

Using OPC™ for Accessing Fisher™ FIELDVUE™ Digital Valve Controller Data

Introduction

Object Linking and Embedding (OLE) for Process Control (OPC) is a technology designed to bridge Windows®-based applications and process control hardware. It is an open standard communications protocol that permits a consistent method of accessing data from digital field devices. This method remains the same regardless of the type and source of data.

This document provides guidance for data gathering via OPC of parameters from FIELDVUE digital valve controllers.

Note

A third party OPC client is required to request and read the data from the OPC Server.

Emerson OPC Servers

An OPC Server is a licensable feature with both AMS Device Manager and the 1410 and 1420 *WirelessHART™* Gateways. The OPC Server allows an OPC client application to access HART (and with AMS Device Manager, FOUNDATION™ Fieldbus) device data in near real-time. Live device information through OPC is not supported from PROFIBUS devices.

References

- HART Field Device Specification for DVC6200 Digital Valve Controller ([D103639X012](#))
- HART Field Device Specification for DVC6000 HW2 Digital Valve Controller ([D103782X012](#))
- HART Field Device Specification for DVC6000 and DVC6200 HW1 Digital Valve Controller ([D103649X012](#))
- HART Field Device Specification for DVC2000 Digital Valve Controller ([D103783X012](#))
- HART Field Device Specification for DVC5000 Digital Valve Controller (Retired) ([D103266X012](#))

Rosemount™ 14x0 WirelessHART Gateway / THUM WirelessHART Adapter

With a *WirelessHART* Gateway, the information available via OPC from FIELDVUE digital valve controllers is obtained through the two HART® messages configured in the THUM *WirelessHART* adapter used for routine polling of the field device. The OPC Server can only serve up parameter data and cannot provide detailed device alert information, so the best choices for the two THUM commands to the FIELDVUE instrument should be to gather as many device parameters as possible. See Appendix A for proper configuration of the THUM *WirelessHART* adapter for optimum OPC data gathering from FIELDVUE digital valve controllers. See Appendix B for information on the configuration of OPC parameters in the Rosemount *WirelessHART* Gateway.

Refer to table 1 for information available via the Gateway OPC Server.

Table 1. Information Available Via the Gateway OPC Server

Digital Valve Controller	ID by Variable Number	ID by Parameter Label	ID by Dynamic Variable	Possible Unit Codes
ALL	0 0_UNITS	ANALOG_INPUT ANALOG_INPUT_UNITS	PV PV_UNITS	39, 57
ALL	2 2_UNITS	PRESSURE_PORT_A PRESSURE_PORT_A_UNITS	TV TV_UNITS	6, 7, 10, 12
ALL	4 4_UNITS	DRIVE_SIGNAL DRIVE_SIGNAL_UNITS		57
ALL	5 5_UNITS	PRESSURE_PORT_B PRESSURE_PORT_B_UNITS		6, 7, 10, 12
ALL	6 6_UNITS	TRAVEL_SETPOINT TRAVEL_SETPOINT_UNITS		57
ALL	8 8_UNITS	SUPPLY_PRESSURE SUPPLY_PRESSURE_UNITS		6, 7, 10, 12
ALL	9 9_UNITS	IMPLIED_VALVE_POSITION IMPLIED_VALVE_POSITION_UNITS	SV SV_UNITS	57
ALL	10 10_UNITS	PRIMARY_FEEDBACK PRIMARY_FEEDBACK_UNITS	QV QV_UNITS	57
DVC6200 HW2 only	1 1_UNITS	INTERNAL_TEMPERATURE INTERNAL_TEMPERATURE_UNITS		32, 33
All except DVC6200 HW2	211 211_UNITS	TEMPERATURE TEMPERATURE_UNITS		32, 33
ALL	245 245_UNITS	CURRENT CURRENT_UNITS		39
ALL		DEVICE_MALFUNCTION MORE_STATUS_AVAILABLE		true / false true / false

Units Code	Meaning
6	psi
7	Bar
10	kg/cm²
12	kPa
32	°C
33	°F
39	mA
57	%

AMS Device Manager OPC Server

The information available via the AMS Device Manager OPC Server, shown in table 2, is obtained from FIELDVUE digital valve controllers via the definitions in the DD file and include information from both device variables, proprietary variables, and (for the DVC6200 HW2 device only) Spec Sheet information as configured in the instrument (see table 3).

