Instructions - Parts

Communications Gateway Module Installation Kit
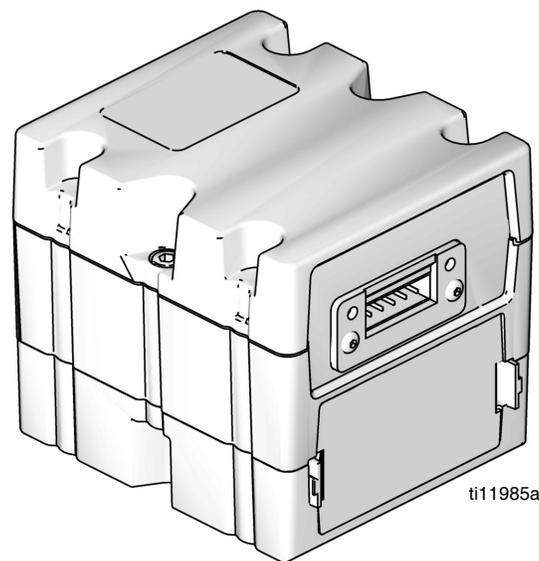
3A1704L

EN

For use with HFR™ systems to provide fieldbus communications abilities. For professional use only.

Kit 24J415

Important Safety Instructions
Read all warnings and instructions in your system manual. Save all instructions.

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CGM with DeviceNet connector shown

Contents

Kits

The following kit is the Communications
Gateway Module (CGM) hardware/software and is
required for all installations. The kit is used in conjunction with the correct fieldbus device.

CGM Part No.	Description
24J415	CGM Installation Kit (Required)

The following kits work with kit 24J415 and includes all
remaining parts necessary to install a CGM. See manual 312864 for repair parts for each assembly.

CGM Part No.	Fieldbus
CGMDN0	DeviceNet
CGMEP0	EtherNet/IP
CGMPB0	PROFIBUS
CGMPN0	PROFINET

Related Manuals

Manual	Description
3A1974	CAN Adapter Kit, Instructions
312864	Communications Gateway Module, Instructions - Parts
313997	HFR Operation
313998	HFR Repair - Parts
406987	GCA CAN Cables, Reference

Overview

The Communications Gateway Module (CGM) provides
a control link between the HFR system and a selected
fieldbus. This provides the means for remote monitoring
and control by external automation systems.

The data available by the CGM to the fieldbus depends
on which GCA based system is connected. Unique data
maps are defined for each GCA system and are available on the token provided in the kit.

See **Available Internal Data** on page 9 for a list of internal data from the HFR system that can be viewed or
modified by your fieldbus master.

NOTE: The following system network configuration files
are available at www.graco.com.

* EDS file: DeviceNet or Ethernet/IP fieldbus networks
* GSD file: PROFIBUS fieldbus networks
* GSDML: PROFINET fieldbus networks

Installation

1. Install the CGM in the desired location.

   a. Remove access cover (D). Loosen two screws (C) and remove CGM (A) from base (B).
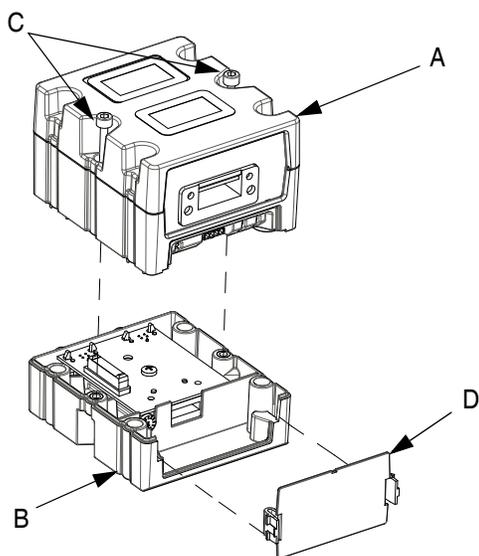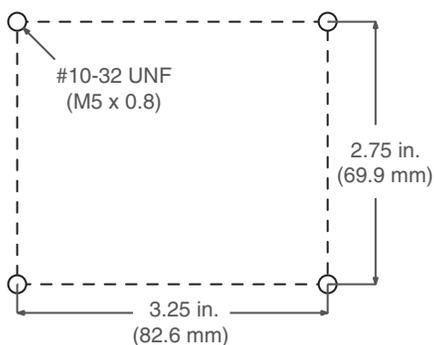

FIG. 1

   b. Mount base (B) in desired location with four screws supplied in this kit. See the following mounting dimensions.

#10-32 UNF (M5 x 0.8)

2.75 in. (69.9 mm)

3.25 in. (82.6 mm)

   c. Mount CGM (A) on base (B) with two screws (C).

2. Install access cover (D).

3. Attach the ferrite suppressor to the CGM on each end of the CAN cable.

NOTICE
To avoid severe damage to GCA modules, ensure the CAN cable is connected to the appropriate CAN connection.

NOTICE
To avoid severe machine damage, do not connect any CAN device to connectors 2A, 2B, or 2C on the Motor Control Module. Connectors 2A, 2B, and 2C are not CAN connectors.

NOTE: CAN ports are located on the base of cube shaped GCA modules or port 6 on the High Power Temperature Control Module.

NOTE: If there are no free CAN ports, plug splitter (121807) into the CAN distribution block located in the Power Distribution Box (PDB). Connect the CAN cable into the splitter. For more detail, refer to the CAN Adapter Kit manual.
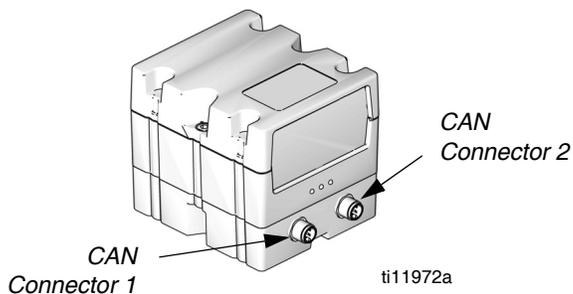

CAN Connector 2

CAN Connector 1

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FIG. 2: Cable Connections

4. If used, connect the ethernet, DeviceNet, or PROFI-BUS cable to the CGM as applicable. Connect the other end of the cable to the FieldBus device.

