Smith Meter® AccuLoad® IV

Split Architecture Upgrade Manual

Bulletin MN06206 Issue/Rev. 0.0 (4/22)

Important

All information and technical specifications in this document have been carefully checked and compiled by the author; however, we cannot completely exclude the possibility of errors. TechnipFMC is always grateful to be informed of any errors; contact us at TechnipFMC.com.

Caution

The default or operating values used in this document and in the configuration parameters of the AccuLoad IV 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 configuration parameter must be reviewed and programmed for that specific metering system application.

Disclaimer

TechnipFMC hereby disclaims all responsibility for damages, including but not included 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 IV.

Technical Support

Field Service Response Center
24/7 Technical Support/Schedule a Technician: +1 844.798.3819

System installation supervision, startup, and commissioning services are available.

Customer Support

Customer Service
TechnipFMC
Measurement Solutions
1602 Wagner Avenue
Erie, PA 16510 USA
+1 814.898.5000
MS.ResponseCenter@TechnipFMC.com
TechnipFMC.com

Literature Library
info.smithmeter.com/literature

Contents

1 Introduction

This manual provides guidance for upgrading and configuring an existing Smith Meter AccuLoad III Split Architecture (SA) model or another model of the AccuLoad IV to the AccuLoad IV SA model. When installed following the guidelines contained in this manual, the AccuLoad should provide many years of safe, accurate, and reliable use.

This manual addresses the requirements specific to the AccuLoad IV SA model and it is assumed that the installation designers and fabricators are familiar with the applicable industrial facility construction standards specific to the particular facility. For additional installation instructions, refer to the AccuLoad IV Installation & Maintenance Manual (MN06201). For additional configuration information, refer to the AccuLoad IV Operator Reference Manual (MN06200).

1.1 Upgrade Process Installation & Configuration

The AccuLoad IV SA model has unique installation and configuration requirements. When you commission a new AccuLoad IV SA model or purchase the SA upgrade kit, most of the required configuration is done at the factory so that its board sets can communicate internally and the man-machine interfaces (MMIs) can connect to the board sets. However, you will need to configure site-specific operating parameters.

Tasks performed at the factory include:

- Setting the A4M board's dual in-line package (DIP) switch settings to properly identify each board set's role
- Setting internal Internet protocol (IP) addresses to avoid conflicts at startup
- Properly wiring the network cables

See Appendix A for details about these factory and recommended settings.

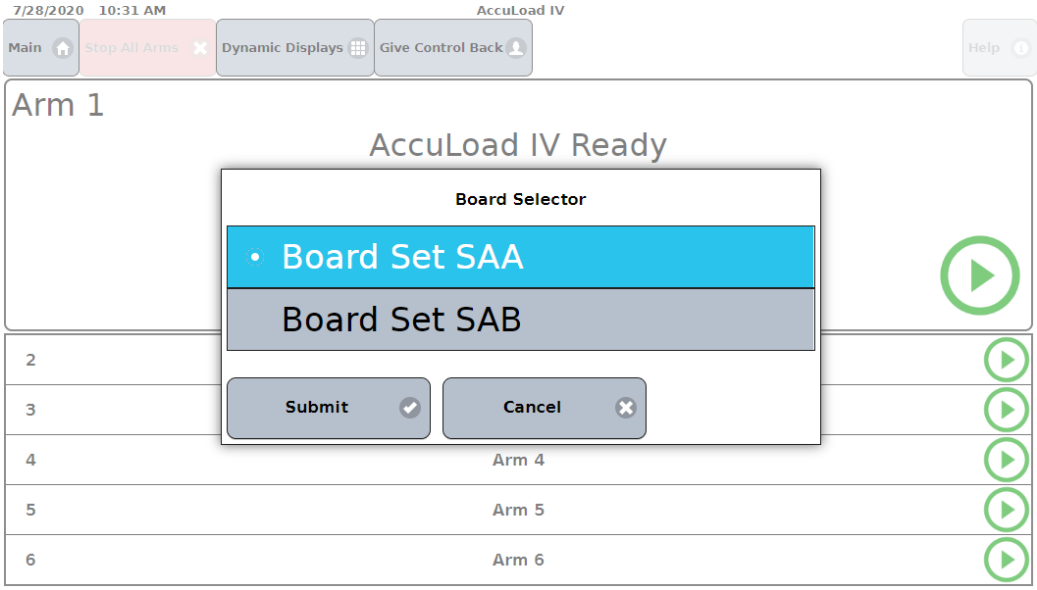
1.2 Overview of Installation

Several steps are required both before and after physically upgrading to the SA model. An overview of the full installation process is provided in the following sections.

1.3 SA Model Operating Differences

In Run mode when using the SA model, you will be prompted to select the board set you want to work with whenever you click the Main menu or the Dynamic Displays menu.

Figure 1: Run Mode Board Set Prompt



2 Installation

The general steps in the installation process are to physically add or exchange circuit boards, electronically connect them to work with associated equipment, and then configure the unit to suit its specific operational and measurement environment.

Those performing this installation should be experienced in working with electrical equipment in hazardous locations and take every precaution to ensure a safe working environment. If questions arise, please contact our Field Service Response Center or Customer Support.

2.1 Pre-Installation Steps

The following steps should be taken prior to installing new SA circuit boards:

1. Using AccuMate for AccuLoad III, read and save the configuration file (*.A3X) and any supporting configuration files (such as *.RPT, *.EQX, *.LGX, and *.DDB) for each board set in the AccuLoad III SA model.
2. Import the configuration into AccuMate for AccuLoad IV. The imported AccuLoad III configuration file (*.A3X) is converted and updated to an AccuLoad IV configuration file (*.AL4).
3. Verify the configuration imported correctly.

2.2 Upgrading an AccuLoad III SA to the AccuLoad IV SA

2.2.1 Board Set Installations

The installation process you perform is different based on the following scenarios:

- Upgrading an AccuLoad III SA model to an AccuLoad IV SA model
- Expanding an existing AccuLoad IV SA model with board sets B or C
- Expanding an existing AccuLoad IV SA model with board set D
- Adding an optional A4I board

See the appropriate sections below based on the scenario that applies to your site.

Before installing the AccuLoad IV SA boards, complete the following steps:

- Ensure and verify that all power sources are removed (multiple power sources may exist).
- Ensure that all connectors and cables are marked to indicate where they were connected.
- Remove all AccuLoad III boards and associated hardware.

2.2.2 Board Set Locations

When adding a board set to an existing field control module (FCM), the same expansion kit is used for both new AccuLoad IV FCMs and upgraded AccuLoad III FCMs. The kit includes the appropriate mounting hardware for both back planes.

