

E2 and XM678D with EX3

Installation, Replacement, and Troubleshooting Guide

PART 1: Device Setup

This document contains installation, replacement, and troubleshooting information for the E2 and XM678D with EX3. For XM678D with EX3 wiring connections, refer to *Figure 21 - XM678D and EX3 Wiring Diagram*.



Figure 1 - XM678D with EX3 and CX660 Keyboard









Setting Address on XM678D Device Using CX660 Keyboard

1. Press **SET** + **↓** at the same time for five seconds to open the first level programming. The display will stop flashing when it has entered programming mode.
2. Navigate through the parameters by pressing **↓** or **↑** until **Adr** is displayed.
3. Press **SET** and assign the corresponding address for the device by pressing **↓** or **↑**.
4. Press **SET** to save changes.
5. To exit, press **SET** + **↑** or wait a few seconds without pressing any key; the display will start flashing.



Figure 2 - XM678D Display and Keyboard

E2 Serial Port Setup

1. Log into the E2 controller by pressing the  button.
2. Enter USER in the **Username** field and press .
3. Enter PASS in the Password field and press .
4. Press , , ,  (*General Controller Info*).
5. Press  twice to move to the *C3: Serial* tab.

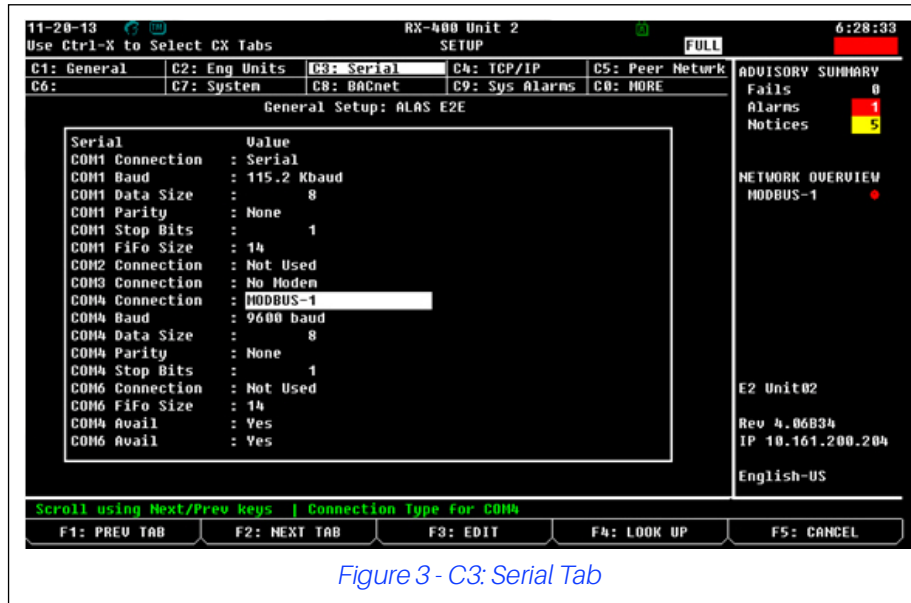









Figure 3- C3: Serial Tab

6. Press the down arrow key to highlight the **COM2 Connection** value:
 - 6-A. Press  (*LOOK UP*) and select **MODBUS-1** (if MODBUS-1 is being used, select **MODBUS-2** or **MODBUS-3** connection).
 - 6-B. Press  to set configuration.
 - 6-C. Set **MODBUS Connection** as follows: (Press  to select options and  to set configuration).
 - **COM2 Baud:** 19200 baud
 - **COM2 Data Size:** 8
 - **COM2 Parity:** None
 - **COM2 Stop Bits:** 1
7. Press  to save changes.
8. Press  to go back to the *Home* screen.

Note: MODBUS Connection must be set to 9600 baud.

PART 2: Adding the XM678D Controller in E2

1. Press , **7**, **7**, **2** (Connected I/O Boards and Controllers).
2. Press **F2** once to move to the C3: ECT (Electronics Communications Tab). Highlight the **XM678D** device and enter the desired number of devices under **Quantity**.

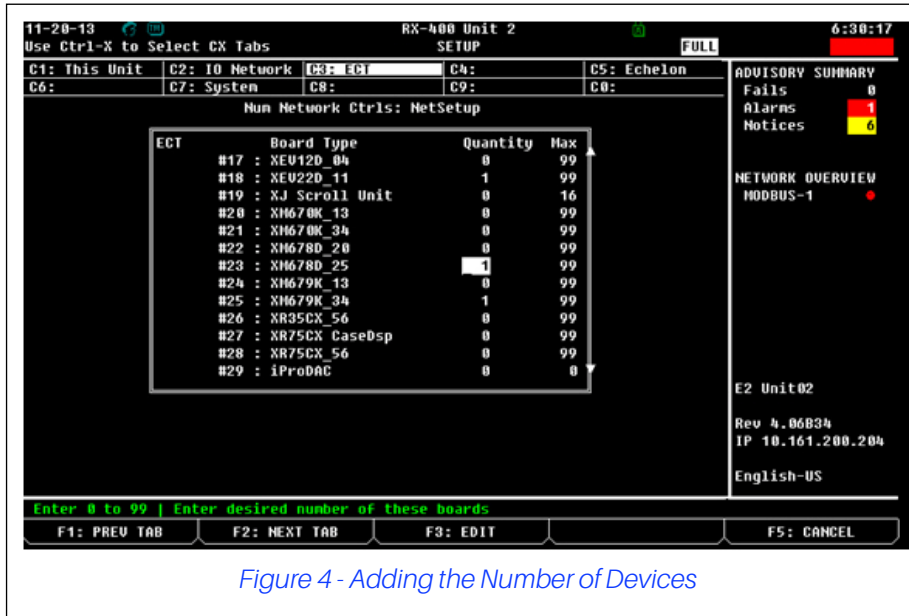





Figure 4 - Adding the Number of Devices

3. Press  to save changes.
4. Press  to go back to the Home screen.

PART 3: Commissioning the XM Case Circuit Controller

1. Press , **7**, **7**, **1** to open the Network Summary screen.
2. Highlight the **XM678D** device to be commissioned by pressing the down arrow key and press **F4**.

