

OTR

Optical TRansceiver



Introduction

The OTR is a DIN-rail mounted smart optical single mode transceiver for various SCADA protocols. Out from the transceiver there are an RS232 interface and a RS485 interface. Both are isolated to the internal control circuits. The OTR operation is supervised and if an internal error is registered the “error relay” contact will close. The OTR can be extended with I/O-modules for instantaneous “in between” communication to other OTR’s connected to the same fiber network. This property allows sending remote inter-trip and close signals between different OTR in different substations.

Technical data for the OTR

General data

Physical size:	99 x 115 x 22.5 mm.
Mounting:	DIN-rail.
Operating temperature:	-05 - +60 °C.
Power supply:	18-72 VDC.
Power consumption:	~100 mA at 24 VDC.
I/O (error relay):	1 closing contact 2 A.
CE-approval:	EN61000-4-x, Level 3. EN61000-6-4, Class B.

Communication interfaces:

- 1, Optical single mode, LC connectors
 - 1, RS232 settable between 300 - 19200 bps
- or
- 1, RS485 port 2- or 4-wire

Communication protocol:

- IEC60870-5-101
- RP570/571/07

Jumpers

- 7 jumpers for RS232 or RS485 selection
- 3 jumpers for selection of baud rate between 300 and 38400 bps.
- 1 jumper for MASTER or SLAVE mode
- 6 jumpers for Address
- 1 jumper for Self test

Expansion

The OTR bus is a 2 wire serial 100 kHz bus. The extension modules act as slaves to the OTR on this bus when equipped with the SHN-software. The OTR supplies up to 4 expansion modules with power.

The expansion modules are:

PBI:	15 binary inputs (20-55 VDC)
PBO:	12 binary relay outputs

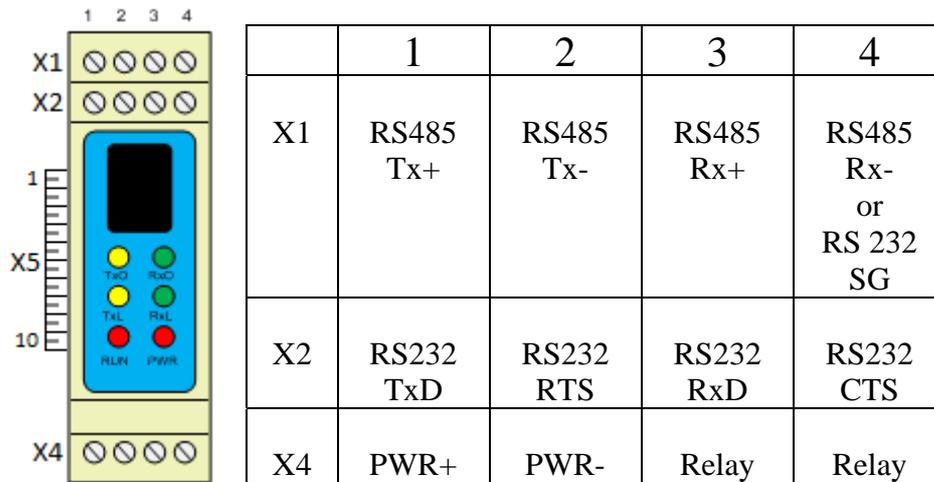


Fig. 1 Terminal designation

The OTR can work in 2 operational modes. In master mode the OTR distribute SCADA protocol messages to the OTRs in slave mode who repeat the telegram on the fiber and also send it out on the RS485/232 line. The original SCADA telegram “circulate” in the optical ring and when it comes back to the master origin it is deleted. Within a certain time, depending on baud rates and reply delays, an answer will be sent from one of the slaves and that answer will be sent back to the original master OTR which will send it back to the SCADA.

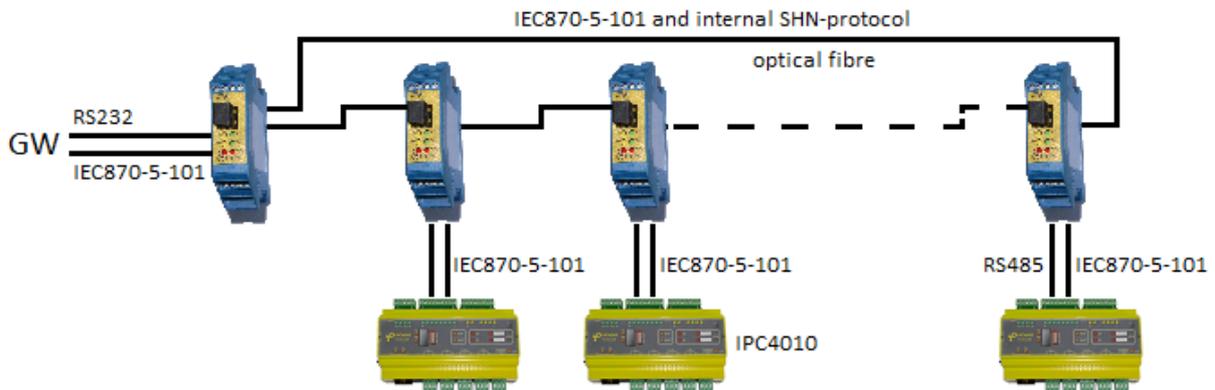


Fig. 2 Typical application with SCADA protocol on optical fiber. The OTR is also available with an internal protocol for Smart Grid Self Healing Network communication which makes it possible to send very fast inter-tripping/closing commands to secondary substations. When secondary substations are equipped with circuit breakers, trip and smart auto-reclosing is possible and makes the network able for Self Healing with just a small dip recognized by the clients.

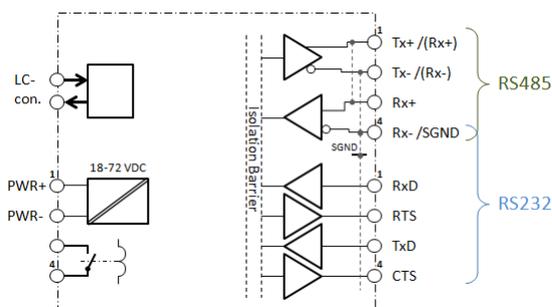


Fig. 3 OTR terminals.