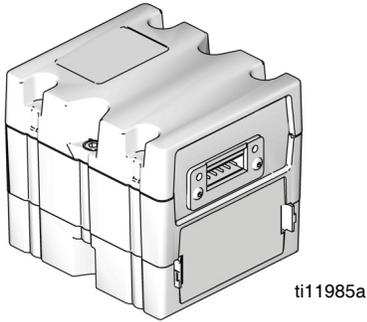
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FIG. 3: Cable Connections

5. Connect cable (LC0032) to the MCM, port 2B, and a customer provided signal device. The signal device must have isolated, dry contacts.

6. Perform the Install or Update Data Map procedure in CGM manual 312864.

7. See **Available Internal Data** on page 9 for details on FieldBus pinout setup.

8. Perform **Setup** on page 5 to configure the fieldbus.

Setup

Gateway Screens

Fieldbus Screens	Page
PROFIBUS	5
PROFINET	6
DeviceNet	7
EtherNet/IP	7

The Gateway screens are used to configure the fieldbus. These screens are shown only if a CGM is correctly installed in your system. See **Installation** on page 3.

1. With the system on and enabled, press 🔒 to access the Setup screens.

2. Press the left arrow key once to navigate to the main Gateway screen. See FIG. 4.

FIG. 4: Example Fieldbus Screen

PROFIBUS Fieldbus Screens

These screens are shown only if you have a PROFIBUS Fieldbus CGM installed. See **Kits** on page 2.

Screen 1

This screen enables the user to set the device address, install date, location tag, function tag, and description.

FIG. 5: PROFIBUS Fieldbus Screen 1

Screen 2

This screen displays the hardware revision, system serial number, and data map identification information.
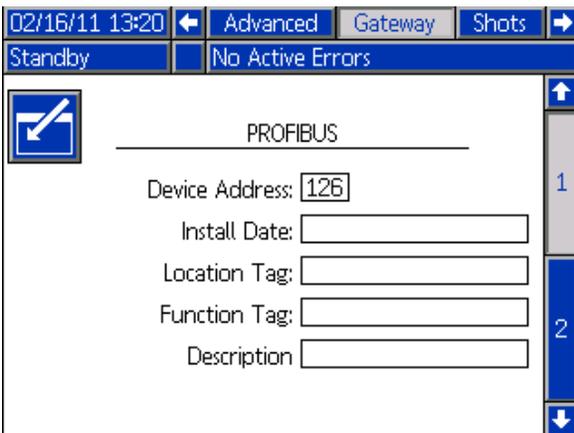

FIG. 6: PROFIBUS Fieldbus Screen 2

PROFINET Fieldbus Screens

These screens are shown only if you have a PROFINET Fieldbus CGM installed. See **Kits** on page 2.

Screen 1

This screen enables the user to set the IP address, DHCP settings, subnet mask, gateway, and DNS information.
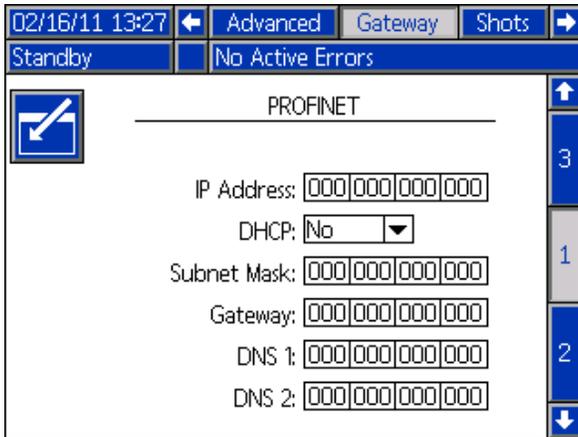
FIG. 7: PROFINET Fieldbus Screen 1

Screen 2

This screen enables the user to set the station name, install date, location tag, function tag, and description.

FIG. 8: PROFINET Fieldbus Screen 2

Screen 3

This screen displays the hardware revision, system serial number, and data map identification information.
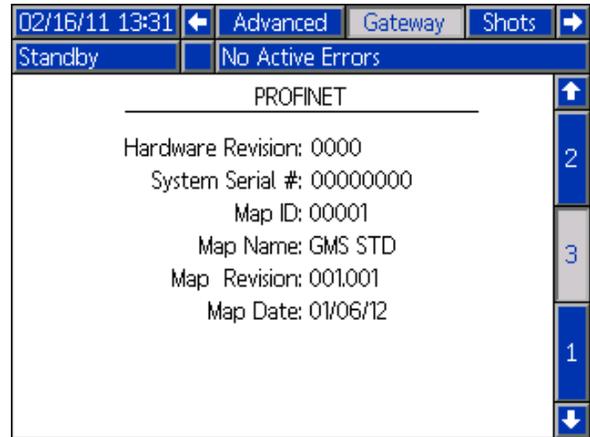
FIG. 9: PROFINET Fieldbus Screen 3

EtherNet/IP Fieldbus Screens

These screens are shown only if you have a EtherNet/IP Fieldbus CGM installed. See **Kits** on page 2.

Screen 1

This screen enables the user to set the IP address, DHCP settings, subnet mask, gateway, and DNS information.
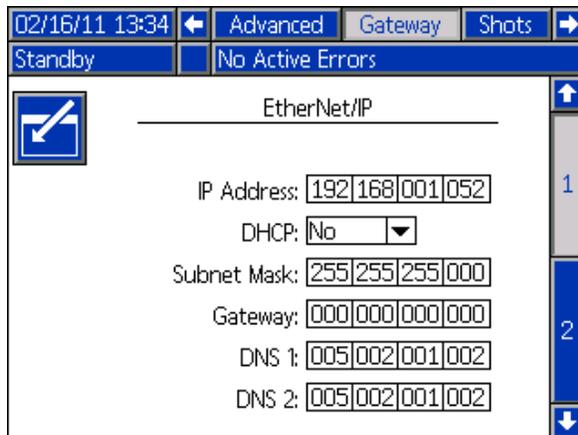
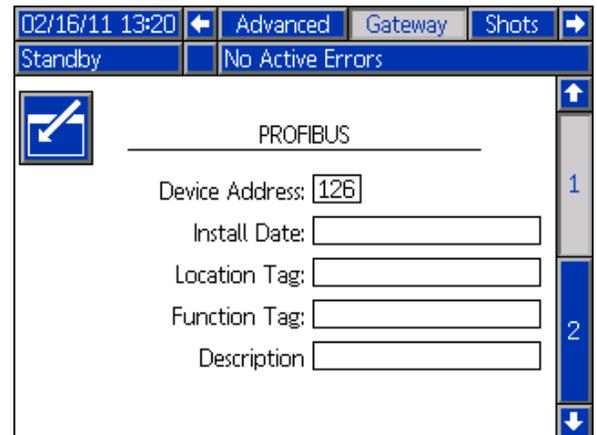**FIG. 10: EtherNet/IP Fieldbus Screen 1**

Screen 2

This screen displays the hardware revision, system serial number, and data map identification information.

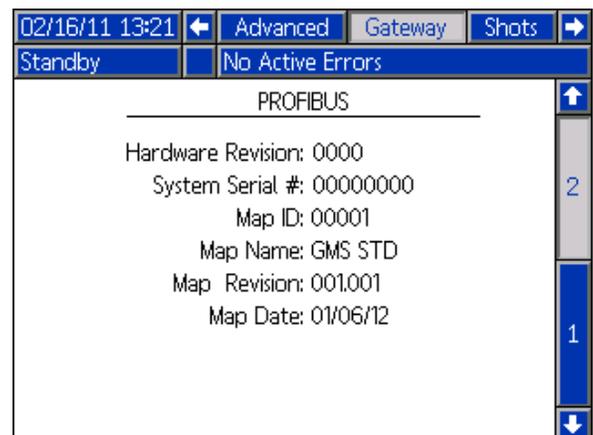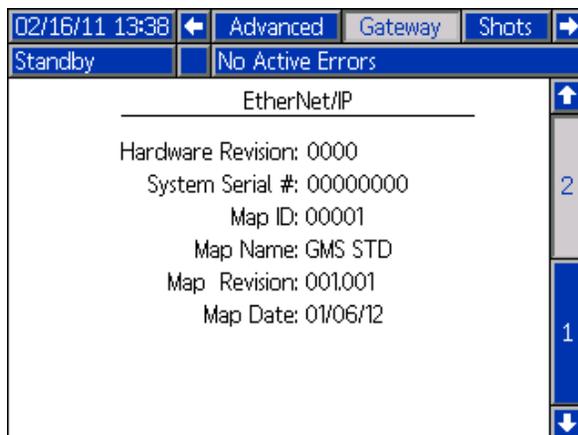**FIG. 11: EtherNet/IP Fieldbus Screen 2**

DeviceNet Fieldbus Screen

This screen is shown only if you have a DeviceNet Fieldbus CGM installed. See **Kits** on page 2.

This screen enables the user to set the device address and baud rate, and to view the hardware revision, system serial number, data map identification information.
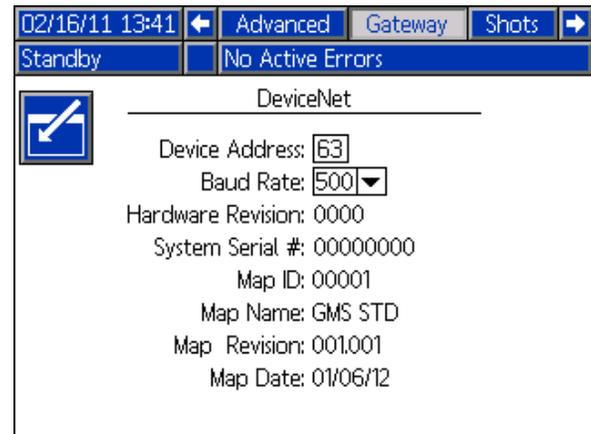
FIG. 12: DeviceNet Fieldbus Screen

Maintenance

Install Upgrade Tokens

NOTE: The Motor Control Module, Fluid Control Module, and Temperature Control Module connection to the system is temporarily disabled during the installation of upgrade tokens.

To install software upgrades:

1. Use correct software token stated in the table. See Graco Control Architecture™ Module Programming manual for instructions.

NOTE: Upgrade all modules in the system to the software version on the token, even if you are replacing only one or two modules. Different software versions may not be compatible.

All data in the module (System Settings, USB Logs, Recipes, Maintenance Counters) may be reset to factory default settings. Download all settings and user preferences to a USB before the upgrade, for ease of restoring them following the upgrade.

See manuals for locations of specific GCA components.

The software version history for each system can be viewed in the technical support section at www.graco.com.

Token	Application
16H821	**HFR**: - Communication Gateway Module

r_257396_3b9905_04b   ti12334a1

ti12358a1   ti12354a1

FIG. 13: Remove Access Cover

Available Internal Data

The following internal data with this system can be viewed and modified by your fieldbus master.

NOTE: Refer to appropriate system manual for machine operation instructions.