Figure 2: AccuLoad IV FCM Back Plane Mounting Plate

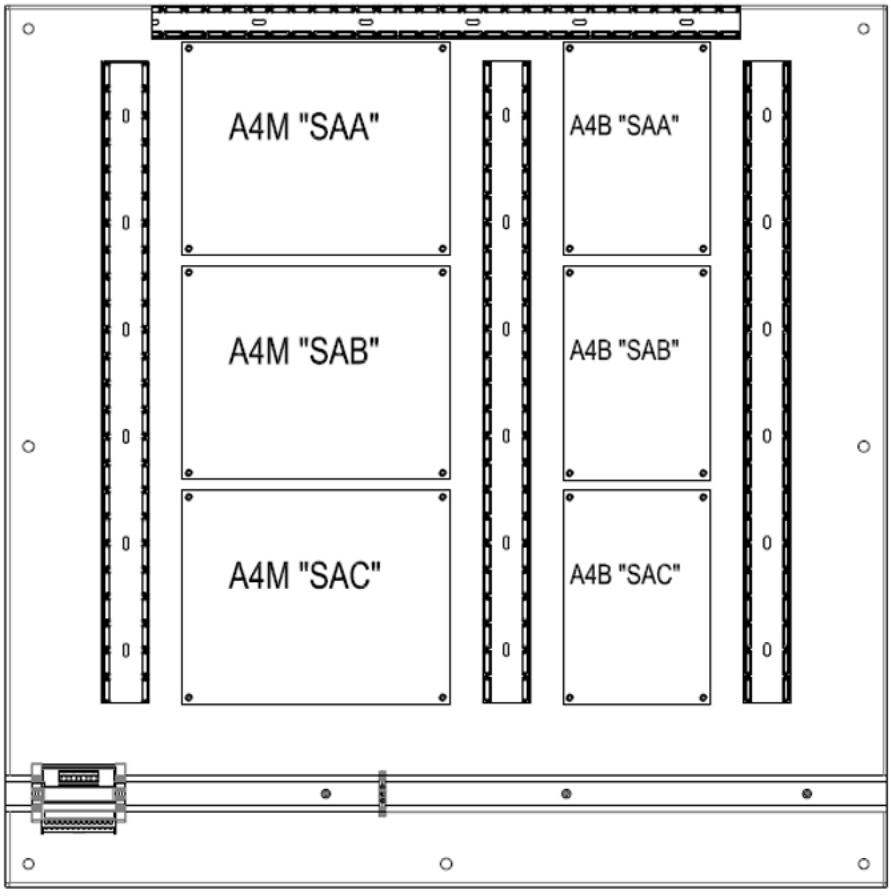
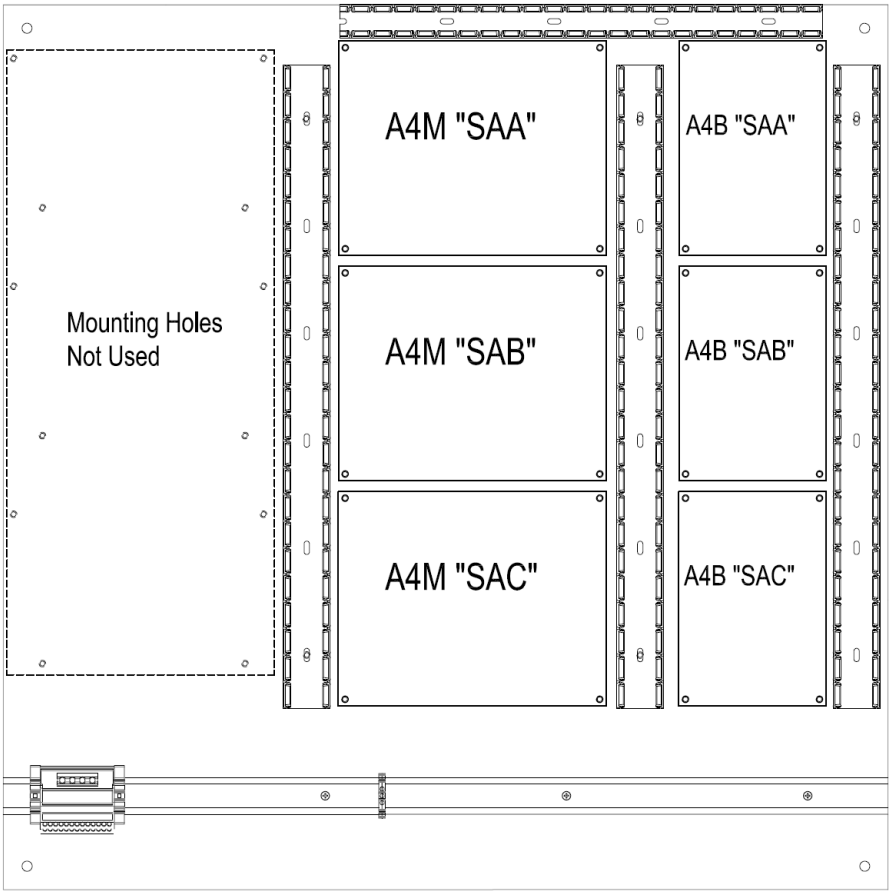


Figure 3: AccuLoad III FCM Back Plane Mounting Plate



2.2.3 Installing Board Set B or C to Expand an Existing AccuLoad IV SA

Complete the following steps to install board set B or C to expand an existing AccuLoad IV SA:

1. Do one of the following steps to install the SAB or SAC board set in the appropriate location on the back plane according to Figure 2: AccuLoad IV FCM Back Plane Mounting Plate
   - Attach the A4M assembly and optional hardware to the mounting plate using the four captive screws included with the A4M assembly kit.
   - Attach the A4B board to the mounting plate using the four captive screws included with the A4B assembly kit.
2. Remove the end clamp from the DIN rail.

3. Attach the volts direct current (VDC) distribution block to the DIN rail touching the rightmost existing VDC distribution block.
4. Reinstall the end clamp to the DIN rail to secure the installed VDC distribution blocks.
5. Install a grounding block on the DIN rail.

2.2.4 Installing Board Set D to Expand an Existing AccuLoad IV SA

Install board set D in front of board set C using the following steps. Refer to Figure 4: Board Set D Expansion and Table 1: Board Set D Expansion for additional details.

1. Install the following standoffs on the SAC A4M board assembly, ensuring the axis of rotation of the hinged standoff is parallel to the DIN rail:
   - Male/male thread adapters (callout 1)
   - Female/female 2-inch standoffs (callout 2)
   - Hinged standoffs (callout 3)
   - Male/female .75-inch standoffs (callout 4)
2. Install the following standoffs on the A4B board assembly:
   - Male/male thread adapters (callout 5)
   - Female/female 2-inch standoffs (callout 2)
   - Hinged standoffs (callout 3)
3. Install the SAD board set on the A4M board and shield assembly on top of the standoffs using 10-24 x 1.125-inch pan-head screws.

   > The stacked A4M and A4B assembly should freely rotate 90 degrees when the upper captive fasteners on the SAD board set A4M board and shield assembly and on the SAD board set A4B board assembly are not secured on their mounting standoffs.

4. Install the direct current (DC) and ground distribution blocks as follows:
   a. Remove the end clamp from the DIN rail.
   b. Attach the VDC distribution blocks to the DIN rail against the existing VDC distribution blocks.

c. Reinstall the end clamp to secure the VDC distribution blocks.

d. Install ground blocks on the DIN rail next to the existing ground blocks.

Refer to the following drawing when installing board set D.

