Saves Your Energy

AUGUSTE 2012 Cabinet

Installation and operation guide

General

- Before unpacking

> Verify that the product in its packaging has not been damaged during transport.
> Verify that the product is suitable for the intended installation.

- Before installation

> Carefully read the operation guide before installing or using this product.
> Perform the installation carefully, ensuring that the equipment remains clean throughout the operation.

- After installation

> If you are installing this product for someone else, leave the guide for the end user.
> Clean the work area after installation.

Legal notices

- The product may only be installed by a competent person with adequate training in the installation practices and with adequate knowledge of proper safety and installation practices for electrical equipment. If local regulations have requirements relating to this training or adequate knowledge in terms of the installation of electrical equipment, the aforementioned requirements must be complied with by this person.
- EnstoNovexia will not be held responsible in any way for damage to property or persons caused by an incorrect installation, incorrect operation or lack of compliance with the safety instructions.

WARNING:

For the operation of this system in complete safety, it is essential that the installers, users and technicians follow the procedures and precautions described in this guide. Non-compliance with these instructions may cause damage to the products and/or serious or even mortal injury.

1 Presentation

1.1. Product purpose

The cabinet contains, with reduced space requirements, all of the functions required to control an AUGUSTE circuit breaker and fault detection (Current and Directional). Combining the equipment with the circuit breaker makes the electrical network more reliable by reducing the number and duration of blackouts.

Several remote operating modes for the control station are available to meet any requirements (RADIO, GSM/GPRS or External modem, STN telephone line).

1.2. General characteristics

The equipment is used to control the AUGUSTE circuit breaker. In addition, it is equipped with functions for remote communication, acquisition of analogue values, fault detection and automation.

✓ **Remote communication with the control centre:**

The cabinet includes a remote operation module integrated into the CPU board. Several communication methods are possible (RADIO, GSM/GPRS or External modem, STN telephone line). The TRANSMISSION, RECEPTION, LINE & COMMUNICATION FAULT information is available on the user interface (see page 10 - “user interface description”).

✓ **Transmission characteristics:**

By GSM, GPRS, digital radio or IP network: Procedure IEC 870-5-104

✓ **Control of AUGUSTE HTA circuit breakers:**

It is possible to control the AUGUSTE circuit breaker in remote control or local mode. The circuit breaker can be controlled by the ASF automation. The position of the cut-off device is accessible via the user and PC interface.

✓ **Acquisition of analogue values:**

- The cabinets measure the following HTA network values:
  - Standard version.
    >Measurement of instantaneous line current
    >Measurement of instantaneous HTA voltage
    >Calculation of average HTA voltage over 10 minutes
    >Calculation of average current over 10 minutes
    >Saving of maximum instantaneous current

- The product measures, in real time, the information listed below:
  - >LV supply voltage
  - >Voltage and current relating to the 12V internal power supply (12V radio)
  - >Remaining battery capacity
  - >Cabinet temperature

✓ **Display of the cabinet status and information relating to the HTA network:**

-Position of the HTA circuit breaker
-State of the circuit breaker (neutralised or unlocked)
-Number of operations
-Number of openings by ASF
-Cabinet 12V voltage and supply voltage out of range
-Battery fault
-Equipment fault
-Local or remote mode
-Automation (ASF) status
-Date and time

✓ **Detection of HTA faults:**

-Current, directional
-Fault counters: Poly-phase & Phase/Earth
-Display of faults on the user interface.

✓ **Automation:**

Auto Sectionalizing function (ASF)

✓ **Recording of Timestamp Event (EED):**

All of the cabinet events (opening, fault detection, etc.) can be consulted or downloaded in .txt format using the PC interface.

✓ **Power supply:**

-Alternating current 230V±15% or 135V±15% or 101V±15%.
-Sealed lead battery 12V 38Ah or 24Ah (autonomous supply).

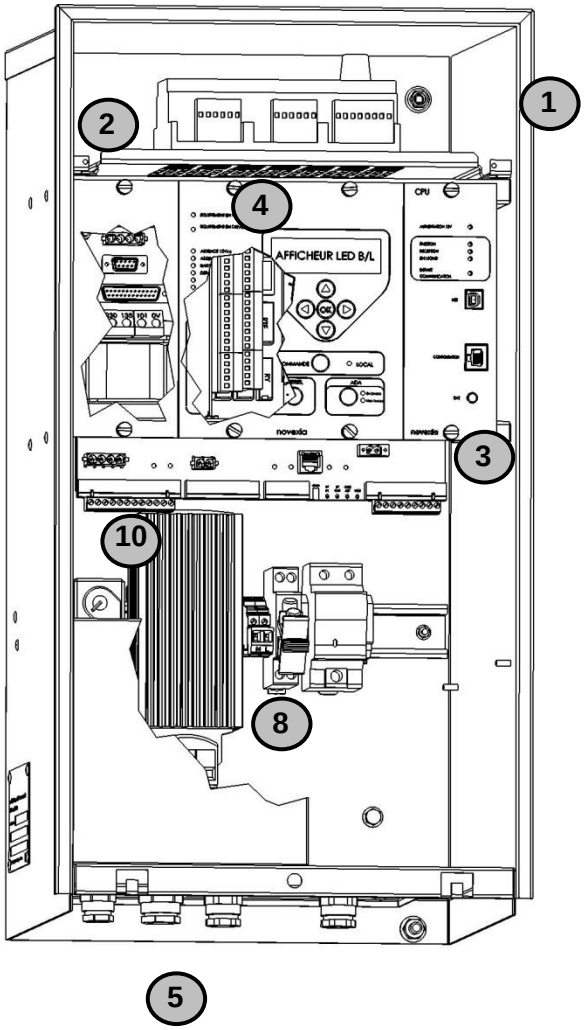
✓ **Overview of the product:**

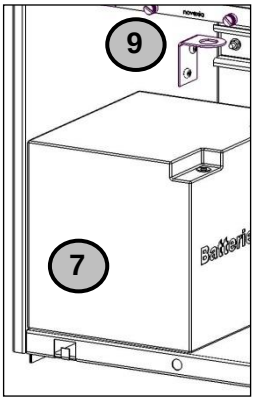
The AUGUSTE cabinet is available in 2 versions:

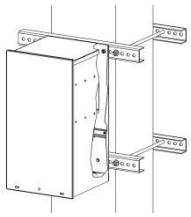
Small cabinet: Cabinet dimensions h x w x d, 625 x 335 x 345 mm

Large cabinet: Cabinet dimensions h x w x d, 782 x 362 x 300 mm

The cabinets are broken down into several sub-assemblies accessible at different access levels.

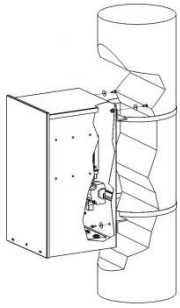






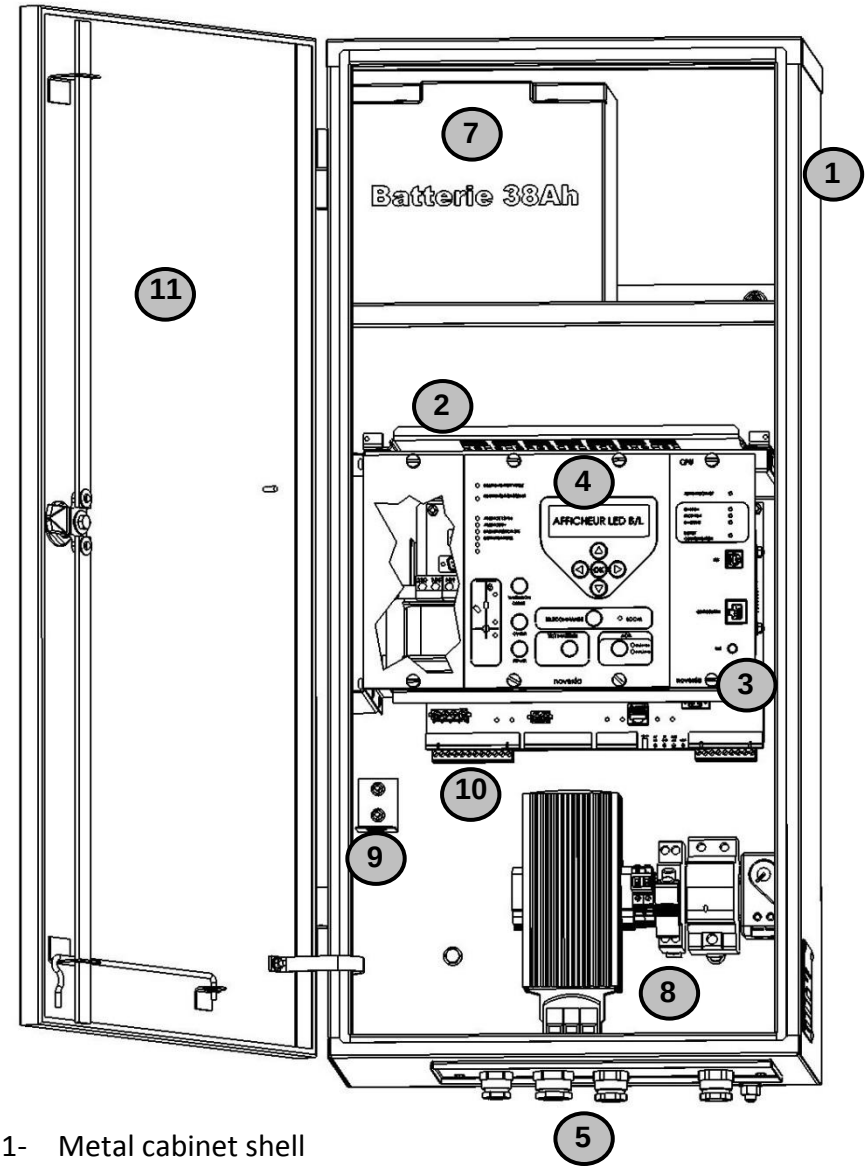
Clamp mounting
fastening / square pole

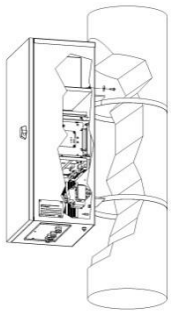
6



Strap mounting
fastening / circular pole

12





Clamp mounting
fastening / square pole

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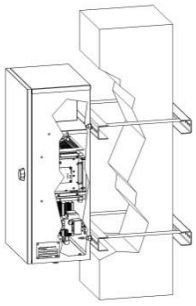


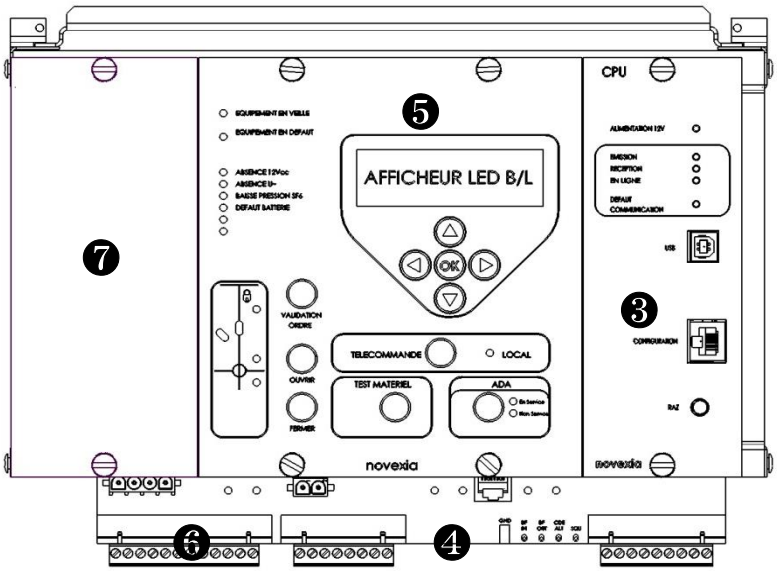
Strap mounting
fastening / circular pole

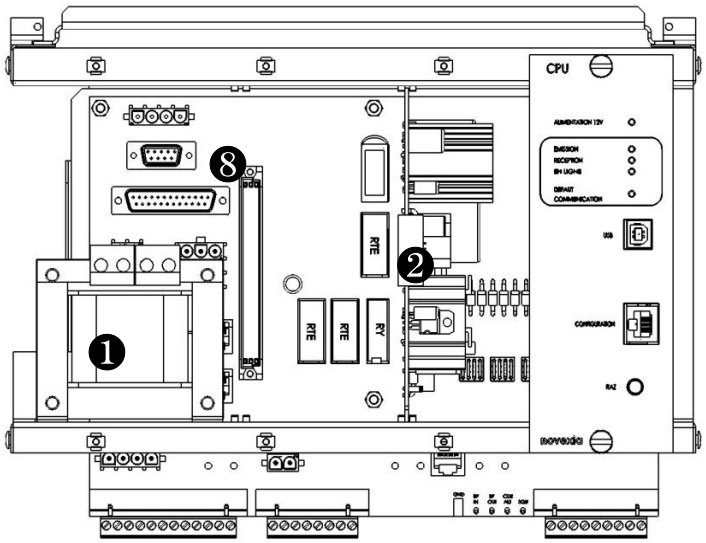
12

1- Metal cabinet shell
2- Metal drawer containing the communication system
3- Card rack containing the power supplies, the CPU, the voltage and current acquisition modules, the modem card and the circuit breaker control interface
4- User interface (UI)
5- Packing gland for the passage of external cables (electrical control, sensors, etc.)
6- Hardware for attaching the cabinet to a round or square post
7- Battery (autonomous source)
8- 230V AC supply connection and over-voltage protection
9- Radio interface: Radio antenna connection area
10- Electrical control connectors (male and female)
11- Door
12- Brackets for attaching the cabinet to a square post

Description of the card rack:

The rack is made up of 8 functional units shown in the diagram below:

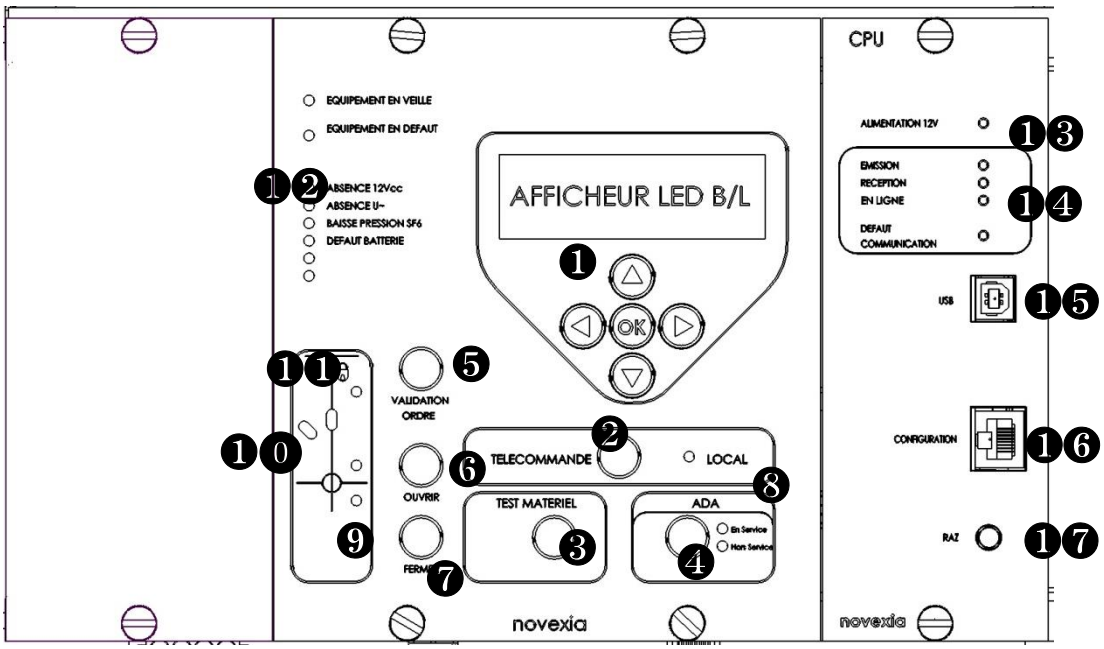




1- Product power supply transformer.
2- 12V module: Charges the battery and delivers the cabinet internal and external power supply. The module also has automatic protection of the battery and loads (internal and external).
3- CPU / modem / acquisition: Supervises all of the equipment and supports the modules: current, voltage and RTC or radio modem.
4- Backplane board: Connection interface for internal and external equipment (cards, cables, sensors, etc.).
5- User interface: Allows the user to exchange information with the product (display of certain cabinet parameters).
6- Switch control connector
7- Board supporting the optional modules: 230V plug, door switch, light
8- Position for **additional In/Out module**

<u>Description of the user interface (UI):</u>

The user interface is available at access level 1. It allows the user to display certain equipment parameters.



