

SPA-ZC 200/SPA-ZC 202

IEC 60870-5-103/SPA-gateway Modules

Installation Manual



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Features

- IEC 60870-5-103 connection module for devices including SPA-bus interface.
- Polling of measurements, indications and events from SPA-bus slave modules to the local database.
- Spontaneous sending of updated measurements, indications and events to IEC 60870-5-103 devices.
- Configuration/programming via IEC 60870-5-103 interface.
- SPA-bus interface using a 9-pin D-connector with RS-485, RS-232 or TTL-level signalling. Maximum communication rate 19200 bits/s.
- IEC 60870-5-103 interface using glass or plastic fibre cables with a maximum communication rate of 9600 or 19200 bits/s. The idle time state for the interface is lit according to the IEC 60870-5-103 standard.

1. Safety information

	Dangerous voltages can occur on the connectors, even though the auxiliary voltage is disconnected.
	National and local electrical safety regulations must always be followed.
	The products contain components that are sensitive to electrostatic discharge.
	The frame of the device has to be carefully earthed.
	Only a competent electrician is allowed to carry out the electrical installation.
	Non-observance can result in death, personal injury or substantial property damage.

2. Introduction

The IEC 103/SPA-gateway is an interface module for SPA-bus devices to be connected to the bus defined in standard IEC 60870-5-103. The bus is called IEC_103 in this document.

This manual describes the mechanical and electrical connection of the gateway to a device containing a SPA-bus interface. How to program the gateway is described in the SPA-ZC 200/202 Commissioning Manual (1MRS752023-MUM) and is beyond the scope of this document.

The SPA interface type is selected with DIP switches located between the D9-connector and the fibre-optic connectors. The operating current for the SPA-ZC 200 module is received from the device it is connected to. The SPA-ZC 202 module contains a power supply.

The first section of this document describes the mechanical installation illustrated with some examples. The second section describes the electrical configuration of the gateway for different SPA-bus types and supply voltages. Additional information such as technical data and data for fault diagnosis is found in the Commissioning Manual (1MRS752023-MUM).

2.1. Contents of delivery

SPA-ZC 200

- SPA-ZC 200 module
- Connection cable (SPA25A05)
- Installation plate
- Fastening screws (in the bottom of SPA-ZC 200)
- This manual
- SPA-ZC 200/202 configuration CD

SPA-ZC 202

- SPA-ZC 202 module
- Connection cable 1.2 m (1MRS 120518)
- This manual
- SPA-ZC 200/202 configuration CD

