SPA bus connection modules

SPA-ZC

1MRS 750432-MBG
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Issued: April 1999
Status: New
Data subject to change without notice

Features

- Electrical-to-optical converter for the SPA bus
- Connects the substation secondary devices to the fibre-optic SPA bus
- High immunity to electrical and electromagnetic interference
- Easy mounting and installation
- Complete range of bus connection modules for different applications
- Products of the SPACOM product family, ABB's Distribution Automation system and ABB's Panorama concept

Application

The SPA bus interconnects the substation protection relays, annunciator systems and other devices by means of a fibre-optic loop based on a glass or plastic fibre cable. The devices are connected to the bus over bus connection modules type SPA-ZC_ which convert the electrical signals of the devices to optical signals for the bus and, vice versa, the optical signals of the bus to electrical signals of the devices. All the standard secondary devices of a substation are equipped with a serial interface for receiving and transmitting information.

The serial ports of the devices are TTL, RS 485 or RS 232 C signal level interfaces. Bus connection modules are available for these interface types.

Design

The SPA bus connection modules are used in both ends of the SPA bus, i.e. on the substation level for connection of the bus to the communication units and on the feeder level for connection of the bus to the substation secondary devices.

Bus connection module SPA-ZC 17

The bus connection module SPA-ZC 17 is used for connecting substation secondary devices to the SPA bus. It converts the TTL or RS 485 level signals of the host device to fibre optic signals for the bus and vice versa. The unit comprises one 9-pin D type connector for the host device and one pair of optical transceivers for the SPA bus. The module can be powered from the host device or from a separate power source. In the latter case the bus connection module and the fibre-optic bus remain operative, should the power supply from the host device be interrupted.

The bus connection module SPA-ZC 17 can be used in both master and slave mode.

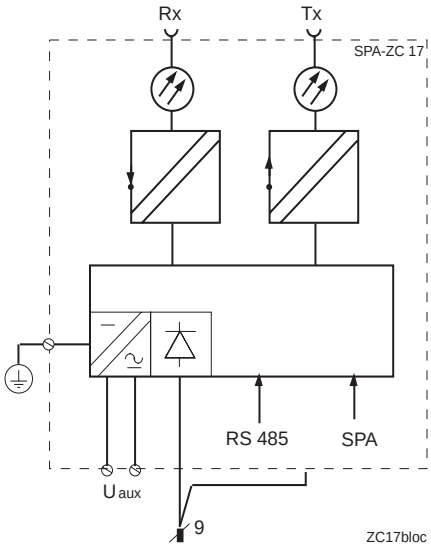

Fig. 1 Block diagram of SPA-ZC 17

Bus connection module SPA-ZC 20

The bus connection module SPA-ZC 20 is used for multiplying the number of available fibre-optic loops in a substation. The module is provided with 15 transceiver pairs, that is it can form 15 fibre-optic loops. All of the loops formed by the module carry the same information. In certain applications, where operational reliability is of primary concern it can be recommended to limit the number of substation secondary devices connected to one single loop. In these applications the bus connection module SPA-ZC 20 is applied.

The SPA-ZC 20 is only used in master mode and it is powered from the device to which it is connected. The input interface of the device is of the RS 485 type.

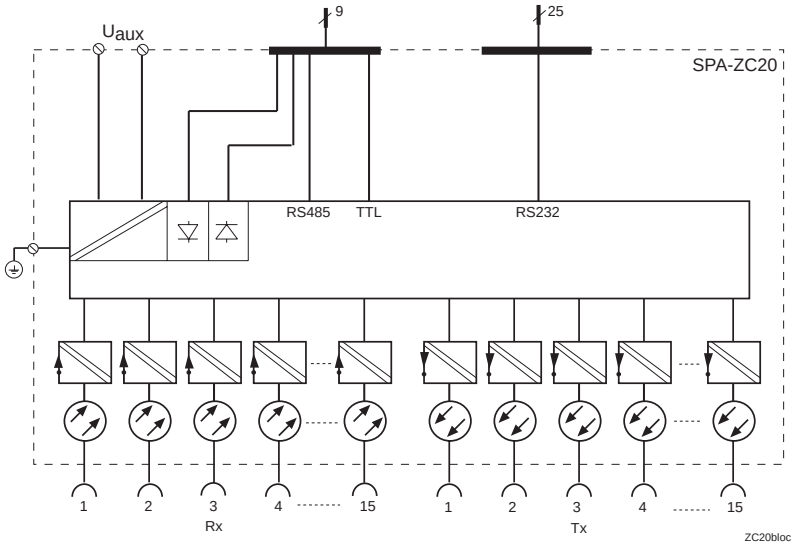

Fig. 2 Block diagram of SPA-ZC 20

Design (cont'd)

