Maretron® MConnect®

Vessel Monitoring and Control Software for NMEA 2000® Networks

User's Manual

Revision 1.0.2

120 Intracoastal Pointe Dr.
Jupiter, FL 33477 USA

https://www.maretron.com

Maretron Manual Part #: M003144

Revision History

Rev.	Date	Description
1.0.0	9/11/2023	Original document.
1.0.1	9/28/2023	Section of Actions and Conditions added. Components and Parameters have been removed.
1.0.2	5/6/2024	Actions and Conditions updated

Table of Contents

Table of Figures

1 Introduction

Thank you for purchasing the Maretron MConnect Vessel Monitoring and Control System. MConnect is a cost-effective way to view hundreds of datapoints required to effectively monitor the complex systems found on today's boats. The control functionality allows switching of digital loads using Maretron's MPower products, and those from other manufactures.

With 2 NMEA 2000 Can ports, MConnect can monitor both redundant networks and systems with separate Vessel Monitoring and Navigation buses.

MConnect is an HTML 5 web server. This means that it does not have a display but will serve an HTML page over the Ethernet connection that can be displayed on a web browser. In particular, it is designed to work with the built-in browsers on the following MFDs, commonly found in boats:

- Garmin
- Raymarine
- Navico / Simrad
- Furuno

The webpage can also be displayed on computers, mobile phones, and tablets.

It will support up to 4 simultaneous users, each operating independently with different screen layouts.

MConnect includes new engaging modern graphics for all its on-screen components, and for OEMs and users that require their own look it also has a number of custom components where you can add your own graphics.

2 Software Version

This manual corresponds to MConnect Version 1.0.4.

3 MConnect System Features

- Provides monitoring of a wide variety of NMEA 2000 data:
  - AC Parameters (Average and Phase specific)
  - Breakers
  - DC Voltages and Currents
  - Depth
  - Electric Drives and Electric Energy Storage
  - Engine and Transmissions
  - Environment (Wind, Temperature, Pressure, Humidity)
  - Fuel Management
  - GPS (Position, Course, Speed over Ground)
  - Heading
  - Indicators and Switches
  - Pressure / Vacuum and Temperatures
  - Rudder
  - Tank Levels
  - Video
  - Watermakers (requires a compatible Watermaker)
- Some automation through Conditions and Actions
- Provides ability to control compatible NMEA 2000 switches and circuit breakers.
- Alerts - This release of MConnect does not support Alerts.
- Anchoring - This release of MConnect does not support Anchor Watch functions.

- The Client/Server architecture allows monitoring from anywhere in the world with an internet connection. If a direct connection to the boat is not possible, MConnect comes with a pre-installed TailScale VPN. Setting this up is simple once you create a TailScale account.
-

4 Setting Up

This section will help you discover the MConnect product on your network and display the default demo configuration.

4.1 Discover MConnect

4.1.1 On a PC, mobile phone or browser

MConnect uses the mDNS protocol which enables devices on the same subnet to discover each other without using a DNS table from a server.

On the URL line of your browser, type “mconnect.local” to connect to the MConnect Web Server.

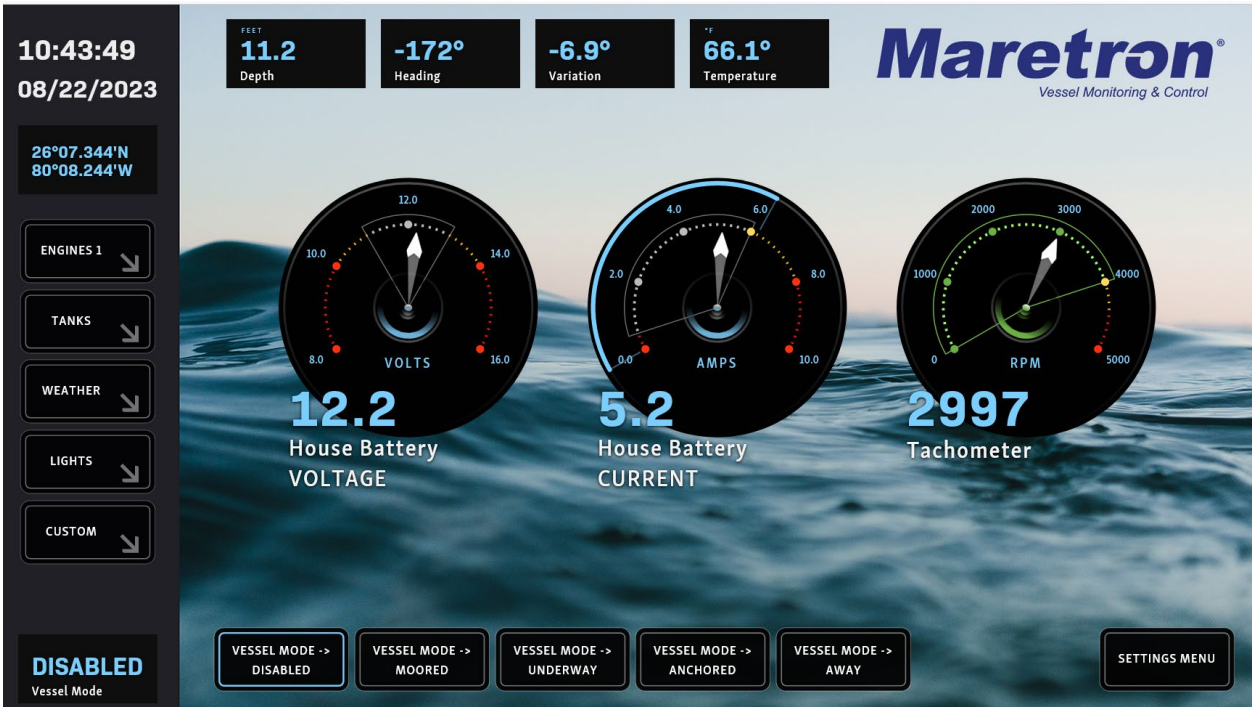


Figure 1 – MConnect Sample Screen

4.1.2 Using the IP Address

As a fallback, which should only be required if the mDNS functions are not possible, you can also display the pages by typing the IP address of the MConnect box. The easiest way to obtain this address is to insert a USB drive into the box and remove it 30

seconds later. MConnect will write a small file to the USB drive, called *mconnect-data.json,* with the following contents.

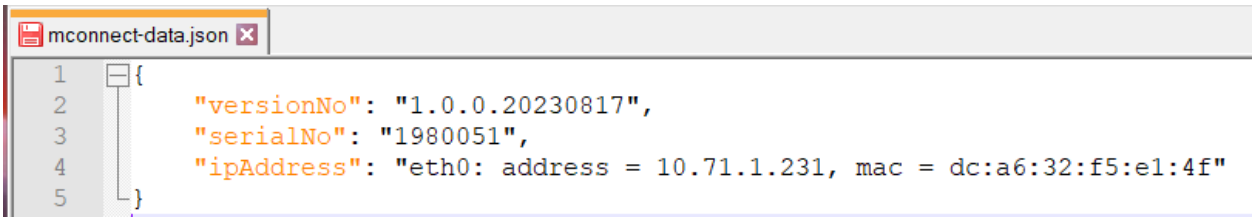


Figure 2 – mconnect-data.json file

MConnect is designed to work with the following MFDs:

- Garmin
    - 942xs Software update in Aug 2023 Not Supported
    - GPSMAP 943xsv Software Version 24.x Not Supported
    - GPSMAP 943xsv Software Version 25.30 Supported
    - GPSMAP 943xsv Software Version 30.10 Supported
    - GPSMAP 943xsv Software Version 33.30 Supported
    - GPSMAP 8617 Software Version 30.10 Supported
    - GPSMAP 8617 Software Version 31.10 Supported
- Raymarine
- Navico / Simrad
- Furuno

MConnect is pre-installed with software to communicate with these MFDs, and an option to display the MConnect webpage will be automatically added to the list of applications supported by the MFD.

4.2 Installing Cameras

MConnect supports MJPEG video streams from the following camera manufacturers:

4.2.1 Axis

All cameras supporting the VAPIX protocol are supported. The following cameras have been tested by Maretron:

- Axis 212 PTZ Network Camera. This is a wall-mounted camera with software pan, tilt and zoom.
- Axis 215 PTZ Network Camera. This is a sophisticated camera with hardware Pan Tilt and Zoom. It requires a 12V power supply which is supplied with the camera.
- Axis P3301 Fixed Dome Network Camera
- Axis Single Video Server 241S
- Axis Quad Video Server 241Q
- Axis Q7401 Video Encoder
- Axis Quad Video Server 240Q
- Axis M3113 Network Camera
- Axis M3114 Network Camera
- Axis M3343 Network Camera
- Axis M5525 PTZ Network Camera
- Axis P3245 PTZ Network Camera
- Axis P3265 PTZ Network Camera

Other Axis cameras supporting the Vapix Protocol will also work.

4.2.2 Hatteland

The Seahawk range of cameras are supported.

4.2.3 Omnisense

The Onmisense IP cameras are supported.

5 Using MConnect

5.1 Touch Screen Operation

MConnect was designed so that all functions in operational mode can be performed with either a keyboard / mouse or a touch screen.

5.2 Keyboard Operation

A keyboard is suggested to configure MConnect. There are a few fields that need to be entered with text. In normal operation, if a keyboard is connected, short cuts can be used to easily navigate from screen to screen.

5.3 NMEA 2000 Considerations

This section describes some requirements for the NMEA 2000 networks to be monitored with MConnect.

5.3.1 Instancing

The one aspect of NMEA 2000 that you need to be aware of as a user of MConnect is the concept of instance numbers, or instancing. To enable parameters from different devices to be distinguished, an instance number is associated with the source of each parameter. This may be done as a Device Instance or a Data Instance, depending on the message format used to transport the data on the NMEA 2000 bus. The user does not need to know whether Device Instancing or Data Instancing is used to configure MConnect. When configuring each component on the display, the instance number associated with the source of the data should be known to ensure that the component is monitoring the correct instance of the parameter.

For example: when configuring a control to monitor the Port Engine RPM, the instance number should be set to 0; setting it to 1 would monitor the RPM of the Starboard Engine.

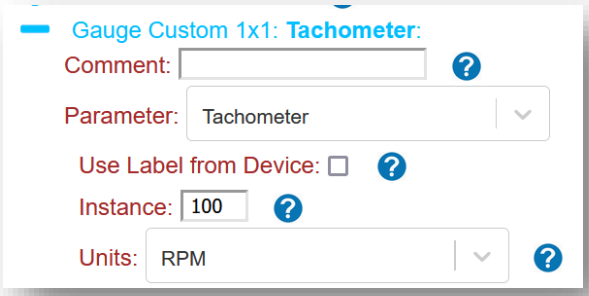


Figure 3 – Setting Instance Number

For simple configurations, where there is only one source of data, MConnect allows the Instance Number to be set to “Any”, represented by the value “-1”. If this is chosen, the component will lock on to the first matching parameter received on the NMEA 2000 bus, regardless of its Instance Number. If there are more than two matching parameters on the bus, this will lead to unpredictable behavior. If there is only one matching parameter, it is an easy way to set up the component without knowing what the real Instance Number is.

