M2 OLED Temperature Monitor Instructions

PN 1841

Installation Checklist

- ☑ Check for components included
- ☑ Read Warning and Cautions
- ☑ Read Meter Functions and Connections
- ☑ Read Initial System Setup, Detailed Wiring, and Mounting Considerations
- ☑ Prepare materials
- ☑ Follow Initial System Setup instructions to install meter
- ☑ Configure Displays
- ☑ Configure Alarms
- ☑ Configure Relays

Specifications

Display Size	55mm x 28mm
Power Supply	7V–70V DC
Power Consumption	0.3W–1.0W*
Sensors	Blue Sea Systems PN (1820, 1821)
Sensor Range**	-40°F – 250°F (-40°C –120°C)
Sensor Resolution	1%
Temp Alarms	80dB
External Relay	0.5A DC

* Variable with voltage, display intensity, and sleep mode

Regulatory

Monitor face is IP66 – protected against powerful water jets when installed according to instructions

** Not all sensors are compatible for full range.

Warning and Caution Symbols

WARNING: The ⚠ symbol refers to possible injury to the user or significant damage to the meter if the user does not follow the procedures.

CAUTION: The ⚠ symbol refers to restrictions and rules with regard to preventing damage to the meter.

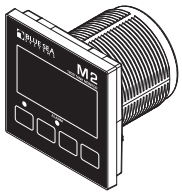
WARNING ⚠

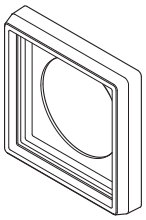
- If you are not knowledgeable about electrical systems, have an electrical professional install this unit. The diagrams in these instructions pertain to the installation of M2 Digital Meters and not to the overall wiring of the vessel.
- If an inverter is installed on the vessel, its power leads must be disconnected at the battery before the meter is installed.
- If an AC generator is installed on the vessel, it must be stopped and rendered inoperable before the meter is installed.
- Verify that no other DC or AC sources are connected to the vessel's wiring before installing the meter.

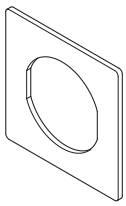
CAUTION ⚠

- The back of the unit is not waterproof. Do not install where the back of the meter is exposed to water.

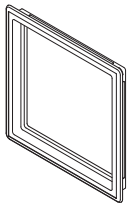
Components Included

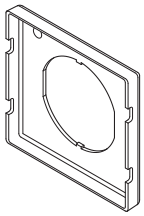

M2 Head Unit


Surface Mount Bezel and Seal


Surface Mount Gasket


Surface Mount Cover

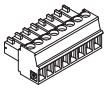

Flat Mount Bezel

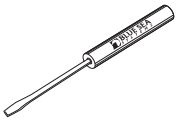

Flat Mount Clamp


Mounting Ring


Mounting Nut

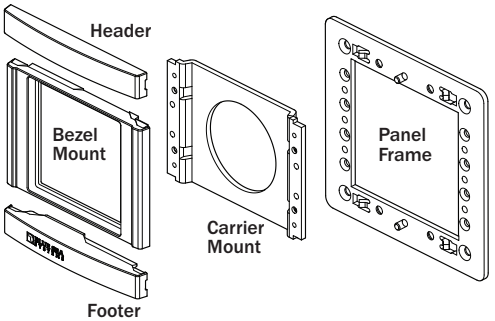

2 x 1820 Temperature Sensors


Connector


Screwdriver
Retail Package Only


2 x 1821 Temperature Sensors

360 Panel Mounting Kit (PN 1525 sold separately)




#6-32 x 1/4" Flat Head Machine Screws (4X)


#6-32 x 3/8" Flat Head Machine Screws (4X)

TEMPERATURE FUNCTIONS (1841)

Monitor up to four temperatures. Provides High/Low level alarms for each channel.

Memory

All M2 meters store settings in flash memory that will remember your settings while powered off.

Meter Power Supply Connections

All meters must have pins 1 (DC Negative) and 2 (DC Supply) connected. These pins are used to provide power to the meter. Connect pin 1 to ground and pin 2 to a 12V to 48V power source through a 5A fuse.

Temperature Connections

Use Blue Sea Systems Temperature Sensor 1820 or 1821

Only use Blue Sea Systems temperature sensor 1820 or 1821. Other temperature sensors may not give the correct temperature result.
The negative lead of all the temperature sensors should terminate as close as possible to pin 1. For a simple and clean installation, use Blue Sea Systems PN 2304 as a small common bus bar for all of the meters DC negative connection. There should be one connection between pin 1 of the meter and the bus bar using 18 AWG wire. This connection should be as short as possible to minimize temperature reading errors.

INITIAL SYSTEM SETUP

Note: If you have any questions regarding the installation of your M2 meter, or any Blue Sea System product, please contact the technical support team
Email: tech.bluesea@OneASG.com
Phone: 1.800.307.6702 Select option 2 for Technical Support. Select Blue Sea Systems from the brand menu.

Installation:

1. Review installation instructions and have all material prepared before beginning installation.
2. You may need the following in addition to the meter and its included contents:
   - One (1) 5A fuse and fuse holder
   - Common connection point such as a Power Post or Bus Bar.
   - Up to four (4) temperature sensors (included).
     i. 1820 sensors (2 included) are rated -40C to 80C (-40F to 175F) and are water proof.
     ii. 1821 sensors (2 included) are rated -40C to 150C (-40F to 300F) and are NOT water proof.
   - Wires, terminals, and tools needed for electrical installation.
     i. Use water proof heat shrink or water proof rated heat shrink terminals for temp sensors installed in wet locations.
3. Choose Meter mounting style from page 13 and use the provided cutout templates on page 14 to prepare the installation location

- The Quick Start Guide also contains mounting options and cutout templates.
- Cutout template for the 1525 360 Panel Mounting Kit is provided with the 1525.

