BLUE SEA SYSTEMS

M2 OLED Bilge Monitor Instructions
PN 1842

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

Display Size	55mm x 28mm
Power Supply	7V–70V DC
Power Consumption	0.3W–1.0W*

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

1842 Specifications
Compatible with bilge pumps with external float switches, or with automatic bilge pumps that indicate ON status via a DC positive voltage output.

Input Signal Range	5V - 70V DC
Monitors	Runtime per Hour
	Cycles per 24 hour
	Average cycles per 7 days
Alarms/Relays	Runtime per Hour
	Cycles per 24 hour

* Variable with voltage, display intensity, and sleep mode

Warning and Caution Symbols

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

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

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 monitor is installed.
• If an AC generator is installed on the vessel, it must be stopped and rendered inoperable before the monitor is installed.
• Verify that no other DC or AC sources are connected to the vessel's wiring before installing the monitor.
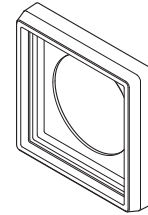
CAUTION ⚠
• The back of the unit is not waterproof. Do not install where the back of the monitor is exposed to water.
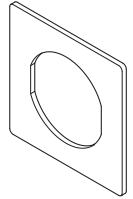
Components Included
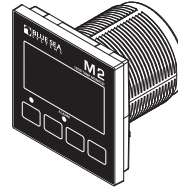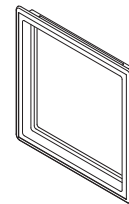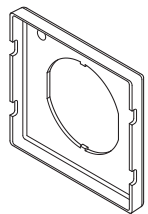

M2 Head Unit

Surface Mount Bezel and Seal
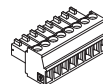
Surface Mount Gasket

Surface Mount Cover

Flat Mount Bezel

Flat Mount Clamp

Mounting Ring

Mounting Nut

Connector

Screwdriver
Retail Package Only

360 Panel Mounting Kit (PN 1525 sold separately)

Header

Bezel Mount

Carrier Mount

Footer

Panel Frame

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

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

BILGE FUNCTIONS

Monitor up to four bilge pumps for: Run Time per 60 minutes, Cycles per 24 hour, 7 Day average of cycles per 24 hours. Provides high alarms for Runtime per 60 minutes and cycles per 24 hours for each channel.

Memory

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

IMPORTANT! The 1842 M2 Bilge Monitor has the ability to provide a 7 day average of daily bilge cycles. The meter must be powered for the entire time to provide this data point. Power cycling the meter will cause it to lose all current bilge data; Runtime per 24 hours, cycles per 24 hours, 7 day average cycles per 24 hours. Factory Reset, Read Config, and Write Config actions will also reset counters.

Connections

Monitor Power Supply Connections

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

Bilge Connections

The 1842 Bilge Monitor will register bilge activity anytime the bilge input is greater than 5 volts. The inputs can be connected directly to a float switch or the bilge motor supply.

Note: The 1842 Bilge Monitor is not compatible with most automatic style bilge pumps.

Relay Connection

⚠ M2 Meters contain 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, and inline 5A fuse should be used to protect the wire to the Relay Supply. In typical applications, a power source is connected to the Relay Supply (pin 4) and a load is connected to the Relay Output (pin 3).
For more information see page 5.

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 instillation instructions and have all material prepared before beginning installation.
2. You may need the following in addition to the meter and its included contents:
   - Minimum of 1, and up to 5, 5A fuses
   - Minimum of 1, and up to 5 Inline Fuse holders, one for each 5A fuse
   - Common connection point such as a Power Post or Bus Bar.
   - Up to four (4) bilge pumps
   - Wires, terminals, and tools needed for electrical installation.
3. Choose Meter mounting style from page 13 and use the provided cutout templates on page 14 to prepare the instillation 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. If needed, install Bilge Pumps according to the manufactures instructions
6. 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.
7. Plug wired terminal block into the back of the meter.
8. Keeping hands away from the terminal block, insert the 5A fuse into the fuse holder, this will power the meter.
9. 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 1842 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 Bilge 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 Bilge Setup.
7. Detailed instructions for setting up Alarms or Relay control can be found on pages 6-7.

