MONTANA
12.8V
7:48
Max
60W
Output: 0.0W
Current Draw: 0.0A
Output: 60.0W
Current Draw: 0.3A
Set Max Power
Water Heater
Mains Power
Waste Tank
Master
Light
Pump
Awning
On
Off
On
Off
On
Off
On
Off

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Overview:

The Montana control panel allows the user a central point to check:

- Leisure battery voltage
- Vehicle battery voltage
- Leisure battery current
- Vehicle battery current
- Auto Battery Select
- Load current
- Main's current
- Internal temperature
- External temperature
- Water Tank level
- Waste Tank level

The Montana control panel also allows the user to:

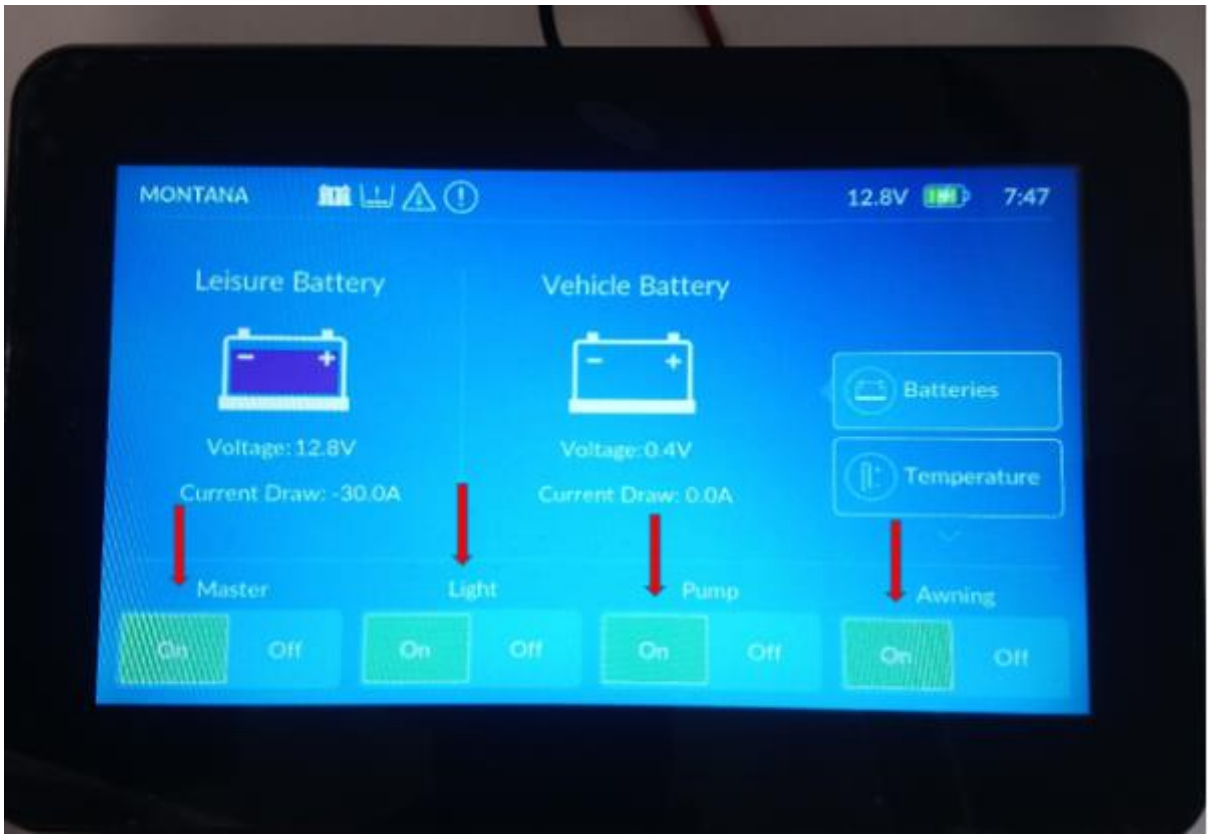
- Switch on/off all non-essential electrical appliances/accessories
- Switch on/off the lights
- Change the pump mode
- Switch on/off the pumps
- Switch on/off the awning light
- Switch over the battery supply from Leisure to Vehicle
- Charge the Vehicle battery when a mains 230V connection is present
- Calibrate water/waste probes

The Montana control panel also has audio and visual warnings for:

- Low Vehicle Battery Voltage
- Low Leisure Battery Voltage
- Temperature Sensor Open
- Low water tank level
- Full waste tank
- Thermistor faults
- Fuse blown alarms
- High Load Current

Note: Depending on the vehicle configuration, some of the features above may not be available.