4. Ensure all Power Sources (both AC and DC) are disconnected before wiring meter.
5. Make all connection to the meter's terminal block before connecting terminal block to meter.
   - See Wiring Diagram and Pinout notes on page 4.
   - The 5A Fuse to pin 2 should be within 7" of the power source. Do not put the fuse in the fuse holder at this time.
   - If you are not using the relay output feature the pins 3 and 4 do not need to be wired.
   - See pages 11-12 for some wiring options for the Relay Out feature.
6. Plug wired terminal block into the back of the meter.
7. Keeping hands away from the terminal block, insert the 5A fuse into the fuse holder, this will power the meter.
8. Go to next section "Basic Meter Setup" to properly setup your meter.

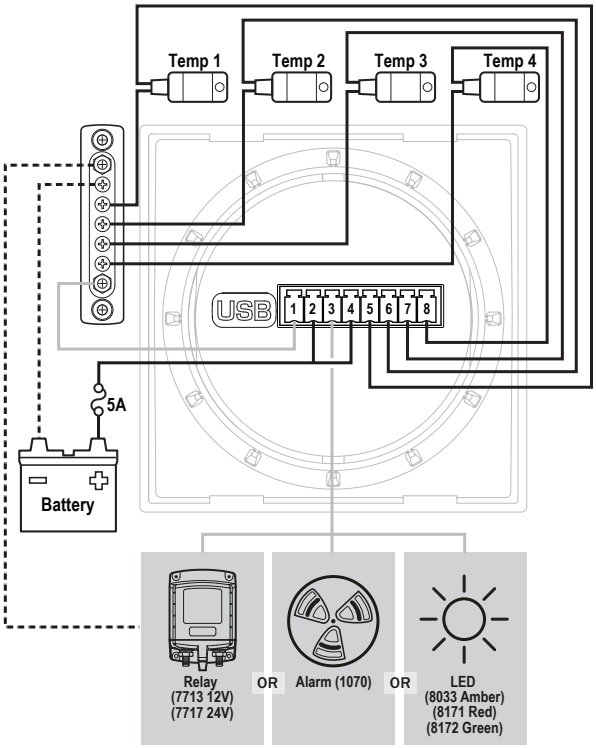
Basic Meter Setup:

Note: Meters running firmware revision SW014 or higher, have the ability to read and write a configuration file, allowing you to save your settings to a USB thumb drive. This can be used to restore previous settings or to quickly set up additional meters. Please see the firmware update and configuration instructions on our website: www.bluesea.com
Note: Detailed information of meter use and settings start on page 5.

1. No setup is required to use the 1841 M2 Bilge Monitor. However, you may want to change the input label or turn off unused inputs to prevent them from being displayed.
2. To do this, go to the Setup Menu by pressing any button to bring up the button labels, then pressing the Select button.
3. Scroll down to Temp 1 Setup and press the Select button.
4. If the input is used, you can change the label by pressing the Select button, when the label is highlighted.
5. If the input is not used, set Enabled to OFF. This will prevent unused inputs from being displayed.
6. Repeat steps 4-5 for each Temp Setup.
7. Display options and explanations is found on page 6 under "Other Display Indications".

DETAILED WIRING

1841 Temperature Monitor



Note: The negative feed of all of the temperature sensors should terminate as close as possible to pin 1. Use Blue Sea Systems' PN 2304 Mini Bus with a short 18 AWG guage wire from pin 1 to the Mini Bus.

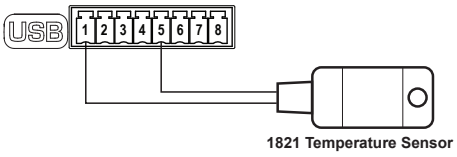
Pin-out Table

1841 Connector Pin Assignment Table

USB	Micro USB Port
8 Pin Connector*	**Function**
1 *Required Connection*	DC Negative
2 *Required Connection*	DC Supply
3	Relay DC Output
4	Relay DC Supply
5	Temperature 1
6	Temperature 2
7	Temperature 3
8	Temperature 4

*The 8 pin low voltage connector supports wire sizes from 16-26 AWG

Temperature Sensor Connections 1821

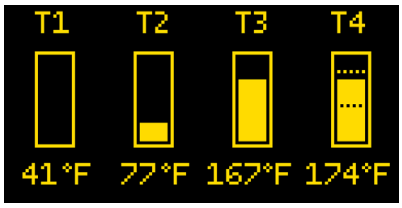


Temperature 1 Example

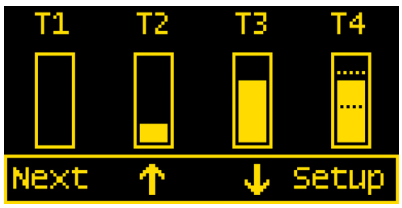
USING THE METERS

Example Screens From PN 1841 Temperature Meter

When an M2 Meter is initially powered up, it will display the Blue Sea Systems Logo, its serial number and its Software revision.
After a couple of seconds, the unit will display a high-level System Summary screen.

