E2 setup with M400 VFD drive for 527-0431

This document will guide you through setting up and commissioning the M400 Control Techniques VFD Drive in the E2 controller.

Note that Open MODBUS Description files require E2 firmware version 3.01F01 or higher.

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.

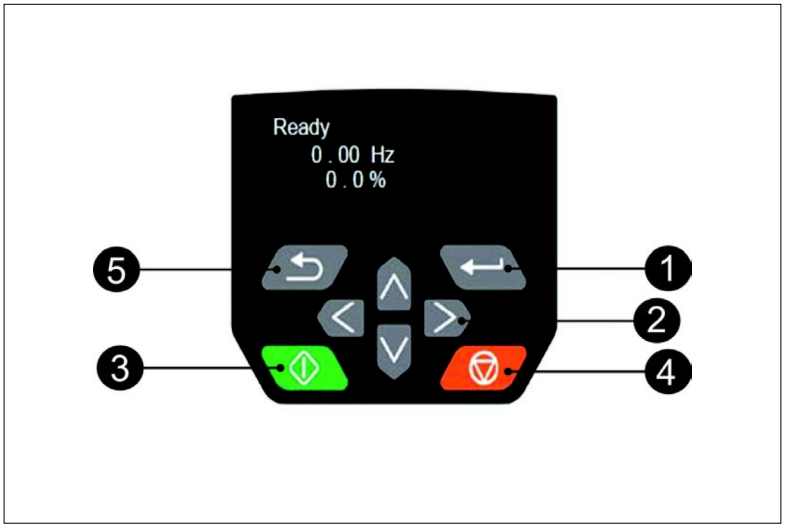

Figure 1 - Unidrive M400 keypad details

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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.

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 E2 controller and ready for test/run.

Step 2: Uploading the description file to the E2 controller

1. From UltraSite, connect to your E2 controller.
2. Right-click on the E2 icon and select **Description File Upload**.
3. Browse to the location of the description file and click **Upload**.
4. Once the upload is complete, **reboot** the E2 controller.

