iPro I/O Module Installation and Operation Manual

iPro I/O Module Firmware Versions 2.0 and Above

026-1741 Rev 0

EMERSON™

Emerson
1065 Big Shanty Road NW, Suite 100
Kennesaw, GA 30144 USA
770-425-2724 • www.emerson.com
Emerson Customer Service *479-845-3430*

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1 General Description

The I/O Module is a PLC application that uses the iPro hardware platform as a source of auxiliary input and output capacity for the E2E supervisor controller. The I/O Module is compatible with E2E version 4.09F04 or later. The I/O Module can be used with RX, BX, or CX models of the E2E. The I/O Module is sold in 10 DIN IPG215D PLC hardware model depending on what I/O capacity is needed.

The I/O Module inputs and outputs are fully configurable from the E2E controller via BACnet MS/TP. The I/O Module can be used with the Emerson E2E controller to gather data from analog or digital inputs, control the I/O Module's Onboard relays, and provide an analog output signal through I/O Module's Onboard analog outputs. Both I/O Module hardware models can also can provide +5VDC or +12VDC power supply for using transducers or other input devices that require a power supply.

The I/O Module communicates with E2E via BACnet/MSTP protocol and can be deployed anywhere wherein a new or auxiliary I/O capacity is needed. Once BACnet MS/TP communication between the I/O Module and E2E is established, each input and output can be configured completely from the E2E screen and keyboard. The Visograph display is used as a local display where the PLC is mounted and is used to display input and output status, configure BACnet serial settings, and view system information.

1.1 I/O Capacity

The following table outlines the Onboard I/O capabilities of each PLC model. Technical specifications of each input or output can be found in ***Section 1.4*** to ***Section 1.7***.

Feature	10 DIN IPG215D
Analog Inputs	10
Digital Inputs	20
Analog Outputs	6
Relay Outputs	15
Remote Display	Yes

Table 1-1 *- PLC Onboard I/O Capabilities*

1.2 Ordering and Part Numbers

Emerson Part Number	Description
851-4445	E2E I/O Module Panel
818-9205	Replacement Visograph Display
818-9057	Replacement 10 Din iPro Large

Table 1-2 *- Module Ordering Information and Part Numbers*

1.3 10 DIN IPG215D Hardware Overview

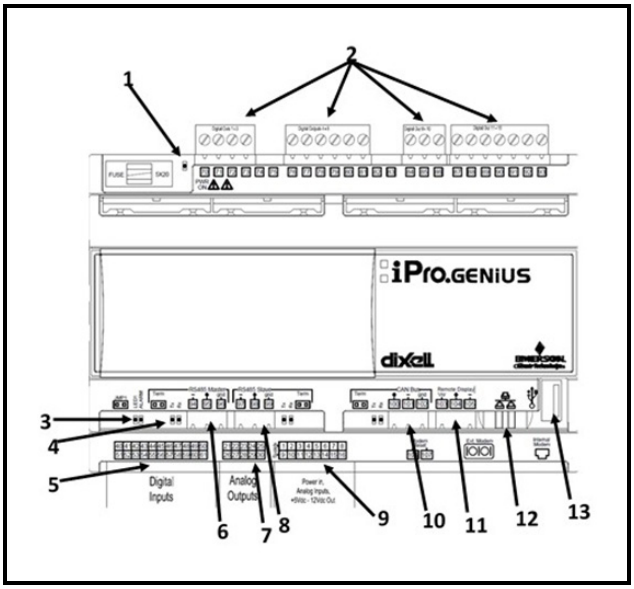

Figure 1-1 *- 4 DIN IPG208D*

10 DIN IPG215D Legend	
1	General Status LED
2	Relay Output Connectors
3	LED 1 and General Alarm LED
4	RS485 Transmit/Received LED
5	Digital Input Connector
6	BACnet MS/TP Connection
7	Analog Output Connector
8	***RS485 Slave Plug - Not Used in I/O Module***
9	Analog Inputs/24VAC Power In Connector
10	***CAN Bus Connection - Not Used in I/O Module***
11	Remote Display Port - Visograph
12	TCP/IP Port - BACnet IP Port
13	USB Port

1.4 Analog Input Specifications

The below tables outline the Analog Input specifications.

10 DIN 215D Analog Input Specifications	
Analog conversion type	10-bit A/D converter
Number of inputs	10
Type of analog input (configurable via software parameter)	NTC Dixell (-58T230°F; 10KΩ ±1% at 77°F) PTC Dixell (-67T239°F; 990Ω ±1% at 77°F) Emerson/CPC Temperature Sensors Voltage: 0V, 0 to 5V, 0 to 10V (input resistance 3.7KΩ) Current: 0 to 20mA, 4 to 20mA (input resistance 100Ω)
Digital input status variation detection time	100ms (in any case it depends on the cycle time set by the user in the given application)
Accuracy	NTC, PTC: ±1°C 0 to 1V: ±20mV 0 to 5V: ±100mV 0 to 10V: ±200mV 2 to 20mA, 4 to 20mA: ±0.30mA
Additional Power	+12V: 200mA in total +5V: 100mA

Table 1-3 *- 10 DIN 215D Analog Input Specifications*

CAUTION: Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

1.5 Digital Input Specifications

The below tables outline the digital input specifications.

CAUTION: Use another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

10 DIN 215D Digital Input Specifications	
Type (configurable via software parameter)	Opto-insulated free or live contact (24VAC/DC) External power 24VAC/DC ±20%
Number of inputs	20
Digital input status variation detection time	100ms (depends on the cycle time set by the user in the given application)

Table 1-4 *- 10 DIN 208D Digital Input Specifications*

CAUTION: If the digital inputs are used with voltage, use another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

1.6 Relay Output Specifications

The below tables outline the relay output specifications.

10 DIN 215D Relay Output Specifications	
Type	Relays with NO contacts
Number of outputs	15
Maximum load	5A(250VAC) SPST 5(2)A

Table 1-5 *- 10 DIN 208D Relay Output Specifications*

WARNING: Verify the capacity of the output used. There is double insulation between the digital outputs and the low voltage of the rest of the circuit. Do not use different voltages for the various groups of relays or within each group.

1.7 Analog Output Specifications

The following tables outline the analog output specifications. The 10 DIN IPG215D model requires an additional 24VAC power supply to the analog output connector block in order to supply power to the analog outputs. A separate transformer other than the controller supply power is required to power the 10 DIN's analog outputs. When purchasing one of the Emerson control panels, the analog output wiring and 24 VAC supply wiring is factory-wired to a terminal block. Installers only need to make connections for signal wiring between the factory terminal block and device in the field to be controlled.

CAUTION: The electrical devices controlled by these analog outputs must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the outputs from malfunctioning or being damaged.

10 DIN 215D Analog Output Specifications	
Type	Opto-insulated with separate 24VAC/DC power supply
Number of outputs	6
Type of analog output (configurable via software parameter)	4 fixed outputs 0 to 10VDC (Out 1 to Out 4) 2 configurable outputs 0 to 10VDC, 4 to 20mA (Out 5 and Out 6)
Maximum load	40mA (Out1 to Out 4) 20mA (Out 5 and Out 6) max with configured outputs 0 to 10VDC 400Ω max with configured outputs 4 to 20mA 22Ω per live analog output

***Table 1-6** - 10 DIN 215 Analog Output Specifications*

1.8 Connector Descriptions

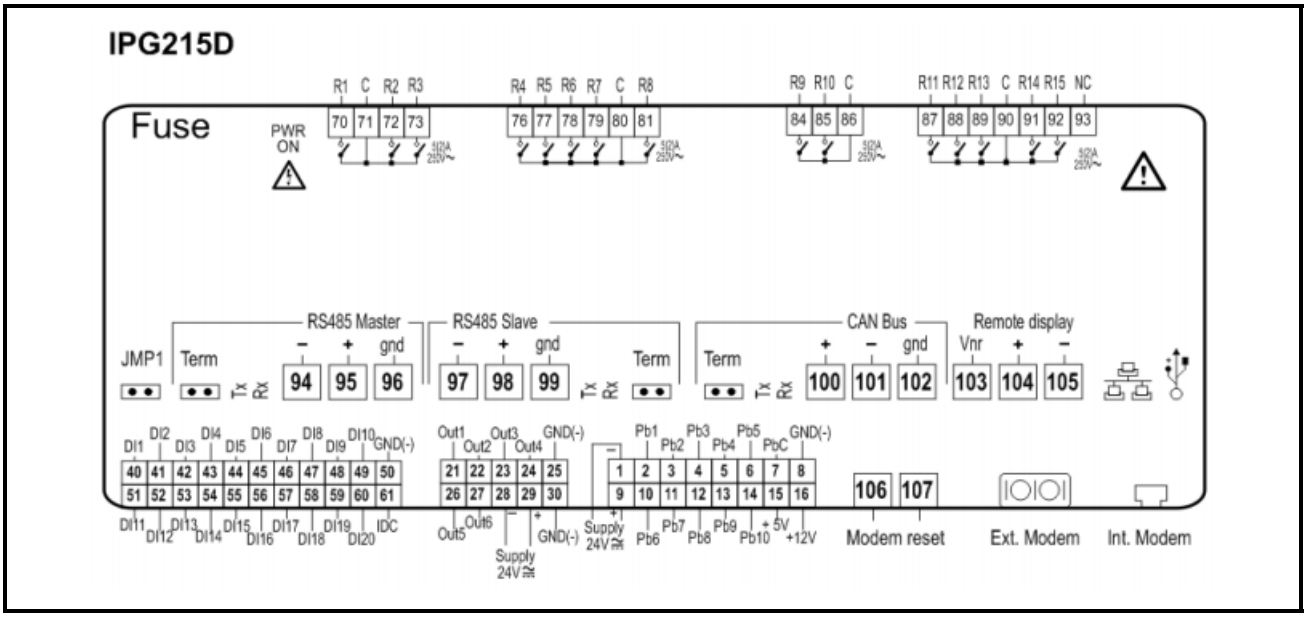

Figure 1-2 *- 10 DIN 215D Connectors*

Input No.	Type of Input	Description
1	Supply	Reference "-"/ GND power (24VAC or 24VDC)
2	Pb1	Configurable analog input 1 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
3	Pb2	Configurable analog input 2 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
4	Pb3	Configurable analog input 3 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
5	Pb4	Configurable analog input 4 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
6	Pb5	Configurable analog input 5 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
7	PbC	Common analog inputs (NTC, PCTC, DI)
8	GND (-)	Additional power reference 5VDC and 12VDC, analog inputs (0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V)
9	Supply	Reference "+" power supply (24VAC or 24VDC)
10	Pb6	Configurable analog input 6 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
11	Pb7	Configurable analog input 7 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)

Table 1-7 *- 4 DIN 208D Input Connector Descriptions*

Input No.	Type of Input	Description
12	Pb8	Configurable analog input 8 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
13	Pb9	Configurable analog input 9 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
14	Pb10	Configurable analog input 10 (NTC, PTC, 0 to 20mA, 4 to 20mA, 0 to 10V, 0 to 1V, 0 to 5V, DI)
15	+5V	Additional power +5VDC
16	+12V	Additional power +12VDC
21	Out 1	Opto-insulated analog output 1 (0 to 10V)
22	Out 2	Opto-insulated analog output 2 (0 to 10V)
23	Out 3	Opto-insulated analog output 3 (0 to 10V)
24	Out 4	Opto-insulated analog output 4 (0 to 10V)
25	GND (-)	Common opto-insulated analog output
26	Out 5	Analog output 5 (0 to 10V, 4 to 20mA, Opto-insulated relay)
27	Out 6	Analog output 6 (0 to 10V, 4 to 20mA, Opto-insulated relay)
28	Supply	Power for opto-insulated analog outputs as 24VAC or 24VDC (-)
29	Supply	Power for opto-insulated analog outputs as 24VAC or 24VDC (+)
30	GND (-)	Common opto-insulated analog output
40	DI1	Opto-insulated digital input 1
41	DI2	Opto-insulated digital input 2
42	DI3	Opto-insulated digital input 3
43	DI4	Opto-insulated digital input 4
44	DI5	Opto-insulated digital input 5
45	DI6	Opto-insulated digital input 6
46	DI7	Opto-insulated digital input 7
47	DI8	Opto-insulated digital input 8
48	DI9	Opto-insulated digital input 9
49	DI10	Opto-insulated digital input 10
50	GND (-)	Reference “-” for opto-insulated digital inputs 1 to 20 (if inputs 24VAC or 24VDC)
51	DI11	Opto-insulated digital input 11
52	DI12	Opto-insulated digital input 12
53	DI13	Opto-insulated digital input 13

***Table 1-7** - 4 DIN 208D Input Connector Descriptions*

Input No.	Type of Input	Description
54	DI14	Opto-insulated digital input 14
55	DI15	Opto-insulated digital input 15
56	DI16	Opto-insulated digital input 16
57	DI17	Opto-insulated digital input 17
58	DI18	Opto-insulated digital input 18
59	DI19	Opto-insulated digital input 19
60	DI20	Opto-insulated digital input 20
61	IDC	Common opto-insulated digital input 1 to 20 (if voltage free inputs)
70	RL1	Relay 1 normally open contact
71	C	Common relays 1, 2, and 3 (6A Max)
72	RL2	Relay 2 normally open contact
73	RL3	Relay 3 normally open contact
74	C	Voltage free contact (6A Max)
75	C	Voltage free contact (6A Max)
76	RL4	Relay 4 normally open contact
77	RL5	Relay 5 normally open contact
78	RL6	Relay 6 normally open contact
79	RL7	Relay 7 normally open contact
80	C	Common relays 4, 5, 6, 7 and 8 (6A Max)
81	RL8	Relay 8 normally open contact
82	C	Voltage free contact (6A Max)
83	C	Voltage free contact (6A Max)
84	RL9	Relay 9 normally open contact
85	RL10	Relay 10 normally open contact
86	C	Common relays 9 and 10 (6A Max)
87	RL11	Relay 11 normally open contact
88	RL12	Relay 12 normally open contact
89	RL13	Relay 13 normally open contact
90	C	Common relays 11, 12, 13, 14 and 15 (6A Max)
91	RL14	Relay 14 normally open contact
92	RL15	Relay 15 normally open contact

***Table 1-7** - 4 DIN 208D Input Connector Descriptions*

Input No.	Type of Input	Description
93	C	Voltage free contact (6A Max)
94	RS485 Master	RS485 Master connection (-)
95	RS485 Master	RS485 Master connection (+)
96	RS485 Master	RS485 Master connection (insulated GND)
97	RS485 Slave	RS485 Slave connection (-)
98	RS485 Slave	RS485 Slave connection (-)
99	RS485 Slave	RS485 Slave connection (insulated GND)
100	CAN Bus	CAN Bus connection (+), not open
101	CAN Bus	CAN Bus connection (-), not open
102	CAN Bus	CAN Bus connection (insulated GND), not open
103	Remote Display	Connection for VISOGRAPH remote terminal (Vnr)
104	Remote Display	Connection for VISOGRAPH remote terminal (+)
105	Remote Display	Connection for VISOGRAPH remote terminal (-)
106	Modem Reset	NC relay input to reset an external modem (24VAC/DC)
107	Modem Reset	NC relay output to reset an external modem (24VAC/DC)

***Table 1-7** - 4 DIN 208D Input Connector Descriptions*

1.9 Visograph Display

The local user interface for the I/O Module is the Visograph 2.0 V2IPG. The Visograph is an LCD display with eight (8) keys (labeled T1-T8) on a membrane keyboard. Visograph is used to configure BACnet MS/TP settings, perform backups, perform restores and view the status of inputs and outputs. Input and output configuration is performed from the E2E. In most situations the Visograph is factory-mounted and wired inside an Emerson control panel.

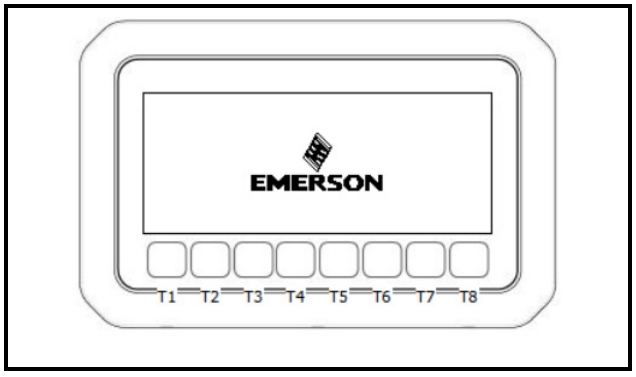

***Figure 1-3** - Visograph Front Display With Labeled Keys*

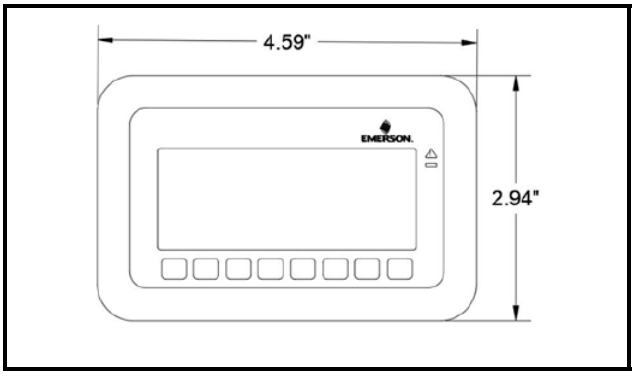

***Figure 1-4** - Visograph Dimensions*

2 Panel Mounting and Wiring

In most situations the I/O Module PLC will be factory-mounted and wired inside an Emerson UL listed industrial control panel. Installers need only to make field connections for the panel's supply power and any input or output wiring that is being used specific to the installation.

2.1 10 DIN IPG215D Panel Mounting and Wiring

The 10 DIN I/O Module controller panel is Emerson *P/N 851-4445*. The panel provides the I/O Module PLC and Visograph display already factory mounted, wired and ready for field connection to loads and inputs. The panel also includes an E2E RX300 controller and 10 toggle switches to be used for dual temperature refrigeration cases. The toggle switches are factory-mounted and wired to the I/O Module digital inputs and are used to signal to E2E the temperature mode for dual temperature refrigeration cases to run in. The panel dimensions (16 5/16" W, 20 3/8" L, 6" D) are shown in ***Figure 2-1***.

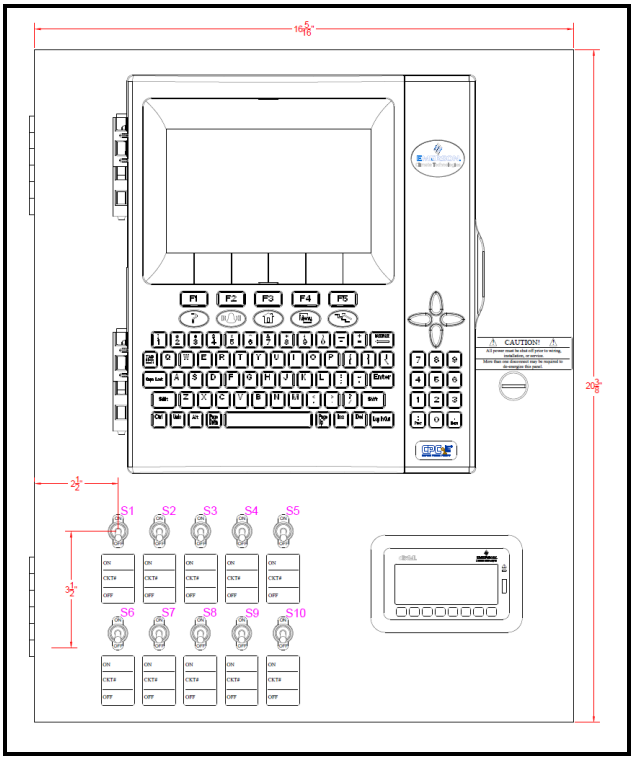

Figure 2-1 - *10 DIN E2E Panel Mounting*

The panel has four (4) screw holes for easy mounting. The dimensions of the mounting holes center to center are shown in ***Figure 2-2***. The panel mounting screws should be set in a high strength construction material such as a lumber stud, metal stud, or concrete/block/masonry with anchor.

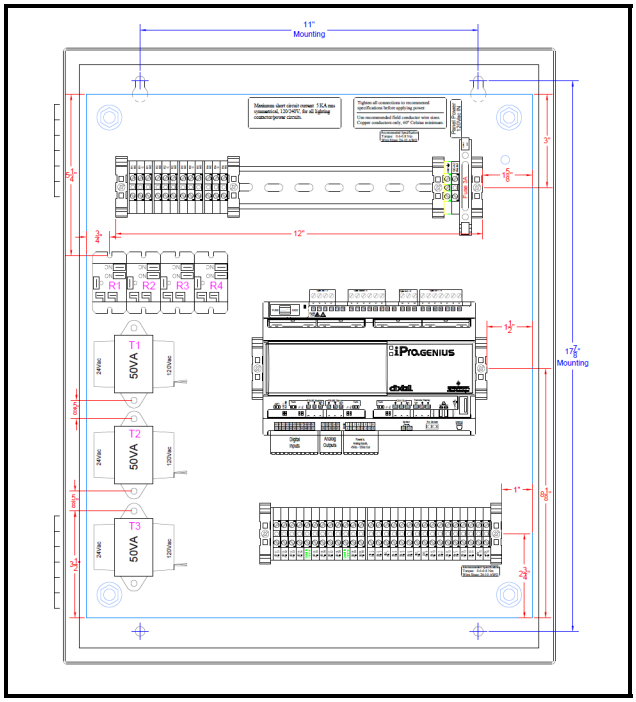

Figure 2-2 - *10 DIN E2E Panel Wiring*

2.1.1 10 DIN Panel Supply Power

The supply power for the panel should be 120VAC, 60 Hz, single phase. An upstream disconnect and circuit protection (MCCB, 20A max) supplied by the installer is required for the control circuit. The supply power connection is made at the terminal block in the top right corner of the panel on connections 120V Hot, 120V Neutral and GND. All guidelines and recommendations on the panel labels must be followed when wiring the supply power.

WARNING: All power must be shut off prior to wiring, installation or service. More than one disconnects may be required to de-energize this panel.

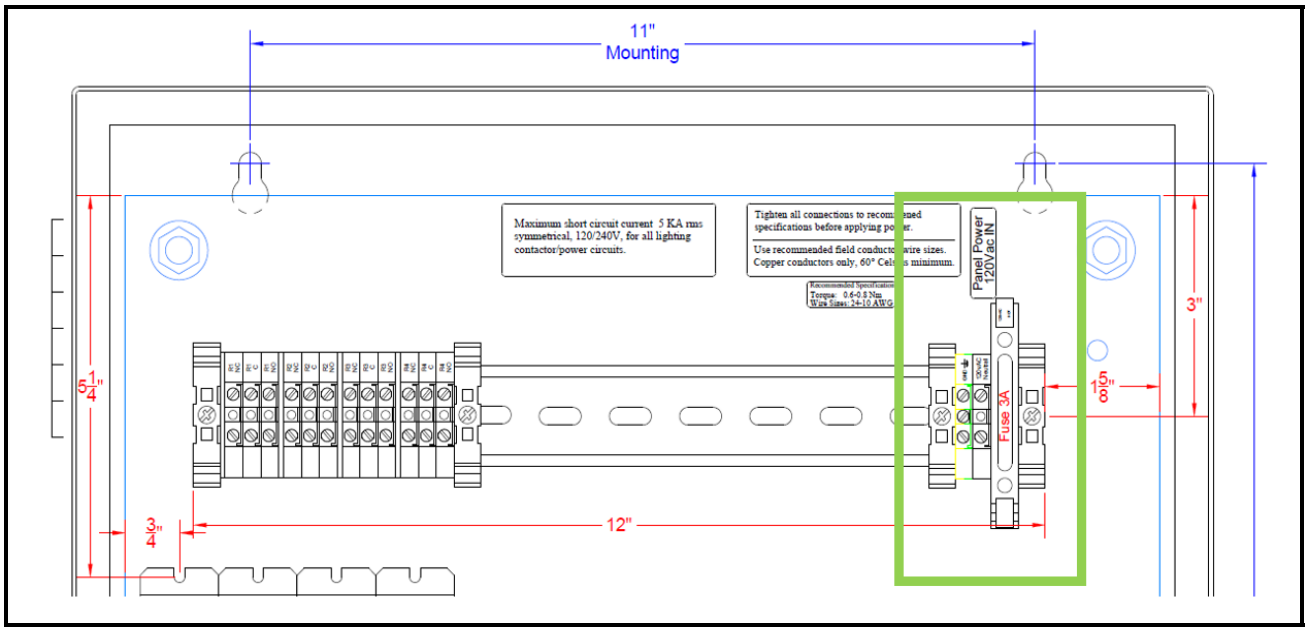

Figure 2-3 *- 10 DIN Panel Supply Power*

2.1.2 10 DIN Panel Temperature Sensor Wiring

The *851-4445* panel provides analog inputs factory wired to a terminal block on the panel back plate for easy connection of input sensors. ***Figure 2-4*** shows wiring detail for connecting temperature sensors. Connect one side of the temperature leads to the **Pb1** connection and the other side to the **PbC** probe Common. If more than 1 temperature sensor is used, the **PbC** Common terminal is used for the Common terminal of all sensors. The **PbC** probe Common should only be used for resistive type inputs and not voltage/current inputs. If temperature sensors must be extended beyond the factory leads, Emerson specifies *P/N 135-0600* 22/2 shielded cable.

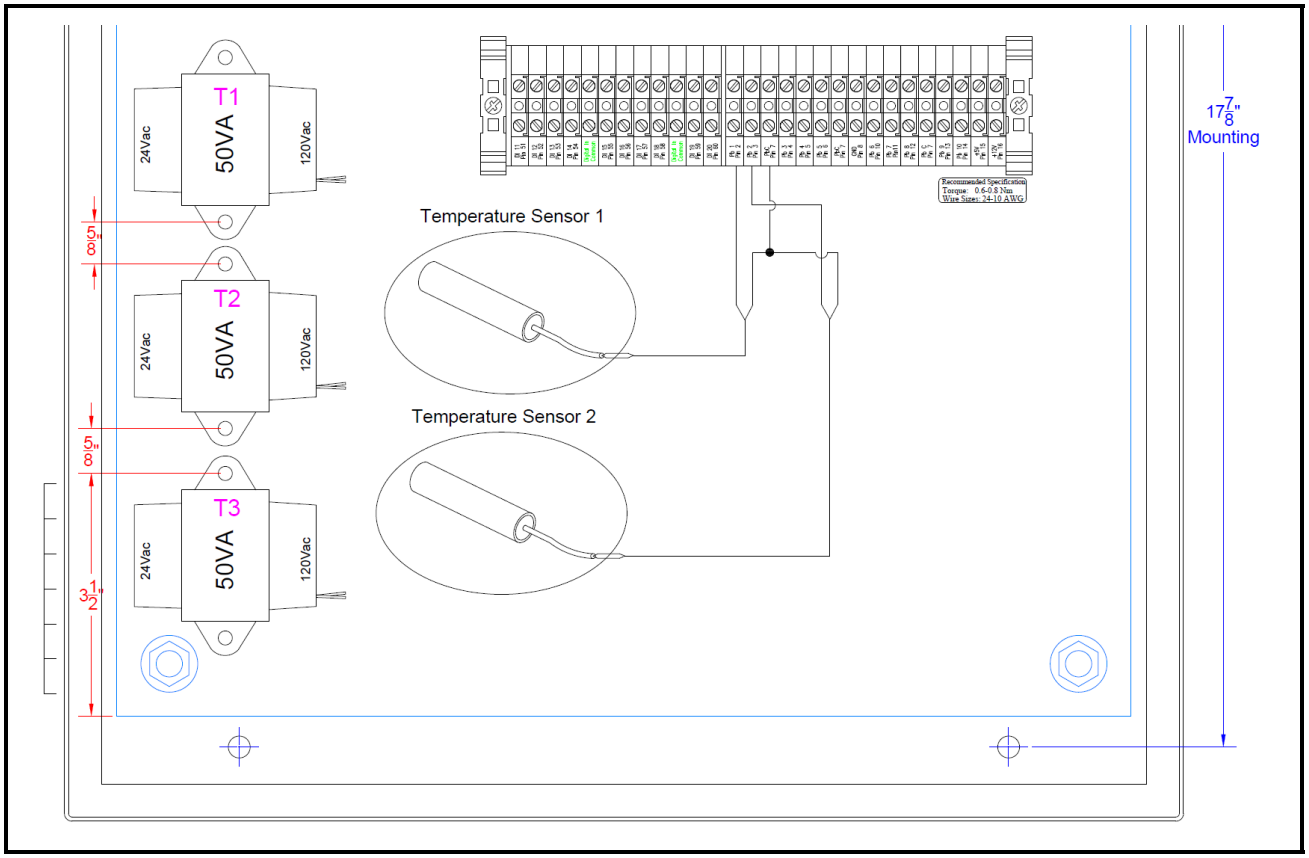

Figure 2-4 *- 10 DIN Panel Temperature Sensor Wiring*

2.1.3 10 DIN Panel Pressure Transducer and Voltage Input Wiring

Emerson Pressure Transducer

The *851-4445* panel provides analog inputs factory-wired to a terminal block on the panel back plate for easy connection of input sensors. ***Figure 2-5*** shows wiring detail for connecting Emerson pressure transducers, applicable for part numbers *800-2100*, *800-2200,* and *800-2500*. Connect the white signal wire from the sensor lead to the Pb1 connection, connect the black ground to the GND pin 8, connect the red power source wire to the +5V pin 15 terminal. Connect the sensor cable shield wire to earth ground by attaching to the panel back plate. If the Emerson pressure transducer wiring must be extended beyond the factory leads, then Emerson specifies *P/N 135-8771* 22/3 shielded cable.

