

# Integrated PCF™ with Advanced Map

3A4649F

EN

*For use with PCF Metering Systems to provide enhanced fieldbus communications abilities. For professional use only.*

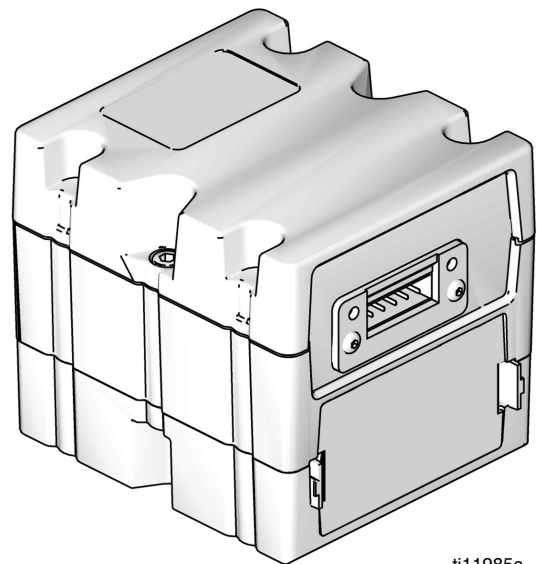
**Not approved for use in explosive atmospheres or hazardous locations.**



### Important Safety Instructions

Read all warnings and instructions in this manual and in related manuals. Save all instructions.

See page page 3 for PCF model information.



ti11985a

*CGM with DeviceNet connector shown*



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# Related Manuals

Manual	Description
3A1974	CAN Adapter Kit, Instruction
312864	Communications Gateway Module, Instruction - Parts
3A2098	PCF Operations, Instructions - Parts
406987	GCA CAN Cables, Reference

# Integrated PCF Model Options

There are a number of ways in which an Integrated PCF with Advanced Map can be obtained. The following are options which allow the user to achieve an Integrated PCF with Advanced Map:

- An Integrated PCF with Advanced Map (Pfx6x, Pfx7x) can be ordered directly. See **Models** on page 3 for more information.
 

**NOTE:** The Integrated PCF with Advanced Map does not come with an ADM.
- If the user already has an upgradeable PCF unit, CGM upgrade kit (25C527) can be purchased. See **Models** on page 3 and **CGM Upgrade Kit** on page 4 for more information on upgradeable PCF models.
- The user can purchase an upgradeable PCF unit and CGM upgrade kit (25C527) separately. See **Models** on page 3 and **CGM Upgrade Kit** on page 4 for more information on upgradeable PCF models.

# Models

Check the identification (ID) plate for the 6-digit part number of the fluid metering system. Use the following matrix to define the construction of the system, based on the six digits. For example, Part **PF1110** represents a PCF fluid metering system (**PF**), a two style system (**1**), a fluid plate with a cartridge regulator and no meter (**1**), a DeviceNet™ user interface (**1**) with a 100-240 Vac power supply (**0**).

**NOTE:** To order replacement parts, see Parts section manual 3A2098. The digits in the matrix do not correspond to the Ref. Nos. in the Parts drawings and lists.

<b>PF</b>	<b>1</b>		<b>1</b>		<b>1</b>		<b>0</b>		
<b>First and Second Digits</b>	<b>Third Digit</b>		<b>Fourth Digit</b>		<b>Fifth Digit</b>		<b>Sixth Digit</b>		
	<b>Style/Size</b>		<b>Fluid Plate</b>		<b>User Interface</b>		<b>Voltage</b>		
		<b>Description</b>		<b>Regulator</b>	<b>Meter</b>		<b>Description</b>		<b>Description</b>
<b>PF</b> (Precision Continuous Flow)	<b>1</b>	2 Styles	<b>1</b>	*Cartridge	None	<b>0</b>	◆Discrete	<b>0</b>	100 - 240 Vac
	<b>2</b>	16 Styles	<b>2</b>	*Mastic	None	<b>1</b>	DeviceNet™	<b>1</b>	24 Vdc
	<b>3</b>	256 Styles	<b>3</b>	*Cartridge	High Resolution	<b>2</b>	EtherNet/IP™	<b>2</b>	100 - 240 Vac with Integrated Swirl
			<b>4</b>	*Mastic	High Resolution	<b>3</b>	PROFIBUS™	<b>3</b>	24 Vdc with Integrated Swirl
			<b>5</b>	Heated Mastic	Heated Standard Resolution	<b>4</b>	PROFINET™		
			<b>6</b>	Heated Mastic	None	<b>5</b>	Not Used.		
						<b>6</b>	DeviceNet No ADM		
			<b>7</b>	*Cartridge	Ultra High Resolution	<b>7</b>	EtherNet I/P No ADM		
			<b>8</b>	Cartridge	High Resolution /GB				
			<b>9</b>	Mastic	High Resolution /GB				
		<b>C</b>	Cartridge	Coriolis					

- ◆ Discrete Gateway systems do not include automation interface cables. The following Graco accessories are available for wiring to the automation system. Installers should follow **Appendix B - Discrete Gateway Module (DGM) Connection Details** in manual 3A2098 for custom wiring.

For single fluid plate systems only: 50 ft (15 m) cable with flying leads (123793)

All systems: Breakout board (123783) and 50 ft (15 m) cable (123792)

**NOTE:** 256 styles option is not available with Discrete Gateway systems.

- \* These fluid metering systems have ETL certification.

**NOTE:** Fluid metering systems with heated mastic regulators are not ETL certified.



**Intertek**

9902471

Certified to CAN/CSA C22.2 No. 61010-1  
Conforms to  
UL 61010-1

**1** This product has been tested to the requirements of CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements.

# CGM Upgrade Kit

The following kit is the Communications Gateway Module (CGM) software and is required for all PCF Models outlined in the **Advanced Map Compatibility** table. The kit is used in conjunction with the correct fieldbus device.

Part No.	Description
25C527	CGM Software (16K743) and Advanced Map (17P799)

**NOTE:** Map 17P799 is not available for individual purchase. Users must purchase Map Kit 25C527 in order to get the required software.

The following kits work with kit 25C527 and include 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

The **Advanced Map Compatibility** table identifies which PFxxx Models are compatible with 25C527.

**NOTE:** The correct blue token (PF2xxx or PF3xxx) must be purchased in order to upgrade any PCF system using 25C527. See **Key Tokens** in this manual and in manual 3A2098 for more information.

## Advanced Map Compatibility

PCF Model	User Interface Description	Able to Upgrade	Upgrade Kit
PFxx0x	Discrete (DGM)	No	N/A
PFxx1x	Device Net (CGM)	Yes	25C527
PFxx2x	Ethernet I/P (CGM)	Yes	25C527
PFxx3x	ProfiBus (CGM)	No	N/A
PFxx4x	ProfiNet (CGM)	No	N/A
PFxx6x	Device Net (CGM)	Already has upgrade installed	Already has upgrade installed
PFxx7x	Ethernet I/P (CGM)	Already has upgrade installed	Already has upgrade installed

Although 25C527 is designed to be as reverse compatible as possible, the standard fieldbus setup will change per the chart below upon upgrade. This will render the PCF system offline until the update to the PLC controller is made.

Standard Gateway Map: 16N601 System Software: 16K743	
Comm. Format:	Data - SINT
Input Assembly Instance:	100
Input Instance Size:	26
Output Assembly Instance:	150
Output Instance Size:	42

Advanced Gateway Map: 17P799 System Software: 16K743 (newest version)	
Comm. Format	Data - SINT
Input Assembly Instance:	100
Input Instance Size	126
Output Assembly Instance:	150
Output Instance Size:	44

## Key Tokens

Refer to the **Key Tokens** section in manual 3A2098 for more information.

Part	Description
16M100	FCM Key Token, 2 styles, Flow Meter, ADM required
16M101	FCM Key Token, 2 styles, No Flow Meter, ADM required
16M102	FCM Key Token, 16 styles, Flow Meter, Integrator Mode Enabled, ADM not required
16M103	FCM Key Token, 16 styles, No Flow Meter, Integrator Mode Enabled, ADM not required
16M104	FCM Key Token, 256 styles, Flow Meter, Integrator Mode Enabled, ADM not required
16M105	FCM Key Token, 256 styles, No Flow Meter, Integrator Mode Enabled, ADM not required
16M217	ADM Key Token, Standard PCF

# Overview

## System Overview

The PCF fluid metering system supports a Communications Gateway Module (CGM) that provides a control link between the PCF system and a selected fieldbus. While the standard PCF supplies a basic level of integration, the “Integrated PCF” allows for a much higher level of integration with the controller. The Advanced Map and detailed supporting documentation allow for complete integration with a PCF with relative ease. The Advanced Map and proper key token information can be found on page 4, and the detailed documentation can be found at [www.graco.com](http://www.graco.com).

## CGM Overview

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

See **CGM I/O Data Map** on page 8 for a list of internal data from the PCF system that can be viewed or modified by your fieldbus master.

**NOTE:** The following system network configuration files are available at [www.graco.com](http://www.graco.com).

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

\* Not available with upgrade kit 25C527

## Recommended Integration

### Non-Removal of Advanced Display Module (ADM)

If the user wishes to integrate the PCF and leave the ADM for troubleshooting and support, it is recommended that the user integrates the following 5 screens. The integration of these screens is recommended as they represent the minimum required to run a PCF. The other screens, which are not accessed as often, reside on the ADM only.

### Required Run Screens

- **Fluid Plate Run 1.1** (page 16)
- **Fluid Plate Run Errors** (page 21)
- **Fluid Plate Run Jobs** (page 22)

### Required Setup Screens

- **Fluid Plate Setup 1.1** (page 23)
- **Fluid Plate Setup 1.8** (page 32)

## Removal of ADM

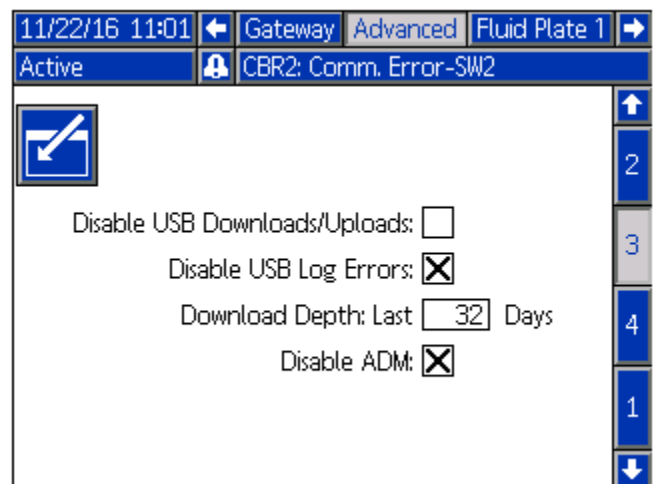
For support purposes, the integration of **all screens** is recommended if the user wishes to remove the ADM.

**NOTE:** Please refer to **Overview** on page 5.

After integrating, the user may find that removing the ADM on future machines is the more cost effective option. This option is only available if one of the following conditions is met:

1. If the user directly orders the correct PCF system (PFxx6x or PFxx7x) that does not include an ADM, and the system has the proper run key token to enable integration mode.
2. It is also possible to remove the ADM from a standard machine as long as the machine has a 16 style or 256 style run key token inserted.





To remove an ADM from a capable system, simply navigate to Advanced Screen 3 and check the “Disable ADM” box (see the image below). This will allow the CAN cable to be removed and the system to run through the CGM.



# Setup

## Automation Gateway Setup Screens

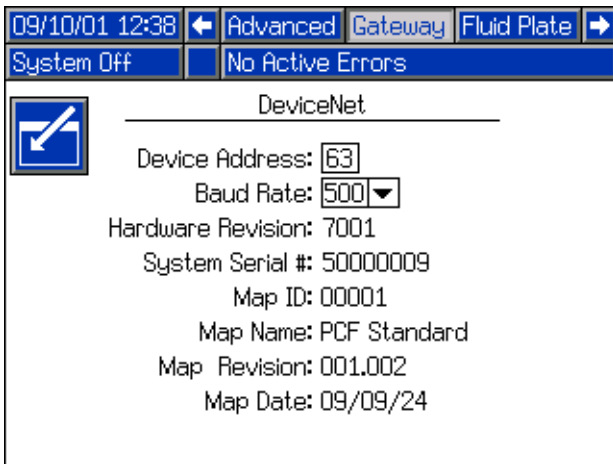
There are up to three automation Gateway Setup screens (depending on fieldbus), which enable users to set or change information regarding the automation Gateway module used on the PCF system. These screens also enable users to view information regarding the particular automation Gateway module used.