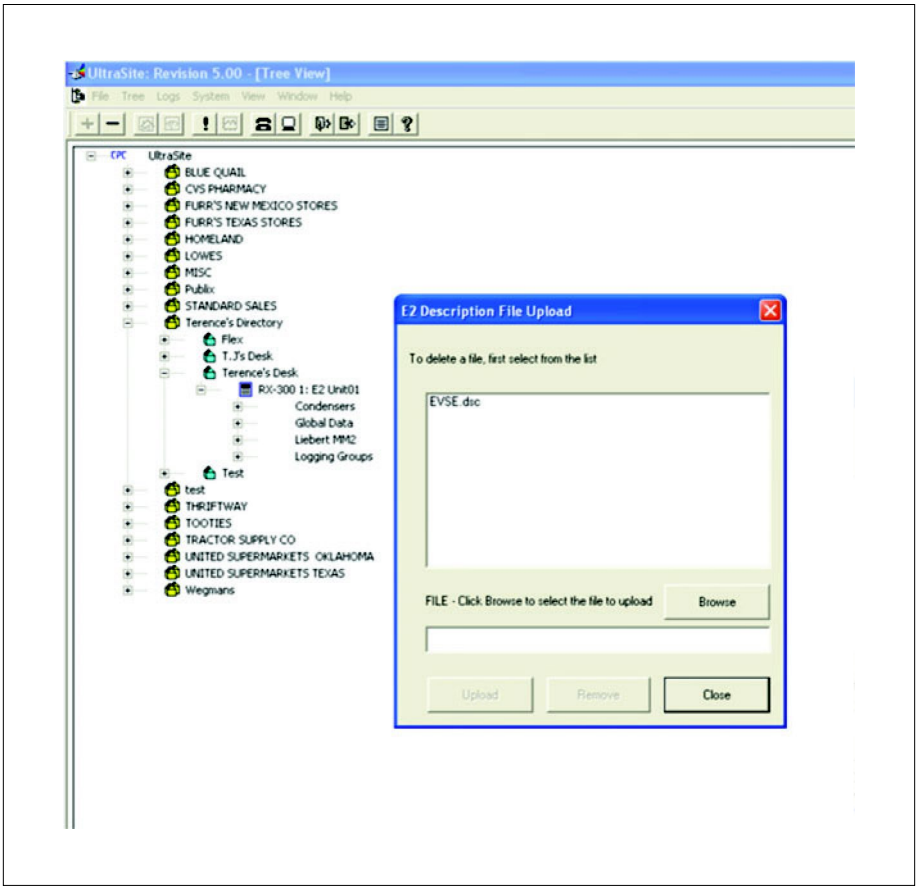

Figure 2 - E2 description file upload window

Step 3: Activating the license of the device

1. From the E2 front panel (or via Terminal Mode), press Menu, & 7 (*System Configuration*) and (9 (*Licensing*).

2. Press F1 (*ADD FEATURE*) and enter the license key. Press Home to save changes.

Figure 3 - add license screen

Step 4: Setting the baud rate in the E2 controller

1. Press Menu, & 7 (*System Configuration*), $ 4 (*Remote Communication*) and # 3 (*TCP/IP Setup*).

2. Press F2 (NEXT TAB) to shift over to the Serial tab. Select COM port, then set Baud rate to **19200**, Data Size to **8**, Parity to **None** and Stop Bits to **1**.

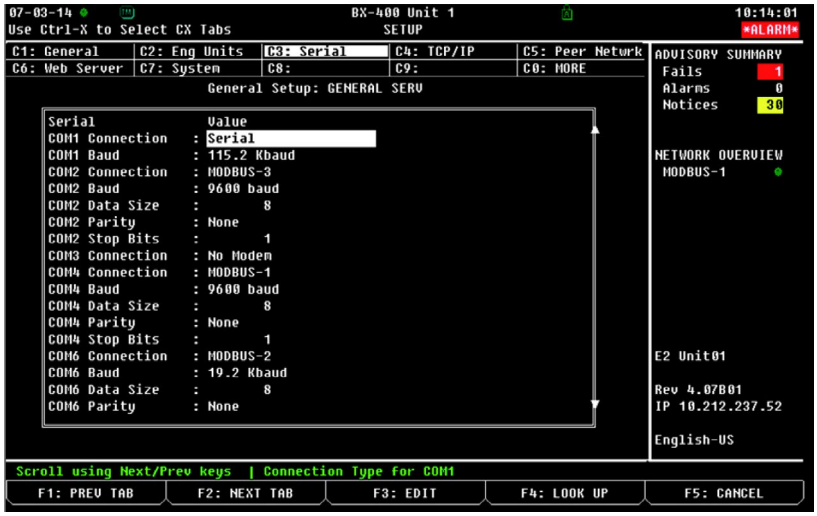

Figure 4 - set the baud rate, data size, parity and stop bits

Step 5: Wiring the M400 VFD device

Wire the device as shown below.
Note: Do not connect device communications to the E2 controller.

