

# Acti9 Smartlink SI B User Manual

03/2018



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## 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.

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# 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 B communication system.

### Validity Note

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

It combines command and control, metering and protection functions designed for energy efficiency solutions. Based on the Modbus protocol, the Acti9 Smartlink SI B 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 B (English, Dutch, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	NVE12086
User Guide for the Acti9 Smartlink Ethernet (English)	DOCA0073EN
Instruction Sheet for the Acti9 Smartlink Modbus (English, Dutch, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B33423
User Guide for the Acti9 Smartlink Modbus (English)	DOCA0004EN
Instruction Sheet for the iACT24 Auxiliary on the iCT Contactor (English, Dutch, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B33421
Instruction Sheet for the iATL24 Auxiliary on the iTL Remote Control Switch (English, Dutch, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B33422
Instruction Sheet for the RCA iC60 Remote Control (English, Dutch, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1A4079001
User Manual for the RCA iC60 Remote Control (English)	A9MA01EN
User Manual for the Reflex iC60 Integrated Control Circuit Breaker (English)	A9MA03EN
Instruction Sheet for the Reflex iC60 Integrated Control Circuit Breaker (English, Dutch, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B8674701
Instruction Sheet for the iEM2000T Meter (English, Dutch, French, Finnish, German, Hungarian, Italian, Norwegian, Polish, Portuguese, Spanish, Swedish, Chinese, Russian)	S1A89364
Instruction Sheet for the iEM3100, iEM3110, iEM3115 Meters (English, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B46581
Instruction Sheet for the iEM3150, iEM3155 Meters (English, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B46583
Instruction Sheet for the iEM3200, iEM3210, iEM3215 Meters (English, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B46598
User Manual for the iEM3100 series / iEM3200 series Energy Meters (English)	DOCA0005EN
Instruction Sheet for the iEM3250, iEM3255 Meters (English, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B46602
Instruction Sheet for the PM3200 Series Power Meters (English, French, German, Italian, Portuguese, Spanish, Chinese, Russian)	S1B46607

Title of Documentation	Reference Number
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 Sensors 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 Sensors for Compact NSX400-630, Compact NS400-630, Compact INS320-630, Compact INV320-630 (Chinese, English, French, German, Italian, Portuguese, Russian, Spanish)	QGH46820
Instruction Sheet for the PM3200 Series Power Meters (Czech, Danish, Finnish, Hungarian, Dutch, Norwegian, Polish, Swedish)	S1B62914
User Manual for the PM3200 Series Power Meters (English)	DOCA0006EN
User Manual for the PowerLogic EGX300 Ethernet Gateway (English, French, German, Spanish)	63230-319-216
Technical Advice on the Acti9 Smartlink Device (English)	CA908033EN
User Manual for the Acti9 Communication System Diagnostics (English)	DOCA0042EN
Ecoreach Installation Guide (English)	<a href="#">DOCA0134EN</a>

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

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# Chapter 1

## Acti9 Smartlink System

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### Overview

#### Introduction

The Acti9 Smartlink system is used to control and monitor the final distribution boards to any supervision system.

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

The Acti9 Smartlink system concentrates the data from electrical distribution boards in real time, thus contributing to achieve energy efficiency targets.

The Acti9 Smartlink system collects data from any meter (including kilowatt-hour, water, air, gas, or steam meters).

This system consists of:

- Acti9 Smartlink SI B and the test kit.
- iOF+SD24, OF+SD24, iOF/SD24 indication auxiliaries.
- iACT24 and iATL24 auxiliaries for contactors and impulse relays in the Acti9 range.
- The Acti9 RCA iC60 remote control module with Ti24 interface.
- The Reflex iC60 integrated control circuit breaker with Ti24 interface.
- iEM2000T, iEM3110, iEM3155, iEM3210, iEM3255, and iEM3355 pulse meters and Modbus meters.
- 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 B through a wireless communication. The circuit breaker auxiliary allows you to monitor and control 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 of the device.
- Pre-wired cables.

This system offers the following advantages and services:

- Calculation functions.
- Telemetry applications.
- Monitor load unbalance.
- Monitor power and voltage loss.
- Alarm temperature, humidity, and luminescence.
- Energy management and regulations.
- Scheduled control of electrical distribution with any building systems.

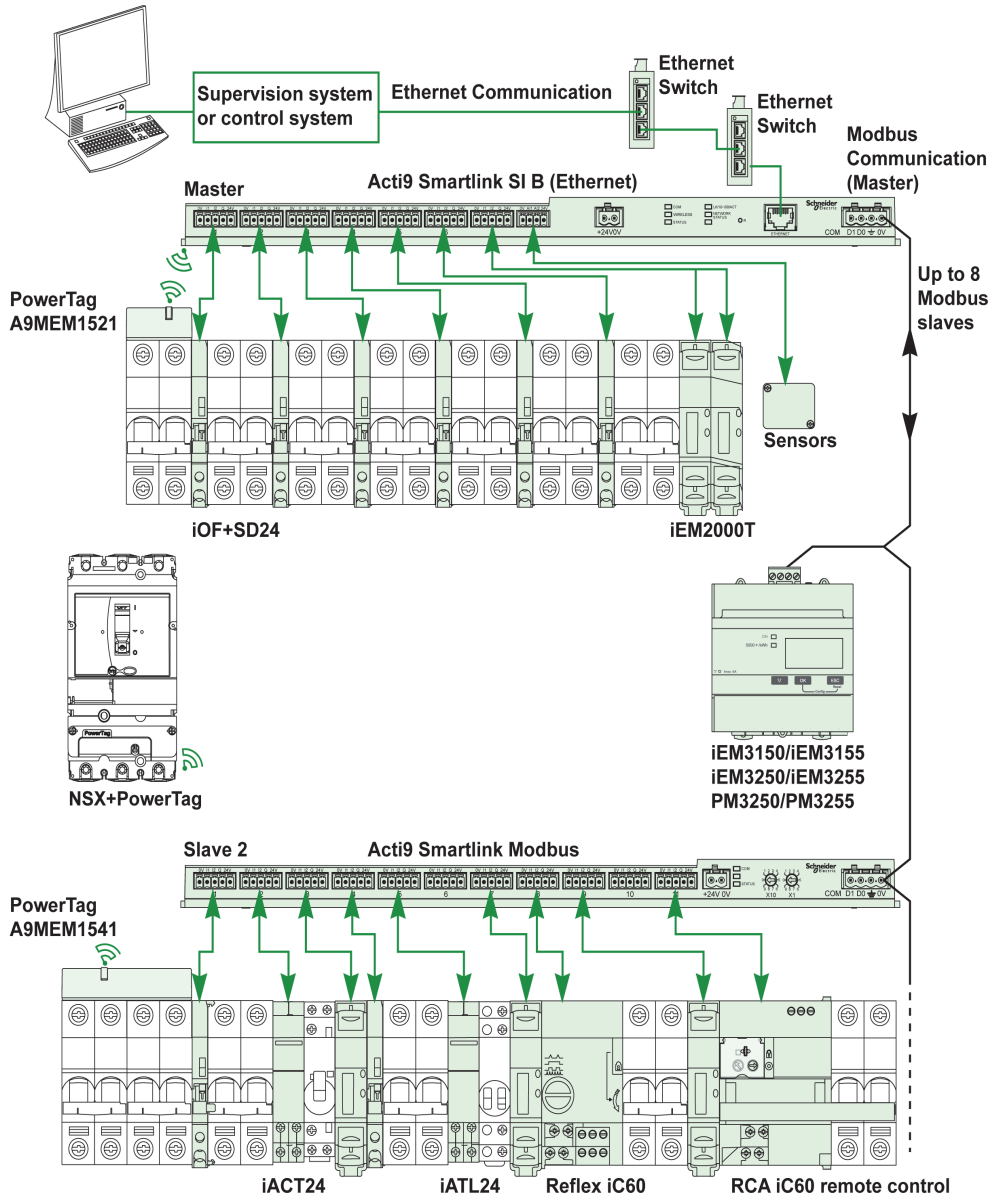
The Acti9 Smartlink system is an open system:

- Acti9 Smartlink SI B can be used as a standard I/O distributed module.
- Acti9 Smartlink SI B is equipped with seven digital channels. Each channel is represented by a Ti24 interface consisting of:
  - Two power supply terminals: 0 V and 24 Vdc
  - Two 24 Vdc logic inputs (I1 and I2)
  - One 24 Vdc logic output (Q)
- Each Ti24 interface is compatible with Miniconnect Phoenix standard connectors (at intervals of 3.81 mm) or equivalent.
- Acti9 Smartlink SI B is equipped with one analog channel having:
  - Two power supply terminals: 0 V and 24 Vdc
  - Two analog inputs (4...20 mA or 0...10 V)
- Acti9 Smartlink SI B is compatible with any type of counter (pulse output) compliant with standard IEC 62053-21 (minimum pulse width of 30 ms):
  - The pulse weight must be configured (written in a Modbus register).
  - Acti9 Smartlink SI B calculates consumption and flow.
- Acti9 Smartlink SI B is compatible with any type of device equipped with low-level inputs and outputs (24 Vdc).

The Acti9 Smartlink system is simple to use:

- The Acti9 Smartlink system pre-wired cables reduce complexity and wiring time by allowing connection on a Acti9 Smartlink SI B module of the Acti9 Smartlink system components and 24 Vdc compatible products.
- The Acti9 Smartlink system functions can be created by sending messages (Modbus protocol) to Acti9 Smartlink SI B devices (Modbus slave or Ethernet server) that act on devices via Ti24 interfaces.

**Acti9 Smartlink SI B Communication System Block Diagram**



Acti9 Smartlink SI B can manage a gateway function (Modbus TCP/IP to Modbus RS485). It can support up to eight Modbus RS485 slave devices (address from 1 to 149). The default address of the Modbus master port is 255.

Acti9 Smartlink SI B also manages webpage in order to configure settings or to monitor and control the Acti9 devices.



  **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

It is recommended not to use Acti9 Smartlink SI B to remotely control the circuits or loads requiring visual attendance.

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

 **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.**



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# Chapter 2

## Architecture of Acti9 Smartlink System

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Acti9 Smartlink SI B	16
Acti9 Communication System Pre-assembled Cables	17
Acti9 Devices with Ti24 Interface	19
Acti9 Devices without Ti24 Interface	20
PowerTag Wireless Communication Devices	21
Devices out of the Acti9 Range	24
Devices with Analog Output	25

## Acti9 Smartlink SI B

### Introduction

The Acti9 Smartlink SI B device has seven digital channels (24 Vdc) and one analog channel (4...20 mA or 0...10 Vdc) and can be connected to the devices in the Acti9 range equipped with a Ti24 interface. The data can be transmitted from the Acti9 Smartlink SI B device to a PLC or a supervision system via a Modbus TCP/IP protocol.

The Acti9 Smartlink SI B device channels can also be used to transmit standardized I/O. The Acti9 Smartlink SI B device can also therefore communicate with devices (not in the Acti9 range) with or without a Ti24 link.

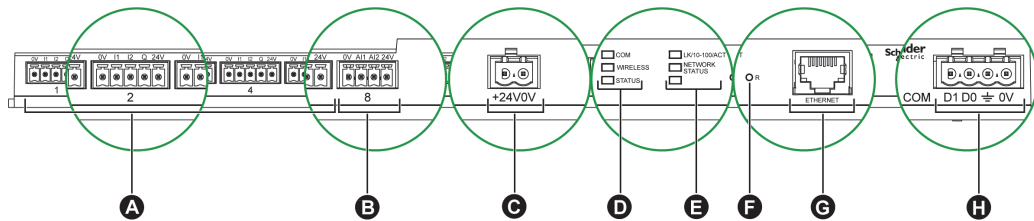
The devices which can be connected to the Acti9 Smartlink SI B include:

- Acti9 products: control switch for iACT24 contactors and iATL24 impulse relays, iC60 iOF+SD24 indication auxiliary, C60 OF+SD24 indication auxiliary, RCA iC60 remote control with Ti24 interface, Reflex iC60 integrated control circuit breaker with Ti24 interface.
- Meters: iEM2000T or other meters (Schneider Electric or other manufacturers) in compliance with IEC 62053-21 (minimum pulse 30 ms).
- Any product (not in the Acti9 range) that has command and control information: 2 discrete 24 V outputs and 1 discrete 24 V input.
- PowerTag energy sensors.
- Any product using analog output (4...20 mA or 0...10 V).

The Acti9 Smartlink SI B device is an intermediary between the supervisor and various electrical appliances. It can therefore be used to retrieve and process data received from devices and also control them. The functions available depend on the type of connected devices.

The Acti9 Smartlink SI B functions are described in Acti9 Smartlink SI B functions (*see page 101*).

### Description



- A** 7 digital input/output channels
- B** 1 analog channel with two inputs
- C** 1 x 24 V power connector
- D** Status LEDs (including Wireless LED)
- E** Ethernet LEDs
- F** Reset button
- G** Ethernet communication port
- H** 1 Modbus connector: 4-way

### Acti9 Smartlink SI B 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). 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 alarm on load level of each phase to monitor and balance the loads, and sends an alarm if the electrical device is down.

The Acti9 Smartlink SI B behaves as a data concentrator to collect information from digital, analog, wireless auxiliaries, and downstream Modbus devices. The Acti9 Smartlink SI B provides monitoring and control of the digital switchboard over Modbus TCP for upstream software and via embedded web pages for local access. The addition of new wireless auxiliaries provides affordable metering with panel size optimization.

## Acti9 Communication System Pre-assembled Cables

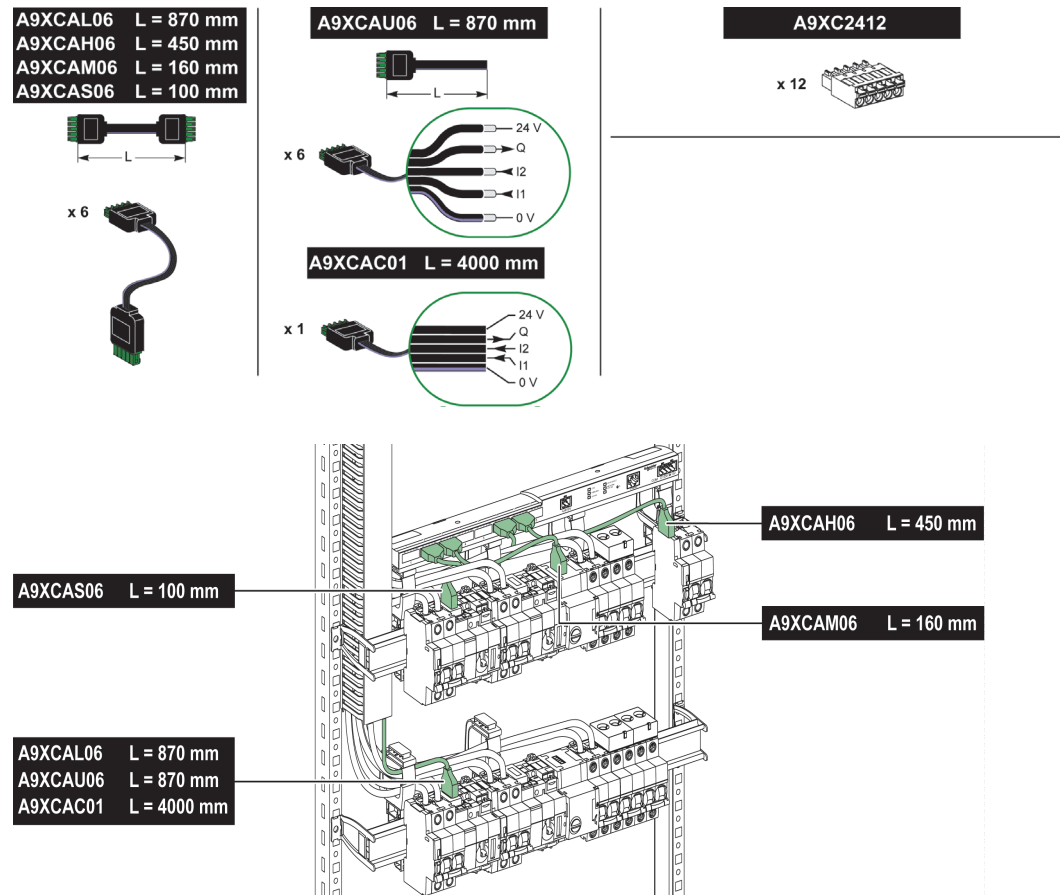
### Description

Acti9 communication pre-assembled cables are a quick way to connect all the Acti9 communication system components and compatible products (24 Vdc) to the channels of the Acti9 Smartlink SI B module.

The pre-assembled cables are:

Product Reference	Description	Length (mm)
A9XCAS06	Set of six pre-assembled cables with two Ti24 connectors	100
A9XCAM06	Set of six pre-assembled cables with two Ti24 connectors	160
A9XCAL06	Set of six pre-assembled cables with two Ti24 connectors	870
A9XCAH06	Set of six pre-assembled cables with two Ti24 connectors	450
A9XCAU06	Set of six pre-assembled cables with one Ti24 connector	870
A9XCAC01	One pre-assembled cable with one Ti24 connector	4,000
A9XC2412	Set of 12 connectors with 5-pin spring	-

Each Ti24 interface (I/O channel) is compatible with Miniconnect Phoenix standard connectors (at intervals of 3.81 mm) or equivalent.



**NOTE:** The connectors in each pre-assembled cable have a flat surface where a self-adhesive label can be placed to identify the channel number used. Self-adhesive labels are not supplied by Schneider Electric.

	<b>Description of the Connector at the Ti24 Interface End</b>	
	<b>Terminal</b>	<b>Description</b>
	24 V	24 V of the 24 Vdc power supply
	Q	Control output
	I2	Input number 2
	I1	Input number 1
0 V	0 V of the 24 Vdc power supply	

**NOTE:**

- Do not connect two wires in each of the Ti24 connector terminals (A9XC2412).
- Do not connect a wire with cable end in each of the Ti24 connector terminals.

The following figure gives the characteristics of cables that can be used with the A9XC2412 connector:

10 mm	0.5...1.5 mm <sup>2</sup>	0.4 x 2.5	

## Acti9 Devices with Ti24 Interface

### Description

Devices that can be connected to the Acti9 Smartlink SI B are listed in the table below:

Device	Product Reference	Description
iACT24 auxiliary for iCT contactor	A9C15924	The iACT24 auxiliary: <ul style="list-style-type: none"> <li>Can be used to control a contactor (iCT) via its Y1, Y2, and Y3 inputs. The Y3 (24 Vdc) input can be controlled by one of the Acti9 Smartlink SI B device channels.</li> <li>Is used to find out the contactor status (O/C status).</li> </ul>
iATL24 auxiliary for iTL contactor	A9C15424	The iATL24 auxiliary: <ul style="list-style-type: none"> <li>Can be used to control an (iTL) impulse relay via its Y1, Y2, and Y3 inputs. The Y3 (24 Vdc) input can be controlled by one of the Acti9 Smartlink SI B device channels.</li> <li>Is used to find out the impulse relay status (O/C status).</li> </ul>
iOF/SD24 indication auxiliary for iC60 and RCBO	A9A19804	OF24 allows you to monitor the Open/Close status of the breaker. This is chosen mechanically at device level. Based on your choice, you will configure the OF24 object on input. SD24 allows you to monitor the Trip/No Trip status of the breaker. This is chosen mechanically at device level. Based on your choice, you will configure the SD24 object on input.
iOF+SD24 indication auxiliary for iC60, iC65, MCB, and iDPN	A9A26897	The iOF+SD24 indication auxiliary is used to find out the status of a iC60, iC65 (OF and states) and iDPN circuit breaker(sold in China).
OF+SD24 indication auxiliary for C60, C120, C60H-DC, and iDPN circuit breakers	A9N26899	The OF+SD24 indication auxiliary is used to find out the status of a C60, C120, C60H-DC (OF and $\overline{SD}$ ) and iDPN circuit breaker (sold in all the countries except China).
Acti9 RCA iC60 remote control with Ti24 interface	A9C7012•	The Acti9 RCA iC60 remote control: <ul style="list-style-type: none"> <li>Should have a Ti24 interface (with product references A9C70122 and A9C70124).</li> <li>Can be used to control an iC60 circuit breaker via input Y3 of its Ti24 interface. Input Y3 (24 Vdc) can be controlled by one of the device channels Acti9 Smartlink SI B.</li> <li>Can be used to find out the OF and <math>\overline{SD}</math> status of the circuit breaker associated with the RCA iC60 remote control.</li> </ul>
Acti9 Reflex iC60 integrated control circuit breaker with Ti24 interface	A9C6••••	The Acti9 Reflex iC60 integrated control circuit breaker: <ul style="list-style-type: none"> <li>Should have a Ti24 interface (with product references A9C6••••).</li> <li>Can allow the device to be controlled via input Y3 of its Ti24 interface. The Y3 (24 Vdc) input can be controlled by one of the Acti9 Smartlink SI B channels.</li> <li>Can be used to communicate its O/C and auto/OFF status.</li> </ul>

**NOTE:** All the devices in the above table can be connected to channel N ( $1 \leq N \leq 7$ ) of the Acti9 Smartlink SI B module with A9XCAS06 pre-wired cable (or A9XCAM06 or A9XCAL06 or A9XCAH06).

## Acti9 Devices without Ti24 Interface

### Description

Devices that can be connected to the Acti9 Smartlink SI B are listed in the table below:

Designation	Product Reference	Description
iEM2000T	A9MEM2000T	Single-phase energy meter without display
iEM3110	A9MEM3110	Three-phase energy meter with display
iEM3155	A9MEM3155	Three-phase energy meter with display
iEM3210	A9MEM3210	Three-phase energy meter with display
iEM3255	A9MEM3255	Three-phase energy meter with display
iEM3310	A9MEM3310	Three-phase energy meter with display
iEM3350	A9MEM3350	Three-phase energy meter with display
iEM3355	A9MEM3355	Three-phase energy meter with display
iPRD (Type 2)	A9L****1	Withdrawable surge arresters with remote indication contact iPRD65r/iPRD40r/iPRD20r/iPRD8r
iPRD 40r PV (Type 2)	A9L40271 A9L40281	Withdrawable surge arresters with remote indication contact
iPRF1 12.5r (Type 1 + Type 2; Type B+C)	A9L16632 A9L16633 A9L16634	Monobloc surge arresters with remote indication contact
PRD1 25r (Type 1 + Type 2)	16329 16330 16331 16332	Withdrawable surge arresters with remote indication contact
PRD1 Master (Type 1)	16360 16361 16362 16363	Withdrawable surge arresters with remote indication contact
iQuick PRD (Type 2)	A9L16292 A9L16293 A9L16294 A9L16295 A9L16296 A9L16297 A9L16298 A9L16299 A9L16300	Withdrawable surge arresters with integrated backup MCB and remote indication contact

**NOTE:** The connection of these devices can be done with an pre-wired cable: molded connector (at Smartlink end), and with five wires (at device end).

The table below describes products that need a low level interface relay in order to be connected to Acti9 Smartlink SI B:

Designation	Product Reference	Description
IH, IHP	see catalog	Timer switches with RBN type low level relays or equivalent
IC	see catalog	Light sensitive switches with RBN type low level relays or equivalent
TH, THP	see catalog	Thermostats with RBN type low level relays or equivalent



## PowerTag Wireless Communication Devices

### Description

Wireless communication devices that can be connected to the Acti9 Smartlink SI B 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	Three-phase 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 B 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 B 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 B in the central cubicle. For more than three columns of 650 mm in the same switchboard, add one Acti9 Smartlink SI B 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 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 energy sensors among the 16 available radio channels. It is recommended to dispatch the Acti9 Smartlink SI B devices among the 16 channels using the manual channel selection in this section.
- use as many PowerTag 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 energy sensors that are in the same channel, to avoid overloading the bandwidth:

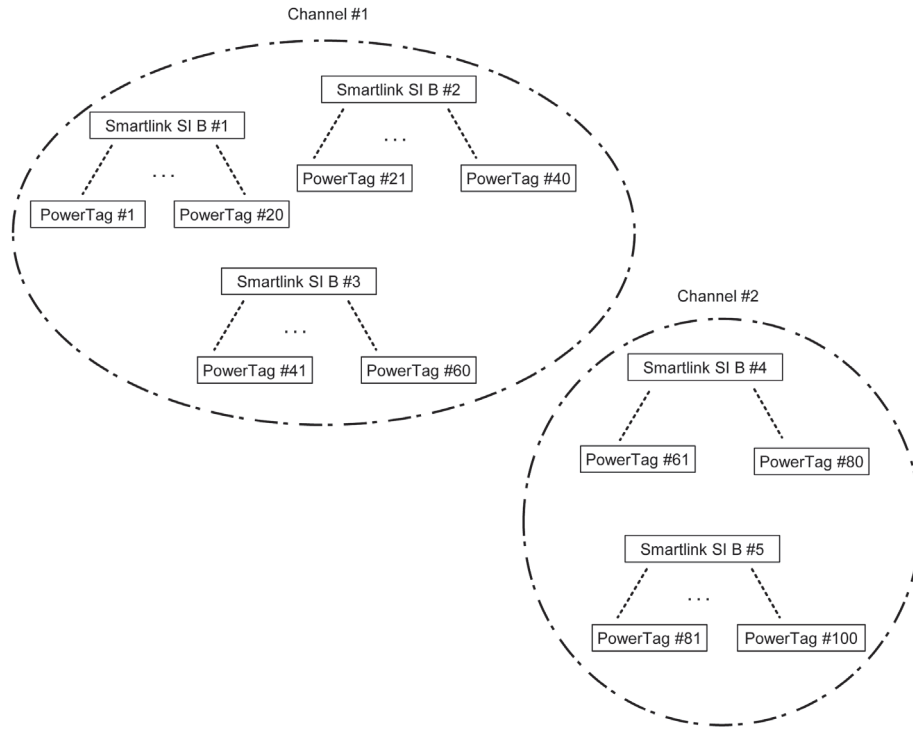
- Up to 100 PowerTag energy sensors by radio channel: communication period to be set to 5 seconds
- Up to 200 PowerTag energy sensors by radio channel: communication period to be set to 10 seconds
- Up to 400 PowerTag energy sensors by radio channel: communication period to be set to 20 seconds
- Up to 600 PowerTag energy sensors by radio channel: communication period to be set to 30 seconds
- Up to 1200 PowerTag 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 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 B and is applied to all the PowerTag energy sensors that are commissioned with Acti9 Smartlink SI B.
- An Acti9 Smartlink SI B device can manage up to 20 PowerTag energy sensors.
- Several Acti9 Smartlink SI B devices can use the same radio channel to communicate with PowerTag energy sensors.
- A set of Acti9 Smartlink SI B devices has to be installed and commissioned to concentrate all the needed PowerTag energy sensors.



## Devices out of the Acti9 Range

### Description

The devices that can be connected to the Acti9 Smartlink SI B are:

- Meter with a pulse output and compliant with standard IEC 62053-31.
- Volt-Free Low Level Indication Contact.
- Volt-Free Standard Indication Contact.
- Contactor and Relay.
- Indication device or PLC input can be directly connected to the output (Q) of Acti9 Smartlink SI B channel.

The connected device should have the following characteristics:

- To be powered with 24 Vdc.
- The consumption must be less than 100 mA.
- Any device (for example: motor) that needs a command circuit of more than 100 mA can be controlled by the output (Q) of a channel of Acti9 Smartlink SI B. The electrical diagram must be indirect between Acti9 Smartlink SI B and this device: a low level relay must be installed between the command of this device and Acti9 Smartlink SI B.

**NOTE:** The connection of these devices can be done with an A9XCAU06 or A9XCAC01 pre-wired cable: molded connector (at Smartlink end), and with five wires (at device end).

All sensors (compliant with IEC 61000-6-2 and IEC61000-6-3 standards) using one output (compatible with 4...20 mA or 0...10 V) can be directly connected to analog inputs of Acti9 Smartlink SI B (the cable for analog channel is delivered with the product).

## Devices with Analog Output

### Overview

All sensors (compliant with IEC 61000-6-2 and IEC61000-6-3 standards) using 24 Vdc as power supply input and 0...10 V or 4...20 mA output can be connected to the Acti9 Smartlink SI B analog inputs (female analog connector is delivered with the product).



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# Chapter 3

## Technical Characteristics

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Technical Characteristics of the Acti9 Smartlink SI B	28
Technical Characteristics of the Devices with Ti24 Interface	31

## Technical Characteristics of the Acti9 Smartlink SI B

### General Characteristics

Characteristic		Value
Product marking		CE
Temperature	Operation (horizontal)	-25...+60°C
	Operation (vertical)	-25...+50°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		IP 20
Level of pollution		3
Overvoltage category		OVC II
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 for the I/O, Modbus and Ethernet communication. 2 kV for the 24 Vdc - 5 kHz - 100 kHz power supply
Surge	IEC 61000-4-5	Power supply: 0.5 kV Modbus and 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 <sup>2</sup> S/SO <sup>2</sup> /NO <sup>2</sup> /Cl <sup>2</sup>
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

### Integrated Functions

Characteristic		Value
Counter	Number of counters	Up to 14 (14 inputs)
	Maximum frequency	16.667 Hz, IEC 62053-31
Period stored in backup memory		10 years

### 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		Modbus RTU, RS485 serial connection Modbus TCP/IP Ethernet
Transmission	Modbus RS485	Transfer rate: 9,600...19,200 Baud Medium: Double shielded twisted pair Impedance 120 Ω
	Ethernet	Transfer rate: 10/100 Mbps Medium: Shielded, STP or S/FTP, Cat5e or 6, straight cable, RJ45 connector
Structure	Type	Modbus, Ethernet
	Method	Master/Slave
Device type	Modbus	Master
	Ethernet	Server
Turnaround time	Modbus	10 ms
	Ethernet	1 ms
Maximum length of cable	Modbus	1000 m
	Ethernet	100 m
Type of bus connector	Modbus	4-pin connector
	Ethernet	RJ45 (Shielded)
Power supply	Nominal	Non-isolated 24 Vdc 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
Isolation	Between the Modbus serial connection and 24 Vdc Ti24 I/O interfaces	1.9 kVdc for 1 minute
	Between the Ethernet serial connection and 24 Vdc Ti24 I/O interfaces	1.9 kVdc for 1 minute
Number of digital I/O channels		7
Number of analog input channels		1
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
Number of radio frequency devices	up to 20
RF standard compliance	ETSI / EN 300328 v1.9.1 ETSI / EN 301489-17 v2.2.1

## Digital Inputs

Characteristic	Value
Number of logic inputs	14 (2 per channel)
Rated input voltage	24 Vdc
Input type	Current sink, type 1 IEC 61131-2
Weight (0 V)	1 for 2 inputs (1 per channel)
Input voltage limits	19.2...28.8 Vdc

Characteristic	Value
Rated input current	2.5 mA
Maximum input current	5 mA
Filter time	2 ms
Acquisition time	10 ms
Isolation	No isolation between the Ti24 interfaces
Negative voltage protection	Yes
Maximum length of cables and cordsets	500 m (conductor c.s.a. of at least 0.5 mm <sup>2</sup> )

### Digital Outputs

Characteristic	Value	
Number of logic outputs	7 (1 per channel)	
Logic output	Current source, 24 Vdc 0.1 A IEC 61131-2	
Weight (0 V)	1	
Rated output voltage	Voltage	24 Vdc
	Maximum current	100 mA
Filter time	1 ms	
Voltage drop (voltage at state 1)	1 V max.	
Maximum current inrush	500 mA	
Leakage current	0.1 mA	
Overvoltage protection	33 Vdc	
Short-circuit protection	Yes	
Overload protection	Yes	
Current limiting	Yes	
Maximum length of cables and cordsets	500 m (conductor c.s.a. of at least 0.5 mm <sup>2</sup> )	

### Analog Inputs

Characteristic	Value	
Number of analog inputs	2	
Type of each input	Voltage/Current: IEC 61131 - 2 compliant	
Rated input voltage	0...10 V	
Rated input current	4...20 mA	
Input impedance	Current mode	140 Ω
	Voltage mode	50 KΩ
Resolution	12 bits	
Accuracy	≤ ± 1% of the full scale	
Refresh time	500 ms	
Isolation	None	
Type of cable	Twisted shielded pair and screened cable	
Cable length	< 30 m maximum <sup>(1)</sup>	
Channel 8 (Analog inputs) maximum sourcing current at 24 V to power the sensors	200 mA for each analog sensor	
Conversion time/Refresh time	100 ms	
Connector type	Screw type (4-pin), 3.5 mm pitch	

**NOTE:** <sup>(1)</sup> Wrong wiring or wrong configuration can cause the analog input damage.

Introduce analog isolators (with 0.5 to 1% accuracy) when the cables go outside the switchboard where Acti9 Smartlink SI B is mounted.

## Technical Characteristics of the Devices with Ti24 Interface

### iACT24

Characteristic		Value
Control voltage (Ue)		230 Vac, +10 %, -15 % (Y2) 24 Vdc, ± 20 % (Y3)
Control voltage frequency		50/60 Hz
Insulation voltage (Ui)		250 Vac
Rated impulse withstand voltage (Uimp)		8 kV (OVC IV)
Level of pollution		3
Degree of protection		IP20B device only IP40 device in modular enclosure
Width in 9 mm modules		2
Auxiliary contact (O/C) Ti24		24 Vdc protected output, min. 2 mA, max. 100 mA
Contact		1 O/C operating category AC 14
Temperature	Operation	-25 ... 60°C
	Storage	-40 ... +80°C
Consumption		< 1 W
Standard		IEC/EN 60947-5-1

### iATL24

Characteristic		Value
Control voltage (Ue)		230 Vac, +10 %, -15 % (Y2) 24 Vdc, ± 20 % (Y3)
Control voltage frequency		50/60 Hz
Insulation voltage (Ui)		250 Vac
Rated impulse withstand voltage (Uimp)		8 kV (OVC IV)
Level of pollution		3
Degree of protection		IP20B device only IP40 device in modular enclosure
Width in 9 mm modules		2
Auxiliary contact (O/C) Ti24		24 Vdc protected output, min. 2 mA, max. 100 mA
Contact		1 O/C operating category AC 14
Temperature	Operation	-25 ... 60°C
	Storage	-40 ... +80°C
Consumption		< 1 W
Standard		IEC/EN 60947-5-1

### OF+SD24 (A9N26899)

Characteristic		Value
Insulation voltage (Ui)		500 Vac
Rated impulse withstand voltage (Uimp)		6 kV (OVC IV)
Rated operational current (Ie)		2...100 mA at 24 Vdc (± 20 %)
Level of pollution		2
Degree of protection		IP20
Width in 9 mm modules		1
Temperature	Operation	-25 ... 60°C
	Storage	-40 ... +85°C
Standard		IEC 60947-5-1 IEC 60947-5-4

**iOF+SD24 (A9A26897)**

Characteristic		Value
Insulation voltage (Ui)		500 Vac
Rated impulse withstand voltage (Uimp)		6 kV (OVC IV)
Rated operational current (Ie)		2...100 mA at 24 Vdc ( $\pm 20\%$ )
Level of pollution		2
Degree of protection		IP20B device only IP40 device in modular enclosure
Width in 9 mm modules		1
Temperature	Operation	-35 ... 70°C
	Storage	-40 ... +85°C
Standard		IEC 60947-5-1 IEC 60947-5-4

**iOF/SD24 (A9A19804)**

Characteristic		Value
Insulation voltage (Ui)		500 Vac
Rated impulse withstand voltage (Uimp)		6 kV (OVC IV)
Rated operational current (Ie)		2...100 mA at 24 Vdc ( $\pm 20\%$ )
Level of pollution		2
Degree of protection		IP20B
Width in 9 mm modules		1
Temperature	Operation	-25 ... 60°C
	Storage	-40 ... +85°C
Standard		IEC 60947-5-1 IEC 60947-5-4

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# Chapter 4

## Sizing the 24 Vdc Power Supply

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Definition of the 24 Vdc Power Supply	34
Protection Against a 240 Vac Fault on the Acti9 Smartlink SI B Channels	36
Electromagnetic Compatibility (EMC) Recommendations	37

## Definition of the 24 Vdc Power Supply

### Safety Information


DANGER

**RISK OF ELECTROCUTION**

Isolate the Acti9 Smartlink SI B 24 V power terminals from the power terminals connected to the Modbus network line.

