

HART® Field Device Specification

Fisher™ FIELDVUE™ DVC6200 Digital Valve Controller

| HART Revision | Device Type | Device Revision | Firmware Revision |
|---------------|-------------|-----------------|-------------------|
| HART 5 | 09 | 1 | 3, 4, 5, 6, 7 |
| HART 7 | 1309 | 2 | 3, 4, 5, 6 |
| | | 3 | 7 |

Contents

- Introduction 2
 - Product Overview 2
 - Purpose of this document 2
 - Abbreviations and definitions 2
 - Reference Documentation 3
- Device Identification 3
- Product Interfaces 4
 - Control Valve Interface 4
 - Host interface 4
 - Pushbutton Calibration 4
 - Internal Jumpers and Switches 5
 - Write Protection 5
- Dynamic Variables 6
- Device Variables 6
- Unit Codes 7
- Status Information 7
 - Device Status 7
- Universal Commands 8
- Common-Practice Commands 16
 - Burst Mode 16
 - Condensed Status 16
- Device-Specific Commands 22
- Performance 22
- Annex A Compatibility Checklist 23
- Annex B DVC6200 Parameters as part of a Rosemount™ 1410/1420 WirelessHART® Gateway 24



W9713

Introduction

Product Overview

The FIELDVUE DVC6200 digital valve controller is designed to control the pneumatic actuator of a process control valve. It receives a current signal from a host and uses instrument air supply to create a metered pressure output signal to the pneumatic actuator. Movement of the actuator as it positions the process control valve is measured by the DVC6200 travel sensor as its primary feedback. The name plate is located on the bottom side of the DVC6200 master module assembly and indicates the model name, individual product serial number, and any applicable third party approvals.

Purpose of this document

This specification is designed to be a technical reference for HART capable host application developers, system integrators and knowledgeable end-users. It also provides functional specifications (e.g., commands, enumerations and performance requirements) used during field device development, maintenance and testing. This document assumes the reader is familiar with HART Protocol requirements and terminology. Additional product information is available in DVC6200 product literature, available from Emerson Automation Solutions.

Abbreviations and definitions

| | |
|--------------------------------|---|
| AR | Alert Record |
| Configuration Variables | Variables which represent nonvolatile values of manufacturing-initialized data or user-specified configuration information. These variables cannot be enumerated via Command 54 and as such stand on their own with no associated units or range information. |
| Device Variable | Measured variables that are exposed to HART and can be enumerated using Command 54. Generally there are variables whose ID is in the range of 0 to 13 and are associated with units codes, status, and range values. |
| Enumeration | A pre-defined set of values or text. |
| MV | Measured Variable, a physical input to the instrument. |
| NV | Named Variable – a logical point inside the device, hard-mapped to a given MV as the source of NV data. |
| Point | A term that applies to diagnostic data packets. It is defined as a collection of periodically sampled variables captured at a single instant in time. It does not include the “Monitor” point. |
| PS1 | The PORT A output pressure which increases with increasing drive signal. |
| PS2 | The PORT B output pressure which decreases with increasing drive signal. |
| PST | Partial Stroke Test, a limited form of ramped valve diagnostic. |
| Byte | An 8-bit unsigned integer. |
| Word | A 16-bit unsigned integer. |
| Float | Refers to the IEEE 754 floating point format. |
| Packed ASCII | A special form of characters defined by HART in which 6-bit ASCII characters are packed into byte data. |
| Standard Span Format | A proprietary 16-bit integer format for numerical values used by some of this device’s Device Specific commands. |

Reference Documentation

HART Smart Communications Protocol Specification Revision 7.6; a group of documents specifying the HART Communication Protocol, physical layers, and Data Link Layers as defined by the HART Communications Foundation.

Bulletin 62.1:DVC6200 Fisher FIELDVUE DVC6200 Digital Valve Controller ([D103415X012](#))

Fisher FIELDVUE DVC6200 Series Digital Valve Controllers Quick Start Guide ([D103556X012](#))

Fisher FIELDVUE DVC6200 Digital Valve Controller (HW 2) Instruction Manual ([D103605X012](#))

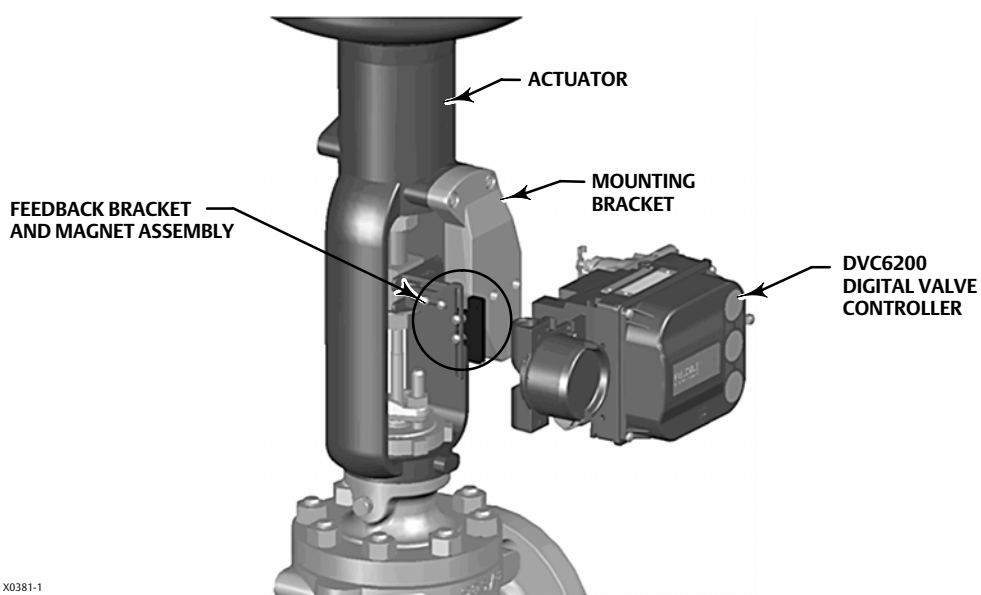
Device Identification

| | | | |
|--|------------------|-------------------------|-------------|
| Manufacturer Name | Fisher Controls | Model Name(s) | DVC6200 |
| Manufacture ID Code | 19 (13 Hex) | Device Type Code | 09 (09 Hex) |
| HART Protocol Revision | 7.6 | Device Revision | 2 & 3 |
| User Selectable HART Revision between HART 5 and HART 7 | Yes | | |
| Number of Device Variables | 13 | | |
| Physical Layers Supported | FSK | | |
| Physical Device Category | Valve Positioner | | |

Product Interfaces

Control Valve Interface

The DVC6200 digital valve controller is mechanically attached to the valve's actuator by means of a mounting bracket. The control valve's position is conveyed to the travel sensor of the DVC6200 digital valve controller by means of the feedback bracket and magnet assembly attached to the actuator's stem.



Pneumatic tubing connected to the DVC6200 brings instrument supply air to the DVC6200 and takes controlled output air from the DVC6200 to the actuator. Pressure sensors in the DVC6200 measure these pressure signals and present them as device variables

Host interface

The input to the DVC6200 can either be two-wire 4-to-20 mA current loop (in point-to-point mode) or 24 VDC (in multi-drop mode). This input is connected in the DVC6200's terminal box on two terminals marked "LOOP +" and "LOOP -". Refer to the DVC6200 Series quick start guide for connection details.

Pushbutton Calibration

A pushbutton near the wiring terminals in the terminal box provides a quick means to autocalibrate the travel of the instrument. The button must be pressed for 3 to 10 seconds. Autocalibration will move the valve through the full range of travel whether the Instrument Mode is In Service or Out of Service. However, if the Write Protection is Protected, this button will not be active. To abort, press the button again for 1 second. The calibration button is disabled by default.

