

TTY 1Channel Half-Duplex/Point to Point Link

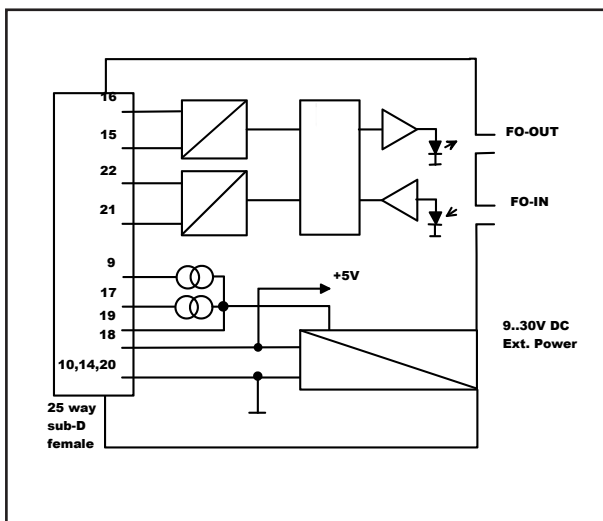
1 General

This device is a compact and robust modem for asynchronous data transmission of one TTY (20mA) data channel in half-duplex mode, suitable for harsh environments in industrial applications. According to the used fiber optic cable, data link length's up to 20km are possible.

2 Features

- 1Channel TTY - FO Transceiver
- Half-Duplex Data Transmission
- Bidirectional TTY-Interface
- Galvanic isolated TTY-port
- 100 kBit Data rate. NRZ coding
- Two internal current sources
- Protocol-transparent
- „Power-Good“ LED
- „Receive-Data“ LED
- 25-way Sub-D connector female
- F-SMA, F-ST optical connectors
- Aluminium case (optional with rail mounting latching element)
- 660nm plastic optical fiber (POF)
- 850nm multi-mode fiber
- 1300nm single-mode fiber
- +5V or 9 .. 30V DC power supply

3 Block Diagram



Pic. 2 Schematic



Pic. 1 F-ST / MMF / TTY 850nm Media Converter

4 Ordering Information

Model	Part Number
660nm / F-SMA / POF	90100TTZ1K043
with latching element	90100TTZ1KR43
660nm / F-ST / POF	90100TTZ1K047
with latching element	90100TTZ1KR47
850nm / F-SMA / MMF	90100TTZ1K041
with latching element	90100TTZ1KR41
850nm / F-ST / MMF	90100TTZ1K045
with latching element	90100TTZ1KR45
1300nm / F-ST / SMF	90100TTZ1K035
with latching element	90100TTZ1KR35

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5 CE-Conformation _____

The TTY 1Channel half-duplex modem meets the requirements according to Article 4 and Appendix III of Directive 89/336/EEG: 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)

6 Operation _____

The TTY half-duplex 1channel FO-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 TTY format. Because the modem operates in half-duplex mode, the electrical TTY port is disabled for app. 10µs after receiving data from the optical port. Long electrical wire connections (l>50m) can produce heavy capacitive loading on the current loop transmitter. This can cause undesired pulse width distortions on the TTY loop greater than the 10µs timeout period leading to transmission errors. The TTY-FO conversion takes place acc. to following scheme:

$I_F \geq 15mA = \text{'Space'}$ --> opt. Out=On
 $I_F \leq 4mA = \text{'Mark'}$ --> opt. Out=Off

The driver current for the TTY-loop can be supplied by an internal current source.

7 Power Supply _____

The modem can be powered by three ways:

A) +5V DC ±5% at Pin 18 Sub-D

Pin 19 Sub-D and screw terminal must leave unconnected.

Internal current sources are disabled.

B) +9V...+30V DC (unregulated) at Pin 19 Sub-D

A switching regulator generates the +5V power for the modem. The current sources can be activated with the supplied power. The screw terminal must leave unconnected.