DETAILED WIRING

1842 Bilge Pump Monitor
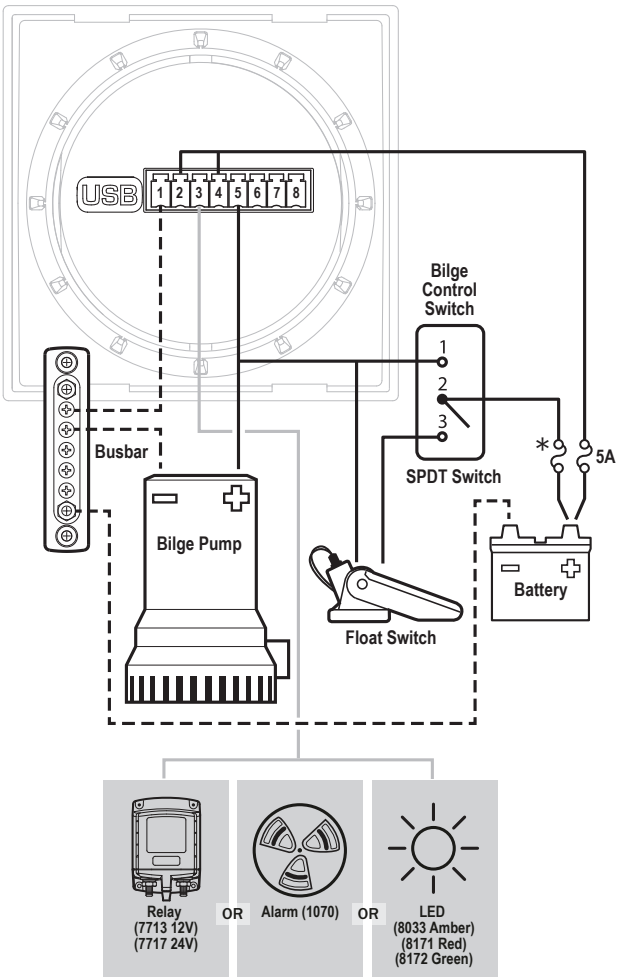
See page 13 for detailed relay instructions.

* Use bilge pump manufacturer's recommended fuse.

Float Switch Connections

Pin-out Table

1842 Connector Pin Assignment Table

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

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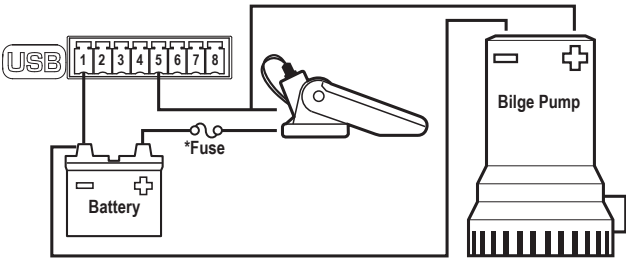
USING THE METERS

Example Screens From PN 1842 Bilge Monitor

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.

For each channel, the monitor displays 4 key pieces of information.
1. If the bilge is active, then the channel label will flash.
2. **Min 60**:The graph show the runtime over the previous 60 minutes. For example, B1 ran for about 10 minutes in the last hour.
3. **Cyc 24h**: Displays the number of times the bilge cycled in the previous 24-hours.
4. **Cyc Avg**: Displays the number of cycles over the last seven day divided by 7. This is the daily average. Compare this count with the 24-hour count to see if the bilge is running more or less often.
   For example, in B2 the 24-hour count is 42, while the **Avg** is 15. This tells you that the bilge is running more often than normal.

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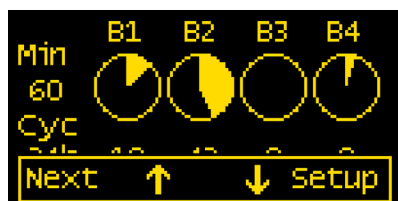
The menu system is a two dimensional matrix. Pressing the **NEXT** button will transition the display between the System Summary screen which displays summary information for each of the "bilge pump" channels.

