7XV5655-0BB00
Ethernet Modem for Substations

Fig. 13/36
Front view of the Ethernet modem

Function overview

- RS232 interface for data transfer and configuration of the modems
- Serial data rate and data format (RS232/RS485) for the terminal devices is selectable from 2.4 kbit/s up to 57.6 kbit/s with data format 8N1, 8E1
- FO interface for serial data transfer
- 10 Mbit Ethernet interface (LAN) to the 10/100 Mbit Ethernet network
- Increased security with password protection and IP address selection is possible
- Exchange of serial data via Ethernet network between two Ethernet modems (e.g. DIGSI protocol, IEC 60870-5-103 protocol)
- Exchange of serial protocols via Ethenet without gaps in the telegram structure

Description

A control PC and protection relays can exchange serial data via an Ethernet network using two Ethernet modems 7XV5655. Connection to the Ethernet modem is in each case made via the asynchronous serial interface of the terminal devices. In the modem the serial data is packed into the secure IP protocol as information data, and is transferred between the modems using the Ethernet connection. Conformity with the standard and gap-free transmission of serial DIGSI or IEC 60870-5-103/101 telegrams (frames) via the network is ensured by the modem which receives the serial telegram communication and packs the serial IEC telegrams into blocks for communication via the Ethernet. Data is transmitted in full duplex mode, the serial handshake is not supported. Connection is set up between the IP address of the dialing modem in the office and the IP address of the answering modem in the substation and is configured prior to dial up with DIGSI by means of AT commands via the RS232 interface.

The substation modem may be configured to have password protection, and provides the additional security feature, permitting access only from defined IP addresses, e.g. only that of the office modem. The modem is accessed with DIGSI Remote like a normal telephone modem with the exception that instead of telephone numbers, IP addresses are assigned by the network administrator for each modem.

Application

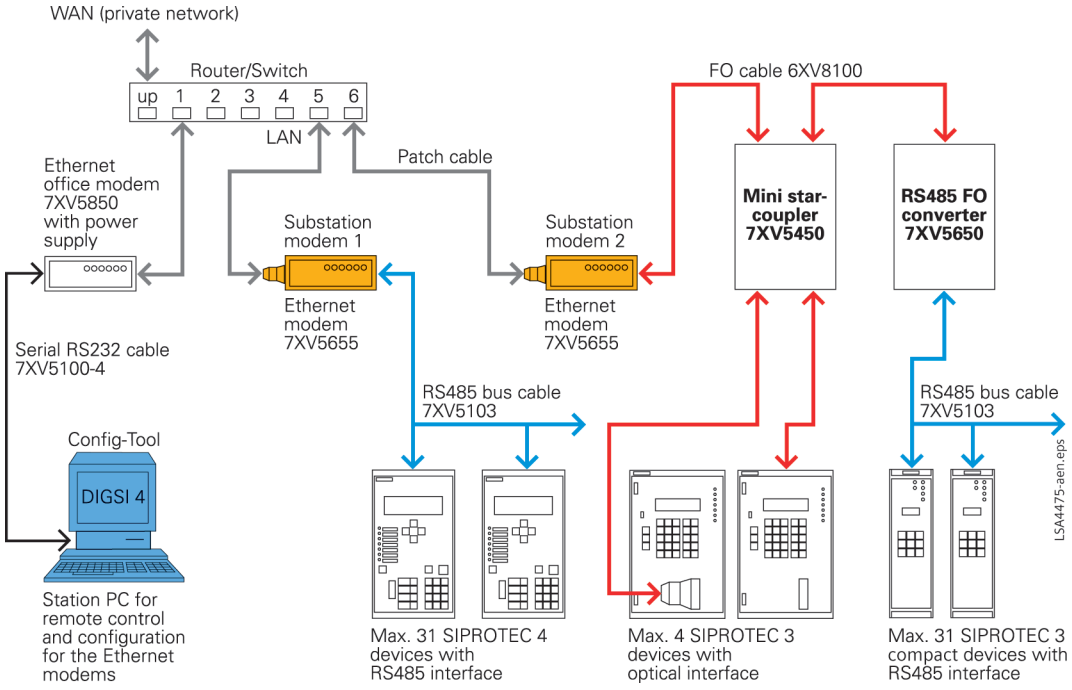

Fig. 13/37
Operation of various SIPROTEC protection unit generations via Ethernet modems

Using the office computer and DIGSI 4, both substations 1 and 2 may be dialed up via the Ethernet modems. An IP point-to-point data connection is established between the office and corresponding substation modem when dialed up via the network. This is maintained until the office modem terminates the connection. The serial data exchange takes place via this data connection whereby the modem converts the data from serial to Ethernet with full duplex mode. Between the office modem and the office PC the highest data rate e.g. 57.6 kbit/s for SIPROTEC 4 devices is always used. The serial data rate of the substation modem is adapted to the data rate required by the protection relays e.g. substation modem 1 with 57.6 kbit/s for SIPROTEC 4 and substation modem 2 with 9.6 kbit/s for SIPROTEC 3 devices. These settings are only pre-set once in the modem.

The Ethernet modems are integrated similarly to telephone modems in DIGSI 4. Instead of the telephone number, the pre-set IP address assigned to the modem is selected. If later an Ethernet connection is available in the substation, the existing modem can be replaced by an Ethernet modem. The entire serial bus structure and cabling may remain unchanged.

Technical data

Connections

RS232 interface 9-pin SUB-D or
RS485 interface 9-pin SUB-D settable by switches
FO interface 820 nm with ST connectors for the connection to 62.5/125 µm multi-mode FO cables.
Ethernet 10BaseT, 10/100 Mbit, RJ45 connector
Power supply / Fail safe relay with screw-type terminals

Housing

Rail mounting, plastic, charcoal grey, 90 x 90 x 107 (W x H x D) in mm

Wide-range power supply / fail safe relay

Auxiliary voltage 24 to 250 V DC and 115/230 V AC connected with screw-type terminals
Fail safe relay for power supervision connected with screw-type terminals

Indication (8 x LED)

Power	Operating voltage o.k.	System	RS232 connection established
RS232 T x D	Transmitting data to RS232	RS232 R x D	Receiving data from RS232
LAN T x	Transmitting data to LAN	LAN R x	Receiving data from LAN
Error	Error on RS232	Link LAN	LAN connection established

Selection and ordering data

Description	Order No.
Ethernet modem	*7XV5655 - 0BB00*

Ethernet modem for serial, asynchronous transmission of data up to
57.6 kbit/s via the 10/100 Mbit Ethernet and configuration software
DIN-rail device mounting device suitable for substation.
Connection to Ethernet via RJ45 connector. Serial connection SUB-D 9-pin socket
RS232/RS485 interface settable by switches.
FO interface 820 nm for 62.5/125 µm multi-mode - FO cables.
Auxiliary supply 24 - 250 V DC and 115/230 V AC.
Fail safe contact for device supervision.
With gender-changer (pin-pin) for adaptation to
DIGSI - cable 7XV5100-4 (cable not included in the scope of supply).