

# **Manual**

## **Plastic Fiber Optic Interfaces**

### **Fiber Optic Cutting Tool**



Type	81009, 81025 81026, 81029 81600
Release	1.2

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Subject to errors and changes:

Since we can make mistakes, none of our statements should be used without checking. Please let us know of any mistakes or misunderstandings you are aware of, so that we can recognize and eliminate them quickly.

Perform work on and with W&T products only as described here and only if you have read and understood the manual fully. Unauthorized use can result in hazards. We are not liable for the consequences of unauthorized use. When in doubt, check with us or consult your dealer!

Wiesemann & Theis offers an entire family of compact self-powered fiber optic interfaces that allows you to convert RS232 serial ports into an optical port for connecting POF cable.

This interface family is described on the following pages along with the corresponding technical data and including connection examples.

For up-to-date information on new developments, see our Internet site at <http://www.wut.de> or check the e-mail short notices at the W&T Interface Club, which you can also subscribe to from the W&T Homepage.

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**Interface RS232 ↔ Plastic Fiber Optic**

The W&T Plastic Fiber Optic Interfaces, type 81009, 81025, 81026 and 81029 permit bi-directional transmission of RS232 signals by the means of duplex plastic fiber optic cable.

**Function**

The Interfaces support one data line in each direction and transmit data over a distance of max. 100 meters (dependent on the model of the interface convertor).

The transmission medium is standard duplex plastic fiber optic cable, which is inexpensive and extremely easy to work with and install. The use of fiber optic as a transmission medium ensures perfect galvanic isolation between the connected devices and clean transmission even in noise-prone environments.

The interfaces convert both of the data lines, while the optional handshake lines can be used to carry additional supply voltage for the interface. The converter uses jumper resistors between RTS and CTS as well as DTR and DSR for enabling the connected interface, so that as a rule no additional jumpers are required in the connector.

**Power supply**

The W&T Fiber Optic Interfaces sources its supply voltage from the connected RS232 lines, and does not require any additional external power supply. Getting sufficient power to the Interfaces requires that the data lines as well as the handshake lines be connected.

**Notes for use of the fiber optic interfaces**

All specifications for maximum transmission parameters refer to operation of the interfaces on serial ports equipped with type MC1488 RS232 drivers and at a voltage of  $\pm 12V$ . The specifications also presume that the handshake lines of the interface are enabled.



If the interfaces are supplied only from the data lines, and when operating on low-efficiency RS232 ports you must take into account limitations with respect to maximum transmission length, baud rate and temperature range.

Since maintaining of all three parameters is a more or less direct function of the construction of the RS232 port and with it a clean power supply for the ports, and these parameters have a mutual effect, it is not possible to suggest specific values.

Practice has shown that for RS232 ports equipped with MAX232-compatible IC's (presently the standard configuration of RS232 ports), no operating restrictions exist as long as the handshake lines on the port are enabled.

Laptop ports with low output levels are however only in exceptional cases able to provide the fiber optic interfaces with sufficient power.

For short distances, however (up to max. 20 meters), there is a special power-saving version 81029, which can be purchased for such applications.

When there are power supply problems, it is always however possible to supply the interface converter externally through its handshake inputs with a voltage of up to 9V, or to use fiber optic interfaces with their own power supply (such as our model 81201).

**Pinout and connectors**

The fiber optic connection for the interface is configured as a self-locking coupling for duplex plastic fiber optic, with the RS232 interface formatted as DB9/DB25 connector. Refer to the following table for connector pin assignments:

Pinout RS232 <> POF interface, model 81009 and 81029

pin	function
2	data out
3	data in
4	con. to pin 6
5	signal GND
6	con. to pin 4
7	con. to pin 8
8	con. to pin 7

Pinout RS232 <> POF interface, model 81025

pin	function
2	data in
3	data out
4	con. to pin 5
5	con. to pin 4
6	con. to pin 20
7	signal GND
20	con. to pin 6

Pinout RS232 <> POF interface, model 81026

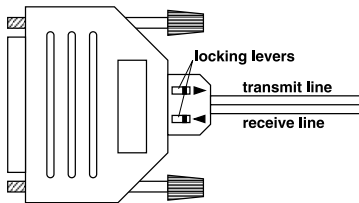
pin	function
2	data out
3	data in
4	con. to pin 5
5	con. to pin 4
6	con. to pin 20
7	signal GND
20	con. to pin 6