Instance Numbers can either be allocated to the Device as a whole (Device Instancing) or to individual data elements (Data Instancing).

5.3.1.1 Device Instancing

The *device instance* is an eight-bit value (ranging between 0 and 255) that every NMEA 2000 device transmits when it joins the bus and upon request thereafter. This becomes important when you have multiple devices that transmit the same data. It is possible, for example, to have two GPS antennas on a vessel, with one serving as a primary antenna and others serving as backups. If this is so, the NMEA 2000 standard requires that the two different antennas have two different device instances. If you are using a certified NMEA 2000 product, the NMEA 2000 standard requires that a user be able to set the device instance in each product. Consult the device documentation or contact your device manufacturer to determine how to set the instance into a particular device.

5.3.1.2 Data Instancing

Certain NMEA messages, such as those from batteries, tanks, engines, and transmissions, have *data instances* embedded in the messages. These data instances are used, if programmed, to relate data to specific data sources. Data instances are

also required by the NMEA 2000 standard to be field-programmable, so please consult your device's documentation for details on how to program this value.

In order to support "plug-and-play" operation, if MConnect receives the same data from multiple devices that have the same device instance programmed, it will "lock on" to the first unit it receives data from until either 1) it stops receiving data from the first unit, in which case it will switch to the second unit, or 2) it starts receiving data from another unit with higher Priority, in which case it will transmit the data from that unit.

5.3.2 Data Source Types

The NMEA 2000 standard provides for the transmission of data from similar devices, but for different sources. For example, the NMEA 2000 standard supports six different types of fluid tanks: Fuel, Oil, Live Well, Fresh Water, Wastewater, Black Water, and Gasoline. It further supports up to sixteen tanks of each of these types. It is the responsibility of the person installing the NMEA 2000 system to ensure that each tank level sender is programmed with the appropriate fluid type and tank instance.

5.4 Vessel Mode

MConnect supports the following Vessel Operating Modes, which match those of N2KView:

- Disabled –
- Moored –
- Anchored –
- Underway –
- User 1 –
- User 2 –
- User 3 –
- User 4 –

The full extent of these modes will realized in a future release of MConnect with full Alert Capability.

In this release, the mode is used to control which warnings and errors are displayed on the Screen Status buttons.

This shows that the Engines 1 page has 1 warning and 2 errors.

In this case, we could use the Vessel Mode to only show Engine Errors on the Home Screen when the vessel is Underway. A low pressure warning is meaningless when the engine is not running.

5.5 Parameters

The key concept of MConnect is the display of *parameters*. A parameter is a piece of information about some function of the vessel, such as engine speed or barometric pressure. In addition, a particular instance of that data type will also need to be specified, e.g. the speed of the Port Engine and possibly a source, e.g. Port Fuel Tank Level.

The list of parameters that MConnect can display are listed in the MConnect Parameters file (see section 8.4). A device is required to be connected to the NMEA 2000 bus and produce the relevant data for it to be displayed.

5.6 Components

Each parameter may be displayed on a User-defined Screen using a *component*. A component is a graphical display that is generally dedicated to the display of the value of a parameter. Examples of components include the digital display, a gauge, or a bar graph. A complete listing of available component types appears in the MConnect Parameters file (see section 8.4). If data is not available for a component, the component will display two dashes (“- -“), and the indicators for gauge type components will be at the end stop (or peg). More complex components such as the compass will show a dimmed needle to indicate data not being available. Where secondary data is not available to perform a calculation to get the required parameter, every effort is made to inform the user what secondary data is missing. (e.g., If variation is not available to convert Magnetic Heading to True Heading the digital display will show “No VAR”.)

5.7 Conditions

Conditions are used to detect values passing a predefined level or entering a predefined state. When the condition is met, the condition is true; when it is not met, the condition is false. An example of a condition would be *Battery Voltage less than 11.7 V*, or *Breaker tripped*.

All conditions have a stable time. The value being measured must be in range continuously for a period greater than the stable time before the condition goes into the true state. The value must also be out or range for a period greater than the stable time before the condition goes back to the false state. This prevents multiple actions being initiated when the value hovers at the predefined condition.

Conditions may be displayed on the screen using any Indicator type component, such as Indicator Beams, Indicator Moving Lines, Indicators etc.

Conditions may also trigger one or more Actions when the condition goes from the inactive (false) state to the active (true) state. No action is executed when the condition goes from the active to the inactive state. If this is a requirement, then a second condition should be created.

While there are limited conditions defined in MConnect currently, more will be added in the future. A complete listing of available Condition Types may be found in the MConnect Parameters file (see section 8.4).

5.8 Actions

Actions may be executed when a condition becomes true. An example would be to turn the Water Maker ON when the level of the Water Tank is below 10%.

While there are limited actions defined in MConnect currently, more will be added in the future. A complete listing of available Action Types may be found in the MConnect Parameters file (see section 8.4).

5.9 User-defined Screens and Parameter Display

MConnect has user-defined screens. You can set up your own screens with your layout to display a group of components which generally will display related parameters, such as engine data, navigation data, tank levels, and so on.

5.10 Configurations

MConnect can store multiple configurations. A configuration is a set of screens, each containing a set of components that display different data values, plus the graphical images chosen by the designer to be displayed as backgrounds on those screens or within individual components. The layout of the screen and types of components will have been set up previously.

When first connecting to MConnect, you will be shown the first screen on one of the configurations previously designed for your boat.

If MConnect was installed as part of an OEM project, the initial screen will be correctly laid out for you, and you may be prevented from editing it.

If no configuration has been defined, you will see the default configuration.

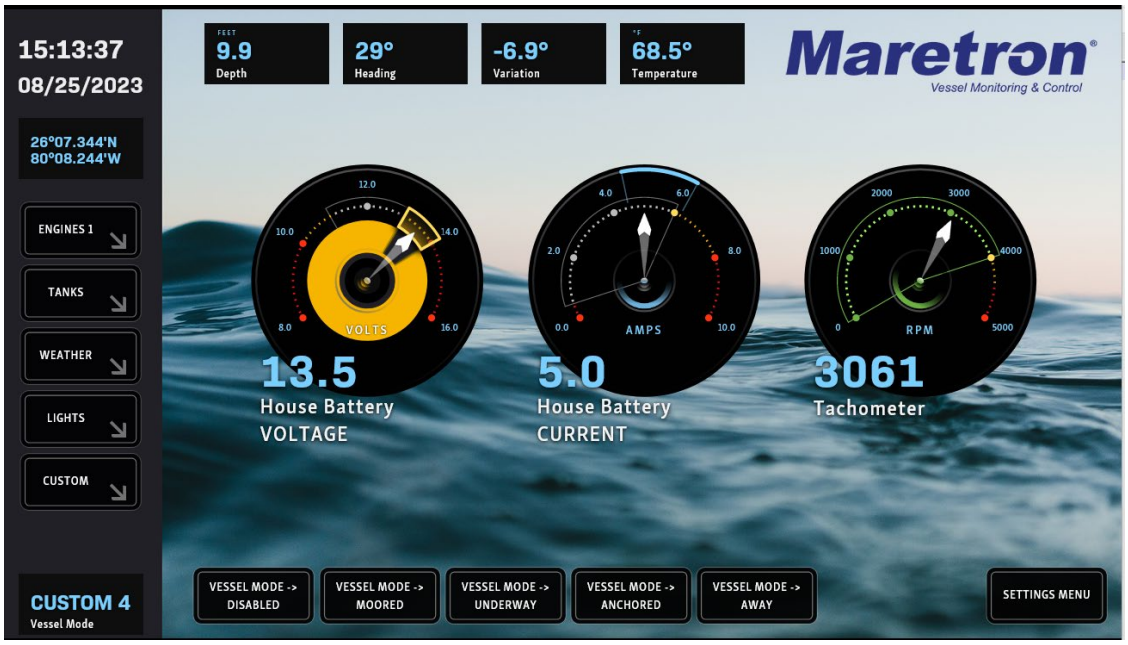


Figure 4 – MConnect Default Screen

Once the configuration is chosen, the name will be stored in user-memory on your device, and you will open that configuration when you make a connection.

5.11 Changing Screens

To display other screens, the following components have been provided:

- Screen Navigation Buttons / Screen Status Buttons

- Screen Navigation Bar

Pressing on any of these button will change the screen displayed, within the same configuration.

If you are already on that screen, the button will have a light blue border.

Other ways of changing screens are:

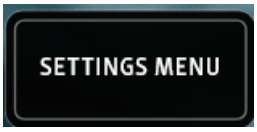
- Press the left and right arrow buttons on a keyboard
- Swipe up or down on a screen that supports those gestures.
- Press the Home button, or the Home key on your keyboard, which will quickly take you to a screen named “Home”
- Press the Backspace button, or the backspace key on your keyboard, which will take you to the previous screen.

6 Settings

6.1 Settings Menu

The Settings menus is opened in one of two ways

- The “Settings Menu” action button



This button may be placed on the screen by the designer.

- Using the Settings Button

This is normally found at the top right of every screen. If a Settings Menu action button is on the screen, then the Settings Button will be suppressed. The position of the Settings Button may also be changed, so look for it all over the screen if you don’t see it at the top right.

Pressing the Settings button will display the Settings Menu. This is a set of buttons where you choose which dialog to view.

