Instructions

Gateway Network Communication Assembly

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

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

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

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.


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.

**WARNING**

**FIRE AND EXPLOSION HAZARD**
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:

- 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.

**ELECTRIC SHOCK HAZARD**
This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.

- 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.
 WARNINGS

EQUIPMENT MISUSE HAZARD
Misuse can cause death or serious injury.
- 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.

PERSONAL PROTECTIVE EQUIPMENT
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:
- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.
Install the Gateway Assembly Hardware

**Location**

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.

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.

**NON-HAZARDOUS LOCATION**

Gateway Assembly

- USB Cable (included with all models); for initial setup only
- PLC Communication Wire/Cable (protocol dependent)
- Graco System Controller
- Computer (PC)
- Programmable Logic Controller (PLC)
- 2-wire twisted pair cable, with shield wire, CATV cable or fiber optic cable

**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).

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). Remove the ground wire (35) end, as shown, and tighten the ground screw (4) securely. Connect the ground clamp to a true earth ground.

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**Fig. 2: Power Off**

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**Fig. 3: Enclosure Grounding**
Install the Gateway Assembly Hardware

Power Connections

Improper wiring may cause electric shock or other serious injury if work is not performed properly.

- 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.

NOTE:
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).

Improper wiring may cause electric shock or other serious injury if work is not performed properly.
Install the Gateway Assembly Hardware

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.

Models 25B471/2/3 come with 50 ft. of the twisted pair cable for an RS485 connection.

Communication Wire/Cable (to PLC). This connection is protocol dependent.

2-wire twisted pair cable, with shield wire. See Electrical Schematics on page 16 for pin connections.

Fig. 5: Gateway Ethernet Assembly Cable Connection Points - Model 25B471
2-wire twisted pair cable, with shield wire (to EasyKey). See Electrical Schematics on page 17 for pin connections.

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

External control network cable

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

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

USB Port

Ethernet network cable

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)**
Install the Gateway Assembly Hardware

A USB/PG port cable is provided with all models for configuration and setup.

**Fig. 11: Programming Port Options**

**Fig. 12: Ethernet Connection**
Install the Gateway Assembly Hardware

Electrical Schematics

FIG. 13: Electrical Schematic - Model 25B471
Install the Gateway Assembly Hardware

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

**Fig. 15: Electrical Schematic - Model 25B486**

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3A7639A 17
Install the Gateway Assembly Hardware

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.

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.
Install the Red Lion™ Crimson® 3.0/3.1 Software

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

<table>
<thead>
<tr>
<th>LEDs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STS</td>
<td>Status LED indicates condition of the Gateway Assembly.</td>
</tr>
<tr>
<td>TX/RX</td>
<td>Transmit/Receive LEDs show serial activity.</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Link and activity LEDs.</td>
</tr>
<tr>
<td>CF</td>
<td>CompactFlash LED indicates card status and read/write activity</td>
</tr>
</tbody>
</table>
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 per-file 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.

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.

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.

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

**Fig. 19 Red Lion Crimson 3.0/3.1 Main Page**

**Fig. 20: Set Communications Port to USB**
Parts

25B471 Gateway Ethernet Assembly
## 25B471 Gateway Ethernet Assembly Parts List

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
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<td>1</td>
<td>15V339</td>
<td>Enclosure</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>15T752</td>
<td>Cover</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>n/a</td>
<td>Screw, machine, serrated hex-head</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>116343</td>
<td>Screw, ground</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>186620</td>
<td>Label, ground</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>n/a</td>
<td>Din rail</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>103833</td>
<td>Screw, machine, CRBH</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>120838</td>
<td>End block, din rail</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>112443</td>
<td>Terminal block, ground</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>19Y920</td>
<td>Power supply</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>15V344</td>
<td>Connection converter, terminal block to RJ45</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>18C235</td>
<td>Gateway Assembly</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>15V345</td>
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<td>2</td>
</tr>
<tr>
<td>18</td>
<td>n/a</td>
<td>Wireway</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
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</tr>
<tr>
<td>20</td>
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</tr>
<tr>
<td>23</td>
<td>15W776</td>
<td>Label, warning, electrical</td>
<td>1</td>
</tr>
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<table>
<thead>
<tr>
<th>Ref.</th>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>121994</td>
<td>Cable, CATV</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>121700</td>
<td>Cable, 2 conductor, RS485, 50 ft.</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>065145</td>
<td>Wire, electrical, copper</td>
<td>1</td>
</tr>
<tr>
<td>27</td>
<td>112515</td>
<td>Ferrule, wire, red; not shown</td>
<td>4</td>
</tr>
<tr>
<td>28</td>
<td>547005</td>
<td>Wire, power, 24 VDC +, blue</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>555770</td>
<td>Wire, ground, green</td>
<td>1</td>
</tr>
<tr>
<td>31</td>
<td>112514</td>
<td>Ferrule, wire, AWG-18; not shown</td>
<td>2</td>
</tr>
<tr>
<td>33</td>
<td>17R419</td>
<td>Card, SD; not shown</td>
<td>1</td>
</tr>
<tr>
<td>34</td>
<td>15T999</td>
<td>Cable, USB, 5 meters; not shown</td>
<td>1</td>
</tr>
<tr>
<td>35</td>
<td>223547</td>
<td>Cable, ground, 25 ft.</td>
<td>1</td>
</tr>
</tbody>
</table>

