Smart Panels

Digitized switchboards

Selection and configuration guide

Tested
Validated
Documented
Architectures

Schneider Electric

Important information

People responsible for the application, implementation and use of this document must make sure that all necessary design considerations have been taken into account and that all laws, safety and performance requirements, regulations, codes, and applicable standards have been obeyed to their full extent.
Schneider Electric provides the resources specified in this document. These resources can be used to minimize engineering efforts, but the use, integration, configuration, and validation of the system is the user's sole responsibility. Said user must ensure the safety of the system as a whole, including the resources provided by Schneider Electric through procedures that the user deems appropriate.

Notice

This document is not comprehensive for any systems using the given architecture and does not absolve users of their duty to uphold the safety requirements for the equipment used in their systems, or compliance with both national or international safety laws and regulations.
Readers are considered to already know how to use the products described in this document.
This document does not replace any specific product documentation.
The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.
Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.
Failure to follow these instructions can result in injury or equipment damage.

CAUTION

CAUTION, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** equipment damage.
Failure to follow these instructions can result in injury or equipment damage.

NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.
A qualified person is one who has skills and knowledge related to the construction, operation and installation of electrical equipment, and has received safety training to recognize and avoid the hazards involved.

Before you Begin

This electrical monitoring and control equipment and related software is used to connect a variety of electrical switchboards. The type or model of electrical monitoring and control equipment suitable for each application will vary depending on factors such as the system dependability level, unusual conditions and government regulations etc.
Only the user can be aware of all the conditions and factors present during setup, operation and maintenance of the solution. Therefore only the user can determine the electrical monitoring and control equipment and the related safeties and interlocks which can be properly used.
When selecting electrical monitoring and control equipment and related software for a particular application, the user should refer to the applicable local and national standards and regulations. The National Safety Council's Accident Prevention Manual also provides much useful information.
Ensure that appropriate safeties and mechanical/electrical interlocks protection have been installed and are operational before placing the equipment into service. All mechanical/electrical interlocks and safeties protection must be coordinated with the related automation equipment and software programming.

NOTE

Coordination of safeties and mechanical/electrical interlocks protection is outside the scope of this document.

START UP AND TEST

Following installation but before using electrical control and automation equipment for regular operation, the system should be given a start up test by qualified personnel to verify the correct operation of the equipment. It is important that arrangements for such a check be made and that enough time is allowed to perform complete and satisfactory testing.

EQUIPEMENT OPERATION HAZARD

Follow all start up tests as recommended in the equipment documentation. Store all equipment documentation for future reference.

⚠ WARNING

Software testing must be done in both simulated and real environments.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Verify that the completed system is free from all short circuits and grounds, except those grounds installed according to local regulations (according to the National Electrical Code in the USA, for example). If high-potential voltage testing is necessary, follow recommendations in the equipment documentation to prevent accidental equipment damage.
Before energizing equipment:

- remove tools, meters, and debris from equipment
- close the equipment enclosure door
- remove ground from incoming power lines
- perform all start-up tests recommended by the manufacturer.

OPERATION AND ADJUSTMENTS

The following precautions are from NEMA Standards Publication ICS 7.1-1995 (English version prevails):
Regardless of the care exercised in the design and manufacture of equipment or in the selection and rating of components; there are hazards that can be encountered if such equipment is improperly operated.
It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

⚠ WARNING

UNEXPECTED EQUIPMENT OPERATION
- Only use software tools approved by Schneider Electric for use with this equipment.
- Update your application program every time you change the physical hardware configuration.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

INTENTION

This document is intended to provide a quick introduction to the described system. It is not intended to replace any specific product documentation, nor any of your own design documentation. On the contrary, it offers information additional to the product documentation on installation, configuration and implementing the system.
The architecture described in this document is not a specific product in the normal commercial sense. It describes an example of how Schneider Electric and third-party components may be integrated to fulfill an industrial or classic application.
A detailed functional description or the specifications for a specific user application is not part of this document. Nevertheless, the document outlines some typical applications where the system might be implemented.
The architecture described in this document has been fully tested in our laboratories using all the specific references you will find in the component list near the end of this document. Of course, your specific application requirements may be different and will require additional and/or different components. In this case, you will have to adapt the information provided in this document to your particular needs. To do so, you will need to consult the specific product documentation of the components that you are substituting in this architecture. Pay particular attention in conforming to any safety information, different electrical requirements and normative standards that would apply to your adaptation.
It should be noted that there are some major components in the architecture described in this document that cannot be substituted without completely invalidating the architecture, descriptions, instructions, wiring diagrams and compatibility between the various software and hardware components specified herein. You must be aware of the consequences of component substitution in the architecture described in this document as substitutions may impair the compatibility and interoperability of software and hardware.

⚠ CAUTION

EQUIPMENT INCOMPATIBILITY OR INOPERABLE EQUIPMENT
Read and thoroughly understand all hardware and software documentation before attempting any component substitutions.

Failure to follow these instructions can result in injury or equipment damage.

This document is intended to describe how to select and configure the Smart Panel system.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, BURN OR EXPLOSION

- Only qualified personnel familiar with low and medium voltage equipment are to perform work described in this set of instructions. Workers must understand the hazards involved in working with or near low and medium voltage circuits.
- Perform such work only after reading and understanding all of the instructions contained in this bulletin.
- Turn off all power before working on or inside equipment.
- Use a properly rated voltage sensing device to confirm that the power is off.
- Before performing visual inspections, tests, or maintenance on the equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested, grounded, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of back feeding.
- Handle this equipment carefully and install, operate, and maintain it correctly in order for it to function properly. Neglecting fundamental installation and maintenance requirements may lead to personal injury, as well as damage to electrical equipment or other property.
- Beware of potential hazards, wear personal protective equipment and take adequate safety precautions.
- Do not make any modifications to the equipment or operate the system with the interlocks removed. Contact your local field sales representative for additional instruction if the equipment does not function as described in this manual.
- Carefully inspect your work area and remove any tools and objects left inside the equipment.
- Replace all devices, doors and covers before turning on power to this equipment.
- All instructions in this manual are written with the assumption that the customer has taken these measures before performing maintenance or testing.

Failure to follow these instructions will result in death or serious injury.

Table of contents

Introduction

Introduction

Electrical substations use modern communication tools to share information within their electrical monitoring and control equipments and with external interfaces. Enerlin'X communication devices offer a simple and reliable link to local displays and to hosted Energy Management services.

1.1 Purpose

The purpose of this guide is to provide basic knowledge on Enerlin'X system and how to use it to design Smart Panels, electrical distribution switchboards featuring full digital connectivity. This is achieved by providing reference architectures, which have been tested validated and documented (TVDA) in Schneider Electric laboratories, showing how to select, build and configure Smart Panels.

1.2 Prerequisites

Familiarity with LV electrical distribution components is required to understand and benefit from this guide.

1.3 Glossary

This section explains some words or acronyms which might be unclear to a reader who does not know the system or the environment.

Term	Description
Acti9	Modular system for final LV distribution
Acti9 Smart Test	Configuration and test software for Smartlink – modular interface
BMS	Building Management System
DHCP	Dynamic Host Configuration Protocol
DPWS	Devices Profile for Web Services
EMC	Electromagnetic Compatibility
EMS	Energy Management System
IT service	Information Technology service, manage the computers and network
LV	Low Voltage
Modbus	Serial line protocol, also known as Modbus RTU
Prisma	Range offer of prefabricated LV cubicle
RSU / RSU-A	Configuration software for LV circuit breaker (Masterpact – Compact NS – Compact NSX)
SMTP	Simple Mail Transfer Protocol
SNTP	Simple Network Time Protocol
TCP/IP	Ethernet protocol
Ti24 connector	Prefabricate connector in Acti9 system
TVDA	Tested Validated Documented Architecture
WAGES	Water Air Gas Electricity Steam

1.4 Smart Panel overview

Smart Panels are key components for energy management in buildings. You can only manage what you measure and see. Therefore, Schneider Electric Smart Panels are the basis of a simple solution to understand how a building functions in terms of its energy consumption and technical performance. Smart Panels are your first step to start an energy management strategy. Combined with Schneider Electric Energy Management Services, they form a complete solution for real energy savings.

Smart Panels are based on Ethernet network. Ethernet is widely used in domestic and industrial applications, allowing easy transparent access to electrical devices from any location.

1.5 Scope of Smart Panels

The first release of this guide deals with LV switchboards for non-critical, medium and small buildings:

> School
> Gymnasium
> Small Hotel
> Bank
> Office
> Hotel ***
> Supermarket
> Retail...

Only new buildings are considered in this document. For revamping projects, verify the compatibility of existing devices with the new Enerlin'X system, using RSU configuration tool or with the help of your local Schneider Electric support.

1.6 Local or on-line Energy Management

Energy Management can be performed on-line, using either of Schneider Electric's dedicated services, or locally through dedicated software (BMS or EMS), through Enerlin'X device embedded web pages or using a switchboard display.

With on-line Energy Management Services, Schneider Electric handles transmission, storage, processing and availability of your energy data. By deploying best-in-class practices for physical security, data security, and network reliability, Schneider Electric ensures your data is protected and available when you need it.

> Easily access your data from anywhere through the Internet.
> Only usual web browser required, no need for additional hardware of software.
> Outsource data storage, backup, and management.
> Take advantage of top level energy management expertise
> Make budget forecasting easier with a service contract.

The different possible connections of Smart Panels are summarized on the schemes below:

1) On-line Energy Management Services using Schneider Electric's cloud.

2) Enerlin'X local display to monitor and control the switchboard.

3) Standard computer or workstation to easily access Enerlin'X devices web pages or run a local Energy Management application.

Selection

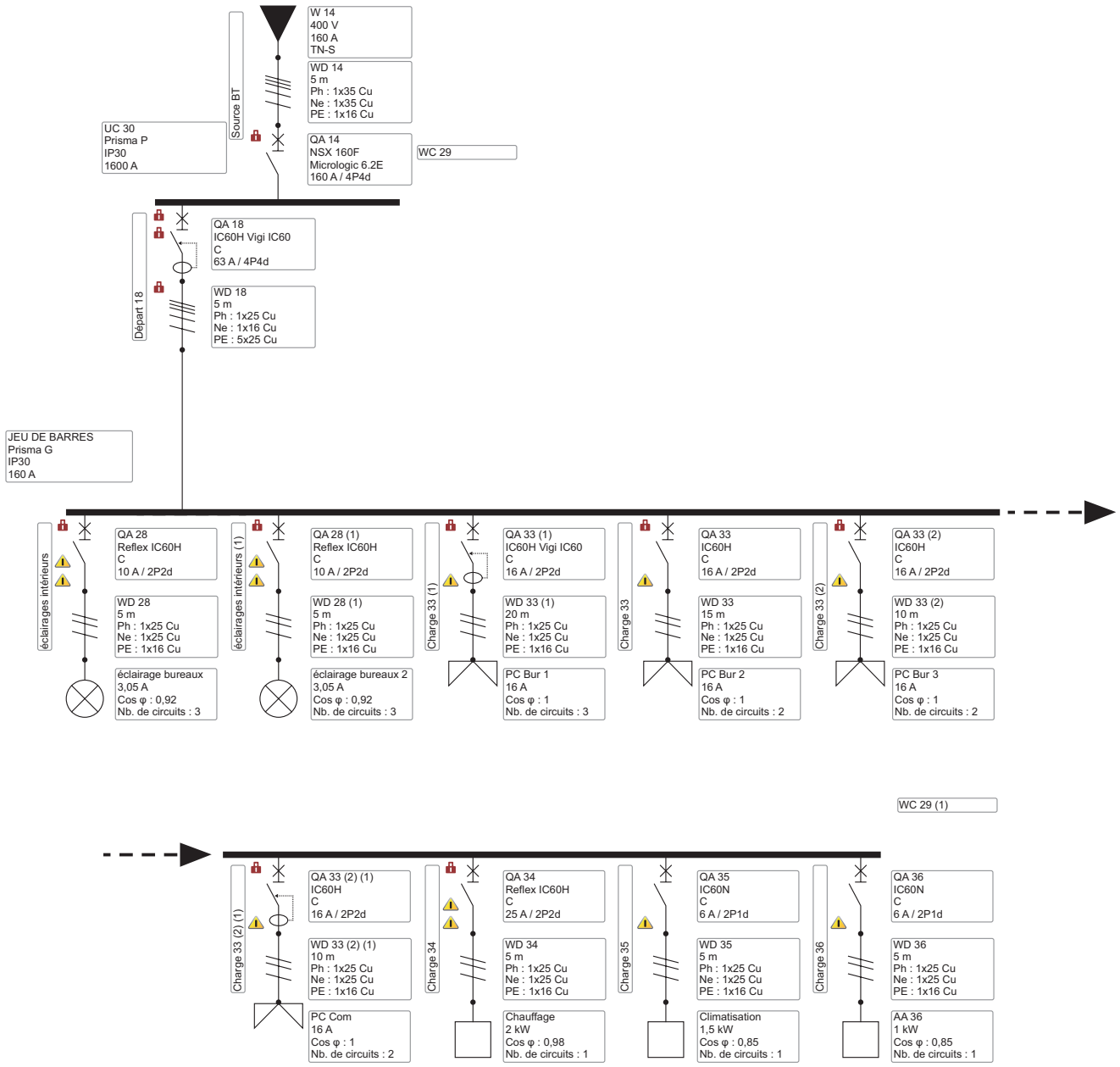
2

This chapter gives a detailed description of the Tessted Validated Documented reference architectures for Smart Panels, selected for this guide.

2.1 Small Buildings

2.1.1 Single Line Diagram

The electrical architecture associated with a small building is represented below:



The installation electrical drawing is provided in the reference document.

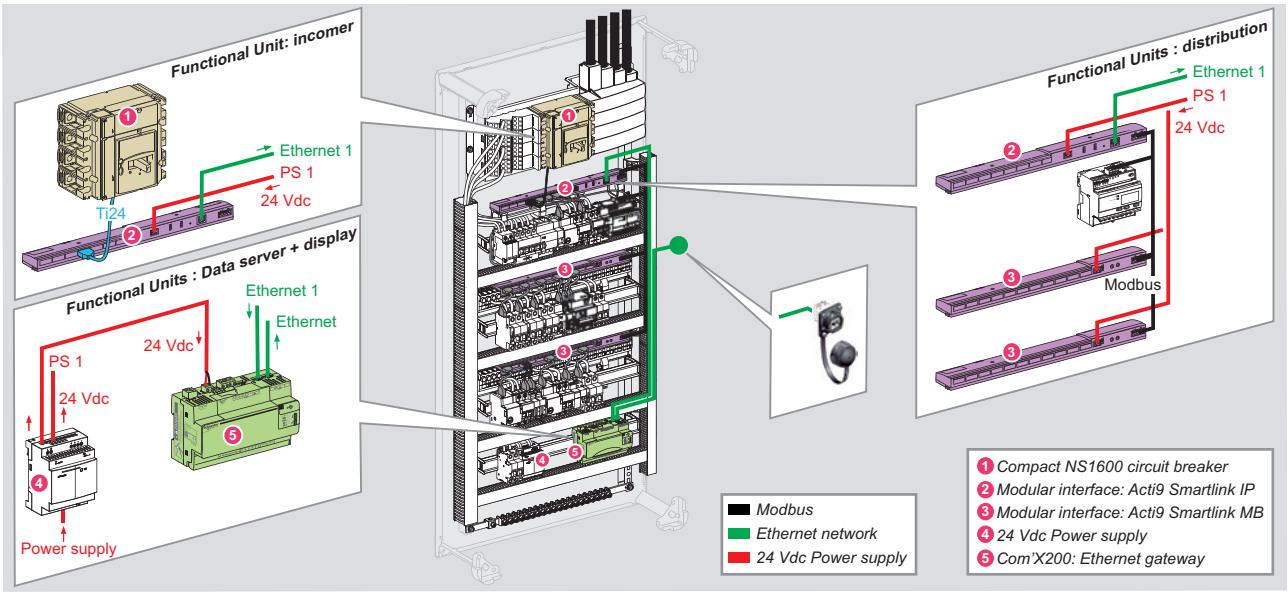
> *Please refer to chapter 5.3.*

2.1 Small Buildings

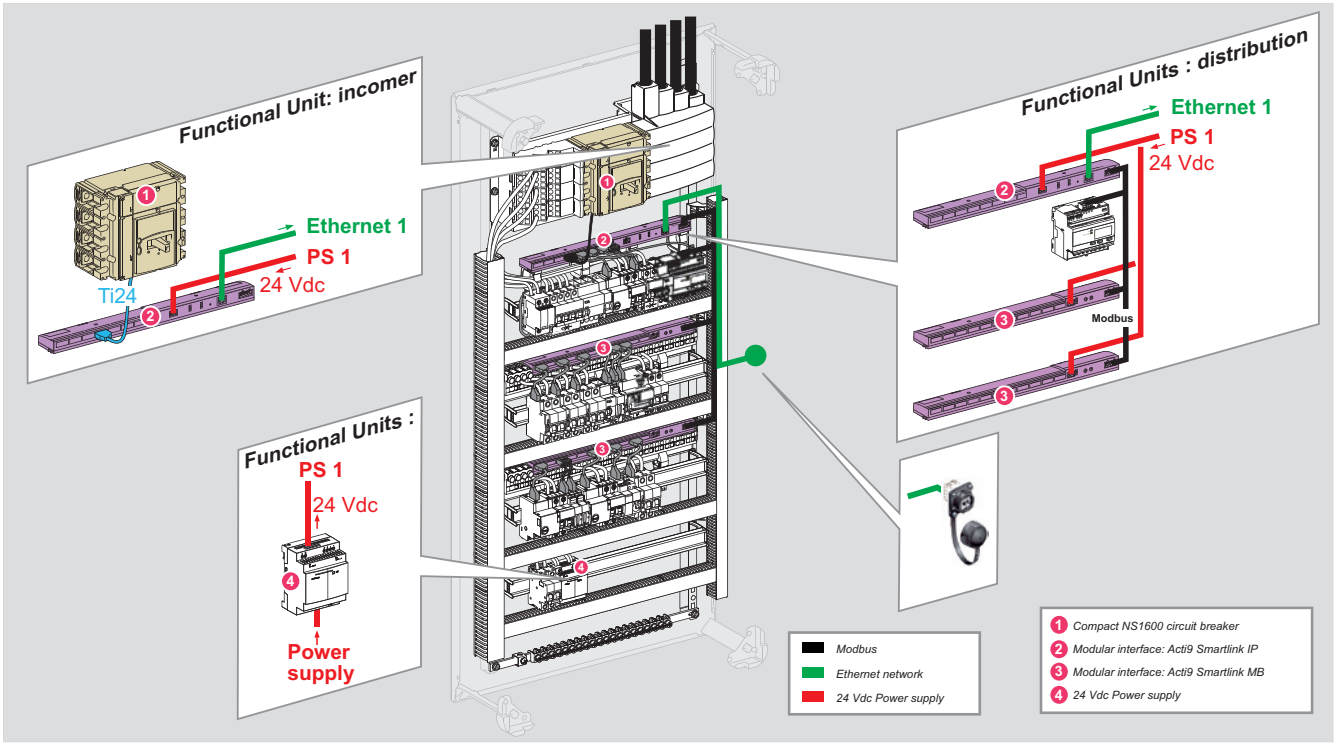
2.1.2 Switchboard architecture

The reference architecture for Smart Panels in a small building is represented below:

On-line Energy Management:



Local Energy Management:



2.1 Small Buildings

2.1.3 Enclosure

A switchboard made of Prisma G system is used as typical example for the architecture:

2.1.4 General Design

This section describes the choice of hardware, circuit breakers, meters and digital interfaces for the small building reference architecture. It focuses on the digital architecture. So the user needs to understand that the general design is applicable for many other electrical single line diagrams. For more detail, > *please refer to the user manual referenced in section 5.3.*

The key driver for this selection is to add just enough digital devices to the electrical switchboard in order to offer remote monitoring and control. The selected architecture is represented through 3 functional units:

> Incomer (status monitoring only)

> Distribution (monitoring and control)

> Data server (in case of on-line Energy Management only).

For final distribution, Acti 9 Smartlink digital interfaces are associated mainly with iOF/SD module for protection monitoring, Reflex iC60 for load control iEMT2010 for energy metering.

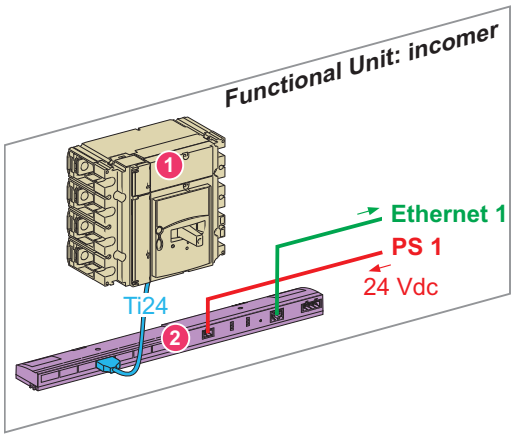
An FDM128 local display is not proposed in this solution. However, it can be added to obtain quick and easy access to electrical data of the Smart Panels. This requires adding an Ethernet switch (reference is provided in the Appendix).

2.1 Small Buildings

2.1.5 Incomer

The power input of the Smart Panel is protected by a Compact NSX circuit breaker. In this example, we will use a non communicating version. The trip unit is thermal-magnetic and does not provide communication capabilities. However, OF (Open / Close) status and SDE (Electrical Fault Trip) from the incomer circuit breaker are hardwired to Acti9 Smartlink, Ethernet:

Incomer functional unit



Main component of the incomer functional unit are:

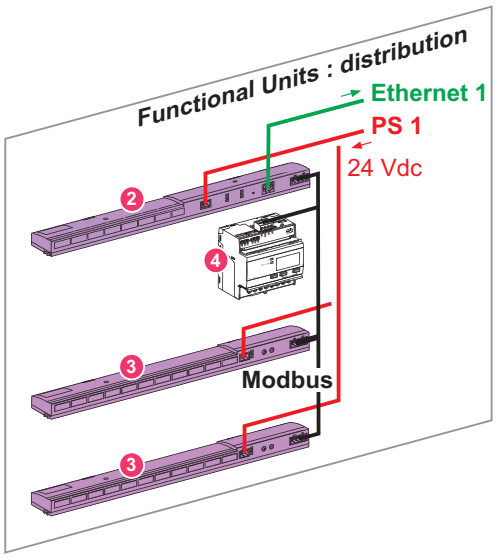
1. Compact NSX (Incomer), equipped with OF and SDE contacts.
2. Acti9 Smartlink Ethernet.

Ti24 pre fabricated connector.

2.1.6 Distribution

The digital architecture of the distribution is detailed below:

Distribution functional unit



Main component are:

2. Acti9 Smartlink Ethernet
3. Acti9 Smartlink Modbus
4. Energy Meter Acti9 iEM3150.

Acti9 Smartlink Ethernet version acts as Modbus-SL master and aggregates data from :

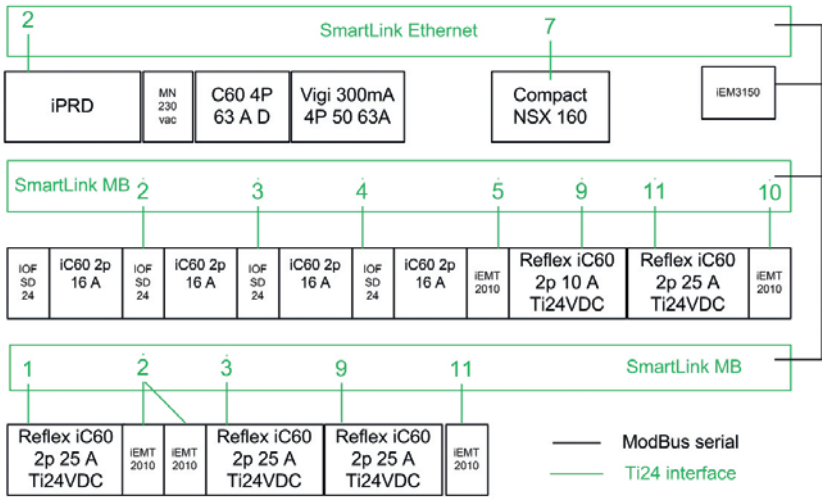
> Energy Meter (Modbus energy meter is or an IEM or a PM).

> All Modbus versions of Acti9 Smartlink.

Web pages, embedded in Ethernet version of Acti9 Smartlink enable monitoring of electrical values, of device status, and control of Reflex iC60 circuit breakers.

2.1 Small Buildings

Final distribution is summarized below:



Acti9 Smartlink devices transfer data from Acti9 final distribution devices to a monitoring system via the digital network. Prefabricated cables (Ti24 interface) allow an easy connection of Acti9 devices:

> iOF + SD: position and trip indication of circuit breaker
> Reflex iC60: remote controlled circuit breaker
> iEMT: energy meter (2 iEMT can be connected to the same Smartlink channel).

2.1.7 Energy Server (for on-line Energy Management Services)

Com'X 200 Energy Server enables WAGES data to be collected and sent to a platform providing on-line energy management services.

Main components of the functional unit are:

4 24 V DC Power Supply

5 Com'X 200 energy server.

Com'X 200 collects data from final distribution through Acti9 Smartlink (Ethernet version) and sends it to an energy management service platform, hosted in the Schneider-Electric cloud.
This functional unit supplies the whole with 24 V DC power required for digital devices. This auxiliary power supply is protected by a dedicated circuit breaker.

In this TVD architecture, Com'X 200 gathers electrical values and temperature monitoring from the Smart Panel to publish data to hosted platform via Ethernet.

Com'X 200 energy server can collect data from:

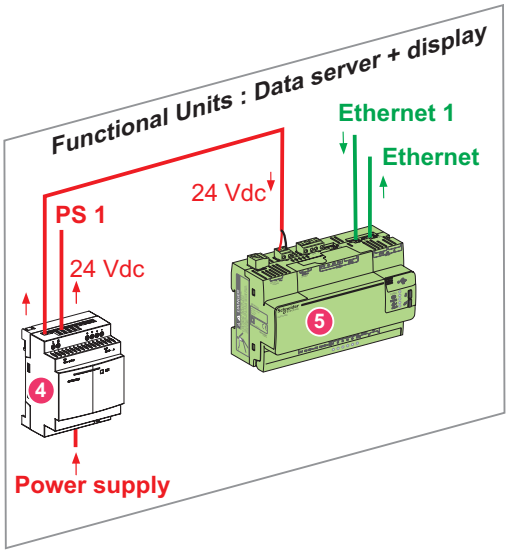
> Meters with pulse signal outputs, directly connected to its digital inputs
> Devices connected to Modbus RS485 network
> Devices connected to Ethernet TCP/IP network
> Sensors (temperature, humidity) directly connected to its analog inputs.

Com'X 200 logs data at intervals ranging from 1 to 60 minutes.

The data can be sent to Schneider Electric on-line energy management platform via:

> Ethernet media, Internet (ADSL, WIFI…)
> GPRS, for isolated sites, or sites where IT administrators do not allow use of the network infrastructure.

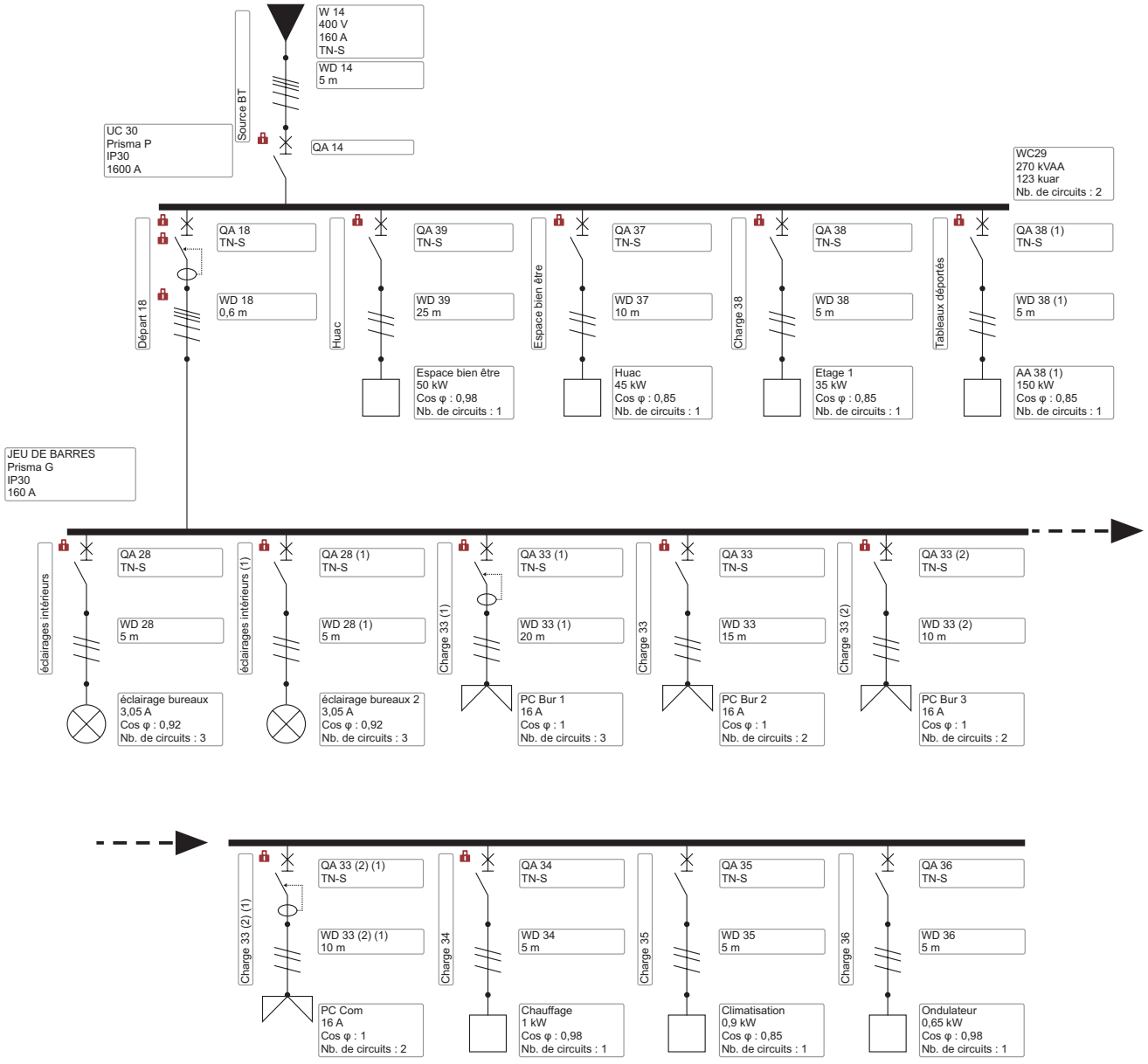
Energy server functional unit



2.2 Medium Buildings

2.2.1 Single Line Diagram

The electrical architecture associated to a medium building is represented below:



The electrical drawing of this installation is provided in reference document.

