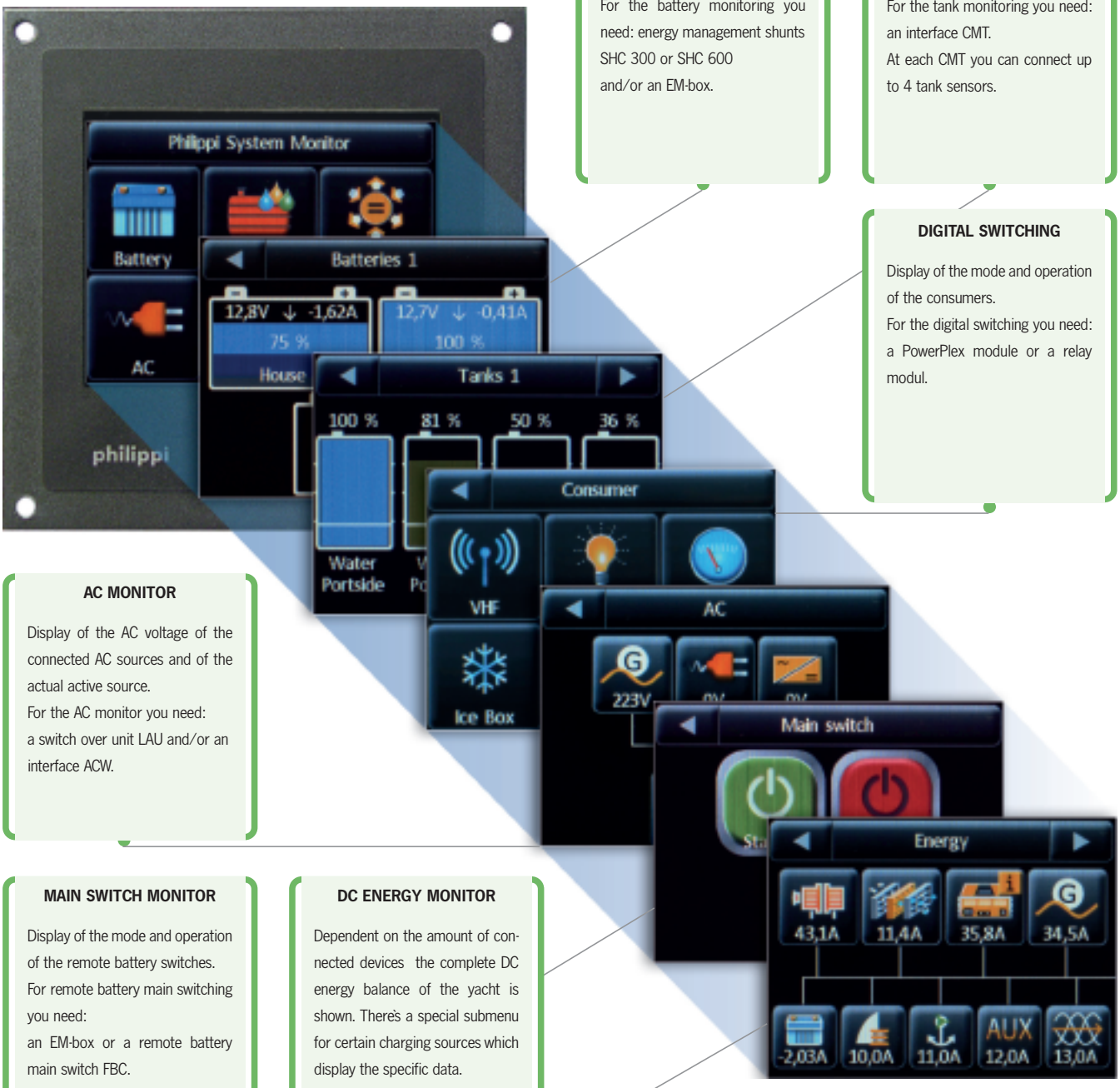
The PSM system monitor is the central indicating and operating device of the electrical system on board. It enables the monitoring and controlling of all connected philippi PBUS compatible components and further components connected to PBUS - interfaces. The clear structure of the system monitor PSM provides an intuitive and logical operation via the touchscreen. The PBUS system design allows to connect more than one system monitor side by side to obtain information about tanks, batteries, energy management and AC-power simultaneously. Alternatively several PSM system monitors may be installed on board at different locations to obtain the required information independently of each other.

The combination of the system monitor PSM with a digital shunt SHC 300 as battery monitor for the main battery including voltage measurement for a starter battery can be the first step for this new system. By fitting additional shunts SHC 300 for further batteries and/or other interfaces it's easy to extend the system to your desire. All further connections of PBUS components expand the system monitor PSM to a multifunctional monitor.

PSM MONITOR



BATTERY MONITOR

Display of all data (V/A/Ah) of up to 16 battery groups.
For the battery monitoring you need: energy management shunts SHC 300 or SHC 600 and/or an EM-box.