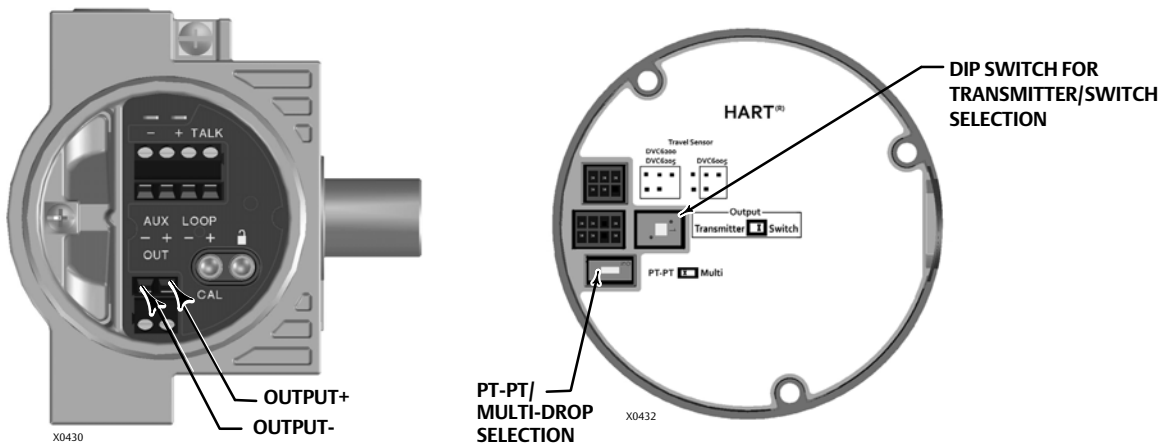
Internal Jumpers And Switches (Optional)

The input to the DVC6200 is determined by the Pt-Pt/Multi-Drop switch on the printed wiring board.

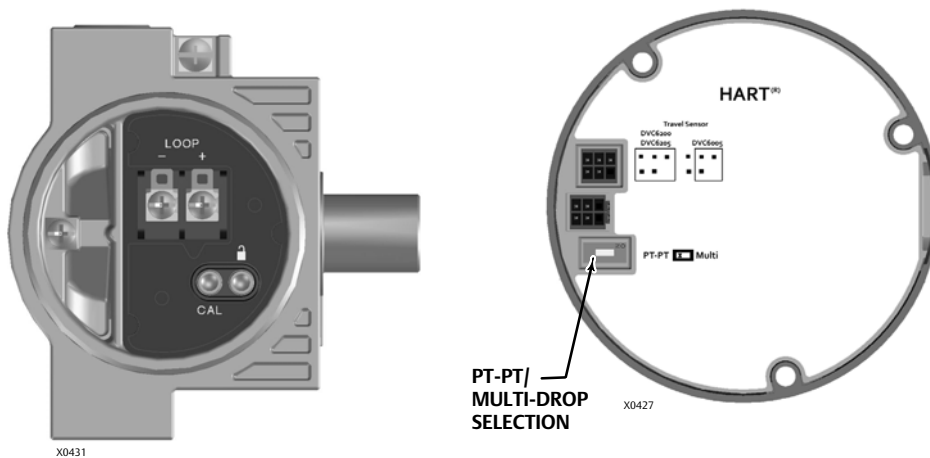
The DVC6200 also has a pair of optional “Output” terminals that can either function as a position transmitter or a discrete switch. Electrical configuration of the output circuit requires the proper setting of a DIP switch on the DVC6200’s printed wiring board. Additionally, the functional operation of the output circuit must be configured with the user interface.

Refer to the DVC6200 instruction manual for additional details on the settings of the selection switches.

WITH OPTIONAL I/O PACKAGE



WITHOUT I/O PACKAGE



Write Protection

There are two Write Protection states for the DVC6200: Not Protected or Protected. Protected prevents configuration and calibration changes to the instrument. The default setting is Not Protected. Protection is controlled under software control. Write Protection can be enabled remotely. However, to disable Write Protection to Not Protected, you must have physical access to the instrument. The procedure will require you to press a button inside the terminal box when directed by the software as a security measure.

Dynamic Variables

Four Dynamic Variables are implemented.

| | Default Meaning | Units |
|-----|-----------------|-----------------------------------|
| PV | Analog Input | mA, % |
| SV* | Travel Setpoint | % |
| TV* | Pressure | PSI, BAR, KPA, Kg/cm ² |
| FV* | Travel | % |

* User selectable

The SV, TV, and FV variables are user selectable via Command 51 to any of the following variables. Variable selections are listed below:

| Variable | Units |
|-----------------|-----------------------------------|
| Travel | % |
| Travel Setpoint | % |
| Pressure Port A | PSI, BAR, KPA, Kg/cm ² |
| Pressure Port B | PSI, BAR, KPA, Kg/cm ² |
| Pressure A – B | PSI, BAR, KPA, Kg/cm ² |
| Supply Pressure | PSI, BAR, KPA, Kg/cm ² |
| Drive Signal | % |
| Analog Input | mA, % |

Device Variables

These variables represent measurements taken by the device, are read only values, and are all in float format. These can be read with Commands 9, 33, and 54.

| Variable ID | Meaning | Units |
|-------------|---|-----------------------------------|
| 0 | Analog Input | mA, % |
| 1 | Internal Temperature | °C, °F |
| 2 | Pressure Port A | PSI, BAR, KPA, Kg/cm ² |
| 3 | Travel | % |
| 4 | Drive Signal | % |
| 5 | Pressure Port B | PSI, BAR, KPA, Kg/cm ² |
| 6 | Travel Setpoint | % |
| 7 | Differential Pressure (Port A – Port B) | PSI, BAR, KPA, Kg/cm ² |
| 8 | Supply Pressure | PSI, BAR, KPA, Kg/cm ² |
| 9 | Implied Valve Position | % |
| 10 | Primary Feedback (user selected, either Travel or Pressure) | % |
| 11 | Friction* | As defined in ValveLink software |
| 12 | Deadband* | As defined in ValveLink software |

* Only available with PD diagnostic level

Unit Codes

| Variable Units Code | Units |
|---------------------|---|
| 0 | No Units |
| 6 | Pounds per square inch, psi |
| 7 | Bar |
| 10 (\$0A) | Kilograms per square centimeter, kg/cm ² |
| 12 (\$0C) | Kilopascals, kPa |
| 32 (\$20) | Celsius, °C |
| 33 (\$21) | Fahrenheit, °F |
| 39 (\$27) | Milliamps, mA |
| 57 (\$39) | Percent, % |

Status Information

Device Status

The Field Device Status Byte is the only status byte defined in the HART protocol. The order and meaning of each of the eight bits within the byte are fixed by the protocol. This byte is one of the status bytes included with each HART response. It is not part of the Command 48 data.

| Bit | Name of Status Bit | Meaning |
|-----|-------------------------------|--|
| 7 | Field Device Malfunction | Set / cleared by the firmware based on self test results. This bit is set if the pressure, position or temperature sensors provide invalid readings. |
| 6 | Configuration Changed | Two such bits exist internally, one for each HART master. Both copies are set when any variable, HART message, tag, descriptor or date are changed from HART. Cleared by command 38, separately for each master. This bit survives loss of power. |
| 5 | Cold Start | Set by the firmware whenever a RESET sequence is executed or at initial device power up. Cleared by the first HART command. Two such bits exist internally, one for each HART master. |
| 4 | More Status | Active when any bit in command 48 is active. |
| 3 | Analog Input Fixed | Active if the Instrument Mode of the DVC6200 is in the “Out Of Service” condition or if the Control Mode of the DVC6200 is in one of the digital set point modes. |
| 2 | Analog Input Saturated | The loop current reading is beyond sensor limits. |
| 1 | Internal Sensor Out of Limits | (This bit is named “Non-Primary Variable Out Of Limits” in the HART documentation for transmitters. It has been renamed to reflect the fact that these variables are INTERNAL INPUTS to FIELDVUE products). The firmware sets this bit when any sensor (pressure, position, temperature) exceeds its operating limits. |
| 0 | Variable Out of Range | Set when any variable 0, 1, 2, 3, 5, 8 or 10, is saturated. |

Universal Commands

The DVC6200 field device implements all Universal Commands. Commands 14, 15, 17, 48 are listed below to indicate their unique responses.