Press the **UP ↑** or **DOWN ↓** arrow buttons to display more detailed information about an input channel or to show a single parameter, such as "B1" in the display (see example below).
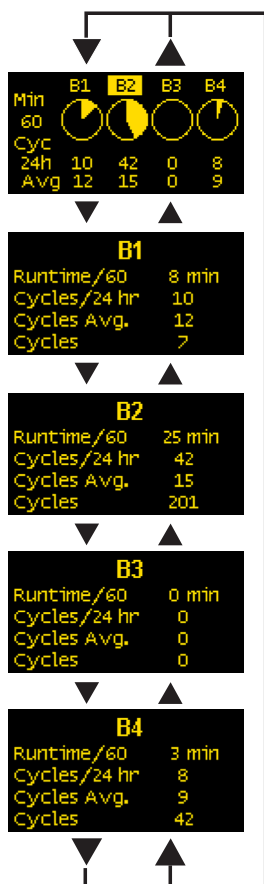
Press the Menu button to bring up the Setup menus. Press the **UP ↑** and **DOWN ↓** arrow buttons to move the cursor over the options and press the **Select** button to see a selected display. To return to the previous display, press the **Back** button.

Configuring the Monitor

Monitor 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
Relay Setup
Display Setup
Bilge 1 Setup
Back          ↓ Select
```
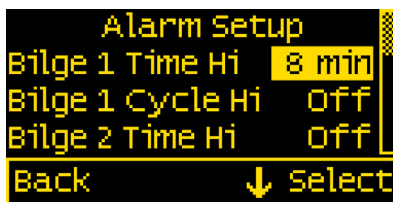
ALARM SETUP & CONTROL

The meter monitors two different conditions that can activate an alarm. The meter monitors the amount of time the bilge is active over the last 60 minutes. The monitor can be set to sound an alarm anytime the monitor exceeds a certain amount of run time. The monitor can also monitor the number of cycles that have occurred in the last 24 hours. 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 Monitor family provides monitoring capability of bilge 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 a run time high alarm.

1. Go to the Alarm Setup menu.
2. Scroll to the desired input channel (i.e., Bilge 1 Hi).
3. Press the Select button and the cursor should start blinking.
4. Set the bilge 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.

```
      Alarm Setup
Bilge 1 Time Hi    8 min
Bilge 1 Cycle Hi   Off
Bilge 2 Time Hi    Off
Back          ↓ Select
```

In the above example, an alarm will set anytime Bilge 1 is running longer than or equal to 8 minutes.

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.

