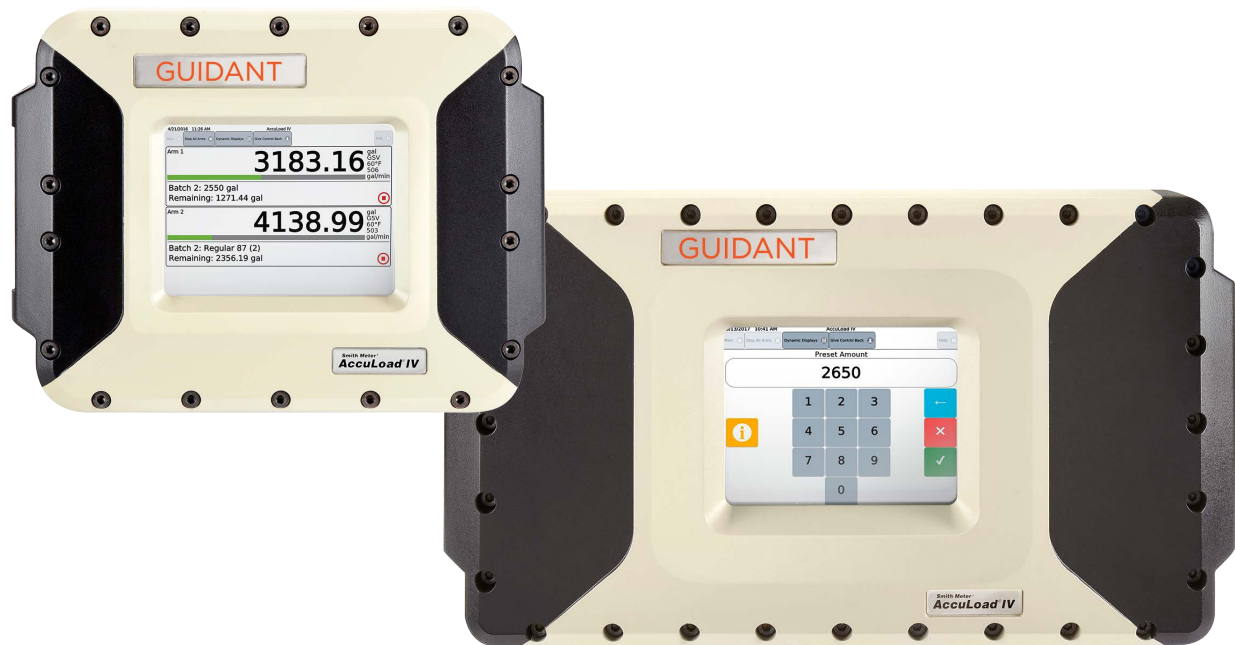




## Smith Meter® AccuLoad® III to IV

### Upgrade Manual for AccuLoad III Models S and Q

Bulletin MN06203 Issue/Rev 0.0 (4/17)



## ***Important***

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All information and technical specifications in this documentation have been carefully checked and compiled by the author. However, we cannot completely exclude the possibility of errors. Guidant is always grateful to be informed of any errors. Contact us on the website.

Smith Meter is a registered trademark of Guidant.

## ***Caution***

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The default or operating values used in this manual and in the program 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 program parameter must be reviewed and programmed for that specific metering system application.

## ***Disclaimer***

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Guidant 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 IV.

## ***Technical Support***

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Contact Information:

### ***Field Service Response Center***

24/7 Technical Support/Schedule a Technician: 1-844-203-4014

System Installation Supervision, Start-Up, and Commissioning Services Available

## ***Customer Support***

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Contact Information:

### ***Customer Service***

Guidant 1602 Wagner Avenue

Erie, Pennsylvania 16510 USA

P: +1 814 898-5000

F: +1 814 899-8927

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## ***Introduction***

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This manual provides installation instructions for the AccuLoad III to IV Upgrade Kits, Models ALIV-ST-UG3 and ALIV-QT-UG3. These kits replace all of the electronics of the AccuLoad III S and Q creating units equivalent to the AccuLoad IV ST and QT models. Using the upgrade kits reduces the time and expense required to gain the advantages of the new electronics by leaving the field wiring and the back half of the enclosure intact. The new AccuLoad IV circuit boards and front cover fit to the existing rear housing exactly as the AccuLoad III counterparts and the field wiring plugs directly into the new boards with minimal modification.

## ***Electrical Safety Regulatory Requirements***

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It is imperative that this upgrade procedure 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. Part of this procedure involves a critical assessment of the suitability of the flame paths of the existing enclosure for continued use. 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 back 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. UL/CUL Note: "Repair upgrade kits are not permitted to be installed in Class II (Explosive Dust) hazardous locations" as the kit was not evaluated for this atmosphere.

**The operator must ensure that electrical equipment is:**

- Installed and operated correctly
- Monitored on a regular basis
- Maintained with due regard to safety

## ***For ATEX and IECEx Installations***

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- Installation/inspection/maintenance/repair/overhaul/reclamation of 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.
- Installation/inspection/maintenance/repair/overhaul/reclamation of AccuLoads relying upon the IECEx certification must be performed by qualified personnel in accordance with the applicable requirements of IEC 60079-14, IEC 60079-17, and IEC 60079-19 as required by local codes/regulations.
- Guidance for Ex protected equipment is provided by EN/IEC 60079-14: "Electrical installations design, selection and erection"
- 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 this guidance should be utilized for the inspection / maintenance process.
- Cable entries must be in accordance to EN/IEC 60079-1 section 13.
- For wiring systems utilizing cable glands, the gland and or thread adaptor must be Ex d certified and the cable end must be securely installed and be properly protected from mechanical damage.

- For wiring systems utilizing conduit, an Ex d certified sealing device must be used immediately at the entrance of the enclosure.
- Any unused entry must be suitably blocked with an Ex d IIB IP65 certified plug for ATEX and IECEx applications. For North America Zone applications, the plug must be listed close up type.
- Equipment bonding shall be provided at the external grounding facility terminal, external connection is not required when using metallic conduit or armored cable. External grounding facility terminal wire range: 10-12 AWG (5.26 mm<sup>2</sup> to 3.31 mm<sup>2</sup> wire).
- Special Fasteners: Cover Bolts are steel grade 12.9, M8 x 1.25; substitution is not allowed.
- The Touch Keypad sensor is protected by an intrinsic safe barrier, the enclosure must be grounded as per national electrical code regulations, for example NEC/CEC, etc.

**Warning:** To prevent ignition of hazardous atmospheres, disconnect from supply before opening. Keep tightly closed when circuits are alive. Contains internal battery-powered circuit, to prevent the ignition of hazardous atmospheres, do not open enclosure unless the area is known to be non-hazardous. To reduce the risk of ignition of hazardous atmospheres, conduit runs must have a sealing fitting connected within 18 inches of the enclosure. Substitution of components may impair intrinsic safety.

**Note:** The maximum ambient temperature for the enclosure is 60°C for ATEX and IECEx applications and 55°C for North American Zone applications.

- Select wiring and cable glands suitable for 81°C operation.

## Receipt of Equipment

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Inspect the packaging of the upgrade equipment and immediately report any damage to the shipping agent. If the packing is intact, open the shipping container and remove the upgrade equipment. Verify that the upgrade kit is complete using the parts list for your particular model found in Appendix (C). If there are missing or damaged parts, a written report should be submitted to Guidant ATTN: Customer Service Department 1602 Wagner Ave. Erie, PA 16510.

## Tools Required

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The tools required for the upgrade procedure vary depending on the model as follows: AccuLoad III S and Q Ex-proof models:

- 6 mm hex key
- #2 flat blade screwdriver
- Terminal screwdriver
- #2 Phillips screwdriver
- 0.0015" (0.04mm) feeler gauge
- Torque wrench with 6mm hex allen key adaptor, with torque units of (In-Lb or Ft-Lb) or (Nm or kg•cm)

## General Description

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The upgrade process will vary slightly depending upon the AccuLoad model but generally consists of replacing the internal electronics and the front cover display assembly, leaving the rear housing and field wiring plugs intact. The new electronics are installed in place of the old electronic board assemblies according to the tables below:

Existing AccuLoad III-S	AccuLoad IV-ST Upgrade
EAAI	A4M
AICB (optional)	A4I (optional)

Existing AccuLoad III-Q	AccuLoad IV-QT Upgrade
EAAI	A4M
BSE	A4B
AICB (optional)	A4I (optional)

## General Notes and Warnings

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**Save Hardware** – When replacing circuit boards, some of the same mounting hardware will be re-used. Note the arrangement of the mounting hardware and which assembly it is associated with as it is removed so it can be re-installed in the same manner with the new board assemblies.

**Field Wiring** – Do not remove the field wiring from the terminal plugs as it will remain connected to the original plugs (with minor exceptions where noted) which will be inserted into the new replacement board assemblies.

**Use ESD Precautions** – The electronic board assemblies are susceptible to damage due to electrostatic discharge (ESD) and must be handled using ESD prevention practices.

**Warning: Hazardous Voltages** – Ensure all power to the AccuLoad and any associated wiring is disconnected / de-energized. All circuits must be de-energized and locked out prior to starting this procedure for both personal and hazardous locations safety.