Command 0: Read Unique Identifier

Command 1: Read Primary Variable

Command 2: Read Primary Variable (current) and Percent of Range

Command 3: Read Dynamic Variables and Primary Variable (current)

Command 6: Write Polling Address

* Command 7: Read Loop Configuration

* Command 8: Read Dynamic Variable Classifications

* Command 9: Read Device Variable with Status

Command 11: Read Unique Identifier Associated with Tag

Command 12: Read Message

Command 13: Read Tag, Descriptor, Date

Command 14: Read Primary Variable Transducer Information

Command 15: Read Primary Variable Output Information

Command 16: Read Final Assembly Number

Command 17: Write Message

Command 18: Write Tag, Descriptor, Date

Command 19: Write Final Assembly Number

* Command 20: Read Long Tag

* Command 21: Read Unique Identifier Associated with Long Tag

* Command 22: Write Long Tag

Command 38: Reset Configuration Changed Flag

Command 48: Read Additional Status

* Commands 7, 8, 9, 20, 21, and 22 are HART 7 only.

Command 14: Read Primary Variable Transducer Information

The transducer limits reported in this command are either 4-20 milliamps, or 0-100%, and reflect the units code most recently supplied in command 44.

Note

The Transducer Serial Number is not applicable to the DVC6200 and is set to “0”.

| | Byte | Format | Description | Returned Value |
|---------------------|-------------|--------------|---|----------------|
| Request Data bytes | None | | | |
| Response Data Bytes | 0-2 | UINT24 | Transducer Serial Number | 000000 |
| | 3 | Enum | Transducer Limits and Minimum Span Units Code | From Cmd 44 |
| | 4-7 | Float | Upper Transducer Limit | 20mA |
| | 8-11 | Float | Lower Transducer Limit | 4.0mA |
| | 12-15 | Float | Minimum Span | 1.0mA |
| | Code | Class | Description | |
| Response Codes | None | | | |

Command 15: Read Primary Variable Output Information

This command returns the upper/lower range values for the primary variable which is defined to be the loop current signal. These are the loop current values for the ends of physical travel, and are used to derive set point from the loop current. It reports the range supplied in Command 35.

For example, the lower range, for an increase to open valve, will be the current which will produce a 0% set point. However, for an increase to close valve, the lower range will be the loop current for a 100% set point.

The range values can be changed via Command 35.

The DVC6200 assumes 0% = 4mA and 100% = 20mA.

| | Byte | Format | Description | Returned Value |
|--|-------------|--------------|--|----------------|
| Request Data bytes | None | | | |
| Response Data Bytes | 0 | Enum | PV Alarm Selection Code. The Alarm Selection Code indicates the action taken by the device under error conditions. For Actuators, the action taken by the positioner is indicated. | 250 (Not Used) |
| | 1 | Enum | PV Transfer Function Code. The Transfer Function Code must return "0", Linear, if transfer functions are not supported by the device. | 250 (Not Used) |
| | 2 | Enum | AI Upper and Lower Range Values Units Code, as supplied in command 35. | From CMD 35 |
| | 3-6 | Float | AI Upper Range Value | From Cmd 35 |
| | 7-10 | Float | AI Lower Range Value | From Cmd 35 |
| | 11-14 | Float | PV Damping Value (units of seconds) | 0.0 |
| | 15 | Enum | Write Protect Code (0=Disabled, 1=Enabled) | 0 or 1 |
| | 16 | Enum | Reserved. Must be set to "250", Not Used. | 250 |
| | 17 | Uint8 | PV Analog Channel Flags | 01 |
| | Code | Class | Description | |
| Additional Device-Related Response Codes | None | | | |

Command 17: Write Message

This command allows you to write a 24 character informational message into the device.

However, per common implementation of Emerson devices, writing a specific string to the Message field will signal the device to transition operation from HART 5 to HART 7 mode and vice versa. The original message in the device will not be altered if these strings are encountered.

To switch HART versions, send one of the following strings.

To switch to HART 5 mode: send "HART5".

To switch to HART 7 mode: send "HART7".

| | Byte | Format | Description |
|--------------------------------|------|---------|--|
| Request Data bytes | 0-23 | Packed | A message string used by the master for HART Mode switching. HART 7 20 14 94 DE 08 20 82 08 20 82 08 20 82 08 20 82 08 20 82 08 20 82 08 20 HART 5 20 14 94 D6 08 20 82 08 20 82 08 20 82 08 20 82 08 20 82 08 20 82 08 20 |
| Response Data Bytes | 0-23 | Packed | Message String |
| | Code | Class | Description |
| Command-Related Response Codes | 0 | Success | No command specific errors |
| | 5 | Error | Too few data bytes |
| | 6 | Error | Device Specific command error |
| | 7 | Error | In write protect mode |
| | 16 | Error | Access Restricted |
| | 32 | Error | Busy |

Command 48: Read Additional Status

This command was significantly revised in HART 7, but can operate in backward compatible mode for HART 5 masters which do not supply data bytes in the request.

Supplying data bytes allows you to acknowledge the current status, and cause the `more_status` bit to be withdrawn until some status bit changes value.

Exactly 0 or 9 data bytes must be supplied. If supplied, the data must exactly match the current command 48 response in order for the `more_status` bit to be withdrawn.

| | Byte | Format | Description |
|-----------------------------------|------------------|--------------------|---|
| Request Data bytes | 0 or 9 | | None or nine bytes of status. |
| Response Data Bytes | 0 | Uint8 | Command 48 Response Byte 0 |
| | 1 | Uint8 | Command 48 Response Byte 1 |
| | 2 | Uint8 | Command 48 Response Byte 2 |
| | 3 | Uint8 | Command 48 Response Byte 3 |
| | 4 | Uint8 | Command 48 Response Byte 4 |
| | 5 | Uint8 | Command 48 Response Byte 5 |
| | 6 | Uint8 | HART 7 Extended Field Device Status byte |
| | 7 | Uint8 | HART 7 Operating Mode byte |
| | 8 | Uint8 | HART 7 Standardized Status 0 byte |
| | 9 ⁽¹⁾ | Uint8 | HART 7 Standardized Status 1 byte |
| | Code | Class | Description |
| Command - specific Response Codes | 5 | Too few data bytes | $0 < x < 9$, or $x > 9$ |
| | 14 | Data Mismatch | Data was supplied but does not match current status |

1. Firmware Revision 7 or higher.

Additional Device Status

Command 48 returns 10 bytes of data, with the following status information:

| Byte | Bit | Name of Status Bit | Meaning |
|------|-----|--------------------------------------|--|
| 0 | 7 | Flash Integrity Failure | Active if there is a failure associated with flash ROM (read only memory). |
| | 6 | Minor Loop Sensor Alert | Active if the pneumatic relay position reading is outside the valid range. |
| | 5 | Reference Voltage Failure | Active if there is a failure associated with the internal voltage reference. |
| | 4 | Drive Current Failure | Active when the drive current to the I/P converter is not flowing as expected. |
| | 3 | Critical NVM Failure | Active if there is a failure of non-volatile memory used for configuration data critical for instrument operation. |
| | 2 | Temperature Sensor Failure | Active when the instrument temperature sensor fails or the sensor reading is outside of the range of -60° to 100°C (-76° to 212°F). |
| | 1 | Pressure Sensor Failure | Active if any of the 3 pressure sensor readings are outside the range of -24.0% to 125.0% of the calibrated pressure for more than 60 seconds. |
| | 0 | Travel Sensor Failure | Active if the sensed travel is outside the range of -25.0% to 125.0% of calibrated travel. |
| 1 | 7 | Alert Record Not Empty Alert | Active when there are 1 or more alerts stored in the alert record. |
| | 6 | Reserved | |
| | 5 | Calibration In Progress Alert | Active when calibration is in progress. |
| | 4 | Diagnostics in Progress Alert | Active when a diagnostic test is in progress. |
| | 3 | Pressure Fallback Active Alert | Active when the instrument has detected a problem with the travel feedback and is now controlling the output like an I/P transducer. |
| | 2 | Reserved | |
| | 1 | NVM Protective Mode ⁽²⁾ | Active when excessive NVM writes are detected and further writes to NVM are rejected (to avoid NVM wear-out) |
| | 0 | Auto Cal in Progress Alert | Active when auto calibration is in progress. |
| 2 | 7 | Reserved | |
| | 6 | Non-Critical NVM Alert | Active if there is a failure of non-volatile memory used for data not critical for instrument operation. |
| | 5 | Cycle Counter High Alert | Active if the Cycle Counter exceeds the Cycle Count Alert Point. |
| | 4 | Travel Accumulator High Alert | Active if the Travel Accumulator exceeds the Travel Accumulator Alert Point. |
| | 3 | Instrument Time is Approximate Alert | Active if the instrument has been powered down since the last time the instrument clock was set. |
| | 2 | Alert Record Full Alert | Active when the alert record contains the maximum number of 20 alerts. |
| | 1 | Offline / Failed Alert | Active if a shutdown alert has put the DVC6200 in a failed state. |
| | 0 | Reserved | |

¹"Reserved" bits are always set to 0.

