

# Multi-Point Digital Gas Detection and Control System



## DESCRIPTION

Wall-mounted, microprocessor-based, multi-point, multi-channel, digital RS-485 communicating gas detection and control system.

## IM-CONTROL

## APPLICATION

To control and alarm upon the presence of any toxic, combustible or refrigerant gases. Any combination of the RS-485 communicating ITS series or 4-20 mA gas transmitters can be connected to the control unit. The controller can interface via binary outputs, MODBUS communication and optional 4-20 mA signals with any compatible electronic analog control, DDC/PLC control or automation system.



NRTL/C

## FEATURES

- Continuous monitoring
- RS-485 digital bus, 4-port, serial communication
- Up to (32) remote RS-485 communicating transmitter inputs
- (8) analog inputs, 4-20 mA
- Up to (99) binary/relay outputs:
  - (3) relay outputs built-in
  - Optional, up to (12) remote RS-485 communicating relay modules, total of (96) relays
- Optional, (8) analog outputs, 4-20 mA
- (2) 24 VDC outputs
- Buzzer built-in
- RS-422, MODBUS output
- RS-232, programming port
- Accept combination of toxic, combustible gases, or refrigerant sensor inputs
- Liquid Crystal Display (LCD)
- LED status indicators
- Keypad user interface
- Manual system power switch
- Lockable enclosure
- Easy programming via PC or laptop computer

## SPECIFICATIONS

### Electric

Power supply 24 VAC (20-28 VAC), floating, 50/60 Hz, 24 VDC (20-28 VDC)

Protection Fuse, 2 A

Power consumption w/o remote devices

- standard unit 15.6 VA (650 mA)

- w/optional analog output card 21.6 VA (900 mA)

### Type of Control

General Three-stage control, i.e. low-med-high level/alarm, assignable to any available relay outputs

Digital input/output, serial communications (4) RS-485 parallel ports, proprietary protocol, single 4-conductor multi-drop configuration link per port

- device configuration (32) remote transmitters and (12) remote relay modules maximum per controller/system, up to 32 devices (transmitters/relay modules) can be linked to one port

Analog inputs

Stage level / setpoint

- hysteresis/switching differential Relay outputs

- standard, built-in

- optional, remote

Relay assignment and configuration

*“Use twisted, balanced, shielded pair RS-485 cable with an impedance of 120 Ω e.g. Belden 9841”*

(8) 4-20 mA, from any analog gas transmitter  
Field adjustable over full range via keypad user interface or through supplied software installed on a remote laptop computer

Selectable for each sensor point

(3) DPDT, 5 (3.7) A  
240 VAC / 30 VDC  
Up to (96) DPDT, 5 A  
(max. (8) relays/modules)

Independent, individually set to one or all remote transmitters;  
Fail assignment for all transmitter inputs  
Normally/not-normally energized and latching

## SPECIFICATIONS

### Type of Control (cont...)

- time delay switching Individually set, make, break, average, and voting, 0 to 60 minutes

Alarm acknowledgement Menu-driven and system reset function for latched relays

### User Interface

Keypad type Refer to "illustration keypad user interface"

Touch buttons Sixteen (16), audible

Status indicators (5) red LEDs, one each for relay 1, relay 2, relay 3, hush and fault

Digital display Liquid Crystal Display (LCD), two lines, 2x16 characters, with backlight

- scroll rate Adjustable, 1-9 sec.

- displays Transmitter address, gas type, concentration and alarm status

### Programming

Down & uploading large data bases RS-232 port w/RJ-11 connector

Data base configuration Refer to "IM-View Controller, Software" section

**MODBUS Slave Port** RS-422, responds as a RTU slave using MODBUS Plus protocol, communicates read status information to remote building automation systems

### Environmental

Permissible ambient  
 - working temperature -4° to 122°F (-20°C to 50°C)  
 - storage temperature 32°F to 104°F (0°C to 40°C)  
 - humidity, continuous 15 to 90% RH, non-condensing  
 - humidity, intermitted 0 to 99% RH, non-condensing  
 - working pressure Atmospheric ± 10%

### Physical

Enclosure w/supplied key  
 - material Steel case  
 - color Epoxy black  
 - protection NEMA 1, general purpose  
 - installation Wall (surface) mounted