2.2. Parts of modules

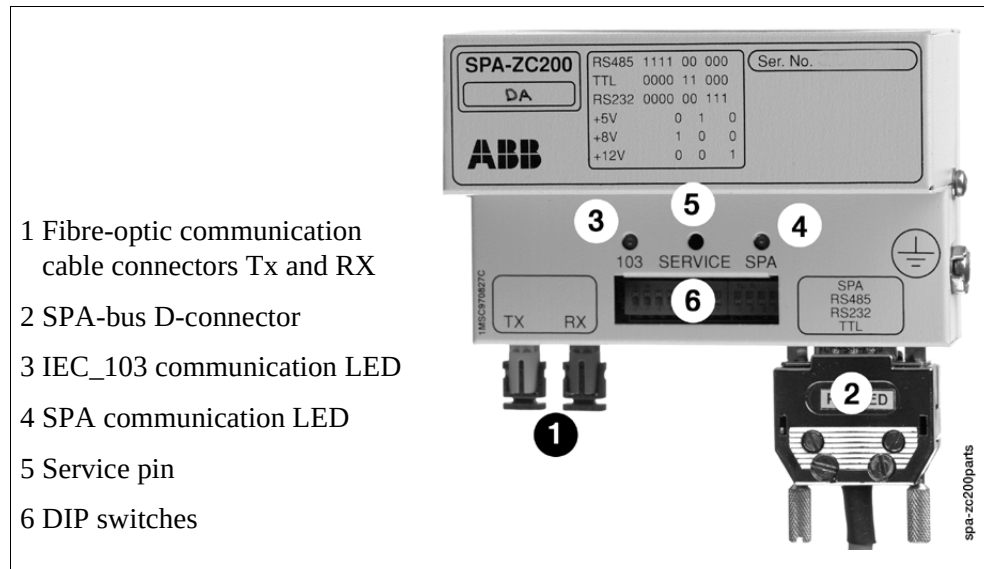


Fig. 2.2.-1 Parts of SPA-ZC 200

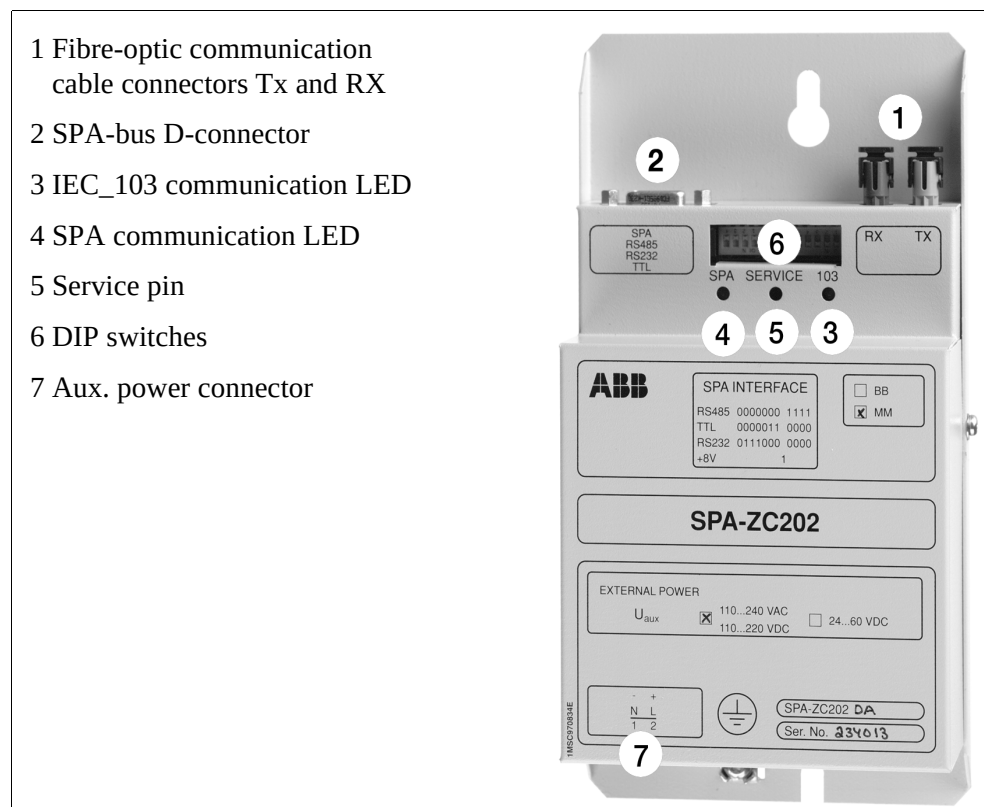


Fig. 2.2.-2 Parts of SPA-ZC 202

3. Mechanical installation

3.1. Instructions for SPA-ZC 200

Normally, the gateway replaces the other SPA-bus connection modules of the SPA device. The SPA-ZC 200 is installed on the back of the SPA device using the installation plate and the screws which are enclosed in the delivery.