Montana Control Panel Buttons:



Master Button

When the Master Button is pressed, the control panel will switch power to all non-essential accessories.

- Some features, such as lights or pumps, may need the Master Button to be switched on to work.

Lights Button

When the Lights Button is pressed, the control panel will switch power to all the interior lighting circuits

- The Master Button must be switched on for this button to affect the lights.

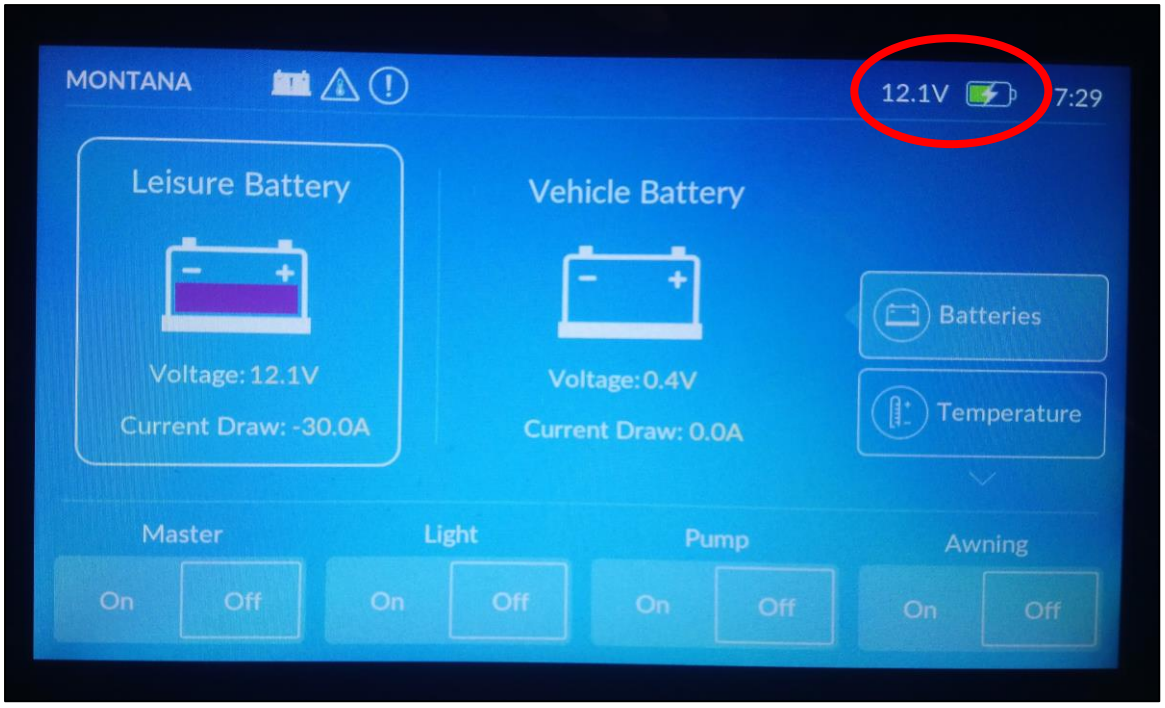
Pump Button

When the Pump Button is pressed, the control panel will switch power to the selected water pump.

Awning Button

When the Awning Button is pressed the control panel will switch power to the exterior awning light.

- The Master Button must be enabled to control the awning light.



