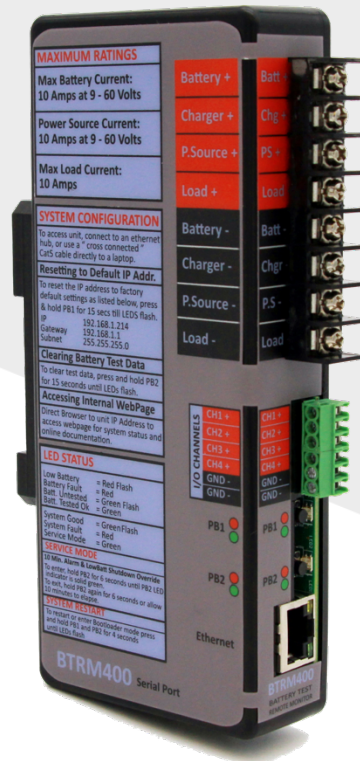# ventev®

HOW TO USE THE

BTRM
In Remote Enclosures

Part Number: BTRM-300 and BTRM-400
Product Release Date: June 24, 2021
Software Version: BTRM400v4619-202106-23

The Ventev Battery Test Remote Monitoring (BTRM) system has four independent, ground reference IO channels. Channels one and two can be used to activate relays, audible indicators, or lamps by pulling the IO pin to ground under certain alarm conditions. These channel contacts are normally open when power is off. The user can select normally open or normally closed under an alarm condition. The maximum relay ratings for the contact are 60 volts, 80 milliamps. It is not recommended to use to directly operate AC line connected equipment. The channel contacts are available for basic RTU functionality. Example configurations include:

- Door alarm
- AC power off
- DC power on

Channels three and four can be used to measure the voltage present (ground referenced). This can be used to monitor equipment voltages in the system. The maximum relay ratings for the contact are 60 volts, 80 milliamps. It is not recommended to use to monitor AC line voltages.

Door Alarm

The most common application for the relay contacts is a door alarm. The door alarm consists of an adjustable, polycarbonate pin switch and a door bracket for the pin switch. A DC voltage is applied to the pin switch as shown in Figure 1. The ground contact of the alarm does not have to be connected to complete the circuit, since the contacts of the BTRM are ground referenced.

