Stratomaster Smart Single

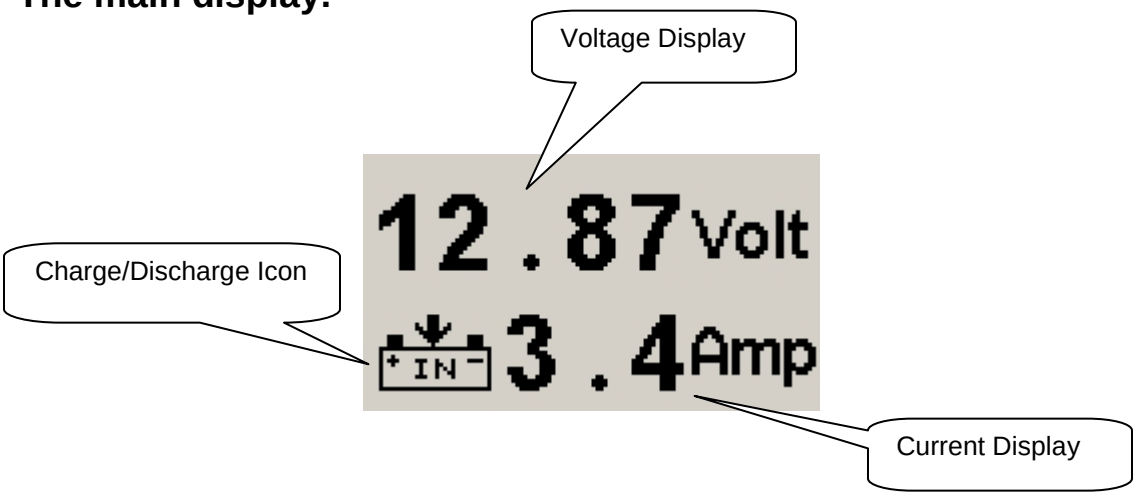
BAT-1

Battery Monitor

The BAT-1 is a 2.25” instrument which is used to monitor your aircrafts battery supply. It can be used on lead-acid, NiCad batteries as well as gel cells. This instrument is very useful in determining your battery’s health, charging status, as well as the current load consumption of your aircraft.

The BAT-1 can measure voltages up to +30V and can measure charging/discharging currents of up to 20A (Shunt dependant).

The main display:

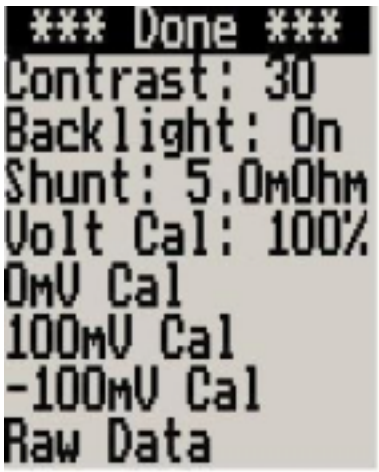


This Icon is displayed when the battery is charging (Charge current > Load current)

This Icon is displayed when the battery is discharging (Load Current > Charge current)

Setting up the BAT-1:

Main Menu …

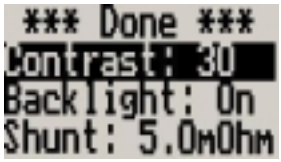


Press the Menu key to enter the menu. You can move forward and backwards in the menu by using the + and – keys. To change or select a menu item, move the highlight to the desired item and then press the Menu key. To end an edit or function, press the Menu key again.

To exit the menu and continue normal operation, select the ***Done*** function and press the Menu key. Note, all changes you have initiated (except Technical setup functions) during your session will only be remembered by the instrument if you exit the menu using the ***Done*** function.

Technical setup functions “0mV Cal”, “100mV Cal”, “-100mV Cal”, “Raw Data” are only accessible if you start up the instrument while pressing both “+” and “-“ buttons at the same time)

Contrast: …



This function allows you to change the display contrast to your liking. The contrast can be adjusted from 20 to 45. (Value can vary depending on display type).

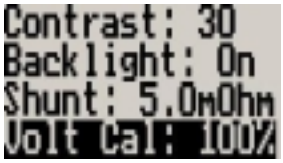
Backlight …

This function allows you to switch the display backlight on or off.