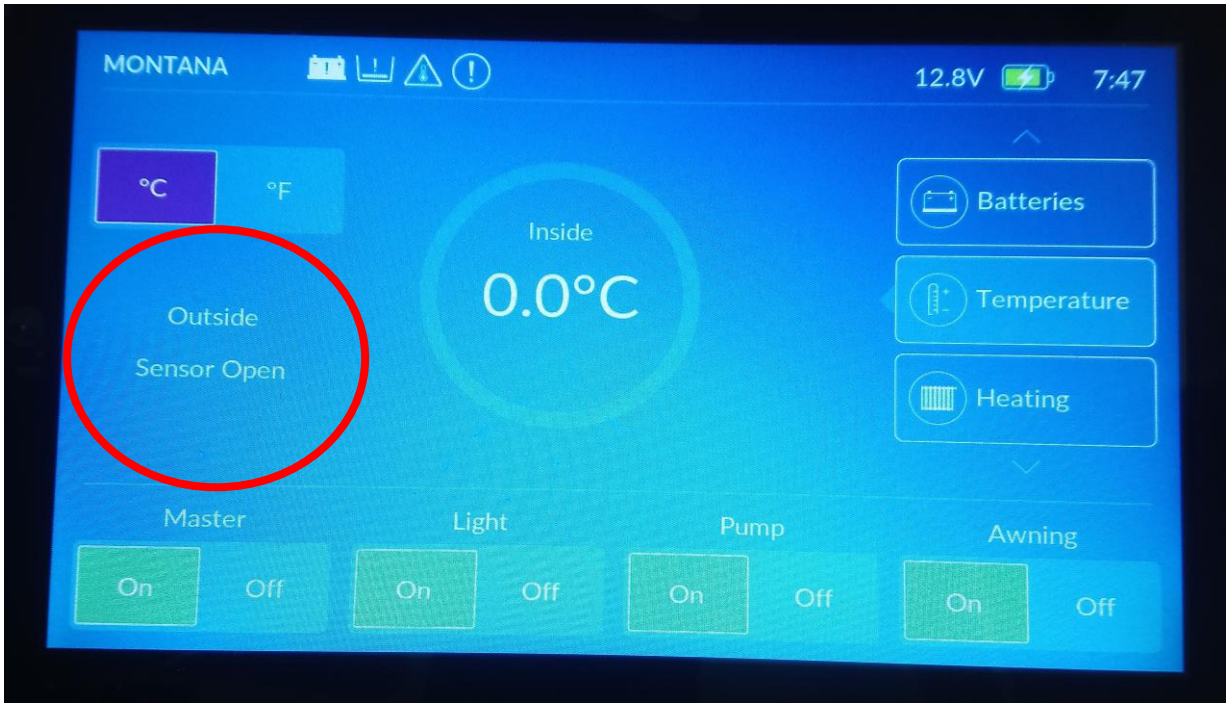
This displays both the voltage and current draw for the vehicle's Leisure Battery as well as for a Vehicle Battery if one is connected. The selected battery voltage is shown in the top right corner (highlighted in red) on all standard pages.

The picture shown above the left half of the screen with the Leisure Battery displayed has a white rounded box around it, this indicates that the currently selected power source is the Leisure Battery.

To change the power source to the Vehicle Battery, simply tap on the Vehicle Battery to switch over. Note that if the Auto Battery function is enabled then the panel will automatically switch from Vehicle to Leisure if the Vehicle power goes below a threshold value, this value is normally 12.4v. If the user then attempts to switch back to the Vehicle Battery while the Vehicle Battery voltage is 12.4v or lower then the panel will prevent the switch from occurring, this is to prevent the Vehicle Battery from being fully drained.

If the Current Draw shows a negative current then it means that the battery is being charged up, for example -2.3A would mean that the Battery is being charged with 2.3A.