Dimensions (H x W x D) 10.0 x 8.0 x 2.0 in.)  
(254 x 203 x 51 mm)

Cable entry 4 holes for 3/4 in. conduit, covered

Wire connection Terminal blocks, screwed type for lead wire

Wire size Min. 24 AWG (0.25 mm<sup>2</sup>), Max. 14 AWG (2.5 mm<sup>2</sup>)

Weight 4.5 lbs. (2.0 kg)

**Approvals / Listings** CSA, NRTL/C, C22-205

**Warranty** 12 months material and workmanship

## OPTIONS

### Analog Output Card

- signal outputs (8) 4-20 mA  
 - power supply 24 VAC floating, or 24 VDC  
 - power provided Internally from controller or externally isolated

- signal assignable Single or multiple sensor inputs, scalable, for single, average or high values

VDC output supply (2) 24 VDC, 0.3 A

Audible alarm Buzzer built-in, 90 db @ 1 ft (0.3 m), 2700 Hz, assignable to any stage level

- buzzer settings Selectable for continuous double-tap intermittent, or intermittent 50% duty cycle sound

Alarm acknowledgement Press "HUSH" button on keypad user interface

## ORDERING INFORMATION

### IM-CONTROL-0

Options	
0	Standard controller
T	w/ (1) Analog output card, (8) 4-20 mA
N	NEMA 4X enclosure

Standard control system, ordering part number:

**IM-CONTROL-0**  
configuration includes:

Digital, software programmable, RS-485 network controller with keypad user interface, LCD & LEDs, 24 VAC/VDC, 50/60 Hz, NEMA 1 enclosure

- Inputs:
- Via the (4) RS-485 ports
  - up to (32) remote RS-485 communicating transmitters
  - (8) 4-20 mA
  - RS-232 programming port
- Outputs:
- (3) Relays, DPDT, 5 A, (optional via the (4) RS-485 ports up to (12) remote RS-485 communicating relay modules, total of 96 relays)
  - (2) 24 VDC, 0.3 A
  - (1) RS-422 MODBUS port

## CONTROL TRANSFORMER SIZING

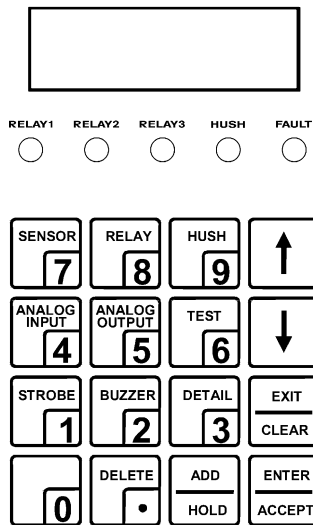
<u>Hardware</u>	<u>Rating, each</u>
• IM-CONTROL Standard controller	16 VA
• IM-CONTROL w/optional (8) 4-20 mA outputs	22 VA
• ITS-M5160-NET CO remote digital transmitter	2 VA
• Other remote transmitters	2-5 VA
• IM-RELAY Unit w/2 relays, 5 A	3 VA
Unit w/4 relays, 5 A	5 VA
Unit w/6 relays, 5 A	8 VA
Unit w/8 relays, 5 A	9 VA
• External strobe light	7 VA
• External horn	7 VA

*“Add 20 to 25% safety margins to the total net VA requirement for selecting appropriate control transformer’s VA rating.”*

*Note: Maximum 240 VA / 24 VAC power input to the controller is allowable.*

## USER INTERFACE & CONTROLLER

### Keypad User Interface



Digital Display

Status LEDs

Keypad

### IM-VIEW Controller Software



IM-VIEW software supplied on a CD – to be used for programming and generating the controller data base.

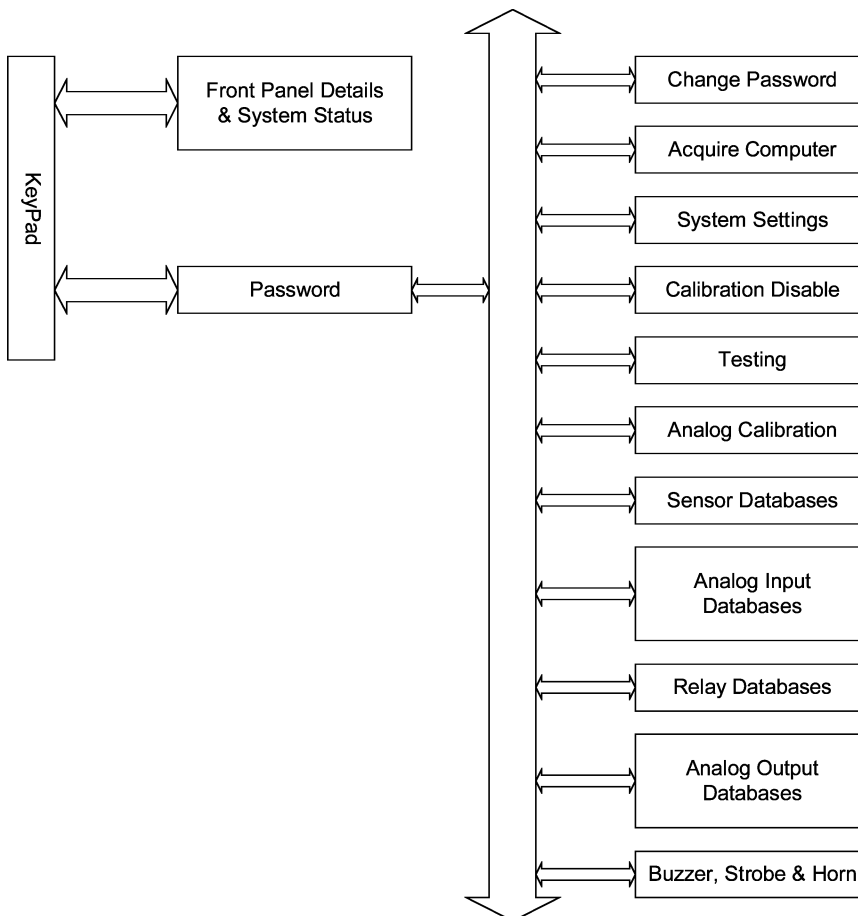
The IM-VIEW CD kit includes a cable with serial connector and RJ-11 jack, which can be used to establish a link between the IM controller's RS-232 programming port and a PC or laptop.



All data base programming and configuration is possible through the front panel keypad. However, this is practical only for short programs and minor modifications.

