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PL – Series Sensor Hub X2

This sensor hub is to connect two PL-xxx current sensors in parallel. The current of both sensors will be summarized and passed to the FC. The voltage measurement of the LiPo packs will be collected from both sensors and passed through the Hub to the FC.

The main purpose of this hub is to replace existing protection circuits (like an ideal diode) and to monitor, that both paralleled LiPo's supply the same current to the system. Since we monitor the current of both batteries, we will find out very early when a LiPo starts to fail… before it is too late.

If the difference in current is larger than +/- 15%, the Alarm output will be always ON to indicate the fault… the pilot should immediately land and check the batteries.

Improved design compared to HS - Sensor Hub "V1":

- No more DF13 connectors, all connectors are Molex Clik-Mate / 1.25mm
- Dual color LED (red/green) for status of the current sensors.
- Delivery inclusive CFK enclosure

To set-up a complete system you would need:

1x PL Sensor Hub X2 "V2"
2x Current sensor board:
2x PL-050 = 2 x   50A = 0-100A Total
2x PL-100 = 2 x 100A = 0-200A Total
2x PL-200 or PL-200/8 = 2 x 200A = 0-400A Total
1x PL - BEC (1x, 2x or 3x) or Power-Cube 1, 2, 3 or 4 "V2"
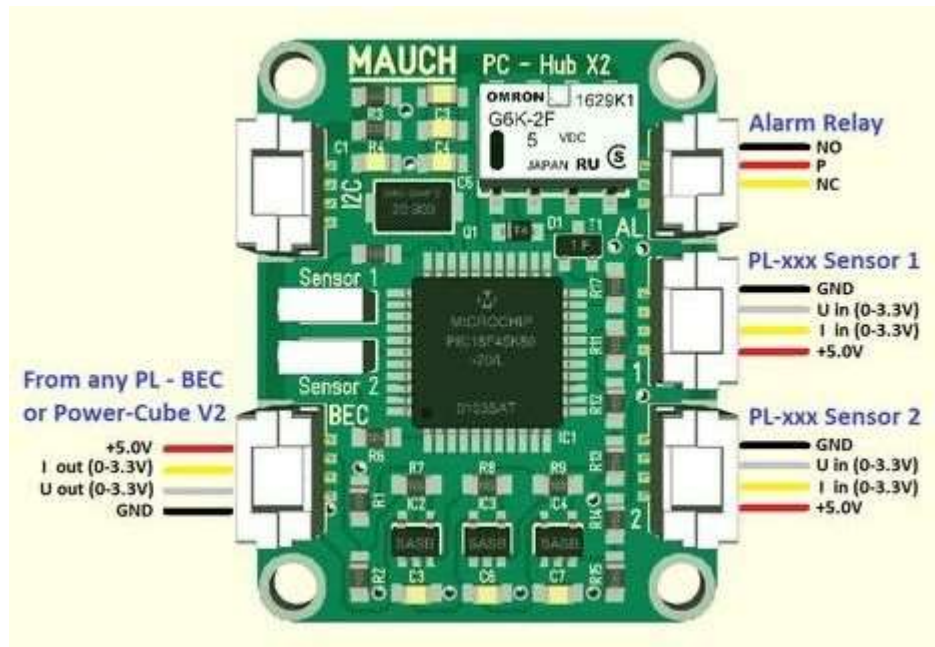
Scope of delivery:

1x PL Sensor Hub X2 "V2"
1x CFK enclosure
2x Sensor cable / Molex 1.25mm - 4p / L = 150mm
1x Alarm output cable / Molex 1.25mm - 3p / L = 100mm
Installation:
The PL - Sensor Hub X2 can be screwed down to the main frame, by removing the 4 bottom M3 screws and drilling holes into the frame. Then reinstall the screws trough the frame.
Size: 42mm x 34mm x 10mm

Pin-out:

Status LED's:

During boot up the Sensor Hub X2 will perform an internal test:
RED -> Flashing RED -> If all OK, then GREEN for 1 second.
After that, the LED status is dependent on the current flow and if the current of both main batteries is within acceptable tolerance.

Flashing GREEN (Both LED's) -> The current flow is below 3-5A per sensor and the X2 is in standby.
Solid GREEN (Both LED's) -> The current flow is above 3-5A per sensor and the X2 is monitoring the main batteries.

If either one of the two main batteries reduces the supplied current by approx. 20% than the other battery, then the LED of this sensor (S1 or S2) will change to solid RED and the alarm relay is on.

The alarm can be canceled, by either rebooting the Sensor Hub X2 (power cycle) or reducing the current flow to below 3-5A per sensor and waiting 1 minute. -> If the Sensor Hub X2 is 1 minute in standby then he will reset any existing alarm and switch off the alarm relay.

Setup in MissionPlanner:

Please follow the procedure here: http://ardupilot.org/copter/docs/common-mauch-power-modules.html
You can calculate the total setting for Batt1 monitor in MissionPlanner:

Voltage divider = (Voltage divider sensor 1 + Voltage divider sensor 2) / 2
Amp/ Volt = Amp/V Sensor 1 + Amp/V Sensor 2

Wiring diagram for 2 main batteries in parallel:

Wiring diagram for 4 main batteries in parallel: