7XV5655-0BA00
Ethernet Serial Hub for Substations

Fig. 13/38
Front view of Ethernet serial hub for substation

Function overview

- Configuration software for Windows NT/2000/XP to configure virtual COM ports on the PC and for configuration of the serial hub.
- RS232/RS485 - interfaces for data transfer and configuration of the serial hub
- FO interface for serial data transfer
- Serial data rate and data format (RS232) for the terminal devices is selectable from 2.4 kbit/s up to 57.6 kbit/s with data format 8N1, 8E1.
- 10 Mbit Ethernet interface (LAN) to the 10/100 Mbit Ethernet network.
- Better security with password protection for the access to the protection relays via the serial hup
- Exchange of serial data via Ethernet network (e.g. DIGSI protocol, IEC 60870-5-103 protocol)
- Exchange of serial protocols via Ethernet without gaps in the telegram structure

Description

By means of the serial hub and the associated configuration software it is possible to establish serial communication via an Ethernet network between a PC or notebook running DIGSI 4 and SIPROTEC protection relays. The configuration software installs virtual serial interfaces (Com ports) on the PC. Each COM port is allocated to a serial hub within the network by means of its IP address. This must be set in the serial hub. The PC is connected to the network via Ethernet interface. The protection relays are connected via an RS232/RS485 or FO interface to the serial hub. Connection with DIGSI is achieved via the virtual COM port on the PC and the IP address of the serial hub in the substation. The serial data is packed as user data into a secure IP protocol in the PC and transferred via the Ethernet connection to the serial hub. The requirements regarding standard compliant gap-free transmission of serial DIGSI or IEC 60870-5-103/101 telegrams (frames) via the network is complied with by the communication driver on the PC and the serial hub which monitor the serial telegram communication. The serial IEC telegrams are transferred in blocks across the Ethernet. Data communication is full duplex. Control signals of the serial interfaces are not used.
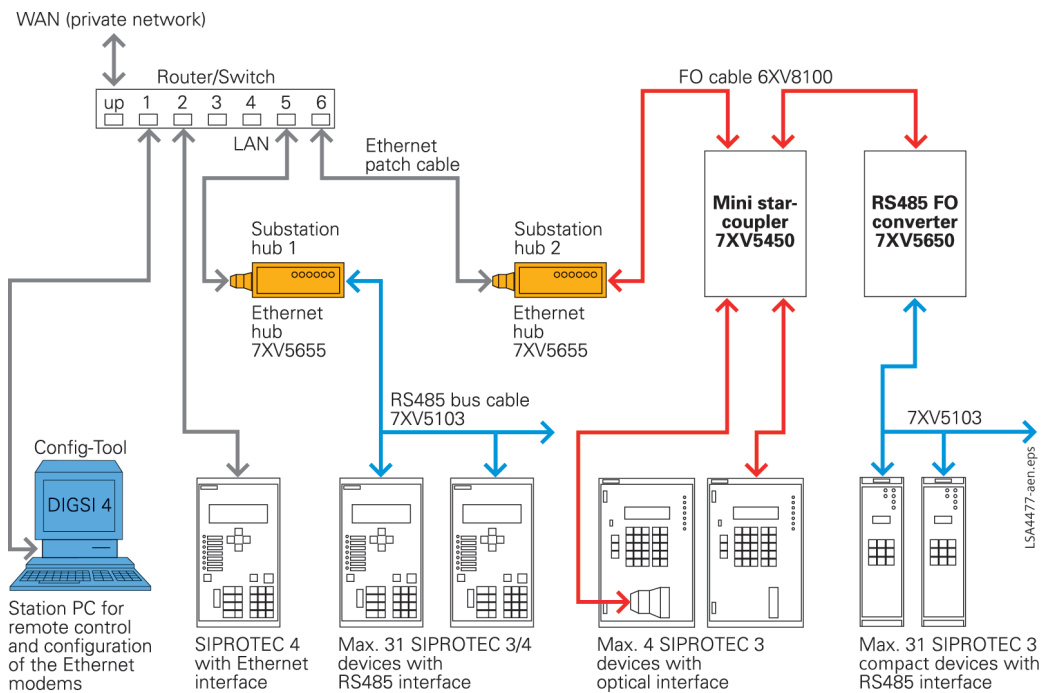
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Application

Fig. 13/39
Operation of various SIPROTEC protection unit generations via serial hub

From the office PC running DIGSI 4 it is possible to select one of the serial hubs 1 and 2 via one of the virtual COM ports. In DIGSI 4, when the COM port is selected, a IP point-to-point data connection via the network is established and maintained between the office and the relevant substation modem until the interface is released. The serial data exchange takes place via this data link, whereby the data conversion from serial to Ethernet is full duplex. The office PC towards the network is always operating with high data rate, as the data is fed to the network via the network driver on the PC. The serial data rate of the serial hub in the substation is adapted to the baud rate set in the protection relay, e.g. serial hub 1 with 57.6 kbit/s for SIPROTEC 4 and serial hub 2 with 9.6 kbit/s for SIPROTEC 3 devices. These parameters must be pre-set on the serial hub. With DIGSI 4 the serial hubs are integrated by means of further serial COM ports (max. 254). The connection to the IP address of the serial hub in the network is achieved by opening the corresponding COM port. If an Ethernet network to the substation or in the substation is available, serial data can then be transferred via this network.

The existing serial star or bus structure with cabling in the substation can still be used.

SIPROTEC 4 devices from version 4.6 and newer with integrated Ethernet interface may be connected directly to the router or switch by means of a patch cable.

Technical data	**Connections**			
	RS232 interface 9-pin SUB-D socket or RS485 interface 9-pin SUB-D socket selectable via DIL switch. FO interface 820 nm with ST connectors for connection to multi-mode FO cables. Ethernet 10BaseT, 10/100 Mbit, RJ45 connector to Ethernet Auxiliary voltage/alarm relay (5 terminals)			
	Housing			
	Rail mounting, plastic, charcoal grey, 90 x 90 x 107 (W x H x D) in mm			
	Wide-range power supply			
	Auxiliary voltage 24 to 250 V DC and 115/230 V AC connected with screw-type terminals Alarm relay for monitoring of the device			
	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 hub for substations	*7XV5655 - 0BA00*

Serial hub for serial, asynchronous transfer of data up to 57.6 kbit/s
via 10/100 Mbit Ethernet including configuration software.
Connection to the Ethernet via RJ45 connector. Serial connection with
RS232/RS485 interface via SUB-D 9-pin socket or optical with 820 nm
ST connector and multi-mode FO cable.
Wide-range auxiliary supply for 24 - 250 V DC and 115/230 V AC.
With gender-changer (pin-pin) for adaptation to
DIGSI cable 7XV5100-4 (cable not included in the scope of supply).

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