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

**Example:** The 0 V and the 24 V of a 24 Vdc power supply connected to the TRV00210 ULP communication module must be isolated from the **0 V** or **+24 V** terminals of the 24 Vdc power supply for the Acti9 Smartlink SI B device.

### General Characteristics

The Acti9 Smartlink SI B device consumption:

Status	Consumption
Device with no load	110 mA
Device under load	1.5 A maximum

### Products in the Acti9 Range

If products connected to the channels (Ti24 interfaces) of an Acti9 Smartlink SI B device are in the Acti9 range, the consumption of a channel output is the same as the consumption of an input because the output is connected to the input. All that needs to be done is to add up the consumption of three input currents per channel.

**Example:** Assuming that the input current is less than 5 mA and two analog sensors connected to Acti9 Smartlink SI B, the consumption of an Acti9 Smartlink Ethernet Wireless device is as follows:

$$\text{No-load consumption} + (\text{number of digital channels} \times 3 \text{ input currents}) + (\text{Analog sensor} \times 2) = 110 \text{ mA} + (7 \times (3 \times 5 \text{ mA})) + (200 \text{ mA} \times 2) = 615 \text{ mA}$$

### Products that can be Controlled by a Channel

If products connected to the channels (Ti24 interfaces) of an Acti9 Smartlink SI B device are in a different range, the maximum consumption of a device channel is 110 mA. The output for each channel supplies 100 mA, the digital inputs can consume up to 10 mA and the analog input can consume up to 200 mA.

**Example:** Assuming that the consumption of one channel is 110 mA, the consumption of one Acti9 Smartlink SI B device is as follows:

$$\text{No-load consumption} + (\text{number of digital channels} \times \text{consumption per channel}) + (\text{Analog sensor} \times 2) = 110 \text{ mA} + (7 \times 110 \text{ mA}) + (200 \text{ mA} \times 2) = 1.3 \text{ A}$$

### Selection of the Acti9 Smartlink SI B 24 Vdc Power Supply

The 24 Vdc power supply must correspond to the following criteria:

- It must be located inside the electrical cabinet.
- It must be different from the Modbus network 24 Vdc power supply so as to maintain galvanic isolation between the Modbus network (common to several electrical cabinets) and the 24 Vdc I/O.
- It must be Safety Extra Low Voltage (SELV) type.
- Galvanic isolation between the power supply input (AC voltage) and the power supply output (DC voltage) must be at least 3 kVac at 50 Hz.
- The rated AC voltage of the power supply input must be 240 Vac +15/-20%.
- This power supply can be used to supply other products inside the electrical cabinet provided that these products are double insulated or with reinforced insulation so as to preserve the power supply's SELV quality.

Phaseo ABL8MEM240xx (OVC II) or ABL7RM24025 (OVC II) modular power supplies and their accessories comply with the above recommendations. These accessories provide the redundancy and backup power supply functions and can eliminate micro-cuts on the line.

The upstream and downstream protection functions of the Phaseo power supply must be installed as indicated in their respective manuals.

**NOTE:** OVC indicates the overvoltage category.

If overvoltage category IV or III is needed in the installation, we recommend using:

- Either power supplies (limited to 1 A) in the ULP (Universal Logic Plug) system with product references 54440 to 54445. See the User's Manual, ULP Connection System, product reference TRV99100
- Or use the Phaseo power supply recommended above, protecting it with an isolating transformer from the Phaseo Optimum (ABL6TS) range or the Universal (ABT7PDU) range.

**NOTE:** For each of these solutions, you should refer to the respective manuals.

#### **Protection Against a 240 Vac Fault on the Acti9 Smartlink SI B Device 24 Vdc Input**

A fuse protection is provided if a 240 Vac power supply is accidentally connected to the 24 Vdc input on the Acti9 Smartlink SI B power supply.

## Protection Against a 240 Vac Fault on the Acti9 Smartlink SI B Channels


### Overview

In the event of a wiring error or electrical fault, the 240 Vac voltage may be present on the Acti9 Smartlink SI B device channels: the neutral or phase (240 Vac) can be in contact with the Ti24 interfaces or the 24 Vdc power supply.


The insulation inside the Acti9 Smartlink SI B device prevents propagation of this dangerous voltage (240 Vac) over the Modbus and Ethernet network.

The protection function inside the Acti9 Smartlink SI B device eliminates the risk of fire inside the Acti9 Smartlink SI B device.

These two protection functions (internal insulation and internal protection) cannot prevent wiring errors or electrical faults. A risk of dangerous voltage remains on the Acti9 Smartlink SI B device channels.

 <b>DANGER</b>
<b>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</b>
<ul style="list-style-type: none"><li>• Implement a TT or TN-S earthing system.</li><li>• Connect the SELV (Safety Extra Low Voltage) power supply 0 Vdc to the protective earth to make it a PELV (Protective Extra Low Voltage) power supply. The upstream residual current protection must be type A.</li></ul>
<b>Failure to follow these instructions will result in death or serious injury.</b>

**NOTE:** In the majority of cases, the presence of a PELV means an upstream residual current protection can trip, thus protecting people and property.

 <b>DANGER</b>
<b>ACCIDENTAL EQUIPMENT BEHAVIOR</b>
<ul style="list-style-type: none"><li>• Connect the 0 Vdc of the SELV power supply to the protective earth at a single point to avoid any stray currents (50 Hz, harmonics, or transient currents) circulating across the 0 Vdc.</li><li>• Check that products supplied by this power supply are not already connecting the 0 Vdc to the protective earth.</li></ul>
<b>Failure to follow these instructions will result in death or serious injury.</b>

<b>NOTICE</b>
<b>RISK OF DAMAGING THE ACTI9 SMARTLINK DEVICE</b>
<ul style="list-style-type: none"><li>• Connect the 0 Vdc of the SELV power supply to the protective earth at a single point to avoid any stray currents (50 Hz, harmonics, or transient currents) circulating across the 0 Vdc.</li><li>• Check that products supplied by this power supply are not already connecting the 0 Vdc to the protective earth.</li></ul>
<b>Failure to follow these instructions can result in equipment damage.</b>

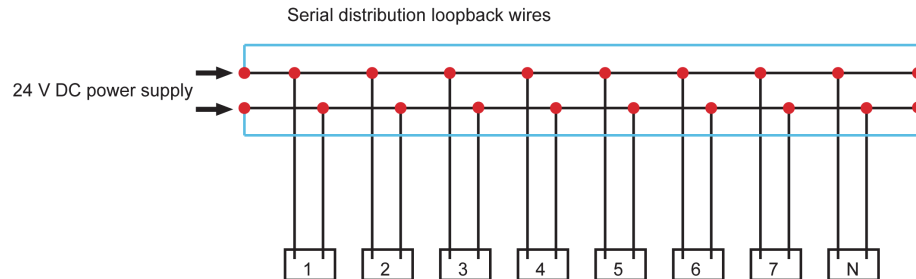


## Electromagnetic Compatibility (EMC) Recommendations

### Overview

A star 24 Vdc distribution is preferable to a serial 24 Vdc distribution because star 24 Vdc distribution can minimize the wiring impedance.

If serial distribution is used, it is recommended to wire two serial loopback wires (see the two blue wires in the drawing below) in order to minimize impedance.



In a poor-quality electrical distribution network, it is recommended to use a Phaseo power supply from the Universal range (ABL8MEM240xx (OVC II) or ABL7RM24025 (OVC II)) which can withstand up to 500 Vac incoming and also offers galvanic insulation between the power supply AC input and the power supply DC output of 4 kVac at 50 Hz.

It is mandatory to comply with the segregation rules between low level signals (24 Vdc) and power conductors, see:

- [www.electrical-installation.org](http://www.electrical-installation.org) see "ElectroMagnetic Compatibility (EMC)" part, "Wiring recommendations" section (information only available in English).
- Electrical Installation Guide in pdf format: Document No. EIGED306001EN.



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# Chapter 5

## Installation

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Mounting	40
Connection	46

## Mounting

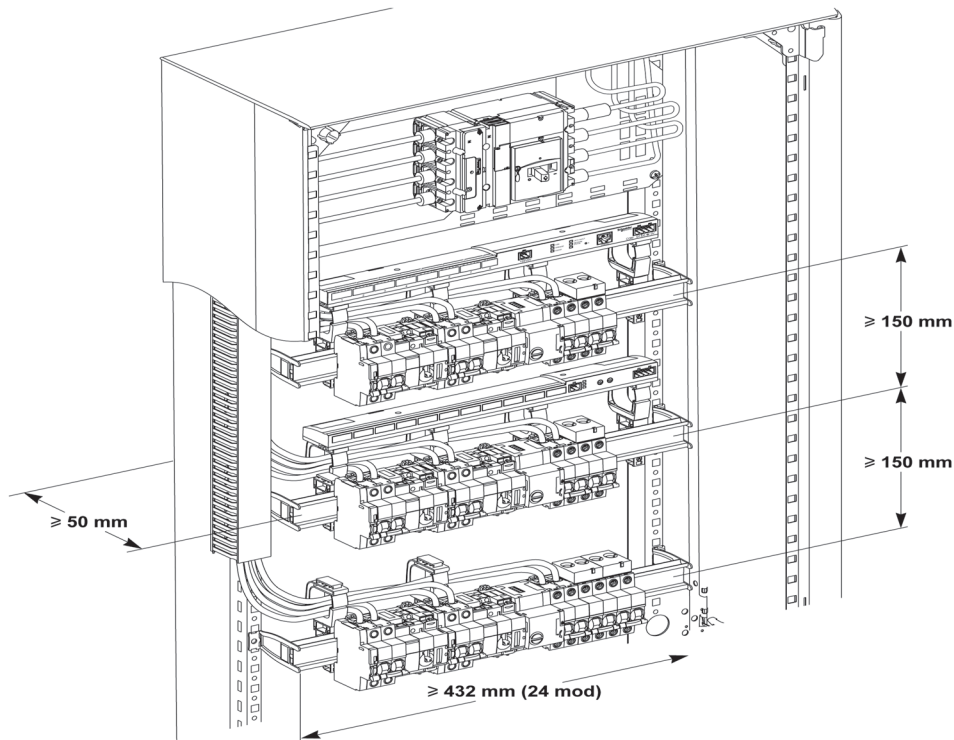
### Introduction

The Acti9 Smartlink SI B can be mounted on:

- DIN rail
- Multiclip 80
- Multiclip 200
- Mounting brackets
- Mounting Kit for Pragma and Kaedra

The Acti9 Smartlink SI B can be installed horizontally or vertically:

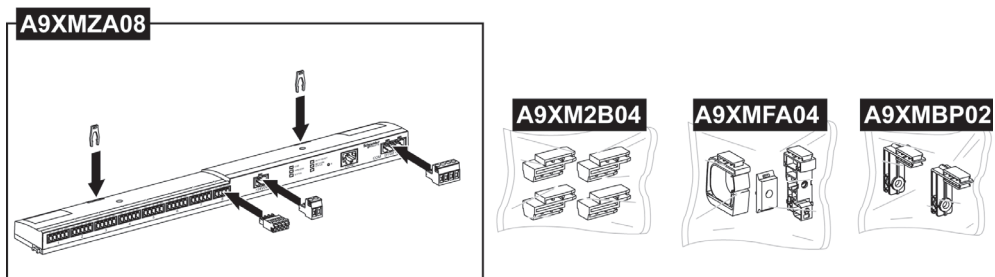
- In a horizontal mounting, Acti9 Smartlink SI B is clipped onto DIN rails with fixing centers of 150 mm or more.
- Wall-mounted and floor-standing enclosures must be at least 24 modules wide (18 mm x 24 = 432 mm).
- The distance between the DIN rail and the back of the wall-mounted or floor-standing enclosure must be at least 50 mm.



The ambient operating temperature is:

- Horizontal mounting: -25°...+60°C
- Vertical mounting: -25°...+50°C

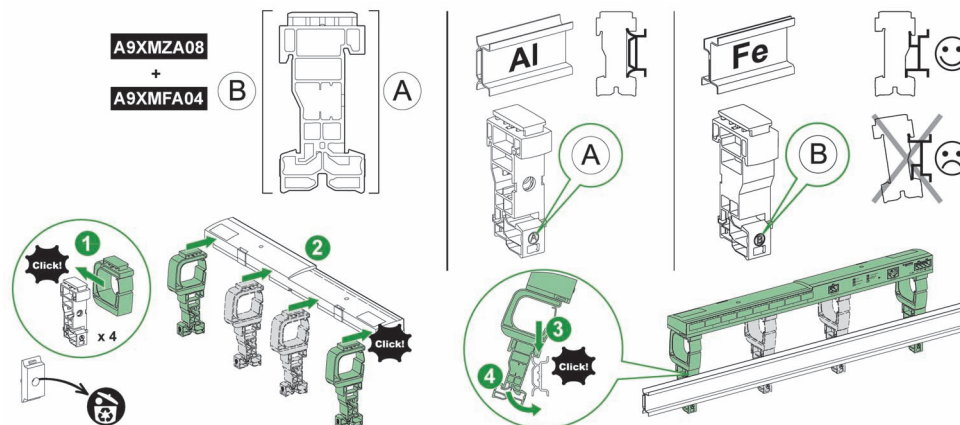
### Mounting Components



Product Reference	Description
A9XMZA08	Acti9 Smartlink SI B
A9XMFA04	Set of bracelets, adapters, and feet for DIN rail mounting
A9XM2B04	Spacers for Multiclip 200 mounting
A9XMBP02	Mounting brackets kit

### DIN Rail Mounting

The side of the foot (**A** or **B** in the drawing below) used to mount the system on the DIN rail depends on the type of rail (aluminum or iron).

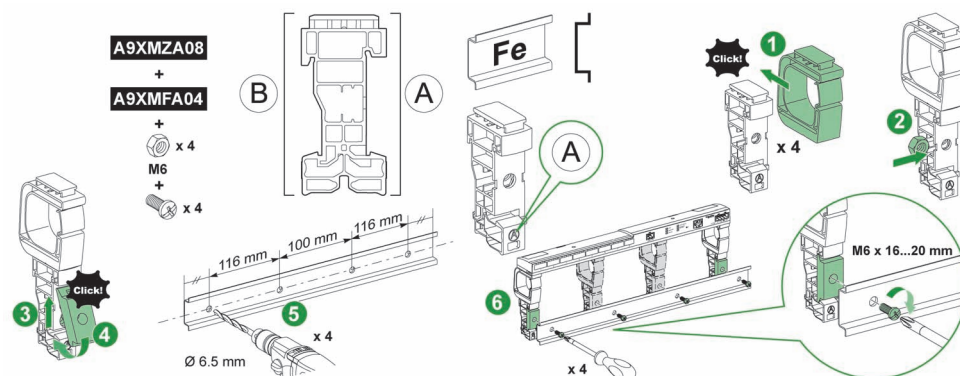


The following table describes the procedure for mounting the Acti9 Smartlink SI B device on a DIN rail:

Step	Action
1	Clip one bracelet onto one foot according to the type of rail. Repeat this step three times.
2	Clip the Acti9 Smartlink SI B device on top of the bracelets.
3	Place the top of the foot at an angle against the top lip of the rail.
4	Clip the bottom of the foot into place.
5	Repeat steps 3 and 4 for each of the other three feet.

### Simple DIN Rail Mounting

To mount the system on a simple DIN rail (iron), use side **A** of the foot.

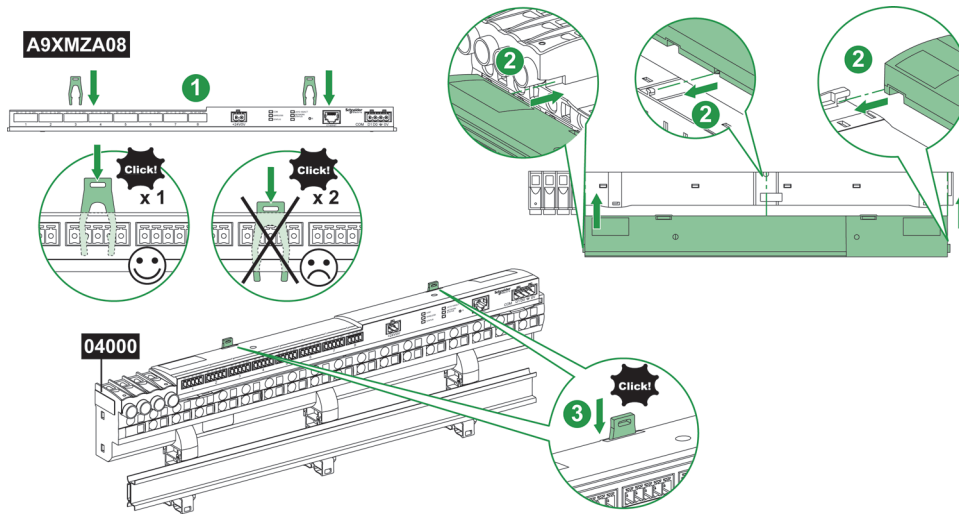


The following table describes the procedure for mounting the Acti9 Smartlink SI B device on a simple DIN rail:

Step	Action
1	Clip one bracelet onto side <b>A</b> of a foot. Repeat this step three times.
2	Place one M6 nut inside a foot. Repeat this step three times.
3	Position the top of an adapter diagonally at the front of a foot.
4	Clip the bottom of the adapter into place. Repeat steps 3 and 4 three times.

Step	Action
5	Drill the rail making sure that the drill hole diameters and positioning dimensions are correct, as shown in the above graphic.
6	Screw the feet onto the rail.

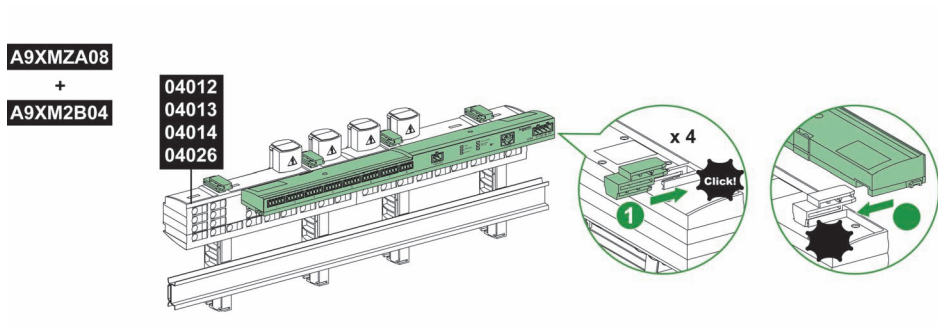
**Mounting on Multiclip 80**



The following table describes the procedure for mounting the Acti9 Smartlink SI B device on Multiclip 80.

Step	Action
1	Position the two clips in the notches on the Acti9 Smartlink SI B device.
2	Slide the Acti9 Smartlink SI B device front first onto the Multiclip 80 until fully inserted.
3	Push down the two clips until they click into place.

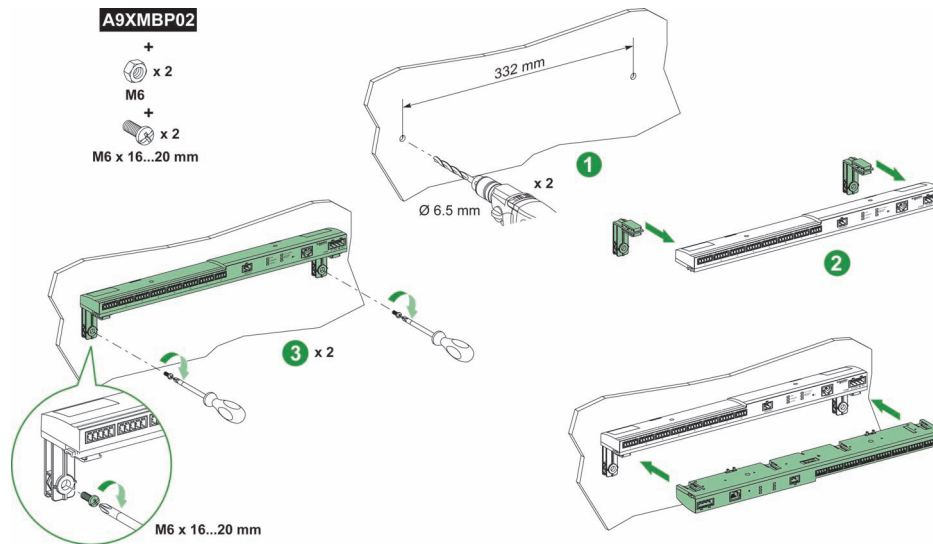
**Mounting on Multiclip 200**



The following table describes the procedure for mounting the Acti9 Smartlink SI B device on Multiclip 200.

Step	Action
1	Slide the four spacers from the back into the notches on top of the Multiclip 200.
2	Slide the Acti9 Smartlink SI B device front first onto the spacers, until it clicks into place.

## Mounting with Brackets

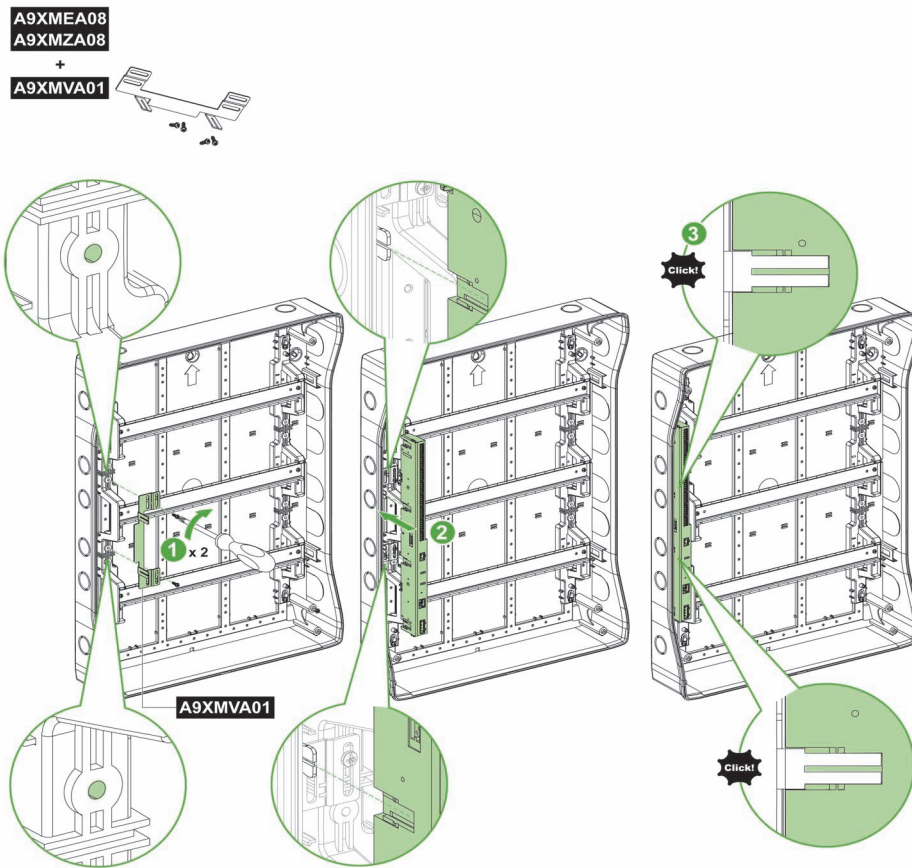


The following table describes the procedure for mounting the Acti9 Smartlink SI B with brackets.

Step	Action
1	Drill the plate of the cubicle making sure that the drill hole diameters and positioning dimensions are correct, as shown in the preceding graphic.
2	Slide the 2 brackets, from the back of the Acti9 Smartlink SI B device, into the notches on the bottom of the Acti9 Smartlink SI B device until they click into place.
3	Screw the brackets onto the plate.

Mounting Kit for Pragma and Kaedra

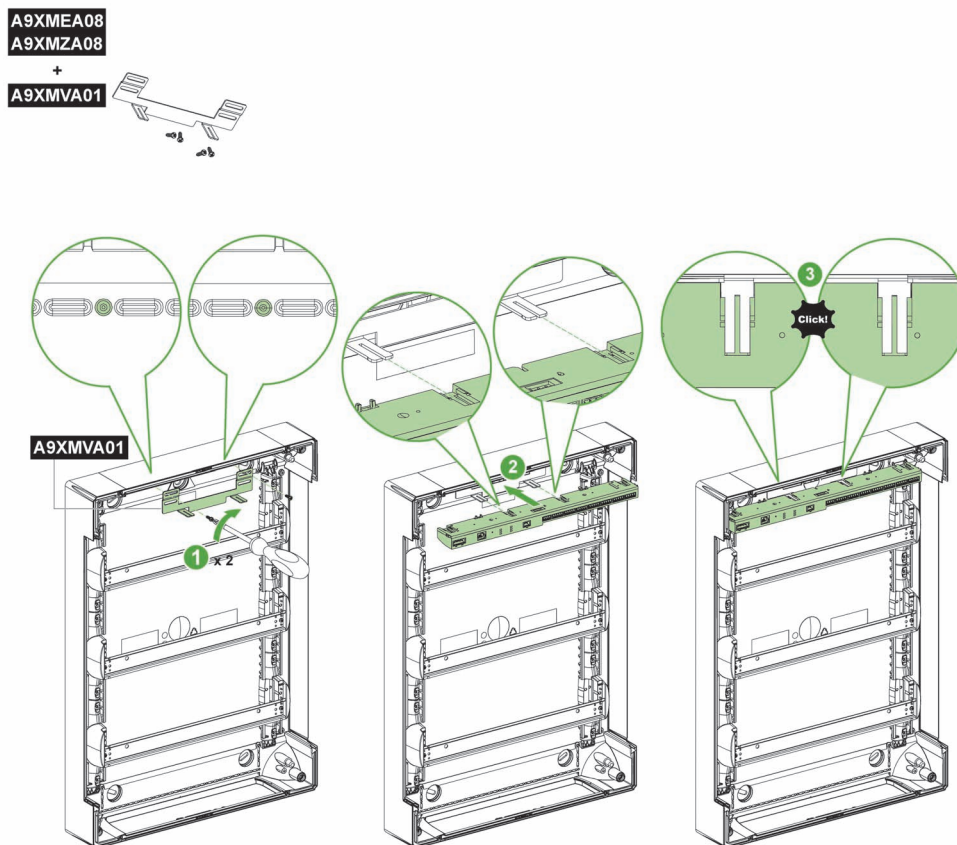
Mounting Possibilities for Kaedra Surface Panel



Acti9 Smartlink SI B (A9XMEA08, A9XMZA08) and A9XMVA01	Surface Enclosures
Smartlink: Mounted Vertical	Kaedra 13M 3R Kaedra 18M 3R
Smartlink: Mounted Horizontal	Kaedra 18M 1R Kaedra 18M 2R Kaedra 18M 3R Kaedra 18M 4R



Mounting Possibilities for Pragma Surface Panel



Acti9 Smartlink SI B (A9XMEA08, A9XMZA08) and A9XMVA01	Surface Enclosures
Smartlink: Mounted Vertical	Pragma 13M 3R Pragma 13M 4R Pragma 18M 3R Pragma 18M 4R
Smartlink : Mounted Horizontal	Pragma 18M 1R Pragma 18M 2R Pragma 18M 3R Pragma 18M 4R Pragma 24M 1R Pragma 24M 2R

This kit allows you to install Acti9 Smartlink SI B inside some of the Pragma and Kaedra panels.

Step	Action
1	Screw the A9XMVA01 kit either horizontally or vertically on the Pragma and Kaedra panel.
2	Slide and clip the Acti9 Smartlink SI B on the mounting kit.

## 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 completely 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.**

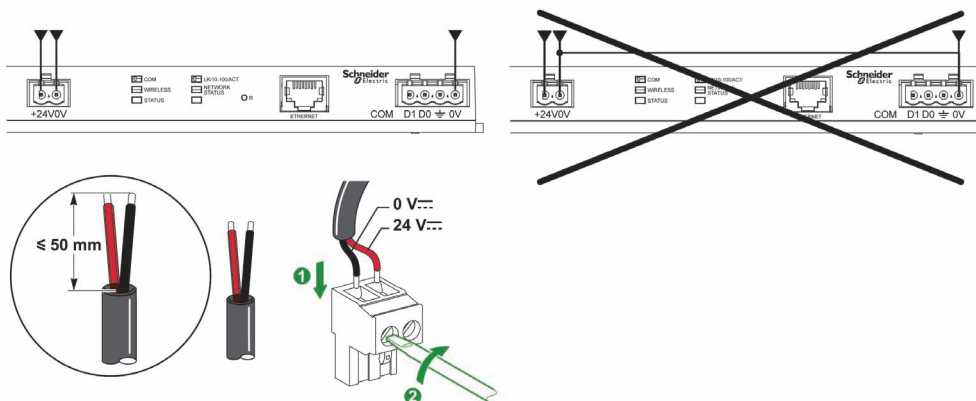
**⚡ ⚠ DANGER**

**RISK OF ELECTROCUTION**

Isolate the Acti9 Smartlink SI B power terminals from the power terminals connected to the Modbus network line.

**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.

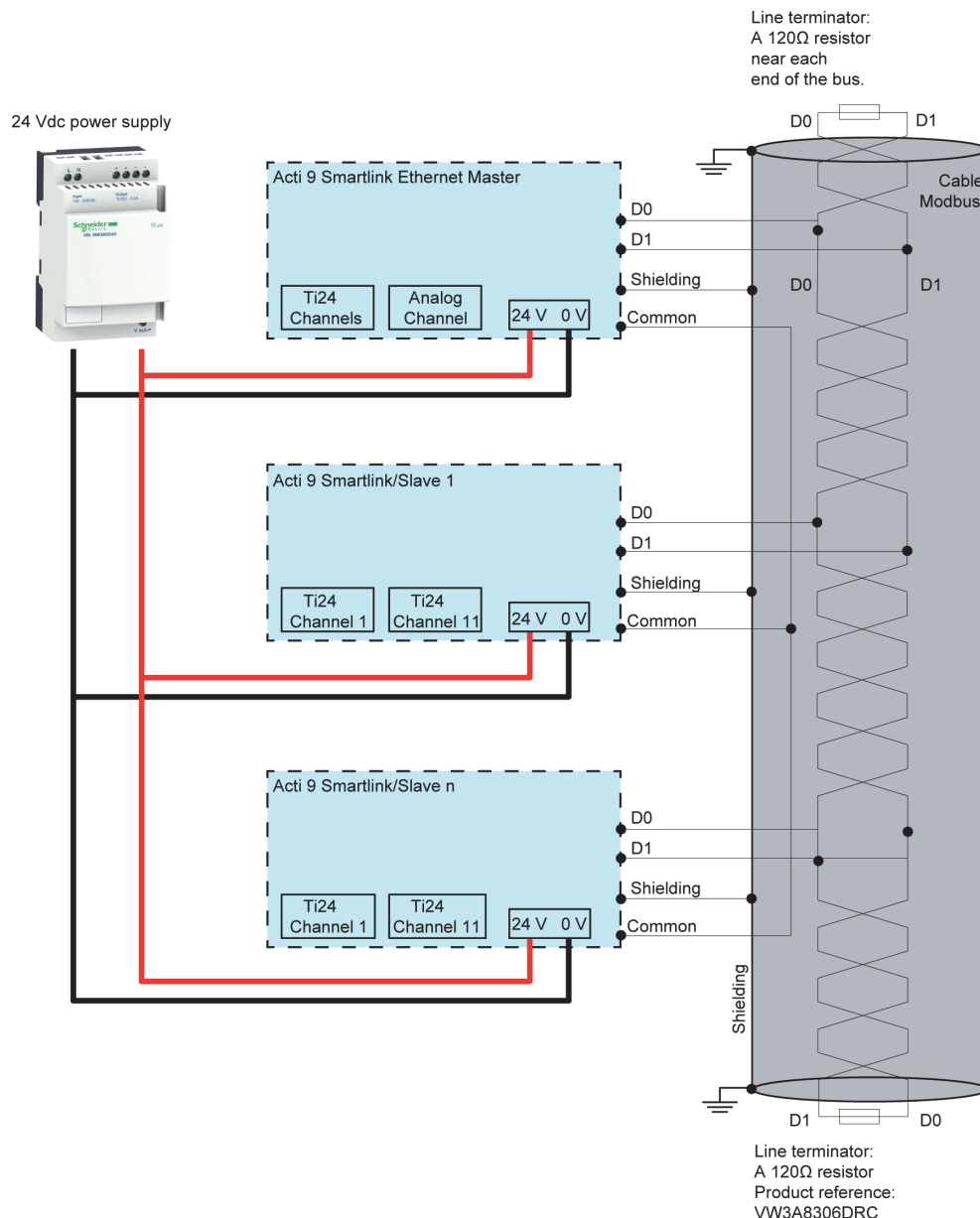
The following figure gives the characteristics of cables that can be used to connect the 24 Vdc power supply:

7 mm	0.2...1.5 mm <sup>2</sup>			0.8 N.m	0.6 x 3.5

### Connecting the Modbus Connector

The Schneider Electric communication cables to be used are:

Product Reference	Description	Length (m)
50965	RS 485 double shielded twisted pair cable for Modbus serial link (supplied without connector)	60



**NOTE:**

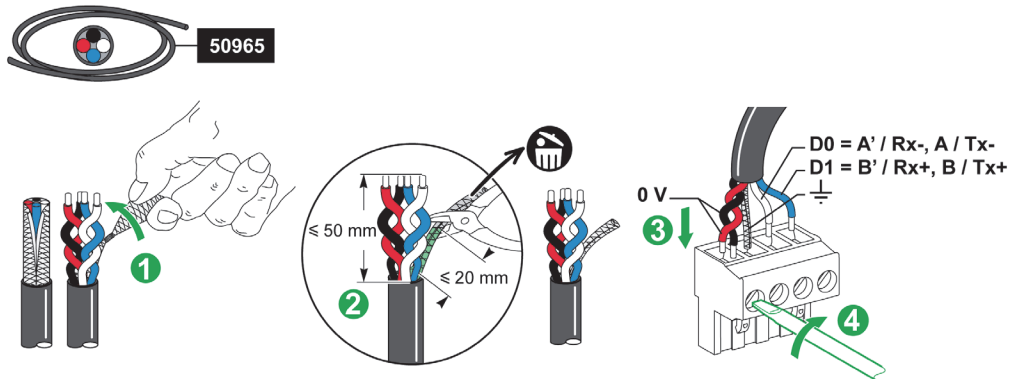
- It is possible to use a common 24 Vdc power-supply for several Acti9 Smartlink devices if installed in the same switchboard.

**NOTICE**

**HAZARD OF NON-OPERATION OF MODBUS NETWORK**

Comply with the wiring and connection rules described below in order to create a working Modbus network.

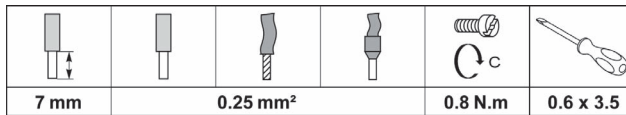
**Failure to follow these instructions can result in equipment damage.**



The following table describes the procedure for connecting the Modbus connector:

Step	Action
1	Coil up the Modbus communication cable shielding.
2	Cut the shielding 20 mm from the sheath.
3	Insert the stripped wires in the connector terminals as shown in the above graphic.
4	Fix the wires in place using the connector tightening screw.

