

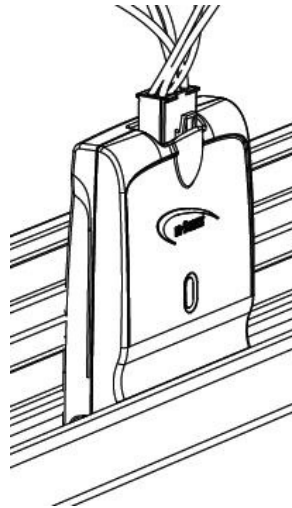


m-Senzor Installation Manual

p/n 6300-071C

About this manual

This manual is intended for use with PowerShield m-Sensor battery sensor.



A battery is more commonly known as a monoblock or jar in the critical power industry and therefore these terms are used throughout this manual.

Part Number 6300-071
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Contents

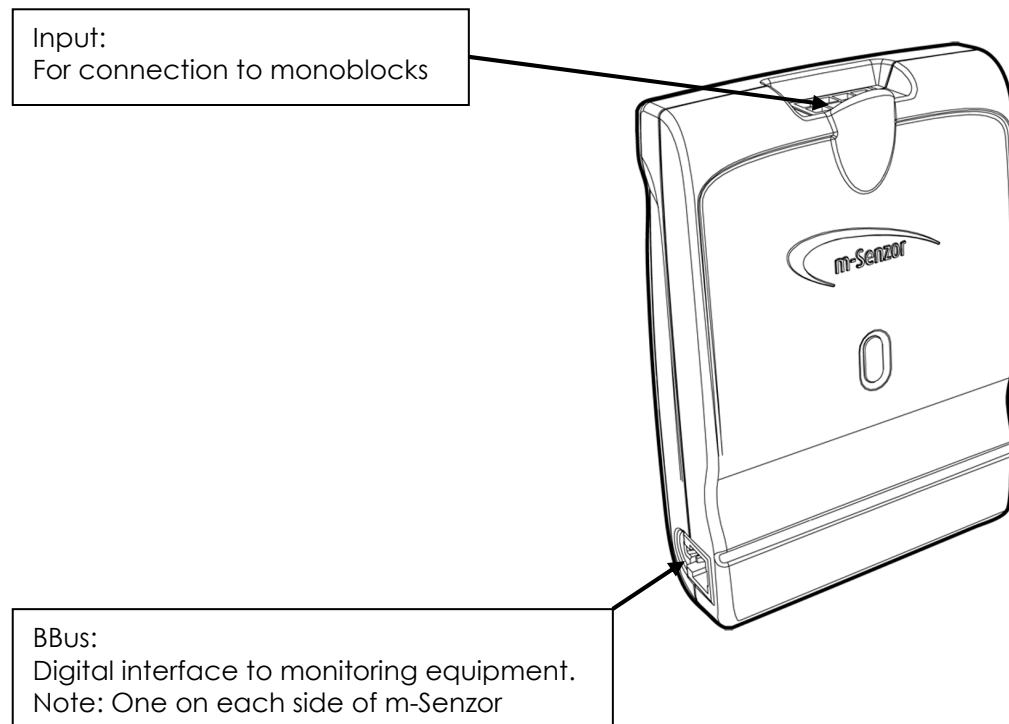
- Safety Information2
- Operation.....3
- Installation – Preliminaries.....3
 - Bbus3
- Installation4
 - Step 1 - Monoblocks/Jars4
 - Step 2 – Mounting Rail for m-Sensors5
 - Step 3 – m-Sensor Power Leads6
 - Step 4 – Connect m-Sensors.....7
 - Step 5 – Connect the Bbus8
 - Step 6 – Confirmation9
- Specifications10
- Appendix 1 – LED Behaviour11
- Appendix 2 – m-Sensor Connections12
 - Dual m-Sensor12
 - Single m-Sensor12

Safety Information

To ensure that the m-Sensor is installed and used in a safe manner, observe the following guidelines:

- Read this manual completely before installing the m-Sensor and follow all safety instructions.
- The m-Sensor must be correctly installed and configured in order to obtain accurate results. The installation must be carried out only by suitably trained personnel. Installation must be in an adequately ventilated environment or warranty may be invalidated.
- The m-Sensor may operate in a potentially hazardous environment making it imperative that all installation personnel have adequate training and experience. The m-Sensor must be installed in a Service Access area.
- The m-Sensor is intended for indoor use only.
- The m-Sensor is intended to be used in an environment with a maximum relative humidity of 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C.
- The m-Sensor is intended to be used in a Pollution Degree 2 environment.
- The m-Sensor is a Measurement Category I (CAT I) product. It should not be used for Measurement Categories II, III and IV.
- The m-Sensor is designed to withstand transient over-voltages up to 2500V.
- Consult the manual whenever you see the caution symbol .