1- **Display/navigation button module:** Displays product information
2- **Remote control button:** Selects local or remote mode.
3- **Equipment test button:** Lights up all of the lights to check their proper operation.
4- **ASF button:** Turns the automation (ASF) on/off. When ON is lit, the ASF automation is operating. When OFF is lit, the ASF automation is not operating.
5- **Order validation button:** To be used simultaneously with the open/close button.
6- **Open button:** Open command
7- **Close button:** Close command
8- **Local light:** Local mode is indicated when the red indicator light is on. If the light is off, it is in remote control mode.
9- **Fault indicator light:** Displays fault signals. In the case of a Current detector, the green light signals a fault between Phase and Earth, the red light signals a fault between Phases.
10- **Position indicator light:** Position (open/closed) of the circuit breaker.
11- **Locking indicator light:** Blinking indicates disengagement of the AUGUSTE motor and/or locking of the AUGUSTE by the manual control lever.
12- **Cabinet status indicator light:** If the "EQUIPMENT FAULT" indicator light is lit, you should look at the cabinet status information indicator lights or the "Maintenance" Ethernet page to see the cause of the fault.
13- **12V power supply indicator light:** Lit if the cabinet is powered.
14- **Communication indicator lights:** Indicates the traffic present on the communication device. The **"transmit"** indicator light signals information going from the cabinet to the communications device. The **"receive"** indicator light signals information going from the communications device to the cabinet. The **"online"** indicator light signals the connection of the communications device line to a remote communications device. The **"Communication faulty"** indicator light indicates a problem initialising the communications device or that the recipient's telephone number is invalid (several failed attempts to call).
15- **USB port:** Not currently used.
16- **ETHERNET port:** Allows access to the configuration PC interface and communication by TCP/IP.
17- **Reset button:** Pressing this button cuts the cabinet power for a very short period and lights up the CPU module LEDs during the re-initialisation. During this reset, the parameters are reinitialised with the values stored in the EEPROM or the default values if there are no parameters stored in the EEPROM. The time delays are reinitialised, as is the communications device.

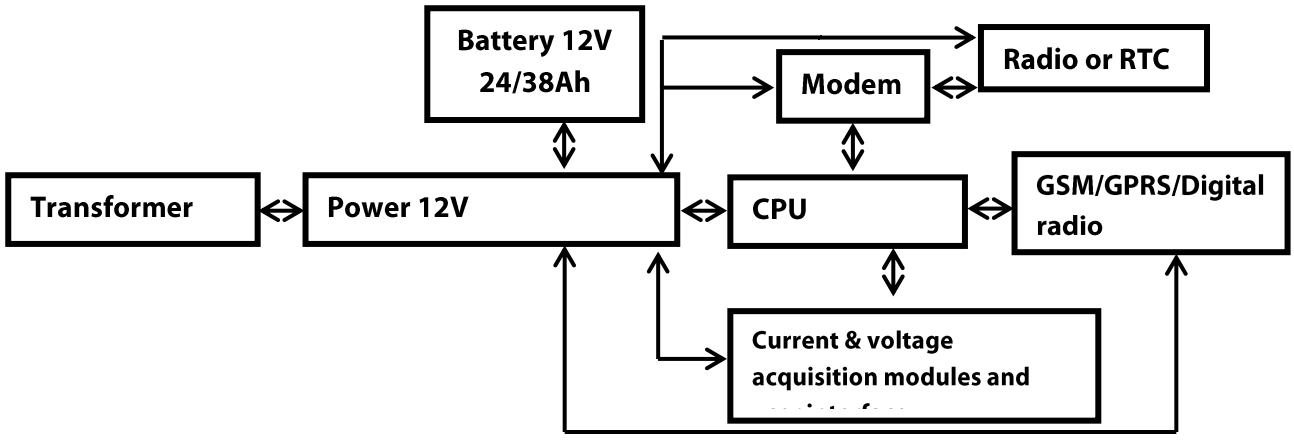
✓ **Sachet of accessories:**

This contains the items necessary for the installation and maintenance of the product.

It contains the following items:

- Replacement fuses: 12V internal (Radio) & 12V or 48V motorisation
- Installation and operation guide
- Hardware for the mounting brackets

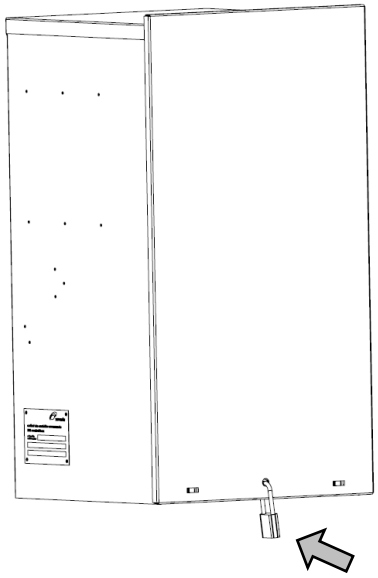
✓ **System block diagram:**

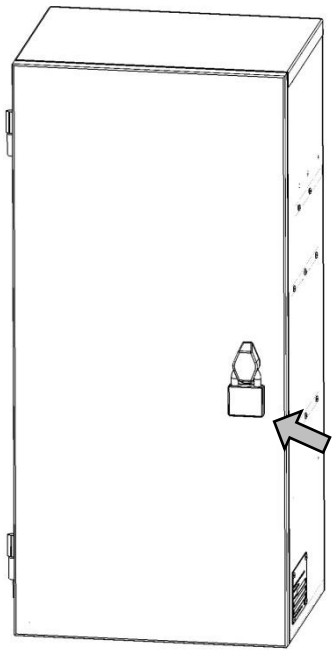


✓ **Access level:**

The cabinets have two access levels as defined below:

-





level 0 > in service: All of the cabinet interfaces are inaccessible. The upper part of the cabinet is padlocked (not supplied by EnstoNovexia).

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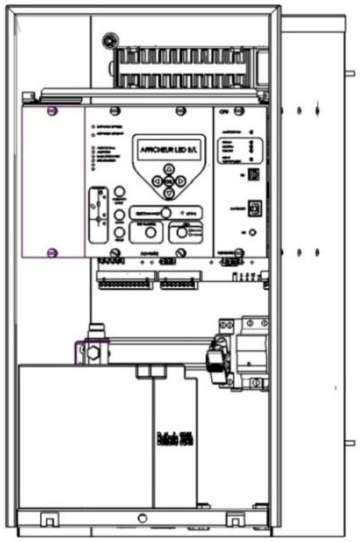
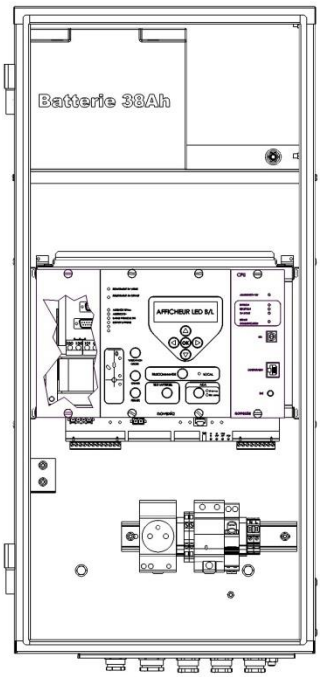




-level 1 >**maintenance**: maintenance technician access (complete accessibility).

1.3. Mechanical specifications

✓ **Characteristics:**

Small cabinet dimensions	H x W x D	625 mm × 335 mm × 345 mm
Large cabinet dimensions	H x W x D	782 mm × 362 mm × 300 mm
Weight *(with battery)*	Small / Large cabinet	30Kg / 34Kg
Shell material		Stainless steel
Protection index		IP55
Mechanical impacts		IK10
Mechanical vibration	According to NF EN 60068-2-6	(10Hz to 500Hz 2 g or 0.15 mm peak to peak)
Resistance to saline fog	NF EN 60068-2-11	Exposure 698h
Earthquake resistance	NF 60255-21-3	Class 2
Operating temperatures	Small cabinet Large cabinet	-25°C to +55°C -50°C to +55°C
Storage temperature		-25°C to +70°C

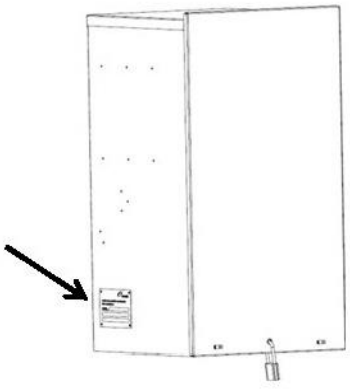
The cabinet has four attachment points >> 260mm centre to centre between the 2 upper holes and 200mm between the 2 lower. × 495mm allowing attachment to the pole support bracket.

✓ **Nameplate**

An easy to see outside plate allows identification of the cabinet.

It gives the following data:

-The protocol
-The serial number
-The product's date of manufacture



✓ **Identification of electronic circuit boards:**

Placed on each electronic circuit board is an identifying serial number and type. The information for each board (serial number and type) are also listed inside the cabinet.

Examples:

2006666 COFFRET ITI2012-1A AUG BT BOLIVIE **N°1300003 Date :2013/11/21**

Board Designation	Novexia code	Serial n°	Board Designation	Novexia code	Serial n°
CPU PR 154 V1.6 - PR148 V1.0	2006215	1300003	BACKPLANE	2005828	1300005
FAULT COUR. DETEC.BOARD PR 175 V1.0	2006207	1300004	CHARGEUR BOARD 8A PR 142 V1.2	2004993	1300006
METALIC BOX BATCH N°	2006515	AA	DISPLAY BOARD PR 144 V1.2	2006210	1300007

Ensto-Novexia customer care : +336 16 66 46 43

Way A

Tests :
CPU FIRMWARE
POWER and CONFIGURATION
FONCTIONAL TESTS
HEATER TEST
OUTDOOR FAULT INDICATOR
CUSTOMER PARAMETERS

Comments :
CPU ref:2006292 - IEC101- PR154 V1.7

English version

Spanish version

2006666 COFFRET ITI2012-1A AUG BT BOLIVIE **N°1300001 Date :21/11/2013**

Designación tarjeta	Código Novexia	Serial n°	Designación tarjeta	Código Novexia	Serial n°
MODULO UC PR 154 V1.6 - PR148 V1.0	2006215	1300001	PLACA BASE	2005828	1300004
TARJETA PASO DE FALTA PR 175 V1.0	2006207	1300002	TARJETA CARGADOR PR 142 V1.2	2004993	1300005
CONJUNTO CAJA METALICA N°	2006515	AA	TARJETA DE VISUALIZACION PR 144 V1.2	2006210	1300006

Ensto-Novexia customer care : +336 16 66 46 43

Via A

Tests :
PROGRAMACION UC
ALIM. y PARAMETRIZACION
PRUEBAS FUNCIONALES
PRUEBAS LAMPARA EXT.
CONFIGURACION CLIENTE

UC ref:2006292 - IEC101- PR154 V1.7

1.4. List of equipment required for installation

When preparing an installation site, check that the following equipment is present

✓ **Battery:**

The batteries used in operation meet the following criteria:
- Stationary lead, sealed type with valve according to NF EN 60696-21 and 22
- Maximum dimensions: 195mm x 160mm x 170mm
- Initial capacity: 38 Ah or 24 Ah
- Connection by insulated screw terminals type M5

If the low voltage supply is absent, the storage battery can provide power to the cabinet. In addition, the battery provides the power required to motorise the circuit breaker during a manoeuvre.

✓ **Cabinet attachment element:**

To hold the bracket to the post, use metal strapping.

✓ **Ethernet cable:**

A straight Ethernet cable (standard business cable) is required to connect the PC to the cabinet.

✓ **Tools:**

Only standard tools are necessary for installation of the product (spanners, screwdriver, etc.), except for the step of strapping the bracket to the post.

✓ **Current sensor and connecting cable:**

The sensors take instantaneous measurements of the three HTA line currents to detect faults and to capture the analogue values.
The coils and connecting cables are pre-installed on the AUGUSTE circuit breaker.

On the sensitive detection version, the sensors take instantaneous measurements of the 2 line currents and any fault current to earth.

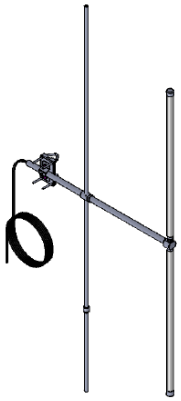
✓ **Capacitive voltage sensor and connecting cable:**

The transducers measure the individual HTA voltages to detect directional faults and voltage presence.
When the option has been requested, the voltage sensors and the connecting cable are pre-installed on the AUGUSTE circuit breaker.

Sampling by the voltage acquisition card allows reading of the head capacitors with values between 16.8pF and 25.2pF for HTA voltages between 15kV and 20kV. The sampling method is described in §4.2.

✓ **Radio antenna and support (only used for the RADIO version):**

Install a communications antenna in accordance with the internal specification C1CDC A5917-001.



2 Installation

2.1. Installation operations

2.2. External connections

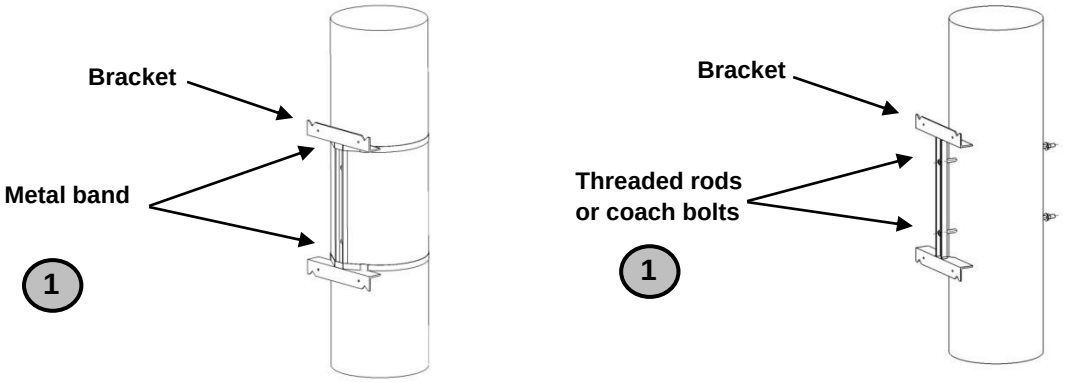
2.3. Earthing instructions

2.1. Installation operations

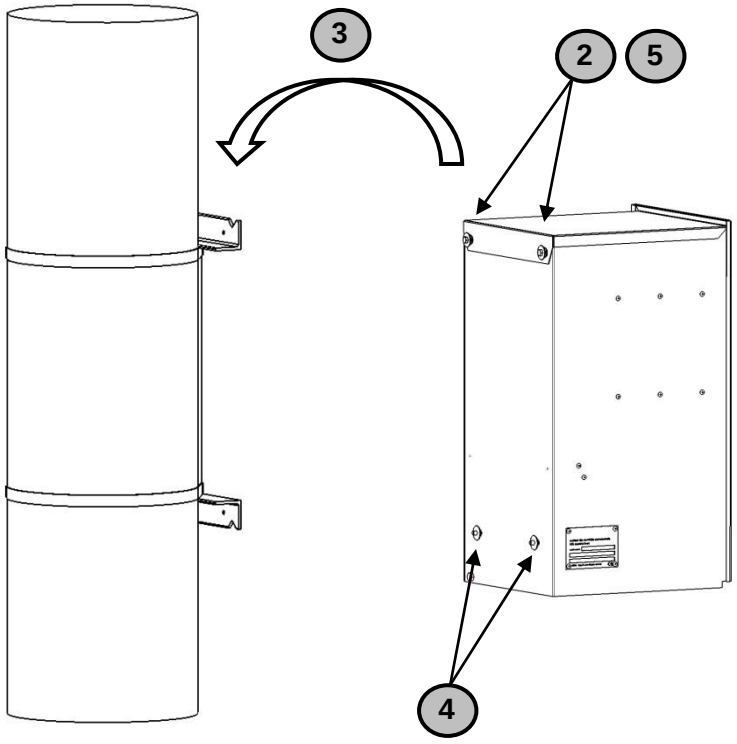
There are two types of attachment used to install a cabinet on a post:

- **With the mounting brackets**

✓ **Step 1**: Attach the support bracket to the pole using metal band, threaded rods or coach bolts.

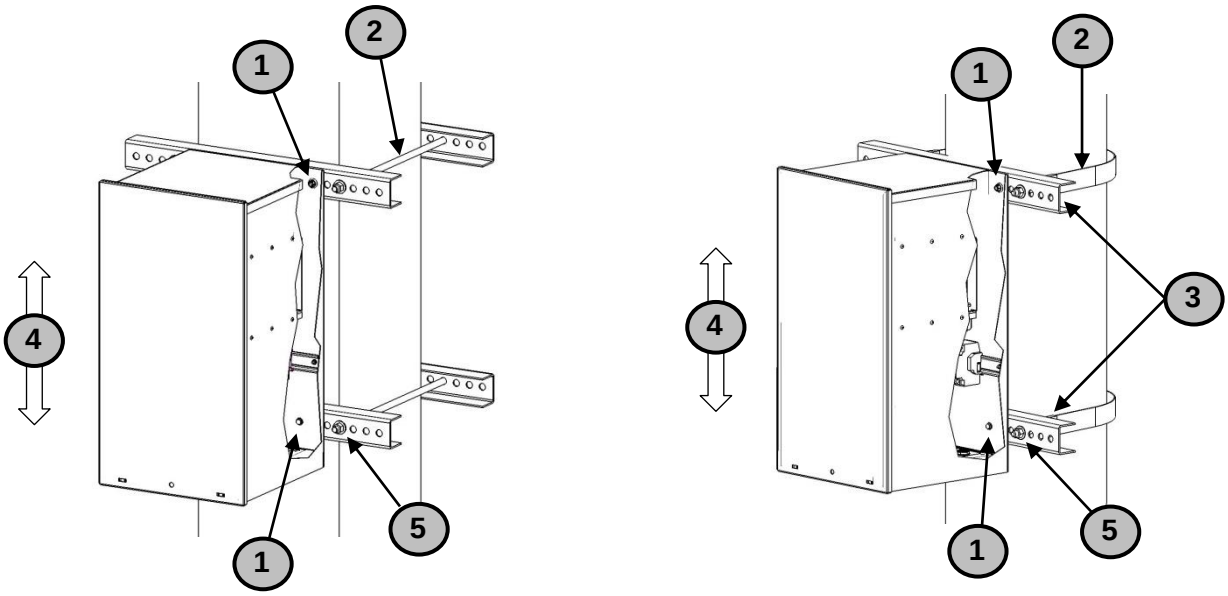


✓ **Step 2: Outside** the cabinet >>> screw in the two top screws by 10mm.
✓ **Step 3:** Hang the cabinet on the bracket.
✓ **Step 4: From the inside** of the cabinet, screw in and tighten the two lower screws.
✓ **Step 5:** Tighten the two top screws.



