TechnipFMC

Electronic Preset Delivery System

Smith Meter® AccuLoad® III with ALX Firmware

Installation Manual

Bulletin MN06135 Issue/Rev 1.3 (6/17)

Caution

The default or operating values used in this manual and in the program of the AccuLoad III are for factory testing only and should not be construed as default or operating values for your metering system. Each metering system is unique and each program parameter must be reviewed and programmed for that specific metering system application.

Disclaimer

FMC Technologies Measurement Solutions, Inc. hereby disclaims any and all responsibility for damages, including but not limited to consequential damages, arising out of or related to the inputting of incorrect or improper program or default values entered in connection with the AccuLoad III.

Receipt of Equipment

When the equipment is received the outside packing case should be checked immediately for any shipping damage. If the packing case has been damaged, the local carrier should be notified at once regarding his liability. Carefully remove the unit from its packing case and inspect for damaged or missing parts.

If damage has occurred during shipment or parts are missing, a written report should be submitted to the Customer Service Department, FMC Technologies Measurement Solutions, Inc., 1602 Wagner Avenue, Erie, Pennsylvania 16510.

Prior to installation, the unit should be stored in its original packing case and protected from adverse weather conditions and abuse.

Caution:

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this Instruction Manual, may cause interference to radio communications. It has not been tested to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Warning

These preset devices must be used with fail-safe backup equipment to prevent accidental runaway delivery of product. Failure to provide backup equipment could result in personal injury, property loss and equipment damage.

Warning

On initial power-up of a new unit or after installation of a new computer board, there are several alarms that will be triggered which cannot be cleared until the AccuLoad is programmed.

United States NIST Handbook 44 UR.3.5.1. and UR.3.5.2.

For compliance to United States NIST Handbook 44 UR.3.5.1. and UR.3.5.2., invoices printed using a mechanical numeric-only printer (e.g., Smith Meter Load Printer) must contain in preprinted form the following information:

a. Volume corrected to 60 degrees F
b. API/C of E _____
c. Temperature _____
d. Gross Volume _____

where the API/C of E, temperature, and gross volume may be hand-written on the ticket. Refer to Handbook 44, UR.3.5.1. and UR.3.5.2. for current requirements.

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Table of Contents

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Section I – Introduction

This manual is to be used for the installation of the AccuLoad III Electronic Preset Controller with AccuLoad III firmware. The manual is divided into the following sections: Introduction, Pre-Installation Considerations, Installation, Diagrams, Maintenance, Completing the Installation, and Related Publications.

Receipt of Equipment

When the equipment is received the outside packing, case should be checked immediately for any shipping damage. If the packing case has been damaged, the local carrier should be notified at once regarding his liability. Carefully remove the unit from its packing case and inspect for damaged or missing parts.

If damage has occurred during shipment or parts are missing, a written report should be submitted to the Customer Service Department, FMC Technologies Measurement Solutions, Inc., 1602 Wagner Avenue, Erie, Pennsylvania 16510.

Before installation, the unit should be stored in its original packing case and protected from adverse weather conditions and abuse.

Warnings and Precautions

Before you begin please read all of the following warnings and cautions to reduce the risk of injury, equipment damage or malfunction.

Emergency Shutdown – The AccuLoad has an extensive set of built-in safety features.

IMPORTANT: The AccuLoad should never be relied upon to act as the primary safety system control for the flow valve and pump controls, i.e. emergency stop, overfill, ground protection, etc. These should always be handled by separate systems specifically designed for that application. For example, Safety systems specifically to meet SIL requirements. Any power control circuits from these external systems shall be wired in series ahead of the AccuLoad to remove power to the ancillary devices.

Hazardous Voltages – There are hazardous voltages involved in the installation and maintenance of the AccuLoad and only qualified individuals should perform installation.

Hazardous Locations – The S and Q models are approved for use in an explosive (Class I, Div. I, Groups C & D and Zone 1 Ex d ia, IIB Gb) atmosphere but there are specific installation methods required to produce a comprehensive explosion-proof system. This manual provides guidance for the AccuLoad installation only. In general, keeping the front cover bolted close in accordance with the instructions in Section VII is the key to maintaining explosion protection.

Any modification of the AccuLoad housing invalidate the hazardous location rating of the AccuLoad.

- Do not replace the bolts in the front cover except with those supplied by the manufacture. Using unapproved bolts invalidates the explosion-proof rating of the enclosure.
- Do not drill or machine the housing.
- Do not attempt to replace the touchscreen or glass except as part of the factory supplied assembly.

Electrostatic Discharge Precautions – The electronic components in the AccuLoad are susceptible to damage by static discharge. To minimize the risk of damage, the following precautions should be followed:

- Before touching a circuit board with hands or tools, personnel/tools should be grounded using a wrist strap.
- Avoid touching components or traces on the circuit boards and handle by the edges/mounting holes.
- Circuit boards should be kept in conductive bags when not installed.

ATEX / IEC Installations – There are special requirements for ATEX approved installations. Please refer to Section III for a detailed list of the specific requirements.

RF Radiation - The AccuLoad generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this Manual, may cause interference to radio communications. It has not been tested to comply with the limits pursuant to Part 15 (CFR 47) of FCC Rules, as electronic control equipment utilized by an industrial complex is exempt from the rules.

Operation of this equipment in a residential area may cause interference, in which case the user, at his own expense, will be required to take whatever measures that may be required to correct the interference. The AccuLoad has been evaluated against the standard EN 61326-1: “Electrical equipment for measurement, control and laboratory use” and has been found to comply to the European Community EMC Directive 2014/30/EU.

Weights and Measures Requirements

The AccuLoad is a device marketed for a global market. Requirements vary depending on the region. It is a user requirement to verify that the AccuLoad is programmed and operated in a manner consistent with local codes and that proper notification (permit for use) or registration has been filed with the local authority or jurisdiction.

Mechanical

In addition to the following, all previous warnings and cautions should be reviewed before installation.

1. A solid base (pedestal or shelf) should be used to support the explosion-proof AccuLoad III housing.

   Weight: = 50 lb. (22.7 kg) ALIII-S Hardware
   Weight: = 125 lb. (57.5 kg) ALIII-Q Hardware

2. The location and the height of AccuLoad III should be selected to permit easy viewing of the display and to provide convenient access to the keypad by all users.

3. Access for servicing AccuLoad III is through the front cover. For ease of service and removal of parts the cover must swing open more than 90°. The explosion-proof AccuLoad III is hinged on the left.

4. Conduit entry to the explosion-proof AccuLoad III is both through the bottom and top. The top entries are used for those units where the CI-VACON Grounding and overfill board is installed. For the ALIII-S hardware there are three 1-1/4" 11.5 NPT conduit entrances in the bottom of the unit and two 1" 11.5 NPT conduit entrances in the top of the unit. For the ALIII-Q hardware there are two 1-1/4" 11.5 NPT conduit entrances and five 1" 11.5 NPT conduit entrances in the bottom of the unit and one 1" 11.5 NPT conduit entrance in the top of the unit.

5. In warm climates, AccuLoad III should be shaded from direct sunlight. The maximum external temperature of the AccuLoad III housing must not exceed 140°F (60°C) to ensure that the internal temperature limit is not exceeded.

Electrical

1. All DC wiring must be routed into AccuLoad III through the conduit entries located in the bottom of the housing. Do not route DC and AC wiring through the same conduit entry.

2. The DC signal wires must be multi-conductor shielded cable of 18 to 24 AWG minimum strand copper.

Note: *The following recommendations are based on our knowledge of the electrical codes. The local electrical codes should be reviewed to ensure that these recommendations follow the local code. Also installation manuals of all the equipment being wired into the AccuLoad should be reviewed for transmission distances and wire recommendations.*

Table 1. Typical Wire Sizes

Equipment	Number & Gauge of Wire	Belden Number or Equivalent
Transmitters	4 / 18 Ga. 4 / 20 Ga.	9418 8404
Temp. Probes Density & Pressure Transmitters	4 / 22 Ga.	8729 OR 9940
EIA-232 Communications	3 / 24 Ga.	9533
EIA-485 Communications	4 / 24 Ga.	9842

Table 2. Maximum Cable Length and Baud Rate (EIA-232)

Baud Rate	Feet	Meters
38,400	250	75
19,200	500	150
9,600	1,000	305
4,800	2,000	610
2,400	4,000	1,220
1,200	4,000	1,220

Table 3. Maximum Cable Length and Baud Rate (EIA-485)

Baud Rates	Feet	Meters
1,200 to 38,400	4,000	1,220

Note: *For Ethernet communications, refer to standard IT practices for connecting any AccuLoad using routers, hubs, switches, etc.*

3. All AC wiring must be routed into AccuLoad III through the conduit entries located in the bottom of the housing. Connectors sized for a maximum of 14-gauge wire, consult the local electrical codes for the minimum AC wire size required for your application. Do not route AC and DC wiring through the same conduit entry.

4. All AC wiring should be stranded copper and must comply with federal, state and local codes and specifications.

5. Two separate AC circuits must be provided from the breaker panel. One circuit will supply isolated power to the AccuLoad III electronics (instrument power). The second circuit will supply power to the external devices.

6. For proper operation the AccuLoad III must be earth grounded. The grounding point should be as close to the unit as possible. To ensure proper earth ground:

   a) The resistance between the ground lug in the AccuLoad III and the grounding point must not exceed 2 Ω.

   b) The proper grounding point is a ½" to ¾" diameter copper stake that extends into the water table. Where this is not practical, a ground plane may be used.

      Note: *Electrical conduit, piping, and structural steel are not considered proper grounding points for equipment using electronics.*

   c) No other devices, except AccuLoad IIIs and ancillary equipment such as load printers, should be connected to any point in the grounding circuit.

7. If external relay permissives are used in series with AccuLoad III relays, an RC network must be placed in parallel with the permissive to prevent a false turn-on of the AccuLoad III relays. Recommended RC network = 0.1 UF capacitor and a 680 Ω resistor (Electrocube part number RG 2031-11).

8. Interposing relays must be installed between the pump controller, alarming device, and the AccuLoad III permissive sense relays.

Environmental

Models ALIII-S-XP and ALIII-Q-XP

The enclosures of Explosion / Flame proof models are manufactured from aluminum alloy, and are designed to be operated in normal environmental conditions free of corrosive agents.

In areas including but not limited to environmentally corrosive atmospheres, special considerations for additional environmental protections shall be made if installing into near shore areas that are subject to wind borne salt sea water spray and subject to possible continuous accumulations of wetted salt water on the equipment. The recommended protection is exclusion of the environment by placing the equipment into secondary protected environment such as a kiosk or a control room. If exclusion of the environment is not possible, then extra means must be taken to maintain the equipment integrity, this includes frequent cleaning and inspection intervals. See Section IV for additional information.

In areas where the ambient temperature is very high, it is recommended that the equipment be installed under a canopy / sun shield to limit direct sunlight radiation.

In areas of high humidity (tropical) or with varying temperature swings, it is recommended to place TechnipFMC P/N 647 001 443 or similar desiccant packs inside of the enclosures, and to maintain these while in service.

Mechanical

See Pre-installation Considerations.

Electrical

ATEX & IEC EX - Approved Units

(a) **Cable Entry must be in accordance to IEC 60079-1 section 13:**
For systems utilizing cable glands, the gland and/or thread adaptor must be Ex certified. The cable end must be securely installed and, depending on the cable type, be properly protected from mechanical damage. Requirements outlined in Section 10.4 of IEC 60079-14 shall be followed.

(b) **Cable Entry must be in accordance to IEC 60079-1 section 13:**
For systems utilizing conduit, an Ex certified sealing device must be immediately at the entrance of the enclosure. Any unused entry must be suitably blocked with an Ex d IIB certified plug. Requirements outlined in Section 10.5 of IEC 60079-14 shall be followed.

(c) **Installation:**
General Installation to be in accordance with IEC 60079-14, wiring system to be in accordance with section 9.

(d) **Flame Path Dimensions:**
AccuLoad Joint Dimensions: Flanged joint widths are 19.05 mm minimum and gaps are 0.051 mm maximum. Flameproof joints shall be maintained as outlined in section 10.4 or IEC 60079-14.

(e) **Cover Fasteners:**
AccuLoad Special Fasteners: Cover Bolts – steel grade 12.9, M8 x 1.25.

(f) **Cautions and Warnings:**
Caution: To prevent ignition of hazardous atmospheres, disconnect from supply circuit before opening, keep tightly closed when circuits are in operation.

Warning: Contains internal battery-powered circuit, to prevent ignition of hazardous atmospheres, do not open enclosure unless area is known to be non-hazardous.

General Requirements

It is imperative that the electrical installation be performed by a competent individual that is familiar with associated risks involved with the installation, operation, and maintenance, of electrical equipment in hazardous (classified) locations. This individual must possess knowledge of local, national electrical codes, and/or ordinances concerned with hazardous location safety requirements. It is recommended (may be required in some jurisdictions) that the final installation should be verified / inspected by the authority having jurisdiction before placing the equipment into service.

Electrical installations in hazardous areas have features specifically designed to make them suitable for use in such locations and it is the operator's responsibility to maintain the integrity of those special features.

The operator must ensure that electrical equipment is:

a. Installed and operated correctly

b. Monitored on a regular basis

c. Maintained with due regard to safety

d. Follow all requirements of National Electrical Code for the country of installation.

e. AC Circuits must be isolated from DC circuits and brought into the unit through their respective conduit openings.

f. Be sure all connections on the terminal blocks are tight.

g. All shields must be connected to terminals 3, 13, 14, or 15 on terminal block TB4 on the EAAI Board or terminal 3 and 4 on terminal block TB6 on the KDC Board, or terminals 9 and 10 on TB14 on the BSE Board.

   All exposed shields must be properly insulated to prevent short circuits to other terminals or to the chassis. The shield at the device (e.g., temperature device, transmitter, etc.) must be cut back to the insulation and taped off. All shields should be continuous. If splices are required, they must be soldered and properly insulated. If other communicating devices are used with the AccuLoad III, refer to the manual for that unit for shielding information. Shields for other communicating equipment should not be terminated in the AccuLoad III.

Note: *Shields must not be terminated at the ground lugs.*

h. Sufficient slack should be provided for the wiring in the AccuLoad III to permit easy removal of the boards. With sufficient slack, the terminal blocks can be removed and laid back out of the way so that the boards can be replaced without removing individual wires.

i. There is a ground lug provided in the unit. The wire from the lug should be connected to the proper grounding point. See Pre-Installation Considerations, page 2.

j. Typical electrical installation diagrams are provided in the following sections to show the AccuLoad III and ancillary equipment. Before wiring the ancillary equipment, refer to its installation manual.

Installing and Removing the Analog I/O Module

Caution: Turn off the power at the unit prior to installing or removing the Analog I/O Module. Failure to do so will damage modules.

Care should be taken when installing or removing the Analog I/O modules so as not to damage the board or the module. To install the module, line up the alignment pins with the socket and push down on the module. Once it is seated, screw in the mounting screw until tight. Do not over-tighten the screw. To remove the modules from the board, loosen the mounting screw and pull up on the module.

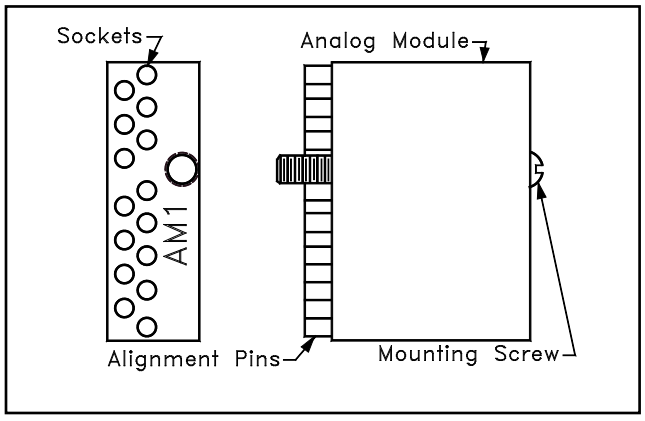


Figure 1. Analog Modules

Input Frequency x2

If the application requires a pulse rate that is higher than the meter is capable of putting out, the AccuLoad III can multiply the incoming pulses times 2. This option is activated by switches located on the PIB boards. The PIB boards are located on the EAAI and the BSE boards.

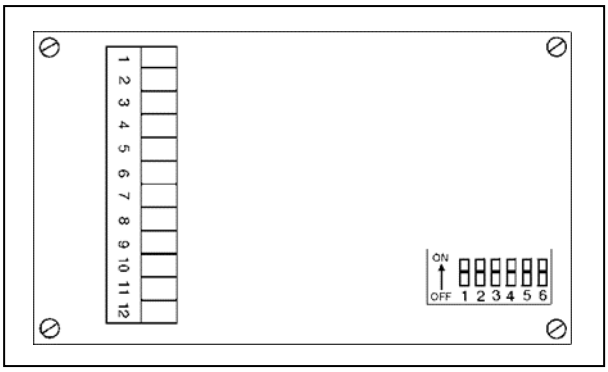


Figure 2. Connector and Switches on PIB Board

The default setting from the factory is “times 1.” The switch is closed (ON). To multiply the incoming pulses times 2, push the switch of the incoming pulse channel to the open (OFF) position. The switches are located on the PIB boards, as shown in Figure 2. The PIB board that is located on the EAAI board is for pulse inputs 1 through 6. The PIB board that is located on the BSE board is for pulse inputs 7 through 12.

Note: *The switches correspond to the pulse input channels (i.e., Meter Pulse In #1 is equal to Switch #1.) See Table 6 for corresponding Pulse Input channels.*

Start-Up

When the wiring is completed and verified, power may be applied to the unit. The displays should light, indicating that the AccuLoad III is ready for Start-Up. Please reference the Operator Reference Manual.

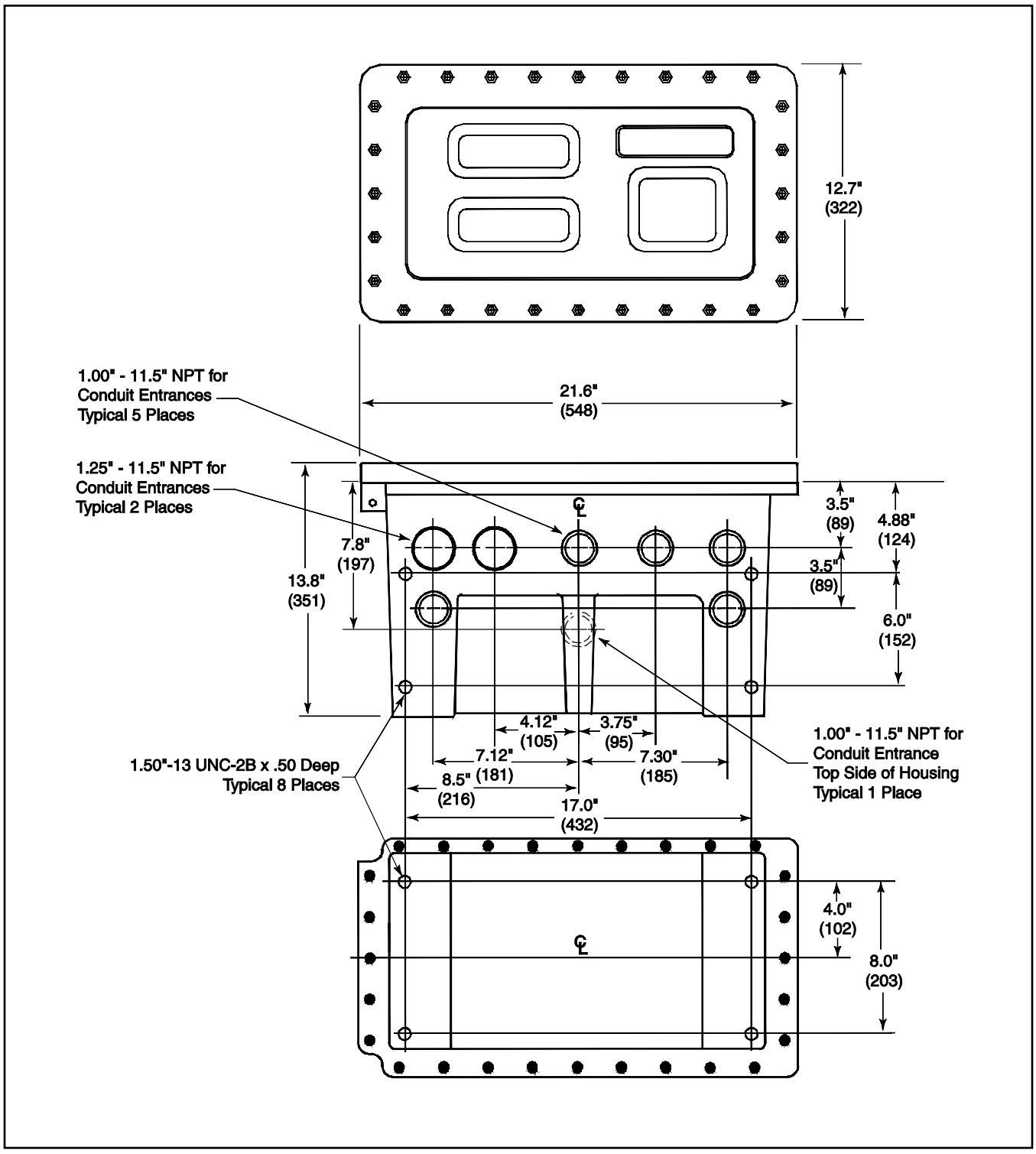


Figure 3. AccuLoad III-Q Dimensions

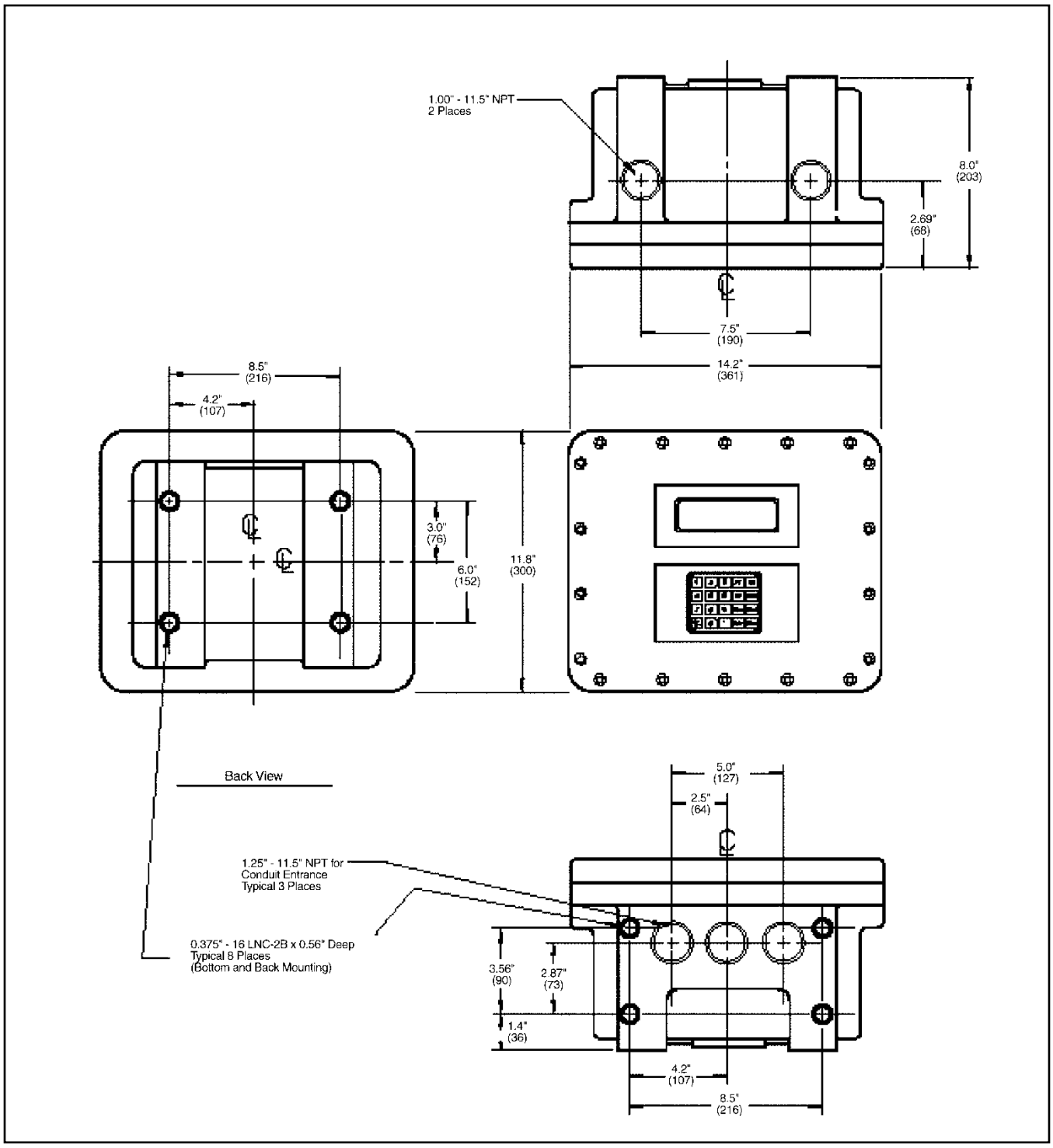


Figure 4. AccuLoad III-S Dimensions

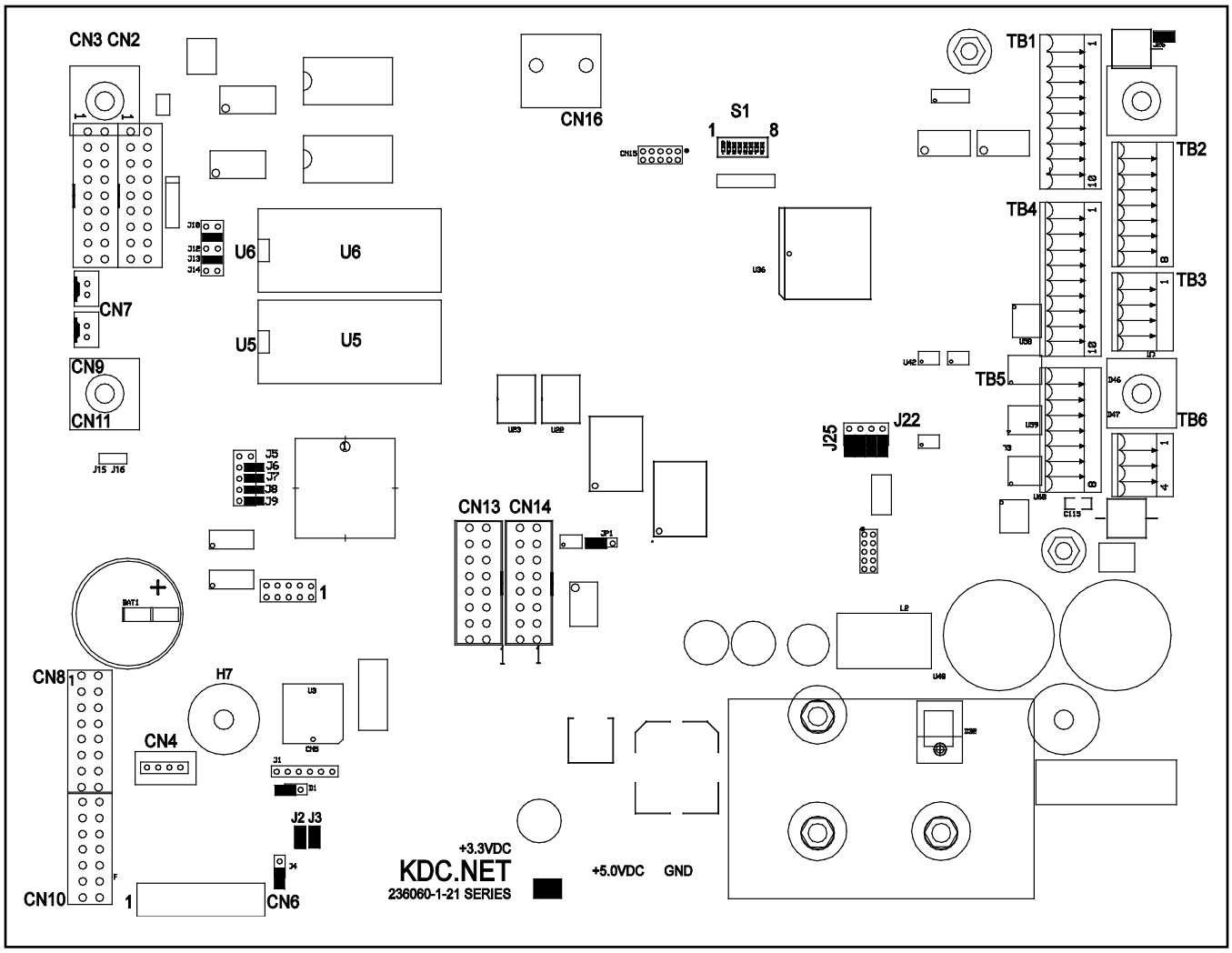


Figure 5. KDC Layout

Configurable jumper locations are heavily circled on the diagram above. It is important to note that all but one of these jumpers, J22, are factory defaults and should not be configured by the user. The proper settings are provided below so if one of these is accidentally changed, it can be returned to its original position. J22 is the jumper used to zero the passcodes and security input access level (151-157). Jumpers are configured using the plugs that fit over the jumper prongs. A jumper with no prongs plugged, or with one prong plugged, is OUT. A jumper with both prongs plugged is IN.

Note: *Should Program Mode be inaccessible after changing PROMs, or if the operator loses or forgets the access code, set J22 to In, then power up. Entry to the program mode is provided. Check passcodes and remove jumper J22 when finished.*

1 – In	4 – Out	7 – Out	10 – Out	13 – In	16 – Out	25 – Out
2 – In	5 – Out****	8 – Out	11 – In	14 – Out	23 – In*	
3 – In	6 – In***	9 – Out	12 – Out	15 – In	24 – In**	

* Jumper 23 if removed indicates there is not a BSE board in the System (ALIII-S Hardware)
** Jumper 24 if removed indicates there is only one display (ALIII-S Hardware)
*** For units shipped prior to October 2001: J6 must be in the “in" position for Optrex Model DMF5003N. For units shipped after October 2001: J6 must be in the “out" position for Model MTG-2406 displays.
**** For units shipped prior to August 2005: J5 must be in the “out” position. After August 2005 and for all units with Rev. B displays, the Jumper J5 must be in the “in” position.

Switch Settings

A new 8 pin DIP switch will be available for use (SW → SW1-8). The switch will be utilized as follows:

SW1-1 force firmware upgrade (powers up waiting for firmware upgrade)

SW1-2	SW1-3	
OFF	OFF	use programmed IP address
ON	OFF	use 192.168.0.1
OFF	ON	use 10.0.0.1
ON	ON	use DHCP

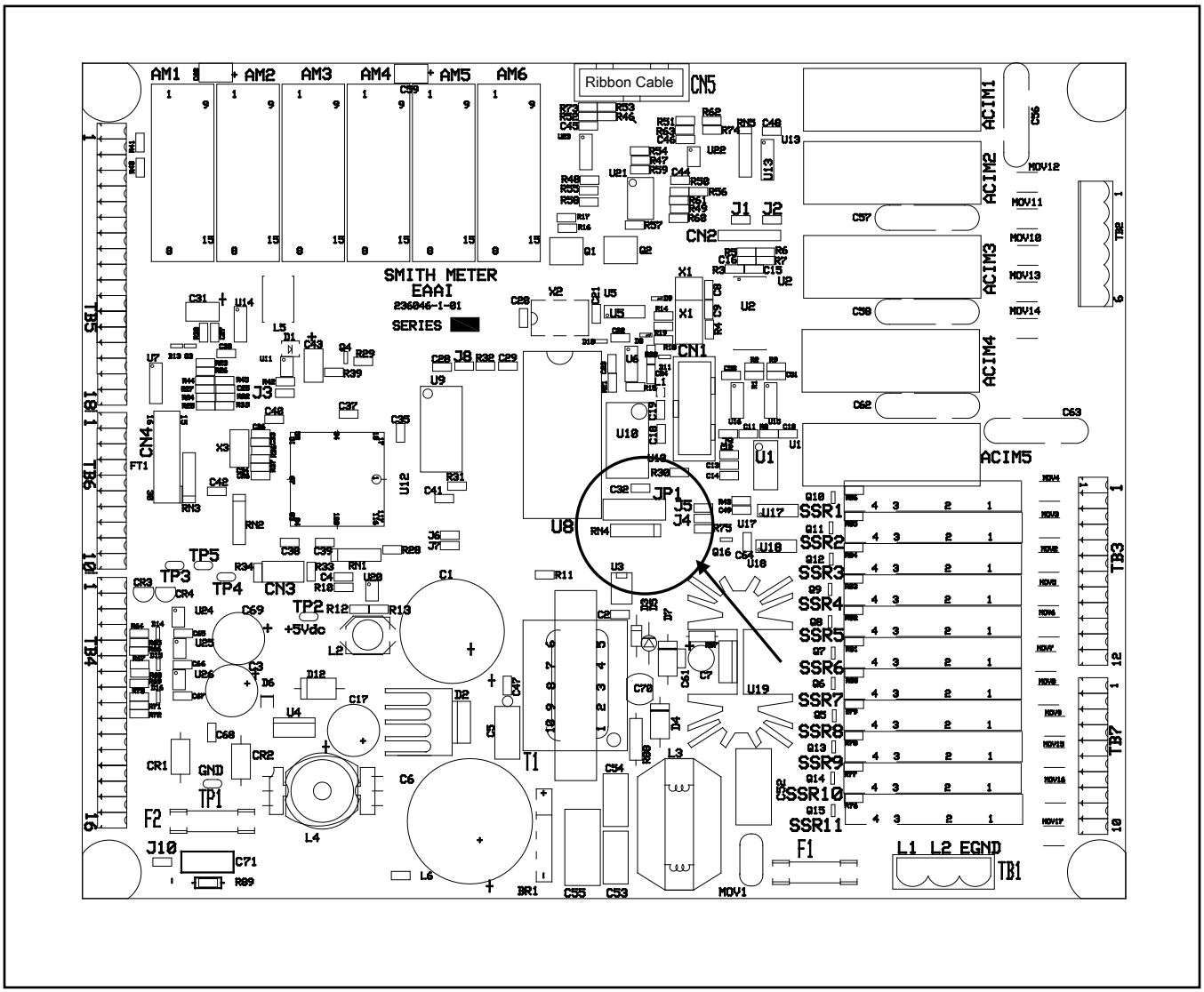


Figure 6. EAAI Layout

The user-configurable jumper on the EAAI board is indicated by a circle and arrow in the diagram above. See the table on the following page for an explanation of analog module settings. This jumper has been configured for the modules that were shipped with the unit. Changes should only be made if different modules are added or deleted. Modules must be installed with inputs first, followed by outputs.