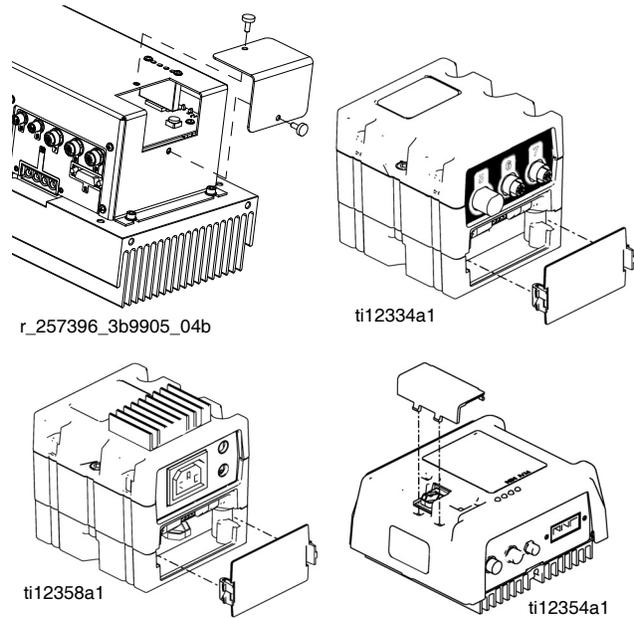|	**Units** (Bit Number | Name)	**In Byte**	**CGM Input from PLC Output**	**Out Byte**	**CGM Output to PLC Input**	**Descriptions**
System Status	0 | Heartbeat	1-2	Needs to follow the CGM Output.	1-2	Square wave toggles every 3 sec.	CGM initiates a square wave that toggles every 3 sec. The PLC must follow the heartbeat. If the heart beat is lost from the PLC or CGM then the system will shutdown. If the PLC does not detect the heartbeat then the PLC should cycle the PLC output bit HI/LO in attempt to establish the heartbeat from the CGM. If no heartbeat is detected then a disconnected cable or major error may exist in the CGM.
	1 | Status of Dispense				1= Dispense Active, 0 = Dispense not active	Monitor Only: On Circulation systems, this indicates that a dispense is pending or in progress (or when pre dispense timer is active and during a dispense).On an L-head system Dispense Valve is considered open until the end of the clean out cycle. On other types of systems the bit will indicate a dispense is active.
	2 | Dispense Valve (1 = Open)		0 = Close Dispense Valve 1 = Open Dispense Valve		0 = Dispense ValveClosed, 1 = Dispense Valve Open	Used in diagnostics only. Not to be used to control a dispensed shot.
	4 | Pump Parked (1 = Parked)		1= Begin Park		0 = Pump is not Parked, 1 = Pump is Parked	Parking the pump involves moving the Red pump to the position which the pump shaft is least exposed to the atmosphere. System must be in Standby mode. Chemical will dispense out of the dispense valve.
System Status	5 | DV Lockout / Circulation Control (1 = Locked out)	1-2	0 = Unlock Dispense Valve, Non-Circulation State 1 = Lockout Dispense Valve , Circulation State	1-2	0 = Dispense Valve is unlocked or in Non-Circulation State 1 = Dispense Valve is locked out or in Circulation State	Used to lock out the dispense valve or configure to circulation mode (circulation type system) when in standby/operator or operator/night modes only. Only for stall to pressure systems with an electric dispense valve or any stall to pressure dispense valve configuration (circulation type system).

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
	6	Mix head Cleanout (1 = Closed)		0 = Open Clean Out 1 = Close Clean Out		0 = Clean Out is open 1 = Clean Out is closed	Used for L-Head systems cleanout / diagnostics only.
	7	SYSTEM STARTUP BIT (1 = On) Valid for Circulation systems ONLY		0 = Stop System Startup 1 = Start System Startup		0 = System Startup OFF 1 = System Startup ON	System Startup bit will initiate a controlled startup of the system. The temperature conditioning zones will be initiated when the bit is high. Low pressure recirculation is also enabled when the bit is set (Standby and night modes). Turning off this bit will turn OFF the temperature conditioning zones and circulation. For stall to pressure systems with a manual dispense valve, setting this bit will configure the pumps to stall to the pressure set point. For stall to pressure systems, set to operator mode and set the DV Lockout / Circulation Control bit to high. Setting this bit will start a recirculation dispense for recirculation type systems.
	8	Not Used		Not Used		Not Used	Not Used
	10	Base Purge (1 = Base Purge Request)		0 = Base Purge Not Requested 1 = Base Purge Requested		0 = Base Purge Not Active 1 = Base Purge Active	Only valid for HFR's with MCM Software, U82329. The system must be in Standby Mode to get into Base Purge Mode.
System Status	11	Recirc Status (1 = High Pressure Recirc)	1-2	0 = Low Pressure circulation ON 1 = High Pressure circulation ON	1-2	0 = Low Pressure circulation ON 1 = High Pressure circulation ON	Valid for full circulation systems only. Indicates status of the pumping system when in circulation. If system is in low pressure recirc the pumps will shift to High pressure circ and then start the pre-dispense time. When the pre-dispense time expires, user can request dispenses. After expiration of post-dispense time, the system will return to low pressure modes. Pre and post dispense times are settable on the ADM system-2 sub screens.
	12	Purge Alarm (1 = Purge Active)		--		0 = Purge shot not Active 1 = Purge Shot Active	Monitoring Only. Indicates status of the purging routine.

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
	13 | PLC Disables dispensing		0 = Enable Dispensing 1 = Disable dispensing		0 = Dispensing Enabled 1 = Dispensing Disabled	PLC enables / disable dispensing from the GCA controller / footswitch or remote start via the MCM.
	14 | CGM Control Enabled		0 = ADM has control of the system 1 = CGM has control on the system		0 = CGM can only monitor 1 = CGM can control the system	Select via the PLC the control of the system from either the CGM or the ADM. CGM can monitor status in either mode.
	15 | USED INTERNALY		--		--	
Operating Mode	System Mode Select	3	DISABLED Mode = 1 STANDBY Mode = 2 SHOT Mode= 3 SEQUENCE Mode = 4 OPERATOR Mode = 5 PRIME Mode = 6 NIGHT Mode= 7	3	DISABLED Mode = 1 STANDBY Mode = 2 SHOT Mode= 3 SEQUENCE Mode = 4 OPERATOR Mode = 5 PRIME Mode = 6 NIGHT Mode= 7	PLC selects the various modes of the dispensing system. CGM feedbacks the status of the system to the PLC. Prime mode is only available for variable ratio systems. Night mode is only available on standard HFRs with full circulation systems. If using a manually controlled dispense valve, shot and sequence modes are not available.
Selected Shot	Select Shot number, or Sequence Position Number	4	In Shot Mode, Selects the Active Shot number. In Sequence Mode, selects the Active Sequence position number.	4	Shot or Sequence number feedback	Select, via the PLC, the active shot number when in Shot mode or the Current Sequence position number when in Sequence mode
Selected Sequence	Select sequence	5	In Sequence mode, selects that active sequence. Is ignored in other modes	5	Sequence selected feedback	Select via the PLC the active sequence when in Sequence mode