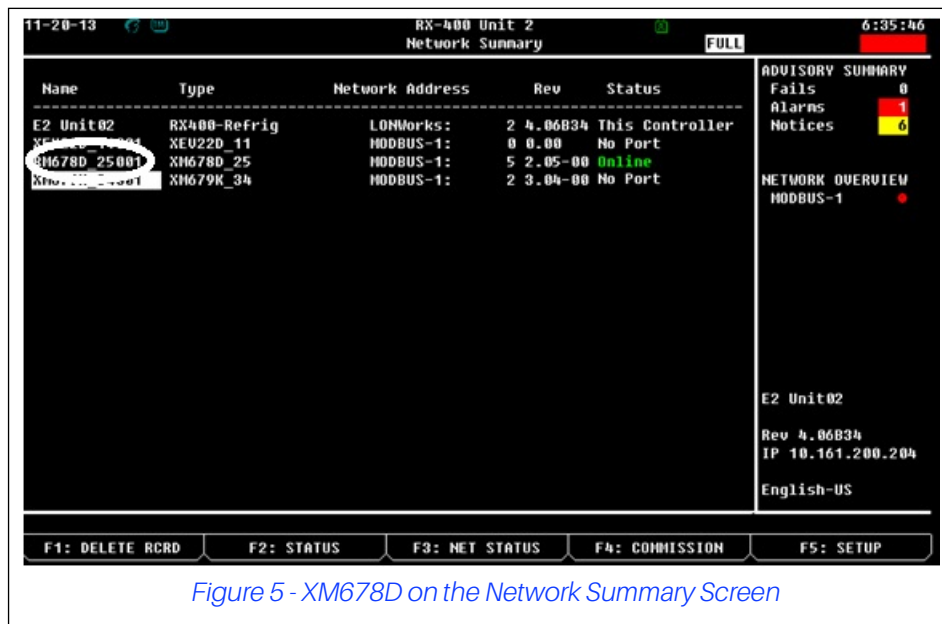




Figure 5 - XM678D on the Network Summary Screen

3. If a *Select Network* box appears, select the MODBUS number where you configured the device and press .

4. Select the address for the device and press .

NOTE: The MODBUS device address must be the same as the address assigned on the device in the **Setting Address on XM678D Device Using CX660 Keyboard** section.