The following figure gives the characteristics of cables that can be used to connect the Modbus connector:



**Checking the Modbus Serial Link**

The following table gives the characteristics of the RS 485 link that need to be checked during installation:

Designation	Description
Shielding connection	Each Modbus serial link must have shielding connected at one point to an earthed link.
Bus polarization	<ul style="list-style-type: none"> <li>● Pull-up resistor connected to the 5 V: 450...650 Ohm</li> <li>● Pull-down resistor connected to ground (Modbus 0 V): 450...650 Ohm</li> </ul> <p><b>NOTE:</b> This polarization is recommended for the master.</p>
Line terminator	A 150 Ohm resistor $\pm$ 5%
Ground polarity	The ground circuit (0 V of an optional power supply) must be connected directly to a protected earth, preferably at a single point on the bus. This point is usually placed on the master or its slaves.
Trunk cable	A pair of shielded twisted cables and a third conductor at minimum.
Maximum length of bus	1000 m at 19,200 Baud with the Schneider Electric 50965 cable.

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# Chapter 6

## Connection of Input/Output Channels

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Acti9 Devices with Ti24 Interface	50
Meters	51
Volt-Free Low Level Indication Contact	52
Volt-Free Standard Indication Contact	53
Surge Arresters	54
Contactor and Relay (Not in the Acti9 Range)	57
Direct Output Connection	58
Indirect Output Connection	59
Generating Summary Data Using iOF+SD24, OF+SD24, OF24, or SD24	60
Analog Input Characteristics and Connection (Recommendation)	62
Recommendation for Cabling	63

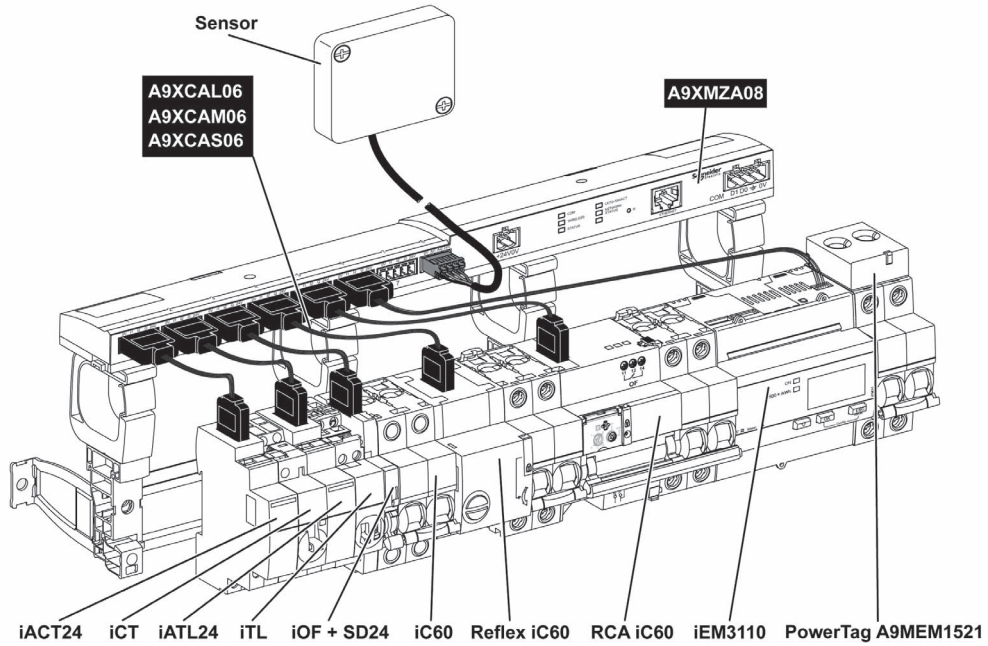
## Acti9 Devices with Ti24 Interface

### Overview

Auxiliary devices such as iACT24, iATL24, OF+SD24, OF/SD24, RCA iC60, and Reflex iC60 can be connected to the Acti9 Smartlink SI B with Acti9 Smartlink system pre-assembled cables.

### Wiring

The figure below shows the connection of auxiliary devices to the Acti9 Smartlink SI B using pre-assembled cables:



**NOTE:** A9XCAU06 or A9XCAC01 cable could be used to link Acti9 devices with Ti24 interface to Acti9 Smartlink. In this case, for the connection of iACT24 and iATL24, input I2 must be connected on both ends of A9XCAU06 or A9XCAC01 cable.

## Meters

### Overview

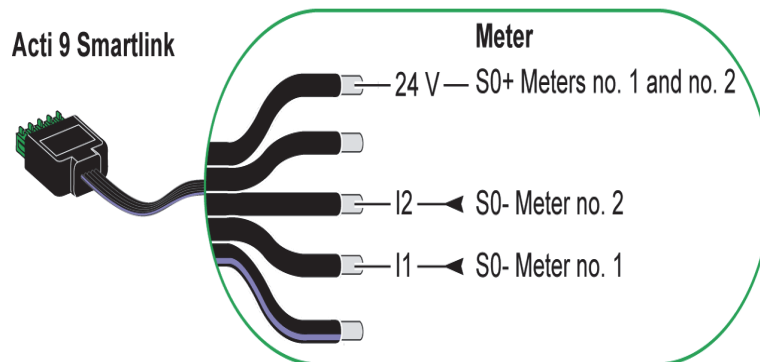
The iEM2000T, iEM2010, iEM3110, iEM3155, iEM3210, iEM3255, iEM3310, and iEM3355 products are kilowatt-hour pulse meters from the Schneider Electric range.

Meters not in the Acti9 range can be controlled by an Acti9 Smartlink channel. These meters must have the following characteristics:

- 1 pulse output
- Compatibility with standard CEI 62053-31

### Wiring

iEM2000T, iEM2010, iEM3110, iEM3155, iEM3210, iEM3255, iEM3310, and iEM3355 kilowatt-hour meters can be connected to channel N ( $1 \leq N \leq 7$ ) of an Acti9 Smartlink SI B module with an A9XCAU06 or A9XCAC01 pre-wired cable: molded connector (at Acti9 Smartlink SI B end), and with 5 wires (at iEM2000T end).

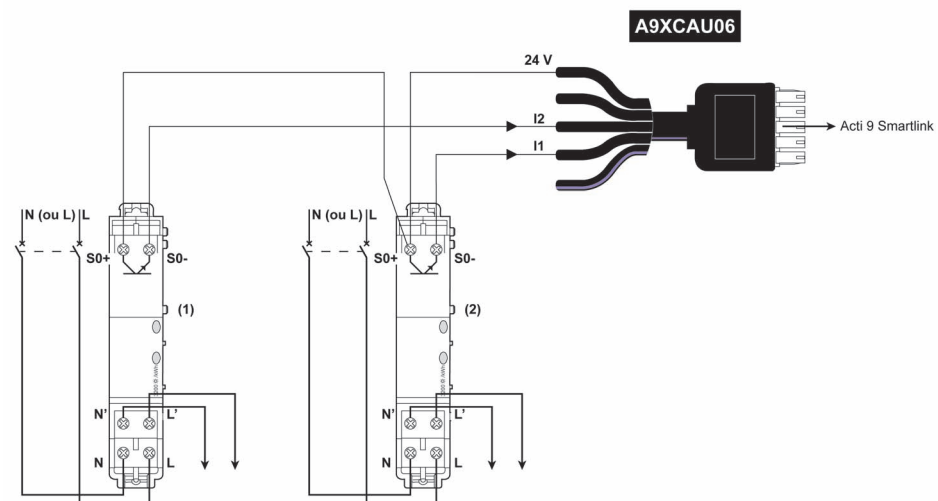


**NOTE:** A single Acti9 Smartlink SI B channel can take account of 2 meters, 1 meter on input I1 and 1 meter on input I2.

**NOTE:**

- Do not connect 2 wires in each of the Ti24 connector terminals (A9XC2412).
- Do not connect a wire with cable end in each of the Ti24 connector terminals.

### Example of Connection of iEM2000T Pulse Meters



- 1 iEM2000T meter
- 2 iEM2000T meter

## Volt-Free Low Level Indication Contact

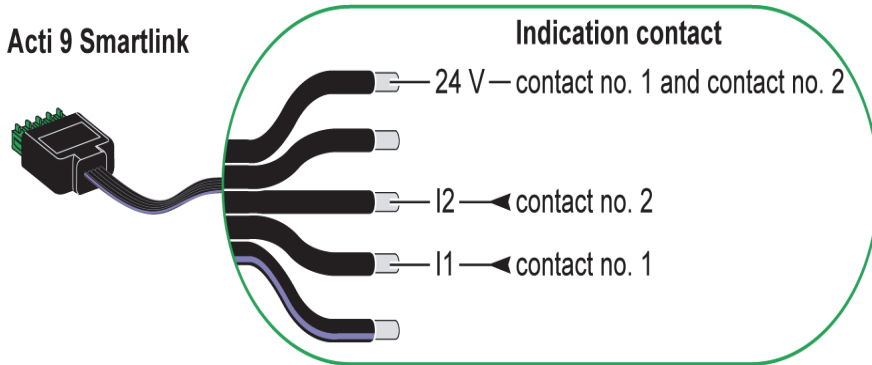
### Overview

A low level type indication contact (NO or NC) can be connected to input I1 or I2 of an Acti9 Smartlink SI B channel.

**NOTE:** A single Acti9 Smartlink SI B channel can take account of two indication contacts, one contact on input I1, and one contact on input I2.

### Wiring

An indication contact can be connected with an A9XCAU06 or A9XCAC01 pre-wired cable: molded connector (at Acti9 Smartlink end, and with the five wires (indication contact end).

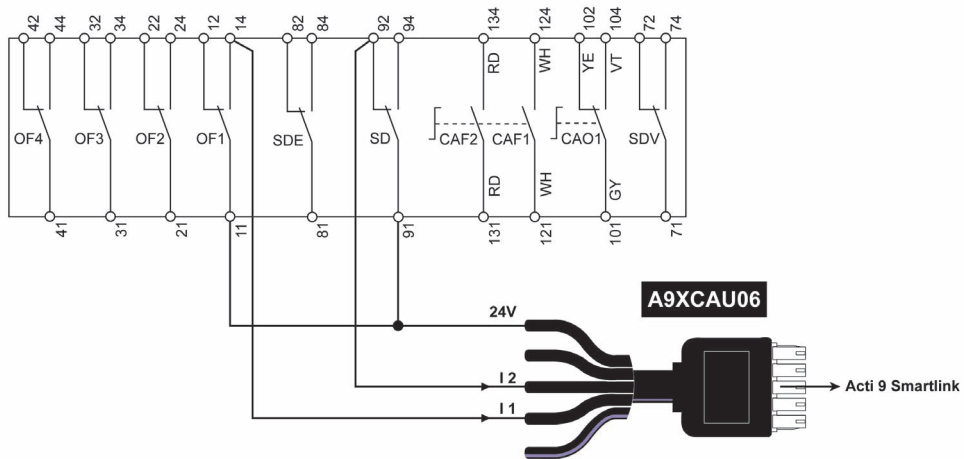


**NOTE:**

- Do not connect 2 wires in each of the Ti24 connector terminals (A9XC2412).
- Do not connect a wire with cable end in each of the Ti24 connector terminals.

### Example of Connection

The OF and SD contacts of a NSX circuit breaker could be directly connected to Acti9 Smartlink.





## Volt-Free Standard Indication Contact

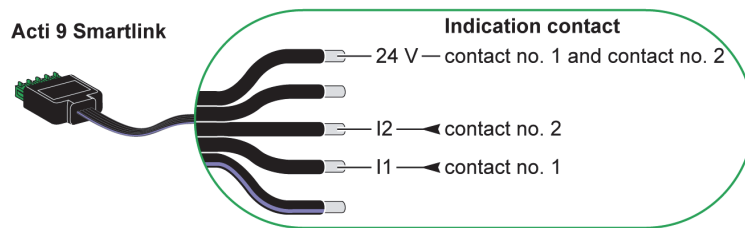
### Overview

A standard indication contact (NO or NC) can be connected to input I1 or I2 of an Acti9 Smartlink SI B channel.

**NOTE:** A single Acti9 Smartlink SI B channel can take account of two indication contacts, one contact on input I1 and one contact on input I2. The electrical diagram must be indirect between Acti9 Smartlink SI B and this device: a low level relay must be installed between the contact of this device and Acti9 Smartlink SI B.

### Wiring

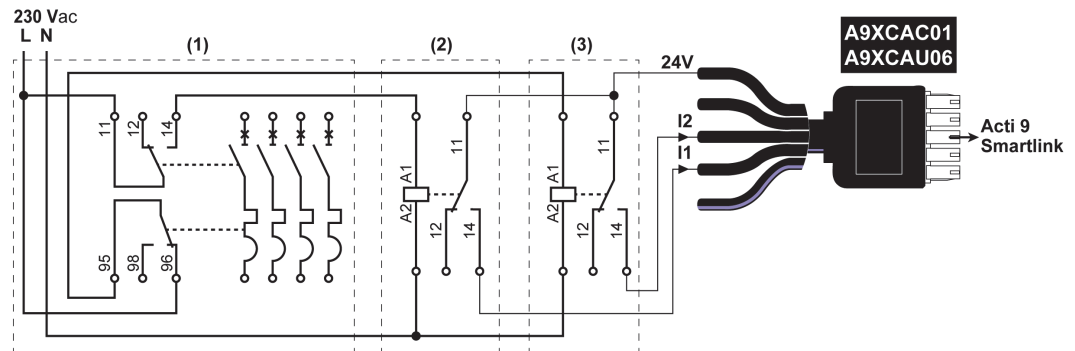
An indication contact can be connected with an A9XCAU06 or A9XCAC01 pre-wired cable: molded connector (at Acti9 Smartlink SI B end, and with the five wires (indication contact end).



**NOTE:**

- Do not connect two wires in each of the Ti24 connector terminals (A9XC2412).
- Do not connect a wire with cable end in each of the Ti24 connector terminals.

### Example of Connection



- (1) NG125 circuit breaker: OF+SD auxiliary contacts with a minimum current of 100 mA
- (2) iRBN relay for OF signal
- (3) iRBN relay for SD signal

## Surge Arresters

### Overview

Acti9 surge arresters can be connected to Acti9 Smartlink:

- The remote transfer contact (indication contact: NO) of an Acti9 surge arrester can be connected to input I1 or I2 of an Acti9 Smartlink channel.
- The SD fault-trip indication contact (indication contact: NC) of the circuit breaker associated to an Acti9 surge arrester can be connected to input I1 or I2 of an Acti9 Smartlink channel.

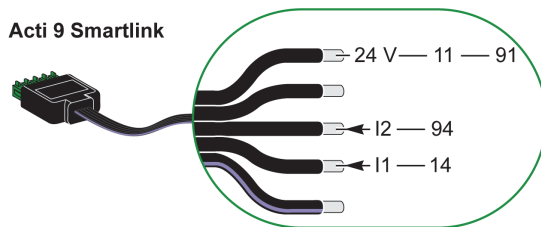
**NOTE:** A single Acti9 Smartlink channel can take account of two indication contacts, one contact on input I1 and one contact on input I2.

### Wiring

An indication contact can be connected with an A9XCAU06 or A9XCAC01 pre-wired cable: molded connector (at Acti9 Smartlink end), and with the five wires (indication contact end).

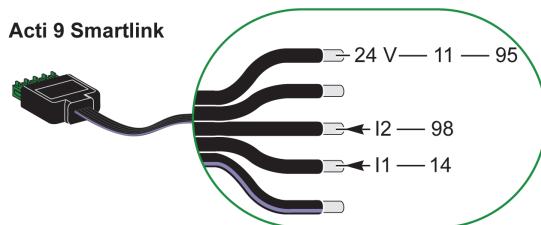
The following wiring is dedicated to surge arresters:

- iPRD
- iPRD 40r PV
- iQuick PRD



The following wiring is dedicated to surge arresters:

- iPRF1 12.5r
- PRD1 25r
- PRD1 Master

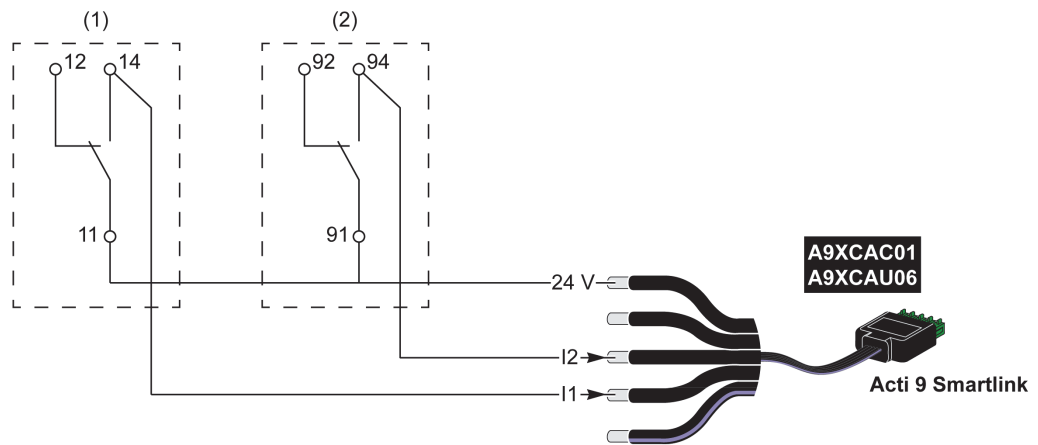


**NOTE:**

- Do not connect 2 wires in each of the Ti24 connector terminals (A9XC2412).
- Do not connect a wire with cable end in each of the Ti24 connector terminals.

**Examples of Connection**

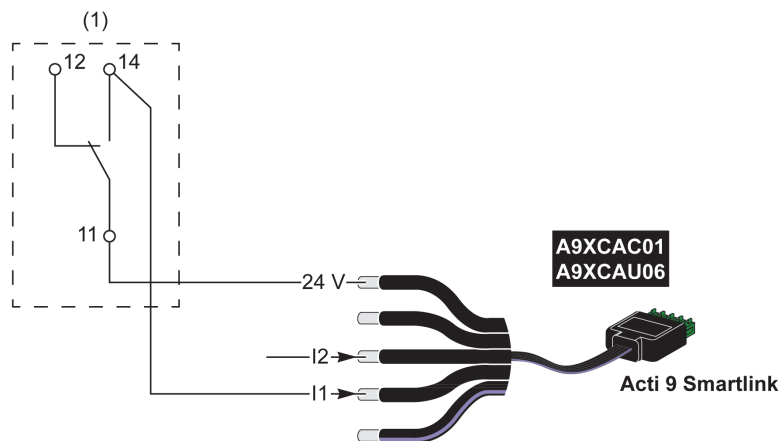
The following electrical diagram is dedicated to iPRD surge arrester.



- (1) Remote transfer contact of iPRD surge arrester: cartridges status
- (2) iSD fault-trip indication contact of iC60 circuit breaker associated to iPRD surge arrester

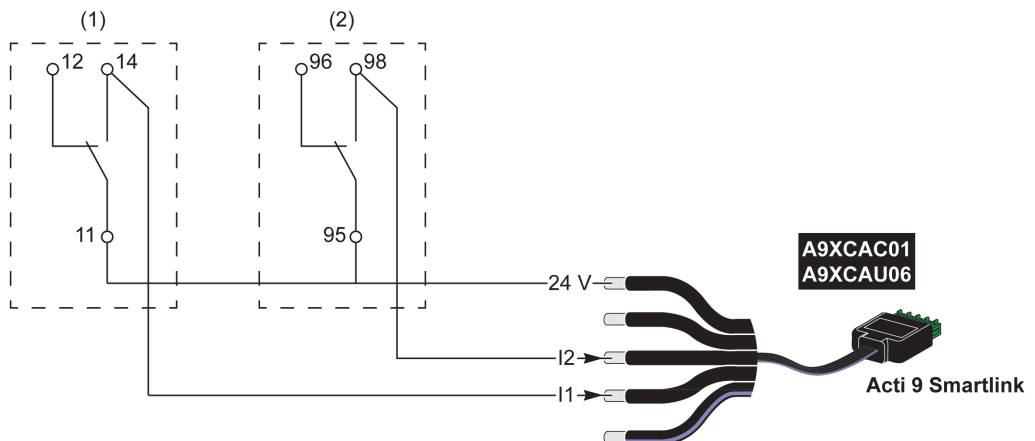
The following electrical diagram is dedicated to surge arresters:

- iPRD 40r PV
- iQuick PRD



- (1) Remote transfer contact of surge arrester: cartridges status

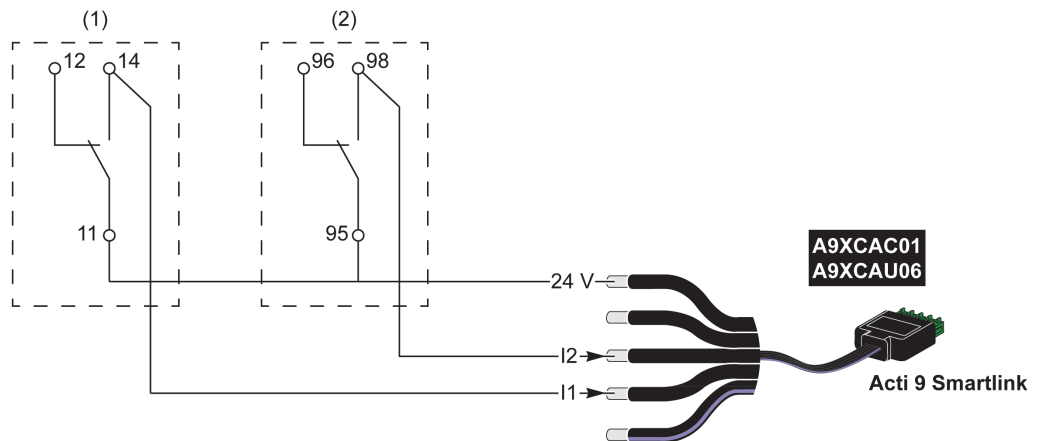
The following electrical diagram is dedicated to iPRF1 12.5r surge arresters:



- (1) Remote transfer contact of iPRF1 12.5r surge arrester: surge arrester status
- (2) iSD fault-trip indication contact of NSX160F or NG125 circuit breaker associated to iPRF1 12.5r surge arrester

The following electrical diagram is dedicated to surge arresters:

- PRD1 25r
- PRD1 Master



- (1) Remote transfer contact of PRD1 25r or PRD1 Master surge arrester: cartridges status  
(2) iSD fault-trip indication contact of NSX160 circuit breaker associated to PRD1 25r or PRD1 Master surge arrester

## Contactor and Relay (Not in the Acti9 Range)

### Overview

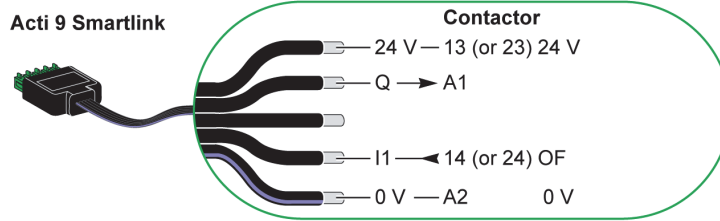
A contactor or relay powered with 24 Vdc can be connected to Acti9 Smartlink SI B. This should have the following characteristics:

- The contactor or relay coil must not draw more than 100 mA.
- The indication contact must be low level type.

Only contactors in the Acti9 range can be connected to Acti9 Smartlink SI B using the iACT24 auxiliary.

### Wiring

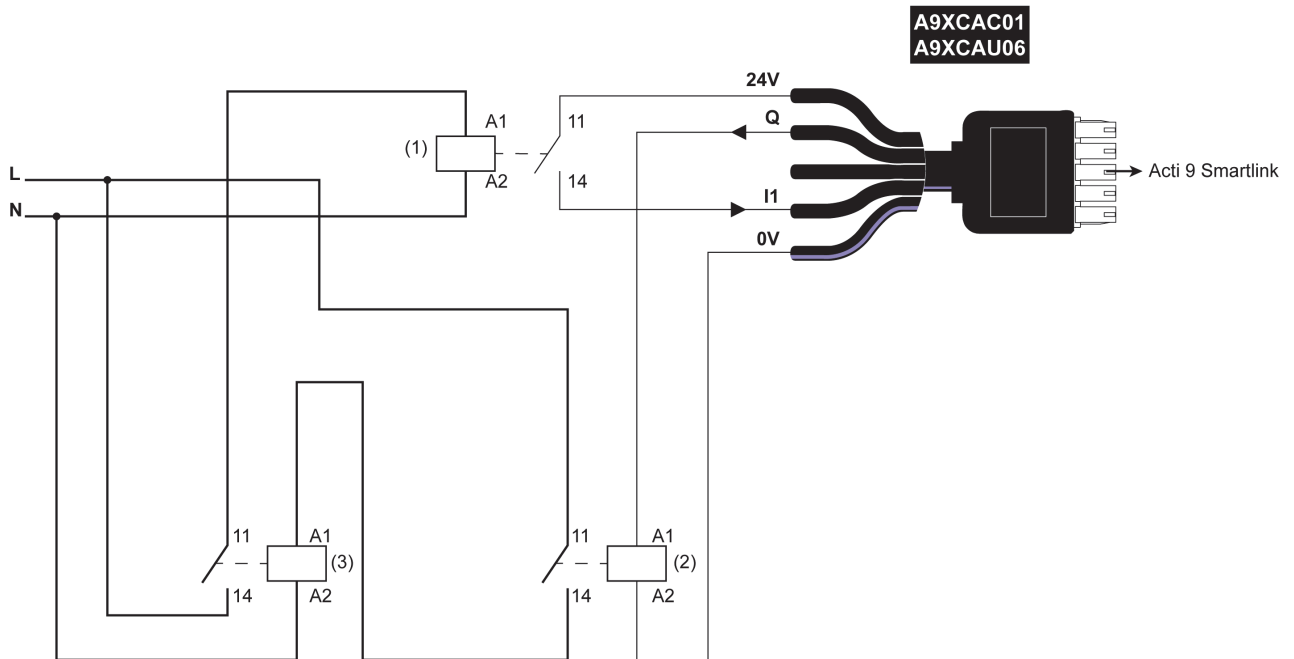
A contactor can be connected with an A9XCAU06 or A9XCAC01 pre-wired cable: molded connector (at Acti9 Smartlink SI B end), and with five wires (at contactor end).



#### NOTE:

- Do not connect 2 wires in each of the Ti24 connector terminals (A9XC2412).
- Do not connect a wire with cable end in each of the Ti24 connector terminals.

### Example of Connection



- 1 Low level relay (for example, iRBN)
- 2 24 Vdc relay
- 3 Power contactor (for example, TeSys D, type LC1)

## Direct Output Connection

### Overview

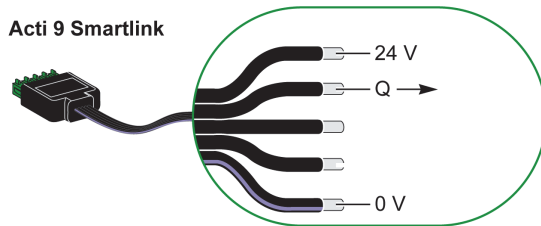
An indication device or a PLC input can be directly connected to the output (Q) of Acti9 Smartlink SI B channel.

The connected device should have the following characteristics:

- To be powered with 24 Vdc.
- The consumption must be less than 100 mA.

### Wiring

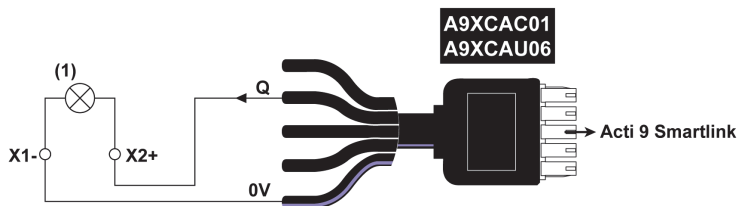
The wiring can be done with an A9XCAU06 or A9XCAC01 pre-wired cable: molded connector (at Acti9 Smartlink end), and with five wires (at contactor end).



#### NOTE:

- Do not connect two wires in each of the Ti24 connector terminals (A9XC2412).
- Do not connect a wire with cable end in each of the Ti24 connector terminals.

### Example of Connection



(1) Indication light 24 Vdc

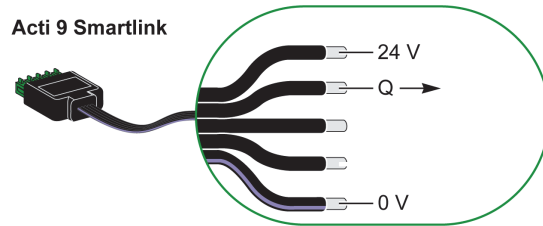
## Indirect Output Connection

### Overview

Any device (for example: motor) that needs a command circuit of more than 100 mA can be controlled by the output (Q) of a channel of Acti9 Smartlink SI B. The electrical connection between Acti9 Smartlink SI B and the device must be indirect. A low level relay must be installed between the command of the connected device and Acti9 Smartlink SI B.

### Wiring

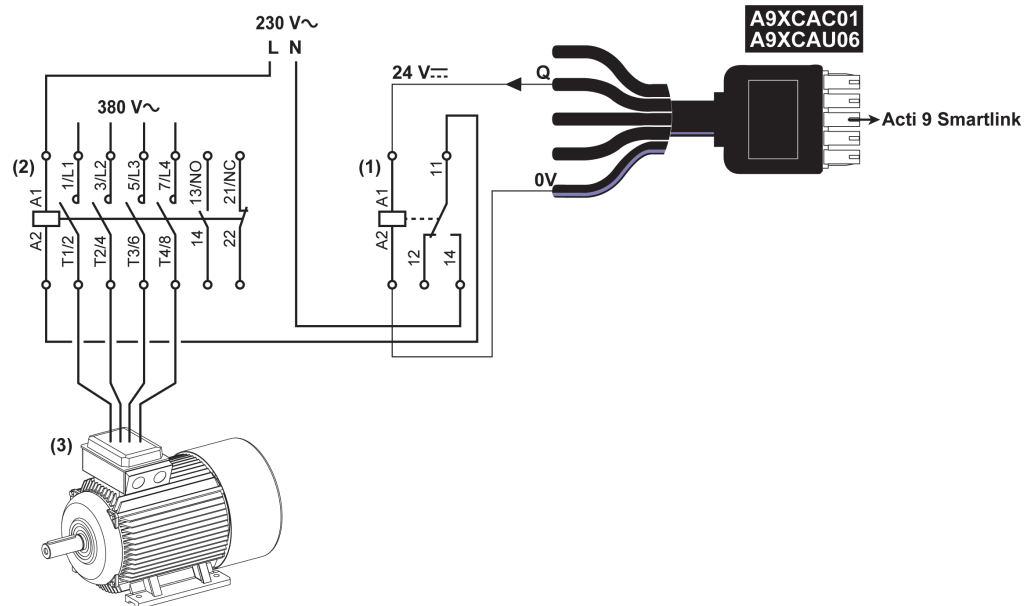
The wiring can be done with an A9XCAU06 or A9XCAC01 pre-wired cable: molded connector (at Acti9 Smartlink end), and with five wires (at contactor end).



#### NOTE:

- Do not connect two wires in each of the Ti24 connector terminals (A9XC2412).
- Do not connect a wire with cable end in each of the Ti24 connector terminals.

### Example of Connection



- (1) Relay iRTBT
- (2) Contactor Tesys D LC1D•25 with an 230 Vac coil
- (3) Motor 10 kW with power supply 3-phases 380 Vac

## Generating Summary Data Using iOF+SD24, OF+SD24, OF24, or SD24

### Overview

The electrical summary of the SD contacts or summary of the OF contacts can be generated with iOF+SD24, OF+SD24, OF24, and/or SD24 auxiliaries.

The electrical summary of the OF signals can be done by cabling in series of all OF signals and by connecting this circuit to the I1 input of a channel of Acti9 Smartlink SI B.

The electrical summary of the SD signals can be done by cabling in series of all SD signals and by connecting this circuit to the I2 input of another channel of Acti9 Smartlink SI B.

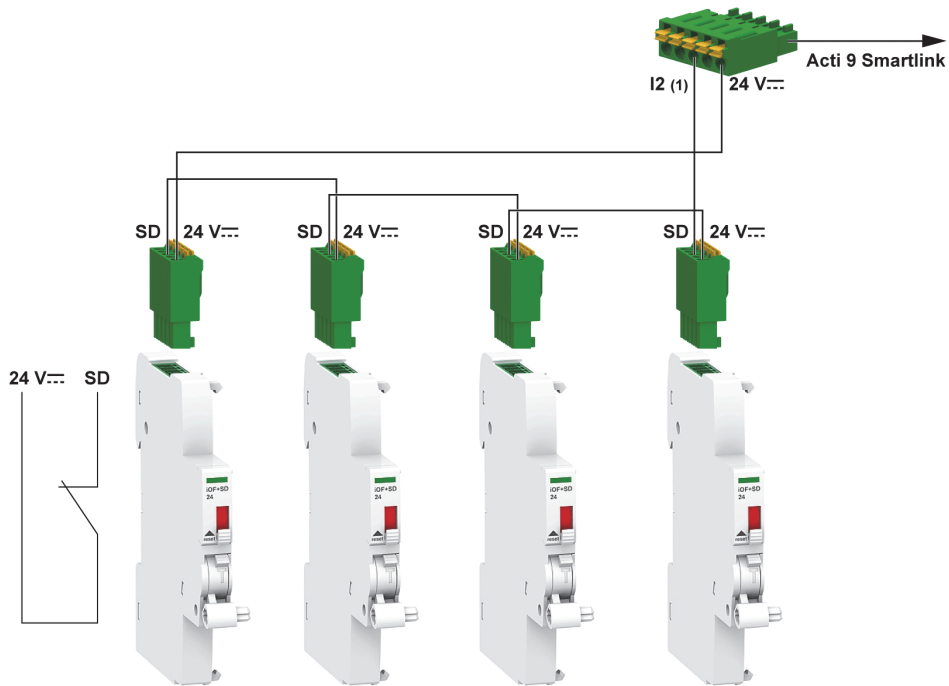
The OF connections (on I1 input) and the SD connections (on I2 input) cannot be connected to the same channel of Acti9 Smartlink SI B, as the summary information dedicated to the OF signals cannot be separated from the summary information dedicated to the SD signals in Acti9 Smartlink SI B.

The two new auxiliaries are OF24 and SD24, where OF24 has a breaker with Open/Close status and SD24 has a breaker with Tripped status.

The summary of OF (or SD) signals can be wired in series using the A9XC2412 15-pin connector (spring cage). A maximum of 10 OF (or SD) signals can be wired in the same summary.