- By direct attachment

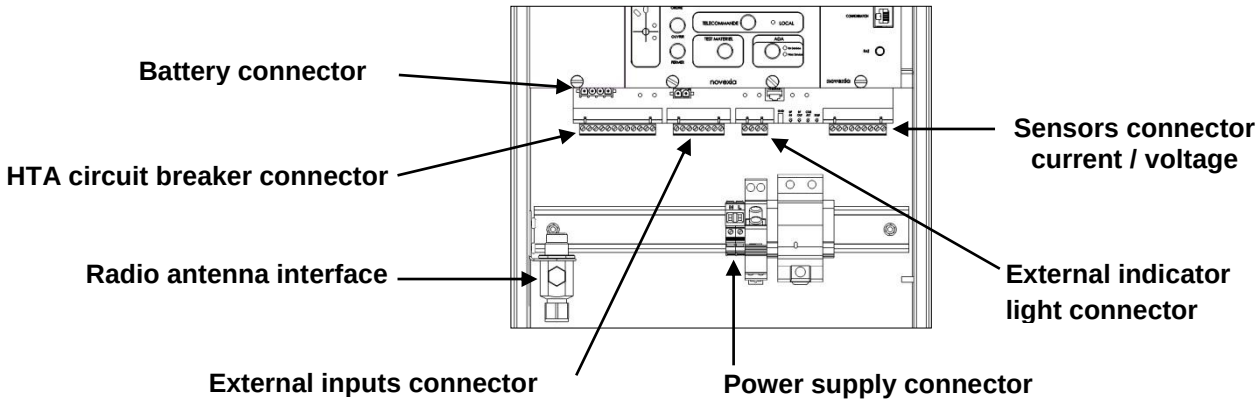
✓ **Step 1:** Attach the two brackets to the cabinet (screws supplied by Novexia).
✓ **Step 2:** Measure and cut two pieces of the supplied band (strap mounting) or measure and cut 4 M12 threaded rods not supplied (clamp mounting).
✓ **Step 3:** Fit the supplied tightening devices to the ends of the 2 bands.
✓ **Step 4:** Attach the bracket to the cabinet and position it at the desired height.
✓ **Step 5:** Tighten the assembly in position.

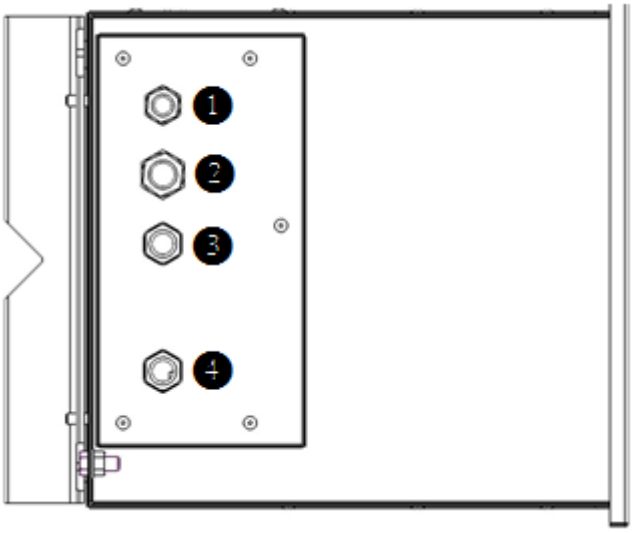


2.2. External connections

✓ **Location of the various packing gland and connectors:**

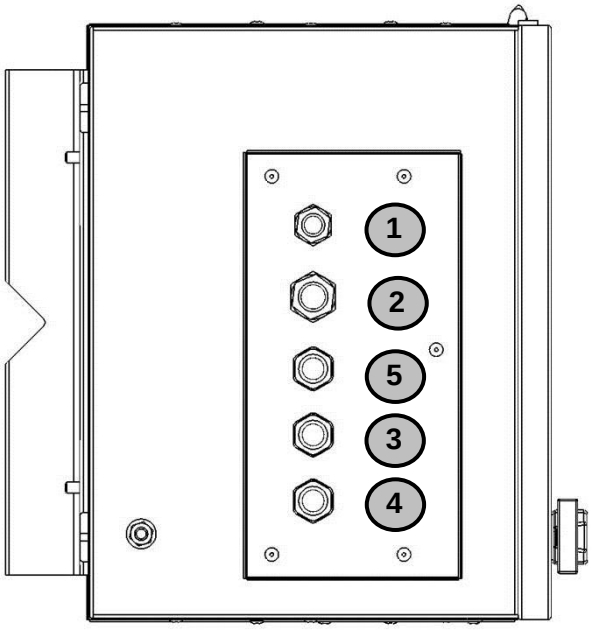
The purpose of these assembly drawings is to facilitate connection of the external elements to the product (battery, current sensor, communications, etc.)





Bottom view of small cabinet

1- Radio antenna connection packing gland
2- AUGUSTE circuit breaker connection packing gland
3- Cabinet power connection packing gland
4- Current sensors connection packing gland
5- Spare packing gland

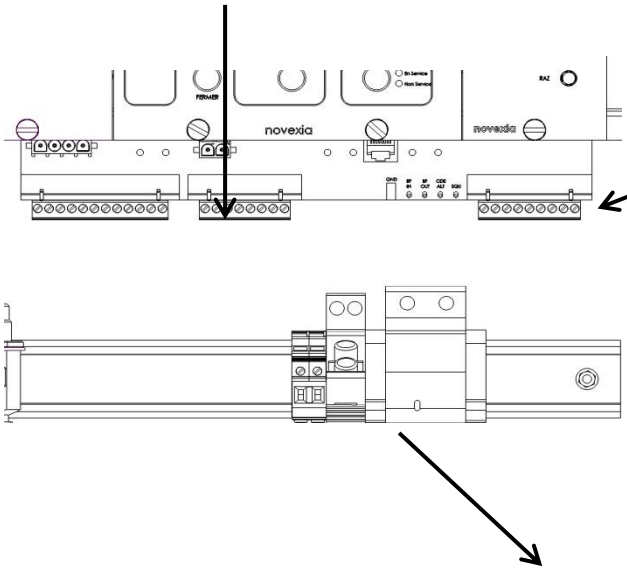


Bottom view of large cabinet

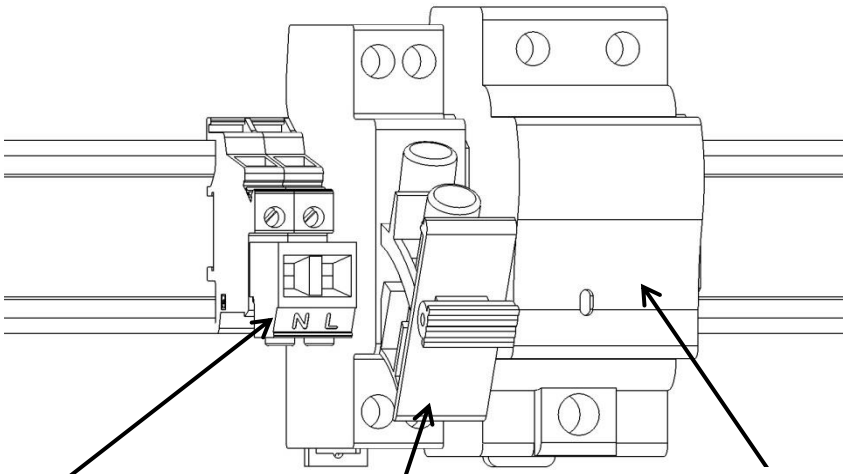
External connector including:

- External signalling

- Reserve inputs



Voltage and current sensor connector



AC power
101V/135V/230V

Lighting protector

- Fuse-Holder *(Includes a spare fuse).*or a - Thermo-magnetic breaker

✓ **Connection:**

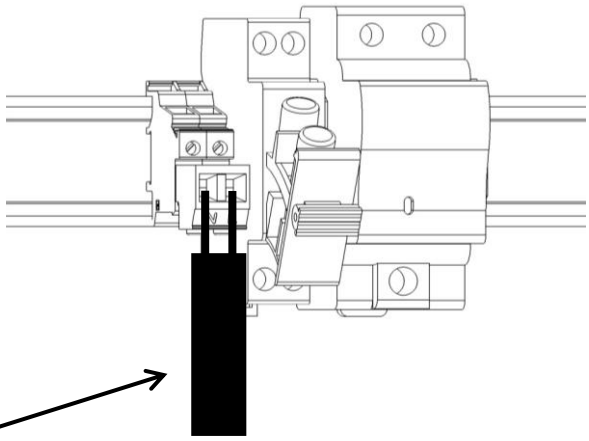
To facilitate the connection stage of external elements, refer to §2.2. "Location of the various packing gland and connectors".

- Cabinet power supply:

The cabinet being at access level 1, open the AC power supply circuit fuse and remove the power supply fuse.
Then insert the **power supply connection cable** into the packing gland provided for this purpose.

To complete this operation, connect the cable to **the power connector** (Neutral to the left, phase to the right).

Note: It is possible to unplug the connector to perform this operation.



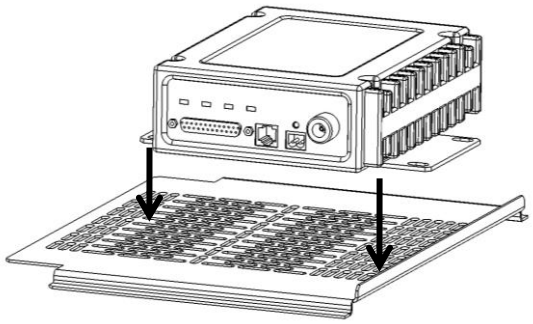
- Transmission by RADIO – GSM/GPRS – external RTU communication:

Note: The data and radio power cables are pre-connected at the factory depending on the type of radio requested.

1-Position the cabinet to access level 1

2-Pull out the metal communications drawer.

4-Attach the communications system to the support.



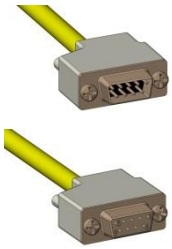
5-Connect the equipment **power** cable to the supplied connector as shown.

The **data cable** is already connected with the 25pts connector on the back plane. In the event that this connection is not adequate with your device's communication, it can be changed by following the instructions below.

>>>>>>> See DATA cable 9 pins F plan *C50710035* or DATA cable 9 pins M plan *253077* as appropriate.

25pts connecter Nb — *9pts connecter Nb*

1, **7**, **11** ----------0V---------- **5**
2 ----------TX -----**>>**---------- **3**
3 ----------RX ----**<<**---------- **2**
4 ----------RTS ---**>>**
5 ----------CTS ---**<<**
6 ----------DSR ---**<<**
20 ----------DTR ---**>>**
9 ---------- +12V / +5V



7- Connect the radio or the GSM/GPRS to the antenna connector

8-Close the drawer.

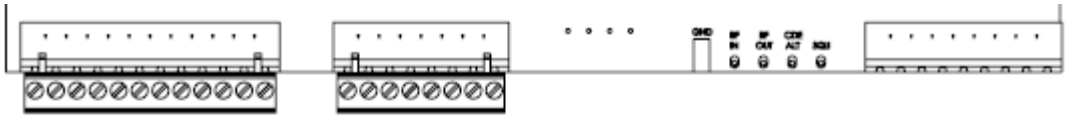
To complete the assembly, connect the **radio antenna interface** to the communications antenna.

- Current sensors (coils):

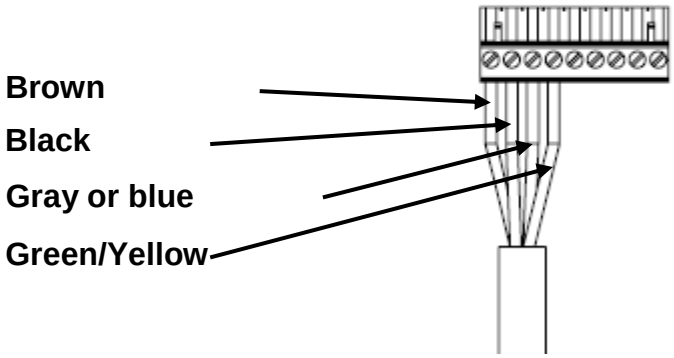
The current sensors and the connecting cable are pre-installed on the cut-off device (AUGUSTE circuit breaker).

Introduce the **current sensor connection** cable via the dedicated packing gland.

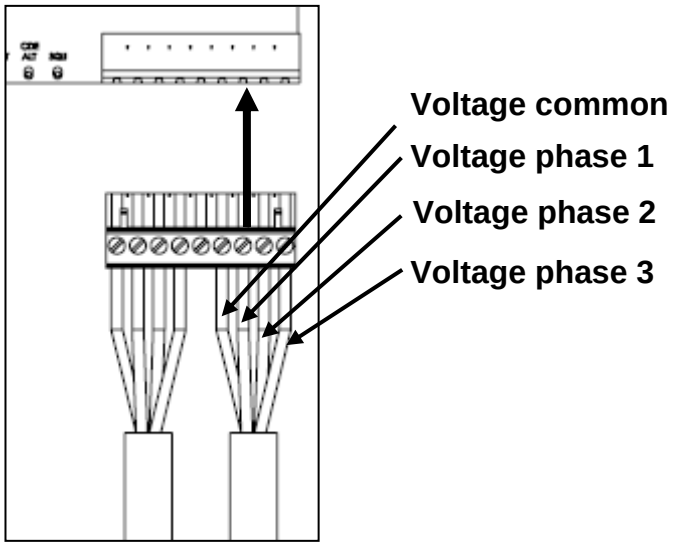
Connect the current sensor connection cable to the green 9-pin connector on the backplane board. **Properly connect the wires to the connector.**



Brown: Current phase 1
Black: Current phase 2
Grey or blue: Current phase 3
Green/yellow Current common



Note: It is possible to disconnect the green 9-pin connector to simplify connection.



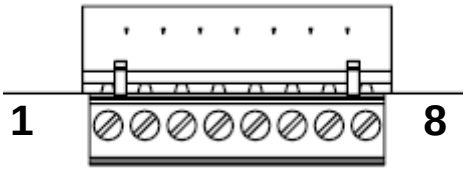
Voltage sensors (capacitive divider):

The voltage sensors and the connecting cable are pre-installed on the cut-off device (AUGUSTE circuit breaker).
Introduce the **voltage sensor connection** cable via the dedicated packing gland.
Connect the voltage sensor connection cable to the green 9-pin connector on the backplane board (shared with the current sensors).
Properly connect the wires to the connector.

External signalling connector (on the backplane board):

This contains the external Remote signalling (for example: Door switch) and reserved connections.

Identification of the pins of the external connector:



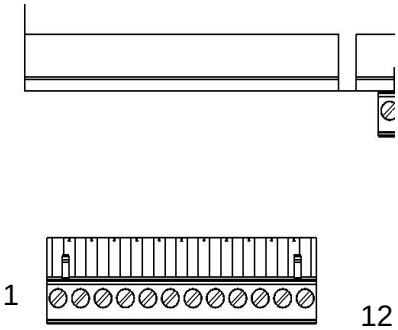
Pin no.	Function
1	Urgent fault on external equipment
2	Non-urgent fault on external equipment
3	0V
4	Water level alarm
5	Door open alarm
6	reserved 3
7	reserved 4
8	0V

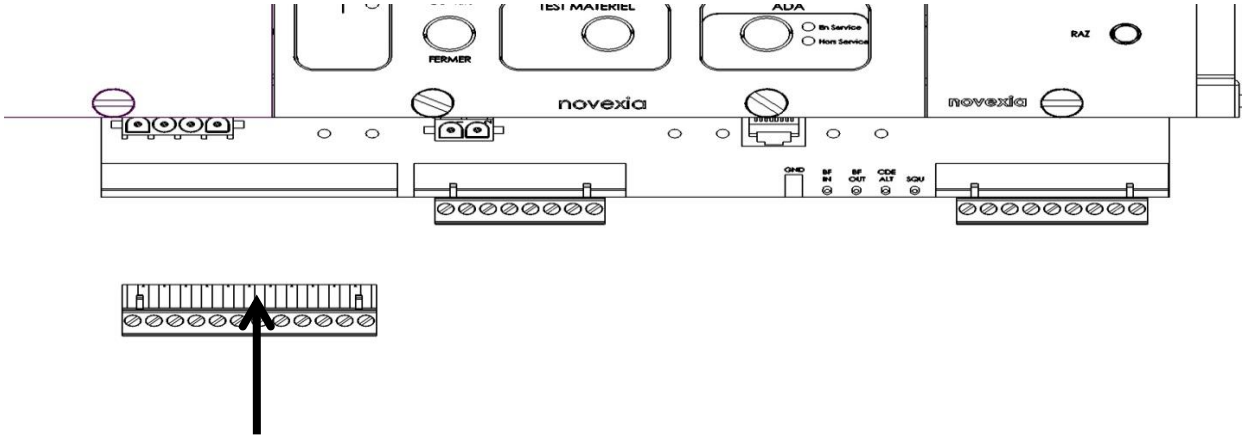
Electrical control of the AUGUSTE circuit breaker:

The 12-pin connector is to be connected to the AUGUSTE circuit breaker connector cable (on the backplane).