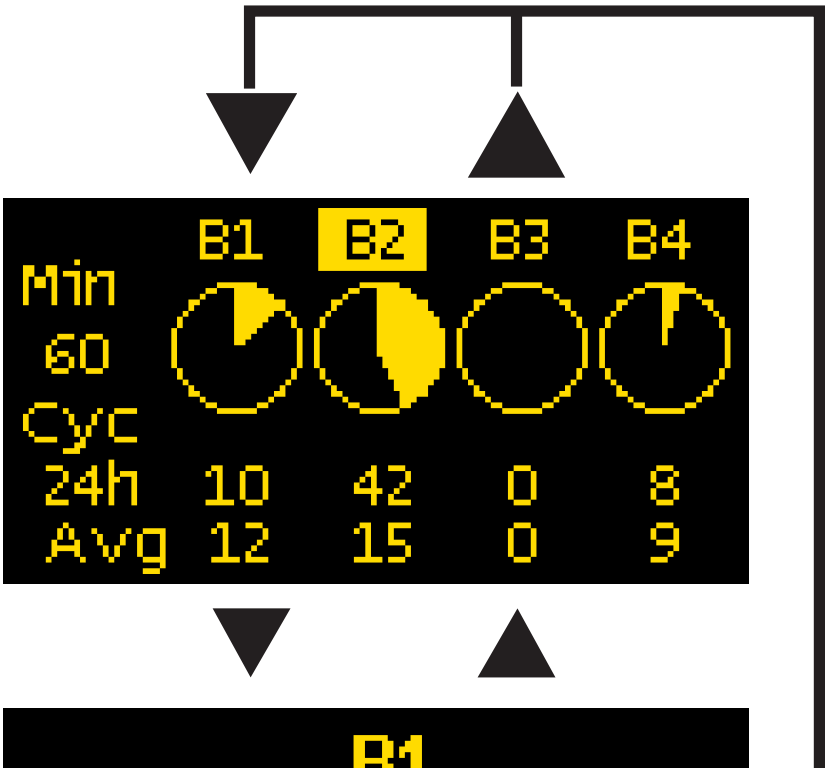


Pressing any button will display a temporary pop-up menu. Select an option by pressing the button beneath it. The pop-up menu will disappear after the first button is pressed.



The menu system is a two dimensional matrix. Pressing the **NEXT** button will transition the display between the System Summary screen which displays summary information for each of the “temperature” channels.

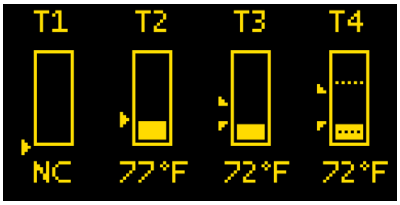
Press the **UP** ↑ or **DOWN** ↓ arrow buttons to display more detailed information about an input channel or to show a single parameter, such as “T1” in the display (see example below).



Press the Menu button to bring up the Setup menus. Press the **UP** ↑ and **DOWN** ↓ arrow buttons to move the cursor over the options and press the **Select** button to see a selected display. To return to the previous display, press the **Back** button.

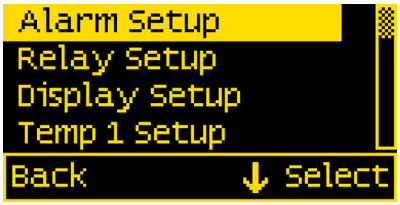
Other Display Indications

The dotted lines in T4 indicate the Hi and Lo Alarm Levels. The Hi and Lo Relay levels are not shown.
If **Display MinMax** is on, then split triangles on the right side of the each graph indicate the minimum and maximum levels levels that sensor has measured. A single triangle indicates that the minimum and maximum levels are close to each other.
The following temperature error messages may be displayed under certain error conditions.
HI -- The temperature is greater than 275°F (135°C).
LO -- The temperature is less than -40°F (-40°C).
NC -- The temperature sensor is not connected.



Configuring the Meter

Meter settings can be configured from the Setup menu. This menu can be accessed by pressing the **Menu** button and then scrolling to and selecting Setup. Press the **UP** ↑ and **DOWN** ↓ arrow buttons to move the cursor. The different setup options are described below.



ALARM SETUP & CONTROL

The meter's alarm can be set to trigger based on High or Low temperature levels. Alarms can be set from the Alarm Setup menu.
To get there, first navigate to the Setup menu. Then scroll to Alarm Setup and press the **Select** button.

Setting Alarms

The M2 Meter family provides monitoring capability of temperature input channels. Alarms are triggered if a channel is above or below a certain user selected threshold value. The following example indicates how to setup an over temperature alarm.

1. Go to the Alarm Setup menu.
2. Scroll to the desired input channel (i.e., Temp. 1 Hi).
3. Press the Select button and the cursor should start blinking.
4. Set the temperature threshold using the ← and → buttons (Holding down the buttons allows faster selection).
5. Press the **Enter** button to save the change or the **Cancel** button to cancel any change.

NOTE: A low temperature level threshold cannot be set above a high temperature threshold. Likewise, a high temperature threshold cannot be set below the low temperature threshold. The meter will automatically increase or decrease the temperature settings to enforce this.
NOTE: The display can be changed from °F to °C in the Display Setup screen.
NOTE: The alarm levels are graphically displayed on the main menu screen.

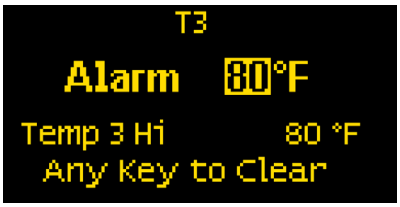
Temp Delay (Alarm)

Set the Alarm hold off time in minutes. The hold off timer operates as a count-up/count-down timer. When the temperature exceeds the alarm value then the timer will start counting up until it reaches the delay time. When it reaches the delay timer, an alarm will sound. If the alarm condition goes away before the delay timer has been met, then the timer will count down until the timer is zero again. For example, if the Alarm Delay is set for 5 minutes and an alarm condition is active for 4 minutes and then inactive for 1 minute then if the alarm condition is active again, the alarm will sound in 2 minutes (5 minutes - 4 minutes + 1 minute). Note that there is only one delay per channel.

