

RER 115 Bus Connection Module

Technical Description



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1. General

The bus connection module RER 115 acts as an interfacing unit between the terminal units REC 523, REM 54_ or REF 54_ and the twisted-pair FTT-10A LON[®] bus. The RER 115 is not a stand alone device; a terminal unit is always required.

The RER 115 module is plugged into the D-type connector on the rear plate of the terminal unit. The module can be used together with terminal units provided with a 9-pin D-type connector.

The RER 115 module is powered by the D-type connector. The RER 115 module converts the incoming differential signal from the FTT-10A LON[®] bus to an electrical RS-485 signal for the terminal units, and vice versa.

The communication speed of the RER 115 module is 78 Kbit/s; other speeds are not supported. The bit rate of the LON interface in the terminal unit must be set to 78 Kbit/s.

The RER 115 module uses twisted-pair interface, which is not fully immune for electrical and magnetic disturbances, which is why the Acknowledged service must be used. Possible short communication breaks will cause resending of the disturbed message, which guarantees that the message will be received correctly but it will increase the response time. The cable type used is case-specific in the environmental, mechanical and electromagnetic compatibility point of view and the shielding of the cable must be sufficient to avoid communication breaks.

The RER 115 module is intended for small systems with low communication load and short distances. The RER 115 module and the FTT-10A LON[®] bus is not intended and not tested, and must not be used to build complete substation automation systems, i.e. several relays communicating to a substation control system and a substation gateway. These systems have to be built using 1.25 Mbit/s fiber-optic LON with collision detection facilities (e.g. RER 111). This is due to the lower available bandwidth, 78 kbit/s compared to 1.25 Mbit/s. Correspondingly, all the response times are longer with 78 kbit/s LON than with 1.25 Mbit/s.

The RS-485 interface of the RER 115 module is shown in Fig. 1.-1. The RER 115 module contains a Service Pin for LON[®] node installation.

Pin	Connection
1	Data signal A
2	Data signal B
3	RTS A, request to send signal A
4	RTS B, request to send signal B
5	Not connected
6	Not connected
7	GND, signal ground for power supply
8	Service pin connection (TTL level signal)
9	+ 5 V in, power supply for the module

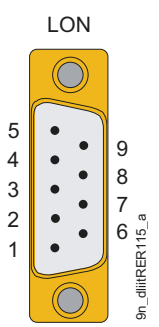


Fig. 1.-1 Pin connections and a 9-pin D-type connector

Technical Description

The FTT-10A LON[®] bus interface of the RER 115 module is shown in Fig. 1.-2.


Pin	Connection	
1	DATA A Network segment	
2	Data B Network segment	

Fig. 1.-2 Pin connections and a FTT-10A LON[®] bus connector

A RER 115 delivery includes the bus connection module (RER 115), a split ferrite and a manual for the device.

2. Principle of operation

The RER 115 module functions as follows:

A message received from the twisted pair interface is passed through the RER 115 module:

- First to the FTT-10A transceiver,
- Then to the RS-485 interface, and vice versa

The FTT-10A is a free topology transceiver meaning that Star, Bus, Loop or any combination of these wirings is supported, see the Fig. 2.-1. The FTT-10A does not support collision detection mode. Therefore you should use acknowledged LON services for LON communication in devices using RER 115. The service pin is connected via the RS-485 interface to the Neuron[®] chip of the device connected to the RER 115 module.

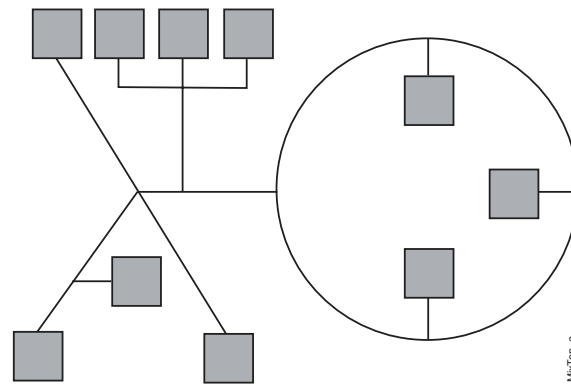


Fig. 2.-1 Mixed topology

3. Construction and installation

The RER 115 module is connected to the REC 523, REM 54_ or REF 54_ terminal units with a 9-pin male type D-connector. The RER 115 module is plugged into the back of the unit and screwed on to the 9-pin female type D-connector.

The RER 115 module is packed into a plastic case. The dimensions of the case are: 20.0 mm x 73.0 mm x 35.0 mm.