Identification of control pins:

Pin no.	Connecting cable wire no.	Function
1	1	Low SF6 pressure (option)
2	2	0V
3	3	Switch open
4	4	Motor -
5	5	Switch closed
6	6	Motor -
7	7	Manual mode
8	8	Motor -
9	9	Reserved
10	10	Motor +
11	11	Reserved
12	12	Reserved





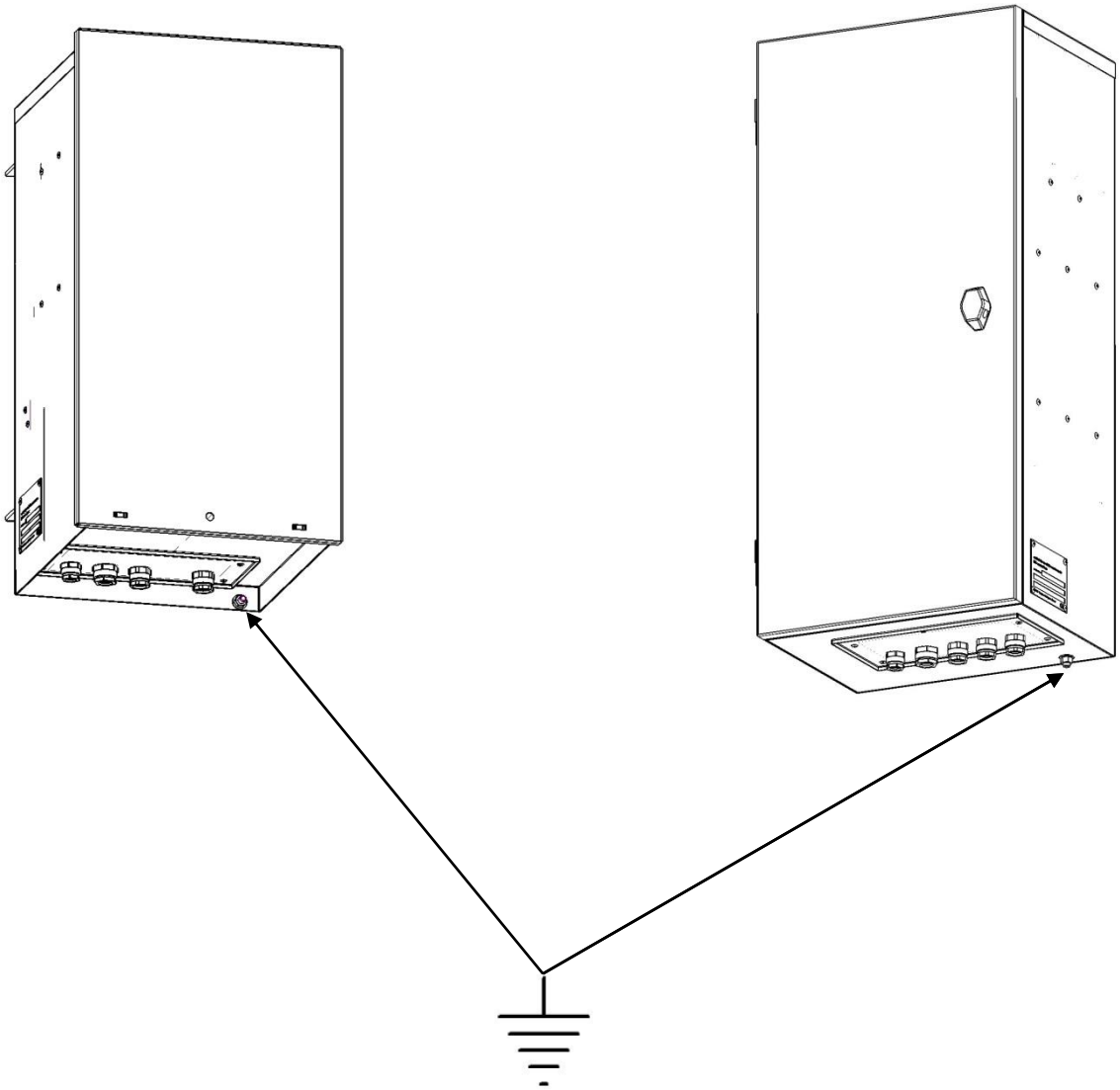
Then plug the connector into the male part.

Make sure you re-tighten all of the packing gland.

2.3. Earthing instructions

Undo the M8 earthed bolt nut.
Remove the two washers (flat and locking).
Place the **earthed terminal connected to the equipment** on the bolt.
Place the two washers on the bolt and hold it all
with the nut.

A missing or bad earthing may cause malfunction of your control cabinet.



3 Commissioning

3.1. Points to be checked before commissioning

3.2. List of commissioning operations

3.3. Operational tests

3.1. Points to be checked before commissioning

Check the product with a simple visual examination (cabinet and user interface without impacts). Check the battery charge.

3.2. List of commissioning operations

✓ **Powering up the product:**

Connect the battery cable to the autonomous power source.

Pay attention to the connector polarity

Insert the battery into its housing and connect it to the equipment (see §2.2)

Connect the power cable from the AUGUSTE. Place the power supply fuse into its holder and close the fuse door.

The equipment is now powered up

✓ **Configuration:**

In this phase the equipment is configured. To do this, it is necessary to use a computer with an Ethernet connection and the web browser Internet Explorer.

If Java is not installed on your PC, you need to install it:

Download address:
https://www.java.com/fr/download/manual.jsp

Initially, it is necessary to establish a connection between the equipment and the embedded software.

Note: The PC used must have at least Windows XP, an Ethernet connection and the web browser Internet explorer, and the software Java for your operating system (Windows XP, Windows 7, Windows 8) of your computer (in 32 or 64 bytes)

Modification of an IP address on a PC

The connection to the new ITI2012 cabinets is via an Ethernet port and uses the IP protocol. Therefore, for this to work, you must give the configuration PC an IP address in accordance with that of the cabinet.

The IP address of the cabinets is common to all of our products and is:

- @ IP: 192.168.0.1
- Subnet mask: 255.255.255.0

The configuration PC address must be:

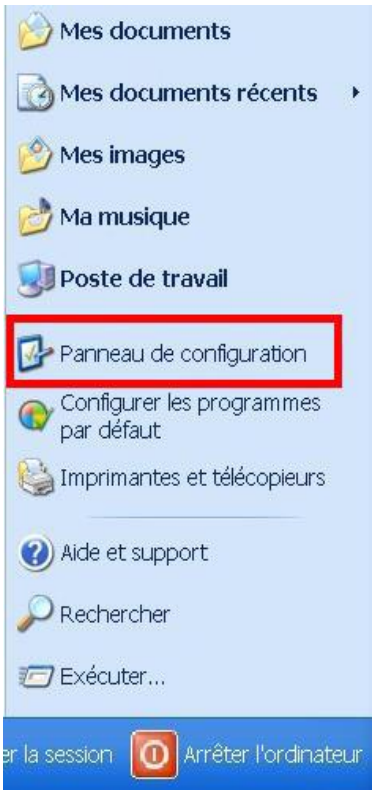
- @ IP: from **192.168.0.2 (or up to 192.168.0.254) except address 192.168.0.10**
- Subnet mask: **255.255.255.0**

On each PC, this operation only has to be performed once to connect to all cabinets.
It is essential to have administrator rights to modify the PC IP addresses.

Note: After configuration, if this PC must be connected to one or more networks, you should change its IP address in order to make it compliant with the network addressing scheme (fixed IP, DHCP).

See below for the method of modifying the PC IP address for the various PC operating systems:

- Windows XP

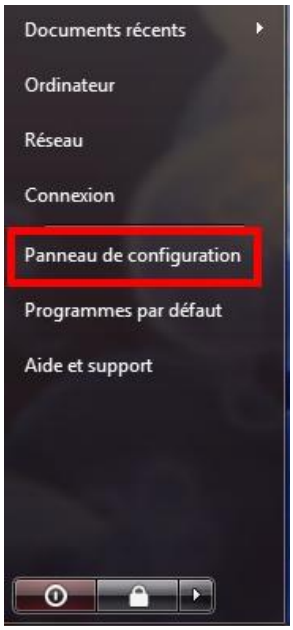


In the “Start” menu, select “Control Panel”;

Select the icon “Network Connections”

For the rest of the procedure, refer to § “Parts common to all OSs”.

- Windows Vista

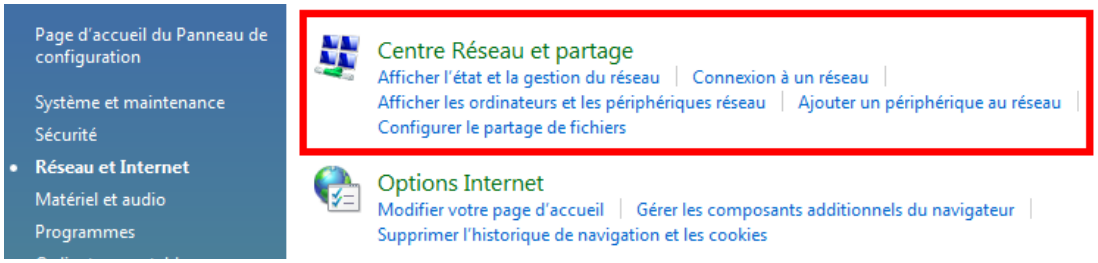


In the “Start” menu, select “Control Panel”.

①First case: Display by “Control Panel home page”

②Select “Network and internet”

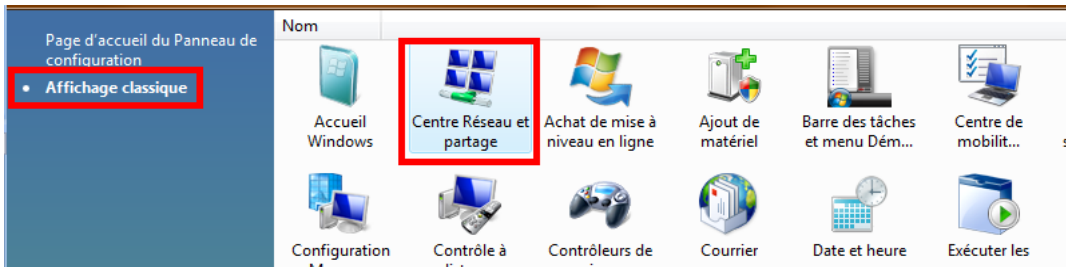
Then



Select “Network and sharing centre”

② Sélectionnez « Centre Réseau et partage »

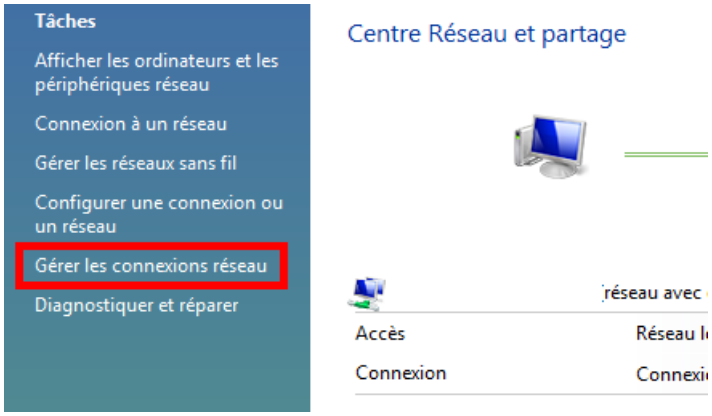
Second case: ①"Classic" display



①

②Select "Network and sharing centre"

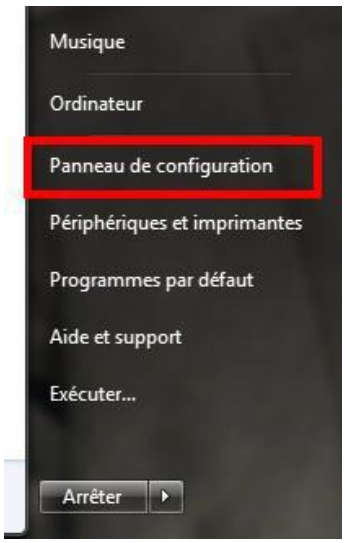
② Sélectionnez « Centre Réseau et partage »



In the left side band, select "Manage network connections"

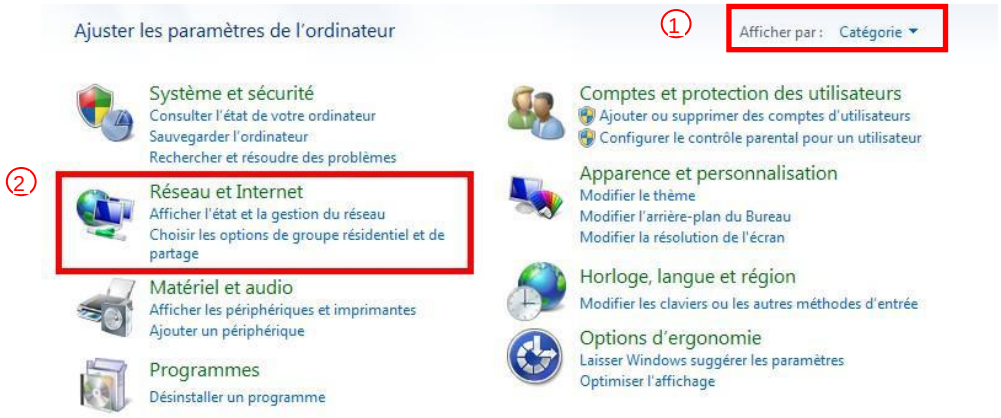
For the rest of the procedure, refer to § "Parts common to all OSs".

- Windows 7



In the "Start" menu, select "Control Panel";

First case: ①"Category" display

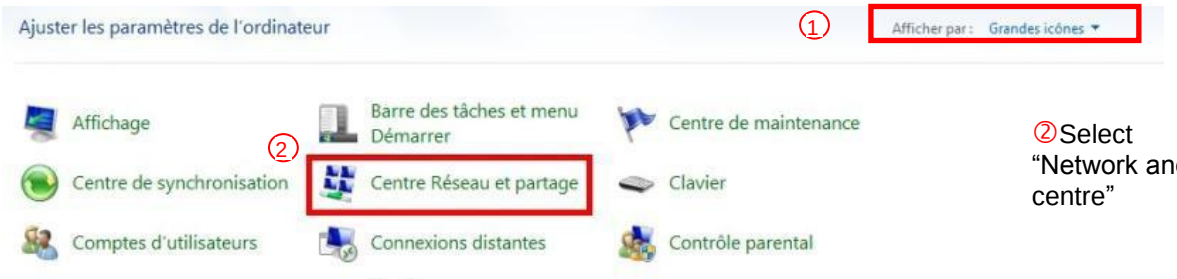


②Select "Network and Internet"

Then

Select
"Network and sharing centre"

Second case: ①"Large icons" or "Small icons" display



②Select
"Network and sharing centre"

In the left side bar, select "Modify card parameters"

For the rest of the procedure, refer to § "Parts common to all OSs".

- Windows 8

First case: Using the desktop tiles

Click on the tile labelled "Office"

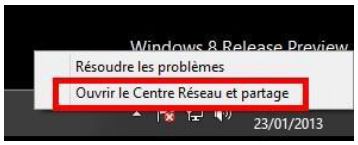
Second case: Using the hidden menu to the right of the desktop

Mouse: To display the menu at the right, move the mouse to the extreme right of the screen

Touch: Place your finger at the extreme right of the screen

Select the "window" icon

Right-click on the network icon in the right menu bar.



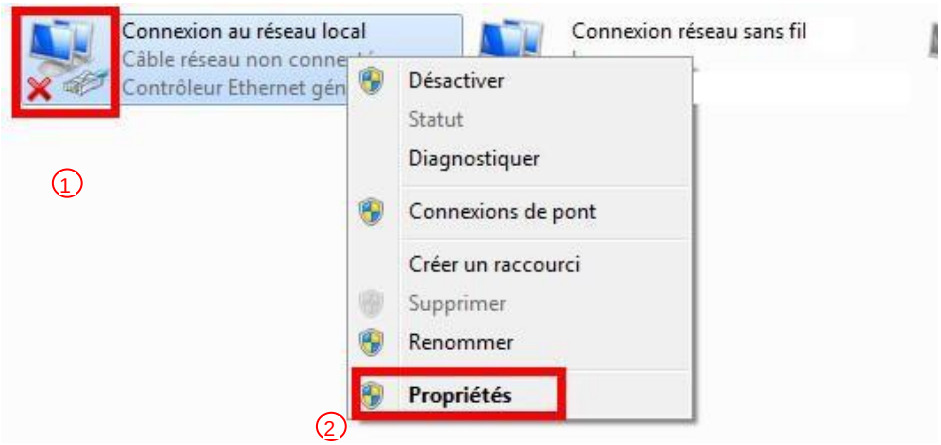
Select “Open the network and sharing centre”

In the left side bar, select “Modify card parameters”

For the rest of the procedure, refer to § “Parts common to all OSs”.