**NOTE:** For a new configuration iOF+SD24 does not exist anymore but OF+SD24 auxiliary is used instead.

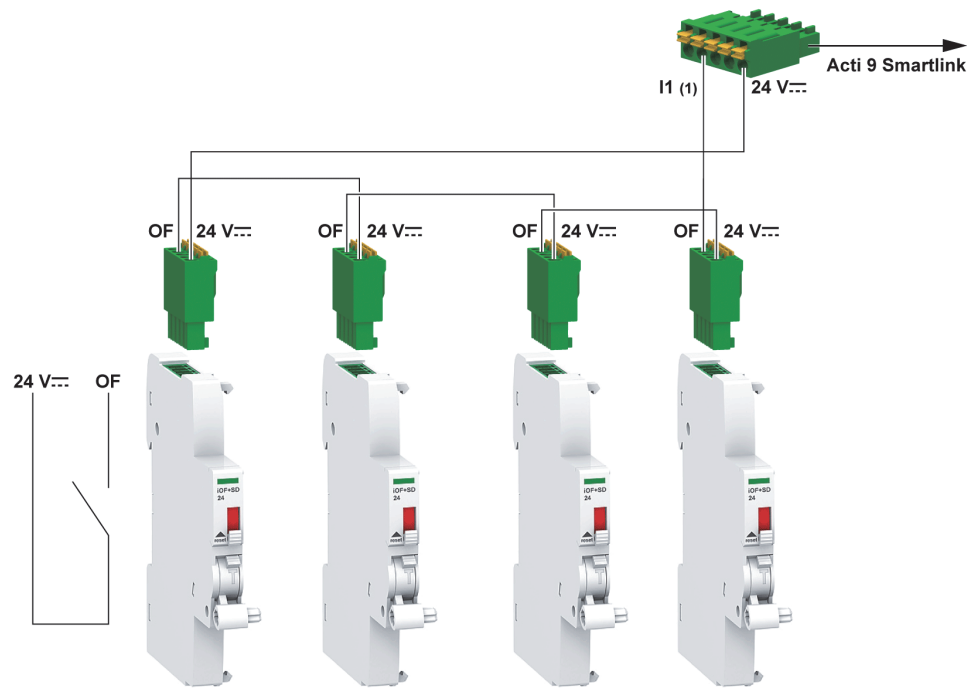
### Wiring SD Contacts on iOF+SD24 or OF+SD24 in Series



(1) Input I2 (of a channel) on Acti9 Smartlink SI B or PLC input



Wiring OF Contacts on iOF+SD24 or OF+SD24 in Series



(1) Input I1 (of a channel) on Acti9 Smartlink SI B or PLC input

## Analog Input Characteristics and Connection (Recommendation)

### Overview

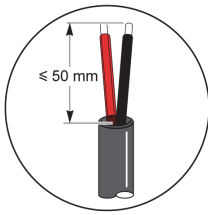

Analog Input Characteristics	Value
Number of analog inputs	2
Type of input	Voltage/Current: IEC 61131 - 2
Rated input voltage	0...10 V
Rated input current	4...20 mA
Input impedance for current mode	140 $\Omega$
Input impedance for voltage mode	50 k $\Omega$
Resolution	12 bits
Accuracy	$\leq \pm 1\%$ of the full scale
Refresh time	500 ms
Isolation	None
Type of cable	Twisted shielded pair or screened cable
Cable length	< 30 m maximum <sup>(1)</sup>
Channel 8 (analog inputs) maximum sourcing current at 24 V to power the sensors	200 mA for each analog sensor
Conversion time/Refresh time	100 ms
Connector type	Screw type (4-pin), 3.5 mm pitch





**NOTE:** <sup>(1)</sup> The instruction for missed wiring or wrong configuration can result in input damage.

## Recommendation for Cabling

### Connecting the Analog Input Connector

The following table gives the details of the cable reference and specifications of the analog input connector:

Cable Reference		Specifications	Cable Stripping Length	
Manufacturer	Alpha wire	STP Cable (shielded twisted pair)		
Part reference	3303	Cable length < 30 m		
-		AWG between 26 - 16	-	

			
7 mm	0.1...1.5 mm	0.8 N.m	0.6 x 3.5

## NOTICE

### RISK OF DAMAGING THE EQUIPMENT

Ensure that the analog channel configuration and physical connection is accurate.

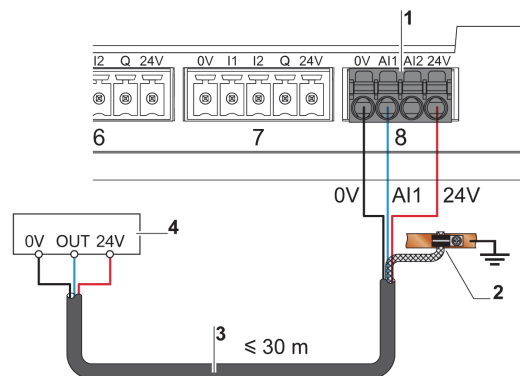
**Failure to follow these instructions can result in equipment damage.**

The reference of the analog input connector are:

- Manufacturer: Phoenix
- Commercial reference: 1916410
- Description: PTB PLUG 3.5 NA FMLE MCSCW 4 1x4 PA

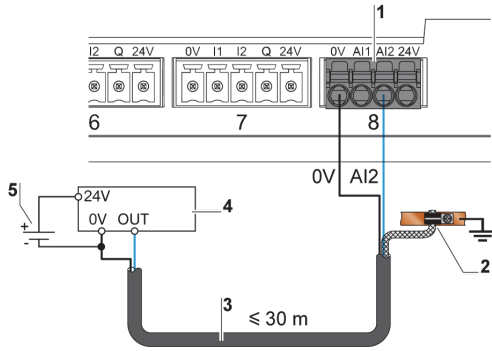
## Wiring

The following figure shows the sensor powered by Acti9 Smartlink SI B:



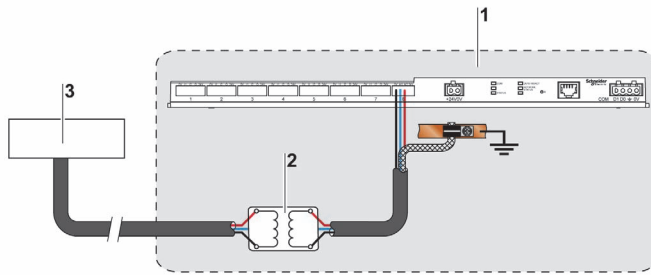
- 1 Consumption of each AI1 or AI2: 200 mA
- 2 The shield must be connected to ground near the Acti9 Smartlink SI B with a clamp only
- 3 Twisted pair, shielded cable
- 4 Sensor (current/voltage) compliant with IEC 61000-6-2 and IEC61000-6-3 standards

The following figure shows the sensor powered by external power supply:



- 1 Consumption of each AI1 or AI2: 200 mA
- 2 The shield must be connected to ground near the Acti9 Smartlink SI B with a clamp only
- 3 Twisted pair, shielded cable
- 4 Sensor (current/voltage) compliant with IEC 61000-6-2 and IEC61000-6-3 standards
- 5 External power supply

If the analog sensor is placed outside the panel, then an analog isolator is recommended as per the system specifications.



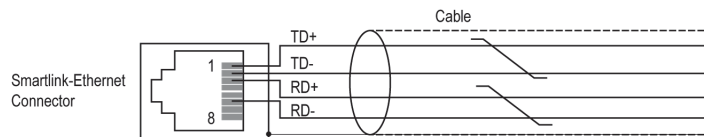
- 1 Acti9 Smartlink SI B
- 2 Analog isolator
- 3 Sensor (current/voltage) compliant with IEC 61000-6-2 and IEC61000-6-3 standards

### Connecting the Ethernet Connection

The connection between Acti9 Smartlink SI B and other Ethernet devices is done using a standard straight Ethernet cable (shielded, STP or S/FTP, Cat5e or 6, RJ45 connector).

If Acti9 Smartlink SI B is mounted on Multiclip 200, the cable must be a right angle RJ45 Ethernet cable in order to install a cover in the panel.

### RJ45 Connector and Signal Pin



The following table gives the details of RJ45 connector and signal description:

RJ45 Female Pin Number	Signal	RJ45 Male Plug Pair	Signal Description
1	TX+	A	Transmit+
2	TX-	A	Transmit-
3	RX+	B	Receive+
4	Not connected	-	Not connected
5	Not connected	-	Not connected
6	RX-	B	Receive-
7	Not connected	-	Not connected
8	Not connected	-	Not connected

---

# Chapter 7

## Getting Started with Acti9 Smartlink SI B

---

### What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
7.1	General Principle to Commission an Acti9 Smartlink SI B System	66
7.2	Commissioning an Acti9 Smartlink SI B System with Ecoreach Software	67
7.3	Commissioning an Acti9 Smartlink SI B System with Web Pages	71

# Section 7.1

## General Principle to Commission an Acti9 Smartlink SI B System

### Commissioning Overview

#### Overview

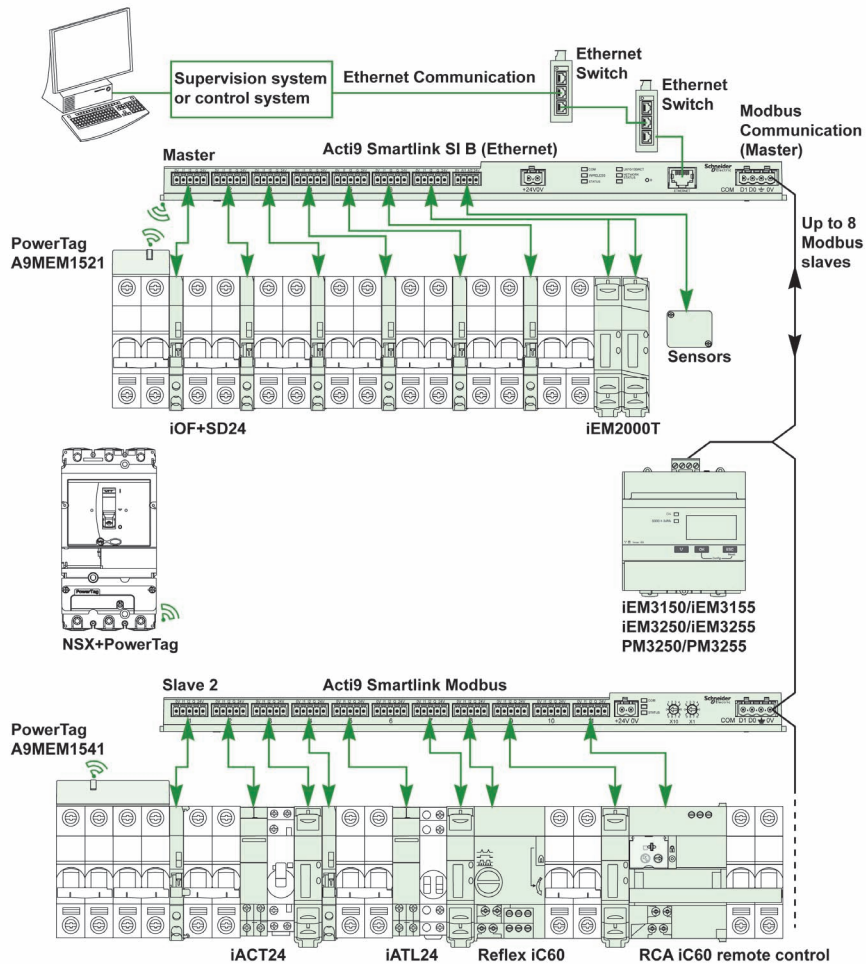
The commissioning of an Acti9 Smartlink SI B system can be performed using:

- the Ecoreach software *Ecoreach Online Help*
- the Acti9 Smartlink SI B web pages. The web pages are autonomous to configure any devices connected or paired with Acti9 Smartlink SI B.

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



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## Section 7.2

### Commissioning an Acti9 Smartlink SI B System with Ecoreach Software

---

#### What Is in This Section?

This section contains the following topics:

Topic	Page
Installation of Ecoreach Software	68
Commissioning with Ecoreach Software	69

## Installation of Ecoreach Software

### Downloading and Installation

To download and install the Ecoreach software, refer [Ecoreach Installation Guide](#).



## Commissioning with Ecoreach Software

### Overview

In Ecoreach, you can connect Acti9 Smartlink SI B and configure it in the following applicable tabs:

- Wired devices
- Wireless devices

### Commissioning the Acti9 Smartlink SI B Wired Devices

To configure the channels of Acti9 Smartlink SI B wired devices:

Step	Action
1	Connect the Acti9 Smartlink SI B device to the PC.
2	Launch the Ecoreach software.
3	Click <b>Launch Device Discovery</b> in the welcome screen. <b>Result:</b> <b>Discover Device(s)</b> window displays all the devices connected in the network.
4	Select the device in the <b>Switchboard View</b> .
5	In the <b>Device View</b> , select <b>Local Connection</b> only if you are connecting the device through the test port.
6	Click <b>Connect to device</b> . <b>Result:</b> Plugin icon is displayed indicating the device is connected to the network.
7	Click <b>Configure → Launch</b> in the <b>Device view</b> , and then click <b>Wired devices</b> tab. <b>Result:</b> The device categories are displayed.
8	In the required channel, select <b>Wired devices</b> in <b>Device category</b> . <b>Result:</b> The <b>Device type</b> , <b>Name</b> , <b>Label</b> , and <b>Usages</b> are displayed.
9	Click the edit device icon in <b>Device type</b> . <b>Result:</b> The device type is displayed.
10	Select the required device type and click <b>OK</b> .
11	Enter the <b>Name</b> and <b>Label</b> .
12	In the <b>Usages</b> list, select the required option.

### Commissioning the Acti9 Smartlink SI B Wireless Devices

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

Step	Action
1	Connect the Acti9 Smartlink SI B device to the PC.
2	Launch the Ecoreach software.
3	Click <b>Launch Device Discovery</b> in the welcome screen. <b>Result:</b> <b>Discover Device(s)</b> window displays all the devices connected in the network.
4	Select the device in the <b>Switchboard View</b> .
5	In the <b>Device View</b> , select <b>Local Connection</b> only if you are connecting the device through the test port.
6	Click <b>Connect to device</b> . <b>Result:</b> Plugin icon is displayed indicating the device is connected to the network.
7	Click <b>Configure → Launch</b> in the <b>Device View</b> , and then click <b>Wireless devices</b> tab.
8	Click <b>Scan</b> to discover the PowerTag energy sensors. <b>Result:</b> The discovered PowerTag energy sensor is displayed.
9	Click <b>Locate</b> to find the PowerTag energy sensor in an electrical panel. <b>Result:</b> The <b>Locate Wireless Device</b> dialog box is displayed and the associated PowerTag energy sensor on the electrical panel continuously blinks green.
10	Click <b>STOP BLINK</b> to stop blinking of the device once it is identified.
11	Click the down arrow icon. <b>Result:</b> 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 <b>Asset name</b> field.
14	Select the usage of the load from the <b>Usage</b> list.
15	Enter the value for the energy counter in the <b>Partial energy (kWh)</b> field.
16	Select the circuit breaker rating from the <b>Associate breaker rating (A)</b> list to calculate the percentage of loads.

Step	Action
17	Select the phase sequence corresponding to the physical sequence wired in the panel from the <b>Phase sequence</b> list.
18	Select <b>Modbus Product Address</b> and <b>Load works when Power is &gt;= (W) (kWh)</b> by moving the slider left or right.
19	Click <b>Check Up</b> on each device to verify that all the devices are configured.

### Commissioning the Modbus Meters

To configure the Modbus energy meters:

Step	Action
1	Connect the Acti9 Smartlink SI B device to the PC.
2	Launch the Ecoreach software.
3	Click <b>Launch Device Discovery</b> in the welcome screen. <b>Result:</b> <b>Discover Device(s)</b> window displays a list of detected gateways in the network.
4	Click <b>Add more gateways manually</b> to add one or more gateways that are not detected automatically.
5	Enter the <b>IP address</b> . <b>NOTE:</b> <ul style="list-style-type: none"> <li>• You can also enter a range of IP address (for example, 10.179.192.110-120).</li> <li>• In <b>Deep Scan</b>, the <b>IP</b> check box is selected by default.</li> </ul>
6	Enter the <b>Modbus address</b> . <b>NOTE:</b> You can also enter a range of Modbus address.
7	Click <b>START DEEP SCAN</b> . <b>Result:</b> <b>Discover Device(s)</b> window displays a list of gateways and meters.
8	Select the required gateway and Modbus meters in the <b>Devices List</b> .
9	Click <b>ADD TO PROJECT</b> .
10	In the <b>Project Information</b> window, click <b>APPLY</b> . <b>Result:</b> <b>Switchboard View</b> window is displayed.
11	Select the Modbus meter in the <b>Switchboard View</b> . <b>NOTE:</b> You can add up to 8 Modbus meters.
12	In the <b>Communication View</b> , click <b>CONNECT TO DEVICE</b> and then click <b>Configure</b> . <b>Result:</b> The parameter values in the Modbus meter and the project are displayed.
13	Click <b>WRITE TO DEVICE</b> to transfer the project values to the Modbus meters. or Click <b>WRITE TO PROJECT</b> to transfer the Modbus meter values to the project.

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## Section 7.3

### Commissioning an Acti9 Smartlink SI B System with Web Pages

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#### What Is in This Section?

This section contains the following topics:

Topic	Page
Discovering Acti9 Smartlink SI B through Windows Explorer	72
Login into Web Pages	74
Web Page Layout	75
Firmware Upgrade	76
Basic Commissioning of PowerTag Wireless Communication Energy Sensors	79
Commissioning the Modbus Meters	81

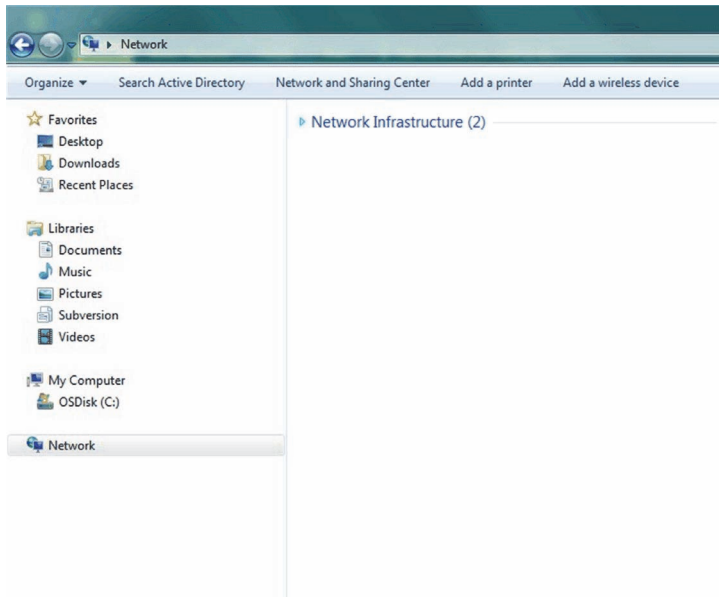
## Discovering Acti9 Smartlink SI B through Windows Explorer

### Accessing Acti9 Smartlink SI B from Windows Operating System

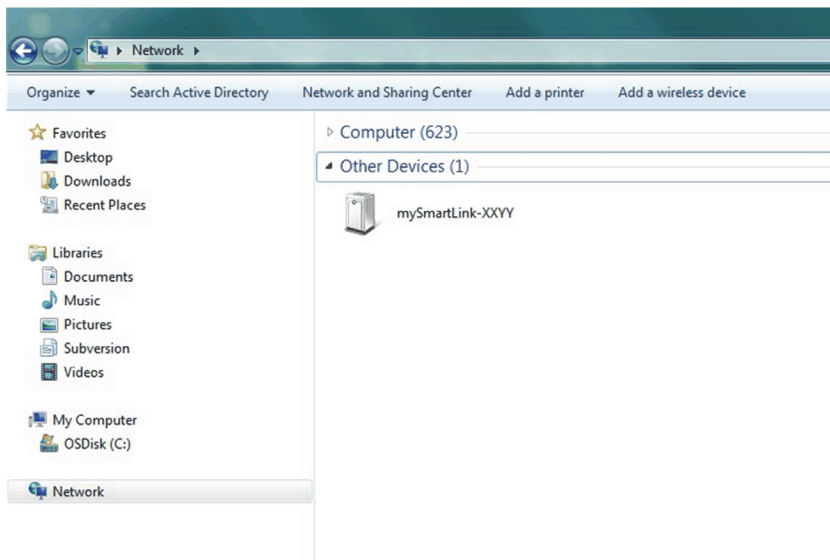
Follow the steps given in the table to access the web page of Acti9 Smartlink SI B through Windows Explorer from Windows operating system:

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

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



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



**NOTE:** If Acti9 Smartlink SI B 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 B 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 B.

Step	Action
1	When Acti9 Smartlink SI B 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: <ol style="list-style-type: none"> <li>1. Go to <b>Control Panel → Network and Internet → Network Connections → Local Area Connection</b></li> <li>2. Right-click the <b>Local Area Network</b> and click <b>Properties</b>.</li> <li>3. Select <b>Internet Protocol Version 4 (TCP/IPv4)</b> from the list and click <b>Properties</b>.</li> <li>4. Select the option <b>Use the following IP address</b> from the properties window to change the IP address.</li> </ol>
3	Change the IP Address of the PC to be in the same subnet as the Acti9 Smartlink SI B. For example, if the IP address of Acti9 Smartlink SI B 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 B, and hence can connect to Acti9 Smartlink SI B.
4	To connect to Acti9 Smartlink SI B: <ul style="list-style-type: none"> <li>● See <i>Ecoreach Online Help</i></li> <li>● Open the web browser and type the IP address of the Acti9 Smartlink SI B, and start the commissioning.</li> </ul> In the web pages, change the IP settings if you need to have your Acti9 Smartlink SI B in dynamic IP allocation mode (DHCP mode).

### Accessing Acti9 Smartlink SI B from the Operating System other than Windows

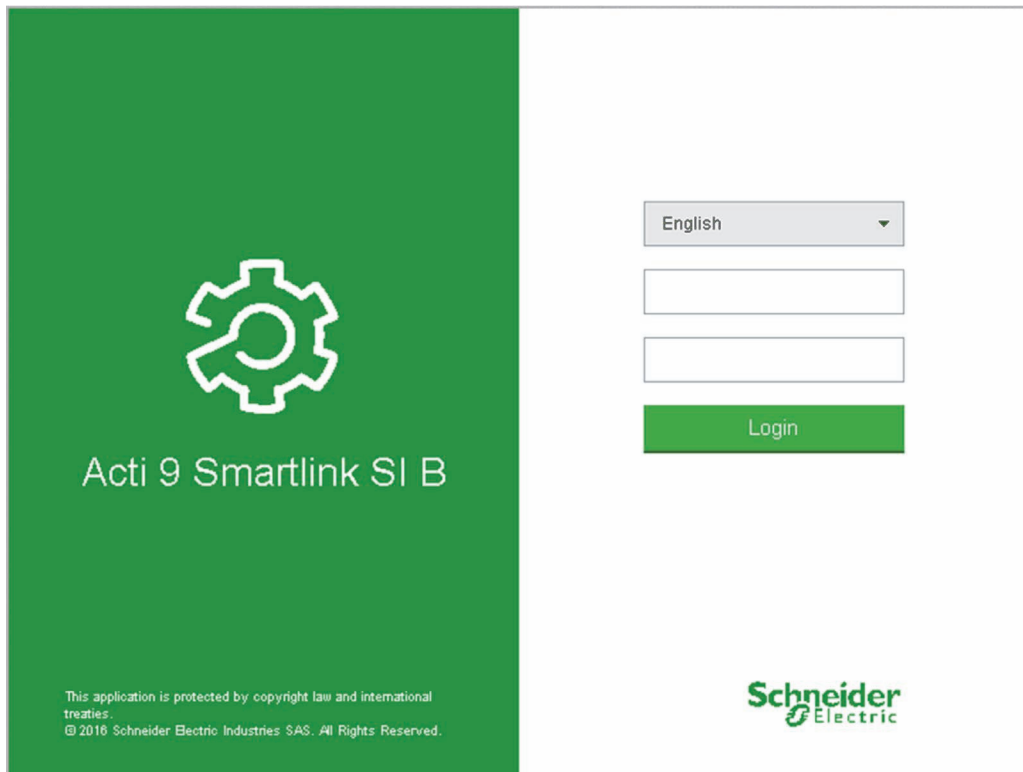
Follow the steps given in the table to access the web page of Acti9 Smartlink SI B from the operating system other than Windows:

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 B) in the <b>Address</b> field of the web browser and press <b>Enter</b> to access the login page.
3	Type the user name ("admin" by default) and password ("admin" by default). <b>NOTE:</b> 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 B web pages. When the user connects to the Acti9 Smartlink SI B 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 B. 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 B web page.

## Web Page Layout

### Description

The Acti9 Smartlink SI B has an embedded web server and a user can control and monitor the electrical distribution by using embedded web pages with PC or smartphone like laptop (*see page 91*).

The web pages can be used for multiple operations:

- Monitoring and control 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 B on the network.
- Diagnosis of exchanges on Ethernet network.
- Configuration of the devices connected.
- Adding or removing Acti9 Smartlink and devices connected to Acti9 Smartlink SI B.

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

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

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

The scope of products supported in web pages are:

- Acti9 Smartlink SI B.
- Acti9 Smartlink Modbus slave connected to Acti9 Smartlink SI B.
- Energy meter IEM3000, power meter PM3000, Modbus slaves connected to Acti9 Smartlink SI B.
- PowerTag energy sensors.

The web page can support one Acti9 Smartlink SI B and up to eight Modbus slaves.

### 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, wireless parameters, Modbus parameter, communication product, and auxiliary devices

## Firmware Upgrade

### Overview

The firmware upgrade of Acti9 Smartlink SI B can only be done using Ecoreach software. For more information, see *Ecoreach Online Help*.

Connection	Modbus address	Module	Status	Device Version	Available Version	Recommended Action
10.179.90.60	8	Smartlink Modbus	✓	V1.3.7	V1.3.7	None
10.179.90.51	1	BCM_ULP	✓	V4.1.7	V4.1.9	UPGRADE None
		IFM	✓	V2.2.11	V2.2.11	None
10.179.90.60	255	Smartlink SI B	✓	V2.1.0	V2.1.0	UPGRADE
10.179.90.45	255	Smartlink SI D	✓	V2.1.0	V2.1.0	UPGRADE
10.179.90.51	2	BCM_ULP	✓	V4.1.7	V4.1.9	UPGRADE None
		IFM	✓	V2.2.11	V2.2.11	None
10.179.90.51	3	Micrologic	✓	D1.0.6	V1.1.0	UPGRADE None

### NOTICE

#### RISK OF DAMAGING THE EQUIPMENT

Ensure to operate the Acti9 Smartlink SI B firmware upgrade only by a maintenance person.  
**Failure to follow these instructions can result in equipment damage.**

### NOTICE

#### RISK OF DAMAGE TO THE EQUIPMENT

It is recommended to connect the PC directly with the Acti9 Smartlink using a RJ45 cable to perform a peer to peer firmware upgrade.  
**Failure to follow these instructions can result in equipment damage.**

#### Pre-requisites

The following are the pre-requisites to perform before firmware upgrade:

- The FTP should be activated in the web page of Acti9 Smartlink before the firmware upgrade launch. It is always activated by default. If the FTP is not activated, enable the FTP in the Acti9 Smartlink web page in the **Settings → Configuration → IP Network Services** page and select **Enable** option under the FTP.
- If the Acti9 Smartlink uses static IP network configuration, it is recommended to change the configuration from static to DHCP mode in the web pages of Acti9 Smartlink before the firmware upgrade. Perform the firmware upgrade and then change it back to the static IP. (This avoids changing the PC network settings to be in the same IP subnet mask as the static IP to perform the firmware upgrade).

### 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.



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 1.1 Firmware Version	Smart Panels 1.2 Firmware Version	Smart Panels 1.3 Firmware Version	Smart Panels 1.4 Firmware Version
Enerlin'X	IO Input/Output Interface for LV Circuit Breaker	LV434063	V2.1.4	V2.1.4	V3.1.8	V3.2.9
	IFE Ethernet Interface for LV Circuit Breaker	LV434010 LV434011	Firmware V1.9.8 Webpage V1.9.9	Firmware V1.10.18 Webpage V1.10.18	Firmware V3.4.2 Webpage V3.4.2	Firmware V3.6.11 Webpage V3.6.11
	eIFE Ethernet Interface for LV Circuit Breaker	-	-	-	Firmware V3.4.2 Webpage V3.4.2	Firmware V3.6.11 Webpage V3.6.11
	IFM Modbus-SL Interface for LV Circuit Breaker	TRV00210	V2.2.7	V2.2.9	V2.2.11	V2.2.11
	FDM121 Display for LV Circuit Breaker	TRV00121	V2.3.5	V2.3.5	V2.3.5	V2.3.5
	FDM128 Display for 8 LV Devices	LV434128	V6.1.1	V6.2.2	V6.2.9	V6.4.2
	ULP Accessories	LV4*****	-	-	-	-
	Com'X 200 / 210	EBX200 EBX210	V1.3.5	V2.2.1	V2.2.1	V3.6.3
	Com'X510	EBX510	-	V3.0.6	V3.1.1	V3.6.3
	BCM ULP module (Breaker Communication Module)	33702 33703 33708 33713 33714 33842 33848 S64205	V4.0.9 Product data code greater than or equal to 14251	V4.1.4 Product data code greater than or equal to 14251	V4.1.5 Product data code greater than or equal to 14251	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	V2.2.7	V2.2.7	V2.2.7	
Low voltage breakers	Micrologic trip unit for Masterpact NT/NW and Compact NS Circuit Breakers	-	V8282	V8282	V8282	V8282
	Micrologic X trip Unit for Masterpact MTZ Circuit Breaker	-	-	-	V1.0	V1.0.2
Final distribution	Acti9 Smartlink Modbus	A9XMSB11	V1.2.1	V1.3.5	V1.3.5	V1.3.7
	Acti9 Smartlink SI B	A9XMZA08	-	-	V1.0.6	V1.2.8

Range	Product	Reference Number	Smart Panels 1.1 Firmware Version	Smart Panels 1.2 Firmware Version	Smart Panels 1.3 Firmware Version	Smart Panels 1.4 Firmware Version
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 B. 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 B 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 B 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 B.

Hence, it is recommended to check whether the RF signal quality is good between the PowerTag energy sensors and the Acti9 Smartlink SI B 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:

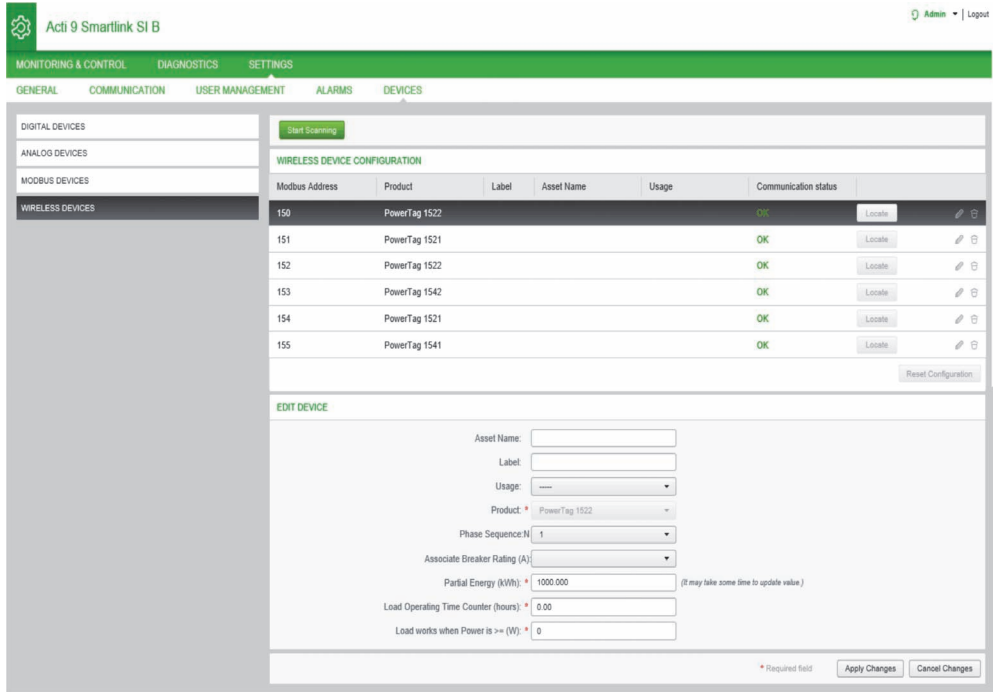
1. Place the Acti9 Smartlink SI B inside the panel along with the associated PowerTag energy sensors.
2. Ensure that the closest Wi-Fi access point is at least three meters away from the panel enclosure.

### Commissioning the Wireless Communication Devices

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

Step	Description
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings → Devices → Wireless Devices</b> to configure the PowerTag energy sensors.
4	Click <b>Start Scanning</b> to discover the wireless communication devices. <b>Result:</b> 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 B. The Modbus slave ID ranges from 150 through 220. <b>NOTE:</b> The Acti9 Smartlink SI B can discover up to 20 wireless devices.
5	Select any wireless communication device and click <b>Locate</b> to find the device in the panel. <b>Result:</b> The associated device blinks in the panel.
6	Configure the device with the following parameters: <ul style="list-style-type: none"> <li>● Asset name</li> <li>● Usage</li> <li>● Associated Breaker Rating (A)</li> <li>● Phase Sequence</li> <li>● Modbus address</li> <li>● Load works when power is &gt;= (W)</li> <li>● Product (for PowerTag NSX)</li> <li>● Zigbee ID (for PowerTag NSX)</li> <li>● Product (for PowerTag NSX)</li> <li>● System Type (for PowerTag NSX)</li> <li>● Partial Active Energy Delivered (kWh) (for PowerTag NSX)</li> <li>● Partial Active Energy Received (kWh) (for PowerTag NSX)</li> <li>● Partial Reactive Energy Delivered (kVARh) (for PowerTag NSX)</li> <li>● Partial Reactive Energy received (kVARh) (for PowerTag NSX)</li> <li>● Load Operating Time Counter (hours) (for PowerTag NSX)</li> </ul>
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 B 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 B 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 B devices are powered on while you commission a new Acti9 Smartlink SI B, the new Acti9 Smartlink SI B automatically selects the less polluted radio channel, and creates its network on a different channel than the previous Acti9 Smartlink SI B 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 B without any issues.

## Commissioning the Modbus Meters

### Commissioning the Modbus Energy Meters

The configuration of the Modbus meters is done with Ecoeach software, see *Ecoeach Online Help*.



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# Chapter 8

## Setting Up Wireless Communication

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Wireless Network Configuration	84
Wireless Communication Devices Selection and Configuration	87

## 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 B 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

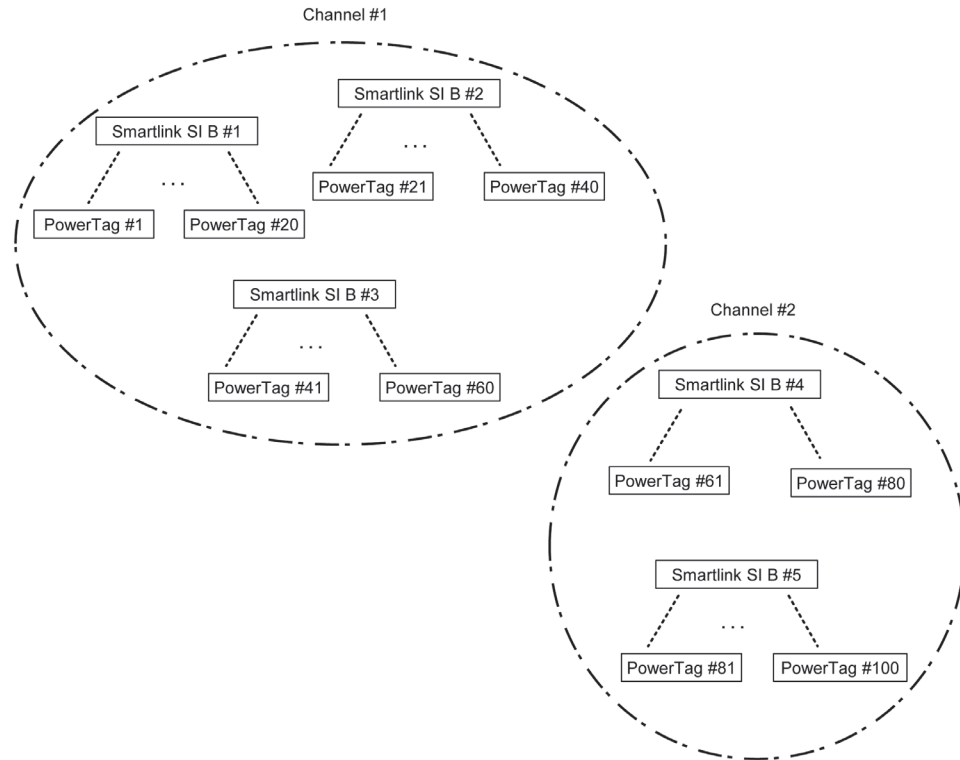
Any modification to the communication period has to be done after the commissioning of the PowerTag wireless communication energy sensors is completed to avoid slowdown of the commissioning process.

