

Supervisory Controller Setup with M400 VFD Drive

Quick Start Guide

This document will guide you through setting up and commissioning the M400 VFD Drive in Supervisory Controllers (E3 and Site Supervisor).

Complete All Programming Before you setup the M400 Drive.

Note that the M400 Drive requires Supervisory Controller firmware version 2.14F01 and above.

The keypad and display gives information about the operating status of the drive and trip codes. It provides the ability to change parameters, stopping and starting the drive, and the ability to perform a drive reset.

Keypad Number	Keypad Description
1 (Enter)	The Enter button is used to enter parameter view or edit mode, or to accept a parameter edit.
2 (Navigation)	The Navigation keys can be used to select individual parameters or to edit parameter values. In keypad mode, the “Up” and “Down” keys are also used to increase or decrease the motor speed.
3 (Start)	The Start key is used to start the drive in keypad mode.
4 (Stop/Reset)	The Stop / Reset key is used to stop and reset the drive in keypad mode. It can also be used to reset the drive in terminal mode.
5 (Escape)	The Escape key is used to exit from the parameter edit / view mode or disregard a parameter edit.



Figure 1 - Unidrive M400

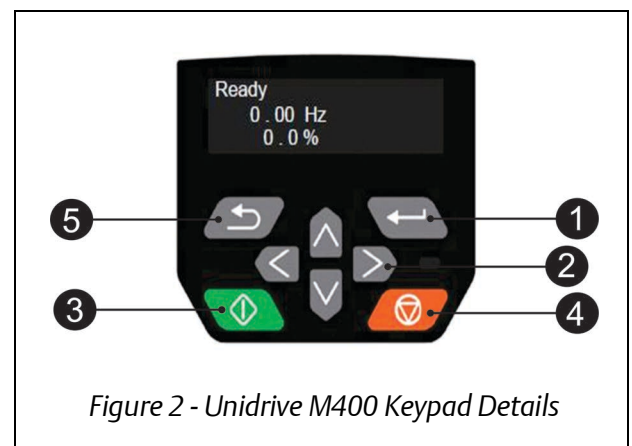


Figure 2 - Unidrive M400 Keypad Details

STEP 1: Configuring M400 VFD Drive

Note: Do not connect the device communications to E2 controller.

1. Press right/ left arrow key and go to **Pr MM.000** then press . Select **Reset 60Hz defs** then press .

Note: Pressing allows you to enter and exit parameter edit mode.

2. Press to return the drive into the **No Action** display.
3. Go to **Pr 00.005** (Drive Config), then press . Select **Preset**, then press .
4. Set **Pr 00.010** (User Security Status), then press . Select **All Menus**, then press .
5. Set **Pr 06.004** (Start/Stop Logic), then press . Select **6**, then press .
6. Set **Pr 11.023** (Serial Address), then press . Select **2**, then press .
7. Set **Pr 11.024** (Serial Mode), then press . Select **8 1 NP**, then press .
8. Set **Pr 11.020** (Serial Reset), then press . Select **On** to reset communications.

*Note: The device will flash to **On** and returns to **Off**, press .*

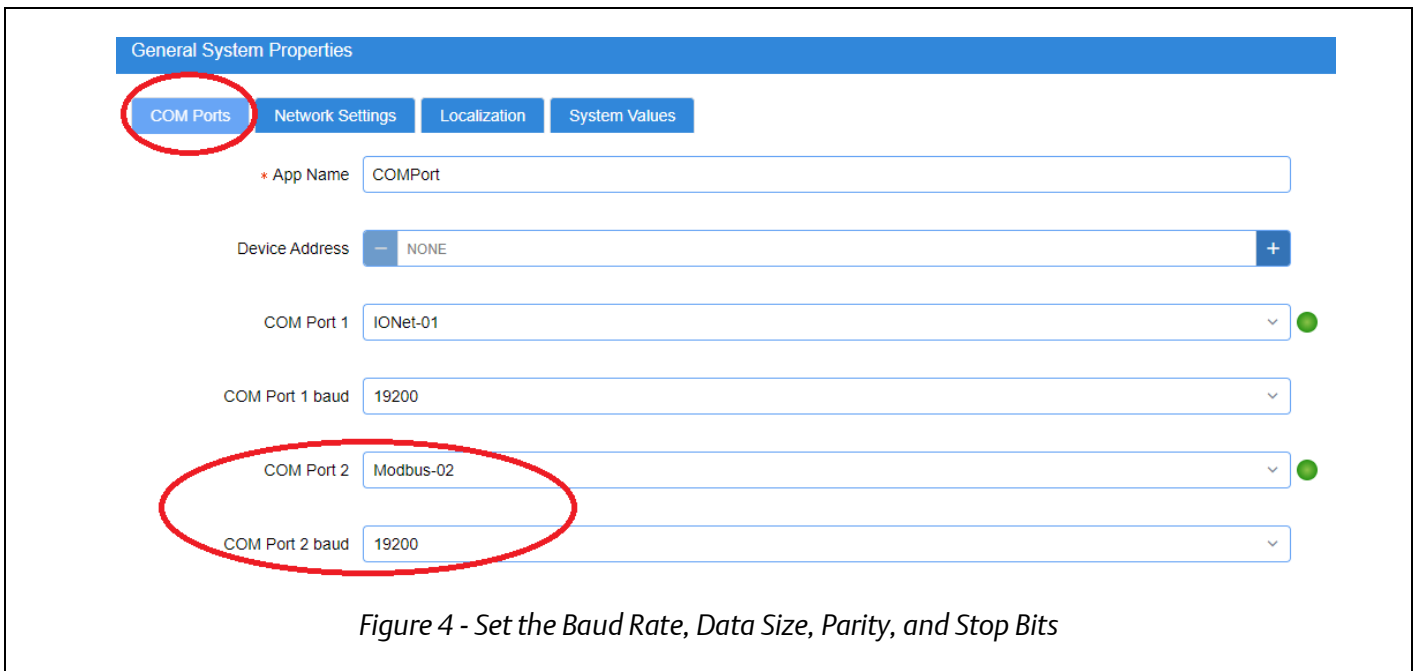
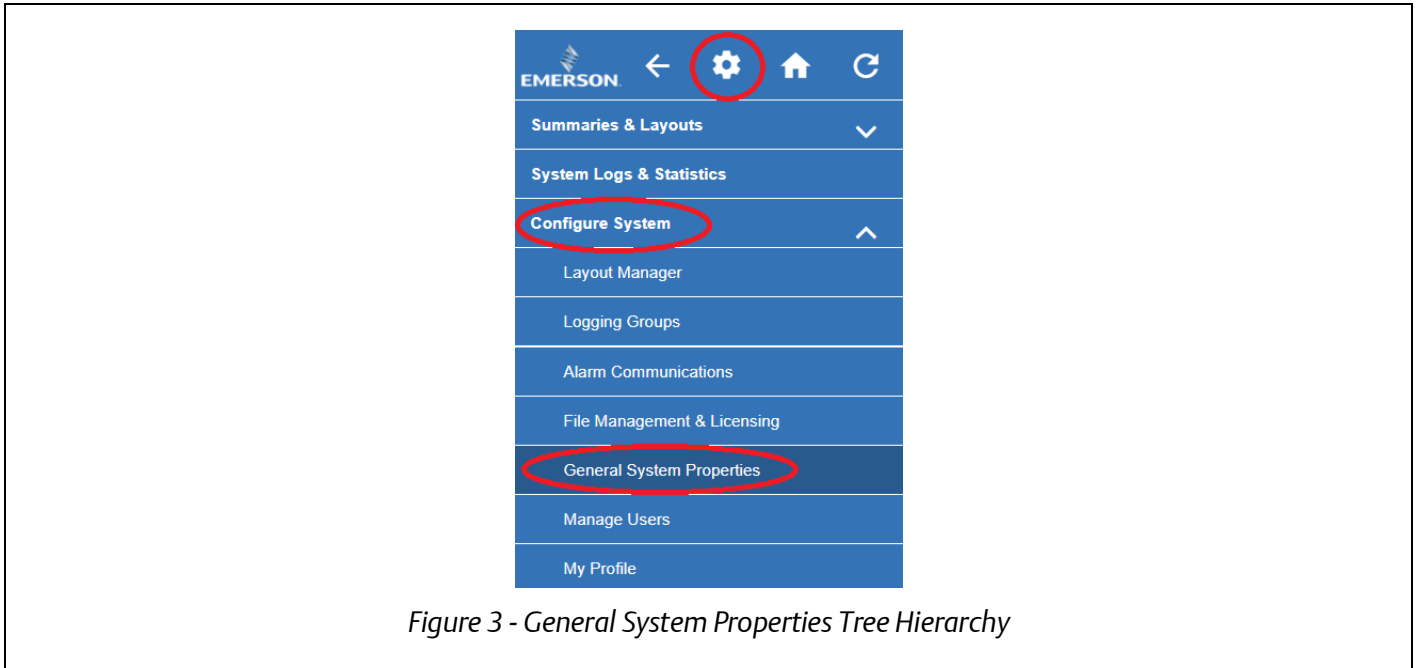
9. Set **Pr 12.000** (Parameter mm.000), then press . Select **Save Parameters**, then press .
10. Press to return the drive into the **No Action** display.