Figure 4: Board Set D Expansion

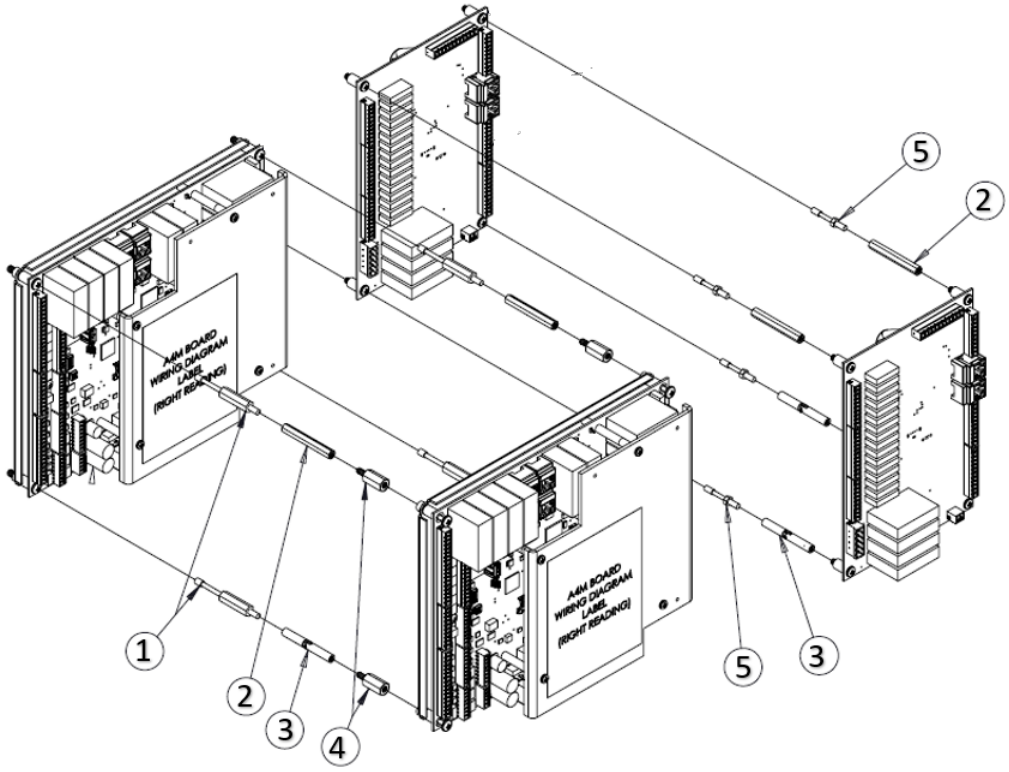


Table 1: Board Set D Expansion

Callout Number	Description	Number Included
1	Male/male 10-24 to 8-32 hex thread adapter standoff	4
2	Female/female 8-32 x 2.00-inch length .25-inch hex stainless steel standoff	4
3	Hinged female 8-32 x 2.00-inch length .25-inch round stainless steel standoff	4
4	Male 8-32/Female 10-24 .375 hex .75-inch LG stainless steel standoff	4
5	Male/male 8-32 hex thread adapter standoff	4

2.2.5 Installing an A4I Board

To install an A4I board, complete the following steps. See Figure 5: A4I Assembly Mounted on A4M Shield, Figure 6: A4I Board Layout, and Table 2: A4I DC Wiring below for additional details.

1. Remove the A4M shield from the A4M board and shield assembly.
2. Attach standoffs to the A4M shield using nuts.
3. Reinstall the A4M shield by securing the captive screws into nylon spacers.
4. attach the A4I board to the A4M board and shield assembly as follows:
    a. Place the A4I board on standoffs.
    b. Place the A4I shield over the A4I board and secure it with captive screws.
5. Secure the A4I board ground wire to the A4M board as follows:
    a. Remove the captive fastener from the bottom-right corner of the A4M board.
    b. Insert the captive fastener through the terminal lug on the ground wire.
    c. Reinstall the captive fastener into the A4M standoff.

Repeat the above process for each configured board set.