## Before You Begin

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Any information stored in the existing AccuLoad III will be lost during the upgrade. Refer to Appendix (A) for the procedure to ensure that no important data is lost as a result of this upgrade. Once the hardware changes are complete, the configuration file(s) can be transferred to the newly upgraded AccuLoad. See Appendix (B).

While it is recommended that analog input modules be replaced as part of the upgrade process, it is not a requirement. If the analog modules from the AccuLoad III are to be re-used in the upgraded unit, they should be transferred from the AccuLoad III EAAI board to the corresponding position in the AccuLoad IV A4M board. Once the upgrade is complete, it is important to verify that the calibration numbers written on the modules correctly match the Config->Analog parameters in the configuration database of the upgraded unit. This will ensure the most accurate results. See manual [MN06201](#) for the module installation procedure.

## AccuLoad III-S and AccuLoad III-Q Upgrade Procedure

1. After verification that all circuit connections to the AccuLoad are de-energized, remove the (eighteen ALII-S) or (twenty-eight ALIII-Q) 8 mm cap screws securing the front cover. These cap screws are part of the hazardous location protection method and will not be re-used.
2. A detailed Inspection of the flame path is required in accordance with the following Inspection Criteria.

**Note:** If damage or corrosion is detected on the machined flame path surface or cover bolt threads of the enclosure, then the enclosure will require replacement to maintain the hazardous locations protection.

**Warning:** Do not use enclosures with damaged flame path surfaces or threaded entries, this condition could lead to fire or explosion risk! It is the owner / operator's responsibility to maintain the hazardous locations protection method.

### Flame Path Inspection Criteria

- I. All flame paths, which are defined as the machined flanged surface between the housing and the cover, are clean and undamaged, no scratches, nicks, corrosion, or other defects that would affect the integrity of the flame path are allowed.  
In corrosive atmospheres such as near salt water, it is recommended to apply a coating of petroleum jelly or Guidant grease (P/N 644886401) to the flanged surface to offer a protective barrier to help mitigate the effects of exposure to saline solution i.e. wet salt air. The most effective preventive maintenance is periodic wash downs of the enclosure with clean fresh water and mild detergent (not pressure washing, which can damage the protective paint surface) to remove the salt buildup on the outside surfaces.
- II. All tapped cover bolt threaded locations are clean and intact with no missing/stripped threads.
- III. Cover bolts are the required M8 x 1.25-6g, Din 912, Steel Grade 12.9 supplied with the upgrade kit.
- IV. Any blind threaded cover bolt holes should not have grease packed into them as this could cause hydraulic fractures of the enclosure when the bolts are tightened.
- V. 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 Guidant grease (P/N 644886401) before reattachment of the cover to the housing.

If the flame path is found to be acceptable, proceed with the remainder of this procedure.

### Disassembly

1. Unplug the field wiring plug connectors identified as TB1 through TB5 from the KDC board assembly. The field wiring terminal functionality has been moved to the new A4M board assembly and is now identified as TBK1 through TBK5. The factory wiring ribbon cable(s) to the EAAI and the BSE board assembly(s) (if equipped) is no longer used and should be discarded.
2. Unplug the field wiring plug connectors from the BSE and PIB board assemblies combination (if equipped), the field wiring terminal identification from the BSE to A4B are identical with the exception of Terminal Block PT1 where the Pulse input assignments have been modified as follows:

The original PIB board PT1 connector had pulse inputs identified as Pulse In 7 through Pulse In 12; the new assignment for PT1 on the A4B board is Pulse In 9 through Pulse In 14.

**Note:** No wiring changes should be required, the function of the pulse inputs is unchanged; only the numbering is changed.



3. Unplug the field wiring plug connectors from the AICB board assembly (if equipped), the field wiring terminal identification from the AICB to A4I are identical.

**Note:** Serial communications via connector TB2 will not be required as the communication link to the new A4I board will utilize the Ethernet communications.

4. Unplug the field wiring plug connectors from the EAAI and PIB board assembly combination. The field wiring terminal identification from the EAAI to the A4M is also nearly identical, with the differences as follows:

The terminal plugs on the EAAI that were identified as TB1 through TB7 have been renamed to TBE1 through TBE7 on the A4M.

The terminal plug on the PIB that was identified as PT1 has been moved to PT1 on the A4M and remain the same Pulse Inputs for Pulse In 1 through Pulse In 6.

A new Pulse input plug identified as PT2 has been added to the A4M board, this serves for the Pulse Inputs for Pulse In 7 and Pulse In 8 which are new in the ALIV. Since these are new, there will not be any connections for a simple upgrade. Only if additional equipment is added as part of the upgrade will there be connections to PT2.

5. Using Figure 1 (ALIII-S) or Figure 2 (ALIII-Q) as a guide, remove the circuit board assemblies from the back housing. The EAAI board is standard for all ALIII models and, therefore, it is always installed. The BSE is standard on the ALIII-Q and the AICB board(s) is optional. (It may or may not be installed in either the -S or -Q model.)
6. While supporting the front cover assembly, remove the four bolts securing the cover hinges to the rear housing and remove the front cover assembly. See Figure 3 for ALIII-S and Figure 4 for ALIII-Q.

**Caution:** The front covers are heavy - 18 lbs (8 kg) for the ALIII-S cover and 36 lbs. (16 kg) for the ALIII-Q cover. It is recommended to either mechanically support the front cover or have assistants help support it during this procedure to avoid injury or damaging the equipment.

### Reassembly

1. ALIV-QT: Mount the new front cover assembly using the two hinges and four hinge bolts removed in the previous step. ALIV-ST: Mount the new front cover assembly using the two hinges and four hinge bolts supplied in the upgrade kit. The original hinges cannot be re-used as the design has changed.

**Caution:** The front covers are heavy - 24 lbs. (11 kg) for ALIV-ST and 43 lbs. (19 kg) for ALIV-QT. It is recommended to either mechanically support the front cover or have assistants help support it during this procedure to avoid injury or damaging the equipment.

2. Replace the EAAI board with the new A4M board assembly. Insert the field wiring connectors into the A4M board into the same locations that were used on the EAAI board. The connectors on the EAAI that were labelled TB1 through TB7 are now labelled TBE1 through TBE7 on the A4M board. These are located in the same position on the A4M as they were on the EAAI board. Connect Meter Pulse Inputs 1 through 6 to TP1; reference Appendix (D) for Meter Pulse configuration details. See Figures 1 and 2. May require program parameter changes - reference [MN06201](#).
3. Insert the field wiring plugs that were connected to the KDC board assembly identified as TB1 through TB5 into the A4M board assembly in positions TBK1 through TBK5 respectively. If an Ethernet cable from the local network was plugged into the KDC, insert it into the RJ-45 connector labeled as ETH4 on the A4M board. See Figure (E).

4. If a BSE/PIB board set was removed (ALIII-Q only), replace it with the new A4B board and reconnect all of the original field connection. Apply the supplied A4B wiring label over the BSE label (after cleaning) that is located on the inside of the -Q housing. The parallel communications ribbon cable that originally connected the BSE to The KDC has been replaced with Ethernet communications on the A4B board assembly. Connect the supplied Ethernet jumper cable from the A4B RJ-45 connector labeled ETH1 to the RJ-45 connector labeled ETH3 on the A4M board.
5. If an AICB board was removed, replace it with the new A4I board and reconnect the field connections from TB1 and TB3 through TB9, which includes the 24 VDC power connection plug TB1. Also connect the supplied Ethernet jumper cable from the A4I RJ-45 connector labeled ETH1 to the RJ-45 connector labeled ETH3 on the A4M (ALIII-S only); if an A4B (ALIII-Q) is installed, make the connection to the RJ-45 connector labeled ETH2 on the A4B board to create a daisy chain communications link. If a second (optional) A4I board is installed, then connect the RJ-45 connector labeled ETH1 on the second A4I board to the RJ-45 connector labeled ETH2 on the first A4I board. See Appendix E.

**Note:** Connector TB2 was used for the serial communications link from the old AICB to the old EAAI assembly and is no longer required.

6. Install the cable clamp(s) used to hold the power and Ethernet cable assembly in the locations as shown. One clamp for the -ST (refer to Figure 7) and two clamps for the -QT (refer to Figure 8). The clamps are installed so that the top edge of the clamp is 1 1/2" down from the housing flange on the -ST housing, and 5 1/2" down on the -QT housing.

#### **Proper Installation Steps:**

**Surface Preparation** – For rubber and acrylic based foam tape, a mixture of water and isopropyl may be used on most surfaces. Ensure the area is dry before applying the mount.

**Installing the Mount** – For proper installation of adhesive backed mounts with foam tape, remove the release liner from the foam adhesive. Without touching the adhesive, place the mount in the proper location. Apply firm pressure for five seconds to the foam tape mount to ensure proper adhesion. The dwell time for rubber-based adhesive foam tape is two hours.

