

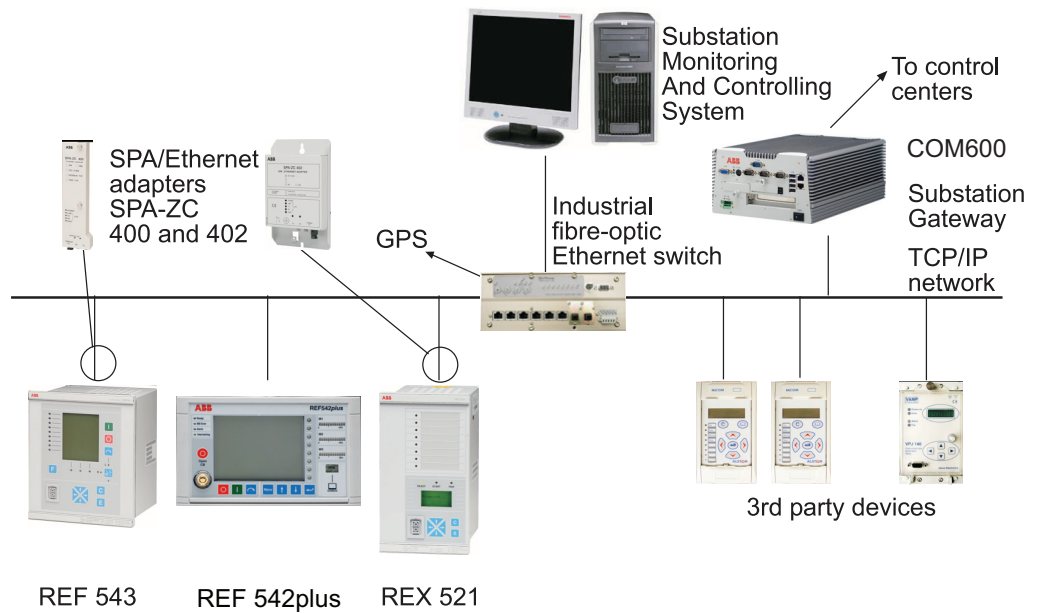




**Features**

- Enables IEC 61850 connectivity for IEDs with a fibre optic SPA bus.
- Auxiliary power supply
- Disturbance recorder file upload via IEC 61850
- Easy-to-use configuration tool for the IEC 61850 data mapping
- Communication over SPA/TCP
- Communication over Modbus/TCP

**Application**



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Fig. 1 Conceptual picture of a typical system setup

**Introduction**

Using the SPA-ZC 402, an Intelligent Electronic Device (IED) with a fibre optic SPA bus can be connected to the Ethernet based IEC 61850-8-1 station bus.

IEC 61850 is the new standard for substation communication. Additionally to being a communication standard, it also supports general substation automation functions as well as the engineering process.

SPA-ZC 402 also enables ethernet access to an IED using the SPA over TCP/IP and Modbus over TCP/IP.

The SPA-ZC 402 acts as a communication adapter between the SPA bus and the IEC 61850-8-1 station bus. The SPA-ZC 402

maps the SPA protocol interface to the IEC 61850-8-1 standard. This enables connecting products with optical SPA interface to IEC 61850 based networks in both new and retrofit installations.

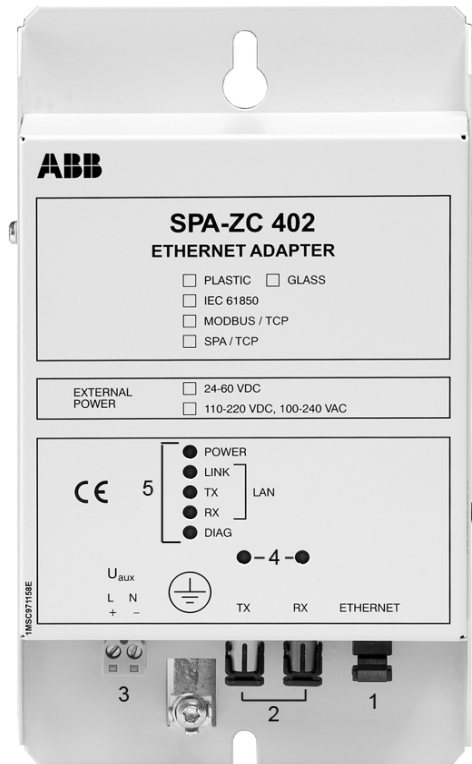
More information on how to physically connect the device can be found in the chapter 5 of the Installation and Commissioning manual. SPA-ZC 402 programming is described in the Installation and commissioning manual, chapter 6, Engineering.