Analog Module Settings (JP1 on EAAI)

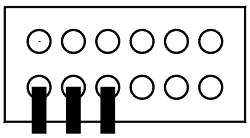
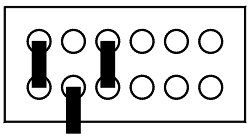
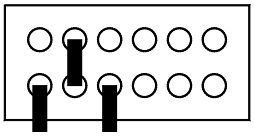
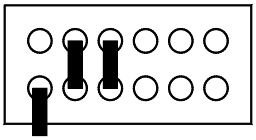
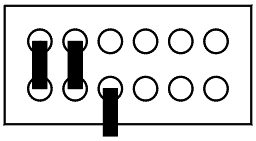
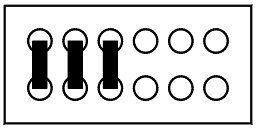
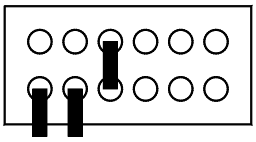
6 Inputs, 0 Outputs		**2 Inputs, 4 Outputs**	
5 Inputs, 1 Output		**1 Input, 5 Outputs**	
4 Inputs, 2 Outputs		**0 Inputs, 6 Outputs**	
3 Inputs, 3 Outputs			

Table 4. Analog Module Settings

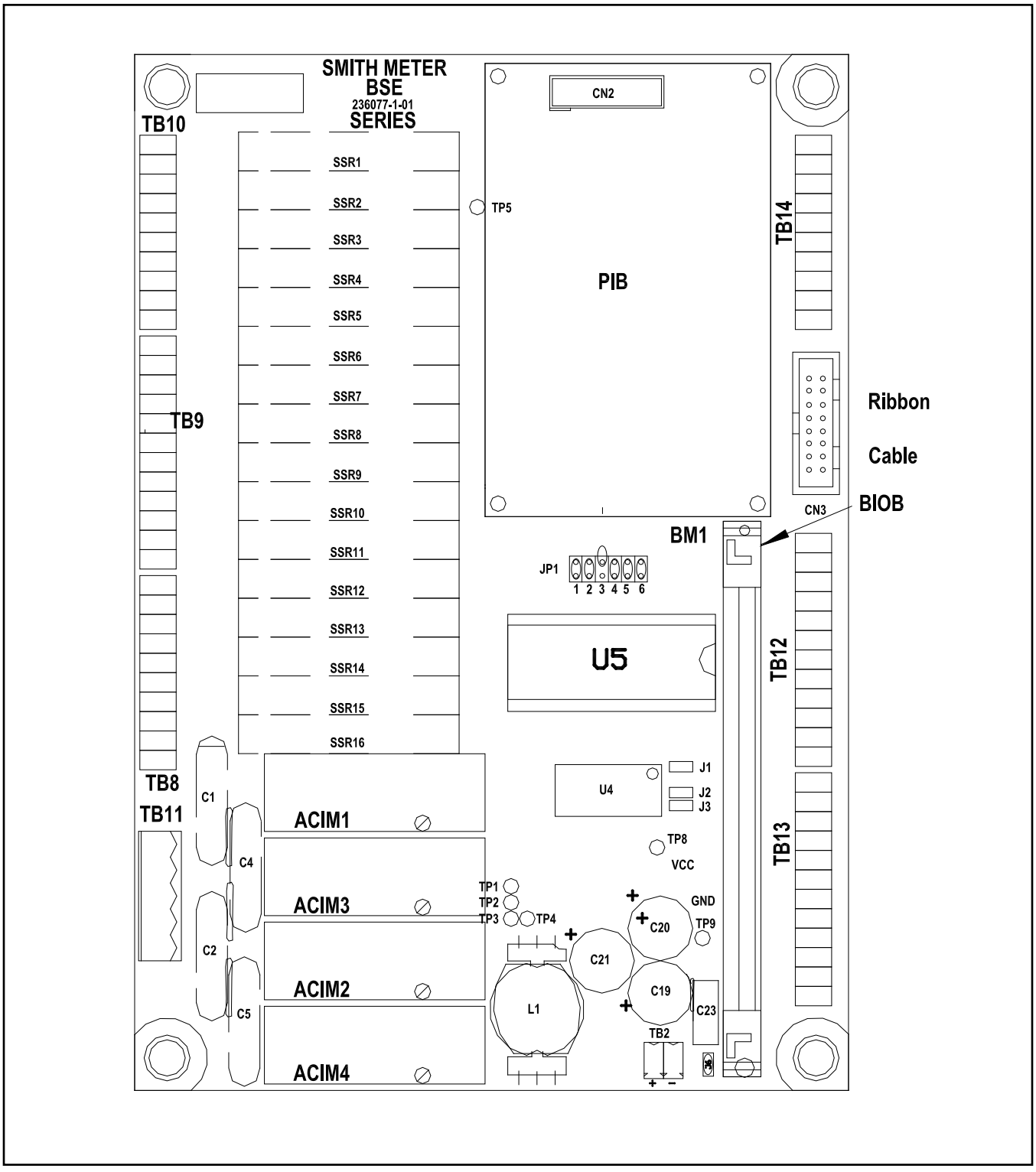


Figure 7. BSE Layout

Note: *JP1 3 through 6 define the number of BIOB inputs. JP1 1 and 2 are not used.*

Bi-State DC Inputs and Output Jumper Settings (JP1 on the BSE)

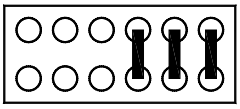
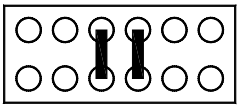
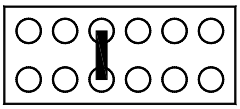
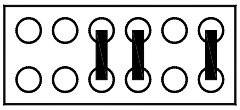
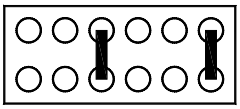
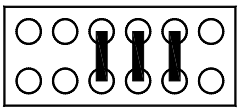
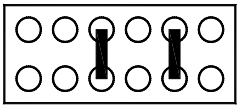
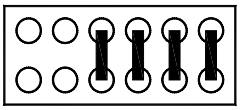
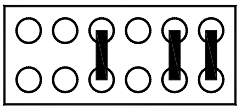
8 Inputs, 0 Outputs		**3 Inputs, 5 Outputs**	
7 Inputs, 1 Output		**2 Input, 6 Outputs**	
6 Inputs, 2 Outputs		**1 Inputs, 7 Outputs**	
5 Inputs, 3 Outputs		**0 Inputs, 8 Outputs**	
4 Inputs, 4 Outputs			

Table 5. Bi-State Inputs and Outputs

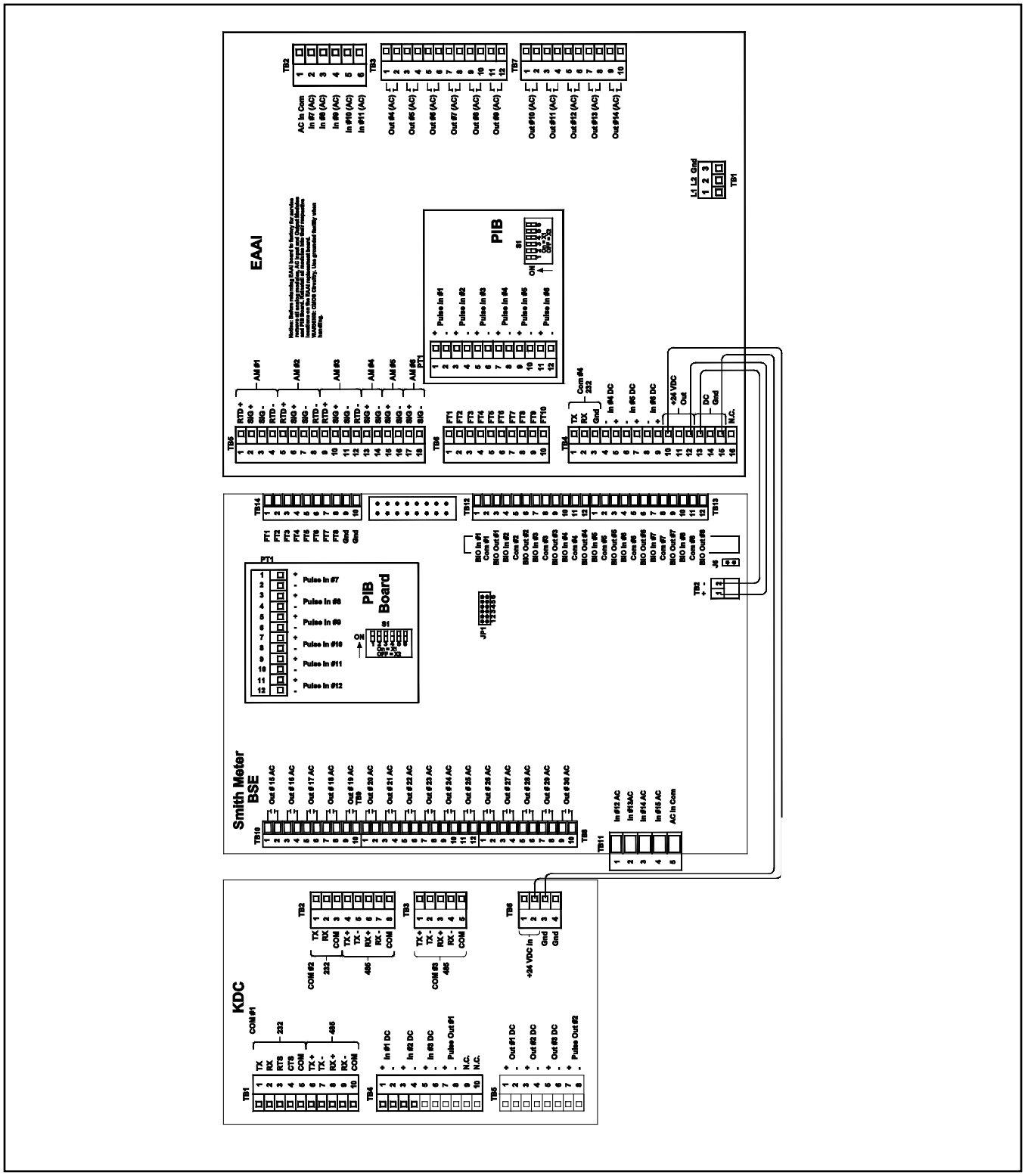


Figure 8. KDC/EAAI/PIB/BSE Boards

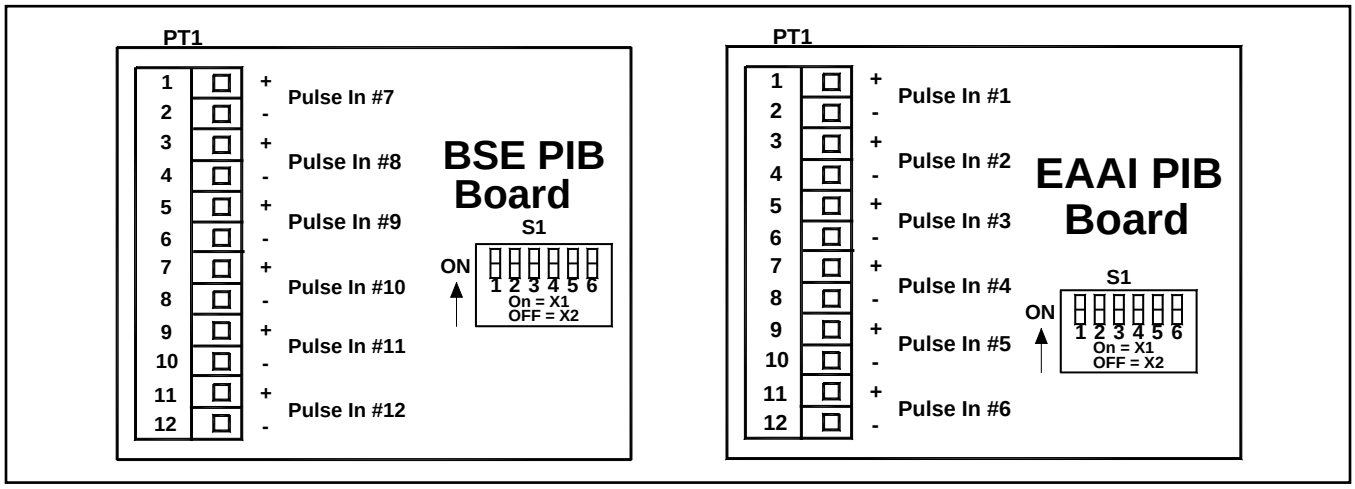


Figure 9. PIB Boards

Note: *AccuLoad III-S hardware has one PIB board.*

PIB Update

Refer to MN06113

Note: *If AccuLoad III Rev. 10.12 or higher is being used and the reverse flow is implemented; PIB board Rev. 3 or above must be used.*

Pulse Inputs

6-Product Meters (AccuLoad III-Q Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Meter # 3A	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Meter # 3A	Meter #2A	Meter #2B	Meter # 3B
Dual/Integrity	N/A	N/A	N/A	N/A	N/A	N/A
	Input #7	**Input #8**	**Input #9**	**Input #10**	**Input #11**	**Input #12**
Single Pulse	Meter #4A	Meter #5A	Meter #6A	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #4A	Meter #4B	Meter #6A	Meter #5A	Meter #5B	Meter #6B
Dual/Integrity	N/A	N/A	N/A	N/A	N/A	N/A
5-Product Meters (AccuLoad III-Q Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Meter # 3A	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Meter # 3A	Meter #2A	Meter #2B	Meter # 3B
Dual/Integrity	N/A	N/A	N/A	N/A	N/A	N/A
	Input #7	**Input #8**	**Input #9**	**Input #10**	**Input #11**	**Input #12**
Single Pulse	Meter #4A	Meter #5A	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #4A	Meter #4B	Injector/Dens.	Meter #5A	Meter #5B	Injector/Dens.
Dual/Integrity	N/A	N/A	N/A	N/A	N/A	N/A

4-Product Meters (AccuLoad III-Q Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens.	Meter #2A	Meter #2B	Injector/Dens.
Dual/Integrity	Meter #1A	Meter #1B	Meter #1A Bar	Meter #2A	Meter #2B	Meter #2A Bar
	Input #7	**Input #8**	**Input #9**	**Input #10**	**Input #11**	**Input #12**
Single Pulse	Meter #3A	Meter #4A	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #3A	Meter #3B	Injector/Dens.	Meter #4A	Meter #4B	Injector/Dens.
Dual/Integrity	Meter #3A	Meter #3B	Meter #3A Bar	Meter #4A	Meter #4B	Meter #4A Bar
3-Product Meters (AccuLoad III-Q Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens.	Meter #2A	Meter #2B	Injector/Dens.
Dual/Integrity	Meter #1A	Meter #1B	Meter #1A Bar	Meter #2A	Meter #2B	Meter #2A Bar
	Input #7	**Input #8**	**Input #9**	**Input #10**	**Input #11**	**Input #12**
Single Pulse	Meter #3A	Injector	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #3A	Meter #3B	Injector/Dens.	Reserved	Reserved	Injector/Dens.
Dual/Integrity	Meter #3A	Meter #3B	Meter #3A Bar	Injector/Dens.	Injector/Dens.	Injector/Dens.
2-Product Meters (AccuLoad III-Q Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens.	Meter #2A	Meter #2B	Injector/Dens.
Dual/Integrity	Meter #1A	Meter #1B	Meter #1A Bar	Meter #2A	Meter #2B	Meter #2A Bar
	Input #7	**Input #8**	**Input #9**	**Input #10**	**Input #11**	**Input #12**
Single Pulse	Injector	Injector	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Injector	Injector	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual/Integrity	Injector	Injector	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
1-Product Meter (AccuLoad III-Q Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Reserved	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Reserved	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual/Integrity	Meter #1A	Meter #1B	Meter #1A Bar	Injector/Dens.	Injector/Dens.	Injector/Dens.
	Input #7	**Input #8**	**Input #9**	**Input #10**	**Input #11**	**Input #12**
Single Pulse	Injector	Injector	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Injector	Injector	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual/Integrity	Injector	Injector	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.

6-Product Meters (AccuLoad III-S Hardware Rev. 10.08 and above firmware						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Meter #3A	Meter #4A.	Meter #5A.	Meter #6A
Dual Pulse	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Dual/Integrity	N/A	N/A	N/A	N/A	N/A	N/A
5-Product Meters (AccuLoad III-S Hardware Rev. 10.08 and above firmware						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Meter #3A	Meter #4A.	Meter #5A.	Injector/Dens.
Dual Pulse	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Dual/Integrity	N/A	N/A	N/A	N/A	N/A	N/A
4-Product Meters (AccuLoad III-S Hardware Rev. 10.08 and above firmware						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Meter #3A	Meter #4A.	Injector/Dens.	Injector/Dens.
Dual Pulse	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Dual/Integrity	N/A	N/A	N/A	N/A	N/A	N/A
3-Product Meters (AccuLoad III-S Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Meter #3A	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Meter #3A	Meter #2A	Meter #2B	Meter #3B
Dual/Integrity	N/A	N/A	N/A	N/A	N/A	N/A
2-Product Meters (AccuLoad III-S Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Meter #2A	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens.	Meter #2A	Meter #2B	Injector/Dens.
Dual/Integrity	Meter #1A	Meter #1B	Meter #1A Bar	Meter #2A	Meter #2B	Meter #2A Bar
1-Product Meter (AccuLoad III-S Hardware)						
	Input #1	**Input #2**	**Input #3**	**Input #4**	**Input #5**	**Input #6**
Single Pulse	Meter #1A	Reserved	Injector/Dens.	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual Pulse	Meter #1A	Meter #1B	Reserved	Injector/Dens.	Injector/Dens.	Injector/Dens.
Dual/Integrity	Meter #1A	Meter #1B	Meter #1A Bar	Injector/Dens.	Injector/Dens.	Injector/Dens.

Table 6. Pulse Inputs

Note: *When using dual pulse and not the A Bar inputs for transmitter security, the pulse inputs for the A Bar assignment will be not used*

Dual Pulse Inputs for Rev. 10.07 and Above Firmware (With Flow Controlled Additive)

5 Product Meters with 1 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Meter #3A	Meter #2A	Meter #2B	Meter #3B
Dual/Integrity	NA	NA	NA	NA	NA	NA
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	Meter #4A	Meter #4B	FC Inj #1A	Meter #5A	Meter #5B	FC Inj #1B
Dual/Integrity	NA	NA	NA	NA	NA	NA
4 Product Meters with 2 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Meter #3A	Meter #2A	Meter #2B	Meter #3B
Dual/Integrity	NA	NA	NA	NA	NA	NA
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	Meter #4A	Meter #4B	FC Inj #2A	FC Inj #1A	FC Inj #1B	FC Inj #2B
Dual/Integrity	NA	NA	NA	NA	NA	NA
4 Product Meters with 1 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Meter #3A	Meter #2A	Meter #2B	Meter #3B
Dual/Integrity	NA	NA	NA	NA	NA	NA
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	Meter #4A	Meter #4B	Injector/Dens	FC Inj #1A	FC Inj #1B	Injector/Dens
Dual/Integrity	NA	NA	NA	NA	NA	NA
3 Product Meters with 3 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Meter #3A	Meter #2A	Meter #2B	Meter #3B
Dual/Integrity	NA	NA	NA	NA	NA	NA
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #1A	FC Inj #1B	FC Inj #3A	FC Inj #2A	FC Inj #2B	FC Inj #3B
Dual/Integrity	NA	NA	NA	NA	NA	NA
3 Product Meters with 2 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Meter #3A	Meter #2A	Meter #2B	Meter #3B
Dual/Integrity	NA	NA	NA	NA	NA	NA
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #1A	FC Inj #1B	Injector/Dens	FC Inj #2A	FC Inj #2B	Injector/Dens
Dual/Integrity	NA	NA	NA	NA	NA	NA

3 Product Meters with 1 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens	Meter #2A	Meter #2B	Injector/Dens
Dual/Integrity	Meter #1A	Meter #1B	Meter #1 Bar	Meter #2A	Meter #2B	Meter #2 Bar
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	Meter #3A	Meter #3B	Injector/Dens	FC Inj #1A	FC Inj #1B	Injector/Dens
Dual/Integrity	Meter #3A	Meter #3B	Meter #3 Bar	FC Inj #1A	FC Inj #1B	FC Inj #1 Bar

2 Product Meters with 4 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	FC Inj #1A	Meter #2A	Meter #2B	FC Inj #1B
Dual/Integrity	NA	NA	NA	NA	NA	NA
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #2A	FC Inj #2B	FC Inj #4A	FC Inj #3A	FC Inj #3B	FC Inj #4B
Dual/Integrity	NA	NA	NA	NA	NA	NA
2 Product Meters with 3 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	FC Inj #1A	Meter #2A	Meter #2B	FC Inj #1B
Dual/Integrity	NA	NA	NA	NA	NA	NA
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #2A	FC Inj #2B	Injector/Dens	FC Inj #3A	FC Inj #3B	Injector/Dens
Dual/Integrity	NA	NA	NA	NA	NA	NA
2 Product Meters with 2 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens	Meter #2A	Meter #2B	Injector/Dens
Dual/Integrity	Meter #1A	Meter #1B	Meter #1 Bar	Meter #2A	Meter #2B	Meter #2 Bar
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #1A	FC Inj #1B	Injector/Dens	FC Inj #2A	FC Inj #2B	Injector/Dens
Dual/Integrity	FC Inj #1A	FC Inj #1B	FC Inj #1 Bar	FC Inj #2A	FC Inj #2B	FC Inj #2 Bar
2 Product Meters with 1 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens	Meter #2A	Meter #2B	Injector/Dens
Dual/Integrity	Meter #1A	Meter #1B	Meter #1 Bar	Meter #2A	Meter #2B	Meter #2 Bar
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #1A	FC Inj #1B	Injector/Dens	Reserved	Reserved	Injector/Dens
Dual/Integrity	FC Inj #1A	FC Inj #1B	FC Inj #1 Bar	Injector/Dens	Injector/Dens	Injector/Dens

1 Product Meters with 4 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	FC Inj #2A	FC Inj #1A	FC Inj 1 B	PC Inj #2B
Dual/Integrity	NA	NA	NA	NA	NA	NA
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #3A	PC Inj #3B	Injector/Dens	FC Inj #4A	FC Inj #4B	Injector/Dens
Dual/Integrity	NA	NA	NA	NA	NA	NA
1 Product Meters with 3 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens	FC Inj #1A	FC Inj 1 B	Injector/Dens
Dual/Integrity	Meter #1A	Meter #1B	Meter #1 Bar	FC Inj #1A	FC Inj 1 B	FC Inj #1 Bar
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #2A	PC Inj #2B	Injector/Dens	FC Inj #3A	FC Inj #3B	Injector/Dens
Dual/Integrity	FC Inj #2A	PC Inj #2B	PC Inj #2 Bar	FC Inj #3A	FC Inj #3B	FC Inj #3 Bar
1 Product Meters with 2 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens	FC Inj #1A	FC Inj 1 B	Injector/Dens
Dual/Integrity	Meter #1A	Meter #1B	Meter #1 Bar	FC Inj #1A	FC Inj 1 B	FC Inj#1 Bar
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	FC Inj #2A	PC Inj #2B	Injector/Dens	Reserved	Reserved	Injector/Dens
Dual/Integrity	FC Inj #2A	PC Inj #2B	PC Inj #2 Bar	Injector/Dens	Injector/Dens	Injector/Dens

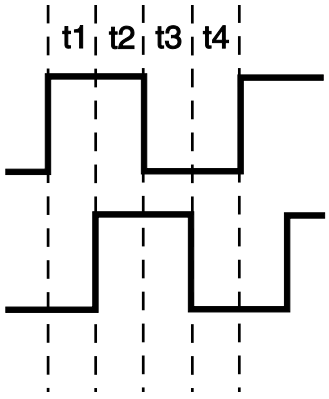
1 Product Meters with 1 Flow Controlled Additive (AccuLoad III – Q Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens	FC Inj A	FC Inj 1 B	Injector/Dens
Dual/Integrity	Meter #1A	Meter #1B	Meter #1 Bar	FC Inj A	FC Inj 1 B	FC Inj Bar
	Input #7	Input #8	Input #9	Input #10	Input #11	Input #12
Dual Pulse	Injector	Injector	Injector/Dens	Injector/Dens	Injector/Dens	Injector/Dens
Dual/Integrity	Injector	Injector	Injector/Dens	Injector/Dens	Injector/Dens	Injector/Dens

2 Product Meters with 1 Flow Controlled Additive (AccuLoad III – S Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	FC Inj #1A	Meter #2A	Meter #2B	FC Inj #1 B
Dual/Integrity	NA	NA	NA	NA	NA	NA

1 Product Meter with 2 Flow Controlled Additive (AccuLoad III – S Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens.	FC Inj A	FC Inj 1 B	Injector/Dens.
Dual/Integrity	Meter #1A	Meter #1B	Meter #1 Bar	FC Inj A	FC Inj 1 B	FC Inj Bar
1 Product Meter with 1 Flow Controlled Additive (AccuLoad III – S Hardware)						
	Input #1	Input #2	Input #3	Input #4	Input #5	Input #6
Dual Pulse	Meter #1A	Meter #1B	Injector/Dens.	FC Inj A	FC Inj 1 B	Injector/Dens.
Dual/Integrity	Meter #1A	Meter #1B	Meter #1 Bar	FC Inj A	FC Inj 1 B	FC Inj Bar

Dual Pulse Security phase shift requirements between the A and B pulses:

The AccuLoad will interpret a valid quadrature signal (90° phase shift between A and B pulses) if t1, t2, t3, and t4 are all greater than or equal to 25usec in the following diagram:



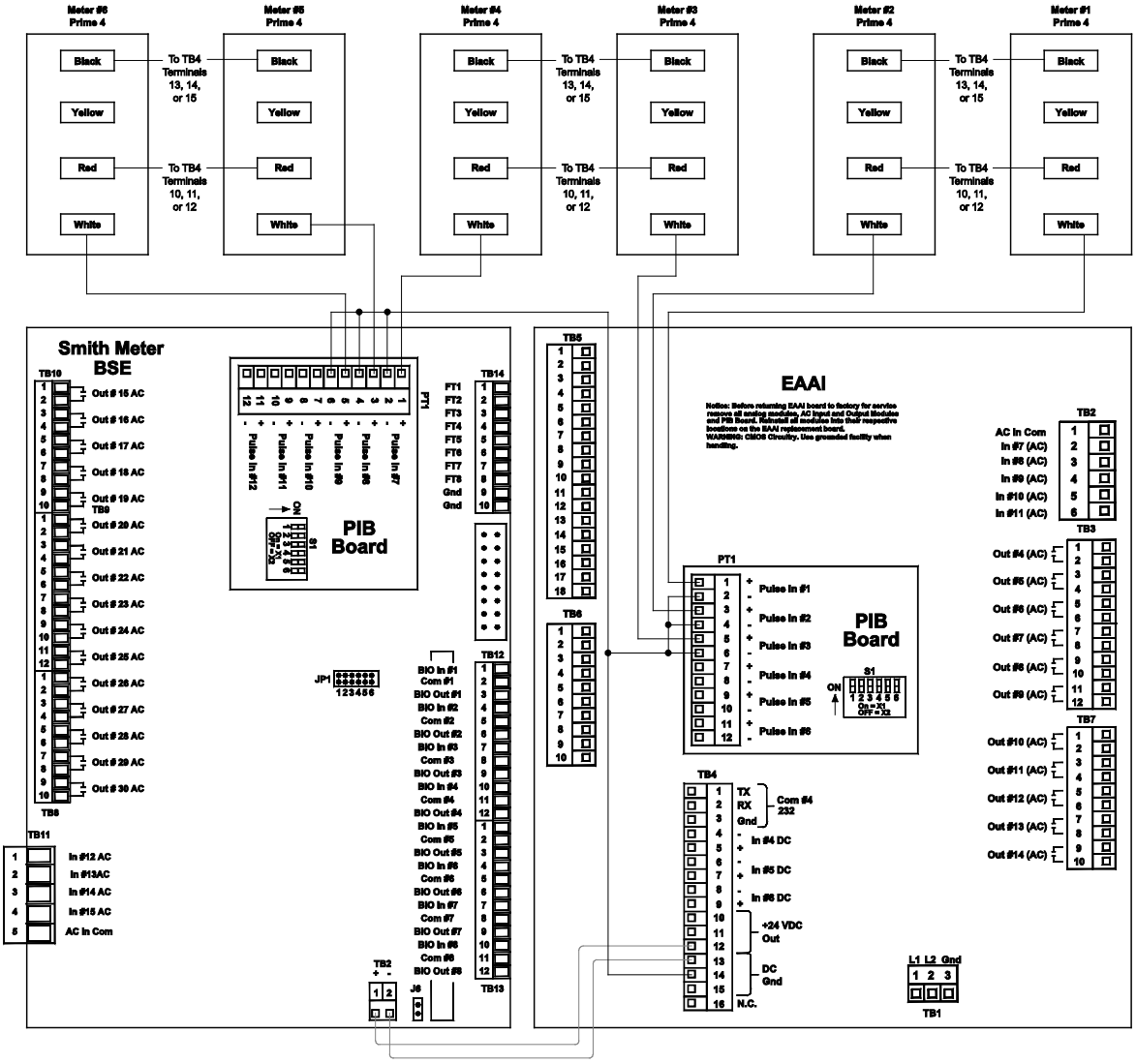


Figure 10. Wiring Diagram, Prime 4 Meter Single Pulse

Note: *Wiring between transmitter and AccuLoad should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

Prime 4 Wire Codes:
Black: Common
Red: Input Power
White: Signal A Output
Yellow: Signal B Output

