Installation Manual
00825-0100-1600, Rev AE
July 2024

Micro Motion™ 1600 Ethernet Transmitters

Ethernet Installation

MICRO MOTION™

EMERSON™

Safety messages

Safety messages are provided throughout this manual to protect personnel and equipment. Read each safety message carefully before proceeding to the next step.

Safety and approval information

This Micro Motion product complies with all applicable European directives when properly installed in accordance with the instructions in this manual. Refer to the EU Declaration of Conformity for directives that apply to this product. The following are available: the EU Declaration of Conformity, with all applicable European directives, and the complete ATEX installation drawings and instructions. In addition, the IECEx installation instructions for installations outside of the European Union and the CSA installation instructions for installations in North America are available at Emerson.com or through your local Micro Motion support center.

Other information

Troubleshooting information can be found in the appropriate Configuration and Use Manual. Product Data Sheets and Manuals are available from the Micro Motion website at Emerson.com.

Return policy

Follow Emerson procedures when returning equipment. These procedures ensure legal compliance with government transportation agencies and help provide a safe working environment for Emerson employees. If you fail to follow Emerson procedures, then Emerson will not accept your returned equipment.

Return procedures and forms are available on our web support site at Emerson.com, or by calling the Micro Motion Customer Service department.

Contents

1 Before you begin

1.1 About this document

This manual provides information on planning, mounting, wiring, and initial setup of the Micro Motion transmitter. For information on full configuration, maintenance, troubleshooting, or service of the transmitter, see the appropriate configuration and use manual.

The information in this document assumes that users understand basic transmitter and sensor installation, configuration, and maintenance concepts and procedures.

1.2 Hazard messages

This document uses the following criteria for hazard messages based on ANSI standards Z535.6-2011 (R2017).

DANGER
Serious injury or death will occur if a hazardous situation is not avoided.

WARNING
Serious injury or death could occur if a hazardous situation is not avoided.

CAUTION
Minor or moderate injury will or could occur if a hazardous situation is not avoided.

NOTICE
Data loss, property damage, hardware damage, or software damage can occur if a situation is not avoided. There is no credible risk of physical injury.

Physical access

WARNING
Unauthorized personnel can potentially cause significant damage and/or misconfiguration of end users' equipment. Protect against all intentional or unintentional unauthorized use.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access to protect users' assets. This is true for all systems used within the facility.

1.3 Related documentation

You can find all product documentation on the product documentation DVD shipped with the product or at Emerson.com.

See any of the following documents for more information:

- Micro Motion 1600 Transmitters Product Data Sheet
- Micro Motion 1600 with Ethernet Transmitter Configuration and Use Manual
- Micro Motion 1600 Transmitters EtherNet/IP Rockwell RSLogix Guide
- Sensor installation manual

2 Planning

2.1 Installation checklist

☐ If possible, install the transmitter in a location that will prevent direct exposure to sunlight. The environmental limits for the transmitter may be further restricted by hazardous area approvals.

WARNING
If you plan to mount the transmitter in a hazardous area:

- Verify that the transmitter has the appropriate hazardous area approval. Each transmitter has a hazardous area approval tag attached to the transmitter housing.
- Ensure that any cable used between the transmitter and the sensor meets the hazardous area requirements.
- For all hazardous area installations, you must strictly adhere to the safety instructions documented in the ATEX/IECEx and CSA approvals documentation available on the product documentation DVD shipped with the product or at Emerson.com/flowmeasurement, and /or with requirements specified by the local Authority Having Jurisdiction (AHJ) over the installation.

☐ Verify that you have the appropriate cable and required cable installation parts for your installation. For wiring between the transmitter and sensor, verify the maximum cable length does not exceed 1,000 ft (305 m). For installations with Smart Meter Verification, the maximum is 60 ft (18.28 m).

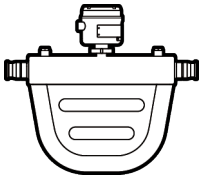
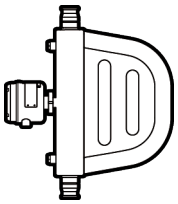
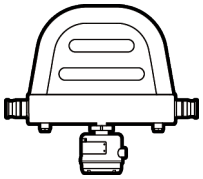
☐ Ensure that you use the following cables for the different connections:
- A twisted-pair instrument cable for the Channel B I/O connection
- A suitable shielded or unshielded Cat5e or a higher-rated instrumentation cable for the Ethernet connections to connect the meter(1)

Note
If the transmitter is powered by the PoE connection, use shielded Cat5e cables to meet the requirements of NAMUR NE-21.

Note
The instrumentation cable should have an overall screen to cover all cores. Where permissible, connect the overall screen to earth at the host end (360° bonded).

☐ You can mount the transmitter in any orientation as long as the conduit openings do not point upward.
Installing the transmitter with the conduit openings facing upward risks condensation moisture entering the transmitter housing, which could damage the transmitter.
Following are examples of possible orientations for the transmitter:

(1) Connections must meet the EC Directive for Electromagnetic Compatibility (EMC).

Preferred orientation	Alternate orientations	
		

- ☐ Any fittings, adapters, or blanking elements used on either conduit entries or threaded joints that are a part of flame-proof joints must comply with the requirements of EN/IEC 60079-1 & 60079-14 or CSA C22.2 No 30 & UL 1203 for Europe/International and North America respectively.
  Only qualified personnel can select and install these elements in accordance with EN/IEC 60079-14 for ATEX/IECEx or to National Electrical Code (NEC)/Canadian Electrical Code (CEC) for North America.

- ☐ To prevent conduit connectors from seizing in the threads of the conduit openings, apply a conductive anti-galling compound to the threads.
  Any anti-galling compound used on Flamepath threads must comply with the requirements of EN/IEC 60079-1 & 60079-14 or CSA C22.2 No 30 & UL 1203 for Europe/International and North America respectively.

- ☐ To maintain the Ingress protection thread sealant, a sealing washer or O-ring must be applied.
  - For Zone 1 applications, thread sealant must also comply with the requirements of EN/IEC 60079-14 and thus must be non-setting, non-metallic, non-combustible, and maintain earthing between the equipment and conduit.
  - For Class I, Groups A, B, C, and D applications thread sealant must also comply with the requirements of UL 1203/CSA C22.2 No. 30.

  Ensure any selected thread sealant is acceptable with your local jurisdictional authority.
  Review this information before performing the tasks in Wiring the channels.