Bus connection module SPA-ZC 21

The bus connection module SPA-ZC 21 is used for connecting substation secondary devices to the SPA bus. It converts the TTL or RS 485 level signals of the host device to fibre optic signals for the bus and vice versa. The unit comprises one 9-pin D type connector for the host device and one pair of optical transceivers for the SPA bus. The module is powered from the host device.

The bus connection module SPA-ZC 21 can be used in both master and slave mode.

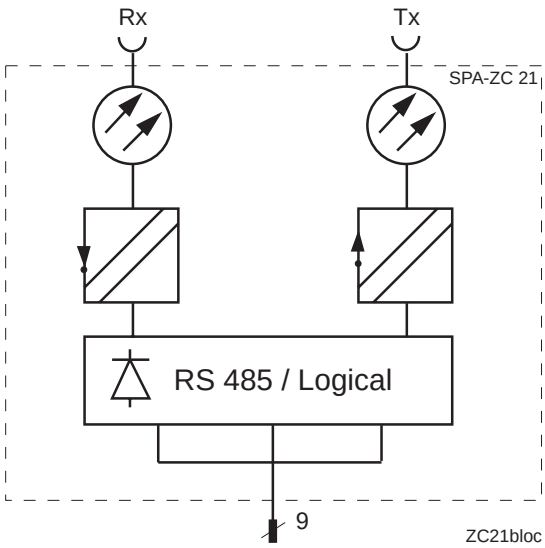

Fig. 3 Block diagram of SPA-ZC 21

Bus connection module SPA-ZC 22

The bus connection module SPA-ZC 22 is used for dividing the system into several fibre-optic loops. The SPA-ZC 22 module is available in two versions, one with five fibre-optic transceiver pairs and one with two pairs. The SPA-ZC 22 module is connected to the communicator units of the SPA loop. The bus connection module features a built in RS 232 C interface for direct connection to a PC, a modem, etc. and one RS 485 interface for connection to e.g. a SRIO unit. The bus connection module can also be used in slave mode if a double connection to one substation secondary device is needed. The third mode of operation for the SPA-ZC 22 module is the optical repeater mode. In the optical repeater mode a fibre pair from the communicator unit's optical module is connected to the first transceiver pair of the SPA-ZC 22 module. The data is then retransmitted over the other transceiver pair(s) in the module.

The bus connection module SPA-ZC 22 is powered form the device to which it is connected or from an external power source.

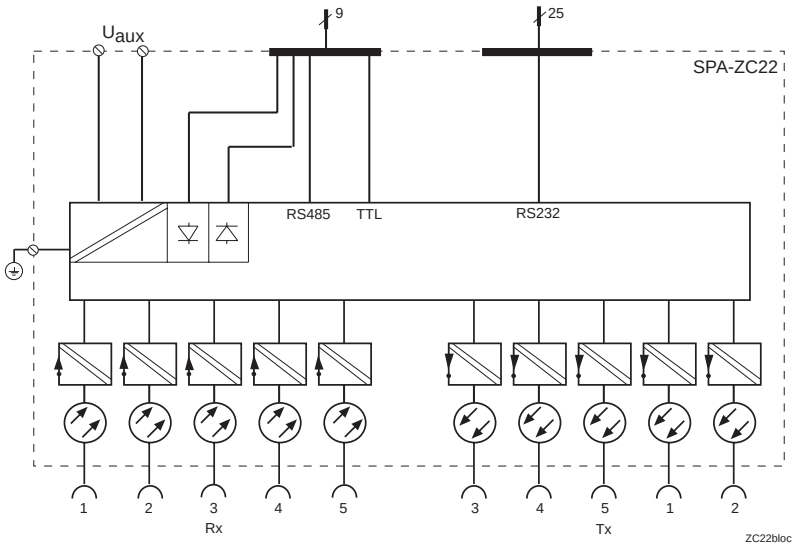

Fig. 4 Block diagram of SPA-ZC 22

Design (cont'd)

Bus connection module SPA-ZC 23

The bus connection module SPA-ZC 23 is used in applications requiring a redundant communication system. If a message is received via Channel 1 of the module it is also retransmitted via Channel 1. If the Rx or Tx fibre is broken the master unit cannot receive an answer to its requests and the system will switch over to Channel 2.