Figure 1: Door Alarm Wiring Configuration
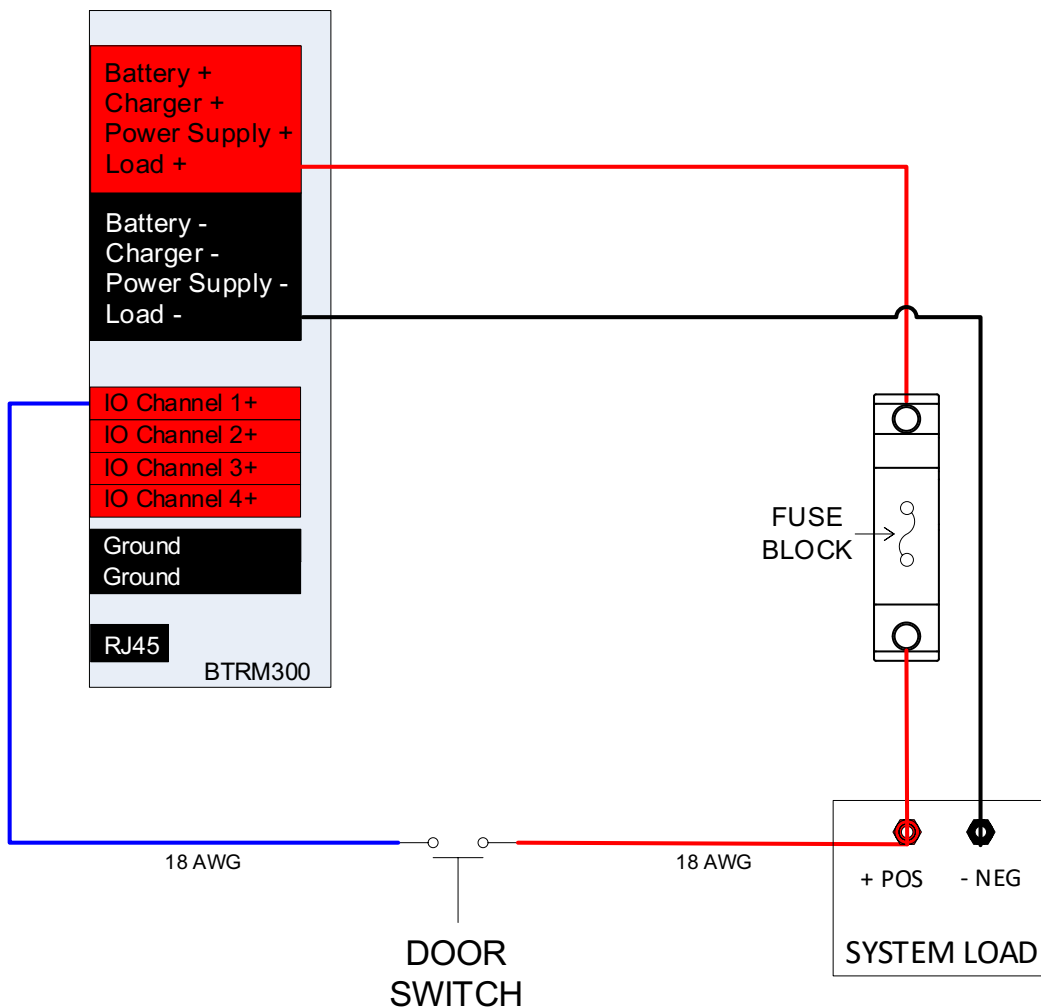
Once the alarm electrical connections have been made, the BTRM IO options need to be configured. On the BTRM webpage, click on the Port Options tab on the left to go to the BTRM Options page (configure arrow in Figure 2). Under the IO Channel being used for the alarm, the Digital Input Alarm if > 2V should be set (setting arrow in Figure 2). Click the save radio button at the bottom of the page after you have completed the changes (save arrow in Figure 2).
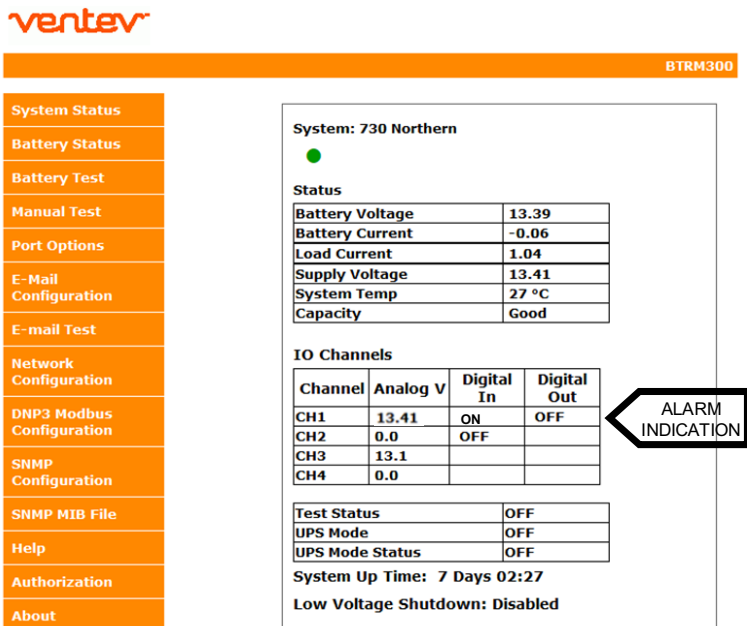
Figure 2: BTRM Options for Door Alarm

Figure 3: BTRM System Status Page Showing Door Alarm Indication

The door alarm status is shown on the BTRM status home page (Figure 3). When the door on the enclosure is closed, the polycarbonate pin switch will be open circuited. There is no voltage going to the contact on the BTRM. The Analog V will show 0V for Channel CH1 and show "off" for Digital In. When the door on the enclosure is opened, the polycarbonate pin switch will close the circuit. There will be a voltage going to the contact on the BTRM. The Channel CH1 will show the voltage from the

system load for Analog V and show "on" for Digital In, which indicates that an alarm message has been sent from the BTRM to the IT network.