- ☐ Mount the meter in a location and orientation that satisfies the following conditions:
  - Allows sufficient clearance to open the transmitter housing cover. Install with 8 in (203 mm) to 10 in (254 mm) clearance at the wiring access points.
  - Provides clear access for installing cabling to the transmitter.
  - Provides clear access to all wiring terminals for troubleshooting.

2.2 Additional considerations for retrofitting existing installations

- ☐ The transmitter installation may require 3 in (76 mm) to 6 in (152 mm) of additional wiring for the input/output and power connections. This length would be in addition to the currently installed wiring. Confirm you have the additional wiring necessary for the new installation.

- ☐ Before removing the existing transmitter, be sure to record the configuration data for the currently installed transmitter. At initial startup of the newly installed transmitter, you will be prompted to configure the meter via a guided setup.
  Record the following information (if applicable):

Variable	Setting
Tag	
Mass flow units	
Volume flow units	
Density units	
Temperature units	
Channel configuration	
mA Output (if licensed)	— Power (Internal or External): — Source: — Scaling (LRV, URV): — Fault Action:
Frequency Output (if licensed)	— Power (Internal or External): — Source: — Scaling (Frequency Factor or Flow Rate Factor): — Fault Action: — Fault Frequency:
Discrete Output (if licensed)	— Power (Internal or External): — Source: — Scaling: — Fault Action:
Calibration parameters (for 9-wire installations only)	
Flow calibration factor	FCF (Flow Cal or Flow Calibration Factor):
Density calibration factors	— D1: — D2: — K1: — K2: — TC: — FD:

2.3 Power requirements

The 1600 supports DC power or Power Over Ethernet (POE) through the Channel A Ethernet RJ-45 port.

DC power

- Power range is 18-30 VDC
- Typical power is 3.5 watts
- Maximum power is 8 watts
- Polarity sensitive

POE power

- Power range is 44-57 VDC
- Powered Device (PD) classification is 3

Cable sizing formula

M = 18V + (R x L x 0.5A)

- M: minimum supply voltage
- R: cable resistance (in Ω/ft)
- L: cable length (in ft)

Typical power cable resistance at 68 °F (20.0 °C)

Wire gauge	Resistance
14 AWG	0.0050 Ω/ft
16 AWG	0.0080 Ω/ft
18 AWG	0.0128 Ω/ft
20 AWG	0.0204 Ω/ft
2.5 mm^2	0.0136 Ω/m
1.5 mm^2	0.0228 Ω/m
1.0 mm^2	0.0340 Ω/m
0.75 mm^2	0.0460 Ω/m
0.50 mm^2	0.0680 Ω/m

2.4 1600 transmitters in Ethernet networks

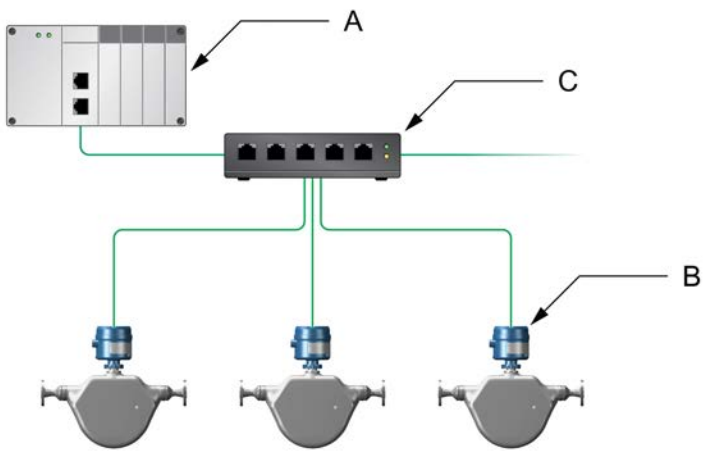
Install the 1600 Ethernet transmitter in a star network using an industrial-rated shielded Ethernet cable.

- Make sure that each cable is no longer than 328 ft (100 m).
- Connect the 1600 Ethernet transmitter to the host system via a LAN (Local Area Network) and not a WAN (Wide Area Network).
- Follow all network security best practices.

2.4.1 Star topology

1600 Ethernet transmitters are installed in a star network.

Figure 2-1: 1600 star network



A. Programmable Logic Controller (PLC)
B. 1600 with Ethernet output
C. External Ethernet switch

3 Mounting and sensor wiring

3.1 Mounting and sensor wiring for integral-mount transmitters

There are no separate mounting requirements for integral transmitters, and there is no need to connect wiring between the transmitter and the sensor.

3.2 Mounting transmitters

There is one option available for mounting 1600 remote transmitters:

- Mount the transmitter to an instrument pole.

3.2.1 Mount the transmitter to a pole

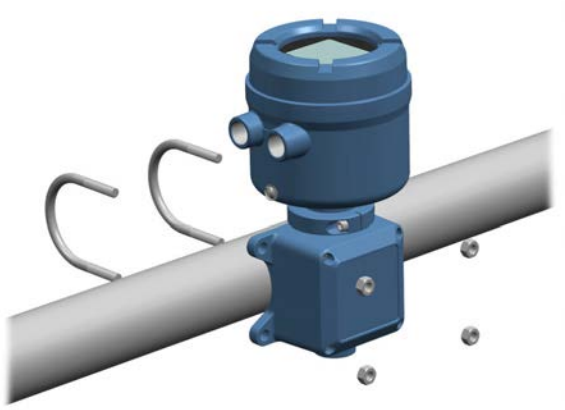
Prerequisites

- Ensure that the instrument pole extends at least 12 in (305 mm) from a rigid base and is no more than 2 in (51 mm) in diameter.
- Confirm that you have the necessary tools, and the instrument-pole mounting kit shipped with the transmitter.

Procedure

For pole-mount installations, fit the U-bolt mounting piece to the instrument pole.

Figure 3-1: Pole-mounting bracket attachment for an aluminum transmitter



3.3 Wire a remote-mount transmitter to the sensor

Use this procedure to wire a 4-wire or 9-wire remote-mount transmitter to the sensor.

Prerequisites

- Prepare the 9-wire cable as described in the *Micro Motion 9-Wire Flow Meter Cable Preparation and Installation Guide*.
- Connect the cable to the sensor-mounted core processor or junction box as described in the sensor documentation. You can access all product documentation on the documentation DVD shipped with the product or at Emerson.com.

