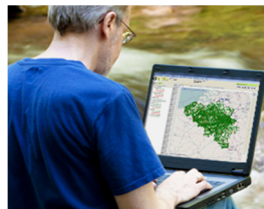


COMP@S

USER'S GUIDE



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Chapter 1 – About this guide

The information and pictures within this guide is believed to be true at the time of publication however Alpha Technologies S.A. accepts no responsibility to consequences from printing errors or inaccuracies. The information, pictures, drawings and specifications contained herein are subject to change without notice.

Guide History:

Date	Edition	Notes
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Chapter 2 – Overview

- [Comp@s Overview](#)
- [Block Diagram of Energy Systems managed by Comp@s](#)
- [DC System Overview](#).

2.1 Comp@s Overview

Magell@n Comp@s is the product name of our new controller. It consists in a new platform extending the range of applications of a traditional dc-system shelf controller. Comp@s product is a “site” monitoring, allowing the supervision and the control of:

- Environmental issues: temperature, humidity, water detection, etc.
- Access control issues: RFID badge reader, door lock, open door detection, etc.
- Integrity issues: vandalism and traffic accident detection
- Whatever you may need, just ask us.

This solution targets large network infrastructure, also with heterogeneous architecture. It is the ideal solution for access networks cabinet monitoring and control. This platform allows customization to satisfy your needs.

Comp@s can be easily integrated in your management system. It supports broad range of standard communication protocols and do not request any proprietary application.

This site monitoring is a powerful tool for OPEX (**O**Perating **E**Xpenditures) reduction. It lowers energy costs, reduce field interventions and provide data logging and statistics facilities.

Comp@s has a very flexible hardware and software architecture, as shown on the following figure. Thanks to this architecture, our platform is open, scalable and evolvable. All our devices (rectifiers and extensions) are connected to a reliable digital bus (CAN Bus). This allows the main monitoring unit to retrieve information, configure and command the devices. This main monitoring unit is running the site management application. This site management application provides multiple communication interfaces: Web server, XML services and SNMP. These interfaces are available over Ethernet and also over USB for local connection (Rem: SNMP not available over USB). All the interfaces allowing access to the monitoring are secured. One administrator and up to five users can have different access and privileges:

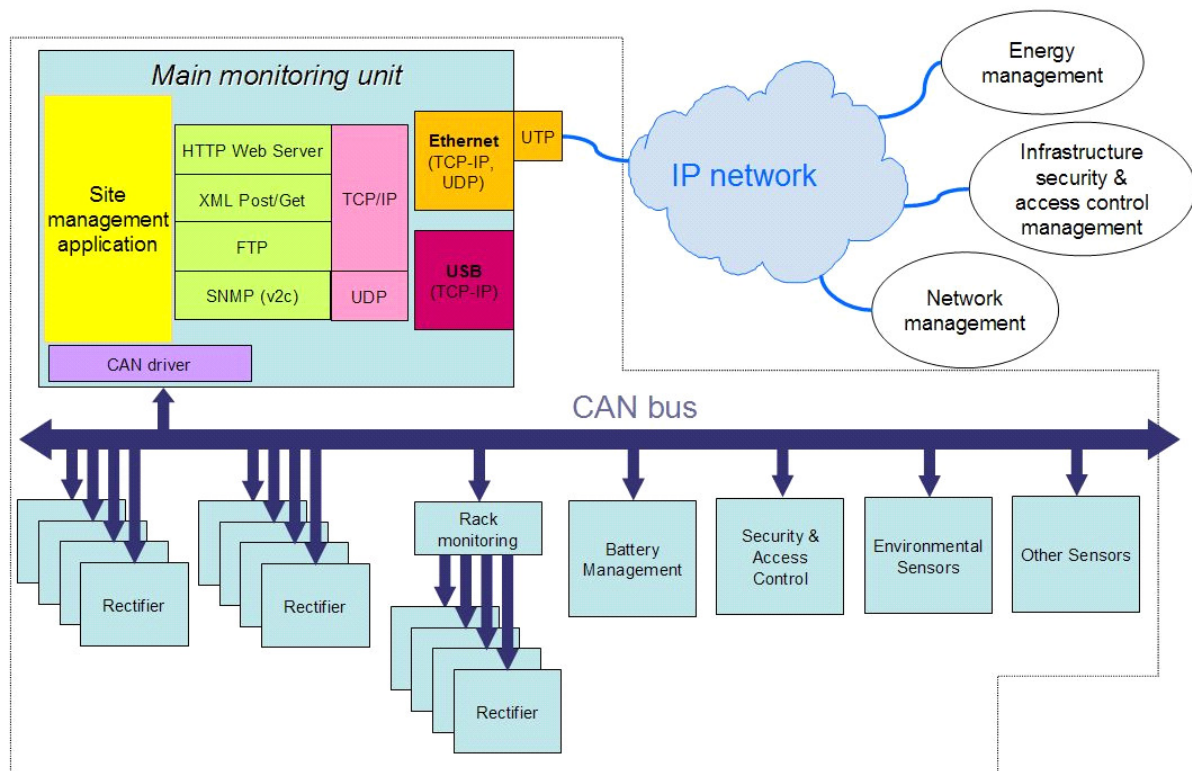


Figure 1 Comp@s Bloc Diagram

2.2 Block Diagram of Energy Systems managed by Comp@s

The following figure schematizes a sub-shelf which integrates 4 rectifiers, a controller unit, an extension card to interface multiple sensors/actuators and the distribution, including the breakers. The typical size of such a sub-shelf is 2U height, and 19" wide:

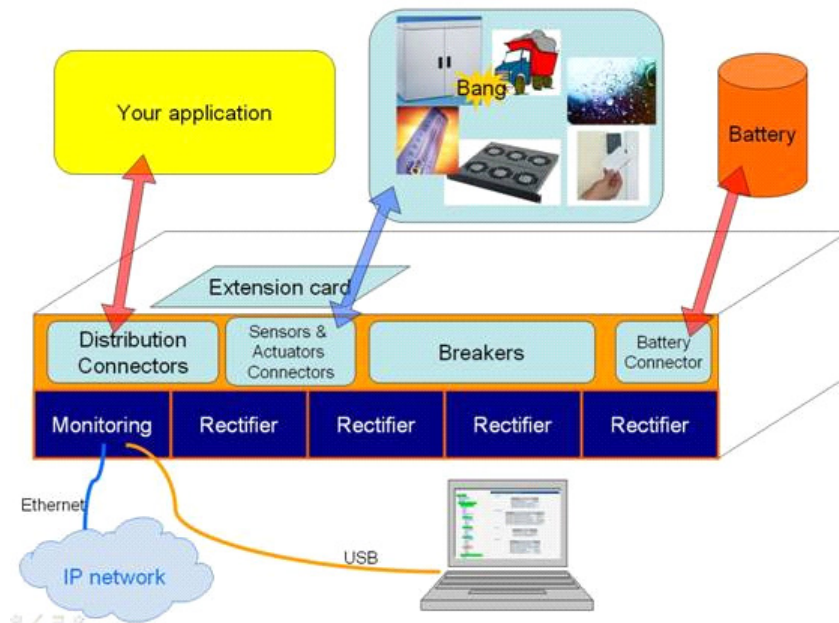


Figure 2 Schematic of the inside of a cabinet

2.3 DC System Overview

- [DC Power System Principles](#)
- [General Information on MCU](#)
- [Mode Of Operation](#)
- [Battery Temperature Compensation](#)
- [Battery Charge Current Control](#)
- [Battery Low Voltage Disconnect Operation \(LVD\)](#)
- [DC System Alarms Overview](#)
- [Battery Test](#)
- [Boost Mode](#)
- [List Of Possible Events.](#)

2.3.1 DC Power System Principles

A DC system is a system converting AC power to DC power.

It is composed of:

- Rectifiers
- AC distribution
- DC distribution
- Battery(ies), avoiding application interruption.
- MCU (Monitoring Control Unit).

The following diagram is a classical representation of a DC system:

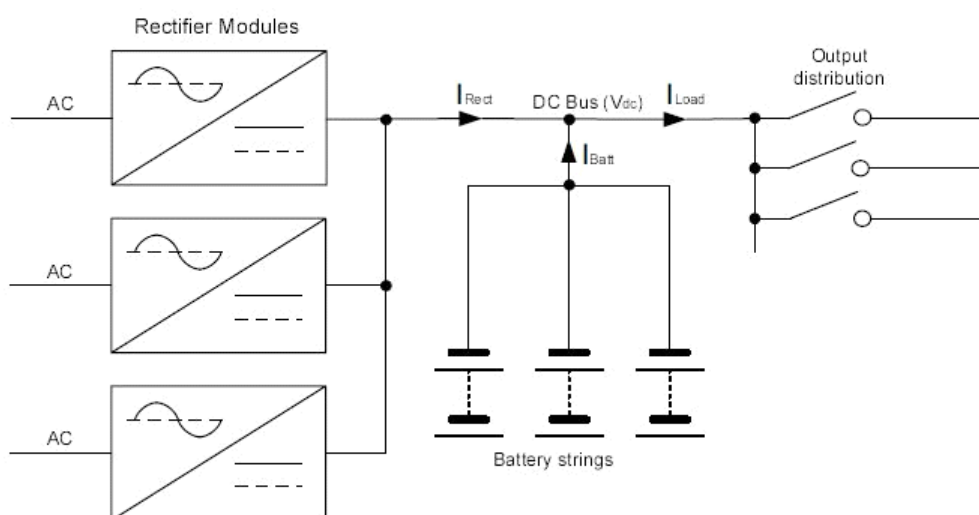


Figure 3 DC System

The following sub-chapters include a high level description of generic functionalities. More information should be available on the user manual of the specific system you are using.

2.3.2 General Information on MCU

A Monitoring Control Unit (MCU) is a micro controller-based monitoring system intended for use to monitor DC Systems, including rectifiers, batteries, and other modules.

The MCU has generally a Comp@s card on it, allowing the human and machine to machine interfaces (over Ethernet/USB). It also extends the functionalities.

If Comp@s is not available, the MCU will control the system with the configuration saved in the Flash.

On most of the systems, the controller is a hot-pluggable, hot-swappable unit that fits into the rectifier rack.

There is often the followings Leds on the front plate :

- Status Led (Green) :
 - Steady : Monitoring is OK
 - Quick Blinking (200ms): Comp@s is not present (or starting), the MCU is working in standalone (With the configuration saved inside the MCU - This can be copied from Comp@s with "Save In MCU" function)
 - Slow Blinking (1Hz): Battery test is running
 - 800 ms On, 200 ms Off : System is in boost mode
- LVD OK (Green) : Is steady on when the LVD is closed
- 4 Leds for Alarms (Red): The leds are linked to the dry alarm relays. Each alarm can be mapped to any relay number (1-4). By convention, we use by default the 1 for major alarms, the 2 for Minor alarms, the 3 for battery specific alarms, and the 4 when the system is in AC Failure.

There is often one push-button:

- Pressed for 1-5 sec : Save configuration
- Pressed for 5-10 sec : Start Battery Test
- Pressed for > 10 sec: Force Battery Test
- Pressed during battery test cancel the test.

2.3.3 Mode Of Operation

The DC system can be in one of the following mode:

- **Float** : the output voltage is set to the float voltage setting. It can be automatically adjusted by the temperature compensation or the current limitation.
- **Boost** : the output voltage is set to the boost voltage setting. It can be automatically adjusted by the temperature compensation or the current limitation.
- **Battery Test** : the battery is being tested. The voltage is going down. Alarm like "Bus Voltage Low" can be generated.
- **Ac Failure** : all the rectifiers are not powered. The battery is discharging.
- **Safe** : the system can go to safe when when there is communication problems or when the voltage/current/temperature sense are not connected correctly.

2.3.4 Battery Temperature Compensation

- [BTC: General Overview](#)
- [BTC: Configuration Parameters](#)
- [Theory Of Battery Temperature Compensation.](#)

BTC: General Overview

The controller includes a control loop that compares the bus voltage with a reference value, and pilots on the rectifiers programming voltage accordingly. It also measures the battery temperature through an external temperature probe (NTC 10K). This measurement, together with the “DC Bus Float Voltage at 25°C” and “Battery Temperature Compensation” configuration, determines the reference voltage. The maximum compensation can be configured.

The Battery Temperature Compensation is regulated by the MCU. The configuration is stored in the MCU, and is updated by Comp@s if present.

BTC: Configuration Parameters

Here is a non-exhaustive list of the related configuration parameters (see equipment tables for detailed information):

- Temperature Compensation Slope
- Maximum Positive Temperature Compensation
- Maximum Negative Temperature Compensation.

Theory Of Battery Temperature Compensation

Battery life expectancy and performance is directly related to battery ambient temperature. The optimum temperature for battery operation is 25°C (77°F). Without compensation, battery life is seriously compromised at temperatures above 25°C, while battery performance is reduced below it.

Adjusting the battery’s float voltage to correspond with temperature fluctuations will ensure maximum battery performance and life expectancy. With the MCU, this may be accomplished by using the software’s built-in automatic temperature compensation function.

This function works by adjusting the system voltage, by step of 0.1V, as the temperature changes, according to the defined parameters.

Temp Comp occurs at standard rates commonly referred to as slope-compensation settings. For maximum performance, it’s important to match the battery slope compensation with the setting recommended by the battery manufacturer. This is not to be confused with slope regulation; which refers to the process of regulating current among a group of parallel-operating rectifiers.

The Temp Comp feature has programmable breakpoints. These are the points at which Temp Comp will cease. Further temperature decreases or increases will NOT increase or decrease the output voltage. This protects the connected load from excessive voltage conditions. As Temp Comp is active in either float or equalize mode, breakpoints should be set with this in mind.

The Temp Comp feature also incorporates fail-safe circuitry to prevent it from driving the rectifier system to a voltage higher than is suitable for the load or battery.

2.3.5 Battery Charge Current Control

- [BCCC: General Overview](#)
- [BCCC: Configuration Parameters.](#)

BCCC: General Overview

The Battery Monitor feature enhances the controller's capability to provide information about the battery to the User. Charge Current Control will help increase battery longevity by keeping the battery current to within specified limits. Charge current to the battery during recharge will be limited to a value as programmed by the Supervisor. This value will be derived from the battery manufacturer's specification sheet and entered by the Supervisor.

The controller performs this limitation by lowering the rectifiers programming voltage when needed, through a control loop in the controller program. This limitation is also active in boost mode.

BCCC: Configuration Parameters

Here is a non-exhaustive list of the related configuration parameters (see equipment tables for detailed information):

- Battery Charge Current Limit
- Shunt Rating At 60mV.

2.3.6 Battery Low Voltage Disconnect Operation (LVD)

- [LVD: General Overview](#)
- [LVD: Configuration Parameters.](#)

LVD: General Overview

The purpose of the Low Battery Disconnect mechanism is to prevent permanent damage to the lead acid battery due to excessive deep discharge.

In most of the systems, there is an hardware and a software LVD. The hardware should be lower than the software.

For 54V systems, the hardware is around 42V. The software will be configured around 46V.

When the LVD is opened, and that the system has no AC input power, the application will not be powered anymore.

It is possible to configure a delay before the opening. It allows to absorb peaks of consumptions without opening the LVD and/or to shut down properly the application thanks to the alarm "DC Bus Voltage Extra Low" for instance.

Before opening the LVD, a DC System event is generated : "System Dying".

LVD: Configuration Parameters

Here is a non-exhaustive list of the related configuration parameters (see equipment tables for detailed information):

- LVD Disconnect Voltage
- LVD Disconnect Delay
- DC Bus Voltage Extra Low.

2.3.7 DC System Alarms Overview

- [Alarms Related To DC Output Bus Voltage](#)
- [Alarms Related To Rectifiers](#)
- [Alarms Related To The Input AC Power Of The Rectifiers](#)
- [Alarms Related To Battery](#)
- [Alarms Related To General Input.](#)

Alarms Related To DC Output Bus Voltage

Here are follows the most common alarms name related to DC output bus voltage. More information can be found in the detailed equipment table of this guide:

- *DC Bus Extra Low* : with parameters "DC Bus Voltage Extra Low" and "DC Bus Voltage Extra Low Hysteresis"

- *DC Bus Low* : with parameters "DC Bus Voltage Low" and "DC Bus Voltage Low Hysteresis"
- *DC Bus High* : with parameters "DC Bus Voltage High" and "DC Bus Voltage High Hysteresis"
- *DC Bus Extra High* : with parameters "DC Bus Voltage Extra High" and "DC Bus Voltage Extra High Hysteresis"
- *DC Bus Voltage Sense Failure.*

It is only related to the Bus voltage measurement. There are different hystereses to avoid changing alarm state around borders values.

Low and extra low alarms happens when the battery is getting discharged.

High and Extra High should never appear with correct configuration, as there is hardware OVP in the rectifiers.

Alarms Related To Rectifiers

The alarms are the following:

- One Rectifier Failure
- More Than One Rectifier Failure
- Missing Rectifiers : with parameter "Minimal Number Of Present Rectifiers".

Note that a rectifier can be considered as in failure when it is not powered, depending of the system configuration. When there is no communication with the rectifier, it is not possible to know if the AC has a problem, or if the rectifier is defect.

Alarms Related To The Input AC Power Of The Rectifiers

The alarms are the following:

- Mains Failure
- Mains Partial Failure
- Mains Low (on some systems)
- Mains High (on some systems).

Alarms Related To Battery

The alarms are the following:

- Battery Last Test Failed
- Battery On Discharge

- Battery LVD Relay Open
- Battery Temperature Too High : with parameters "Battery Temperature High" and "Battery Temperature Hysteresis"
- Battery Temperature Too Low : with parameters "Battery Temperature Low" and "Battery Temperature Hysteresis"
- Battery Temperature Sensor Fail.

Alarms Related To General Input

The alarms are the following:

- Digital Input X
- Battery Breaker Open
- Distribution Breaker Open
- Ambient Temperature Too High
- Ambient Temperature Too Low
- Ambient Temperature Sensor Fail.

These alarms have no consequence on the system regulation by default.

2.3.8 Battery Test

A battery test can be started periodically, remotely, or when the front plate switch of the MCU is pressed for more than 5 seconds.

- [Principle](#)
- [Applied Equations](#)

Principle

The test itself consists of programming the required bus voltage down to a low level, which has the effect of discharging the battery into the load. The battery discharge current is then integrated over time, and the integration result is compared to a given Ampere hour value.

During the battery test, the discharge current of the battery is regulated at the configured parameter "Battery Test Discharge Current". If the output current is greater than the discharge current limit, the rectifiers supply the difference of current. If the output current is

too low, according to parameter “Battery Test Minimal Discharge Current”, the test will be canceled.

If the Ampere hour value is reached while the bus voltage is still above the “Battery Test End Voltage”, the battery is considered good and the “Battery Last Test Failed” alarm is not generated.

If the bus voltage reaches the “Battery Test End Voltage” prior to reaching the Ampere hour value, the battery test is considered as failed and the “Battery Last Test Failed” alarm is generated. This alarm remains active until the front panel switch is pressed or reset through a communication interface.

If the front panel switch is pressed during a test, the test is immediately canceled.

After a battery test (succeeded, failed or canceled), the DC system returns in float or boost mode, according to configuration.

Applied Equations

Battery test is based on Peukert's law for discharging a lead-acid battery ([1]), that predicts battery capacity for a given discharge current and discharge time.

Battery String Capacity is the capacity in Ampere-hours given by constructor for a rated discharge time (generally: 10 hours). Peukert Number is a constant comprised between 1.1 and 1.3, according to lead-acid used technology and battery aging.

According to this model, effective current (battery capacity divided by actual time to discharge it) is calculated by: $\text{actual current} * (\text{actual current} * \text{rated discharge time} / \text{battery capacity})^{(Peukert - 1)}$.

- If effective current is < 0 , battery is discharging.
- If effective current is > 0 , battery is charging.

Battery remaining capacity equals (in %) to: $100 * (\text{battery capacity} + \text{sum}(\text{effective current}(\text{minute}) / 60) / \text{battery capacity})$.

[1] http://en.wikipedia.org/wiki/Peukert%27s_law

2.3.9 Boost Mode

The DC bus voltage can be increased in order to charge the battery faster. This mode can be automatically started after an AC Failure, after a battery test, or remotely. (This mode is recommended only with some kind of battery).

2.3.10 List Of Possible Events

Here is a non-exhaustive list of DC System's possible events. For each listed event, a possible fix or user action is suggested:

Event Name	Description	Fix
DC System Started	DC System shelf has been detected by Comp@s and is now monitored	Nothing to do
DC System Dying	This event only happens when DC system is using battery. Alarm "DC Bus Extra Low" will be generated just before this event happens (see: Battery Low Voltage Disconnect Operation (LVD)).	Charge battery, or recover AC input voltage
DC Mode Changed <new_mode>	: Mode of operation has been changed (see: Mode Of Operation). If critical, an alarm will be generated.	Check alarm
Alarm Set: <alarm_name>	The corresponding alarm has been set.	Check alarm
Alarm Clear: <alarm_name>	The corresponding alarm has been cleared.	Nothing to do

Chapter 3 – Getting Started

- [Connecting the Comp@s Web Server over Ethernet](#)
- [Connecting the Comp@s Web Server over USB](#)
- [Using The Web Interface](#)
- [Using the Comp@s SNMP Agent](#)

3.1 Connecting the Comp@s Web Server over Ethernet

The Comp@s monitoring RJ45 female port provides a standard 10/100 MBit Ethernet connection. The default network configuration is:

Default Ethernet Configuration

IP address: **192.168.45.2**

Sub Mask: **255.255.255.0**

Required material:

- A personal computer with Ethernet capabilities;
- A crossed Ethernet cable if the PC is directly connected to the Comp@s monitoring (Some recent PC have an automatic polarity detection, in this case a straight cable can be used);
- A straight Ethernet cable if the Comp@s monitoring is connected to a switch.

Required software:

- Any operating system with an up to date web browser. It is recommended to use Firefox >= 2.x or Internet Explorer >=7.x.

To connect to the system, the personnel computer has to be configured with a static IP address. You can use the IP 192.168.45.1 for example, with 255.255.255.0 as sub mask.

To do this under Windows XP, Access the Network Connections control panel (**Start -> Control Panel -> Network Connections**). Pick the connection you're using, generally Local Area Connection. Right-click on that connection's icon and pick Properties. Under "this connection uses the following items," scroll down to "Internet Protocol (TCP/IP)" and double-click on that. The "Internet Protocol (TCP/IP) Properties" window will appear:

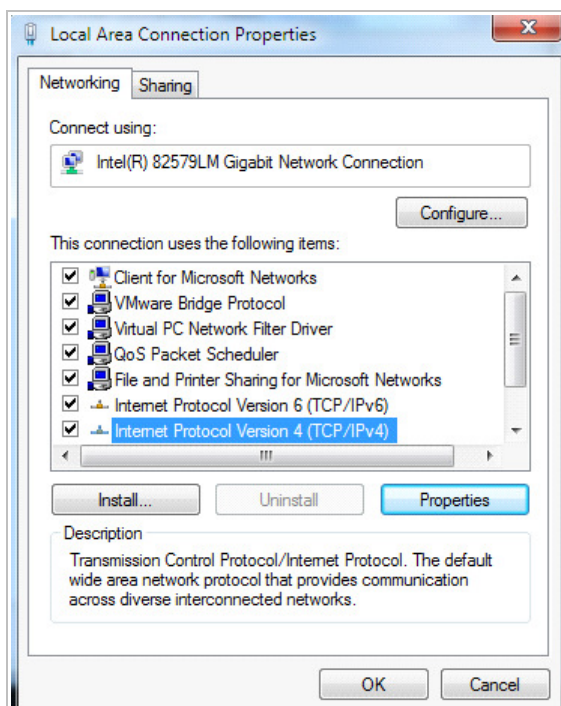


Figure 4 Network Configuration

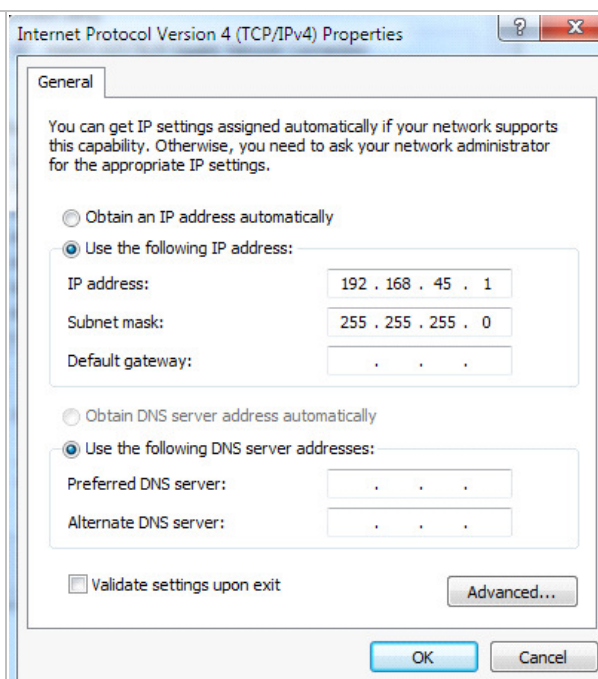


Figure 5 TCP/IP Configuration

Right now, "Obtain an IP address automatically" is probably selected. Instead, select "Use the following IP address." In the "IP address:" field, enter the address you chose (for example, 192.168.45.1). The subnet mask will automatically become 255.255.255.0, which is correct. Then, click the "OK" button.

You can now start your web browser and browse to the URL <http://192.168.45.2>. The Comp@s web server will ask for a login and a password which are:

Default Admin Password

Login/User Name : **admin**

Password : **compas**

(Please note that login and password are case sensitive)

You are now connected on the web interface as administrator of the system. For the users : refer to [User Access Management](#).

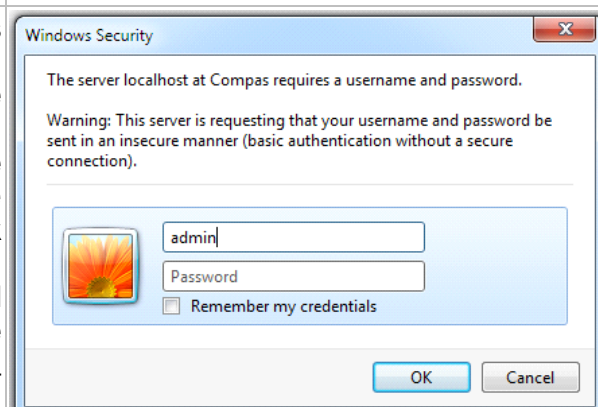


Figure 6 Authentication

3.2 Connecting the Comp@s Web Server over USB

The USB Type-B socket provides a standard USB client connection, allowing having a local connection with any computer. Here follows the procedure.

Required material:

- A personal computer with Ethernet capabilities;
- A standard Type-B plug to Type-A USB plug.



Required software:

- A Windows XP / Vista / Seven operating system.
- A web browser: it is recommended to use Firefox >= 2.x or Internet Explorer >=7.x.
- The free Microsoft Active Sync application. This application is available on the web: <http://www.microsoft.com/en-us/download/details.aspx?id=15>
- Please note that with Vista, you don't have to install Active Sync. The "Sync Center" is already installed and is enough. (In this case, you can skip step 2.) With Windows 7, you should download the free Microsoft Mobile Device Center application: <http://www.microsoft.com/download/en/details.aspx?id=14> (32-bit), <http://www.microsoft.com/download/en/details.aspx?id=3182> (64-bit).

STEP 1: Do not connect the USB cable yet

STEP 2: Install the Active Sync application. A computer reboot may be asked at the end of the installation.

STEP 3: Activate the port forwarding over USB. To do this, a small modification in the registry must be done. You can use the windows registry editor "Regedit", and add the following entry:

In HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows CE Services\ProxyPorts, add the "HTTP PORT FORWARDING" DWORD value, with data: 00000050.

STEP 4 (facultative): If you need to redeploy on several client, open a new text file and write the followings 3 lines:

```
Windows Registry Editor Version 5.00
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows CE Services\ProxyPorts
"HTTP PORT FORWARDING"=dword:00000050
```

Then, save the file as "Compas.reg" and execute it (double-click).

STEP 5: Connect the USB cable between the personal computer and the Comp@s monitoring.

STEP 6: Active Sync application should detect the connection and ask to "Set Up a Partnership". Just click on "No" and afterwards on "Next".

STEP 7: It is now possible to browse the Comp@s Flash disk content by going to: Start menu > Computer > Compas, under Windows Vista or Windows 7 (or: Desktop > My Computer > Mobile Device, under Windows XP).

STEP 8: Start your Web Browser and enter the URL address <http://127.0.0.1> or <http://localhost> .

STEP 9: The Comp@s web server will ask for a login and a password which are:

Default admin password

Login/User Name: **admin**

Password: **compas**

(Please note that login and password are case sensitive)

You are now connected on the web interface as administrator of the system.

3.3 Using The Web Interface

- [Web Page Layout Overview](#)
- [Modifying Comp@s Settings](#)
- [Modifying Comp@s SettingsChanging the Network Configuration](#).

3.3.1 Web Page Layout Overview

The following figure shows the initial web page displayed after login. The left part displays the last refresh time of the web page and a hierarchy of the component of the system (Site, DC System, Rectifier, etc.). If all these tree nodes are in a grey color, no alarm is active. The main content concerns the description of a site, comprising address, GPS position, etc. One can see the presence of different tabs (Description, Alarms, Events, Data, Records, Configuration), allowing to see corresponding values related to the selected tree node:

Comp@s : the Alpha Technologies Monitoring System

[Main Page](#) | [Main Page Without JavaScript](#) | [Summary](#) | [Normal Mode](#) | [Edit Mode](#) | [site.xml](#) | [configuration.xml](#) | [SNMP MIB](#) | [Advanced](#)

Last Refresh : 2012-02-27T17:26:44
Uptime : 0d 0h 4m 33s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

DC System (2)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

DC System (1)

Site (1) - Status is normal

Description

Site

1	Site Number	1
2	Site Name	Comp@s Site
3	Short Description	Comp@s Site Description
4	Info	none

Contact

7	Contact Name	
8	Phone Number	

Address

11	Street	undefined
12	City	undefined
13	Province	undefined
14	Postal Code	undefined
15	Region	undefined
16	Country	undefined

GPS Position

31	Latitude	0
32	Longitude	0
33	Altitude	0

Comp@s

91	Software Revision	0.1.0.102
----	-------------------	-----------

[Show Help](#)

Figure 7 Initial page displayed

The following tabs are therefore available:

- [Description Tabs](#)
- [Alarm Tabs](#)
- [Event Tabs](#)
- [Data Tabs](#)
- [Record Tabs](#)
- [Configuration Tabs](#)
- [Control Tabs.](#)

Description Tabs

The following screenshot shows an automatic description of a specific rectifier. Some of our rectifiers embed their hardware/software reference and revision, their serial number,

manufacturing id, manufacturing date, etc. This allows a powerful traceability of our products in a network of widely spread cabinet:

Rectifier (2) - Status is normal

Description
Alarms
Events
Data
Records
Config
Control

manufacturer

11111111111111111111

Product Name	CAR0948TN
Hardware Reference	9411 010 95001
Hardware Revision	3
Software Reference	4004 110 60953
Software Revision	3
Serial Number	1357
Manufacturing ID	0605538
Manufacturing Date	Y07W09

Figure 8 Rectifier Tab

Alarm Tabs

The following figure illustrates how the alarms are displayed. The active alarms are highlighted in a color corresponding to the severity type of the alarm (Red: major, Orange: minor, Yellow: warning). One can see the start time and the stop time of a specific alarm, the associated relay (if dry alarms exist), the severity type and the severity level. When equipment is in alarm, the left tree menu reflects the situation, allowing to quickly locating a problem:

Last Refresh : 2007-11-30T11:11:43
Uptime: 6d 20h 19m 57s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (3)

Rectifier (5)

DC System (1) - Status is alarms

Description
Alarms
Events
Data
Records
Config
Control

ID	Name	Start Time	Stop Time	Severity Type	Severity Level	Relay	Is On
1	DC Bus Extra Low	***	***	major	6	1	False
2	DC Bus Low	2007-11-26 21:05:30Z	2007-11-30 10:25:45Z	minor	4	2	False
3	DC Bus High	***	***	minor	4	2	False
4	DC Bus Extra High	***	***	major	6	1	False
5	DC Bus Voltage Sense Failure	***	***	major	6	1	False
6	Mains Failure	2007-11-30 11:03:08Z	***	minor	4	4	True
7	Mains Partial Failure	2007-11-15 15:31:46Z	2007-11-15 15:32:23Z	minor	4	4	False
8	Mains Low	***	***	warning	2	4	False
10	One Rectifier Failure	***	***	major	6	1	False
11	More Than One Rectifier Failure	***	***	major	6	1	False
13	Battery Last Test Failed	***	***	minor	4	3	False
14	Battery On Discharge	***	***	minor	4	3	False
17	Battery Low Voltage Disconnect Open	2000-01-01 00:00:15Z	***	none	0	0	True
18	Battery Temperature Too ...	***	***	minor	4	3	False

Figure 9 Alarms at the DC System level

The following figure illustrates how an alarm can be configured. It is possible to change the severity type, the severity level, the associated dry alarm relay, the set delay and the clear delay:

DC System (1) - Status is normal						
Description	Alarm	Event	Data	Record	Configuration	Control
ID	Name	Severity Type	Severity Level	Relay	Set Delay	Clear Delay
1	DC Bus Extra Low	major Modify	6 Modify	1 Modify	1 Modify	1 Modify
2	DC Bus Low	minor Modify	4 Modify	2 Modify	1 Modify	1 Modify
3	DC Bus High	minor Modify	4 Modify	2 Modify	1 Modify	1 Modify
4	DC Bus Extra High	major Modify	6 Modify	1 Modify	1 Modify	1 Modify
5	DC Bus Voltage Sense Failure	major Modify	6 Modify	1 Modify	1 Modify	1 Modify
6	Mains Failure	minor Modify	4 Modify	4 Modify	1 Modify	1 Modify

Figure 10 Alarm configuration

The following figure shows alarms related to some sensors and actuators connected to an extension module: Vandalism alarm (shock detection), Water Detection, Cabinet Temperature Too High, Cabinet Humidity High, Badge Reader Failure, etc.:

Sensors And Actuators (1) - Status is alarms

Description	Alarm	Event	Data	Record	Configuration	Control
ID	Name	Start Time	Stop Time	Severity	Is Set	
1	Cabinet Temperature High	***	***	major (6)	False	
2	Cabinet Temperature Low	2008-05-14 15:57:18Z	***	major (6)	True	
3	Cabinet Temperature Sensor Fail	***	***	minor (4)	False	
11	Cabinet Humidity High	***	***	major (6)	False	
12	Cabinet Humidity Low	***	***	major (6)	False	
21	Water Detection Alarm	***	***	major (6)	False	
31	Tilt X Alarm	***	***	major (6)	False	
32	Tilt Y Alarm	***	***	major (6)	False	
41	Vandalism Alarm	***	***	major (6)	False	
51	Badge Reader Failure	2008-05-14 15:57:16Z	***	major (6)	True	
71	General Input 1	***	***	warning (2)	False	
72	General Input 2	***	***	warning (2)	False	
73	General Input 3	***	***	warning (2)	False	
74	General Input 4	***	***	warning (2)	False	
75	General Input 5	***	***	warning (2)	False	
76	General Input 6	***	***	warning (2)	False	
77	Door 1 Open	2008-05-14 15:57:15Z	***	warning (2)	True	
78	Door 2 Open	2008-05-14 15:57:15Z	***	warning (2)	True	
79	Door 3 Open	2008-05-14 15:57:15Z	***	warning (2)	True	
80	Door 4 Open	2008-05-14 15:57:15Z	***	warning (2)	True	

Figure 11 Sensors and Actuators alarms

Event Tabs

The following figures show a list of events related to a DC System. It is possible to configure the number of events to keep. These events can be sent to multiple servers with SNMP traps or by HTTP post of XML files to a primary and a secondary server:

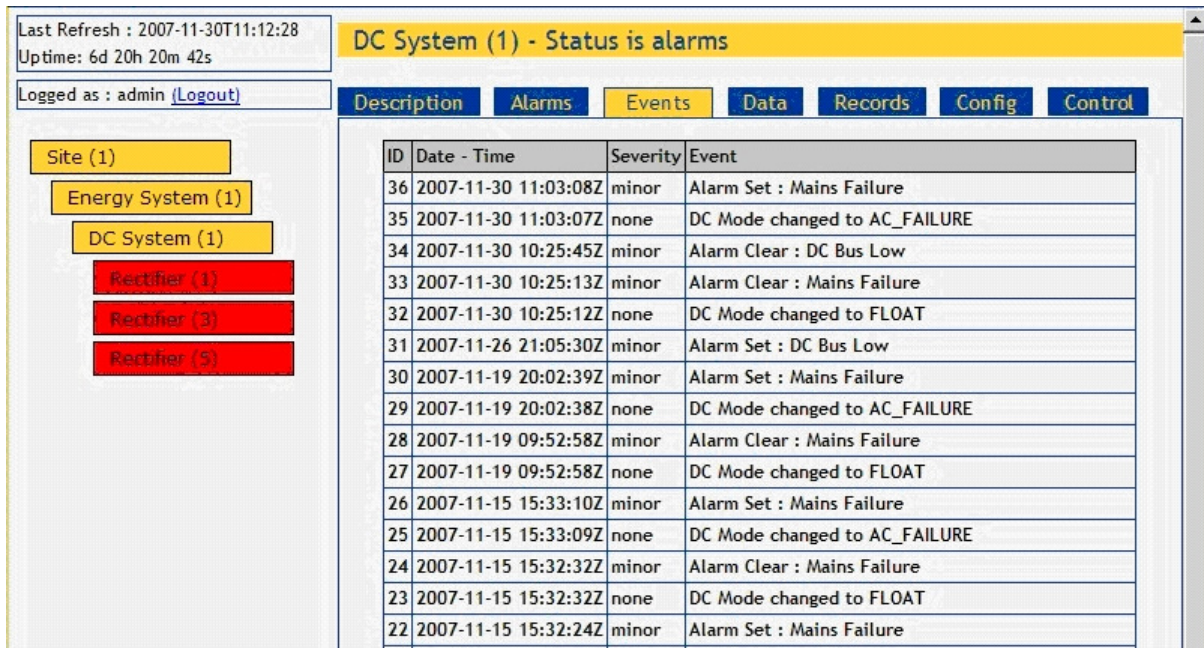


Figure 12 Events related to DC System

Data Tabs

The following figure shows some data related one DC system: bus voltage, number of present rectifier, load power, rectifier output power, etc.:

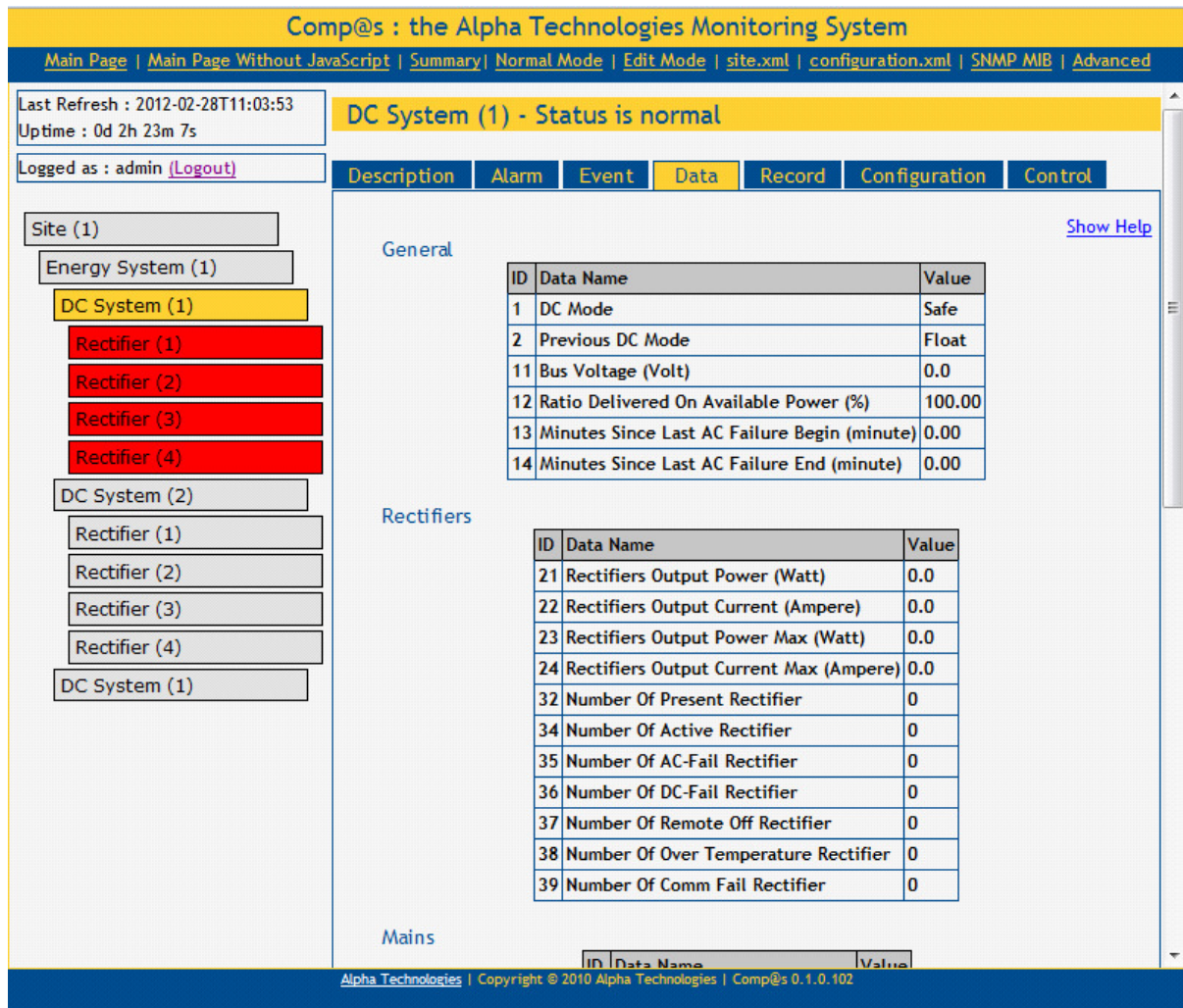


Figure 13 Data related to DC System

The following screenshot shows detailed data related to a specific rectifier. It is possible to retrieve for example: the power rating, the fan speed, the temperature, the total converted energy, the service time, the input AC voltage, etc. The screenshot is an example for the CAR0948TN rectifier:

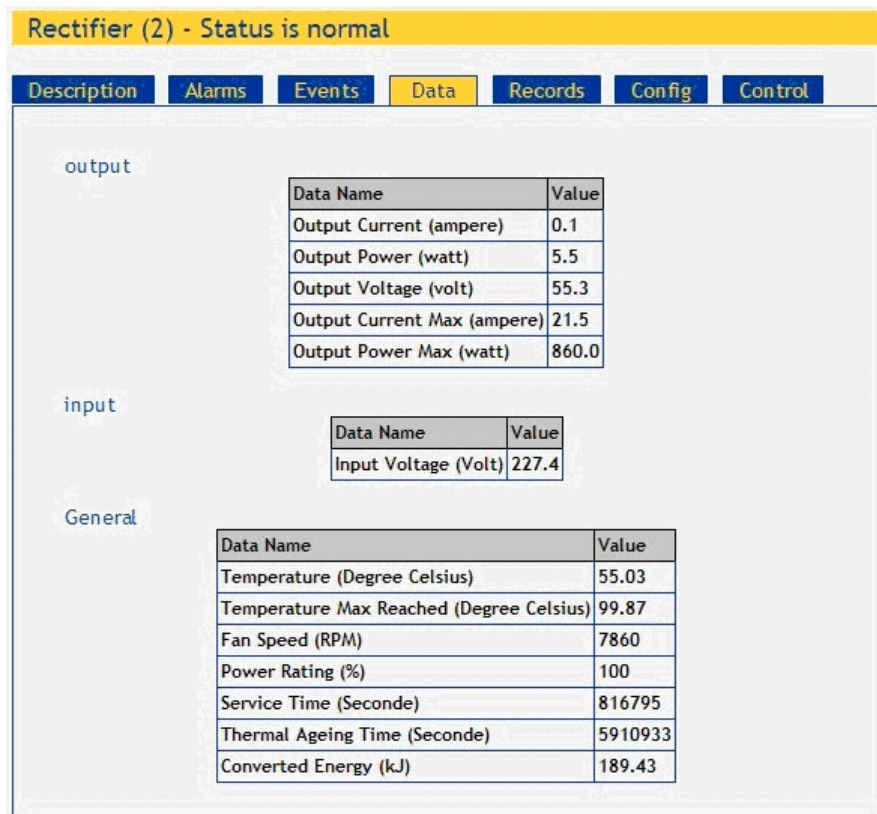


Figure 14 Rectifier Data

The following screenshot shows data related to some sensors and actuators connected to an extension card. One can see the cabinet temperature, the relative humidity, the tilt of a cabinet, heat exchanger status, RFID badge reader information, door lock state, etc.:

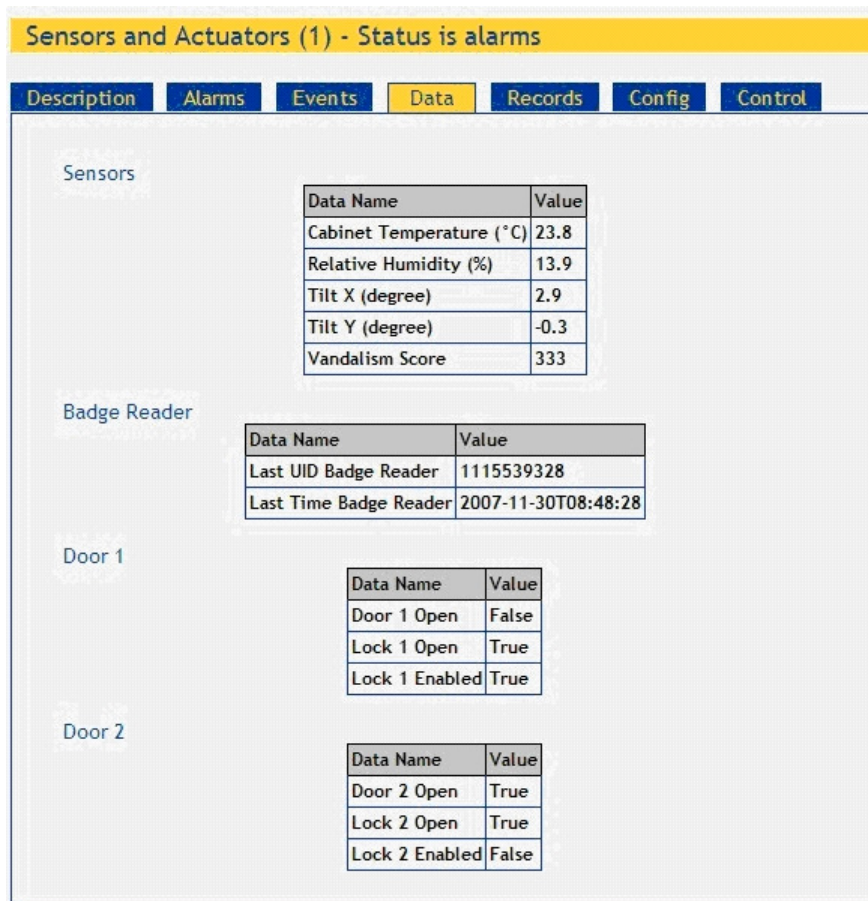


Figure 15 Sensors and Actuators data

Configuration Tabs

The following screenshot illustrates some configuration elements for a dc system. Battery test, boost, partial load disconnection, opening LVD, battery temperature compensation can be configured in these tabs:

Last Refresh : 2007-11-30T10:49:05
Uptime: 6d 19h 57m 19s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (3)

Rectifier (5)

DC System (1) - Status is normal

Description

Alarms

Events

Data

Records

Config

Control

Bus Voltage

DC Bus Float Voltage at 25 degC (Volt)	54.00
DC Bus Voltage Extra Low (Volt)	45.00
DC Bus Voltage Extra Low Hysteresis (Volt)	1.00
DC Bus Voltage Low (Volt)	48.00
DC Bus Voltage Low Hysteresis (Volt)	0.50
DC Bus Voltage High (Volt)	56.50
DC Bus Voltage High Hysteresis (Volt)	0.50
DC Bus Voltage Extra High (Volt)	58.00
DC Bus Voltage Extra High Hysteresis (Volt)	0.50
LVD Disconnect Voltage (Volt)	43.20
LVD Disconnect Delay (Seconds)	0

Temperature Compensation

Temperature Compensation Slope (mV/degree)	-72
Maximum Positive Temperature Compensation (Volt)	3.00
Maximum Negative Temperature Compensation (Volt)	-3.00

Battery

Battery Charge Current Limit (A)	10.00
Battery String Capacity (Ah)	35
Battery Temperature Low (degree)	0.00
Battery Temperature High (degree)	40.00
Battery Temperature Hysteresis (degree)	2.00
Minimal Current For Discharging Alarm (A)	2
Current Hysteresis for discharging alarm (A)	0.2

Figure 16 DC System Configuration Tab

The configuration of the site:

Comp@s : the Alpha Technologies Monitoring System

[Main Page](#) | [Main Page Without JavaScript](#) | [Summary](#) | [Normal Mode](#) | [Edit Mode](#) | [site.xml](#) | [configuration.xml](#) | [SNMP MIB](#) | [Advanced](#)

Last Refresh : 2012-03-26T16:30:14
Uptime : 0d 0h 0m 29s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

Sensors And Actuators (1)

Site (1) - Status is alarms

Description
Alarm
Event
Data
Record
Configuration
Control

Network

Time

Web Server

Event Posting

1	DHCP Enabled	False
2	IP Address If Static	192.168.45.2
3	Subnet Mask If Static	255.255.255.0
4	Default Gateway If Static	192.168.45.1
5	DNS If Static	192.168.45.1
9	Ethernet Mode	auto

11	SNTP Time Server	NOT AVAILABLE
14	Time Zone Name	Not Available

22	Web Server Security Enabled	True
23	Web Server Port	80
24	Web Authentication Method	Basic access

41	XML Event Posting Activated	True
42	XML Event Posting Refresh Time (second)	2
43	XML Event Posting Timeout (millisecond)	2000
45	XML Event Posting To Secondary Only If Primary Failure	True

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Figure 17 Site Configuration

Sensors and Actuators (1) - Status is alarms

Description
Alarms
Events
Data
Records
Config
Control

Alarm Parameters

Cabinet Temperature High (°C)	40.00
Cabinet Temperature Low (°C)	-5.00
Cabinet Humidity High (%)	80.00
Cabinet Humidity Low (%)	0.00
Tilt X High (degree)	10.00
Tilt Y High (degree)	10.00
Vandalism Detection Threshold	500

Access Control

Access Control Enabled On Door 1	True
Authorised OID Door 1	
Auto Close Time Door 1	30
Door 1 Lock Disabled If Badge Reader Failure	True
Access Control Enabled On Door 2	False
Authorised OID Door 2	
Auto Close Time Door 2	30
Door 2 Lock Disabled If Badge Reader Failure	True

Digital Inputs

Digital Input 1 Name	General Input 1
Digital Input 1 Normally Closed	True
Digital Input 2 Name	General Input 2
Digital Input 2 Normally Closed	True
Digital Input 3 Name	General Input 3
Digital Input 3 Normally Closed	True

Figure 18 The configuration of an extension card

Record Tabs

The monitoring can keep data records. It can provide the record of the last seconds, last minutes, last hours, last days, and last months. This is a powerful tool to do statistics and optimize many parameters in your systems.

Note that these records are accessible only if the “asset” license package is present.

Comp@s : the Alpha Technologies Monitoring System

[Main Page](#) | [Main Page Without JavaScript](#) | [Summary](#) | [Normal Mode](#) | [Edit Mode](#) | [site.xml](#) | [configuration.xml](#) | [SNMP MIB](#) | [Advanced](#)

Last Refresh : 2012-05-04T12:38:17
 Uptime : 0d 0h 1m 12s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

Sensors And Actuators (1)

DC System (1) - Status is alarms

Description
Alarm
Event
Data
Record
Configuration
Control

List Of The Available Recorded Data:

ID	Group	Data Name	Record Period
11	General	Bus Voltage	second - minute - hour - day
21	Rectifiers	Rectifiers Output Power	second - minute - hour - day
22	Rectifiers	Rectifiers Output Current	second - minute - hour - day
51	Load	Load Power	second - minute - hour - day
52	Load	Load Current	second - minute - hour - day
61	Battery	Battery Input Current	second - minute - hour - day
62	Battery	Battery Input Power	second - minute - hour - day
71	Battery	Battery Temperature	second - minute - hour - day
151	Sensors	Ambient Temperature	second - minute - hour - day
161	Sensors	Voltage Sense 1	second - minute - hour - day
162	Sensors	Voltage Sense 2	second - minute - hour - day
163	Sensors	Voltage Sense 3	second - minute - hour - day
204	Sensors	Digital Input 4 Counter	second - minute - hour - day

Download All Data Records In CSV Format	Record Period
Records Of Average	second - minute - hour - day
Records Of Minimum	minute - hour - day
Records Of Maximum	minute - hour - day

List of the Available Recorded Battery Test:

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Figure 19 DC System Record Tab

The following screenshots show charts with the bus voltage for the last days and minutes and the battery temperature for the last days:

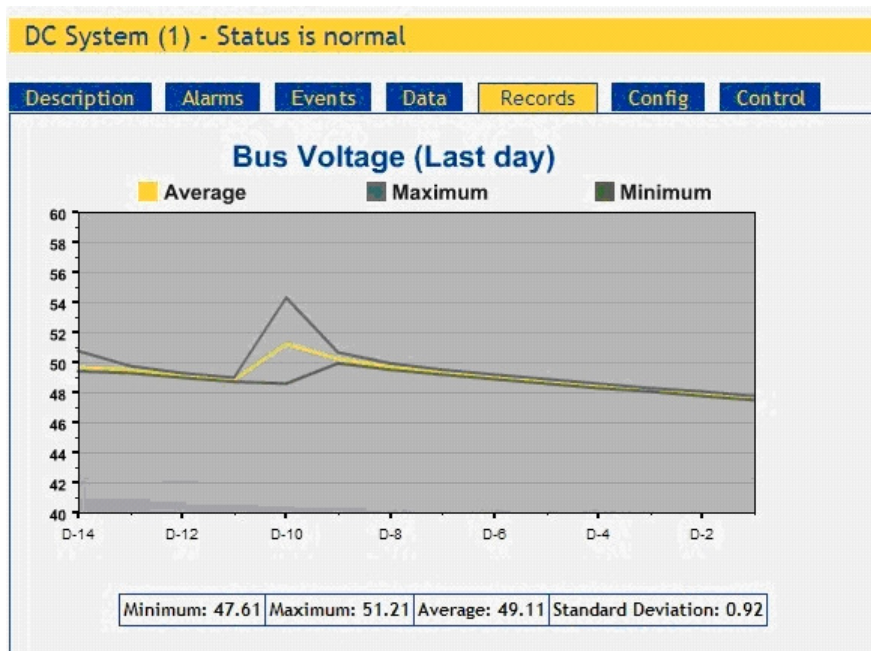


Figure 20 Bus Voltage record of the last days

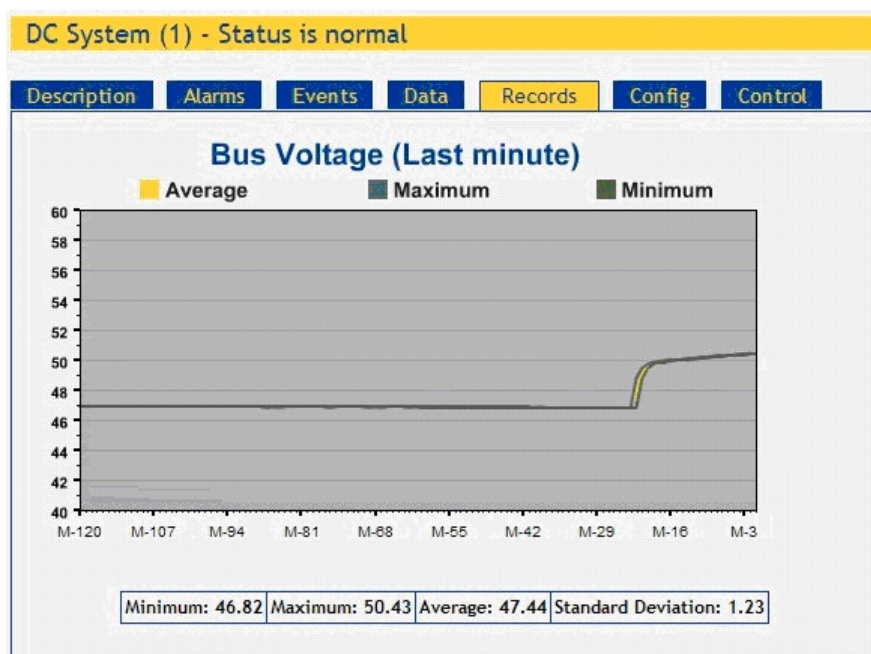


Figure 21 Bus Voltage record of the last minutes

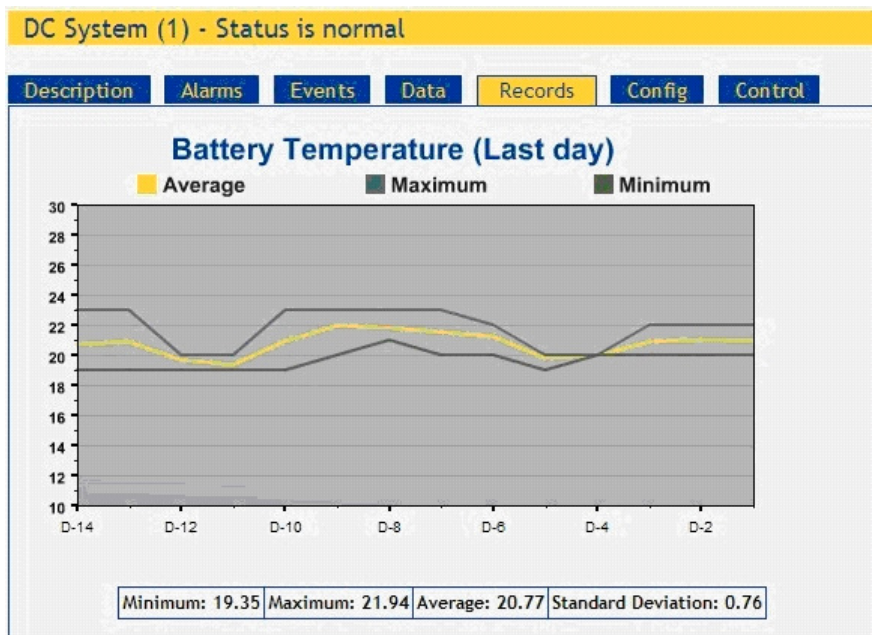


Figure 22 Battery Temperature record for the last days

Control Tabs

A control tab contains elements which can be executed, like starting a battery test, rebooting the monitoring, etc. The control command when the user clicks on the “Execute” button. On some entry, a parameter value is passed when executing the command:

Site (1) - Status is alarms

Description Alarm Event Data Record Configuration Control

Comp@s

Reboot Monitoring	Execute
Save Configuration And Reboot Monitoring	Execute
Apply LAN Configuration	Execute

Time

Force SNTP Time Refresh	Execute
Set Local Time	2008-05-14T20:08:51 Execute
Set UTC Time	2008-05-14T18:08:51 Execute
Reset Uptime	Execute

Save

Save XML User Configuration	Execute
Save Events	Execute

Translation

Reload Translations	Execute
---------------------	---------

Figure 23 Control Tab at site level

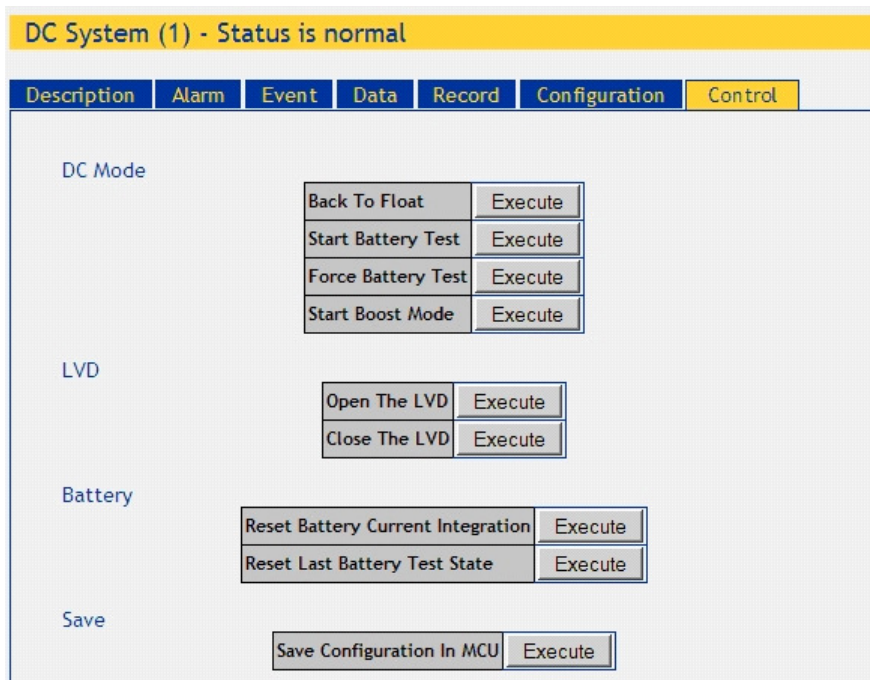


Figure 24 Control Tab at DC System level

3.3.2 Modifying Comp@s Settings

- [Modifying values](#)
- [Saving The Changes.](#)

Modifying values

The following figures illustrate how to change any configurable value. When you click on "Edit Mode" ("Config Mode" on previous release), all the configurable values become editable. You are now able to change the value:

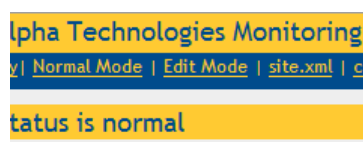


Figure 25 Edit Mode

Comp@s : the Alpha Technologies Monitoring System

[Main Page](#) |
 [Main Page Without JavaScript](#) |
 [Summary](#) |
 [Normal Mode](#) |
 [Edit Mode](#) |
 [site.xml](#) |
 [configuration.xml](#) |
 [SNMP MIB](#) |
 [Advanced](#)

Last Refresh : 2012-02-27T14:09:33
Uptime : 0d 1h 25m 57s

Logged as : admin ([Logout](#))

DC System (1) - Status is normal

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

DC System (2)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

DC System (1)

Description
Alarm
Event
Data
Record
Configuration
Control

[Show Help](#)

Bus Voltage

1	DC Bus Float Voltage at 25 degC (Volt)	54.00	Modify
2	DC Bus Voltage Extra Low (Volt)	45.00	Modify
3	DC Bus Voltage Extra Low Hysteresis (Volt)	1.00	Modify
4	DC Bus Voltage Low (Volt)	48.00	Modify
5	DC Bus Voltage Low Hysteresis (Volt)	0.50	Modify
6	DC Bus Voltage High (Volt)	56.50	Modify
7	DC Bus Voltage High Hysteresis (Volt)	0.50	Modify
8	DC Bus Voltage Extra High (Volt)	58.00	Modify
9	DC Bus Voltage Extra High Hysteresis (Volt)	0.50	Modify

Temperature Compensation

21	Temperature Compensation Slope (mV/degree)	-72	Modify
22	Maximum Positive Temperature Compensation (Volt)	3.00	Modify
23	Maximum Negative Temperature Compensation (Volt)	-3.00	Modify

Battery

30	Number Of Battery String (Ampere)	0	Modify
31	Battery Charge Current Limit (Ampere)	1000.00	Modify
32	Battery String Capacity (Ah)	0	Modify

Figure 26 Modifying values

A click on the “Modify” button sends the change to the monitoring. This method is used to change any parameter of the system. If the parameter is wrong, a message is displayed or the previous parameter is reset.

Note that each modification of setting must be confirmed individually by a “click” on the “Modify” button of the concerned parameter or information.

If you reboot the system after parameters change, modification will be lost. You have to save the system configuration after changes, as explained in [Saving The Changes](#).

Saving The Changes

Once settings have been modified, they must be saved in the persistent Comp@s memory. If not, these modifications will be lost on the next reboot.

STEP 1: Click on “Site”

STEP 2: Browse to “Control” (Most right tab)

STEP 3: Click on “Execute” at the entry “Save XML User Configuration”

STEP 4: The settings are now stored in the Comp@s Persistent Memory:

Comp@s : the Alpha Technologies Monitoring System

[Main Page](#) | [Main Page Without JavaScript](#) | [Summary](#) | [Normal Mode](#) | [Edit Mode](#) | [site.xml](#) | [configuration.xml](#) | [SNMP MIB](#) | [Advanced](#)

Last Refresh : 2012-02-15T13:59:54
 Uptime : 0d 0h 1m 49s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

Sensors And Actuators (1)

34 Export Data Records in CSV
Execute

35 Archive Data Records
Execute

40 Emulate Records
Execute

41 Reload Translations
Execute

51 Reload License
Execute

CAN Bus

81	Reset CAN Bus Node	1	Execute
82	Save CANOpen LSS Configuration		Execute
83	Start New Inventory		Execute
84	Remove Missing Devices		Execute
91	Upgrade Node Firmware	0,filename	Execute
92	Cancel Firmware Upgrade		Execute

Comp@s Advanced Function

103	Flash Binary		Execute
110	Download File From Url		Execute
111	Delete User Uploaded File		Execute
112	Move User Uploaded File		Execute
113	Extract Zip File in user-upload		Execute
121	Generate AML Doc		Execute

Event

501	Clear My Events		Execute
502	Clear All Events		Execute
511	Add Event	Test Event	Execute
512	Add Major Event	Test Major Event	Execute
521	Reset Default Names		Execute

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Figure 27 Saving of settings

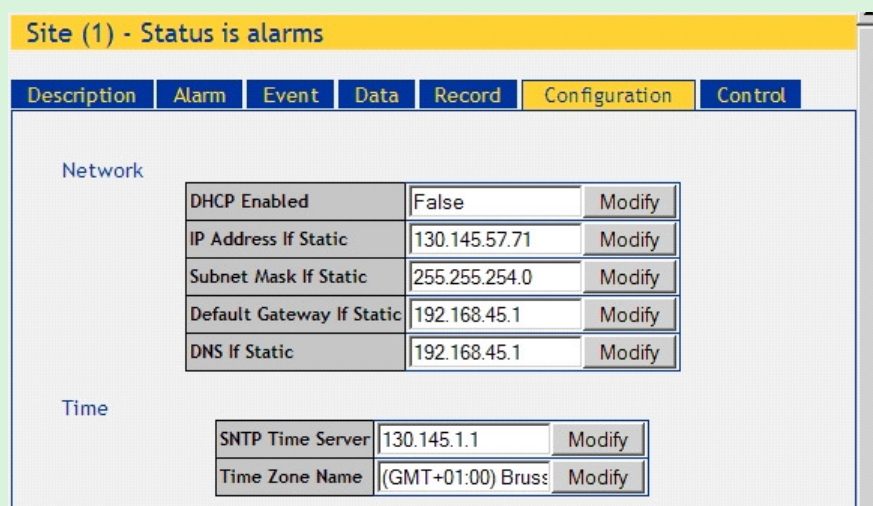
For more details about configuration savings, refer to [Save / Load configuration](#).

3.3.3 Changing the Network Configuration

Network configuration steps

STEP 1: Configure the Network Configuration:

The configuration parameters are available in Site -> Configuration, as shown on Figure 28. Information about these parameters is available in the detailed table of chapter 8.1.:



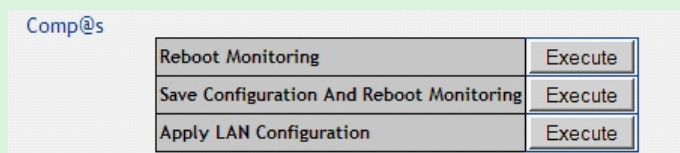
Site (1) - Status is alarms

Description	Alarm	Event	Data	Record	Configuration	Control
Network						
DHCP Enabled			False		Modify	
IP Address If Static			130.145.57.71		Modify	
Subnet Mask If Static			255.255.254.0		Modify	
Default Gateway If Static			192.168.45.1		Modify	
DNS If Static			192.168.45.1		Modify	
Time						
SNTP Time Server			130.145.1.1		Modify	
Time Zone Name			((GMT+01:00) Bruss		Modify	

Figure 28 Network configuration

Note that the changes are not applied immediately! You have to apply the changes ...

STEP 2: To apply the changes, there are two possibilities:



Comp@s

Reboot Monitoring	Execute
Save Configuration And Reboot Monitoring	Execute
Apply LAN Configuration	Execute

Figure 29 Apply changes

-> "Save Configuration And Reboot Monitoring"

Or

-> "Apply LAN Configuration": this control will apply the modification without saving them. This has the advantage to be able to test a configuration without rebooting. If the configuration is working, you can simply "Save XML User Configuration", without rebooting:

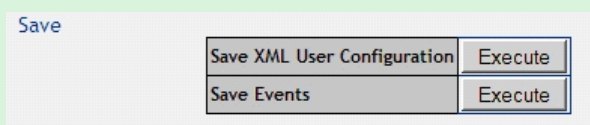


Figure 30 Save XML user configuration

Remark: At any time, you can check the actual real configuration in Site -> Data:

Description	Alarm	Event	Data	Record	Configuration	Control
Network						
ID	Data Name	Value				
1	Current IP Address	130.145.57.71				
2	Current IP Mask	255.255.254.0				
3	Current MAC Address	00-14-2D-20-0B-20				

Figure 31 Network data

3.4 Using the Comp@s SNMP Agent

The Simple Network Management Protocol (SNMP) exposes management data in the form of variables on the managed systems, which describe the system configuration. These variables can then be queried and sometimes set by managing applications.

The Comp@s monitoring provides a SNMP v1, v2c and V3 interface. Please note that SNMP V3 is available only since Comp@s 0.1.0.26.

The Management Information Base (MIB) can be downloaded at the url:

["http://the_ip/Compas.mib"](http://the_ip/Compas.mib)

A quick link is available on the top of the website to download this MIB:



Figure 32 Download of the SNMP MIB

This MIB is generated dynamically according to the number and the type of the sub-equipments present at the time of the generation:

- dc systems

- extension module
- etc.

The default port running the SNMP agent is 161. This can be configured if requested.

When an event happens, a SNMP trap can be sent. Multiple target IP can be configured. These multiple IP must be configured for each sub-equipment to increase the flexibility of the system.

If you want free software to test SNMP, you can download iReasoning MIB Browser from URL: <http://www.ireasoning.com/mibbrowser.shtml>.

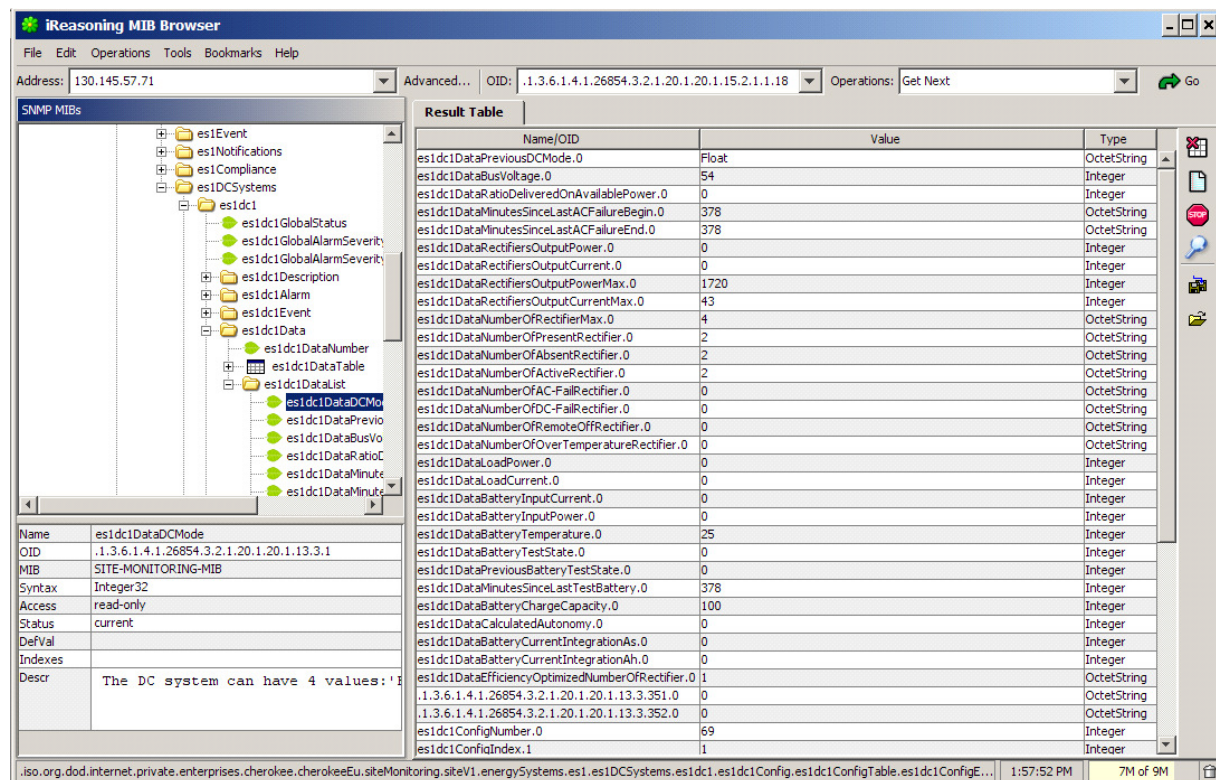


Figure 33 Ireasoning MIB Browser

The SNMP agent supports the SNMP v1, v2c and V3 command:

- GET
- SET
- WALK

The SNMP configuration is available at the site -> configuration level, as shown on the following screenshot:

SNMP	
SNMP Activated	True
SNMP Trap Version	V2c
SNMP GET Minimum Security Level	V1 Community
SNMP SET Minimum Security Level	V1 Community
SNMP V3 Auth Algorithm	MD5
SNMP V3 Privacy Algorithm	DES
SNMP V3 Privacy Password	

Figure 34 SNMP Configuration Level

SNMP v2c uses the mechanism of the SNMP communities (Read and Write). An SNMP community is the group that devices and management stations running SNMP belong to. It helps define where information is sent. The community name is used to identify the group. It will not respond to requests from management stations that do not belong to one of its communities. The login and password are the same as for the web server interface. BUT, as the community is only a string, the syntax is:

SNMP authentication syntax

LOGIN:PASSWORD

Default login and password are

SNMP default login and password

Read Community -> [admin:compas](#)

Write Community -> [admin:compas](#)

SNMP V3 uses login and passwords. The same accounts are used as in the web interface.

You can define a minimum security level (an SNMP version) for SET and GET operations:

- No Authentication
- V1 Community
- V2c Community
- V3

If you are using SNMP V3, you can set an Auth Algorithm:

- MD5 : Message Digest Algorithm 5 – HMAC-MD5-96
- SHA : Secure Hash Algorithm – HMAC-SHA-96
- Any: Both MD5 and SHA will be tried.

You can also use privacy password with a privacy Algorithm:

- DES: Data Encryption Standard
- AES: Advanced Encryption Standard with key length of 128
- 3DES: Triple Data Encryption Standard.

Chapter 4 – Functionalities

- [User Access Management](#)
- [Save / Load configuration](#)
- [Automatic events saving](#)
- [Date and Time Management](#)
- [Software Upgrade Management](#)
- [Reset Factory Settings](#)
- [Copying configuration from a system to another](#)
- [PLC Functionalities](#)
- [Translating The Web Interface](#)
- [Replacing a Rectifier in a DC System](#)
- [Measuring Power and Energy.](#)

4.1 User Access Management

The web server and the SNMP agent are protected by an authentication mechanism based on login/password.

There are by default six users defined: one administrator and 5 users:

<u>Login</u>	<u>Password</u>
admin	compas
user1	compas
user2	compas
user3	compas
user4	compas
user5	compas

All these default login/password can be changed by the help of any interface. The passwords are encrypted with cryptographic hash function (MD5, 128 bits). These parameters are located in Site -> Configuration, as shown on the following figure:

Users	
Administrator Login:Password	admin:1F41C076E8B0C2B69FD36514C54BD86F
User 1 Login:Password	user1:1F41C076E8B0C2B69FD36514C54BD86F
User 2 Login:Password	user2:1F41C076E8B0C2B69FD36514C54BD86F
User 3 Login:Password	user3:1F41C076E8B0C2B69FD36514C54BD86F
User 4 Login:Password	user4:1F41C076E8B0C2B69FD36514C54BD86F
User 5 Login:Password	user5:1F41C076E8B0C2B69FD36514C54BD86F
Allowed Users	
Read Access User Numbers	1,2,3,4,5
Write Access User Numbers	

Figure 35 Users login and password configuration

The administrator is allowed to use all the functionalities of the monitoring and to change any configuration parameter.

The 5 users can only access the functionalities they are authorized to. It is possible to define, for each equipment of the site hierarchy, which user has read access and which user has write access. The following figure shows the “Read Access User Numbers” and the “Write Access User Numbers” configuration entries. The value is a list of coma separated values corresponding to the user number allowed to read or write at the Site level. These 2 parameters are also available in each “DC system” and in each “Sensors and Actuators”.

Please remark that the users which have write access at the Site level are able to change the login and the password of all the other users, including the administrator.

The procedure to change the login and password of a user is:

STEP 1: Browse to Site ->Configuration

STEP 2: Click on “Edit Mode”

STEP 3: Enter the new login and password in clear for the desired user id. The syntax is:

Login and password
 LOGIN:PASSWORD -> [mike:mypassword](#)

User 1 Login:Password	mike:mypassword	Modify
-----------------------	-----------------	--------

Figure 36 User login and password change screen

STEP 4: Click on “Modify”. The password is immediately hashed and the page is refreshed:

User 1 Login:Password	mike:34819D7BEE	Modify
-----------------------	-----------------	--------

Figure 37 User new login and password change screen

STEP 5: Do not forget to save the configuration.

4.2 Save / Load configuration

When a system is correctly configured, you can save the configuration to keep the same configuration in case of reboot of the system. This function is available in Site -> Configuration:



Figure 38 Save / Load configuration

Please refer to [Copying configuration from a system to another](#) to load a configuration on a system.

4.3 Automatic events saving

The system is configured to keep all the events in case of power failure of the monitoring. Just before dying (battery disconnection), all the events are saved on persistent storage. If you want to stop the system, by pressing 1 second on the front panel button (Bat Test/Save), events will be saved and you can shut down the system.

4.4 Date and Time Management

- [Real Time Clock](#)
- [Time zone and Daylight Saving Time](#)
- [\(S\)NTP Time Protocol](#).

4.4.1 Real Time Clock

The monitoring embeds a real time clock in order to manage the event time, periodic actions, etc. This time is set at factory.

You can change the local or the UTC time in Site -> Control, as shown on the following figure:

Time

Force SNTP Time Refresh	Execute	
Set Local Time	2008-05-15T11:42:	Execute
Set UTC Time	2008-05-15T09:42:	Execute
Reset Uptime	Execute	

Figure 39 Setting the time

The time configuration at factory is the one from the “Brussels, Copenhagen, Madrid, Paris” time zone.

4.4.2 Time zone and Daylight Saving Time

You can configure the time zone in Site -> Configuration, as shown on the following figure:

Time

SNTP Time Server	130.145.1.1
Time Zone Name	(GMT+01:00) Brussels, Copenhagen, Madrid, Paris

Figure 40 Time Configuration Elements

All the available time zone can be retrieved at URL:

Available time zone

http://the_ip/timezones.txt

Here follows a screenshot of a part of this list:

```
Available TimeZones:
(GMT) Casablanca, Monrovia
(GMT) Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London
(GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
(GMT+01:00) Belgrade, Bratislava, Budapest, Ljubljana, Prague
(GMT+01:00) Brussels, Copenhagen, Madrid, Paris
(GMT+01:00) Sarajevo, Skopje, Warsaw, Zagreb
(GMT+01:00) West Central Africa
(GMT+02:00) Athens, Istanbul, Minsk
(GMT+02:00) Bucharest
(GMT+02:00) Cairo
(GMT+02:00) Harare, Pretoria
(GMT+02:00) Helsinki, Kyiv, Riga, Sofia, Tallinn, Vilnius
(GMT+02:00) Jerusalem
(GMT+03:00) Baghdad
(GMT+03:00) Kuwait, Riyadh
(GMT+03:00) Moscow, St. Petersburg, Volgograd
(GMT+03:00) Nairobi
(GMT+03:30) Tehran
```

Figure 41 Partial Time Zone List

You can copy/paste the correct one.

The daylight saving time is activated on the monitoring, the summer and winter time will be automatically adjusted according to the selected time zone.

Note: When a change in time zone has been done, it is necessary to reboot the monitoring to have the changes applied.

4.4.3 (S)NTP Time Protocol

The time can be automatically synchronized with an UTC time server, implementing the Network Time Protocol (NTP) protocol (or SNTP). This allows having all the monitoring time synchronized with one reference time server.

The configuration parameters are available at Site -> Configuration, as shown above ([Time zone and Daylight Saving Time](#)).

You can configure SNTP Time Server with an IP address or with a domain (if the DNS is set correctly - swisstime.ethz.ch, for example).

The time is retrieved automatically when the system boot and every week. If it fails, it will automatically retry the next day.

You can force an SNTP time refresh in Site -> Control, as shown above ([Real Time Clock](#)).

4.5 Software Upgrade Management

- [Upgrading the Comp@s Software](#)
- [Upgrading a Firmware with Comp@s.](#)

4.5.1 Upgrading the Comp@s Software

- [Checking Comp@s revision](#)
- [Upgrading Locally with USB](#)
- [Upgrading Remotely with Ethernet](#)

Checking Comp@s revision

You can check the running Comp@s software version in Site -> Data -> Software Revision:

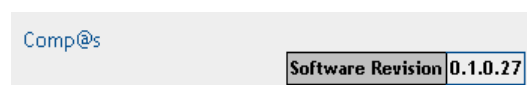


Figure 42 Software Revision

It is also displayed at the bottom of all the web pages:

Figure 43 Software Revision at bottom of web pages

To update the Comp@s software, two possibilities are available:

- Upgrading remotely with Ethernet
- Upgrading locally with USB.

Upgrading Locally with USB

The upgrade is done through the USB Active Sync connection.

STEP 1: Be sure you have ActiveSync correctly installed as described in (Getting Started – Connecting with USB).

STEP 2: Connect the USB cable between the Comp@s system and your personal computer.

STEP 3: Open the windows explorer and click on “Mobile Device”, under “My Computer”. You should have access to the memory of the Comp@s Monitoring.

STEP 4: Browse to “\\FlashDisk\User” (“\\NOR Flash\\User” on some previous release):

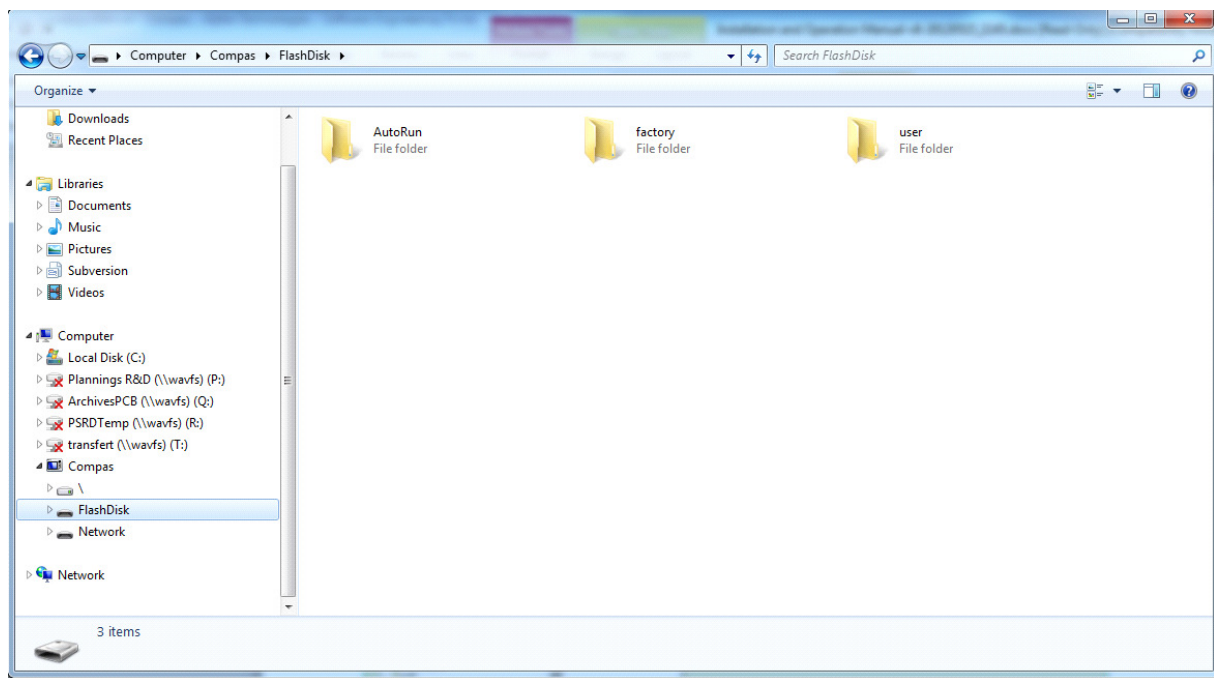


Figure 44 Browse to “FlashDiskUser”

STEP 5: Copy the new “Compas.exe” release in that folder.