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

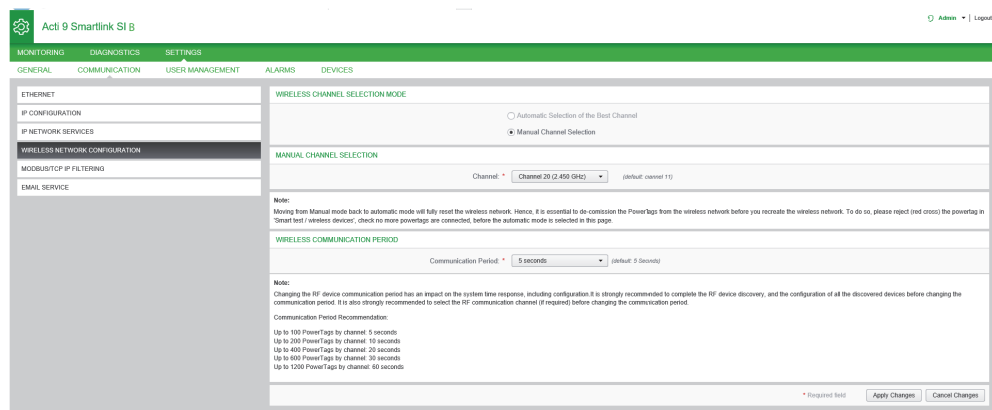




### Description

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

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



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 <b>Manual Channel Selection</b> .
2	Select the required channel from the <b>Channel</b> list. The default channel is <b>Channel 11</b> .
3	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

The communication period defines the amount of time each PowerTag sends its data to the Acti9 Smartlink SI B. 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 Devices Selection and Configuration

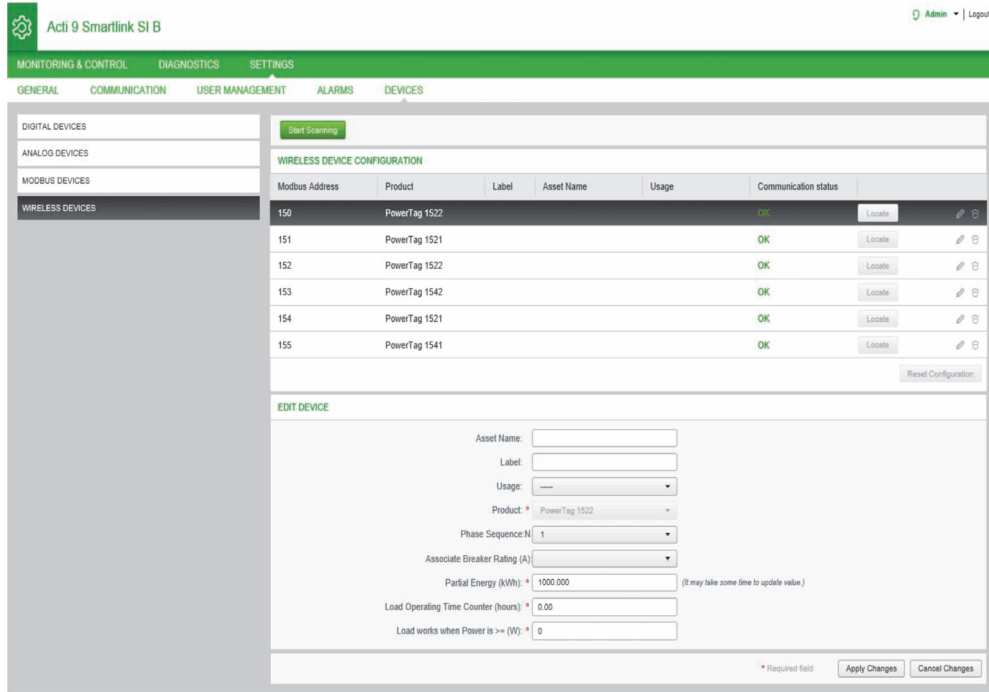
### Description

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

The Acti9 Smartlink SI B web page allows the configuration of the following wireless 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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings → Devices → Wireless Devices</b> .



Follow the procedure to configure the wireless devices:

Step	Action
1	Click <b>Start Scanning</b> to discover the wireless devices connected to the Acti9 Smartlink SI B. <b>Result:</b> 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 <b>Asset Name</b> of a wireless device.
4	Enter the <b>Label</b> of a wireless device
5	Select the <b>Usage</b> from the drop-down list.
6	Select the phase sequence for the wireless device from the <b>Phase Sequence</b> . 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 <b>Mounting Position</b> as either <b>Up</b> or <b>Down</b> .
8	Select the breaker rating from the <b>Associate Breaker Rating (A)</b> list to calculate the percentage of loads.
9	Enter the value for the energy counter in the <b>Partial Energy</b> area. Click <b>Reset</b> or enter the value as 0 to reset the partial energy counter.
10	<b>Load Operating Time Counter (hours):</b> 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	<b>Load work when Power is &gt;=:</b> The Load Operating Time counter increments only when this condition is met. The default value is 0. You can set the value between 10W to 15000W.
12	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

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# Chapter 9

## Setting Up Ethernet Communication

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Ethernet Principle	90
Set Up and Ethernet Addressing Mode	91
Ethernet Settings	94
IP Configuration	95
IP Network Services	96
Acti9 Smartlink SI B Device Function	101

## 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 B can be connected to a PC or a laptop over Ethernet. The Acti9 Smartlink SI B provides a Modbus TCP/IP gateway over Ethernet to enable Modbus TCP communication from a Modbus TCP master to any Modbus slave devices connected to it.

The maximum active Modbus TCP client connection is eight.

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

The settings of the Ethernet communication are done through Acti9 Smartlink SI B 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 B device:

Step	Action
1	<b>Disconnect your PC from all networks.</b>
2	Connect an Ethernet straight cable between your PC or a laptop and the Ethernet port on the Acti9 Smartlink SI B.
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 B from Windows XP and Windows 7.

### Access Web Page of Acti9 Smartlink SI B from Windows XP

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

Use Case	Procedure
Panel not connected to building network	<ol style="list-style-type: none"> <li>1. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)<sup>(1)</sup> on your PC.</li> <li>2. Type the IPv4 address<sup>(2)</sup> in the address field of the web browser.</li> <li>3. Press ENTER. This opens the home page of the web page.</li> </ol>
Panel is already connected for the first time to building network with no DHCP server, using static addressing mode	<ol style="list-style-type: none"> <li>1. Connect your PC or a laptop directly to Acti9 Smartlink Ethernet (point to point) or if not connected to Acti9 Smartlink SI B, connect your PC to the building Ethernet network.</li> <li>2. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)<sup>(1)</sup> on your PC.</li> <li>3. Type the IPv4 address<sup>(2)</sup> in the address field of the web browser.</li> <li>4. Press ENTER. This opens the home page of the web page.</li> <li>5. From the web page, click <b>Settings</b> menu - <b>IP Configuration, Manual IP Addressing</b> parameter, type new IPv4 address, subnet mask, and gateway address.</li> <li>6. Put a sticker on the product with the new IPv4 address.</li> </ol>
Panel is already connected to building network with DHCP server, using dynamic addressing mode	<ol style="list-style-type: none"> <li>1. Connect your PC or a laptop to the building Ethernet network.</li> <li>2. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)<sup>(1)</sup> on your PC.</li> <li>3. Type the name<sup>(3)</sup> of the Acti9 Smartlink SI B in the address field of the web browser.</li> <li>4. Press ENTER. This opens the home page of the web page.</li> </ol>
<p><sup>(1)</sup> The browsers compatible with Acti9 Smartlink SI B are:</p> <ul style="list-style-type: none"> <li>● Internet Explorer (Windows) version 8, 9, 10, and 11</li> <li>● Google Chrome (Windows) version 42.0.2311.90m</li> <li>● Mozilla Firefox version 27.0.1</li> <li>● Safari (Windows) from 5.1.7</li> </ul> <p><sup>(2)</sup> IPv4 address is printed on Acti9 Smartlink SI B with this format 169.254.xxx.yyy. The last two numbers (xxx, yyy) are unique per product.</p> <p><sup>(3)</sup> By default the name of the product is MySmartLink-6550.</p>	

### Access Web Page of Acti9 Smartlink SI B from Windows 7

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

Use Case	Procedure
Panel not connected to building network	<ol style="list-style-type: none"> <li>1. Connect your PC or a laptop directly to Acti9 Smartlink SI B (point to point) or connect your PC or a laptop to the Ethernet switch of the panel.</li> <li>2. Launch the Windows Explorer, then select Network to see the available devices.</li> <li>3. Double-click the auto-discovered<sup>(3)</sup> Acti9 Smartlink SI B product. This opens the home page of the web page.</li> </ol>

Use Case	Procedure
Panel is already connected for the first time to building network with no DHCP server, using static addressing mode	<ol style="list-style-type: none"> <li>1. Connect your PC or a laptop directly to Acti9 Smartlink SI B (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 B, connect your PC to the building Ethernet network.</li> <li>2. Launch the Windows Explorer, then select Network to see the available devices.</li> <li>3. Double-click the auto-discovered<sup>(3)</sup> Acti9 Smartlink SI B product. This opens the home page of the web page.</li> <li>4. From the web page, click <b>Settings</b> menu - <b>IPv4/v6</b> page, <b>Manual IP Addressing</b> parameter, type new IPv4 address, subnet mask, and gateway address.</li> <li>5. Put a sticker on the product with the new IPv4 address.</li> </ol>
Panel is already connected to building network with DHCP server, using dynamic addressing mode	<p>From either different subnet or same subnet:</p> <ol style="list-style-type: none"> <li>1. Connect your PC or a laptop to the building Ethernet network.</li> <li>2. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)<sup>(1)</sup> on your PC.</li> <li>3. Type the name<sup>(3)</sup> of the Acti9 Smartlink SI B in the address field of the web browser.</li> <li>4. Press ENTER. This opens the home page of the web page.</li> </ol> <p>From same subnet:</p> <ol style="list-style-type: none"> <li>1. Connect your PC or a laptop to the building Ethernet network.</li> <li>2. Launch the Windows Explorer, then select Network to see the available devices.</li> <li>3. Double-click the auto-discovered<sup>(3)</sup> Acti9 Smartlink SI B product. This opens the home page of the web page.</li> </ol>
Panel is already connected to the building network with DHCP server, using fixed addressing mode	<p>From either different subnet or same subnet:</p> <ol style="list-style-type: none"> <li>1. Connect your PC or a laptop to the building Ethernet network.</li> <li>2. Launch the web browser (Google Chrome, Internet Explorer, Mozilla Firefox, or Safari)<sup>(1)</sup> on your PC.</li> <li>3. Type the IPv4 address<sup>(2)</sup> of the Acti9 Smartlink SI B in the address field of the web browser.</li> <li>4. Press ENTER. This opens the home page of the web page.</li> </ol> <p>From same subnet:</p> <ol style="list-style-type: none"> <li>1. Connect your PC or a laptop to the building Ethernet network.</li> <li>2. Launch the Windows Explorer, then select Network to see the available IP devices.</li> <li>3. Double-click the auto-discovered<sup>(3)</sup> Acti9 Smartlink SI B product. This opens the home page of the web page.</li> </ol>
<p><sup>(1)</sup> The browsers compatible with Acti9 Smartlink SI B are:</p> <ul style="list-style-type: none"> <li>● Internet Explorer (Windows) version 8, 9, 10, and 11</li> <li>● Google Chrome (Windows) version 42.0.2311.90m</li> <li>● Mozilla Firefox version 27.0.1</li> <li>● Safari (Windows) from 5.1.7</li> </ul> <p><sup>(2)</sup> IPv4 address is printed on Acti9 Smartlink SI B with this format 169.254.xxx.yyy. The last two numbers (xxx, yyy) are unique per product.</p> <p><sup>(3)</sup> By default the name of the product is MySmartLink-6550.</p>	

**Access Web Page Using Tablet**

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

Step	Action
1	Connect Acti9 Smartlink SI B to the wireless router using Ethernet cable.
2	Search for the available networks in the tablet.
3	Connect the tablet to the same wireless router to which Acti9 Smartlink SI B is connected.
4	Launch web browser in the tablet after a connection is established.
5	<p>The IP address of the Acti9 Smartlink SI B on the web browser depends on Static IP address mode or DHCP mode:</p> <ul style="list-style-type: none"> <li>● 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.</li> <li>● 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.</li> <li>● If the product is in static mode, then the device uses the IP address which the user has configured.</li> </ul>
6	Type the username and the password in the login page to access the device.



### Access Web Page Using Smartphone

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

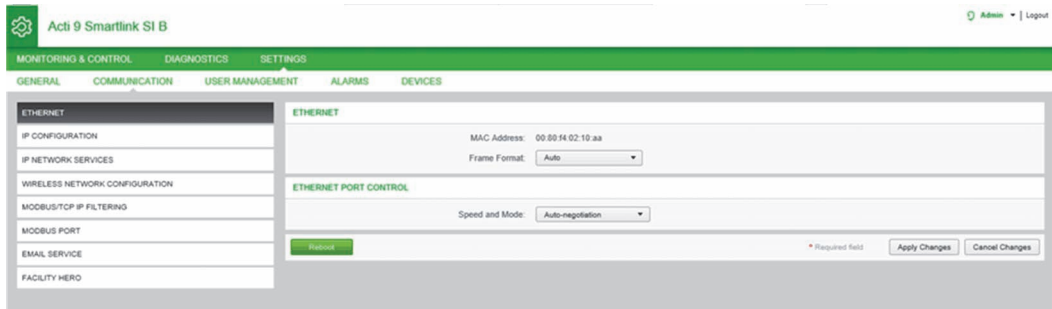
Step	Action
1	Connect Acti9 Smartlink SI B to the wireless router using Ethernet cable.
2	Search for the available networks in the smartphone.
3	Connect the smartphone to the Wi-Fi network to access to the Ethernet. If Wi-Fi network is not available, it is recommended to use Wifer from Schneider Electric that can connect to Acti9 Smartlink and create a Wi-Fi hotspot on which the smartphone can be connected.
4	Launch web browser in the smartphone after a connection is established.
5	Enter the IP address of the Acti9 Smartlink SI B on the web browser of the smartphone.
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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>Communication</b> → <b>Ethernet</b> .



The following procedure describes to configure Ethernet parameters:

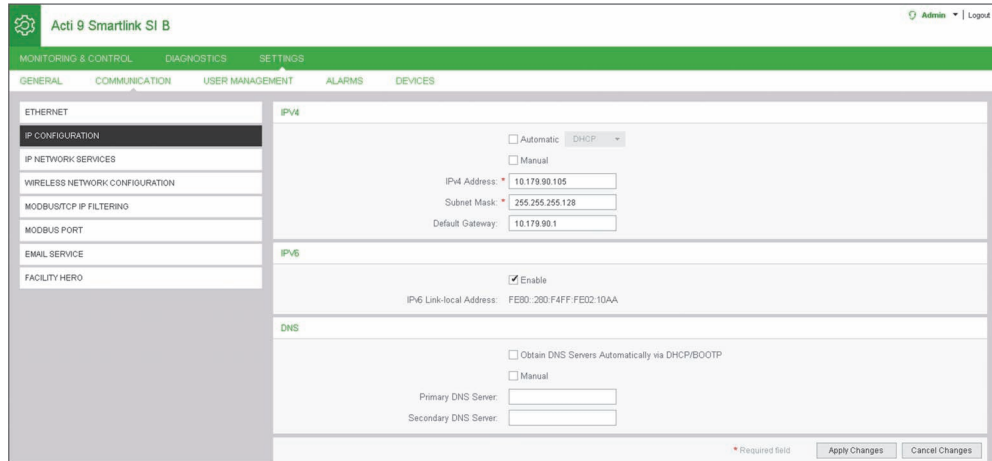
Step	Action
1	Select the type of Ethernet frame format from the <b>Frame Format</b> list. It can be <b>Ethernet II</b> , <b>802.3</b> , or <b>Auto</b> . The default value of the frame format is <b>Auto</b> .
2	Select the value for speed and mode of the Ethernet port from the <b>Speed and Mode</b> list. The value of speed and mode can be one of the following: <ul style="list-style-type: none"> <li>● <b>10 Mbps - Half duplex</b></li> <li>● <b>10 Mbps - Full duplex</b></li> <li>● <b>100 Mbps - Half duplex</b></li> <li>● <b>100 Mbps - Full duplex</b></li> <li>● <b>Auto-negotiation</b></li> </ul> The default value is <b>Auto-negotiation</b> .
3	Click <b>Apply Changes</b> and then click <b>Reboot</b> to automatically restart the device to save the settings. Click <b>Cancel Changes</b> 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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings → Communication → IP Configuration</b> .



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 B 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 <b>Manual</b> .
2	Enter the <b>IPv4 Address</b> of the device.
3	Enter the <b>Subnet Mask</b> of the device.
4	Enter the <b>Default Gateway</b> of the device.
5	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

Follow the procedure below to configure IPv6 parameters:

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

Acti9 Smartlink SI B 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:

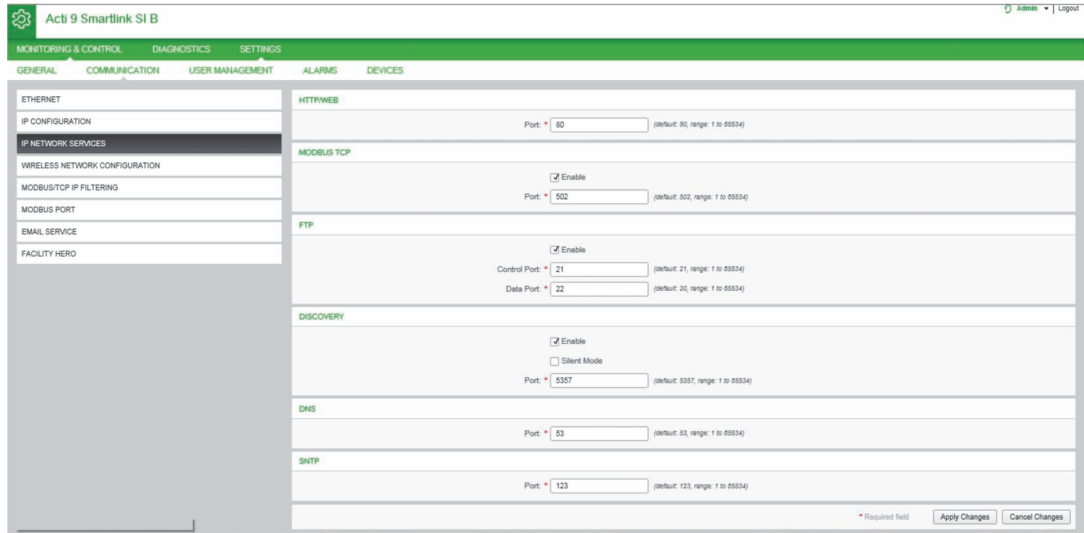
Step	Action
1	Select <b>Manual</b> .
2	Enter the <b>Primary DNS Server</b> of the device.
3	Enter the <b>Secondary DNS Server</b> of the device.
4	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

## 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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>Communication</b> → <b>IP Network Services</b> .



Acti9 Smartlink SI B supports HTTP, HTTPS, Modbus/TCP, FTP protocols, DNS, SNMP, and discovery services.

The default value of the HTTP port number is 80.

Follow the procedure to configure HTTPS parameters:

Step	Action
1	Select the <b>Enable</b> check box to enable the Modbus/TCP service. The <b>Enable</b> check box is selected by default.
2	Displays the port number of the HTTPS network. The default value is 443.
3	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

Follow the procedure to configure Modbus/TCP parameters:

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

Follow the procedure to configure FTP parameters:

Step	Action
1	Select the <b>Enable</b> check box to enable the FTP service. The <b>Enable</b> 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 <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

Follow the procedure to configure discovery services:

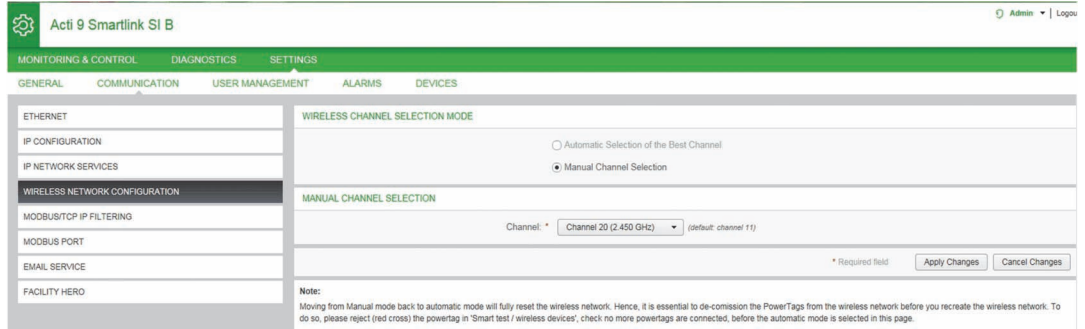
Step	Action
1	Select the <b>Enable</b> check box to enable the discovery service. The <b>Enable</b> check box is selected by default.
2	Select the <b>Silent Mode</b> check box. The <b>Silent Mode</b> check box is selected by default.

Step	Action
3	Displays the port number of the discovery network. The default value is 5357.
4	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

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

### Wireless Network Configuration Page

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



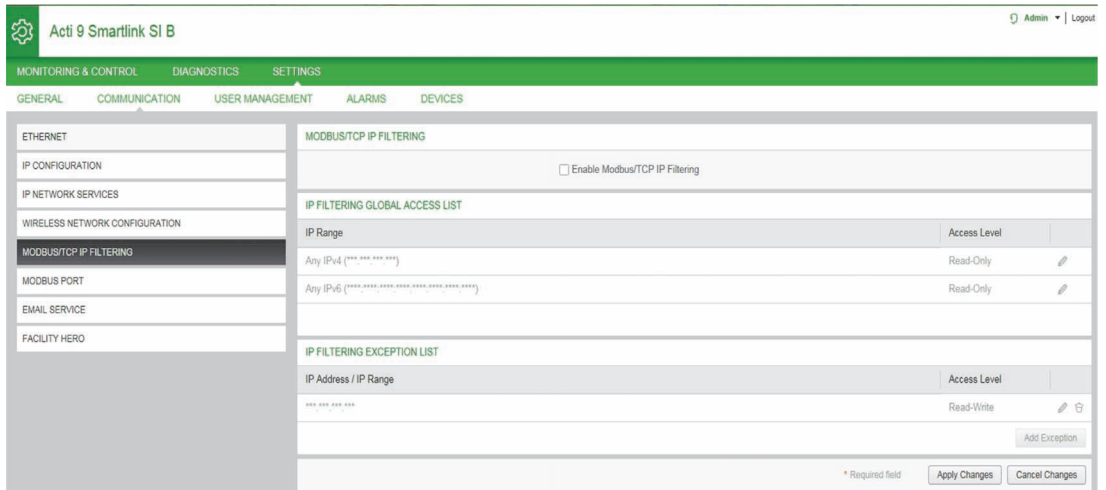
Click **Automatic Selection of the Best Channel** to select the channel automatically.

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

Step	Action
1	Click <b>Manual Channel Selection</b> .
2	Select the required channel from the <b>Channel</b> list. The default channel is <b>Channel 11</b> .
3	Select the wireless power selection from the <b>Power</b> list. The power value ranges from -22...+3.
4	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

### Modbus TCP/IP Filtering Page

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.



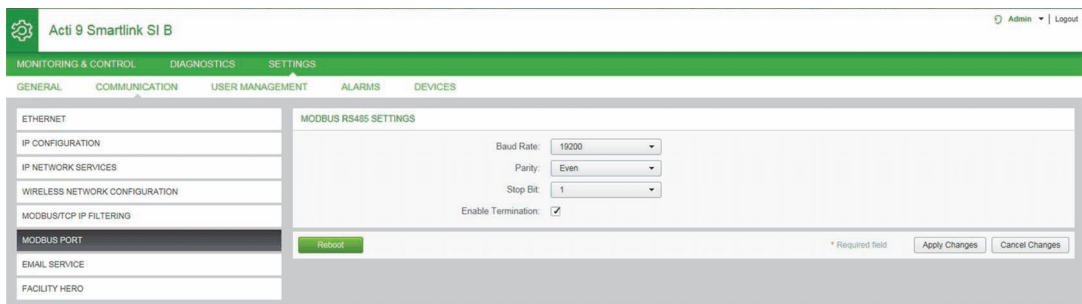
Follow the procedure to configure the IP address to enable write access:

Step	Action
1	Select the <b>Enable Modbus TCP/IP Filtering</b> check box to enable write access for the global IP address range and for the listed IP address range. <b>NOTE:</b> If you do not select the <b>Enable Modbus TCP/IP Filtering</b> check box, you cannot edit global IP address range and add or edit applicable exceptions.
2	Click <b>Add exception</b> 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 <b>IP address/range</b> area and select the <b>Access level</b> for the entered IP address.
4	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> 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.

### Modbus Port Page

The **Modbus Port** page is used to configure Modbus serial line settings.



Follow the procedure to configure the Modbus parameters:

Step	Action
1	Select the baud rate from the <b>Baud Rate</b> list. The default value is 19,200.
2	Select the type of parity from the <b>Parity</b> list. The default value is <b>Even</b> .
3	Select the type of stop bit from the <b>Stop Bit</b> list. The default value is <b>1</b> .
4	Select the <b>Enable Termination</b> check box if Acti9 Smartlink SI B is at the beginning or end of RS485 network. The <b>Enable Termination</b> check box is enabled by default.
5	Click <b>Apply Changes</b> and then click <b>Reboot</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

### Email Service Page

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. The event notifications require unfiltered Internet access. This level of service is suited for small or mid-sized non-critical buildings. The device sends the emails when Internet access is available through a dedicated connection or through a local area network (LAN) with Internet access.

**NOTE:** 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.

Click the **Enable** check box to configure the email server settings. Acti9 Smartlink Ethernet allows you to select the **schneider-electric mail server** or **my own SMTP server** profiles from the drop-down list.

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 <b>SMTP Server Address</b> area.
2	Select the type of security mode from the <b>Connection Security Mode</b> list. The following are the available connection security modes: <ul style="list-style-type: none"> <li>• <b>None</b></li> <li>• <b>TLS/SSL</b></li> <li>• <b>STARTTLS</b></li> </ul>
3	Enter the server port value in the <b>SMTP Server Port</b> area. The value ranges from 1 to 65535.
4	Select <b>Authentication</b> if the server requires login information. This option is disabled by default.
5	Enter the user name in the <b>SMTP Account Login</b> area.
6	Enter the password to authenticate the SMTP login in the <b>SMTP Account Password</b> area.
7	Enter the email address of the administrator who is administering the device in the <b>From Address</b> area. The <b>From Address</b> can be used in different ways: <ul style="list-style-type: none"> <li>• Use the <b>From Address</b> as a context provider: If you want to notify and does not want to receive a reply, use a <b>From Address</b> as contextual information. The <b>From Address</b> syntax includes “no-reply”, “device name”, “site name”, @a validated domain .com, .net, and so on.</li> <li>• Create an alias in the <b>From Address</b> 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.</li> </ul>
8	Select the language of the email body from the <b>Language</b> list.
9	Click <b>Apply Changes</b> to save the settings. If you do not want to save the changes, click <b>Cancel Changes</b> .
10	Enter the email address of the recipient to test the delivery of the email in the <b>Recipient Address for Test</b> 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 <b>Test</b> 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.

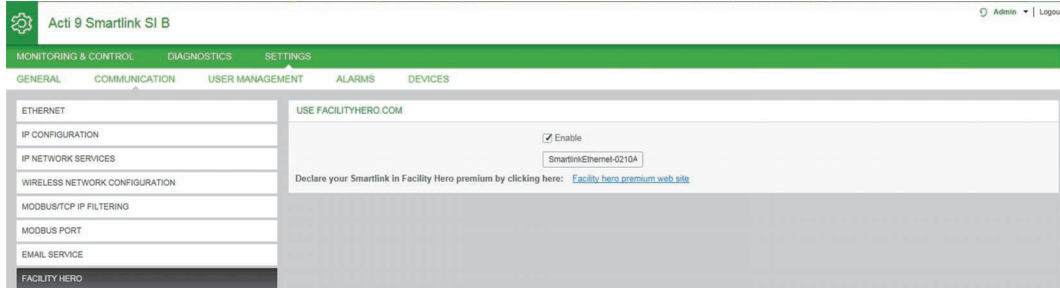
Schneider Electric provides an email service, free of charge, which allows you to receive the alarm notifications. When you choose to activate this service, you accept that Schneider Electric collects the data of your Smart Panels and your email address for the purpose to improve the product and the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

### Facility Expert Page

The **Facility Expert** service enables the electricians and the facility manager to stay connected with their customer assets. The manager in charge of maintaining the electrical installation can receive the alarms from all the installed Acti9 Smartlink devices logged in a notebook, and the complete history of the maintenance is shared within the maintenance staff. You can receive alarms directly in the notification center of **Facility Expert** as it is easy to monitor all the connected panels in the same space.

For more details on facility expert, see [www.facilityhero.com](http://www.facilityhero.com).

The following figure allows you to connect the Acti9 Smartlink SI B to the Facility Expert service:



#### Enabling Facility Expert

Follow the steps given in the table to configure the Facility Expert service:

Step	Action
1	Select the <b>Enable</b> check box to enable the Facility Expert service in Acti9 Smartlink SI B.
2	Click <b>OK</b> to confirm. When you enable the Facility Expert service, you can receive all the alarm emails in the Facility Expert notification center. <b>NOTE:</b> If the SMTP server is already configured, then the Facility Expert service over writes the SMTP configuration and saves the earlier configuration.
3	Click the link <b>Facility hero premium web site</b> to log into the Facility Expert account. Facility Expert manages a special page to declare the Acti9 Smartlink SI B.
4	An alarm notification is sent to the Facility Expert premium website on occurrence of an alarm.

#### Disabling Facility Expert

Follow the steps given in the table to disable the Facility Expert service:

Step	Action
1	Click to clear the <b>Enable</b> check box to disable the Facility Expert service in Acti9 Smartlink SI B.
2	Click <b>OK</b> to confirm the disable of the Facility Expert service.
3	No alarm is sent to the Facility Expert on occurrence of an alarm.



## Acti9 Smartlink SI B Device Function

### Modbus TCP/IP Server

The Acti9 Smartlink SI B provides a Modbus TCP server to give access to all its data and configuration parameters. The Acti9 Smartlink SI B has a fixed unit ID of 255. The Modbus data mapping and read or write accesses is identical to RS485 for same functions or data. In other words, the Modbus data mapping is a subset of RS485 data mapping (at least for digital channels related accesses).

### Modbus TCP/IP Gateway

The Modbus TCP/IP gateway on Acti9 Smartlink SI B enables communication between a Modbus TCP/IP client connected to the TCP/IP port on the Acti9 Smartlink SI B and any Modbus slave devices connected to the Acti9 Smartlink SI B. The Acti9 Smartlink SI B provides a simple and transparent interface between Ethernet based networks and field devices. This includes meters, monitors, protective relays, trip units, motor controls, and other devices that communicate using Modbus RS485 slave.

The Acti9 Smartlink SI B can manage up to eight Modbus RS485 slaves. The address of these slaves could be from 1 to 149 (the default address ranges from 1 through 8).

**Modbus** communication parameters are:

- Data rate (in Baud) 9,600 and 19,200 (19,200 is the default data rate).
- Parity
  - Even and one stop bit.
  - Odd and one stop bit.
  - No Parity (parity bit eliminated) two stop bits are needed.



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# Chapter 10

## Setting Up Modbus Communication (Gateway Function)

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Modbus Master Principle	104
Possible Architecture	106
Setup	107
Gateway Features	108
Modbus Port Settings	109

## Modbus Master Principle

### Overview

The Modbus protocol exchanges data using a request/response mechanism between a master and a slave. The master/slave principle is a type of communication protocol in which a device (the master) controls one or more devices (the slaves). A standard Modbus network consists of one master and up to 31 slaves.

**NOTE:** For more information, a detailed description of the Modbus protocol is available on [www.modbus.org](http://www.modbus.org).

### Characteristics of the Master/Slave Principle

The master/slave principle has the following characteristics:

- Only one master at a time is connected to the network.
- Only the master can launch communication and send requests to slaves.
- The master can address each slave individually using its dedicated address or all slaves simultaneously using address 0.
- The slaves can only send responses to the master.
- Slaves cannot launch communication with either the master, or the other slaves.

### Master/Slave Communication Modes

The Modbus protocol can exchange data using two communication modes:

- Request/response mode
- Broadcast mode

The Acti9 Smartlink SI B support Modbus protocol as master and can support up to eight Modbus slave devices as Acti9 Smartlink RS485. Each Acti9 Smartlink RS485 has a Modbus address (1 to 99), and concentrates data from connected devices on its 11 channels (Ti24 interface).

The states and orders for each device connected (with Ti24 interface) to Acti9 Smartlink SI B are accessible in registers whose address depends on the digital channels (1 to 7) on which the device is connected.

### Request/Response Mode

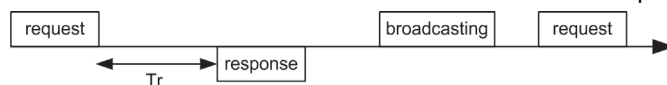
In request/response mode, the master addresses one slave using the slave's dedicated address. The slave processes the request, then responds to the master.

### Broadcast Mode

In broadcast mode, the master addresses all the slaves using address 0. Slaves do not respond to broadcast messages.

### Turnaround Time

The turnaround time  $T_r$  is the time between the end of receipt of a request and sending the response.



The typical value of the turnaround time  $T_r$  is less than 10 ms with the Modbus protocol.

### Data Exchange

The Modbus protocol uses two data types:

- Bits
- 16-bit words called registers

Each register has a register number. Each data type (bit or register) has a 16-bit address.

Messages exchanged with the Modbus protocol contain the address of the data to be processed.

## Frames

All frames exchanged with the Modbus protocol are 256 bytes maximum and consist of 4 fields:

Field	Definition	Size	Description
1	Slave number	1 byte	Destination of the request <ul style="list-style-type: none"> <li>● 0: broadcast (all slaves are affected)</li> <li>● 1...149: unique destination</li> </ul>
2	Function code	1 byte	Modbus TCP/IP Function ( <i>see page 176</i> )
3	<ul style="list-style-type: none"> <li>● Data</li> <li>● Sub-function code</li> </ul>	n bytes	<ul style="list-style-type: none"> <li>● Request or response data</li> <li>● Sub-function code</li> </ul>
4	Check	2 bytes	CRC16 (to check transmission errors)

## Data Format

The data format is configured as shown below according to Modbus RTU protocol:

Start	Data	Parity	Stop
1 bit	8 bits	1 bit	1 bit

**NOTE:** The Modbus RTU data format is composed of 11 bits.

Even parity is required, other modes (odd parity, no parity) may be also used.