7. Install the Ethernet jumper and power cable that will be used to connect the new display module identified as the HMI assembly as shown in Appendix E from the A4M board assembly. Plug the supplied Ethernet jumper cable into RJ-45 connector ETH2 on the A4M board. The other end of this jumper cable will plug into the RJ-45 connector on the back of the display. Connect the supplied twisted pair power cable (red wire) to TBE4 terminal 10, or 11 or 12 and the common (black wire) to TBE4 terminal 13 or 14 or 15; refer to Figure 6.
8. Connect the other end of the twisted pair power cable from the A4M to the connector identified as CN4 +24VDC (red) to CN4 Terminal 1; Common (black) to CN4 terminal 2 or 3. (Refer to Figure 5.)
9. Connect the Intrinsic safety ground wire (Green wire) ring terminal from the front cover to the selected board assembly mounting screw to establish a ground connection to the back housing. See Figure 7 for the -ST housing location, and Figure 8 for the -QT location. Remove the captive mounting screw to place the ring terminal.
10. Route and secure the Ethernet jumper and power cables as shown in Figure 5.

11. Grease exposed metal on mating surfaces of cover flange with petroleum jelly or Guidant grease (P/N 644886401) before reattachment of the cover to the housing. Close the front cover and follow the bolt torquing sequence shown in Figure 9 for ALIV-ST or Figure 10 for ALIV-QT, to secure the front cover to the rear housing using the new 8 mm cap screws provided in the upgrade kit.

Note the locations for the two longer bolts used for the security seal wire.

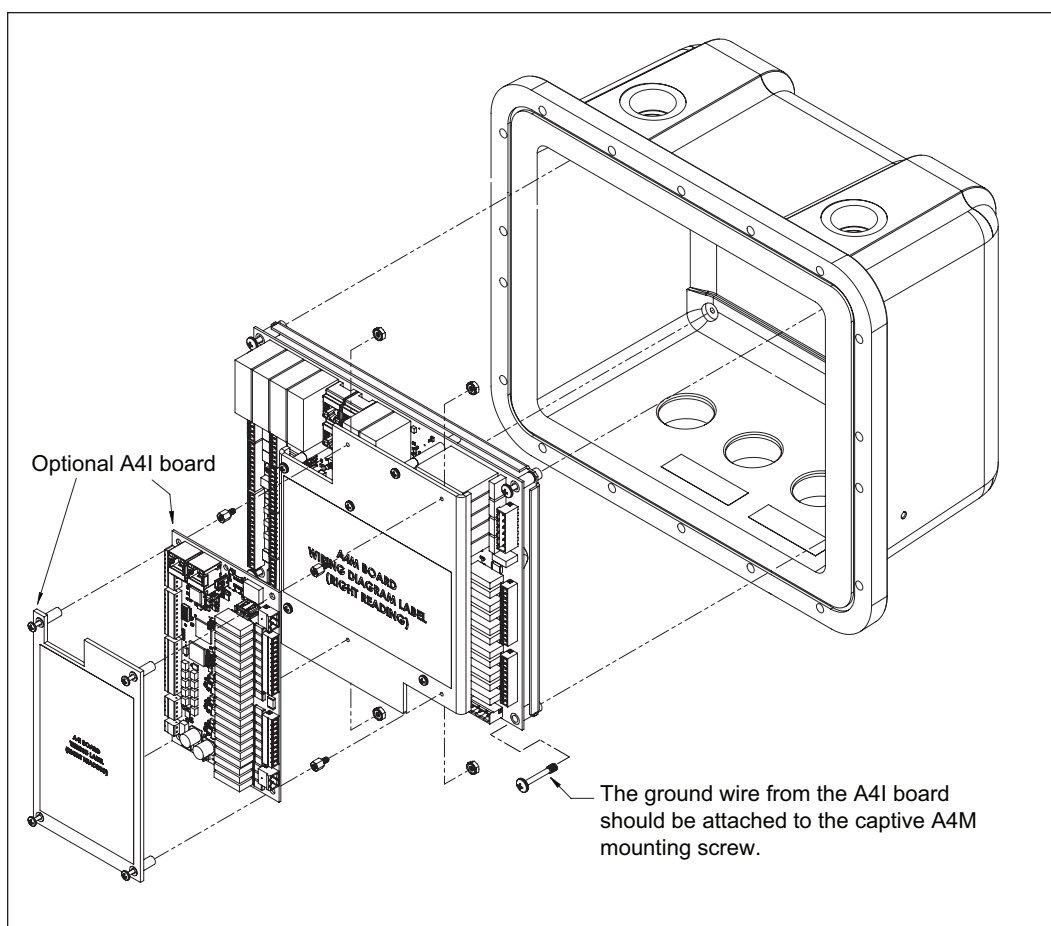
Final torque bolts to 20 FT-LB / 240 IN-LB (27.1 Nm / 276.4 Kg.cm.

**Warning:** To maintain hazardous location protection, the cover to enclosure joint “gap” must be verified with a 0.0015" (0.04mm) 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 9 for example.

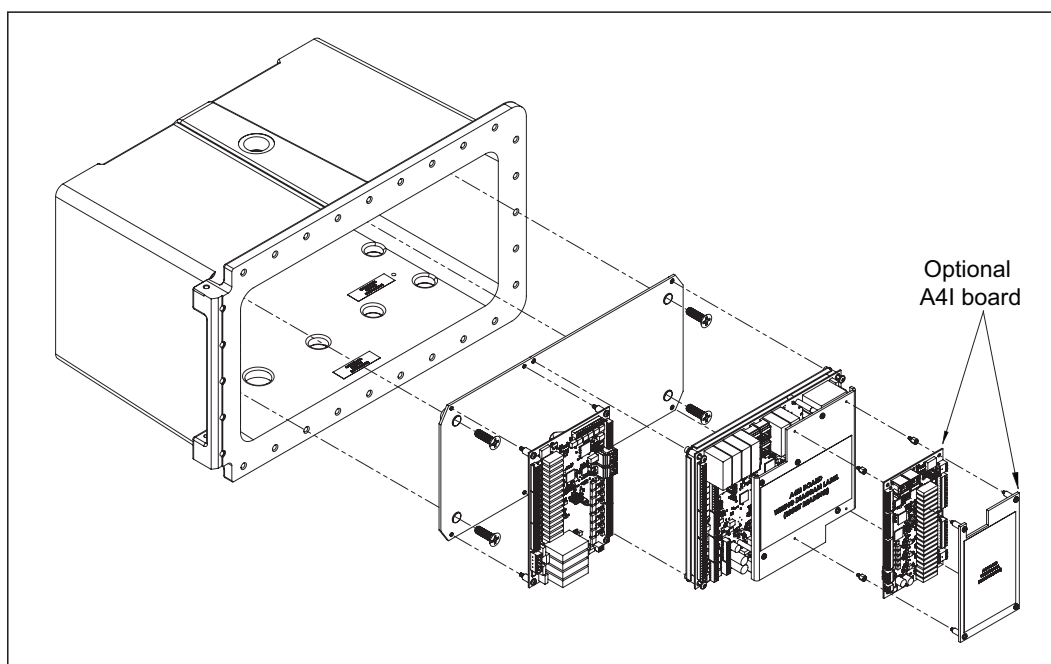
12. Apply power to the unit and follow the steps outlined in Appendix B to restore the configuration.

**Caution:** If this step is to be performed prior to the installation of the cover bolts in the previous step (i.e. restoring the hazardous locations protection) it is imperative that the area is known to be non-hazardous, or a valid hot work permit is issued by the authority in charge of the facility.