STEP 6: Reboot the monitoring with the Web Interface.

STEP 7: You can check that the running software revision has changed.

Upgrading Remotely with Ethernet

- [FTP](#)
- [HTTP POST](#)

FTP

The upgrade is done through FTP connection:

Upgrading Comp@s remotely with FTP

STEP 1: Connect the system with your FTP client (See "Connecting the Comp@s FTP Server").

STEP 2: Browse to the "\user" folder, in the "\\FlashDisk" folder ("\\NOR Flash" on previous software release):

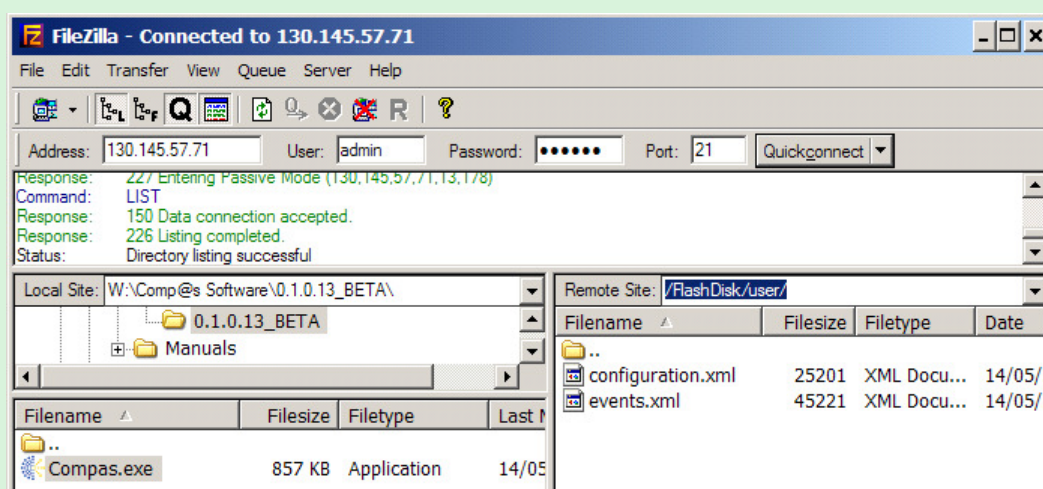


Figure 45 FTP Connection with Filezilla

STEP 3: Copy the new "Compas.exe" release in that folder.

STEP 4: Reboot the monitoring with the Web Interface (Site -> Control) or with SNMP.

STEP 5: You can check that the running software revision has changed.

HTTP POST

The upgrade is done by following the hyperlink: "Advanced" > "Advanced Functions Links: manage_files.html" or by going to the address: http://the_ip/manage_files.html.

Upgrading Comp@s remotely with HTTP POST

STEP 1: Go to "File Upload to user-upload Folder". Click "Browse" and select the file to upload to FlashDisk\\user\\upload folder. **If the file size is greater than 1.5 MB, a zip**

archive containing the file must be uploaded instead.

File Upload To user-upload folder
Please specify a file to upload to Compas's user upload directory:

List Of Files in user-upload folder

File	Creation Time	File Size	Other Info	Std Command	Detected Specific Command

List Of Files in user-firmware folder

File	Creation Time	File Size	Other Info	Std Command	Detected Specific Command
CXRF_48-4kW_HP_1.02f.acan	9/26/2012 7:36:14 PM	32938		Delete	
CXRF_48-4kW_HP_1.02g.acan	9/26/2012 7:36:16 PM	34074		Delete	
CXRF_48-4kW_HP_1.02e.acan	9/26/2012 7:36:16 PM	32874		Delete	
CXRF_48-4kW_HP_1.02h.acan	10/2/2012 12:44:34 PM	34774		Delete	
0340014-001_D_CXRF_48-4kW_CUSTOMER_v1.02.acan	10/22/2012 3:26:34 PM	34318		Delete	

List Of Files in user folder

File	Creation Time	File Size	Other Info	Std Command	Detected Specific Command
Compas.exe	1/1/2000 12:03:06 AM	2375168	1.0.74.0	Delete	
events_flat.xml	1/1/2000 12:05:16 AM	333530		Delete	
configuration.xml	11/14/2012 11:17:40 AM	39748		Delete	
data_records.xml	1/1/2000 12:12:52 AM	276566		Delete	

List Of Files in factory folder

File	Creation Time	File Size	Other Info	Std Command	Detected Specific Command
Compas.exe	7/11/2012 4:53:30 PM	2200064	0.109.0.3		

Figure 46 Comp@s Manage Files Page

STEP 2: Press "Send" to upload the file. A message "COMMAND_EXECUTED" (or "COMMAND ERROR") is displayed. Return to the address: http://the_ip/manage_files.html (or press Internet Explorer back, then refresh buttons) to continue.

STEP 3: The file appears in "List of Files in user-upload Folder". You can select "Extract File" to uncompress a zip archive, then press "Delete" to erase it from folder.

STEP 4: Press "Replace/Move Compas.exe to user Folder" to move the new compas.exe file to FlashDisk\user folder.

STEP 5: Return to Compas index page. Reboot by following the link: "Site" > "Control" > "Reboot Monitoring".

4.5.2 Upgrading a Firmware with Comp@s

Any software/firmware of any Alpha Technologies equipment connected to the CAN bus can be upgraded remotely thanks to Comp@s.

WARNING: DO NOT POWER OFF THE EQUIPMENT DURING THE PROCEDURE.

STEP 1: You must first upload the firmware 'SOFT_XXXXX_XX.txt' file on the comp@s card. The correct folder is "\\FlashDisk\User\Firmware". This can be done through FTP or USB. The following screenshot shows the folder with one file, in a Windows Vista environment:

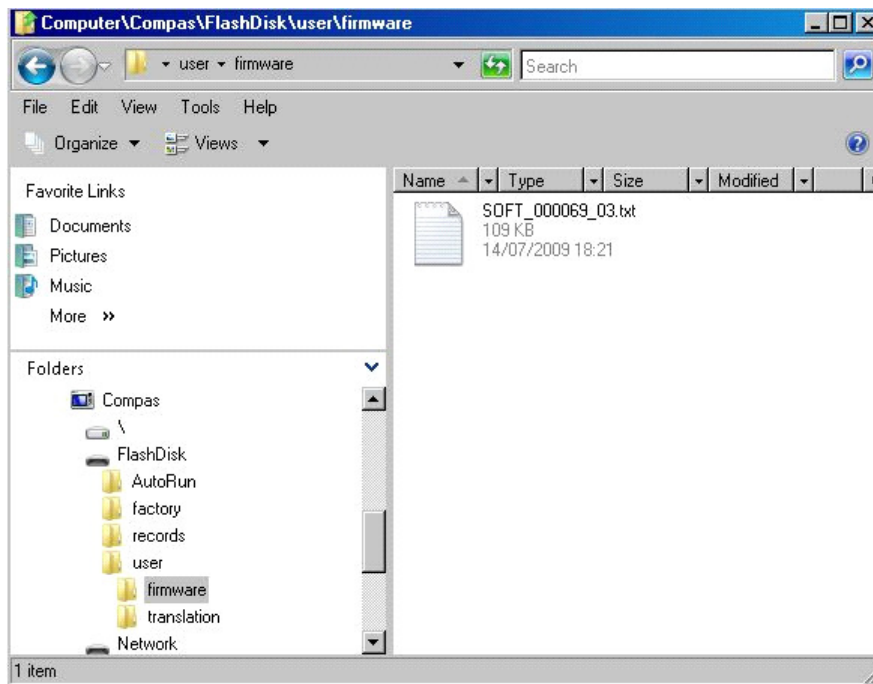


Figure 47 Firmware selection

STEP 2: Browse to the comp@s web page and click on the "Advanced" link, at the top right:

Comp@s : the Alpha Technologies Monitoring System

[Main Page](#) | [Main Page Without JavaScript](#) | [Summary](#) | [Normal Mode](#) | [Edit Mode](#) | [site.xml](#) | [configuration.xml](#) | [SNMP MIB](#) | [Advanced](#)

Last Refresh : 2012-03-26T16:32:44
Uptime : 0d 0h 2m 59s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

Sensors And Actuators (1)

CAN Bus Nodes

Node ID	Node Available	HW Info	SW Info	Product Name
1	true - Heartbeat(1014 ms)	9411 010 95001	4004 110 60953	CAR948TN
2	true - Heartbeat(1014 ms)	9411 010 95001	4004 110 60953	CAR948TN
3	true - Heartbeat(1014 ms)	9411 010 95001	4004 110 60953	CAR948TN
4	true - Heartbeat(1014 ms)	9411 010 95001	4004 110 60953	CAR948TN
101	true - Heartbeat(1014 ms)	9413 000 48301	SOFT 000030 01	MCU 4x850W
111	true - Heartbeat(1014 ms)	9413 000 48301	SOFT 000003 01	SAM 0948

Possible Firmware Upgrade

Bootloader Actif	False
Node	0
Line Sent /Total Line	0/0
File Name	
State	0

Node ID	Actual SW 12NC	Available Upgrade File
---------	----------------	------------------------

Update Type	Related File
-------------	--------------

CAN Information

To Send Message Queue Length	0
Sent Msg	0 / 0
Received Msg	0 / 0
RX10VR counter	0

Alpha Technologies | Copyright © 2010 Alpha Technologies | Comp@s 0.106.0.3

Figure 48 Comp@s web page Advanced link

STEP 3: In the “Possible Firmware Upgrade”, you can see buttons “Execute” with the available upgrades. Click the button and wait a feedback from the browser. The Comp@s card is decoding the file during this time (about 10 seconds):

Possible Firmware Upgrade

Bootloader Actif	False
Node	0
Line Sent /Total Line	0/0
File Name	
State	0

Node ID	Actual SW 12NC	Available Upgrade File
---------	----------------	------------------------

Update Type	Related File
-------------	--------------

03.txt	Execute
--------	--

The page at http://127.0.0.1 says:

COMMAND_EXECUTING

CAN Information

Figure 49 File decoding

STEP 4: Once you received the message “COMMAND_EXECUTING”, click ‘OK’. After, you can click again on the “Advanced” link to see the upgrade progress. The Comp@s card is sending the firmware to the device over the CAN Bus (about 2-3 minutes). Your equipment will disappear from the left tree during the upgrade:

CAN Bus Nodes				
Node ID	Node Available	HW 12NC	SW 12NC	Product Name
126	true - Heartbeat(2011 ms)	9413 060 05041	SOFT 000053 04	SYS/CDM

Possible Firmware Upgrade	
Bootloader Actif	True
Node	101
Line Sent /Total Line	2794/3862
File Name	SOFT_000069_03.txt
State	5

Node ID	Actual SW 12NC	Available Upgrade File
126	SOFT 000053 04	

Figure 50 Equipment disappearing during upgrade

STEP 5: When the progression is finished, the equipment reboot and is detected again by Comp@s. The new firmware is installed. You can see the firmware revisions in the “Advanced” section (CAN Bus Nodes – SW 12NC).

4.6 Reset Factory Settings

It is possible to easily restore all the settings and software installed in our factory. To do this, delete all the files and folders present in the “\\FlashDisk\User” folder. At next reboot, your monitoring is like the first time you get it.

4.7 Copying configuration from a system to another

STEP 1: Retrieve the configuration of one system. On the web interface, click on “configuration.xml” and save the file as “configuration.xml”.

STEP 2: Copy this file (configuration.xml) on the other system, in the “user” folder, with FTP over Ethernet, or locally with ActiveSync over USB.

STEP 3: Reboot this other system, the same configuration is applied.

You copy also the network configuration, including the IP address. Keep in mind that if two systems with the same IP address are present on same network, it will not work! A solution to this is to edit the XML file before copying it and to change the IP address.

Note

If you want to deploy a configuration as the default configuration for your network, you can put the file in the folder “factory”. This file can be renamed like XXX_configuration.xml where XXX is free and of any length. This way you can indicate in the file the type of configuration. Make sure to delete the “configuration.xml” in the “user” folder as this last has the priority. Here follows a diagram for better understanding:

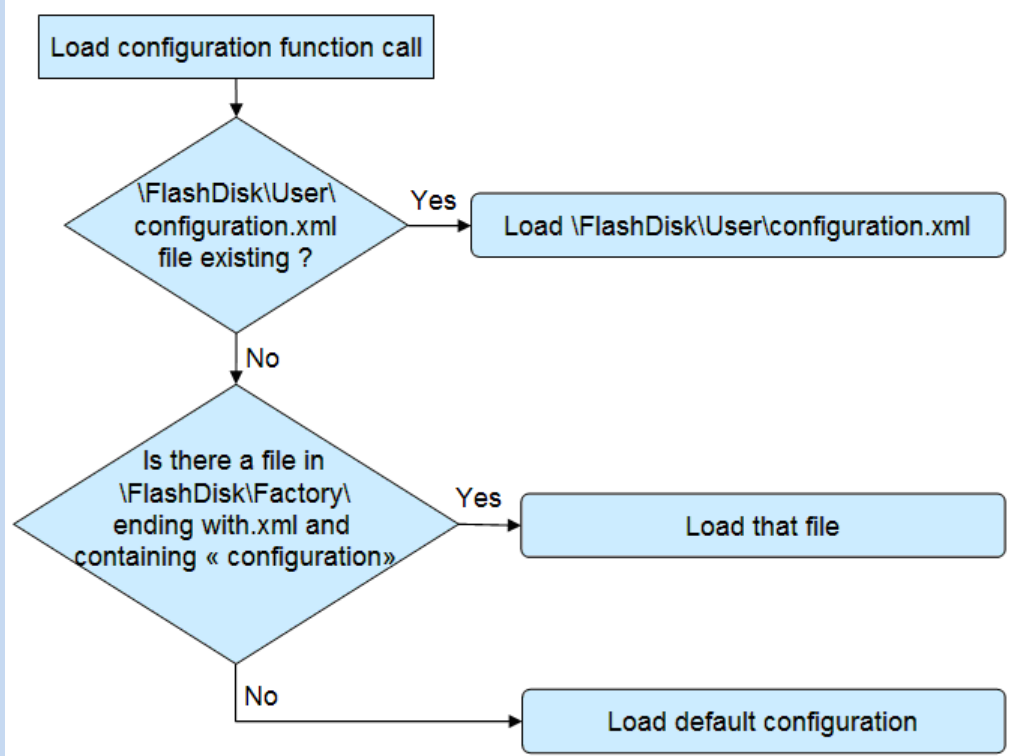


Figure 51 Workflow of the load configuration function

4.8 PLC Functionalities

Some configuration elements can be filled with a Boolean expression or a mathematical expression. Here follow information about the syntax and some examples of valid expressions:

- [Syntax](#)
- [Examples of Boolean Conditions](#)
- [Examples of Mathematical Expressions](#)
- [PLC License Package](#).

4.8.1 Syntax

- [Using Data Entries](#)
- [Using Alarm Entries](#)
- [Operators](#)
- [Time Variables](#)
- [Other Functions.](#)

Using Data Entries

Syntax	Signification
@(dataXXX)	The data with id XXX of the relative equipment
@(dcY_dataXXX)	The data with id XXX relative to the dc system with id Y. Example: @(dc1_data11) is the bus voltage of the DC System 1.
@(saY_dataXXX)	The data with id XXX relative to the Sensors And Actuators with id Y.

Using Alarm Entries

Syntax	Signification
@(alarmXXX)	The data with id XXX of the relative equipment
@(dcY_alarmXXX)	The data with id XXX relative to the dc system with id Y. Example: @(dc1_data11) is the bus voltage of the DC System 1.
@(saY_alarmXXX)	The data with id XXX relative to the Sensors And Actuators with id Y.
@(severity_level)	The severity level of the relative equipment (0->9). This can be useful to activate a relay based on the severity level.
@(dcY_severity_level)	The severity level relative to the dc system with id Y.
@(saY_severity_level)	The severity level relative to the Sensors And Actuators with id Y.

Operators

Syntax	Signification
(...)	Parentheses
&&	Logical AND

	Logical OR
==	Equal
!=	Not Equal
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Modulo

Time Variables

Syntax	Signification
\$second()	Second part of the actual time
\$minute()	Minute part of the actual time
\$hour()	Hour part of the actual time
\$day()	Integer indicating the day of the month.
\$dayofweek()	Integer indicating the day of the week. This integer ranges from zero, indicating Sunday, to six, indicating Saturday
\$dayofyear()	Integer indicating the day of the year.
\$month()	Integer indicating the month of the year.
\$year()	Integer indicating the year.
\$time()	The time of the day
@ts(XXXXXX)	Create a time span variable from XXXX string. Example: @ts(11:32) corresponds to 11h32.

Other Functions

Syntax	Signification
\$abs(XXX)	The absolute value of XXX
\$sqrt(XXX)	The square root value of XXX
\$ceil(XXX)	The ceil value of XXX
\$floor(XXX)	The floor value of XXX
\$max(X1, X2, X3, ...)	The maximum value between X1,X2,X3, etc.
\$min(X1, X2, X3, ...)	The minimum value between X1,X2,X3, etc.
\$canid(XXX)	Can Id XXX is present

4.8.2 Examples of Boolean Conditions

Tested Condition	Configuration Element Value
The bus voltage is under 47V	@(data11)<47
The rectifier output power is over 2500W	@(data21)>2500
The time of the day is comprised between 10:23 and 11:34	(\$time())>@ts(10:23))&&(\$time())<@ts(11:34))

The day of the week is sunday	\$dayofweek()==0
The alarm with id 17 is active	@(alarm17) ==True
The alarm with id 17 and 18 are active	@(alarm17) ==True && @(alarm18) ==True
true 5 seconds over 10	\$second()%10<5

4.8.3 Examples of Mathematical Expressions

Wanted calculation	Configuration Element Value
Voltage on bloc 2 of the battery	@(data161)-@(data162)

4.8.4 PLC License Package

With the PLC License activated, you are able to add custom data and custom alarms. In Site, DC System and “Sensors and Actuators”, in the configuration tab, the following parameters are available:

PLC

Number Of PLC Data	0
Number Of PLC Alarm	0

Figure 52 PLC Number

By default, “Number of PLC Data” and “Number of PLC Alarm” is set to 0. If you increase these numbers, you can access new configuration entries in the same tab:

PLC

Number Of PLC Data	2	Modify
Number Of PLC Alarm	2	Modify
PLC Alarm 1 Name	PLC Alarm 1	Modify
PLC Alarm 1 Boolean Expression		Modify
PLC Alarm 2 Name	PLC Alarm 2	Modify
PLC Alarm 2 Boolean Expression		Modify
PLC Data 1 Name	PLC Data 1	Modify
PLC Data 1 Mathematical Expression		Modify
PLC Data 2 Name	PLC Data 2	Modify
PLC Data 2 Mathematical Expression		Modify

Figure 53 New configuration entries

You are now able to enter new Boolean expression for the alarms and new Mathematical expression for the data.

These changes are reflected in the data tab and in the alarm tab, as shown on the following figures:

PLC

ID	Data Name	Value
351	PLC Data 1	0
352	PLC Data 2	0

Figure 54 PLC Data

28	Digital Input 4	2008-05-15 08:39:50Z	***	none (0)	0	True
101	PLC Alarm 1	***	***	none (0)	0	False
102	PLC Alarm 2	***	***	none (0)	0	False

Figure 55 PLC Alarm

4.9 Translating The Web Interface

It is possible to translate the Comp@s Web Interface to satisfy your needs. Here follows the steps:

STEP 1: An empty CSV file with the list of the words and sentences used in the Comp@s interface is available at URL: http://the_compas_ip/translation.csv

STEP 2: This file is encoded in UTF8. After the coma of each line, you can put the wanted translation.

STEP 3: The first two lines are:

CSV file:
 #LANGUAGE;MYLANGUAGE
 #LANG;MYLANG

STEP 4: Replace "MYLANGUAGE" by the equivalent of "ENGLISH".

STEP 5: Replace "MYLANG" by the equivalent of "EN".

STEP 6: Then, save the file (in UTF8!)? You can choose the name you want, but the extension must be "csv".

STEP 7: Copy it to the monitoring with an FTP client to the folder: "/FlashDisk/user/translation/"

Remark

Excel 2003 is not able to save in CSV UTF8. You can use the free "OpenOffice Calc" to do it. Alternatively, you can use any UTF8-capable text editor like SciTE, Notepad2 or Notepad++.

Remark

The coma separator is "," and there is no text delimiter

STEP 8: Browsing to Site -> Control.

STEP 9: Reload the Translations as shown on the following figure:

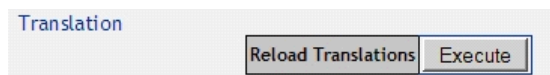


Figure 56 Reload Translations

4.10 Replacing a Rectifier in a DC System

When pulling out one of the rectifiers from a DC System shelf, it is **mandatory to wait a minimum time delay** in order that Comp@s detect the removal the CAN Open node. You can check that it was removed in the "Advanced" menu.

The delay is usually **around 15-20 seconds**.

After CAN Open node was removed from the "Advanced" menu, it is possible to insert another rectifier into the DC System shelf. This one will be automatically detected.

4.11 Measuring Power and Energy

By connecting devices like Schneider PM9C ([1]) or IEM3150 ([2]), it is possible to integrate power and energy metering functionalities into Comp@s.

By default, those devices connect to RS-485 Modbus port, that is present on some Alpha Technologies products.

To configure Comp@s, add for instance the following line to parameter 210 (RS485 Extensions configuration) in Site > Configuration (fields separated by semicolons):

RS485 Extensions configuration
PM9C(1);IEM3150(2)

Comp@s : the Alpha Technologies Monitoring System

[Main Page](#) | [Main Page Without JavaScript](#) | [Summary](#) | [Normal Mode](#) | [Edit Mode](#) | [site.xml](#) | [configuration.xml](#) | [SNMP MIB](#) | [Advanced](#)

Last Refresh : 2012-11-19T15:42:20

Uptime : 0d 0h 0m 23s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

Rectifier (5)

Rectifier (6)

Rectifier (7)

Rectifier (8)

Rectifier (9)

Rectifier (10)

Sensors And Actuators (1)

74	SNMP V3 Trap Username	compas
75	SNMP V3 Trap Auth Password	
76	SNMP V3 Trap Privacy Password	

General

81	Generate Event On Configuration Changes	True
82	Auto Archive Period Data Record (hour)	0

System Configuration CANOpen

91	Required CAN Bus Node IDs	
92	LSS CAN id range	1-100
93	System Nodes Definition	
95	LSS CANOpen Saved Configuration	

Users

101	Administrator Login:Password	admin:iUlvrGzLaY2IWH7tZyJFVzsfLvj1Prv2uUh6YSrsk5g=
102	User 1 Login:Password	user1:XwhM5CCz+GT9SMS+Lzbebb2S01vfwrp/yTG3W3Wcubg=
103	User 2 Login:Password	user2:mWOpPjKfVsW6xDoGU/QbCz1aJtFqOm0RQqMfyixGhzA=
104	User 3 Login:Password	user3:Z7+ekqLzcpnmFr4tBA0Bo+xSyCKFKBGdby55kchGAnM=
105	User 4 Login:Password	user4:viQkEzvhBGaqOyXpUo/BkiqMaxZVRXTfniljvtgQWpU=
106	User 5 Login:Password	user5:zqlmAxvb3DRWu3Rn4el0ks43Rw7u3C74MEh9QVOT75l=

Extensions

210	RS485 Extensions configuration	PM9C(1);IEM3150(2)
-----	--------------------------------	--------------------

Allowed Users

521	Read Access User Numbers	1,2,3,4,5
522	Write Access User Numbers	

Event

601	Event Table Length	100
611	SNMP Trap Targets IP	
612	Minimal Event Severity For Traps	none
651	XML Events Primary Post URL	
652	XML Events Primary Post Login	
653	XML Events Primary Post Password	
661	XML Events Secondary Post URL	
662	XML Events Secondary Post Login	
663	XML Events Secondary Post Password	

PLC

901	Number Of PLC Data	0
902	Number Of PLC Alarm	0

Figure 57 Configure Power and Energy Meter

In example above, PM9C device with address 1 is added. Also is added IEM3150 with adress 2. Only addresses from 1 to 10 are currently authorized. The devices will be displayed in Comp@s in the same order as in configuration parameter (in example above: 1, 2).

The measurement devices must be configured with following serial communication parameters:

- Baudrate: 9600
- Data bits: 8

- Parity: Odd
- Stop bits: 1.

Once added, following data are available in Energy System > Data:

Comp@s : the Alpha Technologies Monitoring System

[Main Page](#) | [Main Page Without JavaScript](#) | [Summary](#) | [Normal Mode](#) | [Edit Mode](#) | [site.xml](#) | [configuration.xml](#) | [SNMP MIB](#) | [Advanced](#)

Last Refresh : 2012-11-19T15:42:57
Uptime : 0d 0h 1m 0s

Logged as : admin ([Logout](#))

Site (1)

Energy System (1)

DC System (1)

Rectifier (1)

Rectifier (2)

Rectifier (3)

Rectifier (4)

Rectifier (5)

Rectifier (6)

Rectifier (7)

Rectifier (8)

Rectifier (9)

Rectifier (10)

Sensors And Actuators (1)

s(1) - Energy System (1) - Status is alarms

Description

Alarm

Event

Data

Record

Configuration

Control

[Show Help](#) [Rename Tool](#)

Energy Meter PM9C 1

ID	Data Name	Value
2000	I1 (Ampere)	0.00
2007	V1N (Volt)	102.80
2010	Frequency (Hz)	49.90
2011	Ptot (kW)	0.00
2012	Qtot (kvar)	0.00
2013	Stot (kVA)	0.00
2014	PF	1.00
2015	PF Sector	Inductive
2016	Power Demand (kW)	0.00
2017	Power Demand Max (kW)	0.08
2018	Operating Time Counter (hour)	444.55
2019	Active Energy Total Counter (kWh)	165
2020	Reactive Energy Total Counter (kvarh)	165
2021	Active Energy Partial Counter (kWh)	6

Energy Meter IEM3150 2

ID	Data Name	Value
2100	I1 (Ampere)	0.00
2106	V1N (Volt)	223.92
2109	Frequency (Hz)	49.97
2110	Ptot (kW)	0.00
2111	PF	NaN
2112	Active Etot Import (kWh)	2.96
2113	Active Epart Import (kWh)	2.96
2114	Active E Phase 1 Import (kWh)	2.96

Figure 58 Power and Energy Meter Data

If 3-phase current is used instead of single-phase, supplementary data will be displayed. In case of IEM3150, device configuration (single-phase, 3-phase) is displayed in Energy System > Description. It is also possible to record data by navigating to Energy System > Records.

[1] http://www.schneider-electric.com/search/ww/en/relevance/10_1/Product%20Information;;68c72df3-e11c-4867-b873-73310c776a59/all?search_text=pm9c&search_type=new&filters=txt_by_category::CAT_PRD_DATA

[2] http://www.downloads.schneider-electric.com/sites/oreo/ww/document-detail.page?p_docId=18054169&p_Conf=i#http://www.downloads.schneider-electric.com

Chapter 5 – Software Interfaces

- [Web Server](#)
- [FTP Server](#)
- [Modbus Slave](#)
- [SNMP Agent.](#)

5.1 Web Server

- [ETSI Protocol](#)
- [Retrieving XML files](#)
- [Retrieving data records in CSV format](#)
- [HTTP GET of any description, data, configuration, etc.](#)
- [HTTP POST to configure and control.](#)

5.1.1 ETSI Protocol

The XML files described in [Retrieving XML files](#) are compliant with ETSI standard ES 202 336: “Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks)”.

This chapter provides a summary about the structure of this file:

- [The Hierarchy of the devices/equipments](#)
- [Common structure of any system/equipment](#)
- [The <description table> element](#)
- [The <alarm table> element](#)
- [The <event table> element](#)
- [The <data table> element](#)
- [The <config table> element](#)
- [The <control table> element.](#)

Common structure of any system/equipment

Any equipment XML node can have the following attributes:

Attribute	Description	Datatype	O/M
id	The id of the equipment, system or subsystem.	xs:integer	M
status	"normal" or "alarms" or "unknown".	xs:string	M
severity_type	If status is "alarms", this attribute gives the more severe "severity type" of the table of alarm. This attribute shall be present only when the attribute status is "alarms".	xs:string	M
severity_level	If status is "alarms", this attribute gives the more severe "severity level" of the table of alarm. This attribute shall be present only when the attribute status is "alarms".	xs:integer	M
datetime	The datetime attribute can be used to know the date and the time at which the element was refreshed. It is possible to have different datetime in different elements because all the equipment/systems cannot provide the data at the same time.	xs:datetime	O

For each equipment, system or subsystem, child elements that can be used are described in the following table:

Child Element	Description	Datatype	O/M
<description_table>	A table with description elements of the equipment/system.	xs:complexType	O
<alarm_table>	The table of alarms related to the equipment/system	xs:complexType	O
<event_table>	A log of events related to the equipment/system	xs:complexType	O
<data_table>	The table of the data (measurements, states and calculated values) related to the equipment/system	xs:complexType	O
<data_record_table>	Records of the historic of some data present in the data table	xs:complexType	O
<config_table>	The table of configuration of the equipment	xs:complexType	O
<control_table>	The table of control of the equipment	xs:complexType	O

The <alarm_table> element

This element contains multiple <alarm> elements. It corresponds to the table of all the possible alarms, with the associated severity type and severity level.

The information about the alarm is included in the attributes of the <alarm> element:

Attribute	Description	Datatype	O/M
id	The identification number of the alarm	xs:integer	M
active	This value is "true" if the alarm is active or "false" if the alarm is not active.	xs:boolean	M
name	The name of the alarm	xs:string	M
severity_type	Can be: critical, major, minor, warning or information	xs:string	M

severity_level	Value from 0 to 9	xs:integer	M
start_time	The date and time at which the alarm has started	xs:datetime	O
stop_time	The date and time at which the last active alarm has stopped. (When an alarm is active, this attribute cannot be present as it is nonsense).	xs:datetime	O

The <config_table> element

This child contains multiple <config> elements. Each of these elements is identified by a unique id. The table is specific for each equipment, and describes by itself the entire available configurable element related to this equipment.

The inner text of a <config> element is the value (xs:string) corresponding to the config parameter.

The <config> element has the followings attributes:

Attribute	Description	Datatype	O/M
id	The unique id of the config element, it corresponds at the key of the table.	xs:integer	M
name	The English name of the configuration parameter	xs:string	M
group	This attribute provide a way to group config element, like for the <data> elements	xs:string	O
subgroup	This attribute allows to group data under the parent group	xs:string	O
unit	The unit of the config parameter	xs:string	O
info	Short additional information on the config parameter	xs:string	O

The <control_table> element

This child contains multiple <control> elements. Each of these elements is identified by a unique id. The table is specific for each equipment/system, and describes by itself the entire available control element related to this equipment.

Writing to a control element is similar to start a function of the equipment. For example it can be used to start a battery test, to reboot an equipment, etc. The target of the write is the inner text of the <config> element.

The inner text of a <control> is always empty in the read xml document, but is used to pass arguments to the control function.

The <config> element has the followings attributes:

Attribute	Description	Datatype	O/M
id	The unique id of the config element, it corresponds at the key of the table.	xs:integer	M
name	The English name of control function	xs:string	M
group	This attribute provide a way to group function element, like for the <data> elements	xs:string	O
subgroup	This attribute allows to group data under the parent group	xs:string	O
info	Short information on the control function	xs:string	O

The <data_table> element

This child contains multiple <data> elements. Each of these elements is identified by a unique id. The table is specific for each equipment, and describes by itself the all the available data related to this equipment.

The inner text of the <data> element is the value ([xs:string](#)) corresponding to the data.

The <data> element has the followings attributes:

Attribute	Description	Datatype	O/M
name	The English name of the data	xs:string	M
group	This attribute provide a way to group data of a same category when they are displayed. By example, data related to the output of equipment could be grouped with the attribute value "output". All the temperature measurements could be grouped under "temperature".	xs:string	O
subgroup	This attribute allows to group data under the parent group	xs:string	O
type	The type of data, this can be "measurement" or "calculated_value"	xs:string	O
unit	When a physical data must be represented, it is useful to know the unit of the data. The units allowed by the present document are the same as the one of the International System Units.	xs:string	O
info	Short additional information on the parameter	xs:string	O
name_XX	Where XX is correspond to the abbreviation of a language. By example, name_FR represents the translation in French of the name attribute.	xs:string	O

The <description_table> element

This element contains multiple <description> elements. It corresponds to the the description elements of the system/equipment.

The inner text of the <description> element is the data of the description.

The allowed attributes of the <description> element are:

Attribute	Description	Datatype
id	The id of the description, it shall be different for all the description, it correspond at the key of the table.	xs:integer
name	The name in English of the description element	xs:string
group	This attribute provide a way to group descriptions of a same category when they are displayed. By example, description related to the manufacturer of equipment could be grouped with the attribute value "Manufacturer".	xs:string
subgroup	This attribute allows to group data under the parent group	xs:string
unit	When a physical data must be represented, it is useful to know the unit of the data. By example, to describe the maximum output power of a dc system, the value of the attribute unit can be "watt". The units allowed by the present document are the same as the one of the International System Units.	xs:string

info	Short additional information on the parameter	xs:string
------	---	---------------------------

The <event_table> element

The <event_table > element is the parent of <event> elements, described as follows: an <event> element can only exist as a child of an <event_table>.

The inner text of the <event> element is a string ([xs:string](#)) describing the event.

The event element has the followings attributes:

Attribute	Description	Datatype	O/M
id	The id of the event	xs:integer	M
type	The type of event, can be: alarm set, alarm clear or information	xs:string	M
datetime	The date and time at which the event has happened	xs:datetime	M
severity_type	This attribute exist if the event concern an alarm. Than, the severity type value is the one of the corresponding alarm.	xs:string	O/M
severity_level	This attribute exist if the event concern an alarm. Than, the severity level value is the one of the corresponding alarm.	xs:integer	O/M
alarm_id	This attribute exist if the event concern an alarm. Than, the alarm_id value is id of the alarm in the alarm table of the equipment.	xs:integer	O/M
info	Any additional information	xs:string	O

The Hierarchy of the devices/equipments

Equipments and devices connected to the monitoring are structured in a hierarchic way. The root level is the site, it corresponds to a cabinet, a building, or any place where is located a system. Each site must have a different id to distinguish the sites from the management office center.

A site can have multiple energy systems. Cabinets usually have only one energy system, but this structure allows flexibility for other complex sites. Sensors and actuators related to the whole site, like access control, will be also reported under the site level.

An energy system comprises one or more dc system. A DC System comprises one or more rectifier.

All these equipment are described with a common XML structure. This common structure allows retrieving information and configuring all the system/equipment in a same way.

5.1.2 Retrieving XML files

Each Comp@s monitoring can act as a server, holding one or more XML documents. Each existing document is within the HTTP standard referred to as a resource. Each resource is identified by a unique resource identifier known as a URI (Uniform Resource Identifier). An example of URI is "http://the_ip/site.xml". The first part of the URI is always the IP address of the site. If hostname are defined, the IP address can be replaced.

A request to such an URI will result in a response message from the server with information about the status of the request and, in applicable cases, the XML document requested.

Parameters can be passed with the URI to retrieve specific parts of the XML file. The following table describes these parameters:

Parameter name	Value	Description
description (or description_table)	true/false	Define if the description table must be included in the generated xml document (at each level of hierarchy)
alarm (or alarm_table)	true/false	Define if the alarm be included in the generated xml document (at each level of hierarchy)
event (or event_table)	true/false	Define if the event must be included in the generated xml document (at each level of hierarchy)
data (or data_table)	true/false	Define if the data must be included in the generated xml document (at each level of hierarchy)
data_record (or data_record_table)	true/false	Define if the data record must be included in the generated xml document (at each level of hierarchy)
configuration (or config_table)	true/false	Define if the configuration table must be included in the generated xml document (at each level of hierarchy)
control (or control_table)	true/false	Define if the control table must be included in the generated xml document (at each level of hierarchy)
level	0, 1, 2, etc	Define the maximum level of hierarchy. 0 will retrieve only the site level, 1 will retrieve site and energy system level, etc. If this parameter is not specified, you will receive all the level of hierarchy.
newEvents	0, 1, 2	This option can be used to know which events were not posted yet to a Management Server. If you set this parameter to 1, you will get all the events not posted to the Primary Post Server. If you set this parameter to 2, you will get all the events not posted to the Secondary Post Server. If you set this parameter to 0, you will get all the events.
notable	true/false	This is an option to receive no table at all but you can still add some table you want with the corresponding parameters set to true.

These parameters are passed in the URI. The order of the parameters is free, and none is mandatory.

For example, if we want to retrieve the data table and the alarm table up to the third level of hierarchy, the URI is:

URI example

http://the_site_ip/site.xml?description=false&alarm=true&event=false&data=true&data_record=false&config=false&level=3

If no option is set, the whole file is sent, except data record table and control table.

Some other files can also be retrieved, with the same available options:

File Name	Description
energy_system.xml	You get only the energy system XML part
dc_system.xml or dc_system1.xml	You get only the first dc system XML part

dc_system2.xml	You get only the second dc system XML part
configuration.xml	You get the actual user configuration file of the system

These XML files are compliant with the ETSI ES 202 336 standard, a summary of the relevant parts is available in [ETSI Protocol](#) .

5.1.3 Retrieving data records in CSV format

It is possible to download data records in CSV format (Comma-Separated values). This allows using these records in Microsoft Excel for statistical and advanced charting purpose.

These files can be downloaded through the web interface, in the “records” tab of any element. It is possible to download the records of average, minimum and maximum values of data element. The period of time can be a second, a minute, an hour or a day:

Download All Data Records In CSV Format	Record Period
Records Of Average	second- minute- hour- day
Records Of Minimum	minute- hour- day
Records Of Maximum	minute- hour- day

Figure 59 CSV data records

Please note that this function requires the “asset” license.

5.1.4 HTTP GET of any description, data, configuration, etc.

It is possible to retrieve easily element values through a simple HTTP get request. This can be considered as an equivalent of an SNMP get, but over HTTP. The following examples illustrate some requests:

Get local time:

Get local time

http://the_ip/get.txt?path=/site/data_table/21

Get dc system 1 bus voltage:

Get dc system 1 bus voltage

http://130.145.57.71/get.txt?path=/site/energy_system/dc_system/data_table/11

Get severity type of the alarm 1 of the dc system:

Get severity type

http://130.145.57.71/get.txt?path=/site/energy_system/dc_system/alarm_table/1/severity_type

5.1.5 HTTP POST to configure and control

- [Introduction to HTTP POST and implementation](#)
- [SetValue.cgi](#)
- [ProcessXML.cgi](#)

Introduction to HTTP POST and implementation

The Comp@s web server supports some HTTP POST command.

Here follows the source code of a simple c# implementation of the post. You can easily use it with test the code with the free environment [Microsoft C# Express](#).

The function takes as parameter:

- the URL of the post
- the data string to send in the body of the post
- the login of an user allowed to change values for this equipment
- the password of this user.

```
C#
public string PostMsg(string url, string postdata, string login, string password)
{
    WebRequest webRequest = WebRequest.Create(url);
    webRequest.ContentType = "application/x-www-form-urlencoded";
    Encoding asciiEncoding = Encoding.ASCII;
    byte[] byteArray = new byte[asciiEncoding.GetByteCount("xxx:xxx")];
    byteArray = asciiEncoding.GetBytes(login+":"+password);
    webRequest.Headers.Add(HttpRequestHeader.Authorization, "Basic " +
        Convert.ToBase64String(byteArray));
    webRequest.Method = "POST";
    byte[] bytes = Encoding.ASCII.GetBytes(postdata);
    Stream os = null;
    try
    { // send the Post
        webRequest.ContentLength = bytes.Length; //Count bytes to send
        os = webRequest.GetRequestStream();
        os.Write(bytes, 0, bytes.Length); //Send it
    }
    catch (WebException ex)
    {
        return "error";
    }
    finally
    {
        if (os != null)
        {
            os.Close();
        }
    }
}
```

```
}  
try  
{ // get the response  
WebResponse webResponse = webRequest.GetResponse();  
if (webResponse != null)  
{  
    StreamReader sr = new StreamReader(webResponse.GetResponseStream());  
    return sr.ReadToEnd().Trim();  
}  
}  
catch { return "error"; }  
return "error";  
}
```

SetValue.cgi

The arguments to pass in the HTTP POST body are:

- path : this is the path to the parameter to change
- value : this is the new value

Here is an example of code to manually set the local time:

```
C#  
string path = "/site/1/control_table/control/12";  
string value = System.DateTime.Now.ToString("s");  
string postdata = "path=" + path + "&value=" + value;  
PostMsg("http://192.168.45.2/SetValue.cgi", postdata, "admin", "compas");
```

ProcessXML.cgi

This function can be used to configure multiple parameters in one command. It is possible to send a full XML structure (like the configuration.xml) in the post data. All the valid elements will be updated with the new value.

This allows to remotely changing multiple config parameters by posting on each IP where a Comp@s monitoring is running.

5.2 FTP Server

- [Connecting the Comp@s FTP Server](#)
- [Changing default login and password.](#)

5.2.1 Connecting the Comp@s FTP Server

In order to use the FTP functionalities of Comp@s, you need a FTP client installed. We recommend the use of “Filezilla”, a free FTP solution available at <http://filezilla-project.org/>.

The connection parameters are:

IP address / Host	The IP of your system
Port	21
Default login	admin
Default password	compas

5.2.2 Changing default login and password

The passwords are independent from the main Comp@s application. There are managed in an independent XML file named “Compas_FTPServer.xml” located in the “user” folder. If this file does not exist, the default login and password are used:

STEP 1: Start a text editor like Notepad

STEP 2: Copy –Paste the following content:

```
XML  
<ftpserver>  
<ftpusers>  
<user login="admin" password="compas"/>  
</ftpusers>  
</ftpserver>
```

STEP 3: Modify the login and password

STEP 4: Save the file as “Compas_FTPServer.xml”

STEP 5: Copy that file in the “\\FlashDisk\\user” (“\\Nor Flash\\user” on previous release).

STEP 6: You have to use the new login and password at the next FTP connection.

Remark 1

You can create multiple ftp users by adding more than one <user/> node under the <ftpusers/> node.

