

Instructions

Gateway Network Communication Assembly



3A7639A

EN

Used to control, monitor, and download production data from various Graco System Controllers to a PLC or PC for automation or production information reporting. For professional use only.

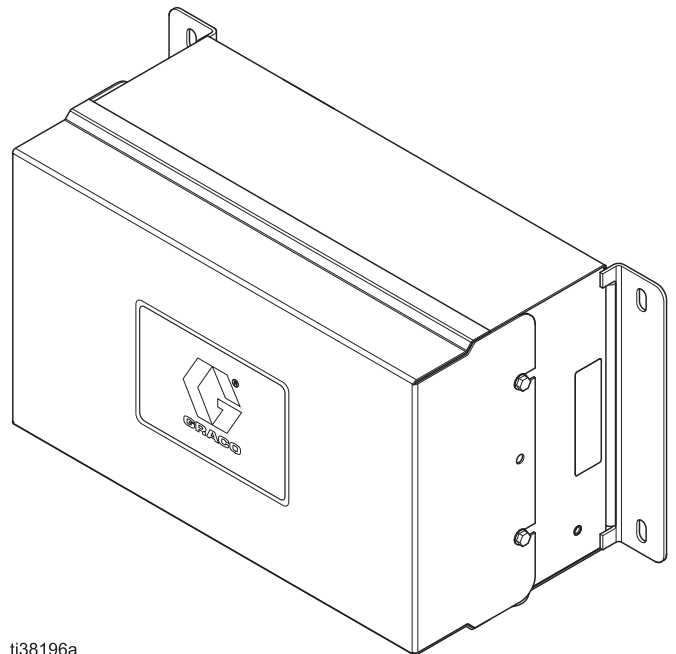
Not approved for use in explosive atmospheres or hazardous (classified) locations.

See pages 3 and 4 for information and model numbers for each Gateway Assembly.



Important Safety Instructions

Read all warnings and instructions in this manual and in your proportioning system manual before using the equipment. Save all instructions.



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Related Manuals

Manual in English	Description
312778	ProMix® 2KS Automatic System, Installation
312779	ProMix® 2KS Automatic System, Operation
312780	ProMix® 2KS Automatic System, Repair-Parts
313386	ProMix® 2KS/3KS Web Interfaces, Instructions
3A6948	ProControl™ 1KE Plus Models, Instructions-Parts
332013	DCM and ADCM, Instructions
3A0006	24H372 ACS Module, Instructions
3A2527	E-Flo® DC Control Module Kit, Instructions
3A3469	ProDispense™, Operation-Parts
	Crimson 3.1 User Manual (supplied with Red Lion Gateway Module)

Gateway Assembly Overview

The Gateway Network Communication Assembly (referred to as Gateway Assembly throughout this manual) enables various Graco systems to communicate with PLCs (programmable logic controllers) and network communication systems. Communication assemblies are available for many different communication protocols, including Modbus TCP, Ethernet IP, DeviceNet, and Profibus. The Gateway Assembly supports many other protocols; contact Graco Technical Assistance for information to support your desired protocol.

NOTE: Only persons very familiar with their PLC and Network communication architecture should use this hardware and software. This manual assumes that the person using the Gateway Assembly has full understanding of the PLC equipment and related software.

NOTE: Network communications essentially operate with the same rules as Discrete I/O. However, network communications require placing correct values or adjusting appropriate bits within various registers depending on the protocol. Network communications should only be installed by qualified persons familiar with this type of communication.

The Red Lion Gateway Module allows for most PLCs to communicate with the various Graco systems via the protocol selected by mapping registers from the Graco system to the PLC or communications hardware of choice. Software is available to do this, as well as pre-configured database mappings from Graco for various Graco systems. As a result, the PLC has full access to all the registers for monitoring and controlling the Graco system. It is the responsibility of the integrator or user to ensure proper configuration of the communication hardware on the PLC side.

NOTE: The Red Lion Gateway Module (Graco part no. 18C235) used in each Gateway Assembly is the core communication component of all five Gateway Assembly models covered in this manual. The Red Lion Gateway Module includes Modbus TCP, Modbus RTU Serial, and many other protocols.

Gateway Terminology

The following terminology is used throughout this manual when referring to Gateway Assemblies and components:

Term	Definition
Gateway Module	Red Lion Gateway and protocol converters.
Gateway Assembly	A Red Lion Gateway Module with an enclosure and power supply.
Graco System Controller	Any Graco System Controller like, but not limited to, EasyKey, ProDispense, ProControl 1KE Plus, Graco DCM/ADCM, ACS, etc.

Gateway Assemblies

Model 25B471 Gateway Ethernet Assembly

Allows communication between various Graco systems with a PLC and other communications hardware over an ethernet. Enables process equipment to read and write communication network variables from various Graco systems.

Model 25B472 Gateway DeviceNet Assembly

Allows communication between various Graco systems with a PLC and other communications hardware using DeviceNet process control. Enables process equipment to read and write variables from various Graco systems. See **Appendix A: DeviceNet® Secondary Communication** on page 32 for DeviceNet details.

Model 25B473 Gateway Profibus Assembly

Allows communication between various Graco systems with a PLC and other communications hardware using Profibus process control. Enables process equipment to read and write variables from various Graco systems. See **Appendix B: Profibus® DP Secondary Communication** on page 35 for DeviceNet details.

Model 25B486 Gateway Ethernet Assembly with 16K465 Fiber Conversion Module

Allows communication with a Graco ADCM and DCM control module through a fiber cable in hazardous and non-hazardous locations.








NOTE: This communication method is used for the ADCM and DCM modules, regardless of where they are placed.

Model 25B489 Gateway Ethernet Assembly with Ethernet Switch




Gateway Ethernet Assembly with an 8-port Ethernet switch that allows communication with up to seven Graco ACS modules via an Ethernet network.

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.



 <h2 style="margin: 0;">WARNING</h2>	
   	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well-ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking). • Ground all equipment in the work area. See Grounding instructions. • Never spray or flush solvent at high pressure. • Keep work area free of debris, including solvent, rags, and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
 	<p>ELECTRIC SHOCK HAZARD</p> <p>This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power at the main switch before disconnecting any cables and before servicing or installing equipment. • Connect only to grounded power source. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

WARNING

 	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Specifications in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Specifications in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Install the Gateway Assembly Hardware

Location

				
<p>This equipment is not for use in explosive atmospheres or hazardous locations. To reduce the risk of fire or explosion, do not install equipment approved only for non-hazardous location in a hazardous location.</p>				

Install the Gateway Assembly near the Graco System Controller in a non-hazardous location.

Mounting

1. See **Dimensions**, page 38.
2. Ensure the wall or mounting structure is sturdy enough to support the assembly and connection cabling, and without excessive vibrations that could cause reduced component performance or failure.
3. Using the equipment as a template, mark the mounting holes on the wall at a convenient height for the operator and so equipment is easily accessible for maintenance.
4. Drill mounting holes in the wall. Install anchors as needed.
5. Bolt equipment securely.

NON-HAZARDOUS LOCATION

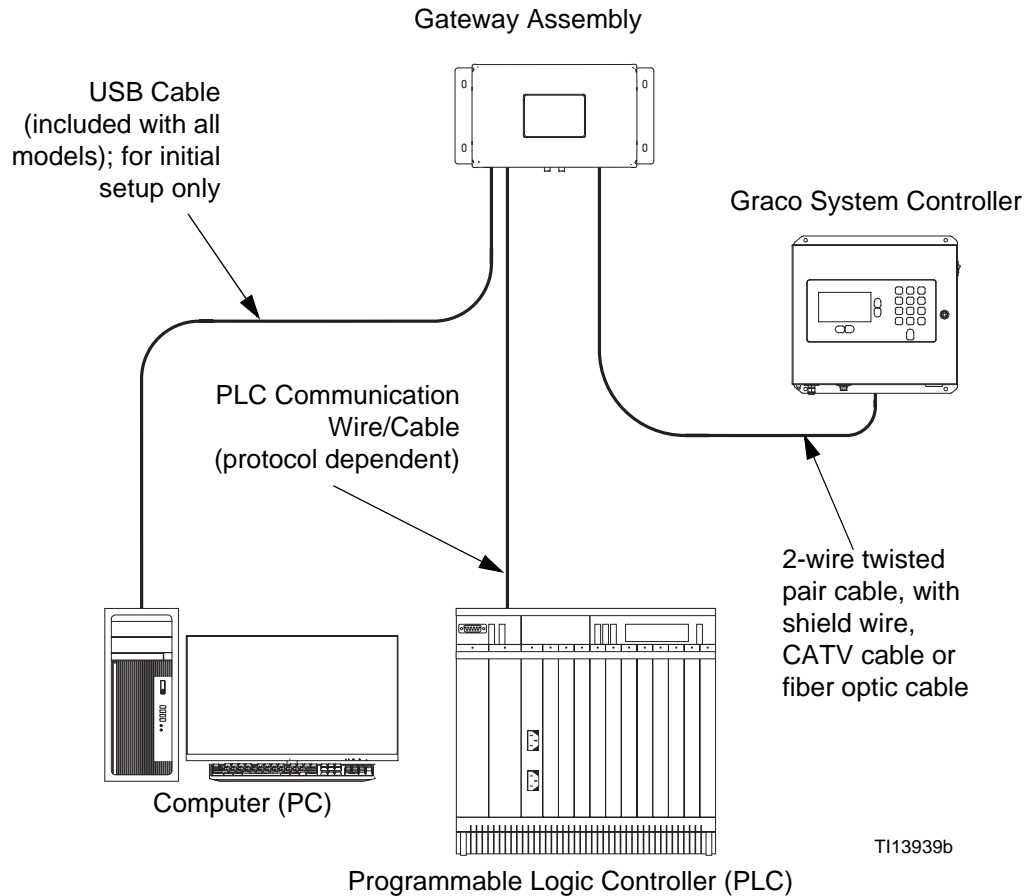


FIG. 1: Gateway Assembly Typical Installation

Connect Gateway Assembly Communication to the Graco System Controller



FIG. 1 is only a guide showing installation of the Gateway Assembly in a ProMix 2KS System; it is not a complete system design. Contact your Graco distributor for assistance in designing a system to suit your particular needs. This procedure is an example of how to connect the Gateway Assembly to a Graco EasyKey, though it may also apply to other Graco System Controllers.

1. Shut off power at the main circuit breaker
2. Shut off ProMix 2KS power (0 position). See FIG. 2.
3. Turn off power to the Graco EasyKey and the Gateway Assembly before connecting or disconnecting communication cables.

NOTE: For specific system communication circuit connections and register mapping details, refer to the following product family manuals: ProMix 2KS (312779), ProControl 1KE (3A6948 and 332013), Graco ACS Module (3A0006), and Graco ProDispense (3A3469).

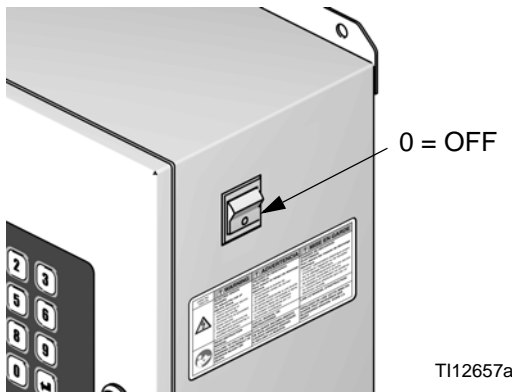


FIG. 2: Power Off

4. Connect a 2-wire twisted pair cable (provided with assemblies 25B471-25B473), see FIG. 5, with shield wire from the EasyKey connector to the connector on the Gateway Module.

5. Connect a communications wire/cable (protocol dependent) from the Gateway Module to the PLC. (See **Communication Connections**, page 11.)

NOTE: Graco provides expansion cards for DeviceNet and Profibus protocols. DeviceNet setup procedures are on page 32. Profibus setup procedures are on page 35. See **Parts**, page 26, for part numbers.

NOTE: When using the Gateway Assembly in your system, disconnect both communication cables (one to the Graco System Controller and the other to the PC or PLC) before updating the system software.

Grounding



The equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.

Gateway Assembly

Grounding is provided by both a proper power connection and a grounding screw on the enclosure.

- For a proper power connection, see **Power Connections**, page 9, and **Electrical Schematics**, page 16, for details and grounding locations.
- For the enclosure grounding screw (4), use a ground wire (35) and clamp (supplied). Remove the grounding screw (4). Attach the ground wire (35) end, as shown, and tighten the ground screw (4) securely. Connect the ground clamp to a true earth ground.