Clearing Alarms

When an alarm occurs, the buzzer will sound, the red ALARM LED will light, and the screen will display which alarm was triggered, the Alarm set point and the current value. Pressing any button silences the buzzer and another button press returns to the previous display.

Until the cause of the alarm is resolved, the ALARM LED will remain on and the channel that triggered the alarm will blink.



Viewing Alarms Status

For any active alarm, the parameter will flash if it is displayed. To view a complete list of active alarms, press **Menu>Setup>Alarm Setup**. Any active alarm will flash. You may have to scroll through the menu to see all of the alarms.

RELAY SETUP & CONTROL

M2 Meters provide an option to control an external relay. The M2 can trigger the relay based on high or low temperature levels.

These relay options can be set from the Relay Setup menu. To get there, first navigate to the **Setup** menu. Then scroll to **Relay Setup** and press the **Select** button.

Relay Normally On/Off

This setting sets the normal operating state of the connected relay. The options are ON or OFF where ON means the relay is on (contacts closed) in normal operation and OFF means it is normally off (open contacts). Scroll to Relay Normally, press **Select** (selection will flash), then press the **LEFT** ← or **RIGHT** → arrow buttons to change the setting. Press **Enter** to save your selection. Press **Cancel** to cancel a change.

Notification

The Notification setting controls whether or not a notification is displayed when a relay is activated. Notifications will show which relay threshold was surpassed and for which channel. Scroll to Notification and press **Select** to change the setting. Press the **LEFT** ← or **RIGHT** → arrow buttons to choose either ON or OFF. ON will display notifications and OFF will not. Use this option if you don't want to be notified that the relay is activating. Press **Enter** to save the setting or **Cancel** to cancel a change.

Silence Relay

Turn this option on if you want the relay to deactivate after the user presses a key on the display. The key press will only deactivate the relay and will not engage any functions on the meter. For example, this option could be used to silence an external buzzer. Scroll to Silence and press Select to change the setting. Press the **LEFT** ← or **RIGHT** → arrow buttons to choose either ON or OFF. Press **Enter** to save the setting or **Cancel** to cancel any change.

Temp Delay (Relay)

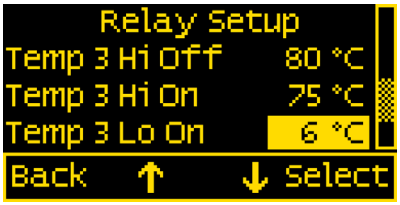
A relay delay can be specified so that relays don't immediately trigger. The relay delay functions the same as the alarm delay.
See Temp Delay (Alarm) on page 6 for details

Viewing Relay Status

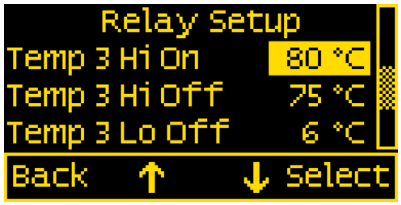
To view a complete list of active relays, press **Menu>Setup>Relay Setup**. Any active relay will flash.

Setting Input Thresholds

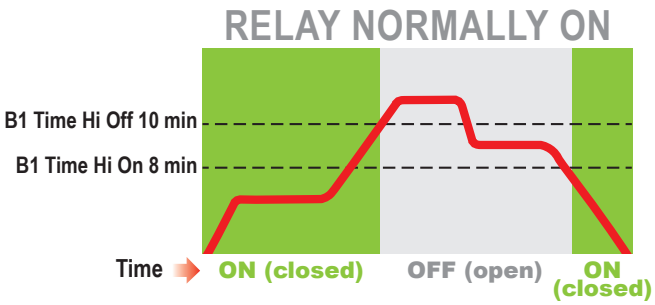
Settings for each channel's high and low temperature thresholds are provided. The connected relay's normal operating state will toggle (change state) if these thresholds are met. For both high and low thresholds, the activation and deactivation levels are different to prevent the relay from rapidly toggling (cycling on and off). Each channel has Hi ON and Hi OFF settings and Lo ON and Lo OFF settings.

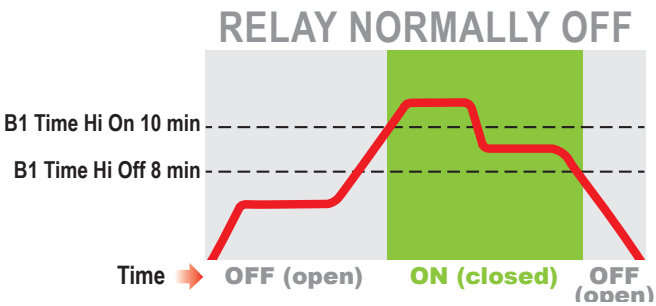


Relay Setup Screen with Relay Normally = On (Closed)



Relay Setup Screen with Relay Normally = Off (Open)





LEGEND
Temp Level

Example. This setting can be used to notify if there is an over heated wet exhaust line or if the exhaust line is approaching freezing. If the relay is Normally On (closed) and Temperature 3 is configured as above, then it will open when the temperature on channel 3 is greater than Temp 3 Hi On (80°C). To close, the level must drop below Temp3 Hi Off (75°C). Similarly, the relay will open when the temperature is below Temp3 Lo On (4°C, not shown) and then close again when the temperature is above Temp3 Lo Off (6°C).