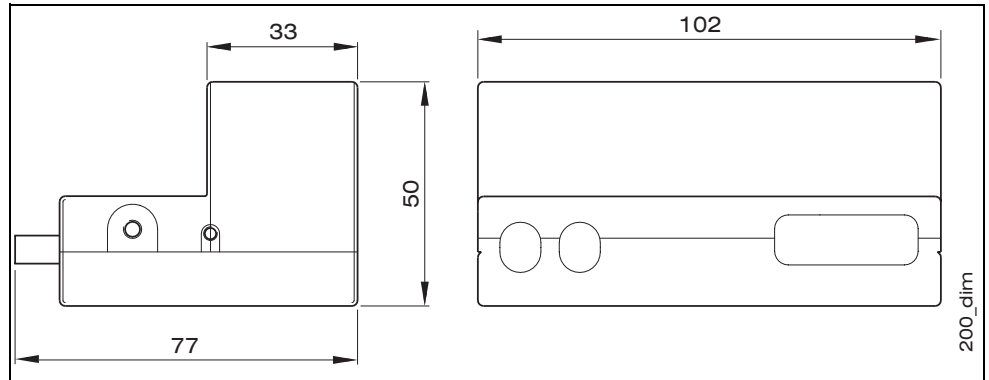


Fig. 3.1.-1 Dimensions of SPA-ZC 200 module

1. Attach the installation plate to the SPA-ZC 200 module. Use the screws fastened on the bottom of the module. Longer screws can damage the electric circuit board inside it.
2. Fix the assembly to the back of the relay, see fig. 3.1.-2.
3. Ensure that the DIP switch configuration of the module is correct, see chapter 4.
4. Connect the cable SPA25A05, which is included in the delivery, between the SPA device and the SPA-bus D-connector of SPA-ZC 200. Fore more information see chapter 4.3.
5. Fix the fibre-optic cable connectors to the optic transmitter (Tx) and receiver (Rx) terminals of the SPA-ZC 200. The other end of the cables are fixed to a RER 125 (IEC_103 Star Coupler) or to a similar device, so that the fibre-optic cable fixed to the SPA-ZC 200 transceiver (Tx) is fixed to the RER 125 receiver (Rx) and vice versa.



Do not bend the fibre-optic cable more than permitted (~ 50mm). For additional information, see manual 1MRS752089-MUM “Plastic-core fibre-optic cables. Features and instructions for mounting”.

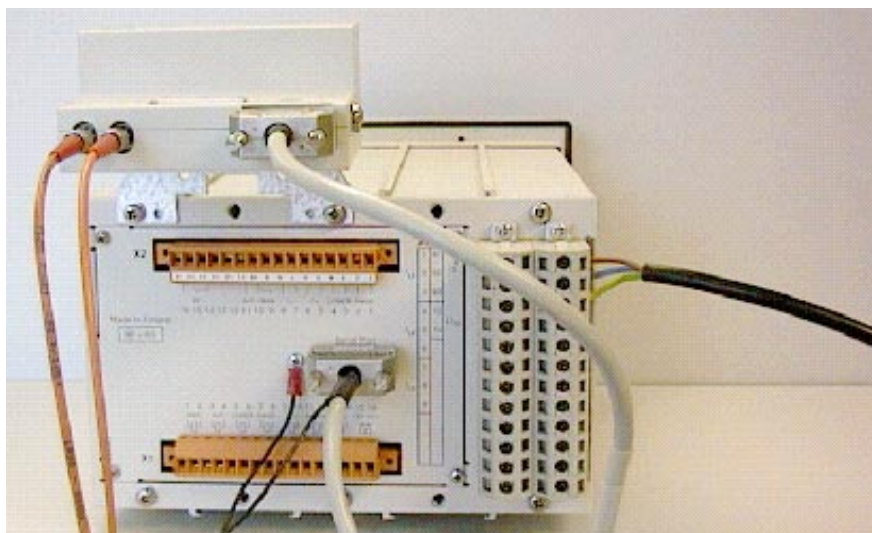


Fig. 3.1.-2 A typical SPA-ZC 200 module connection to a SPACOM relay

3.2.