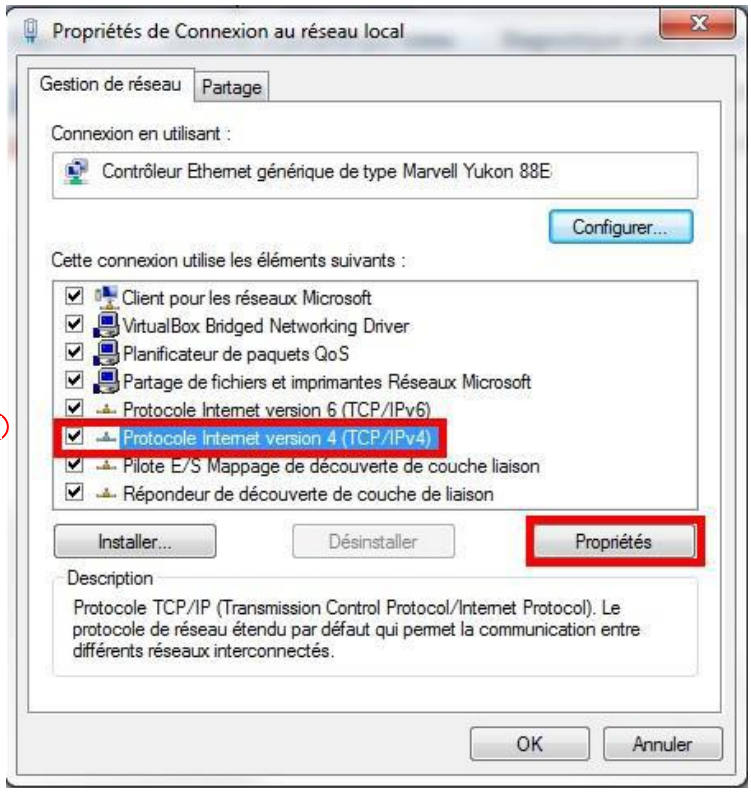
- <u>Parts common to all OSs</u>

In this part, the procedure for all operating systems (Windows XP, Windows Vista, Windows 7 and Windows 8) is the same except for small visual differences.



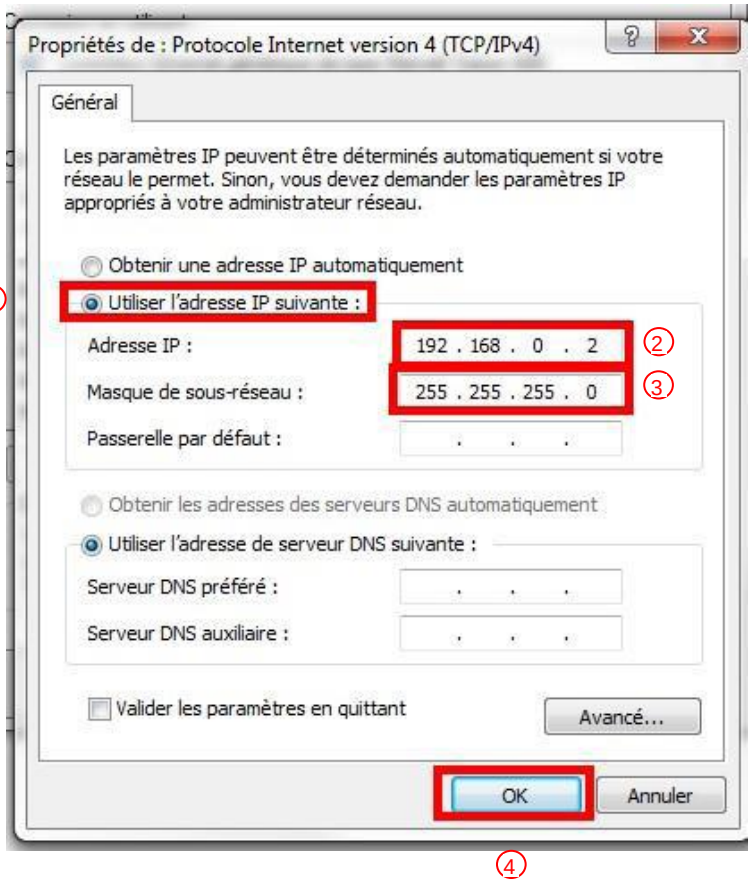
① Select and right-click the icon to display the context menu for the network connection that will be used.

② Select “Properties”



① Select “Internet Protocol (TCP/IP)” or “Internet Protocol version 4 (TCP/IPv4)” (without deactivating the check-box)

② Select “Properties”



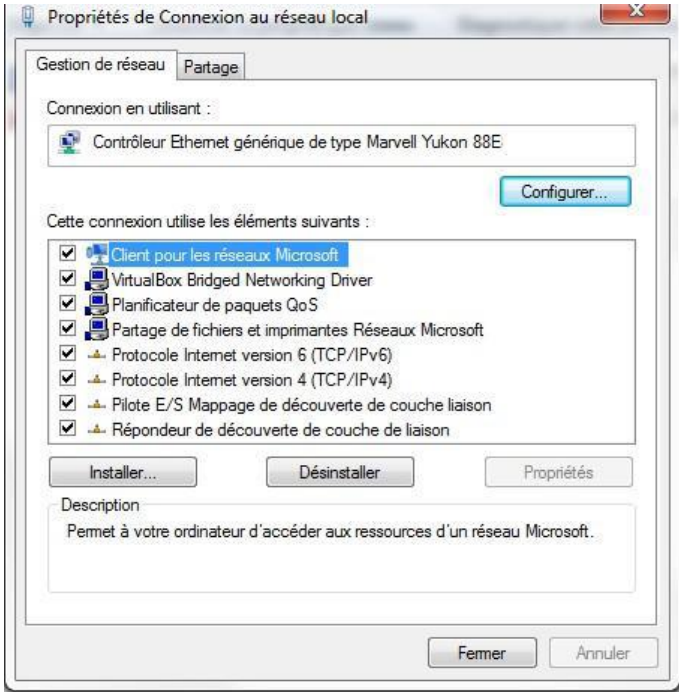
① Select “Use the following IP address”

Enter:

② the IP address

③ the sub-net mask

④ Confirm with “Ok”



Select “Close”.

The IP address change is effective.

Next connect your PC to the cabinet’s Ethernet port using the cable.
Open the Ethernet browser and enter on the address bar: **http://192.168.0.1**

You are then taken to the home page of the embedded software. Once the home page is displayed on the PC, operation and maintenance modes are available.

Operation mode only allows you to browse the product status, the configuration parameters and information relating to the network.

In order to programme the cabinet parameters, it is necessary to go to **Maintenance mode** (default password “novexia”). In addition, put the product in local mode to access the configuration.

For remote configuration: Enter the password “remote” to modify any parameter.

The minimum parameters to be configured are the following:

- Maintenance and commissioning menu:

> Programme the date and time automatically (set to the computer's time) or manually (enter the parameters)
> Start up the battery
> Verify the cabinet type "aerial"
> For remote configuration, enter the gateway address.

- Fault detection menu:

> Define the parameters for fault detection (Current or Directional)

In Directional fault detection mode, calibrate the voltage sensors (see §4.2. for the method)

- Communications device menu:

> Configure the type of support

- Communications Protocol menu:

> Configure the protocol

- Double and single remote signalling protocol menu:

> If necessary, configure the double and single remote signalling

- Remote measurements menu:

> If necessary, configure the remote measurements and counters

- Automation configuration menu:

> If necessary, programme the automation (ASF)

For more information, refer to §4.2 (commands, tests, configuration)

Perform the operational tests as given in §3.3.

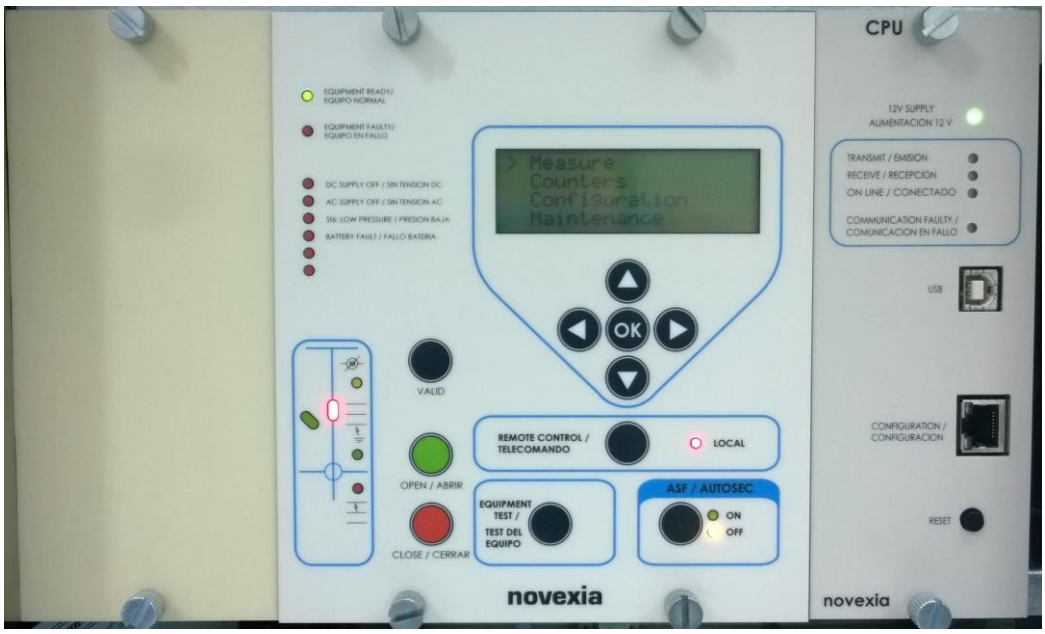
Switch to remote control mode (on the user interface).
Close the cabinet to complete this phase of commissioning (see §1.2 > Access levels).

3.3. Operational tests

The description of the user interface is available in §1.2.

Using the local panel, check the display of the following information:

12V POWER SUPPLY indicator light	STEADY ON
EQUIPMENT IN STANDBY indicator light	BLINKING
LOCAL indicator light	STEADY ON
POSITION indicator light	STEADY ON RED OR GREEN (if circuit breaker or simulator connected)
LOCKING indicator light	OFF OR BLINKING (depending on the position of the manual control)
TEXT display	**>Measurements Counters** **Configuration Maintenance**



✓ Press the **EQUIPMENT TEST** button and check that all the indicator lights come on and that the display is greyed out.

For the following commission operations, it is necessary to use the display/navigation button module. A note relating to the use of the local panel is available in §4.2.

✓ *Test*:

The internal test routines are displayed. Also, advanced functions such as fault detection and ASF automation are controllable via devices sold by EnstoNovexia.

- Battery test:

The equipment includes a battery test function to check that it is in good condition.

Maintenance Battery test Press the "OK" button

20 seconds later, the screen will display the message: **"Battery test OK" or "Battery test HS"**. If the procedure failed, refer to §5.2 (corrective maintenance) to research the cause of the problem.

- Fault detector test:

To start this test, use the display/navigation button module:

Maintenance Detector test Press the "OK" button

The blinking of the fault lights indicates that the detector is working correctly. If the procedure failed, refer to §5.2 (corrective maintenance) to research the cause of the problem.

✓ *Calibration procedure: (if voltage sensors are installed)*

Once the circuit breaker is connected to the network under power, the voltage sensor calibration procedure can be started from the display/navigation button module.

Maintenance V Sensor Cal Press the "OK" button

After 10s, the display will show the status of the calibration procedure (OK or failed). If the procedure failed, refer to §5.2 (corrective maintenance) to research the cause of the problem.

- ✓ Perform communication tests with the operating station and check the proper return of information to the remote control centre.

- ✓ Check the proper operation of the electrical control of the MT circuit breaker. To do that, perform an open/close cycle (via the local panel by simultaneously pressing the order validation and the open or close buttons) and check the correspondence between the position of the circuit breaker and the position indicator lights available on the user interface.

4 Operation

4.1. Functions

4.2. Commands, tests, parameters

4.3. Upgrade with new functions

4.1. Functions

The cabinet contains, with reduced space requirements, all of the functions required to remotely control an AUGUSTE circuit breaker. In addition, it can detect line faults, for example, a branch fallen on the line.

The purpose of the product is to make the MT network more reliable and reduce power blackouts to the end user (industry, households, etc.)

The cabinet can use different communication protocols (HNZ, IEC870-5-101, DNP3, IEC870-5-104, Modbus, PUR). It can also be supplied without a communications protocol by including an additional module (module 16I/O) that can interface to an external RTU.

Several variants are available to meet all communications needs (RTC, RADIO & External modem).

They can be viewed and configured by PC using the embedded HTML pages in the equipment. Certain parameters can be viewed on the local panel.

4.1.1 Energy workshop function

Functional description

The energy workshop consists of:

Overvoltage protection
Vn: 230V, power capacity: 15kA (Soulé type PM15BI)

Primary isolation transformer 100VA with protective screen
0V – 101V – 135V – 230V (V±15%) (to be connected depending on the LV voltage)
secondary: 0V – 27V = 3A

dielectric resistance: primary/screen: 4kV 50Hz – 1mm, 5kV with a shock wave of 1.2/50µs
secondary/screen: 4kV 50Hz – 1mm, 5kV with a shock wave of 1.2/50µs
primary/secondary: 4kV 50Hz – 1mm, 5kV with a shock wave of 1.2/50s

Earth/primary, secondary & screen: 4kV 50Hz – 1mm, 5kV with a shock wave of 1.2/50µs

Battery charger

- Battery voltage 12V. The charger is voltage regulated with temperature compensation and a 3.5A current limiter. The charge curve is specific for each battery type, batteries must be replaced with batteries of the same type and brand. The supply board can provide 15A for 50ms and 6A for 7s for controlling the motor.

- Management of the 12V power supply required by the cabinet. Fuse F1 (4A) protects the charger. Fuse F2 (6.3A) protects the motor power supply. In standby or during operating cycles, the voltage is 12V +30%, -10% depending on load and ambient temperature.

- residual ripple less than 1% from 50Hz to 3kHz

- 0V connected to earth

- battery protection against deep discharge

- after an AC voltage loss of 16 hours, the loads fed by the battery are disconnected (the cabinet is no longer powered).
Restart of power by:
    * return of the AC voltage
    * pressing the reset button which restarts the cycle of load powering for 16 hours

- In the case of excessive consumption by your communications equipment (I > 2A for more than 2 min.) the 12V power supply circuit is disconnected. The power supply is restarted by the reset push button which reinitialises the cabinet.

- Monitoring of the AC voltage. The loss of AC voltage (V<30%) is signalled by:
    * Remote signalling: “loss of AC voltage”
    * a red indicator light appears on the front panel of the local module panel

- periodic battery test: periodically tests the 12V batteries. A battery test system is incorporated into the battery charger. The battery capacity is systematically tested every 24 hours.

Values measured:
- battery voltage: 12V ±2%±0.1V 48V ±2%±0.4V (depending on model)
A current of 6A is drawn by a resistive load for 2s. The battery voltage is measured before, during and after this test. This allows us to calculate the voltage drop at the terminals. Passing the voltage drop threshold indicates that the battery characteristics are no longer adequate to ensure normal operation of the control cabinet (battery at the end of its life or insufficient charge). This information is signalled by the flashing red indicator lights (battery

fault and EQUIPMENT FAILURE) on the front panel and via remote signalling.
The battery voltage varies according to ambient temperature, the allowable voltage drop threshold is compensated by the temperature measurement.

Note that this test can also be started manually via the display menu. This test takes about 2s. If a battery fault is detected, the battery fault remote signal is activated. The battery fault and the red equipment failure indicator lights switch on and remain lit until total removal of the power supplies.

Batteries

Lead batteries: 12V/24Ah or 12V/38Ah (depending on the RTU and RTC types and the radio communications mode). Plan to replace the battery with an identical battery every 4 to 5 years.

Caution:
In the case of prolonged storage, the battery must be recharged every 3 months.

Charging voltage 12V	Temperature
13.9V	15°
13.8V	20°
13.7V	25°

Note that you can recharge the battery using the control cabinet by connecting it to mains power

4.1.2 Fault detection function

The device consists of:

- 3 current measuring coils installed on the phases with a ratio of 500A/1A and 3KV insulation between the windings and earth
or
2 current measuring coils installed on phases 1 and 2 and a homopolar coil, ratio 500A/1A insulation 3kV between windings and earth, for detecting low value phase/earth faults (>4A).

- A coil short-circuiting device (optional). This device is equipped with a relay that short-circuits the coils when the connecting cable is disconnected inside the cabinet or when the cabinet is powered off. This prevents any risk of excessive voltage across the connector when the current transformer circuit is open.

- 3 isolation transformers with 2kV coils protect our electronic system from over-voltages.

- an electronic assembly that consists of the modules for:
  * phase current measurement
  * detection of exceeding thresholds
  * monitoring of AC voltage (optional)
  * fault display
  * remote signalling of faults

The current fault detector is designed to detect poly-phase faults and failures (between phase and earth) on medium voltage 3-phase networks with resistance or earthed neutral.

Any exceeding of the phase current or phase-earth current threshold with a duration exceeding 300ms (±10ms) (programmable from 30ms to 990ms) is signalled by:
  * display of a red indicator light on the front panel of the cabinet
  * remote signalling of “fault occurrence”

The deletion of memorisation is done when the AC voltage returns or after 2 hours of signalling. However, the information is maintained for at least 3s after the fault disappears.

