

Operating instructions

System Monitor PSL



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The System Monitor PSL is used to monitor and control all philippi PBUS compatible devices. It is the central display and user interface. The System Monitor PSL is used to monitor, control and manage the electrical system. Several System Monitors can be mounted in one P-Bus system to display different information about tanks, batteries, electrical current or AC shore power simultaneously. The Monitors PSL can be installed at different locations on board to be able to retrieve the desired information independently.

With the system monitor as the central unit, you can expand the electrical on-board system step by step from basic system, e.g. with only one shunt SHC as battery monitor, to a full digital control and monitor systems including digital switching and energy management.

1 Safety Instructions

No changes may be made to the device, otherwise the CE - sign will be cancelled. The PSL should only be installed by a qualified electrician. Before installing and mounting the PSL, disconnect the battery poles. Pay attention to the correct polarity of the battery connection

The present assembly and operating instructions are part of the component delivery. It is - important for later maintenance work - be kept in a safe place and passed on to any subsequent owners of the meter.

1.1 Disclaimer of liability

Neither the compliance with the operating instructions nor the conditions and methods of installation, operation, use and maintenance of the PSL can be monitored by philippi electrical systems. Therefore, we do not assume any responsibility or liability for loss, damage or costs resulting from incorrect installation and improper use.

1.2 Guarantee

On the basis of our "General Terms and Conditions - Paragraph 7", we provide a guarantee for the delivered equipment. These terms and conditions are the basis of all sales and delivery offers, they are printed in our catalogues and attached to all quotations and order confirmations.

1.3 CE Marking

This device meets the requirements of the EU directives:

2014/30/EC "Electromagnetic compatibility

The conformity of the device with the above mentioned directives is confirmed by the CE mark.

2 Scope of delivery

1x	System Monitor PSL incl. operating instructions
1x	Plug-in terminal 3-pin for connecting the power supply
2 x	M12 terminating resistors (each 1x male/female)
1x	M12 T-cable

3 Technical data

Supply voltage	DC 8-32 V
Supply current consumption	100 mA @ 12 V for operation with lighting 100%. 10 mA @ 12 V at stand-by
Dimensions:	157.5 x 105 x 40 mm
Panel cut-out:	142 x 85 mm

4. installation

4.1 Equipment required

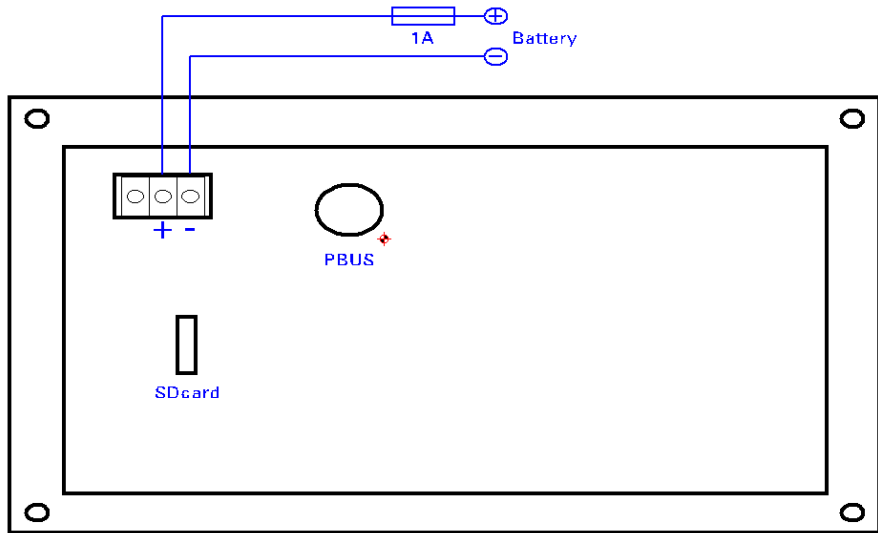
The following parts are required to install the PSL:

- 2x terminating resistors M12 (included in the scope of delivery of the PSL)
- 1x M12-T cable for connecting the system monitor PSL to the P-BUS with other components, e.g. shunt SHC, tank interface CMT (included in the scope of delivery of the PSM2)

For each additional component a additional network connection cable M12 (NMEA2000®) is required.

