

PEU 016
USB to 16x Serial Port
Extender Unit
User Manual



Device:
PEU 016

Document:
User manual

Code:
PEUMU016

Date:
17.08.2020

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1 PREFACE

Liability statement

We have checked the contents of this manual to ensure that the descriptions of both hardware and software are as accurate as possible. However, deviations may occur so that no liability can be accepted for any errors or omissions contained in the information given.

The contents of this manual will be checked in periodical intervals, corrections will be made in the following editions.

We reserve the right to make technical improvements without notice.

Contact

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Explanation of the symbols



Read the instructions!



Device was tested with 2 kV AC voltage to check the device insulation.



Device ground terminal.



Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC; the affixed product label indicates that you must not discard this electrical/electronic product in domestic household waste.

Warnings

In this paper the following terms are used:

Danger

indicates that death, severe personal injury or substantial property damage will result if proper precautions are not taken.

Warning

indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.

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Caution

indicates that minor personal injury or property damage can result if proper precautions are not taken. This particularly applies to damage on or in the device itself.

General information

These paper contain the information that is necessary for the proper and safe operation of the described devices. This paper is intended for technically qualified personnel.

**Warning!**

Hazardous voltage is present inside the device during operation. Disregarding of safety rules can result in severe personal injury or property damage.

Only qualified personnel may work with described devices after being familiar with warnings and safety notices in this paper and other safety regulations.

**Warning!**

Device must operate completely assembled! Device must be used as described. No modifications of the device should be made.

**Warning!**

Do not open device while it is energized! Hazardous voltage is present inside the device. Disconnect all connectors before opening!

**Warning!**

If device is damaged disconnect it from power supply! Send it to the manufacturer for inspection.

**Warning!**

Connect to earth before attaching power supply!

2 PEU 016 SYSTEM

2.1 DESCRIPTION

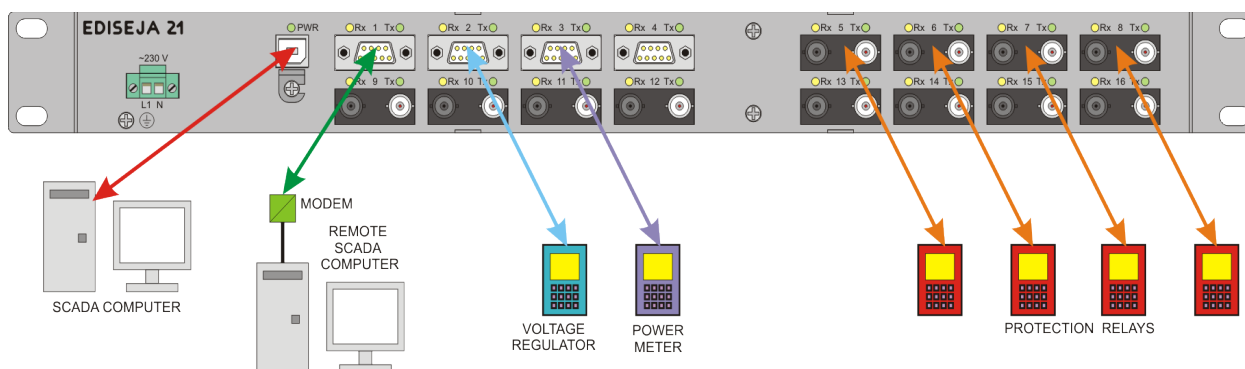
Port extender unit (PEU 016) is system for extending computer serial ports. It adds 16 serial ports to the operating system from single USB port. It galvanically separates RS232 to prevents ground loops and increases computer's electromagnetic immunity (EMI). Besides RS232 it additionally provides RS485 and multimode fiber optic ports for connection to protection relays, voltage regulators, ect. Number of each port is user selectable.

PEU system is assembled from PEU 016 device and appropriate drivers for multiple operating systems.

