Acti9 Smartlink SI D
User Manual

03/2018

DOCA0115EN-03

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. 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 a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE 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 and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

At a Glance

Document Scope

The purpose of this manual is to provide users, installers, and maintenance personnel with the technical information necessary to install and use the Acti9 Smartlink SI D communication system.

Validity Note

The Acti9 Smartlink SI D communication system can be easily integrated into any building management architecture.

It combines monitoring and metering and protection functions designed for energy efficiency solutions. Based on the Modbus protocol, the Acti9 Smartlink SI D communication system allows switchboard data to be exchanged in real time with a supervision system or a PLC.

This system's pre-wired cables can save time and prevent wiring errors during installation.

Related Documents

Title of Documentation	Reference Number
Instruction Sheet for the Acti9 Smartlink SI D (English, Dutch, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	NVE60007
Instruction Sheet for the PowerTag Acti9 M63 Wireless Communication Energy Sensors (English, Dutch, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	EAV31628_web
Instruction Sheet for the PowerTag Acti9 P63 Wireless Communication Energy Sensors (Chinese, Dutch, English, French, German, Italian, Portuguese, Romanian, Russian, Spanish)	QGH78639_A QGH78639_B
Instruction Sheet for the PowerTag Acti9 F63 Wireless Communication Energy Sensors (Chinese, Dutch, English, French, German, Italian, Portuguese, Romanian, Russian, Spanish)	QGH78642_A QGH78642_B
Instruction Sheet for the PowerTag NSX Wireless Communication Energy Sensor for Compact NSX100-250, Compact NS100-250, Compact INS250, Compact INV100-250 (Chinese, English, French, German, Italian, Portuguese, Russian, Spanish)	QGH46815
Instruction Sheet for the PowerTag NSX Wireless Communication Energy Sensor for Compact NSX400-630, Compact NS400-630, Compact INS320-630, Compact INV320-630 (Chinese, English, French, German, Italian, Portuguese, Russian, Spanish)	QGH46820
Ecoreach Installation Guide (English)	*DOCA0134EN*

You can download these technical publications and other technical information from our website at https://www.schneider-electric.com/en/download

Chapter 1
Acti9 Smartlink System

What Is in This Chapter?

This chapter contains the following topics:

Overview

Introduction

The Acti9 Smartlink system is used to monitor the final distribution switchboards through any supervision system.

Modular Acti9 devices in the Acti9 Smartlink system are used to monitor, and measure the electrical distribution boards via a Modbus TCP/IP communication network.

The Acti9 Smartlink system collects the data from electrical distribution boards in real time, thus contributing to achieve energy efficiency targets or monitoring final loads.

This system consists of:

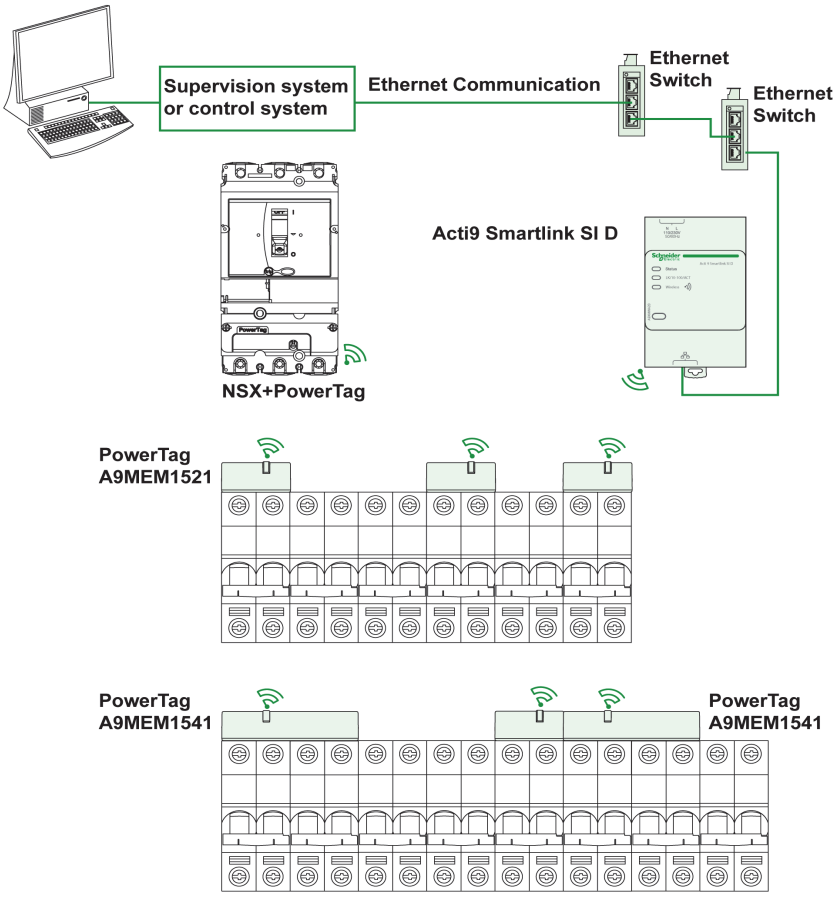
- Acti9 Smartlink SI D
- PowerTag energy sensors (PowerTag Acti9 M63 (for iC60 offer), PowerTag Acti9 P63 (for DT40 and iC40 offers), PowerTag Acti9 F63 (for other devices such as VigiBlock and specific installations), and PowerTag NSX (for Compact NSX, Compact INS, Compact INV)) are the wireless devices that are directly mounted on a protective device and are connected to Acti9 Smartlink SI D through a wireless communication. PowerTag energy sensors allow you to monitor the devices and collects not only energy, but also power and alarm events on the voltage loss. PowerTag energy sensors are mounted upstream or downstream, or downstream of devices.

This system offers the following advantages and services:

- Telemetering applications.
- Monitor load unbalance.
- Monitor power and voltage loss.
- Energy management and regulations.

Acti9 Smartlink SI D is a wireless concentrator that exposes over TCP/IP all the Modbus registers of metering and monitoring data to any supervision system.

Acti9 Smartlink SI D Communication System Block Diagram



Acti9 Smartlink SI D also manages web pages in order to configure settings or to monitor the wireless devices.

⚠ WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change the default passwords to help prevent unauthorized access to device settings and information.
- Disable unused ports or services and default accounts to minimize pathways for malicious attackers.
- Place networked devices behind multiple layers of cyber defenses (such as firewalls, network segmentation, and network intrusion detection and protection).
- Use cyber security best practices (for example, least privilege, separation of duties) to help prevent unauthorized exposure, loss, or modification of data and logs, or interruption of services.

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

Acti9 Smartlink SI D

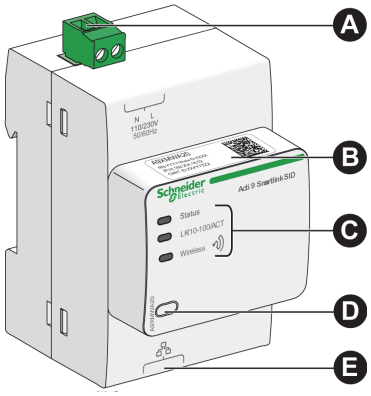
Introduction

The Acti9 Smartlink SI D device can be connected to the laptop or a PC using a straight Ethernet cable. The data can be transmitted from the Acti9 Smartlink SI D device to a PLC or a supervision system.

The Acti9 Smartlink SI D is used to concentrate wireless data from PowerTag energy sensors.

The PowerTag energy sensors can be connected to the Acti9 Smartlink SI D through wireless communication.

Description



A Power supply connector 230 Vac
B Default IPv4 address
C Communication status indicators
D Reset button
E RJ45 Ethernet connection

Acti9 Smartlink SI D Acting as a PowerTag Concentrator

The PowerTag auxiliaries provide compact and high density metering solution with rich and accurate data for building systems (that can send energy, power, current, voltage, and power factor to Acti9 Smartlink concentrator every 5 seconds). You can configure up to 20 PowerTag energy sensors per Acti9 Smartlink SI D. Tagging a circuit breaker with PowerTag allows you to monitor any electrical device with high flexibility (for example, you can add PowerTag energy sensors after the last-minute changes in the distribution board).

The PowerTag energy sensors provide an advanced monitoring on load level of each phase and phase unbalance sends an alarm if the electrical device is down (voltage loss alarms).

The Acti9 Smartlink SI D behaves as a data concentrator to collect information from wireless auxiliaries. The Acti9 Smartlink SI D provides monitoring of the switchboard via embedded web pages for local access. The addition of new wireless auxiliaries provides affordable metering with panel size optimization.

PowerTag Wireless Communication Devices

Description

Wireless communication devices that can be connected to the Acti9 Smartlink SI D are listed in the following table:

Designation	Product Reference	Description
PowerTag Acti9 M63 Wireless Communication Energy Sensor 1P	A9MEM1520	One-phase wireless communication energy sensor (installation on top or bottom of a protective device).
PowerTag Acti9 M63 Wireless Communication Energy Sensor 1P+N Top	A9MEM1521	One-phase and neutral wireless communication energy sensor (installation on top of a protective device).
PowerTag Acti9 M63 Wireless Communication Energy Sensor 1P+N Bottom	A9MEM1522	One-phase and neutral wireless communication energy sensor (installation on bottom of a protective device).
PowerTag Acti9 M63 Wireless Communication Energy Sensor 3P	A9MEM1540	One-phase and neutral wireless communication energy sensor (installation on top or bottom of a protective device).
PowerTag Acti9 M63 Wireless Communication Energy Sensor 3P+N Top	A9MEM1541	Three-phase and neutral wireless communication energy sensor (installation on top of a protective device).
PowerTag Acti9 M63 Wireless Communication Energy Sensor 3P+N Bottom	A9MEM1542	Three-phase and neutral wireless communication energy sensor (installation on bottom of a protective device).
PowerTag Acti9 P63 Wireless Communication Energy Sensor 1P+N Top	A9MEM1561	One-phase and neutral wireless communication energy sensor (installation on top of a protective device).
PowerTag Acti9 P63 Wireless Communication Energy Sensor 1P+N Bottom	A9MEM1562	One-phase and neutral wireless communication energy sensor (installation on bottom of a protective device).
PowerTag Acti9 P63 Wireless Communication Energy Sensor 1P+N Bottom	A9MEM1563	One-phase and neutral wireless communication energy sensor (installation on bottom of a protective device).
PowerTag Acti9 P63 Wireless Communication Energy Sensor 3P+N Top	A9MEM1571	Three-phase and neutral wireless communication energy sensor (installation on top of a protective device).
PowerTag Acti9 P63 Wireless Communication Energy Sensor 3P+N Bottom	A9MEM1572	Three-phase and neutral wireless communication energy sensor (installation on bottom of a protective device).
PowerTag Acti9 F63 Wireless Communication Energy Sensor 1P+N	A9MEM1560	One-phase and neutral wireless communication energy sensor (installation on top or bottom of a protective device).
PowerTag Acti9 F63 Wireless Communication Energy Sensor 3P+N	A9MEM1570	Three-phase and neutral wireless communication energy sensor (installation on top or bottom of a protective device).
PowerTag NSX Wireless Communication Energy Sensor 3P for Compact NSX100-250, Compact NS100-250, Compact INS250, Compact INV100-250	LV434020	Three-phase wireless communication energy sensor (installation on top or bottom of a device).
PowerTag NSX Wireless Communication Energy Sensor 4P for Compact NSX100-250, Compact NS100-250, Compact INS250, Compact INV100-250	LV434021	Four-pole wireless communication energy sensor (installation on top or bottom of a device).
PowerTag NSX Wireless Communication Energy Sensor 3P for Compact NSX400-630, Compact NS400-630, Compact INS320-630, Compact INV320-630	LV434022	Three-phase wireless communication energy sensor (installation on top or bottom of a device).
PowerTag NSX Wireless Communication Energy Sensor 4P for Compact NSX400-630, Compact NS400-630, Compact INS320-630, Compact INV320-630	LV434023	Four-pole wireless communication energy sensor (installation on top or bottom of a device).

Principle of Wireless Device Installation

The Acti9 Smartlink SI D is installed in such a manner that the PowerTag Energy Sensors are distributed around the concentrator. It is recommended to install the Acti9 Smartlink SI D in the center of the switchboard for maximum data quality.

For example, when the switchboard is partitioned, and if you have three-column switchboard with PowerTag Energy Sensors in each column, then install the Acti9 Smartlink SI D in the central cubicle. For more than three columns of 650 mm in the same switchboard, add one Acti9 Smartlink SI D for every three sections.

The system is compatible with Prisma Plus enclosure (form1 and form2), Prisma iPM form 1, Pragma, and plastic final distribution enclosures. The distance between the concentrator and PowerTag Energy Sensors should be smaller than 3 meters.

NOTE: There is a possibility of disruption in the RF signal quality if PowerTag Energy Sensors are installed in a different switchboard (particularly if the enclosure has metallic partitions and door).

Maximum Number of PowerTag Energy Sensors in an Electrical Room

The wireless network configuration is used for special applications like data centers and high density metering applications. In standard building applications, use the default settings.

At data centers, thousands of PowerTag wireless communication energy sensors are placed in the same environment. Therefore, it is necessary to consider the radio plan and bandwidth, in order to:

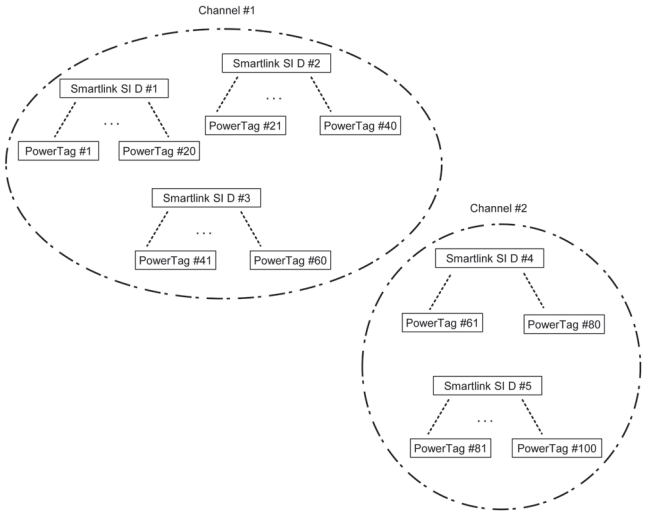
- dispatch all the PowerTag wireless communication energy sensors among the 16 available radio channels. It is recommended to dispatch the Acti9 Smartlink SI D devices among the 16 channels using the manual channel selection in this section.
- use as many PowerTag wireless communication energy sensors as possible in the same radio channel to increase the number of points without decreasing the radio quality.
  Following are the recommendations to slow down the communication period of the PowerTag wireless communication energy sensors that are in the same channel, to avoid overloading the bandwidth:
  - Up to 100 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 5 seconds
  - Up to 200 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 10 seconds
  - Up to 400 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 20 seconds
  - Up to 600 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 30 seconds
  - Up to 1200 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 60 seconds

Any modification to the communication period has to be done after the commissioning of the PowerTag wireless communication energy sensors is completed to avoid slowdown of the commissioning process.

NOTE: Modification in communication period does not slowdown the alarms. The voltage loss is sent immediately on demand. The communication period is used to send regular metering data (P, U, I, E, PF), not voltage loss alarms.

NOTE:

- The radio channel is chosen in the wireless settings of Acti9 Smartlink SI D and is applied to all the PowerTag wireless communication energy sensors that are commissioned with Acti9 Smartlink SI D.
- An Acti9 Smartlink SI D device can manage up to 20 PowerTag wireless communication energy sensors.
- Several Acti9 Smartlink SI D devices can use the same radio channel to communicate with PowerTag wireless communication energy sensors.
- A set of Acti9 Smartlink SI D devices has to be installed and commissioned to concentrate all the needed PowerTag wireless communication energy sensors.



Chapter 2
Technical Characteristics

Technical Characteristics of the Acti9 Smartlink SI D

General Characteristics

Characteristic		Value
Product marking		CE
Temperature	Operation (horizontal)	–25...+60°C
	Storage	–40...+85°C
Tropicalization		Execution 2 (relative humidity of 93% at 40°C)
Resistance to voltage dips		10 ms, class 3 according to IEC 61000-4-29
Degree of protection	Front face	IP 40
	Casing	IP 20
Level of pollution		2
Overvoltage category		OVC III
Conforming to SELV specifications		Yes
Altitude	Operation	0...2,000 m
	Storage	0...3,000 m
Immunity to vibration	IEC 60068-2-6	1 g/± 3.5 mm, 5...300 Hz, 10 cycles
Immunity to mechanical shock		15 g/11 ms
Immunity to electrostatic discharge	IEC 61000-4-2	Air: 8 kV
		Contact: 4 kV
Immunity to radiated electromagnetic interference	IEC 61000-4-3	10 V/m – 80 MHz to 3 GHz
Immunity to fast transients	IEC 61000-4-4	1 kV Ethernet communication. 2 kV for the 230 Vac - 5 kHz - 100 kHz power supply
Surge	IEC 61000-4-5	Power supply: 0.5 kV Ethernet: 1 KV
Immunity to conducted magnetic fields	IEC 61000-4-6	10 V from 150 kHz to 80 MHz
Immunity to magnetic fields at line frequency	IEC 61000-4-8	30 A/m continuous 100 A/m pulse
Conducted emissions	IEC 61131-2, CISPR	Class A (0.15...30 MHz)
Radiated emissions	IEC 61131-2, CISPR	Class A (30...1000 MHz)
Resistance to corrosive atmospheres	IEC 60721-3-3	Level 3C2 on $H^2S/SO^2/NO^2/Cl^2$
Fire withstand	For live parts	30 s at 960°C. IEC 60695-2-10 and IEC 60695-2-11
	For other parts	30 s at 650°C. IEC 60695-2-10 and IEC 60695-2-11
Salt mist	IEC 60068-2-52	Severity 2
Environment		Conforms to RoHS directives
Installation position		Horizontal or vertical
Mean time between failures		More than 1 M hours

Mechanical Characteristics

Characteristic		Value
Dimensions	Length	359 mm
	Height	22.5 mm
	Depth	42 mm
Weight		180 g

Communication Module

Characteristic		Value
Type of interface module		Ethernet
Transmission	Ethernet	Transfer rate: 10/100 Mbps Medium: Shielded, STP or S/FTP, Cat6, straight cable, RJ45 connector
Structure	Type	Ethernet
	Method	Master/Slave
Transmission		Server
Turnaround time		1 ms
Maximum length of cable		100 m
Type of bus connector		RJ45 (Shielded)
Power supply	Nominal	Non-isolated 230 Vac with protection against negative voltages up to -28.8 Vdc
	Voltage limits	19.2... 28.8 Vdc with ripple
	Current consumption, no-load	110 mA
	Maximum input intensity	1.5 A
	Maximum current inrush	3 A
Number of Ethernet ports		1

Radio Frequency Characteristics

Characteristic	Value
Radio communication ISM band	2.4...2.4835 GHz
Number of channels	11...26 (IEEE 802.15.4)
Equivalent isotropic radiated power (EIRP)	0 dBm (1)
Number of wireless devices	up to 20
RF standard compliance	ETSI / EN 300328 v1.9.1 ETSI / EN 301489-17 v2.2.1
(1)0dBM = 1 mW	

Chapter 3
Installation

What Is in This Chapter?

This chapter contains the following topics:

Mounting

Introduction

The Acti9 Smartlink SI D can be mounted on a DIN rail and can be also installed horizontally.