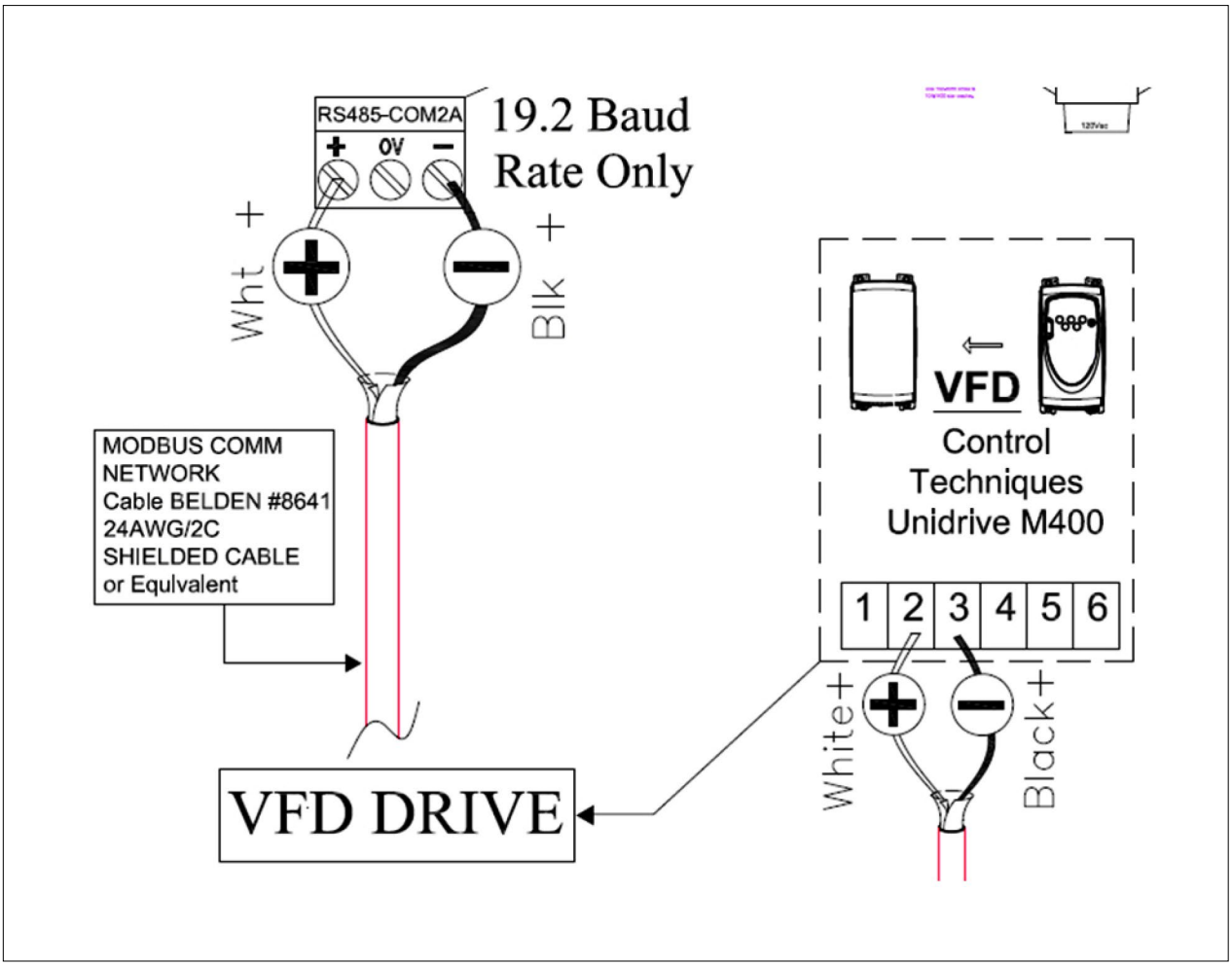

Figure 5 - Wire the M400 VFD Device

Step 6: Adding the device to the E2 controller

1. Press Menu, & 7 (*System Configuration*), & 7 (*Network Setup*), @ 2 (*Connected I/O Boards & Controllers*).

2. Press F2 (*NEXT TAB*) to shift over to the *C4: Third Party* tab. The name of the device will display in the list. Highlight the device name and enter the number of devices. Then press ⌂ to save changes.