Note: The drive is now ready to communicate with the Supervisory controller and is ready for a test/run.

Model		Max # of Instances
1	SR	20
2	CXe	16
3	CX	16
4	BXe	16
5	BX	16
6	RXe	16
7	RX	16
8	SMF	No

STEP 2: Setting the Baud Rate in the Supervisory Controller

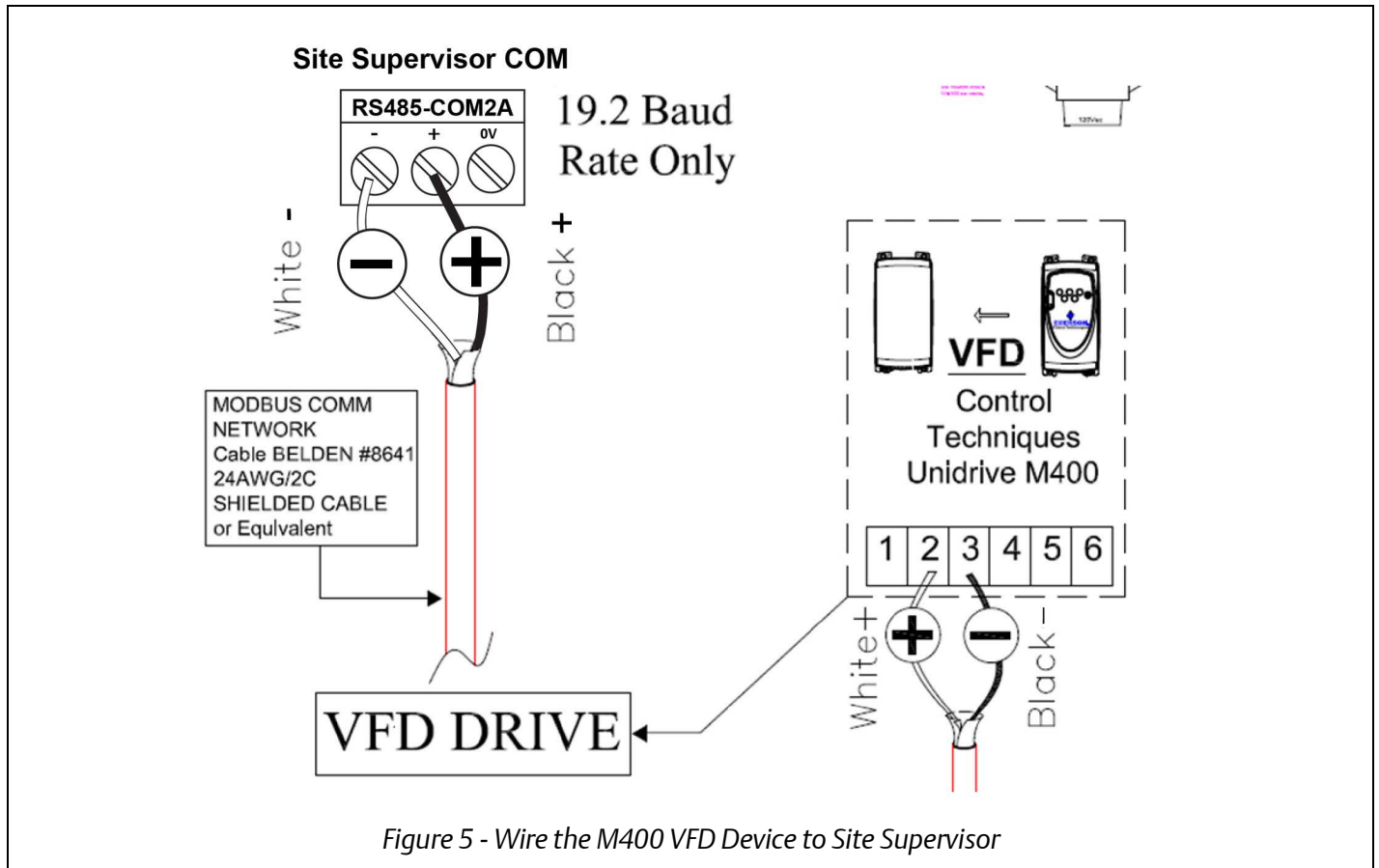
Gear icon  > Configure System Properties > General System Properties



- Set the Com Port baud to 19.2

STEP 3: Wiring the M400 VFD Device to Emerson Controllers

Wire the device as shown below:



COM wiring is the REVERSE polarity of Site Supervisor.

