MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ABB

SPGU 240A1

AUXILIARY POWER SUPPLY MODULE

Used with the applicable ABB SPACOM configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

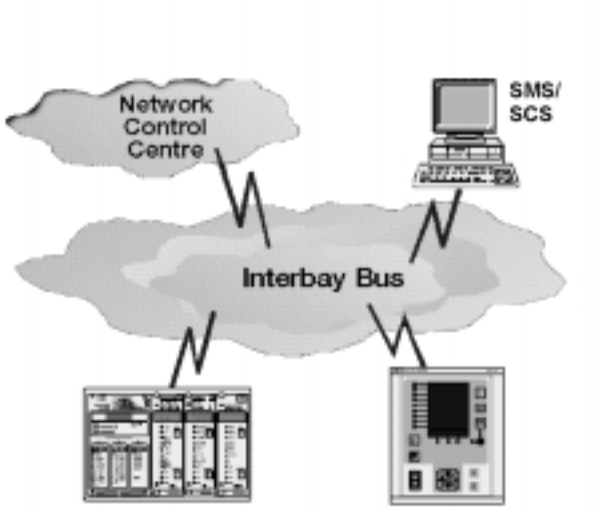
Selected official manufacturer pages follow this cover.

Source: ABB manufacturer documentation

LON bus communication devices

RER

1MRS 750435-MBG
Page 1
Issued: April 1999
Status: New
Data subject to change without notice



Features

- The LonWorks Network is an open system adapted for various application areas
- Peer-to-peer protocol which allows all the networked devices to communicate with each other
- Powerful LonTalk protocol for substation information interchange in LonWorks networks
- Nodes identified by their own subnet and node number
- Max. 255 subnets and 127 nodes per subnet
- High immunity to electric and electromagnetic interference due to fibre-optic transfer media
- The protocol complies with the reference model for open system interconnection (OSI) by ISO
- Maximum network speed 1.25 Mbit/s in ABB substations with fibre-optic media
- Member of ABB's Distribution Automation system and ABB's Panorama concept

Application

Due to the increasing amount of data transferred within and from modern substations the communication feature of the protection and control equipment is being utilized more and more. This requires fast and reliable operation of the information transfer media to be used for communication.

For this reason a new communication protocol, i.e. the LON protocol, has been added to our concept.

Design

The LonTalk protocol used in LonWorks networks, is designed to fulfill the requirements of a great variety of industrial applications.

The protocol complies with the reference model for open systems interconnection (OSI) developed by the International Standard Organization (ISO).

The speed of the network depends on the medium used and the transceiver design. The fibre-optic media used with our protection and control devices allow the maximum speed of 1.25 Mbit/s to be used.

The protocol is a peer-to-peer protocol which allows all the devices connected to the network to communicate with each other. The

Design (cont'd)

nodes are identified by their own subnet and node number (max. 255 subnets and 127 nodes per subnet).

The LON bus is used in a similar way as ABB's original SPA bus, i.e. to link the different parts of the substation protection and control system to each other. Measured values, status data and event information are spontaneously sent to the higher-level devices. When required, these higher-level devices are able to read and write memorized values, setting values and other parameter data. In addition, the LON bus allows the bay level devices to communicate with each other and, thus, provide interlocking information between the bay controllers and blocking signals between the protection relays.

The LonTalk protocol supports two types of application layer objects: network variables and explicit messages. The network variables are used to deliver short messages such as measured values, status information and interlocking/blocking signals, whereas explicit messages are used for longer messages, for instance, events and explicit read and write messages, to access device data. SPA-bus messages can also be sent transparently in the form of explicit messages, for the purpose of transferring parameter data to devices communicating over the SPA bus. Our protective relays and control units which are equipped with a SPA-bus interface can be connected to the LON bus using the LON/SPA gateway module SPA-ZC 100. An SRIO 1000M unit connects to the LON bus through an SLTA (Serial LonTalk Adapter) card in the star coupler. The RE_ 500 series devices have built-in LON support.