² Firmware Revision 3, 4, 5, & 6 only.

(continued)

Additional Device Status (continued)

| Byte | Bit | Name of Status Bit | Meaning |
|------|-----|---|---|
| 3 | 7 | Diagnostic Data Available Alert | Alert is active when diagnostic data has been collected and is being stored in the instrument. |
| | 6 | Reserved | |
| | 5 | Supply Pressure Low Alert | Active if the supply pressure falls below the supply pressure low alert point. |
| | 4 | End Point Pressure Deviation Alert | Active if the instrument is in pressure control and the pressure is not tracking the set point within the configured deviation allowance. |
| | 3 | Reserved | |
| | 2 | Supply Pressure High Alert ⁽¹⁾ | Active if the supply pressure exceeds the supply pressure high alert point. |
| | 1 | Integrator Saturated High Alert | Active if the instrument integrator is saturated at the high extreme. |
| | 0 | Integrator Saturated Low Alert | Active if the instrument integrator is saturated at the low extreme. |
| 4 | 7 | Travel Alert Lo | Active when the Travel is below the Travel Alert Lo Point. |
| | 6 | Travel Alert Lo Lo | Active when the Travel is below the Travel Alert Lo Lo Point. |
| | 5 | Travel Alert Hi | Active when the Travel exceeds the Travel Alert Hi Point. |
| | 4 | Travel Alert Hi Hi | Active when the Travel exceeds the Travel Alert Hi Hi Point. |
| | 3 | Travel Deviation Alert | Active if the difference between the Travel Target and the Travel exceeds the Travel Deviation Alert Point for more than the Travel Deviation Time. |
| | 2 | Travel Limit/Cutoff Hi Alert | Active when the Travel exceeds the Hi Limit/Cutoff Point. |
| | 1 | Travel Limit/Cutoff Lo Alert | Active when the Travel falls below the Lo Limit/Cutoff Point. |
| | 0 | Drive Signal Alert | Active when the Drive Signal exceeds target limits (<10% or >90%) for more than 20 seconds when not in Cutoff condition. |
| 5 | 7 | Reserved | |
| | 6 | Reserved | |
| | 5 | Reserved | |
| | 4 | Reserved | |
| | 3 | Reserved | |
| | 2 | Output Circuit Error | Active if the output circuit is not responding. |
| | 1 | Output Pressure Limiting ⁽¹⁾ | Active if pneumatic output A exceeds the configured limit. |
| | 0 | Reserved | |

⁽¹⁾ "Reserved" bits are always set to 0.

1. Firmware Revision 7 or higher.

(continued)

Additional Device Status (continued)

| Byte | Bit | Name of Status Bit | Meaning |
|------------------|----------------------------|--------------------------------------|---|
| 6 | 7 | Reserved | Byte 6 is the Extended Field Device Status as defined by the HART Standard. Alerts in Byte 6 are summaries of device-specific alerts from Bytes 0 through 5. Alerts indicated with "N/A" are not available from the DVC6200 instrument. Bit 1: One of the device variables in the list [0,1,2,3,5,8, and 10] is out of the range of -25% to +125% of calibrated span. |
| | 6 | Reserved | |
| | 5 | Function Check ⁽⁶⁾ | |
| | 4 | Out of Specification ⁽⁶⁾ | |
| | 3 | Failure ⁽⁶⁾ | |
| | 2 | Power Critically Low ⁽⁶⁾ | |
| | 1 | Device Variable alert ⁽¹⁾ | |
| | 0 | Maintenance Required ⁽²⁾ | |
| 7 | 7 | Reserved | Byte 7 is the Operating Mode, reserved by the HCF, and is always 0. |
| | 6 | Reserved | |
| | 5 | Reserved | |
| | 4 | Reserved | |
| | 3 | Reserved | |
| | 2 | Reserved | |
| | 1 | Reserved | |
| | 0 | Reserved | |
| 8 | 7 | Configuration Locked | Byte 8 is the Standardized Status 0 as defined by the HART Standard. Alerts in Byte 8 are summaries of device-specific alerts from Bytes 0 through 5. Alerts indicated with "N/A" are not available from the DVC6200 instrument. |
| | 6 | Electronic Defect ⁽³⁾ | |
| | 5 | Environmental Limit ⁽⁴⁾ | |
| | 4 | Voltage Error | |
| | 3 | Reserved | |
| | 2 | RAM Error | |
| | 1 | NVM Error ⁽⁵⁾ | |
| 0 | Variable Simulation Active | | |
| 9 ⁽⁶⁾ | 7 | Reserved | Byte 9 is the Standardized Status 1 as defined by the HART Standard. Bit 2: Event Overflow is not supported by the DVC6200. |
| | 6 | Reserved | |
| | 5 | Reserved | |
| | 4 | Reserved | |
| | 3 | Reserved | |
| | 2 | Event Overflow | |
| | 1 | Reserved | |
| 0 | NE107 Simulation Active | | |

"Reserved" bits are always set to 0.

1. Variable Limited = Variable 0 or 1 or 2 or 3 or 5 or 8 or 10 is outside the range of -25% to 125%

2. Maintenance Required

Firmware Revision 3, 4, 5, & 6 = Cycle Counter Alert or Travel Accumulator Alert or Travel Deviation or Supply Pressure Alert or PST Fail or Drive Signal Alert or Integrator Saturated High or Integrator Saturated Low

Firmware Revision 7 or higher = user configurable

3. Electronic Defect = Program memory CRC Error or MLFB Read Back Fail or A/D Reference Error or Drive Current Readback Error or Temperature Sensor Error or Pressure Sensor Error or Position Sensor Error or Program Flow Error or SIS Override Fail or Option Module Error

4. Environmental Limit = Temperature outside -60 to 90 degrees C

5. NVM Error = Critical NVM Checksum Error or Non-Critical NVM Checksum Error

6. Firmware Revision 7 or higher.

Common-Practice Commands

The DVC6200 field device supports the following common practice commands:

- Command 33: Read Device Variables
- Command 35: Write Primary Variable Range Values
- Command 42: Perform Master Reset
- Command 44: Write Primary Variable Units
- Command 50: Read Dynamic Variable Assignments
- Command 51: Write Dynamic Variable Assignments
- Command 52: Set Device Variable Zero
- Command 53: Set Device Variable Units
- Command 54: Read Device Variable Information
- Command 59: Write Number of Response Preambles

Burst Mode⁽¹⁾

- Command 103: Write Burst Period⁽²⁾
- Command 104: Write Burst Trigger⁽²⁾
- Command 105: Read Burst Mode Configuration⁽²⁾
- Command 107: Write Burst Device Variables
- Command 108: Write Burst Mode Command Number
- Command 109: Burst Mode Control

Condensed Status

- Command 523: Read Condensed Status Mapping Array
- Command 524: Write Condensed Status Mapping⁽³⁾
- Command 525: Reset Condensed Status Map⁽³⁾
- Command 526: Write Status Simulation Mode⁽³⁾
- Command 527: Simulate Status Bit⁽⁴⁾

1. Burst Mode is available in HART 5 mode with all Firmware Revisions. Burst Mode is available in HART 7 mode with Firmware Revision 7 or later.
2. Commands 103, 104, and 105 apply to HART 7 mode only.
3. The instrument will reject a write command with error code 6 if the power is critically low or error code 7 if write protection is enabled.
4. The instrument will reject an attempt to enter simulation mode if write protection is enabled. Simulation mode will exit automatically in 15 minutes if the instrument is in service, or remain indefinitely if the instrument is out of service. Simulation mode will exit when the instrument is placed in service.

Command 33: Read Device Variables

This command is used to read the value of up to four selected Device Variables.