Terminals



Operation

The m-Sensor is a battery sensor with a digital interface. The m-Sensor can measure battery temperature, voltage and ohmic value of the battery it is connected to. The measurements and configuration of the m-Sensor need to be retrieved via the digital interface. The m-Sensor has 2 LED's to indicate status, the details of which are outlined in Appendix 1.

Installation – Preliminaries

Each m-Sensor is specific to the monoblock voltage to which it will be fitted – 2V/4V/6V/8V/12V – but it is a dual device and is connected across a pair of these monoblocks. The pair of monoblocks must be located one after the other in series, within the same battery string. The most positive monoblock of the pair is V1, the most negative monoblock of the pair is V2. The m-Sensor measures each monoblock individually.

Each m-Sensor has a factory set ID number between 1 and 125. Any m-Sensor can be fitted to any 'in series' pair of monoblocks, regardless of ID number; however, each m-Sensor on a single digital interface must have a unique ID.

For installations containing strings with uneven numbers of monoblocks, or where layout makes pairs impossible, a one monoblock 'single' version of the m-Sensor is available. This is identical to and treated in the same manner as the dual version, but connected across a single block.

Bbus

m-Sensors communicate via the PowerShield Bbus digital interface. This connects m-Sensor to m-Sensor and m-Sensor to monitoring equipment in a chain. One Bbus is not limited to a single monoblock/jar string, or even consecutive monoblocks. If it is more practical, each Bbus may span between monoblock/jar strings.

It is advisable to keep the total length of the BBus interface to less than 150m. This is the total length of the Bbus to the furthest module, including the short connecting cables between each m-Sensor.

Installation



Installation must be carried out only by suitably trained personnel.

Installation must be in an adequately ventilated environment.

Step 1 - Monoblocks/Jars

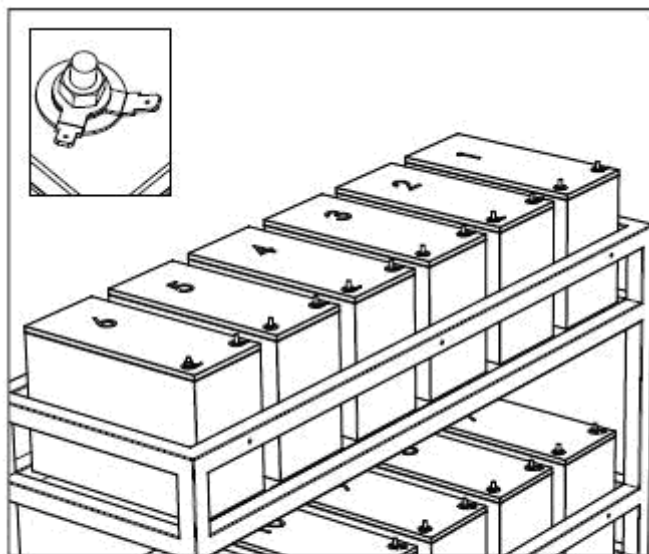
Each monoblock must be uniquely identified, preferably by number, to aid in mapping modules to monoblocks. It does not matter which numbers are allocated to which monoblock, although it is advisable that monoblocks in a single string are identified by a single consecutive sequence of numbers. Where there are multiple strings in a system, ensure every monoblock is uniquely identified, i.e. 1-24, 25-48, 49-72, NOT 1-24, 1-24, 1-24.

Ensure that all terminals have 6.3mm tabs available for m-Sensor connection as follows:

Where a dual m-Sensor is to be used – fit two tabs on the negative (-) terminal of the most negative monoblock and two tabs on the positive (+) terminal of the most positive monoblock. Fit one tab on each of the remaining terminals.

Where a single m-Sensor is to be used – two tabs are required on each monoblock terminal.

For simplicity, it may be easier and more efficient to fit two tabs to every terminal.

