

**Data Sheet**      **FO Interface**  
**RS485 1Channel**

**RS485 1Channel/Point to Point Link**

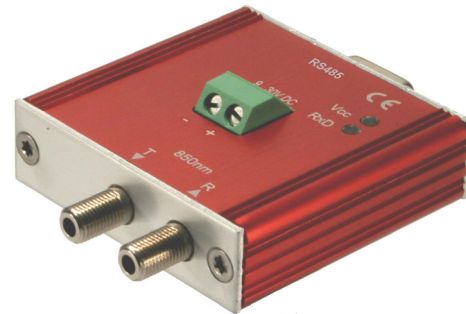
**1 General**

This device is a compact and robust modem for asynchronous data transmission in half-duplex mode at 660 or 850nm optical wavelength over glas or plastic multi mode mode fiber. According to the used fiber optic cable, data link length's up to 3000m are possible.



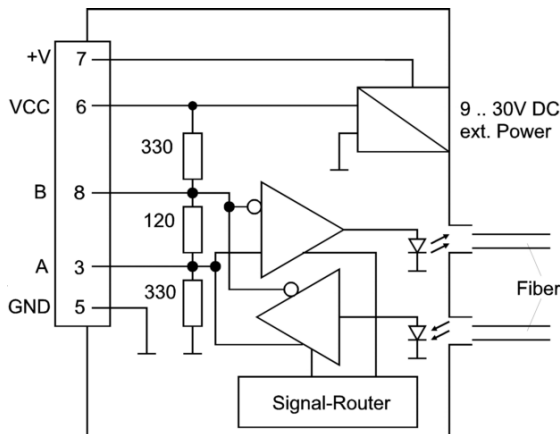
**2 Features**

- 1Channel RS485 - FO Transceiver
- Half-Duplex data transmission
- 1 MBit data rate
- protocol-transparent
- 'Power-Good' LED
- 'Receive-Data' LED
- 9-way Sub-D connector **female**
- F-ST, F-SMA standardized optical connectors
- 650nm plastic optical fiber
- 850nm glas multi mode fiber
- aluminium case with DIN rail mounting latching element
- +5V or 9...30V DC power supply



Pic. 2

**3 Block Diagram**



Pic. 1

**4 Ordering Information**

Model	Part Number
660nm / F-SMA / POF	901RS4851K053
with latching element	901RS4851KR53
660nm / F-ST / POF	901RS4851K051
with latching element	901RS4851KR51
850nm / F-SMA / MMF	901RS4851K049
with latching element	901RS4851KR49
850nm / F-ST / MMF	901RS4851K045
with latching element	901RS4851KR45

## RS485 1Channel/Point to Point Link

### 5 CE-Declaration of Conformity \_\_\_\_\_

The RS485 1Channel modem meets the basic requirements according to Article 4 and Appendix III of Directive 89/336/EWG: Electromagnetic Interference (EMI).  
 The modem complies with the followings standards:

- EN 55022 or EN 50081-1
- EN 55024 or EN 50082-1
- EN 50082-2 (Industrial use)

### 6 Operation \_\_\_\_\_

The RS485 1Channel Modem is a code transparent electro-optical transceiver. Incoming data at the electrical interface is converted into optical signals and transmitted by optical fiber. The optical receiver at the other side recovers the optical signal to the corresponding RS485 format. The RS485-FO conversion takes place acc. to following scheme:

$$U_{DIFF3/8} \geq +200mV = \text{'High'} \Rightarrow \text{opt. Out=On}$$

$$U_{DIFF3/8} \leq -200mV = \text{'Low'} \Rightarrow \text{opt. Out=Off}$$

The modem internal resistor termination (see block diagram) pulls the electrical busline into a defined state if the connected RS485 application driver changes to high impedance (HIGH-Z) condition.

! Please check your application to avoid any mismatch on the electrical busline caused by the modem internal termination !