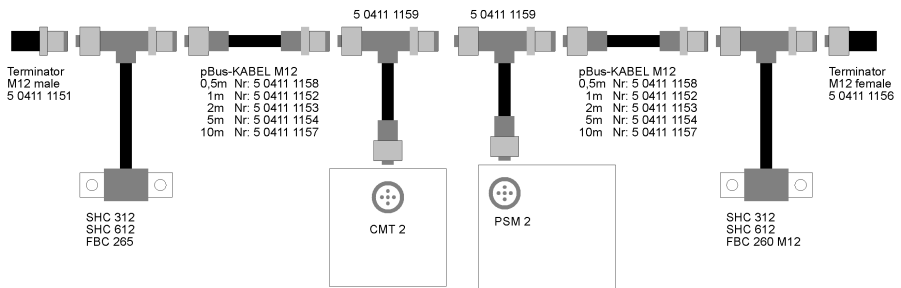
4.2 Installation and connection PSL

Mount the system monitor PSL in a protected, dry and clearly visible place so that it can be read at any time. The required installation cut-out is 142x85 mm, the required minimum depth is 40 mm.



4.3 PBUS system structure

All components connected to the PBUS are interconnected by PBUS M12 network cable (NMEA2000®). The order of the individual components does not matter.



A terminating resistor must be plugged in at each end point.
Without the two terminating resistors the PBUS is not functional!

5 Quick commissioning of the PSL

Portrait/landscape format

The PSL is supplied as a single unit in landscape format and, in the case of panel integration, as a portrait version. You can switch between both versions by loading the software. It is available for download on our website under Download. The file name for the landscape format is PB100xxx-000 and for the portrait format PB100xxx-270.

The large, backlight colour touch screen display informs you about all values of the electrical system that are available.

The following functions are available in the header from left to right:

Stand-by Setup Alarms Date and Time Arrange Page



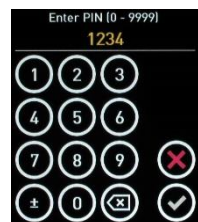
To activate the standby mode, you have to push the Standby button at the left side from the header. By touching the display at any position the PSL returns to the active operating mode.

For initial commissioning, it is necessary to have connected and switched on all devices belonging to the PBUS so that the system monitor PSL can detect all devices in order to include them in the internal device list.

5.1 Password protection (PIN) of the Setup menu

Please press the cogwheel in the top left corner of the main menu. Afterwards you will be asked for the PIN, which is "1234" in the delivery state. After successful entry with subsequent confirmation OK you will reach the Settings - Menu.

Here you select "PBUS Network".



5.2 Recognition of all devices connected to the PBUS

In the PBUS NETWORK settings, select the item "Update device list" if you miss a device.

Normally devices which are already added at this point are added automatically. If devices have been removed in the meantime or are not ready for operation, they are automatically removed from the device list.

If duplicate devices are listed after the device login, the function Renew device addresses must be used to renew the addresses of the connected and active PBUS components.

Setup PBUS Network						
PBUS Master		Connected Devices				
		Device	SN	ID	SW	HW
Renew Device Addresses		CMT2	12715	4	21	TG1
		CMT2	12715	5	21	TG2
		CMT2	12715	6	21	TG3
Refresh Device List		CMT2	12715	7	21	TG4
		SHX 300-C	7771	0	8	
		FBC 265	12975	0	15	
		TPC4	9526	3	2	
		TPC4	9526	4	2	
		TPC4	9526	5	2	
		TPC4	9526	6	2	

NOTE:

The function "Renew device addresses" is only active if the "Master PSL" is set. Please note that if there are several PSM 2 or PSL system monitors in the system, the "Master PSL" (for PSM2: "Address 0") is only set for one monitor!

5.3 Setting the operating parameters

After all devices have been detected, the individual settings of all registered devices can be made in the menu item "Devices". See chapter 6 and the explanations in the individual component manuals.

5.3.1 Updating a new device list

Some interfaces such as tank or temperature interfaces offer more inputs or outputs than are needed. These are set to "not active" in the device configuration.

After changing the settings, they are greyed out. To remove them, the device list must be updated again.

5.4 Arranging the icons



Press the "Arrange" button for 2 seconds on the main page and the button page, then the icons will be re-sorted and arranged. Afterwards the icons can be arranged on the main page and the button page by moving them around at your own choice. There will always be an exchange of one icon for another to avoid empty spaces between them.