Press   to scroll through the Gateway Setup screens. Once in the desired Advanced Setup screen, press  to access the fields to make changes. Press  to exit edit mode.

**NOTE:** Users must be out of edit mode to scroll through the Gateway Setup screens.

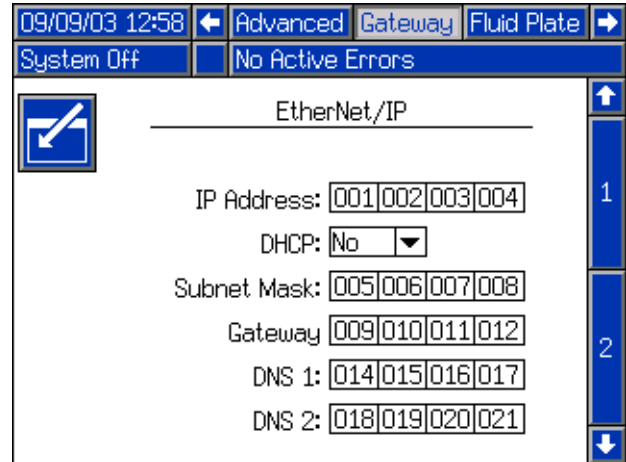
### Gateway Setup Screen 1 - DeviceNet

This screen enables users to set the device address and the baud rate. The DeviceNet screen displays the hardware revision number, system serial number, map ID, name, revision number, and install date.



### Gateway Setup Screen 1 - EtherNet/IP

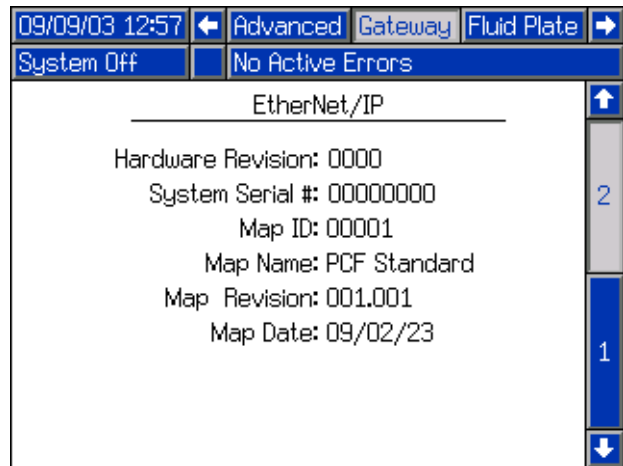
This screen enables users to set the IP address, subnet mask, Gateway, DNS 1, DNS 2, and if a DHCP is used.



### Gateway Setup Screen 2 - EtherNet/IP

This screen is the same for EtherNet/IP and PROFIBUS. It enables users to view the following information regarding the Gateway module used on the PCF system:

- hardware revision number
- system serial number
- map ID number
- map name
- map revision number
- date the map was created



# Maintenance

## Install Upgrade Tokens

**NOTE:** The Fluid Control Modules and Advanced Display 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 the Graco Control Architecture™ (GCA) Module Programming manual for instructions.

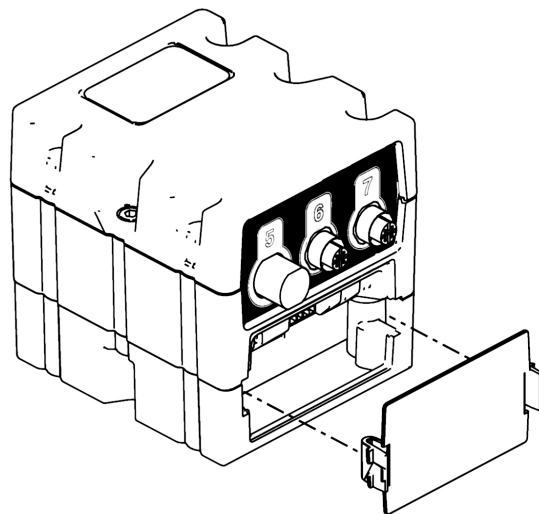
**NOTE:** Upgrade all modules in the system to the software version on the token, even if you are replacing only one or two modules. Different software versions may not be compatible.

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](http://www.graco.com).

Token	Application
16K743	<b>PCF System Software:</b> - Includes PCF Software for the ADM, FCM, CGM, and DGM.



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**FIG. 1: Remove Access Cover**

# CGM I/O Data Map

## Outputs from PLC; Inputs to Graco PCF

Signal	Data Type	BIT	BYTE
FP1 - Style Strobe	Boolean	0	BYTE 0
FP1 - Dispense Complete	Boolean	1	
FP1 - Dispense Gun 1 On	Boolean	2	
FP1 - Dispense Gun 2 On	Boolean	3	
FP1 - Dispense Gun 3 On	Boolean	4	
FP1 - Dispense Gun 4 On	Boolean	5	
FP1 - Error Reset	Boolean	6	
FP1 - Remote Start / Purge	Boolean	7	
SW1 - Swirl Enable	Boolean	0	BYTE 1
SW1 - Remote Start	Boolean	1	
(Spare)	Boolean	2-7	BYTE 2
FP1 - Style	Integer	0-7	
(Spare)	Boolean	0-7	BYTE 3
FP1 - Flow Command Voltage	Integer	0-11	BYTES 4-5
(Spare)	Boolean	12-15	
SW1 - Swirl Command	Integer	0-11	BYTES 6-7
(Spare)	Boolean	12-15	
FP2 - Style Strobe	Boolean	0	BYTE 8
FP2 - Dispense Complete	Boolean	1	
FP2 - Dispense Gun 1 On	Boolean	2	
FP2 - Dispense Gun 2 On	Boolean	3	
FP2 - Dispense Gun 3 On	Boolean	4	
FP2 - Dispense Gun 4 On	Boolean	5	
FP2 - Error Reset	Boolean	6	
FP2 - Remote Start / Purge	Boolean	7	
SW2 - Swirl Enable	Boolean	0	BYTE 9
SW2 - Remote Start	Boolean	1	
(Spare)	Boolean	2-7	BYTE 10
FP2 - Style	Integer	0-7	
(Spare)	Boolean	0-7	BYTE 11
FP2 - Flow Command Voltage	Integer	0-11	BYTES 12-13
(Spare)	Boolean	12-15	
SW2 - Swirl Command	Integer	0-11	BYTES 14-15
(Spare)	Boolean	12-15	
FP3 - Style Strobe	Boolean	0	BYTE 16
FP3 - Dispense Complete	Boolean	1	
FP3 - Dispense Gun 1 On	Boolean	2	
FP3 - Dispense Gun 2 On	Boolean	3	
FP3 - Dispense Gun 3 On	Boolean	4	
FP3 - Dispense Gun 4 On	Boolean	5	
FP3 - Error Reset	Boolean	6	
FP3 - Remote Start / Purge	Boolean	7	



<b>Signal</b>	<b>Data Type</b>	<b>BIT</b>	<b>BYTE</b>
SW3 - Swirl Enable	Boolean	0	BYTE 17
SW3 - Remote Start	Boolean	1	
(Spare)	Boolean	2-7	
FP3 - Style	Integer	0-7	BYTE 18
(Spare)	Boolean	0-7	BYTE 19
FP3 - Flow Command Voltage	Integer	0-11	BYTES 20-21
(Spare)	Boolean	12-15	
SW3 - Swirl Command	Integer	0-11	BYTES 22-23
(Spare)	Boolean	12-15	
FP4 - Style Strobe	Boolean	0	BYTE 24
FP4 - Dispense Complete	Boolean	1	
FP4 - Dispense Gun 1 On	Boolean	2	
FP4 - Dispense Gun 2 On	Boolean	3	
FP4 - Dispense Gun 3 On	Boolean	4	
FP4 - Dispense Gun 4 On	Boolean	5	
FP4 - Error Reset	Boolean	6	
FP4 - Remote Start / Purge	Boolean	7	
SW4 - Swirl Enable	Boolean	0	BYTE 25
SW4 - Remote Start	Boolean	1	
(Spare)	Boolean	2-7	
FP4 - Style	Integer	0-7	BYTE 26
(Spare)	Boolean	0-7	BYTE 27
FP4 - Flow Command Voltage	Integer	0-11	BYTES 28-29
(Spare)	Boolean	12-15	
SW4 - Swirl Command	Integer	0-11	BYTES 30-31
(Spare)	Boolean	12-15	
Command Interface - Command	Integer	0-31	BYTES 32 -35
Command Interface - Value	Integer	0-31	BYTES 36 -39
Command Interface - Control Bits - Write	Boolean	0	Byte 40
Command Interface - Control Bits - Read	Boolean	1	
(Spare)	Boolean	2-7	
(Spare)	Boolean	0-7	Byte 41
System Power State	Boolean	0-7	Byte 42
Added to make Even number of Bytes	Boolean	0-7	Byte 43

## Inputs to PLC; Outputs from Graco PCF

Signal	Data Type	BIT	BYTE
FP1 - Dispenser Ready	Boolean	0	0
FP1 - Dispenser No Alarm	Boolean	1	
FP1 - Dispense No Error	Boolean	2	
FP1 - Dispense in Process	Boolean	3	
FP1 - Dispense Volume OK	Boolean	4	
(Spare)	Boolean	5	
FP1 - Dispenser Purge Request	Boolean	6	
FP1 - Dispenser Remote Start / Purge In Process	Boolean	7	
FP1 - Pressure Units - Bit 0	Boolean	0	1
FP1 - Pressure Units - Bit 1	Boolean	1	
FP1 - Heartbeat	Boolean	2	
(Spare)	Boolean	3-7	2
FP1 - Dispense Valve 1 Precharge on	Boolean	0	
FP1 - Dispense Valve 2 Precharge on	Boolean	1	
FP1 - Dispense Valve 3 Precharge on	Boolean	2	
FP1 - Dispense Valve 4 Precharge on	Boolean	3	
(Spare)	Boolean	4-7	
FP1 - Error	Integer	0-7	3
FP2 - Dispenser Ready	Boolean	0	4
FP2 - Dispenser No Alarm	Boolean	1	
FP2 - Dispense No Error	Boolean	2	
FP2 - Dispense in Process	Boolean	3	
FP2 - Dispense Volume OK	Boolean	4	
(Spare)	Boolean	5	
FP2 - Dispenser Purge Request	Boolean	6	
FP2 - Dispenser Remote Start / Purge In Process	Boolean	7	
FP2 - Pressure Units - Bit 0	Boolean	0	5
FP2 - Pressure Units - Bit 1	Boolean	1	
FP2 - Heartbeat	Boolean	2	
(Spare)	Boolean	3-7	6
FP2 - Dispense Valve 1 Precharge on	Boolean	0	
FP2 - Dispense Valve 2 Precharge on	Boolean	1	
FP2 - Dispense Valve 3 Precharge on	Boolean	2	
FP2 - Dispense Valve 4 Precharge on	Boolean	3	
(Spare)	Boolean	4-7	
FP2 - Error	Integer	0-7	7
FP3 - Dispenser Ready	Boolean	0	8
FP3 - Dispenser No Alarm	Boolean	1	
FP3 - Dispense No Error	Boolean	2	
FP3 - Dispense in Process	Boolean	3	
FP3 - Dispense Volume OK	Boolean	4	
(Spare)	Boolean	5	
FP3 - Dispenser Purge Request	Boolean	6	
FP3 - Dispenser Remote Start / Purge In Process	Boolean	7	
FP3 - Pressure Units - Bit 0	Boolean	0	9
FP3 - Pressure Units - Bit 1	Boolean	1	
FP3 - Heartbeat	Boolean	2	
(Spare)	Boolean	3-7	

