MIDTRONICS

Battery Management Innovation

48V Cellguard Trace

Instructions
October 2007
168-987B

Description

The Midtronics 48V Cellguard Trace Battery Monitor (UBM-1048) is designed to monitor and test conductance, voltage and temperature in 48V battery backup system applications. In the event of test failure, the Battery Monitor can also be configured to send an alarm via binary contacts.

The Cellguard Trace can be permanently installed on a battery rack along with the supplied 48V Battery Cable Harness. Using the included DB-9 cable, the monitor can communicate with a Windows-based computer running the included MonitorClient application software. Collected data can also be displayed in standard spreadsheet applications.

Contents

1 - UBM-1048 Battery Monitor

1 - 48V Battery Cable Harness

1 - DB-9 Cable

1 - MonitorClient Software CD

Battery Connections

Use the supplied custom cable harness to connect the battery monitor to the batteries in the rack.

1. Disconnect the batteries from the charging unit.

⚠ DANGER

Hazardous voltage.
Can cause death or serious personal injury.

To avoid electrical shock or burn, turn off main and control voltages before performing installation or maintenance.

⚠ WARNING

System will not have back up while main power is disconnected.

To minimize risk of downtime, install the monitor during non-peak hours.

2. Locate battery 1 in a series configuration. Battery 1 is considered to be the most positive battery.
3. Attach the fuselinks connected to the red and blue wires in the cable harness labeled BATT 1 (+) to the positive (+) terminal on battery 1. (Figure 2)
4. At the BATT 1 (–) end of the cable, attach the fuselinks connected to the black wires bundled with the white and green wires, and the copper ring terminal to the negative (–) terminal of battery 1.
5. Attach the fuselinks connected to the red and blue wires in the cable harness labeled BATT 2 (+) to the positive (+) terminal of battery 2.

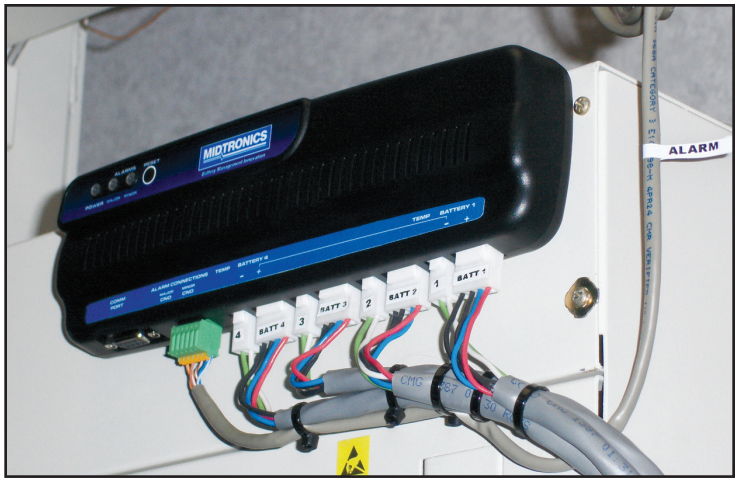


Figure 1

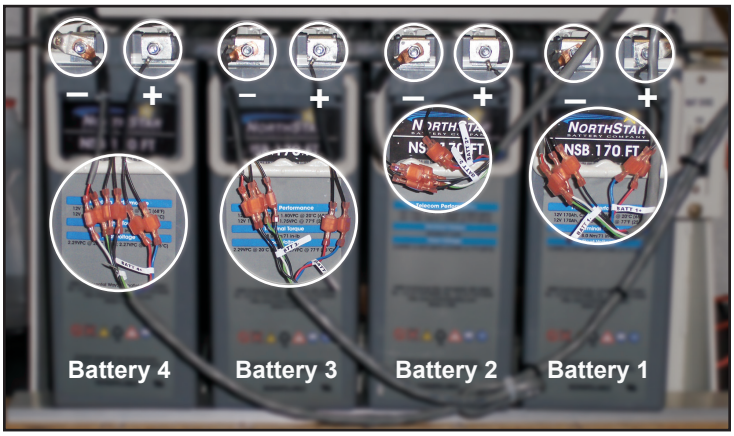


Figure 2

6. At the BATT 2 (-) end of the cable, attach the fuselinks connected to the black wires bundled with the white and green wires, and the copper ring terminal, to the negative (-) terminal of battery 2.
7. Repeat steps 5 and 6 for batteries 3 and 4.

