AKCP Battery Monitoring Sensor User Manual

AKCP

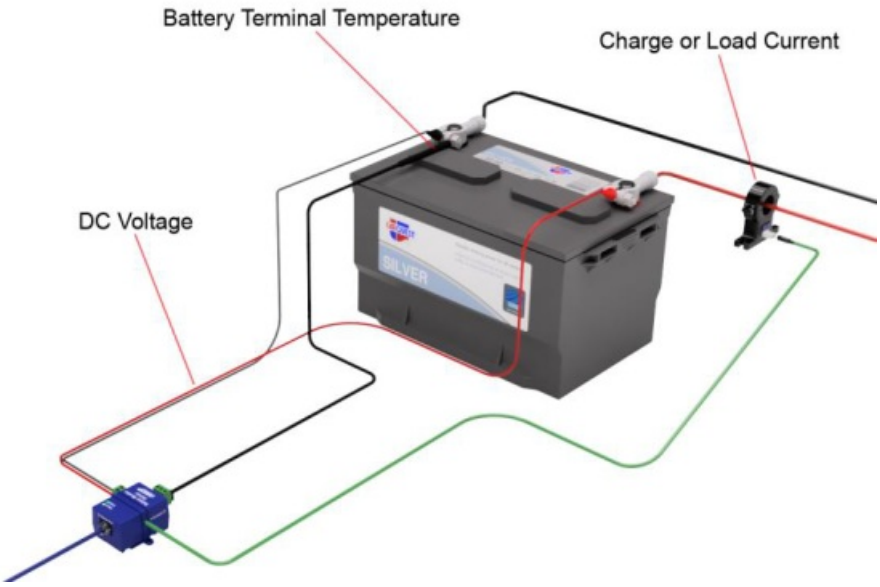
Est. USA 1981

Battery Monitoring Sensor Manual

Contents

Introduction

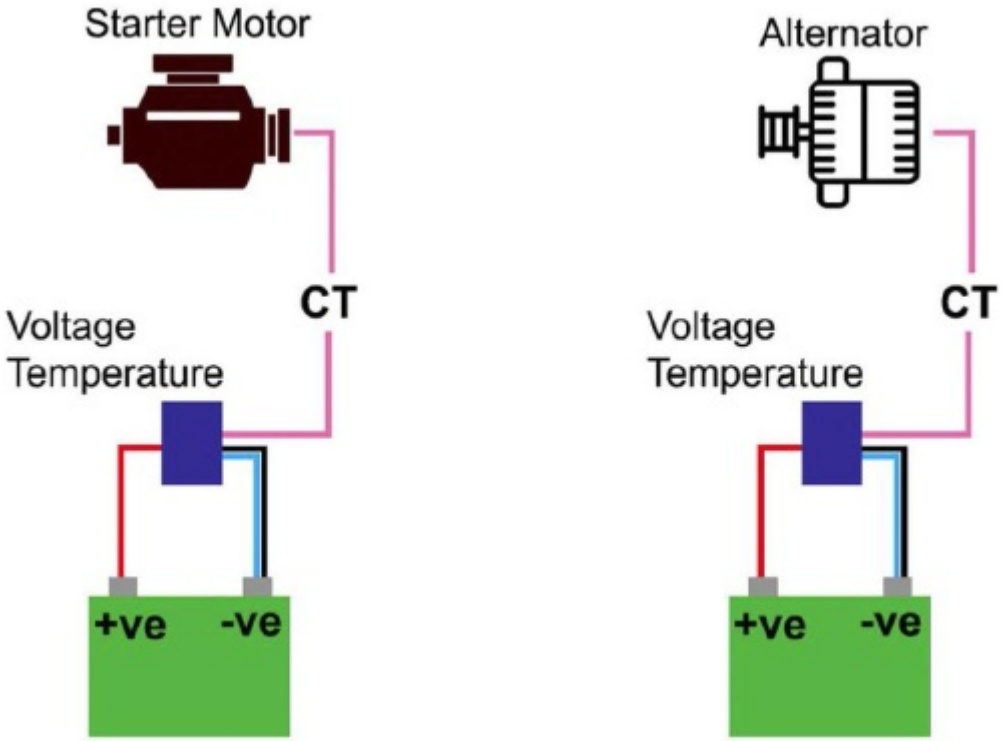
The Battery Monitoring Sensor is a simple, yet effective way to monitor a variety of battery types:
Lead Acid, LiPoly type batteries, individual cells, or banks of batteries.
You can monitor Voltage, Amps, and Temperature for batteries. The sensor consists of a Battery Terminal Temperature Sensor, Battery DC Voltage Meter, and Current Monitoring combined.
With this sensor, you can check the battery system performance, such as charge/discharge state and it aids in maintaining battery health.



Generator battery monitoring

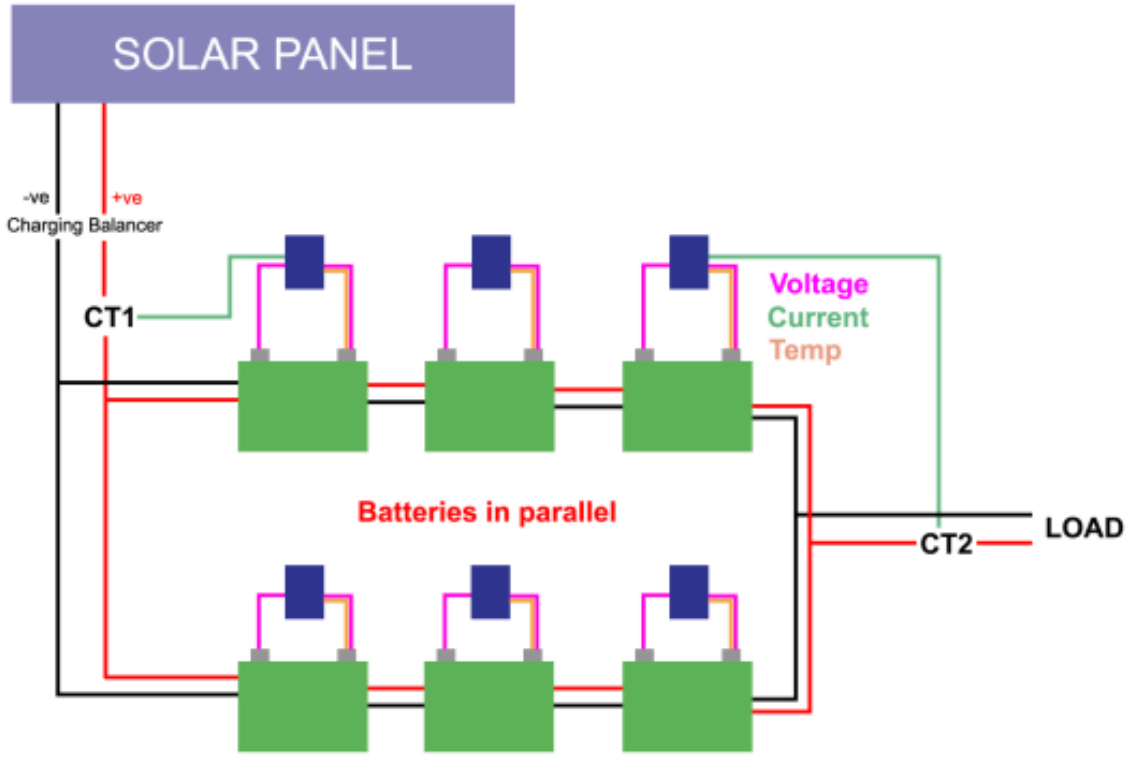
Use the BMS to monitor your generator's electrical system. The sensor is compatible with both 12 and 24 VDC battery configurations. Depending on your setup, the sensor can monitor the current draw on the crank or the charge current from the alternator. This can be used as an aid in monitoring battery health.
Decreasing current on crank over a period of months can be an early sign of a problem that could lead to a failure to start and can alert you to undertake maintenance prior to a failure to start scenario taking place.
Alternatively, you can set up the sensor with the current transformer (CT) on the engine alternator line.
This can give an indication of alternator charging performance, to ensure that when the engine is running the alternator is maintaining battery charge.
The following diagram is showing two ways how the sensor could be installed on a generator: to monitor either the

crank current from the starter motor or the charge current from the alternator.