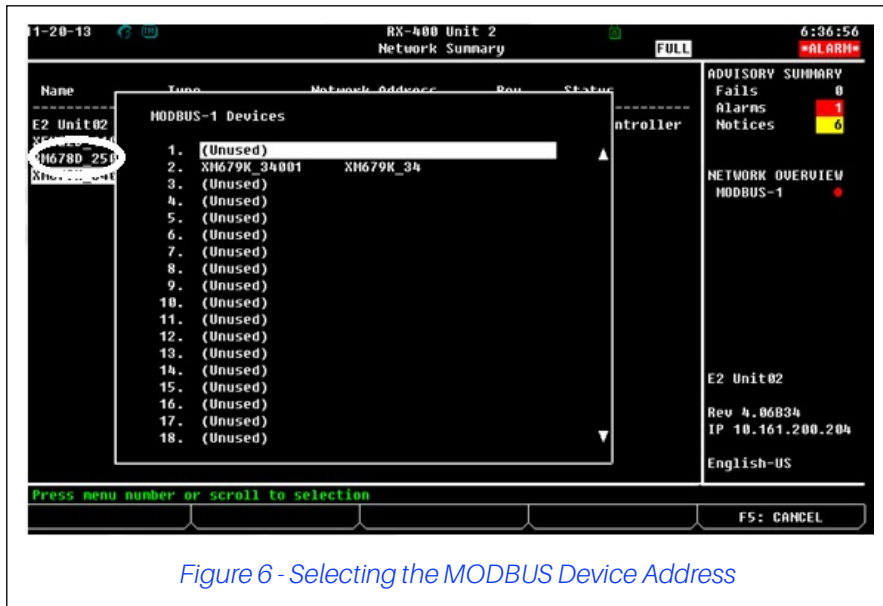



Figure 6 - Selecting the MODBUS Device Address

5. The screen for setting the physical address appears, press  to continue.



Figure 7 - Physical Address Screen

6. Press  to save the assigned address.

7. Press  to return to the *Home* screen.

8. Press , , ,  to open the *Network Summary* screen.

9. Wait for a few seconds and the XM678D device should appear online.

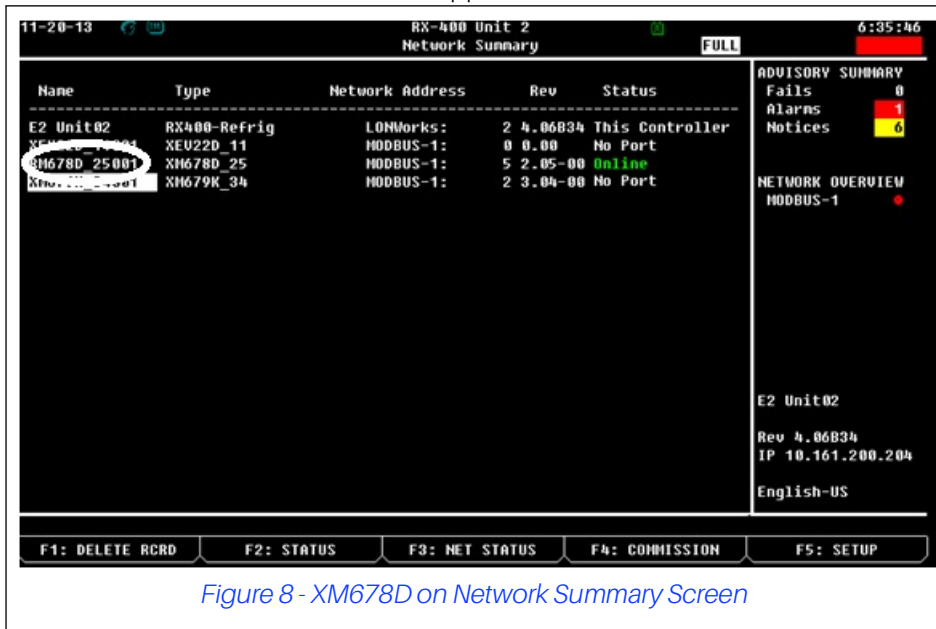


Figure 8 - XM678D on Network Summary Screen

10. Repeat the process for the other devices.

PART 4: Adding the XM Circuit Application

1. Press **Menu**, **6**, **1** to open the Add Application screen.

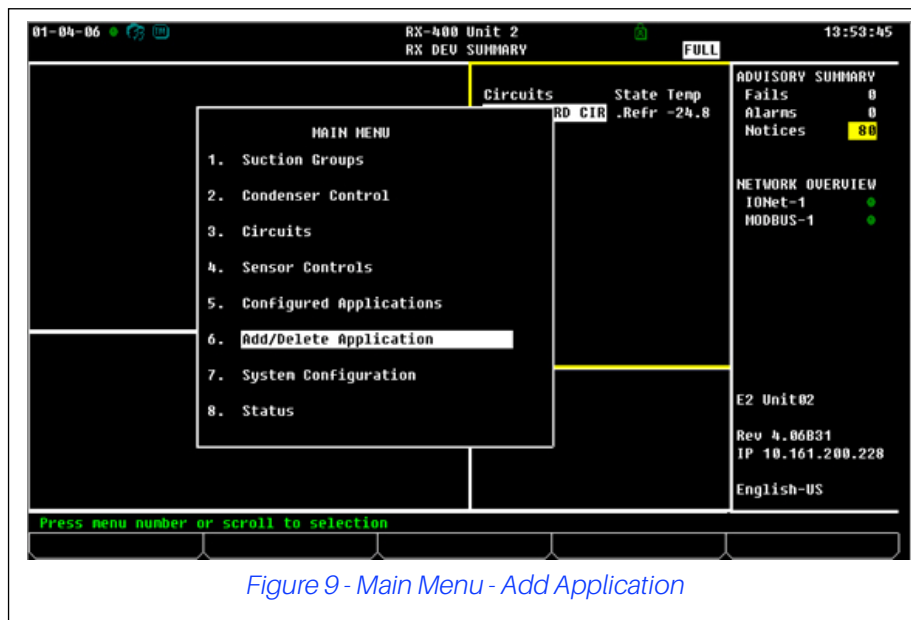
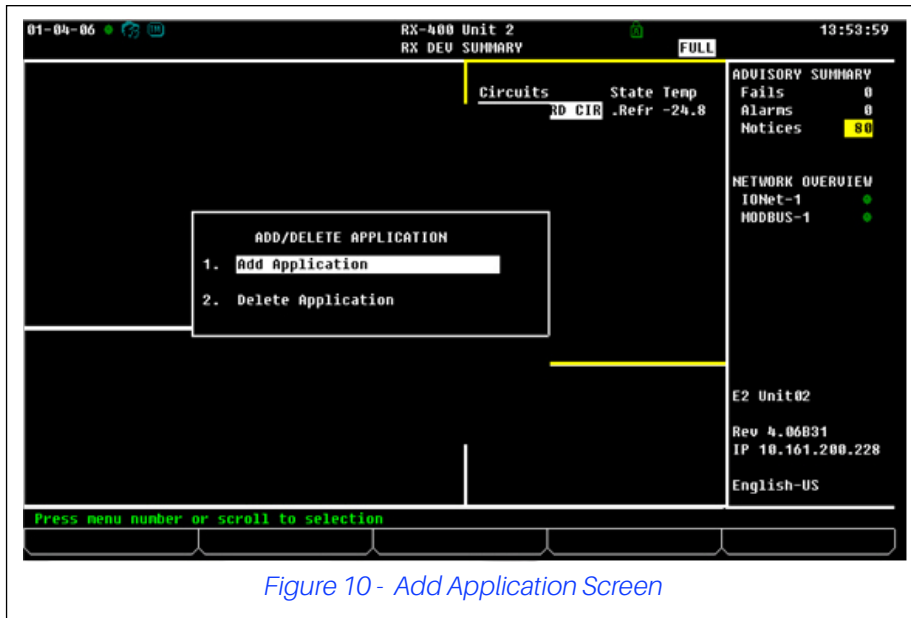
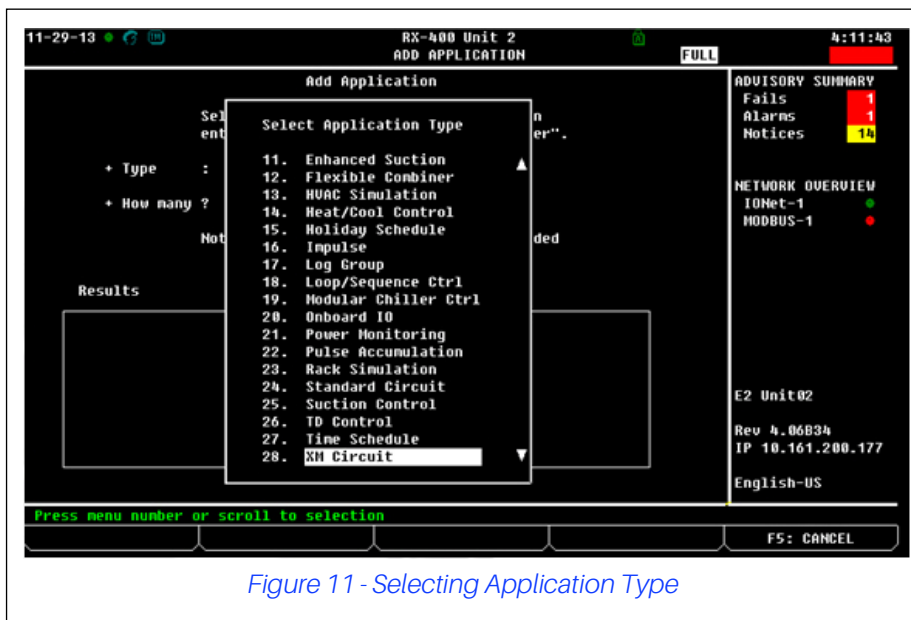