Signal	Data Type	BIT	BYTE
FP3 - Dispense Valve 1 Precharge on	Boolean	0	10
FP3 - Dispense Valve 2 Precharge on	Boolean	1	
FP3 - Dispense Valve 3 Precharge on	Boolean	2	
FP3 - Dispense Valve 4 Precharge on	Boolean	3	
(Spare)	Boolean	4-7	
FP3 - Error	Integer	0-7	11
FP4 - Dispenser Ready	Boolean	0	12
FP4 - Dispenser No Alarm	Boolean	1	
FP4 - Dispense No Error	Boolean	2	
FP4 - Dispense in Process	Boolean	3	
FP4 - Dispense Volume OK	Boolean	4	
(Spare)	Boolean	5	
FP4 - Dispenser Purge Request	Boolean	6	
FP4 - Dispenser Remote Start / Purge In Process	Boolean	7	13
FP4 - Pressure Units - Bit 0	Boolean	0	
FP4 - Pressure Units - Bit 1	Boolean	1	
FP4 - Heartbeat	Boolean	2	
(Spare)	Boolean	3-7	14
FP4 - Dispense Valve 1 Precharge on	Boolean	0	
FP4 - Dispense Valve 2 Precharge on	Boolean	1	
FP4 - Dispense Valve 3 Precharge on	Boolean	2	
FP4 - Dispense Valve 4 Precharge on	Boolean	3	
(Spare)	Boolean	4-7	15
FP4 - Error	Integer	0-7	
Command Interface Status - Command Active	Boolean	0	20
Command Interface Status - Command Success	Boolean	1	
Command Interface Status - Command Failure	Boolean	2	
Command Interface Status - Value Coerced	Boolean	3	
(Spare)	Boolean	4-7	
SW1 - Swirl Ready	Boolean	0	21
SW1 - Swirl No Alarm	Boolean	1	
SW1 - Swirl No Error	Boolean	2	
(Spare)	Boolean	3-6	
SW1 - Swirl Remote Start In Process	Boolean	7	22
SW2 - Swirl Ready	Boolean	0	
SW2 - Swirl No Alarm	Boolean	1	
SW2 - Swirl No Error	Boolean	2	
(Spare)	Boolean	3-6	
SW2 - Swirl Remote Start In Process	Boolean	7	23
SW3 - Swirl Ready	Boolean	0	
SW3 - Swirl No Alarm	Boolean	1	
SW3 - Swirl No Error	Boolean	2	
(Spare)	Boolean	3-6	24
SW3 - Swirl Remote Start In Process	Boolean	7	
SW4 - Swirl Ready	Boolean	0	
SW4 - Swirl No Alarm	Boolean	1	
SW4 - Swirl No Error	Boolean	2	
(Spare)	Boolean	3-6	25
SW4 - Swirl Remote Start In Process	Boolean	7	
(Spare)	Boolean	0-7	

Signal	Data Type	BIT	BYTE
FP1 - Operation Mode	Integer	0-2	26
FP1 - Precharge Active	Boolean	3	
FP1 - Valve 1 State	Boolean	4	
FP1 - Valve 2 State	Boolean	5	
FP1 - Valve 3 State	Boolean	6	
FP1 - Valve 4 State	Boolean	7	
FP1 - Ready to Dispense	Boolean	0	27
FP1 - In Job Cycle	Boolean	1	
FP1 - Job Cycle Complete	Boolean	2	
FP1 - Alarm Active	Boolean	3	
FP1 - Deviation Active	Boolean	4	
FP1 - Advisory Active	Boolean	5	
FP1 - Dispensing Disabled	Boolean	6	28
FP1 - Fluid Plate Enabled	Boolean	7	
FP1 - Flowmeter Enabled	Boolean	0	
FP1 - Inlet Sensor Enabled	Boolean	1	
FP1 - Heated Plate	Boolean	2	
FP1 - Integrator/Headless Mode Enabled on Token	Boolean	3	
(Spare)	Boolean	4	29
(Spare)	Boolean	5	
FP1 - Valve 1 Swirl Installed	Boolean	6	
FP1 - Valve 2 Swirl Installed	Boolean	7	
FP1 - Valve 3 Swirl Installed	Boolean	0	
FP1 - Valve 4 Swirl Installed	Boolean	1	
FP1 - Valve 1 Swirl Active	Boolean	2	30-31
FP1 - Valve 2 Swirl Active	Boolean	3	
FP1 - Valve 3 Swirl Active	Boolean	4	
FP1 - Valve 4 Swirl Active	Boolean	5	
FP1 - Fault Reset	Boolean	6	
FP1 - Remote Start/Purge	Boolean	7	
FP1 - Percent Error	Integer	0-15	32
FP1 - Selected Style Number	Integer	0-7	33-34
FP1 - Requested Volume	Integer	0-15	35-36
FP1 - Dispensed Volume	Integer	0-15	37-38
FP1 - Command Voltage	Integer	0-15	39-40
FP1 - Inlet Pressure	Integer	0-15	41-42
FP1 - Outlet Pressure	Integer	0-15	43-44
FP1 - Pressure Command	Integer	0-15	45-46
FP1 - Flow Command	Integer	0-15	47-48
FP1 - Actual Flowrate	Integer	0-15	49-50
Swirl1 Actual speed RPM	Integer	0-15	

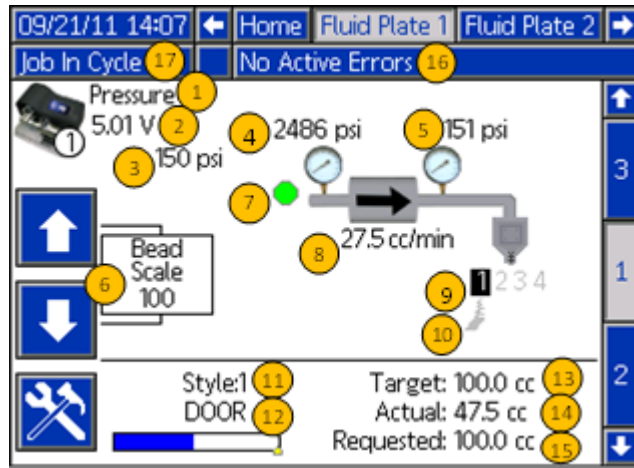
Signal	Data Type	BIT	BYTE
FP2 - Operation Mode	Integer	0-2	51
FP2 - Precharge Active	Boolean	3	
FP2 - Valve 1 State	Boolean	4	
FP2 - Valve 2 State	Boolean	5	
FP2 - Valve 3 State	Boolean	6	
FP2 - Valve 4 State	Boolean	7	52
FP2 - Ready to Dispense	Boolean	0	
FP2 - In Job Cycle	Boolean	1	
FP2 - Job Cycle Complete	Boolean	2	
FP2 - Alarm Active	Boolean	3	
FP2 - Deviation Active	Boolean	4	
FP2 - Advisory Active	Boolean	5	
FP2 - Dispensing Disabled	Boolean	6	53
FP2 - Fluid Plate Enabled	Boolean	7	
FP2 - Flowmeter Enabled	Boolean	0	
FP2 - Inlet Sensor Enabled	Boolean	1	
FP2 - Heated Plate	Boolean	2	
FP2 - Integrator/Headless Mode Enabled on Token	Boolean	3	
(Spare)	Boolean	4	
(Spare)	Boolean	5	
FP2 - Valve 1 Swirl Installed	Boolean	6	
FP2 - Valve 2 Swirl Installed	Boolean	7	
FP2 - Valve 3 Swirl Installed	Boolean	0	54
FP2 - Valve 4 Swirl Installed	Boolean	1	
FP2 - Valve 1 Swirl Active	Boolean	2	
FP2 - Valve 2 Swirl Active	Boolean	3	
FP2 - Valve 3 Swirl Active	Boolean	4	
FP2 - Valve 4 Swirl Active	Boolean	5	
FP2 - Fault Reset	Boolean	6	
FP2 - Remote Start/Purge	Boolean	7	
FP2 - Percent Error	Integer	0-15	55-56
FP2 - Selected Style Number	Integer	0-7	57
FP2 - Requested Volume	Integer	0-15	58-59
FP2 - Dispensed Volume	Integer	0-15	60-61
FP2 - Command Voltage	Integer	0-15	62-63
FP2 - Inlet Pressure	Integer	0-15	64-65
FP2 - Outlet Pressure	Integer	0-15	66-67
FP2 - Pressure Command	Integer	0-15	68-69
FP2 - Flow Command	Integer	0-15	70-71
FP2 - Actual Flowrate	Integer	0-15	72-73
Swirl2 Actual speed RPM	Integer	0-15	74-75

Signal	Data Type	BIT	BYTE
FP3 - Operation Mode	Integer	0-2	76
FP3 - Precharge Active	Boolean	3	
FP3 - Valve 1 State	Boolean	4	
FP3 - Valve 2 State	Boolean	5	
FP3 - Valve 3 State	Boolean	6	
FP3 - Valve 4 State	Boolean	7	
FP3 - Ready to Dispense	Boolean	0	77
FP3 - In Job Cycle	Boolean	1	
FP3 - Job Cycle Complete	Boolean	2	
FP3 - Alarm Active	Boolean	3	
FP3 - Deviation Active	Boolean	4	
FP3 - Advisory Active	Boolean	5	
FP3 - Dispensing Disabled	Boolean	6	
FP3 - Fluid Plate Enabled	Boolean	7	78
FP3 - Flowmeter Enabled	Boolean	0	
FP3 - Inlet Sensor Enabled	Boolean	1	
FP3 - Heated Plate	Boolean	2	
FP3 - Integrator/Headless Mode Enabled on Token	Boolean	3	
(Spare)	Boolean	4	
(Spare)	Boolean	5	
FP3 - Valve 1 Swirl Installed	Boolean	6	79
FP3 - Valve 2 Swirl Installed	Boolean	7	
FP3 - Valve 3 Swirl Installed	Boolean	0	
FP3 - Valve 4 Swirl Installed	Boolean	1	
FP3 - Valve 1 Swirl Active	Boolean	2	
FP3 - Valve 2 Swirl Active	Boolean	3	
FP3 - Valve 3 Swirl Active	Boolean	4	
FP3 - Valve 4 Swirl Active	Boolean	5	
FP3 - Fault Reset	Boolean	6	
FP3 - Remote Start/Purge	Boolean	7	80-81
FP3 - Percent Error	Integer	0-15	
FP3 - Selected Style Number	Integer	0-7	82
FP3 - Requested Volume	Integer	0-15	83-84
FP3 - Dispensed Volume	Integer	0-15	85-86
FP3 - Command Voltage	Integer	0-15	87-88
FP3 - Inlet Pressure	Integer	0-15	89-90
FP3 - Outlet Pressure	Integer	0-15	91-92
FP3 - Pressure Command	Integer	0-15	93-94
FP3 - Flow Command	Integer	0-15	95-96
FP3 - Actual Flowrate	Integer	0-15	97-98
Swirl3 Actual speed RPM	Integer	0-15	99-100

Signal	Data Type	BIT	BYTE
FP4 - Operation Mode	Integer	0-2	101
FP4 - Precharge Active	Boolean	3	
FP4 - Valve 1 State	Boolean	4	
FP4 - Valve 2 State	Boolean	5	
FP4 - Valve 3 State	Boolean	6	
FP4 - Valve 4 State	Boolean	7	102
FP4 - Ready to Dispense	Boolean	0	
FP4 - In Job Cycle	Boolean	1	
FP4 - Job Cycle Complete	Boolean	2	
FP4 - Alarm Active	Boolean	3	
FP4 - Deviation Active	Boolean	4	
FP4 - Advisory Active	Boolean	5	
FP4 - Dispensing Disabled	Boolean	6	103
FP4 - Fluid Plate Enabled	Boolean	7	
FP4 - Flowmeter Enabled	Boolean	0	
FP4 - Inlet Sensor Enabled	Boolean	1	
FP4 - Heated Plate	Boolean	2	
FP4 - Integrator/Headless Mode Enabled on Token	Boolean	3	
(Spare)	Boolean	4	
(Spare)	Boolean	5	
FP4 - Valve 1 Swirl Installed	Boolean	6	
FP4 - Valve 2 Swirl Installed	Boolean	7	
FP4 - Valve 3 Swirl Installed	Boolean	0	104
FP4 - Valve 4 Swirl Installed	Boolean	1	
FP4 - Valve 1 Swirl Active	Boolean	2	
FP4 - Valve 2 Swirl Active	Boolean	3	
FP4 - Valve 3 Swirl Active	Boolean	4	
FP4 - Valve 4 Swirl Active	Boolean	5	
FP4 - Fault Reset	Boolean	6	
FP4 - Remote Start/Purge	Boolean	7	
FP4 - Percent Error	Integer	0-15	105-106
FP4 - Selected Style Number	Integer	0-7	107
FP4 - Requested Volume	Integer	0-15	108-109
FP4 - Dispensed Volume	Integer	0-15	110-111
FP4 - Command Voltage	Integer	0-15	112-113
FP4 - Inlet Pressure	Integer	0-15	114-115
FP4 - Outlet Pressure	Integer	0-15	116-117
FP4 - Pressure Command	Integer	0-15	118-119
FP4 - Flow Command	Integer	0-15	120-121
FP4 - Actual Flowrate	Integer	0-15	122-123
Swirl4 Actual speed RPM	Integer	0-15	124-125

# Fluid Plate Run Screens

## Fluid Plate Run 1.1



**NOTE:** Several items on the ADM screens (volumes, flow rates, k-factor, etc.) are grayed out (i.e. not editable) on fluid plates without a flowmeter. Flow meter enabled can be check by fluid plate status (command interface offset 0x0F8 bit 16).