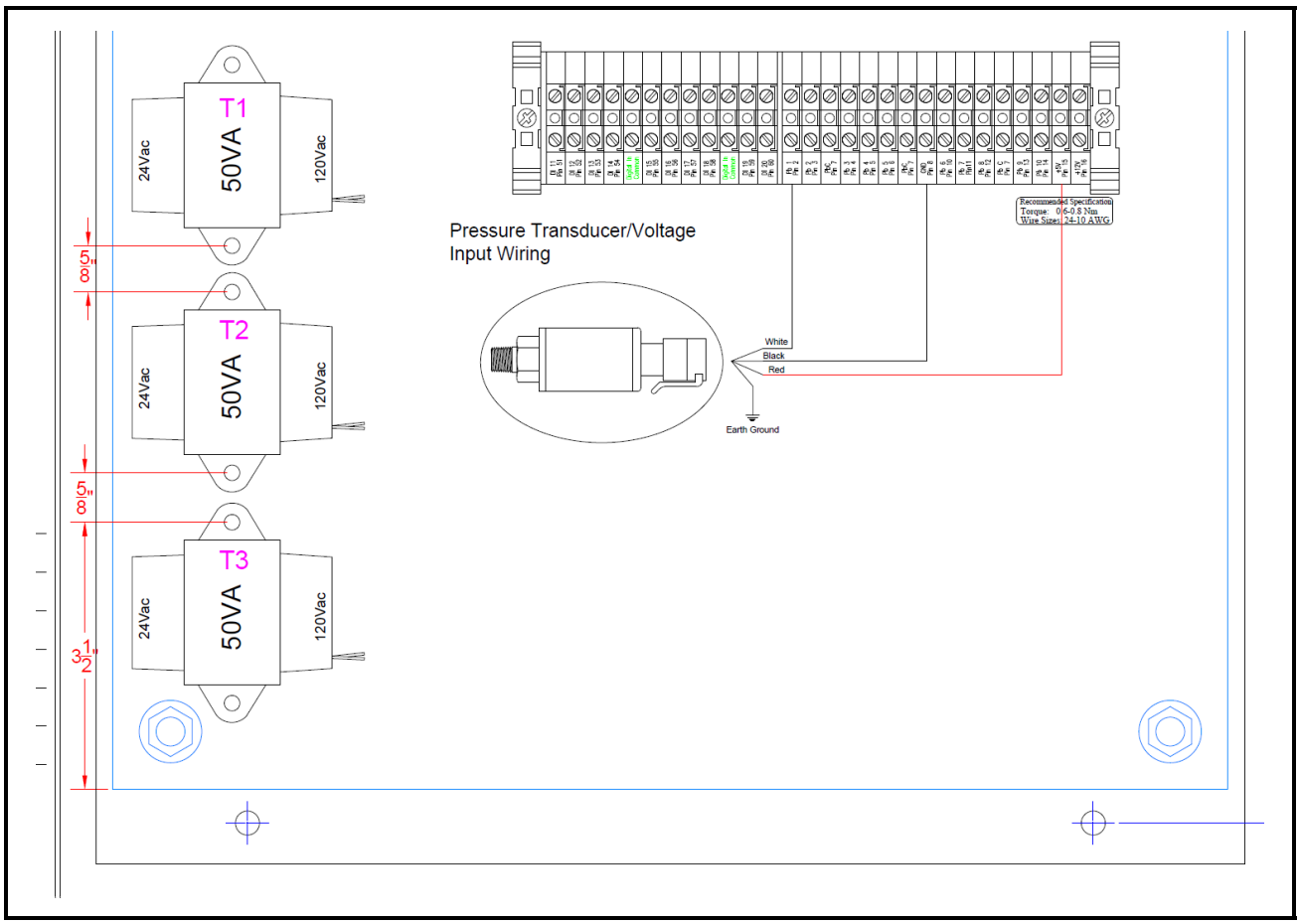

Figure 2-5 *- Emerson Pressure Transducer Input Wiring*

0 to 1 VDC, 0 to 5 VDC, and 0 to 10 VDC Sensor Wiring

Other voltage type inputs that require 5V or 12V power can be wired similar to the 5 volt transducer. Connect the input signal wire to one of the Pb inputs on the terminal strip. If the sensor requires 5V power supply, attach the sensor power supply wire to +5V pin 15 on the terminal strip; 12V can be sourced from the +12 V pin 16 on the terminal strip. For all voltage type inputs the GND terminal is used, not the **PbC** probe Common.

2.1.4 10 DIN Panel 4-20mA Input Wiring

The *851-4445* panel provides analog inputs factory wired to a terminal block on the panel backplate for easy connection of input sensors. The I/O Module can accept 4 to 20mA type inputs that have their own separate power supply or that require supply power from I/O Module. ***Figure 2-6*** shows wiring detail for current inputs with and without their own power supply.

2.1.5 10 DIN Panel Relay Wiring and Specifications

The 10 DIN control panel comes factory-wired with four (4) single pole double throw pilot relays with form C contacts (Emerson *P/N 221-1132*). The relay coil (24VAC) circuit is already factory-wired to the I/O Module Onboard relays; R1 pilot relay is controlled directly from the I/O Module relay 1. Installers need only to make connections to the factory terminal block for the load circuit that needs to be controlled. The pilot relay specifications can be found in the ***Table 2-1*** and the panel terminal strips are shown in ***Figure 2-7***.

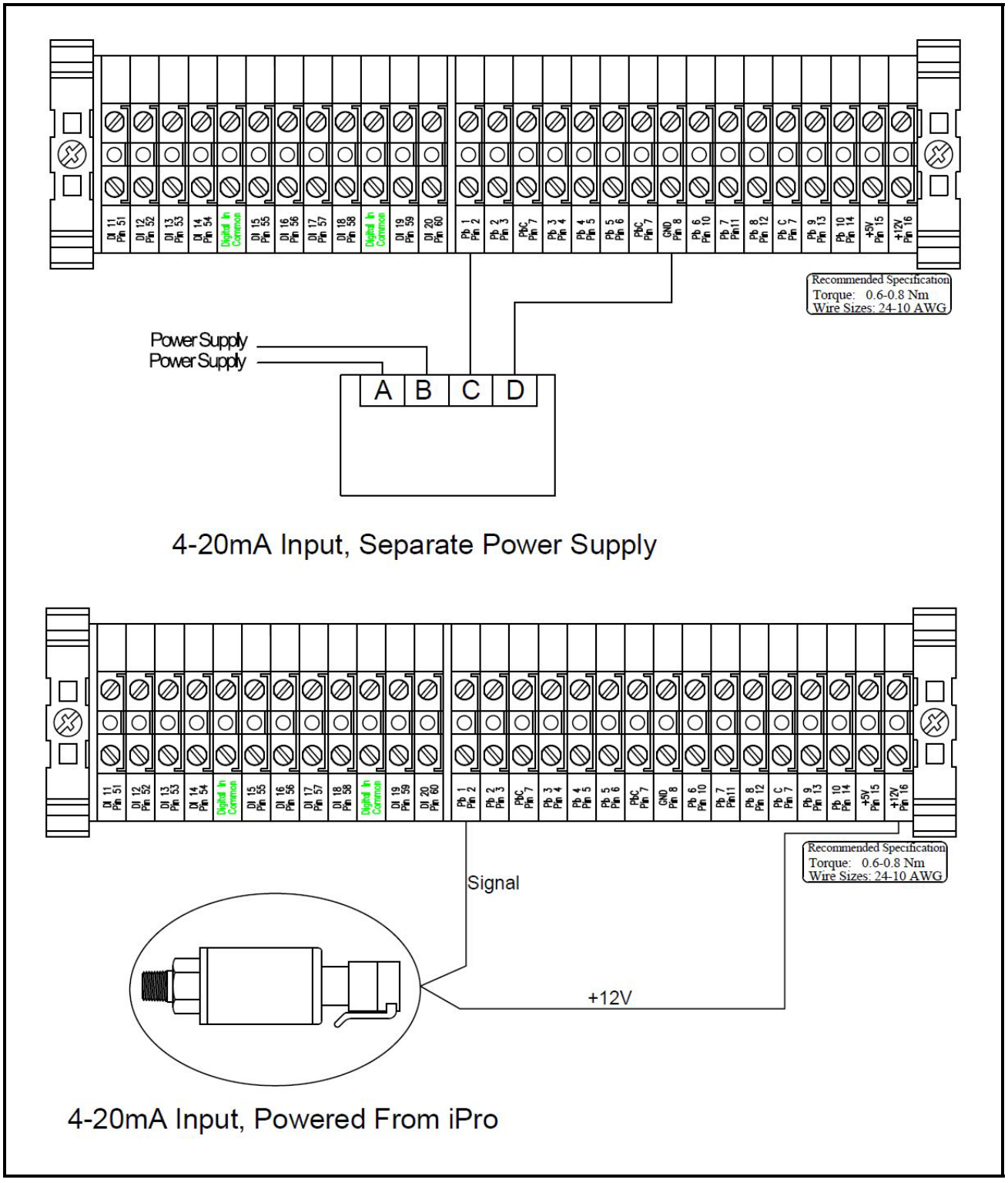

Figure 2-6 *- 10-DIN 420mA Input Wiring*

Contact Characteristics	
Contact Material	Silver Alloy
Contact Rating (resistive)	30 A NO Contacts/40 A NC Contacts 277VAC
Max Switching Voltage	277V
Max Switching Current	40A
HP	2 @ 277VAC
HP	1 @ 120VAC
Coil Characteristics	
Voltage Range	12 to 277VAC
Average Consumption	2VA

Table 2-1 *- 10 DIN Panel Pilot Relay Specifications*

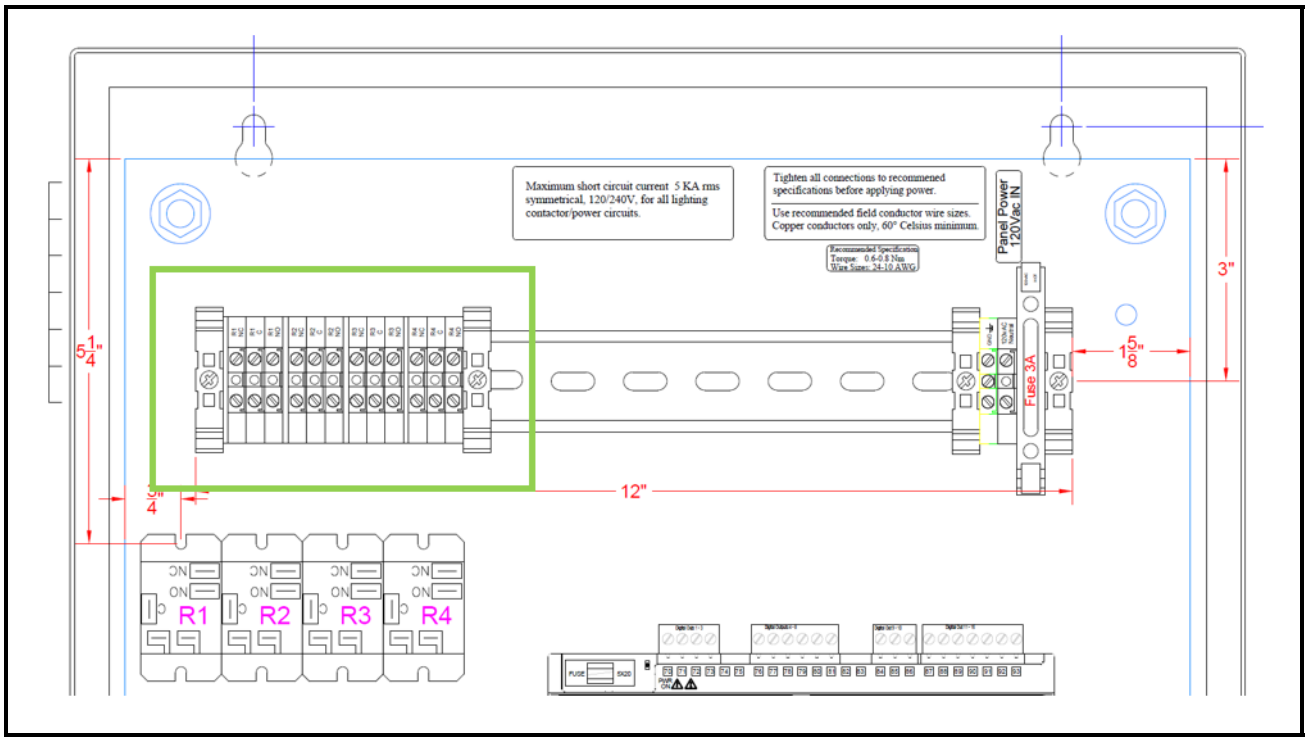

Figure 2-7 *- 10 DIN Panel Relay Wiring*

2.1.6 10 DIN Panel Dual Temperature Switches

The *851-4445* control panel comes with ten (10) toggle switches factory-mounted in the front of the panel door beneath the E2E controller. The switches are used to put dual temperature refrigeration cases in either medium or low temperature operation mode. The ten (10) switches are factory-wired back to the I/O Module's digital inputs 1 to 10. The panel door has a label already provided beneath each switch for easy labeling of refrigeration circuit names.

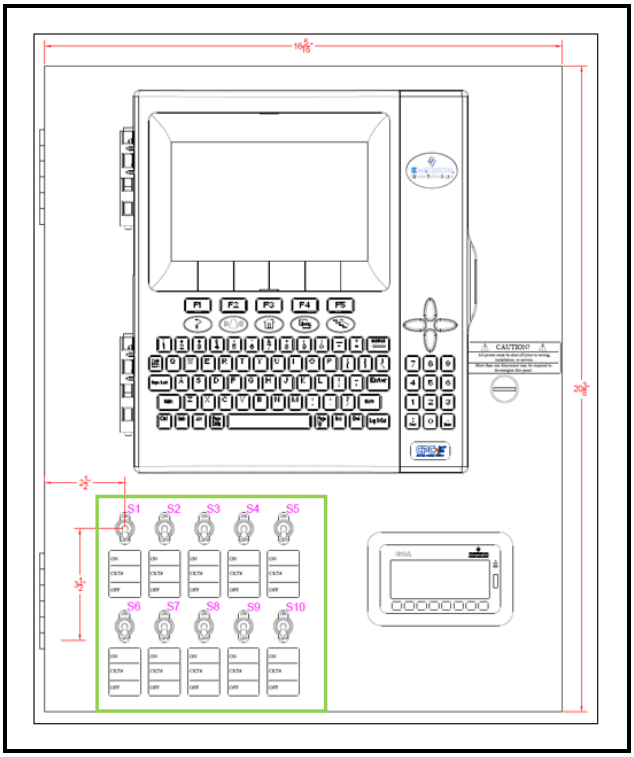

Figure 2-8 *- 10 DIN Panel Dual Temperature Switches*

2.1.7 10 DIN Panel Digital Inputs

The 10 DIN control panel has 20 voltage-free digital inputs for connecting switches and loads. Digital inputs 1 to 10 are reserved for use for dual temperature switches however, inputs 11 to 20 are available to be connected to other field inputs. The 11 to 20 digital inputs are factory-wired to a terminal block on the panel backplate for easy field wiring. The digital inputs share a Common terminal on the PLC hardware, when more than one (1) digital input is configured, join the Commons together and wire to Digital-In Common terminal on terminal block. A wiring example is shown in ***Figure 2-9***.

