User Manual

Allen-Bradley

FLEX I/O Isolated Input/Output HART Analog Modules

Catalog Numbers 1794-IF8IH, 1794-IF8IHNFXT, 1794-OF8IH

Allen-Bradley • Rockwell Software

Rockwell Automation

Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence
	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Why Read This Manual

This manual shows you how to use your FLEX I/O analog modules with the ControlNet products and ControlNet network, and Ethernet products and Ethernet network. The manual helps you install, program, and troubleshoot your module. This manual:

Who Should Use This Manual

You must be able to program and operate a ControlNet product and ControlNet or Ethernet network to make efficient use of a FLEX I/O module.

About the Vocabulary

In this manual, we refer to the:

- 1794-IF8IH and 1794-IF8IHNFXT as the input modules
- 1794-OF8IH as the output module

Related Documentation

The following documents contain additional information concerning Rockwell Automation products. To obtain a copy, contact your local Rockwell Automation office or distributor.

Resource	Description
FLEX I/O 8 Isolated Input HART Analog Module Installation Instructions, publication 1794-IN115	Information on wiring and installing the 1794-IF8IH HART input module.
FLEX I/O 8 Isolated Output Analog Module Installation Instructions, publication 1794-IN120	Information on wiring and installing the 1794-OF8IH HART output module.
FLEX I/O-XT 8-Input Channel Isolated HART Analog Module, publication 1794-IN134	Information on wiring and installing the 1794-IF8IHNFXT HART XT input module.
FLEX I/O and FLEX XT I/O Selection Guide, publication 1794-SG002	A description and overview of the 1794 and 1797 series FLEX I/O modules compatible control platforms, and overview of how to specify a FLEX I/O system.
DTM Library FLEX and FLEX EX Release Notes, publication 1794-RN068	Web updates for FLEX I/O and FLEX EX I/O DTM libraries.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	More information on proper wiring and grounding techniques.
Allen-Bradley Industrial Automation Glossary, AG-7.1.	A glossary of industrial automation terms and abbreviations.

Common Techniques Used in this Manual

The following conventions are used throughout this manual:

- Bulleted lists such as this one provide information, not procedural steps.
- Numbered lists provide sequential steps or hierarchical information.
- *Italic* type is used for emphasis.

Notes:

Summary of Changes

This manual contains new and updated information. Changes throughout this revision are marked by change bars, as shown to the right of this paragraph.

New and Updated Information

This table contains the changes made to this revision.

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About the FLEX I/O HART Analog Modules

Overview

This chapter describes the FLEX I/O Highway Addressable Remote Transducer (HART) analog modules and what you must know and do before you begin to use them.

Read this chapter to familiarize yourself with the HART analog modules.

IMPORTANT To use all of the features of these modules it must be used with the 1794-ACN(R)15 with version 5.001 firmware or later, or the 1794-AENT with firmware revision 4.002 and later, or the 1794-AENTR with firmware version 1.011 and later.

For more information about using these modules with 1794-ACN(R)15 with firmware revision 5.001 and later, see 1794-RN071.

IMPORTANT Logix Designer version 24 includes a full profile for 1794-IF8IHNFXT module. You cannot use the 1794-IF8IH profile to configure the 1794-IF8IHNFXT module.

See Use the 1794-IF8IHNFXT with the Generic and Thin Profiles on page 135 if you are using RSLogix 5000 version 23 or earlier.

IMPORTANT The Logix Designer application is the rebranding of the RSLogix 5000 application.

What FLEX I/O Analog Modules Do

The FLEX I/O HART input and output modules must be used in a ControlNet or EtherNet network.

The 1794-IF8IH module accepts up to 8 analog inputs. The inputs are isolated and will accept current in either of the following two ranges: 4...20 mA or 0...20 mA. The default input range is 0...20 mA. The inputs have both fixed hardware filters and selectable firmware digital filters.

The 1794-IF8IHNFXT module supports 0...20 mA and 4...20 mA ranges, with a default input range of 0...20 mA. It has seven selectable input filters and seven input data formats. It provides support for loop alarm, which detects gross signal errors such as open and short circuit. It has programmable user alarms (high, low, remote high high, and remote low low). The module has a HART modem per channel. It is compliant with HART versions 5, 6, and 7, with the exception of multi-drop support.

The 1794-OF8IH module provides as many as eight (8) analog outputs. The outputs are isolated and will provide current in either of the following two ranges: 4...20 mA or 0...20 mA. The default output range is 0...20 mA.

Each module offers:

- full functionality without switches or jumpers.
- multiple data ranges that can be independently programmed for each channel.
- lead breakage detection.
- overrange/underrange alarms.
- remote transmitter alarm.

Communicate with Programmable Controllers

Data connections are established between the FLEX I/O module and an Allen-Bradley programmable controller (PLC) to transfer information between the two at a scheduled rate.

Input module information is then automatically made available in the PLC data table through the data connection. Reciprocally, output data information determined by the PLC program is also automatically transferred from the PLC data table to the output module through the data connection.

In addition, when the data connection is originally established, configuration information for the module is automatically transferred to it via the network.

Events Following Powerup

You must apply +24V DC power to your FLEX I/O analog I/O modules. The following sequence of events occurs after power has initially been applied to your module:

1. The module status indicator will blink red until a connection is established and a valid configuration is passed to the module.

2. After the diagnostic check, module configuration information, selected by the user and downloaded over the network, is applied by the module. For more information on configuration options, refer to Configurable FLEX I/O Analog Module Features on page 7.

3. Following the module configuration download for the 1794-IF8IH and 1794-IF8IHNFXT modules, the module begins producing runtime data for the PLC processor.

   Following the module configuration download for the 1794-OF8IH module, the module applies configuration data to output channels.

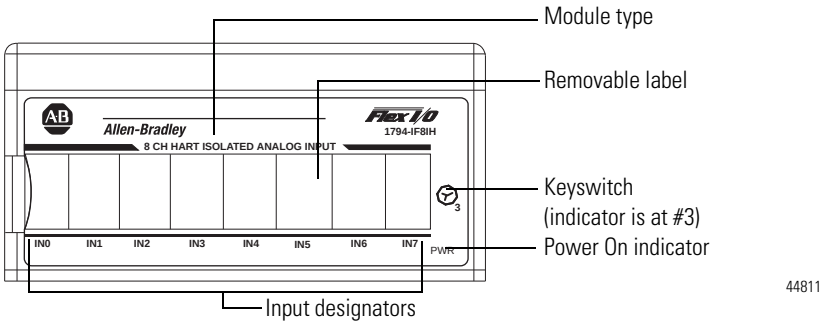
4. If any diagnostics or alarms are generated during normal module operation, the data is returned to the PLC processor.

Physical Features of Your Module

The module label identifies the key-in position, wiring and module type. Use the removable label to note individual designations per your application.

Indicators

Indicators are provided to identify input or output fault conditions, and to show when power is applied to the module. For example, the 1794-IF8IH module is shown below.



Use Alarms on the Input Modules

The 1794-IF8IH and 1794-IF8IHNFXT FLEX I/O modules are capable of generating four alarms:

- Low Alarm
- High Alarm
- Remote Fault
- Local Fault

These alarm conditions are described in general terms and as they relate to bits on the FLEX I/O module on the following pages.

Low Alarm

The low alarm notifies you when module input signal moves below the configured low alarm trigger point. If the input signal falls below 0% (4 mA), a Low Alarm is generated.

High Alarm

The high alarm works converse to the low alarm. This feature notifies you when the input signal falls above the configured high alarm trigger point. If the input signal falls above 0% (4 mA), an Underrange Alarm is generated.

Remote Fault Alarm

The remote fault alarm is intended for use with remote transmitter loops.

For example, the remote transmitter may be measuring temperature and converting it to a standard mA signal. In such a loop, though, the input module cannot determine the state of the loop on the far side of the transmitter. However, the remote transmitter may be capable of diagnosing a problem in the remote loop and signal the input module local loop with a preprogrammed out-of-range (high or low) value.

The Fault Enable bit allows the 1794-IF8IH and 1794-IF8IHNFXT modules to work with transmitters like the one just described.

IMPORTANT	Once the alarm is issued, it remains active as long as the input signal value remains above or below the programmed value.

Use Remote Fault Alarm to Determine High-High or Low-Low Alarm Levels

If you do not have a remote transmitter in your loop, this alarm can also be used to program a high-high or low-low alarm level between the levels which actuate the overrange or underrange alarms and the high or low local fault alarms.

Programming the Remote Fault Alarm

For the remote fault alarm, you must program the threshold in 0.1 mA steps at any level on the high or low end of input signal range. The remote fault alarm activates if your I/O module receives input signal values of:

- 100.63...111.88% (20.1...21.9 mA) on the high end of input signal range

  or

- -0.63...-11.88% (3.9...2.1 mA) on the low end of input signal range.

Local Fault Alarm

The local fault alarm notifies you when the loop to the transmitter or field device (if no transmitter is used) is open or shorted.

IMPORTANT	Once the alarm is issued, it remains active as long as the input signal value remains in the programmed range.

- 112.50% (22 mA) or higher on the high end of input signal range. This value indicates a short in the loop.

  or

- -12.50% (2 mA) or lower on the low end of input signal range. This value indicates an open wire condition in the loop.

The remote fault and local fault alarms are issued with the same bit whether the cause is an under or overrange. Monitor the overrange and underrange bits in your programming software to determine if the problem is a high current or low current.

Use the HART Capabilities

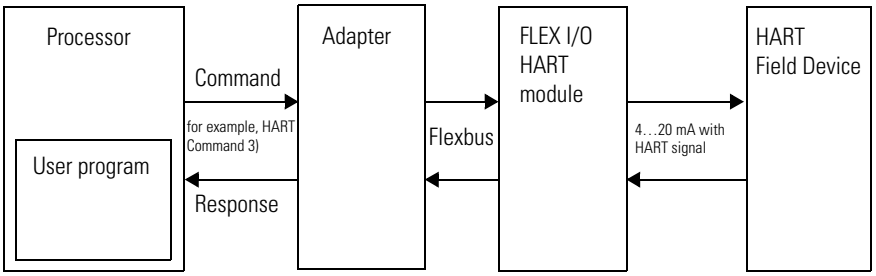
Before using the HART capabilities, be sure that:

- the I/O module and the associated field device are working properly in the analog 4...20 mA mode.
- the I/O module is configured for 4...20 mA range.
- the field device is HART capable.
- no more than one HART field device is connected to each channel.
- input filtering is set to a valid (defined) value.

HART Implementation Overview

The FLEX I/O HART modules act as intelligent HART multiplexers. Basically, the module learns which HART devices are attached to its channels and then routes HART messages, as appropriate, between the HART field devices and the flexbus. Since the HART modules act as intelligent HART multiplexers, HART commands can be issued to the HART modules themselves.

Communication on the flexbus occurs between the adapter and the HART module. The adapter converts these messages to the appropriate network format for communication with the controlling processor. The controlling processor gets its command from the user program, storing the responses in its memory.



Chapter Summary

In this chapter, you learned about FLEX I/O analog I/O modules and HART module capabilities. Read the next chapter to learn about configurable features on your module.

Configurable FLEX I/O Analog Module Features

Overview

Read this chapter to familiarize yourself with configurable features on the input and output analog modules.

HART configurable features described in this chapter include the following

1794-IF8IH and 1794-IF8IHNFXT Input Modules	1794-OF8IH Output Module
Fault Mode	Output Enable
High Low Error Level	Module Fault State Mode
Input Filter Cutoff	Local Fault Mode
Data Format	Data Format
	Global Reset
	Analog Fault State
	Latch Retry Mode
	Fault Alarm

IMPORTANT You must use the I/O configuration portion of your PLC programming software to select and configure these features for 1794-IF8IH and 1794-OF8IH modules. This manual assumes familiarity with the programming software. A brief description of each module feature is provided here.

To learn more about configuration for the 1794-IF8IH and 1794-OF8IH modules, see the following:

- Configuration on page 27
- Use the 1794-IF8IH Module with the Generic Profile on page 119
- Use the 1794-OF8IH Module with the Generic Profile on page 159

IMPORTANT Configuration for the 1794-IF8IHNFXT module is done through Logix Designer software version 24. See Edit Your 1794-IF8IHNFXT Configuration with Logix Designer (Full Profile) on page 76.

See Use the 1794-IF8IHNFXT with the Generic and Thin Profiles on page 135 if you are using RSLogix 5000 version 23 or earlier.

Select Your Analog Input Module Operating Features

All features of the 1794-IF8IH and the 1794-IF8IHNFXT analog input modules are independently configurable.

IMPORTANT The default selection value for all parameters is 0.

Fault Enable

Your input modules are capable of indicating various fault conditions, depending on the input signal value. Use the Fault Enable feature to enable or disable two alarms:

- Remote Fault Alarm
- Local Fault Mode

Use your programming software to set the Fault Enable bit to 0 to disable these alarms. Set the bit to 1 to enable them.

IMPORTANT Fault Enable will only enable or disable the Remote and Local Fault alarms. It does not affect the Underrange and Overrange alarms. They are always active.

For more information refer to Remote Fault Alarm on page 4 and Local Fault Alarm on page 5.

Sample Filter Frequency Rates

Six available input filter settings for the 1794-IF8IH module and seven input filter settings for the 1794-IF8IHNFXT module allow you to choose the best rolloff frequency for input channels on your I/O module. When choosing a filter, remember that time filter selection affects your input signal's accuracy.

For example, if you choose the highest frequency of 470 Hz (filter 0) for the 1794-IF8IH module, signal noise is more likely to affect the reading, but the slowest frequency of 4.17 Hz (filter 5) provides the most accurate signal due to

incoming noise filtering. It is recommended that you use 62 Hz when HART is enabled to get more accurate signals due to incoming noise.

Refer to the Input Filter Frequency table to decide which input filter to use in your FLEX I/O analog I/O application:

Input Filter Frequency for the 1794-IF8IH Module

0	1	2	3	4	5	6	7
470 Hz	62 Hz	19.6 Hz	16.7 Hz	10 Hz	4.17 Hz	n/a	n/a

Input Filter Frequency for the 1794-IF8IHNFNXT Module(1)

0	1	2	3	4	5	6	7
242 Hz	123 Hz	62 Hz	19.6 Hz	16.7 Hz	10 Hz	4.17 Hz	n/a

(1) To configure input filter frequency and other module features for 1794-IF8IHNFXT module in Logix Designer, see Configure 1794-IF8IHNFXT Module with Logix Designer Software on page 191.

Choose the best input filter cutoff in your programming software.

Data Formats

You must choose a module data format in your user program. Six data formats are available for the 1794-IF8IH module, and seven data formats for the 1794-IF8IHNFXT module.

Default format is 0…20 mA.

The data format selected interprets input readings and returns them to the PLC.

See the Data Format (Configuration Words 2, 3 – bits 0...3, 4...7, 8...11, 12...15) on page 37 for Data Format tables and a more detailed description of data formats for the 1794-IF8IH and 1794-IF8IHNFXT modules.

To configure data formats and other module features for 1794-IF8IHNFXT module in Logix Designer, see Configure 1794-IF8IHNFXT Module with Logix Designer Software on page 191.

Select Your Analog Output Module Operating Features

All features of the 1794-OF8IH analog output module are independently configurable.

IMPORTANT The default selection value for all parameters is 0.

Local Fault Mode

The Local Fault Mode can be programmed to determine how the module responds to communications faults and internal module faults.

When setting the Local Fault Mode feature in your programming software, set this feature's bit to 0 to use the analog fault state or digital fault state only if a communications fault occurs. Set the bit to 1 to use the Analog Fault state or Digital Fault state if any fault occurs.

Analog fault state and digital fault state determine how the module reacts to faults when a channel is used in analog mode or digital mode, respectively.

Latch Mode

Latch Mode determines channel operation under wire-off or lead-break fault conditions. This feature is available for each channel. Channel detection occurs on a continuous basis. If a fault is detected, the channel fault alarm is set.

If Latch mode is enabled when a fault occurs, the fault will remain latched in its fault state until a Global Reset is issued. If Latch mode is disabled when a fault occurs, the channel reports a fault until the fault is corrected. Global Reset is not necessary if Latch mode is disabled.

When using your programming software, set the Latch mode bit to 0 to disable the feature. Set the bit to 1 to enable it.

Global Reset

Global Reset works in conjunction with Latch mode during fault conditions. If Latch mode is enabled and a fault condition occurs, the channel operating with a fault remains in this condition (with analog or digital fault state implied) until a Global Reset is issued. The Global Reset feature resets all outputs of a particular channel group to accept normal system output data.

The Global Reset feature is an edge triggered signal. Use your programming software to set the Global Reset bit to 1 for normal operation. Resetting of outputs occurs during the 1 to 0 transition.

Data Format

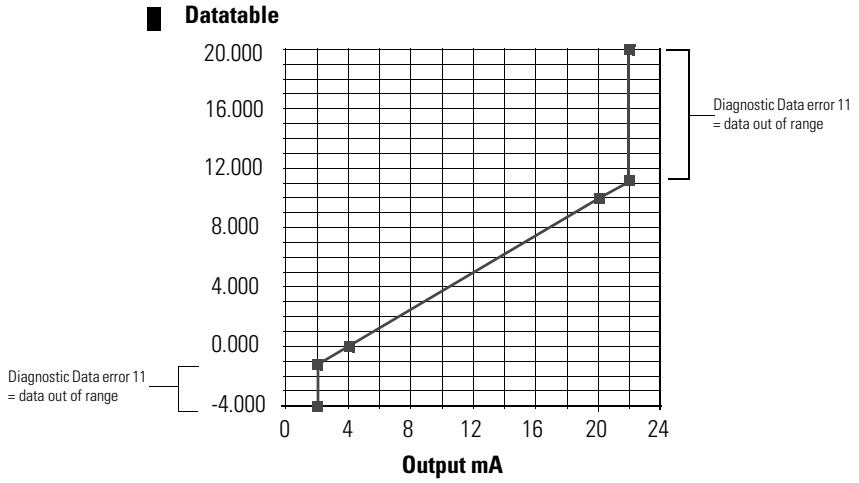
You must choose a module data format in your user program. See 1794-OF8IH Data Formats on page 64 for an explanation of each bit. Data Formats 2, 5, 6, 8, 9, 10, 11, 12, 13 and 15 are not assigned.

When choosing a data format, remember the following:

- If an unassigned Analog Data Format is selected, the module sets Diagnostic Data to 2 for configuration failure and puts affected channels in the corresponding fault state.
- An unconfigured module channel can be assumed to have the default configuration Analog Data Format 0, 0 to 20 mA and Analog Mode Fault State minimum range. If a non-assigned format is selected, then the diagnostic 2 for configuration failure is set and the module channel goes to the default fault state minimum range.
- If on the other hand, the configuration had been changed, from the default, and then it was changed again to a non-assigned format, then the diagnostic bit 2 for configuration failure is set and the module goes to the fault state for the last valid configuration.
- Formats 13 and 14 are 2's complement data formats, and require data to the module in that form.
- Range: 0...15
- Default: 0
- Data Table Reference: data format, word 12 and 13, bits 0...3, bits 4...7

If the data is sent to the module which is out of range, the value will be clipped and Diagnostic Data will be set to 11 data out of range.

Example of Analog Format 14 and Data Clipping Performance.



For data format tables and a more detailed description of the data formats for the 1794-OF8IH module, see Data Format (Configuration Words 2, 3 – bits 0...3, 4...7, 8...10, 12...15) on page 63.

Fault Alarm

Fault Alarm selects whether the channel fault detection is enabled or disabled. There is a 100 Hz (10 ms) filter for wire off or lead break detection.

Use your programming software to set the Fault Alarm. Set the feature bit to 0 to disable the alarm. Set the bit to 1 to enable wire off/lead break fault detection.

Understand Image Table Mapping and Bit/Word Descriptions

All Allen-Bradley FLEX I/O modules have a sixteen word table of Real Time Data (RTD) to be transferred between the controller and the I/O module. Not all 16 words need be allocated.