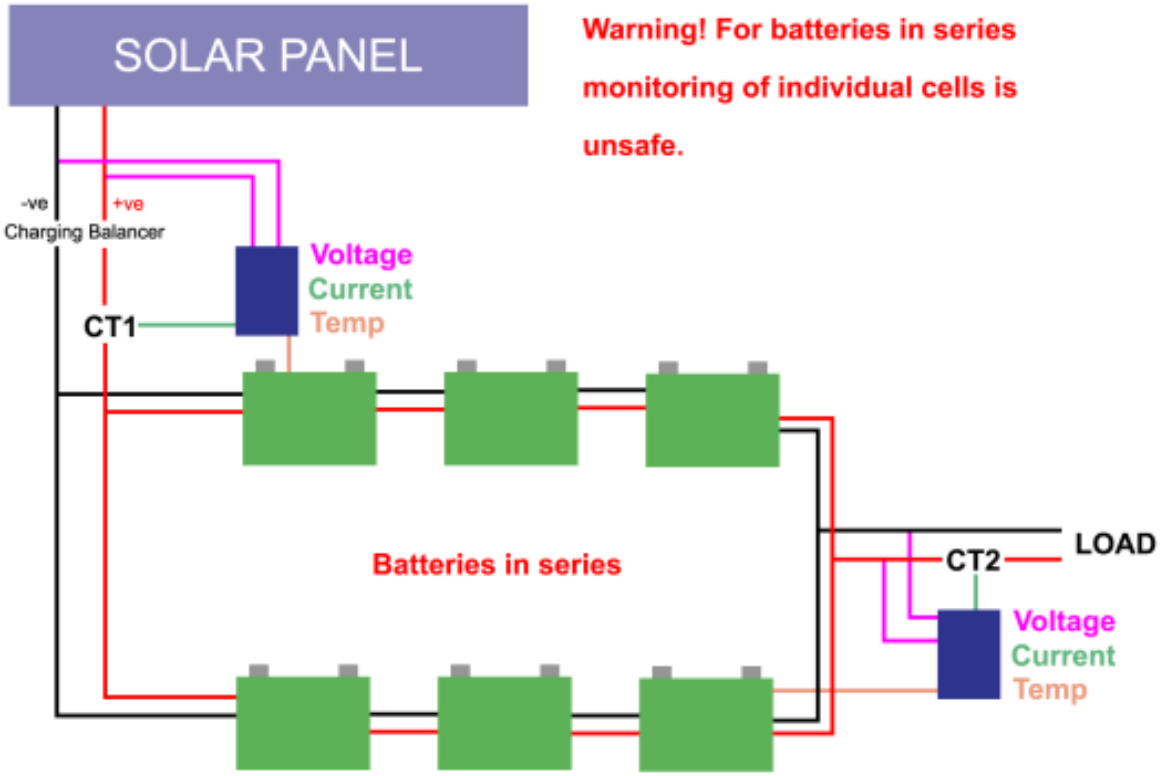
Solar System Monitoring

The BMS sensor can be installed on solar panel battery systems. Order with Split Core Current Transformer (CT) and use to monitor individual battery cell voltage and temperature.
Place a single CT on the battery stack, as well as a CT on the output from your solar panels for complete end-to-end monitoring of the solar system's charge current, battery load, cell voltages, and temperatures.
The following diagram shows that individual cell monitoring is possible when the batteries are linked in parallel:



CT1 = Monitor current from solar panels

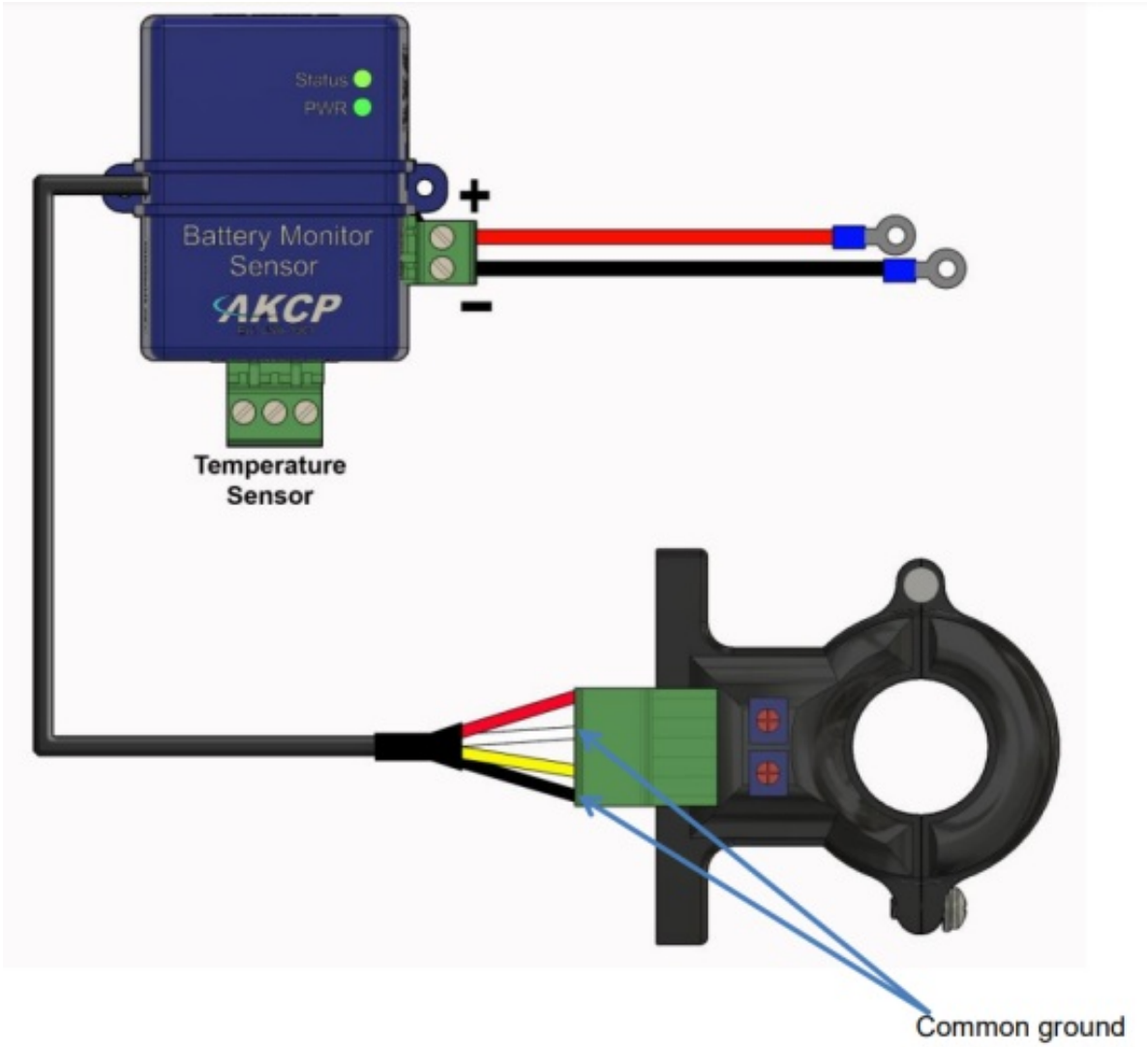
CT2 = Monitor current draw from battery stack
You can also place the batteries in series, and monitor the overall performance of the system.
However, as the next diagram shows, when the batteries are in series you cannot monitor the individual cells:



Important notes:

- The Battery Monitoring Sensor is not isolated; you cannot use it to monitor multiple battery cells in a bank.
- You must be careful about the voltage potential levels that may reach the sensor.
- The bottom module box has a common ground for all its IOs (see below).