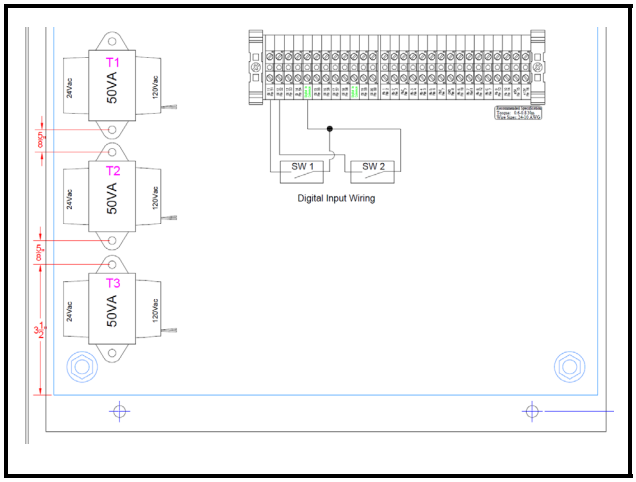

Figure 2-9 *- 10 DIN Panel Digital Inputs*

2.1.8 10 DIN Panel Replacement Parts

Part Number	Description
140-0041	50VA, Class 2 24VAC Transformer
117-1003	3A Fast Blow Fuse
221-1132	Relay, SPDT, 24VAC coil, 30A
118-3200	Toggle Switch DPDT
818-9057	iPro 10 DIN IPG215D I/O Module with Connectors
818-9205	Visograph Display
846-0812	E2E RX300 with Display

Table 2-2 *- 10 DIN Panel Replacement Parts*

3 Navigating Visograph Display

The Visograph display is used to view the status of inputs and outputs, toggle refrigeration circuit overrides and edit BACnet MS/TP network settings. There are eight (8) keys, T1-T8, along the bottom of the display that are used to navigate the display.

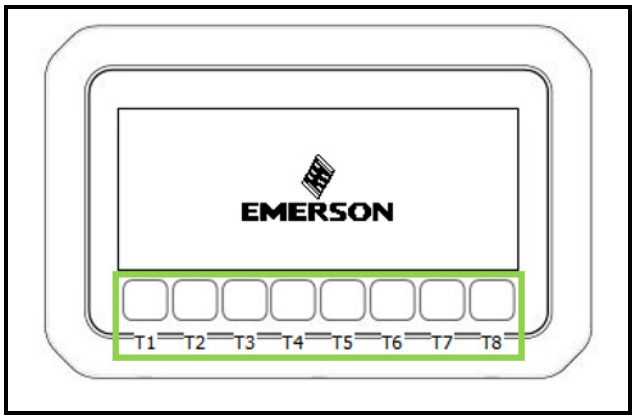

Figure 3-1 *- Navigating Visograph Display*

3.1 Accessing Status Screen

The main screen is the Analog Inputs screen where there are shortcut keys to access other the other status screens quickly. The analog inputs status screen shows the current value of each of the analog inputs. If an input is not configured from E2E then a "**not used**" label will appear in place of the sensor value. If a sensor is configured but in error, an **AI Error** message will appear in place of the sensors value. The shortcut keys are also available from all other screens as well for quick navigation.

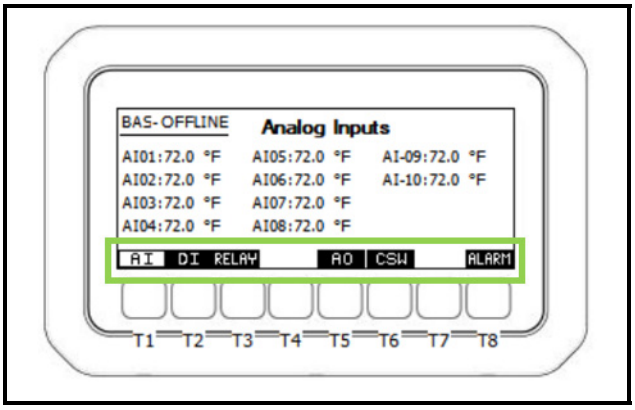

Figure 3-2 *- Visograph Main Status Screens*

DI Shortcut

Press **T2** key to access the digital input status screen. This gives an overview of the value of each of the digital inputs. For the 10 DIN model, the **T8** key can be used to page over to see additional digital input values.

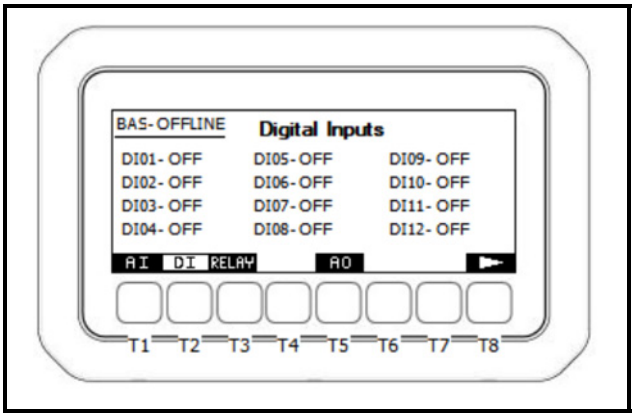

Figure 3-3 *- Visograph Digital Input Screen*

Relay Shortcut

Press the **T3** key to access the relay output status screen. This screen gives an overview of the value of each of the relay outputs. For the 10 DIN model, the **T8** key can be used to page over to see additional relay outputs.

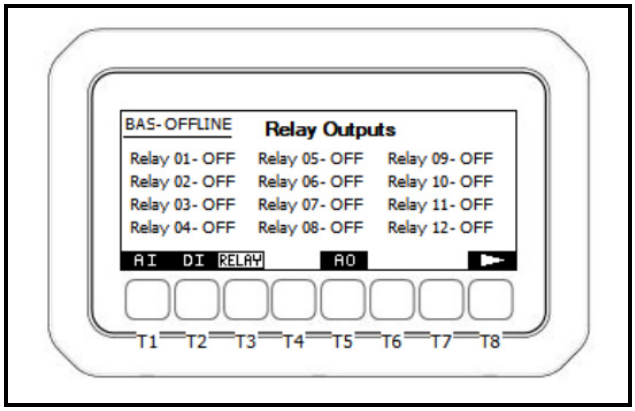

Figure 3-4 *- Visograph Relay Output Screen*

AO Shortcut

Press the **T5** key to access the analog output status screen. This screen displays the current signal voltage for all analog outputs. If no analog outputs are defined from E2E, a "**not used**" label will appear in place of the signal value.

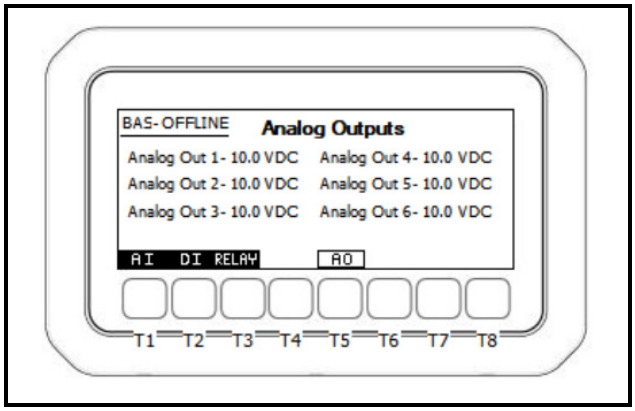

Figure 3-5 *- Visograph Analog Output Screen*

CSW Shortcut

If there is at least one circuit override configured from E2E, the **CSW** shortcut key will appear. Press the **T6** key to access the Circuit Override Status screen. This screen is an overview of the refrigeration circuit overrides where up to 30 overrides can be defined for 30 refrigeration circuits. Use the **T8** key to page over through the overrides.

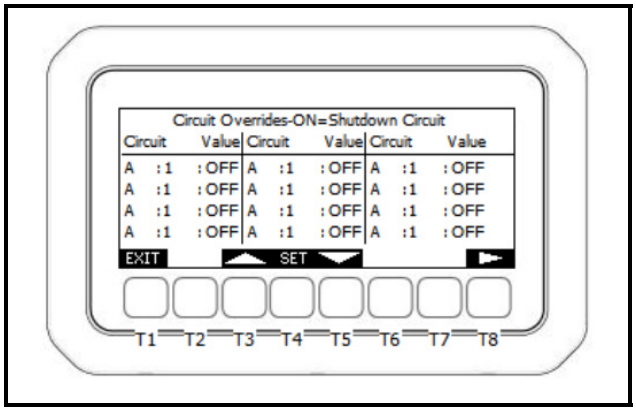

Figure 3-6 *- Visograph Circuit Override Screen*

ALARM Shortcut

If there is at least one (1) alarm present in the system, the alarm shortcut will become visible. Press the **T8** key to enter the Alarms screen. This screen gives a list of all currently active alarms.

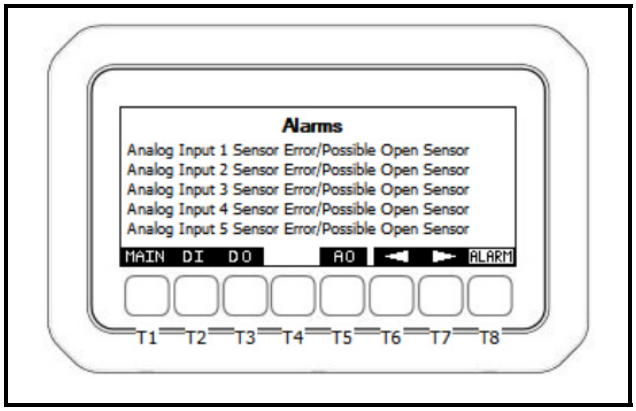

Figure 3-7 *- Visograph Alarms Screen*

3.2 Accessing Main Menu

To enter the Main Menu, the display must be on the Analog Inputs screen shown in ***Figure 3-8***. Press and hold the **T4** key for three (3) seconds and to access the menu. Use the **T4/T6** keys to move through the list of options and the **T5 SET** key to enter a menu.

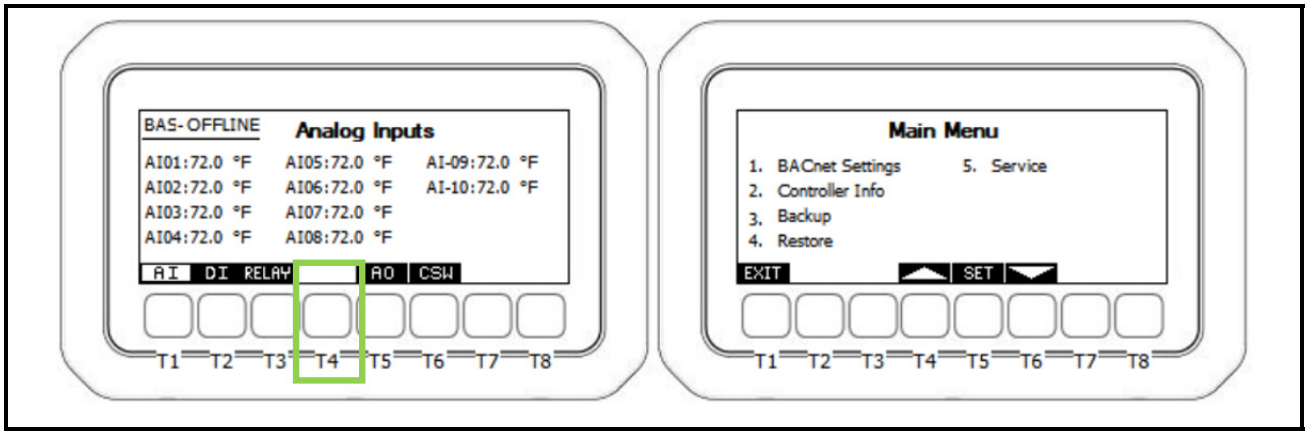

Figure 3-8 *- Visograph Main Menu*

3.3 Configuring BACnet Settings

From the Main Menu, use the **T6** key to arrow down to **1. BACnet Settings** and press **T5 SET** to enter. The BACnet settings must be configured for the I/O Module to communicate with E2E or another BACnet client. Use the **T4/T6** keys to move between settings. To edit a setting, highlight it and press **T5 SET** to enter edit mode and the value will blink. Use the **T4/T6** keys to scroll the value up or down. Once the desired value is reached, use **T5 SET** to save it.

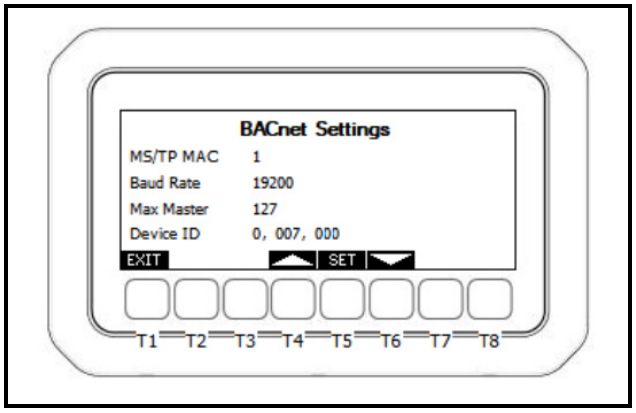

Figure 3-9 *- Configuring BACnet Settings*

MS/TP MAC

This parameter specifies the MS/TP network MAC address of the I/O Module. Each BACnet device on the bus must have a unique number here. Enter a unique number between 0-127.

Baud Rate

This parameter specifies how fast data is sent over the serial line. Set to 19200 for communications with E2E.

Max Master

This parameter defines the value of the highest allowable address for master nodes on the network. Determine the highest MS/TP MAC address used on the bus and set Max Master equal to this value.

Example: If there are 40 controllers on the bus and the highest address is 40, set the max master of all 40 controllers to 40.

Device ID

Enter the BACnet device identifier here. Enter a unique number for the MS/TP network in the range of 0-4, 194, 303.

Once at least one (1) setting has been edited, a cancel option will appear above the **T7** Key and a save option above the **T8** key. Pressing **CANCEL** reverts the system back to the previous settings and no change is applied.

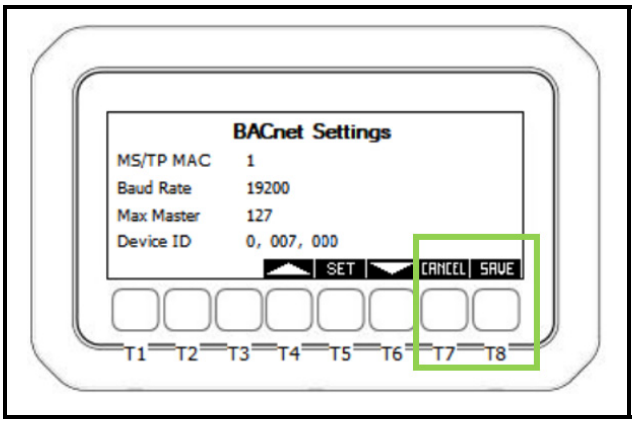

Figure 3-10 *- BACnet Buttons*

Pressing **SAVE** will apply the changes made and the system will reboot.

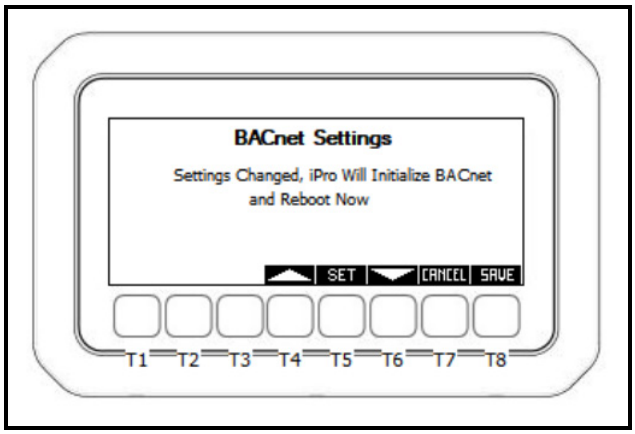

Figure 3-11 *- Reboot BACnet Settings*

Once the I/O Module has booted back up, it is ready for connection to E2E.

3.4 Controller Info

From the Main Menu, use the **T6** key to arrow down to **2. Controller Info** and press **T5 SET** to enter. The Controller Info screen has information about the current application version and build date.