Temperature Button



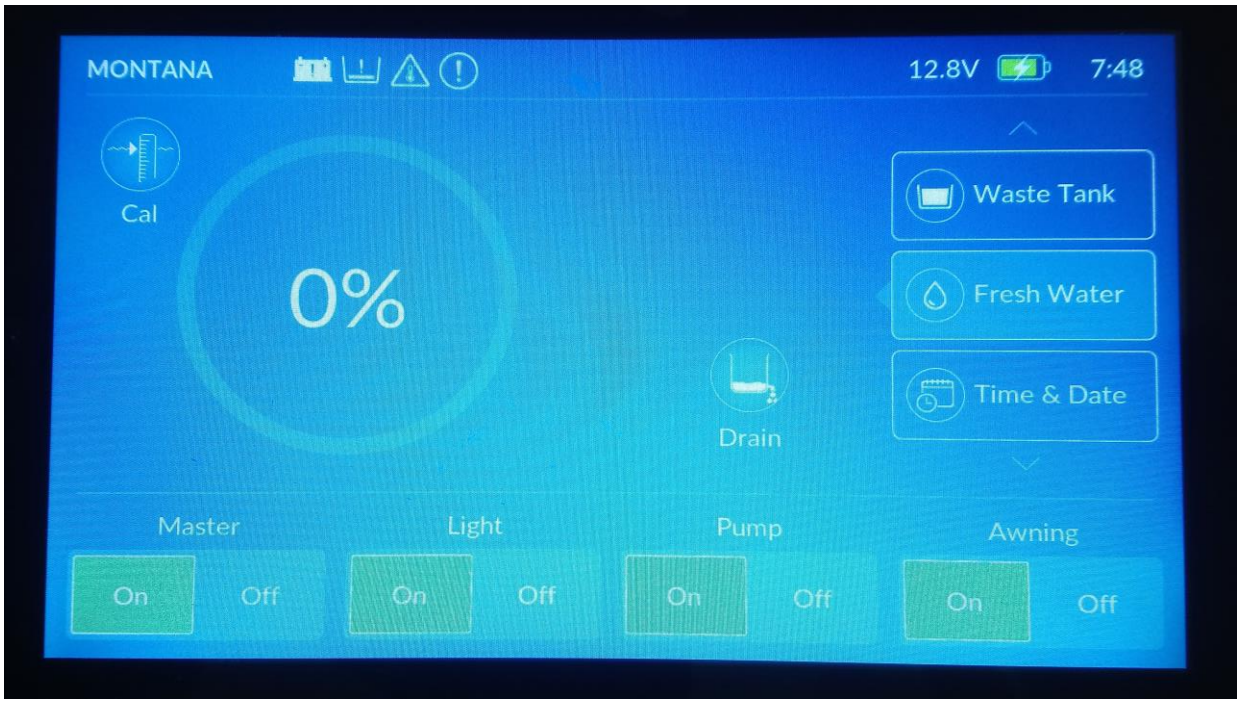
When the Temperature page is selected, the control panel will display the reading of any enabled temperature sensor, the panel works with the BCA External and Internal temperature sensors. Note that some vehicles may only have the Internal Temperature sensor or no sensors at all.

If there are any issues with the enabled temperature sensors then these will be shown on the top notification bar like all notifications but this page will also display any temperature sensor-related issues in the area highlighted in red.

In the example image shown above the External Temperature sensor is enabled but is not plugged in, giving a warning that the Outside sensor is open-circuit.

When the Mains Power page is selected, the control panel display the output power and current draw for both the battery and AC power source. This will only work if the appropriate current monitor is installed.

Set Max Power allows the user to set the threshold of a high AC current warning that will occur. This is when the user connects to a lower current supply to help prevent tripping the site's supply.