Procedure

1. Remove the transmitter-to-sensor wiring compartment cover to reveal the terminal connections.

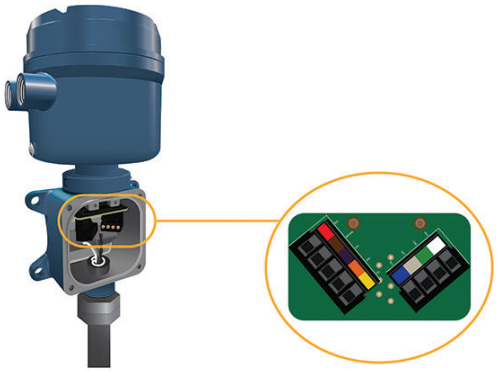
Figure 3-2: Removal of the transmitter-to-sensor wiring compartment cover

2. Feed the sensor wiring cable into the transmitter wiring compartment.

Figure 3-3: Sensor wiring feedthrough

3. Connect the sensor wires to the appropriate terminals.
   - See Figure 3-4 for 9-wire terminal connections.

Figure 3-4: 9-wire transmitter-to-sensor wiring connections



Note
Connect the four drain wires in the 9-wire cable to the ground screw located inside the junction box.

4. Replace the transmitter-to-sensor wiring compartment cover and tighten the screws to 14 in lbf (1.58 N m) to 15 in lbf (1.69 N m).

3.4 Ground the meter components

Prerequisites

NOTICE
Improper grounding could cause inaccurate measurements or meter failure.

WARNING
Improper grounding could result in an explosion causing death or serious injury.

Note
For hazardous area installations in Europe, refer to standard EN 60079-14 or national standards.

If national standards are not in effect, adhere to the following guidelines for grounding:

- Use copper wire, 14 AWG (2.08 mm^2) or larger wire size.
- Keep all ground leads as short as possible, less than 1 Ω impedance.
- Connect ground leads directly to earth, or follow plant standards.

Procedure

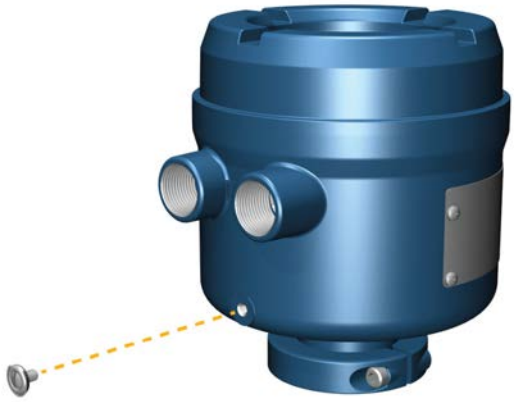
1. Ground the Coriolis sensor according to the instructions in the sensor installation manual.
2. Ground the transmitter according to applicable local standards, using the transmitter's internal or external ground screw.
   - The internal ground screw is located inside the power wiring compartment.

   Figure 3-5: Internal ground screw

   - The earth ground terminal is located inside the power wiring compartment.
   - The external ground screw is located on the outside of the transmitter housing below the transmitter tag.

Figure 3-6: External ground screw



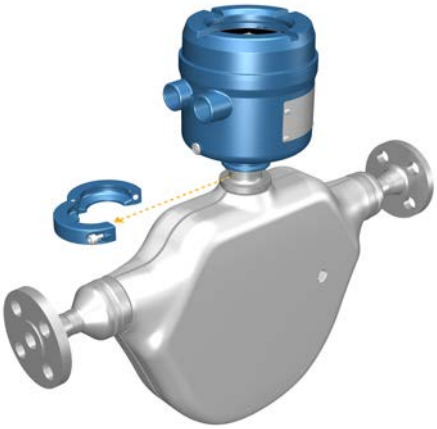
3.5 Rotate the transmitter on the sensor (optional)

In integral installations, you can rotate the transmitter on the sensor up to 360°.

Procedure

1. Using a 4 mm hex key, loosen and remove the clamp securing the transmitter head in place.

Figure 3-7: Removal of the sensor clamp



2. Rotate the transmitter to the desired position.

   You can rotate the transmitter to any of the eight positions, but a stop exists that will not allow a full 360° rotation.

3. Gently lower the transmitter onto the base, confirming that the transmitter is in a locked position.
4. Replace the aluminum clamp in its original position and tighten the cap screw. Torque to 29 in lbf (3.28 N m) to 31 in lbf (3.50 N m).
5. Replace the stainless steel clamp in its original position and tighten the cap screw. Torque to 21 in lbf (2.37 N m) to 23 in lbf (2.60 N m).

3.6 Rotate the transmitter display

Configure the software to rotate the transmitter display 0°, 90°, 180°, or 270°. You cannot physically rotate the display.

Procedure

1. Choose **Menu** → **Configuration** → **Display Settings** → **Rotation**.
2. Select the appropriate direction.

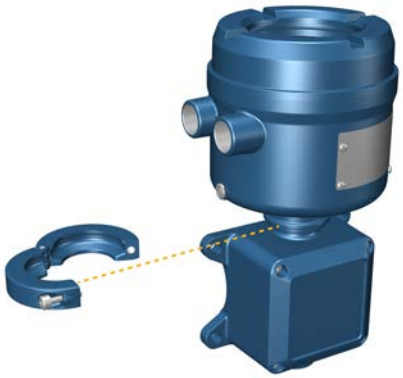
3.7 Rotate the 1600 transmitter housing on a remote-mount transmitter (optional)

In remote-mount installations, you can rotate the 1600 transmitter, but please note that a stop exists that will not allow for full 360 rotation.

Procedure

1. Using a 4 mm hex key, loosen and remove the clamp securing the sensor wiring junction box in place.

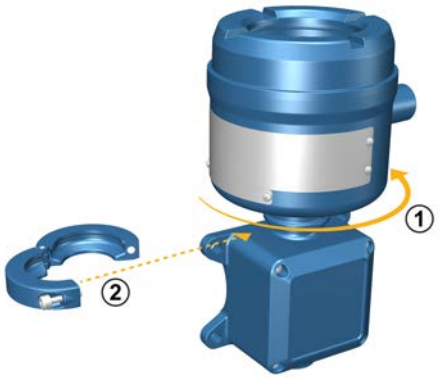
Figure 3-8: Remove the clamp



2. Gently rotate the junction box to the desired position.
3. Gently set the junction box into its new position, confirming that the position is locked.

4. Replace the clamp in its original position and tighten the cap screw. Torque to 29 in lbf (3.28 N m) to 31 in lbf (3.50 N m).

Figure 3-9: Rotate transmitter head and replace clamp



4 Wiring the channels

Note
Before wiring the channels, refer to the ingress wiring guidelines towards the end of Installation checklist.