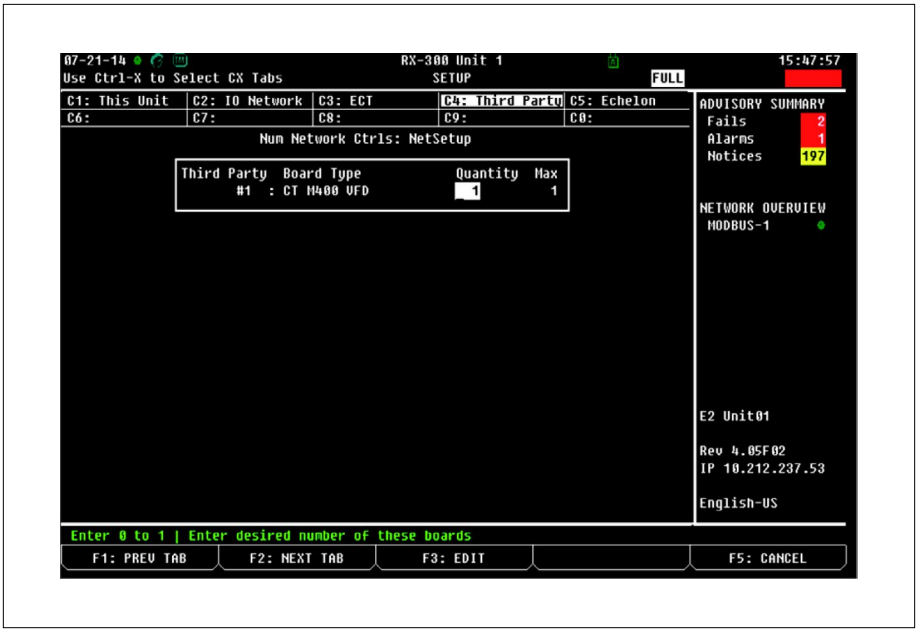

Figure 6 - third party tab

Step 7: Commissioning the device to the E2 controller

1. Press Menu, 7 (*System Configuration*), 7 (*Network Setup*), 1 (*Network Summary*).

2. On the *Network Summary* screen, press F4 (*COMMISSION*) and select the preferred MODBUS port. Select the MODBUS device address and press ↵.