**NOTE:** Refer to page 37 for Command Interface examples and further instruction.

Label	Description	Command Interface Offset (bits 256-275)	Gateway Map FP 1 (much faster) ◆	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
1	Active Operating Mode	0x0F8 (bits 0-2)	Input byte:26 bits:0-2	Fluid Plate Status bitfield	Read Only	Read Only	see manual page 43	
2	Command Voltage	0x115	Input Bytes:37-38	uint12	0x00000FFF	-	A 12 bit positive value	12-bit value; 0xFFF = 10.0V
3	Command Pressure/Flow	0x0DC (pressure) or 0x403 (flow)	Pressure = Input Bytes 43-44 Flow = Input Bytes 45-46	#### cc/min	Read Only	Read Only		
4	Inlet Pressure	0x0FB	Input Bytes: 39-40	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)	Read Only	Read Only		
5	Outlet Pressure	0x0FC	Input Bytes: 41-42	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)	Read Only	Read Only		
6	Bead Scale	0x20F	NA	### (percent)	0x00000096	0x00000032		
7	Job in Progress	0x0F8 (bit 9)	Input byte:26 bit:9	Fluid Plate Status bitfield	Read Only	Read Only	see manual page 43	
8	Actual Flow Rate	0x404	Input Bytes: 47-48	#### cc/min	Read Only	Read Only		Not displayed on systems without flow meter



Label	Description	Command Interface Offset (bits 256-275)	Gateway Map FP 1 (much faster) ◆	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
9	Dispense Valve States	0x0F8 (bits 4-7)	Input byte:26 bits:4-7	Fluid Plate Status bitfield	Read Only	Read Only	see manual page 43	
10	Swirl States	0x0F8 (bits 26-29)	Input byte:26 bits:26-29	Fluid Plate Status bitfield	Read Only	Read Only	see manual page 43	Only visible if swirl installed on that valve (0x0F8 bits 22-25), set on fluid plate setup screen 9
11	Selected style number	0x3FB	Input Byte: 32	###	style number purchased	style number purchased		Displayed style latched on job start
12	Active/Most recent style name	0xC04-0xC3F	NA	STR_3_0 through STR_15_1 2	0x20202020			depends on style number (may not need to display)
13	Target Dispense	0x800 + 4*(style number)	NA	#####.# (cc)	0x000F423F	0x00000000		Grayed out on systems without flow meter
14	Actual Dispensed Volume	0x0FF	Input Bytes: 35-36	#####.# (cc)	Read Only	Read Only		Grayed out on systems without flow meter
15	Requested Dispensed Volume	0x0FE	Input Bytes: 33-34	#####.# (cc)	Read Only	Read Only		Grayed out on systems without flow meter
16	Active Fault Error Code	0x0DB	Input byte:3 bits:0-7 <i>*See Note Below</i>	Fault Error Code	0x31303242		A 32-bit string in the format of 0xDDCCBBAA where 0xAA represents the most significant character in the string and 0xDD represents the least significant character in the string. Please refer to an ASCII table.	
17	System Power State	0x100	<b>Output</b> byte:40 bit:0	Bool	0x00000003	0x00000000	see manual page 43	

◆ Use with Map 17P799

**NOTE:** The error codes listed use an 8 bit number in place of the 32bit used in the command interface. They are included in the integration package and are available for download at [www.graco.com](http://www.graco.com).

## Fluid Plate Run 1.2

01/15/16 11:17 ← Errors Fluid Plate 1 Jobs Events →

Active No Active Errors

Robot Outputs

Style Strobe:  Style: 0

Dispense Complete:

Dispense Trigger: 1  2  3  4

Command: 0.11 V

Robot Inputs

Dispenser Ready:  In Process:

No Alarm:  No Error:

Vol. OK:  Error: 0

Dispensed Volume: 0 cc

Description	Command Interface Offset		32bit Command Value (bits 288-319)
Dispense Control	0x3FF	Dispense Control 1 Bitfield	See manual page 43
Fluid Plate Status 0	0x406	Fluid Plate Status 0 Bitfield	See manual page 43
Fluid Plate Faults	0x409	Gateway Error Number	

# Fluid Plate Run 1.3

01/15/16 11:19		←	Errors	Fluid Plate 1	Jobs	Events	→
Active		No Active Errors					
			<u>Volume</u>		<u>Limit</u>		
Supply:	3	0.057	3c	0	gal(US)	2	
V/P:	4	0.054	4d	0	gal(US)		
Regulator:	1	0.054	1a	0	gal(US)		
Flowmeter:	2	0.057	2b	0	gal(US)	3	
Valve 1:	5	0.054	5e	0	gal(US)		
Valve 2:	6	0.000	6f	0	gal(US)		
Valve 3:	7	0.000	7g	0	gal(US)	1	
Valve 4:	8	0.000	8h	0	gal(US)		

Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
1	Regulator Maintenance - Dispensed Volume*	0x302	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)				
2	Flow meter Maintenance - Dispensed Volume*	0x303	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)				
3	Supply Maintenance - Dispensed Volume*	0x304	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)				
4	V/P Maintenance - Dispensed Volume*	0x305	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)				
5	Valve 1 Maintenance - Dispensed Volume*	0x308	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)				
6	Valve 2 Maintenance - Dispensed Volume*	0x309	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)				

Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
7	Valve 3 Maintenance - Dispensed Volume*	0x30A	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)				
8	Valve 4 Maintenance - Dispensed Volume*	0x30B	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)				
1a	Regulator Maintenance - Dispense Time*	0x312	##### (hours)				Flowmeter option not enabled on purchased blue token
2b	Flow meter Maintenance - Dispense Time*	0x313	##### (hours)				Flowmeter option not enabled on purchased blue token
3c	Supply Maintenance - Dispense Time*	0x314	##### (hours)				Flowmeter option not enabled on purchased blue token
4d	V/P Maintenance - Dispense Time*	0x315	##### (hours)				Flowmeter option not enabled on purchased blue token
5e	Valve 1 Maintenance - Dispense Time*	0x318	##### (hours)				Flowmeter option not enabled on purchased blue token
6f	Valve 2 Maintenance - Dispense Time*	0x319	##### (hours)				Flowmeter option not enabled on purchased blue token
7g	Valve 3 Maintenance - Dispense Time*	0x31A	##### (hours)				Flowmeter option not enabled on purchased blue token
8h	Valve 4 Maintenance - Dispense Time*	0x31B	##### (hours)				Flowmeter option not enabled on the purchased blue token

## Fluid Plate Run Events

**NOTE:** Only available on an ADM, not available though CGM.

# Errors and Job Screen

## Fluid Plate Run Errors

Date	Time	Code	Description
01/15/16	11:04	CAD1-A	Comm. Error-FP1
01/15/16	11:03	V2D1-D	Low Analog-FP1
12/28/15	13:05	V2D1-D	Low Analog-FP1
12/28/15	13:03	V2D1-D	Low Analog-FP1
11/13/15	12:15	CAD1-A	Comm. Error-FP1
11/13/15	12:13	CBD1-A	Comm. Error-FP1
11/13/15	12:12	CAD1-A	Comm. Error-FP1
11/13/15	11:34	CAC1-A	Gateway Comm. Error-FP1
11/13/15	11:29	CAC1-A	Gateway Comm. Error-FP1
11/13/15	11:27	CBD1-A	Comm. Error-FP1

Label	Description	Command Interface Offset (bits 256-275)	Gateway Map FP 1 (much faster) ♦	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
1	Active Fault Error Code	0x0DB	Input byte:3 bits:0-7 <i>*See Note Below</i>	Fault Error Code	0x31303242	na	A 32-bit string in the format of 0xDDCCBBAA where 0xAA represents the most significant character in the string and 0xDD represents the least significant character in the string. Please refer to an ASCII table.	

♦ Use with Map 17P799

The codes will be sent to this location on the map/ command interface when a fault is triggered. A PLC/robot program must grab the code, decode it from its ASCII characters, time stamp it and log it to memory. This will give the controller the ability to log errors.

**NOTE:** The error codes listed use an 8 bit number in place of the 32bit used in the command interface. They are included in the integration package and are available for download at [www.graco.com](http://www.graco.com).

## Fluid Plate Run Jobs

01/15/16 11:20		Fluid Plate 1		Jobs	Events	Errors
Active		No Active Errors				
Date	Time	Target	Actual			
Dispenser	Style	Requested	% Error			
01/15/16	11:03	0.0 cc	0.0 cc			
1	1	0.0 cc	0.0 %			
12/28/15	13:05	0.0 cc	32.0 cc			
1	1	0.0 cc	100.0 %			
12/28/15	13:04	0.0 cc	1.1 cc			
1	1	0.0 cc	100.0 %			
11/13/15	11:02	0.0 cc	0.0 cc			
1	1	0.0 cc	0.0 %			
11/13/15	11:02	0.0 cc	0.0 cc			
1	1	0.0 cc	0.0 %			

Label	Description	Command Interface Offset (bits 256-275)	Gateway Map FP 1 (much faster) ◆	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
1	Target Dispense	0x800 + 4*(style number)	NA	#####. # (cc)	0x000F423F	0x00000000		Grayed out on systems without flow meter
2	Actual Dispensed Volume	0x0FF	Input Bytes: 35-36	#####. # (cc)	Read Only	Read Only		Grayed out on systems without flow meter
3	Job Percent Error	0x0D5	Input Bytes: 30-31	#####. # (cc)	Read Only	Read Only		Grayed out on systems without flow meter
4	Requested Dispensed Volume	0x0FE	Input Bytes: 33-34	#####. # (cc)	Read Only	Read Only		Grayed out on systems without flow meter
5	Selected style number	0x3FB	Input Byte: 32	###	style number purchased**	style number purchased**		Displayed style latched on job start
9	Dispense Valve States	0x0F8 (bits 4-7)	Input byte:26 bits:4-7	Fluid Plate Status bitfield	Read Only	Read Only	see manual page 43	

◆ Use with Map 17P799

\*\*Returns current style number up to the number of styles available (purchased on a Blue Run Token)

PF1xxx - 2 styles

PF2xxx - 16 styles

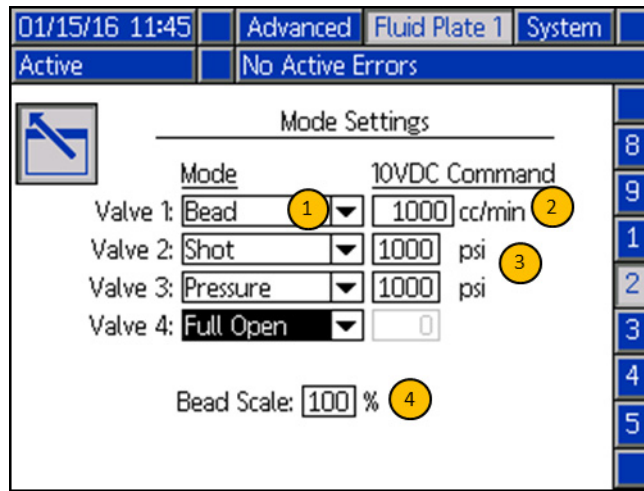
PF3xxx - 256 styles

# Fluid Plate Setup Screens

## Fluid Plate Setup 1.1

Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
1	Dispense Trigger Source	0x204	Dispense Trigger Source Enumeration	0x00000003	0x00000000	0 - Command Cable, 1 - Gateway, 2 - Combined, 3 - Command Cable 3x	
2	Enabled Valves (1-4)	0x212-0x215	###	0x00000001	0x00000000		Only applies if Dispense Trigger Source is "Command Cable". Otherwise grayed out on ADM
3	Command Value Source	0x208	Command Value Source Enumeration	0x00000002	0x00000000	0 - Display, 1 - Command Cable, 2 - Gateway	If display is not present, 0 should not be present
4	Job End Mode	0x210	Job End Mode Enumeration	0x00000001	0x00000000	0 - Timer, 1 - Gateway	
5	Job End Delay Time	0x211	Integer (Seconds)	0x00000063	0x00000000		Only applies if Job End Mode is "Timer". Otherwise grayed out on ADM
6	Run Mode Bead Adjust	N/A					allows user to adjust bead scale from fluid plate run screen - may not be required on robot HMI
7	End Job On Alarm	0x2B5	Boolean	0x00000001	0x00000000	TRUE/FALSE	
8	Display Control Password	N/A					only applies to ADM