Figure 5: A4I Assembly Mounted on A4M Shield

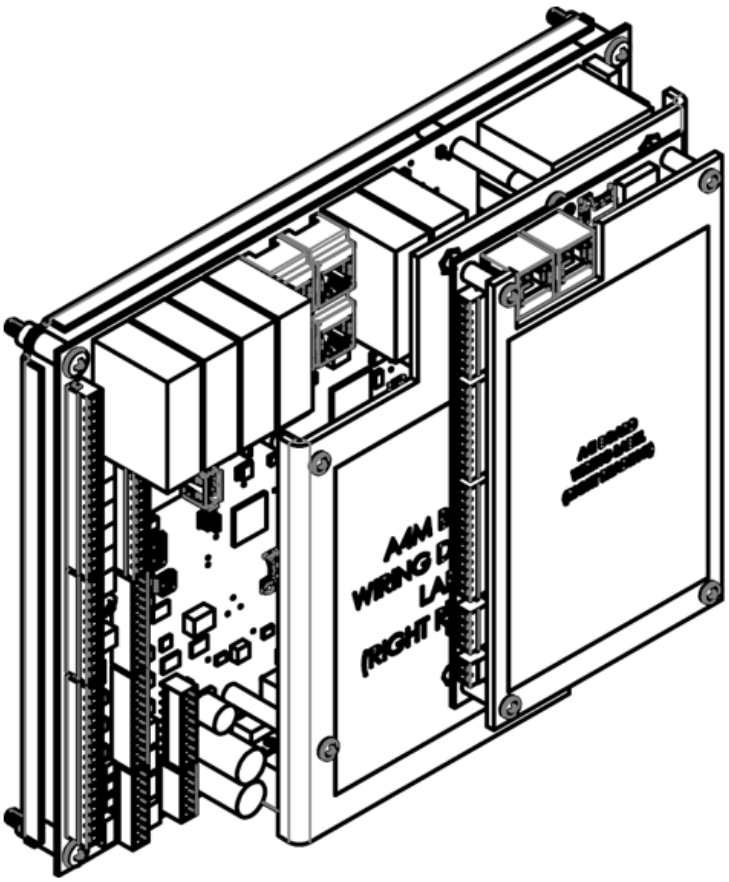


Figure 6: A4I Board Layout

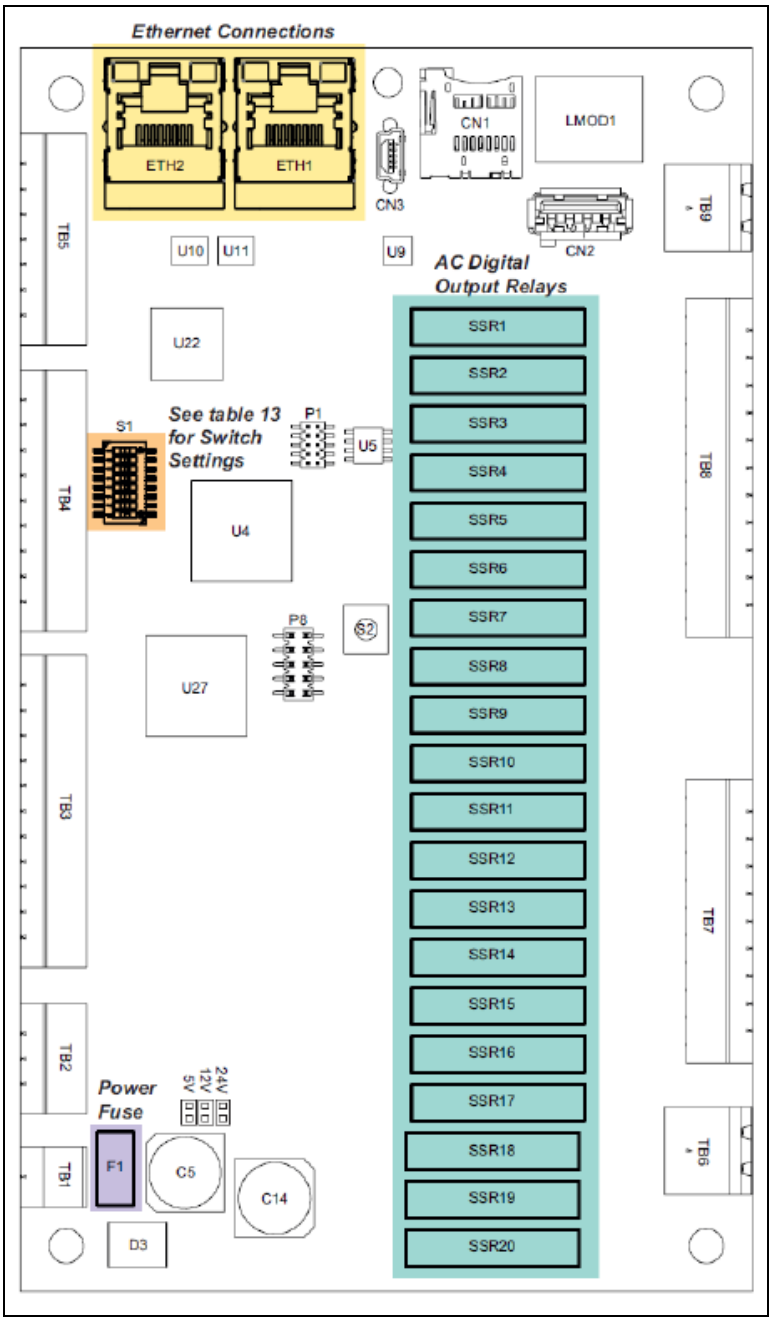


Table 2: A4I DC Wiring

Board Set	Wire Color	From	To
Any	Red	A4M TBE4-12	A4I TB1-1
Any	Black	A4M TBE4-15	A4I TBI-2

3 SA Model Configuration

The following tasks are required when configuring the SA model.

> When upgrading from an AccuLoad III SA model to the AccuLoad IV SA model, this configuration must be done after importing the AccuMate III file into the AccuMate IV. These tasks must be done before pushing the configuration file to the AccuLoad IV.

1. Configure each board set's function.
2. Ensure the System Status Display view option is enabled.
3. Configure external network settings.
4. Configure internal network settings.
5. Configure board set IP addresses.
6. Configure arm addresses.
7. Assign arms to each MMI.
8. Configure optional SA parameters.

Instructions for each of these tasks is provided in the following sections.

3.1 Configuring Board Set Functions

The AccuLoad IV SA requires each MMI in the system to be logically tied to a board set internal to the FCM. To do so, complete the following steps:

1. Click the Main button.
2. Select a board set.
3. Select Program Mode > Config > System Layout > Board Set Function (parameter 1003).
4. Select one of the following options as the board's function:
   - No HMI—The board set does not have an MMI connected to it.
   - HMI A—The board set has an MMI A connected to it.

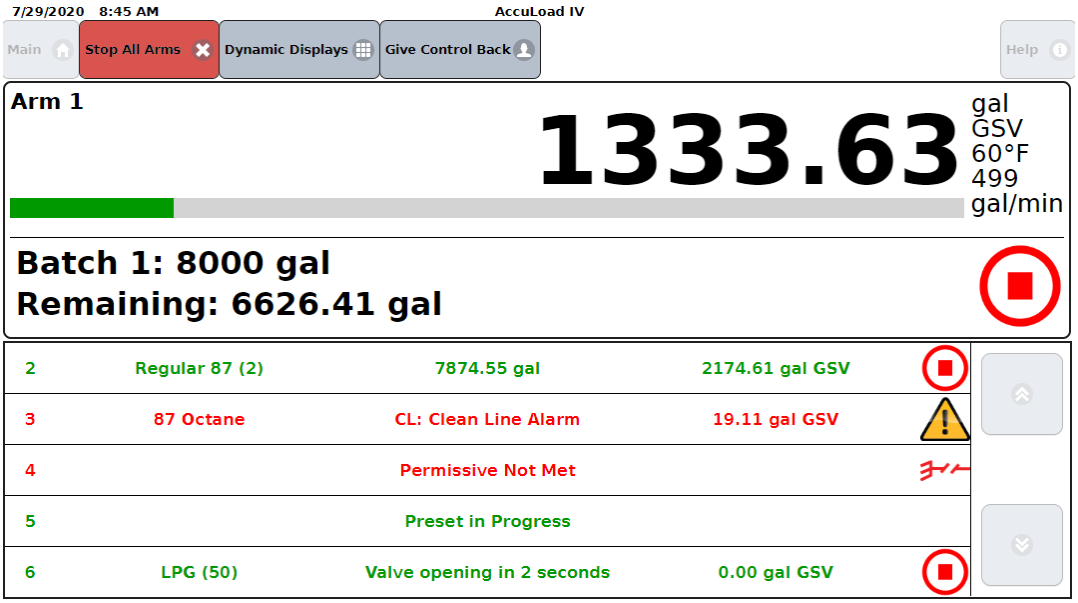
- HMI B—The board set has an MMI B connected to it.
- Dual HMI—The board set is connected to two MMIs.

3.2 Enabling the System Status Display Option

The System Status Display view option (parameter 139) is required for SA models and is typically configured at the factory for new systems. This display option dedicates the lower panel of the screen to the system status display.

The upper panel is a full-screen view of the arm currently in focus, while the lower scrolling panel contains a selectable list all of the configured arms.

Figure 7: System Status Display



To enable this option, complete the following steps for each board set in the system:

1. Select Program Mode > System > General Purpose.
2. Select Yes (1) for the system status display.

3.3 Configuring External Network Settings

Complete the following steps to configure external network settings:

1. Click the Main button.
2. Select a board set.
3. Select Program Mode > System > Communications > Host Interface.
4. Select one of the following options for the IP Discovery setting (parameter 1700):
   - Manual--Indicates the AccuLoad has a static IP address.
   - DHCP--Indicates the AccuLoad should obtain an address automatically from a DHCP server on the network.
5. If you selected Manual for the IP Discovery setting, complete the following steps:
   a. Specify a unique IP address (parameter 735).
   b. Specify the subnet netmask's address (parameter 736).
   c. Specify the gateway address (parameter 737).

3.4 Configuring Internal Network Settings

Before configuring internal network settings, first determine all of the IP address to be used for the system, noting that:

- A unique internal IP address is needed for each board set in the system.
- A unique THMI IP address is needed for the board set connected to MMI A.
- A unique THMI B IP address is needed for the board set connected to MMI B (if applicable).
- The same class of IP address must be used for each parameter.
- All IP addresses must be on the same logical IP network.

Complete the following steps to configure internal network settings:

1. Click the Main button.
2. Select a board set.
3. Select Program Mode > System > Communications > Host Interface.

4. Change the IP addresses for the following parameters:
    - Internal IP Address (parameter 1720)—Ensure a valid, unique IP address is entered for each internal IP address. The following default values can be used or you can enter custom values:
        - Board set SAA: 10.0.0.1
        - Board set SAB: 10.0.0.2
        - Board set SAC: 10.0.0.3
        - Board set SAD: 10.0.0.4
    - THMI IP Address (parameter 1721)—Ensure a valid, unique THMI IP address is entered for the board set connected to MMI A. You can use the default value of 10.0.0.6 or you can enter a custom value.
    - THMI B IP Address (parameter 1722)—Ensure a valid, unique THMI address is entered for the board set connected to MMI B (if applicable). You can use the default value of 10.0.0.7 or you can enter a custom value.

