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COMP@S

USER'S GUIDE




Your Power Solutions Partner

member of The alpha Group™

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
15 May 2008	01	First Edition
26 June 2008	02	Typo corrections, added Modbus chapter and information about PLC functions
09 July 2008	03	Added chapter “Connecting multiple shelves together”.
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Chapter 2 – 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 (**OP**erating **EX**penditures) 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:

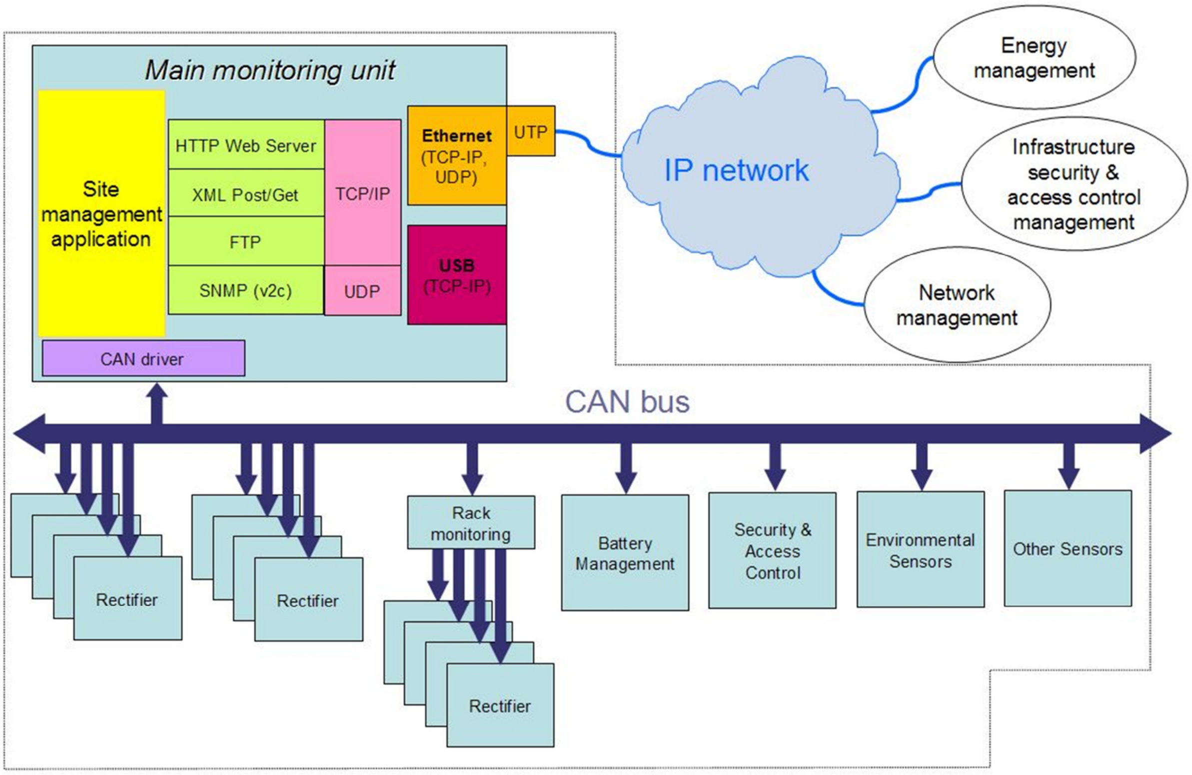


Figure 1 Comp@s Bloc Diagram

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:

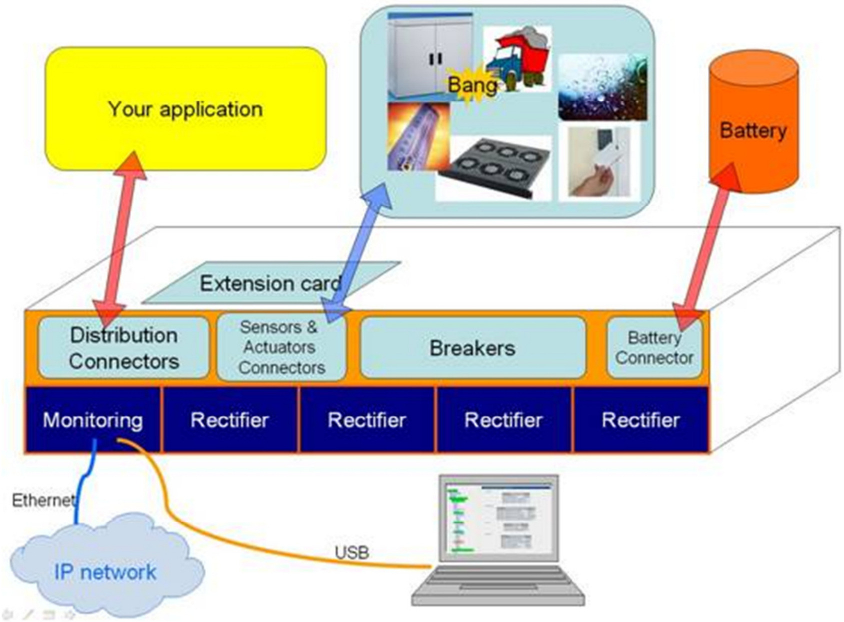


Figure 2 Schematic of the inside of a cabinet

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:

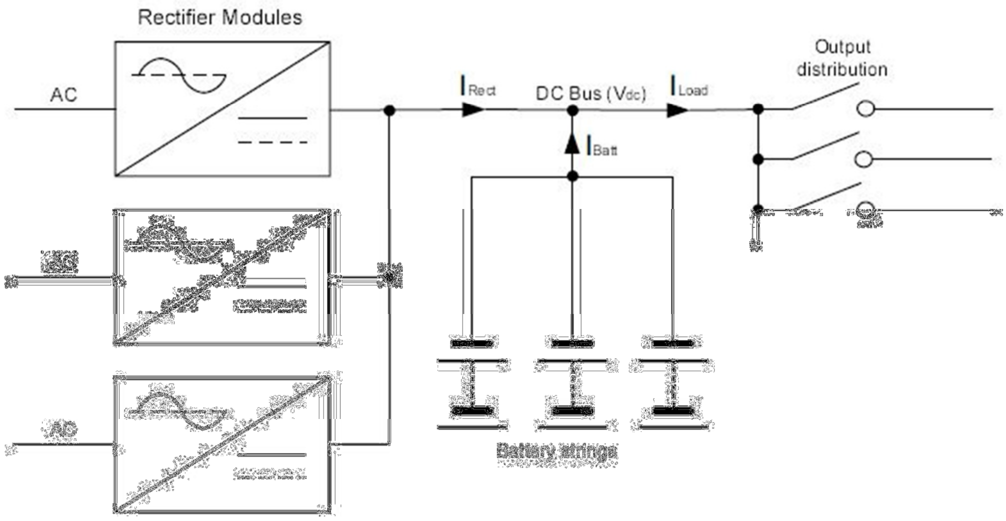


Figure 3 DC System

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

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 trough 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 comprized 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: actual current * (actual current * rated discharge time / battery capacity) ^ (Peukert - 1).

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

Battery remaining capacity equals (in %) to: 100 * (battery capacity + sum (effective current (minute)) / 60) / 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

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:

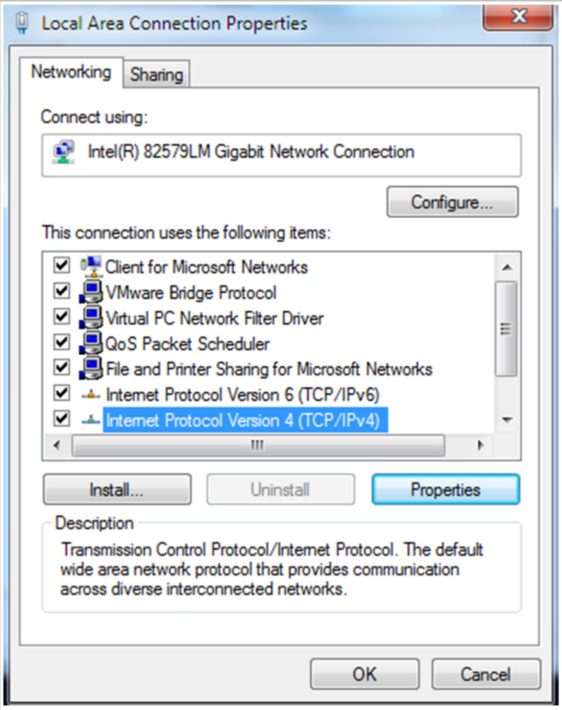


Figure 4 Network Configuration

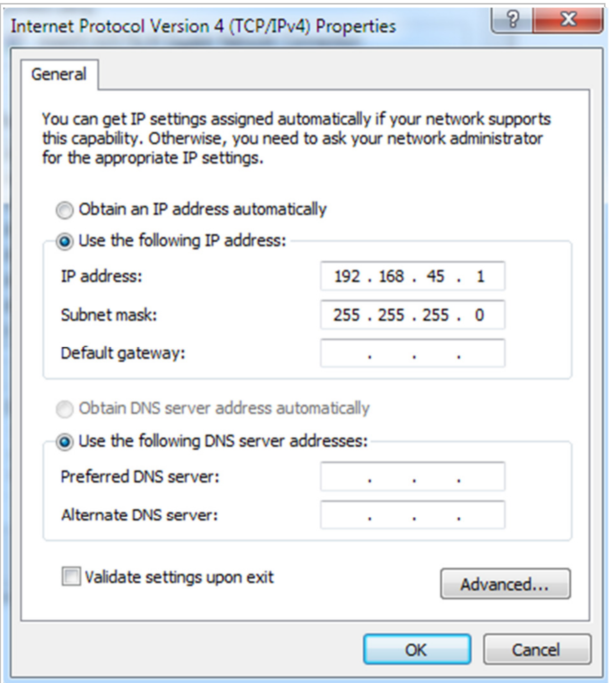


Figure 5 TCP/IP Configuration

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. Than, 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:

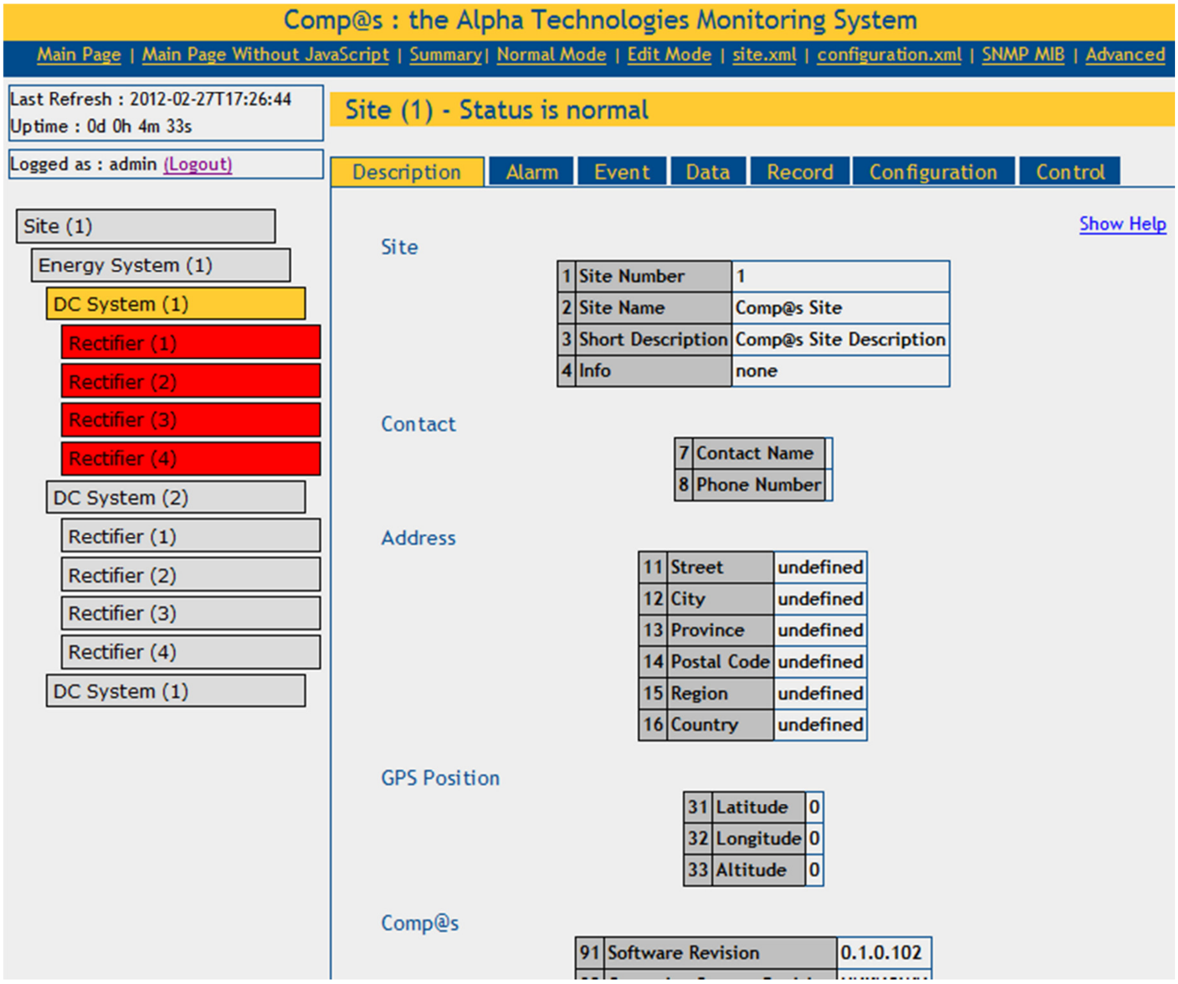


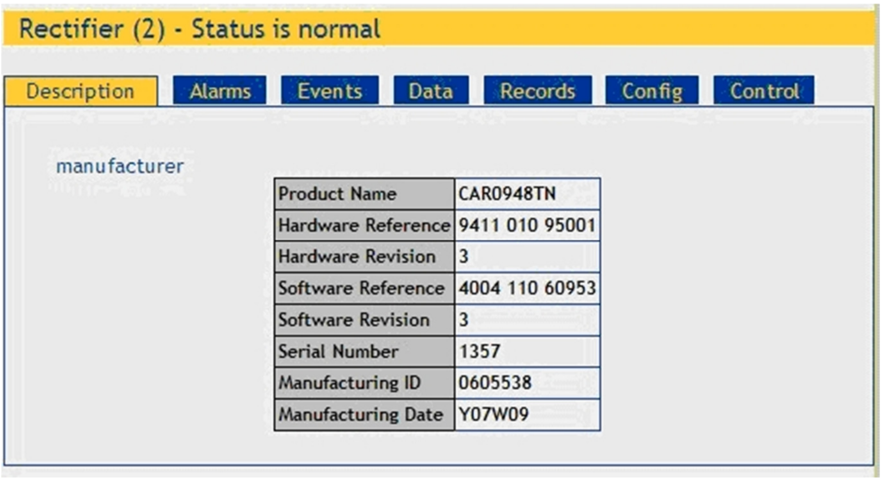
Figure 7 Initial page displayed

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:

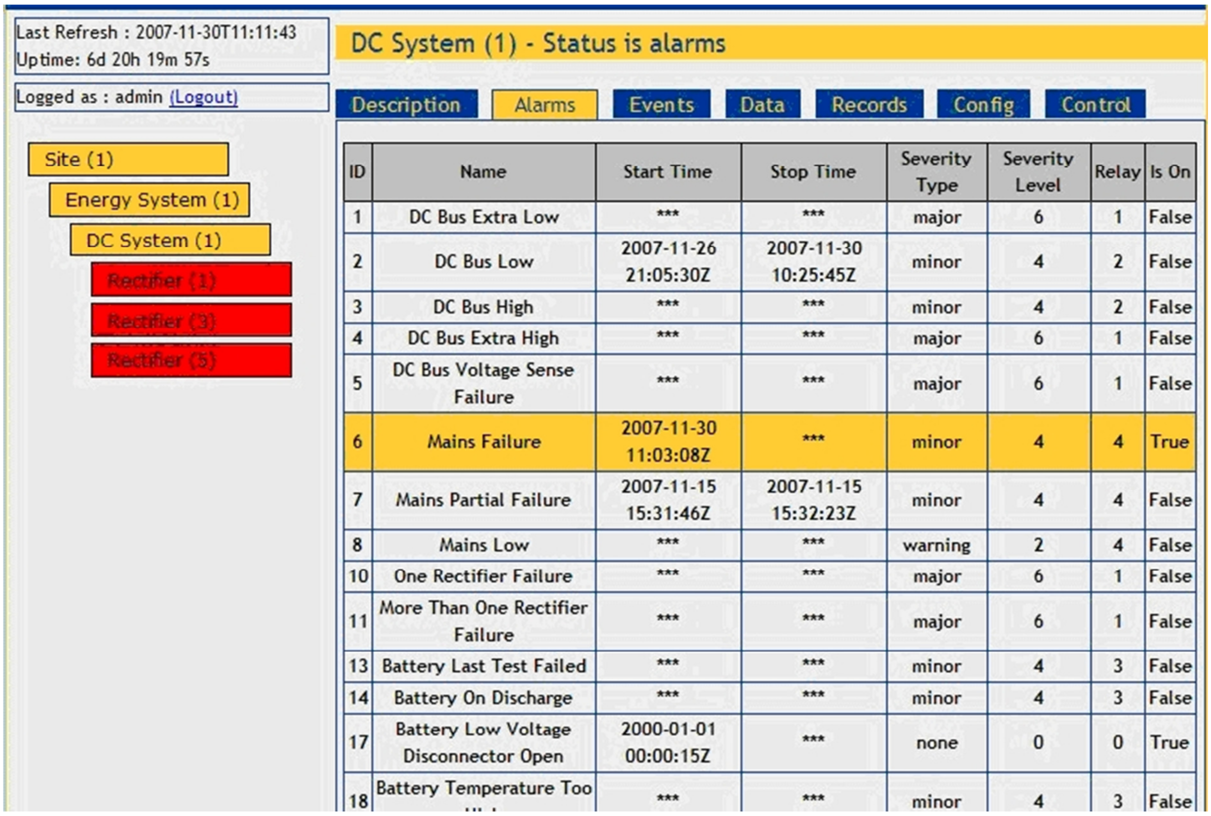


Product Name	CAR0948TN
Hardware Reference	9411 010 95001
Hardware Revision	3
Software Reference	4004 110 60953
Software Revision	3
Serial Number	1357
Manufacturing ID	0605538
Manufacturing Date	Y07W09

Figure 8 Rectifier Tab

Alarm Tabs

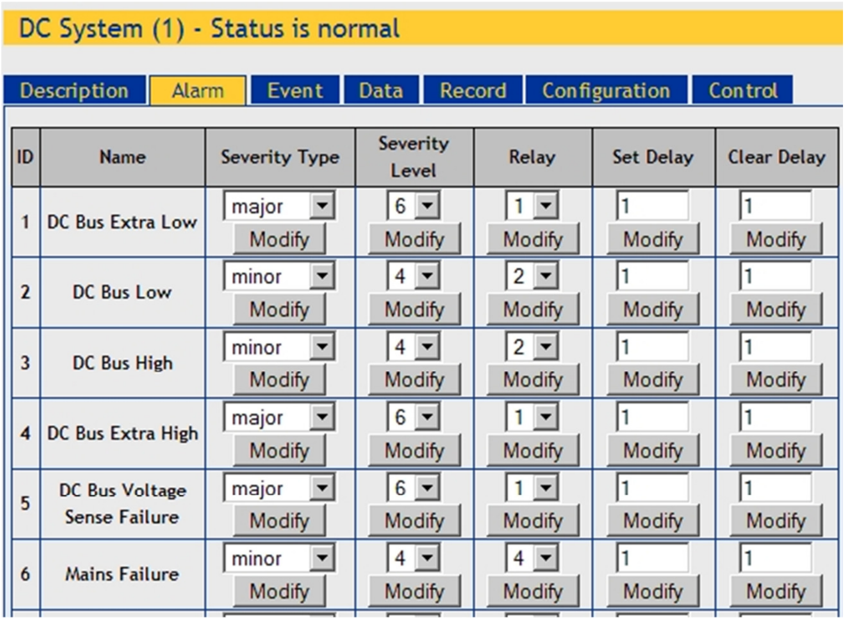
The following figure illustrates how the alarms are displayed. The active alarms are highlighted in a color corresponding to the severity type of the alarm (Red: major, Orange: minor, Yellow: warning). One can see the start time and the stop time of a specific alarm, the associated relay (if dry alarms 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:



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 Disconnector 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

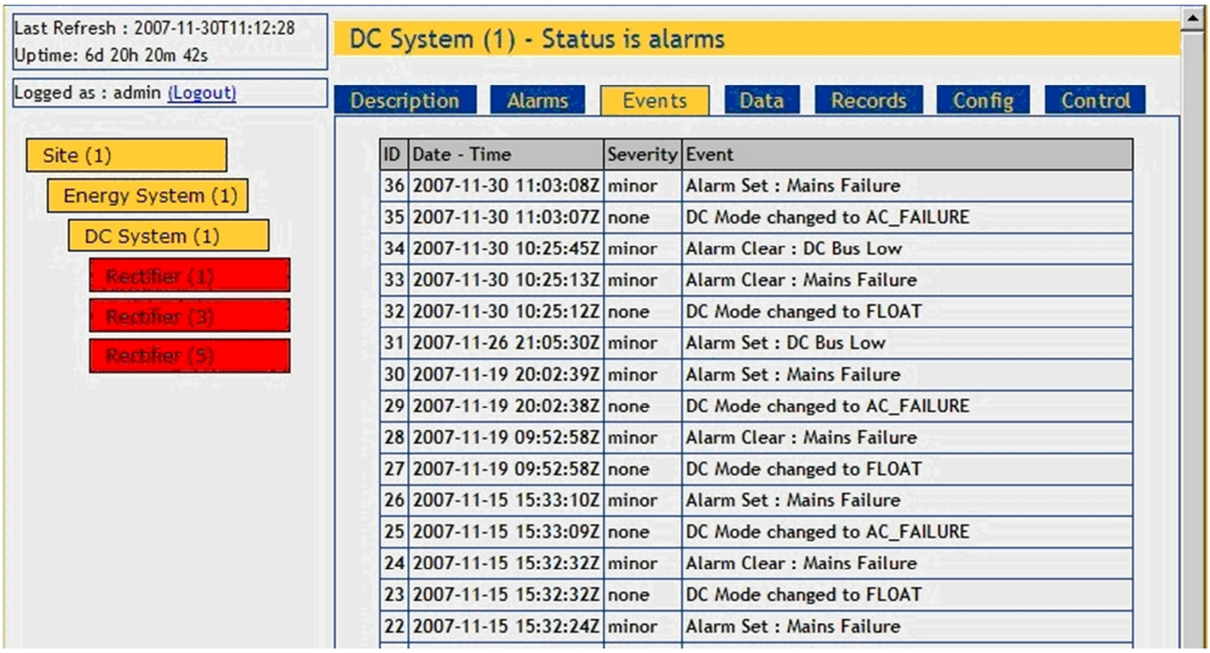
Description | Alarm | Event | Data | Record | Configuration | Control

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:



ID	Date - Time	Severity	Event
36	2007-11-30 11:03:08Z	minor	Alarm Set : Mains Failure
35	2007-11-30 11:03:07Z	none	DC Mode changed to AC_FAILURE
34	2007-11-30 10:25:45Z	minor	Alarm Clear : DC Bus Low
33	2007-11-30 10:25:13Z	minor	Alarm Clear : Mains Failure
32	2007-11-30 10:25:12Z	none	DC Mode changed to FLOAT
31	2007-11-26 21:05:30Z	minor	Alarm Set : DC Bus Low
30	2007-11-19 20:02:39Z	minor	Alarm Set : Mains Failure
29	2007-11-19 20:02:38Z	none	DC Mode changed to AC_FAILURE
28	2007-11-19 09:52:58Z	minor	Alarm Clear : Mains Failure
27	2007-11-19 09:52:58Z	none	DC Mode changed to FLOAT
26	2007-11-15 15:33:10Z	minor	Alarm Set : Mains Failure
25	2007-11-15 15:33:09Z	none	DC Mode changed to AC_FAILURE
24	2007-11-15 15:32:32Z	minor	Alarm Clear : Mains Failure
23	2007-11-15 15:32:32Z	none	DC Mode changed to FLOAT
22	2007-11-15 15:32:24Z	minor	Alarm Set : Mains Failure

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.:

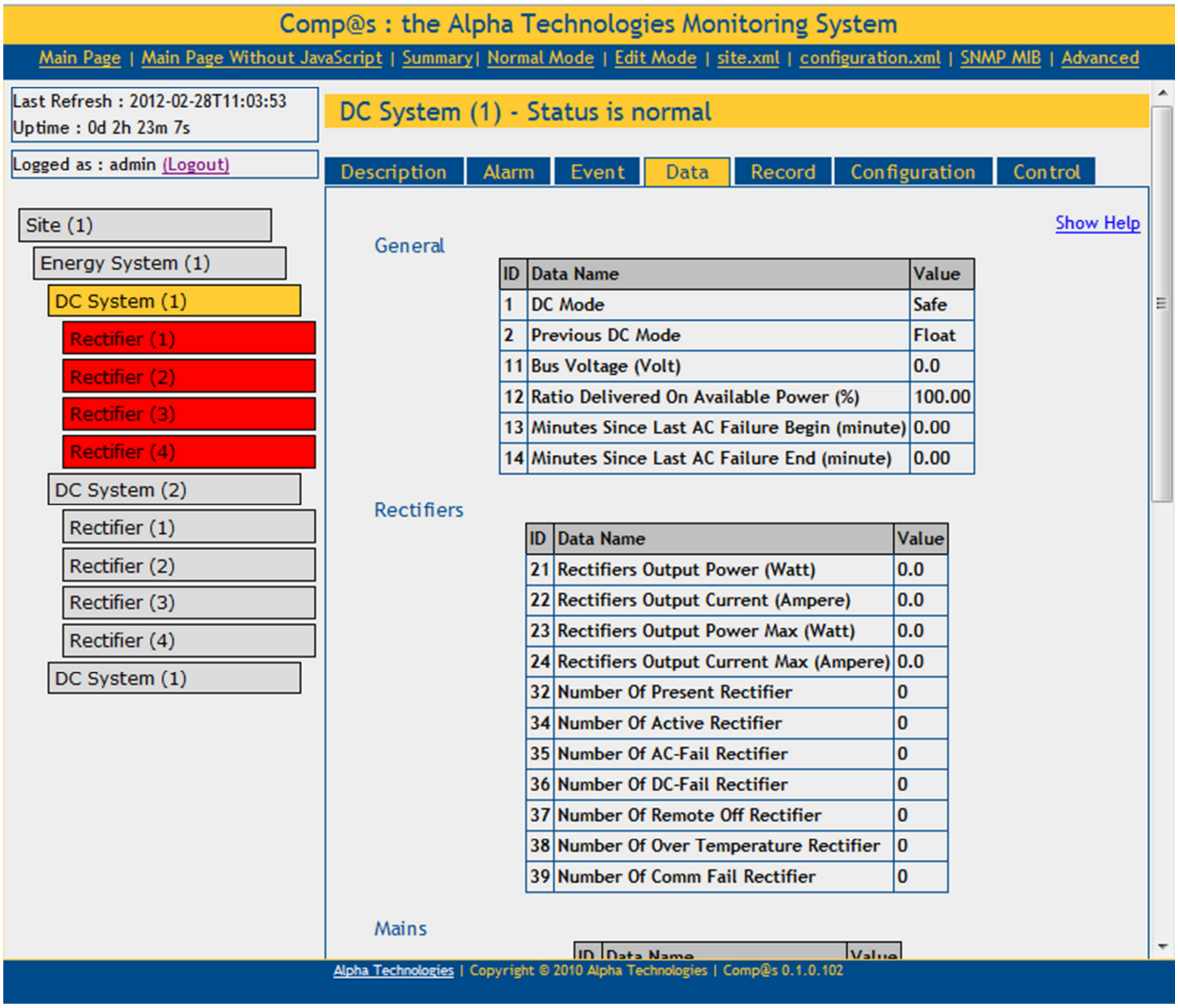
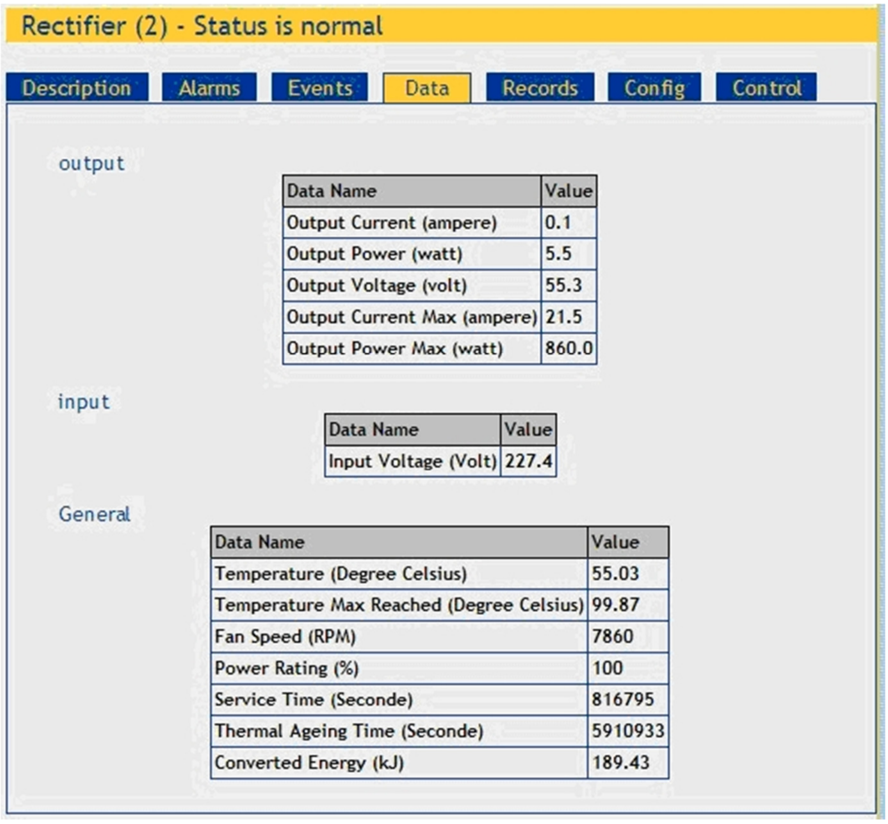


Figure 13 Data related to DC System

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:



Rectifier (2) - Status is normal

Description | Alarms | Events | Data | Records | Config | Control

output

Data Name	Value
Output Current (ampere)	0.1
Output Power (watt)	5.5
Output Voltage (volt)	55.3
Output Current Max (ampere)	21.5
Output Power Max (watt)	860.0

input

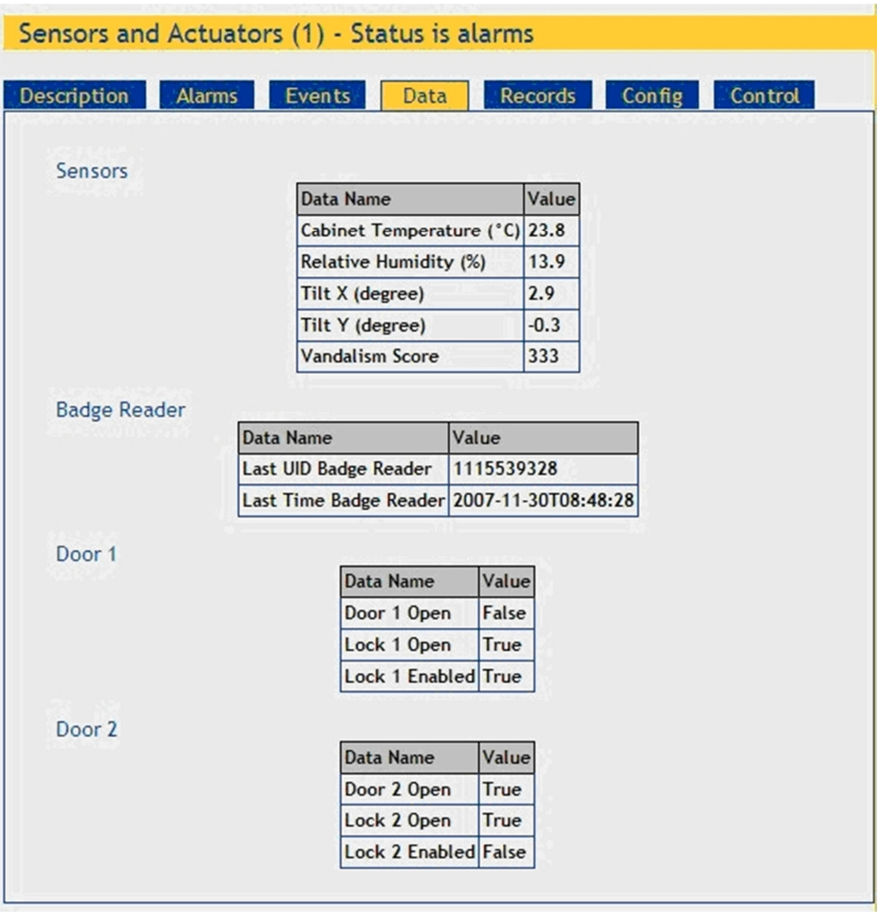
Data Name	Value
Input Voltage (Volt)	227.4