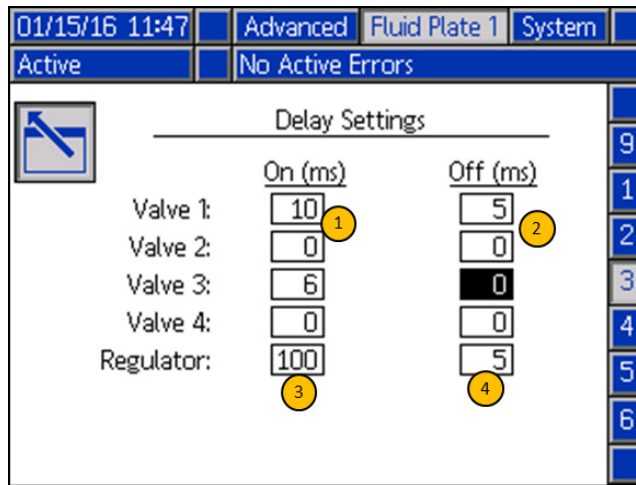
## Fluid Plate Setup 1.2



Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Max Write Value	32bit Command Value (bits 288-319)	Comments
1	Valve Mode (1-4)	Valve 1: 0x292 Valve 2: 0x293 Valve 3: 0x294 Valve 4: 0x295	Valve Mode Enumeration	0x00000003	0x00000000	0 - Pressure, 1 - Bead, 2 - Shot, 3 - Full Open	
2	Flow 10VDC command	Valve 1: 0x296 Valve 2: 0x297 Valve 3: 0x298 Valve 4: 0x299	Volume: ##### (cc/sec); ##### (cc/min); Mass: ##### (g/sec); ##### (g/min)				ADM display depends on mode. For pressure and shot mode, pressure is displayed. For bead mode, flow rate is displayed. For full open mode, nothing is displayed.
3	Pressure 10VDC command	Valve 1: 0x29A Valve 2: 0x29B Valve 3: 0x29C Valve 4: 0x29D	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)				
4	Bead scale	0x20F	### (percent)	0x00000096	0x00000032		Duplicate from front screen (i.e. two points of contact for same variable)

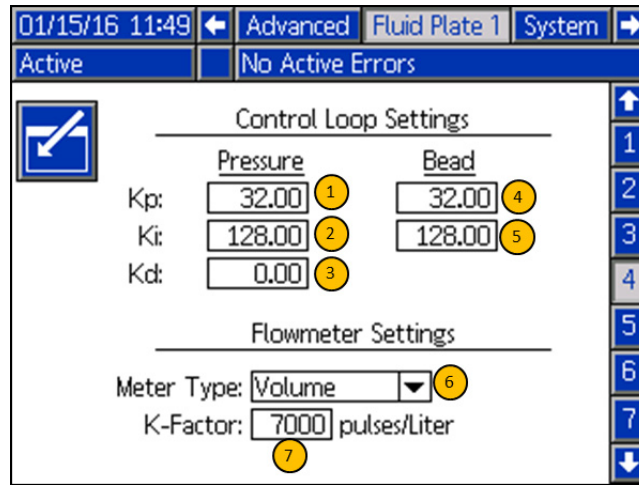


# Fluid Plate Setup 1.3



Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Max Write Value	32bit Command Value (bits 288-319)	Comments
1	Valve <b>On</b> Delay	Valve 1: 0x218 Valve 2: 0x219 Valve 3: 0x21A Valve 4: 0x21B	### (mS)	0x000003E7	0x00000000		0x03E7 corresponds to approx 1 second or 999ms
2	Valve <b>Off</b> Delay	Valve 1: 0x21C Valve 2: 0x21D Valve 3: 0x21E Valve 4: 0x21F	### (mS)	0x000003E7	0x00000001		0x03E7 corresponds to approx 1 second or 999ms
3	Regulator <b>On</b> Delay	0x216	### (mS)	0x000003E7	0x00000002		0x03E7 corresponds to approx 1 second or 999ms
4	Regulator <b>Off</b> Delay	0x217	### (mS)	0x000003E7	0x00000003		0x03E7 corresponds to approx 1 second or 999ms

# Fluid Plate Setup 1.4



Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Max Write Value	32bit Command Value (bits 288-319)	Comments
1	Pressure Kp	0x248	####.##	0x000F423F	0x00000000		A unitless number to tweak the gains of the control loop.
2	Pressure Ki	0x249	####.##	0x000F423F	0x00000001		A unitless number to tweak the gains of the control loop.
3	Pressure Kd	0x247	####.##	0x000F423F	0x00000002		A unitless number to tweak the gains of the control loop.
4	Bead Kp	0x254	####.##	0x000F423F	0x00000003		A unitless number to tweak the gains of the control loop.
5	Bead Ki	0x255	####.##	0x000F423F	0x00000004		A unitless number to tweak the gains of the control loop.
6	Flow Meter Type	0x230	Flow Meter Type Enumeration	0x00000002	0x00000001	1- Volume, 2 - Mass	
7	Flow Meter K-Factor	0x231	##### (pulses/Liter, pulses/kg)	0x0001869F	0x00000004		Used to set the units

## Fluid Plate Setup 1.5

01/15/16 16:05 ← Advanced Fluid Plate 1 System →

Active No Active Errors

Pressure Sensors

Offset Pressure

Inlet: + ▾ 0 psi ① 87 psi

Outlet: + ▾ 0 psi ② -4 psi

Limit Error Type

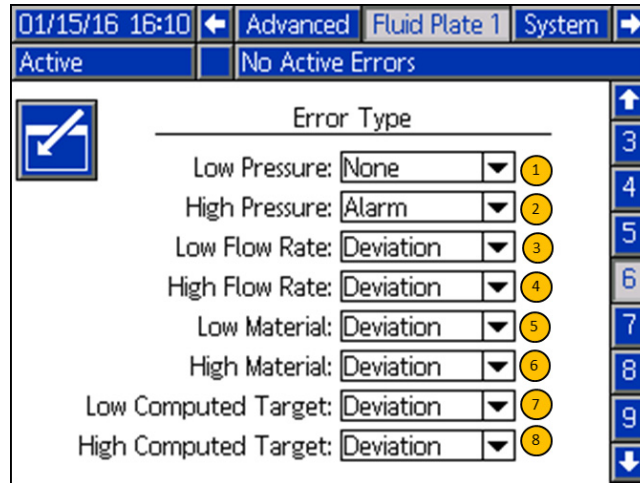
Min Inlet: 0 psi ③ Deviation ⑥

Max Inlet: 5000 psi ④ Deviation ⑦

Max Outlet: 5000 psi ⑤ Deviation ⑧

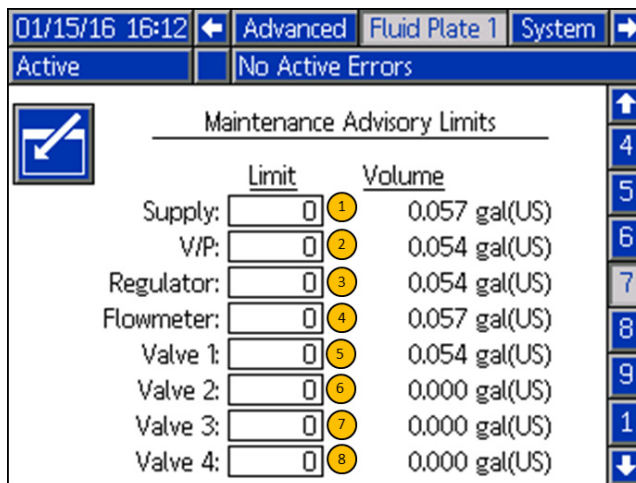
Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
1	Inlet Pressure Sensor User Offset	0x23D	sint32; #### (psi); ###.# (bar); ##.## (Mpa)	0x00000064	0xFFFFFFFF9C - 100 psi		Negative number in two compliment
2	Outlet Pressure Sensor User Offset	0x23C	sint32; #### (psi); ###.# (bar); ##.## (Mpa)	0x00000064	0xFFFFFFFF9C - 100 psi		Negative number in two compliment
3	Minimum Inlet Pressure	0x244	uint32; #### (psi); ###.# (bar); ##.## (Mpa)	0x00001388	0x00000000		
4	Maximum Inlet Pressure	0x245	uint32; #### (psi); ###.# (bar); ##.## (Mpa)	0x00001388	0x00000000		
5	Maximum Outlet Pressure	0x241	uint32; #### (psi); ###.# (bar); ##.## (Mpa)	0x00001388	0x00000000		
6	Low Inlet Pressure Error Type	0x28E	Error Type Enumeration 2	0x00000002	0x00000001	1 - Alarm, 2 - Deviation	
7	High Inlet Pressure Error Type	0x28F	Error Type Enumeration 2	0x00000002	0x00000001	1 - Alarm, 2 - Deviation	
8	High Outlet Pressure Error Type	0x289	Error Type Enumeration 2	0x00000002	0x00000001	1 - Alarm, 2 - Deviation	

# Fluid Plate Setup 1.6



Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Max Write Value	32bit Command Value (bits 288-319)	Comments
1	Low Pressure Error Type	0x286	Error Type Enumeration 1	0x00000002	0x00000000	0 - None, 1 - Alarm, 2 - Deviation	
2	High Pressure Error Type	0x287	Error Type Enumeration 1	0x00000002	0x00000000	1 - None, 1 - Alarm, 2 - Deviation	
3	Low Flow Rate Error Type	0x284	Error Type Enumeration 1	0x00000002	0x00000000	2 - None, 1 - Alarm, 2 - Deviation	
4	High Volume Error Type	0x285	Error Type Enumeration 1	0x00000002	0x00000000	3 - None, 1 - Alarm, 2 - Deviation	
5	Low Volume Error Type	0x28A	Error Type Enumeration 1	0x00000002	0x00000000	4 - None, 1 - Alarm, 2 - Deviation	
6	High Volume Error Type	0x28B	Error Type Enumeration 1	0x00000002	0x00000000	5 - None, 1 - Alarm, 2 - Deviation	
7	Low Computed Target Error Type	0x28C	Error Type Enumeration 1	0x00000002	0x00000000	6 - None, 1 - Alarm, 2 - Deviation	
8	High Computed Target Error Type	0x28D	Error Type Enumeration 1	0x00000002	0x00000000	7 - None, 1 - Alarm, 2 - Deviation	

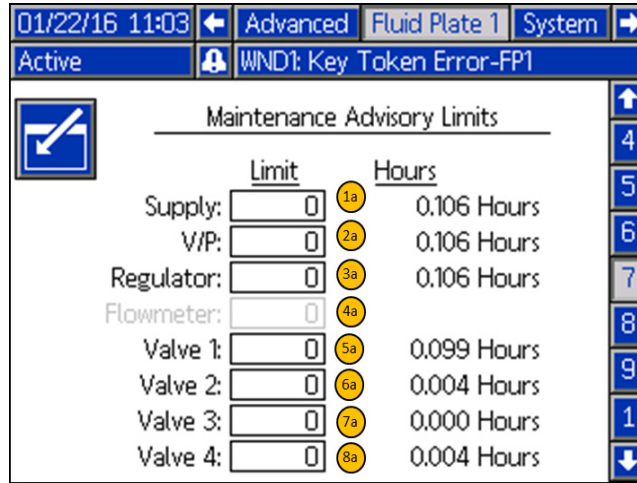
# Fluid Plate Setup 1.7



Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
1	Supply Volume/Mass Advisory Limit	0x26A	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	0x000F423 F	0x00000000		Volume and Mass are selectable from the flowmeter kfactor(i.e. setup screen 4)
2	V/P Volume/Mass Advisory Limit	0x26E	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	0x000F423 F	0x00000000		
3	Regulator Volume/Mass Advisory Limit	0x262	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	0x000F423 F	0x00000000		
4	Flow meter Volume/Mass Advisory Limit	0x266	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	0x000F423 F	0x00000000		
5	Valve 1 Volume/Mass Advisory Limit	0x278	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	0x000F423 F	0x00000000		