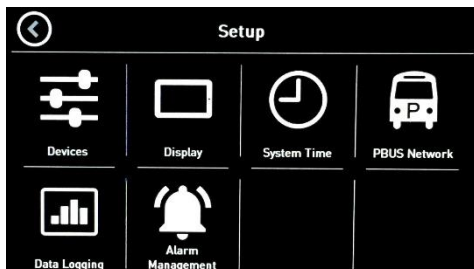
To do this, the button (Arrange) must be pressed briefly and when it is highlighted in green, the icons can be moved by dragging them to another place that is already occupied.

Finally the button "Arrange" must be pressed again briefly to save the arrangement. Done!

This can/must be done separately for the information and counter side. The energy side is subject to a fixed arrangement

6 Settings

All settings for the PSL itself and the connected interfaces are made here. The settings are stored locally in the respective interfaces and are available to other system monitors immediately after changes are made.



6.1 "Display" settings

Device info

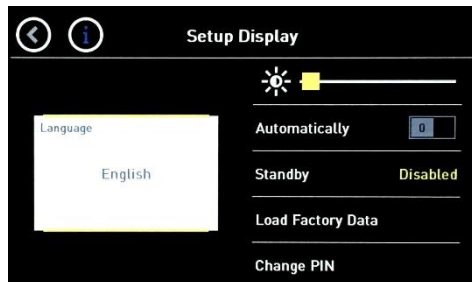
Pressing the "i" symbol indicates the software status of the PSL monitor.

Language

The language can be set in the left field.

Brightness

The brightness of the display illumination can be changed between 20 and 100%.



Brightness Automatic

The brightness of the display illumination is automatically adjusted by the light sensor.

PSL Restart

The PSL is restarted.

Stand by

After an adjustable time after the last touch of the screen, the PSL goes into standby mode to save energy. The time span is adjustable between 20 and 600 seconds. If 0 is set, the PSL does not go into standby mode automatically.

Load factory settings

The PSL is reset to the delivery status.

Change PIN

Access to the setup and optional operation of the battery main switch is protected by a 4-digit PIN. This PIN can be changed by the user. If the PIN has been forgotten, the PIN can be reset (factory setting 1234) by pressing and holding the touch screen in the PIN change screen (15 sec.).

6.2 P-BUS network

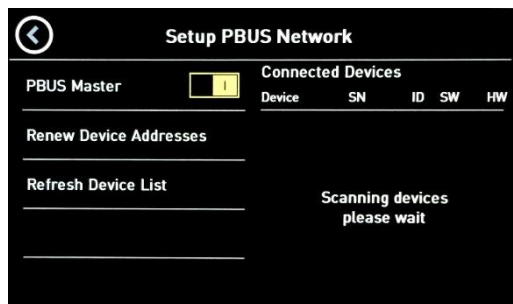
These functions may only be carried out by the commissioning engineer / system integrator, as this will delete or change the configuration of the system!

Connected devices

All active devices connected to the PBUS are displayed.

Master PSL

If there is only one System Monitor PSL in the network, the Master PSL must be set to activate the initial address assignment of the connected devices! If there is more than one PSL, this must be set for any one PSL and not for the others.



Renewing device addresses

When this function is selected, the sub-addresses of the connected and active PBUS components assigned by the system monitor PSL are reset. This is only necessary if new components are added to the system that were previously already in use in another system and duplicate device addresses would therefore exist in the current system. This function may only be used in this case, as the display sequence of the individual devices may change.

Register devices

All devices connected and active on the P-BUS at this time are determined. After the scan has been completed, all detected devices are listed. Devices added at this time are added automatically. If devices have been removed in the meantime or are not operational, they are automatically removed.

6.3 Logging

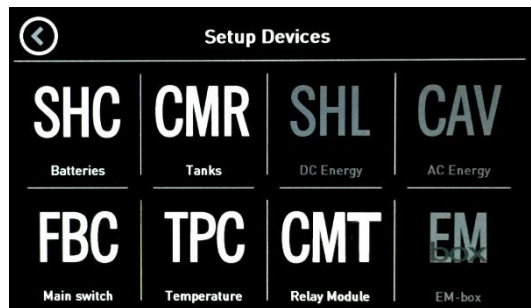
This function is only active when an SD card is inserted. This allows all measurement data to be recorded and later analyzed on a PC. One file is created per existing instance. The data is saved in .CSV format and can later be read in e.g. in a spreadsheet for analysis.