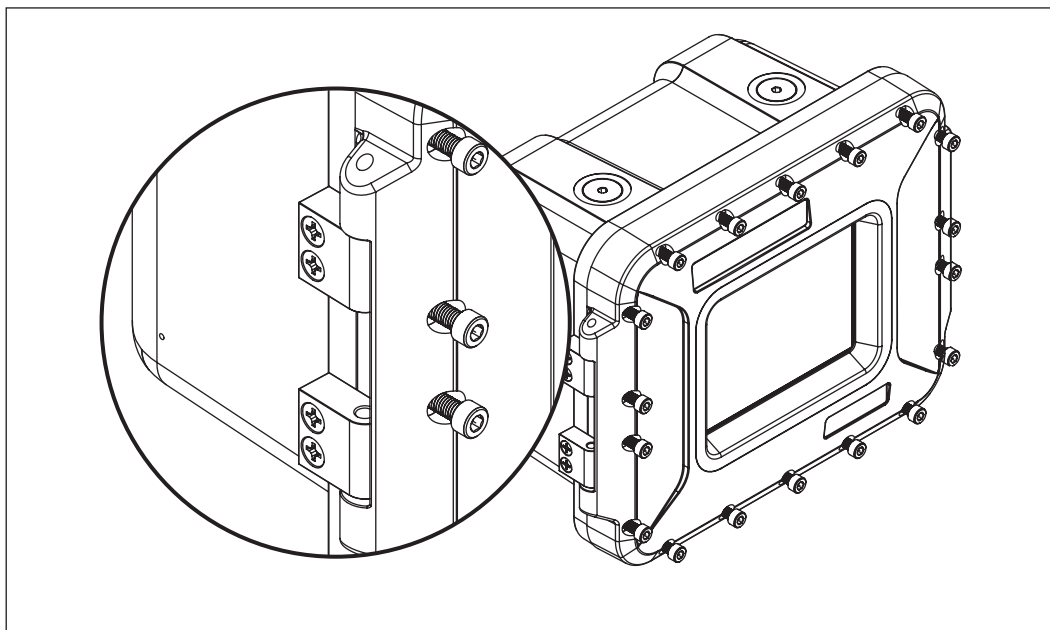
## Diagrams



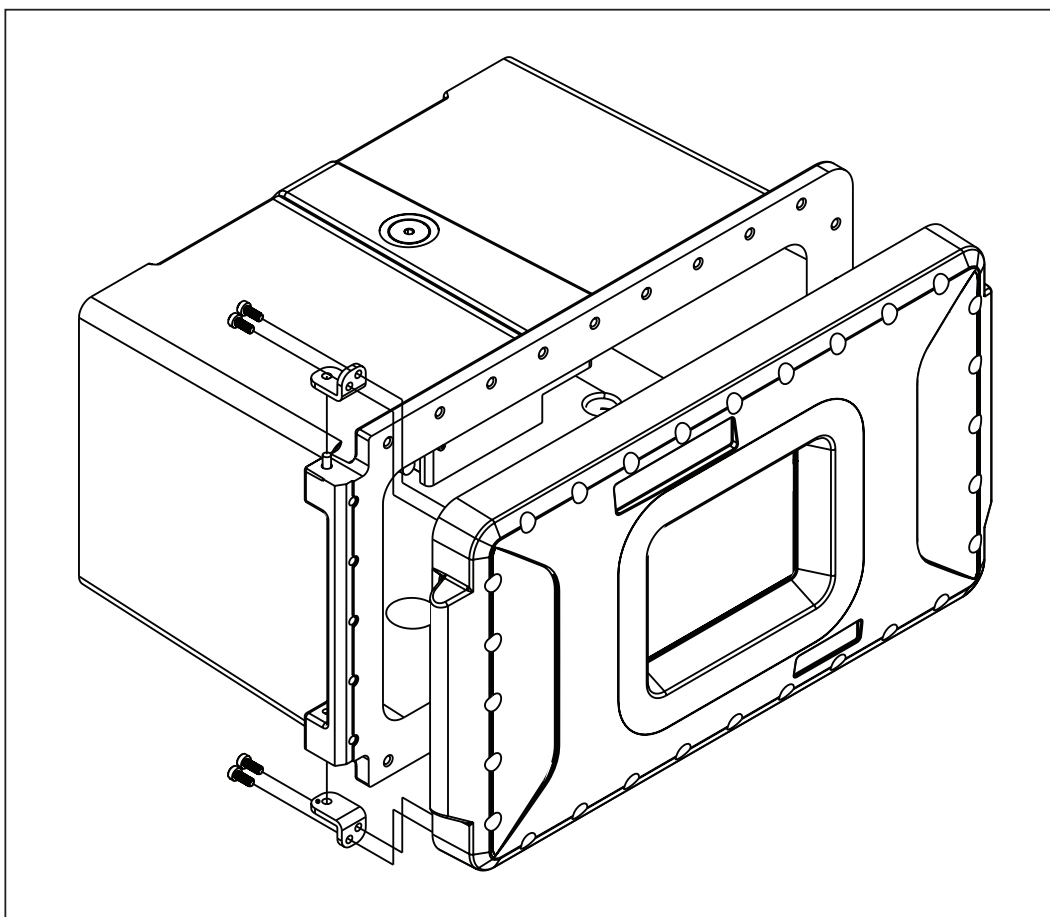
**Figure 1** – ALIV-ST board placement



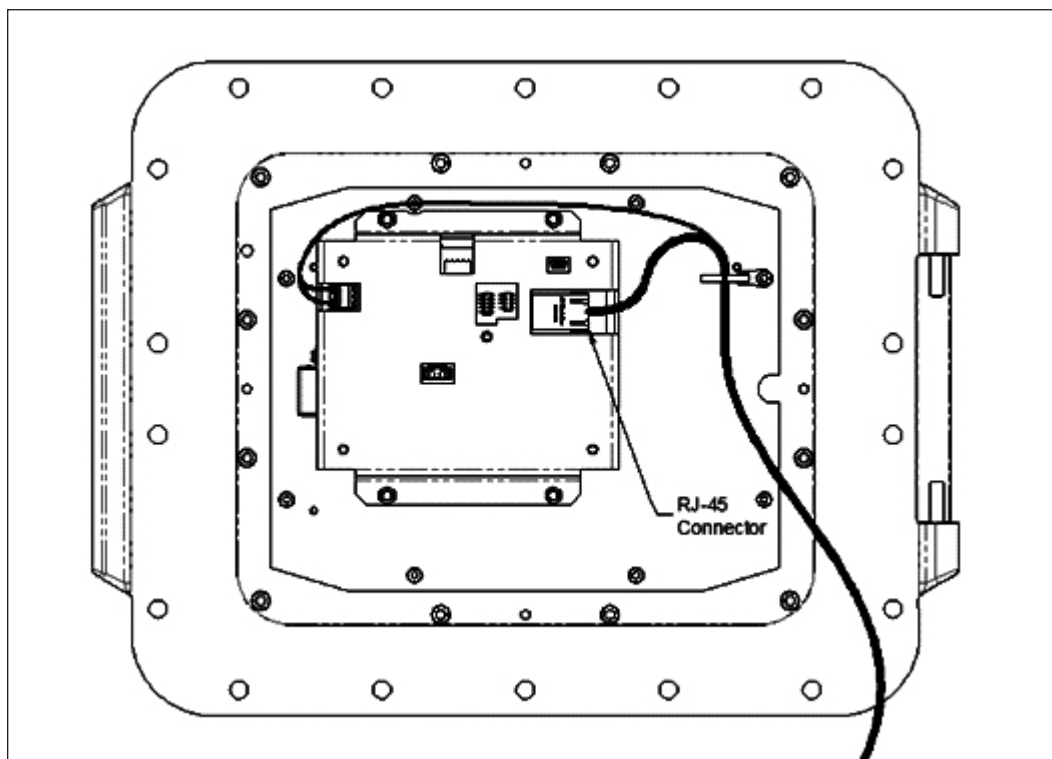
**Figure 2** – ALIV-QT board placement



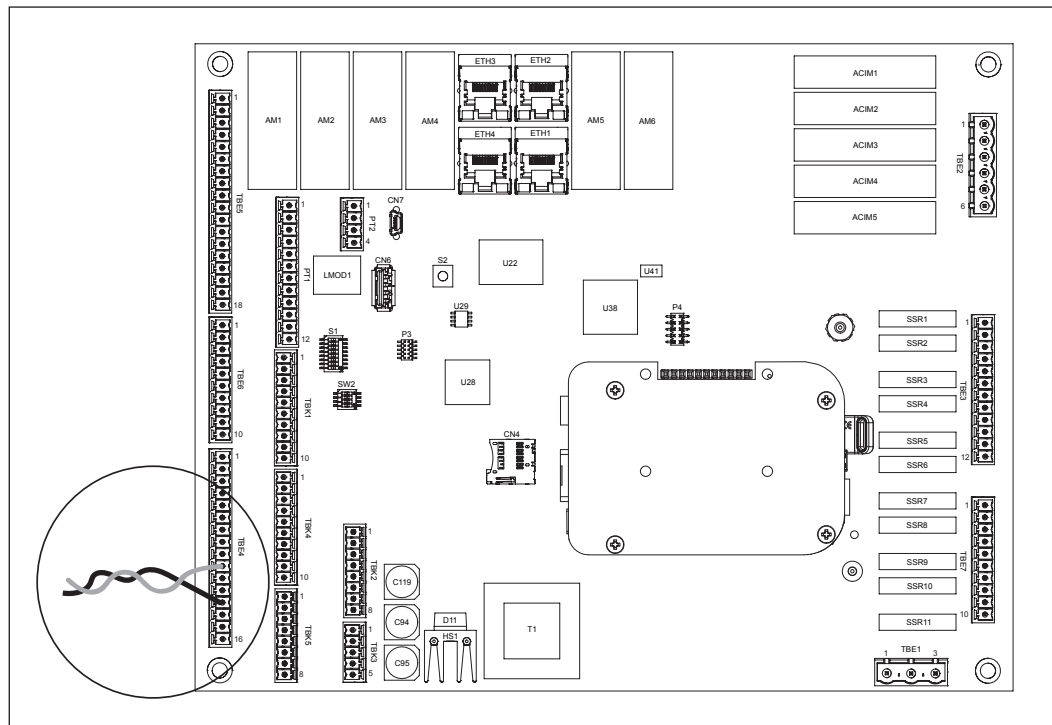
**Figure 3** – ALIV-ST hinge bolt location



