

INSTRUCTION MANUAL

System Monitor PSM 2



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1 Safety references	3
1.1 Exclusion of liability	3
1.2 Warranty	3
1.3 CE Conformity	4
2 Content	4
3 Technical data	4
4. Installation	4
4.1 Necessary equipment	4
4.2 Installation and connection of the PSM2	5
4.3 System arrangement PBUS	5
5 Quick operation Start-Up of the PSM2	6
5.1 Password protection (PIN) of the Setup menu	6
5.2 Identification of all devices connected to the PBUS	7
5.3 Adjustment of the operational parameters	7
6 PSM Setup	7
6.1 Setup „Display “	8
6.2 P-BUS Network	9
6.3 Data Logging	10
6.4 Device	10
6.5 Alert management	10
6.5 System time	11
6.7 Consumer (digital switch)	11
7. Operation	13
7.0 Alarm display	13
7.1 Submenu battery	14
7.2 Submenu Tank	15
7.2.1 Features of Tanks	15
7.2.2 Power save Mode CMT2	15
7.2.3 Troubleshooting tank sensors	16
7.3 Submenu Energy	16
7.3.1 Features Energy	16
7.3.2 Battery Charger ACE	17
7.4 Submenu main switch	17
7.5 Submenu AC (LAU)	18
7.6 Submenu AC (combi inverters)	18
7.7 Temperature	19
7.8 Consumer	19
8. Software Update	20

The System Monitor PSM2 is designed for the supervision and control of all philippi components that are connected to the PBUS system. It is the main display and operational interface, and the electrical system can be supervised, operated and controlled using the PSM2 system monitor. Additional System Monitors PSM2 can be added to show different information simultaneously at the same location or at various locations to enable monitoring and control from multiple stations. These monitors will allow all information to be shown independent of each other.

The System Monitor PSM2 operates as a central monitor, and the system can be easily expanded from a simple battery monitor comprising of a PBUS system monitor plus a battery Shunt SHC, up to a multi-functional monitor and control panel in a digitally switched CAN-bus system.

1 Safety references

Unauthorised change to the equipment will invalidate the CE sign.

The installation of the PSM2 should be made only by electrical specialists.

Before connection of the PSM2, the battery terminals must be disconnected.

Important - pay attention to the correct polarity of the batteries!

The inlet of the power supply must be protected by a fuse of a suitable rating.

The assembly and operating instruction is a component of the PSM2 package. It must be kept (for reference). Importantly: - for later maintenance work - and for the use of subsequent owners of the equipment.

1.1 Exclusion of liability

Both adherence to the operating instruction, and the conditions and methods used during installation, use, and maintenance of the PSM2 cannot be supervised by philippi elektrische systeme gmbh. Therefore, we do not take any responsibility for loss, damage or costs, which develop due to incorrect installation and/or inappropriate use or operation.

1.2 Warranty

philippi elektrische systeme gmbh grants a two-year limited warranty due to our „terms of sale and delivery - passage 7“ for our devices. This “terms of sale and delivery” are the basis of all our sales and deliveries. They are printed in our catalogues and part of all quotations and delivery confirmations.

1.3 CE Conformity

philippi elektrische systeme gmbh certifies herewith, that the System Monitor PSM2 fulfils the requirements of the European Regulation:

2004/108/EG “Electromagnetic compatibility”

The compatibility of the device is certified by the CE-sign.

2 Content

1x	System Monitor PSM2
1x	Pluggable 3-pole terminal for the connection of the power supply
2x	M12 terminators (male + female)
1x	M12 T-cable
	This instruction manual

3 Technical data

Nominal voltage	DC 8-32 V
Power consumption	100 mA @ 12 V operating at 100% illumination. 5 mA @ 12 V at stand-by mode (illumination 0%).
Dimensions:	105 x 105 x 40 mm
Cut out:	88 x 88 mm

Software Versions

FEB 2017	VERSION 1	First Version
MRZ 2017	VERSION 2	Second version with temperature display
JUN 2017	VERSION 3	Third version with integration of PSS / EM-box V3

4. Installation

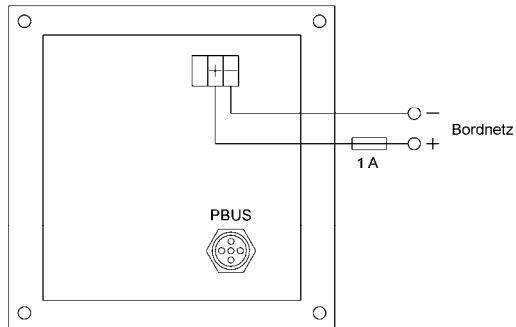
4.1 Necessary equipment

Following parts are needed for the installation of the PSM2:

- terminator female and male (content of the PSM package)
- M12-T-cable for the connection of the monitor to the PBUS (content of the PSM package)
- For each further PBUS component you need a further M12-connection cable.