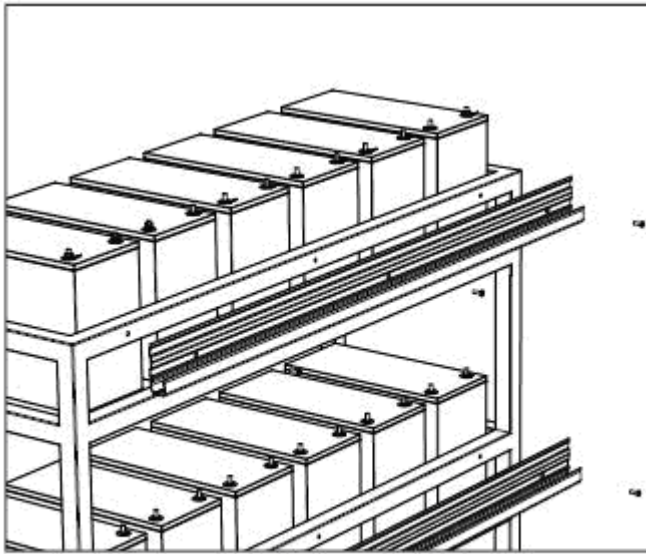


Number all monoblocks individually
(eg. 1-32, 33-64, 65-96, Not 1-32, 1-32, 1-32).
Fit 6.3mm QC terminal tags, 2 for each.

Step 2 – Mounting Rail for m-Sensors

The m-Sensor mounting rail can be fitted in any orientation and can be used with both racks and cabinets.

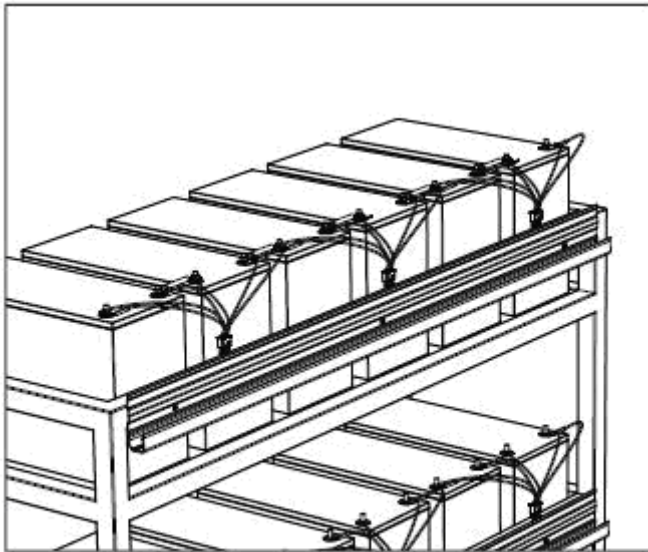
Drill to suit and fasten with screws or cable ties.



Secure the mounting rail to suit battery layout.

Step 3 – m-Senzor Power Leads

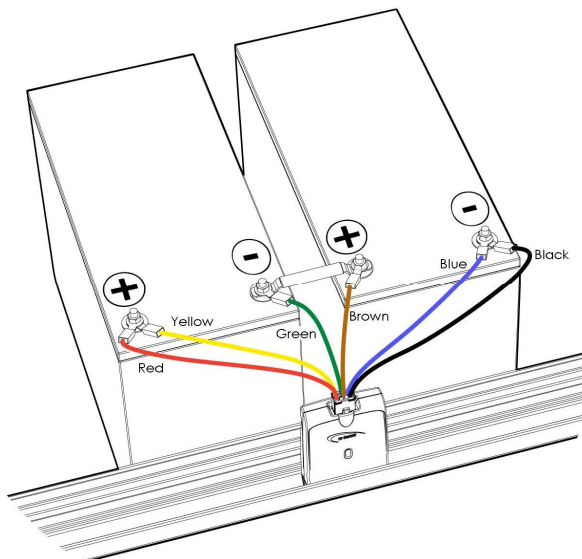
Fit the m-Senzor power leads to the monoblock/jar terminals. Ensure the dual power leads are connected across an 'in series' pair of monoblocks/jars. Refer Appendix 2 for connection details.