The Device Variables and Variable Units Codes are listed on page 6 and 7.

| | Byte | Format | Description | Allowable choices |
|---------------------------------|-------------|-----------------------------|---|-------------------------------|
| Request Data Bytes | 0 | Variable ID | Variable assigned to slot #0 | See Device Variable on page 6 |
| | 1 | Variable ID | Variable assigned to slot #1 | See Device Variable on page 6 |
| | 2 | Variable ID | Variable assigned to slot #2 | See Device Variable on page 6 |
| | 3 | Variable ID | Variable assigned to slot #3 | See Device Variable on page 6 |
| Response Data Bytes | 0 | Variable ID | Variable assigned to slot #0 | |
| | 1 | Byte, hex | Slot #0 Variable units code | |
| | 2-5 | Float | Slot #0 Variable value | |
| | 6 | Variable ID | Variable assigned to slot #1 | |
| | 7 | Byte, hex | Slot #1 Variable units code | |
| | 8-11 | Float | Slot #1 Variable value | |
| | 12 | Variable ID | Variable assigned to slot #2 | |
| | 13 | Byte, hex | Slot #2 Variable units code | |
| | 14-17 | Float | Slot #2 Variable value | |
| | 18 | Variable ID | Variable assigned to slot #3 | |
| 19 | Byte, hex | Slot #3 Variable units code | | |
| 20-23 | Float | Slot #3 Variable value | | |
| | Code | Class | Description | |
| Command-Specific Response Codes | 0 | Success | No Command-Specific Errors | |
| | 2 | Error | Invalid selection – Invalid Variable ID | |

Command 35: Write Primary Variable Range Values

In the DVC6200, the Primary Variable is defined to be the Analog Input (loop current).

This command is used to write the ranging values reported in Command 15. It controls how the DVC6200 interprets the loop current when creating the Travel Target. The upper range must be greater than the lower range.

This command does units conversion, accepting range values in milliamps or percent. If the primary variable is not configured to use the same units as supplied in this command, the supplied ranges will be converted to PV units before being applied. Range values are validated against those reported in Command 14 to assure that they are within the allowable range and are separated by a minimum span.

If the range values are in percent, then they are assumed to be percent of 4-20 mA. For example, to range an increase to open unit from 8 mA to 16 mA, but using percent range numbers, specify lower_range = 25% and upper_range = 75%.

This ranging is done in conjunction with the zero power condition. For an Increase-to-Open valve, the lower range is the 0% setpoint level (valve plug in the valve seat), while the upper range is the 100% setpoint level. An Increase-to-Close valve is exactly opposite.

This command will be accepted when the DVC6200's Instrument Mode is In Service but will be rejected if Write Protection is in effect.

| | Byte | Format | Description | Allowable choices |
|---------------------------------|-------|---------------------|---|----------------------------|
| Request Data Bytes | 0 | UINT8 | Upper and Lower Range Values Unit Code | Unit Code 39 (mA) or 57(%) |
| | 1 - 4 | Float | Primary Variable Upper Range Value | |
| | 5 - 8 | Float | Primary Variable Lower Range Value | |
| Response Data Bytes | 0 | UINT8 | Upper and Lower Range Values Unit Code | Unit Code 39 (mA) or 57(%) |
| | 1 - 4 | Float | Primary Variable Upper Range Value | |
| | 5 - 8 | Float | Primary Variable Lower Range Value | |
| | Code | Class | Description | |
| Command-Specific Response Codes | 0 | Success | No Command-Specific Errors | |
| | 2 | Error | Invalid selection - Units code not 39 (mA) or 57(%) | |
| | 6 | Error | Insufficient power | |
| | 7 | Error | In Write Protect Mode | |
| | 9 | Error | Lower Range too high | |
| | 10 | Error | Lower Range too low | |
| | 11 | Error | Upper Range too high | |
| | 12 | Error | Upper Range too low | |
| | 13 | Error | Both ranges are invalid | |
| | 14 | Error | Span is too small | |
| | 16 | Error | Access Restricted - other master has access locked. | |
| | 29 | Error | Upper range less than lower range | |
| | 32 | Error | Busy | |
| 78 | Error | NVM Protection Mode | | |

Command 42: Perform Master Reset

This command will cause the instrument to reset by reading the nonvolatile memory (NVM) data and putting it into effect. All NVM data is written with the exception of the real-time clock, restart mode, and default implied valve position.

| | Byte | Format | Description |
|---------------------|------|--------|-------------|
| Request Data bytes | None | | |
| Response Data Bytes | None | | |

Command 44: Change Primary Variable Units Code

This command is issued to change the units of the Primary Variable, which is defined in the DVC6200 as the Analog Input (loop current). The choices for units are Percent (code 57) or Milliamps (code 39). This command will cause variable 0 (loop current), and the response to Command 14, to be reported in the new units.

In addition to changing the units code, execution of this command will also change the DVC6200's Analog Input Upper and Lower Range values to reflect the new units. (For example: When the DVC6200's Analog Input is configured as "4-20 mA" and Command 44 with request Data Byte 57 is executed, the DVC6200's Analog Input units and range values will change to "0-100%". Likewise, when the DVC6200's Analog Input is configured as "0-100%" and Command 44 with request Data Byte 39 is executed, the DVC6200's Analog Input units and range values will change to "4-20 mA").

This command will be accepted when the DVC6200's Instrument Mode is In Service, but will be rejected if Write Protection is in effect.

| | Byte | Format | Description | Allowable choices |
|---------------------------------|------|---------|---|----------------------------|
| Request Data Bytes | 0 | UINT8 | Primary Variable Units Code | Unit Code 39 (mA) or 57(%) |
| Response Data Bytes | 0 | UINT8 | Primary Variable Units Code | |
| | Code | Class | Description | |
| Command-Specific Response Codes | 0 | Success | No Command-Specific Errors | |
| | 2 | Error | Invalid selection - Units code not 39 (mA) or 57(%) | |
| | 6 | Error | Insufficient Power | |
| | 7 | Error | In Write Protect Mode | |
| | 78 | Error | NVM Protective Mode | |

Command 50: Read Dynamic Variable Assignments

This command returns a list of four device variable codes, taken from the Device Variables table on page 6, which are returned in Command 3. These Dynamic Variables are specified via Command 51.

| | Byte | Format | Description |
|---------------------------------|------|--------|--|
| Request Data Bytes | None | | |
| Response Data Bytes | 0 | UINT8 | ID of variable returned as the first variable (PV) in Command 3 |
| | 1 | UINT8 | ID of variable returned as the second variable (SV) in Command 3 |
| | 2 | UINT8 | ID of variable returned as the third variable (TV) in Command 3 |
| | 3 | UINT8 | ID of variable returned as the fourth variable (FV) in Command 3 |
| | Code | Class | Description |
| Command-Specific Response Codes | None | | |

Command 51: Write Dynamic Variable Assignments

This command assigns Device Variables to the Secondary (SV), Tertiary (TV), and Quaternary (QV) Dynamic Variables as returned in Command 3. Note that the Primary Variable (PV) is constrained to be only variable 0 (Analog Input). The variables in SV, TV, and QV can be any Device Variable 0...10 which includes Analog Input, Temperature, all pressure readings, Travel, or Travel Setpoint.

This command is accepted when in service, and is afforded write protection.

| | Byte | Format | Description |
|---------------------------------|------|---------|---|
| Request Data Bytes | 0 | UINT8 | Device variable ID assigned to PV (must be variable 0 only) |
| | 1 | UINT8 | Device variable ID assigned to SV (0-10 inclusive) |
| | 2 | UINT8 | Device variable ID assigned to TV (0-10 inclusive) |
| | 3 | UINT8 | Device variable ID assigned to QV (0-10 inclusive) |
| Response Data Bytes | 0 | UINT8 | Device variable ID assigned to PV |
| | 1 | UINT8 | Device variable ID assigned to SV |
| | 2 | UINT8 | Device variable ID assigned to TV |
| | 3 | UINT8 | Device variable ID assigned to QV |
| | Code | Class | Description |
| Command-Specific Response Codes | 0 | Success | No Command-Specific Errors |
| | 2 | Error | Invalid selection (Slot #0 is not 0) or other slots not 0...10. |
| | 6 | Error | Insufficient Power |
| | 7 | Error | In Write Protect Mode |
| | 16 | Error | Access Restricted - other master has access locked. |
| | 78 | Error | NVM Protective Mode |

Command 52: Set Device Variable Zero

This command is used to force one of the pressure inputs to read 0. To use this for pressure, apply 0 psi to the sensor. Then, send this command, specifying the affected pressure Device Variable. The offset will be adjusted to force the present value to read 0. An error will be generated, and no change applied, if the new value causes a change of more than about 3%.