1794-IF8IH Analog Data Table

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Channel 0 Input Data															
1	Channel 1 Input Data															
2	Channel 2 Input Data															
3	Channel 3 Input Data															
4	Channel 4 Input Data															
5	Channel 5 Input Data															
6	Channel 6 Input Data															
7	Channel 7 Input Data															
8	H7	H6	H5	H4	H3	H2	H1	H0	L7	L6	L5	L4	L3	L2	L1	L0
9	R7	R6	R5	R4	R3	R2	R1	R0	P7	P6	P5	P4	P3	P2	P1	P0
10	Reserved								Diagnostic Status							
11	C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0
12	X7	X6	X5	X4	X3	X2	X1	X0	Reserved							
Where:	Hn: Channel n High Alarm Ln: Channel n Low Alarm Pn: Channel n Out Of Range Alarm Rn: Channel n Second (Remote) Alarm Fn: Channel n HART Failure Cn: Channel n HART Current Fault Xn: Channel n HART Transmitter Present 0: False 1: True															

1794-IF8IHNFXT Analog Data Table

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Channel 0 Input Data															
1	Channel 1 Input Data															
2	Channel 2 Input Data															
3	Channel 3 Input Data															
4	Channel 4 Input Data															
5	Channel 5 Input Data															
6	Channel 6 Input Data															
7	Channel 7 Input Data															
8	H7	H6	H5	H4	H3	H2	H1	H0	L7	L6	L5	L4	L3	L2	L1	L0
9	R7	R6	R5	R4	R3	R2	R1	R0	P7	P6	P5	P4	P3	P2	P1	P0
10	X7[1]	X6	X5	X4	X3	X2	X1	X0	Diagnostic Status							
11	C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0
Where:	Hn: Channel n High Alarm Ln: Channel n Low Alarm Pn: Channel n Out Of Range Alarm Rn: Channel n Second (Remote) Alarm Fn: Channel n HART Failure Cn: Channel n HART Current Fault Xn: Channel n HART Transmitter Present 0: False 1: True															

(1) When Xn is set, a device is connected and a has a valid device information data set available. This bit will clear if the channel is inhibited, the device is removed, or the device is faulted, and will not be set again until a complete device information set is successfully regathered. Words S:0…S:3 are input data classified as Status Words but in RSLogix generic profile, these words are shown as tags I:8…I:11.

1794-IF8IHNFXT Output Analog Data Table

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	R	R	R	R	R	R	R	R	HO7	HO6	HO5	HO4	HO3	HO2	HO1	HO0
Where:	HOn: Channel n HART Off Dynamic Control bit 0: False 1: True															

Chapter Summary

In this chapter, we told you about the FLEX I/O system and the analog I/O modules, and how they communicate with programmable controllers. Move on to the next chapter to learn how to install your FLEX I/O analog module.

Notes:

Install Your FLEX I/O Analog Modules

Overview

Read this chapter to install the input and output analog modules.

Before You Install Your Analog Module

Before installing your FLEX I/O analog module:

You Need To	As Descibed Under
Verify that the module will be installed in a suitable enclosure	Removal and Insertion Under Power on page 15
Position the keyswitch on the terminal base	Install the Module on page 16

ATTENTION: These modules do not receive primary operational power from the backplane. +V and -V DC power must be applied to your module before installation. If power is not applied, the module position will appear to the adapter as an empty slot in your chassis.

Removal and Insertion Under Power

WARNING: These modules are designed so you can remove and insert them under power. However, take special care when removing or inserting these modules in an active process. I/O attached to any module being removed or inserted can change states due to its input/output signal changing conditions.
If you insert or remove the terminal base while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

WARNING: When used in a class I, division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring method that complies with the governing electrical codes.

Install the Module

Installation of the module consists of the following:

- Mounting the terminal base unit.
- Installing the analog I/O module into the terminal base unit.
- Installing the connecting wiring to the terminal base unit.

If you are installing your module into a terminal base unit that is already installed, proceed to page 20.

ATTENTION: Do not use the unused terminals on the terminal base unit. Using the terminals as supporting terminals can result in damage to modules and/or unintended operation of your system.

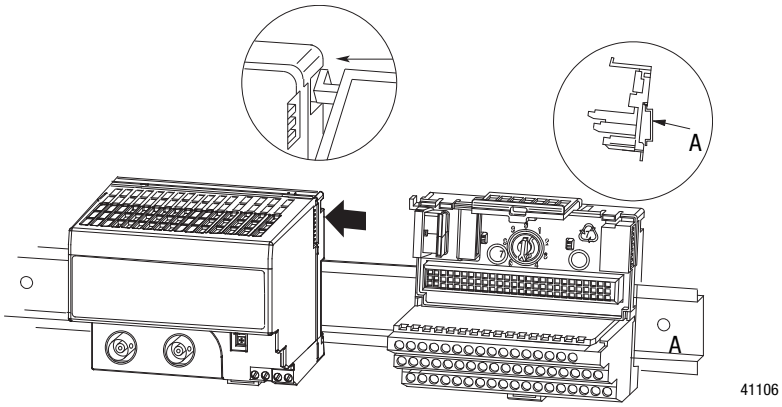
Mount on a DIN Rail

ATTENTION: Do not remove or replace a terminal base unit when power is applied. Interruption of the flexbus can result in unintended operation or machine motion.

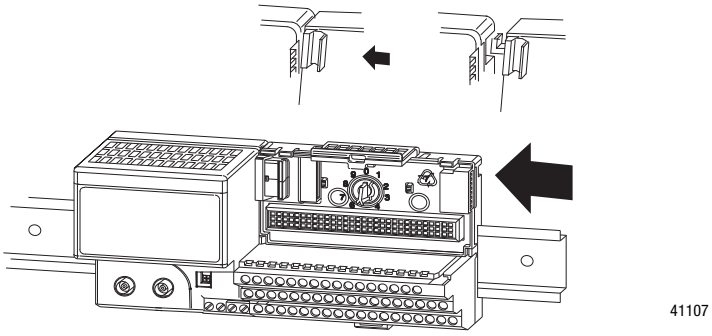
Install the Terminal Base Unit

1. Remove the cover plug in the male connector of the unit to which you are connecting this terminal base unit.
2. Check to make sure that the 16 pins in the male connector on the adjacent device are straight and in line so that the mating female connector on this terminal base unit will mate correctly.
3. Make certain that the female flexbus connector is **fully retracted** into the base unit.

4. Position the terminal base at a slight angle and hooked over the top of the 35 x 7.5mm DIN rail A
(Allen Bradley part number 199-DR1)



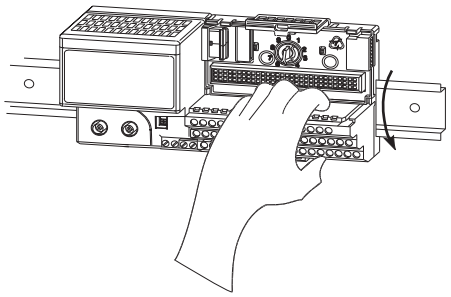
5. Slide the terminal base over tight against the adapter (or proceeding terminal base). Make sure the hook on the terminal base slides under the edge of the adapter (or proceeding terminal base) and the flexbus connector is fully retracted.



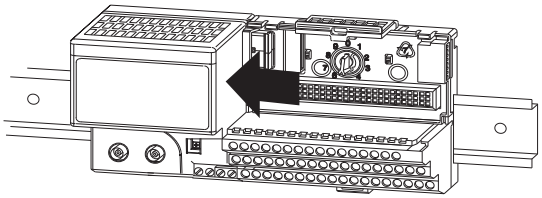
ATTENTION: Do not force the terminal base into the adjacent modules. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

6. Rotate the terminal base onto the DIN rail with the top of the rail hooked under the lip on the rear of the terminal base.
Use caution to make sure that the female flexbus connector does not strike any of the pins in the mating male connector.

7. Press down on the terminal base unit to lock the terminal base on the DIN rail. If the terminal base does not lock into place, use a screwdriver or similar device to open the locking tab, press down on the terminal base until flush with the DIN rail and release the locking tab to lock the base in place.



Gently push the flexbus connector into the side of the adapter (or proceeding terminal base) to complete the backplane connection.



8. For specific wiring information, refer to the installation instructions for the module you are installing in this terminal base unit.
Terminal assignments are also given later in this chapter, see page 22.

9. Repeat the above steps to install the next terminal base unit.
Be sure the flexbus connector cover on the last terminal base unit is in place.

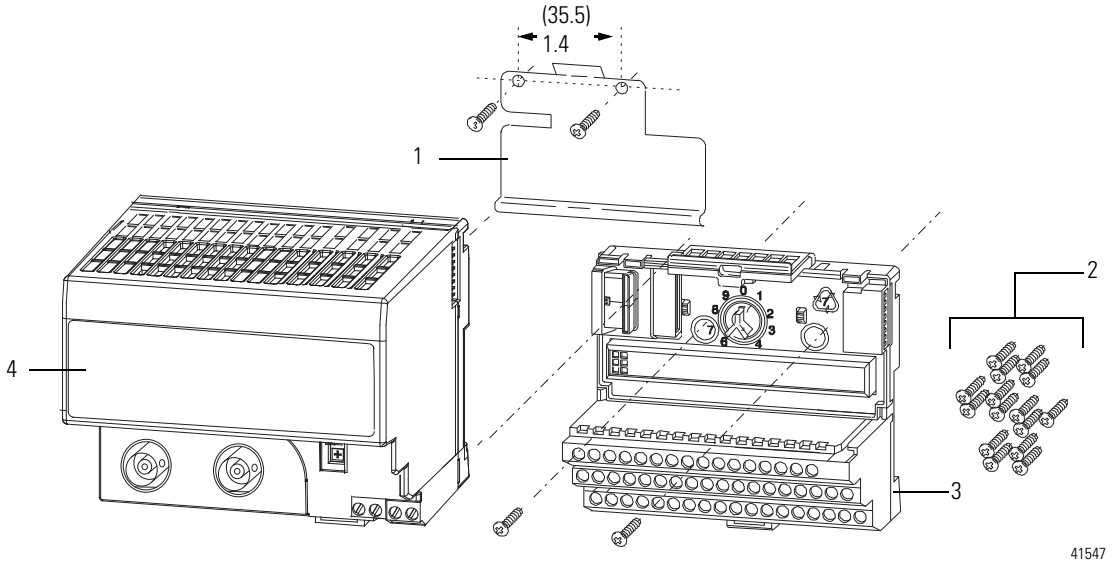
Mount on a Panel or Wall

Installation of a FLEX I/O system on a wall or panel consists of:

- laying out the drilling points on the wall or panel.
- drilling the pilot holes for the mounting screws.
- mounting the adapter mounting plate.
- installing the terminal base units and securing them to the wall or panel.

If you are installing your module into a terminal base unit that is already installed, proceed to Mount the Analog Modules on the Terminal Base Unit on page 20.

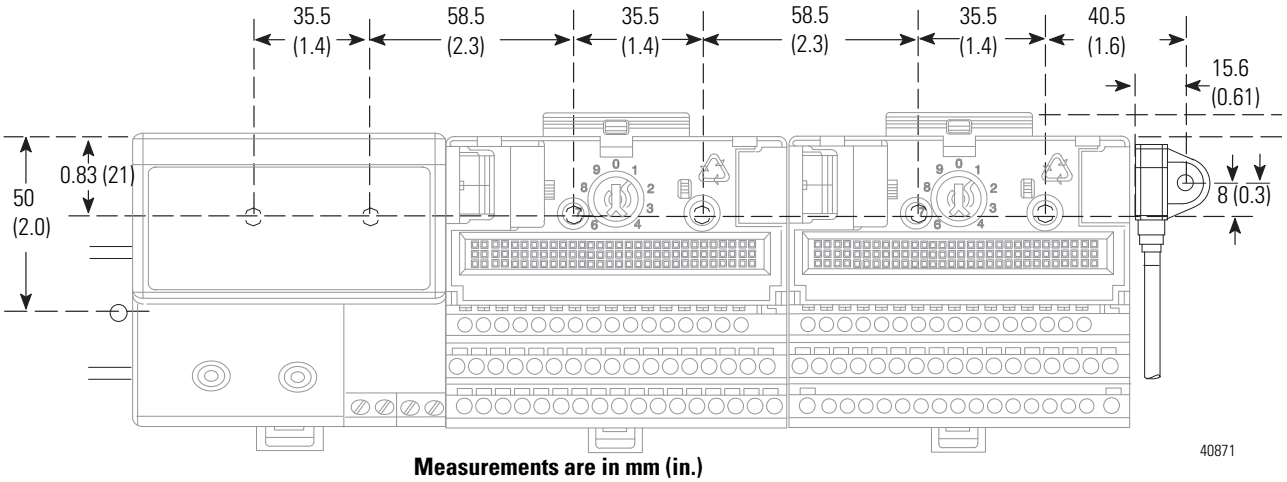
Use the mounting kit Cat. No. 1794-NM1 for panel/wall mounting.



	Description		Description
1	Mounting plate for adapter	3	Terminal base unit (not included)
2	#6 Self-tapping screws	4	Adapter module (not included)

To install the mounting plate on a wall or panel:

1. Lay out the required points on the wall/panel as shown in the drilling dimension drawing.



Measurements are in mm (in.)

TIP Cable is either 292.1 mm (11.5 in.) or 901.0 mm (35.5 in.) from upper connector — depending if you use 0.3 m (1 ft) or 0.91 m (3 ft) cable.

ATTENTION: Be careful of metal chips when drilling cable mounting holes. Do not drill holes above a system that has any modules installed.

2. Drill the necessary holes for the #6 self-tapping mounting screws.
3. Mount the mounting plate for the adapter module using two #6 self-tapping screws (18 included for mounting up to 8 modules and the adapter).

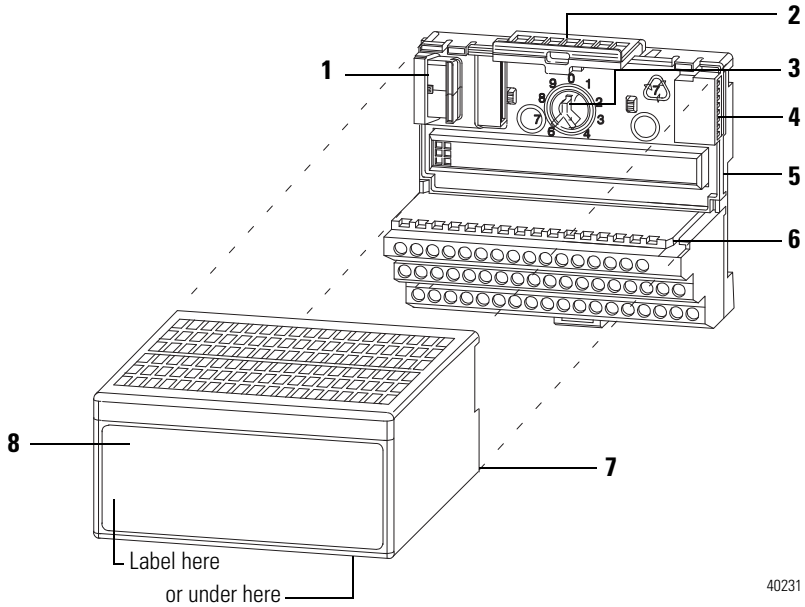
IMPORTANT	Make certain that the mounting plate is properly grounded to the panel. Refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

4. Hold the adapter at a slight angle and engage the top of the mounting plate in the indention on the rear of the adapter module.
5. Press the adapter down flush with the panel until the locking lever locks.
6. Position the terminal base unit up against the adapter and push the female bus connector into the adapter.
7. Secure to the wall with two #6 self-tapping screws.
8. Repeat for each remaining terminal base unit.

Mount the Analog Modules on the Terminal Base Unit

The HART analog input and output modules mounts on a 1794-TB3 or 1794-TB3S terminal base unit.

1. Rotate keyswitch on terminal base unit clockwise to position 3 for the 1794-IF8IH/1794-IF8IHNFXT modules or position 4 for the 1794-OF8IH as required for each type of module.
   Do not change the position of the keyswitch after wiring the terminal base unit.



	Description		Description
1	Flexbus connector	5	Base unit
2	Latching mechanism	6	Alignment groove
3	Keyswitch	7	Alignment bar
4	Cap plub	8	Module

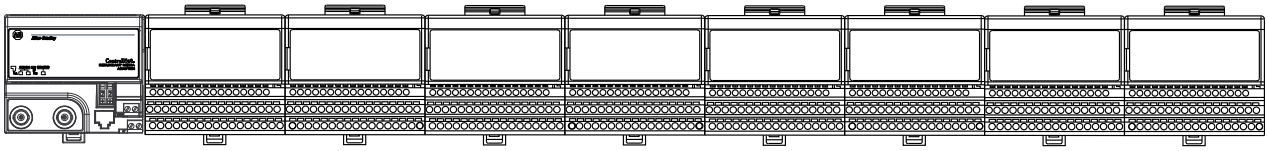
2. Make certain the flexbus connector is pushed all the way to the left to connect with the neighboring terminal base/adapter.
   You cannot install the module unless the connector is fully extended.

3. Make sure the pins on the bottom of the module are straight so they will align properly with the connector in the terminal base unit.

4. Position the module with its alignment bar aligned with the groove on the terminal base.

5. Press firmly and evenly to seat the module in the terminal base unit.
   The module is seated when the latching mechanism is locked into the module.

6. Remove cap plug and attach another terminal base unit to the right of this terminal base unit if required.
   Make sure the last terminal base has the cap plug in place.



IMPORTANT	The adapter is capable of addressing eight modules. Do not exceed a maximum of eight terminal base units in your system.

Wire the Terminal Base Units

Wiring the FLEX I/O HART analog input modules is done using the 1794-TB3 or the 1794-TB3S terminal base unit.

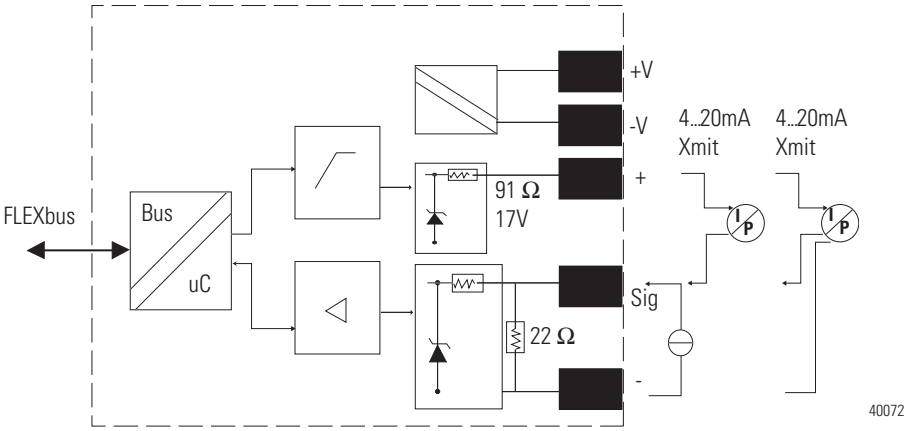
ATTENTION: The FLEX I/O analog modules do not receive primary operational power from the backplane. +24V DC power must be applied to your module before operation. If power is not applied, the module position will appear to the adapter as an empty slot in your chassis. If the adapter does not recognize your module after installation is completed, cycle power to the adapter.