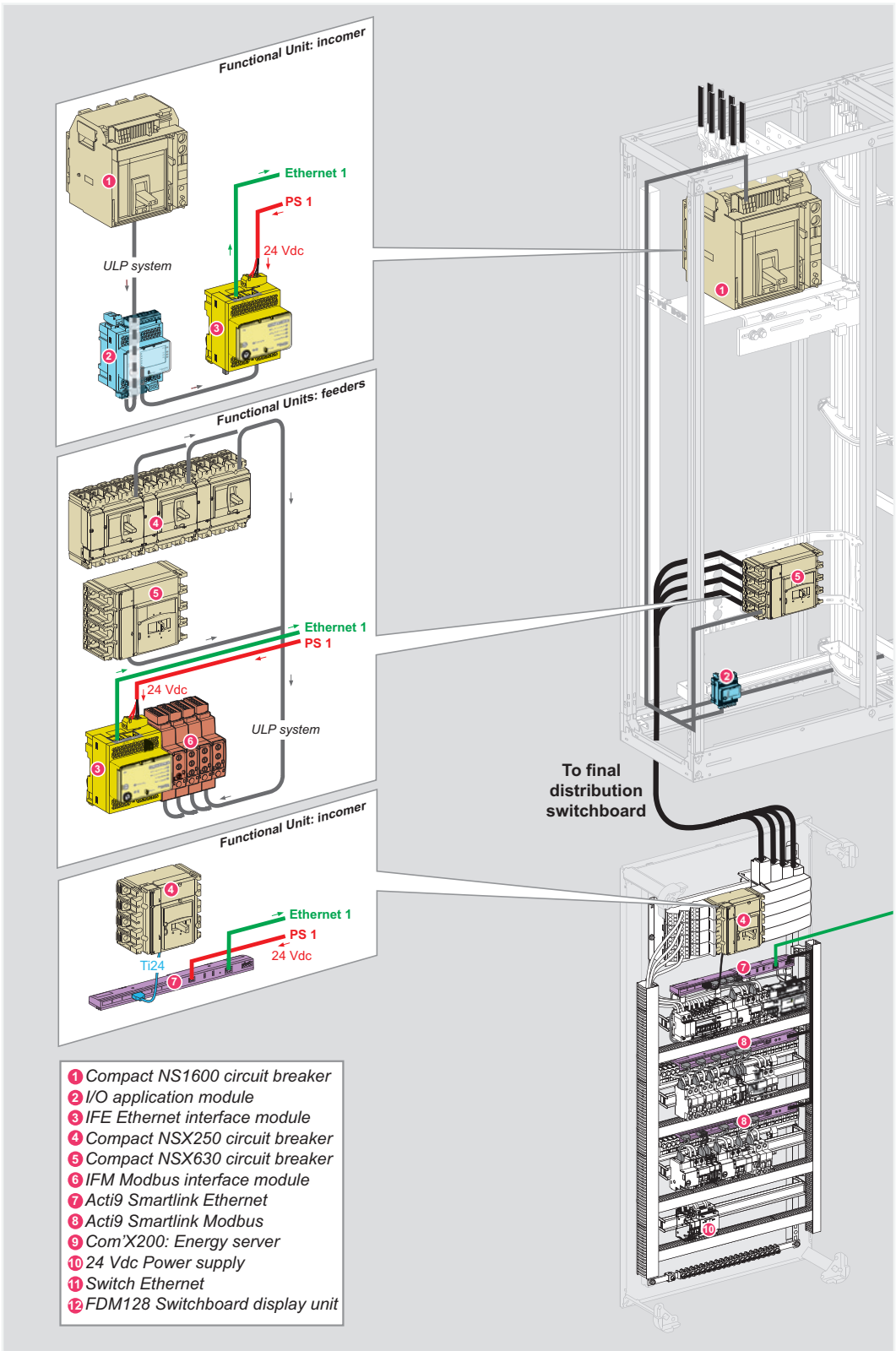
> *Please refer to chapter 5.3.*

2.2 Medium Buildings

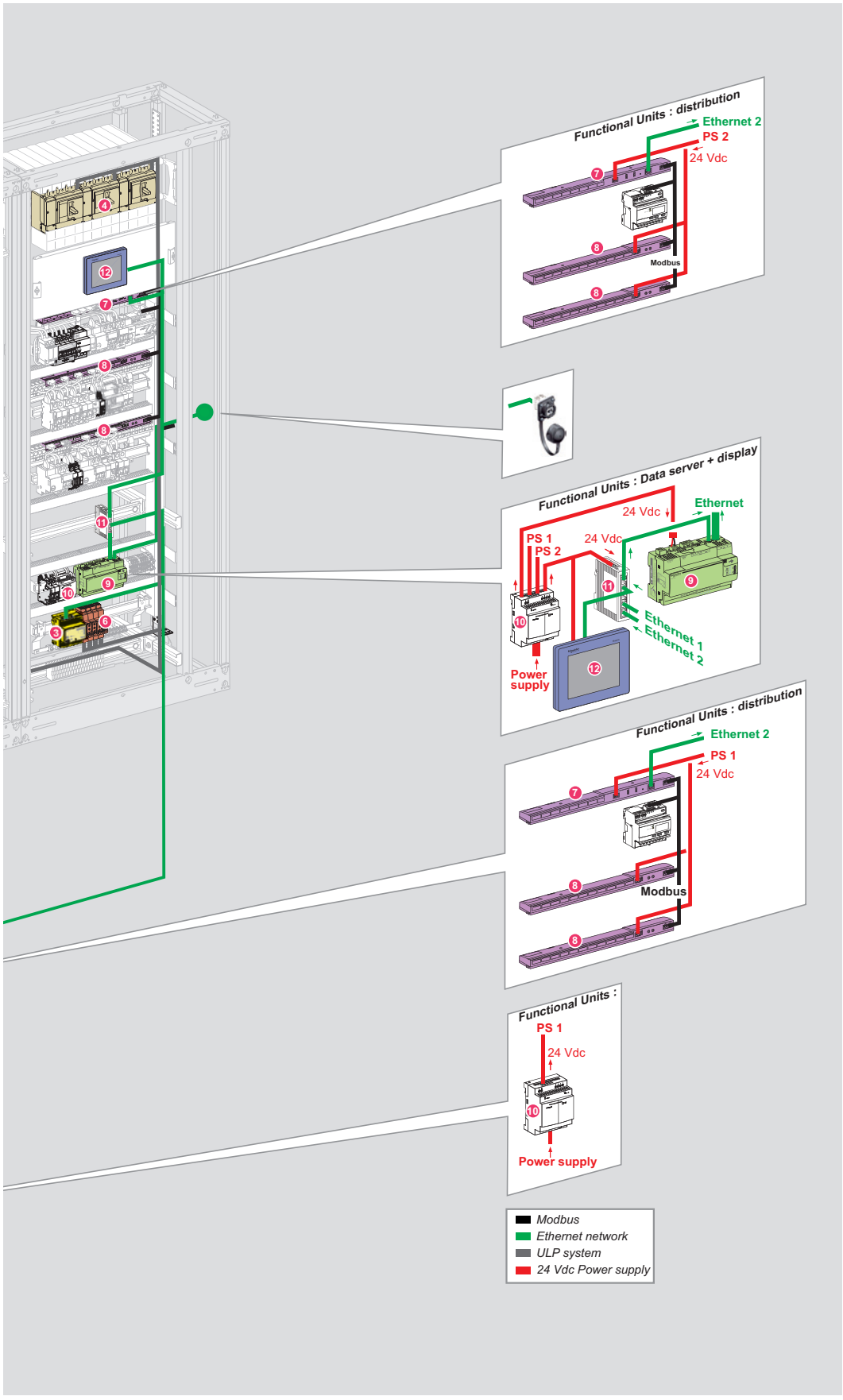
2.2.2 Switchboard architecture

The Smart Panels reference architecture for main low voltage electrical switchboard in a medium building is represented below:

On-line Energy Management Services:

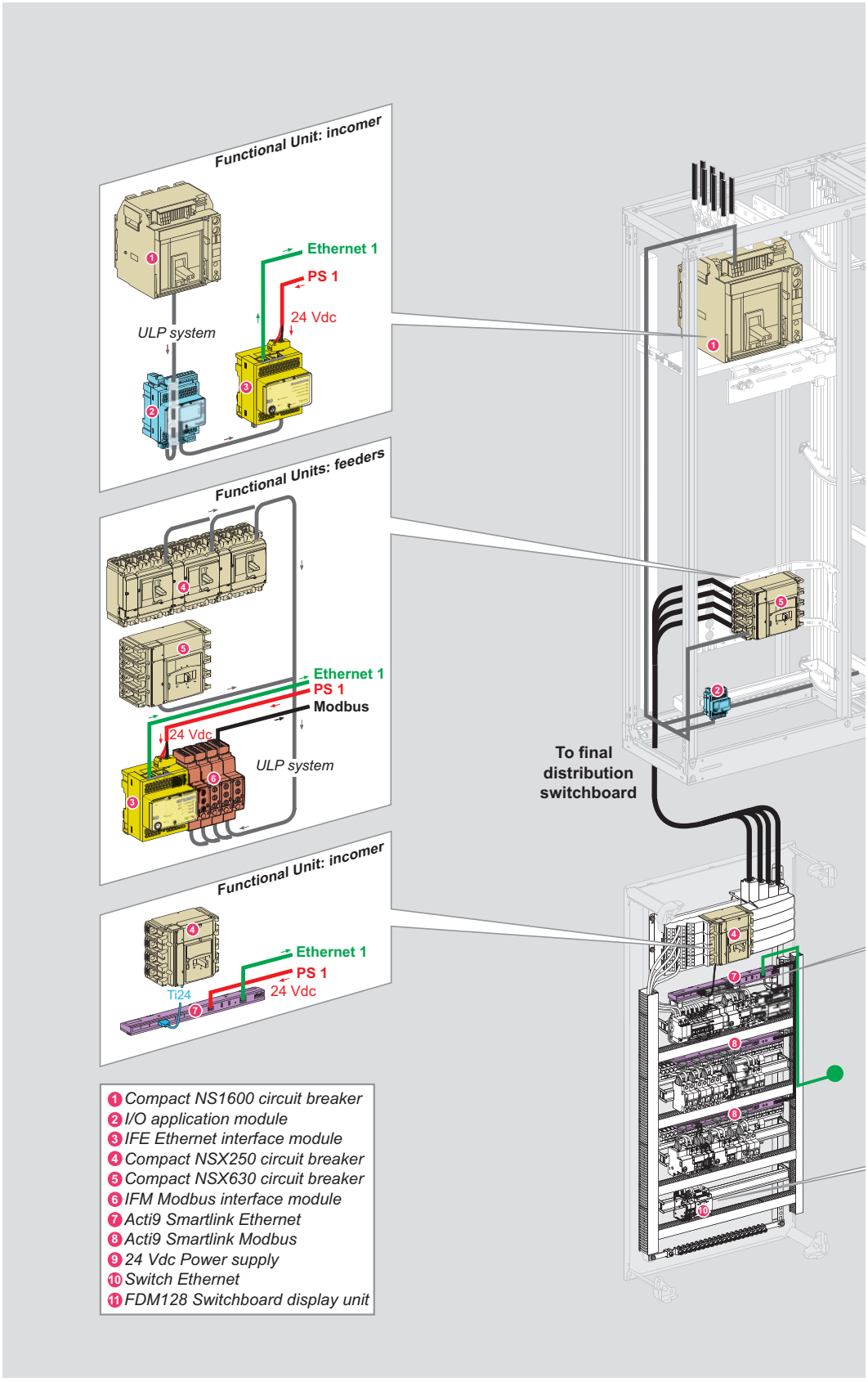


2.2 Medium Buildings

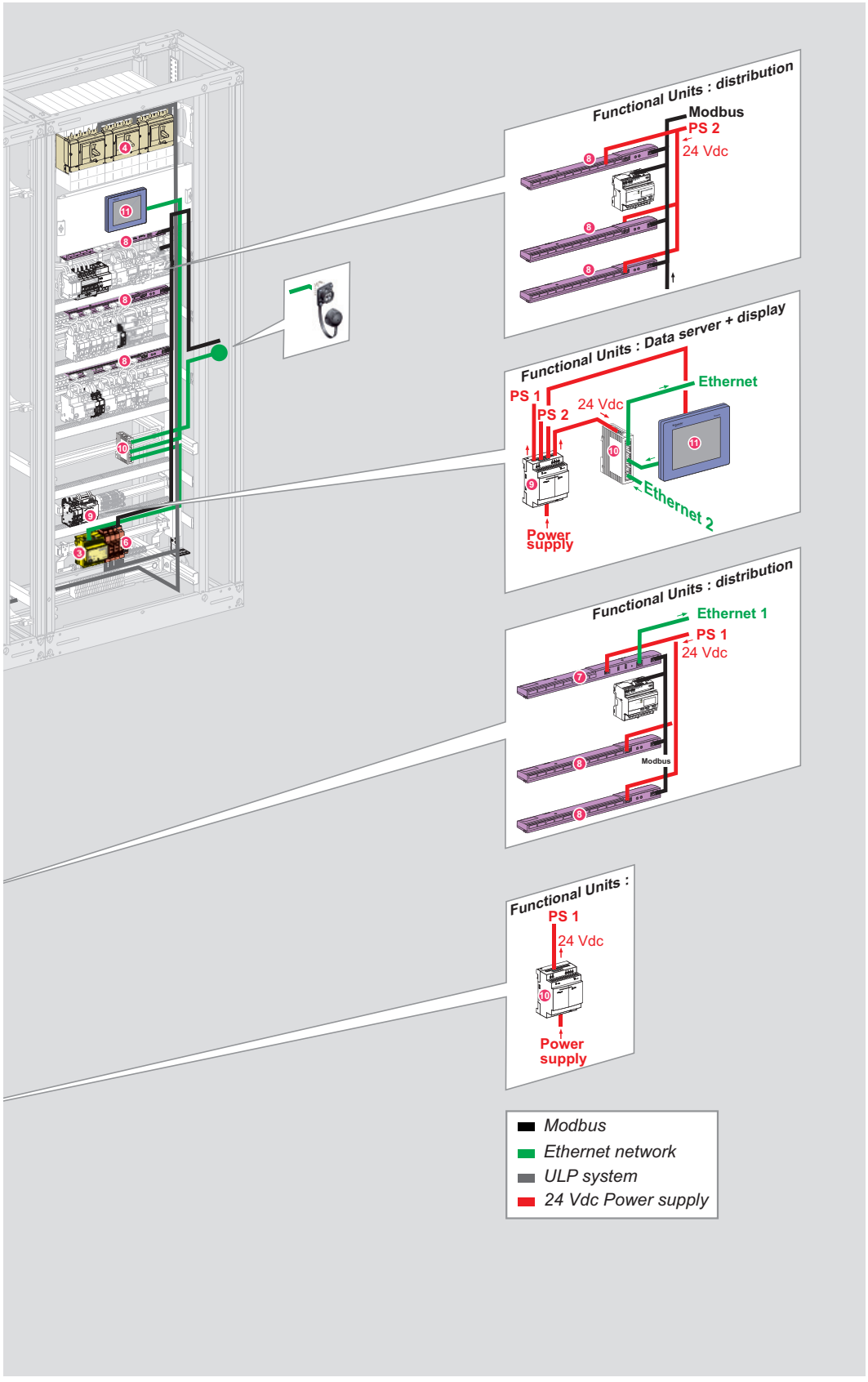


2.2 Medium Buildings

Local energy management:



2.2 Medium Buildings



2.2 Medium Buildings

2.2.3 Enclosures

A switchboard made of Prisma P system is used as example, in addition to the Prisma G switchboard seen in the small building architecture.

Final Distribution

Main Switchboard

2.2 Medium Buildings

2.2.4 General Design

This section describes the choice of hardware, network and software for the medium building reference architecture. It focuses on digital architecture. So the user needs to understand that the design is applicable for many other electrical single line diagrams.
For more detail, > *please refer to the Enerlin'X user manuals referenced in section 5.3.*

The key driver for this selection is to add just enough digital devices to the electrical switchboard so as to offer remote monitoring and control. The selected architecture is represented through 6 functional units:

> Main Switchboard: Main Incomer (monitoring only)

> Main Switchboard: LV Feeders (monitoring only)

> Main Switchboard: Distribution (monitoring and control)

> Main Switchboard: local display (monitoring and control) + energy server (for on-line energy management)

> Final Distribution: Incomer (status monitoring only)

> Final Distribution: Distribution (monitoring and control).

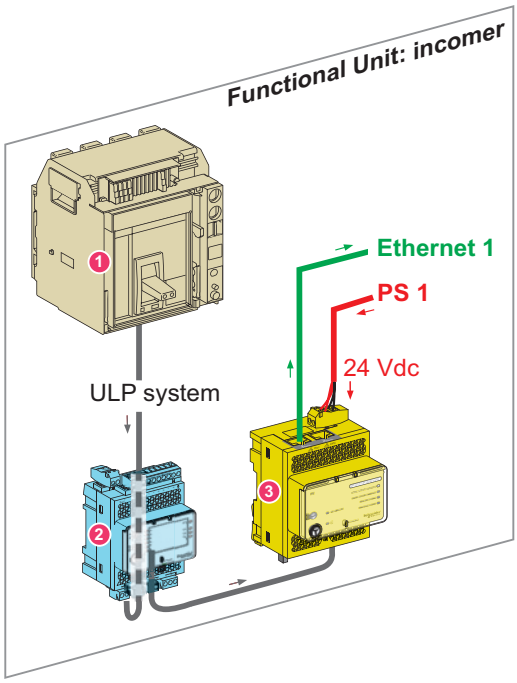
Both panels have Ethernet connectivity. Local web pages are available through IFE for the main switchboard and through Acti9 Smartlink Ethernet for the final distribution switchboard. When connecting to the on-line services platform, only one Com'X 200 is required for the entire application.

Both distributions are identical and are based on Acti9 system: Smartlink digital interfaces are associated mainly with iOF/SD module for protection monitoring, Reflex iC60 for load control and pulse meter iEMT2010.

2.2.5 Main Incomer

The power input of the Smart Panel is protected by a Compact NS circuit breaker. For this architecture, we chose an incomer with manual operation only (no remote controls):

Incomer Functional Unit



Main components of the Incomer functional unit are:

1. Compact NS Withdrawable circuit breaker
2. Enerlin'X I/O interface (Cradle status)
3. Enerlin'X IFE interface (Ethernet / ULP system).

24 V DC power is disbributed within this functional unit thanks to ULP system.

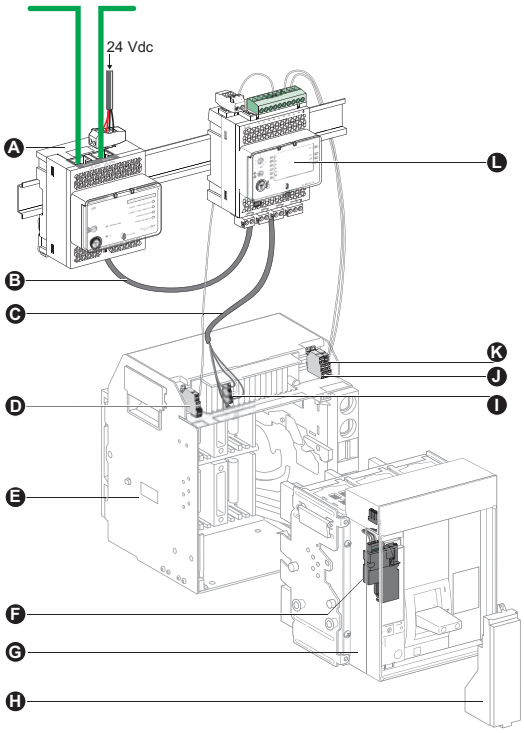
Status and measures of the Incomer functional unit are available through web pages embedded in Enerlin'X IFE. Third party system can also request data using IFE as an Ethernet gateway.

The circuit breaker local display is supported with a FDM128. For a dedicated circuit breaker local display, FDM121 can be added in the ULP system.

2.2 Medium Buildings

This circuit breaker is equipped with an electronic trip unit (Micrologic E) that offers communication from the BCM ULP.

Connection of IFE and I/O interfaces to a Draw out Compact NS circuit breaker and BCM ULP

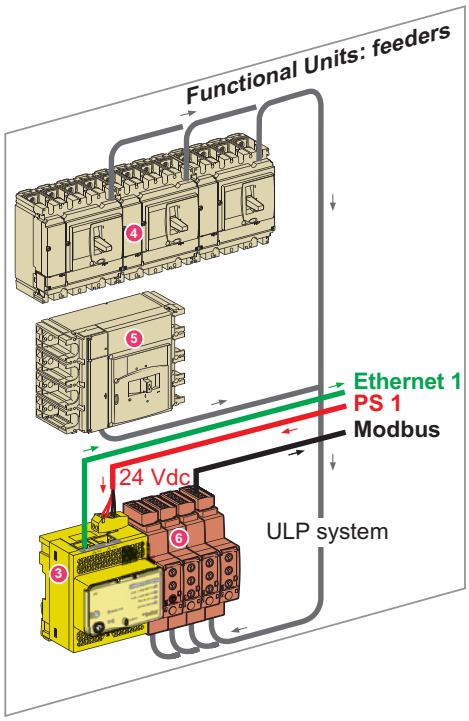


A: Enerlin'X IFE Ethernet interface for LV circuit breaker
B: ULP cable
C: Circuit breaker ULP cord
D: Circuit breaker disconnected position contact (CD)
E: Circuit breaker cradle
F: BCM ULP circuit breaker communication module
G: Drawout circuit breaker
H: Micrologic Trip Unit
I: Drawout terminal block
J: Circuit breaker connected position contact (CE)
K: Circuit breaker test position contact (CT)
L: Enerlin'X I/O input/output interface for LV circuit breaker

2.2.6 Power feeders

The main distribution circuits are protected by Compact NSX circuit breakers. One of them is dedicated to supply the final distribution switchboard. The TVD architecture uses a feeder with manual operation (no remote control):

Feeders Functional Unit



Main components of the feeder functional units are:

3 Enerlin'X IFE gateway (Ethernet / Modbus)
4 Compact NSX circuit breaker (Main loads)
5 Compact NSX circuit breakers (Feeder Distribution)
6 Enerlin'X IFM gateway (Modbus / ULP)

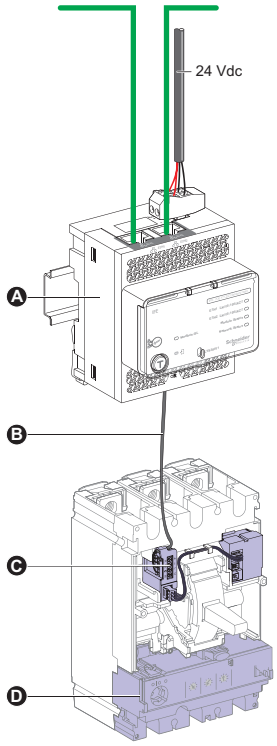
24 VDC power is disbributed within this functional unit thanks to ULP system.

Status and measures of all the device of the functional unit are available from web pages embedded in Enerlin'X. A third party system can also request data using IFE as an Ethernet gateway.

2.2 Medium Buildings

These circuit breakers are equipped with an electronic trip unit (Micrologic E) and a BSCM that features digital communication:

Connection of the IFE to the BSCM and to the Micrologic Trip Unit



A: Enerlin'X IFE, Ethernet interface for LV circuit breaker
B: Compact NSX cord
C: BSCM: Compact circuit breaker status and control module
D: Micrologic trip unit

In this application Enerlin'X IFE is used both as an interface (Incomer FU) and as a gateway (Feeder FU). It will also supply all devices with 24 V DC. The picture below shows the stacking principle between Enerlin'X IFE (Modbus master) and Enerlin'X IFM (Modbus slave). The Modbus addresses need to be set for each IFM using its rotary switches, and then the Modbus serial line parameters are automatically tuned.

IFE+ is used in this example

Note:
Two references are available for Enerlin'X IFE:

Enerlin'X IFE+ : Ethernet interface & Gateway
Ref: LV434011 for Modbus to Ethernet

Enerlin'X IFE : Ethernet interface Ref: LV434010 for circuit breakers

2.2 Medium Buildings

2.2.7 Distribution

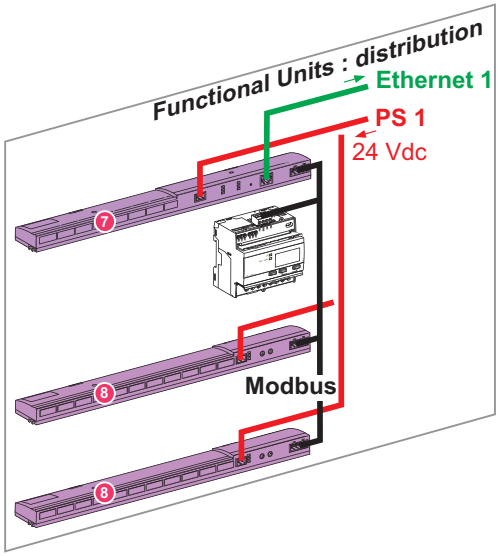
The digital architecture of medium size building final distribution is different upon whether energy management is performed local or on-line.

For local energy management, Ethernet network will feature one IP connection point for each of the Smart Panels.

2.2.7.1 On-line energy management

The communication architecture of the Acti9 part is detailed below:

Distribution functional unit



Main components of the distribution functional unit are:

7 Acti9 Smartlink Ethernet

8 Acti9 Smartlink Modbus.

Energy meter Acti9 iEM3150.

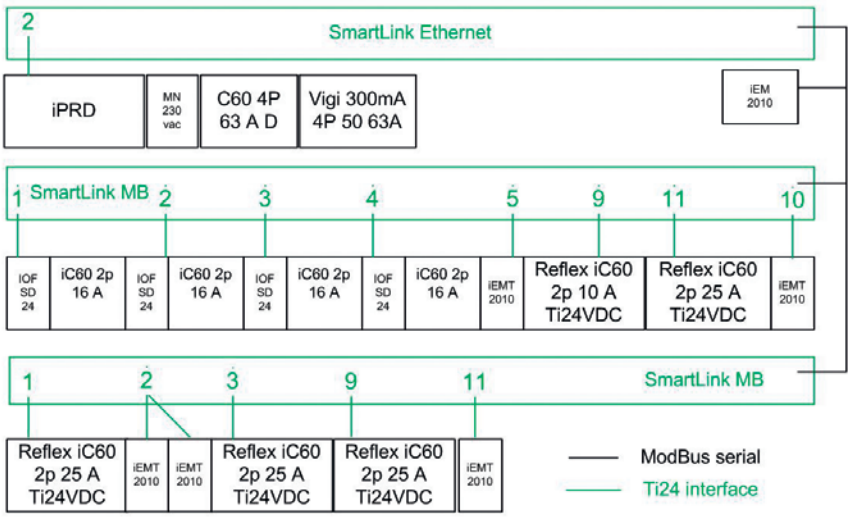
Acti9 Smartlink Ethernet version acts as Modbus-SL master and aggregates data from :

> Energy Meter (Modbus energy meter is or an IEM or a PM)

> All Modbus versions of Acti9 Smartlink.

Web pages, embedded in Ethernet version of Acti9 Smartlink enable monitoring of electrical values, of device status, and control of Reflex iC60 circuit breakers.

Final distribution architecture is summarized below:

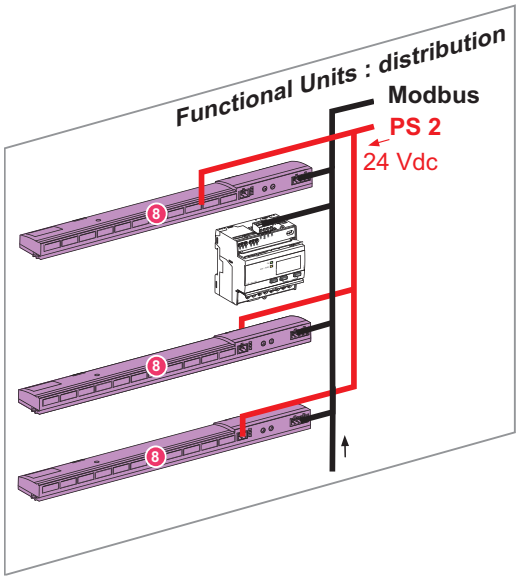


2.2 Medium Buildings

2.2.7.2 Local energy management

The communication architecture of the Acti9 part is detailed below:

Distribution functional unit



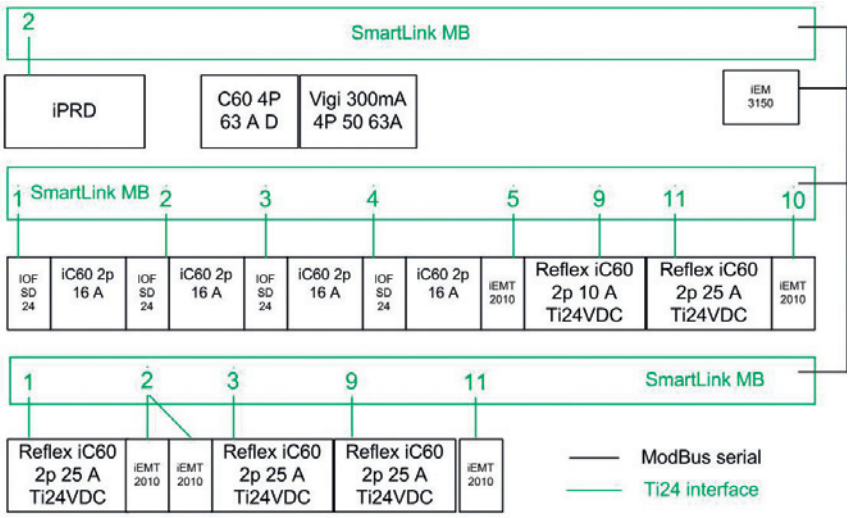
Main components of the distribution functional unit are:

8 Acti9 Smartlink Modbus.

Energy meter (Acti9 iEM3150)

Acti9 Smartlink Modbus and energy meter are connected directly to the Modbus serial line input of Enerlin'X IFE. Enerlin'X IFE web pages enable electrical value monitoring and circuit breaker control.

Final distribution is synthesized below:

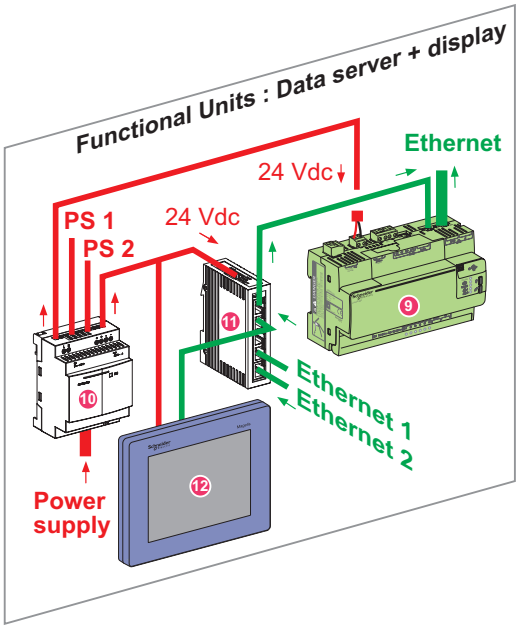


2.2 Medium Buildings

2.2.8 Local Display, and Energy Server (for on-line energy management)

In case of on-line energy management, Com'X 200 energy server enables WAGES data to be collected and sent to a platform providing energy management services.

Data Server and Display Functional Unit



Main components of this functional unit are:

9 Com'X 200 energy server

10 24 V DC Power Supply

11 Ethernet Switch

12 FDM128 local display.

Com'X 200 collects data from final distribution through Acti9 Smartlink (Ethernet version) and sends it to an energy management service platform, hosted in the Schneider Electric cloud.

This functional unit supplies the whole with 24 V DC power required for digital devices. This auxiliary power supply is protected by a dedicated circuit breaker.

In this TVD architecture, Com'X 200 is used to gather electrical values and temperature monitoring from the Smart Panels to publish data to a hosted platform via Ethernet.

FDM128 is a color LCD touch screen integrated in the main switchboard. It provides local monitoring and control of the distribution network.

Com'X 200 can collect data from:

> Meters with pulse signal outputs, directly connected to its digital inputs

> Devices connected to Modbus RS485 network

> Devices connected to Ethernet TCP/IP network

> Sensors (temperature, humidity…) directly connected to its analog inputs.

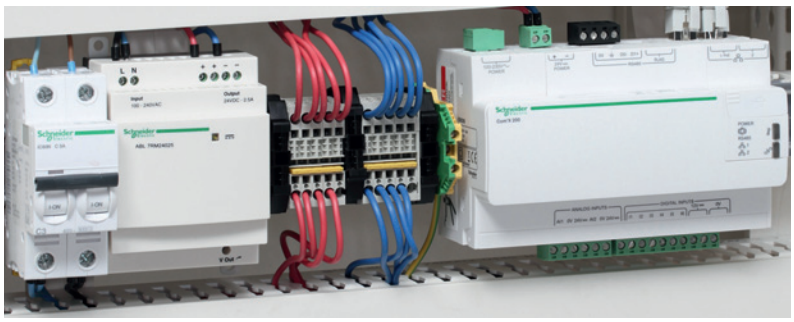
Com'X 200 logs data at intervals ranging from 1 to 60 minutes.

The data can be sent to Schneider Electric on-line energy management platform via:

> Ethernet media to access Internet (ADSL, WIFI…)

> GPRS media, for isolated sites, or sites where IT administrators do not allow use of the network infrastructure.

This picture shows the physical implementation in the cubicle:



Configuration

Configuration

In this chapter we show how to configure hardware and software in Smart Panels to provide either local or on-line energy management.

The configuration and test are conducted with configuration software tools or through Enerlin'X devices embedded web pages. Smart Panels manufacture and Enerlin'X devices fitting recommendations are not detailed here. You will find a chapter summarizing installation best practices in the appendix. Further recommendations are available in "**Smart Panels digitized switchboards assembly guide"**, provided in reference document.

> *Please refer to chapter 5.3 .*

Smart Panels digital system can be configured with the following:
> Software configuration tools **(Acti9 Smartlink test tool, RSU)**
> Enerlin'X device embedded web pages.

Enerlin'X devices have web pages to easily configure the system. However, additional configuration tools would be useful for configuring advanced settings (e.g. protection setting, automatic test report…).

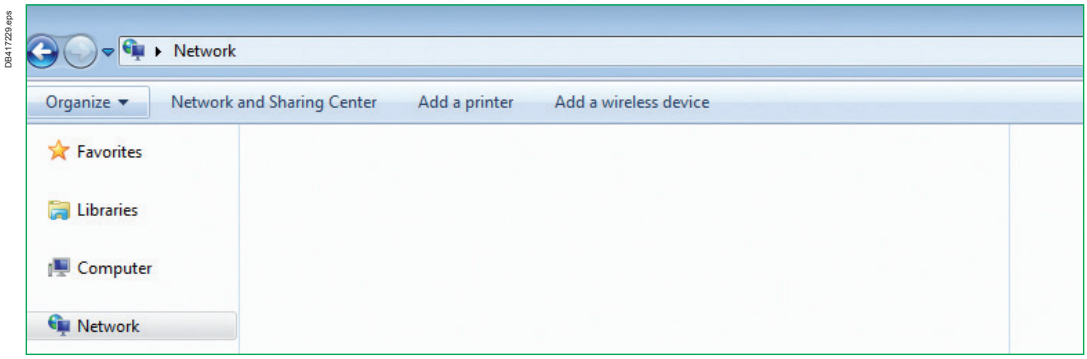
Note: in this chapter, it is assumed that all devices are configured with their respective factory settings.

Note: the electrical protection configuration settings are not described because these parameters are project specific.