Figure 9 - Main Menu - Add Application



2. Press **F4** (LOOK UP).
3. Scroll down by pressing the down arrow key and highlight **XM Circuit**.



4. Press **Enter**.

5. Enter the desired number of XM Circuit applications to add.

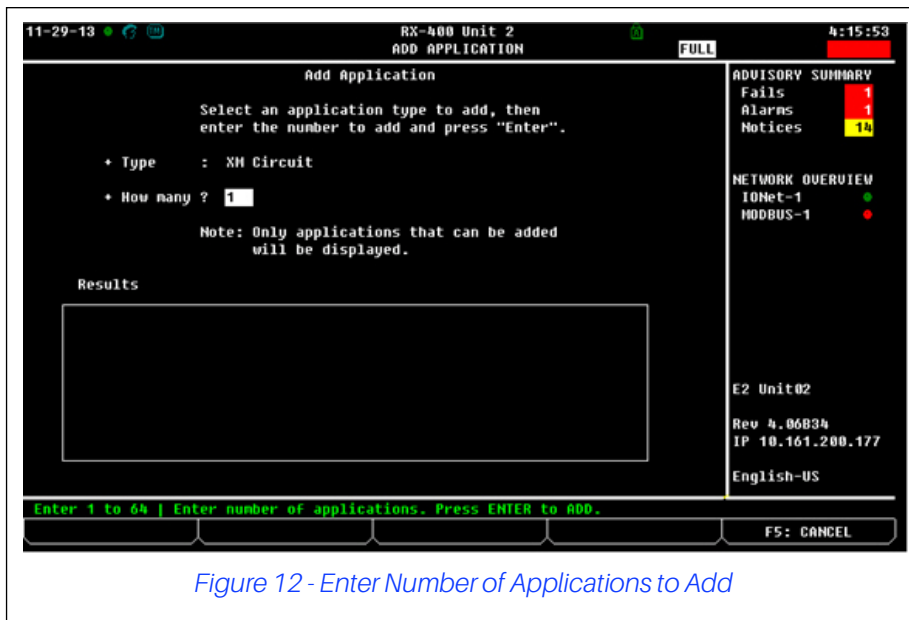



Figure 12 - Enter Number of Applications to Add

6. Press .
7. A message will appear; press Y for Yes if you want to edit the newly added application.

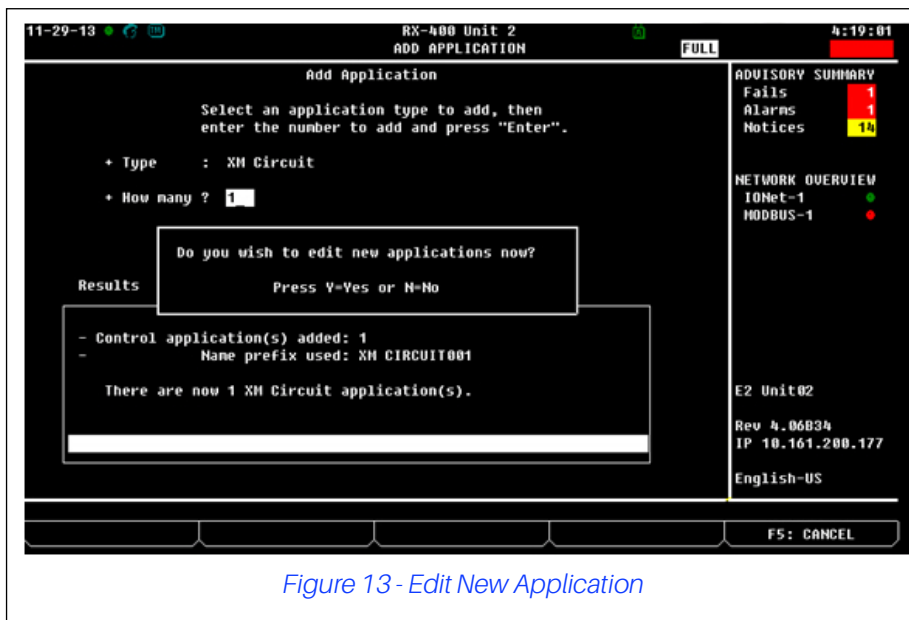






Figure 13 - Edit New Application

8. Enter the appropriate name for the XM Circuit application.
9. Press  to save changes.
10. Press  to go back to the Home screen.