As a prerequisite, you should understand the communication properties of the IED that is to be connected to Ethernet adapter. This information is available in the manual for the protection IED in question.

## Design

## Module parts

1. Ethernet connector
2. Fibre optic SPA-bus connectors
3. Auxiliary power supply connector
4. SPA TX and RX LEDs
5. LAN and diagnostic LEDs



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Fig. 2 Parts of SPA-ZC 402

## Technical data

### Interfaces

#### SPA-ZC 402 - IED interface

- ST multimode glass fibre transmitter/receiver pair or
- Snap-in multimode plastic fibre transmitter/receiver pair

#### IEC 61850 interface

LAN connectors

- RJ-45 (STP CAT5e) galvanic connection
- MT-RJ multimode glass fibre transceiver
- LC multimode glass fibre transceiver

### Optical fibres

See fibre optic guides:

- SPA-ZF Optical glass fibres, multimode graded index type specifications, 1MRS755371

- Plastic-core fibre optic cables, features and instructions for mounting, 1MRS752089-MUM

### Diagnostic leds

#### SPA-ZC 402 common diagnostic LEDs:

- Power
- Diagnostic:
  - Red
  - Green

#### LAN diagnostic LEDs:

- LINK
- TX
- RX

#### SPA diagnostic LEDs:

- TX
- RX

Technical data (cont'd) SPA-ZC402 dimensions and weight

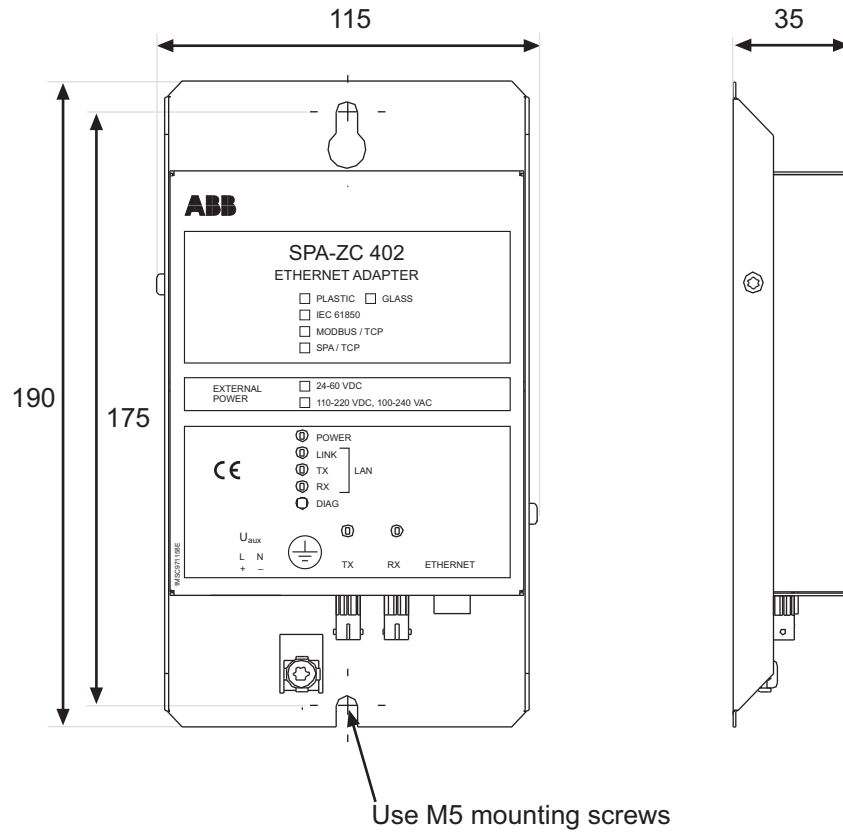


Fig. 3 SPA-ZC 402 dimensions

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Type	Dimensions [mm]	Weight [g]
SPA-ZC 402	190 x 115 x 35	510

Tests and conditions

Environmental tests and conditions

Recommended service temperature range	-10...+55°C (continuous)
Limit temperature range (short-term)	-40...+70°C
Transport and storage temperature range	-40...+85°C according to the IEC 60068-2-48
Dry heat test	IEC 60068-2-2
Dry cold test	IEC 60068-2-1
Damp heat test	IEC 60068-2-30

Electromagnetic compatibility tests

EMC immunity test level meets the requirements listed below	
1 MHz burst disturbance test, class III Common mode Differential mode	According to the IEC 60255-22-1 2.5 kV 1.0 kV
Electrostatic discharge test, class IV  For contact discharge For air discharge	According to the IEC 6100-4-2 and IEC 60255-22-2 8 kV Not applicable

## Technical data (cont'd)

**Electromagnetic compatibility tests**

Radio frequency interference tests Conducted, common mode	According to the IEC 61000-4-6 and IEC 60255-22-6 10 V (rms), f = 150 kHz ... 80 MHz
Radiated, amplitude-modulated	According to the IEC 61000-4-3 and IEC 60255-22-3 10 V/m (rms), f = 80 ... 2700 MHz
Radiated, pulse-modulated	According to the ENV 50204 and IEC 60255-22-3 10 V/m, f = 900 MHz
Fast transient disturbance tests All terminals	According to the IEC 60255-22-4 and IEC 61000-4-4 4 kV
Surge immunity test Power supply SPA-ZC402xxxA	According to the IEC 60255-22-5 and IEC 61000-4-5 4 kV, line to earth
Power supply SPA-ZC402xxxC	2 kV, line to line
RJ-45 cable	2 kV, line to earth 1 kV, line to line 2 kV, line to earth
Power frequency (50 Hz) magnetic field	According to the IEC 61000-4-8 300 A/m continuous
Electromagnetic emission tests Conducted, RF-emission (Mains term.)	According to the EN 55011 EN 55011, class A, IEC 60255-25
Radiated RF-emission	EN 55011, class A, IEC 60255-25
CE compliance	Complies with the EMC directive 2004/108/EC and the LV directive 2006/95/EC

**Standard tests**

Mechanical tests	
Vibration tests (sinusoidal)	According to the IEC 60255-21-1, class I
Shock and bump test	According to the IEC 60255-21-2, class I

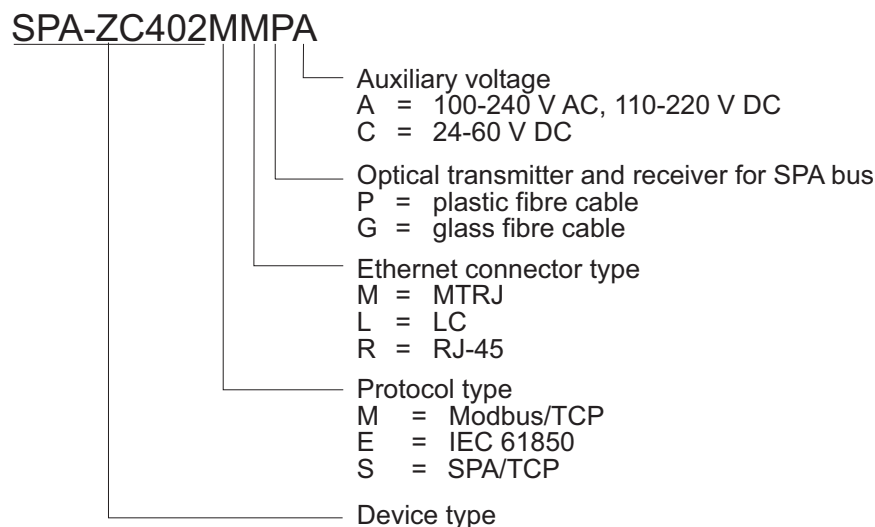
**Auxiliary power supplies**

Type	SPA-ZC 402 xxxA	SPA-ZC 402 xxxC
Input voltage AC	110/120/220/240 V	-
Input voltage DC	110/125/220 V	24/48/64 V
Voltage variation	AC 85...110%, DC 80...120% of rated value	DC 80.120% of rated value
Burden	<4W	
Ripple in DC auxiliary voltage	max. 12% of rated DC value (IEC 60255-11)	
Interruption time in auxiliary DC voltage without resetting	110 V < 40ms	24 V < 24ms

**RoHS Compliance**

Complies with the RoHS directive 2002/95/EC
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## Ordering



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Fig. 4 Ordering information for SPA-ZC402

### SPA-ZC 402CD

- SPA-ZC 402 configuration CD
  - Communication Engineering Tool (CET) for SPA-ZC 40x.



Order at least one SPA-ZC 402 configuration CD with your delivery to get the Communication Engineering Tool.



The connectivity packages for a set of ABB IEDs can be found from the internet address: <http://www.abb.com/substationautomation>. Please contact ABB to check the connectivity package's status for the IED in question.

## References

## Related documents

Name of the document	Document id
SPA-ZC 402 Installation and commissioning manual	1MRS755380
SPA-ZC 402 configuration CD	1MR151049
CAP 505 User's Guide	1MRS752292-MUM
SPA-ZF Optical glass fibres, multimode graded index type specifications	1MRS755371
Plastic-core fibre optic cables, features and instructions for mounting	1MRS752089
Standard	IEC 61850, parts -6, -7-2, -7-3, -7-4, -8-1



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