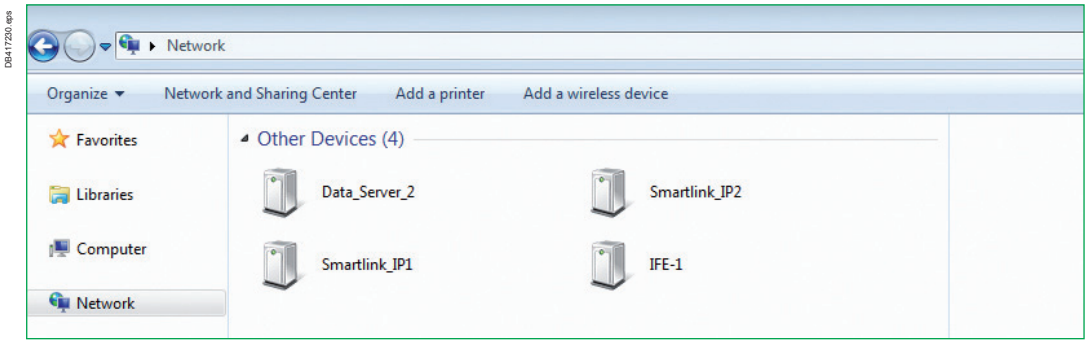
3.1 Ethernet connected devices detection

Enerlin'X devices connected to Ethernet network are automatically detected and identified, thanks to DPWS (device profile for web services) embedded in Microsoft Windows Vista, Windows 7 and Windows 8. This feature has been tested and validated with Windows 7, as hereunder described.

Connect your computer to the Smart Panels network or an Enerlin'X device. Open Windows Explorer:



Click on network to automatically display connected devices:



Double click a device to access its web pages.

Note: connection via routers is not compatible with the DPWS feature.

3.2 Acti9 Smartlink

In this section we configure the communication and cabling association on Acti9 Smartlink channels.

3.2.1 Hardware configuration

Modbus version:

Ti24 connector
11 input/output channels
> Pin 1: 0 V
> Pin 2: I1 Input 1
> Pin 3: I2 Input 2
> Pin 4: Q Output
> Pin 5: +24 V DC

Modbus slave cabling
RS485 Modbus
> Pin 1: D1 Modbus
> Pin 2: D0 Modbus
> Pin 3: shielding
> Pin 4: common/0 V

Modbus slave addressing
with rotary switch (Modbus address must be unique).

Ethernet version :

Ti24 connector
7 input/output channels
> Pin 1: 0 V
> Pin 2: I1 Input 1
> Pin 3: I2 Input 2
> Pin 4: Q Output
> Pin 5: +24 V DC

Ethernet Cabling
100 base T - 1* RJ45

Modbus master cabling
RS485 Modbus
> Pin 1: D1 Modbus
> Pin 2: D0 Modbus
> Pin 3: shielding
> Pin 4: common/0 V

3.2 Acti9 Smartlink

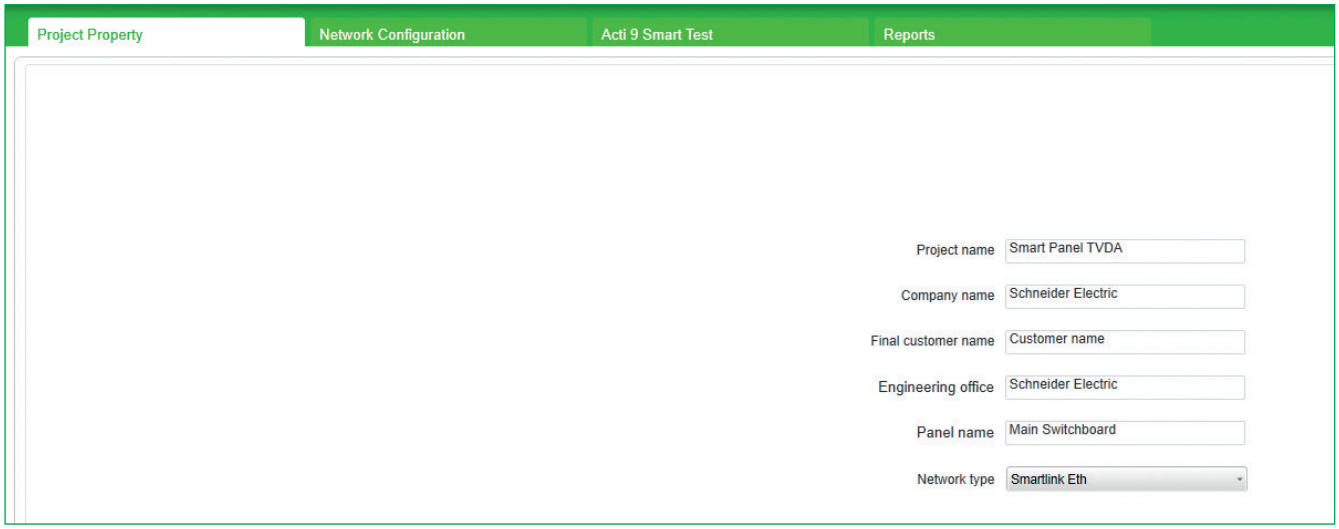
3.2.2 Software Configuration

Acti9 Smartlink can be configured and tested can be executed through dedicated software or via web pages embedded in Ethernet version. Smartlink devices must be correctly connected with correct addressing to work effectively.

3.2.2.1 Acti9 Smartlink test software

Launch Acti9 Smart Test and create a project:

DB417231.eps

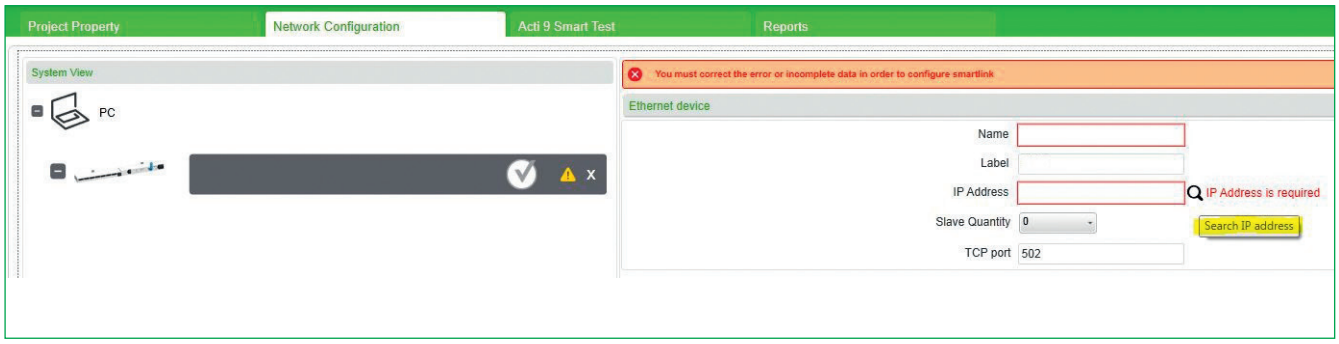


This TVDA selected a "Smartlink Eth" Network type.

Network configuration

Go to "Online" mode and click the 🔍 icon to discover Smartlink Ethernet devices (Ethernet DPWS feature).

DB417232.eps



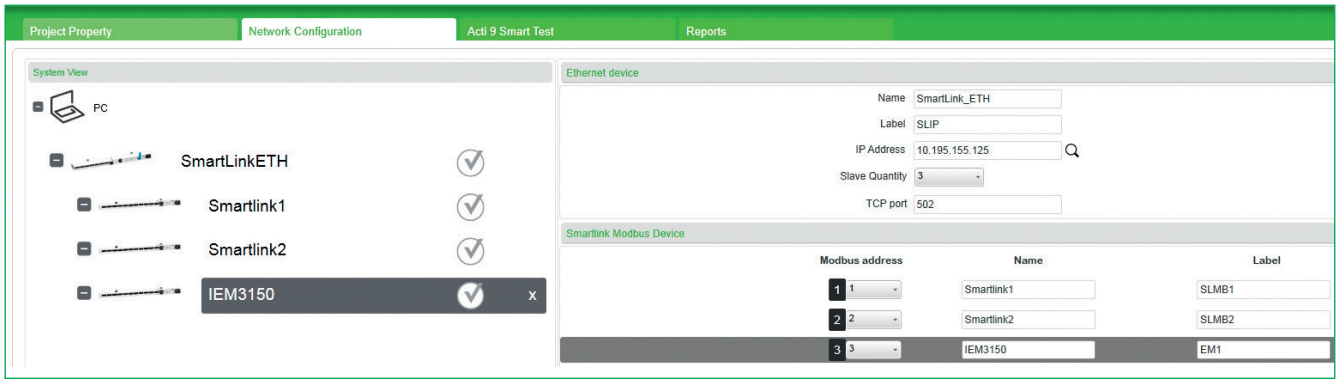
Acti9 Smartlink devices, Ethernet version, will appear automatically when configured correctly. Identify the master and each slave that must be declared:

> Ethernet versions (Modbus master): IP address, label, number of slaves
> Modbus versions (Slave): Modbus address, label
> Other Modbus (Slave): Modbus address, label: iEM3150 in our case.

3.2 Acti9 Smartlink

The following illustration shows the expected configuration:

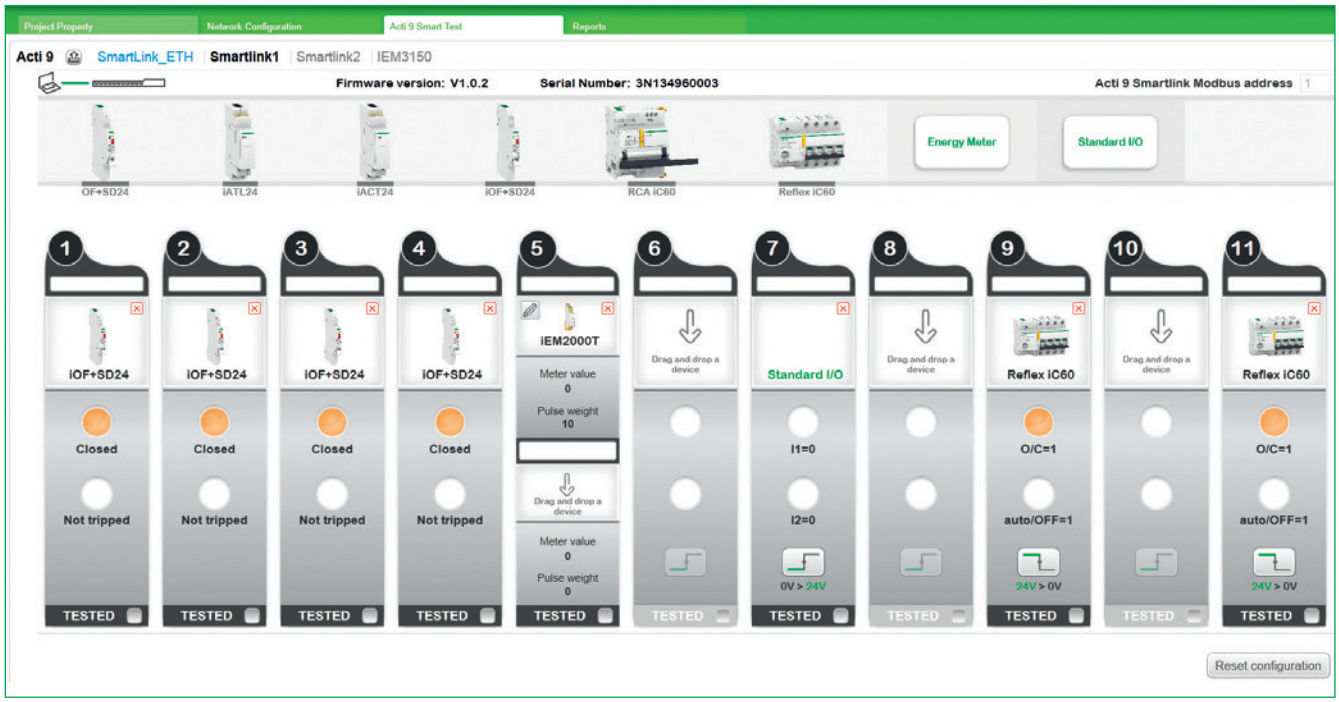
DB417233.eps



Acti9 devices association

Associate the Acti9 connected devices to the corresponding channel using the Acti9 Smart Test software. Use the drag and drop feature to associate corresponding devices to each channel. Repeat the Drag and Drop operation until each Acti9 device have a corresponding channel.

DB418216.eps



Both communication and functional aspects of each Acti9 Smartlink can be tested with the software. An automatically generated report can be used to supplement contractual documentation in a project.

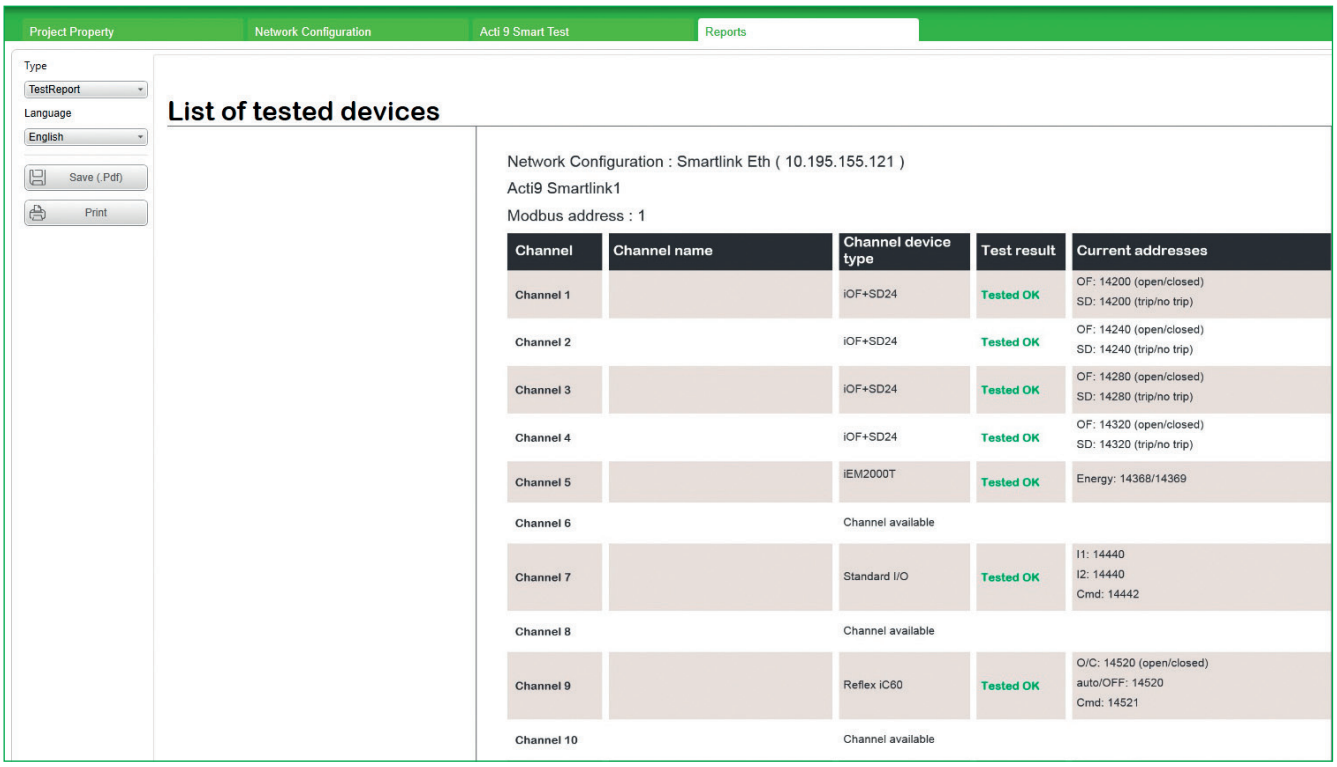
3.2 Acti9 Smartlink

Control Test
For each controlled channel (i.e. connected to a contactor), the software can be used to generate an ON – OFF signal. The result can be physically observed and recorded in the Test Report.

Monitoring Test
For each monitored channel (i.e. connected to a circuit breaker), the circuit (breaker can be manually operated. The result is displayed on the Test page and recorded in the Test Report.

Test Report
Example of test report, ready to be saved or printed:

DB417235.eps



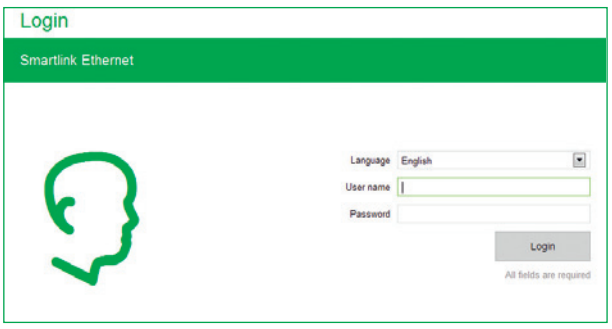
3.2.2.2 Acti9 Smartlink embedded web Pages

The same configuration process can carried out with the web pages, embedded in Ethernet version of Acti9 Smartlink.

Access:

Follow DPWS process as described in chapter 3.1, then click on Acti9_XXYYZZ (where XXYYZZ is the device name in DPWS). On opening, enter the device's login and password to gain access to the web pages:

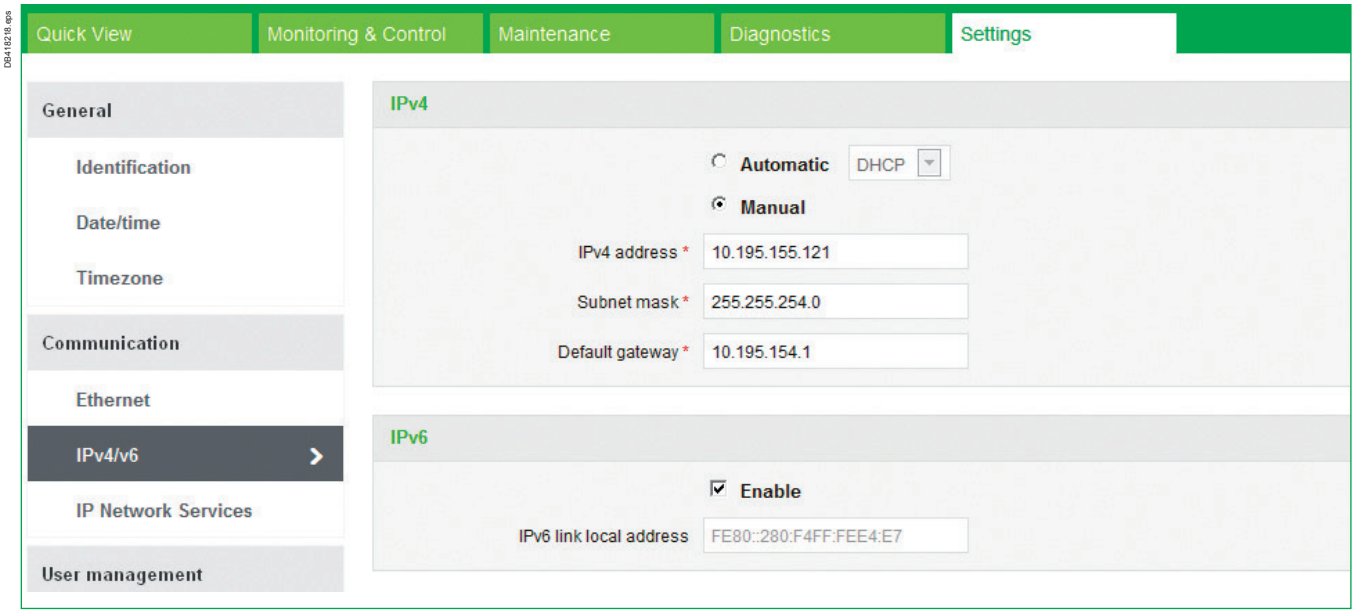
DB418217.eps



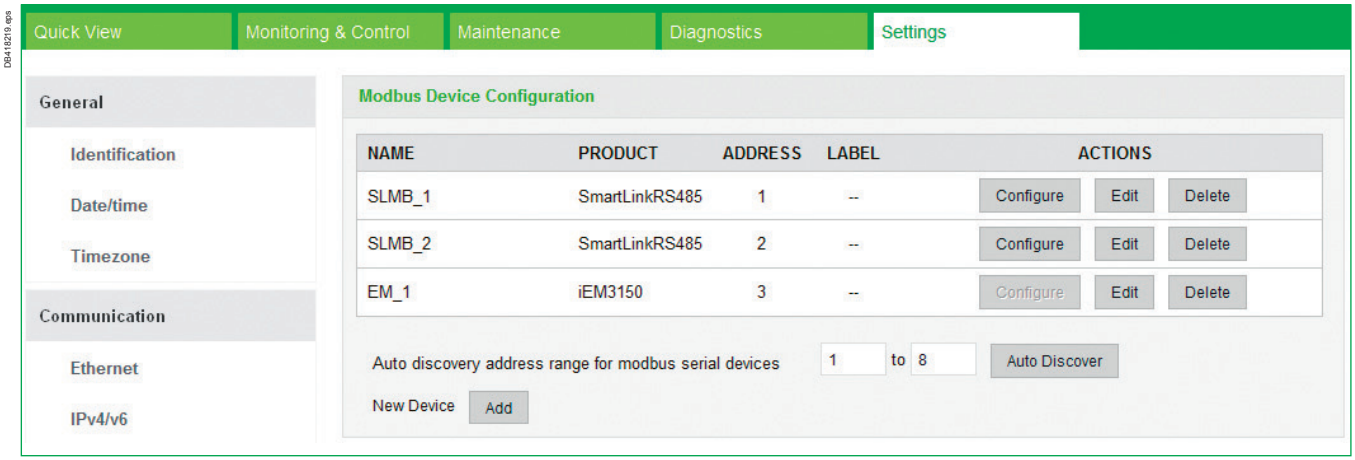
3.2 Acti9 Smartlink

Network Configuration

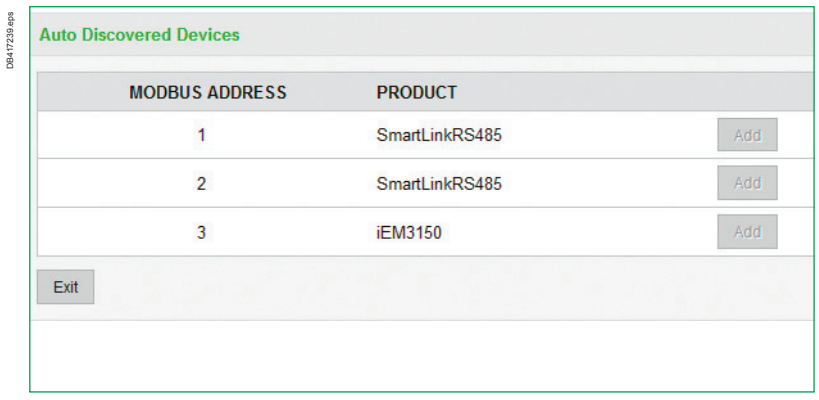
Start by entering the information for all general and communication parameters in the setting menu: Name, IP addressing, label.



Follow the previous step by configuring the Modbus slave Acti9 Smartlink devices: Name, Modbus address, and label.



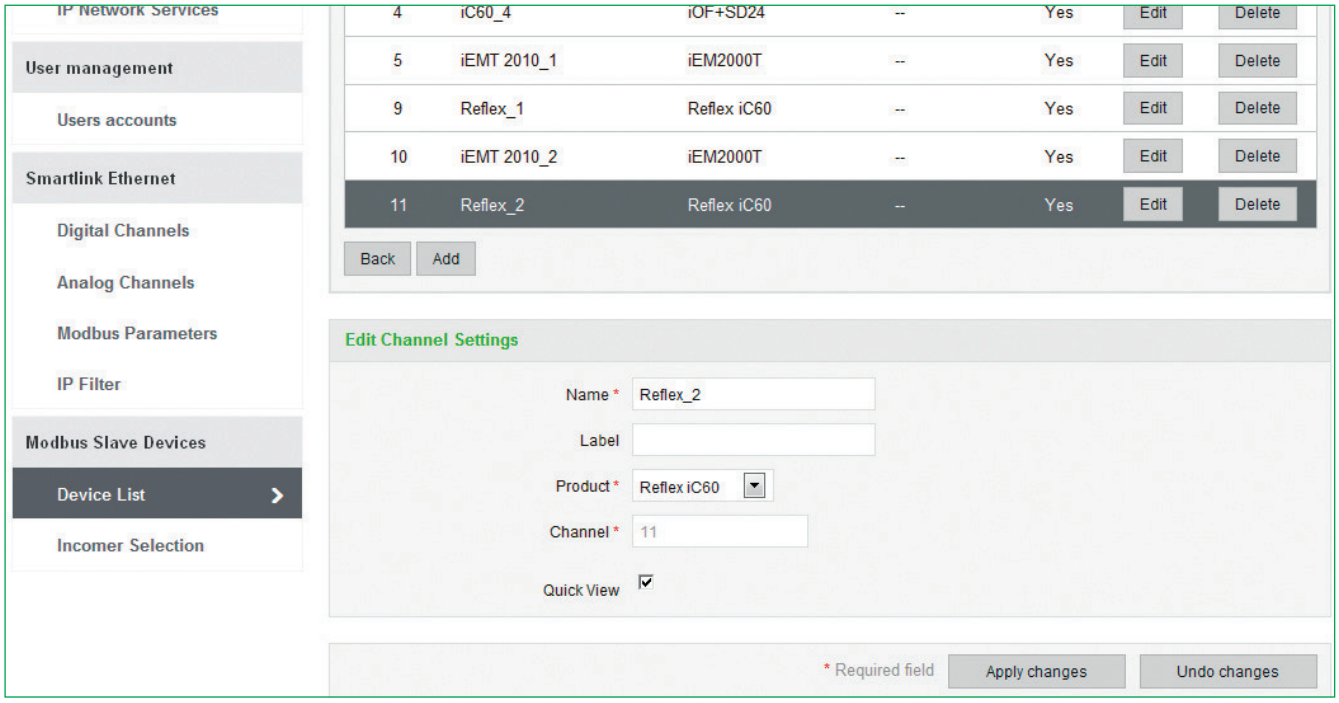
Modbus auto discovery feature is available:



3.2 Acti9 Smartlink

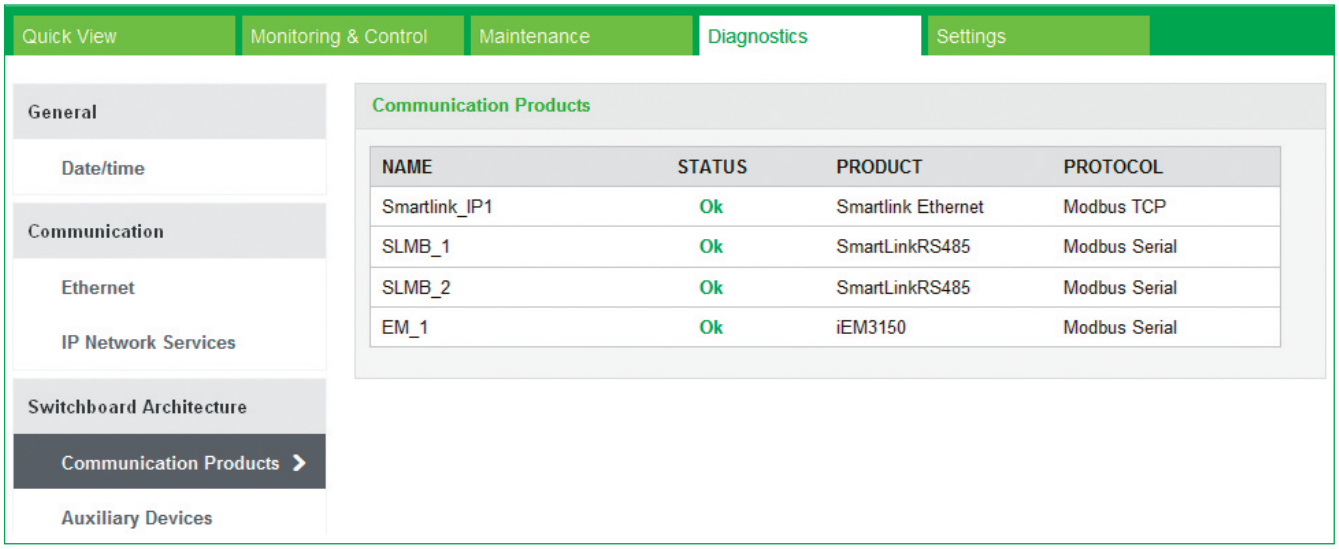
Channel Association

Associate each Acti9 connected devices to the corresponding channel. For each device and each channel, complete the device association:



Test Report

Both communication and functional aspects of each Acti9 Smartlink can be tested with the web pages. An automatically generated report is not created like with dedicated test software. However, a screen print can be used to create the report:



3.3 Enerlin'X IFM

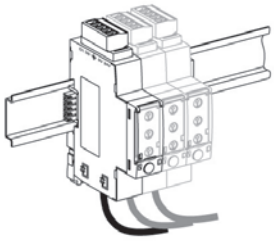
Modbus addresses:

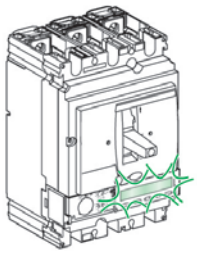
Modbus addresses must be set with the two rotary switches symbolized with **X1** and **X10**. The symbol **X10** corresponds to the tens, and the symbol **X1** to the ones. To set the Modbus address to 4, proceed as follows:

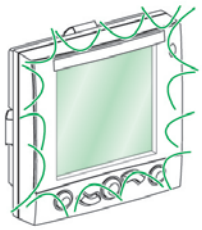
IFM rotary switch:

> Set the **X10** switch to 0
> Set the **X1** switch to 4
> Turn the padlock switch to the unlocked position.

Verify connection between Enerlin'X IFM and circuit breaker: press the test button on IFM and visually check that the associated Micrologic trip unit flashes simultaneously (ON: 1000 ms/OFF: 1000 ms):







Note: If an FDM121 is used, its screen also flashes.

3.4 Enerlin'X IFE

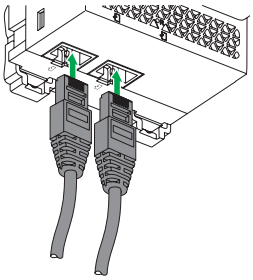
In this section we configure communication with LV circuit breakers.

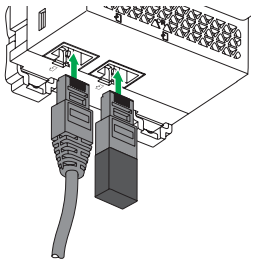
3.4.1 Hardware Configuration

ULP Connection:

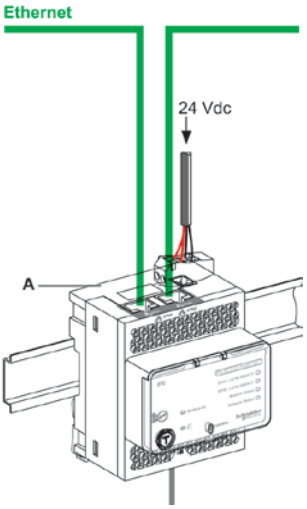
All connection configurations require the circuit breaker ULP cord. An insulated Compact NSX cord is mandatory for system voltages greater than 480 VAC. When the second ULP RJ45 connector is not used, it must be closed with a ULP terminator.

3.4 Enerlin'X IFE





Check the connection between Enerlin'X IFE, I/O interface and circuit breaker using the "ULP test button". Press the test button on IFE and visually check that IFE, I/O interface and associated Micrologic trip unit flash simultaneously (ON: 1000 ms/OFF: 1000 ms):



Ethernet connection:

Enerlin'X IFE has two Ethernet ports E1 and E2:

Ethernet Cabling

100 base T – 2* RJ45 – E1 and E2

Ethernet 1 and Ethernet 2 ports act as a non manageable switch.

Note: IFE doesn't support redundant Ethernet protocol (RSTP, MRP, Hyper Ring...). IFE provides Ethernet daisy chain connection.

If a daisy chain loop is requested, an Ethernet loop manager must be used.

Note: be careful with ULP and Ethernet connections as both use RJ45 connectors. ULP system supplies 24 V DC power to all connected devices. Serious damage can occur in the event of a false connection.

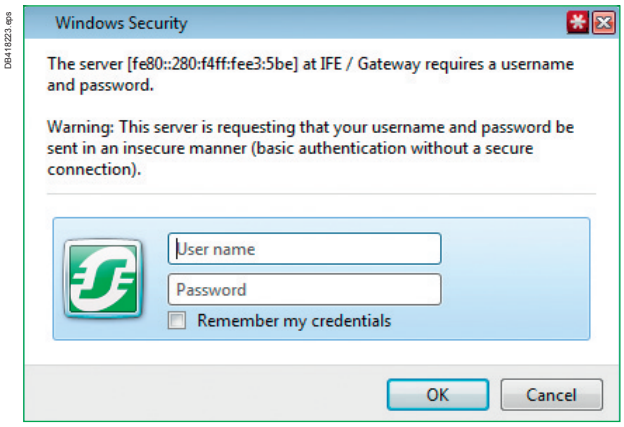
3.4.2 Software Configuration

This part details Enerlin'X IFE configuration and test that is carried out by web pages. IFE devices must be connected and addressed correctly.