Table 2. Information Available Via AMS Device Manager OPC Server

Digital Valve Controller	ID by Variable Number	ID by Parameter Label	ID by Dynamic Variable	Possible Unit Codes
ALL	0 0_UNITS	ANALOG_INPUT ANALOG_INPUT_UNITS	PV PV_UNITS	39, 57
ALL	2 2_UNITS	PRESSURE_PORT_A PRESSURE_PORT_A_UNITS	TV TV_UNITS	6, 7, 10, 12
ALL	4 4_UNITS	DRIVE_SIGNAL DRIVE_SIGNAL_UNITS		57
ALL	5 5_UNITS	PRESSURE_PORT_B PRESSURE_PORT_B_UNITS		6, 7, 10, 12
ALL	6 6_UNITS	TRAVEL_SETPOINT TRAVEL_SETPOINT_UNITS		57
ALL	8 8_UNITS	SUPPLY_PRESSURE SUPPLY_PRESSURE_UNITS		6, 7, 10, 12
ALL	9 9_UNITS	IMPLIED_VALVE_POSITION IMPLIED_VALVE_POSITION_UNITS	SV SV_UNITS	57
ALL	10 10_UNITS	PRIMARY_FEEDBACK PRIMARY_FEEDBACK_UNITS	QV QV_UNITS	57
DVC6200 HW2 only	1 1_UNITS	INTERNAL_TEMPERATURE INTERNAL_TEMPERATURE_UNITS		32, 33
All except DVC6200 HW2	211 211_UNITS	TEMPERATURE TEMPERATURE_UNITS		32, 33
ALL	245 245_UNITS	CURRENT CURRENT_UNITS		39
ALL ALL ALL ALL ALL ALL ALL ALL DVC6200 HW2 DVC6200 HW2 DVC6000 / DVC6200 DVC6000 / DVC6200 ALL	DEVICE_STATUS CYCLE_COUNTER TVL_ACCUM DEVICE_SPECIFIC_STATUS_0 ("XMTR_DEVICE_STATUS" for older Digital Valve Controllers) DEVICE_SPECIFIC_STATUS_1 DEVICE_SPECIFIC_STATUS_2 DEVICE_SPECIFIC_STATUS_3 DEVICE_SPECIFIC_STATUS_4 DEVICE_SPECIFIC_STATUS_5 MAX_RECORDED_TEMP MIN_RECORDED_TEMP NUMBER_OF_POWER_UPS RUN_TIME (number of 18 hour increments) TAG LONG_TAG INST_SERIAL_NUM VALVE_SERIAL_NUM ZERO_POWER_CONDITION			true / false (value) (value) (string) (string) (string) (string) (string) (string) (value) (value) (value) (value) (string) (string) (string) open / close

Units Code	Meaning
6	psi
7	Bar
10	kg/cm ²
12	kPa
32	°C
33	°F
39	mA
57	%

Table 3. DVC6200 Spec Sheet Information Available Via AMS Device Manager OPC Server

Digital Valve Controller	Spec Sheet Information
DVC6200 HW2	spec_actuator_air spec_actuator_effective_area spec_actuator_lever_arm_length spec_actuator_lower_bench_set spec_actuator_manufacturer spec_actuator_model spec_actuator_nominal_supply spec_actuator_size spec_actuator_spring_rate spec_actuator_upper_bench_set spec_area_units spec_breakout_torque spec_dynamic_torque spec_length_units spec_lever_style spec_LSVC spec_LSVO spec_position_xmtr spec_quick_release spec_sheet_version spec_solenoid_valve spec_spring_rate_units spec_torque_units spec_travel_units spec_trim_flow_direction spec_trim_flow_tendsto spec_trim_leak_class spec_trim_port_diameter spec_trim_port_type spec_trim_push_downto spec_trim_seat_type spec_trim_unbal_area spec_valve_actual_travel spec_valve_class spec_valve_inlet_pressure spec_valve_manufacturer spec_valve_models spec_valve_outlet_pressure spec_valve_packing_type spec_valve_rated_travel spec_valve_size spec_valve_stem_diameter