4.1 Available channels

Signal	Channel A	Channel B
Channel options	EtherNet/IP ProLink III and the Integrated Web server can always be connected to Channel A	mA Output
	Modbus TCP	Frequency Output
		Discrete Output

4.2 Wire the I/O channel

Channel B can be configured as:

- mA Output
- Frequency Output
- Discrete Output

4.2.1 Access the wiring channels

Procedure

Remove the wiring access cover to reveal the I/O wiring terminal block connectors.

4.2.2 Wire the mA Output

Wire the mA Output for nonhazardous installations.

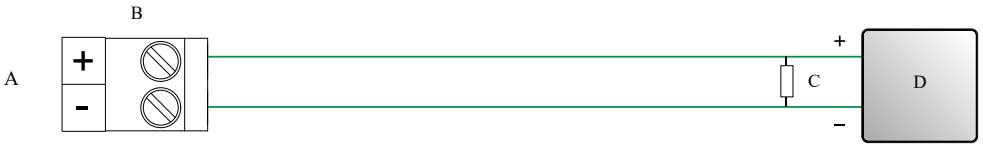
Prerequisites

WARNING
Meter installation and wiring should be performed only by suitably-trained personnel using the appropriate government and corporate safety standards.

Procedure

Wire to the appropriate output terminal and pins.

Figure 4-1: Internally-powered mA Output wiring



A. mA Output
B. Channel B
C. 820 Ω maximum loop resistance

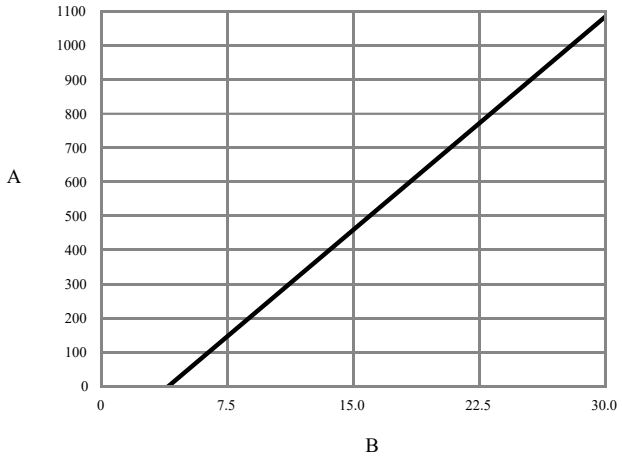
Note
This resistor is normally built into the signal device (d). This resistor is not used for HART® communications.

D. Signal device

Figure 4-2: Externally-powered mA Output wiring

A. mA Output
B. Channel B
C. 5–30 VDC (maximum)
D. See Figure 4-3
E. Signal device

Figure 4-3: Externally-powered mA Output: maximum loop resistance



A. Maximum resistance (Ω)
B. External supply voltage (V)

4.2.3 Wire the Frequency Output

Wire the Frequency Output in nonhazardous installations.

Prerequisites

WARNING
Meter installation and wiring should be performed only by suitably-trained personnel using the appropriate government and corporate safety standards.

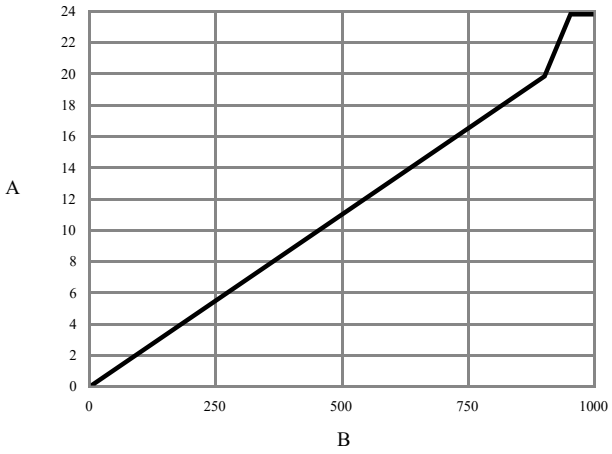
Procedure

Wire to the appropriate output terminal and pins.

Figure 4-4: Internally-powered FO wiring

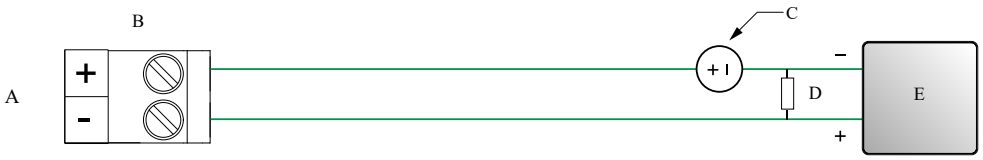
A. Frequency Output
B. Channel B
C. See Figure 4-5
D. Counter

Figure 4-5: Internally-powered FO: output amplitude versus load resistance [24 VDC (Nom) open circuit]



A. Output amplitude (V)
B. Load resistor (Ω)

Figure 4-6: Externally-powered FO wiring



A. Frequency Output
B. Channel B
C. 5–30 VDC (maximum)
D. 500 mA current (maximum)
E. Counter

4.2.4 Wire the Discrete Output

Wire the Discrete Output in nonhazardous installations.

Prerequisites

WARNING
Meter installation and wiring should be performed only by suitably-trained personnel using the appropriate government and corporate safety standards.

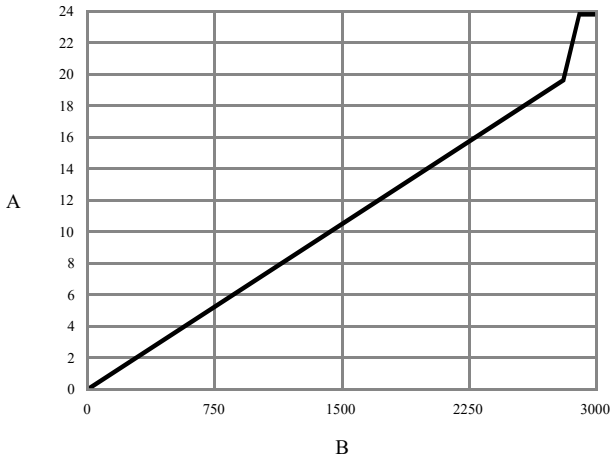
Procedure

Wire to the appropriate output terminal and pins.

Figure 4-7: Internally-powered DO wiring

A. Discrete Output
B. Channel B
C. See Figure 4-8
D. Counter

Figure 4-8: Internally-powered DO: output amplitude versus load resistance [24 VDC (Nom) open circuit]



A. Output amplitude (V)
B. Load resistor (Ω)

Figure 4-9: Externally-powered DO wiring

A. Discrete Output
B. Channel B
C. 3–30 VDC (maximum)
D. 500 mA current (maximum)
E. Counter

4.2.5 Wire the I/O channel using an M12-terminated cable (optional)

Use this procedure if you are using an M12-terminated cable to wire the I/O channel.