AC Power Off

Another application for the relay contacts is an AC power off alarm. This alarm works in conjunction with DC OK dry contacts of a power supply. A positive voltage of the DC fuse distribution is applied to the BTRM IO channel via the DC OK contacts as shown in Figure 4. The IO channel ground contact of the BTRM connects to the negative voltage of the DC fuse distribution.

Figure 4: AC Alarm Wiring Configuration
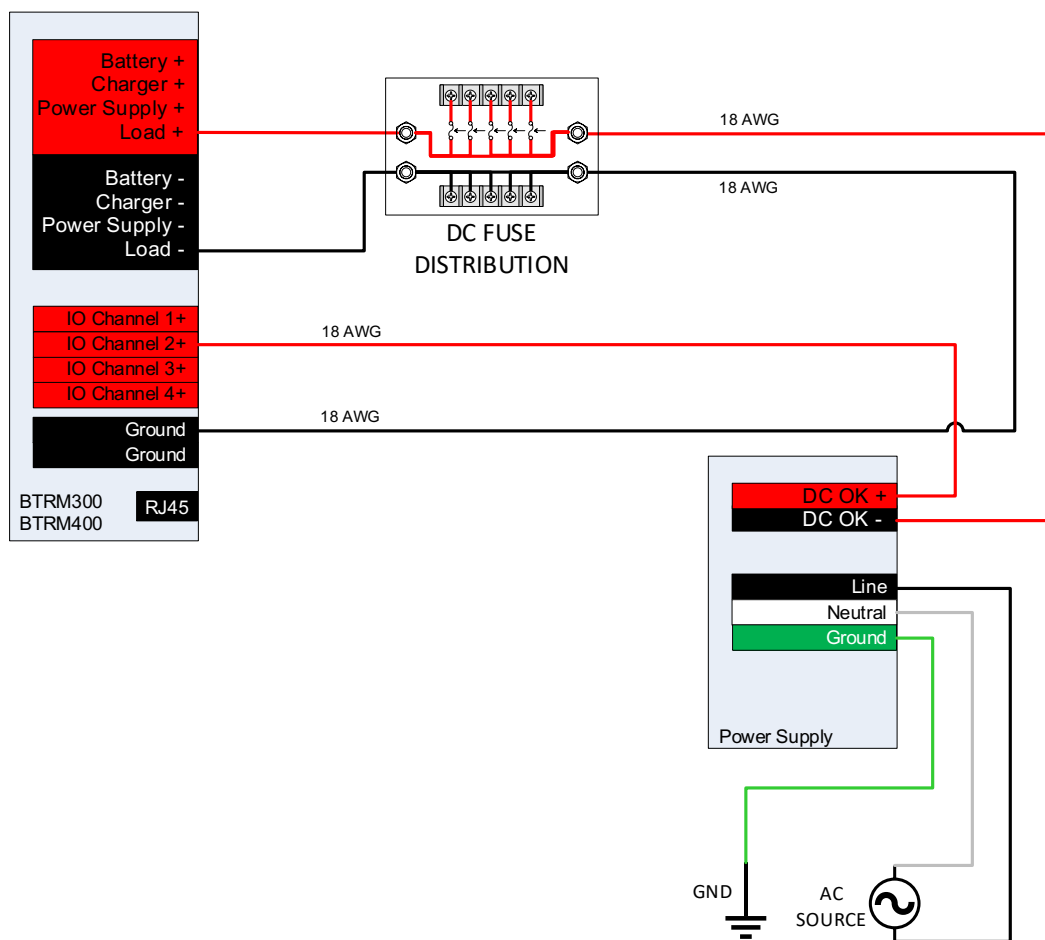
Once the electrical connections have been made to IO Channel 2, the BTRM IO options need to be configured. On the BTRM webpage, click on the Port Options tab on the left to go to the BTRM Options page (configure arrow in Figure 5). Under the IO Channel being used for the alarm, the Digital Input Alarm if < 1V should be set (setting arrow in Figure 5). Click the save radio button at the bottom of the page after you have completed the changes (save arrow in Figure 5).