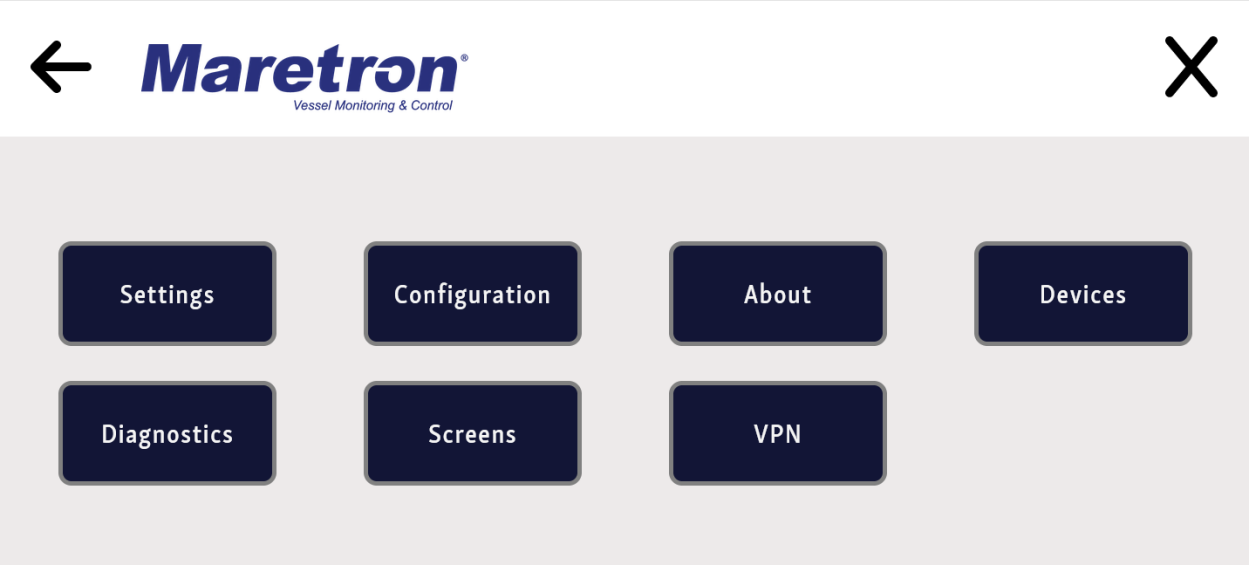


Figure 5 – MConnect Settings Menu

The ← will display the previously viewed dialog, the X will close the dialogs and display the data screens.

6.2 Settings Dialog

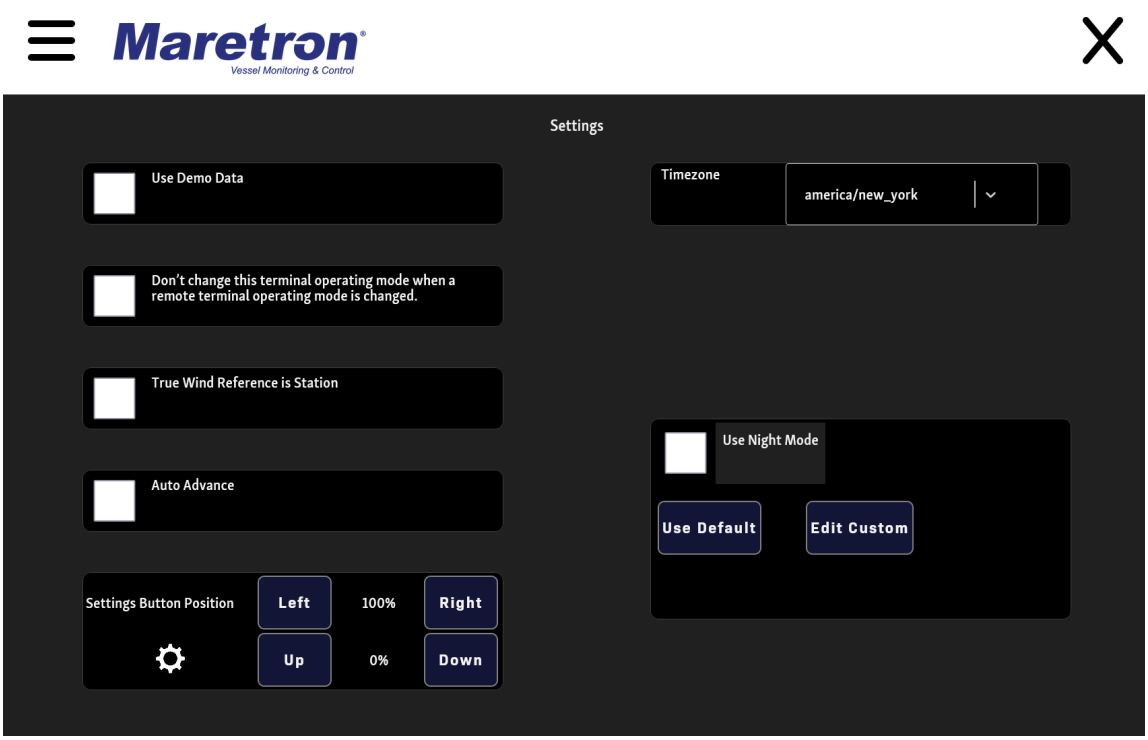


Figure 6 – Settings Dialog

The fields in this dialog control the operation of MConnect.

The hamburger menu ☰ will return to the Settings Menu.

The X will return to the data screens.

6.2.1 Use Demo Data

Normally this box will be unchecked.

If checked, MConnect will inject data into the PGN database to simulate instruments on the NMEA 2000 bus. These PGNs will all contain instance numbers of 100, 101, or 102; they will cause conflicts with any real data received on the NMEA 2000 bus with the same instance numbers. The default configuration supplied with MConnect will display this data.

6.2.2 Don’t change this terminal operating mode when a remote terminal operating mode is changed.

By default, this box is unchecked.

When used on the same NMEA 2000 network as other MConnect boxes, or a computer running N2KView (PC / MBB300C / TSM810 etc.) The Vessel Mode is normally synchronized between all these devices. Checking this box, will allow this instance of MConnect to have independent control of its Vessel Mode.

6.2.3 True Wind Reference is Station

By default, this box is unchecked.

If MConnect is installed on a fixed platform, not a ship, that does not have heading, then this should be checked.

6.2.4 Auto Advance

By default, this box is unchecked.

When checked, MConnect will cycle through the screens automatically.

6.2.5 Settings Button Position

By default, the horizontal position is 100% and the vertical position 0%, i.e. at the top right of the screen.

This controls the position of the Settings Button on every screen.

6.2.6 Timezone

By default, this is “UTC”.

Select the Default Timezone for MConnect from the drop-down list. To help find the correct Timezone, start typing the name of the timezone, such as “New York”.

The chosen Timezone will automatically adjust for daylight savings time.

6.2.7 Use Night Mode

Night Mode will place a colored filter over the screen, to allow for better night time viewing on a dark bridge. The default color is red, and users may choose their own color and opacity.

Checking the box will apply the filter.

6.3 Configuration Dialog

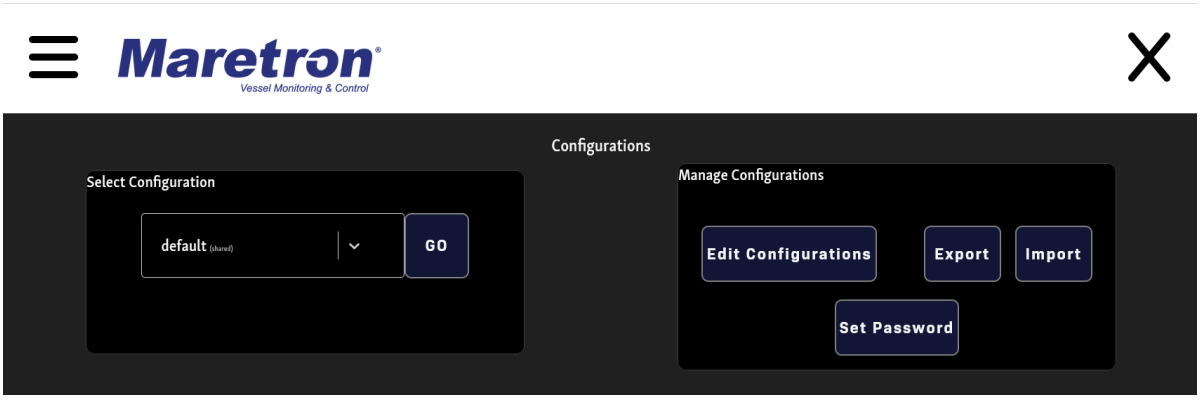


Figure 7 – Configuration Dialog

This dialog is used to select and manage the configurations stored on MConnect.

6.3.1 Select Configuration

This is a drop-down list of all the configurations stored on MConnect. Starting to type the name of the configuration you want to use will help you find it.

Press the GO button to load the configuration.

Loading a configuration for one display screen does not affect other screens connected to the same MConnect.

6.3.2 Manage Configurations

Configurations may be edited, exported, imported and password protected.

6.3.2.1 Edit Configurations

This will launch the MConnect Editor in a separate browser window. Marine MFDs do not support this functionality, so it is advised to use a PC / Mac to edit configurations.

A full description of the MConnect Editor can be found in section 8.

6.3.2.2 Export

Pressing Export will display the Export dialog within the Configuration Dialog.

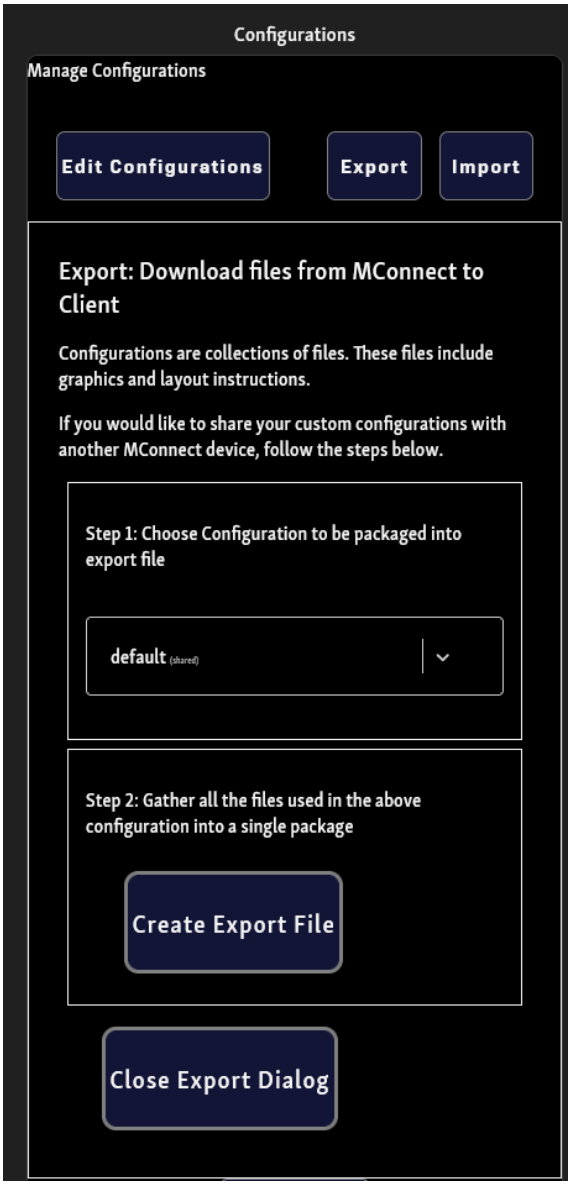


Figure 8 – Export Configuration Dialog

The files are exported to the same computer on which this dialog is being displayed – it is not saved to the USB port on the MConnect hardware.