Web Pages Access

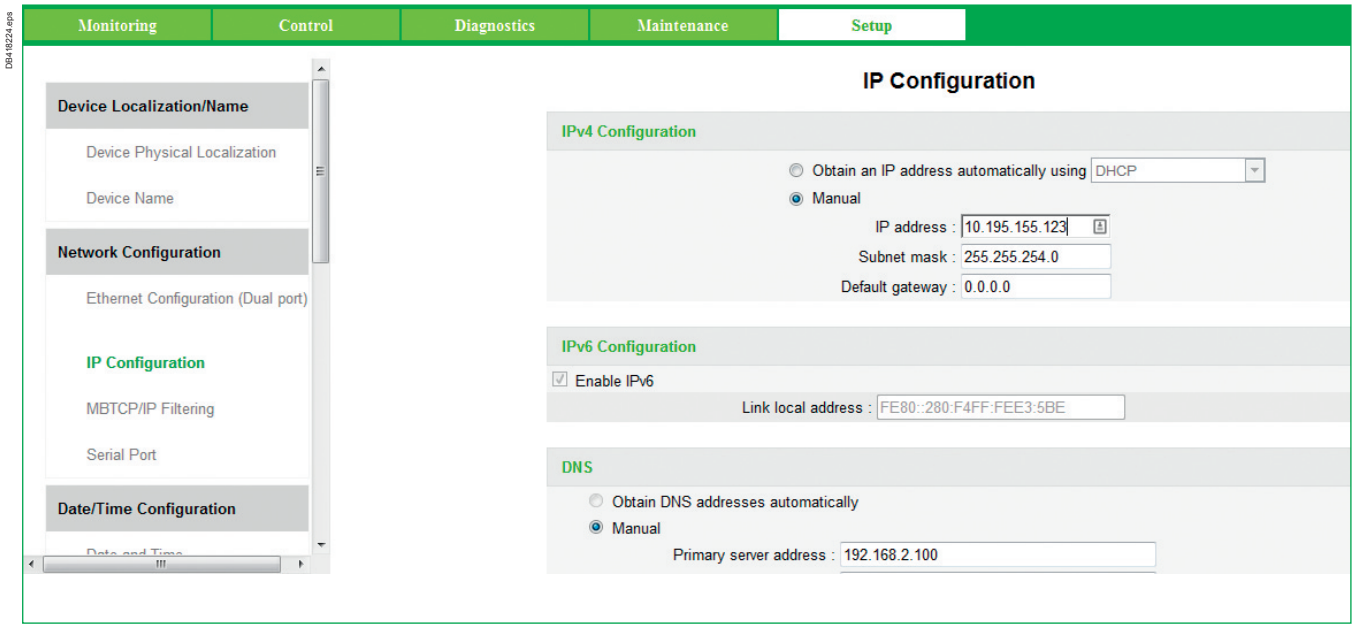
Using the Ethernet discovery feature (DPWS) as described in chapter 3.1, open the IFE web pages by clicking on IFE_XXYYZZ and enter the device login and password:

3.4 Enerlin'X IFE



Ethernet network configuration

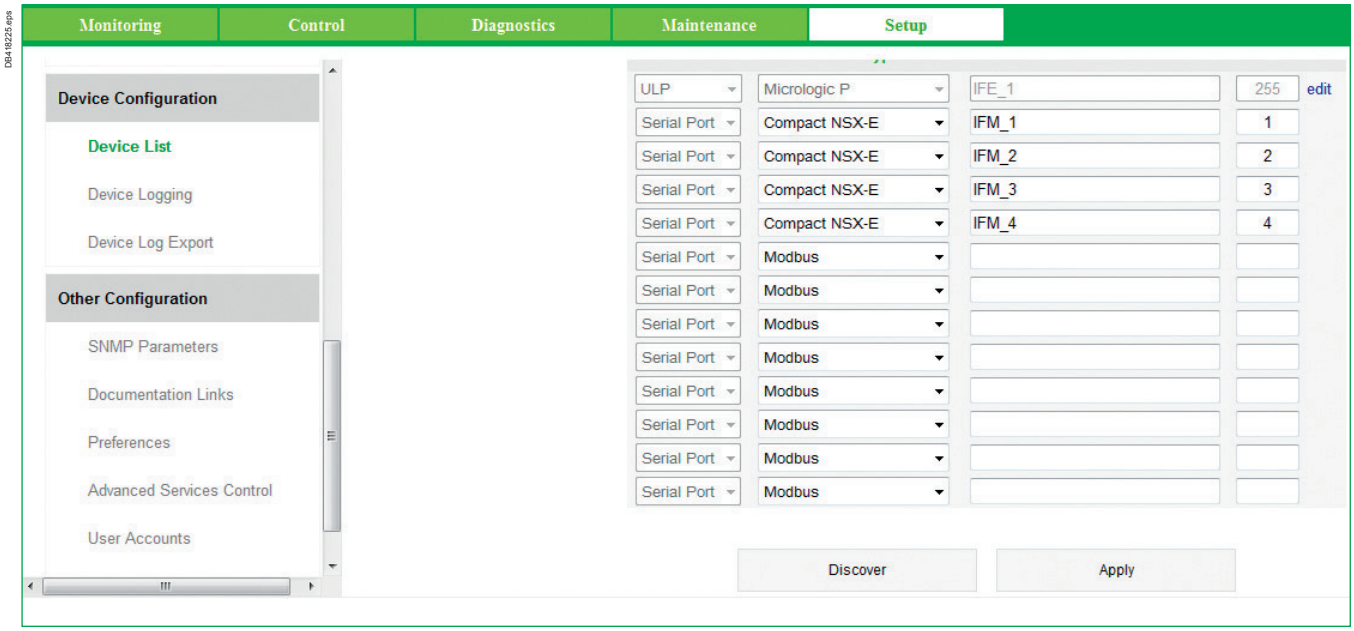
Enter information for all general and communication parameters in the setup menu: Name, IP addressing, label.



3.4 Enerlin'X IFE

Modbus configuration

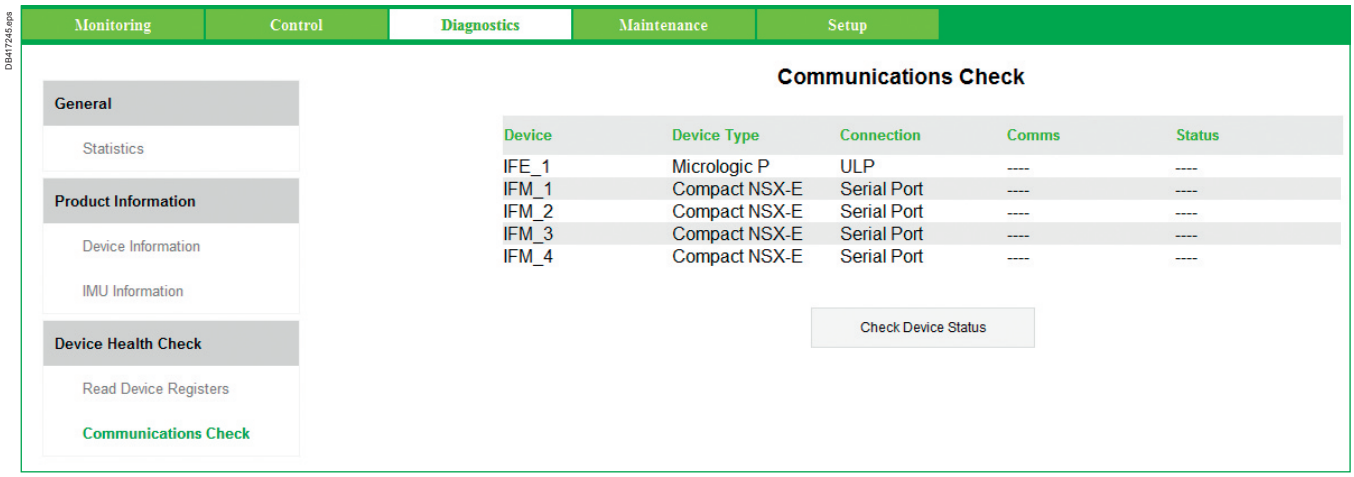
After completing the Ethernet configuration, configure the Modbus slave devices: Name, Modbus address.



Enerlin'X IFE provides an auto discovery feature of connected Modbus slave devices.

Test Report

Both communication and functional aspects (Open / close status and Open / Close control) can be tested with the web pages. A screen print of the web pages can be used to create a test report:



3.4 Enerlin'X IFE

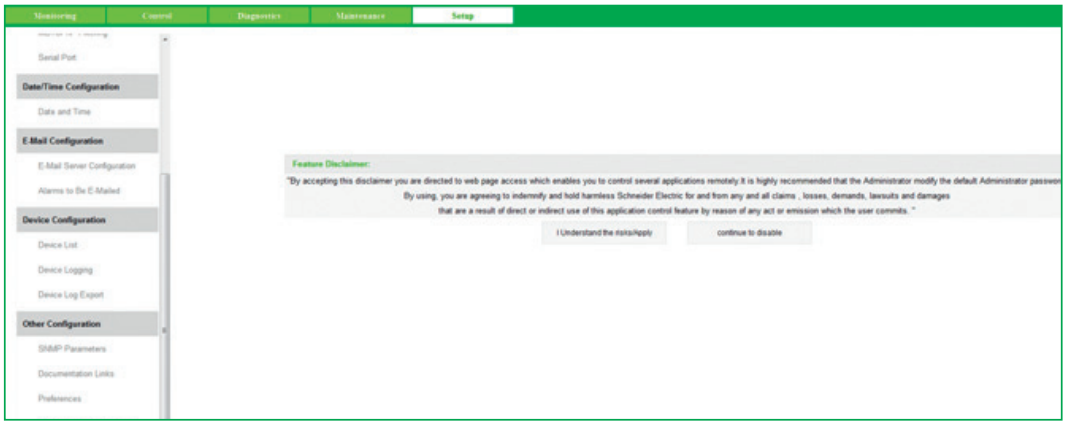
Control Activation

In this document, all main LV circuit breakers are manually operated with no support for open/ close remote controls. However, Enerlin'X IFE provides opening and closing controls from the web pages when using a remote controlled circuit breaker. The feature needs to be activated:

> 1. Press the test button of Enerlin'X IFE for 10 to 15 seconds

> 2. Connect to the IFE web pages / Setup / Webpage Access and accept the feature Disclaimer:

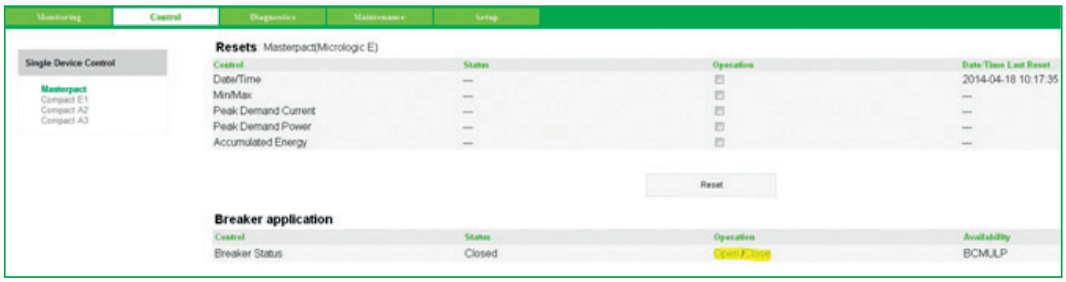
DB418226.eps



The page will time out after 5 minutes if an acceptance or refusal is not entered. If the page times out, the disclaimer page will disappear and the remote control features are not enabled.

> 3. After accepting the disclaimer, device open/ close control orders can be sent remotely by clicking the link under the Operation heading (Open/ Close).

DB418227.eps



3.4.3 Notification

A notification feature is provided by Enerlin'X IFE for circuit breakers directly connected to the ULP system. A notification is sent via e-mail. The notification may be triggered upon an event such as a circuit breaker alarm and the IO interface. Multiple e-mails can be transmitted to multiple users for different alarm conditions. Settings are managed through the device web pages, > *see chapter 3.9.3.7 for details.*

Note: e-mail notifications require a non-encrypted SMTP server. For example, notifications will not work in an environment using encryption (SSL/TLS) or SMTP servers (smtp.google.com).

3.5 Enerlin'X I/O Module Application

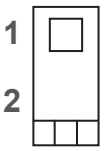
The I/O module provides pre defined application for circuit breaker management. It is an Input / Output interface for Compact and Masterpact circuit breakers. In this TVDA, one I/O module is used for the main incomer with cradle management (Connected - Disconnected - Test Positions).

3.5.1 Hardware Configuration

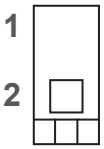
I/O Module Identification Setting

Two I/O modules can be used for the same breaker connected to a ULP system (I/O Module 1 or I/O Module 2).

When 2 I/O modules are connected in the same ULP network, the 2 I/O modules are differentiated by the position of the dip switches located on the bottom of the I/O module:



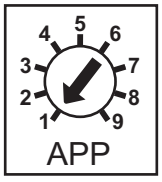
Dip switch on position 1
for I/O module 1 (factory setting).



Dip switch on position 2
for I/O module 2.

I/O Module Predefined Application

The application rotary switch is used to select predefined applications. The switch has 9 positions with each position assigned to a predefined application. The factory set position is application 1.



The Predefined Applications are summarized in the table below:

Application rotary switch position	Predefined application	Description
1	Cradle management	Monitors the position of the circuit breaker in the cradle
2	Circuit breaker operation	Controls the opening and closing of the circuit breaker by using the control mode (local or remote) and the close inhibit order
3	Cradle management and Energy Reduction Maintenance Setting (ERMS)	Monitors the position of inputs and controls the ERMS mode of the circuit breaker
4	Light and load control	Controls the light and load application
5-8	Spare	Future evolution
9	Custom	Performs the user-defined applications with the I/O module

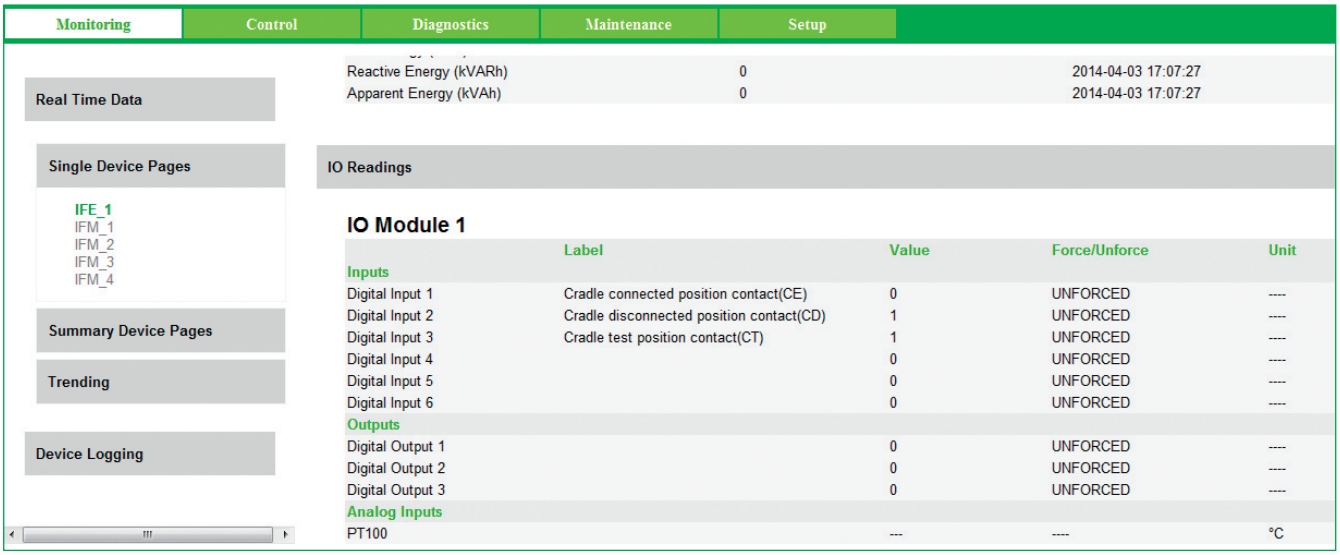
3.5 Enerlin'X I/O Module Application

3.5.2 Software Configuration

Enerlin'X I/O module tests can be configured in the IFE web pages. IFE device and I/O module must be connected and addressed correctly to function.

Enerlin'X I/O Module Test

Access the monitoring web page of Enerlin'X IFE associated with the I/O module:

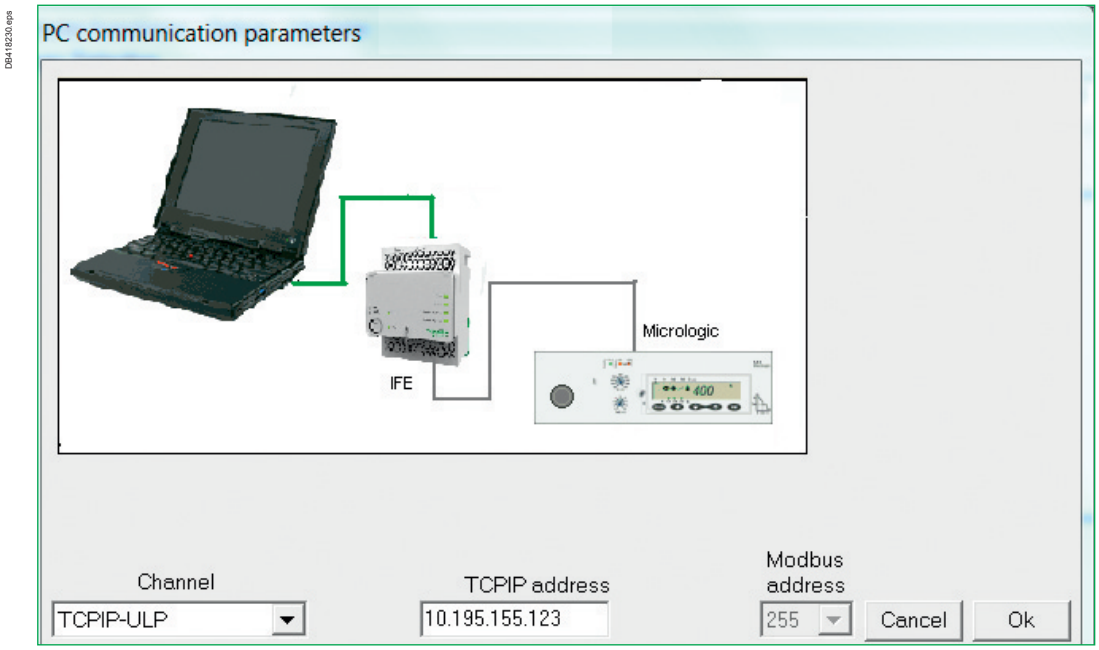


A print screen of the web pages can be used to create a report on the I/O module installation

Input / Output Assignment with RSU software

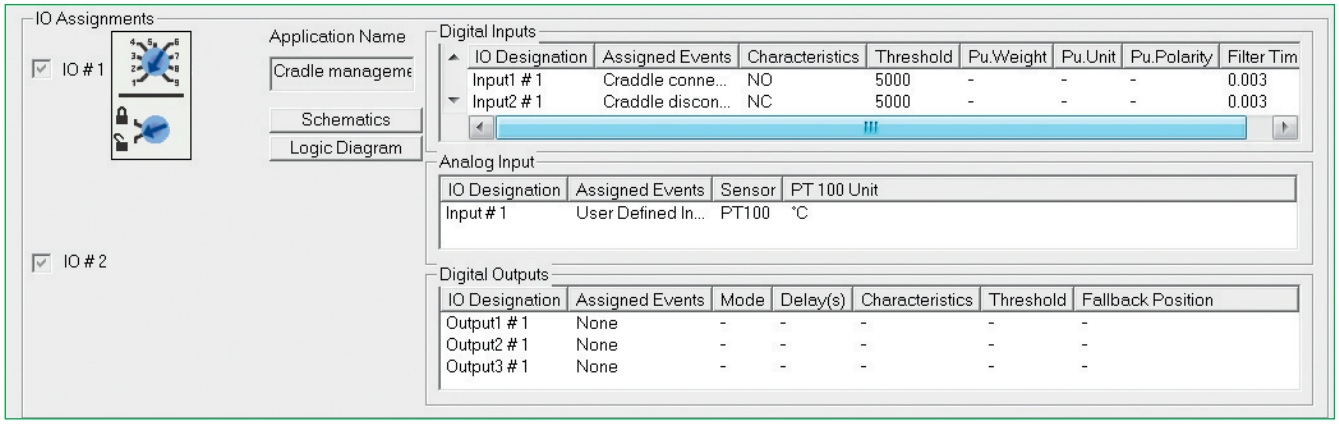
In predefined applications, the Input / Output that are not used are available for customization. Customization can be done by assigning input and output through the software configuration tool RSU:

> From your computer, launch RSU and connect to an Enerlin'X IFE associated with the I/O module.

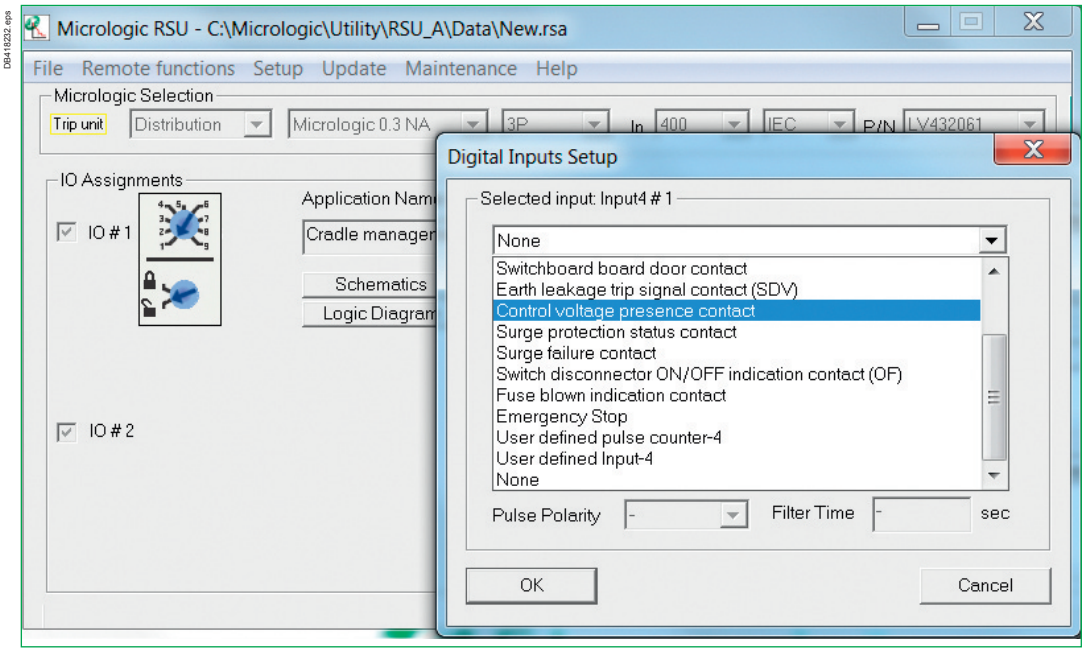


3.5 Enerlin'X I/O Module Application

> Select I/O assignment menu



> Assign input or output to the desired predefined functions



> Send the parameters to the circuit breaker.

3.5 Enerlin'X I/O Module Application

Input Test

Input and output values can be checked through Enerlin'X IFE embedded web pages under monitoring:

DB418233.eps

IO Readings

Feeder NT (Micrologic E)

IO Module 1

	Label	Value	Force/Unforce
Inputs			
Digital Input 1	Cradle connected position contact(CE)	0	UNFORCED
Digital Input 2	Cradle disconnected position contact(CD)	1	UNFORCED
Digital Input 3	Cradle test position contact(CT)	1	UNFORCED
Digital Input 4		0	UNFORCED
Digital Input 5		0	UNFORCED
Digital Input 6		0	UNFORCED
Outputs			
Digital Output 1		0	UNFORCED
Digital Output 2		0	UNFORCED
Digital Output 3		0	UNFORCED
Analog Inputs			
PT100		---	----

Output Test

Output values can be checked through Enerlin'X IFE embedded web pages under the control menu. Follow the same procedure as the IFE control activation. After the procedure is complete, the output can be forced:

DB418234.eps

Reset

Breaker application

ControlStatus

Closed

Control

Open | Close

IO application

Control	Status	Operation	Availability
Reset Input Counters	---	I1 I2 I3 I4 I5 I6	IO Module 1
Reset Output Counters	---	O1 O2 O3	IO Module 1

3.6 Enerlin'X FDM128

A setting wizard is automatically launched on the initial power up to help complete the FDM128 display unit setup. After configuration, only the date & time need to be adjusted in the event of a power supply failure (Enerlin'X FDM128 will maintain a date and time record of the power supply outages). Each time the digital network is modified, it is recommended to update the communication settings.

3.6.1 General Setting

The following table outlines the steps used in the FDM128 display unit settings wizard:

Step	Screen	Action
1	Welcome	Press the screen to start the wizard.
2	Language selection	Press the desired language. In the footer, press the down arrow icon to access the next step.
3	Date	Press the up/down arrows icons to set the current year, month, and day. In the footer, press the down arrow icon to access the next step.
4	Time	Press the up/down arrows icons to set the current hour and minute. In the footer, press the down arrow icon to access the next step.
5	Phase ID	Press one of the two possible ways to represent the phases 1,2,3,N, or A, B, C, N. In the footer, press the down arrow icon to access the next step.
6	Units of measurement	Select the units of measurement for the analog input of the I/O modules: > the unit of temperature (°C or °F) > the unit of volume (m3 or gallon US or gallon UK).
7	Brightness	Press the -/+ icons to adjust the brightness level of the display. In the footer, press Finish. The setting wizard displays the Selection of the communication architecture screen, to set up the FDM128 communication. Follow the communication settings procedure that corresponds to the network architecture.

3.6.2 Communication Setting Procedure

In this TVD architecture, the version of FDM128 allows configuring up to 8 devices connected to the Ethernet network. In addition, only one gateway is configurable (In this TVDA's local application, a choice is made between IFE and Smartlink Ethernet as a Modbus gateway. Depending on the number of discovered devices behind the gateway, more Ethernet devices can be added up to a total of 8).

The two procedures for configuring the FDM128 communication are detailed in the section below.

3.6.2.1 Enerlin'X IFE or Acti9 Smartlink gateway based Architecture

This procedure is applicable when:

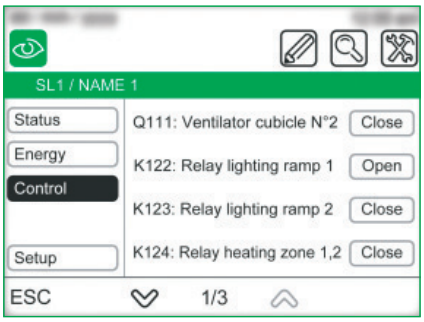
> FDM128 display unit is connected to an IFE gateway (IFE+)
> FDM128 display unit is connected to an Acti9 Smartlink Ethernet gateway.

3.6 Enerlin'X FDM128

Step	Action
1	In the Selection of the communication architecture screen, select IFE-based architecture or Acti 9 Smartlink Ethernet-based architecture.
2	Configure the FDM128 display unit within the network. Set the following parameters: > FDM128 IP address > Subnet mask > Subnet default gateway.
3	Press YES to indicate that the FDM128 display unit is connected to an IFE gateway or Acti9 Smartlink Ethernet gateway.
4	Set the IP address of the IFE gateway or Acti9 Smartlink Ethernet gateway.
5	Press Start to launch the auto discovery sequence. Up to 16 devices are displayed.
6	Select up to eight devices among the devices displayed.
7	If you selected fewer than 8 devices among the devices displayed, you can add manually IFE or Acti 9 Smartlink Ethernet devices.
8	Press Finish. The FDM128 display unit can now monitor the list of selected devices. The setting wizard displays the Editing devices screen to allow you to edit the label and name of the devices.

The setup of Acti9 Smartlink devices is excluded from the wizard. To set up an Acti9 Smartlink device, open its Device view screen, and navigate to the Setup menu and click the Setup button:

DB418235.eps



3.6.2.2 Enerlin'X IFE or Acti9 Smartlink Ethernet architecture

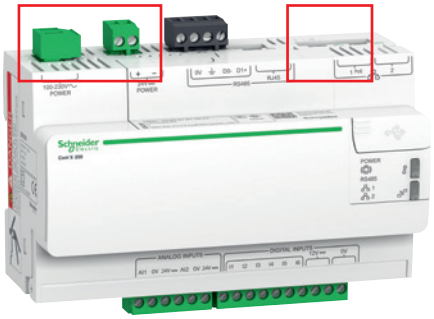
This procedure is applicable when:
> FDM128 display unit is connected to an IFE interface
> FDM128 display unit is connected to an Acti9 Smartlink Ethernet.

The FDM128 setting wizard guides you through the following steps:

Step	Action
1	In the Selection of the communication architecture screen, select IFE-based architecture or Acti 9 Smartlink Ethernet-based architecture.
2	Configure the FDM128 display unit within the network. Set the following parameters: > FDM128 IP address > Subnet mask > Subnet default gateway.
3	Press NO to indicate that there is no gateway.
4	Configure manually up to 8 IFE or Acti9 Smartlink Ethernet devices.
5	Press Finish. The FDM128 display unit can now monitor the list of selected devices. The setting wizard displays the Editing devices screen to allow you to edit the label and name of the devices.

The setup of Acti9 Smartlink devices is excluded from the wizard. To set up an Acti9 Smartlink device, open its Device view screen, and navigate to the Setup menu and click the Setup button.

3.7 Com'X 200 energy server



3.7.1 Hardware Configuration

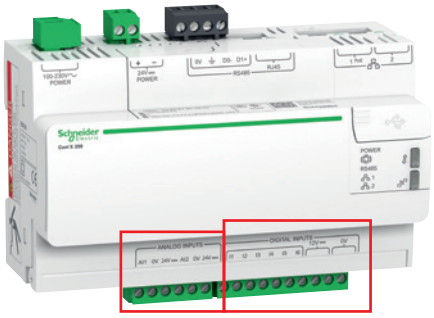
Wiring of Power Supply:

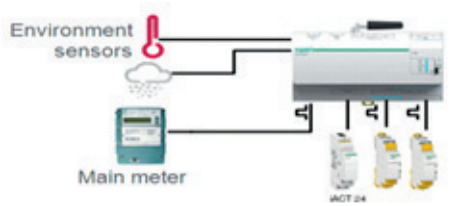
> 100-240V AC (+15 %, -20 %)

> 24V DC (+15 %, -20 %)

DC can be the power backup of AC supply (like a battery)
> Power Over Ethernet (PoE).

No external power supply required, easiest installation.





Digital and Analog inputs

No additional I/O block required.

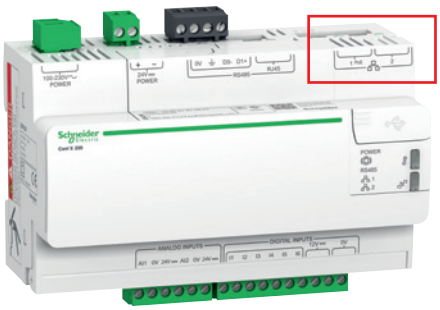
> 6 Digital Inputs (DI)

WAGES and pulse meters can be connected directly to Com'X 200 for simple architecture:

- With LED indication of status and pulse reception
- DI can be powered directly by Com'X 200: one 12 V DC power output available for pulse metering contact or status reading.

> 2 Analog Inputs (AI):

- Accuracy 1 % for PT100 or PT1000 or 0.5 % for 0-10 V and 4-20 mA
- AI can be powered directly by Com'X 200: one 24VDC power supply output available for sensors.



Ethernet Port

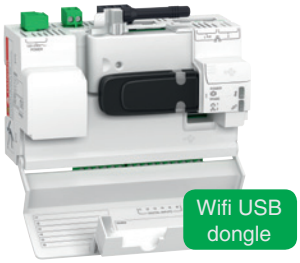
> 2 Ethernet ports can be configured:

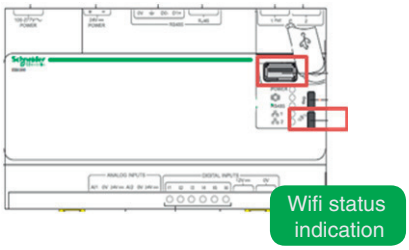
- As a switch: one IP address for both E1 and E2 ports
- As separate interface: E2 data acquisition and E1 data publication.

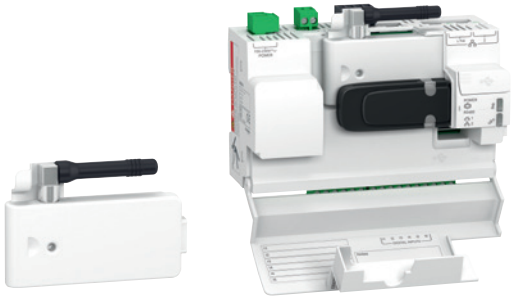
3.7 Com'X 200 energy server

WIFI module

Com'X 200 as a WIFI access point used for easy configuration.







GPRS module

> Easily installed or removed after wiring Com'X 200.

> For isolated sites or sites without access permission to IT infrastructure:

- To send data to Energy Management service platform.
- LED displaying GPRS modem status and signal level.

3.7.2 Software Configuration

Com'X 200 is only configurable via its web pages. Com'X 200 software configuration is not detailed in this document. For more information, > *Please refer to chapter 3.9.3.* > *Please refer to the Com'X 200 user manual for instructions specific to your project.*

Com'X 200 web page access for configuring is done through the following:

> DPWS method, > *refer to 3.1.*

> Com'X 200 is a DHCP server by default on E2, it will automatically attribute an IP address to the computer so that it can connect to Com'X 200 default IP address: 10.25.1.1

> WIFI USB dongle, Com'X 200 as an access point with nothing to configure:

- A convenient way to configure the Com'X 200 energy server when access is difficult or to avoid requesting an IP to the customer network ('Private' WIFI network of Com'X 200)
- Galvanic isolation with WIFI.