PART 5: Associating XM678D to the XM Circuit Application

1. Press ,  for System Configuration.

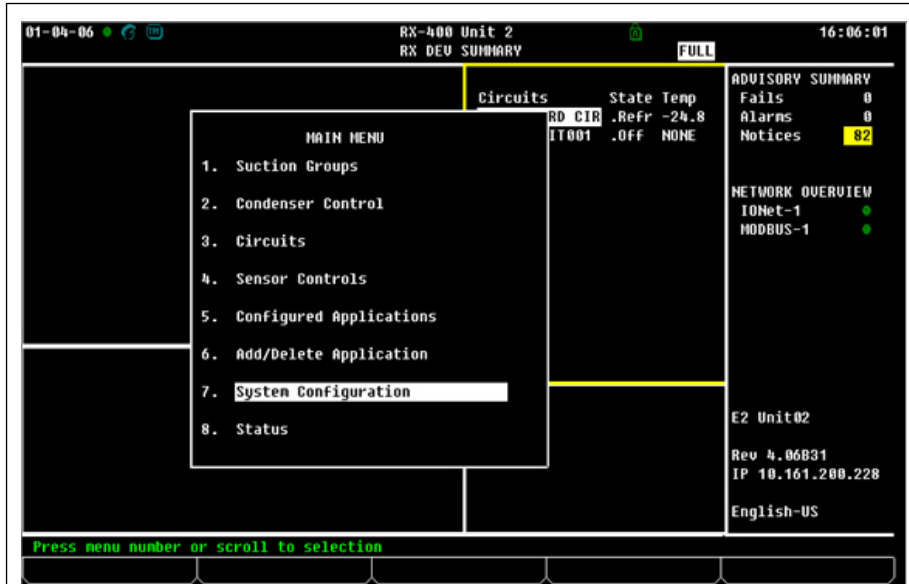


Figure 14 - Choose System Configuration

2. Press ,  for Network Setup.

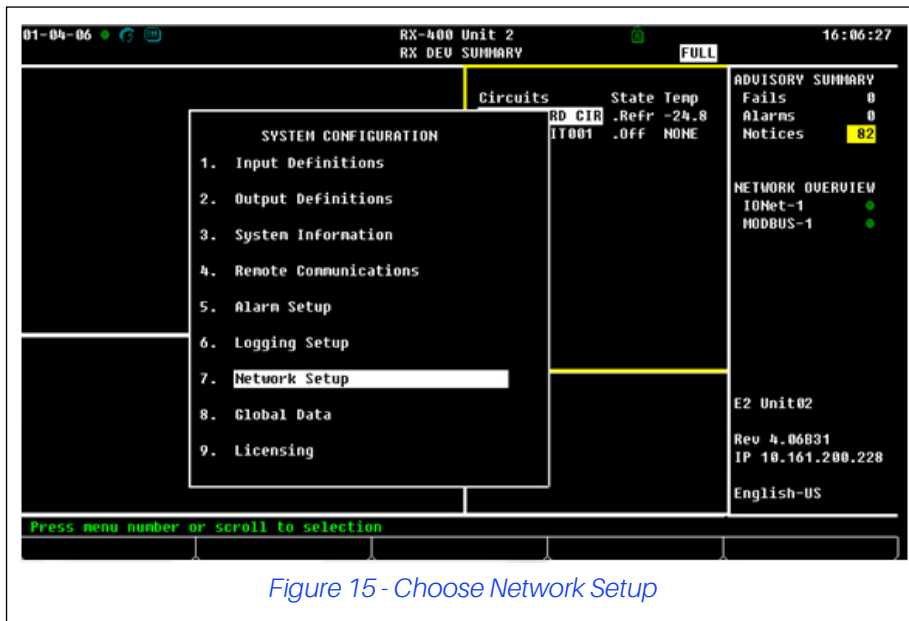
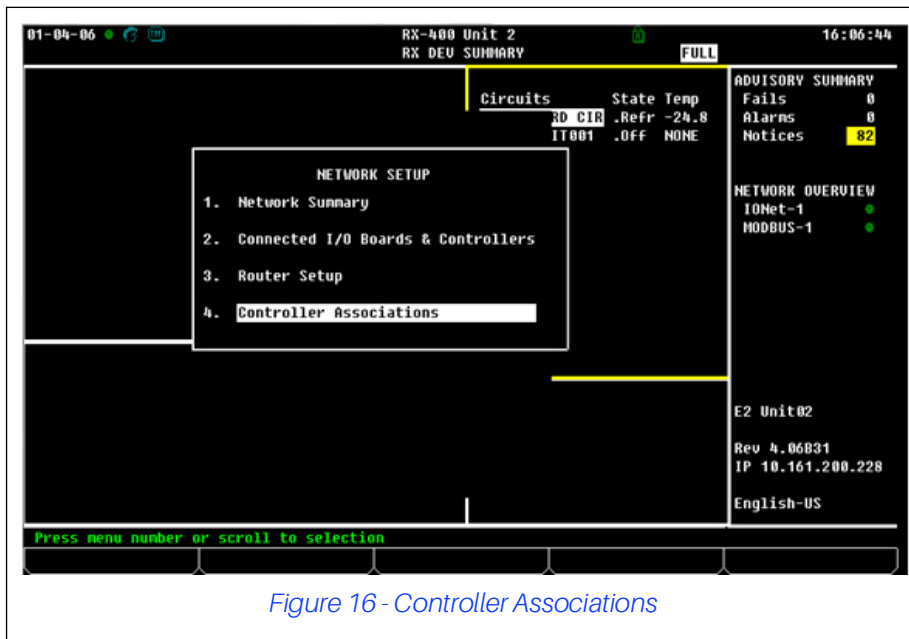
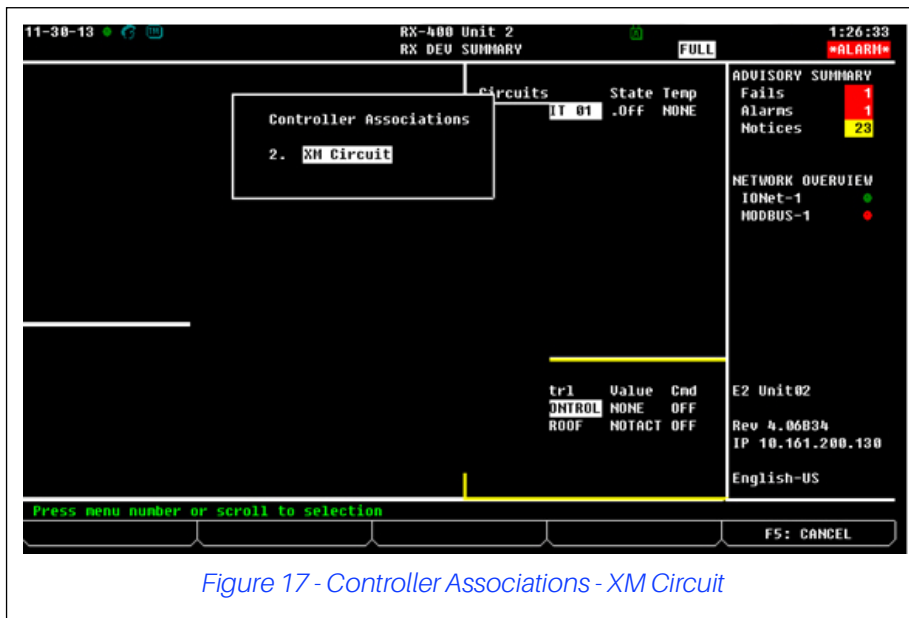