Appendix A

Configuration of a THUM Wireless Adapter for Optimum OPC Data Coverage

1. Scope

This procedure is the site infrastructure guide for setting up a *WirelessHART* network of FIELDVUE digital valve controllers for use as a read-only data gathering for OPC data in table 1 provided by Rosemount Smart Wireless Gateway.

2. Emerson Wireless HART Equipment

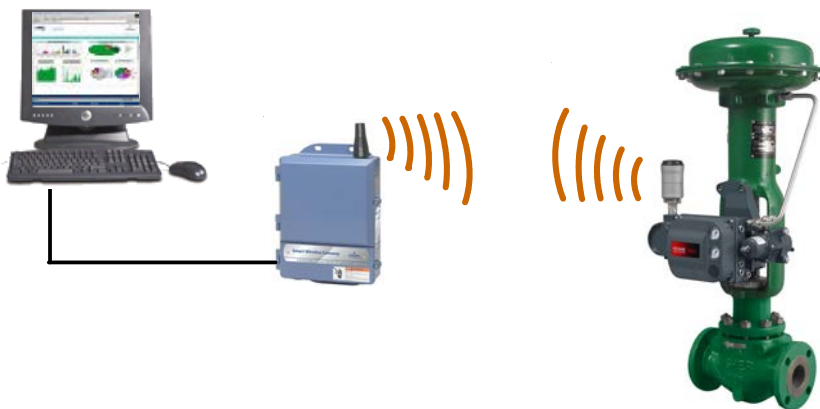
The following Emerson *WirelessHART* equipment is required to provide wireless HART communication connectivity:

- A *WirelessHART* 775 THUM Adapter installed on every FIELDVUE digital valve controller.
- One or more Smart *WirelessHART* Gateway 1410 (25 device tags) or 1420 (100 device tags) with the Dual Ethernet connect (Option 2) and the D2, D4, or D6 Data Protocol option that includes support of the OPC data protocol.
- Proper physical placement and sufficient number of wireless devices to support a robust field *WirelessHART* mesh network.

Note

AMS Device Manager software and ValveLink SNAP-ON for AMS are NOT required for the OPC data transfer from the Gateway. AMS Device Manager or another DD-based handheld configuration tool is required to configure the THUM *WirelessHART* adapter as described below along with the necessary network credentials to join the *WirelessHART* network.

Figure 1. Data Transfer



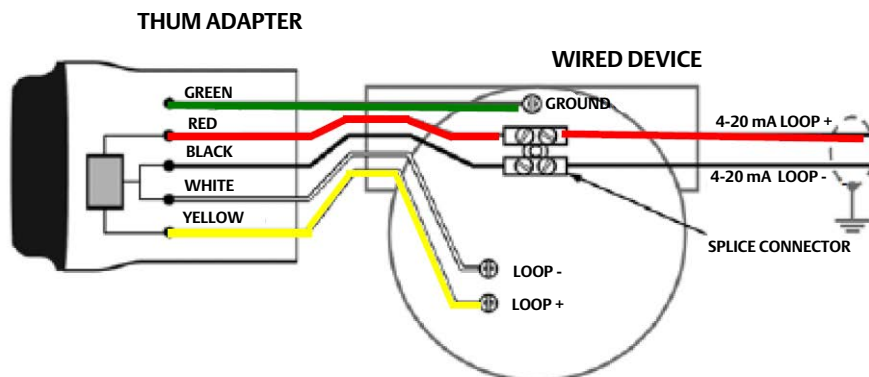
3. Wireless Network Configuration

- Wire the Wireless 775 THUM Adapter to the FIELDVUE instrument as shown in figure 2.
 - THUM adapter's Yellow wire attached to digital valve controller's "LOOP +" terminal.
 - THUM adapter's White wire attached to digital valve controller's "LOOP -" terminal.
 - THUM adapter's Green wire attached to the Ground terminal on digital valve controller.
 - THUM adapter's Red wire attached to 4-20 mA "Loop +" source.
 - THUM adapter's Black wire attached to 4-20 mA "Loop -" source.