Characteristics:

- phase current threshold: 500A (programmable from 60 to 615A ±3%)

- earth fault current threshold:
  40A (programmable from 8 to 160A ±3% ±1A in 3-coil mode)
  20A (programmable from 4 to 80A ±3% ±1A in single coil mode)

- fault signalling by red indicator light on the front panel

- the measurement signal is isolated by a 2kV isolation transformer

- detection of absence of MV voltage at V<30% of supply voltage

4.1.3 ASF function

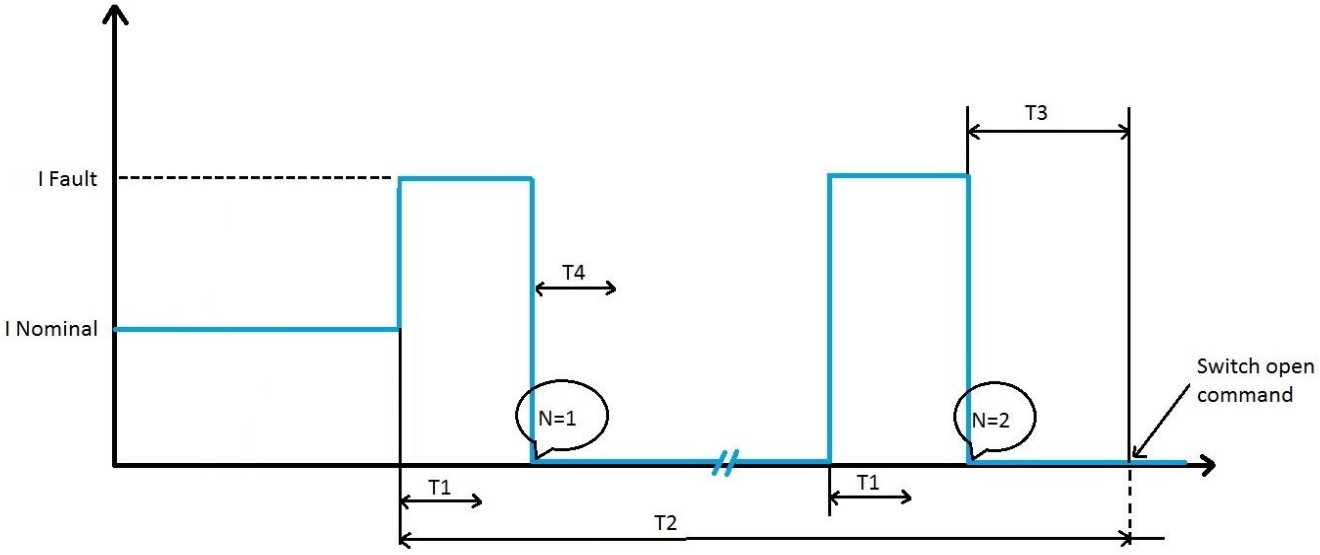
The automation analyses and stores the occurrence of permanent faults detected by the fault detector and controls the automatic opening of the switch if the number of faults threshold is reached. A fault is considered permanent when, in the supply (or source) sub-station, the upstream circuit breaker performs a slow re-engagement cycle without effect.

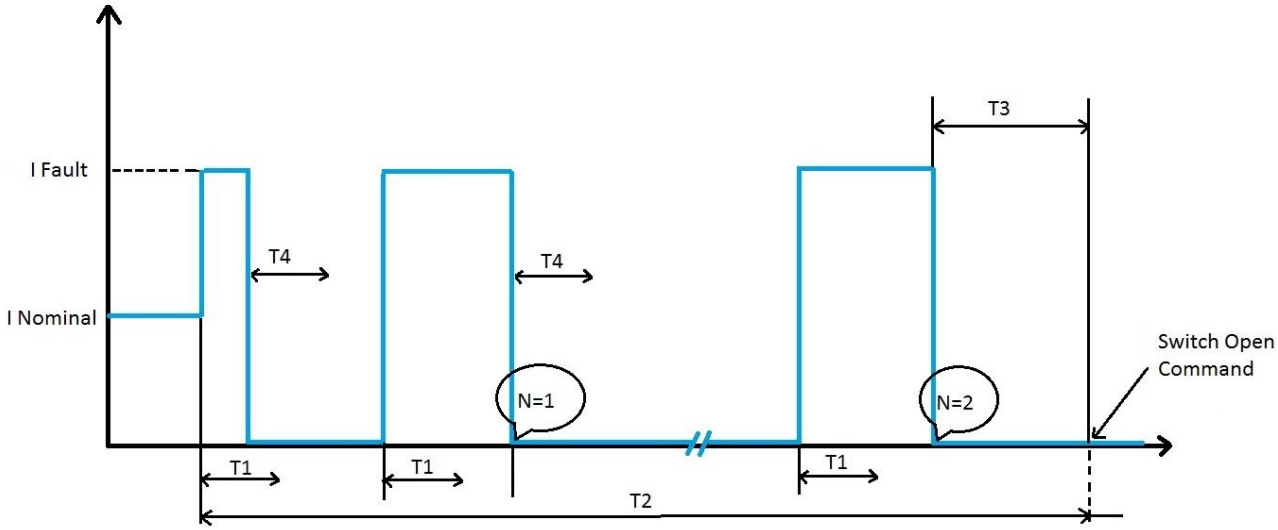
The AUTOMATION considers a fault downstream of the circuit breaker to be permanent when N number of network faults (N programmable from 1 to 7) are detected. The faults taken into consideration are Phase-Earth or Phase-Phase faults > 300ms (T1). Faults < 250ms are not considered.

E.g.:
The circuit breaker cycle takes place as shown in the diagram. The order to open the circuit breaker is sent 3s (T3) after the second occurrence of a current fault only if the line is switched off.

If the voltage is still present, the opening order is not sent.

If no second fault is detected during a time of T2 seconds after the occurrence of the first fault, the automation returns to the initial mode (T2 programmable from 15s to 80s).





T1: Time to take a fault into account (page “fault detector parameter programming”)
T2: Timeout to return to the initial state
T3: Time delay before opening order
T4: Minimum time between two faults
N: Number of faults before opening

4.2. Commands, tests, parameters

The product has user and PC interfaces for configuration and displaying cabinet and network information. This section tells the technician how to use the product interfaces.

- ### Method for using the user interface (UI):

The user interface consists of buttons, indicator lights and a display.
The use of the push buttons and the display of the LEDs is intuitive. The note (below) is available to handle the ***display/navigation button*** module.

Usage note for the display/navigation button module

In *the initial state* in local mode, the screen displays the following tabs:

> Measurements
> Counters
> Configuration
> Maintenance

Position the arrow on a tab and press the OK button to access it. To exit the tab, press the LEFT button. The arrow is moved with the UP and DOWN buttons.

Scrolling through the information contained in the tabs is possible with the UP and DOWN buttons.

The “Configuration” and “Maintenance” menus are used to display certain cabinet parameters.

In **operation** mode, the following modules are only available for display:

- Cabinet status display → **Display HTML page**
- Programming of the Fault Detection parameters → **Parameter detection HTML page**
- Programming of Operating parameters (Communication/Modem Support) → **Modem Parameters HTML Page Novexia, Nullm, Modem/Digital Radio, GSM/Cell phone, Tetra)**
- Programming of Operating parameters: → **Protocol parameters HTML page**

(Messaging/Protocol)	**(depending on protocol installed on the CPU)**
- TSD configuration	→ **Remote signalling HTML page double**
- TSS configuration	→ **Remote signalling HTML page single**
- Measurement configuration	→ **Measurement HTML page**
- Automatism configuration	→ **Automation configuration**
- Display of dated event	→ **Dated events**
- Change access level	→ **Return to home page**

Maintenance mode has the same functions as operation mode plus the ability to modify the configuration parameters.

You need to enter the password on the home page (default: **novexia**). The security code is modifiable in maintenance mode using the HTML page “Password modification”.

In this mode, the following additional modules are available:

- Maintenance and commissioning
- Read/write the parameters from/to a file
- Password modification
- CPU programme update

The cabinet must be in local mode for the entered parameters to take effect.

The parameters can be modified by entering the value from the keyboard of the PC or by scrolling menu. The data is saved to the equipment when the **save button** is pressed on the corresponding page.

Below>>presentation of detailed description of the AUGUSTE cabinet functions:

✓ Description of display information:

Parameters	Location	Possibilities	Definitions
Position of the circuit breaker (can only be displayed if a circuit breaker or simulator is connected)	HTML page **Display** UI LEDs	Open Closed XXXXX Red LED lit Green LED lit XXXXX	Circuit breaker open Circuit breaker closed Circuit breaker not present Circuit breaker open Circuit breaker closed Circuit breaker not present
Counter operation (can only be displayed if a circuit breaker is connected)	HTML page **Display** UI display **Counters**	0 to 9999	Number of operations opening and closing
Instantaneous current	HTML page **Display** UI display **Measurement**	0 to 999	Instantaneous average value of the three line currents
Average current	HTML page **Display** UI display **Measurement**	0 to 999	Averaged instantaneous current
Maximum current	HTML page **Display** UI display **Measurement**	0 to 999	Maximum instantaneous current
Number of openings by ASF	HTML page **Display** UI display **Measurement**	0 to 32767	Number of openings performed by the ASF automation
Phase/earth fault (Only in Current detection mode)	HTML page **Display** UI display **Counters**	0 to 9999	Number of faults between phase and ground
Fault between phases	HTML page **Display** UI display **Counters**	0 to 9999	Number of faults between phases
Red fault (only in directional detection mode)	HTML page **Display** UI display **Counters**	0 to 9999	Number of red faults
Green fault (only in directional detection mode)	HTML page **Display** UI display **Counters**	0 to 9999	Number of green faults
Supply voltage absent	HTML page **Display** User interface LED	Ticked Not ticked On Off	Absence of supply if voltage less than 170V (for a 230V power supply)
12V disconnect	HTML page **Display** User interface LED	Ticked Not ticked On Off	Cut-off of internal and external 12V if the 12V supply is below 10.5V or the AC source is absent for more than 16h.
Battery fault	HTML page **Display** User interface LED	Ticked Not ticked On Off	Battery anomaly if the voltage at the terminals is less than 10.5V or its capacity is zero or the battery test fails.
Local	HTML page **Display**	Ticked Not ticked	Display of product operation mode (local/remote)

	User interface LED	On Off	
Low SF6 pressure	HTML page **Display** User interface LED	Ticked Not ticked On Off	Low SF6 pressure in the circuit breaker
12V absent	HTML page **Display** User interface LED	Ticked Not ticked On Off	Absence of internal and external 12V if the voltage is not within the regulation range.
LV voltage value	HTML page **Display** UI display **Measurement**	0 to 999	Value of the AC voltage in V
HTA voltage value	HTML page **Display**	0 to 99	Value of the HTA voltage in kV from the LV
HTA average voltage	HTML page **Display**	0 to 99	Value of the averaged HTA voltage in kV
12V voltage	HTML page **Display** UI Display **Measurement**	0 to 99.9	Instantaneous value of the internal 12V voltage in V
12V current	HTML page **Display** UI Display **Measurement**	0 to 9.9	Instantaneous current supplied to external elements (Radio, etc.) in A.
48V voltage	HTML page **Display** UI Display **Measurement**	0 to 99.9	Instantaneous voltage of the 48V source in V
48V current	HTML page **Display** UI Display **Measurement**	0 to 9.9	Instantaneous current supplied to the circuit breaker
Battery capacity	HTML page **Display**	0 to 38Ah	Capacity remaining in the battery with respect to the original capacity
Cabinet temperature	HTML page **Display** UI Display **Measurement**	±99.9°	Temperature inside the cabinet in degrees
Current date	HTML page **Display** UI Display **Configuration**		day/month/year
Current time	HTML page **Display** UI Display **Configuration**		hour/minute/second

✓ **<u>Detection of HTA faults:</u>**

The two types of detection can be configured from an HTML page.

The directional fault detection is the most advanced as it can determine the direction of the fault relative to the equipment (green or red)
In the case of a directional fault detection, the red directional signalling LED blinks indicating a fault on the HTA source side. In the case of a current detection, the red LED signals a fault between phases and the green LED indicates a fault between phase and earth.

- **Description of the current fault detection parameters:**

Parameters	Location	Possibilities	Definitions
Earth fault current thresholds	HTML page **Detection parameters** **User interface display** **Configuration** **Fault detection**	4A to 80A	Detection of an earth fault if the residual current is greater than the threshold for an interval longer than the time for triggering an earth fault
Intra-phase fault current thresholds	HTML page **Detection parameters** **User interface display** **Configuration** **Fault detection**	60A to 615A	Detection of a phase fault if at least two line currents are greater than the configured thresholds
Fault triggering time	HTML page **Detection parameter**	30ms to 990ms	Minimum fault time to trigger detection
Minimum hold time for fault remote signalling	HTML page **Detection parameter**	100ms to 99s	Minimum duration for presence of remote signalling
Maximum hold time for fault remote signalling	HTML page **Detection parameter**	1 min to 9 hours	Maximum duration for the presence of remote signalling if the LV is not present
Reset detector by LV presence	HTML page **Detection parameter**	No Yes	Configuring to **No** implies a remote signalling duration defined only by the "**Maximum hold time for fault remote signalling**" parameter regardless of the AC supply voltage.

- **Description of the directional fault detection parameters:**

Parameters	Location	Possibilities	Definitions
Double fault current thresholds	HTML page **Detection parameter**	250A	Detection of a double fault if the residual current is greater than the configured threshold
Poly-phase fault current thresholds	HTML page **Detection parameter**	500A	Detection of a phase fault if at least two line currents are greater than the configured threshold
Double fault trigger time	HTML page **Detection parameter**	80ms	Minimum fault time to trigger detection of a double fault
Phase fault trigger time	HTML page **Detection parameter**	80ms	Minimum fault time to trigger detection of a phase fault
Homopolar fault detection sensitivity (green or red fault)	HTML page **Detection parameter** **UI Display** **Configuration** **Fault detection**	Set 1 Set 2	Refer to the specification HN 54-S51 for the operating principle

HTA network voltage value	HTML page **Detection parameter**	15kV 20kV	HTA network voltage in kV
Complete fault sequence recording (EEMD)	HTML page **Detection parameter**	No Yes	If yes, recording of the complete line fault sequence
Fault remote signalling acquisition time	HTML page **Detection parameter**	1 to 99s, 1s steps	Minimum fault time to validate the associated remote signalling
Hold time for fault remote signalling	HTML page **Detection parameter**	1 min to 9 hours, 1s steps then 1h	Remote signalling duration if HTA absent

✓ **Remote communication with the control centre:**

Communication configuration can be done via the HTML pages named **"Programming operation parameters (communication/modem support)" & "Programming operating parameters (Messaging/protocol)"**.

NB: The Novexia modem parameters (radio and RTC) are specific to operation with the HNZ protocol

- **Description of the radio modem parameters:**

Parameters	Location	Possibilities	Definitions
Radio network type	HTML page **RADIO modem parameters**	N1/N2 N3	
5 tone code	HTML page **RADIO modem parameters**	Valid Invalid	Allows power increase of the radio relay.
Code N° (only configurable for N1/N2 type networks)	HTML page **RADIO modem parameters**	5 digits to be entered	Identifies the 5-tone code
Squelch management (only configurable for N3 type networks)	HTML page **RADIO modem parameters**	Yes No	Allows detection of the carrier wave
Transmission speed	HTML page **RADIO modem parameters** Display **Operation parameter**	R38 Channel 3 R38 Channel 5 V23 600 V23 1200	Selection of transmission speed (compatibility with the radio relay)
Relay drop time (T)	HTML page **RADIO modem parameters**	20 to 40s	
Station power up time (T1)	HTML page **RADIO modem parameters**	200 to 500ms, 50ms steps	
Relay power up time (T2)	HTML page **RADIO modem parameters**	100ms to 1s, 50ms steps	
Pure LF transmission time (T3)	HTML page **RADIO modem parameters**	100ms to 1s, 50ms steps	
Modem card transmission gain	HTML page **RADIO modem parameters**	0 dB -10dB	
Modem input impedance	HTML page **RADIO modem parameters**	10k Ohms 600 Ohms	
Negotiation time delay	HTML page **RADIO modem parameters**	1 to 4s, 1s steps	HNZ protocol time delay
Offset time delay	HTML page **RADIO modem parameters**	0ms 650ms 1.3s	HNZ protocol time delay
Forcing time delay	HTML page **RADIO modem parameters**	10 to 59s, 1s steps	HNZ protocol time delay

Abandon time delay	HTML page **RADIO modem parameters**	1 to 9min, 1min steps	HNZ protocol time delay
2nd transmission	HTML page **RADIO modem parameters**	2 to 4min, 1min steps	Time delay between 1st and 2nd alarm
3rd transmission	HTML page **RADIO modem parameters**	2 to 8min, 1min steps	Time delay between 2nd and 3rd alarm
Remote control impulse duration	HTML page **RADIO modem parameters**	1 to 15s, 1s steps	Impulse duration for remote control of a circuit breaker
Command monitoring duration	HTML page **RADIO modem parameters**	2 to 45s, 1s steps	Duration of monitoring for the circuit breaker to return to position
Non-complementary time delay	HTML page **RADIO modem parameters**	2 to 30s, 1s steps	Duration a non-complementary position is authorised