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
Condition-ing / Heat zones		6	Bit 0 = 1, Red Tank heat enable	6	Bit 0 = 1, Red Tank heat ON	PLC enables / disable the various Conditioning Zones. Setting the bit = 1 enables the Heat Zone. Setting the bit = 0 disables the Heat Zone. Feedback: 0 = zone OFF, 1 = Zone ON
			Bit 1 = 1, Blue Tank heat enable		Bit 1 = 1, Blue Tank heat ON	
			Bit 2 = 1, Red Inline heat enable		Bit 2 = 1, Red Inline heat ON	
			Bit 3 = 1, Blue Inline heat enable		Bit 3 = 1, Blue Inline heat ON	
			Bit 4 = 1, Red Hose heat enable		Bit 4 = 1, Red Hose heat ON	
			Bit 5 = 1, Blue Hose heat enable		Bit 5 = 1, Blue Hose heat ON	
			Bit 6 = 1, Red Chiller heat enable		Bit 6 = 1, Red Chiller ON	
			Bit 7 = 1, Blue Chiller heat enable		Bit 7 = 1, Blue Chiller ON	
Tank Blue Fill	1 = Filling, 0 = Off	7	Tank Fill Not Active = 0 Begin Tank Filling = 1	7	Tank not Fill-ing = 0 Tank Filling = 1	Initiates a fill valve open. This bit can be used to initiate a manual fill cycle or a auto fill cycle if the auto fill mode is selected. The tank fill valve will close upon reaching the high level switch. See Byte 79 for tank level status. If the Tank fill bit is maintained the GCA will close the valve when the tank is full. Auto time out and alarm if the Hi level is not reached within a preset time.

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
Tank Red Fill	1 = Filling, 0 = Off	8	Tank Fill Not Active = 0 Begin Tank Filling = 1	8	Tank not Filling = 0 Tank Filling = 1	Initiates a fill valve open. This bit can be used to initiate a manual fill cycle or a auto fill cycle if the auto fill mode is selected. The tank fill valve will close upon reaching the high level switch. See Byte 79 for tank level status. If the Tank fill bit is maintained the GCA will close the valve when the tank is full. Auto time out and alarm if the Hi level is not reached within a preset time.
Errors Needing Acknowl-edgement		9-12	The PLC ASCII Output must match the PLC Input ASCII value.	9-12	CGM ASCII value of the error currently requiring Acknowledge-ment.	Errors requiring acknowledgement are presented on first in first out basis. The latest error is currently in the error register in the CGM. The PLC must send back the exact ASCII value for the error to be acknowledged in the CGM. If an incorrect ASCII error code is sent back to the CGM then the error will not clear and the CGM register will be overwritten with the incorrect error. If multiple error codes exists then the PLC must acknowledge them in the order the errors are sent to the PLC from the CGM. See bytes 80-83 and 84 for errors and status.

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
Units and Operating Info	**Units and Operating Info Bit | Function**	--	--	13-14	**Bit xx | Meaning**	
	0-1 | Volume Units		--		0 0 | Gallons; 0 1 | cc's; 1 0 | Liter	Monitoring Only. The operating units of the machine can be read into the PLC and used as required.
	2 -3 | Weight Units		--		0 0 | grams; 0 1 | kilo-grams; 1 0 | pounds	
	4-5 | Pressure Units	--	--	13-14	0 0 | bar; 0 1 | psi; 1 0 | MPa	Monitoring Only. The operating units of the machine can be read into the PLC and used as required.
	6 | Temperature		--		0 = Fahren-heit; 1 = Cel-sius	
	7 | Flow Unit		--		0 = Volume; 1 = Weight	
	8 | Rate Unit		--		0 = Minute; 1 = Second	
	9 | Control Mode		--		0 = Pressure; 1 = Flow	
	10 11 | Dispense Mode		--		0 0 | Time; 0 1 | Volume; 1 0 | Weight	
	12 | Reserved for future use		--		--	
	13 | Reserved for future use		--		--	
	14 | Reserved for Future use		--		--	
	15 | Reserved for future use		--		--	
Flow rate setpoint	Depending on system setup the units can be by weight or volume	--	--	15-18	Integer value of the Flow rate setpoint in the dis-pensing sys-tem.	Monitoring Only. The value from the CGM is an integer and must be mul-tiplied by 0.0001 for the requested flow rate to be in system units
Dispense amount setpoint	Depending on system setup the units can be by weight, volume, or time	--	--	19-22	Integer value of the Dis-pense amount setpoint in the dispensing system.	Monitoring Only. The value from the CGM is an integer and must be mul-tiplied by 0.001 for the requested amount to be in system units

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
Ratio of the Blue / Red material - setpoint	Depending on system setup the units can be by weight or volume	--	--	23-24	Integer value of the Blue / Red Material Ratio setpoint in the dispensing system.	Monitoring Only. The value from the CGM is an integer and must be multiplied by 0.01 for the requested material Ratio to be in system units Blue is the value and Red is always = 1. Blue: Red == xx.xx:1
Pump Red Pressure - Actual	PSI, bar, or MPa	--	--	25-28	Integer value of the actual Red pump pressure in the dispensing system.	Monitoring Only. The value from the CGM is an integer and must be multiplied by 0.0001 for the actual Red pump pressure to be in system units
Pump Blue Pressure - Actual	PSI, bar, or MPa	--	--	29-32	Integer value of the actual Blue pump pressure in the dispensing system.	Monitoring Only. The value from the CGM is an integer and must be multiplied by 0.0001 for the actual Blue pump pressure to be in system units
Pump Flow - Actual	Depending on system setup the units can be by weight or volume	--	--	33-36	Integer value of the actual Flow rate in the dispensing system.	Monitoring Only. The value from the CGM is an integer and must be multiplied by 0.0001 for the actual flow rate to be in system units
Ratio of the Blue / Red materials -Actual	Depending on system setup the units can be by weight or volume	--	--	37-38	Integer value of the actual Material Ratio in the dispensing system.	Monitoring Only. The value from the CGM is an integer and must be multiplied by 0.01 for the Actual material Ratio to be in system units. Blue is the value and Red is always = 1. Blue: Red == xx.xx:1
Dispense Amount - Actual	Depending on system setup the units can be by weight or volume	--	--	39-42	Integer value of the actual Dispense amount in the dispensing system.	Monitoring Only. The value from the CGM is an integer and must be multiplied by 0.001 for the actual amount to be in system units
Dispense Duration -Actual	mS	--	--	43-46	Actual Duration of the dispense in mS	Monitoring Only. Time base is 0.001 seconds == xxx ms.
Blue Inline Temp - Actual	Depending on system setup the units can be read in C or F	--	--	47-48	Actual temperature	Monitoring Only. The value from the CGM is an integer and must be multiplied by 0.1 for the actual temperature to be in system units.
Blue Hose Temp - Actual	Depending on system setup the units can be read in C or F	--	--	49-50	Actual temperature	
Red Inline Temp - Actual	Depending on system setup the units can be read in C or F	--	--	51-52	Actual temperature	

