

RS422 1Channel Part-Line / Point to Point Link

1 General

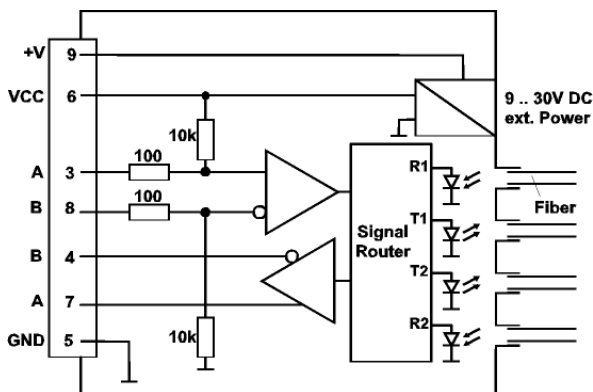
This device is a compact and robust modem for asynchronous data transmission in full-duplex mode, suitable for harsh environments in industrial applications. According to the used multimode fiber optic cable, data link length's up to 2000m are possible. The integrated repeater function makes it possible to build up an interference free RS485 fiber optic based bus system.

2 Application

Due to the max. data rate of 5 MBit/s, the max. link length of 2000m between 2 stations and the protocol free operation the modem can be used in many applications

- Interference free extension of existing electrical RS485 Systems over high distances
- Extension of RS422 bus systems beyond 20km
- Interference-free data transmission in EMI loaded area
- Electrical isolation of RS422 bus systems

3 Block Diagram



Pic. 2 Block diagram



Pic. 1 RS422

4 Features

- 1Channel RS422 - Fiber optic Transceiver
- active optical Repeater
- Full-duplex data transmission
- Bidirectional RS422 Interface
- 5 MBit data rate
- full protocol transparent
- „Power-Good“ LED
- „Receive-Data“ LED
- 9-way Sub-D female connector RS422 Interface
- F-SMA, F-ST or other standardized optical connectors
- Aluminium case (optional with rail mounting latching element)
- 5V or 9...30V DC power supply

5 Ordering Information

Model	Part Number
660nm / F-SMA	901RS4221K053
660nm / F-ST	901RS4221K051
850nm / F-SMA	901RS4221K049
850nm / F-ST	901RS4221K045

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6 CE-Conformation _____

The RS422 1Channel modem meets the requirements according to Article 4 and Appendix III of Directive 89/336/EWG: Electromagnetic Interference (EMI). The modem complies to the following standards:

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

7 Operation _____

The RS422 1Channel Modem is a code transparent electro-optical transceiver and repeater. 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 RS422 format. The RS422-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 bus wire into a defined state if the connected RS422 application driver changes to high impedance (HIGH-Z) condition.

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

In addition to the media conversion the optical signal will be regenerated and transmitted at the opposite fiber optic port of the media converter. Further information about fiber optic party line systems are available under application note AN0003.

8 Power Supply _____

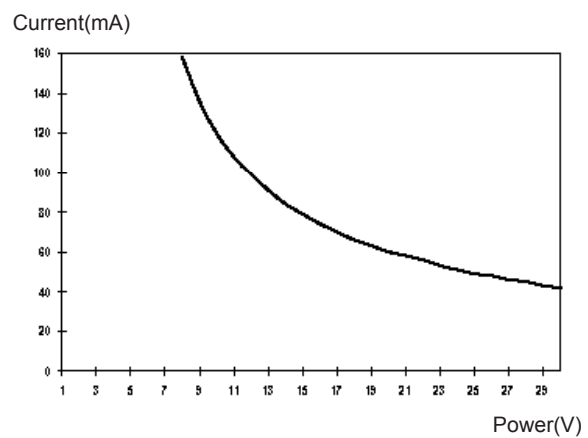
The modem can be powerd by three different ways:

A) +5V DC ±5% at Pin 6 Sub-D
 The screw terminal and Pin 9 must be unconnected.

B) 9V..+30V DC (unregulated) at screw terminal
 A switching regulator generates the +5V power for the modem.
 Pin 6 is a +5V output with max. 50mA current load.
 Pin 9 must be unconnected.

C) 9V..+30V DC (unregulated) at Pin 9 Sub-D
 A switching regulator generates the +5V power for the modem.
 Pin 6 is a +5V output with max. 50mA current load.
 The screw terminal must be unconnected.

Pic. 3 shows the current consumption versus input power for case B) and C).