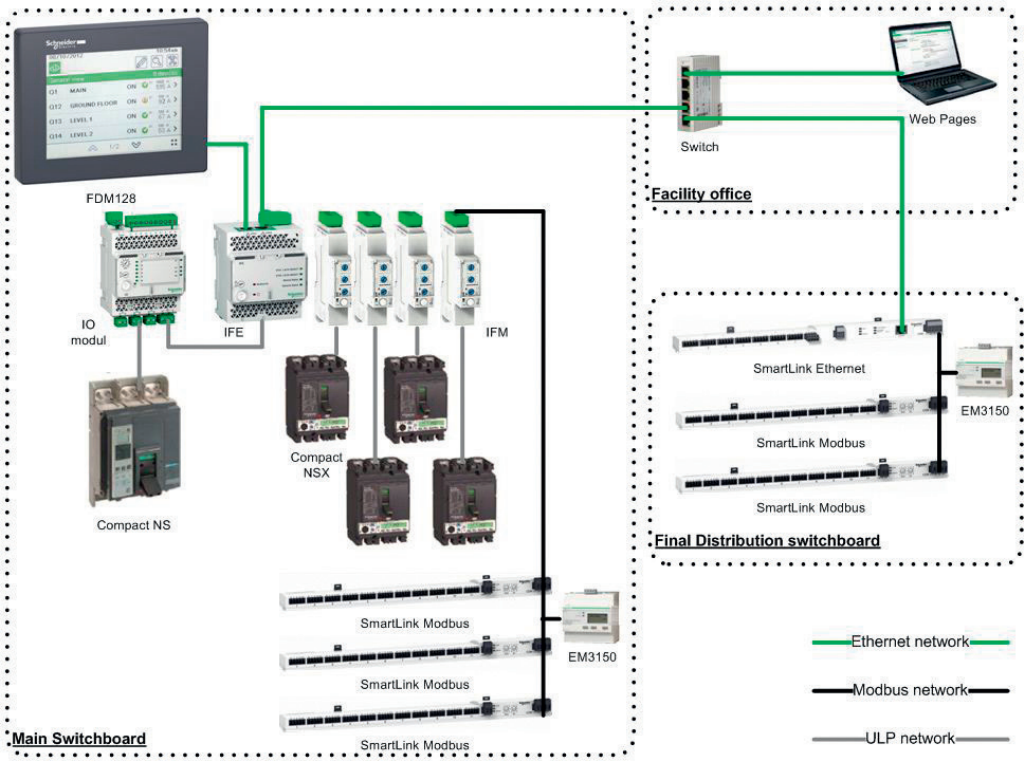
3.8 Local energy management

3.8.1 Customer Requirements

In this scenario, Smart Panels are connected to a local monitoring and control system. A local display FDM128 installed on front of the main switchboard provides local monitoring and control of electrical devices. The Ethernet network infrastructure provides remote access to the electrical device web pages. Using these access points, the building electrical equipment can be monitored and controlled from the energy monitoring dashboard.

3.8.2 Network Configuration

The network infrastructure is very simple by providing easy commissioning and operation. IT service is not needed to access the data of the electrical installation for application. Data can be seen easily from the web page interface. The drawing below details the digital network architecture:



In this application Enerlin'X FDM128, Enerlin'X IFE and Acti9 Smartlink must be connected to the same Ethernet network. So Enerlin'X FDM 128 a must be manually configured to be compliant with both connected products Enerlin'X IFE and Acti9 Smartlink Ethernet, with their respective default IP addresses.

3.8 Local energy management

The table below gives the Modbus and Ethernet network addresses.

Device type	Name	Localization	Network type	Network address
FDM128	Display_MS	Main Switchboard	Ethernet	169.254.0.50
IFE	IFE_MS	Main Switchboard	Ethernet	169.254.5.190
IFM	IFM1	Main Switchboard	Modbus	1
IFM	IFM2	Main Switchboard	Modbus	2
IFM	IFM3	Main Switchboard	Modbus	3
IFM	IFM4	Main Switchboard	Modbus	4
Smartlink MB	SLMB_MS1	Main Switchboard	Modbus	5
Smartlink MB	SLMB_MS2	Main Switchboard	Modbus	6
Smartlink MB	SLMB_MS3	Main Switchboard	Modbus	7
EM3150	EM_MS	Main Switchboard	Modbus	8
Smartlink Eth	SLIP_FD1	Final Distribution	Ethernet	169.254.0.231
Smartlink MB	SLMB_FD1	Final Distribution	Modbus	1
Smartlink MB	SLMB_FD2	Final Distribution	Modbus	2
EM3150	EM_FD	Final Distribution	Modbus	3

Network mask: 255.255.0.0

Default gateway / DNS server: 169.254.1.1 (not relevant in this application).

3.8.3 System configuration

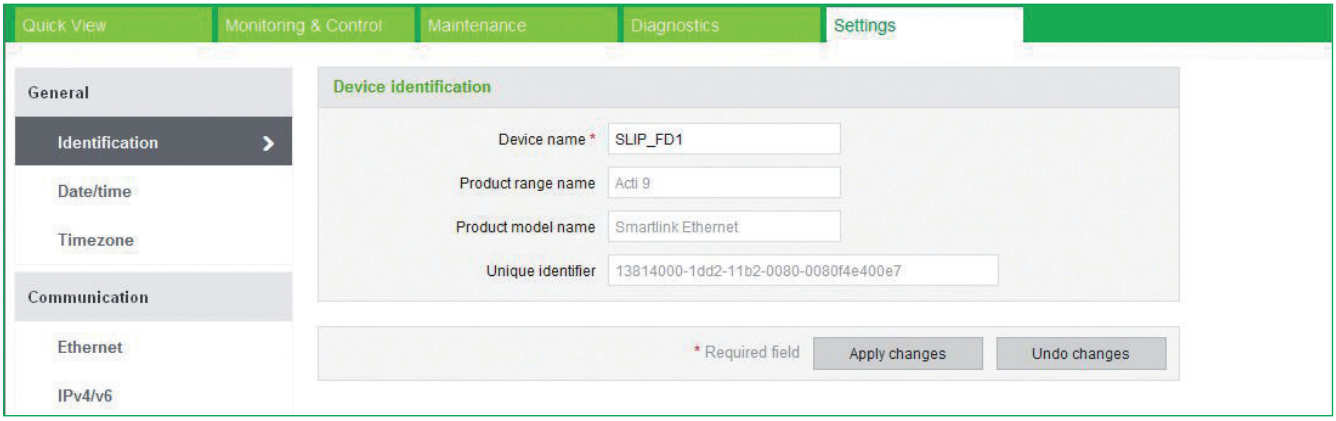
In this scenario, Enerlin'X IFE and Acti9 Smartlink use the default IP addresses. The default configuration uses a DHCP client with a backup default IP address in the event a DHCP server is not available. As a result, Enerlin'X IFE and Acti9 Smartlink options need to set the IP Address to static mode with the default IP address.

To set Enerlin'X FDM128, ensure the name and IP addresses are set according to the above table. After being set, the Modbus devices behind IFE and Smartlink Ethernet can be automatically detected.

3.8.3.1 IP addressing / naming

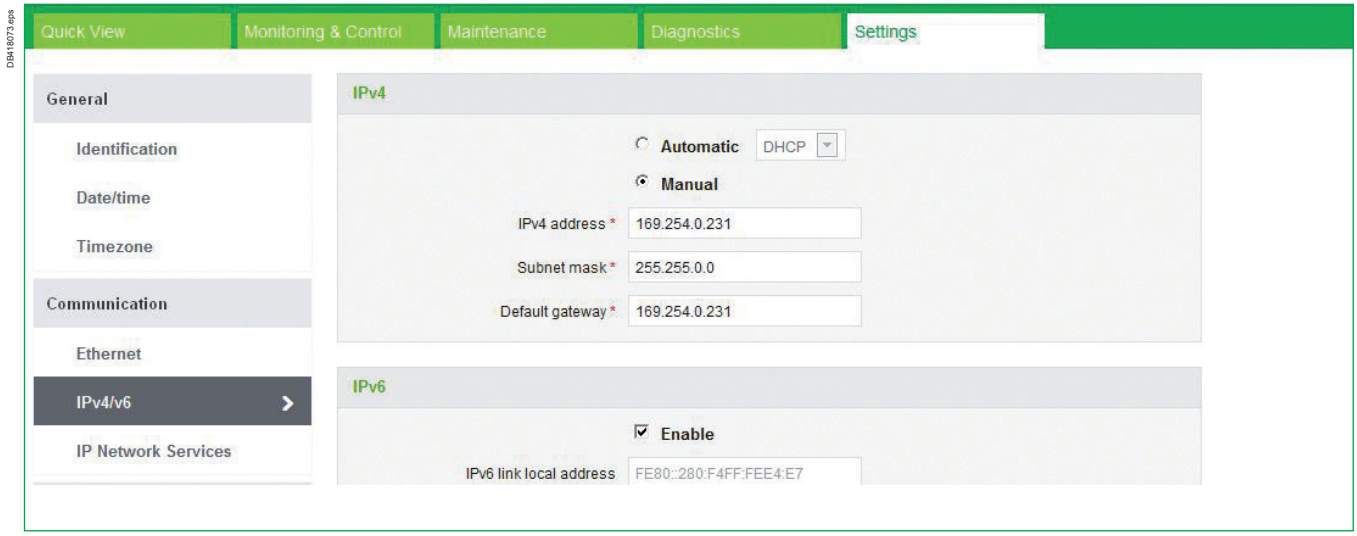
Using the Acti9 Smartlink embedded web pages; the names can be configured as shown below:

DB418072.eps

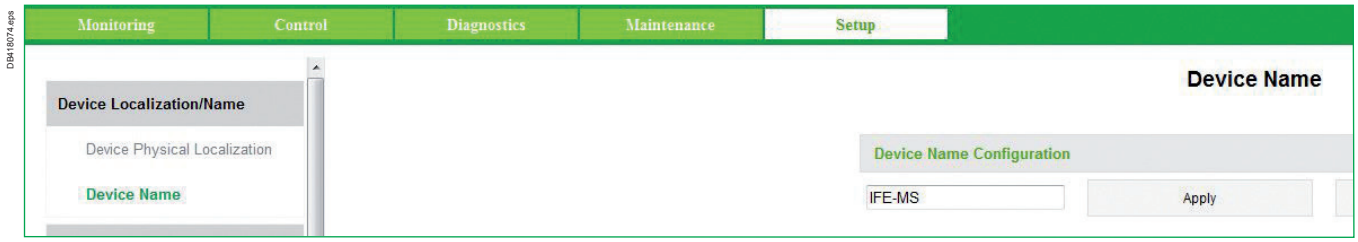


After the name is configured, click on the Communication menu to see the IP address settings. Leave the default IPv4 address and click the "Manual" radio control in the IPv4 section.

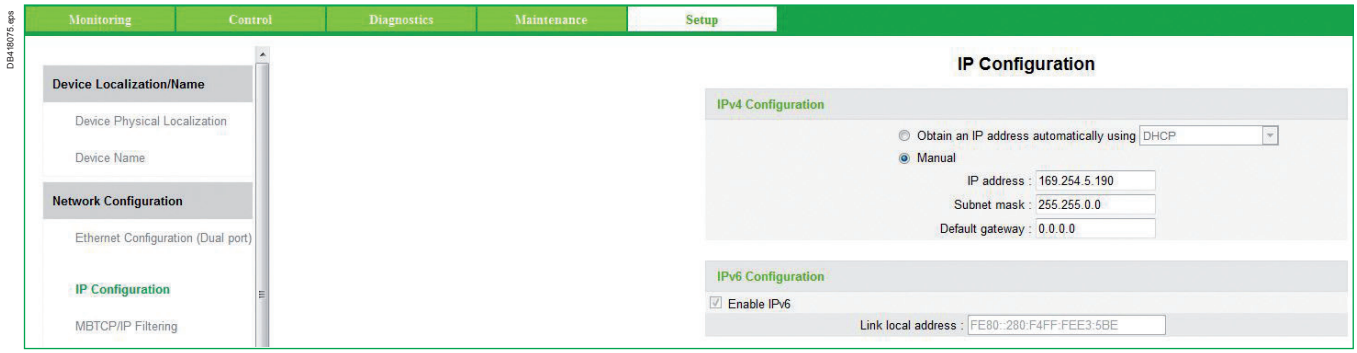
3.8 Local energy management



Access the Enerlin'X IFE web pages to configure the device name:



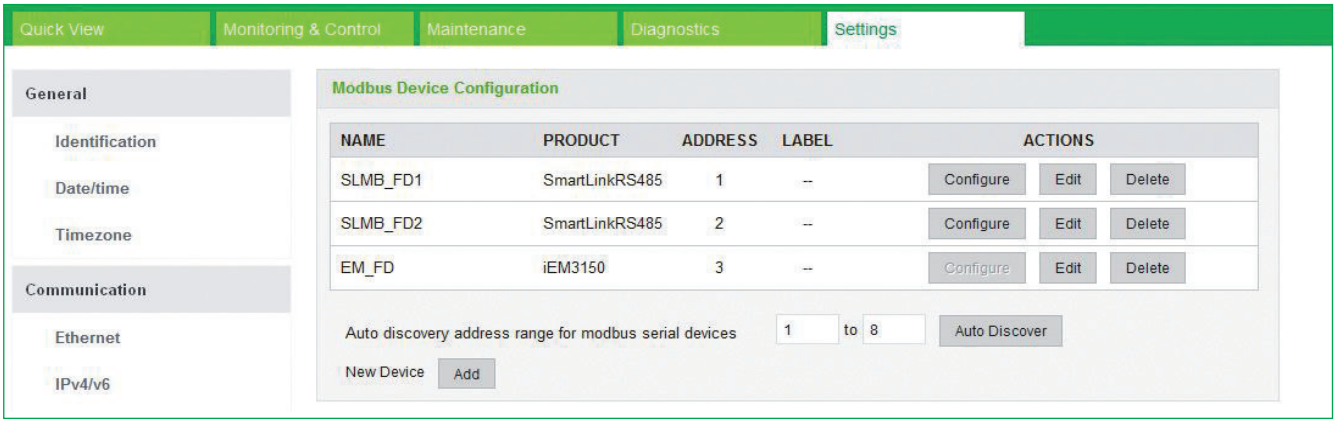
In the IFE web pages, click on IP Configuration under Network Communication. Leave the default IPv4 address and click the "Manual" radio control in the IPv4 section.



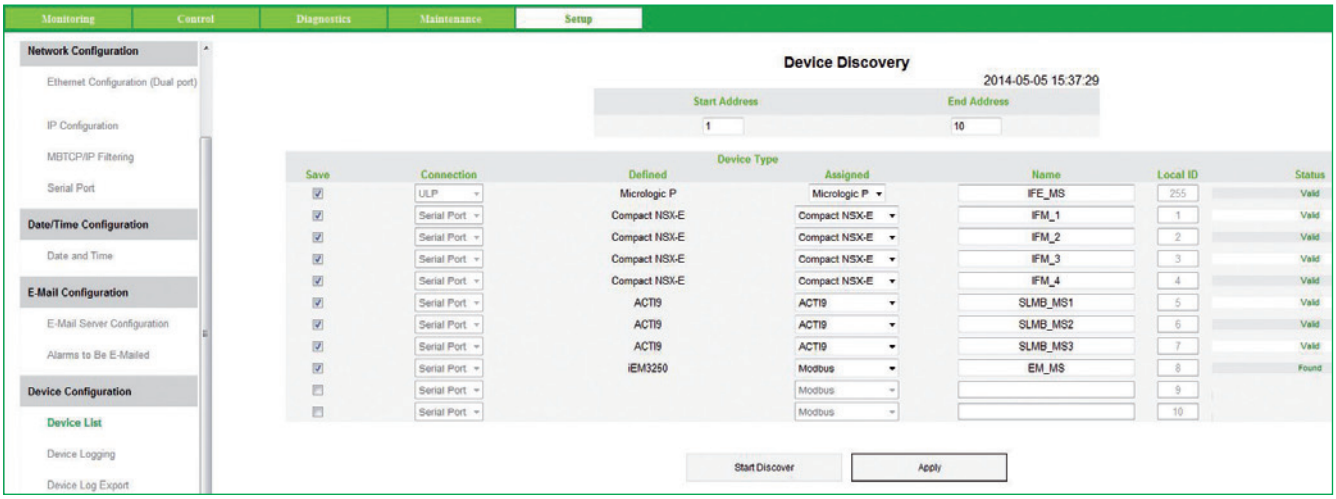
3.8 Local energy management

3.8.3.2 Modbus Devices Discovery

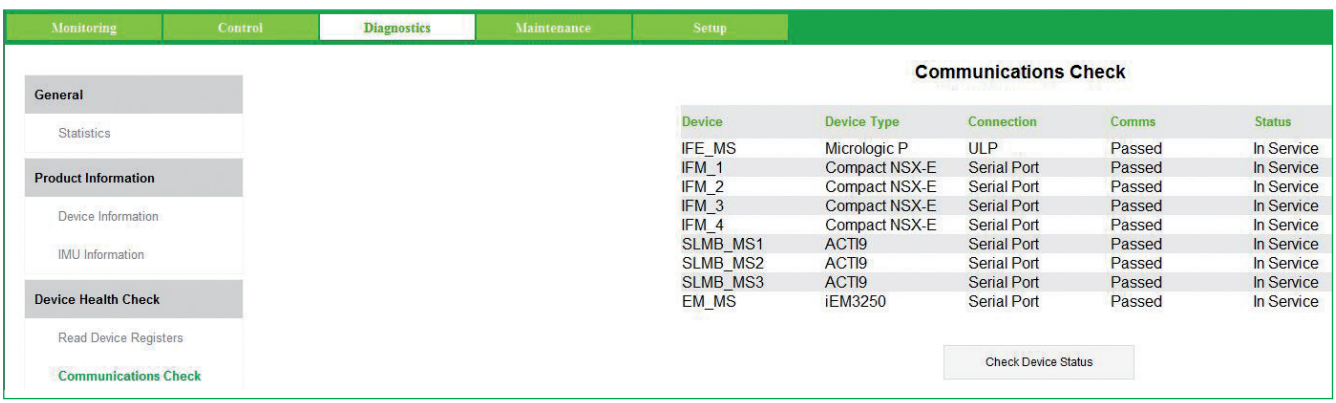
From Acti9 Smartlink web pages, launch the Modbus "Auto Discover" feature and correctly name the detected devices:



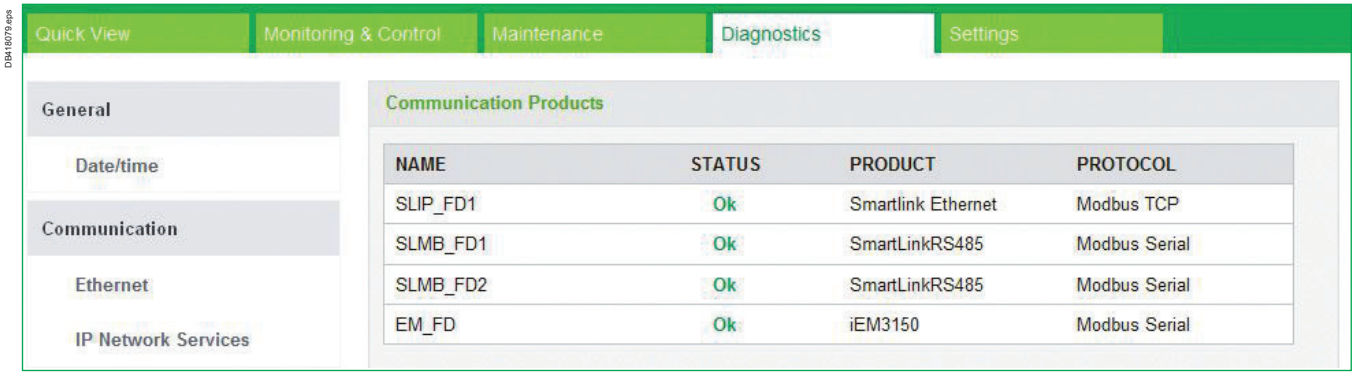
From Enerlin'X IFE web pages, launch the Modbus "Auto Discover" feature and correctly name the detected devices:



Modbus communication diagnosis is available for Enerlin'X IFE and Acti9 Smartlink (Ethernet version).

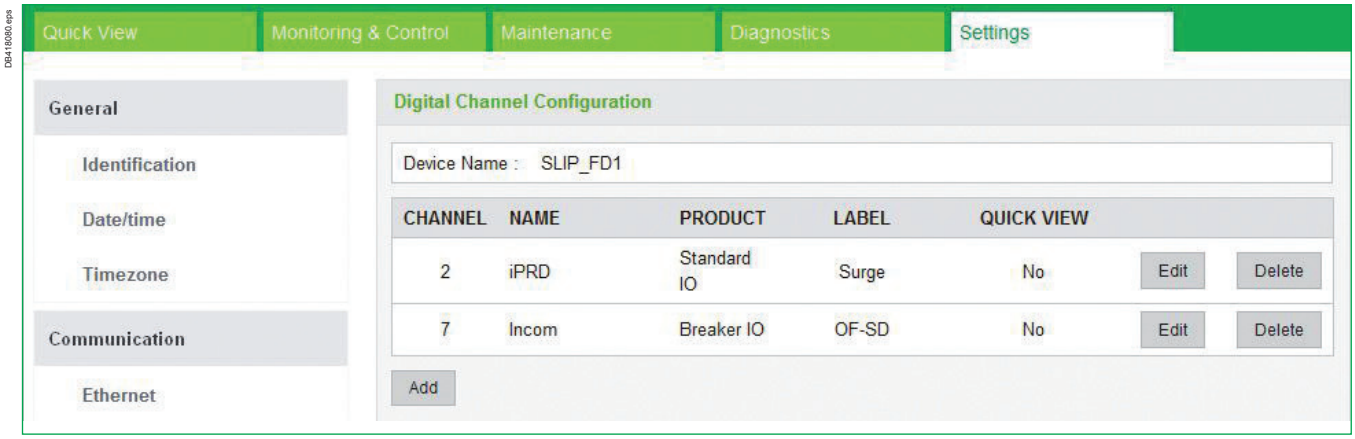


3.8 Local energy management

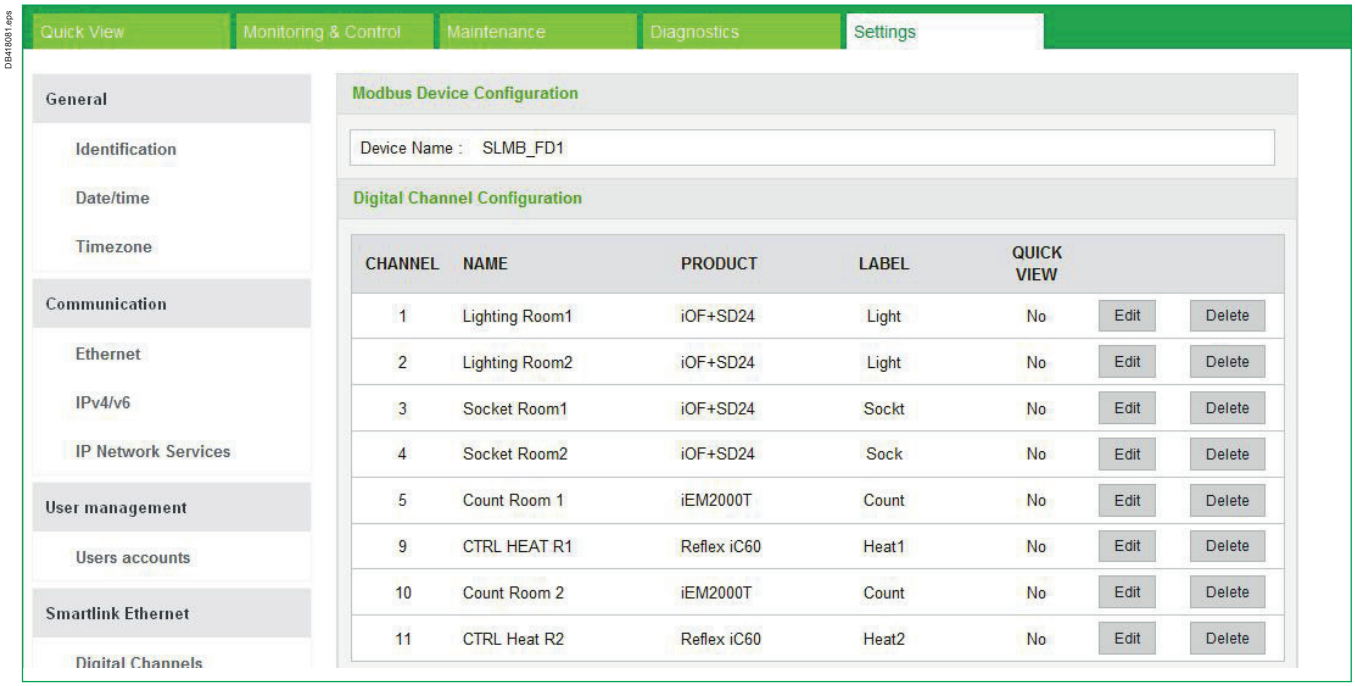


3.8.3.3 Acti9 Smartlink channel association

From Acti9 Smartlink web pages, configure the channel for SLIP_FD1.



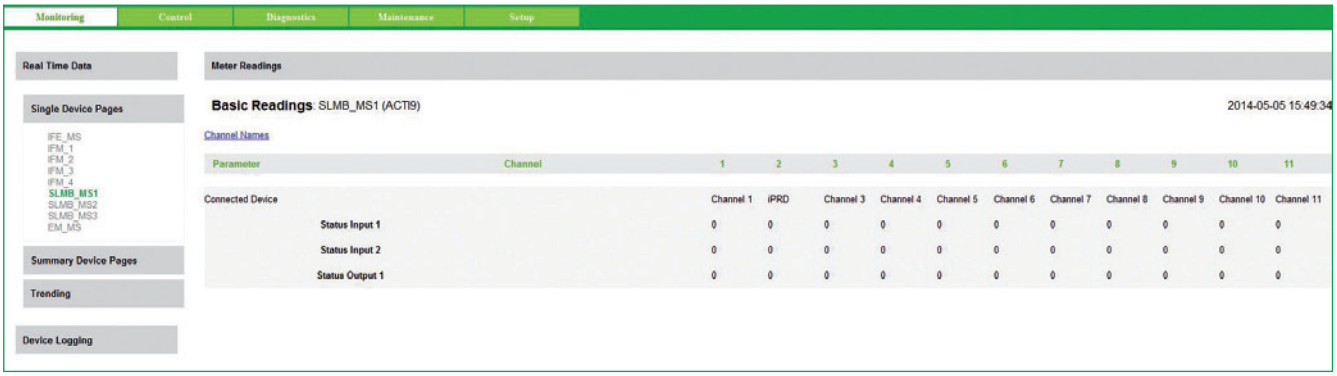
Do the same for SLMB_FD1 and SLMB_FD2:



3.8 Local energy management

The Acti9 Smartlink Modbus channels can also be named when connected to Enerlin'X IFE (SLMB_MS1, SLMB_MS2, and SLMB_MS3).

DB418082.eps



Note: in this TVD architecture, channels cannot be controlled from IFE web pages (this feature will be supported in a later version).

3.8.3.4 Web Page monitoring and control

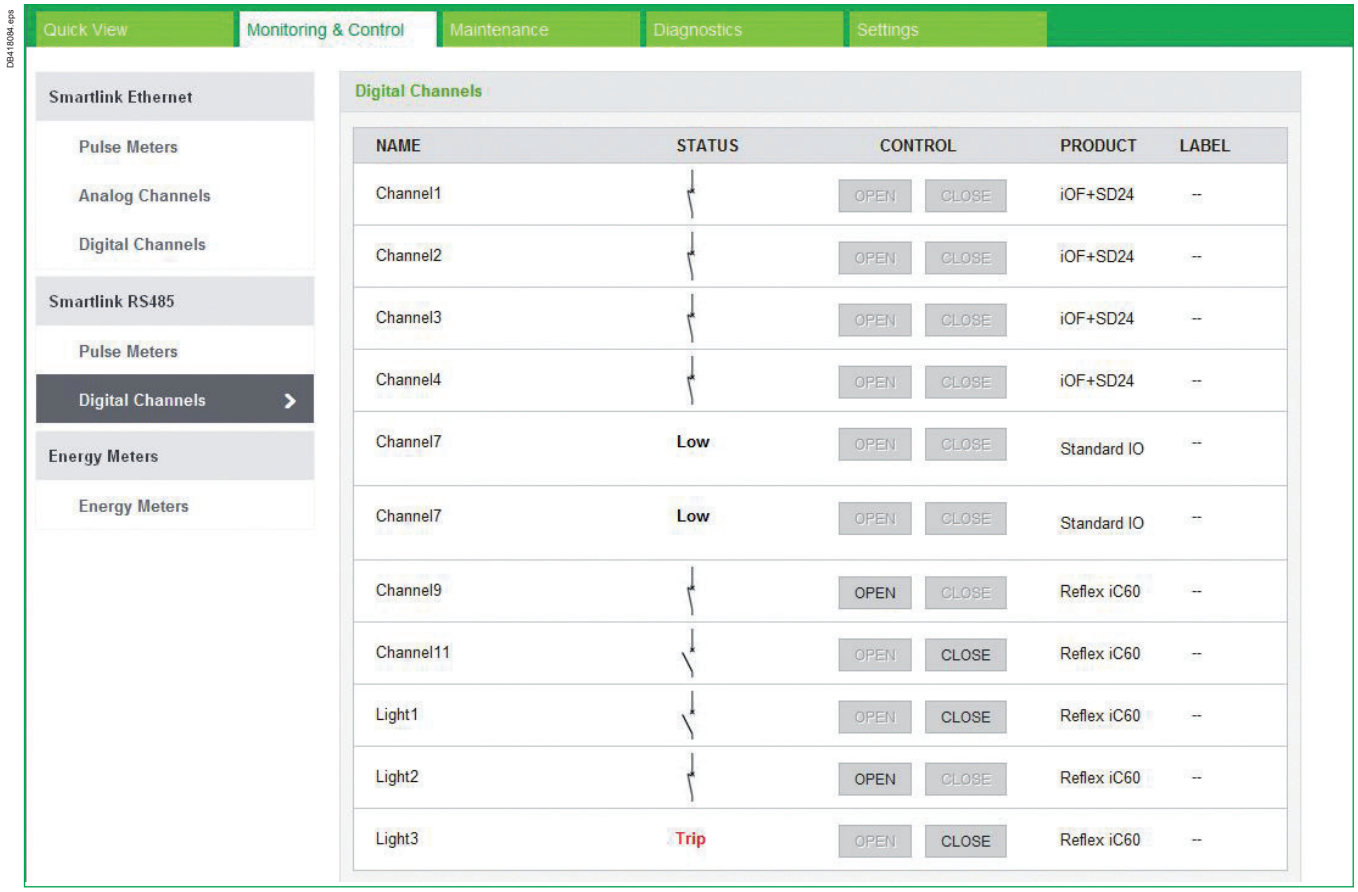
Finally, the configuration of the system can be checked using the steps below.

From Enerlin'X IFE web pages, monitoring real time data are displayed:

DB418083.eps

3.8 Local energy management

From Acti9 Smartlink web pages, monitoring real time data are displayed and control channels are available for remote controlled devices:



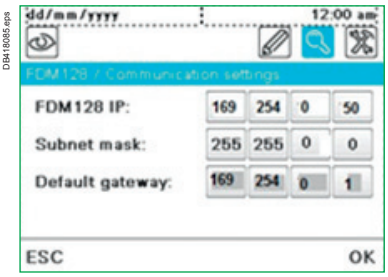
3.8.3.5 Local Display

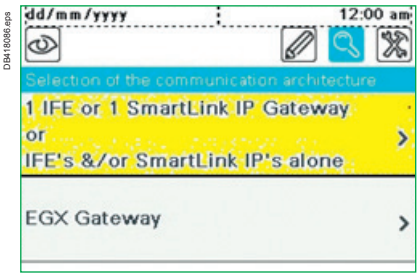
Enerlin'X FDM128 local display allows configuring up to 8 devices. The devices must be selected from the electrical application. In addition, FDM128 only allows configuring one Modbus gateway. As a result, Enerlin'X IFE is selected as a Modbus gateway. So the SLIP_FD1 is not configured in the FDM128 as a Modbus gateway, but as an Ethernet interface: SLIP_FD1.

Device type	Name	Localization	Network type	Network address
IFE	IFE_MS	Main Switchboard	Ethernet	169.254.5.190
IFM	IFM3	Main Switchboard	Modbus	3
IFM	IFM4	Main Switchboard	Modbus	4
Smartlink MB	SLMB_MS1	Main Switchboard	Modbus	5
Smartlink MB	SLMB_MS2	Main Switchboard	Modbus	6
Smartlink MB	SLMB_MS3	Main Switchboard	Modbus	7
Smartlink Eth	SLIP_FD1	Final Distribution	Ethernet	169.254.0.231

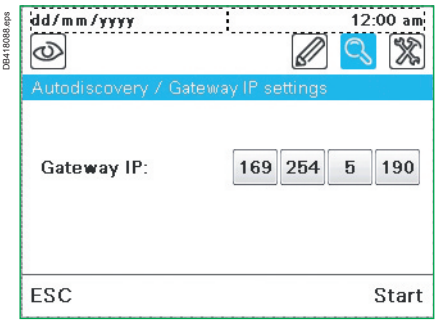
3.8 Local energy management

Set the date, time and IP address of FDM128. Then select Enerlin'X IFE Gateway:

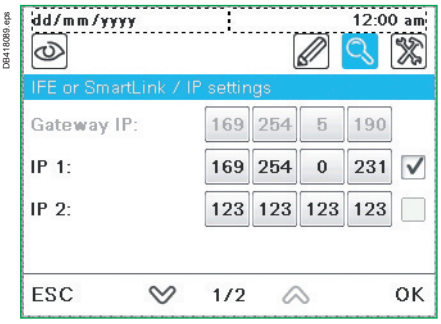




Enter the IP address of Enerlin'X IFE, launch the Modbus auto discovery and select the 6 devices selected for the main switchboard.

