MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official Emerson pages

OVATION HART ANALOG OUTPUT

5X00062G01

HART ANALOG OUTPUT ELECTRONICS MODULE

OFFICIAL SOURCES

Emerson Ovation HART 8-Channel Analog Output PWS_010205 [3]. Selected pages retain their original content, color and aspect ratio.

Ovation™ HART 8-Channel Analog Output Module

Features



- Eight multiplexed analog output channels, 4-20mA generated by the HART Analog Output module
- Channels are not isolated from one another and share a common external +24 VDC auxiliary power supply and ground
- 16 MHz micro-controller for A/D and D/A conversion and HART interface control
- 14-bit A/D converter shared amongst 8 output channels
- Array of switches superimpose transmitted signals upon each 4 - 20 mA analog outputs to the output device
- Interfaces through a low-level frequency, shift-keyed sine wave signal that is superimposed on the 4-20mA signal
- Directly links the Ovation control system to intelligent field devices
- Uses the AMS Suite, Device Manager for information collection and maintenance
- Software configurable I/O bus communication time-out period
- 1000 VDC/RMS electrical isolation between field and logic circuitry
- Electronic ID information stored on logic board EEPROM (Electrically Erasable Programmable Read-Only Memory)

Introduction

Ovation automation technology offers the ability to solve complex automation issues facing power generation plants and water/wastewater treatment facilities. Ovation's open, expandable architecture allows our customers to take advantage of continuing strides in technology without cost prohibitive changes to their control systems.

Ovation HART input/output modules directly link the Ovation system to intelligent devices in the field, allowing operators to easily gather information from valve positioners through the AMS Device Manager.

The Ovation HART (Highway Addressable Remote Transducer) Analog Output module consists of an Electronics module and a Personality module.

The Ovation HART Analog Output (HAO) module is designed to interface with eight HART compliant output devices utilizing a 4-20mA control loop signal. A HART compliant output device exchanges digital information with the Ovation control system in addition to the standard 4-20mA control loop signal.

The digital information is imposed on the 4-20mA signal according to the guidelines of the HART Protocol Specification. HART uses a low-level frequency, shift-keyed sine wave signal that is superimposed on the 4-20mA signal. The average value of the HART signal is zero. Therefore, the HART signal does not interfere with the 4-20mA control signal.

Some field devices, referred to as "smart" devices, are field devices in which the analog 4-to-20 mA signal, digital communication, and sometimes power, co-exist on the same pair of wires. Since the HART sine wave signal is small (and its average value is zero), the current loop analog 4-20 mA signal is not significantly affected by the presence of the HART signal. Using HART allows field devices to provide parameter setting and diagnostic features, which are not available with just the 4-20 mA analog current signal.

Smart device information can be used like any other data for trending and alarming since it can be updated on a two second basis to the controller.

Information flow can be increased from four to eight times using HART instrumentation. An Emerson Coriolis mass flow meter can provide mass flow, temperature, density, and volume flow. An Ovation HART high-performance output module controls the smart valve, supplies air pressure, and allows position feedback to be used for monitoring purposes.

Electronics module 5X00062 - (HAO)

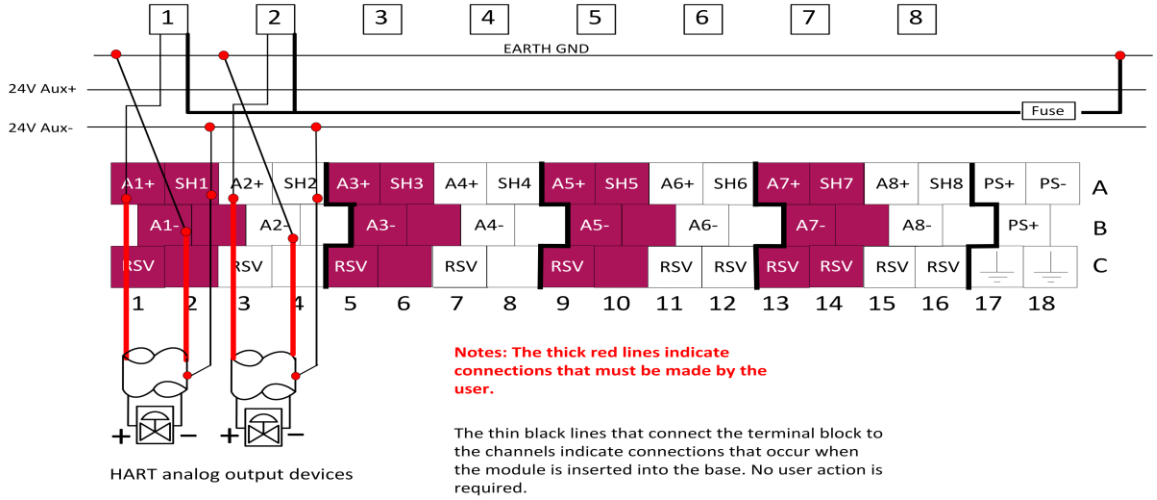
- 5X00062G01 contains eight multiplexed, 4-20mA output channels that interface with eight HART output devices.