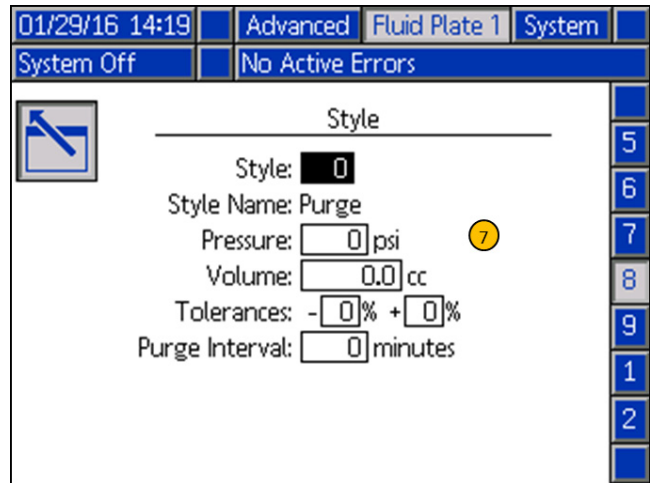
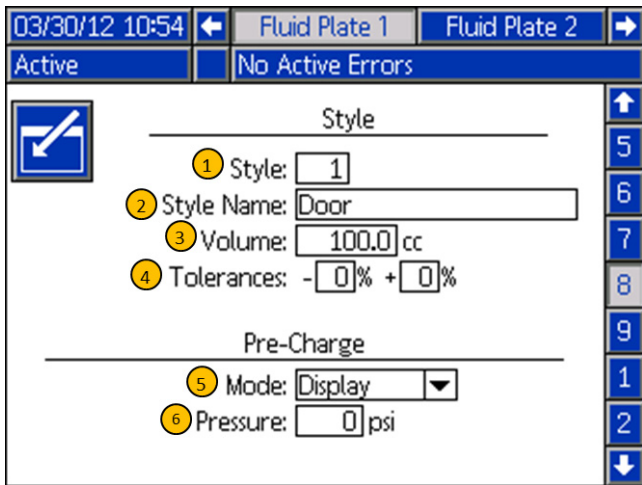
Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Min Write Value	32bit Command Value (bits 288-319)	Comments
6	Valve 2 Volume/Mass Advisory Limit	0x279	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)	0x000F423 F	0x00000000		
7	Valve 3 Volume/Mass Advisory Limit	0x27A	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)	0x000F423 F	0x00000000		
8	Valve 4 Volume/Mass Advisory Limit	0x27B	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)	0x000F423 F	0x00000000		

**Optional:** No flowmeter purchased, volume cannot be measured and PCF system will now use time for maintenance advisory limits.



Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Max Write Value	32bit Command Value (bits 288-319)	Comments
1a	Supply Time Advisory Limit	0x268	##### (hours)	0x000F423F	0x00000000		Flowmeter option not enabled on purchased blue token
2a	V/P Time Advisory Limit	0x26C	##### (hours)	0x000F423F	0x00000000		Flowmeter option not enabled on purchased blue token
3a	Regulator Time Advisory Limit	0x260	##### (hours)	0x000F423F	0x00000000		Flowmeter option not enabled on purchased blue token
4a	Flow meter Time Advisory Limit	0x264	##### (hours)	0x000F423F	0x00000000		Flowmeter option not enabled on purchased blue token
5a	Valve 1 Time Advisory Limit	0x270	##### (hours)	0x000F423F	0x00000000		Flowmeter option not enabled on purchased blue token
6a	Valve 2 Time Advisory Limit	0x271	##### (hours)	0x000F423F	0x00000000		Flowmeter option not enabled on purchased blue token
7a	Valve 3 Time Advisory Limit	0x272	##### (hours)	0x000F423F	0x00000000		Flowmeter option not enabled on purchased blue token
8a	Valve 4 Time Advisory Limit	0x273	##### (hours)	0x000F423F	0x00000000		Flowmeter option not enabled on purchased blue token

# Fluid Plate Setup 1.8



**NOTE:** Style 0 is reserved for Purge and is handled a little differently than other styles. User can set the purge time and interval, and precharge settings are not applicable.

When style Zero is selected, the machine enters purge mode and a new screen is shown.

**NOTE:** The number of styles available for the fluid plate (either 2, 16, or 256; depends on model) is stored at offset 0x0DF.

Label	Description	Command Interface Offset	Units	Max Write Value	Max Write Value	32bit Command Value (bits 288-319)	Comments
1	Style Number	0x3FB	###	style number purchased	style number purchased		
2	Style Name	0xC04-0xC3F	STR_3_0 through STR_15_12	0x20202020	0x00000000		15 character max
3	Target Volume	0x800 + 4*(style number)	#####.# (cc)	0x000F423F	0x00000000		
4	Tolerances	0x802 + 4*(style number)	Tolerances Type	0x00006363	0x00000000		0x000000FF - LOW TOLERANCES 0x0000FF00 - HIGH TOLERANCES
5	Precharge Mode	0x803 + 4*(style number)		0xFFFFFFFF	0x00000000		0x0000000F - MODE 0x0000FFF0 - DURATION 0x00FF000F - CLOSED SCALE 0xFF000000 - OPENING SCALE
7	Purge Period	0x203	#### (minutes)	0X0000270F	0x00000000		



## Fluid Plate Setup 1.9

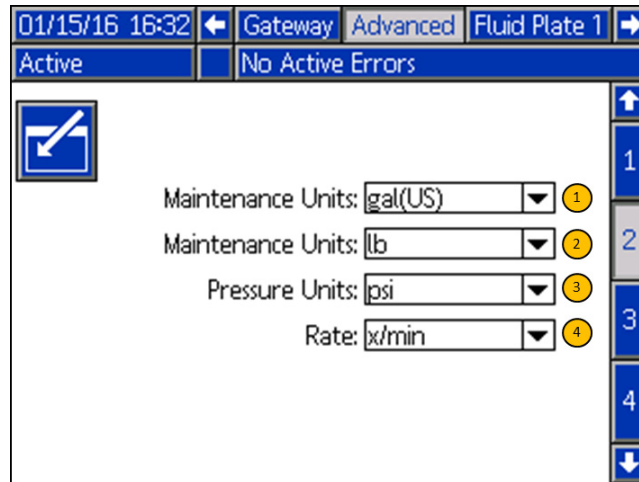
Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Max Write Value	32bit Command Value (bits 288-319)	Comments
1	Valve 1 Swirl Association (Swirl Zone)	0x2AD	Swirl Enumeration	0x00000004	0x00000000	0 - None, 1 - Swirl 1, 2 - Swirl 2, 3 - Swirl 3, 4 - Swirl 4	
2	Valve 2 Swirl Association (Swirl Zone)	0x2AE	Swirl Enumeration	0x00000004	0x00000000	0 - None, 1 - Swirl 1, 2 - Swirl 2, 3 - Swirl 3, 4 - Swirl 4	
3	Valve 3 Swirl Association (Swirl Zone)	0x2AF	Swirl Enumeration	0x00000004	0x00000000	0 - None, 1 - Swirl 1, 2 - Swirl 2, 3 - Swirl 3, 4 - Swirl 4	
4	Valve 4 Swirl Association (Swirl Zone)	0x2B0	Swirl Enumeration	0x00000004	0x00000000	0 - None, 1 - Swirl 1, 2 - Swirl 2, 3 - Swirl 3, 4 - Swirl 4	
5	Swirl Fault Error Type	0x283	Error Type Enumeration 2	0x00000002	0x00000001	1 - Alarm, 2 - Deviation	

# Advanced Setup Screens

## Advanced Setup 1

**NOTE:** Information is not available through a gateway.

## Advanced Setup 2



Label	Description	Command Interface Offset (bits 256-275)	Units	Max Write Value	Max Write Value	32bit Command Value (bits 288-319)	Comments
1	Maintenance Volume Units	0x2A0	Volume Units Enumeration	0x00000002	0x00000000	0 - gal(US), 1 - gal(UK), 2 - Liters	
2	Maintenance Mass Units	0x2A1	Mass Units Enumeration	0x00000001	0x00000000	0 - lb, 1 - kg	
3	Pressure Units	0x29E	Pressure Units Enumeration	0x00000002	0x00000000	0 - psi, 1 - bar, 2 - MPa	
4	Rate Units	0x29F	Rate Units Enumeration	0x00000001	0x00000000	0 - x/min, 1 - x/sec	

## Advanced Setup 3

**NOTE:** The USB and its configurations are not available through a gateway.

## Advanced Setup 4

Module	Software Part #	Software Version
Advanced Display	16K405	1.07.001
USB Configuration	16J874	1.02.001
Gateway	16X255	1.01.001
Fluid Plate 1	16J873	1.07.001

Label	Description	Command Interface Offset (bits 256-275)	Units	32bit Command Value (bits 288-319)	Comments
1	Software Part Number (fluid plate 1)	0x004	STR_3_0	A 32 bit value where X signifies which character in the string that the most significant byte represents and Y signifies which character in the string that the least significant byte represents.	Read only
2	Software Part Number (fluid plate 2)	0x005	STR_7_4		
3	Software Part Number (fluid plate 3)	0x006	STR_11_8		
4	Software Part Number (fluid plate 4)	0x007	STR_15_12		
5	Software Version	0x008	Version	A 32 bit value in the format of 0x00CCBBAA where 0xAA represents the major version, 0xBB represents the minor version and 0xCC represents the build version.	Read only

# Unrepresented Variables

The variables below are part of the Command Interface, but do not directly link to any screen action.

<b>Description</b>	<b>Command Interface Offset (bits 256-275)</b>	<b>Units</b>	<b>Comments</b>
Maintenance Units Type	0x0DD	Maintenance Units Enumeration	Determined base on flow meter present and meter type
Enabled Styles	0x0DF	###	Returns number of styles available (purchased on a Blue Run Token) PF1xxx - 2 styles PF2xxx - 16 styles PF3xxx - 256 styles
Error Reset / Remote Start	0x116	Dispense Control 2 Bitfield	
Disable Dispensing	0x118	Boolean	Lock out the ADM from dispensing
Dispense Control	0x3FF	Dispense Control 1 Bitfield	

# Command Interface

## CGM Command Interface

**NOTE:** The CGM command interface is only available for fluid plates with 16 or 256 styles.

**NOTE:** Some data instances are offered directly on the map and through the command interface. It is recommended that you use the data available directly to improve communication speed.

The CGM command interface utilizes bits in the CGM I/O Data Map to support many additional functions that are not available in the other CGM I/O bits.

**NOTE:** When changes are made over the command interface, the ADM screen may not update immediately. It may be necessary to navigate away from the screen then back to it.

The CGM command interface uses automation output bits 256 to 327. These bits can be used to request the value of a current system setting (read) or change a system setting (write).

- Output bits 256-267 are used to identify the individual command. Each bit will have a single binary value to create the hex code listed in the commands table.
- Output bits 268-275 are used to identify the individual Fluid Plate or Swirl dispenser to which the commands will apply.
- Output bits 288-319 are used to identify the value of the command specified by bits 256-267 and 268-275.
- Output bit 321 identifies the command as a write command.
- Output bit 320 identifies the command as a read command.

The CGM command interface uses automation input bits 128-159 to read the current system values. It also uses input bits 160-163 to identify the status of commands:

- Bit 160: Command Active
- Bit 161: Command Success
- Bit 162: Command Failure
- Bit 163: Value Coerced

**NOTE:** If both output bits 320 (read) and 321 (write) are high during a command the result will be a command failure identified by input bit 162 (command failure) going high.