Figure 15 - Choose Network Setup

- Press **4** to open the *Controller Associations* screen.

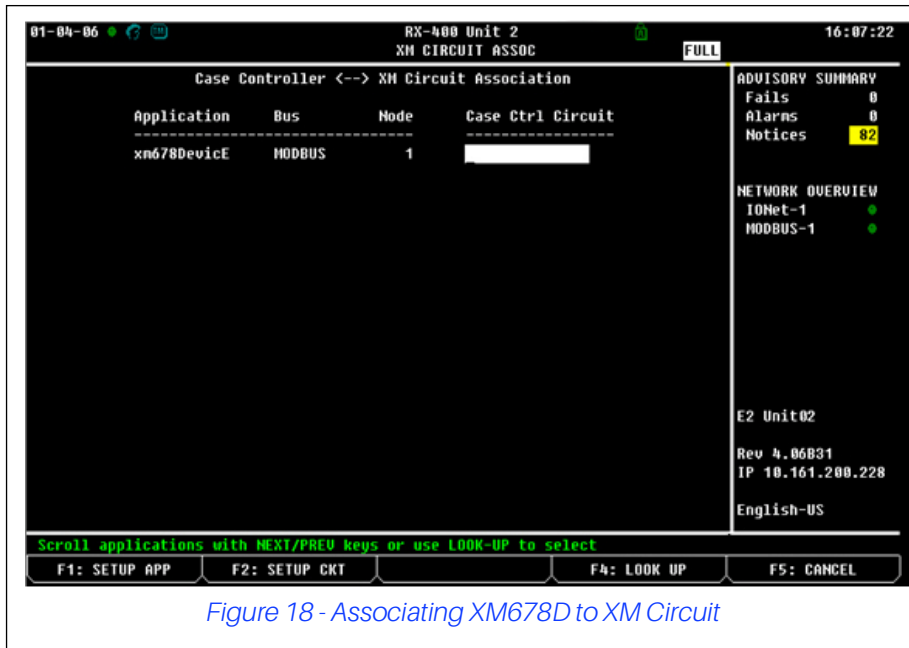


- Select XM Circuit.

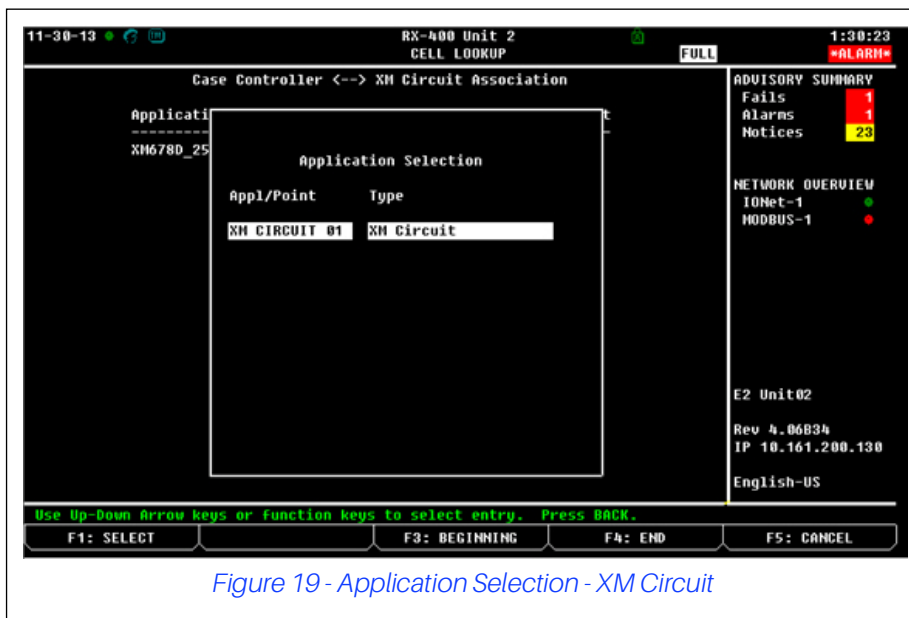


- Press **Enter**.

- Select the **XM678D** device that you will associate to the XM Circuit.



- Press **F4** (LOOK UP) and highlight the **XM Circuit** application.