General

Data Name	Value
Temperature (Degree Celsius)	55.03
Temperature Max Reached (Degree Celsius)	99.87
Fan Speed (RPM)	7860
Power Rating (%)	100
Service Time (Seconde)	816795
Thermal Ageing Time (Seconde)	5910933
Converted Energy (kJ)	189.43

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.:



Sensors

Data Name	Value
Cabinet Temperature (°C)	23.8
Relative Humidity (%)	13.9
Tilt X (degree)	2.9
Tilt Y (degree)	-0.3
Vandalism Score	333

Badge Reader

Data Name	Value
Last UID Badge Reader	1115539328
Last Time Badge Reader	2007-11-30T08:48:28

Door 1

Data Name	Value
Door 1 Open	False
Lock 1 Open	True
Lock 1 Enabled	True

Door 2

Data Name	Value
Door 2 Open	True
Lock 2 Open	True
Lock 2 Enabled	False

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 it these tabs:

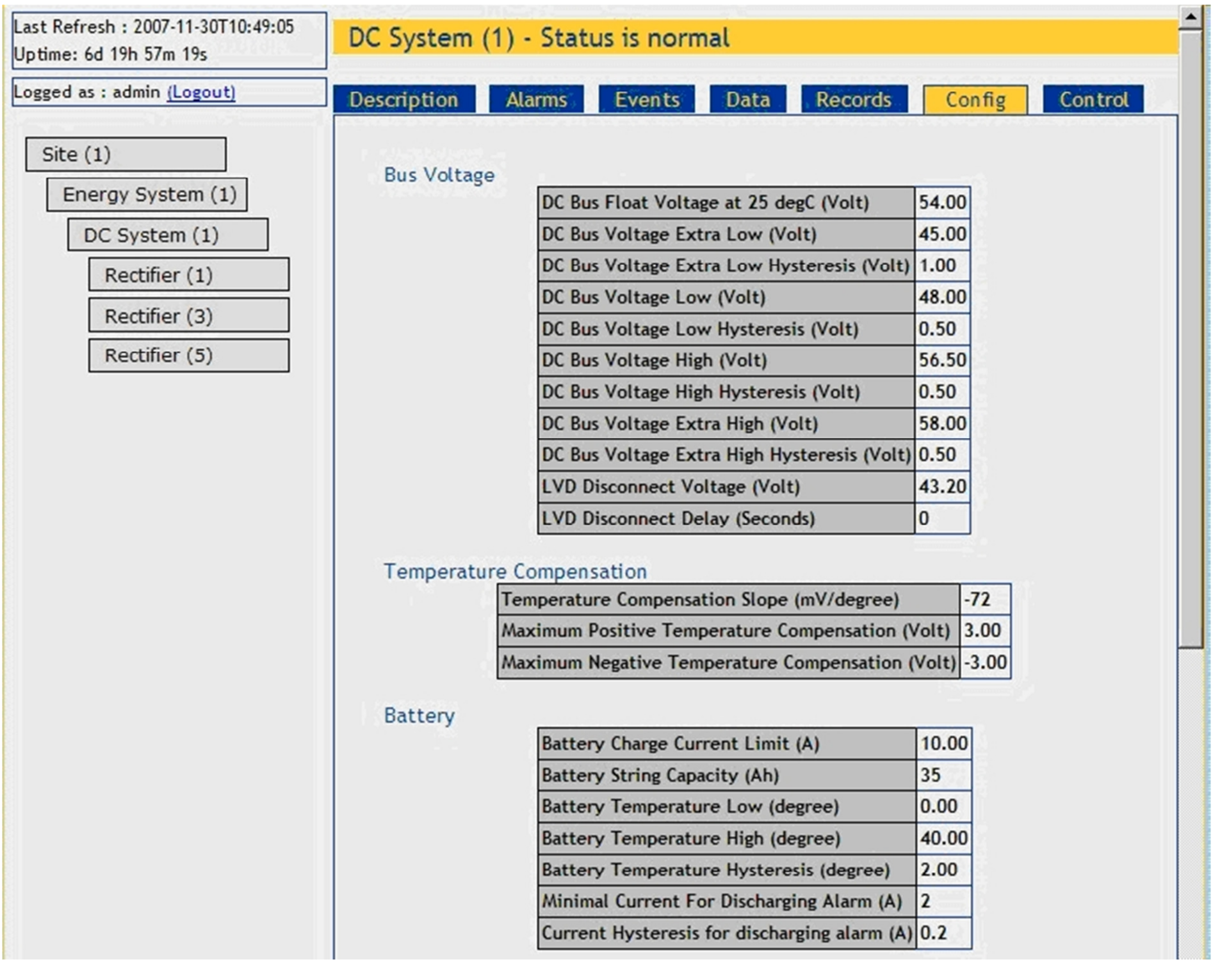


Figure 16 DC System Configuration Tab

The configuration of the site:

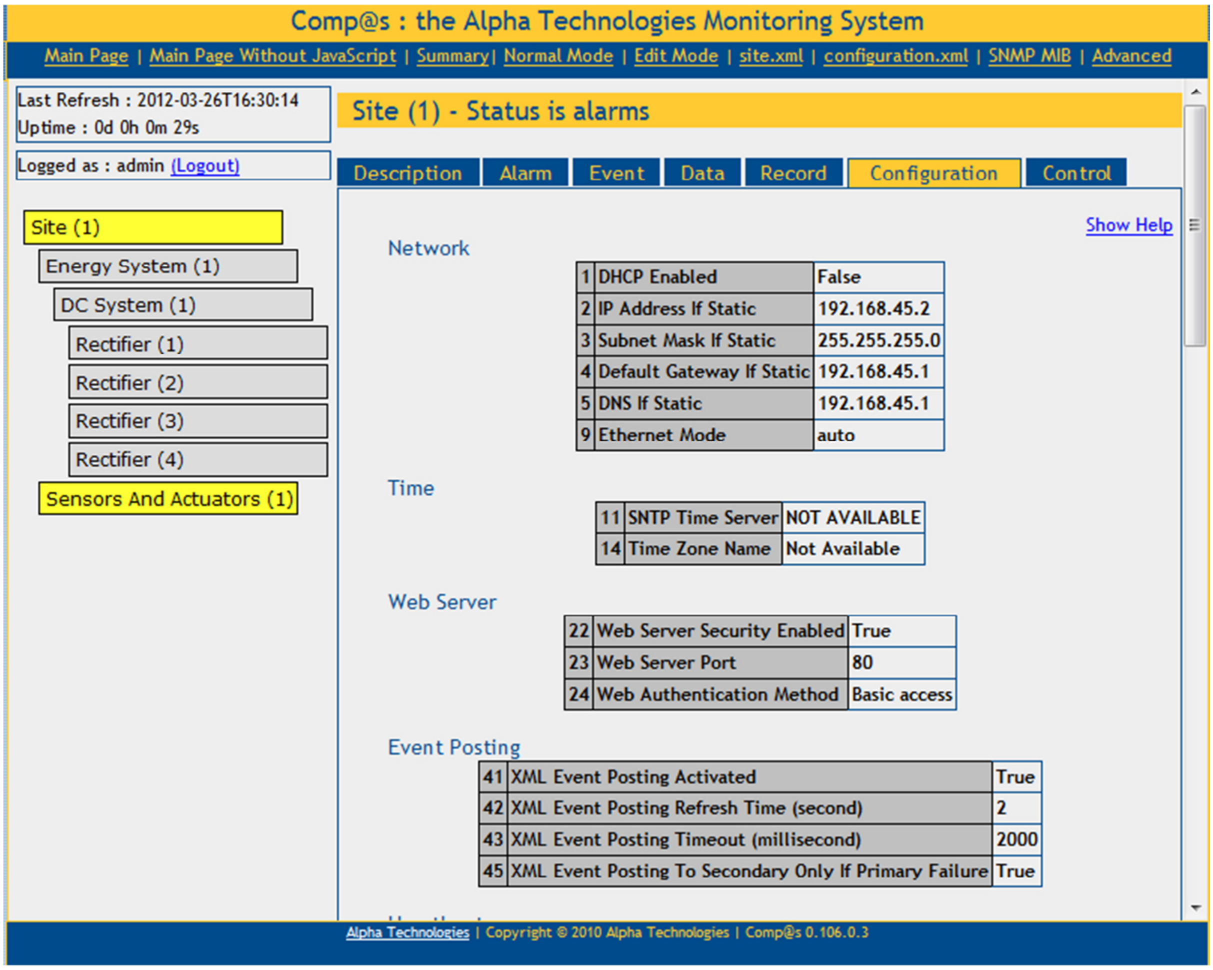


Figure 17 Site Configuration

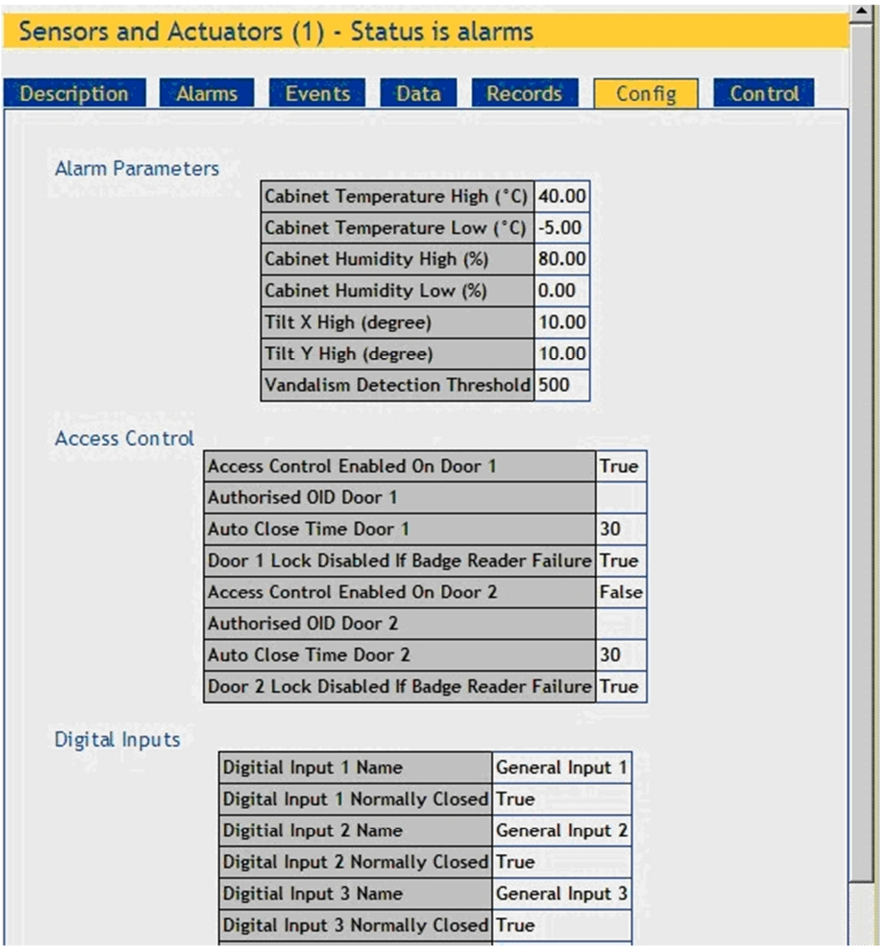


Figure 18 The configuration of an extension card

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.

