Application Note 51372
(Revision NEW, 2/2010)

Original Instructions

VPC Firmware Update
GS6, GS16, LQ6

VPC Firmware Update GS6, GS16, LQ6

Summary

The VPC is the on-board electronic driver for the GS6, GS16, and LQ6 fuel metering valves. The VPC is comprised of digital electronics and firmware that control the valve.

The VPC product line (GS6, GS16, LQ6) has been updated to an improved version of firmware. New and returned units to Woodward will be automatically updated to the new version of firmware. For users with existing units, a field update tool is also available. This document describes the firmware changes and the new VPC Service Tool.

NOTICE

For field firmware update, it is at the customer's discretion whether this firmware update is suitable for their application. New and serviced units will be automatically updated to the new version of firmware.

Firmware Changes

Position Controller
The new VPC firmware incorporates Woodward's improved controller software, utilizing robust control architecture. The improved controller expands performance over a broad range of unknown factors, including low friction conditions that can cause limit cycle.

Improved Noise Immunity Option (GS6 VALVE ONLY)
The new firmware has an improved noise immunity option for the GS6 valve. An optional settings file can be loaded after the VPC firmware update. In this settings file, excessive bandwidth above 6 Hz was eliminated to reduce over-activity of the valve. This retuned 6 Hz dynamic response matches typical turbine system implementations.

Previous installations of the valve may have additional filtering added to the turbine controller to achieve an overall 6 Hz response from the valve. This filtering, if applicable, may now be removed or turned off if the optional settings file is loaded, as the valve now accomplishes this inherently. Contact Woodward Technical Support for questions regarding valve bandwidth.

Previous versions of the valve firmware could respond at 10 Hz, and will continue to do so after the firmware update as long as the 6 Hz settings are not loaded into the valve. If the 6 Hz setting are inadvertently loaded into the valve, contact Woodward Technical Support for a file to revert back to 10 Hz.

Woodward recommends upgrading firmware, and using the same 6 Hz or 10 Hz settings, for all valves in the system at the same time. This will yield the above mentioned benefits and avoid confusion.

Service Tool

The new VPC Service Tool incorporates the latest in Woodward Service Tool features and functions. It requires the user to update to the latest version of VPC firmware mentioned above. With its customer configurable features, it eliminates the need for custom application part numbers.

The following list shows the customer-configurable features:

- Input type selection & configuration
  - CANopen, DeviceNet™ *, Analog
- Adjustable analog input/output scaling & fault ranges
- Input noise filtering options (basic & non-linear)
- Configurable position error settings
- Configurable shutdown annunciation mode
  - This feature allows the user to select whether the external shutdown is echoed back through the status relay, or the analog feedback.
- Configurable alarm & shutdown list
  - Input Voltage High
  - Input Voltage Low
  - Power-up Reset
  - Shutdown Input Active

*—DeviceNet is a trademark of ODVA (Open DeviceNet Vendor Association, Inc.)

Configuration File Management
The Service Tool allows the user to create and save configuration files for future use or multiple unit configurations.

Trending
The new VPC Service Tool also incorporates a trending feature that allows the customer to trend various parameters such as drive current and actual position.

Firmware Update Wizard
The Service Tool now incorporates a Firmware update wizard. This allows users to upgrade to the latest version of the VPC firmware from most previous versions.

User Information

Service Tool
The new VPC Service Tool is available for download here: **www.woodward.com/software**

Woodward Part Number Information
The VPC Service Tool part number is 9927-1685
The updated VPC firmware part number is 5418-3482

After installing the new VPC Service Tool, the user must follow the instructions given in the applicable valve manual to update firmware.

NOTICE **Follow all instructions in the valve manuals for the VPC firmware update.**

Valve Manuals
GS6, GS16, and LQ6 valve manuals can be downloaded from the Woodward website here: **www.woodward.com/searchpublications.aspx**

Valve Configurations
With the added customer configuration features that the new VPC firmware allows, valves can no longer be purchased with specific configurations. All new and serviced units will be returned in a standard configuration. It will be up to the user to configure the valve for operation using the new VPC Service Tool.

NOTICE

During firmware field update, certain parameters such as Input Noise Filtering will be set to default values. In this case, the Input Noise Filtering will be set to OFF. It is up to the user to configure the valve for operation. Contact Woodward Technical Support for specific configuration information of existing units.

Application File Location Information
During the firmware update process the Service Tool will ask for the Application File Location. The Service Tool installer will add the application file to the installation directory for the tool.

For Windows XP, the Application File (5418-3482.wapp) is located here:
C:\Program Files\Woodward\VPC Service Tool\

6 Hz GS6 Settings File Location Information
If you are currently using a 10 Hz GS6 valve, it may be retuned to 6 Hz dynamic response using a Woodward Settings File (.wset) that is loaded by the Service Tool Installer. The Service Tool installer will add the settings file to the installation directory for the tool.

For Windows XP, the 6 Hz GS6 Settings File is located here:
C:\Program Files\Woodward\VPC Service Tool\

The file name is “GS6DRControlModelParameters6Hz.wset”

NOTICE

Do not load the GS6 6 Hz dynamic settings on any other valve types. These dynamic settings are only tuned for the GS6 metering valves. Loading these settings on the LQ6 or GS16 valves may result in a loss of performance.

Standard Service Tool Settings

These settings are listed as a recommended starting place for configuring the valve. It is up to the user to insure that the valve is configured correctly. Contact Woodward Technical Support or OEM for questions about other settings or configurations. Recommended settings may be different from valve default settings.

CANopen Settings

CANopen Node ID:	1
CANopen Baud Rate:	500 kbps
Enable Extended PDO's (5, 6):	Enabled
Communication Timeout:	40 ms

DeviceNet Settings

DeviceNet Mac ID:	63
DeviceNet Baud Rate:	125 kbps

Analog Input Scaling (4–20 mA)

Minimum Input Value:	4.00 mA
Maximum Input Value:	20.00 mA
Minimum Position Input Value:	0.00%
Maximum Position Input Value:	100.00%
Low Limit Input Value:	2.00 mA
High Limit Input Value:	22.00 mA

Input Noise Filter Settings

Typically input noise filtering is disabled (Threshold = 0.00%). Contact Woodward for questions about input noise filtering.

Position Error Settings

Position Error Delay:	500 ms
Position Error Threshold:	1.0%

Dual Resolver Difference Diagnostics

Dual Resolver Difference Error Mode:	Use Average Value when error is detected (use Higher Value may also be used if desired)
Dual Resolver Max Error Alarm:	1.0% (0.5% recommended for DLE)
Dual Resolver Max Error Shutdown:	2.0% (1.0% recommended for DLE)

Output Scaling & Selections

4–20 mA Output Scaling

Minimum Position Value:	0.00%
Maximum Position Value:	100.00%
Minimum Position Output Value:	4.00 mA
Maximum Position Output Value:	20.00 mA

Output Shutdown Modes

Analog Output Shutdown Mode:	Do not shut down (this selection will not echo the input signal back through the analog output; the analog output will only go to shutdown state on internal valve fault).
Discrete Output Shutdown Mode:	Use Shutdown Internal (this selection will not echo the input signal back through the discrete output; the discrete output will only go to shutdown state on internal valve fault)

Alarm and Shutdown Selections

Input Voltage High:	Alarm
Input Voltage Low:	Alarm
Power-Up Reset:	Shutdown
Shutdown Input Active:	Shutdown

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Send comments to: icinfo@woodward.com

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