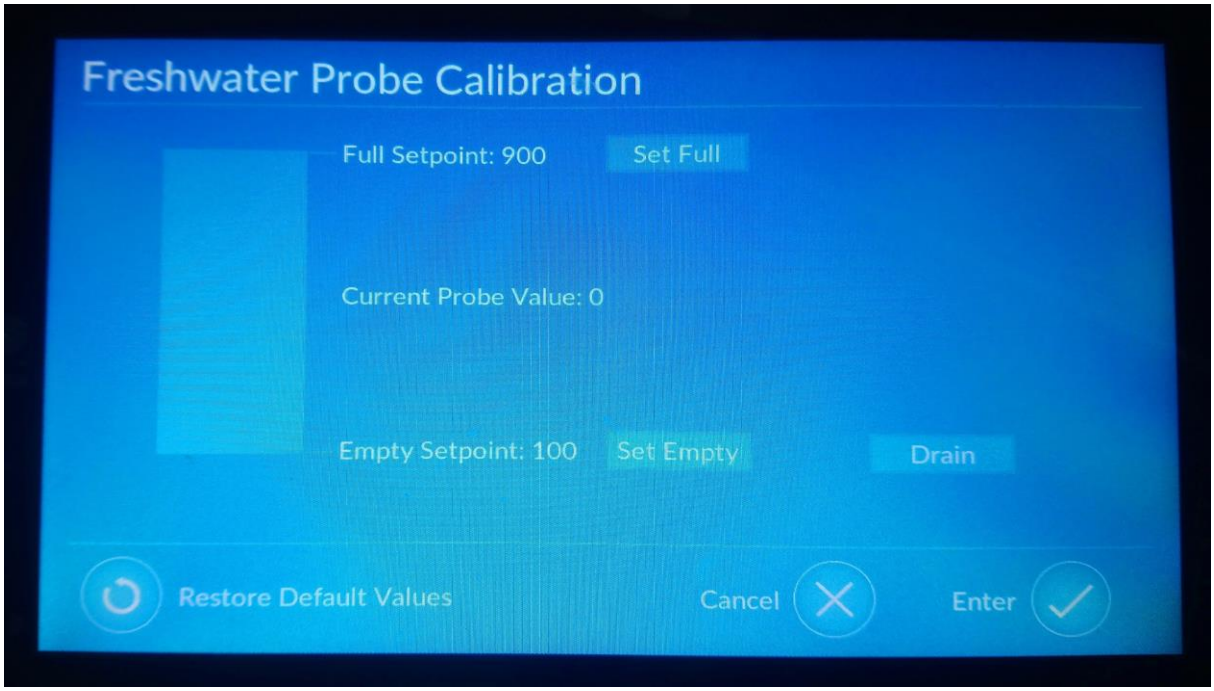
When the Fresh Water page is selected, the control panel will display the fresh tank water level. The Master must be enabled to measure the water level.

If the Water Level goes below 10% then a warning will sound to inform the user that the freshwater level is running low.

This page also has the Drain option for vehicles that have the system as well as the Calibration Routine button in the top left corner.

When using the vehicle for the first time, it is highly recommended to calibrate the water take levels. Please see the following section on how to calibrate the water levels.

Calibrate Routine



After pressing the Calibration Button in the top left of the Water Tank page this menu will pop up.

When on this menu the end-user will be able to see the current water probe value, the Full Setpoint and the Empty Setpoint. Note that the values here do not reflect the filled water percentage, they are abstract values based on the Water Probe's measurement system.

To Calibrate the tank a Full Setpoint and an Empty Setpoint must be Set, it is often best to calibrate the Empty Setpoint first and then the Full Setpoint, to calibrate the Empty Setpoint follow the instructions below:

- Ensure that the Water Tank is empty
- Ensure that the Master is enabled
- Press the "Set Empty" Button to take a new Empty calibration value

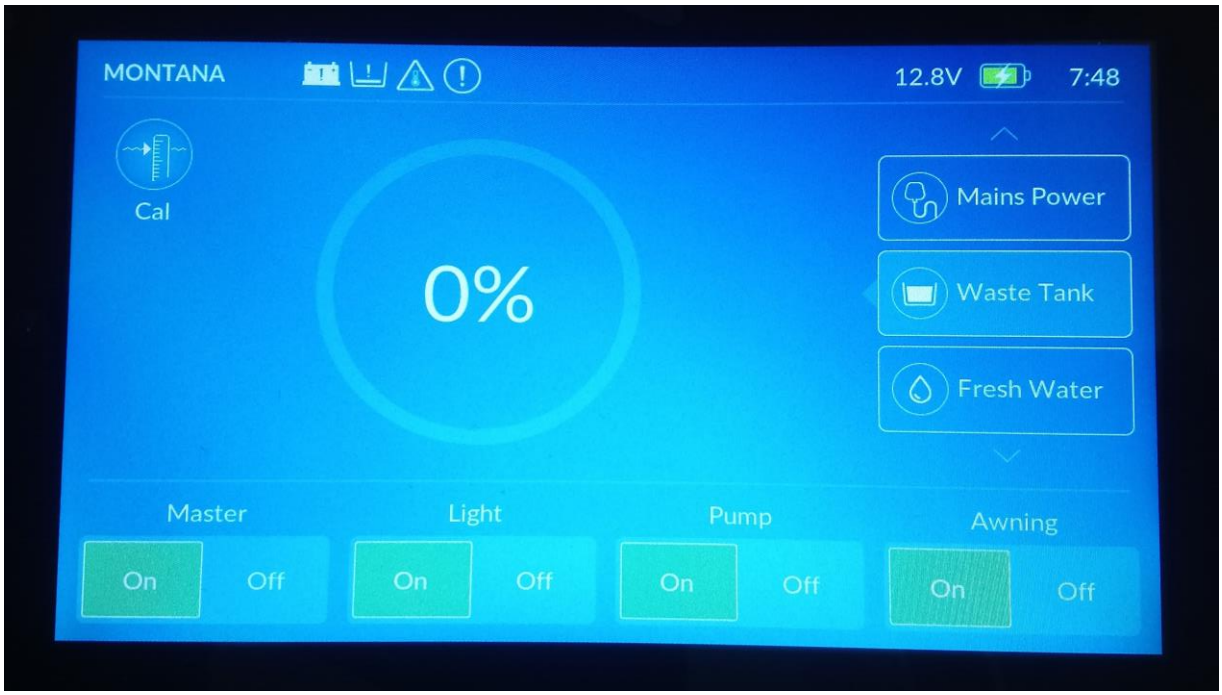
To Calibrate the Full Setpoint follow the instructions below:

- Ensure that the Master is enabled
- Fill the Water Tank up to the desired full / 100% level
- If water is exiting through the overflow pipe after filling to the desired level, wait until the water flow has ceased
- Press the "Set Full" Button to set the new Full calibration value

After following both of these instructions for Set Empty and Set Full the water tank will now be calibrated.

The calibration of the Waste Tank is done in the same manner as above.

Waste Tank



When the Waste Tank page is selected, the control panel will display the waste tank level. As with the Water Tank page, the Master must be enabled to view the Waste Tank Level.

The Waste Tank also requires calibrating when the vehicle is used for the first time, the calibration method is the same as the Water Tank.

If the Waste Tank level goes above 90% then a warning will sound to inform the user that their Waste Tank is very full and may be close to its maximum capacity soon.

When the Time & Date page is selected, the control panel will display the current time and date. It will also allow the user to set the time, date and alarm by pressing the buttons located between the time display and the 4 operation buttons.

- **Set Time**
  The Set Time button will bring the set time selection screen. It allows the user to change the time and AM to PM or vice versa. It also allows the user to change the time format i.e., 12 hrs/24hrs
- **Set Alarm**
  Set Alarm button will bring the alarm set screen. It allows the user what time an alarm will sound. This alarm is a daily repetitive alarm. To clear the alarm simply tap on the screen and this will clear the alarm.
  To disable the alarm, the user needs to go to the alarm set screen and set alarm off.
- **Set Date**
  The Set Date button will bring the set date screen. It allows the user to set the desired date.

When the Settings page is selected, the control panel allows the user to change the following settings:

- **Display brightness**
  To change the brightness level of the screen, the user can use the **+** or **–** buttons to increase/decrease the screen brightness.

- **Warnings On/Off**
  Setting the warning to off prevent the warning screen and warning buzzer from displaying and sounding, the warning can still be viewed by pressing the icon in the top centre of the screen.

- **Beeps On/Off**
  Setting the beep to on enables a short tapping sound to play on the selected page when interacting with any buttons specific on the selected page.

- **Power**
  Pressing the power button displays the power down option menu. The Standby button in this menu when pressed puts the unit into standby mode. Tapping the screen will wake the unit from standby mode.
  Pressing the Shutdown button will switch the unit into shutdown mode. The shutdown mode is only to be used when the vehicle is placed in storage.

To wake the unit from shutdown mode, the unit must be power cycled, the easiest way to power cycle the device is to remove the control panel fuse(F5) and place it back in. This will reset the device and the unit will power up.