Fit Module power leads to terminal tags,
confirming correct polarity

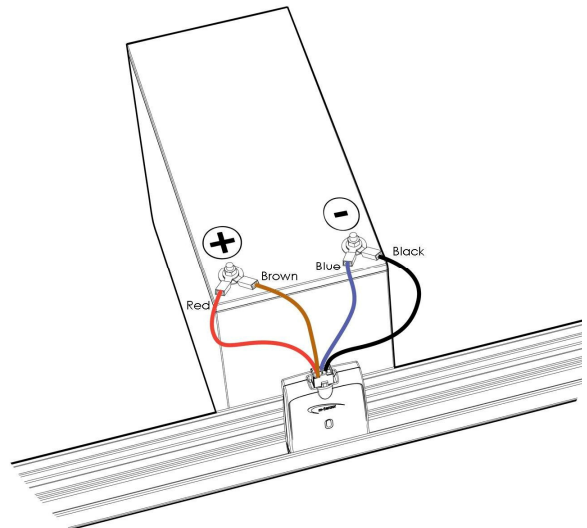
Dual m-Senzor

Dual m-Senzor Power Lead Connection Detail



Single m-Senzor

Single m-Senzor Power Lead Connection Detail

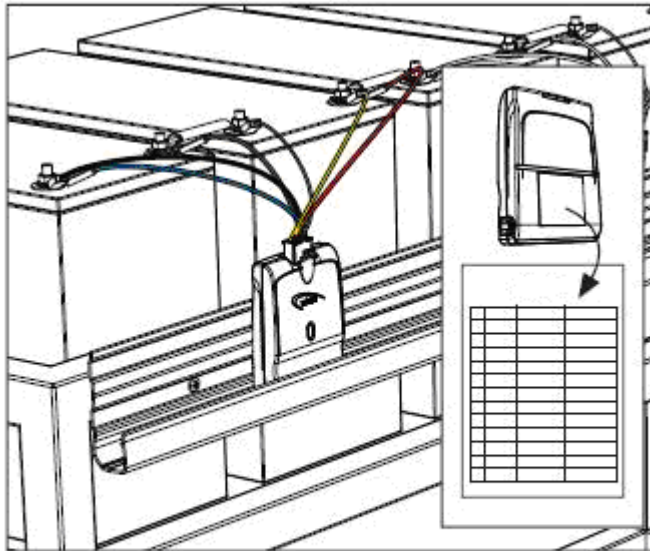


Step 4 – Connect m-Sensors

Connect the m-Sensors to the power leads and snap into mounting rail. Ensure the module ID and monoblock number are recorded. Without this information the monitoring system cannot be properly configured. The ID range is 1-125, however the m-Sensors can be installed in any arrangement. The only requirement is that when connected to the monitoring equipment each m-Sensor on a Bbus communication link has a different ID.

The LED should light solid green when the m-Sensor is powered correctly. If the LED lights red, check the connections of the power lead.

A full list of m-Sensor LED states is available in Appendix 1

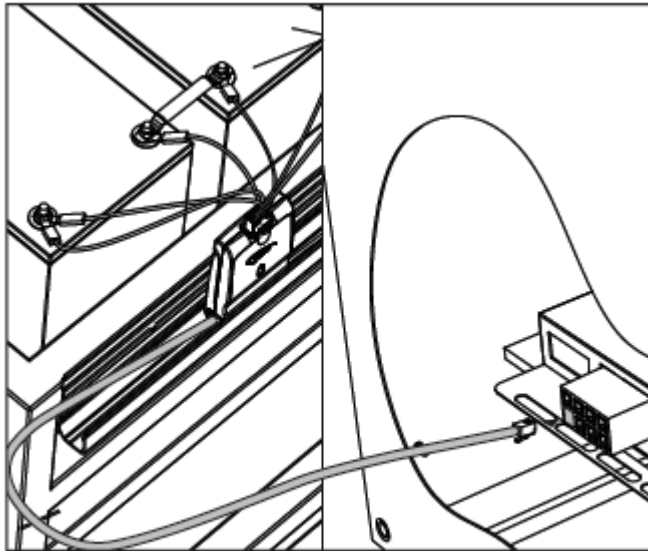


Fit modules, connect power leads.
The LED should turn on green.
Record Module ID and battery number.

Step 5 – Connect the Bbus

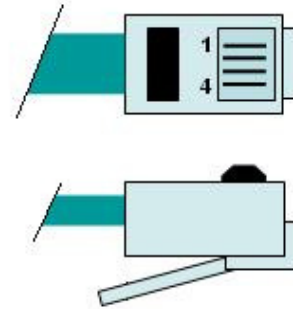
The Bbus is the digital interface between m-Sensors and monitoring equipment and is single ended [not a loop]. The m-Sensors can be connected in any arrangement, so long as each m-Sensor on a single BBus has a different ID number.

Use the short Bbus interconnect cables from m-Sensor to m-Sensor, and the longer Bbus port cables from m-Sensor to monitoring equipment.