To change one of the settings, scroll to desired setting and press **Select**. Press the **LEFT** ← or **RIGHT** → arrow buttons to change the temperature value and then press **Enter** to save the setting. Press **Cancel** to cancel the change.

NOTE: Lower threshold settings cannot be set above higher temperature threshold settings. Similarly, higher temperature thresholds cannot be set below lower temperature thresholds. The meter will automatically increase or decrease the temperature thresholds to enforce this.

Clearing Relay Notification

If the Notification option is set to ON then any time the relay is opened (Normally Off) or closed (Normally On). A message will be displayed on the main screen. Pressing a key will clear this notification. If Silence is set to ON then the relay will be opened (Normally Off) or closed (Normally On).

Viewing Relay Status

For any active alarm, the parameter will flash if it is displayed. To view a complete list of active alarms, press **Menu>Setup>Relay Setup**. Any active relay will flash.

DISPLAY SETUP

The meter display settings can be accessed from the Display Setup menu. From the setup screen, scroll to Display Setup and press the **Select** button. The different display settings are described below. To change a setting, press Enter and press the **LEFT ←** or **RIGHT →** arrow buttons to view the available setting options. Press **Enter** to save the setting. Press **Cancel** to cancel a change.

Brightness

This setting is for adjusting the brightness of the display. The value is a percentage where 0% is dimmest and 100% is brightest.

Sleep Timer

Following a certain period of inactivity, the meter will enter a sleep mode and will turn off the display. Any button may be pressed to exit the sleep mode and restore the display. The Sleep Timer sets the number of minutes from 0 to 600 before entering sleep mode. This feature will be disabled by changing the setting to **OFF**.

Dim Timer

In addition to sleep mode, the meter can also dim its display after a period of inactivity. The duration of delay in minutes from 0 to 600 can be adjusted with this setting. This feature will be disabled by changing the setting to OFF. By continuously pressing the **LEFT ←** button the meter can be placed in AUTO dim mode. In this mode the meter will automatically dim after two minutes when the ambient light is low (night mode). When the light comes back on, the meter will revert to its normal brightness.

Units

The temperature meter can display temperatures in °F or °C. Press the **LEFT ←** or **RIGHT →** arrow buttons to toggle to toggle between the °F or °C.

Display Min/Max

Minimum and Maximum arrows are only displayed on the vertical bar summary screen. Minimum and Maximum values are always displayed on the individual temperature screens.

Demo Mode

With Demo Mode ON, the meter displays factory programmed values. Changing the setting to OFF returns the meter to display actual measured values. This mode is typically used for commercial or promotional purposes. Note: Alarms and Relay settings will still respond to the actual settings and not the Demo settings. To enter Demo Mode, press **Menu>Setup>Display Setup>Demo** Mode. Press the **LEFT ←** or **RIGHT →** arrow buttons to toggle Demo Mode ON or OF

TEMPERATURE CHANNEL SETUP

Changing System Labels

The M2 allows the user to change the labels that are displayed above each channel. Each channel can have a maximum of 16 characters however in the summary screens only the first 11 or 12 characters of the channel label are displayed.

Changing Label Names

To change the name of a temperature channel, follow the instructions below:
1. Navigate to the setup menu for the desired temperature channel. **Menu->Setup->Temp. 1 Setup.**
2. In the battery setup menu, move the cursor to temperature channel name to be changed (indicated by the >> symbol).
3. Press **Select** to enter the name editing mode.
4. Use the **LEFT** ← and **RIGHT** → arrow buttons to move the cursor over the characters.
5. When the cursor is over a character, press **Enter** to edit that character. The cursor will start blinking.
6. Use the **UP** ↑ and **DOWN** ↓ arrow buttons to select a new character and press **Ok** to set that character.
7. Once all desired characters have been changed, press the **Cancel** button to exit the name editing mode.
Note: Although the maximum label length is 14 characters, some screens may only be able to display the first 5 or so characters.

Additional Temperature Settings

The meter provides custom settings for each temperature input. To access these settings, first go to the Setup menu.
Scroll to the desired temperature channel.
The temperature setup settings are described below. To make a change, scroll to setting and press **Enter**. Press the **LEFT** ← or **RIGHT** → arrow buttons to view the available setting options. Press **Enter** to save the setting. Press **Cancel** to cancel a change.

Enable

To display the temperature and its measurements, change this setting to **ON**. If enable is **OFF**, the temperature along with its measured values will not be displayed.
However, any associated alarm or relay settings are still activate. To deactive the alarm or relay, disable them in the Alarm Setup and Relay Setup menus.

Min/Max Reset

Resets the minimum and maximum values for the temperature channel.

Graph Hi/Graph Lo

On the graphical summary screens, set the highest and lowest value on the graph. For example, if we were monitoring our ice box temperature, we might want to have the maximum temperature displayed at 50°F and the minimum value set to 30°F.

VERSION INFO

The Version Info option in the Setup menu displays the product name, serial number, and software version. This information will be displayed on a screen after scrolling to Version Info and pressing Select. Pressing any button will return to the Setup menu.

FACTORY RESET

The Factory Reset option in the Setup menu allows the user to restore the meter's factory default settings. First scroll to Factory Reset and press Select. Text will appear asking to confirm or cancel the reset request. Press Yes to confirm or No to cancel the reset.