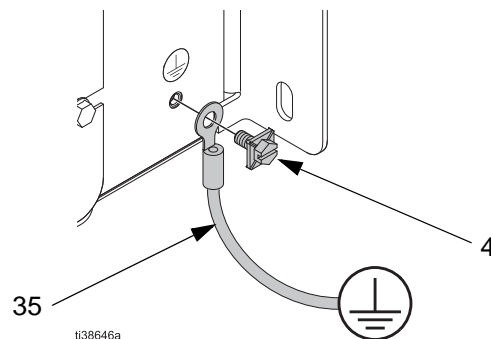






FIG. 3: Enclosure Grounding

Power Connections

				
<p>Improper wiring may cause electric shock or other serious injury if work is not performed properly.</p> <ul style="list-style-type: none"> This equipment must be grounded. Connect only to a grounded power source. All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 				

NOTICE

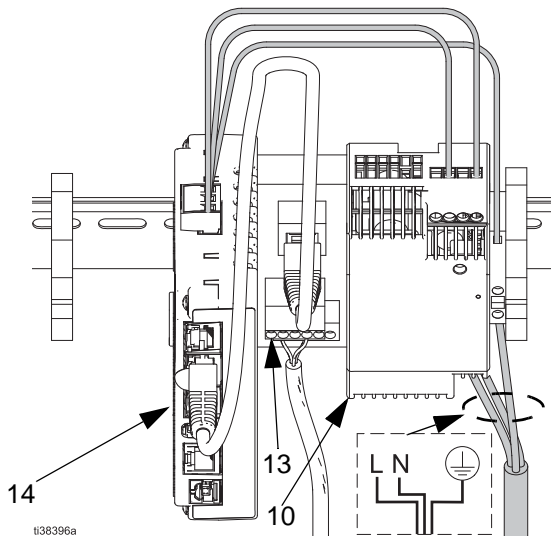
If power and grounding connections are not done properly, the equipment will be damaged and the warranty voided.

The Gateway Assembly is rated for 100-240 VAC, 50-60 Hz, with a maximum of 1 amp current draw. Power connections are common to all Graco Assembly models. See FIG. 4. For specific wiring details, see **Electrical Schematics** on page 16.

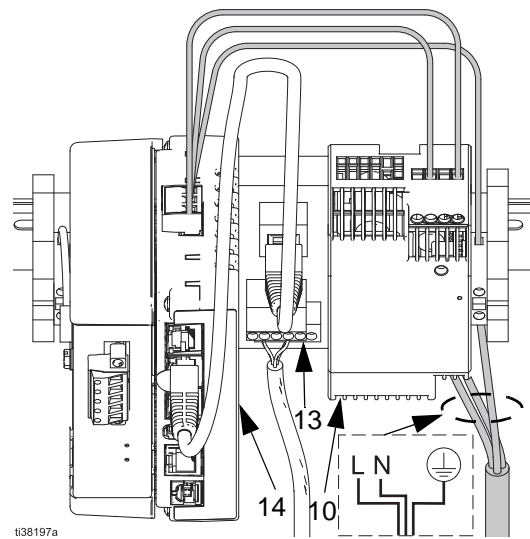
NOTE: A means of disconnect must be provided during installation. Branch circuit protection of 15 amp maximum must be provided during installation. Power wires must be made of copper and have a minimum temperature rating of 140°F (60°C). The wire gauge size must be 12-14 AWG.

1. Disconnect power to the Graco System Controller.
 2. Disconnect power to the Gateway Assembly.
 3. Loosen the screws (3) and remove the enclosure cover (2). See **Parts**, starting on page 24.
 4. Route the power cable from a 100-240V, 50/60 Hz, AC power source through the hole provided in the bottom of the enclosure (1).
- NOTE:** The strain relief fitting or connector must be provided in the field according to local electrical codes.
5. Connect the supply ground wire to the ground terminal block (9) in the enclosure (1).
 6. Connect the incoming power wires (L and N) to the labeled L and N terminals on the 24 V power supply (10). Gently pull on all connections to verify they are properly secured.
 7. Torque the power input terminal screws to 0.56 N•m (5 in-lb).
 8. Connect the communication cables (see **Communication Connections**, pages 11-13, and **Electrical Schematics**, pages 16-18).
 9. Verify that all items are connected properly, then replace the enclosure cover (2) and tighten the screws (3).

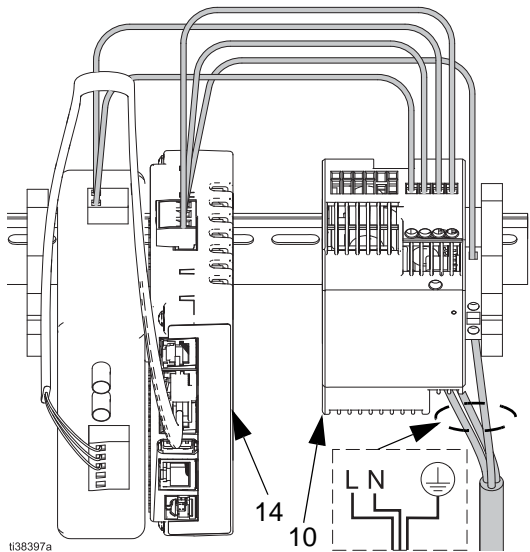
Install the Gateway Assembly Hardware



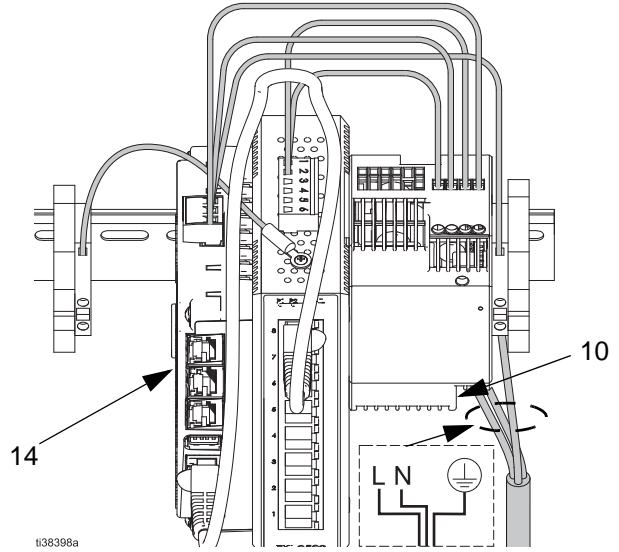
Model 25B471



Models 25B472 and 25B473



Model 25B486



Model 25B489

Fig. 4. Power Connections

Communication Connections



See FIG. 9 and FIG. 10 for typical cable connections in a ProMix 2KS system.

FIG. 11 and FIG. 12 show other possible cable connections.

Refer to your Graco system manual for communication protocol and connection requirements to complete your specific Gateway Assembly installation. System manuals have details for protocol and connections.

For example,

- A Graco EasyKey (ProMix 2KS) requires an RS485 connection. See FIG. 6.
- An DCM/ADCM (ProControl 1KE Plus and Intelligent Paint Kitchen) requires a fiber optic converter and connection. See FIG. 7.
- An ACS controller can use an RS485 or EtherNet switch; determine the protocol to be used and make the appropriate connection. See FIG. 8.

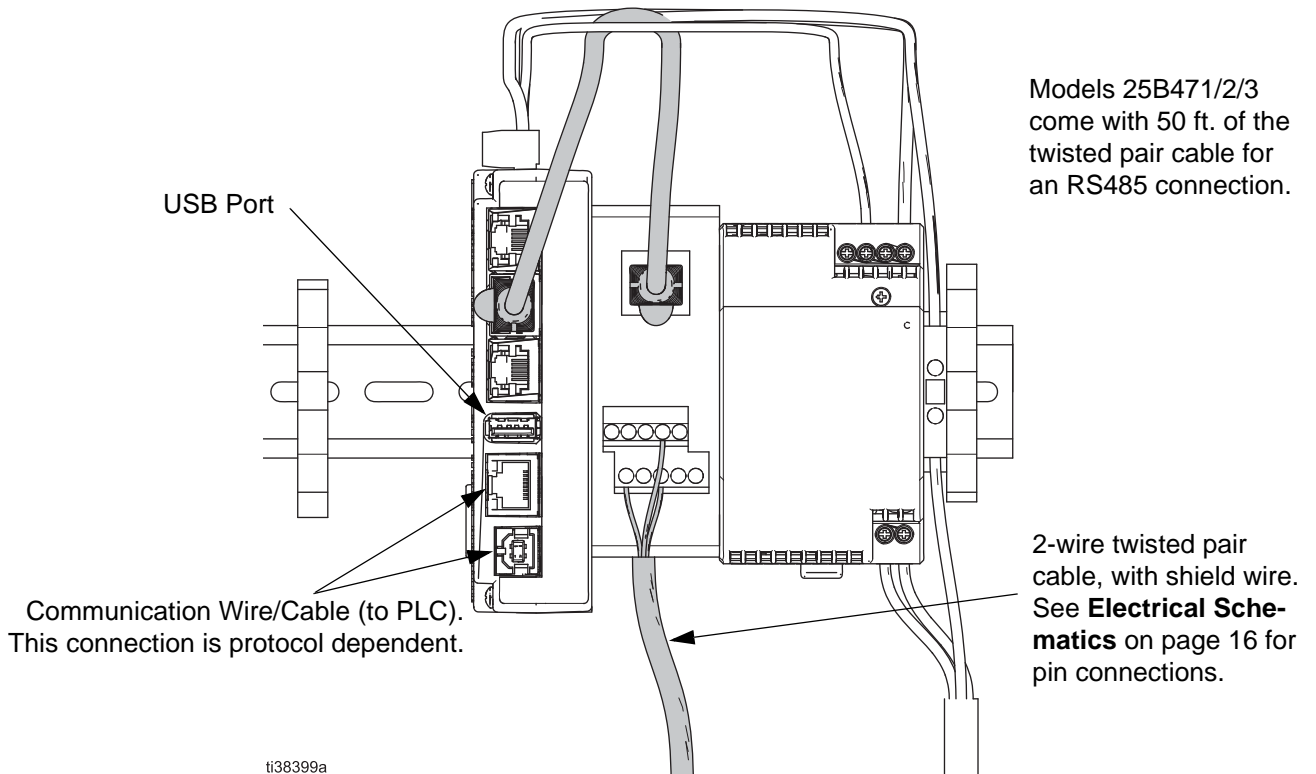
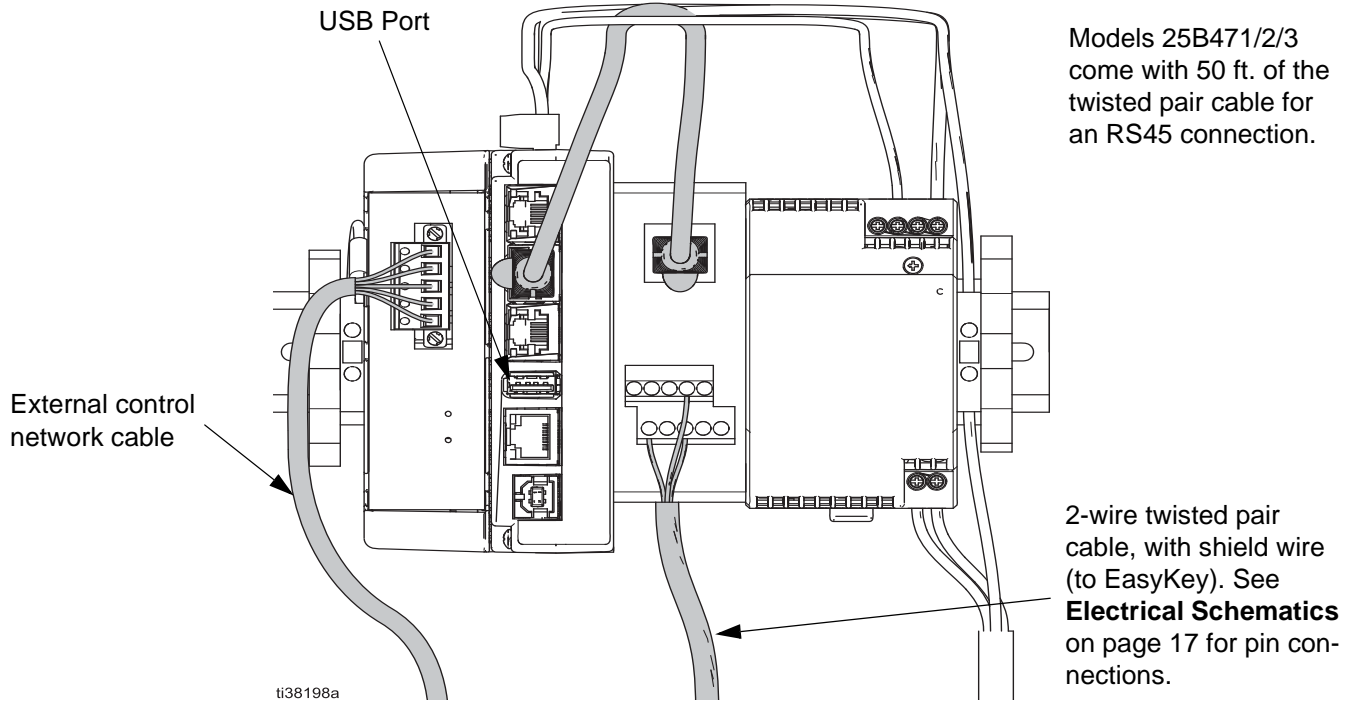