1. Choose the configuration you wish to export from the drop-down list.
2. Press the **Create Export File** button to create a file on the MConnect box. This file will contain the screen layouts and all the graphic images used by the configuration.
3. Press the **Download** button to download the file to the downloads directory on your PC.

6.3.2.3 Import

Pressing Import will display the Import dialog within the Configuration Dialog.

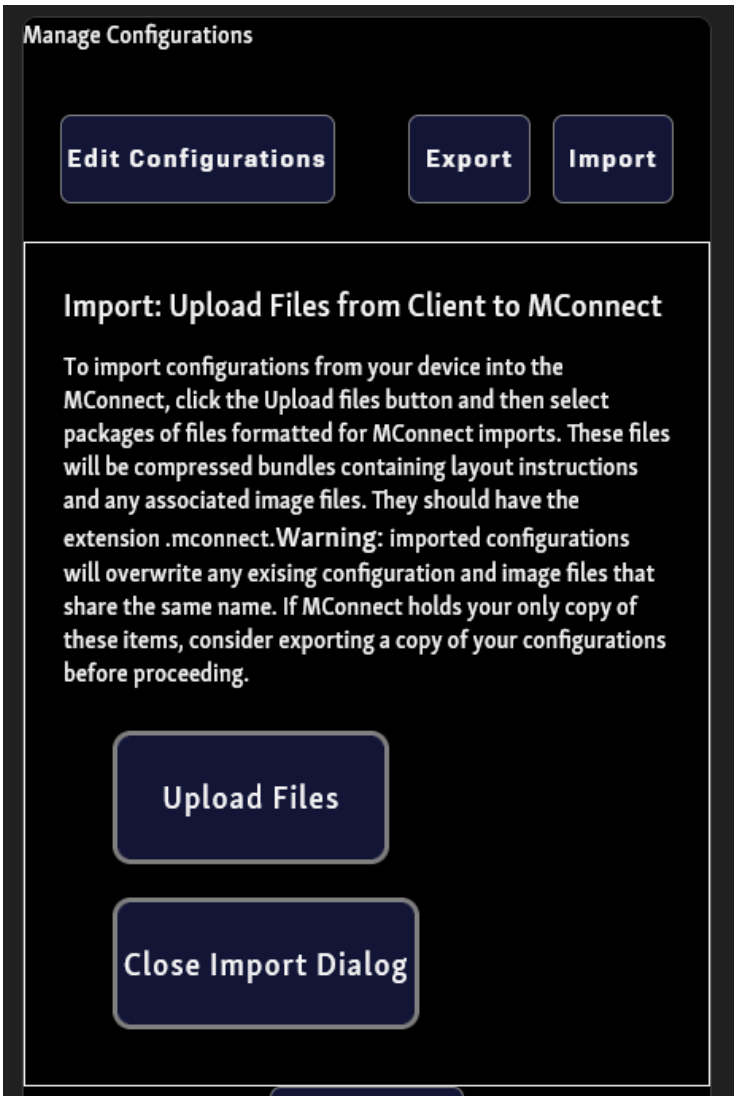


Figure 9 – Import Configuration Dialog

The files are imported from the same computer on which this dialog is being displayed – it is not read from the USB port on the MConnect hardware.

1. Press the **Upload Files** button and select an MConnect configuration file on your computer. The filename must have an extension of *.mconnect*.

2. When the import is complete, the dialog will close.

6.3.2.4 Set Password

This opens the Service Mode Settings dialog, which allows you to set, delete, or change the password and enter installation notes.

If a password is set in the system, the ability to edit, import and export configurations will require you to know the password.

Setting an empty password allows the password to be deleted.

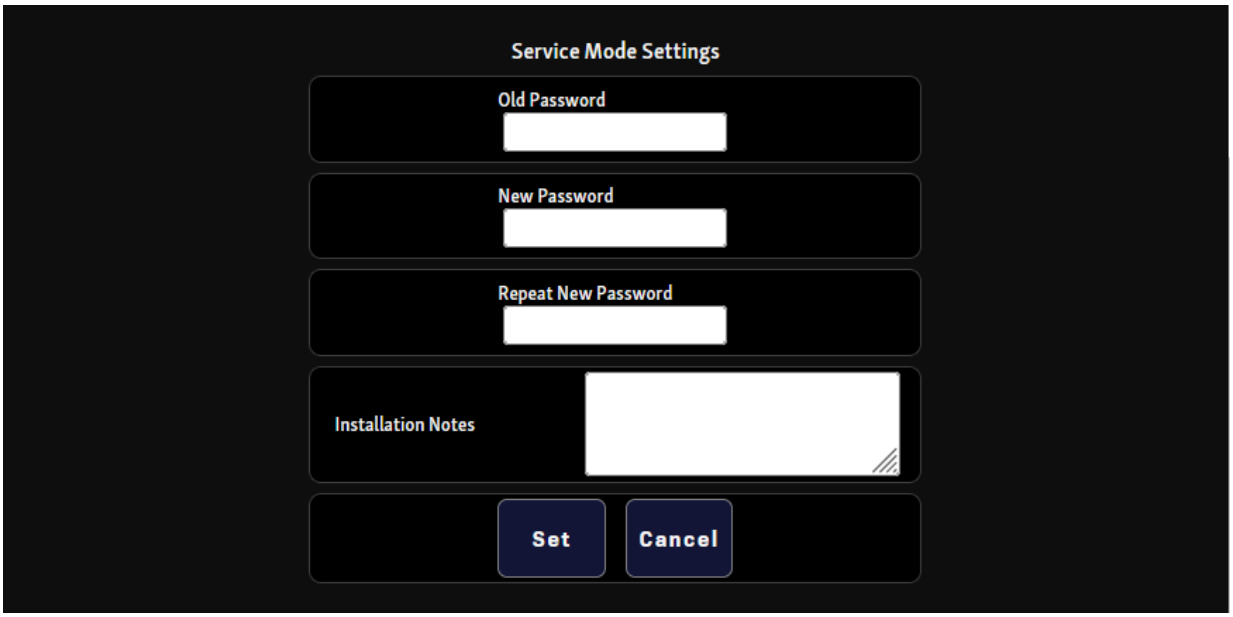


Figure 10 – Password Dialog

6.4 About Dialog

The About Dialog shows information about the program, including the IP Address of the MConnect box, the software version and the serial number. This information will be required by Maretron when contacting Technical Support.

Figure 11 – About Dialog

6.5 Devices Dialog

This is a useful dialog when debugging data received on the NMEA 2000 bus. It contains all the information received on the bus, organized by the devices that transmit the data.

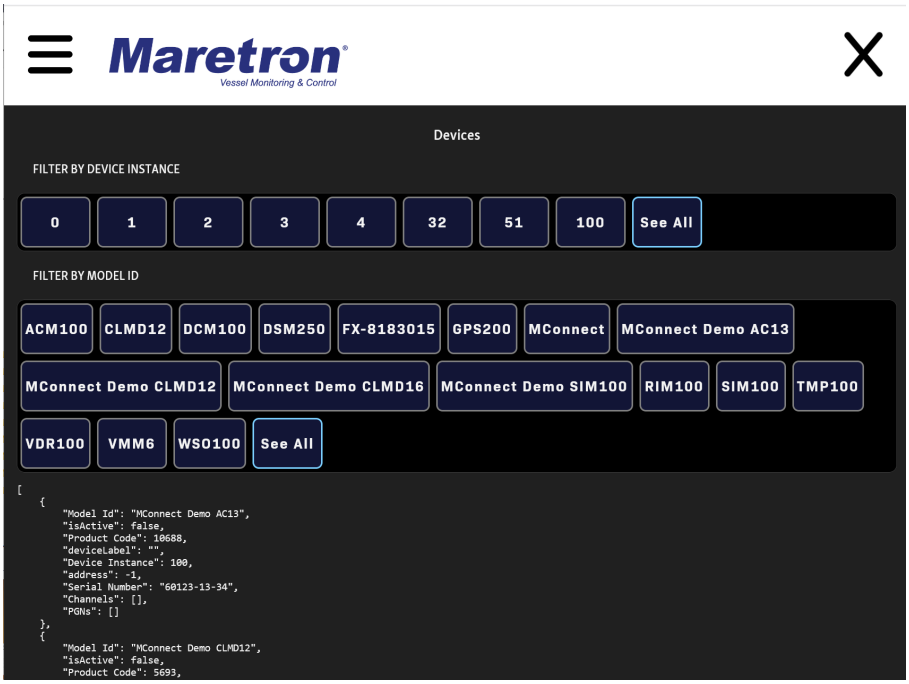
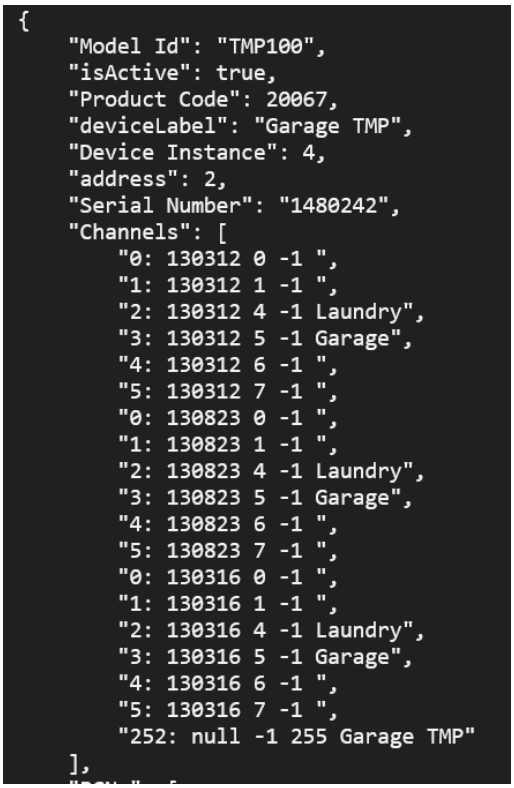


Figure 12 – Devices Dialog

The devices shown may be filtered by Device Instance Number, or model Id, or both.