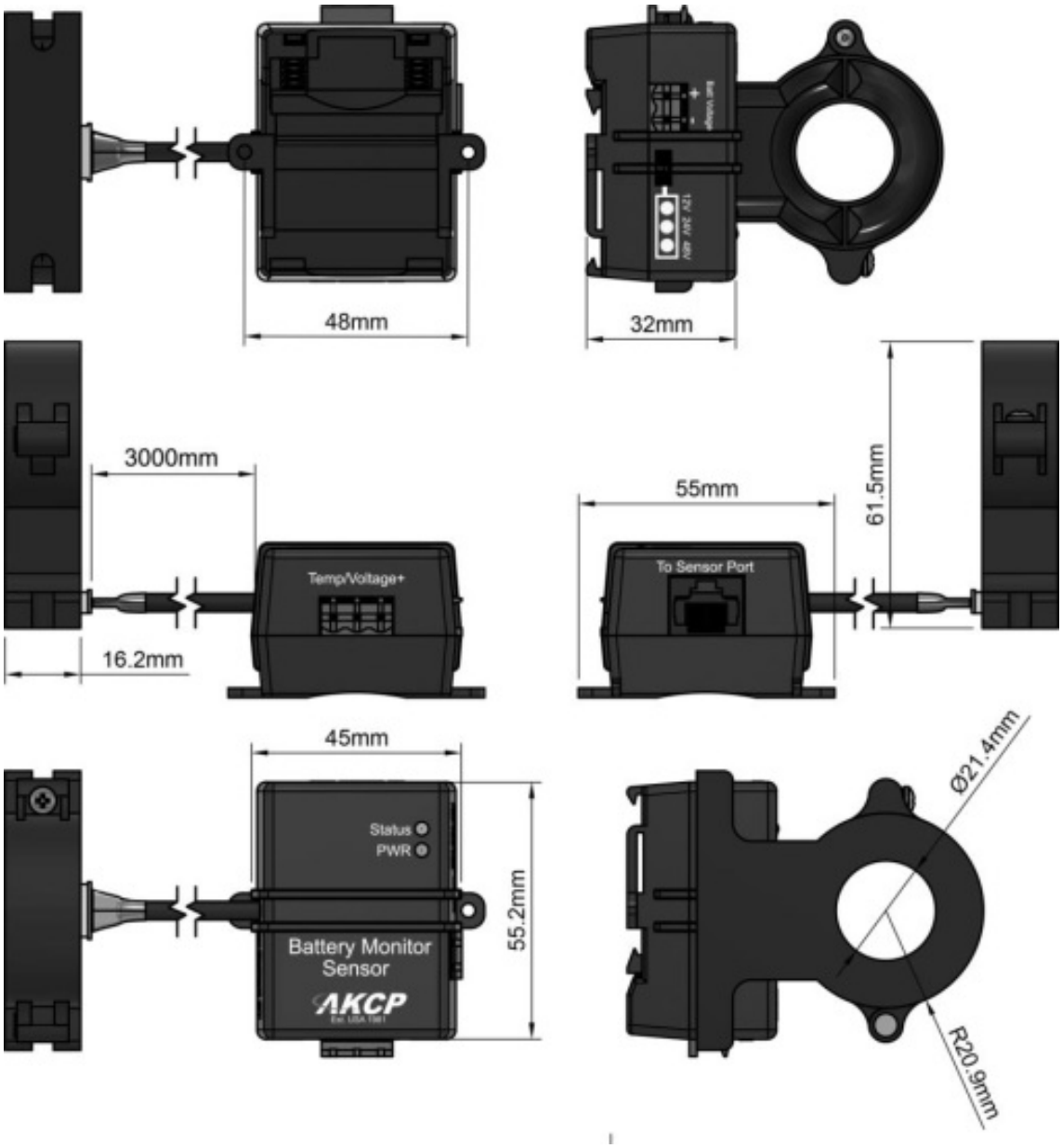
To Sensor Port



For the sensor’s wiring there is :

- one connector+cable for input voltage
- one connector+cable for temperature sensor
- one connector/cable for the CT

Technical drawing



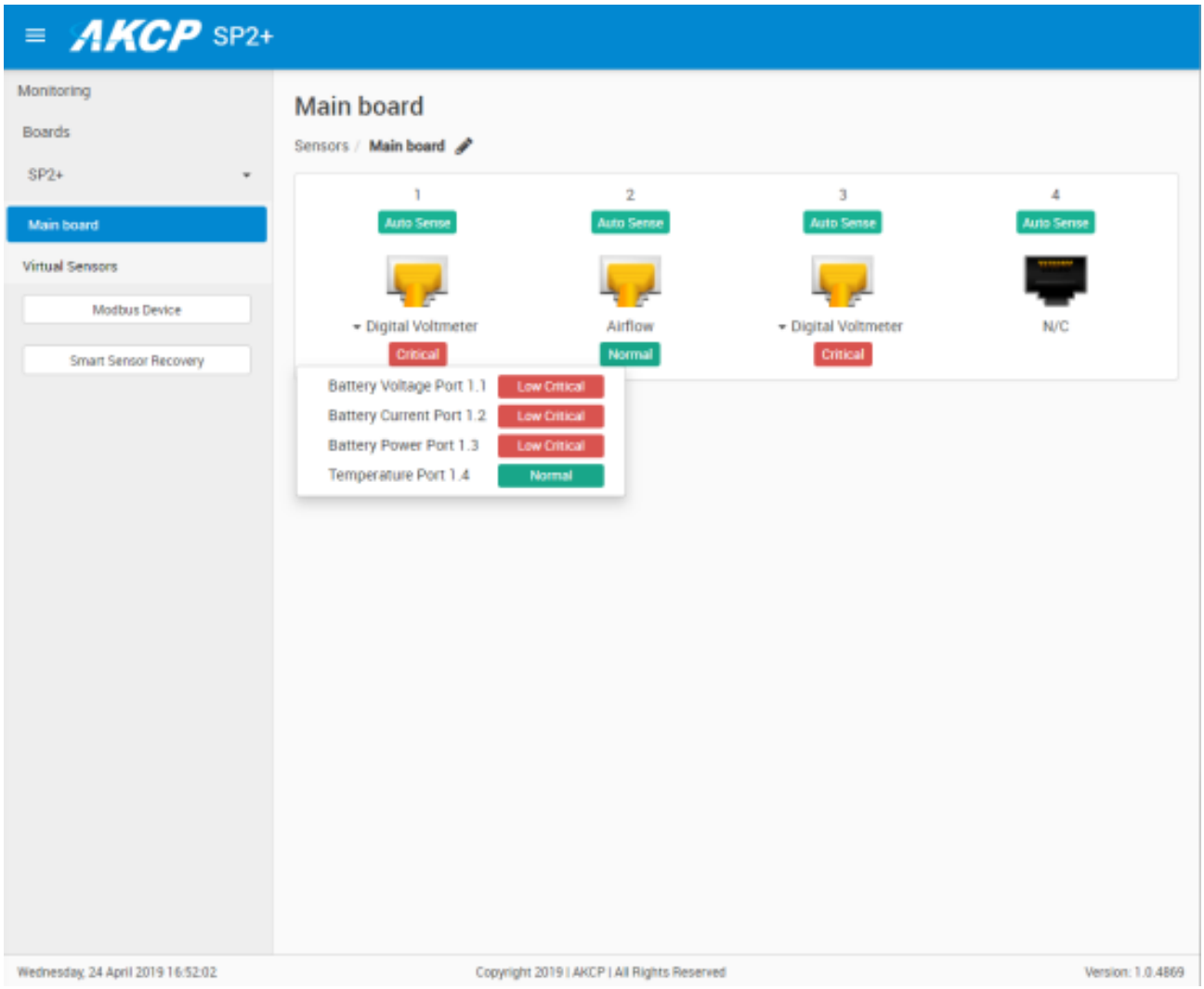
Specifications

Power	Input Voltage and Current ratings : Voltage: 0~60VDC (3 configurable ranges : 0~15V, 0~30V or 0~60V) Current: external CT + 50A (standard) + 100A + 200A + 400A + 500A + 600A + 800A + 1000A + 1500A