WRITE CONFIG

Save a configuration file storing all of the meters current settings to a USB thumb drive. File will be saved as Config_BSSXXXX.bcf, where XXXX is the model number of the meter, e.g. Config_BSS1830.bcf

READ CONFIG

Read a configuration file from a USB thumb drive. Configuration file must be in the root directory, not in a folder, and must be named Config_BSSXXXX.bcf, where XXXX is the model number of the meter, e.g. Config_BSS1830.bcf.
During a READ operation, the meter will create a backup configuration file Config.BSSXXXX.bkp that will also be stored on the thumb drive.
IMPORTANT! This will overwrite all current meter settings to the settings stored in the configuration file.

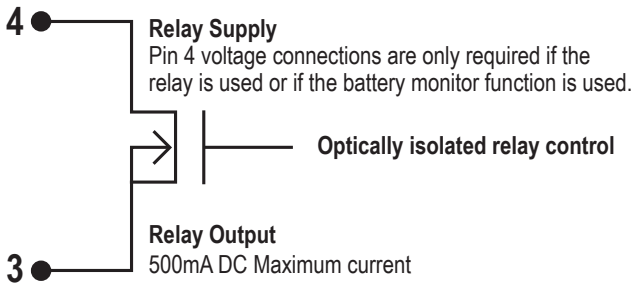
SOFTWARE UPDATE

Meters with firmware SW014 or later have the ability to update their firmware. Instructions for updating firmware and current firmware files can be found on our website: www.bluesea.com.

OPTIONAL WIRING

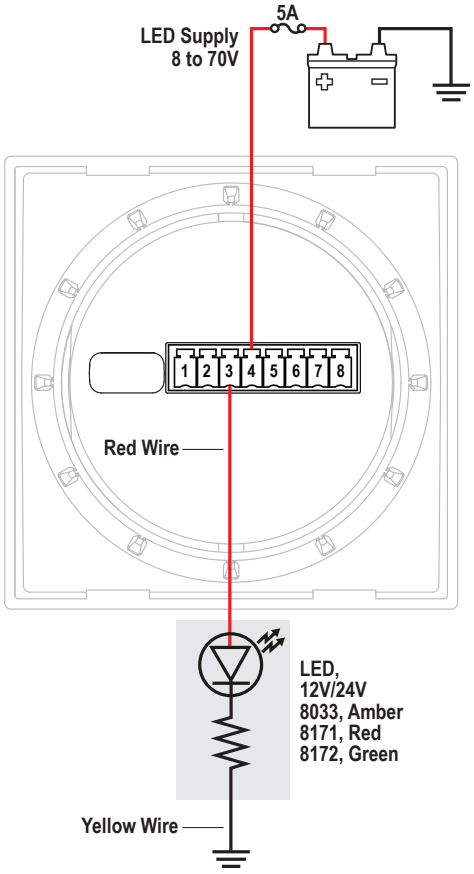
M2 Relay Connections

M2 Meters contains an internal MOSFET relay that can drive external DC loads up to 0.5A. The input is protected with a thermally activated auto-resetting fuse that will protect against shorts. In addition, an inline fuse rated at 5A should be used to protect against shorts. In typical applications, a power source is connected to the Relay Supply pin and a load is connected to the Relay Ouput connection. In the 1830 and 1833 meters, the Relay Supply connection can also be used to monitor a voltage.



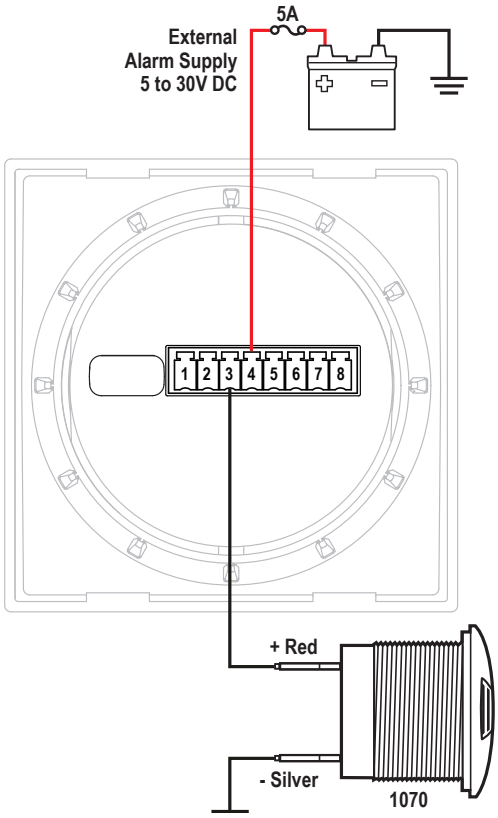
External LED

An external LED such 8171 can be connected to the Relay Output terminal. If the system is going to operate at more than 24V nominal, an additional 4K Ohms of resistance should be placed in-line with the LED.