NOTE: The ring terminals are for the temperature sensor.

Connection Verification

⚠ WARNING

Improper battery connections could damage battery monitor.

Verify battery connections with a voltmeter before connecting the Battery Monitor.

Verify the proper battery connections using the connectors at the Battery Monitor end of the cable harness.

1. Insert the positive voltmeter lead into the red wire on the Battery 1 connector. (Figure 3)

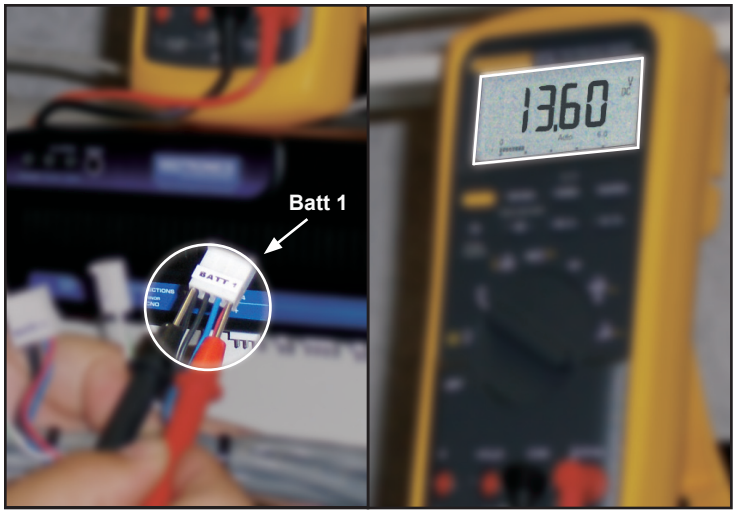


Figure 3

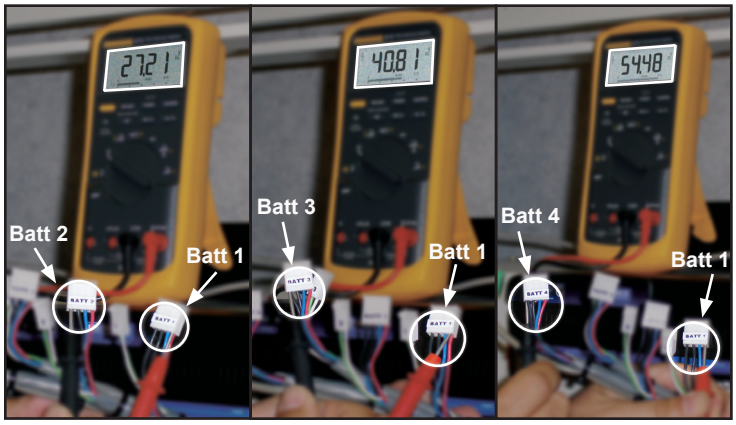


Figure 4

2. Insert the negative voltmeter lead into one of the black wires on the Battery 1 connector.
3. Measure the voltage. When properly connected, the meter should read a nominal +12 Volts. (Figure 3)
4. Move the negative voltmeter lead to one of the black wires on the Battery 2 connector. When properly connected the meter should read a nominal +24 Volts. (Figure 4)
5. Repeat the process for batteries 3 and 4. The meter should read a nominal 36 and 48 volts respectively.

Monitor Connections

Only connect the 48V Battery Cable Harness to the Battery Monitor after the battery connections have been verified with a voltmeter.

1. Plug the ALARM cable into the ALARM connector on the Monitor (Six pin green connector).
2. For battery 4, plug the two-pin temperature connector into the 2-pin TEMP and the four-pin battery connector into the four-pin connector connector on the Battery Monitor.
3. Repeat step 2 for batteries 3, 2, and 1.
4. The green POWER LED on the top of the Battery Monitor should now be illuminated.