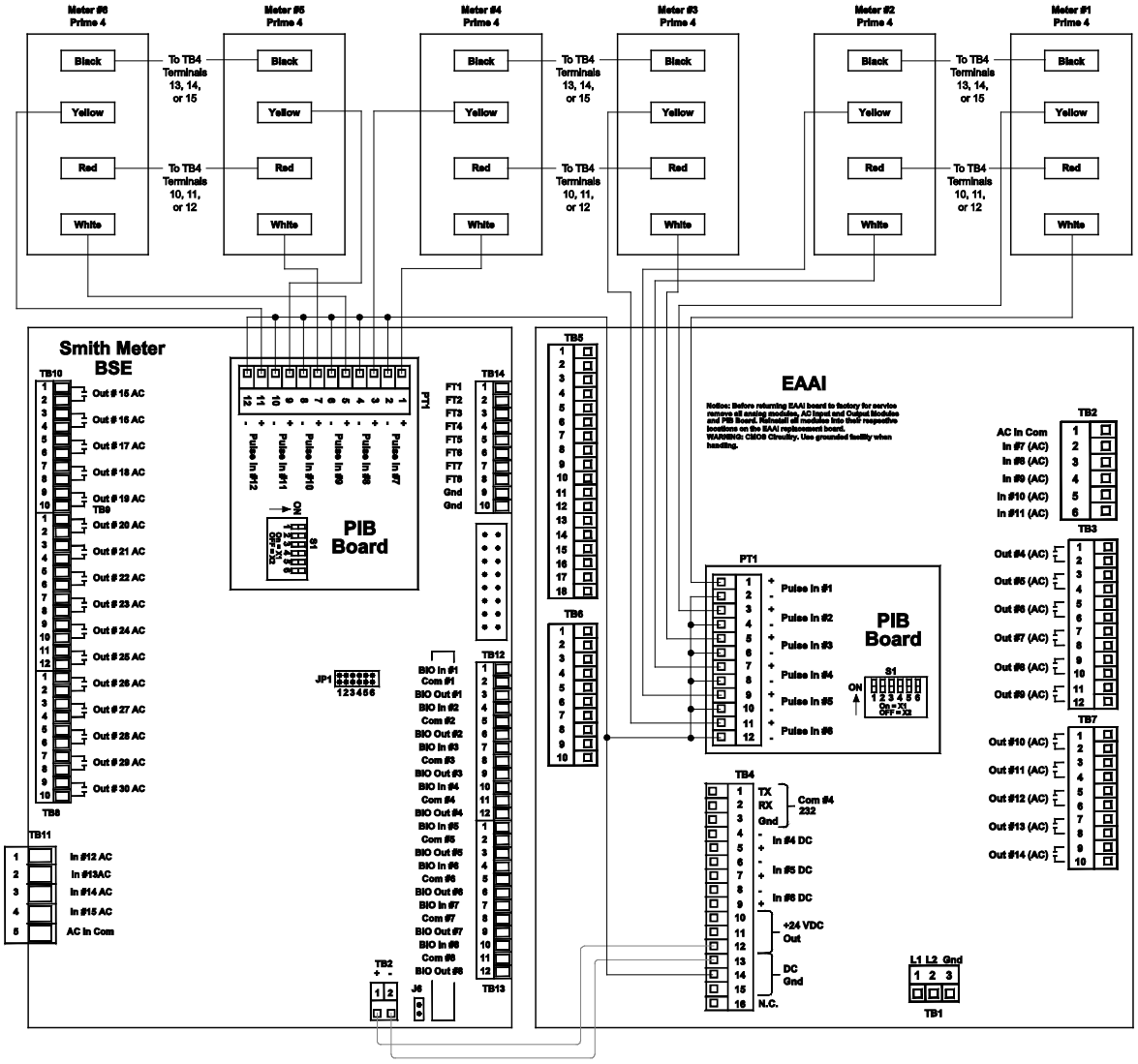


Figure 11. Wiring Diagram, Prime 4 Meters Dual Pulse

Note: *Drawing is shown with dual meters and each meter being shown wired as a dual pulse input. When not using the dual pulse input, see figure 10.*

Note: *Wiring between transmitter and AccuLoad should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

Prime 4 Wire Codes:
Black: Common
Red: Input Power
White: Signal A Output
Yellow: Signal B Output

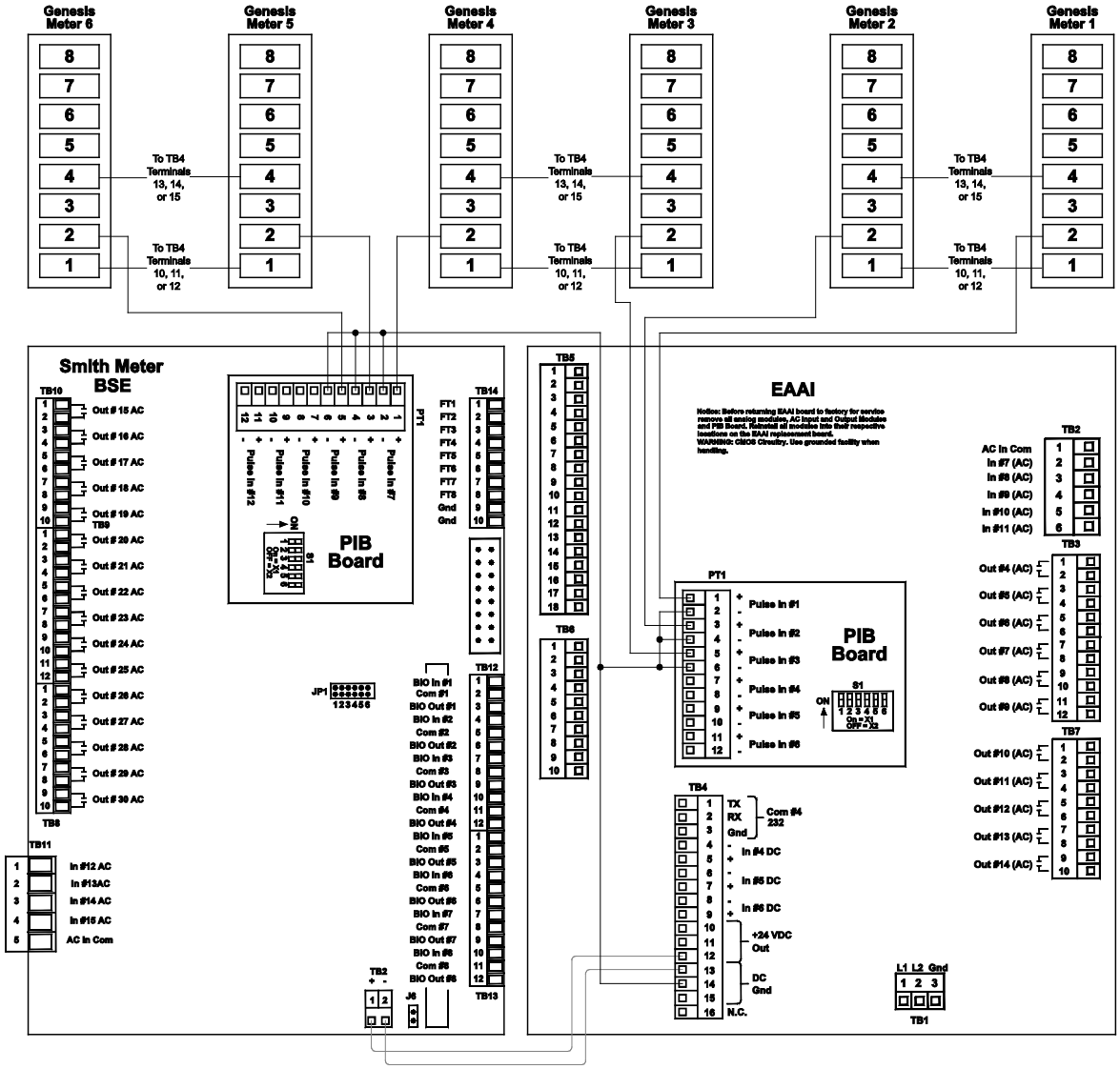


Figure 12. Wiring Diagram, Genesis Meter Single Pulse

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

Genesis Terminal Connections:

1: Input Power
2: Signal A Output
3: Signal B Output
4: Electronics Ground
5: Not used
6: Not used
7: Not used
8: Not used

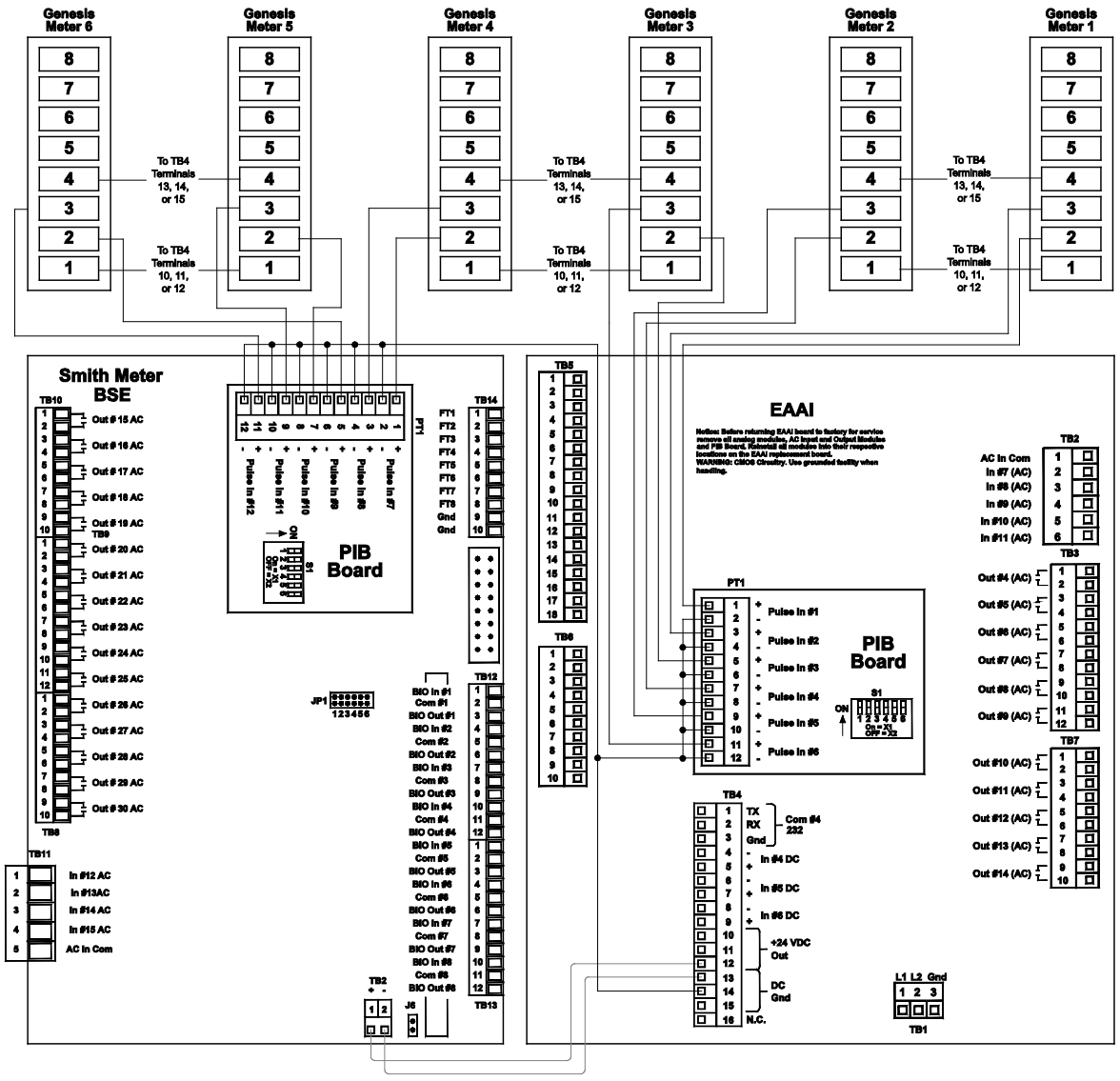


Figure 13. Wiring Diagram, Genesis Meter Dual Pulse

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

Genesis Terminal Connections:

1: Input Power
2: Signal A Output
3: Signal B Output
4: Electronics Ground
5: Not used
6: Not used
7: Not used
8: Not used

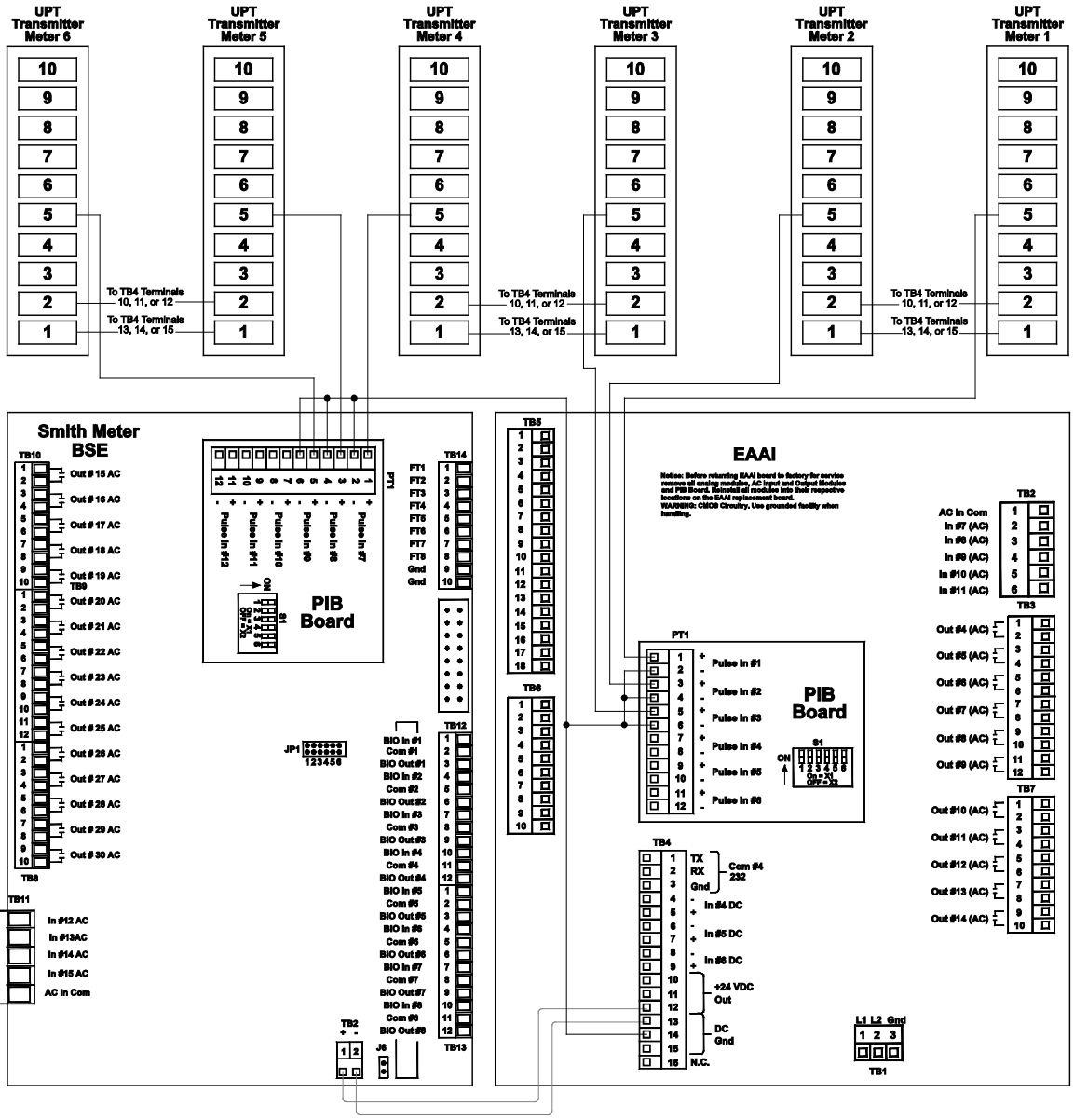


Figure 14. Wiring Diagram, UPT Transmitter Single Pulse

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

UPT Terminal Connections:

1: Electronics Ground
2: Input Power
3: Signal B Output
4: $\overline{B}$ Output
5: Signal A Output
6: $\overline{A}$ Output
7: Shield
8: Verification Pulse Output
9: Inverted Verification Pulse
10: Not Used

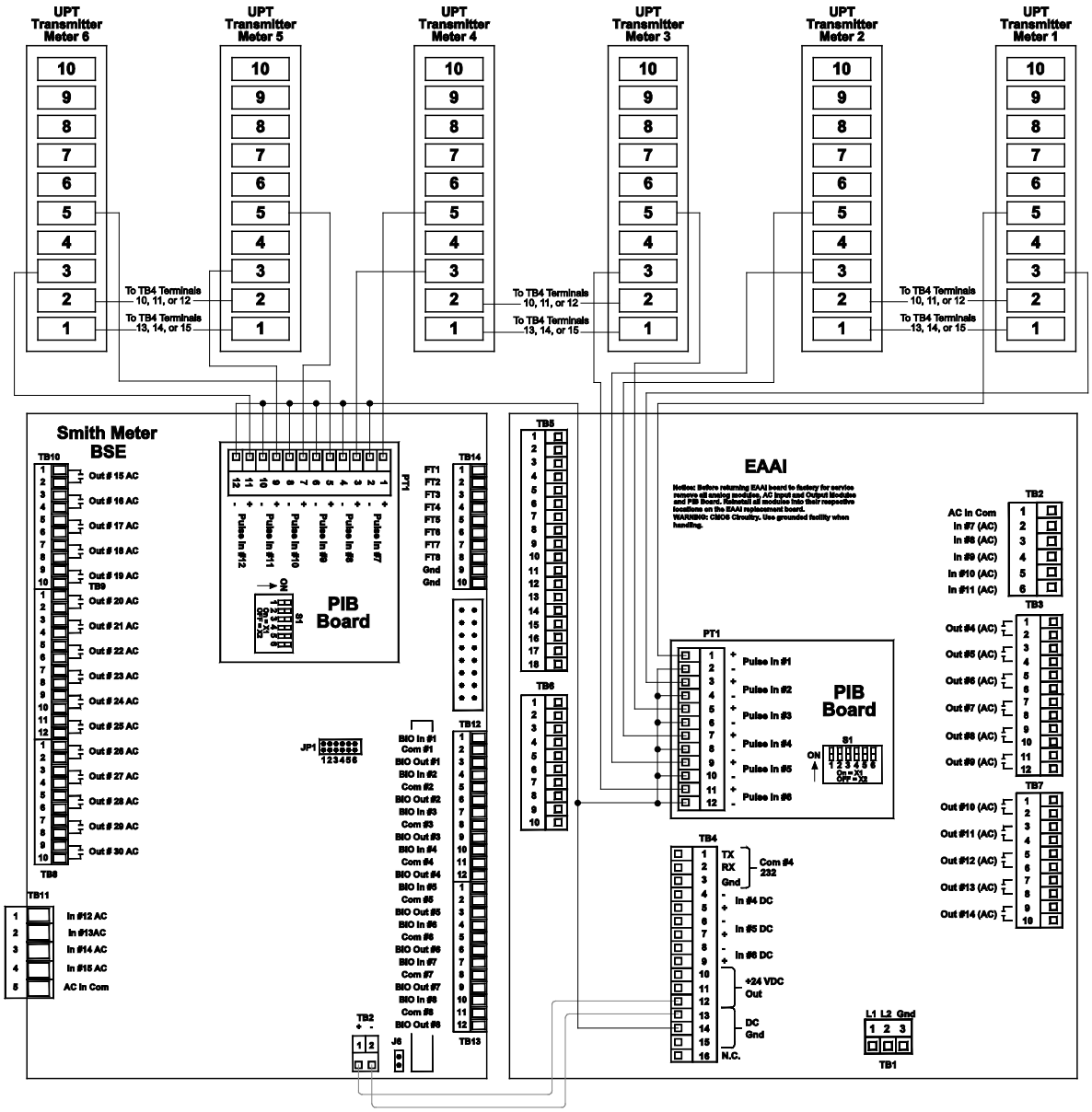


Figure 15. Wiring Diagram, UPT Transmitter Dual Pulse

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

UPT Terminal Connections:

1: Electronics Ground
2: Input Power
3: Signal B Output
4: $\overline{B}$ Output
5: Signal A Output
6: $\overline{A}$ Output
7: Shield
8: Verification Pulse Output
9: Inverted Verification Pulse Output
10: Not Used

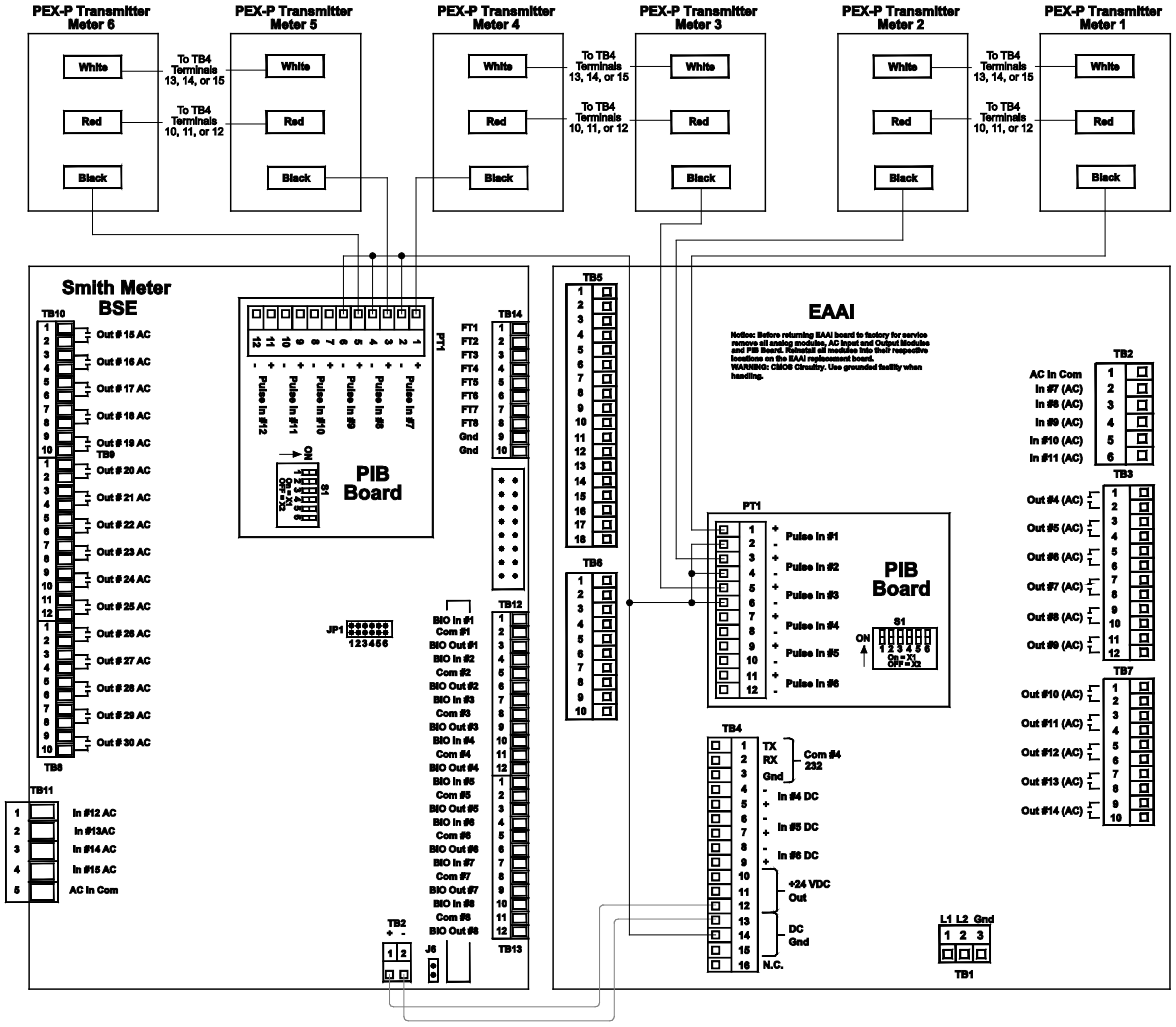


Figure 16. Wiring Diagram, PEX-P Transmitter Single Pulse

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

PEXP Wire Codes:
Black: Signal
Red: Input Power
White: Common

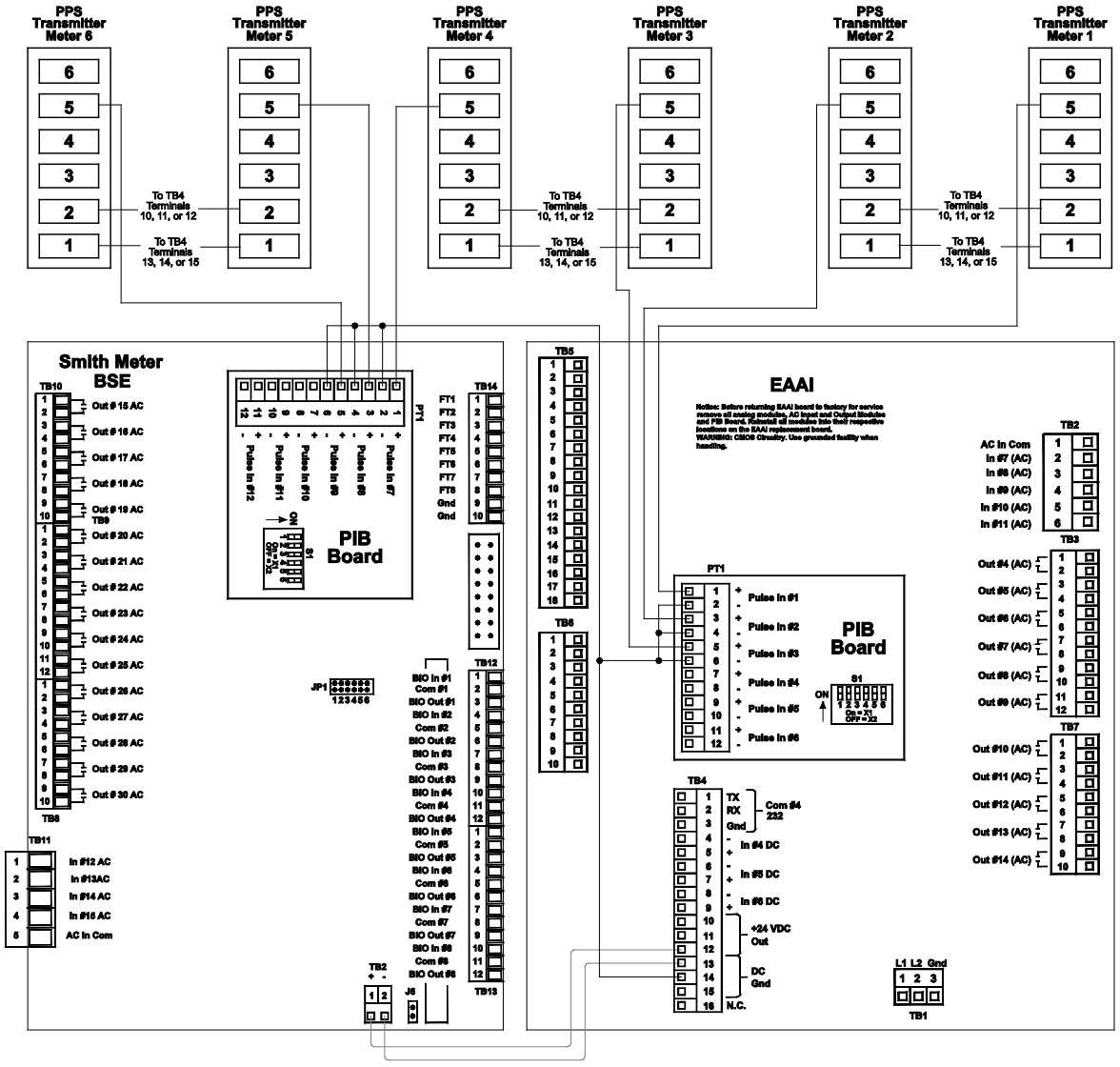


Figure 17. Wiring Diagram, PPS Transmitters Single Pulse

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

PPST Terminal Connections

1: Common
2: Input Power
3: Signal B Output
4: $\overline{B}$ Output
5: Signal A Output
6: $\overline{A}$ Output

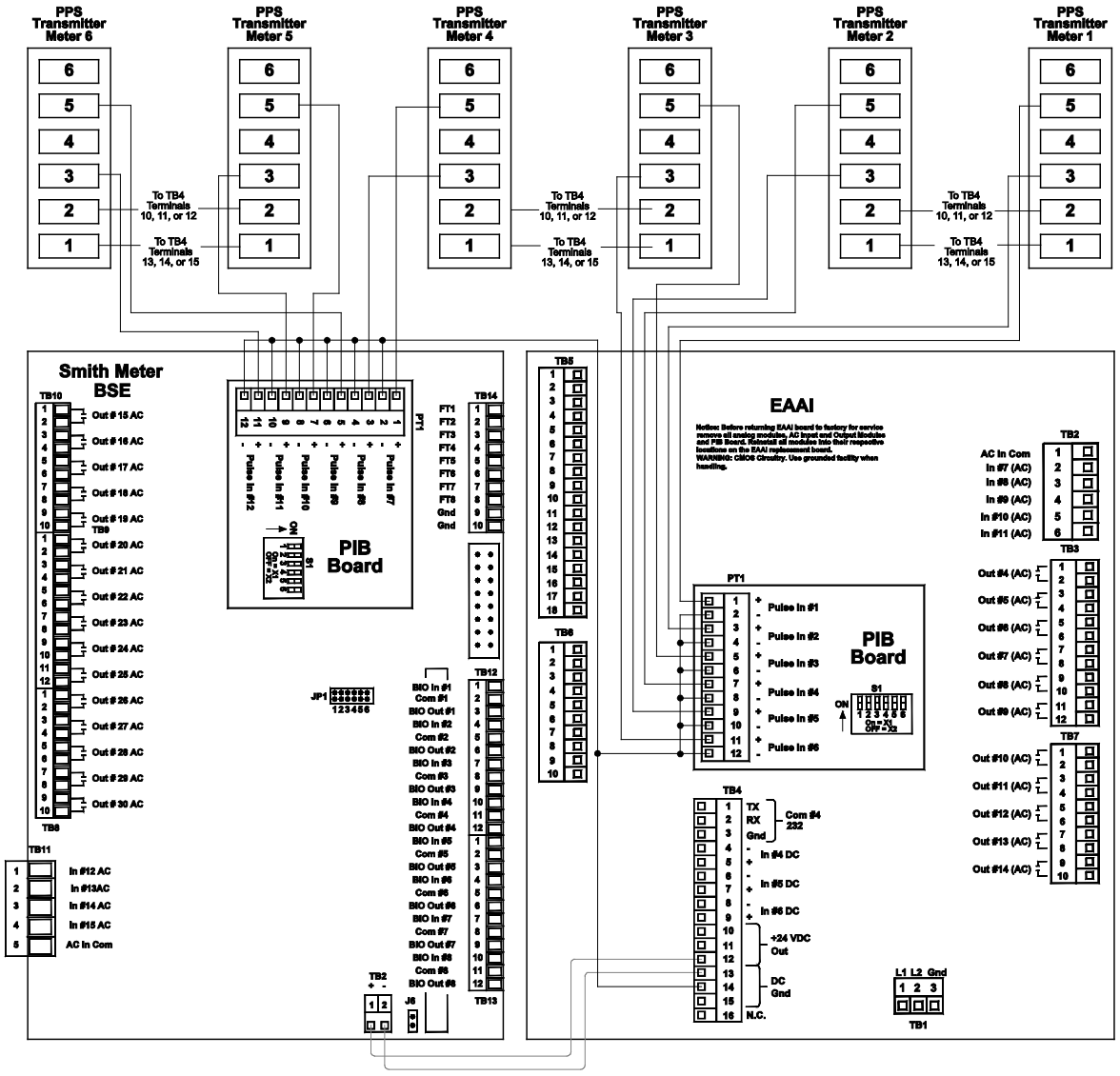


Figure 18. Wiring Diagram, PPS Dual Pulse Transmitter

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

PPST Terminal Connections:

1: Common
2: Input Power
3: Signal B Output
4: $\overline{B}$ Output
5: Signal A Output
6: $\overline{A}$ Output