```
        B1
  Alarm  8 min
Bilge 1 Time Hi   8 min
   Any Key to Clear
```
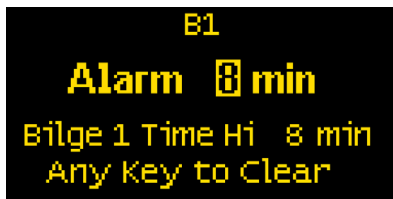
Viewing Alarms Status

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.

Notes on Alarms and Relay Settings:
Unlike many other monitors, the M2 Bilge Monitor, determines its Alarm and Relay states by conditions over long periods of time, either one hour (60 minutes) or one day (24 hours). To prevent repeated alarms for the same issue, after an alarm or relay has been triggered the status being monitored must drop below the trigger set point before the alarm/relay will reactivate.

In the above example, Bilge 1 will trigger after 8 minutes of run time. If the alarm is cleared by the user and the bilge runs again within the next hour, the alarm will not activate again. However, let's assume Bilge 1 runs for 15 minutes, triggering an alarm after 8 min, which is cleared by the user. If Bilge 1 sits for 55 minutes, at that point the runtime / 60 should read 5 minutes. If Bilge 1 starts to run again, the alarm will sound after 3 minutes (5 minuets left from previous run + 3 new minutes of running = 8 minute trigger).

The icon of an input that is over its alarm trigger will flash as long as the value is over the alarm set point. Even if the alarm has been cleared.

RELAY SETUP & CONTROL

M2 Monitors provide an option to control an external relay. The M2 can trigger the relay based on runtime in an hour or the number of cycles in 24 hours.

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.