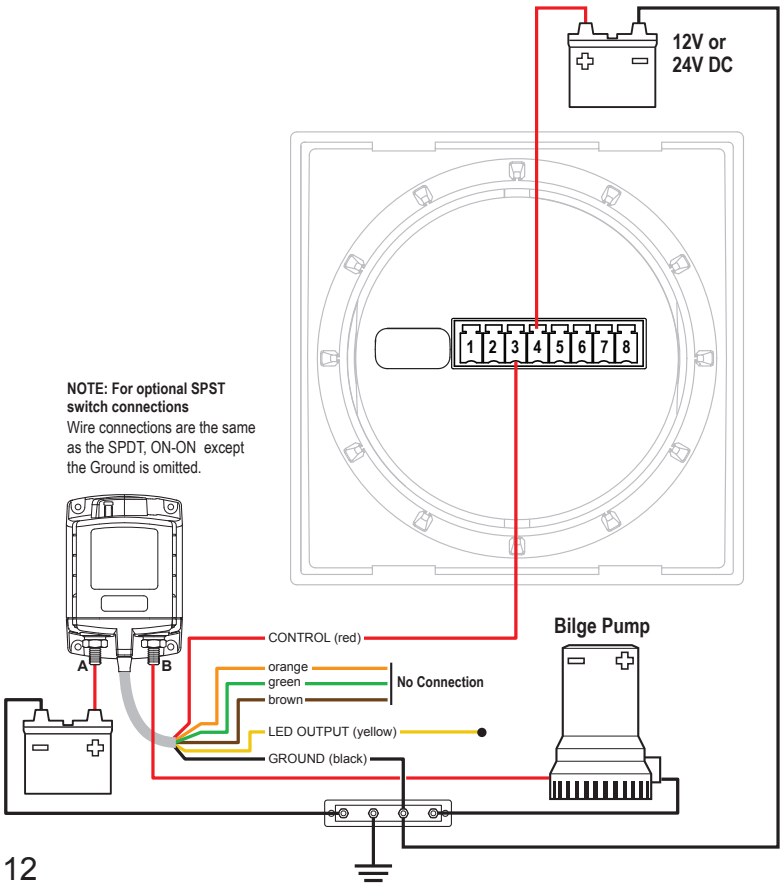
External Alarm (1070 Floyd Bell Turbo)

The Relay output terminal can support an external audible alarm. Such as the Floyd Bell Turbo Alarm (1070).



External Relay

If you need to switch more than 0.5 A, you can use an external relay such as PN 7713, 12V or PN 7717, 24V Remote Battery Switch. Connect the Relay relay output terminal to the red control wire. Activating the internal relay will also activate PN 7713.



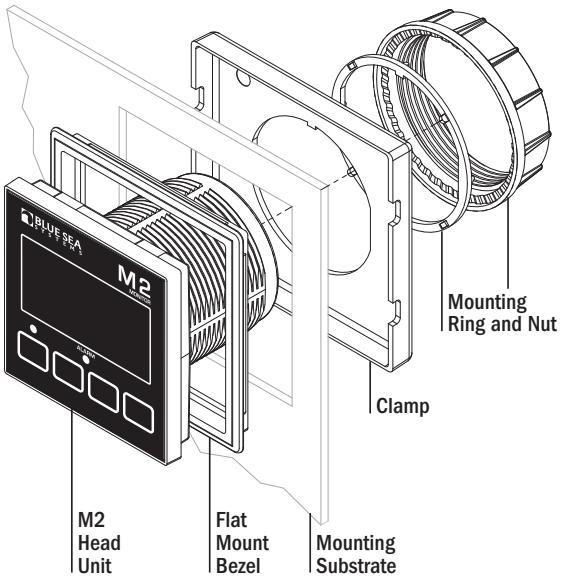
NOTE: 9012, 7700, 7701, 7702, & 7703 Remote Battery Switches are not compatible with the internal relay.

MOUNTING TEMPLATES

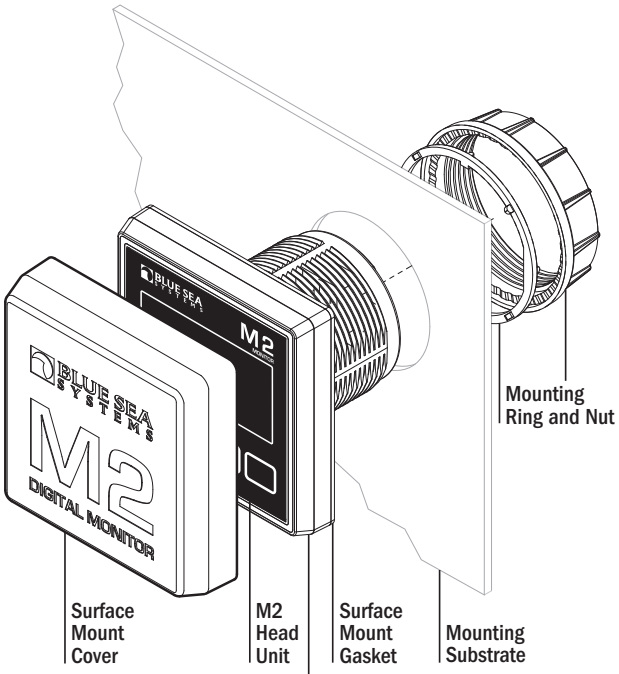
Mounting Considerations

M2 Digital Meters have three mounting methods: Surface mount, Flat panel mount, and 360 panel mount. When surface mounted per instructions the unit face is waterproof to IP66. Flat panel and 360 mounting systems are not waterproof. The unit should not be flat panel or 360 mounted if used in an exposed location. For all mountings, the back of the unit is not waterproof and must be kept dry.