3.5 Configuring Board Set IP Addresses

After IP addresses have been configured for each board set, additional parameters must be configured so the board sets are aware of each other. Complete the following steps to enable the board sets to communicate with each other:

1. Click the Main button.
2. Select a board set.
3. Select Program Mode > Split Architecture > Board Addresses.
4. For each board set, enter the corresponding IP addresses in the following parameters (see the AccuLoad IV Operator Reference Manual (MN06200) for more details):
    - Board Set 2 (parameter 1611)
    - Board Set 3 (parameter 1612)
    - Board Set 4 (parameter 1613)

    > Any unused board sets should remain set to 0.0.0.0.
5. Exit program mode and save your changes.

3.6 Configuring Arm Addresses

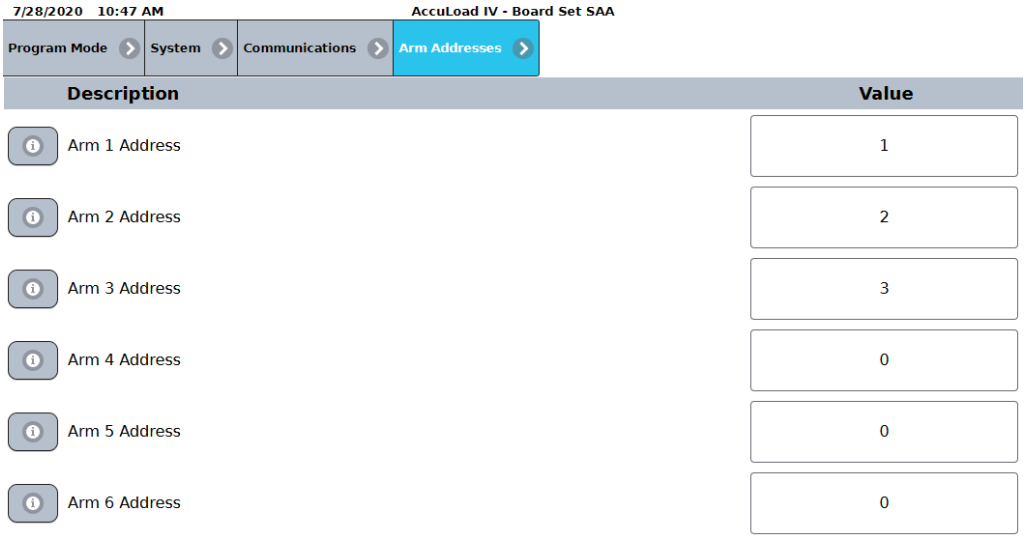
Arm addresses for all arms used by the AccuLoad IV SA model must be configured.

> Each arm address must be unique for the system, not just this FCM unit.

Complete the following steps to configure an arm address:

1. Click the Main button.
2. Select a board set.
3. Select Program Mode > System > Communications > Arm Addresses.
4. For each arm, type a numeric value of up to two digits to uniquely identify the arm for the board set. See Figure 8: AccuLoad IV SA Arm Addresses for an example.

Figure 8: AccuLoad IV SA Arm Addresses



3.7 Assigning Arms to MMI Units

The MMI units act as the operator control panels for the AccuLoad IV. To assign arm addresses to the SA model's MMI units, complete the following steps for each arm configured on each board set:

1. Click the Main button.
2. Select a board set.
3. Select Program Mode > Arms.

4. Select the arm you want to assign to an MMI.
5. Select General Purpose > Bay Assignment.
6. Assign the loading arm to a bay by changing the arm's Bay Assignment (parameter 109) to one of the following settings:
   - Independent—Not used for SA applications.
   - Bay A—Arm to be displayed on MMI A.
   - Bay B—Arm to be displayed on MMI B.
   - Swing Arm—Arm displayed on appropriate bay based on the swing arm's switch position.

3.8 Configuring Optional SA Parameters

The following additional SA parameters are available:

- Board Set ID (parameter 1608)—Enables you to define a descriptive identifier for a SA board set.
- Stop Key (parameter 1609)—Enables you to indicate whether the Stop All button should stop all arms on both MMIs or only on the current MMI.
- Idle Arm Alarm (parameter 1610)—Enables you to indicate whether all arms should be stopped when an alarm occurs on an idle arm that cannot be displayed.

4 Post-Installation & Configuration Steps

When you finish installing board sets as instructed above, complete the following steps to restore the external network and power connections:

1. One board at a time, restore the power and network connections and then download the configuration using AccuMate.

   > Ensure that only the board set in which the file transfer is intended is connected to the external network and powered on.

   > Ensure that all IP and arm addresses in the system do not conflict.

2. After all of the board sets are configured, restore all Ethernet connections.
3. Power on the system.

5 Related Publications

The following literature can be obtained from TechnipFMC Measurement Solutions Literature Fulfillment at Measurement.Fulfillment@TechnipFMC.com or online at info.smithmeter.com/literature/online_index.html.

When requesting literature, please reference the appropriate title and document number, as follows:

- AccuLoad IV Installation & Maintenance Manual (MN06201)
- AccuLoad IV Operator Reference Manual (MN06200)
- AccuLoad IV Parts List (PO06200)
- AccuLoad IV specifications (SS06200)
- AccuLoad Calculations technical paper (TP06004)