Shunt: …

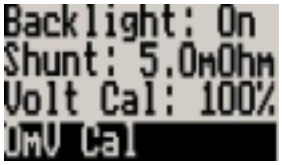
This function allows you to adjust the current shunts resistance value. We recommend using the current shunts supplied by MGL Avionics but other shunts can be used. The shunt can be adjusted from 1.0mOhm to 9.9 mOhms.

Volt Cal: …



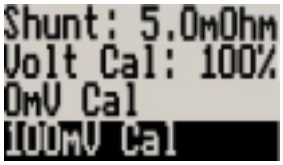
The voltage calibration is precalibrated by the factory. Use a multimeter to measure your battery voltage exactly and then use this function to tweak the voltage display to the multimeter reading.

0mV Cal (Technical Setup function) …



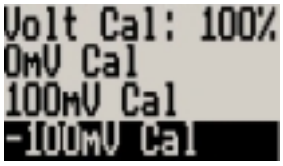
Caution: This function is for technical personal. It is not used for ordinary operation of the unit. This function should only be attempted if you have a precision mV source. Using this function will affect the displayed current readings. Use this function if you wish to recalibrate the current readings. Apply 0mV to the Shunt+ and Shunt- Terminal and press the menu button.

100mV Cal (Technical Setup function) …



Caution: This function is for technical personal. It is not used for ordinary operation of the unit. This function should only be attempted if you have a precision mV source. Using this function will affect the displayed current readings. Use this function if you wish to recalibrate the current readings. Apply 100mV to the Shunt+ and Shunt- Terminal and press the menu button.

-100mV Cal (Technical Setup function) …



Caution: This function is for technical personal. It is not used for ordinary operation of the unit. This function should only be attempted if you have a precision mV source. Using this function will affect the displayed current readings. Use this function if you wish to recalibrate the current readings. Apply -100mV to the Shunt+ and Shunt- Terminal and press the menu button.

Raw Data (Technical Setup function) …

This function displays the raw data from the analog to digital converter. This is mainly used for debugging installations.

Operating Tips

If using a multimeter to calibrate the current or voltage, please make sure your multimeter can measure the average voltage and average current and not the true RMS value. The true RMS value will differ to the average value. The BAT-1 will only measure the average value of the current waveform.

Caution: Do not connect the aircrafts starter motor through the shunt to the battery. This could cause irreversible damage to the shunt and or equipment.

Shunt damage as a result of applying excessive currents are excluded from warranty.