Instructions for SPA-ZC 202

1. Fix the module with two screws on the bottom or wall of the cubicle near by the relay it will be connected to observing the 1.2 m length of the SPA communication cable 1MRS120518.

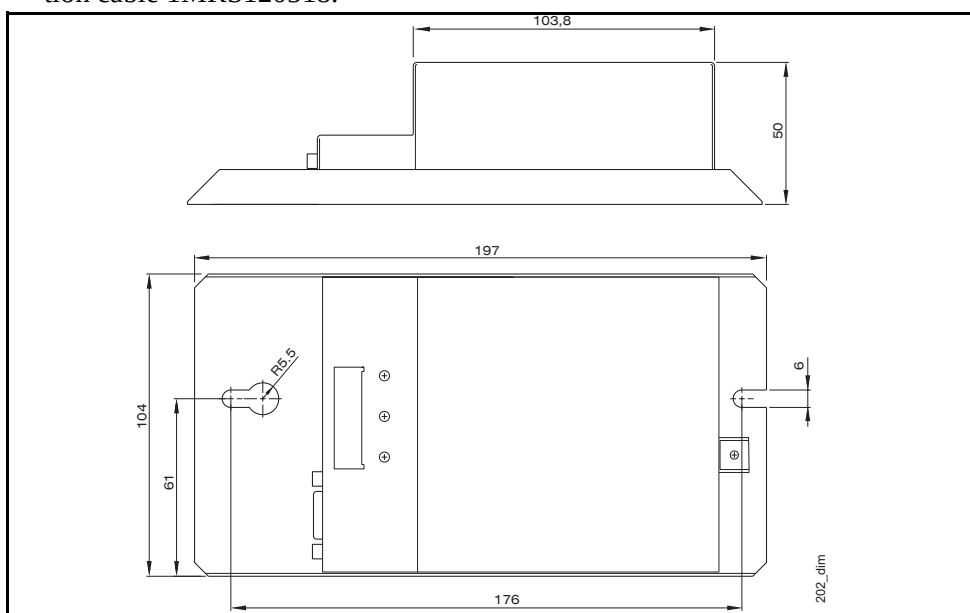


Fig. 3.2.-1 Dimensions of SPA-ZC 202 module

2. Ensure that the DIP switch configuration of the module is correct, see chapter 4.
3. Connect the SPA communication cable between the SPA device and the SPA-bus D-connector of SPA-ZC 202. For more information see chapter 4.3.
4. Fix the fibre-optic cable connectors to the optic transmitter (Tx) and receiver (Rx) terminals of the SPA-ZC 202. The other end of the cables are fixed to a RER 125 (IEC_103 Star Coupler) or to a similar device, so that the fibre-optic cable fixed to the SPA-ZC 202 transceiver (Tx) is fixed to the RER 125 receiver (Rx) and vice versa.

4. Electrical installation

4.1. Fibre-optic IEC_103 interface

For an interface to IEC_103, the gateway includes a fibre-optic transmitter and receiver for glass core or plastic core fibre-optic cables.

4.2. SPA-bus interface

For a SPA-bus interface, the gateway includes a 9-pin D-connector. Used interface types are RS-232, RS-485 or TTL. The supply voltage levels for SPA-ZC 200 are +5V, +8V and +12V. The DIP switches located on the connector board between the fibre-optic connectors and the D-connector are used to select signal types and voltage levels.

4.2.1. Dip-switch configuration

Tables 4.2.1.-1 and 4.2.1.-2, and figures 4.2.1.-1 and 4.2.1.-2 show how to select the signalling level and power supply of the SPA-bus interface for the SPA-ZC 200 and the SPA-ZC 202.