TANK MONITOR

Display of the tank levels of up to 16 tanks (4x CMT).
For the tank monitoring you need: an interface CMT.
At each CMT you can connect up to 4 tank sensors.

DIGITAL SWITCHING

Display of the mode and operation of the consumers.
For the digital switching you need: a PowerPlex module or a relay modul.

AC MONITOR

Display of the AC voltage of the connected AC sources and of the actual active source.
For the AC monitor you need: a switch over unit LAU and/or an interface ACW.

MAIN SWITCH MONITOR

Display of the mode and operation of the remote battery switches.
For remote battery main switching you need:
an EM-box or a remote battery main switch FBC.

DC ENERGY MONITOR

Dependent on the amount of connected devices the complete DC energy balance of the yacht is shown. There's a special submenu for certain charging sources which display the specific data.
For the DC energy monitor you need: a measuring shunt SHL 300, or an EM-box, or a charger series ALC or gensets /inverters connected via the interface CBI.

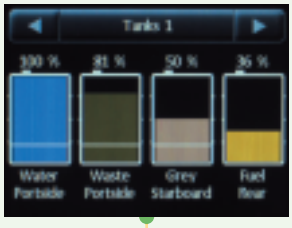
BATTERY MONITOR

Apart from the current, voltage and capacity display the battery level is shown graphically. Further information as remaining time and statistics are available on command. If you connect further shunts SHC the system monitor PSM can display all information of e.g. the starter, bow or second service battery.

SHC 300

TANK MONITOR

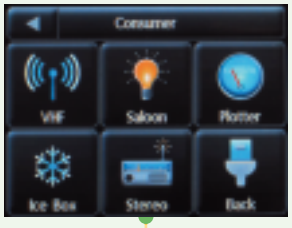
Different kind of liquids are shown in different colours independently from the tank sensor. If the tank level exceeds or falls below a given threshold the respective tank will be displayed in red. The names and locations of the tanks are adjustable individually.



CMT

DIGITAL SWITCHING

The switching of consumers in a digital CAN bus system enables a comfortable operation from one or more locations on the boat. By using the interface CMR you can dimm LED-lights without interferences.



CMR

PowerPlex

ENERGY MONITOR AC

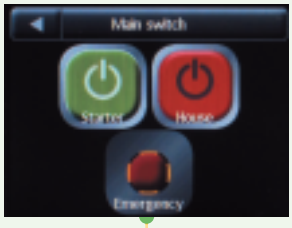
The voltage and frequency of the connected sources, the active source and its power data will be displayed. There's a sub menu for gensets and inverters which shows specific information and from where you have operational possibilities.

CMI+Genset

LAU+ACW

MAIN SWITCH MONITOR

The battery main switches can be switched by keypress. An optional PIN code protects the system against unauthorised use. The deep discharge protection of the batteries can be activated on demand.

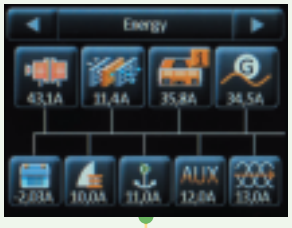


FBC

EM-box

ENERGY MONITOR DC

The ongoing charge or discharge currents of the sources and consumers are displayed in an energy scheme. Alternatively the energy up to now charged or used can be shown (e.g. the harvest of a solar panel per season). There's a sub menu for chargers or inverters which displays their specific data and from where you operate and change the settings of these devices.



SHL 300

EM-box

ALC

CMI+Xtender

System monitor in use

The PBUS system together with its monitor PSM can easily be enhanced by a growing demand on board. You can start from the smallest stage for instance with only a shunt SHC. Then the PSM is a battery monitor for a service and a starter battery. By adding more shunts SHC you can supervise additional battery groups. Or you connect a tank interface CMT to have a combination of a battery and a tank monitor.

The integration of further PBUS components expands the system monitor PSM from a single battery or tank monitor to a multifunctional control and operation unit.

Due to an integrated microSD card reader the software can be kept up to date easily.

SYSTEM MONITOR PSM

PSM Order-No.: **0 7100 2000**

System monitor PSM for displaying and operating the PBUS. Intuitive coloured TFT touch screen graphic display, with adjustable brightness, connectable to PBUS via PBUS- or standard RJ45 cable.

Operation voltage	8-60 V
Consumption	100 mA, Stand-by: 10 mA
Dimensions	L 105 x B 105 x H 35 mm
Cut out	88 x 88 mm

PSM-G Order-No.: **0 7100 2010**

System monitor PSM with integrated switching contact (open collector) for operating a genset with automatic start function.