Power Metering	• Voltage (V) : +/-0.05% Full-Scale, error +/-0.05% Full-Scale • Current (A) : +/-0.05% Full-Scale, error +/-0.05% Full-Scale, Temperature Drift : +/-0.02%/°C • Power (W) : +/-0.05% resolution
Environment monitoring	• Temperature sensor with 1 meter cable *range -40°C to +75°C
Status Indication	LED indication for power LED indication for input presence
Components	Manufactured using highly integrated, low-power surface mount technology to ensure long-term reliability.
Operating Environment	Temperature: Min. -35° C – Max.80° C Humidity: Min. 20% – Max. 80% (Non-Condensing)
MTBF	1,400,000 Hours based on field experience with sensorProbe units.
Inputs	1x sensor RJ45 Port Hardwired with following plugs : • Phoenix connector for voltage • Phoenix connector for temperature • Phoenix connector for external current transformer

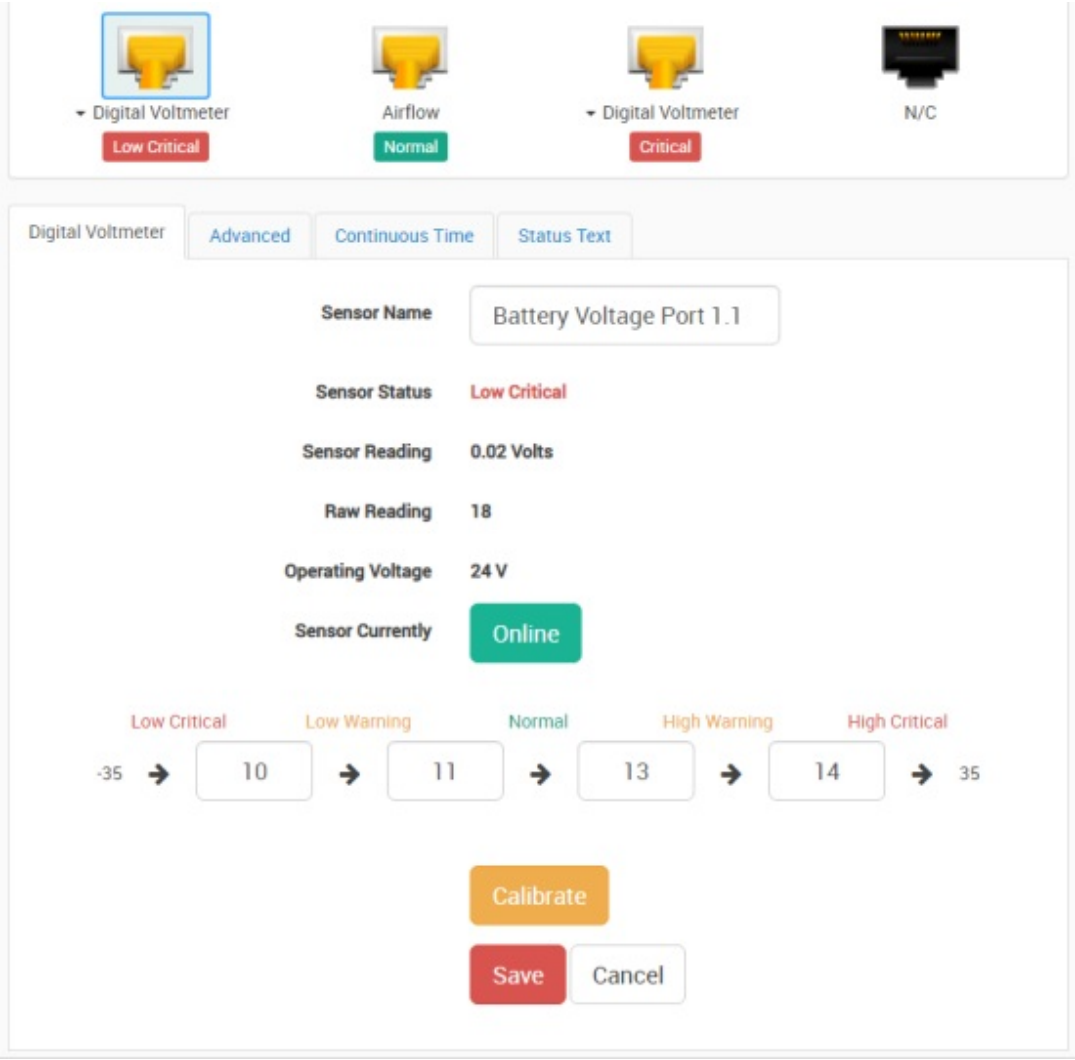
WebUI configuration

The Battery Monitoring Sensor is a Smart Sensor type and therefore is only supported on the SP+ and SEC+ series of units.



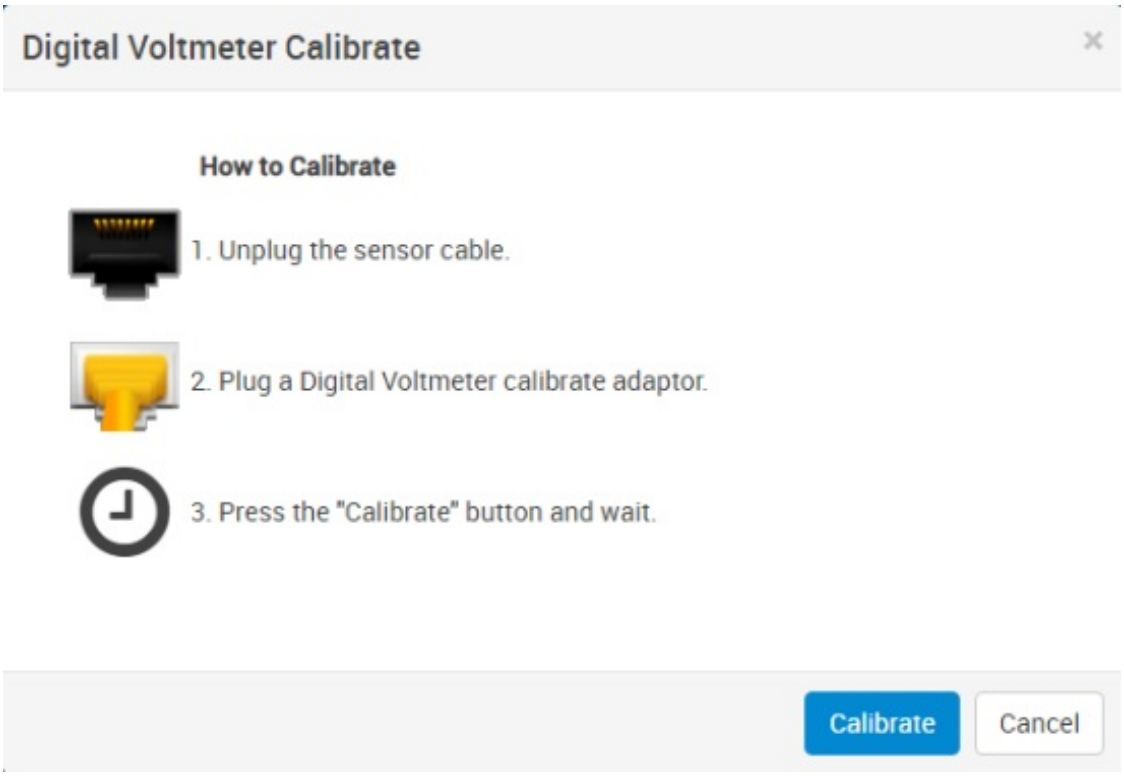
When connected to a sensor port on the base unit, the BMS will appear as a Digital Voltmeter type, with multiple sensors.
Depending on your sensor type, it will have more or fewer sensors available.
The screenshots below will show a BMS sensor that also has a Temperature Sensor.