Supported Variables:

- 2 = Port A Pressure
- 5 = Port B Pressure
- 8 = Supply Pressure

| | Byte | Format | Description | Allowable choices |
|---------------------------------|------|---------|---|-------------------------|
| Request Data Bytes | 0 | UINT8 | Device Variable ID | Variable IDs 2, 5, or 8 |
| Response Data Bytes | 0 | UINT8 | Device Variable ID | Variable IDs 2, 5, or 8 |
| | Code | Class | Description | |
| Command-Specific Response Codes | 0 | Success | No Command-Specific Errors | |
| | 2 | Error | Invalid selection – Unsupported variable ID | |
| | 6 | Error | Insufficient Power | |
| | 7 | Error | In Write Protect Mode | |
| | 9 | Error | Present Value is too high | |
| | 10 | Error | Present Value is too low | |
| | 78 | Error | NVM Protective Mode | |

Command 53: Set Device Variable Units

This command is used to set the units for reporting of the device variables related to the DVC6200’s temperature or pressure sensors. In addition to changing the units code, execution of this command will also change the device variable’s Upper and Lower Range values to reflect the new units. Units Codes are listed on page 7.

To change the units of PV (Analog Input), variable 0, use Command 44.

Supported variables are:

- 1 = Temperature
- 2 = Port A Pressure
- 5 = Port B Pressure
- 7 = Differential Pressure
- 8 = Supply Pressure

| | Byte | Format | Description | Allowable choices |
|---------------------------------|------|---------|---|-------------------------------|
| Request Data Bytes | 0 | UINT8 | Device Variable ID | Variable IDs 1, 2, 5, 7, or 8 |
| | 1 | UINT8 | Pressure or Temperature Units Code | |
| Response Data Bytes | 0 | UINT8 | Device Variable ID | Variable IDs 1, 2, 5, 7, or 8 |
| | 1 | UINT8 | Pressure or Temperature Units Code | |
| | Code | Class | Description | |
| Command-Specific Response Codes | 0 | Success | No Command-Specific Errors | |
| | 6 | Error | Insufficient Power | |
| | 7 | Error | In Write Protect Mode | |
| | 11 | Error | Invalid Variable ID | |
| | 12 | Error | Invalid Units Code for the Variable ID provided | |
| | 78 | Error | NVM Protective Mode | |

Command 54: Read Device Variable Information

This command is used to identify each of the Device Variables, in the range of IDs 0...10 inclusive. Responds with the Sensor Serial Number, Sensor Range Units, Sensor Ranges, Damping Value, and Minimum Span of the selected variable. The variable range values will be in the same units as the variable units.

Items marked by “*” are only supported in HART 7 mode.

| | Byte | Format | Description |
|---------------------------------|-------------|--|--|
| Request Data Bytes | 0 | Enum | Device Variable ID, this command is applicable to variables 0-10. All others will return invalid selection |
| Response Data Bytes | 0 | UINT8 | Device Variable ID |
| | 1-3 | | Device Variable Sensor Serial Number, 24-bit number (NOT USED - always zero) |
| | 4 | UINT8 | Device variable units code |
| | 5-8 | Float | Device Variable Upper Range |
| | 9-12 | Float | Device Variable Lower Range |
| | 13-16 | Float | Device Variable Damping Value, (NOT USED - always zero) |
| | 17-20 | Float | Device Variable Minimum Span (NOT USED - always zero) |
| | *21 | UINT8 | Device Variable Classification |
| | *22 | UINT8 | Family Code (NOT USED – always 250) |
| *23-26 | Time | Update period in 1/23 of a millisecond | |
| | Code | Class | Description |
| Command-Specific Response Codes | 0 | Success | No Command-Specific Errors |
| | 2 | Error | Invalid Selection |

Device-Specific Commands

The DVC6200 field device supports device-specific commands. However, these device-specific commands require use of the ValveLink software application or DD methods and cannot be utilized outside of those controlled environments.

Performance

Refer to the DVC6200 Digital Valve Controller Instruction Manual ([D103605X012](#)) and Product Bulletin 62.1:DVC6200 ([D103415X012](#)) for details on DVC6200 performance.

Annex A Compatibility Checklist

| | |
|---|--|
| Manufacturer, Model, and Revision | Fisher Controls DVC6200 Device Revision 2 & 3 |
| Device Type | Pneumatic Control Valve Positioner |
| HART Protocol Revision | 7.6 |
| User switchable between HART 5 mode and HART 7 mode? | Yes, either with configuration within DD or with a special string in the Message field. |
| Device Description Available? | Device Revision 1 is for HART 5 mode. Device Revision 2 & 3 is for HART 7 mode. |
| Number and type of process connections | None |
| Number of host connections | Input: Control signal to Loop \pm terminals Output (Optional): Transmitter or Switch from Out \pm terminals |
| Number of Dynamic Variables | 4 |
| Mappable Dynamic Variables? | Yes. SV, TV, and FV are mappable. PV is not. |
| Number of Device Variables | 13 |
| Number of Supported Common Practice Commands | 10 |
| Burst Mode? | Yes: Device Revision 1 & 3 No: Device Revision 2 |
| Capture Device Variables? | No |
| Write Protection? | Yes |

Annex B DVC6200 Parameters as part of a Rosemount 1410 / 1420 WirelessHART Gateway

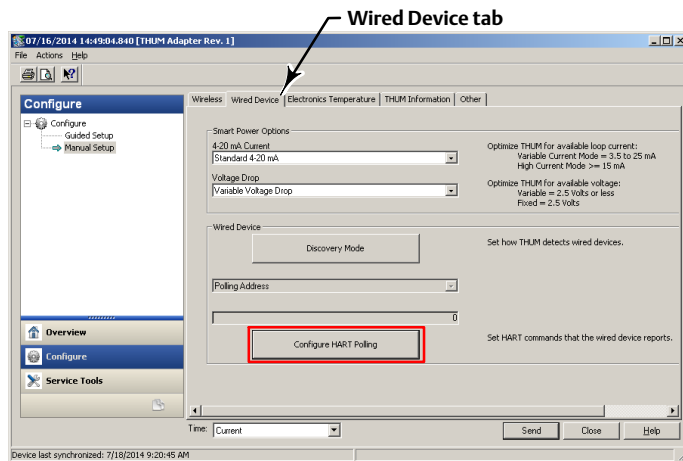
A FIELDVUE DVC6200 can join a wireless network through the addition of a Rosemount 775 THUM *WirelessHART* adapter. The wireless adapter acts both as a HART modem for communications coming to the DVC6200 from application software and as an independent master issuing commands periodically to the wired device pertaining to it's status. This independently gathered status information is relayed back to the Rosemount 1410 or 1420 Wireless Gateway and is made available to the user either through viewing the HTML interface or via mapping as "Published Data" parameters via the Gateway's MODBUS or OPC outputs.

For HART 5 devices the PV, SV, TV, and QV variables can be mapped.

For HART 7 devices up to 8 variables can be mapped.