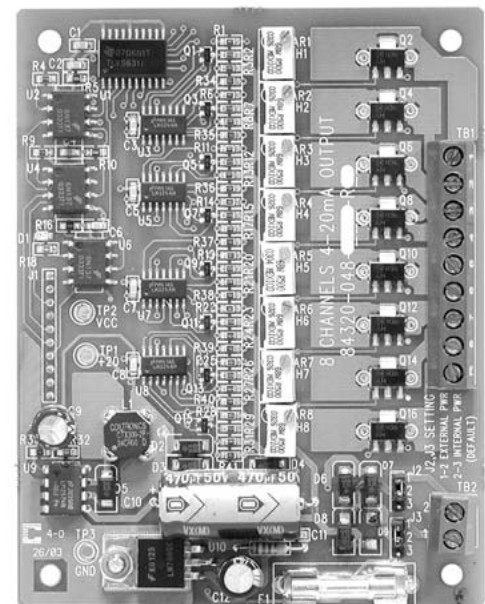
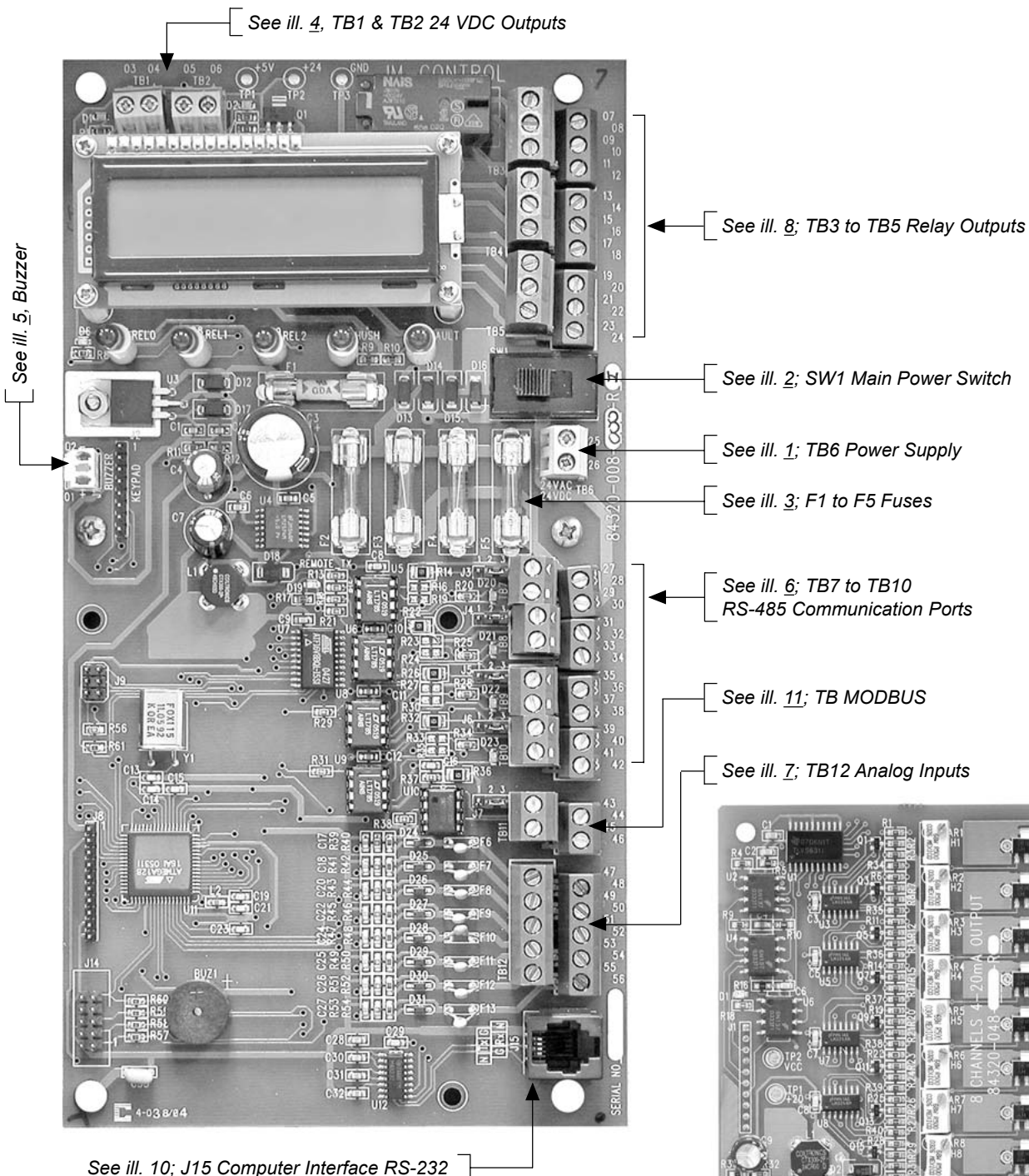
Refer to the IM-CONTROL user's manual for detailed operation guidelines and database configuration parameters.

