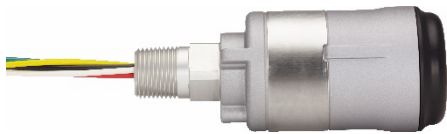


# Best Practices for use of Emerson 775 THUM™ *WirelessHART*® Adapters with FIELDVUE™ Digital Valve Controllers

The Emerson Wireless 775 THUM Adapter is used to enable field devices communicating via the version 5, 6, or 7 wired HART® protocol to participate as members of a *WirelessHART* network. The THUM adapter communicates both via a HART modem to the wired field device as well as via the *WirelessHART* radio to the *WirelessHART* network.



The THUM adapter is an external attachment to a field device and is not an integral component of it. Because of this unique capability among *WirelessHART* devices and because of HART communication requirements of ValveLink™ diagnostics with FIELDVUE digital valve controllers, there are “Best Practices” options related to integrating a THUM adapter with FIELDVUE instruments that may differ from, or are in addition to, the traditional best practices for other *WirelessHART* devices and networks.

## Reference Documents

- DVC6200 HW2 FW7 Instruction Manual [D103605X012](#)
- DVC2000 Instruction Manual [D103176X012](#)
- DVC6200 SIS Instruction Manual [D103557X012](#)
- DVC6000 HW2 Instruction Manual [D103785X012](#)
- DVC6000 Instruction Manual (Supported) [D102794X012](#)
- DVC5000 Instruction Manual (Retired) [D200442X012](#)
- Using OPC™ for Accessing Fisher FIELDVUE Digital Valve Controller Data [D104429X012](#)
- Emerson Wireless THUM Adapter Instruction Manual [00809-0100-4075](#)
- Flyer: Emerson Wireless 775 THUM Adapter Unlock the Value in Your Existing Field Devices [00807-0200-4075](#)
- White Paper: [Smart Wireless THUM Adapter Effect on the 4-20 mA Loop](#)

## Required Loop Power for THUM Adapters with FIELDVUE Instruments

In a patented design, rather than relying on battery power, a THUM adapter scavenges the electrical power it needs for operation from the loop to which it is attached.

The configuration choice for the THUM adapter’s Voltage Drop parameter when used with FIELDVUE digital Valve controllers should be set to “Variable Voltage Drop”.

**Note**

The THUM has no effect on loop current. Loop current flows through the THUM’s series loop connection (Red-Yellow Wire) thus generating a 2 V drop. No loop current is returned through the parallel (Black-White connection). The Black/White pair are capacitively coupled to the loop for wired HART communication purposes. Best practice is to recalibrate the Analog Input reading of the FIELDVUE instrument while the THUM adapter is in circuit so that the FIELDVUE Instrument reads the control current at the same level as the host commands.

The loop must be capable of supplying the power for both the THUM Adapter and the FIELDVUE Instrument sub-device with which it is communicating.

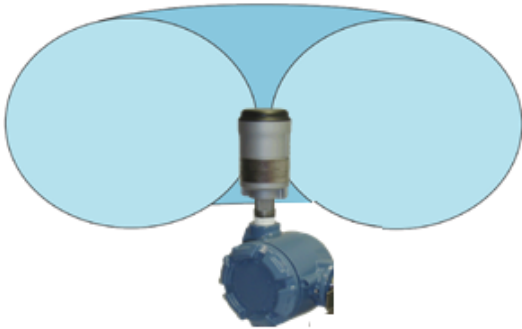
FIELDVUE Instrument Type	Minimum required loop voltage to ensure HART Communications (per Digital Valve Controller Instruction Manuals)	Minimum required voltage for powering both the FIELDVUE Instrument and THUM Adapter
DVC6200 device type 1309 DVC6200 SIS device type 130A DVC6000 HW2 device type 130B	10.0 VDC	12.0 VDC
DVC2000 device type 1305	9.0 VDC	11.0 VDC
DVC6000 device type 1303	11.0 VDC	13.0 VDC
DVC5000 device type 1302	12.0 VDC	14.0 VDC

**Note**

The minimum control current guaranteed without microprocessor restart for all FIELDVUE instruments is 3.5 mA. FIELDVUE instruments should not be powered below this minimum control current level. The trigger point for the Low Travel Cutoff zero pressure saturation (0.5% / 4.08 mA) is higher than the minimum control current value so there is no reason to power the FIELDVUE instrument any lower than 3.5 mA. Doing so may risk processor restart and the loss of FIELDVUE and THUM communications.