▲ 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.
25B472 Gateway DeviceNet Assembly
25B473 Gateway Profibus Assembly
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
## 25B486 Gateway Ethernet Assembly with Fiber Conversion Module 16K465 Parts List

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

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

▲ 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 Parts List

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15V339</td>
<td>Enclosure</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>15T752</td>
<td>Cover</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>n/a</td>
<td>Screw, machine, serrated hex-head</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>116343</td>
<td>Screw, ground</td>
<td>1</td>
</tr>
<tr>
<td>5▲</td>
<td>186620</td>
<td>Label, ground</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>n/a</td>
<td>Din rail</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>103833</td>
<td>Screw, machine, CRBH</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>120838</td>
<td>End block, din rail</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>112443</td>
<td>Terminal block, ground</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>19Y920</td>
<td>Power supply</td>
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<tr>
<td>12</td>
<td>15V342</td>
<td>Switch, ethernet</td>
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</tr>
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<td>14</td>
<td>18C235</td>
<td>Gateway Assembly</td>
<td>1</td>
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<tr>
<td>16</td>
<td>15V345</td>
<td>Grommet, cable entry</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>n/a</td>
<td>Wireway</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>n/a</td>
<td>Cover, wireway</td>
<td>1</td>
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<tr>
<td>20</td>
<td>15U918</td>
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<thead>
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<th>Ref.</th>
<th>Part No.</th>
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<th>Qty</th>
</tr>
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<td>Label, warning, electrical</td>
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</tr>
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<td>121994</td>
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<td>1</td>
</tr>
<tr>
<td>26</td>
<td>065145</td>
<td>Wire, electrical, copper</td>
<td>1</td>
</tr>
<tr>
<td>27</td>
<td>112515</td>
<td>Ferrule, wire, red; not shown</td>
<td>8</td>
</tr>
<tr>
<td>28</td>
<td>547005</td>
<td>Wire, power, 24 VDC +, blue</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td>114090</td>
<td>Terminal</td>
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</tr>
<tr>
<td>30</td>
<td>555770</td>
<td>Wire, ground, green</td>
<td>1</td>
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<tr>
<td>31</td>
<td>112514</td>
<td>Ferrule, wire, AWG-18; not shown</td>
<td>3</td>
</tr>
<tr>
<td>33</td>
<td>17R419</td>
<td>Card, SD; not shown</td>
<td>1</td>
</tr>
<tr>
<td>34</td>
<td>15T999</td>
<td>Cable, USB, 5 meters; not shown</td>
<td>1</td>
</tr>
<tr>
<td>35</td>
<td>223547</td>
<td>Cable, ground, 25 ft.</td>
<td>1</td>
</tr>
</tbody>
</table>

▲ 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.
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**

<table>
<thead>
<tr>
<th>DP Priority</th>
<th>DP Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output Block</strong>&lt;br&gt;byte 256 to byte 383</td>
<td><strong>Input Block</strong>&lt;br&gt;word 0 to word 63</td>
</tr>
<tr>
<td><strong>Input Block</strong>&lt;br&gt;byte 256 to byte 383</td>
<td><strong>Output Block</strong>&lt;br&gt;word 0 to word 63</td>
</tr>
</tbody>
</table>
Dimensions

California Proposition 65

CALIFORNIA RESIDENTS

## Technical Specifications

### Gateway Network Communication Assemblies

<table>
<thead>
<tr>
<th>Power</th>
<th>US</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>100 - 240 VAC</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz AC</td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>1.34 amp Max</td>
<td></td>
</tr>
<tr>
<td>Wattage</td>
<td>60 Watts</td>
<td></td>
</tr>
<tr>
<td><strong>Weights</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 25B471</td>
<td>9.0 lbs</td>
<td>4.1 kg</td>
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</table>

### Gateway Communication Module

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

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

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.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS
The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présent document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Information

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