Battery Voltage



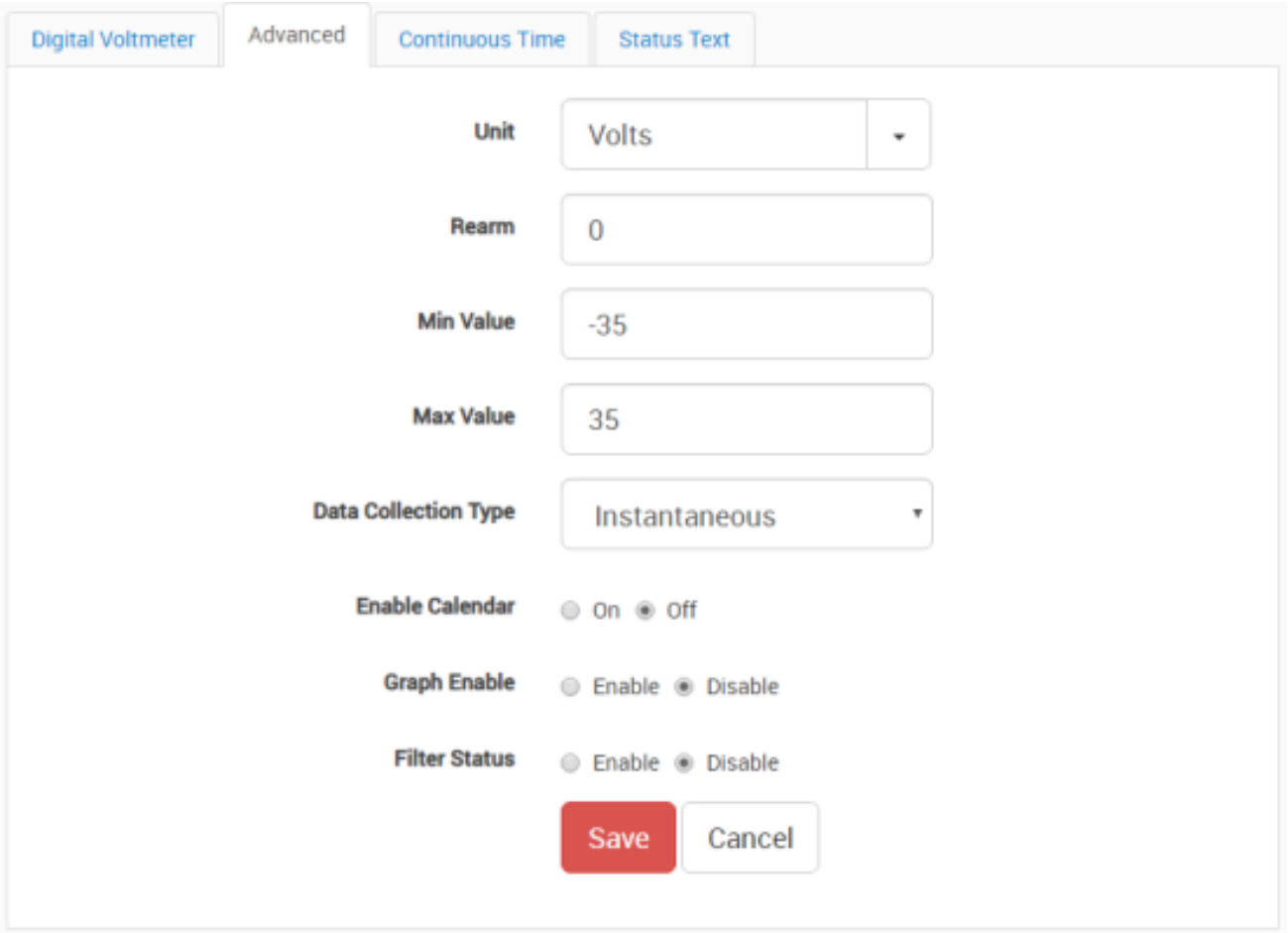
The configuration is similar to a Digital Voltmeter sensor.
You can customize the sensor name and reading thresholds.
Note the displayed **Operating Voltage;** it can be 12V, 24V, or 48V depending on your selection on the sensor by the voltage selector switch (see on the next picture).
If the sensor receives a voltage that is above the scale (for example 36V when the scale maximum is 35V) then the sensor becomes Sensor Error state, this is normal.
Important: You'll need to recalibrate the sensor every time you change the operating voltage.
The polarity of the Batt Voltage is (- +) you must be careful to connect the correct polarity.

Important:
The Battery Monitoring Sensor is not isolated; you must be careful about the voltage potential levels that may reach the sensor.
If the voltage reading isn't correct, or when you change the operating voltage, you can use the **Calibrate** button and follow the instructions to recalibrate:



Note: you'll need to use the calibration adaptor unit that arrives with the sensor's packaging.
Voltage calibration process:

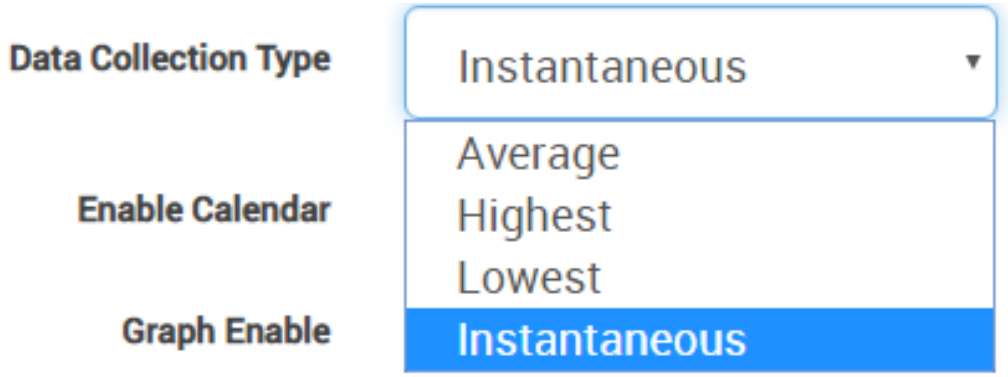
- Move the switch on the sensor to the desired Voltage position.
- Plug iDCV Calibration Cable to Voltage connector of Battery Monitoring Sensor.
- Click "Calibrate" in the dialog window and wait about 10 seconds.
- Put back the voltage connector instead of iDCV Calibration Cable on the sensor.



Under the **Advanced** tab, you can change further options for the sensor:

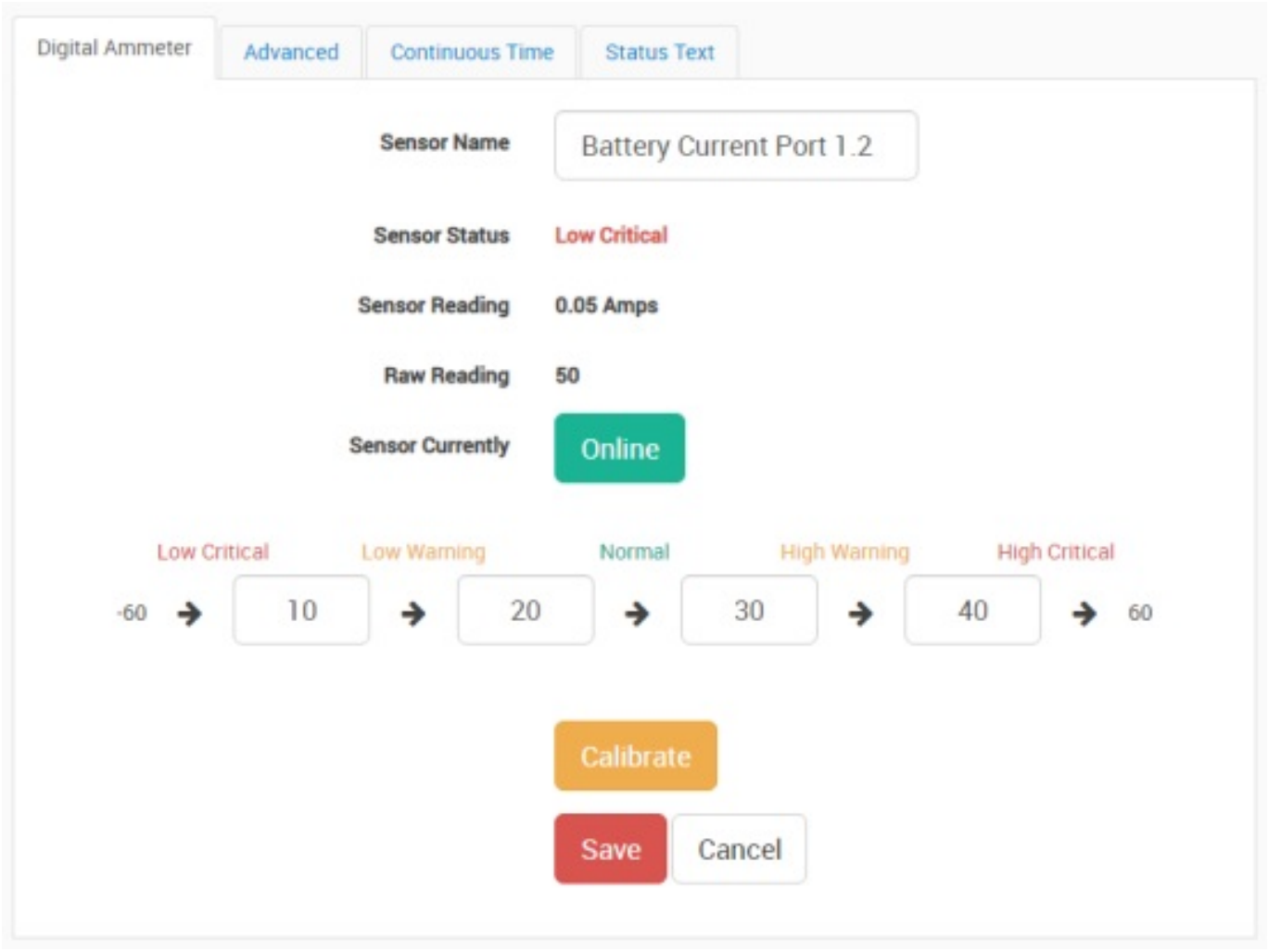
- Change the Unit type (default is Volts)
- Adjust the reading scale min/max values
- Adjust the rearm value
- Enable/disable the Calendar feature (then you'll be able to define a calendar schedule; you can check how to use this feature in other AKCP manuals)
- Enable/disable the graphing of this sensor
- Enable/disable status filtering (to prevent quick changes)

