

Table 3-1. Ovation Module Choices (Cont'd)

Module Type	Channel	Electronic Module	Personality Module
Digital Input (24 VAC/DC or 48 VDC differential)	16	1C31107G01	1C31110G02
Digital Input (24 VAC/DC or 48 VDC single ended)	16	1C31107G01	1C31110G01
Compact Digital Input (125 VAC/DC differential)	16	1C31232G03	5X00034G01 or Cavity Insert) ²
Compact Digital Input (24/48 VAC/DC differential)	16	1C31232G02	5X00034G01 or Cavity Insert) ²
Compact Digital Input (24/48 VDC single ended)	16	1C31232G01	Cavity Insert) ²
Digital Output (0 - 60 VDC)	16	1C31122G01	1C31125G01
Digital Output (0 - 60 VDC w/relay pnl comm)	16	1C31122G01	1C31125G02
Digital Output (0 - 60 VDC w/relay pnl comm ext fuses)	16	1C31122G01	1C31125G03
HART Analog Input (4 - 20 mA)	8	5X00058G01	5X00059G01
HART Analog Output (4 - 20 mA)	8	5X00062G01	5X00063G01
HART High Performance Analog Input (4 - 20 mA)	8	5X00062G01	5X00063G01
Loop Interface (AI: 0 - 10V AO: 0 - 10V)	6	1C31174G01	1C31177G01
Loop Interface (AI: 0 - 10V AO: 0 - 10V) User defined Digital Inputs ³	6	1C31174G21	1C31177G01
Loop Interface (AI: 0 - 5V AO: 0 - 10V)	6	1C31174G02	1C31177G01
Loop Interface (AI: 0 - 5V AO: 0 - 10V) User defined Digital Inputs ³	6	1C31174G22	1C31177G01
Loop Interface (AI: 4 - 20mA AO: 4 - 20mA remote powered)	6	1C31174G03	1C31177G03
Loop Interface (AI: 4 - 20mA AO: 4 - 20mA remote powered) User defined Digital Input ³	6	1C31174G23	1C31177G03
Loop Interface (AI: 4 - 20mA AO: 4 - 20mA local powered)	6	1C31174G03	1C31177G02
Loop Interface (AI: 4 - 20mA AO: 4 - 20mA local powered) User defined Digital Input ³	6	1C31174G23	1C31177G02
Loop Interface (AI: 4 - 20mA remote powered)	4	1C31174G04	1C31177G03

Table 3-3. Personality Module Fuses (Cont'd)

Type	Rating	Used On	Part Number
5 x 20 mm cartridge	1.25A; 250V; Fast acting	Loop Interface Pmods 1C31177G01 - G03 Digital Output Pmods 1C31125G01 Valve Positioner Pmods 1C31197G01 - G04 Relay Panels (Solid State) 5A22410H01 - H02 Relay Panels (16 G2R) 5A22411H01	EX06098
5 x 20 mm cartridge	2.0A; 250V; Fast acting	Relay Panels (8 KU) 5A22412H01 Relay Base (12 KUEP) 1C31222G01	EX06105
5 x 20 mm cartridge	3.15A;250V Fast acting	Digital Output Pmods 1C31125G02	EX06101
Micro-Fuse Plug-in	0.5A;125V Fast acting	16 Point Individually fused Digital Input Pmod 5X00034G01	PS10007H03
Micro-Fuse Plug-in	0.063A;125V Fast acting	HART Analog Input Pmods Analog Inputs 5X00059G01	1X00030H01
Micro-Fuse Plug-in	0.6A;125V Fast acting	HART Analog Output Pmods 5X00063G01	PS10007H14
Micro-Fuse Plug-in	0.5A;125V Fast acting	HART Analog Input Pmods 5X00059G01 Rev. 2 or later	PS10007H03

Section 13. HART Analog Input Module

13-1. Description

HART (Highway Addressable Remote Transducer) is a digital communication protocol designed for industrial process measurement applications. Field measurement devices (transmitters) interface a process control system via an analog 4-to-20 mA current loop. HART uses a low-level frequency shift-keyed sine wave signal that is superimposed on the standard 4-to-20 mA process measurement current loop. Since the HART sine wave signal is small and its average value is zero, the current loop analog 4-to-20 mA signal is not significantly affected by the presence of the HART signal. Using HART allows a field device to provide more than one measurement, which is a feature not available when using only the 4-to-20 A analog current signal.

“Smart” field devices may be described as field devices in which the analog 4-to-20 mA signal, digital communication, and sometimes power, co-exist on the same pair of wires. The Ovation HART Analog Input (HAI) module is a standard form factor Ovation I/O module, which will permit Ovation to communicate with HART devices.

The HART Analog Input Module is applicable for CE Mark configured systems.

Note

See **Section 3. I/O Modules** for environmental, installation, wiring and fuse information.

13-2. Module Groups

13-2.1. Electronics Module

There is one Electronics Module group for the HART Analog Input Module:

- 5X00058G01 interfaces to eight current loop signals with an input range of 4-20 mA.

13-2.2. Personality Module

There is one Personality Module group for the HART Analog Input Module.

- 5X00059G01 contains a single printed circuit board assembly with eight fused two-wire loop-powered or non-fused active-source (four-wire isolated current output) transmitter inputs. Eight user servicable fuses (one fuse for each analog input channel) are located on the personality module. Each fuse is used to protect the auxiliary power supply only if the associated analog input channel is connected to a two-wire loop powered current transmitter.

Note

Revision 02 and later personality modules contain a ninth user servicable fuse (1/2 A) for the electronics module +24 VDC auxiliary power input.

Table 13-1. HART Analog Input Subsystem (16 Bit)

Range	Channels	Electronic Module	Personality Module
4-20 mA loop powered (2 wire) or active source (4 wire)	8	5X00058G01	5X00059G01

This configuration is CE Mark Certified.

13-3. Module Block Diagram

The Ovation HART Analog Input Module assembly consists of two modules, an electronics module containing a logic printed circuit board (LHA) and a field printed circuit board (FHI). The simplified block diagram for the FHI field board is shown in [Figure 13-1](#). The electronics module is used in conjunction with a personality module, which contains a single printed circuit board (PHAI).

In addition, all modules utilizing the auxiliary power supplies, including the HART modules, **MUST** utilize shielded I/O cables in order to suppress coupled noise and transients into the HART modules. This includes modules on the same branch utilizing the auxiliary power, or modules on other branches utilizing the same auxiliary power. This recommendation applies regardless of the type of power supply chosen by the user.

13-5. Specifications

Electronics Module (5X00058)
Personality Module (5X00059)

Table 13-3. HART Analog Input Module Specifications

Description	Value
Number of channels	8
Input range	4 to 20 mA normal operation 0 to 23 mA with under-range and over-range levels user selected and Controller monitored.
A/D Resolution	16 bits
Reference accuracy (@ 25°C)	+/-0.05% of span @ 99.7% confidence
Accuracy over temperature	+/-0.1% of span over the full operating temperature range
Sampling rate (per ms)	Each channel is sampled every 24 ms.
Dielectric isolation: Channel to channel Channel to logic	No channel to channel isolation 1000 VAC/VDC for one minute
Operating temperature range	0° to 60°C. (32°F to 140°F)
Humidity (non-condensing)	0% to 95%
Module power	Main: 1.2W typical. 2.5W maximum Aux. power supply voltage = 24 VDC -5%, +6.25% Aux: 4.1W typical. 7.2W maximum
Two-wire transmitter power	13.5V minimum (P_{n+} to A_{n+}) @ 20 mA where n = 1 to 8 (current limited to 32 mA maximum)