### 7 Power Supply \_\_\_\_\_

The modem can be powerd by three ways:

**A) +5V DC ±5% at Pin 6 Sub-D  
 System ground at Pin 5**

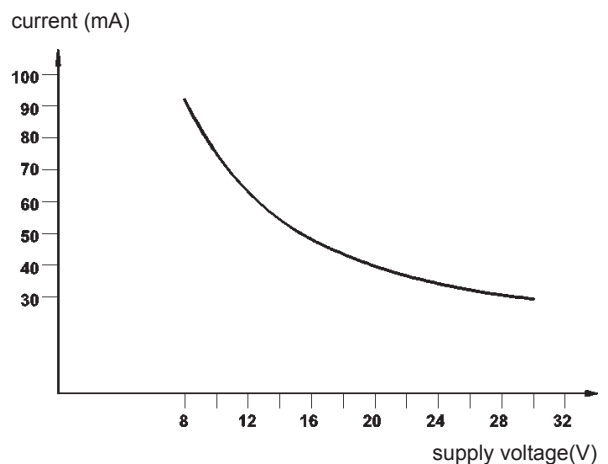
PCB Terminal must be unconnected.

**B) +9..30V DC (unregulated) at PCB Terminal**

A switching regulator generates the +5V power for the modem. Pin 6 is a +5V output with max. 50mA current load. Pin 7 must be unconnected

**C) +9..30V DC (regulated) at Pin 7**

A switching regulator generates the +5V power for the modem. PCB Terminal must be unconnected. Pin 6 is a +5V output with max. 50mA current load.



Pic. 3 current consumption



## RS485 1Channel/Point to Point Link

### 8 Installation

- Place the modem at a suitable location
- Though the modem is hot pluggable, make sure that all equipment is off power to avoid electrical damage during installation
- connect the modem to the RS485 interface of your application
- connect the FO cable with the Fiber-Optic-Interface (see Pic. 4)
- check all connections for correct configuration
- power up your system

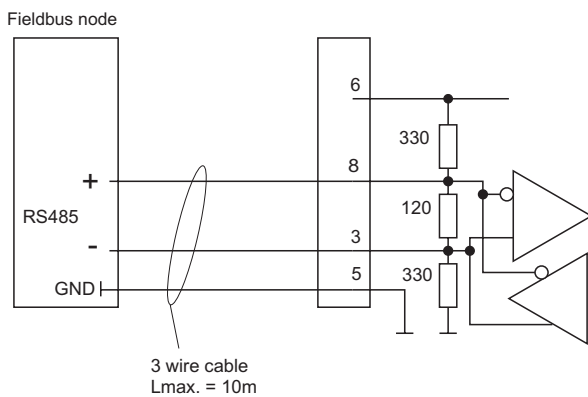


Pic. 4

### 9 RS485 Adaptation

The link between an active node and the FO interface should be a twisted pair cable with an impedance of  $Z=120\text{ Ohm}$ . If the node and the FO interface are powered by different power supplies, node system ground and FO Interface system ground should be connected (see example 1). This procedure avoids an overshoot of the common mode input swing.

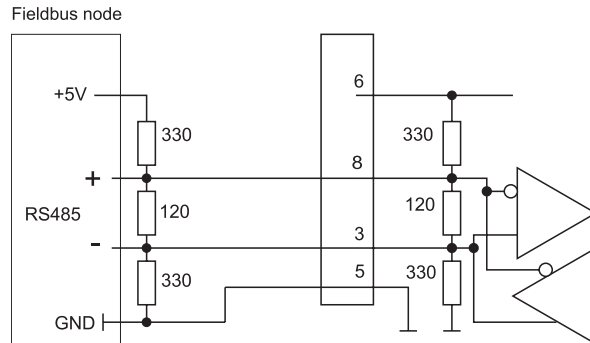
Example 1:



Pic. 5

For cable lengths over 10 m following termination should be used at the node (see example 2).

Example 2:



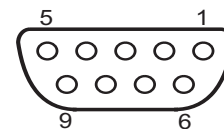
Pic. 6

This circuit allows electrical cable length up to approx. 120m.