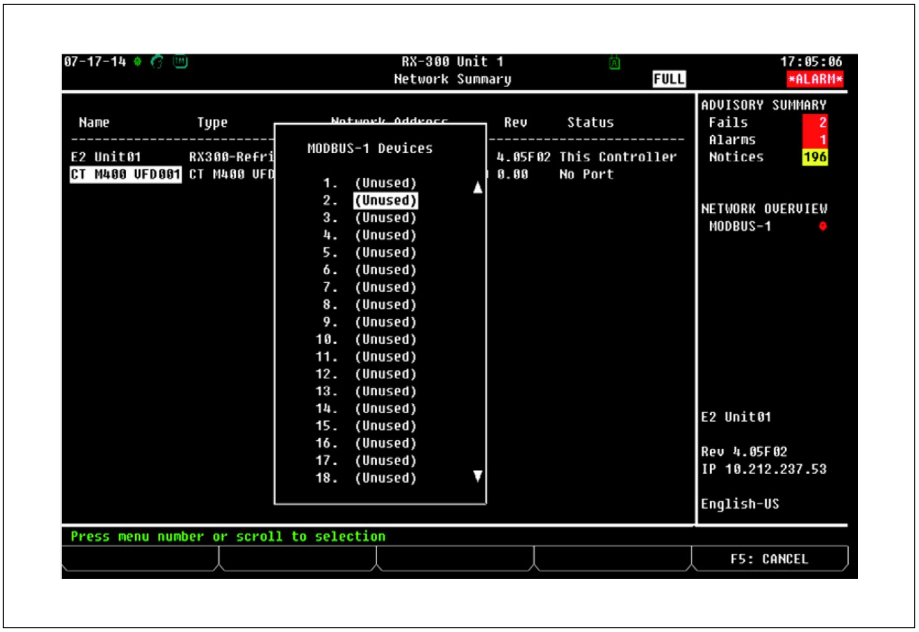

Figure 7 - select the MODBUS port

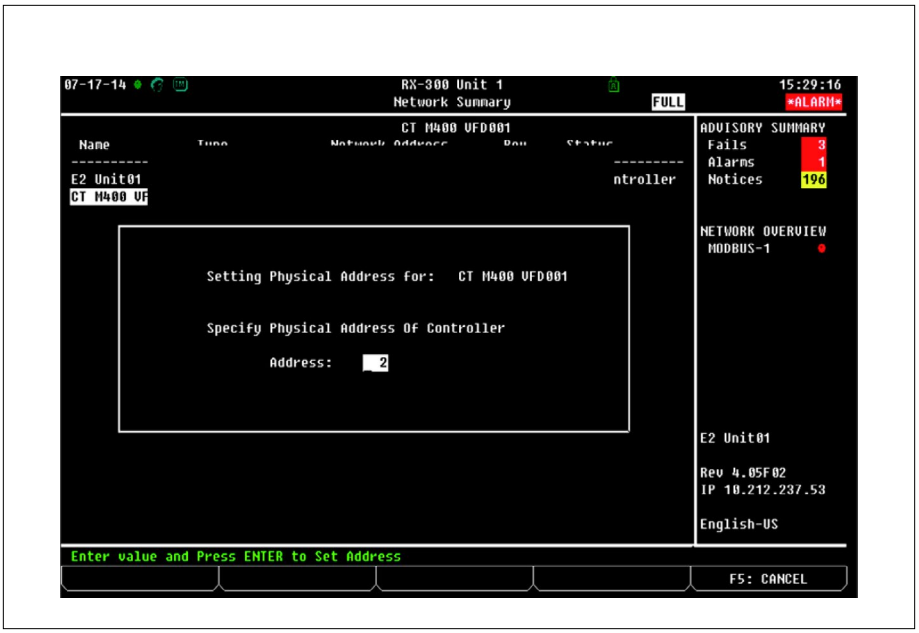

Figure 8 - enter the MODBUS device address

3. After setting and saving the device address, press **F2** to go to the *Status* screen.

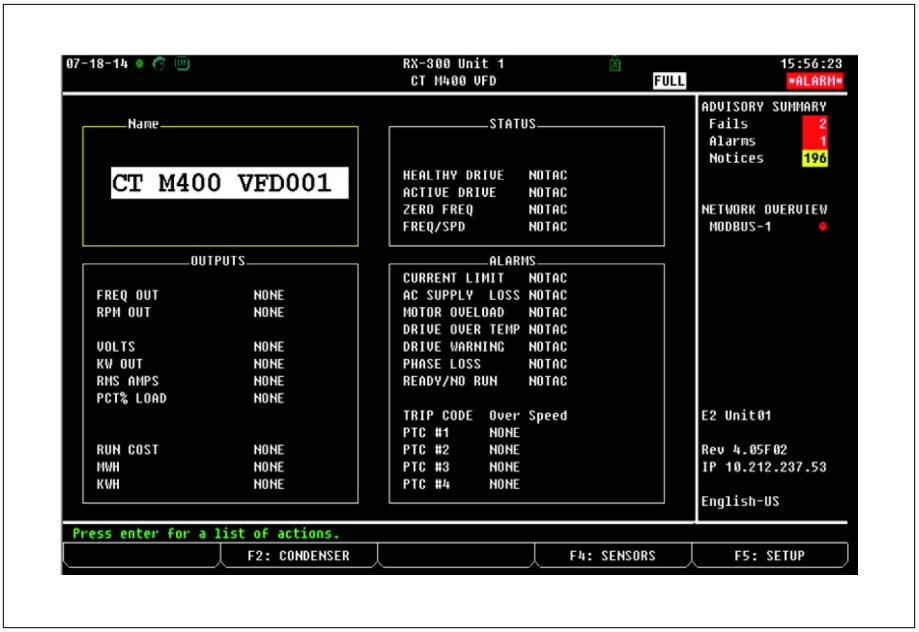

Figure 9 - device status screen

4. Press **F5**, **F2**, **F2** to shift over to the *Setpoints* tab. Set values for **Motor Voltage**, **Motor RPM** and **Motor FLA** from the motor plate of the device.