Note

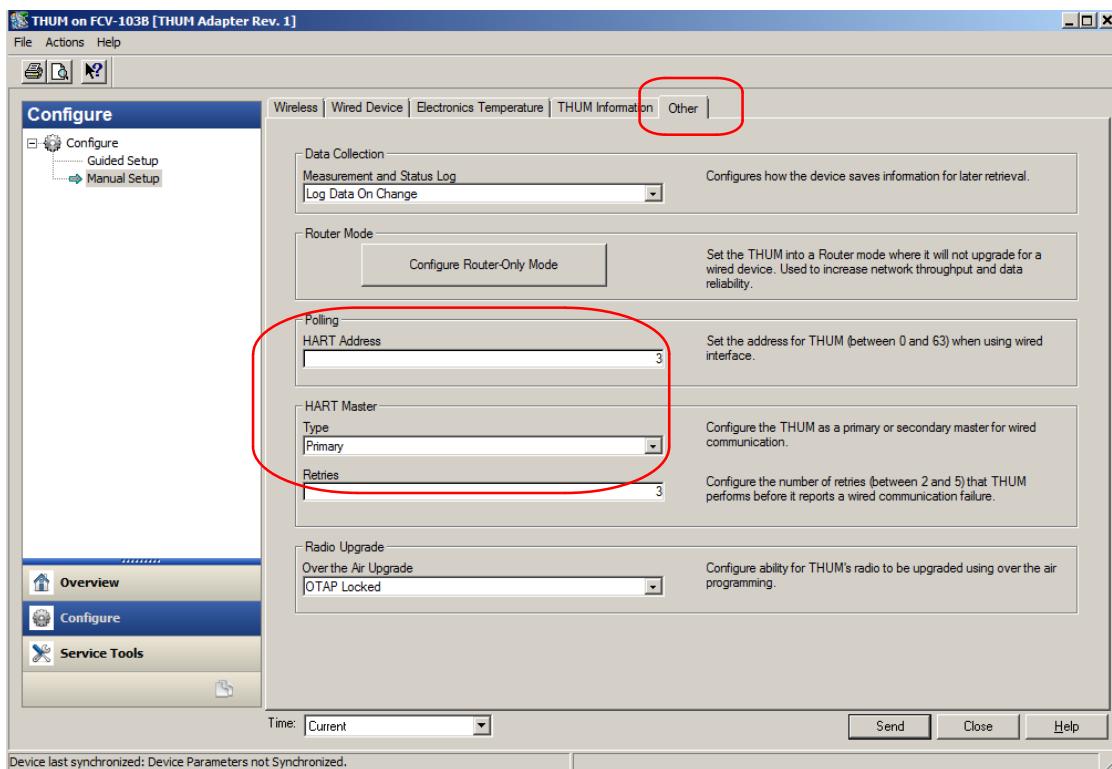
A 250-ohm resistor is NOT used when wiring a 775 THUM adapter to a FIELDVUE digital valve controller.

