

Technical manual for HP8480

Main battery switch with current monitor.

- + Low power output for rain light.
- + Battery discharge warning output.



Date: 2018-03-27\KT

Table of content

| | |
|-------------------------------------------------|----|
| 1) Product description | 3 |
| 2) Electric installation | 4 |
| 3) Mechanic installation..... | 6 |
| 4) CAN bus messages | 7 |
| 4.1) Setup message | 7 |
| 4.2) Status message..... | 8 |
| 5) Technical specifications | 9 |
| 6) Factory calibration of current sensors | 10 |

1) Product description.

The main function is a high power battery switch designed for current up to 1000A. The high current is achieved by connecting 9 or 18 (depending on model) Power MOSFET, each specified to handle 250 ampere, transistors in parallel.

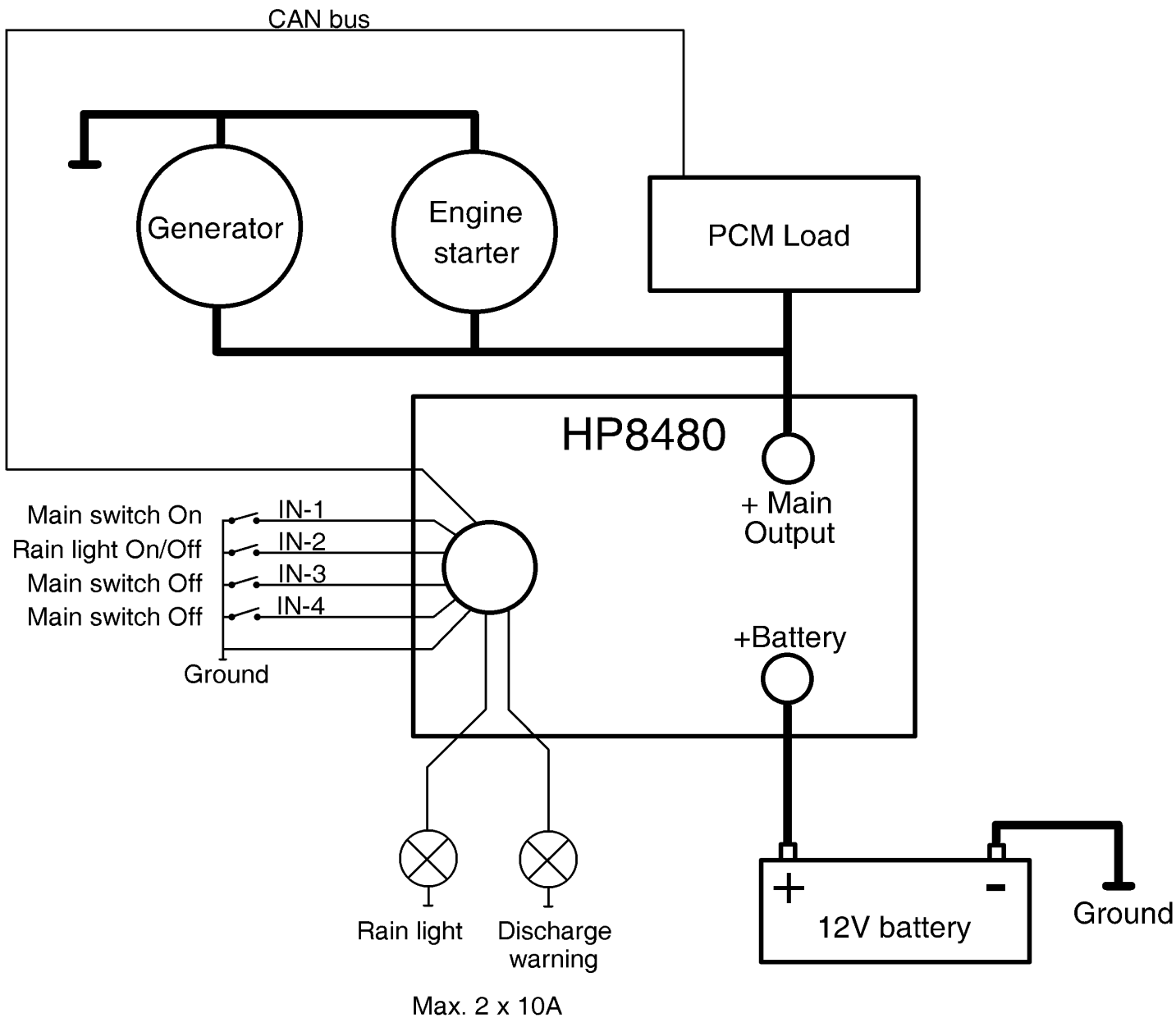
Additional features:

- a) A low loss current sensor monitors if the battery is charged or discharged.
Both available as signal on CAN bus, and output for driving "Discharging" warning light.
- b) Low power output for driving "Rain light" (independent of main switch).
- c) Electronic current limit on low power outputs.
Switch Off if current above 10A for more than 1 second.
Automatic reset (switch On) after 20 seconds.
- d) Temperature sensor.
- e) Automatic switch to PowerDown mode after 30 seconds with Main-Switch off.
Only input 1..4 and Light output may be used then HP8480 is in Power down.

2) Electric installation

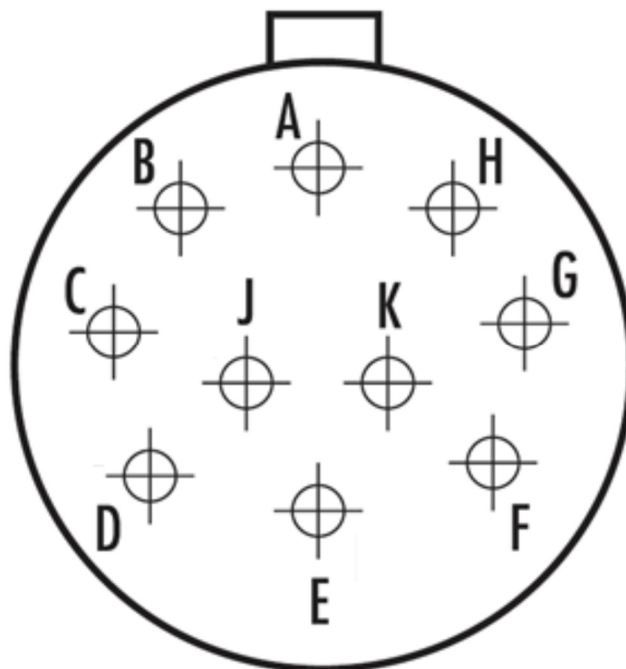
Connect battery to M8 bolt terminal marked "+ Battery".

Connect all electric equipment (incl. engine starter, charger) to M8 bolt terminal marked "+ Main Output". Only exception is the rain light.



Technical manual for HP8480

| Pinout of the 12 pole Auto sport connector | |
|--------------------------------------------|------------------------------------------------------------------------------------|
| Pin | Signal |
| A | Ground (connect to minus pole on battery). |
| B | IN-3: Input to set Main switch Off (active low). |
| C | CAN-High. |
| D | CAN-low (internal terminated with 470R) |
| E | Out-1: Light output, Max. 10A |
| F | Out-2: Discharge warning signal, max. 10A. |
| G | IN-2: Input to toggle Light output On/Off (active low, internal pull-up resistor). |
| H | IN-1: Input to set Main switch On (active low, internal pull-up resistor). |
| J | Data: Serial data signal for maintenance, etc. |
| K | IN-4: Input to set Main switch Off (active low). |



Mating male connector: Male Souriau 8STA6-12-98PN

3) Mechanic installation

| | | |
|---------------------------------|------|-------------------|
| Recommended torque for M5 | 5Nm | (Mounting screws) |
| Recommended torque for M8 bolts | 24Nm | (Main power nuts) |

4) CAN bus messages

4.1) Setup message

Fixed CAN-ID= 0xFF001

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|---------------------------------------------------------|-------|-------|------------|----------|-------|-------|-------|
| 0 | | | | Byte order | Bit rate | | | |
| 1 | CAN base ID, Low byte. | | | | | | | |
| 2 | CAN base ID, Mid byte 1. | | | | | | | |
| 3 | CAN base ID, Mid byte 2. | | | | | | | |
| 4 | CAN base ID, High byte | | | | | | | |
| 5 | Current threshold for detecting charging / discharging. | | | | | | | |
| 6 | Not used (set to 0). | | | | | | | |
| 7 | Not used (set to 0). | | | | | | | |

Bit rate 1= 1MBit, 2= 500 Kbit, 3= 250 KBit. Default= 1 (1Mbit)

Byte order 0= Low-byte / High-byte, 1= High-byte / Low-byte. Default= 0.