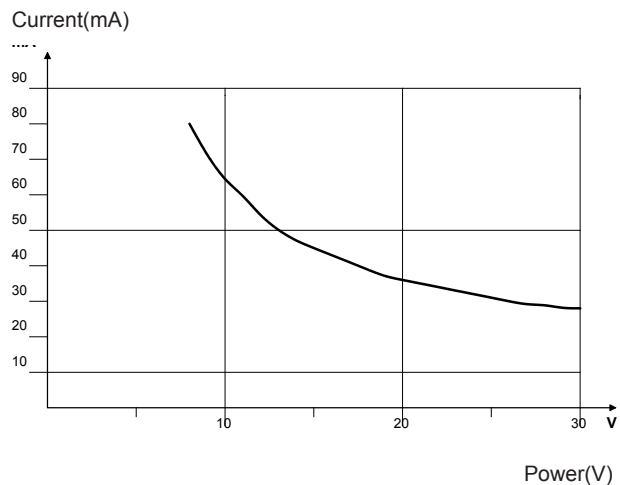
Pin 18 is a +5V output with max. 50mA current load.

C) +9V...+30V DC (unregulated) at screw-terminal

A switching regulator generates the +5V power for the modem. The current sources can be activated with the supplied power. Pin 19 Sub-D must leave unconnected.

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Pic. 3 shows the current consumption versus input power for case B) and C) without current loading on 20mA sources.



Pic. 3 Current consumption



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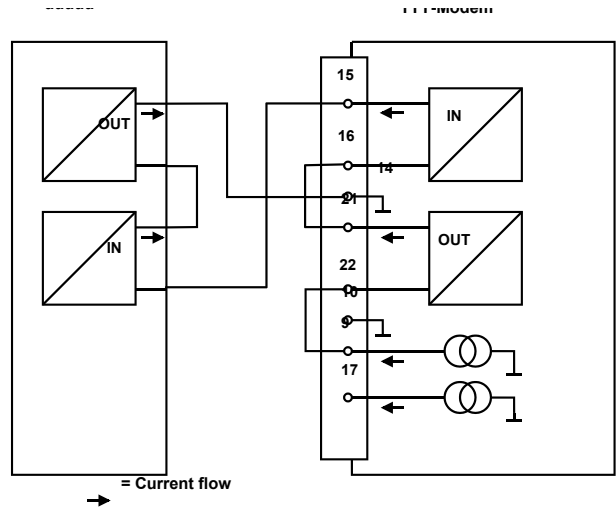
8 Installation

- 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 TTY 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 FO-Link

Example 2:



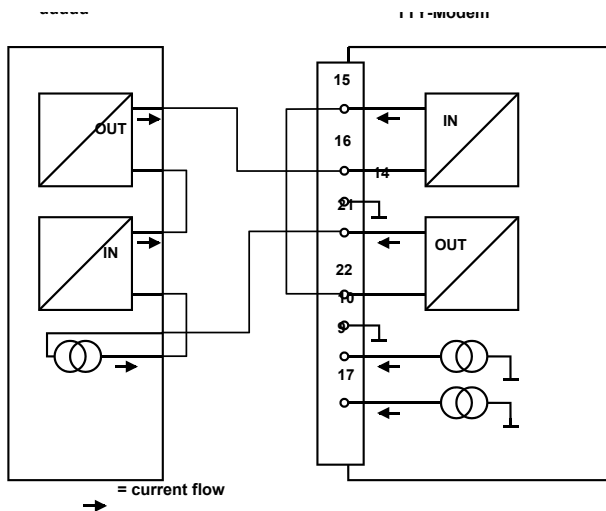
Pic. 6 TTY application 2

One internal current source is activated, because the application comes without current sources.

9 TTY-Application

A TTY data channel is always a closed current loop with a 20mA current source. The layout of the current loop is application specific.

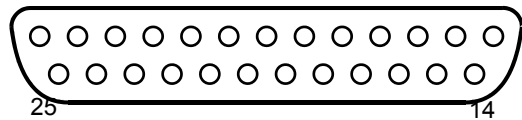
Example 1:



Pic. 5 TTY application

Internal current sources of the TTY-FO modem not enabled. The current loop is powered from application.