PEU 016 housing is made from inox and intended for 19" rack mounting or surface mounting.

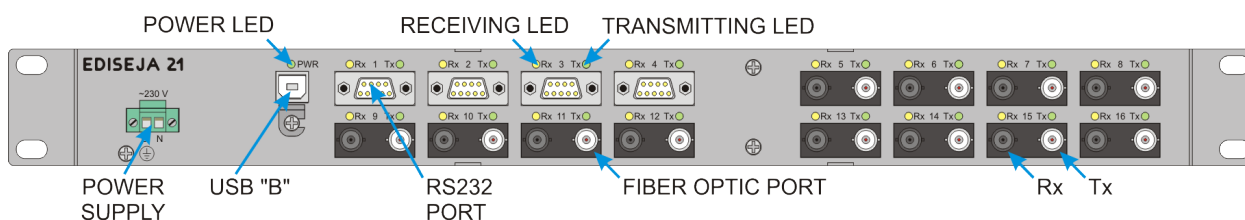
This device is intended for use in cubicles and cabinets in all kinds of power production, transmission and distribution stations. It requires no maintenance. All normally used connectors, switches and light indicators are accessed at the front side of the device. Light indicators indicate communication activity of each port.

2.2 TYPICAL APPLICATION



Picture 1: Typical application

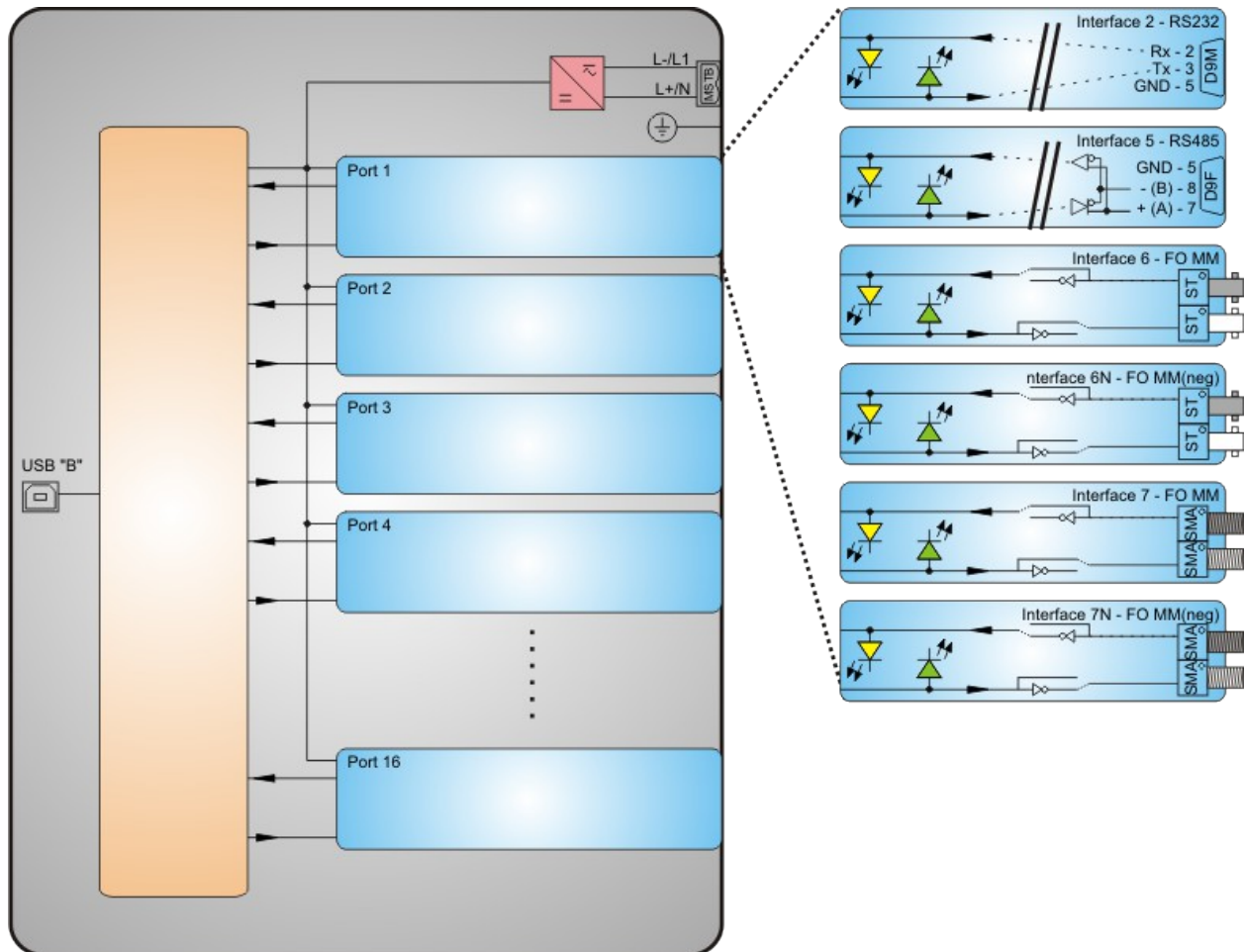
2.3 APPEARANCE



Picture 2: Front view

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3 SCHEMATIC



Picture 3: PEU 016 schematic

4 INSTALLATION

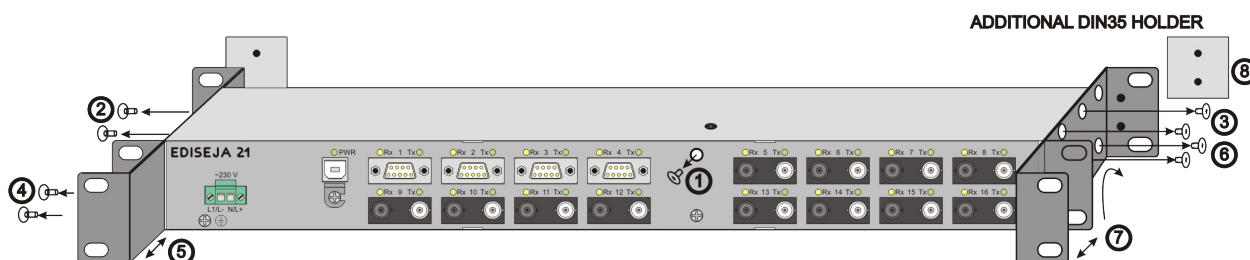
4.1 DEVICE OPENING AND 19" RACK HOLDING BRACKET POSITION CHANGE



Warning!

Hazardous voltage is present inside the device during operation. Disregarding of safety rules can result in severe personal injury or property damage.

Before following steps are made, unplug ALL cables from the device especially power supply!



Picture 4: Device opening & holding bracket position change steps

Device 19" rack or surface mounting holding bracket position change:

follow the steps

- 3 (unscrew 2 upper screws)
- 6 (unscrew 2 lower screws)
- 7 (adjust & turn 19" rack holding bracket according to your needs)
- reverse step 3 & 6
- then follow the steps 2, 4, 5, reverse step 2 & 4.
- Step 8: attach DIN35 additional holder if needed (not included).

Removing cards for fiber optic logic change:

follow the steps

- 1 (unscrew 1 upper screws)
- 2 (unscrew 2 upper screws on the left side)
- 3 (unscrew 2 upper screws on the right side)
- remove top of the device

for ports 1-8:

- unscrew 4 screws inside the device that holds the cards
- take a picture of flat cable connectors is possible
- move both boards simultaneously
- disconnect flat cables
- remove both boards simultaneously.

for ports 9-16:

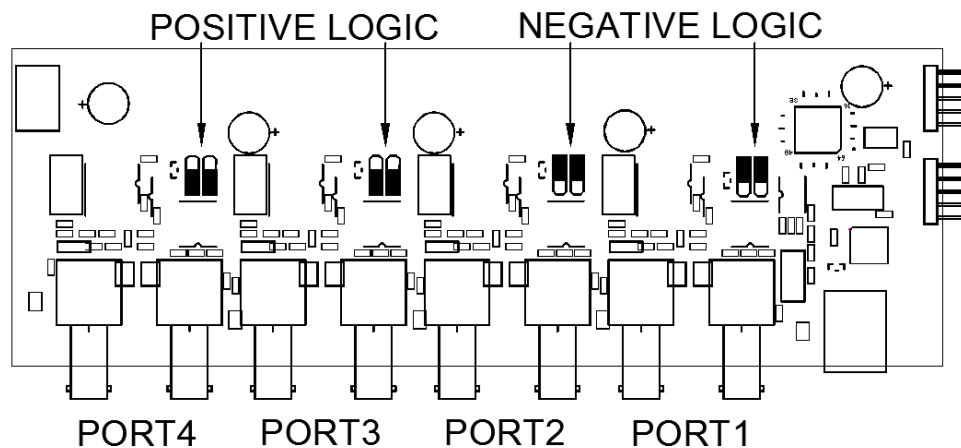
- unscrew 4 distance bolts that holds the cards
- remove both boards simultaneously.

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4.2 FIBER OPTIC LOGIC SETTINGS

Fiber optic port can operate with the positive logic (light OFF in idle state) or with the negative logic (light ON in idle state). User can set the logic with jumper settings on each fiber optic port inside the device. To do so, **unplug ALL cables from the device**. And see previous chapter for opening the device.

After board(s) are removed from the device, set the jumpers according to the requirements.



Picture 5: Fiber optic settings: left - positive logic (light OFF in idle state)
right - negative logic (light ON in idle state)

After jumper setting is completed, assemble the device in reverse order.

4.3 USB DRIVERS INSTALLATION

4.3.1 VIRTUAL COM PORT DRIVERS

Virtual COM port (VCP) drivers cause the USB device to appear as an additional COM port available to the PC. Application software can access the USB device in the same way as it would access a standard COM port.

USB drivers are available for many operating systems:

- ◆ Windows 7, Windows Server 2008 R2 and Windows 8, 8.1, Windows server 2012 R2, Windows Server 2016 and Windows 10
- ◆ Linux supported in Ubuntu 11.10, kernel 3.0.0-19
- ◆ Mac OS X 10.3 and above
- ◆ Windows CE 4.2-5.2
- ◆ Windows CE 6.0/7.0
- ◆ Windows CE 2013

Drivers & more information can be obtained at:

<https://www.ftdichip.com/Drivers/VCP.htm>

4.3.1.1 VIRTUAL COM PORT DRIVERS EXECUTABLE SETUP FOR WINDOWS

For setup executable file click on link in red frame on

<https://www.ftdichip.com/Drivers/VCP.htm>

web site:

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https://www.ftdichip.com/Drivers/VCP.htm

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Virtual COM Port Drivers
This page contains the VCP drivers currently available for FTDI devices.
For D2XX Direct drivers, please click [here](#).
Installation guides are available from the [Installation Guides](#) page of the [Documents](#) section of this site for selected operating systems.

VCP Drivers
Virtual COM port (VCP) drivers cause the USB device to appear as an additional COM port available to the PC. Application software can access the USB device in the same way as it would access a standard COM port.

This software is provided by Future Technology Devices International Limited "as is" and any express or implied warranties, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose are disclaimed. In no event shall future technology international limited be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including, but not limited to, procurement of substitute goods or services; loss of use, data, or profits; or business interruption) however caused and on any theory of liability, whether in contract, strict liability, or tort (including negligence or otherwise) arising in any way out of the use of this software, even if advised of the possibility of such damage.
FTDI drivers may be used only in conjunction with products based on FTDI parts.
FTDI drivers may be distributed in any form as long as license information is not modified.
If a custom vendor ID and/or product ID or description string are used, it is the responsibility of the product manufacturer to maintain any changes and subsequent WHCK re-certification as a result of making these changes.
For more detail on FTDI Chip Driver licence terms, please [click here](#).