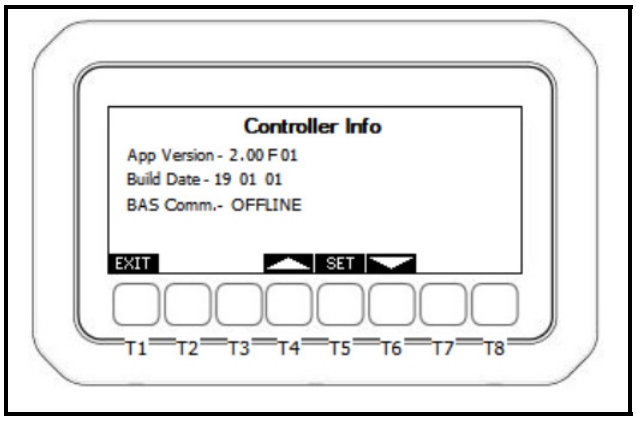

Figure 3-12 *- Visograph Controller Info*

App Version

This field gives the version of the application that is currently running on the PLC.

Build Date

This field gives the build date of the application that is currently running on the PLC.

BAS Comm

This field gives the status of communication between the I/O Module and the BAS system.

3.5 Performing a Backup

The I/O Module has the capability to back up all parameters to a backup file and transfer to the file to a USB. This feature can be helpful during a replacement device scenario or any time a quick parameter configuration is needed.

1. From the Main Menu use the **T4/T6** keys to arrow down to **3. Backup** and press **T5 SET** key to enter the menu.

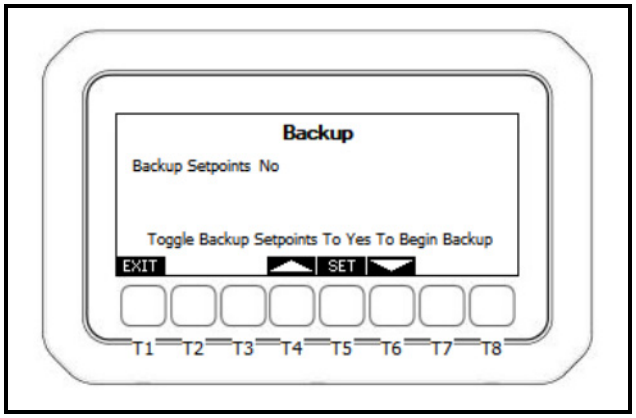

Figure 3-13 *- Visograph Backup*

2. Use the **T5 SET** key to enter edit mode on **Backup Setpoints**, use **T4/T6** to change the value to **YES**. The **Backup in progress** message will appear.

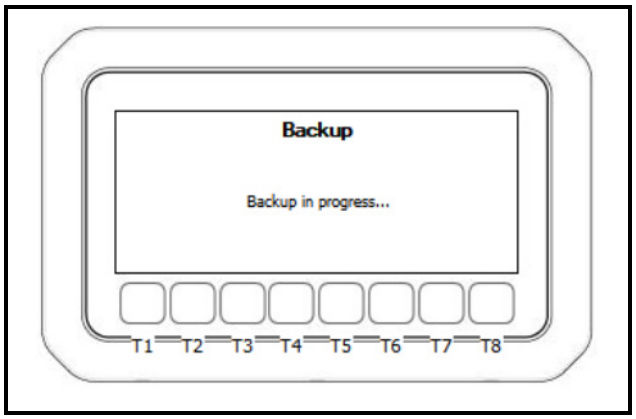

Figure 3-14 *- Visograph Backup in Progress*

3. Once the backup is complete the display will show **Backup Successful, Press USB to Transfer Backup File to USB**. Press **T8** to start the USB transfer.

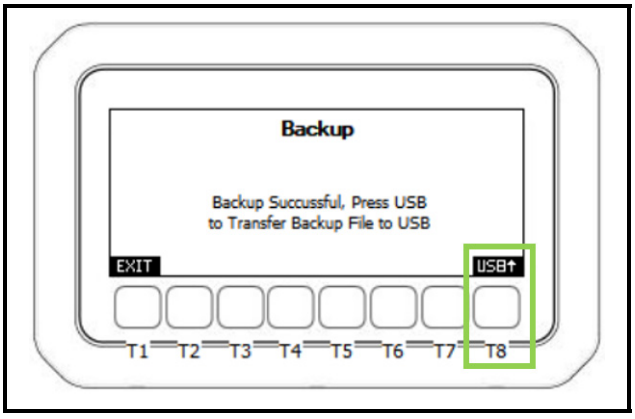

Figure 3-15 *- Visograph Transfer Backup to USB*

4. The I/O Module will search for connected USBs, and if no USB is detected, it will prompt the user to insert a USB drive.

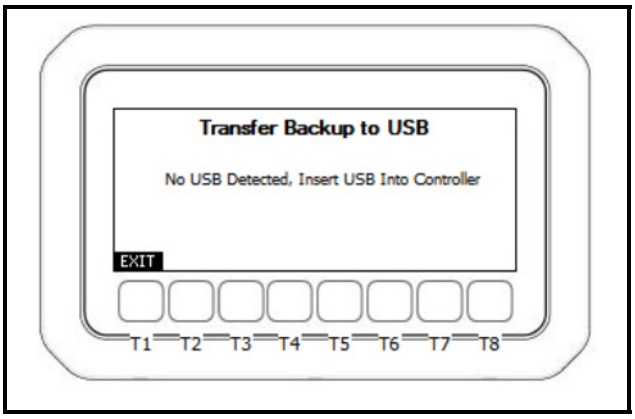

Figure 3-16 *- Visograph Transfer Backup - Insert USB*

5. Once the USB drive is inserted, the screen will prompt the user to press the USB button. Press **T8 USB** to copy the backup to USB drive.

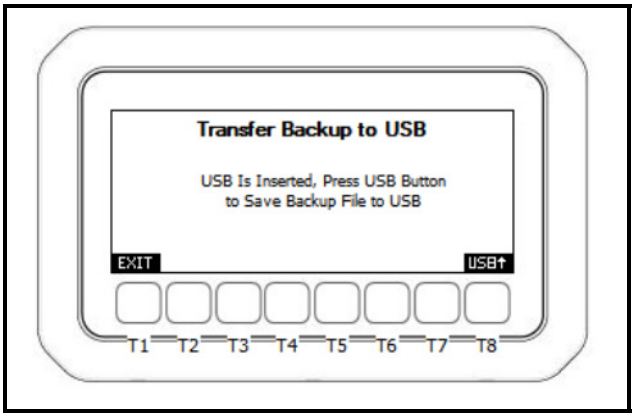

Figure 3-17 *- Visograph Transfer Backup - Save*

6. The display will show **Backup Transfer to USB Complete, Remove USB and Exit**. It is now safe to remove the USB drive.

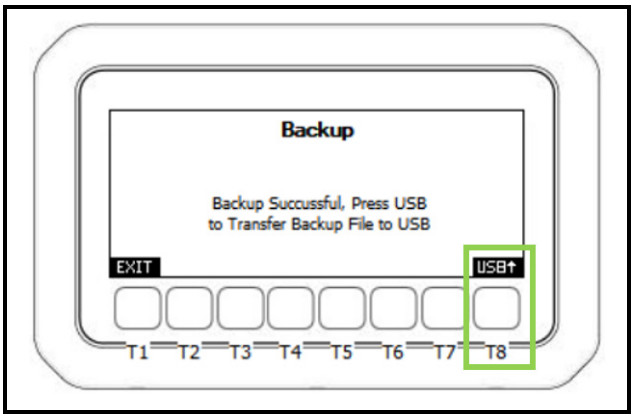

***Figure 3-18** - Visograph Backup Successful*

3.6 Performing a Restore

If a backup operation has been performed with a USB drive, that same USB drive can be used to update or restore I/O Module parameter values to the values in the backup file.

1. From the Main Menu, use the **T4/T6** keys to arrow down to **4. Restore** and press the **T5 SET** key to enter the menu. A warning message will be displayed to warn the user that performing a restore operation will set all parameter values to the values in the backup file they are loading.
2. Insert a USB drive with a backup file.
3. Press **TS NEXT** to continue.

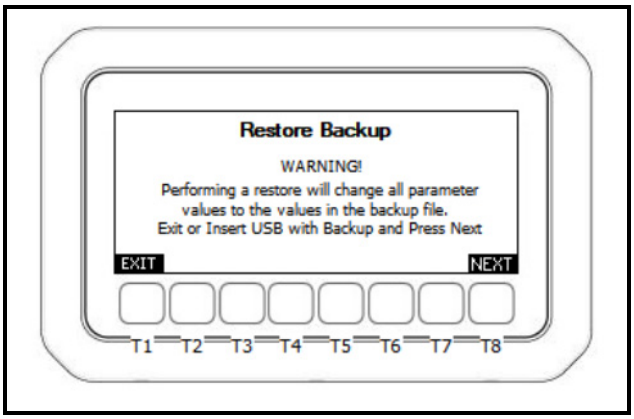

***Figure 3-19** - Visograph Restore Backup*

4. The I/O Module will display that the backup file is found and to press **T8 START** to begin restoring.

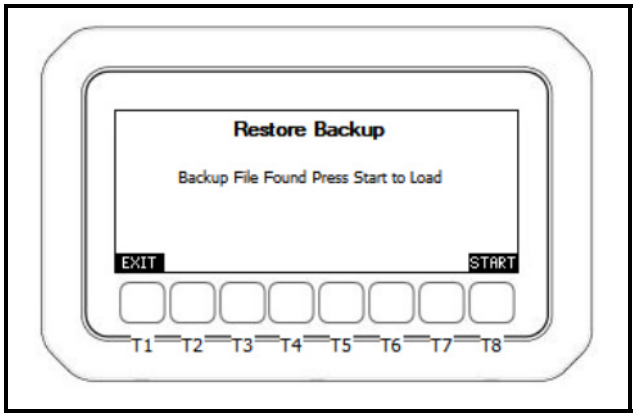

***Figure 3-20** - Visograph Restore Backup - File Found*

5. The restore process will begin and display a **Restore In Progress** message:

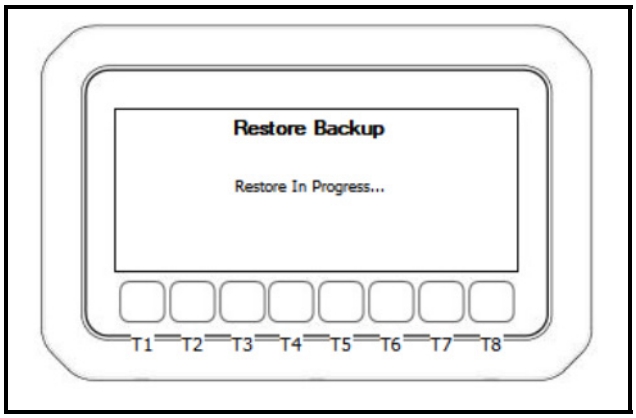

***Figure 3-21** - Visograph Restore Backup - In Progress*

6. Once the **Restore Is Complete** message is displayed, press **T1 EXIT**.

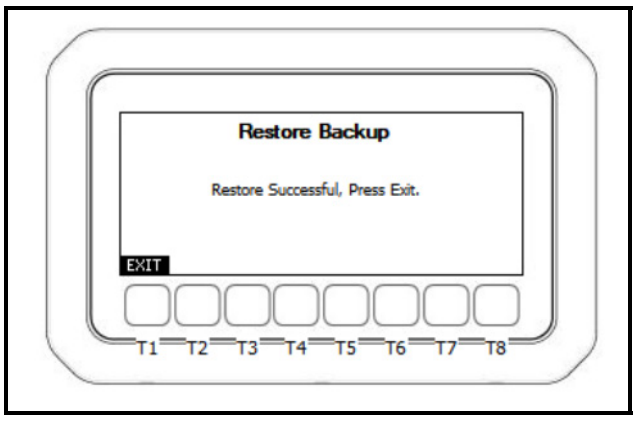

***Figure 3-22** - Visograph Restore Backup - Successful*

3.7 Service Menu

The Service Menu is used to reboot the controller, re-initialize BACnet, and update the template.bin file for the Visograph. From the Main Menu, use the **T4/T6** keys to select **5. Service** and press **T5 SET** to enter the menu.

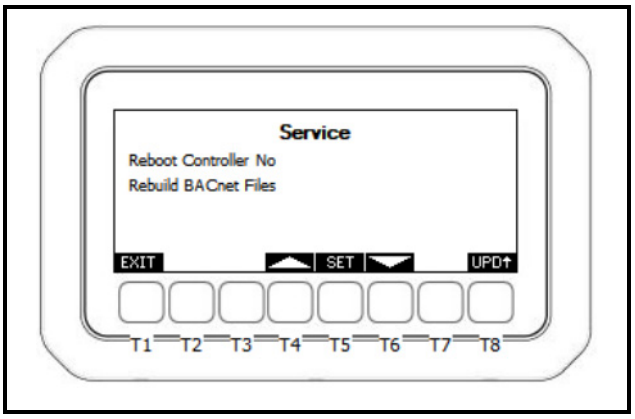

***Figure 3-23** - Visograph Service Menu*

3.7.1 Updating Visograph Template File

The Visograph display can receive software updates from the I/O Module through the wiring connection. If a firmware update is performed on the I/O Module, a Visograph update procedure should be performed to make sure the display version and controller version are aligned.

CAUTION: The following actions must be avoided during the Visograph update procedure:

1. ***Interrupting the power supply to the case controller.***
2. ***Interrupting the wiring connection between the I/O Module and Visograph display.***
3. ***Performing a reboot of the I/O Module.***

The update procedure could become compromised resulting in an inoperable Visograph display.

1. From the Service Menu, press and hold the **T8** UPD↑ key for three (3) seconds to start the update procedure.

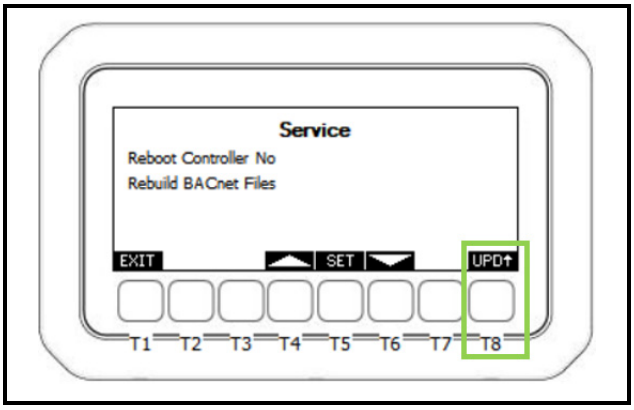

***Figure 3-24** - Visograph Service Menu - Update button*

2. The update procedure will begin and the Visograph will show an update status screen.

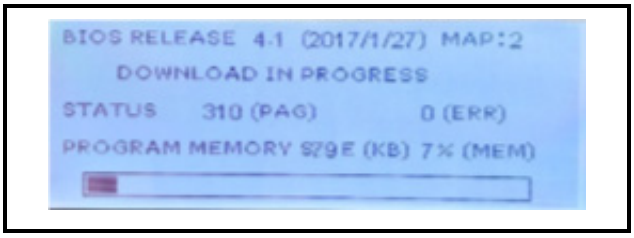

***Figure 3-25** - Visograph - Update Status Screen*

3. The update will progress and when complete the display will reset and boot back up to the Analog Inputs screen. Once the Analog Inputs screen is reached after the screen reset, the update process is complete.

