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Instruction Manual

PMU485 • Smart Setup Hub for RS-485 instruments

1908-01

1. Important user information

Dear customer, thank you for purchasing a Physicus instrument. It is essential that you read this manual completely for a full understanding of the proper and safe installation, use, maintenance and operation of your new PMU485 Smart Setup Hub.

We understand that no instruction manual is perfect, so should you have any comments regarding this manual we will be pleased to receive them at:

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Tel: +421-905-852 073
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Warranty and liability
Physicus guarantees that the product delivered has been thoroughly tested to ensure that it meets its published specifications. The warranty included in the conditions of delivery is valid only if the product has been installed and used according to the instructions supplied by Physicus.

Physicus shall in no event be liable for incidental or consequential damages, including without limitation, lost profits, loss of income, loss of business opportunities, loss of use and other related exposures, however incurred, rising from the faulty and incorrect use of the product.

Modifications made by the user may affect the instrument performance, void the warranty, or affect the validity of the CE declaration or other approvals and compliances to applicable International Standards.

Physicus reserves the right to make changes to this manual, brochures, specifications and other product documentation without prior notice.

Manual document number: 1908-01
Publication date: August 2019

EU DECLARATION OF CONFORMITY

Manufacturer:

Physicus

Silvanska 27

841 04 Bratislava

Slovakia

Product Identification:

PMU485

Product Description:

USB / RS485 converter

Statement of Conformity:

This declaration of Conformity is issued under the sole responsibility of the manufacturer. This product conforms to the following EU directives:

Directive 2014/30/EU, Electromagnetic Compatibility (EMC)

Directive 2014/35/EU, Low Voltage (LVD)

Standards Used:

EN 61326-1:2013 , EN 61000-6-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-6

Date: 22.6.2018

Issued by:

Jan Gvozdjak

DECLARATION OF CONFORMITY

Manufacturer:

Physicus

Silvanska 27

841 04 Bratislava

Slovakia

Product Identification:

PMU485

Product Description:

USB / RS485 converter

Statement of Conformity:

The indicated product is compliant to the following standards:

FCC Title 47 CFR Part 15

Date: 22.6.2018

Issued by:

Jan Gvozdjak

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2. Introduction

Reading this entire manual is recommended for a full understanding of this product.

The triangle with exclamation mark is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the instrument.

This electrical equipment should only be serviced by authorized personnel, meaning people who have been trained and designated as “authorized” by their employers.

This manual has been written by Physicus to support Kipp & Zonen customers in using the PMU485.

2.1. Safety Precautions

Many hazards are associated with installing and maintaining instruments on towers or elevated structures. It is advised to use qualified personnel for installation and maintenance. The client is responsible for following the local safety regulations. The use of appropriate equipment and safety practices is mandatory. Check your company's safety procedure and protective equipment prior to performing any work.

While every attempt is made to get the highest degree of safety in our products, the client assumes all risk from injuries resulting from improper installation, use or maintenance of the PMU485.

2.2. Waste disposal

The pictogram showing a waste bin with a cross means that the product is subject to European Union regulations covering segregated waste disposal. This applies both to the product itself and to any accessories marked with the same symbol. Disposal of any such item as unsorted domestic waste is not allowed.

The PMU485 contains one AA sized 14500 rechargeable Li-ion cell that is easy to remove before discarding the PMU485.

2.3. Lithium battery safety

Fire and explosion hazard.

Lithium batteries may get hot, explode or ignite and cause serious injury if exposed to abuse conditions.

The battery is pre-installed, pre-charged and there’s no need to open the instrument and/or replace the battery.

2.4. Customer support

In case you bought the PMU485 via a Kipp & Zonen office or distributor and you need support, please contact:

Kipp & Zonen B.V.
Delftechpark 36, 2628 XH Delft, - or
P.O. Box 507, 2600 AM Delft,
The Netherlands