Currently Supported VCP Drivers:

Operating System	Release Date	Processor Architecture							Comments
		x86 (32-bit)	x64 (64-bit)	PPC	ARM	MIPSII	MIPSIV	SH4	
Windows*	2017-08-30	2.12.28	2.12.28	-	-	-	-	-	Available as a setup executable Please read the Release Notes and Installation Guides
Linux	-	-	-	-	-	-	-	-	All FTDI devices now supported in Ubuntu 11.10, kernel 3.0.0-19 Refer to TN-101 if you need a custom VCP VID/PID in Linux VCP drivers are integrated into the kernel.
Mac OS X 10.3 to 10.8	2012-08-10	2.2.18	2.2.18	2.2.18	-	-	-	-	Refer to TN-105 if you need a custom VCP VID/PID in MAC OS
Mac OS X 10.9 and above	2020-08-13	-	2.4.4	-	-	-	-	-	This driver is signed by Apple

Download the file, unzip it and run that exe file. (Currently named CDM21228_Setup.exe).

Wait until installation is complete, reboot PC if it is instructed so.

Connect PEU 016 to power supply.

Connect PEU 016 USB cable to the computer.

Wait operating system to find and install all that is needed.

After installation is completed, there should be new serial ports installed into the computer's system. Number of new ports depends on PEU 016 device type.

If not, reboot the computer. If that does not help, deinstall serial ports, unplug USB cable reboot the computer and repeat previously described procedure.

4.3.2 DLL DRIVERS (for advanced users)

D2XX drivers allow direct access to the USB device through a DLL. Application software can access the USB device through a series of DLL function calls. Drivers & more information can be obtained at:

<https://www.ftdichip.com/Drivers/D2XX.htm>

4.4 SERIAL PORT APPLICATION START

Note!

Application which connects to the serial ports must be started after all ports are recognised by the operating system. Ports must be recognised by the operating system every time that PC or PEU device is powered and/or USB cable is connected to the PC. If this requirement is not followed, some ports may not work!

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4.5 MOUNTING



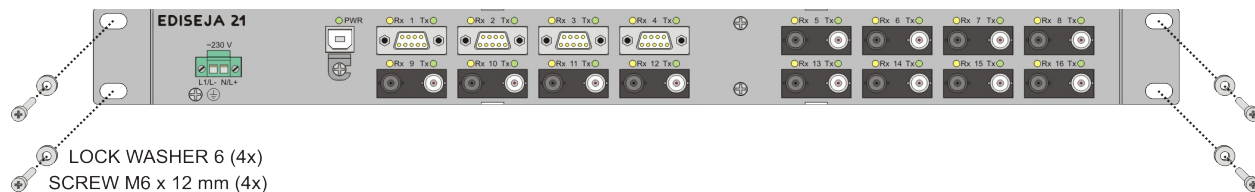
Warning!

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Following instruction must be taken into consideration:

- ◆ The device must be accessible to qualified personnel only.
- ◆ The device is permitted to operate in enclosed housing or cabinet only.
- ◆ The device location must be vibration-free.
- ◆ The admissible operating temperature must be observed.
- ◆ Check the device for damage at unpacking. If device is damaged it must not be installed but it should be send to the manufacturer for repair.
- ◆ The device should be screwed with 4 M6 screws to the 19" rack or to the mounting surface.
- ◆ Attach ground wire before attaching power supply. Device must be grounded during operation!
- ◆ Connect power supply to appropriate voltage.
- ◆ Single core or stranded wire 0,5 – 2,5 mm² must be used for power supply connection. If stranded wire is used, ferrules must be used to prevent fraying. Recommended stripping lenght is 5 mm.
- ◆ Protective earthing wire must be terminated with tinned copper ear terminal.
- ◆ The prescribed bending radius of the optical fibre cables must be observed.



Picture 6: Mounting

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5 COMMISSIONING & MAINTENANCE

5.1 COMMISSIONING

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Hazardous voltage is present inside the device during operation. Disregarding of safety rules can result in severe personal injury or property damage.

Only qualified personnel may work with described device after being familiar with warnings and safety notices in this paper and other safety regulations.

Following instruction must be taken into consideration:

- ◆ Device must operate completely assembled! Device must be used as described. No modifications of the device should be made.
- ◆ Attach ground wire before attaching power supply. Device must be grounded during operation!
- ◆ Check if the power supply voltage complies with device operation voltage.
- ◆ Do not open device while it is energized! Hazardous voltage is present inside the device.

5.2 MAINTENANCE

The device is maintenance-free. Disconnect power supply before cleaning it. Use moist cloth. Do not use liquids.

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6 TECHNICAL DATA

Power supply		
Rated voltage	DC	110 V-220 V
	AC	230 V
Permissible voltage range	DC	88 V-370 V
	AC	85 V-264 V
Input current	max 0,1 A	
Frequency range	47 - 63 Hz	
Voltage dips	> 20 ms	
Connector type	screw type „MSTB“ Phoenix 2pin	
Wire crossection	0,5 – 2,5 mm ²	
Voltage dips	20 ms	
Connector type	screw type „MSTB“ Phoenix 2pin	
Power Supply Wire	crossection	0,5 – 2,5 mm ²
	type	single or stranded wire
	voltage rating	500 V
	colour	see valid standard
Ground wire	crossection	Cu, 2,5 mm ²
	colour	see valid standard

Communication ports RS232 (interface 2)	
Type	RS232
Direction	full duplex
Speed	up to 115,2 kbit/s
Distance	up to 15 m
Isolation	500 V DC
Connector type	DB9 male
Lines support	Rx, Tx

Communication ports - RS485 (interface 5)	
Type	RS485
Direction	half duplex
Speed	up to 115,2 kbit/s
Distance	up to 1200 m

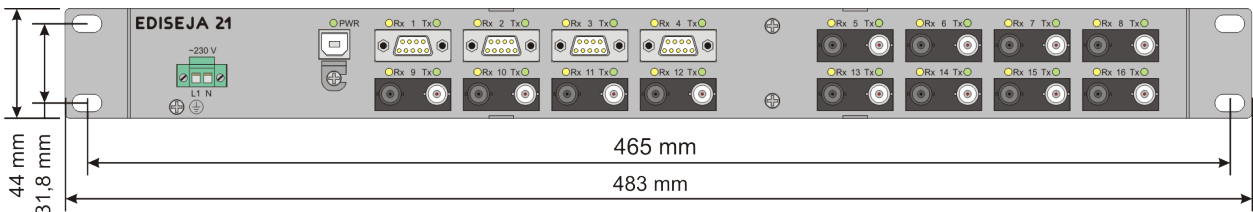
Communication ports - RS485 (interface 5)	
Isolation	500 V DC
Connector type	DB9 female

Communication ports - Multimode Fiber Optic (interface 6, 6N, 7 & 7N)				
Type	multimode fiber optic			
Wave lenght	820 nm			
Fiber size	50/125 µm	62,5/125 µm	100/140 µm	200 µm HCS
Distance (approx.)	600 m	2000 m	1800 m	
Optical output power	-18 dB			
Reciver sensitivity	-24 dB			
Laser class	I (IEC 60825-1)			
Direction	full duplex			
Speed	up to 115,2 kbit/s			
Input	1 receiver (grey connector)			
Output	1 transmitter (white connector)			
Logic*	interface 6 & 7	positive - light OFF in idle state		
	interface 6N & 7N	negative - light ON in idle state		
Connector type	interface 6 & 6N	ST		
	interface 7 & 7N	SMA		

*Logic can be changed by switch on each fiber optic port inside the device.