If no parity is implemented in the Modbus Master, an additional stop bit must be transmitted by the Modbus Master to fill out the character frame to a full 11 bit asynchronous character.

**NOTE:** For more information, a detailed description of the Modbus protocol is available on [www.modbus.org](http://www.modbus.org).

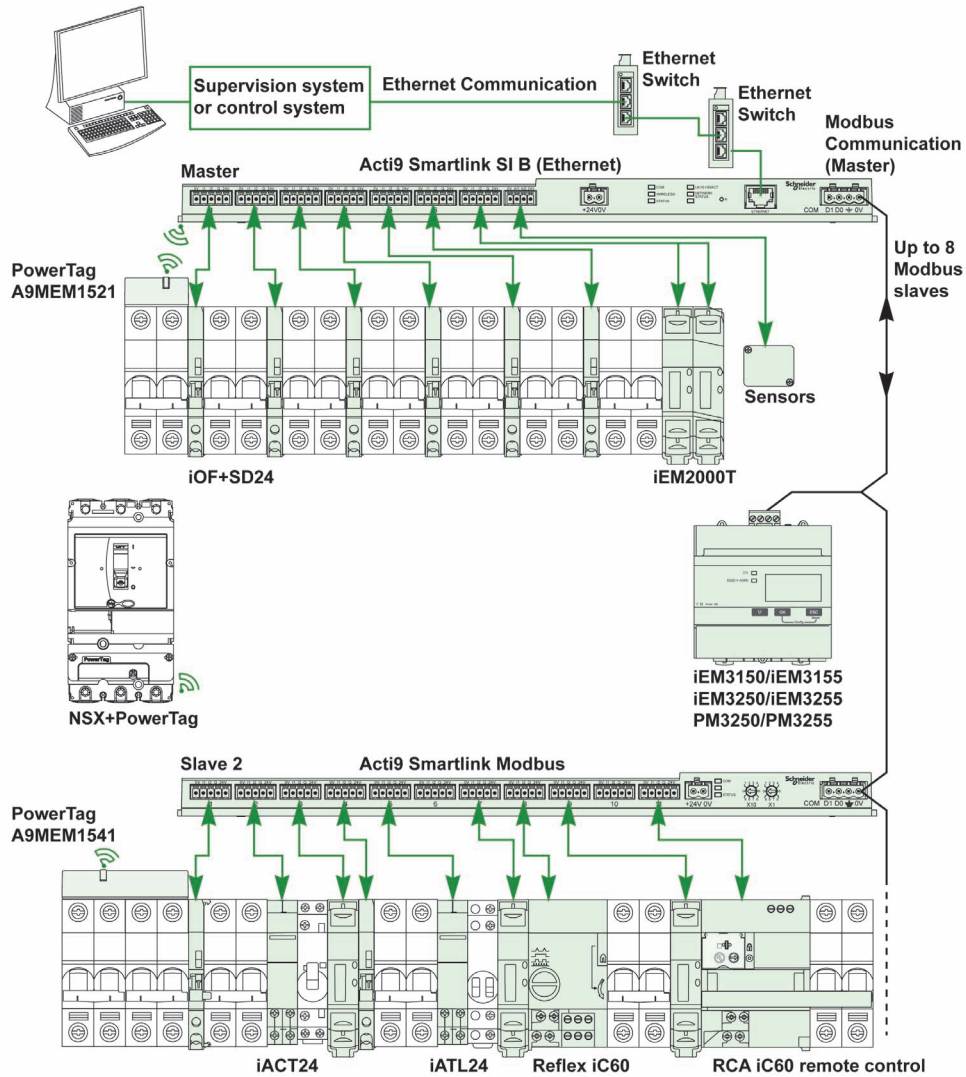
## Possible Architecture

### Description

The Acti9 Smartlink SI B acts as a Modbus master that can be connected to 8 slave devices. The default Modbus address of Acti9 Smartlink SI B is 255.

Address 0 is used to broadcast and address from 248 to 254 is used as reserved address. Slave devices can be assigned from any address between 1 to 149 (the default slave addresses ranges from 1 through 8).

The Acti9 Smartlink SI B acts as a data concentrator to represent the PowerTag energy sensors as a Modbus device. The PowerTag energy sensors Modbus address ranges from 150...220 are available in the Acti9 Smartlink SI B



## Setup

### Overview

The setting of the Modbus Communication is done through Acti9 Smartlink SI B web pages.

The default gateway ID of Smartlink Ethernet is 255.

The following table provides the communication parameter values:

Settings	Authorized Values	Default Valued
Data rate (in Bauds)	9600 and 19,200	19,200
Parity	<ul style="list-style-type: none"> <li>● Even and one stop bit</li> <li>● Odd and one stop bit</li> <li>● No parity (parity bit eliminated), 2 stop bits are needed.</li> </ul>	Even (with 1 stop bit)

**NOTE:** The Modbus network communication speed is same for all serial connections. It is imposed by the lowest communication speed of a slave device. If slave implements auto go, then it obtains Modbus parameters from the master (Acti9 Smartlink Ethernet Wireless) automatically. If slave does not support auto go, then user has to configure Modbus parameters as that of the master.

## Gateway Features

### Overview

The Acti9 Smartlink SI B supports Modbus TCP/IP gateway. The gateway features enable Modbus TCP communication from a Modbus TCP master to any Modbus RS485 slave devices connected to it. Acti9 Smartlink SI B provides a simple and transparent interface between Ethernet based networks and field devices. These devices are meters, monitors, protective relays, trip units, motor controls, and other devices that communicate using Modbus TCP/IP.



## Modbus Port Settings

### Modbus Port Page

The **Modbus Port** page is used to configure Modbus serial line settings.

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>Communication</b> → <b>Modbus Port</b> .

The screenshot shows the 'Modbus RS485 SETTINGS' page in the Acti9 Smartlink SI B web interface. The page has a green header with the title 'Acti9 Smartlink SI B' and a user profile 'Admin' with a 'Logout' link. Below the header is a navigation bar with tabs: 'MONITORING & CONTROL', 'DIAGNOSTICS', and 'SETTINGS'. Under 'SETTINGS', there are sub-tabs: 'GENERAL', 'COMMUNICATION', 'USER MANAGEMENT', 'ALARMS', and 'DEVICES'. The 'COMMUNICATION' sub-tab is active, and the 'MODBUS PORT' option is selected in the left sidebar. The main content area shows 'MODBUS RS485 SETTINGS' with the following configuration: Baud Rate: 19200, Parity: Even, Stop Bit: 1, and Enable Termination: . At the bottom right, there is a '\* Required field' label and buttons for 'Apply Changes' and 'Cancel Changes'. A 'Reboot' button is located at the bottom left of the settings area.

Follow the procedure to configure the Modbus parameters:

Step	Action
1	Select the baud rate from the <b>Baud Rate</b> list. The default value is 19,200.
2	Select the type of parity from the <b>Parity</b> list. The default value is <b>Even</b> .
3	Select the type of stop bit from the <b>Stop Bit</b> list. The default value is <b>1</b> .
4	Select the <b>Enable Termination</b> check box if Acti9 Smartlink SI B is at the beginning or end of RS485 network. The <b>Enable Termination</b> check box is enabled by default.
5	Click <b>Apply Changes</b> and then click <b>Reboot</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.



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# Chapter 11

## System Settings Configuration

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
General Network Settings	112
Modbus TCP/IP Filtering	115
Email Service	116
User Management	118
Alarms	120
Devices	122

## General Network Settings

### Identification Page

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>General</b> → <b>Identification</b> .

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

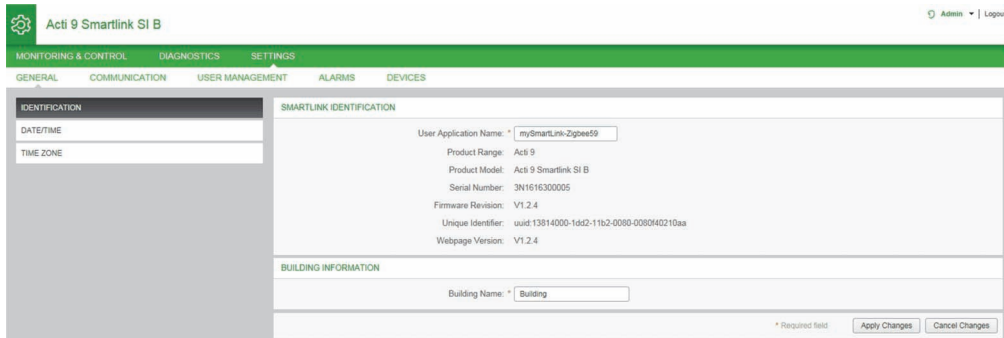
Parameters	Description
<b>Smartlink Identification</b>	
<b>User Application Name</b>	Displays the name of the particular device used by communication services to identify the device.
<b>Product Range</b>	Displays the product range name of the device.
<b>Product Model</b>	Displays the product model name of the device.
<b>Serial Number</b>	Displays the serial number of the device.
<b>Firmware Revision</b>	Displays the firmware version number of the device.
<b>Unique identifier</b>	Displays the identifier used by communication protocols.
<b>Webpage Version</b>	Displays the web page version of the device.
<b>Building Information</b>	
<b>Building Name</b>	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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>General</b> → <b>Date/Time</b> .

## 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 <b>Manual</b> .
2	Enter the <b>Date</b> to be set in the format <b>yyyy-mm-dd</b> .
3	Enter the <b>Time</b> in the format <b>hh:mm:ss</b> . Ensure to enter the time in a proper format. The following error message pops up if you enter the time in an incorrect format: <div data-bbox="268 981 826 1220" style="border: 1px solid gray; padding: 5px; margin: 5px 0;"> <p>Time (hh:mm:ss)* 11:38:23</p> <p>Date/Time</p> <p>no time source is selected. Please select a source</p> <p>OK</p> </div>
4	Select <b>Network Synchronization via SNTP/NTP</b> to configure the date and time automatically via SNTP/NTP.
5	Select <b>Network Synchronization via Modbus TCP</b> to configure the date and time via Modbus TCP.
7	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> 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 B can communicate with NTP and server to synchronizes its time.

The Acti9 Smartlink SI B 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 B receives date and time from SNTP server after every poll interval time. Follow the procedure to configure date and time using **SNTP/NTP** parameters:

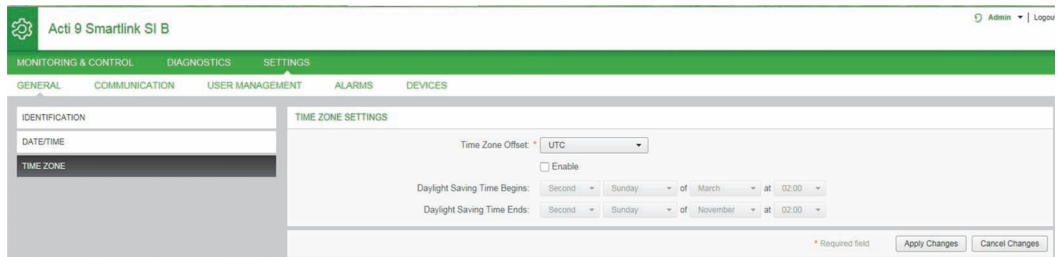
Step	Action
1	Enter the value for <b>Poll Interval</b> in hours that ranges from 1 through 63. The default value of poll interval is 1.
2	Select <b>Obtain SNTP/NTP Servers Automatically via DHCP/BOOTP</b> to obtain the server address automatically from SNTP or NTP servers.
3	Select <b>Manual</b> .

Step	Action
4	Enter the primary server name or IP address for <b>Primary SNTP/NTP Server</b> parameter. The primary server can be: <ul style="list-style-type: none"> <li>● IPv4 address</li> <li>● IPv6 address</li> <li>● Domain name</li> </ul>
5	Enter the secondary server name or IP address for <b>Secondary SNTP/NTP server</b> parameter. This is an optional parameter.
6	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

**Time Zone Page**

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>General</b> → <b>Time Zone</b> .

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 <b>Time Zone Offset</b> list.
2	Select the <b>Enable</b> check box to configure the daylight time saving settings. The <b>Enable</b> 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 <b>Daylight Saving Time Begins</b> list.
4	Select the day, month, and time to configure the end time of daylight saving time from the <b>Daylight Saving Time Ends</b> list.
5	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> 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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>Communication</b> → <b>Modbus TCP/IP Filtering</b> .

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

Step	Action
1	Select the <b>Enable Modbus TCP/IP Filtering</b> check box to enable write access for the global IP address range and for the listed IP address range. <b>NOTE:</b> If you do not select the <b>Enable Modbus TCP/IP Filtering</b> check box, you cannot edit global IP address range and add or edit applicable exceptions.
2	Click <b>Add exception</b> 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 <b>IP address/range</b> area and select the <b>Access level</b> for the entered IP address.
4	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> 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

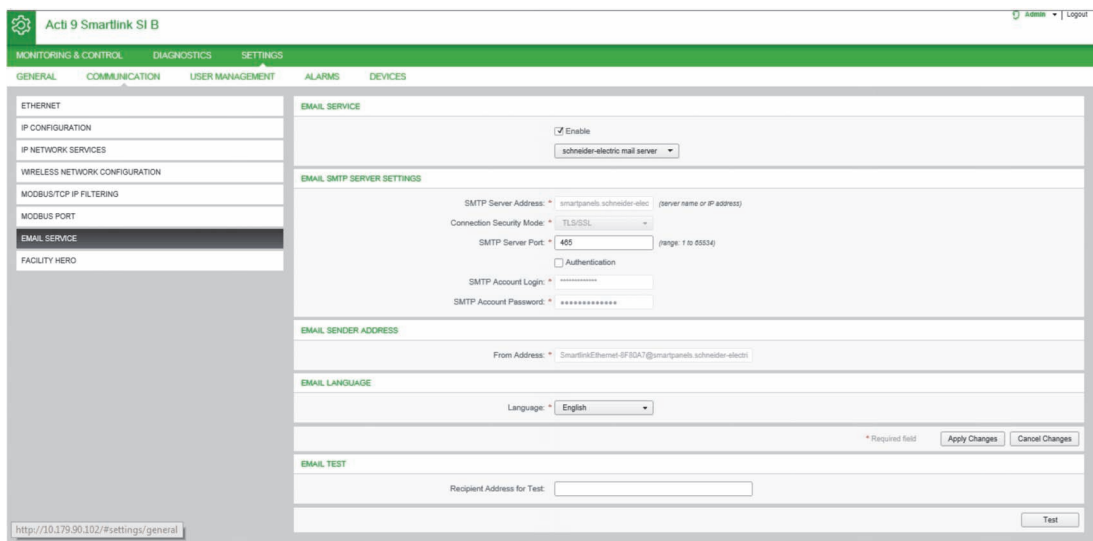
### Email Service Page

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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>Communication</b> → <b>Email Service</b> .



Click the **Enable** check box to configure the email server settings (enabled by default). Acti9 Smartlink SI B 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 my own SMTP mail server is the default profile selected to simplify the connections. However, you can select schneider-electric server profile.

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 <b>SMTP Server Address</b> area.
2	Select the type of security mode from the <b>Connection Security Mode</b> list. The following are the available connection security modes: <ul style="list-style-type: none"> <li>● <b>None</b></li> <li>● <b>TLS/SSL</b></li> <li>● <b>STARTTLS</b></li> </ul>
3	Enter the server port value in the <b>SMTP Server Port</b> area. The value ranges from 1 to 65535.
4	Select <b>Authentication</b> if the server requires login information. This option is disabled by default.
5	Enter the user name in the <b>SMTP Account Login</b> area.
6	Enter the password to authenticate the SMTP login in the <b>SMTP Account Password</b> area.



Step	Action
7	<p>Enter the email address of the administrator who is administering the device in the <b>From Address</b> area.</p> <p>The <b>From Address</b> can be used in different ways:</p> <ul style="list-style-type: none"> <li>• Use the <b>From Address</b> as a context provider: If you want to notify and does not want to receive a reply, use a <b>From Address</b> as contextual information. The <b>From Address</b> syntax includes "no-reply", "device name", "site name", @a validated domain .com, .net, and so on.</li> <li>• Create an alias in the <b>From Address</b> 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.</li> </ul> <p>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.</p>
8	Select the language of the email body from the <b>Language</b> list.
9	Click <b>Apply Changes</b> to save the settings. If you do not want to save the changes, click <b>Cancel Changes</b> .
10	<p>Enter the email address of the recipient to test the delivery of the email in the <b>Recipient Address for Test</b> area.</p> <p>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.</p>
11	Click <b>Test</b> 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.

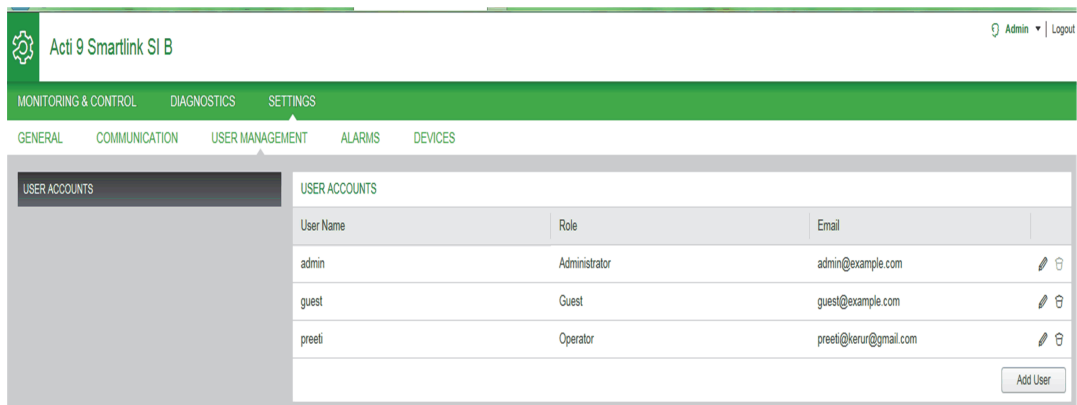
**NOTE:** The email associated to each declared user is significant, as it is used during an alarm creation to send an email if there is an occurrence of an alarm.

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

User Accounts	Access	Username	Password
Administrator	<ul style="list-style-type: none"> <li>Edit parameters in <b>Settings</b> menu</li> <li>Monitor and control of the devices</li> <li>View all menus</li> </ul>	admin	admin
User	<ul style="list-style-type: none"> <li>Monitor and control of the devices</li> <li>View all menus</li> </ul>	user	user
Guest	<ul style="list-style-type: none"> <li>View all menus</li> </ul>	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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>User Management</b> → <b>User Accounts</b> .



Follow the procedure to add a new user profile:

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

Acti 9 Smartlink SI B

MONITORING & CONTROL | DIAGNOSTICS | **SETTINGS**

GENERAL | COMMUNICATION | **USER MANAGEMENT** | ALARMS | DEVICES

**USER ACCOUNTS**

User Name	Role	Email
admin	Administrator	admin@example.com
guest	Guest	guest@example.com
preeti	Operator	preeti@kerur@gmail.com

Add User

**EDIT USER**

User Name: \* guest

Password: \* \*\*\*\*\*

Confirm Password: \* \*\*\*\*\*

Role: \* Guest

Email: \* guest@example.com

\* Required field

Apply Changes Cancel Changes

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

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

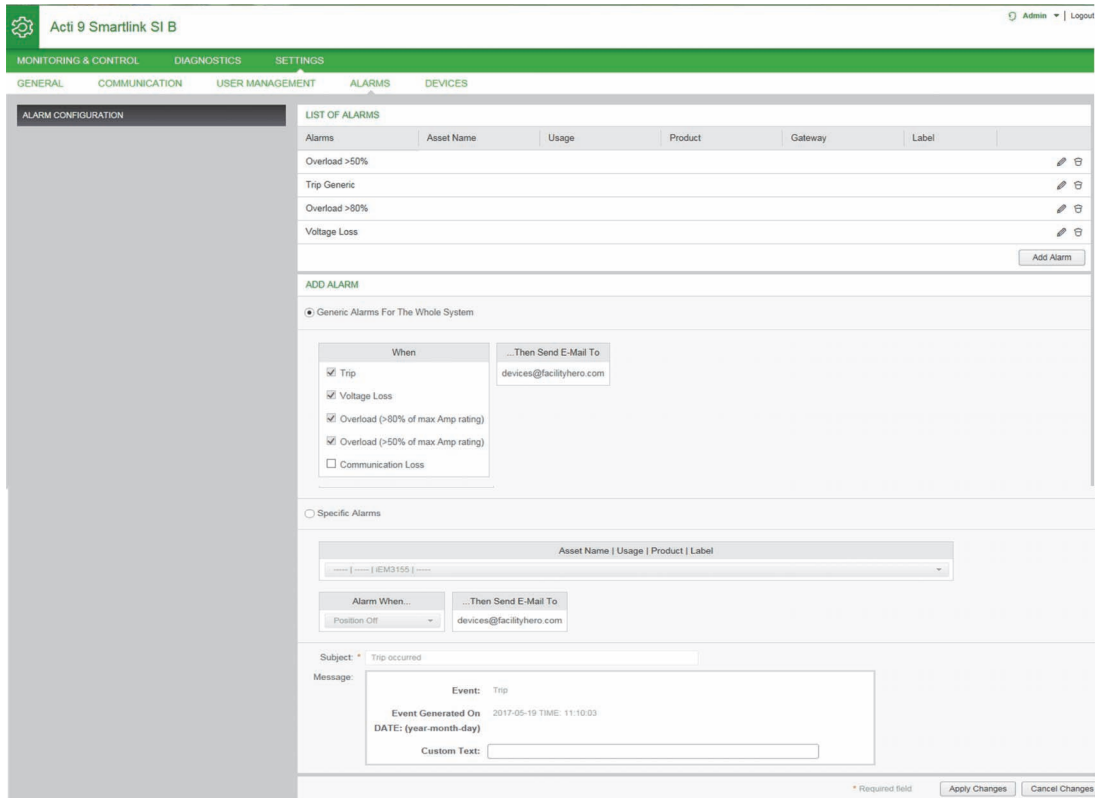
Click the delete icon to delete the user profile from web page. The user profile with Admin account cannot be deleted.

## 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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings → Alarms → Alarm Configuration</b> .



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 <b>Add Alarm</b> to add a new event. You can create either generic alarm for the whole system or specific alarms to a selected device.
2	Select <b>Generic Alarms for the Whole System</b> , select when an alarm to occur, and then select the users to whom an alarm notification to be sent through email. Or Select <b>Specific Alarms</b> , 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 <b>Subject</b> and <b>Message</b> of the email event.
5	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> 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 <b>Email</b> list.
4	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

ALARM CONFIGURATION

LIST OF ALARMS

Alarms	Asset Name	Usage	Product	Gateway	Label
Overload_80					✎ ☰
Voltage_Loss					✎ ☰
Trip_Generic					✎ ☰
Overload_50					✎ ☰

EDIT ALARMS

GENERIC ALARMS FOR THE WHOLE SYSTEM

When
...Then Send E-Mail To

Overload (>80% of max Amp rating)

Subject:

Message:

Connected Device:

Event:

Event Generated On

DATE: (year-month-day)

Custom Text:

\* Required field

## Devices

### Digital Device Page (Devices Connected to Ti24 Interface)

The **Digital Device** page displays the list of connected I/O devices connected to Ti24 interface. This page is used to configure an I/O device and to edit or delete an existing I/O device on Acti9 Smartlink SI B.

Acti9 Smartlink SI B web page allows the configuration of the following digital channels:

- OF+SD24
- iOF+SD24
- OF24
- SD24
- iACT24
- iATL24
- Reflex iC60
- RCA iC60
- Breaker IO
- Pulse Counter
- iEM3110
- iEM3155
- iEM3210
- iEM2000T
- iEM3255
- iEM3355
- PM3210
- PM3255
- Standard Input
- Standard Output

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>Devices</b> → <b>Digital Devices</b> .

The screenshot shows the Acti9 Smartlink SI B web interface. At the top, there is a navigation bar with 'MONITORING & CONTROL', 'DIAGNOSTICS', and 'SETTINGS'. Below this, a sub-menu includes 'GENERAL', 'COMMUNICATION', 'USER MANAGEMENT', 'ALARMS', and 'DEVICES'. The 'DEVICES' section is active, showing a sidebar with 'DIGITAL DEVICES', 'ANALOG DEVICES', 'MODBUS DEVICES', and 'WIRELESS DEVICES'. The main content area is titled 'DIGITAL DEVICE CONFIGURATION' and shows a table of devices. The table has columns for Channel, Asset Name, Usage, Product, Label, and Monitor. One device is listed with Channel 1, Asset Name 'ss', Usage 'Lighting', and Product 'OFSD24'. Below the table is an 'EDIT DEVICE' form with fields for Asset Name, Label, Usage (dropdown), Product (dropdown), Channel, and Monitor (checkbox). The 'Monitor' checkbox is checked. At the bottom right, there are 'Apply Changes' and 'Cancel Changes' buttons.

Follow the procedure to configure the digital channels:

Step	Action
1	Click <b>Add Device</b> to add a new digital device.
2	Enter the <b>Asset Name</b> of a digital channel.
3	Enter the <b>Label</b> of a digital channel.
4	Select the type of the product from the <b>Product</b> list. <b>NOTE:</b> The configuration depends on the type of the product selected.
5	Enter the <b>Channel</b> number of a digital channel.
	Configuration of pulse meters.
6	Repeat steps 1 to 5.
7	Enter the <b>Input</b> number of a digital channel.
8	Enter <b>Pulse Weight</b> for the pulse meter. <b>NOTE:</b> The pulse weight is measured with respect to watt-hour (Wh).
9	Enter the energy <b>Consumption</b> value. <b>NOTE:</b> You can reset the energy counter or change it any value. However, the value you set has to be a multiple of pulse weight.
	Configuration of standard input and output devices.
10	Repeat steps 1 to 5.
11	Select the <b>Meaning of input</b> and <b>Meaning of Output</b> .
12	Select the <b>Monitor</b> check box to display the digital channel in the <b>Monitoring &amp; Control</b> page.
13	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

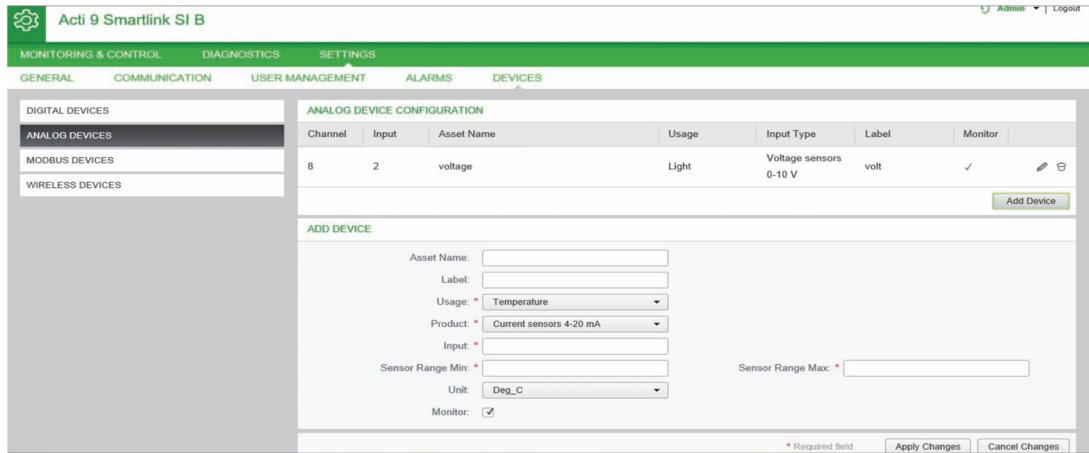
**NOTE:** You can configure the value of the pulse weight as Acti9 Smartlink SI B does not read the default pulse weight values (on web page, the value is always displayed as 10) from Smartlink devices.

Click the edit icon to modify the device details. Click the delete icon to remove the analog channel from the web page.

### Analog Device Page

The **Analog Device** page displays the list of connected analog devices. This page is used to add new analog device and to edit or delete an existing analog device.

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>Devices</b> → <b>Analog Devices</b> .



Follow the procedure to configure the analog channels:

Step	Action
1	Click <b>Add Device</b> to add a new analog channel.
2	Enter the <b>Asset Name</b> of an analog channel.
3	Enter the <b>Label</b> of an analog channel.
4	Select the <b>Usage</b> from the following: <ul style="list-style-type: none"> <li>● Temperature</li> <li>● Humidity</li> <li>● CO2</li> <li>● Pollution</li> <li>● Light</li> <li>● Debit</li> <li>● Volume</li> <li>● Mass</li> <li>● Speed</li> </ul>
5	Select either <b>Voltage_Sensor</b> or <b>Current_Sensor</b> from the <b>Product</b> list.
6	Enter the value for the <b>Input</b> .
7	Specify the <b>Sensor Range Min</b> and <b>Sensor Range Max</b> values.
8	Select the type of unit from the <b>Unit</b> list.
9	Select the <b>Monitor</b> check box to display the analog channel in the <b>Monitoring</b> page.
10	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

Click the edit icon to modify the device details. Click the delete icon to remove the analog channel from the web page.

**NOTE:** The device flags a conflict status in case the sensor type is wrongly configured.

### Modbus Devices Page

The Modbus slave **Modbus Devices** page is used to view and configure the **Modbus** slave devices connected to Acti9 Smartlink SI B. The devices can be discovered automatically with this page.

The web page supports the following devices:

- Smartlink RS485
- PM3250
- PM3255
- IEM3150
- IEM3155
- IEM3250
- IEM3350
- IEM3255
- IEM3355



Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Settings</b> → <b>Devices</b> → <b>Mpdbus Devices</b> .

The screenshot shows the 'Acti9 Smartlink SI B' web interface. The top navigation bar includes 'MONITORING & CONTROL', 'DIAGNOSTICS', and 'SETTINGS'. Under 'SETTINGS', there are sub-menus for 'GENERAL', 'COMMUNICATION', 'USER MANAGEMENT', 'ALARMS', and 'DEVICES'. The 'DEVICES' menu is active, showing a sidebar with 'DIGITAL DEVICES', 'ANALOG DEVICES', 'MODBUS DEVICES', and 'WIRELESS DEVICES'. The main content area is titled 'MODBUS DEVICES CONFIGURATION' and contains a table of devices with columns for Name, Usage, Product, Address, and Label. Below the table is an 'AUTO DISCOVERY' section with input fields for 'Address Min' and 'Address Max'. At the bottom is an 'ADD DEVICE' form with fields for Name, Label, Product (a dropdown menu), and Address.

You can add devices to Acti9 Smartlink SI B either in manual mode or by using auto discover feature. Follow the procedure to add the devices in manual mode to Acti9 Smartlink SI B:

Step	Action
1	Click <b>Add Device</b> to add Modbus slaves to Acti9 Smartlink SI B.
2	Enter the <b>Zone Name</b> of the device to be added.
3	Enter the <b>Label</b> of the device, if required.
4	Choose the required product type from the <b>Product</b> list.
5	Enter the <b>Address</b> of the device to be added.
6	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.

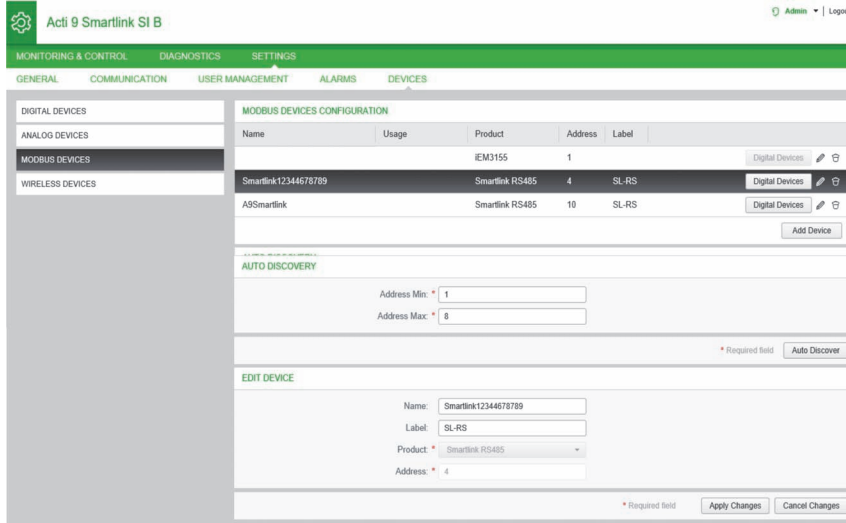
#### Auto Discovery Feature

Follow the procedure below to add any supported devices using auto discover feature:

Step	Action
1	Specify the start and end address for Modbus serial device. The default Modbus address for discovery ranges from 1 through 8, but you can choose to discover any device in the address range of 1 through 149. <b>NOTE:</b> It is recommended to use a closer address range for rapid detection of the devices.
2	Click <b>Auto Discover</b> to start auto discovery of the devices. <b>NOTE:</b> It is recommended to stay on the <b>Device List</b> page when auto discovery is in progress. The communication with upper supervisory systems, if any, could be disrupted while auto discovery is in progress.
3	After the auto discovery of the devices, the list of auto discovered devices are displayed.
4	Click <b>Add Device</b> to add <b>Name</b> , <b>Label</b> , <b>Modbus Address</b> , and <b>Device Type</b> of the auto discovered device.
5	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.
6	Click <b>Stop Discovery</b> to stop the auto discovery of the devices.

**NOTE:** For Acti9 Smartlink SI B web page to display the latest configuration of Acti9 Smartlink Modbus, it is essential to restart Acti9 Smartlink SI B when the configuration of downstream Acti9 Smartlink Modbus is updated from remote master (like Ecoreach software, IFE, FDM 128, and so on).

Click the edit icon to modify the device parameters. Click the delete icon to delete the selected device from the device list.



You can configure the digital devices of Acti9 Smartlink Modbus from the **Device List** page. Follow the procedure to configure the digital channels:

Step	Action
1	Click the <b>Digital Device</b> button to configure the digital channels of Acti9 Smartlink Modbus.
2	Click <b>Add</b> or <b>Edit</b> or to add a digital channel or to modify the parameters of a digital channel.
3	Enter the required parameters.
4	Click <b>Apply Changes</b> to save the settings. Click <b>Cancel Changes</b> to revert the settings.
5	Click <b>Back</b> to navigate to the <b>Device List</b> page.
6	Click the delete icon to delete a digital channel.

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# Chapter 12

## Monitoring, Control, and Diagnostics Web Pages

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Monitoring and Control Page	128
Alarms Page	131
General Diagnostics	132
Communication Diagnostics	133

## Monitoring and Control Page

### Description

The **Monitoring & Control** page is used to monitor and control the electrical status, consumption, and alarms of the 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.

The **Monitoring & Control** 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 devices connected to Acti9 Smartlink Ethernet, Acti9 Smartlink RS485, energy meter IEM3000 or power meter PM3000 (Modbus slaves), PowerTag energy sensors, and auxiliary devices.
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 data of the electrical status, consumption of power, and status of the analog sensors.

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Monitoring &amp; Control</b> → <b>General</b> .