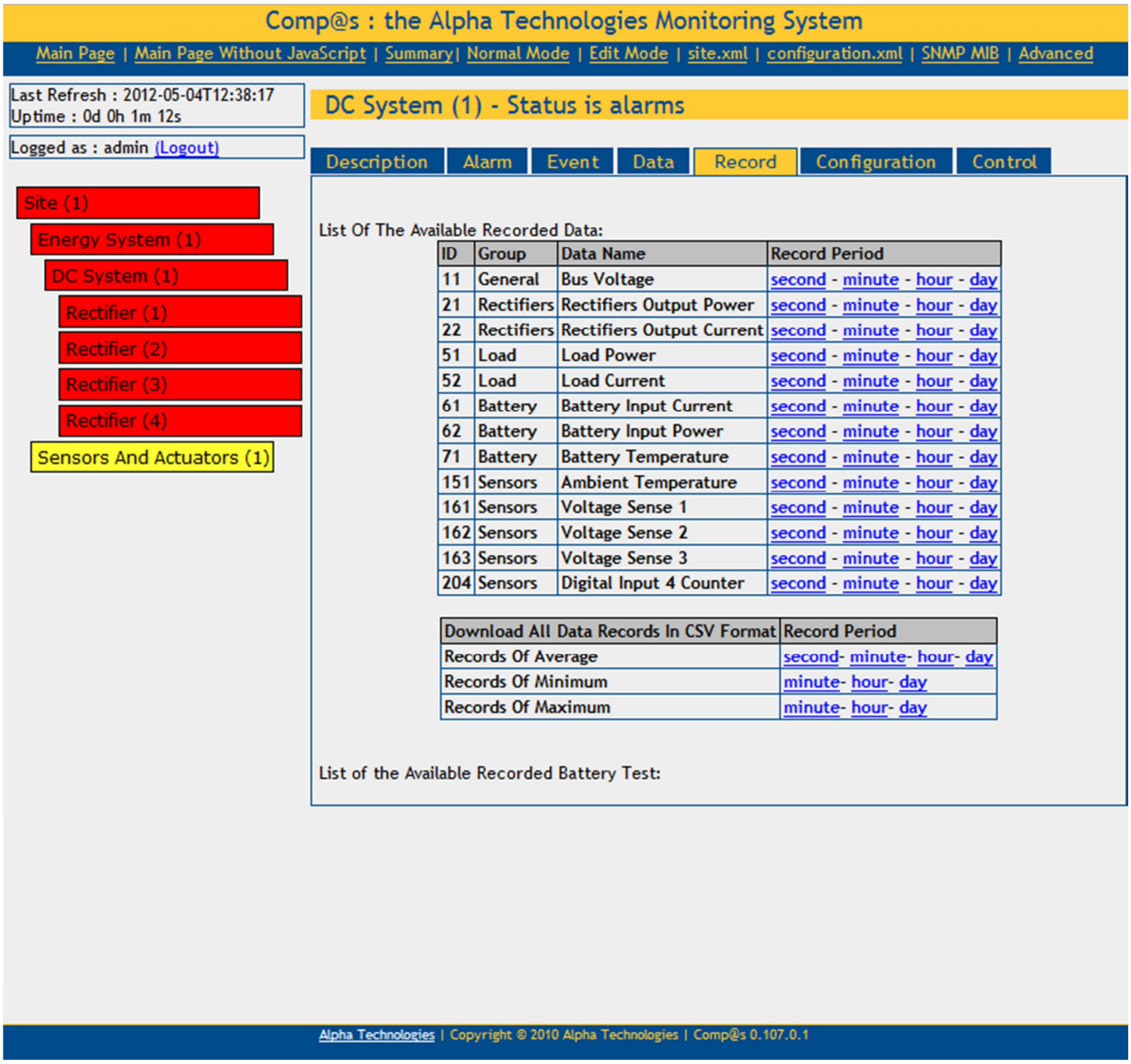


Figure 19 DC System Record Tab

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

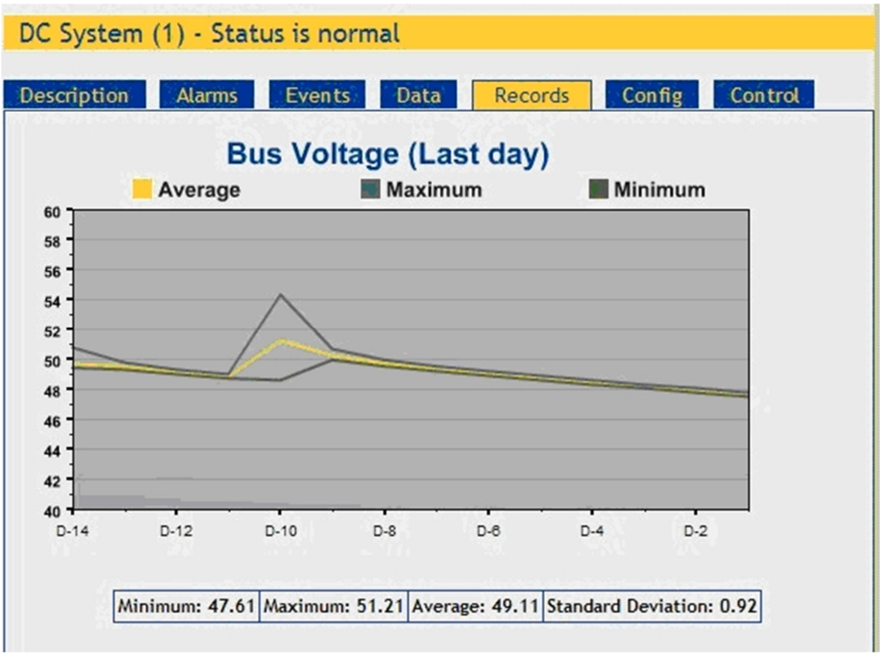


Figure 20 Bus Voltage record of the last days

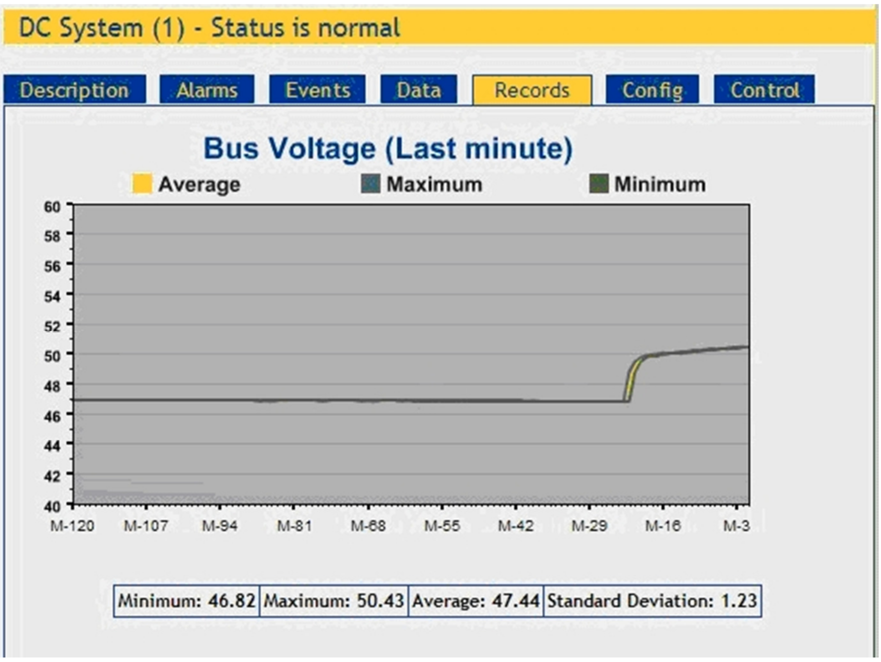


Figure 21 Bus Voltage record of the last minutes

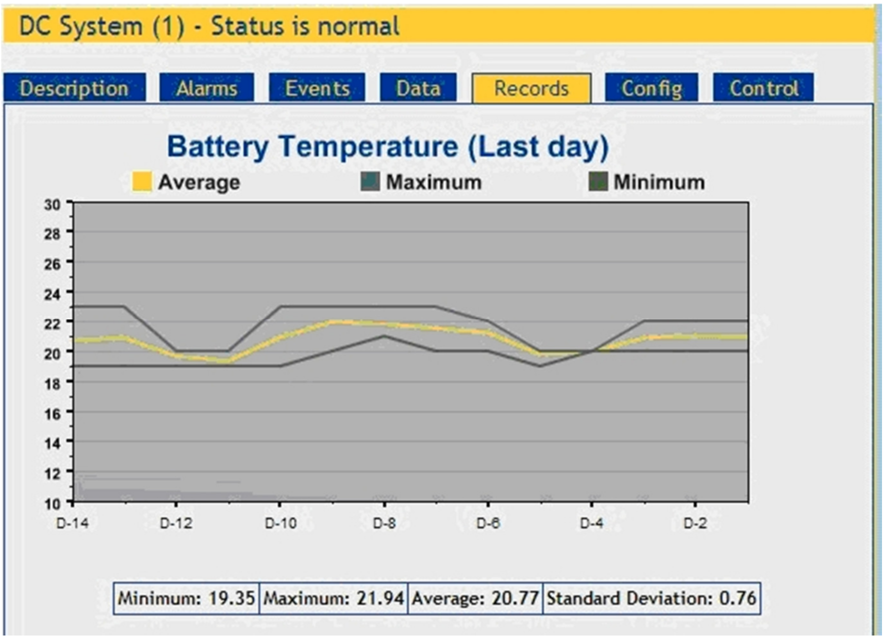


Figure 22 Battery Temperature record for the last days

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:

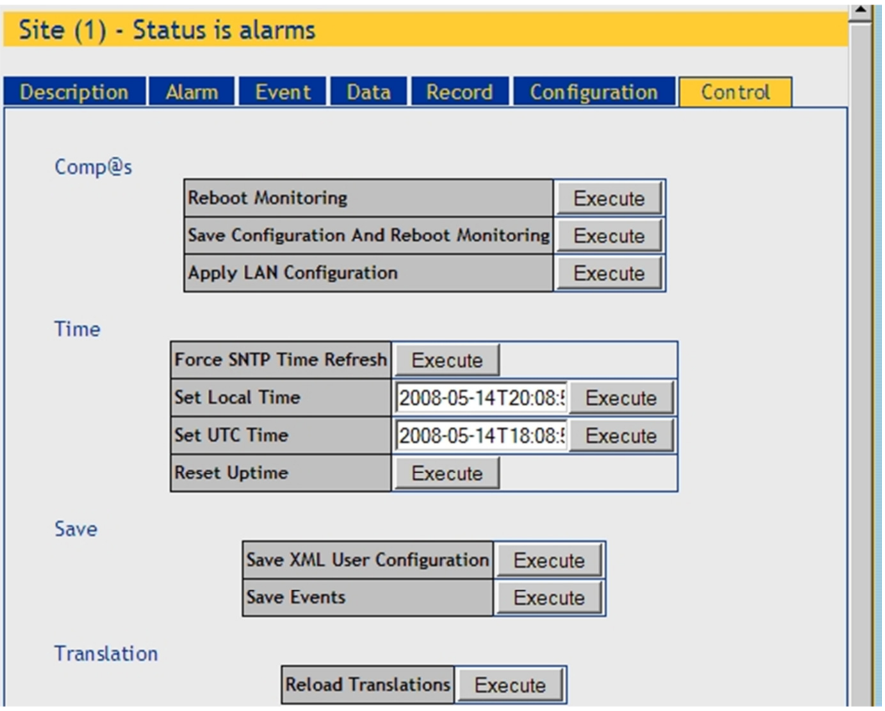


Figure 23 Control Tab at site level

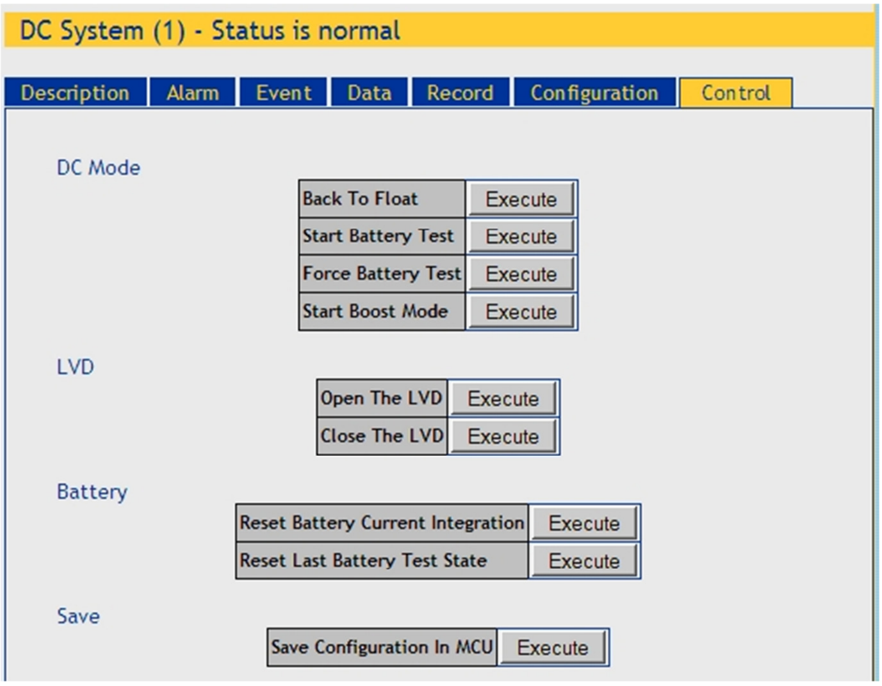


Figure 24 Control Tab at DC System level

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:

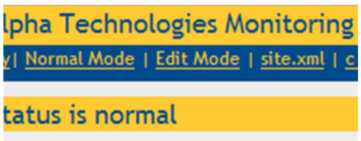


Figure 25 Edit Mode

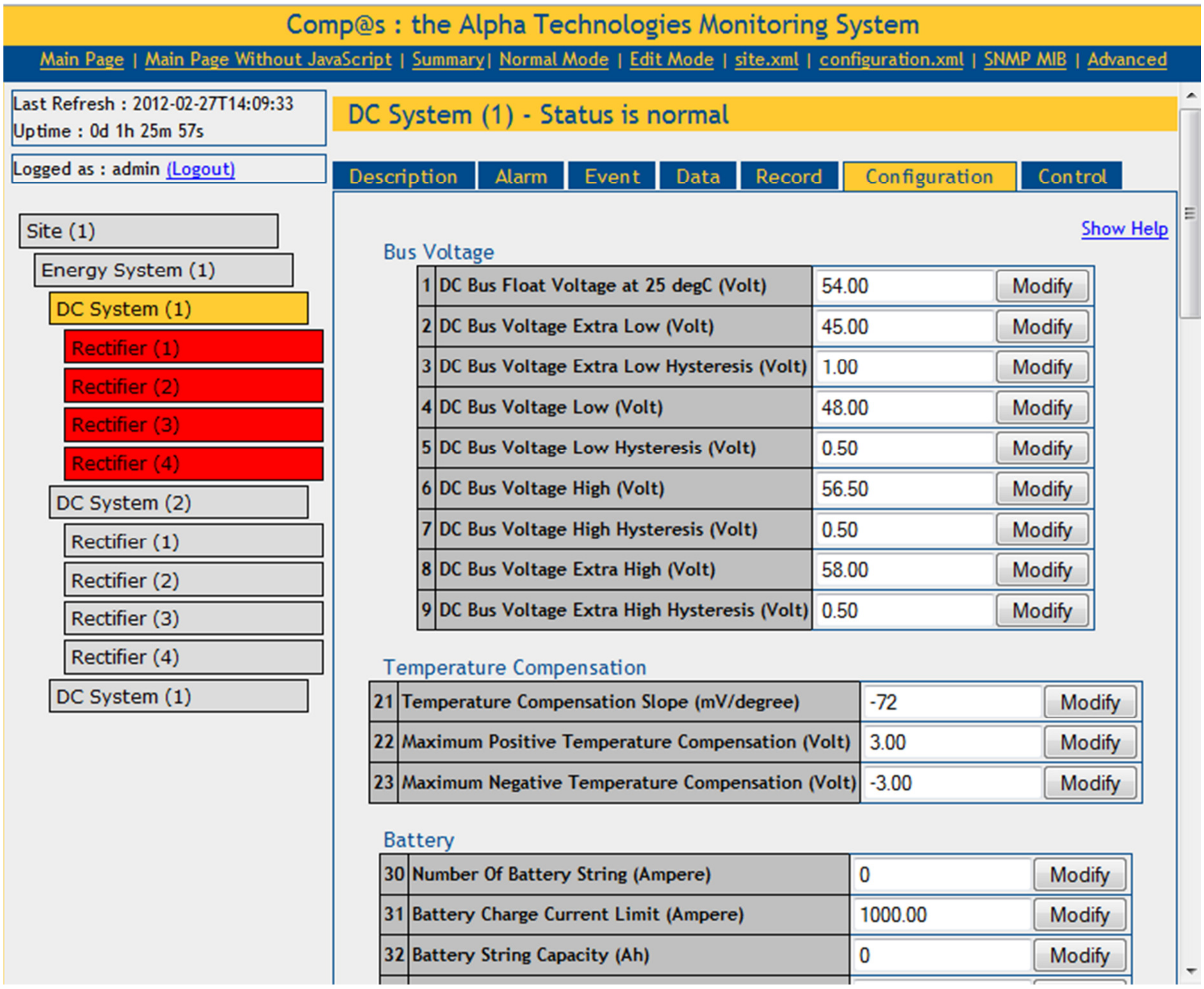


Figure 26 Modifying values

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:

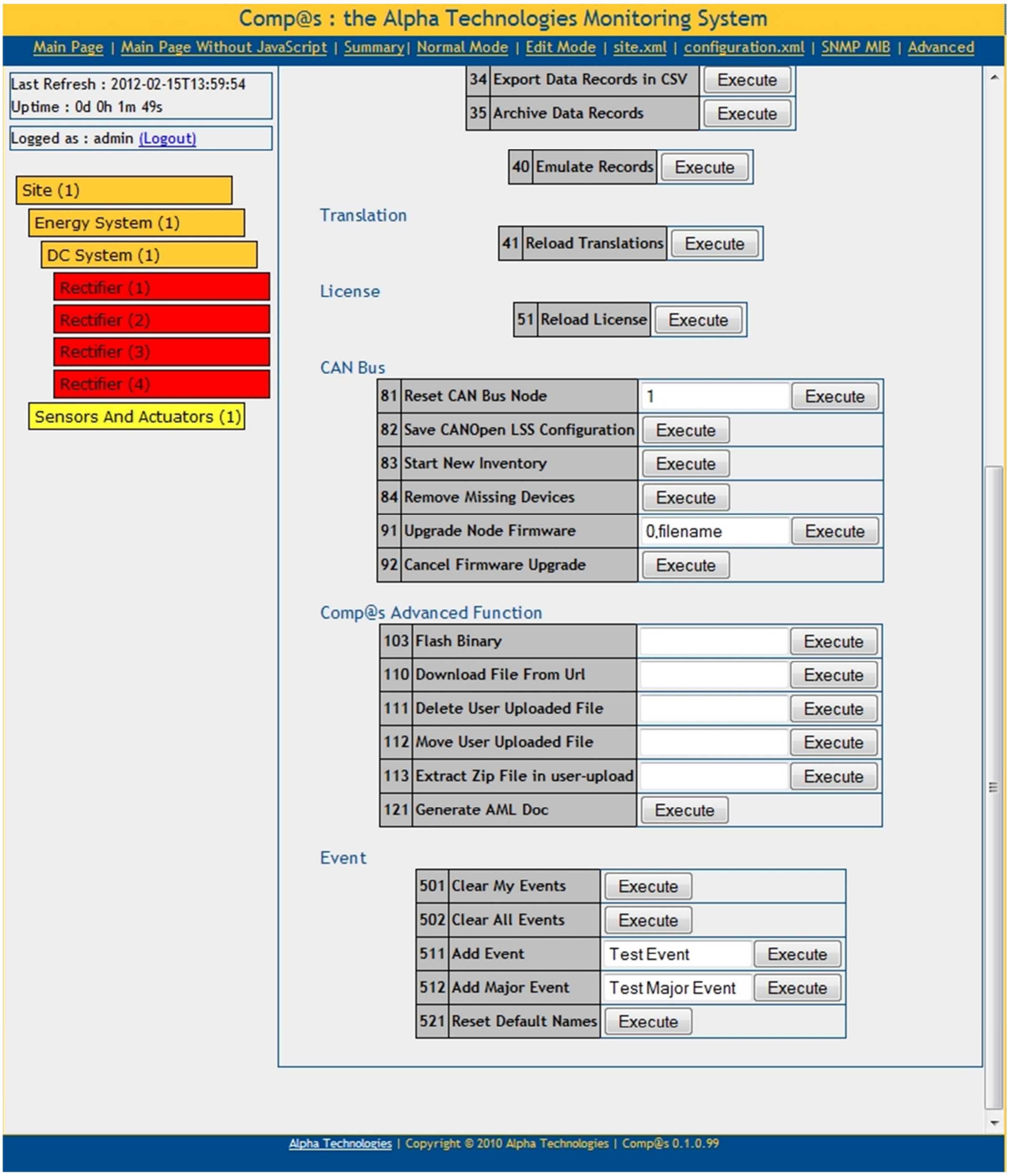


Figure 27 Saving of settings

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.:

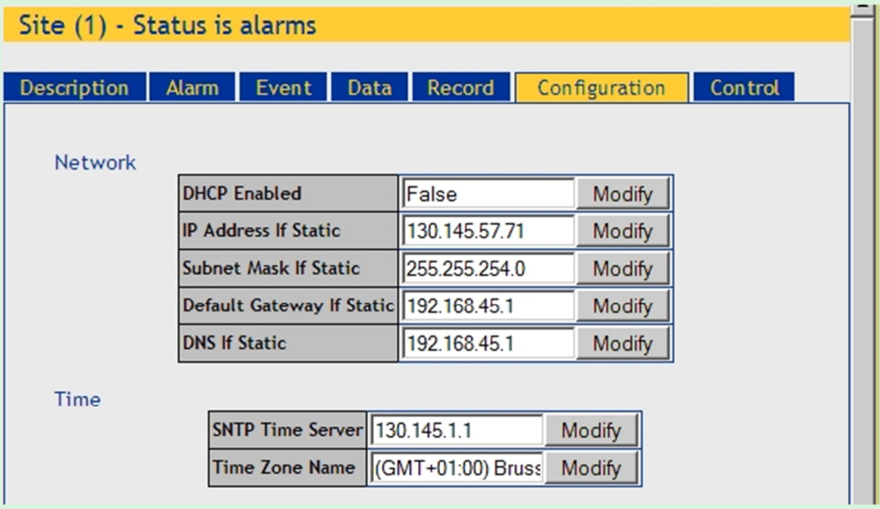


Figure 28 Network configuration

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

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

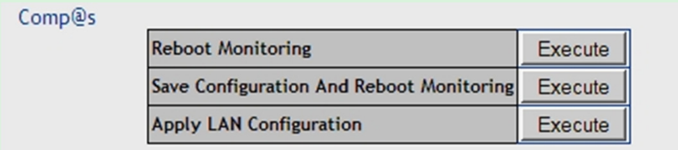


Figure 29 Apply changes

-> “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:

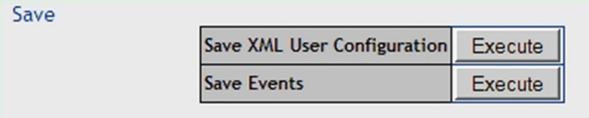


Figure 30 Save XML user configuration

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

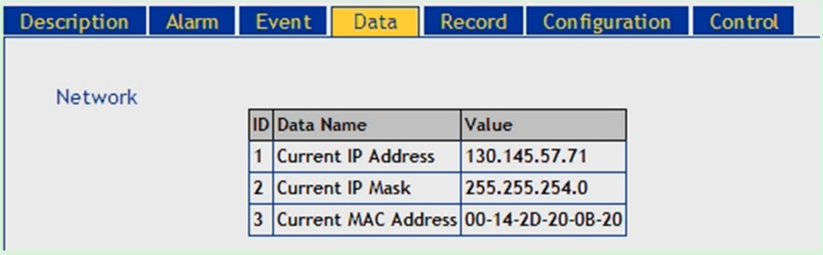


Figure 31 Network data

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"

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.

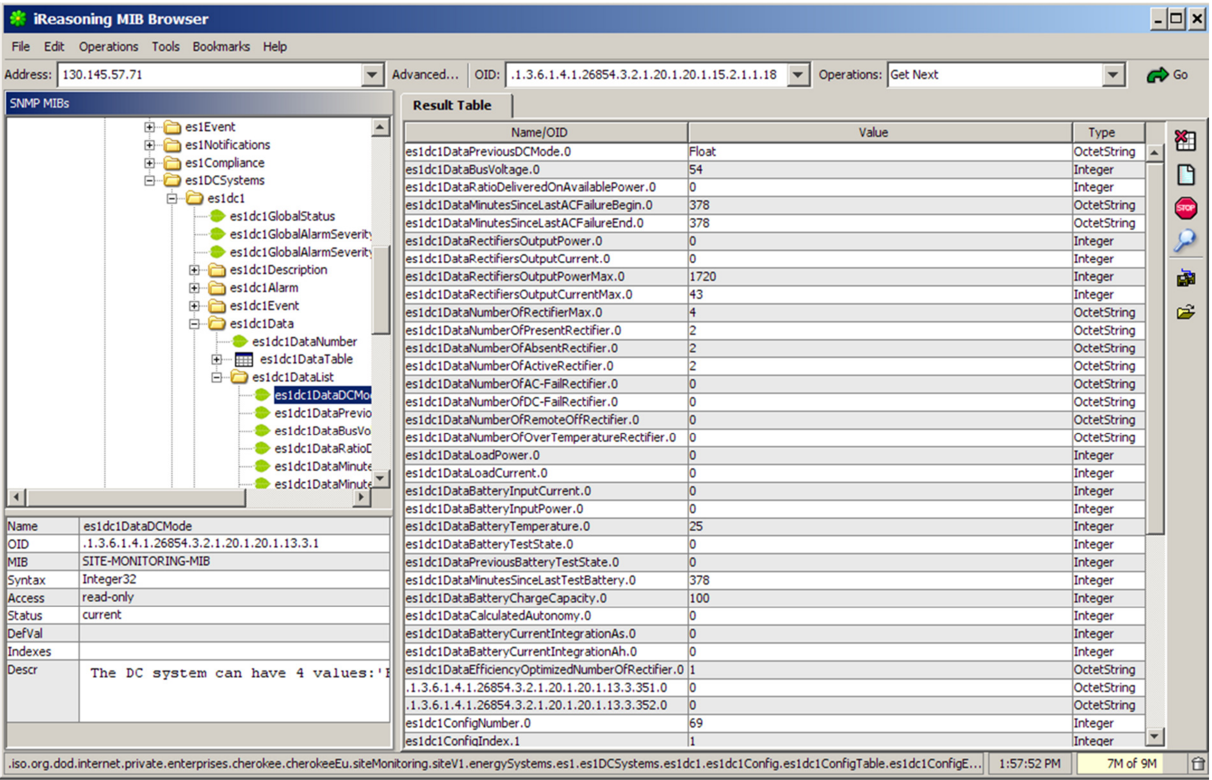


Figure 33 Ireasoning MIB Browser

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:

Login	Password
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:

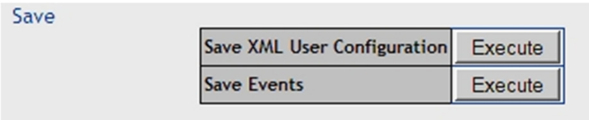


Figure 38 Save / Load configuration

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	2008-05-15T11:42:1	Execute
Set UTC Time	2008-05-15T09:42:1	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:

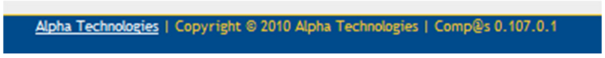


Figure 43 Software Revision at bottom of web pages

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 trough 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):

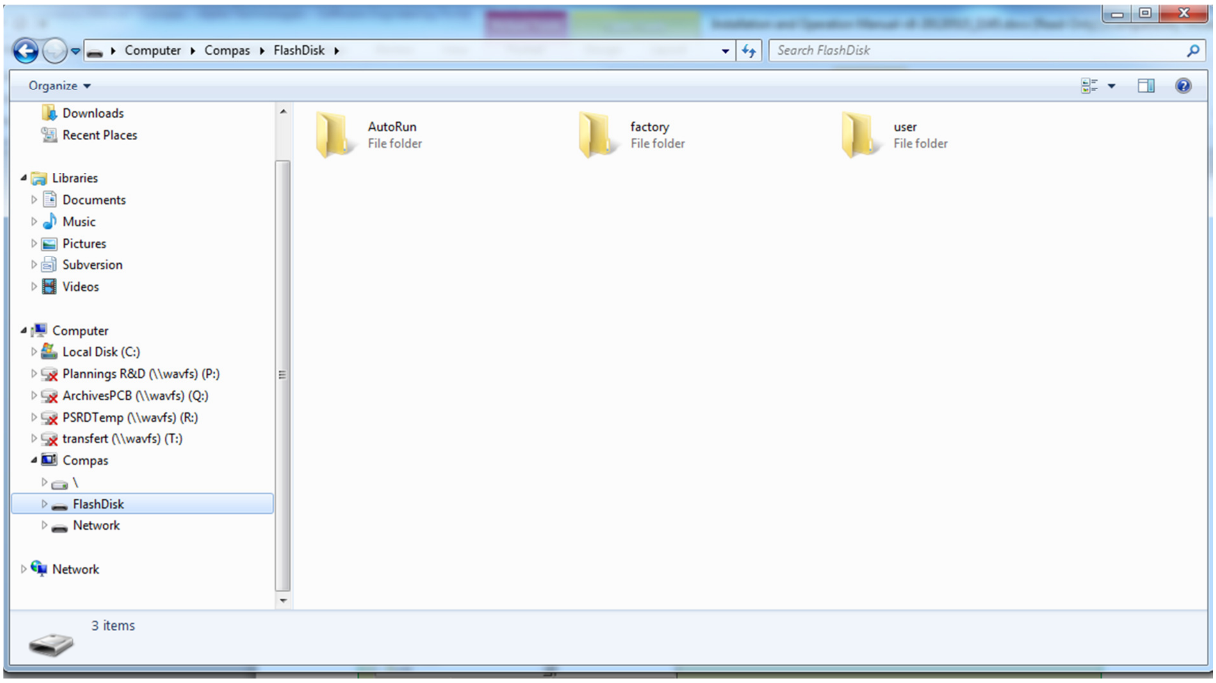


Figure 44 Browse to “\FlashDiskUser”

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.

- FTP
- HTTP POST

FTP

The upgrade is done trough 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):

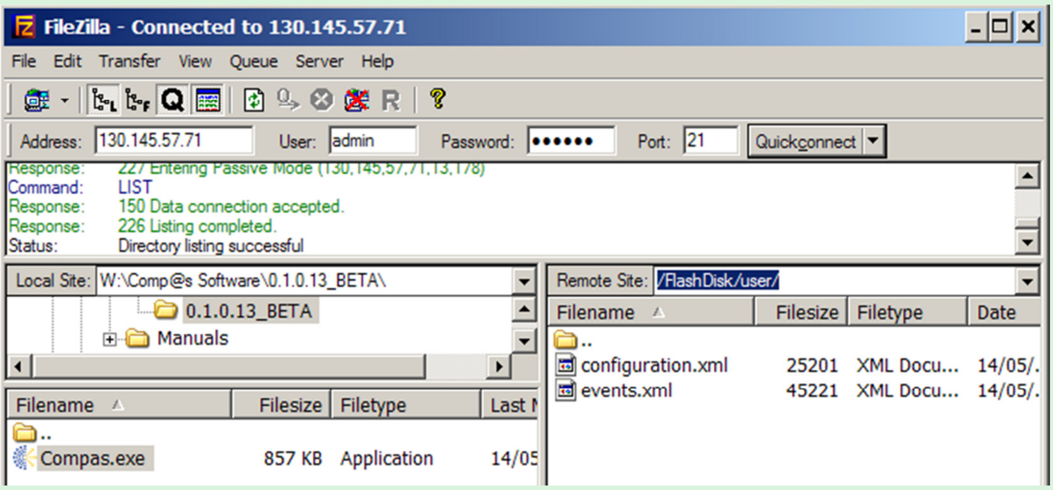


Figure 45 FTP Connection with Filezilla

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 geater than 1.5 MB, a zip**

archive containing the file must be uploaded instead.

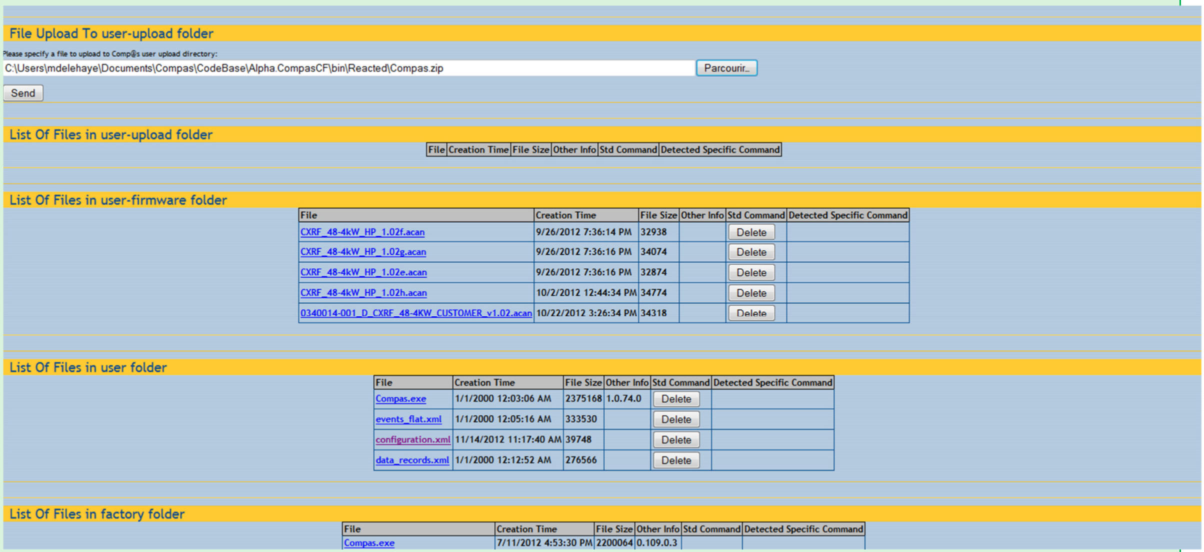


Figure 46 Comp@s Manage Files Page

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:

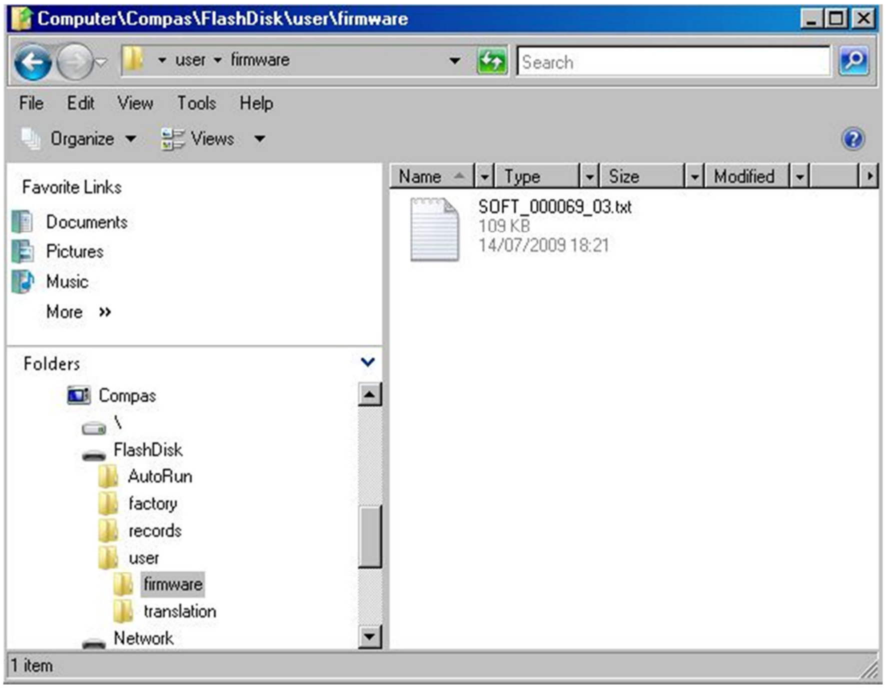


Figure 47 Firmware selection

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

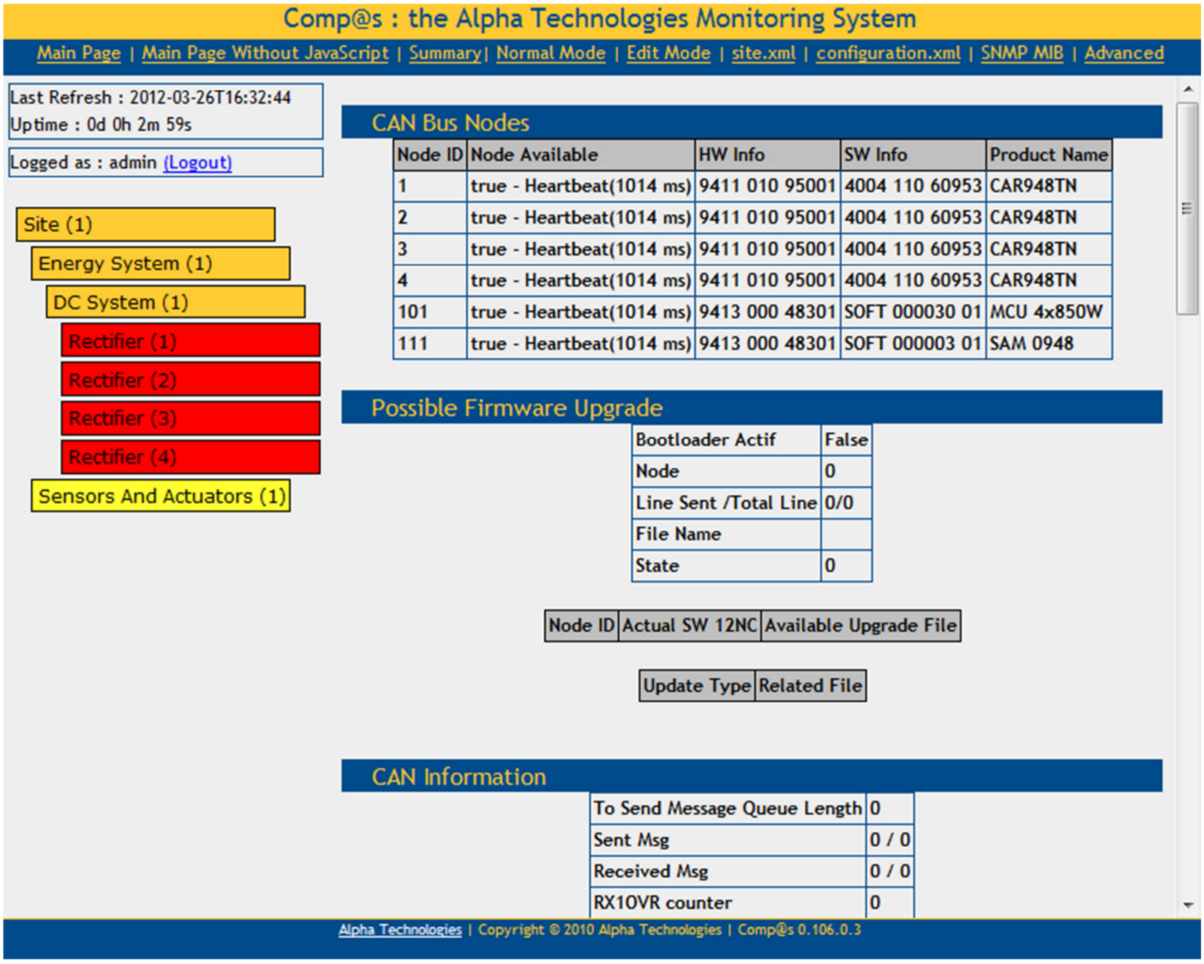
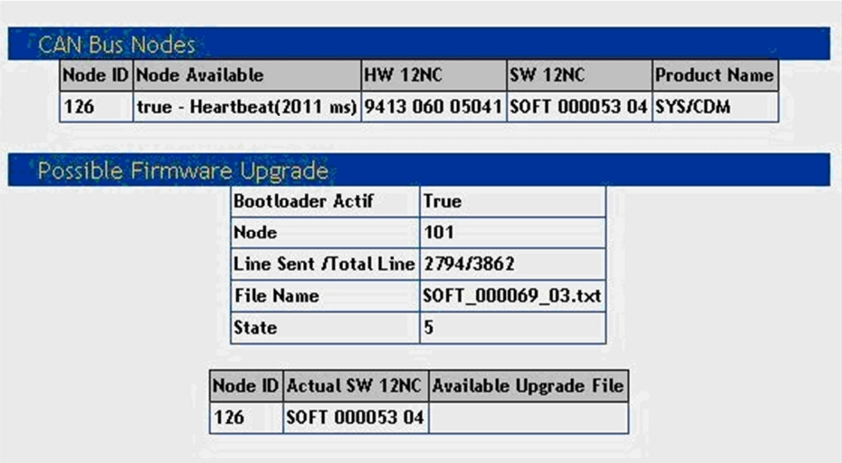


Figure 48 Comp@s web page Advanced link

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):

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 is 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:

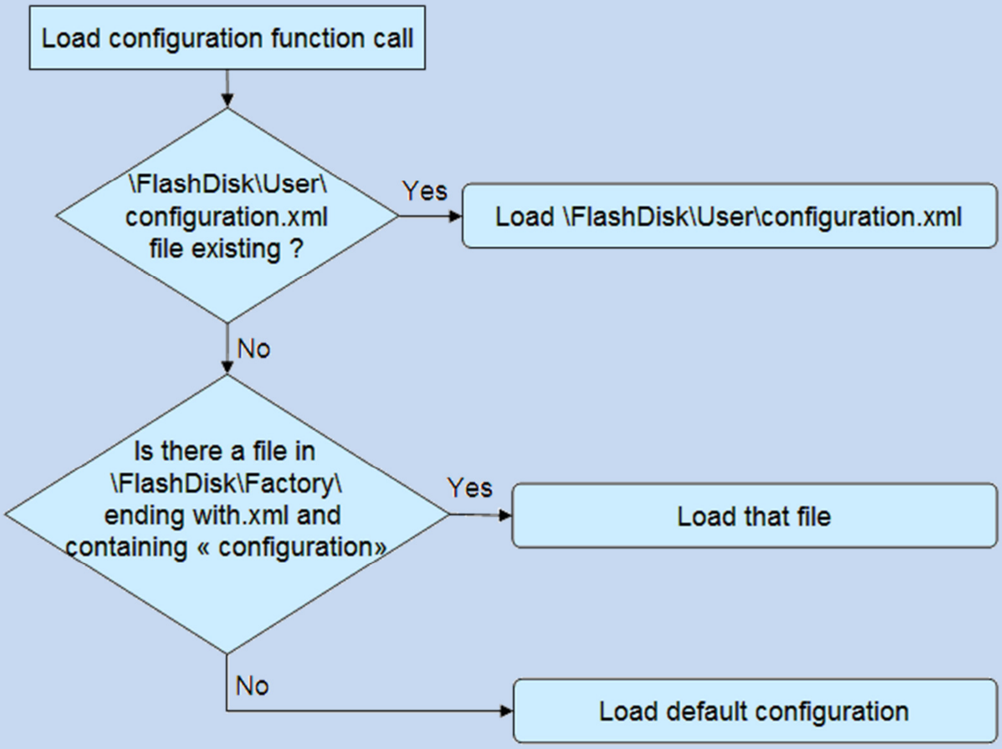


Figure 51 Workflow of the load configuration function

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

<table>
<tr><td>||</td><td>Logical OR</td></tr>
<tr><td>==</td><td>Equal</td></tr>
<tr><td>!=</td><td>Not Equal</td></tr>
<tr><td>+</td><td>Addition</td></tr>
<tr><td>-</td><td>Subtraction</td></tr>
<tr><td>*</td><td>Multiplication</td></tr>
<tr><td>/</td><td>Division</td></tr>
<tr><td>%</td><td>Modulo</td></tr>
</table>

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(XXXXX)	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:

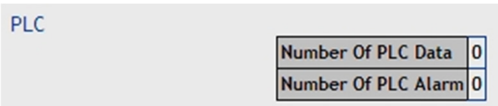


Figure 52 PLC Number

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:

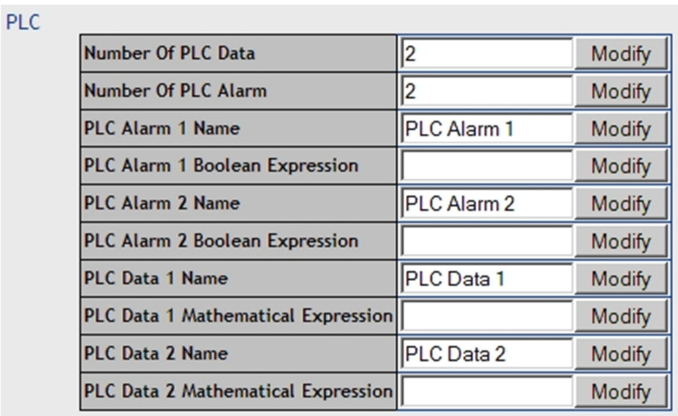


Figure 53 New configuration entries

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:

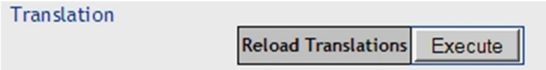


Figure 56 Reload Translations

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 seperated by semicolons):

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

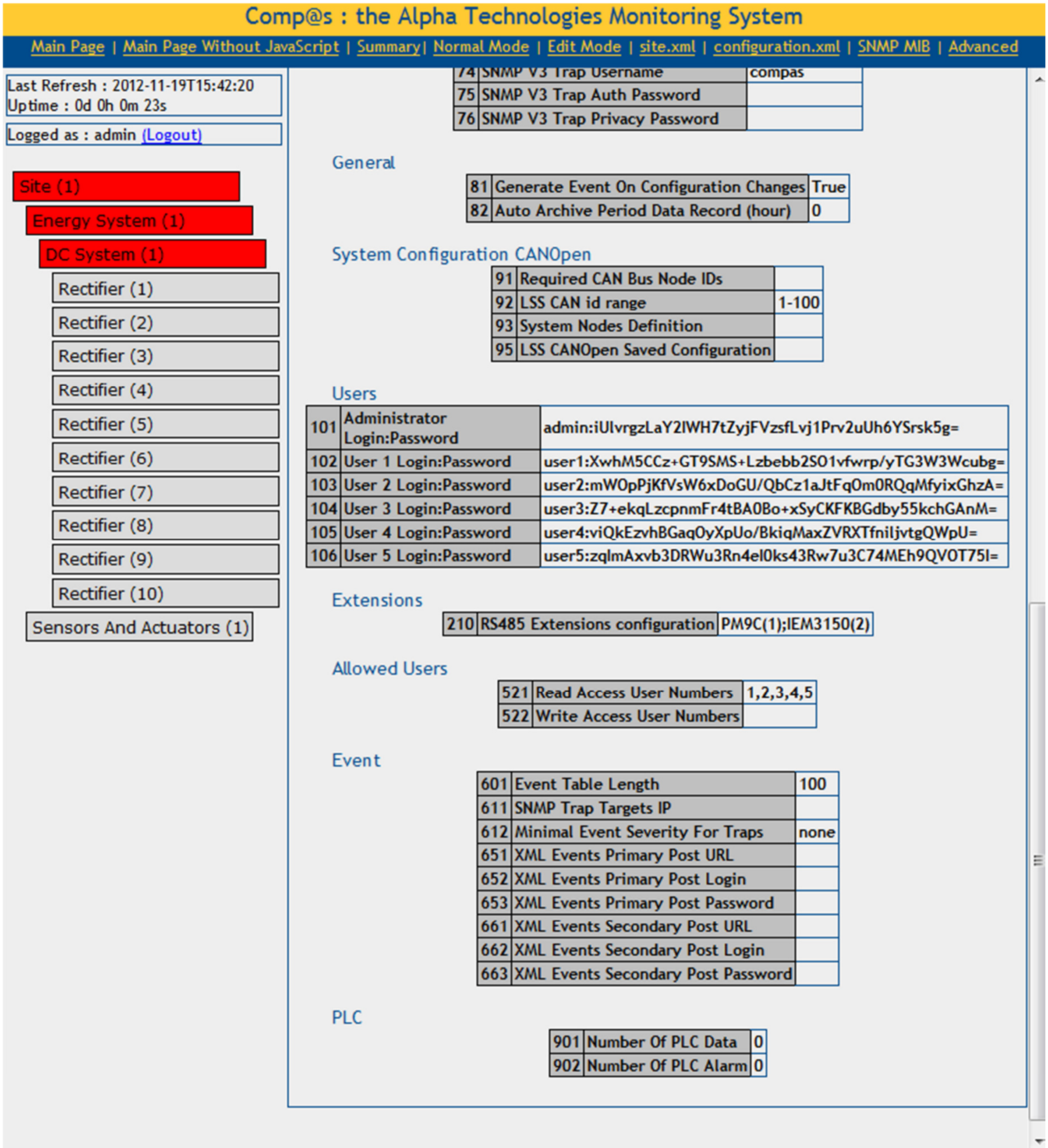


Figure 57 Configure Power and Energy Meter

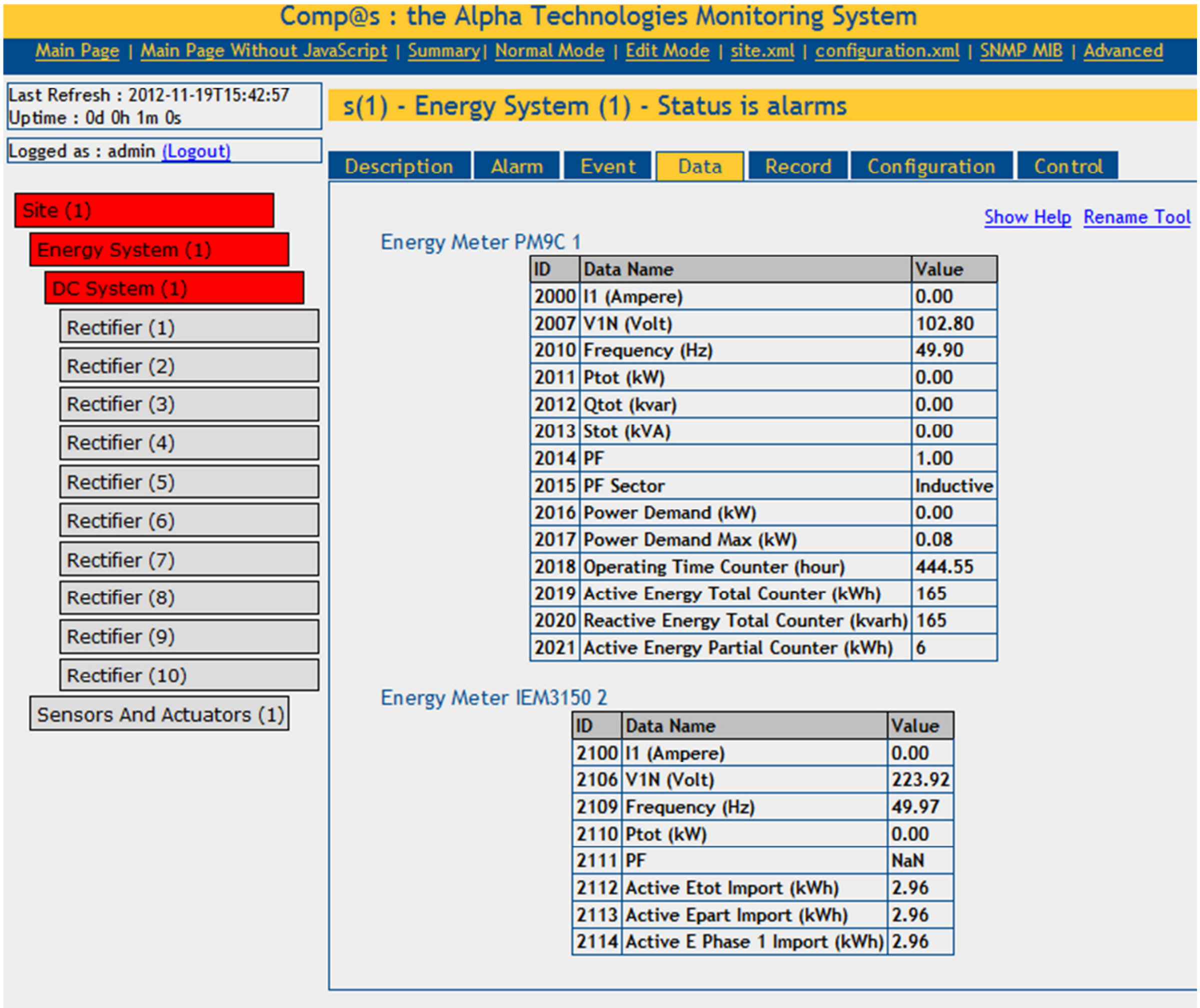
In example above, PM9C device with address 1 is added. Also is added IEM3150 with adress 2. Only addresses from 1 to 10 are currently authorized. The devices will be displayed in Comp@s in the same order as in configuration parameter (in example above: 1, 2).