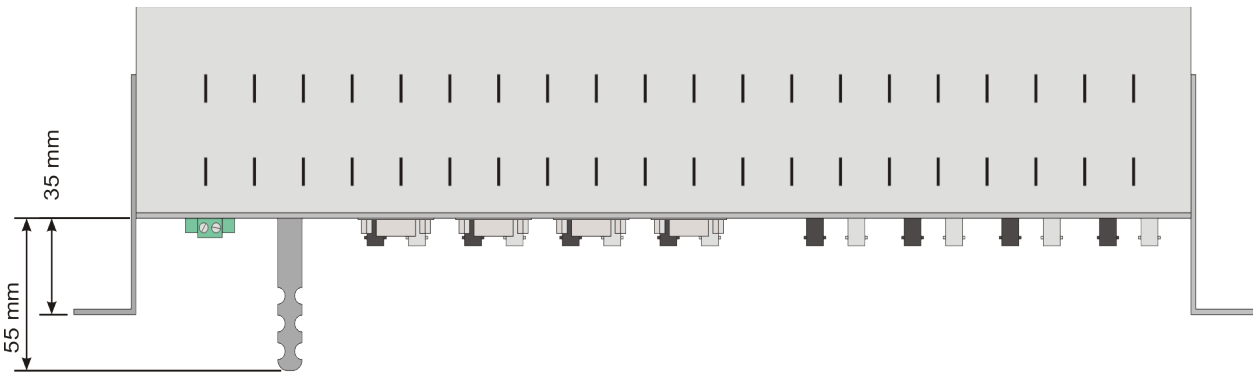
Other data		
Weight	up to 1,3 kg	
Dimensions	(W) 19" rack, (H) 1U (44 mm), (D) 115mm or 87 mm+ connectors	
Temperature range	0 °C to +55 °C	
Humidity operating	up to 95 % (noncondensing)	
Enclosure	Material	inox
	IP	40
Mount type	19" rack mount or surface mount with 4x M6 screws	
Class	I	
Overvoltage category	II	

7 DIMENSIONS



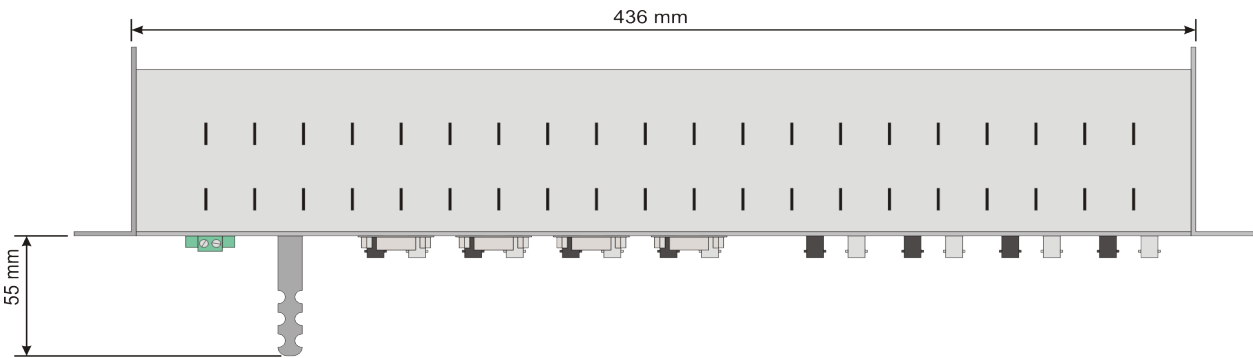
Picture 7: Dimensions front side

19" rack holding bracket position can be changed by the user. See chapter „Installation“.