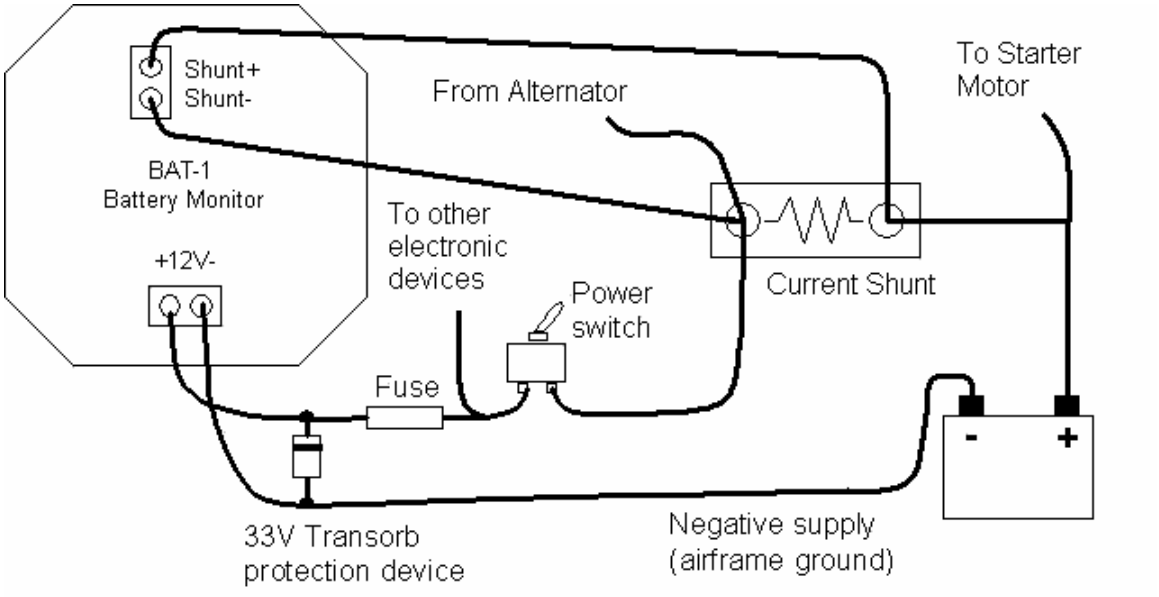
Replacement Shunts

Additional replacement shunts can be purchased from MGL Avionics. When installing the shunt, make sure to type in the value indicated on the shunt PCB (MGL Avionics Shunt) into the shunt resistance menu function.

Technical specifications:

Display temperature range (operational): -20 to +80 degrees C
Supply voltage: +8 to +18V. +24/28V with optional pre-regulator.
Supply current: 15mA/70mA (backlight off/on)
Display: Graphic LCD with rear green/yellow LED backlight
Weight: 90 grams
Voltage measurement range: 0 to +30Vdc
Current measurement range: Shunt Dependant eg. -20A to +20A with a 5mOhm shunt.
Shunt adjustment value: 1.0 to 9.9 milliohms
Current Charge/discharge indication: Icon based.
Current resolution: 100mA from 0 to +-10A, 1A from 10A.
Voltage resolution: 10mV.
Protection: Build in reverse voltage and 33V over voltage protection

Installing the BAT-1



Connect the supply terminals to your aircrafts power supply (you need a dropping resistor or pre-regulator for 24/28V systems).Install suitable power supply protection if you have a supply that can contain large voltage transients such as can be created by starter motors and solenoids.

Ensure that the supply voltage will not drop below 8V during operation as this may result in incorrect readings.

Make sure that the starter motor does not go through the shunt resistor. This will cause excessive currents to be drawn and can result in damage to the shunt. Also check to see that the cable from the alternator is going through the shunt, so that charging currents can be measured

Make sure the BAT-1 is installed in the same configuration as the above drawing.

Warranty:

MGL avionics warrants their products for a period of one year from date of purchase against faulty workmanship. Warranty is limited to the replacement of faulty components and includes the cost of labour. Shipping costs are for the account of the purchaser.

Note for operation on supplies with inductive loads:

Any operation of electronic instrumentation on power supplies that are subject to high voltages caused by operation of inductive loads (starter motors, solenoids, relays) are required to be fitted with suitable protection.
The BAT-1 instrument is guaranteed to withstand temporary over voltage up to 33V without additional protection. We recommend that measures are taken to prevent voltage transients in excess of this limit. MGL Avionics recommends the fitment of a fuse in line to protect electronic instruments, radios and intercom systems.

Please note that product warranty excludes damages caused by unprotected, unsuitable or incorrectly wired electrical supplies.

Any signs of opening the instrument or tampering with any of the internal parts will invalidate the warranty.

Shunt damage as a result of applying excessive currents are excluded from warranty.

Disclaimer:

MGL Avionics cannot be held responsible for incidents or damage by whatsoever nature caused by incorrect readings, displays, installation or operation of the instrument.
Operation of the BAT-1 instrument is the responsibility of the pilot in command of the aircraft. The pilot in command has to make themself familiar with the operation and limitations of the BAT-1 instrument before commencing ground or flight operations as well as all other aspects of operation.

The BAT-1 is intended for operation by a licensed pilot who is the holder of a MPL (Micro light pilot license) or PPL (Private Pilot license) or the equivalent thereof. The pilot should further be rated on the aircraft type on which the BAT-1 is being operated.
The BAT-1 has not been submitted to the CAA or FAA or any of its agencies for any form of certification. Operation and installation of this instrument is subject to the relevant rules and regulations of your country and flight authority. If any of the above is not acceptable to the pilot in command then they must refrain from operating the aircraft or remove the BAT-1 from the aircraft before commencing aircraft operations.