### Keypad Menu Tree



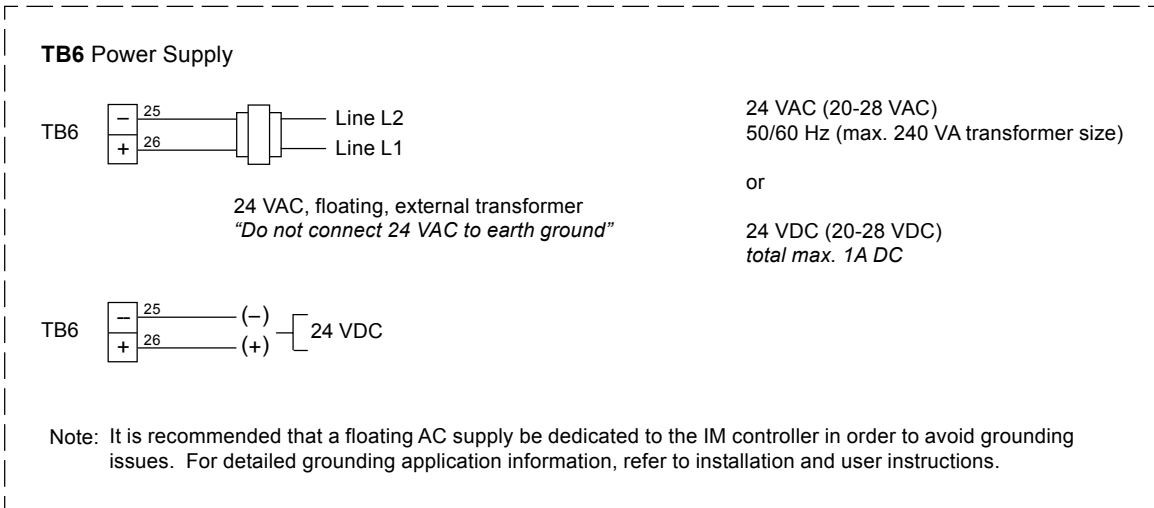
FIELD WIRING CONFIGURATION

IM-CONTROL Main PC Board

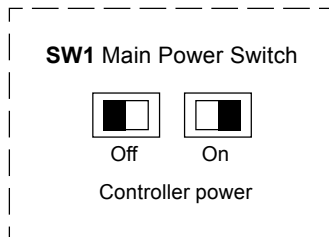


See ill. 9; Optional Analog Output Card

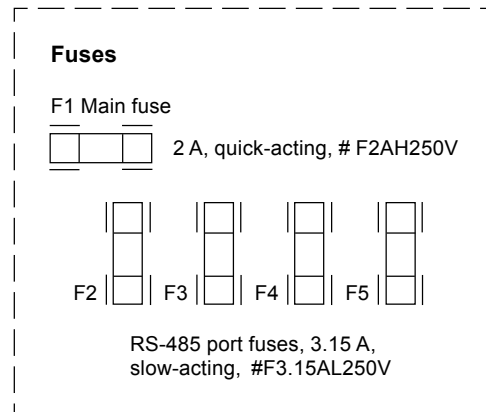
FIELD WIRING CONFIGURATION (cont...)



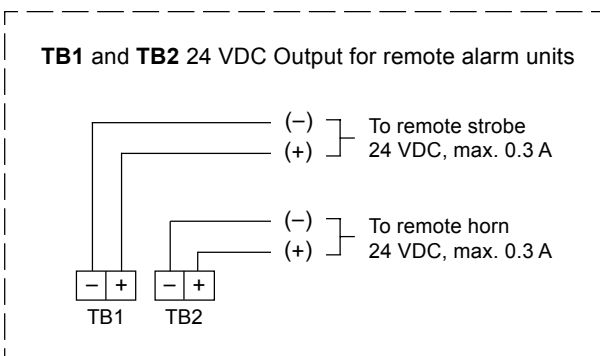
ill. 1



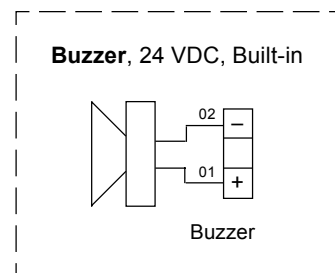
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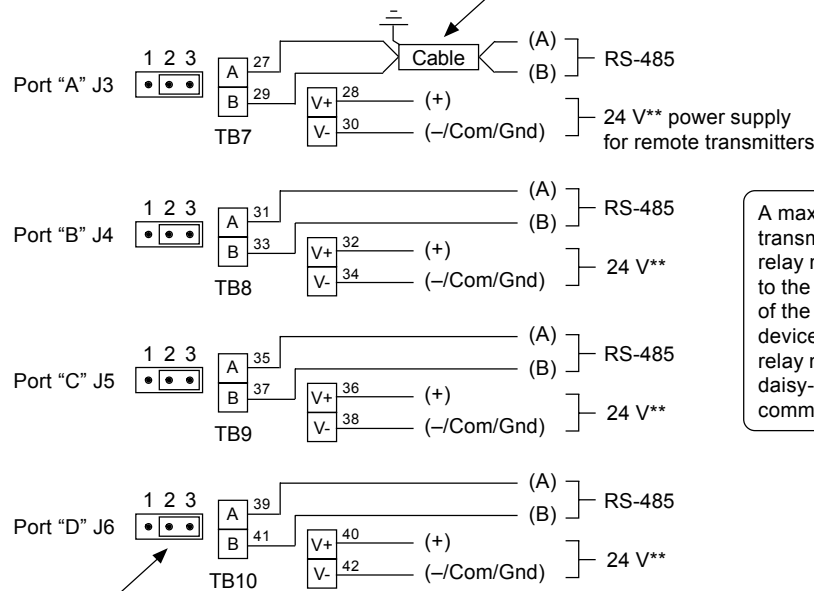
ill. 5

