USB/RS-485 INTERFACE CONVERTER

PD10

USER'S MANUAL

Contents

1. APPLICATION

The PD10 converter is a device which transmits data from the USB interface to the RS-485 industrial interface. USB interface, as the first, is destined to communicate with the device having a USB Host port, which is the most frequently a PC computer.

The RS-485 interface, as the second, is destined to communicate with devices in the object side. The maximal baud rate is 1 Mb/s. This baud rate depends on the RS-485 cable length. The converter does not interfere in the structure of transmitted data and is compatible with several industrial communication protocols, e.g. Modbus RTU, Modbus ASCII, a.s.l. In order to protect devices at both sides of interfaces, a galvanic separation is applied.

A program controller of the virtual serial port COM for the computer PC is added to the set.

It allows to exchange data by master programs with industrial objects through the P10 converter.

2. CONVERTER SET

The PD10 converter set includes:

- PD10 converter 1 pc
- User's manual 1 pc
- USB cable of 1.8 m long 1 pc
- CD with drivers 1 pc

When unpacking the converter, please check the set completeness and whether the type and execution code on the data plate correspond to the order code.

3. CONVERTER INSTALLATION

3.1 Converter installation and operational safety

The converter is a portable device supplied from the USB bus. Dimensions of the converter are presented on the fig. 1.

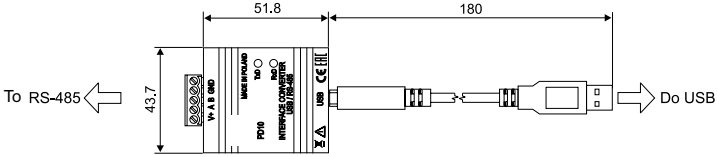

Fig.1 Overall dimensions of the PD10 converter

In the safety service scope, the PD10 converter meets to requirements of the EN 61010-1 standard.

Observations concerning the operational safety

- All operations concerning transport, installation, and commissioning as well as maintenance, must be carried out by qualified, skilled personnel, and national regulations for the prevention of accidents must be observed.
- Before switching converter on, one must check the correctness of connection to the network.
- Do not connect the converter to the network through an autotransformer.
- Before removing the converter housing, one must switch the supply off and disconnect measuring circuits.
- The removal of the meter housing during the guarantee contract period may cause its cancellation.
- The PD10 converter is destined to be installed and used in industrial electromagnetic environment conditions.

- One must remember that in the building installation a switch or a circuit-breaker should be installed. This switch should be located near the device, easy accessible by the operator, and suitably marked.

3.2. Description of converter leads

Markings of individual leads are shown on the fig. 2

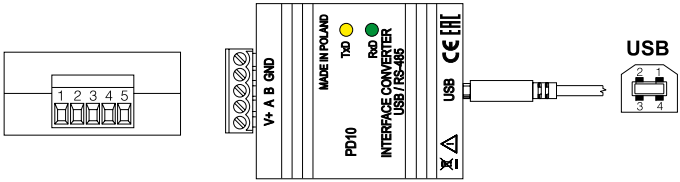

Fig. 2 External leads of the PD10 converter

External signals must be connected acc. to tables 1 and 2, in which the assignment of individual PD10 converter leads are described.
There are two diodes on the frontal plate:
Green (RxD) – signals the reception of data via RS-485.
Yellow (TxD) – signals the transmission of data via RS-485.

RS-485 interface leads *Table 1*

Nr of the RS-485 pin	RS-485 signals
(5) V+	Line +5 V (for teminator)
(4) A	Line A
(3) B	Line B
(2) GND	Line GND
(1) GND	Line GND

USB interface leads *Table 2*

Nr of USB pin (type B)	USB signal
1	+5 V d.c.
2	-Data
3	+Data
4	GND

3.3. Installation of the COM port for Windows

The PD10 converter makes use of FTDIBUS Driver and FTDIPORT Driver, licensed by the Future Technology Devices International Ltd company. This software creates in the system a device of Universal Serial Bus - The **Converter USB-RS485 of PD10 type** and connected to it, the virtual COM port, named **USB-RS485 Converter Port Com of PD10 type**.

The controller installation in the Windows system causes the addition of a successive COM serial port to the list of ports serviced by the operating system.

3.4. Installation of COM port controllers on the computer

After connecting the connector to the USB port, the operating system informs about the appearance of a new device by means of a message presented on the fig. 4.

The creator to find the new hardware of the Universal Serial Bus . One must operate acc. to the creator, choosing the installation from the indicated location and giving the path to controllers being in the added CD.