FIG. 5: Gateway Ethernet Assembly Cable Connection Points - Model 25B471

Gateway Assembly

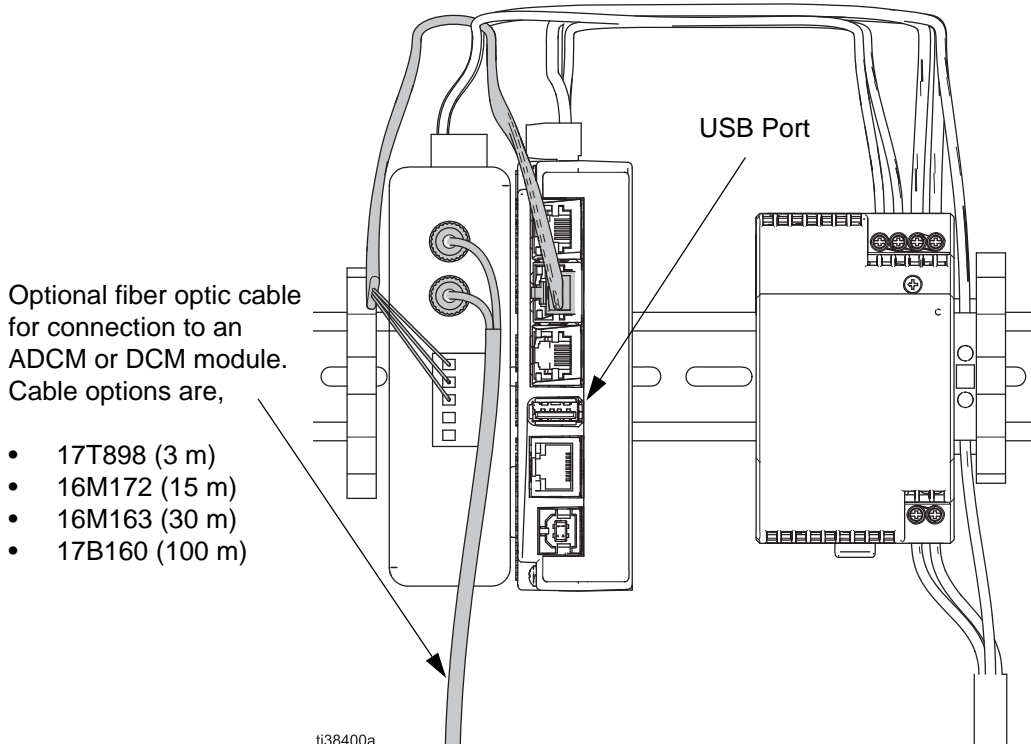


Models 25B471/2/3 come with 50 ft. of the twisted pair cable for an RS45 connection.

2-wire twisted pair cable, with shield wire (to EasyKey). See **Electrical Schematics** on page 17 for pin connections.

FIG. 6: Gateway DeviceNet and Profibus Assembly Cable Connection Points - Models 25B472 and 25B473

**Gateway Assembly
with Fiber Optic communication conversion to the PC/PLC**



Optional fiber optic cable for connection to an ADCM or DCM module. Cable options are,

- 17T898 (3 m)
- 16M172 (15 m)
- 16M163 (30 m)
- 17B160 (100 m)

FIG. 7: Gateway Ethernet Assembly w/Fiber Optic Conversion Cable Connection Points - Model 25B486

**Gateway Assembly
with EtherNet Switch for EtherNet conversion to the PC/PLC**

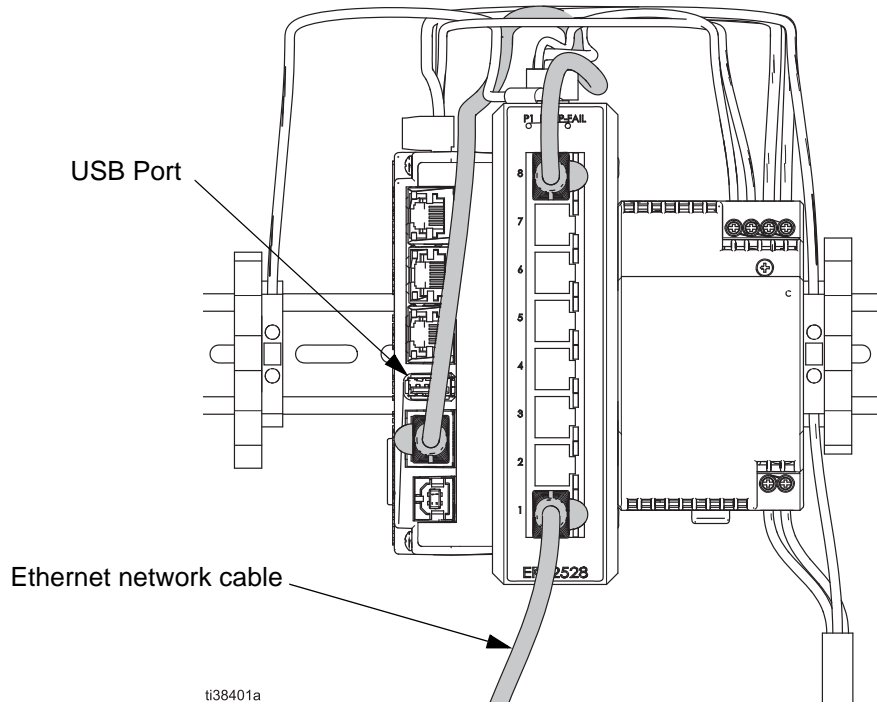


FIG. 8: Gateway Ethernet Assembly w/Ethernet Switch Cable Connection Points - Model 25B489

Install the Gateway Assembly Hardware

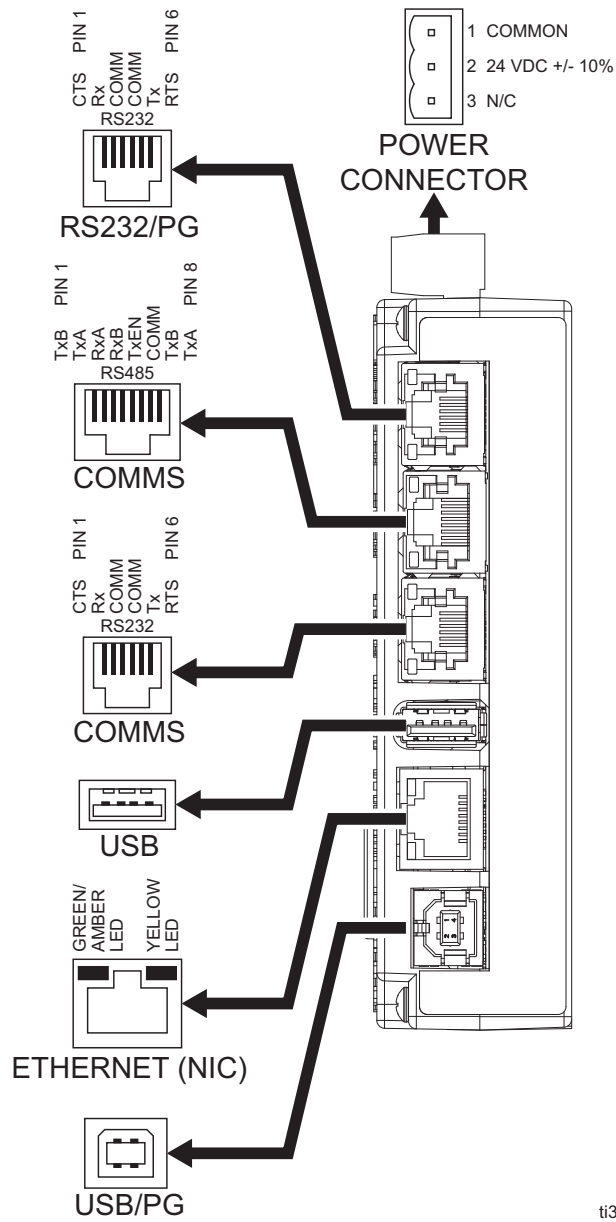


FIG. 9: Gateway Module Port Pin Outs

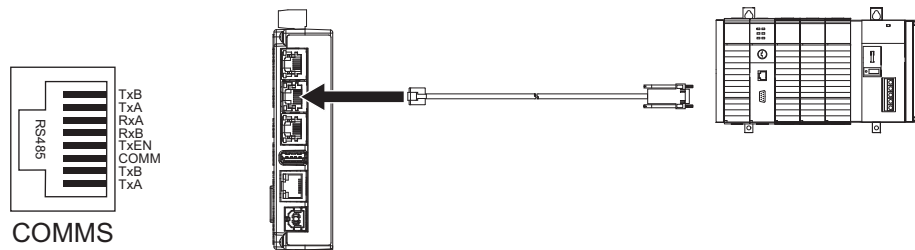


FIG. 10: RS485 Communication Port (Typical ProMix 2KS Connection)