Remark 2

If you want to keep your password more secret, it is possible to provide a hashed version of the password with the following syntax:

```
XML  
<ftpserver>
```

```
<ftpusers>
<user login="admin" passwordHash="1F41C076E8B0C2B69FD36514C54BD86F"/>
</ftpusers>
</ftpserver>
```

5.3 Modbus Slave

With the Modbus license, a DC system can be monitored with the Modbus over TCP/IP protocol. Here follows the exchange table between the supervisor and the Comp@s monitoring. The Modbus transport layer is Ethernet over TCP/IP. The default used port is 502:

- [Discrete Inputs \(Read Only\)](#)
- [Input Registers \(Read Only\)](#)
- [Discrete Coils Table \(Command\)](#).

5.3.1 Discrete Inputs (Read Only)

Each discrete input is associated with an alarm related to the DC System level. This table corresponds to the alarm table in [Tables at the DC System level](#).

Index	Name	Help
1	DC Bus Extra Low	The bus voltage is extra low
2	DC Bus Low	The bus voltage is low
3	DC Bus High	The bus voltage is high
4	DC Bus Extra High	The bus voltage is extra high
5	DC Bus Voltage Sense Failure	The DC bus voltage sense is defect or unconnected
6	Mains Failure	All the phases are down
7	Mains Partial Failure	Some rectifiers are in AC Failure
8	Mains Low	The main voltage is low on one or more phases
9	Mains High	The main voltage is high on one or more phases
10	One Rectifier Failure	One rectifier must be replaced
11	More Than One Rectifier Failure	More than one rectifier must be replaced
12	Missing Rectifiers	There is not enough rectifier according to the minimal number of rectifier configuration element
13	Battery Last Test Failed	The last battery test did not succeed. Maybe the battery should be replaced.
14	Battery On Discharge	The battery is discharging. This means

		that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure.
17	Battery LVD Relay Open	The battery Low Voltage Disconnect is open.
18	Battery Temperature Too High	The temperature of the battery is too high.
19	Battery Temperature Too Low	The temperature of the battery is too low.
20	Battery Temperature Sensor Fail	The battery temperature sense (NTC) is not connected or is defect.
21	Ambient Temperature Too High	The ambient temperature is too high.
22	Ambient Temperature Too Low	The ambient temperature is too low.
23	Ambient Temperature Sensor Fail	The ambient temperature sense (NTC) is not connected or is defect
25	Digital Input 1	This alarm is related to digital input 1
26	Digital Input 2	This alarm is related to digital input 2
27	Digital Input 3	This alarm is related to digital input 3
28	Digital Input 4	This alarm is related to digital input 4
29	Digital Input 5	This alarm is related to digital input 5
30	Digital Input 6	This alarm is related to digital input 6
31	Digital Input 7	This alarm is related to digital input 7
32	Digital Input 8	This alarm is related to digital input 8

If custom alarms are defined with the PLC, they are available starting from index 101.

5.3.2 Input Registers (Read Only)

These input registers correspond to the main data related to the DC System level. All these values are coded as signed 16 bits:

Index	Name:	Group	Unit	Help
1	DC Mode	General		The DC system can be in 4 possible states: FLOAT : 0 BOOST : 1 BATTERY_TEST : 2 AC_FAILURE : 3
2	Previous DC Mode	General		The DC system was previously in one of the 4 possible states: FLOAT : 0 BOOST : 1 BATTERY_TEST : 2 AC_FAILURE : 3
11	Bus Voltage	General	0.1 Volt	The DC bus voltage in volt.
12	Ratio Delivered On Available Power	General	0.01 %	This is the ratio of the delivered power divided by the installed power, in %.
13	Hours Since Last AC Failure Begin	General	hour	The number of hours since the last AC Failure begin

14	Hours Since Last AC Failure End	General	hour	The number of hours since the last AC Failure end
21	Rectifiers Output Power	Rectifiers	100 Watt	The sum of the delivered rectifier power
22	Rectifiers Output Current	Rectifiers	Ampere	The sum of the delivered rectifier current
23	Rectifiers Output Power Max	Rectifiers	100 Watt	The sum of the deliverable rectifier power
24	Rectifiers Output Current Max	Rectifiers	Ampere	The sum of the deliverable rectifier current
31	Number Of Rectifier Max	Rectifiers		The maximum possible number of rectifier in this dc system
32	Number Of Present Rectifier	Rectifiers		The actual number of present rectifier in this dc system
33	Number Of Absent Rectifier	Rectifiers		The actual number of absent rectifier in this dc system
34	Number Of Active Rectifier	Rectifiers		The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.
35	Number Of AC-Fail Rectifier	Rectifiers		The actual number or rectifier in AC Failure.
36	Number Of DC-Fail Rectifier	Rectifiers		The actual number or rectifier with DC Failure.
37	Number Of Remote Off Rectifier	Rectifiers		The actual number or rectifier in remote off.
38	Number Of Over Temperature Rectifier	Rectifiers		The actual number or rectifier in Over Temperature.
41	AC Phase 1 Voltage	AC	0.1 Volt	The voltage on AC phase 1
42	AC Phase 2 Voltage	AC	0.1 Volt	The voltage on AC phase 2
43	AC Phase 3 Voltage	AC	0.1 Volt	The voltage on AC phase 3
51	Load Power	Load	100 Watt	Estimation of the load power consumption
52	Load Current	Load	Ampere	Estimation of the load current consumption
61	Battery Input Current	Battery	Ampere	Measurement of the battery input current. A negative value means that the battery is discharging
62	Battery Input Power	Battery	100 Watt	Measurement of the battery input power. A negative value means that the battery is discharging
71	Battery Temperature	Battery	0.1 °C	The battery temperature
72	Battery Test State	Battery		This is about the result of the last battery test. 9 values are possible : NEVER_TESTED : 0 SUCCESS : 1

				ON_GOING : 2 FAILED_TIMEOUT : 3 FAILED_VBUS_TOO_LOW : 4 FAILED_LOAD_TOO_LOW : 5 FAILED_AC_FAILURE : 6 FAILED_CANCELED : 7 FAILED_LVD_OPENED : 8	
73	Battery Discharged Capacity	Test	Battery	0.01%	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.
74	Battery Discharged Capacity Ah	Test	Battery	Ah	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.
75	Battery Test Final Voltage		Battery	0.1 Volt	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.

5.3.3 Discrete Coils Table (Command)

These outputs Boolean register correspond to the entries for controlling the DC System. All these commands are also executable with the CDM (Comp@s Display Module).

In order to start the command, a "1" must be written to this entry. The value is directly reset to 0 on the command start.

ID	Name	Group	Help
1	Back To Float	DC Mode	The dc system must go back in floating mode.
2	Start Battery Test	DC Mode	The dc system must start a battery test.
3	Force Battery Test	DC Mode	The dc system must force a battery test.
4	Start Boost Mode	DC Mode	The dc system must go in boost mode.
11	Open The LVD	LVD	The LVD must be opened
12	Close The LVD	LVD	The LVD must be closed
31	Reset Battery Current Integration	Battery	Reset the integration of the battery current.
41	Reset Last Battery Test State	Battery	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.

5.4 SNMP Agent

- For SNMP Agent: see [Using the Comp@s SNMP Agent](#)

- [Using and Configuring SNMP traps.](#)

5.4.1 Using and Configuring SNMP traps

- [SNMP Comp@s configuration](#)
- [Sending a testing trap](#)
- [Receiving traps.](#)

SNMP Comp@s configuration

STEP 1: Connect the Comp@s web server

STEP 2: Browse to Site -> Configuration

STEP 3: Check that SNMP Activated is “True”.

STEP 4: Configure the “SNMP” targets IP”, further in the page. This parameter can be filled with multiple IP address separated by coma. Example: “130.145.23.1, 130.23.12.45”.

STEP 5: Check that “Minimal Event Severity For Traps” is set to “none”. This is the minimal severity of the event to send a SNMP trap. You can set this parameter to “warning”, “minor”, “major” or “critical”.

STEP 6: Repeat STEP 4 and STEP 5 at the DC System level and on the Sensors and Actuators if you have. This allows sending traps to different servers in function of the concerned equipment.

Your system is now configured; each event will be sent by trap.

Sending a testing trap

STEP 1: Connect the Comp@s web server

STEP 2: Browse to Site -> Control or to DC System -> Control

STEP 3: At the bottom of the page, you can enter a text in the field called “Add Event”.

STEP 4: Click on the corresponding “Execute” button.

STEP 5: An event has been added and was sent trough traps.

Receiving traps

In order to receive traps, you need SNMP software able to receive traps. You can download the free Ireasoning MIB Browser which can do the job. The install file is available at: <http://www.ireasoning.com/mibbrowser.shtml>.

Once you have installed the MIB browser and loaded the MIB. You can use the “Trap Receiver” located in tools:

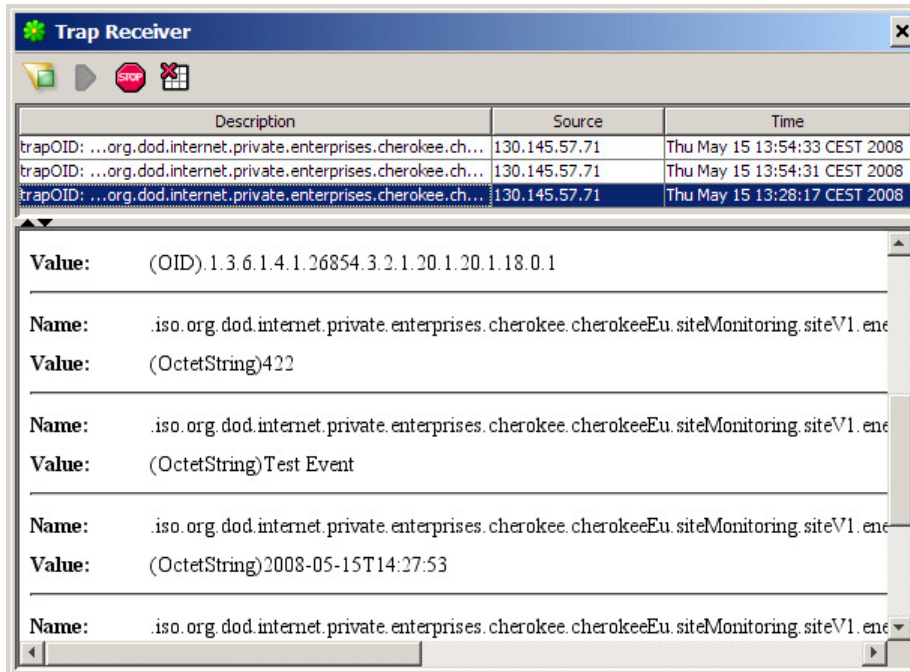


Figure 60 Ireasoning trap receiver

Chapter 6 – CAN Bus related information

- [CAN Bus - The internal field bus](#)
- [Connecting multiple rectifier shelves together.](#)

6.1 CAN Bus - The internal field bus

Comp@s systems use the CAN bus to communicate with the equipment. The CAN bus Controller Area Network (CAN) is an ISO approved standard for a low cost real time communication protocol. It is a fault tolerant and robust system. It is commonly used in automobiles, automated robots, airplanes, etc. In our application, the maximal bus length is 500m. The monitoring application is able to detect BUS problems like a short between the lines of the bus or devices which are unreachable.

Each node connected on the CAN Bus has an id. These ids are defined as shown in the following table:

Equipment Type	Range	Comments
Node Rectifier	[1,100]	Each rectifier with CAN capabilities has an address comprised between 1 and 100.
Node MCU Remote Central	[100,1]	
Node MCU	[101,110]	Up to 10 shelves monitoring (MCU)
Node Extension	[111,120]	Up to 10 extension card.
Node_CDM	[126]	Comp@s display module
Node Comp@s	[127]	The Comp@s node id. (used by CDM)

To see the list of the nodes connected on a Comp@s System, browse to Site -> Data. There, you can view the "CAN Bus Node IDs" list, as shown on the following figure:

CAN Bus		
ID	Data Name	Value
51	CAN Bus Node IDs	2,3,101,111

Figure 61 CAN Bus Node IDs

6.2 Connecting multiple rectifier shelves together

It is possible to interconnect multiple shelves to increase the system power. If the DC outputs are interconnected, the shelves are working in parallel. If the DC outputs of the shelves are independent, the shelves are independent.

In both situations, the CAN bus has to be connected between the shelves. Each MCU must have a unique CAN Id.

On MCU1848, the DIP Switch use is described in the following table:

Switches	Parameter	Description
1-3	CAN Id	Unique identifier of the MCU on the CAN bus. MCU CAN Id range begins at 101 and switch [1-3] represents a LSB encoded binary value that defines 8 successive Id's from 101 to 109.
4-6	-	Reserved for future use
7	Master/Slave	OFF: this MCU behaves as the master of the system ON: this MCU behaves as a slave of master MCU
8	Termination	OFF: external CAN bus termination must be used ON: CAN bus is internally terminated by a 147Ω resistor

- [Multiple Shelves working in parallel](#)
- [Multiple Shelves Independent.](#)

6.2.1 Multiple Shelves working in parallel

The CAN bus, VPROG and Sharing signals must be interconnected between the shelves. The whole system is seen as only one DC system by Comp@s. Here follows two typical configurations:

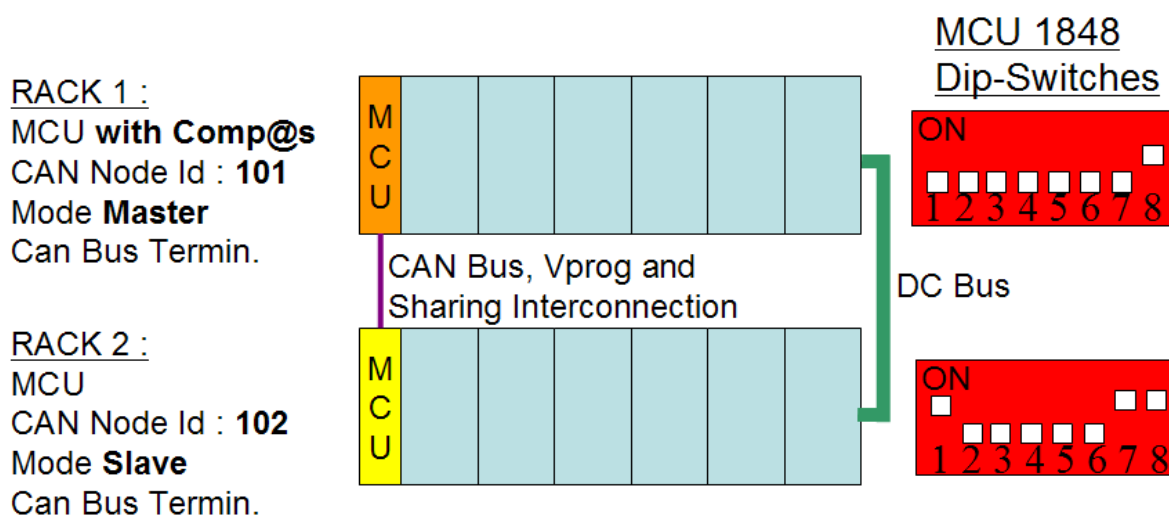


Figure 62 Example with a system with 2 shelves of 6x1800W rectifiers

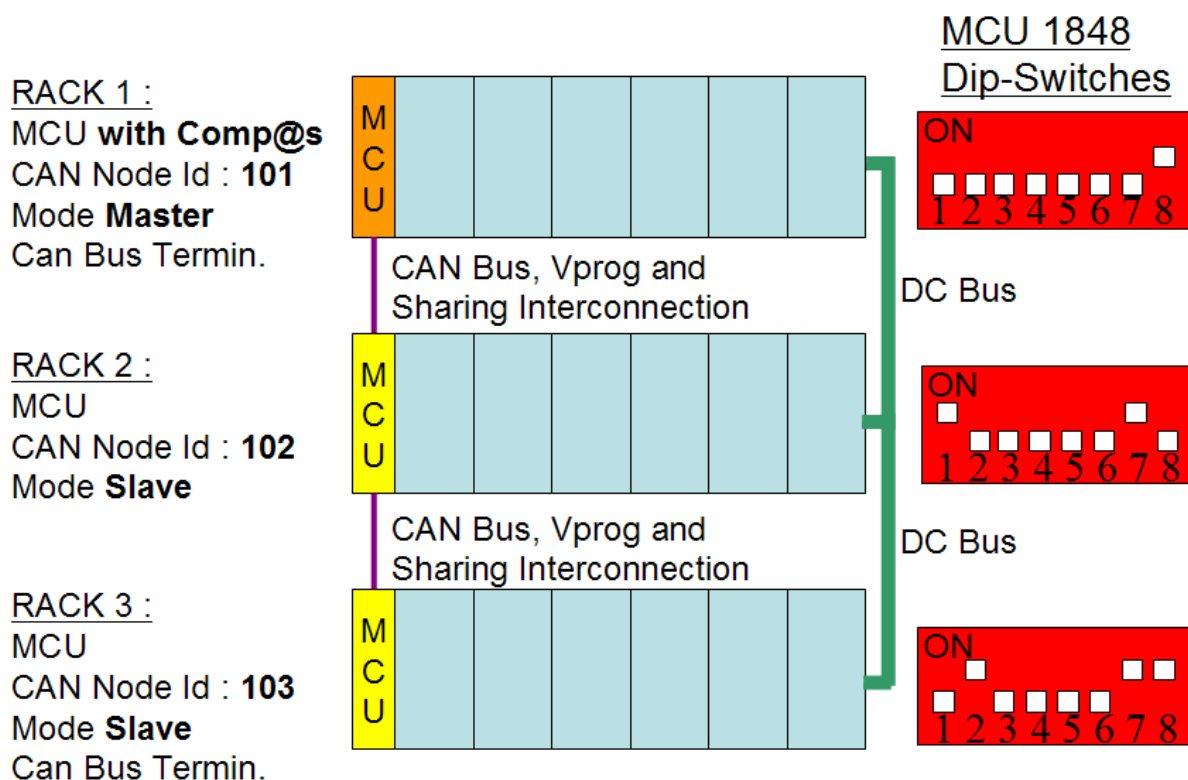


Figure 63 Example with a system of 3 shelves of 6x1800W rectifiers

6.2.2 Multiple Shelves Independent

An independent shelf will manage the bus voltage, the alarms, the LVD, etc. Multiple DC systems are seen by Comp@s:

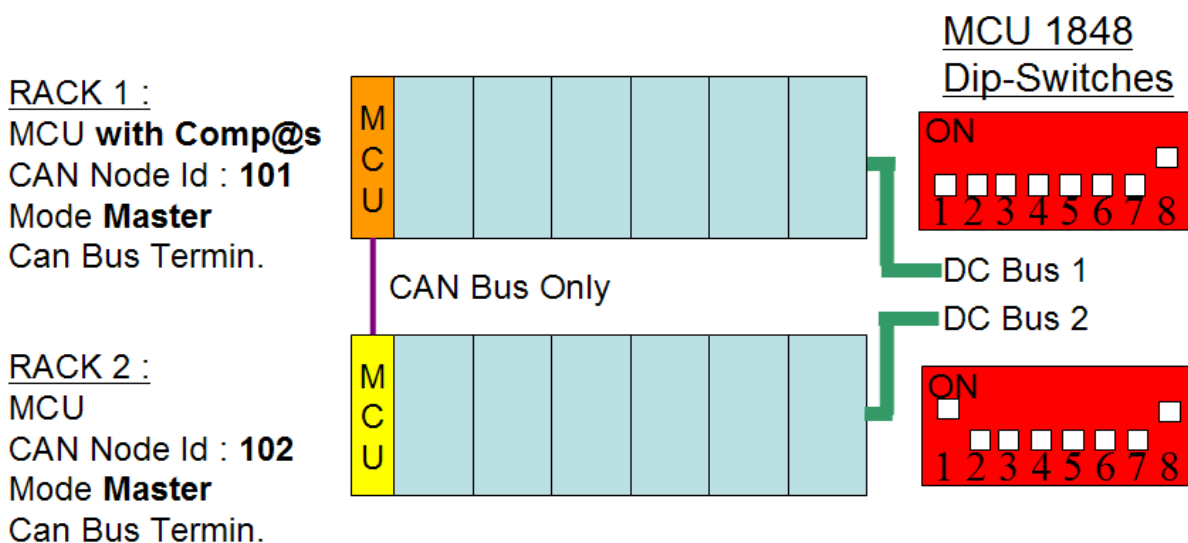


Figure 64 Example with a system with 2 shelves of 6x1800W rectifiers

Chapter 7 – Equipment Tables

The following chapters list the description, data, alarm, configuration and control tables that will be available in Comp@s for most of the supported devices. (Rectifier, MCU, Extension board, etc.)

7.1 Site Tables

7.1.1 COMPAS

Device Information	
Name	COMPAS
Short Description	Comp@s Platform Card
Long Description	
Hardware Reference	4004 110 96531
Software Reference	SOFT 000031 XX
Equipment Type	General for all Comp@s
ETSI Level	/site/

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Site Number	Description	basic
	The identification number of the site		
2	Site Name	Description	basic
	The name of the site		
3	Short Description	Description	basic
	A short description of the site		
4	Info	Description	basic
	Some more information about the site		
5	Description	Description	basic
	A free text zone to write a system description		
6	Reference	Description	basic
	A free text zone to write the customer reference of the system		
7	Contact Name	Contact	basic
	Contact Name		
8	Phone Number	Contact	basic
	Contact Name		
11	Street	Address	basic
	Street part of the site address		
12	City	Address	basic

	City part of the site address		
13	Province	Address	basic
	Province part of the site address		
14	Postal Code	Address	basic
	Postal Code part of the site address		
15	Region	Address	basic
	Region part of the site address		
16	Country	Address	basic
	Country part of the site address		
31	Latitude	GPS Position	asset
	The latitude of the site		
32	Longitude	GPS Position	asset
	The longitude of the site		
33	Altitude	GPS Position	asset
	The altitude of the site		
91	Software Revision	Comp@s	basic
	The software revision of Comp@s (read only)		
92	Operating System Revision	Comp@s	basic
	The operating system of Comp@s (read only)		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	CAN Bus Failure	major (6)	5 / 2
	This alarm is active when there is a problem with the CAN Bus.		
3	Missing CAN Bus Node IDs	major (6)	10 / 2
	This alarm is active if configured node ids are not detected on the bus		
4	Running CAN LSS Device Detection	warning (2)	5 / 2
	This alarm is active when new devices are being detected.		
6	RS 485 Bus Failure	major (6)	5 / 2
	This alarm is active when there is a problem with the RS 485 bus		
11	Monitoring Reboot Required	major (6)	5 / 2
	This alarm is active if the system should be rebooted for some reason		
15	Last Configuration Changes Unsaved	warning (2)	1 / 2
	This alarm is active if the system should be rebooted for some reason		
21	XML Heartbeat Post Failure	major (6)	5 / 2
	This alarm is active when the heartbeat is not accepted by the primary or the secondary post server. Please note that this alarm is inactive if the heartbeat mechanism is inactive.		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licence</u>
1	Current IP Address	Network		basic
	This is the actual IP address of the Comp@s platform. If the Ethernet cable is not correctly connected, the address will be 0.0.0.0.			

2	Current IP Mask	Network		basic
	This is the actual IP address of the Comp@s platform. If the Ethernet cable is not correctly connected, the address will be 0.0.0.0.			
3	Current MAC Address	Network		basic
	This is the MAC address of IP interface.			
11	Licensed Options	License		basic
	This is the options of the actual license.			
21	Date And Time Local	Time		basic
	This is the local time of the monitoring.			
22	Date And Time UTC	Time		basic
	This is the UTC time of the monitoring.			
31	Monitoring Memory Used	Operating System Info	Kb	basic
	This is actual amount of RAM memory used by the application.			
32	CPU Percentage Usage	Operating System Info	%	basic
	This is actual percentage of CPU used			
33	Free Flash Memory Space	Operating System Info	MBytes	basic
	This is free flash memory available on the Comp@s card, in Megabytes			
41	Total Fifo Size Of Second Records	Data Records Info		basic
	No information			
42	Total Fifo Size Of Minute Records	Data Records Info		basic
	No information			
43	Total Fifo Size Of Hour Records	Data Records Info		basic
	No information			
44	Total Fifo Size Of Day Records	Data Records Info		basic
	No information			
51	CAN Bus Node IDs	CAN Bus		basic
	The coma separated list of the node ids present on the CAN bus.			

Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
1	DHCP Enabled	Network		True/False (False)	basic
	The monitoring will try to get an IP with the DHCP protocol if this parameter is set to True. By default, this parameter is set to False.				
2	IP Address If Static	Network		192.168.45.1	basic
	The static IP address of the monitoring. This configuration parameter is not used if the DHCP is enabled. The default IP is 192.168.45.2.				
3	Subnet Mask If Static	Network		255.255.255.0	basic
	The static Subnet Mask of the monitoring. This configuration parameter is not used if the DHCP is enabled. The default mask is 255.255.255.0.				
4	Default Gateway If Static	Network		192.168.45.1	basic
	The static Default Gateway of the monitoring. This configuration parameter is not used if DHCP is enabled. This is only useful if the monitoring have to use a gateway, this is				

	generally not necessary. The default gateway is 192.168.45.1.				
5	DNS If Static	Network		192.168.45.1	basic
	The static DNS of the monitoring. This configuration parameter is used to resolve URI and server name. This is not necessary if you are only IP address as target server. The default DNS server is 192.168.45.1.				
9	Ethernet Mode	Network		True/False (False)	basic
	The monitoring will try to get an IP with the DHCP protocol if this parameter is set to True. By default, this parameter is set to False.				
11	SNTP Time Server	Time		192.168.45.1	basic
	The address of the server acting as SNTP timer server. If this server is not valid, the monitoring cannot update automatically his time. The default SNTP Time server is 192.168.45.1.				
14	Time Zone Name	Time		((GMT+01:00) Brussels, Copenhagen, Madrid, Paris)	basic
	The Time Zone of the site				
22	Web Server Security Enabled	Web Server		True/False (True)	basic
	This is a True/False parameter used to activate or deactivate the access control to the web server.				
23	Web Server Port	Web Server		0/65535 (80)	basic
	This is an unsigned integer parameter used to configure the port at which the web server is accessible. By default, the port is 80. If you change this port, you must be sure that the traffic is allowed by your switches and routers on this port.				
24	Web Authentication Method	Web Server			basic
	The web access security can be managed with 2 authentication methods: Basic Access or Digest Access. It is recommended to use the secured Digest access if security is an issue for you.				
41	XML Event Posting Activated	Event Posting		True/False (True)	basic
	This is a True/False parameter used to activate or deactivate the XML event posting.				
42	XML Event Posting Refresh Time	Event Posting	second	1/3600 (2)	basic
	The minimal time in second between to calculation of the XML events to send. By default, this is done every two seconds.				
43	XML Event Posting Timeout	Event Posting	millisecond	500/600000 (100000)	basic
	The timeout in millisecond when trying to post XML data to a Web Server.				
45	XML Event Posting To Secondary Only If Primary Failure	Event Posting		True/False (True)	basic
	If this parameter is set to true, the events will be sent to secondary only if primary server is not available. If this parameter is set to false, all the events will be sent to primary and secondary server				
51	XML Heartbeat Time	Heartbeat	minute	0-2880	basic
	This is the time between 2 XML Post of heartbeat. If set to 0, no heartbeat.				
61	SNMP Activated	SNMP		True/False (True)	basic
	This is a True/False parameter used to activate or deactivate the SNMP agent.				
63	SNMP Trap Version	SNMP			basic
	Traps/Notification can be sent with SNMP V1, V2c or V3 format.				

64	SNMP GET Minimum Security Level	SNMP			basic
	4 choices are available: No Authentication, V1 Community, V2c Community or V3.				
65	SNMP SET Minimum Security Level	SNMP			basic
	4 choices are available: No Authentication, V1 Community, V2c Community or V3.				
66	SNMP V3 Auth Algorithm	SNMP			basic
	3 choices are available: MD5, SHA, Any				
67	SNMP V3 Privacy Algorithm	SNMP			basic
	3 choices are available: DES, AES, 3DES				
68	SNMP V3 Privacy Password	SNMP			basic
	The global SNMP V3 Encryption Password. This one is common for all the users to avoid complexity				
69	SNMP V3 Engine ID	SNMP			basic
	The SNMP V3 Local Engine ID string				
72	SNMP V3 Trap Auth Algorithm	SNMP			basic
	2 choices are available: MD5, SHA				
73	SNMP V3 Trap Privacy Algorithm	SNMP			basic
	3 choices are available: DES, AES, 3DES				
74	SNMP V3 Trap Username	SNMP			basic
	The SNMP V3 Trap UserName used for all the SNMP V3 traps				
75	SNMP V3 Trap Auth Password	SNMP			basic
	The SNMP V3 Trap Authentication Password				
76	SNMP V3 Trap Privacy Password	SNMP			basic
	The SNMP V3 Trap Privacy Password				
81	Generate Event On Configuration Changes	General		True/False (True)	basic
	This is a True/False parameter used to activate or deactivate the tracking of configuration changes				
82	Auto Archive Period Data Record	General	hour		basic
	Period in hour to auto save records (when detailed and long duration records are needed). 0 means disabled.				
91	Required CAN Bus Node IDs	System Configuration CANOpen			basic
	This is a coma separated list with the required CAN bus node ids				
92	LSS CAN id range	System Configuration CANOpen			basic
	By default 50-100, means up to 50 Can Nodes like rectifiers with CAN Id 50 to 100. To support up to 100 rectifiers, change it to 1-100.				
93	System Nodes Definition	System Configuration CANOpen			basic

	dc3(30-100)				
95	LSS CANOpen Saved Configuration	System Configuration CANOpen			basic
	No information				
101	Administrator Login:Password	Users		(admin:compas)	basic
	This is the login and the password of the administrator. It is saved with a special syntax. First the login in clear, followed of 2 points, followed of the MD5 hashed password. If you change the login:password by entering a non hashed password, this last is automatically hashed.				
102	User 1 Login:Password	Users		(user1:compas)	basic
	This is the login and the password of the user number 1.				
103	User 2 Login:Password	Users		(user2:compas)	basic
	This is the login and the password of the user number 2.				
104	User 3 Login:Password	Users		(user3:compas)	basic
	This is the login and the password of the user number 3.				
105	User 4 Login:Password	Users		(user4:compas)	basic
	This is the login and the password of the user number 4.				
106	User 5 Login:Password	Users		(user5:compas)	basic
	This is the login and the password of the user number 5.				
210	RS485 Extensions configuration	Extensions		PM9C(1)	asset
	The configuration string for RS485 Extensions				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
611	SNMP Trap Targets IP	Event		192.168.45.1	basic
	One or multiple target IP to send traps, coma separated. Ex: 130.145.23.1, 130.23.12.45				
612	Minimal Event Severity For Traps	Event		(none)	basic
	This is the minimal severity of the event to send a SNMP trap				
651	XML Events Primary Post URL	Event			basic
	This is the first URL at which the events related to this equipment must be posted. The XML ETSI standard is used in the posted data content.				
652	XML Events Primary Post Login	Event			basic
	The login which must be used when posting events to the primary server				

653	XML Events Primary Post Password	Event			basic
	The password which must be used when posting events to the primary server				
661	XML Events Secondary Post URL	Event			basic
	This is the second URL at which the events related to this equipment must be posted. The XML ETSI standard is used in the posted data content. This allows having redundancy with the management server.				
662	XML Events Secondary Post Login	Event			basic
	The login which must be used when posting events to the secondary server				
663	XML Events Secondary Post Password	Event			basic
	The password which must be used when posting events to the secondary server				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens e</u>
1	Reboot Monitoring	Comp@s	basic
	Writing a '1' to this control element will reboot the monitoring. Events and Records will be saved.		
2	Save Configuration And Reboot Monitoring	Comp@s	basic
	Writing a '1' to this control element will first save the actual configuration and will reboot the monitoring after.		
3	Reboot Monitoring Without Saving Records	Comp@s	basic
	Writing a '1' to this control element will reboot the monitoring without saving records		
6	Apply LAN Configuration	Comp@s	basic
	Writing a '1' to this control element will reconfigure the ethernet according to the Network Configuration. If you change the IP address in the config table without using this command after, the configuration is not applied.		
11	Force SNTP Time Refresh	Time	basic
	Writing a '1' to this control element will force the monitoring to try to refresh his time with the configured SNTP Time Server.		
12	Set Local Time	Time	basic
	Writing a date and time to this control element allows to manually change the local time of the monitoring. The syntax of the date and the time is: 2007-11-19T13:02:34		
13	Set UTC Time	Time	basic

	Writing a date and time to this control element allows to manually change the UTC time of the monitoring. The syntax of the date and the time is: 2007-11-19T13:02:34		
14	Reset Uptime	Time	basic
	Writing a '1' to this control element will reset the uptime of the monitoring.		
21	Save XML User Configuration	Save	basic
	Writing a '1' to this control element will save all the configuration of all the connected equipment in a XML format. This file is read when the monitoring is starting in order to configure the monitoring. This file is also accessible trough the FTP server or can be downloaded trough the web interface.		
22	Save Inventory	Save	underd ev
	Writing a '1' to this control element will save save the inventory in a XML format. This file is read when the monitoring is starting in order to configure the monitoring. This file is also accessible trough the FTP server or can be downloaded trough the web interface.		
33	Save Data Records	Save	basic
	Writing a '1' to this control element will force the monitoring to save all the data records. This is useful if you want to unpower the Comp@s monitoring. This function is called automatically everyday.		
34	Export Data Records in CSV	Save	basic
	Writing a '1' to this control element will force the monitoring to save all the CVS records files. The CSV files are stored in the records folder.		
35	Archive Data Records	Save	basic
	Writing a '1' to this control element will force the monitoring to save all the data records. This is useful if you want to unpower the Comp@s monitoring. This function is called automatically everyday.		
40	Emulate Records	Emulation	underd ev
	No information		
41	Reload Translations	Translation	basic
	Writing a '1' to this control element will reload all the csv translation files		
51	Reload License	License	basic
	Writing a '1' to this control element will reload the license file		
61	Remove Absent Equipments	Inventory	basic
	No information		
81	Reset CAN Bus Node	CAN Bus	basic
	Writing a valid CAN bus node id to this control element will reset the correspondent device.		
82	Save CANOpen LSS Configuration	CAN Bus	basic
	No information		
83	Start New Inventory	CAN Bus	basic
	No information		
91	Upgrade Node Firmware	CAN Bus	basic
	This control element is used to start the firmware upgrade of a CAN bus Node. You need to upload first the firmware trough ftp in the /user/firmware path. Then you need to write the id number of the CAN Node, followed by a coma, followed by the file name. Example : '101,SOFT_0000030_01.txt'.		
92	Cancel Firmware Upgrade	CAN Bus	basic
	This control element is used to cancel the runiing firmware upgrade of a CAN bus		

	Node.		
103	Flash Binary	Comp@s Function	Advanced basic
	This control element is used to start a binary flash update. You need to upload first the firmware trough ftp in the /user/firmware path.		
110	Download File From Url	Comp@s Function	Advanced basic
	This control element is used to download a file wiht HTTP get, the argument is an url. The file is saved in the upload folder		
111	Delete User Uploaded File	Comp@s Function	Advanced basic
	This control element is used to delete a file in the user-upload folder. This is riskless as these files are not used, they are temporary files.		
112	Move User Uploaded File	Comp@s Function	Advanced basic
	This control element is used to copy a file from the user-upload folder to another one. Be aware of what your are doing !		
113	Extract Zip File in user-upload	Comp@s Function	Advanced basic
	This control element is used to delete a file in the user-upload folder. This is riskless as these files are not used, they are temporary files.		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2 DC System Tables

7.2.1 MCU1X6

Device Information

Name	MCU1X6
Short Description	Controller without LCD display
Long Description	Monitoring and control unit with USB and Ethernet port - ACE186 and ACE106 (+24V) lines
Hardware Reference	9413 060 10121
Software Reference	SOFT 000069 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		

5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		

22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
29	Digital Input 5	disabled (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	disabled (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	disabled (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	disabled (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licens</i></u> <u><i>e</i></u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			

14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic

	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.		
74	Battery Test Discharged Capacity	Battery	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.		
75	Battery Test Final Voltage	Battery	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.		
81	Previous Battery Test State	Battery	basic
	The result of the previous battery test		
82	Minutes Since Last Test Battery	Battery	basic
	The number of minute without battery test		
91	Battery Charge Capacity	Battery	basic
	The battery charge capacity, calculated by integration of the current.		
92	Calculated Autonomy	Battery	basic
	Calculation of the remaining autonomy		
93	Battery Current Integration	Battery	basic
	Actual value of the integration of the current, in Ampere * second		
94	Battery Current Integration	Battery	basic
	Actual value of the integration of the current, in Ampere * hour		
101	LVD State	LVD	basic
	Actual state of the LVD		
121	Efficiency Optimized Number Of Rectifier	Smart Energy	asset
	The optimal number of ON rectifier for Efficiency Optimization		
122	System Loss Without Optimisation	Smart Energy	under dev
	Estimation of the losses without optimisation		
123	System Loss With Optimisation	Smart Energy	under dev
	Estimation of the losses with optimisation		
124	Rectifier Model Used For Calculation	Smart Energy	asset
	The rectifier model used		
125	Smart Energy Savings	Smart Energy	asset
	Estimation of the losses with optimisation		
151	Ambient Temperature	Sensors	basic
	The ambient temperature (second temperature sense)		
161	Voltage Sense 1	Sensors	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC		
162	Voltage Sense 2	Sensors	basic
	The voltage measured by the sense 2. Can be used for battery symmetry measurement. Calculation can be done with the PLC		
163	Voltage Sense 3	Sensors	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC		
204	Digital Input 4 Counter	Sensors	basic

	The counter value of the digital input 4.
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Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				

25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
41	Shunt Rating At 60mV	Battery	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery

	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	3/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic

	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				

133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens</u> <u>e</u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic

	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.2 MCU1X6M3

Device Information	
Name	MCU1X6M3
Short Description	MCU for rack 3x1800W
Long Description	
Hardware Reference	9413 061 85051
Software Reference	SOFT 000082 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		

2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2

	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licence</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			

2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			

71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			

Config Table

<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max</i></u> <u><i>(default)</i></u>	<u><i>License</i></u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				

26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge	Battery Test	Ampere	3/100 (1000)	battery

	Current				
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc

	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		

3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.3 MCU0024

Device Information	
Name	MCU0024
Short Description	MCU for rack 6x1500W +24V
Long Description	
Hardware Reference	9413 000 XXXX

Software Reference	SOFT 000042 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		

7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2

	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
29	Digital Input 5	none (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	none (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	none (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	none (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			

23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
41	Mains Phase 1 Voltage	Mains	Volt	basic
	The voltage on AC phase 1			
42	Mains Phase 2 Voltage	Mains	Volt	basic
	The voltage on AC phase 2			
43	Mains Phase 3 Voltage	Mains	Volt	basic
	The voltage on AC phase 3			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic

	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.		
74	Battery Test Discharged Capacity	Battery	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.		
75	Battery Test Final Voltage	Battery	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.		
81	Previous Battery Test State	Battery	basic
	The result of the previous battery test		
82	Minutes Since Last Test Battery	Battery	basic
	The number of minute without battery test		
91	Battery Charge Capacity	Battery	basic
	The battery charge capacity, calculated by integration of the current.		
92	Calculated Autonomy	Battery	basic
	Calculation of the remaining autonomy		
93	Battery Current Integration	Battery	basic
	Actual value of the integration of the current, in Ampere * second		
94	Battery Current Integration	Battery	basic
	Actual value of the integration of the current, in Ampere * hour		
101	LVD State	LVD	basic
	Actual state of the LVD		
121	Efficiency Optimized Number Of Rectifier	Smart Energy	asset
	The optimal number of ON rectifier for Efficiency Optimization		
122	System Loss Without Optimisation	Smart Energy	under dev
	Estimation of the losses without optimisation		
123	System Loss With Optimisation	Smart Energy	under dev
	Estimation of the losses with optimisation		
124	Rectifier Model Used For Calculation	Smart Energy	asset
	The rectifier model used		
125	Smart Energy Savings	Smart Energy	asset
	Estimation of the losses with optimisation		
151	Ambient Temperature	Sensors	basic
	The ambient temperature (second temperature sense)		
161	Voltage Sense 1	Sensors	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC		
162	Voltage Sense 2	Sensors	basic
	The voltage measured by the sense 2. Can be used for battery symmetry measurement. Calculation can be done with the PLC		
163	Voltage Sense 3	Sensors	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC		
204	Digital Input 4 Counter	Sensors	basic

	The counter value of the digital input 4.
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Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max</u> <u>(default)</u>	<u>License</u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	20/30 (27)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	20/30 (22)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/2 (0)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	20/30 (24)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/2 (0.25)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	20/30 (28.25)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/2 (0.25)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	20/30 (29)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/2 (0.25)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/25 (21.6)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/1000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-500/0 (-36)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/5 (1)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-5/0 (-1)	basic
	The maximal allowed negative compensation.				