- + On the Com port goes to - on the VFD.
- - On the Com port goes to the + on the VFD.
- Do NOT connect shield to any terminal on the controller or VFD. Connect shield directly to Earth Chassis at the controller; clip and insulate shield at VFD end of cable.
- If VFD is the last device at the end of Com segment, terminate with 150 ohms between terminals 2 and 3.

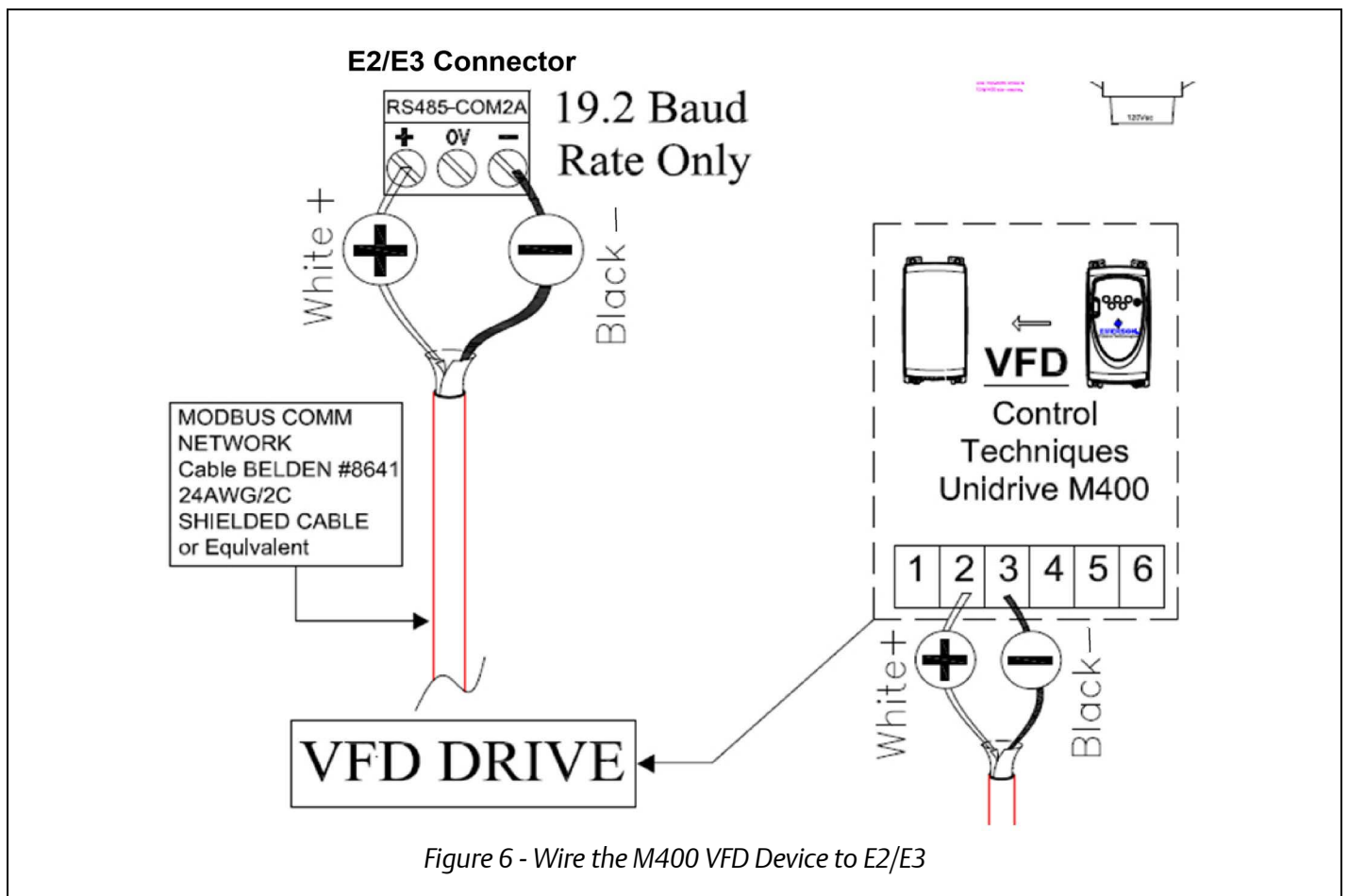


Figure 6 - Wire the M400 VFD Device to E2/E3

COM wiring is the same polarity as E2 and E3.

- + On the Com port goes to + on the VFD.
- - On the Com port goes to - on the VFD.
- Do NOT connect shield to any terminal on the controller or VFD. Connect shield directly to Earth Chassis at the controller; clip and insulate shield at VFD end of cable.
- If VFD is the last device at end of Com segment, terminate with 150 ohms between terminals 2 and 3.