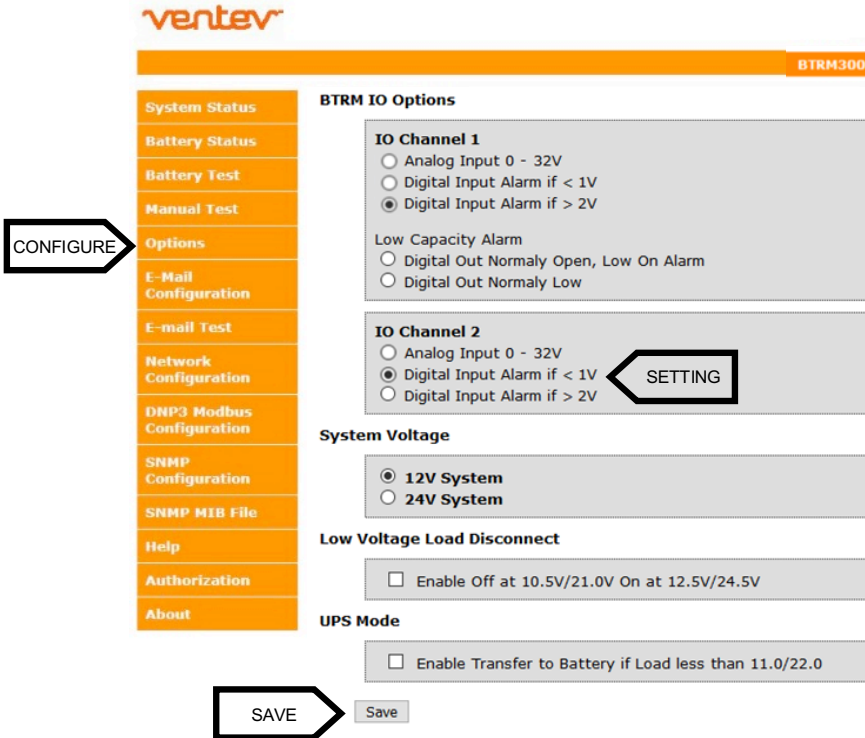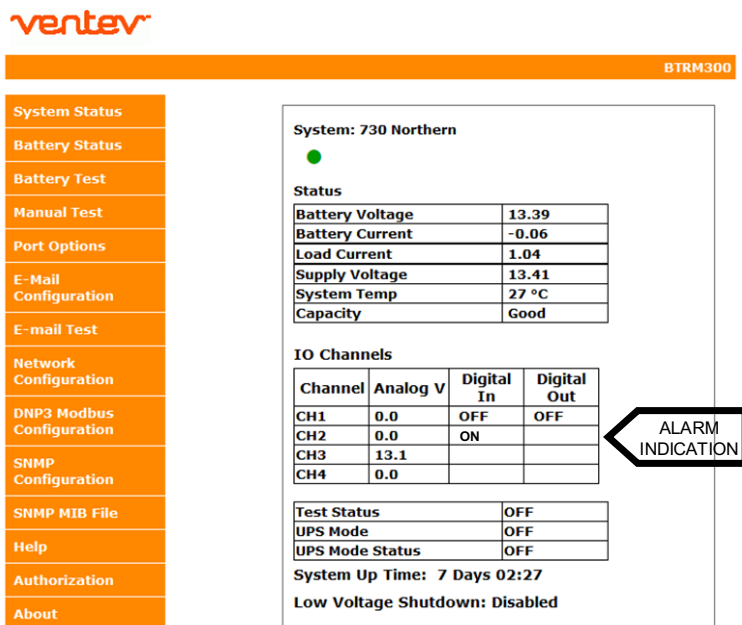
Figure 5: BTRM Options for AC Alarm

Figure 6: BTRM System Status Page Showing AC Power Indication

The AC alarm status is shown on the BTRM status home page (Figure 6). When the AC power to the enclosure is present, the DC OK relay in the power supply is closed. A closed loop circuit is made between the power supply and the BTRM. The Channel CH2 will show the voltage from the system load for Analog V and show "off" for Digital In. When the AC power to the enclosure is disconnected, the DC OK relay in the power supply is open. The circuit between the power supply and the BTRM is

now open. The Analog V will show 0V for Channel CH2 and show "on" for Digital In, which indicates that an alarm message has been sent from the BTRM to the IT network.