Controllers are compatible with systems: Windows 2000, Windows XP, Windows Vista, Windows Server 2003 (x86 and x64).

When installing controllers, information about the lack of controller digital signature can occur. One must ignore this information and further continue the installation.

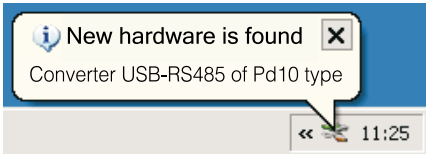

Fig. 3 Systemic message about the detection of the PD10 converter through the System

After the creator closure, the system immediately detects the next device – USB Serial Port (fig. 4). The creator to find new hardware will be started again.

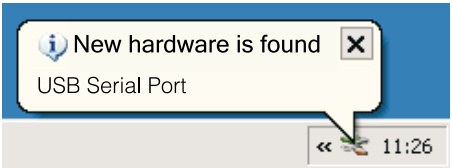

Fig. 4 Systemic message about the find of a new device.

After a successful termination of the installation, the system informs about the installation of the new hardware (fig.5) In the Device Manager, two new devices appear:

- **Converter USB—RS485 of P10 type** and Port COM named: **Converter USB-RS485 of PD10 type**, acc. the fig. 6.

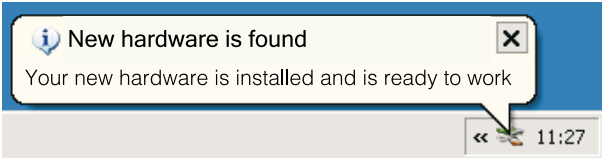

Fig. 5 Systemic message ending the installation of PD10 controllers

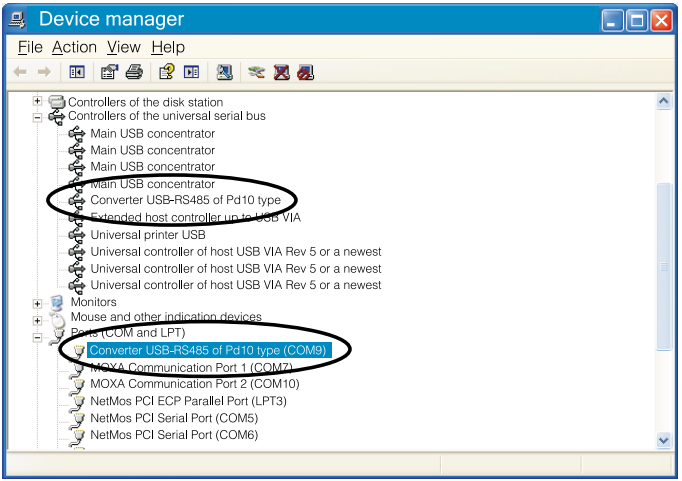

Fig. 6. Correct installation of PD10 in the Win32 system

4. OPERATION DESCRIPTION

The RS-485 standard enables the data exchange of half duplex type. That means that they can be in the same time transmitted or received.

PD10 converters can work with a maximal baud rate up to 1 Mb/s depending on the line length (e.g. 9600 kb/s on lines up to 1000 m long, 1 Mb/s on lines up to 10 m long). At lines over 800 m, between lines A and B of the RS-485 interface, one must use terminators (resistors) on ends of the bus. The terminator value should be adapted to the application.

In the environment with unknown interference level it is recommended to observe following principles:

- Connections of communication interface circuits must be conducted individually by twisted wires in a screen.
- Apply the general principle that wires (group of wires) leading different signals should be led in the possible farthest distance between them (not less than 50 cm) and the crossing of such group of wires should be made at right angle.
- The device does not fulfil requirements concerning the electromagnetic compatibility in residential environment

5. TECHNICAL DATA

Transmission data	
- baud rate	up to 1000 kb/s, depending on the line length
- data flow direction control	automatic
- controllers	Windows 2000, XP, Server 2003, Vista, Server 2008 (x86 and x64).
Converter power consumption	≤ 1,5 W
Rated operation conditions:	
- supply voltage	5 V d.c., from the USB port
- ambient temperature	0...55°C
- relative humidity	< 85%
- working position	any
Storage and transport conditions:	
- ambient temperature	0...70°C
- relative humidity	< 85%
Ensured protection grades (EN 60529):	
- from the housing side	IP 40
- from the terminal side	IP 20
Dimensions	52 × 44 × 24 mm
Weight	0,1 kg
Electromagnetic compatibility:	
- immunity	EN 61000-6-2
- emission	EN 61000-6-4
Maximal working voltage in relation to earth:	< 50 V

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