FIELD WIRING CONFIGURATION (cont...)

**TB7 to TB10** RS-485 Digital Communication Links/Ports and Power Supplies to remote Transmitters

\*\* IM controller to be powered (TB6) by a remote transformer. The transformer VA rating has to be sized for covering total system hardware configuration. A 24 VAC powered controller provides 24 VAC at terminal V+/V-; and powered with 24 VDC, it provides 24 VDC at terminals V+/V-. The 24 VAC outputs V+/V- are suitable for powering the remote transmitters/relay modules. In case of VDC powering, use external, separate 24 VDC power only.

RS-485 cable, twisted, balanced shielded pair; with characteristic impedance of 120 Ω, e.g. Belden 9841



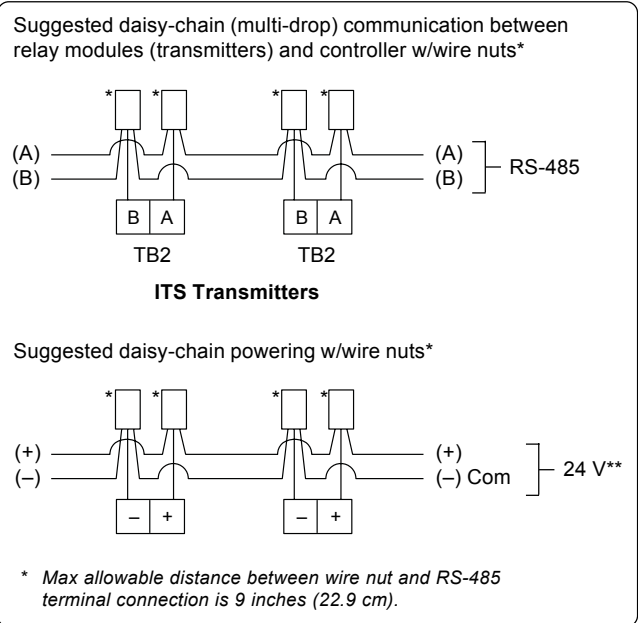
A maximum of (32) remote transmitters and (12) remote relay modules can be assigned to the (4) communication ports of the IM controller. Up to (32) devices, transmitters and/or relay modules can be daisy-chained via (1) communication link (port).

**J3 to J6 Jumper Selectors, RS-485 End-of-Line Terminator**

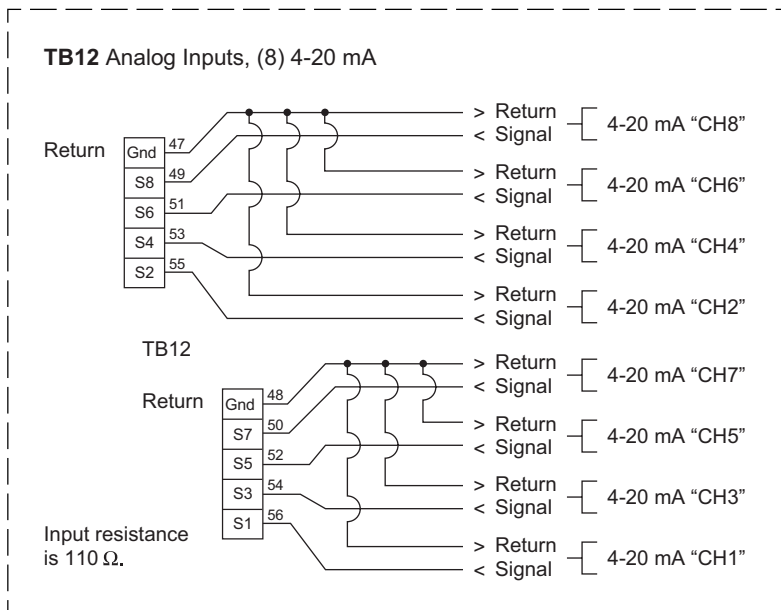
- Jumper covers pins 2 and 3 = Open/disabled (factory set)
- Jumper covers pins 1 and 2 = Closed/enabled