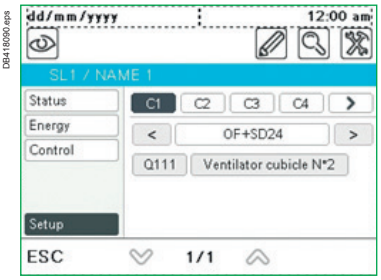


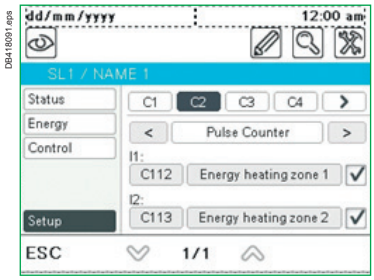
Enter the IP address of Acti9 Smartlink and launch the auto discovery:



Note that two more IP addresses are configurable. In this scenario, one will be added.

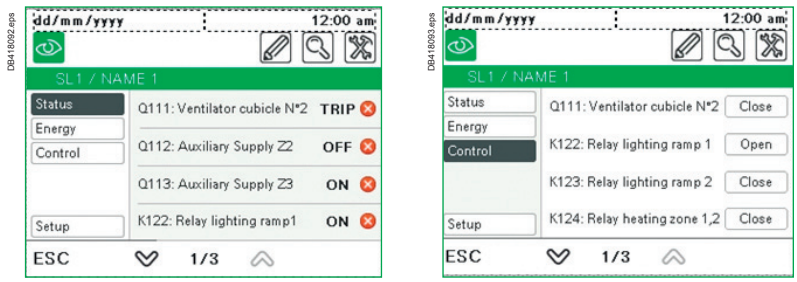
In total, 7 devices are shown in the local display that must be configured for the Smartlink channels to complete the process.





3.8 Local energy management

After the above steps are complete, the installation can be locally monitored and controlled from Enerlin'X FDM128:



3.8.3.6 Data Logging and Trending

The electrical real time trending data can be exported for analyses through an IFE capability:

Select a data point for real time trending:

Data logging is also configurable from the setup menu and allows data point storage.

For example, Enerlin'X IFE can store up to three months of data in memory with a 5 sec. logging interval. The collected data points can be exported using FTP to a CSV formatted file.

3.9 On-line Energy Management

3.9.1 Customer Requirements

In this scenario, Smart Panels provide two ways for monitoring and control of the electrical equipment. The first is through the local software application and the second is using a Schneider Electric on-line energy management service. Enerlin'X FDM128 local display fitted on front of the main switchboard provides local monitoring and control of electrical devices. Through the on-line solution, monitoring and control of the electrical equipment of the building can be accessed almost anywhere with access to an energy report.

3.9.2 Network Configuration

In this application Internet access is required to provide:

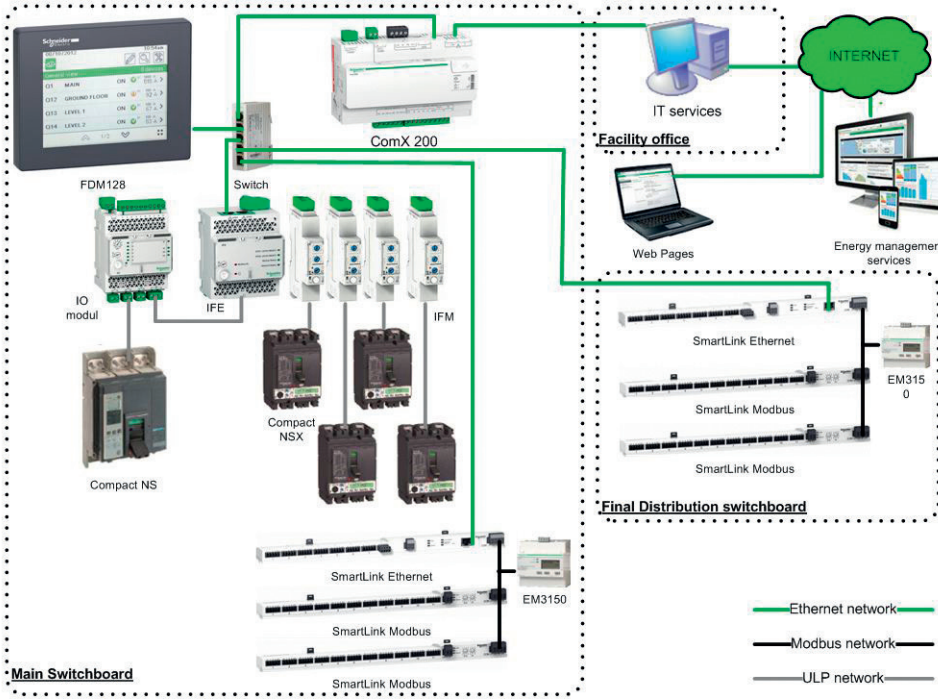
> Access to on-line energy management service

> E-mail notification

> Remote access to the electrical building installation.

Internet access needs to be provided through local IT Services or through the Com'X 200 GPRS connection. In this document, it is assumed that the IT services managing the building Ethernet network and internet connection (through DHCP, DNS) and security protocols (e.g. firewalls) will provide secure access. If IT services are not available for this application, Com'X 200 provides a GPRS connection option to push data to an energy management platform. In this scenario, Enerlin'X IFE email notifications are not available.

The drawing below details the digital network architecture:



In this application, an IT service manages the addressing rules to connect the Smart Panels to the building network infrastructure. IP addresses are distributed in fixed mode by a DHCP server. This is done to prevent changing Enerlin'X IFE and Acti9Smartink IP addresses that are manually configured in FDM128 and Com'X 200.

3.9 On-line Energy Management

To sum up, IP addresses delivered by IT service must keep the fixed link between Ethernet devices. IT services must also offer an SMTP server to provide e-mail notifications. The following table gives the Modbus and Ethernet network IP addresses:

Device type	Name	Localization	Network type	Network address
Com'X 200	Data_Server	Main Switchboard	Ethernet	10.195.155.120
FDM128	Display_MS	Main Switchboard	Ethernet	10.195.155.124
IFE	IFE_MS	Main Switchboard	Ethernet	10.195.155.123
IFM	IFM1	Main Switchboard	Modbus	1
IFM	IFM2	Main Switchboard	Modbus	2
IFM	IFM3	Main Switchboard	Modbus	3
IFM	IFM4	Main Switchboard	Modbus	4
Smartlink Eth	SLIP_MS1	Main Switchboard	Modbus	10.195.155.125
Smartlink MB	SLMB_MS1	Main Switchboard	Modbus	1
Smartlink MB	SLMB_MS2	Main Switchboard	Modbus	2
EM3150	EM_MS	Main Switchboard	Modbus	3
Smartlink Eth	SLIP_FD1	Final Distribution	Ethernet	10.195.155.121
Smartlink MB	SLMB_FD1	Final Distribution	Modbus	1
Smartlink MB	SLMB_FD2	Final Distribution	Modbus	2
EM3150	EM_FD	Final Distribution	Modbus	3

Network mask: 255.255.254.0
Default gateway / DNS server: 10.195.154.1 / 10.195.136.22.

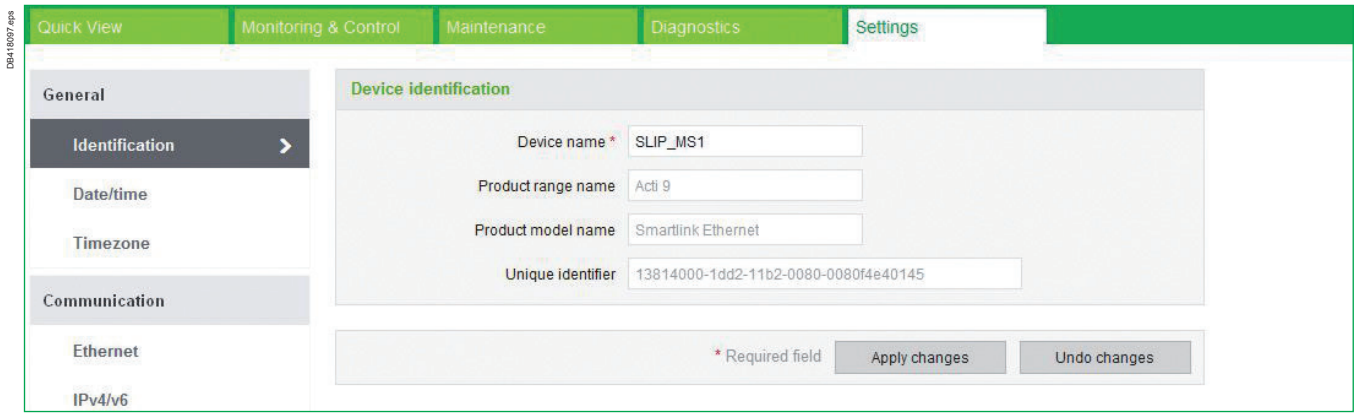
3.9.3 System configuration

In this scenario, Com'X 200 gathers data from both switchboards, IFE_MS, SLIP_MS1 and SLIP_FD1 to transfer them to "Energy Operation", one of on-line services by Schneider Electric. A local FDM128 display provides monitoring and control of selected loads in both switchboards. The notification service from Enerlin'X IFE provides alerts to users in case of main power supply failure.

The first step is to name and set the IP addresses according to the above table. Then use discover feature to find the Modbus devices behind Enerlin'X IFE and Acti9 Smartlink devices. After this detection, set the FDM128 display to the Com'X 200.

3.9.3.1 IP Addressing / Naming

From Acti9 Smartlink web pages, configure the name:

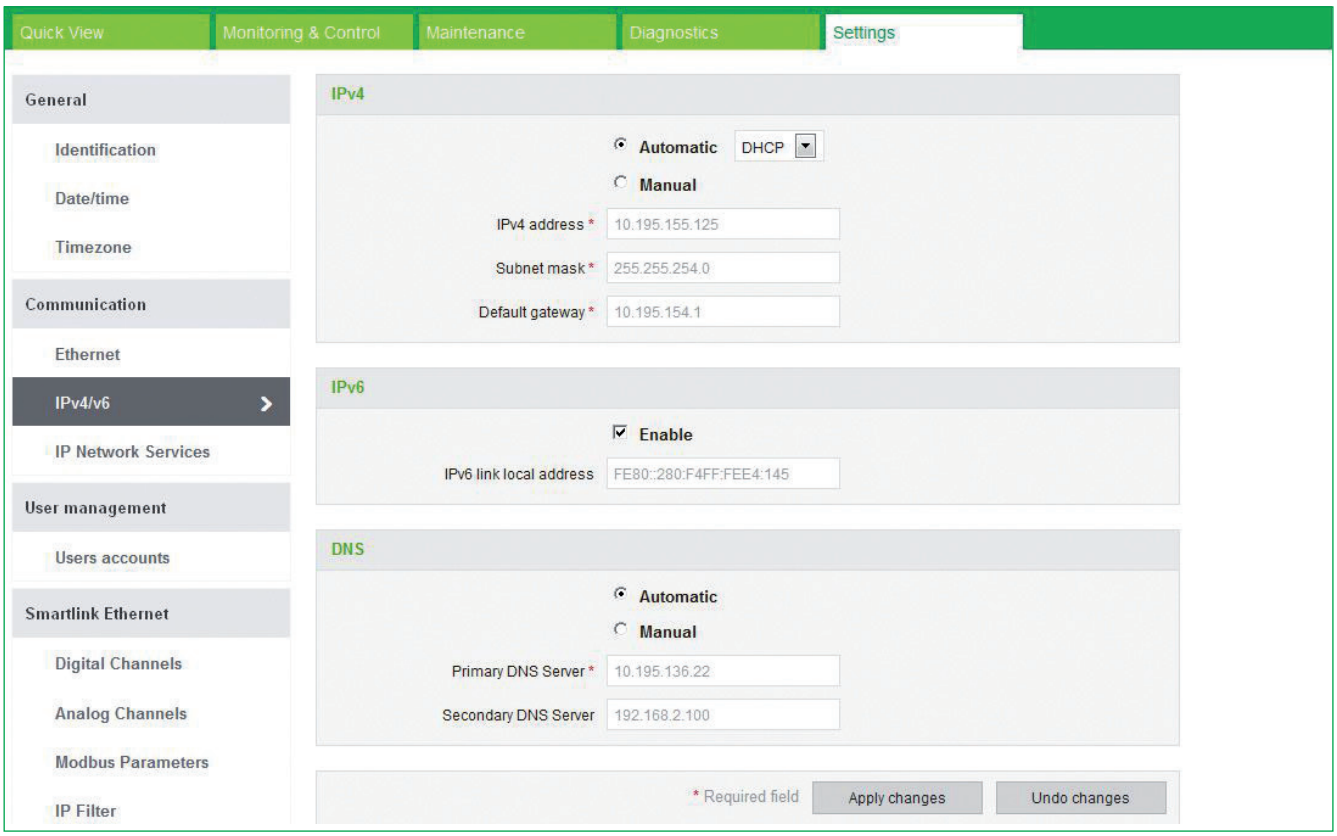


In this section, two Acti9 Smartlink Ethernet devices are used. To reduce the risk of errors, it is recommended to connect them one by one on the Ethernet LAN.

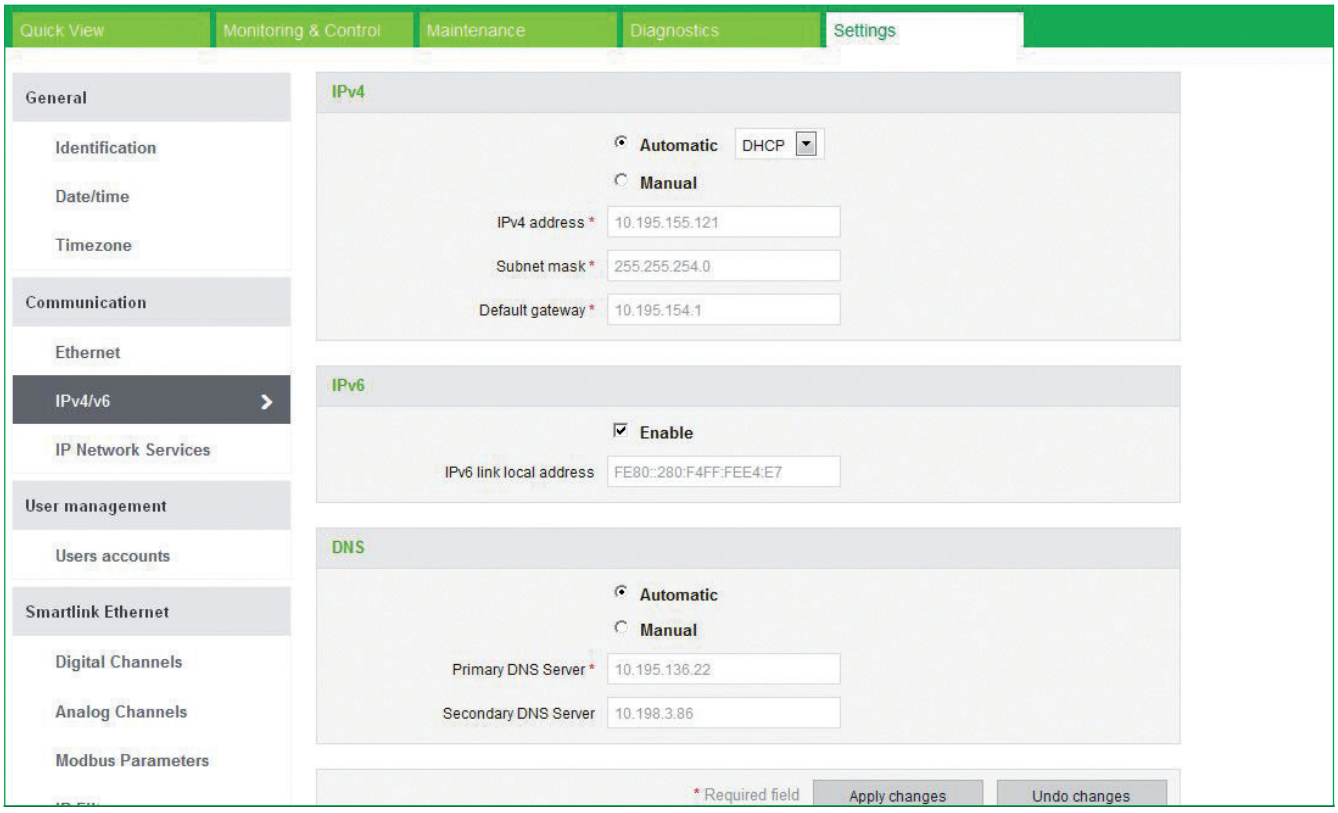
This can be repeated for all Enerlin'X devices given in the previous table.

3.9 On-line Energy Management

Check the communication with the IP Address provided by IT Services and connected in the distributed Enerlin'X products:
For Acti9 Smartlink MS1:

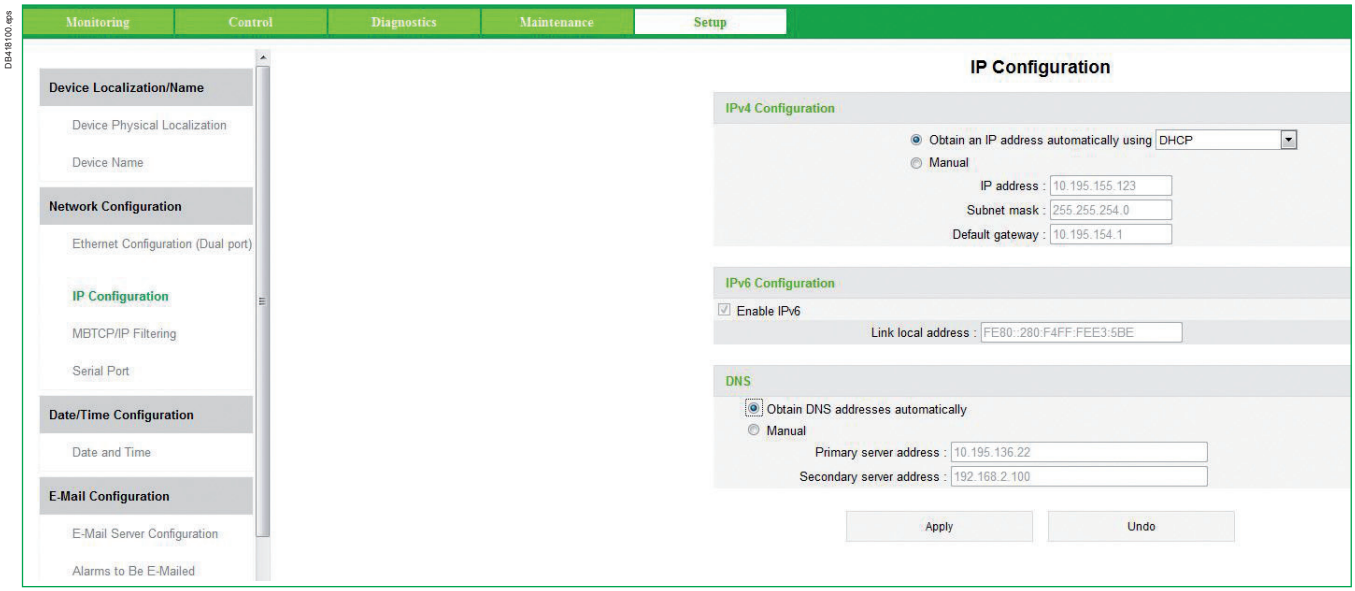


For Acti9 Smartlink FD1:

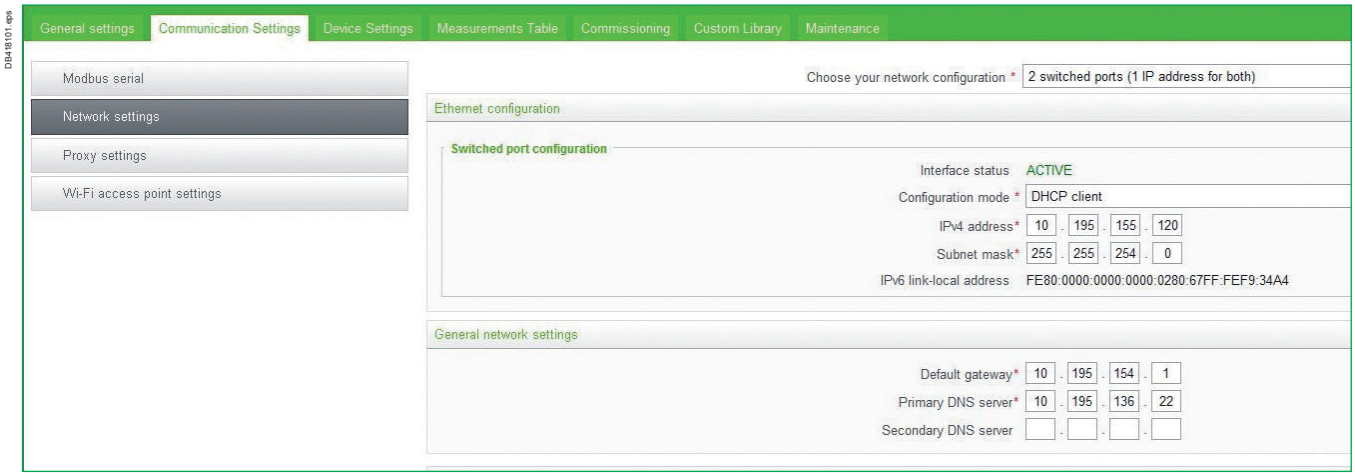


3.9 On-line Energy Management

For Enerlin'X IFE:



For Com'X 200:



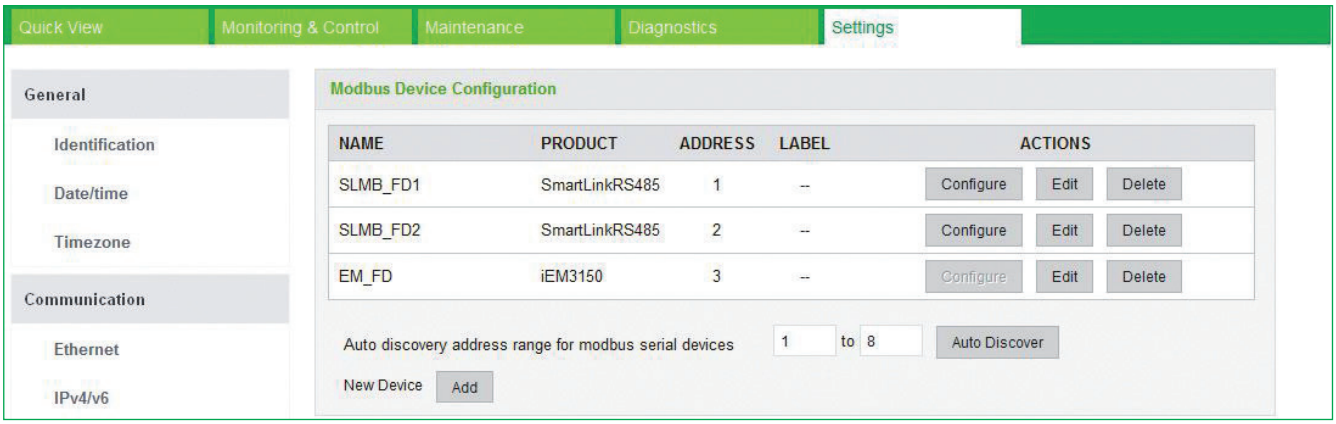
For Enerlin'X FDM128:

IP Address needs to be entered manually. DHCP feature is not supported.

3.9 On-line Energy Management

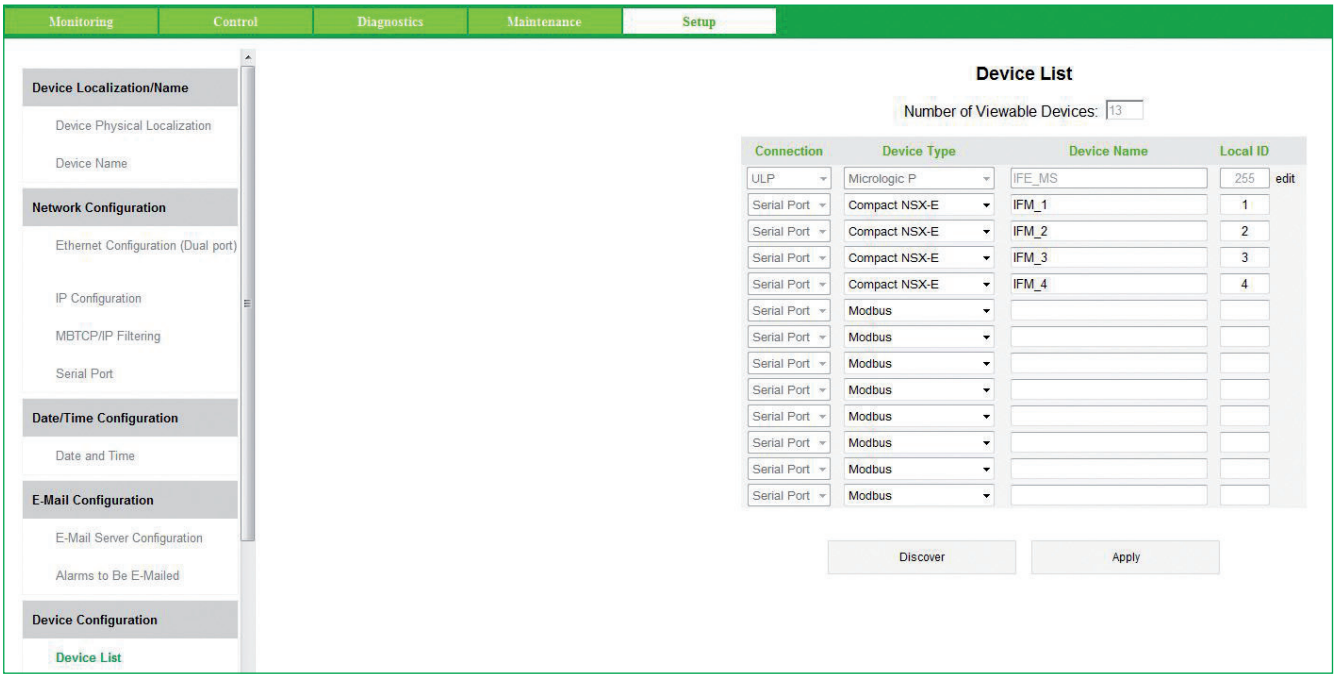
3.9.3.2 Modbus Devices Discovery

From Acti9 Smartlink web pages, launch the Modbus "Auto Discover" feature and correctly name the detected devices:



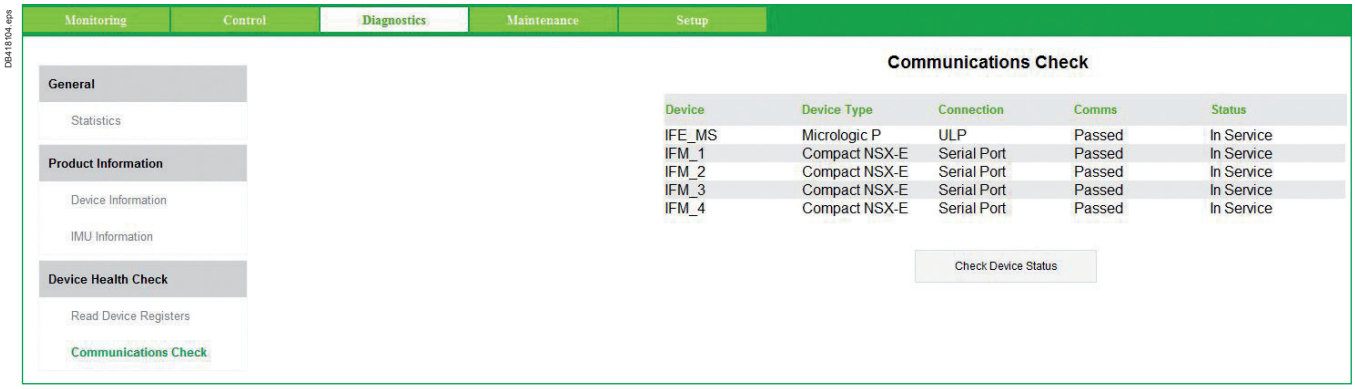
Do the same for the Smartlink located on the main switchboard.

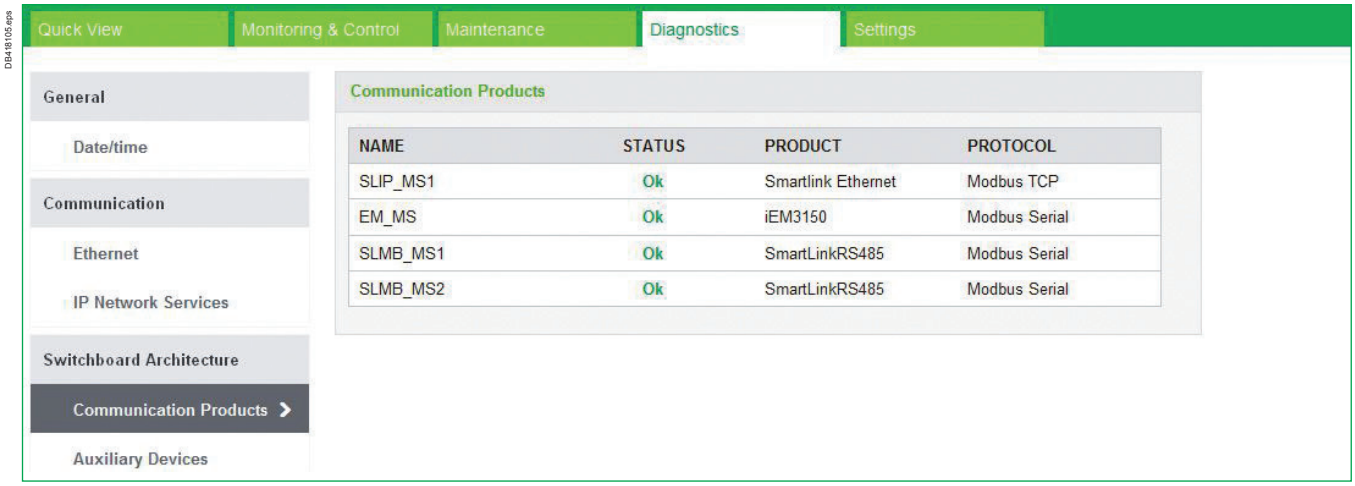
From Enerlin'X IFE web pages, launch the Modbus "Auto Discover" feature and correctly name the detected devices:



3.9 On-line Energy Management

Modbus communication diagnosis is available for Enerlin'X IFE and Acti9 Smartlink Ethernet version.





3.9.3.3 Acti9 Smartlink channel association

For all Acti9 Smartlink devices, configure the channel association.

For Prisma G switchboard:

> SLIP_FD1

> SLMB_FD1

> SLMB_FD2.

For Prisma P switchboard:

> SLIP_MS1

> SLMB_MS1

> SLMB_MS2.

Carry out the configurations from either Acti9 Smartlink test software or from embedded web pages.