Table 4.2.1-1 Interface type and DIP switch positions for SPA-ZC 200

Interface type	DIP switch positions
RS-485 (+8V pin 9, GND pins 7,5)	1.1 - 1.5 ON 1.6 - 1.8 OFF 2.1 - 2.4 OFF
TTL (+8V pin 9, GND pins 7,5)	1.1 - 1.4 OFF 1.5 - 1.7 ON 1.8 OFF 2.1 - 2.4 OFF
TTL (+5V pin 8, GND pins 7,5)	1.1 - 1.5 OFF 1.6 - 1.8 ON 2.1 - 2.4 OFF
RS-232 (+12V pin 4, GND pins 5,7)	1.1 - 1.8 OFF 2.1 - 2.4 ON

Table 4.2.1-2 Interface type and DIP switch positions for SPA-ZC 202

Interface type	DIP Switch positions
RS-485	1.1 - 1.4 ON 1.6 - 1.8 OFF 2.1 - 2.4 OFF
TTL	1.1 - 1.4 OFF 1.6 - 1.7 ON 1.8 OFF 2.1 - 2.4 OFF
RS-232	1.1 - 1.4 OFF 1.6 - 1.8 OFF 2.1 - 2.4 ON
Output voltage +8 V on pin 9 (GND pins 5,7)	1.5 ON