25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
41	Shunt Rating At 60mV	Battery	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	21/25 (23)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	25/29 (28.2)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	15/30 (23)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery

	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	3/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic

	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				

133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licens</i></u> <u><i>e</i></u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic

	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.4 MCU0348LP

Device Information	
Name	MCU0348LP
Short Description	Low profile controller (1/2U high)
Long Description	Low profile monitoring and control unit for CAPTIN300 line
Hardware 12NC	9413 060 10141
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Customer	basic
	A free text zone to write a system description		
2	Reference	Customer	basic

	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
17	Manufacturing ID	Monitoring	asset
	The batch id of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table		
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>
1	DC Bus Extra Low	major (6)
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST	
2	DC Bus Low	minor (4)
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'	
3	DC Bus High	minor (4)
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'	
4	DC Bus Extra High	major (6)
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'	
5	DC Bus Voltage Sense Failure	major (6)
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.	
6	Mains Failure	minor (4)
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.	
7	Mains Partial Failure	minor (4)
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.	
8	Mains Low	warning (2)
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit	

10	One Rectifier Failure	minor (4)
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'	
11	More Than One Rectifier Failure	major (6)
	There is no mains failure and number of rectifier failures is greater than 1.	
12	Missing Rectifiers	major (6)
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'	
13	Battery Last Test Failed	minor (4)
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.	
14	Battery On Discharge	minor (4)
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.	
17	Battery LVD Relay Open	major (6)
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD	
18	Battery Temperature Too High	minor (4)
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.	
19	Battery Temperature Too Low	minor (4)
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.	
20	Battery Temperature Sensor Fail	minor (4)
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.	
21	Ambient Temperature Too High	minor (4)
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.	
22	Ambient Temperature Too Low	minor (4)
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.	
23	Ambient Temperature Sensor Fail	minor (4)
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.	
25	Distribution Breaker Open	major (6)
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
26	Battery Breaker Open	minor (4)
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	

27	Digital Input 3	none (0)
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
28	Digital Input 4	none (0)
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
29	Digital Input 5	none (0)
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
30	Digital Input 6	none (0)
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licence</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			

35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in OVER Temperature.			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity Ah	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration As	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration Ah	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			

101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Asset Data		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Asset Data	Watt	asset
	The optimal number of ON rectifier for Efficiency Optimization			
123	System Loss With Optimisation	Asset Data	Watt	asset
	The optimal number of ON rectifier for Efficiency Optimization			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				

21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (0.5)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (0.2)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				

53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (2)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	0.5/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	0.2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic

	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too				

	Low' alarms.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
611	SNMP Trap Targets IP	Event		192.168.45.1	basic
	One or multiple target IP to send traps, coma separated. Ex: 130.145.23.1, 130.23.12.45				
612	Minimal Event Severity For Traps	Event		(none)	basic
	This is the minimal severity of the event to send a SNMP trap				
651	XML Events Primary Post URL	Event			basic
	This is the first URL at which the events related to this equipment must be posted. The XML ETSI standard is used in the posted data content.				
652	XML Events Primary Post Login	Event			basic
	The login which must be used when posting events to the primary server				
653	XML Events Primary Post Password	Event			basic
	The password which must be used when posting events to the primary server				
661	XML Events Secondary Post URL	Event			basic
	This is the second URL at which the events related to this equipment must be posted. The XML ETSI standard is used in the posted data content. This allows having redundancy with the management server.				
662	XML Events Secondary Post Login	Event			basic
	The login which must be used when posting events to the secondary server				
663	XML Events Secondary Post Password	Event			basic
	The password which must be used when posting events to the secondary server				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean				

	condition. In order to use these functionalities, you need a licence with the 'PLC' module
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Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>
1	Back To Float The dc system must go back in floating mode.	DC Mode	basic
2	Start Battery Test The dc system must start a battery test.	DC Mode	battery
3	Force Battery Test The dc system must force a battery test.	DC Mode	battery
4	Start Boost Mode The dc system must go in boost mode.	DC Mode	battery
11	Open The LVD The LVD must be opened	LVD	basic
12	Close The LVD The LVD must be closed	LVD	basic
21	Correct Battery Current Offset No information	Battery	basic
31	Reset Battery Current Integration Reset the integration of the battery current.	Battery	basic
41	Reset Last Battery Test State Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.	Battery	battery
51	Save Configuration In MCU Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.	Save	basic
61	Set Digital Input 4 Counter Value Set Counter Value	Counters	basic
501	Clear My Events By writing '1' to this control element, all the events of this equipment will be cleared.	Event	basic
502	Clear All Events By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.	Event	basic
511	Add Event This control element adds an event of severity none. The event name is the text written to this control element	Event	basic
512	Add Major Event This control element adds an event of severity major. The event name is the text written to this control element	Event	basic
521	Reset Default Names This control element adds an event of severity major. The event name is the text written to this control element	Event	basic

7.2.5 MCU0348M4

Device Information	
Name	MCU0348M4
Short Description	1U high controller with LCD display
Long Description	Monitoring and control unit, 1U high with LCD display, USB and Ethernet port - Captin300 line
Hardware 12NC	9413 060 10131
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Customer	basic
	A free text zone to write a system description		
2	Reference	Customer	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
17	Manufacturing ID	Monitoring	asset
	The batch id of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table		
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>
1	DC Bus Extra Low	major (6)
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST	
2	DC Bus Low	minor (4)
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'	
3	DC Bus High	minor (4)
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'	

4	DC Bus Extra High	major (6)
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'	
5	DC Bus Voltage Sense Failure	major (6)
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.	
6	Mains Failure	minor (4)
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.	
7	Mains Partial Failure	minor (4)
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.	
8	Mains Low	warning (2)
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit	
10	One Rectifier Failure	minor (4)
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'	
11	More Than One Rectifier Failure	major (6)
	There is no mains failure and number of rectifier failures is greater than 1.	
12	Missing Rectifiers	major (6)
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'	
13	Battery Last Test Failed	minor (4)
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.	
14	Battery On Discharge	minor (4)
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.	
17	Battery LVD Relay Open	major (6)
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD	
18	Battery Temperature Too High	minor (4)
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.	
19	Battery Temperature Too Low	minor (4)
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.	
20	Battery Temperature Sensor Fail	minor (4)
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.	
21	Ambient Temperature Too High	minor (4)

	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.	
22	Ambient Temperature Too Low	minor (4)
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.	
23	Ambient Temperature Sensor Fail	minor (4)
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.	
25	Distribution Breaker Open	major (6)
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
26	Battery Breaker Open	minor (4)
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
27	Digital Input 3	none (0)
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
28	Digital Input 4	none (0)
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
29	Digital Input 5	none (0)
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	
30	Digital Input 6	none (0)
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'	

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licence</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			

21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity Ah	Battery	Ah	basic

	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration As	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration Ah	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Asset Data		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Asset Data	Watt	asset
	The optimal number of ON rectifier for Efficiency Optimization			
123	System Loss With Optimisation	Asset Data	Watt	asset
	The optimal number of ON rectifier for Efficiency Optimization			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic

	The voltage hysteresis on the alarm 'DC Bus Voltage Low'				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High'				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High'				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic

	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (0.5)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (0.2)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (2)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	0.5/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	0.2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				

83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative	Dry Alarms		False	plc

	Boolean Condition				
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
611	SNMP Trap Targets IP	Event		192.168.45.1	basic
	One or multiple target IP to send traps, coma separated. Ex: 130.145.23.1, 130.23.12.45				
612	Minimal Event Severity For Traps	Event		(none)	basic
	This is the minimal severity of the event to send a SNMP trap				
651	XML Events Primary Post URL	Event			basic
	This is the first URL at which the events related to this equipment must be posted. The XML ETSI standard is used in the posted data content.				
652	XML Events Primary Post Login	Event			basic
	The login which must be used when posting events to the primary server				
653	XML Events Primary Post Password	Event			basic
	The password which must be used when posting events to the primary server				
661	XML Events Secondary Post URL	Event			basic

	This is the second URL at which the events related to this equipment must be posted. The XML ETSI standard is used in the posted data content. This allows having redundancy with the management server.				
662	XML Events Secondary Post Login	Event			basic
	The login which must be used when posting events to the secondary server				
663	XML Events Secondary Post Password	Event			basic
	The password which must be used when posting events to the secondary server				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licens e</i></u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		

61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		

7.2.6 MCU0348M4 / MCU0348LP

Device Information	
Name	MCU0348M4 / MCU0348LP
Short Description	1U high controller with LCD display / Low profile controller (1/2U high)
Long Description	Monitoring and control unit, 1U high with LCD display, USB and Ethernet port - Captin300 line / Low profile monitoring and control unit for CAPTIN300 line
Hardware Reference	9413 060 10131 / 9413 060 10141
Software Reference	SOFT 000081 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset

	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should		

	be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system is in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambient temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambient temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
24	Humidity Out Of Range	major (6)	5 / 2
	The humidity is not comprised between a lower limit, corresponding to configuration parameter 'Humidity Low', and an upper limit, corresponding to configuration parameter 'Humidity High'. There is an hysteresis corresponding to configuration parameter 'Humidity Hysteresis'. This alarm is only active in MCU master types 0548.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

29	Digital Input 5	none (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	none (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	none (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	none (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			

35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in OVER Temperature.			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic

	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
152	Relative Humidity	Sensors	%	basic
	The relative humidity in the cabinet			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				

9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High'				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (0.5)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For	Battery	Ampere	0/50 (0.2)	basic

	Discharging Alarm				
	The hysteresis on the 'Battery On Discharge' alarm.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (2)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	0.5/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	0.2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic

	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				

111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
135	Cabinet Humidity High	Alarm Parameters	%	0/100 (80)	basic
	The relative humidity over which the cabinet humidity is too high				
136	Cabinet Humidity Low	Alarm Parameters	%	0/100 (0)	basic
	The relative humidity over which the cabinet humidity is too low				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical				

	calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens e</u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		

521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.7 MCU0548M4

Device Information	
Name	MCU0548M4
Short Description	Controller with basic site monitoring functions (4x500W)
Long Description	Monitoring and control unit with front connector for site monitoring - ACE054 line
Hardware Reference	9413 060 55101
Software Reference	SOFT 000081 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		

2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an		

	hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
24	Humidity Out Of Range	major (6)	5 / 2
	The humidity is not comprised between a lower limit, corresponding to configuration parameter 'Humidity Low', and a upper limit, corresponding to configuration parameter 'Humidity High'. There is an hysteresis corresponding to configuration parameter 'Humidity Hysteresis'. This alarm is only active in MCU master types 0548.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
29	Digital Input 5	none (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	none (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	none (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	none (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licens e</i></u>
1	DC Mode The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE	General		basic
2	Previous DC Mode The previous value of the DC Mode	General		basic
11	Bus Voltage The DC bus voltage in volt.	General	Volt	basic
12	Ratio Delivered On Available Power This is the ratio of the delivered power divided by the installed power, in %.	General	%	basic
13	Minutes Since Last AC Failure Begin The number of minute since the last AC Failure begin	General	minute	basic
14	Minutes Since Last AC Failure End The number of minute since the last AC Failure end	General	minute	basic
21	Rectifiers Output Power The sum of the delivered rectifier power	Rectifiers	Watt	basic
22	Rectifiers Output Current The sum of the delivered rectifier current	Rectifiers	Ampere	basic
23	Rectifiers Output Power Max The sum of the deliverable rectifier power	Rectifiers	Watt	basic
24	Rectifiers Output Current Max The sum of the deliverable rectifier current	Rectifiers	Ampere	basic
31	Number Of Rectifier Max The maximum possible number of rectifier in this dc system	Rectifiers		basic
32	Number Of Present Rectifier The actual number of present rectifier in this dc system	Rectifiers		basic
33	Number Of Absent Rectifier The actual number of absent rectifier in this dc system	Rectifiers		basic
34	Number Of Active Rectifier The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.	Rectifiers		basic
35	Number Of AC-Fail Rectifier The actual number or rectifier in AC Failure.	Rectifiers		basic
36	Number Of DC-Fail Rectifier The actual number or rectifier with DC Failure.	Rectifiers		basic
37	Number Of Remote Off Rectifier The actual number or rectifier in remote off.	Rectifiers		basic
38	Number Of Over Temperature Rectifier The actual number or rectifier in Over Temperature.	Rectifiers		basic
51	Load Power Estimation of the load power consumption	Load	Watt	basic

52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev

	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
152	Relative Humidity	Sensors	%	basic
	The relative humidity in the cabinet			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic

		n			
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (0.5)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (0.2)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery

	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (2)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	0.5/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	0.2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is				

	not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				

114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
135	Cabinet Humidity High	Alarm Parameters	%	0/100 (80)	basic
	The relative humidity over which the cabinet humidity is too high				
136	Cabinet Humidity Low	Alarm Parameters	%	0/100 (0)	basic
	The relative humidity over which the cabinet humidity is too low				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens</u> <u>e</u>

1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.8 MCU0948DW

Device Information

Name	MCU0948DW
Short Description	MCU for rack 2x850W -54V
Long Description	
Hardware Reference	9413 000 XXXXX
Software Reference	SOFT 000076 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or		

	unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an		

	hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
29	Digital Input 5	none (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	none (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	none (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	none (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			

21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
41	Mains Phase 1 Voltage	Mains	Volt	basic
	The voltage on AC phase 1			
42	Mains Phase 2 Voltage	Mains	Volt	basic
	The voltage on AC phase 2			
43	Mains Phase 3 Voltage	Mains	Volt	basic
	The voltage on AC phase 3			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible :			

	NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
161	Voltage Sense 1	Sensors	Volt	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
162	Voltage Sense 2	Sensors	Volt	basic
	The voltage measured by the sense 2. Can be used for battery symmetry			

	measurement. Calculation can be done with the PLC			
163	Voltage Sense 3	Sensors	Volt	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max</i></u> <u><i>(default)</i></u>	<u><i>License</i></u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic

	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (2)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (0.5)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (2)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery

	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	3/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is				

	not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				

132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens</u> <u>e</u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic

	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.9 MCU0948M4 / MCU0948M4LP

Device Information	
Name	MCU0948M4 / MCU0948M4LP
Short Description	1U high controller with LCD display / Low profile controller (1/2U high)
Long Description	Monitoring and control unit, 1U high with LCD display, USB and Ethernet port - Captin FA, Captin BW, ACE102FALP and ACE094 lines / Low profile monitoring and control unit, 0.5U high, USB and Ethernet port - CAPTIN FA, CAPTIN BW lines
Hardware Reference	9413 060 95051 / 9413 060 95081
Software Reference	SOFT 000030 XX
Equipment Type	Monitoring Control Unit

ETSI Level	/site/energy_system/dc_system
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Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC		

	failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		

25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			

35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in OVER Temperature.			
41	Mains Phase 1 Voltage	Mains	Volt	basic
	The voltage on AC phase 1			
42	Mains Phase 2 Voltage	Mains	Volt	basic
	The voltage on AC phase 2			
43	Mains Phase 3 Voltage	Mains	Volt	basic
	The voltage on AC phase 3			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic

	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
161	Voltage Sense 1	Sensors	Volt	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
162	Voltage Sense 2	Sensors	Volt	basic
	The voltage measured by the sense 2. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
163	Voltage Sense 3	Sensors	Volt	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic

	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				

32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (2)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (0.5)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (2)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	3/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery

	The timeout in minute after which the battery test must be stopped.					
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery	
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.					
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset	
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.					
86	Battery LVD Node Id	LVD		True/False (False)	basic	
	This is a list of the node id of the Smart Electronic LVDs, coma separated					
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic	
	The name of the digital input 1					
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic	
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.					
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic	
	The name of the digital input 2					
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic	
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.					
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic	
	The name of the digital input 3					
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic	
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.					
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic	
	The name of the digital input 4					
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic	
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.					
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc	
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.					
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc	
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.					
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc	
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean					

	condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens e</u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		

3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.10 MCU1848M3 / MCU1848M3D

Device Information	
Name	MCU1848M3 / MCU1848M3D
Short Description	Controller without LCD display / Controller with LCD display
Long Description	Monitoring and control unit with USB and

	Ethernet port, no LCD display - ACE153 and ACE156 lines / Monitoring and control unit with LCD display, USB and Ethernet port - ACE153 and ACE156 line
Hardware Reference	9413 061 85041 / 9413 061 85051
Software Reference	SOFT 000066 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2

	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic

	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset

	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			

Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic

	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				

54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	3/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				

95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc

	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module
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Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>
1	Back To Float The dc system must go back in floating mode.	DC Mode	basic
2	Start Battery Test The dc system must start a battery test.	DC Mode	battery
3	Force Battery Test The dc system must force a battery test.	DC Mode	battery
4	Start Boost Mode The dc system must go in boost mode.	DC Mode	battery
11	Open The LVD The LVD must be opened	LVD	basic
12	Close The LVD The LVD must be closed	LVD	basic
21	Correct Battery Current Offset No information	Battery	basic
31	Reset Battery Current Integration Reset the integration of the battery current.	Battery	basic
41	Reset Last Battery Test State Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.	Battery	battery
51	Save Configuration In MCU Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.	Save	basic
61	Set Digital Input 4 Counter Value Set Counter Value	Counters	basic
501	Clear My Events By writing '1' to this control element, all the events of this equipment will be cleared.	Event	basic
502	Clear All Events By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.	Event	basic
511	Add Event This control element adds an event of severity none. The event name is the text written to this control element	Event	basic
512	Add Major Event This control element adds an event of severity major. The event name is the text written to this control element	Event	basic
521	Reset Default Names And Groups This control element resets all the element Names, Groups and Subgroups to default values for this equipment	Advanced	basic

522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.11 MCU1848M6

Device Information	
Name	MCU1848M6
Short Description	Controller without LCD display
Long Description	Monitoring and control unit with USB and Ethernet port - ACE186 line
Hardware Reference	9413 061 85001
Software Reference	SOFT 000033 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		

3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		

20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			

22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test.			

	This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
161	Voltage Sense 1	Sensors	Volt	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
162	Voltage Sense 2	Sensors	Volt	basic
	The voltage measured by the sense 2. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
163	Voltage Sense 3	Sensors	Volt	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table

<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max</i></u> <u><i>(default)</i></u>	<u><i>License</i></u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				

26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
41	Shunt Rating At 60mV	Battery	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is				

	set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	3/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is				

	not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean				

	condition. In order to use these functionalities, you need a licence with the 'PLC' module
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Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>
1	Back To Float The dc system must go back in floating mode.	DC Mode	basic
2	Start Battery Test The dc system must start a battery test.	DC Mode	battery
3	Force Battery Test The dc system must force a battery test.	DC Mode	battery
4	Start Boost Mode The dc system must go in boost mode.	DC Mode	battery
11	Open The LVD The LVD must be opened	LVD	basic
12	Close The LVD The LVD must be closed	LVD	basic
21	Correct Battery Current Offset No information	Battery	basic
31	Reset Battery Current Integration Reset the integration of the battery current.	Battery	basic
41	Reset Last Battery Test State Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.	Battery	battery
51	Save Configuration In MCU Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.	Save	basic
61	Set Digital Input 4 Counter Value Set Counter Value	Counters	basic
501	Clear My Events By writing '1' to this control element, all the events of this equipment will be cleared.	Event	basic
502	Clear All Events By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.	Event	basic
511	Add Event This control element adds an event of severity none. The event name is the text written to this control element	Event	basic
512	Add Major Event This control element adds an event of severity major. The event name is the text written to this control element	Event	basic
521	Reset Default Names And Groups This control element resets all the element Names, Groups and Subgroups to default values for this equipment	Advanced	basic
522	Reset Default Names And Groups Recursive This control element resets all the element Names, Groups and Subgroups to default	Advanced	basic

	values for this equipment and all sub equipments
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7.2.12 MCU3048M6

Device Information	
Name	MCU3048M6
Short Description	MCU3048M6
Long Description	
Hardware Reference	9413 063 05001
Software Reference	SOFT 000070 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm :		

	'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
9	Mains High	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. The alarm is only active if MCU master type is 30110, 3096 or 3048M6. Therefore, an hysteresis _phase123Hysteresis is subtracted to the voltage lower limit.		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an		

	hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
29	Digital Input 5	none (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	none (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	none (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	none (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			

2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
41	Mains Phase 1 Voltage	Mains	Volt	basic
	The voltage on AC phase 1			
42	Mains Phase 2 Voltage	Mains	Volt	basic
	The voltage on AC phase 2			
43	Mains Phase 3 Voltage	Mains	Volt	basic
	The voltage on AC phase 3			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic

	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
63	Battery String 1 Input Current	Battery	Ampere	basic
	Measurement of the battery 1 input current. A negative value means that the battery is discharging			
64	Battery String 2 Input Current	Battery	Ampere	basic
	Measurement of the battery 2 input current. A negative value means that the battery is discharging			
65	Battery String 3 Input Current	Battery	Ampere	basic
	Measurement of the battery 3 input current. A negative value means that the battery is discharging			
67	Voltage Offset For Shunt regulation	Battery	Volt	basic
	No information			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			

101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
161	Voltage Sense 1	Sensors	Volt	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
162	Voltage Sense 2	Sensors	Volt	basic
	The voltage measured by the sense 2. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
163	Voltage Sense 3	Sensors	Volt	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	40/60 (54)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	40/60 (45)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/5 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	40/60 (48)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low'				
6	DC Bus Voltage High	Bus Voltage	Volt	40/60 (56.5)	basic

	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High'				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	40/60 (58)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/5 (0.5)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High'				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/50 (43.2)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/2000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-1000/0 (-72)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/10 (3)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-10/0 (-3)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
28	Rectifier CAN Node IDs Range	Rectifiers			basic
	No information				
29	Rectifier Ids Declared	Rectifiers			basic
	No information				
31	Battery Charge Current Limit	Battery	Ampere	0.5/3250 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/6500 (100)	basic
	The battery capacity in Ah.				

33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/5000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/500 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
40	Number of Battery String	Battery		1-3	basic
	The Number of Battery String in the system				
41	Shunt Rating At 60mV	Battery	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
42	Battery 2 Charge Current Limit	Battery 2	Ampere	0.5/3250 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
43	Battery 2 String Capacity	Battery 2	Ah	3/6500 (100)	basic
	The battery capacity in Ah.				
44	Shunt Rating At 60mV	Battery 2	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
45	Battery 3 Charge Current Limit	Battery 3	Ampere	0.5/3250 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
46	Battery 3 String Capacity	Battery 3	Ah	3/6500 (100)	basic
	The battery capacity in Ah.				
47	Shunt Rating At 60mV	Battery 3	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	43/50 (46)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	50/58 (56.4)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery

	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	30/60 (46)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	3/5000 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic

	Closed				
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				

131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
141	AC Voltage Low	Mains	Volt		basic
	The AC voltage under which the alarm AC Low is set.				
142	AC Voltage High	Mains	Volt		basic
	The AC voltage over which the alarm AC High is set.				
143	AC Voltage Hysteresis	Mains	Volt		basic
	The AC voltage hysteresis on alarms AC High and AC Low.				
144	AC Phase 1 PLC	Mains			basic
	This is the mathematical expression of the calculation of AC phase 1. If empty, the rectifiers are used. The syntax for writting mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.				
145	AC Phase 2 PLC	Mains			basic
	This is the mathematical expression of the calculation of AC phase 2. If empty, the rectifiers are used. The syntax for writting mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.				
146	AC Phase 3 PLC	Mains			basic
	This is the mathematical expression of the calculation of AC phase 3. If empty, the rectifiers are used. The syntax for writting mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.				
151	PLD Condition	PLD			basic
	The PLC conditon to enable the PLD command				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				

902	Number Of PLC Alarm	PLC	(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module			

Control Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>	
1	Back To Float	DC Mode	basic	
	The dc system must go back in floating mode.			
2	Start Battery Test	DC Mode	battery	
	The dc system must start a battery test.			
3	Force Battery Test	DC Mode	battery	
	The dc system must force a battery test.			
4	Start Boost Mode	DC Mode	battery	
	The dc system must go in boost mode.			
11	Open The LVD	LVD	basic	
	The LVD must be opened			
12	Close The LVD	LVD	basic	
	The LVD must be closed			
21	Correct Battery Current Offset	Battery	basic	
	No information			
31	Reset Battery Current Integration	Battery	basic	
	Reset the integration of the battery current.			
41	Reset Last Battery Test State	Battery	battery	
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.			
51	Save Configuration In MCU	Save	basic	
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.			
61	Set Digital Input 4 Counter Value	Counters	basic	
	Set Counter Value			
501	Clear My Events	Event	basic	
	By writing '1' to this control element, all the events of this equipment will be cleared.			
502	Clear All Events	Event	basic	
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.			
511	Add Event	Event	basic	
	This control element adds an event of severity none. The event name is the text written to this control element			
512	Add Major Event	Event	basic	
	This control element adds an event of severity major. The event name is the text written to this control element			
521	Reset Default Names And Groups	Advanced	basic	

	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.13 MCU3096M6

Device Information	
Name	MCU3096M6
Short Description	MCU for rack 6x3000W +96V
Long Description	
Hardware Reference	9413 063 07041
Software Reference	SOFT 000091 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm :		

	'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
9	Mains High	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. The alarm is only active if MCU master type is 30110, 3096 or 3048M6. Therefore, an hysteresis _phase123Hysteresis is subtracted to the voltage lower limit.		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2

	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
29	Digital Input 5	none (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	none (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	none (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	none (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens</u>

				<u>e</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
41	Mains Phase 1 Voltage	Mains	Volt	basic
	The voltage on AC phase 1			
42	Mains Phase 2 Voltage	Mains	Volt	basic
	The voltage on AC phase 2			
43	Mains Phase 3 Voltage	Mains	Volt	basic
	The voltage on AC phase 3			

51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			

123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
161	Voltage Sense 1	Sensors	Volt	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
162	Voltage Sense 2	Sensors	Volt	basic
	The voltage measured by the sense 2. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
163	Voltage Sense 3	Sensors	Volt	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	65/105 (94.5)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	65/105 (78.75)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0.5/10 (2)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	65/105 (84)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0.5/10 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	70/105 (98.875)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0.5/10 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	70/105 (101.5)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0.5/10 (1)	basic

	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High'				
10	LVD Disconnect Voltage	Bus Voltage	Volt	65/87.5 (75.6)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/4000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-2000/0 (-126)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/20 (6)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-20/0 (-6)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				

41	Shunt Rating At 60mV	Battery	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	75.25/87.5 (80.5)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	87.5/101.5 (98.7)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	52.5/105 (80.5)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	10/5000 (2000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic

	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				

111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
141	AC Voltage Low	Mains	Volt		basic
	The AC voltage under which the alarm AC Low is set.				
142	AC Voltage High	Mains	Volt		basic
	The AC voltage over which the alarm AC High is set.				
143	AC Voltage Hysteresis	Mains	Volt		basic
	The AC voltage hysteresis on alarms AC High and AC Low.				
144	AC Phase 1 PLC	Mains			basic
	This is the mathematical expression of the calculation of AC phase 1. If empty, the rectifiers are used. The syntax for writting mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.				
145	AC Phase 2 PLC	Mains			basic
	This is the mathematical expression of the calculation of AC phase 2. If empty, the rectifiers are used. The syntax for writting mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.				
146	AC Phase 3 PLC	Mains			basic
	This is the mathematical expression of the calculation of AC phase 3. If empty, the rectifiers are used. The syntax for writting mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means				

	that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens e</u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic

	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.14 MCU30110M6

Device Information	
Name	MCU30110M6
Short Description	Controller without LCD display (6x3kW - 110V)
Long Description	Monitoring and control unit with USB and Ethernet port - ACE306 (+110V & +125V) line
Hardware Reference	9413 063 07011
Software Reference	SOFT 000040 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		

16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
9	Mains High	warning (2)	10 / 2
	The main voltage is low on one or more phases. No rectifier is in AC failure. The alarm is only active if MCU master type is 30110, 3096 or 3048M6. Therefore, an hysteresis _phase123Hysteresis is subtracted to the voltage lower limit.		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		

12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

29	Digital Input 5	none (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	none (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	none (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	none (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			
31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			

35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in OVER Temperature.			
41	Mains Phase 1 Voltage	Mains	Volt	basic
	The voltage on AC phase 1			
42	Mains Phase 2 Voltage	Mains	Volt	basic
	The voltage on AC phase 2			
43	Mains Phase 3 Voltage	Mains	Volt	basic
	The voltage on AC phase 3			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test. This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic

	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
161	Voltage Sense 1	Sensors	Volt	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
162	Voltage Sense 2	Sensors	Volt	basic
	The voltage measured by the sense 2. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
163	Voltage Sense 3	Sensors	Volt	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	60/120 (108)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	60/120 (90)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/10 (2)	basic

	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	60/120 (96)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/10 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	60/120 (113)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/10 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	60/120 (116)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/10 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/100 (86.4)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/4000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-2000/0 (-144)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/20 (6)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-20/0 (-6)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				
26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				

32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
41	Shunt Rating At 60mV	Battery	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	86/100 (92)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	100/116 (112.8)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	60/120 (92)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery
	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	10/5000 (2000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is				

	too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				

102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
141	AC Voltage Low	Mains	Volt		basic
	The AC voltage under which the alarm AC Low is set.				
142	AC Voltage High	Mains	Volt		basic
	The AC voltage over which the alarm AC High is set.				
143	AC Voltage Hysteresis	Mains	Volt		basic
	The AC voltage hysteresis on alarms AC High and AC Low.				
144	AC Phase 1 PLC	Mains			basic
	This is the mathematical expression of the calculation of AC phase 1. If empty, the				

	rectifiers are used. The syntax for writing mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.			
145	AC Phase 2 PLC	Mains		basic
	This is the mathematical expression of the calculation of AC phase 2. If empty, the rectifiers are used. The syntax for writing mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.			
146	AC Phase 3 PLC	Mains		basic
	This is the mathematical expression of the calculation of AC phase 3. If empty, the rectifiers are used. The syntax for writing mathematical expression is described in the PLC chapter. The PLC data element is the result of the calculation.			
521	Read Access User Numbers	Allowed Users	(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4			
522	Write Access User Numbers	Allowed Users	()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4			
601	Event Table Length	Event	10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000			
602	Event Table Length By Rectifier	Event	10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000			
901	Number Of PLC Data	PLC	(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module			
902	Number Of PLC Alarm	PLC	(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module			

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens</u> <u>e</u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		

11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		
41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.2.15 MCU30125M6

Device Information	
Name	MCU30125M6
Short Description	MCU for rack 6x3000W +125V
Long Description	
Hardware Reference	9413 000 XXXX
Software Reference	SOFT 000057 XX
Equipment Type	Monitoring Control Unit
ETSI Level	/site/energy_system/dc_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	DC Bus Extra Low	major (6)	5 / 2
	The bus voltage is extra low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Extra Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra Low Hysteresis'. The alarm is not activated when DC mode is BATTERY TEST		
2	DC Bus Low	minor (4)	5 / 2
	The bus voltage is low. The alarm is set when the bus voltage is lower than the configuration parameter 'DC Bus Voltage Low'. There is an hysteresis on the alarm : 'DC Bus Voltage Low Hysteresis'		
3	DC Bus High	minor (4)	5 / 2
	The bus voltage is high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage High'. There is an hysteresis on the alarm : 'DC Bus Voltage High Hysteresis'		
4	DC Bus Extra High	major (6)	5 / 2
	The bus voltage is extra high. The alarm is set when the bus voltage is higher than the configuration parameter 'DC Bus Voltage Extra High'. There is an hysteresis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	DC Bus Voltage Sense Failure	major (6)	5 / 2
	The DC bus voltage sense is defective. The DC bus voltage is unconnected or unconfigured.		
6	Mains Failure	minor (4)	5 / 2
	The number of active rectifiers is equal to 0 and the number of rectifiers in AC failure is greater than 0.		
7	Mains Partial Failure	minor (4)	10 / 2
	The number of active rectifiers is greater than 0 and the number of rectifiers in AC failure is greater than 0. Some rectifiers are in AC Failure. It may be caused by an open breaker, a real phase failure, or by a rectifier failure.		
8	Mains Low	warning (2)	10 / 2

	The main voltage is low on one or more phases. No rectifier is in AC failure. If MCU master type is 30110, 3096 or 3048M6, an hysteresis _phase123Hysteresis is added to the voltage lower limit		
10	One Rectifier Failure	minor (4)	5 / 2
	One rectifier must be replaced or is not powered correctly. The DC fail alarm of the rectifier is set. The number of rectifier with DC Failure is higher than 0, there is no mains failure, and the 'More Than One Rectifier Failure alarm is not set.'		
11	More Than One Rectifier Failure	major (6)	10 / 2
	There is no mains failure and number of rectifier failures is greater than 1.		
12	Missing Rectifiers	major (6)	5 / 2
	There is not enough rectifier according to the configuration parameter : 'Minimal Number Of Rectifier'		
13	Battery Last Test Failed	minor (4)	5 / 2
	The last battery test did not succeed and was not cancelled. Maybe the battery should be replaced.		
14	Battery On Discharge	minor (4)	10 / 2
	The battery is discharging. This means that the load is too high for the installed rectifiers. This alarm is inactive when the system in AC Failure or during a battery test. There is an hysteresis corresponding to battery parameter 'Is discharging current hysteresis'.		
17	Battery LVD Relay Open	major (6)	5 / 2
	The battery Low Voltage Disconnect is open. On Systems without LVD_Status signal, like MCU 1848 or MCU 1x6, the alarm is present only if the signal LVD_COM asks to open the LVD		
18	Battery Temperature Too High	minor (4)	5 / 2
	The temperature of the battery is too high and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
19	Battery Temperature Too Low	minor (4)	5 / 2
	The temperature of the battery is too low and is greater than -600 units. There is an hysteresis corresponding to battery parameter 'Temperature hysteresis'.		
20	Battery Temperature Sensor Fail	minor (4)	5 / 2
	The battery temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
21	Ambient Temperature Too High	minor (4)	5 / 2
	The ambient temperature is too high and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
22	Ambient Temperature Too Low	minor (4)	5 / 2
	The ambient temperature is too low and is greater than -600 units. There is an hysteresis corresponding to parameter 'Ambiant temperature hysteresis'. This alarm is only activated on MCU master types 30110, 3096, 30125, 0024, 0948, 0548, 0348, 0948 and 3048M6.		
23	Ambient Temperature Sensor Fail	minor (4)	5 / 2
	The ambient temperature sensor (NTC) value is inferior to -500 units meaning that it is not connected or defective.		
25	Distribution Breaker Open	major (6)	5 / 2
	This alarm is related to digital input 1. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

26	Battery Breaker Open	minor (4)	5 / 2
	This alarm is related to digital input 2. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
27	Digital Input 3	none (0)	5 / 2
	This alarm is related to digital input 3. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
28	Digital Input 4	none (0)	5 / 2
	This alarm is related to digital input 4. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
29	Digital Input 5	none (0)	5 / 2
	This alarm is related to digital input 5. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
30	Digital Input 6	none (0)	5 / 2
	This alarm is related to digital input 6. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
31	Digital Input 7	none (0)	5 / 2
	This alarm is related to digital input 7. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		
32	Digital Input 8	none (0)	5 / 2
	This alarm is related to digital input 8. This alarm is activated if digital input value is different to configuration parameter 'Digital Input Alarm Value'		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	DC Mode	General		basic
	The DC system can have 4 values: 'FLOAT', 'BOOST', 'BATTERY_TEST', 'AC_FAILURE' or SAFE			
2	Previous DC Mode	General		basic
	The previous value of the DC Mode			
11	Bus Voltage	General	Volt	basic
	The DC bus voltage in volt.			
12	Ratio Delivered On Available Power	General	%	basic
	This is the ratio of the delivered power divided by the installed power, in %.			
13	Minutes Since Last AC Failure Begin	General	minute	basic
	The number of minute since the last AC Failure begin			
14	Minutes Since Last AC Failure End	General	minute	basic
	The number of minute since the last AC Failure end			
21	Rectifiers Output Power	Rectifiers	Watt	basic
	The sum of the delivered rectifier power			
22	Rectifiers Output Current	Rectifiers	Ampere	basic
	The sum of the delivered rectifier current			
23	Rectifiers Output Power Max	Rectifiers	Watt	basic
	The sum of the deliverable rectifier power			
24	Rectifiers Output Current Max	Rectifiers	Ampere	basic
	The sum of the deliverable rectifier current			

31	Number Of Rectifier Max	Rectifiers		basic
	The maximum possible number of rectifier in this dc system			
32	Number Of Present Rectifier	Rectifiers		basic
	The actual number of present rectifier in this dc system			
33	Number Of Absent Rectifier	Rectifiers		basic
	The actual number of absent rectifier in this dc system			
34	Number Of Active Rectifier	Rectifiers		basic
	The actual number of active rectifier in this dc system. An active rectifier is a rectifier which is present, DC OK, AC OK and not in remote off.			
35	Number Of AC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier in AC Failure.			
36	Number Of DC-Fail Rectifier	Rectifiers		basic
	The actual number or rectifier with DC Failure.			
37	Number Of Remote Off Rectifier	Rectifiers		basic
	The actual number or rectifier in remote off.			
38	Number Of Over Temperature Rectifier	Rectifiers		basic
	The actual number or rectifier in Over Temperature.			
41	Mains Phase 1 Voltage	Mains	Volt	basic
	The voltage on AC phase 1			
42	Mains Phase 2 Voltage	Mains	Volt	basic
	The voltage on AC phase 2			
43	Mains Phase 3 Voltage	Mains	Volt	basic
	The voltage on AC phase 3			
51	Load Power	Load	Watt	basic
	Estimation of the load power consumption			
52	Load Current	Load	Ampere	basic
	Estimation of the load current consumption			
61	Battery Input Current	Battery	Ampere	basic
	Measurement of the battery input current. A negative value means that the battery is discharging			
62	Battery Input Power	Battery	Watt	basic
	Measurement of the battery input power. A negative value means that the battery is discharging			
71	Battery Temperature	Battery	degree C	basic
	The battery temperature			
72	Battery Test State	Battery		basic
	This is about the result of the last battery test. 9 values are possible : NEVER_TESTED, SUCCESS, ON_GOING, FAILED_TIMEOUT, FAILED_VBUS_TOO_LOW, FAILED_LOAD_TOO_LOW, FAILED_AC_FAILURE, FAILED_CANCELED, FAILED_LVD_OPENED			
73	Battery Test Discharged Capacity Ratio	Battery	%	basic
	This is the battery capacity, in percent, discharged during the last battery test. This value is updated at the end of the battery test.			
74	Battery Test Discharged Capacity	Battery	Ah	basic
	This is the battery capacity, in ampere hour, discharged during the last battery test.			

	This value is updated at the end of the battery test.			
75	Battery Test Final Voltage	Battery	%	basic
	This is the bus voltage at the end of the last battery test. This value is updated at the end of the battery test.			
81	Previous Battery Test State	Battery		basic
	The result of the previous battery test			
82	Minutes Since Last Test Battery	Battery		basic
	The number of minute without battery test			
91	Battery Charge Capacity	Battery	%	basic
	The battery charge capacity, calculated by integration of the current.			
92	Calculated Autonomy	Battery	minute	basic
	Calculation of the remaining autonomy			
93	Battery Current Integration	Battery	As	basic
	Actual value of the integration of the current, in Ampere * second			
94	Battery Current Integration	Battery	Ah	basic
	Actual value of the integration of the current, in Ampere * hour			
101	LVD State	LVD		basic
	Actual state of the LVD			
121	Efficiency Optimized Number Of Rectifier	Smart Energy		asset
	The optimal number of ON rectifier for Efficiency Optimization			
122	System Loss Without Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses without optimisation			
123	System Loss With Optimisation	Smart Energy	Watt	under dev
	Estimation of the losses with optimisation			
124	Rectifier Model Used For Calculation	Smart Energy		asset
	The rectifier model used			
125	Smart Energy Savings	Smart Energy	Watt	asset
	Estimation of the losses with optimisation			
151	Ambient Temperature	Sensors	degree C	basic
	The ambient temperature (second temperature sense)			
161	Voltage Sense 1	Sensors	Volt	basic
	The voltage measured by the sense 1. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
162	Voltage Sense 2	Sensors	Volt	basic
	The voltage measured by the sense 2. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
163	Voltage Sense 3	Sensors	Volt	basic
	The voltage measured by the sense 3. Can be used for battery symmetry measurement. Calculation can be done with the PLC			
204	Digital Input 4 Counter	Sensors		basic
	The counter value of the digital input 4.			

Config Table

<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max</i></u> <u><i>(default)</i></u>	<u><i>License</i></u>
1	DC Bus Float Voltage at 25 degC	Bus Voltage	Volt	92/138 (125)	basic
	The floating dc bus voltage of the system at 25 Celsius degree				
2	DC Bus Voltage Extra Low	Bus Voltage	Volt	92/138 (103.5)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Extra Low' is set.				
3	DC Bus Voltage Extra Low Hysteresis	Bus Voltage	Volt	0/10 (2)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra Low'.				
4	DC Bus Voltage Low	Bus Voltage	Volt	92/138 (110.4)	basic
	The bus voltage under which the alarm 'DC Bus Voltage Low' is set.				
5	DC Bus Voltage Low Hysteresis	Bus Voltage	Volt	0/10 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Low				
6	DC Bus Voltage High	Bus Voltage	Volt	92/138 (129.95)	basic
	The bus voltage over which the alarm 'DC Bus Voltage High' is set.				
7	DC Bus Voltage High Hysteresis	Bus Voltage	Volt	0/10 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage High				
8	DC Bus Voltage Extra High	Bus Voltage	Volt	92/138 (133.4)	basic
	The bus voltage over which the alarm 'DC Bus Voltage Extra High' is set.				
9	DC Bus Voltage Extra High Hysteresis	Bus Voltage	Volt	0/10 (1)	basic
	The voltage hysteresis on the alarm 'DC Bus Voltage Extra High				
10	LVD Disconnect Voltage	Bus Voltage	Volt	0/115 (99.36)	basic
	The dc bus voltage under which the battery must be disconnected of the bus. This allows preserving the battery life. The load will be unpowered.				
11	LVD Disconnect Delay	Bus Voltage	second	1/4000 (1)	basic
	The delay in second before disconnecting the battery if the dc bus voltage is under the configured disconnected voltage. This avoids disconnection during a low bus transient.				
21	Temperature Compensation Slope	Temperature Compensation	mV/degree	-2000/0 (-165)	basic
	The slope of the battery temperature compensation in mv/degree. For a 48V system, -72mV/degree is often used.				
22	Maximum Positive Temperature Compensation	Temperature Compensation	Volt	0/20 (6)	basic
	The maximal allowed positive compensation.				
23	Maximum Negative Temperature Compensation	Temperature Compensation	Volt	-20/0 (-6)	basic
	The maximal allowed negative compensation.				
25	Minimal Number Of Present Rectifiers	Rectifiers		0/100 (0)	basic
	The minimal number of rectifier which must be present. If there is less present rectifiers, the alarm 'Missing Rectifiers' is set.				