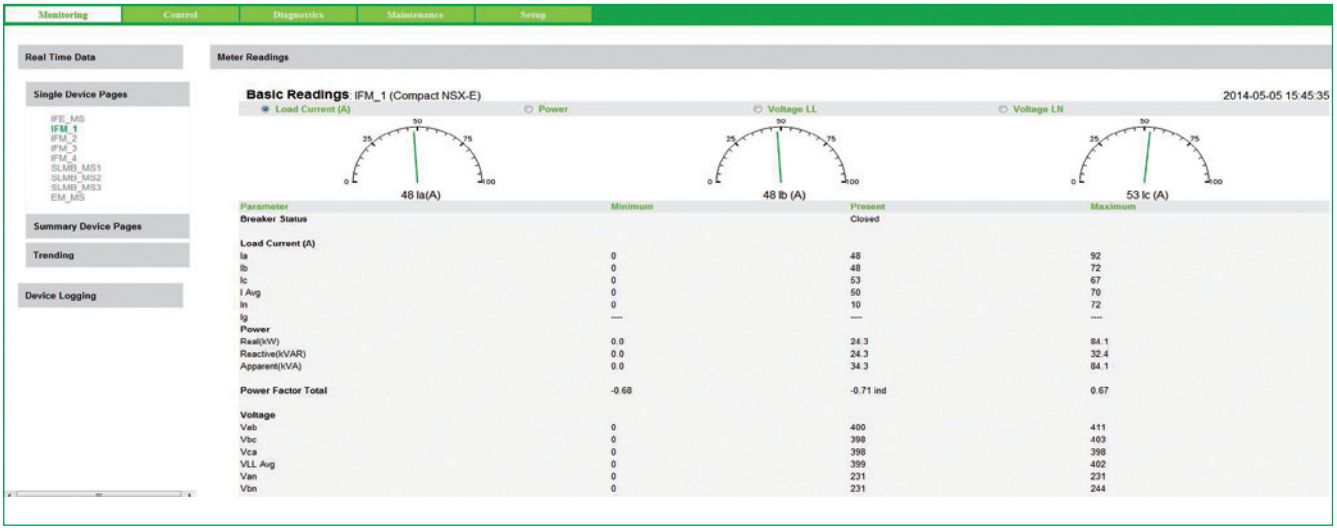
> *Please refer to chapter 3.8.3.3 for a detailed example.*

3.9 On-line Energy Management

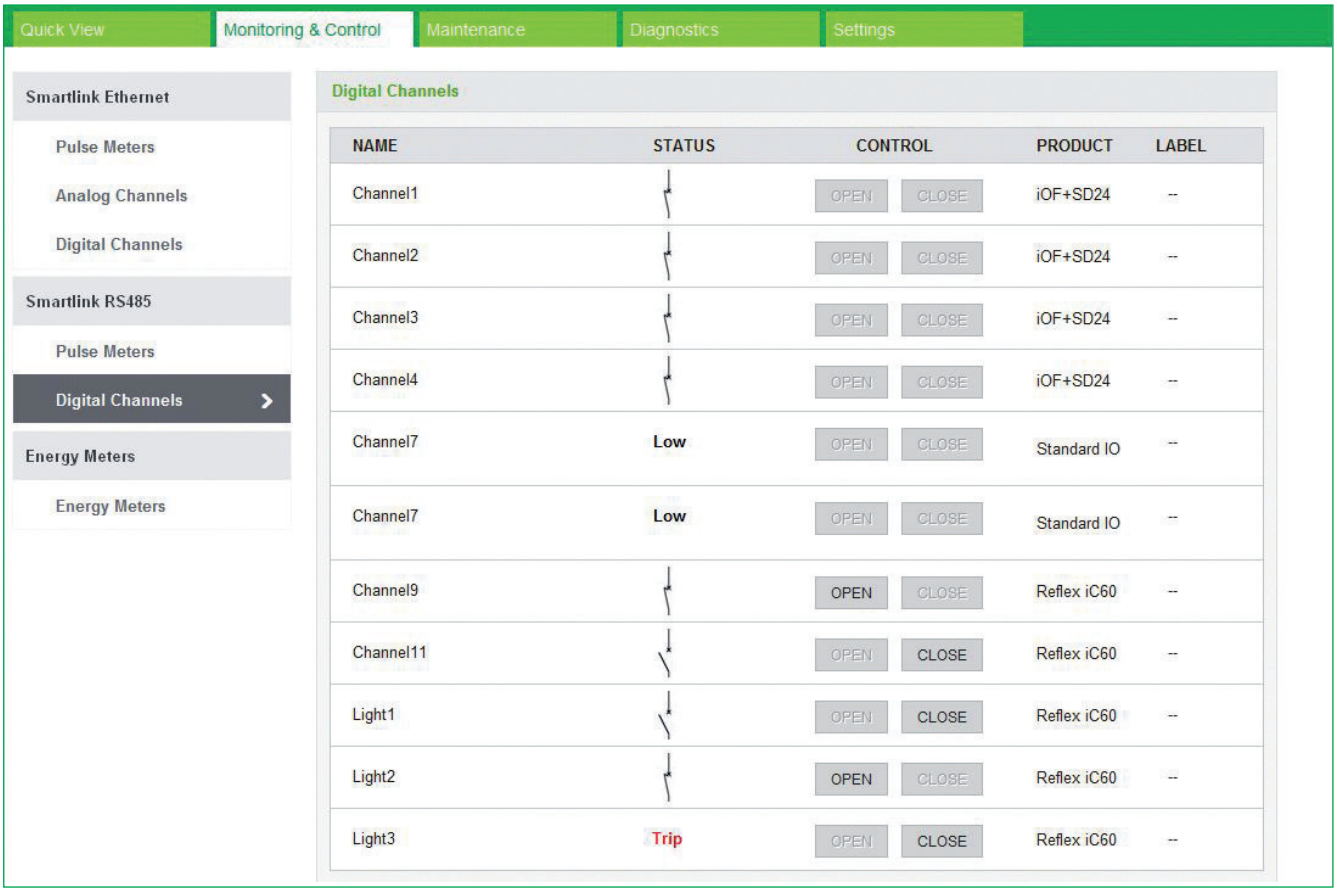
3.9.3.4 Monitoring and Control Web Page

This final step details the operation that you may carry out to check configuration of the digital system.

From Enerlin'X IFE web pages, monitoring real time data are displayed:



From Acti9 Smartlink web pages, monitoring real time data are displayed and control channels are available for remote controlled devices:



3.9 On-line Energy Management

3.9.3.5 Local Display

Enerlin'X FDM128 local display allows configuring up to 8 devices. These devices must be selected from the electrical equipment. In addition, FDM128 only allows configuring one Modbus gateway. As a result, the SLIP_MS1 is used as a Modbus gateway for monitoring & control of final distribution from local display.

Device type	Name	Localization	Network type	Network address
IFE	IFE_MS	Main Switchboard	Ethernet	10.195.155.123
Smartlink Eth	SLIP_MS1	Main Switchboard	Modbus	10.195.155.121
Smartlink MB	SLMB_MS1	Main Switchboard	Modbus	1
Smartlink MB	SLMB_MS2	Main Switchboard	Modbus	2
Smartlink Eth	SLIP_FD1	Final Distribution	Ethernet	10.195.155.125

In this scenario, 5 devices can be displayed in FDM128. To achieve this, follow the procedure:

> **1.** Set the date & time and IP address of the FDM128

> **2.** Select Acti9 Smartlink Ethernet gateway

> **3.** FDM128 asks if an IP gateway master is available, answer Yes

> **4.** Enter the IP address of SLIP_MS1, launch the Modbus auto discovery and validate the 3 devices selected for the main switchboard

> **5.** Enter IP address of SLIP_FD1 and launch the discovery

> **6.** Enter IP address of IFE and launch the discovery

> **7.** Configure all the Acti9 Smartlink channels in the FDM128 display.

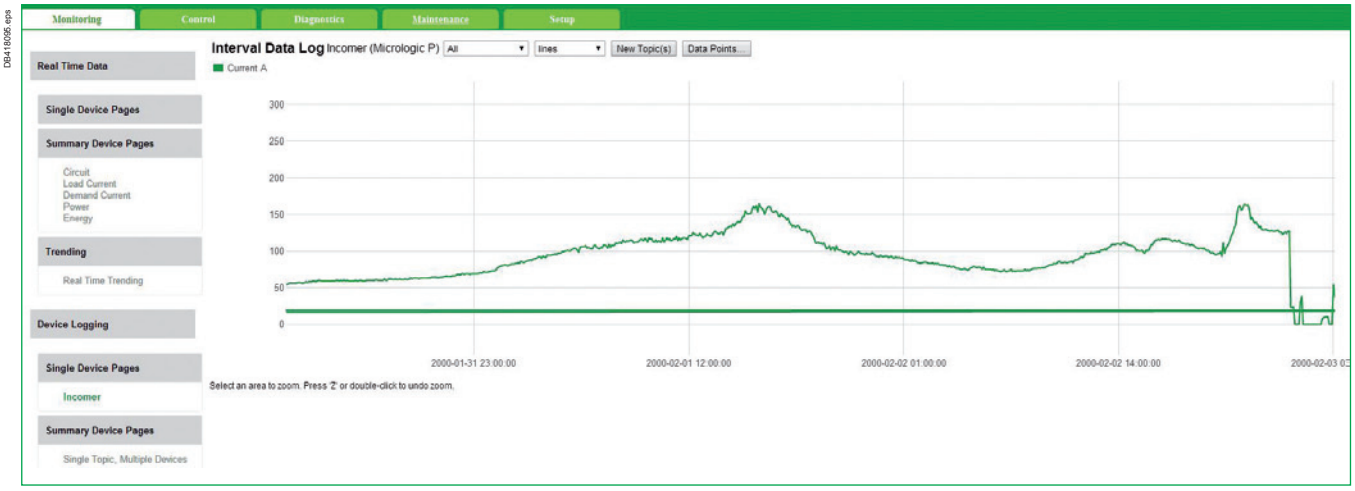
3.9.3.6 Data Logging and Trending

The electrical application real time trending data can be exported for analyses through an IFE capability:

Select a data point for real time trending:

3.9 On-line Energy Management

Data logging is also configurable from the setup menu and allows data point storage.

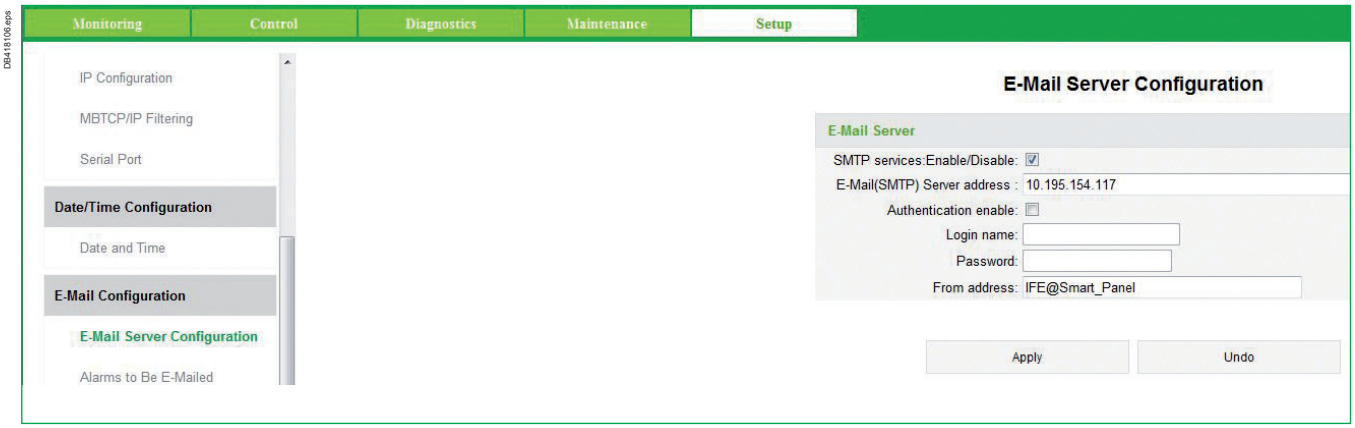


For example, Enerlin'X IFE can store up to three months of data in memory with a 5 sec logging interval. The collected data points may be exported using FTP to a CSV formatted file.

3.9.3.7 Notifications

Notifications provide facility managers with an e-mail alert message when the main incomer trips. The e-mail alert is sent from Enerlin'X IFE (IFE_ MS).

IT services must provide the SMTP server name (or IP address). The image below shows the e-mail configuration screen:



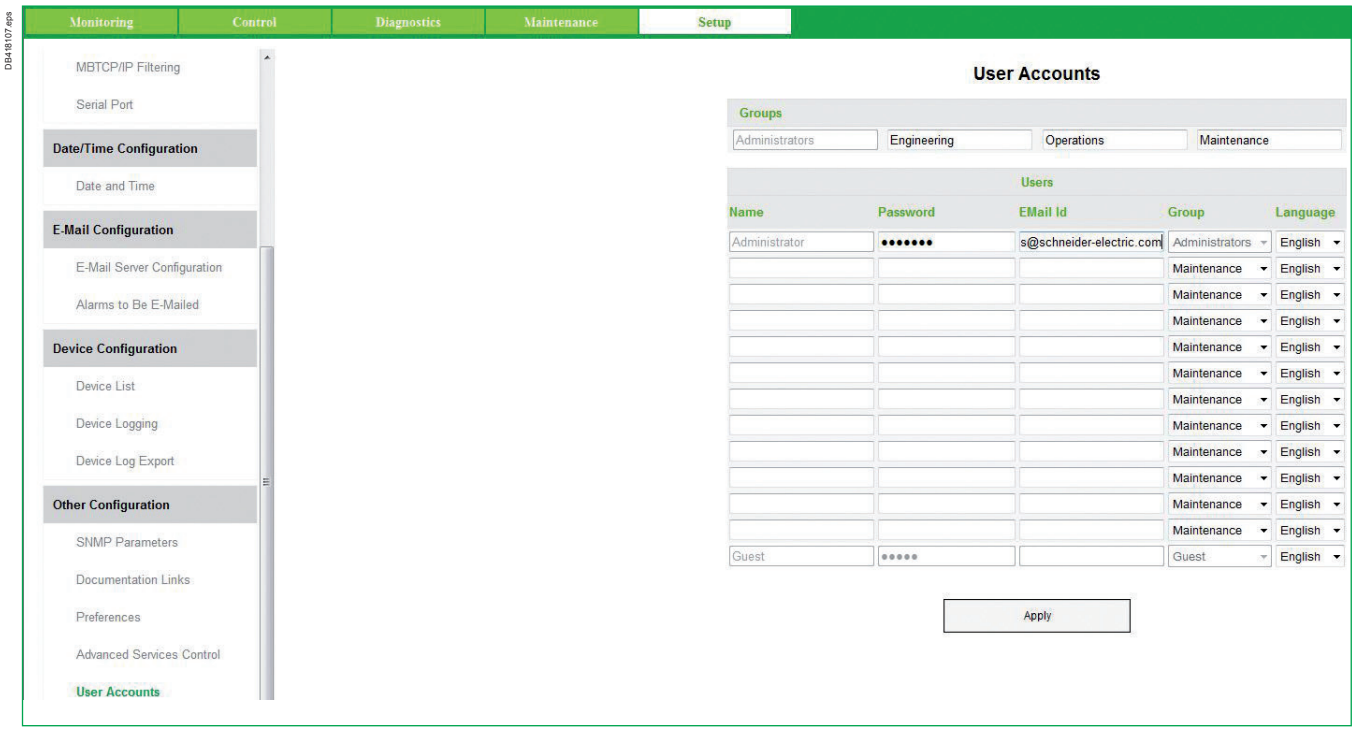
In this document, the SMTP server characteristics are:

> Authentication is not required

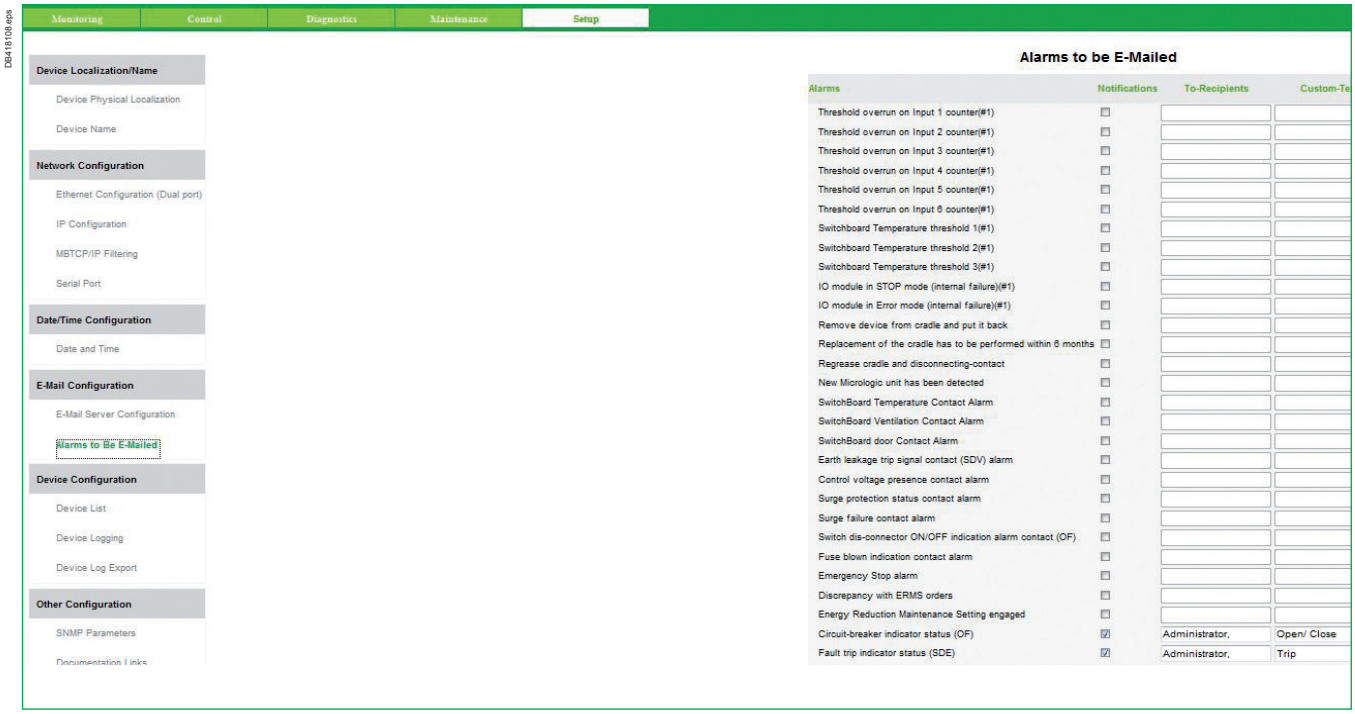
> SSL or TLS encryption is not supported (Use standard port 25).

3.9 On-line Energy Management

Define the e-mail address of the receiver:



Configure the e-mail trigger(s):



3.9 On-line Energy Management

In this example, an e-mail alert was configured for changing position or trip of the main incomer. An example of the e-mail sent is shown below:

From : <IFE@Smart_Panel>
To : facility_Manager/FR/Schneider@Europe,
Date : 06/05/2014 15:00
Subject : IFE-, IFE / Gateway: Fault trip indicator status (SDE)
Message automatically generated by: IFE-, IFE / Gateway
On DATE (year-month-day): 2014-05-06 / TIME: 14:58:44
Device information:
IP Address: 10.195.155.123 (Subnet Mask: 255.255.254.0)
Firmware version: 001.008.000
Hardware version: 001.000.000
****
IMU NAME: NS1600H
Event NAME: Fault trip indicator status (SDE)
Event Description: Main Incomer Trip
****
Important Notice: This Email has been automatically generated. Please do not reply.
Copyright (C) 2014, Schneider Electric. All rights reserved.

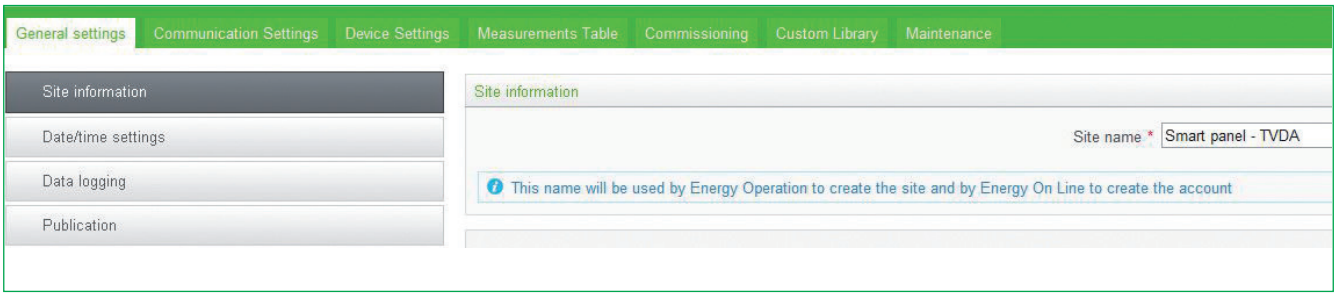
Note: beware that e-mail notifications should not be used as a deterministic method; E-mail delivery can be delayed or cancelled based on the e-mail server load and settings. Some paid SMTP services may support e-mail notifications with determinism (Loop check – resend etc.).

3.9.3.8 Com'X 200

Com'X 200 configuration process is a task oriented workflow, intuitive for commissioning phase.

Set the general settings: site information, date & time, data logging time interval and publication method.

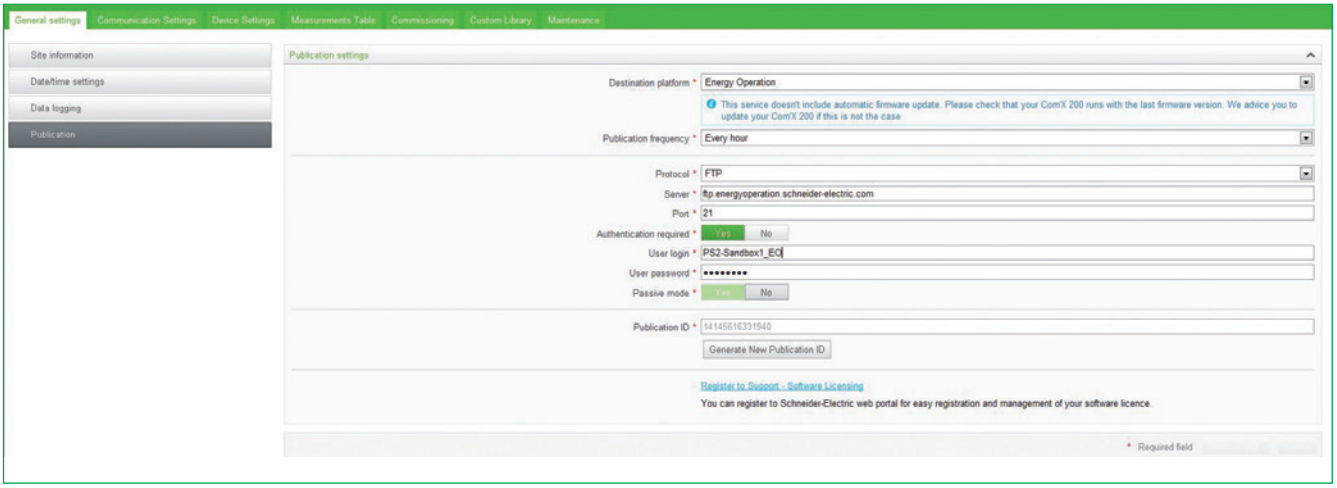
DB418109.eps



Each WAGES data set can be stored using its own data logging frequency (e.g. electrical values having faster variations than temperature). The image below shows data publication settings in the Schneider Electric on-line energy management service "Energy Operation". These settings are provided by Schneider-Electric and must be shared with the building IT services to allow data exchange with the cloud.

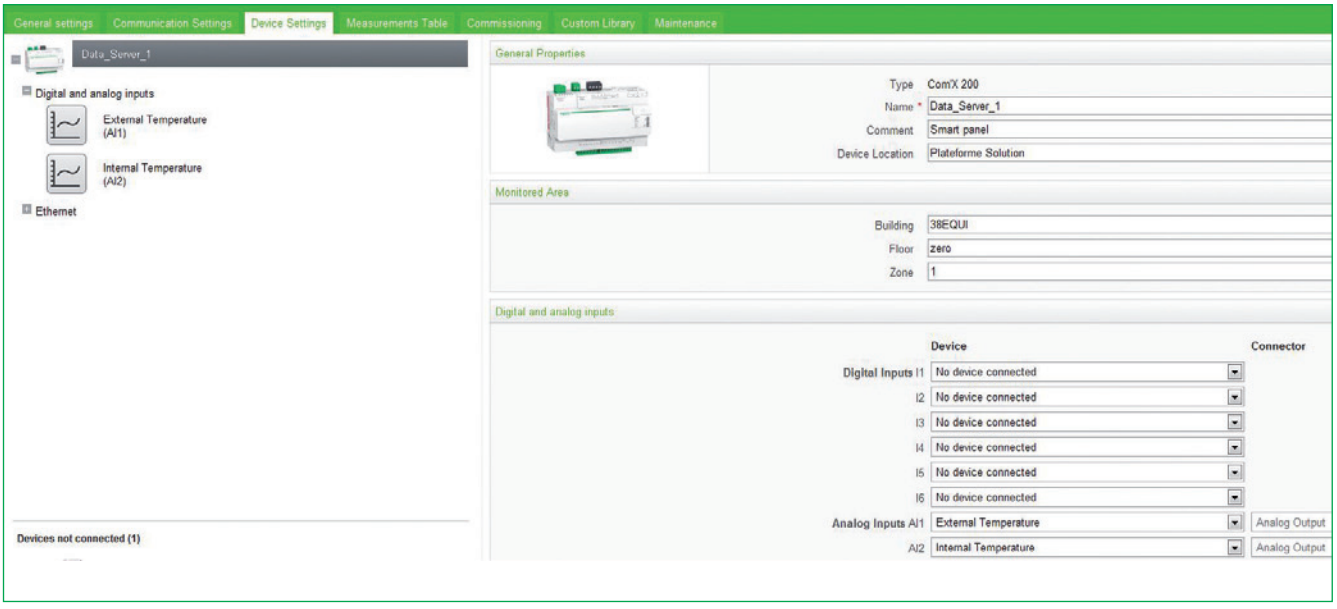
3.9 On-line Energy Management

DB418110.eps



Configure the Com'X 200 energy server using the communication interface. In this TVDA, the Modbus serial line input of Com'X 200 is not used as a digital input. Two analog inputs are configured with PT100 temperature sensor.

DB418111.eps

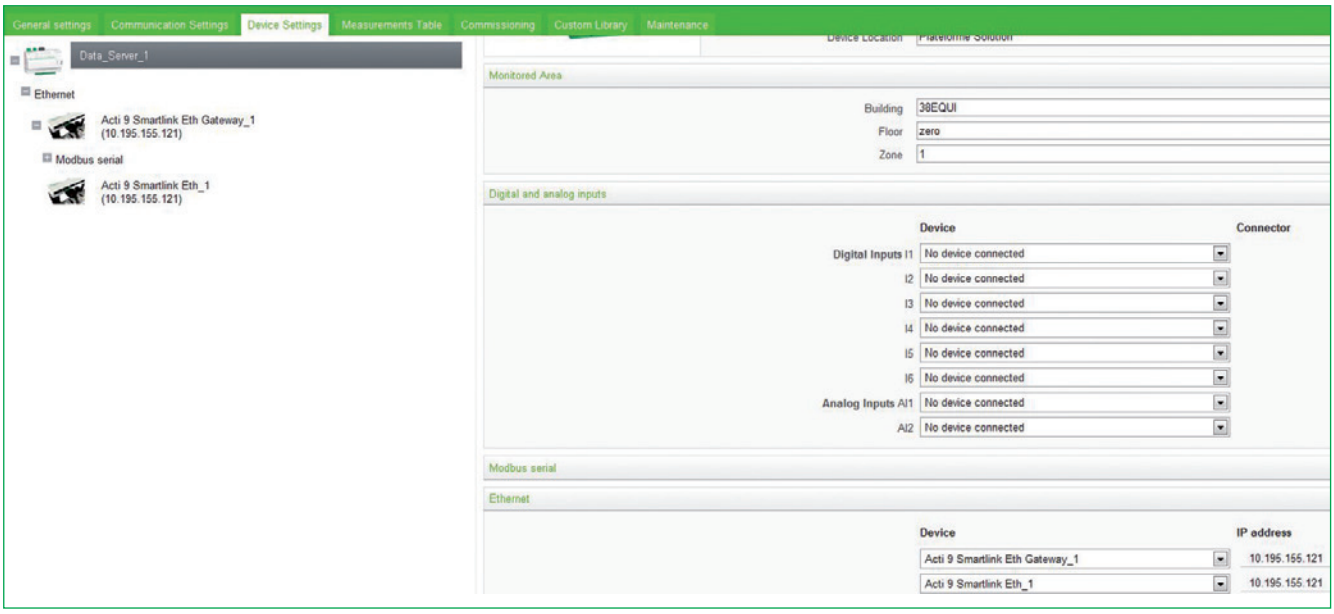


Configure the Com'X 200 energy server to collect data from IFE_MS, SLIP_MS1 and SLIP_FD1 over Ethernet network:

3.9 On-line Energy Management

Acti9 Smartlink Ethernet Configuration

DB418112.eps

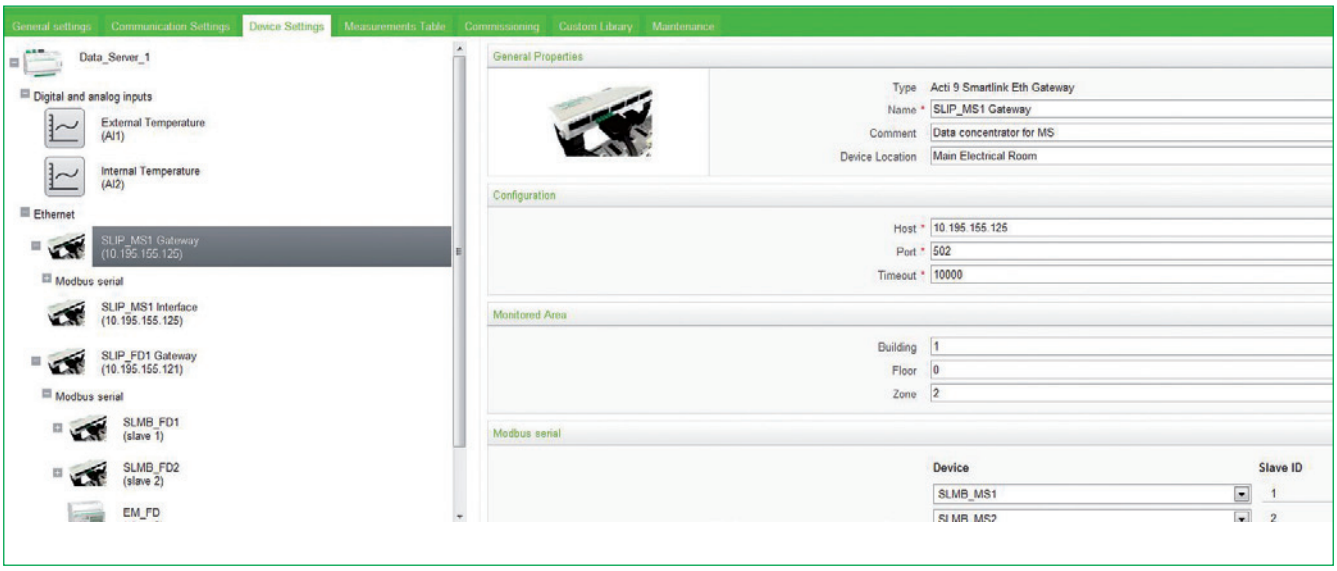


It is mandatory to instantiate two Acti9 Smartlink Ethernet devices. One for the Acti9 channels and the other to get the data from Acti9 Smartlink Modbus devices.

Acti9 Smartlink Modbus Configuration

Auto discovery feature is available to set the Modbus serial line. Manual configuration is also possible.

DB418116.eps

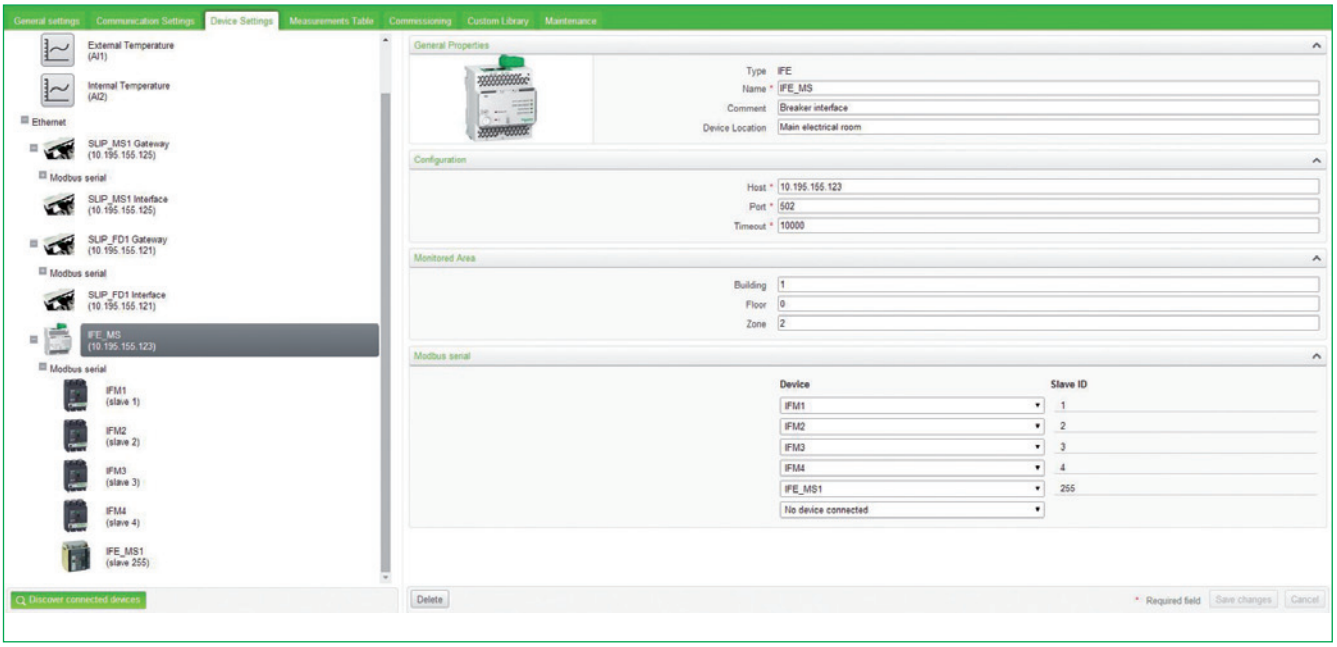


Acti9 channel association needs to be completed for each Acti9 Smartlink in the Com'X 200. Fill in as much information as possible in the Com'X 200. This may include information like localization and description to be ensured analysis of energy data is done correctly.

3.9 On-line Energy Management

Enerlin'X IFE Ethernet Configuration

DB418117.eps



Add one Enerlin'X IFE on the Ethernet network of the Com'X 200 and launch auto discovery via the Modbus serial line (manual configuration is also possible). Enter the correct names of the detected circuit breaker.

It is mandatory to check (or uncheck) data selected to publish to the EMS for each device. Each one will be listed in the measurement table described just after.