Figure 2. THUM Adapter Wiring

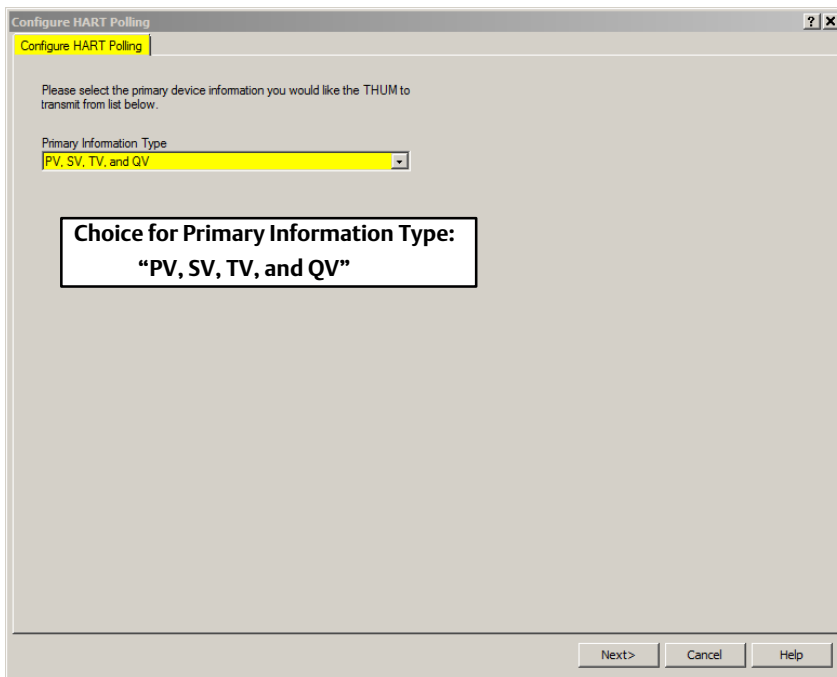
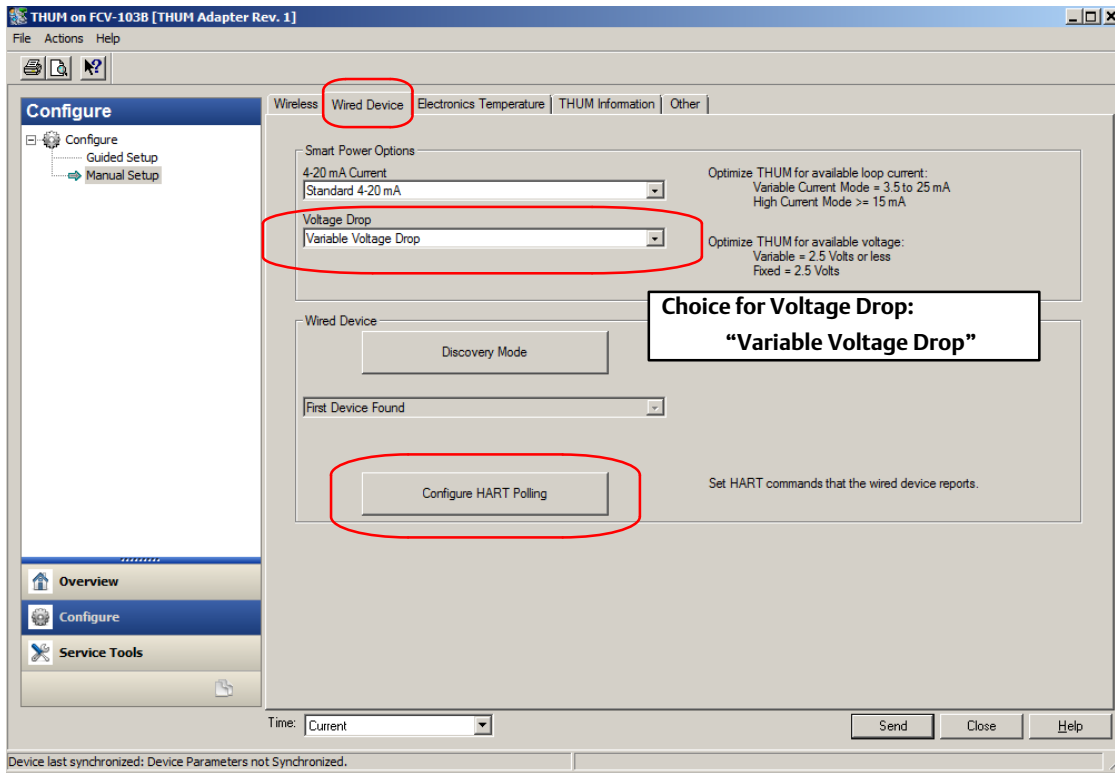


