# 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*.



#### Setting Address on XM678D Device Using CX660 Keyboard

- Press + 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 Z or

until **Adr** is displayed.

- 3. Press and assign the corresponding address for the device by pressing or .
- Figure 2 XM678D Display and Keyboard

- 4. Press **st** to save changes.
- 5. To exit, press 📰 + 🛆 or wait a few seconds without pressing any key; the display will start flashing.



#### E2 Serial Port Setup

- 1. Log into the E2 controller by pressing the Log infort button.
- 2. Enter USER in the **Username** field and press
- 3. Enter PASS in the Password field and press
- 5. Press F2 twice to move to the C3: Serial tab.

-20-13 😚 🛄 • Ctrl-X to Select	CX Tabs	КА	-400 Unit 2 SETUP		FULL	6:28:
: General C2: E	ing Units 🛛	3: Serial	C4: TCP/IP	C5: Peer	Neturk	ADVISORY SUMMARY
: 07: 5	System (	8: BACnet	C9: Sys Alarms	C0: MORE		Fails 0
	Genera	1 Setup: ALA	S E2E		-	Alarms 1 Notices 5
Serial COM1 Connection	Value : Serial					
COM1 Baud COM1 Data Size	: 115.2 Kb : 8	aud				NETWORK OVERVIEW MODBUS-1
COM1 Parity COM1 Stop Bits	: None : 1					
COM1 FiFo Size COM2 Connection	: 14 : Not Used					
COM3 Connection COM4 Connection	: No Moden : MODBUS-1					
COM4 Baud COM4 Data Size	: 9600 bau : 8	đ				
COM4 Parity COM4 Stop Bits	: None : 1					
COM6 Connection COM6 FiFo Size	: 14					E2 Unit02
COM4 Avail COM6 Avail	: Yes : Yes					Rev 4.06B34 IP 10.161.200.20
						English-US
roll using Next/Pr	ev keys   C	onnection Ty	pe for CON4			
F1: PREV TAB	F2: NEXT	TAB	F3: EDIT	F4: L00K	UP	F5: CANCEL
		Figure	3 - C3: Serial Ta	h		

6. Press the down arrow key to highlight the COM2 Connection value:

6-A. Press **F4** (*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 **F4** to select options and **Enter** 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 O 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 (, Ž, Ž, Ž) (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.

11-20-13 (6 🛛	Gelect CX Tabs	1	RX-400 Unit 2 SETUP		FULL	6:30:17
C1: This Unit	C2: IO Network	C3: ECT	C4:	C	5: Echelon	ADVISORY SUMMARY
C6:	C7: System	C8:	C9:	C	0:	Fails 0
	Nun Net	work Ctrls:	NetSetup			Alarms 1 Notices 6
	ECT Boar #17 : XEV	d Type	Quantity Ø	Max 99		
	#18 : XEU		1	<b>99</b>		NETWORK OVERVIEW
		Scroll Unit	0	16		MODBUS-1
	#20 : XH67	0K 13	6	99		
	#21 : XH67	/0K_34	0	99		
	#22 : XM67	78D_20	0	99		
	#23 : XM67		_ 1	99		
	#24 : XH67		0	99		
	#25 : XH67		1	99		
	#26 : XR3		0	99		
		CX CaseDsp	0	99		
	#28 : XR79		8	99		
	#29 : iPro	DAC	0			E2 Unit02
						Rev 4.06B34 IP 10.161.200.204
						English-US
Enter 0 to 99	Enter desired n	number of the	ese boards			
F1: PREV TA	B F2: NEX1	TAB	F3: EDIT	L		F5: CANCEL
	Figur	ə 4 - Addi	ng the Numl	ber 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 (, , , , , , , 1 to open the Network Summary screen.
- 2. Highlight the XM678D device to be commissioned by pressing the down arrow key and press

|--|

	Network S	nit 2 Sunnary	FULL	6:35:40
Туре	Network Address	Rev	Status	ADVISORY SUMMARY Fails 0
	MODBUS-1:	0 0.00 5 2.05-00	No Port Online	Alarns 1 Notices 6
XM679K_34	HODBUS-1:	2 3.04-00	No Port	NETWORK OVERVIEW Modbus-1 •
				E2 Unit02
				Rev 4.06B34 IP 10.161.200.204
				English-US
	TUS F3: NET	STATUS	F4: COMMISSION	F5: SETUP
	RX400-Refrig XEV22D_11	RX400-Refrig         LONWorks:           XEU22D_11         HODBUS-1:           XH078D_25         HODBUS-1:	RX400-Refrig LONWorks: 2 4.06834 XEU22D_11 HODBUS-1: 0 0.00 XH078D_25 HODBUS-1: 5 2.05-00	RX400-Refrig         LONWorks:         2 4.06834         This Controller           XEU22D_11         HODBUS-1:         0 0.00         No Port           XH078D_25         HODBUS-1:         5 2.05-00         Online

- 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.

20-13 🥝		RX-400 Unit 2 Network Summary	() FULL	6:36:50 •ALARH
unit02	NODBUS-1 Devices	Notunek Addeace Pou	statur  ntroller	ADVISORY SUMMARY Fails 0 Alarns 1 Notices 6
7780 250 	1. [Unused] 2. XH679K_3440: 3. (Unused) 4. (Unused) 5. (Unused) 6. (Unused) 7. (Unused) 8. (Unused) 10. (Unused) 11. (Unused) 12. (Unused) 13. (Unused) 14. (Unused) 15. (Unused) 16. (Unused) 17. (Unused) 18. (Unused)	I XH679K_34	Ţ	NETWORK OVERVIEV NODBUS-1 E2 Unit02 Rev 4.06834 IP 10.161.200.204
ess menu n	umber or scroll to s	selection		English-US F5: CANCEL

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

11-20-13 🕜 💷		RX-400 Unit 2	<u>نا</u>	6:38:17
		Network Sunnary	FULL	
		RH678D_25001		ADVISORY SUMMARY
Name	Tuno	Notwork Addrocc Dou	Statue	Fails 0
E2 Unit02			ntroller	Alarms 1 Notices 6
XE11202 440			licioner	HOCIGES 0
sH6780_25£				
0				NETWORK OVERVIEW
				MODBUS-1 🔶
	Setting Physica	L Address for: RH678D_25001		
	Specify Physica	L Address Of Controller		
	Address	_ 5		
				E2 Unit02
				D h. 0(00h
				Rev 4.06B34 IP 10.161.200.204
				10110112001204
				English-US
Enter value and	Press ENTER to Se	t Address		
				F5: CANCEL

Figure 7 - Physical Address Screen

- 6. Press to save the assigned address.
- 7. Press O to return to the Home screen.
- 8. Press (, ž, ž, to open the Network Summary screen.

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

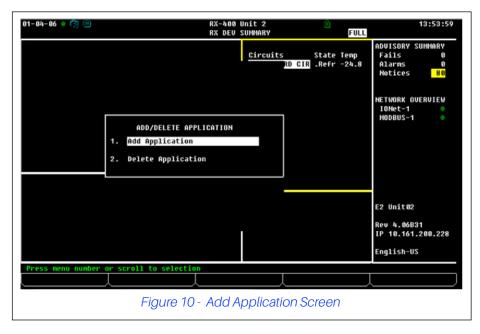
11-20-13 🕜		RX-400 U Network S		Ö FULL	6:35:46
Nane E2 Unit 02 416780 2500 Xito001	Type RX400-Refrig XEU220_11 XH0780_25 XH079K_34	Network Address LONWorks: HODBUS-1: HODBUS-1: HODBUS-1:	Rev 2 4.06B34	Status This Controller No Port Online	ADUISORY SUHHARY Fails 0 Alarns 1 Notices 6 NETWORK OVERVIEW MODBUS-1 0
					E2 Unit02 Rev 4.06834 IP 10.161.200.204
					English-US
F1: DELETE P	CRD F2: STA	TUS F3: NET	STATUS	F4: COMMISSION	F5: SETUP
	Figure 8 -	XM678D on Ne	twork Sur	mmary Screen	

10. Repeat the process for the other devices.

## PART 4: Adding the XM Circuit Application

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

81-84-86 🔹 🥱 💷	RX-400 RX DEU		Â FULL	13:53:45
	HAIN MENU 1. Suction Groups 2. Condenser Control 3. Circuits 4. Sensor Controls 5. Configured Applications 6. Add/Delete Application 7. System Configuration 8. Status	<u>Circuits</u> RD CIR	State Temp .Refr -24.8	ADUISORY SUHMARY Fails 0 Alarns 0 Notices 80 NETWORK OUERUIEW IONet-1 0 HODBUS-1 0 E2 Unit02 Rev 4.060831 IP 10.161.200.228 English-US
Press menu number o	or scroll to selection	Ļ	ļ	
	Figure 9 - Main Men	u - Add Appl	ication	



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

-29-13 🔹 🥱 📖	RX-400 Unit 2 ADD APPLICATION	۵ 4:11:43 FULL
	Add Application	ADUISORY SUMMARY Fails
Sel ent	Select Application Type er".	Alaras 1 Notices 14
+ Type : + How many ? Not	11. Enhanced Suction         12. Flexible Combiner         13. HVAC Simulation         14. Heat/Cool Control         15. Holiday Schedule         16. Impulse	NETWORK OVERVIEW IONet-1 Hodbus-1
Results	17. Log Group 18. Loop/Sequence Ctrl 19. Modular Chiller Ctrl 20. Onboard IO 21. Power Monitoring 22. Pulse Accumulation 23. Rack Simulation 24. Standard Circuit	
	24. Standard Carton 25. Suction Control 26. TD Control 27. Time Schedule 28. KM Circuit ▼	E2 Unit02 Rev 4.06B34 IP 10.161.200.177
		English-US
	oll to selection	

6

4. Press

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

11-29-13 🔹 🍞 📟	RX-400 Unit 2 👘	FULL	4:15:53
	Add Application		ADVISORY SUMMARY
	Select an application type to add, then enter the number to add and press "Enter".		Fails 1 Alarms 1 Notices 14
+ Type	: XM Circuit		
+ How many	? 1		NETWORK OVERVIEW IONet-1 • MODBUS-1 •
	Note: Only applications that can be added will be displayed.		
Results			
			E2 Unit02
			Rev 4.06B34 IP 10.161.200.177
		,	English-US
Enter 1 to 64   En	ter number of applications. Press ENTER to ADD.		
			F5: CANCEL
	Figure 12 - Enter Number of Applications	s to Add	1

#### 6. Press Enter.

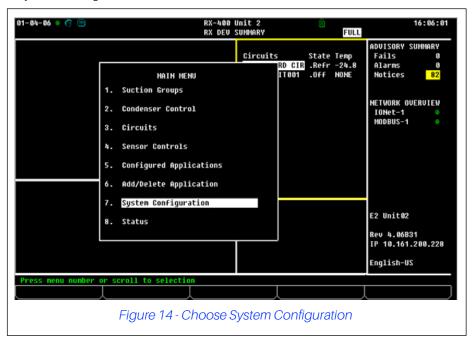
7. A message will appear; press Y for Yes if you want to edit the newly added application.