Lon Star-Coupler RER 111

The Lon Star-Coupler RER 111 is used to interconnect the nodes in a LonWorks network. It offers a variety of configuration options. As standard the RER 111 unit provides the following:

- Single or double auxiliary power supply units with input voltage ranges 80…265 V ac/dc or 18…80 V dc
- Input/Output (I/O) Card
- Mother Board
- 9 slot placements for option cards

The following five option cards are available:

- The Fibre-Optic Option Card SFIBER MM provides three fibre-optic transceiver pairs for the interconnection of bay level devices, connection between two RER 111 modules equipped with Fibre-Optic Option Cards or between a RER 111 module and higher level devices e.g. MicroSCADA.
- The RS-485 Option Card SRS485 MM provides a means of connecting LON bus devices using the RS-485 interface to the LonWorks network. The card also comprises a fibre-optic transceiver pair.
- The SLTA Option Card SSLTA MM provides the interconnection between higher level devices (e.g. monitoring terminals, PC, etc.) and the LonWorks network. It can also provide the interconnection between RER 111 modules by using the fibre-optic transceiver pair.
- The Router Option Card, SROUT MM, provides connection to devices using twisted pair (TP/XF-78 or TP/XF-1250) transceivers and / or using fibre-optic transceiver pairs. It also provides a means by which an overall system can be divided into multiple subsystems.
- The Double Connection Option Card SREDU MM provides a means for connecting devices together by using double connections. This method enables the use of two fibre-optic transceiver pairs to connect to any device supporting double connection. In the event of a fault in one fibre-optic connection, this connection is still able to receive and transmit data to devices.

Bus connection module RER 103

The RER 103 (104) is used for connecting REx 53x devices to the LON bus. The RER 103 is also used when the REx 53x devices are connected to the SPA bus. The RER 103 module comprises one 9-pin D type RS 485 connector for the connection to the device and one glass or plastic transceiver pair for the bus connection. The RER 103 is powered from the device to which it is connected.

Interface card RER 109

The RER 109 is the PCLTA card which is used to interface a PC/ISA bus to a LonWorks Network. The RER 109 is an ISA card which fits into any empty full length ISA slot in a PC. The RER 109 can host one or two SMX transceivers needed for the physical connecting to the LON Works Network. The SMX transceiver can be of different types, e.g. TP - transceiver etc. For ABB Substation Automation Systems the RER 107 Fibre-Optic SMX transceiver is most commonly used.

Fibre-optic SMX transceiver RER 107

The RER 107 is a fibre-optic SMX transceiver used together with the RER 109, PCLTA card, as fibre-optic LonWorks interface for a PC, e.g. a MicroSCADA system. The RER 107 is mounted on the PCLTA card and provides the card with one or two (two RER 107 required) fibre-optic channels to the LonWorks Network. The fibre-optic connection is made of plastic or glass fibre cables.

SRIO 1000M LON interface

A LON interface is included in SRIO 1000M provided with program version 8.31 or later. The SRIO 1000M with LON interface is a remote control gateway used to connect LON to a higher-level system that has an ANSI X3.28 or a SACO 100M protocol.

Connection module SPA-ZC 100 and SPA-ZC 102

The connection modules SPA-ZC 100 and SPA-ZC 102 are used to connect SPACOM products, or other devices provided with the SPA bus interface, to the LON bus.

The module polls the SPA-bus device for data and if data have changed the module spontaneously sends new information on the LON bus. Transparent SPA-bus messages received by the module from the LON network are forwarded as standard SPA-bus messages to the SPA-bus device.

The module connects to the SPA-bus device by means of a TTL (SPA), RS 485 or RS 232 interface and to the LON network is by means of glass or plastic fibre-optic cables.

The SPA-ZC 100 Gateway is powered from the host device to which it is connected, while the SPA-ZC 102 is powered from an external power supply.

Bus connection module SPA-ZC 101 and SPA-ZC 103

The SPA-ZC 101/SPA-ZC 103 modules or the IEC 870-5-103/SPA gateways are used to connect SPACOM products, or other devices using the SPA-bus interface, to the VDEW interface 6 bus.