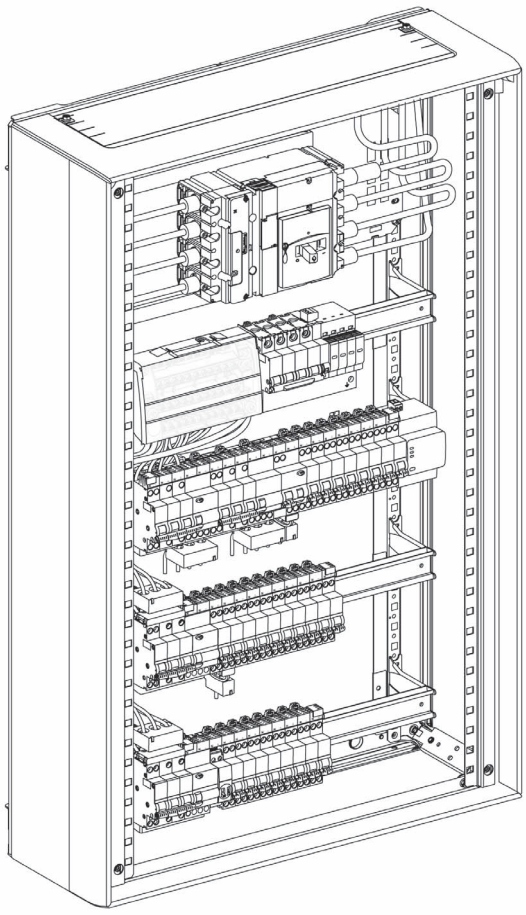
The ambient operating temperature is:
- Horizontal mounting: −25°...+60°C

⚠ DANGER

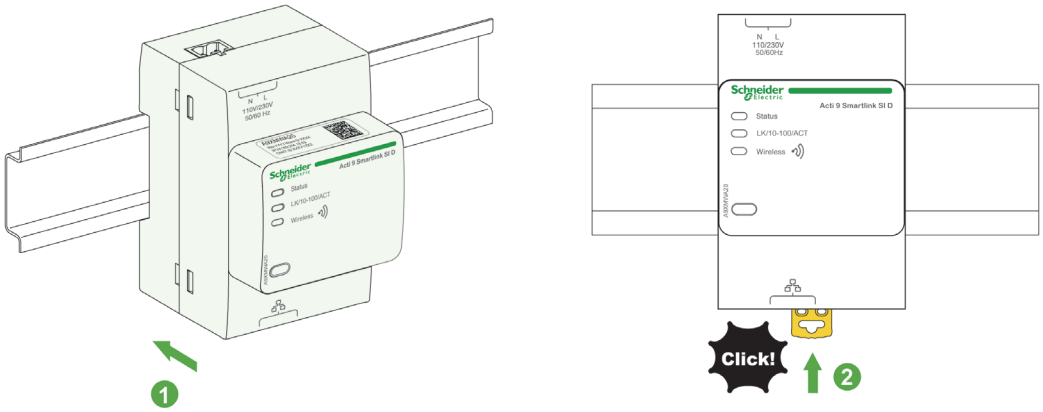
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Turn off all power supply sources before installing and during maintenance of this equipment.
- This equipment is intended only for installation in a restricted access location.
- Always use a voltage detection device with an appropriate rated value to make sure that the power supply is off

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



DIN Rail Mounting



The following table describes the procedure for mounting the Acti9 Smartlink SI D device on a DIN rail:

Step	Action
1	Position the Acti9 Smartlink SI D onto the DIN rail.
2	Slide the Acti9 Smartlink SI D device until it clicks into place.

Connection

Safety Instructions

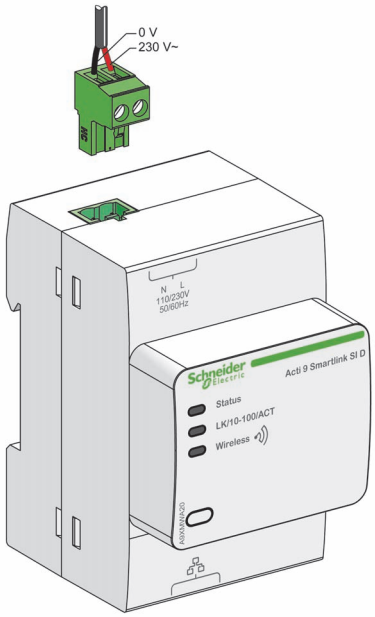
DANGER

RISK OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Wear suitable personal protective equipment and follow the currently applicable electrical safety instructions.
- This equipment may only be installed by qualified electricians who have read all the relevant information.
- NEVER work alone.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been de-energized, tested, and tagged. Pay particular attention to the design of the power system. Consider all power supply sources, particularly the potential for backfeed.
- Before closing protective covers and doors, carefully inspect the work area to ensure that no tools or objects have been left inside the equipment.
- Take care when removing or replacing panels. Take special care to ensure that they do not come into contact with live Busbars. To minimize the risk of injuries, do not tamper with the panels.
- The successful operation of this equipment depends upon proper handling, installation, and operation. Failure to follow basic installation procedures can lead to personal injury as well as damage to electrical equipment or other property.
- NEVER shunt an external fuse/circuit breaker.
- This equipment must be installed inside a suitable electrical cabinet.

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

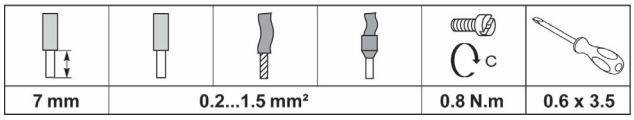
Connecting the Power Supply Connector



The following table describes the procedure for connecting the power supply connector:

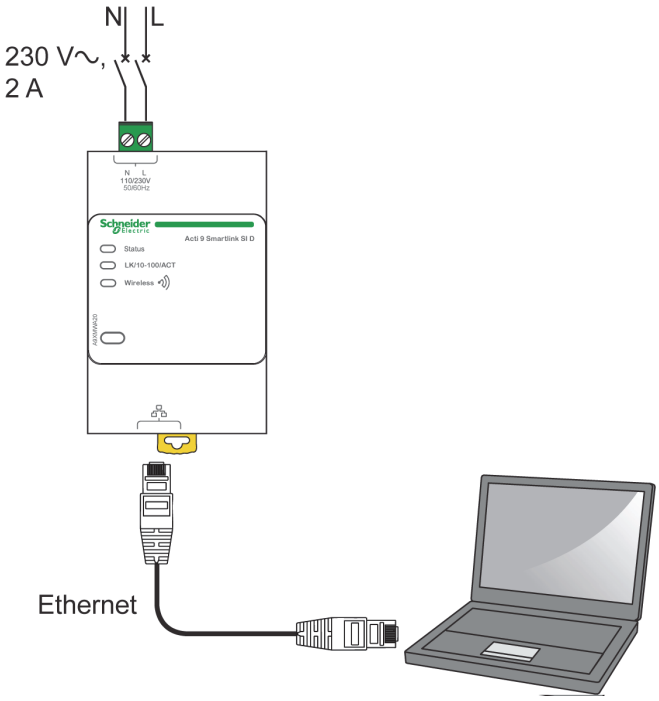
Step	Action
1	Insert both stripped power supply wires in the connector.
2	Fix the wires in place using the connector tightening screws.

The following figure gives the characteristics of cables that can be used to connect the 230 Vac power supply:



NOTICE
HAZARD OF EQUIPMENT DAMAGE Plug the power-supply connector (Phase-Neutral) into the power-supply socket with marking N-L on the Acti9 Smartlink SI D product. **Failure to follow these instructions can result in equipment damage.**

Ethernet Connection



Acti9 Smartlink SI D has an embedded web server. A web server is used to set Ethernet parameters or to display PowerTag energy sensors configured with Ecoreach software, see *Ecoreach Online Help*.

1. Disconnect your computer from all networks.
2. Connect an Ethernet straight cable between your PC and the Ethernet port on the Acti9 Smartlink SI D.

Chapter 4
Getting Started with Acti9 Smartlink SI D

What Is in This Chapter?

This chapter contains the following sections:

Section 4.1
General Principle to Commission an Acti9 Smartlink SI D System

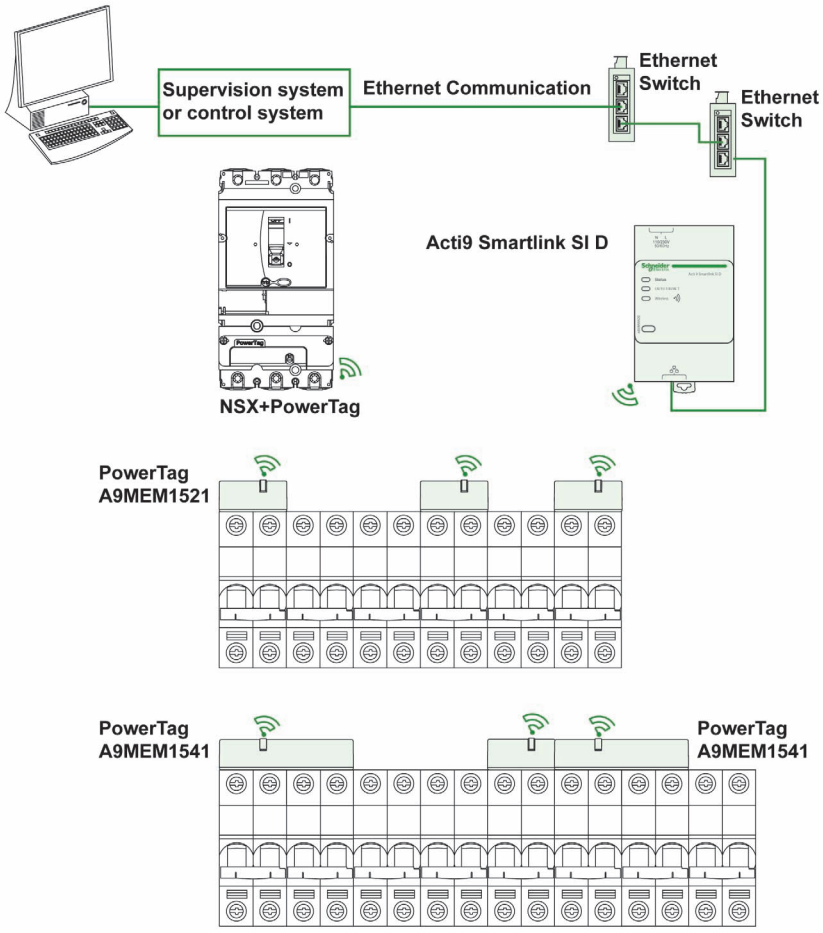
Commissioning Overview

Overview

The commissioning of an Acti9 Smartlink SI D system can be performed using:
- the Ecoreach software (see *Ecoreach Online Help*).
- the Acti9 Smartlink SI D web pages. The web pages are autonomous to configure any devices connected or paired with Acti9 Smartlink SI D.

However, if the Acti9 Smartlink system is composed of many devices, it is easier to commission the devices with Ecoreach software.

NOTE:
- Before commissioning the Acti9 Smartlink SI D device, update the firmware of the Acti9 Smartlink SI D device.
- The firmware upgrade of the Acti9 Smartlink SI D device can only be done using the Ecoreach software, see *Ecoreach Online Help*.



Section 4.2
Commissioning an Acti9 Smartlink SI D System with Ecoreach Software

What Is in This Section?

This section contains the following topics:

Installation of Ecoreach Software

Downloading and Installation

To download and install the Ecoreach software, refer *Ecoreach Installation Guide*.

Commissioning with Ecoreach Software

Overview

Each PowerTag wireless communication energy sensor is recognized by Acti9 Smartlink SI D. The PowerTag wireless communication energy sensors are commissioned with one Acti9 Smartlink SI D that is installed in the same electrical panel.

Step	Action
1	Connect the Acti9 Smartlink SI D device to the PC.
2	Launch the Ecoreach software.
3	Click **Launch Device Discovery** in the welcome screen. **Result**: **Discover Device(s)** window displays all the devices connected in the network.
4	Select the device in the **Switchboard View**.
5	In the **Device View**, select **Local Connection** only if you are connecting the device through the test port.
6	Click **Connect to device**. **Result**: Plugin icon is displayed indicating the device is connected to the network.
7	Click **Configure → Launch** in the **Device View**, and then click **Wireless devices** tab.
8	Click **Scan** to discover the PowerTag energy sensors. **Result**: The discovered PowerTag energy sensor is displayed.
9	Click **Locate** to find the PowerTag energy sensor in an electrical panel **Result**: The **Locate Wireless Device** dialog box is displayed and the associated PowerTag energy sensor on the electrical panel continuously blinks green.
10	Click **STOP BLINK** to stop blinking of the device once it is identified.
11	Click the down arrow icon. **Result**: The configuration parameters page is displayed.
12	Enter the label for the PowerTag energy sensor.
13	Enter the name of the asset (name of the load), where it is located in the building, in the **Asset name** field.
14	Select the usage of the load from the **Usage** list.
15	Enter the value for the energy counter in the **Partial energy (kWh)** field.
16	Select the circuit breaker rating from the **Associate breaker rating (A)** list to calculate the percentage of loads.
17	Select the phase sequence corresponding to the physical sequence wired in the panel from the **Phase sequence** list.
18	Select **Modbus Product Address** and **Load works when Power is >= (W) (kWh)** by moving the slider left or right.
19	Click **Check Up** on each device to verify that all the devices are configured.

Section 4.3
Commissioning an Acti9 Smartlink SI D System with Web Pages

What Is in This Section?

This section contains the following topics:

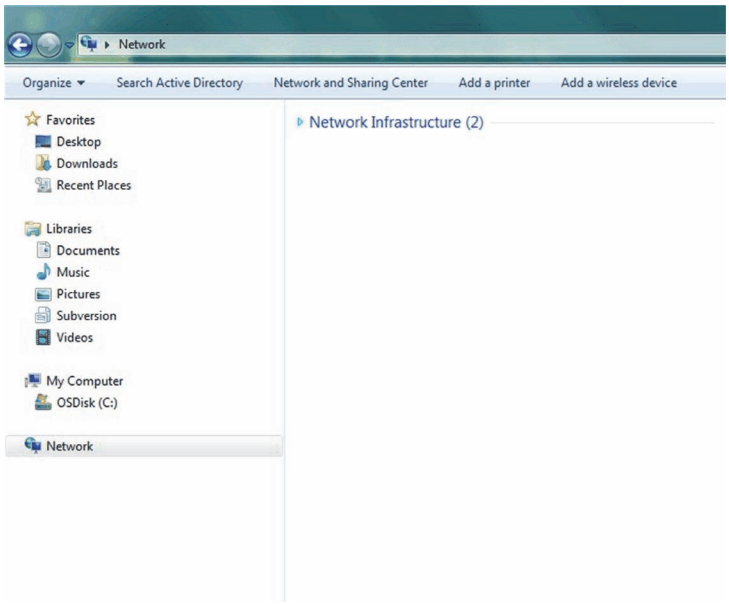
Discovering Acti9 Smartlink SI D through Windows Explorer

Accessing Acti9 Smartlink SI D from Windows Operating System

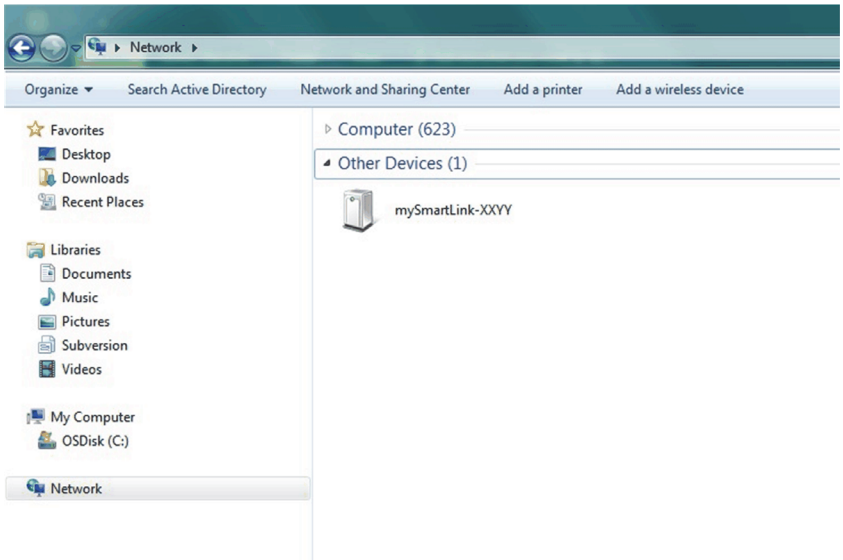
Follow the steps given in the table to access the web page of Acti9 Smartlink SI D through Windows Explorer from Windows operating system:

Step	Action
1	Open the Windows Explorer and click **Network** to display the Acti9 Smartlink SI D icon in the list of devices (if the Acti9 Smartlink SI D icon does not appear, change the IP settings of the system as given in the note below).
2	Double-click the Acti9 Smartlink SI D icon. This launches the login page automatically in the web browser.
3	Type the user name (“admin” by default) and password (“admin” by default). **NOTE:** These identifiers are case-sensitive.
4	Click OK.

The following figure shows the Windows Explorer screen without the discovery of Acti9 Smartlink SI D.



The following figure shows the Windows Explorer screen after the discovery of Acti9 Smartlink SI D.



NOTE: If Acti9 Smartlink SI D does not appear in the Windows Explorer, the IPv4 settings on the computer has certainly a static IP address to connect to the IP network. If Acti9 Smartlink SI D is also not in DHCP and its setup is in static IP address (for example, factory IP settings mode), change the computer IPv4 settings to be in the same subnet as that of Acti9 Smartlink SI D.

Step	Action
1	When Acti9 Smartlink SI D comes from factory, look at the IP address printed on front face of the product.
2	In the configuration panel of Windows, click the local network properties and change the IPv4 settings. For example, in Windows 10 version: **1.** Go to **Control Panel → Network and Internet → Network Connections → Local Area Connection** **2.** Right-click the **Local Area Network** and click **Properties**. **3.** Select **Internet Protocol Version 4 (TCP/IPv4)** from the list and click **Properties**. **4.** Select the option **Use the following IP address** from the properties window to change the IP address.
3	Change the IP Address of the PC to be in the same subnet as the Acti9 Smartlink SI D. For example, if the IP address of Acti9 Smartlink SI D is 169.254.26.61, set a local static IP address at 169.254.26.60 for your computer. This way the computer is in the same sub network as Acti9 Smartlink SI D, and hence can connect to Acti9 Smartlink SI D.
4	To connect to Acti9 Smartlink SI D: ● See *Ecoreach Online Help*, ● Open the web browser and type the IP address of the Acti9 Smartlink SI D, and start the commissioning. In the web pages, change the IP settings if you need to have your Acti9 Smartlink SI D in dynamic IP allocation mode (DHCP mode).

Accessing Acti9 Smartlink SI D from the Operating System other than Windows

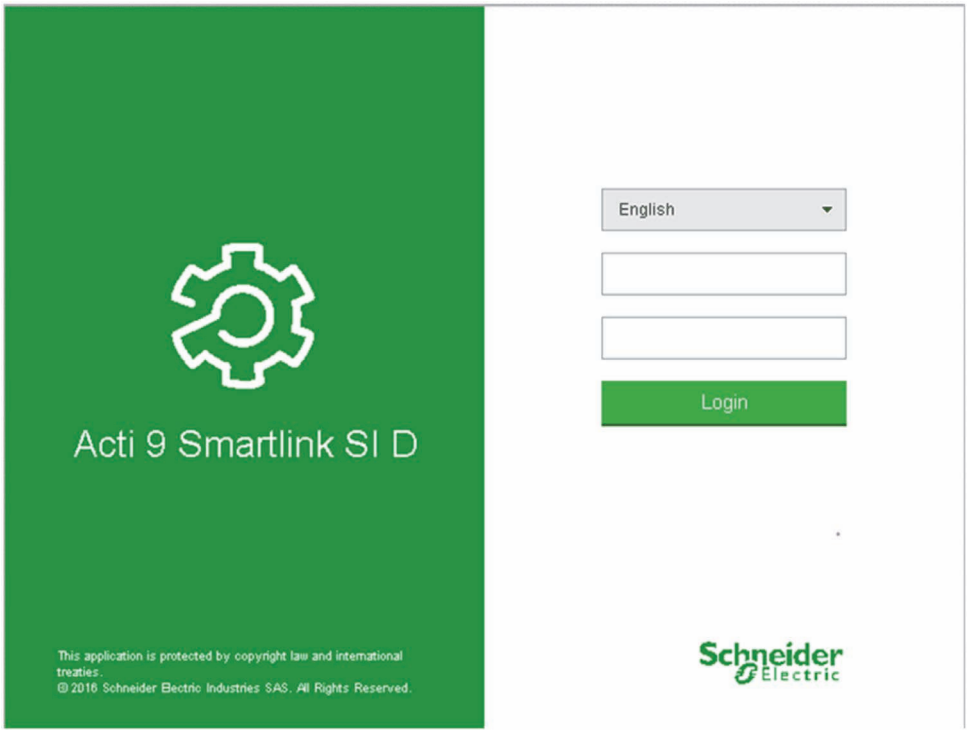
Follow the steps given in the table to access the web page of Acti9 Smartlink SI D from the operating system other than Windows:

Step	Action
1	Launch the Internet browser.
2	Type the IPv4 address (encoded into the data matrix on the upper side of Acti9 Smartlink SI D) in the **Address** field of the web browser and press **Enter** to access the login page.
3	Type the user name (“admin” by default) and password (“admin” by default). **NOTE:** These identifiers are case-sensitive.
4	Click OK.

Login into Web Pages

Login Page

The **Login** page is used to enter the user credentials and select the preferred language to access Acti9 Smartlink SI D web pages. When the user connects to the Acti9 Smartlink SI D through a web browser, the **Login** page is displayed as shown in the following figure.