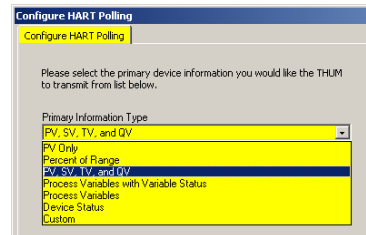
Configure the THUM as follows:

Navigate to Configure > Manual Setup
Under the *Wired Device* tab select *Configure HART Polling*

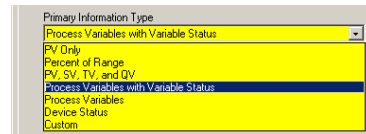


FOR PRIMARY DEVICE INFORMATION:

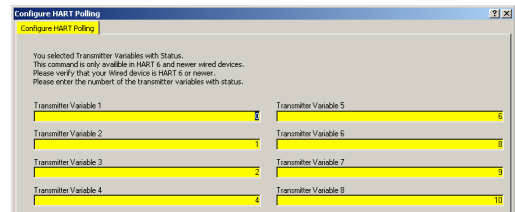
HART 5 - select PV, SV, TV, and QV



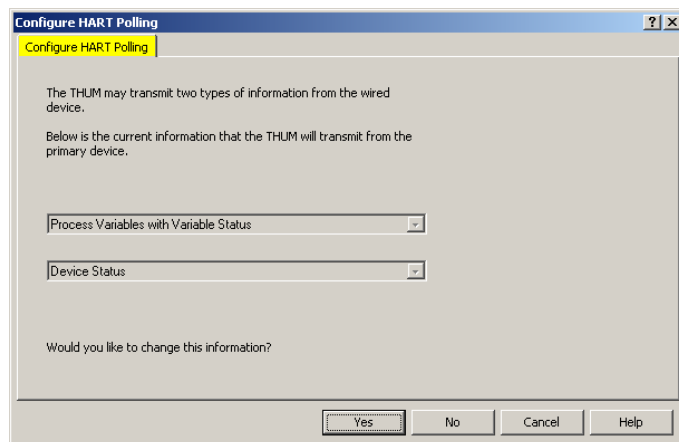
HART 7 - select Process Variables with Variable Status



Choose Variables 0, 1, 2, 4, 6, 8, 9, and 10

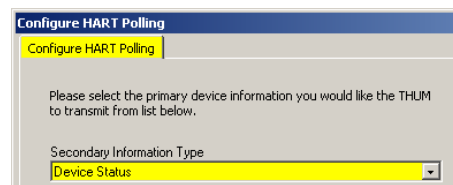


Select Yes if changes are required



FOR SECONDARY DEVICE INFORMATION:

Both HART 5 and HART 7 - select Device Status



The FIELDVUE instrument is defined on the Gateway by “Tag” (read from the device’s “Message” field).

Smart Wireless Gateway

For each Tag, the Gateway provides updated values for:

- Variables
- Additional Status
- Published Data

HART 5

| HART Variables | | | | | |
|--------------------------------|------------|--------|-------|---------------------|-------------------|
| Device name DVC6200 HW2 | | | | | |
| Variable | Assignment | Value | Units | Status | Last update |
| ANALOG_INPUT | PV | 13.602 | mA | ✔ Good, Not limited | 04/22/14 11:16:04 |
| DIFFERENTIAL_PRESSURE | TV | -0.287 | PSI | ✔ Good, Not limited | 04/22/14 11:16:04 |
| PRIMARY_FEEDBACK | QV | 60.281 | % | ✔ Good, Not limited | 04/22/14 11:16:04 |
| SV | SV | 59.938 | % | ✔ Good, Not limited | 04/22/14 11:16:04 |
| CURRENT | CURRENT | 13.602 | mA | ✔ Good, Not limited | 04/22/14 11:16:04 |

HART 7

| HART Variables | | | | | |
|--------------------------------|------------|--------|-------|---------------------|-------------------|
| Device name DVC6200 HW2 | | | | | |
| Variable | Assignment | Value | Units | Status | Last update |
| ANALOG_INPUT | PV | 19.984 | mA | ✔ Good, Not limited | 07/16/14 16:28:50 |
| TRAVEL_SETPOINT | | 59.938 | % | ✔ Good, Not limited | 07/16/14 16:28:50 |
| PRESSURE_PORT_A | TV | 14.914 | PSI | ✔ Good, Not limited | 07/16/14 16:28:50 |
| INTERNAL_TEMPERATURE | | 77.750 | DegF | ✔ Good, Not limited | 07/16/14 16:28:50 |
| DRIVE_SIGNAL | | 61.375 | % | ✔ Good, Not limited | 07/16/14 16:28:50 |
| SUPPLY_PRESSURE | | 29.781 | PSI | ✔ Good, Not limited | 07/16/14 16:28:50 |
| IMPLIED_VALVE_POSITION | SV | 59.938 | % | ✔ Good, Not limited | 07/16/14 16:28:50 |
| PRIMARY_FEEDBACK | QV | 59.656 | % | ✔ Good, Not limited | 07/16/14 16:28:50 |

Published Data, used for the Gateway’s OPC and Modbus outputs, falls into the following categories:

Field Device Identification Values:

Values that define the identity of the DVC6200. These include:

- MANUFACTURER (for “Fisher Controls” the value is “19”)
- DEVICE_TYPE (for a DVC6200 the value is “9”)
- DEVICE_REVISION
- HARDWARE_REVISION
- SOFTWARE_REVISION
- DEVICE_ID
- UNIVERSAL_REVISION (HART version)
- REQUEST_PREAMBLES
- RESPONSE_PREAMBLES

Variable information:

The Gateway receives updates concerning the DVC6200’s configured device variables. The information for any given device variable is displayed by:

1. Dynamic Variable indicator (“PV”, “SV”, etc.)
2. The Device Variable ID number assigned to that Dynamic Variable
3. By the Device Variable Name (only if the Gateway has version 4.4 firmware or later)

| | Dynamic Variable | Device Variable ID | Device Variable Name(s) |
|------------------------|------------------|--------------------|-------------------------|
| Analog Input | PV | 0* | ANALOG_INPUT |
| Internal Temperature | | 1 | INTERNAL_TEMPERATURE |
| Pressure | TV | 2* | PRESSURE_PORT_A |
| Travel | | 3 | TRAVEL |
| Drive Signal | | 4 | DRIVE_SIGNAL |
| Pressure | | 5 | PRESSURE_PORT_B |
| Travel Setpoint | | 6 | TRAVEL_SETPOINT |
| Pressure | | 7 | DIFFERENTIAL_PRESSURE |
| Pressure | | 8 | SUPPLY_PRESSURE |
| Implied Valve Position | SV | 9* | IMPLIED_VALVE_POSITION |
| Travel | QV | 10* | PRIMARY_FEEDBACK |
| Milliamp Current | | 245 | CURRENT |

*Default Value indicated

Any of these choices [Dynamic Variable, Device Variable ID, or Device Variable Name(s)] can be substituted for the “#” sign in the Variable Identifier fields below.

| Variable Identifier | Comments / Explanation |
|---------------------|--|
| # | See any of the variable identifiers in the table immediately above. |
| #_CLASS | Always “0”. |
| #_CODE | The “Device Variable ID” number in the table immediately above. |
| #_HEALTHY | A “true” or “false” indication of the health of the sensor providing this value. |
| #_STATUS | |
| #_UNITS | Decimal “Variable Units code” number from the “Units Codes” table on page 7. |

Device Status:

The eight standard status conditions (present in ANY HART field device) are all represented by a Boolean “true” or “false” state. These eight conditions, discussed on page 7, are:

- DEVICE_MALFUNCTION
- CONFIGURATION_CHANGED
- COLD_START
- MORE_STATUS_AVAILABLE
- LOOP_CURRENT_FIXED
- LOOP_CURRENT_SATURATED
- NONPRIMARY_VALUE_OUT_OF_LIMITS
- PRIMARY_VALUE_OUT_OF_LIMITS

Detailed Device Alerts:

The Alert Groupings are:

- ADDITIONAL_STATUS_0
- ADDITIONAL_STATUS_1
- ADDITIONAL_STATUS_2
- ADDITIONAL_STATUS_3
- ADDITIONAL_STATUS_4
- ADDITIONAL_STATUS_5
- ADDITIONAL_STATUS_6*
- ADDITIONAL_STATUS_7*
- ADDITIONAL_STATUS_8*

Each of these status bytes represent eight individual bits with values that range from “00” to “255”. To determine which of the eight bits are active requires converting a decimal value to its binary equivalent value. Refer to Command 48 on page 12 for details on the individual alert bits inside of each Additional Status Byte.

Note

Gateways with firmware version 4.4 define the alerts of DVC6200 hardware 2 devices. There are slight differences between the names of the alerts as defined in the Gateway in the Command 48 tables, as detailed in the following tables.

ADDITIONAL_STATUS bytes 0 - 5 are supported by HART 5.