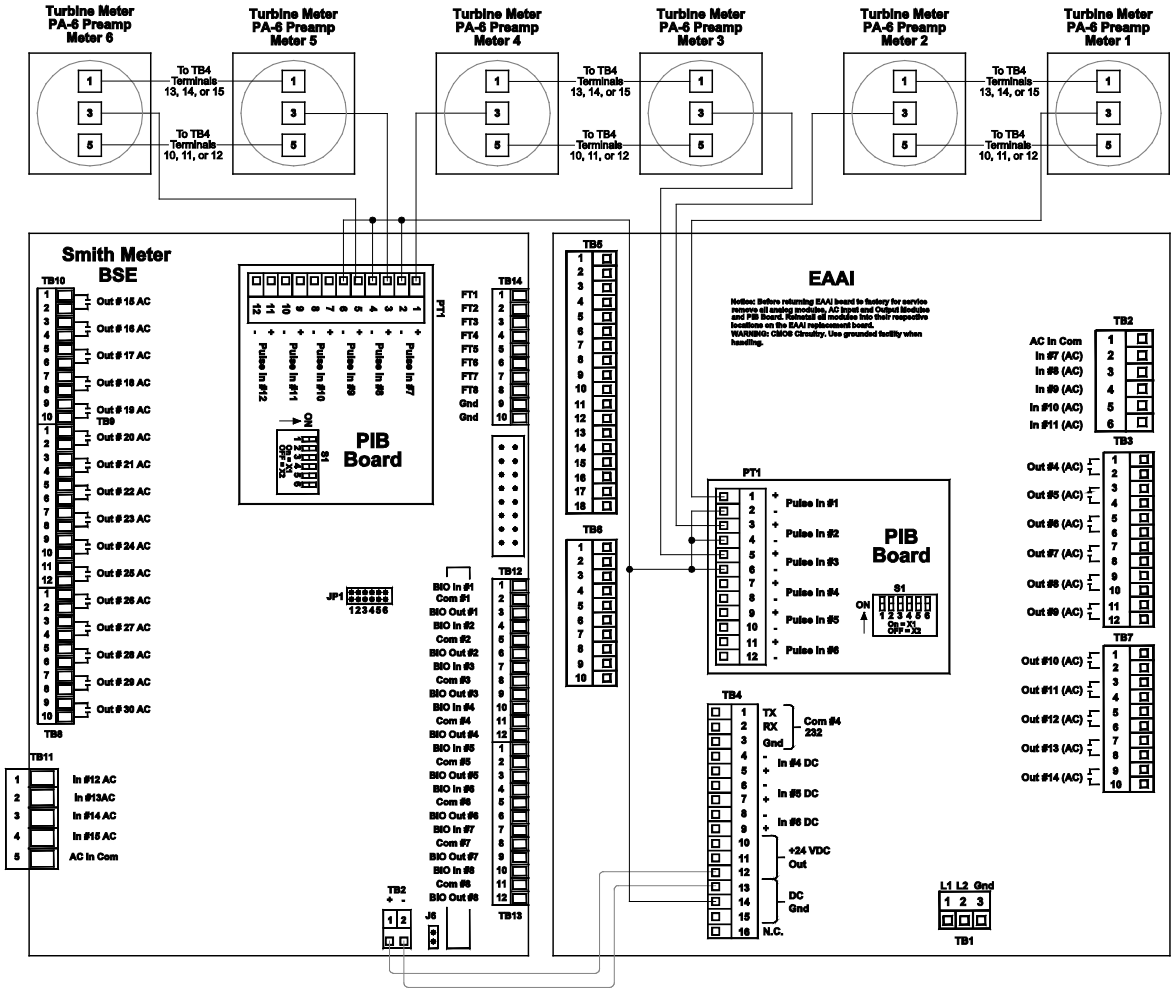


Figure 19. Wiring Diagram, Turbine Meters with PA-6 Preamps Single Pulse

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

PA-6 Terminal Connections

1: Common
3: Signal Output
5: Input Power

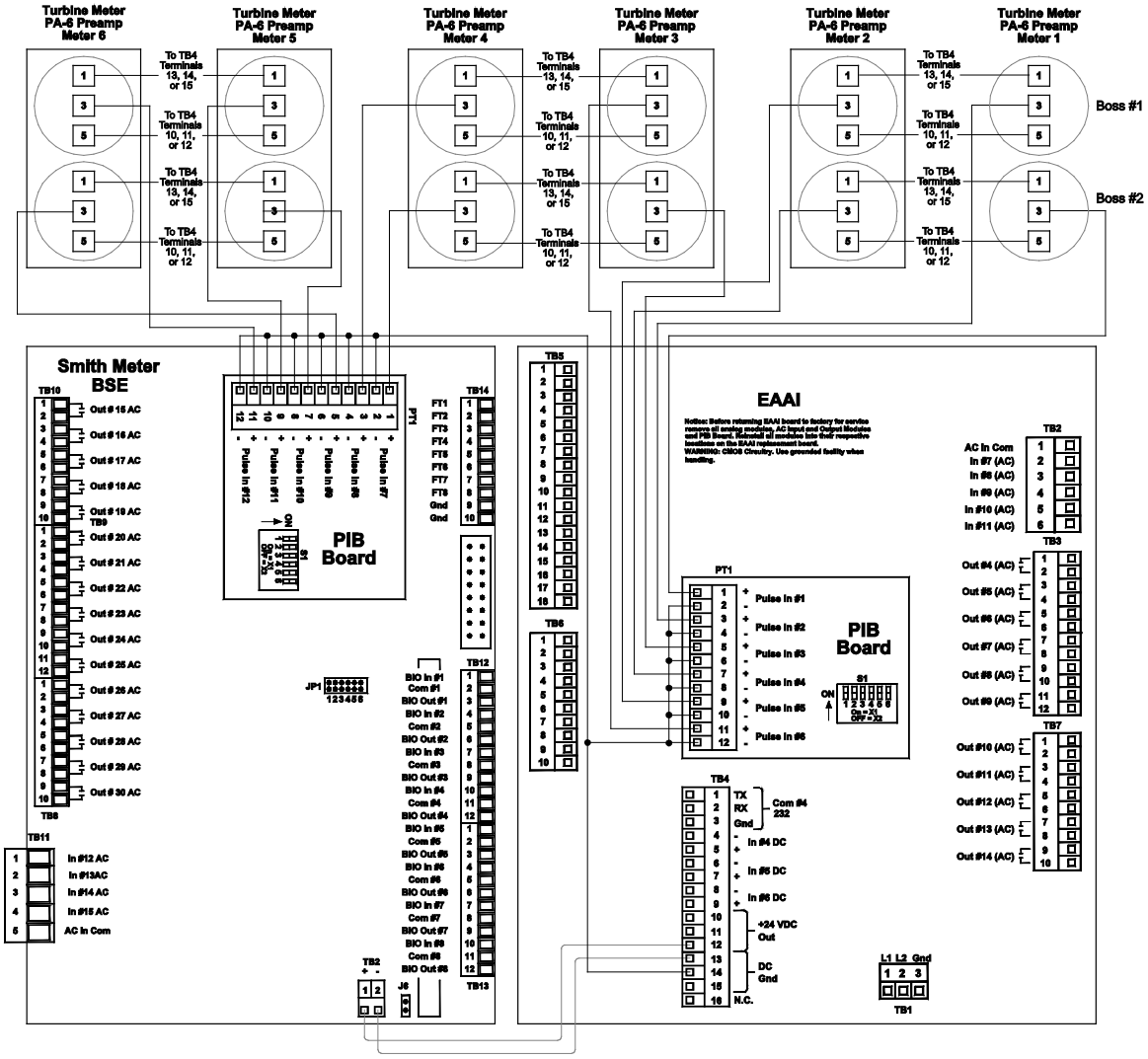


Figure 20. Wiring Diagram, Dual Pulse Turbine Meters with PA-6 Preamps

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected able utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

PA-6 Terminal Connections (Boss #2)

1: Common
3: Signal A Output
5: Input Power

PA-6 Terminal Connections (Boss #1)

1: Common
3: Signal B Output
5: Input Power

Promass 80, 83, and 84 Coriolis Meters

When connecting the Promass 84 (does not apply to the Promass 80 or 83 models) to an AccuLoad, it is important that the “Line Monitoring” function on the Promass 84 be disabled. This is because the pulse input circuitry of the AccuLoad requires the input pulse “off” voltage to be less than one volt (and the “on” voltage to be greater than 5 volts). If the “Line Monitoring” on the Promass 84 is enabled, the “off” voltage of the pulses will be greater than one volt and therefore will not be counted by the Accuload. There are three jumpers on each of the frequency output submodules on the I/O board that enable/disable the “Line Monitoring” function. The factory default is to enable “Line Monitoring”. Follow the steps from section 6.4.2 of the Proline Promass 84 Operating Instruction – Bulletin MN0M032 to enable/disable this function.

Transmitter/Sensor	Modeling	+ Terminal	- Terminal
80XXX	-X-XXX-X-X-X-X-X-X-X-A	24	25
80XXX	-X-XXX-X-X-X-X-X-X-X-D	24	25
80XXX	-X-XXX-X-X-X-X-X-X-X-S	24	25
80XXX	-X-XXX-X-X-X-X-X-X-X-T	24	25
80XXX	-X-XXX-X-X-X-X-X-X-X-8	22	23
83XXX	-X-XXX-X-X-X-X-X-X-X-A	24	25
83XXX	-X-XXX-X-X-X-X-X-X-X-B	24	25
83XXX	-X-XXX-X-X-X-X-X-X-X-S	24	25
83XXX	-X-XXX-X-X-X-X-X-X-X-T	24	25
83XXX	-X-XXX-X-X-X-X-X-X-X-C	24	25
83XXX	-X-XXX-X-X-X-X-X-X-X-D	24	25
83XXX	-X-XXX-X-X-X-X-X-X-X-N	22	23
83XXX	-X-XXX-X-X-X-X-X-X-X-P	22	23
83XXX	-X-XXX-X-X-X-X-X-X-X-2	24	25
83XXX	-X-XXX-X-X-X-X-X-X-X-4	24	25
83XXX	-X-XXX-X-X-X-X-X-X-X-5	24	25
84XXX	-X-XXX-X-X-X-X-X-X-X-S	24	25
84XXX	-X-XXX-X-X-X-X-X-X-X-T	24	25
84XXX	-X-XXX-X-X-X-X-X-X-X-N	22	23
84XXX	-X-XXX-X-X-X-X-X-X-X-D	24	25
84XXX	-X-XXX-X-X-X-X-X-X-X-2	24	25

Table 7. Promass Modeling for Single Pulse Wiring

Transmitter/Sensor	Modeling	+ Terminal	- Terminal
83XXX	-X-XXX-X-X-X-X-X-X-X-M	22, 24	23, 25
84XXX	-X-XXX-X-X-X-X-X-X-X-M	22, 24	23, 25
84XXX	-X-XXX-X-X-X-X-X-X-X-1	22, 24	23, 25

Table 8. Promass Modeling for Dual Pulse Wiring

Note: *In dual pulse mode, Output 1 (24/25) leads Output 2 (22/23) when flowing in the forward direction.*

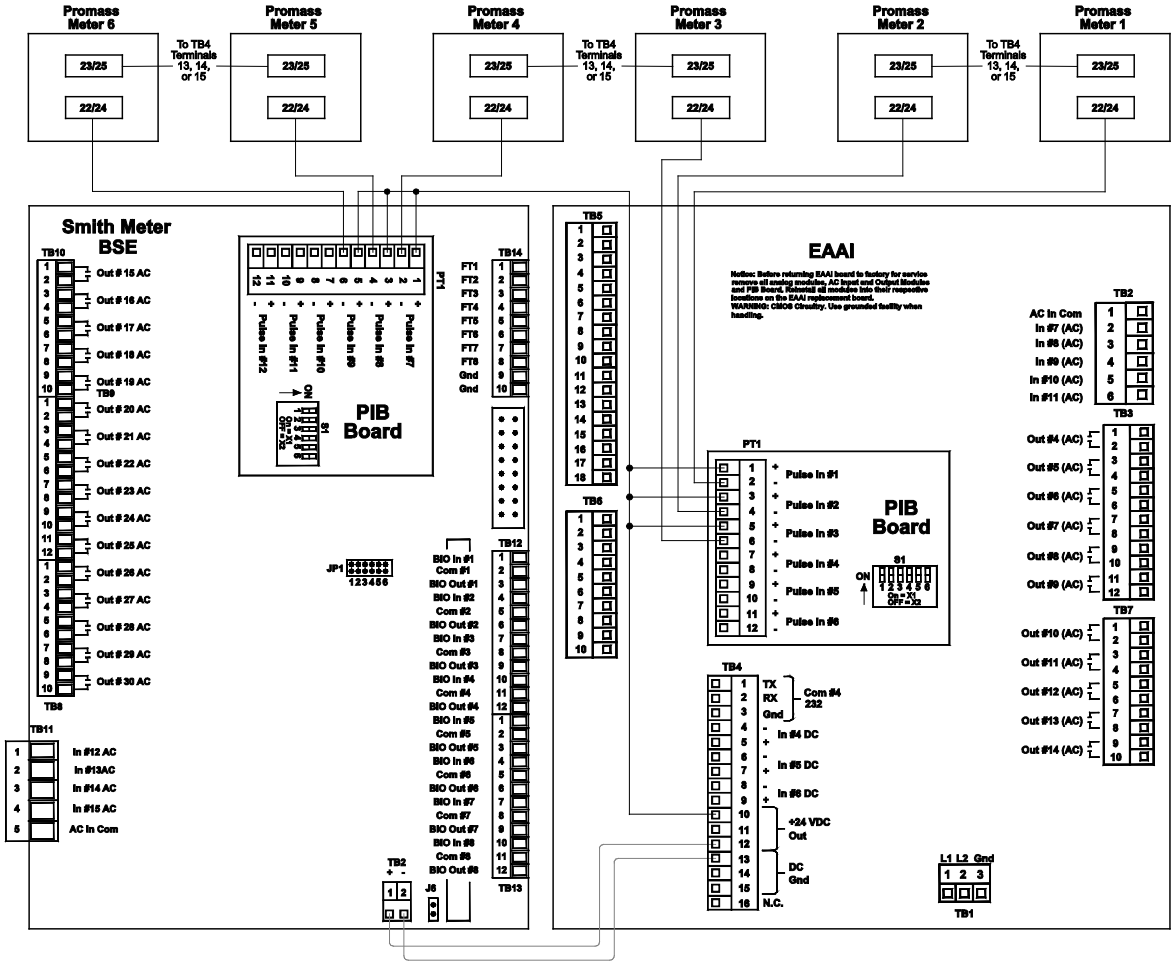


Figure 21. Wiring Diagram, Promass 80, 83, and 84 Single Pulse

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

Promass Wire Codes:
Terminal 22/24: +
Terminal 23/25: -

Note: *The pulse input circuitry on the PIB has 1.6kΩ of current limiting resistance "built-in" so that an external pull-up resistor is not required when an open collector output device is connected as shown.*

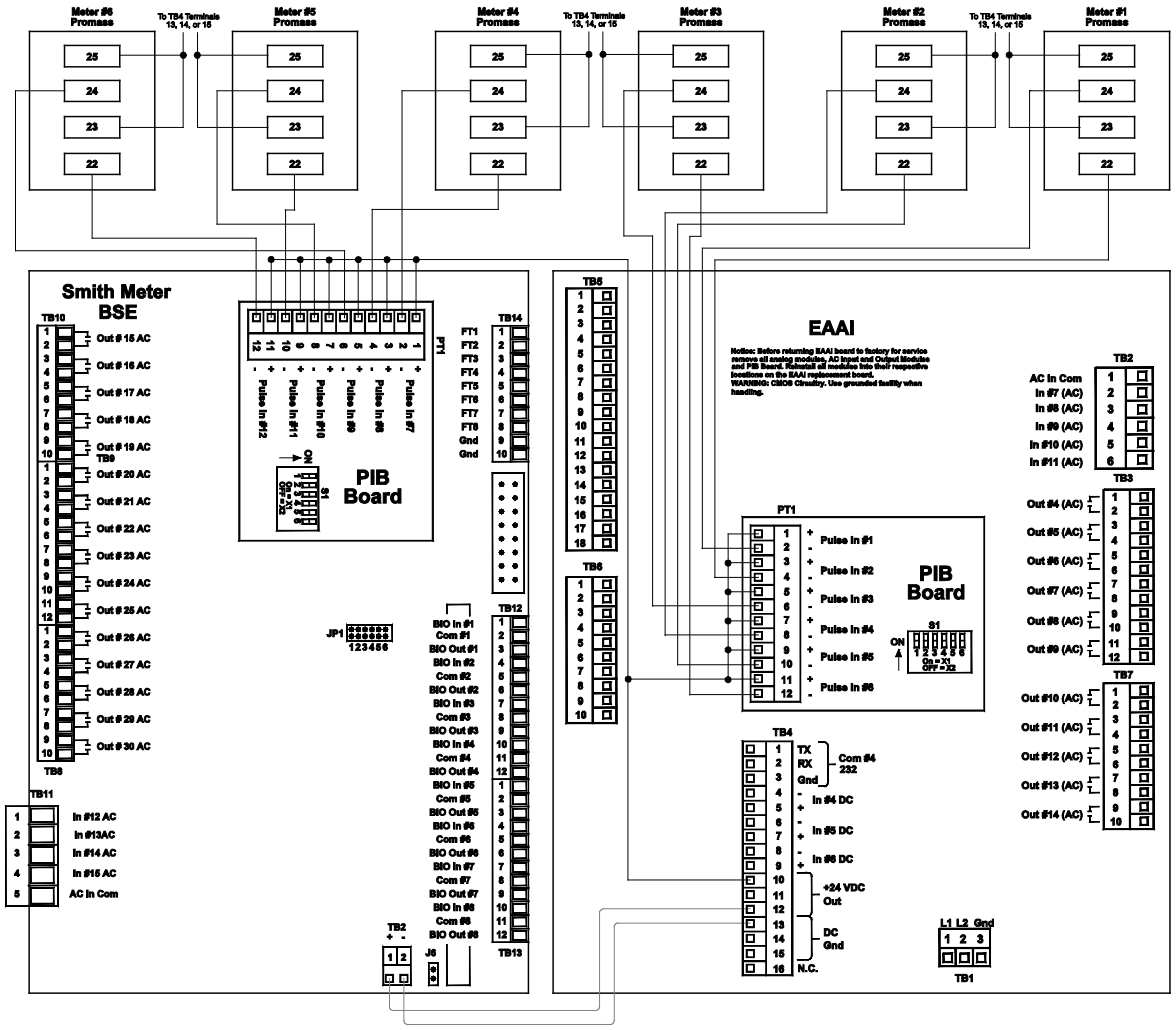


Figure 22. Wiring Diagram, Promass 83 and 84 Dual Pulse

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

Promass Wire Codes:

Terminal 22: Output 2+
Terminal 23: Output 2-
Terminal 24: Output 1+
Terminal 25: Output 1-

Note: *The pulse input circuitry on the PIB has 1.6kΩ of current limiting resistance "built-in" so that an external pull-up resistor is not required when an open collector output device is connected as shown.*

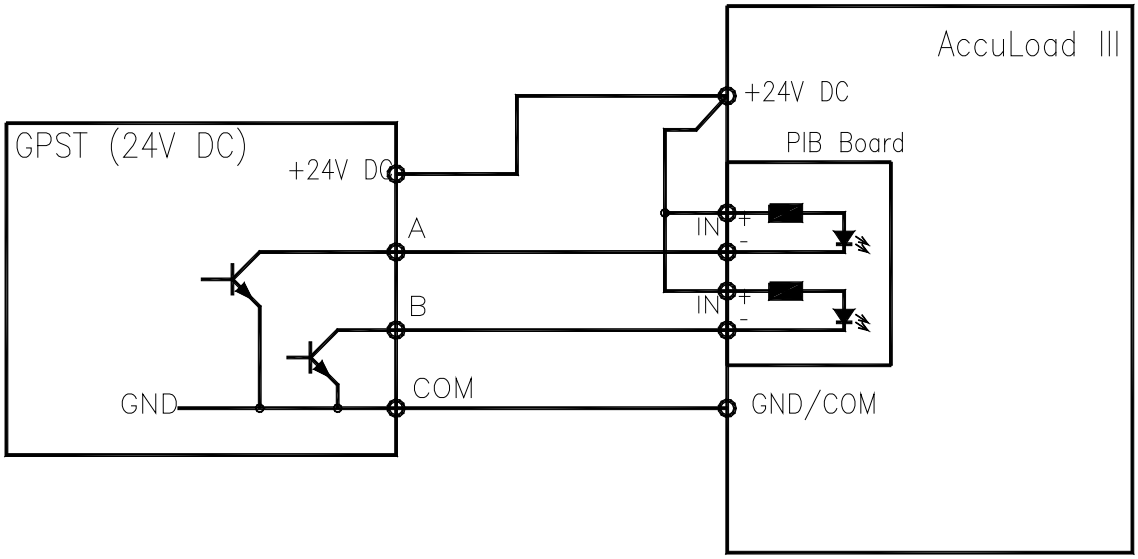


Figure 22B. Wiring Diagram, GPST Dual Pulse Transmitter + 24 Vdc with Open Collector Output with Common Ground

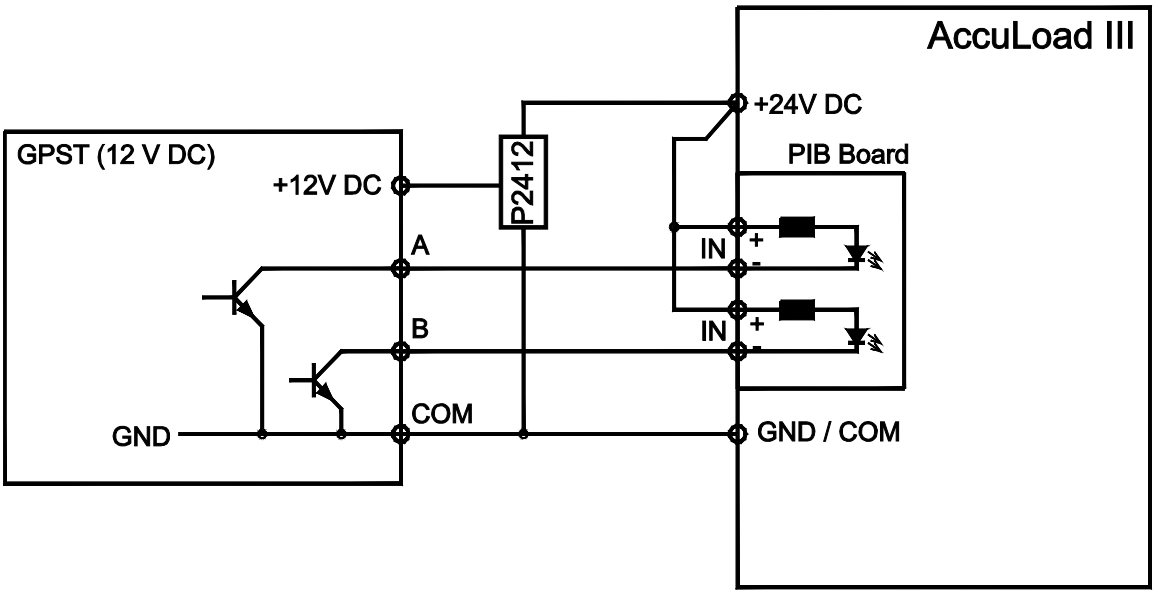


Figure 22C. Wiring Diagram, GPST Dual Pulse Transmitter + 12 Vdc with Open Collector Output with Common Ground Converter P2412 see MN06117.

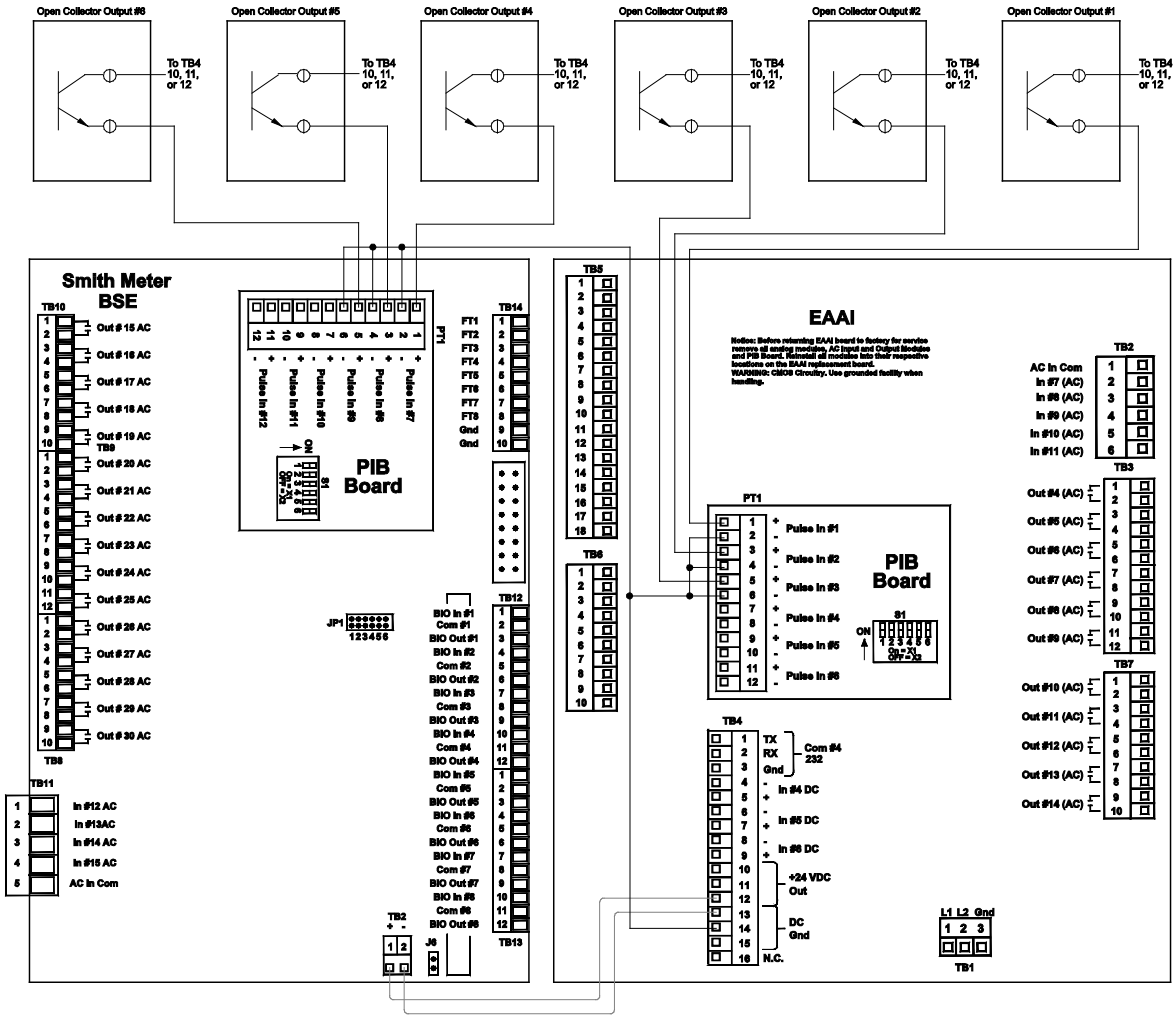
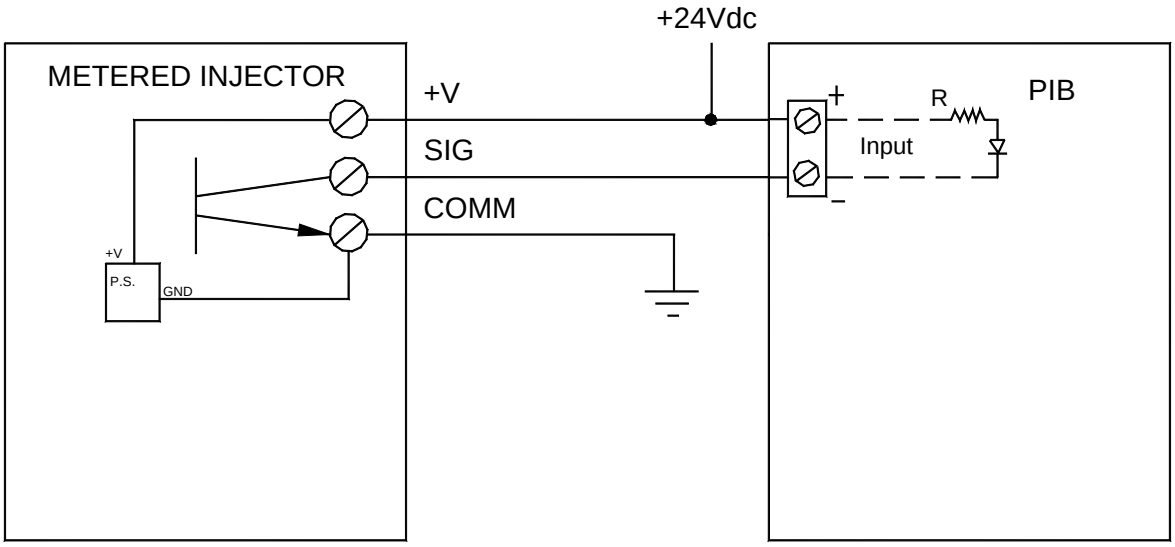


Figure 23. Wiring Diagram, Open Collector Output

Note: *Wiring between transmitter and Accuload should be done with a shielded cable per each transmitter. If selected cable utilizes twisted pairs, do not run more than one signal in a twisted pair.*

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

Note: *This diagram assumes that each output's collector and emitter are isolated.*



Typical Metered Injector Additive Meter

Figure 24. Metered Injector to PIB Wiring Diagram

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

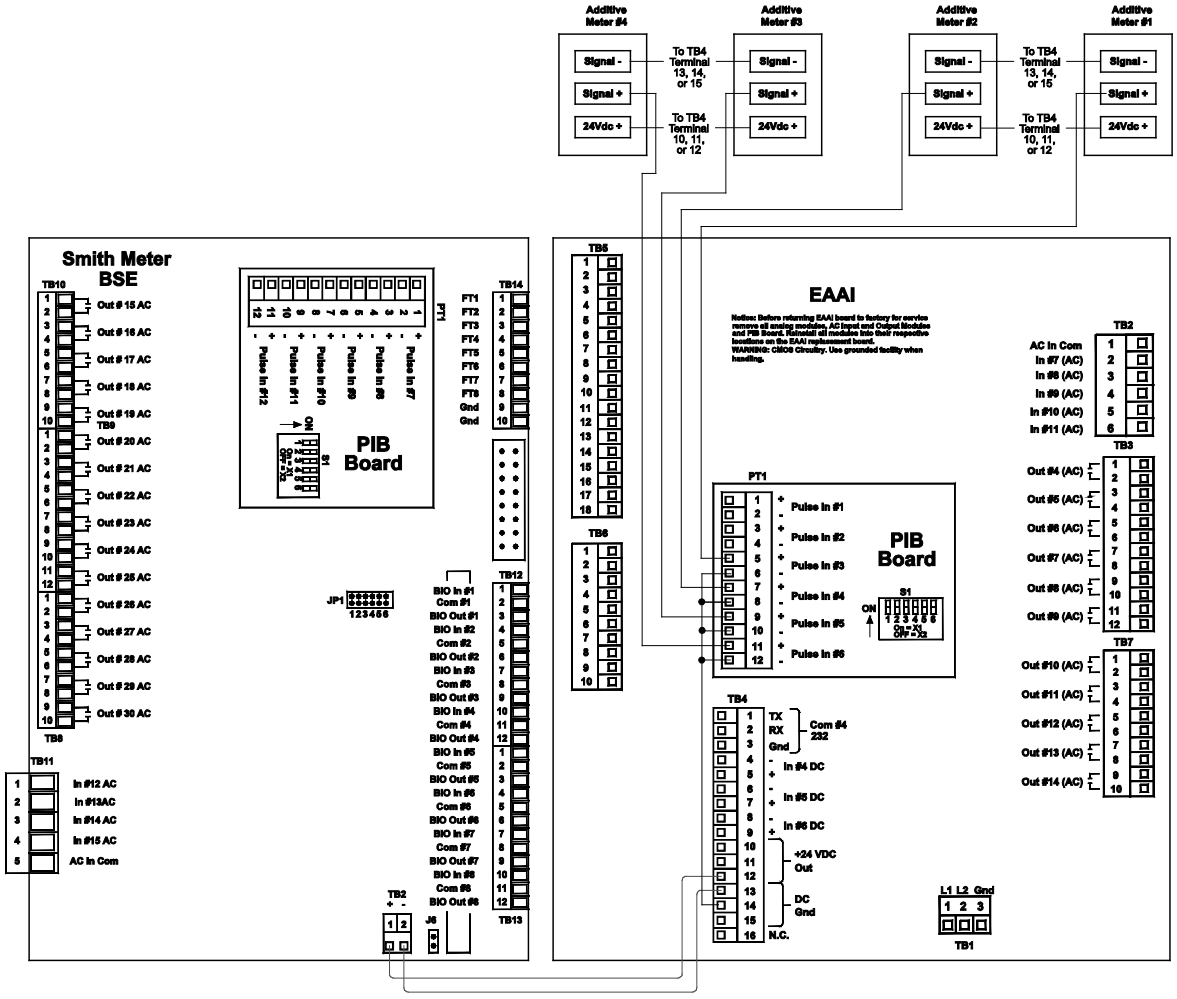
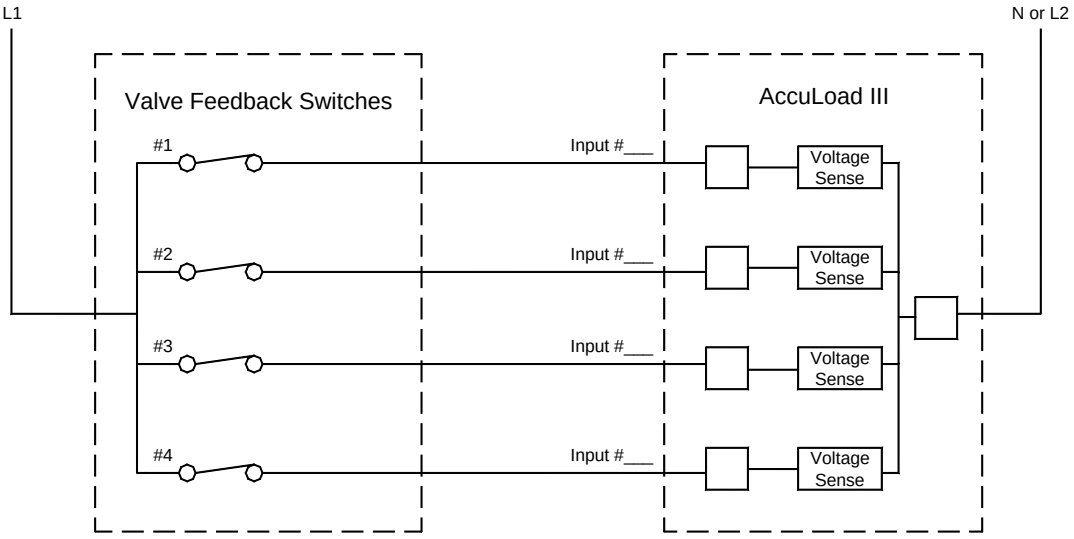


Figure 25. Wiring Diagram, Four Additive Meters

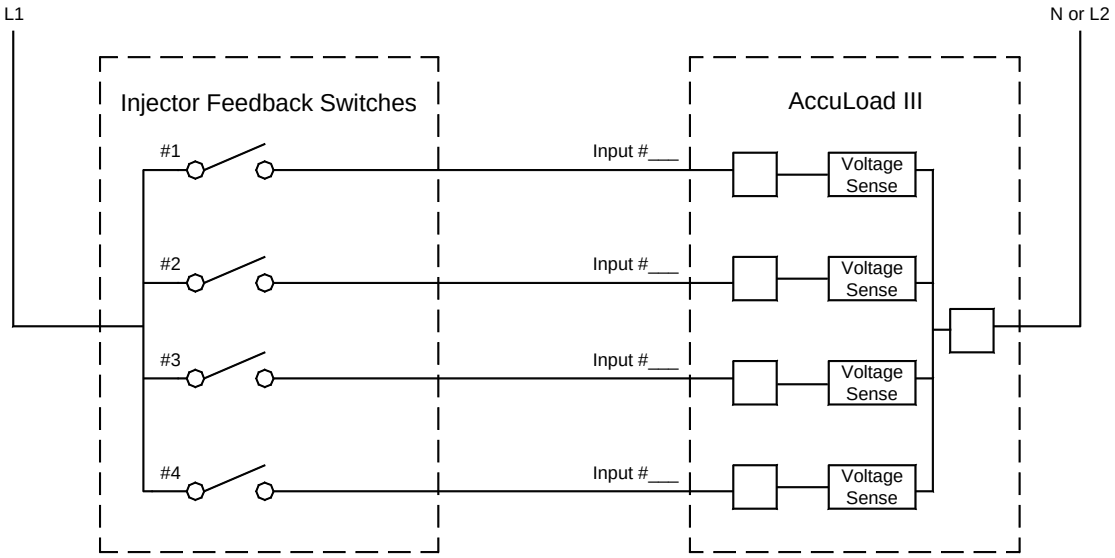
This diagram is valid only when using one or two product meters. For other setups refer to the table on pulse inputs for available wiring connections.