### Examples

**NOTE:** See the timing diagram and tables starting on page 38 for detailed descriptions of the input and output bits.

Example 1: if output bits 256-275 are 0xB0203, output bits 288-319 are 0x0004, and output bit 321 is high, this means:

- The command relates to the purge period in minutes (0x\_\_203)
- The command relates to fluid plate 1 (0xB0\_\_)
- The command is a write command (bit 321 high)
- The value of the command is 4 (0x0004)

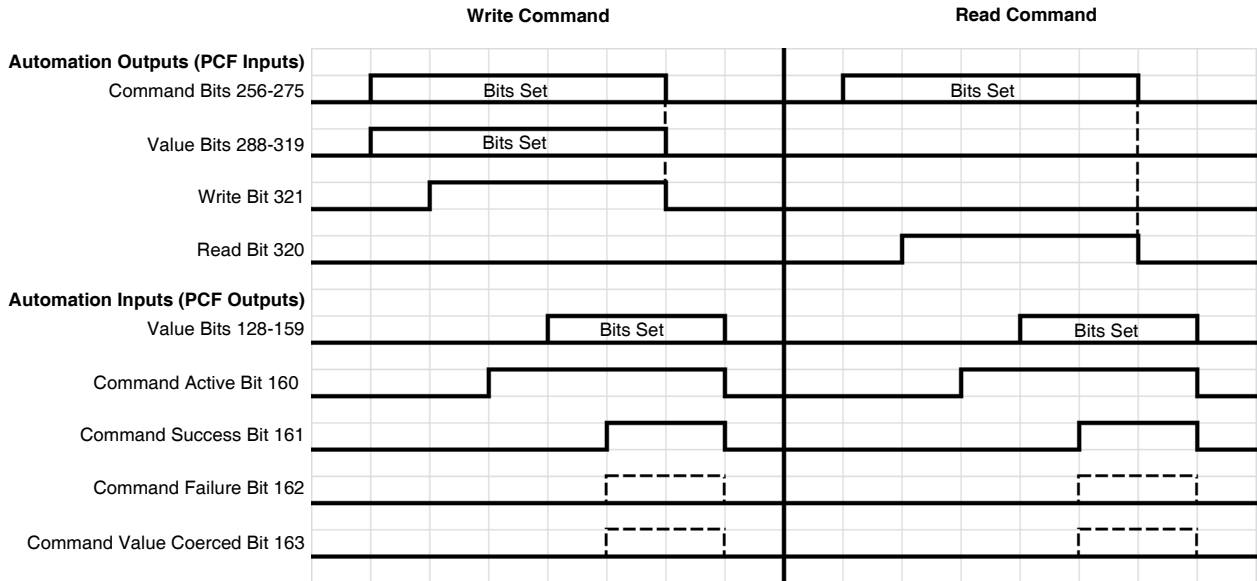
Combine these individual pieces to understand the command as a whole: *Change the purge period setting on fluid plate 1 to 4 minutes.*

Example 2: if output bits 256-275 are 0xB3212, input bits 288-319 are 0x0000, and output bit 320 is high, this means:

- The command relates to whether valve 1 is enabled (0x\_\_212)
- The command relates to fluid plate 4 (0xB3\_\_)
- The command is a read command (bit 320 high)
- The value of the command is 0 (0x0000)

Combined, this means: *Valve 1 on fluid plate 4 is disabled.*

### Command Interface Timing Diagram



**FIG. 2: CGM Command Interface Timing Diagram**

#### Command Interface Write Operation

1. Set Command Identification Bits and Fluid Plate/Swirl Identification Bits to the desired values.
2. Set Value Bits (Output) with the value that is desired to be written.
3. Set Write Bit.
4. Wait for the Command Active Bit to become set. This indicates that an operation is in process.
5. Wait for the Command Success Bit, Command Failure Bit, or Command Value Coerced Bit to become set.

**NOTE:** The Value Bits (Input) now contain the value that was actually written.

6. Clear the Write Bit to end the write command operation.

#### Command Interface Read Operation

1. Set Command Identification Bits and Fluid Plate/Swirl Identification Bits to the desired values.
2. Set Read Bit.
3. Wait for the Command Active Bit to become set. This indicates that an operation is in process.

4. Wait for the Command Success Bit or Command Failure Bit to become set.

**NOTE:** If Command Success Bit has been set, valid data will be present within the Value Bits (Input).

5. Clear the Read Bit to end the read command operation.

#### Fluid Plate/Swirl Identification Commands

Output Bits 268-275	Description
0xB0	Fluid Plate 1
0xB1	Fluid Plate 2
0xB2	Fluid Plate 3
0xB3	Fluid Plate 4
0xE1	Swirl 1
0xE2	Swirl 2
0xE3	Swirl 3
0xE4	Swirl 4

#### Fluid Plate Commands

Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x004	Software Part Number	STR_3_0	Read Only
0x005	Software Part Number	STR_7_4	Read Only
0x006	Software Part Number	STR_11_8	Read Only

Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x007	Software Part Number	STR_15_12	Read Only
0x008	Software Version	Version	Read Only
0x0DD	Maintenance Units Type	Maintenance Units Enumeration	Read Only
0x0DF	Enabled Styles	###	Read Only
0x203	Purge Period	#### (minutes)	Read / Write
0x204	Dispense Trigger Source	Dispense Trigger Source Enumeration	Read / Write
0x208	Command Value Source	Command Value Source Enumeration	Read / Write
0x20F	Bead Scale	### (percent)	Read / Write
0x210	Job End Mode	Job End Mode Enumeration	Read / Write
0x211	Job End Delay Time	Integer (Seconds)	Read / Write
0x2B5	End Job On Alarm	Boolean	
0x212	Valve 1 Enable	Boolean	Read / Write
0x213	Valve 2 Enable	Boolean	Read / Write
0x214	Valve 3 Enable	Boolean	Read / Write
0x215	Valve 4 Enable	Boolean	Read / Write
0x216	Regulator On Delay	### (mS)	Read / Write
0x217	Regulator Off Delay	### (mS)	Read / Write
0x218	Valve 1 On Delay	### (mS)	Read / Write
0x219	Valve 2 On Delay	### (mS)	Read / Write
0x21A	Valve 3 On Delay	### (mS)	Read / Write
0x21B	Valve 4 On Delay	### (mS)	Read / Write
0x21C	Valve 1 Off Delay	### (mS)	Read / Write
0x21D	Valve 2 Off Delay	### (mS)	Read / Write
0x21E	Valve 3 Off Delay	### (mS)	Read / Write
0x21F	Valve 4 Off Delay	### (mS)	Read / Write
0x230	Flow Meter Type	Flow Meter Type Enumeration	Read / Write
0x231	Flow Meter K-Factor	##### (pulses/Liter, pulses/kg)	Read / Write
0x23C	Outlet Pressure Sensor User Offset	sint32; #### (psi); ###.# (bar); ##.## (Mpa)	Read / Write

Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x23D	Inlet Pressure Sensor User Offset	sint32; #### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x241	Maximum Outlet Pressure	uint32; #### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x244	Minimum Inlet Pressure	uint32; #### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x245	Maximum Inlet Pressure	uint32; #### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x248	Pressure Kp	####.##	Read / Write
0x249	Pressure Ki	####.##	Read / Write
0x247	Pressure Kd	####.##	Read / Write
0x254	Bead Kp	####.##	Read / Write
0x255	Bead Ki	####.##	Read / Write
0x260	Regulator Time Advisory Limit	##### (hours)	Read / Write
0x262	Regulator Volume/Mass Advisory Limit	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x264	Flow meter Time Advisory Limit	##### (hours)	Read / Write
0x266	Flow meter Volume/Mass Advisory Limit	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x268	Supply Time Advisory Limit	##### (hours)	Read / Write
0x26A	Supply Volume/Mass Advisory Limit	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x26C	V/P Time Advisory Limit	##### (hours)	Read / Write
0x26E	V/P Volume/Mass Advisory Limit	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x270	Valve 1 Time Advisory Limit	##### (hours)	Read / Write
0x271	Valve 2 Time Advisory Limit	##### (hours)	Read / Write
0x272	Valve 3 Time Advisory Limit	##### (hours)	Read / Write

Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x273	Valve 4 Time Advisory Limit	##### (hours)	Read / Write
0x278	Valve 1 Volume/Mass Advisory Limit	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x279	Valve 2 Volume/Mass Advisory Limit	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x27A	Valve 3 Volume/Mass Advisory Limit	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x27B	Valve 4 Volume/Mass Advisory Limit	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x283	Swirl Fault Error Type	Error Type Enumeration 2	
0x284	Low Flow Rate Error Type	Error Type Enumeration 1	Read / Write
0x285	High Flow Rate Error Type	Error Type Enumeration 1	Read / Write
0x286	Low Pressure Error Type	Error Type Enumeration 1	Read / Write
0x287	High Pressure Error Type	Error Type Enumeration 1	Read / Write
0x289	High Outlet Pressure Error Type	Error Type Enumeration 2	Read / Write
0x28A	Low Volume Error Type	Error Type Enumeration 1	Read / Write
0x28B	High Volume Error Type	Error Type Enumeration 1	Read / Write
0x28C	Low Computed Target Error Type	Error Type Enumeration 1	Read / Write
0x28D	High Computed Target Error Type	Error Type Enumeration 1	Read / Write
0x28E	Low Inlet Pressure Error Type	Error Type Enumeration 2	Read / Write
0x28F	High Inlet Pressure Error Type	Error Type Enumeration 2	Read / Write
0x292	Valve 1 Mode	Valve Mode Enumeration	Read / Write

Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x293	Valve 2 Mode	Valve Mode Enumeration	Read / Write
0x294	Valve 3 Mode	Valve Mode Enumeration	Read / Write
0x295	Valve 4 Mode	Valve Mode Enumeration	Read / Write
0x296	Valve 1 10 VDC Analog Scale Flow rate	Volume: ##### (cc/sec); ##### (cc/min); Mass: ##### (g/sec); ##### (g/min)	Read / Write
0x297	Valve 2 10 VDC Analog Scale Flow rate	Volume: ##### (cc/sec); ##### (cc/min); Mass: ##### (g/sec); ##### (g/min)	Read / Write
0x298	Valve 3 10 VDC Analog Scale Flow rate	Volume: ##### (cc/sec); ##### (cc/min); Mass: ##### (g/sec); ##### (g/min)	Read / Write
0x299	Valve 4 10 VDC Analog Scale Flow rate	Volume: ##### (cc/sec); ##### (cc/min); Mass: ##### (g/sec); ##### (g/min)	Read / Write
0x29A	Valve 1 10 VDC Analog Scale Pressure	Pressure: ##### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x29B	Valve 2 10 VDC Analog Scale Pressure	Pressure: ##### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x29C	Valve 3 10 VDC Analog Scale Pressure	Pressure: ##### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x29D	Valve 4 10 VDC Analog Scale Pressure	Pressure: ##### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x302	Regulator Maintenance - Dispensed Volume*	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x303	Flow meter Maintenance - Dispensed Volume*	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x304	Supply Maintenance - Dispensed Volume*	Volume: ##### (gal(US)); ##### (gal(UK)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write



Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x305	V/P Maintenance - Dispensed Volume*	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x308	Valve 1 Maintenance - Dispensed Volume*	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x309	Valve 2 Maintenance - Dispensed Volume*	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x30A	Valve 3 Maintenance - Dispensed Volume*	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x30B	Valve 4 Maintenance - Dispensed Volume*	Volume: ##### (gal(US)); ##### (gal(Uk)); ##### (Liters); Mass: ##### (lb), ##### (kg)	Read / Write
0x312	Regulator Maintenance - Dispense Time*	##### (hours)	Read / Write
0x313	Flow meter Maintenance - Dispense Time*	##### (hours)	Read / Write
0x314	Supply Maintenance - Dispense Time*	##### (hours)	Read / Write
0x315	V/P Maintenance - Dispense Time*	##### (hours)	Read / Write
0x318	Valve 1 Maintenance - Dispense Time*	##### (hours)	Read / Write
0x319	Valve 2 Maintenance - Dispense Time*	##### (hours)	Read / Write
0x31A	Valve 3 Maintenance - Dispense Time*	##### (hours)	Read / Write
0x31B	Valve 4 Maintenance - Dispense Time*	##### (hours)	Read / Write
0x800	Purge Definition - Volume	#####.# (cc)	Read / Write

Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x801	Purge Definition - Pressure	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x802	Purge Definition - Tolerances	Tolerances Type	Read / Write
0x803	Purge Definition - Duration	#### (seconds)	Read / Write
0x804	Style 1 Definition - Volume	#####.# (cc)	Read / Write
0x805	Style 1 Definition - Pressure	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0x806	Style 1 Definition - Tolerances	Tolerances Type	Read / Write
0x807	Style 1 Definition - Precharge Settings	Precharge Settings Type	Read / Write
0xBFC	Style 255 Definition - Volume	#####.# (cc)	Read / Write
0xBFD	Style 255 Definition - Pressure	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)	Read / Write
0xBFE	Style 255 Definition - Tolerances	Tolerances Type	Read / Write
0xBFF	Style 255 Definition - Precharge Settings	Precharge Settings Type	---
0xC04	Style 1 Definition - Name	STR_3_0	Read / Write
0xC05	Style 1 Definition - Name	STR_7_4	Read / Write
0xC06	Style 1 Definition - Name	STR_11_8	Read / Write
0xC07	Style 1 Definition - Name	STR_15_12	Read / Write
0xC3C	Style 15 Definition - Name	STR_3_0	Read / Write
0xC3D	Style 15 Definition - Name	STR_7_4	Read / Write
0xC3E	Style 15 Definition - Name	STR_11_8	Read / Write
0xC3F	Style 15 Definition - Name	STR_15_12	Read / Write
0x29E	Pressure Units	Pressure Units Enumeration	Read / Write
0x29F	Rate Units	Rate Units Enumeration	Read / Write

Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x2A0	Maintenance Volume Units	Volume Units Enumeration	Read / Write
0x2A1	Maintenance Mass Units	Mass Units Enumeration	Read / Write
0x2A2	Maintenance Time Units	Mass Units Enumeration	Read / Write
0x2AD	Valve 1 Swirl Association (Swirl Zone)	Swirl Enumeration	Read / Write
0x2AE	Valve 2 Swirl Association (Swirl Zone)	Swirl Enumeration	Read / Write
0x2AF	Valve 3 Swirl Association (Swirl Zone)	Swirl Enumeration	Read / Write
0x2B0	Valve 4 Swirl Association (Swirl Zone)	Swirl Enumeration	Read / Write
0x2B5	End Job On Alarm	Boolean	Read / Write
0x3FB	Style Bits	###	Read / Write
0x115	Command Value	uint12	Read / Write
0x116	Error Reset / Remote Start	Dispense Control 2 Bit field	Read / Write
0x118	Disable Dispensing	Boolean	Read / Write
0x3FF	Dispense Control	Dispense Control 1 Bit field	Read / Write
0x0FB	Inlet Pressure	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)	Read Only
0x0FC	Outlet Pressure	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)	Read Only
0x0DC	Pressure Command	Pressure: #### (psi); ###.# (bar); ##.## (Mpa)	Read Only
0x403	Flowrate Command	##### cc/min	Read Only
0x404	Flowrate Actual	##### cc/min	Read Only
0x406	Fluid Plate Status 0	Fluid Plate Status 0 bitfield	Read Only
0x409	Fluid Plate Faults	Gateway Error Number	Read Only
0x0FF	Fluid Plate Dispensed Volume	#####.# (cc)	Read Only
0x0DB	Active Fault Error Code	Fault Error Code	Read Only

Output Bits 256-267	Description	Units *See Units Definitions, page 43	Read or Write
0x0F8	Fluid Plate Status Bits	Fluid Plate Status bit field	Read Only
0x0FE	Requested Volume	#####.# (cc)	Read Only
0X0D5	Job Percent Error	#####.#	Read Only
0x0D6	Selected Style	###	Read Only
0x0D7	Target Volume	#####.#	Read / Write
0x100	Enable Fluid Plate	xx	Read / Write

\* Maintenance dispensed volume/time can only be set to 0.

### Swirl Commands

Output Bits 264-275	Description	Gateway Units	Read or Write
0x004	Software Part Number	STR_3_0	Read Only
0x005	Software Part Number	STR_7_4	Read Only
0x006	Software Part Number	STR_11_8	Read Only
0x007	Software Part Number	STR_15_12	Read Only
0x00B	Software Version	Version	Read Only
0x400	Swirl Speed Source	Speed Source Enumeration	Read / Write
0x401	Swirl Fixed Speed	##### (RPM)	Read / Write
0x403	Swirl Speed Scaling	### (percent)	Read / Write
0x404	Swirl Maintenance Time Advisory Limit	##### (hours)	Read / Write
0x3FF	Swirl - Actual Run Time	##### (hours)	Read / Write
0x2FC	Swirl Status Bits 1	Swirl Status Bit field 1	Read Only
0x4FE	Swirl Actual Speed	##### (RPM)	Read Only
0x500	Swirl Control	Swirl Control Enumeration	Read / Write
0x501	Swirl Requested Speed	uint12	Read / Write

## Units Definitions

Unit s String	Definition																																																																		
Command Value Source Enumeration	0 - Display, 1 - Command Cable, 2 - Gateway																																																																		
Dispense Control 1 Bitfield	<table border="0"> <tr> <td><b>Bit .....</b></td> <td><b>Function</b></td> <td>3 .....</td> <td>Valve 2 On</td> <td>6 .....</td> <td>Error Reset</td> </tr> <tr> <td>0 .....</td> <td>Style Strobe</td> <td>4 .....</td> <td>Valve 3 On</td> <td>7 .....</td> <td>Remote Start/Purge</td> </tr> <tr> <td>1 .....</td> <td>Dispense Complete</td> <td>5 .....</td> <td>Valve 4 On</td> <td></td> <td></td> </tr> <tr> <td>2 .....</td> <td>Valve 1 On</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	<b>Bit .....</b>	<b>Function</b>	3 .....	Valve 2 On	6 .....	Error Reset	0 .....	Style Strobe	4 .....	Valve 3 On	7 .....	Remote Start/Purge	1 .....	Dispense Complete	5 .....	Valve 4 On			2 .....	Valve 1 On																																														
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1 .....	Dispense Complete	5 .....	Valve 4 On																																																																
2 .....	Valve 1 On																																																																		
Dispense Control 2 Bitfield	Bit 14 - Error Reset, Bit 15 - Remote Start																																																																		
Dispense Trigger Source Enumeration	0 - Command Cable, 1 - Gateway, 2 - Combined, 3 - Command Cable 3x																																																																		
Error Type Enumeration 1	0 - None, 1 - Alarm, 2 - Deviation																																																																		
Fault Error Code	A 32-bit string in the format of 0xDDCCBBAA where 0xAA represents the most significant ASCII character in the string and 0xDD represents the least significant character in the string.																																																																		
Flow Meter Type Enumeration	1 - Volume, 2 - Mass																																																																		
Fluid Plate Status 0 Bitfield	<table border="0"> <tr> <td><b>Bit .....</b></td> <td><b>Function</b></td> <td>3 .....</td> <td>Dispense In Process</td> <td>7 .....</td> <td>Purge in Process/Remote Start in Process</td> </tr> <tr> <td>0 .....</td> <td>Dispenser Ready</td> <td>4 .....</td> <td>Dispensed Volume OK</td> <td></td> <td></td> </tr> <tr> <td>1 .....</td> <td>Dispense No Alarm</td> <td>5 .....</td> <td>---</td> <td></td> <td></td> </tr> <tr> <td>2 .....</td> <td>Dispense No Error</td> <td>6 .....</td> <td>Dispenser Purge Request</td> <td></td> <td></td> </tr> </table>	<b>Bit .....</b>	<b>Function</b>	3 .....	Dispense In Process	7 .....	Purge in Process/Remote Start in Process	0 .....	Dispenser Ready	4 .....	Dispensed Volume OK			1 .....	Dispense No Alarm	5 .....	---			2 .....	Dispense No Error	6 .....	Dispenser Purge Request																																												
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		23 .....	Valve 2 Swirl Installed																																																																
Job End Mode Enumeration	0 - Timer, 1 - Gateway																																																																		
Maintenance Units Enumeration	0 - Volume, 1 - Mass, 2 - Time																																																																		
Mass Units Enumeration	0 - lb, 1 - kg																																																																		
Precharge Settings Type	<p>A 32 bit value in the format of 0xDDCCBBA:</p> <p>0xA.....Precharge mode enumeration: 0 - Display, 1 - Gateway, 2 - Valve 1</p> <p>0xB...Precharge valve opening duration (ms)</p> <p>0xCC.....Precharge scale - valve closed (%)</p> <p>0xDD.....Precharge scale - valve opening (%)</p>																																																																		
Pressure Units Enumeration	0 - psi, 1 - bar, 2 - MPa																																																																		
Rate Units Enumeration	0 - x/min, 1 - x/sec																																																																		
sint32	A 32 bit positive or negative value																																																																		
Speed Source Enumeration	0 - Display, 1 - Gateway																																																																		
STR_X_Y	A 32 bit value where X signifies which character in the string that the most significant byte represents and Y signifies which character in the string that the least significant byte represents.																																																																		
Swirl Control Enumeration	0 - Swirl Enable																																																																		
Swirl Enumeration	0 - None, 1 - Swirl 1, 2 - Swirl 2, 3 - Swirl 3, 4 - Swirl 4																																																																		
Swirl Status Bitfield 1	0 - Swirl Active, 1 - Swirl Ready, 2 - Swirl Enabled																																																																		
Tolerances Type	A 32 bit value in the format of 0x0000BBAA where 0xAA represents the low tolerance (%) and 0xBB represents the high tolerance (%). A value of 0 means that tolerance is disabled.																																																																		
Valve Mode Enumeration	0 - Pressure, 1 - Bead, 2 - Shot, 3 - Full Open, 5 - None																																																																		
uint12	A 12 bit positive value																																																																		
uint32	A 32 bit positive value																																																																		
Version	A 32 bit value in the format of 0x00CCBBAA where 0xAA represents the major version, 0xBB represents the minor version and 0xCC represents the build version.																																																																		
Volume Units Enumeration	0 - gal(US), 1 - gal(UK), 2 - Liters																																																																		

# I/O Signal Descriptions

This section provides details about the CGM and DGM Automation Input and Output signals.

## Automation Inputs

### Dispenser (Fluid Plate) Ready

This signal is 0 on power up. This signal will be 1 under the following conditions:

- The system is in an active state, and
- The dispenser (fluid plate) does not have an active Alarm (Deviations have no effect).

### Dispenser (Fluid Plate) No Alarm

For systems with a CGM, this signal will be 1 under the following condition:

- The system does not have an alarm.
- For systems with a DGM, this signal can be configured to be active high or active low.

### Dispenser (Fluid Plate) No Error

For systems with a CGM, this signal will be 1 under the following condition:

- The system does not have an error (alarm, deviation, or advisory).
- For systems with a DGM, this signal can be configured to be active high or active low.

### Dispense in Process

This signal is 0 on power up. This signal will be 1 under the following condition:

- The system is in the middle of a job.

### Dispense Volume OK

This signal will be 1 under the following conditions:

- The system has completed a job, and
- the volume of the job is within the tolerance specified, and
- the style strobe is 1.

### Dispenser (Fluid Plate) Purge Request

This signal is 1 on power up if a purge interval has been defined, 0 on power up otherwise. Any dispensing will turn off this bit and reset the purge timer. This signal will be 1 under the following condition:

- The system purge interval timer has expired.

### Dispenser (Fluid Plate) Remote Start / Purge in Process

This signal is 0 on power up. This signal will be 1 under the following conditions:

- A remote start sequence is in process. This signal shall remain asserted until the dispense equipment has achieved Dispense Ready status.
- A purge sequence is in process. This signal shall remain asserted until the purge sequence is complete.

### Units

All units settings are set in the Advanced Display Module. The following signals are used to communicate this information to the automation controller.

#### Pressure Units

Value	Units
0	psi
1	bar
2	MPa
3	reserve

### Errors

Error numbers are formed by 8 bits. This is the error number in the system.

## Automation Outputs

### Style

The desired style of the next job. These 8 bits are read at the start of a job to determine the selected style.

### Style Strobe

This bit is used to start a new job. A new job is started when the style strobe changes from 0 to 1.

### Dispense Complete

This bit is used to signal the end of a job. A job is ended when this signal changes from 0 to 1.

### Dispense Valve X On

These 4 bits are used to signal the turn on and turn off of each of the 4 dispense valves on the applicable fluid plate.

### Command Value

This 12 bit value indicates the analog command value from 0-10Volts (0x000-0xFFFF). This analog value is scaled to a flow rate (in bead mode) or pressure (in pressure or shot mode) command based on the configured scale factor.

### Error Reset / Cancel Job

If the “End Job On Alarm” setting is enabled:

- If in a job, setting this bit will cancel the current job.
- If not in a job, setting this will reset errors.

If the “End Job On Alarm” setting is disabled:

- Setting this bit will reset errors regardless of job status.

### Remote Start / Purge

This bit is used to restart the dispense system from any “not-ready” state. If the system is already in a Dispense Ready state, this signal shall initiate a purge based on the configured purge parameters.

### Swirl X Enable

This bit is used to signal the on and off status of each swirl dispenser motor.

### Swirl Command Value

This 12-bit value indicates a swirl speed command from 0-10 volts. 0 volts (0x000) represents a speed of 6,600 rpm and 10 volts (0xFFFF) represents 24,000 rpm.

### Dispense Valve X Precharge On

These 4 bits are used to turn on precharge for each of the 4 dispense valves when the precharge mode is set to Gateway.

# Graco Standard Warranty

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

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

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

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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.

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# Graco Information

## Sealant and Adhesive Dispensing Equipment

For the latest information about Graco products, visit [www.graco.com](http://www.graco.com).

For patent information, see [www.graco.com/patents](http://www.graco.com/patents).

**TO PLACE AN ORDER**, contact your Graco distributor, go to [www.graco.com](http://www.graco.com) and select "Where to Buy" in the top blue bar, or call to find the nearest distributor.

***If calling from the US: 800-746-1334***

***If calling from outside the US: 0-1-330-966-3000***

*All written and visual data contained in this document reflects the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.*

Original instructions. This manual contains English. MM 3A4649

**Graco Headquarters:** Minneapolis

**International Offices:** Belgium, China, Japan, Korea

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