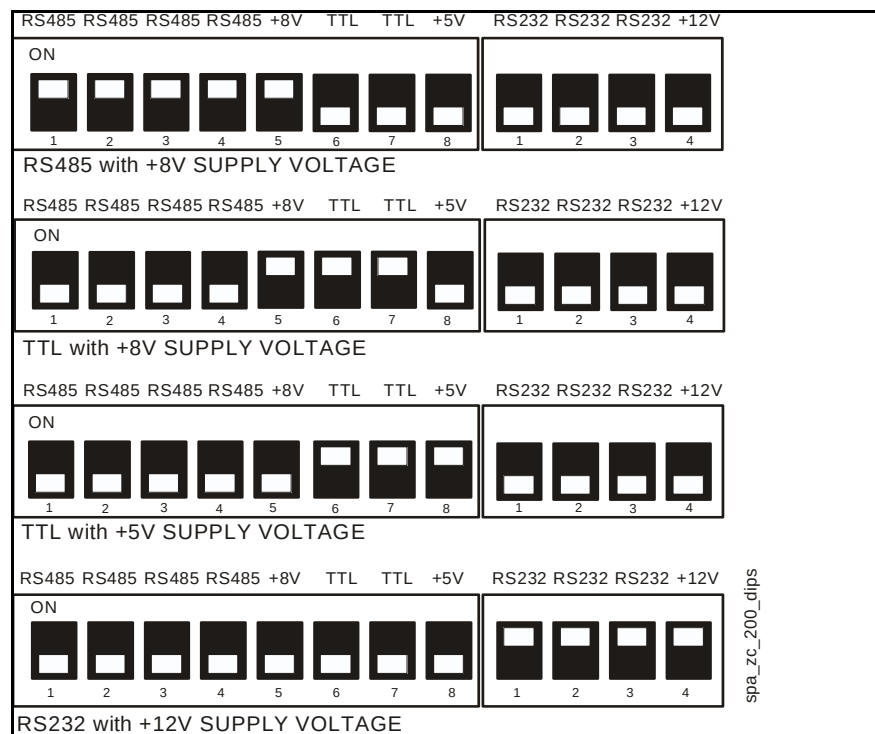


Fig. 4.2.1.-1 DIP switch configuration in the SPA-ZC 200 module

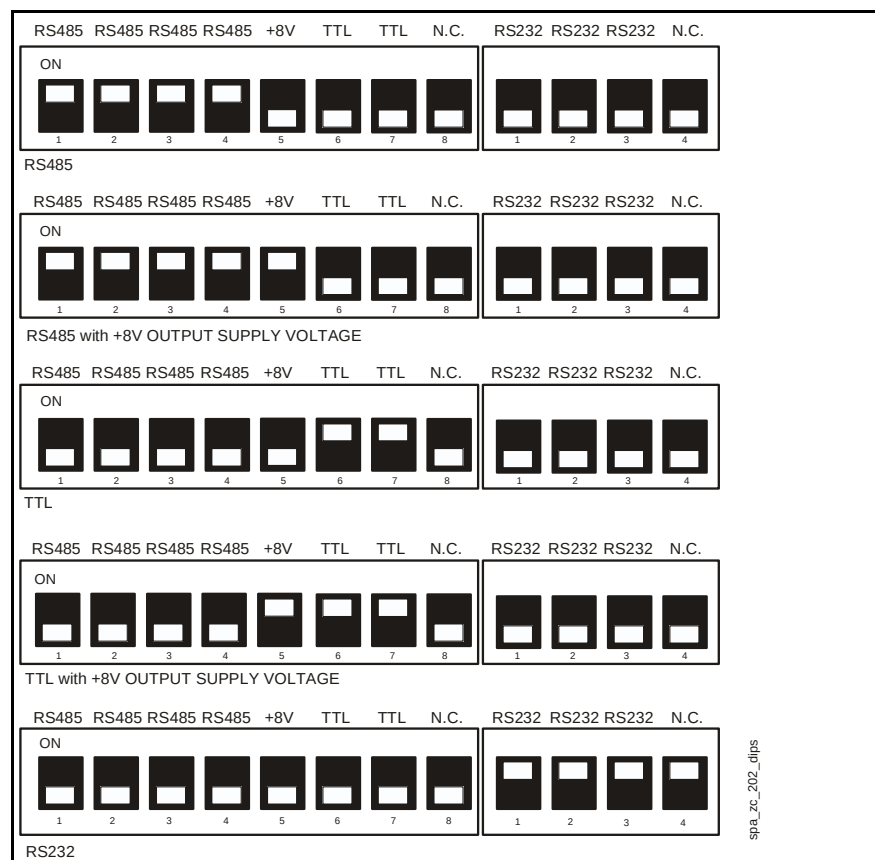


Fig. 4.2.1.-2 DIP switch configuration in the SPA-ZC 202 module

4.3. Cable connections

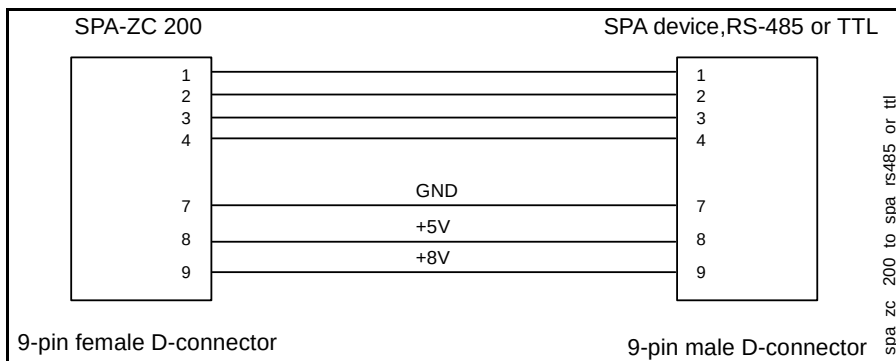


Fig. 4.3.-1 Interface cable SPA25A05: a SPA-ZC 200 connected to a SPA-bus device with RS-485 or TTL/Logic interface

Table 4.3.-1 Pin numbers of the SPA-bus/RS485 connection with SPA-ZC 200

Pin	Usage
1	DATA A, data signal pair, signal A (+)
2	DATA B, data signal pair, signal B (-)
3	RTS A, request to send signal pair, signal A (+)
4	RTS B, request to send signal pair, signal B (-)
7	GND, signal ground for the power supply
8	+5V, optional power supply for the SPA-ZC 200
9	+8V, power supply for the SPA-ZC 200