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*



Arm #1

Figure 26. Typical Block Valve Feedback Wiring



Arm #1

Figure 27. Typical Additive Feedback Wiring

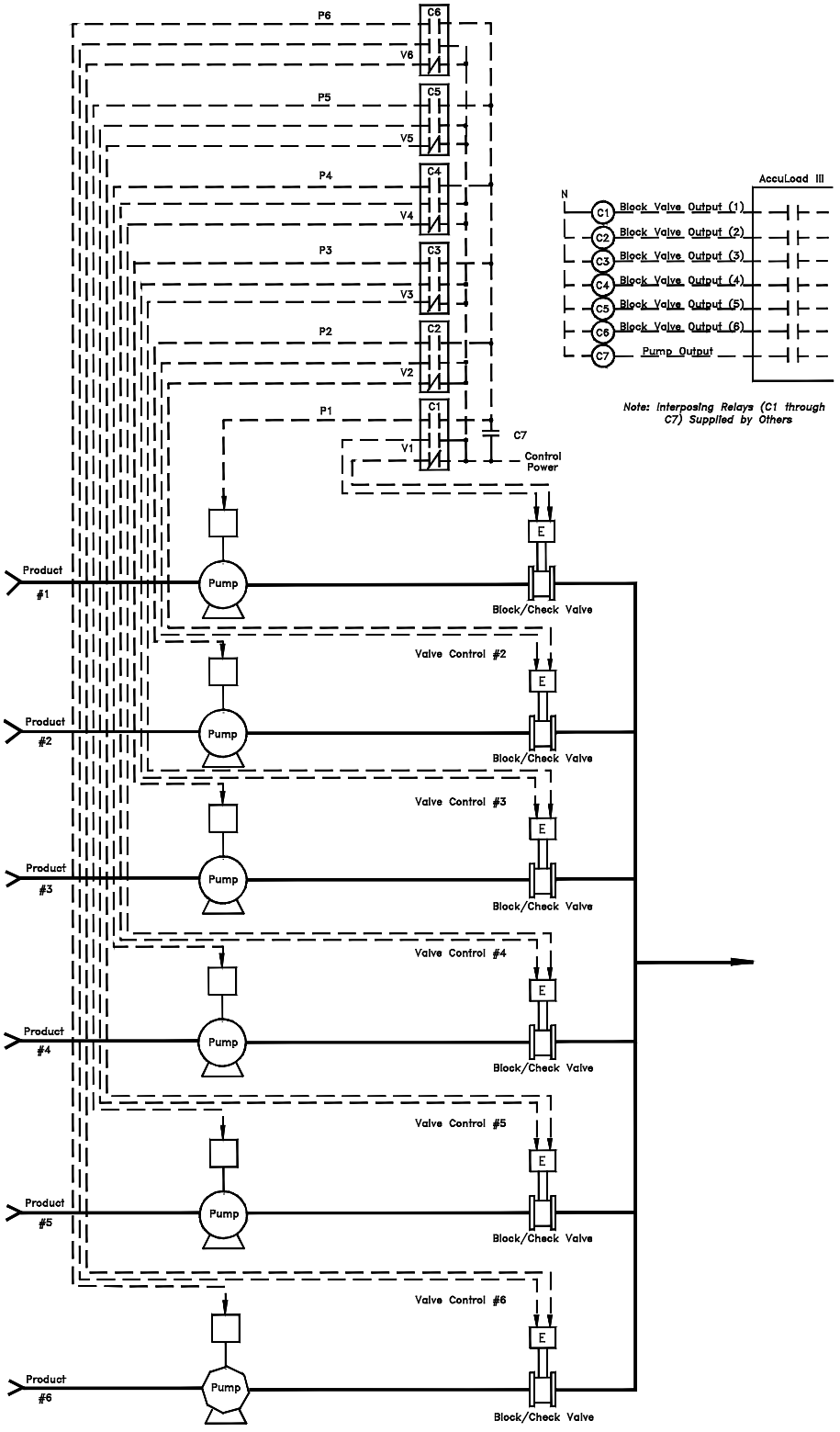
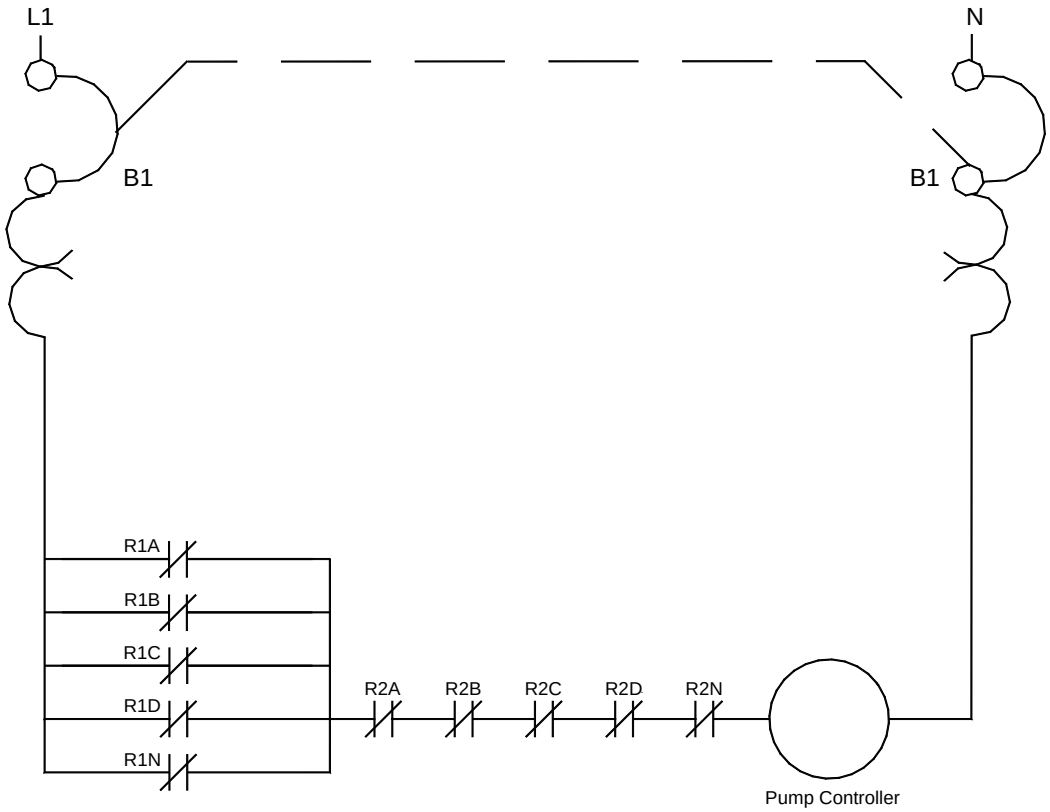


Figure 28. Electric Motor-Operated Block Valve/Pump Control



Notes:
1. This figure shows wiring for a typical pump and alarm contact array for multiple AccuLoad III-controlled load arms if the pump and alarm control options are used.
2. R1A through R1N represent the contacts of the customer-supplied relay (R1) on the output of the AccuLoad III pump permissive contacts.
3. R2A through R2N represent the contacts of the customer-supplied relay (R2) on the output of the AccuLoad III alarm permissive contacts.
4. An interposing relay must be used between the pump controller and the AccuLoad III pump contacts.

Figure 29. AccuLoad III Pump and Alarm Contacts

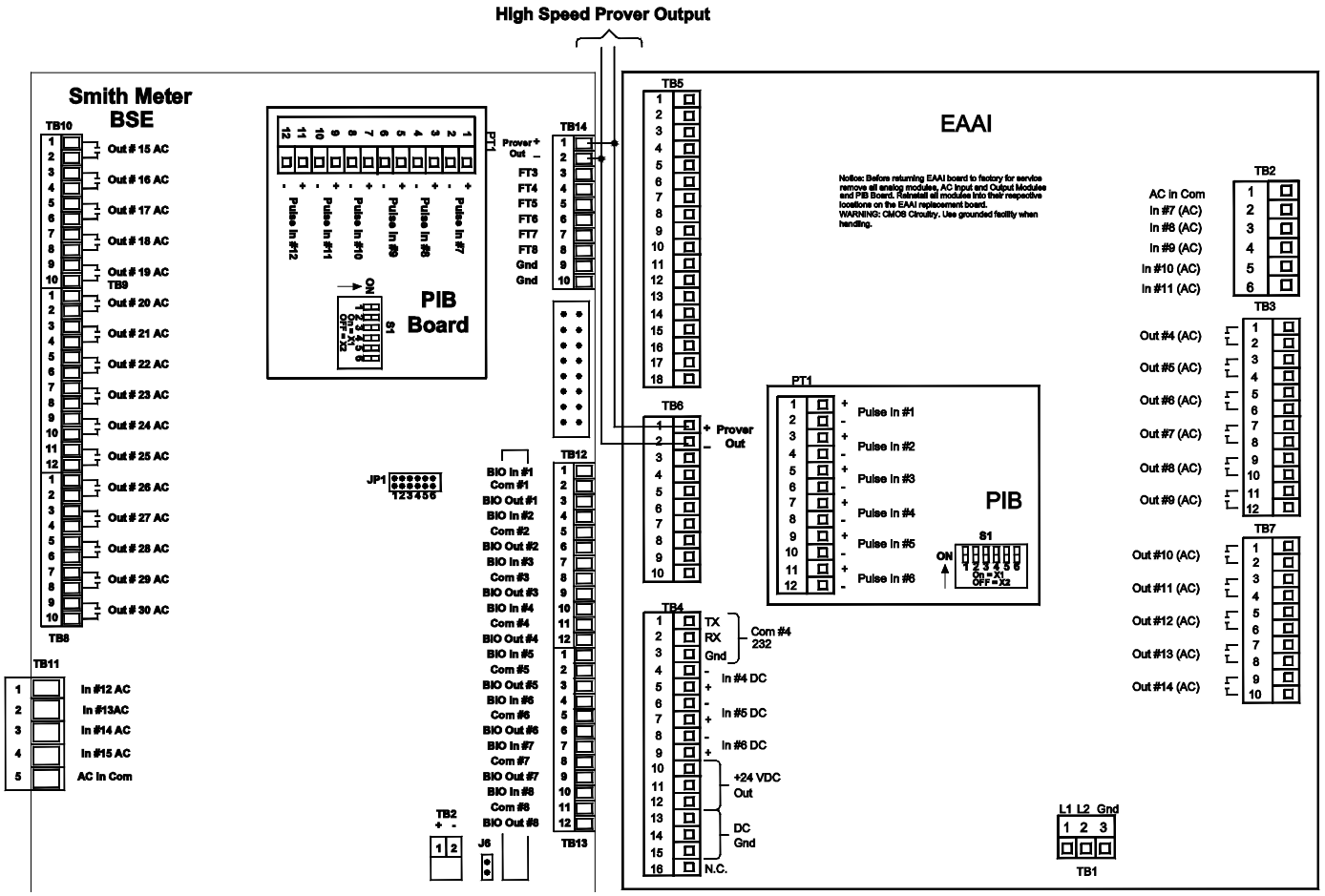


Figure 30. Wiring Schematic, High Speed Prover Output (Open Collector Opto Coupler)

Caution: *For clarity, shields not shown. Connect shields to terminals 3, 13, 14, or 15 of Terminal Block 4.*

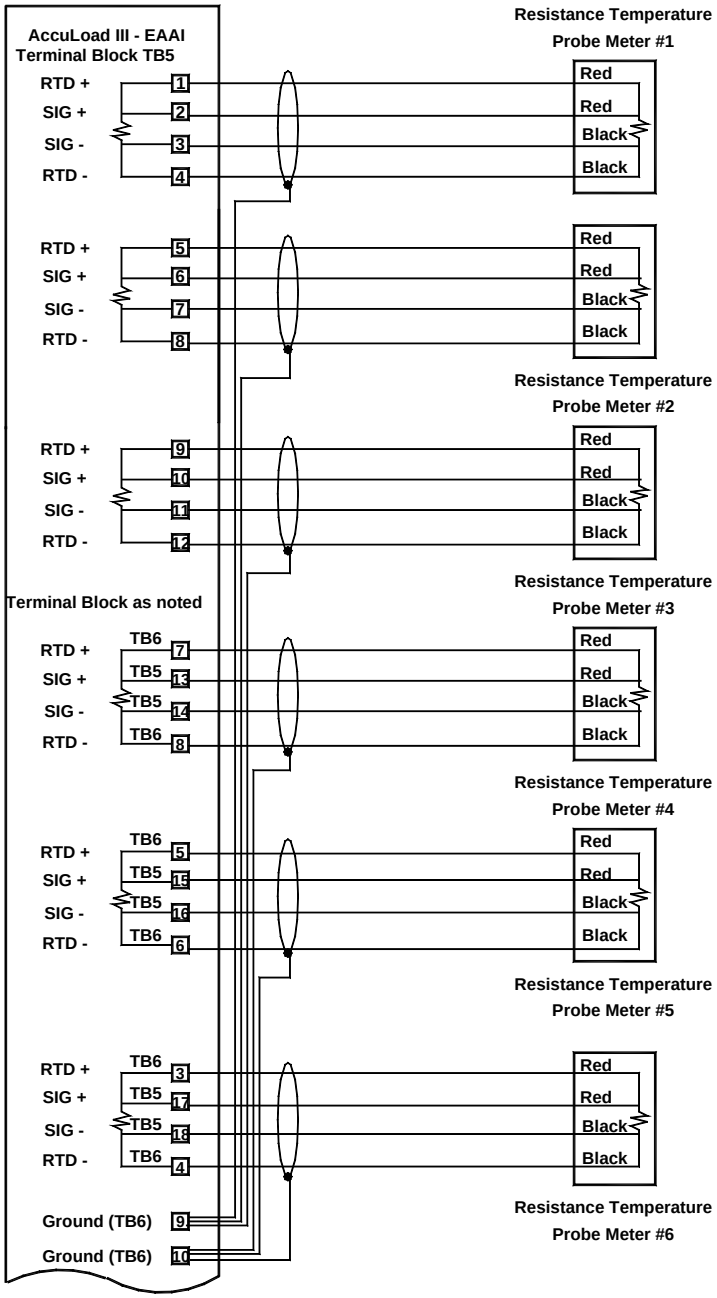


Figure 31. Resistance (RTD) Input

Note: *If using two twisted pairs of wires, RTD+ and RTD– should be wired with one twisted pair. Sig+ and Sig– should be wired with another twisted pair.*

Used for temperature input from a platinum RTD. This input requires a four-wire connection to a platinum sensor with the following specification:

1. *100 Ω @ 0 Degrees Celsius.*
2. *0.00385 Ω/Ω/Deg. C., DIN 43760, BS1904, or IPTS 1948 Temperature Coefficient.*

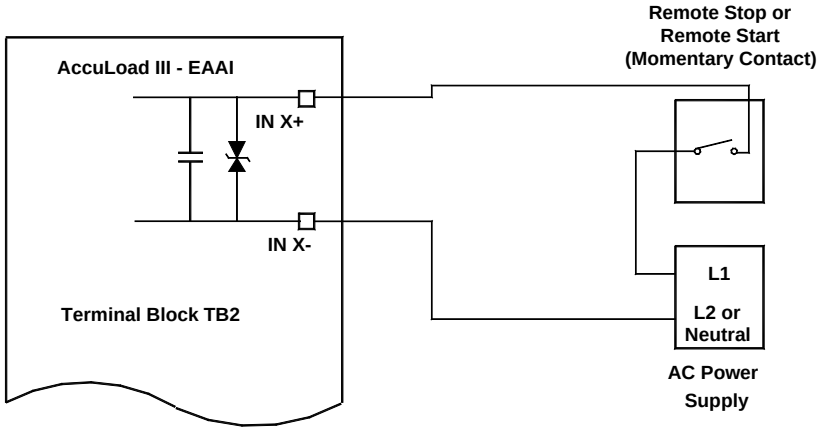


Figure 32. AC Remote Start and Stop

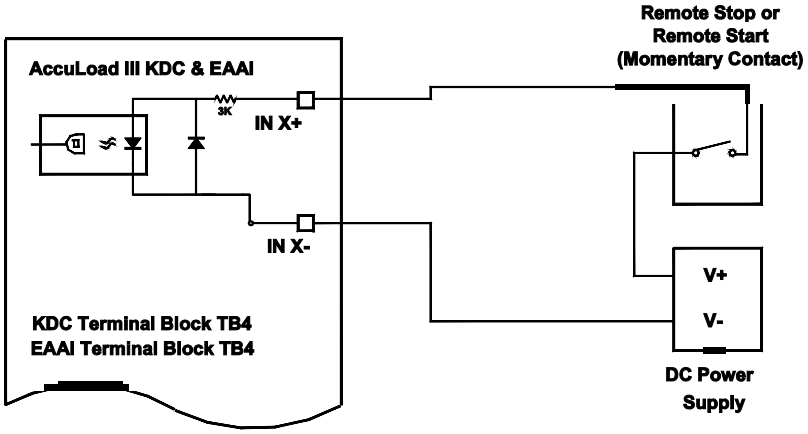


Figure 33. DC Remote Start and Stop

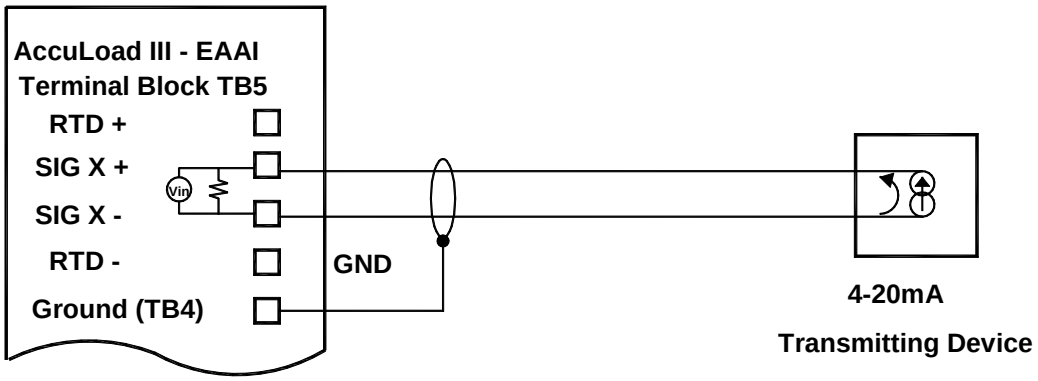


Figure 34. 4-20mA Inputs (Active)

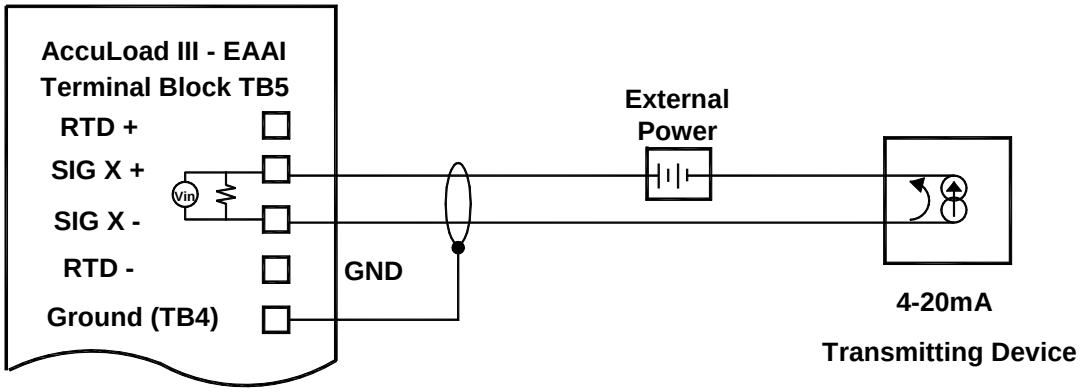


Figure 35. 4-20mA Inputs (Passive)

The 4-20mA inputs are isolated from the processor and main power and can be programmed for the function required by the application. The analog inputs are also scaleable through the I/O Configuration Menu of the unit. The inputs should be wired with shielded twisted pairs of wires of 18 to 24 gauge.

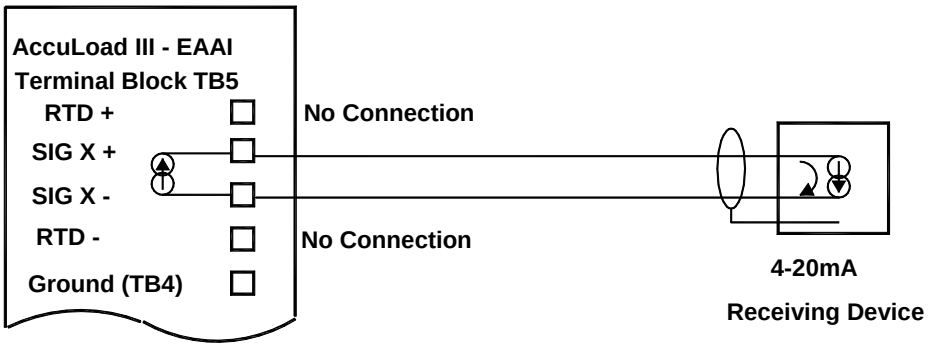


Figure 36. 4-20mA Outputs

The 4-20mA outputs are isolated from the processor and main power and can be programmed for the function required by the application. The analog outputs are also scaleable through the I/O Configuration Menu of the unit. The outputs should be wired with shielded twisted pairs of wires of 18 to 24 gauge.

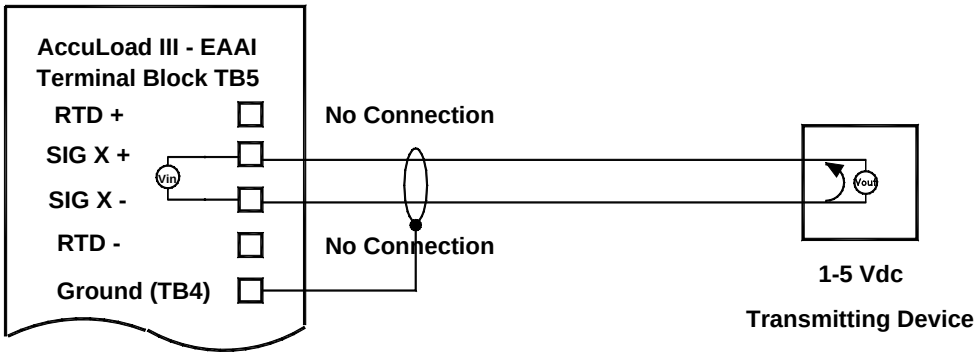


Figure 37. 1-5 Vdc Input

The 1-5 Vdc inputs are isolated from the processor and main power and can be programmed for the function required by the application. The inputs are scalable through the I/O Configuration Menu of the unit. The inputs should be wired with shielded twisted pairs of wires of 18 to 24 gauge.

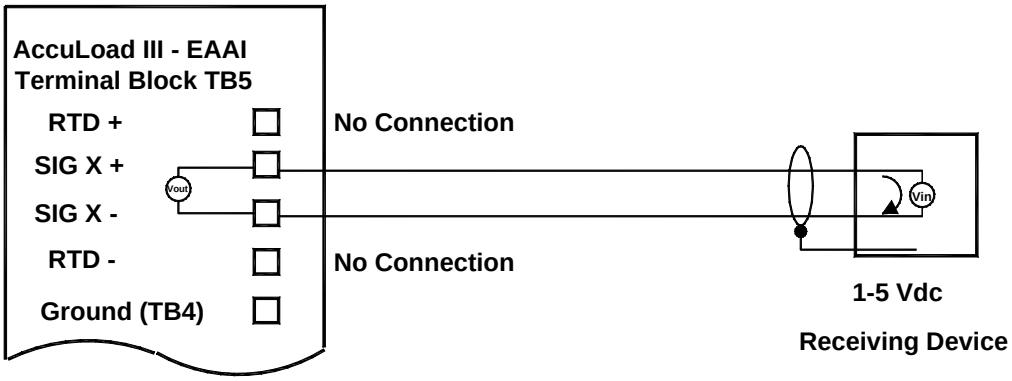


Figure 38. 1-5 Vdc Output

The 1-5 Vdc outputs are isolated from the processor and main power and can be programmed for the function required by the application. The outputs are also scaleable through the I/O Configuration Menu of the unit. The outputs should be wired with shielded twisted pairs of wires of 18 to 20 gauge.

Wiring Terminals, 4-20mA and 1-5 Vdc Inputs/Outputs

Module Number	Connection	Terminal Number	Board	Terminal Block
AM #1	+	2	EAAI	TB5
AM #1	-	3	EAAI	TB5
AM #1	Shield	3, 13, 14, or 15	EAAI	TB4
AM #2	+	6	EAAI	TB5
AM #2	-	7	EAAI	TB5
AM #2	Shield	3, 13, 14, or 15	EAAI	TB4
AM #3	+	10	EAAI	TB5
AM #3	-	11	EAAI	TB5
AM #3	Shield	3, 13, 14, or 15	EAAI	TB4
AM #4	+	13	EAAI	TB5
AM #4	-	14	EAAI	TB5
AM #4	Shield	3, 13, 14, or 15	EAAI	TB4
AM #5	+	15	EAAI	TB5
AM #5	-	16	EAAI	TB5
AM #5	Shield	3, 13, 14, or 15	EAAI	TB4
AM #6	+	17	EAAI	TB5
AM #6	-	18	EAAI	TB5
AM #6	Shield	3, 13, 14, or 15	EAAI	TB4

Table 9. Analog Terminal Connection

Digital Inputs

The AccuLoad III is capable of providing fourteen DC digital inputs and nine AC digital inputs (standard). The inputs can be programmed as to function through the configuration directory. Eight of the DC digital inputs are bi-state and can be used as either inputs or outputs depending on how they are programmed and wired. (See Tables 8 and 10 for digital inputs terminal connections. For optional AICB inputs, see Table 18.)

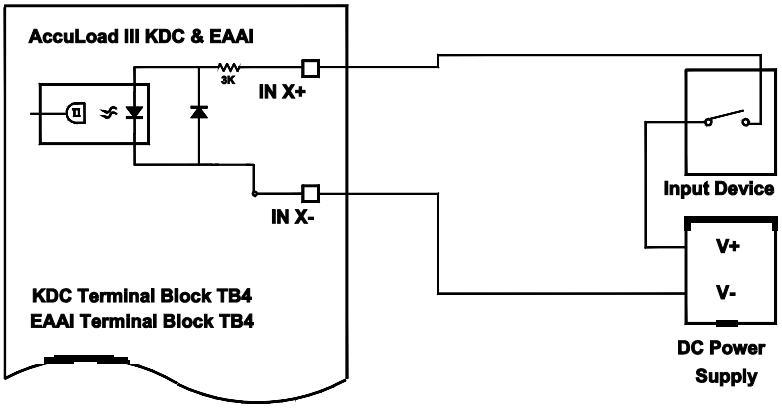


Figure 39. DC Inputs

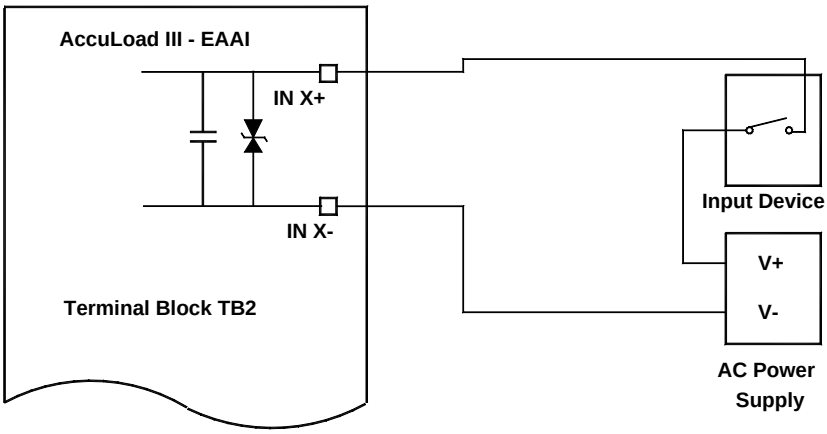


Figure 40. AC Inputs

Wiring Terminals, Digital Inputs

Input #	Voltage Type	Board	Terminal Block	Terminal Input (+)	Connections Common (-)
1	DC	KDC	TB4	1	2
2	DC	KDC	TB4	3	4
3	DC	KDC	TB4	5	6
4	DC	EAAI	TB4	5	4
5	DC	EAAI	TB4	7	6
6	DC	EAAI	TB4	9	8
7	AC	EAAI	TB2	2	1
8	AC	EAAI	TB2	3	1
9	AC	EAAI	TB2	4	1
10	AC	EAAI	TB2	5	1
11	AC	EAAI	TB2	6	1
12	AC	BSE	TB11	1	5
13	AC	BSE	TB11	2	5
14	AC	BSE	TB11	3	5
15	AC	BSE	TB11	4	5

Table 10. Digital Inputs

Digital Outputs

The AccuLoad III is capable of providing eleven DC digital outputs and twenty-seven AC digital outputs (standard). The outputs can be programmed as to function through the configuration directory. Eight of the DC digital outputs are bi-state and can be used as either inputs or outputs depending on how they are programmed and wired. (See Tables 9 and 10 for digital outputs terminal connections. For optional AICB outputs, see Table 19.)