Tel. +31 15 2755 210
support@kippzonen.com
www.kippzonen.com

Otherwise contact:
Physicus
Silvanska 27
841 04 Bratislava

Slovakia
Tel: +421-905-852 073
Email: physicus @physicus .eu

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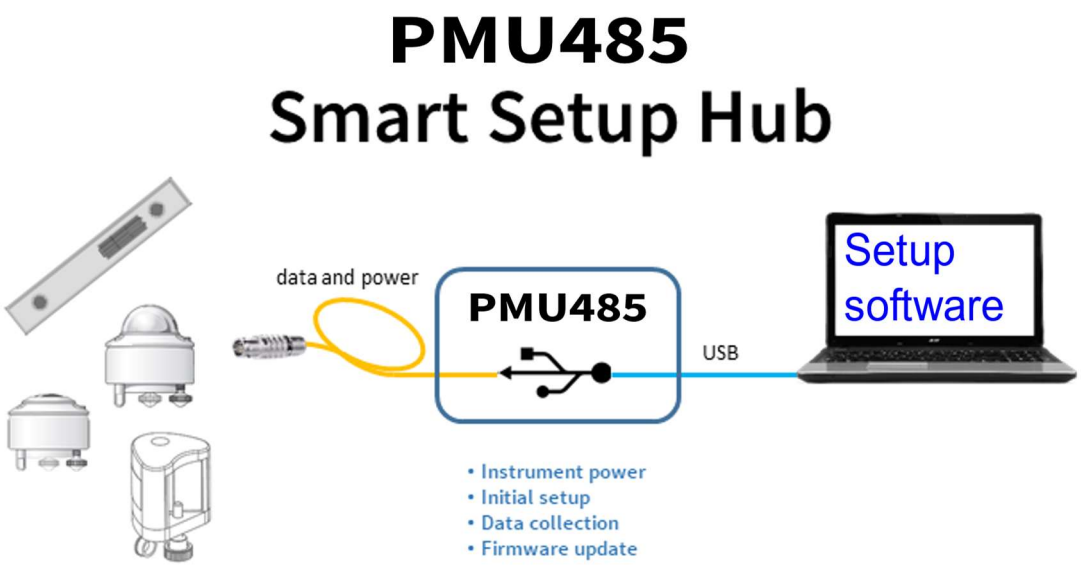
3. Product overview

This manual provides information related to the installation, maintenance, product specifications and applications of the PMU485 Smart Setup Hub.

3.1. The PMU485 Smart Setup Hub

The PMU485 Smart Setup Hub is a unique, high quality tool to convert the computer USB power into steady 12V power and the USB serial data into a 2-wire RS-485 connection.



3.2. Included with the product

Check the contents of the shipment for completeness (see 3.4) and note whether any damage has occurred during transport. If there is damage, a claim should be filed with the carrier immediately. In the case of damage and/or the contents are incomplete, contact your local Physicus supplier.

The PMU485 Smart Setup Hub comes with a 1.5m USB cable to connect to the computer and a screw terminal with cap for the RS-485 connection. The customer has to supply his own cable between the instrument and the PMU485.

3.3. Intended use

The PMU485 Smart Setup Hub is a tool to function as an interface between a computer and an instrument with a 2-wire RS-485 interface.

The PMU485 Smart Setup Hub is not optically isolated and intended for indoor use only.

Short external use only under dry conditions to e.g. upgrade firmware of an instrument is possible as long as the instrument is (temporarily) not connected to other devices or instruments and not connected to a host, data logger or SCADA system.

3.4. What's in the box

In the box are: The PMU485, USB cable, connector and housing, download card.

4. Installation

Please follow the instructions in this section carefully for the mechanical and electrical installation of the PMU485 Smart Setup Hub.

Note do not connect the PMU485 to a computer, until instructed to do so

4.1. Tools required

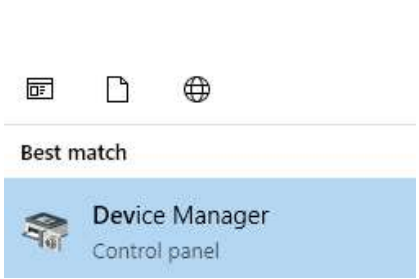
A good quality 2.5mm slotted screwdriver.

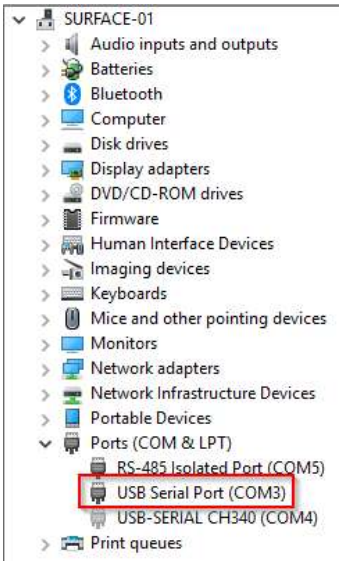
4.2. Pre-installation

Before connecting an instrument it is wise to just attach the PMU485 to the computer to let it install the FTDI drivers needed. The needed drivers come standard with Windows 7, 8, 10 or are automatically downloaded when the PMU485 is plugged in.

4.3. Finding the COM port

One way of checking the COM port number is by using the standard Windows Device Manager via Control Panel





Write down the COM port number as your software will need it to function properly.

4.4. Connecting the instrument cable to the PMU485

It is advised to temporarily remove the green screw terminal from the PMU485, connect the wires from the instrument and re-install the screw terminal.