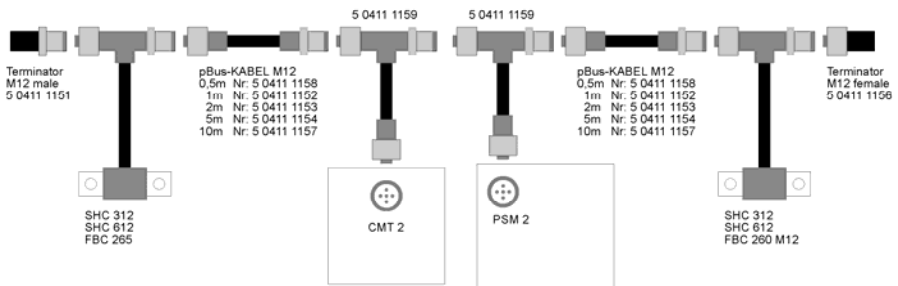
4.2 Installation and connection of the PSM2

Install the PSM2 in a dry and visible place, so that it can be read off at any time. The necessary installation cut out is 88 x 88mm (3.5" x 3.5"), the necessary minimum depth is 40mm (1.6").



4.3 System arrangement PBUS

All PBUS components are connected via a PBUS network cable. The components can be in any order or sequence.



Ensure that the terminators are installed at each end of the network. Without these terminator resistors the PBUS will not function.

5 Quick operation Start-Up of the PSM2

On the large illuminated colour touch screen display, information of the available systems is displayed and operation and adjustments are possible. If a device is connected to the network and activated, details will be shown in the appropriate sub menu.

In the headline, the following functions from left to right are available:



- 1) To activate the standby-mode the left switch must be touched upon. If you want the PSM2 to return into operating mode you can touch the screen anywhere.
- 2) The display is going to glow in the brightness which is adjusted for the standby-mode in the Setup (Chapter 6.1.4). By touching the display one more time it's going to switch back into day-mode.
- 3) Display of Time
- 4) Display of the alarm list
- 5) Settings (Gear)

Before using the PSM2 System Monitor for the first time it is necessary to connect all components to the PBUS network and ensure that they are all powered up. When this is accomplished, the PSM2 System Monitor will recognise all the devices connected to the network and will add them to its memory.

5.1 Password protection (PIN) of the Setup menu

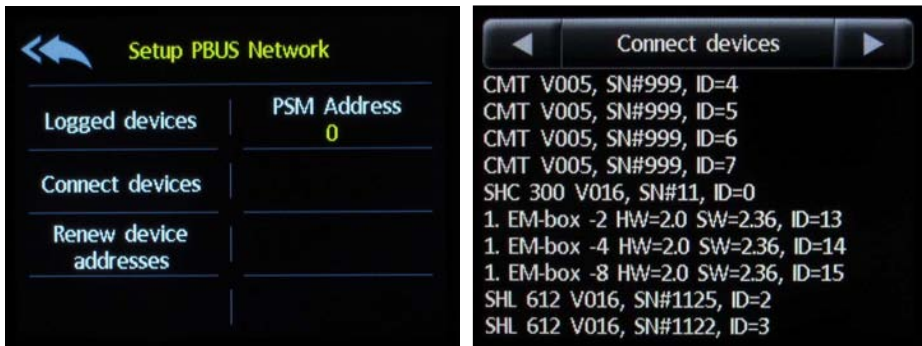
The Setup menu is password protected. When you choose "Setup" from the main menu you will be asked for a PIN, which is factory set to 1234. Once the password is entered and "OK" is pressed, the screen will change to the Setup menu page.

NOTE: If the language on the main menu appears to be German, press the button "Einstellungen", enter the PIN "1234" and press OK. On the next screen press the button "Anzeige", then the button "Sprache" and then you can choose the language.