DC Power On

An application like the AC power off alarm is the DC power alarm. This alarm works in conjunction with a DC power distribution panel. The positive and negative contacts of the DC distribution connect to the respective BTRM relay contacts as shown in Figure 7.

Figure 7: DC Alarm Wiring Configuration
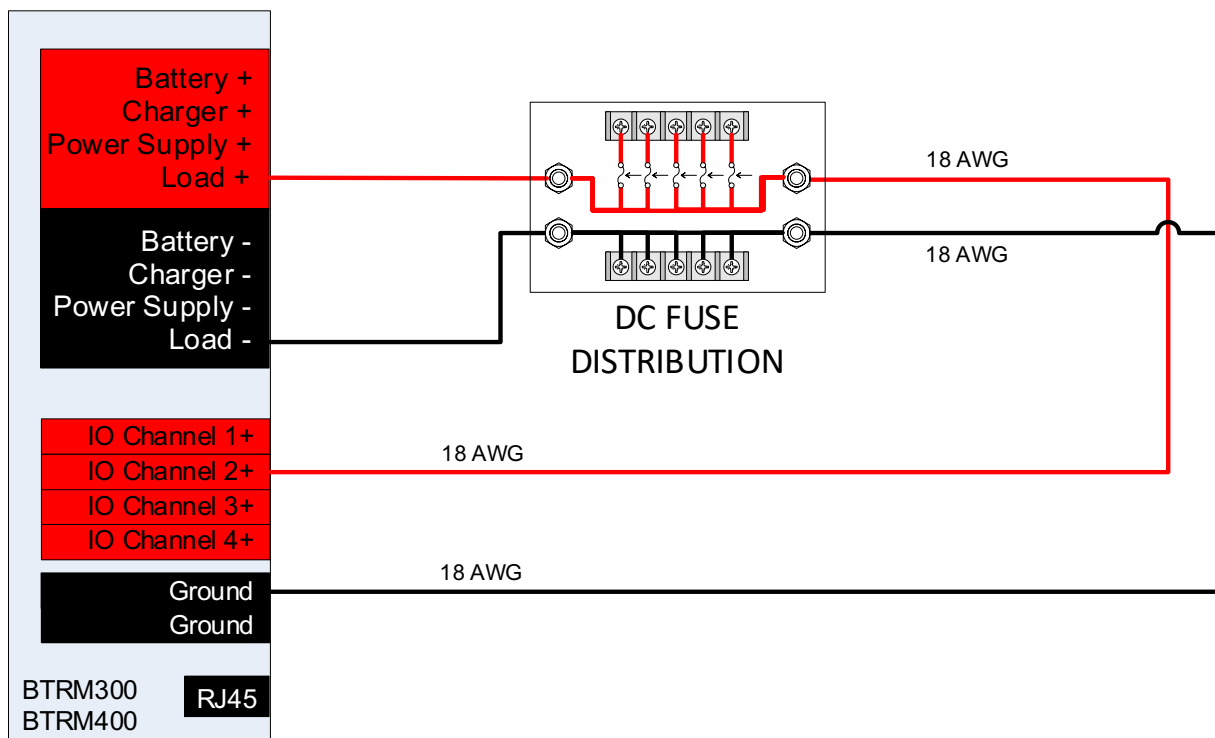
Once the electrical connections have been made to IO Channel 2, the BTRM IO options need to be configured. On the BTRM webpage, click on the Port Options tab on the left to go to the BTRM Options page (configure arrow in Figure 8). Under the IO Channel being used for the alarm, the Digital Input Alarm if < 1V should be set (setting arrow in Figure 8). Click the save radio button at the bottom of the page after you have completed the changes (save arrow in Figure 8).