11-29-13 🔹 🌈 🛄	RX-400 Unit 2 ADD APPLICATION	Ö FULL	4:19:01
	Add Application		ADVISORY SUMMARY
	Select an application type to add, then enter the number to add and press "Enter".		Fails 1 Alarms 1 Notices 14
+ Type	: XM Circuit		
+ How many	) ?   1		NETWORK OVERVIEW IONet-1 © HODBUS-1 ●
Results	) you wish to edit new applications now? Press Y=Yes or N=No		
- Control app -	lication(s) added: 1 Name prefix used: XM CIRCUIT001		
There are	now 1 XM Circuit application(s).		E2 Unit02
			Rev 4.06834 IP 10.161.200.177
			English-US
	l l		F5: CANCEL
	Figure 13 - Edit New Appli	cation	

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

### PART 5: Associating XM678D to the XM Circuit Application

1. Press (Menu), 2 for System Configuration.



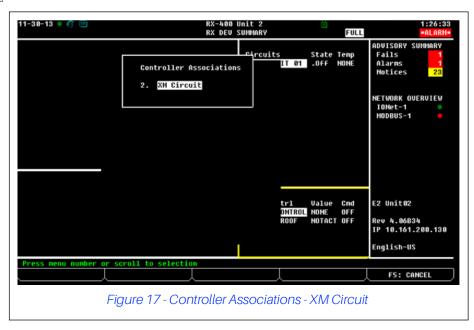
2. Press <sup>a</sup> for *Network Setup*.

01-04-06 🔹 🤭 📟	RX-400 RX DEV	Unit 2 SUMMARY	<u>í</u> FULL	16:06:27
		Circuits	State Temp	ADUISORY SUMMARY Fails 0
	SYSTEM CONFIGURATION 1. Input Definitions 2. Output Definitions 3. System Information 4. Remote Communications 5. Alarm Setup 6. Logging Setup	RD CIR	.Refr -24.8 .Off NONE	Alarns O Notices 82 NETWORK OVERVIEW IONet-1 MODBUS-1
	<ol> <li>Cogging secup</li> <li>Network Setup</li> <li>Global Data</li> </ol>			E2 Unit02
	9. Licensing			Rev 4.06B31 IP 10.161.200.228
				English-US
Press nenu number	or scroll to selection			
	Figure 15 - Choo	se Network S	etup	

3. Press to open the *Controller Associations* screen.

81-84-86 🔹 🥱 💷	RX-400 RX DEU	Unit 2 SUHMARY	🙆 FULL	16:06:44
		Circuits RD C IT00		ADUISORY SUMMARY Fails 0 Alarms 0 Notices <mark>82</mark>
	NETWORK SETUP 1. Network Summary 2. Connected I/O Boards & Co 3. Router Setup 4. Controller Associations	ntrollers		HETWORK OVERVIEW IONet-1 ● MODBUS-1 ●
				E2 Unit02 Rev 4.06831 IP 10.161.200.228 English-US
Press menu number	or scroll to selection			
	Figure 16 - Contr	oller Associ	iations	

4. Select XM Circuit.



9

5. Press

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

01-04-06 🔹 🌈 📟		RX-400 Xm circu	Unit 2 IT ASSOC	íð Full		16:07:22
Case	Controller <>	XM Circuit	Association		ADVISORY S Fails	UMMARY B
Application	Bus	Node	Case Ctrl Circuit		Alarns Notices	82
xm678DevicE	MODBUS	1	_		HULICES	82
					NETWORK OU IONet-1 MODBUS-1	JERUIEW
					E2 Unit02	
					Rev 4.06B3 IP 10.161.	
					English-US	
Scroll applications with	th NEXT/PREV key	s or use LO	OK-UP to select			
F1: SETUP APP	F2: SETUP CKT		F4:	LOOK UP	F5: CA	NCEL
Fig	gure 18 - Ass	sociating	XM678D to X	M Circuit		