Acti 9 Smartlink SI B
Admin | Logout

MONITORING & CONTROL
DIAGNOSTICS
SETTINGS

GENERAL
ALARMS

BuildingName1 | ! You have 17 new alarms

---

**ELECTRICAL STATUS**

Asset Name	Usage	Product	Gateway	Status	Control
-	Lighting	OFSD24	mySmartLink-80A9	Tripped	<input type="button" value="Open"/> <input type="button" value="Close"/>
<p><b>Real time data :</b></p> <p style="margin-left: 20px;">Operation Counter : 1589</p> <p style="margin-left: 20px;">Number of Trips : 0</p> <p style="margin-left: 20px;">Load Running Time : 0 Hour</p>					
+		SMC13 250A 3P	mySmartLink-80A9	40327.347 kWh	<div style="width: 40%; height: 10px; background-color: #90EE90; margin-bottom: 2px;"></div> <div style="width: 40%; height: 10px; background-color: #90EE90; margin-bottom: 2px;"></div> <div style="width: 40%; height: 10px; background-color: #90EE90; margin-bottom: 2px;"></div> <div style="width: 40%; height: 10px; background-color: #90EE90; margin-bottom: 2px;"></div>
-		PowerTag 1540	mySmartLink-80A9	0.000 kWh	<div style="width: 0%; height: 10px; background-color: #FF0000; margin-bottom: 2px;"></div> <div style="width: 0%; height: 10px; background-color: #FF0000; margin-bottom: 2px;"></div> <div style="width: 0%; height: 10px; background-color: #FF0000; margin-bottom: 2px;"></div>
<p><b>Real time data :</b></p> <p style="margin-left: 20px;">Total Active Energy Delivered : 1.745 kWh</p> <p style="margin-left: 20px;">Partial Active Energy Delivered : 0.000 kWh</p> <p style="margin-left: 20px;">Total Active Power : 0.000 kW</p> <p style="margin-left: 20px;">Load Operating Time Counter : 0.00 hour (Last Set/Reset: 2000/01/04 at 01:13:00)</p> <p style="margin-left: 40px;">PF : 1.00</p> <p style="margin-left: 40px;">I1 : 0.00 A    V1 : NaN V    U12 : 399.40 V    P1 : NaN kW</p> <p style="margin-left: 40px;">I2 : 0.00 A    V2 : NaN V    U23 : 399.30 V    P2 : NaN kW</p> <p style="margin-left: 40px;">I3 : 0.00 A    V3 : NaN V    U31 : 398.10 V    P3 : NaN kW</p>					
+		SMC13 250A 3P	mySmartLink-80A9	34.500 kWh	<div style="width: 333%; height: 10px; background-color: #FF0000; margin-bottom: 2px;"></div> <div style="width: 333%; height: 10px; background-color: #FF0000; margin-bottom: 2px;"></div> <div style="width: 333%; height: 10px; background-color: #FF0000; margin-bottom: 2px;"></div>

The following information is displayed for Acti9 devices:

Parameter	Description
<b>Asset Name</b>	Displays the user-defined name for the device.
<b>Usage</b>	Displays the type of usage.
<b>Product</b>	Displays the name of the connected device.
<b>Gateway</b>	Displays the user configured gateway of the device.
<b>Status</b>	Displays the following status for the device: <ul style="list-style-type: none"> <li><b>Open:</b> Applicable to all devices.</li> <li><b>Closed:</b> Applicable to all devices.</li> <li><b>Tripped:</b> Applicable to only OF+SD24, iOF+SD24, SD24, and RCA iC60 devices.</li> <li><b>Disconnected:</b> Applicable to only iACT24 and iATL24 devices.</li> <li><b>OFF:</b> Applicable to only Reflex iC60 devices.</li> </ul>
<b>Control</b>	The device can be opened or closed using the control buttons (accessible only for administrator and user accounts). Click <b>Open</b> to open the contacts of the corresponding device and click <b>Close</b> to close the contacts of the corresponding device.

The following information is displayed for the pulse meters, energy meters, and PowerTag energy sensors:

Parameter	Description
Asset Name	Displays the user-defined name for the device.
Usage	Displays the type of usage.
Product	Displays the name of the connected device.
Gateway	Displays the user configured gateway of the device.
Partial Energy	Displays the energy dissipated for each device.
Load by Phase	Displays the percentage of load for each device. <b>Green:</b> Indicates that the circuit is loaded up to 50% in regards to circuit breaker rating. <b>Orange:</b> Indicates that the circuit is loaded between 50% and 80%. <b>Red:</b> Indicates that the circuit is loaded above 80% versus circuit breaker rating. <b>NOTE:</b> To use and see the percentage of load, enter the maximum breaker rating during the configuration of PowerTag energy sensors in Acti9 SmartTest software.

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

## Alarms Page

### 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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Monitoring &amp; Control</b> → <b>Alarms</b> .

Alarm Type	Alarm Value	Asset Name	Usage	Product	Gateway	Email Content	Date & Time
Trip occurred		ss	Lighting	OFSD24	mySmartLink-Zigbee59	<a href="#">Email</a>	2000/01/01 00:00:13

Parameter	Description
<b>Alarm Type</b>	Displays the type of an alarm when an alarm is occurred.
<b>Alarm Value</b>	Displays the threshold value of an alarm.
<b>Asset Name</b>	Displays the user-defined name of the alarm.
<b>Usage</b>	Displays the type of the usage.
<b>Product</b>	Displays the device type for which an alarm is configured.
<b>Gateway</b>	Displays the user-configured gateway of the device.
<b>Email Content</b>	Click <b>Email</b> to view the custom text of the email defined during an alarm configuration.
<b>Date &amp; Time</b>	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.

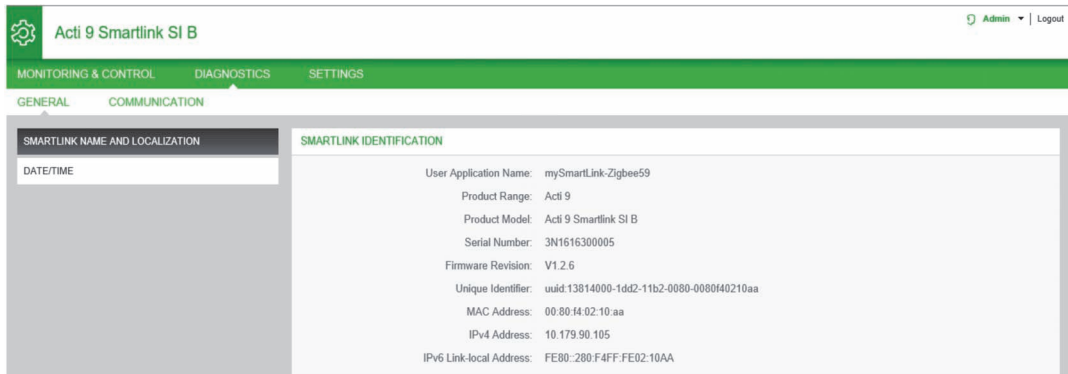
Click **Change alarm configuration** to modify an existing alarm or to configure a new alarm in the **Settings** → **Alarms** → **Alarm Configuration** page.

## General Diagnostics

### Smartlink Name and Localization

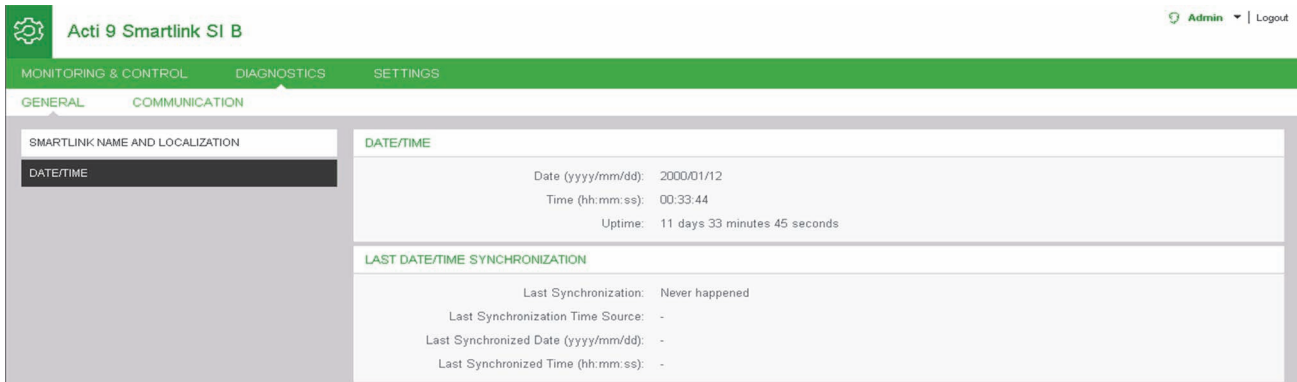
Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Diagnostics</b> → <b>General</b> → <b>Smartlink Name and Localization</b> .

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



### Date/Time

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Diagnostics</b> → <b>General</b> → <b>Date/time</b> .



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

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

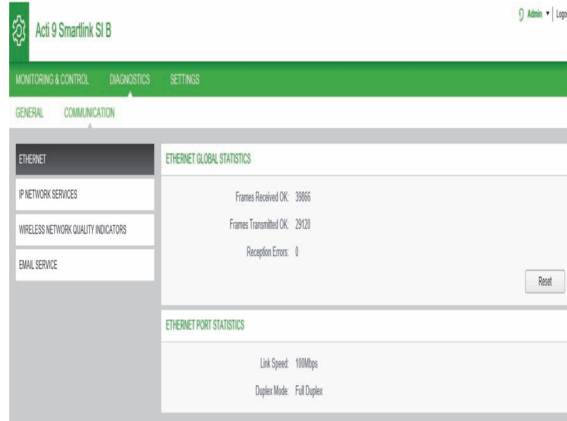


## Communication Diagnostics

### Ethernet

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Diagnostics</b> → <b>Communication</b> → <b>Ethernet</b> .

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



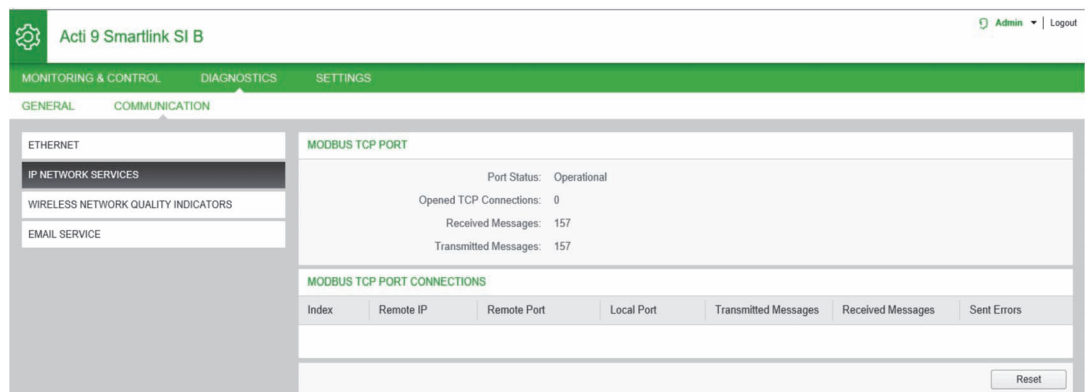
	Function Name	Description
<b>Ethernet Global Statistics</b>	Frames Received OK	Displays the number of frames received from all the Ethernet ports.
	Frames Transmitted OK	Displays the number of frames transmitted from all the Ethernet ports.
	Reception Errors	Displays the number of errors during reception of the frames.
<b>Ethernet Port Statistics</b>	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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Diagnostics</b> → <b>Communication</b> → <b>IP Network Service</b> .

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



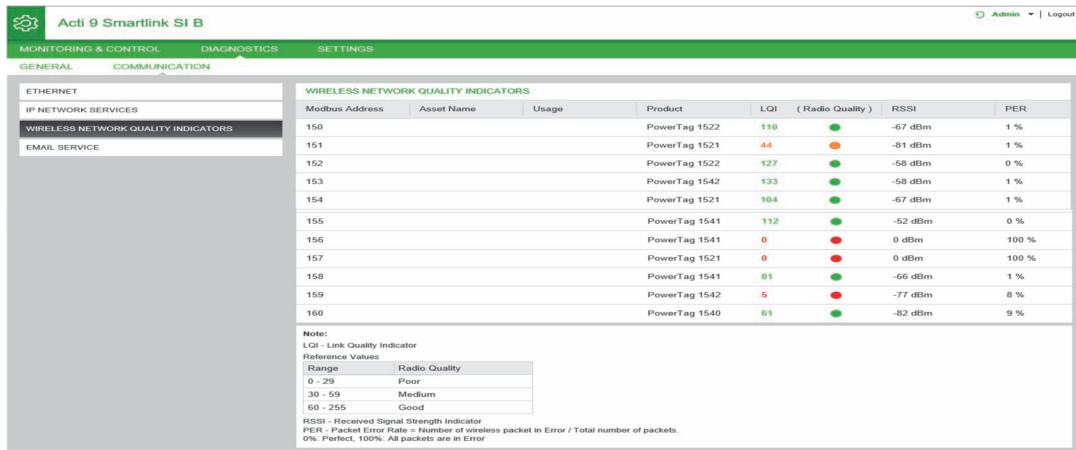
	Function Name	Description
<b>Modbus TCP Port</b>	Port status	Displays the current status of the Modbus/TCP port.
	Opened TCP connections	Displays the number of established Modbus/TCP connections.
	Received messages	Displays the counter of received Modbus/TCP messages.
	Transmitted messages	Displays the counter of transmitted Modbus/TCP messages.
<b>Modbus TCP Port Connections</b>		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 B web page in the web browser.
2	Login with user name and password.
3	Click <b>Diagnostics → Communication → Wireless Network Quality Indicators</b> .

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).

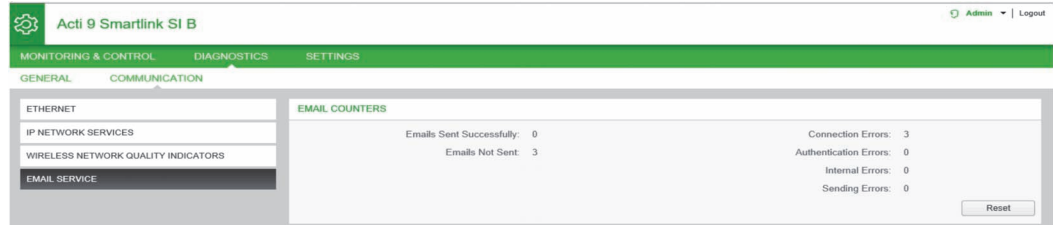


Parameter	Description
<b>Asset Name</b>	Displays the user-defined asset name of the wireless network.
<b>Usage</b>	Displays the user-defined usage of the wireless network.
<b>Product</b>	Displays the PowerTag energy sensors.
<b>LQI</b>	<p>Displays the measurement of the strength and / or quality of the received frames. The following values of LQI indicates the quality of the received frames:</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>The value greater than 59 indicates that the RF communication is OK.</li> </ul> <p><b>NOTE:</b> It is recommended to use this indicator as the main indicator of acceptance.</p>
<b>RSSI</b>	<p>Displays the measurement of the power level (in dBm) that an RF device is exchanging from the remote radio nodes.</p> <p>This indicator is used if the LQI is not acceptable.</p> <ul style="list-style-type: none"> <li>The value &lt; -95 dBm is not good.</li> <li>The value &gt; -95 dBm is acceptable.</li> </ul>
<b>PER</b>	<p>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.</p>

## Email Service

Step	Action
1	Launch the Acti9 Smartlink SI B web page in the web browser.
2	Login with user name and password.
3	Click <b>Diagnostics</b> → <b>Communication</b> → <b>Email Service</b> .

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

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



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# Chapter 13

## Modbus Registers Tables

---

### What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
13.1	General Description of Modbus Tables	138
13.2	Summary and Detailed Modbus Tables	144
13.3	Modbus Tables for Connected Devices	163

## Section 13.1

### General Description of Modbus Tables

---

#### What Is in This Section?

This section contains the following topics:

Topic	Page
Overview	139
Modbus Table Format and Data Types	141

## Overview

### Overview

All the Modbus tables in the Acti9 Smartlink SI B device have been designed to minimize the number of Modbus requests that the master system needs to send in order to collect the data prepared by Acti9 Smartlink SI B.

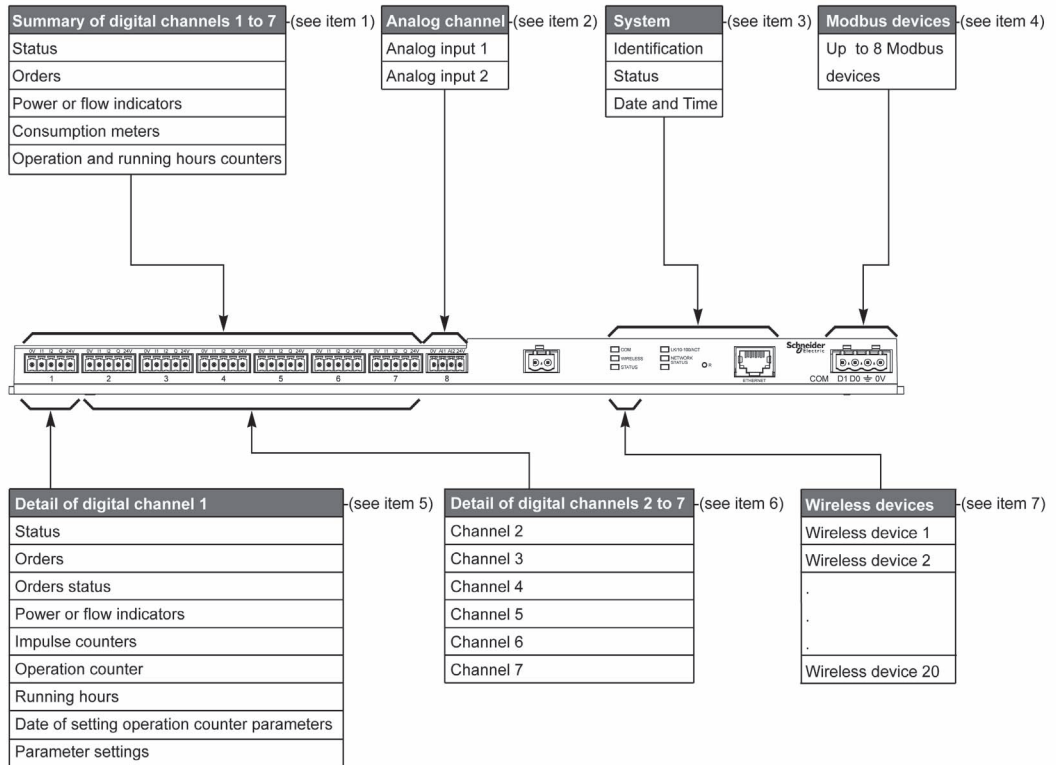
The Modbus tables in the Acti9 Smartlink SI B device are compact and summaries of all the data are collected on the seven digital channels and one analog channel of the Acti9 Smartlink SI B device.

The Modbus tables in the Acti9 Smartlink SI B device are described in:

- The section presenting:
  - The overall list of Acti9 Smartlink SI B device address zones (*see page 144*).
  - The summary of channel 1 to 7 address zones
  - The details of channel 1 to 7 address zones (*see page 150*).
  - Analog inputs (*see page 155*).
- The section presenting the address zones for each type of device that can be connected to Acti9 Smartlink SI B: (*see page 163*)
  - iOF+SD24
  - OF+SD24
  - OF24
  - SD24
  - iACT24
  - iATL24
  - RCA iC60
  - Reflex iC60
  - iEM2000T
  - Analog sensors
  - Energy meters
  - Contactor
  - Impulse relay
  - PowerTag energy sensors
- The section presenting the address zones for each type of data (status, orders, measurements, and parameter settings) with a description of the summary zones and a description of the detailed data zones for each channel (*see page 144*).

**NOTE:** All Modbus registers and their descriptions can be exported as a PDF file using Ecoreach software, see *Ecoreach Online Help*.

General Organization of Modbus Tables in Acti9 Smartlink SI B Devices



Item	Description	Link
1	Channel summary data	<a href="#">(see page 147)</a>
2	Analog inputs 1 to 2	<a href="#">(see page 155)</a>
3	System data independent of the channel	<a href="#">(see page 145)</a>
4	Modbus devices 1 to 8 (with slave numbers from 1 to 149)	(see instruction sheet and user manuals of the Modbus devices)
5	Data for channel 1 Devices that can be connected to channel 1	<a href="#">(see page 150)</a> <a href="#">(see page 163)</a>
6	Data for channel 2 to 7 Devices that can be connected to channel 2 to 7	<a href="#">(see page 150)</a> <a href="#">(see page 163)</a>
7	PowerTag energy sensors 1 to 20	<a href="#">(see page 157)</a>



## 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 protocol 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: <ul style="list-style-type: none"> <li>Scale "X1" means that the value of the register is the right one with the unit indicated.</li> <li>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.</li> <li>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.</li> </ul>
Unit	Information unit of measurement: <ul style="list-style-type: none"> <li>"-": no unit corresponding to the value expressed.</li> <li>"h": hours</li> <li>"D": the unit depends on the connected device.</li> </ul>
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: <ul style="list-style-type: none"> <li>"Y": the value of the register is saved in the event of a power failure.</li> <li>"N": the value is lost in the event of a power failure.</li> </ul> <p><b>NOTE:</b> On start-up or reset, the available values are retrieved.</p>
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)																
<b>R4:</b>								Bit reserved									
<b>Year:</b>								7 bits (year starting at 2000)									
<b>Month:</b>								4 bits									
<b>Day:</b>								5 bits									
<b>Hour:</b>								5 bits									
<b>Minute:</b>								6 bits									
<b>Millisecond:</b>								16 bits									
<b>WD (day of the week) :</b>								Bit at 0 if this parameter is not used.									
<b>SU (summertime):</b>								Bit at 1 for summertime, bit at 0 if this parameter is not used.									
<b>iV (validity of the information received):</b>								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 B 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 Ethernet Modbus Address
Function code	1 byte	0x03	Reads n output or internal words
Number of Bytes	2 bytes	0x0058	Number of bytes read

Definition	Number of Bytes	Value	Comment
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 protocol addresses, the addresses to be supplied to this controller must be the Modbus addresses.

---

## Section 13.2

### Summary and Detailed Modbus Tables

---

#### What Is in This Section?

This section contains the following topics:

Topic	Page
System Modbus Table	145
Summary of Digital Channels 1 to 7	147
Details of Digital Channels 1 to 7	150
Analog Inputs	155
PowerTag Wireless Communication Energy Sensors Modbus Tables	157
Embedded Configuration Registers	161

## System Modbus Table

### Identification

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]] <ul style="list-style-type: none"> <li>● PP: SAP Bridge plant number</li> <li>● YY: Year in decimal notation [05...99]</li> <li>● WW: Week in decimal notation [1...53]</li> <li>● D: Day of the week in decimal notation [1...7]</li> <li>● nnnn: Sequence of numbers [0001...10.000–1]</li> </ul>
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. <b>Example:</b> “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 B device status and diagnostic register Bit 0 = 1: start-up phase Bit 1 = 1: operating phase Bit 2 = 1: downgraded mode <sup>(1)</sup> 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  <b>NOTE:</b> Bits 0 to 3 are exclusive: only one mode is used at any given time.

<sup>(1)</sup>Downgraded mode comes into effect:

- When the power supply is cut or less than 16 Vdc.
- In the event of overcurrent (overload or short-circuit) on the Ti24 I/O.

If a short-circuit on an output has caused a change to downgraded mode, at the end of the short-circuit, the output is reset to 0 by the electronics: the Modbus master system sends a Modbus message to reset the output to 1 if it was at 1, before the short-circuit.

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 B device.

(1) See description of the DATE type ([see page 142](#)).

## Summary of Digital Channels 1 to 7

### Status

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
120	1	R	–	–	BITMAP	–	0x0000	N	01, 02, 03, 100–4	Electrical status on input 1 of all channels <sup>(1)</sup> .
121	1	R	–	–	BITMAP	–	0x0000	N	01, 02, 03, 100–4	Electrical status on input 2 of all channels <sup>(1)</sup> .

(1)

- Bit 0 to 6: channel 1 to 7
- Bits 7 to 15: reserved

Each bit gives the electrical level of input 1 and 2:

- 0 = no current
- 1 = input current

Reserved bits do not mean anything.

### Orders

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
130	1	RW	–	–	BITMAP	–	0x0000	N	01, 02, 03, 05, 06, 15, 16, 100–4	Open order for Acti9 product <sup>(1)</sup> .
131	1	RW	–	–	BITMAP	–	0x0000	N	01, 02, 03, 05, 06, 15, 16, 100–4	Close order for Acti9 product <sup>(1)</sup> .
132	1	RW	–	–	BITMAP	–	0x0000	N	01, 02, 03, 05, 06, 15, 16, 100–4	Deactivation order for product not in the Acti9 range <sup>(1)</sup> .
133	1	RW	–	–	BITMAP	–	0x0000	N	01, 02, 03, 05, 06, 15, 16, 100–4	Activation order for product not in the Acti9 range <sup>(1)</sup> .

(1)

- Bit 0 to 6: channel 1 to 7
- Bits 7 to 15: reserved

#### NOTE:

- Each bit corresponds to an open order (activated when the bit is at 1).
- The open order on several channels is possible.
- The Acti9 Smartlink SI B device resets the bit to state 0 when the order is taken into account (unless no product is connected to the channel).
- If a reserved bit is at 1, the Acti9 Smartlink SI B device resets it to 0.
- “No meaning” indicates that the bits are fixed at 0 or 1 and do not affect the system.
- If bits 0 and 1 are at 1, there is no effect on the system.

### Power or Flow Indicators

	Channels						
	1	2	3	4	5	6	7
Input I1	14000	14002	14004	14006	14008	14010	14012
Input I2	14022	14024	14026	14028	14030	14032	14034

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14000	2	R	X1	D	Float32	–	0	N	03, 100–4	Power or flow indicator for channel 1/input 1 <sup>(1)</sup> .

- (1)
- When the impulse counter (the unit depends on the connected device: energy, gas, water, etc.) is connected to input 1 or 2 of channel 1, the register contains the flow value. This is calculated as follows:
    - $(3600 \times \text{pulse weight})/t$ ,  $t$  representing the time in seconds between 2 pulses. The result is expressed for one hour.
  - The default value of pulse weight is 10 and it can be configured by the Modbus command.

**Example:** This register indicates the active power between the last 2 pulses if an iEM2000T device is connected to the channel 1/input 1 (Pulse weight = 10 Wh).

**NOTE:**

This register is reset to 0:

- After a duration  $d = 3 \times t$  ( $t$  being the time in seconds between the last 2 pulses), if  $3 \times t$  is less than 5 seconds, the duration  $d$  equals 5 seconds.
- After 24 hours without a pulse.
- After loss of the 24 Vdc input/output voltage.

The accuracy of the power or flow indication is:

- 5% if the pulse frequency is 5 Hertz or less.
- 17% if the pulse frequency equals the maximum frequency of 17 Hertz.

### Consumption Meters

The consumption meters in this Modbus table indicate the consumption from meters connected to each Acti9 Smartlink SI B channel (1 to 7).

The consumption value (associated with a channel) is obtained by multiplying the number of pulses (received by inputs I1 and I2 of this channel) by the pulse weight.

	Channels						
	1	2	3	4	5	6	7
Input I1	14050	14052	14054	14056	14058	14060	14062
Input I2	14072	14074	14076	14078	14080	14082	14084

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14050	2	R	X1	-	UINT32	-	0	Y	03, 100-4	Consumption meter on channel 1/input I1.

**NOTE:**

- The number of pulses from inputs I1 and I2 of each channel (1 to 7) are available in registers 14212 (channel 1) to 14454 (channel 7). The number of pulses can be preset by writing to the impulse counter register. See the Operation Counters ([see page 153](#)) chapter.
- The pulse weights of inputs I1 and I2 of each channel (1 to 7) are available and can be set in registers 14230 (channel 1) to 14471 (channel 7). The pulse weight is 10 by default. See the Pulse Weight Settings ([see page 154](#)) chapter.

### Operation Counters

	Channels						
	1	2	3	4	5	6	7
Input I1	14100	14102	14104	14106	14108	14110	14112
Input I2	14122	14124	14126	14128	14130	14132	14134

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14100	2	RW	X1	-	UINT32	-	0	Y	03, 16, 100-4	Operation counter for channel 1/input 1: changes from state 1 to state 0.



## Running Hour Counters of the Circuit Breaker

	Channels						
	1	2	3	4	5	6	7
Input I1	14144	14146	14148	14150	14152	14154	14156

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14144	2	RW	X1	h	UINT32	–	0	Y	03, 16, 100–4	Running hours counter for channel 1/input 1. Counting starts when the input is activated.

## Details of Digital Channels 1 to 7

### Channels 1 to 7 Overview

	Channels						
	1	2	3	4	5	6	7
<b>Status</b>							
Input I1 (bit 0)	14200	14240	14280	14320	14360	14400	14440
Input I2 (bit 1)	14200	14240	14280	14320	14360	14400	14440
<b>Orders</b>							
Commands output Q (bit 0 and bit 1): Acti9 product	14201	14241	14281	14321	14361	14401	14441
Commands output Q (bit 0 and bit 1): non-Acti9 product	14202	14242	14282	14322	14362	14402	14442
State of output Q (bit 0)	14203	14243	14283	14323	14363	14403	14443
<b>Counters</b>							
Input I1 power or flow indicator <sup>(2)</sup>	14204	14244	14284	14324	14364	14404	14444
Input I2 power or flow indicator <sup>(2)</sup>	14206	14246	14286	14326	14366	14406	14446
Input I1 consumption meter <sup>(1)(2)</sup>	14208	14248	14288	14328	14368	14408	14448
Input I2 consumption meter <sup>(1)(2)</sup>	14210	14250	14290	14330	14370	14410	14450
<b>Operation and Running Hours Counters of the Circuit Breaker</b>							
I1 operation counter <sup>(1)</sup>	14212	14252	14292	14332	14372	14412	14452
I2 operation counter <sup>(1)</sup>	14214	14254	14294	14334	14374	14414	14454
I1 input running hours <sup>(1)</sup>	14216	14256	14296	14336	14376	14416	14456
<b>Setting Date of Operation Counters of the Circuit Breaker</b>							
Input I1 date	14218	14258	14298	14338	14378	14418	14458
Input I2 date	14222	14262	14302	14342	14382	14422	14462
Running hours parameter setting date on input I1	14226	14266	14306	14346	14386	14426	14466
<b>Pulse Weight Settings (Pulse Meters)</b>							
Pulse weight for input I1 <sup>(2)</sup>	14230	14270	14310	14350	14390	14430	14470
Pulse weight for input I2 <sup>(2)</sup>	14231	14271	14311	14351	14391	14431	14471
<b>Flow Indicator Without Weight</b>							
Flow indicator for input I1	14232	14272	14312	14352	14392	14432	14472
Flow indicator for input I2	14234	14274	14314	14354	14394	14434	14474

<sup>(1)</sup> Data type: UINT32

<sup>(2)</sup> Information specific to meter type devices

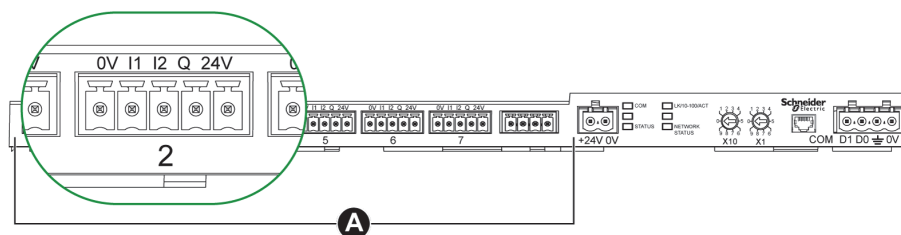
### Modbus Address

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 (Modbus 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 protocol addresses, the addresses to be supplied to this controller must be the Modbus addresses.

The figure below shows the terminals for each channel.



A Channels from 1 to 7

Description of terminals for each channel (Ti24 interface):

Terminal	Description
24 V	24 V of the 24 Vdc power supply
Q	Control output
I2	Input number 2
I1	Input number 1
0 V	0 V of the 24 Vdc power supply

### Status

	Channels						
	1	2	3	4	5	6	7
Input I1 (bit 0)	14200	14240	14280	14320	14360	14400	14440
Input I2 (bit 1)	14200	14240	14280	14320	14360	14400	14440

For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14200	1	R	-	-	BITMAP	-	0x0000	N	03, 100-4	Electrical status of inputs 1 and 2 of all connected devices <sup>(1)</sup> .

(1)

- Bit 0 = electrical level of input 1
- Bit 1 = electrical level of input 2
- Bits 2 to 15 = reserved

**NOTE:** "Reserved" means that the bits are fixed at 0 and do not mean anything.

Meaning of bits for inputs I1 and I2:

- 0 = no current
- 1 = input current

### Orders

	Channels						
	1	2	3	4	5	6	7
Output Q (bit 0 and bit 1): Acti9 product	14201	14241	14281	14321	14361	14401	14441

For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14201	1	RW	-	-	BITMAP	-	0x0000	N	03, 06, 16, 100-4	Close and open order for products in the Acti9 range <sup>(1)</sup> .

	Channels						
	1	2	3	4	5	6	7
Output Q (bit 0 and bit 1): non-Acti9 product	14202	14242	14282	14322	14362	14402	14442

For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14202	1	RW	–	–	BITMAP	–	0x0000	N	03, 06, 16, 100–4	Deactivation and activation order for product not in the Acti9 range <sup>(2)</sup> .

(1)

- Bit 0 = open order
- Bit 1 = close order
- Bits 2 to 15 = no meaning

(2)

- Bit 0 = deactivation order
- Bit 1 = activation order
- Bits 2 to 15 = no meaning

**NOTE:**

- The Acti9 Smartlink SI B device resets the bit to state 0 when the order is taken into account (unless no product is connected to the channel).
- If a reserved bit is at 1, the Acti9 Smartlink SI B device resets it to 0.
- “No meaning” indicates that the bits are fixed at 0 or 1 and do not affect the system.
- If bits 0 and 1 are at 1, there is no effect on the system.

**Power or Flow Indicators**

	Channels						
	1	2	3	4	5	6	7
Input I1 power or flow indicator <sup>(6)</sup>	14204	14244	14284	14324	14364	14404	14444
Input I2 power or flow indicator <sup>(6)</sup>	14206	14246	14286	14326	14366	14406	14446

For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14204	2	R	X1	D	Float32	–	0	N	03, 100–4	Power or flow indicator for input 1 <sup>(1)</sup> .
14206	2	R	X1	D	Float32	–	0	N	03, 100–4	Power or flow indicator for input 2 <sup>(1)</sup> .

(1) The same channel (Ti24 interface) on the Acti9 Smartlink SI B can take account of 2 counters:

- One counter connected to input I1
- One counter connected to input I2

**Consumption Meters**

	Channels						
	1	2	3	4	5	6	7
Input I1 consumption meter <sup>(1)</sup>	14208	14248	14288	14328	14368	14408	14448
Input I2 consumption meter <sup>(1)</sup>	14210	14250	14290	14330	14370	14410	14450

(1) The same channel (Ti24 interface) on the Acti9 Smartlink SI B can take account of 2 meters:

- One meter connected to input I1
- One meter connected to input I2

## For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14208	2	R	X1	–	UINT32	–	0	Y	03, 100–4	Consumption meter on input 1.
14210	2	R	X1	–	UINT32	–	0	Y	03, 100–4	Consumption meter on input 2.

## Operation Counters

	Channels						
	1	2	3	4	5	6	7
I1 operation counter	14212	14252	14292	14332	14372	14412	14452
I2 operation counter	14214	14254	14294	14334	14374	14414	14454

## For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14212	2	RW	X1	–	UINT32	–	0	Y	03, 16 100–4	Operation counter for channel 1/input 1. This register indicates the number of changes of state of input 1 from state 1 to state 0.