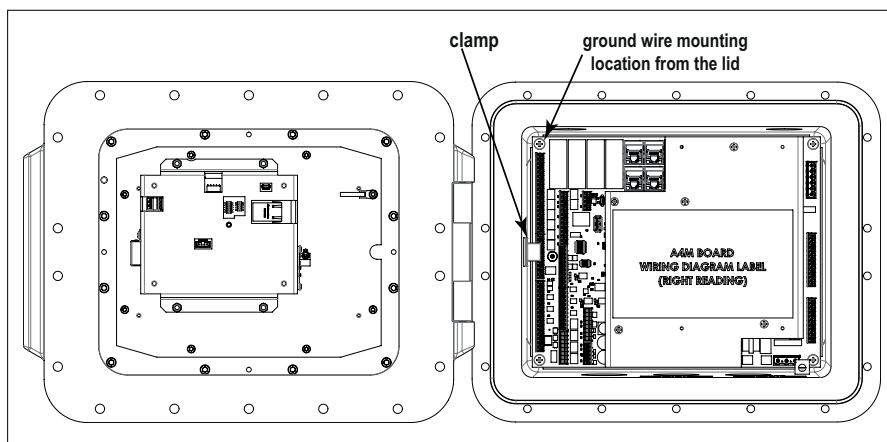
**Figure 4** – ALIV-QT hinge bolt location



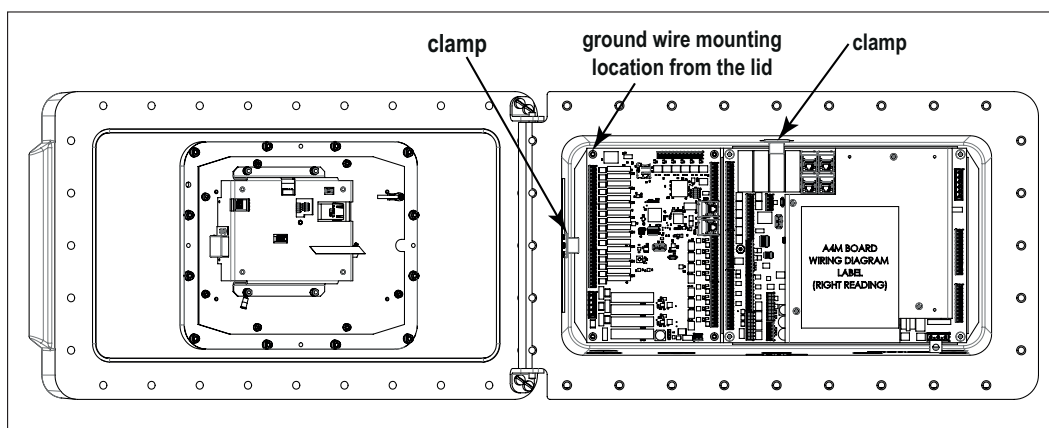
**Figure 5** – Display Ethernet port location (ALIV-ST Shown)



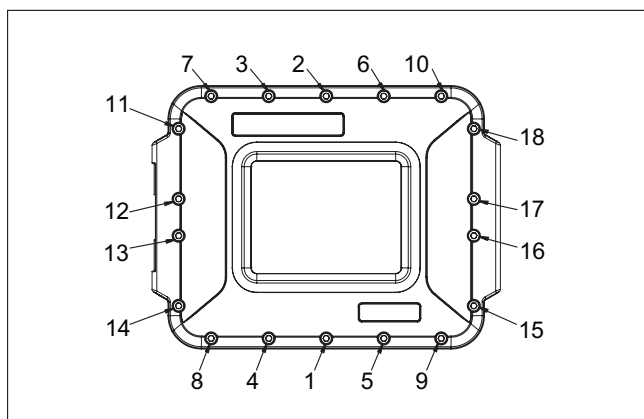
**Figure 6** – Power connection for HMI



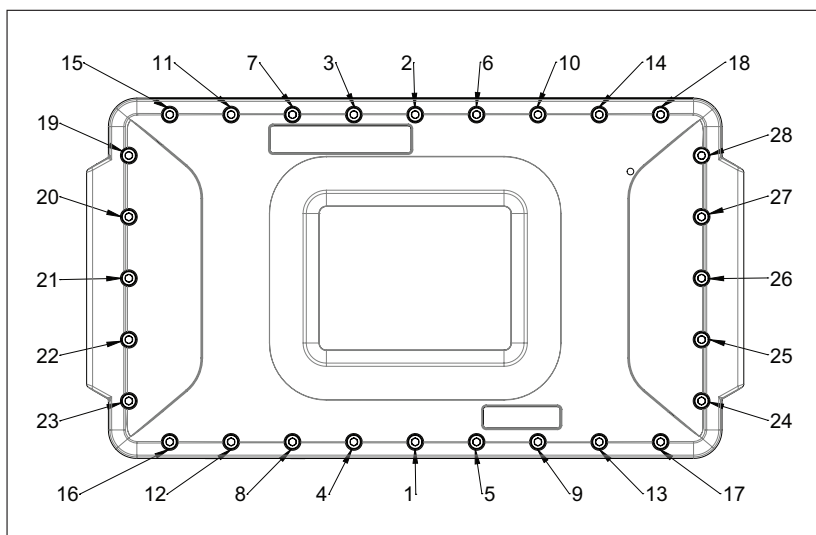
**Figure 7** – ALIV-ST clamp location



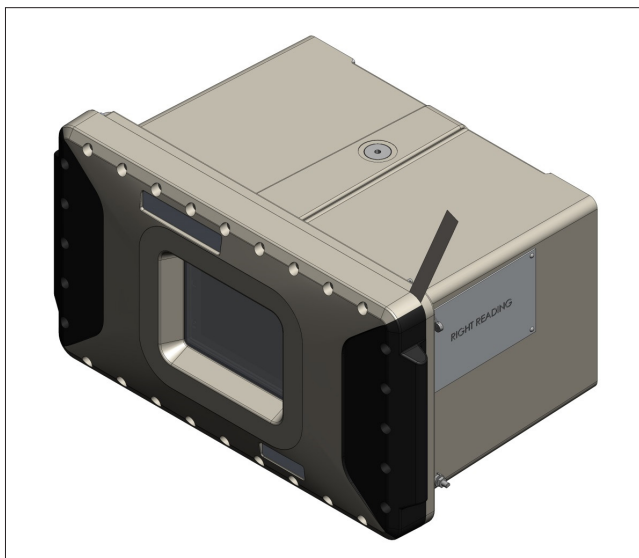
**Figure 8** – ALIV-QT clamp locations



**Figure 9** – Cover bolt torque pattern for AccuLoad IV-ST



**Figure 10** – Cover bolt torque pattern for AccuLoad IV-QT



**Figure 11** – Feeler gauge test of cover flame path joint, inspect joint around the complete perimeter using a 0.0015" (0.0381 mm) feeler gauge. (ALIV-QT shown - use the same procedure for ALIV-ST)



## ***Appendix A – Saving the Data in the AccuLoad III***

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The AccuLoad III KDC board contains permanently stored data which may be of value. The AccuMate of the same revision as the AccuLoad III is used to collect this data and save it on a PC. For detailed information regarding the operation of the AccuMate program, refer to AccuMate for AccuLoad III-X I/O Manual, [MN06136](#) available at [info.smithmeter.com/literature/accuload\\_manuals.htm](http://info.smithmeter.com/literature/accuload_manuals.htm) and the AccuMate software is available on our website. The following is a list of the items which make up the complete dataset from an AccuLoad III. At a minimum, the configuration should be saved. The remaining items are optional and in some cases are un-used.

- Read the complete configuration by selecting Edit->Read All from the toolbar drop down menu. Once the configuration data has been read, save it to a file using File->Save As.
- Read and save non-resettable totals: Tools->Retrieve Nonresettables.
- Read the transaction log to a file. Tools->Transaction Log to File. Note the current transaction number.
- Read the Event log: Tools->Event Log to File.
- Read the Audit Trail log: Tools->Audit Log to File.
- Read the custom BOL definition file by opening a new report file: File->New->Report Configuration. Then Edit->Read Report from AccuLoad III.
- Read the Equation Set file: File->New->Equation Set. Then Edit->Read Equations from AccuLoad III.
- Read the Translation Definition file: File->New->Translation. Then Edit->Read all Translation Entries from AccuLoad III.
- Read the Driver Database file: File->New->Driver Database. Then Edit->Read All from AccuLoad III.

## ***Appendix B – Transferring AccuLoad III Data to AccuLoad IV***

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The AccuLoad III configuration saved as described in Appendix A can be transferred to the AccuLoad IV using the AccuMate for AccuLoad IV available on our website once the hardware portion of the upgrade is complete. Install the AccuMate for AccuLoad IV software, connect the PC and AccuLoad to the same network, apply power to the AccuLoad and establish communications between the PC running AccuMate and the AccuLoad. Refer to the AccuMate for AccuLoad IV I/O Manual for detailed information on the AccuMate program.

From the File menu browse to the folder where the AccuLoad III configuration file was saved (By default in Win 7 it is in C:\Windows\Program Files\). Opening the file will automatically update the file to ALIV format. Download the updated file to the AccuLoad.