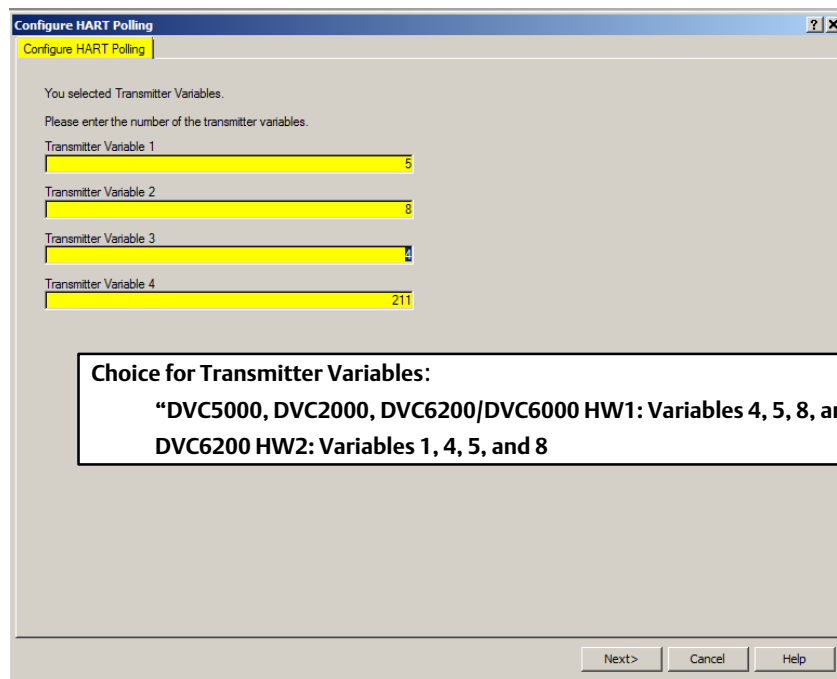
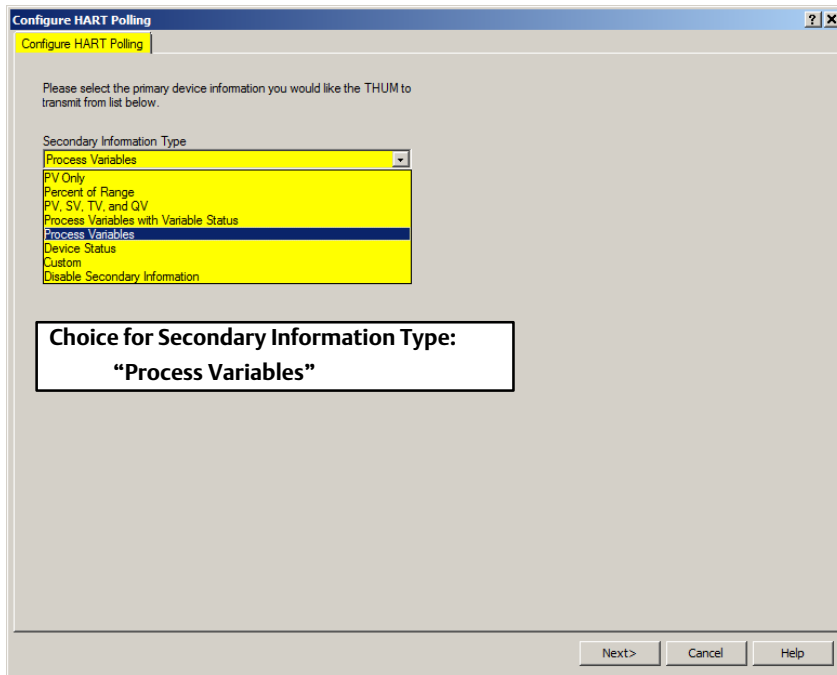
4. Configuration of Wireless 775 THUM Adapter

- Using AMS Device Manager, configure the Wireless 775 THUM Adapter as follows:
 - OTHER Tab:
 - 775 THUM’s HART address to desired address “3” through “63”
 - 775 THUM’s HART Master Type:
 - “Primary” if control system is non-HART communicating
 - “Secondary” if control system is HART-communicating