Green screw terminal, can be unplugged

+12V to the instrument to be connected
Power Ground
Data Ground (internally connected to PWR GND)
D- signal
D+ signal

Figure 1 Connector components

Figure 2 Assembled connector and housing

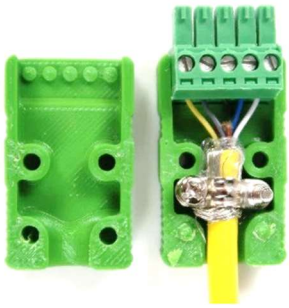


Figure 3 Connector with cable and strain relief

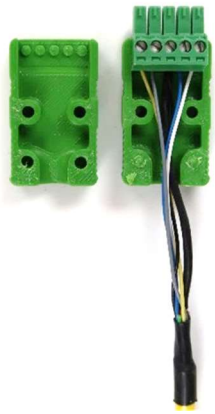


Figure 4 Connector without strain relief

Common Kipp & Zonen, IMT and Lufft connections using their supplied cables:

UPM485		SMP/SHP/SGR SUV/DustIQ		RT1 (black data cable)		RaZON AUX (data only)		IMT panel temperature		Lufft WSx UMB
+12V out		white		red		not used		red		pin 1 brown
GND		black		blue		black		black		pin 2 white
GND		blue		green		not used		not used		not used
D-		grey		grey		white		orange		pin 4 yellow
D+		yellow		yellow		brown		brown		pin 3 green

On the left-hand side there are 3 LED indicators

Green = Received data from instrument

Yellow = Transmit data to instrument

Red = Power from USB has switched on the PMU485

4.5. My device needs a Start from Boot

When the attached instrument needs a Power Off / Power On cycle sometimes called Start from Boot, it is **not the USB** connector you must temporarily unplug but the **green terminal screw block** that needs to be unplugged.

Unplugging the USB connector interrupts the computer's serial communication abruptly and could cause the used RS-485 or Smart Explorer software to crash.

To solve a possible crash the PMU485 USB connector must be unplugged and the software stopped. Once the red LED of the PMU485 is off the PMU485 connector can be plugged in again and the software can be restarted.

5. Specifications

Physicus reserves the right to make changes to specifications and other product documentation without prior notice.

5.1. Electrical

Ambient working temperature	0 to +45˚C
Storage temperature	-20 to +60˚C
IP Class	IP30 for indoor use only
Communication to host	USB 2.0 to computer
Communication to instrument	Modbus® over 2-wire RS485 to instrument 300 – 115.200 baud
Power output	12V, 300mA in 5s peak,10% duty cycle and 200mA sustained
Communication chip	FTDI FT231X based USB 2.0 full speed
Current drawn from USB port	50mA for low power instruments like SMP, SGR, SHP, SUV,PH1, PR1 and RT1 Each extra low power instrument adds 10mA to the USB load. 200mA sustained for DustIQ 400mA peak for DustIQ The USB port needs to be capable of delivering 400mA of current.
RS-485 isolation	None
12V power isolation	None
Internal battery	One Li-ion 14500, 22 gram
Supported number of attached instruments due to power constraints	Low power instruments like up to 10 High power instrument like DustIQ one.

5.2. Dimensions and weight

Dimensions packed	t.b.a.
Dimensions unpacked	6 x 6 x 3 cm
Weight packed	t.b.a.
Weight unpacked with USB cable	150 g

6. Trouble shooting

There are no user-serviceable parts within the PMU485 and it must not be opened or taken apart without the agreement and instruction of Physicus and only by qualified personnel.

6.1. Output signal not present or incorrect

The following contains a procedure for checking the PMU485 in case it appears not to function correctly:

1. Check the that the instrument wire connections are secure to the green screw terminal. (power and D+ and D-)
2. Check the 12V power output if possible with a multimeter
3. Check that your program is using the Modbus® address that the instrument really has.
4. Check that the instrument's baud rate, stop bits and parity are the ones your program is using.
5. Check all other communication settings of your program like virtual DTR, CTS , polling interval, response timeout and consult the software manual when in doubt.
6. Check if you are trying to read from or write to the right and allowed Modbus® registers in your instrument. Consult the manual that came with the instrument.
7. Check the LEDs.
   a. The red one should be on continuously
   b. The green one should flash to indicate data going to the instrument
   c. The yellow should flash to indicate data coming from the instrument
8. If you haven't used the PMU485 for many months the internal Li-ion battery could be discharged too much. Leave the PMU485 attached to the computer but without an instrument attached and for a few hours. Then retry.

Any malfunction or visible damage should be reported to your Physicus representative, who will suggest the appropriate action.

6.2. Frequently Asked Questions

The most frequently asked questions are listed below.

Q: Which products are supported by the PMU485?
A: Currently all Kipp & Zonen Smart instruments are supported: SMPxx, SGRxx, SUVx, SPH1, PR1, PH1, RT1, DustIQ as well as the RaZON$^+$ Solar Monitoring System in 2-wire mode only.

Q: Does the PMU485 work with non-Kipp products?
A: Most likely so when the instrument works on 12V, uses less than 200mA and uses 2-wire RS485.

Q: What to do, when I get a very high COM port number and my software doesn't understand that?
A: Unplug the PMU485, in the Device Manager select "*View, Show hidden devices*" and remove all unused entries under Ports (COM & LPT) including the PMU485, plug the PMU485 back in. It should now get a much lower COM port number.