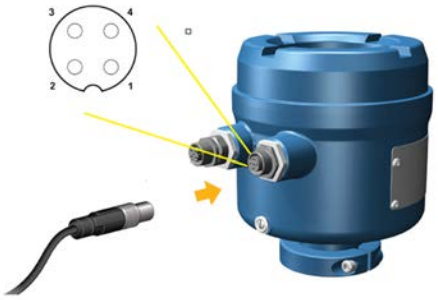
Prerequisites

Obtain an A-coded M12-terminated cable.

Procedure

1. Attach the M12-terminated cable to the configuration I/O connector on the 1600 transmitter.

Figure 4-10: M12-terminated cables to the configuration I/O



2. Attach the other cable end using the pinouts described in the following table.

Note
For M12 I/O channel pinouts, only pins 2 and 4 are used.

Table 4-1: M12 Configuration I/O pinouts

Pin identification	Wire color	Outputs on board	Signal name
Pin 1	Brown	Terminal 3	VDC +
Pin 2	**White**	**Terminal 1**	**Channel B +**
Pin 3	Blue	Terminal 4	VDC -
Pin 4	**Black**	**Terminal 2**	**Channel B -**

4.3 Wire the Ethernet channels

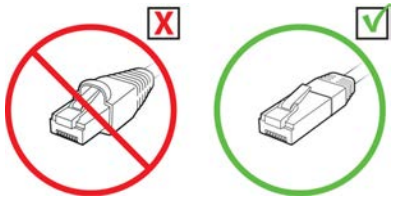
To meet the EC Directive for Electromagnetic Compatibility (EMC), use a suitable shielded or unshielded Cat5e, or higher-rated instrumentation cable to connect the meter. If your 1600 is powered by the PoE connection, in order to meet the requirements of NAMUR NE-21, use shielded Cat5e cable.

The instrumentation cable should have an overall screen to cover all cores. Where permissible, connect the overall screen to earth at the host end (360° bonded).

4.3.1 Wire an Ethernet network using the RJ45 ports

Prerequisites

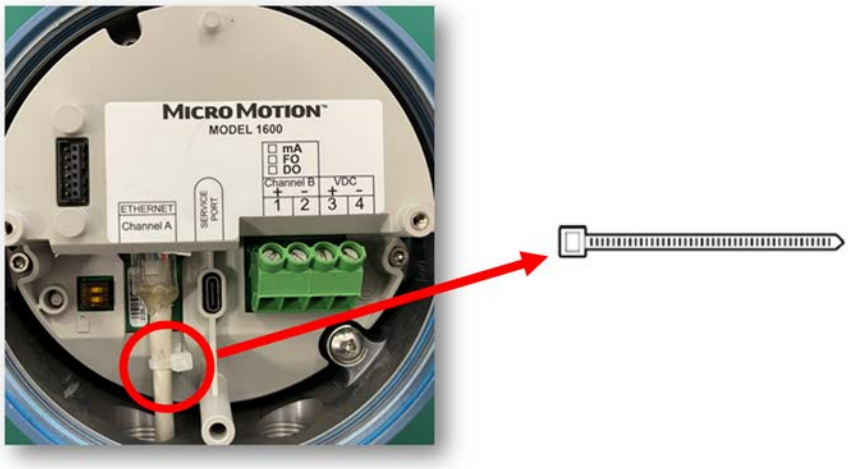
When using a pre-terminated RJ45 cable, ensure there is no protective boot on the connector, as a protective boot will not fit through the conduit. Alternatively, you can use the RJ45 connector using a shielded-field termination connector.



4.3.1 Direct connection and star topology

Procedure

1. Feed the RJ45 cable through the conduit on the 1600 transmitter.
2. Connect the RJ45 cable into Channel A.
3. Anchor the cable to the module convex hug using a cable tie.



4.3.2 Wire the Ethernet I/O using M12-terminated cables (optional)

Prerequisites

Obtain one D-coded M12-terminated Ethernet cable.

Procedure

1. Attach the M12-terminated Ethernet cable to the Ethernet I/O connector on the 1600 transmitter.

Figure 4-11: M12-terminated cables to the Ethernet I/O

2. Attach the other cable end using the pinouts described in the following table.

Table 4-2: M12 Ethernet I/O pinouts

Pin identification	Wire color	Outputs on RJ45	Signal name
Pin 1	Orange/White	Pin1	TDP1/RDP2
Pin 2	Green/White	Pin 3	RDP1/TDP2
Pin 3	Orange	Pin 2	TDN1/RDN2
Pin 4	Green	Pin 6	RDN1/RDN2

5 Power supply wiring

Depending on the power supply you plan to install, perform only one of the following tasks:

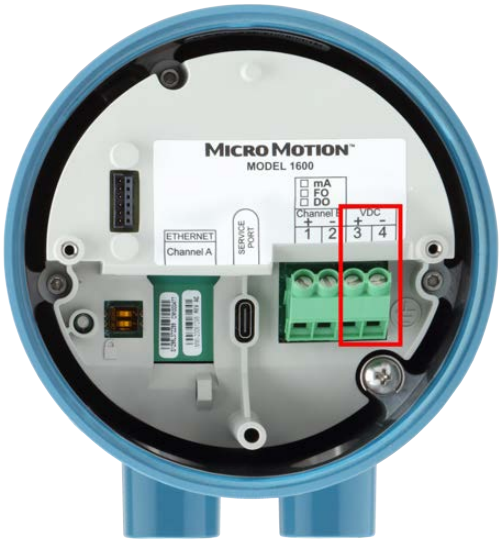
- Wiring the VDC power supply
- Wiring the Power over Ethernet (PoE) power supply

5.1 Wiring the VDC power supply

You can install a user-supplied switch in the power supply line.

Important
For compliance with the Low Voltage Directive 2014/35/EU (European installations), verify that the transmitter is located in close proximity to a switch.

Figure 5-1: Location of power supply wiring terminals and equipment ground



Procedure

1. Remove the housing cover and the display, where applicable.
2. Connect the power supply wires.
   - For DC power, connect to terminals VDC (+) and VDC (-).
3. Tighten the two screws of the power connector to hold the wire.

5.2 Wiring the Power over Ethernet (PoE) power supply

The transmitter supports both IEEE 802.3af and IEEE 802.3 standards for PoE. Use this procedure if you are using PoE from Power Sourcing Equipment (PSE) through the Ethernet cable.