In addition, you can change the **Data Collection Type:**

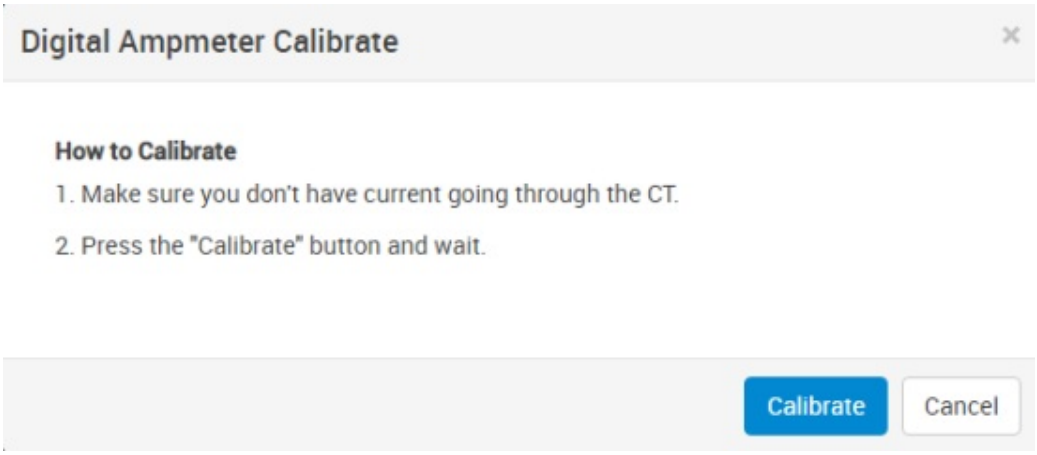


The default type is Instantaneous; for a description of each type, you can refer to our SP+ Introduction manual.
This Data Collection Typesetting is the same for each sensor on the BMS so we won't detail it below.
The **Continuous-Time** and **Status Text** tabs are the same as with any other AKCP sensor.

Battery Current



The configuration is similar to a Digital Ammeter sensor.
You can customize the sensor name and reading thresholds.
If the Amperage reading isn't correct, you can use the **Calibrate** button and follow the instructions to recalibrate:

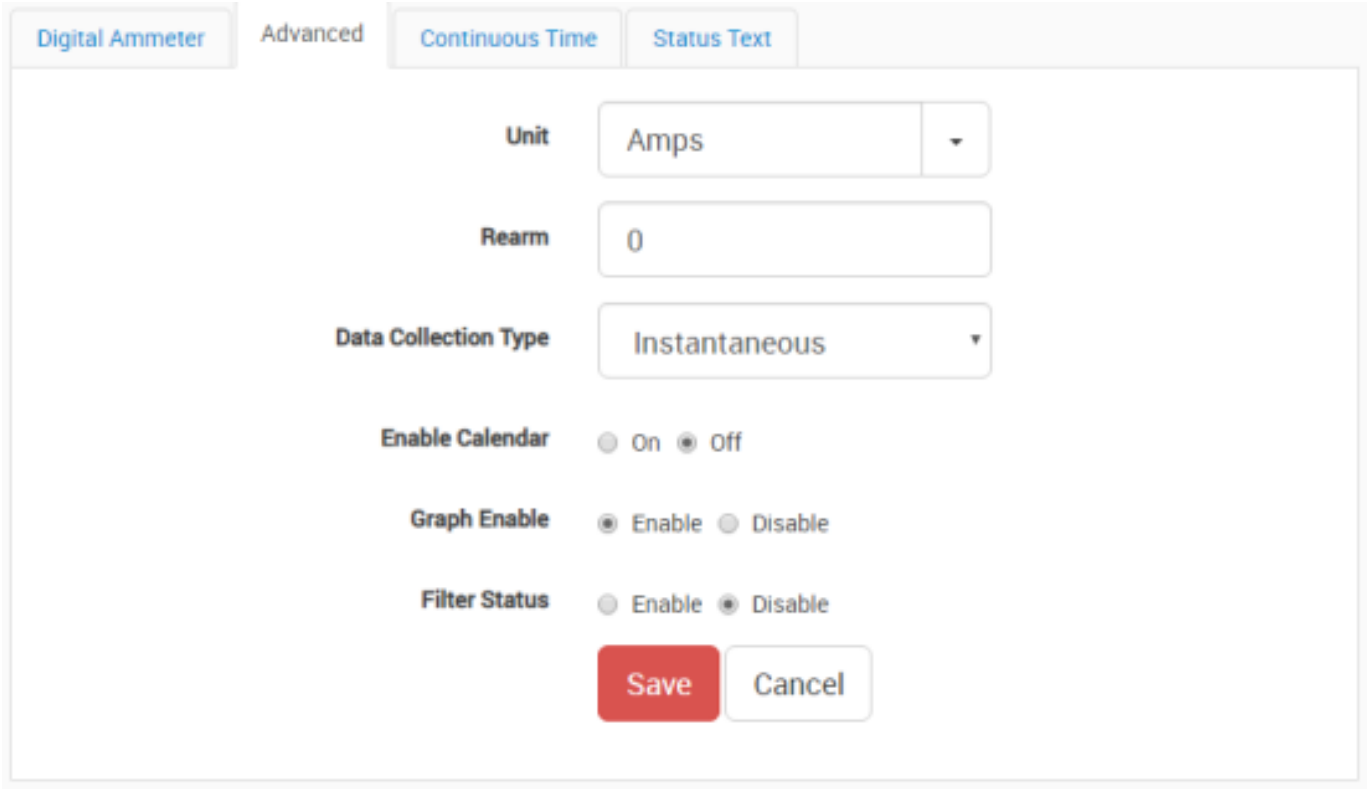


Note: the sensor arrives pre-calibrated from the factory, so usually this is not necessary.
Current calibration process:

- Make sure you don't have current going through the CT.
- Click "Calibrate" in the dialog window and wait about 10 seconds.
- Re-enable the current load and measure if it displays correctly.

Important note: if you're observing reading fluctuation, slight variations can be considered normal.
For example, a 3A variation on the 1500A CT (0.2%) follows the variation of the ambient temperature (5C).
The CT specs an output drift of +/-0.5mV per degree Celsius, so a 5C variation could induce a drift of +/-2.5mV, which for the 1500A CT would correspond to +/-3.5A variation.