- **Description of the RTC modem parameters:**

Parameters	Location	Possibilities	Definitions
Tel. no.	HTML page **RTC modem parameters**	10 digits to be entered	Cabinet telephone number
Numbering type	HTML page **RTC modem parameters**	Multi-frequency Decimal	
Transmission speed	HTML page **RTC modem parameters**	V21 normal V22 inverse V22 600 V22 1200	
RTC hold on alarm	HTML page **RTC modem parameters**	No Yes	
RTC hold duration	HTML page **RTC modem parameters**	1 to 40min, 1s steps	
Hang-up time on loss of carrier	HTML page **RTC modem parameters**	100 to 500ms, 100ms steps	
Pause duration	HTML page **RTC modem parameters**	1 to 9s, 1s steps	
Wait time for dial tone	HTML page **RTC modem parameters**	9 to 20s, 1s steps	
No. of rings before hang-up	HTML page **RTC modem parameters**	1 to 8	
2nd transmission	HTML page **RTC modem parameters**	2 to 4min, 1min steps	
3rd transmission	HTML page **RTC modem parameters**	4 to 8min, 1min steps	
Remote control impulse duration	HTML page **RTC modem parameters**	1 to 15s, 1 s steps	Impulse duration for remote control of a circuit breaker
Command monitoring duration	HTML page **RTC modem parameters**	2 to 45s, 1s steps	Duration of monitoring for the circuit breaker to return to position
Non-complementary time delay	HTML page **RTC modem parameters**	2 to 30s, 1s steps	Duration a non-complementary position is authorised

- **Description of the Null Modem/Digital Radio parameters:**

Parameters	Location	Possibilities	Definitions
Transmission speed	HTML page **Operating parameters** **UI Display**	1200 to 38400 baud	
Parity	HTML page **Operating parameters** **UI Display**	Even Odd None	

Flow control	HTML page **Operating parameters**	Xon/Xoff Hardware None	
Stop bits	HTML page **Operating parameters** **UI Display**	1 or 2	
Data bits	HTML page **Operating parameters** **UI Display**	7 or 8	
RTS pre-activation time	HTML page **Operating parameters**	0 to 2550ms	
RTS post-activation time	HTML page **Operating parameters**	0 to 2550ms	
DTR pre-activation time	HTML page **Operating parameters**	0 to 2550ms	
DTR post-activation time	HTML page **Operating parameters**	0 to 2550ms	
RTS-CTS timeout	HTML page **Operating parameters**	0 to 2550ms	
CTS-Tx time delay	HTML page **Operating parameters**	0 to 2550ms	
CTS mode	HTML page **Operating parameters**	Ticked Not ticked	
Anti-collision activation	HTML page **Operating parameters**	Yes No	synchronisation of the radio transmission
DCD active	HTML page **Operating parameters**	level 0 level 1	
DCD appearance time (T0)	HTML page **Operating parameters**	0 to 255ms	System slot time
Wa	HTML page **Operating parameters**	0 to 255, from T0	Base value for calculating radio channel occupation
Wb	HTML page **Operating parameters**	0 to 255, from T0	Base value for calculation of random slot transmission
Prio. Slot 1	HTML page **Operating parameters**	0 to 255, from T0	priority slot for spontaneous messages
Prio. Slot 2	HTML page **Operating parameters**	0 to 255, from T0	priority slot for requested messages

- **Description of GSM/Cell phone parameters:**

Parameters	Location	Possibilities	Definitions
Transmission speed	HTML page **Operating parameters** **UI Display**	1200 to 38400 baud	
Parity	HTML page **Operating parameters** **UI Display**	Even Odd None	
Flow control	HTML page **Operating parameters**	Xon/Xoff Hardware None	
Stop bits	HTML page **Operating parameters** **UI Display**	1 or 2	
Data bits	HTML page **Operating parameters** **UI Display**	7 or 8	
RTS pre-activation time	HTML page **Operating parameters**	0 to 2550ms	

RTS post-activation time	HTML page **Operating parameters**	0 to 2550ms	
Initialisation buffer 1	HTML page **Operating parameters**	30 characters maximum	Modem initialisation AT command
Initialisation buffer 2	HTML page **Operating parameters**	30 characters maximum	Modem initialisation AT command
Initialisation buffer 3	HTML page **Operating parameters**	30 characters maximum	Modem initialisation AT command
Numbering buffer	HTML page **Operating parameters**	30 characters maximum	
Line pick-up authorisation	HTML page **Operating parameters**	Yes No	
Time delay before hang-up	HTML page **Operating parameters**	0 to 10 minutes	
1st alarm retransmission delay	HTML page **Operating parameters**	0 to 10 minutes	
2nd alarm retransmission delay	HTML page **Operating parameters**	0 to 10 minutes	

- **Description of the Tetra parameters:**

Parameters	Location	Possibilities	Definitions
Transmission speed	HTML page **Operating parameters** **UI Display**	1200 to 38400 baud	
Parity	HTML page **Operating parameters** **UI Display**	Even Odd None	
Flow control	HTML page **Operating parameters**	Xon/Xoff Hardware None	
Stop bits	HTML page **Operating parameters** **UI Display**	1 or 2	
Data bits	HTML page **Operating parameters** **UI Display**	7 or 8	
RTS pre-activation time	HTML page **Operating parameters**	0 to 2550ms	
RTS post-activation time	HTML page **Operating parameters**	0 to 2550ms	
Initialisation buffer 1	HTML page **Operating parameters**	30 characters maximum	AT commands
Initialisation buffer 2	HTML page **Operating parameters**	30 characters maximum	AT commands
Initialisation buffer 3	HTML page **Operating parameters**	30 characters maximum	AT commands
Delay between initialisation buffers 1 and 2	HTML page **Operating parameters**	0 to 99s	
Tetra message header	HTML page **Operating parameters**	30 characters maximum	

On the "**Maintenance**" HTML page, protocol frame filtering is available via a drop-down menu. When frame filtering is set to “Yes”, only valid frames are displayed in the “Protocol Trace” page.

- **Description of additional module in the case of a version without protocol:**

The additional In/Out module is used for:

- remote signalling (dry contacts)
- the reception of remote control orders by dry contact
- sending analogue values

It is intended for:

- 2 double remote controls
- 2 double remote signalling
- 8 single remote signalling
- 4 analogue values

It is used to:

- transmit the sensor status (SF6, current sensors, etc.)
- transmit the circuit breaker position
- transmit the status of the ASF automation
- transmit information (Abs V, local mode, etc.)
- receive remote control commands to open or close the circuit breaker
- receive remote control commands to turn ASF automation on/off
- send measurement information (current on each phase, supply voltage, etc.)

The values returned are related to the allocation of single and double remote signalling and analogue monitoring.

✓ **Description of communication protocol parameters:**

See specific protocol document

✓ **Recording of manoeuvres, signals, remote measurements:**

The product transmits remote signals (double & single remote signalling and remote monitoring) relating to the status of the cabinet and the HTA network. The remote signals can be configured via the PC interface. If a remote signal is alarmed, then its change of state automatically triggers its transmission by the cabinet to the control station.

These events are only sent once after interrogation by the control station or spontaneously depending on the configuration

✓ Description of double remote signalling parameters:

Parameters	Location	Possibilities	Definitions
Position of the circuit breaker	HTML page **Double remote signalling**	Non-alarmed Alarm on opening only Alarm on closing only Alarm on opening and closing Alarm delay: 1s to 9h:9m:9s	
ASF on/off	HTML page **Double remote signalling**	Non-alarmed Alarm on opening only Alarm on closing only Alarm on opening and closing Alarm delay: 1s to 9h:9m:9s	
Unassigned	HTML page **Double remote signalling**	Non-alarmed	

✓ Description of single remote signalling parameters:

Parameters	Location	Possibilities	Definitions
LV absent	HTML page **Single remote signalling**	Non-alarmed Alarm on appearance only Alarm on disappearance only Alarm on disappearance and appearance Alarm delay: 1s to 9h:9m:9s	Signals the absence of AC voltage
Local	same	same	Signals whether the device is in local or remote control mode.
Manual mode channel 1	same	same	Signals a manual manoeuvre or locking of the device in the open or closed position.
Urgent fault ext1	same	same	
Urgent fault ext2	same	same	
Non-urgent fault ext1	same	same	
Non-urgent fault ext2	same	same	
Water level alarm	same	same	Used for underground cabinets
Door open	same	same	Signals that the door is open (option)
Reserve 3	same	same	
Reserve 4	same	same	
Earth fault in Current mode	same	same	Signals a fault current to earth
Phase fault in Current mode	same	same	Signals a fault current between phases
Earth or intra-phase current fault	same	same	Signals a fault current to earth or between phases
Green fault	same	same	Only for directional fault management
Red fault	same	same	Only for directional fault management
ASF on	same	same	
ASF off	same	same	
Fault signalling on	same	same	
Fault signalling off	same	same	
Switch closed channel A	same	same	Signals the closed position of the circuit

			breaker
Switch open channel A	same	same	Signals the open position of the circuit breaker
Low pressure SF6	same	same	Signals a low SF6 pressure (option)
Persistent V absence	same	same	Signals a V absence > 8h
Board failure	same	same	Signals a fault on a card in the cabinet
Battery fault	same	same	Signals that the battery test has failed
Disabling phone number	same	same	Signals that the stored telephone number can no longer be used to communicate with the remote operating station.
External load excessive current	same	same	Signals excessive current on external loads (Radio, etc.)
Equipment fault	same	same	Signals an equipment fault if one of the following faults is present: V absent, position discordance, battery fault, low SF6 pressure, 12Vdc absent, battery not installed, etc. Displayed by the red "EQUIPMENT FAULT" indicator light
Position discordance channel 1	same	same	Signals discordance of the circuit breaker contacts position.
Unassigned	same	same	

This list of remote signals will vary depending on the cabinet configuration (type of fault detection, number of remote controllable channels, number of fault detectors)

✓ **<u>Remote measurements:</u>**

The allocation of the remote measurements and counters is configurable using the **"Remote measurement programming"** HTML page. The list of remote measurements will vary depending on the cabinet configuration (measurement unit, 48V version, number of remote-control detection channels, etc.)

Parameters	Location	Definitions
Cabinet V	HTML page **RM programming**	Value of the AC power supply voltage from the HV transformer.
U12V	same	Value of the 12V supply voltage
Average current channel X	same	Average of currents on the 3 phases $I_{1+}I_{2+}I_{3/3}$.
Number of manoeuvres channel X	same	Number of circuit breaker manoeuvres
Number of earth faults channel X	same	
Number of faults between phases channel X	same	
Number of ASF openings	same	Number of openings performed by the ADA automation
Number of poly-phase faults channel X	same	Only in directional detection
Number of red faults channel X	same	Only in directional detection
Number of green faults channel X	same	Only in directional detection
Phase 1 current channel X	same	Instantaneous current on phase 1 (also visible on the display)
Phase 2 current channel X	same	Instantaneous current on phase 2 (also visible on the display)
Phase 3 current channel X	same	Instantaneous current on phase 3 (also visible on the display)

Depending on the protocol used, the counters may be configurable in a special page accessible from the "Remote measurement programming" page. The list of counters is as follows:

- Number of manoeuvres channel X
- Number of homopolar faults channel X
- Number of phase faults channel X
- Number of ASF openings
- Number of poly-phase faults channel X
- Number of red faults channel X
- Number of green faults channel X

If the measurement unit is present, the following values are added to the preceding list of remote measurements:

- True RMS value of the currents on each phase
- True RMS value of the individual upstream voltages on each phase
- True RMS value of the individual downstream voltages on each phase
- True RMS value of the combined upstream voltages on each phase
- True RMS value of the combined downstream voltages on each phase
- Total active power
- Active power on each phase
- Total reactive power
- Reactive power on each phase
- Total apparent power
- Apparent power on each phase
- Total power factor
- Power factor on each phase

The measurement unit is intended to detect faults and calculate the physical values of the network.

✓ **Auto sectionalizing function (ASF):**

Turning on the Alarmed Decentralised Automation (ASF) is possible via the user or PC interfaces.

Parameters	Location	Possibilities	Definitions
ASF function	HTML page **ASF Automation configuration**	Active Inactive	Activate or deactivate the ASF function
Function	HTML page **ASF Automation configuration** User interface Buttons	On Off	Turns the automation service on/off via: user or PC interface or remote control

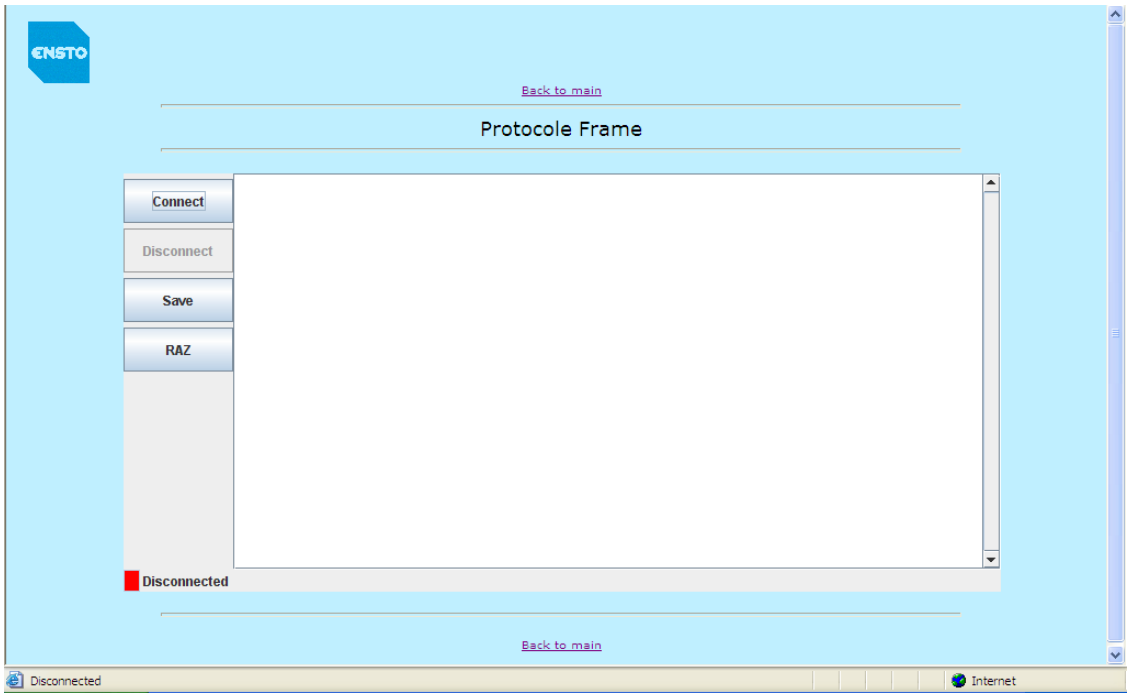
ASF configuration	HTML page **ASF Automation configuration**	Valid Invalid	Invalid deactivates the function on the specified channel (for a multi-channel cabinet).
Fault configuration (N)	HTML page **ASF Automation configuration**	Fault 1 to 7	Opening of the circuit breaker after the 1st to 7th fault
ASF Time delay (T4)	HTML page **ASF Automation configuration**	0 to 9990ms by 10ms steps	Time between 2 faults for the fault to be considered
Fault configuration (only in directional)	HTML page **ASF Automation configuration**	Red Green	Defines the type of fault triggering opening
ASF standby time delay (T2)	HTML page **ASF Automation configuration**	15 to 80s	Automation resets to the original condition after the time delay
ASF opening time delay (T3)	HTML page **ASF Automation configuration**	1 to 3s	Time delay for opening with respect to the time when the ASF conditions are met.
LV monitoring during opening		Yes No	A 'yes' setting implies opening only if the LV is not present.

✓ **Protocol tracing:**

Using the **"Protocol trace"** HTML page, it is possible to display the protocol frames in real time.

Before starting the dialogue,
you should press the "Connect" button.

It is possible to save the displayed frames in a TXT file. To do that:
- Stop frame acquisition by pressing **"Disconnect"**
- Save the frames by pressing **"Save"**



The format of the trace is as follows:

14:30:05:56	==>	10496400AD16

- The first column shows the time down to 1/100 of a second
- The second column shows the transmission direction
- The third column shows the frame content in hexadecimal

==> Indicates a frame sent by the cabinet
<== Indicates a frame received by the cabinet

✓ **Display of Dated Maintenance Event Recordings (EED):**

The cabinet records a stack of 1000 dated events that can be displayed on the **"Dated events"** HTML page . If the stack capacity is exceeded, the most recent events overwrite the oldest.

It is not possible to delete an event.

Certain EEDs linked to events related to operation of the network and the cabinet can be transmitted by remote control. The list of these EEDs is given in the appendix (§ 6.2).

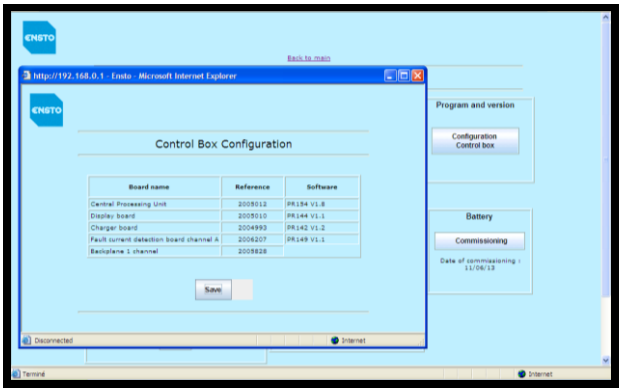
The format of the list of dated events is as follows:

Event number	Date/Time	Reference	Description

It is possible to save this summary into a TXT file using the **"Save as"** button.

✓ **Display and recording of the identification of the product circuit boards:**

The **"Maintenance"** HTML page can display and record the identification (board name, part number, software version) of each circuit board.
It is possible to save this summary into a TXT file using the **"Save as"** button.