If the logging function is activated, the time span between two log entries can be set from 1 to a maximum of 60 minutes. For each device group you can specify whether the data should be recorded.



6.4 Equipment

In this submenu all devices connected to the P-BUS are configured. Please refer to the instructions of the individual P-BUS compatible devices. Only individual settings are available for Mastervolt units. The basic configuration must be done via the MasterAdjust software.



6.4.1 PowerPlex (Digital Switching)

This is where the screen buttons are assigned to the input numbers of the Node IDs in the Powerplex configuration. This has to be done on each PSL individually, because each PSL monitor should be configured as an independent node.

The following settings are possible in this submenu:

Load configuration from SD card:

A previously saved configuration is loaded from the SD card.

Save configuration on SD card

The current configuration is stored on the SD card.

PowerPlex Node

Enter the ID of the E-T-A PowerPlex module on which the virtual feedback information for the PSL is available.

PSL node

The ID of the virtual E-T-A PowerPlex module is entered here, under which node address the PSL sends its switching commands.

Key ...

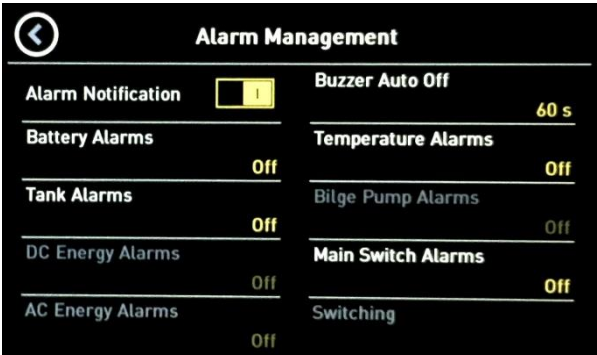
For each icon (screen key), an icon and the text displayed can be selected. After calling the switch page, the buttons appear according to the programming. The buttons must be assigned according to the programmed ID, and can also be moved later using the Arrange function.



Pressing the on-screen button triggers the switch command defined in the PowerPlex system.

6.5 Alarm management

To display battery, energy, temperature, main switch and tank alarms, alarm handling can be activated for this monitor. If the alarm handling is switched off, no alarms are displayed. When alarm handling is switched on, a device-specific (battery, energy, temperature, main switch and tank) setting can be made.



- Off:

No alarm is displayed for this unit.
- Message:

Only one message is displayed on the screen for this unit.
- Message + Buzzer

For this unit, a message is displayed on the screen and Buzzer at the same time an acoustic signal sounds when the Screen illumination.

6.6 System time

The PSL has a battery-backed real-time clock that provides a meaningful time stamp in the logging function. The alarm events can also be interpreted in time. The time and date are set using the keypads.

If the watch has a rate inaccuracy, this can be adjusted via "Clock adjustment".

Here 1Hz corresponds to a deviation of 2.6 seconds per day.



If the monitor starts with a date in the year 2000, the time has not yet been set or the built-in button cell is empty and must be replaced. To do this, the rear cover must be removed and the button cell must be pushed out of the holder and replaced with a new battery (CR2032 - 3V).

Attention:

If there are several PSL/PSM2 in the network, the master PSL or PSM2 with address 0 sends the date/time to the other participants. It must therefore be ensured that in this case only one PSL as master or the PSM2 has the address 0. If this is not the case, a corresponding message appears in the alarm list and the monitors must be configured accordingly.

7. Operation

All available data is displayed on 3 main pages which can be switched by wiping vertically or pressing the page change key. If more information is available than can be displayed on one page, you can switch between information by wiping horizontally.



7 Alarms

If alarm handling is activated, this is indicated by a green alarm icon. In case of an alarm, the alarm icon turns red and a list of all alarms present in the system is automatically displayed as soon as a new alarm is reported.

If it is set in the settings that the display of a new alarm should be accompanied by an acoustic and optical signal, the display

illumination flashes in time with the acoustic signal in case of an alarm.

The acoustic signal sounds for a maximum of 60 seconds, but can also be switched off prematurely by touching the screen.



7.1 Main page Information - Batteries

Required interface/components: SHC 312 / SHC 612 / EM-box.