8. Press .

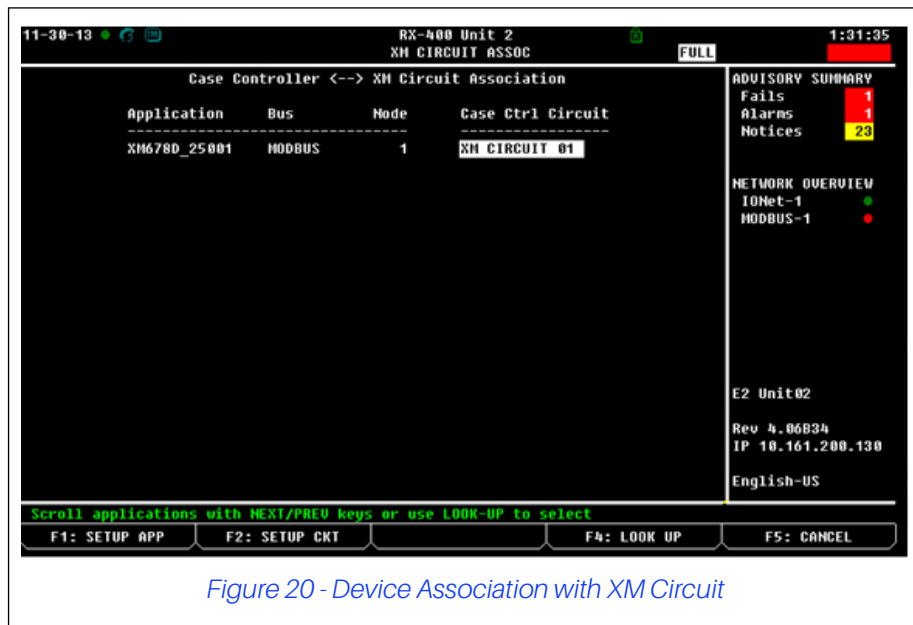



Figure 20 - Device Association with XM Circuit

9. The **XM678D** device is now associated with an **XM Circuit**. Repeat the same procedure when associating other XM678D controllers with an XM circuit.

10. Press  to save changes.

11. Press  to go back to the *Home* screen.

Suggested Starting Values for XM678D

Table 1 - XM678D Starting Values

XM	Copeland	Device	Description	Starting Value
Electronic Expansion Valve				
FY	Refrig Type	XM	Kind Of Gas used by plant. Fundamental parameter for correct functioning of all system.	404
PMU	Pressure Unit	XM	Pressure Measurement Unit. MPA means the value of pressure measured by kPA×10.	bAr(0); PSI(1); MPA(2)
Atu	Autotune SH	XM	Minimum Stable Superheat. This function automatically reduces the setpoint in order to optimize the use of the evaporator while at the same time keeping the superheating regulation stable. The minimum allowed SH setpoint is LSH+2°C.	ATU=y
AMS	Auto Superheat	XM	Self Adaptive SH regulation enabling. The parameter AMS enables the self adaptive mode for the superheat regulation. In this functioning the values of Pb and inC parameter are automatically set by the controller according to the kind of applications and the response of the system.	AMS=y
SSH	Superheat SP	XM	Superheat Setpoint. This is the value used to regulate superheat.	8.0 °C (default) 46 °F
Pb	SH TR	XM	Proportional Band. The valve changes its opening on the band [SSH, SSH + Pb]. At SSH value of superheat the valve will be at 0% (without integral contribution) and at [SSH + Pb] value of superheat the valve will be at MnF . For values bigger than [SSH + Pb] the valve is completely opened.	8 °C (default) 46 °F
rS	SH TR Offset	XM	Proportional Band Reset	0
inC	SH I-Gain	XM	Integration time for superheat regulation.	200