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

- Baudrade: 9600
- Data bits: 8

- Parity: Odd
- Stop bits: 1.

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



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 trough 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 no 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 Disconnector 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 Test Discharged Capacity	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 Test Discharged Capacity Ah	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:

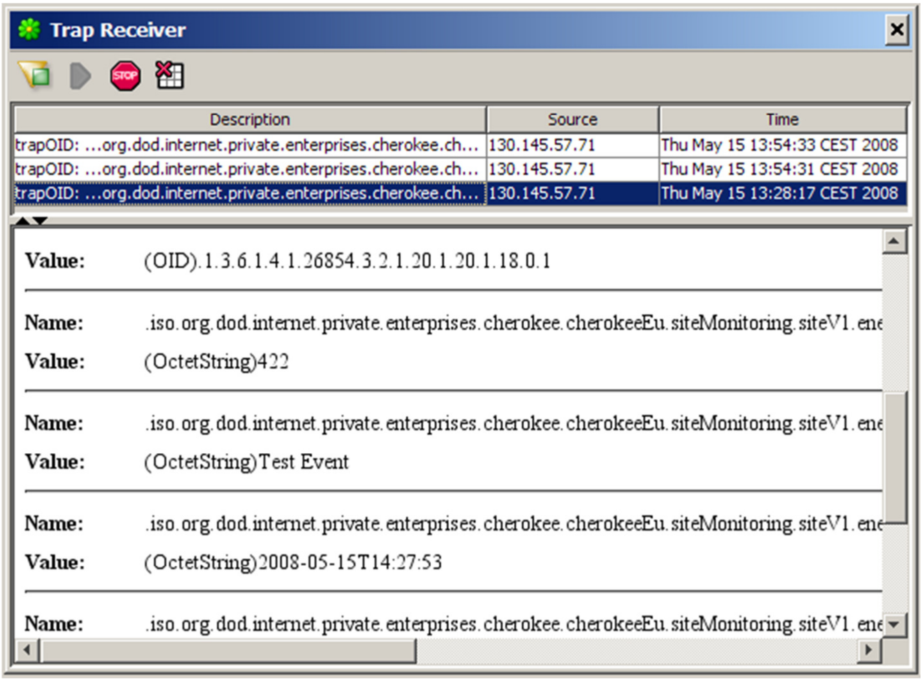


Figure 60 IReasoning trap receiver

Chapter 6 – CAN Bus related information

- CAN Bus - The internal field bus
- Connecting multiple rectifier shelves together.

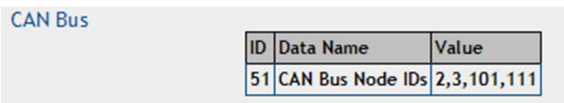
6.1 CAN Bus - The internal field bus

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:

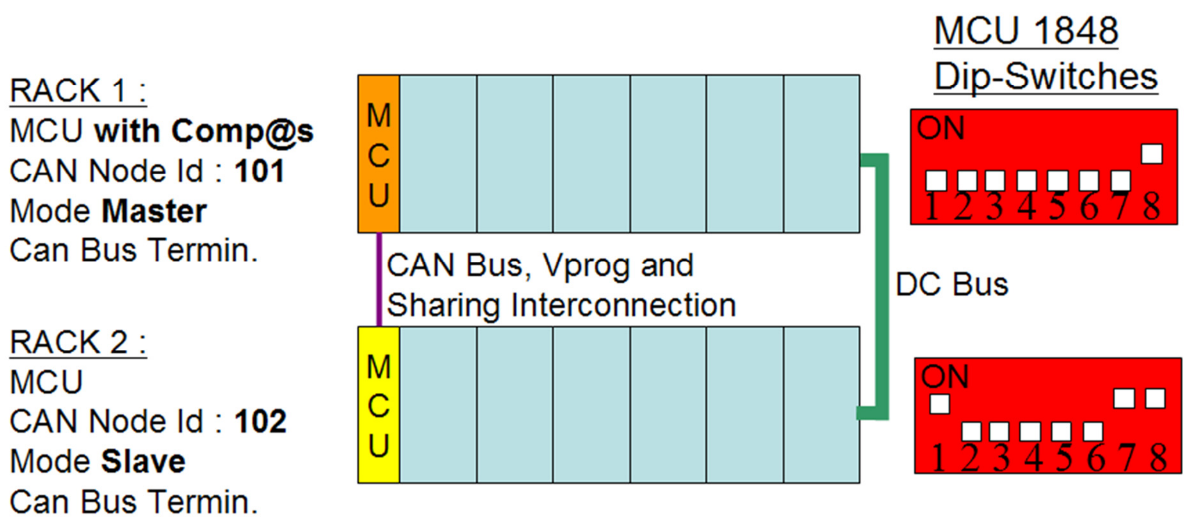


Figure 62 Example with a system with 2 shelves of 6x1800W rectifiers

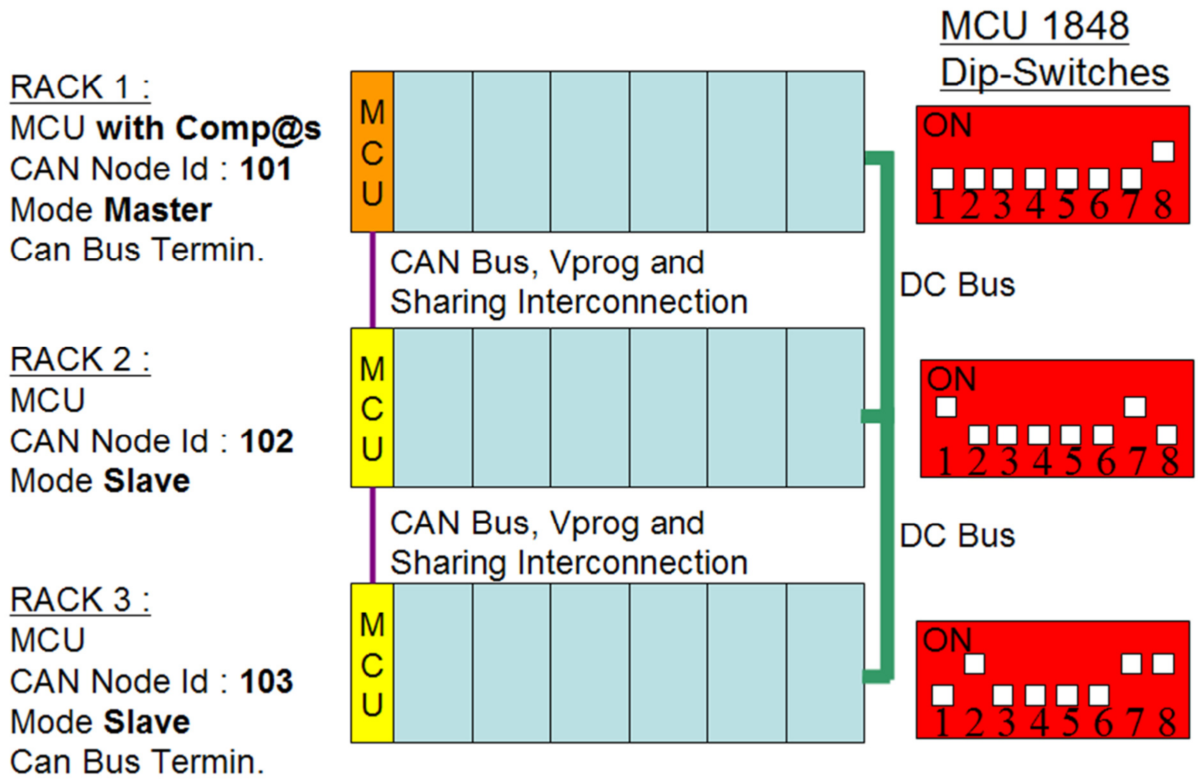


Figure 63 Example with a system of 3 shelves of 6x1800W rectifiers

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:

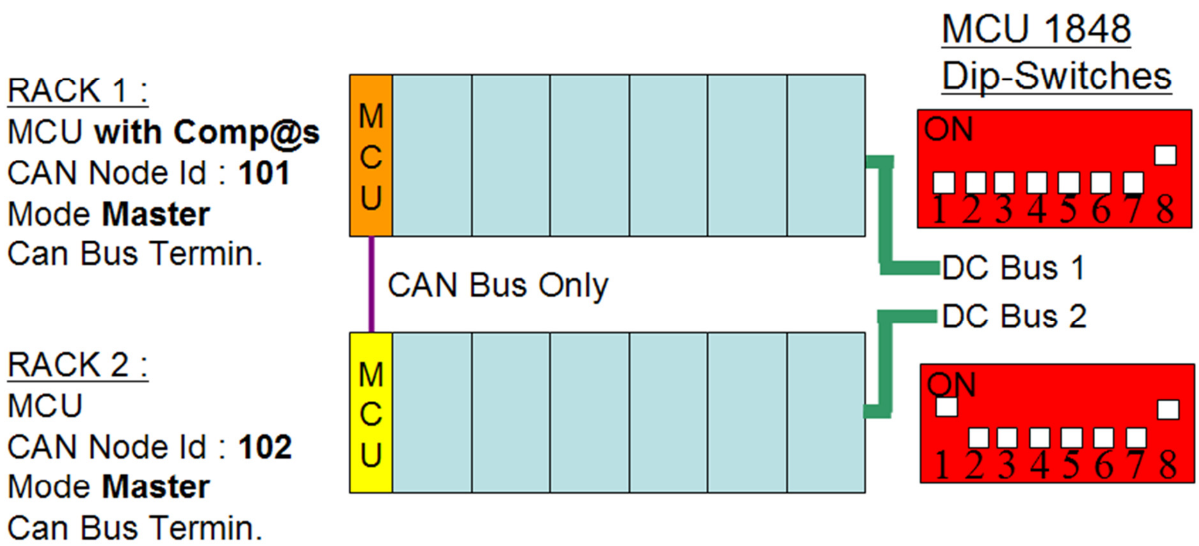


Figure 64 Example with a system with 2 shelves of 6x1800W rectifiers

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 beeing 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 / 1
	This alarm is active if the system should be rebooted for some reason		
21	**XML Hearbeat 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				
Id	*Name*	*Group*	*Unit*	*License*
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					
Id	Name	Group	Unit	Range: Min/Max (default)	License
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	500/20000 (2000)	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 hearbeat.				
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 detailled 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			
Id	*Name*	*Group*	*License*
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	underdev
	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	underdev
	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			

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant 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					
Id	Name	Group	Unit	Range: Min/Max (default)	License
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 Rectifers**	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			
_Id_	_Name_	_Group_	_License_
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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				
Id	*Name*	*Group*	*Unit*	*License*
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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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 Rectifers**	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				

Control Table			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant 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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
1	**DC Bus Float Voltage at 25**	Bus Voltage	Volt	20/30 (27)	basic

	degC				
	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 Rectifers**	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**	Digital Inputs		True/False (True)	basic

	Closed				
	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			
_Id_	_Name_	_Group_	_License_
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		

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			
Id	*Name*	*Group*	*License*
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		
Id	*Name*	*Severity Type (Level)*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant temperature (second temperature sense)			
204	**Digital Input 4 Counter**	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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	Volt	-10/0 (-3)	basic

	Temperature Compensation	Compensation			
	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 Rectifers**	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				

Control Table			
Id	*Name*	*Group*	*License*
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		

7.2.5 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			
Id	*Name*	*Group*	*License*
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		
Id	*Name*	*Severity Type (Level)*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant temperature (second temperature sense)			
204	**Digital Input 4 Counter**	Sensors		basic
	The counter value of the digital input 4.			

Config Table					
_Id_	_Name_	_Group_	_Unit_	_Range: Min/Max (default)_	_License_
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 Rectifers**	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.				
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**	Dry Alarms		False	plc

	Boolean Condition				
	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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant 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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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 Rectifers**	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**	Dry Alarms		False	plc

	Boolean Condition				
	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			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		

5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant 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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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 Rectifers**	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			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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 ambiant 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				
Id	Name	Group	Unit	License
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 ambiant 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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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**	Bus Voltage	Volt	0/5 (1)	basic

	Hysteresis				
	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 Rectifers**	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			
Id	*Name*	*Group*	*License*
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		

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

Description Table			
Id	*Name*	*Group*	*License*
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			
Id	Name	Severity Type (Level)	Set/Clear Delay
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant 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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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 Rectifers**	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			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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				
Id	*Name*	*Group*	*Unit*	*License*
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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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 Rectifers**	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				

Control Table			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant 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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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**	Bus Voltage	Volt	0/5 (0.5)	basic

	Hysteresis				
	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 Rectifers**	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	basic

				Breaker Open	
	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			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 substracted 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 Disconnector 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 ambiant 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				
Id	Name	Group	Unit	License
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 ambiant 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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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 Rectifers**	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
	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 Condittion**	PLD			basic
	The PLC conditon to enable the PLD command				
521	**Read Access User Numbers**	Allowed		(1,2,3,4,5)	basic

		Users			
	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			
_Id_	_Name_	_Group_	_License_
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		

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			
_Id_	_Name_	_Group_	_License_
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 substracted 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 Disconnector 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 ambiant 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				
Id	Name	Group	Unit	License
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 ambiant 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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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**	Bus Voltage	Volt	0.5/10 (2)	basic

	Hysteresis				
	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 Rectifers**	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			
Id	*Name*	*Group*	*License*
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		

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

Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 substracted 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant 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					
Id	Name	Group	Unit	Range: Min/Max (default)	License
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 Rectifers**	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**	Digital Inputs		True/False (True)	basic

	Closed				
	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

Id	Name	Group	License
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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 paramenter 'DC Bus Voltage High'. There is an hysterisis 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 paramenter 'DC Bus Voltage Extra High'. There is an hysterisis on the alarm : 'DC Bus Voltage Extra High Hysteresis'		
5	**DC Bus Voltage Sense Failure**	major (6)	1 / 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 Disconnector 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 ambiant 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				
Id	*Name*	*Group*	*Unit*	*License*
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 ambiant 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					
Id	Name	Group	Unit	Range: Min/Max (default)	License
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 Rectifers**	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**	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.				
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			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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.		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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.			

