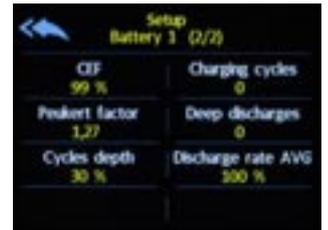
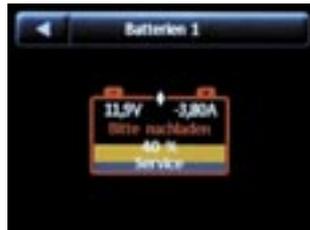
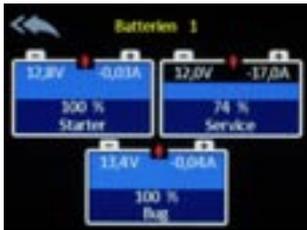


The battery management shunt SHX precisely records the current, voltage and capacity of the connected battery. The galvanically isolated P-BUS enables the acquisition of battery data from battery groups isolated from the vehicle electrical system (e.g. emergency battery for radio systems or

electric drives).

The active shunt SHX calculates the current battery capacity from the continuously measured current and voltage values and the System Monitor displays this in colour in the battery symbol.

BATTERY MONITORING



BATTERY CAPACITY

The bar height of the battery indicates how much remaining capacity is available.

The light 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 always be avoided in order not to damage the battery.

If the shunt SHX has detected during operation that the nominal battery capacity is not available, e.g. due to ageing influences, by reaching a deep discharge prematurely, this unusable part of the total capacity is represented by a dark grey area.

By touching the battery symbol you can switch between the remaining capacity in Ah, the remaining time until the capacity alarm and the battery temperature (temperature sensor Temp-BT required).

Battery Alarms

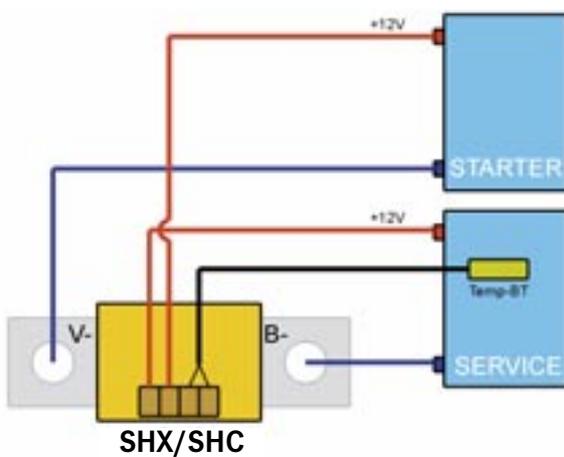
In the event of overvoltage, or when the voltage falls below the set warning threshold or when the battery is recognised as almost empty or deeply discharged, a warning message appears on the display.

Battery analysis

At each battery cycle, the collected data is analyzed. The CEF (charge efficiency) and the number of cycles at which the set minimum cycle depth has been reached can be queried. The number of deep discharges and the average discharge depth are also recorded. This allows conclusions to be drawn about battery usage and wear.

Recording the battery temperature

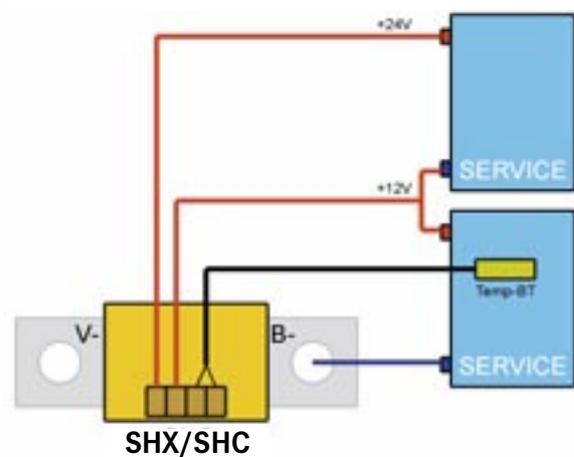
The battery temperature can also be monitored via the optional temperature sensor.



SHX/SHC

Measurement of a 2nd battery voltage

In addition to the house battery, the voltage of a starter battery can also be recorded. The second battery voltage is displayed on the System Monitor in a separate monochrome battery symbol. If the voltage of this battery falls below a set alarm threshold, the battery is displayed in red and an alarm message is output.



SHX/SHC

Monitoring One 24V battery

To monitor a 24V battery block, it is recommended to measure the partial voltage to be aware of uneven charging and the resulting premature failure of the batteries.



SHX 300 Order-No.: 0 7100 0305

Digital battery management shunt for installation in the negative line between battery and neg. terminal. Power supply via the positive measuring line. Connection bolts M8.

Current rating	300 A, 600 A 1 min, 1500 A 0,5 s
Consumption	20 mA (5 mA sleep-mode)
Operating voltage	8-32 V
Current range	10 mA - 300 A
Dimensions	L 118 x W 40 x H 65 mm



SAS 4 Order-No.: 0 8000 9014

This bus bar will be attached directly on the shunt SHC 612 to connect smaller lugs / lines (M12, 2x M10, M8).

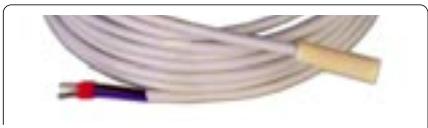
Dimensions L 140 x W 30 x H 30 mm



SHC 612 Order-No.: 0 7100 0612

Digital battery management shunt for higher currents / bigger loads. Connection bolts M16. Matching negative bus bar SAS 4

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



Temp-BT Order-No.: 0 5900 3000

Temperature sensor for battery-management-shunt

TEMPERATURE MONITORING

With the temperature interface TPC 4 important temperature values can be recorded. Per temperature interface 4 temperature sensors Temp-HT or Temp-BT can be connected. Up to four TPC 4 can be connected to the P-BUS.

Individual limit values can be set for each temperature sensor, which generate an alarm as soon as the limit values fall below or exceed. Temperature-dependent actions can be switched via the CMR4 relay module.



TPC 4 Order-No.: 0 7100 0104

Interface for 4 temperature sensors
Connection via pluggable screw terminals.
A M12-T-cable is included in delivery.

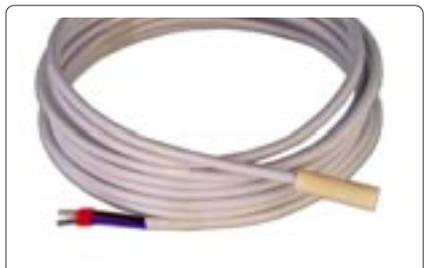
Operation voltage	DC 8-32 V
Consumption	8 mA
Dimensions (mm)	L 107 x W 85 x H 40

The following temperature values are of interest on board yachts and in vehicles:

Air temperatures
(inside / outside / battery room / engine room / storage / refrigerator / freezer compartment)

Water temperatures
Engine cooling water sweet + salt / Exhaust collector / Sea water / Water tank / Boiler

Further temperatures
alternator / gearbox / exhaust / cylinder head / turbocharger / engine block / engine oil



Temp-BT Order-No.: 0 5900 3000

Temperature sensor for temperature interface TPC 4. NTC sensor integrated in plastic housing cast, with PVC cable 2.8 m.
Can be used for measurement of water and air temperatures from -30°C to +70°C.



Temp-HT Order-No.: 0 5900 3300

Temperature sensor for temperature interface TPC 4. NTC sensor inserted in brass cable lug encapsulated and electrically insulated.
Hole Ø 4 mm Cable length 32 cm.
Can be used to measure temperatures from +30°C to +250°C.