The bus connection module SPA-ZC 23 is only used in slave mode and can be powered from the host device or from an external power source.

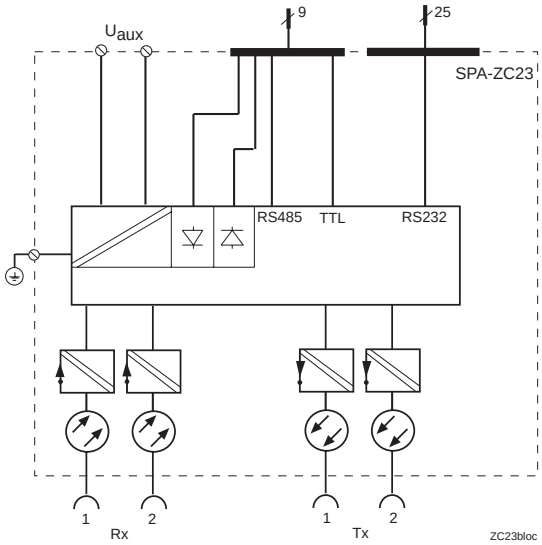

Fig. 5 Block diagram of SPA-ZC 23

Technical data

Table 1: Power supply

From host device	SPA-ZC 20 SPA-ZC 21
From host device and external supply	SPA-ZC 17 SPA-ZC 22 SPA-ZC 23
Supply voltage when supplied from external source	80…265 V ac or dc 18…80 V dc

Ordering

When ordering, please specify:

Ordering information	Ordering example
1. Type designation and quantity	SPA-ZC 17BB2A, 5 pieces
2. Order number	RS 951 014-AA
3. Auxiliary voltage U_{aux}, if applicable	110 V dc

Order numbers of bus connection module SPA-ZC 17

Type designation	Auxiliary supply	Transmitter	Receiver	Order No.
SPA-ZC 17BB2A	80…265 V ac, dc	Plastic	Plastic	RS 951 014-AA
SPA-ZC 17BB2C	18…80 V dc	Plastic	Plastic	RS 951 014-BA
SPA-ZC 17BM2A	80…265 V ac, dc	Plastic	Glass	RS 951 014-CA
SPA-ZC 17BM2C	18…80 V dc	Plastic	Glass	RS 951 014-DA
SPA-ZC 17MB2A	80…265 V ac, dc	Glass	Plastic	RS 951 014-EA
SPA-ZC 17MB2C	18…80 V dc	Glass	Plastic	RS 951 014-FA
SPA-ZC 17MM2A	80…265 V ac, dc	Glass	Glass	RS 951 014-GA
SPA-ZC 17MM2C	18…80 V dc	Glass	Glass	RS 951 014-HA

Order numbers of bus connection module SPA-ZC 17 for SACO units

Type designation	Auxiliary supply	Transmitter	Receiver	Order No.
SPA-ZC 17BB2A/S	80…265 V ac, dc	Plastic	Plastic	RS 951 014-AB
SPA-ZC 17BB2C/S	18…80 V dc	Plastic	Plastic	RS 951 014-BB
SPA-ZC 17BM2A/S	80…265 V ac, dc	Plastic	Glass	RS 951 014-CB
SPA-ZC 17BM2C/S	18…80 V dc	Plastic	Glass	RS 951 014-DB
SPA-ZC 17MB2A/S	80…265 V ac, dc	Glass	Plastic	RS 951 014-EB
SPA-ZC 17MB2C/S	18…80 V dc	Glass	Plastic	RS 951 014-FB
SPA-ZC 17MM2A/S	80…265 V ac, dc	Glass	Glass	RS 951 014-GB
SPA-ZC 17MM2C/S	18…80 V dc	Glass	Glass	RS 951 014-HB