✓ **Configuration method using a factory file:**

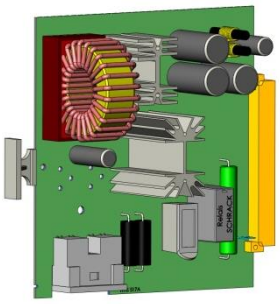
To simplify the commissioning phase for the equipment, it is possible to use factory files stored on the PC.

On the **"Read/Write parameters from/to a file"** HTML page click the **"Config PC ITI"** button. A window will appear allowing you to open the factory file to transfer. When the operation is complete, a window will be displayed indicating that configuration has succeeded.

4.3. Upgrade with new functions

On request, this cabinet can be customised with the modules below.

12V/48V converter card

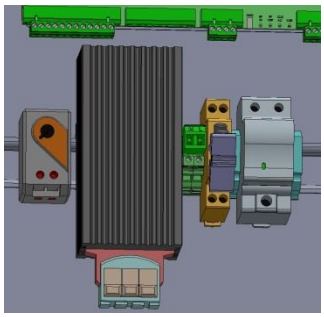


To be used with a 48V motor

Door switch module

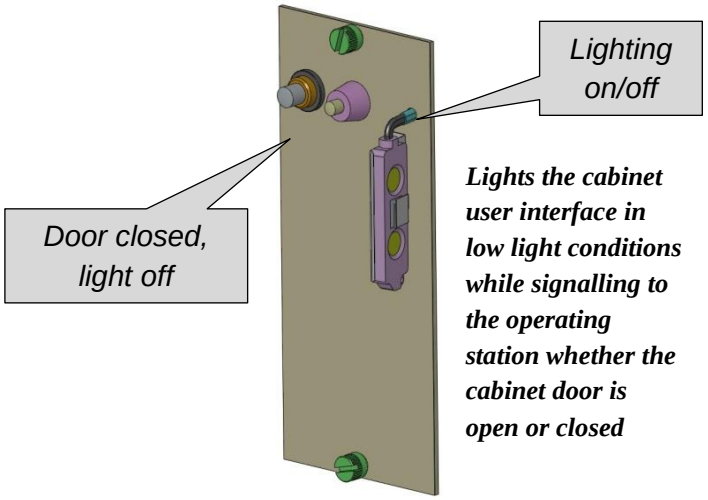
Signals to the control station whether the door is open or closed

Heater 100W



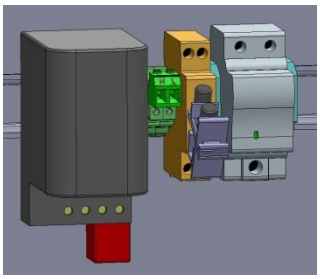
Maintains a sufficient temperature inside the insulated cabinet to allow it to be used down to -50°C

Lighting and door switch module



Lights the cabinet user interface in low light conditions while signalling to the operating station whether the cabinet door is open or closed

Anti-condensation 50W

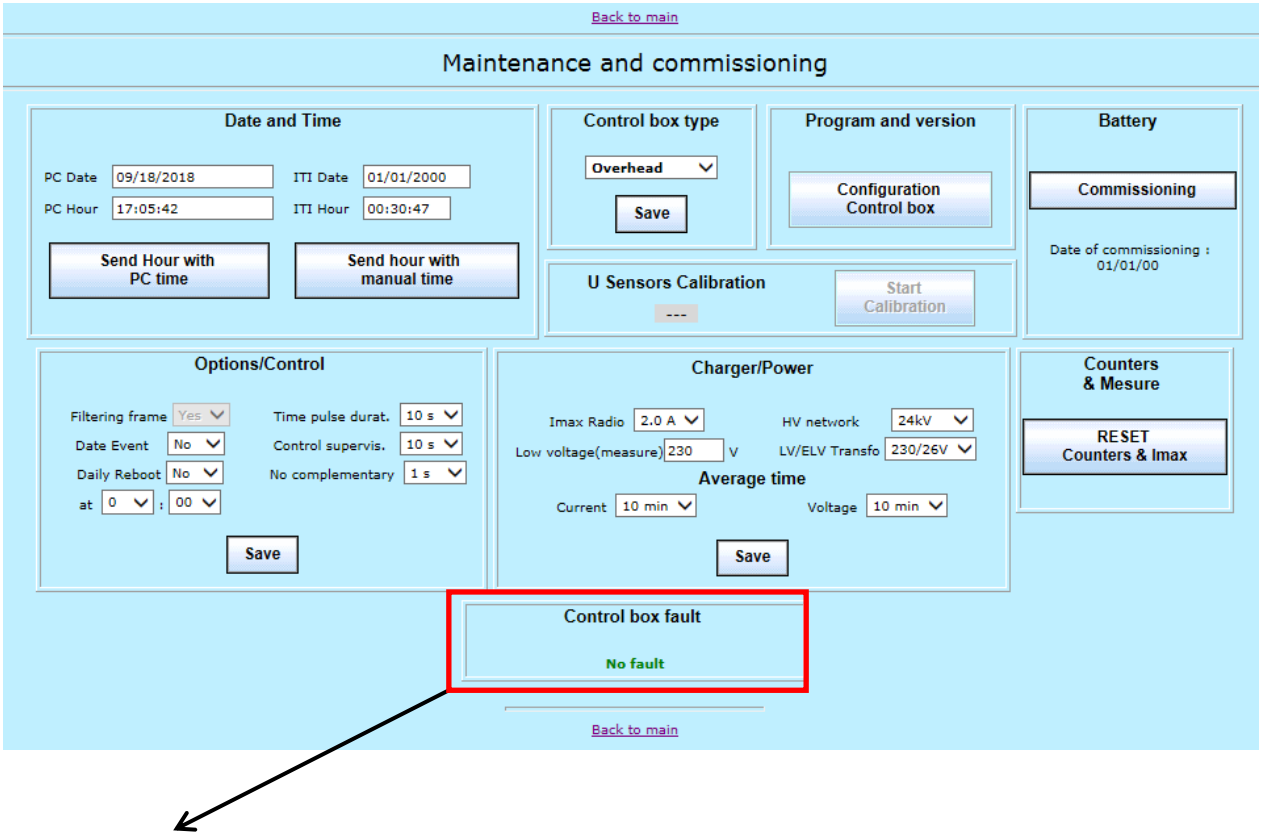


Reduces condensation due to temperature variations inside the cabinet

5 Maintenance

5.1. Preventive

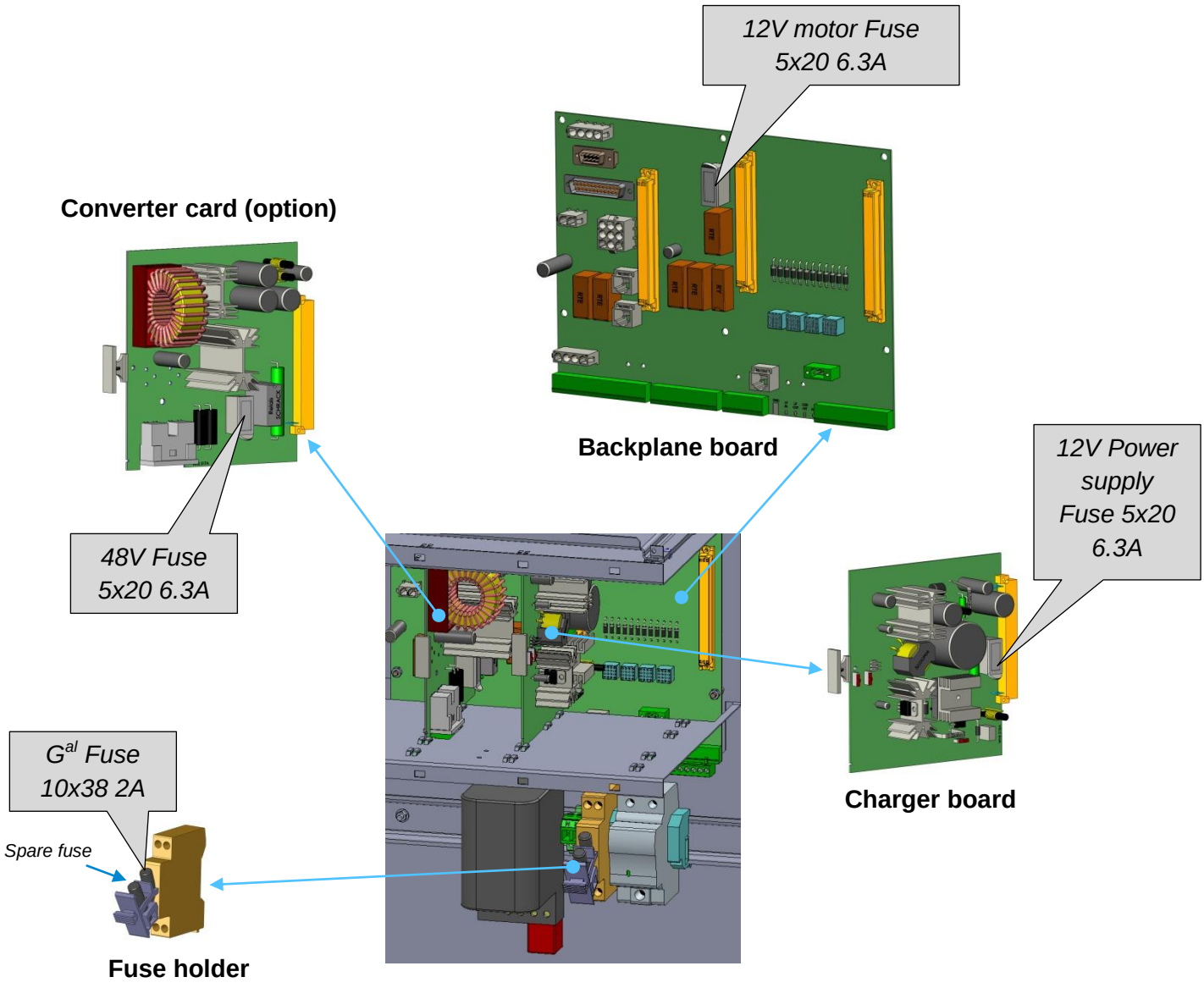
Equipment internal fault visualization



See appendices 6.2 to visualize the fault list

5.2. Corrective

Locating of protection fuses



6 Appendices

6.1. List of Dated Maintenance Event Recordings (EED)

RS = Remote Signalling
RC = Remote Control
APSS = Automatic Power Source Switching

N° Description
0 Lack of AC V > 2H
1 Charger anomaly Non Urgent RS
2 Prolonged lack of AC Voltage
3 Telephone number failed Non Urgent RS
4 Loss of EEMD Non Urgent RS
5 Local start RS
6 Local end RS
7 Start 12V DC anomaly Urgent RS
8 End 12V DC anomaly
9 Start electric control power supply anomaly Urgent RS
10 End electric control power supply anomaly
11 Start AC power anomaly Urgent
12 End AC power anomaly
13 Start autonomous source anomaly Urgent RS
14 End autonomous source anomaly
15 Start Autonomous source backup -
16 End Autonomous source backup -
17 Presence V RS
18 Absence V - RS
19 to 26 Red fault channel X RS
27 to 34 Green fault channel X RS
35 to 42 Poly-phase fault channel X RS
43 Radio in permanent transmission Urgent RS
44 to 51 Selection channel x for manoeuvre
52 to 59 Request for manual open channel x RC
60 to 67 Request for manual close channel x RC
68 to 75 Request for remote control open channel x RC
76 to 83 Request for remote control close channel x RC
84 to 91 HTA circuit breaker open channel x RS
92 to 99 HTA circuit breaker closed channel x RS
100 to 107 Start of neutralisation channel x
108 to 115 End of neutralisation channel x RS
116 to 123 Start signalling circuit breaker closed channel x “heart-beat”
124 to 131 End signalling circuit breaker closed channel x “heart-beat”
132 to 139 Start signalling circuit breaker open channel x “heart-beat”
140 to 147 End signalling circuit breaker open channel x “heart-beat”
148 to 155 Start signalling Command Neutralised Channel x “heart-beat”
156 to 163 End signalling Command Neutralised Channel x “heart-beat”
164 to 171 Start signalling HTA presence channel x “heart-beat”
172 to 179 End signalling HTA presence channel x “heart-beat”
180 Start signalling urgent external fault “heart-beat”
181 End signalling urgent external fault “heart-beat”
182 Start signalling non-urgent external fault “heart-beat”
183 End signalling non-urgent external fault “heart-beat”
184 Start signalling external locking permutation “heart-beat”
185 End signalling external locking permutation “heart-beat”
186 Start signalling water level fault “heart-beat”

187 End signalling water level fault “heart-beat”
188 to 195 ADA configuration channel x
196 to 203 ADA configuration channel x green fault
204 to 211 ADA configuration channel x red fault
212 ADA function activation
213 ADA function deactivation
214 Start ADA local RS
215 Stop ADA local RS
216 Start ADA by remote RS
217 Stop ADA by remote RS
218 to 225 Request for ADA open channel x RC
226 to 233 Fault opening by ADA channel x
234 APSS configuration: simplified automation
235 APSS configuration: full automation
236 Declaration Src1 = channel x, y, \
237 Declaration Src2 = channel x, y, \
238 Switching direction = Src1 -> Src2
239 Switching direction = Src1 <-> Src2
240 Switching direction = Src1 <- Src2
241 APSS function activation
242 APSS function deactivation
243 Start APSS local RS
244 Stop APSS local RS
245 Start APSS by remote RS
246 Stop APSS by remote RS
247 Absence of voltage Src1
248 Presence of voltage Src1
249 Absence of voltage Src2
250 Presence of voltage Src2
251 Start of Switching in progress
252 End of Switching in progress
253 Start of locking switching
254 End of locking switching
255 Abandon switching Urgent RS
256 to 263 Request for open channel x by APSS RC
264 to 271 Request for close channel x by APSS RC
272 Open fault Src active APSS
273 Close fault Src backup APSS
274 Reset
275 Equipment start
276 Display test
277 Appearance of urgent external fault Urgent RS
278 Disappearance of urgent external fault
279 Appearance of non-urgent external fault Non-urgent RS
280 Disappearance of non-urgent external fault
281 Appearance of water level fault RS
282 Disappearance of water level fault RS
283 to 290 HTA presence channel x (functional unit info)
291 to 298 HTA absence channel x (functional unit info)
299 to 306 HTA presence channel x (voltage sensor info)
307 to 314 HTA absence channel x (voltage sensor info)
315 to 322 Electronic fault tcd channel x
323 to 324 Electronic fault on wiring board x
325 to 332 Fault board in default channel
333 Eeprom parameter in fault
334 fuse 48V in fault
335 Default on fault voltage detector 1
336 Default on fault voltage detector 2
337 Default on display board
338 Default on converter board
339 to 346 Default on mesure station channel x
347 modem fault 1
348 modem fault 2
349 UC board in fault
350 Start SPS level water
351 Start warning door open
352 12V motor fuse failure
353 End SPS level water

354 End warning door open
355 End12V motor fuse failure
356 Initialization voltage board
357 Failure initialization voltage board
358 Initialization voltage board 2
359 Failure initialization voltage board 2
360 telealarme fault
361 Appearance SF6 low pressure
362 Disappearance SF6 low pressure
363 Modem2 Disabling phone number
364 Reset equipment
365 Reset bus
366 Reset protocol
367 Reset RTOS
368 Reset on exception
369 mac eeprom fault
370 fram fault
371 modem interface fault
372 temperature probe fault
373 horodator fault
374 Recording date and time
375 Date Event
376 Equipment board fault
377 Safety closing automatism activated
378 Safety closing automatism deactivated
379 to 406 free
407 Start signalling extern 2 urgent fault “heart-beat”
408 End signalling extern 2 urgent fault “heart-beat”
409 Start signalling extern 2 non urgent fault “heart-beat”
410 End signalling extern 2 non urgent fault “heart-beat”
411 Start signalling reserve 1 “heart-beat”
412 End signalling reserve 1 “heart-beat”
413 Start signalling reserve 2 “heart-beat”
414 End signalling reserve 2 “heart-beat”
415 Start signalling reserve 3 “heart-beat”
416 End signalling reserve 3 “heart-beat”

6.2. Fault list of maintenance screen

	Fault equipment	Modem fault
Ualim fault	X	
12V regulation fault	X	
48V fault	X	
battery fault	X	
Radio blocked	X	
Position discordance channel x	X	
SF6 low pressure	X	
12V motor fuse failure	X	
charger board fault	X	
eeprom parameter fault	X	
mac eeprom fault	X	
fram fault	X	
interface Led modem fault	X	
temperature probe fault	X	

horodator fault	X	
tcd fault channel x	X	
wiring board fault x	X	
dd board fault channel x	X	
Default on mesure station channel x	X	
Voltage board 1 not initialize	X	
voltage board 1 fault	X	
Voltage board 2 not initialize	X	
voltage board 2 fault	X	
commissioning of Battery not realize	X	
display board fault	X	
16 I/O board fault	X	
Phone Number out of use		X
Internal Modem fault		X
Internal Modem 2 fault		X
ASF opening fault channel x		
PASA permutation fault		
48V fuse fault		

7 Technical assistance

The company has an after-sales department to help with installation or repair of the equipment.

After sales contact:

ENSTO BAGNERES DE BIGORRE **+33 (0)5 62 91 45 36**

8 End of Product life

For any question relating to the end of the product's life, contact the after-sales service with the technical details of the sub-assemblies and/or products to be recycled.

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