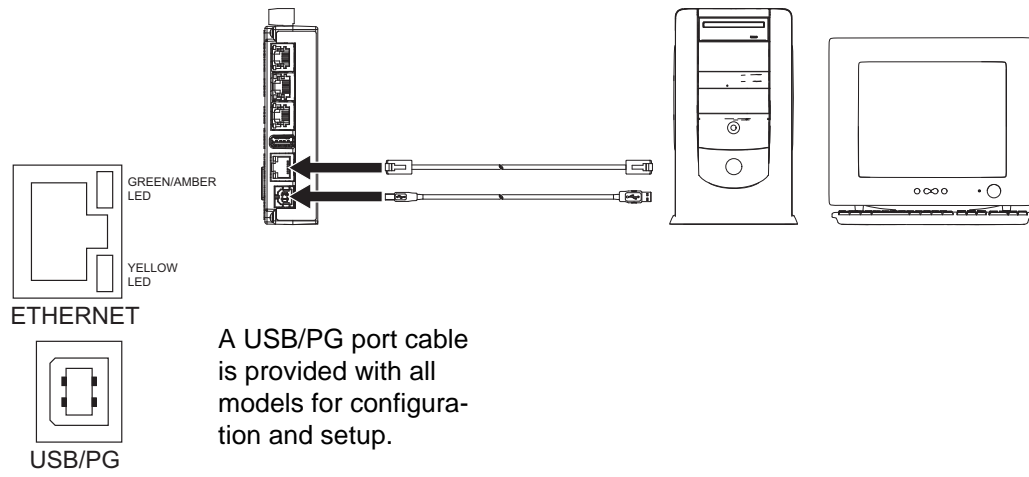


FIG. 11: Programming Port Options

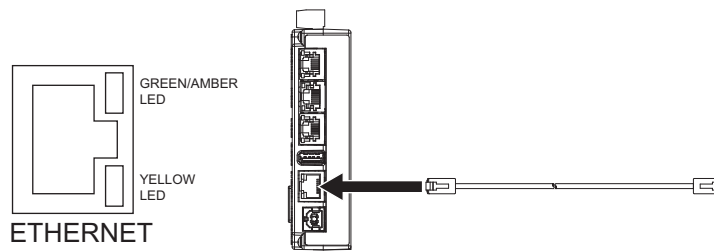


FIG. 12: Ethernet Connection

Electrical Schematics

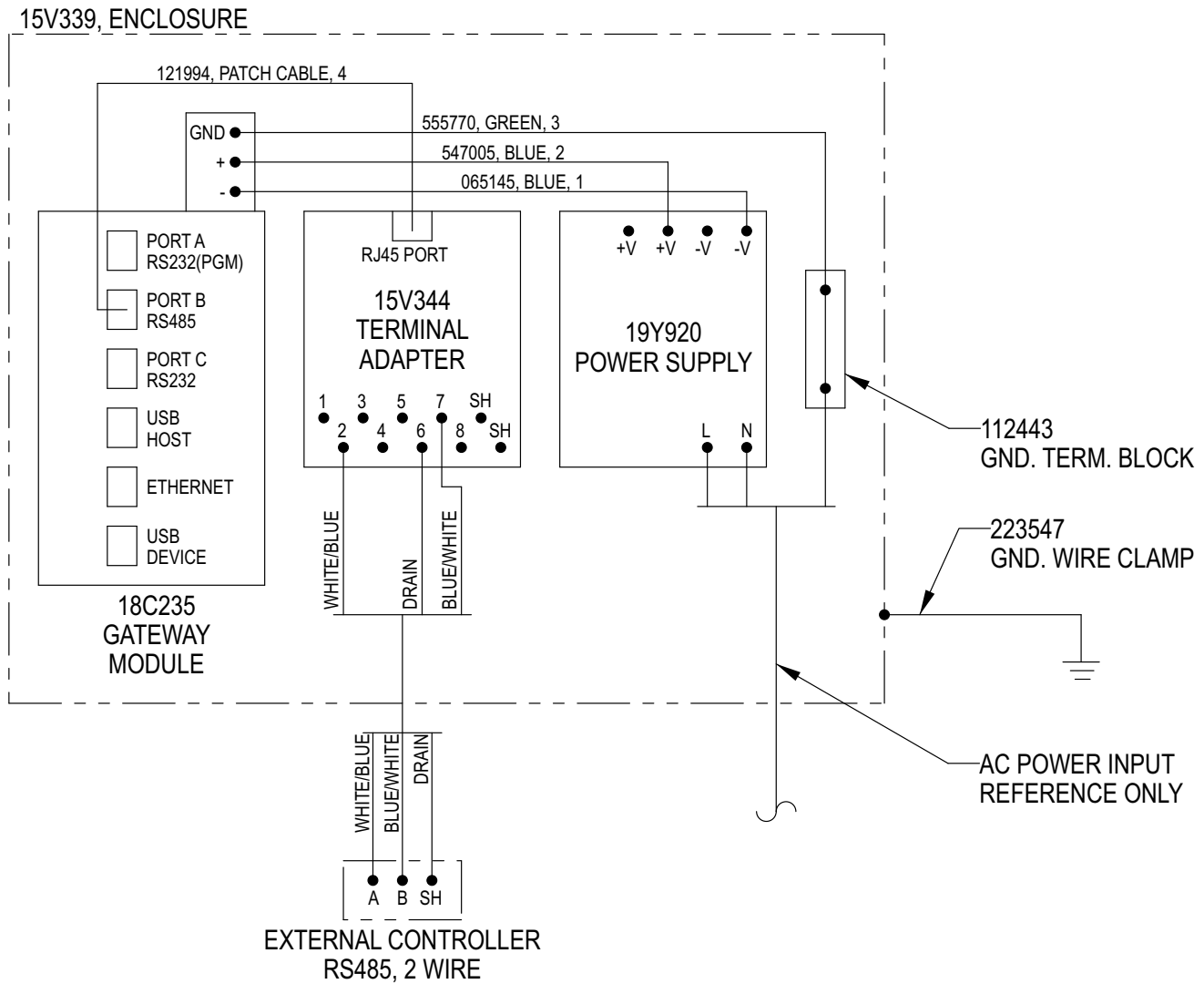


FIG. 13: Electrical Schematic - Model 25B471

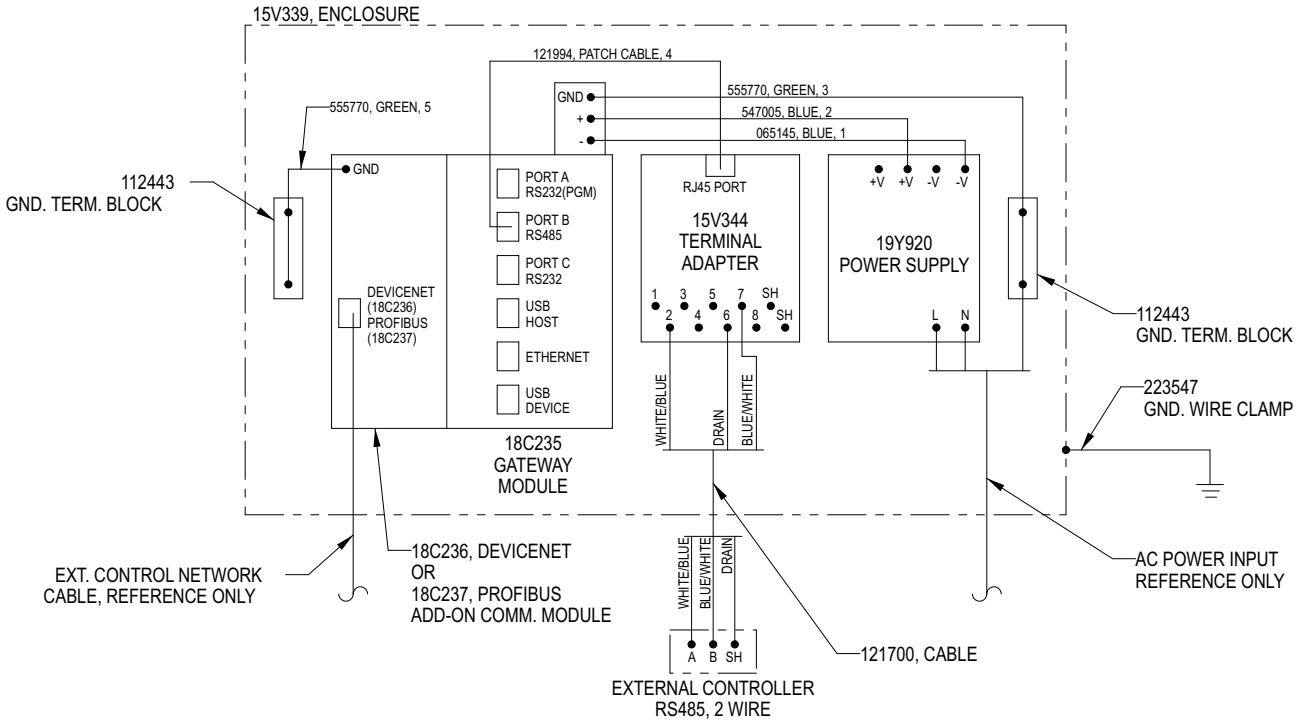


Fig. 14: Electrical Schematic - Model 25B472 and 25B473

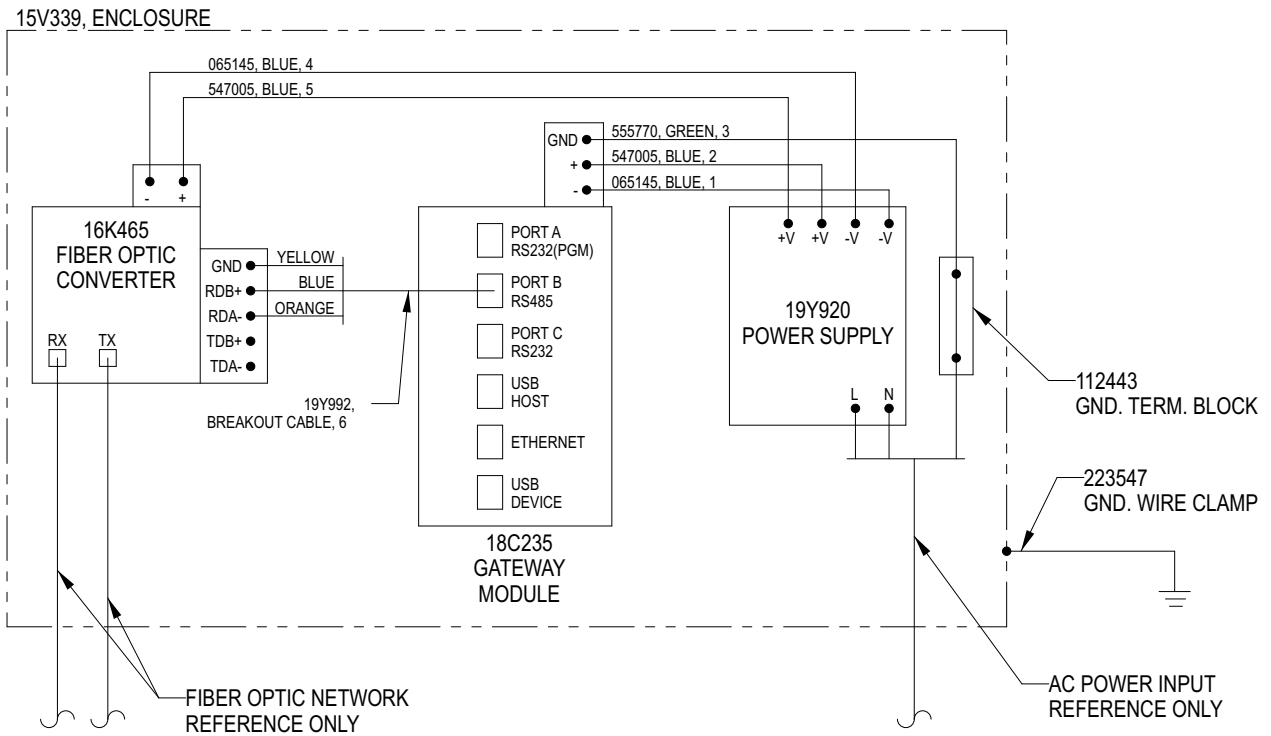


Fig. 15: Electrical Schematic - Model 25B486

Install the Gateway Assembly Hardware

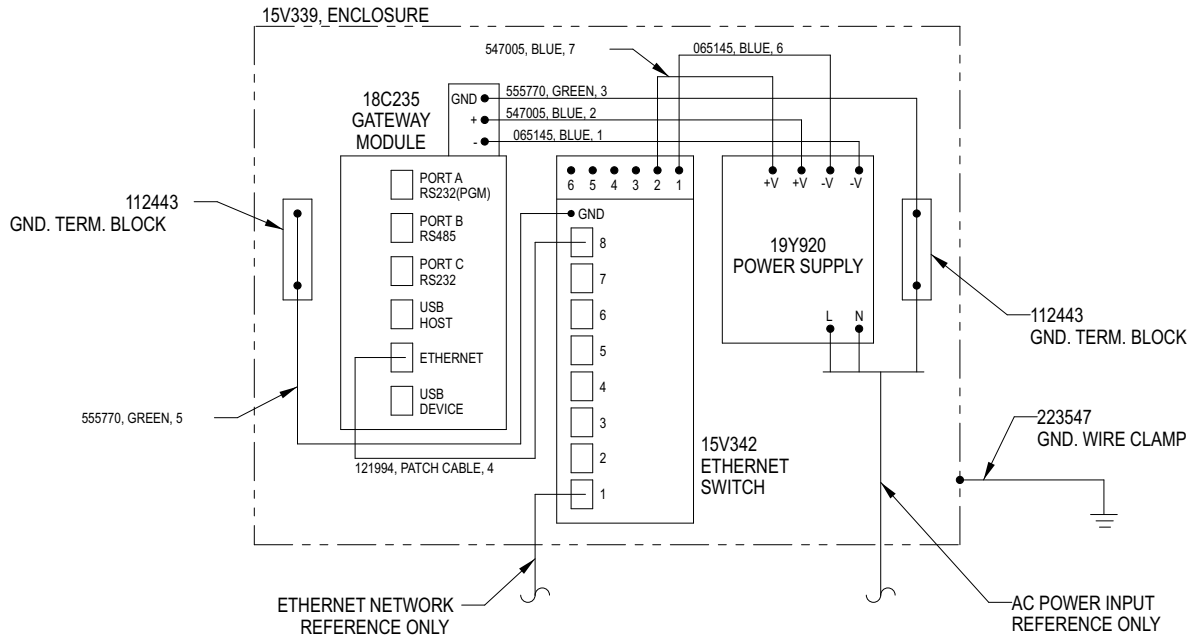


FIG. 16: Electrical Schematic - Model 25B489

Install SD Card (17R419)

NOTE: One SD card is provided with each Gateway Assembly.

The SD socket accepts either Type I or Type II cards. These cards are available at most computer and office supply retailers. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes. Use the SD card for optional database storage only. See FIG. 17.

1. Disconnect power to the Gateway Assembly and remove the cover.
2. Install the SD card in the orientation shown in FIG. 17.
3. Install the Gateway Assembly cover and connect power.

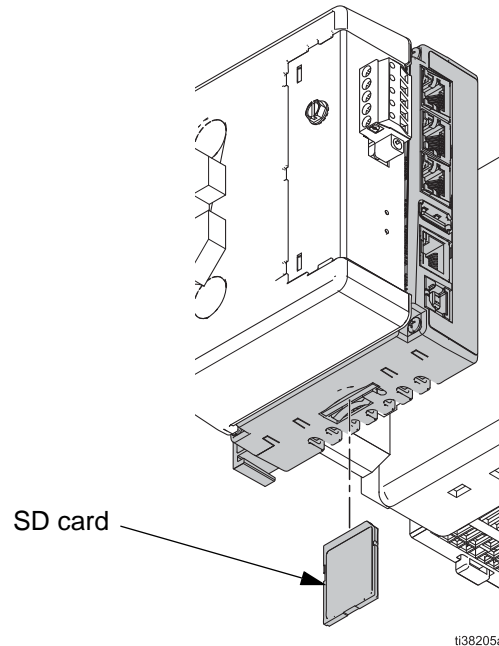


FIG. 17: Install an SD Card

Install the Red Lion™ Crimson® 3.0/3.1 Software

NOTE: Use of the term “target device” in this section is consistent with documentation provided by Red Lion and refers the Red Lion Gateway Module referenced earlier in this manual.