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
Red Hose Temp - Actual	Depending on system setup the units can be read in C or F	--	--	53-54	Actual temperature	
Blue Tank Material - Actual	Depending on system setup the units can be read in C or F	--	--	55-56	Actual temperature	
Red Tank Material - Actual	Depending on system setup the units can be read in C or F	--	--	57-58	Actual temperature	
Blue Chiller Temp - Actual	Depending on system setup the units can be read in C or F	--	--	59-60	Actual temperature	
Red Chiller Temp - Actual	Depending on system setup the units can be read in C or F	--	--	61-62	Actual temperature	
Blue Inline Temp - Set point	Depending on system setup the units can be read in C or F	--	--	63-64	Set point temperature	Monitoring Only. The value from the CGM is an integer and must be multiplied by 0.1 for the set point temperature to be in system units. See CGM Input bytes 23-26 for changing the temperature setpoints.
Blue Hose Temp - Set point	Depending on system setup the units can be read in C or F	--	--	65-66	Set point temperature	
Red Inline Temp - Set point	Depending on system setup the units can be read in C or F	--	--	67-68	Set point temperature	
Red Hose Temp - Set point	Depending on system setup the units can be read in C or F	--	--	69-70	Set point temperature	
Blue Tank Material- Set point	Depending on system setup the units can be read in C or F	--	--	71-72	Set point temperature	
Red Tank Material - Set point	Depending on system setup the units can be read in C or F	--	--	73-74	Set point temperature	
Blue Chiller Temp - Set point	Depending on system setup the units can be read in C or F	--	--	75-76	Set point temperature	
Red Chiller Temp - Set point	Depending on system setup the units can be read in C or F	--	--	77-78	Set point temperature	

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
Tank Material Level Status Feedback	Tank Level High = 3 Tank Level Mid = 2 Tank Level Low = 1	--	--	79	Bits 3-0 = Red Tank Level Bits 7-4 = Blue Tank Level	Monitoring Only. The values from the CGM: Tank Level High = 3 Tank Level Mid = 2 Tank Level Low = 1
Scrolling Error	ASCII values of the current errors	--	--	80-83	This will contain the ASCII characters of the Error Code matching the Error in the Scrolling Error Bar on the ADM.	Monitoring Only. The ASCII value from the CGM matches the current Error Codes on the ADM. The errors scroll if multiple error exists. The errors may require acknowledgement, see Bytes 9-12. See system manual for description of the errors.

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
ADM Feedback		--	--	84		Monitoring Only: Error types that need acknowledged will be indicated first. After all errors have been acknowledged then current error types will be indicated.
					Bits 3-0 = ADM Status bits.	**Bits 7-4 Status** Error needing Acknowledged - Alarm = (0x03) Error needing Acknowledged - Deviation = (0x02) Error needing Acknowledged - Advisory = (0x01) Error - Alarm = (0x0C) Error - Deviation = (0x08) Error - Advisory = (0x04) System status bits available.
					Bits 4-7 are broken down as follows:	**Bits 3 thru 0 as noted:**
					Bit 4 = System Power status	System Power status 0 = Off, 1 = On (Bit 0)
					Bit 5 = Dispense System ready to dispense	Dispense System ready to dispense 0 = Not Ready, 1 = Ready (Bit 1)
					Bit 6 = Dispense System is ready for external requests	Dispense System is ready for external requests 0 = Not Ready, 1 = Ready (Bit 2)
					Bit 7= Future Use	Dispense Valve Open (=1) Indication

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
Change Dispense Flow Rate or Pressure Set point	Depending on system setup the units can be by weight, volume, flow, or pressure	13-16	Integer value of the requested rate in the dispensing system.	--	--	Changes current shot selected to a new rate. The value outputted to the CGM must be an integer. The PLC value is xxx.xxx and must be multiplied by 1000 prior to being sent to the CGM
Change Dispense Amount Set point	Depending on system setup the units can be by weight, volume, or time	17-20	Integer value of the requested Dispense amount in the dispensing system.	--	--	Changes current shot selected to a new dispense amount. The value outputted to the CGM must be an integer. The PLC value is xxx.xxx and must be multiplied by 1000 prior to being sent to the CGM
Change material Ratio Set point	Depending on system setup the units can be by weight or volume	21-22	Integer value of the requested Material Ratio in the dispensing system. Blue: Red	--	--	Changes current shot selected in a variable ratio system to a new ratio. The value outputted to the CGM must be an integer and must be multiplied by 100 for the requested material Ratio. Blue is the value and Red is always = 1. PLC input is: Blue: Red == xx.xx:1
Change Temperature Conditioning Set point	Select conditioning zone set point to change MSW = Conditioning Zone Selected LSW = Temperature setpoint in 0.1 degree increments (example: 501 = 50.1)	23-24	0 = Red Tank 1 = Blue Tank 2 = Red Inline 3 = Blue Inline 4 = Red Hose 5 = Blue Hose 6 = Red Chiller 7 = Blue Chiller	--	--	When changing a heat zone, select the appropriate zone number which will enable the CGM to write a new temperature set point to the heat zone selected. Only 1 heat zone can be selected at a time. MSW + LSW combined to form a DINT from the PLC output to CGM input. **NOTE:** If the system is a standard HFR, the LSW setpoint must be 0.1 °C, regardless if Fahrenheit mode is selected on the ADM.