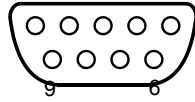


Pic. 3 Current consumption



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9 Sub-D Pin Out



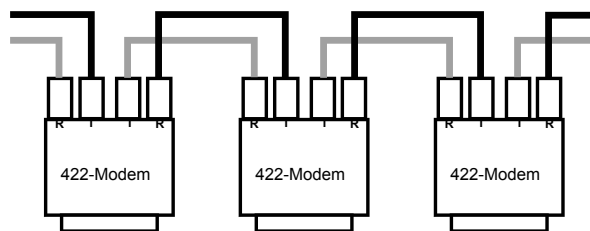
Pic. 4 Sub-D female

PIN No.	name	function
1	NC	not connected
2	NC	not connected
3	TxD A	Data In positiv
4	RxD B	Data Out inverted
5	GND	System Ground
6	VCC	+5V DC input/output
7	RxD A	Data Out positiv
8	TxD B	Data In inverted
9	V+	9..30V DC input

! 'NC' labeled pins are without function and should be left open. !

10 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 RS422 interface of your application
- Connect the FO cable with the Fiber-Optic Interface (see Pic. 5)
- Check all connections for correct configuration
- Power up your system



Pic. 5 Fiber optic link

11 Maximum Ratings

Power supply +V _____ +35V DC
 Power supply 5V _____ DC+5.5V DC
 RS422 driver current _____ 70mA
 Common mode input voltage _____ ±12V
 Storage temperature _____ -55..+125°C
 Operating temperature _____ -40..+85°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 .. 5 MBit/s
Bit distortion: max. ± 200ns
max. P_{OUT} @850nm: 100µW / 200/230µm
 27µW / 50/125µm
 60µW / 62,5/125µm
max. P_{OUT} @660nm: 700µW / 980/1000µm
min. P_{IN} @850nm: approx. 1µW
min. P_{IN} @660nm: approx. 3µW
Wavelength: 660nm, 850nm
opt. interface: F-ST, F-SMA
max. link length: 3000m 50µ GI-Fiber
 2000m 200µ HCS-Fiber
 70m 1000µ POF

Data format el.: RS422
EI. interface: 9-way Sub-D female
Power supply: +5V DC ±5% Pin 6 Sub-D
 9..30V DC via PCB terminal or via Pin 9 Sub-D

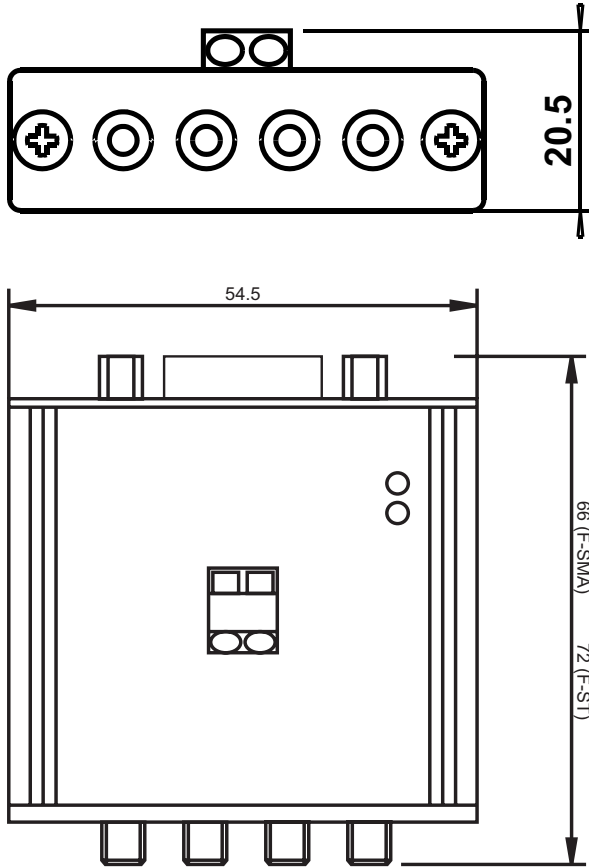
Current consumption: 230mA (±10%) / 5V
IED indicators: green = Vcc
 yellow = RxD (rec. Data)

Case: Aluminium extruded
Dimension: 72x55x20mm (LxWxD)
Protection class: IP40
Weight: 100g
Temperature range: -40 .. +80°C



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13 Case Drawing _____



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