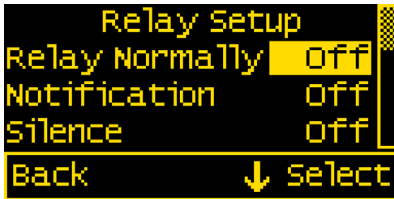

Relay Normally On/Off

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.
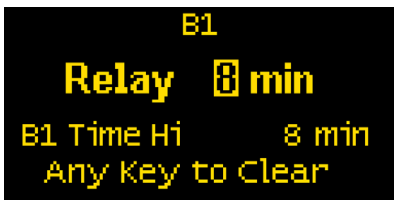
Silence Relay

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 monitor. 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.

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 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.

Relay Setup Screen with
Relay Normally = On (Closed)

Relay Setup Screen with
Relay Normally = Off (Open)
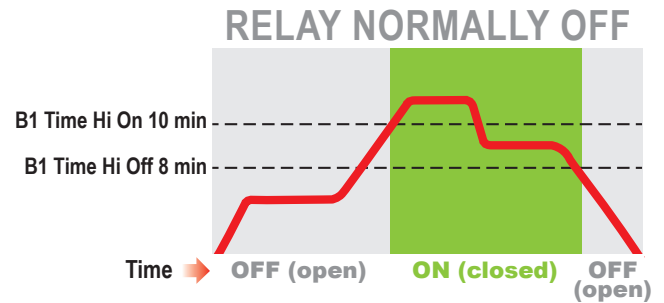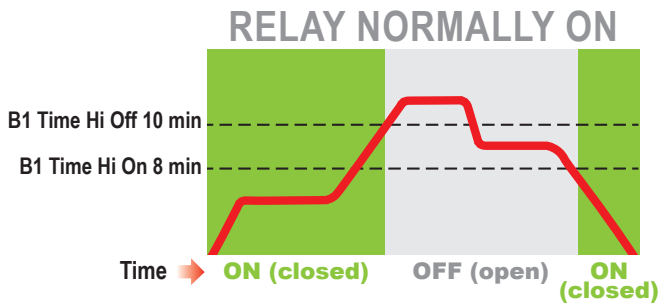
LEGEND

Bilge Run Time ▬▬

Example. If the relay is Normally On (closed) and Bilge 1 is configured as above, then it will turn off (open) when the bilge has been running longer than 10 minutes in any given hour. When the runtime drops below 8 minutes/hr then the relay will turn on (close) again.

To change one of the settings, scroll to desired setting and press **Select**. Press the **LEFT ←** or **RIGHT →** arrow buttons to change the value and then press **Enter** to save the setting. Press **Cancel** to cancel the change. In this case, it would take a minimum of 53 minutes for the runtime/60 to drop from 10 to 7, resetting the relay to its default state.

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

Clearing Relay Notification