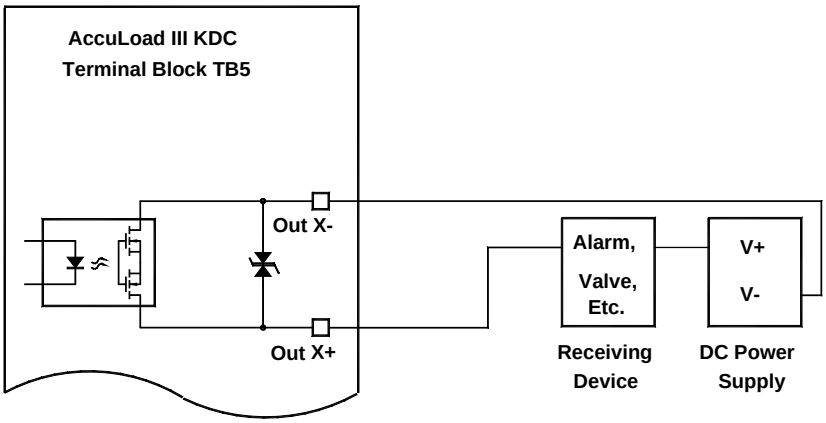


Figure 41. DC Outputs

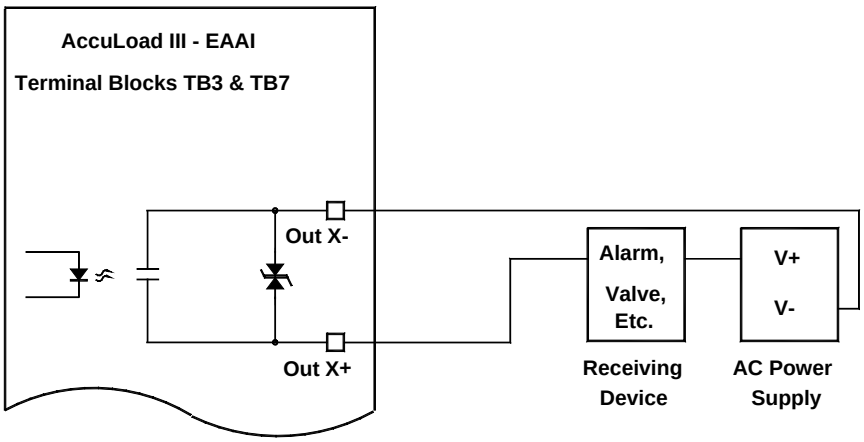


Figure 42. AC Outputs

Wiring Terminals, Digital Outputs

Output #	Voltage Type	Board	Terminal Block	Terminal Output (+)	Connections Common (-)
1	DC	KDC	TB5	1	2
2	DC	KDC	TB5	3	4
3	DC	KDC	TB5	5	6
4	AC	EAAI	TB3	1	2
5	AC	EAAI	TB3	3	4
6	AC	EAAI	TB3	5	6
7	AC	EAAI	TB3	7	8
8	AC	EAAI	TB3	9	10
9	AC	EAAI	TB3	11	12
10	AC	EAAI	TB7	1	2
11	AC	EAAI	TB7	3	4
12	AC	EAAI	TB7	5	6
13	AC	EAAI	TB7	7	8
14	AC	EAAI	TB7	9	10
15	AC	BSE	TB10	1	2
16	AC	BSE	TB10	3	4
17	AC	BSE	TB10	5	6
18	AC	BSE	TB10	7	8
19	AC	BSE	TB10	9	10
20	AC	BSE	TB9	1	2
21	AC	BSE	TB9	3	4
22	AC	BSE	TB9	5	6
23	AC	BSE	TB9	7	8
24	AC	BSE	TB9	9	10
25	AC	BSE	TB9	11	12
26	AC	BSE	TB8	1	2
27	AC	BSE	TB8	3	4
28	AC	BSE	TB8	5	6
29	AC	BSE	TB8	7	8
30	AC	BSE	TB8	9	10

Table 11. Digital Outputs

Input*	Output*	Voltage Type	Board	Terminal Block	Terminal Connections		
					Input +	Common -	Output +
16	31	DC	BSE	TB12	1	2	3
17	32	DC	BSE	TB12	4	5	6
18	33	DC	BSE	TB12	7	8	9
19	34	DC	BSE	TB12	10	11	12
20	35	DC	BSE	TB13	1	2	3
21	36	DC	BSE	TB13	4	5	6
22	37	DC	BSE	TB13	7	8	9
23	38	DC	BSE	TB13	10	11	12

Table 12. Bi-State Inputs/Outputs

***Note:** Relay numbers for programming*

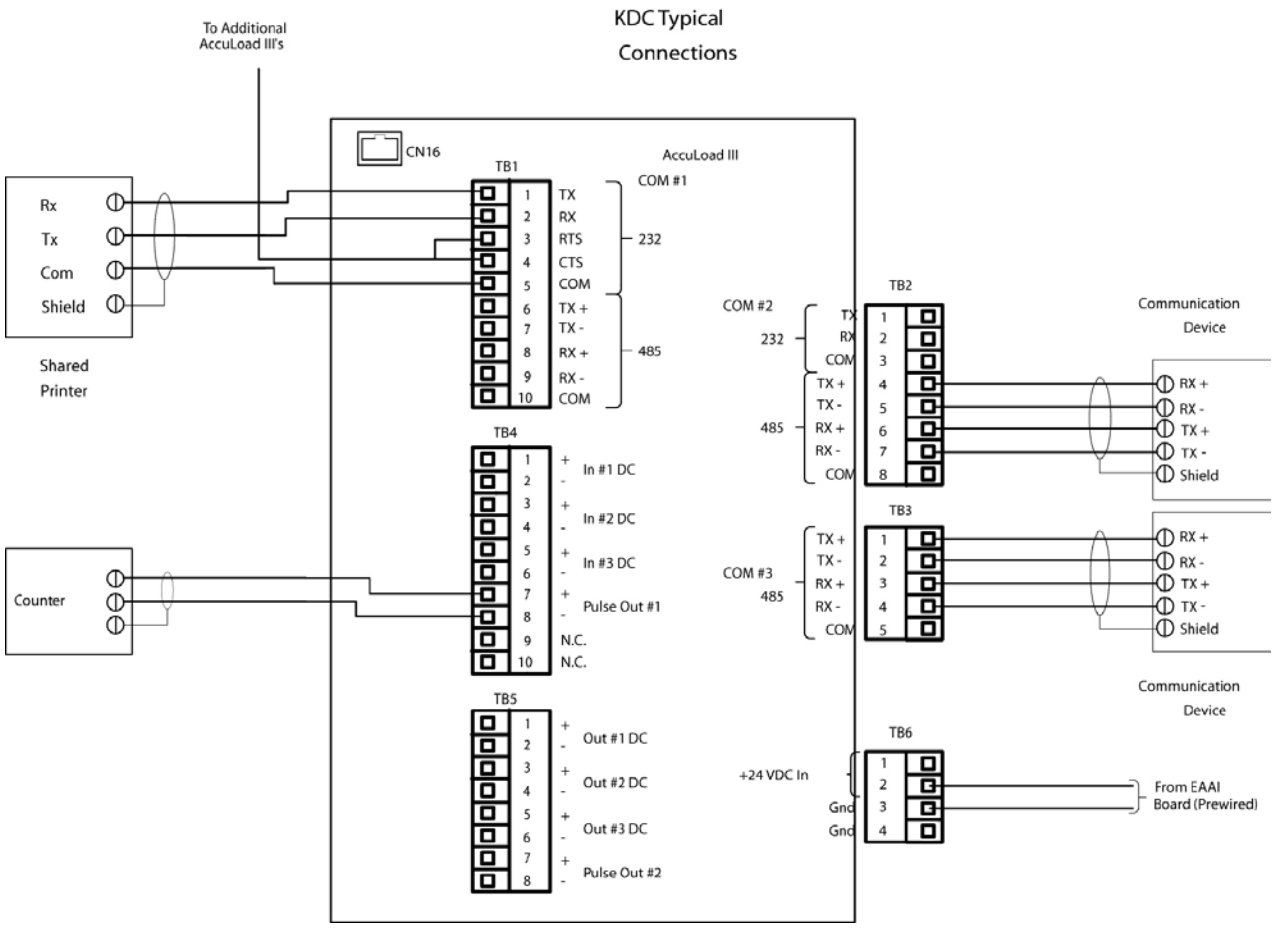


Figure 43. KDC Typical Diagram

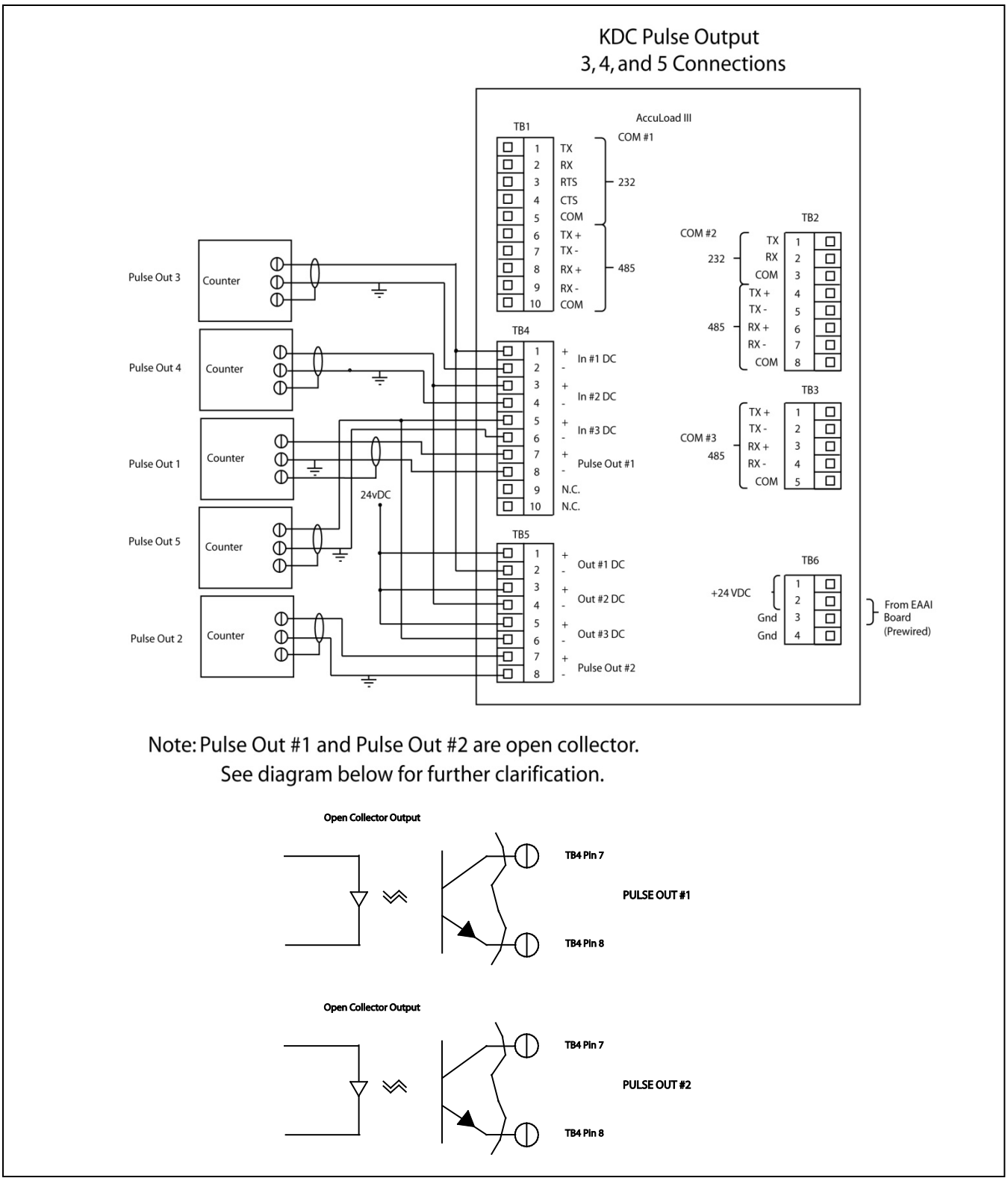


Figure 44. KDC Pulse Output 3, 4, and 5 Connections

Note: *Maximum Frequency of these pulse outputs is 125 Hz.*
Pulse Output 3: Terminals 1 and 2 on TB4 and 1 and 2 on TB5.
Pulse Output 4: Terminals 3 and 4 on TB4 and 3 and 4 on TB5.
Pulse Output 5: Terminals 5 and 6 on TB4 and 5 and 6 on TB5.

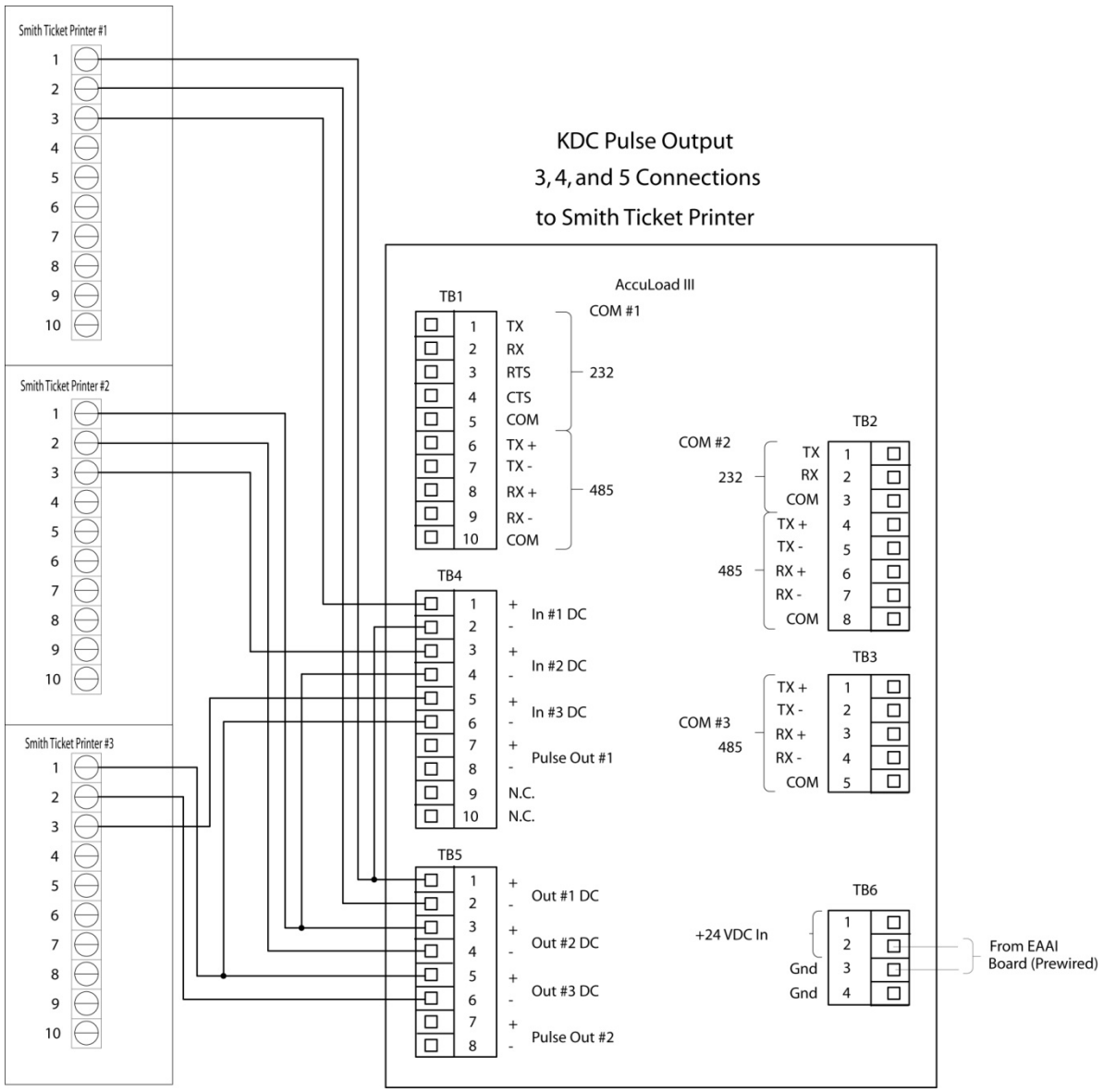


Figure 45. KDC Pulse Output 3, 4, and 5 Connections to Smith Meter Ticket Printer

Note: *Maximum Frequency of these pulse outputs is 125 Hz.*
Pulse Output 3: Terminals 1 and 2 on TB4 and 1 and 2 on TB5.
Pulse Output 4: Terminals 3 and 4 on TB4 and 3 and 4 on TB5.
Pulse Output 5: Terminals 5 and 6 on TB4 and 5 and 6 on TB5.

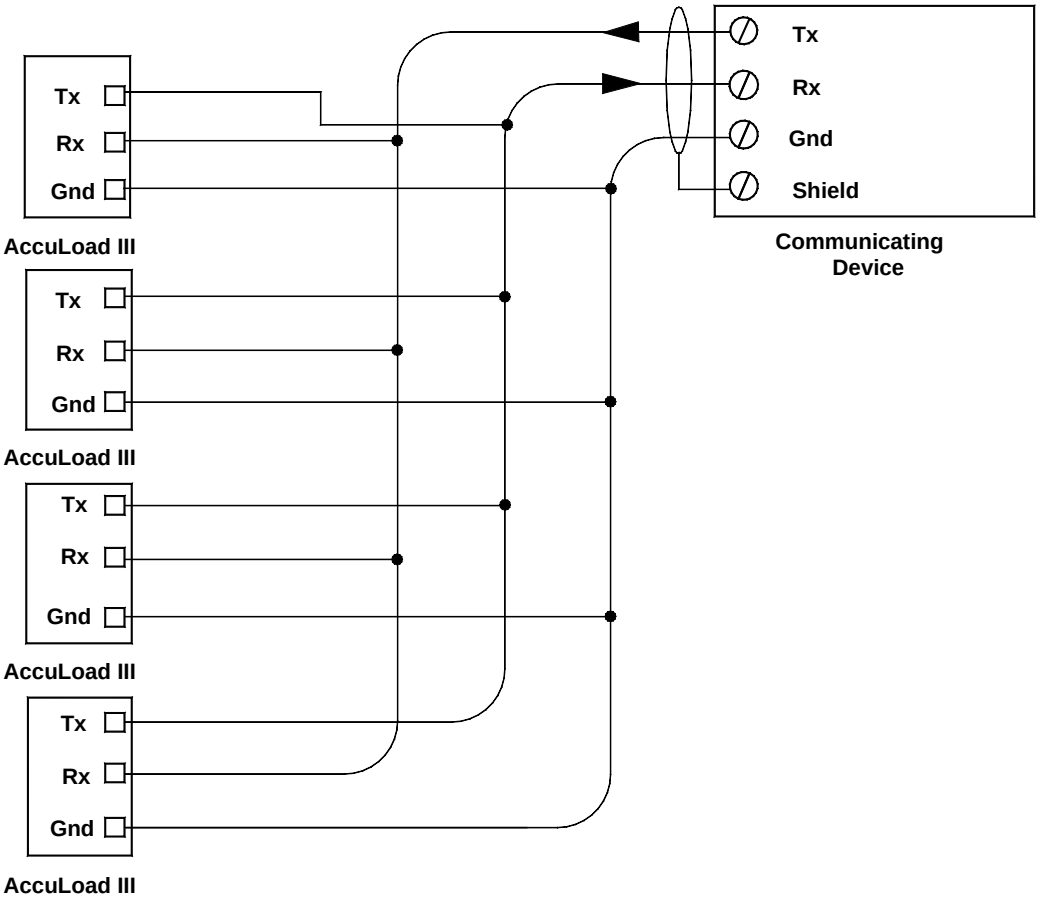


Figure 46. EIA-232 Multi-Drop Communications

The figure shows the typical wiring scheme for multi-drop communications between a communications device and multiple AccuLoad IIIs. Refer to the table below for pin numbers on each of the EIA-232 communication ports. Note that the shield is to be terminated at the communication device.

Comm Port	Tx	Rx	Common	Board	Terminal Block
1	1	2	5	KDC	TB1
2	1	2	3	KDC	TB2
4	1	2	3	EAAI	TB4

Table 13. EIA 232 Communication Ports

Note: *Communications Ports 1 and 2 can be either EIA-232 or EIA-485.*

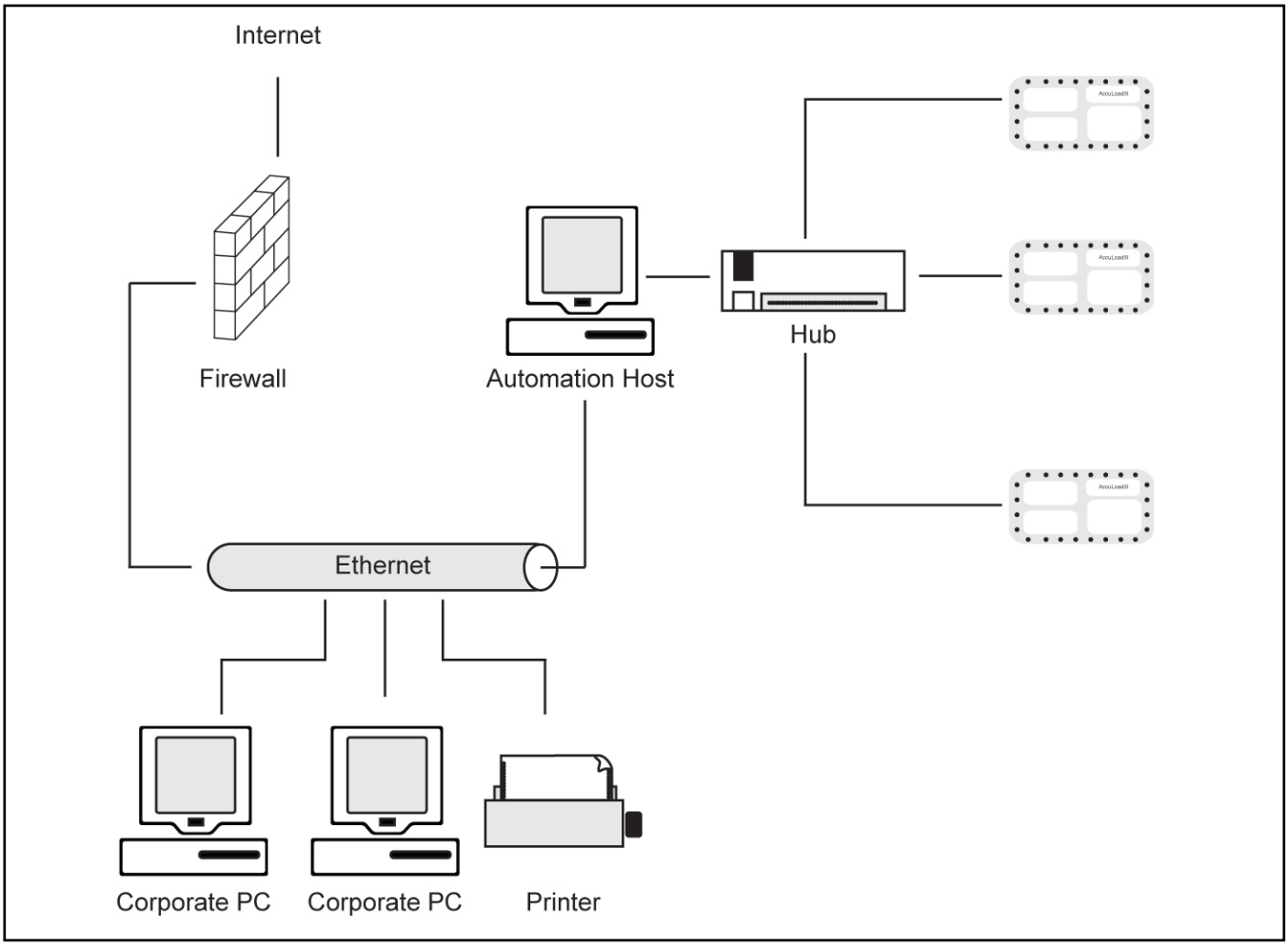


Figure 47. Network configuration for multiple AccuLoads connected via a hub then linked directly to the automation system and LAN.

Refer to the standards IEEE 802.X states for wiring and using Ethernet connectivity rules and regulations. Utilize standard IT practices and protocol when connecting several AccuLoads to any type of hub, router, or switching device. There are various connectivity configurations and the responsibility of each configuration is left to each individual. Distances, transmission time, etc. will all follow the standard IEEE spec rating. If there are any questions regarding installation of multiple AccuLoads over Ethernet communications, please consult the factory.

Employ the standard CAT 5 Cable, used for connecting an AccuLoad to any router, switch, or hub.

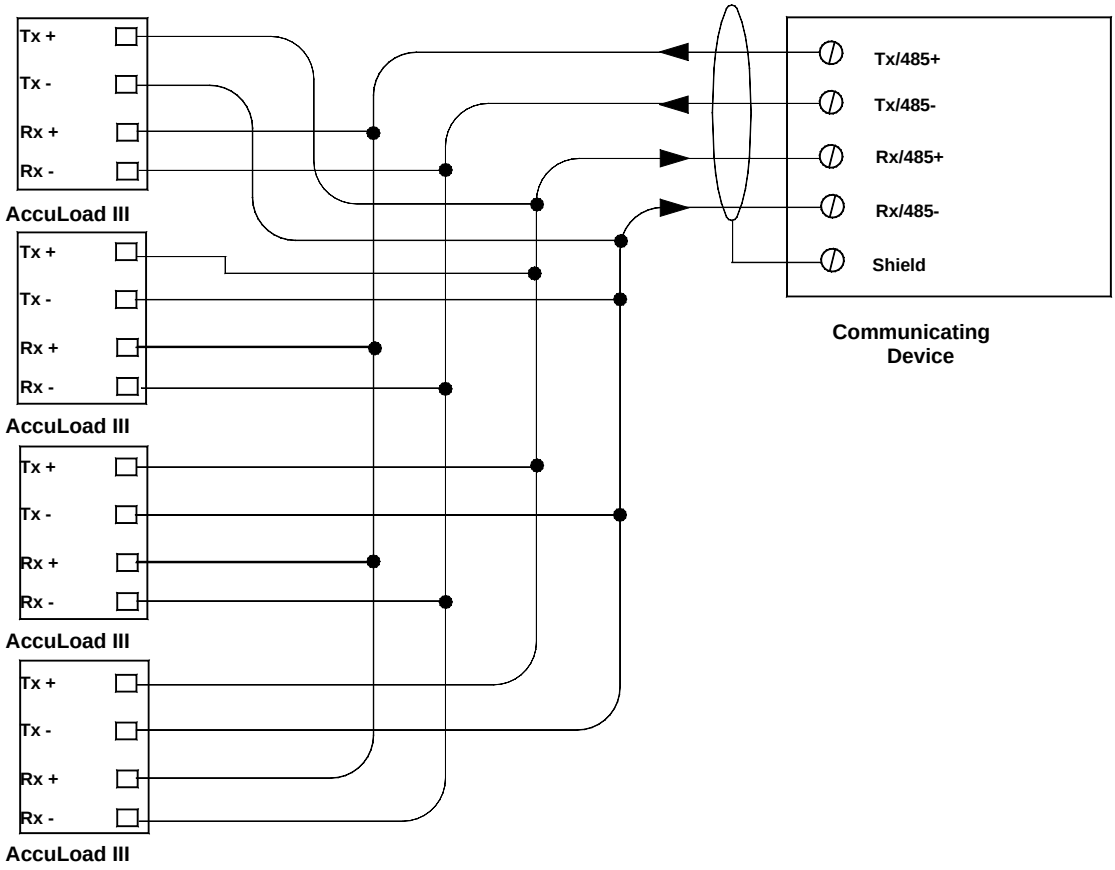


Figure 48. EIA-485 Multi-Drop Communications

The figure shows the typical wiring scheme for multi-drop communications between a communications device and multiple AccuLoad IIIs. Refer to the table below for pin numbers on each of the EIA-485 communication ports. Note that the shield is to be terminated at the communication device.

Comm Port	Tx +	Tx -	Rx +	Rx -	Board	Terminal Block
1	6	7	8	9	KDC	TB1
2	4	5	6	7	KDC	TB2
3	1	2	3	4	KDC	TB3

Table 14. EIA-485 Communication Ports

Note: *Communications Ports 1 and 2 can be either EIA-485 or EIA-232.*

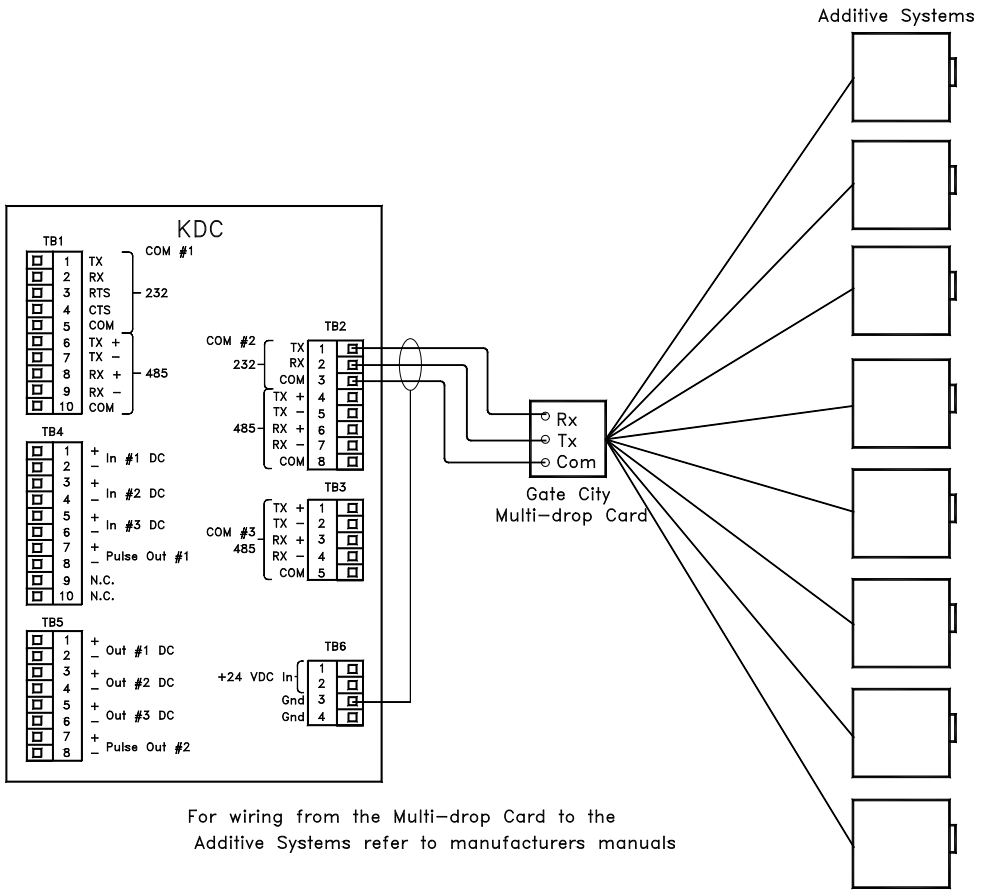


Figure 49. Lubrizol EIA-232 Communications

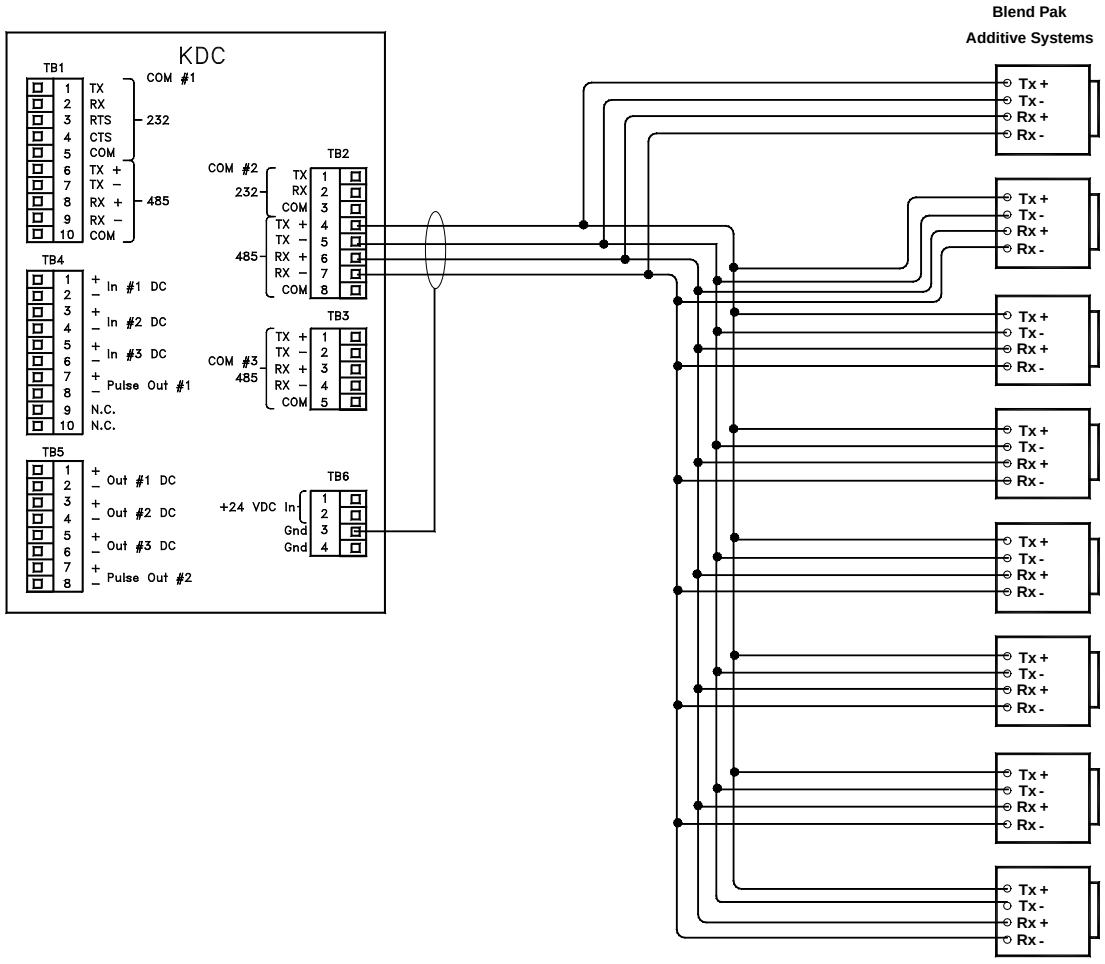


Figure 50. EIA-485 (Four-Wire) Additive Communication (Lubrizol Blend-Pak)