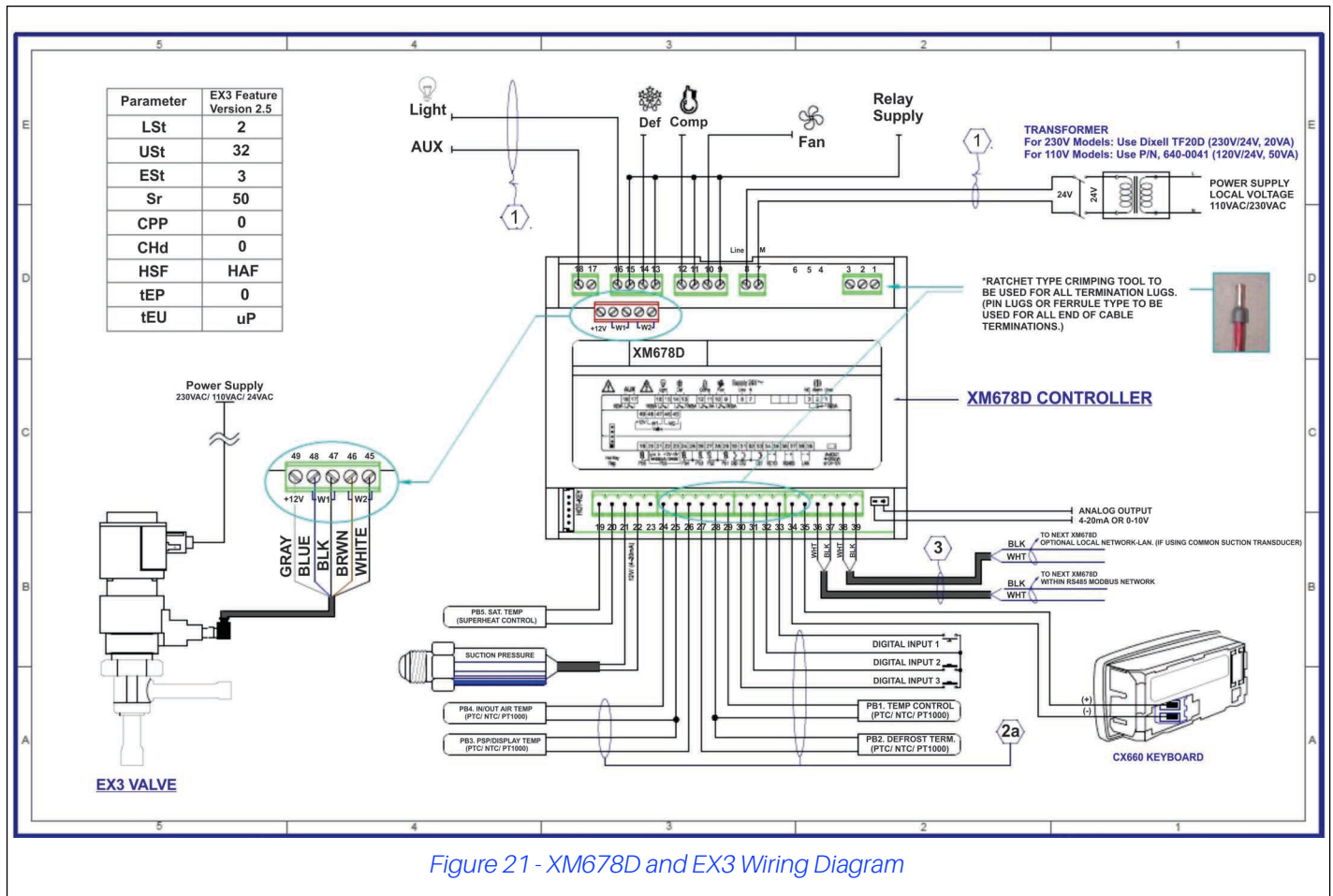
Table 1 - XM678D Starting Values

PA4	Sens Min Pres	XM	Value of pressure at 4mA for current probe [4 to 20mA] or value at 0V for ratiometric probes. The value is absolute or relative according to PrU parameter.	-0.5 bAr (default) -7.25 PSI
P20	Sens Max Pres	XM	Value of pressure at 20mA for current probe [4 to 20mA] or value at 5V for ratiometric probes. The value is absolute or relative according to PrU parameter.	11.0 bAr (default) 159 PSI
oPE	Start %	XM	Opening valve percentage during hot gas defrost. During hot gas defrost there is not SH control.	85
SFd	Start Dur	XM	Duration of soft start phase with opening at OPE . Set start function duration and post-defrost duration. During this phase the alarms are neglected. Format: min.10sec, resolution: 10sec.	0.1
FRC	Fast Recov Cont	XM	Integration additive constant (Fast recovery). It permits the integral action when SH value is below the setpoint to decrease faster. With higher values the valve closes faster. If [FrC = 0] fast recovery function is disabled.	0
LSt	Valve Min Steps	XM	Minimum number of steps where the valve can be considered as completely closed.	0
USt	Valve Max Steps	XM	Maximum number of steps that can be performed.	0
ESt	Extra Steps	XM	Extra steps in closing valve.	0
Sr	Step Rate	XM	The speed to change step. Too high value causes a wrong driving.	10
CPP	Max Phase Cur	XM	Current per phase during bipolar valve driving.	0
CHD	Hold Phase Cur	XM	Current per phase to maintain the actual position (Holding current).	0
HSF	Motor Movement	XM	Kind of Motor Movement. HAF = half step. Use this setting for the unipolar valve. FUL = half step. Use this setting for the bipolar valve.	FUL
teP	Valve List	XM	Predefined valve selection. If (teP = 0) the user has to modify all the parameters of configuration in order to use the valve. If teP is different from 0 the device performs a fast configuration of the following parameters: LSt, uSt, Sr, CPP, CHd .	0
teU	Valve Type	XM	Type of Stepper motor. It permits to select the kind of valve. uP = 5-6 wires unipolar valves; bP = 4 wires bipolar valves. WARNING! by changing this parameter the valve has to be reinitialized.	uP-bP
Regulation				
HY	HY/TR	XM	Differential. If [CrE = n] then HY is the hysteresis for ON/OFF thermoregulation. If (CrE = Y) or (CrE = EUP) then HY is the proportional band for temperature PI controller. On these cases the value should be greater than 5°C.	2.0 °C (default) 35.6 °F
int	I-Gain Case	XM	Integral time for room temperature regulation. This value is used only when (CrE = Y) or (CrE = EUP). It is the integral time for thermoregulation: high values mean slower regulation. 0 (zero) = no integral action.	150
CrE	Continuous Reg	XM	Continuous regulation activation. With (CrE = Y) or (CrE = EUP) the regulation become PI , HY become a band and int an integral time n = standard regulation Y = continuous regulation; to be used only in centralized plants EUP = evaporator valves	n
CF	Temp Unit	XM	Temperature measurement unit. °C = Celsius °F = Fahrenheit WARNING! When the measurement unit changes, all parameters with temperature values will have to be checked.	°C (default)
Fan				
FnC	Fan Mode	XM	Fan Operating Mode. C-n = running with the solenoid valve, OFF during the defrost C-Y = running with the solenoid valve, ON during the defrost O-n = continuous mode; OFF during the defrost O-Y = continuous mode; ON during the defrost	O-n
FSt	Fan Delay	XM	The fan is always OFF when above the evaporator probe temperature.	10.0 °C (default) 50 °F

Notes:

- Parameters with (-) are site specific.
- For XM678D Version 2.5, probes are Copeland type.
- The same Engineering Unit needs to be used in the PA4 and P20 parameters as set in the device. See example below.
 - If a PP11 transducer is connected to an XM678D, **Prn** set to **rEL** and **PMU** (**PNU** in device) set to **Bar**, the following settings should be done:
 - PA4= -0.5
 - P20= 11
 - To change the pressure reading on screen from **bar** to **psi**, the **ff.** procedures should be done in order:
 - Set PNU to psi
 - Set PA4= -7
 - Set P20= 161

XM Wiring Diagram



Visit our website at copeland.com/en-us/products/controls-monitoring-systems for the latest technical documentation and updates. For Technical Support call 833-409-7505 or email ColdChain.TechnicalServices@Copeland.com