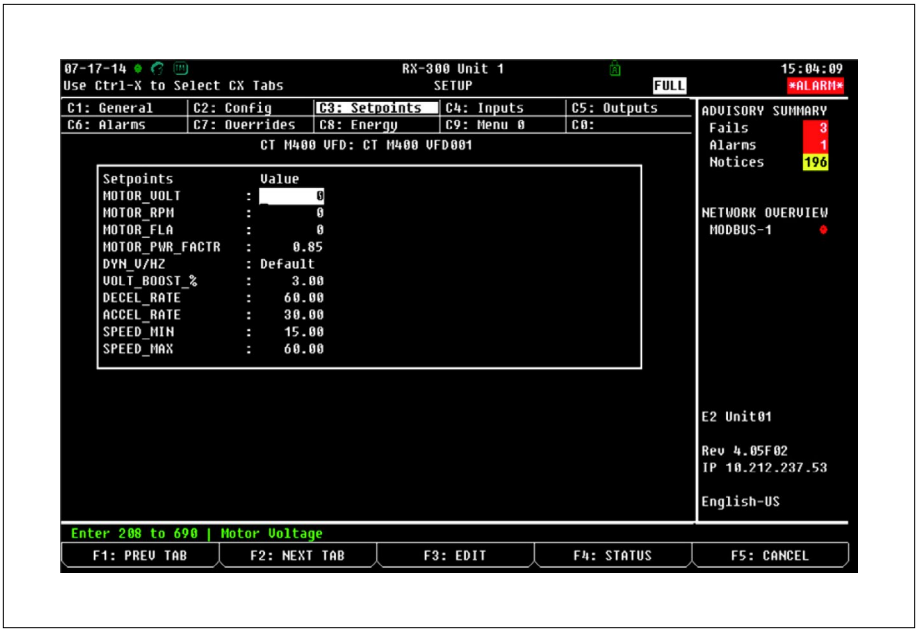

Figure 10 - setpoints tab

5. Press ⏎ to go back to the Status screen. Connect device communications to the E2 controller, then the device will appear **Online**.