Enter the following details in the **Login** page:

- **Language**
- **User name**
- **Password**

Enter the user name and password to access the web pages related to Acti9 Smartlink SI D. The default user name and password is **admin** to access the web page for the first time. You can select the language in the **Login** page so that all the pages are displayed in the selected language.

The top right corner of all the web pages displays the following information:

- User name
- Logout

The **Logout** link is used to logout of the Acti9 Smartlink SI D web page.

Web Pages Layout

Description

The Acti9 Smartlink SI D has an embedded web server and a user can monitor the electrical distribution by using embedded web pages with PC or smart phone like laptop.

The web pages can be used for multiple operations:

- Monitoring page allows the facility managers to check the health of the electrical devices (such as HVAC, lighting, pumps, machines, and so on).
- Setting of Ethernet parameters and wireless device parameters to connect Acti9 Smartlink SI D on the network.
- Diagnosis of exchanges on Ethernet network.
- Configuration of the wireless devices connected.
- Adding or removing the wireless devices connected to Acti9 Smartlink SI D.

The administration part of the web pages allows the system integrators commission the Acti9 Smartlink system.

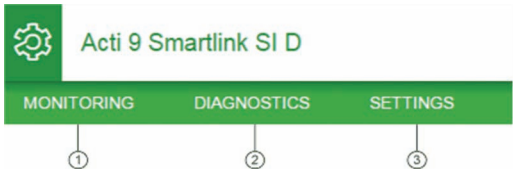
Web pages are accessible to the following three categories of user:

- Administrator can access all information and modify the parameters in the **Settings** menu.
- User and Guest can access only the monitoring pages of the connected devices.

The scope of products supported in the web pages are:

- Acti9 Smartlink SI D
- PowerTag energy sensors.

Web Page Organization

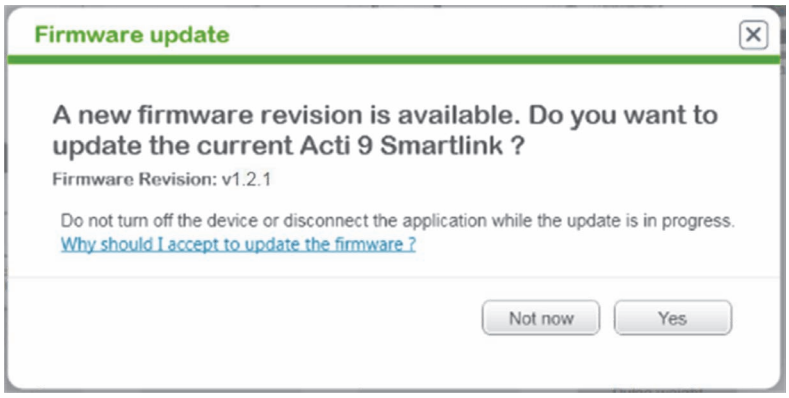


1 Displays the electrical status and consumption of the devices. This also displays the active alarms, if any.
2 Information is classified based on product and channel; Ethernet diagnosis
3 Configuration of Ethernet parameter and wireless parameters

Firmware Upgrade

Firmware Upgrade

The firmware upgrade of Acti9 Smartlink SI D can only be done using the Ecoreach software if the Acti9 Smartlink SI D is not in the latest firmware version.



Firmware Compatibility

If you add or update a device, the firmware has the potential to create inconsistencies. Hence, it is important to review your firmware upgrade plan with respect to other devices in the system. If the firmware creates inconsistencies, the system may have some limitations or unexpected behavior.

NOTE: Acti9 Smartlink SI D is not compatible with previous versions of Smart Panels. The table below shows the firmware versions compatible for Ecostruxure Power V1.5 version.

The primary reason for updating the system is to obtain the latest system features. The following system compatibility table shows the firmware versions of the products that are compatible with each other:

Range	Product	Reference Number	Smart Panels 1.4 Firmware Version
Enerlin'X	IO Input/Output Interface for LV Circuit Breaker	LV434063	V3.2.9
	IFE Ethernet Interface for LV Circuit Breaker	LV434010 LV434011	Firmware V3.6.11 Webpage V3.6.11
	eIFE Ethernet Interface for LV Circuit Breaker	-	Firmware V3.6.11 Webpage V3.6.11
	IFM Modbus-SL Interface for LV Circuit Breaker	TRV00210	V2.2.11
	FDM121 Display for LV Circuit Breaker	TRV00121	V2.3.5
	FDM128 Display for 8 LV Devices	LV434128	V6.4.2
	ULP Accessories	LV4•••••	-
	Com'X 200 / 210	EBX200 EBX210	V3.6.3
	Com'X510	EBX510	V3.6.3
	BCM ULP module (Breaker Communication Module)	33702 33703 33708 33713 33714 33842 33848 S64205	V4.1.7 Product data code greater than or equal to 14251
	BSCM (Breaker Status and Control Module)	Product data code greater than or equal to 3N141810186	V2.2.7
Low voltage breakers	Micrologic trip unit for Masterpact NT/NW and Compact NS Circuit Breakers	-	V8282
	Micrologic X trip Unit for Masterpact MTZ Circuit Breaker	-	V1.0.2

Range	Product	Reference Number	Smart Panels 1.4 Firmware Version
Final distribution	Acti9 Smartlink Modbus	A9XMSB11	V1.3.7
	Acti9 Smartlink SI D	A9XMWA20	V1.2.8
Power Customer Engineering Tool	Ecoreach	LV434063 LV434010 LV434011 LV851001 LV434000 LV434001 LV434002 TRV00121 (FDM121) A9XMSB11 (Acti9 Smartlink Modbus) A9XMEA08 (Acti9 Smartlink Ethernet) A9XMZA08 (Acti9 Smartlink SI B) A9XMWA20 (Acti9 Smartlink SI D)	V2.5

For example, the following device updates require a mandatory update of device firmware between Smart Panels V1.0/V1.1/V1.2 and Smart Panels V1.3.3

- FDM128 V6.2.9 can work with Acti9 Smartlink Ethernet version V2.5.5
- FDM128 V6.1.1 requires Acti9 Smartlink Modbus to be updated to V1.3.5.
- IFE V1.9.8 requires Acti9 Smartlink Ethernet to be updated to V2.2.6.
- IFE V3.4.2 requires Acti9 Smartlink Modbus to be updated to V1.3.5.
- Acti9 Smartlink Ethernet V2.5.5 requires Acti9 Smartlink Modbus to be updated to V1.3.5.

To manage the device firmware, refer to the device documentation and Ecoreach to obtain the complete and compatible feature set.

NOTE: The Ecoreach compatibility check is used for Compact NSX, PowerPact H-, J-, and L-frame circuit breakers and Masterpact devices. As a result, the Enerlin'X devices that are not part of these product lines (for example, FDM128, Acti9 Smartlink Ethernet, Acti9 Smartlink Modbus, Com'X, iEM, and power meters) need to be manually verified with system compatibility table.

Basic Commissioning of PowerTag Wireless Communication Energy Sensors

Principle of Wireless Device Commissioning

Each PowerTag energy sensor is recognized by Acti9 Smartlink SI D. You can enter the name of the associated electrical device and the associated rating of the associated circuit breaker to have the complete advantage of the load monitoring feature.

The PowerTag energy sensors are commissioned with one Acti9 Smartlink SI D that is installed in the same switchboard. You can configure up to 20 PowerTag energy sensors. It is recommended to commission the PowerTag energy sensors with Acti9 Smartlink SI D before the panel site installation.

NOTE: If you install a Wi-Fi access point in an electrical room right above the panel after commissioning of the PowerTag energy sensors, there is a possibility of overlapping of the frequencies of the data exchange between the PowerTag energy sensors and the Acti9 Smartlink SI D.
Hence, it is recommended to check whether the RF signal quality is good between the PowerTag energy sensors and the Acti9 Smartlink SI D if Wi-Fi is used in an electrical room. However, if there is an issue in RF signal quality due to Wi-Fi overlapping, it is easy to change the channel of communication manually to a new frequency in the **Diagnostics → Communication → Wireless Network Quality Indicators** web page and check the RF signal quality after few seconds.

To avoid any interference issues, it is recommended to follow the rules below:

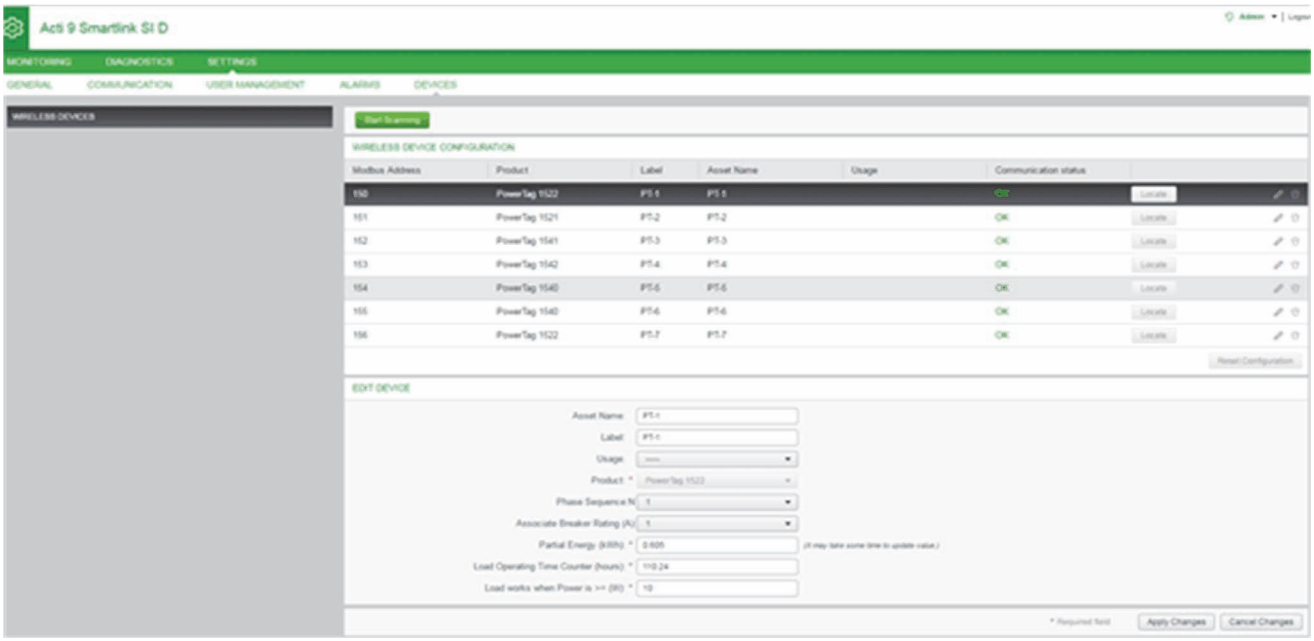
1. Place the Acti9 Smartlink SI D inside the panel along with the associated PowerTag energy sensors.
2. Ensure that the closest Wi-Fi access point is at least three meters away from the panel enclosure.

Commissioning the Wireless Communication Devices

The configuration of the wireless communication devices (PowerTag energy sensors) is done with Acti9 Smartlink SI D web page.

Step	Description
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings → Devices → Wireless Devices** to configure the PowerTag energy sensors.
4	Click **Start Scanning** to discover the wireless communication devices. **Result**: Displays the discovered devices and assigns the Modbus slave ID to each PowerTag. Each supervision system can read this address inside the Acti9 Smartlink SI D. The Modbus slave ID ranges from 150 through 220. **NOTE:** The Acti9 Smartlink SI D can discover up to 20 wireless devices.
5	Select any wireless communication device and click **Locate** to find the device in the panel. **Result**: The associated device blinks in the panel.
6	Configure the device with the following parameters: ● Asset name ● Usage ● Associated Breaker Rating (A) ● Phase Sequence ● Modbus address ● Load works when power is >= (W) ● Product (for PowerTag NSX) ● Zigbee ID (for PowerTag NSX) ● Product (for PowerTag NSX) ● System Type (for PowerTag NSX) ● Partial Active Energy Delivered (kWh) (for PowerTag NSX) ● Partial Active Energy Received (kWh) (for PowerTag NSX) ● Partial Reactive Energy Delivered (kVARh) (for PowerTag NSX) ● Partial Reactive Energy received (kVARh) (for PowerTag NSX) ● Load Operating Time Counter (hours) (for PowerTag NSX)
7	Select the wireless device and click the delete icon to reject or decommission the wireless device.

NOTE: You can also configure the PowerTag energy sensors and do the firmware upgrade of Acti9 Smartlink SI D using Ecoreach software. For further details, refer *Ecoreach Online Help*.



NOTE: If you have multiple panels and if each panel has PowerTag energy sensors, then it is recommended to switch on power and commission each Acti9 Smartlink SI D one by one. This helps to discover only the required wireless communication devices specific to each Acti9 Smartlink and avoids discovering the long list of devices.
If other Acti9 Smartlink SI D devices are powered on while you commission a new Acti9 Smartlink SI D, the new Acti9 Smartlink SI D automatically selects the less polluted radio channel, and creates its network on a different channel than the previous Acti9 Smartlink SI D devices. This avoids having all the PowerTag energy sensors on the same radio channel.
However, if all panels are powered on and commissioned simultaneously, then locate only the required PowerTag energy sensors in multiple panels and reject the ones you do not want to configure with the panel currently commissioned. All the rejected PowerTag energy sensors can be auto-discovered again from another Acti9 Smartlink SI D without any issues.

Chapter 5
Setting Up Wireless Communication

What Is in This Chapter?

This chapter contains the following topics:

Wireless Network Configuration

Overview

The wireless network configuration is used for special applications like data centers and high density metering applications. In standard building applications, use the default settings.

At data centers, thousands of PowerTag wireless communication energy sensors are placed in the same environment. Therefore, it is necessary to consider the radio plan and bandwidth, in order to:

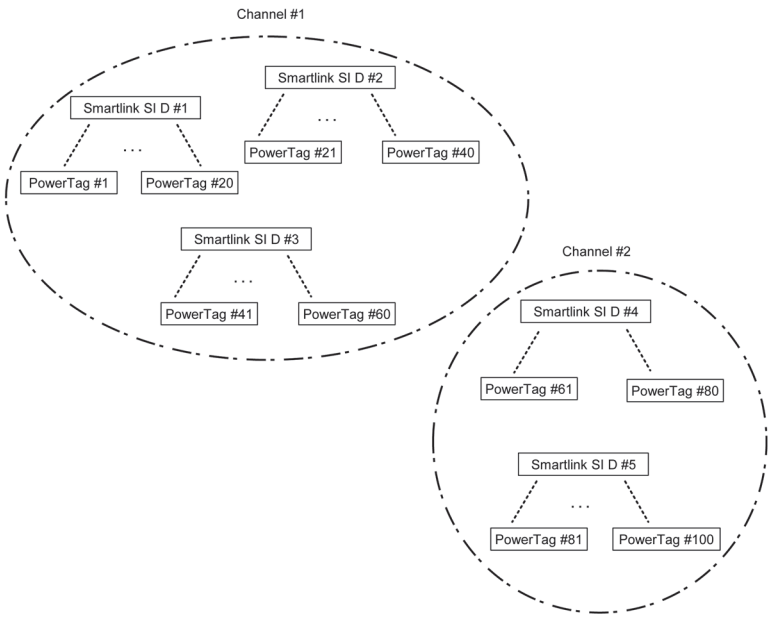
- dispatch all the PowerTag wireless communication energy sensors among the 16 available radio channels. It is recommended to dispatch the Acti9 Smartlink SI D devices among the 16 channels using the manual channel selection in this section.
- use as many PowerTag wireless communication energy sensors as possible in the same radio channel to increase the number of points without decreasing the radio quality.
  Following are the recommendations to slow down the communication period of the PowerTag wireless communication energy sensors that are in the same channel, to avoid overloading the bandwidth:
  - Up to 100 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 5 seconds
  - Up to 200 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 10 seconds
  - Up to 400 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 20 seconds
  - Up to 600 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 30 seconds
  - Up to 1200 PowerTag wireless communication energy sensors by radio channel: communication period to be set to 60 seconds

Any modification to the communication period has to be done after the commissioning of the PowerTag wireless communication energy sensors is completed to avoid slowdown of the commissioning process.

NOTE: Modification in communication period does not slowdown the alarms. The voltage loss is sent immediately on demand. The communication period is used to send regular metering data (P, U, I, E, PF), not voltage loss alarms.

NOTE:

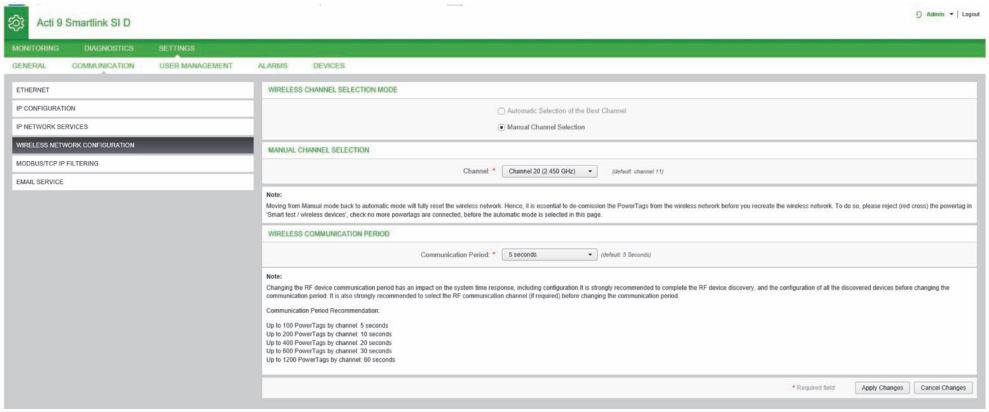
- The radio channel is chosen in the wireless settings of Acti9 Smartlink SI D and is applied to all the PowerTag wireless communication energy sensors that are commissioned with Acti9 Smartlink SI D.
- An Acti9 Smartlink SI D device can manage up to 20 PowerTag wireless communication energy sensors.
- Several Acti9 Smartlink SI D devices can use the same radio channel to communicate with PowerTag wireless communication energy sensors.
- A set of Acti9 Smartlink SI D devices has to be installed and commissioned to concentrate all the needed PowerTag wireless communication energy sensors.



Description

The **Wireless Network Configuration** web page is used to configure wireless parameters.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings → Communication → Wireless Network Configuration**.



This page allows you to select the wireless channel either automatically or manually. Click **Automatic Selection of the Best Channel** to select the channel automatically.

Follow the procedure to configure wireless parameters in the manual mode:

Step	Action
1	Click **Manual Channel Selection**.
2	Select the required channel from the **Channel** list. The default channel is **Channel 11**.
3	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

The communication period defines the amount of time each PowerTag sends its data to the Acti9 Smartlink SI D. The standard communication period is 5 seconds. However, it can move up to 60 seconds. This step has to be done after commissioning.

Wireless Communication Device Selection and Configuration

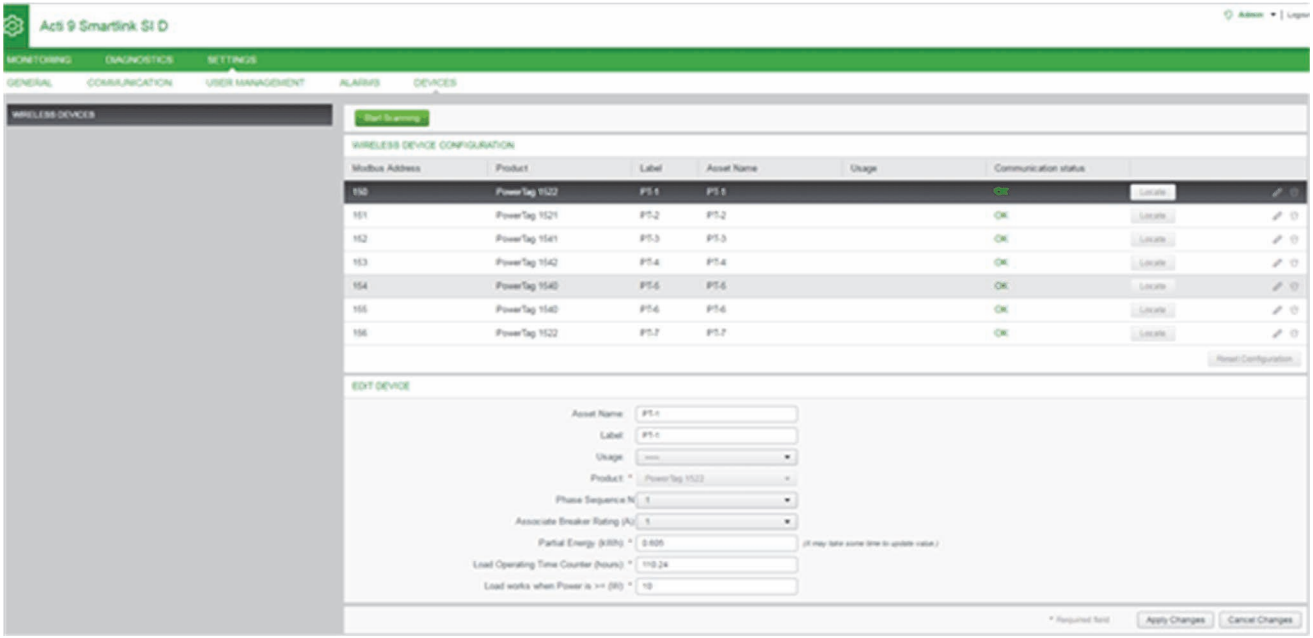
Description

The **Wireless Communication Devices** page discovers and configures the wireless communication devices connected to Acti9 Smartlink SI D. It also allows you to edit the configuration or unpair the wireless communication device from Acti9 Smartlink SI D.