The gateway polls the SPA-bus device for data and if data have changed, it sends the messages spontaneously to the VDEW6 interface. Transparent SPA-bus messages are received by the IEC 870-5-103/SPA gateway from the VDEW6 network and are forwarded as standard SPA-bus messages to the SPA-bus device.

The IEC 870-5-103/SPA Gateway connects to the SPA-bus devices by means of a TTL (SPA), RS 485 or RS 232 interface and to the VDEW6 bus is by means of glass or plastic fibre-optic cables.

The SPA-ZC 101 Gateway is powered from the host device to which it is connected, while the SPA-ZC 103 is powered from an external power supply.

SPA-ZC_

The SPA-ZC 17, 20, 21,22 are used for connecting SPACOM devices to the SPA bus. The opto-modules are available with (SPA-ZC 17) or without (SPA-ZC 21) external power supply. Versions with more than one fibre-optic pair output are also available, i.e. SPA-ZC 22 with five outputs/inputs and SPA-ZC 20 with 15 outputs/inputs.

Technical data

Table 1: IEC 870-5-103/SPA gateway RER 111

Power supply	SPGU 240A1	rated voltage	U_n = 110/120/230/240 V ac U_n = 110/125/220 V dc
		operative range	U = 80…265 V ac/dc
	SPGU 48B2	rated voltage	U_n = 24/48/60 V dc
		operative range	U = 18…80 V dc
	Power consumption when all option cards installed		<16 W
Output relays	Terminal numbers		X2/1-2, 3-2, 4-2, 5-2
	Rated voltage		250 V ac/dc
	Continuous current carrying capacity		5 A
	Make and carry for 0.5 s		10 A
	Make and carry for 3 s		8 A
	Breaking capacity for dc when the control circuit time constant L/R < 40 ms, at 48/110/220 V dc		1 A/0.25 A/0.15 A
	Contact material		$AgCdO_2$
Enclosure	Degree of protection by enclosure of the device case according to IEC 529		IP 20

Ordering

Order numbers for RER 103

Type designation	Transmitter	Receiver	Order No.
RER 103 BB	Plastic	Plastic	1MRS 090701-BB
RER 103 BM	Plastic	Glass	1MRS 090701-BM
RER 103 MB	Glass	Plastic	1MRS 090701-MB
RER 103 MM	Glass	Glass	1MRS 090701-MM

Order numbers for RER 107

Type designation	Item	Order No.
RER 107-MM	Fibre-optic SMX transceiver, glass	1MRS 090702-MM
RER 107-BB	Fibre-optic SMX transceiver, plastic Snap-in type connectors	1MRS 090702-BB
RER 107-SS	Fibre-optic SMX transceiver, plastic SMA type connectors	1MRS 090702-SS

Order numbers for RER 109

Type designation	Item	Order No.
RER 109	PCLTA card	1MRS 090703

Order numbers for RER 111

The basic version of the RER 111 module includes the case, the I/O card, the power supply card(s) and the wall mounting bracket.

Explanation of the order number:
1MRS 090700-[A/C][A/C/0], where
A = auxiliary power supply voltage 80…265 V ac/dc, f = 50/60 Hz
C = auxiliary power supply voltage 18…80 V dc
0 = the RER module includes only one power supply card

Example orders of a basic version of RER 111
Example 1: 1MRS 090700-AC, RER 111 with auxiliary supply 1: 80…265 V ac/dc, supply 2: 18…80 V dc
Example 2: 1MRS 090700-C0, RER 111 with only one auxiliary supply: 18…80 V dc