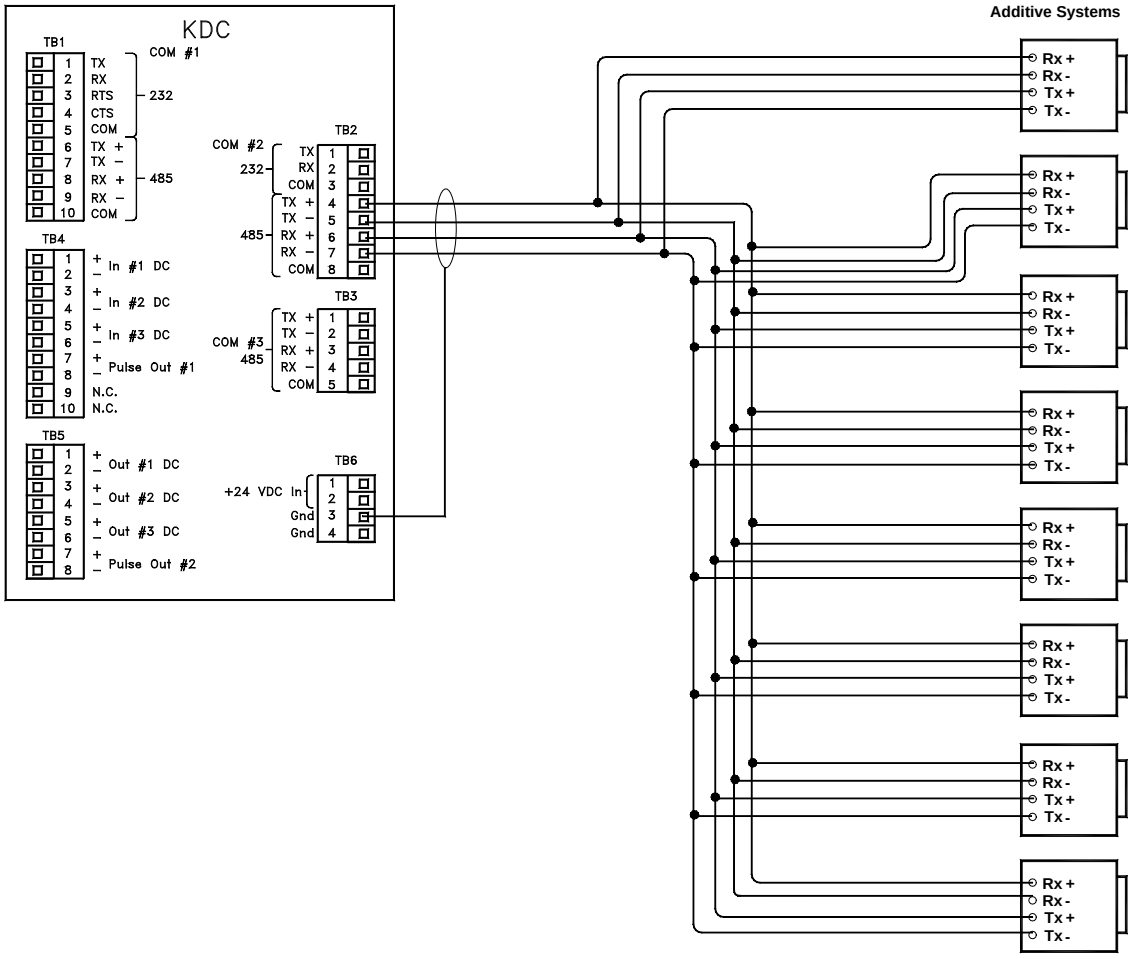


Figure 51. EIA-485 (Four-Wire) Additive Communication (Titan Pac3)

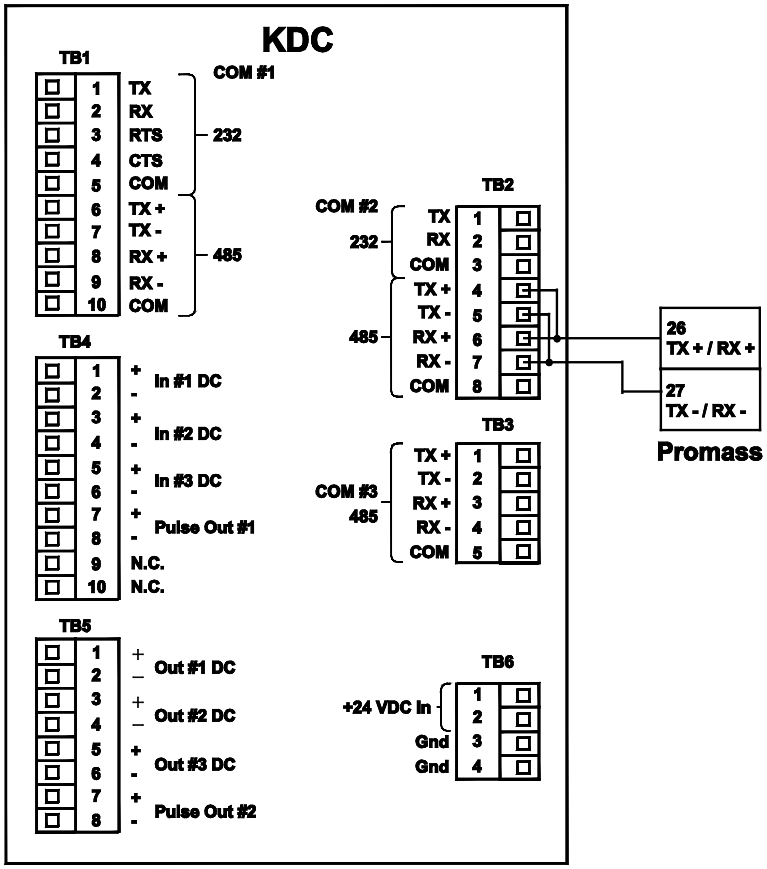


Figure 52. Promass Coriolis Meter Communications

Programming

Parameter	AccuLoad III	Promass
Baud Rate	38400	38400
Parity	8/No Parity/2 Stop bits	No Parity, 2 stop bits
Modbus Endian	Big	Byte order 3-2-1-0
Sequence Number	1	Address 1
Mass Meter type	Promass	
Timeout	0	
Transmission Mode		RTU
Reply delay		10 mS

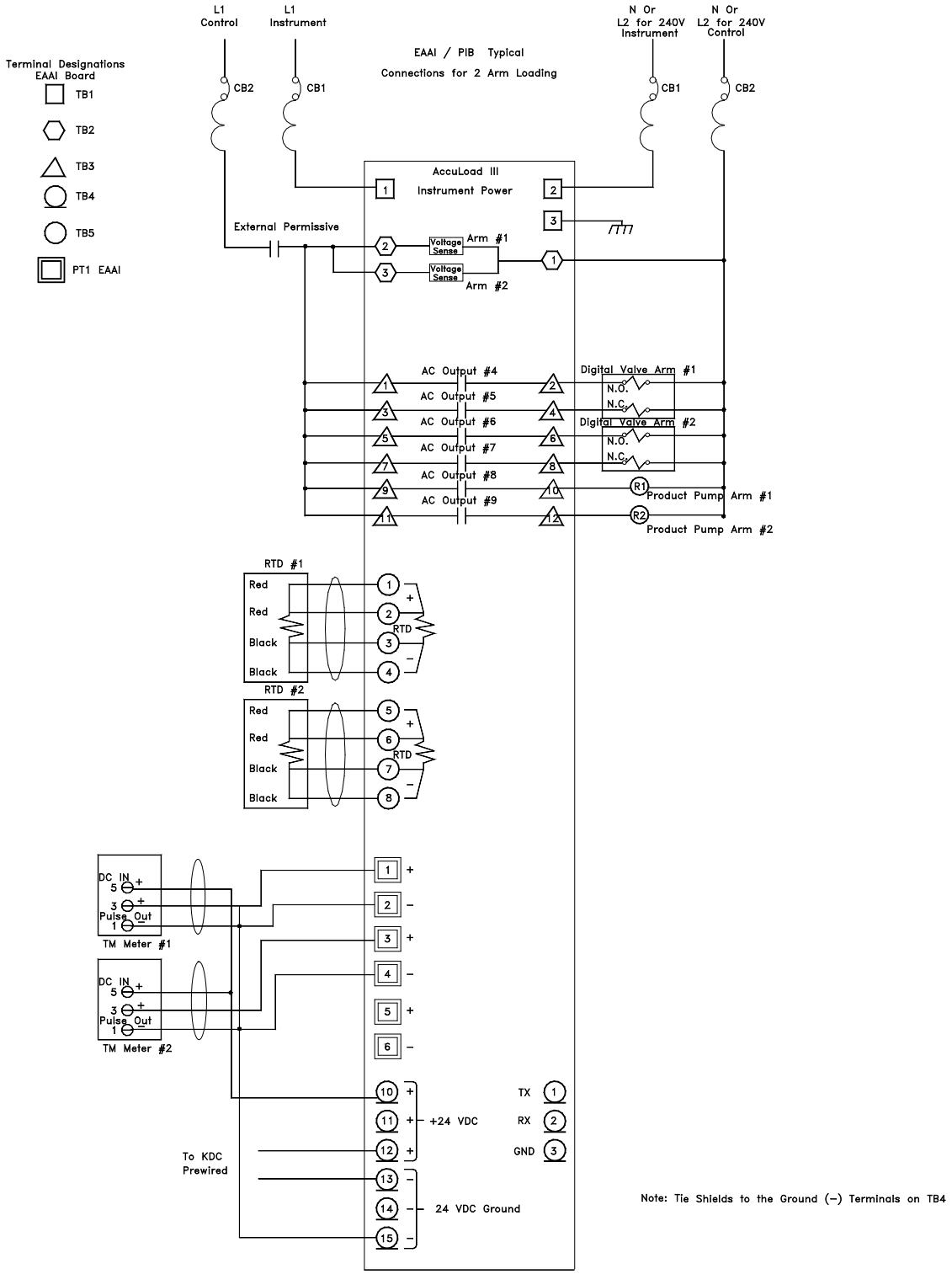


Figure 53. Two-Arm Straight Product Loading as Configured Through AccuMate (AccuLoad III-S Hardware)

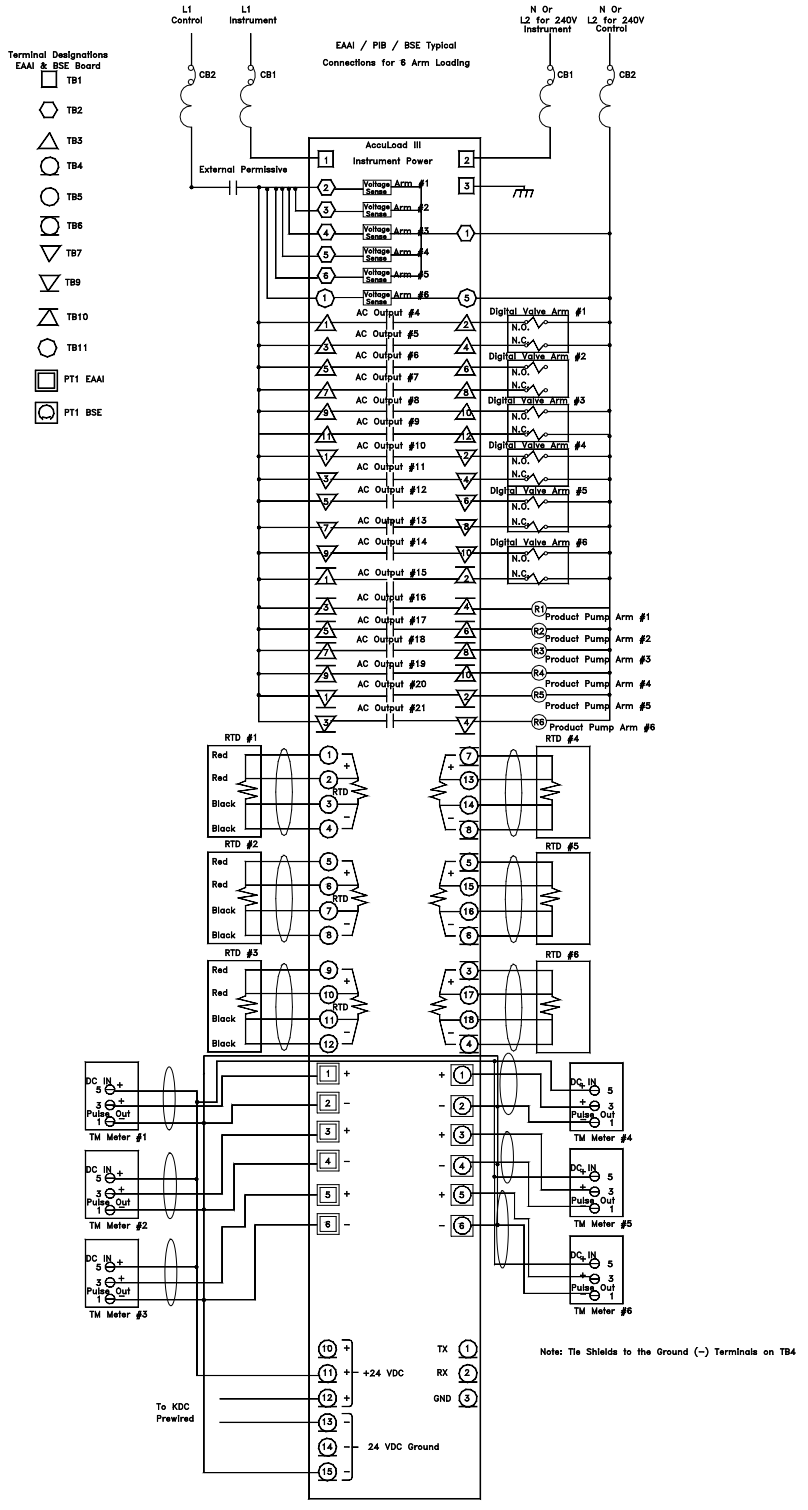


Figure 54. Six-Arm Straight Product Loading as Configured Through AccuMate (AccuLoad III-Q Hardware)

Digital Inputs – AICB

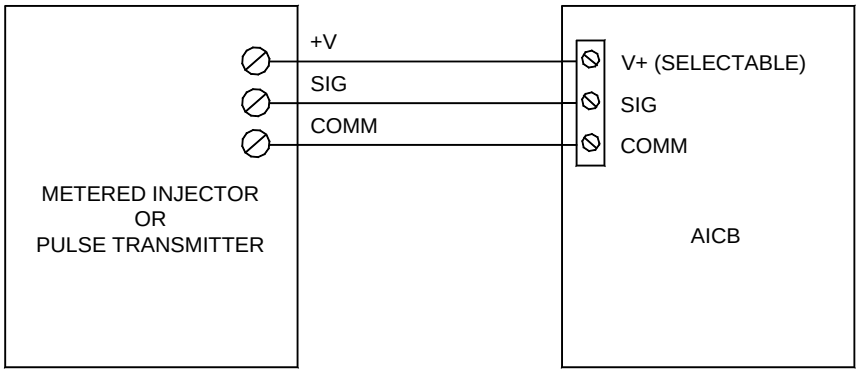


Figure 55. Metered Injector / Pulse Transmitter Wiring Diagram

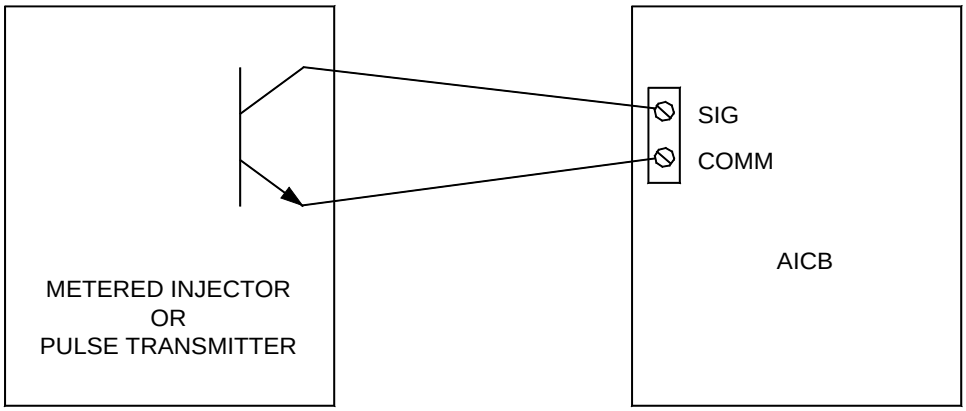
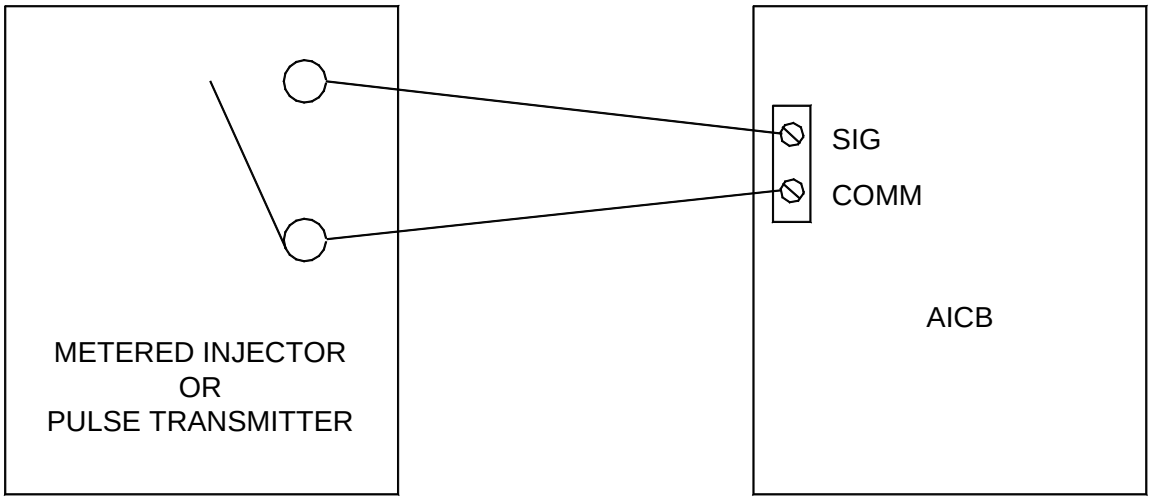


Figure 56. Metered Injector / Open Collector Wiring Diagram



Monoblock Additive Meter

Figure 57. Metered Injector / Contact Closure Wiring Diagram

Optional AICB Board(s) (Additive Inputs/Outputs)

Terminal connections for the optional AICB board are shown in

Figure 6. Metered Additive Pulses 1 and 2 (AccuLoad III-S) or Metered Additive Pulses 1 through 4 (AccuLoad III-Q) are wired into the PIB board on the EAAI board. Metered Additives 5 through 24 are wired to the AICB board(s). Connections are shown in the table below.

Meter Pulses (Optional AICB #1)					
Injector #			**Metered Additive Pulses**		
ALIII-S Hardware	**ALIII-Q Hardware**	**Terminal Block**	**+ Voltage**	**Signal**	**Common**
5	5	TB5	1	2	3
6	6	TB5	4	5	6
7	7	TB5, TB4	7 (TB5)	8 (TB5)	1 (TB4)
8	8	TB4	2	3	4
9	9	TB4	5	6	7
10	10	TB4	8	9	10
11	11	TB3	1	2	3
12	12	TB3	4	5	6
13	13	TB3	7	8	9
14	14	TB3	10	11	12
Meter Pulses (Optional AICB #2)					
N/A	15	TB5	1	2	3
N/A	16	TB5	4	5	6
N/A	17	TB5, TB4	7 (TB5)	8 (TB5)	1 (TB4)
N/A	18	TB4	2	3	4
N/A	19	TB4	5	6	7
N/A	20	TB4	8	9	10
N/A	21	TB3	1	2	3
N/A	22	TB3	4	5	6
N/A	23	TB3	7	8	9
N/A	24	TB3	10	11	12

Table 15. Meter Pulses (Optional AICB #1 and #2)

Additive Pumps 1 through 4 are wired to the programmed terminals on the EAAI board. Additive Pumps 3 through 12 (AccuLoad III-S hardware) or Additive Pumps 5 through 24 (AccuLoad III-Q hardware) are wired per the following table. Terminals are automatically assigned as additive pumps if metered injectors are programmed in the AccuLoad.

Additive Pumps (Optional AICB #1)			
Additive Pump #			
ALIII-S Hardware	ALIII-Q Hardware	Terminal +V	Terminal Block
5	5	10	TB8
6	6	8	TB8
7	7	6	TB8
8	8	4	TB8
9	9	2	TB8
10	10	10	TB7
11	11	8	TB7
12	12	6	TB7
13	13	4	TB7
14	14	2	TB7
Additive Pumps (Optional AICB #2)			
N/A	15	10	TB8
N/A	16	8	TB8
N/A	17	6	TB8
N/A	18	4	TB8
N/A	19	2	TB8
N/A	20	10	TB7
N/A	21	8	TB7
N/A	22	6	TB7
N/A	23	4	TB7
N/A	24	2	TB7

Table 16. Additive Pumps (Optional AICB #1 and #2)

Additive Solenoids 1 through 4 are wired to the programmed terminals on the EAAI board. Additive Solenoids 3 through 12 (AccuLoad III-S hardware) or Additive Solenoids 5 through 24 (AccuLoad III-Q hardware) are wired per the following table. Terminals are automatically assigned as additive solenoids if metered injectors are programmed in the AccuLoad.

Additive Solenoids (Optional AICB #1)			
Additive Solenoid #			
ALIII-S Hardware	ALIII-Q Hardware	Terminal +V	Terminal Block
5	5	9	TB8
6	6	7	TB8
7	7	5	TB8
8	8	3	TB8
9	9	1	TB8
10	10	9	TB7
11	11	7	TB7
12	12	5	TB7
13	13	3	TB7
14	14	1	TB7
Additive Solenoids (Optional AICB #2)			
N/A	15	9	TB8
N/A	16	7	TB8
N/A	17	5	TB8
N/A	18	3	TB8
N/A	19	1	TB8
N/A	20	9	TB7
N/A	21	7	TB7
N/A	22	5	TB7
N/A	23	3	TB7
N/A	24	1	TB7

Table 17. Additive Solenoids (Optional AICB #1 and #2)

Communications (AICB Boards)

Communications				
Type	**Function**	**Terminal**	**Jumpers**	
			CN4	**CN5**
EIA - 232	TX	TB2 (4)	1-2 Out 3-4 Out 5-6 In	1-2 Out 3-4 Out
EIA – 232	RX	TB2 (2)		
EIA – 232	Com	TB1 (2)		
EIA - 485	RX+	TB2 (1)	1-2 Out 3-4 Out 5-6 Out	1-2 In 3-4 In
EIA - 485	RX-	TB2 (2)		
EIA - 485	TX+	TB2 (3)		
EIA - 485	TX-	TB2 (4)		

Table 18. Communications (AICB Boards)

Jumper Locations

Transmitter Power		
Designation	**Jumpers**	**Description**
CN2	1 – 2	24V – +V Out
CN2	3 – 4	12V – +V Out
CN2	5 – 6	5V – +V Out
Communications		
Designation	**Jumper**	**Description**
CN4	1 – 2	In Address 200, Out Address 100*
CN4	3 – 4	In 9600 Baud, Out 38.4K Baud
CN4	5 – 6	In 232 Communications, Out 485 Communications
Last Unit Only (Termination of Communications with AccuLoad)		
Designation	**Jumper**	**Description**
CN5	1 – 2	In EIA 485, Out EIA 232
CN5	3 – 4	In EIA 485, Out EIA 232

Table 19. Jumper Locations

***Note:** For ALIII-S hardware and Additives 5 through 14 on the ALIII-Q hardware, jumper must be out (Address 100). For Additives 15 through 24, the jumper must be installed (Address 200).*
***Note:** Jumpers CN1 and CN3 for factory use only.*

Optional AICB Board(s) (General Purpose Inputs/Outputs)			
DC Inputs (Optional AICB #1)			
Input #	**Terminal Block**	**Signal**	**Common**
24	TB5	2	3
25	TB5	5	6
26	TB5/TB4	8 (TB5)	1 (TB4)
27	TB4	3	4
28	TB4	6	7
29	TB4	9	10
30	TB3	2	3
31	TB3	5	6
32	TB3	8	9
33	TB3	11	12
DC Inputs (Optional AICB #2) (Not Applicable to ALIII-S Hardware)			
34	TB5	2	3
35	TB5	5	6
36	TB5/TB4	8 (TB5)	1 (TB4)
37	TB4	3	4
38	TB4	6	7
39	TB4	9	10
40	TB3	2	3
41	TB3	5	6
42	TB3	8	9
43	TB3	11	12

Table 20. Optional AICB DC Inputs

AC Outputs (Optional AICB #1)		
Output #	**Terminal +V**	**Terminal Block**
39	10	TB8
40	9	TB8
41	8	TB8
42	7	TB8
43	6	TB7
44	5	TB7
45	4	TB7
46	3	TB7
47	2	TB7
48	1	TB7
49	10	TB7
50	9	TB7
51	8	TB7
52	7	TB7
53	6	TB7
54	5	TB7
55	4	TB7
56	3	TB7
57	2	TB7
58	1	TB7
AC Outputs (Optional AICB #2) (Not Applicable to ALIII-S Hardware)		
59	10	TB8
60	9	TB8
61	8	TB8
62	7	TB8
63	6	TB8
64	5	TB8
65	4	TB8
66	3	TB8
67	2	TB8
68	1	TB8
69	10	TB7
70	9	TB7
71	8	TB7
72	7	TB7
73	6	TB7
74	5	TB7
75	4	TB7
76	3	TB7
77	2	TB7
78	1	TB7

Table 21. Optional AICB AC Outputs

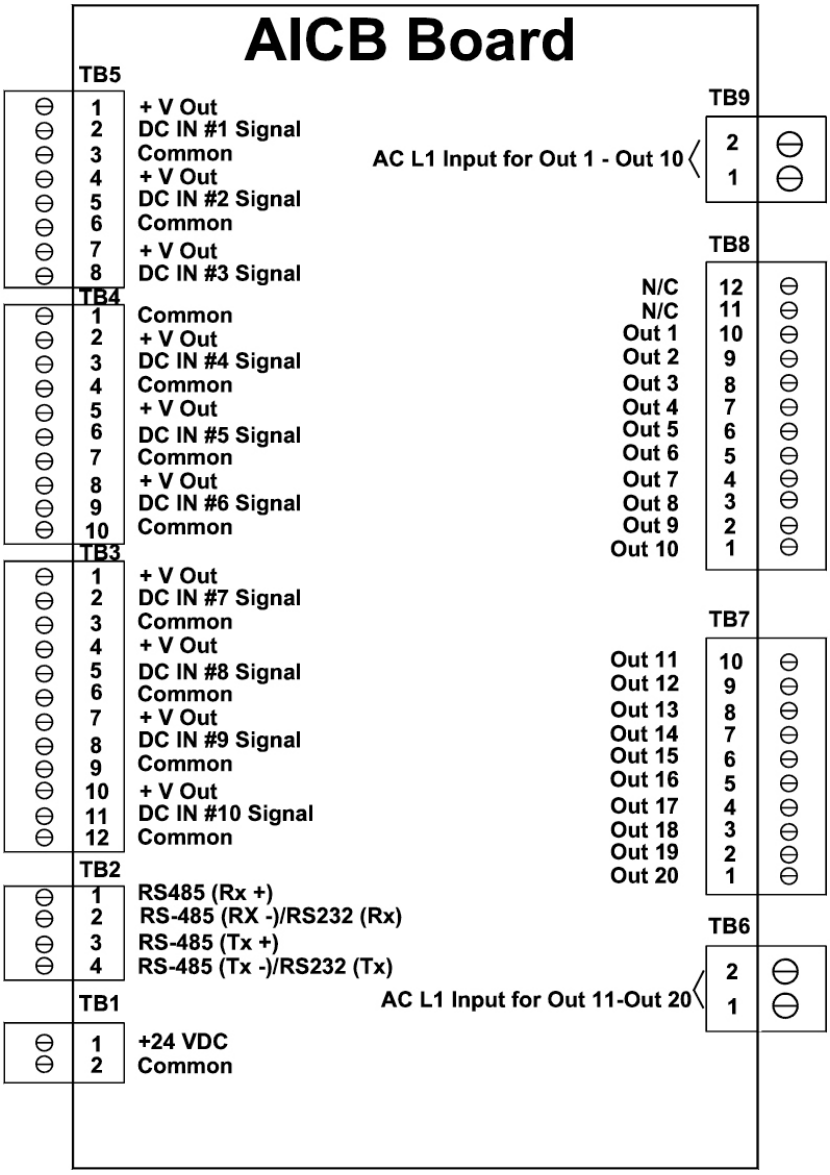


Figure 58. Optional AICB Board(s)