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

11-30-13 🔹 🌈 回		RX-400 Unit 2 CELL LOOKUP	۵) FUL	1:30:23 L *ALARM*
	e Controller <	> XM Circuit Associat	ion	ADUISORY SUMMARY Fails
Applicati			t	Alarms 1 Notices 23
XM678D_25	Applica	tion Selection		1002005
	App1/Point	Туре		NETWORK OVERVIEW
	XM CIRCUIT 01	XM Circuit		HODBUS-1 🔶
				E2 Unit02
				Rev 4.06834 IP 10.161.200.130
L				English-US
Use Up-Down Arrow key	s or function ke	ys to select entry.	Press BACK.	
F1: SELECT		F3: BEGINNING	F4: END	F5: CANCEL
	E:	oplication Select		

#### 8. Press

-30-13 🔶 🍞 💷			400 Unit 2 IRCUIT ASSOC	🖄 FULL	1:31:35
Case	Controller <	> XM Ciro	cuit Association		ADVISORY SUMMARY
Application	Bus	Node	Case Ctrl Circuit		Alarms 1
XM678D_25881	MODBUS	1	XM CIRCUIT 01		Notices 23
					NETWORK OVERVIEW IONEL-1 0 Hodbus-1 0
					E2 Unit02
					Rev 4.06834 IP 10.161.200.130
					English-US
croll applications wit		ys or us	e LOOK-UP to select		
	F2: SETUP CKT		Ebe	LOOK UP	F5: CANCEL

- 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 O to go back to the Home screen.

### Suggested Starting Values for XM678D

#### Table 1 - XM678D Starting Values

ХМ	Copeland	Device	Description	Starting Value		
	Electronic Expansion Valve					
FtY	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 $\star$ 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 <b>SH</b> setpoint is LSH+2°C.	ATU=y		
AMS	Auto Superheat	XM	Self Adaptive SH regulation enabling. The parameter <b>AMS</b> enables the self adaptive mode for the superheat regulation. In this functioning the values of <b>Pb</b> and <b>inC</b> 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		

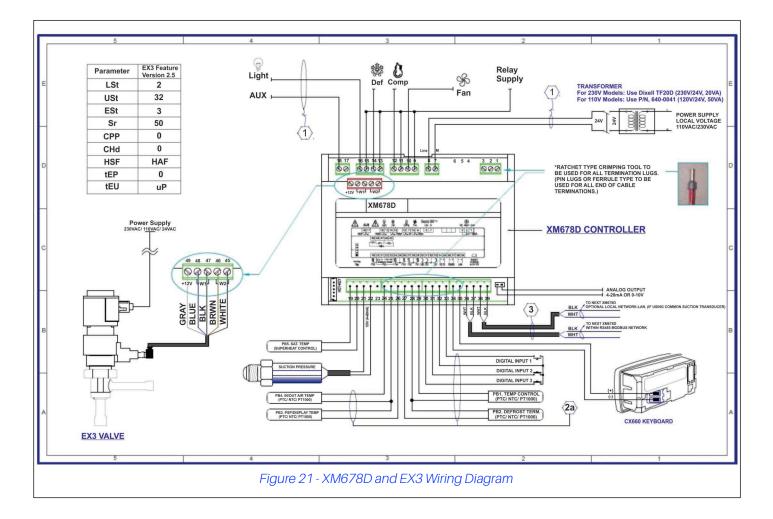
#### Table 1 - XM678D Starting Values

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 <b>PrU</b> 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 <b>PrU</b> 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 <b>OPE</b> . 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 ( <b>tEP</b> = 0) the user has to modify all the parameters of configuration in order to use the valve. If <b>tEP</b> is different from 0 the device performs a fast configuration of the following parameters: <b>LSt, uSt, Sr, CPP, CHd</b> .	0
teU	Valve Type	XM	Type of Stepper motor. It permits to select the kind of valve. <b>uP</b> = 5-6 wires unipolar valves; <b>bP</b> = 4 wires bipolar valves. <b>WARNING!</b> 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:
    - a. PA4= -0.5 b. P20= 11
  - To change the pressure reading on screen from **bar** to **psi**, the **ff**. procedures should be done in order:
    - a. Set PNU to psi
    - b. Set PA4= -7
    - c. 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

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