Order numbers of bus connection module SPA-ZC 20

Type designation	Transmitter		Receiver		Order No.
	Plastic	Glass	Plastic	Glass	
SPA-ZC 20 15B0M	15	0	15	0	RS 951 020-AA
SPA-ZC 20 10B5M	15	0	15	1	RS 951 020-BB
SPA-ZC 20 5B10M	15	0	15	2	RS 951 020-CB
SPA-ZC 20 0B15M	15	0	15	3	RS 951 020-DB

Ordering (cont'd)

Order numbers of bus connection module SPA-ZC 21

Type designation	Transmitter	Receiver	Order No.
SPA-ZC 21BB	Plastic	Plastic	RS 951 021-AA
SPA-ZC 21BM	Plastic	Glass	RS 951 021-BA
SPA-ZC 21MB	Glass	Plastic	RS 951 021-CA
SPA-ZC 21MM	Glass	Glass	RS 951 021-DA

Order numbers of bus connection modules SPA-ZC 21 for SACO units

Type designation	Transmitter	Receiver	Order No.
SPA-ZC 21BB/S	Plastic	Plastic	RS 951 021-AB
SPA-ZC 21BM/S	Plastic	Glass	RS 951 021-BB
SPA-ZC 21MB/S	Glass	Plastic	RS 951 021-CB
SPA-ZC 21MM/S	Glass	Glass	RS 951 021-DB

Order numbers of bus connection module SPA-ZC 22, version with two bus loops

Type designation	TX1/TX2	TX2/RX2	Order No.
SPA-ZC 22C 2B0M	Plastic/Plastic	Plastic/Plastic	RS 951 027-EA
SPA-ZC 22C 1B1M	Plastic/Plastic	Glass/Glass	RS 951 027-CA
SPA-ZC 22C 1B1M/B	Plastic/Glass	Plastic/Glass	RS 951 027-CB
SPA-ZC 22C 1B1M/M	Glass/Plastic	Glass/Plastic	RS 951 027-CC
SPA-ZC 22C 0B2M	Glass/Glass	Glass/Glass	RS 951 027-AA
SPA-ZC 22A 2B0M	Plastic/Plastic	Plastic/Plastic	RS 951 027-FA
SPA-ZC 22A 1B1M	Plastic/Plastic	Glass/Glass	RS 951 027-DA
SPA-ZC 22A 1B1M/B	Plastic/Glass	Plastic/Glass	RS 951 027-DB
SPA-ZC 22A 1B1M/M	Glass/Plastic	Glass/Plastic	RS 951 027-DC
SPA-ZC 22A 0B2M	Glass/Glass	Glass/Glass	RS 951 027-BA

Order numbers of bus connection module SPA-ZC 22, version with five bus loops

Type designation	Transmitter/receiver pairs		Order No.
	Plastic	Glass	
SPA-ZC 22C 5B0M	5	0	RS 951 027-UA
SPA-ZC 22C 4B1M	4	1	RS 951 027-SA
SPA-ZC 22C 3B2M/B	3	2	RS 951 027-PA
SPA-ZC 22C 2B3M	2	3	RS 951 027-MA
SPA-ZC 22C 1B4M	1	4	RS 951 027-KA
SPA-ZC 22C 0B5M	0	5	RS 951 027-GA
SPA-ZC 22A 5B0M	5	0	RS 951 027-VA
SPA-ZC 22A 4B1M	4	1	RS 951 027-TA
SPA-ZC 22A 3B2M	3	2	RS 951 027-RA
SPA-ZC 22A 2B3M	2	3	RS 951 027-NA
SPA-ZC 22A 1B4M	1	4	RS 951 027-LA
SPA-ZC 22A 0B5M	0	5	RS 951 027-HA

The letters A or C following the code string SPA-ZC 22 of the type designation indicates the auxiliary voltage and the rated frequency of the bus connection module as follows:
A = 50 Hz or 60 Hz, 80…265 V ac or 80…265 V dc, C = 18…80 V dc

