OMPX-EP

OPTICAL MULTIPLEXER

Field of application

The ***EuroProt*** type complex protection in respect of hardware and software is a modular device. The modules are assembled and configured according to the requirements, then the functions are determined - within the hardware limitations - by the software. This document describes the individual characteristics of a specific application: the factory configuration ***OMPX-EP*** optical multiplexer. The general description of the members of the ***EuroProt*** type complex protection family can be found in document "***EuroProt*** complex protection, hardware and software description and user's manual" (further "*EuroProt manual*").

Application field

The digital protection devices made by PROTECTA Co. Ltd. communicate with the SCADA system via serial communication line, or connected to a fibre optic loop they can be supervised by the protection engineering workstation. This connection is suitable for connecting protective devices equipped with optional disturbance recorder module to the monitoring and archiving system.

The protective devices receive binary signals via opto-coupler inputs, and give command and signals on the relay outputs.

If the connections mentioned above have to be realised among devices of a plant located far away from each others, e.g. industrial plant, oil mining area, etc., then an economic solution can be to collect information in individual part-areas into one device, and the information is sent via common long distance fibre optic cable to the data collection centre.

The ***OMPX-EP*** type optical multiplexer is a device designed for data collection and communication of this kind.

Main features

Hardware characteristics:

- Digital signal processing,
- Modular structure,
- Device extension suitable for the special tasks.

Communication:

- 2x16 character LCD display for setting the functions,
- On-line screen on external PC to make commissioning and testing easier,
- External communication interface for long distance fibre optic data communication and for connection the individual devices.
- The set parameters can be saved and downloaded,
- Real time clock handling with the aid of RAM with battery, (which can be synchronised via optical fibre cable connected to external PC, to the SCADA system, or through an optical cable).

Working principle

The device is composed of the following modules; the configuration can be assembled according to the requirements:

OX module: optical interface and multiplexer
The optical interface and multiplexer unit is the driver of the fibre optic cable for the long distance data communication, and it distributes the received data to the eight channels.

- The driver of the fibre optic cable is a laser diode (1300 nm),
- the receiver element of the fibre optic connection is the IGaAs detector,
- the modulation speed of the fibre optic cable is 10 MHz,
- the data communication speed of the fibre optic cable is 1,2 Mbaud.

This module contains a serial optic interface for the case, if a single information local channel is sufficient. A single information channel can handle the information amount of practically any number (maximum 255) of protective devices and disturbance recorders.

The number of OX modules determines the number of independent directions; the device can perform long distance data communication.

DX module: digital interface and multiplexer unit
The digital interface and multiplexer unit handles the local digital information exchange received or sent by fibre optic cables, and it has direct connection via internal bus of the device with the CPU. A single module can connect maximum four local information channels.

If not all connection possibilities of the DX module are used, then the not used channels can transmit binary signals.

OPTO module: input unit for binary signals
The task of the OPTO module is to interface 220 V DC binary signals to the internal bus system of the device. A single OPTO module can receive 8 digital signals.

RELAY module: relay unit
The relay unit contains the output contacts of the device. A single module contains 4 galvanic independent Morse contacts.

The configuration of the device is coded with the following name: **OMPXa-b**
Where : „**a**" means the number of the OX modules, so the number of the independent high distance communication channels.
„**b**" means the number of local serial channels, an OX module with the associated DX module can handle.

The ***OMPX-EP*** device is a fully microprocessor based construction, the functions and their versions are realised basically on software.

Technical data

OX module	
Optical code	Manchester
Optical speed	10 MHz
Communication speed	1.2 Mbit/s
Optical sending element	Laser diode
Wave length	1300 nm
Greatest allowed attenuation	-5 dBm
Optical connection	FC PC or ST
Serial I/O baudrate	150...19200 Baud (steps 2x)
Serial communication	fibre optic cable
DX module	
Number of serial channels	Max. 4
Serial I/O baudrate	150...19200 Baud (steps 2x)
Serial communication	fibre optic cable
Optical fibre cable operation mode	serial or loop
OPTO module	
Opto-coupler inputs (8 pcs)	220 V DC, or as ordered
RELAY module	
Output contacts, electrical data: rated switching voltage continuous load current making current DC breaking capability at 220 V, at pure conductive load at load of L/R = 40 ms *option* at load of L/R = 40 ms	 250 V 8 A 16 A 0,25 A 0,14 A 4 A
Auxiliary DC voltage (the same supply unit) voltage tolerance	220 V or 110 V 88...310 V

Options

The device can be extended by optional units:

- SCADA connection (see *EuroProt* system information sheet),
- output relays with 4 A breaking capability.

Information required with order

- Protection type [OMPXa-b-EP],
- Protection case type [19" cabinet frame mounted device, or panel mounted device
- Output relay contact type [NC or NO, if deviates from the *Technical Data*],
- Need of output relays with 4 A breaking capability.