If the Notification option is set to ON then any time the relay changes from it's default state, a message will be displayed on the main screen. Pressing a key will clear this notification. For example: If the relay is set to normally off and notifications are on then anytime the relay closes (turns on) the notification message will be displayed
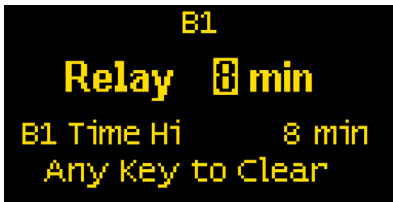
Viewing Relay Status

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 monitor 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 monitor 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 monitor 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 monitor can be placed in AUTO dim mode. In this mode the monitor will automatically dim after two minutes when the ambient light is low (night mode). When the light comes back on, the monitor will revert to its normal brightness.

Demo Mode

With Demo Mode ON, the monitor displays factory programmed values. This mode is typically used for commercial or promotional purposes. To enter Demo Mode, press **Menu>Setup>Display Setup>Demo** Mode. Press the **LEFT ←** or **RIGHT →** arrow buttons to toggle Demo Mode ON or OFF. After Demo Mode has been changed from ON to OFF, the meter must be power cycled before resuming normal operation.

BILGE 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 bilge channel, follow the instructions below:
1. Navigate to the setup menu for the desired bilge channel. **Menu->Setup->Bilge 1 Setup.**
2. In the battery setup menu, move the cursor to bilge 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 Bilge Settings