5.2 Identification of all devices connected to the PBUS

In the Setup menu, press “Display”, and on the next page press the arrow in the top right-hand of the screen to go to page 2. On page 2, pressing “Connected Devices” initiates a scan of all devices connected and shows them on the “Logged Devices” list. If new devices are added they are logged on automatically. If changes are made to the connected devices (e.g. new devices, devices omitted or not ready-to-operate) these changes will be recognised automatically and only the connected devices will be listed. **ATTENTION: This function is only available on the PSM2 Monitor with the ID “0”.** If additional Displays are added, they must have different addresses; i.e. “1”, “2”, etc.



If duplicate devices are listed after the device login, you to have to press the button “Renew device addresses” in order to reset the sub-addresses of the connected and active PBUS components.

5.3 Adjustment of the operational parameters

After identification of all devices you can adjust the individual parameters of the tanks, batteries etc. Please have a look at the explanations of the parameters of each component’s manual.

6 PSM Setup

All settings of the PSM2 display and the devices connected to the network are made in the Setup menu. Settings for the connected devices are saved on the devices themselves, and can be accessed and adjusted from any PSM2 System Monitor on the network.



6.1 Setup „Display “

Language

Please choose your language.

Brightness operation

You can adjust the brightness of the display illumination while in operation from 20 to 100 %.

Brightness Day

You can adjust the brightness of the display illumination in the normal mode from 20 to 100 %.

Brightness Night

You can adjust the brightness of the display illumination in the standby mode from 0 to 20 %.

PSM Restart

The PSM2 will be re-started

Device Info

Shows the software version of the PSM2 monitor.

Standby

To save energy and reduce glare, the PSM2 display will enter a standby mode of reduced brightness after an adjustable delay. The delay is adjustable from 20 to 250 seconds after the last operation. If you choose any value under 20 the PSM2 won't enter standby mode.

Start page

You can set the page that the PSM2 System Monitor displays when powered up as either the main menu or one of the available submenus.

Change PIN

Access to the Setup menu is protected by a 4-digit PIN. You can change this PIN at any time from the factory setting of "1234". If the PIN is lost or cannot be recalled, the factory default setting of 1234 can be re-set by pressing "PIN" on the first page of the Setup menu for at least 15 seconds.



6.2 P-BUS Network

This configuration can delete the whole system so **only** the system integrator is allowed to carry it out!



Logged devices

This shows the devices which are or were connected to the PBUS network at the time of the last scan of connected devices.

Connect devices

Pressing this button will initiate a scan of all connected active devices. They are identified and shown on a list. If new devices are connected into the network, they will be added automatically at the time of their connection. If there were changes in the connected devices (e.g. new devices, devices omitted or not ready-to-operate) these changes will be recognised automatically and only connected devices will be listed.

Renew device addresses

By pressing this button all sub-addresses of the connected and active PBUS network components are reset. This will only be required if new components are added which have been used on other PBUS networks, and where the possibility of duplicate addresses may exist. NOTE: This function should only be used in the case noted above, otherwise the allocation and display order of connected devices may be altered or otherwise affected.

PSM Address

Each PSM2 System Monitor connected to the PBUS network requires a different address in order to avoid conflicts. If more than one PSM2 System Monitor is connected to the network, each one must have a unique address, from between 0 and 15.

NOTE: If only one PSM2 System Monitor is connected, it must have the address "0".

IMPORTANT: If there is only one PSM2 Monitor available, it has to hold the address "0", otherwise the address assignment to the connected Interfaces is not going to work.

6.3 Data Logging

If there is an SIM card inserted into the PSM2 this function is activatable. With this function, you can record all the measurable data and analyse them on your PC later. A new folder is created for each measurable parameter. The data is stored in CSV format and can for better analyse be read into a spreadsheet.

The period of recording can be adjusted between 1 minute up to max. 60 minutes. For each device group, it can be defined if the data should be recorded.



6.4 Device

In this submenu, all through the PBUS connected devices get configured. Please refer to the appropriate manuals of the individual PBUS compatible devices.



6.5 Alert management

For the display of battery -, energy-, main switch and tank alert the alert notification can be activated for each monitor. If the alert notification is turned off, the system will not show any alarms. If the alert notification is turned on, it's possible to change the device specific (e.g. battery- or tank) settings.



System Monitor PSM 2

<i>Off:</i>	For this device the alert notification is turned off and no alarm will be displayed /reported.
<i>Message:</i>	For this device the alert notification will be displayed in form of a report
<i>Message + Buzzer</i>	For this device the alert notification will be shown on the display as a report and simultaneously an acoustic signal occurs and the display is flashing.