Within each device, there is a section containing details of the device



```
{
    "Model Id": "TMP100",
    "isActive": true,
    "Product Code": 20067,
    "deviceLabel": "Garage TMP",
    "Device Instance": 4,
    "address": 2,
    "Serial Number": "1480242",
    "Channels": [
        "0: 130312 0 -1 ",
        "1: 130312 1 -1 ",
        "2: 130312 4 -1 Laundry",
        "3: 130312 5 -1 Garage",
        "4: 130312 6 -1 ",
        "5: 130312 7 -1 ",
        "0: 130823 0 -1 ",
        "1: 130823 1 -1 ",
        "2: 130823 4 -1 Laundry",
        "3: 130823 5 -1 Garage",
        "4: 130823 6 -1 ",
        "5: 130823 7 -1 ",
        "0: 130316 0 -1 ",
        "1: 130316 1 -1 ",
        "2: 130316 4 -1 Laundry",
        "3: 130316 5 -1 Garage",
        "4: 130316 6 -1 ",
        "5: 130316 7 -1 ",
        "252: null -1 255 Garage TMP"
    ],
```


Figure 13 – Devices Dialog – Device Data

and a list of PGNs received from that device, as interpreted by MConnect.


```
{
    "PGN Number": "126996 (Product Information)",
    "last received": "from CAN 1 at Fri Aug 25 2023 13:43:23 GMT-0400 (Eastern Daylight Time)",
    "Raw Data": "[ 2, 126996, 2, 255, 6, 0, 2000, 20067, TMP100, 1.1.2.7, 1.0, 1480242, 0, 1 ]",
    "Parameters": [
        "NMEA 2000 Database Version : 2000",
        "NMEA Manufacturers Product Code : 20067",
        "Manufacturers Model Id : TMP100",
        "Manufacturers Software Version Code : 1.1.2.7",
        "Manufacturers Model Version : 1.0",
        "Manufacturers Model Serial Code : 1480242",
        "NMEA 2000 Certification Level : 0",
        "Load Equivalency : 1"
    ]
},
```


Figure 14 – Devices Dialog – PGN Data

6.6 Diagnostics Dialog

This dialog contains information that may be requested by Maretron Support.

6.7 Screens Dialog

This contains a drop-down list of all the screens in the active configuration. You may select a screen and press the GO button to display that screen. This need only be used if the screen designer did not add a screen navigation button to a screen.

6.8 VPN Dialog

MConnect supports the Tailscale VPN.

This should be used when the user wishes to access the MConnect Web Server over the Internet when away from the boat. Using a VPN is a very secure way of accessing the boats network.

MConnect must have access to the Internet for both the installation of Tailscale and when you want to access the data.

1. Press the Install Tailscale VPN button.

When Tailscale is installed, the following screen will be displayed, and the status will change to VPN not Running.

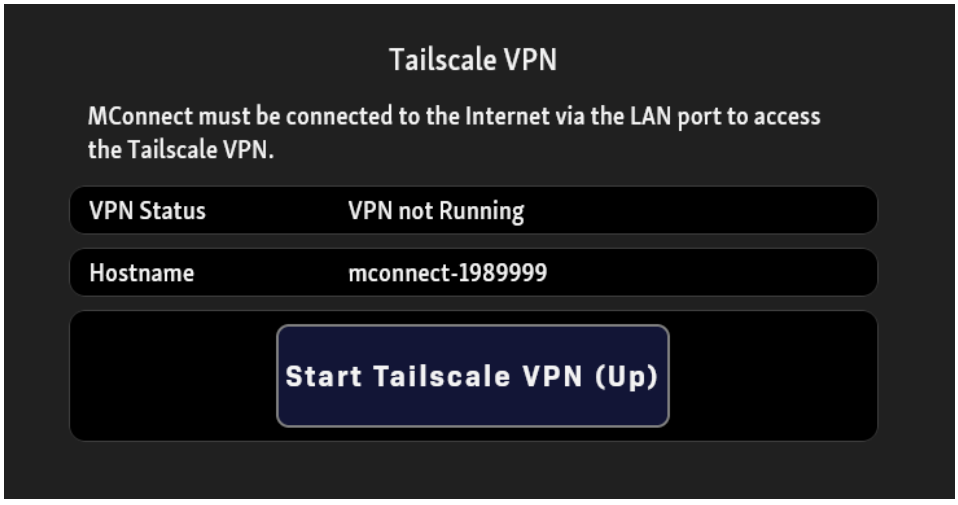


Figure 15 – VPN Dialog

Note the Hostname – you will need it to create a Tailscale account.

2. Press the Start Tailscale VPN button.

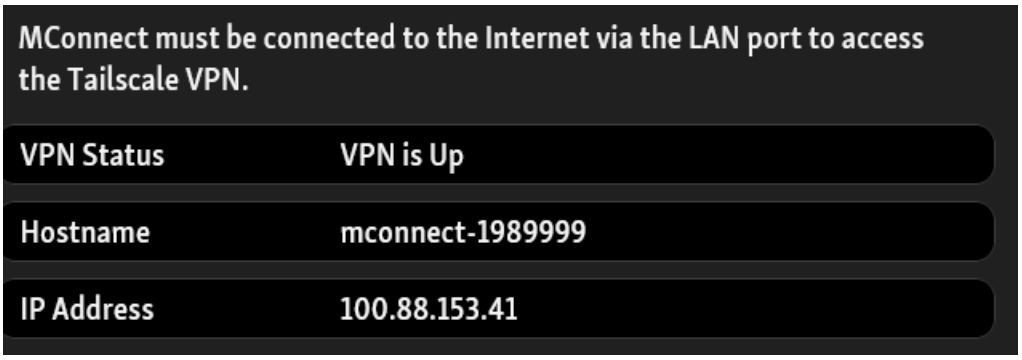
If you already have an account, the VPN will go active.

If you do not have an account, you will need to create one, and the following dialog will be shown :

Figure 16 – VPN QR Code

Either scan the QR code or copy the URL and complete your application for a Tailscale account on their website. Tailscale will provide you with an app for your phone to set up the VPN on your phone.

When the VPN is working, the VPN Status changes to *VPN is Up*.



And you get an option to stop Tailscale when you no longer need the VPN.

7 Upgrading MConnect

As MConnect is released with new features on a regular basis, you will want to keep it upgraded to the latest version.

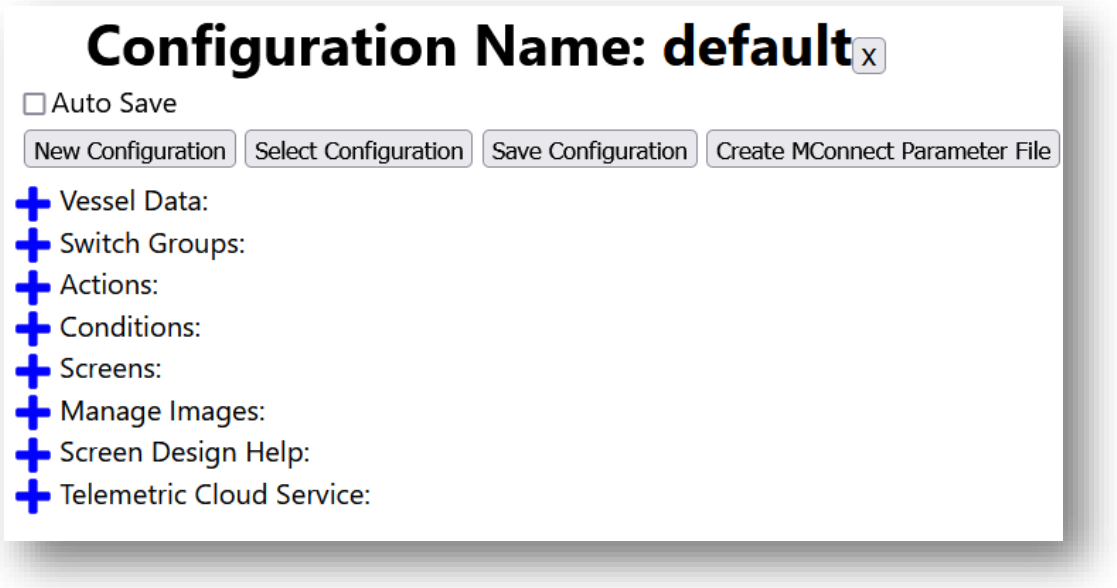
Updates may be posted on the Maretron website on the MConnect page. Please download the update file, and follow the instructions given with the update.

8 MConnect Editor

The MConnect Editor opens in a separate window. This functionality is not supported by Marine MFDs, so it is suggested that a computer or laptop be used to create and edit your configuration.

To open the Editor, first open the **Configuration Dialog** (see 6.3.2.1) and then press the **Edit Configuration** button.

A new screen will be displayed.



For the safest working experience, leave the **Auto Save** box unchecked. Any changes you make will not be sent back to the MConnect box, and you can go back to the saved configuration at any time. When you are ready to make the changes permanent, press the **Save Configuration** button.

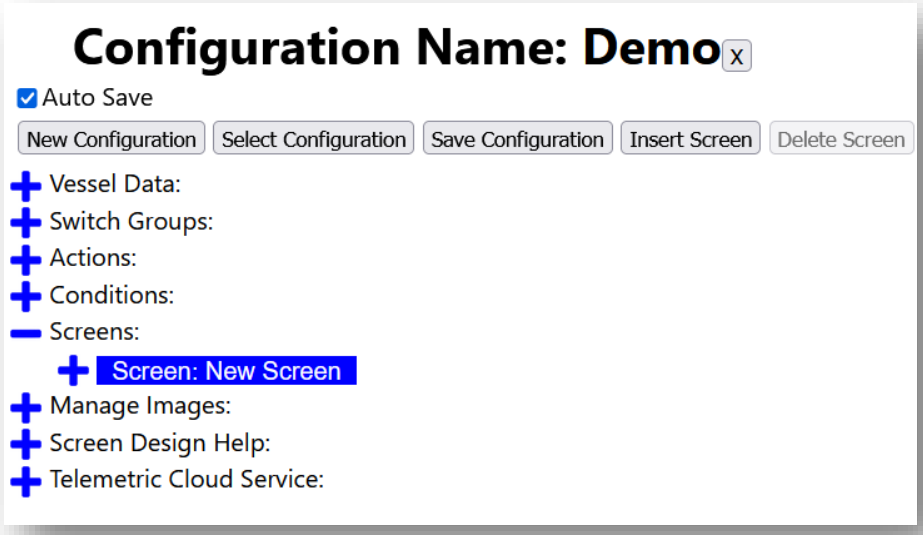
For the easiest working experience, check the **Auto Save** box, and arrange your screen with the MConnect display webpage and the MConnect Editor webpage side by side.

With this arrangement, every change made in the editor will be immediately saved in the Configuration Database on the MConnect box and immediately shown on the screen.