The Acti9 Smartlink SI D web page allows the configuration of the following wireless communication devices:

Designation	Product Reference
PowerTag Acti9 M63 Wireless Communication Energy Sensor 1P	A9MEM1520
PowerTag Acti9 M63 Wireless Communication Energy Sensor 1P+N Top	A9MEM1521
PowerTag Acti9 M63 Wireless Communication Energy Sensor 1P+N Bottom	A9MEM1522
PowerTag Acti9 M63 Wireless Communication Energy Sensor 3P	A9MEM1540
PowerTag Acti9 M63 Wireless Communication Energy Sensor 3P+N Top	A9MEM1541
PowerTag Acti9 M63 Wireless Communication Energy Sensor 3P+N Bottom	A9MEM1542
PowerTag Acti9 P63 Wireless Communication Energy Sensor 1P+N Top	A9MEM1561
PowerTag Acti9 P63 Wireless Communication Energy Sensor 1P+N Bottom	A9MEM1562
PowerTag Acti9 P63 Wireless Communication Energy Sensor 1P+N Bottom	A9MEM1563
PowerTag Acti9 P63 Wireless Communication Energy Sensor 3P+N Top	A9MEM1571
PowerTag Acti9 P63 Wireless Communication Energy Sensor 3P+N Bottom	A9MEM1572
PowerTag Acti9 F63 Wireless Communication Energy Sensor 1P+N	A9MEM1560
PowerTag Acti9 F63 Wireless Communication Energy Sensor 3P+N	A9MEM1570
PowerTag NSX Wireless Communication Energy Sensor 3P for Compact NSX100-250, Compact NS100-250, Compact INS250, Compact INV100-250	LV434020
PowerTag NSX Wireless Communication Energy Sensor 4P for Compact NSX100-250, Compact NS100-250, Compact INS250, Compact INV100-250	LV434021
PowerTag NSX Wireless Communication Energy Sensor 3P for Compact NSX400-630, Compact NS400-630, Compact INS320-630, Compact INV320-630	LV434022
PowerTag NSX Wireless Communication Energy Sensor 4P for Compact NSX400-630, Compact NS400-630, Compact INS320-630, Compact INV320-630	LV434023

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings → Devices → Wireless Devices**.



Follow the procedure to configure the wireless devices:

Step	Action
1	Click **Start Scanning** to discover the wireless devices connected to the Acti9 Smartlink SI D. **Result**: Displays the discovered wireless devices and allocates Modbus address to each device.
2	Select any wireless device and click the edit icon to modify the configuration of the selected wireless device.
3	Enter the **Asset Name** of a wireless device.
4	Enter the **Label** of a wireless device
5	Select the **Usage** from the drop-down list.
6	Select the phase sequence for the wireless device from the **Phase Sequence**. You can define 1, 2, or 3 phase sequence of the meter depending on the way the physical panel is wired (from left to right).
7	Select the **Mounting Position** as either **Up** or **Down**.
8	Select the breaker rating from the **Associate Breaker Rating (A)** list to calculate the percentage of loads.
9	Enter the value for the energy counter in the **Partial Energy** area. Click **Reset** or enter the value as 0 to reset the partial energy counter.
10	**Load Operating Time Counter (hours)**: The Load Operating Time counter indicates the running operating time of the load in hours. The load is powered and power flows to/from the load above the set threshold. The default value in this field is 0. You can set this between 0 to 1000000 hours.
11	**Load work when Power is >=:** The Load Operating Time counter increments only when this condition (the power is greater or equal to (>/=)) is met.The default value is 0. You can set the value between 10W to 15000W.
12	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

Chapter 6
Setting Up Ethernet Communication

What Is in This Chapter?

This chapter contains the following topics:

Ethernet Principle

Overview

Ethernet is a data link and physical layer protocol defined by IEEE 802 specification that connects computer or other Ethernet devices. Ethernet is an asynchronous Carrier Sense Multiple Access with Collision detection (referred as CSMA/CD) protocol. Carrier Sense means that the hosts can detect whether the medium (coaxial cable) is idle or busy. Multiple Access means that multiple hosts can be connected to the common medium. Collision Detection means that a host detects whether its transmission has collided with the transmission of another host (or hosts).

The Acti9 Smartlink SI D can be connected to a PC or a laptop over Ethernet.

The Acti9 Smartlink SI D has an embedded web server (web page).

The settings of the Ethernet communication are done through Acti9 Smartlink SI D web pages.

Set Up and Ethernet Addressing Mode

Ethernet Connection

The following table provides the steps recommended to connect a PC or a laptop for the first time to Acti9 Smartlink SI D device:

Step	Action
1	**Disconnect your PC from all networks.**
2	Connect an Ethernet straight cable between your PC or a laptop and the Ethernet port on the Acti9 Smartlink SI D.
3	Perform the actions described in the section below for accessing web page.

The following tables provide the steps to access web page of Acti9 Smartlink SI D from Windows XP and Windows 7.

Access Web Page of Acti9 Smartlink SI D from Windows XP

The following table provides the steps to access web page of Acti9 Smartlink SI D from Windows XP:

Use Case	Procedure
Panel not connected to building network	1. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)(1) on your PC. 2. Type the IPv4 address(2) in the address field of the web browser. 3. Press ENTER. This opens the home page of the web page.
Panel is already connected for the first time to building network with no DHCP server, using static addressing mode	1. Connect your PC or a laptop directly to Acti9 Smartlink SI D (point to point) or if not connected to Acti9 Smartlink SI D, connect your PC to the building Ethernet network. 2. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)(1) on your PC. 3. Type the IPv4 address(2) in the address field of the web browser. 4. Press ENTER. This opens the home page of the web page. 5. From the web page, click **Settings → Communication → IP Configuration** and type new IPv4 address, subnet mask, and gateway address. 6. Put a sticker on the product with the new IPv4 address.
Panel is already connected to building network with DHCP server, using dynamic addressing mode	1. Connect your PC or a laptop to the building Ethernet network. 2. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)(1) on your PC. 3. Type the name(3) of the Acti9 Smartlink SI D in the address field of the web browser. 4. Press ENTER. This opens the home page of the web page.

(1) The browsers compatible with Acti9 Smartlink SI D are:
- Internet Explorer (Windows) version 8, 9, 10, and 11
- Google Chrome (Windows) version 42.0.2311.90m
- Mozilla Firefox version 27.0.1
- Safari (Windows) from 5.1.7

(2) IPv4 address is printed on Acti9 Smartlink SI D with this format 169.254.xxx.yyy. The last two numbers (xxx, yyy) are unique per product.

(3) By default the name of the product is MySmartLink-6550.

Access Web Page of Acti9 Smartlink SI D from Windows 7

The following table provides the steps to access web page of Acti9 Smartlink SI D from Windows 7:

Use Case	Procedure
Panel not connected to building network	1. Connect your PC or a laptop directly to Acti9 Smartlink SI D (point to point) or connect your PC or a laptop to the Ethernet switch of the panel. 2. Launch the Windows Explorer, then select Network to see the available devices. 3. Double-click the auto-discovered(3) Acti9 Smartlink SI D product. This opens the home page of the web page.
Panel is already connected for the first time to building network with no DHCP server, using static addressing mode	1. Connect your PC or a laptop directly to Acti9 Smartlink SI D (point to point) or connect your PC or a laptop to the Ethernet switch of the panel or if not connected to Acti9 Smartlink SI D, connect your PC to the building Ethernet network. 2. Launch the Windows Explorer, then select Network to see the available devices. 3. Double-click the auto-discovered(3) Acti9 Smartlink SI D product. This opens the home page of the web page. 4. From the web page, click **Settings → Communication → IP Configuration**, type new IPv4 address, subnet mask, and gateway address. 5. Put a sticker on the product with the new IPv4 address.
Panel is already connected to building network with DHCP server, using dynamic addressing mode	From either different subnet or same subnet: 1. Connect your PC or a laptop to the building Ethernet network. 2. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)(1) on your PC. 3. Type the name(3) of the Acti9 Smartlink SI D in the address field of the web browser. 4. Press ENTER. This opens the home page of the web page. From same subnet: 1. Connect your PC or a laptop to the building Ethernet network. 2. Launch the Windows Explorer, then select Network to see the available devices. 3. Double-click the auto-discovered(3) Acti9 Smartlink SI D product. This opens the home page of the web page.
Panel is already connected to the building network with DHCP server, using fixed addressing mode	From either different subnet or same subnet: 1. Connect your PC or a laptop to the building Ethernet network. 2. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)(1) on your PC. 3. Type the IPv4 address(2) of the Acti9 Smartlink SI D in the address field of the web browser. 4. Press ENTER. This opens the home page of the web page. From same subnet: 1. Connect your PC or a laptop to the building Ethernet network. 2. Launch the Windows Explorer, then select Network to see the available IP devices. 3. Double-click the auto-discovered(3) Acti9 Smartlink SI Dproduct. This opens the home page of the web page.

(1) The browsers compatible with Acti9 Smartlink SI D are:
- Internet Explorer (Windows) version 8, 9, 10, and 11
- Google Chrome (Windows) version 42.0.2311.90m
- Mozilla Firefox version 27.0.1
- Safari (Windows) from 5.1.7

(2) IPv4 address is printed on Acti9 Smartlink SI D with this format 169.254.xxx.yyy. The last two numbers (xxx, yyy) are unique per product.

(3) By default the name of the product is MySmartLink-6550.

Access Web Page Using Tablet and Smartphone

The following table describes the procedure to access web page using tablet:

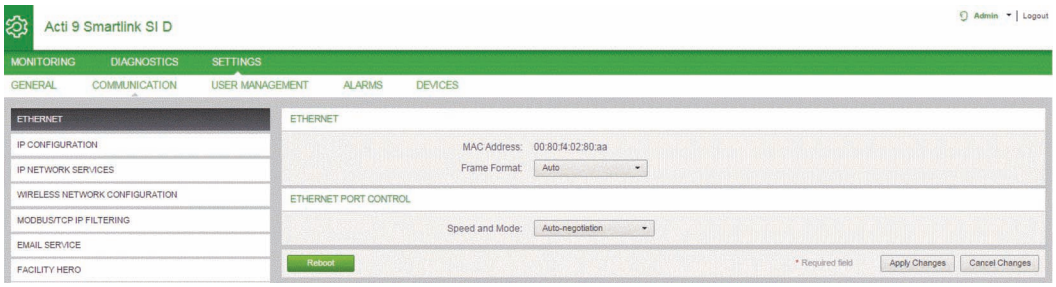
Step	Action
1	Connect Acti9 Smartlink SI D to the wireless router using Ethernet cable.
2	Search for the available networks.
3	Connect the tablet or a smartphone to the same wireless router to which Acti9 Smartlink SI D is connected.
4	Launch web browser in the tablet or a smartphone after a connection is established.
5	The IP address of the Acti9 Smartlink SI D on the web browser depends on Static IP address mode or DHCP mode: ● If the product is in default DHCP mode and the DHCP server is connected, then the device uses the IP address assigned from DHCP server. ● If the product is in DHCP mode (default) and DHCP server is not connected, then the device uses the IP address which is printed on the product. ● If the product is in static mode, then the device uses the IP address which the user has configured.
6	Type the username and the password in the login page to access the device.

Ethernet Settings

Description

The Ethernet page is used to configure the frame format and speed and mode of the Ethernet port. This page also displays the MAC address of the Ethernet network.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings** → **Communication** → **Ethernet**.



Follow the procedure to configure Ethernet parameters:

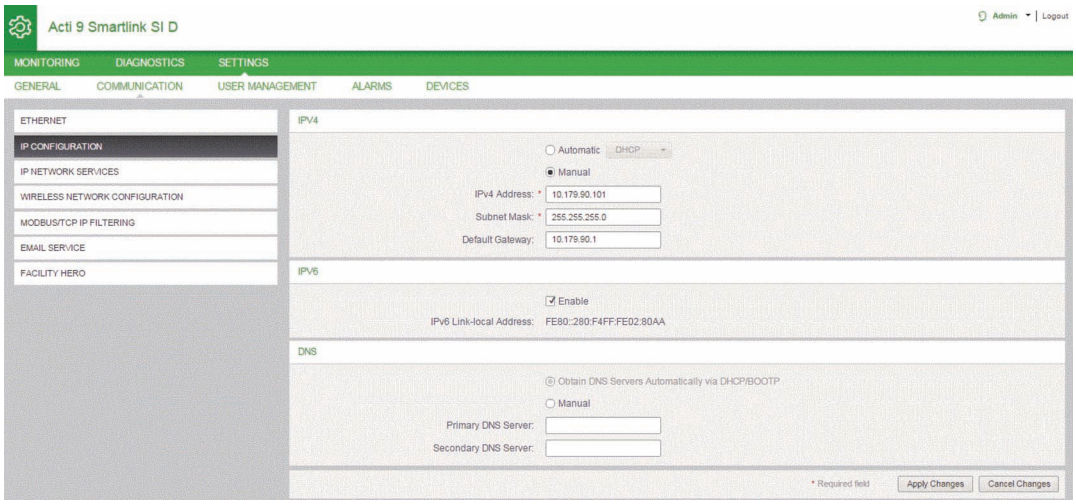
Step	Action
1	Select the type of Ethernet frame format from the **Frame Format** list. It can be **Ethernet II**, **802.3**, or **Auto**. The default value of the frame format is **Auto**.
2	Select the value for speed and mode of the Ethernet port from the **Speed and Mode** list. The value of speed and mode can be one of the following: • **10 Mbps - Half duplex** • **10 Mbps - Full duplex** • **100 Mbps - Half duplex** • **100 Mbps - Full duplex** • **Auto-negotiation** The default value is **Auto-negotiation**.
3	Click **Apply Changes** and then click **Reboot** to automatically restart the device to save the settings. Click **Cancel Changes** to revert the settings.

IP Configuration

Description

The **IP Configuration** page is used to configure IPv4, IPv6, and DNS parameters.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings** → **Communication** → **IP Configuration**.



IPv4 parameters can be set either in manual mode or in automatic mode. To configure IPv4 parameter in automatic mode, click **Automatic** and select the type of protocol (DHCP or BOOTP) from the list. The default type is **DHCP** protocol.

DHCP mode is used to acquire the IPv4 address from the DHCP server in the network to which Acti9 Smartlink SI D is connected. BOOTP mode is used to acquire the IPv4 address if DHCP server is not present in the network. A BOOTP server is configured in the network to assign the IPv4 address.

Follow the procedure to configure IPv4 parameters in the manual mode:

Step	Action
1	Select **Manual**.
2	Enter the **IPv4 Address** of the device.
3	Enter the **Subnet Mask** of the device.
4	Enter the **Default Gateway** of the device.
5	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

Follow the procedure below to configure IPv6 parameters:

Step	Action
1	Select the **Enable** check box to enable the IPv6 service. The **Enable** check box is selected by default.
2	Displays the value of the **IPv6 Link Local Address**. You cannot modify this parameter.
3	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

The Acti9 Smartlink SI D can acquire the domain name automatically or you can set the DNS server address manually. Click **Obtain DNS Servers Automatically via DHCP/BOOTP** to acquire the DNS server automatically from the network.

Follow the procedure below to configure DNS parameters in manual mode:

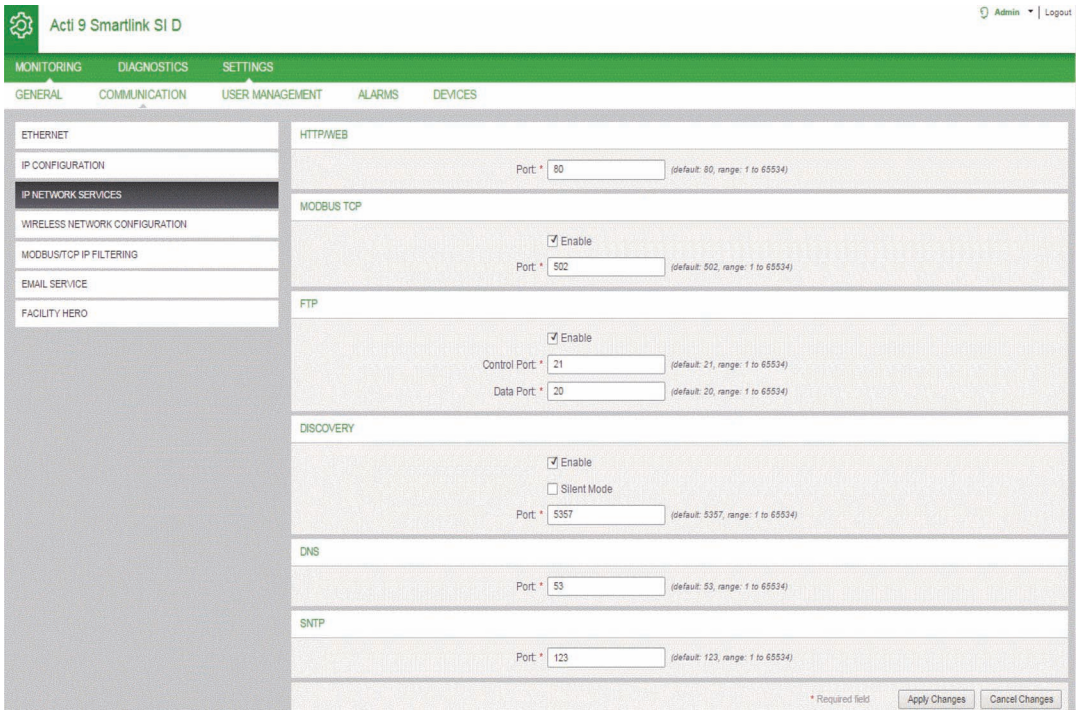
Step	Action
1	Select **Manual**.
2	Enter the **Primary DNS Server** of the device.
3	Enter the **Secondary DNS Server** of the device.
4	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

IP Network Services

Description

The **IP Network Services** page is used to configure the network protocols and discovery services.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings** → **Communication** → **IP Network Services**.



The Acti9 Smartlink SI D supports HTTP, Modbus/TCP, FTP protocols, DNS, SNTP, and discovery services.

The default value of the HTTP port number is 80.

Follow the procedure to configure Modbus/TCP parameters:

Step	Action
1	Select the **Enable** check box to enable the Modbus/TCP service. The **Enable** check box is selected by default.
2	Displays the port number of the Modbus/TCP network. The default value is 502.
3	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

Follow the procedure to configure FTP parameters:

Step	Action
1	Select the **Enable** check box to enable the FTP service. The **Enable** check box is selected by default.
2	Displays the control port number of the FTP network. The default value is 21.
3	Displays the data port number of the FTP network. The default value is 20.
4	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

Follow the procedure to configure discovery services:

Step	Action
1	Select the **Enable** check box to enable the discovery service. The **Enable** check box is selected by default.
2	Select the **Silent Mode** check box. The **Silent Mode** check box is selected by default.
3	Displays the port number of the discovery network. The default value is 5357.
4	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

Displays the port value of the DNS and SNTP network. The default value of the port number is 53 and 123 respectively.

Chapter 7
System Settings Configuration

What Is in This Chapter?

This chapter contains the following topics:

General Network Settings

Identification Page

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings → General → Identification**.