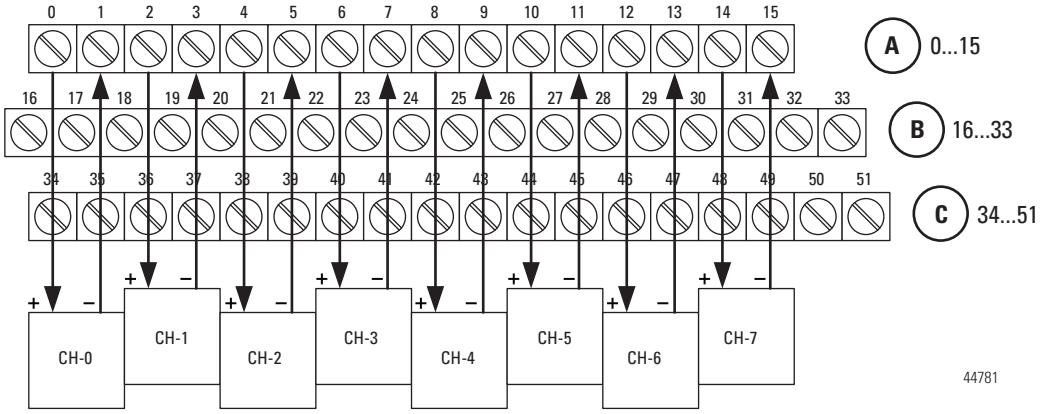
Connect Wiring to the FLEX I/O HART Analog Modules

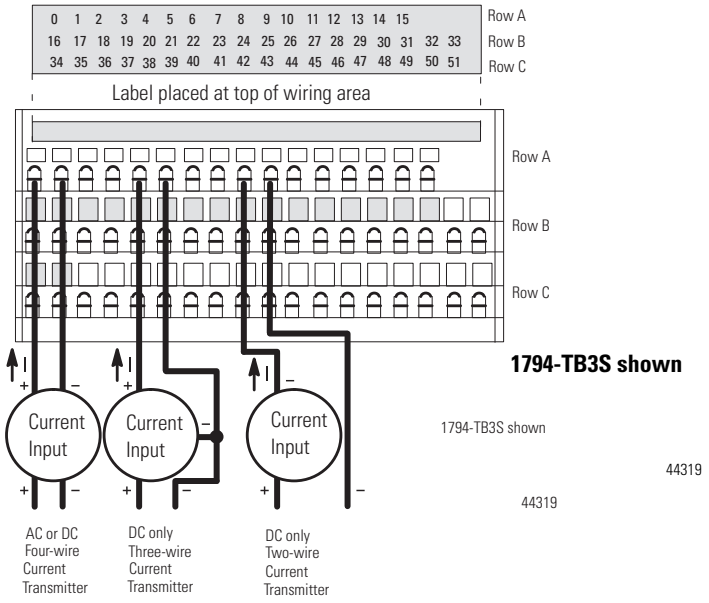
Each 1794-IF8IH and IF8IHNFXT input can be operated from an analog field device signal, and each 1794-OF8IH output channel can operate an analog field device.

IMPORTANT	When interconnecting several lines, you must consider the total accumulated power.

Connections for the 1794-IF8IH and 1794-IF8IHNFXT HART Analog Input Modules on a 1794-TB3S Terminal Base Unit





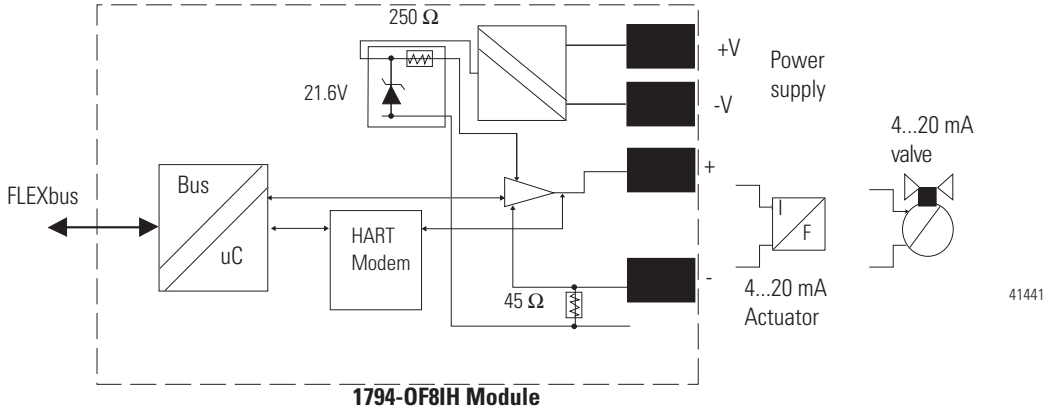


For Two-wire Transmitter Devices:

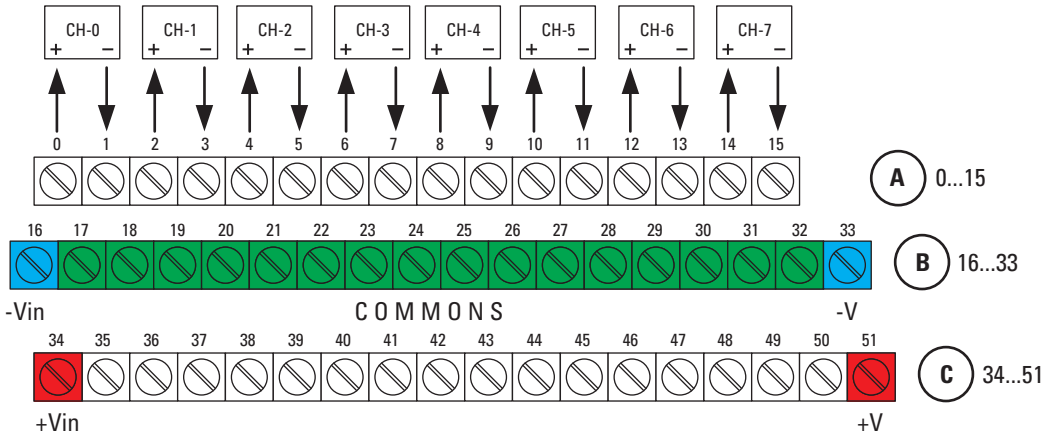
1. Connect the individual input wiring to terminal pairs (0/1) (2/3) (4/5) (6/7) (8/9), (10/11), (12/13), (14/15) .
2. Connect +V DC power to terminal 34 on the 34...51 row (C).
3. Connect -V to terminal 35 on the 34...51 row (C).
4. If continuing power to the next terminal base unit, connect a jumper from terminal 50 (+V DC) on this base unit to +V DC power terminal on the next terminal base unit.
5. If continuing common to the next terminal base unit, connect a jumper from terminal 51 (-V common) on this base unit to the -V common terminal on the next terminal base unit.

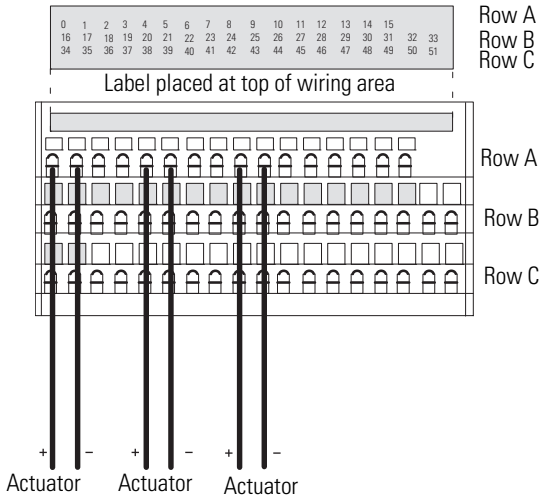
ATTENTION: Do not use the unused terminals on the terminal base unit. Using these terminals as supporting terminals can result in damage to the module and/or unintended operation of your system.

Connections for the 1794-OF8IH HART Analog Output Module on a 1794-TB3 or 1794-TB3S Terminal Base Unit



1794-OF8IH Module





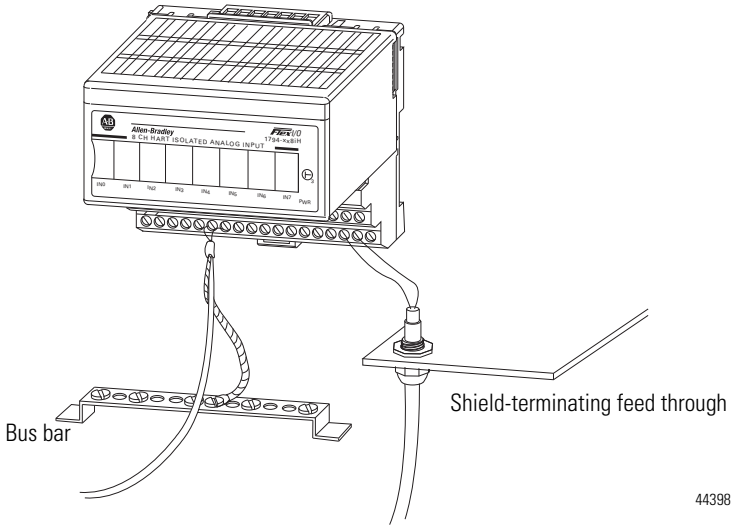
1794-TB3S shown

ATTENTION: Do not use the unused terminals on the terminal base unit. Using these terminals as supporting terminals can result in damage to the module and/or unintended operation of your system.

1. Connect the individual input wiring to terminal pairs (0/1), (2/3), (4/5), (6/7), (8/9), (10/11), (12/13), (14/15).
2. Connect +V DC power to terminal 34 on the 34...51 row (C).
3. Connect -V to terminal 35 on the 34...51 row (C).
4. If continuing power to the next terminal base unit, connect a jumper from terminal 50 (+V DC) on this base unit to +V DC power terminal on the next terminal base unit.
5. If continuing common to the next terminal base unit, connect a jumper from terminal 51 (-V common) on this base unit to the -V common terminal on the next terminal base unit.

Ground the Module

All I/O wiring must use shielded wire. Shields must be terminated external to the module, such as bus bars and shield-terminating feed throughs.



Chapter Summary

In this chapter, we told you how to install your input module in an existing programmable controller system and how to wire to the terminal base units.

Go to the next chapter to learn about input, output and configuration files for HART analog I/O modules on ControlNet and EtherNet/IP networks.

Configuration

Overview

This section provides descriptions of the different configuration parameters for your FLEX I/O HART modules.

IMPORTANT Configuring the 1794-IF8IH and 1794-OF8IH modules require RSLogix 5000 version 17 or later. See the following sections for configuring your modules:

- Use the 1794-IF8IH Module with the Generic Profile on page 119
- Use the 1794-OF8IH Module with the Generic Profile on page 159

IMPORTANT Configuring the 1794-IF8IHNFXT module requires Logix Designer[1] version 24 or later. See Edit Your 1794-IF8IHNFXT Configuration with Logix Designer (Full Profile) on page 76 for information on how to configure the 1794-IF8IHNFXT module with Logix Designer.

If you are using RSLogix 5000 version 23 or earlier, you can use the thin and generic profiles to configure your module, see Use the 1794-IF8IHNFXT with the Generic and Thin Profiles on page 135.

(1) The Logix Designer application is the rebranding of RSLogix 5000 software.

See the table for a list of where to find specific information in this chapter.

Data Transfer Types

The modules make use of three data transfer modes that will be supported by the FLEX I/O Adapter.

The first mode is traditional real time data transfer called Cyclic Data Transfer (CDT). This class 1 connection continuously transfers 16 words maximum, composed of Input, Output, and Configuration registers. CDT will be used for standard Analog data transfers.

The second mode of data transfer makes use of the Cyclic EDT mode. Cyclic EDT will be used for continuous Class 1 transfer of HART data. This includes the first four dynamic HART Data variables, along with standard HART status information.

The third mode of data transfer uses EDT for HART pass-through Class 3 Messages. HART pass-through messages can be initiated from a number of sources, and are non-periodic. This allows the HART pass-through messages from the HART Foundation Server, and other third party sources.

1794-IF8IH and 1794-IF8IHNFXT I/O Profiles

All Allen-Bradley FLEX I/O modules have a sixteen word table of Real Time Data (RTD) to be transferred between the controller and the I/O module. Not all 16 words need be allocated. The 1794-IF8IH and 1794-IF8IHNFXT modules have the following RTD IO Profile:

1794-IF8IH RTD I/O Profile

RTD Index	Assembly/Index	Asembly
RTD 0	MSW	Module Status Word
RTD 1	EDT Read Word	EDT Read Word
RTD 2…9	I:0…I:7	RTD Input Data
RTD 10…14	S:0…14	RTD Status Data
RTD 15	EDT Write Word	EDT Write Word

In addition to the RTD, the module uses EDT for Configuration and HART data. The 1794-IF8IH and 1794-IF8IHNFXT modules have the following EDT IO Profiles:

1794-IF8IH EDT I/O Profile

Number of Word	EDT Assembly
42	EDT Configuration Data
98	Cyclic EDT HART Input Data (Accessed in eight 24 byte Assemblies)
48	EDT Output Pass-Through message request buffer A

1794-IF8IHNFXT EDT IO Profile

Number of Word	EDT Assembly
106	EDT Configuration Data
98	Cyclic EDT HART Input Data (Accessed in eight 24 Assemblies)

Configuration Parameters for 1794-IF8IH

The configuration parameters for 1794-IF8IH module is shown in the following table. These are normal module configuration items and are sent to the module. Configuration is located at EDT assembly 37. The last row of the following table gives a brief explanation of each configuration parameter bit.

1794-IF8IH Configuration Data Table

Word	Bit															
	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
0	R	R	F7	F6	F5	F4	BOB(1)		R	R	F3	F2	F1	F0	BOA(1)	
1	DH7	DH6	DH5	DH4	DH 3	DH2	DH1	DH0	Reserved(2)							
2	CH 3 Format				CH 2 Format				CH 1 Format				CH 0 Format			
3	CH 7 Format				CH 6 Format				CH 5 Format				CH 4 Format			
4	CH1 HART Current Ratio					FLTR1			CH0 HART Current Ratio					FLTR0		
5	CH3 HART Current Ratio					FLTR3			CH2 HART Current Ratio					FLTR2		
6	CH5 HART Current Ratio					FLTR5			CH4 HART Current Ratio					FLTR4		
7	CH7 HART Current Ratio					FLTR7			CH6 HART Current Ratio					FLTR6		
8	Reserved															
9	CH0 High Alarm threshold															
10	CH0 Low Alarm threshold															
11	CH0 Remote High High Alarm Limit															
12	CH0 Remote Low Low Alarm Limit															
13…16	Words 9…12 for Channel 1															
17…20	Words 9…12 for Channel 2															
21…24	Words 9…12 for Channel 3															
25…28	Words 9…12 for Channel 4															
29…32	Words 9…12 for Channel 5															
33…36	Words 9…12 for Channel 6															
37…40	Words 9…12 for Channel 7															
41	Reserved								C7	C6	C5	C4	C3	C2	C1	C0
Where:	BOA = Byte Order Group A BOB = Byte Order Group B Note: Byte order group A and B values must match each other. See the table Byte Order on page 32.															
	FLTRn = Channel n Digital Filter. See the table 1794-IF8IH Channel Digital Filter on page 35.															
	Fn = Fault mode channel. 0: Local/Remote Faults disabled; 1: Enabled.															
	CHn HART Current Ratio = HART current ratio limiti on Channel n. Valid values are 0, or 5…31 percent of full scale. A value of 0 disables this feature. See table 1794-IF8IH HART Current Ratio on page 51 for more information.															
	DHn = Disable HART communication on Channel n. 0: HART communications enabled; 1: HART communications disabled.															
	Cn = HART Data Publishing Disable for Channel n. 0: HART Data Publishing Disable enabled; 1: HART Data Publishing Disable disabled.															
	R = Reserved.															
	CH N format = Data format for Channel n. See table 1794-IF8IH Channel Data Formats on page 38.															

(1) Not shown or used in the RSLogix 5000 software.

(2) Reserved data may not be shown in certain controller software.

After looking at the configuration tables, see also Configuration Parameter Descriptions for 1794-IF8IH and 1794-IF8IHNFXT on page 32 for a detailed description of the configuration parameter bits.

Configuration Parameters for 1794-IF8IHNFXT

The last row of the following table gives a brief explanation of each configuration bit. See also, Configuration Parameter Descriptions for 1794-IF8IH and 1794-IF8IHNFXT on page 32, for a more detailed description of the configuration bits.

1794-IF8IHNFXT Configuration Data Table

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	R	R	F7	F6	F5	F4	BOB[1]		R	R	F3	F2	F1	F0	BOA[1]	
1	DH7	DH6	DH5	DH4	DH3	DH2	DH1	DH0	Reserved							
2	CH 3 Format				CH 2 Format				CH 1 Format				CH 0 Format			
3	CH 7 Format				CH 6 Format				CH 5 Format				CH 4 Format			
4	HART_Ilimit_CH1					FLTR1			HART_Ilimit_CH0					FLTR0		
5	HART_Ilimit_CH3					FLTR3			HART_Ilimit_CH2					FLTR2		
6	HART_Ilimit_CH5					FLTR5			HART_Ilimit_CH4					FLTR4		
7	HART_Ilimit_CH7					FLTR7			HART_Ilimit_CH6					FLTR6		
8	CH0 High Alarm Threshold															
9	CH0 Low Alarm Threshold															
10	CH0 Remote High High Alarm Limit															
11	CH0 Remote Low Low Alarm Limit															
12	CH0 PvDampingValue (32 bit, Floating Point, LowWord)															
13	CH0 PvDampingValue (32-bit Floating Point, HighWord)															
14	CH0 PvUpperRange (32-bit Floating Point, LowWord)															
15	CH0 PvUpperRange (32-bit Floating Point, HighWord)															
16	CH0 PvLowerRange (32-bit Floating Point, LowWord)															
17	CH0 PvLowerRange (32-bit Floating Point, HighWord)															
18	Reserved								CH0 PV Range Units Code							
19	Unused															
20…31	Words 8…19 for channel 1															
32…43	Words 8…19 for channel 2															
44…55	Words 8…19 for channel 3															
56…67	Words 8…19 for channel 4															
68…79	Words 8…19 for channel 5															
80…91	Words 8…19 for channel 6															
92…103	Words 8…19 for channel 7															
104	Reserved								C7	C6	C5	C4	C3	C2	C1	C0
105	ER7	ER6	ER5	ER4	ER3	ER2	ER1	ER0	ED7	ED6	ED5	ED4	ED3	ED2	ED1	ED0
Where:	BOA = Byte Order Group A BOB = Byte Order Group B Byte order group A and B values must match each other. See Byte Order (Configuration Word 0 – bits 0…1, 8…9) on page 32 for more information.															
	FLTRn = Channel n Digital Filter. See table 1794-IF8IH Channel Digital Filter on page 35 and 1794-IF8IHNFXT Channel Digital Filter on page 36.															
	Fn = Fault mode Channel n. 0: Local / Remote faults disabled; 1: Enabled.															
	HART_Ilimit_CHn = HART Loop Tolerance Error Limit for Channel n. Defines comparison limit for HART current loop to ADC compare. Valid values are 0, or from 5 to 31 percent of full scale. A value of zero disables this feature. Full scale is defined as the difference between the normal high scale and the normal low. Example: 4..20 mA: 20 - 4 = 16. 5% of 16 is 0.8 mA. Example: 4..20 mA: 20 - 0 = 20. 5% of 20 is 1.0 mA.															
	DHn = Disable HART communication on Channel n. 0: HART communications enabled; 1: HART communications disabled.															
	Cn = HART Data Publishing Disable for Channel n. 0: HART Data Publishing Disable enabled; 1: HART Data Publishing Disable disabled.															
	EDn = Enable HART PV Damping Value for Channel n. 0: True; 1: False.															
	ERn = Enable HART PV Upper and Lower Range for Channel n. 0: True; 1: False.															
	R = Reserved.															
	CH N Format = Data format for Channel n. See table 1794-IF8IHNFXT Channel Data Formats on page 39 and Data Format (Configuration Words 2, 3 – bits 0…3, 4…7, 8…11, 12…15) on page 37..															
	CHn PVDampingValue = 32-bit Float (per channel) value used in HART Cmd 34 to set the device's PV (primary value) damping value.															
	CHn PV Range Units Code = 8-bit unsigned (per channel) PV Range Units Code used in HART Command 35. This value specifies the "Units Code" for the Upper and Lower Range value configuration parameters and also supplies the value for command 44. This value is required by Command 35 to inform the device what units the Upper and Lower range values being sent in Command 35 are in. Command 35 does not change the PV units of the device. Command 44 is automatically sent by the module if the module detects that the PV Units code of the device does not match the parameter in the configuration table.															
	CHn PvUpperRange = 32-bit Float (per channel) specifies the value for the PV Upper Range value used in HART Cmd 35 to set the device PV Upper Range Value.															
	CHn PvLowerRange = 32-bit Float (per channel). Specifies the value for the PV Upper Range value used in HART Cmd 35 to set the device PV Upper Range Value.															