## Assembly

Connecting the plastic fiber optic cable to the W&T Fiber Optic Interfaces requires no special tools:

- Trim the fiber optic cable to the desired length using a sharp knife and separate the individual duplex conductors back from the cut point to a distance of around 2 cm.
- Pull the locking levers on the fiber optic female connector back towards the module along the upper side of the coupling. At the same time insert the separated end of the fiber optic duplex line into the fiber optic coupling female.
- Releasing the locking levers locks the fiber optic into the coupling.
- To release, pull the two locking levers on the top of the coupling towards the module, and pull the fiber optic cable out of the female.

The arrows on the top side of the coupling show the location of the emitter and receiver lines.



Please note that when connecting two fiber optic components, the emitter of the first must always be connected to the receiver channel of the second component.

A visible red light beam is always sent along with data, so that the sending line can always be easily identified.

**Common technical data:**

Baud rate:	110..115,200 baud
Data format:	any format
Signal lines:	RxD, TxD (full duplex)
Power supply:	through the RS232 signals
Fiber-optic cable adapter:	integrated socket with automatic interlocking of the fiber-optic cable
Wavelength:	approx. 660 nm
Ambient temperature:	Storage: -40..+70°C Operation: 0..+50°C
Housing:	SUB-D adapter housing
Weight:	approx. 30 g

**RS232 <> POF interface, 9-pin, #81009**

Transfer distance:	max. 80 m
RS232 adapter:	9-pin SUB-D socket for PC
Delivery:	RS232 <> POF interface, #81009

**RS232 <> POF interface, 9-pin, #81029**

Transfer distance:	max. 20 m
RS232 adapter:	9-pin SUB-D socket for PC
Delivery:	RS232 <> POF interface, #81029

**RS232 <> POF interface, 25-pin, DCE, #81025**

Transfer distance:	max. 100 m
RS232 adapter:	25-pin SUB-D socket, DCE pinout
Delivery:	RS232 <> POF interface, #81025 Gender changer, 25-pin, m/m

**RS232 <> POF interface, 25-pin, DTE, #81026**

Transfer distance:	max. 100 m
RS232 adapter:	25-pin SUB-D plug, DTE pinout
Delivery:	RS232 <> POF interface, #81026 Gender changer, 25-pin, f/f

## EC Declaration of conformity

# W&T

www.WuT.de

W&T Interfaces for TCP/IP, Ethernet, RS-232, RS-485, USB, 20mA, Glas- und Kunststoff-LWL, Inp, SNMP, OPC, IO digital, IO analog, ISA, PCI

### Declaration of conformity according to directives 89/336/EEC, 92/31/EEC, 93/68/EEC (EMC) and 73/23/EEC (LVD)

Wiesemann & Theis GmbH hereby confirms that the products

RS232 <-> Plastic FO Interface, 9-pin.	Model 81009
RS232 <-> Plastic FO Interface, 9-pin., Low Power	Model 81029
RS232 <-> Plastic FO Interface, 25-pin. DCE	Model 81025
RS232 <-> Plastic FO Interface, 25-pin. DTE	Model 81026
20mA <-> Plastic FO Interface, 15-pin.	Model 41015
RS232 <-> Glass FO Interface	Model 81210
RS232 <-> Glass FO Interface with Handshake	Model 81211
RS422/485 <-> Glass FO Interface	Model 61210
Profibus <-> Glass FO Interface	Model 61211
20mA <-> Glass FO Interface	Model 41210
RS485 <-> Glass FO Bus Interface	Model 65210
Profibus <-> Glass FO Bus Interface	Model 65211

fulfill the requirements of the directives / regulations specified below:

#### 1. Emission according to

- 1.1. EN 55022 Cl. B (1998) +A1 +A2
- 1.2. EN 61000-3-2 (2000)
- 1.3. EN 61000-3-3 (1995) +A1


#### 2. Noise Immunity according to EN 61000-6-2 (2001):

- |                    |                                       |
|--------------------|---------------------------------------|
| 2.1. EN 61000-4-2  | ESD                                   |
| 2.2. EN 61000-4-3  | Radiated Immunity                     |
| 2.3. EN 61000-4-4  | Burst                                 |
| 2.4. EN 61000-4-5  | Surge                                 |
| 2.5. EN 61000-4-6  | Conducted Immunity                    |
| 2.6. EN 61000-4-8  | H-Field                               |
| 2.7. EN 61000-4-11 | Supply Voltage Dips and Interruptions |