	Units	In Byte	CGM Input from PLC Output	Out Byte	CGM Output to PLC Input	Descriptions
Change Temperature Conditioning Set point	Depending on system setup the units can be read in C or F LSW = Desired set point in 0.1°C for standard HFR units. Desired setpoint in 0.1 °C / 0.1°F for recirculation units.	25-26	The temperature set points are limited by the temperature high and low alarm values. There must be a difference of at least 10 between the new set point and the alarm values or the new set point will be ignored.	--	--	The value outputted to the CGM must be an integer and must be multiplied by 10 for the requested zone temperature. Temperature input into the PLC == xxx.x F or C and must be changed to xxxx C prior to sending to the CGM (standard HFR only). The temperature set points are limited by the temperature high and low alarm values. The alarm setpoints must be greater than 10 degrees (standard HFR) or 2 degrees (recirculation unit) from the requested setpoint. If the alarm is closer than 10 degrees (standard HFR) or 2 degrees (recirculation unit) then the requested setpoint will be ignored. Manually changing the alarm setpoints on the ADM will be required prior to a new setpoint change. See Output Bytes 63 thru 78 for temperature zone feedback from the CGM. LSW = Desired Set point in 0.1° units LSW + MSW combined to form a DINT from the PLC output to CGM input.
System Power	System Power	27	Toggles System Power on change.	--	--	System power is ON when the ADM is in any active mode. System power is OFF when the power LED is in the yellow state. To turn the System power ON or OFF, write a different value to the System Power byte. Changing the value will toggle the state from ON to OFF or OFF to ON. See Out Byte 84 for System Power Status

Controlling Device

CGM Control and Night Mode

When the controlling device sets the HFR into night mode using the CGM, the controlling device will be responsible for turning on and off the pumps accordingly (by setting or clearing the "SYSTEM STARTUP BIT", or bit 7 bytes 1-2) when the "CGM Control Enabled" bit is set (Bit 14, bytes 1-2). Any active night mode periodic or time of day timer will be over-ridden by the controlling device when the corresponding timer expires within the Advanced Display Module (ADM). If the controlling device clears the "CGM Control Enabled" bit after setting the HFR into night mode, the night mode timers will operate properly and condition the dispense material accordingly.

CGM Control and Parking the Pumps

After the HFR is set to Standby mode, the controlling device (and user by pressing the footswitch) will have the option to park the pumps. When the pumps are parked, the red material pump shaft will be immersed into the red material, hence preventing exposure of the shaft and red material on the shaft to the atmosphere.

If the system is a full circulation based system, the controller device will need to have the pumps cycling in low pressure mode (by setting the "SYSTEM STARTUP BIT", or bit 7 bytes 1-2) prior to setting the "Pump Parked" bit (bit 4, bytes 1-2). For a standard HFR, the user will have to remove the "SYSTEM STARTUP BIT" immediately after the pump reaches the parked position. For a recirculation type system, the pump will remain in the park position, and ignore an active "SYSTEM STARTUP BIT" request. For a recirculation type system, to exit a parked state, the controlling device will need to clear the "Pump Parked" bit, then set the "SYSTEM STARTUP BIT" from a cleared state. When this occurs, the pumps will start cycling in the last low pressure flow rate executed.

If the system is a stall to pressure type system, the controlling device simply needs to set the "Pump Parked" bit from an idle state, then the pumps will move to the parked position. If the system has a manual dispense valve, the user will need to ensure the pump pressures are less than approximately 391 psi (2.7 MPa, 27 bar) prior to setting the "Pump Parked" bit, and ensure either the dispense valve is opened, or the material is diverted out of the pressure relief valves at the material manifold.
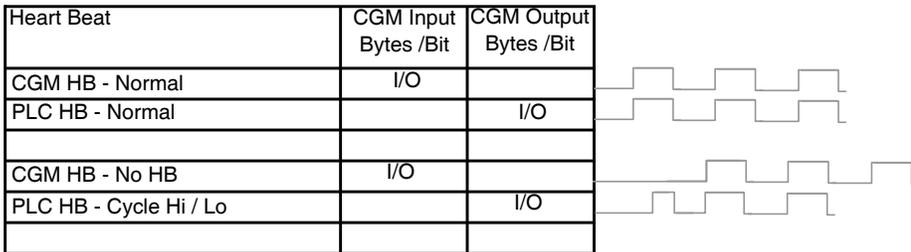
ADM Screen Information when CGM Control is Started or ended

When the user or controlling device sets or clears the "CGM Control Enabled" bit, information provided on the ADM display may or may not be current. If the user navigates away, then back to the main home run screen, the information provided will be current.
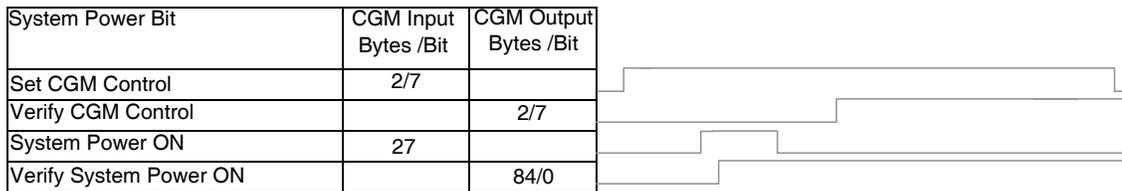
Timing Diagrams