(1) Not shown in RSLogix 5000 software.

Configuration Parameter Descriptions for 1794-IF8IH and 1794-IF8IHNFXT

This following sections describe in detail each configuration parameter included in the tables:

- 1794-IF8IH Configuration Data Table on page 29
- 1794-IF8IHNFXT Configuration Data Table on page 31

These parameter descriptions apply to both 1794-IF8IH and 1794-IF8IHNFXT modules, unless otherwise specified.

Byte Order (Configuration Word 0 – bits 0…1, 8…9)

This setting selects the byte order of module's data. Note: The MSW and EDT words (Words 0, 1 and 15) of the Primary Input Data Table are not swapped. All other Primary Input Data and Configuration Data are adjusted according to the following chart.

Byte Order

Byte Order Group B		Byte Order Group A		
Bit 9	**Bit 8**	**Bit 1**	**Bit 0**	**Description**
0	0	0	0	Little Endian Format (default) — all data entries in true Little Endian format
1	0	1	0	Word Swap — word swap only values requiring more than one word, for example, 32 bit float values.
0	1	0	1	Byte Swap — byte swap all words in data table.
1	1	1	1	Big Endian Format — all data entries in true Big Endian format.

IMPORTANT Byte Order cannot be changed using RSLogix 5000 software. RSLogix 5000 uses the default Byte Swap setting.

The purpose of this parameter is to allow this module to operate properly within data networks or systems utilizing various byte orders, across all data types (for example, Boolean data to 32 bit float data). Upon receiving the configuration assembly the module must inspect BYTE ORDER to determine how to interpret the configuration assembly.

IMPORTANT RSLogix 5000 users will never need to configure the Byte Order bits. For non-RSLogix 5000 users, see the 1794-IF8IH Configuration Data Table on page 29 and 1794-IF8IHNFXT Configuration Data Table on page 31 on how to map the Byte Order bits.

Two sets of Byte Order bits are provided since the module will not know at powerup and configuration reception what Endian format the configuration data being received is in. No matter what the format, two bit sets will always convey correct information to the module. Both sets must match each other for the module to accept the configuration and begin processing it for operation. If the two sets do not match, the module will revert to the last valid configuration (in

case of original startup this would be default configuration) and set module Diagnostic Status to 2, configuration failure.

Reasoning for this configuration parameter: Within the CIP based Rockwell Automation control system all data is transported and utilized in Little Endian format. As such the default mode of operation for these modules will be Little Endian.

Since these modules are HART modules, and HART data is normally provided in Big Endian format, the module will be responsible for converting any HART in Big Endian format into Little Endian format.

Examples

In each of the following examples, the module operates internally with little Endian byte order.

Little Endian Byte Order

If BYTE ORDER indicates Little Endian, utilize the configuration assembly directly.

Partial Configuration Assembly as Received

1	Param A Ch2	Param B Ch2	Param A Ch1	Param B Ch1
2	Param C CH0 (2nd byte)		Param C CH0 (low byte)	
3	Param C CH0 (high byte)		Param C CH0 (3rd byte)	

Partial Configuration Assembly after BYTE ORDER Inspection and Processing

1	Param A Ch2	Param B Ch2	Param A Ch1	Param B Ch1
2	Param C CH0 (2nd byte)		Param C CH0 (low byte)	
3	Param C CH0 (high byte)		Param C CH0 (3rd byte)	

Provide all data to the Primary Data table in Little Endian byte order.
The following two tables are an example of the Primary Input Data, if BYTE ORDER indicated Little Endian.

Primary Input Data Before BYTE ORDER Processing for Little Endian

1	Ch2 Data A (REAL) (2nd byte)	Ch2 Data A (REAL) (low byte)
2	Ch2 Data A (REAL) (high byte)	Ch2 Data A (REAL) (3rd byte)
3	Ch2 Data C	Ch2 Data B

Primary Input Data After BYTE ORDER Processing for Little Endian

1	Ch2 Data A (REAL) (2nd byte)	Ch2 Data A (REAL) (low byte)
2	Ch2 Data A (REAL) (high byte)	Ch2 Data A (REAL) (3rd byte)
3	Ch2 Data C	Ch 2 Data B

Word Swap Byte Order

If BYTE ORDER indicates Word Swap, utilize the known structure of the configuration assembly to re-order multi-word data elements to Little Endian byte order, for example, word swap FLOATS.

Partial Configuration Assembly as Received

1	Param A Ch2	Param B Ch2	Param A Ch1	Param B Ch1
2	Param C CH0 (high byte)		Param C CH0 (3rd byte)	
3	Param C CH0 (2nd byte)		Param C CH0 (low byte)	

Partial Configuration Assembly after BYTE ORDER Inspection and Processing

1	Param A Ch2	Param B Ch2	Param A Ch1	Param B Ch1
2	Param C CH0 (2nd byte)		Param C CH0 (low byte)	
3	Param C CH0 (high byte)		Param C CH0 (3rd byte)	

Provide all data to the Primary Data table in Word Swap byte order, except the MSW and EDT words (Words 0, 1 and 15), these remain in Little Endian byte order.

The following tables are an example of the Primary Input Data, if BYTE ORDER indicated Word Swap.

Primary Input Data Before BYTE ORDER Processing for Little Endian

1	Ch2 Data A (REAL) (2nd byte)	Ch2 Data A (REAL) (low byte)
2	Ch2 Data A (REAL) (high byte)	Ch2 Data A (REAL) (3rd byte)
3	Ch2 Data C	Ch 2 Data B

Primary Input Data After BYTE ORDER Processing for Little Endian

1	Ch2 Data A (REAL) (high byte)	Ch2 Data A (REAL) (3rd byte)
2	Ch2 Data A (REAL) (2nd byte)	Ch2 Data A (REAL) (low byte)
3	Ch2 Data C	Ch 2 Data B

Fault Mode (Configuration Word 0, bits 2…5, 10…13)

Selects whether the channel fault detection for Local and Remote Alarms is enabled or disabled. This does not disable High and Low Alarms.

Range: 0=disable, 1=fault detection enabled (remote transmitter loop, wire off and overload or short circuit)
Default: 0

Digital Filter (Configuration Words 4…7 – bits 0…2, 8…10)

Digital filter for the channel. This parameter affects channel accuracy. See the following table.

Accuracy vs Filter Cutoff for 1794-IF8IH

Filter Cutoff	7[1]	6[1]	5	4	3	2	1	0 (Default)
Frequency	n/a	n/a	470 Hz	62 Hz	19.6 Hz	16.7 hz	10 Hz	4.17 Hz
Word Setting	n/a	n/a	101	100	011	010	001	000

(1) For settings of 6 and 7 the module will return a configuration error and remain in the last properly configured state.

Accuracy vs Filter Cutoff for 1794-IF8IHNFXT

Filter Cutoff	7	6	5	4	3	2	1	0 (Default)
Frequency	n/a[1]	4.17 Hz	10 Hz	16.7 Hz	19.6 Hz	62 hz	123 Hz	242 Hz
Word Setting	n/a	110	101	100	011	010	001	000

(1) Invalid or configuration error.

1794-IF8IH Channel Digital Filter[1]

Digital Filter frequency	Decimal Value	Bits		
		10	**9**	**8**
		2	**1**	**0**
470 Hz	0	0	0	0
62 Hz	1	0	0	1
19.6 Hz	2	0	1	0
16.7 Hz	3	0	1	1
10 Hz	4	1	0	0

1794-IF8IH Channel Digital Filter(1)

Digital Filter frequency	Decimal Value	Bits		
		10	9	8
		2	1	0
4.17 Hz	5	1	0	1
Not applicable	6	1	1	0
Not applicable	7	1	1	1

(1) Channel Digital Filters are represented by Words 4…7 (bits 8…10 and 0…2) in the 1794-IF8IH Configuration Data Table on page 29.

1794-IF8IHNFXT Channel Digital Filter(1)

Digital Filter frequency	Decimal Value	Bits		
		10	9	8
		2	1	0
242 Hz	0	0	0	0
123 Hz	1	0	0	1
62 Hz	2	0	1	0
19.6 Hz	3	0	1	1
16.7 Hz	4	1	0	0
10 Hz	5	1	0	1
4.17 Hz	6	1	1	0
Not applicable	7	1	1	1

(1) Channel Digital Filters for the 1794-IF8IHNFXT module are represented by Words 4…7 (bits 0…2, and 8…10) of the 1794-IF8IHNFXT Configuration Data Table on page 31.

ADC Conversion Rate, Channel Update Time and Repeatability

The following table shows the channel update time, channel settling time, repeatability, 50 Hz normal mode rejection and 60 Hz normal mode rejection for each A/D conversion rate. The repeatability is based on six-sigma RMS noise levels.

ADC Conversion Rate Effects for the 1794-IF8IH Module

A/D Conversion Rate	Channel Update Time	Channel Settling Time	50 Hz Rejection	60 Hz Rejection
4.17 Hz	240 ms	480 ms	70 dB	70 dB
10.0 Hz	100 ms	200 ms	65 dB	65 dB
16.7 Hz	60 ms	120 ms	75 dB	

ADC Conversion Rate Effects for the 1794-IF8IH Module

A/D Conversion Rate	Channel Update Time	Channel Settling Time	50 Hz Rejection	60 Hz Rejection
19.6 Hz	51 ms	101 ms		70 dB
62 Hz	16 ms	32 ms		
470 Hz	2 ms	4 ms		

ADC Conversion Rate Effects for the 1794-IF8IHNFXT Module

A/D Conversion Rate	Channel Update Time	Channel Settling Time	50 Hz Rejection	60 Hz Rejection
4.17 Hz	240 ms	480 ms	70 dB	70 dB
10 Hz	100 ms	200 ms	65 dB	65 dB
16.7 Hz	60 ms	120 ms	75 dB	
19.6 Hz	51 ms	101 ms		70 dB
62 Hz	16 ms	32 ms		
123 Hz	8 ms	17 ms		
242 Hz	4 ms	8 ms		

Data Format (Configuration Words 2, 3 – bits 0…3, 4…7, 8…11, 12…15)

Specifies the module data format. If they are selected, a configuration failure will be declared. The configuration is not accepted and the last valid configuration will be used.

Range: 0...15, See the following 1794-IF8IH and 1794-IF8IHNFXT data format tables.
Default: 0

1794-IF8IH Data Formats[(1)]

Data Format	Format	Resolution	Input Range	Module Data Processing	Data Table Value (Interpretation)	Count per mA/ Resolution
0	0…20 mA as mA	0.1% of 0…20 mA	0…22 mA	Datatable = 1000 (input)	0…22000 (0…22.000 mA)	1000/ 1.0 µA
1	0…20 mA as %	0.2% of 0…20 mA	0…22 mA	$\text{Datatable} = 10000 \left(\frac{\text{input}}{20}\right)$	0…11000 (0…110.00%)	500/2.0 µA
3	0…20 mA as unsigned integer	0.03% of 0…20 mA	0…20 mA	$\text{Datatable} = 65535 \left(\frac{\text{input}}{20}\right)$	0…65535 (0…20 mA)	3276/ 0.3052 µA

1794-IF8IH Data Formats(1)

Data Format	Format	Resolution	Input Range	Module Data Processing	Data Table Value (Interpretation)	Count per mA/ Resolution
4	4…20 mA as mA	0.1% of 4…20 mA	2…22 mA	Datatable = 1000 (input)	2000…22000 (2.000…22.000 mA)	1000/ 1.0 µA
5	4…20 mA as %	0.16% of 4…20 mA	2…22 mA	Datatable = 10000 $\left(\frac{\text{input-4}}{16}\right)$	-1250 … +11250 (2's complement) (-12.50% … +112.50%)	625/ 1.6 µA
7	4…20 mA as unsigned integer	0.03% of 4…20 mA	4…20 mA	Datatable = 65535 $\left(\frac{\text{input-4}}{16}\right)$	0…65535 (4…20 mA)	4095/ 0.2441 µA

(1) All other formats are invalid.

1794-IF8IH Channel Data Formats(1)

Format (2)	Bits				Format Name	Signal Range		User Range		Resolution
	15	14	13	12						
	11	10	9	8						
	7	6	5	4		LO	HI	LO	HI	
	3	2	1	0						
0	0	0	0	0	0…20 mA in Milliamps	0.00	22.00	0 (0.000 mA)	22000 (22.000 mA)	1.0 µA
1	0	0	0	1	0…20 mA in % Full Scale	0.00	22.00	0 (0%)	11000 (110.00%)	2.0 µA
3	0	0	1	1	0…20 mA in UINT	0.00	20.00	0	65535	0.3052 µA
4	0	1	0	0	4…20 mA in Milliamps	2.00	22.00	2000 (2.000 mA)	22000 (22.000 mA)	1.0 µA
5	0	1	0	1	4…20 mA in % Full Scale	2.00	22.00	-1250 (-12.50%)	11250 (112.50%)	1.6 µA
7	0	1	1	1	4…20 mA in UINT	4.00	20.00	0	65535	0.2441 µA

(1) Channel Data Formats for 1794-IF8IH are represented by Words 2 and 3 in the 1794-IF8IH Configuration Data Table on page 29.

(2) All other formats are invalid.

1794-IF8IHNFXT Data Formats(1)

Data Format	Format	Normal Signal Range		Normal User Range		Resolution
		LO	HI	LO	HI	
0	0…20 mA as mA	0.00	20.0	0	20000	1.0 µA
1	0…20 mA as %	0.00	20.0	0	10000	2.0 µA
3	0…20 mA as unsigned integer	0.00	20.0	0	65535	0.3052 µA
4	4…20 mA as mA	4.00	20.0	4000	20000	1.0 µA
5	4…20 mA as %	4.00	20.0	0	10000	1.6 µA
6	4 .. 20 mA Signed 2's Complement	4.00	20.0	0	30840	0.5188 µA

1794-IF8IHNFXT Data Formats[1]

Data Format	Format	Normal Signal Range		Normal User Range		Resolution
		LO	HI	LO	HI	
7	4…20 mA as unsigned integer	4.00	20.0	0	65535	0.2441 µA

(1) All other formats are invalid.

1794-IF8IHNFXT Data Formats Full Reporting Range

Data Format	Format	0.0 mA	2.0 mA	4.0 mA	20.0 mA	21.0 mA	22.0 mA
0	0…20 mA as mA	0	2000	4000	20000	21000	22000
1	0…20 mA as %	0	1000	2000	10000	10500	11000
3	0…20 mA as unsigned integer	0	6554	13107	65535	65535[2]	65535[2]
4	4…20 mA as mA	2000[2]	2000	4000	20000	21000	22000
5	4…20 mA as %	-1250[2]	-1250	0	10000	10625	11250
6	4 .. 20 mA Signed 2's Complement[1]	-7710	-3855	0	30840	32767	32767[2]
7	4…20 mA as unsigned integer	0[2]	0[2]	0	65535	65535[2]	65535[2]

(1) This 4…20 mA format is different from all the other 4…20 mA formats in that it continues to report values all the way down to 0 mA while the other 4…20 mA formats stop reporting @ 2 mA (except for binary which stops @ 4 mA). In addition, this 4…20 mA format will not force the input value to the Minimum Scale value on an open circuit or short circuit condition.

(2) These values are under or over the supported user range and are clamped at the lowest/highest supported values.

1794-IF8IHNFXT Channel Data Formats[1]

Format	Bits				Format Name	Signal Range		User Range		Resolution
	15	14	13	12						
	11	10	9	8						
	7	6	5	4		LO	HI	LO	HI	
	3	2	1	0						
0	0	0	0	0	0…20 mA in Milliamps	0.00	20.00	0 (0.000 mA)	20000 (20.000 mA)	1.0 µA
1	0	0	0	1	0…20 mA in % Full Scale	0.00	20.00	0 (0%)	10500 (105.00%)	2.0 µA
3	0	0	1	1	0…20 mA in UINT	0.00	20.00	0	65535	0.3052 µA
4	0	1	0	0	4…20 mA in Milliamps	4.00	20.00	4000 (4.000 mA)	20000 (20.000 mA)	1.0 µA
5	0	1	0	1	4…20 mA in % Full Scale	4.00	20.00	0	10000 (100.00%)	1.6 µA
6	0	1	1	0	4…20 mA Signed 2's Complement	4.00	20.00	0	30840	0.5188 µA
7	0	1	1	1	4…20 mA in UINT	4.00	20.00	0	65535	0.2441 µA

(1) Channel Data Formats are represented by Words 2 and 3 in the 1794-IF8IHNFXT Configuration Data Table on page 31.

Remote Low Low Alarm Limit

This bit parameter exists on both 1794-IF8IH and 1794-IF8IHNFXT configuration but have different configuration word number assignations in the Configuration Data Table. See Data Table Reference below.

Sets the limit for the Remote Fault Low Low alarm. This affects Data Formats 0...7. Steps apply to the 4...20 mA range.

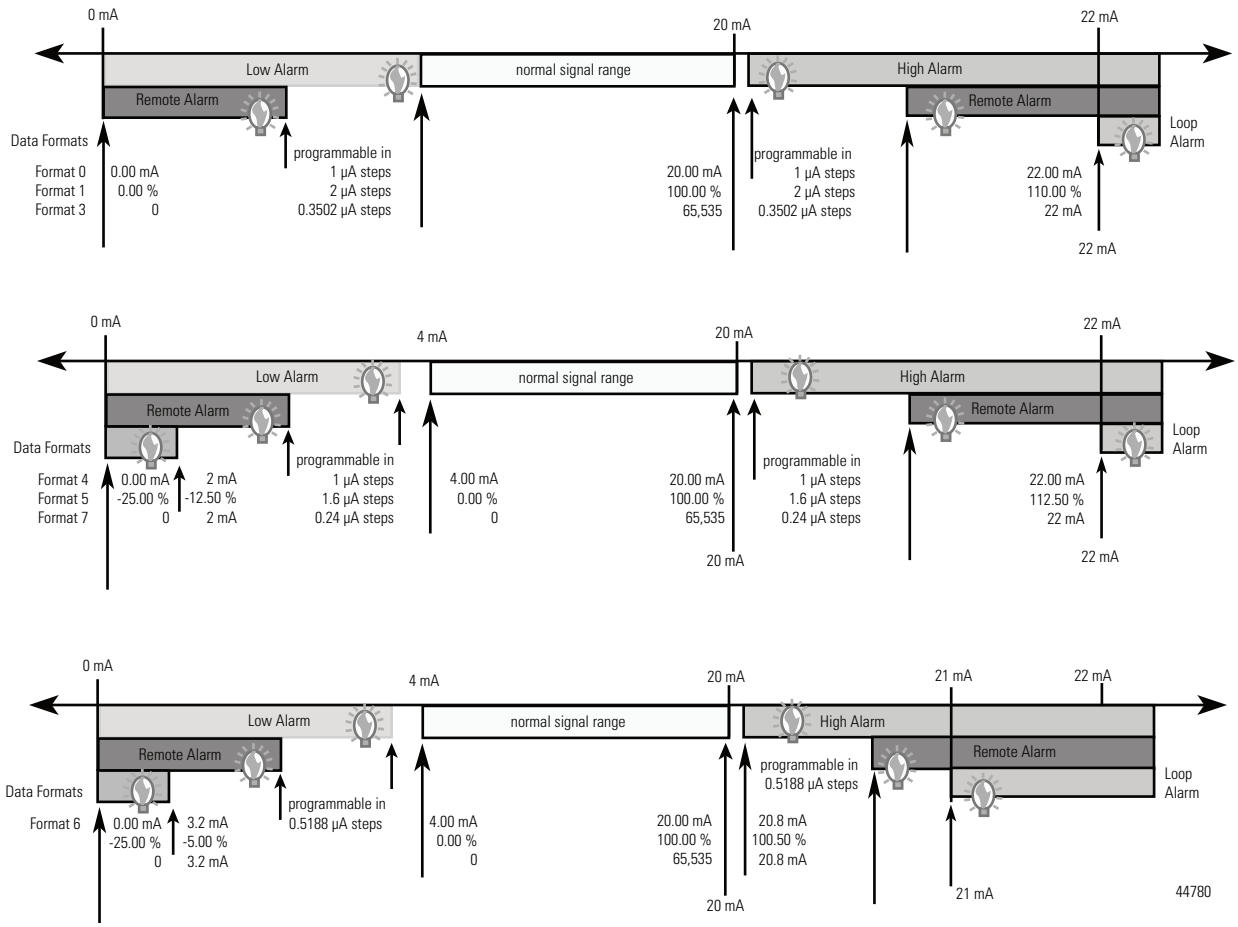
For example, a value of 3600 will cause a Remote Fault Low Low Alarm below 3.6 mA (3600*1 µA=3.6 mA).