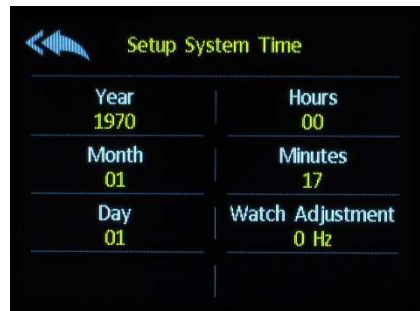
6.5 System time

The PSM2 is equipped with a battery-backed real-time clock, which makes it possible to have a punctual time stamp in the protocoling. It also makes it easier to assign the alerts temporal.

The time and date can be adjusted through the keypad.

Should the clock have deviations they can be adjusted through the Setup System Time. Thereby 1 Hz comply with a deviation of 2,6 seconds per day.

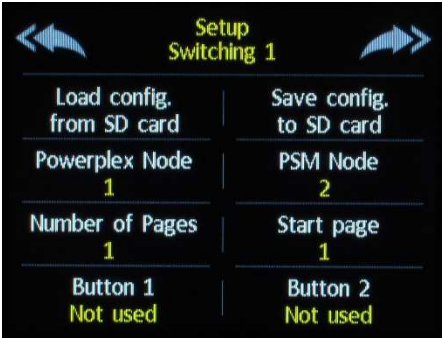
If the monitor starts with the date set to 1970 the time must be adjusted accordingly. If the installed header is empty, the battery must be removed and replaced. Therefore, the rear lid must be removed and the header has to be shoved out of the holder and be replaced with a new battery (CR2032-3V).



6.7 Consumer (digital switch)

Here the user can assign the consumer relays to the display buttons.

This assignment has to be carried out individually for each PSM2 monitor, because each PSM2 monitor can be configured differently.



In this Submenu, the following settings are possible:

Load configuration from SD card

A previously saved configuration can be loaded from the SD-Card

Save configuration to SD card

The actual configuration is stored on the SD-Card

PowerPlex-Node (only for ETA PowerPlex)

If the PSM2 is used to send E-T-A PowerPlex switching commands, the address of the E-T-A PowerPlex on which the notification information is available must be registered here.

PSM-Node (only for ETA PowerPlex)

If the PSM2 is used to send E-T-A PowerPlex switching commands, the node address under which the PSM2 sends his switching commands must be registered here.

Number of Pages

The number indicates how many consumer pages each with 6 buttons are displayed in the PSM2. The maximum number of pages is limited to 4, which results in 24 switch functions.

Start page

Indicates which consumer page is shown first.

Button X

For each button (screen-button) it's possible to choose a symbol and the displayed text. Also the command which relay on which relay module shall be triggered (relay module number and relay 1-4) will be chosen in this submenu. An ETA PowerPlex module can also be chosen from this submenu.

The number of the individual buttons are allocated as follows:

1	2	3
4	5	6

7	8	9
10	11	12

13	14	15
16	17	18

19	20	21
22	23	24

After entering the consumer page, the buttons will appear according to the programming.



Through pressing the screen button, the consumer will turn ON or OFF.

7. Operation

In the main menu, the subitems are active which are connected and able to receive data. This is displayed by a colourful representation of the activated subitems.

7.0 Alarm display

An activated alert notification is displayed through a green alert symbol. In case of an alarm the alert symbol will change its colour to red. A list with all present alarms will appear as soon as a new alarm is reported.

If you've chosen "Message + Buzzer" in the alert management, a new alarm will be indicated through an acoustical and optical signal (the screen is going to flash in the rhythm of the acoustic sound) .

The acoustic signal chimes for a max. length of 60 seconds, it can be turned off earlier by touching the screen.



7.1 Submenu battery

Needed interface / component: **SHC 312 / SHC 612 / EM-box.**

A maximum of 4 batteries or battery banks are displayed per page. Further batteries can be displayed on subsequent pages. The pages can be changed by pressing the arrow buttons at the top.