3.7.2 Performing a Reboot

The I/O Module can be triggered to reset and reboot from the Visograph Service Menu.

1. From the Service Menu, use the **T4/T6** keys to scroll to **Reboot Controller - No**.
2. Use the **T5 SET** key to enter edit mode and use the **T4/T6** arrow keys to change the value to **Yes** and press **T5 SET** to save.

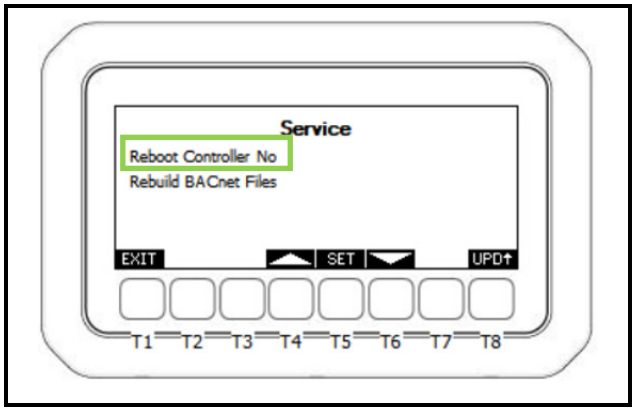

Figure 3-26 *- Visograph Service - Reboot Controller No.*

3. The controller will perform a reboot.

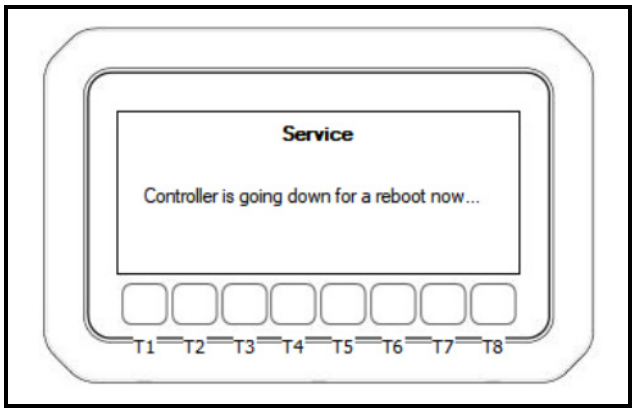

Figure 3-27 *- Visograph Service - Controller Reboot*

3.7.3 Re-initialize BACnet MS/TP

The Service menu has the option **Rebuild BACnet Files** listed. When triggered, it forces the BACnet object list to be rebuilt with what is programmed in the application, it also resets all MS/TP parameters back to factory default values. Under normal circumstances it is not necessary to perform this action but it could be used in a troubleshooting scenario if the need arises.

1. From the service menu using the **T4/T6** keys, move the cursor to the **Rebuild BACnet Files** and press **T5 SET** to begin.

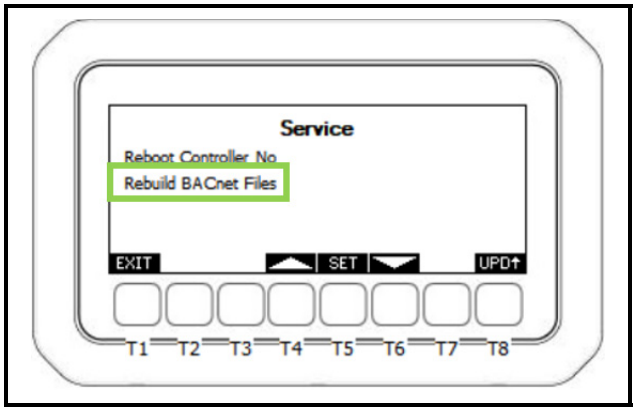

Figure 3-28 *- Visograph Service - Rebuikd BACnet Files*

2. The warning message will be displayed, press **T8** to continue the action or **T1** to exit and abort.

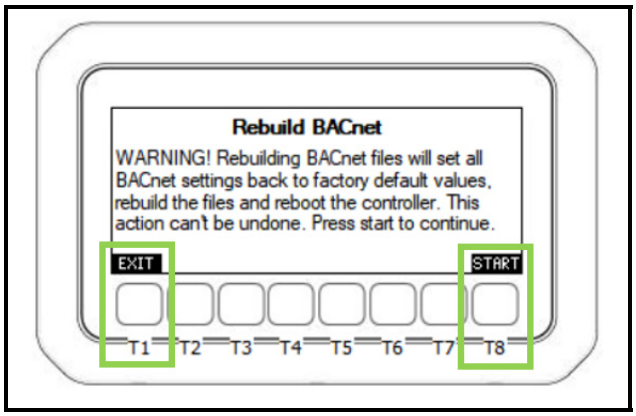

Figure 3-29 *- Rebuild BACnet Warning Message*

3. Pressing **T8 START** will finalize the action and a status message will be displayed.

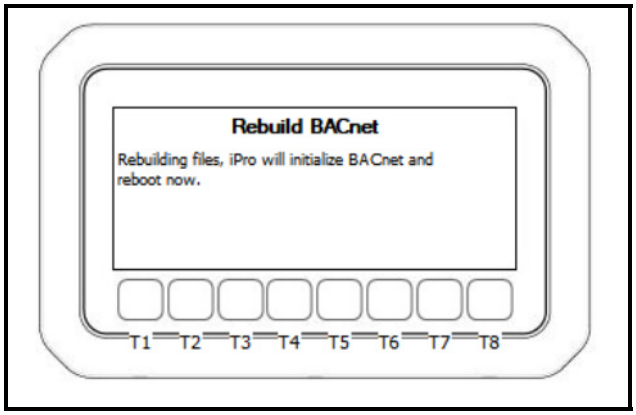

Figure 3-30 *- Rebuilding BACnet Files*

4 E2E Setup and Overview

The I/O Module can communicate with E2E version 4.09F04 or later. The I/O Module must be online and communicating with E2E to configure inputs and outputs. After the BACnet MS/TP serial settings have been set up in the I/O Module as outlined in ***Section 3.3, Configuring BACnet Settings***, the E2E setup can now be completed. This section will outline how to add and configure the I/O Module controller to the E2E.

Communication between E2E and I/O Module takes place using an RS485 BACnet MS/TP network. The communication cabling comes factory wired inside the I/O Module control panel to an E2E serial port. If the serial port from the factory must be changed to a different port, the I/O Module must be connected in a daisy chain topology only.

4.1 Set Up Network Ports and Commissioning

The E2E serial port with the I/O Module connected must be configured for BACnet MS/TP protocol in E2E's serial setup settings. First locate the serial port that I/O Module is connected to by opening the door of the E2E enclosure. Examine the serial ports on E2E's power interface board (PIB) to determine which port has I/O Module's RS485 wires connected to it. The I/O Module will be connected to a COM2, COM6, or COM4 connector. The BACnet daisy chain must only be connected to the E2E serial port connectors **2a**, **6**, or **4a**. *Note that connecting one daisy chain of BACnet controllers to the **a** and another daisy chain of BACnet controllers to the **b** side of the serial port simultaneously is not supported.*

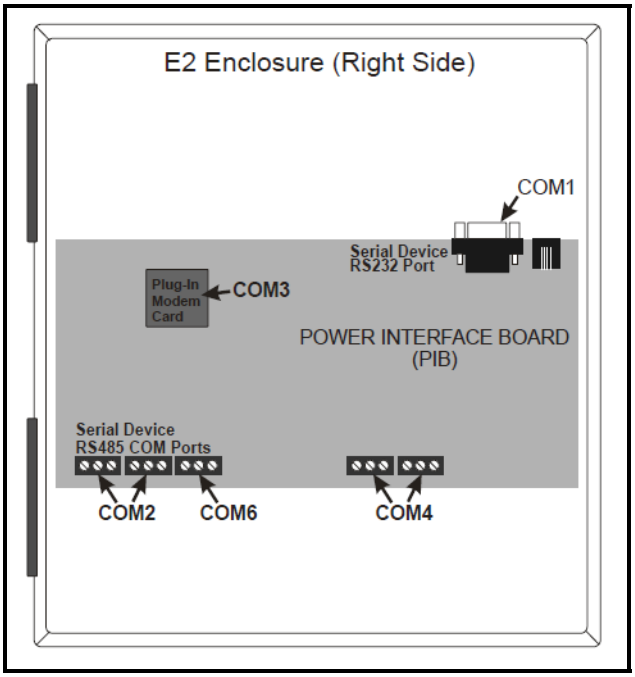

Figure 4-1 *- E2E Serial Port*

After you have determined which serial COM port the I/O Module RS485 is connected to, log into the E2E controller with level 4 access or higher.

1. Login to E2E with username: **user** and password: **pass**.
2. Press Alt + M on the E2E keyboard to access the serial tab of the general controller setup screen. This screen will have a connection field for all available COM ports on the E2E. Highlight the COM port connection for which you will be using the I/O Module and press F4 **(LOOKUP)** and select BACnet MS/TP-1 from the list of network types.

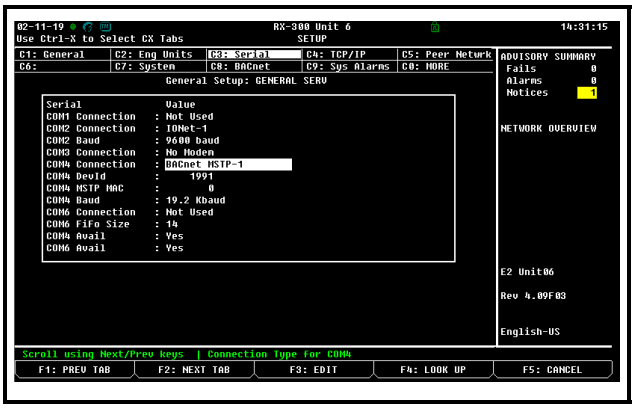

Figure 4-2 *- E2E- Serial Tab*

3. Three (3) fields will become visible underneath the COM4 Connection that pertain to the way the device communicates:

   a. **COM4 DevId** - This is the E2E BACnet Device ID; set this to a unique number from all other BACnet nodes on the network in the range of **0-4194303**.

   b. **COM4 MSTP MAC** - This is the E2E BACnet MSTP MAC address; set this to a unique number for E2E in the range of **1-127**. Each BACnet device on the network must have its own unique MSTP MAC for successful communication.

   c. **COM4 Baud** - Default setting is **9600**; this must be changed to **19.2k** (all devices connected to the same COM port should be set to the same baud rate).

   d. After the baud rate setting has been selected, press the key to exit and save selections.

5. Now the BACnet MS/TP specific settings must be configured. From the Home screen on E2E press Alt + T on the keypad to navigate to this screen.

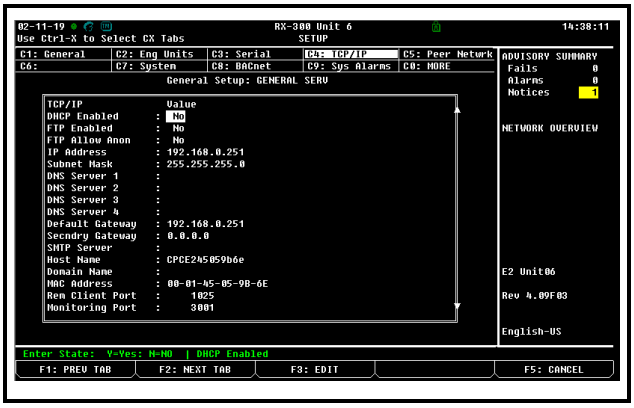

Figure 4-3 *- E2E- TCP/IP Tab*

6. Press Ctrl + * 8 at the same time to reach the **BACnet** tab.

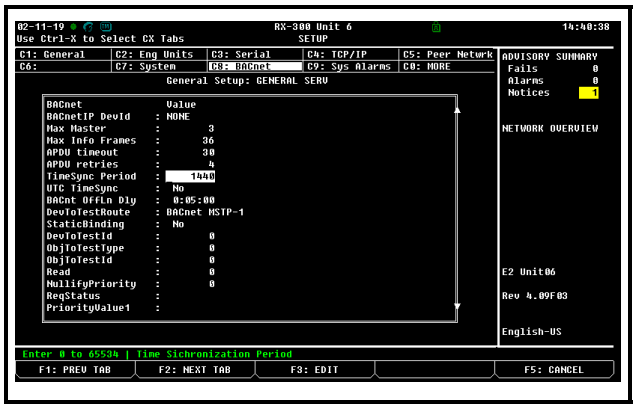

Figure 4-4 *- E2E- BACnet Tab*

7. Three settings must be configured on the **BACnet** tab:

   a. **Max Master** - The default setting is 127, edit and change the value to be equal to the highest BACnet mac address that E2E will communicate with on any of its three (3) comm ports. Determine what BACnet MS/TP devices are connected to E2E's comm ports, then determine the highest MS/TP MAC address of all the devices. Set the E2E Max Master equal to the highest MS/TP MAC address determined.

   b. **Max Info Frames** - This is the max number of BACnet frames E2E can transmit per token. Set to **36**.

   c. **APDU timeout** - This is the amount of time in seconds between retransmissions of an APDU requiring acknowledgment for which no acknowledgment has been received. Enter a value of **30** in this field.

   d. **APDU retries** - This is the maximum amount of times that an APDU shall be retransmitted. Enter a value of **3** in this field.

   e. **TimeSync Period** - This is the number of minutes between time synchronization broadcasts. Enter a value of 1440.

   f. **UTC TimeSync** - This toggles the time sync broadcast to use coordinated universal time mode. Toggle this field to **NO**.

7. Now the Module can be added to E2E. Press Menu & 7 & 7 @ 2 to access **Connected I/O Boards and Controllers** screen.

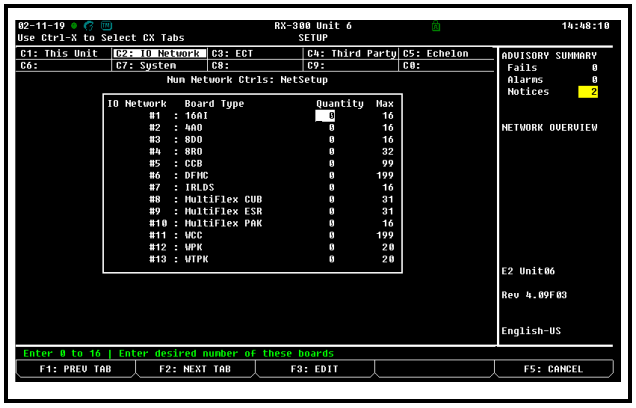

Figure 4-5 *- E2E- IO Network Tab*

8. Press F2 (NEXT) to move over to the tab **C4: Third Party**. In the **Connected I/O** screen under the **Third Party** tab, enter the number of I/O Module devices on the **Quantity** field.

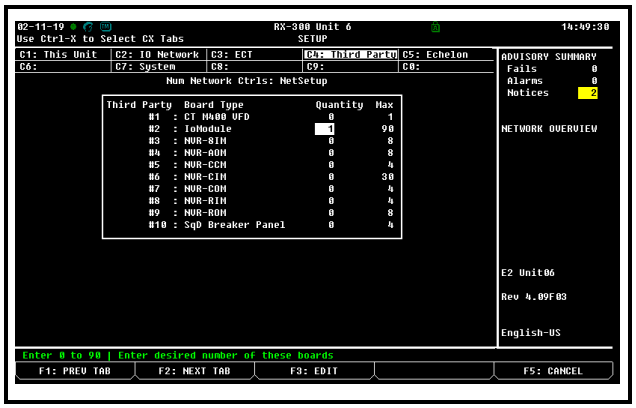

Figure 4-6 *- E2E- Third Party Tab*

9. Press the Enter key to save and exit.
10. Press Alt + N at the same time to enter the **Network Summary** screen.
11. The number of I/O Module devices added in *Step 3* should now be visible in the **Network Summary** screen.