26	Rectifier Model	Rectifiers			basic
	The rectifier model				
27	Forced Remote Off Rectifiers	Rectifiers			basic
	A list of rectifier which are forced in remote off. The id of the rectifier must be coma separated. Ex: 1,3 will maintain rectifier 1 and 3 off.				
31	Battery Charge Current Limit	Battery	Ampere	0.5/1000 (1000)	basic
	The maximal battery current when the battery is charging. The monitoring regulates the bus voltage in order to satisfy this condition. This parameter is often equal to the nominal battery capacity divided by 10.				
32	Battery String Capacity	Battery	Ah	3/1000 (100)	basic
	The battery capacity in Ah.				
33	Battery Temperature Low	Battery	degree C	-100/20 (0)	basic
	The temperature under which the alarm 'Battery Temperature Too Low' must be set.				
34	Battery Temperature High	Battery	degree C	5/100 (40)	basic
	The temperature over which the alarm 'Battery Temperature Too High' must be set.				
35	Battery Temperature Hysteresis	Battery	degree C	0/10 (2)	basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too Low' alarms.				
36	Minimal Current For Discharging Alarm	Battery	Ampere	0/1000 (3)	basic
	The minimal discharging current to set the 'Battery On Discharge' alarm.				
37	Current Hysteresis For Discharging Alarm	Battery	Ampere	0/50 (1)	basic
	The hysteresis on the 'Battery On Discharge' alarm.				
41	Shunt Rating At 60mV	Battery	Ampere	25/5000 (250)	basic
	The rating of the battery shunt at 60mV.				
51	Boost Automatic	Boost		False/False (False)	battery
	The boost mode must be automatically after the fact that during a mains failure, the bus voltage went under the configured 'Boost Activation Low Voltage'. This allows charging the battery faster.				
52	Boost Activation Low Voltage	Boost	Volt	86/100 (92)	battery
	The voltage under which the boost mode can be activated.				
53	Boost Termination Voltage	Boost	Volt	115/133.4 (129.72)	battery
	The voltage over which the system must go back to floating mode.				
54	Boost Termination Current	Boost	Ampere	0/100 (4)	battery
	The battery charging current under which the system must go back to floating mode.				
55	Boost Termination Time	Boost	minute	10/240 (120)	battery
	The time in minute after which the system must go back in floating mode.				
70	Battery Test End Voltage	Battery Test	Volt	69/138 (105.8)	battery
	The voltage at which any battery test must be stopped.				
71	Battery Test Discharge Ratio	Battery Test	%	0/100 (0)	battery
	The ratio of the battery capacity to discharge. If 30 is set, 30% of the battery will be discharged during the test				
72	Battery Test Interval	Battery Test	day	0/3000 (0)	battery

	The number of days between two automatically started battery test. If this parameter is set to 0, the battery test is not started automatically. The user can remotely or locally start or force this test.				
73	Battery Test Discharge Current	Battery Test	Ampere	3/100 (1000)	battery
	The current at which the battery must be discharged during a battery test. The monitoring regulates the bus voltage in order to satisfy this condition. The load current must be of course higher than this parameter.				
74	Battery Test Minimal Discharge Current	Battery Test	Ampere	2/90 (2)	battery
	The battery current under which the battery test must be stopped because the load is too low.				
75	Battery Test Time Out	Battery Test	minute	1/5000 (10)	battery
	The timeout in minute after which the battery test must be stopped.				
76	Battery Test Requested Minutes Without Mains Failure	Battery Test	minute	0/5000 (1440)	battery
	The minimal time in minute without mains failure in order to allow a battery start. This parameter is not taken into account when the battery test is forced.				
83	Smart Energy Boolean Condition	Smart Energy		121-125	asset
	This is the boolean condition which allows or not to automatically optimize the number of rectifier in remote off.				
86	Battery LVD Node Id	LVD		True/False (False)	basic
	This is a list of the node id of the Smart Electronic LVDs, coma separated				
91	Digital Input 1 Name	Digital Inputs		Distribution Breaker Open	basic
	The name of the digital input 1				
92	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 2 Name	Digital Inputs		Battery Breaker Open	basic
	The name of the digital input 2				
94	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
96	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
98	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic

	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
100	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				
102	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
103	Digital Input 7 Name	Digital Inputs		Digital Input 7	basic
	The name of the digital input 7				
104	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
105	Digital Input 8 Name	Digital Inputs		Digital Input 8	basic
	The name of the digital input 8				
106	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Dry Alarm 1 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 1. The way to define boolean condition is detailed in the PLC chapter.				
112	Dry Alarm 2 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 2. The way to define boolean condition is detailed in the PLC chapter.				
113	Dry Alarm 3 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 3. The way to define boolean condition is detailed in the PLC chapter.				
114	Dry Alarm 4 Alternative Boolean Condition	Dry Alarms		False	plc
	Another Boolean condition to activate the dry alarm relay 4. The way to define boolean condition is detailed in the PLC chapter.				
131	Ambient Temperature Low	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
132	Ambient Temperature High	Sensors	degree C		basic
	The temperature under which the alarm 'Ambiant Temperature Too Low' must be set.				
133	Ambient Temperature Hysteresis	Sensors	degree C		basic
	The hysteresis on the 'Battery Temperature Too High' and 'Battery Temperature Too				

	Low' alarms.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
602	Event Table Length By Rectifier	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens</u> <u>e</u>
1	Back To Float	DC Mode	basic
	The dc system must go back in floating mode.		
2	Start Battery Test	DC Mode	battery
	The dc system must start a battery test.		
3	Force Battery Test	DC Mode	battery
	The dc system must force a battery test.		
4	Start Boost Mode	DC Mode	battery
	The dc system must go in boost mode.		
11	Open The LVD	LVD	basic
	The LVD must be opened		
12	Close The LVD	LVD	basic
	The LVD must be closed		
21	Correct Battery Current Offset	Battery	basic
	No information		
31	Reset Battery Current Integration	Battery	basic
	Reset the integration of the battery current.		

41	Reset Last Battery Test State	Battery	battery
	Reset the state of the last battery test. If an alarm 'Battery Last Test Failed' is set, the alarm will be cleared.		
51	Save Configuration In MCU	Save	basic
	Save configuration parameters in the MCU microcontroller. If comp@s is not present, the system will be correctly managed.		
61	Set Digital Input 4 Counter Value	Counters	basic
	Set Counter Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.3 Rectifier Tables

7.3.1 CAR0548TN

Device Information	
Name	CAR0548TN
Short Description	500W switched mode rectifier
Long Description	500W switched mode rectifier, -48Vdc fixed output
Hardware Reference	9411 010 55001
Software Reference	NO SOFT
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Alarm Table

<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	AC Failure The rectifier is in AC Failure.	major (0)	5 / 2
2	DC Failure The rectifier must be replaced because of a DC Failure.	major (0)	5 / 2
3	Over Temperature The rectifier is too warm.	major (0)	5 / 2
4	Remote Off The rectifier is in remote off.	warning (0)	5 / 2
7	Communication Error The Communication With the rectifier has been lost.	warning (0)	5 / 2

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic

7.3.2 CAR0948TN-1A / CAR0948TN-2A

Device Information	
Name	CAR0948TN-1A / CAR0948TN-2A
Short Description	850W switched mode rectifier / 850W switched mode rectifier
Long Description	850W switched mode rectifier, -48Vdc fixed output / 850W switched mode rectifier, -48Vdc fixed output. - non standard front plate
Hardware Reference	9411 010 95001 / 9411 010 95011
Software Reference	SOFT 000092 XX
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
1	Product Name	Product Info	asset
	The rectifier product name (With CAN capable rectifiers)		
2	Hardware Reference	Product Info	asset
	The rectifier hardware reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
3	Hardware Revision	Product Info	asset
	The rectifier hardware revision. (With CAN capable Rectifiers)		
4	Software Reference	Product Info	asset
	The rectifier software reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
6	Serial Number	Product Info	asset
	The rectifier serial number - Wb (With CAN capable rectifiers)		
8	Manufacturing Date	Product Info	asset
	The rectifier production date (With CAN capable rectifiers)		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	AC Failure	major (0)	5 / 2
	The rectifier is in AC Failure.		
2	DC Failure	major (0)	5 / 2
	The rectifier must be replaced because of a DC Failure.		
3	Over Temperature	major (0)	5 / 2
	The rectifier is too warm.		
4	Remote Off	warning (0)	5 / 2
	The rectifier is in remote off.		
7	Communication Error	warning (0)	5 / 2
	The Communication With the rectifier has been lost.		
10	AC High	minor (0)	5 / 2
	The AC input in too high		
11	Short Error	major (0)	5 / 2
	A short circuit is present on the bus		
12	Fan Error	major (0)	5 / 2
	The FAN is defect		
13	Derating Error	major (0)	5 / 2
	The rectifier is in derating		
14	AC Derating	major (0)	5 / 2
	The rectifier is in AC derating		
15	Thermal Derating	major (0)	5 / 2
	The rectifier is in thermal derating		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic
11	Input Voltage The rectifier AC Input voltage (For CAN capable rectifiers)	Input	Volt	asset
12	Temperature The rectifier temperature (For CAN capable rectifiers)	General	degree C	asset
13	Fan Speed The rectifier FAN Speed in RPM. (For CAN capable rectifiers)	General	RPM	asset
14	Power Rating The rectifier power rating (For CAN capable rectifiers)	General	%	asset
15	Service Time The rectifier total service time, in second (For CAN capable rectifiers)	General	second	asset
16	Thermal Aging Time The rectifier thermal aging time, in second (For CAN capable rectifiers)	General	second	asset
17	Converted Energy The total energy converted by the rectifier since the production. (For CAN capable rectifiers)	General	kJ	asset

7.3.3 CAR0948TN-3A

Device Information	
Name	CAR0948TN-3A
Short Description	850W switched mode rectifier, AC & DC input
Long Description	850W switched mode rectifier, -48Vdc fixed output, AC and DC input
Hardware Reference	9411 010 95031
Software Reference	SOFT 000084 XX
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
1	Product Name	Product Info	asset
	The rectifier product name (With CAN capable rectifiers)		
2	Hardware Reference	Product Info	asset
	The rectifier hardware reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
3	Hardware Revision	Product Info	asset
	The rectifier hardware revision. (With CAN capable Rectifiers)		
4	Software Reference	Product Info	asset
	The rectifier software reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
6	Serial Number	Product Info	asset
	The rectifier serial number - Wb (With CAN capable rectifiers)		
8	Manufacturing Date	Product Info	asset
	The rectifier production date (With CAN capable rectifiers)		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	AC Failure	major (0)	5 / 2
	The rectifier is in AC Failure.		
2	DC Failure	major (0)	5 / 2
	The rectifier must be replaced because of a DC Failure.		
3	Over Temperature	major (0)	5 / 2
	The rectifier is too warm.		
4	Remote Off	warning (0)	5 / 2
	The rectifier is in remote off.		
7	Communication Error	warning (0)	5 / 2
	The Communication With the rectifier has been lost.		
10	AC High	minor (0)	5 / 2
	The AC input in too high		
11	Short Error	major (0)	5 / 2
	A short circuit is present on the bus		
12	Fan Error	major (0)	5 / 2
	The FAN is defect		
13	Derating Error	major (0)	5 / 2
	The rectifier is in derating		
14	AC Derating	major (0)	5 / 2
	The rectifier is in AC derating		
15	Thermal Derating	major (0)	5 / 2
	The rectifier is in thermal derating		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic
11	Input Voltage The rectifier AC Input voltage (For CAN capable rectifiers)	Input	Volt	asset
12	Temperature The rectifier temperature (For CAN capable rectifiers)	General	degree C	asset
13	Fan Speed The rectifier FAN Speed in RPM. (For CAN capable rectifiers)	General	RPM	asset
14	Power Rating The rectifier power rating (For CAN capable rectifiers)	General	%	asset
15	Service Time The rectifier total service time, in second (For CAN capable rectifiers)	General	second	asset
16	Thermal Aging Time The rectifier thermal aging time, in second (For CAN capable rectifiers)	General	second	asset
17	Converted Energy The total energy converted by the rectifier since the production. (For CAN capable rectifiers)	General	kJ	asset

7.3.4 CAR1024TP

Device Information	
Name	CAR1024TP
Short Description	1000W switched mode rectifier
Long Description	1000W switched mode rectifier, +24Vdc fixed output
Hardware Reference	9411 011 02001
Software Reference	NO SOFT
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	AC Failure The rectifier is in AC Failure.	major (0)	5 / 2
2	DC Failure The rectifier must be replaced because of a DC Failure.	major (0)	5 / 2
3	Over Temperature The rectifier is too warm.	major (0)	5 / 2
4	Remote Off The rectifier is in remote off.	warning (0)	5 / 2
7	Communication Error The Communication With the rectifier has been lost.	warning (0)	5 / 2

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic

7.3.5 CAR1048TN-1A

Device Information	
Name	CAR1048TN-1A
Short Description	1000W switched mode rectifier
Long Description	1000W switched mode rectifier, -48Vdc fixed output
Hardware Reference	9411 011 05001
Software Reference	SOFT 000067 XX

Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	asset
	The rectifier product name (With CAN capable rectifiers)		
2	Hardware Reference	Product Info	asset
	The rectifier hardware reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
3	Hardware Revision	Product Info	asset
	The rectifier hardware revision. (With CAN capable Rectifiers)		
4	Software Reference	Product Info	asset
	The rectifier software reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
6	Serial Number	Product Info	asset
	The rectifier serial number - Wb (With CAN capable rectifiers)		
8	Manufacturing Date	Product Info	asset
	The rectifier production date (With CAN capable rectifiers)		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	AC Failure	major (0)	5 / 2
	The rectifier is in AC Failure.		
2	DC Failure	major (0)	5 / 2
	The rectifier must be replaced because of a DC Failure.		
3	Over Temperature	major (0)	5 / 2
	The rectifier is too warm.		
4	Remote Off	warning (0)	5 / 2
	The rectifier is in remote off.		
7	Communication Error	warning (0)	5 / 2
	The Communication With the rectifier has been lost.		
10	AC High	minor (0)	5 / 2
	The AC input in too high		
11	Short Error	major (0)	5 / 2
	A short circuit is present on the bus		
12	Fan Error	major (0)	5 / 2
	The FAN is defect		
13	Derating Error	major (0)	5 / 2
	The rectifier is in derating		
14	AC Derating	major (0)	5 / 2
	The rectifier is in AC derating		

15	Thermal Derating	major (0)	5 / 2
	The rectifier is in thermal derating		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licens e</i></u>
1	Output Current	Output	Ampere	basic
	The current delivered by the rectifier			
2	Output Power	Output	Watt	basic
	The power delivered by the rectifier			
3	Output Voltage	Output	Volt	basic
	The output voltage of the rectifier			
4	Output Current Max	Output	Ampere	basic
	The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.			
5	Output Power Max	Output	Watt	basic
	The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.			
11	Input Voltage	Input	Volt	asset
	The rectifier AC Input voltage (For CAN capable rectifiers)			
12	Temperature	General	degree C	asset
	The rectifier temperature (For CAN capable rectifiers)			
13	Fan Speed	General	RPM	asset
	The rectifier FAN Speed in RPM. (For CAN capable rectifiers)			
14	Power Rating	General	%	asset
	The rectifier power rating (For CAN capable rectifiers)			
15	Service Time	General	second	asset
	The rectifier total service time, in second (For CAN capable rectifiers)			
16	Thermal Aging Time	General	second	asset
	The rectifier thermal aging time, in second (For CAN capable rectifiers)			
17	Converted Energy	General	kJ	asset
	The total energy converted by the rectifier since the production. (For CAN capable rectifiers)			

7.3.6 CAR1048TN-2A

Device Information	
Name	CAR1048TN-2A
Short Description	1000W switched mode rectifier, AC & DC input
Long Description	1000W switched mode rectifier, -48Vdc fixed output, AC & DC input

Hardware Reference	9411 011 05021
Software Reference	SOFT 000083 XX
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
1	Product Name	Product Info	asset
	The rectifier product name (With CAN capable rectifiers)		
2	Hardware Reference	Product Info	asset
	The rectifier hardware reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
3	Hardware Revision	Product Info	asset
	The rectifier hardware revision. (With CAN capable Rectifiers)		
4	Software Reference	Product Info	asset
	The rectifier software reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
6	Serial Number	Product Info	asset
	The rectifier serial number - Wb (With CAN capable rectifiers)		
8	Manufacturing Date	Product Info	asset
	The rectifier production date (With CAN capable rectifiers)		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	AC Failure	major (0)	5 / 2
	The rectifier is in AC Failure.		
2	DC Failure	major (0)	5 / 2
	The rectifier must be replaced because of a DC Failure.		
3	Over Temperature	major (0)	5 / 2
	The rectifier is too warm.		
4	Remote Off	warning (0)	5 / 2
	The rectifier is in remote off.		
7	Communication Error	warning (0)	5 / 2
	The Communication With the rectifier has been lost.		
10	AC High	minor (0)	5 / 2
	The AC input in too high		
11	Short Error	major (0)	5 / 2
	A short circuit is present on the bus		
12	Fan Error	major (0)	5 / 2
	The FAN is defect		
13	Derating Error	major (0)	5 / 2
	The rectifier is in derating		

14	AC Derating	major (0)	5 / 2
	The rectifier is in AC derating		
15	Thermal Derating	major (0)	5 / 2
	The rectifier is in thermal derating		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licence</u>
1	Output Current	Output	Ampere	basic
	The current delivered by the rectifier			
2	Output Power	Output	Watt	basic
	The power delivered by the rectifier			
3	Output Voltage	Output	Volt	basic
	The output voltage of the rectifier			
4	Output Current Max	Output	Ampere	basic
	The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.			
5	Output Power Max	Output	Watt	basic
	The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.			
11	Input Voltage	Input	Volt	asset
	The rectifier AC Input voltage (For CAN capable rectifiers)			
12	Temperature	General	degree C	asset
	The rectifier temperature (For CAN capable rectifiers)			
13	Fan Speed	General	RPM	asset
	The rectifier FAN Speed in RPM. (For CAN capable rectifiers)			
14	Power Rating	General	%	asset
	The rectifier power rating (For CAN capable rectifiers)			
15	Service Time	General	second	asset
	The rectifier total service time, in second (For CAN capable rectifiers)			
16	Thermal Aging Time	General	second	asset
	The rectifier thermal aging time, in second (For CAN capable rectifiers)			
17	Converted Energy	General	kJ	asset
	The total energy converted by the rectifier since the production. (For CAN capable rectifiers)			

7.3.7 CAR1548TN

Device Information	
Name	CAR1548TN
Short Description	1500W switched mode rectifier

Long Description	1500W switched mode rectifier, -48Vdc fixed output
Hardware Reference	9411 011 55001
Software Reference	NO SOFT
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	AC Failure The rectifier is in AC Failure.	major (0)	5 / 2
2	DC Failure The rectifier must be replaced because of a DC Failure.	major (0)	5 / 2
3	Over Temperature The rectifier is too warm.	major (0)	5 / 2
4	Remote Off The rectifier is in remote off.	warning (0)	5 / 2
7	Communication Error The Communication With the rectifier has been lost.	warning (0)	5 / 2

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic

7.3.8 CAR1848TN-1A

Device Information

Name	CAR1848TN-1A
Short Description	1800W switched mode rectifier
Long Description	1800W switched mode rectifier, -48Vdc fixed output
Hardware Reference	9411 011 85001
Software Reference	NO SOFT
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	AC Failure The rectifier is in AC Failure.	major (0)	5 / 2
2	DC Failure The rectifier must be replaced because of a DC Failure.	major (0)	5 / 2
3	Over Temperature The rectifier is too warm.	major (0)	5 / 2
4	Remote Off The rectifier is in remote off.	warning (0)	5 / 2
7	Communication Error The Communication With the rectifier has been lost.	warning (0)	5 / 2

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic

7.3.9 CAR1848TN-2A

Device Information	
Name	CAR1848TN-2A
Short Description	1800W switched mode rectifier extended input range
Long Description	1800W switched mode rectifier, -48Vdc fixed output, 150-280Vac input
Hardware Reference	9411 011 85011
Software Reference	NO SOFT
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	AC Failure The rectifier is in AC Failure.	major (0)	5 / 2
2	DC Failure The rectifier must be replaced because of a DC Failure.	major (0)	5 / 2
3	Over Temperature The rectifier is too warm.	major (0)	5 / 2
4	Remote Off The rectifier is in remote off.	warning (0)	5 / 2
7	Communication Error The Communication With the rectifier has been lost.	warning (0)	5 / 2

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic

7.3.10 CAR2648TN

Device Information	
Name	CAR2648TN
Short Description	1800W switched mode rectifier extended input range
Long Description	1800W switched mode rectifier, -48Vdc fixed output, 150-280Vac input
Hardware Reference	9411 012 65001
Software Reference	SOFT 000075 XX
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	AC Failure The rectifier is in AC Failure.	major (0)	5 / 2
2	DC Failure The rectifier must be replaced because of a DC Failure.	major (0)	5 / 2
3	Over Temperature The rectifier is too warm.	major (0)	5 / 2
4	Remote Off The rectifier is in remote off.	warning (0)	5 / 2
7	Communication Error The Communication With the rectifier has been lost.	warning (0)	5 / 2

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic

7.3.11 CAR30110TP

Device Information	
Name	CAR30110TP
Short Description	3000W +110V switched mode rectifier
Long Description	3000W switched mode rectifier, +110Vdc fixed output
Hardware Reference	9411 013 07001
Software Reference	SOFT 000065 XX
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	asset
	The rectifier product name (With CAN capable rectifiers)		
2	Hardware Reference	Product Info	asset
	The rectifier hardware reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
3	Hardware Revision	Product Info	asset
	The rectifier hardware revision. (With CAN capable Rectifiers)		
4	Software Reference	Product Info	asset
	The rectifier software reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
6	Serial Number	Product Info	asset
	The rectifier serial number - Wb (With CAN capable rectifiers)		
8	Manufacturing Date	Product Info	asset
	The rectifier production date (With CAN capable rectifiers)		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	AC Failure	major (0)	5 / 2
	The rectifier is in AC Failure.		
2	DC Failure	major (0)	5 / 2
	The rectifier must be replaced because of a DC Failure.		
3	Over Temperature	major (0)	5 / 2
	The rectifier is too warm.		
4	Remote Off	warning (0)	5 / 2
	The rectifier is in remote off.		
7	Communication Error	warning (0)	5 / 2
	The Communication With the rectifier has been lost.		
10	AC High	minor (0)	5 / 2

	The AC input in too high		
11	Short Error	major (0)	5 / 2
	A short circuit is present on the bus		
12	Fan Error	major (0)	5 / 2
	The FAN is defect		
13	Derating Error	major (0)	5 / 2
	The rectifier is in derating		
14	AC Derating	major (0)	5 / 2
	The rectifier is in AC derating		
15	Thermal Derating	major (0)	5 / 2
	The rectifier is in thermal derating		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current	Output	Ampere	basic
	The current delivered by the rectifier			
2	Output Power	Output	Watt	basic
	The power delivered by the rectifier			
3	Output Voltage	Output	Volt	basic
	The output voltage of the rectifier			
4	Output Current Max	Output	Ampere	basic
	The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.			
5	Output Power Max	Output	Watt	basic
	The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.			
11	Input Voltage	Input	Volt	asset
	The rectifier AC Input voltage (For CAN capable rectifiers)			
12	Temperature	General	degree C	asset
	The rectifier temperature (For CAN capable rectifiers)			
13	Fan Speed	General	RPM	asset
	The rectifier FAN Speed in RPM. (For CAN capable rectifiers)			
14	Power Rating	General	%	asset
	The rectifier power rating (For CAN capable rectifiers)			
15	Service Time	General	second	asset
	The rectifier total service time, in second (For CAN capable rectifiers)			
16	Thermal Aging Time	General	second	asset
	The rectifier thermal aging time, in second (For CAN capable rectifiers)			
17	Converted Energy	General	kJ	asset
	The total energy converted by the rectifier since the production. (For CAN capable rectifiers)			

7.3.12 CAR30125TP

Device Information	
Name	CAR30125TP
Short Description	3000W +125V switched mode rectifier
Long Description	3000W switched mode rectifier, +125Vdc fixed output
Hardware Reference	9411 013 07011
Software Reference	SOFT 000068 XX
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	asset
	The rectifier product name (With CAN capable rectifiers)		
2	Hardware Reference	Product Info	asset
	The rectifier hardware reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
3	Hardware Revision	Product Info	asset
	The rectifier hardware revision. (With CAN capable Rectifiers)		
4	Software Reference	Product Info	asset
	The rectifier software reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
6	Serial Number	Product Info	asset
	The rectifier serial number - Wb (With CAN capable rectifiers)		
8	Manufacturing Date	Product Info	asset
	The rectifier production date (With CAN capable rectifiers)		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	AC Failure	major (0)	5 / 2
	The rectifier is in AC Failure.		
2	DC Failure	major (0)	5 / 2
	The rectifier must be replaced because of a DC Failure.		
3	Over Temperature	major (0)	5 / 2
	The rectifier is too warm.		
4	Remote Off	warning (0)	5 / 2
	The rectifier is in remote off.		
7	Communication Error	warning (0)	5 / 2
	The Communication With the rectifier has been lost.		
10	AC High	minor (0)	5 / 2

	The AC input in too high		
11	Short Error	major (0)	5 / 2
	A short circuit is present on the bus		
12	Fan Error	major (0)	5 / 2
	The FAN is defect		
13	Derating Error	major (0)	5 / 2
	The rectifier is in derating		
14	AC Derating	major (0)	5 / 2
	The rectifier is in AC derating		
15	Thermal Derating	major (0)	5 / 2
	The rectifier is in thermal derating		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current	Output	Ampere	basic
	The current delivered by the rectifier			
2	Output Power	Output	Watt	basic
	The power delivered by the rectifier			
3	Output Voltage	Output	Volt	basic
	The output voltage of the rectifier			
4	Output Current Max	Output	Ampere	basic
	The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.			
5	Output Power Max	Output	Watt	basic
	The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.			
11	Input Voltage	Input	Volt	asset
	The rectifier AC Input voltage (For CAN capable rectifiers)			
12	Temperature	General	degree C	asset
	The rectifier temperature (For CAN capable rectifiers)			
13	Fan Speed	General	RPM	asset
	The rectifier FAN Speed in RPM. (For CAN capable rectifiers)			
14	Power Rating	General	%	asset
	The rectifier power rating (For CAN capable rectifiers)			
15	Service Time	General	second	asset
	The rectifier total service time, in second (For CAN capable rectifiers)			
16	Thermal Aging Time	General	second	asset
	The rectifier thermal aging time, in second (For CAN capable rectifiers)			
17	Converted Energy	General	kJ	asset
	The total energy converted by the rectifier since the production. (For CAN capable rectifiers)			

7.3.13 CDC1548TN

Device Information	
Name	CDC1548TN
Short Description	1500W DC/DC converter 110-220Vin/48Vout
Long Description	1500W DC/DC converter 110-220Vin/48Vout
Hardware Reference	9413 000 88001
Software Reference	NO SOFT
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	AC Failure The rectifier is in AC Failure.	major (0)	5 / 2
2	DC Failure The rectifier must be replaced because of a DC Failure.	major (0)	5 / 2
3	Over Temperature The rectifier is too warm.	major (0)	5 / 2
4	Remote Off The rectifier is in remote off.	warning (0)	5 / 2
7	Communication Error The Communication With the rectifier has been lost.	warning (0)	5 / 2

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licens e</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic

7.3.14 CXRF48-4kW

Device Information	
Name	CXRF48-4kW
Short Description	4kW high efficiency rectifier
Long Description	Cordex HP 4kW, high efficiency switched mode rectifier, -48Vdc fixed output
Hardware Reference	D010 623 20040
Software Reference	Unknown
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	asset
	The rectifier product name		
4	Software Reference	Product Info	asset
	The rectifier software reference		
5	Serial Number	Product Info	asset
	The rectifier serial number		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table		
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>
1	Rectifier Fail	major (0)
	The rectifier must be replaced because of a DC Failure.	
2	Minor Problem	minor (0)
	There is a minor problem.	
3	AC Failure	major (0)
	The rectifier is in AC Failure.	
4	Over Temperature	major (0)
	The rectifier is too warm.	
5	Remote Off	warning (0)
	The rectifier is in remote off.	
7	Communication Error	warning (0)
	The Communication With the rectifier has been lost.	
10	Fan Error	major (0)
	The FAN is defect	
11	Current Limitation	warning (0)
	The rectifier is in current limit	
12	Power Limitation	warning (0)
	The rectifier is in power limit	

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
7	Power Ratio This is the ratio power/available power	Output	%	basic
8	Rectifier Mode The internal mode of the rectifier	Mode		basic
11	Input Voltage The rectifier AC Input voltage (For CAN capable rectifiers)	Input	Volt	asset
12	Temperature The rectifier temperature (For CAN capable rectifiers)	General	degree C	asset
13	Phase Number The rectifier Phase - 0 means unconfigured	General		basic
14	Service Time The rectifier total service time, in second (For CAN capable rectifiers)	General	second	asset
15	Converted Energy The total energy converted by the rectifier since the production. (For CAN capable rectifiers)	General	kJ	asset

Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>
1	Locate Rectifier No information	Locate	basic
5	Change Phase Number No information	Phase	basic

7.3.15 CXRF 48-300W

Device Information	
Name	CXRF 48-300W
Short Description	300W high efficiency rectifier
Long Description	Cordex HP 300W, high efficiency switched mode rectifier, -48Vdc fixed output
Hardware Reference	9411 010 35011
Software Reference	SOFT 000101 XX
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
1	Product Name	Product Info	asset
	The rectifier product name (With CAN capable rectifiers)		
2	Hardware Reference	Product Info	asset
	The rectifier hardware reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
3	Hardware Revision	Product Info	asset
	The rectifier hardware revision. (With CAN capable Rectifiers)		
4	Software Reference	Product Info	asset
	The rectifier software reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
6	Serial Number	Product Info	asset
	The rectifier serial number - Wb (With CAN capable rectifiers)		
8	Manufacturing Date	Product Info	asset
	The rectifier production date (With CAN capable rectifiers)		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	AC Failure	major (0)	5 / 2
	The rectifier is in AC Failure.		
2	DC Failure	major (0)	5 / 2
	The rectifier must be replaced because of a DC Failure.		
3	Over Temperature	major (0)	5 / 2
	The rectifier is too warm.		
4	Remote Off	warning (0)	5 / 2
	The rectifier is in remote off.		
7	Communication Error	warning (0)	5 / 2
	The Communication With the rectifier has been lost.		
10	AC High	minor (0)	5 / 2
	The AC input in too high		
11	Short Error	major (0)	5 / 2
	A short circuit is present on the bus		
12	Fan Error	major (0)	5 / 2
	The FAN is defect		
13	Derating Error	major (0)	5 / 2
	The rectifier is in derating		
14	AC Derating	major (0)	5 / 2
	The rectifier is in AC derating		
15	Thermal Derating	major (0)	5 / 2
	The rectifier is in thermal derating		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic
11	Input Voltage The rectifier AC Input voltage (For CAN capable rectifiers)	Input	Volt	asset
12	Temperature The rectifier temperature (For CAN capable rectifiers)	General	degree C	asset
13	Fan Speed The rectifier FAN Speed in RPM. (For CAN capable rectifiers)	General	RPM	asset
14	Power Rating The rectifier power rating (For CAN capable rectifiers)	General	%	asset
15	Service Time The rectifier total service time, in second (For CAN capable rectifiers)	General	second	asset
16	Thermal Aging Time The rectifier thermal aging time, in second (For CAN capable rectifiers)	General	second	asset
17	Converted Energy The total energy converted by the rectifier since the production. (For CAN capable rectifiers)	General	kJ	asset

7.3.16 ECOR0348

Device Information	
Name	ECOR0348
Short Description	Rectifier 300W -54V
Long Description	Replaced by CXRF 48-300W
Hardware Reference	9411 010 35001
Software Reference	SOFT 000097 XX
Equipment Type	Rectifier
ETSI Level	/site/energy_system/dc_system/rectifier

Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
1	Product Name	Product Info	asset
	The rectifier product name (With CAN capable rectifiers)		
2	Hardware Reference	Product Info	asset
	The rectifier hardware reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
3	Hardware Revision	Product Info	asset
	The rectifier hardware revision. (With CAN capable Rectifiers)		
4	Software Reference	Product Info	asset
	The rectifier software reference. This corresponds to the Mitra 12NC (With CAN capable rectifiers)		
6	Serial Number	Product Info	asset
	The rectifier serial number - Wb (With CAN capable rectifiers)		
8	Manufacturing Date	Product Info	asset
	The rectifier production date (With CAN capable rectifiers)		
21	CAN Node Id	CAN Bus	basic
	The CAN Bus Node ID		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	AC Failure	major (0)	5 / 2
	The rectifier is in AC Failure.		
2	DC Failure	major (0)	5 / 2
	The rectifier must be replaced because of a DC Failure.		
3	Over Temperature	major (0)	5 / 2
	The rectifier is too warm.		
4	Remote Off	warning (0)	5 / 2
	The rectifier is in remote off.		
7	Communication Error	warning (0)	5 / 2
	The Communication With the rectifier has been lost.		
10	AC High	minor (0)	5 / 2
	The AC input in too high		
11	Short Error	major (0)	5 / 2
	A short circuit is present on the bus		
12	Fan Error	major (0)	5 / 2
	The FAN is defect		
13	Derating Error	major (0)	5 / 2
	The rectifier is in derating		
14	AC Derating	major (0)	5 / 2
	The rectifier is in AC derating		
15	Thermal Derating	major (0)	5 / 2
	The rectifier is in thermal derating		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Output Current The current delivered by the rectifier	Output	Ampere	basic
2	Output Power The power delivered by the rectifier	Output	Watt	basic
3	Output Voltage The output voltage of the rectifier	Output	Volt	basic
4	Output Current Max The maximal current deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Ampere	basic
5	Output Power Max The maximal power deliverable by the rectifier. This takes into account the derating for CAN capable rectifiers.	Output	Watt	basic
11	Input Voltage The rectifier AC Input voltage (For CAN capable rectifiers)	Input	Volt	asset
12	Temperature The rectifier temperature (For CAN capable rectifiers)	General	degree C	asset
13	Fan Speed The rectifier FAN Speed in RPM. (For CAN capable rectifiers)	General	RPM	asset
14	Power Rating The rectifier power rating (For CAN capable rectifiers)	General	%	asset
15	Service Time The rectifier total service time, in second (For CAN capable rectifiers)	General	second	asset
16	Thermal Aging Time The rectifier thermal aging time, in second (For CAN capable rectifiers)	General	second	asset
17	Converted Energy The total energy converted by the rectifier since the production. (For CAN capable rectifiers)	General	kJ	asset

7.4 Sensors And Actuators Tables

7.4.1 ADIO 7

Device Information	
Name	ADIO 7
Short Description	Standard I/O module D24 T7
Long Description	I/O module with 24 digital inputs and 7 inputs for temperature measurement

Hardware Reference	9413 060 05071
Software Reference	SOFT 000095 XX
Equipment Type	System Extension
ETSI Level	/site/sensors_and_actuators

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	basic
	The commercial name of the extension card.		
2	Hardware Reference	Product Info	basic
	The hardware refence		
3	Hardware Revision	Product Info	basic
	The hardware revision		
4	Software Reference	Product Info	basic
	The software reference		
6	Serial Number	Product Info	basic
	The serial number.		
7	Manufacturing ID	Product Info	basic
	The production batch id.		
8	Manufacturing Date	Product Info	basic
	The production date.		
11	Description	Description	basic
	A free text zone to write a system description		
12	Reference	Description	basic
	A free text zone to write the customer reference of the system		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
71	General Input 1	warning (2)	5 / 2
	Alarm related to digital input 1		
72	General Input 2	warning (2)	5 / 2
	Alarm related to digital input 2		
73	General Input 3	warning (2)	5 / 2
	Alarm related to digital input 3		
74	General Input 4	warning (2)	5 / 2
	Alarm related to digital input 4		
75	General Input 5	warning (2)	5 / 2
	Alarm related to digital input 5		
76	General Input 6	warning (2)	5 / 2
	Alarm related to digital input 6		
77	General Input 7	warning (2)	5 / 2
	Alarm related to digital input 7		
78	General Input 8	warning (2)	5 / 2
	Alarm related to digital input 8		

79	General Input 9	warning (2)	5 / 2
	Alarm related to digital input 9		
80	General Input 10	warning (2)	5 / 2
	Alarm related to digital input 10		
81	General Input 11	warning (2)	5 / 2
	Alarm related to digital input 11		
82	General Input 12	warning (2)	5 / 2
	Alarm related to digital input 12		
83	General Input 13	warning (2)	5 / 2
	Alarm related to digital input 13		
84	General Input 14	warning (2)	5 / 2
	Alarm related to digital input 14		
85	General Input 15	warning (2)	5 / 2
	Alarm related to digital input 15		
86	General Input 16	warning (2)	5 / 2
	Alarm related to digital input 16		
87	General Input 17	warning (2)	5 / 2
	Alarm related to digital input 17		
88	General Input 18	warning (2)	5 / 2
	Alarm related to digital input 18		
89	General Input 19	warning (2)	5 / 2
	Alarm related to digital input 19		
90	General Input 20	warning (2)	5 / 2
	Alarm related to digital input 20		
91	General Input 21	warning (2)	5 / 2
	Alarm related to digital input 21		
92	General Input 22	warning (2)	5 / 2
	Alarm related to digital input 22		
93	General Input 23	warning (2)	5 / 2
	Alarm related to digital input 23		
94	General Input 24	warning (2)	5 / 2
	Alarm related to digital input 24		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Temperature 1	Temperature Sensor	degree C	basic
	Temperature Measurement 1			
2	Temperature 2	Temperature Sensor	degree C	basic
	Temperature Measurement 2			
3	Temperature 3	Temperature Sensor	degree C	basic
	Temperature Measurement 3			

4	Temperature 4	Temperature Sensor	degree C	basic
	Temperature Measurement 4			
5	Temperature 5	Temperature Sensor	degree C	basic
	Temperature Measurement 5			
6	Temperature 6	Temperature Sensor	degree C	basic
	Temperature Measurement 6			
7	Temperature 7	Temperature Sensor	degree C	basic
	Temperature Measurement 7			
8	Temperature 8	Temperature Sensor	degree C	basic
	Temperature Measurement 8			
131	Pulse Counter 1	Pulse Counter		basic
	Energy Consumption Counter 1			
132	Pulse Counter 2	Pulse Counter		basic
	Energy Consumption Counter 2			
133	Pulse Counter 3	Pulse Counter		basic
	Energy Consumption Counter 3			
134	Pulse Counter 4	Pulse Counter		basic
	Energy Consumption Counter 4			
135	Pulse Counter 5	Pulse Counter		basic
	Energy Consumption Counter 5			
136	Pulse Counter 6	Pulse Counter		basic
	Energy Consumption Counter 6			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
71	Digital Input 1 Name	Digital Inputs		General Input 1	basic
	The name of the digital input 1				
72	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
73	Digital Input 2 Name	Digital Inputs		General Input 2	basic
	The name of the digital input 2				
74	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
75	Digital Input 3 Name	Digital Inputs		General Input 3	basic
	The name of the digital input 3				
76	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic

	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.			
77	Digital Input 4 Name	Digital Inputs	General Input 4	basic
	The name of the digital input 4			
78	Digital Input 4 Normally Closed	Digital Inputs	True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.			
79	Digital Input 5 Name	Digital Inputs	General Input 5	basic
	The name of the digital input 5			
80	Digital Input 5 Normally Closed	Digital Inputs	True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.			
81	Digital Input 6 Name	Digital Inputs	General Input 6	basic
	The name of the digital input 6			
82	Digital Input 6 Normally Closed	Digital Inputs	True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.			
83	Digital Input 7 Name	Digital Inputs	General Input 7	basic
	The name of the digital input 7			
84	Digital Input 7 Normally Closed	Digital Inputs	True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.			
85	Digital Input 8 Name	Digital Inputs	General Input 8	basic
	The name of the digital input 8			
86	Digital Input 8 Normally Closed	Digital Inputs	True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.			
87	Digital Input 9 Name	Digital Inputs	General Input 9	basic
	The name of the digital input 9			
88	Digital Input 9 Normally Closed	Digital Inputs	True/False (True)	basic
	True/False value defining if the digital input 9 is normally closed. If this digital input is not in this default state, the related alarm is set.			
89	Digital Input 10 Name	Digital Inputs	General Input 10	basic
	The name of the digital input 10			
90	Digital Input 10 Normally Closed	Digital Inputs	True/False (True)	basic
	True/False value defining if the digital input 10 is normally closed. If this digital input is not in this default state, the related alarm is set.			
91	Digital Input 11 Name	Digital Inputs	General Input 11	basic
	The name of the digital input 11			
92	Digital Input 11 Normally Closed	Digital Inputs	True/False (True)	basic

	True/False value defining if the digital input 11 is normally closed. If this digital input is not in this default state, the related alarm is set.			
93	Digital Input 12 Name	Digital Inputs		General Input 12 basic
	The name of the digital input 12			
94	Digital Input 12 Normally Closed	Digital Inputs		True/False (True) basic
	True/False value defining if the digital input 12 is normally closed. If this digital input is not in this default state, the related alarm is set.			
95	Digital Input 13 Name	Digital Inputs		General Input 13 basic
	The name of the digital input 13			
96	Digital Input 13 Normally Closed	Digital Inputs		True/False (True) basic
	True/False value defining if the digital input 13 is normally closed. If this digital input is not in this default state, the related alarm is set.			
97	Digital Input 14 Name	Digital Inputs		General Input 14 basic
	The name of the digital input 14			
98	Digital Input 14 Normally Closed	Digital Inputs		True/False (True) basic
	True/False value defining if the digital input 14 is normally closed. If this digital input is not in this default state, the related alarm is set.			
99	Digital Input 15 Name	Digital Inputs		General Input 15 basic
	The name of the digital input 15			
100	Digital Input 15 Normally Closed	Digital Inputs		True/False (True) basic
	True/False value defining if the digital input 15 is normally closed. If this digital input is not in this default state, the related alarm is set.			
101	Digital Input 16 Name	Digital Inputs		General Input 16 basic
	The name of the digital input 16			
102	Digital Input 16 Normally Closed	Digital Inputs		True/False (True) basic
	True/False value defining if the digital input 16 is normally closed. If this digital input is not in this default state, the related alarm is set.			
103	Digital Input 17 Name	Digital Inputs		General Input 17 basic
	The name of the digital input 17			
104	Digital Input 17 Normally Closed	Digital Inputs		True/False (True) basic
	True/False value defining if the digital input 17 is normally closed. If this digital input is not in this default state, the related alarm is set.			
105	Digital Input 18 Name	Digital Inputs		General Input 18 basic
	The name of the digital input 18			
106	Digital Input 18 Normally Closed	Digital Inputs		True/False (True) basic
	True/False value defining if the digital input 18 is normally closed. If this digital input is not in this default state, the related alarm is set.			
107	Digital Input 19 Name	Digital Inputs		General Input 19 basic
	The name of the digital input 19			
108	Digital Input 19 Normally Closed	Digital Inputs		True/False (True) basic

	True/False value defining if the digital input 19 is normally closed. If this digital input is not in this default state, the related alarm is set.				
109	Digital Input 20 Name	Digital Inputs		General Input 20	basic
	The name of the digital input 20				
110	Digital Input 20 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 20 is normally closed. If this digital input is not in this default state, the related alarm is set.				
111	Digital Input 21 Name	Digital Inputs		General Input 21	basic
	The name of the digital input 21				
112	Digital Input 21 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 21 is normally closed. If this digital input is not in this default state, the related alarm is set.				
113	Digital Input 22 Name	Digital Inputs		General Input 22	basic
	The name of the digital input 22				
114	Digital Input 22 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 22 is normally closed. If this digital input is not in this default state, the related alarm is set.				
115	Digital Input 23 Name	Digital Inputs		General Input 23	basic
	The name of the digital input 23				
116	Digital Input 23 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 23 is normally closed. If this digital input is not in this default state, the related alarm is set.				
117	Digital Input 24 Name	Digital Inputs		General Input 24	basic
	The name of the digital input 24				
118	Digital Input 24 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 24 is normally closed. If this digital input is not in this default state, the related alarm is set.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC'				

	module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>
101	Set Pulse Counter 1	Pulse Counters	basic
	Set Counter 1 Value		
102	Set Pulse Counter 2	Pulse Counters	basic
	Set Counter 2 Value		
103	Set Pulse Counter 3	Pulse Counters	basic
	Set Counter 3 Value		
104	Set Pulse Counter 4	Pulse Counters	basic
	Set Counter 4 Value		
105	Set Pulse Counter 5	Pulse Counters	basic
	Set Counter 5 Value		
106	Set Pulse Counter 6	Pulse Counters	basic
	Set Counter 6 Value		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.4.2 ADIO 8

Device Information	
Name	ADIO 8

Short Description	Standard I/O module D9 ACR5 LVD PLD DCR2
Long Description	I/O module with 9 digital inputs, 5 relays for AC, Low Voltage Disconnection, Partial Load Disconnection and 2 relays for outputs
Hardware Reference	9413 060 05081
Software Reference	SOFT 000096 XX
Equipment Type	System Extension
ETSI Level	/site/sensors_and_actuators

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	basic
	The commercial name of the extension card.		
2	Hardware Reference	Product Info	basic
	The hardware refence		
3	Hardware Revision	Product Info	basic
	The hardware revision		
4	Software Reference	Product Info	basic
	The software reference		
6	Serial Number	Product Info	basic
	The serial number.		
7	Manufacturing ID	Product Info	basic
	The production batch id.		
8	Manufacturing Date	Product Info	basic
	The production date.		
11	Description	Description	basic
	A free text zone to write a system description		
12	Reference	Description	basic
	A free text zone to write the customer reference of the system		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
71	General Input 1	warning (2)	5 / 2
	Alarm related to digital input 1		
72	General Input 2	warning (2)	5 / 2
	Alarm related to digital input 2		
73	General Input 3	warning (2)	5 / 2
	Alarm related to digital input 3		
74	General Input 4	warning (2)	5 / 2
	Alarm related to digital input 4		
75	General Input 5	warning (2)	5 / 2
	Alarm related to digital input 5		
76	General Input 6	warning (2)	5 / 2

	Alarm related to digital input 6		
77	General Input 7	warning (2)	5 / 2
	Alarm related to digital input 7		
78	General Input 8	warning (2)	5 / 2
	Alarm related to digital input 8		
79	General Input 9	warning (2)	5 / 2
	Alarm related to digital input 9		
80	General Input 10	warning (2)	5 / 2
	Alarm related to digital input 10		
81	General Input 11	warning (2)	5 / 2
	Alarm related to digital input 11		
82	General Input 12	warning (2)	5 / 2
	Alarm related to digital input 12		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>License</i></u>
1	Temperature 1	Temperature Sensor	degree C	basic
	Temperature Measurement 1			
101	Voltage 5V 1	Voltage Sensor	mVolt	basic
	Voltage Measurement 5V 1			
102	Voltage 5V 2	Voltage Sensor	mVolt	basic
	Voltage Measurement 5V 2			
111	Current 4-20mA 1	Current Sensor 4-20mA	mAmpere	basic
	Current 4-20mA Sensor 1			
112	Current 4-20mA 2	Current Sensor 4-20mA	mAmpere	basic
	Current 4-20mA Sensor 2			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
71	Digital Input 1 Name	Digital Inputs		General Input 1	basic
	The name of the digital input 1				
72	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
73	Digital Input 2 Name	Digital Inputs		General Input 2	basic
	The name of the digital input 2				
74	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				

75	Digital Input 3 Name	Digital Inputs		General Input 3	basic
	The name of the digital input 3				
76	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
77	Digital Input 4 Name	Digital Inputs		General Input 4	basic
	The name of the digital input 4				
78	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
79	Digital Input 5 Name	Digital Inputs		General Input 5	basic
	The name of the digital input 5				
80	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
81	Digital Input 6 Name	Digital Inputs		General Input 6	basic
	The name of the digital input 6				
82	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
83	Digital Input 7 Name	Digital Inputs		General Input 7	basic
	The name of the digital input 7				
84	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
85	Digital Input 8 Name	Digital Inputs		General Input 8	basic
	The name of the digital input 8				
86	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
87	Digital Input 9 Name	Digital Inputs		General Input 9	basic
	The name of the digital input 9				
88	Digital Input 9 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 9 is normally closed. If this digital input is not in this default state, the related alarm is set.				
89	Digital Input 10 Name	Digital Inputs		General Input 10	basic
	The name of the digital input 10				
90	Digital Input 10 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 10 is normally closed. If this digital input is not in this default state, the related alarm is set.				