The DC alarm status is shown on the BTRM status home page (Figure 9). When power is applied to the DC distribution, there is a voltage going to the contact on the BTRM. The Channel CH2 will show the voltage from the system load for Analog V and show "off" for Digital In. When the DC power is removed from the DC distribution, there is no voltage going to the contact on the BTRM. The Analog V will show 0V for Channel CH2 and show "on" for Digital In, which indicates that an alarm message has been sent from the BTRM to the IT network.
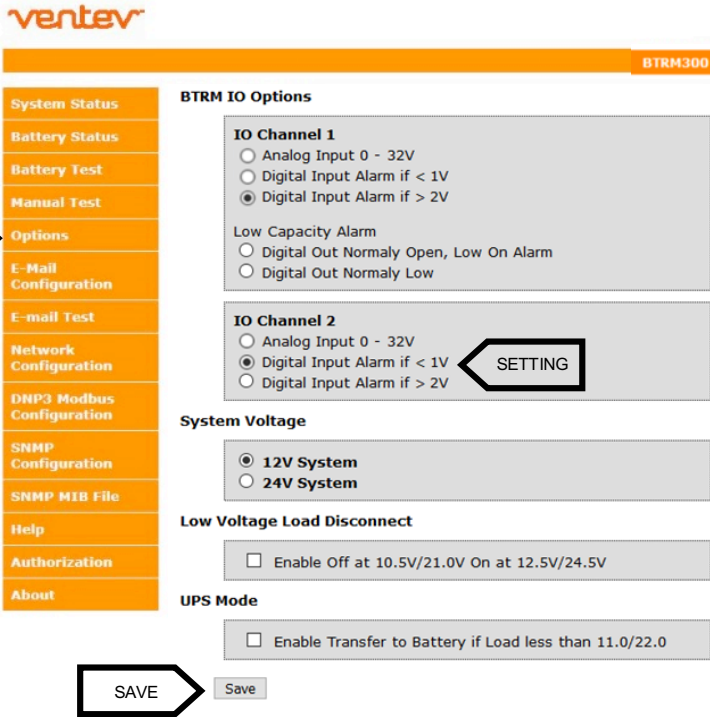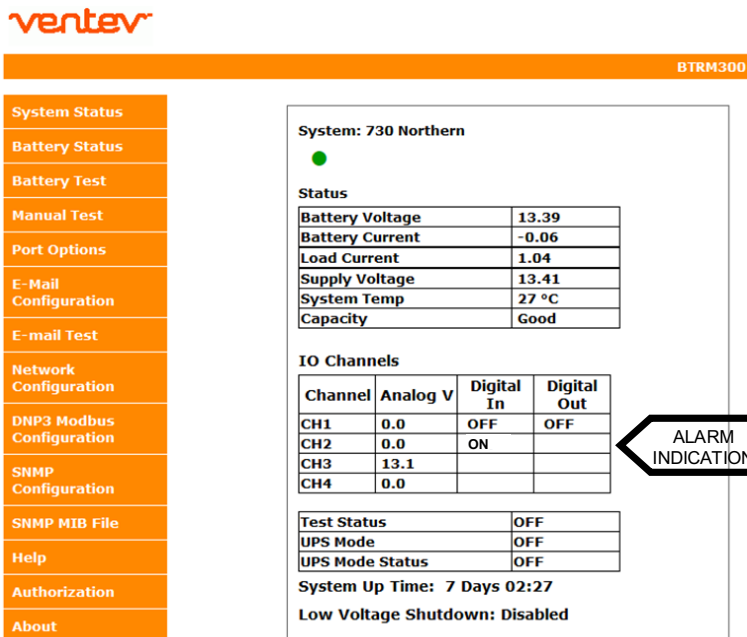
Figure 8: BTRM Options for DC Alarm

Figure 9: BTRM System Status Page Showing DC Power Indication

Additional Applications

The two independent, isolated relay contacts in the BTRM can also be used for:
- Checking component voltages
- Activating a camera when an alarm indication occurs
- Monitoring thermal conditions via thermal couple
- Relaying low battery capacity alarm to a SCADA radio
- Operating external DC relays to control audible alerts or alarm lights