If an active shunt (battery management) is available for the displayed battery group, the colored bar height of the battery indicates how much remaining capacity is available.

At the same time, the available remaining capacity in % and the voltage and charge/discharge current of the battery are displayed.

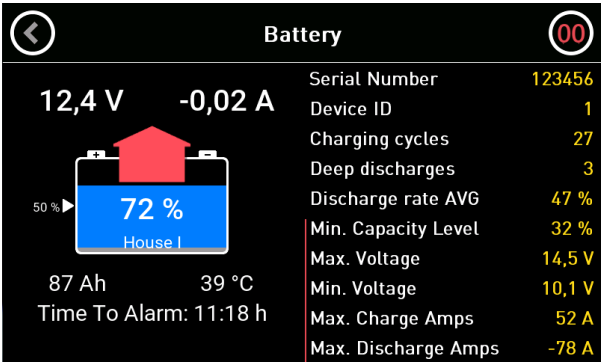


Alternatively, by touching the display, it is possible to switch between the remaining capacity in Ah, the remaining time until the capacity alarm or the estimated charging time in charging mode and with the temperature sensor connected to the shunt.

The current display is dynamically adjusted, i.e. only 3 digits are displayed at a time for better readability (e.g. 120A, 45.5A or 0.01A). A minus sign in front of the ampere number indicates that the battery is being discharged. If there is no minus sign, the battery is charged with the amperage shown on the display.

By long pressure on the battery symbol a detail page is called up which provides detailed information about the battery.

The blue area shows the usable capacity up to the set capacity alarm. The dark blue area shows the theoretically available capacity until the battery is completely discharged (deep discharge), which should be avoided to avoid damaging the battery. If the shunt SHC has already detected during operation that the nominal battery capacity is not available, e.g. due to aging influences, the unusable part of the capacity is shown in a dark grey area.



If the message "Not synchronized" appears in the battery symbol, the shunt SHC has been restarted and the battery capacity display does not yet correspond to the true capacity level. To do this, the battery group connected to the shunt SHC must be fully charged with a charger so that the capacity display can synchronize with the battery. The message then disappears automatically.

If the battery capacity falls below the set threshold, a warning message appears on the display. The remaining capacity is shown in orange and the battery symbol is shown in red.

If the battery is detected as almost empty or deeply discharged or in case of overvoltage (battery voltage > 15 V), a warning message appears on the display. The remaining capacity is shown in orange and the battery symbol is shown in red.

If only one voltage measurement (sufficient for starter battery) is available, this is indicated by a monochrome display and the measured voltage is shown. If the battery voltage drops below the set alarm threshold, the battery is displayed in red.

7.2 Main page Information - Tank

Required interface: CMT2

7.2.1 Functions Tanks

By touching any tank, the display can be switched between none, % and litre display
If a tank is configured as a flow sensor, the level can be adapted to the new situation by tapping the tank designation below the tank level bar. (e.g. setting the tank to 100%). For a watermaker it is recommended to enter 100 times the hourly output as tank size.



7.2.3 Troubleshooting tank sensor

If the tank monitor shows wrong values or (---), first check the tank sensor for function or correct connection. Also check the wiring between tank sensor and CMT, as this is the main source of error.

If the displayed values are completely unreliable, check the supply voltage for the CMT2 and the encoders. It is at least 10V.

7.3 Main page Information - Temperature

Required interface/components: TPC4

This screen displays the temperatures of the respective sensors. By pressing and holding the respective temperature button, further information such as the highest/lowest temperature with time of day can be read.

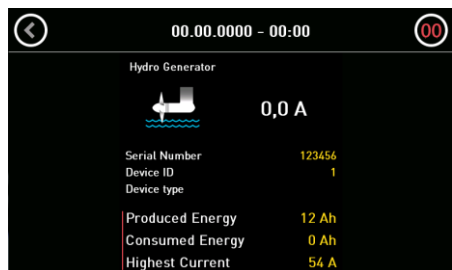


Temperature	
Battery Room	
 37 °C	Serial Number 123456 Device ID 1 Connector TP2 Sensor Type temp-HT
Alarm Low Temp. 5 °C	Highest Temperature 06.02.2020 12:52 57 °C
Alarm High Temp. 35 °C	Lowest Temperature 06.02.2020 13:04 16 °C

7.4 Main page - Energy detail

Required interface/components: SHL 312 / EM-box.