BATTERY MANAGEMENT SHUNT

Battery management shunts for PBUS connection. Precise recording of current, voltage and capacity of a related battery. In addition a voltage of a starter battery or part-voltage of a 24V system can be supervised. The temperature of the battery can be measured via an optional temperature sensor.The PBUS interface of the shunt enables the measuring even of a galvanicly to the on-board system insulated battery system (e.g. an emergency battery for the VHF system or an extra battery system for an electric drive).

SHC 300 Order-No.: **0 7100 0300**

Digital battery management shunt for installation in the negative line between battery and neg. terminal. Power supply via the plus measuring line. Connection bolts M10.

Current rating	300 A, 600 A 1 min, 1500 A 0,5 s
Consumption	6 mA@12 V, 4 mA@24 V
Rated voltage	8-60 V
Current range	10 mA - 300 A
Dimensions	L 118 x W 40 x H 52 mm

SHC 600 Order-No.: **0 7100 0600**

Digital battery management shunt as SHC 300 but for higher currents / bigger consumers. Connection bolts M16. Matching minus bus bar SAS 4 (p. 31)

Current rating	600 A, 800 A 1 min, 2500 A 0,5 s
Consumption	6 mA@12 V, 4 mA@24 V
Rated voltage	8-60 V
Current range	10 mA - 600 A
Dimensions	L 185 x W 44 x H 75 mm

If currents of special consumers or charging sources as solar panels, wind generators, alternators or hydro generators should be measured alone, you can use a shunt SHL for measuring of this special device.

SHL 300 Order-No.: **0 7100 0301**

Digital current measuring shunt for installation in the negative line of a charging source or a single consumer. Connectable to the PBUS. Power supply via the plus measuring line. Connection bolts M10

Current rating	300 A, 600 A 1 min, 1500 A 0,5 s
Consumption	6 mA@12 V, 4 mA@24 V
Rated voltage	8-60 V
Current range	10 mA - 300 A
Dimensions	L 118 x W 40 x H 52 mm

SYSTEM MONITOR PSM

To get the level information of your tank sensors into the PBUS network you need the interface CMT. It receives all the information, supplies the sensors and provides this informations to the system network. All adjustments needed as type of sensor, capacity of the tank, alarm thresholds etc. will be done by the system monitor PSM. You can connect up to four tanks (with different characteristics) to the CMT:

- tank sensor, characteristic: resistance 10-180 Ohm
- tank sensor, characteristic: resistance 240-33 Ohm
- tank sensor, characteristic: resistance free range 0-300 Ohm
- tank sensor, characteristic: current measurement 4-20 mA (Hardware adjustment!)
- tank sensor, characteristic: voltage 0,5-2,5V
- flow sensor DFS.

The interface CMC enables the integration into the PBUS Network of:
- battery charger via RS 485 interface (series AL)
- active shunt via RS 485 interface (series SHA)
- AC-interface ACW via RS 485 (modbus protocol)

CMT Order-No.: **0 7100 0400**

Interface for the PBUS for the measurement of up to 4 tank sensors. Connection by plug-in screw terminals. Connection to the PBUS by 8 pole RJ45 network socket and Y-adapter with 8 pole computer-networkcable CAT 5 or higher.

Dimensions L 107 x W 85 x H 40 mm

CMC Order-No.: **0 7100 0485**

Interface for the PBUS for the integration of a shunt SHA or charger AL. Connection by plug-in screw-terminals

Dimensions L 107 x B 85 x H 40 mm

In order to connect other devices such as inverters or gensets to the PBUS, you can use the interface CBI. With this interface you can display the data of the external device on the PSM. Also adjustments via the PBUS are possible.
To get an up-to-date overview over the supported devices please have a look at our website: www.philippi-online.de (heading: Products / PBUS).

Up to 4 consumers with a max current of 16A can be connected to the power outlet module CMR4. Alternatively 2 consumers with reversed polarity can be connected.
This module can also be used for operating gensets with start/stop automatic.
4 integrated PWM outlets can be used to dimm adequate LED lights. The LED light will get the brightness signal directly from the control system and the partially annoying dimming of the power supply is omitted.

CBI Order-No.: **0 7100 0010**

Interface for operating/displaying other devices. Connection via screwterminals. Available 3rd quarter 2012

Dimensions L 75 x W 100 x H 50 mm

CMR 4 Order-No.: **0 7100 0040**

Power relay outlet module for 4 consumers Max.16 A each..
Connection via pluggable screwterminals. Available 3rd quarter 2012

Dimensions L 115 x W 105 x H 50 mm

ACCESSORIES

- **PBUS-cable 0,5 m** Order-No.: **5 3000 0050**
- **PBUS-Cable 1 m** Order-No.: **5 3000 0100**
- **PBUS-Cable 2 m** Order-No.: **5 3000 0200**
- **PBUS-Cable 5 m** Order-No.: **5 3000 0500**
- **PBUS-Cable 10 m** Order-No.: **5 3000 1000**

Network cable for the connection of PBUS-components (RJ 45).