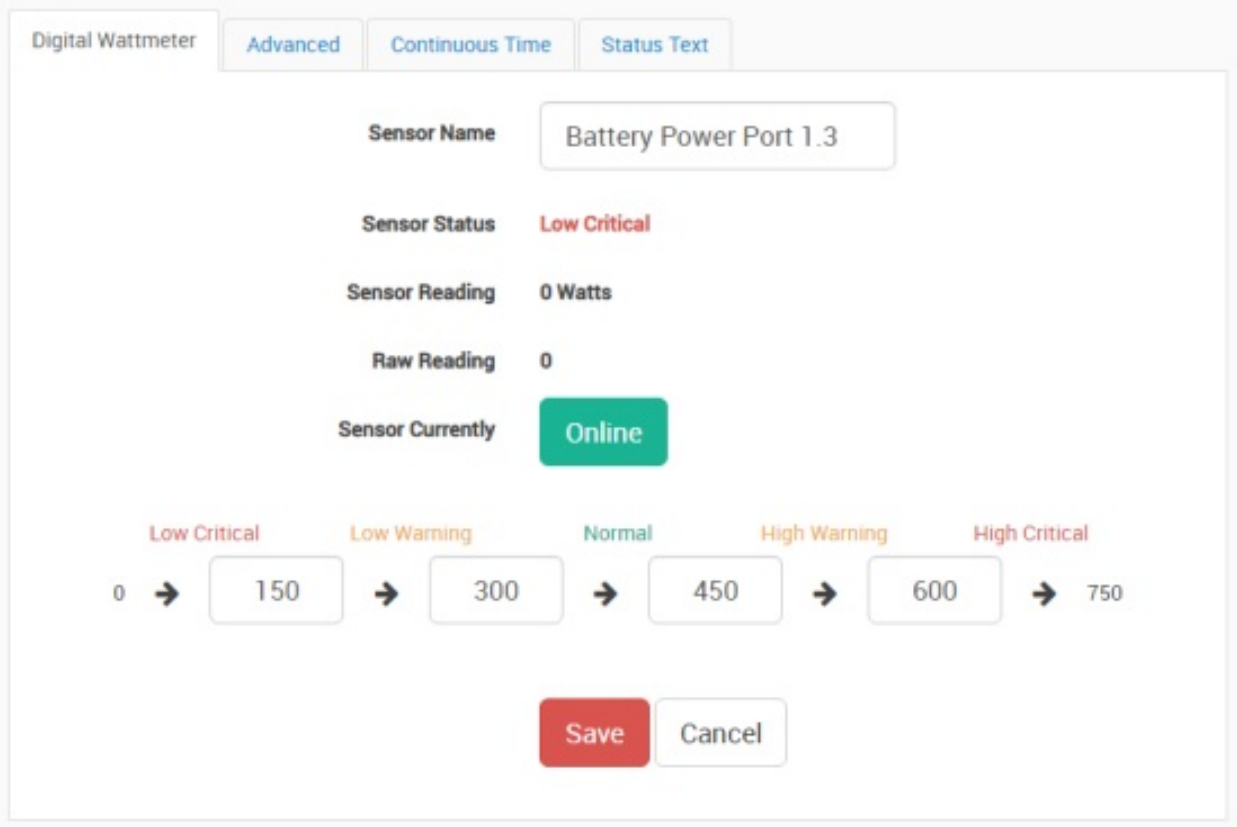
The same temperature drift has much less impact on the 50A CT because the same output variation would correspond to a drift of 0.15A



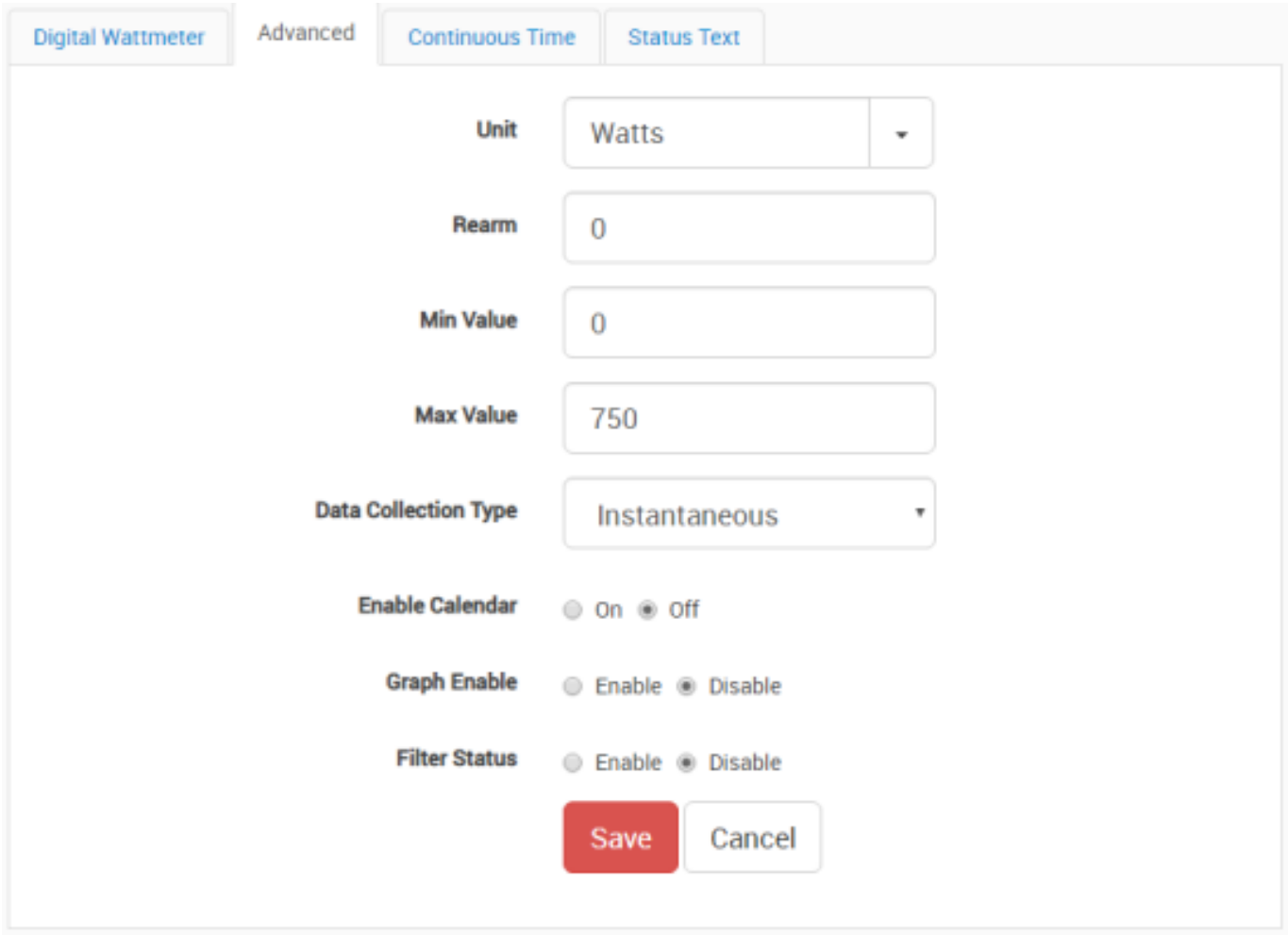
Under the **Advanced** tab, you can change further options for the sensor:

- Change the Unit type (default is Amps)
- Adjust the rearm value
- Change the Data Collection Type
- Enable/disable the Calendar feature (then you'll be able to define a calendar schedule; you can check how to use this feature in other AKCP manuals)
- Enable/disable the graphing of this sensor
- Enable/disable status filtering (to prevent quick changes)