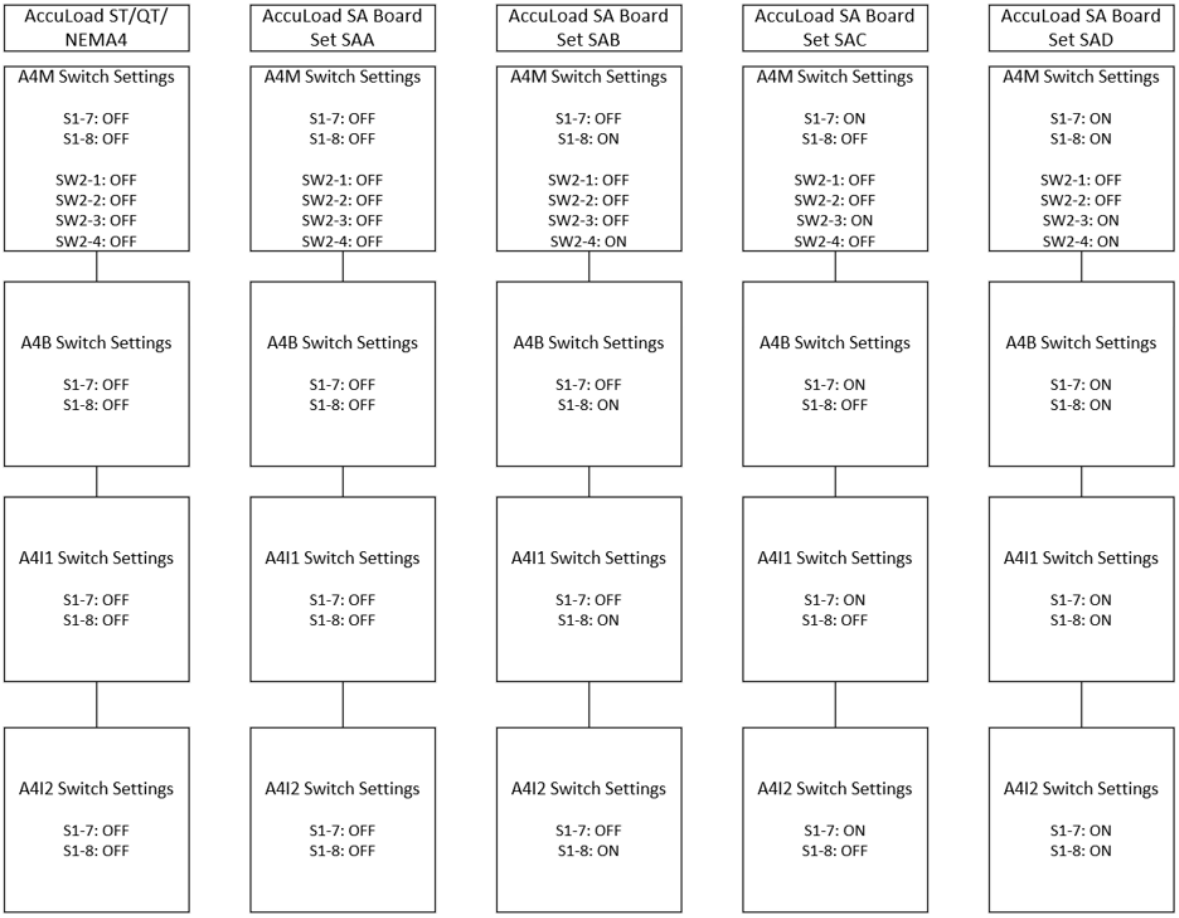
Appendix A: Recommended Settings

This appendix provides supplementary information about factory and recommended settings for the AccuLoad IV SA model.

A.1 A4M DIP Switch Factory Settings

The following A4M DIP switch settings are set by the factory for FCM board sets.

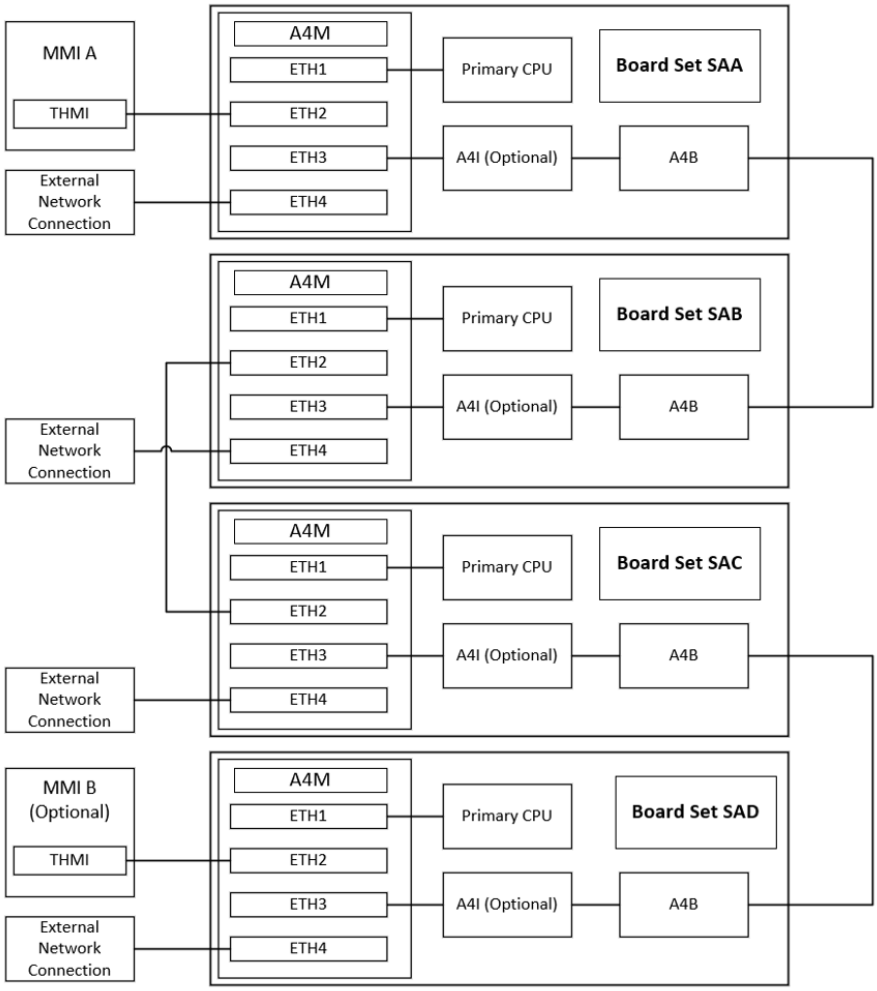
Figure 9: AccuLoad IV Board Set Selector DIP Switch Settings



A.2 Factory and Recommended Internal Network Architecture

The following diagram represents the recommended internal network architecture.

Figure 10: Recommended Internal Network Architecture



A.3 Recommended Cable Routing

The following diagrams and tables represent the recommended routing of cables for each board set.

A.3.1 Board Set SAA Recommended Cable Routing

Figure 11: Existing FMC Cable Routing to Board Set SAA

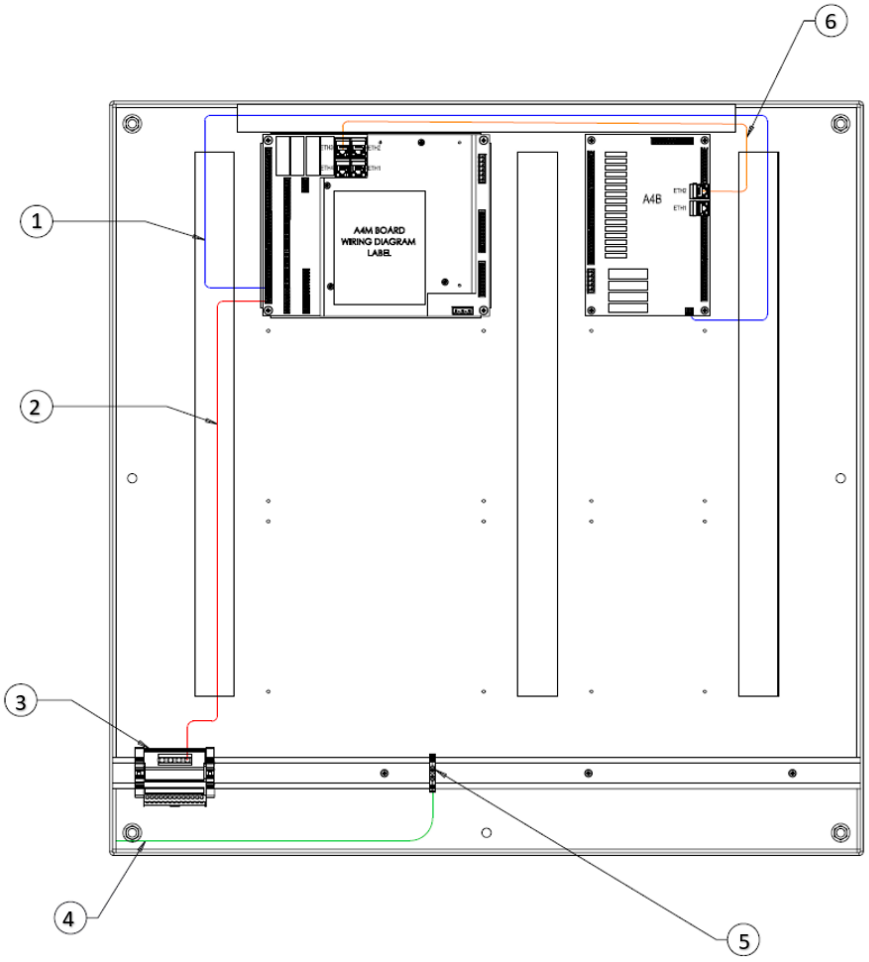


Table 3: Board Set SAA Power and Ethernet Wiring

Callout Number	Wire	From	To
1	RED/BLK 18 American Wire Gauge (AWG)	SAA A4M TBE4-11/TBE4-14	SAA A4B TB2-1/TB2-2
2	RED/BLK 18 AWG	SAA A4M TBE4-10/TBE4-13	'A' VDC distribution block P1 or P2
3	Factory wired	'A' VDC power distribution block	Factory wired
4	GREEN 16 AWG	DIN rail grounding block T1	Enclosure ground lug
5	Factory wired	DIN rail grounding	Factory wired