The **Identification** page is used to edit the device name and it displays the following parameters:

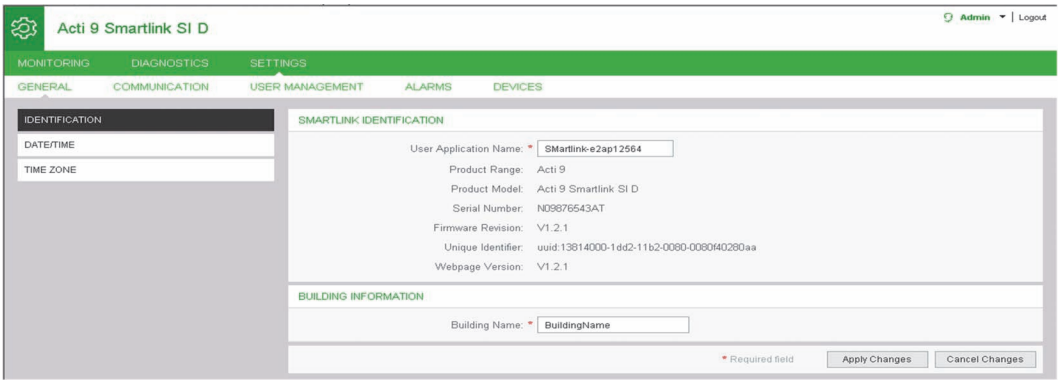
Parameters	Description
Smartlink Identification	
User Application Name	Displays the name of the particular device used by communication services to identify the device.
Product Range	Displays the product range name of the device.
Product Model	Displays the product model name of the device.
Serial Number	Displays the serial number of the device.
Firmware Revision	Displays the firmware version number of the device.
Unique identifier	Displays the identifier used by communication protocols.
Webpage Version	Displays the web page version of the device.
Building Information	
Building Name	Displays the user configured building name.

The **Identification** page allows you to edit only the **Device Name** and the **Building Name**. The **Device Name** is same as the name displayed in Windows 7 explorer. The other parameters in this page cannot be edited, as these are read-only parameters.

NOTE: The **Device Name** should contain only alphanumeric characters and a hyphen (-) character. The '-' character cannot be the last character.

Click **Apply Changes** to save the changes. Click **Cancel Changes** to revert the settings.

NOTE: Once you click apply changes, you cannot undo the changes. You can click undo changes only before saving the changes.

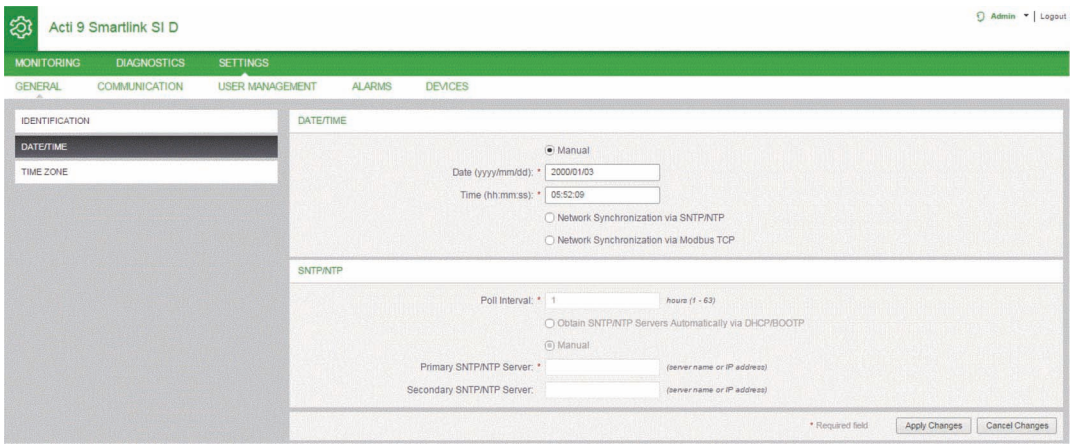


Date/Time Page

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings** → **General** → **Date/Time**.

Manual mode

The **Date/time** page is used to set date and time and SNTP parameters as shown in the following figure:



NOTE: After every power cycle, the device will reset to a default value of date and time. The default date and time value is 2000/1/1, 00:00:00.

Follow the procedure to configure the date and time in **Manual** mode:

Step	Action
1	Select **Manual**.
2	Enter the **Date** to be set in the format **yyyy-mm-dd**.
3	Enter the **Time** in the format **hh:mm:sec**. Ensure to enter the time in a proper format.
4	Select **Network Synchronization via SNTP/NTP** to configure the date and time automatically via SNTP/NTP.
5	Select **Network Synchronization via Modbus TCP** to configure the date and time via Modbus TCP.
7	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

SNTP Mode

Network Time Protocol (NTP) is a networking protocol for clock synchronization between computer systems over packet-switched, variable-latency data networks.

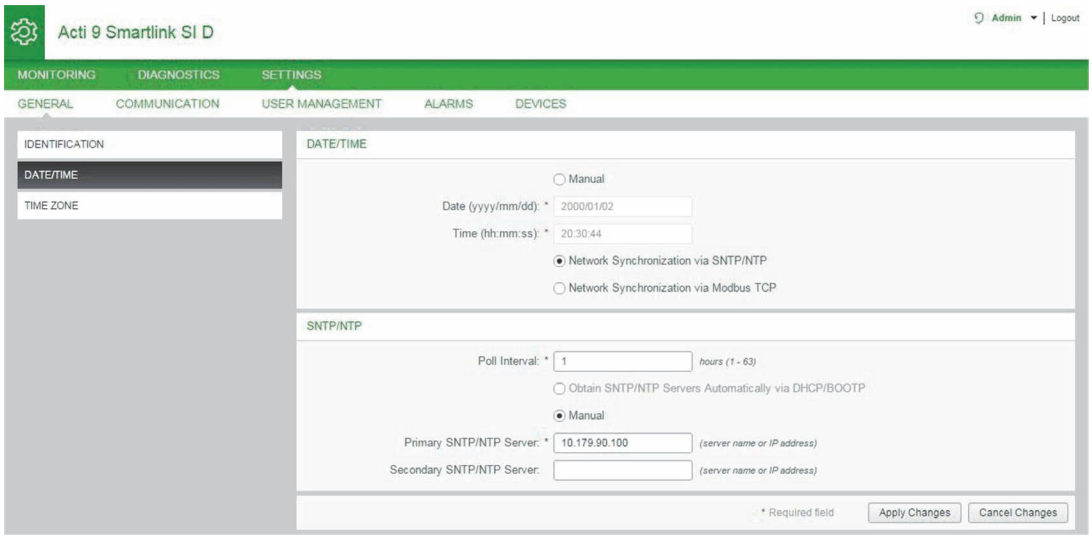
A less complex implementation of NTP, using the same protocol without the storage of state over extended periods of time is known as the Simple Network Time Protocol. It is used in embedded devices and in applications where high accuracy timing is not required.

When automatic time configuration is selected and NTP servers are configured, the Acti9 Smartlink SI D can communicate with NTP and server to synchronizes its time.

The Acti9 Smartlink SI D supports time synchronization with remote server using SNTP. When SNTP is activated, time synchronization from one of the selected time servers can be achieved at every configured interval and also supports Modbus time services Get Date-Time (function code 43-15) and Set Date-Time (function code 43-16). The time is configured in 24-hour format.

In automatic mode, the Acti9 Smartlink SI D receives date and time from SNTP server after every poll interval time. Follow the procedure to configure date and time using **SNTP/NTP** parameters:

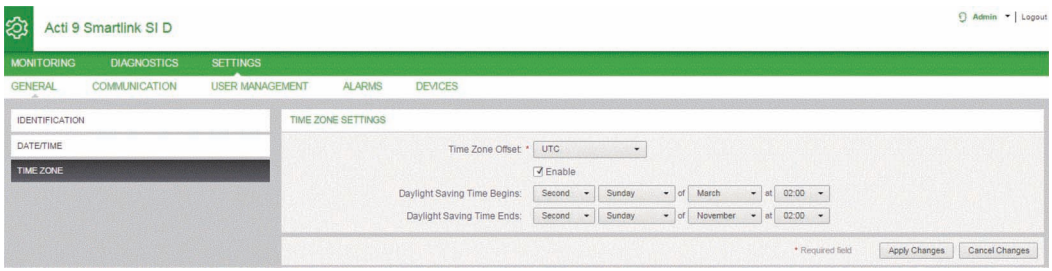
Step	Action
1	Enter the value for **Poll Interval** in hours that ranges from 1 through 63. The default value of poll interval is 1.
2	Select **Obtain SNTP/NTP Servers Automatically via DHCP/BOOTP** to obtain the server address automatically from SNTP or NTP servers.
3	Select **Manual**.
4	Enter the primary server name or IP address for **Primary SNTP/NTP Server** parameter. The primary server can be: ● IPv4 address ● IPv6 address ● Domain name
5	Enter the secondary server name or IP address for **Secondary SNTP/NTP server** parameter. This is an optional parameter.
6	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.



Time Zone Page

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings → General → Time Zone**.

The **Time Zone** page is used to configure the offset and daylight saving time for the selected timezone.



Follow the procedure to configure timezone settings:

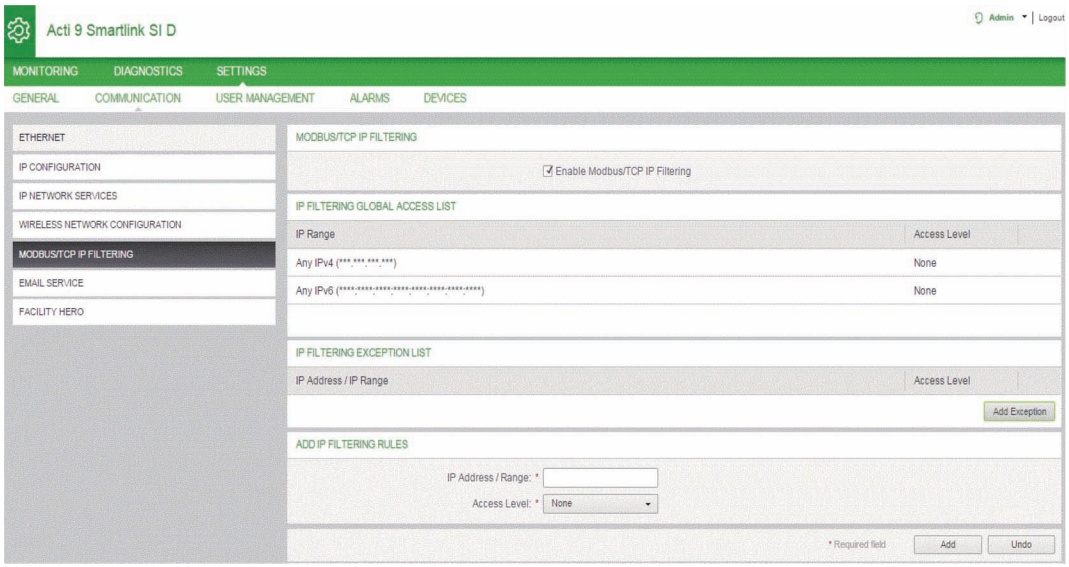
Step	Action
1	Click the offset value used by the local time zone from the **Time Zone Offset** list.
2	Select the **Enable** check box to configure the daylight time saving settings. The **Enable** check box is not selected by default.
3	Select the day, month, and time to configure the start time of daylight saving time from the respective **Daylight Saving Time Begins** list.
4	Select the day, month, and time to configure the end time of daylight saving time from the **Daylight Saving Time Ends** list.
5	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

Modbus TCP/IP Filtering

Description

The Modbus TCP/IP filtering is a security feature that lists the IP addresses from which the communication can be accepted (Ethernet client). This function is used only with Ethernet static addressing mode. This page is used to configure the IP address in order to enable write access.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings → Communication → Modbus TCP/IP Filtering**.



Follow the procedure to configure the IP address to enable write access:

Step	Action
1	Select the **Enable Modbus TCP/IP Filtering** check box to enable write access for the global IP address range and for the listed IP address range. **NOTE:** If you do not select the **Enable Modbus TCP/IP Filtering** check box, you cannot edit global IP address range and add or edit applicable exceptions.
2	Click **Add exception** to add the IP address and access level. A maximum of 10 IP address can be added. The IP address added has a write access.
3	Enter the IP address in the **IP Address/Range** area and select the **Access level** for the entered IP address.
4	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

NOTE: You can only edit the global IP address range, but you cannot delete the global IP address range. You can edit and delete the added exceptions.

Email Service

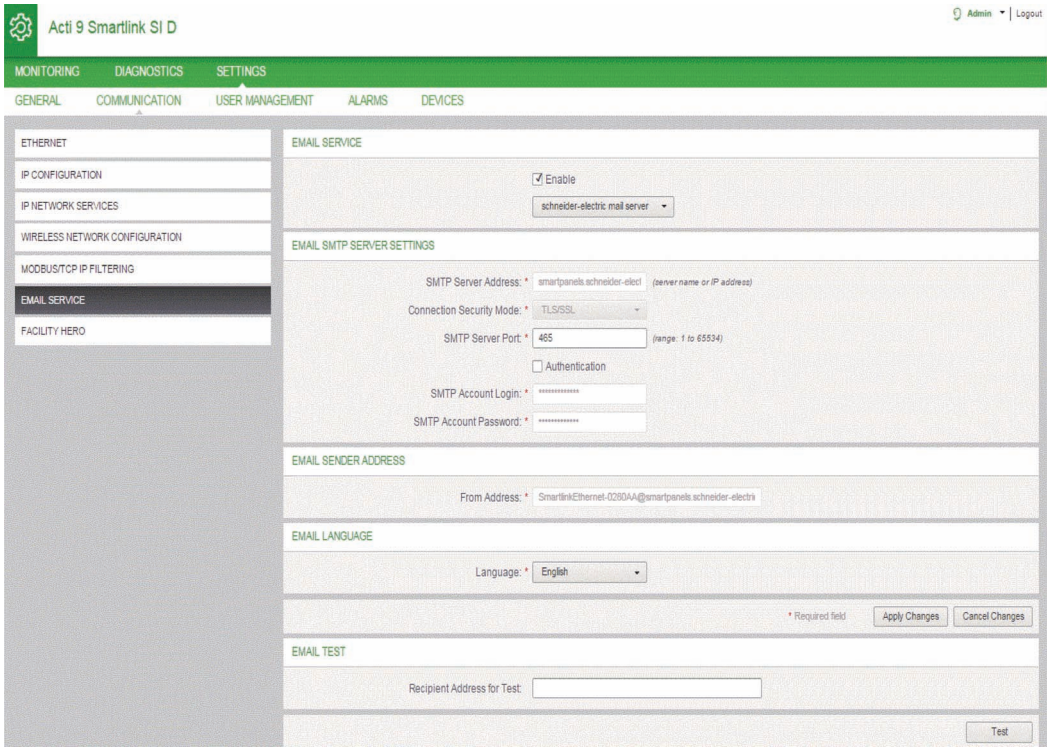
Description

The event notification is used to send emails when the connected devices trigger an alarm. The alarms are configured by the administrator and can be sent to many users.

NOTE: Check your IT policies/administrator to get the right IT connection (port, LAN connection to Internet, and email server to use). The event notifications should not be used if email services are managed internally by a customer IT domain administrator.

The **Email Service** page is used to configure the email server settings.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings** → **Communication** → **Email Service**.



Click the **Enable** check box to configure the email server settings (enabled by default). Acti9 Smartlink SI D allows you to select the **schneider-electric mail server** or **my own SMTP server** profiles from the drop-down list.

NOTE: The SMTP/email server is enabled by default. The **schneider-electric mail server** is the default profile selected to simplify the connections. However, you can select **my own SMTP server** profile to connect to your own server.

Follow the steps given in the table to configure the email server settings if you select **my own SMTP server** profile:

Step	Action
1	Enter the email server name or IP address in the **SMTP Server Address** area.
2	Select the type of security mode from the **Connection Security Mode** list. The following are the available connection security modes: • **None** • **TLS/SSL** • **STARTTLS**
3	Enter the server port value in the **SMTP Server Port** area. The value ranges from 1 to 65535.
4	Select **Authentication** if the server requires login information. This option is disabled by default.

Step	Action
5	Enter the user name in the **SMTP Account Login** area.
6	Enter the password to authenticate the SMTP login in the **SMTP Account Password** area.
7	Enter the email address of the administrator who is administering the device in the **From Address** area. The **From Address** can be used in different ways: ● Use the **From Address** as a context provider: If you want to notify and does not want to receive a reply, use a **From Address** as contextual information. The **From Address** syntax includes “no-reply”, “device name”, “site name”, @a validated domain .com, .net, and so on. ● Create an alias in the **From Address** to allow replies to be sent to the person in charge of an alarm: An email can be sent to multiple people who are responsible for a specific appliance. This feature allows the receivers to reply to follow up with the responsible person. For example, if the facility manager receives an email from an alarm, the facility manager can send a reply email to the Maintenance Contractor to follow up on the action.
8	Select the language of the email body from the **Language** list.
9	Click **Apply Changes** to save the settings. If you do not want to save the changes, click **Cancel Changes**.
10	Enter the email address of the recipient to test the delivery of the email in the **Recipient Address for Test** area. The test email feature enables connection from the device to the service. If the test emails are not received, the Internet connection needs to enable the email ports (port 25 or 587). The port settings are configured in accordance between the device that sends the email and the site router settings.
11	Click **Test** to deliver the email to the added recipient.

If you select **schneider-electric mail server** profile, then you can configure only **SMTP server port** and **Language** parameters.

Schneider Electric provides an email service, free of charge, which allows you to receive the alarm notifications. When you choose to activate this service, you accept that Schneider Electric collects the data of your Smart Panels and your email address for the purpose to improve the product and the associated services and in accordance with our *Data Privacy policy.*

User Management

Users Accounts Page

The **User Management** is used to manage the user profiles. The **Users Accounts** page displays the existing user accounts. This page is used to add a new user account and edit the password of the existing user account.

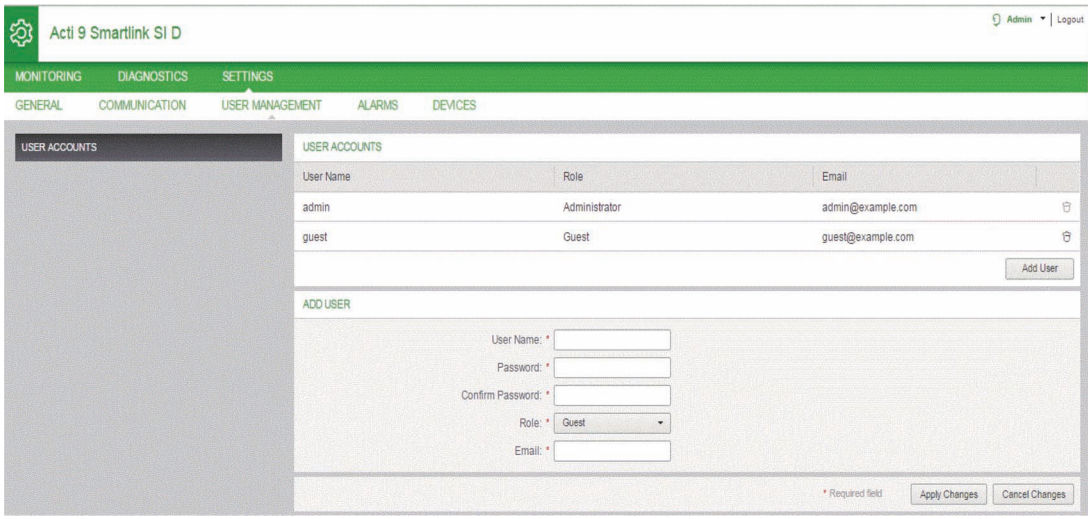
NOTE: The email associated to each declared user is significant, as it is used during an alarm creation to send an email if there is an occurrence of an alarm.

The following table lists the three types of user account supported by Acti9 Smartlink SI D and their access rights:

User Accounts	Access	Username	Password
Administrator	• Edit parameters in **Settings** menu • Monitor the devices • View all menus	admin	admin
User	• Monitor the devices • View all menus	user	user
Guest	• View all menus	guest	guest

Administrator account is the first level of access to the web page by default. The number of user accounts at administrator level is up to 1. The number of user accounts at user level is up to 3.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings** → **User Management** → **User Accounts**.