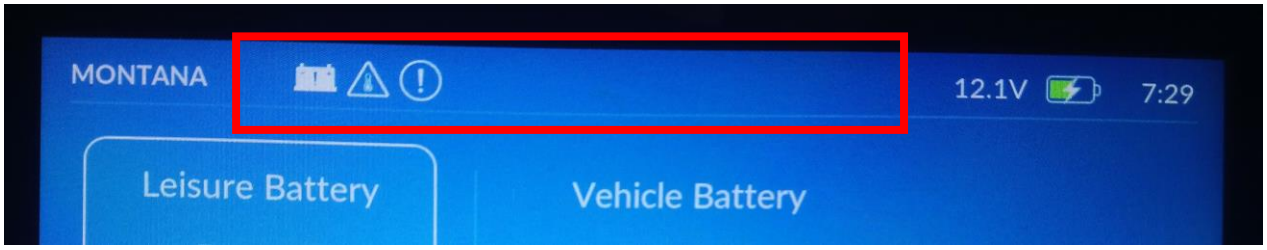
- **Configuration**
  Pressing the Configuration button allows the user to change the Auto Standby Timer where you can set your desired standby timer settings.

  The user can restore default settings by pressing Restore Defaults.

  The user can also check the firmware information by pressing the firmware button.

Alarms & Warnings

If any warning comes up, they will create a pop-up and display any of the active warnings and notifications. The popup is as shown in the image above. To view this popup at any time tap onto the notification bar on the top of the screen as highlighted in red in the image below:



As not all vehicles are configured in the same way or have the same peripherals, some of these notifications and warnings may not be present on a vehicle, for example, there may be no Mains Notifications if no mains current monitor is installed.

The Montana Control Panel has multiple different notifications and warnings, these are:

Low Leisure Battery Voltage Warning:

If the Leisure Battery Voltage drops below a set value then this warning will sound to inform the user that their Leisure Battery is running low. Note that this is designed to operate with Lead-Acid battery types in mind and may not be suitable for Lithium Battery Systems.

The standard setpoint for this is 11.0v

High Leisure Battery Voltage Warning:

If the Leisure Battery Voltage goes above a set value then this warning will sound to inform the user that their Leisure Battery is in an Over-Voltage condition, potentially damaging the battery if left in this state for an extended period of time.

The standard setpoint for this is 15.0v

Low Vehicle Battery Voltage Warning:

If the Vehicle Battery Voltage drops below a set value then this warning will sound to inform the user that their Vehicle Battery is running low. This is often set to a higher value than the Leisure Battery Warning as the Vehicle Battery must retain enough power to be able to start the Vehicles Engine.

The standard setpoint for this is 12.0v

High Vehicle Battery Voltage Warning:

If the Vehicle Battery Voltage goes above a set value then this warning will sound to inform the user that their Vehicle Battery is in an Over-Voltage condition, potentially damaging the battery if left in this state for an extended period of tie.

The standard setpoint for this is 15.0v

High Load Current Warning:

If the electrical system is drawing current above a set value then this warning will sound to inform the user that they are drawing a large amount of power through their electrical system.

The setpoint for this is variable as it depends on the vehicle's configuration.

Low Water Notification:

If the Water Level Measurement goes below a set value then this notification will sound to inform the user that their Freshwater level is getting low.

The standard setpoint for this value is 10%

High Waste Notification:

If the Waste Level Measurement goes above a set value then this notification will sound to inform the user that their Waste Water Tank is getting full.

The standard setpoint for this value is 90%

High Mains Current Notification:

If the vehicle is using an AC current monitor and the measured level goes above a set value then this notification will sound to inform the user that the leisure vehicle’s electrical system is drawing a significant amount of power through the 230v system.

The setpoint for this can be modified by the user on the Mains Page as this should be modified to reflect the maximum draw available from a camping site’s supply.

Pump Running Notification:

If the pump system is enabled and the pump is currently running then this notification will be visible on the top notification bar. As this notification is only active when the pump is running the notification may not be present when the pump circuit is powered, only when the pump is running.

High Leisure Battery Load Notification:

If the measured 12v load on the Leisure Battery is greater than a set value this notification will sound to inform the user that they are drawing a significant amount of power from their leisure battery.

High Vehicle Battery Load Notification:

If the measured 12v load on the Vehicle Battery is greater than a set value this notification will sound to inform the user that they are drawing a significant amount of power from their vehicle battery.