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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)			

7.3.3 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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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)			

7.3.4 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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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.		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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.			

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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.		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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.			

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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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.		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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.			

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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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.		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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.			

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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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.		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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.			

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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.		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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.			

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			
Id	*Name*	*Group*	*License*
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		
Id	*Name*	*Severity Type (Level)*
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				
Id	*Name*	*Group*	*Unit*	*License*
1	**Output Current**	Output	Ampere	basic
	The current delivered by the rectifier			
3	**Output Voltage**	Output	Volt	basic
	The output voltage of the rectifier			
7	**Power Ratio**	Output	%	basic
	This is the ratio power/available power			
8	**Rectifier Mode**	Mode		basic
	The internal mode of the rectifier			
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	**Phase Number**	General		basic
	The rectifier Phase - 0 means unconfigured			
14	**Service Time**	General	second	asset
	The rectifier total service time, in second (For CAN capable rectifiers)			
15	**Converted Energy**	General	kJ	asset
	The total energy converted by the rectifier since the production. (For CAN capable rectifiers)			

Control Table			
Id	*Name*	*Group*	*License*
1	**Locate Rectifier**	Locate	basic
	No information		
5	**Change Phase Number**	Phase	basic
	No information		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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)			

7.3.16 ECOR0348

Device Information	
Name	ECOR0348
Short Description	Rectifer 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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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)			

7.4 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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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 4-20mA Sensor	mAmpere	basic
	Current 4-20mA Sensor 1			
112	**Current 4-20mA 2**	Current 4-20mA Sensor	mAmpere	basic
	Current 4-20mA Sensor 2			

Config Table					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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		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**	Digital Inputs		True/False (True)	basic

	Closed				
	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 Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 1				
122	**Digital Output Relay 2 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 2				
123	**Digital Output Relay 3 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 3				
124	**Digital Output Relay 4 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 4				
125	**Digital Output Relay 5 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 5				
126	**Digital Output Relay 6 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 6				
127	**Digital Output Relay 7 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 7				
128	**Digital Output Relay 8 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 8				
129	**Digital Output Relay 9 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 9				
130	**Digital Output Relay 10 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 10				
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			
Id	*Name*	*Group*	*License*
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		

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

Id	Name	Group	License
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			
Id	Name	Severity Type (Level)	Set/Clear Delay
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				
Id	Name	Group	Unit	License
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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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				

Control Table			
Id	*Name*	*Group*	*License*
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		
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
41	**Shunt Rating At 60mV**	Battery	Ampere		basic
	The rating of the shunt 1 at 60mV.				
42	**Shunt 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	**Digital Output Relay 1 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 1				
122	**Digital Output Relay 2 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 2				

123	**Digital Output Relay 3 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 3				
124	**Digital Output Relay 4 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 4				
125	**Digital Output Relay 5 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 5				
126	**Digital Output Relay 6 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 6				
127	**Digital Output Relay 7 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 7				
128	**Digital Output Relay 8 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 8				
129	**Default Digital Output Binary Vector**	Digital Outputs		(False)	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			
Id	*Name*	*Group*	*Licens e*

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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
1	**Temperature 1**	Sensors	degree C	basic
	The temperature 1			
2	**Temperature 2**	Sensors	degree C	basic
	The temperature 2			

Config Table					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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 Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 1				
122	**Digital Output Relay 2 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 2				
123	**Digital Output Relay 3 Energized Boolan Condition**	Digital Outputs		(False)	basic
	PLC Boolean condition to energize the relay 3				
124	**Digital Output Relay 4 Energized Boolan 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			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*

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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
1	**Cabinet Temperature High**	major (6)	5 / 2
	The temperature of the cabinet is too high.		
2	**Cabinet Temperature Low**	major (6)	5 / 2
	The temperature of the cabinet is too low.		
3	**Cabinet Temperature Sensor Fail**	minor (4)	5 / 2
	The cabinet temperature sense is defect.		
11	**Cabinet Humidity High**	major (6)	5 / 2
	The cabinet humidity is too high		
12	**Cabinet Humidity Low**	major (6)	5 / 2
	The cabinet humidity is too low		
21	**Water Detection Alarm**	major (6)	5 / 2
	Water is detected by the water sensor.		
31	**Tilt X Alarm**	major (6)	5 / 2
	The X-tilt absolute value is too high		
32	**Tilt Y Alarm**	major (6)	5 / 2
	The Y-tilt absolute value is too high		
41	**Vandalism Alarm**	major (6)	5 / 2
	The vandalism score is too high		
51	**Badge Reader Failure**	major (6)	5 / 2
	The badge reader is defect or not connected		
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	**Door 1 Open**	warning (2)	5 / 2
	Alarm related to digital input 7, used for access control by default		
78	**Door 2 Open**	warning (2)	5 / 2
	Alarm related to digital input 8, used for access control by default		
79	**Door 3 Open**	warning (2)	5 / 2
	Alarm related to digital input 9, used for access control by default		
80	**Door 4 Open**	warning (2)	5 / 2
	Alarm related to digital input 10, used for access control by default		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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

Id	Name	Group	Unit	Range: Min/Max (default)	License
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 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		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 Boolan 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

Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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)	5 / 2
	Slot 0 is in alarm		
21	**Slot 1 Alarm**	minor (4)	5 / 2
	Slot 1 is in alarm		
22	**Slot 2 Alarm**	minor (4)	5 / 2
	Slot 2 is in alarm		
23	**Slot 3 Alarm**	minor (4)	5 / 2
	Slot 3 is in alarm		
24	**Slot 4 Alarm**	minor (4)	5 / 2
	Slot 4 is in alarm		
25	**Slot 5 Alarm**	minor (4)	5 / 2
	Slot 5 is in alarm		
26	**Slot 6 Alarm**	minor (4)	5 / 2
	Slot 6 is in alarm		
27	**Slot 7 Alarm**	minor (4)	5 / 2

	Slot 7 is in alarm		
28	**Slot 8 Alarm**	minor (4)	5 / 2
	Slot 8 is in alarm		
29	**Slot 9 Alarm**	minor (4)	5 / 2
	Slot 9 is in alarm		
30	**Slot 10 Alarm**	minor (4)	5 / 2
	Slot 10 is in alarm		
31	**Slot 11 Alarm**	minor (4)	5 / 2
	Slot 11 is in alarm		
32	**Slot 12 Alarm**	minor (4)	5 / 2
	Slot 12 is in alarm		
33	**Slot 13 Alarm**	minor (4)	5 / 2
	Slot 13 is in alarm		
34	**Slot 14 Alarm**	minor (4)	5 / 2
	Slot 14 is in alarm		
35	**Slot 15 Alarm**	minor (4)	5 / 2
	Slot 15 is in alarm		
36	**Slot 16 Alarm**	minor (4)	5 / 2
	Slot 16 is in alarm		

Data Table				
Id	*Name*	*Group*	*Unit*	*License*
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					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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			
Id	*Name*	*Group*	*License*
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		

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			
Id	*Name*	*Group*	*License*
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			
Id	*Name*	*Severity Type (Level)*	*Set/Clear Delay*
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				
Id	*Name*	*Group*	*Unit*	*License*
1	**Number of Configured Power Lines**	Lines		basic
	No information			
2	**Line Configured for Monitoring**	Lines		basic
	No information			
11	**Remote Type**	Remote DC System		basic
	No information			
12	**Input Voltage**	Remote DC System	Volt	basic
	No information			
13	**Input Common Mode Voltage**	Remote DC	Volt	basic

		System		
	Input Common Mode Voltage with respect to ground			
14	**Output Voltage**	Remote DC System	Volt	basic
	No information			
15	**Temperature**	Remote DC System	degree C	basic
	No information			
21	**Number Of Declared Down Converters**	Remote DC System		basic
	No information			

Config Table					
Id	*Name*	*Group*	*Unit*	*Range: Min/Max (default)*	*License*
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			
Id	*Name*	*Group*	*License*
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		

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 Mobdus 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 Release Components

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 dyncamical 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.

10.2 Comp@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 0.114.0.7 (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 - Possiblitly 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 transiant '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 if 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.

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 (Mobdus 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 booloader 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 me 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 severy_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.

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

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:

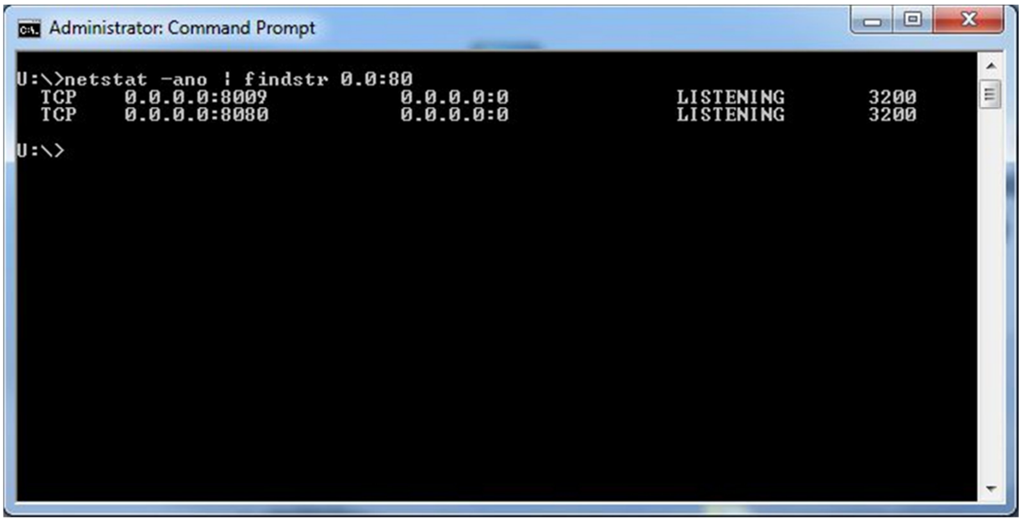


Figure 66 Administrator Command Prompt

- 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:

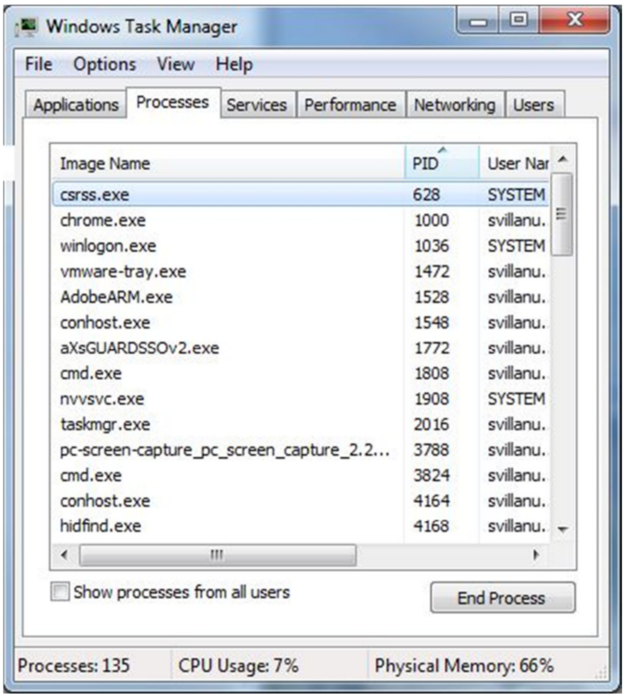


Figure 67 Windows Task Manager

- 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:

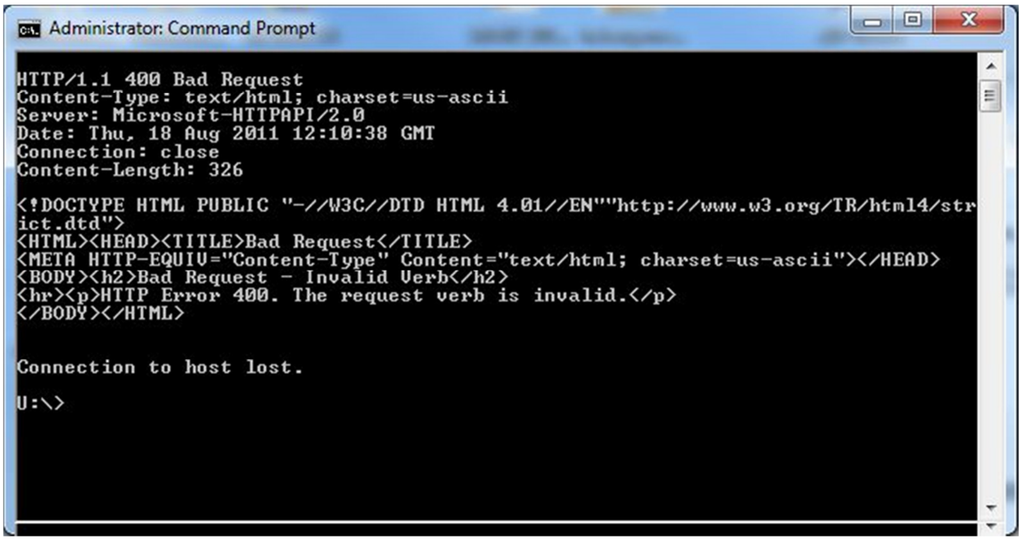


Figure 68 ISS Shutdown

- 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 brower, 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":

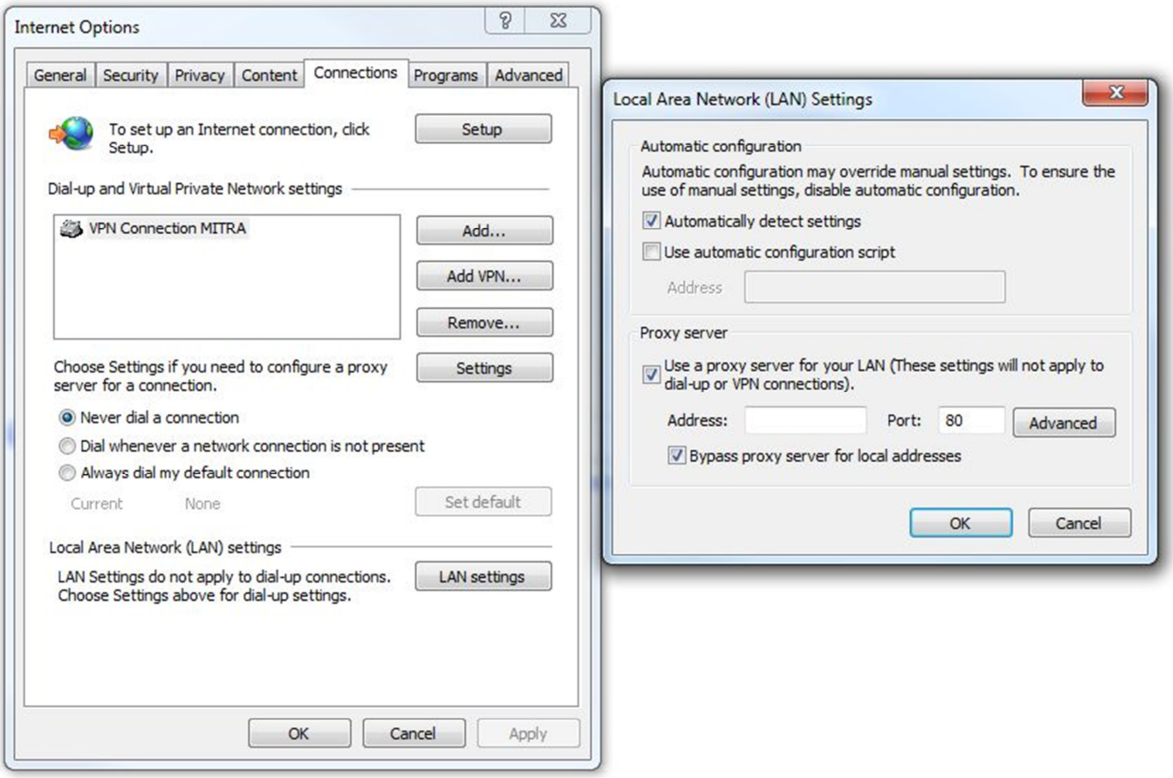


Figure 69 Bypass Proxy Server for Local Address

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.