Red Lion Crimson 3.0/3.1 software provides access to the Gateway Assembly hardware. The CD provided includes a preconfigured database which is essentially a setup file for the Gateway Assembly for various Graco System Controllers. Refer to your appropriate Graco system manual for which of the databases to be used, or contact Graco for optional preconfigured mapping databases. The database file has a .cd31 extension.

The Gateway Assembly provides conversions for many protocols, including the following:

- All Allen-Bradley protocols
- DeviceNet
- Ethernet TCP/IP
- Ethernet IP
- Mitsubishi
- Modbus (ASCII, RTU)
- Profibus
- Siemens

NOTE: Graco provides expansion cards for DeviceNet and Profibus protocols. DeviceNet setup procedures are on page 32. Profibus setup procedures are on page 35. See page 24 for **Parts**.

NOTE: Contact your Graco distributor or Graco Technical Assistance for information regarding additional supported protocols.

System Requirements

Crimson 3.1 is designed to run on any version of Microsoft Windows from Windows Vista onward. Memory requirements are modes and any system that meets the minimum system requirements for its operating system will be able to run Crimson 3.1. About 600MB of free disk space will be needed for installation, and you should ideally have a display with sufficient resolution to

allow the editing of display pages without having to scroll.

Installing the Software

Crimson 3.1 is supplied as an executable or .exe file. You will typically have downloaded this file from Red Lion's website, but if you have downloaded it from another source, please check that Windows is satisfied with the package's digital signature so that you are assured of receiving genuine Red Lion software.

1. Disconnect power to the Gateway Assembly and remove the cover.
2. Connect the USB cable (23, supplied) between the USB port on the Gateway Module and a USB port on your PC. See FIG. 18.

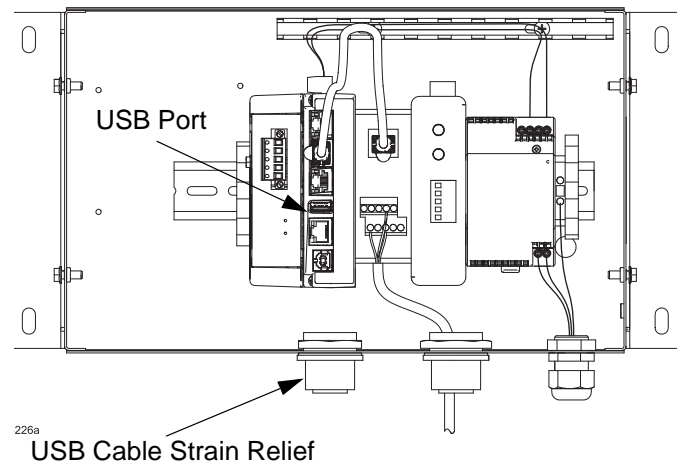


FIG. 18: Gateway Module USB Port

3. Connect power to the Gateway Assembly and refer to the Red Lion Crimson website (<https://redlion.net/red-lion-software/crimson/crimson-31>) for download and usage instructions for the Crimson Software.

NOTE: The supplied Crimson 3.1 User Manual is available for download at the Crimson Software web page at the link in step 3.

4. Follow the PC software installation instructions.

NOTES:

- Connecting the USB cable (23) to the Gateway Assembly and your PC should automatically load the proper drivers. Contact Graco Technical Assistance to ensure the proper drivers are installed for your PC if there are software installation difficulties.
- Graco provides preconfigured files of the data variable mappings for the specific Graco system connected to your Gateway Assembly. This configuration may be sent by email or by purchasing a preconfigured file on an SD Card. Follow the communications manual for the specific Graco system used.
- If you've followed the instructions that came with your target hardware, you will not yet have connected the hardware to your PC. Now that you have completed the Crimson 3.1 installation, you may safely connect the device using a standard USB cable. After some churning, Windows should indicate that it has found the drivers for the new hardware and that it is ready for operation. No further user intervention should be required.

Registration

When you first run Crimson 3.1, you will be offered a chance to register your software. While registration is optional, we strongly recommend that you take the opportunity to provide us with your contact details so that we can keep you informed about updates to Crimson 3.1 and the associated products. Since registration requires an Internet connection, you may skip the process if you do not have such a connection available. Crimson 3.1 will periodically remind you if you are running an unregistered copy of the software.

Checking for Updates

If you have an Internet connection, you can use the Check for Update command in the Help menu to scan Red Lion's website for a new version of Crimson 3.1. If a later version than the one you are using is found, Crimson will ask if it should download the upgrade and update your software automatically. You may also

manually download the upgrade from Red Lion's website by visiting the Downloads page within the Support section.

Troubleshooting

If you connected the target Red Lion Gateway to your PC before installing Crimson, it is possible that an aborted installation has made it impossible for you to install the drivers correctly. To check for this, open the Windows Device Manager by finding the My Computer icon, right-clicking and selecting the Manage command.

The exact process for getting to this point will vary from one operating system to another, but the basic idea is the same: Find the My Computer icon, either on the desktop or on your start menu, right-click it and select Manage. If that doesn't work, select the System option from the Control Panel, and activate the Device Manager from the Hardware tab.

If you have a problem with your USB drivers, you will see a yellow icon carrying an exclamation point under the Universal Serial Bus controllers category. The name of the icon may be HMI or Loader or something similar.

To fix the problem, right-click on the broken device and select Uninstall from the menu.

After asking for confirmation, Windows will remove the device from your system. You can now power the Crimson 3.1 target device off. After a couple of seconds, reapply power and Windows will start the driver installation process once again.

As mentioned above, Crimson 3.1 actually uses distinct device drivers for the boot loader and for the Crimson runtime. You may have to repeat this repair process for each driver, although it is unlikely that things got beyond the boot loader if that install failed.

LEDs

LEDs	Description
STS	Status LED indicates condition of the Gateway Assembly.
TX/RX	Transmit/Receive LEDs show serial activity.
Ethernet	Link and activity LEDs.
CF	CompactFlash LED indicates card status and read/write activity

Getting Assistance

If you hit a problem or need assistance, several resources are available.

Balloon Help

Crimson 3.1 contains a very useful feature called Balloon Help. This feature allows you to see help information for each item within Crimson 3.1. It is controlled via the icon at the right-hand edge of the toolbar or via options on the Help menu. The default mode allows the help text to be displayed by pressing the F1 key, providing a quick way of getting information if you are unsure of the settings for a given field. Keep this in mind, and your life will be a lot easier!

Technical Support

Technical assistance is available on the web at:

www.redlion.net/support.html

Or, Red Lion can be contacted via email at:

support@redlion.net

You may also call +1 (717) 767-6511 and ask for the HMI Support Team.

Downloading to a Device

Crimson 3.1 database files are downloaded to the target device by means of the Link menu. The download process typically takes only a few seconds, but can take somewhat longer on the first download if Crimson has to update the firmware in the device, or if the device does not contain an older version of the current database. After this first download, Crimson uses a process known as incremental download to ensure that only changes to the database are transferred. This means that updates can be made in seconds, thereby reducing your development cycle time and simplifying the debugging process.

Configuring the Link

The programming link between the PC and the target device can be made using a USB port or a TCP/IP connection. First time updates of databases use the USB port. Further updates may be made by the TCP port if configured properly within the updated database and the IP address is known. Before downloading, use the Link-Options command to ensure that you have the correct method selected.

Note that this dialog does not provide any method to select the target IP address when using TCP/IP for download. This information is stored in the database file and is configured via the Download tab of the Network configuration item. This method makes it easier to switch between multiple databases without having to re-configure the target IP every time. Note also that Crimson 3.1 maintains distinct download settings when working with multiple product families. This makes it easier to use USB for downloading to those products that support it, while falling back to serial download for less capable devices.

Sending the Database

Once the link is configured, the database can be downloaded using either the Link-Send or Link-Update commands. The Link-Send command will send the entire database, whether or not individual objects within the file have changed. The Link-Update command will only send changes, and will typically take a much shorter period of time to complete. The Link-Update command is typically the only one that you will need, as Crimson 3.1 will automatically fall back to a complete send if the incremental download fails for any reason. As a shortcut, you can access Link-Update via the lightning bolt symbol on the toolbar, or via the **F9** key on the keyboard.

NOTE: Downloading via TCP/IP to some models relies on a memory card being installed if the device's firmware is to be upgraded. Since you may want to perform such upgrades at some point in time, it is highly recommended that you install a memory card in any device to which TCP/IP downloads are likely to be performed. Note also that the TCP/IP download option must be enabled via the Network settings in the Communications category.

Extracting Databases

The Link-Support Upload command can be used to include the information necessary to support database upload when sending a database to a target device. This setting is stored in the database and can be configured on a perfile basis. Enabling database upload will slow the download process somewhat and may fail with extremely large databases containing many embedded images, but it will ensure that, should you lose your database file, you will be able to extract an editable image from the device.

NOTE: If you lose your database file and you do not have upload support enabled, you will not be able to reconstruct your file without starting from scratch. To extract a database from a panel, use the Link-Extract command. This command will upload the database, and prompt you for a name under which to save the file. The file will then be opened for editing. If the database was password-protected, you may be required to enter the password before it can be opened. In other words, enabling upload will not circumvent password protection.

Sending the Time and Date

The Link-Send Time command can be used to set the target device's clock to match that of the computer on which Crimson 3.1 is executing. This command also sends the current time zone and Daylight Savings Time settings to the target device, allowing the advanced features of the Time Manager to be used. Note that an accurate clock setting is required for certain features to work reliably, most notable those associated with SSL-TLS security.

Software Updates

Contact your distributor or Graco Technical Assistance for software updates. Refer to **Installing the Software**, page 19, for installing software updates.

Download the Preconfigured Database to the Gateway Module

Graco can supply a preconfigured database as a setup file for the Gateway, containing parameters which communicate between the Gateway and various Graco control platforms. The file name has a .cd31 extension.

Red Lion Crimson 3.0/3.1 files are downloaded to the Gateway module using the Link menu. The programming link between the PC and the Gateway module uses the USB cable. Before downloading, check that the Communications Port is set to USB, as follows.

NOTE: During programming the Gateway module may ask for an updated driver. Follow the instructions on the screen to automatically find and select the drivers.

1. Go to Start>Programs>Graco>Red Lion Crimson 3.0/3.1 and run the program. The Red Lion Crimson 3.0/3.1 main page will appear.

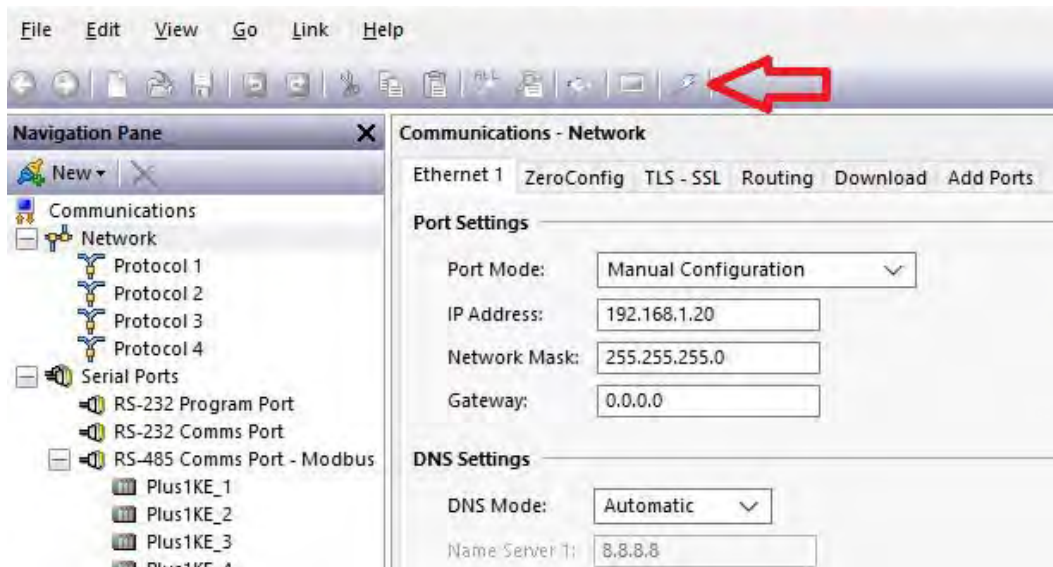


Fig. 19 Red Lion Crimson 3.0/3.1 Main Page

2. Using the Link pulldown menu, select Options to open the Link Options window. Check that the Communications Port is set to USB, and click OK.
3. Go to File>Open and select the file with the xx.cd31 extension. The file name should appear at the top of the window once loaded.
4. Download the database using the Link>Update command. As a shortcut, use the Update symbol on the toolbar. See FIG. 19.