Prerequisites

The PSE connecting to the 1600 transmitter must be labeled as compliant with either the IEEE 802.3af standard or the IEEE 802.3at standard. Check the specific manufacturer's specifications of any device to make sure it references IEEE 802.3 or it may not work with the 1600 transmitter.

NOTICE
If the installation requires NAMUR NE-21 certification on the customer side, you should use shielded Cat5e or shielded high-rated cables.

Note
The1600 transmitter belongs to PD (Power Device) Classification 3 in the IEEE 802.3af and 802.3at standards. If the installation uses Cat5e or Cat6 Ethernet cables, the transmitter supports both Mode A and Mode B power delivery. If the installation uses D code M12 cables, the transmitter only supports Mode A power delivery.

WARNING
If the transmitter is in a hazardous area, do not remove the housing cover while the transmitter is powered up. Failure to follow these instructions can cause an explosion, resulting in serious injury or death.

NOTICE
If both PoE and an external supply power is wired to VDC+, VDC-, the transmitter automatically switches the power to the DC power input.

Procedure

1. Remove the housing cover and the display, where applicable.
2. Connect the PoE on Channel A (refer to Figure 5-2) using either a Cat5e cable or a higher rated cable such as Cat6.

Figure 5-2: Connecting the PoE on Channel A of the Transmitter

3. Because the Cat5e and higher-rated Ethernet cables are 360° bonded these cables need to be grounded at the host end.
4. Replace the display where applicable, and the housing cover.

5.3 Wire the power supply using an M12-terminated cable (optional)

Use this procedure if you are using an M12-terminated cable to wire the power supply.

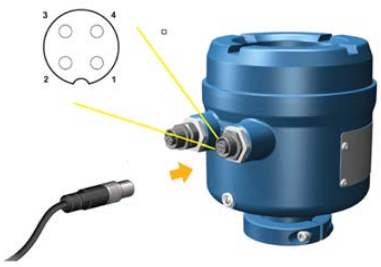
Prerequisites

Obtain an A-coded M12-terminated cable.

Procedure

1. Attach the M12-terminated cable to the power connector on the 1600 transmitter.

Figure 5-3: M12-terminated cables to power supply



2. Attach the other cable end using the pinouts described in Table 5-1.

Note
For M12 power supply pinouts, only pins 1 and 3 are used.

Table 5-1: M12 power supply pinouts

Pin identification	Wire color	Outputs on board	Signal name
Pin 1	Brown	Terminal 3	VDC +
Pin 2	**White**	**Terminal 1**	**Channel B +**
Pin 3	Blue	Terminal 4	VDC -
Pin 4	**Black**	**Terminal 2**	**Channel B -**

6 Set up the printer

Use this section to set up printing with a 1600 Ethernet transmitter and an Epson TM-T88VI Ethernet printer. For information on configuring the printer, see Micro Motion 1600 with Ethernet Transmitter Configuration and Use Manual.

There are two ways to set up printing:

- Use the printer's default IP address
- Change the printer's default IP address

6.1 Set up the printer by changing the printer default IP address

Use this procedure to set up printing with a 1600 Ethernet transmitter and an Epson TM-T88VI printer by changing the printer's default IP address.

Procedure

1. Connect one end of an Ethernet cable and power supply to the printer.
2. Connect the other end of the Ethernet cable to the PC.
3. Power on the printer.
   The printer IP address prints after a few minutes.
4. Temporarily change the Ethernet address for the PC so that the Ethernet is on the same subnet as the printer:
   Default IP address = 192.168.192.168
   a) From Windows 10, right-click the **Start** button and select **Network Connections**.
   b) Right-click the Ethernet connection and select **Properties**.
      Select **Yes** on any user account pop-up windows.
   c) Select **Internet Protocol Version 4 (TCP/IPv4)**, then select **Properties**.
   d) Select **Use the following IP address** and configure the IP address and subnet mask as follows:
      - IP address: 192.168.192.*x*, where *x* is something other than 0, 1, or 168
      - Subnet mask: 255.255.255.0
   e) Select **OK**.
5. Change the printer firmware options.
   a) Open your web browser and type `http://192.168.192.168` (default printer IP).
      The browser displays, `Your connection is not private`. Ignore the warning and proceed to the website.
   b) Select **ADVANCED**.
   c) Select **Proceed to 192.168.192.168**.

d) At the login screen, enter the Epson TM-T88VI Web Interface username and password, depending on the version of the printer:

If you have an older TM-T88VI Printer, specify:

- the default username: `epson`
- the default password: `epson`

If you have a newer TM-T88VI printer, specify:

- the default username: `epson`
- the password as the printer serial number

Note
The password will be the serial number of the printer located on the bottom/back of the Epson printer. The following is an example of the printer serial number: `X6WY363797`.

The EpsonNet Config utility screen displays.

e) Select **TCP/IP** under the configuration settings (not the basic settings), listed on the left side of the screen.

f) Change the **IP Address** (i.e., 192.168.1.55), **Subnet Mask**, and **Default Gateway** based on your network. Select an IP address that is unique to the local network.

The printer must be on the same subnet as the 1600.

g) Required: Set **Acquiring the IP Address** to Manual.

h) Select **Send** to save your settings.

i) Select **Reset**, or power cycle the printer when prompted to apply the changes.

6. Change the PC network settings back to the original settings.
   Use the windows you used in Step 4.
7. Configure the 1600 Ethernet transmitter for the printer.
   a) Remove the Ethernet cable from the PC and connect it to the 1600 Ethernet transmitter.
   b) If you have not already done so, configure the transmitter IP address, subnet mask, and default gateway.

Display	**Menu → Configuration → Ethernet Settings → Network Settings**
ProLink III	**Device Tools → Configuration → Network Settings**

For instructions on how to configure the transmitter and PC Ethernet settings, see the Micro Motion 1600 with Ethernet Transmitter Configuration and Use Manual.

c) Enter the printer IP address you configured in the previous step into the 1600 Ethernet transmitter.

Display	**Menu → Configuration → Printer → Printer IP address**
ProLink III	**Device Tools → Configuration → Printer and Tickets**
Web browser	**Configuration → Printer and Tickets**

8. Perform a test print to verify the settings are correct.

Display	**Menu → Operations → Printer → Print Ticket → Print Test Page**
ProLink III	**Device Tools → Configuration → Printer and Tickets**
Web browser	**Configuration → Printer and Tickets**

If needed, see *Function Check Failed* in the *Status alerts, causes, and recommendations* section of the Micro Motion 1600 with Ethernet Transmitter Configuration and Use Manual.