Personality module 5X00063 - (HAO)

- 5X00063G01 contains passive circuitry for each of the eight channels. There is a user serviceable fuse located on the Personality module. This fuses the auxiliary power supplying the field side circuitry of the eight output channels.

Field wiring connection

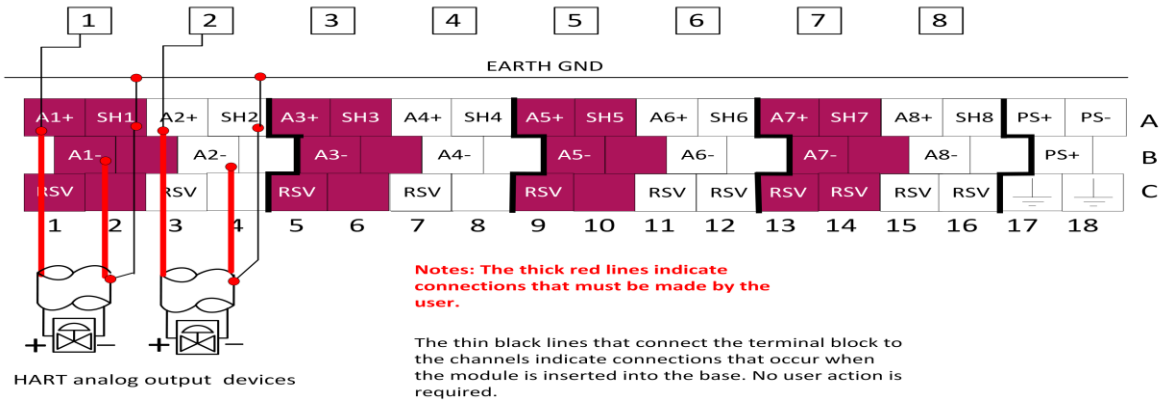
The following figure illustrates the wiring for an 8-Channel HART Analog Output module (non-CE Mark).



Note: All field wiring must be braid-shielded and grounded at the point of entry of the cabinet using the recommended hardware (refer to the *Planning Your Ovation System* manual for information on cabling and grounding).

Terminal block wiring connections for the 8-Channel HART Analog Output module

The following figure illustrates the wiring for an 8-Channel HART Analog Output module (CE Mark).



Note: All field wiring must be braid-shielded and grounded at the point of entry of the cabinet using the recommended hardware (refer to the *Planning Your Ovation System* manual for information on cabling and grounding).

Terminal block wiring connections for the 8-Channel HART Analog Output module (CE Mark)

Maintenance and Diagnostics

- Module Power OK LED
- Communication OK LED
- External Error LED
- Internal Error LED

Specifications

The following table describes HART Analog Output module (8-Channel) specifications.

Description	Value
Number of channels	8
Channel Update Rate	24 mS (Each channel is updated once every 24 mS by the on-board microcontroller, 14-bit resolution typical.)
Output Range	4 to 20 mA
D/A Resolution	14 bits
Accuracy over Temperature Range	0.25% of Span
User Loop Voltage	Power for loop current is supplied through the module by an auxiliary power supply.
Diagnostics	Open loop feedback detection. 8 Pass/Fail bits are stored in data register 0xC in Hex.
Dielectric isolation	Channel to Channel = None Channel to Logic = 1000 VAC/VDC for 1 minute.
Output Loading	4-20mA into 700 ohm load Maximum (230 ohm minimum to 600 ohm Maximum).
Output Compliance	20 mA@21.6 VDC Supply into 700 ohm load.
Operating Temperature Range	0° to 60° C
Humidity (non-condensing)	0% to 95%
Module Power	Main: 24 VDC, 1.2 W typical, 2.5W Maximum Aux: 24 VDC (-5%,+6.25%), 6W typical, 7.2W Maximum

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