Range: 0...22000 (0=disabled, 1*1 µA to 22000*1 µA)
Default: 0=disabled

Data Table Reference for 1794-IF8IH: Remote Low Low Alarm Limit, Configuration Words 12, 16, 20, 24, 28, 32, 36 and 40, bits 0...15

Data Table Reference for 1794-IF8IHNFXT: Remote Low Low Alarm Limit, Configuration Words 11, 23, 35, 47, 59, 71, 83, 95, bits 0...15

Data Formats and Error Ranges



Remote High High Alarm Limit

This bit parameter exists on both 1794-IF8IH and 1794-IF8IHNFXT configurations but have different configuration word number assignations in the Configuration Data Table. See Data Table Reference below.

This parameter sets the limit for the Remote Fault High High Alarm. This affects Data Formats 0...7. Steps apply to the 4...20 mA range and 0...20 mA range.

For example, a value of 20400 will cause a Remote Fault High High Alarm above 20.4 mA (20400*1 µA = 20.4 mA).

Range: 0...22000 (0=disabled, 1*1 µA to 22000*1 µA)
Default: 0=disabled

Data Table Reference for 1794-IF8IH: Remote High High Alarm Limit, Configuration Words 11, 15, 19, 23, 27, 31, 35 and 39, bits 0...15

Data Table Reference for 1794-IF8IHNFXT: Remote High High Alarm Limit, Configuration Words 10, 22, 34, 46, 58, 70, 82, and 94, bits 0...15

Low Alarm Limit

This bit parameter exists on both 1794-IF8IH and 1794-IF8IHNFXT configurations but have different configuration word number assignations in the Configuration Data Tables. See Data Table Reference below.

This parameter sets the limit for the Low Alarm. This affects Data Formats 0...7. Steps apply to the 4...20 mA range.

For example, a value of 4000 will cause an Low Alarm below 4.0 mA (4000*1 μA = 4 mA).

Range: 0...22000 (0=disabled, 1*1 μA to 22000*1 μA)
Default: 0=disabled

Data Table Reference for 1794-IF8IH: Low Alarm Limit, Configuration Words 10, 14, 18, 22, 26, 30, 34 and 38, bits 0...15

Data Table Reference for 1794-IF8IHNFXT: Low Alarm Limit, Configuration Words 9, 21, 33, 45, 57, 69, 81, 93, bits 0...15

High Alarm Limit

This bit parameter exists on both 1794-IF8IH and 1794-IF8IHNFXT configurations but have different configuration word number assignations in the Configuration Data Tables. See Data Table Reference below.

This parameter sets the limit for the High Alarm. This affects Data Formats 0...7. Steps apply to the 4...20 mA range and 0...20 mA range.

For example, a value of 20000 will cause an High Alarm above 20.0 mA (20000*1 μA = 20 mA).

Range: 0...22000 (0=disabled, 1*1 μA to 22000*1 μA)
Default: 0=disabled

Data Table Reference for 1794-IF8IH: High Alarm Limit, Configuration Words 9, 13, 17, 21, 25, 29, 33 and 37, bits 0...15

Data Table Reference for 1794-IF8IHNFXT: High Alarm Limit, Configuration Words 8, 20, 32, 44, 56, 68, 80, 97, bits 0...15

HART Disable Channel 0…7 (Configuration Word 1 – bits 8…15)

When this bit is set, the I/O module inhibits HART Communication.

Range: 0= enable, 1= disable
Default: 0

HART Current Fault Limit (Configuration Words 4…7 – bits 3…7, 11…15)

This bit parameter applies to 1794-IF8IHNFXT only.

Delivers the percentage value (in steps of 1%, starting @ 5%) of the threshold for causing a HART current fault indication (input signal deviation HART/ Analog) = 31% maximum deviation.

If there is no HART transmitter on the loop or the loop is not in the transmitter list the function is switched off internally in the I/O module.

Range: 0=disabled, 1...4= not supported by the I/O module. A configuration request of 1...4 will cause a value of 5 to be utilized by the module.
5...31= percentage threshold data (5...31%).

Default: 0

HART Data Publishing Disable

This bit parameter exists on both 1794-IF8IH and 1794-IF8IHNFXT configurations but have different word number assignations in the Configuration Data Table. See Data Table Reference below.

This bit disables the I/O channel from forwarding the associated HART Command 3 information from the HART Field device through Cyclic EDT to the adapter.

This does not disable the module from gathering HART Command 3 information from the HART Field device. As such, HART Command 3 information from the HART Field device is still available via an unconnected message to the module.

When the adapter powers up, it reads each module to find out which modules are present in the flexbus. For EDT modules it reads Assembly 125 to gain knowledge of all the assemblies the module has, whether they are EDT/CEDT and whether they are GET/SET. If an assembly is a CEDT assembly, the adapter

automatically creates a CEDT entry and drops it into the EDT machine to gather/send this assembly and store the assembly locally in the adapter.

Sometime later, a ForwardOpen configuration arrives by the network for the module. The adapter proxy strips off a portion (Configuration Part 1) and sends the rest (Configuration Part 2) on through EDT to the module. Within this module configuration part are the CMD3 Disable Chx bits. These bits instruct the module to include or not include CMD3 scanning in the work for the channel. Users may not have HART devices on every channel so some channels may want CMD3 disabled. If scanning is disabled, the module also disables the adapter from including that particular associated assembly in the CEDT scanning routine by the method described below.

The module uses the CMD3 Disable Chx bits to adjust the CEDT entries in Assembly 125. Initially, the Assembly 125 CEDT assemblies (46...53) are identified as CEDT (0xC0 Cyclic EDT Get or 0x40 Cyclic EDT Set). This causes the adapter to add them to the CEDT scan. If the module receives a configuration with CMD3 Disable CHx bits set to "1" (disable), the module changes the appropriate channel's Assembly 125 entry from 0xC0 Cyclic EDT Get to 0x80 EDT Get or 0x40 Cyclic EDT Set to 0x00 EDT Set.

Whenever the adapter receives a ForwardOpen to an EDT module, the adapter automatically rereads the module's Assembly 125 to gain a new view of the assemblies. This reread is to check for any changes of CEDT Assemby status to EDT status. If a CMD3 Disable Chx was received on any particular channel, now the previous CEDT assembly is marked as an EDT assembly and the adapter will not add that assembly to his CEDT scan. This ForwardOpen reread will happen any time a module receives a ForwardOpen, including a Null-ForwardOpen received during system runtime.

Range: 0 = enabled, 1 = disabled
Default: 0

Data Table Reference for 1794-IF8IH: HART Data Publishing Disable (Cn) Configuration Word 41 – bits 0...7

Data Table Reference for 1794-IF8IHNFXT: HART Data Publishing Disable (Cn) Configuration Word 104 – bits 0...7

Enable HART PV Upper and Lower Range (Configuration Word 105, bits 8...15)

This configuration bit applies only to the 1794-IF8IHNFXT module only.

This bit enables the PV Upper and Lower Range (HART Command 35) values.

See Auto-configure HART Device with user-supplied PV Damping and Range Values on page 86 for more information.

Range: 0 = true, 1 = false
Default: 0

Enable HART PV Damping Value (Configuration Word 105, bits 0…7)

This configuration bit applies to the 1794-IF8IHNFXT module only.

When this bit is set, it automatically configures a HART device with user-supplied PV (Primary Value) Damping by sending HART Command 34 to the device at the time of device connection.

See Auto-configure HART Device with user-supplied PV Damping and Range Values on page 86 for more information.

Range: 0 = true, 1 = false
Default: 0

Primary Input Data (RTD Input Data) for 1794-IF8IH and 1794-IF8IHNFXT

Primary Input Data for 1794-IF8IH

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Channel 0 Input Data															
1	Channel 1 Input Data															
2	Channel 2 Input Data															
3	Channel 3 Input Data															
4	Channel 4 Input Data															
5	Channel 5 Input Data															
6	Channel 6 Input Data															
7	Channel 7 Input Data															
8	H7	H6	H5	H4	H3	H2	H1	H0	L7	L6	L5	L4	L3	L2	L1	L0
9	R7	R6	R5	R4	R3	R2	R1	R0	P7	P6	P5	P4	P3	P2	P1	P0
10	Reserved								Diagnostic Status							
11	C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0
12	X7	X6	X5	X4	X3	X2	X1	X0	Reserved							

Where:
Hn: Channel n High Alarm
Ln : Channel n Low Alarm
Rn : Channel n Out of Range Alarm
Pn : Channel n Second (Remote) Alarm
Fn : Channel n HART Failure
Cn : Channel n HART Current Fault
Xn : Channel n HART Transmitter Present

Primary Input Data for 1794-IF8IHNFXT

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Channel 0 Input Data															
1	Channel 1 Input Data															
2	Channel 2 Input Data															
3	Channel 3 Input Data															
4	Channel 4 Input Data															
5	Channel 5 Input Data															
6	Channel 6 Input Data															
7	Channel 7 Input Data															
8	H7	H6	H5	H4	H3	H2	H1	H0	L7	L6	L5	L4	L3	L2	L1	L0
9	R7	R6	R5	R4	R3	R2	R1	R0	P7	P6	P5	P4	P3	P2	P1	P0
10	X7	X6	X5	X4	X3	X2	X1	X0	Diagnostic Status							
11	C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0

Where:
Hn: Channel n High Alarm
Ln : Channel n Low Alarm
Rn : Channel n Out of Range Alarm
Pn : Channel n Second (Remote) Alarm
Fn : Channel n HART Failure
Cn : Channel n HART Current Fault
Xn : Channel n HART Transmitter Present

Primary Input Data (Input Words 0…7 – bits 0…15)

Specifies the value of the input data from the module. Specific format is controlled by module Data Format Control parameter.

Range: Refer to Data Format (8 of 4 bits) on page 37.

Module Diagnostic Status (Input Word 10 – bits 0…7)

Response from module on its condition.

Diagnostic Status for 1794-IF8IH and 1794-IF8IHNFXT

Diagnostic Status Value: 0	Channel	Failure
0x00	All	No Errors (default)
0x10	Channel 0	HART Iloop Threshold Configuration Error
0x11	Channel 1	HART Iloop Threshold Configuration Error
0x12	Channel 2	HART Iloop Threshold Configuration Error
0x13	Channel 3	HART Iloop Threshold Configuration Error
0x14	Channel 4	HART Iloop Threshold Configuration Error

Diagnostic Status for 1794-IF8IH and 1794-IF8IHNFXT

Diagnostic Status Value: 0	Channel	Failure
0x15	Channel 5	HART Iloop Threshold Configuration Error
0x16	Channel 6	HART Iloop Threshold Configuration Error
0x17	Channel 7	HART Iloop Threshold Configuration Error
0x20	Channel 0	Remote/Local Alarm Configuration Error
0x21	Channel 1	Remote/Local Alarm Configuration Error
0x22	Channel 2	Remote/Local Alarm Configuration Error
0x23	Channel 3	Remote/Local Alarm Configuration Error
0x24	Channel 4	Remote/Local Alarm Configuration Error
0x25	Channel 5	Remote/Local Alarm Configuration Error
0x26	Channel 6	Remote/Local Alarm Configuration Error
0x27	Channel 7	Remote/Local Alarm Configuration Error
0x30	Channel 0	High/Low Alarm Configuration Error
0x31	Channel 1	High/Low Alarm Configuration Error
0x32	Channel 2	High/Low Alarm Configuration Error
0x33	Channel 3	High/Low Alarm Configuration Error
0x34	Channel 4	High/Low Alarm Configuration Error
0x35	Channel 5	High/Low Alarm Configuration Error
0x36	Channel 6	High/Low Alarm Configuration Error
0x37	Channel 7	High/Low Alarm Configuration Error
0x40	Channel 0	Format Configuration Error
0x41	Channel 1	Format Configuration Error
0x42	Channel 2	Format Configuration Error
0x43	Channel 3	Format Configuration Error
0x44	Channel 4	Format Configuration Error
0x45	Channel 5	Format Configuration Error
0x46	Channel 6	Format Configuration Error
0x47	Channel 7	Format Configuration Error
0x50	Channel 0	ADC Filter Configuration Error
0x51	Channel 1	ADC Filter Configuration Error
0x52	Channel 2	ADC Filter Configuration Error
0x53	Channel 3	ADC Filter Configuration Error
0x54	Channel 4	ADC Filter Configuration Error
0x55	Channel 5	ADC Filter Configuration Error
0x56	Channel 6	ADC Filter Configuration Error
0x57	Channel 7	ADC Filter Configuration Error

Diagnostic Status for 1794-IF8IH and 1794-IF8IHNFXT

Diagnostic Status Value: 0	Channel	Failure
0x70[1]	Channel 0	PV Configuration Enable selected with HART Disabled
0x71[1]	Channel 1	PV Configuration Enable selected with HART Disabled
0x72[1]	Channel 2	PV Configuration Enable selected with HART Disabled
0x73[1]	Channel 3	PV Configuration Enable selected with HART Disabled
0x74[1]	Channel 4	PV Configuration Enable selected with HART Disabled
0x75[1]	Channel 5	PV Configuration Enable selected with HART Disabled
0x76[1]	Channel 6	PV Configuration Enable selected with HART Disabled
0x77[1]	Channel 7	PV Configuration Enable selected with HART Disabled
0x80	Module	Hardware Failure
0x90	Channel 0	Calibration Error
0x91	Channel 1	Calibration Error
0x92	Channel 2	Calibration Error
0x93	Channel 3	Calibration Error
0x94	Channel 4	Calibration Error
0x95	Channel 5	Calibration Error
0x96	Channel 6	Calibration Error
0x97	Channel 7	Calibration Error
0xA0	Channel 0	Internal Bus Com Error
0xA1	Channel 1	Internal Bus Com Error
0xA2	Channel 2	Internal Bus Com Error
0xA3	Channel 3	Internal Bus Com Error
0xA4	Channel 4	Internal Bus Com Error
0xA5	Channel 5	Internal Bus Com Error
0xA6	Channel 6	Internal Bus Com Error
0xA7	Channel 7	Internal Bus Com Error
0xB0[2]	Channel 0	Value set to nearest supported value.
0xB1[2]	Channel 1	Value set to nearest supported value.
0xB2[2]	Channel 2	Value set to nearest supported value.
0xB3[2]	Channel 3	Value set to nearest supported value.
0xB4[2]	Channel 4	Value set to nearest supported value.

Diagnostic Status for 1794-IF8IH and 1794-IF8IHNFXT

Diagnostic Status Value: 0	Channel	Failure
0xB5[2]	Channel 5	Value set to nearest supported value.
0xB6[2]	Channel 6	Value set to nearest supported value.
0xB7[2]	Channel 7	Value set to nearest supported value.
0xC0	Channel 0	Device is write-protected
0xC1	Channel 1	Device is write-protected
0xC2	Channel 2	Device is write-protected
0xC3	Channel 3	Device is write-protected
0xC4	Channel 4	Device is write-protected
0xC5	Channel 5	Device is write-protected
0xC6	Channel 6	Device is write-protected
0xC7	Channel 7	Device is write-protected
0xD0	Channel 0	Value out of limits or invalid selection
0xD1	Channel 1	Value out of limits or invalid selection
0xD2	Channel 2	Value out of limits or invalid selection
0xD3	Channel 3	Value out of limits or invalid selection
0xD4	Channel 4	Value out of limits or invalid selection
0xD5	Channel 5	Value out of limits or invalid selection
0xD6	Channel 6	Value out of limits or invalid selection
0xD7	Channel 7	Value out of limits or invalid selection
0xE0	Channel 0	Primary value configuration HART command(s) not supported
0xE1	Channel 1	Primary value configuration HART command(s) not supported
0xE2	Channel 2	Primary value configuration HART command(s) not supported
0xE3	Channel 3	Primary value configuration HART command(s) not supported
0xE4	Channel 4	Primary value configuration HART command(s) not supported
0xE5	Channel 5	Primary value configuration HART command(s) not supported
0xE6	Channel 6	Primary value configuration HART command(s) not supported
0xE7	Channel 7	Primary value configuration HART command(s) not supported
0xF0	Channel 0	Primary value configuration general error
0xF1	Channel 1	Primary value configuration general error
0xF2	Channel 2	Primary value configuration general error

Diagnostic Status for 1794-IF8IH and 1794-IF8IHNFXT

Diagnostic Status Value: 0	Channel	Failure
0xF3	Channel 3	Primary value configuration general error
0xF4	Channel 4	Primary value configuration general error
0xF5	Channel 5	Primary value configuration general error
0xF6	Channel 6	Primary value configuration general error
0xF7	Channel 7	Primary value configuration general error

(1) This does not apply to the output control bits HART OFF which means HART can still be disabled which would prevent the PV Configuration feature from working until the control bit is cleared.

(2) Applies to 1794-IF8IHNFXT only.

HART Failure (Input Word 11 – bits 0…7)

This bit indicates each time a HART communication failure is detected between the module and the HART field device (HART FD) on the channel. This failure could be due to some of the following reasons: time out, response checksum, parity, framing, HART FD missing, HART FD mismatch from device detected at last rebuild. If there is a failure, the appropriate channel's bit is set. The bit is not latched.

The I/O module performs automatic retries and therefore a user should rarely recognize communication problems at the protocol layer. Therefore, this flag can be used to qualify the communication quality.

Range: 0 = No HART failures are detected, 1 = HART failure is detected

HART Current Ratio (Input Word 11 – bits 8…15)

Alarm signal for HART Current Fault, indicating the HART data value is outside the HART Current Fault limit percentage. Active when limit is exceeded. The analog measured current is compared with the digital current value, read out dynamically via the HART interface. Active when limit is exceeded. See HART Current Fault Limit (Configuration Words 4...7 – bits 3...7, 11...15) on page 43.

Range: 0 = normal, 1 = fault detected.

1794-IF8IH HART Current Ratio(1)

HART Current Ratio Limit	Decimal Value	Bits				
		15	14	13	12	11
		7	6	5	4	3
Disabled	0	0	0	0	0	0
Not applicable	1	0	0	0	0	1
Not applicable	2	0	0	0	1	0
Not applicable	3	0	0	0	1	1
Not applicable	4	0	0	1	0	0
5%	5	0	0	1	0	1
6%	6	0	0	1	1	0
7%	7	0	0	1	1	1
8%	8	0	1	0	0	0
9%	9	0	1	0	0	1
10%	10	0	1	0	1	0
…	…	…	…	…	…	…
30%	30	1	1	1	1	0
31%	31	1	1	1	1	1

(1) HART Current Ratio is represented by Words 4…7 (bits 11…17 and 3…7) in the 1794-IF8IH Configuration Data Table on page 29.

HART Transmitter List (Input Word 10 – bits 8…15)

Indicates a HART transmitter has been detected on this channel, during the last rebuild.

Range: 0 = A HART Transmitter was not detected, 1 = A HART Transmitter is detected.

Secondary Input Data (Cyclic EDT Input Data) for 1794-IF8IH and 1794-IF8IHNFXT

The data in the following table is where the HART protocol device data is published. The data table is not available as a group in the module. It is formed in the communication adapter by the Cyclic EDT mechanism (adapter to module) where the adapter cyclically requests a set of module attributes and forms this data table.

Additionally, the adapter appends the first two words to indicate communication status between adapter and module with regard to each of the cyclic EDT transfers. Two (2) words are provided, for status, as today's adapters provide for up to 32 items in the CEDT queue.

For this module the total Secondary Input Data Table (I) Words = 98, as shown in the HART Input Data table.