The monitor provides custom settings for each bilge input. To access these settings, first go to the Setup menu.
Scroll to the desired bilge channel.
The bilge 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 bilge measurements, change this setting to **ON**. If enable is **OFF**, the bilge 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.

Cycle Reset

Resets the bilge cycle counter and runtime to zero.

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 monitor'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.
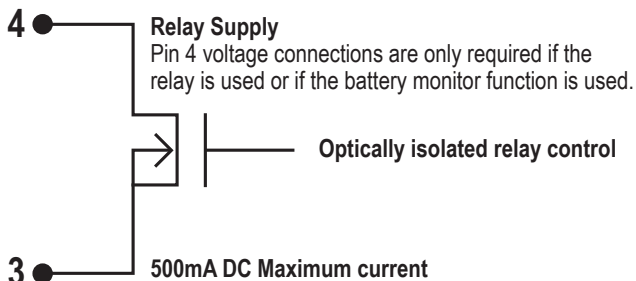
SOFTWARE UPDATE

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.

4 ● ──── **Relay Supply**
Pin 4 voltage connections are only required if the relay is used or if the battery monitor function is used.

Optically isolated relay control

3 ● ──── **500mA DC Maximum current**

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.

**LED Supply
8 to 70V**

5A

Red Wire

**LED,
12V/24V
8033, Amber
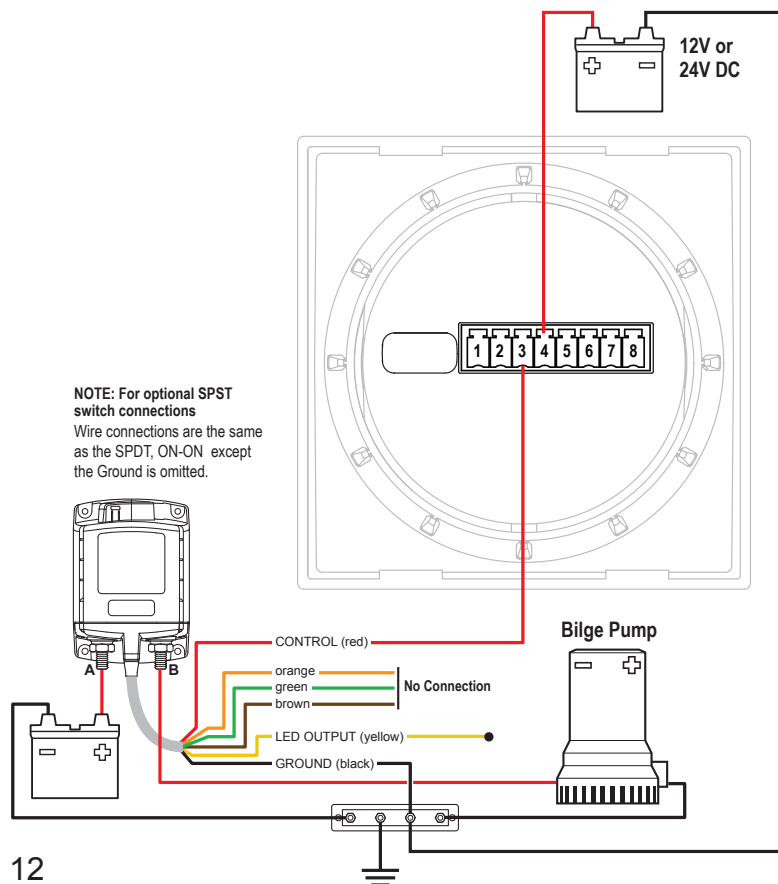8171, Red
8172, Green**

Yellow Wire
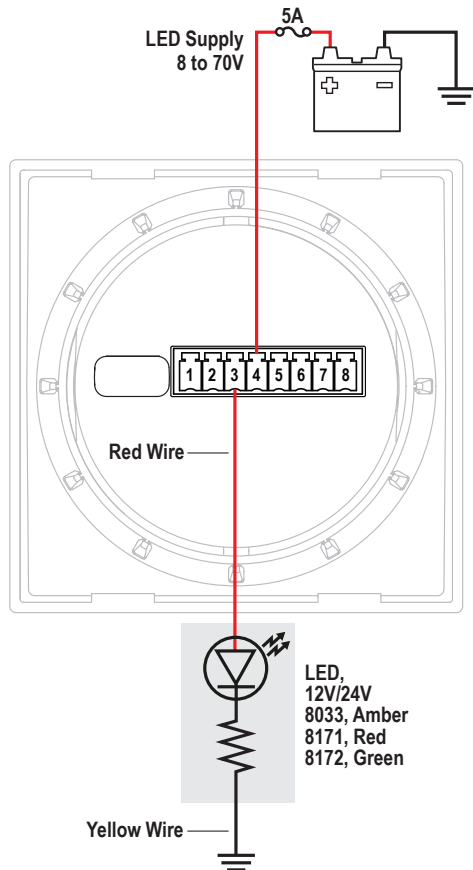
External Alarm (1070 Floyd Bell Turbo)

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

**External
Alarm Supply
5 to 30V DC**

5A

+ Red

- Silver

1070

1 **2** **3** **4** **5** **6** **7** **8**
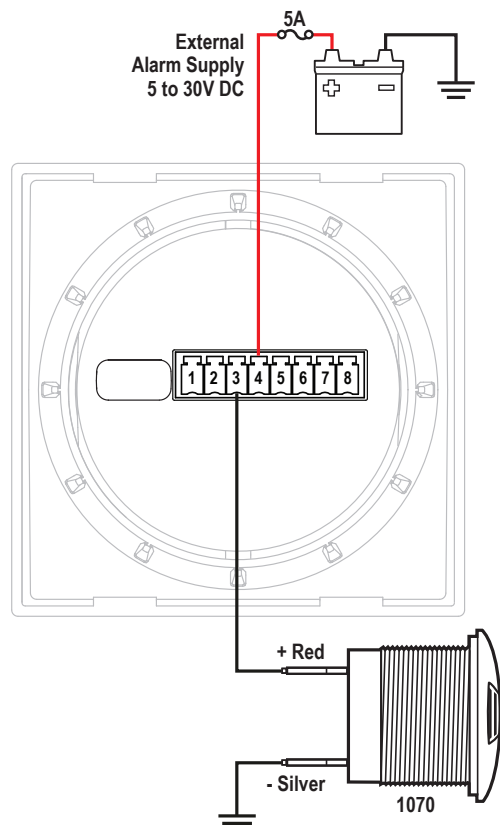
External Relay

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 Output terminal to the red control wire. Activating the internal relay will also activate PN 7713.

**12V or
24V DC**

1 **2** **3** **4** **5** **6** **7** **8**

