

A control PC and protection devices 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 TCP/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 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. The data is transmitted in full duplex mode and the serial handshake is not supported. The connection is made between the IP address of the dialling 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 allows for the additional security feature, whereby access is only permitted 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.

Features:

- DIGSI 4 supports the administration and the building of connections via the Ethernet network.
- Configuration software for Windows NT/2000/XP to configuration of the serial modem.
- Isolated RS232- / RS485-interfaces for data transfer and configuration of the modems.
- FO interface for data transfer
- Serial baud rate and data format (RS232) for the terminal devices is selectable from 2400 Bd up to 57,6 kBd with data format 8N1, 8E1.
- An electrical RJ45 Ethernet-interface (LAN) to the 10/100 Mbit network.
- Increased security with password protection and IP address selection is possible.



Figure 1: Front view of the Ethernetmodem

Technical specification:

Connections:

- RS232-interface 9-pol. Sub-D or
- RS485-interface 9 pol. Sub-D settable by switches (both 500 V_{eff} isolated).
- Optical interface 820 nm with ST-connectors for the connection to 62,5/125 um multimode – fibre cables.
- Ethernet 10BaseT, 10/100 Mbit, RJ45-connector
- Power supply / Fail safe relay with scrow terminals

Modem for DIN mounting:

Housing: Rail mounting plastic anthracite 90X90X107 mm (BXHxD)

Wide range power supply / Fail safe relay:

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

Indication (8 x LED)

<i>Power</i>	Operating voltage ok	<i>System</i>	RS232-connection established
<i>RS232 TXD</i>	Transmitting data to RS232	<i>RS232 RXD</i>	Receiving data from RS232
<i>LAN TX</i>	Transmitting data to LAN	<i>LAN RX</i>	Receiving data from LAN
<i>Error</i>	Error on RS232	<i>Link LAN</i>	LAN connection established

Application example for the remote control of 2 substations:

Using the office computer and DIGSI 4, both substations 1 and 2 may be dialled up via the Ethernet modems. A TCP/IP point to point data connection is established between the office and corresponding plant modem when dialled 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 baud rate e.g. 57,6kB/s for SIPROTEC 4 devices is always used. The serial baud rate of the substation modem is adapted to the baud rate required by the protection devices e.g. substation modem 1 with 57,6kB/s for SIPROTEC 4 and substation modem 2 with 9,6kB/s for SIPROTEC 3 devices. These settings are only pre-set once in the modem. The Ethernet-modems are integrated similar to telephone modems in DIGSI 4. Instead of the telephone number, the IP address which was assigned to the modem via pre-setting is selected. If in future an Ethernet connection will be available in the substation, the existing modem can be exchanged for an Ethernet modem. The entire serial bus-structure and cabling may remain unchanged.

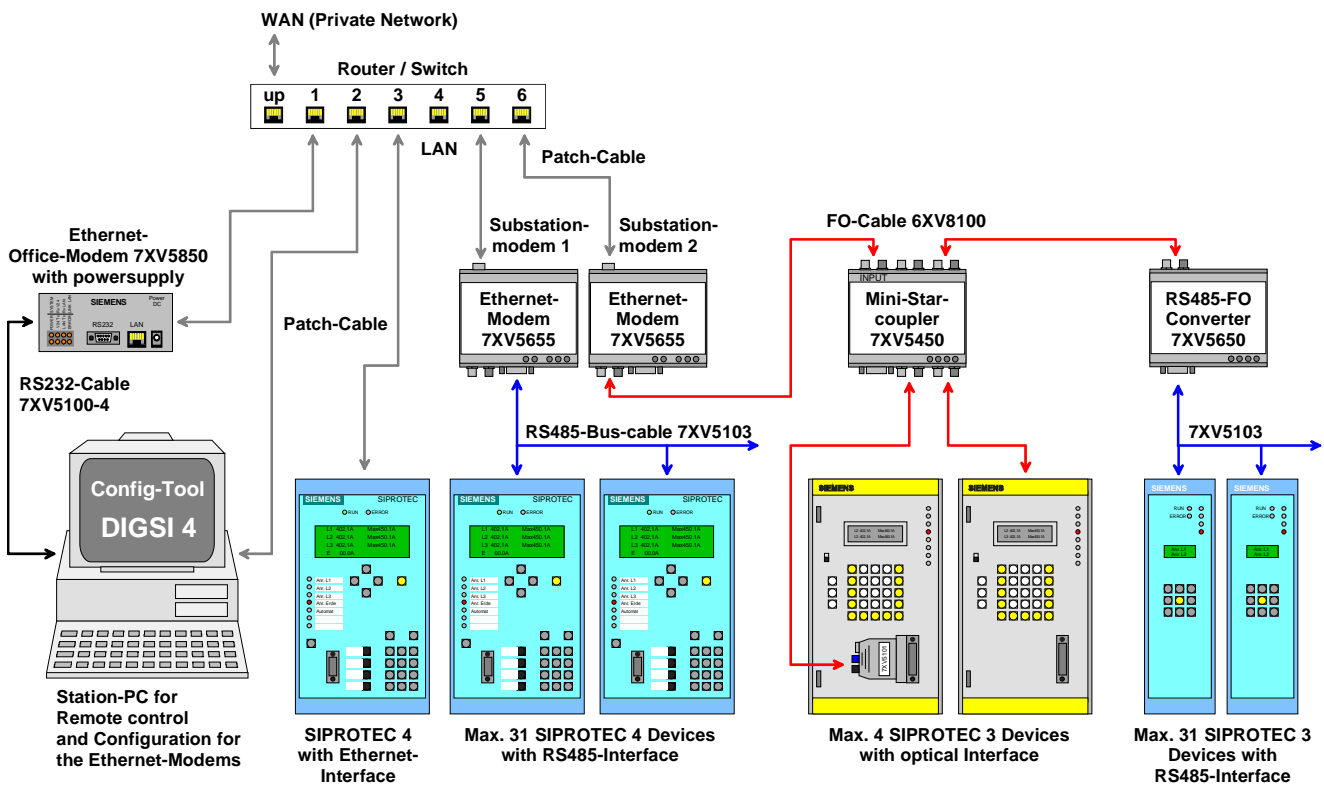


Figure 2: Operation of various SIPROTEC – protection device generations via Ethernet-modems

Selection and Ordering data

Description	Ordering code.:
Ethernet-Modem	7 X V 5 6 5 5 - 0 B B 0 0
Ethernet modem for serial, asynchronous transmission of data up to 57,6kbit/s via the 10/100Mbit/s Ethernet and configuration software	
DIN-rail device mounting device (suitable for)substation.	
Connection to Ethernet RJ45. Serial connection Sub-D 9-pol. socket	
RS232/RS485 interface settable by switches.	
820 nm optical interface for 62,5/125 um multimode – fiber cables.	
Auxiliary supply 24-250 V DC and 115/230 V AV.	
Fail safe contact for device supervision.	
With gender-changer (pin-pin) for adaptation to DIGSI – cable	
7XV5100-4 (cable is not in the scope of supply).	

Responsible for technical content:
Klaus Müller, E D EA PRO LM2
Siemens AG, Nürnberg
Internet: www.SIPROTEC.de

Division: Energy
Energy Automation
PO box 48 06
D-90026 Nuernberg