ADDITIONAL_STATUS bytes 0 - 8 are supported by HART 7.

| ADDITIONAL_STATUS_0 | According to Command 48: | As defined in the Gateway: |
|---------------------|----------------------------|----------------------------|
| Bit 7 | Flash Integrity Failure | FLASH_INTEGRITY_FAILURE |
| Bit 6 | Minor Loop Sensor Alert | MINOR_LOOP_SENSOR_ALERT |
| Bit 5 | Reference Voltage Failure | REFERENCE_VOLTAGE_FAILURE |
| Bit 4 | Drive Current Failure | DRIVE_CURRENT_FAILURE |
| Bit 3 | Critical NVM Failure | CRITICAL_NVM_ALERT |
| Bit 2 | Temperature Sensor Failure | TEMPERATURE_SENSOR_ALERT |
| Bit 1 | Pressure Sensor Failure | PRESSURE_SENSOR_ALERT |
| Bit 0 | Travel Sensor Failure | TRAVEL_SENSOR_ALERT |

| ADDITIONAL_STATUS_1 | According to Command 48: | As defined in the Gateway: |
|---------------------|------------------------------------|--------------------------------|
| Bit 7 | Alert Record Not Empty Alert | ALERT_RECORD_NOT_EMPTY_ALERT |
| Bit 6 | Reserved | |
| Bit 5 | Calibration in Progress Alert | CALIBRATION_IN_PROGRESS_ALERT |
| Bit 4 | Diagnostics in Progress Alert | DIAGNOSTICS_IN_PROGRESS_ALERT |
| Bit 3 | Pressure Fallback Active Alert | PRESSURE_FALLBACK_ACTIVE_ALERT |
| Bit 2 | Reserved | |
| Bit 1 | NVM Protective Mode ⁽¹⁾ | NVM_PROTECTIVE_MODE |
| Bit 0 | Auto Cal in Progress Alert | AUTO_CAL_IN_PROGRESS_ALERT |

1. Firmware Revision 3, 4, 5, & 6 only.

| ADDITIONAL_STATUS_2 | According to Command 48: | As defined in the Gateway: |
|---------------------|--------------------------------------|--------------------------------------|
| Bit 7 | Reserved | |
| Bit 6 | Non-Critical NVM Alert | NON_CRITICAL_NVM_ALERT |
| Bit 5 | Cycle Counter High Alert | CYCLE_COUNTER_HIGH_ALERT |
| Bit 4 | Travel Accumulator High Alert | TRAVEL_ACCUMULATOR_HIGH_ALERT |
| Bit 3 | Instrument Time is Approximate Alert | INSTRUMENT_TIME_IS_APPROXIMATE_ALERT |
| Bit 2 | Alert Record Full Alert | ALERT_RECORD_FULL_ALERT |
| Bit 1 | Offline / Failed Alert | OFFLINE_FAILED_ALERT |
| Bit 0 | Reserved | |

| ADDITIONAL_STATUS_3 | According to Command 48: | As defined in the Gateway: |
|---------------------|---|------------------------------------|
| Bit 7 | Diagnostic Data Available Alert | DIAGNOSTIC_DATA_AVAILABLE_ALERT |
| Bit 6 | Reserved | |
| Bit 5 | Supply Pressure Low Alert | SUPPLY_PRESSURE_ALERT |
| Bit 4 | End Point Pressure Deviation Alert | END_POINT_PRESSURE_DEVIATION_ALERT |
| Bit 3 | Reserved | |
| Bit 2 | Supply Pressure High Alert ⁽¹⁾ | |
| Bit 1 | Integrator Saturated High Alert | INTEGRATOR_SATURATED_HIGH_ALERT |
| Bit 0 | Integrator Saturated Low Alert | INTEGRATOR_SATURATED_LOW_ALERT |

| ADDITIONAL_STATUS_4 | According to Command 48: | As defined in the Gateway: |
|---------------------|--------------------------------|------------------------------|
| Bit 7 | Travel Alert Lo | TRAVEL_ALERT_LO |
| Bit 6 | Travel Alert Lo Lo | TRAVEL_ALERT_LO_LO |
| Bit 5 | Travel Alert Hi | TRAVEL_ALERT_HI |
| Bit 4 | Travel Alert Hi Hi | TRAVEL_ALERT_HI_HI |
| Bit 3 | Travel Deviation Alert | TRAVEL_DEVIATION_ALERT |
| Bit 2 | Travel Limit / Cutoff Hi Alert | TRAVEL_LIMIT_CUTOFF_HI_ALERT |
| Bit 1 | Travel Limit / Cutoff Lo Alert | TRAVEL_LIMIT_CUTOFF_LO_ALERT |
| Bit 0 | Drive Signal Alert | DRIVE_SIGNAL_ALERT |

| ADDITIONAL_STATUS_5 | According to Command 48: | As defined in the Gateway: |
|---------------------|---|--------------------------------------|
| Bit 7 | Reserved | |
| Bit 6 | Reserved | |
| Bit 5 | Reserved | |
| Bit 4 | Reserved | |
| Bit 3 | Reserved | |
| Bit 2 | Output Circuit Error | OUTPUT_CIRCUIT_COMMUNICATION_FAILURE |
| Bit 1 | Output Pressure Limiting ⁽¹⁾ | |
| Bit 0 | Reserved | |

1. Firmware Revision 7 or higher.

| * ADDITIONAL_STATUS_6 | According to Command 48: | As defined in the Gateway: |
|-----------------------|-------------------------------------|----------------------------|
| Bit 7 | Reserved | |
| Bit 6 | Reserved | |
| Bit 5 | Function Check ⁽¹⁾ | |
| Bit 4 | Out of Specification ⁽¹⁾ | |
| Bit 3 | Failure ⁽¹⁾ | |
| Bit 2 | Power Critically Low ⁽¹⁾ | |
| Bit 1 | Device Variable Alert | DEVICE_VARIABLE_ALERT |
| Bit 0 | Maintenance Required | MAINTENANCE_REQUIRED |

| * ADDITIONAL_STATUS_7 | According to Command 48: | As defined in the Gateway: |
|-----------------------|--------------------------|----------------------------|
| Bit 7 | Reserved | |
| Bit 6 | Reserved | |
| Bit 5 | Reserved | |
| Bit 4 | Reserved | |
| Bit 3 | Reserved | |
| Bit 2 | Reserved | |
| Bit 1 | Reserved | |
| Bit 0 | Reserved | |

| * ADDITIONAL_STATUS_8 | According to Command 48: | As defined in the Gateway: |
|-----------------------|----------------------------|---------------------------------------|
| Bit 7 | Configuration Locked | DEVICE_CONFIGURATION_LOCKED |
| Bit 6 | Electronic Defect | ELECTRONIC_DEFECT |
| Bit 5 | Environmental Limit | ENVIRONMENTAL_CONDITIONS_OUT_OF_RANGE |
| Bit 4 | Voltage Error | POWER_SUPPLY_CONDITIONS_OUT_OF_RANGE |
| Bit 3 | Reserved | WATCHDOG_RESET_EXECUTED |
| Bit 2 | RAM Error | VOLITILE_MEMORY_DEFECT |
| Bit 1 | NVM Error | NONVOLITILE_MEMORY_DEFECT |
| Bit 0 | Variable Simulation Active | DEVICE_VARIABLE_SIMULATION_ACTIVE |

* ADDITIONAL_STATUS bytes 6 - 8 are supported by HART 7 mode only.

1. Firmware Revision 7 or higher.



Certificate of Registration FieldComm Group Verified

| | |
|---------------------------------|--|
| Fisher Controls Manufacturer | DVC6200 Product Name |
| 0013 Manufacturer ID (Hex) | 1309 Expanded Device Type (Hex) |
| 7 HART Protocol Revision | 03 Device Revision (Hex) |
| 10 Hardware Revision (Hex) | 07 Software Revision (Hex) |
| 09/25/2017 Test Date | FieldComm Group Verification Method |

The above product has successfully completed the validation process and meets the requirements to be "HART REGISTERED".

"HART REGISTERED" products conform to GB/T 29910.1-6-2013 and IEC 61158 standards.

Registration Number: L2-06-1000-694 Registration Issue Date: November 2, 2017 Approval: T. J. Mastus



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