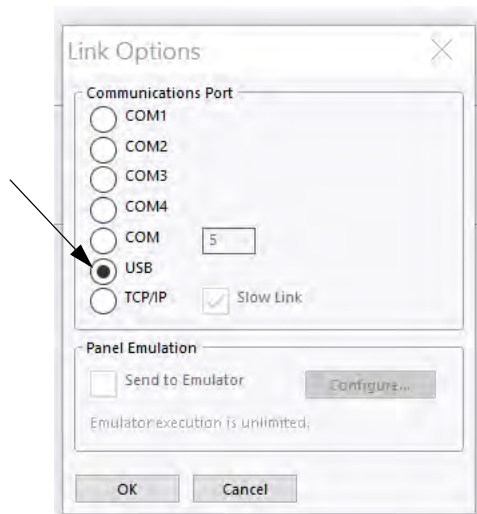
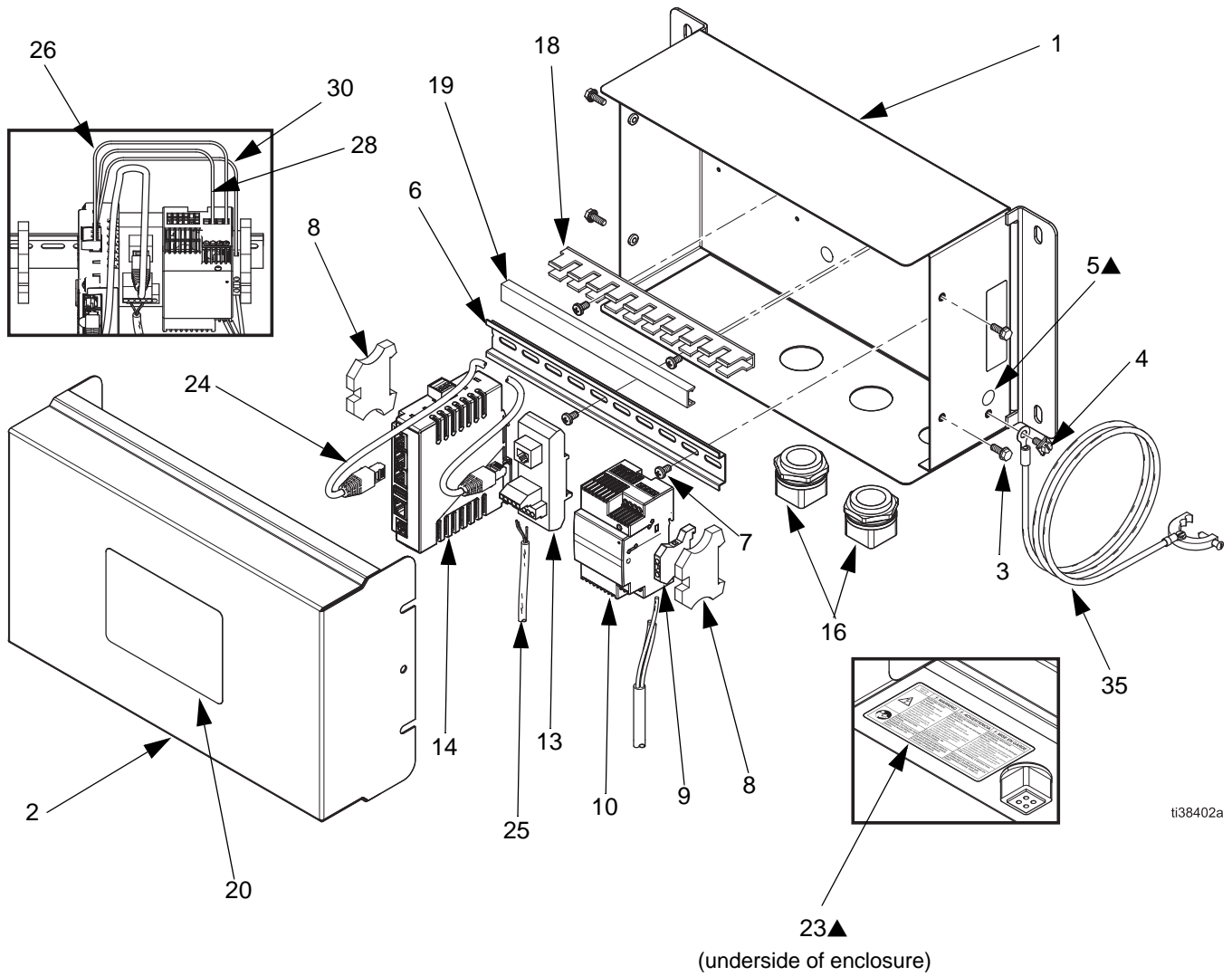


Fig. 20: Set Communications Port to USB

NOTE: Downloading typically takes only a few seconds but may take longer if the software has to update firmware on the Gateway module.

Parts

25B471 Gateway Ethernet Assembly



25B471 Gateway Ethernet Assembly Parts List

Ref.	Part No.	Description	Qty
1	15V339	Enclosure	1
2	15T752	Cover	1
3	n/a	Screw, machine, serrated hex-head	4
4	116343	Screw, ground	1
5▲	186620	Label, ground	2
6	n/a	Din rail	1
7	103833	Screw, machine, CRBH	4
8	120838	End block, din rail	2
9	112443	Terminal block, ground	1
10	19Y920	Power supply	1
13	15V344	Connection converter, terminal block to RJ45	1
14	18C235	Gateway Assembly	1
16	15V345	Grommet, cable entry	2
18	n/a	Wireway	1
19	n/a	Cover, wireway	1
20	15U918	Label, product	1
23▲	15W776	Label, warning, electrical	1

Ref.	Part No.	Description	Qty
24	121994	Cable, CATV	1
25	121700	Cable, 2 conductor, RS485, 50 ft.	1
26	065145	Wire, electrical, copper	1
27	112515	Ferrule, wire, red; not shown	4
28	547005	Wire, power, 24 VDC +, blue	1
30	555770	Wire, ground, green	1
31	112514	Ferrule, wire, AWG-18; not shown	2
33	17R419	Card, SD; not shown	1
34	15T999	Cable, USB, 5 meters; not shown	1
35	223547	Cable, ground, 25 ft.	1

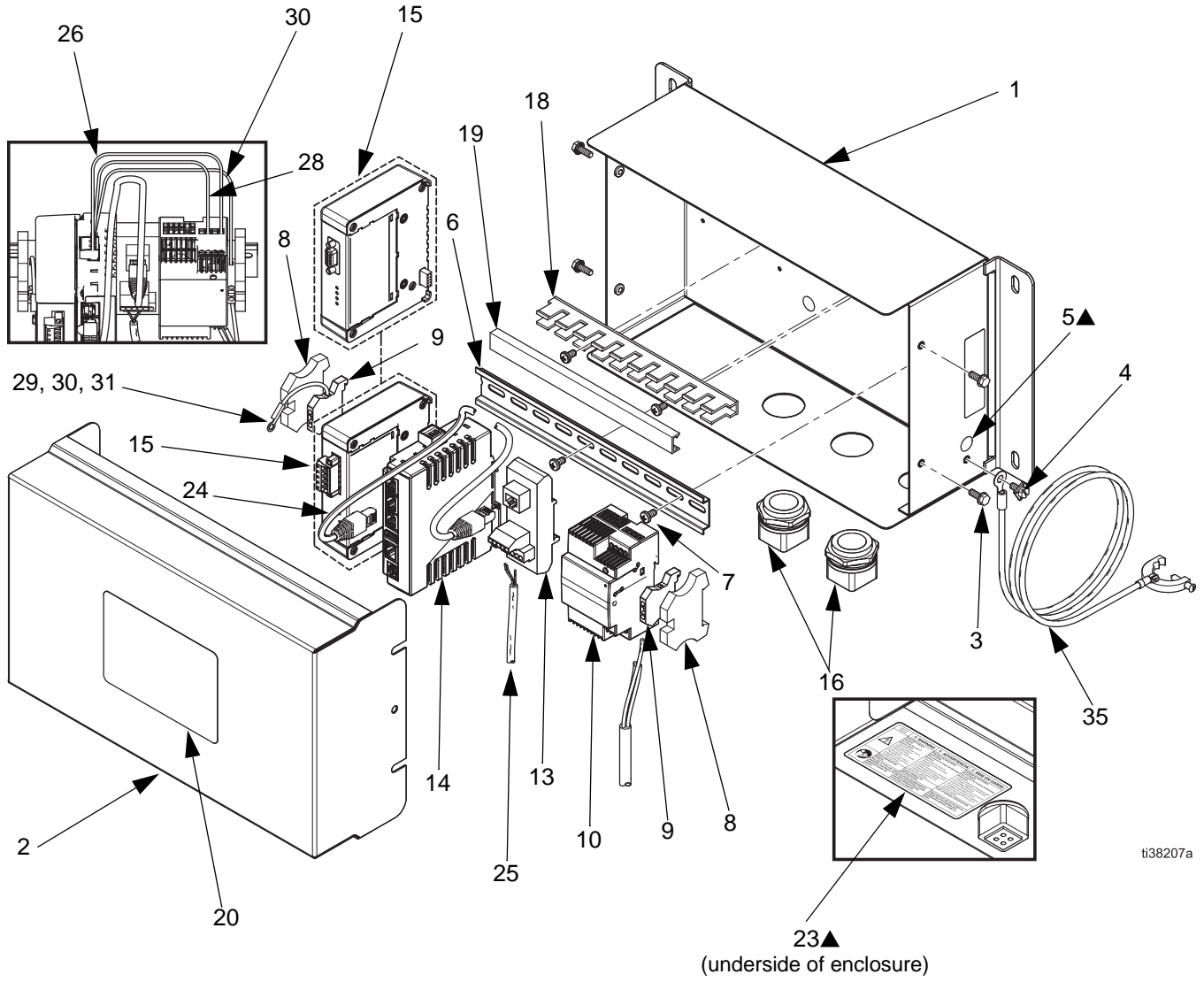
▲ Replacement safety labels, tags, and cards are available at no cost.

Parts labeled n/a are not available separately.

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25B472 Gateway DeviceNet Assembly

25B473 Gateway Profibus Assembly



ti38207a

25B472 Gateway DeviceNet Assembly Parts List**25B473 Gateway Profibus Assembly Parts List**

Ref.	Part No.	Description	Qty
1	15V339	Enclosure	1
2	15T752	Cover	1
3	n/a	Screw, machine, serrated hex-head	4
4	116343	Screw, ground	1
5▲	186620	Label, ground	3
6	n/a	Din rail	1
7	103833	Screw, machine, CRBH	4
8	120838	End block, din rail	2
9	112443	Terminal block, ground	1
10	19Y920	Power supply	1
13	15V344	Connection converter, terminal block to RJ45	1
14	18C235	Gateway Assembly	1
15		Card, expansion	
	18C236	DeviceNet (25B472 only)	1
	18C237	ProfiBus (25B473 only)	1
16	15V345	Grommet, cable entry	2
18	n/a	Wireway	1
19	n/a	Cover, wireway	1