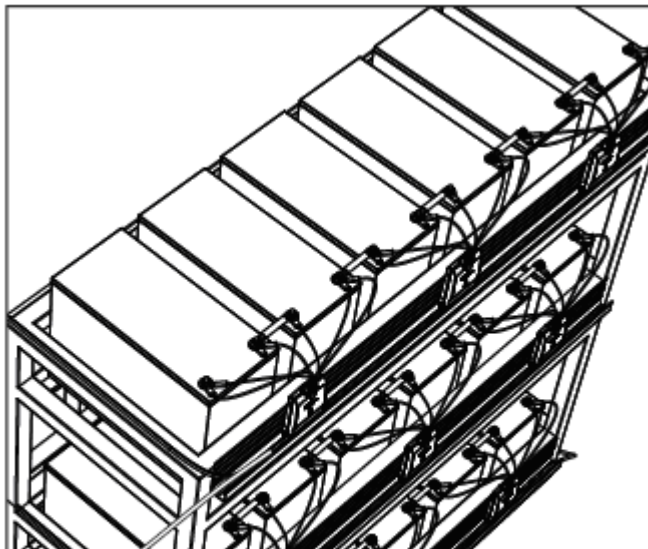
Connect Bbus Port cable from one end of the m-Sensor to monitoring equipment.

Bbus Cable Pin-Out Detail



| Left | | Right | |
|-------|--------|-------|--------|
| Pin # | Color | Pin # | Color |
| 1 | Yellow | 1 | Yellow |
| 2 | Green | 2 | Green |
| 3 | Red | 3 | Red |
| 4 | Black | 4 | Black |

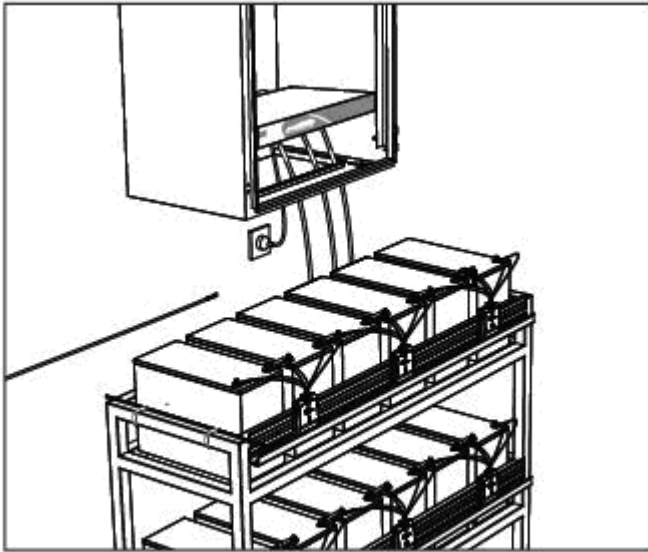
Once the Bbus is connected to powered monitoring equipment, the m-Sensor LEDs should flash green and red in unison.



Remember-each Module on the Bbus must have a different ID.
The LED should flash green and red in unison.

Step 6 – Confirmation

Check that all installed parts are performing as expected, and that the installation forms are complete. Secure all cables with appropriate strain relief.



Confirm all module LEDs are flashing.
Secure all cables tidily.

Your system is now ready for configuration.