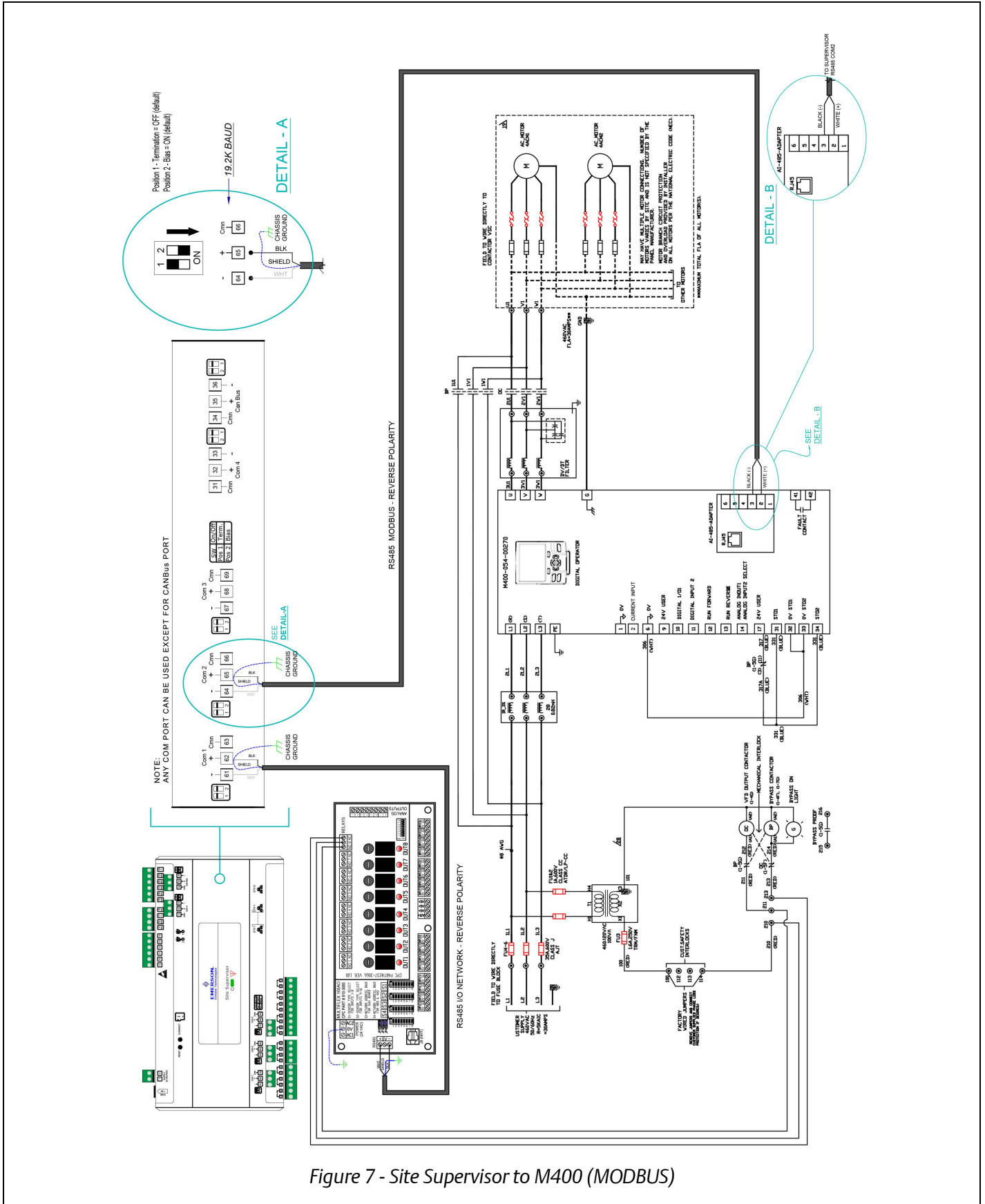


Figure 7 - Site Supervisor to M400 (MODBUS)