Secondary Input Data (Cyclic Input Data) for the 1794-IF8IH and 1794-IF8IHNFXT Modules

Word	Bit															
	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
0/I	Reserved								Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1	Ch0
									HART CMD 3 (Communications Status)							
1	Reserved															
2	Ch0 HART Field Device Status								Ch0 HART Comm Status							
3	Reserved				FVA	TVA	SVA	PVA	Ch0 HART Loop Status							
4	Ch0 HART Primary Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
5																
6	Ch0 HART Secondary Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
7																
8	Ch0 HART Tertiary Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
9																
10	Ch0 HART Fourth (Quaternary) Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
11																
12	Ch0 SV Units Code								Ch0 PV Units Code							
13	Ch0 FV Units Code								Ch0 TV Units Code							
14…25	Words 2…13 for Channel 1															
26…37	Words 2…13 for Channel 2															
38…49	Words 2…13 for Channel 3															
50…61	Words 2…13 for Channel 4															
62…73	Words 2…13 for Channel 5															
74…85	Words 2…13 for Channel 6															
86…97	Words 2…13 for Channel 7															

HART Command 3 Communication Status (Secondary Input Word 0, bits 0…7)

These bits indicate status of the CEDT data transfer between the adapter and the modules. In this module the CEDT attributes transferred are HART command 3 data for the indicated channel number.

Range: 0 = disabled or no CEDT HART Command 3 Communication error between the adapter and the I/O module, 1= a CEDT HART Command 3 Communication error between the adapter and the I/O module.

HART Field Device Command and Communication Status (Secondary Input Word 2, bits 0…7)

This bit indicates the status of HART field device communication for the channel. It is the first status byte of the HART response and the field device status. For example: parity error, framing error, invalid selection or too few data bytes received.

HART Field Device Status (Secondary Input Word 2 – bits 8…15)

This bit is part of the CMD 3 data response of the HART FD. It is the second status byte of the HART response and the FD status, for example: primary variable out of limits or analog output saturated.

CMD3 Second status byte response codes

HART Field Device Status	
Bit 0	Primary variable out of limits
Bit 1	Non-primary variable out of limits
Bit 2	Analog output saturated
Bit 3	Analog output current fixed
Bit 4	More status available
Bit 5	Cold start
Bit 6	Configuration changed
Bit 7	Field device malfunction

IMPORTANT When a communication error is reported in the CMD 3 first status byte, the value of bits 0...7 is 0.

Data Table Reference: HART Field Device Status, Secondary Input Word 2, bits 8...15.

HART Loop Status (Secondary Input Word 3 – bits 0…7)

This bit indicates the status of the HART loop from the I/O modules point of view. This byte is generated by the I/O module itself and not by the HART field device.

HART Loop Status

HART Loop Status	
Bit 0	(1)HCS_COMM_ENABLED, HART is enabled on this channel. Range: 0 = HART not enabled on this channel, 1 = HART enabled on this channel
Bit 1	HCS_CONNECTED. A connection has been established with this device. Range: 0 = no HART connection on this channel, 1 = HART connection on this channela
Bit 2	HCS_RESPONSE_ERROR. A HART message attempt ended in failure. Range: 0 = no HART message failures, 1 = HART message attempt failed
Bit 3	HCS_CMD48_UPDATE. Extended HART status (Command 48) was updated. Range: 0 = extended HART status (Command 48) was not updated, 1 = extended HART status (Command 48) was updated
Bit 4	HCS_ILOOP_TOLERANCE. HART Current Fault loop current fault. Range: 0 = no HART Current Fault loop current fault, 1 = HART Current Fault loop current fault
Bit 5	HART_update. The HART Field Device data for the channel has been updated since last read. Range: 0 = no HART FD data update, 1 = new HART FD data available
Bit 6	HART_Message. The channel's HART message queue has completed a message since request has been received. Range: 0 = no HART message has completed, 1 = a HART message has completed
Bit 7	Reserved (for 1794-IF8IH and 1794-OF8IH)
	PV Configuration Values do not match (for 1794-IF8IHNFXT) Range: 0 = No mismatch, 1 = PV Damping/Range mismatch

(1) HCS - HART Communications State machine.

HART PV Status (Secondary Input Word b, bits 8…15)

This bit indicates the status of the HART variables (primary, secondary, third and fourth).

HART PV Status

Bit 0	The primary variable for this channel has been acquired.
Bit 1	The secondary variable for this channel has been acquired.
Bit 2	The third variable for this channel has been acquired.
Bit 3	The fourth variable for this channel has been acquired.
Bit 4	Reserved

HART PV Status

Bit 5	Reserved
Bit 6	Reserved
Bit 7	Reserved

HART Primary Variable (Secondary Input Words 4, 5 – bits 0…15)

This is the Primary HART Variable from the field device. Its datatype is REAL and it is organized according to Byte Order, see Byte Order (Configuration Word 0 – bits 0...1, 8...9).

HART Secondary Variable (Secondary Input Words 6, 7 – bit 0…15)

This is the Secondary HART Variable from the field device. Its datatype is REAL and it is organized according to Byte Order, see Byte Order (Configuration Word 0 – bits 0...1, 8...9).

HART Third Variable (Secondary Input Words 8, 9 – bits 0…15)

This is the Third HART Variable from the field device. Its datatype is REAL and it is organized according to Byte Order, see Byte Order (Configuration Word 0 – bits 0...1, 8...9).

HART Fourth Variable (Secondary Input Words 10, 11 – bits 0…15)

This is the Fourth HART Variable from the field device. Its datatype is REAL and it is organized according to Byte Order, see Byte Order (Configuration Word 0 – bits 0...1, 8...9).

HART Primary Variable Units Code (Secondary Input Word 12 – bits 0…7)

This is the units code for the Primary HART Variable.

HART Secondary Variable Units Code (Secondary Input Word 12 – bits 8…15)

This is the units code for the Secondary HART Variable.

HART Third Variable Units Code (Secondary Input Word 13 – bits 0…7)

This is the units code for the Third HART Variable.

HART Fourth Variable Units Code (Secondary Input Word – bits 8…15)

This is the units code for the Fourth HART Variable.

RTD Output Data for 1794-IF8IHNFXT

Output data consists of the EDT Write Word and the HART Control Word.

RTD Output Data Table – 1794-IF8IHNFXT

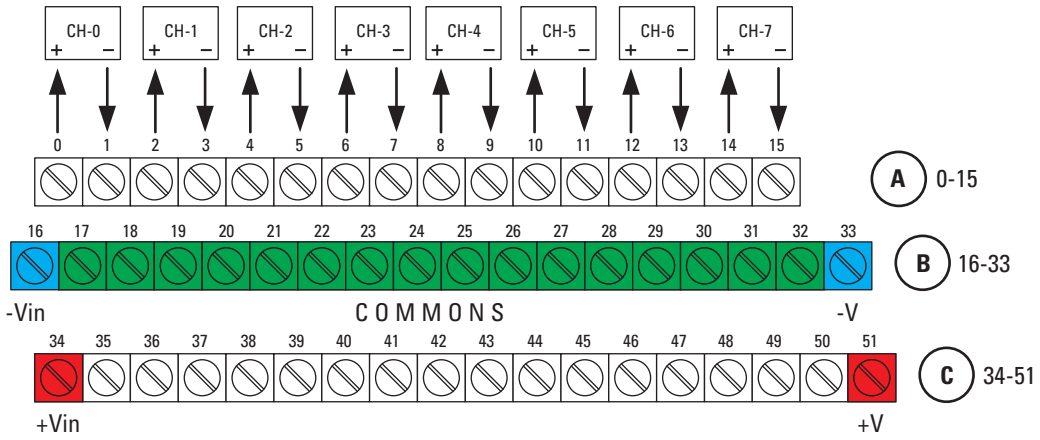
Word	Read / Write	Data Type	Bit															
			15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
14 / EDT	Write	RealT	R/P	Flt	Reserved		EDT COntr				EDT Write Data							
15 / O:0	Write	RealT	Reserved								HO7	HO6	HO5	HO4	HO3	HO2	HO1	HO0
Where:	Flt = Fault R = Reserved HO = HART Off Dynamic Control bit. This HART Off control output bit, along with the HART Disable configuration bit, determines if HART communication is enabled on a channel. The HART Disable configuration bit has priority and disables all communication on a channel at all times even when the HART Off output bit is False(0). If the HART Disable configuration bit is False(0), then the HART OFF output control bit can be used to dynamically turn HART Off and back On again at any time.																	

Module Configuration for the 1794-OF8IH

Output Connections

The 1794-OF8IH module uses the 1794-TB3, Revision B terminal base for full isolation. Connect the I+ output to the terminal contacts indicated and the corresponding center return (R) contact. Be sure to observe the polarity indicated for proper operation. Channels are numbered in order, 0...7, from left to right.

1794-OF8IH Terminal Base Connections



Connect an external 24 V DC power supply to terminals 34 (V+) and 16 (V-) observing polarities indicated. Terminals 17...33 are internally shorted to terminal 16. Terminal 51 is internally shorted to terminal 34. Use the DC output terminals only for low power modules, following FLEX I/O power connection guidelines.

Please follow wiring instruction for FLEX I/O modules, terminal bases and racks. Ground the shield drain wire at one end only. The preferred/required location is at the sensor end. When connecting the shield drain at the module end, connect it to earth ground using a panel or DIN rail mounting screw.

Configuration Parameters for 1794-OF8IH

The last row of the following configuration table provides a brief description of each configuration parameter bit for the 1794-OF8IH module. The next sections provide more information about each bit.

All configuration parameters are EDT (Extended Data Transfer) WRITE items. Configuration is located at EDT assembly 37.

1794-OF8IH Configuration Data Table

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	FT	R	EW7	EW6	EW5	EW4	BOB[3]		R	R	EW3	EW2	EW1	EW0	BOA[1]	
1	DH7	DH6	DH5	DH4	DH3	DH2	DH1	DH0	Reserved[4]							
2	CH 3 Format				CH 2 Format				CH 1 Format				CH 0 Format			
3	CH 7 Format				CH 6 Format				CH 5 Format				CH 4 Format			
4	CH1 HART Current Ratio					L1	AFS1		CH0 HART Current Ratio					L0	AFS0	
5	CH3 HART Current Ratio					L3	AFS3		CH2 HART Current Ratio					L2	AFS2	
6	CH5 HART Current Ratio					L5	AFS5		CH4 HART Current Ratio					L4	AFS4	
7	CH7 HART Current Ratio					L7	AFS7		CH6 HART Current Ratio					L6	AFS6	
8	DF7	DF6	DF5	DF4	DF3	DF2	DF1	DF0	DM7	DM6	DM5	DM4	DM3	DM2	DM1	DM0
9	Channel 0 Analog Fault Value Output Data															
10	Channel 1 Analog Fault Value Output Data															
11	Channel 2 Analog Fault Value Output Data															
12	Channel 3 Analog Fault Value Output Data															
13	Channel 4 Analog Fault Value Output Data															
14	Channel 5 Analog Fault Value Output Data															
15	Channel 6 Analog Fault Value Output Data															
16	Channel 7 Analog Fault Value Output Data															
17	Reserved								C7	C6	C5	C4	C3	C2	C1	C0
Where:	BOA = Byte Order Group A BOB = Byte Order Group B Byte Order Group A and B values must match each other. Refer to the Byte Order table.															
	FT = Local Fault Mode 0: Outputs set to safe value on communication faults only; 1: Outputs set to safe value on any fault															
	EWn = Fault Enable for wire fault detection on channel n.[1] 0: Disable wire off/lead break detection; 1: Enable wire off lead break detection[2]															
	CHn HART Current Ratio = HART current fault ratio on channel n Valid values are 0, 5…31 percent of full scale. A value of 0 disables this feature. See 1794-OF8IH HART Current Ratio on page 63 for more information.															
	AFSn = Analog Fault Selection for Channel n See Channel Fault Mode Selection on page 62.															
	Ln = Channel n Enable Latching of Wire Fault 0: Unlatched; 1: Latched															
	DFn = Channel n Digital Fault Mode Selection 0: Reset (0 mA); 1: Hold Last State															
	DMn = Channel n Enable Digital Mode 0: Analog; 1: Digital															
	Fn = Fault mode channel n 0: Local/Remote faults disabled; 1: Enabled															
	DHn = Disable HART communications on channel n 0: HART communications enabled; 1: HART communications disabled															
	Cn = HART CMD 3 Disable 0: HART CMD 3 communications enabled; 1: HART CMD 3 communications disabled															
	R = Reserved															
	CH N = Channel Data Formats See Channel Data Formats for 1794-OF8IH on page 65.															

(1) Not supported in analog 0…20 mA formats.

(2) Lead break must be present for 100 ms or more.

(3) Not shown or used in RSLogix 5000 software.

(4) Reserved data may not be shown in certain controller software.

Configuration Parameter Descriptions for 1794-OF8IH

This section provides a description of each configuration parameter bit indicated in the table 1794-OF8IH Configuration Data Table on page 58.

Byte Order (Configuration Word 0 – bits 0…1, 8…9)

Selects the byte order of module data.
Note: The MSW and EDT words (Words 0, 1 and 15) of the Primary Input Data Table are not swapped. All other Primary Input Data and Configuration Data are adjusted according to the following chart:

Byte Order Group B		Byte Order Group A		
Bit 9	**Bit 8**	**Bit 1**	**Bit 0**	**Description**
0	0	0	0	Little Endian Format (default) — all data entries in true Little Endian format
1	0	1	0	Word Swap — word swap only values requiring more than one word, for example, 32 bit float values.
0	1	0	1	Byte Swap — byte swap all words in data table.
1	1	1	1	Big Endian Format — all data entries in true Big Endian format.

IMPORTANT Byte Order can not be changed using RSLogix 5000 software. RSLogix 5000 uses the default Byte Swap setting.

The purpose of this parameter is to allow this module to operate properly within data networks or systems utilizing various byte orders, across all data types (for example, Boolean data to 32 bit float data).

Upon receiving the configuration assembly the module must inspect Byte Order to determine how to interpret the configuration assembly.

Two sets of Byte Order bits are provided since the module will not know at powerup and configuration reception what Endian format the configuration data it is receiving in. No matter what the format though these two, two bit sets always convey correct information to the module. Both sets must match each other for the module to accept the configuration and begin processing it for operation. If the two sets do not match the module reverts to the last valid configuration (in case of original start-up this is the default configuration), set module Diagnostic Status to "2" configuration failure, set outputs to fault states and do not start operation.

Within the CIP-based Rockwell Automation (RA) control system all data is transported and utilized in Little Endian format. As such the default mode of operation for these modules is Little Endian.

Since these modules are HART modules, and HART data is normally provided in Big Endian format, the module is responsible for converting any HART in Big Endian format into Little Endian format.

Examples

In each of the following examples, the module operates internally with little Endian byte order.

Little Endian Byte Order

If Byte Order indicates Little Endian, utilize the configuration assembly directly.

Partial Configuration Assembly as Received

1	Param A Ch2	Param B Ch2	Param A Ch1	Param B Ch1
2	Param C CH0 (2nd byte)		Param C CH0 (low byte)	
3	Param C CH0 (high byte)		Param C CH0 (3rd byte)	

Partial Configuration Assembly after BYTE ORDER Inspection and Processing

1	Param A Ch2	Param B Ch2	Param A Ch1	Param B Ch1
2	Param C CH0 (2nd byte)		Param C CH0 (low byte)	
3	Param C CH0 (high byte)		Param C CH0 (3rd byte)	

Provide all data to the Primary Data table in Little Endian byte order.
The following two tables are an example of the Primary Input Data, if Byte Order indicated Little Endian.

Primary Input Data Before BYTE ORDER Processing for Little Endian

1	Ch2 Data A (REAL) (2nd byte)	Ch2 Data A (REAL) (low byte)
2	Ch2 Data A (REAL) (high byte)	Ch2 Data A (REAL) (3rd byte)
3	Ch2 Data C	Ch 2 Data B

Primary Input Data After BYTE ORDER Processing for Little Endian

1	Ch2 Data A (REAL) (2nd byte)	Ch2 Data A (REAL) (low byte)
2	Ch2 Data A (REAL) (high byte)	Ch2 Data A (REAL) (3rd byte)
3	Ch2 Data C	Ch 2 Data B

Word Swap BYTE ORDER

If BYTE ORDER indicates Word Swap, utilize the known structure of the configuration assembly to re-order multi-word data elements to Little Endian byte order, for example, word swap FLOATS).

Partial Configuration Assembly as Received

1	Param A Ch2	Param B Ch2	Param A Ch1	Param B Ch1
2	Param C CH0 (high byte)		Param C CH0 (3rd byte)	
3	Param C CH0 (2nd byte)		Param C CH0 (low byte)	

Partial Configuration Assembly After BYTE ORDER Inspection and Processing

1	Param A Ch2	Param B Ch2	Param A Ch1	Param B Ch1
2	Param C CH0 (2nd byte)		Param C CH0 (low byte)	
3	Param C CH0 (high byte)		Param C CH0 (3rd byte)	

Provide all data to the Primary Data table in Word Swap byte order, except the MSW and EDT words (Words 0, 1 and 15), these remain in Little Endian byte order.

The following tables are an example of the Primary Input Data, if BYTE ORDER indicated Word Swap.

Primary Input Data Before BYTE ORDER Processing for Little Endian

1	Ch2 Data A (REAL) (2nd byte)	Ch2 Data A (REAL) (low byte)
2	Ch2 Data A (REAL) (high byte)	Ch2 Data A (REAL) (3rd byte)
3	Ch2 Data C	Ch 2 Data B

Primary Input Data After BYTE ORDER Processing for Little Endian

1	Ch2 Data A (REAL) (high byte)	Ch2 Data A (REAL) (3rd byte)
2	Ch2 Data A (REAL) (2nd byte)	Ch2 Data A (REAL) (low byte)
3	Ch2 Data C	Ch 2 Data B

Default: 0

Fault Mode (Configuration Word 0 – bit 15)

Selects whether the channel fault detection is enabled or disabled. There is a 100 ms filter for wire off/lead break and short circuit detection.

Range: 0=Disable, 1= Wire off/lead break and short circuit fault detection enabled.
Default: 0

Channel Fault Mode Selection

Analog Fault Mode	Decimal Value	Bits	
		9	**8**
		1	**0**
Min Scale	0	0	0
Max Scale	1	0	0
Hold Last State	2	1	0
User Specifed Data Value	3	1	1

Disable HART Channel 0…7 (Configuration Word 17 – bits 0…7)

When this bit is set, the I/O module inhibits HART Communication.

Range: 0=Enable, 1=Disable
Default: 0

HART Current Ratio (Configuration Words 4…7 – bits 3…7, 11…15.)

Delivers the percentage value (in steps of 1%, starting @ 5%) of the threshold for causing a HART current fault indication (input signal deviation HART/ Analog) = 31% maximum deviation.

If there is no HART transmitter on the loop or the loop is not in the transmitter list the function is switched off internally in the I/O module.

Range:
0=Disabled,
1...4=Not supported by the I/O module. A configuration request of 1...4 causes a value of 5 to be utilized by the module.
5...31=Percentage threshold data (5...31%)
Default: 0

1794-OF8IH HART Current Ratio(1)

HART Current Ratio Limit	Decimal Value	Bits				
		15	14	13	12	11
		7	6	5	4	3
Disabled	0	0	0	0	0	0
Not applicable	1	0	0	0	0	1
Not applicable	2	0	0	0	1	0
Not applicable	3	0	0	0	1	1
Not applicable	4	0	0	1	0	0
5%	5	0	0	1	0	1
6%	6	0	0	1	1	0
7%	7	0	0	1	1	1
8%	8	0	1	0	0	0
9%	9	0	1	0	0	1
10%	10	0	1	0	1	0
…	…	…	…	…	…	…
30%	30	1	1	1	1	0
31%	31	1	1	1	1	1

(1) HART Current Ratio parameter bits are represented by Configuration Words 4, 5, 6, and 7, bits 3…7, 11…15. See 1794-OF8IH Configuration Data Table on page 58.

Data Format (Configuration Words 2, 3 – bits 0…3, 4…7, 8…10, 12…15)

Specifies the module data format for a channel.

If a module channel has never been configured then it can be assumed to have the default configuration Analog Data Format "0", 0...20mA and Analog Mode Fault State minimum range. If a non-assigned format is selected, then the diagnostic "2" for configuration failure is set and the module channel goes to the default fault state minimum range.