Order numbers of bus connection module SPA-ZC 23

Type designation	TX1/TX2	RX1/RX2	Order No.
SPA-ZC 23 A2BBBB	Plastic/Plastic	Plastic/Plastic	RS 651 028-AA
SPA-ZC 23 A2BBBM	Plastic/Plastic	Plastic/Glass	RS 651 028-BA
SPA-ZC 23 A2BBMB	Plastic/Plastic	Glass/Plastic	RS 651 028-CA
SPA-ZC 23 A2BBMM	Plastic/Plastic	Glass/Glass	RS 651 028-DA
SPA-ZC 23 A2BMBB	Plastic/Glass	Plastic/Plastic	RS 651 028-EA
SPA-ZC 23 A2BMBM	Plastic/Glass	Plastic/Glass	RS 651 028-FA
SPA-ZC 23 A2BMMB	Plastic/Glass	Glass/Plastic	RS 651 028-GA
SPA-ZC 23 A2BMMM	Plastic/Glass	Glass/Glass	RS 651 028-HA
SPA-ZC 23 A2MBBB	Glass/Plastic	Plastic/Plastic	RS 651 028-KA
SPA-ZC 23 A2MBBM	Glass/Plastic	Plastic/Glass	RS 651 028-LA
SPA-ZC 23 A2MBMB	Glass/Plastic	Glass/Plastic	RS 651 028-MA
SPA-ZC 23 A2MBMM	Glass/Plastic	Glass/Glass	RS 651 028-NA
SPA-ZC 23 A2MMBB	Glass/Glass	Plastic/Plastic	RS 651 028-PA
SPA-ZC 23 A2MMBM	Glass/Glass	Plastic/Glass	RS 651 028-RA
SPA-ZC 23 A2MMMB	Glass/Glass	Glass/Plastic	RS 651 028-SA
SPA-ZC 23 A2MMMM	Glass/Glass	Glass/Glass	RS 651 028-TA
SPA-ZC 23 C2BBBB	Plastic/Plastic	Plastic/Plastic	RS 651 028-AB
SPA-ZC 23 C2BBBM	Plastic/Plastic	Plastic/Glass	RS 651 028-BB
SPA-ZC 23 C2BBMB	Plastic/Plastic	Glass/Plastic	RS 651 028-CB
SPA-ZC 23 C2BBMM	Plastic/Plastic	Glass/Glass	RS 651 028-DB
SPA-ZC 23 C2BMBB	Plastic/Glass	Plastic/Plastic	RS 651 028-EB
SPA-ZC 23 C2BMBM	Plastic/Glass	Plastic/Glass	RS 651 028-FB
SPA-ZC 23 C2BMMB	Plastic/Glass	Glass/Plastic	RS 651 028-GB
SPA-ZC 23 C2BMMM	Plastic/Glass	Glass/Glass	RS 651 028-HB
SPA-ZC 23 C2MBBB	Glass/Plastic	Plastic/Plastic	RS 651 028-KB
SPA-ZC 23 C2MBBM	Glass/Plastic	Plastic/Glass	RS 651 028-LB
SPA-ZC 23 C2MBMB	Glass/Plastic	Glass/Plastic	RS 651 028-MB
SPA-ZC 23 C2MBMM	Glass/Plastic	Glass/Glass	RS 651 028-NB
SPA-ZC 23 C2MMBB	Glass/Glass	Plastic/Plastic	RS 651 028-PB
SPA-ZC 23 C2MMBM	Glass/Glass	Plastic/Glass	RS 651 028-RB
SPA-ZC 23 C2MMMB	Glass/Glass	Glass/Plastic	RS 651 028-SB
SPA-ZC 23 C2MMMM	Glass/Glass	Glass/Glass	RS 651 028-TB
The character A2 or C2 following the code string SPA-ZC 23 of the type designation indicates the auxiliary voltage and the rated frequency of the bus connection module as follows: A = 50 Hz or 60 Hz, 80…265 V ac or 80…265 V dc, C = 18…80 V dc			

References

Additional information

Manual “Bus connection module SPA-ZC 17”	34 SPACOM 7 EN1
Manual “Bus connection module SPA-ZC 21”	34 SPACOM 22 EN1
Manual “Bus connection module SPA-ZC 22”	34 SPACOM 38 EN1

ABB Substation Automation Oy
P.O. Box 699
FIN-65101 Vaasa
Finland
Telephone: +358 10 224 000
Fax: +358 10 224 1094