Repeat the above step to update and download any:

- Report definition files
- Translation file
- Equations
- Driver database file

## Appendix C – Upgrade Kit Parts

### Model ALIV-ST

	Part Number	General Description
1	P8000011029	A4M Board Assembly
1	P8000012105	Kit – AL-IV ST Cover (8.4" Touch Display)
1	P8000013185	Label – AL3 to AL4 Single Upgrade,

### Optional Items

AccuLoad IV A4M Analog Module Options		
	Part Number	General Description
0	235562101	RTDI Module – PT 100 Resistance Input
0	235553101	CRI Module – 4-20 mA Current Input
0	235565101	CRO Module – 4-20 mA Current Output
0	235559101	VTI Module – 1-5 VDC Input
0	235568101	VTO Module – 1-5VDC Output
Optional A4I Board Kit (and additional components):		
0	P8000011055	AccuLoad IV Single A4I Board Option/Install
0	P8000012789	Ethernet Cable, CAT5e, Blue, 1 foot : Used for A4I

### Model ALIV-QT

	Part Number	General Description
0	P8000008449	AccuLoad III - IV Upgrade (Q-box)
1	P8000010099	A4B Board
1	P8000011029	A4M Board Assembly
1	P8000011394	AL-IV A4B Board Wiring Diagram Label
1	P8000012113	AccuLoad IV QT Cover Kit
1	P8000012789	Ethernet Cable, CAT5e, Blue, 1 foot
1	P8000013186	Label - AL3 to AL4 Quad Upgrade, Cert. of Conformance

### Optional Items

AccuLoad IV A4M Analog Module Options		
	Part Number	General Description
0	235562101	RTDI Module – PT 100 Resistance Input
0	235553101	CRI Module – 4-20 mA Current Input
0	235565101	CRO Module – 4-20 mA Current Output
0	235559101	VTI Module – 1-5 VDC Input
0	235568101	VTO Module – 1-5VDC Output
Optional A4I Board Kit (and additional components):		
0	P8000011055	AccuLoad IV Single A4I Board Option/Install
0	P8000012789	Ethernet Cable, CAT5e, Blue, 1 foot : Used for A4I

## Appendix D Meter Input Wiring Modification Matrix – AccuLoad IV-QT

### Notes:

Differences between the AccuLoad III and AccuLoad IV connections are shown BOLD and colored blue.

**Pgm** – Indicates a pulse input which is programmable to function as a metered injector or densitometer pulse input.

### Example product meter:

M4A – Meter 4 channel A

M5B – Meter 5 channel B integrity

6 Product Meters (AccuLoad IV-QT Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	M3A	Pgm	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	<b>M2A</b>	<b>M2B</b>	<b>M3A</b>	M3B	Pgm	Pgm
Dual/Integrity		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	<b>A 4 B</b>	In #9	In #10	In #11	In #12	In #13	In #14		
Single Pulse		M4A	M5A	M6A	Pgm	Pgm	Pgm		
Dual Pulse		M4A	M4B	<b>M5A</b>	<b>M5B</b>	<b>M6A</b>	M6B		
Dual/Integrity		N/A	N/A	N/A	N/A	N/A	N/A		

5 Product Meters (AccuLoad IV-QT Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	M3A	Pgm	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	<b>M2A</b>	<b>M2B</b>	<b>M3A</b>	M3B	Pgm	Pgm
Dual/Integrity		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	<b>A 4 B</b>	In #9	In #10	In #11	In #12	In #13	In #14		
Single Pulse		M4A	M5A	M6A	Pgm	Pgm	Pgm		
Dual Pulse		M4A	M4B	<b>M5A</b>	<b>M5B</b>	<b>Pgm</b>	Pgm		
Dual/Integrity		N/A	N/A	N/A	N/A	N/A	N/A		

4 Product Meters (AccuLoad IV-QT Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	Pgm	Pgm	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	<b>M2A</b>	<b>M2B</b>	<b>Pgm</b>	Pgm	Pgm	Pgm
Dual/Integrity		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
	<b>A 4 B</b>	In #9	In #10	In #11	In #12	In #13	In #14		
Single Pulse		M3A	M4A	Pgm	Pgm	Pgm	Pgm		
Dual Pulse		M3A	M3B	<b>M4A</b>	<b>M4B</b>	<b>Pgm</b>	Pgm		
Dual/Integrity		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>		

3 Product Meters (AccuLoad IV-QT Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	Pgm	Pgm	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	<b>M2A</b>	<b>M2B</b>	<b>Pgm</b>	Pgm	Pgm	Pgm
Dual/Integrity		M1A	M1B	M1 $\bar{A}$	<b>M1<math>\bar{B}</math></b>	<b>M2A</b>	<b>M2B</b>	<b>M2<math>\bar{A}</math></b>	<b>M2<math>\bar{B}</math></b>
	<b>A 4 B</b>	In #9	In #10	In #11	In #12	In #13	In #14		
Single Pulse		M3A	Pgm	Pgm	Pgm	Pgm	Pgm		
Dual Pulse		M3A	M3B	Pgm	<b>Pgm</b>	<b>Pgm</b>	Pgm		
Dual/Integrity		M3A	M3B	M3 $\bar{A}$	<b>M3<math>\bar{B}</math></b>	Pgm	Pgm		

2 Product Meters (AccuLoad IV-QT Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	Pgm	Pgm	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	<b>M2A</b>	<b>M2B</b>	<b>Pgm</b>	Pgm	Pgm	Pgm
Dual/Integrity		M1A	M1B	M1 $\bar{A}$	<b>M1<math>\bar{B}</math></b>	<b>M2A</b>	<b>M2B</b>	<b>M2<math>\bar{A}</math></b>	<b>M2<math>\bar{B}</math></b>
	<b>A 4 B</b>	In #9	In #10	In #11	In #12	In #13	In #14		
Single Pulse		Pgm	Pgm	Pgm	Pgm	Pgm	Pgm		
Dual Pulse		Pgm	Pgm	Pgm	Pgm	Pgm	Pgm		
Dual/Integrity		Pgm	Pgm	Pgm	Pgm	Pgm	Pgm		

1 Product Meters (AccuLoad IV-QT Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	<b>Pgm</b>	Pgm	Pgm	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	<b>Pgm</b>	Pgm	Pgm	Pgm	Pgm	Pgm
Dual/Integrity		M1A	M1B	M1 $\bar{A}$	<b>M1<math>\bar{B}</math></b>	Pgm	Pgm	Pgm	Pgm
	<b>A 4 B</b>	In #9	In #10	In #11	In #12	In #13	In #14		
Single Pulse		Pgm	Pgm	Pgm	Pgm	Pgm	Pgm		
Dual Pulse		Pgm	Pgm	Pgm	Pgm	Pgm	Pgm		
Dual/Integrity		Pgm	Pgm	Pgm	Pgm	Pgm	Pgm		

## Appendix E Meter Input Wiring Modification Matrix – AccuLoad IV-ST

6 Product Meters (AccuLoad IV-ST Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	M3A	M4A	M5A	M6A	Pgm	Pgm
Dual Pulse		N/A	N/A	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	N/A	N/A

5 Product Meters (AccuLoad IV-ST Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	M3A	M4A	M5A	Pgm	Pgm	Pgm
Dual Pulse		N/A	N/A	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	N/A	N/A

4 Product Meters (AccuLoad IV-ST Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	M3A	M4A	Pgm	Pgm	Pgm	Pgm
Dual Pulse		<b>M1A</b>	<b>M1B</b>	<b>M2A</b>	<b>M2B</b>	<b>M3A</b>	<b>M3B</b>	<b>M4A</b>	<b>M4B</b>
Dual/Integrity		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3 Product Meters (AccuLoad IV-ST Hardware)									
	<b>A 4 M</b>	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	M3A	Pgm	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	<b>M2A</b>	<b>M2B</b>	<b>M3A</b>	<b>M3B</b>	Pgm	Pgm
Dual/Integrity		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