10 Sub-D Pin Out



PIN Nr.	name	function
9	Q1	Current source 1 Output+
10	GND	System ground
14	GND	System ground
15	In-	TTY I_{IN-}
16	In+	TTY I_{IN+}
17	Q2	Current source 2 Output+
18	Vcc	+5V DC Input/Output
19	+V	+9 .. 30V DC Input
20	GND	System ground
21	Out-	TTY I_{OUT-}
22	Out+	TTY I_{OUT+}

! Unnamed pins are without function and should be left open. !

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11 Maximum Ratings

Power supply +V	+35V DC
Power supply 5V DC	+5,5V DC
Loop current	30mA
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 .. 100 kBit/s
 bit distortion: ± 200ns

Wavelength:1300nm

max. opt. P_{OUT}: 400µW / 9/125µm SM-Fiber approx. -4dBm
 min. opt. P_{IN}: 3µW / 9/125µm SM-Fiber approx. -25dBm
 min. Power Budget: 20dB

Wavelength:850nm

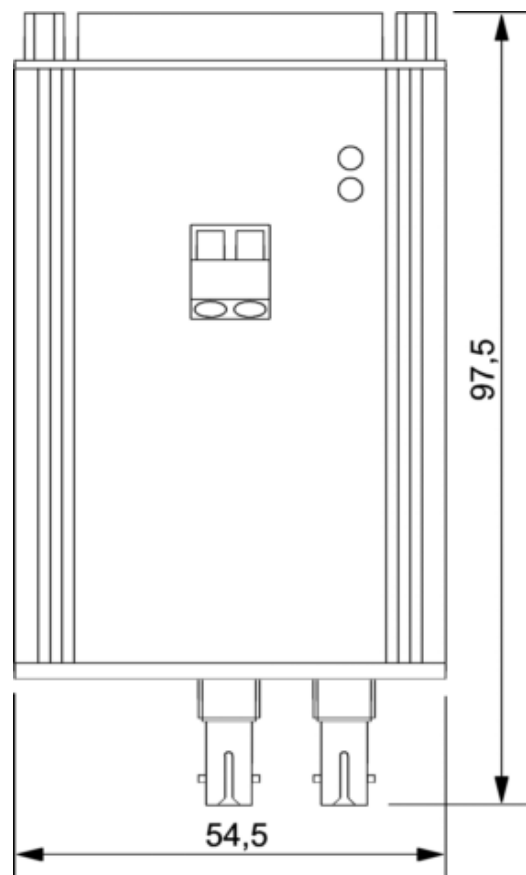
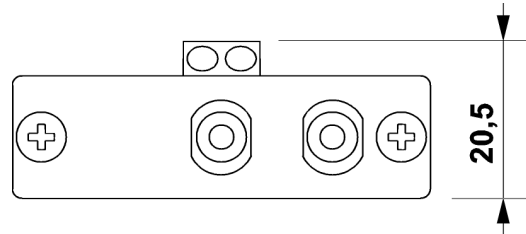
max. opt. P_{OUT}: 30µW / 50/125µm MM-Fiber approx. -15dBm
 min. opt. P_{IN}: 1µW / 50/125µm MM-Fiber approx. -30dBm
 min. Power Budget: 15dB

Wavelength:660nm

max. opt. P_{OUT}: 700µW / 980/1000µm POF ca. -1,5dBm
 min. opt. P_{IN}: 3µW / 980/1000µm POF ca. -25dBm
 min. Power Budget: 23dB

opt. port: F-SMA , F-ST
 data format el.: TTY 20mA
 Logic „0“ > 15mA
 Logic „1“ < 4mA
 el. interface: 25-pin Sub-D female
 power supply: +5V DC ±5% via Sub-D
 or 9 .. 30V DC via Sub-D
 or 9 .. 30V DC via PCB-Terminal
 current consumption: 35mA (±10%) / 24V
 LED's: green = Vcc
 yellow = RxD (receive data)
 case: aluminium extruded
 dimensions: approx. 98x55x20mm
 protection class: IP40
 weight: approx. 100g
 temperature range: -40 .. +80°C

13 Drawing



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