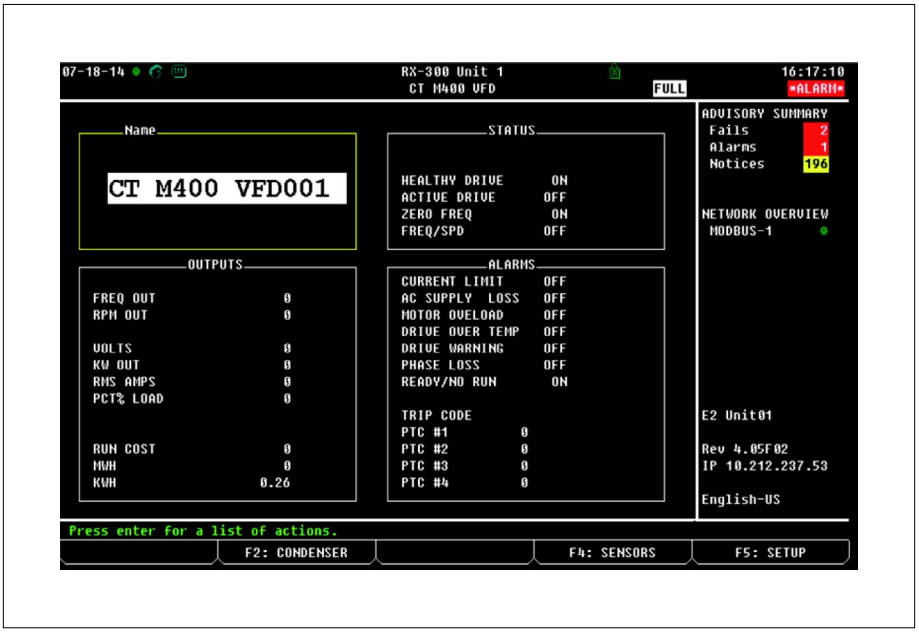

Figure 11 - M400 VFD device status

6. Press Enter to go to the *Actions* menu, then select 9 (*Application Commands*).

Figure 12 - actions menu

7. Select # 3 (*Send E2 Cfg to Device*), to send all information to the drive.

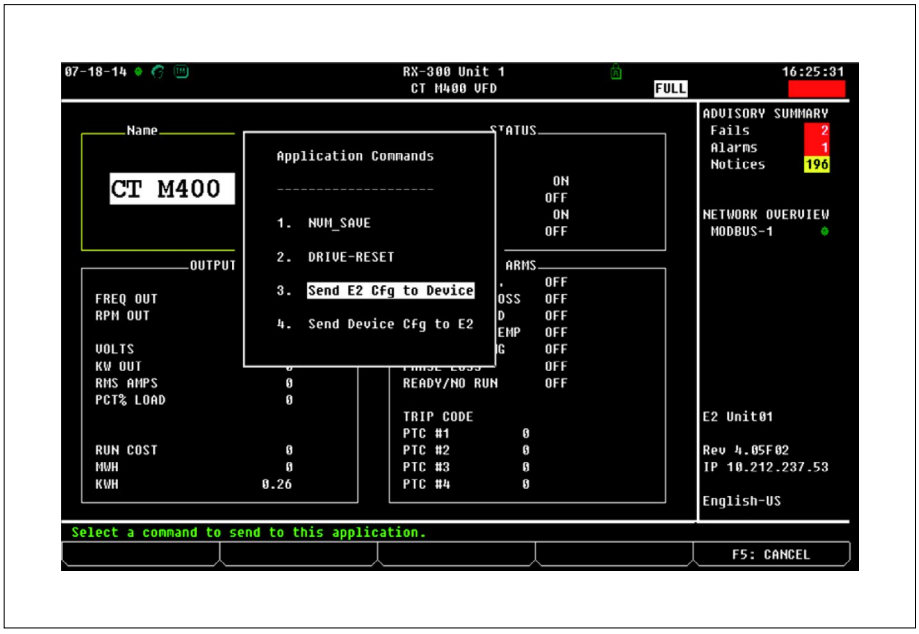

Figure 13 - application commands

8. Press Enter to go to the *Actions* menu, then select (9 (*Application Commands*), @ 2 (*NUM_SAVE*). All parameter values are now saved in NVM (Memory).

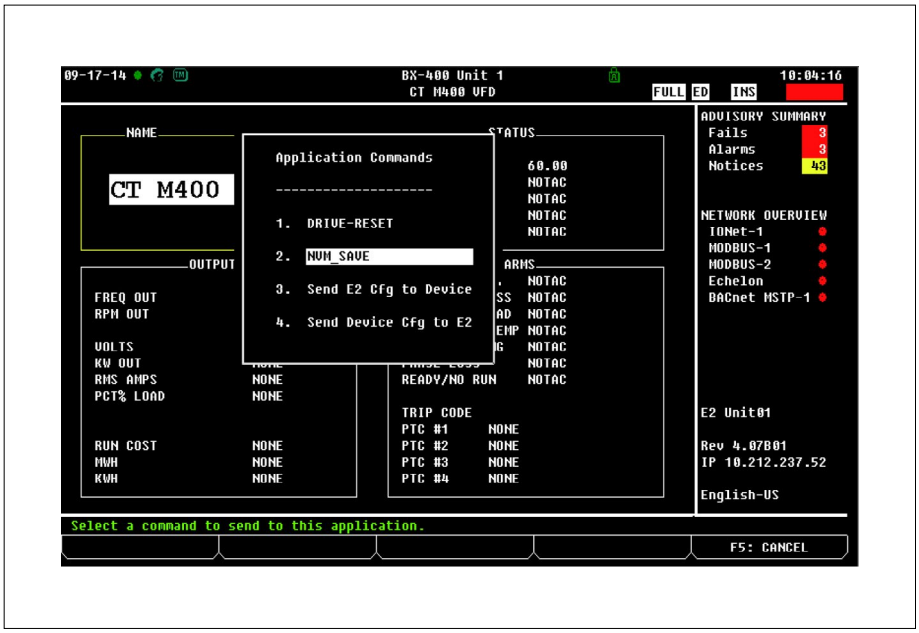

Figure 14 - Application Commands - NUM_SAVE

9. Press Enter to go to the Actions menu, then select 9 (*Application Commands*), 1 (*DRIVE-RESET*). The drive is now reset with the needed configuration.