Item			Order No.
Mounting accessories	Pair of panel mounting brackets		1MRS 050200
	Pair of rack mounting brackets		1MRS 050201
Router option card	ST type glass fibre-optic transceivers	SROUT MM	1MRS 050027
	snap-in type plastic fibre-optic transceivers	SROUT BB	1MRS 050028
	SMA type plastic fibre-optic transceivers	SROUT SS	1MRS 050029
SLTA option card	ST type glass fibre-optic transceivers	SSLTA MM	1MRS 050030
	snap-in type plastic fibre-optic transceivers	SSLTA BB	1MRS 050031
	SMA type plastic fibre-optic transceivers	SSLTA SS	1MRS 050032
Double connection option card	ST type glass fibre-optic transceivers	SREDU MM	1MRS 050033
	snap-in type plastic fibre-optic transceivers	SREDU BB	1MRS 050034
	SMA type plastic fibre-optic transceivers	SREDU SS	1MRS 050035
RS-485 option card	ST type glass fibre-optic transceivers	SRS485 MM	1MRS 050036
	snap-in type plastic fibre-optic transceivers	SRS485 BB	1MRS 050037
	SMA type plastic fibre-optic transceivers	SRS485 SS	1MRS 050038
Fibre-optic option card	ST type glass fibre-optic transceivers	SFIBER MM	1MRS 050039
	snap-in type plastic fibre-optic transceivers	SFIBER BB	1MRS 050040
	SMA type plastic fibre-optic transceivers	SFIBER SS	1MRS 050041
Blank plate	Blank plates are normally included in the module delivery. Additional blank plates can be ordered separately		1MRS 060023

Order numbers for SPA-ZC 100 and SPA-ZC 102

Type designation	Transmitter	Receiver	Order No.
SPA-ZC 100 BB	Plastic	Plastic	1MRS 090704-AA
SPA-ZC 100 MM	Plastic	Glass	1MRS 090704-DA
SPA-ZC 102 BB	Plastic	Plastic	1MRS 090705-AA
SPA-ZC 102 MM	Plastic	Glass	1MRS 090705-DA

Order numbers for SPA-ZC 100 for voltage regulator SPAU 341 C

Type designation	Transmitter	Receiver	Order No.
SPA-ZC 100 BB for SPAU 341 C, no. 1	Plastic	Plastic	1MRS 090704-AB
SPA-ZC 100 BB for SPAU 341 C, no. 2	Plastic	Plastic	1MRS 090704-AC
SPA-ZC 100 BB for SPAU 341 C, no. 3	Plastic	Plastic	1MRS 090704-AD
SPA-ZC 100 MM for SPAU 341 C, no. 1	Glass	Glass	1MRS 090704-DB
SPA-ZC 100 MM for SPAU 341 C, no. 2	Glass	Glass	1MRS 090704-DC
SPA-ZC 100 MM for SPAU 341 C, no. 3	Glass	Glass	1MRS 090704-DD

Order numbers for SPA-ZC 101 and SPA-ZC 103

Type designation	Transmitter	Receiver	Order No.
SPA-ZC 101 BB	Plastic	Plastic	
SPA-ZC 101 MM	Plastic	Glass	
SPA-ZC 103 BB	Plastic	Plastic	
SPA-ZC 103 MM	Plastic	Glass	

References

Additional information

Brochure “Substation Communication”	1MRS 750029-MDS EN
LONWORKS™ for Substation Automation	1MRS 750714-MEG

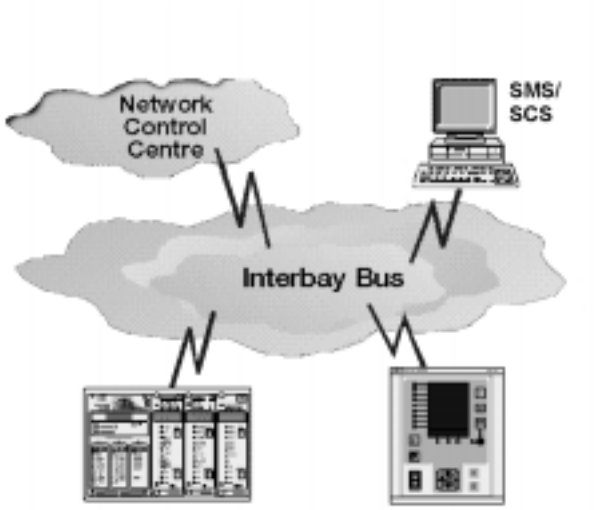
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LON bus communication devices

RER

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