91	Digital Input 11 Name	Digital Inputs		General Input 11	basic
	The name of the digital input 11				
92	Digital Input 11 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 11 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 12 Name	Digital Inputs		General Input 12	basic
	The name of the digital input 12				
94	Digital Input 12 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 12 is normally closed. If this digital input is not in this default state, the related alarm is set.				
121	Output Relay 1 Boolean Condition	Digital Outputs		(False)	basic
	Relay 1 Boolean Condition				
122	Output Relay 1 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 1 Normal State				
123	Output Relay 2 Boolean Condition	Digital Outputs		(False)	basic
	Relay 2 Boolean Condition				
124	Output Relay 2 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 2 Normal State				
125	Output Relay 3 Boolean Condition	Digital Outputs		(False)	basic
	Relay 3 Boolean Condition				
126	Output Relay 3 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 3 Normal State				
127	Output Relay 4 Boolean Condition	Digital Outputs		(False)	basic
	Relay 4 Boolean Condition				
128	Output Relay 4 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 4 Normal State				
129	Output Relay 5 Boolean Condition	Digital Outputs		(False)	basic
	Relay 5 Boolean Condition				
130	Output Relay 5 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 5 Normal State				
131	Output Relay 6 Boolean Condition	Digital Outputs		(False)	basic
	Relay 6 Boolean Condition				
132	Output Relay 6 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 6 Normal State				

133	Output Relay 7 Boolean Condition	Digital Outputs		(False)	basic
	Relay 7 Boolean Condition				
134	Output Relay 7 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 7 Normal State				
135	Output Relay 8 Boolean Condition	Digital Outputs		(False)	basic
	Relay 8 Boolean Condition				
136	Output Relay 8 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 8 Normal State				
137	Output Relay 9 Boolean Condition	Digital Outputs		(False)	basic
	Relay 9 Boolean Condition				
138	Output Relay 9 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 9 Normal State				
139	Output Relay 10 Boolean Condition	Digital Outputs		(False)	basic
	Relay 10 Boolean Condition				
140	Output Relay 10 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 10 Normal State				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
501	Clear My Events By writing '1' to this control element, all the events of this equipment will be cleared.	Event	basic
502	Clear All Events By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.	Event	basic
511	Add Event This control element adds an event of severity none. The event name is the text written to this control element	Event	basic
512	Add Major Event This control element adds an event of severity major. The event name is the text written to this control element	Event	basic
521	Reset Default Names And Groups This control element resets all the element Names, Groups and Subgroups to default values for this equipment	Advanced	basic
522	Reset Default Names And Groups Recursive This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments	Advanced	basic

7.4.3 ADIO 9

Device Information	
Name	ADIO 9
Short Description	Custom I/O module Operanet
Long Description	
Hardware Reference	9413 060 05091
Software Reference	SOFT 000094 XX
Equipment Type	System Extension
ETSI Level	/site/sensors_and_actuators

Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
1	Product Name The commercial name of the extension card.	Product Info	basic
2	Hardware Reference The hardware refence	Product Info	basic
3	Hardware Revision The hardware revision	Product Info	basic
4	Software Reference The software reference	Product Info	basic
6	Serial Number The serial number.	Product Info	basic

7	Manufacturing ID	Product Info	basic
	The production batch id.		
8	Manufacturing Date	Product Info	basic
	The production date.		
11	Description	Description	basic
	A free text zone to write a system description		
12	Reference	Description	basic
	A free text zone to write the customer reference of the system		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
71	General Input 1	warning (2)	5 / 2
	Alarm related to digital input 1		
72	General Input 2	warning (2)	5 / 2
	Alarm related to digital input 2		
73	General Input 3	warning (2)	5 / 2
	Alarm related to digital input 3		
74	General Input 4	warning (2)	5 / 2
	Alarm related to digital input 4		
75	General Input 5	warning (2)	5 / 2
	Alarm related to digital input 5		
76	General Input 6	warning (2)	5 / 2
	Alarm related to digital input 6		
77	General Input 7	warning (2)	5 / 2
	Alarm related to digital input 7		
78	General Input 8	warning (2)	5 / 2
	Alarm related to digital input 8		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>
1	Temperature 1	Temperature Sensor	degree C	basic
	Temperature Measurement 1			
2	Temperature 2	Temperature Sensor	degree C	basic
	Temperature Measurement 2			
3	Temperature 3	Temperature Sensor	degree C	basic
	Temperature Measurement 3			
4	Temperature 4	Temperature Sensor	degree C	basic
	Temperature Measurement 4			
71	Shunt 1	Current Sensor	Ampere	basic
	Shunt Measurement 1			

72	Shunt 2	Current Sensor	Ampere	basic
	Shunt Measurement 2			
73	Shunt 3	Current Sensor	Ampere	basic
	Shunt Measurement 3			
74	Shunt 4	Current Sensor	Ampere	basic
	Shunt Measurement 4			
75	Shunt 5	Current Sensor	Ampere	basic
	Shunt Measurement 5			
76	Shunt 6	Current Sensor	Ampere	basic
	Shunt Measurement 6			
77	Shunt 7	Current Sensor	Ampere	basic
	Shunt Measurement 7			
78	Shunt 8	Current Sensor	Ampere	basic
	Shunt Measurement 8			
91	Voltage 1	Voltage Sensor	Volt	basic
	Voltage Measurement 1			
131	Pulse Counter 1	Pulse Counter		basic
	Energy Consumption Counter 1			
132	Pulse Counter 2	Pulse Counter		basic
	Energy Consumption Counter 2			
133	Pulse Counter 3	Pulse Counter		basic
	Energy Consumption Counter 3			
134	Pulse Counter 4	Pulse Counter		basic
	Energy Consumption Counter 4			

Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
71	Digital Input 1 Name	Digital Inputs		General Input 1	basic
	The name of the digital input 1				
72	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
73	Digital Input 2 Name	Digital Inputs		General Input 2	basic
	The name of the digital input 2				
74	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
75	Digital Input 3 Name	Digital Inputs		General Input 3	basic
	The name of the digital input 3				
76	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				

77	Digital Input 4 Name	Digital Inputs		General Input 4	basic
	The name of the digital input 4				
78	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
79	Digital Input 5 Name	Digital Inputs		General Input 5	basic
	The name of the digital input 5				
80	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
81	Digital Input 6 Name	Digital Inputs		General Input 6	basic
	The name of the digital input 6				
82	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
83	Digital Input 7 Name	Digital Inputs		General Input 7	basic
	The name of the digital input 7				
84	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
85	Digital Input 8 Name	Digital Inputs		General Input 8	basic
	The name of the digital input 8				
86	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc

	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module
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Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>
101	Set Pulse Counter 1 Set Counter 1 Value	Pulse Counters	basic
102	Set Pulse Counter 2 Set Counter 2 Value	Pulse Counters	basic
103	Set Pulse Counter 3 Set Counter 3 Value	Pulse Counters	basic
104	Set Pulse Counter 4 Set Counter 4 Value	Pulse Counters	basic
501	Clear My Events By writing '1' to this control element, all the events of this equipment will be cleared.	Event	basic
502	Clear All Events By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.	Event	basic
511	Add Event This control element adds an event of severity none. The event name is the text written to this control element	Event	basic
512	Add Major Event This control element adds an event of severity major. The event name is the text written to this control element	Event	basic
521	Reset Default Names And Groups This control element resets all the element Names, Groups and Subgroups to default values for this equipment	Advanced	basic
522	Reset Default Names And Groups Recursive This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments	Advanced	basic

7.4.4 ADIO 10

Device Information	
Name	ADIO 10
Short Description	Standard I/O module DC systems
Long Description	I/O module with 2 inputs for temperature measurement, 4 voltage measurements, 2 current measurements, 8 digital inputs and 8 relays
Hardware Reference	9413 060 05101
Software Reference	SOFT 000099 XX

Equipment Type	System Extension
ETSI Level	/site/sensors_and_actuators

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	basic
	The commercial name of the extension card.		
2	Hardware Reference	Product Info	basic
	The hardware refence		
3	Hardware Revision	Product Info	basic
	The hardware revision		
4	Software Reference	Product Info	basic
	The software reference		
6	Serial Number	Product Info	basic
	The serial number.		
7	Manufacturing ID	Product Info	basic
	The production batch id.		
8	Manufacturing Date	Product Info	basic
	The production date.		
11	Description	Description	basic
	A free text zone to write a system description		
12	Reference	Description	basic
	A free text zone to write the customer reference of the system		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
71	General Input 1	warning (2)	5 / 2
	Alarm related to digital input 1		
72	General Input 2	warning (2)	5 / 2
	Alarm related to digital input 2		
73	General Input 3	warning (2)	5 / 2
	Alarm related to digital input 3		
74	General Input 4	warning (2)	5 / 2
	Alarm related to digital input 4		
75	General Input 5	warning (2)	5 / 2
	Alarm related to digital input 5		
76	General Input 6	warning (2)	5 / 2
	Alarm related to digital input 6		
77	General Input 7	warning (2)	5 / 2
	Alarm related to digital input 7		
78	General Input 8	warning (2)	5 / 2
	Alarm related to digital input 8		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>License</i></u>
1	Temperature 1	Temperature Sensor	degree C	basic
	Temperature Measurement 1			
2	Temperature 2	Temperature Sensor	degree C	basic
	Temperature Measurement 2			
71	Shunt 1	Current Sensor	Ampere	basic
	Shunt Measurement 1			
72	Shunt 2	Current Sensor	Ampere	basic
	Shunt Measurement 2			
91	Voltage 1	Voltage Sensor	Volt	basic
	Voltage Measurement 1			
92	Voltage 2	Voltage Sensor	Volt	basic
	Voltage Measurement 2			
93	Voltage 3	Voltage Sensor	Volt	basic
	Voltage Measurement 3			
94	Voltage 4	Voltage Sensor	Volt	basic
	Voltage Measurement 4			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
41	Shunt 1 Rating At 60mV	Battery	Ampere		basic
	The rating of the shunt 1 at 60mV.				
42	Shunt 2 Rating At 60mV	Battery	Ampere		basic
	The rating of the shunt 2 at 60mV.				
71	Digital Input 1 Name	Digital Inputs		General Input 1	basic
	The name of the digital input 1				
72	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
73	Digital Input 2 Name	Digital Inputs		General Input 2	basic
	The name of the digital input 2				
74	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
75	Digital Input 3 Name	Digital Inputs		General Input 3	basic
	The name of the digital input 3				
76	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is				

	not in this default state, the related alarm is set.				
77	Digital Input 4 Name	Digital Inputs		General Input 4	basic
	The name of the digital input 4				
78	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
79	Digital Input 5 Name	Digital Inputs		General Input 5	basic
	The name of the digital input 5				
80	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
81	Digital Input 6 Name	Digital Inputs		General Input 6	basic
	The name of the digital input 6				
82	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
83	Digital Input 7 Name	Digital Inputs		General Input 7	basic
	The name of the digital input 7				
84	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
85	Digital Input 8 Name	Digital Inputs		General Input 8	basic
	The name of the digital input 8				
86	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
121	Output Relay 1 Boolean Condition	Digital Outputs		(False)	basic
	Relay 1 Boolean Condition				
122	Output Relay 1 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 1 Normal State				
123	Output Relay 2 Boolean Condition	Digital Outputs		(False)	basic
	Relay 2 Boolean Condition				
124	Output Relay 2 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 2 Normal State				
125	Output Relay 3 Boolean Condition	Digital Outputs		(False)	basic
	Relay 3 Boolean Condition				
126	Output Relay 3 Normal State	Digital Outputs		(Energized / De-energized)	basic

	Relay 3 Normal State				
127	Output Relay 4 Boolean Condition	Digital Outputs		(False)	basic
	Relay 4 Boolean Condition				
128	Output Relay 4 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 4 Normal State				
129	Output Relay 5 Boolean Condition	Digital Outputs		(False)	basic
	Relay 5 Boolean Condition				
130	Output Relay 5 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 5 Normal State				
131	Output Relay 6 Boolean Condition	Digital Outputs		(False)	basic
	Relay 6 Boolean Condition				
132	Output Relay 6 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 6 Normal State				
133	Output Relay 7 Boolean Condition	Digital Outputs		(False)	basic
	Relay 7 Boolean Condition				
134	Output Relay 7 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 7 Normal State				
135	Output Relay 8 Boolean Condition	Digital Outputs		(False)	basic
	Relay 8 Boolean Condition				
136	Output Relay 8 Normal State	Digital Outputs		(Energized / De-energized)	basic
	Relay 8 Normal State				
137	Default Digital Output Binary Vector	Digital Outputs		(0b00000000)	basic
	This configuration is stored inside the module in case of configuration failure				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration				

	parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licens e</u>
11	Calibrate V1	Calibration	basic
	No information		
12	Calibrate V2	Calibration	basic
	No information		
13	Calibrate V3	Calibration	basic
	No information		
14	Calibrate V4	Calibration	basic
	No information		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.4.5 BIOM

Device Information	
Name	BIOM
Short Description	COMP@S BASIC I/O MODULE SYS BIOM
Long Description	12 Digital Inputs, 4 output relay, 2 temperature sensors

Hardware Reference	9413 060 05051
Software Reference	SOFT 000037 XX
Equipment Type	System Extension
ETSI Level	/site/sensors_and_actuators

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	basic
	The commercial name of the extension card.		
2	Hardware Reference	Product Info	basic
	The hardware refence		
3	Hardware Revision	Product Info	basic
	The hardware revision		
4	Software Reference	Product Info	basic
	The software reference		
6	Serial Number	Product Info	basic
	The serial number.		
7	Manufacturing ID	Product Info	basic
	The production batch id.		
8	Manufacturing Date	Product Info	basic
	The production date.		
11	Description	Description	basic
	A free text zone to write a system description		
12	Reference	Description	basic
	A free text zone to write the customer reference of the system		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
71	General Input 1	warning (2)	5 / 2
	Alarm related to digital input 1		
72	General Input 2	warning (2)	5 / 2
	Alarm related to digital input 2		
73	General Input 3	warning (2)	5 / 2
	Alarm related to digital input 3		
74	General Input 4	warning (2)	5 / 2
	Alarm related to digital input 4		
75	General Input 5	warning (2)	5 / 2
	Alarm related to digital input 5		
76	General Input 6	warning (2)	5 / 2
	Alarm related to digital input 6		
77	General Input 7	warning (2)	5 / 2
	Alarm related to digital input 7		
78	General Input 8	warning (2)	5 / 2
	Alarm related to digital input 8		

79	General Input 9	warning (2)	5 / 2
	Alarm related to digital input 9		
80	General Input 10	warning (2)	5 / 2
	Alarm related to digital input 10		
81	General Input 11	warning (2)	5 / 2
	Alarm related to digital input 11		
82	General Input 12	warning (2)	5 / 2
	Alarm related to digital input 12		

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>License</u>
1	Temperature 1	Sensors	degree C	basic
	The temperature 1			
2	Temperature 2	Sensors	degree C	basic
	The temperature 2			

Config Table					
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Range: Min/Max (default)</u>	<u>License</u>
71	Digital Input 1 Name	Digital Inputs		General Input 1	basic
	The name of the digital input 1				
72	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
73	Digital Input 2 Name	Digital Inputs		General Input 2	basic
	The name of the digital input 2				
74	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
75	Digital Input 3 Name	Digital Inputs		General Input 3	basic
	The name of the digital input 3				
76	Digital Input 3 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
77	Digital Input 4 Name	Digital Inputs		General Input 4	basic
	The name of the digital input 4				
78	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
79	Digital Input 5 Name	Digital Inputs		General Input 5	basic
	The name of the digital input 5				

80	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
81	Digital Input 6 Name	Digital Inputs		General Input 6	basic
	The name of the digital input 6				
82	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
83	Digital Input 7 Name	Digital Inputs		Digital Input 7 Name	basic
	The name of the digital input 7				
84	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
85	Digital Input 8 Name	Digital Inputs		General Input 8	basic
	The name of the digital input 8				
86	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
87	Digital Input 9 Name	Digital Inputs		General Input 9	basic
	The name of the digital input 9				
88	Digital Input 9 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 9 is normally closed. If this digital input is not in this default state, the related alarm is set.				
89	Digital Input 10 Name	Digital Inputs		General Input 10	basic
	The name of the digital input 10				
90	Digital Input 10 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 10 is normally closed. If this digital input is not in this default state, the related alarm is set.				
91	Digital Input 11 Name	Digital Inputs		General Input 11	basic
	The name of the digital input 11				
92	Digital Input 11 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 11 is normally closed. If this digital input is not in this default state, the related alarm is set.				
93	Digital Input 12 Name	Digital Inputs		General Input 12	basic
	The name of the digital input 12				
94	Digital Input 12 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 12 is normally closed. If this digital input is not in this default state, the related alarm is set.				
121	Digital Output Relay 1 Energized Boolean Condition	Digital Outputs		(False)	basic

	PLC Boolean condition to energize the relay 1			
122	Digital Output Relay 2 Energized Boolean Condition	Digital Outputs	(False)	basic
	PLC Boolean condition to energize the relay 2			
123	Digital Output Relay 3 Energized Boolean Condition	Digital Outputs	(False)	basic
	PLC Boolean condition to energize the relay 3			
124	Digital Output Relay 4 Energized Boolean Condition	Digital Outputs	(False)	basic
	PLC Boolean condition to energize the relay 4			
521	Read Access User Numbers	Allowed Users	(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4			
522	Write Access User Numbers	Allowed Users	()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4			
601	Event Table Length	Event	10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000			
901	Number Of PLC Data	PLC	(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module			
902	Number Of PLC Alarm	PLC	(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module			

Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licens e</i></u>
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		

521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.4.6 SAM0948

Device Information	
Name	SAM0948
Short Description	Site management card
Long Description	Site and infrastructure management card, 2 connections (RJ25) for card reader and door lock and 1 I/O connector (Sub-D26) - Captin FA and Captin BW lines
Hardware Reference	9413 060 95131
Software Reference	SOFT 000003 XX
Equipment Type	System Extension
ETSI Level	/site/sensors_and_actuators

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Product Name	Product Info	basic
	The commercial name of the extension card.		
2	Hardware Reference	Product Info	basic
	The hardware refence		
3	Hardware Revision	Product Info	basic
	The hardware revision		
4	Software Reference	Product Info	basic
	The software reference		
6	Serial Number	Product Info	basic
	The serial number.		
7	Manufacturing ID	Product Info	basic
	The production batch id.		
8	Manufacturing Date	Product Info	basic
	The production date.		
11	Description	Description	basic
	A free text zone to write a system description		
12	Reference	Description	basic
	A free text zone to write the customer reference of the system		

Alarm Table

<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	Cabinet Temperature High The temperature of the cabinet is too high.	major (6)	5 / 2
2	Cabinet Temperature Low The temperature of the cabinet is too low.	major (6)	5 / 2
3	Cabinet Temperature Sensor Fail The cabinet temperature sense is defect.	minor (4)	5 / 2
11	Cabinet Humidity High The cabinet humidity is too high	major (6)	5 / 2
12	Cabinet Humidity Low The cabinet humidity is too low	major (6)	5 / 2
21	Water Detection Alarm Water is detected by the water sensor.	major (6)	5 / 2
31	Tilt X Alarm The X-tilt absolute value is too high	major (6)	5 / 2
32	Tilt Y Alarm The Y-tilt absolute value is too high	major (6)	5 / 2
41	Vandalism Alarm The vandalism score is too high	major (6)	5 / 2
51	Badge Reader Failure The badge reader is defect or not connected	major (6)	5 / 2
71	General Input 1 Alarm related to digital input 1	warning (2)	5 / 2
72	General Input 2 Alarm related to digital input 2	warning (2)	5 / 2
73	General Input 3 Alarm related to digital input 3	warning (2)	5 / 2
74	General Input 4 Alarm related to digital input 4	warning (2)	5 / 2
75	General Input 5 Alarm related to digital input 5	warning (2)	5 / 2
76	General Input 6 Alarm related to digital input 6	warning (2)	5 / 2
77	Door 1 Open Alarm related to digital input 7, used for access control by default	warning (2)	5 / 2
78	Door 2 Open Alarm related to digital input 8, used for access control by default	warning (2)	5 / 2
79	Door 3 Open Alarm related to digital input 9, used for access control by default	warning (2)	5 / 2
80	Door 4 Open Alarm related to digital input 10, used for access control by default	warning (2)	5 / 2

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Licence</i></u>

1	Cabinet Temperature	Sensors	degree C	basic
	The temperature in the cabinet			
11	Relative Humidity	Sensors	%	basic
	The relative humidity in the cabinet			
21	Tilt X	Sensors	degree	basic
	The tilt-X value			
22	Tilt Y	Sensors	degree	basic
	The tilt-Y value			
31	Vandalism Score	Sensors		basic
	The vandalism score. This depends of the cabinet acceleration over time.			
41	Last UID Badge Reader	Badge Reader		basic
	The last uid value read by the badge reader			
42	Last Time Badge Reader	Badge Reader		basic
	The date and time at which the badge reader has been used			
52	Lock 1 Open	Access Control 1		basic
	The lock 1 is mechanically closed			
53	Lock 1 Enabled	Access Control 1		basic
	The access control 1 is enabling the electronic lock 1			
62	Lock 2 Open	Access Control 2		basic
	The lock 2 is mechanically closed			
63	Lock 2 Enabled	Access Control 2		basic
	The access control 2 is enabling the electronic lock 2			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
1	Cabinet Temperature High	Alarm Parameters	degree C	-50/100 (50)	basic
	The temperature over which the cabinet temperature is too high				
2	Cabinet Temperature Low	Alarm Parameters	degree C	-50/100 (-5)	basic
	The temperature under which the cabinet temperature is too low				
11	Cabinet Humidity High	Alarm Parameters	%	0/100 (80)	basic
	The relative humidity over which the cabinet humidity is too high				
12	Cabinet Humidity Low	Alarm Parameters	%	0/100 (0)	basic
	The relative humidity over which the cabinet humidity is too low				
21	Tilt X High	Alarm Parameters	degree	0/90 (10)	basic
	The maximum absolute tilt-X value allowed for the cabinet				
22	Tilt Y High	Alarm Parameters	degree	0/90 (10)	basic
	The maximum absolute tilt-Y value allowed for the cabinet				
31	Vandalism Detection Threshold	Alarm Parameters			basic

	The maximum vandalism score allowed for the cabinet.				
41	Access Control 1 Enabled	Access Control 1		True/False (False)	basic
	The access control 1 is enabled. The electronic lock 1 must be managed.				
42	Access Control 1 Authorized UID	Access Control 1			basic
	Coma separated list of the UID allowed to disable the electronic lock 1				
43	Access Control 1 Auto Close Time	Access Control 1	second	0/1000 (30)	basic
	Time in second after which the electronic lock 1 must be automatically locked again				
44	Access Control 1 Disabled If Badge Reader Failure	Access Control 1		True/False (True)	basic
	The electronic lock 1 must be disabled if the 'Badge reader failure' alarm is set.				
45	Access Control 1 Doors Inputs	Access Control 1		(7,9,10)	basic
	This is the coma separated list of the digital inputs which are door contacts related to the access control 1				
51	Access Control 2 Enabled	Access Control 2		True/False (False)	basic
	The access control 2 is enabled. The electronic lock 2 must be managed.				
52	Access Control 2 Authorized UID	Access Control 2			basic
	Coma separated list of the UID allowed to disable the electronic lock 2				
53	Access Control 2 Auto Close Time	Access Control 2	second	0/1000 (30)	basic
	Time in second after which the electronic lock 2 must be automatically locked again				
54	Access Control 2 Disabled If Badge Reader Failure	Access Control 2		True/False (True)	basic
	The electronic lock 1 must be disabled if the 'Badge reader failure' alarm is set.				
55	Access Control 2 Doors Inputs	Access Control 2		(8)	basic
	This is the coma separated list of the digital inputs which are door contacts related to the access control 2				
71	Digital Input 1 Name	Digital Inputs		General Input 1	basic
	The name of the digital input 1				
72	Digital Input 1 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 1 is normally closed. If this digital input is not in this default state, the related alarm is set.				
73	Digital Input 2 Name	Digital Inputs		General Input 2	basic
	The name of the digital input 2				
74	Digital Input 2 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 2 is normally closed. If this digital input is not in this default state, the related alarm is set.				
75	Digital Input 3 Name	Digital Inputs		General Input 3	basic
	The name of the digital input 3				
76	Digital Input 3 Normally	Digital Inputs		True/False (True)	basic

	Closed				
	True/False value defining if the digital input 3 is normally closed. If this digital input is not in this default state, the related alarm is set.				
77	Digital Input 4 Name	Digital Inputs		General Input 4	basic
	The name of the digital input 4				
78	Digital Input 4 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 4 is normally closed. If this digital input is not in this default state, the related alarm is set.				
79	Digital Input 5 Name	Digital Inputs		General Input 5	basic
	The name of the digital input 5				
80	Digital Input 5 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 5 is normally closed. If this digital input is not in this default state, the related alarm is set.				
81	Digital Input 6 Name	Digital Inputs		General Input 6	basic
	The name of the digital input 6				
82	Digital Input 6 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 6 is normally closed. If this digital input is not in this default state, the related alarm is set.				
83	Digital Input 7 Name	Digital Inputs		Digital Input 7 Name	basic
	The name of the digital input 7				
84	Digital Input 7 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 7 is normally closed. If this digital input is not in this default state, the related alarm is set.				
85	Digital Input 8 Name	Digital Inputs		Door 2 Open	basic
	The name of the digital input 8				
86	Digital Input 8 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 8 is normally closed. If this digital input is not in this default state, the related alarm is set.				
87	Digital Input 9 Name	Digital Inputs		Door 3 Open	basic
	The name of the digital input 9				
88	Digital Input 9 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 9 is normally closed. If this digital input is not in this default state, the related alarm is set.				
89	Digital Input 10 Name	Digital Inputs		Door 4 Open	basic
	The name of the digital input 10				
90	Digital Input 10 Normally Closed	Digital Inputs		True/False (True)	basic
	True/False value defining if the digital input 10 is normally closed. If this digital input is not in this default state, the related alarm is set.				
121	Digital Output Relay 1 Energized Boolean Condition	Digital Outputs		(False)	basic

	PLC Boolean condition to energize the relay 1				
521	Read Access User Numbers	Allowed Users		(1,2,3,4,5)	basic
	The list of the user numbers which have read access to this equipment. The user numbers are coma separated. The accepted user id are 1,2,3,4 and 5. Ex: 1,3,4				
522	Write Access User Numbers	Allowed Users		()	basic
	The list of the user numbers which have write access to this equipment. This means that these users can modify the configuration element, the alarm settings and use the control elements. The user numbers are coma separated. The accepted user ids are 1,2,3,4 and 5. Ex: 1,3,4				
601	Event Table Length	Event		10/4000 (100)	basic
	The maximum length of the table. The value must be comprised between 10 and 4000				
901	Number Of PLC Data	PLC		(0)	plc
	The number of PLC data. Every equipment can manage up to 20 user programmable data. Data elements are automatically added in the data table. Configuration parameters are added to set the PLC Data Name and the PLC Data Mathematical calculation. In order to use these functionalities, you need a license with the 'PLC' module				
902	Number Of PLC Alarm	PLC		(0)	plc
	The number of PLC alarm. Every equipment can manage up to 20 user programmable alarms. Alarm elements are automatically added in the alarm table. The alarm parameters are added to set the PLC Alarm Name and the PLC Alarm Boolean condition. In order to use these functionalities, you need a licence with the 'PLC' module				

Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licens e</i></u>
1	Unlock Door 1	Lock Control	basic
	Electronic lock 1 must be disabled		
2	Unlock Door 2	Lock Control	basic
	Electronic lock 2 must be disabled		
11	Lock Door 1	Lock Control	basic
	Electronic lock 1 must be enabled		
12	Lock Door 2	Lock Control	basic
	Electronic lock 2 must be enabled		
31	Auto Calibrate Tilt Zero	Calibration	basic
	The tilt-X and tilt-Y must be calibrated to 0 with the actual tilt.		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic

	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.5 Remote Power Feeding System Tables

7.5.1 CEM03_Remote_Power_Feeding_System

Device Information	
Name	CEM03_Remote_Power_Feeding_System
Short Description	Monitoring for Central Up Converter system
Long Description	Central monitoring card for 4 down converter cards with CAN IN/CAN OUT and 4 relays
Hardware Reference	9413 044 89421
Software Reference	SOFT 000022 XX
Equipment Type	Monitoring For Remote (About Remote Power Feeding System)
ETSI Level	/site/energy_system/remote_power_feeding_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
1	Number of CEM03 By Shelf	Up Converters			basic
	Maximum number of CEM03 cards that are authorized by shelf. This parameter value must be comprised between 1 and 4.				

7.6 Up Converter System Tables

7.6.1 CEM03_Up_Converter_System

Device Information	
Name	CEM03_Up_Converter_System
Short Description	Monitoring for Central Up Converter system
Long Description	Central monitoring card for 4 down converter cards with CAN IN/CAN OUT and 4 relays
Hardware Reference	9413 044 89421
Software Reference	SOFT 000022 XX
Equipment Type	Monitoring For Remote (About Up Converter System)
ETSI Level	/site/energy_system/remote_power_feeding_system/up_converter_system

Description Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>License</i></u>
1	Description	Description	basic
	A free text zone to write a system description		
2	Reference	Description	basic
	A free text zone to write the customer reference of the system		
11	Product Name	Monitoring	basic
	The product name of the DC system monitoring		
12	Hardware Reference	Monitoring	basic
	The hardware reference of the DC system monitoring		
14	Software Reference	Monitoring	asset
	The serial number of the DC system monitoring		
16	Serial Number	Monitoring	asset
	The serial number of the DC system monitoring		
17	Manufacturing ID	Monitoring	asset
	The batch id of the DC system monitoring		
18	Manufacturing Date	Monitoring	asset
	The production date of the DC system monitoring		

Alarm Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Severity Type (Level)</i></u>	<u><i>Set/Clear Delay</i></u>
1	One Up Converter Failure	minor (4)	5 / 2
	One Up converter is defect or not connected to a down converter (and enabled)		

2	More Than One Up Converter Failure	major (6)	5 / 2
	More than one Up converter is defect or not connected to a down converter (and enabled)		
3	More Than One Up Converter Card Failure	major (6)	5 / 2
	More than one up converter card is defect or not connected to a down converter (and enabled)		
11	One FAN Failure	minor (4)	5 / 2
	One FAN has a problem		
12	More Than One FAN Failure	major (6)	5 / 2
	More Than One FAN has a problem		
14	Configuration Problem	minor (4)	5 / 2
	There is a configuration problem. A card is configuted but not available		
20	Slot 0 Alarm	minor (4)	15 / 15
	Slot 0 is in alarm		
21	Slot 1 Alarm	minor (4)	15 / 15
	Slot 1 is in alarm		
22	Slot 2 Alarm	minor (4)	15 / 15
	Slot 2 is in alarm		
23	Slot 3 Alarm	minor (4)	15 / 15
	Slot 3 is in alarm		
24	Slot 4 Alarm	minor (4)	15 / 15
	Slot 4 is in alarm		
25	Slot 5 Alarm	minor (4)	15 / 15
	Slot 5 is in alarm		
26	Slot 6 Alarm	minor (4)	15 / 15
	Slot 6 is in alarm		
27	Slot 7 Alarm	minor (4)	15 / 15
	Slot 7 is in alarm		
28	Slot 8 Alarm	minor (4)	15 / 15
	Slot 8 is in alarm		
29	Slot 9 Alarm	minor (4)	15 / 15
	Slot 9 is in alarm		
30	Slot 10 Alarm	minor (4)	15 / 15
	Slot 10 is in alarm		
31	Slot 11 Alarm	minor (4)	15 / 15
	Slot 11 is in alarm		
32	Slot 12 Alarm	minor (4)	15 / 15
	Slot 12 is in alarm		
33	Slot 13 Alarm	minor (4)	15 / 15
	Slot 13 is in alarm		
34	Slot 14 Alarm	minor (4)	15 / 15
	Slot 14 is in alarm		
35	Slot 15 Alarm	minor (4)	15 / 15
	Slot 15 is in alarm		
36	Slot 16 Alarm	minor (4)	15 / 15

	Slot 16 is in alarm
--	---------------------

Data Table				
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Unit</u>	<u>Licens e</u>
1	Input Voltage	Rack	Volt	basic
	No information			
2	Temperature	Rack	degree C	basic
	No information			
12	Number Of Up Converter NOK	Up Converters		basic
	No information			
13	Number Of Up Converter Card NOK	Up Converters		basic
	No information			
20	Status Slot 0	Slots Status		basic
	No information			
21	Status Slot 1	Slots Status		basic
	No information			
22	Status Slot 2	Slots Status		basic
	No information			
23	Status Slot 3	Slots Status		basic
	No information			
24	Status Slot 4	Slots Status		basic
	No information			
25	Status Slot 5	Slots Status		basic
	No information			
26	Status Slot 6	Slots Status		basic
	No information			
27	Status Slot 7	Slots Status		basic
	No information			
28	Status Slot 8	Slots Status		basic
	No information			
29	Status Slot 9	Slots Status		basic
	No information			
30	Status Slot 10	Slots Status		basic
	No information			
31	Status Slot 11	Slots Status		basic
	No information			
32	Status Slot 12	Slots Status		basic
	No information			
33	Status Slot 13	Slots Status		basic
	No information			
34	Status Slot 14	Slots Status		basic
	No information			
35	Status Slot 15	Slots Status		basic
	No information			

36	Status Slot 16	Slots Status		basic
	No information			
51	Powered Site Ids	Monitoring		basic
	No information			
52	Monitored Site Ids	Monitoring		basic
	No information			
53	Powered Site Ids with Possible Line Feed Problem	Monitoring		basic
	No information			

Config Table					
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>	<u><i>License</i></u>
20	Slot 0	Config Site			basic
	No information				
21	Slot 1	Config Site			basic
	No information				
22	Slot 2	Config Site			basic
	No information				
23	Slot 3	Config Site			basic
	No information				
24	Slot 4	Config Site			basic
	No information				
25	Slot 5	Config Site			basic
	No information				
26	Slot 6	Config Site			basic
	No information				
27	Slot 7	Config Site			basic
	No information				
28	Slot 8	Config Site			basic
	No information				
29	Slot 9	Config Site			basic
	No information				
30	Slot 10	Config Site			basic
	No information				
31	Slot 11	Config Site			basic
	No information				
32	Slot 12	Config Site			basic
	No information				
33	Slot 13	Config Site			basic
	No information				
34	Slot 14	Config Site			basic
	No information				
35	Slot 15	Config Site			basic
	No information				

36	Slot 16	Config Site			basic
	No information				
51	Urgent Relay Energized Boolean Condition	Relays			basic
	No information				
52	Non Urgent Relay Energized Boolean Condition	Relays			basic
	No information				

Control Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>Licence</u>
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

7.7 Remote Site Tables

7.7.1 CEM03_Remote_Site

Device Information	
Name	CEM03_Remote_Site
Short Description	Monitoring for Central Up Converter system
Long Description	Central monitoring card for 4 down converter cards with CAN IN/CAN OUT and 4 relays
Hardware Reference	9413 044 89421
Software Reference	SOFT 000022 XX
Equipment Type	Monitoring For Remote (About Remote Site)
ETSI Level	/site/energy_system/remote_power_feeding_

	system/remote_site
--	--------------------

Description Table			
<u>Id</u>	<u>Name</u>	<u>Group</u>	<u>License</u>
2	Site Name	Site	basic
	The name of the site		
3	Short Description	Site	basic
	A short description of the site		
4	Info	Site	basic
	Some more information about the site		
11	Street	Address	basic
	Street part of the site address		
12	City	Address	basic
	City part of the site address		
13	Province	Address	basic
	Province part of the site address		
14	Postal Code	Address	basic
	Postal Code part of the site address		
15	Region	Address	basic
	Region part of the site address		
16	Country	Address	basic
	Country part of the site address		
31	Latitude	GPS Position	asset
	The latitude of the site		
32	Longitude	GPS Position	asset
	The longitude of the site		
33	Altitude	GPS Position	asset
	The altitude of the site		

Alarm Table			
<u>Id</u>	<u>Name</u>	<u>Severity Type (Level)</u>	<u>Set/Clear Delay</u>
1	One Down Converter Failure	minor (4)	10 / 2
2	More Than One Down Converter Failure	major (6)	10 / 2
3	One Fan Failure	minor (4)	30 / 2
4	More Than One FAN Failure	major (6)	30 / 2
5	Possible Power Feed Reduced	warning (2)	5 / 2
9	Output 1 Off	major (6)	5 / 2
10	Output 2 Off	major (6)	5 / 2

15	Communication Failure	major (6)	5 / 2
25	Digital Input 1	major (6)	5 / 2
	This alarm is related to digital input 1		
26	Digital Input 2	major (6)	5 / 2
	This alarm is related to digital input 2		
27	Digital Input 3	major (6)	5 / 2
	This alarm is related to digital input 3		
28	Digital Input 4	minor (4)	5 / 2
	This alarm is related to digital input 4		
29	Digital Input 5	minor (4)	5 / 2
	This alarm is related to digital input 5		
30	Digital Input 6	minor (4)	5 / 2
	This alarm is related to digital input 6		

Data Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>License</i></u>
1	Number of Configured Power Lines	Lines		basic
	No information			
2	Line Configured for Monitoring	Lines		basic
	No information			
11	Remote Type	Remote System	DC	basic
	No information			
12	Input Voltage	Remote System	DC	Volt
	No information			
13	Input Common Mode Voltage	Remote System	DC	Volt
	Input Common Mode Voltage with respect to ground			
14	Output Voltage	Remote System	DC	Volt
	No information			
15	Temperature	Remote System	DC	degree C
	No information			
21	Number Of Declared Down Converters	Remote System	DC	basic
	No information			

Config Table				
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Unit</i></u>	<u><i>Range: Min/Max (default)</i></u>

91	Digital Input 1 Name	Digital Inputs		Digital Input 1	basic
	The name of the digital input 1				
93	Digital Input 2 Name	Digital Inputs		Digital Input 2	basic
	The name of the digital input 2				
95	Digital Input 3 Name	Digital Inputs		Digital Input 3	basic
	The name of the digital input 3				
97	Digital Input 4 Name	Digital Inputs		Digital Input 4	basic
	The name of the digital input 4				
99	Digital Input 5 Name	Digital Inputs		Digital Input 5	basic
	The name of the digital input 5				
101	Digital Input 6 Name	Digital Inputs		Digital Input 6	basic
	The name of the digital input 6				

Control Table			
<u><i>Id</i></u>	<u><i>Name</i></u>	<u><i>Group</i></u>	<u><i>Licence</i></u>
11	Copy Address From Top Site Level	Address	basic
	Writing a '1' to this control element will copy the Address from the Site level, except the Street Name		
501	Clear My Events	Event	basic
	By writing '1' to this control element, all the events of this equipment will be cleared.		
502	Clear All Events	Event	basic
	By writing '1' to this control element, all the events of this equipment and all the events of all the sub-equipments will be cleared.		
511	Add Event	Event	basic
	This control element adds an event of severity none. The event name is the text written to this control element		
512	Add Major Event	Event	basic
	This control element adds an event of severity major. The event name is the text written to this control element		
521	Reset Default Names And Groups	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment		
522	Reset Default Names And Groups Recursive	Advanced	basic
	This control element resets all the element Names, Groups and Subgroups to default values for this equipment and all sub equipments		

Chapter 8 – Licenses

- [The Comp@s license packages](#)
- [How can I upgrade my license?](#)
- [How is the license stored?](#)

8.1 The Comp@s license packages

The Comp@s software has functionalities which are accessible depending of the licensed options. For the time being, 4 license packages are available: battery, asset, plc and modbus.