Callout Number	Wire	From	To
		block	
6	Ethernet	SAA A4M ETH3	SAA A4B ETH1

A.3.2 Board Set SAB Recommended Cable Routing

Figure 12: Board Set SAB

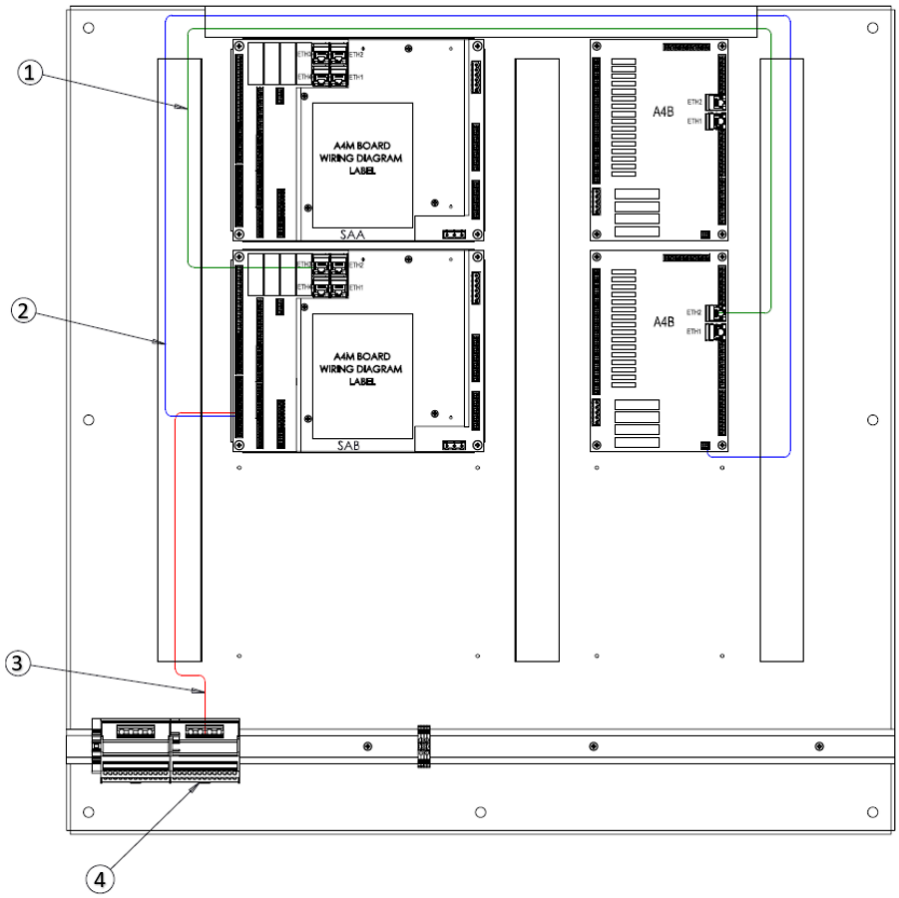


Table 4: Board Set SAB Power and Ethernet Wiring

Callout Number	Wire	From	To
1	Ethernet	SAB A4M ETH3	SAB A4B ETH1
2	RED/BLK 18 AWG	SAB A4M TBE4-11/TBE4-14	SAB A4B TB2-1 or TB2-2
3	RED/BLK 18 AWG	SAB A4M TBE4-10/TBE4-13	'B' VDC distribution block P1 or P2
4	Factory wired	'B' VDC Dist. Block	Factory wired

A.3.3 Board Set SAC Recommended Cable Routing

Figure 13: Board Set SAC

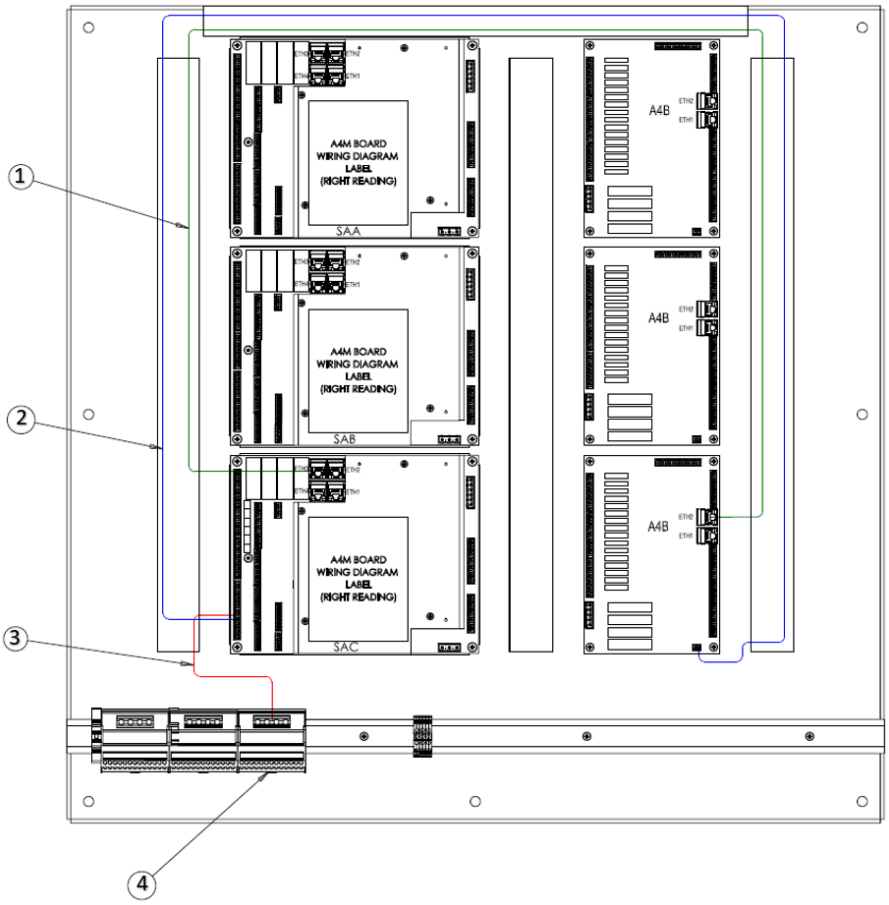


Table 5: Board Set SAC Power and Ethernet Wiring

Callout Number	Wire	From	To
1	Ethernet	SAC A4M ETH3	SAC A4B ETH1
2	RED/BLK 18 AWG	SAC A4M TBE4-11/TBE4-14	SAC A4B TB2-1 or TB2-2
3	RED/BLK 18 AWG	SAC A4M TBE4-10/TBE4-13	‘C’ VDC distribution block P1 or P2
4	Factory wired	‘C’ VDC power distribution block	Factory wired