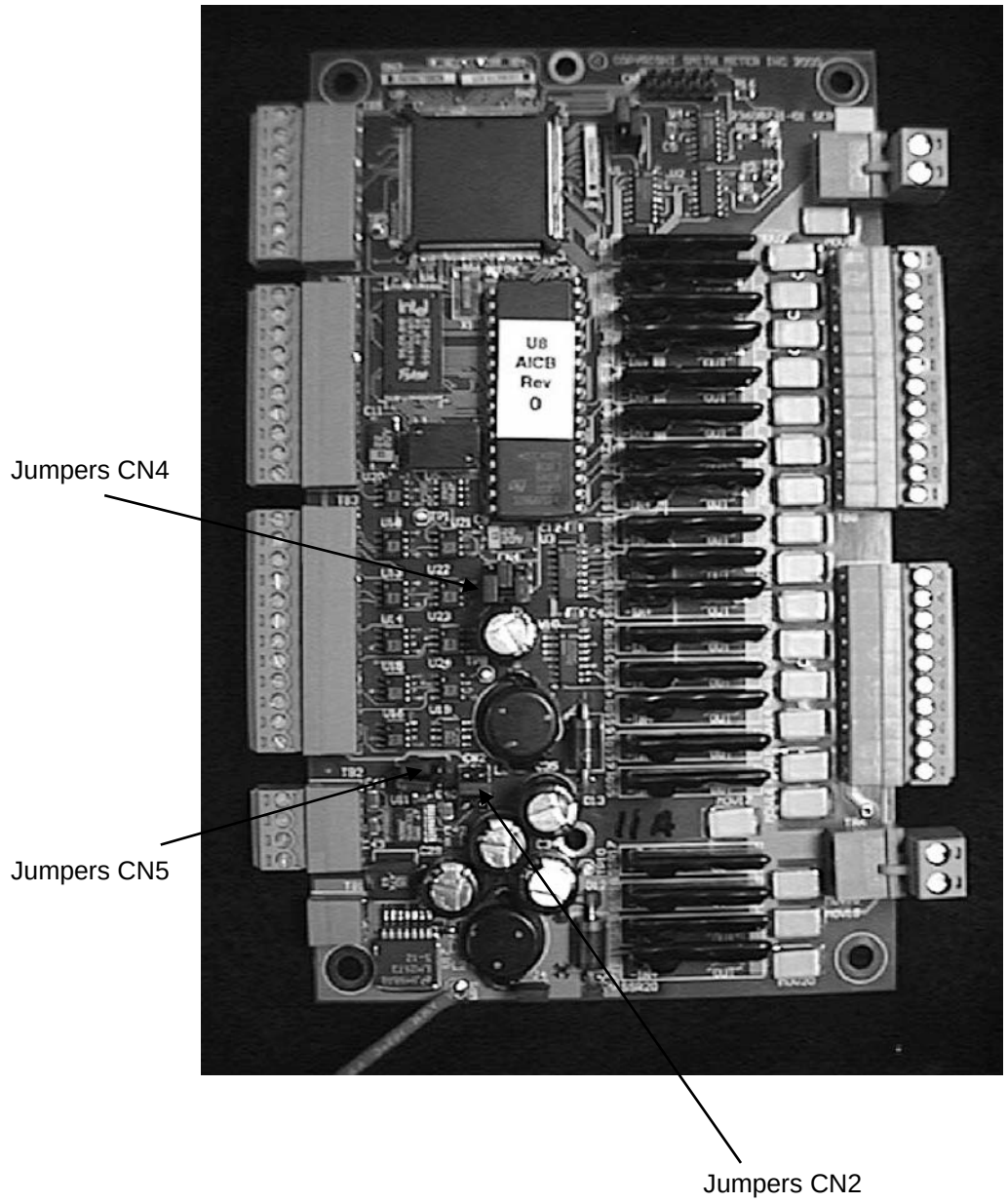


Figure 59. AICB Jumper Locations

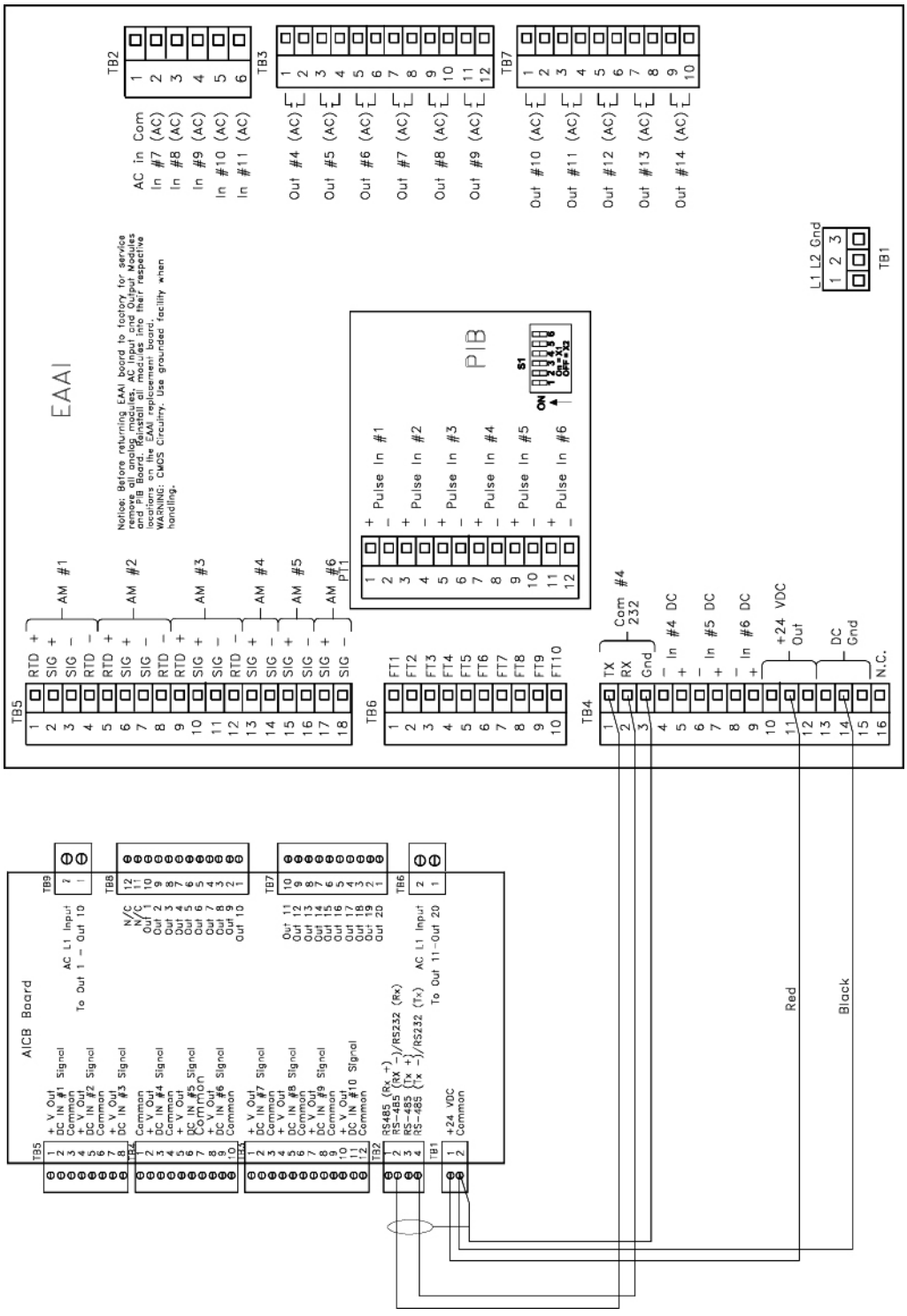


Figure 60. AICB Communications and DC Power

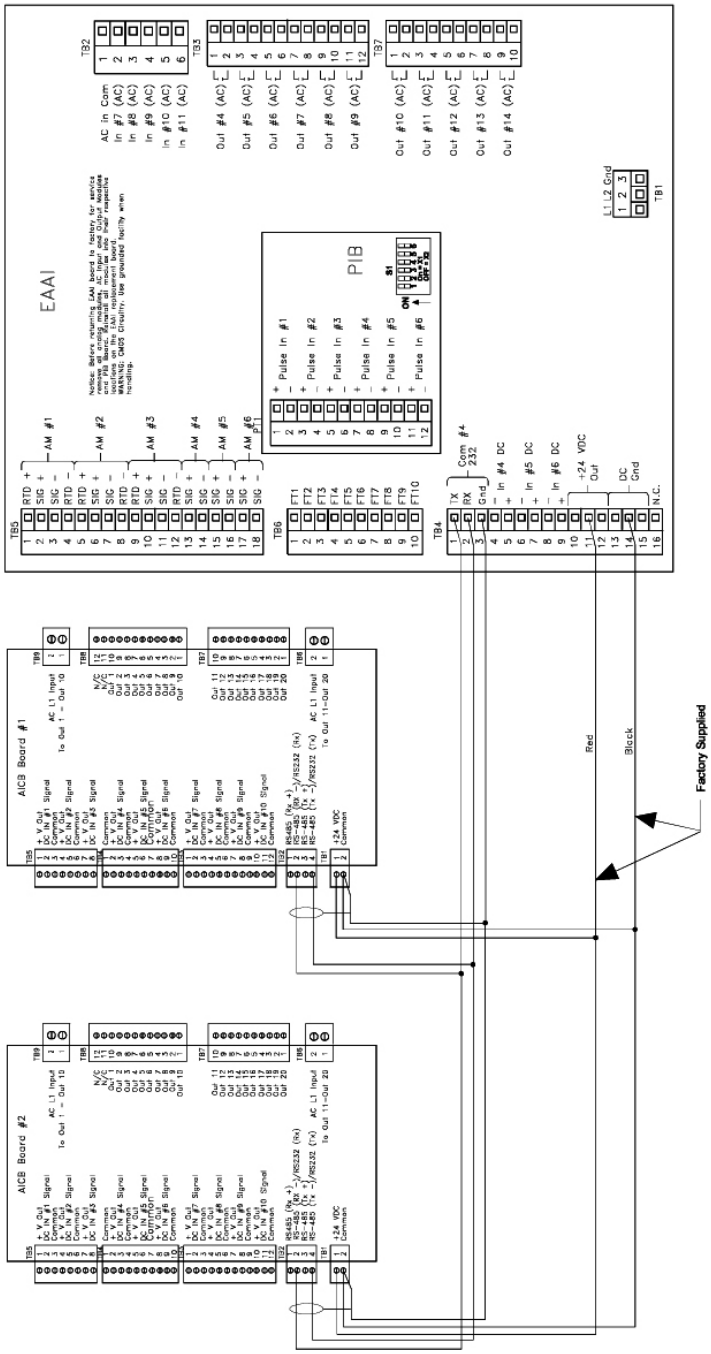


Figure 61. AICB Communications and DC Power with Two AICB Boards (AccuLoad III-Q Hardware Only)

Note: *Change Address to #2 via jumpers*

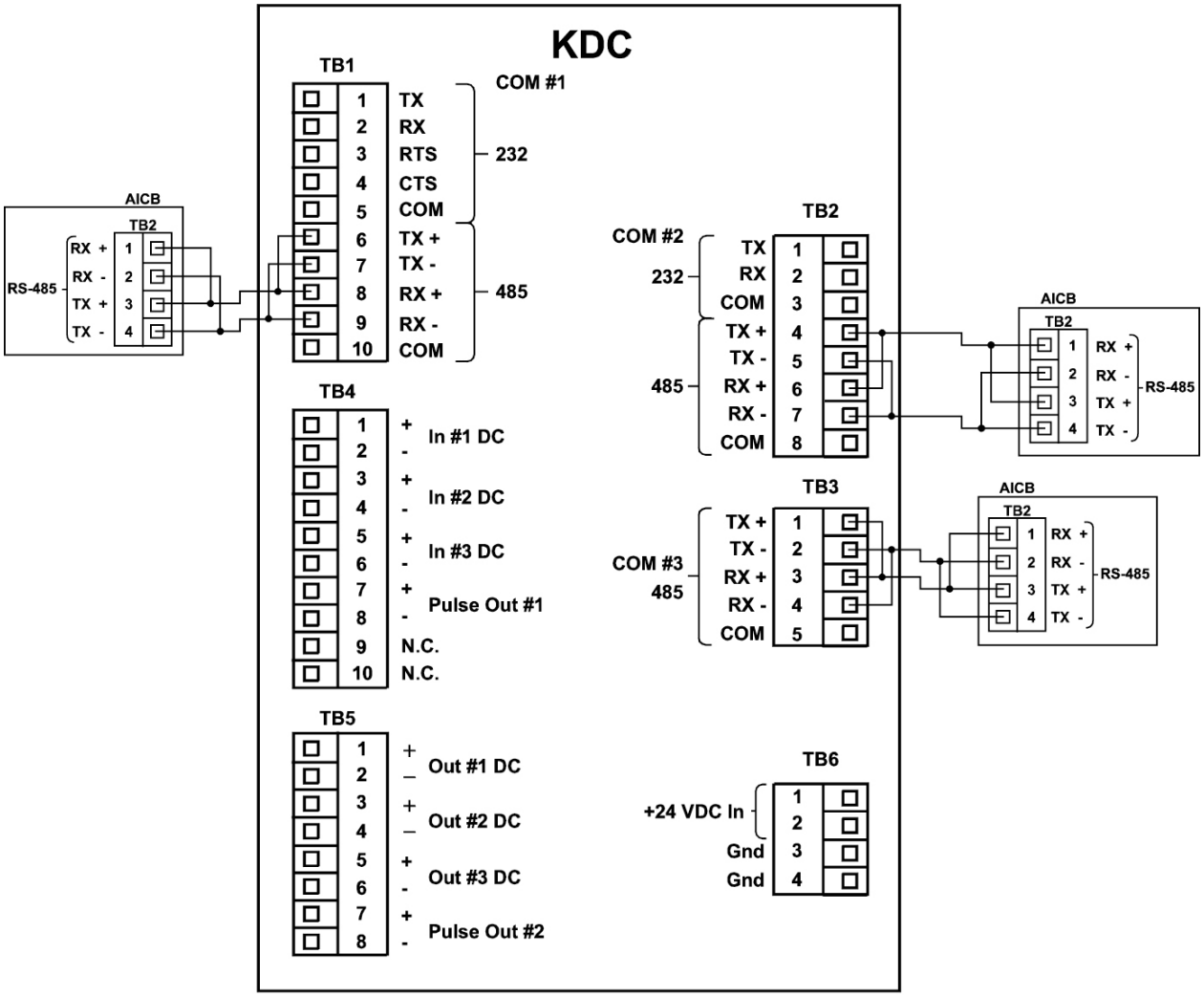


Figure 61 AICB Communications (Two-wire RS 485)

(Two-wire RS-485)

Figure 62. AICB Communications (Two-wire RS-485)

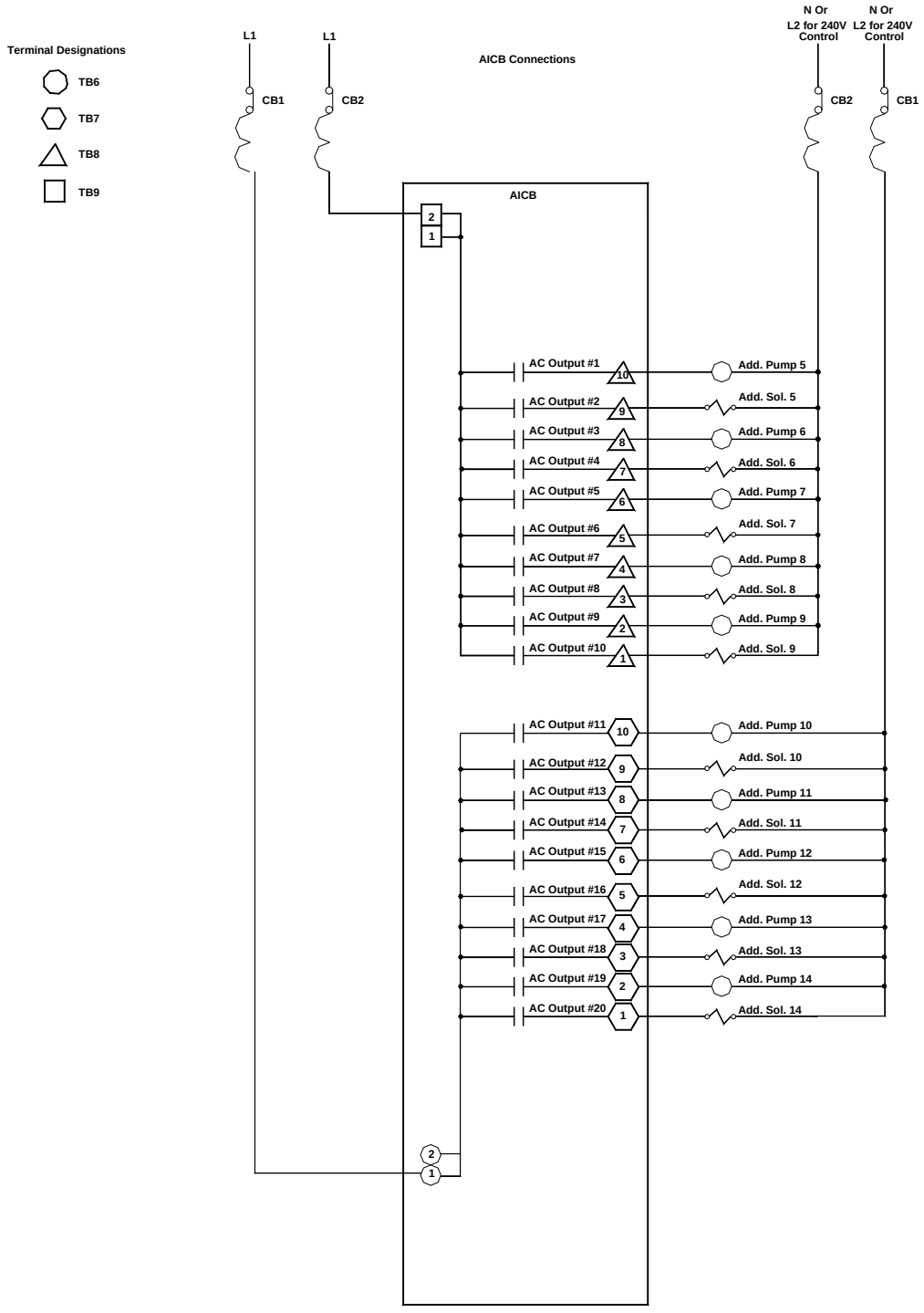


Figure 63. AICB Additive Outputs (Typical ALIII-S Hardware)

Note: *1. ALIII-Q Hardware Additive Pumps start at 5 and go through 14, as do the additive solenoids.*
2. Optional AICB Board #2 Additive Pumps start at 15 and go through 24, as do the additive solenoids.

Optional ComFlash Mass Storage Expansion Board

The ComFlash Mass Storage Expansion Board is an optional hardware feature to the A3X that provides additional flash memory to store transaction data. The expansion board comes with a 512M DS card that has the capability of storing approximately 10,000+ additional transactions per arm. The ComFlash operates on Com4 and uses RS2332 communications. The ComFlash also has the capability of alarming if the device is not operating correctly. (The ComFlash Alarm will be invoked when the interface driver fails to receive a response within a reasonable amount of time.) The A3X also has the ability to operate (on Com4) both the memory expansion board and the Smith Meter Card Reader simultaneously. This option can be chosen by navigating through the system directory and setting the Com4 function to: 20 Card Reader/ComFlash.

IMPORTANT: Must have EAAI board manufacture date year 2006 or newer AND have firmware Rev. 10.13 or higher.

Installation of the ComFlash Data Storage Device:

1. Make sure Power to the AccuLoad is turned OFF.

2. Open the cover of the AccuLoad so that the EAAI board is easily accessible.

3. The ComFlash will be mounted so the SD card is face up.

4. On the EAAI board you will notice CN1, CN2, and J4 & J5. The bottom of the SD Card should be positioned so that the female connectors will line up with all three of the male connectors (CN1, CN2, and J4 & J5).

5. Once the connectors are lined up, simply press the memory expansion board onto the EAAI board until the male connectors are seated fully into the female connectors. All CN1, CN2, and J4 & J5 should now be firmly secured and covered by the ComFlash board (no pins on any of these connectors should be exposed).

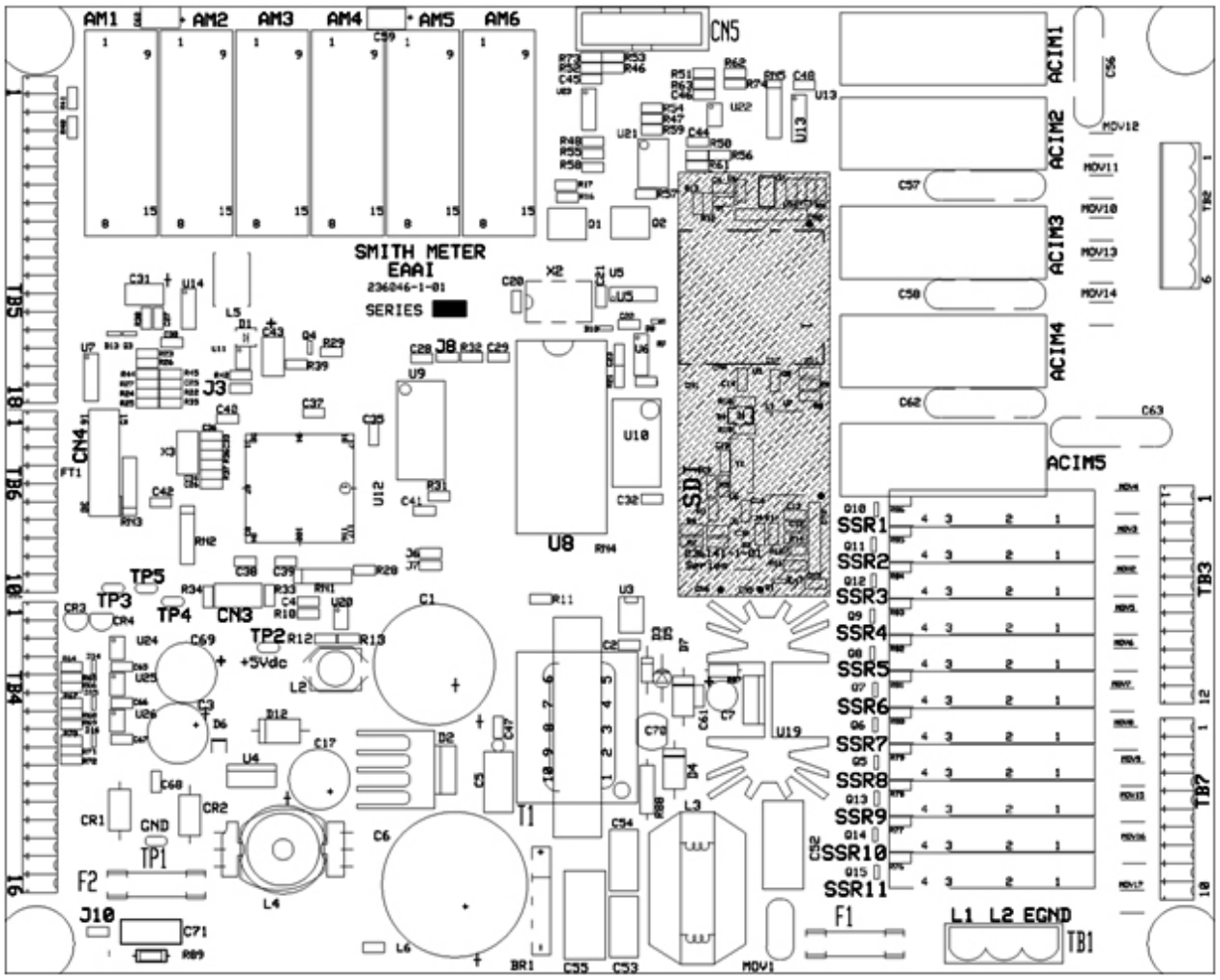


Figure 64. ComFlash Mass Storage Expansion Board

Maintenance

Recommended backup battery replacement interval - 5 years

The following procedure applies to ALIII units with KDC.net boards.

The life of the battery used for the backup RAM can vary due to operational conditions, particularly the amount of time that the unit is left in a powered off state. It is suggested the backup battery be replaced approximately every five years or during a regularly scheduled maintenance period. For applications that are under strict metrological control it may be convenient to replace the battery whenever a W&M official will be on site since the cover seal will need to be broken and must then be reapplied.

Field replacement of the battery is only possible with AccuLoad III.net models (firmware versions 11.00 and up); it is NOT possible to field upgrade pre- .net AccuLoad III units (firmware revisions less than 11.00) as the battery is soldered directly to the KDC board. To facilitate replacement of this battery, the KDC board must be removed from the unit to gain access to the rear side of the board to unsolder and replace the battery. Only qualified technical personnel that are familiar with printed circuit board de-soldering / soldering procedures should attempt this procedure. The KDC board should be returned to TechnipFMC for battery replacement or consider complete replacement of the board assembly with an upgrade to the new KDC.net board.

Caution: Any soldering work will need to be performed in a safe (non-hazardous) area to prevent ignition of hazardous atmospheres. In addition, ESD controls should be employed to avoid damaging sensitive electronic components.

Note: The KDC.net board utilizes a special capacitor that was designed to maintain power to the battery backed up memory during the time of battery replacement when the mains power is disconnected. However, as a precautionary measure, prior to replacing the battery, it recommended to download all parameter data, custom configured print reports, Boolean equations, and or language translations from the AccuLoad via the AccuMate. These files should be saved to be used for the restoration of the AccuLoad in the unlikely event that the battery backed up memory becomes corrupt during the battery exchange.

In the case of a complete board replacement, for example exchanging a KDC board for a KDC.net board, the above procedure must be performed to create the files needed to restore the AccuLoad configuration.

In any case, transaction records should be downloaded for archival purposes if required by local agencies as these cannot be reloaded back into the AccuLoad. The AccuMate companion tool provides a facility for transferring the transaction log records; the transaction log will be converted to a .CSV file and imported into an Excel workbook when utilizing the AccuMate.

Battery replacement procedure:

1. Retrieve all configuration information and data logs as detailed above using the AccuMate program, see MN06136 for specific instructions on the use of AccuMate.

2. Power down the AccuLoad III.

3. Break the W&M seal wire on the two corner cover bolts.

4. Remove the AccuLoad III front cover bolts and open the front cover.

5. Remove the seven barrier screws and barrier plate (Figure 1) from the KDC.net board located on the cover.

6. Replace battery with ENERGIZER P/N CR2032 (substitutes not allowed), TechnipFMC P/N 644581418 (refer to Figure 1 of AB06071 for location of the battery on the KDC.net board).

7. Replace the barrier plates, securing the screws removed earlier.

8. Close the front cover, taking care not to pinch any of the internal cables.

9. Follow cover bolt re-torqueing instructions and flame path gap inspection from Section X.

10. Power-up the AccuLoad III. The initialization test will execute, followed by the Ready Mode display if the configuration data remained intact during the operation.

11. Verify correctness of configuration parameter data, custom figured print reports, Boolean equations, and or language translations if used. If all is correct, proceed to Step 13.

12. If these files are corrupted, then configure and establish communication to the AccuMate program (see manual MN06136) and restore all parameter data, configurable reports, language translation files, Boolean equations, etc. as previously saved in Step 1.

13. Once the restoration is complete, re-seal the unit via the two corner cover bolts (may require local W&M jurisdiction).

Firmware updates

Note: When updating firmware all transaction date is permanently erased from memory, it is the user's responsibility to archive all data utilizing the AccuMate prior to performing any firmware updates.

Optional ComFlash Mass Storage Expansion Board

For units equipped with the optional ComFlash Mass Storage Expansion Board (reference bulletin AB06066), transaction data can be downloaded via the AccuMate and saved to an excel transaction file (see bulletin AB06068). Please note that this process may take a significant amount of time depending on the configured communications channel and the amount of data stored on the card.

To save time during the firmware upgrade process it is recommended to replace the SD card with a new card, this will preserve the transaction data for archival purposes on the original card, the serial number of the unit AccuLoad in which the card was removed should be written onto the SD card for future reference, if data retrieval access is required.

If for some reason the data stored on the SD card must be accessed outside of the AccuLoad consult the factory.

Enclosure Maintenance

Flame Path Inspection Criteria

Models: ALIII-Q-XP or ALIII-S-XP

Warning: To prevent ignition of hazardous atmospheres, disconnect from mains power supply before opening the cover.

I. Installation/inspection/maintenance/repair /overhaul/reclamation of the AccuLoad in the European Union must be performed by qualified personnel in accordance with the applicable requirements of EN 60079-14, EN 60079-17, and EN 60079-19 in addition to all local codes/regulations.

II. Installation/inspection/maintenance/repair /overhaul/reclamation of AccuLoad's relying upon the IECEx certification must be performed by qualified personnel in accordance with the application requirements of IEC 60079-14, IED 60079-17, and IEC 60079-19 as required by local codes/regulations.

III. Guidance for equipment inspection and maintenance is provided by EN/IEC 60079-17: “Electrical Apparatus for explosive gas atmospheres, “Inspection and maintenance of electrical installations in hazardous areas” and should be utilized for the inspection / maintenance process.

IV. When performing maintenance that requires opening of the enclosure cover, all flame paths, which are defined as the machined flanged surface between the housing and the cover, shall be inspected to ensure that they are clean and undamaged, no scratches, nicks, corrosions, or other defects that would affect the integrity of the flame path are allowed. If defects are detected the equipment should not be placed back into service until the issues are resolved. Flame paths between window and cover and keypad and cover should be inspected at an increased frequency for signs of corrosion when installed in special environments.

V. Verify that all tapped cover bolt threaded locations in the enclosure are clean and intact with no missing/stripped threads.

VI. Verify that the cover bolts are the required M8 x 1.25-6g. Din 912, Steel Grade 12.9. Prior to reassembly apply a light coating of nickel based anti-seize such as TechnipFMC P/N (646002401) to all bolt threads.

VII. Verify that any blind threaded cover bolt holes do not have excessive grease / anti-seize packed into them as this could cause hydraulic fractures of the enclosure when the bolts are tightened.

VIII. Inspect to see that the environmental O-ring is correctly installed (seated into the groove) and in good condition, no cracks, etc. if defective replace to maintain environmental protection. Grease cover flange with petroleum jelly or TechnipFMC grease (P/N 644886401) before reattachment of the cover to the housing.

IX. Follow cover bolt torqueing procedure as outlined in section 12, when complete, verify the flame path gaps as per the procedure.

Special Environments

In corrosive environments such as near salt water, is the user’s responsibility to increase the inspection intervals for verification of the flame path integrity. Inspection intervals will vary with local conditions and is the user’s responsibility to select appropriate intervals.

The most effective preventive maintenance is periodic wash downs of the enclosure to remove the salt buildup on the outside surfaces. It is recommended to use a mild soap applied with a sponge or cloth with a low pressure non-saline water rinse.

It is also very important to maintain the painted exterior painted finish of the equipment, if exterior corrosion is detected, the finish should be cleaned, removal of any corrosion by mechanical means and prepared for painting, the affected area shall be repainted with a corrosion inhibiting paint. Factory paint is two-component polyurethane-acrylic enamel, Polane®T manufactured by Sherwin Williams, colors is “Precision Tan” and “Carbon Black”.

It is required to apply a coating of petroleum jelly or TechnipFMC grease (P/N 644886401) to flanged metal surfaces to offer a protective barrier to reduce the effects due to exposure to saline solution i.e. wet salt air, this surface should be cleaned and new grease reapplied every time the cover is opened for inspections or maintenance, this includes the flame path between the window and cover and the keypad and cover.

Completing the Installation

Explosion-proof housing closure

When securing the front cover of the AccuLoad model or QT, use the following procedure to ensure the unit is properly sealed and is safe to operate in a Div. 1/Zone 1 environment:

1. Inspect the door seal O-ring for damage and replace if damaged. The O-ring is not required to maintain the explosion-proof rating, however, it is required to maintain the IP 65 ingress protection rating. Grease cover flange with petroleum jelly or TechnipFMC grease (P/N 644886401) before attachment of the cover to the housing.
2. Verify the mating areas between the front cover and the main housing are not scratched, corroded or otherwise damaged such that the surface contact between them would be compromised.
3. Close the cover and tighten the cap screws around the perimeter of the front cover using the sequence shown below. The final torque should be 20 FT-LB / 240 IN-LB (27.1 Nm / 276.4 Kg.cm). Be sure to note the locations for the two longer bolts used for the security seal wire.
4. Check that the enclosure is properly sealed by verifying the cover to enclosure joint “gap” with a 0.0015" (0.0381mm) feeler gauge. The feeler gauge must not enter the joint for more than a ¼" (6mm) at any point around the perimeter of the cover to housing joint; see Figure 67 for example.

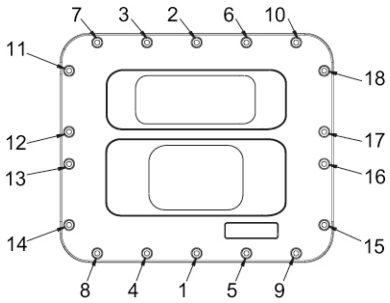


Figure 65. Cover bolt torque pattern for AccuLoad III S

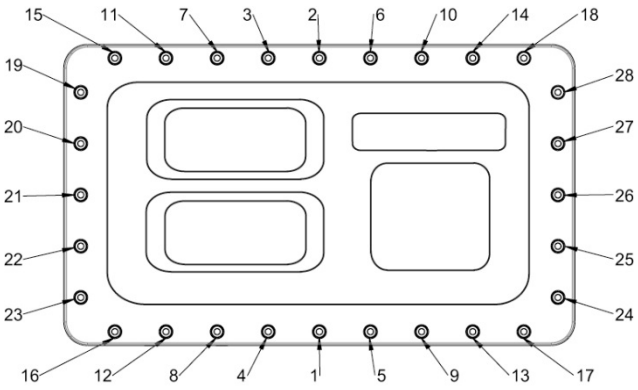


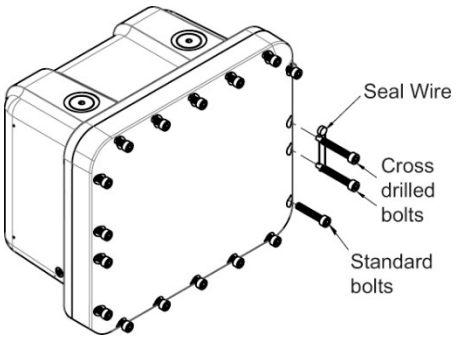
Figure 66. Cover bolt torque pattern for AccuLoad III Q

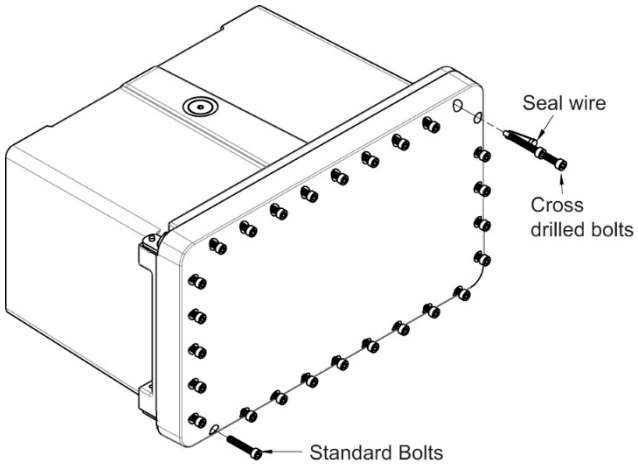
Feeler gauge test of cover flame path joint, inspect joint around the complete perimeter using a 0.0015" (0.0381 mm) feeler gauge. (ALIV-Q shown - use the same procedure for ALIV-S).

Figure 67. Flame path verification

Sealing

Each of the AccuLoad enclosures can be sealed using standard seal wires. On the AccuLoad S and Q models the seal wire is threaded through holes in two cover bolts as shown in the following figures.





Section VII – Related Publications

The following literature can be obtained from FMC Measurement Solutions Literature Fulfillment at mailto:measurement.fulfillment@fmcti.com or online at www.fmctechnologies.com/measurementsolutions

When requesting literature from Literature Fulfillment, please reference the appropriate bulletin number and title.

AccuMate for AccuLoad III

Specification .....Bulletin SS06032
Installation/Operation.....Bulletin MN06136

AccuLoad III

Specification .....Bulletin SS06036
Operator Reference.....Bulletin MN06129
Communications.....Bulletin MN06130L
Modbus Communications .....Bulletin MN06131L

Revisions included in MN06135 rev/issue 1.3 (6/17):

Page 1: Warning and Precautions added.
Page 2: Weights and Measures Requirements added.
Page 4: Environmental Considerations added.
Page 6: General Requirements added.
Page 7: Completing the Installation added.
Page 88: Maintenance added.

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