Flat Mount

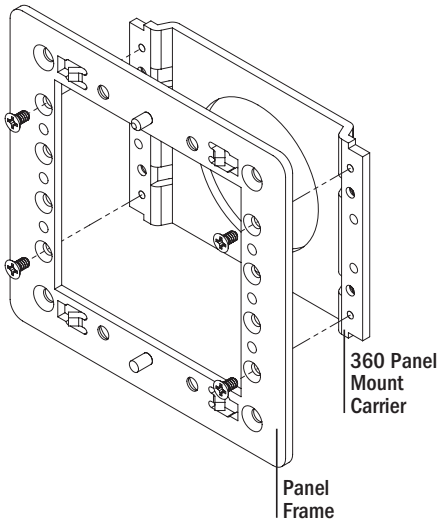


Surface Mount

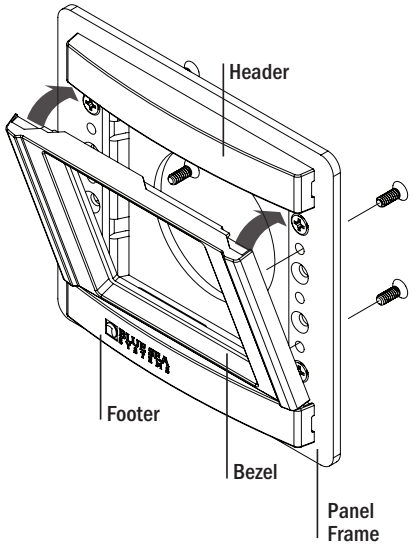


360 Panel Mount PN 1525

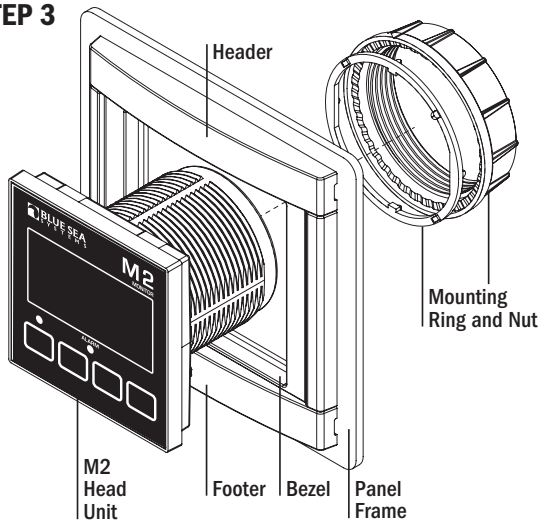
STEP 1
Use 1/4" Mounting Screws



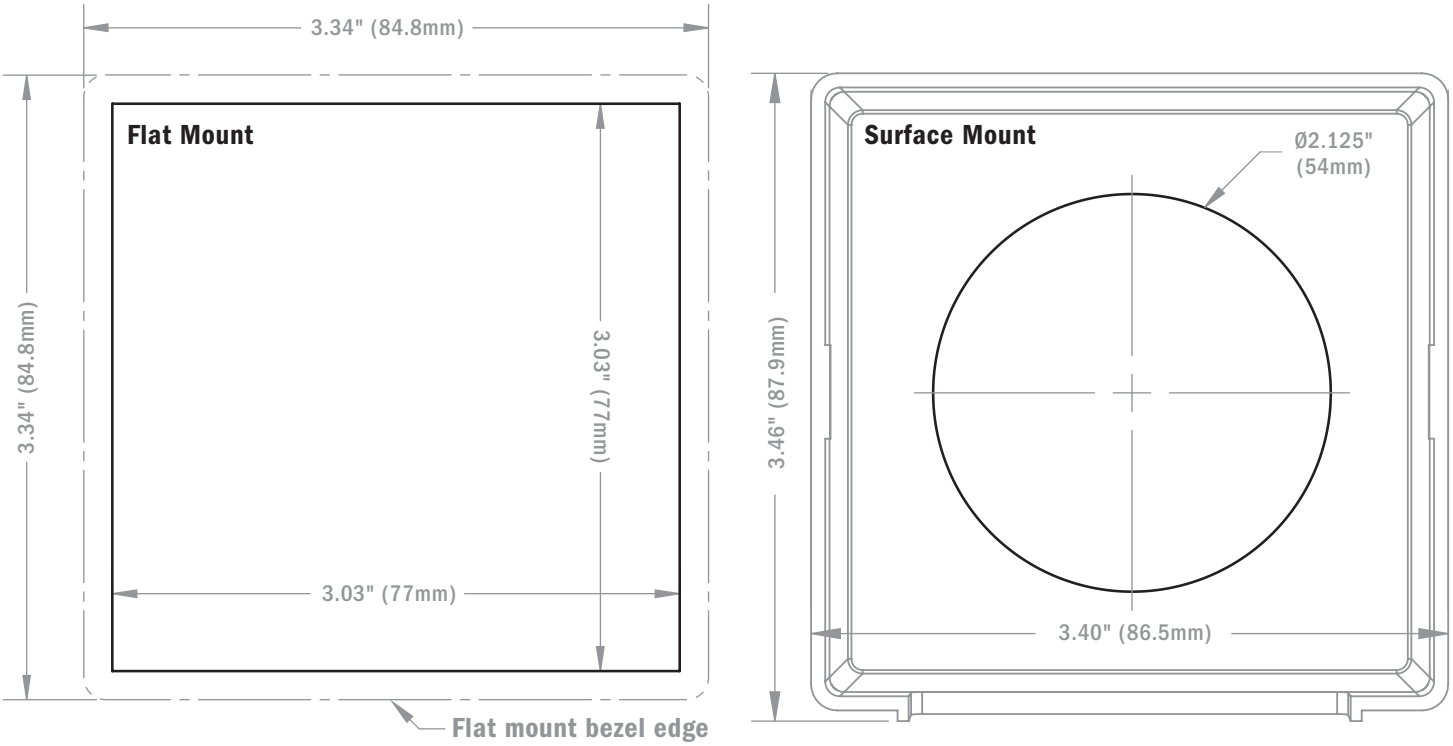
STEP 2
Snap header and footer into mounting clips and post. Snap the mounting bezel into place with the flat edge up.



STEP 3



Cutout Templates



WARNING! For cutouts to be accurate, print the document at full-scale.
Do not print to fit paper size or use any other print scaling options.
Measure printed cutouts to confirm size prior to cutting.

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