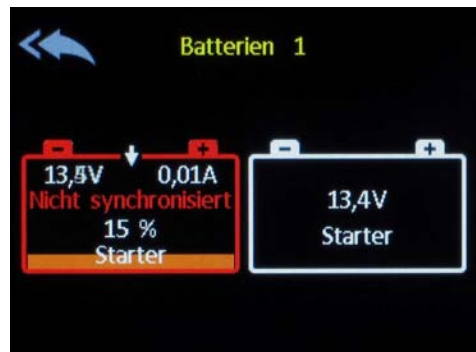
If an active SHC Shunt is connected, the available capacity is shown by the height of the coloured bar section in the appropriate battery symbol.

The available capacity is shown as a percentage along with the voltage and charging/discharging current. By tapping the battery symbol, you can switch between displaying available capacity, the remaining time to the capacity alarm or estimated time of charging, and – if a temperature sensor is connected at the shunt - the temperature.

The current is displayed dynamically to 3 digits (e.g. 120A, 45,0 A or 0.01A). A minus sign before the amperage reading means that the battery is discharging. If no minus sign is present, then the battery will be charging at the amperage shown.

The blue area shows the useable capacity before the alarm threshold. The dark blue area shows the theoretically available capacity until the battery is completely discharged (deep discharge). A deep discharge should be strictly avoided, as the battery will almost certainly be permanently damaged. If the shunt SHC determines that the point of deep discharge has arrived sooner than it should normally be (e.g. by aging), the unusable part will be displayed in the dark grey area.

Appears in the battery symbol the message "Not synchronized" then the shunt SHC was restarted and the display of the battery capacity does not yet correspond to the true capacity level. To synchronize the shunt SHC the connected battery bank has to be fully charged with a battery charger. If the battery is fully charged the message extinguishes automatically.



If the capacity falls below a set threshold a warning appears on the display. The remaining capacity is shown in orange and the battery symbol outline is shown red. If the battery is nearly empty or deeply discharged or if an over-voltage occurs (battery voltage > 15 V) a warning appears. The remaining capacity is shown in orange and the battery symbol outline is shown red.

An additional voltage can be supervised (e.g. the voltage of a starter battery). This voltage will be shown by a symbol with white outline and no colour, together with the measured voltage. If this voltage falls below the adjusted alarm threshold the battery symbol is shown red.

7.2 Submenu Tank

Needed interface/component: **CMT2**



7.2.1 Features of Tanks

By touching on one of the tank graphics, the volume indication changes between percentage, litres, and a no-volume display. If a tank is configured for a DFS Flow Sensor, the percentage volume can be changed manually to the new level by tapping on the name of the tank underneath the graphic. This will bring up another screen where you can enter the new level, i.e. enter 100% when filling the tank completely. For a water maker, we recommend a tank size of 100 times the hourly water making capability.

7.2.2 Power save Mode CMT2

To reduce the current consumption when using ultrasonic sensors, which draw approx. 50mA per sensor, the "Power save" mode can be activated.

The Power save mode is activated as soon as all PSM2 system monitors connected are in sleep mode (display off). At that point, the measuring changes from continuous to a cyclic routine. If the power supply voltage is between 11.5V and 13 V (23 V and 26 V), a measurement is taken every 30 minutes with a duration of 5 minutes. If the power supply voltage drops below 11.5 V (23 V), a 5-minute measurement is made once every 2 hours. Above 13V (26 V) the power save mode is switched off automatically. Below 10V no measurement is taken.

If the system is in Power save mode, a measuring cycle can be initiated as soon as you activate the tank menu to obtain up-to-date volumes.

During periods where no measurements are being taken, the last measured results are shown.

7.2.3 Troubleshooting tank sensors

If the tank monitor shows wrong values or “---“, first check that the sensor is connected properly. Next check the wiring between the sensor and the tank interface CMT2, as this has shown to be the main source of errors.

If the shown values are obviously incorrect, check that the voltage of the power supply of the CMT2 and the sensors is above 10V.

7.3 Submenu Energy

Needed interface/component: **SHL312 / EM-box**

This menu shows the energy balance of the on board DC system. Depending on the deployment of shunts SHL or an EM-box, the current flow can be analysed in detail. The Energy page shows, which energy sources are feeding the system, and at what amperage, and which loads are taking energy and at what rate. It is also possible to see if the batteries are being charged or discharged, and arrows show the direction of the current flow.

The charging sources are shown in the upper part of the display, the loads in the lower part. A “Combi” Inverter/Charger will appear on the bottom line and will show amps being charged or consumed, but will show only accumulative charging Ah.