A.3.4 Board Set SAD Recommended Cable Routing

Figure 14: Board Set SAD

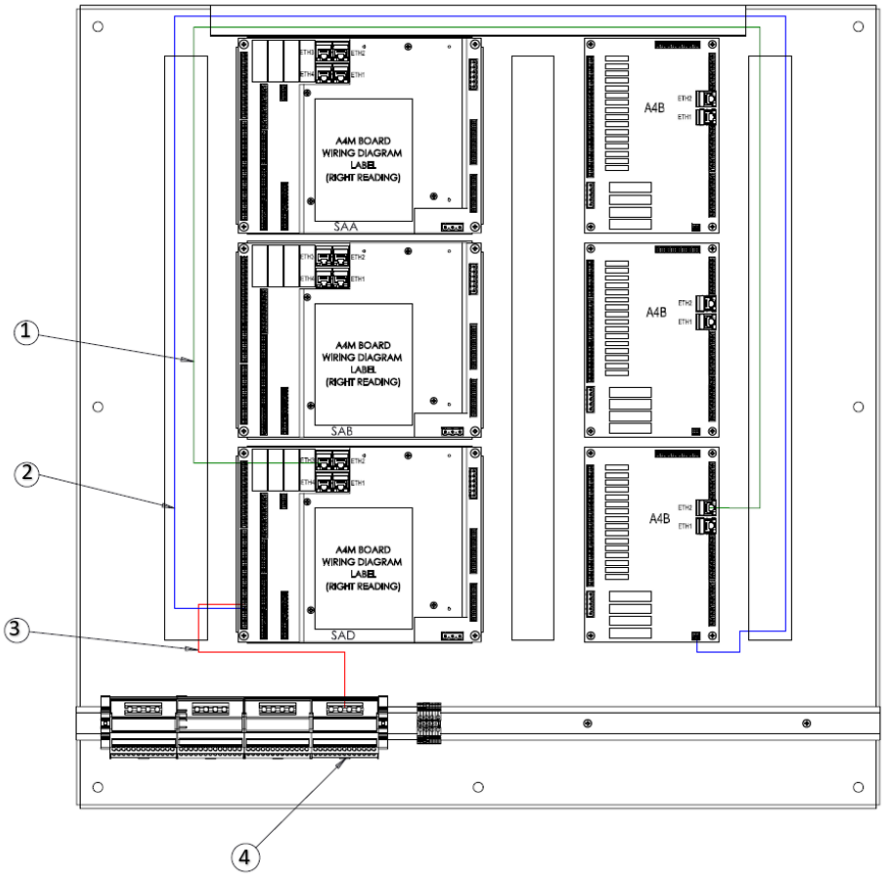


Table 6: Board Set SAD Power and Ethernet Wiring

Callout Number	Wire	From	To
1	Ethernet	SAD A4M ETH3	SAD A4B ETH1
2	RED/BLK 18 AWG	SAD A4M TBE4-11/TBE4-14	SAD A4B TB2-1 or TB2-2
3	RED/BLK 18 AWG	SAD A4M TBE4-10/TBE4-13	'D' VDC distribution block P1 or P2
4	Factory wired	'D' VDC power distribution block	Factory wired

A.3.5 Recommended Inter-Board Set Ethernet Cable Connections

Figure 15: Inter-Board Set Network Connections

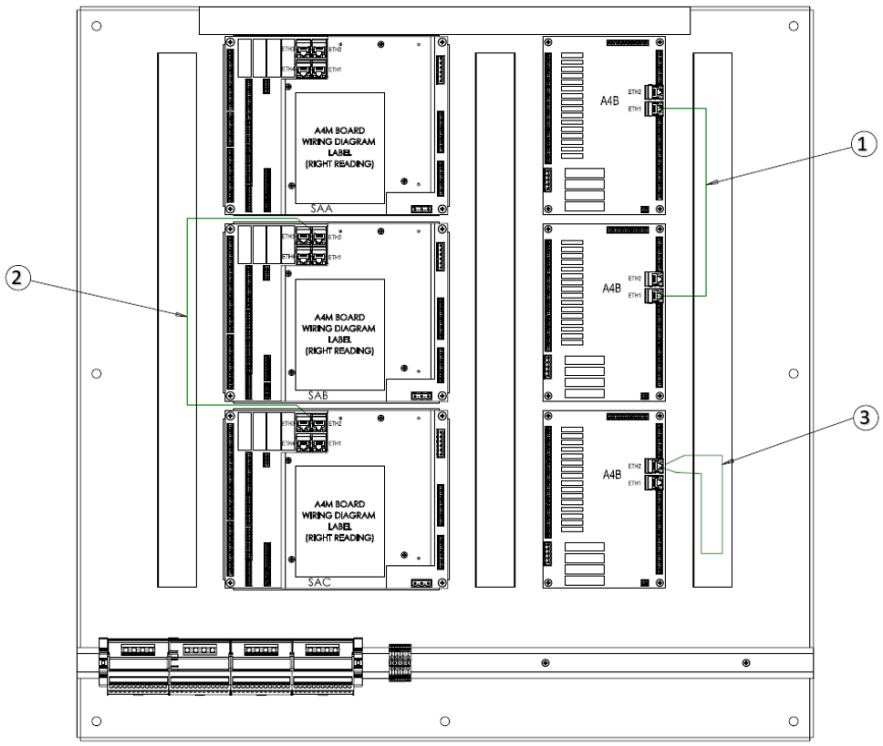


Table 7: Inter-Board Set Network Connections

Callout Number	Wire Type	From	To
1	Ethernet	SAA A4B Eth2	SAB A4B Eth2
2	Ethernet	SAB A4M Eth2	SAC A4M Eth2
3	Ethernet	SAC A4B Eth2	SAD A4B Eth2

Notice

All procedures, data, information, drawings, specifications or other material, whether accompanying this document or separately supplied in furtherance of this document, contain confidential and proprietary information which (i) is the property of TechnipFMC plc (TechnipFMC) and its subsidiaries, (ii) is disclosed by TechnipFMC only in confidence, and (iii) except as TechnipFMC may otherwise permit in writing, is to be used, disclosed or copied only to the extent necessary for the evaluation and use thereof by the recipient.

The foregoing shall not apply to any such material to the extent that the contents (i) are now or subsequently become available to the public without payment, (ii) were previously known to the recipient, or (iii) subsequently become otherwise known to the recipient without restriction.

This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained herein does not purport to cover all details or variations in hardware and software, nor to provide for every possible contingency in connection with installation, operation and maintenance.

TechnipFMC makes no representation or warranty, either expressed or implied, with respect to, and assumes no responsibility for, the accuracy, completeness, or sufficiency of the information contained herein. No warranties of merchantability or fitness for a particular purpose shall apply.

Smith Meter is a registered trademark. The TechnipFMC logo is a trademark.

This document takes precedence over and supersedes in their entirety all previous versions or revisions.

Bulletin MN06206 Issue/Rev. 0.0 (4/22)

TechnipFMC.com

TechnipFMC Corporate Headquarters
13460 Lockwood Road
Building S01
Houston, TX 77044 USA
+1 281.591.4000

USA Operations
1602 Wagner Avenue
Erie, PA 16510 USA
+1 814.898.5000

Germany Operations
Smith Meter GmbH
Regentstrasse 1
25474 Ellerbek, Germany
+49 4101 304.0