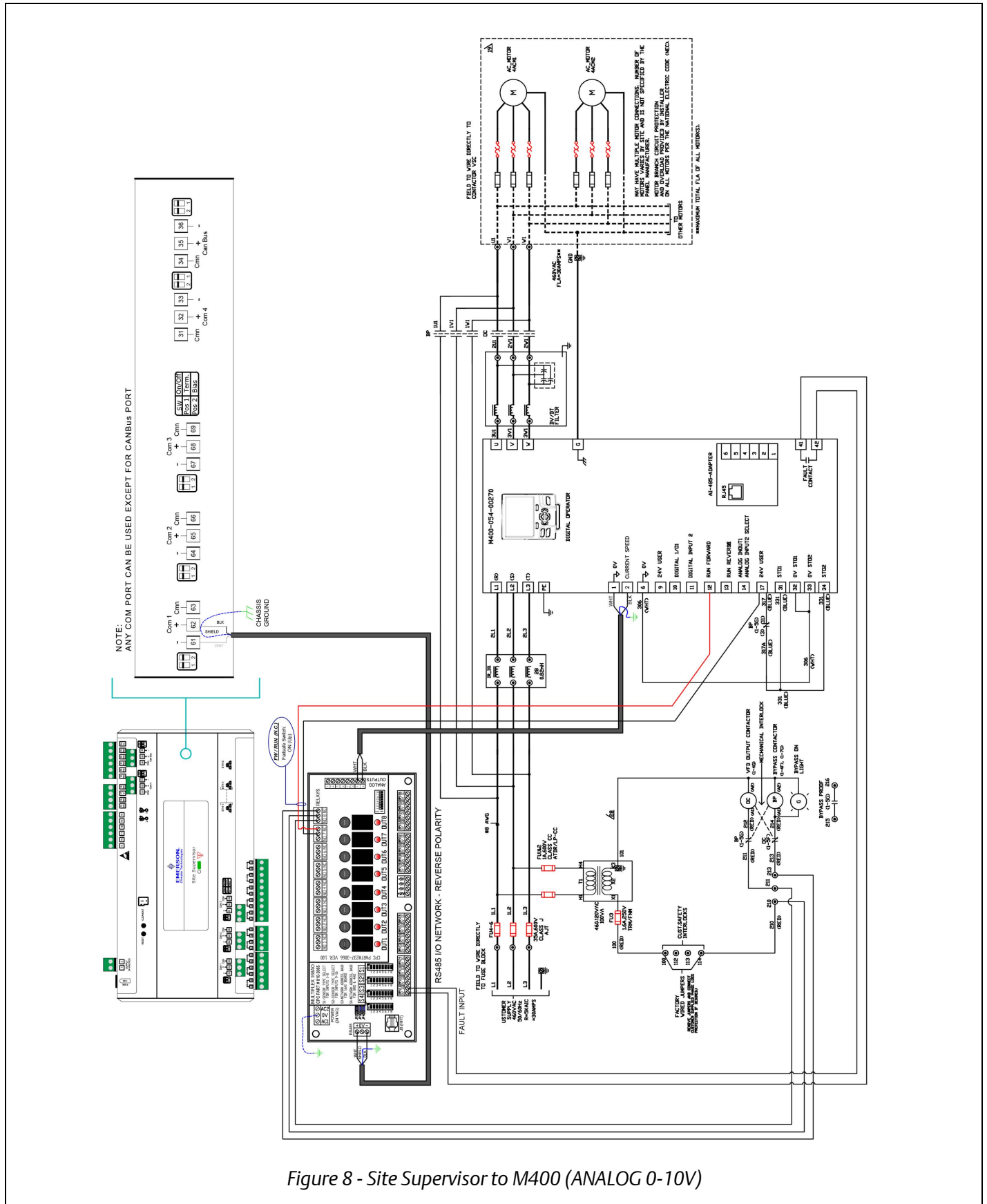

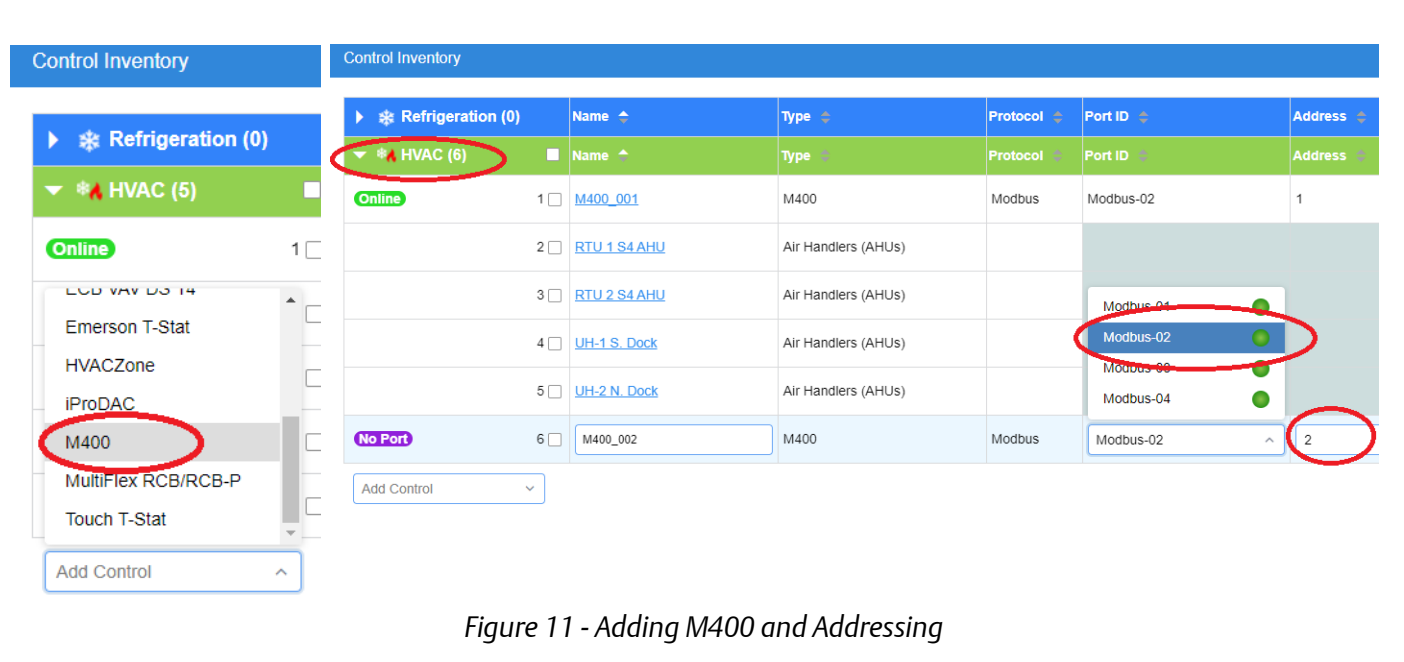


Figure 8 - Site Supervisor to M400 (ANALOG 0-10V)

STEP 4: Adding the Device to the Supervisory Controller


1. From the home page click the control inventory icon  to go to the Control Inventory page.
2. From the HVAC drop-down list, select M400 from the list.



Control Inventory						
Refrigeration (0)						
HVAC (6)						
Name	Type	Protocol	Port ID	Address		
Online	1	M400_001	M400	Modbus	Modbus-02	1
	2	RTU_1_S4_AHU	Air Handlers (AHUs)			
	3	RTU_2_S4_AHU	Air Handlers (AHUs)			
	4	UH-1_S_Dock	Air Handlers (AHUs)			
	5	UH-2_N_Dock	Air Handlers (AHUs)			
No Port	6	M400_002	M400	Modbus	Modbus-02	2

Figure 11 - Adding M400 and Addressing

STEP 5: Commissioning the Device to the Supervisory Controller

From the Control Inventory screen select the Modbus address for the M400 and click the checkmark  to save and start commissioning. **(Best practices tip: set the Modbus number to match the connected Com Port and the Address to match the M400 addressing in STEP 1).**

Drive Setup:

1. Click the M400 to go to the M400 setup page.
2. Go to the General tab.
3. Set CfgSyncAction on the to Write to Device.
4. On the Inputs tab, set **DIRECTION** to Forward or Reverse. This verifies that the drive should run correctly.
5. Set **RUN** to **OFF**. This verifies that the drive should inhibit.