6.2 Set up the printer using the printer default IP address

Use this procedure to set up printing with a 1600 Ethernet transmitter and an Epson TM-T88VI printer using the printer's default IP address.

Procedure

1. Connect one end of an Ethernet cable and power supply to the printer.
2. Connect the other end of the Ethernet cable to the PC.
3. Power on the printer.

   It can take 1-2 minutes for the printer to finish configuring network settings. When complete, the following ticket prints.

```
********************************
IP Address : 192.168.192.168
SubnetMask : 255.255.255.0
Gateway : 0.0.0.0 DHCP : No server - > Static
********************************
```

4. Turn off DHCP if it is enabled.

From the display	From ProLink III
a. Go to **Menu → Configuration → Ethernet Settings → Network Settings → Auto obtain IP(DHCP)**. b. Select **Disabled** and **Save**. c. Back out to the ***Ethernet Settings*** page to apply the DHCP off setting.	a. Go to **Device Tools → Configuration → Network Settings**. b. Uncheck **Obtain an IP address automatically (DHCP)**. c. Select **Apply**.

5. Configure the IP address.
   a) Navigate to one of the following screens:

From the display	From ProLink III
Go to **Menu** → **Configuration** → **Ethernet Settings** → **Network Settings** → **IP address**.	Go to **Device Tools** → **Configuration** → **Network Settings**.

   b) Set the IP address to `192.168.192.x`, where *x* is something other than 0, 1, or 168.

6. Configure the subnet mask.
   a) Navigate to one of the following screens:

From the display	From ProLink III
Go to **Menu** → **Configuration** → **Ethernet Settings** → **Network Settings** → **Subnet Mask**.	Go to **Device Tools** → **Configuration** → **Network Settings**.

   b) Set the subnet mask to `255.255.255.0`.

7. Configure the printer type.
   a) Navigate to one of the following screens:

From the display	From ProLink III
Go to **Menu** → **Configuration** → **Printer** → **Printer Type**.	Go to **Device Tools** → **Configuration** → **Printer and Tickets**.

   b) Verify that the IP address is 192.168.192.168.

6.3 Reset the interface settings

Use this procedure if you forgot the IP address of your printer and need to reset the default (192.168.192.168).

Procedure

1. Turn off the printer and close the roll paper cover.
2. If the connector cover is attached, remove the cover.
3. Hold down the status sheet button on the back of the printer while turning on the printer.
   A message displays indicating that resetting is being performed.
4. Release the status sheet button to reset the printer settings to default.

   Important
   Do not turn off power until the process is complete.

   When complete, a `Resetting to Factory Default Finished` message displays.

6.4 Function Check Failed

A functional check alert is commonly triggered due to the following conditions:

- Incorrect network settings configuration
- Out of paper
- Paper tray is open
- Printer already has six open connections
- Another transmitter tries to start a print while another transmitter is printing configuration items and audit log tickets can take more than 15 minutes to print and use up paper. If during this time another transmitter starts a print, the new print may either be rejected, causing a functional check alert (printer offline), or the print will be inserted in the middle of the configuration/audit log print.

The functional check alert is cleared after a successful print.

7 Power up the transmitter

The transmitter must be powered up for all configuration and commissioning tasks, or for process measurement.

Procedure

1. Ensure that all transmitter and sensor covers and seals are closed.

   WARNING
   If the transmitter is in a hazardous area, do not remove the housing cover while the transmitter is powered up. Failure to follow these instructions can cause an explosion, resulting in serious injury or death.

2. Turn on the electrical power at the power supply.
   The transmitter will automatically perform diagnostic routines. When using DC power, a minimum of 1.5 amps of startup current is required. During this period, Alert 009 is active. The diagnostic routines should complete in approximately 30 seconds. The status LED will turn green and begin to flash when the startup diagnostics are complete. If the status LED exhibits different behavior, an alert is active.

Postrequisites

Although the sensor is ready to receive process fluid shortly after power-up, the electronics can take up to 10 minutes to reach thermal equilibrium. Therefore, if this is the initial startup, or if power has been off long enough to allow components to reach ambient temperature, allow the electronics to warm up for approximately 10 minutes before relying on process measurements. During this warm-up period, you may observe minor measurement instability or inaccuracy.

8 Guided setup

At initial startup of the transmitter, the guided configuration screen appears on the transmitter display. This tool guides you through basic configuration of the transmitter. The guided setup allows you to upload configuration files, set the transmitter display options, configure channels, and review sensor calibration data.

9 Components of the transmitter display

The transmitter display includes two status LEDs, a multi-line LCD panel, and four capacitive buttons — left, up, down, and right — used to access the display menus and navigate the display screens.

Figure 9-1: 1600 transmitter display

A. Status LED
B. LCD Display

Status LEDs

The status LEDs indicate the current state of the transmitter (**STATUS**) and the current state of the Ethernet network (**NET**). From the display, the symbol "√" on the right side is the transmitter status LED. The symbol "NET" on the left side is the network status LED. The 1600 status LED supports NE107 mode. For configuration information, see the Micro Motion 1600 with Ethernet Transmitter Configuration and Use Manual.

Table 9-1: Status LED and device status (MMI mode)

Status LED condition	Device status
Solid green	No alerts are active.
Solid yellow	One or more alerts are active with **Alert Severity** = Out of Specification, Maintenance Required, or Function Check.
Solid red	One or more alerts are active with **Alert Severity** = Failure.
Flashing yellow (1 Hz)	The `Function Check in Progress` alert is active.

Table 9-2: Network status LED and Ethernet network connection status

Network status LED condition	Network status
Flashing green	No connections made with primary protocol host.
Solid green	Connection made with primary protocol host.
Flashing red	Connection from primary protocol host has timed out.
Solid red	Address Conflict Detection (ACD) algorithm has detected a duplicate IP address (All 1600 transmitter Ethernet communications are stopped.)

LCD panel

In normal operation, the LCD panel shows the current value of the display variables, and their measurement units.

The LCD panel also provides access to the display menus and alert information. From the display menus, you can:

- View the current configuration and make configuration changes.
- Perform procedures such as loop testing and zero verification.
- Run batches.

The alert information allows you to see which alerts are active, acknowledge the alerts individually or as a group, and to see more detailed information for individual alerts.

9.1 Access and use the display menus

The display menus allow you to perform most configuration, administration, and maintenance tasks.

The four switches, ⇦⇧⇩⇨, are used to navigate the menus, make selections, and enter data.

Procedure

1. Observe the action bar at the bottom of the LCD panel.

   The action bar displays **Menu⇨**.

2. Hold your thumb or finger over the ⇨ membrane switch to activate it.

   The top-level menu is displayed.