If, on the other hand, the configuration is changed from the default, and then changed again to a non-assigned format, then the diagnostic bit "2" for configuration failure is set and the module goes to the fault state for the last valid configuration.

Formats 13 and 14 are 2's complement data formats, and require data to the module in that form.

Range: 0...15. Refer to the 1794-OF8IH Data Formats table.

1794-OF8IH Data Formats

Data Format	Format	Resolution	Full Output Range	Module Data Processing	Data Table Value (Interpretation)	Count per mA/ Resolution	Analog Fault State
0 (default)	mA as 0…20 mA	0.1% of 0…20 mA	0…22 mA	Output = $\left(\frac{\text{datatable}}{1000}\right)$	0…22000 (0…22.000 mA)	1000/ 1.0 µA	Min=0 mA Max=22 mA hold Last=hold FS value
1	% as 0…20 mA	0.2% of 0…20 mA	0…22 mA	Output = 20 $\left(\frac{\text{datatable}}{10000}\right)$	0…11000 (0…110.00%)	500/ 2.0 µA	Min=0 mA Max=22 mA hold Last=hold FS value
2	0…20 mA	—	0…22 mA	Not Assigned			
3	Unsigned integer as 0…20 mA	0.03% of 0…20 mA	0…20 mA	Output = 20 $\left(\frac{\text{datatable}}{65535}\right)$	0…65535 (0…20 mA)	3276/ 0.305 µA	Min=0 mA Max=20 mA hold Last=hold FS value
4	mA as 4…20 mA	0.1% of 4…20 mA	2…22 mA	Output = $\left(\frac{\text{datatable}}{1000}\right)$	2000…22000 (2.000…22.000 mA)	1000/ 1.0 µA	Min=2 mA Max=22 mA hold Last=hold FS value
5	4…20 mA	—	4…20 mA	Not assigned			
6	4…20 mA		4…20 mA	Not assigned			
7	Unsigned integer as 4…20 mA	0.03% of 4…20 mA	4…20 mA	Output = 16 $\left(\frac{\text{datatable}}{65535}\right)$ + 4	0…65535 (4…20 mA)	4095/ 0.244 µA	Min=4 mA Max=20 mA hold Last=hold FS value
8	0…20 mA		0…20 mA	Not assigned			
9	0…20 mA		0…20 mA	Not assigned			
10	0…20 mA		0…20 mA	Not assigned			
11	0…20 mA		0…20 mA	Not assigned			
12	4…20 mA			Not assigned			
13	4…20 mA			Not assigned			
14	% as 4…20 mA	0.16% of 4…20 mA	2…22 mA	Output = 16 $\left(\frac{\text{datatable}}{10000}\right)$ + 4	-1250 … +11250 (2's complement) (-12.50% … +112.50%)	625/ 1.6 µA	Min=2 mA Max=22 mA hold Last=hold FS value
15	4…20 mA		4…20 mA	Not assigned			

Channel Data Formats for 1794-OF8IH[1]

Format[2]	Bits				Format Name	Signal Range		User Range		Resolution
	15	14	13	12						
	11	10	9	8						
	7	6	5	4		LO	HI	LO	HI	
	3	2	1	0						
0	0	0	0	0	0…20 mA in Milliamps	0.00	22.00	0 (0.000 mA)	22000 (22.000 mA)	1.0 µA
1	0	0	0	1	0…20 mA in % Full Scale	0.00	22.00	0 (0%)	11000 (110.00%)	2.0 µA
3	0	0	1	1	0…20 mA in UINT	0.00	20.00	0	65535	0.3052 µA
4[3]	0	1	0	0	4…20 mA in Milliamps	2.00	22.00	2000 (2.000 mA)	22000 (22.000 mA)	1.0 µA
7[2]	0	1	1	1	4…20 mA in UINT	4.00	20.00	0	65535	0.2441 µA
14[2]	1	1	1	0	4…20 mA in % Full Scale	2.00	22.00	-1250 (-12.50%)	11250 (112.50%)	1.6 µA

(1) Data Format configuration bits are represented by Configuration Words 2 and 3, bits 0…3, 4…7, 8…11, and 12…15. See 1794-OF8IH Configuration Data Table on page 58.

(2) All other formats are invalid.

(3) HART Communications supported with these data formats only.

If data is sent to the module which is out of range, the value is clipped and Diagnostic Data is set to “11” data out of range. To view a graphical representation of this performance, see the example on page 11.

Latch Mode (Configuration Words 4…7 – bits 2, 10)

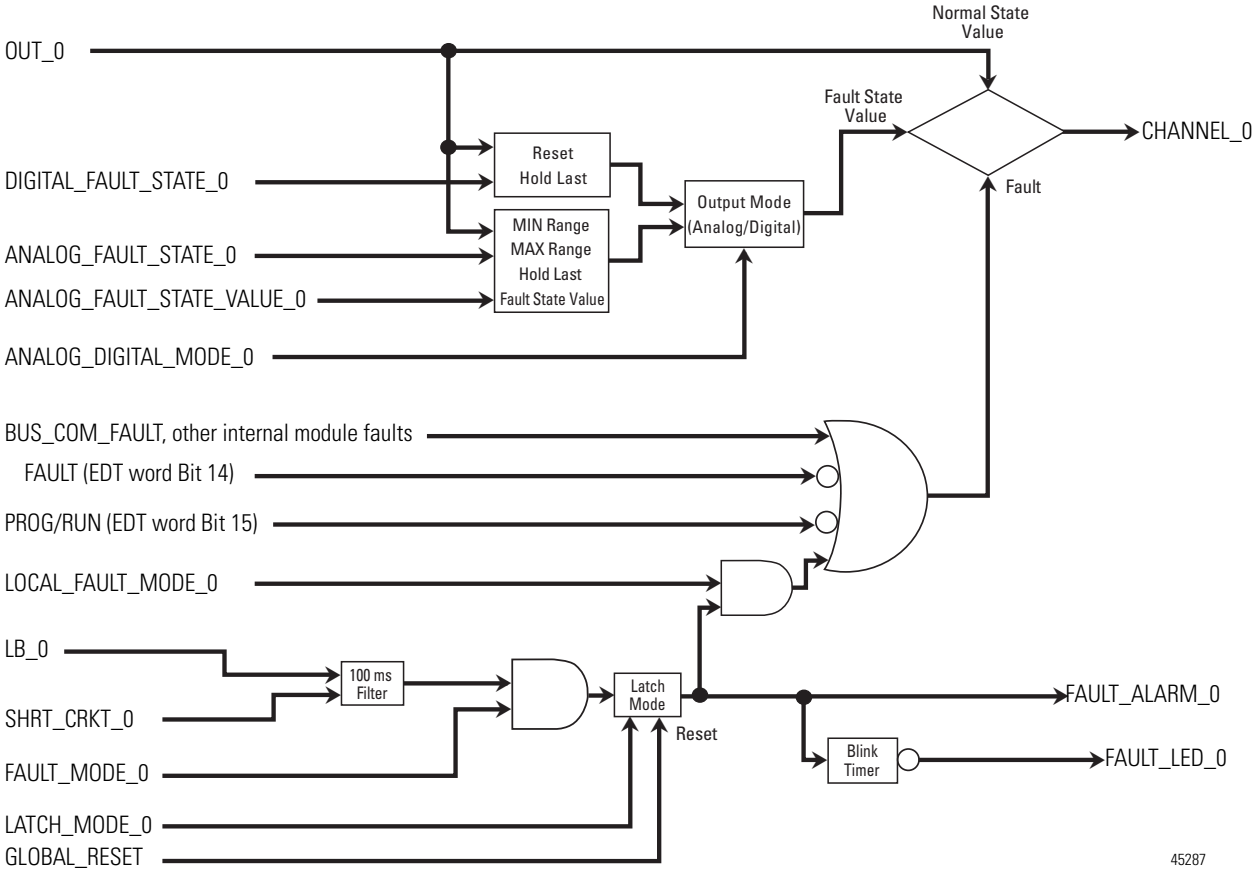
Latch Mode determines channel operation under wire off/lead break fault conditions. Channel fault detection occurs on a continuous basis. If a fault is detected, the channel fault alarm is set (if Fault Mode is enabled).

If latch is ON the fault is latched until a Global Reset is issued at which time the fault is reset.

If latch is OFF the channel reports the fault until the fault is corrected. Upon correction the fault is reset.

Range: 0=OFF, 1=ON
Default: 0

Analog/Digital Output Normal and Fault State Operation



Analog/Digital Output Mode (Configuration Word 8 – bits 0…7)

Selects if the channel acts as a normal analog output or as a switched digital output.

Analog Output Mode will follow the Analog Data Format selected.

Digital Output Mode will output 0 mA = OFF, 22 mA = ON if the Fault Mode is 0 = Disable. Digital Output Mode will output 500 μA = OFF, 22 mA = ON if the Fault Mode is 1 = Wire off fault detection enable.

Range: 0=Normal analog output, 1=Switched digital output
Default: 0

Analog Fault Mode Selection (Configuration Words 4…7 – bits 0…1, 8…9)

Determines how the module reacts to faults when channel is used in analog normal mode.

Range: 0=Go to minimum value of Full Output Range, 1=Go to maximum value of Full Output Range, 2=Hold last state, 3=Use channel fault state values given in Words 10...17.
Default: 0

Analog Fault Value Output Data (Configuration Words 9…16 – bits 0…15)

This parameter specifies the fault state value of the analog output data for the channel. Specific format is controlled by Analog Data Format Control parameter, see Data Format (Configuration Words 2, 3 – bits 0...3, 4...7, 8...10, 12...15) on page 63.

This data is used when the channel is in analog output mode.

Examples

If you choose format 2 and set the fault state value to 11000 (accordingly 110.00%), the I/O module provides 22 mA in case of fault state.

If you choose format 7 and set the fault state value to 32000, the I/O module provides 11.813 mA in case of fault state.

The fault state value is treated in the same way as the normal output value is treated. So you do not need to recalculate the current when you are used to work in a special format.

Range: See Data Format (Configuration Words 2, 3 – bits 0...3, 4...7, 8...10, 12...15) on page 63.

Default: 0

Digital Mode Fault State (Configuration Word 8 – bit 8…15)

Determines how the module reacts to faults when channel is used in digital mode.

Range: 0=Reset, 1=Hold Last State
Default: 0

HART CMD 3 Disable (Configuration Word 7 – bits 0…7)

This bit disables the I/O channel from forwarding the associated HART Command 3 information from the HART Field device through Cyclic EDT to the adapter.

This does not disable the module from gathering HART Command 3 information from the HART Field device. As such, HART Command 3 information from the HART Field device is still available via an unconnected message to the module.

This feature should be exercised by using a Null ForwardOpen method in the Logix system. That is, the connection to the module and original configuration has already been accomplished. If utilized, Command 3 Disable should be utilized under program control (change bit in module configuration tag then issue reconfiguration message to module) or, more unusually, a manual operation by an operator (open module profile, change parameter then apply).

When the adapter powers up, it reads each module to find out who is out there. For EDT modules, it reads Assembly 125 to gain knowledge of all the assemblies the module has, whether they are EDT/CEDT and whether they are GET/SET. If an assembly is a CEDT assembly, the adapter automatically creates a CEDT entry and drops it into his EDT machine to gather/send this assembly and store the assembly locally in the adpater.

After this powerup process, a ForwardOpen configuration arrives by the network for the module. The adapter proxy strips off a portion (Configuation Part 1) and sends the rest (Configuration Part 2) on through EDT to the module. Within this module configuration part are the CMD3 Disable Chx bits. These bits instruct the module to include or not include CMD3 scanning in its work for the channel. Users may not have HART devices on every channel so some channels may want CMD3 disabled.

If users do disable scanning, the module also disables the adapter from including that particular associated assembly in the CEDT scanning routine by the following method:

The module uses the CMD3 Disable Chx bits to adjust the CEDT entries in Assembly 125. Initially the Assembly 125 CEDT assemblies (46...53) are identified as CEDT (0xC0 Cyclic EDT Get or 0x40 Cyclic EDT Set) this causes the adapter to add them to the CEDT scan. If the module receives a configuration with CMD3 Disable CHx bits set to "1" (disable), the module changes the appropriate channel's Assembly 125 entry from 0xC0 Cyclic EDT Get to 0x80 EDT Get or 0x40 Cyclic EDT Set to 0x00 EDT Set.

Whenever the adapter receives a ForwardOpen to an EDT module, the adapter automatically rereads the module Assembly 125 to gain a new view of the assemblies. This reread is to check for any changes of CEDT Assemby status to EDT status. If a CMD3 Disable Chx is received on any particular channel, now

the previous CEDT assembly is marked as an EDT assembly and the adapter does not add that assembly to the CEDT scan. This ForwardOpen reread happens any time a module receives a ForwardOpen, including a Null-ForwardOpen received during system runtime.

Range: 0=Enabled, 1=Disabled
Default: 0

Primary Input Data (RTD Output Data) for the 1794-OF8IH

Primary Input Data (RTD Output Data) for 1794-OF8IH

Word/ SISOC	Read/ Write	Data Transport	Bit															
			15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0/MSW	Read	RealT	Bus Fail Bits			#	# Words to Read				Module ID/Type							
1/EDT	Read	RealT	PU/ Cfg	Event Pdg	Reserved		Read	Write	SeqCount		EDT Data Byte from Module							
2/S0	Read	RealT	F7	F6	F5	F4	F3	F2	F1	F0	Diagnostic status							
3/S1	Read	RealT	Reserved															
4/S2	Read	RealT	C7	C6	C5	C4‘	C3	C2	C1	C0	Reserved							
5/S3	Read	RealT	X7	X6	X5	X4	X3	X2	X1	X0	Reserved							
6/EDT	Write	RealT	Prog/ Run	Fault	Reserved		Read	Write	SeqCount		EDT Data Byte from Module							
7/O0	Read	RealT	Reser ved	Global reset	Reserved						D7	D6	D5	D4	D3	D2	D1	D0
8/O1	Write	RealT	Output Data Channel 0															
9/O2	Read	RealT	Output Data Channel 1															
10/O3	Read	RealT	Output Data Channel 2															
11/O4	Read	RealT	Output Data Channel 3															
12/O5	Read	RealT	Output Data Channel 4															
13/O6	Read	RealT	Output Data Channel 5															
14/O7	Read	RealT	Output Data Channel 6															
15/EDT	Read	RealT	Output Data Channel 7															

Where: Fn : Channel n Fault alarm
Cn : Channel n HART Current Fault
Xn : HART Transmitter List
Dn : Channel n Digital out

Fault Alarm (S0 Read Word – bits 8…15)

Alarm signal for open-wire channel fault, detected @ <2 mA (<500 µA in digital mode) and short circuit (R<42 in the 4...20 mA range, <86 in digital mode, channel off).

This alarm is disabled when a data format is selected which includes 0 mA.
Range: 0=Normal, 1=Wire off/short circuit fault detected
Default: 0

Diagnostic Data (S0 Read Word – bits 0…7)

Response from module as to its condition.

Diagnostic Data

Diagnostic Status Value: 0	Channel	Failure
0x00	All	No Errors (default)
0x10	Channel 0	HART Iloop Threshold Configuration Error
0x11	Channel 1	HART Iloop Threshold Configuration Error
0x12	Channel 2	HART Iloop Threshold Configuration Error
0x13	Channel 3	HART Iloop Threshold Configuration Error
0x14	Channel 4	HART Iloop Threshold Configuration Error
0x15	Channel 5	HART Iloop Threshold Configuration Error
0x16	Channel 6	HART Iloop Threshold Configuration Error
0x17	Channel 7	HART Iloop Threshold Configuration Error
0x40	Channel 0	Format Configuration Error
0x41	Channel 1	Format Configuration Error
0x42	Channel 2	Format Configuration Error
0x43	Channel 3	Format Configuration Error
0x44	Channel 4	Format Configuration Error
0x45	Channel 5	Format Configuration Error
0x46	Channel 6	Format Configuration Error
0x47	Channel 7	Format Configuration Error
0x50	Channel 0	Data out of range
0x51	Channel 1	Data out of range
0x52	Channel 2	Data out of range
0x53	Channel 3	Data out of range
0x54	Channel 4	Data out of range
0x55	Channel 5	Data out of range
0x56	Channel 6	Data out of range
0x57	Channel 7	Data out of range
0x80	Module	Hardware Failure
0x90	Channel 0	Calibration Error
0x91	Channel 1	Calibration Error

Diagnostic Data

Diagnostic Status Value: 0	Channel	Failure
0x92	Channel 2	Calibration Error
0x93	Channel 3	Calibration Error
0x94	Channel 4	Calibration Error
0x95	Channel 5	Calibration Error
0x96	Channel 6	Calibration Error
0x97	Channel 7	Calibration Error
0xA0	Channel 0	Internal Bus Com Error
0xA1	Channel 1	Internal Bus Com Error
0xA2	Channel 2	Internal Bus Com Error
0xA3	Channel 3	Internal Bus Com Error
0xA4	Channel 4	Internal Bus Com Error
0xA5	Channel 5	Internal Bus Com Error
0xA6	Channel 6	Internal Bus Com Error
0xA7	Channel 7	Internal Bus Com Error

HART Status Fields

The 1794-OF8IH module supports two connections for pass-through messages. Pass-through messages provide the ability to send HART messages to the HART device by passing through the I/O Module. In addition, HART device information automatically gathered by the I/O module may be accessed through this interface.

The 1794-OF8IH module provides eight queues for each of the two connections. This allows each connection to have up to eight messages pending at any given time, one for each channel. HART pass-through message implements a timeout which is fixed at 20 seconds.

The first connection is provided for a ladder logic user. The following status bits are provided to simplify ladder logic. The second connection does not have status bits provided in the RTD. It can obtain this status by implementing polling messages using the pass-through message interface.

HART Current Fault (S2 Read Word – bits 8…15)

Alarm signal for HART Current Fault, indicating the HART data value is outside the HART Current Fault limit percentage. Active when limit is exceeded. The analog measured current is compared with the digital current value, read out

dynamically via the HART interface. Active when limit is exceeded. See HART Current Ratio (Configuration Words 4...7 – bits 3...7, 11...15.) on page 62.

Range: 0=Normal, 1=Fault detected

HART Transmitter List (S3 Read Word – bits 8…15)

Indicates a HART transmitter has been detected on this channel, during the last rebuild.

Range: 0=A HART Transmitter was not detected, 1=A HART Transmitter was detected.

Primary Output Data (RTD Output Data) for 1794-OF8IH

Analog Output Data

Specifies the value of the analog output data to the module. Specific format is controlled by Module Data Format Control parameter. This data is used when the channel is in analog output mode.

Range: See Data Format (Configuration Words 2, 3 – bits 0...3, 4...7, 8...10, 12...15) on page 63.

Digital Output Data (O0 Read Word – bits 0…7)

Specifies the value of the digital output data to the module. This data is used when the channel is in digital output mode.

Range:
If the Fault Mode is 0=Disable: 0=Output 0 mA = OFF, 1=22 mA = ON.

If the Fault Mode is 1=Wire off fault detection enabled: 0=Output 500 μA=OFF, 1=22 mA=ON.

See Analog/Digital Output Mode (Configuration Word 8 – bits 0...7) on page 66.

Global Reset (O0 Read Word – bit 14)

This bit resets all latched fault alarms. It acts in conjunction with the Latch Retry parameter. If any channel faults occur, the Latch Retry parameter can be set to

cause the fault to be latched and the output to go to its fault state value if the Local Fault mode bit is set.

This is an edge triggered signal. It must first be set to the "1" state, reset will then occur on the "1" to "0" transition.

Range: 0=Normal, 1=Reset.

Fault (EDT Write Word – bit 14) and Run/Prog (EDT Write Word – bit 13)

Fault bit = signal from the adapter to the module that communications has been interrupted with the network.
Prog/Run bit = signal from the adapter to the module of the processor mode.
These two bits are generally used together.

When the adapter and I/O are first powered-up, the Fault bit is set to '0', by the adapter. On powerup, any module outputs remain OFF (0 mA out) or reset.