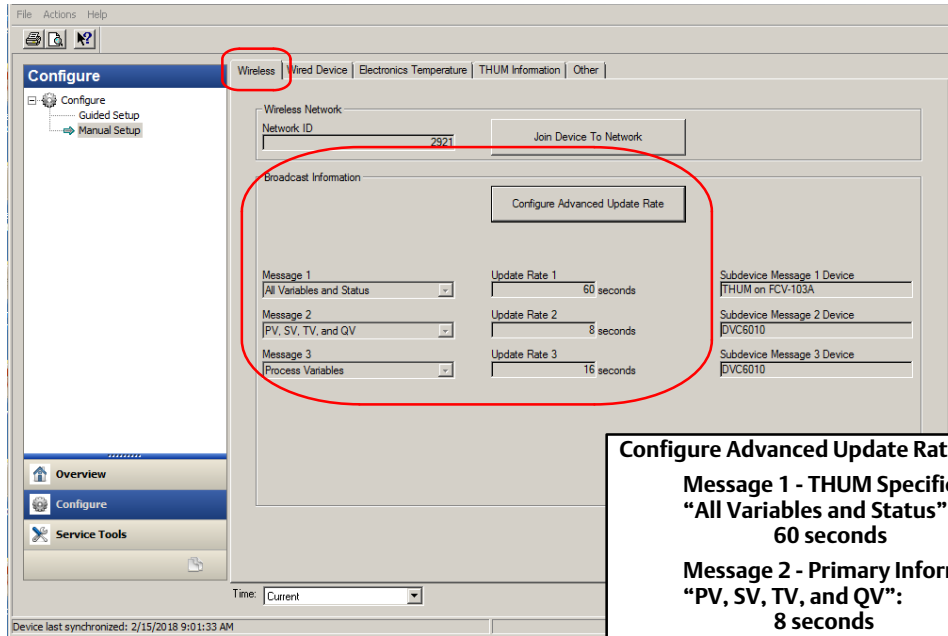


o WIRED DEVICE Tab:





○ WIRELESS Tab:



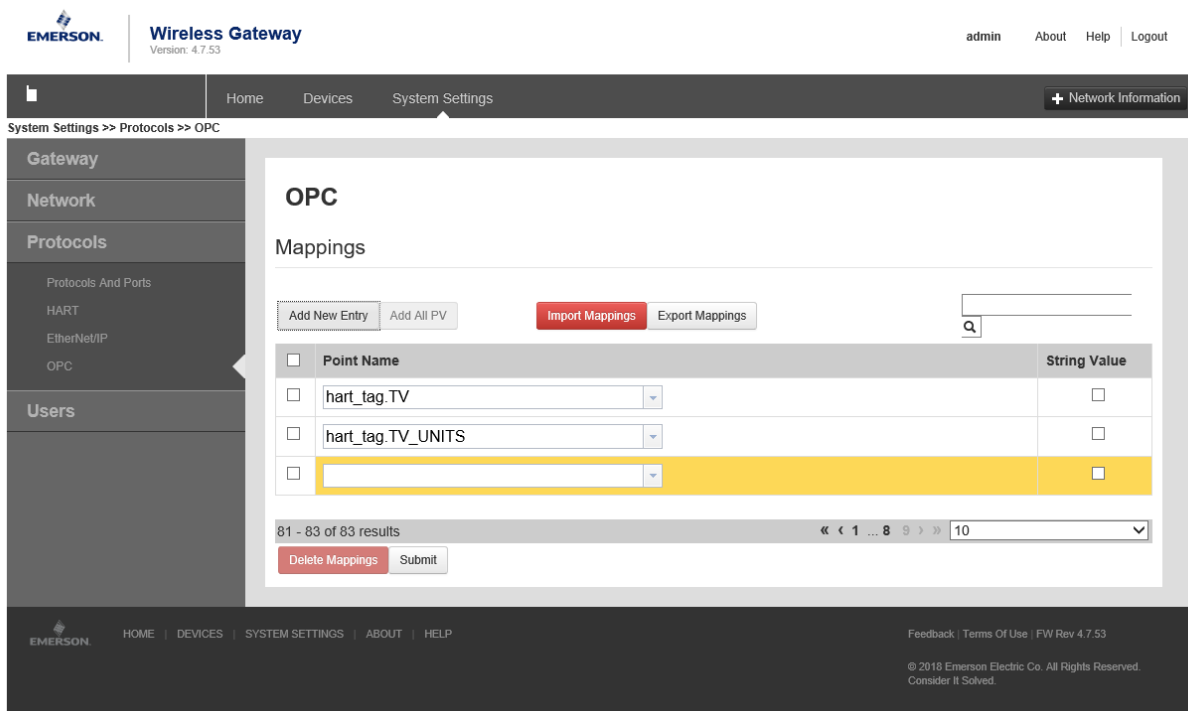
Configure Advanced Update Rate:
Message 1 - THUM Specific Information:
“All Variables and Status”:
60 seconds
Message 2 - Primary Information:
“PV, SV, TV, and QV”:
8 seconds
Message 3 - Secondary Information:
“Process Variables”:
16 seconds