## Running Hour Counters of the Circuit Breaker

	Channels						
	1	2	3	4	5	6	7
I1 input running time	14216	14256	14296	14336	14376	14416	14456

## For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14216	2	RW	X1	h	UINT32	–	0	Y	03, 16 100–4	Running hours counter for a digital channel 1/input 1. Counting starts when the input is activated.

## Setting Date of Operation Counters of the Circuit

	Channels						
	1	2	3	4	5	6	7
Input I1 date	14218	14258	14298	14338	14378	14418	14458
Input I2 date	14222	14262	14302	14342	14382	14422	14462
Running hours parameter setting date on input I1	14226	14266	14306	14346	14386	14426	14466

## For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14218	4	R	–	–	DATE	(1)	(1)	Y	03, 100–4	Date when the operation counter parameter was last set. This register indicates the date and time when the operation counter parameter was last set on input 1.

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14222	4	R	–	–	DATE	(1)	(1)	Y	03, 100–4	Date when the operation counter parameter was last set. This register indicates the date and time when the operation counter parameter was last set on input 2.
14226	4	R	–	–	DATE	(1)	(1)	Y	03, 100–4	Date when the running hours counter parameter was last set. This register indicates the date and time when the running hours counter parameter was last set on input 1.

(1) See description of the DATE type (*see page 142*).

### Pulse Weight Settings (Pulse Meters)

	Channels						
	1	2	3	4	5	6	7
Pulse weight I1	14230	14270	14310	14350	14390	14430	14470
Pulse weight I2 <sup>(1)</sup>	14231	14271	14311	14351	14391	14431	14471

For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14230	1	RW	X1	D	UINT	0...65,535	10	Y	03, 06, 16 100–4	Pulse weight: this register can be used to set the value of the pulse weight for the meter connected to input 1 of a digital channel 1.
14231	1	RW	X1	D	UINT	0...65,535	10	Y	03, 06, 16 100–4	Pulse weight: this register can be used to set the value of the pulse weight for the meter connected to input 2 of a digital channel 1.

(1) The same channel (Ti24 interface) on the Acti9 Smartlink SI B can take account of 2 meters:

- One meter connected to input I1
- One meter connected to input I2

### Flow Indicators Without Weight

	Channels						
	1	2	3	4	5	6	7
Flow indicator without weight I1	14232	14272	14312	14352	14392	14432	14472
Flow indicator without weight I2	14234	14274	14314	14354	14394	14434	14474

For Channel 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
14232	2	R	–	–	Float32	–	0	N	03, 06, 16 100–4	Flow indicator without weight to input 1 of a digital channel 1.
14234	2	R	–	–	Float32	–	0	N	03, 06, 16 100–4	Flow indicator without weight to input 2 of a digital channel 1.

## Analog Inputs

### Analog Channel Synthesis Data Access

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
200	2	R	–	V/mA	Float32	4...20 mA or 0...10 V	0	N	03, 06, 16, 100–4	Analog input 1 raw value <sup>(1)</sup> in Volt (0...10 V) or Ampere (4...20 mA).
202	2	R	–	V/mA	Float32	4...20 mA or 0...10 V	0	N	03, 06, 16, 100–4	Analog input 2 raw value <sup>(1)</sup> in Volt (0...10 V) or Ampere (4...20 mA).

### Analog Channel Detail Information Access

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
<b>Analog input 1 data</b>										
15000	2	R	–	V/mA	Float32	4...20 mA or 0...10 V	0	N	03, 06, 16, 100–4	Analog input 1 raw value <sup>(1)</sup> in Volt (0...10 V) or Ampere (4...20 mA)
15002	2	R	–	User defined	Float32	–	0	N	03, 06, 16, 100–4	Scaled value for analog input 1
<b>Analog input 1 setting</b>										
15010	1	R/W	–	–	BITMAP	–	0x0000	Y	03, 06, 16, 100–4	Details about input 1 Bit 0 0 : 0...10 V 1 : 4...20 mA Bit 1 0 : Input 1 is not scaled 1 : Input 1 is scaled
15011	2	R/W	N/A	User defined	Float32	–	0	Y	03, 06, 16, 100–4	Minimum of scale for the transfer function of analog input 1
15013	2	R/W	N/A	User defined	Float32	–	0	Y	03, 06, 16, 100–4	Maximum of scale for transfer function of analog input 1
<b>Analog input 2 data</b>										
15020	2	R	–	V/mA	Float32	4...20 mA or 0...10 V	0	N	03, 06, 16, 100–4	Analog input 2 raw value <sup>(1)</sup> in Volt (0...10 V) or Ampere (4...20 mA)
15022	2	R	–	User defined	Float32	–	0	N	03, 06, 16, 100–4	Scaled value for analog input 2
<b>Analog input 2 setting</b>										
15030	1	R/W	–	–	BITMAP	–	0x0000	Y	03, 06, 16, 100–4	Details about input 2 Bit 0 0 : 0...10 V 1 : 4...20 mA Bit 1 0 : Input 2 is not scaled 1 : Input 2 is scaled
15031	2	R/W	N/A	User defined	Float32	–	0	Y	03, 06, 16, 100–4	Minimum of scale for the transfer function of analog input 2
15033	2	R/W	N/A	User defined	Float32	–	0	Y	03, 06, 16, 100–4	Maximum of scale for transfer function of analog input 2

#### NOTE:

<sup>(1)</sup> The calculation of the scaled value is based on the following items:

- Analog measurement: Analog input raw value in Volt (0...10 V) or Ampere (4...20 mA).
- Minimum measurement: 0 V or 4 mA.
- Maximum measurement: 10 V or 20 mA.
- Minimum of scale: Minimum of scale for the transfer function of the analog channel (0 V or 4 mA).
- Maximum of scale: Maximum of scale for the transfer function of the analog channel (10 V or 20 mA).

The scaled value is:

Scaled value = [Maximum scale - Minimum scale] / [Maximum measurement - Minimum measurement] x  
Analog measurement + Minimum scale



## PowerTag Wireless Communication Energy Sensors Modbus Tables

### Description

Acti9 Smartlink SI B 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 B.

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 devices) 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
<b>Current - Metering Data</b>										
2999	2	R	–	A	Float32	–	0x8000	N	03, 100–4	Current on phase A.
3001	2	R	–	A	Float32	–	0x8000	N	03, 100–4	Current on phase B.
3003	2	R	–	A	Float32	–	0x8000	N	03, 100–4	Current on phase C.
<b>Voltage -Metering Data</b>										
3019	2	R	–	V	Float32	–	0x8000	N	03, 100–4	Phase-to-phase voltage A-B.
3021	2	R	–	V	Float32	–	0x8000	N	03, 100–4	Phase-to-phase voltage B-C.
3023	2	R	–	V	Float32	–	0x8000	N	03, 100–4	Phase-to-phase voltage C-A.
3027	2	R	–	V	Float32	–	0x8000	N	03, 100–4	Phase-to-neutral voltage A-N.
3029	2	R	–	V	Float32	–	0x8000	N	03, 100–4	Phase-to-neutral voltage B-N.
3031	2	R	–	V	Float32	–	0x8000	N	03, 100–4	Phase-to-neutral voltage C-N.
<b>Power - Metering Data</b>										
3053	2	R	–	W	Float32	–	0x8000	N	03, 100–4	Active power on phase A.
3055	2	R	–	W	Float32	–	0x8000	N	03, 100–4	Active power on phase B.
3057	2	R	–	W	Float32	–	0x8000	N	03, 100–4	Active power on phase C.
3059	2	R	–	W	Float32	–	0x8000	N	03, 100–4	Total active power.
<b>Power Factor - Metering Data</b>										
3083	2	R	–	–	Float32	–	0x8000	N	03, 100–4	Total power factor.
<b>Energy - Metering Data</b>										
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 B.

### 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
<b>Power (P) - Metering Data</b>										
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
<b>Frequency -Metering Data</b>										
3109	2	R	–	Hz	Float32	–	0xFFC00000	N	03, 100–4	AC Frequency
<b>Device temperature - Metering Data</b>										
3131	2	R	–	°C	Float32	–	0xFFC00000	N	03, 100–4	Internal temperature
<b>Energy - Metering Data</b>										
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 Register of the PowerTag wireless communication energy sensors 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	–	–	ENUM	–	0x0000	N	03, 100–4	0 = Alarm OFF. 1 = Alarm ON. Bit 0 = Voltage phase loss. Bit 1 = Current overload.
3301	2	R	–	A	Float32	–	0x8000	N	03, 100–4	RMS Current on phase A at voltage loss.
3303	2	R	–	A	Float32	–	0x8000	N	03, 100–4	RMS Current on phase B at voltage loss.
3305	2	R	–	V	Float32	–	0x8000	N	03, 100–4	RMS Current on phase C at voltage loss.
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	–	0x8000	Y	03, 06, 16, 100–4	User-defined asset name of the wireless device. The user can enter maximum 20 characters.
31010	3	RW	–	–	ASCII	–	0x8000	Y	03, 06, 16, 100–4	User-defined circuit ID of the wireless device. The user can enter maximum five characters.
31013	1	RW	–	–	ASCII	–	0x8000	Y	03, 06, 16, 100–4	Indicates the usage attribute of the wireless device.
31014	1	RW	–	–	ENUM	–	0x8000	Y	03, 06, 16, 100–4	Indicates the phase sequence.
31015	1	RW	–	–	ENUM	–	0x8000	Y	03, 06, 16, 100–4	Indicates the mounting position. 0 = Null 1 = Top 2 = Bottom
31017	1	RW	–	–	UINT	–	0x8000	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

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

## Embedded Configuration Registers

### Details of Digital Channels 1 to 7

	Channels						
	1	2	3	4	5	6	7
Input I1	20009	20137	20265	20393	20521	20649	20777
Input I2	20073	20201	20329	20457	20585	20713	20841
Output	21417	21481	21545	21609	21673	21737	21801

For channel 1, input 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
20009	13	R	–	–	ASCII	–	–	Y	03, 100–4	Name of the device. Maximum is 20 characters and minimum is 1 character.
20022	13	R	–	–	ASCII	–	–	Y	–	Label of the device. Maximum is 5 characters and minimum is zero character.
20035	1	R	–	–	UINT	–	–	Y	–	Indicates the product type. 0 = Null 1 = Standard IO 2 = Standard counter (any pulse meter) 3 = OF+SD24 (breaker with status) 4 = iOF+SD24 (breaker with status) 4 = OF24 (breaker with Open/Close status) 4 = SD24 (breaker with tripped status) 5 = Reflex iC60 (breaker with control) 6 = RCA iC60 (breaker with control) 7 = iACT24 (contactor) 8 = iATL24 (relay) 10 = PM3210 12 = PM3255 13 = iEM3110 15 = iEM3155 16 = iEM3210 18 = iEM3255 18 = iEM3255 19 = iEM2000T 25 = Breaker IO 27 = iEM3355
20036	1	R	–	–	UINT	–	10	Y	–	Indicates the pulse weight from 0...65535.
20037	1	R	–	–	UINT	–	–	Y	–	Indicates the unit of the device. 0 = Wh 2 = M3 3 = L 4 = J 5 = Cal 8 = Gallon
20040	1	R	–	–	ENUM	–	–	Y	–	Indicates the usage attribute.

**NOTE:** The above table provides the description of embedded registers of the digital channels and it is read-only registers.

For channel 1, output

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
21417	13	R	–	–	ASCII	–	–	Y	03, 100–4	Asset name of the device. Maximum is 20 characters and minimum is 1 character.
21430	13	R	–	–	ASCII	–	–	Y	–	Circuit ID of the device. Maximum is 5 characters.
21443	1	R	–	–	UINT	–	–	Y	–	Indicates the product type. 29 = Standard IO output
21444	1	R	–	–	UINT	–	10	Y	–	Indicates the standard IO status
21445	1	R	–	–	UINT	–	–	Y	–	Indicates the unit of the device.
21448	1	R	–	–	ENUM	–	–	Y	–	Indicates the usage attribute.

### Details of Analog Channel

	Analog Channel
Input I1	20905
Input I2	20969

For input 1

Address	No.	RW	X	Unit	Type	Range	Default Value	Svd	Function Code	Description
20905	13	R	–	–	ASCII	–	–	Y	03, 100–4	Name of the analog device. Maximum is 20 characters and minimum is 1 character.
20918	13	R	–	–	ASCII	–	–	Y	–	Label of the analog device. Maximum is 5 characters and minimum is zero character.
20931	1	R	–	–	UINT16	–	–	Y	–	Indicates the product type.
20932	1	R	–	–	UINT16	–	10	Y	–	Indicates the pulse weight from 0...65535.
20933	1	R	–	–	UINT16	–	–	Y	–	Indicates the unit of the analog device.
20936	1	R	–	–	ENUM	–	–	Y	–	Indicates the usage attribute of the analog device.
20937	2	R	–	–	Float32	–	–	Y	–	Indicates the logical minimum value of the analog device.
20939	2	R	–	–	Float32	–	–	Y	–	Indicates the logical maximum value of the analog device.

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## Section 13.3

### Modbus Tables for Connected Devices

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#### What Is in This Section?

This section contains the following topics:

Topic	Page
iOF+SD24 Indication Auxiliary	164
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iEM2000T, iEM3110, iEM3155, iEM3210, iEM3255, iEM3355 Meters, or Meter with Pulse Output (Standard CEI 62053-31)	166
iACT24 Auxiliary for iCT Contactor	167
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## iOF+SD24 Indication Auxiliary

### Overview

The iOF+SD24 indication auxiliary is used to find out the status of the following devices:

- iC60 and iC65 circuit breaker (OF and  $\overline{SD}$  states)
- iID residual current circuit breaker (OF and  $\overline{SD}$  states)
- iSW-NA switch (OF status)
- iDPN circuit breaker (sold in China)

The Modbus information in the table below is given for an iOF+SD24 auxiliary connected to channel 1.

Description	Address <sup>(1)</sup>	No. of Register(s)	Type	Action	Values and Meanings
<b>Status</b>					
OF status	14200	1	BITMAP	R	bit 0 = 0: circuit breaker open bit 0 = 1: circuit breaker closed
status $\overline{SD}$	14200	1	BITMAP	R	bit 1 = 0: device tripped (fault present) bit 1 = 1: device not tripped
<b>Counters</b>					
Number of circuit breaker opening/closing cycles	14212	2	UINT32	RW	–
Number of trippings	14214	2	UINT32	RW	–
Load Operating Time	14216	2	UINT32	RW	in hours

<sup>(1)</sup> To address the digital channel N ( $1 \leq N \leq 7$ ) registers, add  $40 \times (N - 1)$  to the digital channel 1 registers.



## OF+SD24 Indication Auxiliary

### Overview

The OF+SD24 indication auxiliary is used to find out the status of the following devices:

- C60 or C120 circuit breaker (OF and  $\overline{SD}$  states)
- DPN residual current circuit breaker (OF and  $\overline{SD}$  states)
- DPN switch (OF status)
- C60H-DC circuit breaker (OF and  $\overline{SD}$  states)
- iDPN circuit breaker (sold in every country except China)

The Modbus information in the table below is given for an OF+SD24 auxiliary connected to channel 1.

Description	Address <sup>(1)</sup>	No. of Register(s)	Type	Action	Values and Meanings
<b>Status</b>					
OF status	14200	1	BITMAP	R	bit 0 = 0: circuit breaker open bit 0 = 1: circuit breaker closed
Status $\overline{SD}$	14200	1	BITMAP	R	bit 1 = 0: device tripped (fault present) bit 1 = 1: device not tripped
<b>Counters</b>					
Number of circuit breaker opening/closing cycles	14212	2	UINT32	RW	–
Number of trippings	14214	2	UINT32	RW	–
Load Operating Time	14216	2	UINT32	RW	in hours

<sup>(1)</sup> To address the digital channel N ( $1 \leq N \leq 7$ ) registers, add  $40 \times (N - 1)$  to the digital channel 1 registers.

## iEM2000T, iEM3110, iEM3155, iEM3210, iEM3255, iEM3355 Meters, or Meter with Pulse Output (Standard CEI 62053-31)

### Overview

The meter delivers a pulse output.

The Modbus information in the table below is given for a meter connected to a digital channel 1.

The same channel (Ti24 interface) on the Acti9 Smartlink SI B can take account of 2 meters:

- One meter connected to input I1
- One meter connected to input I2

Description	Address <sup>(1)</sup>	No. of Register(s)	Type	Action	Values and Meanings
<b>Status</b>					
Pulse output (meter 1)	14200	1	BITMAP	R	bit 0
Pulse output (meter 2)	14200	1	BITMAP	R	bit 1
<b>Counters</b>					
Power or flow indicator (meter 1)	14204	2	Float32	R	(2)
Power or flow indicator (meter 2)	14206	2	Float32	R	(2)
Consumption meter (meter 1)	14208	2	UINT32	R	(3)
Consumption meter (meter 2)	14210	2	UINT32	R	(3)
<b>Settings</b>					
Pulse weight (meter 1)	14230	1	UINT	RW	(2)
Pulse weight (meter 2)	14231	1	UINT	RW	(2)

<sup>(1)</sup> To address the digital channel N ( $1 \leq N \leq 7$ ) registers, add  $40 \times (N - 1)$  to the digital channel 1 registers.

<sup>(2)</sup> The register contains the flow value.

- The flow is:  $(3600 \times \text{pulse weight})/t$ , with t representing the time in seconds between 2 pulses. The result is expressed for one hour.
- The pulse weight is 10 by default. The unit depends on the connected device: energy, gas, water, etc.

<sup>(3)</sup> The consumption value (associated with a channel) is obtained by multiplying the number of pulses (received by inputs I1 and I2 of this channel) by the pulse weight.

## iACT24 Auxiliary for iCT Contactor

### Overview

The iACT24 auxiliary:

- Can be used to control an iCT contactor rated 25 A or higher via its Y1, Y2 and Y3 inputs.  
The Y3 (24 Vdc) input can be controlled by one of the Acti9 Smartlink SI B device channels.
- Is used to find out the contactor status (O/C status: open/closed status).

The Modbus information in the table below is given for an iACT24 auxiliary connected to a digital channel 1.

Description	Address <sup>(1)</sup>	No. of Register(s)	Type	Action	Values and Meanings
<b>Status</b>					
O/C status: open/closed status	14200	1	BITMAP	R	bit 0 = 0: contactor open bit 0 = 1: contactor closed
Device present	14200	1	BITMAP	R	bit 1 = 0: connection fault or no connected device bit 1 = 1: connected device
<b>Orders</b>					
Deactivate contactor coil	14201	1	BITMAP	RW	bit 0 = 1: deactivate coil <sup>(2)</sup>
Activate contactor coil	14201	1	BITMAP	RW	bit 1 = 1: activate coil <sup>(2)</sup>
<b>Counters</b>					
Number of contactor open/close cycles	14212	2	UINT32	RW	–
Load Operating Time for an NO contactor	14216	2	UINT32	RW	in hours

<sup>(1)</sup> To address the digital channel N ( $1 \leq N \leq 7$ ) registers, add  $40 \times (N - 1)$  to the digital channel 1 registers.

<sup>(2)</sup> The Acti9 Smartlink SI B device resets the bit to state 0 when the order is taken into account (unless no product is connected to the channel). If bits 0 and 1 of address 14201 are activated simultaneously, the Acti9 Smartlink SI B device does nothing.

## iATL24 Auxiliary for iTL Impulse Relay

### Overview

The iATL24 auxiliary:

- Can be used to control an iTL impulse relay via its Y1, Y2, and Y3 inputs.  
The Y3 (24 Vdc) input can be controlled by one of the Acti9 Smartlink SI B device channels.
- Can be used to find out the impulse relay status (O/C status open/closed status).

The Modbus information in the table below is given for an iATL24 auxiliary connected to a digital channel 1.

Description	Address <sup>(1)</sup>	No. of Register(s)	Type	Action	Values and Meanings
<b>Status</b>					
O/C status: open/closed status	14200	1	BITMAP	R	bit 0 = 0: impulse relay open bit 0 = 1: impulse relay closed
Device present	14200	1	BITMAP	R	bit 1 = 0: connection fault or no connected device bit 1 = 1: connected device
<b>Orders</b>					
Impulse relay contact opening	14201	1	BITMAP	RW	bit 0 = 1: Impulse relay contact opening <sup>(2)</sup>
Impulse relay contact closing	14201	1	BITMAP	RW	bit 1 = 1: Impulse relay contact closing <sup>(2)</sup>
<b>Counters</b>					
Number of impulse relay opening/closing cycles	14212	2	UINT32	RW	–
Load Operating Time	14216	2	UINT32	RW	in hours

<sup>(1)</sup> To address the digital channel N ( $1 \leq N \leq 7$ ) registers, add  $40 \times (N - 1)$  to the digital channel 1 registers.

<sup>(2)</sup> The Acti9 Smartlink SI B device resets the bit to state 0 when the order is taken into account (unless no product is connected to the channel). If bits 0 and 1 of address 14201 are activated simultaneously, the Acti9 Smartlink SI B device does nothing.

## Contactor and Relay (Not in the Acti9 Range)

### Overview

A contactor or relay powered with 24 Vdc can be connected to Acti9 Smartlink SI B. This should have the following characteristics:

- The contactor or relay coil must not draw more than 100 mA.
- The indication contact must be low level type.

Only contactors in the Acti9 range can be connected to Acti9 Smartlink SI B using the iATL24 auxiliary.

The contactor can be controlled by one of the Acti9 Smartlink SI B device channels.

The Modbus information in the table below is given for a contactor connected to a digital channel 1.

Description	Address <sup>(1)</sup>	No. of Register(s)	Type	Action	Values and Meanings
<b>Status</b>					
OF status	14200	1	BITMAP	R	bit 0 = 0: contactor open bit 0 = 1: contactor closed
<b>Orders</b>					
Deactivate contactor coil	14202	1	BITMAP	RW	bit 0 = 1: deactivate coil <sup>(2)</sup>
Activate contactor coil	14202	1	BITMAP	RW	bit 1 = 1: activate coil <sup>(2)</sup>
<b>Counters</b>					
Number of contactor open/close cycles	14212	2	UINT32	RW	–
Load Operating Time for an NO contactor	14216	2	UINT32	RW	in hours

<sup>(1)</sup> To address the digital channel N ( $1 \leq N \leq 7$ ) registers, add  $40 \times (N - 1)$  to the digital channel 1 registers.

<sup>(2)</sup> The Acti9 Smartlink SI B device resets the bit to state 0 when the order is taken into account (unless no product is connected to the channel). If bits 0 and 1 of address 14202 are activated simultaneously, the Acti9 Smartlink SI B device does nothing.

## Acti9 RCA iC60 Remote Control with Ti24 Interface

### Overview

The Acti9 RCA iC60 remote control:

- Should have a Ti24 interface (with product references A9C70122 and A9C70124.)
- Can be used to control a iC60 circuit breaker via input Y3 of its Ti24 interface.  
The Y3 (24 Vdc) input can be controlled by one of the Acti9 Smartlink SI B device channels.
- Can be used to find out the OF and  $\overline{SD}$  states of the circuit breaker associated with the Acti9 RCA iC60 remote control.

The Modbus information in the table below is given for an Acti9 RCA iC60 remote control connected to a digital channel 1.

Description	Address <sup>(1)</sup>	No. of Register(s)	Type	Action	Values and Meanings
<b>Status</b>					
OF status	14200	1	BITMAP	R	bit 0 = 0: circuit breaker open bit 0 = 1: circuit breaker closed
Status $\overline{SD}$	14200	1	BITMAP	R	bit 1 = 0: device tripped (fault present) bit 1 = 1: device not tripped
<b>Orders</b>					
Activation of the open order	14201	1	BITMAP	RW	bit 0 = 1: activation of the open order <sup>(2)</sup>
Activation of the close order	14201	1	BITMAP	RW	bit 1 = 1: activation of the close order <sup>(2)</sup>
<b>Counters</b>					
Number of circuit breaker open/close cycles	14212	2	UINT32	RW	–
Number of trippings	14214	2	UINT32	RW	–
Load Operating Time	14216	2	UINT32	RW	in hours

<sup>(1)</sup> To address the digital channel N ( $1 \leq N \leq 7$ ) registers, add  $40 \times (N - 1)$  to the digital channel 1 registers.

<sup>(2)</sup> The Acti9 Smartlink SI B device resets the bit to state 0 when the order is taken into account (unless no product is connected to the channel). If bits 0 and 1 of address 14201 are activated simultaneously, the Acti9 Smartlink SI B device does nothing.

## Acti9 Reflex iC60 Integrated Control Circuit Breaker With Ti24 Interface

### Overview

The Acti9 Reflex iC60 integrated control circuit breaker:

- Should have a Ti24 interface (with product references A9C6\*\*\*\*).
- Can allow the device to be controlled via input Y3 of its Ti24 interface.  
The Y3 (24 Vdc) input can be controlled by one of the Acti9 Smartlink SI B device channels.
- Can be used to communicate its O/C and auto/OFF status.

The Modbus information in the table below is given for an Acti9 Reflex iC60 integrated control circuit breaker connected to a digital channel 1.

Description	Address <sup>(1)</sup>	No. of Register(s)	Type	Action	Values and Meanings
<b>Status</b>					
O/C status: open/closed status	14200	1	BITMAP	R	bit 0 = 0: circuit breaker open bit 0 = 1: circuit breaker closed
auto/OFF status: handle position	14200	1	BITMAP	R	bit 1 = 0: handle in OFF position (device open) bit 1 = 1: handle in upper position: auto
<b>Orders</b>					
Activation of the open order	14201	1	BITMAP	RW	bit 0 = 1: activation of the open order <sup>(2)</sup>
Activation of the close order	14201	1	BITMAP	RW	bit 1 = 1: activation of the close order <sup>(2)</sup>
<b>Counters</b>					
Number of circuit breaker open/close cycles	14212	2	UINT32	RW	–
Number of trippings	14214	2	UINT32	RW	–
Load Operating Time	14216	2	UINT32	RW	in hours

<sup>(1)</sup> To address the digital channel N ( $1 \leq N \leq 7$ ) registers, add  $40 \times (N - 1)$  to the digital channel 1 registers.

<sup>(2)</sup> The Acti9 Smartlink SI B device resets the bit to state 0 when the order is taken into account (unless no product is connected to the channel). If bits 0 and 1 of address 14201 are activated simultaneously, the Acti9 Smartlink SI B device does nothing.





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# Appendices

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## What Is in This Appendix?

The appendix contains the following chapters:

Chapter	Chapter Name	Page
A	Details of Modbus Functions	175
B	Reset of Acti9 Smartlink SI B	187
C	Troubleshooting	189



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# Appendix A

## Details of Modbus Functions

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Modbus TCP/IP Functions	176
Modbus TCP/IP Exception Codes	178
Function 8: Modbus Diagnostics	179
Function 43-14: Read Acti9 Smartlink ID	181
Function 43-15: Read Date and Time	183
Function 43-16: Write Date and Time	184
Function 100-4: Read n Non-Adjacent Words	185

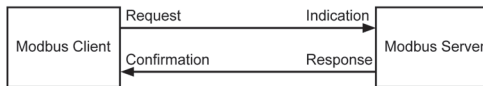
## Modbus TCP/IP Functions

### 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:

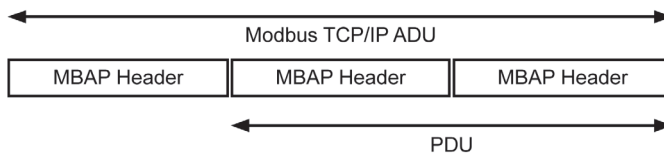
- Modbus Request, the message sent on the network by the client to initiate a transaction.
- Modbus Indication, the request message received on the server side.
- Modbus Response, the response message sent by the server.
- Modbus Confirmation, the response message received on the client side.



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 B 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 <sup>(1)</sup>	Modbus diagnostic data
15	Write n bits
16	Write n words
43-14 <sup>(2)</sup>	Read identification

Function Code	Function Name
43-15 <sup>(3)</sup>	Read the date and time
43-16 <sup>(4)</sup>	Write the date and time
100-4 <sup>(5)</sup>	Read non-adjacent words where $n \leq 100$

<sup>(1)</sup>For more details, see the appendix describing function 8 (*see page 179*)

<sup>(2)</sup>For more details, see the appendix describing function 43-14 (*see page 181*)

<sup>(3)</sup>For more details, see the appendix describing function 43-15 (*see page 183*)

<sup>(4)</sup>For more details, see the appendix describing function 43-16 (*see page 184*)

<sup>(5)</sup>For more details, see the appendix describing function 100-4 (*see page 185*)

## 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 B 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](http://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 B 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: <ul style="list-style-type: none"> <li>● 0x01 = Read diagnostic data</li> <li>● 0x02 = Clear diagnostic data</li> <li>● 0x03 = Clear all diagnostic data</li> <li>● 0x04 = List ports</li> </ul>

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 table below:

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 table below:

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 <ul style="list-style-type: none"> <li>● 0x00 = the internal port of a device that supports an embedded switch or any single port not accessible externally</li> <li>● 0x01 to 0xFE = logical number of the desired port</li> <li>● 0xFF = the port the current request came in</li> </ul> This value should be 0xFF if the requested data is not port specific. See the <b>Port Select Needed</b> column in the table below for which <b>Data Selection Code</b> 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

Data Selection Code	Diagnostic Data Retrieved	Port Select Needed	Type
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 Acti9 Smartlink ID

### Structure of Modbus Read Acti9 Smartlink ID 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	A9XMEA08
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	A9XMEA08
Object 2: version number	Object number	1 byte	0x02
	Object length	1 byte	0x06 (minimum)
	Object content	6 bytes minimum	Vx.y.z
Object 3: manufacturer URL	Object number	1 byte	0x03
	Object length	1 byte	0x1A
	Object content	26 bytes	<a href="http://WWW.Schneider-electric.com">WWW.Schneider-electric.com</a>
Object 4: product name	Object number	1 byte	0x04
	Object length	1 byte	0x12
	Object content	18 byte	Acti9 Smartlink Ethernet

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

## 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 <sup>(1)</sup>	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 142](#)).

## 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 <sup>(1)</sup>	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

<sup>(1)</sup> See description of the DATE type ([see page 142](#)).

#### 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 <sup>(1)</sup>	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

<sup>(1)</sup> See description of the DATE type ([see page 142](#)).

## Function 100–4: Read n Non-Adjacent Words

### Structure of Modbus Read n Non-Adjacent Words Messages Where $n \leq 100$

#### 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 <sup>(1)</sup>	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 <sup>(1)</sup>	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.



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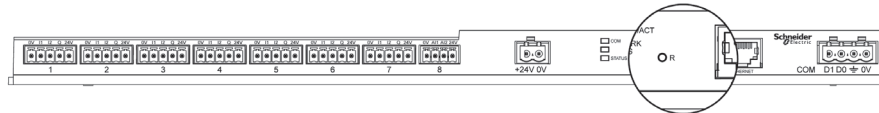
# Appendix B

## Reset of Acti9 Smartlink SI B

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### Description

#### Resetting Acti9 Smartlink SI B



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 B 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 Modbus serial setting is set to 19,200, 8 bits, 1 stop bit, and even parity
- The panel information saved in Acti9 Smartlink SI B is erased.
- The user accounts are erased (only default user accounts are retained).
- The operation counters are set to 0
- The running hours counters are set to 0
- The counter modification values are set to the value "1 January 2000".
- All the digital, analog, Modbus, and 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.**





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# Appendix C

## Troubleshooting

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### What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Common Problems	190
Description of Status LED	191
Description of Ethernet Status LED	192
Description of Wireless Status LED	193

## Common Problems

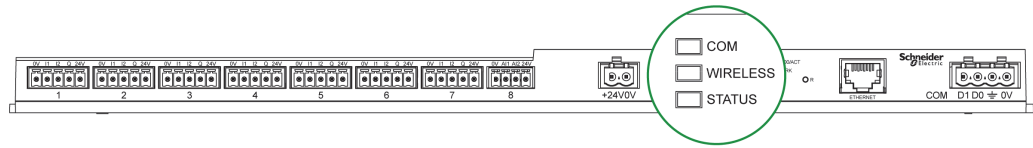
### Description

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.
Analog sensor values on the web page does not appear appropriate.	Incorrect sensor settings	Check the settings in the <b>Settings</b> menu and ensure proper values are applied.
	Wrong wiring between the sensor and Acti9 Smartlink SI B	Check that the wiring between the sensor and Acti9 Smartlink SI B is accurate.
	Sensor is disconnected from Acti9 Smartlink SI B	Check the wiring for loose connections or open terminals.
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: <ol style="list-style-type: none"> <li>1. Disconnect Smartlink from the network.</li> <li>2. Power cycle the Smartlink.</li> <li>3. Connect your PC or laptop directly to the Smartlink.</li> <li>4. Use <b>Automatic Discovery</b> from Ecoreach software to connect Acti9 Smartlink SI B, see <i>Ecoreach Online Help</i>.</li> <li>5. Launch firmware upgrade.</li> </ol>
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 <b>Settings → Communication → Wireless Network Configuration</b> page.
A PowerTag wireless communication energy sensor is not detected/discovered by Acti9 Smartlink SI B.	Acti9 Smartlink SI B 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 B.	Upgrade the firmware of Acti9 Smartlink SI B with Ecoreach software, see <i>Ecoreach Online Help</i> .
How to substitute a Acti9 Smartlink SI B and reconnect all PowerTag wireless communication energy sensors on the new Acti9 Smartlink SI B (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: <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>3. Install the new Smartlink.</li> <li>4. Restart all the PowerTag wireless communication energy sensors. The PowerTag wireless communication energy sensors blink orange (looking for a new Smartlink)</li> <li>5. Switch ON the new Smartlink. Open the Smartlink configuration page (either with Ecoreach software or the web pages).</li> <li>6. Discover the PowerTag wireless communication energy sensors with the scan function.</li> <li>7. In each PowerTag parameters, set the configuration with the initial Modbus slave number of the PowerTag noted in step 1.</li> <li>8. In the Smartlink parameters, set the configuration with the initial Modbus slave number of the old Smartlink noted in step 1.</li> </ol>

## Description of Status LED

### Status LED

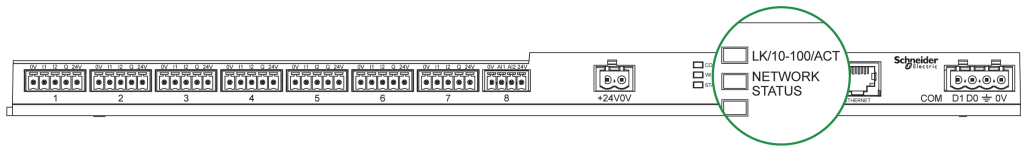


The following table lists the Status LED according to the operating mode:

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, 2blinks/sec) while pressing the reset button for more than 10 seconds. The LED stops blinking after the product restarts: 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 B.
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



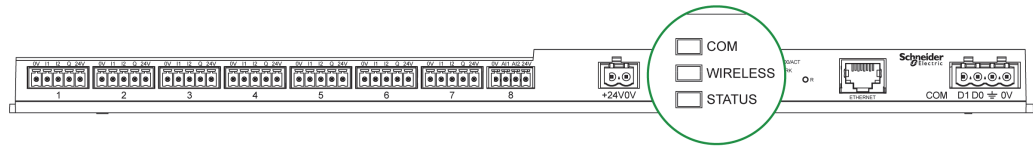
Mode	LK/10-100/ACT LED	Status
Ethernet communication		Activity at 10 Mbps: alternate yellow and white
		Activity at 100 Mbps: alternate green and white

### Network Status LED






Mode	Network Status LED	Status
Network status		No power, invalid IP address
		Connected, valid IP address
		Factory setting IPv4 address
		Duplicated IP address/IP error
		Self-test

## 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







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*As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.*

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