Current threshold Default= 10 (1 Amp).

4.2) Status message

Automatic send each second.

CAN-ID= CAN base ID + 0. Default= 0x480

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| 0 | Status bits – se details below. | | | | | | | |
| 1 | Battery current [100mA] (signed value) Positive value for charging, and negative value for discharging battery. | | | | | | | |
| 2 | | | | | | | | |
| 3 | Battery voltage [mV] (unsigned value). | | | | | | | |
| 4 | | | | | | | | |
| 5 | Current drawn from Safety light output [100mA] (unsigned value). | | | | | | | |
| 6 | Current drawn from Discharge warning output [100mA] (unsigned value). | | | | | | | |
| 7 | Temperature [degree] (signed value). | | | | | | | |

| | |
|--------------|-------------------------------------------------------------------------------------|
| Status bit 0 | Main switch status: 0= Off, 1= On. |
| Status bit 1 | Discharging status: 1= More than current threshold drawn from battery (default 1A). |
| Status bit 2 | Charging status: 1= Charge current above current threshold (default 1A). |
| Status bit 3 | Light switch status: 0= Off, 1= On. |
| Status bit 4 | Discharge warning output status: 0= Off, 1= On. |
| Status bit 5 | Temperature warning: 1= Temperature above 80 degree. |
| Status bit 6 | Temperature high: 1= Temperature above 110 degree. |
| Status bit 7 | Not in use, set to 0. |

Note: This message is not send when HP8480 is in Power-Down mode.

5) Technical specifications

| | | |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------|--------|
| Power supply | 7..18VDC (connected to 12V battery). | |
| Supply current, active | < 60mA | |
| Supply current, power down | < 6mA (entered after 30 seconds with Main Switch Off). | |
| Main switch voltage drop @20A | <3mV (18 PMOS version) <5mV (9 PMOS version) | |
| Current accuracy, Main switch (< 45A) | +/- 0,3A | +/-2% |
| Current accuracy, Main switch (> 45A) | +/- 1,0A | +/-20% |
| Current accuracy, Safety light output | +/- 0,1A | +/-5% |
| Battery voltage accuracy | +/-50mA | +/-1% |
| Temperature accuracy | +/- 0,5 degree @25 degree. +/- 1 degree from -10 to 85 degree. +/- 2 degree from -10 to 125 degree. | |

6) Factory calibration of current sensors

Required equipment:

- a) Power source able to deliver 12V / 12 ampere.
- b) 10 Ampere load for Main-switch current.
- c) 5 Ampere load for Low current outputs.
- d) Serial data interface.
- e) PC running KTerm.exe + osID.h file for HP8480.

Calibration sequence:

- a) Connect +12V to HP8480.
- b) Connect serial data interface + start KTerm on PC + load osID.h file for HP8480.
- c) Check data connected: Press "SW version".
- d) Select: Task=MAIN(00) Event= CALIBRATE (09).
- e) Connect 10Amp load to "+ Main output"
- f) Switch on outputs: Press "Send"
- g) Wait 1 sec.
- h) Calibrate main current sensor: Press "Send"
- i) Connect 5 Amp load to Out-1 (Light output)
- j) Wait 1 sec.
- k) Calibrate current sensor on Out-1: Press "Send"
- l) Connect 5 Amp load to Out-2
- m) Wait 1 sec.
- n) Calibrate current sensor on Out-2: Press "Send"

Note:

- a) If Main switch is off, does the HP8480 automatic switch to Power-down mode after 30 seconds.
- b) Calibrating HP8480 is not possible in PowerDown mode.