The max. transmission band width depends on the cable length between the node and the FO Interface. The following formula shows you the dependence of max. transmission band width and cable length:

$$D_{MAX}(\text{Hz})=L(\text{m}) \times (-8E^3) + 1E^6$$

### 10 Device Sub-D Pin Out



Pic. 7

Pin Nr.	Name	Function
1	NC	not connected
2	NC	not connected
3	TxA / RxA	Data In/Out positiv
4	NC	not connected
5	Gnd	system ground
6	Vcc	+5V DC IN / OUT
7	V+	9 .. 30V DC IN
8	TxB / RxB	Data In/Out inverted
9	NC	not connected

! Non declared pin are without function and should be left open. !

# RS485 1Channel/Point to Point Link

## 11 Maximum Ratings \_\_\_\_\_

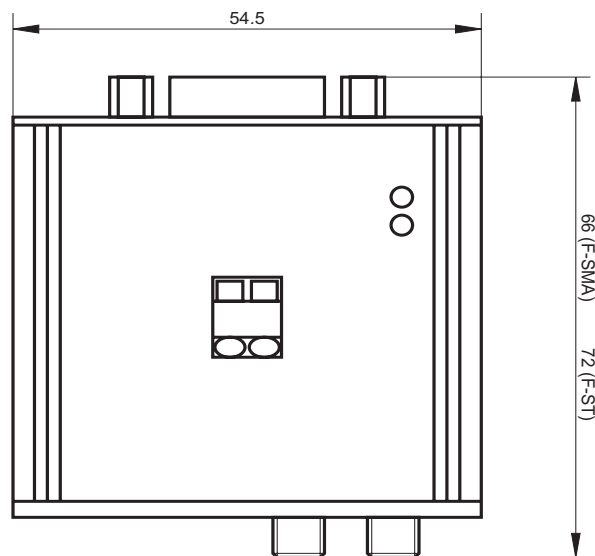
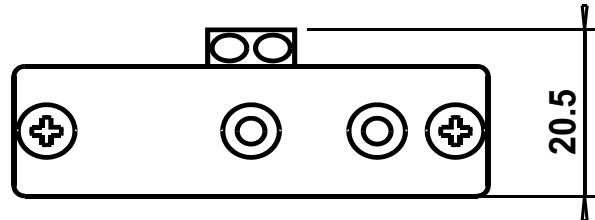
Power supply +V \_\_\_\_\_ +35V DC  
 Power supply 5V \_\_\_\_\_ +5,5V DC  
 RS485 driver current \_\_\_\_\_ 70mA  
 Common mode input \_\_\_\_\_ voltage  $\pm 12V$   
 Storage temperature \_\_\_\_\_  $-55..+125^{\circ}C$   
 Operating temperature \_\_\_\_\_  $-40..+85^{\circ}C$

Stresses beyond those listed under 'Maximum Ratings' may cause permanent damage to the modem. These are stress ratings only, and functional operation of the modem at these conditions is not implied. Exposure to maximum rating conditions for extended periods may affect the modem reliability.

## 12 Technical Data \_\_\_\_\_

**data rate:** 0 .. 1 MBit/s  
**bit distortion:** max.  $\pm 200ns$   
**max. opt. P<sub>OUT</sub>:** 100 $\mu W$  / 200/230 $\mu m$   
 27 $\mu W$  / 50/125 $\mu m$   
 60 $\mu W$  / 62,5/125 $\mu m$   
 700 $\mu W$  / 980/1000 $\mu m$   
**min. opt. P<sub>IN</sub>:** approx. 2 $\mu W$   
**Wavelength:** 660nm, 850nm  
**opt. interface:** F-ST, F-SMA  
**max. link length:** 3000m GI-Fiber  
 2000m HCS-Fiber  
 70m PO-Fiber  
**data format el.:** RS485  
**el. interface:** 9-way Sub-D female  
**power supply:** +5V DC  $\pm 5\%$  via Sub-D  
 or 9 .. 30V DC via Sub-D  
 or 9 .. 30V DC via screw terminal  
**current consumption:** 170mA ( $\pm 10\%$ ) / 5V  
**IED indicators:** green = Vcc  
 yellow = RxD (rec. Data)  
**case:** Aluminium extruded  
**dimension:** approx. 72x55x20mm (LxWxH)  
**protection class:** IP40  
**weight:** approx. 100g  
**temperature range:**  $-40 .. +80^{\circ}C$

## 13 Technical Drawing \_\_\_\_\_



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