#### 3. Product-specific Low-Voltage Directive for communications technology

- 3.1. EN 60950 (2003)

Wuppertal, 04/20/2007

  
Klaus Meyer, EMC Representative

  
Dipl.-Ing. Rüdiger Theis, Managing Director

**Cutting tool for plastic fiber optics, Model 81600**

The 81600 cutting tool enables fast and precise trimming of duplex POF cables size 4.4 x 2.2 mm without the necessity of grinding or polishing the resulting cut surfaces.

**Background information**

For short runs it is generally sufficient to trim the plastic fiber optic cable using simple tools such as a sharp knife. In these cases the additional attenuation caused by a less than ideal cut is non-critical for the stability of the data transmission. The light intensity at the receiving location is almost always sufficient for a reliable connection regardless of cut-related losses.

But when you begin to approach the maximum permissible distance, the cut quality is important in terms of the achievable distance and the stability of the connection, and can determine whether a connection is feasible or not. A perfect cut can give you up to an additional 20 meters of distance in borderline conditions.

The decisive criterion for the quality of the cut is a flat cut at right angles to the cable axis, so that as little light as possible is lost through scatter or reflection. Such cuts can be achieved using the described cutting tool without requiring additional grinding or polishing of the cut surface.

**Important: This tool is not suitable for trimming glass fiber cables. Any attempt to use the tool for cutting glass fiber media will permanently damage the cutting element.**



**Preparing the cutter**

The plier is shipped from the factory with a safety lock which must be removed before using the tool.

**Cutting fiber optic cable**

Open the plier by pressing the two grips on the tool together and then releasing them.

Place the duplex fiber optic cable into the holder provided in the clamping block of the plier:



Close the plier by pressing the two grips together until the fiber optic cable is securely held in the clamping block. While doing this take care not to squeeze the grips until they touch, since this will release the plier again.

Then press the cutting wheel against the fiber optic cable by squeezing the trigger-like grip towards you using your index finger.



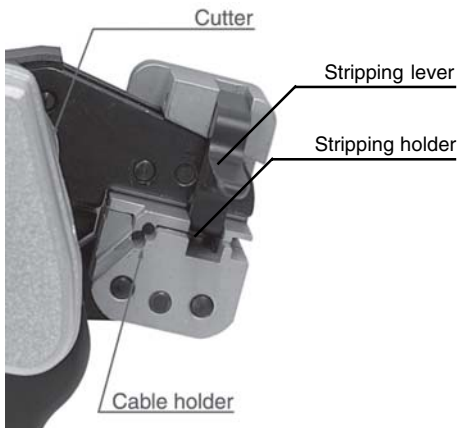
A firm pull with the index finger quickly and cleanly cuts the fiber optic cable. To remove the cable from the clamping block, open the plier.

With each cutting operation the cutting wheel rotates forward by a slight angle, thus significantly increasing the service life of the tool.

### Stripping fiber optic cables

In addition to the cutting function, the plier is also capable of stripping duplex fiber optic cable. This function is now required however when using fiber optic cable together with W&T fiber optic interfaces.

To strip the cable, insert it into the stripping holder of the clamping block and pull the associated lever up to expose the inner cable section.



### Replacing the cutter

In order to ensure consistent cutting quality, the cutter monitors the number of cuts made and indicates the end of the useful life of the cutting wheel in a small window on the side.

When the life expectancy is reached, which occurs after 1260 cutting operations, the entire safety cutter needs to be replaced.

The safety cutter including cutting wheel is user replaceable as a self-contained unit and can be ordered from W&T under Article No. 81602.



**Technical Data**

Functions:	Cutting and stripping fiber optic cables
Compatible media:	2.2 mm Simplex- and 4.4 x 2.2 mm Duplex fibers with 980um fiber core
Dimensions:	200 mm x 80 mm x 50 mm
Weight:	520 g
Included:	Fiber optic cutting tool Allen key for releasing transport safety lock