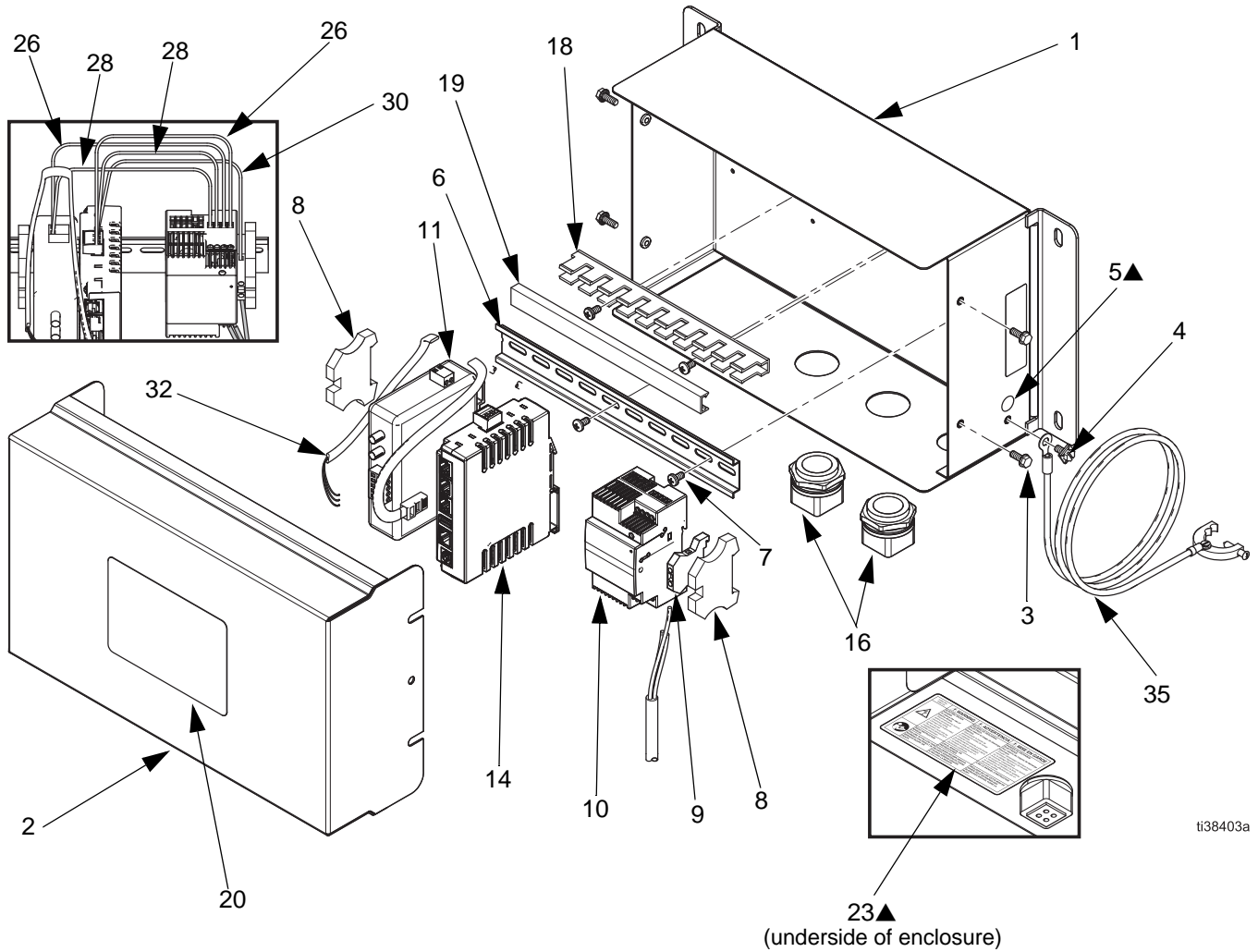
Ref.	Part No.	Description	Qty
20	15U918	Label, product	1
23▲	15W776	Label, warning, electrical	1
24	121994	Cable, CATV	1
25	121700	Cable, 2 conductor, RS485, 50 ft.	1
26	065145	Wire, electrical, copper	1
27	112515	Ferrule, wire, red; not shown	4
28	547005	Wire, power, 24 VDC +, blue	1
29	114090	Terminal	1
30	555770	Wire, ground, green	2
31	112514	Ferrule, wire, AWG-18; not shown	3
33	17R419	Card, SD; not shown	1
34	15T999	Cable, USB, 5 meters; not shown	1
35	223547	Cable, ground, 25 ft.	1

▲ Replacement safety labels, tags, and cards are available at no cost.

Parts labeled n/a are not available separately.

NOTE: All brand names or marks are used for identification purposes and are trademarks of their respective owners.

25B486 Gateway Ethernet Assembly with Fiber Conversion Module 16K465



ti38403a

25B486 Gateway Ethernet Assembly with Fiber Conversion Module 16K465 Parts List

Ref.	Part No.	Description	Qty
1	15V339	Enclosure	1
2	15T752	Cover	1
3	n/a	Screw, machine, serrated hex-head	4
4	116343	Screw, ground	1
5▲	186620	Label, ground	2
6	n/a	Din rail	1
7	103833	Screw, machine, CRBH	4
8	120838	End block, din rail	2
9	112443	Terminal block, ground	1
10	19Y920	Power supply	1
11	16K465	Converter, serial to fiber optic	1
14	18C235	Gateway Assembly	1
16	15V345	Grommet, cable entry	2
18	n/a	Wireway	1
19	n/a	Cover, wireway	1
20	15U918	Label, product	1
23▲	15W776	Label, warning, electrical	1

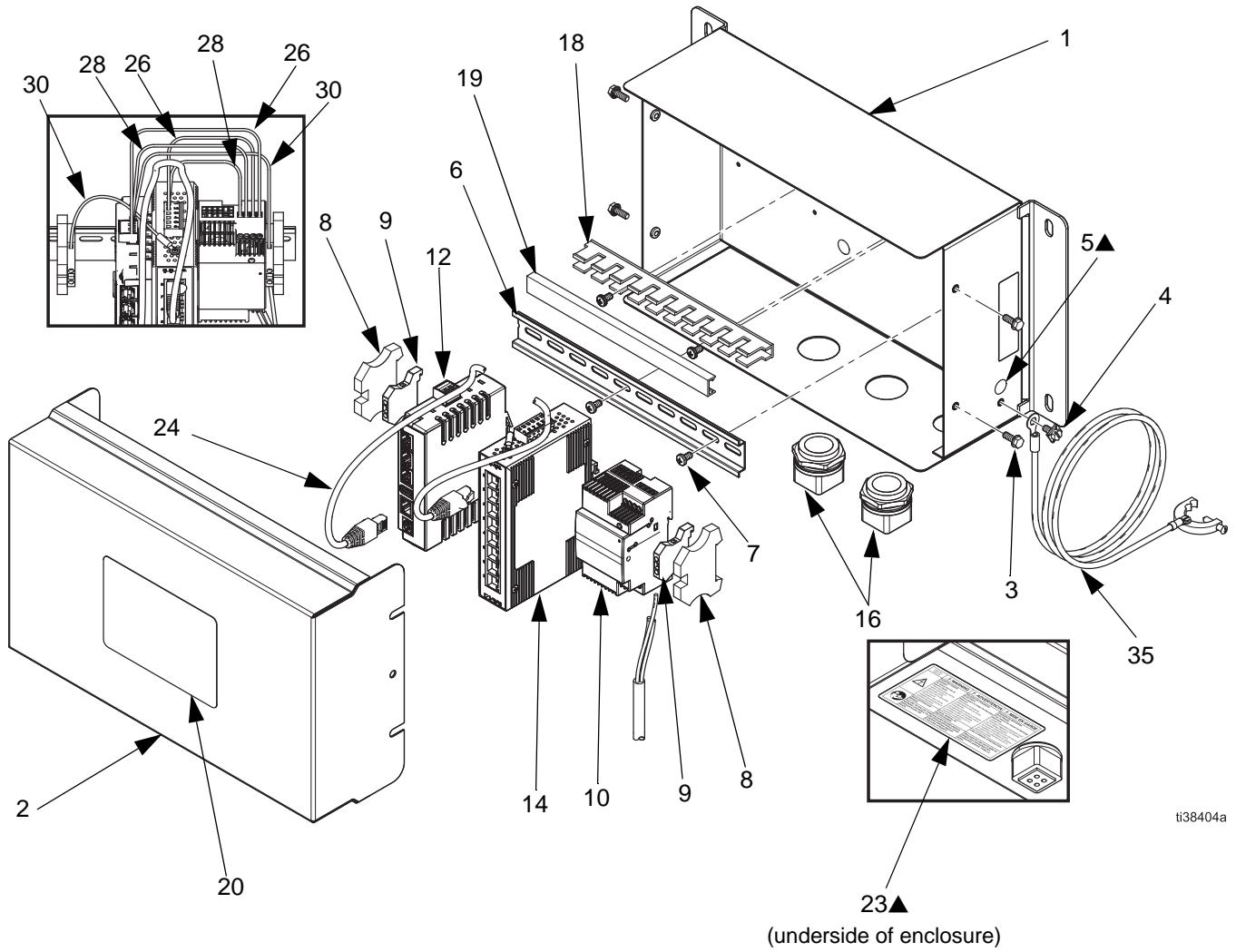
Ref.	Part No.	Description	Qty
26	065145	Wire, electrical, copper	2
27	112515	Ferrule, wire, red; not shown	8
28	547005	Wire, power, 24 VDC +, blue	2
30	555770	Wire, ground, green	1
31	112514	Ferrule, wire, AWG-18; not shown	2
32	19Y992	Cable, Gateway to fiber conversion module	1
33	17R419	Card, SD	1
34	15T999	Cable, USB, 5 meters; not shown	1
35	223547	Cable, ground, 25 ft.	1

▲ Replacement safety labels, tags, and cards are available at no cost.

Parts labeled n/a are not available separately.

NOTE: All brand names or marks are used for identification purposes and are trademarks of their respective owners.

25B489 Gateway Ethernet Assembly with Ethernet Switch 15V342



25B489 Gateway Ethernet Assembly with Ethernet Switch 15V342 Parts List

Ref.	Part No.	Description	Qty
1	15V339	Enclosure	1
2	15T752	Cover	1
3	n/a	Screw, machine, serrated hex-head	4
4	116343	Screw, ground	1
5▲	186620	Label, ground	3
6	n/a	Din rail	1
7	103833	Screw, machine, CRBH	4
8	120838	End block, din rail	2
9	112443	Terminal block, ground	2
10	19Y920	Power supply	1
12	15V342	Switch, ethernet	1
14	18C235	Gateway Assembly	1
16	15V345	Grommet, cable entry	2
18	n/a	Wireway	1
19	n/a	Cover, wireway	1
20	15U918	Label, product	1

Ref.	Part No.	Description	Qty
23▲	15W776	Label, warning, electrical	1
24	121994	Cable, CATV	1
26	065145	Wire, electrical, copper	1
27	112515	Ferrule, wire, red; not shown	8
28	547005	Wire, power, 24 VDC +, blue	2
29	114090	Terminal	1
30	555770	Wire, ground, green	1
31	112514	Ferrule, wire, AWG-18; not shown	3
33	17R419	Card, SD; not shown	1
34	15T999	Cable, USB, 5 meters; not shown	1
35	223547	Cable, ground, 25 ft.	1

▲ Replacement safety labels, tags, and cards are available at no cost.

Parts labeled n/a are not available separately.

NOTE: All brand names or marks are used for identification purposes and are trademarks of their respective owners.

Appendix A: DeviceNet[®] Secondary Communication

Overview

This appendix describes the Gateway's support for DeviceNet and details the configuration steps necessary to use this feature. It does **not** provide a detailed description of DeviceNet, but only a brief introduction, necessary to define the terms that are used throughout the remainder of this document.

Introduction

DeviceNet is a low-level network using the Controller Area Network (CAN) technology, to provide communication between a range of industrial devices, from simple devices such as sensors and actuators, to high-level devices such as controllers and HMIs.

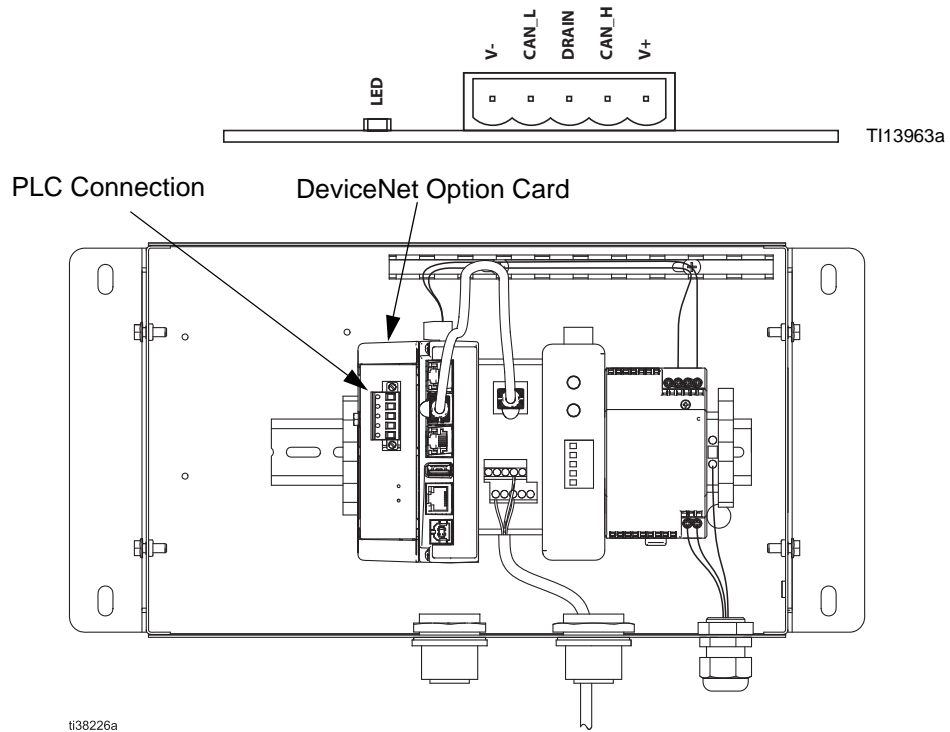
DeviceNet Port Protocols

The DeviceNet option card has one DeviceNet port. See FIG. 21. The port may be configured for various DeviceNet protocols. Contact Graco Technical Assistance for currently supported protocols.

DeviceNet Option Card Pin Outs

- **V-**
Position 1 of the pluggable connector provides a CAN ground connection. This terminal is isolated from the Gateway Assembly.