NOTE: The monitor has 2 form C contacts that can be configured normally open (NO) or normally closed (NC). Both Major and Minor Alarm contacts are in the alarm state when the monitor is not powered.

The NC (Normally Closed) contact is open and the NO (Normally Open) contact is closed when the unit has power and is not in an alarm state. When an alarm is triggered, the NC contact is closed and the NO contact is open. Contact positions are summarized in the following table.

No Power	*With Power*	*Alarm Condition*
NC = Closed	NC = Open	NC = Closed
NO = Open	NO = Closed	NO = Open

If a contact closure triggers an alarm on the alarm panel, then use the CN (Normally Closed) pins on the connector.

5. Re-apply power to the battery charger.

Installing the MonitorClient Software

1. Insert the included software CD into the appropriate drive in a Windows-based computer.
2. Using Windows Explorer or the “My Computer” icon on the desktop, create a new folder on the computer’s hard drive.
3. Copy the files from the CD into the new folder.
4. To open the software from the computer’s hard drive, double click on the “MonitorClient.exe” file to open it or click once on the file to highlight it and then press the Enter key on the keyboard.

NOTE: The Monitor-Client software does not use an installation program.

5. Plug the DB-9 male-to-female serial cable from the COM PORT on the monitor to the PC serial communication port. If your PC does not have a serial communication port, a USB-to-serial adapter (not supplied) is required.

NOTE: The MonitorClient software must be installed on the computer before communications with the Battery Monitor can be established.

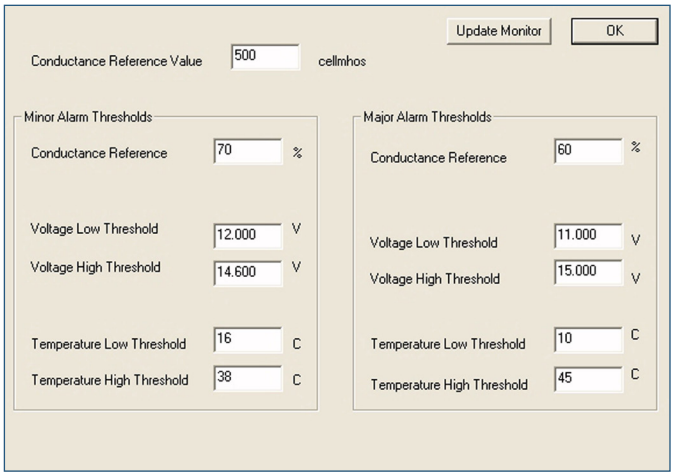
Using the MonitorClient Software

1. Open the MonitorClient software and click on the “Connect” button to connect to the Battery Monitor. If prompted, select the proper COM port for your computer. Once communication with the Battery Monitor has been established, the date, time and results from the most recent test cycle is displayed.

NOTE: The MonitorClient software will not connect with the Battery Monitor while the monitor is actively performing a battery test.

2. Click on the “Reference Setup” button to adjust major and minor threshold parameters.

NOTE: Factory preset settings are for reference only. Configure threshold parameters according to company policies and ambient surroundings.



Battery Monitor Default Settings

Conductance Reference Value = 2200 Mhos

Parameters	*Minor Alarm*	*Major Alarm*
Conductance % of Reference	70%	60%
Low Voltage	11.4	10.5
High Voltage	14.9	15
Low Temperature	-4°C (25°F)	-20°C (-4°F)
High Temperature	50°C (122°F)	60°C (140°F)

3. Click “Update Monitor” to send the new paramaters to the Battery Monitor. A notification window will appear once the parameters have been successfully updated.

4. The monitor **MUST** be reset after the threshold parameters have been updated. Do this by pressing the “Reset” button on top of the Battery Monitor.

NOTE: The Battery Monitor will continue to use the previously loaded values until the monitor has been updated and reset

5. Click “OK” to return to the main screen.

   By default the Battery Monitor will test a battery array once every 24 hours. Click “Test” to force the Battery Monitor to perform a test using the new parameters.