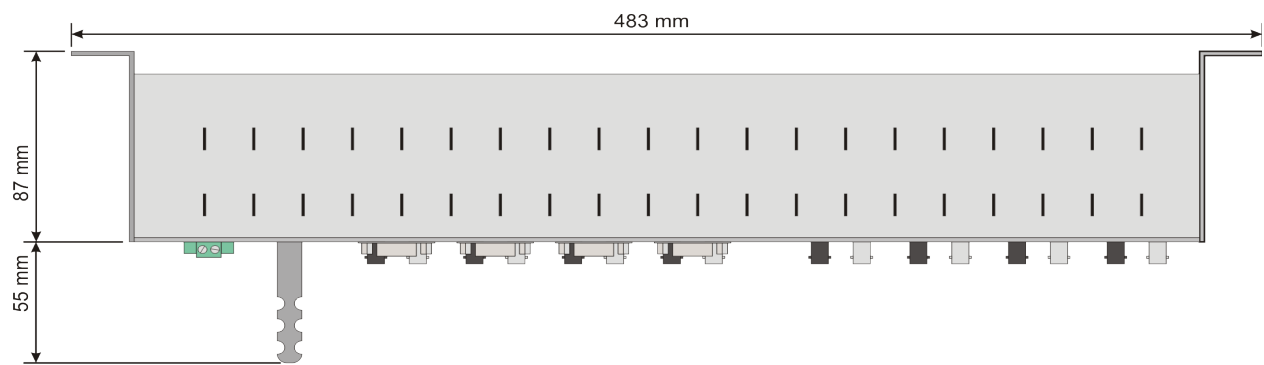


Picture 8: Dimensions top side - 19" rack mount deepened for 35 mm

The prescribed bending radius of the optical fibre cables must be observed so this type of enclosure ensures additional depth between front side of PEU 016 and cabinet door. Bend USB cable holder if it is still too long.



Picture 9: Dimensions top side - normal 19" rack mount



Picture 10: Dimensions top side - surface mount

8 ORDERING

ORDERING NUMBER POSITION:

ORDERING NUMBER:

INTERFACE NUMBER POSITION:

	1	2	3	4	5	6		19
PEU 016 /	☐	☐	☐	☐	☐	☐		☐
	↓	↓	↓					↓
Power supply :								
110 V-220 V DC, 230 V AC	5							
Master port:								
USB		U						
10/100 Base-Tx (ethernet)		E						
Power supply:								
Rserved for future use:			x					
Interfaces: (number of all interfaces in PEU 016 is up to 16!)								
None								N or leave empty
RS232 isolated, Rx & Tx support, DB9M connector								2
RS485 isolated, half duplex, DB9F connector								5
Multimode fiber optic (820 nm) ST connector, pos. logic* (signal -> light ON)								6
Multimode fiber optic (820 nm) ST connector, neg. logic* (signal -> light OFF)								6N
Multimode fiber optic (820 nm) SMA connector, pos. logic* (signal -> light ON)								7
Multimode fiber optic (820 nm) SMA connector, neg. logic* (signal -> light OFF)								7N

* User can set fiber optic logic by opening the device and set jumpers accordingly.

Example: PEU 016 / 5 . U . x . 2 . 2 . 5 . 5 . 6 . 6 . 6N . 6N . 6N . 6N . 6N . 7 . 7N . N . N has

- 110 V-220 V DC, 230 V AC power supply
- 2xRS232 with DB9 male connector
- 2xRS485 with DB9 female connector
- 2x MM Fiber Optic ST connector, positive logic
- 6x MM Fiber Optic ST connector, negative logic
- 1x MM Fiber Optic SMA connector, positive logic
- 1x MM Fiber Optic SMA connector, negative logic

Additional accessories (order if needed):

- power supply cable with „schuko“ plug for PEU 016 power supply, 2 m
- RS232 cable to user's device (state the connector & lenght, up to 15 m)
- fiber optic cables (state the connector type & lenght)
- DIN 35 holder (2 pcs) + screws (4 pcs)

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