- **CAN_L**
Position 2 of the pluggable connector provides the CAN_L bus line (active low). This terminal is isolated from the Gateway Assembly.
- **DRAIN (optional)**
Position 3 of the pluggable connector is provided for optional drain connections. This position is available only to tie drain wires together or to earth ground. There is no internal connection to earth ground. The DRAIN position is not connected to any circuitry internal to the DeviceNet option card.
- **CAN_H**
Position 4 of the pluggable connector provides the CAN_H bus line (active high). This terminal is isolated from the Gateway Assembly.
- **V+ (optional 24 Vdc)**
Position 5 of the pluggable connector is provided for optional 24 Vdc connections. This position is available only to tie 24 Vdc wires together. The DeviceNet option card neither provides or uses 24 Vdc power through this connection. The V+ position is not connected to any circuitry internal to the DeviceNet option card or Gateway Assembly.



ti38226a

FIG. 21: DeviceNet Port Pin Outs and PLC Connection

About DeviceNet

DeviceNet is a connection-based network. In this context the term connection refers to a communication path between two or more devices, and not the physical (cable) connection to the DeviceNet network. A connection must be established between two devices in order to transfer data.

There are two types of connection defined by the DeviceNet specification. Each has different characteristics and is suited to a specific type of communication.

- **I/O Connection** – Dedicated data transfer between a producer and one or more consumers. The format of the data is known or implied by the connection.
- **Explicit Messaging** – Generic multi-purpose messaging connection, typically command and response message commands.

Each connection type has an extensive number of parameters, which can affect the characteristics of the communication path. For many Priority/Secondary communications scenarios, a defined set of connections, together with their respective parameter settings exist under the collective name Predefined Priority/Secondary Connection Set. Many of the steps involved in creating and configuring a connection have been removed with this connection set, thus simplifying the network configuration.

Predefined Priority/Secondary Connection Set

The DeviceNet specification details a number of connections that facilitate data transfer between a Priority and Secondary devices. The following sections detail the connection types supported by the Gateway Assembly.

- *I/O Bit-Strobe Connection:* The Bit-Strobe connection is an I/O connection over which Bit-Strobe I/O command and response messages are transferred. The Bit-Strobe command is broadcast by the Priority device and is received by all Secondary devices simultaneously. The command message contains a single bit of information for each Secondary on the network. Each Secondary device is required to respond with a Bit- Strobe response message. The response message can contain up to 8 bytes of information.
- *I/O Poll Connection:* The Poll connection is an I/O connection over which Poll command and response messages are transferred. The Poll command is transmitted by the Priority, and is directed to a single Secondary device. The Secondary device in turn responds with a Poll response message. Both the Poll command and Poll response messages can contain any number of bytes.
- *I/O Data Connection:* The I/O Data connection is part of the Predefined Priority/Secondary Connection Set, but instead is included for devices, which support creating I/O data connections via the UCMM (Unconnected Message Manager).

Level of Support

The Gateway provides Group 2 Server level support: A UCMM capable device that is configured to act as a **Secondary** for the Predefined Priority/Secondary connection set.

Refer to your Crimson 3.1 User Manual for use and configuration of this DeviceNet card.

Appendix B: Profibus® DP Secondary Communication

Overview

This appendix describes the Gateway's support for Profibus DP and details the configuration steps necessary to set up a Gateway Assembly with an S7300 PLC, CPU315-2DP via Profibus. It does **not** provide a detailed description of Profibus, but only a brief introduction, necessary to define the terms that are used throughout the remainder of this document.

Introduction

Profibus DP stands for "Profibus for Decentralized Peripherals". Profibus DP is a device level bus that supports both analog and discrete signals. It has widespread usage for such items as remote I/O systems, motor control centers, and variable speed drives. Profibus DP communicates at speeds from 9.6 Kbps to 12 Mbps over distances from 100 to 1,200 meters.

The protocol supported by the Profibus DP option card is **Profibus DP Secondary**. Therefore, the Gateway Assembly must be linked to a Profibus network with a PLC.

Profibus Port Protocols

The Profibus option card has one Profibus port. See FIG. 22.

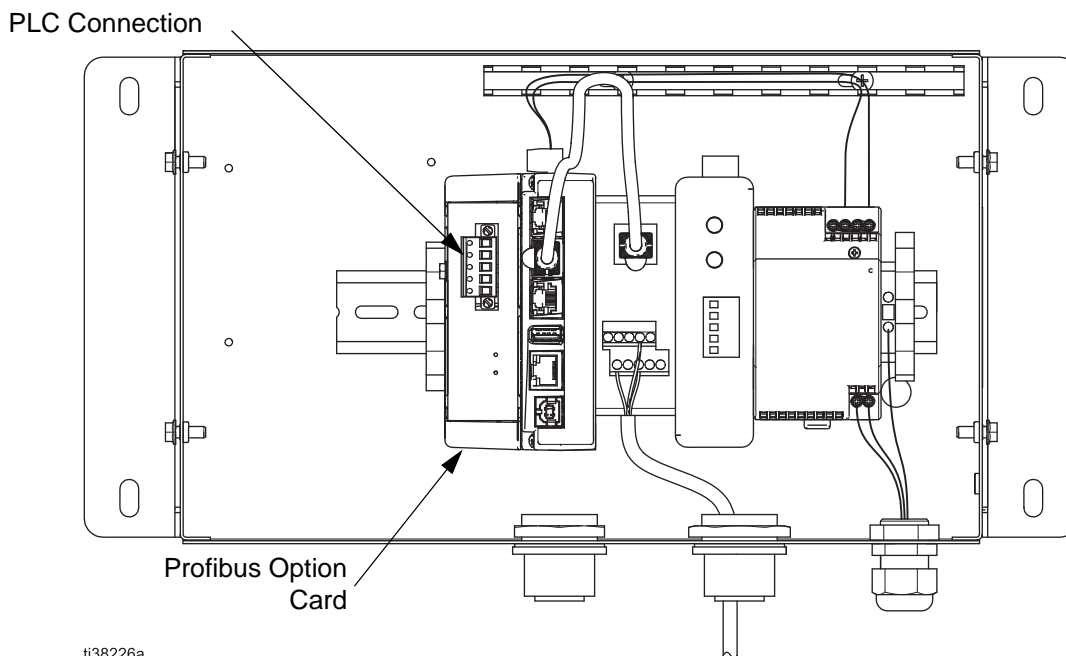


FIG. 22: Profibus PLC Connection

About Profibus DP

Profibus DP communication takes the form of block exchange. Profibus blocks are made of memory bytes where 2 bytes make a word and 4 bytes a double word, or Dword.

A block is a range of consecutive byte addresses and is unidirectional. This means the PLC will exchange data read only and write only blocks with DP Secondary units. Addresses in each device are independent and only relevant to the device for its own program. For example, the address range for the first block in the Priority can start at 256 with a 64 words block length and could result in the Secondary with a range starting from 0 with 64 words length.

However, since blocks are consecutive, this means the first block start address, in the above example 256, will be the Secondary start address 0. Then, 257 in the Priority would be 1 in the Secondary, and so on.

Block length can be defined in bytes, words, or double words. Since start addresses between the Priority and the Secondary can be different, one could give its start address and length in bytes, and the other in words.

For example, the Priority start address is byte 256, with a 64 words block length.

- This results in a range from byte 256 up to byte 383. The Secondary start address is word 0, with a 64 words block length.
- This results in a range from word 0 to word 63. FIG. 23 illustrates this exchange.

NOTE: Do not forget that the Input block is independent from the Output block, and although the address range is the same, the data are different.

NOTE: FIG. 23 has no connection with the Input Block and Output Block in the Gateway Assembly. The terminology used in the tags configuration is from the PLC point of view (DP Priority). Refer to **Install the Gateway Assembly Hardware** for more information.

Refer to your Crimson 3.1 User Manual for setup.

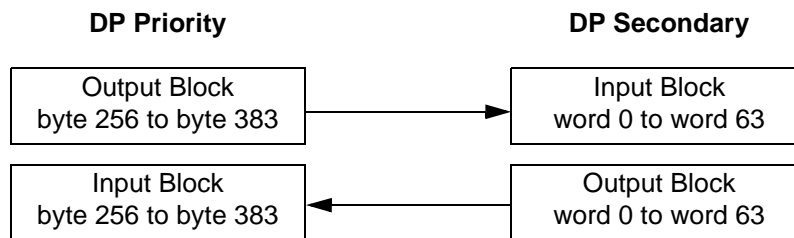
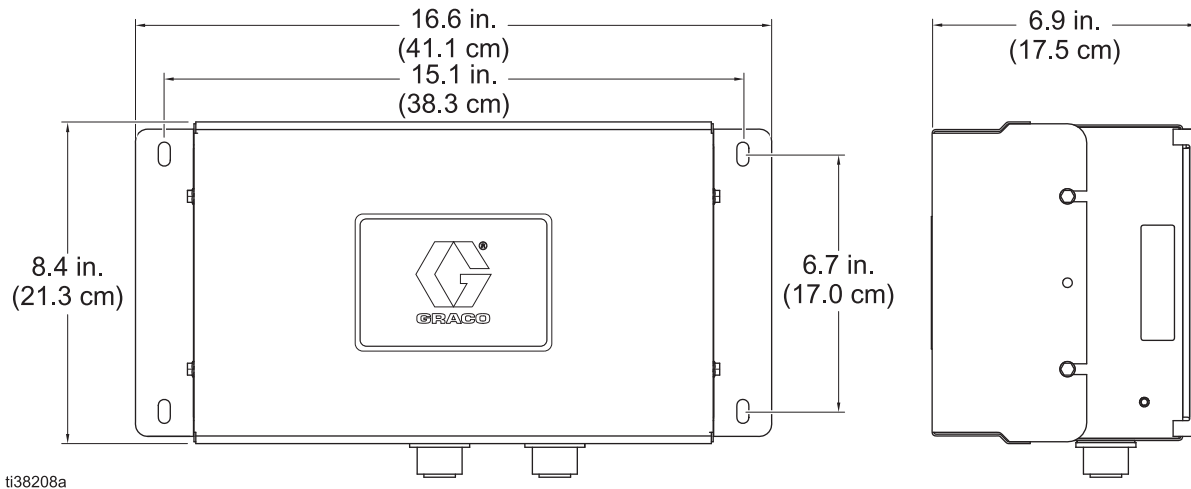


FIG. 23: Priority/Secondary Exchange

Dimensions



California Proposition 65

CALIFORNIA RESIDENTS

⚠ WARNING: Cancer and reproductive harm – www.P65warnings.ca.gov.

Technical Specifications

Gateway Network Communication Assemblies		
	US	Metric
Power		
Input		
Voltage	100 - 240 VAC	
Frequency	50/60 hz AC	
Current	1.34 amp Max	
Wattage	60 Watts	
Weights		
Model 25B471	9.0 lbs	4.1 kg
Models 25B472, 25B473, 25B486, and 25B489	9.5 lbs	4.3 kg

Gateway Communication Module		
	US	Metric
Communication Ports		
USB/PG Ports	Adheres to USB specification 1.1. Device only using Type B connection.	
Serial Ports	Format and Baud rates for each port are individually software programmable up to 115,200 baud.	
RS232/PG Port	RS232 port via RJ12.	
COMM Ports	RS422/485 port via RJ45, and RS232 port via RJ12.	
DH485 TXEN Port	Transmit enable; open collector, $V_{OH}=15$ Vdc, $V_{OL}=0.5$ V @ 25 mA maximum.	
Ethernet Port	10 BASE-T/100 BASE-TX, RJ45 jack is wired as a NIC (Network Interface Card).	
Memory		
On-board user memory	4 Mbytes of non-volatile Flash memory.	
On-board SDRAM	2 Mbytes	
Memory card	CompactFlash Type II slot for Type I and Type II cards. Used for optional database storage only.	
Real-time Clock		
	Typical accuracy is less than 1 minute per month drift. Lithium coin cell battery; typical lifetime of 10 years at 25°C.	
Environmental Conditions		
Operating temperature range	14 to 122°F	-10 to 50°C
Storage temperature range	-4 to 158°F	-20 to 70°C
Operating and storage humidity	85% relative humidity, non-condensing, from 32 to 122°F (0 to 50°C)	
Vibration according to IEC 68-2-6	Operational 5 to 150 Hz, in X, Y, Z direction for 1.5 hr, 2 g's	
Shock according to IEC 68-2-27	Operational 30 g, 11 msec in 3 directions	
Altitude	Up to 6562 ft. (2000 m)	

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

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For the latest information about Graco products, visit www.graco.com.

For patent information, see www.graco.com/patents.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.

Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211, **Fax:** 612-378-3505

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Graco reserves the right to make changes at any time without notice.*

Original instructions. This manual contains English. MM

Graco Headquarters: Minneapolis

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Revision A, August 2020