   In the event of a triggered alarm, the appropriate LED’s on the top of the unit will illuminate. The Battery Monitor can also send an alert via binary contacts.

NOTE: Following an alarm, the Battery Monitor will remain in a latched condition until the reset button on top of the unit has been pressed.

Viewing The Log File

1. To view the logged data, double click on the “MonitorLogAccum.csv” file, located in the same folder created when the software was copied onto the computer.

2. The appropriate spreadsheet application, such as Microsoft Excel, opens and the data is displayed.

NOTE: The spreadsheet application is not included with the MonitorClient software and must already be loaded onto the computer.

Specifications

General

Battery Voltage

The Battery Monitor interfaces with four individual 12 volt batteries with a nominal voltage of 48Vdc.

Battery Type

The monitor is capable of monitoring VRLA (Valve Regulated Lead Acid), AGM (Absorbed Glass Mat), and Gel type stationary batteries.

Battery Terminal Connections

The Monitor battery cabling connects to the battery via ring terminals. Each post will require 1 connection, for a total of 2 connections per battery.

Fused Battery Cabling

The Monitor battery cabling contains in-line fuses of sufficient current rating to support normal system operation and capable of blowing upon the occurrence of an adverse situation such as due to a short or other high current draw.

Battery Temperature Monitor Connections

The Monitor temperature cabling is a 2-wire interface. The cable connects to the negative post of the battery via a ring terminal.

Monitor Alarm Cable

The Monitor alarm cable is a 6-wire, 26 AWG solid conductor

Monitor Functional Specifications

System Measurements

The Monitor measures battery conductance, DC voltage, temperature, and string voltage. The Monitor uses a 1 Amp average current excitation signal.

Alarm Thresholds

Baseline conductance reference values must be determined for each battery model. The monitor provides a temperature compensated percent of reference between 0 – 35°C (32 - 95°F). The percent of reference is compensated 0.7% per degree Celsius away from 25°C. Below 25°C the percent of reference increases and above 25°C the percent of reference decreases.

Monitor Current Consumption

The total power consumed by the Monitor in active, non-testing mode is 60mA.

Monitor Performance Specifications

Battery Conductance Range

100 s < Siemens < 4,000 s for 12 Volt batteries

Battery Voltage Range

10.500 V < V < 15.000 (12 Volt Battery)

NOTE: Monitor is capable of reading above this range.

Battery Temperature Measurement Range

-20°C (-4°F) < T < 70°C (158°F)

String Voltage

42V < V < 58 for 48 Volt operation

Electronics Temperature Range

-20°C (-4°F < T < 70°C (158°F)

Monitor RS232 Data Interface Requirements

Physical Interface

The Monitor supports transfer of signals across the Monitor interface in accordance with the RS-232 standards

Signaling Protocol

The signal transmission adheres to the Universal Asynchronous Receive/Transmit (UART) protocol.

SLAVE Mode

The Monitor is the SLAVE for this interface.

Default UART Parameters:

- 9600 baud rate8 data bits
- 1 stop bit
- No parity
- No flow control

Data Representation

All data is binary

Monitor System Level Requirements

Module Power Source

The Monitor is powered by the batteries being monitored

Module Dimension

Length: 9½”
Width: 3”
Depth: 1¼”

Module Environmental Requirements

The Monitor operates over the environmental ranges specified below:

Operating Temperature:-20°C (-4°F) to 70°C (158°F)
Operating Humidity: 0 – 95% non-condensing

Monitor Alarm Specifications

Alarm Description

Status LEDs are used for present state of alarm. State is re-evaluated hourly.

Minor Alarm LED

Lit when a minor threshold was exceeded. Status indicator is latched on once a minor temperature, voltage, or conductance alarm occurs. Latched state is cleared by depressing the reset switch.

Major Alarm LED

Lit when a major threshold was exceeded. Status indicator is latched on once a major temperature, voltage, or conductance alarm occurs. Latched state is cleared by depressing the reset switch.

Power LED

Lit if power is on and the microprocessor is operational.

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