8.1 Navigation in the Editor

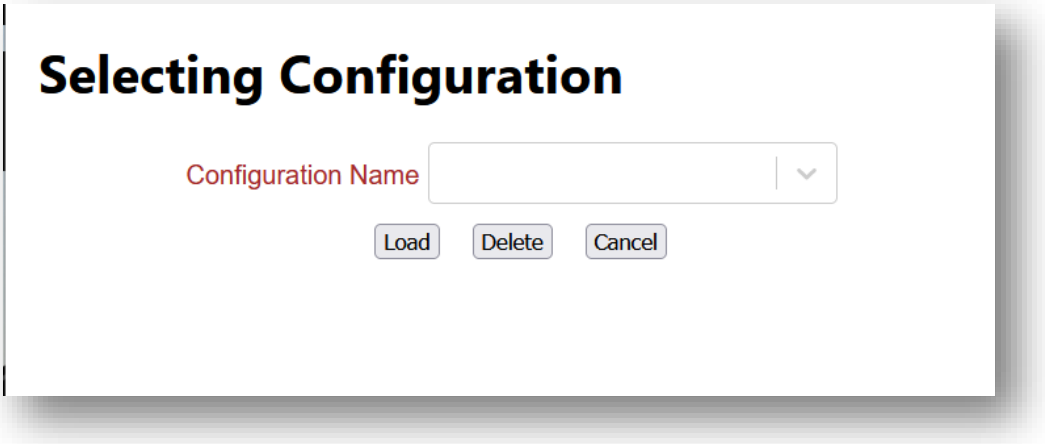
Pressing the − will collapse a section of the editor and pressing a + will expand it.

Clicking on a heading will select the heading, and the background will turn blue. Holding the shift button while clicking will add to the set of items selected, if this is reasonable.



8.2 Select Configuration

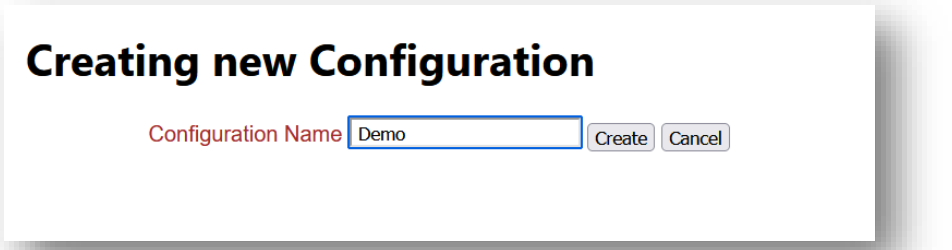
This displays a list of all the configurations stored in MConnect.



After selecting a configuration, you may choose to load it into the editor or delete it from MConnect. Deleting configurations may not be recovered.

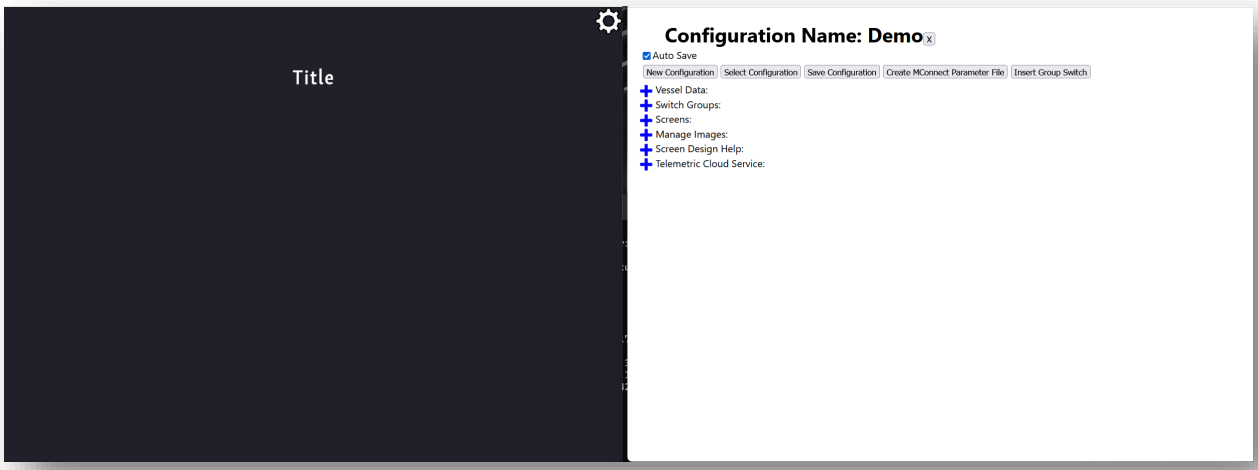
8.3 New Configuration

Pressing the **New Configuration** button allows you to enter the name for the new configuration.



Then pressing the **Create** button creates the new Configuration in the Editor.

Also select the new configuration in the display window.



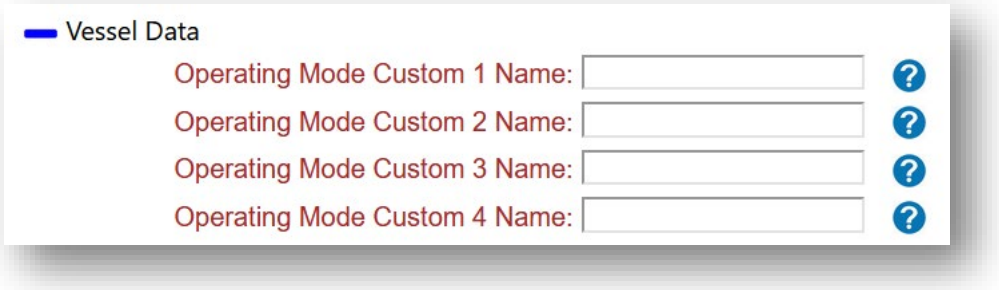
8.4 MConnect Parameter File

As a reference, you can download the list of supported parameters and components by pressing the **Create MConnect Parameters File** button. The file will be stored in your Downloads directory.

8.5 Configuration Sections

8.5.1 Vessel Data

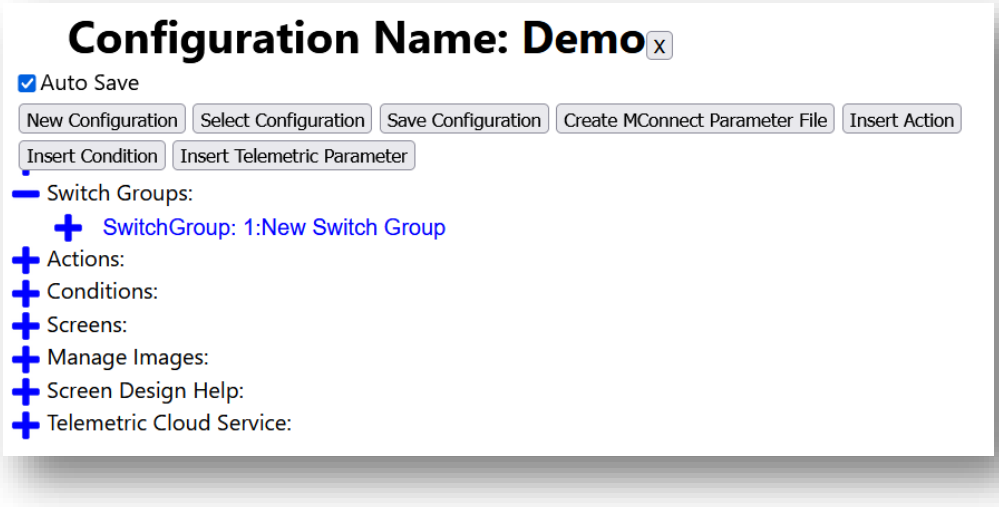
This section contains the names of the user-defined Vessel Operating modes.



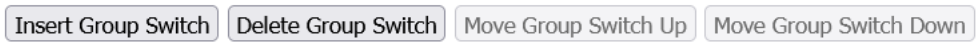
Note the . Throughout the edit, you can get context sensitive help by pressing this button.

8.5.2 Switch Groups

Breakers may be controlled in a group. These groups are called Switch Groups and are defined in this section. To create a new group, press the **Insert Switch Group** button near the top of the editor. This button is only visible when there are no Switch Groups in the Configuration, or an existing Switch Group line has been selected.

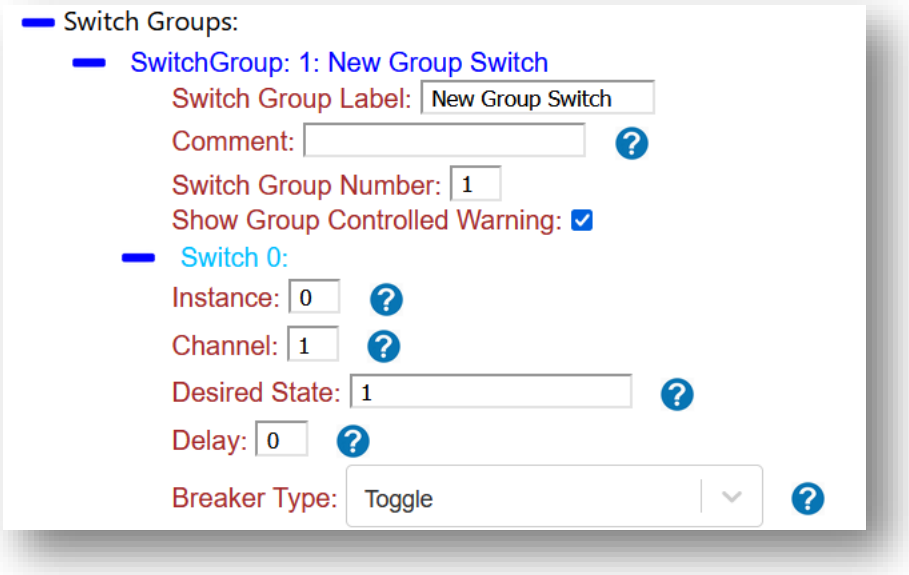


If the Switch Group line is highlighted, the following functions are displayed at the top of the editor.



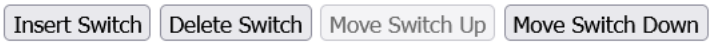
If it is possible to re-arrange the order of the Switch Groups by moving the selected Switch Groups Up and Down, the corresponding Move buttons will be enabled.

Expanding the Switch Group shows that each group has a Label, Comment field, a number and a set of Switches. This set is initially set to just one switch.



When a Switch Group is assigned to a Push Button and the button is pressed, all the switches in the group will be commanded into their desired state after the specified delay. If a Switch Group is created to turn a set of lights on, then a separate Switch Group must be created to turn them off.

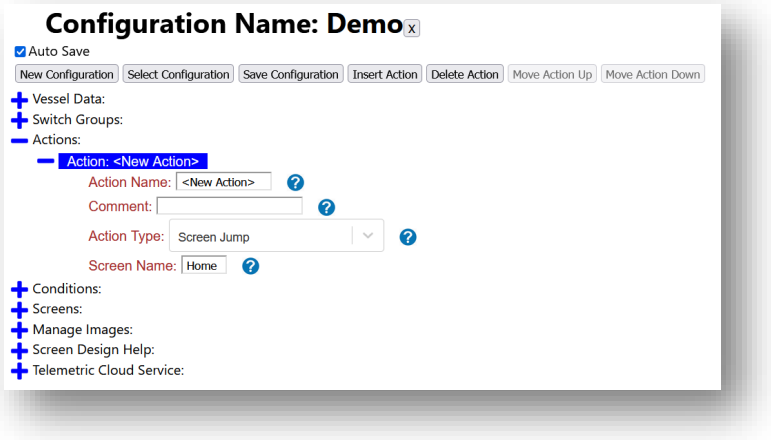
If a Switch line is highlighted, the following functions are displayed at the top of the screen.



8.5.3 Actions

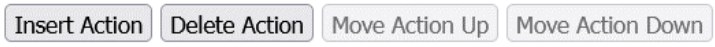
Actions are part of the automation module and are associated with conditions. When a condition is met the action is performed. The automation module will be extended as more features are added to MConnect.

To create a new action, press the **Insert Action** button near the top of the editor. This button is only visible when there are no Actions in the Configuration, or an existing Action line has been selected.



The name alongside the Action is the content of the **Action Name** field.

If the Action line is highlighted, the following functions are displayed at the top of the screen.



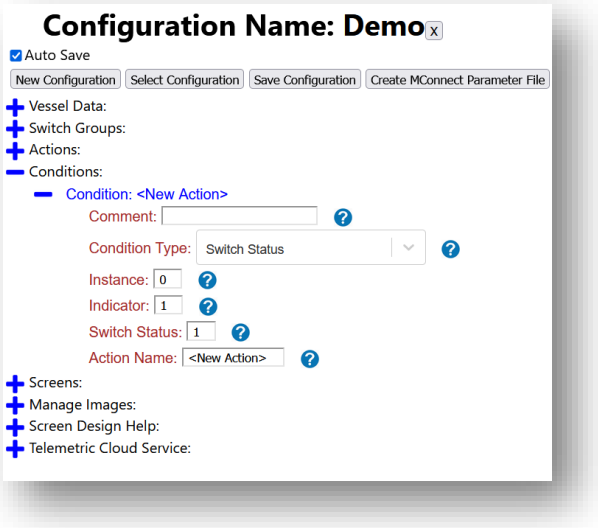
Each Action must have a unique **Action Name**. This name will be referenced in a Condition (see 8.5.4) and the Condition will perform the action when the condition is met.

Only the **Action Type** of **Screen Jump** is available in this release. When the action is performed, all displays showing this configuration will display the screen named in the **Screen Name** field.

8.5.4 Conditions

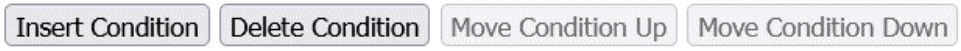
Conditions are part of the automation module. When a condition is met the action is performed. The automation module will be extended as more features are added to MConnect, and more conditions will be added.

To create a new Condition, press the **Insert Condition** button near the top of the editor. This button is only visible when there are no Conditions in the Configuration, or an existing Condition line has been selected.



The name alongside the Condition is the content of the **Action Name** field.

If the Condition line is highlighted, the following functions are displayed at the top of the screen.

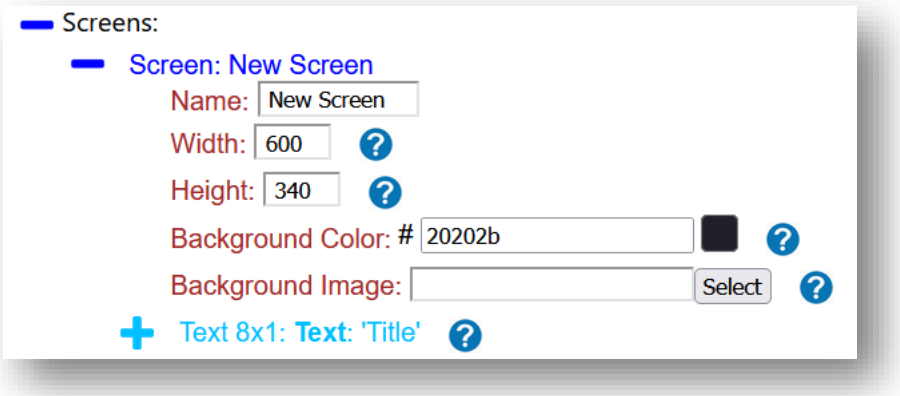


Each Condition will perform one Action, identified by the **Action Name**, when the Condition becomes true. There is no Action associated with the Condition becoming false. If this is required a separate Condition and Action must be created.

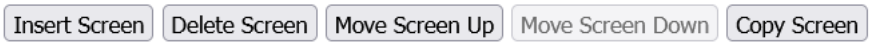
Only the **Condition Type** of **Switch Status** is available in this release. This condition monitors one Status field in the Binary Switch Bank Status PGN (127501), typically transmitted by the Maretron SIM100, RIM100, DCR100, CLMD12, CLMD16, VMM6, and CKM12 devices. The Condition is true when the state of the switch matches that in the **Switch Status** field.

8.5.5 Screens

This is where the screens are designed.



If the Screens line is highlighted, the following controls are displayed at the top of the screen.



Inserting a Screen will create a new screen after the selected screen with a single Text component.

If a Screen is in the copy buffer, and a Screen line is selected, the 

button is displayed. Pressing the Paste Screen button will insert a copy of the screen in the copy buffer after the selected screen.

Screens have Width and Height (in pixels), a Name and a background which is a solid color with an optional image over the color. If the image is a png file, transparent areas of the file will show the background color. The Screen will always be scaled to fit as much of the display area as possible without distortion. If the screen fits top to bottom and still has space on the sides, this space will be filled equally on the left and right with the background color. The background image will be stretched to fill the entered Width and Height. For this reason, the actual pixel values entered are not important, but their ratio should be chosen to match that of the actual physical display area. (e.g., on a 16:9 screen, a width of 160 and height of 900 will display the same as a width of 1600 and height of 900.)

A Screen will display one or more Components. When a Component is highlighted, the following controls are displayed.

Inserting a Component will create a new Text component after the selected component.

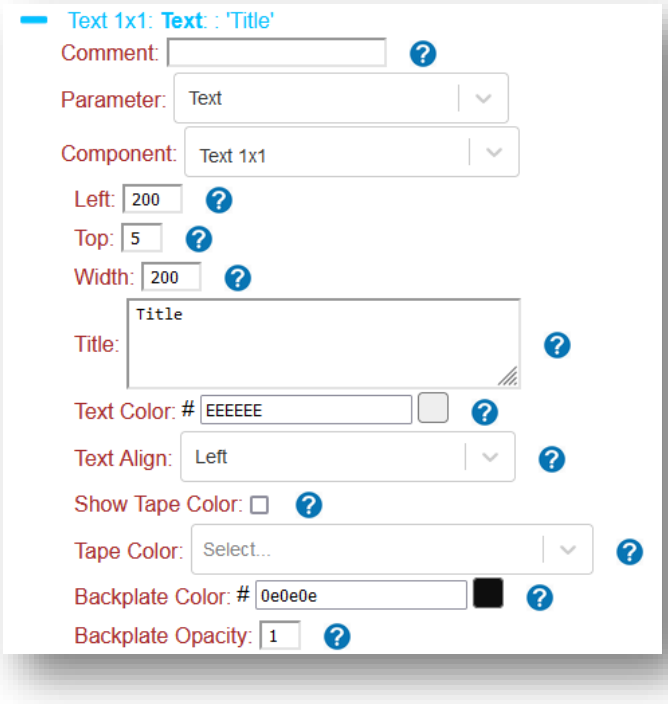
If a Component is in the copy buffer, and a Screen line is selected, the 

button is displayed. Pressing the **Paste Component** button will insert a copy of the component(s) in the copy buffer into the selected screen.

8.5.6 Components

A component contains two main sets of attributes, the Parameter Attributes, and the Component Attributes.

The Parameter Attributes describe how the data is obtained from the source (normally the NMEA 2000 bus) and the Component Attributes describe how the data is displayed on the Screen.



Select the Parameter to be displayed from the Parameter drop down list. See Section 8.4 on how to create an html file of Parameters or reference section 10 in this document

for a complete list. Please consult these lists for descriptions of the attributes of each Parameter or use the context-sensitive help .

Selecting a Parameter will populate the list of Components that may be used to display the Parameter and show the attributes for that Parameter.

Select the Component from the Component drop down list. See Section 8.4 on how to create an html file of Components. Please consult these lists for descriptions of the attributes of each Component or use the context-sensitive help .

Selecting a Component will show the attributes for that Component.

8.6 Manage Images

Screens may contain background images and custom components will contain images and masks. This section of the Editor is used to upload these images to the MConnect Server and manage them.

Images are divided into the following sections:

- Background-images – images used for Screen backgrounds.
- Compass-roses – images used for backgrounds in Custom Compass Rose components.
- Gauges – images used for backgrounds and masks in Custom Gauge components.
- Needles - images used for needles in Custom components.
- Digital-backgrounds - images used for backgrounds in Custom Digital components.
- Icons - images used in Push Button and Indicator components.

8.6.1 Image Types

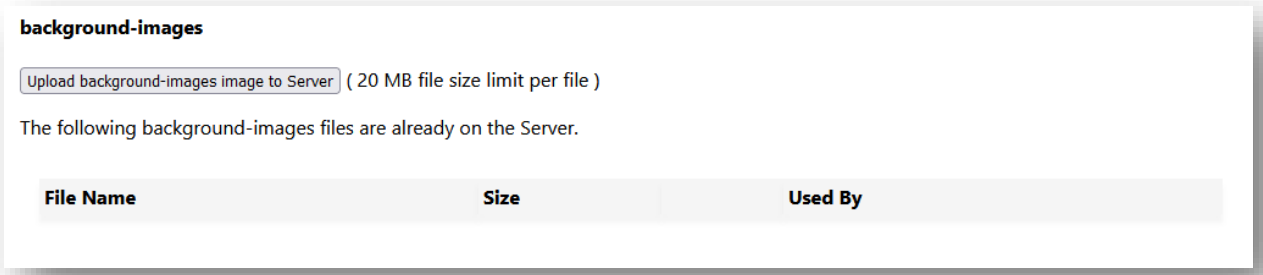
The best images to use are png files. These allow transparent areas, or semi-transparent areas.

Supported image types:

- JPEG (or JPG) - Joint Photographic Experts Group
- PNG - Portable Network Graphics
- GIF - Graphics Interchange Format
- MP4 – Video files

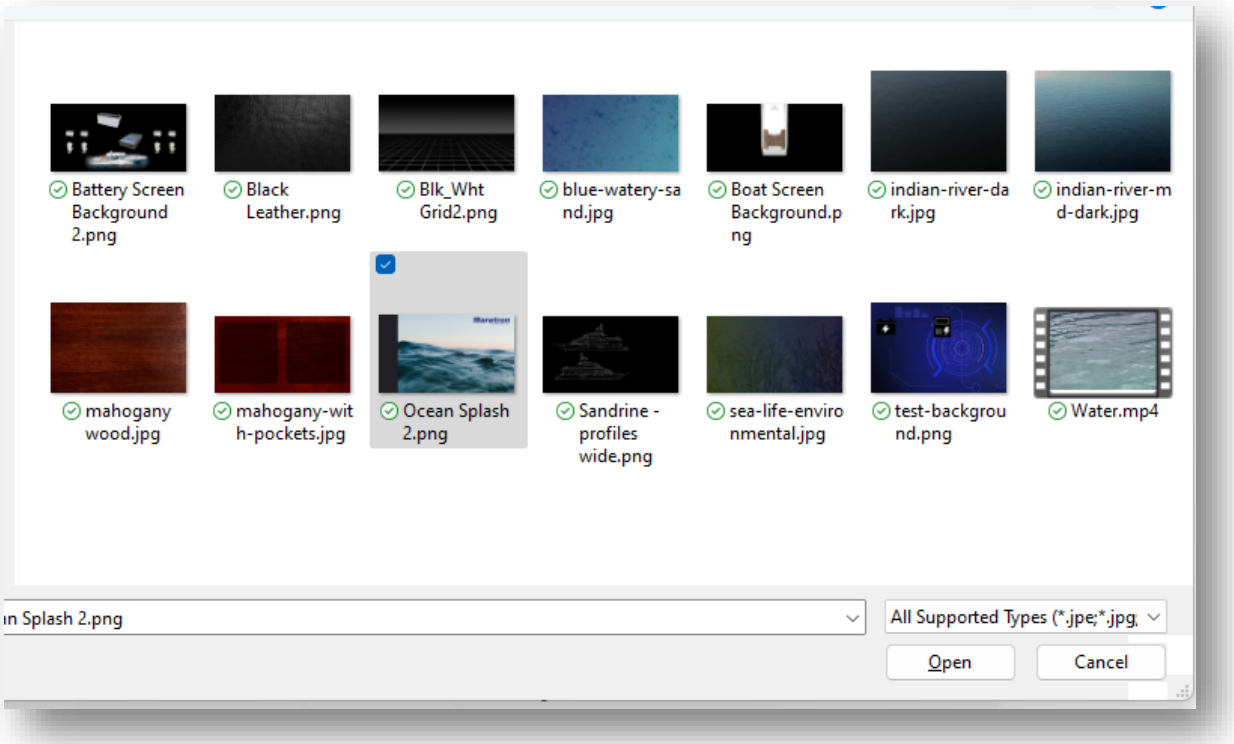
8.6.2 Loading Images

Looking at background-images as an example

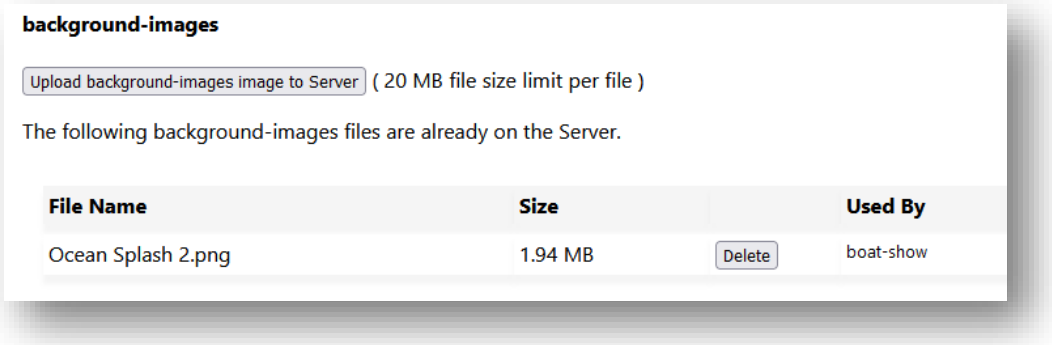


This shows that no customer defined images have been uploaded.

To upload images from your laptop, press the Upload background-images image to Server button. A window will be opened in your browser where you can select the images.

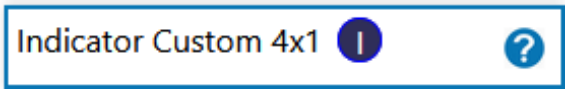


Once uploaded, the file is listed, with its size and the names of the configurations that use the file.

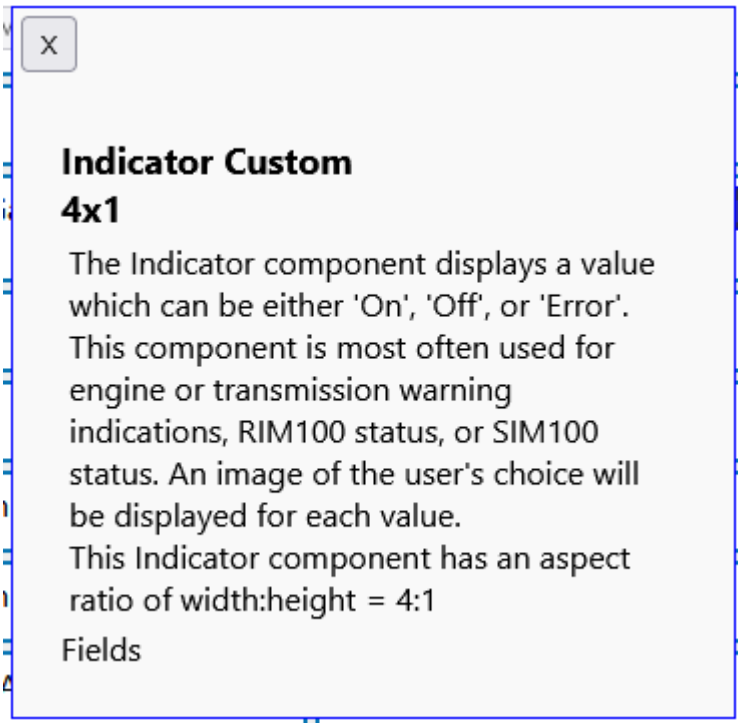


8.7 Screen Design Help

This is a quick list of components. For components that support customs images, the list of custom images is shown.



Pressing the button shows the details of the Component.

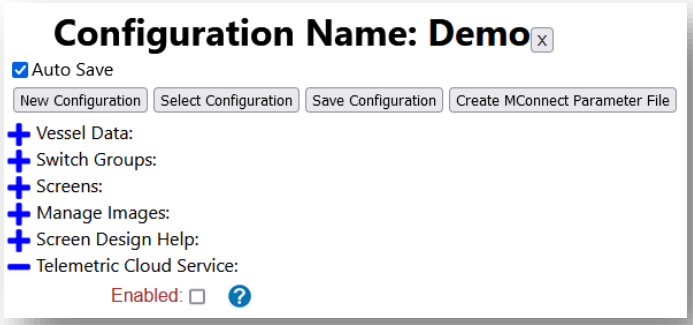


The descriptions of the field attributes of the Component can be viewed by clicking on **Fields.**

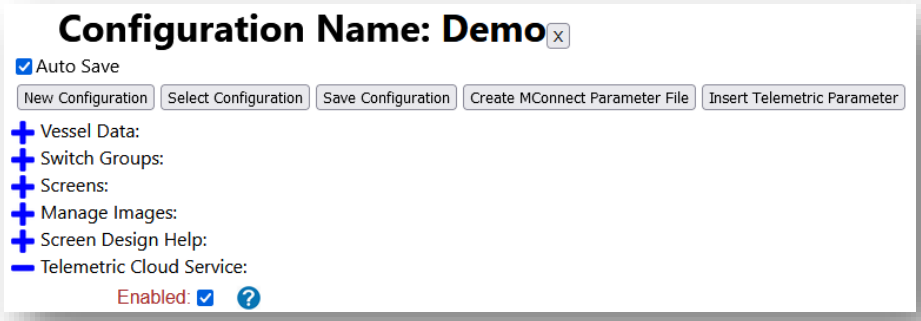
8.8 Telemetric Cloud Service

For off vessel monitoring, MConnect may be paired with a Maretron Telemetric Cloud Service account. See (https://www.maretron.com/products/maretron-telemetric-cloud-service for details.)

If this function is disabled (default) the following is shown:

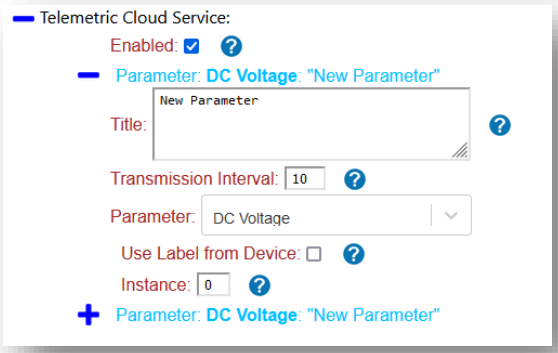


Enable transmission to the Telemetric Cloud Service by checking the Enabled box. This will add the Insert Telemetric Parameter button at the top.



Pressing the Insert Telemetric Parameter will insert the first parameter in the list. Once one parameter is in the list, selecting a Telemetric Parameter will show the following buttons at the top of the screen.

These buttons may be used to insert and manage more Telemetric Parameters.



The attributes of the Telemetric Parameters are like those displayed on the screen, with the addition of a Transmission Interval. The data will be sampled at this interval and transmitted to the Cloud Service.

9 Available Component Types

The list of the component types that MConnect can display on the screen can be found by pressing the **Create MConnect Parameter File** button within the Editor. See section 8.4.

Where the name of the component is followed by (2x1) this gives the aspect ratio of the component as width x height. e.g., Active Button (4x1) is four times wider than it is high. When there is no aspect ratio, the control can be assumed to be square (1x1).

10 Available Parameters

The list of parameters that MConnect can monitor can be found by pressing the **Create MConnect Parameter File** button within the Editor. See section 8.4.

11 Troubleshooting

If you notice an unexpected operation of Maretron MConnect, follow the troubleshooting procedures in this section to remedy simple problems.

Symptom	Troubleshooting Procedure
No data on the MConnect screen (all components display dashes for the data value and gauge indicators are at the end stop.	Tighten the NMEA 2000 CAN connectors.
Only certain digital components display dashes for data or certain gauge indicators are at the end stop.	Make sure that you have the proper transducers on the NMEA 2000 network and that the transducers are properly programmed with the right source type and instance number (if applicable)

If these steps do not solve your problem, please contact Maretron Technical Support (refer to Section Technical Support for contact information).

12 Technical Support

If you require technical support for Maretron products, you can reach us in any of the following ways:

Phone: +1-602-861-1707

Telephone: +1-866-550-9100

Fax: +1-602-861-1777

Sales email: sales@maretron.com

Support email: support@maretron.com

World Wide Web: https://www.maretron.com

Mail: Maretron, Carling Technologies Inc.
Attn: Technical Support
120 Intracoastal Pointe Drive
Jupiter FL, 33477
USA