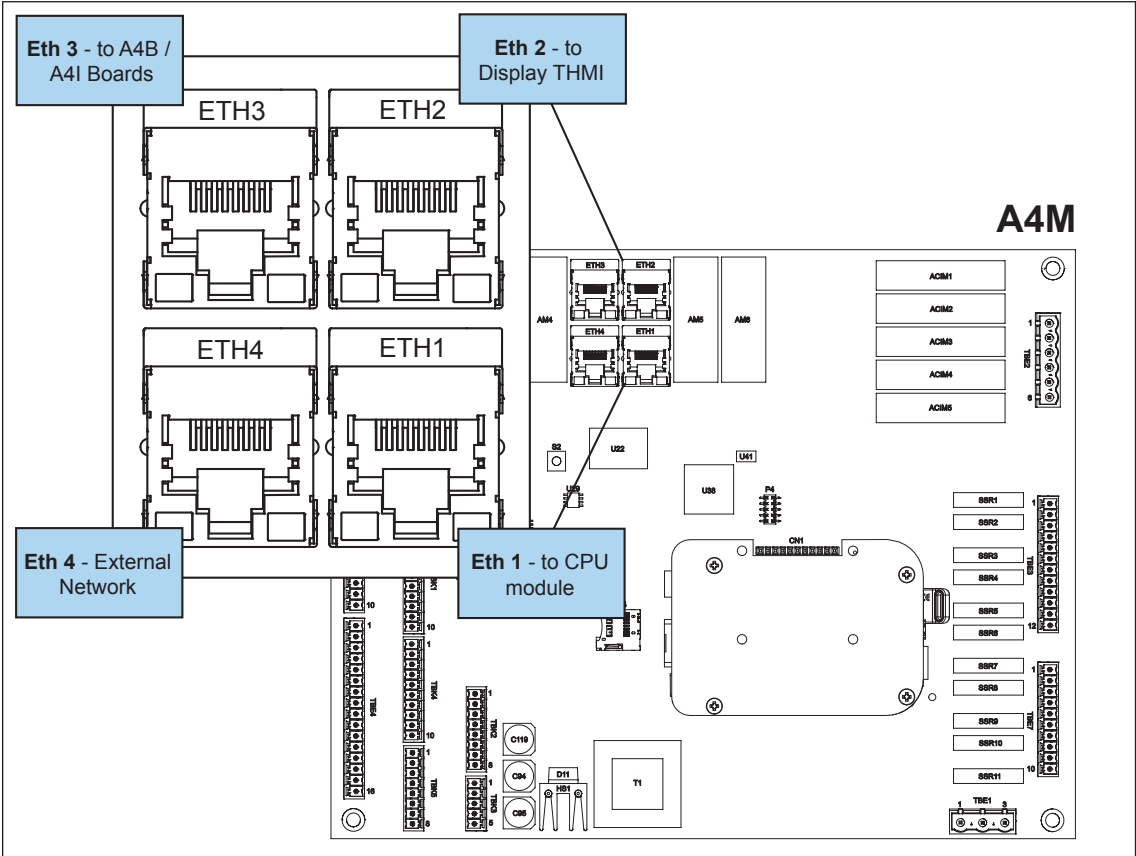
2 Product Meters (AccuLoad IV-ST Hardware)									
	A4M	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	M2A	Pgm	M4A	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	M2A	M2B	Pgm	Pgm	Pgm	Pgm
Dual/Integrity		M1A	M1B	M1Ā	M1B̄	M2B	M2B	M2Ā	M2B̄

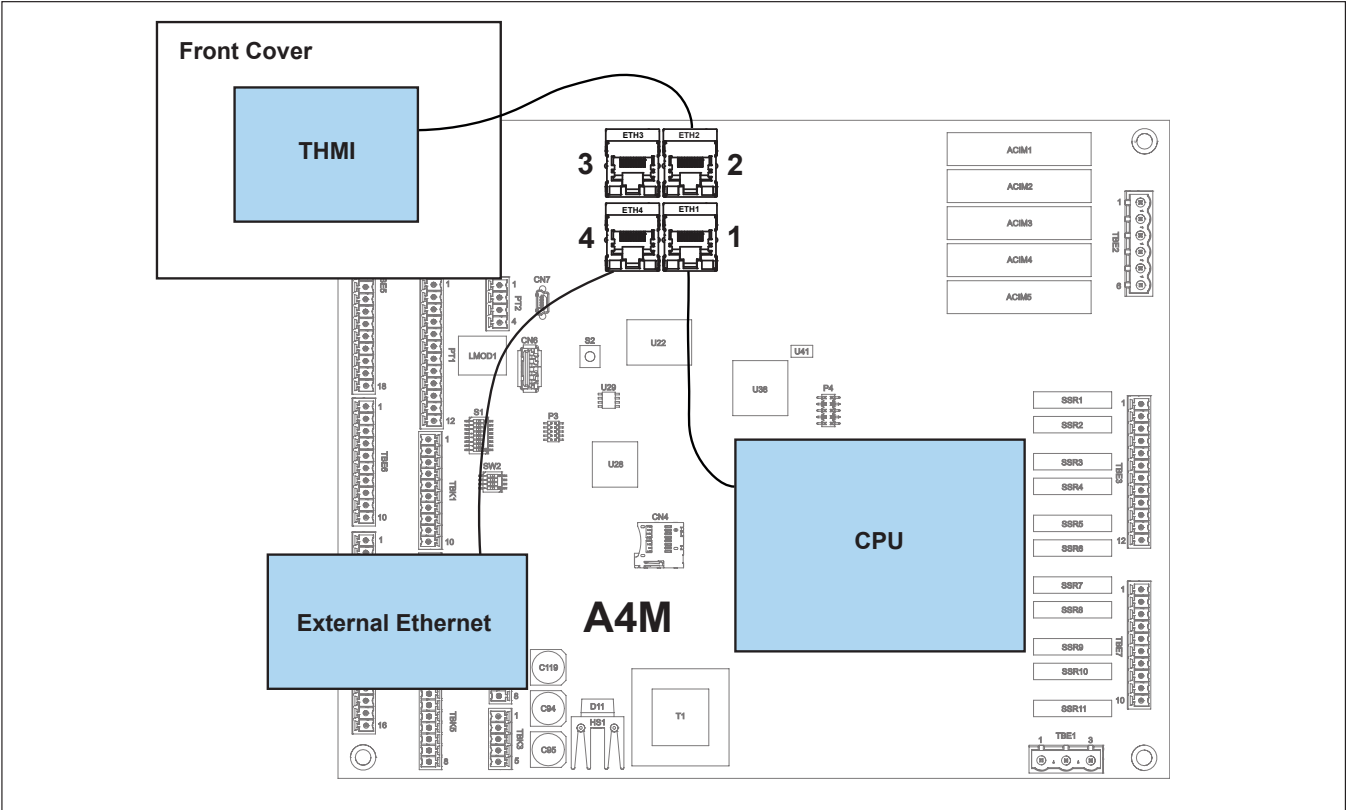
1 Product Meters (AccuLoad IV-ST Hardware)									
	A4M	In #1	In #2	In #3	In #4	In #5	In #6	In #7	In #8
Single Pulse		M1A	Pgm	Pgm	Pgm	Pgm	Pgm	Pgm	Pgm
Dual Pulse		M1A	M1B	Pgm	Pgm	Pgm	Pgm	Pgm	Pgm
Dual/Integrity		M1A	M1B	M1Ā	M1B̄	Pgm	Pgm	Pgm	Pgm

Appendix F – AccuLoad Ethernet Connections

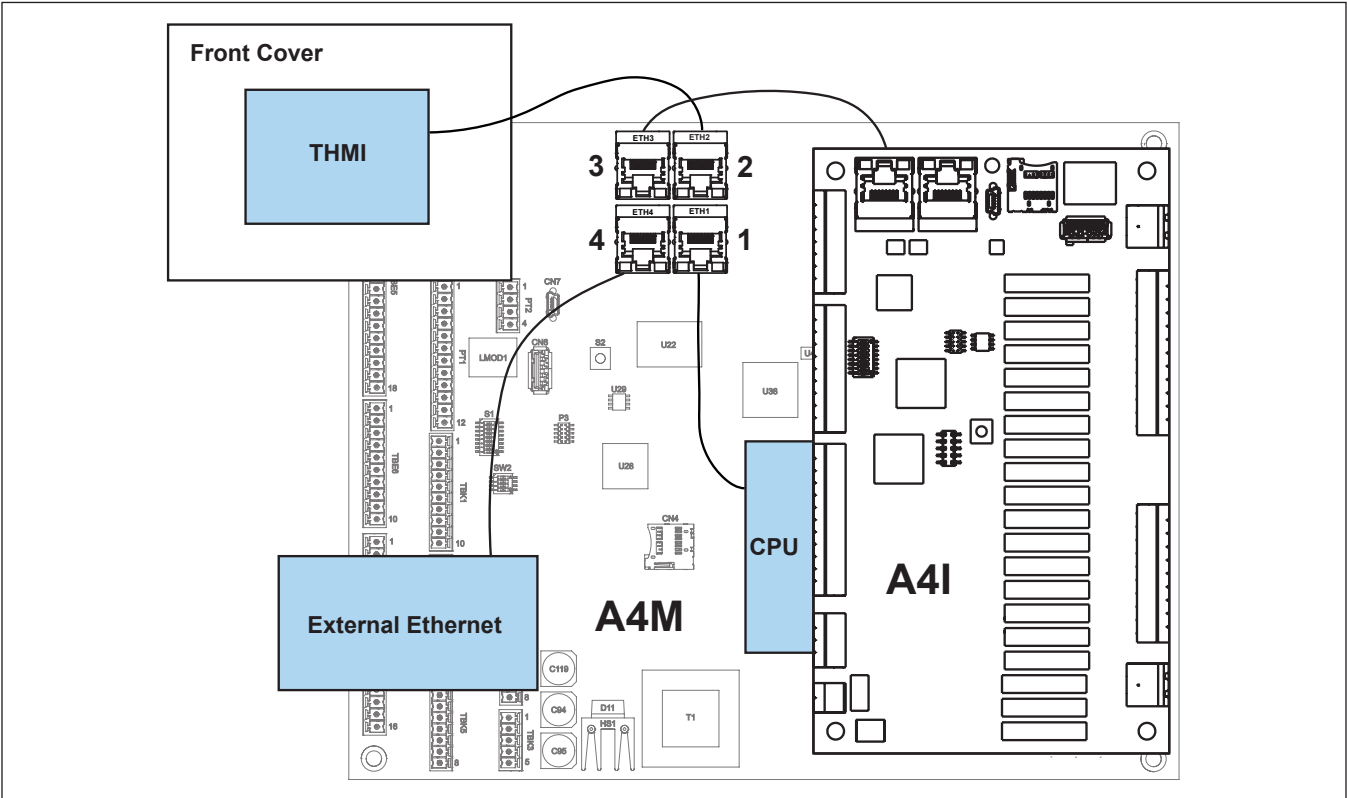
There are four RJ-45 connectors on the A4M board used to connect the separate modules of the AccuLoad and to connect the AccuLoad to an external Ethernet network. The following figures illustrate the correct connections for each of the possible AccuLoad modules.