In this menu, all batteries are combined and shown as one battery in order to give a clear overview. A detailed analysis of the battery systems can be obtained by opening the battery page.



7.3.1 Features Energy

By touching the symbols, the display can be switched to show the accumulative Ah consumed or delivered since the counter was last reset.

If an ACE charger is connected to the network, there is more information available which will appear in a new window after tapping the symbol “Charger”.

The availability of this additional information is shown by an “i” in the upper right corner of the charger symbol.

7.3.2 Battery Charger ACE

In the Charger menu, the parameters of the automatic charger ACE are shown. By touching the buttons “Limit+”, “Limit-“ and “Sleep”, the corresponding operational modes can be adjusted.



7.4 Submenu main switch

Needed interface/component: **FBC 265 / TSC / EM-box**

This menu shows the position of the main switches.

Main Switches can be switched on or off by touching the corresponding button. If a PIN is required for actuation, this will be indicated by a small padlock in the switch symbol.



7.5 Submenu AC (LAU)

Needed interface/component: **LAU 216 / 3xx**

This menu shows the energy situation of the AC system, where the symbols on the top line show the available sources. If these sources are active, the voltage is shown. The active system source is shown by a line connecting it to the symbol on the lower line. If a transducer ACW is connected, the AC parameters of voltage, current, frequency and the kW hours used since the last reset are shown in the symbol on the lower line.

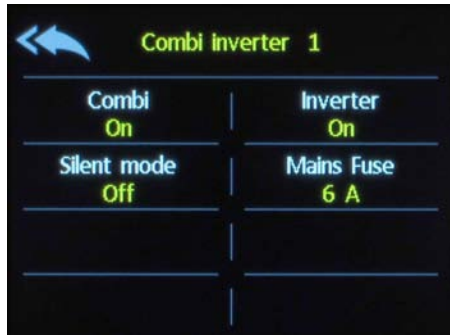
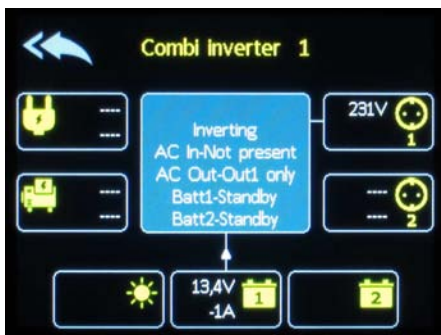


7.6 Submenu AC (combi inverters)

Needed interface/component: **Studer X-tender incl. interface XCOM-CAN or Mastervolt Ultra incl. interface CMB.**

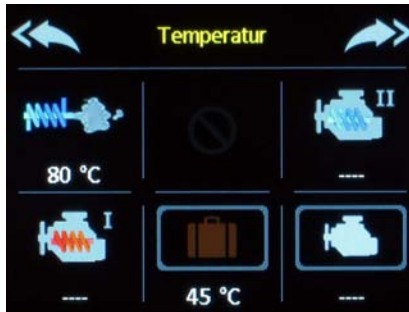
This screen shows the energy situation of the AC plant if a combi- inverter/charger is connected. By touching the blue button in the centre it's possible to configure the most important settings:

- Device ON/OFF
- Inverter ON/OFF
- Silent mode (only when using a mastervolt) ON /OFF
- Settings for the shore connection current



7.7 Temperature

Needed interface/component: **TPC4**



This screen shows the temperatures of the individual sensors. By pressing on the temperature button you can receive further data as highest/lowest temperature with a time stamp.

7.8 Consumer

Needed interface/component: **CMR4**

By pressing the screen button, the consumer is turned *on* or *off*. An activated consumer is indicated by a green hook.



If you press the screen button for a longer time, a new screen is going to appear to set the brightness of the lamp. This option/menu is only available if a dimmable LED lamp like a Prebit Slave light is connected to the control input of the CMR4.

8. Software Update

The software of the PSM2 can be updated by means of a micro-SD card. After having received the software by e-mail, the files need to be copied onto an empty SD-card.

First, remove the power supply plug of the PSM2 and insert the SD-card at the slot of the right hand side of the rear cover.

The power supply can then be plugged in again and the screen should show that new software has been recognised and is being installed automatically. You can see the software updating progress by a blue bar.

After the update is finished please remove theSD-card, which must be done after removing the power supply. The software update is now operational.

If the PSM2 operates normally after inserting the SD-card, it signifies that no new software has been detected or that the SD-card hasn`'t been recognised.