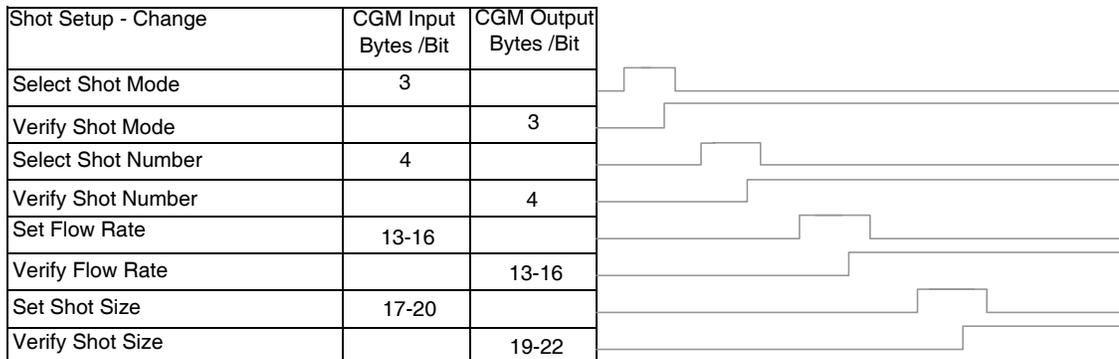The following diagrams show the signal sequence of the CGM communication.
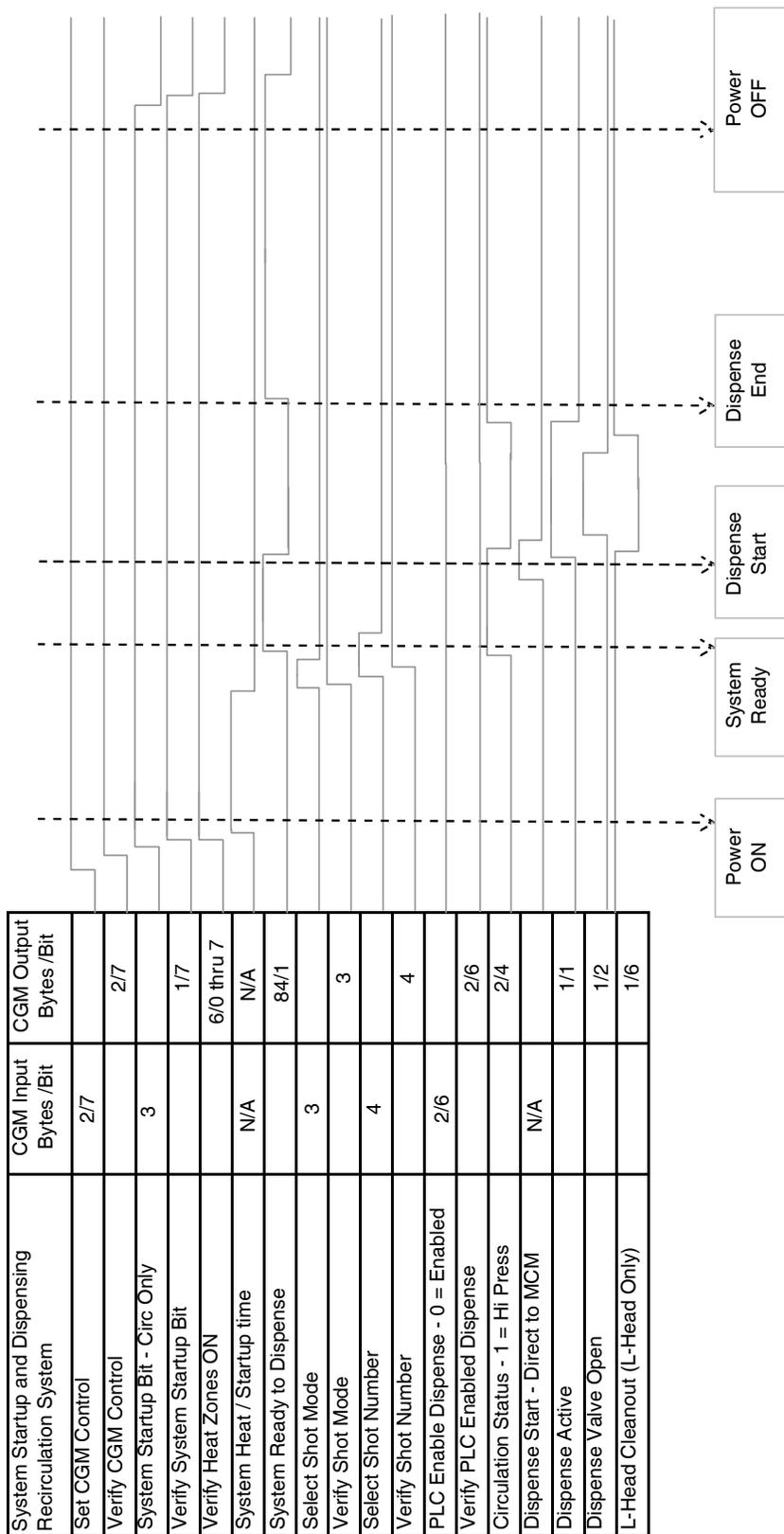
Heart Beat Timing Diagram

Heart Beat	CGM Input Bytes /Bit	CGM Output Bytes /Bit
CGM HB - Normal	I/O	
PLC HB - Normal		I/O
CGM HB - No HB	I/O	
PLC HB - Cycle Hi / Lo		I/O

System Power Bit Diagram

System Power Bit	CGM Input Bytes /Bit	CGM Output Bytes /Bit
Set CGM Control	2/7	
Verify CGM Control		2/7
System Power ON	27	
Verify System Power ON		84/0

Shot Setup - Change Diagram

Shot Setup - Change	CGM Input Bytes /Bit	CGM Output Bytes /Bit
Select Shot Mode	3	
Verify Shot Mode		3
Select Shot Number	4	
Verify Shot Number		4
Set Flow Rate	13-16	
Verify Flow Rate		13-16
Set Shot Size	17-20	
Verify Shot Size		19-22

System Startup and Dispensing Recirculation Diagram

Timing states: Power ON — System Ready — Dispense Start — Dispense End — Power OFF

System Startup and Dispensing Recirculation System	CGM Input Bytes /Bit	CGM Output Bytes /Bit
Set CGM Control	2/7	
Verify CGM Control		2/7
System Startup Bit - Circ Only	3	
Verify System Startup Bit		1/7
Verify Heat Zones ON		6/0 thru 7
System Heat / Startup time	N/A	N/A
System Ready to Dispense		84/1
Select Shot Mode	3	
Verify Shot Mode		3
Select Shot Number	4	
Verify Shot Number		4
PLC Enable Dispense - 0 = Enabled	2/6	
Verify PLC Enabled Dispense		2/6
Circulation Status - 1 = Hi Press		2/4
Dispense Start - Direct to MCM	N/A	
Dispense Active		1/1
Dispense Valve Open		1/2
L-Head Cleanout (L-Head Only)		1/6

Parts

Model 24J415

Ref	Part	Description	Qty
3†	CGMxx0	MODULE, CGM	1
6	114984	SCREW, tapping, phillips pan head	4
7	16J526	TOKEN, map	1
12◆	121000	CABLE, CAN, female / female 0.5 m	1
13◆	121901	SUPPRESSOR, box snap, ferrite	3
15	16H821	TOKEN, GCA, upgrade, ADM32	1
16	121807	CONNECTOR, splitter	1
17	124005	BUSHING, strain relief	1

† *Not included in kit. See **Kits** on page 2 for available CGM modules. See the Communications Gateway Module manual 312864 for CGM parts list.*

◆ *Not shown.*

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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.

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Sealant and Adhesive Dispensing Equipment

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