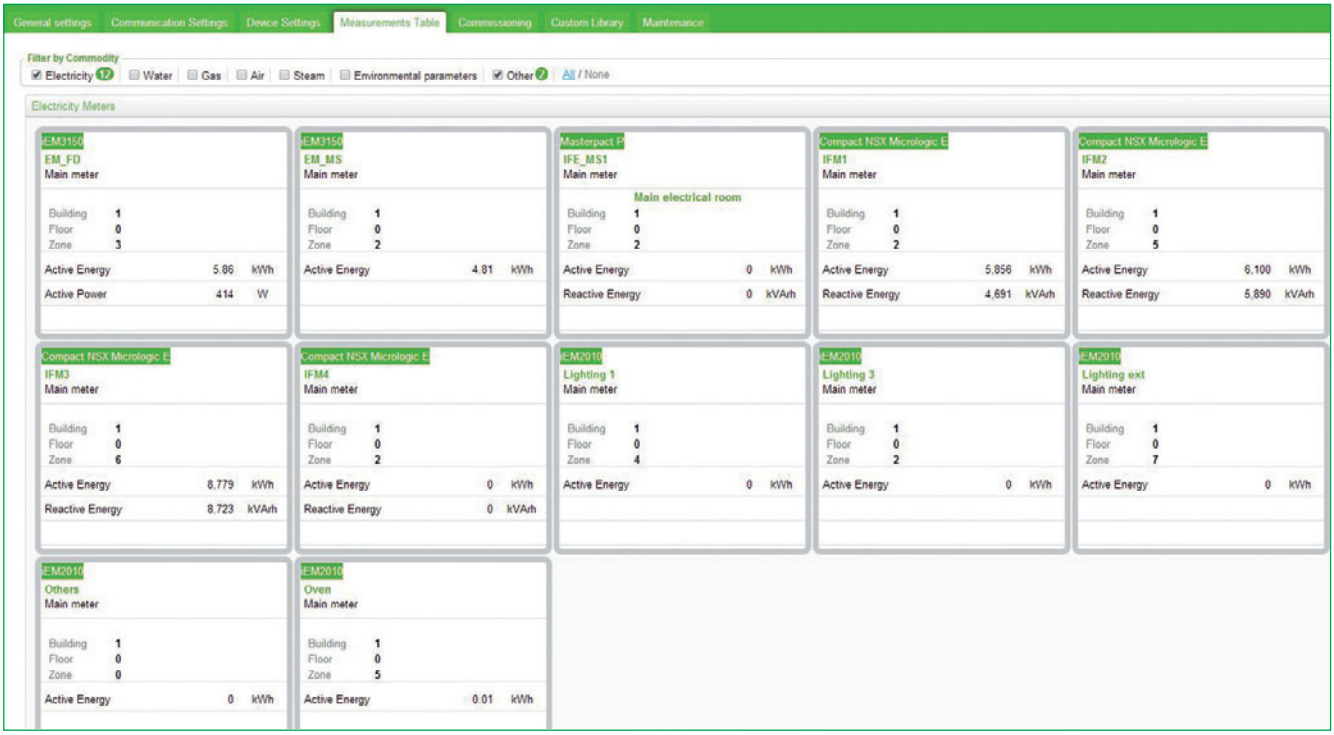
Note: the main circuit breaker connected on ULP input of Enerlin'X IFE must be configured with virtual Modbus address 255.

Monitoring in the Com'X 200

After completing the above steps, the data is accessible in the Com'X 200 monitoring web pages and also available for publication:

3.9 On-line Energy Management

DB418118.eps

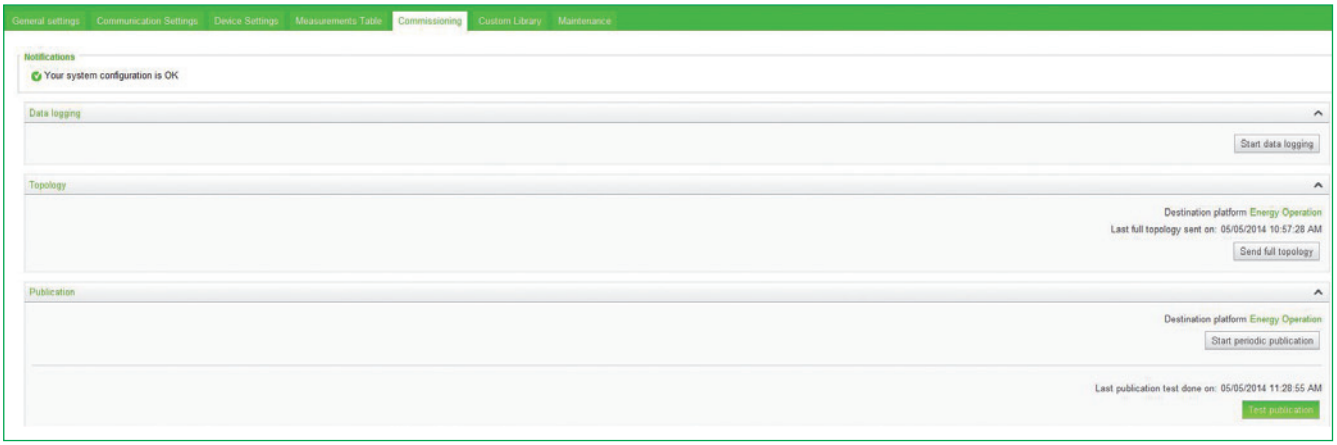


Note: Com'X 200 can store up to about 864 000 data points. For example, this would be up to one month of data when taking 200 measurements over a 10 minute interval. In the event that the connection with Energy Management Service is blocked, the data are temporarily stored and retrieved when the communication link is restored.

Com'X 200 Commissioning

The last step consists in activating the data publication:

DB418119.eps



Verify the health of the system and start periodically publishing data to the EMS.

To publish the data, complete the steps below:

> 1. Activate data logging

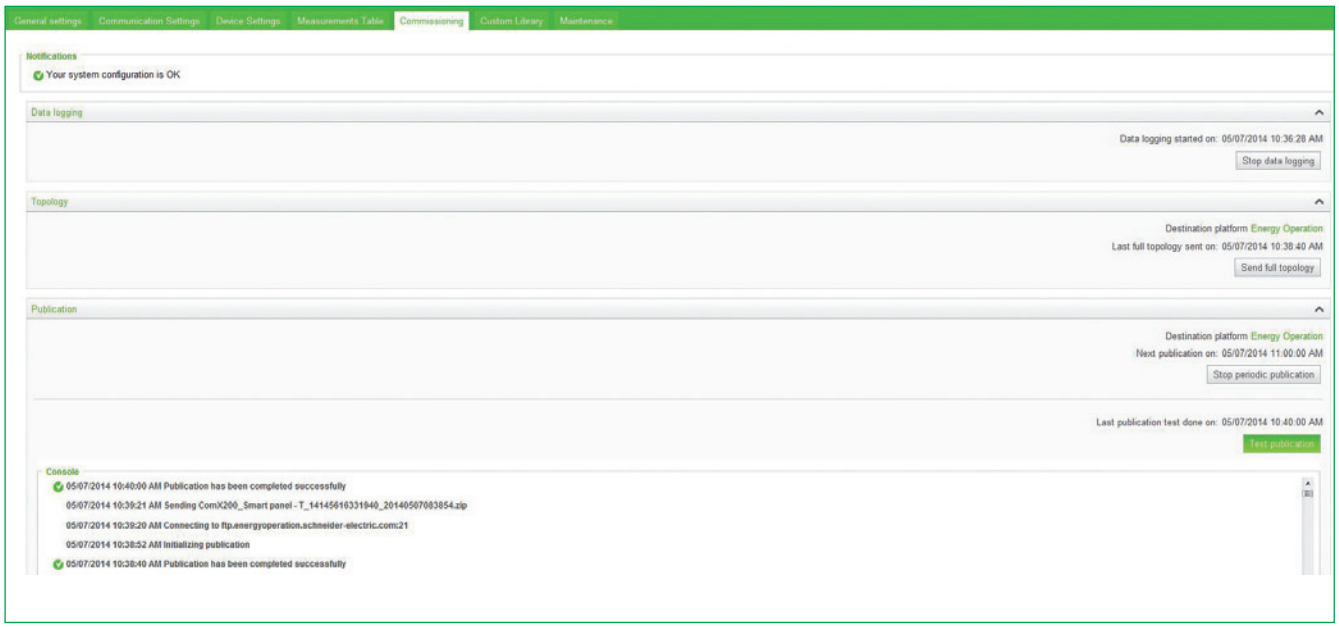
> 2. Send the topology to the EMS once

> 3. Activate periodic data publication.

The system health can be easily checked.

3.9 On-line Energy Management

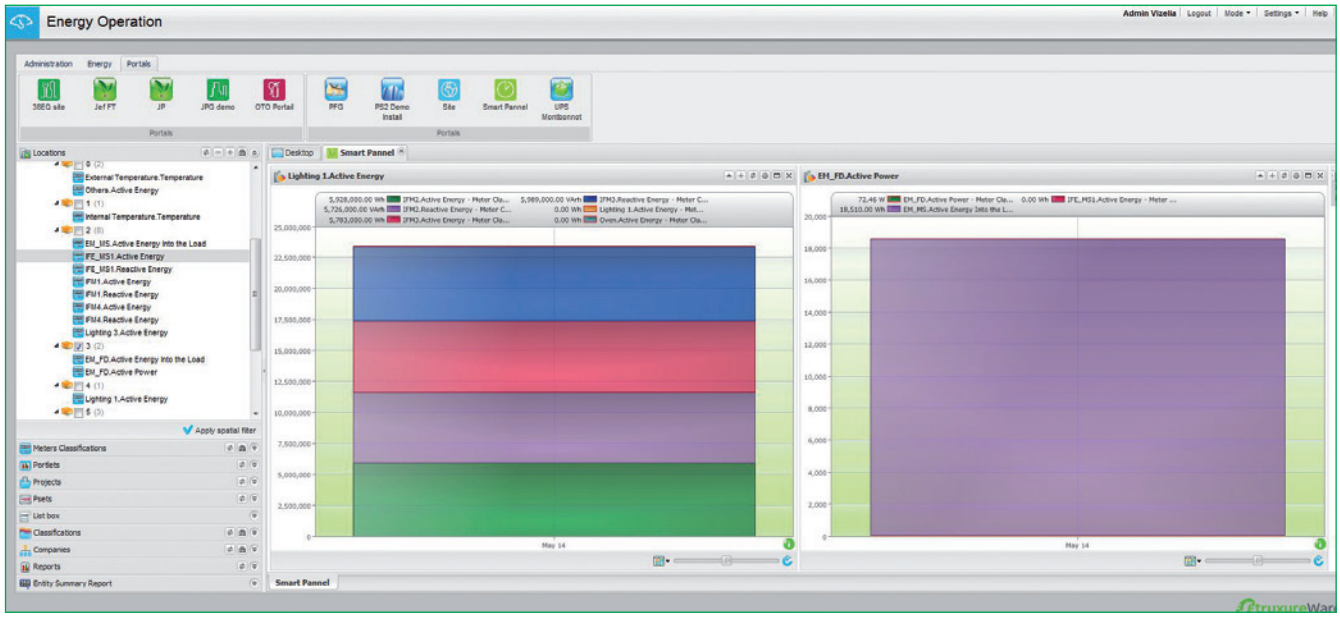
DB418120.eps



3.9.3.9 Link with Energy Management Service

In this example, the EMS is Energy Operation on-line by Schneider Electric:

DB418121.eps



WAGES data points received from Com'X 200 are stored here and can be selected to create an energy dashboard. Site to site comparison is also supported. To enable this feature, contact your Schneider Electric support.

Troubleshooting

4

4.1 Default settings

The default configurations are given below:

To activate default configurations, > *refer to device user guides, listed in chapter 5.3.*

SmartLink Ethernet

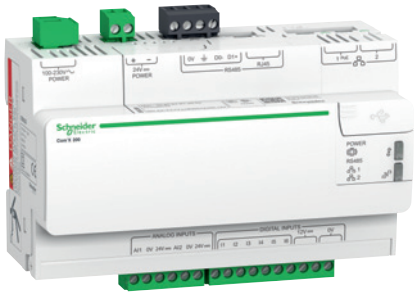
Client DHCP (by default ADDR* =169.254.YY.ZZ**)

Login: admin
Password: admin

IFE

E1 = E2
Client DHCP (by default ADDR* =169.254.YY.ZZ**)

Login: Administrator
Password: Gateway



Com'X200

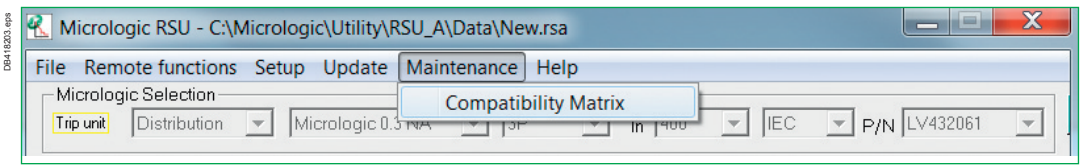
E1<>E2
E1: Client DHCP (By default ADDR* =169.254.YY.ZZ**)
E2: Serveur DHCP (ADDR 10.25.1.1)

Login:admin
Password: admin

*: By default ADDR is the zero conf backup when DHCP is not present
**: YY.ZZ two last digit of MAC ADDR

4.2 Firmware Compatibility

Attention must be paid to the device firmware compatibility (BCM ULP, BSCM, FDM121, MICROLOGIC), when installing a new product range like IFE, adding an I/O association or changing a circuit breaker featuring communication. Use RSU software to verify the Compatibility Matrix:



By clicking on Compatibility Matrix, the ULP system health and operation can be verified.

4.2 Firmware Compatibility

DB418204.eps

Compatibility Matrix

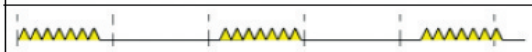
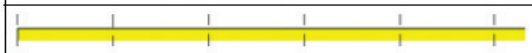
Module	Nominal	Non critical software discrepancy	Non critical hardware discrepancy	Hardware Degraded	Configuration discrepancy	Critical software discrepancy	Critical hardware discrepancy	conflict	Stop	Recommanded actions to be performed	Diagnostic message
Microl...											
BSCM											
IFM											
FDM121											
UTA											
BCM U...	X										
IO #1	X									None	
IO #2											
IFE	X									None	

Device belongs to ULP V1.0 offer release
Device belongs to ULP V1.1 offer release
Device belongs to ULP V1.2 offer release
Device belongs to ULP V2.0 offer release
Device not detected

In some cases, device firmware needs to be upgraded. Upgrades are possible when connected directly and the computer running RSU\Update feature has access to the internet.

4.3 ULP system

Each Enerlin'X product using the ULP system provides a ULP LED diagnostic status. The tables below provide the ULP LED blink code pattern and associated Mode/Action:

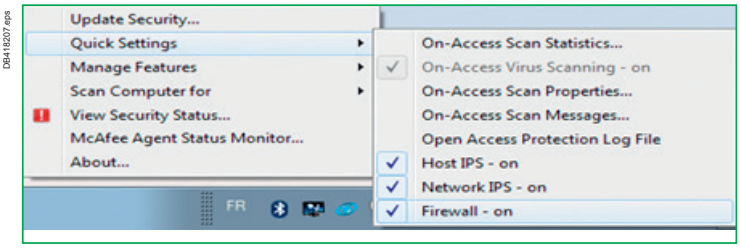
ULP LED	Mode	Action
	Nominal	None
	Conflict	Remove extra ULP module
	Degraded	Replace ULP module at the next maintenance operation
	Test	None
	Non-critical firmware discrepancy	Upgrade firmware at the next maintenance operation
	Non-critical hardware discrepancy	Replace ULP module at the next maintenance operation
	Configuration discrepancy	Install missing features
	Critical firmware discrepancy	Upgrade firmware
	Critical hardware discrepancy	Replace ULP module
	Stop	Replace ULP module
	Power OFF	Check power supply

4.4 Ethernet

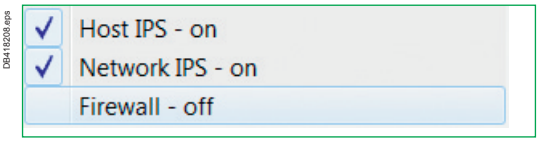
In some computers, DPWS is blocked by the firewall. In the event your firewall blocks the ping, it needs to be temporarily turned off. Otherwise, get support from your local IT service to enable the DPWS service:

> In the Windows notification area, right-click on the firewall icon (Example with McAfee):

> Open the 'Quick Settings' menu and uncheck the 'Firewall' item:



> Open again the 'Quick settings' menu and check the 'Firewall' item is disabled:



4.4 Ethernet

Procedure to connect to Enerlin'X devices with a computer running Windows XP:

DPWS is not supported by XP nor by previous versions of Windows OS. In the event Windows XP is used, a connection can be made to the Enerlin'X devices with Ethernet. The steps to manually change the IP address of the computer to be able to reach the web pages of devices are outlined below:

Step	Action
1	Disconnect your local computer from the local area network (LAN) and switch off Wi-Fi.
2	Connect an Ethernet cable from the computer to the Enerlin'X IFE or Acti9 Smartlink Ethernet.
3	Start Internet Explorer 8+, Mozilla Firefox 15+, Chrome 24+ or later versions. **Note:** the computer automatically should use the default IP address 169.254.#.# (# = 0...255) and the default subnet mask 255.255.0.0.
4	In the address text box, type 169.254.YY.ZZ where YY and ZZ are the last 2 bytes of the IFE MAC address (to be found on the IFE side label) or Smartlink Ethernet IP address (to be found on the Smartlink Ethernet up label), then press Enter, the home page opens in your browser. **For example:** for an IFE with MAC address 00-B0-D0-86-BB-F7, or 0-176-208-134-187-247 in decimal, type 169.254.187.247 in the address text box.
5	Press Enter, the login page automatically opens in your browser.
6	Type user name and password, the home page automatically opens in your browser.

Com'X 200 acts as a DHCP server on port Ethernet 2 by default. Connect the computer via LAN to the E2 in Com'X 200 and type 10.25.1.1 in the address text box to access the Com'X 200.

In both cases, the computer must use DHCP and not use a static IP address. To verify the setting, open a DOS command shell (Start\All Programs\Accessories\Command Prompt) and type "Ipconfig" command line. Click Enter. The following information should be displayed (language will vary based on your OS settings):

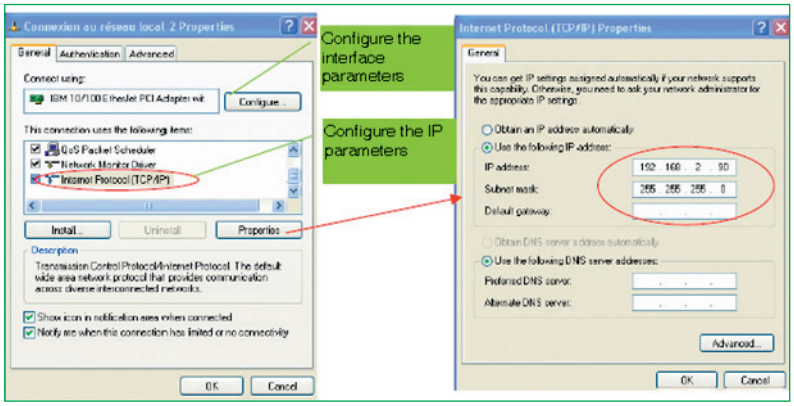
DB418209.eps

```
Carte Ethernet Local Area Connection :

   Suffixe DNS propre à la connexion. . . :
   Adresse IPv6 de liaison locale. . . . .: fe80::8dd0:4950:f650:706%11
   Adresse IPv4. . . . . . . . . . . . . .: 192.168.1.118
   Masque de sous-réseau. . . . . . . . . : 255.255.255.0
   Passerelle par défaut. . . . . . . . . : 192.168.1.1
```

Verify that the IP address is the default one (i.e. static addressing is not enabled). If parameters are not correct, force an IP address directly in your network configuration using the steps below:

DB418210.eps



5.1 Installation & Cabling

5.1.1 General Recommendation

A dedicated **mounting and assembly** guide is available to help build Smart Panels. Please refer to the reference document for details. It is advised to take communication capability into account as early as possible in a project.

General rules for positioning communication devices:

> 1. Maintain the maximum distance between power parts and auxiliary power distribution and Enerlin'X digital components

> 2. Enerlin'X digital components must be located as low as possible or in the bottom part of the panel, especially when internal temperatures may exceed 70 °C

> 3. Smart Panels should provide easy access for connection.

Modbus and Ethernet cables must be twisted and shielded. It is recommended to use RJ45 using 45° or 90° turns to reflect the curvature of beams.

Profiled steel rails should be chosen over aluminum rails. Panels made of several columns must be linked with a PEN bar (Protective Earth and Neutral).

Antennas must not be located an inside a metallic cubicle. If Com'X 200 is used without an external GPRS antenna, special mounting rules must be followed. For related rules, > *please refer to Com'X 200 documentation.*

If Com'X 200 is used with a WIFI dongle, special mounting rules must be followed. > *Please refer to Com'X 200 documentation.*

Surge arrester earth terminal must be connected as close as possible to the main earth.

ULP system provides a power supply to ULP devices. Verify the maximum number of devices the power supply can support.

Do not exceed 8 Modbus slaves for one Modbus master. This will provide better response time (Enerlin'X IFE+ or Acti9 Smartlink Ethernet).

5.1.2 EMC consideration

For painted enclosures, use "toothed slice" to assure the ground continuity between all metal parts.

It is recommended to use iron cable trays over plastic to increase conductivity.

Earth cables must be same diameter as power cables.

It is advised to install a metal grid in the product to provide a high quality ground connection.

Earth of DC power supply must be connected when possible.

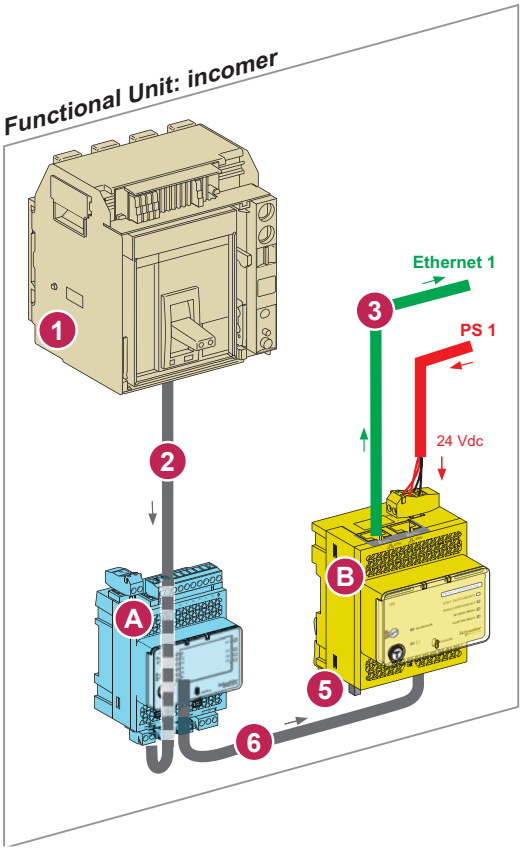
Panel builders should use micro ohmmeters between different ground metal parts to check the equal potential of each ground.

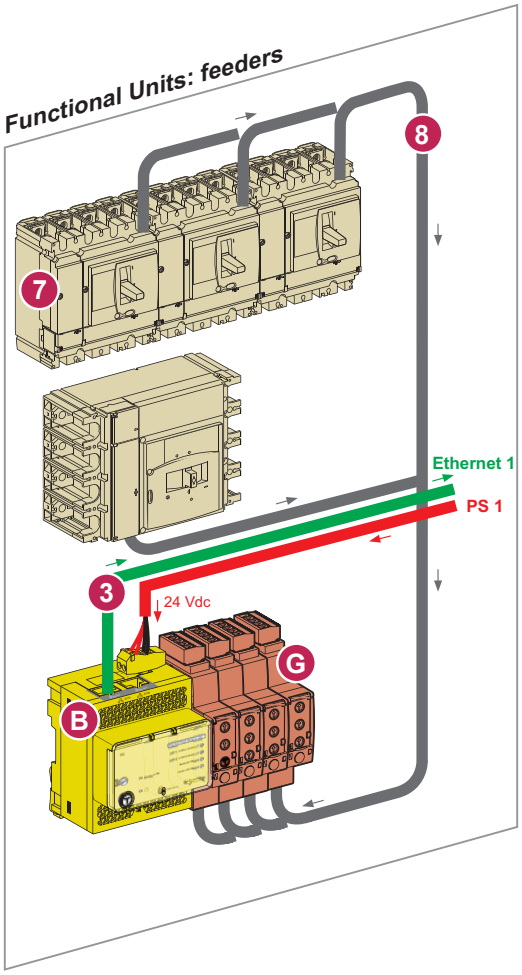
5.2 Bill of Material and Software

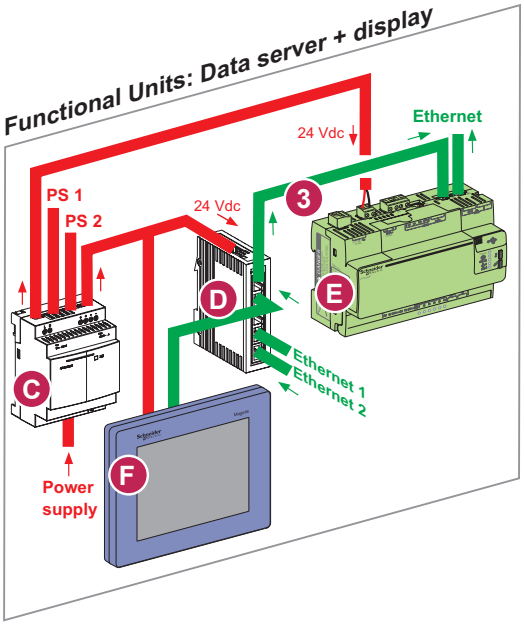
Accessories for Acti 9 Smartlink			
USB cable link / Modbus	for Acti 9 Smartlink test	1	A9XCATM1
Prefabricated cables 2 connectors	Short: 100 mm	6	A9XCAS06
	Medium-sized: 160 mm	6	A9XCAM06
	Long: 870 mm	6	A9XCAL06
Prefabricated cables 1 connector	Long: 870 mm	6	A9XCAU06
Connectors	5-pin connectors (Ti24)	12	A9XC2412
Mounting kit	Din rail (4 feet, 4 straps, 4 adapters)	1	A9XMFA04
	Linergy FM 200 A (4 adapters)	1	A9XM2B04
Spare parts	Lock for Linergy FM 80 A (2 clips)	1	A9XMLA02

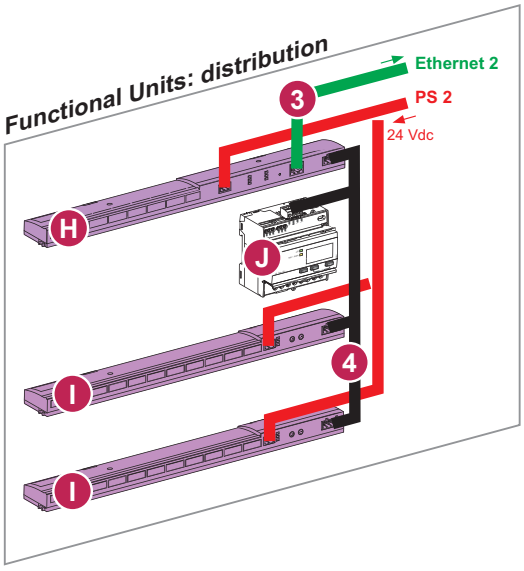
5.2 Bill of Material and Software

The following drawing and table summarize all of the selected hardware:

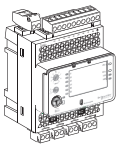
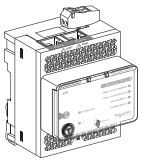
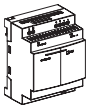
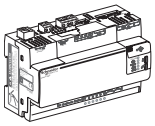
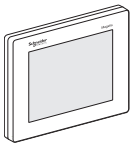
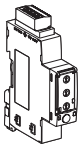
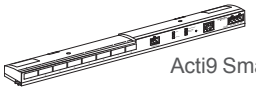
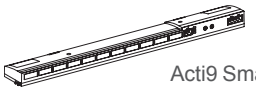
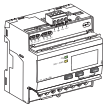


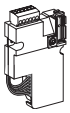
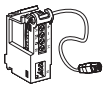
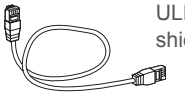
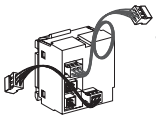
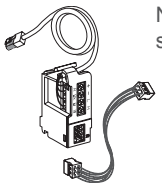






5.2 Bill of Material and Software

Description		Reference
A 	I/O application module	LV434063
B 	IFE Ethernet interface for LV breaker	LV434010
	Ethernet interface for LV breakers and gateway	LV434011
C 	24 Vdc Power supply Class B product recommended	ABL7RM24025
D 	Switch Ethernet	TCS ESU 053SN0
E 	Com'X 200: Energy server	EBX200
F 	Switchboard front display module FDM128	LV434128
G 	IFM Modbus-SL interface module	TRV00210
	Stacker (set of 10)	TRV00217
H 	Acti9 Smartlink Ethernet	A9XMEA08
I 	Acti9 Smartlink Modbus	A9XMSB11
J 	IEM3150	A9MEM3150

Description			Reference
1 	Communicating device with BCM (Breaker Control Module)		33106
	Internal terminal block		33119
2 	ULP cord, shielded cable	L = 0.35 m	LV434195
		L = 1.3 m	LV434196
		L = 3 m	LV434197
3	Ethernet cable RJ45: ■ 10-100 mb ■ Lenght 100 m max ■ Cable RJ45, Category 6 SFTP, recommanded	L = 1 m	VDIP184546010
		L = 0.5 m	VDIP184546005
4 	Modbus cable: ■ shielded twisted pair ■ RS485 standard + Power Supply ■ a roll of cable RS485, 4 wires (2 x RS485 + 2 power supply) with a length of 60 m		50965
5 	10 ULP line terminators		TRV00880
6 	ULP cable, shielded cable	L = 0.3 m	TRV00803
		L = 0.6 m	TRV00806
		L = 1 m	TRV00810
		L = 2 m	TRV00820
		L = 3 m	TRV00830
		L = 5 m	TRV00850
	5 RJ45 connectors female/female		TRV00870
7 	Communicating device with BSCM (Breaker Status & Control Module)		LV434205
8 	NSX cord shielded cable	L = 0.35 m	LV434200
		L = 1.3 m	LV434201
		L = 3 m	LV434202

5

5.3 Reference Documents

The table below outlines referenced documents that can be used as a resource to gather more details when needed.

Document title	Reference	Date
Electrical drawing - Medium size building use case - PRISMA-P	TVDASPV1-CAD1	05/2014
Electrical drawing - Small size building use case - PRISMA-G	TVDASPV1-CAD2	05/2014
Enerlin'X catalogue	LVCATENLX_EN	04/2014
Smart Panels Digitized switchboards design and assembly guide	DESW051_EN	05/2014
IFE - Instruction sheet	HRB49218-01	2014
I/O module - Instruction sheet	HRB49217-00	2014
FDM128 - Instruction sheet	HRB45777-00	2014
Acti9 Smartlink Mobus - Instruction sheet	S1B33423	2012
Acti 9 Smartlink Ethernet - Instruction sheet	EAV14819-00	2014
Com'X 200 - Instruction sheet	253537642	2014
BCM ULP - Instruction sheet	5100512864A (B)	2014
IFM - Instruction sheet	GHD1632301-05	2014
IFE - User Guide	DOCA0084EN-00	04/2014
I/O module - User Guide	DOCA0055EN-00	04/2014
Acti9 Smartlink Modbus - User Guide	DOCA0004EN	2012
Acti 9 Smartlink Ethernet - User Guide	DOCA0073EN	04/2014
Com'X 200 - User Guide	DOCA0036EN-01	03/2014
Com'X 200 - Data acquisition design guide	DOCA0035EN-01	02/2014
FDM128 - Display for 8 LV Devices - User Guide	DOCA0037EN-01	04/2014

5.4 Reference Version

The following tables outline the firmware and software version number of the devices used in this document:

Devices	Firmware version	Web pages
IFE	1.8.0	1.8.3
I/O application module	2.1.1	NA
IFM	1.1.1	NA
Smartlink Ethernet	2.2.1	1.1.0
Smartlink Modbus	1.0.2	NA
FDM128	5.5.3	NA
Com'X 200	1.1.15	NA
BCM ULP	4.0.7	NA
BSCM	9.9.9.9.0	NA

Software tools	Software version	Link
Acti9 Smartlink test	3.0.0	See 5.5.1
RSU	11.13.7	See 5.5.2

NA: Not Applicable.

5.5 Software Configuration Tool Procurement

5.5.1 Acti9 Smart Test: Download Procedure:

> 1. Go to the Schneider Electric home page at www. schneider- electric. com.

> 2. In the Search box, type the range name: Acti9 Smartlink

> 3. Go to Product Offer

> 4. Click the link of Acti9 Smartlink product

> 5. Click Documents & Downloads, and then click Software/Firmware.

5.5.2 RSU-A: Download procedure:

> 1. Go to the Schneider Electric home page www.schneider-electric.com.

> 2. In the Search box, type the name of the following circuit breaker range: Compact NSX

> 3. Go to Product Offer

> 4. Click the link of Compact NSX product

> 5. Click Documents & Downloads, and then click Software/Firmware.

Notes

Notes

Notes

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France

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