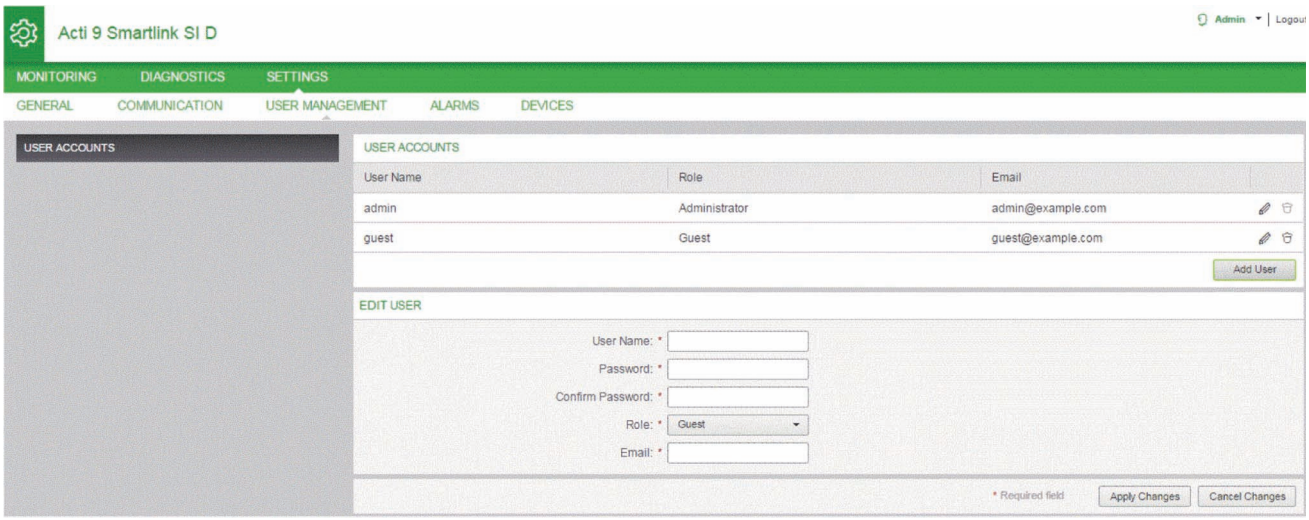
Follow the procedure to add a new user profile:

Step	Action
1	Click **Add User**.
2	Enter the authentication information in the **Username** and **Password** area for a user.
3	Select the type of user from the **Role** list.
4	Enter the email of the user in the **Email** area.
5	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

By default, only one administrator account and one user account is available.

The **Username** and **Password** must meet the following criteria:

- The **Username** must have minimum of four characters.
- The **Username** must not exceed 16 characters.
- The **Password** must contain minimum of eight characters with one special character, one number, and one alphabet in upper case.
- The **Password** must not exceed 16 characters.



Follow the procedure to edit the details of an existing user profile:

Step	Action
1	Select the user account from the **User Accounts** list and click the edit icon.
2	Select the type of user from the **Role** list.
3	Modify the **Password** for the selected user account, if required.
4	Enter the email of the user in the **Email** area.
5	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

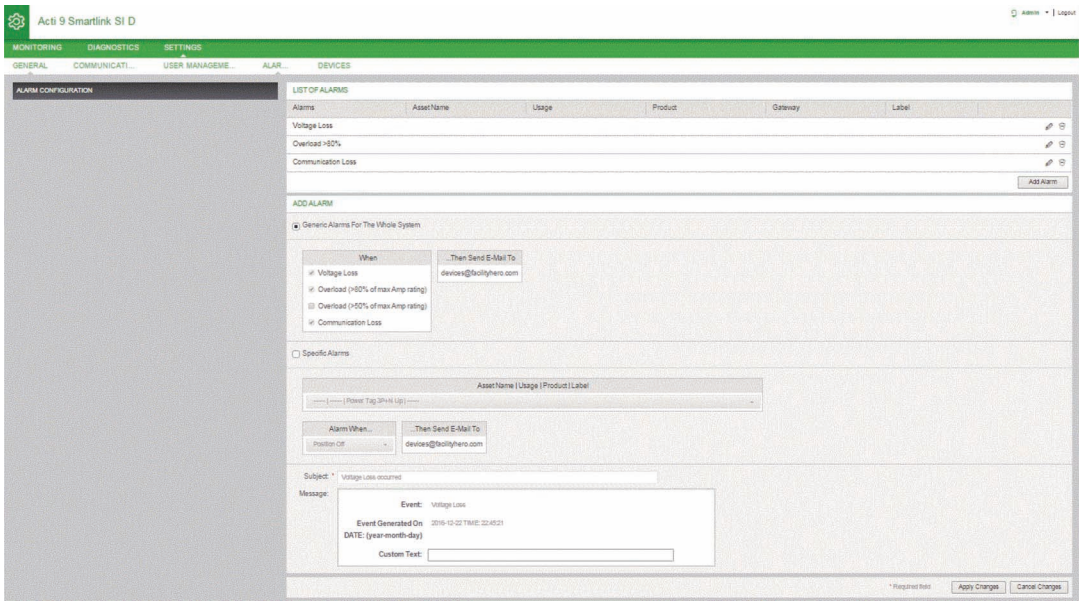
Click the delete icon to delete the user profile from web page. The user profile with Admin account cannot be deleted.

Alarms

Alarm Configuration Page

The **Alarm Configuration** page is used to configure alarms when there is an electrical issue. This page displays the information about the email events, products, channels and devices, and email recipients.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Settings** → **Alarms** → **Alarm Configuration**.



This page allows you to add a new alarm and edit the selected alarm from the list of events.

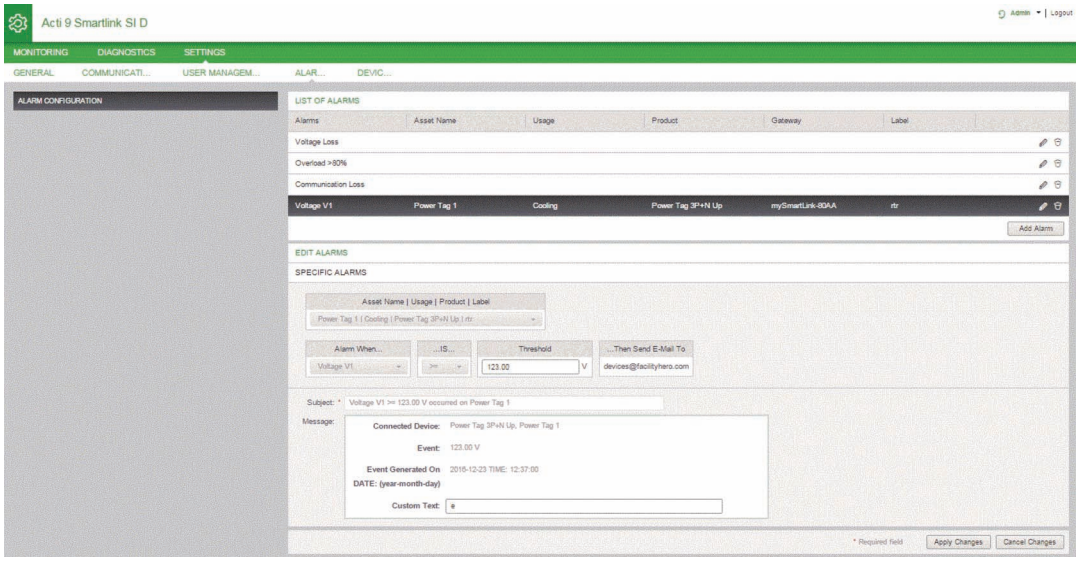
Follow the steps given in the table to add a new alarm:

Step	Action
1	Click **Add Alarm** to add a new event. You can create either generic alarm for the whole system or specific alarms to a selected device.
2	Select **Generic Alarms for the Whole System**, select when an alarm to occur, and then select the users to whom an alarm notification to be sent through email. Or Select **Specific Alarms**, select the required parameters, enter the threshold value that indicates for an alarm to occur, and then select the users to whom an alarm notification to be sent through email.
4	Enter the **Subject** and **Message** of the email event.
5	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.

NOTE: The email with custom text that uses characters such as à, è, ù, é, â, ê, î, ô, û , ë, ï, ü, ÿ, and ç are not shown correctly in the email but the generic text message is shown correctly.

Follow the steps given in the table to edit the parameters of an event:

Step	Action
1	Select an event and click the edit icon to edit the parameters of an event.
2	Modify the required to edit an event.
3	Select the email recipients from the **Email** list.
4	Click **Apply Changes** to save the settings. Click **Cancel Changes** to revert the settings.



Chapter 8
Monitoring and Diagnostics Web Pages

What Is in This Chapter?

This chapter contains the following topics:

Load Monitoring

Description

The **Monitoring** page is used to monitor the wireless communication devices. The facility managers can check the health of the electrical devices like HVAC, lighting, pumps, machines, and so on). The building managers can also monitor the temperature, third-party breakers (breaker inputs), and energy meters (if Acti9 Smartlink SI D is installed together with Acti9 Smartlink SI B).

The **Monitoring** menu, **Diagnostics** menu, and the **Settings** menu consists of two main areas:

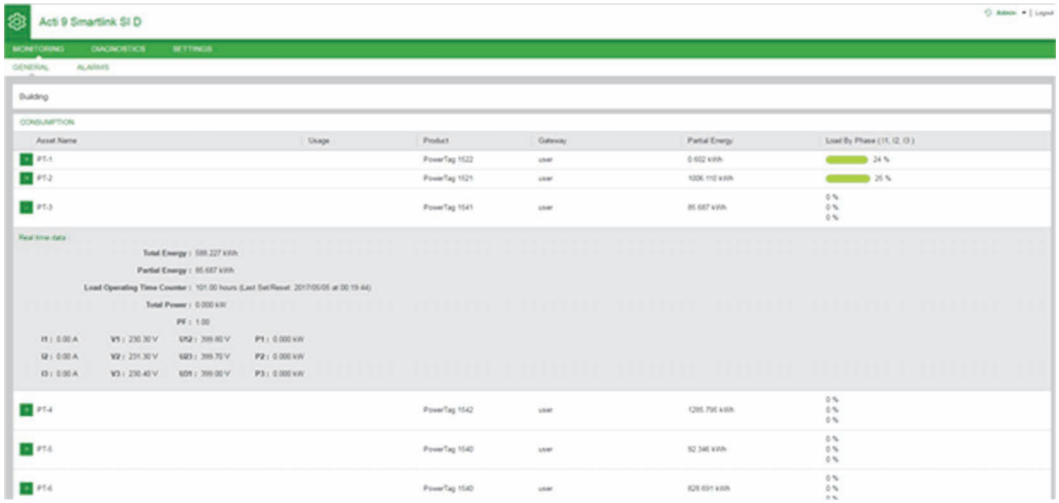
- Sub menu and function list
- Dashboard

Area	Description
Sub menu and function list	List of functions or lists the wireless devices connected to Acti9 Smartlink SI D
Dashboard	Displays the general characteristics of the function depending on the selected device from the function list or device list area.

General Page

The **General** page displays the status of the PowerTag energy sensors.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Monitoring** → **General**.



The following information is displayed for the PowerTag energy sensors:

Parameter	Description
Asset Name	Displays the name of the equipment or load name that the PowerTag tracks.
Usage	Displays the usage of the energy of the equipment or load (for example, cooling, lighting, IT loads, and so on.)
Product	Displays the type of PowerTag device associated to a circuit breaker.
Gateway	Displays the gateway connected to the PowerTag.
Partial Energy	Displays the partial counter of energy for the given electrical asset.
Load by Phase	Displays the percentage of the load of the feeder connected to the PowerTag. The percentage indicates how far an user is away from the tripping of a breaker. It is the ratio of the actual current to breaker rating. **Green:** Indicates the circuit is loaded up to 50% in regards to circuit breaker rating. **Orange:** Indicates the circuit is loaded between 50% and 80%. **Red:** Indicates the circuit is loaded above 80% versus circuit breaker rating. **NOTE:** To use and see the percentage of load, enter the maximum breaker rating during the configuration of PowerTag energy sensors in Ecoreach software, see *Ecoreach Online Help*.

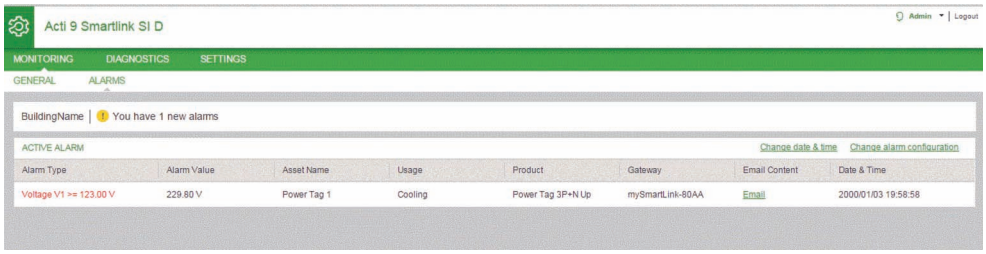
Click the expand button to see the real-time data for each device.

Alarms

Description

The **Alarms** page displays the active alarms when there is an electrical issue on an alarm configured by the user. When an alarm is displayed, a notification is sent to the user either by email (if the email service is enabled) or through Facility Expert notification center. An active alarm disappears when an electrical issue is resolved.

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Monitoring → Alarms**.



Parameter	Description
Alarm Type	Displays the type of an alarm when an alarm is occurred.
Alarm Value	Displays the threshold value of an alarm.
Asset Name	Displays the user-defined name of the alarm.
Usage	Displays the type of the usage.
Product	Displays the device type for which an alarm is configured.
Gateway	Displays the user-configured gateway of the device.
Email Content	Click **Email** to view the custom text of the email defined during an alarm configuration.
Date & Time	Displays the date and time of the configured alarm in yyyy/mm/dd hh:mm:sec format.

Click **Change date & time** to modify the date and time parameters in the **Settings → General → Date & Time** page.

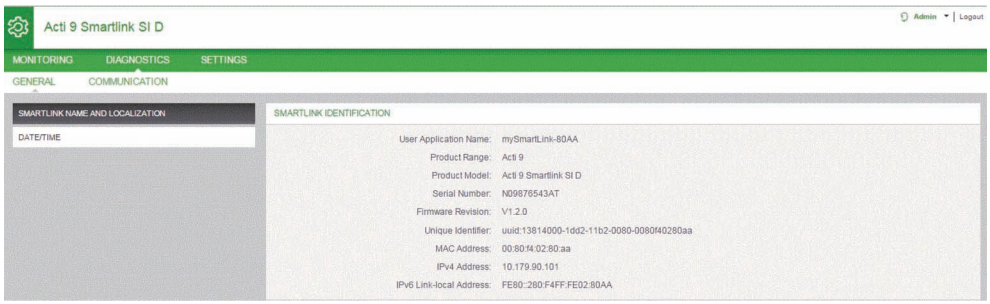
Click **Change alarm configuration** to modify an existing alarm or to configure a new alarm in the **Settings → Alarms → Alarm Configuration** page.

General Diagnostics

Smartlink Name and Localization

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Diagnostics → General → Smartlink Name and Localization**.

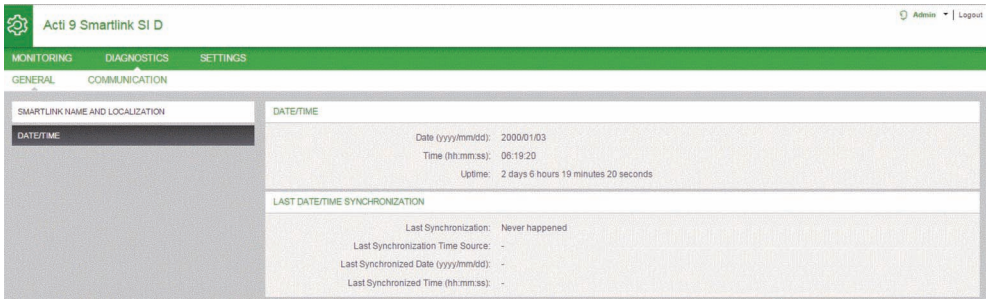
The **Smartlink Name and Localization** page displays the information of the Smartlink as shown in the following figure:



The **User Application Name** is used in different interfaces and in alarms received by emails.

Date/Time

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Diagnostics → General → Date/Time**.



The **Date/Time** page displays the following information:

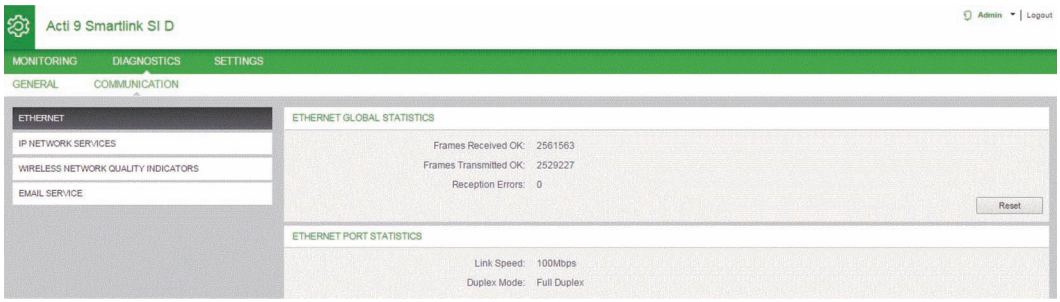
Parameters	Description
Date/Time	
Date	Displays the current date in the format YYYY-MM-DD.
Time	Displays the current in the local time zone in the format hh:mm:ss.
Uptime	Displays the elapsed time since the last restart of the device.
Last Date/Time Synchronization	
Last Synchronization	Displays when the last synchronization happened.
Last Synchronization Time Source	Displays the time source of the last synchronization.
Last Synchronized Date	Displays the last synchronized date in the format YYYY-MM-DD.
Last Synchronized Time	Displays the last synchronized time in the format hh:mm:ss.

Communication Diagnostics

Ethernet

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Diagnostics → Communication → Ethernet**.

The **Ethernet** page displays the global and port statistics of the Ethernet network.



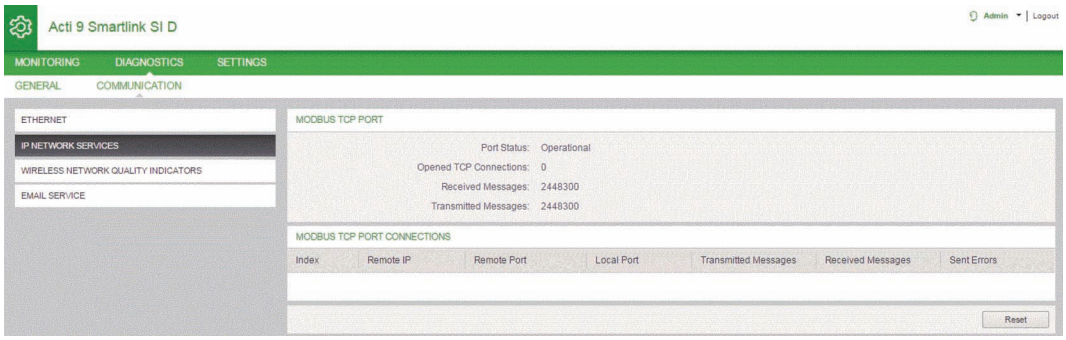
	Function Name	Description
Ethernet Global Statistics	Frames Received OK	Displays the number of frames received from all the Ethernet ports.
	Frames Transmitted OK	Displays the number of frames transmitted from all the Ethernet ports.
	Reception Errors	Displays the number of errors during reception of the frames.
Ethernet Port Statistics	Link speed	Displays link speed on Ethernet port.
	Duplex mode	Displays the communication mode of the Ethernet port. It can be half duplex or full duplex.

Click **Reset** to clear the Ethernet frame counters.

IP Network Services

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Diagnostics → Communication → IP Network Services**.

The **IP Network Services** page displays Modbus/TCP port information, number of active connections, and number of received and transmitted frames.



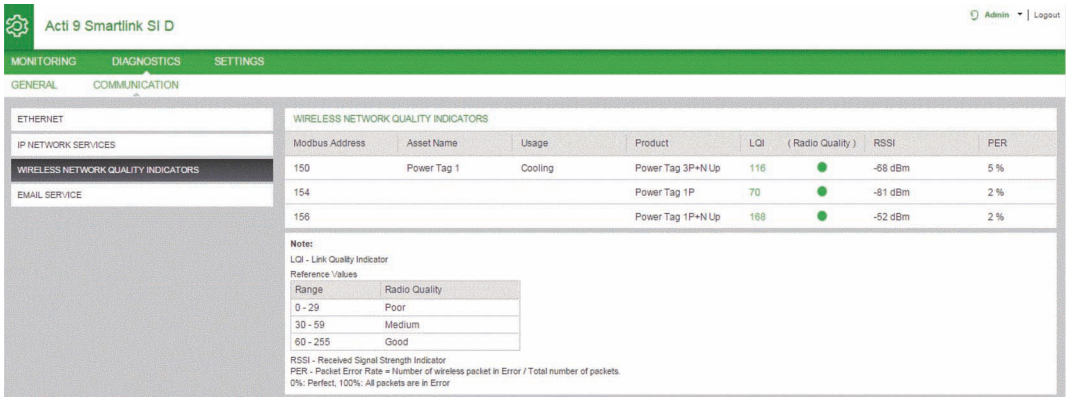
	Function Name	Description
Modbus TCP Port	Port status	Displays the current status of the Modbus/TCP port.
	Opened TCP connections	Displays the number of established Modbus/TCP connections.
	Received messages	Displays the counter of received Modbus/TCP messages.
	Transmitted messages	Displays the counter of transmitted Modbus/TCP messages.
Modbus TCP Port Connections		Displays the statistics of open Modbus/TCP connections.

Click **Reset** to clear the Modbus/TCP counter.