Notes:

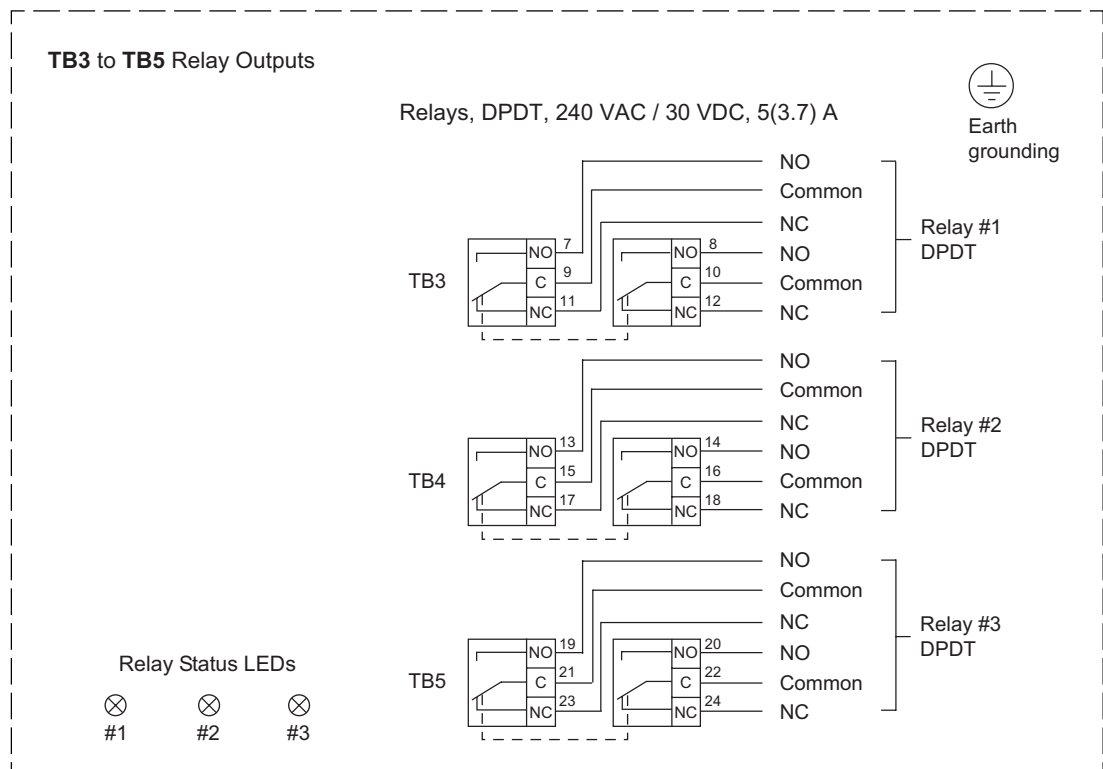
- Do not connect power to **A** and **B**, this will damage all relay modules (transmitters) and controller linked on the same daisy-chain trunk.
- Daisy-chain between relay modules (transmitters) and controller **A** to **A**, **B** to **B**. Do not cross **A** to **B**, this creates malfunction of communication.
- Maximum daisy-chain trunk length is 3,200 ft. (1,000 m).
- Do not use high voltage lines in the same RS-485 communication cable conduit.



FIELD WIRING CONFIGURATION (cont...)



ill. 7



ill. 8

FIELD WIRING CONFIGURATION (cont...)