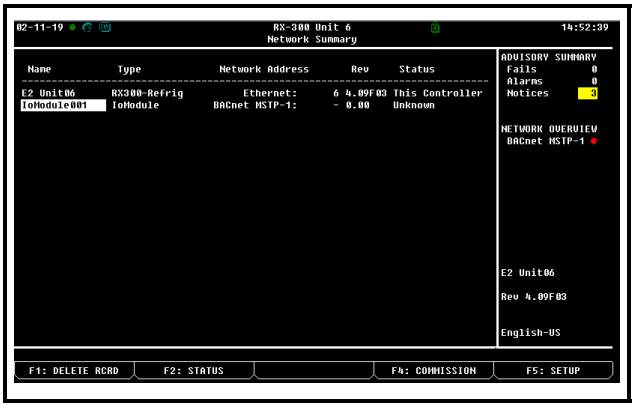

Figure 4-7 *- E2E- Network Summary Screen*

12. Highlight the device and press F4 **COMMISSION**, a list of networks will appear. Select the BACnet MS/TP route assigned to the Com port earlier in ***Step 2***.

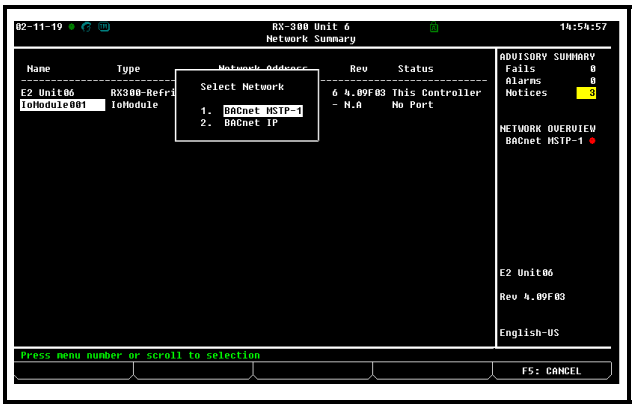

Figure 4-8 *- E2E- Select Network*

13. E2E will scan for available BACnet MS/TP devices.

Figure 4-9 *- E2E- BACnet Device Commission*

14. E2E will display a list of the MS/TP devices discovered during the scan. The number in parenthesis is the BACnet MAC address and the 6-digit number adjacent to it is the BACnet Device ID. Select the device you want to commission and press Enter on the E2E keypad.

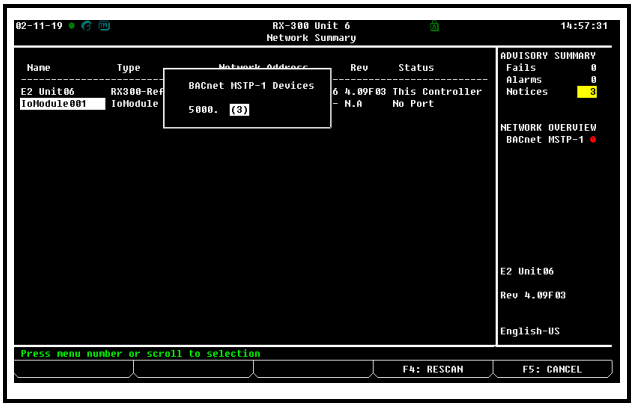

Figure 4-10 *- E2E- BACnet MSTP Devices*

15. Press Enter again on E2E keypad and then E2E will display **BACnet Device ID is set**.

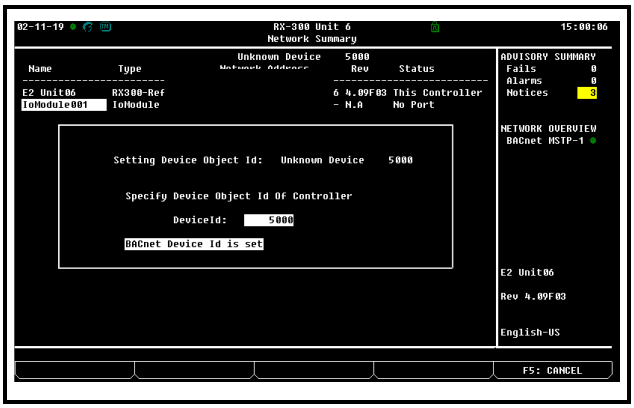

Figure 4-11 *- E2E- BACnet Device ID is Set*

16. Press the oval button to save and exit back to the **Network Summary** screen.

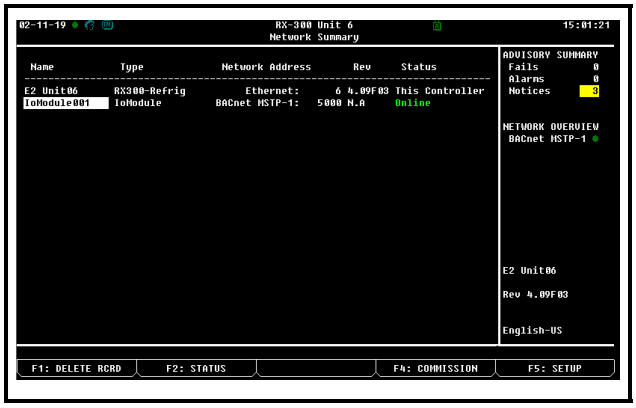

Figure 4-12 *- E2E- Network Summary Screen*

17. The I/O Module device status should now change to **ONLINE** in green. Allow approximately five (5) minutes for initial communication startup and synchronization to complete before editing parameters.

4.2 Configuring Analog Inputs

The I/O Module Analog Inputs are configured from the I/O Module application in E2E. There are 10 analog inputs available for configuration at E2E. ***Table 4-1*** outlines the different input setup options.

AI Setup	Description
1 - Not Used	Sets the input to **Not Used**.
2 - Emerson Temp	Configures the input for any of Emerson's standard temperature sensors.
3 - Emerson 100 PSI	Configures the input for Emerson's 100 PSI transducer. Scaling values and engineering units are automatically configured.
4 - Emerson 200 PSI	Configures the input for Emerson's 200 PSI transducer. Scaling values and engineering units are automatically configured.
5 - Emerson 500 PSI	Configures the input for Emerson's 500 PSI transducer. Scaling values and engineering units are automatically configured.
6 - Custom Pressure	Configures the input for a user defined pressure transducer, input scaling parameters will become visible.

Table 4-1 *- Input Setup Options*

AI Setup	Description
7 - Dixell NTC Temp	Configures the input for standard Dixell NTC temperature sensor.
8 - Dixell PTC Temp	Configures the input for standard Dixell NTC temperature sensor.
9 - Linear	Configures the input for a custom scaled linear input. Scaling values and signal type parameters will become visible.

Table 4-1 *- Input Setup Options*

To start configuring inputs:

1. Login to E2E with username: **user** and password: **pass**.
2. Press Alt + N keys at the same time to navigate to the Network Summary screen.
3. Highlight the I/O Module device and press F5 **(SETUP)**, press F2 tab over to the AI setup tab you wish to configure.

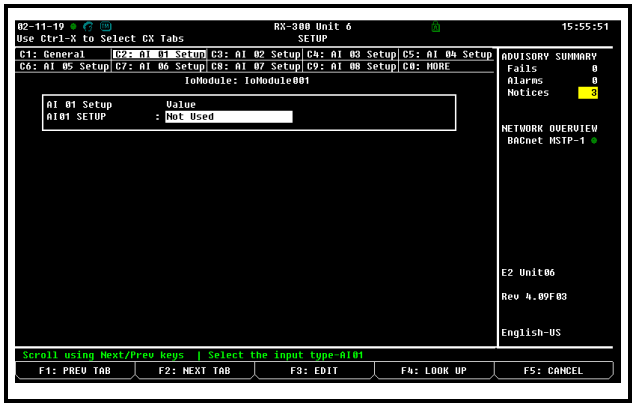

Figure 4-13 *- E2E- AI 01 Setup Tabs*

4. Press F4 **(LOOK UP)** to select a setup option.

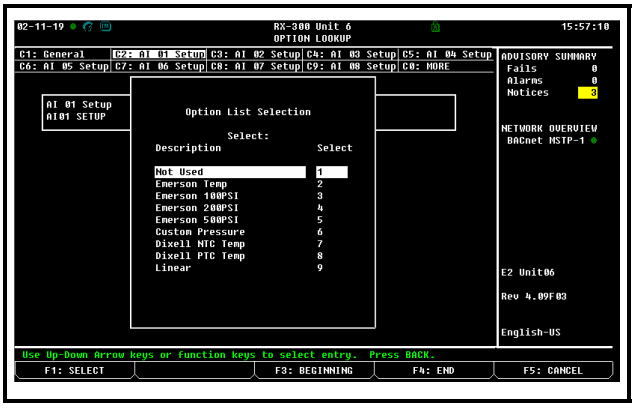

Figure 4-14 *- E2E- AI 01 Setup Tabs*

4.2.1 Configuring a Custom Pressure Transducer

To configure a custom pressure transducer, follow the steps in the above section to select **Option 6** ***(Table 4-1)*** for custom pressure. The sensor's input signal will be scaled linearly with **MIN SIGNAL** corresponding to the **MIN EU** value and **MAX SIGNAL** corresponding to the **MAX EU** value. Once custom pressure is selected, other configuration parameters will become visible: NAME, **MIN SIGNAL**, **MAX SIGNAL**, **MIN EU**, **MAX EU** and **OFFSET**.

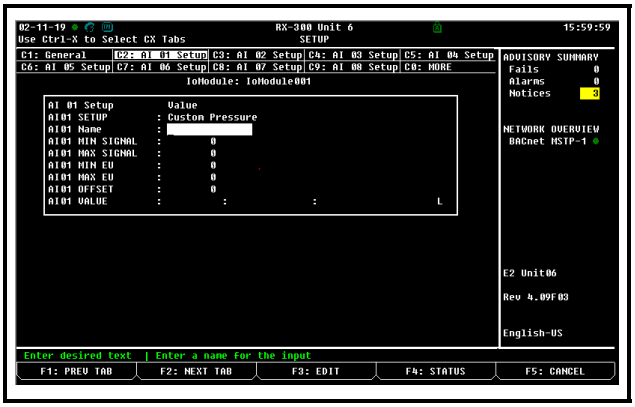

Figure 4-15 *- E2E- Configuring a Custom Pressure Transducer*

MIN SIGNAL

In the MIN SIGNAL field, enter the sensor signal voltage that will correspond to the unit value entered in the **MIN EU** field.

MAX SIGNAL

In the **MAX SIGNAL** field, enter the sensor signal voltage that will correspond to the unit value entered in the **MAX EU** field.

MIN EU

In the **MIN EU** field, enter the engineering unit value that will correspond to the sensor signal voltage value entered in the **MIN SIGNAL** field.

MAX EU

In the **MAX EU** field, enter the engineering unit value that will correspond to the sensor signal voltage value entered in the **MAX SIGNAL** field.

OFFSET

The offset modifies the value of the sensor by adding or subtracting a specific amount, enter a negative value to subtract from the sensors value and positive number to add to it. The offset is typically used to calibrate sensors that are reading slightly too high or too low.

4.2.2 Configuring a Linear Analog Input

Configuring a Linear input is very similar to configuring a custom pressure transducer. Refer the custom pressure transducer section for initial setup. Only two additional parameters need to be defined, **LINEAR TYP** and **LINEAR EU**. The sensor's input signal will be scaled linearly with **MIN SIGNAL** corresponding to the **MIN EU** value and **MAX SIGNAL** corresponding to the **MAX EU** value.

LINEAR TYP

Select the signal type for the linear sensor in this field. The options are: 2-20mA, 4-20mA, 0-10 VDC, 0-1 VDC or 0-5 VDC.

LINEAR EU

Select the Engineering Units of the sensor value here.

4.2.3 Configuring Analog Input Alarms

The E2E supports alarming for the I/O Module analog inputs. When a sensor is configured and in alarm, the I/O Module will communicate to E2E that there is a sensor error present. When the input setup is set to Linear and the signal voltage is set to 0-1, 0-5, or 0-10 the I/O Module can only detect open sensors for sensors that have a minimum signal level of 200 millivolts DC or higher.

*Example: If a sensor outputs 0VDC as a valid signal level and 0 is set for the **MIN SIGNAL** parameter, then the I/O Module will not report open sensor alarms for this because the minimum signal is below 200 millivolts DC.*

To configure analog input alarms:

1. Login to E2E with username: **user** and password: **pass**.
2. Press Alt + N keys at the same time to navigate to the Network Summary screen.
3. Highlight the I/O Module device and press F5 **(SETUP)**, press Ctrl +) 0 at the same time to select the **MORE** tab. Select option **G Alarm** by pressing **G** on the E2E keyboard.

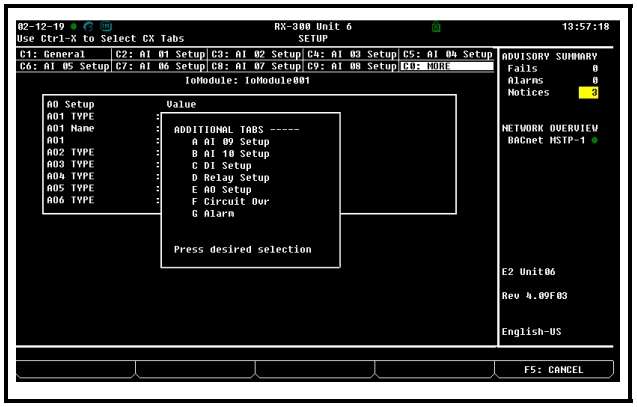

***Figure 4-16** - E2E- Additional Tabs*

4. Three (3) fields per analog input will be shown: **AI0*X* In Alarm**, **AL_Type**, **AL_Prio**.

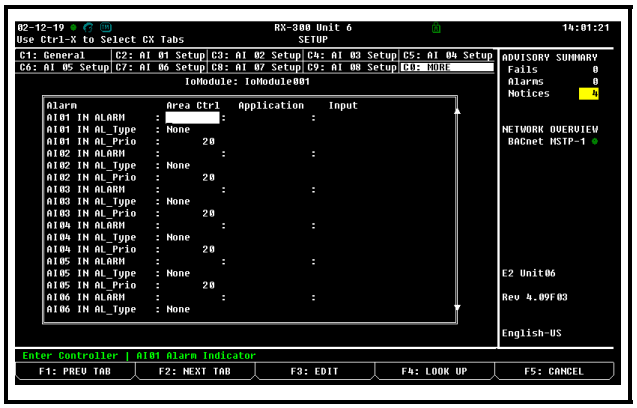

***Figure 4-17** - E2E- Analog Input Alarms*

AI0X In Alarm

This is the value of the analog input alarm signal; the value will be "**..**" under normal conditions and **ALARM** when the sensor is configured and in error.

AL_Type

This field selects the type of entry that will be recorded in the E2E advisory log. *None-no entry* will be made to the E2E advisory log.