This screen shows the energy balance of the onboard system. Depending on the configuration with current measuring shunts SHL or an EM-box, the current flows can be analysed in detail, i.e. which charging sources supply the energy and which sinks (consumers) consume how much energy. It is also possible to determine whether the entire battery system supplies or absorbs energy.



7.4.1 Energy functions

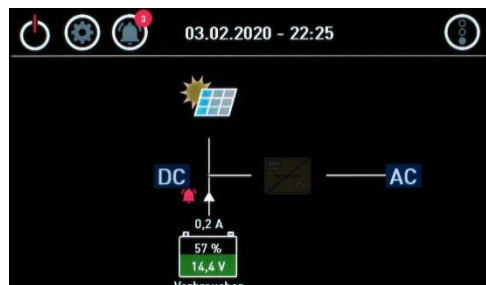
By touching the source icons, the current display can be switched to show the ampere hours supplied or consumed since the last meter reset. The display automatically changes back to the ampere display after 1 minute.

For the ACE series chargers, tapping the icon provides additional information that is displayed in a separate window. This additional information possibility is indicated by a small *i* in the upper right corner of the symbol.

7.5 Energy page

Required components: LAU / SHL / CAV / Studer interface / Mastervolt interface

This screen shows the energy situation of the DC and AC system at a glance. The interface between the DC and AC system is the combined inverter. The upper icons show the available sources.



The charging sources are shown in the upper part, the sinks (consumers) and the battery system in the lower part.

In this view, all batteries are grouped together as one battery to make it easier to understand. For a detailed analysis of the battery system, the submenu Battery is available.

7.5.1 Detailed information on battery charger

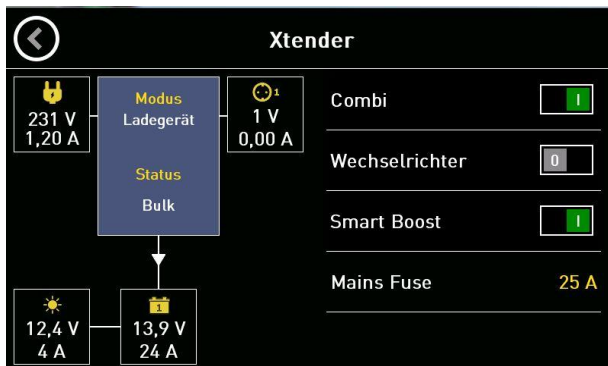
The Charger screen displays the parameters of the ACE and ALC series charger. The Limit+, Limit- keys can be used to limit the charge current and activate the silent mode.

7.5.2 Detail page Combi-inverter

Required interface/components: Studer X-tender with XCOM-CAN or Mastervolt Combi-Ultra, or Combi-Master with Philippi interface

This screen shows the energy situation of the AC system when a combi-inverter is connected. By tapping the middle blue button, the most important settings for operation can be made:

- Device ON/OFF
- Inverter ON/OFF
- Whisper mode (only with Mastervolt)
- Setting the shore power current



7.6 Main page Switch - Main switch

Required interface/components: FBC 265 / TSC / EM-box.

This screen shows the position of the main battery switches.

The main switch can be switched on/off by touching it. The button must be pressed for half a second until a short signal tone sounds, after releasing the button the switching function is triggered.

If a PIN is required for operation, this is indicated by a small lock.



7.6.1 Switch page - CMR - Function

Required interface/components: CMR4.

Depending on the configuration of the individual CMR channels, the switching function (bilge pump, consumer, ...) and the switching status is displayed.

If the channel is set as a consumer, it can be switched on or off by pressing the screen button of the consumer. The switched-on consumer is indicated by a green light symbol.



(in preparation:

If the button is pressed for a long time, a new screen appears on which the brightness of the light can be adjusted, provided that dimmable LED lights with a corresponding control input have been connected.)

8. software update

To update the software of the PSL a Micro-SD card is required. After receiving the software, the file must be copied to the micro-SD card (without folder, top level).

For the update, the power supply must be disconnected from the PSL and the SD card must be inserted into the holder on the back.

Then the power supply can be plugged in and the screen shows that new software has been detected and will be installed automatically. During the update process the progress is indicated by a blue bar. The SD card can remain in the holder and be used to record data.

If the PSL starts normally after inserting the SD card, no newer software was detected.