## Installation Orientation

For optimum radio signal strength, the THUM Adapter should always be mounted in the vertical “THUM’s Up” orientation with its black cap of its antenna at the highest position. As much as possible the THUM adapter should be mounted away from metal components and structures between it and the rest of the *WirelessHART* antennas.

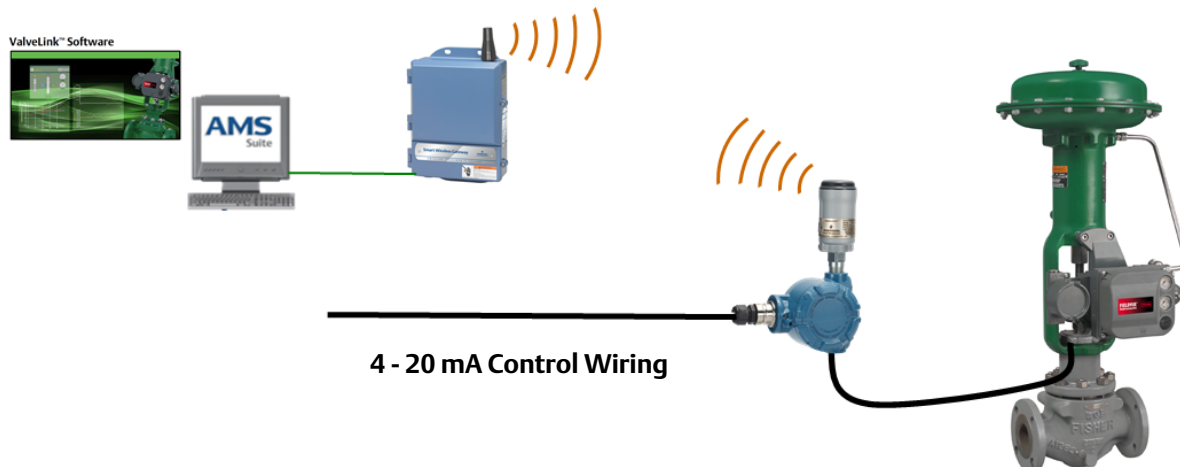


Refer to the Emerson Wireless THUM Adapter Instruction Manual, [00809-0100-4075](https://www.emerson.com/documents/products-services/wireless-thum-adapter-instruction-manual-en-us-00809-0100-4075), for more detailed specifications for the THUM Adapter.

## Installation Location

A field device communicates with a THUM Adapter as if it were an externally attached wired HART modem so the rules of the Frequency Shift Keying (FSK) wired HART physical layer protocol apply to them. HART communication signals exist everywhere along the control wiring to the field device so the THUM Adapter can be physically mounted anywhere along the control wiring. The THUM Adapter is not limited to only local mounted in the terminal box of the field device.

The recommended practice is to remote mount the THUM Adapter along the control wiring at an optimum physical location near the Gateway to minimize the number of “hops” for wireless communication back to the Gateway. The goal is to achieve either a “zero hop” direct line of communication or a “single hop” connection where wireless messages are routed only through one intermediate repeater node. The *WirelessHART* “zero hop” or “single hop” orientation is required to efficiently relay the numerous “request / response” HART messages involved with any ValveLink off-line or on-line diagnostic test routine without excessive time delay or reduced communication reliability. Any *WirelessHART* network with more than two hops through intermediate repeater nodes between the THUM / FIELDVUE instrument and the Gateway could result in test execution times five to ten times longer to complete. This must be avoided by limiting the number of message communication hops required.



## Configuration

Like any other *WirelessHART* device, the THUM adapter periodically replies to the Gateway via wireless burst messaging the status of itself and the wired sub-device it is assigned to. The THUM adapter issues two HART commands to the field device in order to obtain its status information for this broadcast. The Gateway uses this status information as data it publishes as an OPC or Modbus® Server. The Gateway only serves device parameter information and not detailed device alert information.

HART Master Type:

Set to “Primary” if control system is non-HART communicating.

Set to “Secondary” if control system is HART-communicating.

For details on the device parameters available from FIELDVUE digital valve controllers and the THUM commands to best retrieve them for OPC applications, see Instruction Manual Supplement Using OPC for Accessing Fisher FIELDVUE Digital Valve Controller Data, [D104429X012](#).

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