Table 4.3.-2 Pin numbers of the SPA-bus/TTL connection with SPA-ZC 200

Pin	Usage
2	RXD, data from SPA-bus device
3	TXD, data to SPA-bus device
7	GND, signal ground for power supply
8	+5V, optional power supply for SPA-ZC 200
9	+8V, power supply for SPA-ZC 200

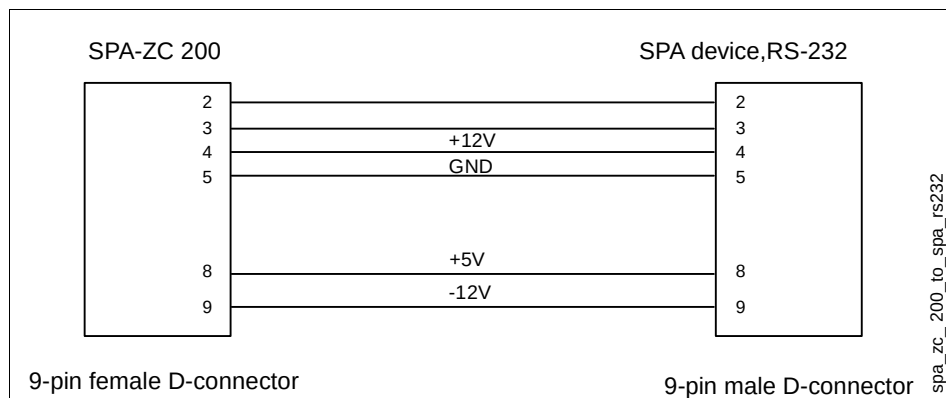
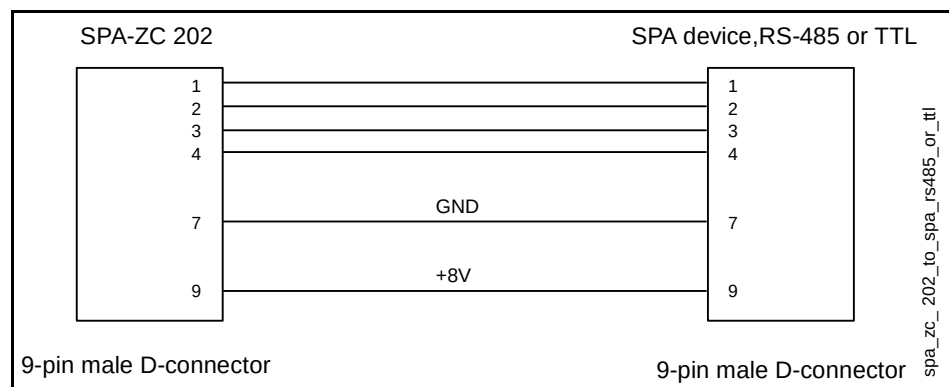


Fig. 4.3.-2 Interface cable SPA25A05: a SPA-ZC 200 connected to a SPA-bus device with RS-232

Table 4.3.-3 Pin numbers of the SPA-bus/RS-232 connection with SPA-ZC 200

Pin	Usage
2	TXD, data to SPA-bus device
3	RXD, data from SPA-bus device
5	GND, signal ground for power supply
4	+12V, power supply for SPA-ZC 200
8	+5V, optional power supply for SPA-ZC 200
9	-12V, not used by SPA-ZC 200

**Fig. 4.3.-3 Interface cable 1MRS120518: a SPA-ZC 202 connected to a SPA-bus device with RS-485 or TTL/Logic interface****Table 4.3.-4 Pin numbers of the SPA-bus/RS-485 connection with SPA-ZC 202**

Pin	Use
1	DATA A, data signal pair, signal A (+)
2	DATA B, data signal pair, signal B (-)
3	RTS A, request to send signal pair, signal A (+)
4	RTS B, request to send signal pair, signal B (-)
7	GND, signal ground
9	+8V, optional power supply from the SPA-ZC 202

The pin numbers of the SPA-bus/TTL connection are the following:

Table 4.3.-5 Pin numbers of the SPA-bus/TTL connection with SPA-ZC 202

Pin	Use
2	RXD, data from SPA-bus device
3	TXD, data to SPA-bus device
7	GND, signal ground
9	+8V, power supply from the SPA-ZC 202

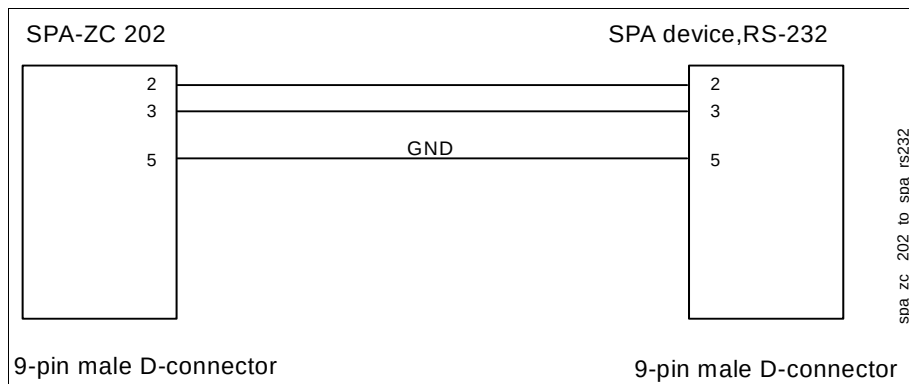


Fig. 4.3.-4 Interface cable 1MRS120518: a SPA-ZC 202 connected to a SPA-bus device with RS-232

Table 4.3.-6 PIN numbers of the SPA-bus/RS-232 connection with SPA-ZC 202

Pin	Use
2	TXD, data to SPA-bus device
3	RXD, data from SPA-bus device
5	GND, signal ground

4.4.

Commissioning of SPA-ZC 200/202 for IEC_103

The commissioning of the SPA-ZC 200/202 module is described in the SPA-ZC 200/202 Commissioning Manual (1MRS752023-MUM).

5. References

- Commissioning Manual 1MRS752023-MUM
- Standard Configuration Templates (1MRS752034-MUM) on SPA-ZC200/202 Configuration CD 1MRS 752078-MCD
- RER 125 User's Manual 1MRS751295-MUM
- <http://www.abb.com/substationautomation>

6. Ordering information

6.1. SPA-ZC 200 product package

The ordering number is SPA-ZC 200-xx, where xx stands for:

AA	plastic fibre-optic connectors
DA	glass fibre-optic connectors

6.2. SPA-ZC 202 product package

The ordering number is SPA-ZC 202-xx, where xx stands for:

AA	plastic fibre-optic connectors, auxiliary voltage 110 V...240 V AC/DC
AC	plastic fibre-optic connectors, auxiliary voltage 24 V...60 V DC
DA	glass fibre-optic connectors, auxiliary voltage 110 V...240 V AC/DC
DC	glass fibre-optic connectors, auxiliary voltage 24 V...60 V DC

Configuration packages

Ordering numbers:

SPA-ZC 20XCD-MM	for glass fibre-optic connectors.
SPA-ZC 20XCD-BB	for plastic fibre-optic connectors.

6.2.1. Contents of the configuration packages

- Configuration communication cable (length 3m)
- Required RS-232/fibre-optic line driver module
- SPA-ZC 200/202 configuration CD with
 - IEC_103/SPA-gateway configuration tool (ICT)
 - Supported SPACOM templates
- Commissioning Manual (1MRS752023-MUM)

Customer Feedback

Date: _____

To fax: +358 10 224 1094

Category: _____

__Comment

__Query

__Complaint

In case of feedback related to a specific product, please state the name of the product.

Product:

Description:

Initiator:

Issuer:

Company:

Country:

Telefax no/

e-mail address:

If necessary, additional pages may be enclosed.



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