Wireless Network Quality Indicators

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Diagnostics → Communication → Wireless Network Quality Indicators**.

The **Wireless Network Quality Indicators** page displays wireless network quality information such as Link Quality Indicator (LQI), Received Signal Strength Indicator (RSSI), and Packet Error Rate (PER).

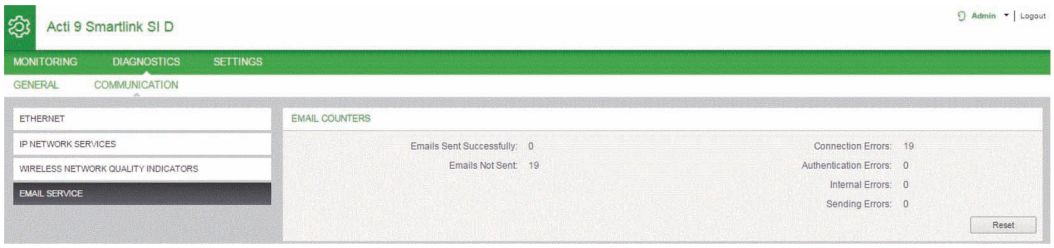


Parameter	Description
Modbus Address	Displays the Modbus address of the wireless device.
Asset Name	Displays the user-defined asset name of the wireless device.
Usage	Displays the user-defined usage of the wireless device.
Product	Displays the type of wireless sensor.
LQI	Displays the measurement of the strength and / or quality of the received frames. The following values of LQI indicates the quality of the received frames: ● The value from 0...29 indicates that the RF communication is bad. In this case, check whether the rules of installation are respected. You can also change the location of the Acti9 Smartlink inside the panel to be closer to the PowerTag energy sensors. ● The values from 29...59 indicates that the RF communication is average. In this case, look at the RSSI value whether to accept the level of quality or not. If the RSSI is above limit, consider the value of LQI as acceptable. ● The value greater than 59 indicates that the RF communication is OK. **NOTE:** It is recommended to use this indicator as the main indicator of acceptance.
Radio Quality	Displays the quality of the frames. When the LQI value is greater then 59, it indicates with green light and when LQI value is lesser than 29, it indicates with red light. When the LQI value is between 30 and 59, it indicates with orange light.
RSSI	Displays the measurement of the power level (in dBm) that an RF device is exchanging from the remote radio nodes. This indicator is used if the LQI is not acceptable. ● The value < -95 dBm is not good. ● The value > -95 dBm is acceptable.
PER	Displays the ratio of the packet that does not reach a destination over the total expected number of packets and is expressed as percentage. For Acti9 Smartlink system, the ratio is calculated over a fixed window of five minutes. The value lesser than 5 % is acceptable.

Email Service

Step	Action
1	Launch the Acti9 Smartlink SI D web page in the web browser.
2	Login with user name and password.
3	Click **Diagnostics → Communication → Email Service**.

The **Email Service** page displays the information such as number of emails sent and emails not sent. This page also displays the error count, if any, for connection errors, authentication errors, internal errors, and sending errors as shown in the following figure:



Parameter	Description
Email Sent successfully	Displays the total number of successfully sent emails.
Emails Not Sent	Displays the total number of emails not delivered to the recipients.
Connection Errors	Displays the total number of connection errors if a connection is lost during an email delivery.
Authentication Errors	Displays the total number of authentication errors.
Internal Errors	Displays the total number of internal errors during the email service.
Sending Errors	Displays the total number of sending errors.

Click **Reset** to clear the Email counter.

Chapter 9
Modbus Registers Tables

What Is in This Chapter?

This chapter contains the following topics:

Modbus Table Format and Data Types

Table Formats

Register tables have the following columns:

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description

Designation	Description
Address	16-bit register address that allows the user to access the variable. The address is expressed in decimal notation. Modbus Address: The list of Modbus addresses, defined by the Modbus protocol, starts at 0. The detailed tables in subsequent chapters of this manual give the Modbus addresses. If the programmable controller (master) refers to the data model addresses, the addresses to be supplied to this controller must meet the following rule: Data model address = Modbus address + 1. If the programmable controller (Modbus master) refers to the procotol addresses, the addresses to be supplied to this controller must be the Modbus addresses.
No.	Number of 16-bit registers that need to be read/written to access the complete information.
RW	Whether the register is read only (R) or read-write (RW).
X	Scale factor: ● Scale “X1” means that the value of the register is the right one with the unit indicated. ● A scale of 10 means that the register contains the value multiplied by 10. The actual value is therefore the value of the register divided by 10. ● A scale of 0.1 means that the register contains the value multiplied by 0.1. The actual value is therefore the value of the register multiplied by 10.
Unit	Information unit of measurement: ● “–”: no unit corresponding to the value expressed. ● “h”: hours ● “D”: the unit depends on the connected device.
Type	Coding data type (see "Data type" table below).
Range	Range of permitted values for the variable, usually a subset of what the format allows. For BITMAP type data, the content of this domain is “–”.
Default Value	Default value for the variable
Svd	Saving the value in the event of a power failure: ● “Y”: the value of the register is saved in the event of a power failure. ● “N”: the value is lost in the event of a power failure. **NOTE:** On start-up or reset, the available values are retrieved.
Function code	Code of functions that can be used in the register.
Description	Information about the register and the restrictions that apply.

Data Types

The following data types appear in the tables of Modbus registers:

Name	Description	Range
UINT	16-bit unsigned integer (1 word)	0...65535
INT	16-bit signed integer (1 word)	-32768...+32767
UINT32	32-bit unsigned integer (2 words)	0...4 294 967 295
INT32	32-bit signed integer (2 words)	-2 147 483 648...+2 147 483 647
INT64	64-bit signed integer (4 words)	-9 223 372 036 854 775 808...9 223 372 036 854 775 807
Float32	32-bit value (2 words)	-3.4028E+38... +3.4028E+38
ASCII	8-bit alphanumeric character	Table of ASCII Characters
BITMAP	16-bit field (1 word)	–
DATE	See below	–

NOTE:
Float32 type data: Single precision float with sign bit, 8 bits exponent, 23 bits mantissa (positive and negative normalized real)
For ASCII type data, the order of transmission of characters in words (16-bit registers) is as follows:
- Character n as least significant
- Character n + 1 as most significant

All registers (16-bit or 2 bytes) are transmitted with Big Endian coding:
- The most significant byte is transmitted first.
- The least significant byte is transmitted second.

32-bit variables saved on two 16-bit words (e.g. consumption meters) are in Big Endian format:
- The most significant word is transmitted first, then the least significant.

64-bit variables saved on four 16-bit words (e.g. dates) are in Big Endian format:
- The most significant word is transmitted first, and so on.

DATE

DATE format in accordance with TI081 standard:

Word	Bits															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	Reserved (0)								R4 (0)	Year (0...127)						
2	0				Month (1...12)				WD (0)			Day (1...31)				
3	SU (0)	0		Hour (0...23)					iV	0	Minute (0...59)					
4	Millisecond (0...59,999)															

R4:	Bit reserved
Year:	7 bits (year starting at 2000)
Month:	4 bits
Day:	5 bits
Hour:	5 bits
Minute:	6 bits
Millisecond:	16 bits
WD (day of the week) :	Bit at 0 if this parameter is not used.
SU (summertime):	Bit at 1 for summertime, bit at 0 if this parameter is not used.
iV (validity of the information received):	Bit at 1 if the information is not valid, bit at 0 if this parameter is not used.

Direct Bit Addressing

Addressing is permitted for BITMAP type zones with functions 1, 2, 5, and 15.

The address of the first bit is constructed as follows: (register address x 16) + bit number.

This addressing mode is specific to Schneider Electric.

Example: For functions 1, 2, 5, and 15, bit 3 of register 0x0078 should be addressed; the bit address is therefore 0x0783.

NOTE: The register whose bit needs to be addressed should have an address ≤ 0x0FFF.

Example of Modbus Frames

Request

Definition	Number of Bytes	Value	Comment
Slave number	1 byte	0x05	Acti9 Smartlink SI D Modbus Address
Function code	1 byte	0x03	Reads n output or internal words
Address	2 bytes	0x36E2	Address of a consumption meter whose address is 14050 in decimal notation.
Number of words	2 bytes	0x002C	Reads 44 16-bit registers.
CRC	2 bytes	xxxx	Value of CRC16.

Response

Definition	Number of Bytes	Value	Comment
Slave number	1 byte	0x05	Acti9 Smartlink SI D Modbus Address
Function code	1 byte	0x03	Reads n output or internal words
Number of Bytes	2 bytes	0x0058	Number of bytes read
Value of words read	88 bytes	–	Reads 44 16-bit registers
CRC	2 bytes	xxxx	Value of CRC16.

Modbus Address

The list of Modbus addresses, defined by the protocol, starts at 0. The detailed tables in subsequent chapters of this manual give the addresses.

If the programmable controller (Modbus master) refers to the data model addresses, the addresses to be supplied to this controller must meet the following rule: Data model address = address + 1.

If the programmable controller (Modbus master) refers to the procotol addresses, the addresses to be supplied to this controller must be the Modbus addresses.

NOTE: How to use registers:
To know the description of each register (how to use them), print the PDF report of Modbus registers using Ecoreach software, see *Ecoreach Online Help*. This report gives a dynamic knowledge of all the registers necessary to be integrated into the building management systems including, a description of each register.

System Modbus Table

Identification

The Modbus slave ID of Acti9 Smartlink SI D to read Identification Modbus table is 255.

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
100	6	R	–	–	ASCII	–	N/A	Y	03, 100–4	Serial number on 12 ASCII characters; 11 alphanumeric digits maximum [SN] or [S/N]: PP YY WW [D[nnnn]] ● PP: SAP Bridge plant number ● YY: Year in decimal notation [05...99] ● WW: Week in decimal notation [1...53] ● D: Day of the week in decimal notation [1...7] ● nnnn: Sequence of numbers [0001...10.000–1]
106	3	R	–	–	ASCII	–	N/A	Y	03, 100–4	Hardware version on 6 ASCII characters
109	3	R	–	–	ASCII	–	N/A	Y	03, 100–4	Software version on 6 ASCII characters. **Example:** “V0.0.1”

Status

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
112	1	R	–	–	BITMAP	–	0x0000	N	01, 02, 03, 100–4	Acti9 Smartlink SI D device status and diagnostic register Bit 0 = 1: start-up phase Bit 1 = 1: operating phase Bit 2 = 1: downgraded mode(1) Bit 3 = 1: failure mode Bit 4: not used Bit 5: not used Bit 6 = 1: invalid data Bit 7 = 1: 24 V channel error Bit 8: not used Bit 9: not used Bit 10: not used Bit 11: not used Bit 12: not used Bit 13: E2PROM error Bit 14: RAM error Bit 15: FLASH error **NOTE:** Bits 0 to 3 are exclusive: only one mode is used at any given time.

(1)Downgraded mode comes into effect when the power supply is cut or less than 16 Vdc.

Failure mode intervenes if there is an FLASH and/or RAM and/or E2PROM error.

The data is invalid in the start-up phase, downgraded, and failure modes. Invalid data include inputs 1 and 2, the power or flow indicator, the operation and running hours counter.

- The E2PROM error bit is activated during the operating phase when a checksum error is detected in an E2PROM page.
- The RAM error bit is activated during the product initialization phase when an error is detected during a test of the RAM.
- The FLASH error bit is activated during the start-up phase when a checksum error is detected on the FLASH memory.

Date and Time

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
115	4	RW	–	–	DATE	(1)	N/A	N	03, 16 100–4	Indicates the year, month, day, hour, minute and millisecond on the Acti9 Smartlink SI D device.

(1) See description of the DATE type *(see page 75)*.

PowerTag Wireless Communication Energy Sensors Modbus Tables

Description

Acti9 Smartlink SI D allocates dynamically, a slave number 150 through 169 for each of the 20 wireless communication devices (up to 20 wireless communication devices) that could be connected to the Acti9 Smartlink SI D.

Each of these 20 devices has exactly the same Modbus register table (same structure, same addresses) as described in the following table.

The supervision system uses the dynamically allocated slave number (of each wireless communication device) to pull the right Modbus register table.

Metering Data Registers of all PowerTag Wireless Communication Energy Sensors

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
Current - Metering Data										
2999	2	R	–	A	Float32	–	0xFFC00000	N	03, 100–4	RMS Current on phase A.
3001	2	R	–	A	Float32	–	0xFFC00000	N	03, 100–4	RMS Current on phase B.
3003	2	R	–	A	Float32	–	0xFFC00000	N	03, 100–4	RMS Current on phase C.
Voltage -Metering Data										
3019	2	R	–	V	Float32	–	0xFFC00000	N	03, 100–4	RMS Phase-to-phase voltage A-B.
3021	2	R	–	V	Float32	–	0xFFC00000	N	03, 100–4	RMS Phase-to-phase voltage B-C.
3023	2	R	–	V	Float32	–	0xFFC00000	N	03, 100–4	RMS Phase-to-phase voltage C-A.
3027	2	R	–	V	Float32	–	0xFFC00000	N	03, 100–4	RMS Phase-to-neutral voltage A-N.
3029	2	R	–	V	Float32	–	0xFFC00000	N	03, 100–4	RMS Phase-to-neutral voltage B-N.
3031	2	R	–	V	Float32	–	0xFFC00000	N	03, 100–4	RMS Phase-to-neutral voltage C-N.
Power - Metering Data										
3053	2	R	–	W	Float32	–	0xFFC00000	N	03, 100–4	Active power on phase A.
3055	2	R	–	W	Float32	–	0xFFC00000	N	03, 100–4	Active power on phase B.
3057	2	R	–	W	Float32	–	0xFFC00000	N	03, 100–4	Active power on phase C.
3059	2	R	–	W	Float32	–	0xFFC00000	N	03, 100–4	Total active power.
Power Factor - Metering Data										
3083	2	R	–	–	Float32	–	0xFFC00000	N	03, 100–4	Total power factor.
Energy - Metering Data										
3203	4	R	–	Wh	INT64	–	0x8000	Y	03	Total active energy delivered by PowerTag energy sensors and received by gateway.
3255	4	R	–	Wh	INT64	–	0x8000	Y	03	Sum of the partial energy set + accumulated active energy, delivered by PowerTag energy sensors.
3259	4	RW	–	Wh	INT64	–	0x8000	Y	03, 16	Set or reset partial energy counter. The value returns to zero by Acti9 Smartlink SI D.

Metering Data Registers of only PowerTag NSX Wireless Communication Energy Sensors

This Modbus registers table is dedicated to the following devices:

- Compact NSX100-250, Compact NS100-250, Compact INS250, Compact INV100-250
- Compact NSX400-630, Compact NS400-630, Compact INS320-630, Compact INV320-630

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
Power (P) - Metering Data										
3067	2	R	–	Var	Float32	–	0xFFC00000	N	03, 100–4	Total reactive power
3075	2	R	–	VA	Float32	–	0xFFC00000	N	03, 100–4	Total apparent power
Frequency -Metering Data										
3109	2	R	–	Hz	Float32	–	0xFFC00000	N	03, 100–4	AC Frequency
Device temperature - Metering Data										
3131	2	R	–	°C	Float32	–	0xFFC00000	N	03, 100–4	Internal temperature
Energy - Metering Data										
3207	4	R	–	Wh	INT64	–	0x8000000000000000	Y	03	Active energy delivered count positively non resettable (Total Energy)
3211	4	R	–	Wh	INT64	–	0x8000000000000000	Y	03	Active energy received count negatively non resettable (Total Energy)
3215	4	R	–	Wh	INT64	–	0x8000000000000000	Y	03	Active energy A delivered-received non resettable (Total Energy)
3219	4	R	–	Wh	INT64	–	0x8000000000000000	Y	03	Active energy B delivered-received non resettable (Total Energy)
3223	4	R	–	Wh	INT64	–	0x8000000000000000	Y	03	Active energy C delivered-received non resettable (Total Energy)
3263	4	R	–	Wh	INT64	–	0x8000000000000000	Y	03	Active energy delivered (Partial)
3267	4	RW	–	Wh	INT64	–	0x8000000000000000	N	03, 16	Active energy delivered SET VALUE. Returns value '0' by Smartlink.
3271	4	R	–	Wh	INT64	–	0x8000000000000000	N	03	Active energy received (Partial)
3275	4	RW	–	Wh	INT64	–	0x8000000000000000	N	03, 16	Active energy received SET VALUE. Returns value '0' by Smartlink.
3279	4	R	–	VARh	INT64	–	0x8000000000000000	Y	03	Reactive energy delivered (Partial)
3283	4	RW	–	VARh	INT64	–	0x8000000000000000	N	03, 16	Reactive energy delivered SET VALUE. Returns value '0' by Smartlink.
3287	4	R	–	VARh	INT64	–	0x8000000000000000	N	03	Reactive energy received (Partial)
3291	4	RW	–	VARh	INT64	–	0x8000000000000000	N	03, 16	Reactive energy received SET VALUE. Returns value '0' by Smartlink.

Load Monitoring Registers

The Modbus Registers of the PowerTag energy sensor allows you to monitor the following statuses in any Building Management System (BMS).

- The voltage loss of the load.
- If an overload has occurred at the voltage loss event.
- The duration of how long the load worked effectively (above a certain power, this avoiding idle/standby times to be counted), to optimize the maintenance times.

NOTE: The current overload register 3300 is set to 1 only after a voltage loss has occurred. For information on overload prior to the voltage loss, use the overload alarms 45% and 80%, sent by e-mail.

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
3297	2	R	–	–	UINT	–	0xFFFF	N	03, 100–4	0 = Invalid. 1 = Valid.
3299	2	R	–	–	UINT	–	0xFFFF	N	03, 100–4	0 = Alarm OFF. 1 = Alarm ON. Bit 0 = Voltage phase loss. Bit 1 = Current overload.
3307	2	RW	–	Sec	UINT32	–	FFFFFFFF	Y	03, 100–4	Load Operating Time counter. This value is incremented every second..
3309	2	RW	–	W	Float32	–	0xFFC00000	Y	03, 100–4	Power Threshold value for Load Operating Time counter.
3311	4	R	–	–	D/T IEC 870-5-4 (T081)	–	0x0000	Y	03, 100–4	Date and time stamp of last Set or reset of Load Operating Time counter.

Basic Configuration Registers

The detailed information for all the wireless devices has the same structure as given in the following table.

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
31000	10	RW	–	–	ASCII	–	0x0000	Y	03, 06, 16, 100–4	User application name of the wireless device. The user can enter maximum 20 characters.
31010	3	RW	–	–	ASCII	–	0x0000	Y	03, 06, 16, 100–4	Circuit identifier of the wireless device. The user can enter maximum five characters.
31013	1	RW	–	–	ENUM	–	0xFFFF	Y	03, 06, 16, 100–4	Indicates the usage attribute of the wireless device.
31014	1	RW	–	–	ENUM	–	0xFFFF	Y	03, 06, 16, 100–4	Indicates the phase sequence.
31015	1	RW	–	–	ENUM	–	0xFFFF	Y	03, 06, 16, 100–4	Indicates the mounting position. 0 = Not configured 1 = Top 2 = Bottom
31016	1	RW	–	–	ENUM	–	0xFFFF	Y	03, 06, 16, 100–4	Indicates the circuit diagnostic. 0 = Disable 1 = Enable
31017	1	RW	–	–	UINT	–	0xFFFF	Y	03, 06, 16, 100–4	Indicates the breaker rating of the wireless device.
31018	1	R	–	–	BITMAP	–	0xFFFF	Y	03	Electrical network System Type (Only for PowerTag NSX) ● 0 = Unknown system type ● 3 = 3PH3W ● 11= 3PH4W
31019	2	R	–	V	Float32	–	0xFFC00000	Y	03	Rated voltage (Only for PowerTag NSX) ● LN rated voltage for single phase wiring systems ● LL rated voltage for 2 or 3 phases wiring systems

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
31024	1	R	–	–	ENUM	–	0x8000	Y	03 100–4	Indicates the product type of wireless devices. 41 = PowerTag Acti9 M63 1P (A9MEM1520) 42 = PowerTag Acti9 M63 1P+N Top (A9MEM1521) 43 = PowerTag Acti9 M63 1P+N Bottom (A9MEM1522) 44 = PowerTag Acti9 M63 3P (A9MEM1540) 45 = PowerTag Acti9 M63 3P+N Top (A9MEM1541) 46 = PowerTag Acti9 M63 3P+N Bottom (A9MEM1542) 81 = PowerTag Acti9 F63 1P+N (A9MEM1560) 82 = PowerTag Acti9 P63 1P+N Top (A9MEM1561) 83 = PowerTag Acti9 P63 1P+N Bottom (A9MEM1562) 84 = PowerTag Acti9 P63 1P+N Bottom (A9MEM1563) 85 = PowerTag Acti9 F63 3P+N (A9MEM1570) 86 = PowerTag Acti9 P63 3P+N Top (A9MEM1571) 87 = PowerTag Acti9 P63 3P+N Bottom (A9MEM1572)
										92 = PowerTag NSX 3P-250 A (LV434020) 93 = PowerTag NSX 4P-250 A (LV434021) 94 = PowerTag NSX 3P-630 A (LV434022) 95 = PowerTag NSX 4P-630 A (LV434023)

Diagnostic Data Registers

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
31144	1	R	–	–	BITMAP	–	0xFFFF	N	03, 100–4	Validity of the communication status. 0 = Invalid. 1 = Valid.
31145	1	R	–	–	BITMAP	–	0xFFFF	N	03, 100–4	Communication status between Acti9 Smartlink SI D and wireless devices. 0 = Communication loss. 1 = Communication OK.
31173	2	R	–	–	BITMAP	–	–	N	03	Alarm status value = 0: Smartlink is operational value different than 0: Smartlink is non operational

Appendices

What Is in This Appendix?