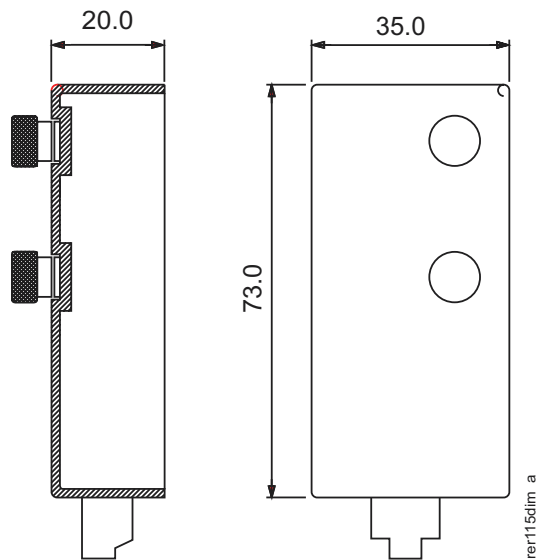


Fig. 3.-1 Dimensions of the RER 115 bus connection module

4. Interfaces

Wiring guidelines for twisted pair cable

The twisted pair network connection is polarity insensitive, and therefore either of the twisted pair wires can be connected either way. For more information of the FTT-10A communication interface specifications regarding the twisted pair network, refer to the document FTT-10A Free Topology Transceiver User's Guide (Echelon Corporation).

Grounding shielding cable and filtering

We recommend that you use shielded twisted pair cable and split ferrites for round cable. We also recommend that you ground the shielded twisted pair cable at both ends. You should use an end capacitor to tie the shield to earth ground, and a large value resistor to bleed off any static charge on the shield. The capacitor and resistor are not delivered with the RER 115 module.

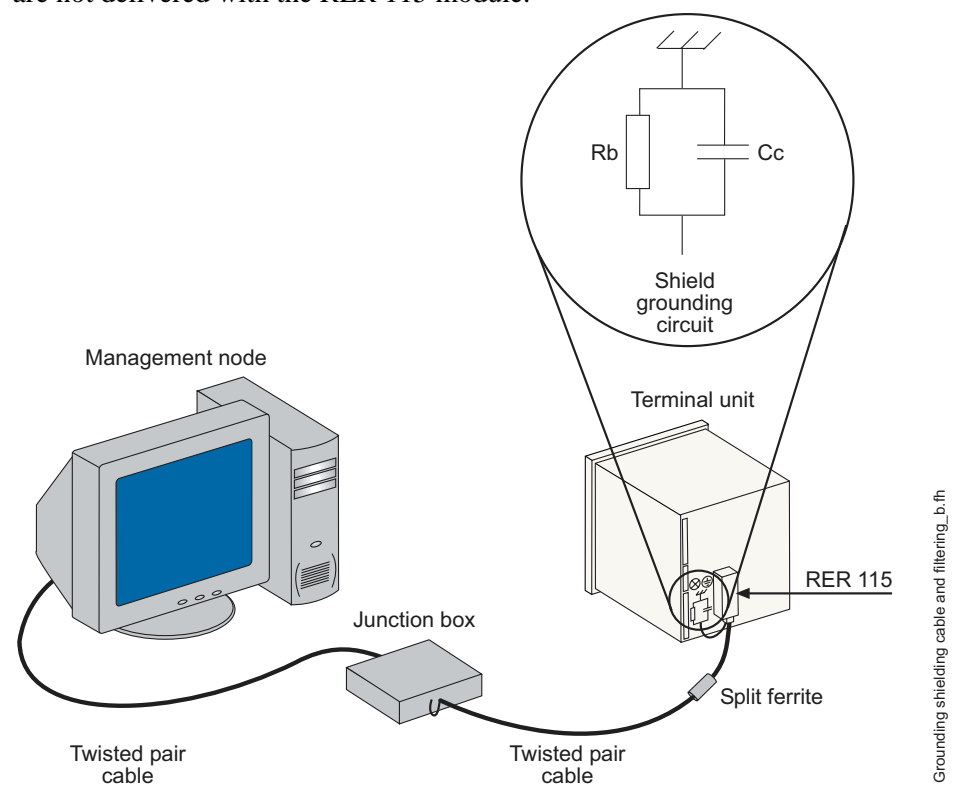


Fig. 4.-1 Grounding shielding cable and filtering

Typical values for Cc and Rb are as follows:

$$C_c = 0.1 \mu\text{F}, 10\% \text{ metalized polyester, } = 100 \text{ V}$$

$$R_b = 470\text{k} \Omega, 1/4 \text{ W, } \pm 5\%$$

The cable shield should be grounded at least once per segment, and preferably at each node/relay.

We also recommend that you use split ferrite for a round cable one or two turns. Install the split ferrite as close to RER 115 module as possible. A split ferrite is delivered with the RER 115 module.

5. Type designation and technical data

Type designation	RER115
Transmitter/Receiver	FTT-10A (Twisted pair)
Ordering number	RER115

Auxiliary power supply	Powered from host device (5V dc)
Burden	~ 0.1 W Max
Data transfer rate	78 kbps
Mechanical dimensions	Width: 35.0 mm Height: 73.0 mm Depth: 20.0 mm
Operating temperature range	-10...55°C
Storage temperature range	-40...70°C



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