- [The Battery Package](#)
- [The Asset Package](#)
- [The PLC Package](#)
- [The Modbus Package](#)
- [License currently in use.](#)

8.1.1 The Battery Package

This package allows using advanced functionalities related to the battery management. It allows configuring and starting battery test, it allows to retrieve test battery records, etc. The detailed table, in chapter 8, details the table entries only available with the battery package.

8.1.2 The Asset Package

This package allows:

- To retrieve any available data record, with a resolution of second, minute, hour or day. This includes also some statistics about the data. The records can be viewed with a web browser with Flash installed. The records can also be downloaded in CSV;
- To retrieve any information about the components of a system, like serial numbers, batch ids, production dates, software information, etc;
- To retrieve detailed information about smart rectifiers;

- To use strategy to optimize the global efficiency.

Note: The PLC package is also included in the Asset Package.

8.1.3 The PLC Package

This PLC package allows:

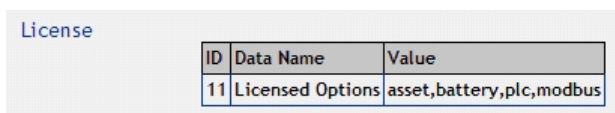
- The creation of customer defined data, like in a Programmable Logic Controller: a PCL Data is defined by any mathematical operation over any data;
- The creation of customer defined alarms, like in a Programmable Logic Controller: a PLC Alarm is defined by any combination of any data and any alarm.

8.1.4 The Modbus Package

This Modbus package allows retrieving the data and the alarms related to one dc system with the Modbus RTU over TCP protocol. This protocol is used in some industrial environment.

8.1.5 License currently in use

In order to check which license is currently used by Comp@s, browse to SiteàData. The entry “Licensed Options” provides the information, as shown on the following figure:



License		
ID	Data Name	Value
11	Licensed Options	asset,battery,plc,modbus

Figure 65 Installed License

8.2 How can I upgrade my license?

If you want to unlock functionalities thanks to a new license:

STEP 1: Please contact your vendor.

STEP 2: He will ask you to send you actual license file.

STEP 3: A new license file will be returned.

STEP 4: Copy it to \\FlashDisk\\User

STEP 5: After a reboot, your system is using the new license.

8.3 How is the license stored?

The Comp@s license is a XML file named “licenseKey_XX-XX-XX-XX-XX-XX.xml”, where XX-XX...-XX is the registered MAC address, in hexadecimal. (Example: licenseKey_00-14-2D-20-0B-20.xml) When the file is installed at factory, it is located in “\\FlashDisk\\Factory”.

The content of this XML file looks like:

XML licence file content:

```
<licenseKey version="1.0">
<product version="0.1.X.X">Cherokee Comp@s</product>
<macAddress>00-14-2D-20-0B-20</macAddress>
<options>asset,battery</options>
<key>vddR+a7oQcx4Qrmt24padm3hSd1DJtbC3LEsKtzxdSJ5mClON9uZMg
NnvemA13CWE5pOZxZBJY/uTsuCPHEwAQ==</key>
</licenseKey>
```

The interesting part is “<options>asset,battery</options>” which corresponds to the licensed option you bought.

Note that this license is unique on each monitoring. If you copy a license file from one monitoring to another, it will not work!

Chapter 9 – Software Components

Release

A comp@s release is composed of different components.

Comp@s is evolving every day to satisfy new customer and new products needs. It supports more and more devices.

When required, we release a production release. This release is composed of the following components :

- [System bootloader](#)
- [The Operating System](#)
- [Comp@s Starter Executable](#)
- [Comp@s Executable](#)
- [Comp@s FTP Server Executable.](#)

9.1 System bootloader

The Bootloader is the first piece of code being executed at start-up. Its main purpose is to load and start the OS (WinCE). The Boot loader is also the place where various settings can be changed.

9.2 The Operating System

Comp@s is running on Windows CE 5.0 operating system, featuring nice features like:

- Real Time
- A reliable TCP/IP stack
- USB driver for local connection
- Fast development capabilities.

The system image is build with the Microsoft Platform Builder. It uses the Toradex BSP (Board Support Package).

An external watchdog system is present to automatically restart the monitoring application if loss of activity is detected.

Microsoft® Windows® CE 5.0 is an open, scalable, 32-bit operating system (OS) that integrates reliable, real time capabilities with advanced Windows technologies. Windows CE allows you to build a wide range of innovative, small footprint devices. A typical Windows CE-based device is designed for a specific use, often runs disconnected from other computers, and requires a small OS that has a deterministic response to interrupts. Examples include enterprise tools, such as industrial controllers, communications hubs, and point-of-sale terminals, and consumer products, such as cameras, Internet appliances, and interactive televisions.

See MSDN Win CE 5.0 for more information: <http://msdn.microsoft.com/en-us/library/ms905511.aspx>.

9.3 Comp@s Starter Executable

That application is stored on the Flash, in the AutoRun folder. The exact file name is : "Compas_Starter.exe".

The application is written in c# and run over the .NET CF 2.0.

9.4 Comp@s Executable

The application is written in c# and run over the .NET CF 2.0.

When Compas is executed, the followings tasks are run:

1. Extract and load of [C Drivers](#)
2. Retrieve [Environment Configuration](#)
3. Load [License](#)
4. Load [Translation Dictionary](#)
5. Create a [Site Object](#)
6. Create Thread "[Decode CAN Msg](#)" >
7. Create Thread "[Web Server](#)"
8. Create Thread [SNMP](#)
9. Create Thread "Modbus Slave"
10. Create Thread "Modbus Master"
11. Create Thread "[ProcessScheduledTasks](#)".

9.4.1 C Drivers

In order to guarantee fast and reliable CAN communication, the can drivers is build in a C DLL (Dynamic Link Library).

The driver is not build in the operating system to allow easy upgrade and avoid compatibility issues.

The hardware CAN controller model is Microchip MCP 2515. It provides a SPI interface used to communicate with the Compas electronic board.

[Microchip MCP 2515 details.](#)

CAN Message Receiving

Each time a message is received, the MCP 2515 use hardware interrupt to request the driver to read the new message.

The CAN messages are stored in a large circular buffer queue. These messages can be read without real time issues.

CAN Message Sending

Message can be sent via 3 different output buffers:

- High Priority Buffer
- Normal Priority Buffer
- Low Priority Buffer

They can be sent one by one or in block of maximum 10 messages. (Block sending is required by the CANOpen LSS algorithm to guarantee the message order)

Other Driver Functions

The C driver is also used to control led, and to reset the hardware watchdog, depending of the hardware configuration.

9.4.2 Environment Configuration

Global variables are configured depending of the environment:

- [BSP Version](#)
- [Flash path](#)
- [Ethernet Device.](#)

BSP Version

The Board Support Package is related to the operating system version.

Flash path

Default path to access the flash memory is \\FlashDisk

But, on previous versions of Compas, \\NOR Flash was used.

Ethernet Device

Depending of the comp@s hardware revision, different chipset are used for Ethernet:

- DM90001
- AX887961

9.4.3 License

The license is validated and loaded if trusted.

9.4.4 Translation Dictionary

On start-up, the list of all the used strings is generated dynamically.

Then, the associated translations are loaded in memory from csv files stored in the user dedicated Flash.

The Namespace in charge of the translations is Compas.Strings.

9.4.5 Site Object

The site object is the root node of the equipments controlled and monitored by Compas.

Any detected equipment/device will be a child of this object.

After the object creation, the associated site configuration is loaded.

9.4.6 Decode CAN Msg

See `MonitoringThreadDecodeCANMsg()`

9.4.7 Web Server Interface

The internal Web server of the application is launched at startup in a separate thread. It is constituted of an request extractor that listens to the HTTP messages, and calls back a method to process them.

Default listening port number is 80.

9.4.8 SNMP Management

A new SNMP agent is instantiated at application startup. This agent is called in order to send an event trap each time a new event is added by an equipment.

9.4.9 Process Scheduled Tasks

This thread is looping on the function “ProcessTasks”, and sleep 20 milliseconds after each execution. It executes the following tasks:

- Execute the “RefreshSlow” of all the equipments. It recalculate the internal variables, the PLC data, manage the regulation, etc. (Every 1000ms)
- Execute the “UpdateAlarmTableAndStatus” of all the equipments. It recalculate each alarm, and update the global status of the equipment. (Every 1000ms)
- Update Led status, for led controlled directly by Comp@s. (every 100ms)
- Ask necessary CANOpen variables refresh (every 100ms)
- Manage CANOpen Nodes, detect nodes to remove (Every 1500ms)
- Check if new CANOpen LSS node has been detected (Every 2000ms)
- Refresh the equipment structure if needed (Every 2000ms)
- Send SNMP trap if Authentication Failure (Every 2000ms)
- Process Data Records elements with second resolution (Every 1 sec)
- Process Data Records elements with minute resolution (Every time the system ime as changed of minute)
- Process Data Records elements with hour resolution (Every time the system time as changed of hour)

- Archive Data records (Every x hours if x is configured and different of 0)
- Process Data Records elements with day resolution, and save all records in flash (Every time the system time as changed of day)
- Post XML events if any and if configured, for all equipments (Every 2 seconds)

9.4.10 Inventory Management and Equipment Mounting

The device inventory is initialized and loaded at startup. First application is searching for the file `devices.xml` in `\\User\\` directory of the flash memory path. If this file doesn't exist, a default initialization procedure is started.

Procedure is the following:

- If a site doesn't exist, application is creating or getting one. Getting one means that application is searching for an equipment with the same name or ID. Otherwise, a new site is created.
- If an energy system doesn't exist, application is creating or getting one.
- After CAN bus initialization, LSS (Layer Setting Services) messages are processed. Each time a new CANOpen node is found, corresponding device is added to the device dictionary.

9.4.11 Alarm Set-up and Clearance

Each time a new alarm is created, two "Set" and "Clear" delay parameters are associated to it. By default they are equal to 0 and 2 seconds respectively:

- Alarm is set if its severity type is different to "Disabled" AND if its alarm condition is true since a time in seconds superior to the set delay parameter.
- Alarm is cleared if its alarm condition is NOT true since a time in seconds superior to the clear delay parameter.

9.4.12 System and Application Configuration

Each equipment of the application possess its own configuration elements. They appear in the Web page Config tab related to the equipment in order to be editable by application user.

9.4.13 Data Record Management

In addition to instantaneous Data objects, the application manages Data Records objects that accumulate information from Data objects. Real-time statistics like average, max. and min. values are computed. The Comp@s Web server uses an integrated javascript applet in order to generate a dynamical display of the data record information.

9.4.14 Equipment Emulation

If equipment emulation is used, CANDriver is emulating a set of equipments by sending corresponding CAN messages.

9.5 Comp@s FTP Server Executable

The application is written in c# and run over the .NET CF 2.0.

This program implements a FTP server. The program is separated from Comp@s to allow software upgrade also when Compas.exe is not running. The security management is separated from the Comp@s one.

File Transfer Protocol (FTP) is a standard network protocol used to transfer files from one host to another host over a TCP-based network, such as the Internet. FTP is built on a client-server architecture and uses separate control and data connections between the client and server.

[Wikipedia - FTP](#)

Chapter 10 – Software Changelog

- [.NET Executable Versioning](#)
- [Comp@s Changelog](#).

10.1.NET Executable Versioning

The software versioning is the process of assigning unique version numbers to unique states of computer software. Each assembly has a version number as part of its identity.

Since March 2012, the standardized format used is :

<major version>.<minor version>.<build number>.<revision>

All the fields are integers.

- The major version changes when a release is made that breaks backwards compatibility.
- The minor version will be used in other cases when we release versions.
- The build number increments as we do code reviews and check in working code to the repository . (this number is not displayed to the customer to avoid confusion - it is showned as 0.
- The revision is used for internal build, it designate alpha or beta status for releases that are not stable enough for general or practical deployment and are intended for testing/internal use only:
 - <revision> - 0 : for alpha (non-stable)
 - <revision> - 1: for beta (internal)
 - <revision> - 2 : for release candidate (QA-passed, final tests)
 - <revision> - 3 : for public (release)
 - <revision> - 4 and following : for releasing specific modifications on a released version (for specific customers - should be avoided as much as possible)

Before that version, the used format was:

0.Y.0.X where:

- X is the minor revision number and is:
 - odd for beta version
 - even for stable version

- Y is the major revision number.

10.2Comp@s Changelog

Note: Only revisions with a SOFT 000031 XX code were released in production. The other versions were distributed to customers for upgrade when necessary.

Legend: + Added feature * Improved/changed feature - Bug fixed ! Known issue / missing feature

Revision 0.119.0.3 (19/02/2013) - SOFT 000031 30
* Default Post XML timeout changed to 100 seconds (was 2 seconds)
* Up Converter System: Set/Clear Delay of the slot alarm increased to 15
* Remote Site - Address is copied from Top Site on first creation
* Remote Site - New control to copy address from the top site level (not the street).
* Optimised version of the XML posting to Armada. Description, Data, Alarm, Config of the equipment are also sent.
- Fix bug : element change event where not added to the correct equipment.

Revision 0.118.0.3 (23/01/2013) - SOFT 000031 29
* Inverter system - Support of ETSI XML posting for real time events in Armada.
- Fix bug introduced in 0.113.0.3 - If the site id is changed to anything starting with 1 like 11, 1021, etc. A stack overflow can happen at next reboot.

Revision 0.117.0.3 (21/01/2013) - SOFT 000031 28
+ Display the Serial Number of Cordex Rectifier and Inverters in the left menu and on top of the element tables, display the reference for systems
+ Web Server: Display the Site Name as title of the web page
* Remote Power System: Alarms are now grouped
* Remote Site: Alarms list is updated depending on remote system (no fan alarm with 60W module for example)
- Fix bug introduced in 0.116.0.3 about the data record xml generation)

Revision 0.116.0.3 (16/01/2013) - SOFT 000031 27
+ Implementation of the periodic automatic battery test
* Finalization of the equalize feature for Cordex dc systems
* New parameters for site.xml, allowing to download only some resolutions of the records (day, hour, minute, second). By default, it retrieves only daily and hourly data records/
+ Inverter system with T2S - New control element to Turn On/Off all modules
- Inverter system with T2S - Save to T2s is now more reliable
+ When the Site Name is configured, it is now the title of the web page. This needs a complete refresh of the web page (Ctrl-F5)
* New control elements to calibrate voltage and currents on ADIO10

- Fix for relay control problem on ADIO10 (introduced in 0.115.0.3 changes)

Revision 0.115.0.3 (20/12/2012) - SOFT 000031 26

* Relay of Alarm 'Missing Rectifiers' can now be saved in MCU
* Support of the T2S with Media Inverters
* Better support of T2S alarms
- Some Alarm Set delay were not reloaded correctly after reboot, like the bus voltage sense failure
- Reworked relay boolean condition on ADIOs. Possibility to configure normal condition as 'Energized' or 'De-Energized'.

Revision 0.114.0.7 (17/12/2012) - SOFT 000031 25

- PLC functions without arguments like \$second() where broken unless used as \$second(0)
* Better support of zip files generation (site.xml.zip). The files are now fully compliant (before, it was a compressed stream)
* Optimisation of the Web Server - Faster and uses less memory when files are posted
- After a 'Clear All Events' or 'Clear Events', the events were not rewritten to flash, and were present again at reboot. (broken in 0.113.0.3)
* Reboot improved to reply to request, delayed by 10 seconds to allow events to be sent to Arm@da
* More robust and faster startup
- Digital Input alarm logic was inverted on ADIO 7-8-9-10. If you are using it, care required when upgrading.
* Improvement of the DC bus voltage sense failure detection on Cordex
* Better implementation of the data_record management. Thread safe and faster.
- If events.xml was corrupted, the system could never start without deleting the file
- Randomly, system could reboot at midnight during data records saving

Revision 0.113.0.3 (15/11/2012) - SOFT 000031 24

+ Cordex - Initial support of firmware upgrade
- SNMP - Traps content oids where shifted of 1
* SNMP - Improved MIB compliance - Some oid related name were too long
* Better implementation of the battery test for Cordex DC Systems
* CEM03 - Remote Site can now have an id > 100 (up to 1000)
* Improved RS485 modbus driver allowing different types of device on the same bus
+ Support of energy meter IEM3150 on RS485 bus
+ Initial limited support of Cordex Converters
+ Possibility to rename Name and Group of any element from the web interface
+ Group is now loaded from configuration.xml for any element, allowing total customisation of name/group of elements
+ Events are now automatically saved in a flat file : events_flat.xml. events.xml is converted on first boot.
+ Introduced group possibilities for the alarm table
- SNMP walk was not working from top snmp node

Revision 0.111.0.5 (12/10/2012)

- Corrected bugs in Cordex regulation, load sharing was wrong if canid did not match rectifier id

Revision 0.111.0.3 (31/07/2012) - SOFT 000031 23

+ Initial support of Alpha CXC over SNMP

* Allow to limit the request of one CAN message at the time (for T2S)

+ Support of multiple Inverter System (T2S)

Revision 0.110.0.3 (11/07/2012) - SOFT 000031 22

- Changed unit of Rectifier Cordex 'Service Time'(s->m) and 'Converted Energy'(KJ->kwh)

- It was no possible to reset to empty the list of required node on the can bus (config Required CAN Bus Node IDs)

- CAN Driver - The can driver was crashing when there was only one node on the bus and it was removed

- CAN Driver - Randomly, a can message was corrupted because of an OS interrupt during SPI communication

* Better conversion from XML to XLS. (site.xml.xls) Can be used to generate a system user guide with the request : site.xml.xls?help=true&control=true

* Better support of T2S inverter monitoring

* Remote Power Feeding - Possiblity to define the number of CEM03 by rack, in master/slave configuration --> up to 64 racks

* Remote Power Feeding - Added customer description element at the Remote Power Feeding System level

+ New alarm at the site level to notify that the last configuration changes are not saved

+ New site control to remove absent equipments

+ Introduction of 'Absent' status for Cordex Rectifiers

+ Auto detection of the rectifier model for smart energy

+ Support of 850W/1000W systems with embedded distribution.

+ Added possibilites to store a fix information about alarms

+ SNMP - Initial Support of monitoring of SNMP device like the Cordex CXC

Revision 0.106.0.3 (22/03/2012) - SOFT 000031 21

* Changed the versioning method to allow modifications of release - 0.106.0.3 is the version after 0.1.0.104

Revision 0.1.0.104 (15/03/2012)

* Remote Power Feeding system - New alarm is generated 'Configuration problem' when the slot is empty but there is a configuration

- Remote Powering System was not detected anymore correctly - broken with 1.0.96

- CET Inverter were not detected anymore correctly -broken with 1.0.96

Revision 0.1.0.102 (23/02/2012)

* Modbus Slave – Do not reply anymore until modbus variable are updated on dc system

creation. This avoids to send transient 'fake' data

Revision 0.1.0.100 (15/02/2012)

- In remote Site in relation of a remote power feeding system, the latitude position parameter was not set correctly. (And changed the longitude).
- Modbus Slave – Socket was closed if the device id did not exist. Comp@s will now send a Modbus exception according to the standard.

Revision 0.1.0.98 (30/11/2011)

- In configurations with multiple independent racks, Modbus data were not correctly updated when multiple request on different racks were processed during one second.

Revision 0.1.0.96 (21/11/2011)

- + Web interface allows minimizing parts of the tables, by group.
- + Optimization of the CAN and CANOpen layer to reduce cpu usage. Great result achieved, CPU usage reduced by more than 20%. This allows better reactivity through the communications interfaces.
- + Complete support of LSS devices (Dynamic CanOpen node addressing for Cordex rectifiers)
- + CanOpen Node definition is now managed to avoid any interference between new development and old qualified developments. (Thanks to better use of the polymorphism)
- + First official release supporting cordex 4kw rectifier, with new UCC

Revision 0.1.0.88 (11/09/2011) - SOFT 000031 20

- * Support of rack 300W, with specific battery configuration possibilities with the help of the front button (electronic LVD)
- * Added debug features to analyze Modbus problems (connection timeout, new sockets, etc.)

Revision 0.1.0.86 (12/07/2011) - SOFT 000031 19

- * The auto-save of records happening at midnight is now running in a separated thread to avoid any loss of communication and any problem in the main loop.

Revision 0.1.0.84 (21/06/2011)

- * Support of up to 4 master racks on the modbus interface. (Previously 4). Modbus id 1-->4 are reserved for the 4 first DC Systems. If a request is sent to another id, the dc system 1 will reply.

Revision 0.1.0.82 (16/06/2011) - SOFT 000031 18

- Problem with reload of current limitation regulation parameter (because development test on going with hard coded values)

Revision 0.1.0.80 (16/06/2011)

- Modbus Slave communication could fail when there are socket problems. (Cable disconnection, timeout, etc.) - This problems appeared with the new Ethernet drivers of BSP 3.9.
+ Support of rack CAPTIN 300W
+ Initial support for Alpha Cordex Rectifiers regulation of the dc system

Revision 0.1.0.78 (30/05/2011) - SOFT 00031 17

+ Added support of PLC functions for es1 device.
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Revision 0.1.0.76 (27/05/2011) - SOFT 00031 17

* RS485 communications was corrupted when interrupted by another task with higher priority.

Revision 0.1.0.74 (24/05/2011)

- BSP 3.9 new Ethernet driver is now synchronous to solve problems when communication is very high – Microsoft bug (Modbus fast request in loop for instance)
* New production tool – display instructions also in English
* New operating system – BSP 3.9
* New CAN driver – reduced CPU usage by up to 30%.

Revision 0.1.0.72 (20/05/2011)

+ Added hidden function to clear registry (may be required after OS update)

Revision 0.1.0.70 (10/05/2011)

+ Initial support of predefined configurations
+ Initial support of independent LVD
+ Possibilities to rename descriptions, alarms, data, configuration and control elements with the configuration.xml file
+ Possibilities to auto save records in xml, download files from web interface, and delete files.

Revision 0.1.0.68 (20/04/2011)

- Hardware watchdog – forgot to uncomment after test.

Revision 0.1.0.66 (20/04/2011)

- Records of the energy system pulse counter were loaded twice with a PM9C device
+ Added zip extraction functions : Extract Zip File in user-upload

Revision 0.1.0.64 (16/04/2011)

+ Added advanced functions in site/control: (used by the manage files web-page) (Flash Binary, Download File From Url, Delete User Uploaded File, Move User Uploaded File
+ The zip files are analysed to discover the compressed file. (Only one file by zip is allowed

to avoid unmanageable folder structure)
+ The exe file are analysed to retrieve the software revision
+ New web page accessible from “Advanced” : manage_files.html
+ Support for the http post of files
+ Added description at site level : Operating System Revision
+ Added data at site level: ‘CPU Percentage Usage’ and ‘Free Flash Memory Space’, with associated records.
+ Support of remote upgrade of the operating system and boot loader. (very advanced, necessary only for specific new functionalities)

Revision 0.1.0.62 (10/04/2011)
- Snmp walk was buggy with some PLC data configurations
* Added possibilities to rename all the variable names. Change the name in the xml configuration file and the related id will be updated on start. (for description, data, alarm, config and control)
* Support of snmp get bulk

Revision 0.1.0.60 (6/04/2011)
+ Improved support of default snmp oid (1.3.6.1.2.1.1.4,5,6,9.1.3
+ Initial support of snmp get bulk
+ Added configuration parameters to force the Ethernet mode (10-100Mb – Half-full duplex. (Require OS 3.5 at least)

Revision 0.1.0.58 (5/04/2011)
- Rewrite of the Modbus RTU Master driver to solve random crash after a few days (windows serial driver bug)

Revision 0.1.0.56 (9/03/2011)
+ Support of PM9C energy counter over RS485
+ Support of additional extensions for Opera Net Project (sensors and actuators)

Revision 0.1.0.54 (21/02/2011)
* Added PLC functions to get site level info
+ CANOpen LSS master implementation
+ Initial support of Alpha rectifiers

Revision 0.1.0.52 (6/01/2011)
* Added entry 151 in Modbus
+ Initial support of RS485 Modbus Master

Revision 0.1.0.50 (29/10/2010) - SOFT 000031 16
* Improved support of 300W rack family

Revision 0.1.0.48 (18/10/2010)

+ Initial support of 300W rack family

Revision 0.1.0.46 (29/06/2010)

* Support of 3 dc-system over Modbus interface

Revision 0.1.0.44 (3/06/2010)

* Added concept of dc system and rectifier models (for smart functions)

Revision 0.1.0.42 (20/04/2010)

- Bug correction of removed rectifiers if not declared in large systems

* Improved support of CET inverters

Revision 0.1.0.40 (21/01/2010) - SOFT 000031 14

- Correction of Ethernet bug with HUB (drivers was switching of the Ethernet devices if disconnected from hub)

* Change of OS, minor security updates (BSP 0.5)

+ Minor support of CET inverters

Revision 0.1.0.38 (19/01/2010)

* Review of the logic for ac fail conditions

Revision 0.1.0.34 (24/11/2009)

* Increased reliability of the CAN bootloader reset algorithm

Revision 0.1.0.32 (19/11/2009)

+ Support of large system with CAN regulation (up to 90x2600W rectifiers)

Revision 0.1.0.30 (19/10/2009)

* Changed remote system type name (3x120w, etc)

+ Support of MCU0548

Revision 0.1.0.28 (19/10/2009) - SOFT 000031 13

- Modification of one registry parameter, to disable the “auto sense mode” of Ethernet, which was disabling the Ethernet when connected to a hub.

* Added cold start type event (to be able to rediscover the site in XML after power outage – according to ES 202 336 standard change request)

* Added support of energy consumption measurement at the energy system level (pulse counter)

* Full support of SNMP V3 traps
* Support of compressed XML file in ZIP (xml.zip)
* Optimization of the XML file generation
* Data records are reloaded on startup
* Data records are now stored in XML, and are auto-saved

Revision 0.1.0.26 (16/06/2009)
- Bug in the data record queue for last days and last hours records.
* Updated version of operation system, with latest windows update and latest drivers. (in production with SOFT 000031 12)
* Web page layout changed from Cherokee to Mitra E&I
* Compilation in VS2008
* Added support of remote power feeding systems
* Added support for SNMP V3, with updated libraries

Revision 0.1.0.24 (27/03/2009)
* Optimization of the CAN driver
* Added support of MCU3048M6

Revision 0.1.0.22 (1/10/2008) - SOFT 000031 12
- DC System Refresh Task buggy if only one rectifier in current limitation --> nothing was refreshed
* (Updated OS drivers on 25 March 2009, because of new bootloader on Comp@s card.)

Revision 0.1.0.20 (1/09/2008) - SOFT 000031 11
- With a very low probability, the application could crash during startup. (It restarted correctly after 5 minutes thanks to the watchdog).
* Support of XXXXconfigurationYYYY.xml files in Factory folder. This allows naming easily the configuration files.
* With the Modbus interface, the currents are now given in 0.1A as unit.

Revision 0.1.0.18 (1/08/2008)
* PLC license is now included in the Asset license.
* Functional battery test is configured (1000A as discharge current, 0% of discharge capacity, duration of 10 minutes). --> Must be correctly configured with the battery parameters for reliable battery test.
* No current limitation by default (1000A by default, must be set correctly).
* Modbus compatibility improvements
* New configuration parameter: XML Heartbeat Time (minute): Define the time in minutes between two heartbeats. It is now possible to request the monitoring to send heartbeat in order to check the communication availability. This XML heartbeat looks like: Note that the same behavior with primary/secondary server is used.
* New configuration parameter: XML Event Posting To Secondary Only If Primary Failure (Set to True by default). This allows sending XML events to the redundant server only if the

first fails.

Revision 0.1.0.16 (1/07/2008)

- On system reboot, the set delay of the alarms was replaced by the clear delay.
- On system reboot, for alarm related events, the datetime is not parsed correctly
- The web server function 'processXML.cgi' processed only site level configuration
- Firmware boot loading may fail under some circumstances
- * CSV Log file of battery tests can be downloaded from web interface
- * Comp@s Display Module Support (CDM)
- * MCU30110 support
- * New Modbus license option

Revision 0.1.0.14 (28/05/2008) - SOFT 000031 10

- Possible web server crash if socket not correctly closed
- XML event posting locked when server answers badly
- The system time could be badly loaded during booting
- + Daylight Saving Time
- + Time Zone support
- * Web page generation 4x faster
- * Web interface compatible with older browser (Internet Explorer 6)

Revision 0.1.0.12 (14/02/2008) - SOFT 000031 09

- The severity_type attribute in the XML syntax was not correctly encoded
- + PLC module added (customization of data and alarm)
- + Support of 2x6x1800W DC systems (with 2 MCU1848)
- + Support of multi-language web interface

Revision 0.1.0.8 (6/01/2008) - SOFT 000031 06

- Problem with reload of customized alarm related to the digital inputs of the dc system.
- DC system alarm relay configuration was not saved if configured on '0'.
- * Improvement of the logic of the site access control with SAM0948. Any digital input can be associated with a door.
- + Support of 3U rack with up to 8 CAR0948TN.
- * The default value of the minimal number of rectifier is 0, to avoid alarm by default.

Revision 0.1.0.2 (1/11/2007)

- Configuration of the SAM0948 was not kept after system reboot
- * Added configuration parameter "Minimal number of rectifier" at DC system level
- * Added alarm "Missing Rectifiers" at DC system level
- + Support of MCU1848

Chapter 11 – Emulation Capabilities

On demand, we can provide an emulation program of the real monitoring application. This emulation program can run on any personal computer running Windows. Thanks to this last, you can develop and test the integration of our monitoring platform inside your network management application.

- [What is the Comp@s emulator?](#)
- [What are the requirements?](#)
- [How to run the emulator?](#)
- [How to use the emulator?](#)
- [Simulating a network of Comp@s system](#)
- [Where can I get the emulator?](#)
- [Remarks.](#)

11.1 What is the Comp@s emulator?

This is software which allows the simulation of the Comp@s monitoring, with some DC Systems and extension cards.

By default, the emulator simulates the presence of 2 sub-shelves 4x850W, with some rectifiers. Also an AC failure alarm appears and disappears, generating events and modifications of element status. An extension card with some sensors and access control is also simulated.

With the emulator, you can develop and test the integration of our monitoring platform inside your network management application.

11.2 What are the requirements?

- Any personal computer running Windows 2000, XP or later.
- You need the Microsoft .NET Framework 2.0 installed on your computer. This is freely available through Microsoft website or Windows Update.

11.3 How to run the emulator?

- When you execute the provided “Compas_Emulator.exe”, it is possible that the windows firewall ask to open port 80 and/or 161. This is necessary in order to run the web server and the SNMP agent.
- To stop the emulator, you just have to close the opened shell window.

11.4 How to use the emulator?

- Start the Compas_Emulator.exe application
- Testing the Web Server :
 - a. Start you favorite web browser (Firefox 2.x or Internet Explorer 7.x)
 - b. Browse to <http://127.0.0.1/> or <http://localhost/>
 - c. You are asked for a login/password which is admin/compas by default
 - d. Please refer to 5.3. to use the Web Interface
- Testing SNMP :
 - a. You need a SNMP MIB browser (see [Using the Comp@s SNMP Agent](#))
 - b. The MIB can be downloaded through the web interface
 - c. You can test the SNMP agent at the ip 127.0.0.1 (port 162)
 - d. Read Community is admin:compas by default
 - e. Write Community is admin:compas by default
 - f. Please refer to [SNMP Agent](#) for more information.

11.5 Simulating a network of Comp@s system

If you want to simulate multiple sites, you can start the emulator on different port. For example, to execute an instance on port 85, execute “Compas_Emulator 85”.

11.6 Where can I get the emulator?

Please contact your vendor.

11.7 Remarks

- This emulator is just an introduction to the different interfaces
- It is not possible to have a real overview of all the Comp@s functionalities.
- This emulator is not deeply tested as the real embedded monitoring, bugs may be present, please tell us.
- By default, the emulator opens the port 80 for the web server. If you are already running a web server on your computer, you will need to start the emulator on another port.
- The FTP Server is not emulated.

Chapter 12 – Frequently Asked Questions

Asked

- [USB Connection Troubles](#)

12.1 USB Connection Troubles

Q : I can browse Comp@s flash disk but I cannot open the Comp@s webpage in my web browser.

A: This kind of troubles usually occurs when software on your computer is listening on port 80. To solve, check if your port 80 is listening and then shutdown the application listening on it or kill it. This trouble appears with IIS, Skype, ...

To do that:

- Open cmd prompt and type the following command:

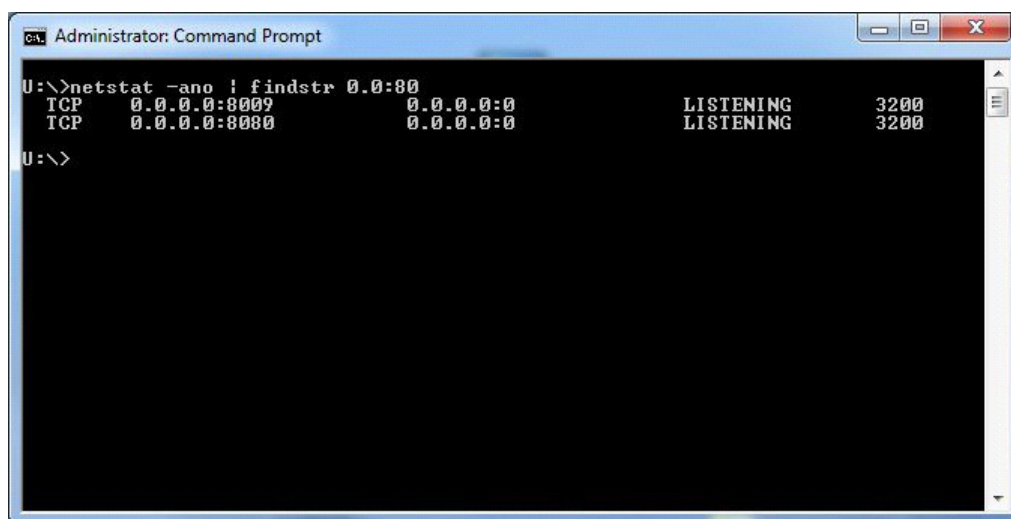


Figure 66 Administrator Command Prompt

- Focus on line: TCP 0.0.0.0:80 0.0.0.0 LISTENING 4. You see on the first line something is listening on port 80 and it's the pid number 4 which is listening.
- Open task manager and check if you can locate pid number. If you cannot see pid column, click "View -> Select columns" and check checkbox "PID Process identifier". Select the pid process and click on "End Process" button:

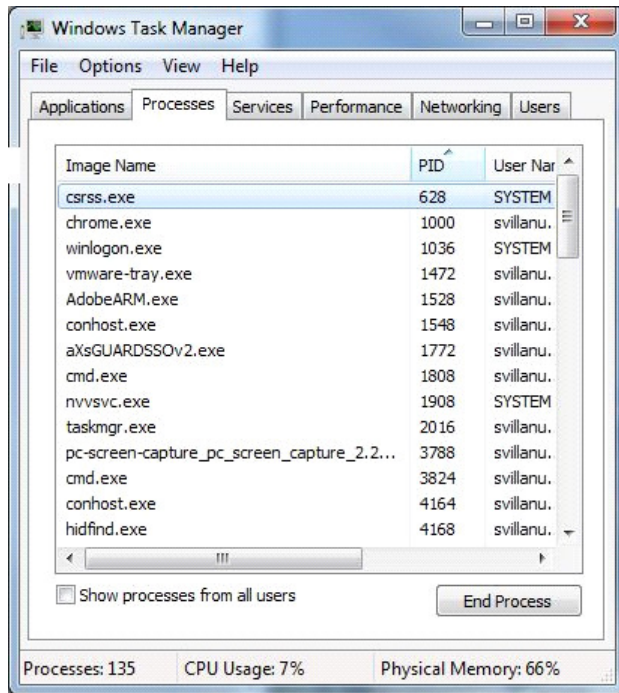


Figure 67 Windows Task Manager

- If you cannot find your pid, open cmd prompt and type “c:\windows\system32\telnet 127.0.0.1 80”. Telnet connect to the port. A black screen occurs and type “Echo”. If the telnet command is not recognized, type “pkgmgr /iu:TelnetClient”, and retry.
- In my example case, I type echo in the black screen and I have the following message. I see it's Microsoft HTTP Server, so I shutdown IIS:

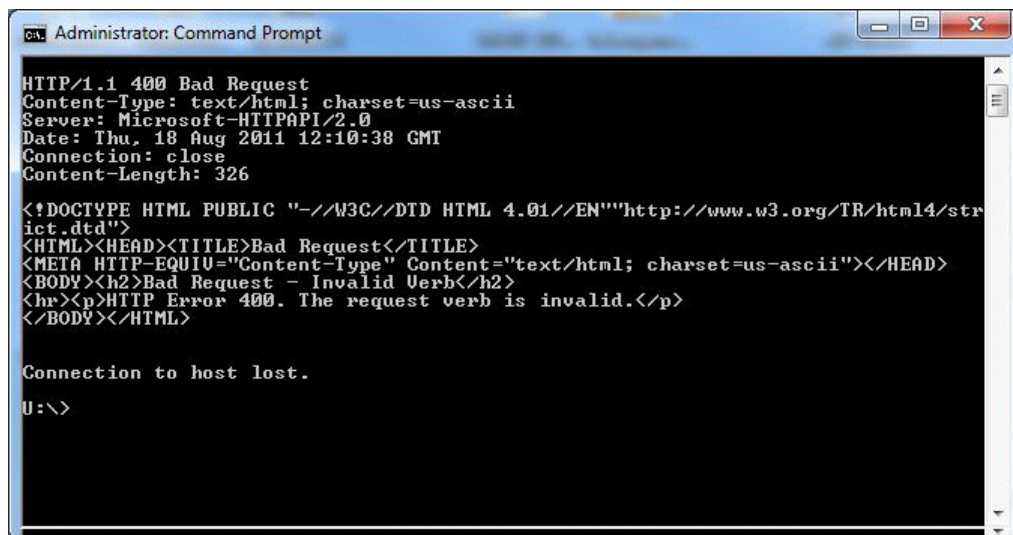


Figure 68 ISS Shutdown

- And finally, I retype “netstat -ano | findstr 0.0:80” and I see nothing is listening on port 80. So I can now connect to Comp@s WebPage.

Q : After plug in, the usb cable in my computer, i see the device is not recognized and the driver could not successfully installed.

A: You have to take care of using multiple mobile devices at the same time. For exemple, it's not possible to connect to compas if you have connected your mobile phone to the computer using bluetooth and so on.

Q: On my web browser, I see access denied to 127.0.0.1 .

A: If you are connected to LAN, and the network uses proxy or firewall, it is possible the connection to 127.0.0.1 is blocked.

Try to unplug your Ethernet cable or switch off your wifi connection, and try again. It's possible to add a special rule in browser connection settings to bypass proxy/firewall when connection to 127.0.0.1 occurs.

For this example, if you use IE, go to options -> Connections -> Lan Settings and check "Bypass proxy server for local address":

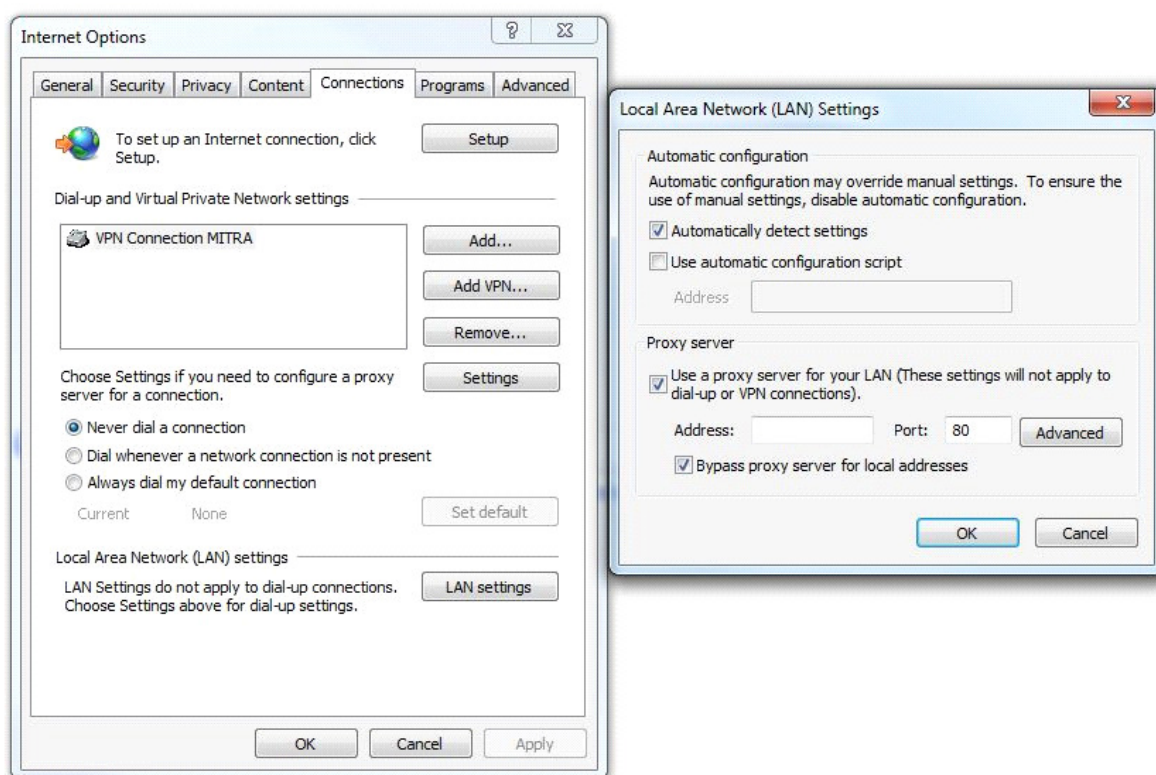


Figure 69 Bypass Proxy Server for Local Address

Chapter 13 – Support

Do not hesitate to contact us in case of questions, problems, suggestions, etc. We want to be your partner in a successful network management.