System Configuration Manual

98612001 Rev: A

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www.elkhartbrass.com

ELKHART BRASS
A Clarience Technologies Company

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Section 2 - Installation

Please refer to the EXM2 Installation, Operating, & Maintenance Instructions

Manual P/N 98608000 for installation instructions. You can find the most current manual at www.elkhartbrass.com.

Section 3 - Connecting to EXM2 Wi-Fi

Before starting, confirm the following:

1. Monitor is NOT in Setup mode.
    - (Setup mode is indicated by the input controller's STATUS LED and monitor's STATUS LED being Solid Magenta).
2. You have a Wi-Fi-enabled device available to connect to the EXM2 Wi-Fi.
    - Be sure you have privileges to change the Wi-Fi connection settings.
    - The device will be disconnected from another networks/internet while connected to the EXM2 Wi-Fi.

Section 3.1 - Turn on Wi-Fi.

There are two ways to turn on the Wi-Fi on an EXM2 monitor:

Section 3.1.1 - EXM2 Input Controller Method

If the Input Controller's Status LED is NOT blinking yellow:

1. Push and hold the STOW and DEPLOY buttons until you see the Input Controller's STATUS LED change to solid blue (about 10 seconds of holding buttons).
2. Release the buttons.

If the Input Controller's Status LED is blinking yellow:

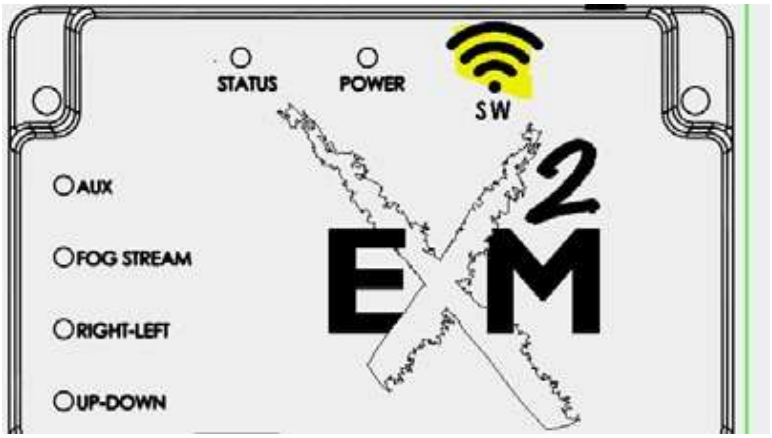
1. Push and hold the STOW and DEPLOY buttons until you see the Input Controller's STATUS LED change to blinking blue (about 10 seconds of holding it).
2. Release the buttons.

Wi-Fi is now on, but you will need to connect your device to it. See section 2.2.

Section 3.1.2 - Magnet Method

There is a magnetic switch on the EXM2 monitor's black control box that can be used to turn the Wi-Fi on or off. A magnet (P/N 46058000) is provided with each EXM2 monitor.

1. Touch and hold the magnet to the Wi-Fi symbol on the EXM2 control box.



2. Continue holding the magnet at the Wi-Fi symbol while the POWER LED starts blinking.
3. Continue holding it until:
    a. STATUS and POWER LEDs on the monitor change to Blue
    b. The UP-DOWN, RIGHT-LEFT, FOG-STREAM, and AUX LEDs blink blue in a cycling pattern.

The Wi-Fi is now on, but you'll need to connect your device to it. See section 2.2.

Section 3.2 - Connect a device to EXM2 Wi-Fi

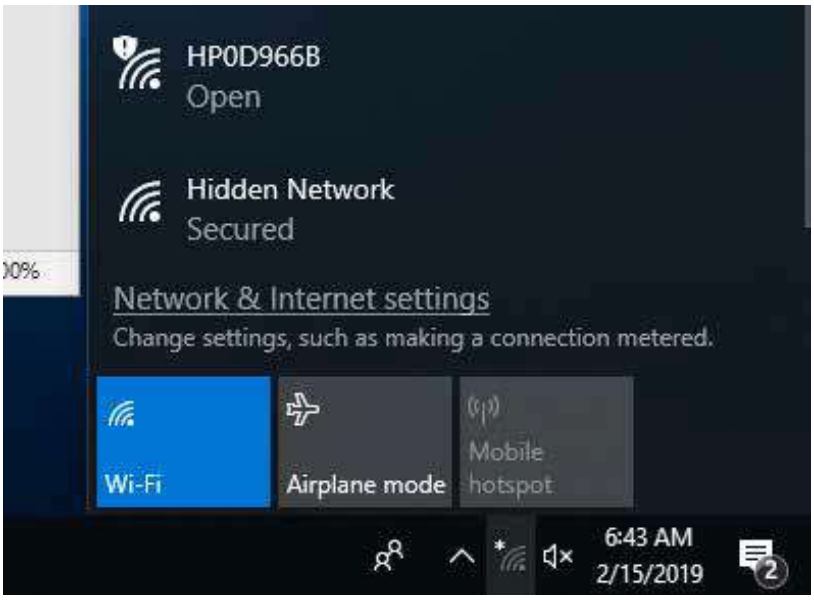
If the 4 cycling LEDs light green instead of blue, then there is already a device connected to the EXM2 Wi-Fi. If the device connected is not your device, be sure to disconnect or disable the connected device's Wi-Fi before trying to connect your device. EXM2 Wi-Fi only supports 1 device connected at a time. Connect your device under Wi-Fi settings. Some examples of connecting using various operating systems are in the following sections. The general Wi-Fi Network settings are as follows:

- Network Name (SSID): the EXM2 monitor's serial number.
    - For example, if the monitor's serial number is 0000012345, then the SSID is 0000012345.
- Security: WPA2-Personal
- Encryption: AES
- Password (or Security Key): EXM2 monitor's serial number backwards
    - For example, if the monitor's serial number is 0000012345, then the network password (or security key) is 5432100000.
- Network type should be set to something other than "Public" ("Private", "Work", etc.).
- Disable auto-connect to network because EXM2 Wi-Fi only works with one device connected. By not auto-connecting, a different device could be used to connect in the future.

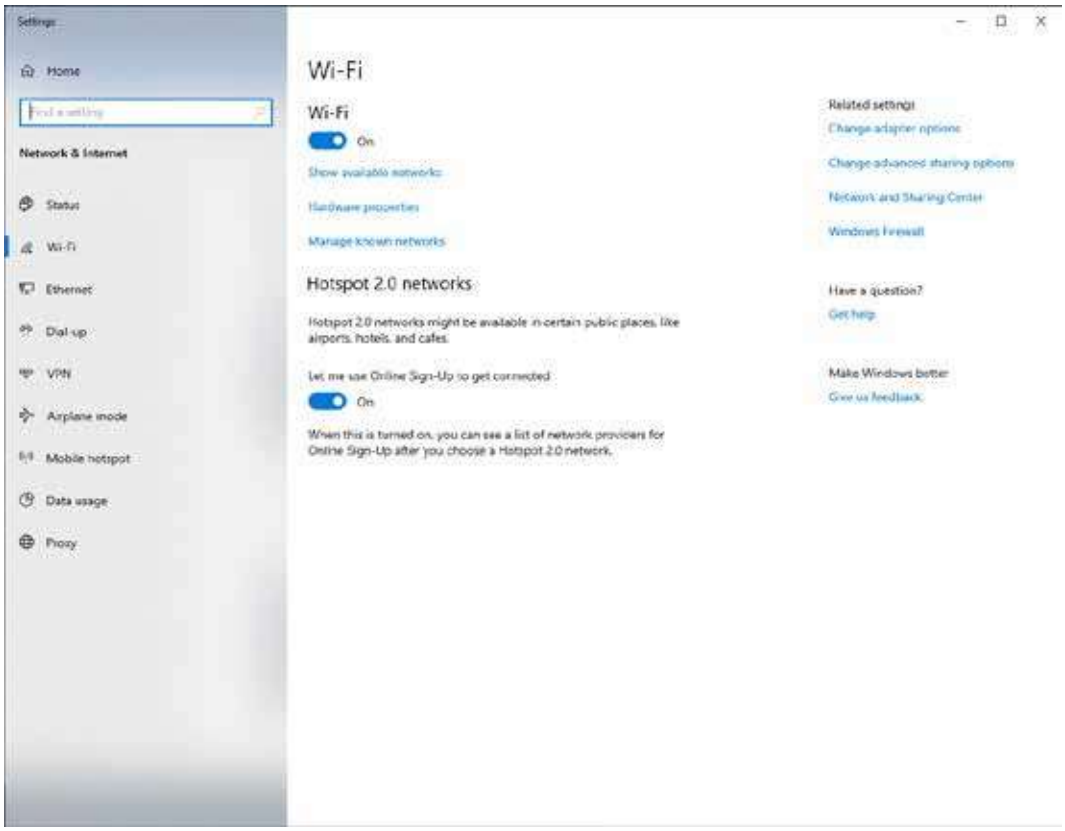
Section 3.2.1 - Windows 10: Wi-Fi Example

Steps for connecting using Windows 10. The monitor's serial number for this example is 0000012345. Use your monitor's serial number instead.

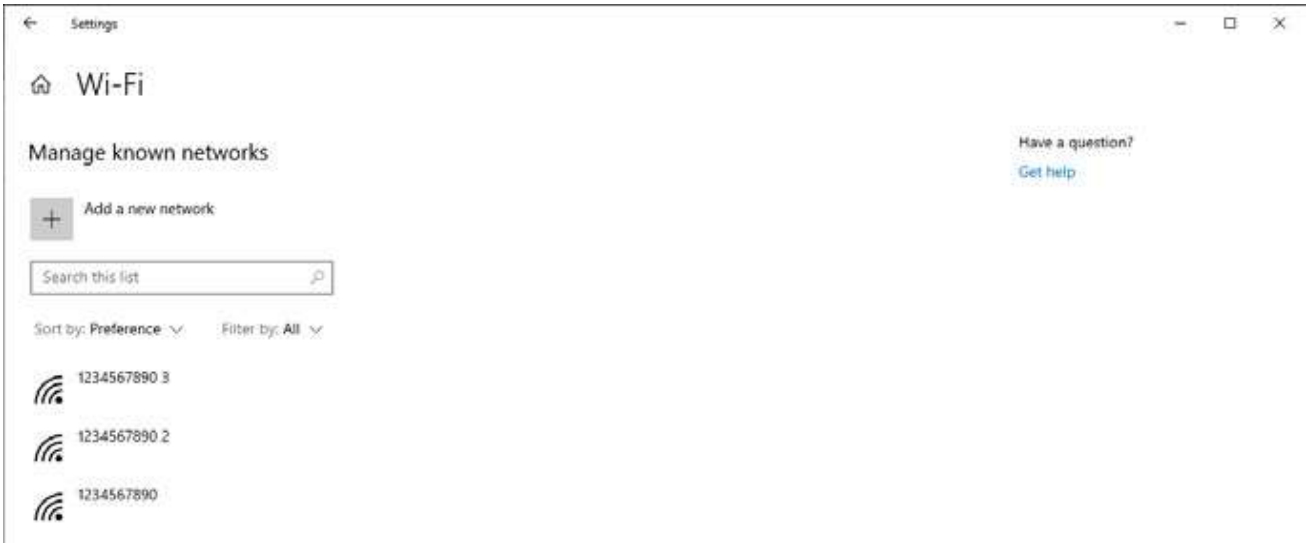
1. Select the Wi-Fi icon on the task bar.



2. Select Network and Internet settings.
3. Once settings appear, select “Wi-Fi” under Network and Internet on the left. (It may already be selected).
4. Then Select “Show available networks” from the middle.

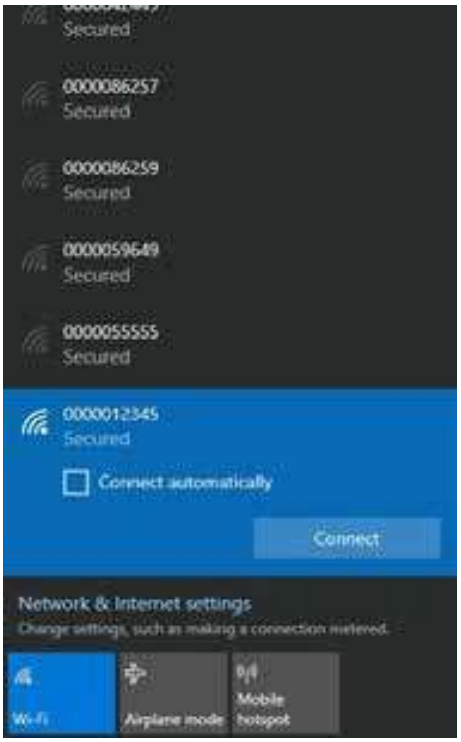


5. Select these settings, but:
    a. replace “0000012345” with the EXM2 monitor’s serial number.
    b. replace “5432100000” with the EXM2 monitor’s serial number backwards.



6. Press Save. But NOT done yet.

Select "Connect"

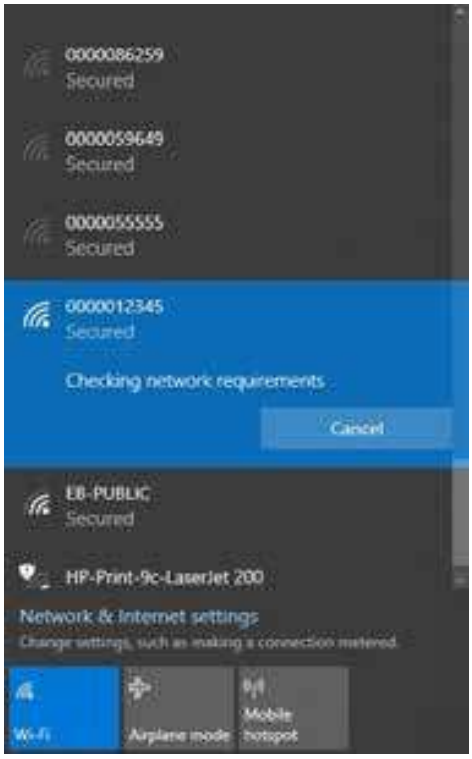


Un-check "Connect Automatically". Select "Next".

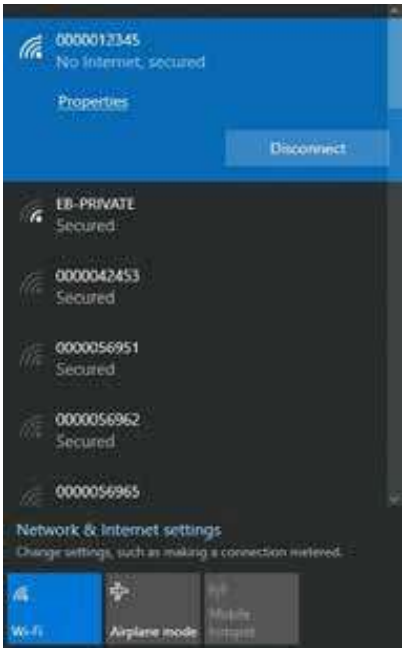
Select "Yes" to the question, "Do you want to allow your PC to be discoverable...?"

Wait for the network to show connected. Then select "Properties."

elkhartbrass.local
Connected
0000012345
Secured
Do you want to allow your PC to be discoverable by other PCs and devices on this network?
We recommend allowing this on your home and work networks, but not public ones.
Yes
No
EB-PRIVATE
Secured
0000042453
Secured
Network & Internet settings
Change settings, such as making a connection metered.
Wi-Fi
Airplane mode
Mobile hotspot


0000086259
Secured
0000059649
Secured
0000055555
Secured
0000012345
Secured
Checking network requirements
Cancel
EB-PUBLIC
Secured
HP-Print-9c-LaserJet 200
Network & Internet settings
Change settings, such as making a connection metered.
Wi-Fi
Airplane mode
Mobile hotspot

Change the network setting to "Private". Confirm the other network settings are as below.



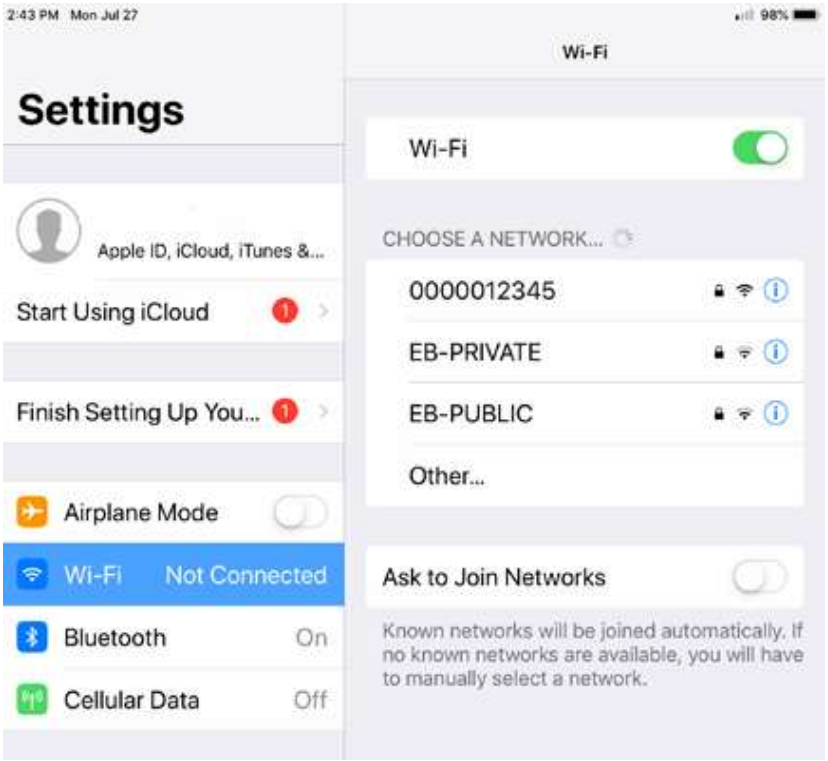
You are now connected. Proceed to section 4 of this document.

Section 3.2.2 - IOS: Wi-Fi Example

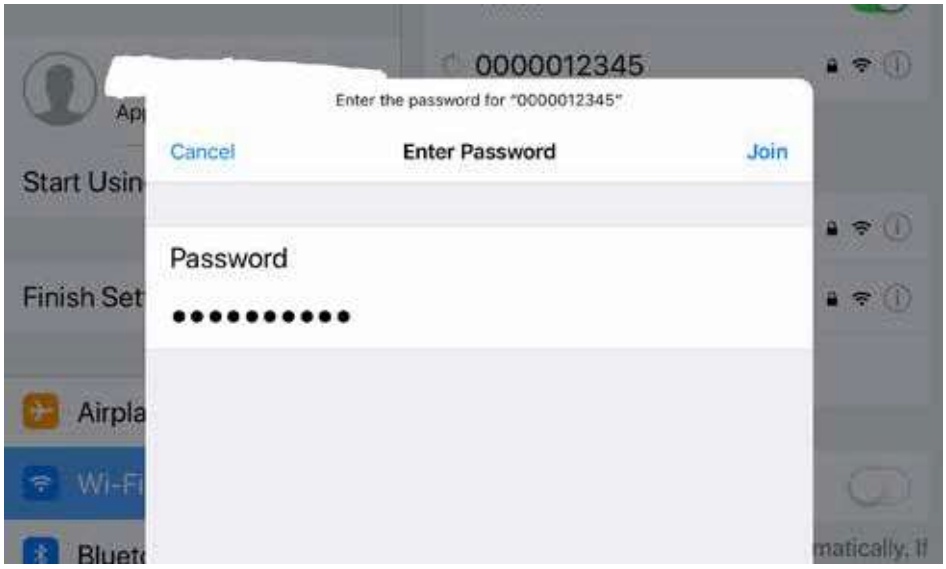
Steps for connecting using IOS device. The monitor's serial number for this example is 0000012345. Use your monitor's serial number instead.

1. Open the settings App.

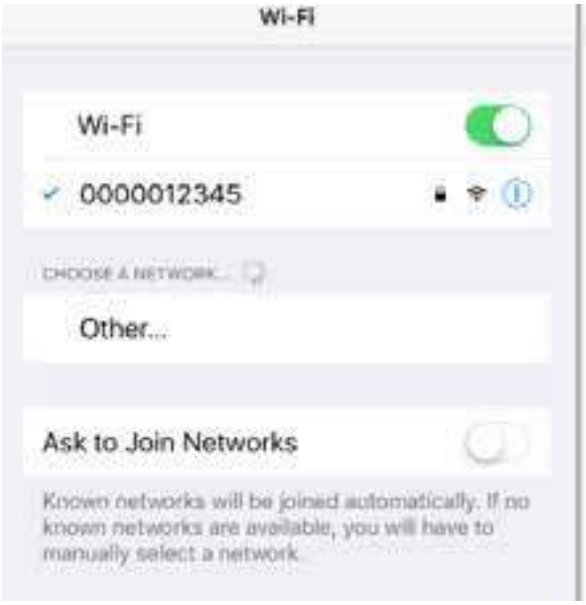
2. Select "Wi-Fi"



3. Select Monitor Serial Number
   a. Name is the EXM2 monitor's serial number (for example:0000012345).
   b. Password is the EXM2 monitor's serial number backwards (for example: 5432100000).



4. Go back to the network list, the network should then show up in the Wi-Fi list.



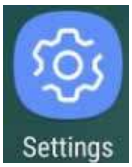
Select the circled (i) icon to get to the network properties. Turn off Auto-Join. Confirm other settings are as shown below.

You are now connected. Proceed to section 4 of this document.

Section 3.2.3 - Android: Wi-Fi Example

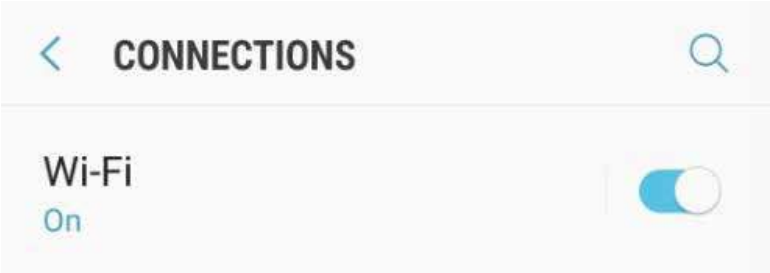
Steps for connecting using an Android device. The monitor's serial number for this example is 0000012345. Use your monitor's serial number instead.

1. Open the settings App.



2. Select "Connections"

3. Select "Wi-Fi"

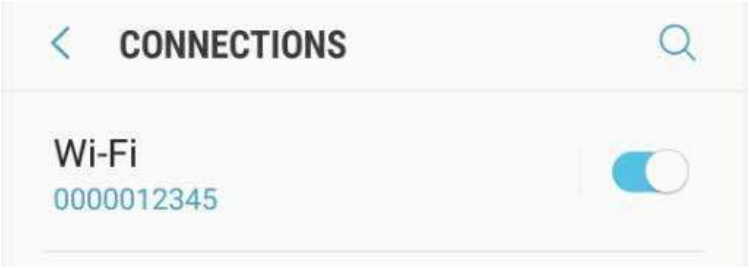


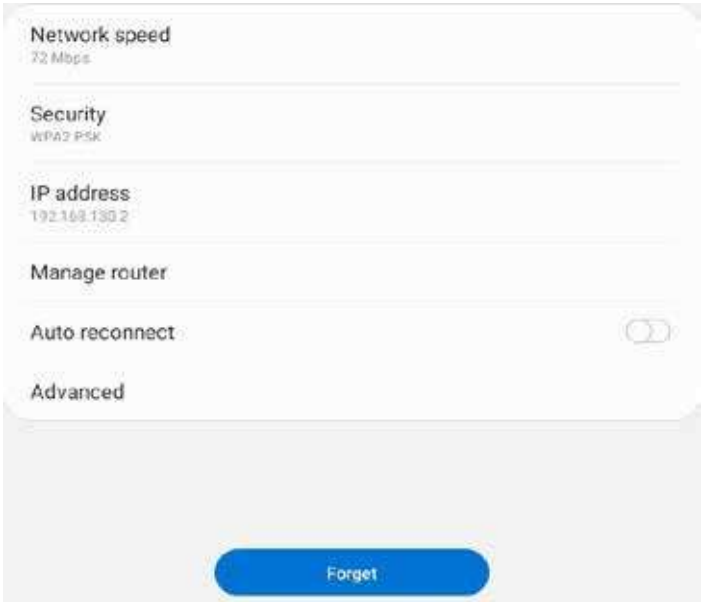
4. Select Monitor Serial Number and "Connect", but:
   a. replace "0000012345" with the EXM2 monitor's serial number.
   b. replace "5432100000" with the EXM2 monitor's serial number backwards.

Select "Advanced". Select these settings then select "Save".

Turn off "Auto Reconnect", enter the network password, then select "Connect".

5. Go back to the Wi-Fi list, the network should then show up in the Wi-Fi list.





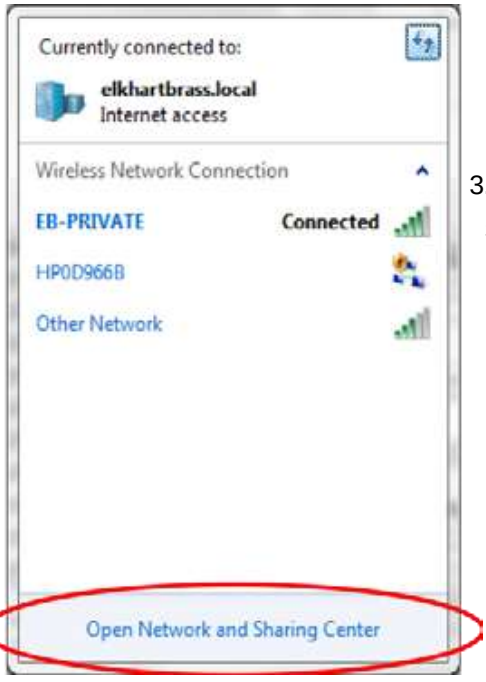
You are now connected. Proceed to section 4 of this document.

Section 3.2.4 - Windows 7: Wi-Fi Example

Steps for connecting using Windows 7. The monitor's serial number for this example is 0000012345. Use your monitor's serial number instead.

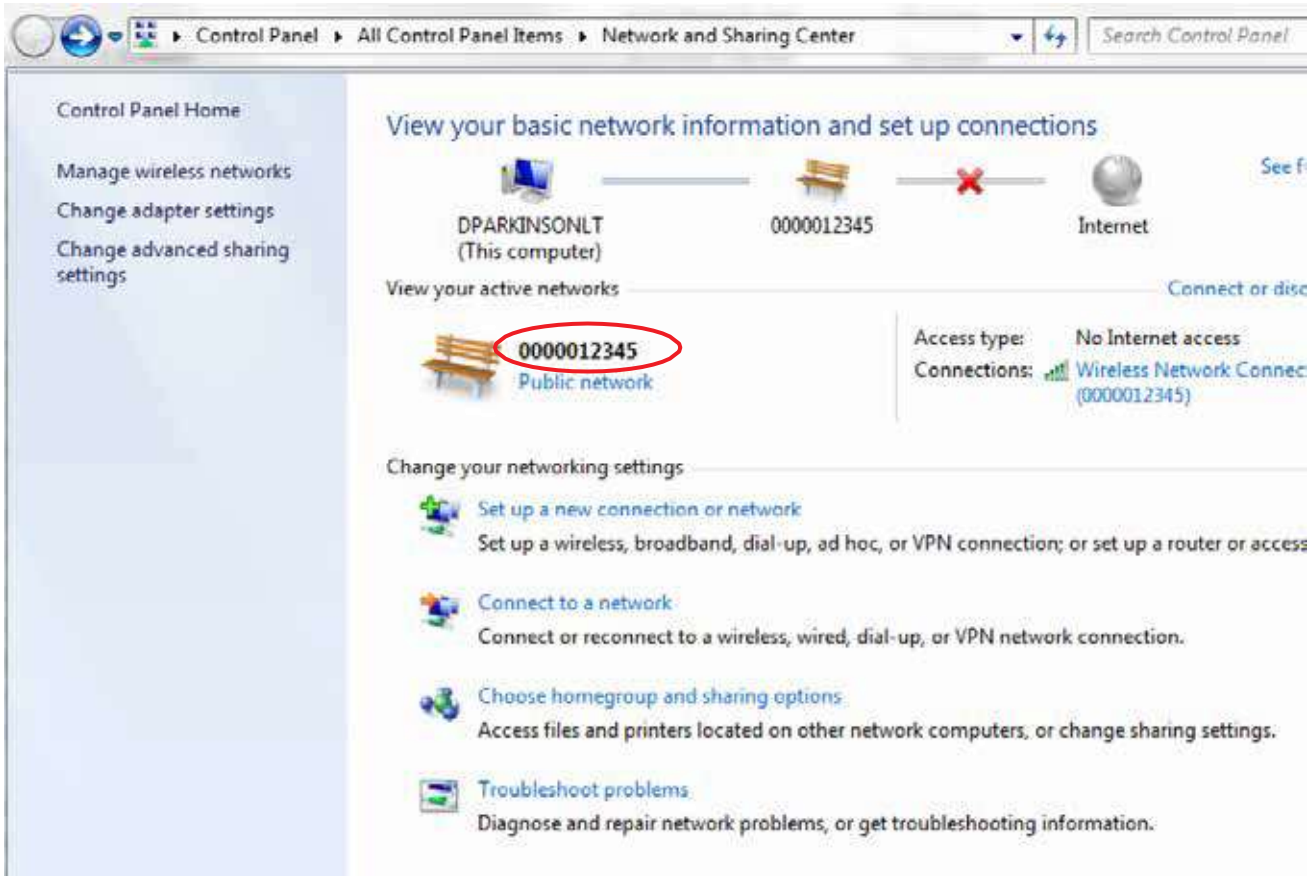
1. Select the Wi-Fi icon on the task bar.

2. Select to connect to the Network, 0000012345.
   Enter the password as the serial number backward.



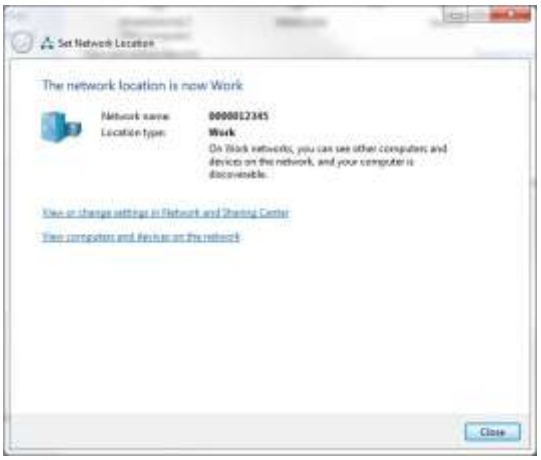
3. Select "Connect" From the Wi-Fi icon on your taskbar, select "Open Network and Sharing Center" again.

4. Click on the Blue text under this network you just connected to (0000012345).



5. Click on to "Work Network" to change the network.

You are now connected.



Section 4 - Web Interface

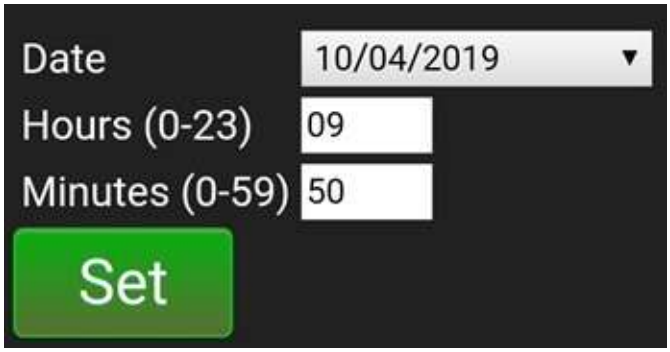
Once connected to the EXM2 network, use your preferred web browser[1] to navigate to exm2.net. If the web page fails to load, try typing in the IP address 192.168.130.1, directly.

Section 5 - Configuring Date/Time Setup

Select "Configure"

Select "Date/Time Setup"

Enter date, hours, and minutes. Select "Set"

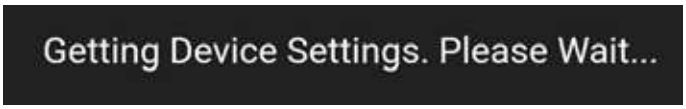


Confirmation screen will appear.

[1] exm2.net works better on Google Chrome, Apple Safari, and Mozilla Firefox.

Section 6 - Status

To see the status of components, select "Status."



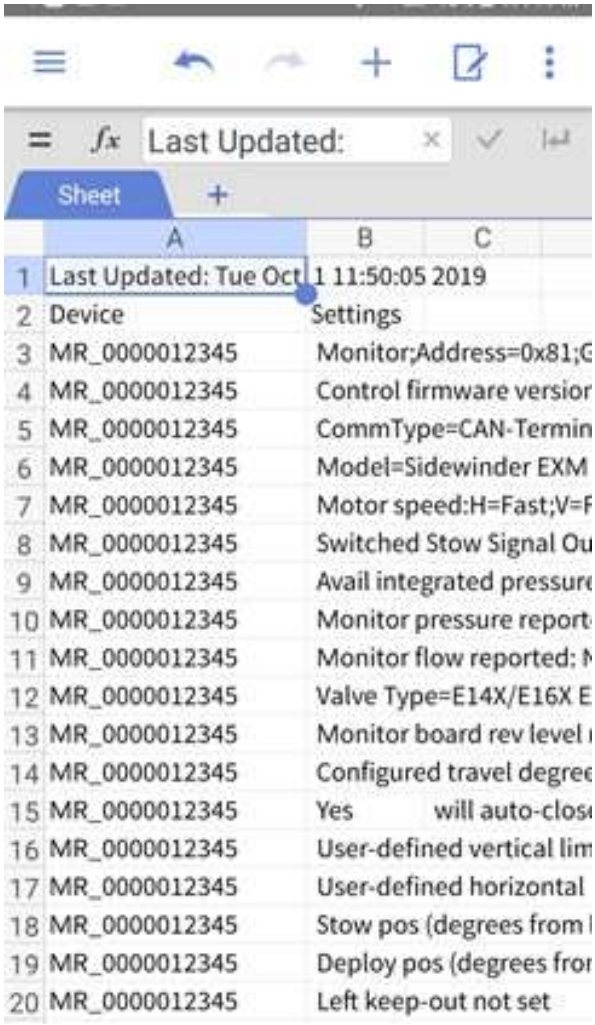
MR_0000012345	Control firmware versions:Boot=3.4;Runtime=4.0.15
MR_0000012345	CommType=CAN-Terminated
MR_0000012345	Model=Cobra EXM 7200 SD / 7250 SD;Customer=Standard
MR_0000012345	Motor speed:H=Fast;V=Fast
MR_0000012345	Switched Stow Signal Output: Available
MR_0000012345	Avail integrated pressure sens: None
MR_0000012345	Monitor pressure reported: None
MR_0000012345	Monitor flow reported: No
MR_0000012345	Valve Type=E14X/E16X Electric Valve; Valve ID=0;
MR_0000012345	Monitor board rev level rev Rel
MR_0000012345	Configured travel degrees H:350;V:170
MR_0000012345	Yes, will auto-close valve before stowing.
MR_0000012345	User-defined vertical limits not set
MR_0000012345	User-defined horizontal limits not set
MR_0000012345	Stow position not set
MR_0000012345	Deploy position not set
MR_0000012345	Left keep-out not set

IC_1111111111	Primary Controller;Address=0xA1;Group=1
IC_1111111111	Control firmware versions:Boot=2.1;Runtime=2.0.12
IC_1111111111	CommType=CAN-UnTerminated
IC_1111111111	Model= 7010X2 EXM2 Panel Mount Controller
IC_1111111111	Valve Type=E14X/E16X Electric Valve; Valve ID=0;
IC_1111111111	Monitor Vertical Controls = Normal
IC_1111111111	Monitor Horizontal Controls = Normal

Once complete, the screen will show all devices and their settings on the CAN bus.

If you would like to save the status to a CSV file, select "Download".

A file will download to your device.



Section 7 - Installation Setup - Configuring Monitor Instructions

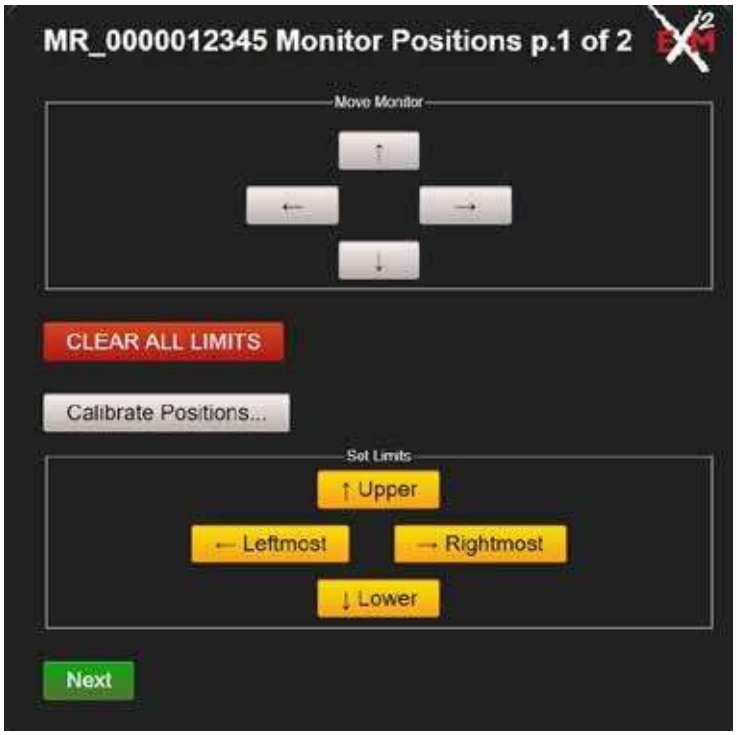
1. Turn on Wi-Fi.
2. Connect to the EXM2 monitor from your device.
3. Use your browser to go to exm2.net.
4. Select Configure

5. Select Monitor Positions

7. Select the monitor.

8. Calibrating Horizontal and Vertical Rotation

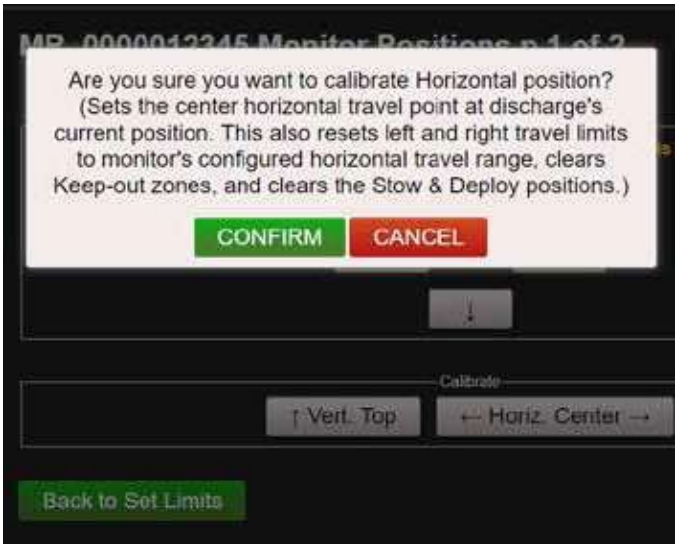
CAUTION: This operation will put the monitor in Setup Mode. There are no vertical or horizontal travel limits when in Setup Mode. MOVE THE MONITOR WITH CAUTION WHILE IN THIS MODE.



Calibrating the EXM2 system's horizontal and vertical rotation is a necessary step for EXM2 systems of all types. The calibration points serve as a starting point for all other motion limits and commands entered to the EXM2 system. If not properly calibrated, the system may not operate correctly.

- Calibrating Horizontal Rotation - This calibration process will establish the zero (0˚) horizontal position and allow rotation half to the left and half to the right of the total rotation range specified during system configuration (ie. 175 degrees left and 175 degrees right of center for a total of 350 degrees of travel).
  - Using RIGHT & LEFT buttons, position the monitor in the location you want to be the center of the allowed range of horizontal travel (i.e. the 0˚ horizontal position).
  - Select ← Horiz. Center →
  - The status LED on the monitor should blink then turns solid.
  - The horizontal axis is now calibrated.

- Select "Confirm."



The monitor's status LED will blink, then turn back to solid.

The monitor's 4 cycling LEDs will simultaneously light solid (yellow), indicating command acknowledgment. An acknowledgement message will be displayed on webpage.

- Calibrating Vertical Rotation - (Optional) The Vertical calibration point is factory set at 90° (straight up). This is the position needed when wiring for extended travel (see Installation, Operating, and maintenance Instructions 98XXX000), or when using a Position Feedback Display. This calibration will establish the highest vertical travel point of the monitor and allow rotation in the downward direction the total range specified during system calibration. This differs from the horizontal rotation calibration where the zero point is in the middle of the rotation range.
  - Using the UP & DOWN buttons, position the monitor such that it is aimed directly vertically or at the uppermost limit of travel specified during system configuration.
  - Select ↑ Vert. Top .
  - The vertical axis is now calibrated.
  - Exit Setup Mode by selecting "Back to set Limits" button and check the monitor's rotation limits. The monitor should not hit itself or other objects. Recalibrate the EXM2 system if needed.

Caution: If the vertical zero point is set too far forward, the monitor may be allowed to crash into itself at the lower points of vertical travel. BE CAREFUL NOT TO MOVE THE MONITOR INTO OBSTRUCTIONS OR ITSELF as this will cause the monitor motors to over current. The monitor may need to be manually reversed if this occurs. NO power

Limits may be cleared by selecting CLEAR ALL LIMITS

Set up all range of motion limits by moving the monitor to its intend farthest position and select the **Set limits button**. For example:

Move the monitor to the furthest Upper position and select ↑ Upper

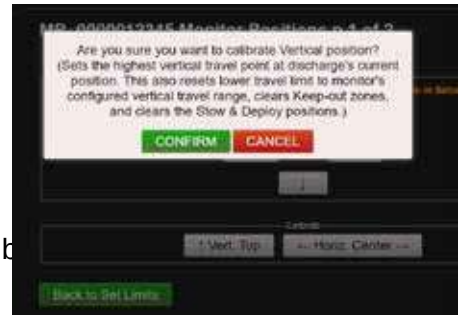
Select Next to set Keep-Out Zones.

9. **Keep-Out Zones (Optional)**

Keep-Out Zones are used when it is desired to restrict the motion of the monitor to a smaller more specific range than that set during system calibration. Keep-Out Zones are different from travel limits in that they do not restrict motion completely in any one direction. Keep-Out Zones can be set to allow the monitor to move above a certain zone or beside the zone to either left or right.

- Lower-Right Keep-Out Zone - The Right Keep-Out Zone will prevent the monitor from moving down and to the right into a specified zone (reference figure 1).
  - Move the monitor to the upper left corner of the keep out zone.
  - The Keep-Out Zone should be set within the previously set monitor calibration points. If a Keep-Out Zone is set outside the intended operating area, operation of the monitor may be unpredictable.
  - Select → (Lower-Right)
  - When the EXM2 system is taken out of Setup Mode, the monitor will be prevented from moving below and to the right of this point.

Select "Confirm"



The monitor's status LED will blink, then turn back to solid.

The monitor's 4 cycling LEDs will simultaneously light solid (yellow), indicating command acknowledgment. An acknowledgement message will b displayed on webpage.

Travel limits are used when it is desired to restrict the motion of the monitor to a smaller, more specific range than the one set at the factory or during system configuration. Travel limits can be used to help in avoiding objects that may interfere with the motions of the monitor.

Limits may be cleared by selecting CLEAR ALL LIMITS

Set up all range of motion limits by moving the monitor to its intend farthest position and select the **Set limits button**. For example:

Move the monitor to the furthest Upper position and select ↑ Upper

Select Next to set Keep-Out Zones.

9. **Keep-Out Zones (Optional)**

Keep-Out Zones are used when it is desired to restrict the motion of the monitor to a smaller more specific range than that set during system calibration. Keep-Out Zones are different from travel limits in that they do not restrict motion completely in any one direction. Keep-Out Zones can be set to allow the monitor to move above a certain zone or beside the zone to either left or right.

- Lower-Right Keep-Out Zone - The Right Keep-Out Zone will prevent the monitor from moving down and to the right into a specified zone (reference figure 1).
  - Move the monitor to the upper left corner of the keep out zone.
  - The Keep-Out Zone should be set within the previously set monitor calibration points. If a Keep-Out Zone is set outside the intended operating area, operation of the monitor may be unpredictable.
  - Select → (Lower-Right)
  - When the EXM2 system is taken out of Setup Mode, the monitor is from moving below and to the right of this point.

  Select "Confirm"

- Lower-Left Keep-Out Zone - The Left Keep-Out Zone will prevent the monitor from moving down and to the left into a specified zone (reference figure 1)
  - Move the monitor to the top right corner of the keep out zone.
  - The Keep-Out Zone should be set within the previously set monitor calibration points. If a Keep-Out Zone is set outside the intended operating area, operation of the monitor may be unpredictable.
  - Select ← (Lower Left)
  - When the EXM2 system is taken out of Setup Mode, the monitor is prevented from moving below and to the left of this point.

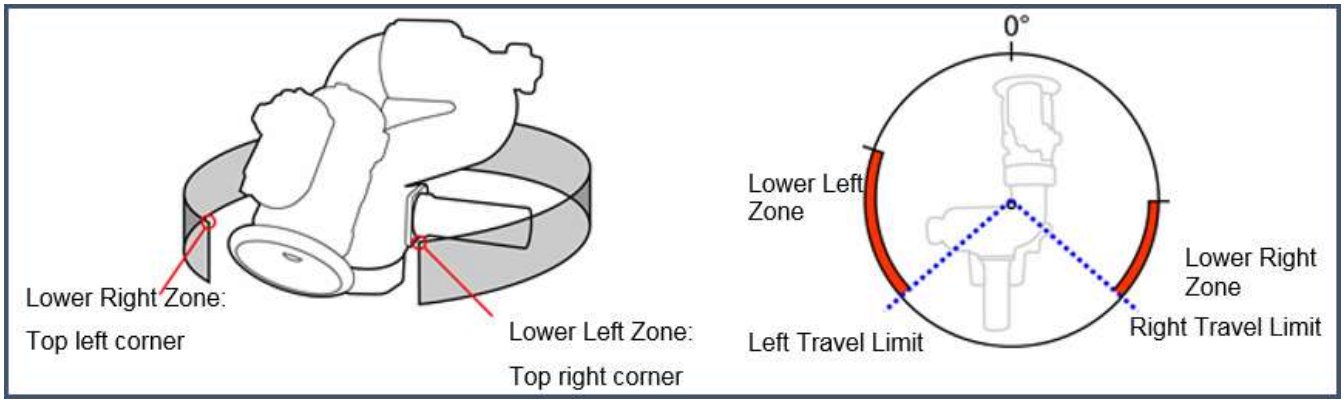


Figure 1: Keep-Out Zones

10. **Stow Position**

The Stow Position is a preset position that can be used to bring the monitor into a position suitable for when the system is powered off. A stow position must be within the allowed travel area defined by any travel limits or keep-out zones, therefore it is recommended that travel limits and keep-out zones are set before setting a stow position.

- Move the monitor to the desired position while in normal operation, not in setup mode. If a travel limit or keep-out zone boundary is met, move the discharge off the boundary a short distance.
- Select

Then, select "Confirm."
- This position will be the Stow Position when the system is brought out of Setup Mode.
- If using valve over CAN, monitor will not stow before valve is calibrated.

Warning! Water SHOULD NOT be flowing while stowing the monitor.

11. **Deploy Position (Optional) Then, Select "Confirm"**

The Deploy Position is a preset position that can be used to bring the monitor to a user programmed position. A deploy position must be within the allowed travel area defined by any travel limits or keep-out zones, therefore it is recommended that travel limits and keep-out zones are set before setting a deploy position.

- Move the monitor to the desired position. If a travel limit or keep-out zone boundary is met, move the discharge off the boundary a short distance.
- Select

- This position will be the Deploy Position when the system is left in Setup Mode.

Select

Use an EXM2 controller to move the monitor across its full travel range and check any stow/deploy operations to confirm the monitor positions are set as desired.

Section 8 - Installation Setup - Configuring Valve Instructions

1. Turn on Wi-Fi.
2. Connect to the EXM2 monitor from your device.
3. Use your browser to go to exm2.net.
4. Select Configure.

5. Select '**Valve Positions**'

6. Select Valve

7. Calibrate valve.

NOTE: LEDs flashing above the closed & open buttons on an input controller indicate that the valve has not been calibrated.

Calibrate it at this time by first placing the valve in a half open position and then selecting Initiate Calibration Allow the valve to complete all movements (closed, opened, closed) before entering additional commands to the system.

Enter a value to set preset percentage.

8. Move monitor vertically to both upper and lower limits of travel, then left and right limits of travel. This will calibrate the position display. Dimly lit LEDs will show maximum allowed travel, and the brightly lit LED will show monitor position within the allowed travel. Changes to the travel limits will require recalibration before new limits will be displayed.

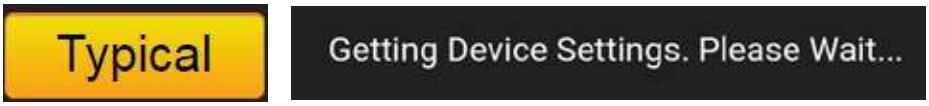
Section 9 - Configuring All Devices Typical Instructions

Typical configuration allows vertical and horizontal travel limits, type of input controller, primary controller and valve to be set. For all other settings, please refer to the Advanced section.

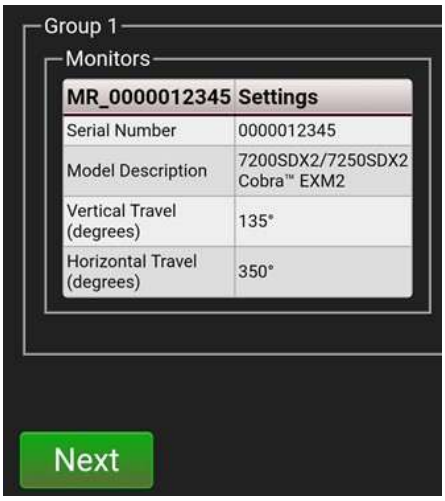
Turn on Wi-Fi to view all devices on CAN.

Select configure.

Select Typical



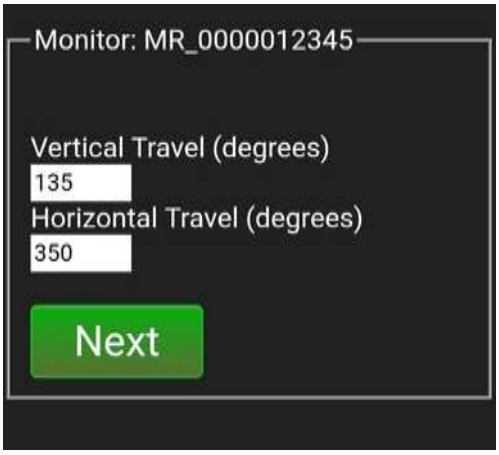
All devices on the CAN bus will appear.



Select “Next”

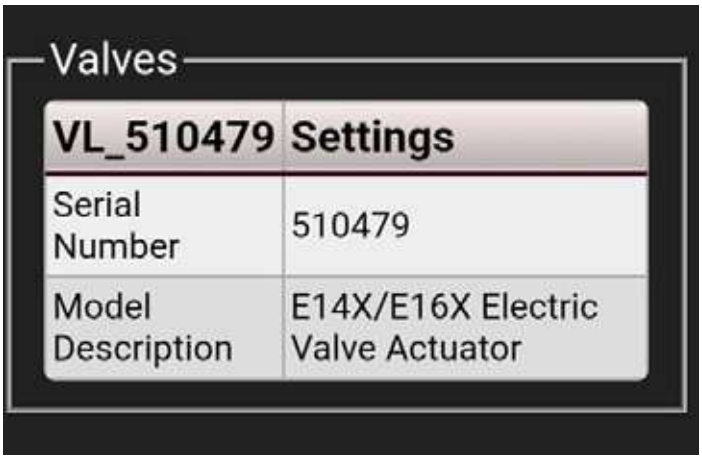
Enter travel degrees and select “Next.”

NOTE: Changing monitor travel limits may reset limits, keep-out zones, and/or stow/deploy positions set using the "Monitor Positions" setup.



Review controllers for the monitor. Select yes or no for each one. Select “Next”

Review valve and select the existing option.



Select primary controller.

Select “Next” and “Confirm”

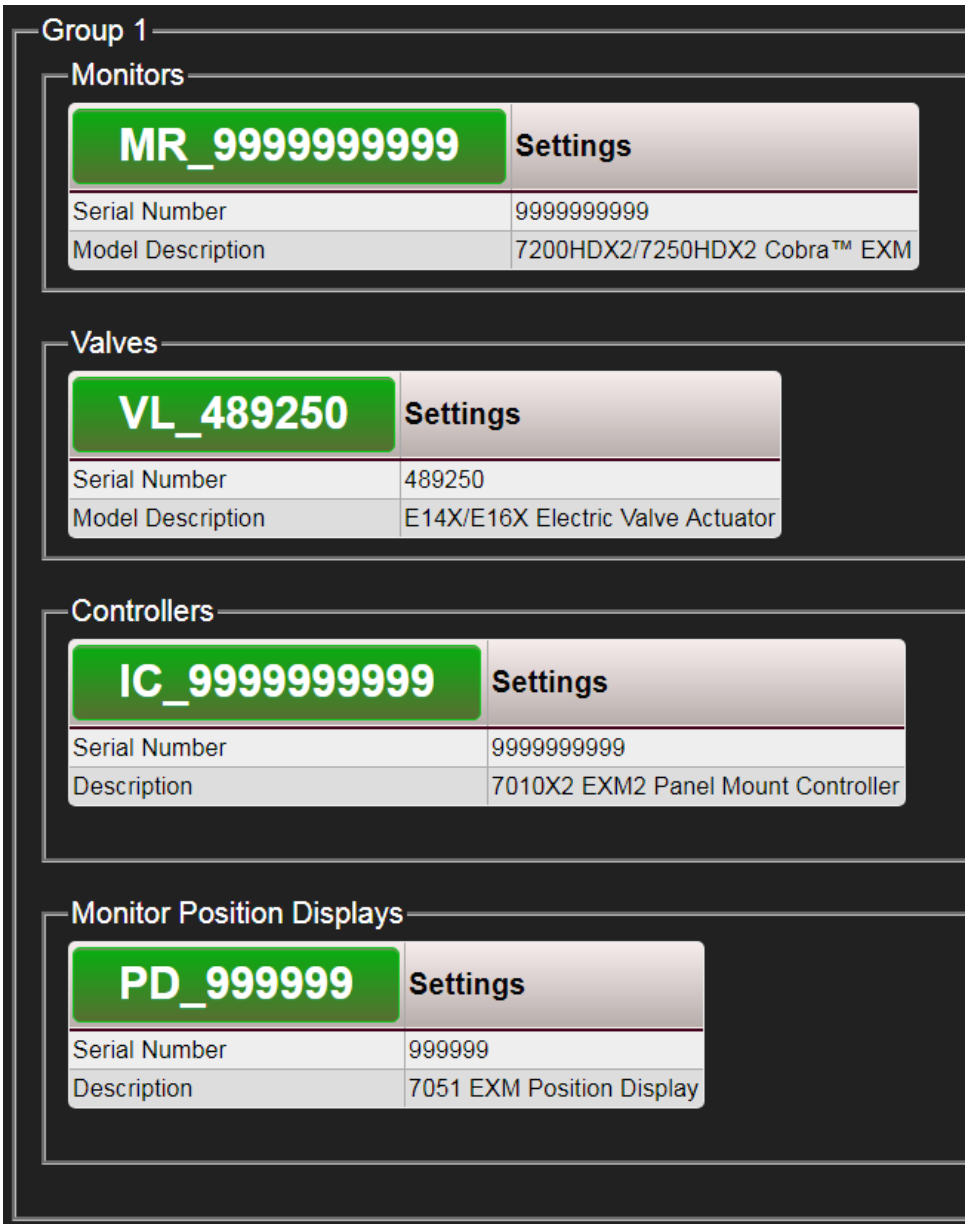
Confirmation screen will appear.

Section 10 - Configuring Advance Instructions - Travel, Motor Speeds and Primary/Secondary Instructions

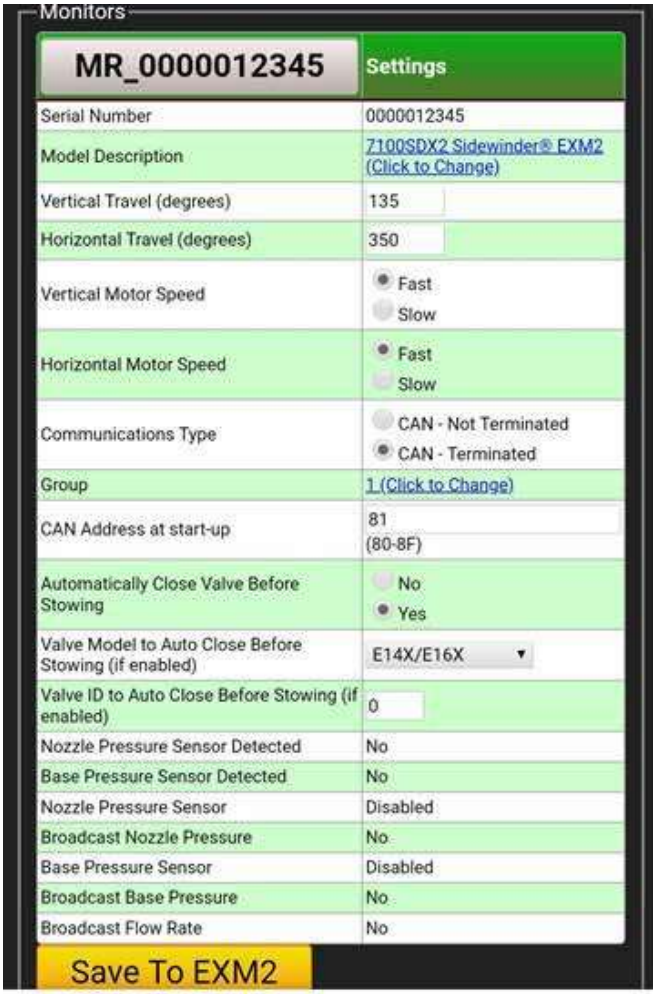
1. Turn on Wi-Fi.
2. Connect to the EXM2 monitor from your device.
3. Use your browser to go to exm2.net.
4. Select "Configure" and this will be in Setup mode.

5. Select "Advanced"

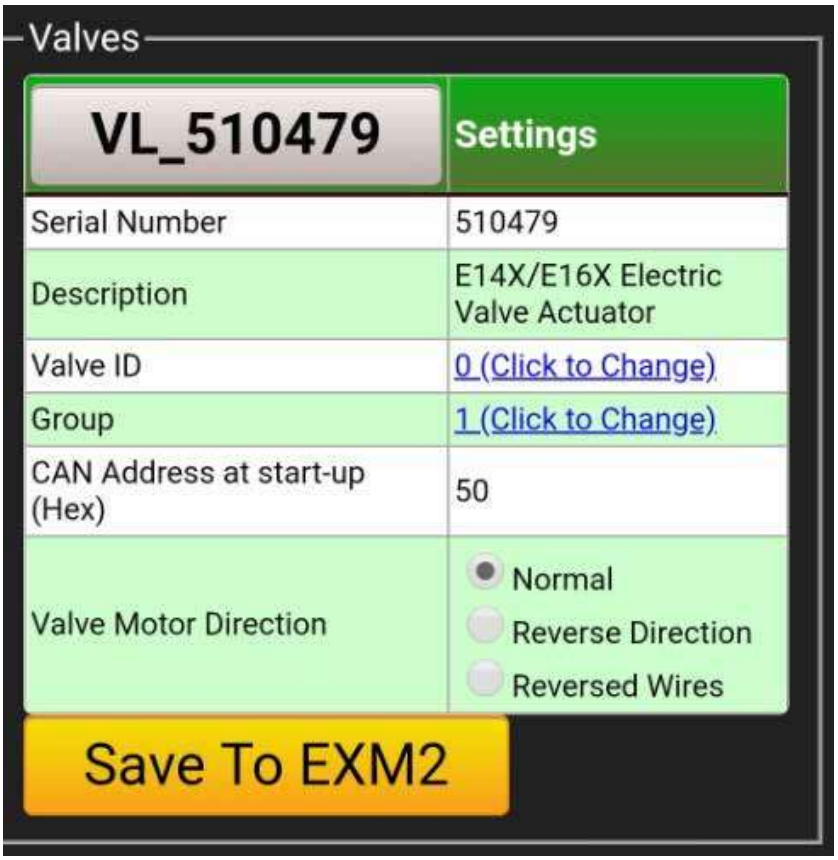
6. This will show all items on the CAN bus. By selecting the green section, the inputs will be visible and can be modified.



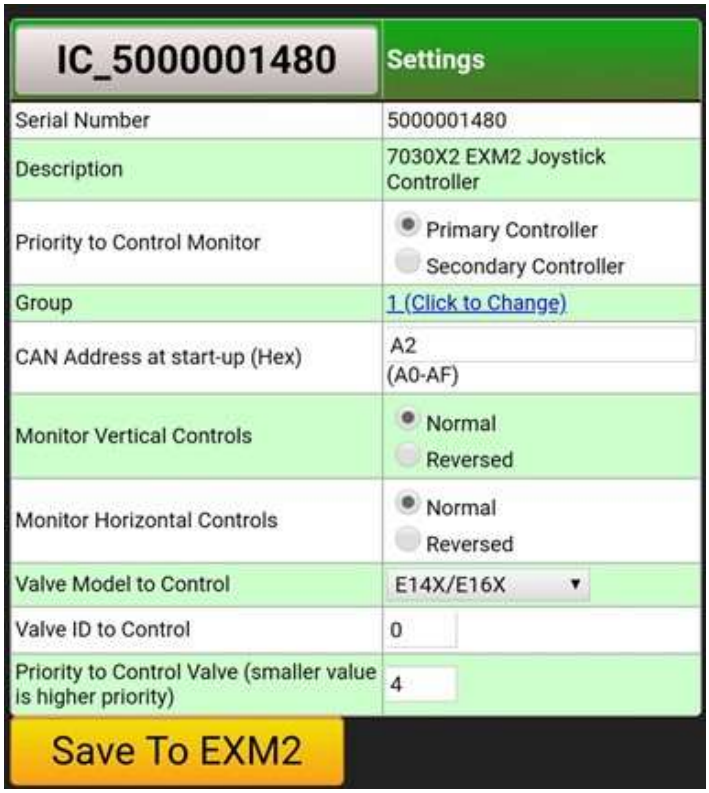
7. The monitor setting can be modified and then saved.



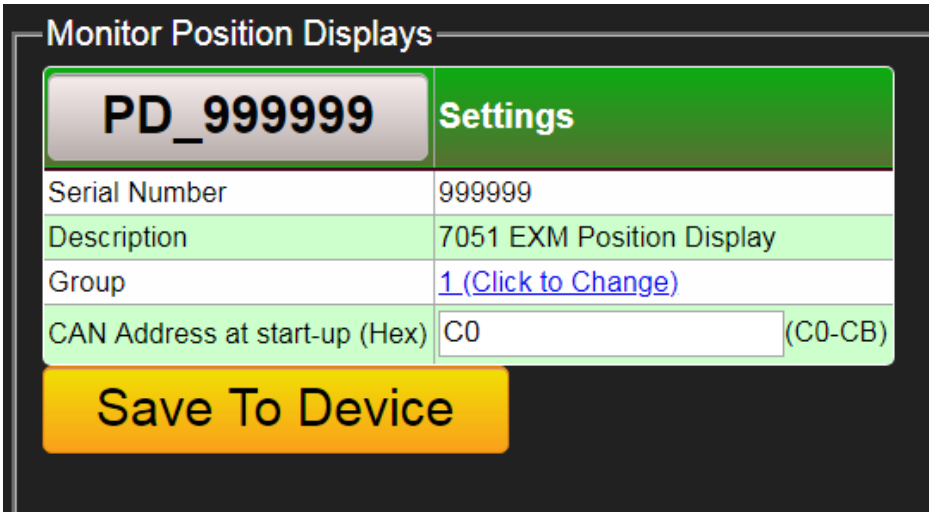
8. The valve settings can be modified and then saved.



9. Each of the controller settings can be modified and then saved to the device.



10. The Position Display settings can be modified and then saved to the device.



Section 11 - RF Pairing Handheld and Gateway - for Replacements Only

Pairing is required for a replacement handheld and gateway. Pairing is only initiated using the Wi-Fi interface:

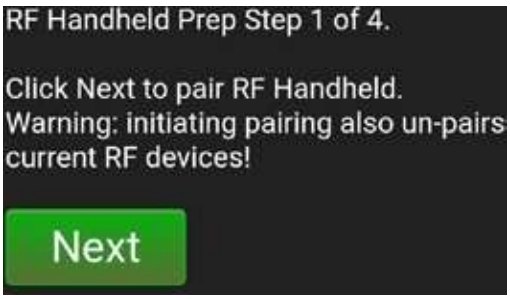
1. Connect to Wi-Fi
2. Navigate to Exm2.net or 192.168.130.1
3. Click "Configure"

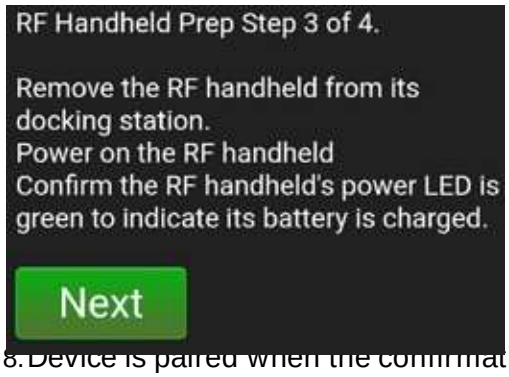
4. Click "Advanced"

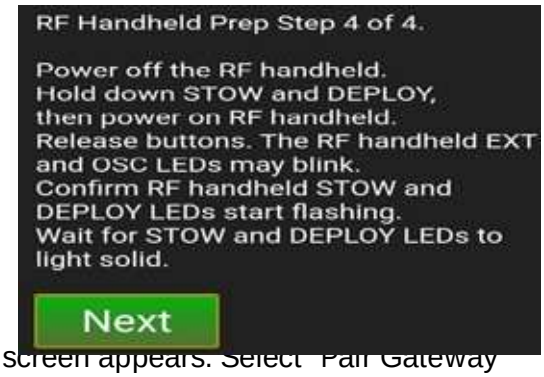
5. Click GW_SERIAL_NUMBER to expand configuration options

6. Click "Pair RF"

7. Instructions will appear on the webpage to pair the device.

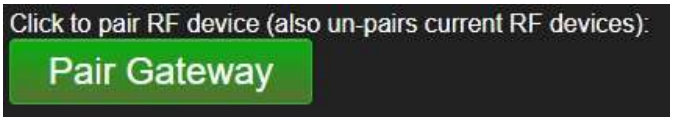


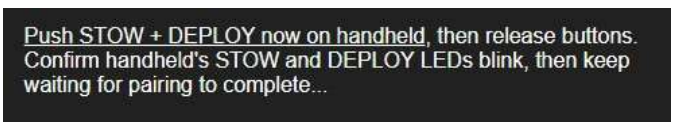




8. Device is paired when the confirmation screen appears. Select "Pair Gateway"

Wait for the webpage to instruct you to simultaneously push the RF handheld's STOW & DEPLOY buttons again, then do so.





Section 12 - RF Pairing Handheld to Monitor Module for Replacement Only

Only specialized monitor modules can be paired directly to a RF handheld. Most monitors require the RF/CAN gateway to communicate with the RF handheld. If purchased as a package, handheld should already be paired to the monitor. Pairing is only initiated using the Wi-Fi interface:

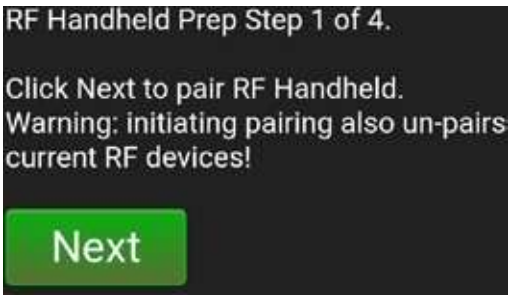
1. Connect to Wi-Fi
2. Navigate to Exm2.net or 192.168.130.1
3. Click "Configure"

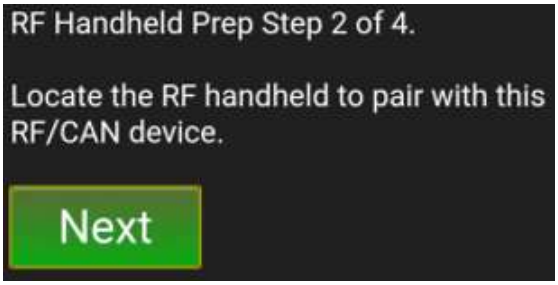
4. Click "Advanced"

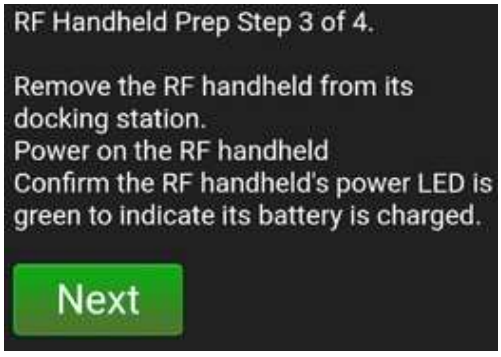
5. Click MR_SERIAL_NUMBER to expand configuration options.

6. Click "Pair RF"

7. Instructions will appear on webpage to pair.







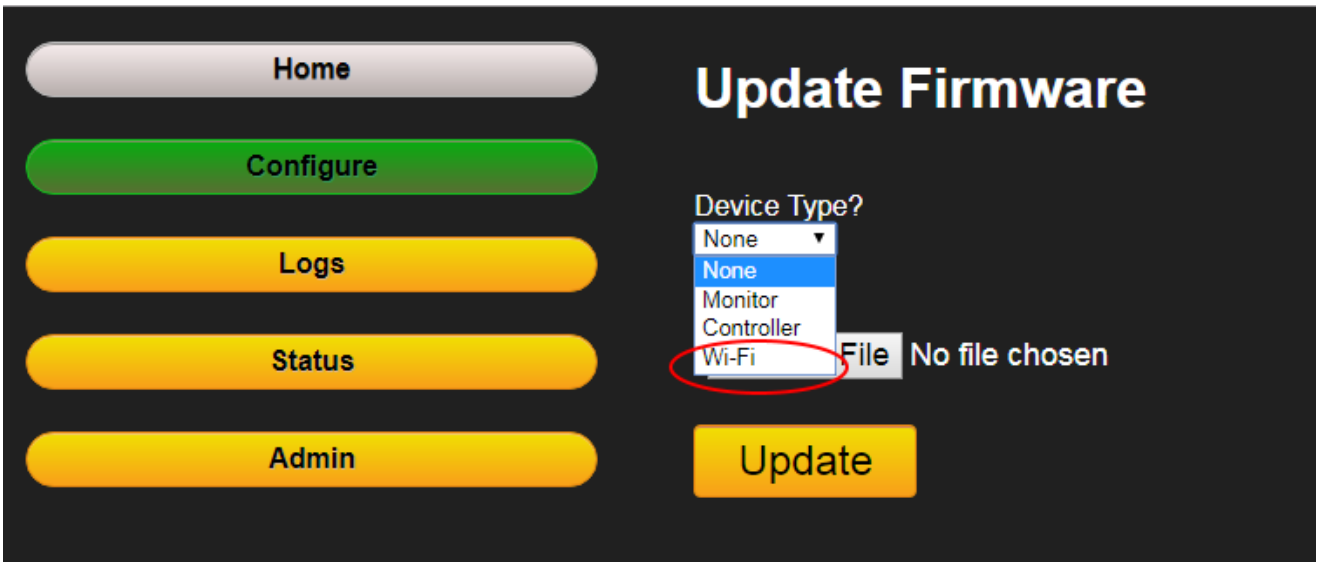
8. Device is paired when the confirmation screen appears.

Section 13 - Firmware Updates

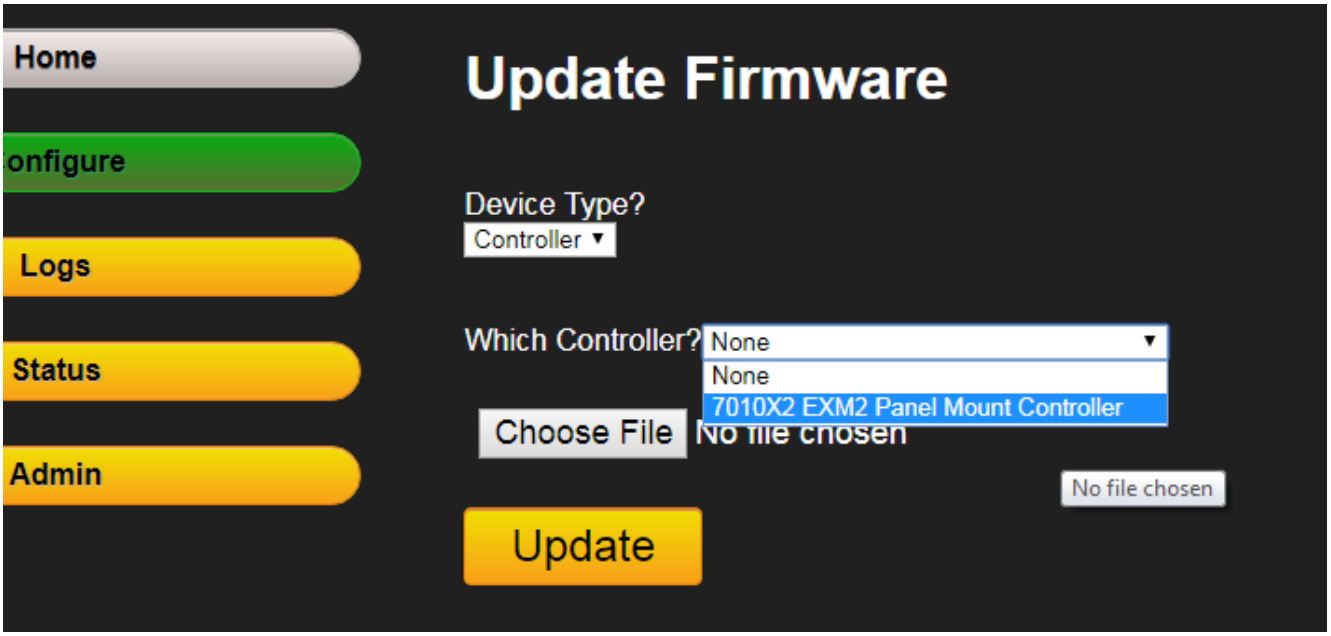
1. Disconnect all devices from the CAN bus, except those that you want to update firmware. This will make the update go faster.
2. Turn on Wi-Fi.
3. Connect to the EXM2 monitor from your device.
4. Use your browser to go to exm2.net.
5. Select "Admin" from the main menu.

6. Select "Update Firmware"

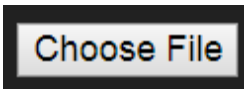
7. Wait for it to find devices.
8. Select the device type you want to update firmware for. Wi-Fi for example



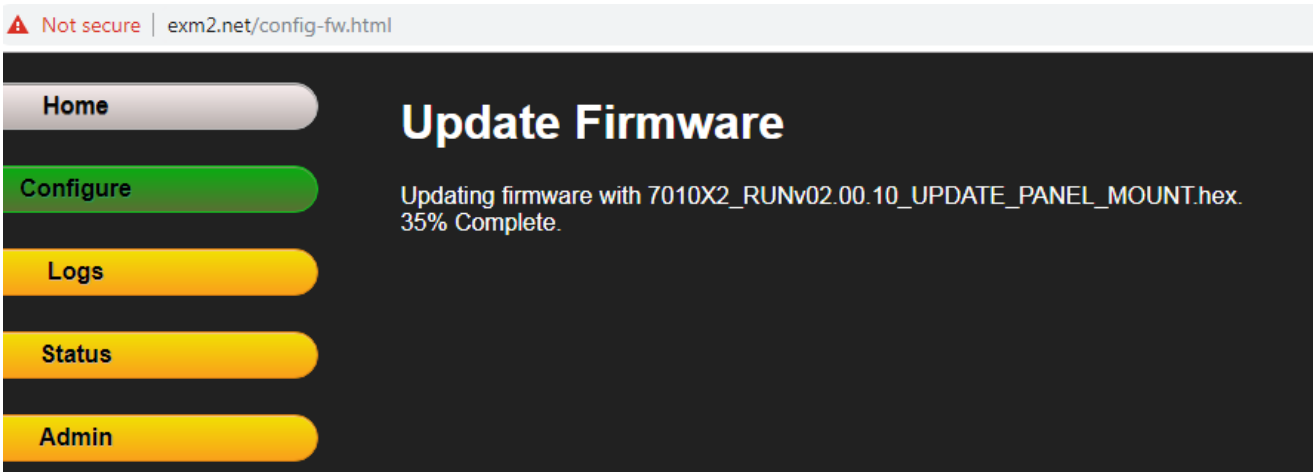
9. If you selected Monitor or Controller, now choose the specific device that you want to update:



10. Click the Choose File button.



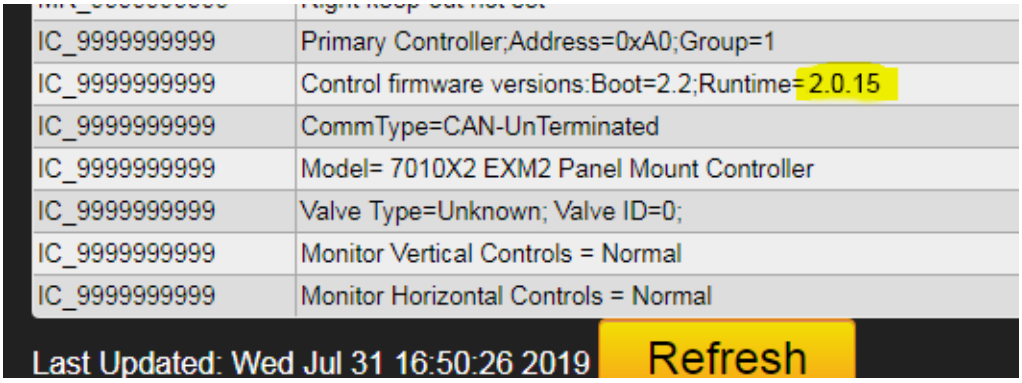
11. Use the explorer to Select the file that contains the firmware update.
    a. For Example, Wi-Fi it's 7nnnX2_WIFIv...MONITOR.bin
    b. For panel mount controller it's 7010X2_RUNv..._PANEL_MOUNT.hex
12. Select "Update" button.
13. Wait for update to complete. Percentage of completion will update.



14. Confirmation of the update will appear on web interface after this has been completed.

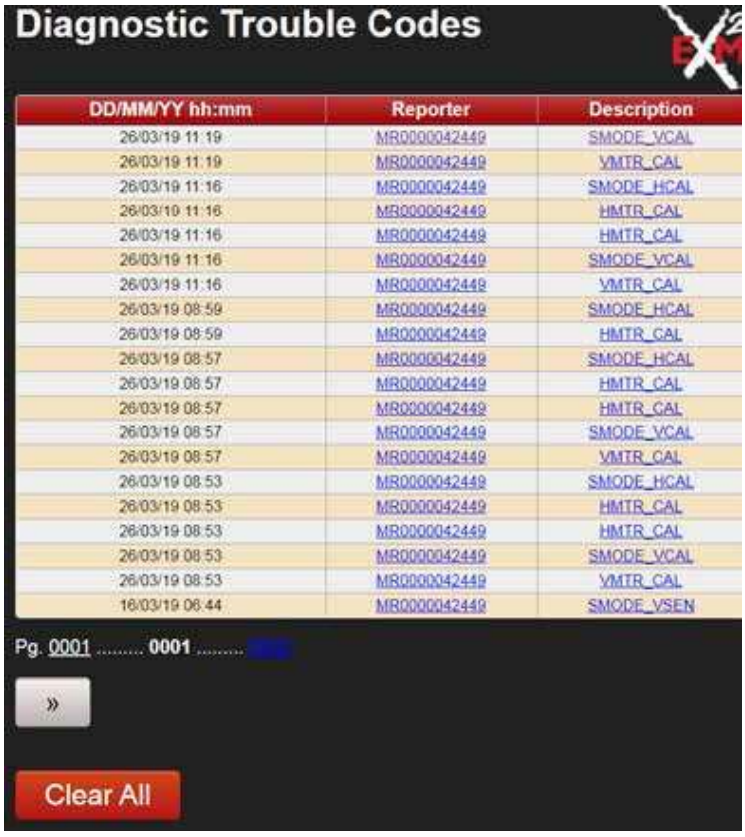
15. Push "Status" button on the main menu and wait for device info to show up.

16. Confirm it shows new firmware.



Section 14 - Diagnostic Log

1. Turn on Wi-Fi.
2. Connect to the EXM2 monitor from your device.
3. Use your browser to go to exm2.net.
4. Select Logs and DTCS for diagnostic trouble codes.



5. Selecting Reporter or Description will supply diagnostic code information.

6. Select "Summary" to go back to the diagnostics trouble codes screen.
7. If you would like to create a CSV file, Select "Download All".

2	Device	Settings
3	MR_0000042453	Monitor;Address=0x81;Group=1
4	MR_0000042453	Control firmware versions:Boot=3.4;Runtime=4.0.15
5	MR_0000042453	CommType=CAN-Terminated
6	MR_0000042453	Model=Sidewinder EXM Standard Duty;Customer=Standard
7	MR_0000042453	Motor speed:H=Fast;V=Fast
8	MR_0000042453	Switched Stow Signal Output: Available
9	MR_0000042453	Avail integrated pressure sens: None
10	MR_0000042453	Monitor pressure reported: None
11	MR_0000042453	Monitor flow reported: No
12	MR_0000042453	Valve Type=E14X/E16X Electric Valve; Valve ID=0;
13	MR_0000042453	Monitor board rev level rev Rel
14	MR_0000042453	Configured travel degrees H:350;V:135
15	MR_0000042453	Yes
16	MR_0000042453	User-defined vertical limits not set
17	MR_0000042453	User-defined horizontal limits not set
18	MR_0000042453	Stow pos (degrees from left and top):H=173;V=67
19	MR_0000042453	Deploy pos (degrees from left and top):H=189;V=67
20	MR_0000042453	Left keep-out not set
21	MR_0000042453	Right keep-out not set
22	IC_5000001060	Secondary Controller (RF);Address=0xA1;Group=1
23	IC_5000001060	Control firmware versions:Boot=None;Runtime=None
24	IC_5000001060	CommType=RF only
25	IC_5000001060	Model= 7015X2WH EXM2 Handheld Controller
26	IC_5000001060	Valve Type=E14X/E16X Electric Valve; Valve ID=0;
27	IC_5000001060	Monitor Vertical Controls = Reversed
28	IC_5000001060	Monitor Horizontal Controls = Reversed
29	IC_5000001480	Primary Controller;Address=0xA2;Group=1
30	IC_5000001480	Control firmware versions:Boot=2.1;Runtime=2.0.9
31	IC_5000001480	CommType=CAN-UnTerminated
32	IC_5000001480	Model= 7030X2 EXM2 Joystick Controller
33	IC_5000001480	Valve Type=E14X/E16X Electric Valve; Valve ID=0;
34	IC_5000001480	Monitor Vertical Controls = Normal
35	IC_5000001480	Monitor Horizontal Controls = Normal

NOTES:

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