- **Alarm**- an alarm entry will be added to the E2E advisory log at the priority specified by **AL_Prio**.
- **Notice** - a notice will be added to the E2E advisory log. For detailed information on the E2E advisory log, reference the E2E User Manual.

AL_Prio

This field is the alarm priority level for the analog input alarm that is generated when the input is configured and in error.

4.3 Configuring Digital Inputs

The I/O Module Digital Inputs are configured from the I/O Module application in E2E. There are 11 digital inputs available for the 4 DIN 208D model iPro and 20 digital inputs for the 10 DIN 215D model. E2E reads the logical value of each input with polarity applied.

To configure digital inputs:

1. Login to E2E with username: **user**, password: **pass**.
2. Press Alt + N keys at the same time to navigate to the Network Summary screen.
3. Highlight the I/O Module device and press F5 **(SETUP)**, press Ctrl + 0 at the same time to bring up more list. Select option **C DI Setup** by pressing **C** on E2E keyboard.

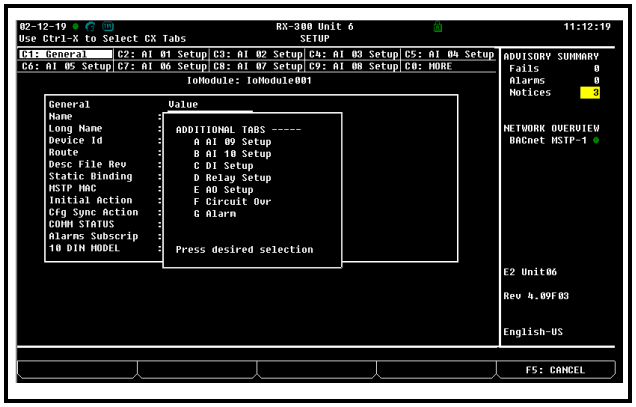

Figure 4-18 *- E2E- Digital Inputs General Tab*

4. In the DI Setup, there are three (3) fields per digital input: **Name**, **DI0X**, and **Polarity**.

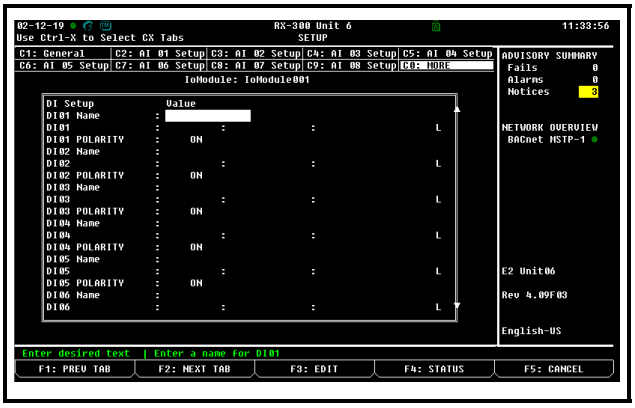

Figure 4-19 *- E2E- Digital Input Alarms*

Name

Enter a descriptive name for the digital input point. The name will be displayed on the status screen.

DI0x

This is the logical value of the digital input and can be associated to other E2E applications.

Polarity

This is the polarity for the digital input. The polarity parameter determines what physical state of the input results in a logical TRUE or ON for the input value.

Physical Input State	Polarity	Logical Input Value
Closed circuit	Closed	True/On
Closed circuit	Open	False/Off
Open circuit	Closed	False/Off
Open circuit	Open	True/On

Table 4-2 *- Digital Input Polarity*

4.3.1 Digital Input Default Value

The digital input values may be linked to other E2E applications and logic. If there is a communications failure between E2E and the I/O Module, the digital inputs will retain the last logical value before the offline event occurred instead of switching to NOTACT or logical 0. When the communication is successful again, the E2E will get the current value for the digital inputs and change the current value if necessary.

4.4 Configuring Relay Outputs

The I/O Module relay outputs are configured from the I/O Module application in E2E. There are eight (8) relay outputs available for the 4 DIN 208D model iPro, and 15 relay outputs for the 10 DIN 215D model. E2E commands the logical value of each relay, and the I/O Module will then apply the polarity setting and switches the physical state of the relay.

To configure relay outputs:

1. Login to E2E with username: **user**, password: **pass**.
2. Press Alt + N keys at the same time to navigate to the Network Summary screen.
3. Highlight the I/O Module device and press F5 **(SETUP)**, press Ctrl + 0 at the same time to access the **MORE** tab. Select option **D Relay Setup** by pressing **D** on the E2E keyboard.

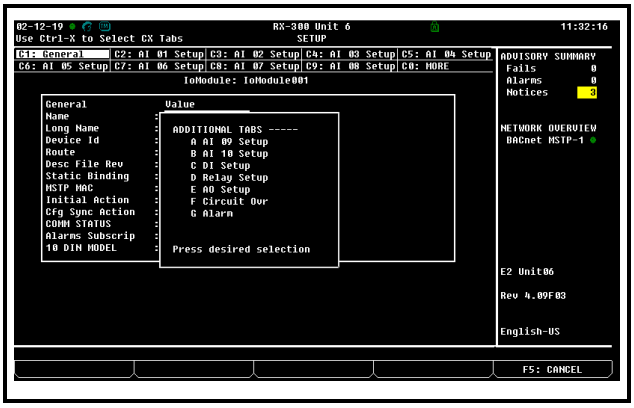

Figure 4-20 *- E2E- Relay Outputs General Tab*

4. In Relay Setup, there are three (3) fields per relay: **Name**, **Polarity**, and **Relay 0*X*** (the relay commanded value).

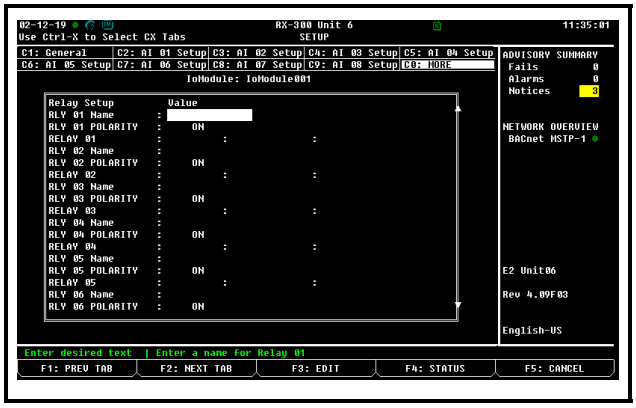

Figure 4-21 *- E2E- Relay Output Alarms*

Name

Enter a descriptive name for the relay output point. The name will be displayed on the status screen.

Polarity

Select the polarity for the relay output here. The polarity parameter determines what physical state the relay contacts will be in when a logical TRUE or ON command is given to the relay.

Relay Polarity	E2E Command Value	Physical State of Relay Contacts
Open	True/On	Open Relay Contacts
Closed	True/On	Closed Relay Contacts
Open	False/Off	Closed Relay Contacts
Closed	False/Off	Open Relay Contacts

Table 4-3 *- Relay Output Polarity*

Relay 0X

This field is the E2E's logical command value for the relay. This can be set to a fixed value or linked to other E2E applications for control. Each time the relay value changes, the communication is written to the I/O Module with the relay command.

4.5 Configuring Analog Outputs

The I/O Module analog outputs are configured from the I/O Module application in E2E. There are four (4) analog outputs available for the 4 DIN 208D model iPro, and six (6) analog outputs for the 10 DIN 215D model. E2E controls the signal output of each analog output by sending a command in the form of 0 to 100%. The analog output command can be linked to other E2E applications to determine the command percentage. The I/O Module will take the percentage command value and scale it linearly to the signal range selected, 0 to 10VDC or 4 to 20mA.

To configure analog outputs:

1. Login to E2E with username: **user**, password: **pass**.
2. Press Alt + N keys at the same time to navigate to the Network Summary screen.
3. Highlight the I/O Module device and press F5 **(SETUP)**, press Ctrl + 0 at the same time to access the **MORE** tab. Select option **E AO Setup** by pressing **E** on the E2E keyboard.

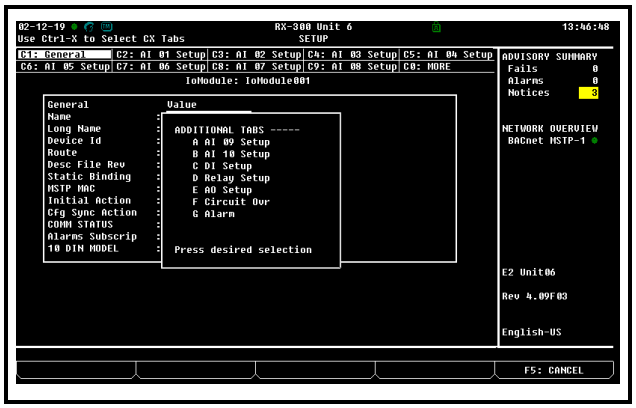

Figure 4-22 *- E2E- Analog Outputs General Tab*

4. In AO Setup there are three (3) fields per analog output: **Type**, **Name**, **AO*X*** (E2E command value for AO).

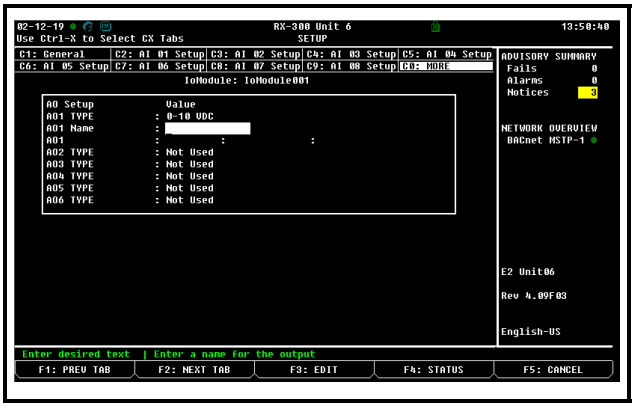

Figure 4-23 *- E2E- Analog Outputs Alarms*

Type

Use this field to select the type of output signal for the analog output. The options are: **Not Used**, **0-10VDC**, or **4-20mA**.

Name

Enter a descriptive name for the output point. The name will be displayed on the status screen.

AO

0-100%. Use this field to control the analog output from E2E. Link this field to other E2E applications or use a fixed value to control the output.

4.6 Configuring Refrigeration Circuit Overrides

The I/O Module supports 30 refrigeration override variables, the refrigeration override variable is a software variable that can be toggled ON or OFF from the Visograph display. The value of the override variable is automatically communicated to E2E for use in disabling or shutting down a refrigerated case or refrigerated circuit application. This way a user can toggle refrigeration circuits in E2E ON or OFF from a central location without wiring physical circuit switches directly back to E2E. Each circuit override can be named with a rack system label and circuit number.

To configure circuit overrides:

1. Login to E2E with username: **user**, password: **pass**.
2. Press Alt + N keys at the same time to navigate to the Network Summary screen.

3. Highlight the I/O Module device and press F5 **(SETUP)**, press Ctrl + 0 at the same time to bring up more list. Select option **F Circuit Ovr** by pressing **F** on the E2E keyboard.

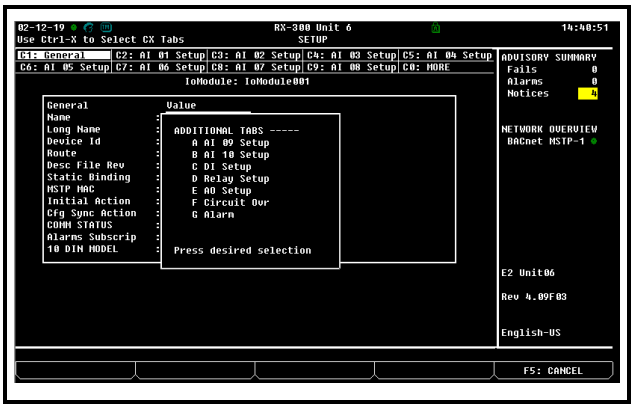

Figure 4-24 *- E2E- Circuit Overrides General Tab*

4. The parameter **Num Circ Ovr's** will become visible, setting this above **0** will define the number of circuit overrides entered and setup parameters will become visible.
5. Once a circuit override is defined, three (3) fields will appear per circuit override: **RACK ID**, **CIRC ID**, and **CIRC OVR**.

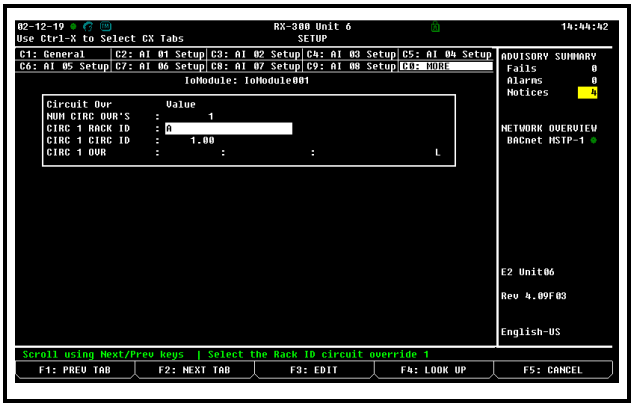

Figure 4-25 *- E2E- Circuit Overrides Setup Values*

Rack ID

Select the Rack name that this circuit is connected to. The rack name will be displayed in Visograph display next to the circuit override value.

Circ ID

Enter the circuit number for the circuit that this circuit override is associated to. The circuit number will be displayed in Visograph display with the rack name.

Circ Ovr

This is the value of the circuit override and can be associated to other E2E applications to shutdown a refrigeration circuit.

4.6.1 Circuit Overrides Default Value

The circuit override values may be linked to other E2E applications and logic. If there is a communications failure between E2E and I/O Module, the circuit override will retain the last logical value before the offline event occurred instead of switching to NOTACT or logical 0. When communication is successful again, the E2E will get the current value for the circuit override and change the current value if necessary.

4.6.2 Setting Override Value with Visograph

Once at least one circuit override is configured in the E2E as outlined above, the override value can be toggled **ON/OFF** from the Visograph display. Setting a value of **ON** in the value column initiates a refrigeration circuit override to turn refrigeration **OFF**. Toggling the value column to **OFF** in the Visograph indicates no override and therefore the refrigeration circuit will be **ON**. Press the **T6 CSW** key from the Analog Inputs screen to navigate to the Circuit Overrides screen and the **T8/T7** arrow keys can be used to move between the Circuit Overrides screens.

To edit the value of the override, use the **T3/T5** keys to move to the override. Press **T4** to enter Edit mode, the value will blink, and use the **T3/T5** arrow keys to advance the value to **ON** or **OFF**. Press **T4** to save the selection.

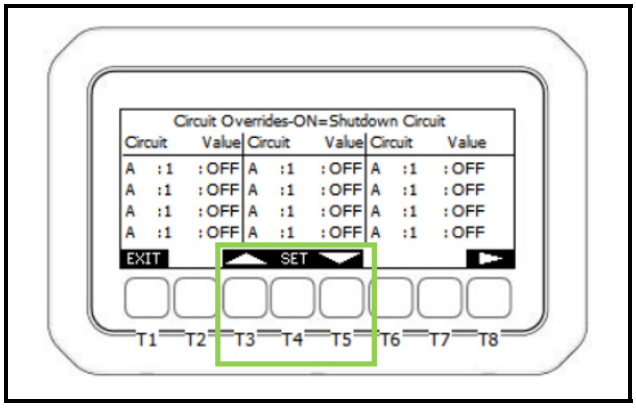

Figure 4-26 *- Visograph - Setting Override*

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