6. Inputs tab on the Details screen:

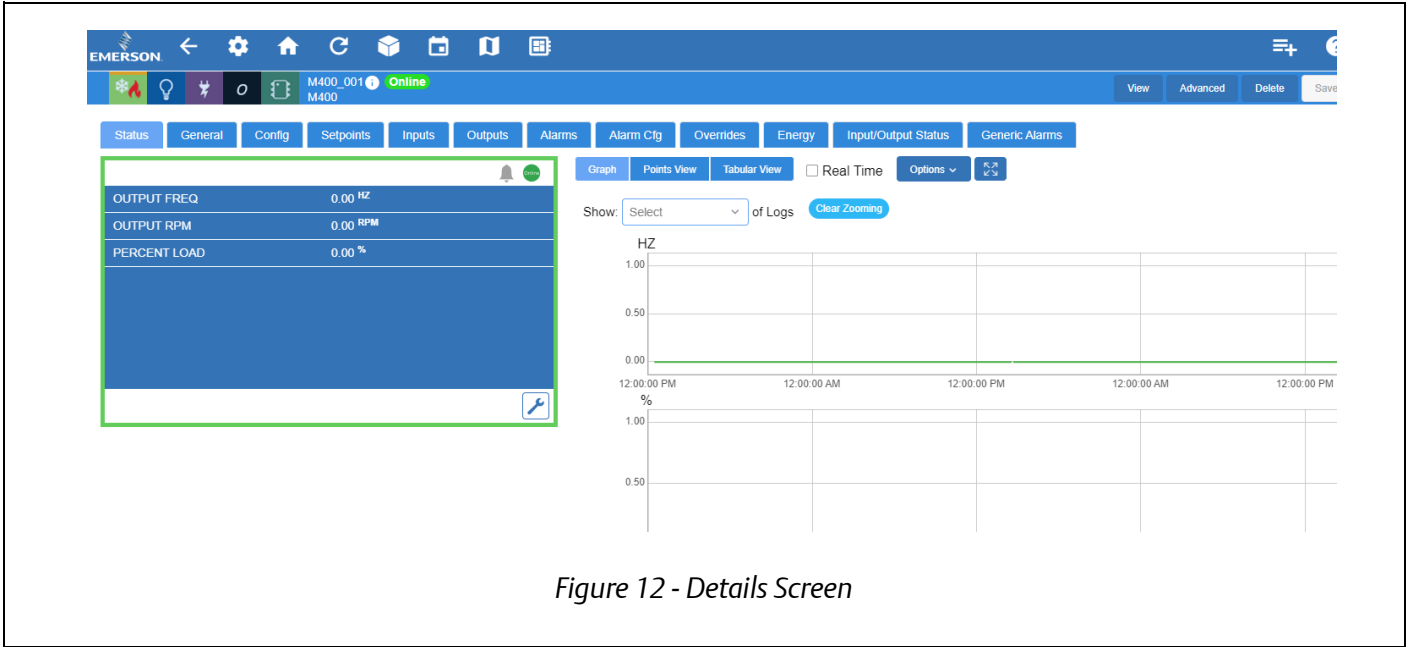


Figure 12 - Details Screen

7. Inputs tab on the Details screen:

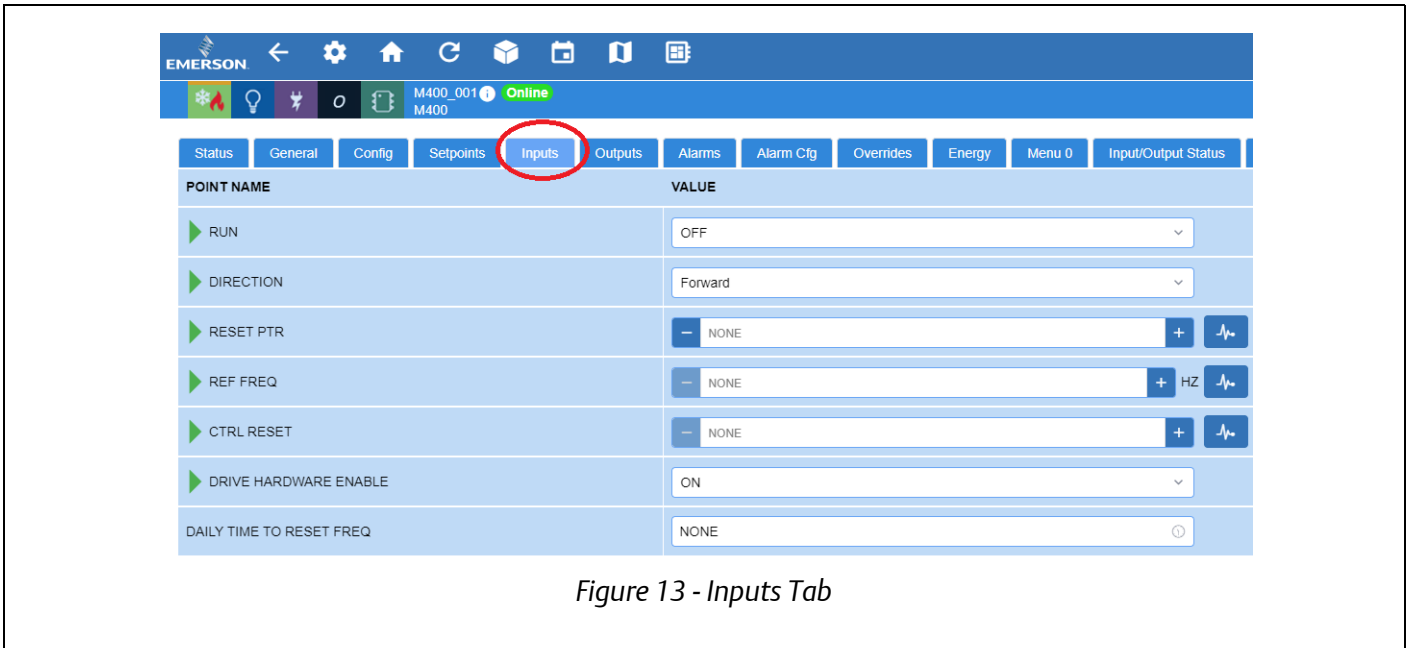


Figure 13 - Inputs Tab

- Go to the Setpoints tab to set the values for MOTOR VOLT, MOTOR RPM, and MOTOR FLA from the motor plate of the device.

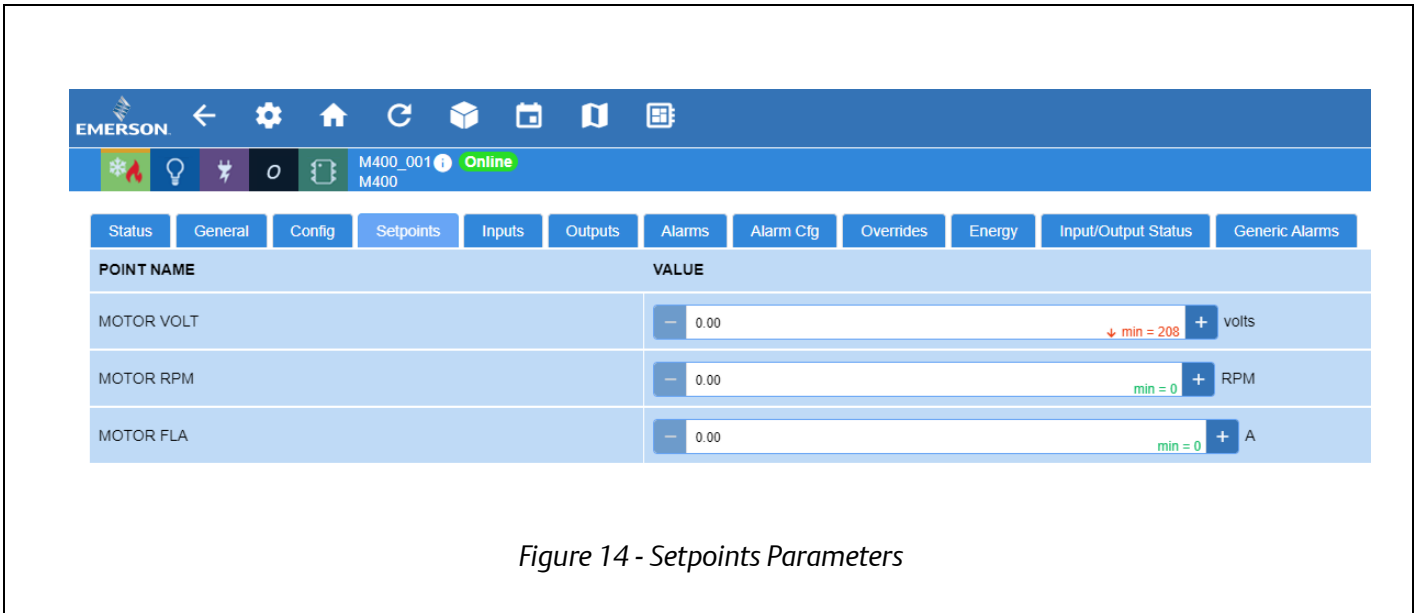


Figure 14 - Setpoints Parameters

- Go to the Status screen and the device will appear online:



Figure 15 - M400 VFD Device Status

10. General tab screen Verify Write to Device is set (default).

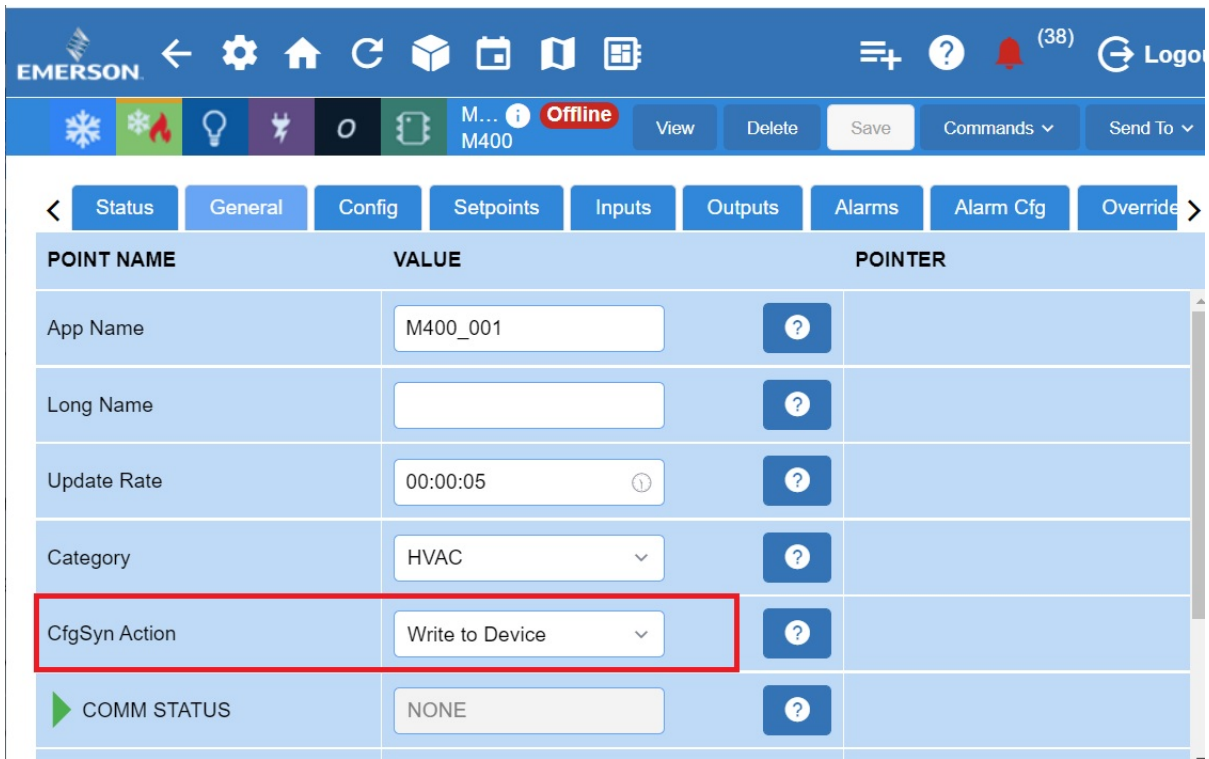


Figure 16 - General Tab Screen

11. From the Details screen, click Commands on the far right and select **NVM_SAVE**:

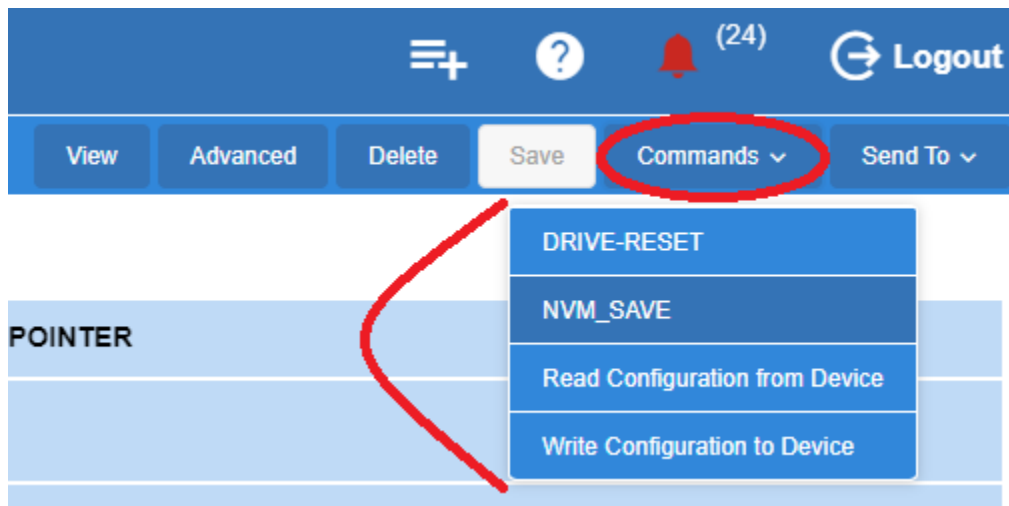


Figure 17 - Application Commands - NVM_SAVE

12. From the Details screen, click **Commands** on the far right and select **DRIVE-RESET**. The drive is now reset with the needed configuration.

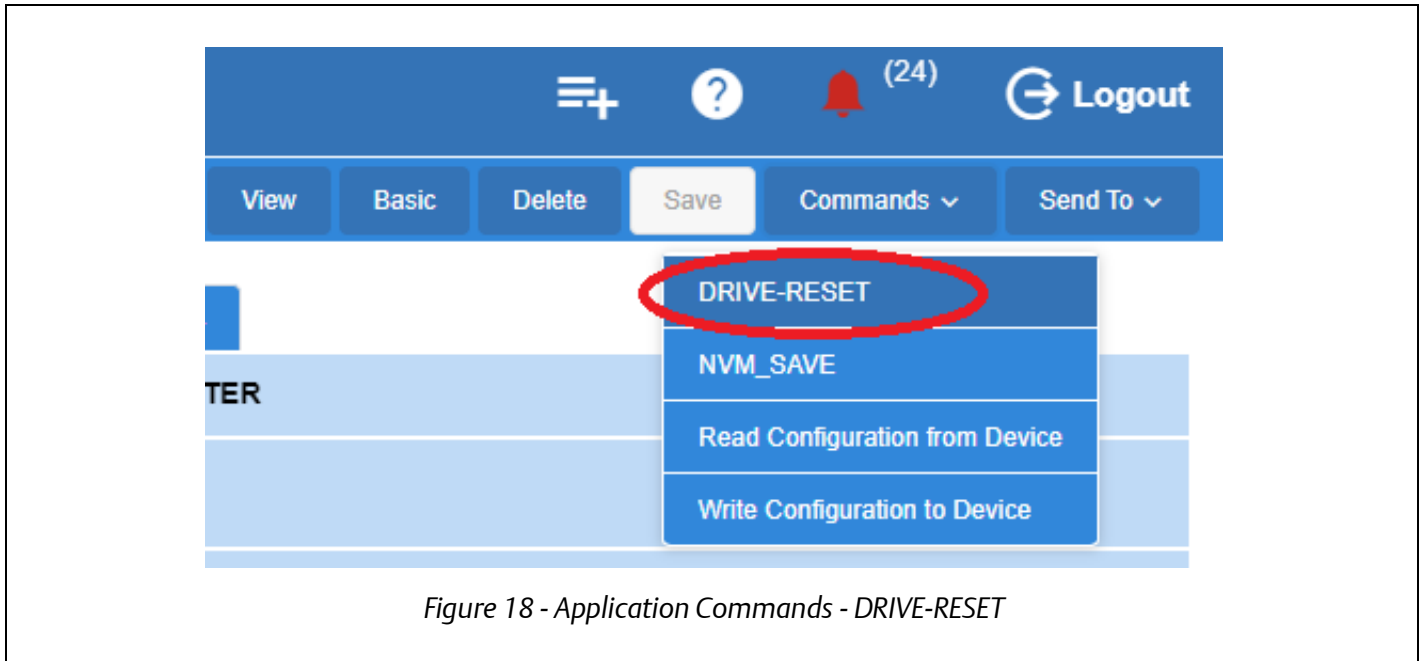


Figure 18 - Application Commands - DRIVE-RESET

STEP 6: Verification of Settings

1. After commissioning the new device, verify that the following values are set in the drive:
 - 0.009 (MOTOR_PWR_FACTOR) = 0.85 or the value that you set
 - 6.004 (Start/Stop Logic) = 6
 - 8.023 (Digital input 3) = 0.000

The following parameters must be set up in the *Inputs* tab to run the drive.