High Solar Load Notification:

If the measured 12v load from the Solar System is greater than a set value this notification will sound to inform the user that their solar panel system is generating a significant amount of power, this is not normally a problem unless the power supplied is greater than the protective fuses's current rating.

Fuse Warnings:

If the vehicle has the required hardware then a large amount of the fuses are monitored and this warning will inform the user if these monitored fuses are blown.

Overload Fault Warning:

If some of the non-relay controlled outputs suffer from an Over-Current condition and switch themselves off for protection this warning will display to inform the user that this has occurred, to re-enabled these Overloaded outputs turn the master off, wait a couple of seconds and turn the master back on to reset the system.

Mains Connected Notification:

This notification is present if the vehicle is connected to a 230v power source, this notification only works with certain BCA chargers, if a charger without a mains signal is used this Mains Connected notification will not present itself when the mains is connected.

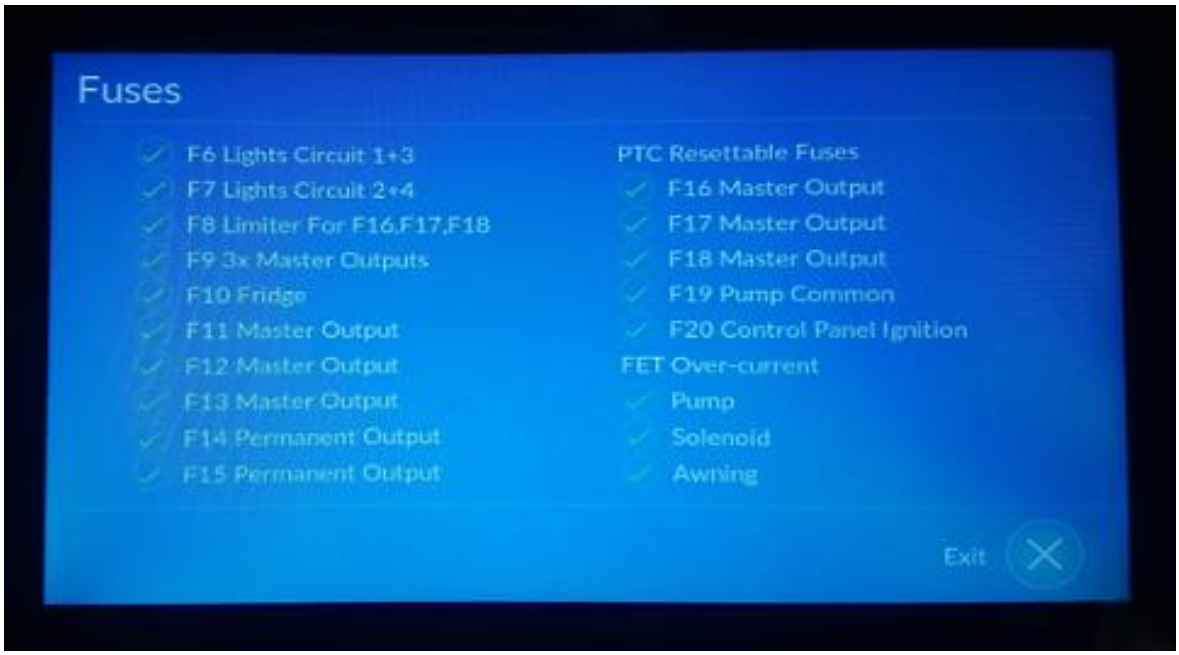
Ignition / Engine Running Notification:

If the vehicle's engine is running the Montana Control Panel will enter its Ignition Mode, in this mode, the screen will go black and display "Ignition On", while this is happening the control panel cannot be used and all the outputs will be set to off.

This is to prevent its use while the vehicle is in motion.

LIN Communication Fault Warning:

This warning will sound if there are faults with the LIN communication system. If this is occurring then it may be due to a bad connection between the PDU and the Control Panel.

Fuse Panel

The fuse panel information is only available if certain hardware is used, so these options may not be available. This page will show the state of any of the measured fuses, not all fuses can be monitored by the system so fuses F1 – F5 are not present on this menu.