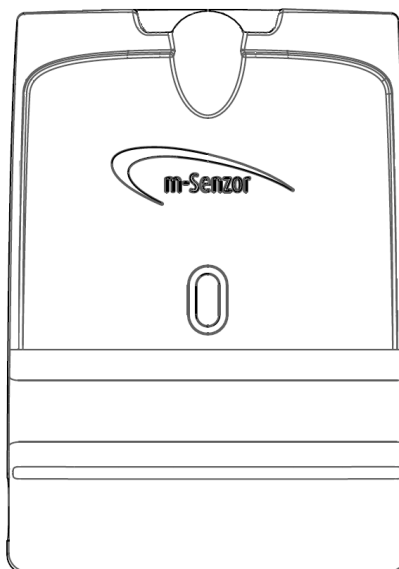
Specifications

Mechanical

Width: 74mm / 3 inches

Depth: 24mm / 1 inch

Height: 105mm / 4.5 inches



Electrical

| | 2V | 4V | 6V | 8V | 12V | |
|---|-----------|----------|-----------|----------|----------|------|
| Part Number Single Model | - | 9100-072 | 9100-089 | 9100-087 | 9100-085 | |
| Part Number Dual Model | 9100-081 | 9100-082 | 9100-090 | 9100-088 | 9100-086 | |
| Voltage Measurement Range ¹ | 1.6-2.6 | 3.2-5.2 | 4.8-7.8 | 6.4-10.4 | 9.6-15.6 | Vdc |
| Voltage Accuracy | ±0.3 | | ±0.2 | | | % |
| Voltage Resolution | 0.001 | 0.005 | | | | Vdc |
| Ohmic Value Range | 0.15 – 5 | | 0.5 - 20 | | 1 - 40 | mΩ |
| Ohmic Value Accuracy | ±15 ±2.5% | | ±25 ±2.5% | | | μΩ |
| Ohmic Value Resolution | 1 | | | | | μΩ |
| Max Normal Current Consumption ² | 36 | | 18 | | | mA |
| Max Current ³ | 3.0 | | 2.1 | 1.5 | 1.1 | Arms |
| Protected Maximum Voltage Unintended Applications | ±6 | ±16 | ±25 | ±65 | | Vdc |

1. Per monoblock.

2. Applies at minimum monoblock voltage.

3. Only applies during impedance measurements.

Connectors

Input: 8 way AMP Mini UMNL p/n 0-0770579-1

BBus Interface: 4 way modular jack p/n Tyco 5-641334-3

Other

Isolation 600V DC

Storage temperature 0-70°C / 32-158°F

Operating temperature 0-50°C / 32-122°F

Powered from monoblock being monitored

Interface PowerShield BBus (maximum 150m/492ft per BBUS link)

Appendix 1 – LED Behaviour

The m-Sensor has a bi-colour [red and green] LED. It will exhibit varying behavior as described below:

Green [Continuous]

m-Sensor connected to the wiring harness & monoblock/jar with no problems detected.

Green & Red [Flashing]

m-Sensor is connected to monoblock/jar and an active Bbus but has not yet been detected.

Green [Flashing]

Normal operation. m-Sensor is connected to monoblock/jar and an active Bbus and has been detected.

Red [Continuous]

m-Sensor has detected a problem with the wiring harness or monoblock/jar.

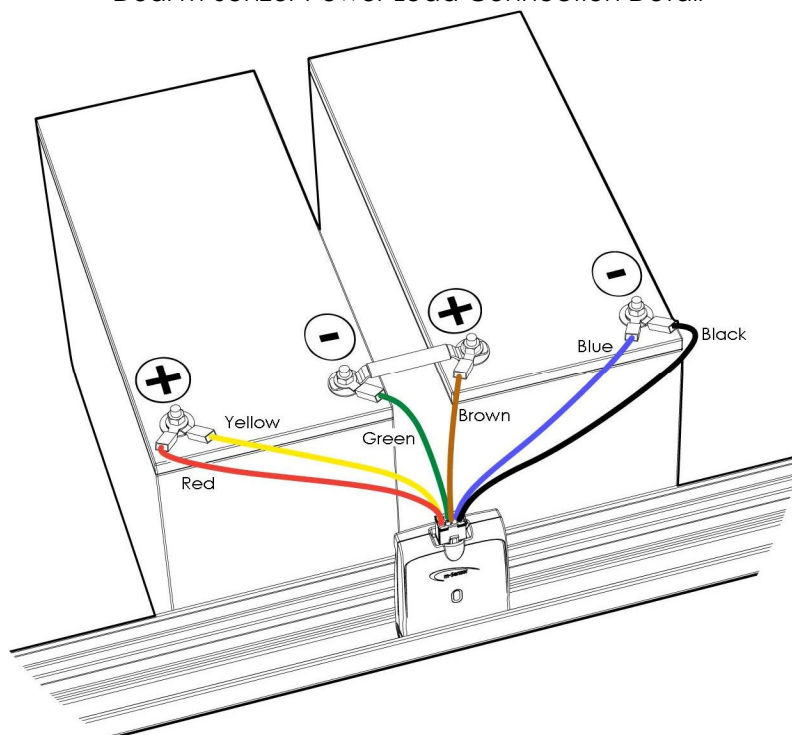
Green & Red [Alternate Flash]

m-Sensor locate function

Appendix 2 – m-Senzor Connections

Dual m-Senzor

Dual m-Senzor Power Lead Connection Detail



Single m-Senzor

Single m-Senzor Power Lead Connection Detail