The appendix contains the following chapters:

Appendix A
Details of Modbus Functions

What Is in This Chapter?

This chapter contains the following topics:

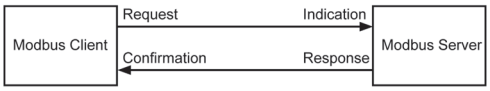
Modbus TCP/IP Functions

General Description

The Modbus messaging service provides a client/server communication between devices connected on an Ethernet TCP/IP network.

The client/server model is based on four type of messages:

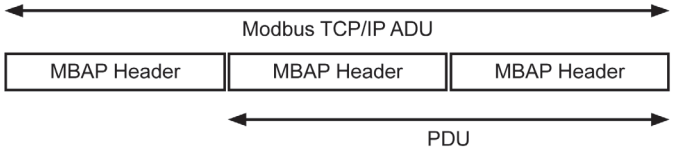
- Modbus Request, the message sent on the network by the client to initiate a transaction.
- Modbus Indication, the request message received on the server side.
- Modbus Response, the response message sent by the server.
- Modbus Confirmation, the response message received on the client side.



The Modbus messaging services (client/server model) are used for real time information exchange between:

- Two device applications.
- Device application and other device.
- HMI/SCADA applications and devices.
- A PC and a device program providing on line services.

A dedicated header is used on TCP/IP to identify the Modbus Application Data Unit. It is called the MBAP header (Modbus Application Protocol header).



The MBAP header contains the following fields:

Fields	Length	Description	Client	Server
Transaction Identifier	2 bytes	Identification of a Modbus Request/Response transaction	Initialized by the client	Recopied by the server from the received request
Protocol Identifier	2 bytes	0 = Modbus protocol	Initialized by the client	Recopied by the server from the received request
Length	2 bytes	Number of following bytes	Initialized by the client (Request)	Initialized by the server (Response)
Unit Identifier	1 byte	Identification of a remote slave connected on a serial line or on other buses	Initialized by the client	Recopied by the server from the received request

Table of Modbus Functions

The following table describes in detail the functions supported by Acti9 Smartlink SI D devices:

Function Code	Function Name
01	Read n output or internal bits
02	Read n input bits
03	Read n output or internal bits
05	Write 1 bit
06	Write 1 word
08(1)	Modbus diagnostic data
15	Write n bits

Function Code	Function Name
16	Write n words
43-14[2]	Read identification
43-15[3]	Read the date and time
43-16[4]	Write the date and time
100-4[5]	Read non-adjacent words where n ≤ 100

[1]For more details, see the appendix describing function 8 *(see page 89)*

[2]For more details, see the appendix describing function 43-14 *(see page 91)*

[3]For more details, see the appendix describing function 43-15 *(see page 93)*

[4]For more details, see the appendix describing function 43-16 *(see page 94)*

[5]For more details, see the appendix describing function 100-4 *(see page 95)*

Modbus TCP/IP Exception Codes

Exception Responses

Exception responses issued by the master or a slave can be the result of data processing errors. One of the following events can occur after a request from the master:

- If the slave receives the request from the master without a communication error and manages the request correctly, it sends back a normal response.
- If the slave does not receive the request from the master due to a communication error, it does not send back a response. The master program ends by applying a time delay condition to the request.
- If the slave receives the request from the master but detects a communication error, it does not send back a response. The master program ends by applying a time delay condition to the request.
- If the slave receives the request from the master without a communication error but cannot manage it (for example, the request consists of reading a register that does not exist), the slave sends back an exception response to inform the master of the nature of the error.

Exception Frame

The slave sends an exception frame to the master to indicate an exception response. An exception response consists of four fields:

Field	Definition	Size
1	Slave number	1 byte
2	Exception function code	1 byte
3	Exception code	n bytes
4	Check	2 byte

Managing Modbus Exceptions

The exception response frame consists of two fields that distinguish it from a normal response frame:

- The exception response's exception function code is the same as the original request function code plus 128 (0x80).
- The exception code depends on the communication error detected by the slave.

The following table describes the exception codes managed by the Acti9 Smartlink SI D device:

Exception Code	Name	Description
01	Illegal function	The function code received in the request is not a permitted action for the slave. It is possible that the slave is in an unsuitable state to process a specific request.
02	Illegal data address	The data address received by the slave is not a permitted address for the slave.
03	Illegal data value	The value of the request data field is not a permitted value for the slave.
04	Slave device failure	The slave is unable to perform a required action due to an unrecoverable error.
06	Slave device busy	The slave is busy processing another command. The master should send the request once the slave is free.

NOTE: For more information, a detailed description of the Modbus protocol is available on *www.modbus.org*.

Access to Variables

A Modbus variable can have the following attributes:

- Read-only
- Read/write
- Write-only

NOTE: An attempt to write to a read-only variable generates an exception response.

Function 8: Modbus Diagnostics

Structure of Modbus Messages Concerning Acti9 Smartlink SI D Diagnostic Counter Management

Request

Definition	Number of Bytes	Value
Slave number	1 byte	0xFF
Function code	2 bytes	08 (0x08)
Sub-function code	2 bytes	22 (0x0016)
Operation code	2 bytes	1 ((0x0001) see below list for operation code)
Diagnostic control	2 bytes	0x0100 (see below list for diagnostic control)
Starting entry index	1 byte	0x00 (0 to 255)

The operation code field is used to select the diagnostic and the statistic data to be read from the device.

Most Significant Byte								Least Significant Byte							
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserved				Protocol Version				Operation Code							

Bit assignments are included in the table below:

Bit	Field	Description
15...12	Reserved	Must be zero
11...8	Protocol Version (PV)	Indicates version of the protocol of the client (requestor) Values are: 0x00 (initial version)
7...0	Operation Code	Indicates function to be performed by the command Values are: ● 0x01 = Read diagnostic data ● 0x02 = Clear diagnostic data ● 0x03 = Clear all diagnostic data ● 0x04 = List ports

The diagnostic control field provides the data selection information for this protocol as well as specifies the logical port from which, the data is to be retrieved (if applicable). The diagnostic control field is defined as shown in the following table:

Most Significant Byte								Least Significant Byte							
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Data Selection Code								Port Select							

Bit assignments are included in the following table:

Bit	Field	Description
15...8	Data Selection Code (DS)	Indicates the diagnostic data to retrieve or to clear from the logical port. See the table below for valid values.
7...0	Port Select (PS)	Indicates the logical port number to retrieve the selected data from ● 0x00 = the internal port of a device that supports an embedded switch or any single port not accessible externally ● 0x01 to 0xFE = logical number of the desired port ● 0xFF = the port the current request came in This value should be 0xFF if the requested data is not port specific. See the **Port Select Needed** column in the table below for which **Data Selection Code** requires a valid port select value.

Data selection code

Data Selection Code	Diagnostic Data Retrieved	Port Select Needed	Type
0x00	Reserved		Public
0x01	Basic network diagnostics		Public
0x02	Ethernet port diagnostics	Yes	Public
0x03	Modbus TCP port 502 diagnostics		Public
0x04	Modbus TCP port 502 connection table		Public
0x05 to 0x7E	Reserved for other public codes		Public
0x7F	Data structure offsets		Public
0x80 to 0xFF	Reserved		Reserved

Response

Definition	Number of Bytes	Value
Slave number	1 byte	0xFF
Function code	2 bytes	08 (0x08)
Sub-function code	2 bytes	22 (0x0016)
Operation code	2 bytes	1 ((0x0001) see the above list for operation code)
Diagnostic control	2 bytes	0x0100 (see the above list for diagnostic control)
Starting entry index	1 byte	0x00 (0 to 255)

Resetting Counters

The counters are reset to 0:

- When they reach the maximum value 65535.
- When they are reset by a Modbus command (function code 8, sub-function code 10).
- When the power is cut off, or
- When the communication parameters are modified.

Function 43-14: Read Device Identification (Basic)

Structure of Modbus Read Device Identification Messages

The ID consists of ASCII characters called objects.

Request for basic information

Definition	Number of Bytes	Value
Slave number	1 byte	0xFF
Function code	1 byte	0x2B
Sub-function code	1 byte	0x0E
Product ID	1 byte	0x01
Object identifier	1 byte	0x00

Response with basic information

Definition		Number of Bytes	Value
Slave number		1 byte	0xFF
Function code		1 byte	0x2B
Sub-function code		1 byte	0x0E
Product ID		1 byte	0x01
Conformity level		1 byte	0x01
Reserved		1 byte	0x00
Reserved		1 byte	0x00
Number of objects		1 byte	0x03
Object 0: manufacturer name	Object number	1 byte	0x00
	Object length	1 byte	0x12
	Object content	18 bytes	Schneider Electric
Object 1: product code	Object number	1 byte	0x01
	Object length	1 byte	0x08
	Object content	8 bytes	A9XMWA20
Object 2: version number	Object number	1 byte	0x02
	Object length	1 byte	0x06 (minimum)
	Object content	6 bytes minimum	Vx.y.z

Request for complete information

Definition	Number of Bytes	Value
Slave number	1 byte	0xFF
Function code	1 byte	0x2B
Sub-function code	1 byte	0x0E
Product ID	1 byte	0x02
Object identifier	1 byte	0x00

Response with complete information

Definition	Number of Bytes	Value
Slave number	1 byte	0xFF
Function code	1 byte	0x2B
Sub-function code	1 byte	0x0E
Product ID	1 byte	0x02
Conformity level	1 byte	0x02
Reserved	1 byte	0x00

Definition		Number of Bytes	Value
Reserved		1 byte	0x00
Number of objects		1 byte	0x05
Object 0: manufacturer name	Object number	1 byte	0x00
	Object length	1 byte	0x12
	Object content	18 bytes	Schneider Electric
Object 1: product code	Object number	1 byte	0x01
	Object length	1 byte	0x08
	Object content	8 bytes	A9XMWA20
Object 2: version number	Object number	1 byte	0x02
	Object length	1 byte	0x06 (minimum)
	Object content	6 bytes minimum	Vx.y.z

NOTE: The above table describes how to read the ID of a Acti9 Smartlink SI D.

Function 43–15: Read Date and Time

Structure of Modbus Read Date and Time Messages

Request

Definition	Number of Bytes	Value	Example
Slave number	1 byte	0x2F	47
Function code	1 byte	0x2B	43
Sub-function code	1 byte	0x0F	15
Reserved	1 byte	0x00	Reserved

Response

Definition			Number of Bytes	Value	Example
Slave number			1 byte	0x2F	47
Function code			1 byte	0x2B	43
Sub-function code			1 byte	0x0F	15
Reserved			1 byte	0x00	Reserved
Date and time(1)	byte 1	Not used	1 byte	0x00	Not used
	byte 2	Year	1 byte	0x0A	Year 2010
	byte 3	Month	1 byte	0x0B	Month of November
	byte 4	Day of the month	1 byte	0x02	Second day of the month
	byte 5	Hour	1 byte	0x0E	14 hours
	byte 6	Minute	1 byte	0x20	32 minutes
	byte 7 and byte 8	Millisecond	2 bytes	0x0DAC	3.5 seconds
(1) See description of the DATE type *(see page 75)*.					

Function 43-16: Write Date and Time

Structure of Modbus Write Date and Time Messages

Request

Definition			Number of Bytes	Value	Example
Slave number			1 byte	0x2F	47
Function code			1 byte	0x2B	43
Sub-function code			1 byte	0x10	16
Reserved			1 byte	0x00	Reserved
Date and time(1)	byte 1	not used	1 byte	0x00	Not used
	byte 2	Year	1 byte	0x0A	Year 2010
	byte 3	Month	1 byte	0x0B	Month of November
	byte 4	Day of the month	1 byte	0x02	Second day of the month
	byte 5	Hour	1 byte	0x0E	14 hours
	byte 6	Minute	1 byte	0x20	32 minutes
	byte 7 and byte 8	Millisecond	2 bytes	0x0DAC	3.5 seconds

(1) See description of the DATE type *(see page 75)*.

Response

Definition			Number of Bytes	Value	Example
Slave number			1 byte	0x2F	47
Function code			1 byte	0x2B	43
Sub-function code			1 byte	0x10	15
Reserved			1 byte	0x00	Reserved
Date and time(1)	byte 1	Not used	1 byte	0x00	Not used
	byte 2	Year	1 byte	0x0A	Year 2010
	byte 3	Month	1 byte	0x0B	Month of November
	byte 4	Day of the month	1 byte	0x02	Second day of the month
	byte 5	Hour	1 byte	0x0E	14 hours
	byte 6	Minute	1 byte	0x20	32 minutes
	byte 7 and byte 8	Millisecond	2 bytes	0x0DAE	3.502 seconds

(1) See description of the DATE type *(see page 75)*.

Function 100–4: Read Non-Adjacent Words

Structure of Modbus Read n Non-Adjacent Words Messages Where n ≤ 100

The example below is the case of reading of 2 non-adjacent words.

Request

Definition	Number of Bytes	Value
Modbus slave number	1 byte	0x2F
Function code	1 byte	0x64
Length of data in bytes	1 byte	0x06
Sub-function code	1 byte	0x04
Transmission number(1)	1 byte	0xXX
Address of the first word to be read (MSB)	1 byte	0x00
Address of the first word to be read (LSB)	1 byte	0x65
Address of the second word to be read (MSB)	1 byte	0x00
Address of the second word to be read (LSB)	1 byte	0x67
(1) The master gives the transmission number in the request.		

NOTE: The above table describes how to read addresses 101 = 0x65 and 103 = 0x67 of a Modbus slave. The Modbus slave number is 47 = 0x2F.

Response

Definition	Number of Bytes	Value
Modbus slave number	1 byte	0x2F
Function code	1 byte	0x64
Length of data in bytes	1 byte	0x06
Sub-function code	1 byte	0x04
Transmission number(1)	1 byte	0xXX
First word read (MSB)	1 byte	0x12
First word read (LSB)	1 byte	0x0A
Second word read (MSB)	1 byte	0x74
Second word read (LSB)	1 byte	0x0C
(1) The slave sends back the same number in the response.		

NOTE: The above table describes how to read addresses 101 = 0x65 and 103 = 0x67 of a Modbus slave. The Modbus slave number is 47 = 0x2F.

Appendix B
Reset of Acti9 Smartlink SI D

Description

Resetting Acti9 Smartlink SI D

There are two levels of reset:

- Level 1: Press and hold the **Reset** button between 1 to 10 seconds to retain all the configurations of the product. However, the mode of IP acquisition is set to DHCP mode, that is if you had set up a static IP address and lost your IP address, you can still retrieve your product using DHCP.
- Level 2: Press and hold the **Reset** button for more than 10 seconds, the Acti9 Smartlink SI D is reset to the factory parameter settings.
  The reset data is as follows:
  - The user application name is set to mySmartlink-xxxx (IP address).
  - The building name becomes default.
  - The mode of IP acquisition is set to DHCP.
  - The password is set to the default value.
  - The panel information saved in Acti9 Smartlink SI D is erased.
  - The user accounts are erased (only default user accounts are retained).
  - The wireless device configurations are deleted.
  - The IP related settings are set to default value (date/time, DNS, IP filter, and email service).
  - Generic events are set to default configurations.
  - Specific alarm is deleted.
  - The PowerTag configurations are removed.

NOTICE
HAZARD OF EQUIPMENT DAMAGE Do not switch off the power supply until the LED status stops blinking in RED, as the reboot is still in progress. **Failure to follow these instructions can result in equipment damage.**

Appendix C
Troubleshooting

What Is in This Chapter?

This chapter contains the following topics:

Common Problems

Description

The following table describe the abnormal behavior and diagnostics, and provide some corrective actions:

Problem	Diagnostics	Action
Web page is displayed only with texts without graphics.	The text and graphics in the web page is loaded based on the traffic and disruptions on the IT network.	Refresh the browser.
IP setting changes are not effected.	IP settings not applied	Reboot the device if the changes do not take effect within two minutes.
Firmware upgrade is not succeeded.	Smartlink is disconnected from the network	Follow the below steps to recover the Smartlink: **1.** Disconnect Smartlink from the network. **2.** Power cycle the Smartlink. **3.** Connect your PC or laptop directly to the Smartlink. **4.** Use **Automatic Discovery** from the Ecoreach software to connect Acti9 Smartlink SI D, see *Ecoreach Online Help*. **5.** Launch firmware upgrade.
Acti9 Smartlink has lost the communication with PowerTag wireless communication energy sensors.	Pollution on the radio frequency channel	Change the radio frequency channel that communicates between PowerTag wireless communication energy sensors and Acti9 Smartlink in the **Settings → Communication → Wireless Network Configuration** page.
A PowerTag wireless communication energy sensor is not detected/discovered by Acti9 Smartlink SI D.	Acti9 Smartlink SI D does not recognize this type of PowerTag wireless communication energy sensor. Only PowerTag Acti9 and PowerTag NSX wireless communication energy sensors are recognized by Acti9 Smartlink SI D.	Upgrade the firmware of Acti9 Smartlink SI D with Ecoreach software, see *Ecoreach Online Help*.
How to substitute a Acti9 Smartlink SI D and reconnect all PowerTag wireless communication energy sensors on the new Acti9 Smartlink SI D (while keeping the same Modbus slave number for the Smartlink and the PowerTag wireless communication energy sensors).	The PowerTag wireless communication energy sensors are connected/linked to the current Smartlink and must be re-allocated to the new Smartlink.	Follow the below steps to replace the Smartlink: **1.** Note the Modbus slave number of Smartlink and the PowerTag wireless communication energy sensors from the web pages if the current Smartlink is still accessible, or from the BMS, or with Ecoreach software. **2.** Remove the current Smartlink to be changed. The PowerTag wireless communication energy sensors blink red because the Smartlink is no more linked to them. **3.** Install the new Smartlink. **4.** Restart all the PowerTag wireless communication energy sensors. The PowerTag wireless communication energy sensors blink orange (looking for a new Smartlink) **5.** Switch ON the new Smartlink. Open the Smartlink configuration page (either with Ecoreach software or the web pages). **6.** Discover the PowerTag wireless communication energy sensors with the scan function. **7.** In each PowerTag parameters, set the configuration with the initial Modbus slave number of the PowerTag noted in step 1. **8.** In the Smartlink parameters, set the configuration with the initial Modbus slave number of the old Smartlink noted in step 1.

Description of Status LED

Status LED

The following table lists the Status LED according to the operating mode:

Mode	Status LED	Status
Initialization / Operation		Green light: Product operates normally.
Start-up		Alternate green and red light every second: Device is starting.
Reset (level 1)		Green blink: Reset button acknowledgment (pressed between 5 to 10 seconds). IP settings are reconfigured to DHCP mode.
Reset (level 2)		Red blink (Fast, 2 blinks/sec): while pressing the reset button for more than10 seconds. The LED stops blinking after the reset button is released: do not switch off the product until the LED stops blinking in RED for at least 30 seconds, as the product restarts.
Duplicate IP address		Red blink (1 blink per second): System has detected duplicate IP address. Check and change the IP address of the Acti9 Smartlink SI D.
Degraded		Flashing orange light: Power supply of the product is degraded.
Failure		Red light: Out of service or hardware failure.

Description of Ethernet Status LED

Ethernet Status LED

Mode	LK/10-100/ACT LED	Status
Ethernet communication		Activity at 10 Mbps: alternate yellow and white
		Activity at 100 Mbps: alternate green and white

Description of Wireless Status LED

Wireless Status LED

The following table lists the Wireless Status LED according to the operating mode:

Mode	Wireless Status LED	Status
Initialization		Solid amber: not configured
Startup		Blinking amber: looking for wireless device
Operation		Flash green every five seconds: networking complete (normal operation
Degraded		Blink green and red (one second): downgraded while boot mode
Disabled		No light: wireless disabled

DOCA0115EN-03

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03/2018