Battery power



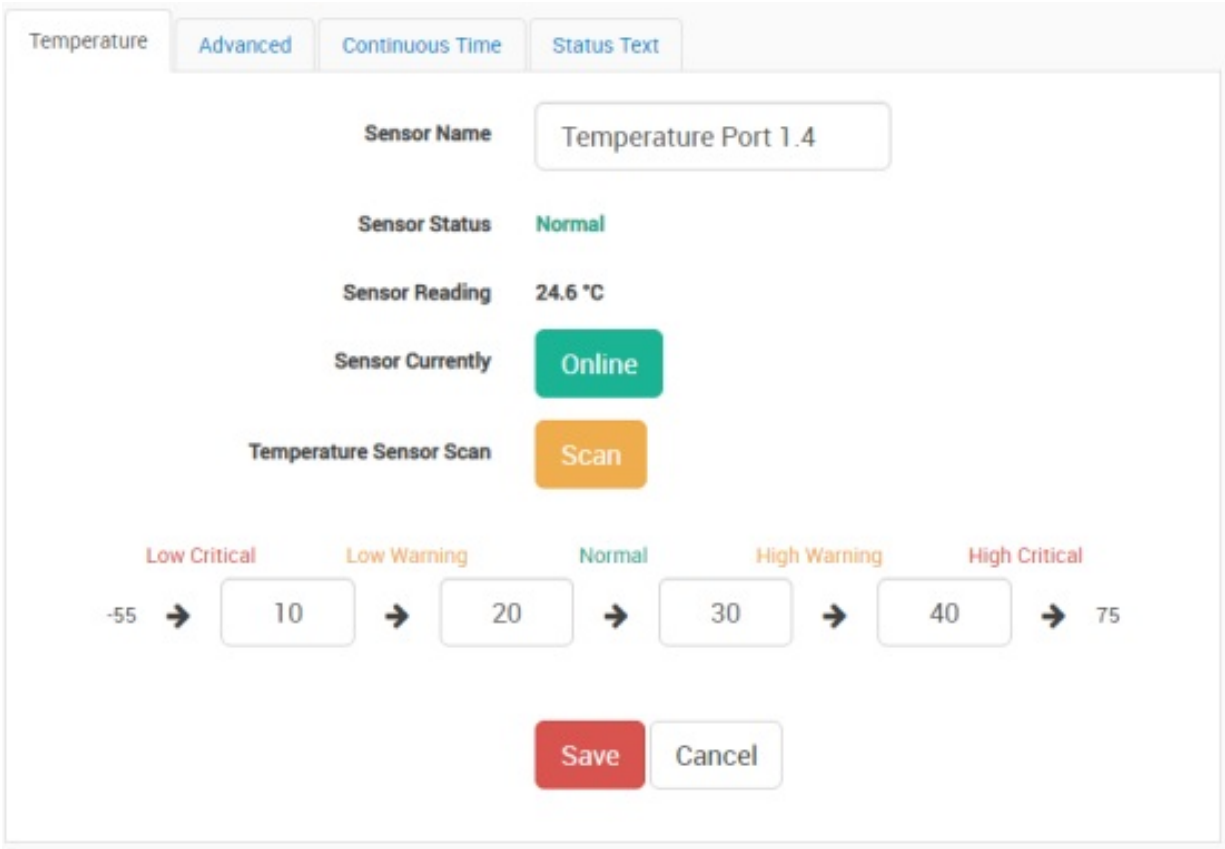
The configuration is similar to a Digital Wattmeter sensor.
You can only customize the sensor name and reading thresholds.



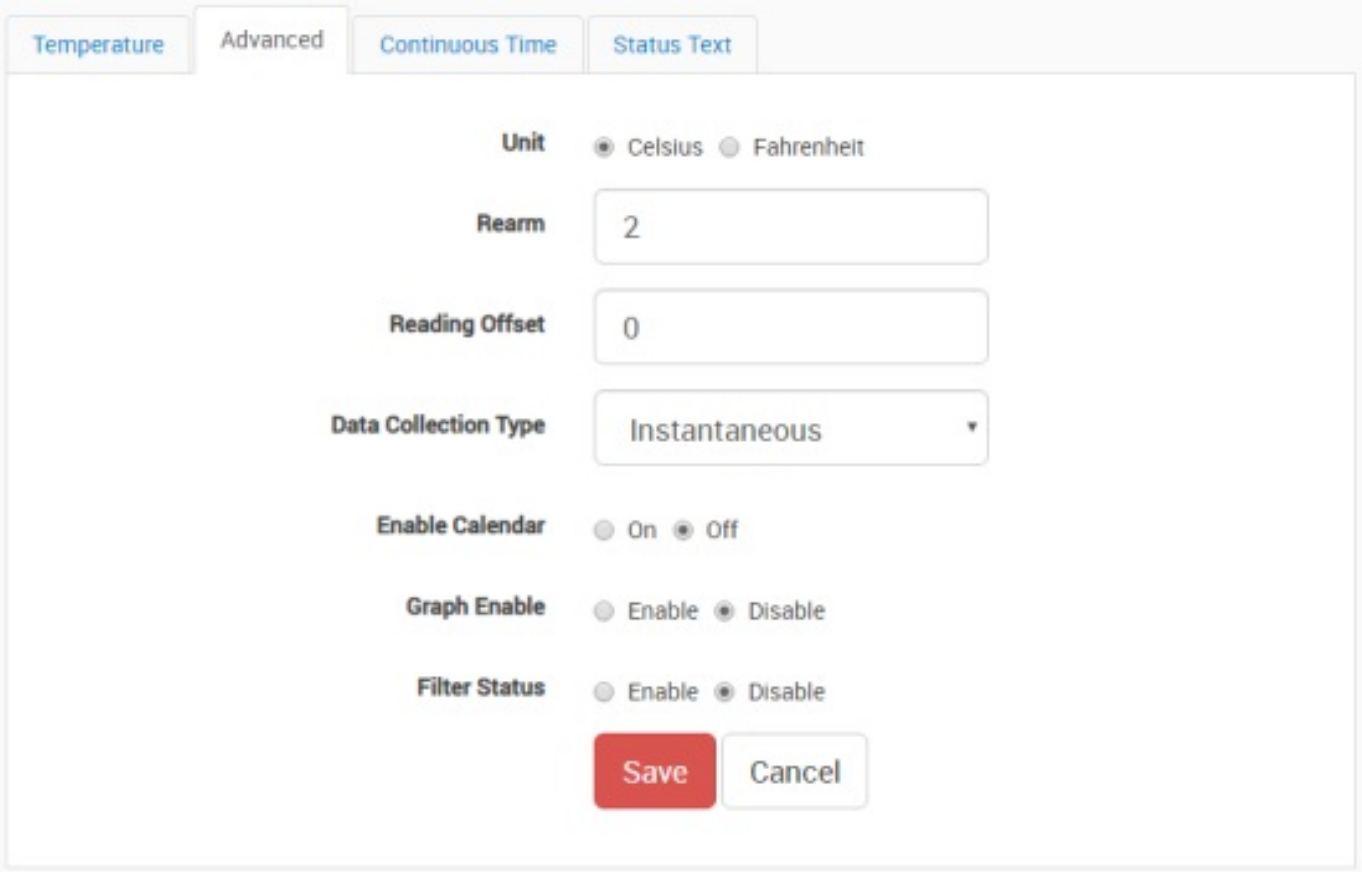
Under the **Advanced** tab, you can change further options for the sensor:

- Change the Unit type (default is Watts)
- Adjust the reading scale min/max values
- Adjust the rearm value
- Change the Data Collection Type
- Enable/disable the Calendar feature (then you'll be able to define a calendar schedule; you can check how to use this feature in other AKCP manuals)
- Enable/disable the graphing of this sensor
- Enable/disable status filtering (to prevent quick changes)

Temperature sensor



The configuration is exactly the same as with any other Temperature sensor.
You can only customize the sensor name and reading thresholds.



Under the **Advanced** tab, you can change further options for the sensor:

- Change the Unit type between Celsius and Fahrenheit
- Adjust the reading offset
- Adjust the rearm value
- Change the Data Collection Type
- Enable/disable the Calendar feature (then you'll be able to define a calendar schedule; you can check how to use this feature in other AKCP manuals)
- Enable/disable the graphing of this sensor
- Enable/disable status filtering (to prevent quick changes)

Please contact support@akcp.com if you have any further technical questions or problems.

Thanks for Choosing AKCP!

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Documents / Resources

	AKCP Battery Monitoring Sensor [pdf] User Manual Battery Monitoring Sensor, Battery Monitoring

References

- AKCP - AKCP Remote Sensor Monitoring | Data Center Monitoring