NOTE: For optional SPST switch connections
Wire connections are the same as the SPDT, ON-ON except the Ground is omitted.

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

A   **B**

CONTROL (red)

orange
green   **No Connection**
brown

LED OUTPUT (yellow)
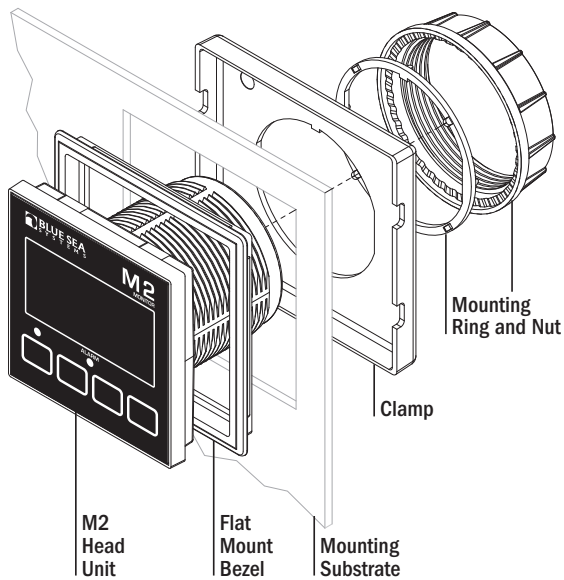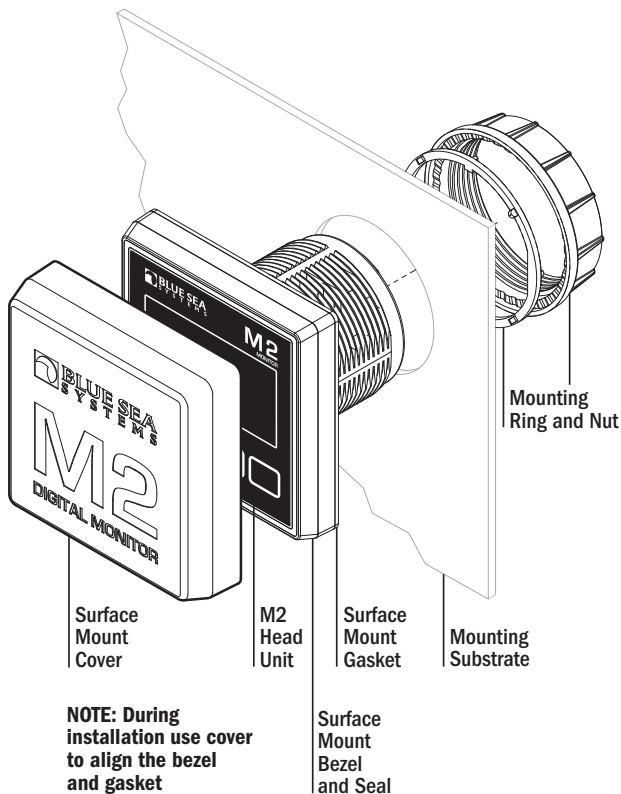
GROUND (black)

Bilge Pump

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.
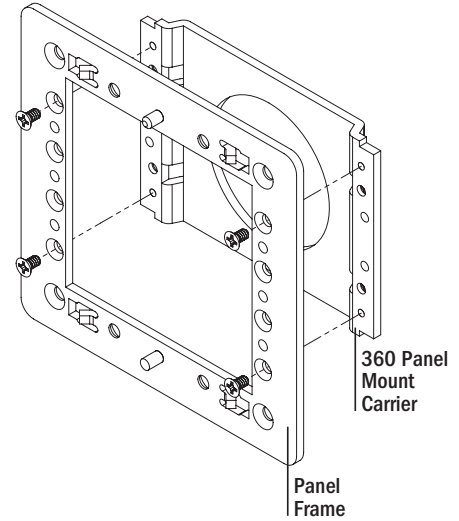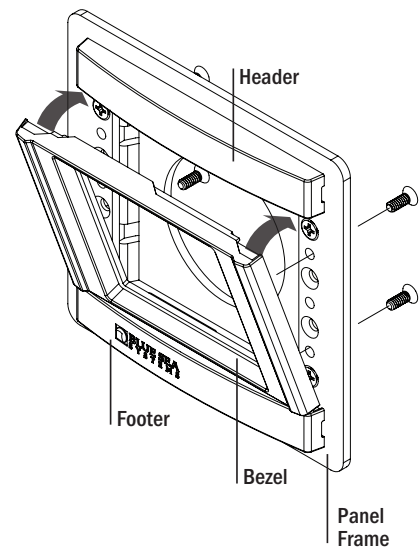
Flat Mount

Mounting Ring and Nut

Clamp

M2 Head Unit

Flat Mount Bezel

Mounting Substrate

Surface Mount

Mounting Ring and Nut

Surface Mount Cover

M2 Head Unit

Surface Mount Gasket

Mounting Substrate

Surface Mount Bezel and Seal

NOTE: During installation use cover to align the bezel and gasket

360 Panel Mount PN 1525
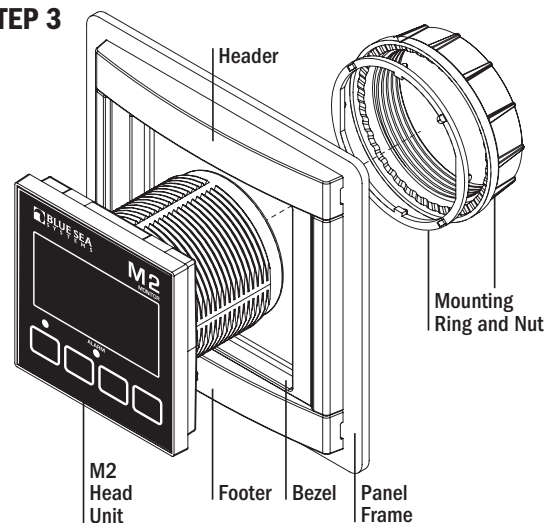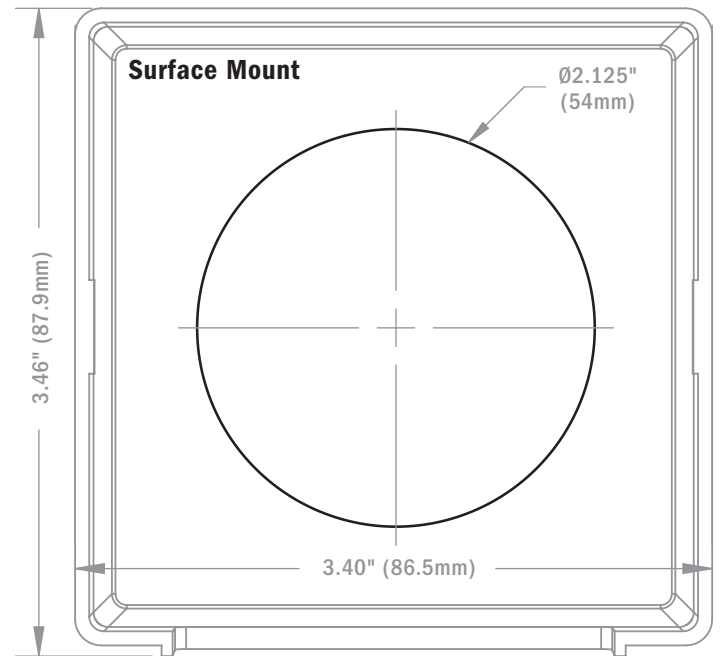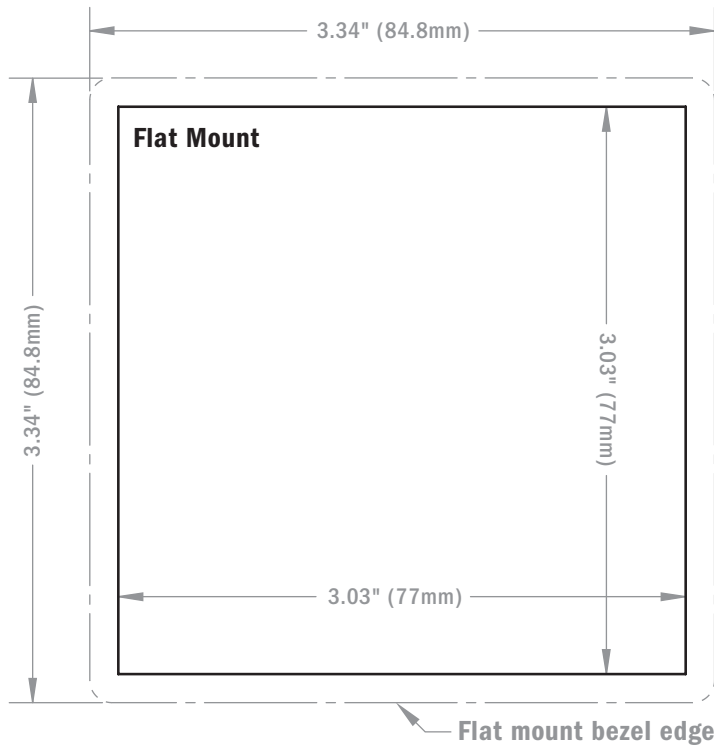
STEP 1
Use 1/4" Mounting Screws

360 Panel Mount Carrier

Panel Frame

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

Header

Footer

Bezel

Panel Frame

STEP 3

Header

Mounting Ring and Nut

M2 Head Unit

Footer

Bezel

Panel Frame

13

Cutout Templates

Flat Mount

3.34" (84.8mm)

3.34" (84.8mm)

3.03" (77mm)

3.03" (77mm)

Flat mount bezel edge

Surface Mount

Ø2.125" (54mm)

3.46" (87.9mm)

3.40" (86.5mm)

⚠ **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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