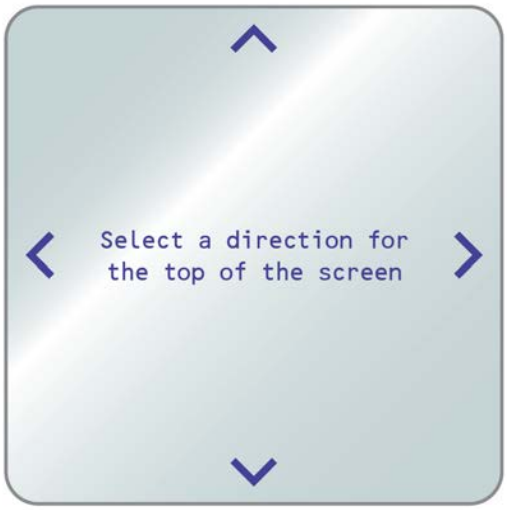
3. Navigate the menus using the four membrane switches:
   - Activate ⇧ or ⇩ to scroll to the previous or next item in the menu.
   - Activate and hold ⇧ or ⇩ (approximately 1 second) to scroll rapidly through numbers or menu options.

- Activate ⇨ to drill down to a lower menu or to select an option.
- Activate and hold ⇨ to save and apply your action.
- Activate ⇦ to return to the previous menu.
- Activate and hold ⇦ to cancel your action.

The action bar is updated with context-sensitive information. The ⇨ and ⇦ symbols indicate the associated membrane switch.

If the menu or the topic is too large for a single display screen, the ⇩ and ⇧ symbols at the bottom and top of the LCD panel are used to indicate that you must scroll down or up to see more information.

Figure 9-2: Navigation arrows



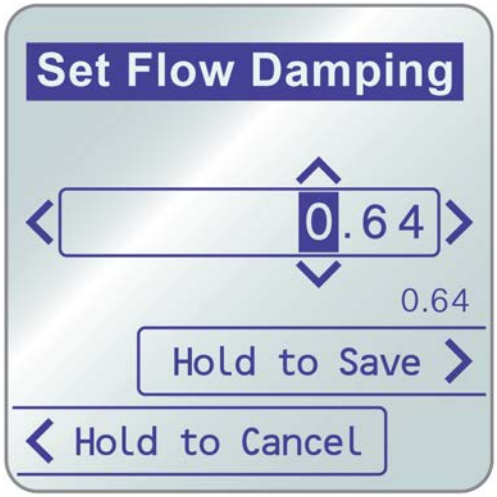
4. If you make a menu choice that leads back to the main menu, or changes to certain procedures such as zero calibration:
   - If display security is not enabled, the display prompts you to activate ⇦⇩⇨, in that order. This feature protects against accidental changes to configuration, but does not provide any security.

Figure 9-3: Security prompts

   - If display security is enabled, the display prompts you to enter the display password.

5. If you make a menu choice that requires entering a numeric value or character string, the display provides a screen similar to the following:

Figure 9-4: Numeric values and character strings



- Activate ⇦ or ⇨ to position the cursor.
- Activate ⇧ and ⇩ to scroll through the values that are valid for that position.
- Repeat until all characters are set.
- Activate and hold ⇨ to save the value.

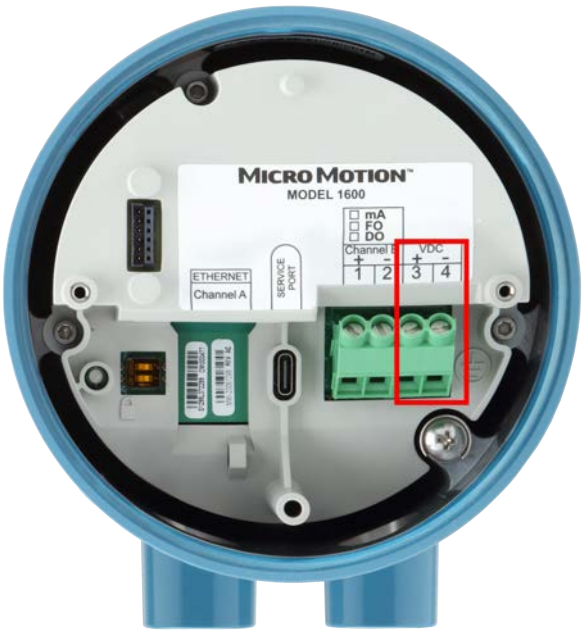
6. To exit the display menu system, use either of the following methods:
   - Wait until the menu times out and returns to the display variables.
   - Exit each menu separately, working your way back to the top of the menu system.

10 Available service port connection

Use the service port connection to download or upload data from/to the transmitter.

To access the service port, you can use the following signal converter to connect to the service port terminals:

- USB to USB Type C
- USB Type C to USB Type C



WARNING
If the transmitter is in a hazardous area, do not remove the housing cover while the transmitter is powered up. Failure to follow these instructions can cause an explosion, resulting in serious injury or death.

A Wire the 1600 to the 3100 relays

Use this procedure to wire the Discrete Output on the 1600 Ethernet transmitter to the 3100 transmitter relays for single-stage batch control.

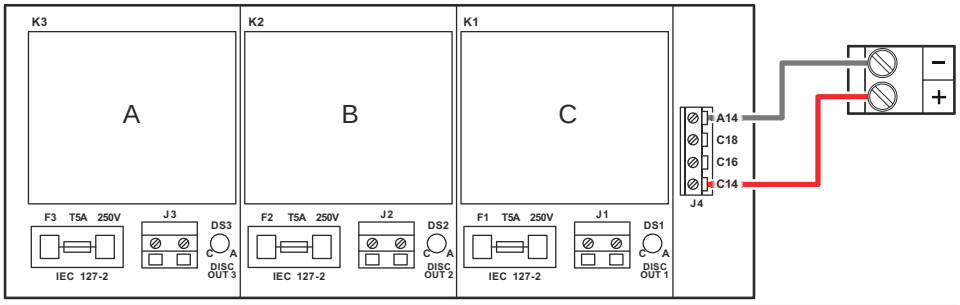
Prerequisites

- Set up the Channel B configuration to DO before wiring.
- Use active high and internal power.
- Use wire size 24 AWG (0.205 mm^2) to 16 AWG (1.31 mm^2).

Procedure

1. Wire the negative terminal on Channel B from the 1600 Ethernet transmitter to A14.
2. Wire the positive terminal on Channel B from the 1600 Ethernet transmitter to either C14, C16, or C18.

Figure A-1: Wiring for 1600 Ethernet Channel B DO to 3100 relays



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