

# HART<sup>®</sup> Communication Module (ROC800-Series)

The HART Communication module allows a ROC800-Series Remote Operations Controller to communicate with HART devices using the Highway Addressable Remote Transducer (HART) protocol. The HART module can receive signals from and transmit signals to HART transmitters.

The module has four HART input/output channels. Switches on the module board allow each channel to be set up as an input or output channel. A channel that is set as an input can be configured for use in point-to-point or multi-drop mode. A channel that is set as an output can be configured for use in point-to-point mode only. Each channel has Analog Input capability that is intended for diagnostic and backup use, not for primary process variable measurement.

HART superimposes Frequency Shift Keying (FSK) signals on the analog signal. The use of this FSK technique allows digital information to be passed to and from the transmitter on the 4 to 20 milliAmp analog signal. In point-to-point mode, the milliAmp signal is still representative of the primary variable. This mode allows communications with one HART device per analog channel.

In multi-drop mode, as many as five HART devices can be connected (in parallel) to each analog input channel. Like the point-to-point mode, digital communications are superimposed on the 4 to 20 milliAmp signal; however, the analog signal is used only to power the end devices and does not represent any process variable value. With all four analog inputs in the multi-drop mode, the ROC can support a maximum of twenty HART devices.

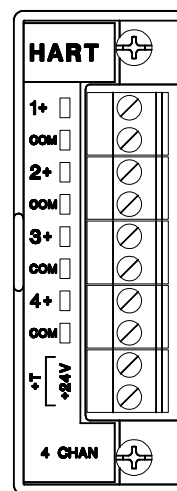
Performance and speed are greatly improved by a separate FSK modem for each channel. The FSK transmission is independent of other channels. The scan time for one channel does not affect the scan time of any other channel.

HART modules can be installed in any of the ROC800-Series module slots, as they are I/O type modules. Modules can easily be installed or removed from the module slots at any time by removing the two captive screws accessible from the front of the unit.

HART modules are hot-swappable, meaning the module can be removed and another module of the same kind can be installed under power. The modules are hot-pluggable, meaning they may be installed directly into unused module slots under power. The modules are also self-identifying via ROCLINK™ 800 Configuration Software.

All modules have removable terminal blocks for convenient wiring and servicing. The terminal blocks can accommodate a wide range of wire gauges (12 AWG or smaller).

A ROC800-Series unit equipped with a HART module is considered to be a HART Host (primary master) interface with a Class 1 Conformance classification. Most Universal and some Common Practice commands are supported. For a list of the commands, refer to the Specifications table on page 2. The supported commands conform to HART Universal Command Specification Revision 5.1 and Common Practice Command Specification Revision 7, (HCF SPEC 127 & 151). Refer to [www.hartcomm.org](http://www.hartcomm.org) for more information on the specifications.



DOC0541A

HART Communication Module

D301203X012

# Specification Sheet

## HART Module Specifications

### FIELD WIRING TERMINALS

- +**: Signal Positive.
- COM**: Common.
- +T**: Transmitter Power.

### CHANNELS

Four channels per module, which communicate via Analog/Digital signals.

**Mode**: Half-duplex.

**Data Rate**: 1200 bps.

**Parity**: Odd.

**Modulation**: Phase coherent, Frequency Shift Keyed (FSK) per Bell 202.

**Carrier Frequencies**: Mark 1200 Hz, Space 2200 Hz,  $\pm 0.1\%$ .

### SUPPORTED HART COMMANDS

**Universal Commands**: Read unique identifier; read primary variable; read primary variable and current; read dynamic variable and current; write polling addresses; read unique identifier associated with tag; read message; read tag; descriptor and date; read primary variable sensor information; read device information; write message; write tag, descriptor and date.

**Common Practice Command**: Read transmitter variables.

### ACCURACY

#### Analog Output:

Absolute accuracy at 25°C (77°F): 0.2%.

Absolute accuracy over operating temperature range: 1.5%.

#### Analog Input:

Absolute accuracy at 25°C (77°F): 1.5%.

Absolute accuracy over operating temperature range: 3.0%

### POWER CONSUMPTION

Main power supply loading at the Battery Terminals (at 12.0 V dc): 110 mA maximum over operating temperature range.

**Additional loading that may apply for each device configured**: 2.5 multiplied by Measured Current Draw at +T terminal.

### LOOP POWER

Total power supplied through the module for HART devices is 20 mA per channel at 24 V dc. Each HART device typically uses 4 mA in multi-drop mode and uses 4-20 mA in point-to-point mode.

### OVER-VOLTAGE PROTECTION

$\pm 25$  V dc, continuous on any terminal.

### ISOLATION

**Field to Logic**: 2500 V dc, 1 minute minimum.

**Field to Power**: 2500 V dc, 1 minute minimum.

**Module to Module**: 2500 V dc, 1 minute minimum.

### WIRING

12 AWG or smaller at the removable terminal block.

### WEIGHT

76 g (2.8 oz).

### DIMENSIONS

26 mm W by 133 mm H by 75 mm D (1.04 in. W by 5.25 in. H by 2.96 in. D).

### ENVIRONMENTAL

Meets the same environmental specifications as the ROC800-Series unit in which it is installed.

### APPROVALS

Meets the same approvals as the ROC800-Series unit in which it is installed.

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