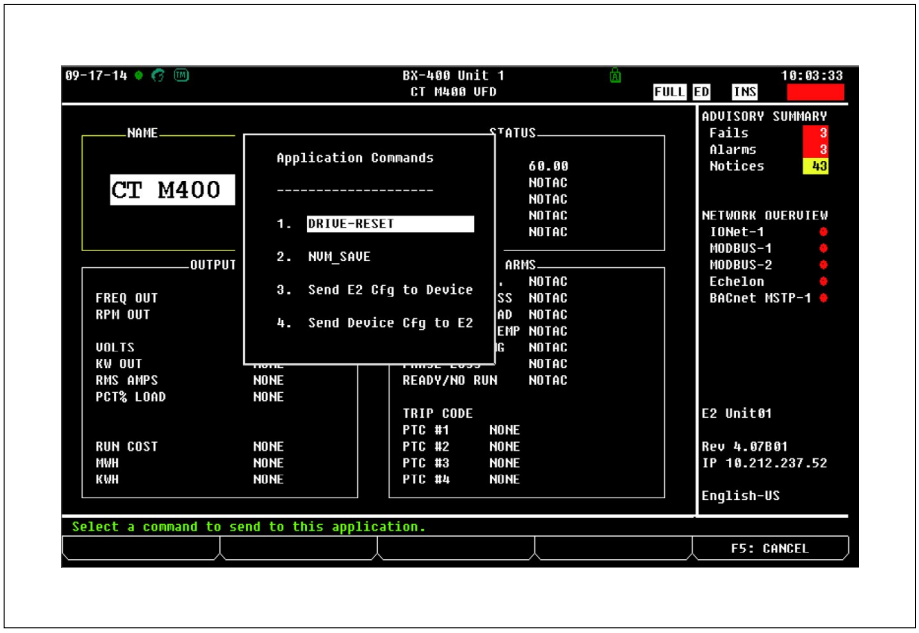

Figure 15 - application commands - DRIVE-RESET

Step 8: 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.

- DRIVE_SW_ENABLE (ON)
- DR_RUN_FWD (ON)
- REF_SPEED (The speed you want the motor to run)

Press F5 , F2 , F2 , F2 to shift over to the *Inputs* tab.

Note: To enter values, press F3 *(EDIT),* 1 *(Alternate I/O Format).*

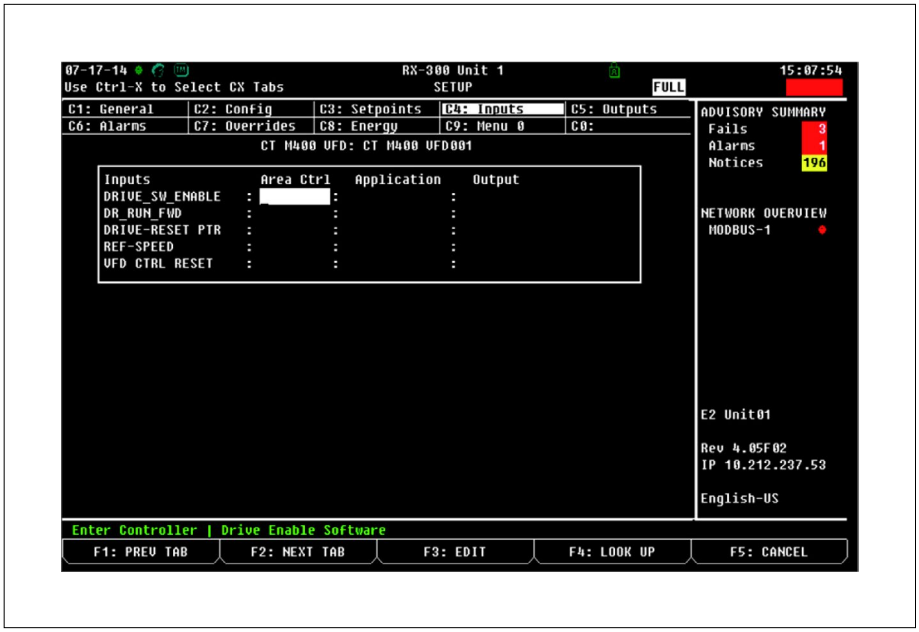

Figure 16 - setting up inputs tab

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
14	Reference Selected	RO	Shows reference selected. Hz desired.	1.001	Info

Table 1 - menu 0 guide

Menu 0 Pr	Description	Value to write	Comments	Parameter	Type
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 Trip1	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

About Copeland

Copeland is a global leader in sustainable heating, cooling, refrigeration and industrial solutions. We help commercial, industrial, refrigeration and residential customers reduce their carbon emissions and improve energy efficiency. We address issues like climate change, growing populations, electricity demands and complex global supply chains with innovations that advance the energy transition, accelerate the adoption of climate friendly low GWP (Global Warming Potential) and natural refrigerants, and safeguard the world's most critical goods through an efficient and sustainable cold chain. We have over 18,000 employees, with feet on the ground in 50 countries - a global presence that makes it possible to serve customers wherever they are in the world and meet challenges with scale and speed. Our industry-leading brands and diversified portfolio deliver innovation and technology proven in over 200 million installations worldwide. Together, we create sustainable solutions that improve lives and protect the planet today and for future generations. For more information, visit copeland.com.

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