Many solar systems use a CANBUS or RS485 bus to acquire battery status information and adjust the power usage from and to the battery accordingly. It is important that the battery is never over-charged or drained below a level which may cause permanent damage to the battery. If the battery voltage goes below a specific value, some systems will not be able to start-up by itself anymore.

There are some batteries on the market which do not have a bus communication facility. This CANBUS BMS unit has been specifically designed to integrate those batteries with the SMA solar system.

Take note that this system is NOT a Battery Management System unit. Every lithium battery MUST have such a device build-in. The primary purpose of a Battery Management System is to protect the cells from gross destructive failures, like over-heating, fire or even explosion.

The CANBUS BMS unit measures the battery voltage and current (charge and discharge) every second and calculates the State-of-charge (SOC) by means of 'Coulomb counting'. On initial start-up, the SOC is set to a low level (30%) to force the system to fully charge the battery upon which the SOC is set to 100%. During discharge, when the battery reaches 47V, the SOC is set to 5%.

CANBUS Data

Details can be found in the SMA documentation, but to summarize, the following information is sent every second:

- Battery max charge and min discharge voltage, pre-set to agreed levels
- Battery max charge and min discharge current, pre-set to agreed levels
- State-of-Charge (SOC) 0 to 100%
- State-of-Health (SOH) 0 to 100%
- Alarms (not used, permanently set to 0)
- Manufacturer name

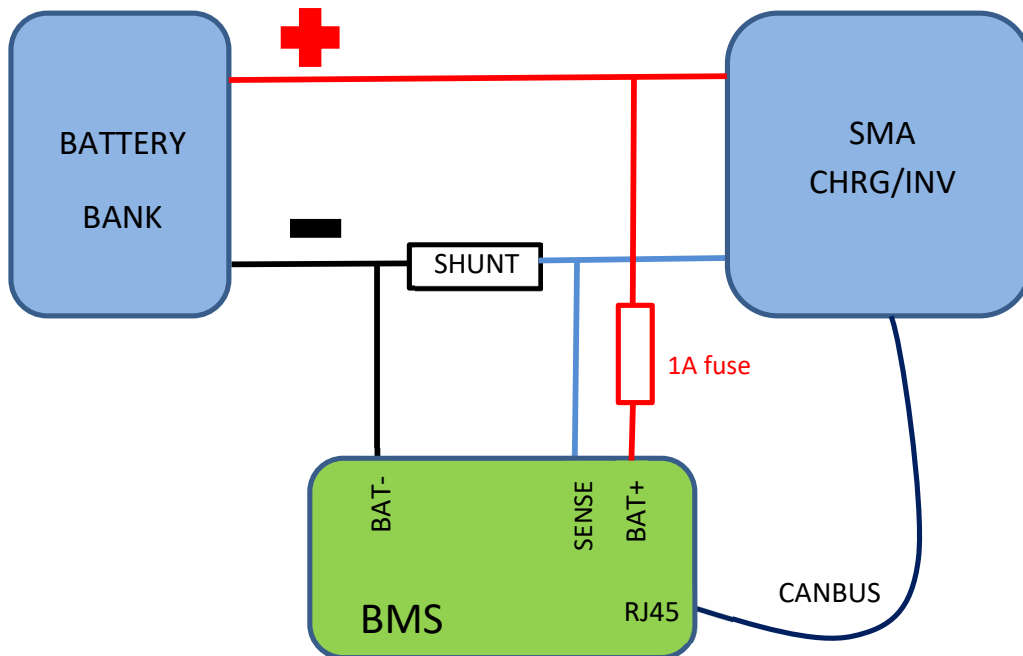## External Indicators

The unit has 2 LED's:

WHITE led   Flashes every second. The unit sends battery status information onto the CANBUS

RED led   When communications on the CANBUS failed, the RED led goes ON
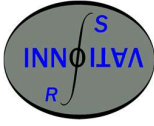
Installation

Installation is very simple. Do take care to correctly connect BAT+ and BAT-, Reversing the polarity WILL damage the unit. The current shunt is placed between the negative battery supply and the SMA unit. The shunt sense voltage is connected closest to the SMA unit. Keep the wires between the unit and the current shunt as short as possible. A twisted wire pair is supplied with the unit to minimise external interference.

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+

BATTERY

BANK
                          -
                              SHUNT
                                                    SMA
                                                    CHRG/INV

                              1A fuse

BAT-              SENSE  BAT+
                                            CANBUS
BMS              RJ45
```

Specifications

- Supply voltage 9V to 65V

- Operating current: <80mA

- Current Shunt: 30 to 500A

- External Fuse: 1A max

- Operating temperature: -10 to 50°C

- The CANBUS wires have short circuit protection between L, H, +5V and GND

- CANBUS Transmission speed: 500Mbit/s
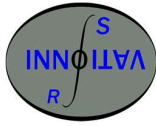
Order form to be completed by installer

Since the BMS unit needs to know the battery bank size in order to calculate the SOC and each system may have a different current shunt, each BMS unit is individually programmed for its unique environment. The max and min voltages are taken from the manufacturer's datasheet on the Averge Batteries.

Client or installation site   [ ]

Battery bank size in kWh   [ ]

Max charge current A   [ ]

Max discharge current A   [ ]

Current shunt size   30A [ ]   50A [ ]   100A [ ]   200A [ ]   500A [ ]

The following is only required if different values are needed from those specified

Max charging voltage V   [ ]   default 58.5V

Min battery voltage V   [ ]   default 46.0V

SOC set to 5% at voltage V   [ ]   default 48.0V

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Name and signature of installer   date