- RUN (ON)
- DIRECTION (FORWARD, REVERSE)
- REF FREQ (the speed setting of the motor)

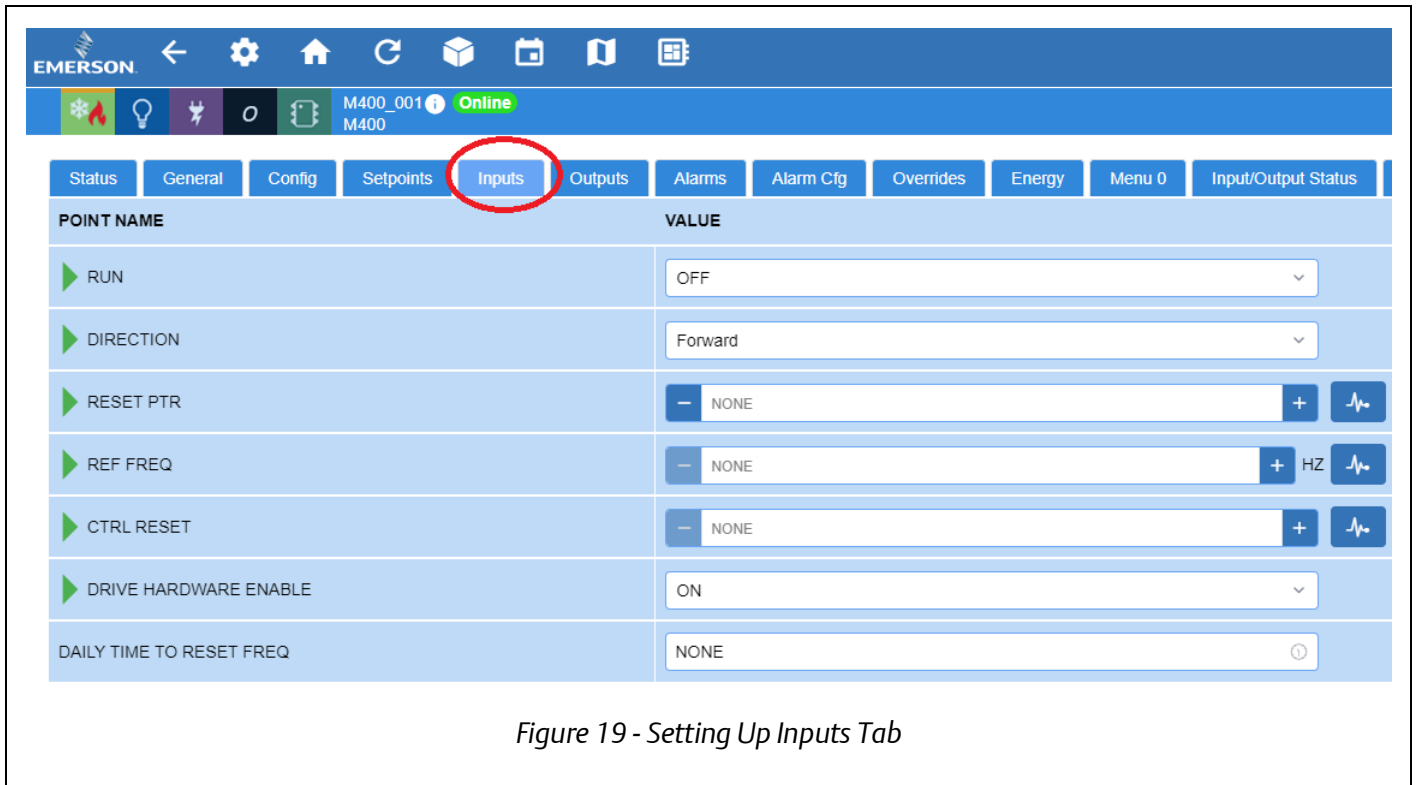


Figure 19 - Setting Up Inputs Tab

2. Use Table 1- Menu 0 Guide to verify values set in the M400 drive.

Note: Table 1- Menu 0 Guide gives diagnostic information about the system. It allows you to double check to make sure that the E2 controller sent the correct parameters.

Menu 0 Pr	Description	Value to Write	Comments	Parameter	Type
1	Drive Configuration	Preset	Sets drive mode to Preset	11.034	Mode
2	Serial Baud Rate	19200	Sets baud to 19200	11.025	Mode
3	Serial Address	2	Set the address for each drive on network.	11.023	Mode
4	Serial Mode	8 1 NP	Set to match mode of E2E	11.024	Mode
5	Reset Serial Communications	Toggle ON/	Set this to ON / OFF to reset communications. Connects	11.02	Mode
6	Motor Rated Current	See Motor	Set from motor nameplate.	5.007	Motor
7	Motor Rated Speed	See Motor	Set from motor nameplate.	5.008	Motor
8	Motor Rated Voltage	See Motor	Set from motor nameplate.	5.009	Motor
9	Motor Power Factor	See Motor	Set from motor nameplate. (Use 0.85 if absent.)	5.010	Motor
10	Security / Parameter Access	Set to All Menus	Set to all Menus to see access Menu 1 to 22	11.044	Access
12	STO 1 State	RO	0=disabled, 1=enabled	8.039	Info
13	STO 2 State	RO	0=disabled, 1=enabled	8.040	Info

Table 1 - Menu 0 Guide

Menu 0 Pr	Description	Value to Write	Comments	Parameter	Type
14	Reference Selected	RO	Shows reference selected. Hz desired.	1.001	Info
15	Value of reference in rpm	RO	Shows reference in rpm.	1.069	Info
16	Hz sent from controller	RW	Can see speed sent from controller here	1.021	Info
20	Preset Speed 2 (Manual)	RW	Use this to set manual / test speed.	1.022	Manual
21	Preset Selector	0 or 2	Use this to turn on manual / test speed.	1.015	Manual
30	Current Trip (Trip 0)	RO	Gives code for current trip. (Trip 0)	10.020	Trip
31	Trip 1	RO	Previous trip - before Trip 0	10.021	Trip
32	Trip 2	RO	Previous trip - before Trip 1	10.022	Trip
33	Trip 3	RO	Previous trip - before Trip 2	10.023	Trip
34	Trip 4	RO	Previous trip - before Trip 3	10.024	Trip
35	Trip 5	RO	Previous trip - before Trip 4	10.025	Trip
36	Trip 6	RO	Previous trip - before Trip 5	10.026	Trip
37	Trip 7	RO	Previous trip - before Trip 6	10.027	Trip
38	Trip 8	RO	Previous trip - before Trip 7	10.028	Trip
39	Trip 9	RO	Previous trip - before Trip 8	10.029	Trip

Table 1 - Menu 0 Guide

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