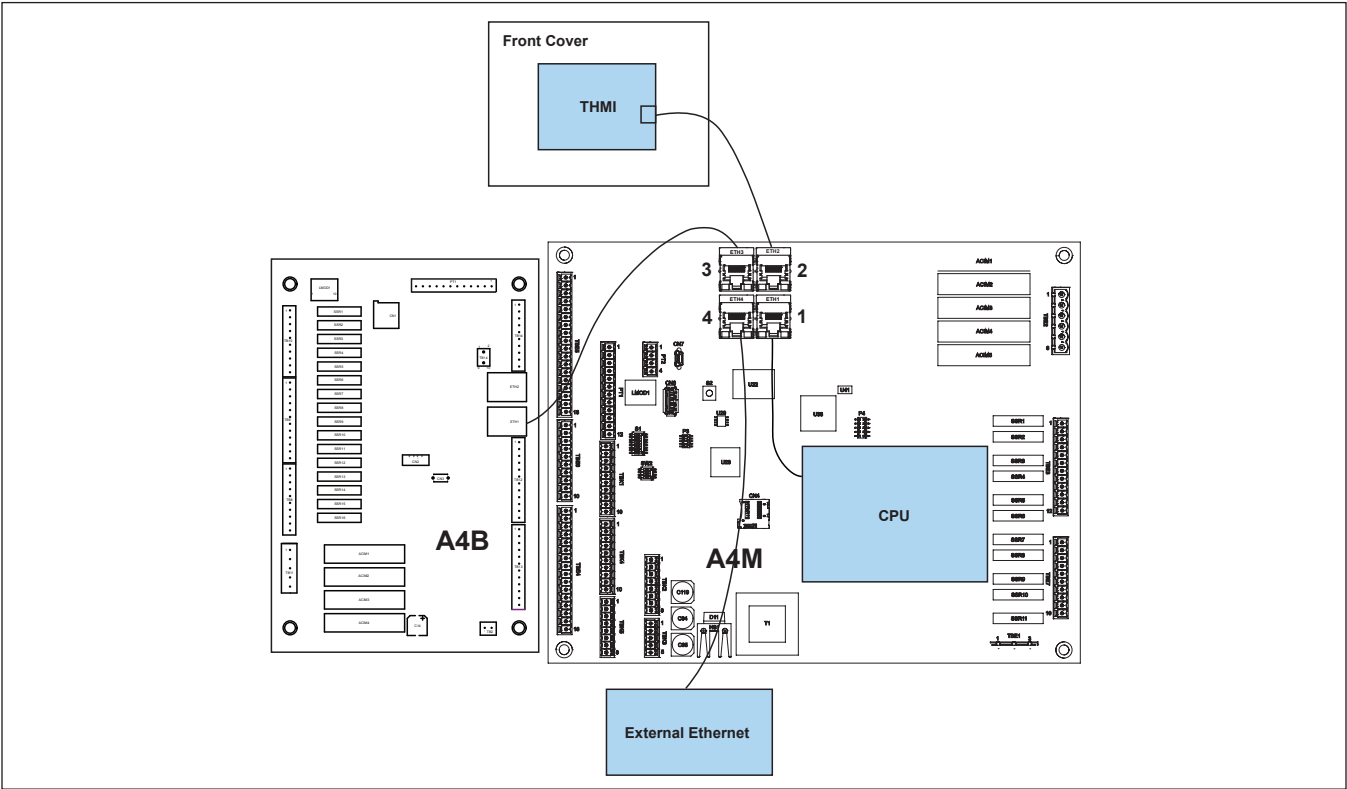
Ethernet connection on A4M



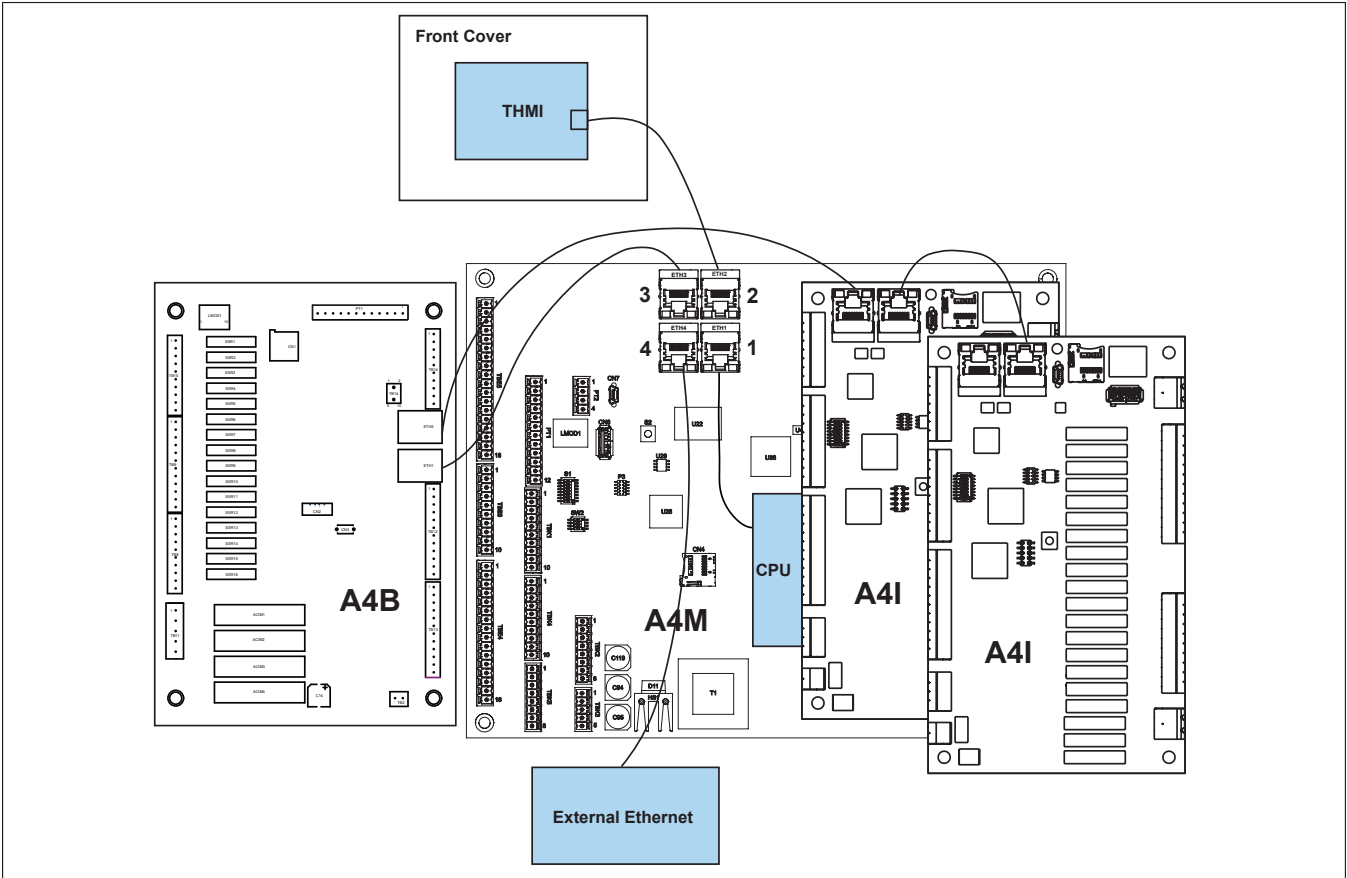
**ALIV-ST without A4I**



**ALIV-ST with A4I**



**ALIV-QT without A4I**



**ALIV-QT with optional A4I(s)**

***Related Publications***

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Modbus Communications ..... Bulletin [MN06131L](#)

Operator Reference.....Bulletin [MN06200](#)

Installation .....Bulletin [MN06201](#)

Smith Communications.....Bulletin [MN06204L](#)

Parts List..... Bulletin [PO06200](#)

Specifications .....Bulletin [SS06200](#)

Calculations .....Bulletin [TP06004](#)

**Technical Support**

Contact Information:  
**Field Service Response Center**  
24/7 Technical Support/Schedule a  
Technician: 1-844-203-4014  
System Installation Supervision,  
Start-Up, Commissioning Services,  
and Training Available

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

USA Operation  
1602 Wagner Avenue  
Erie, Pennsylvania 16510 USA  
P:+1 814.898.5000

Germany Operation  
Smith Meter GmbH  
Regentstrasse 1  
25474 Ellerbek, Germany  
P:+49 4101 304.0