Appendix B

Configuration of OPC Parameters in the Rosemount *WirelessHART* Gateway

1. Scope

This procedure is the site infrastructure guide for setting up a OPC Mapping on a Rosemount Smart 1410 or 1420 Wireless Gateway.



2. Procedure for Mapping New OPC Parameters

1. Select “Add New Entry”.
2. In the blank pop-up box, enter the parameter you wish mapped in the format “*hart_tag.parameter*”. See the list below for available parameters.
3. Repeat steps 1 & 2 for all desired parameters.
4. Select “Submit” to accept the new mappings.

Available Parameter Labels

Parameter Label	Parameter Label
hart_tag.0	hart_tag.DEVICE_TYPE
hart_tag.0_UNITS	hart_tag.DRIVE_SIGNAL
hart_tag.1	hart_tag.DRIVE_SIGNAL_UNITS
hart_tag.10	hart_tag.IMPLIED_VALVE_POSITION
hart_tag.10_UNITS	hart_tag.IMPLIED_VALVE_POSITION_UNITS
hart_tag.1_UNITS	hart_tag.INTERNAL_TEMPERATURE
hart_tag.2	hart_tag.INTERNAL_TEMPERATURE_UNITS
hart_tag.245	hart_tag.MORE_STATUS_AVAILABLE
hart_tag.245_UNITS	hart_tag.PRESSURE_PORT_A
hart_tag.2_UNITS	hart_tag.PRESSURE_PORT_A_UNITS
hart_tag.4	hart_tag.PRESSURE_PORT_B
hart_tag.4_UNITS	hart_tag.PRESSURE_PORT_B_UNITS
hart_tag.5	hart_tag.PRIMARY_FEEDBACK
hart_tag.5_UNITS	hart_tag.PRIMARY_FEEDBACK_UNITS
hart_tag.6	hart_tag.PRIMARY_FEEDBACK
hart_tag.6_UNITS	hart_tag.PRIMARY_FEEDBACK_UNITS
hart_tag.8	hart_tag.PV
hart_tag.8_UNITS	hart_tag.QV
hart_tag.9	hart_tag.QV_UNITS
hart_tag.9_UNITS	hart_tag.STATUS_CODE
hart_tag.ANALOG_INPUT	hart_tag.SUPPLY_PRESSURE
hart_tag.ANALOG_INPUT_UNITS	hart_tag.SUPPLY_PRESSURE_UNITS
hart_tag.CURRENT	hart_tag.SV
hart_tag.CURRENT_UNITS	hart_tag.SV_UNITS
hart_tag.DEVICE_MALFUNCTION	hart_tag.TRAVEL_SETPOINT
hart_tag.CURRENT_UNITS	hart_tag.TRAVEL_SETPOINT_UNITS
hart_tag.DEVICE_MALFUNCTION	hart_tag.TV
	hart_tag.TV_UNITS

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