When the Fault bit is a '1', the outputs follow the data specified in output data words if the Prog/Run bit indicates the processor is in the Run mode '1'. When the Fault bit is a '0' or Prog/Run bit indicates the processor is in the Program mode '0', the outputs follow the data specified in fault state configuration data words. The following is a truth table to explain this in more detail.

Prog/Run	Fault	Description
1	1	Module's outputs follow the output data table
all other states		Module's outputs follow Fault State Values

Range: 0=Local control of outputs, 1=Adapter controls outputs
Default: 0
Data Table Reference: Fault, EDT write word, bit 14

Run/Prog Range: 0=Processor in PROGRAM mode, 1=Processor in RUN mode
Default: 0

Secondary Input Data (Cyclic EDT Input Data) for 1794-OF8IH

The description of this data table section is identical for HART input or output modules.

Bit parameter descriptions are provided in the last row of the following table

Secondary Input Data (Cyclic EDT Input Data) for 1794-OF8IH

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Reserved								CH7 (HART CMD 3 Communications Status)	CH6	CH5	CH4	CH3	CH2	CH1	CH0
1	Reserved															
2	CH0 HART Field Device Status								CH0 HART Comm Status							
3					FVA	TVA	SVA	PVA	CH0 HART Loop Status							
4	CH0 HART Primary Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
5																
6	CH0 HART Secondary Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
7																
8	CH0 HART Tertiary Value (IEEE 754-1985 Single-Precision 32 bit floating point															
9																
10	CH0 HART Fourth (Quaternary) Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
11																
12	CH0 SV Units Code								CH0 PV Units Code							
13	CH0 FV Units Code								CH0 TV Units Code							
14…25	Words 2…13 for channel 1															
26…37	Words 2…13 for channel 2															
38…49	Words 2…13 for channel 3															
50…61	Words 2…13 for channel 4															
62…73	Words 2…13 for channel 5															
74…85	Words 2…13 for channel 6															
86…97	Words 2…13 for channel 7															
Where:	CHn: HART CMD 3 Communication Status 0: HART CMD 3 Communication Disabled or No Error; 1: HART CMD 3 Communication Error between Adapter and Module															
	CHn: HART Comm Status (HART CMD3 Response first status byte) See HART Command 3 Communication Status (Input Word 0 – bits 0…7) on page 75.															
	CHn: HART Field Device Status (HART CMD3 Response second status byte) See HART Field Device Status (Secondary Input Word 2 – bits 8…15) on page 75.															
	HART Loop Status Bit 0: HART enable				0: Disabled				1: Enabled							
	Bit 1: Device Connected				0: Not Connected				1: Connected							
	Bit 2: Response Error				0: No HART message failure				1: Response ended in error							
	Bit 3: CMD 48 Update				0: CMD 48 not updated				1: CMD 48 updated							
	Bit 4: HART Loop Tolerance Error				0: No HART Current Fault				1:HART Current Fault							
	Bit 5: HART Update				0: HART Device information not updated				1: HART Device information updated since last read							
	Bit 6: HART message				0: No new message				1: HART user message queue has completed a message							
	Bit 7				Reserved											
	PVA – The primary variable for this channel has been acquired. SVA – The secondary variable for this channel has been acquired. TVA – The tertiary variable for this channel has been acquired. FVA – The fourth (quaternary) variable for this channel has been acquired.															

Secondary Data Table Section Created by the Adapter

The description of this data table section is identical for HART input or output modules. See HART Command 3 Communication Status (Secondary Input Word 0, bits 0...7) on page 52 for more information.

HART Command 3 Communication Status (Input Word 0 – bits 0…7)

The description of this data table section is identical for HART input or output modules. See HART Command 3 Communication Status (Secondary Input Word 0, bits 0...7) on page 52 for more information.

Secondary Data Table Section from Module CEDT Attribute

The description of this data table section is identical for HART input or output modules.

HART Field Device Status (Secondary Input Word 2 – bits 8…15)

This byte is part of the CMD 3 data response of the HART FD. It is the second status byte of the HART response and the FD status, example: “primary variable out of limits” or “analog output saturated”.

CMD 3 Second Status byte response codes

HART Field Device Status	
Bit 0	Primary variable out of limits
Bit 1	Non-primary variable out of limits
Bit 2	Analog output saturated
Bit 3	Analog output current fixed
Bit 4	More status available
Bit 5	Cold start
Bit 6	Configuration changed
Bit 7	Field device malfunction

IMPORTANT When a communication error is reported in the CMD 3 first status byte, bits 0...7 will have the value of 0.

Data Table Reference: HART Field Device Status, Secondary Input Word 2, bits 8...15.

Interpret the Status Indicators

The module status indicators conform to the FLEX I/O standard. The module will have a single Red and Green indicators for global module status/power indication.

The module supports six states, common to all Phase 1 EDT compliant modules, as described below. A single bi-color indicator displays the module status as given below.

Module Status Indicators

Module State	Condition	PU Bit	Prog/Run bit	Fault bit	LED Color and State
New	Power up initialization is complete and self-test has been passed. Loads stored configuration, if it exists. Read Module Information Block.(1)	*(2)	*	*	Red, blink @ 1 Hz
No Config	Module has not received configuration from Master. It can Set and Get attributes.	0	*	*	Green, blink @ 1 Hz
Idle	Controller in Program mode. Communication is normal.	1	0	1	Green, blink @ 1 Hz
Active	Controller in Run mode and communication is normal.	1	1	1	Green, solid
Fault	FLEX I/O Communications Fault or PU bit is one and Fault=0	*	*	0	Green, blink@ 1 Hz
Fatal fault	Module fails self test or detects illegal state transition.	*	*	*	Red, solid
Off	External power has not been applied.				Off

(1) The status bits in the table correspond to module status bits available in the module status word.

(2) Bit state flagged as '*' depends on the state transition, per FLEX I/O Systems Specifications.

Edit Your 1794-IF8IHNFXT Configuration with Logix Designer (Full Profile)

Logix Designer (or RSLogix 5000) programming software automatically creates module-defined data types and tags when a module is created. This section describes how to modify the default configuration for your 1794-IF8IHNFXT module.

IMPORTANT Configuring the 1794-IF8IH and 1794-OF8IH modules require programming with RSLogix 5000 version 17. Configuration for the 1794-IF8IHNFXT module is done through the Module Definition interface using Logix Designer version 24 and later, as described in the next sections. See Use the 1794-IF8IHNFXT with the Generic and Thin Profiles on page 135 if you are using RSLogix 5000 version 23 or earlier.

Data types symbolically name module configuration, input and output data. Tags let you provide each a unique name, such as where the user-defined data type and slot reside on the controller. This information is used to communicate data between the controller and module.

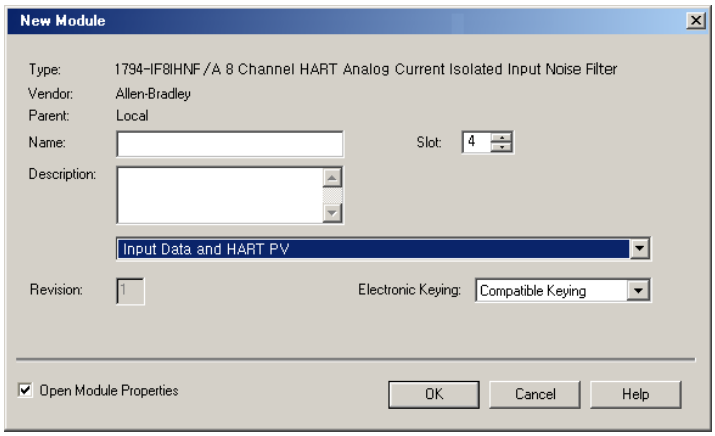
After you have set configuration for a module, you can review and change your choices. You can change configuration data and download it to the controller while online. This is called **dynamic reconfiguration**.

Your freedom to change some configurable features, though, depends on whether the controller is in Remote Run Mode or Program Mode.

IMPORTANT	Although you can change configuration while online, you must go offline to add or delete modules from the project.

The editing process begins on the main page of RSLogix 5000 or Logix Designer software.

1. On the I/O Configuration tree for your project in RSLogix 5000, add your 1794-IF8IHNFXT module.
   On the New Module dialog that appears when you add your module to the I/O Configuration tree, specify the following properties of the module.



2. Click Open Module Properties. The Module Properties dialog appears and has the following tabs available for configuration.

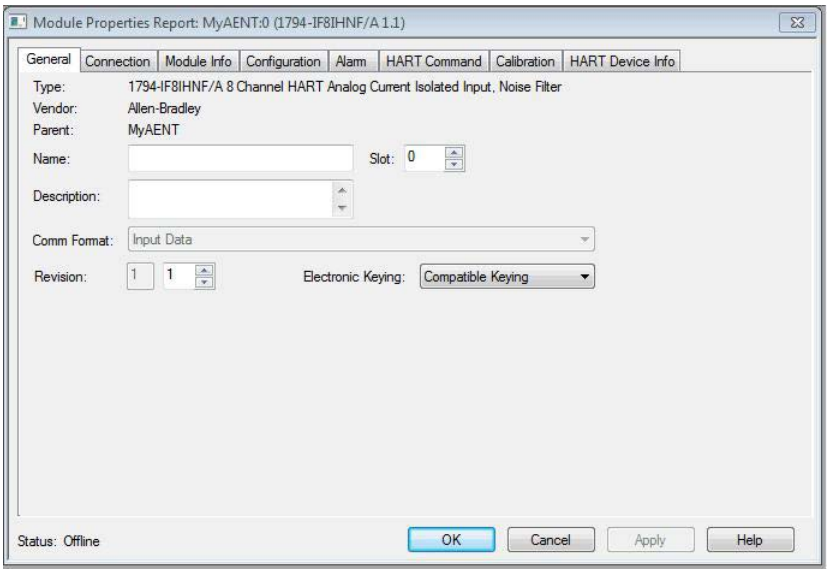
3. Click any of the tabs to edit the parameters for your module.
   The next sections show you how to edit the different tabs in the Module Properties dialog.

TIP	Tabs can be selected in any order. The following examples are for instructional purposes.

General Tab

The General tab allows you to edit general properties such as Name, Description, and Slot for your module, which you can specify in the New Module dialog, as shown previously.

You also can edit Module Definition properties such as revision and electronic keying.



General Tab Field Descriptions

Field Name	Description
Revision	Specifies the module major and minor revision.
Electronic Keying	The electronic keying feature automatically compares the expected module, as shown in the RSLogix 5000 I/O Configuration tree, to the physical module before I/O communication begins. You can use electronic keying to help prevent communication to a module that does not match the type and revision expected. For each module in the I/O Configuration tree, the user-selected keying option determines if, and how, an electronic keying check is performed. Typically, three keying options are available: • Exact Match • Compatible Module (default) • Disable Keying **Exact Match** is an electronic keying protection mode that requires the physical module and the module configured in the software to match according to vendor, catalog number, major revision and minor revision. **Compatible Module** indicates that the module determines whether to accept or reject communication. Compatible Keying is the default setting. It allows the physical module to accept the key of the module configured in the software, provided that the configured module is one the physical module is capable of emulating. The exact level of emulation required is product and revision specific. **Disable Keying** indicates the keying attributes are not considered when attempting to communicate with a module. Other attributes, such as data size and format, are considered and must be acceptable before I/O communication is established. With Disabled Keying, I/O communication may occur with a module other than the type specified in the I/O configuration tree with unpredictable results. We generally do not recommend using Disabled Keying.

General Tab Field Descriptions

Field Name	Description
Comm Format	The following Comm Format options are available: • **Input Data** – specifies an independent connection where a device receives inputs from the target device and send configuration data to the target device. An Input Only connection does not send outputs; it only receives inputs. You can specify multiple Input Only connections to the target device from different originators. • **Listen-Only and Input Data** – The Listen Only mode option lets the controller and module establish communication without the controller sending any configuration data. • **Input Data and HART PV** • **Listen-Only, Input Data and HART PV**

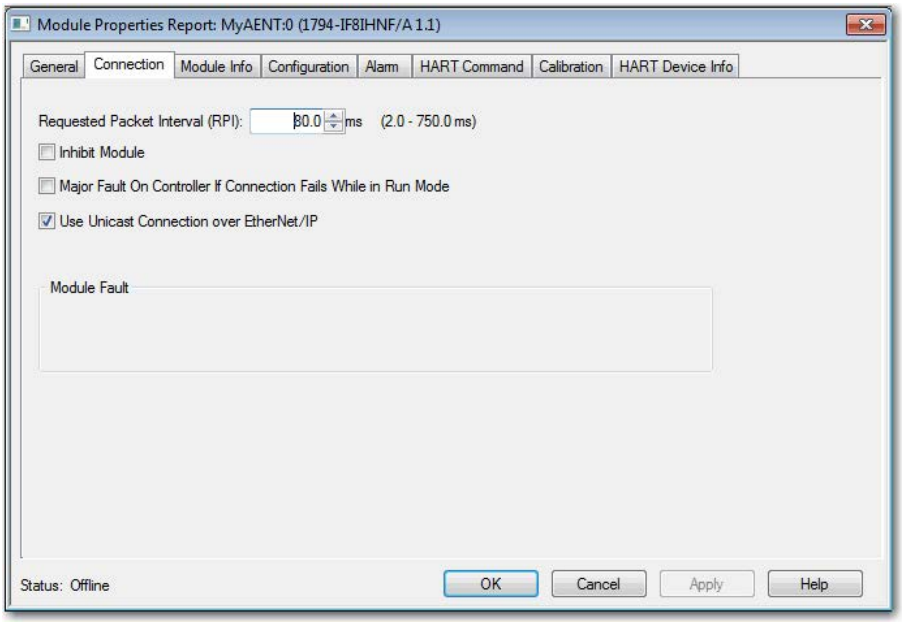
Connection Tab

The Connection tab on the Module Properties dialog box lets you enter a requested packet interval (RPI), inhibit a module, and set a connection fault when the controller is in Run mode. The RPI provides a defined, maximum period of time when data is transferred to the owner-controller.

1. Choose from the options on the Connection tab.

Connection Tab Field Descriptions

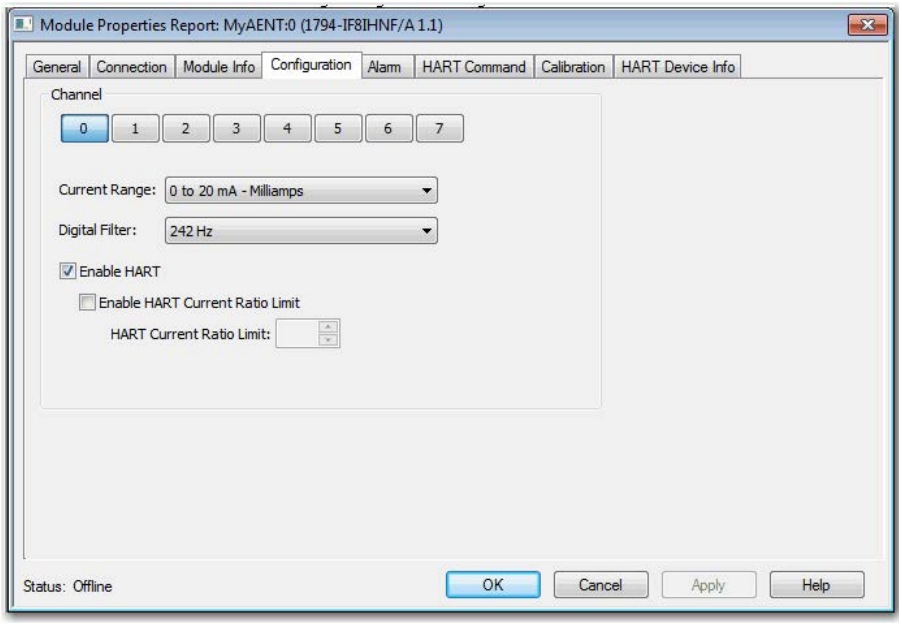
Field	Description
Requested Packet Interval (RPI) (ms)	A user-defined rate at which the module updates the information sent to its owner-controller. This interval defines the slowest rate at which a module sends its data to the owner-controller. The time ranges from 2.0…750 ms and is sent to the module with all other configuration parameters.
Inhibit Module	Check the box to prevent communication between the owner-controller and the module. This option allows for maintenance of the module without faults being reported to the controller.
Major Fault On Controller If Connection Fails While in Run Mode	Check the box to create a major fault if there is a connection failure with the controller while in Run mode.
Use Unicast Connection over EtherNet/IP	This option is enabled by default. **Unicast** connections are point to point transmissions between a source node and destination node on the network. A Frame is sent to a single destination.
Module Fault	The fault box is empty if you are offline. The type of connection fault appears in the text box if a fault occurs when the module is online.



2. Do one of the following:
   - Click Apply to store a change but stay on the dialog box to choose another tab.
   - Click OK if you are finished making changes.

Configuration Tab

The Configuration tab on the Module Properties dialog box lets you program information on each of the eight channels on the 1794-IF8IHNFXT module.



1. Choose from the options on the Configuration tab.

Configuration tab

Field	Description
Channel	Indicates the eight input channels 0…7.
Current range	Current range with the following value options: • 0..20 mA Milliamps (Default) • 0..20 mA % Full Scale • 0..20 mA BINARY • 4..20 mA Milliamps • 4..20 mA % Full Scale • 4..20 mA Signed 2's Complement • 4..20 mA Binary
Digital filter	Serves to reject higher frequency noise and harmonics. Choose a value in Hz that specifies the time constant for a digital first order lowpass filter on the input. A value of 0 disables the filter. • 242 Hz (Default) • 123 Hz • 62 Hz • 19.6 Hz • 16.7 Hz • 10 Hz • 4.17 Hz
Enable HART	Allows to enable or disable HART feature. Check the box to enable HART. Default: Unchecked. The Enable HART check box (DHn bit in the configuration data table) along with the HART OFF Dynamic control bit determines if HART communication is enabled on a channel. The Enable HART check box has priority and will disable all HART communication on a channel at all times even when the HART OFF Dynamic control bit is False(0). If Enable HART check box is checked, then the HART OFF output control bit can be used to dynamically turn HART Off and back On again at any time. See HART On/Off at Dynamic Runtime on page 82.
Enable HART Current Ratio	Allows for enabling or disabling ratio limit per channel. Default: Unchecked.
HART Current Ratio Limit	Sets the ratio limit. For more information about this parameter, see HART Current Ratio (Configuration Words 4…7 – bits 3…7, 11…15.) on page 62.

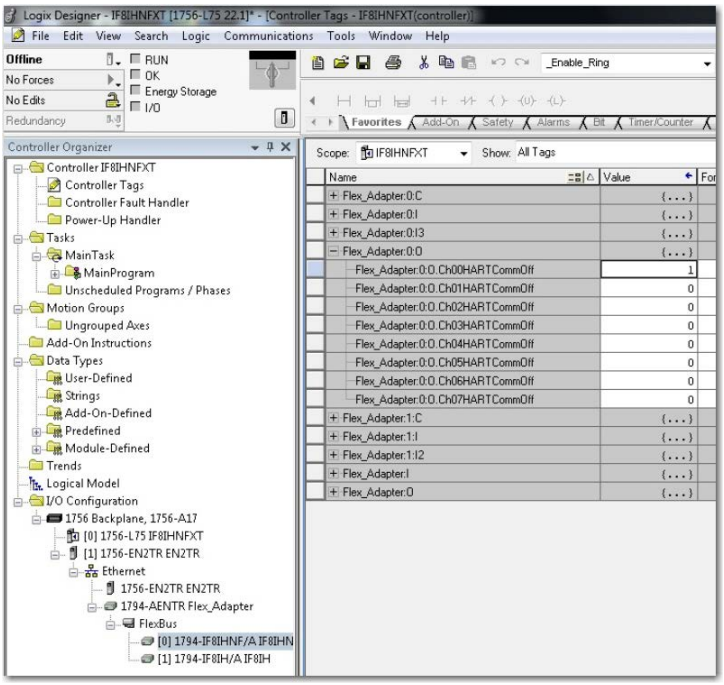
2. Do one of the following:
   - Click Apply to store a change but stay on the dialog box to choose another tab.
   - Click OK if you are finished making changes.

HART On/Off at Dynamic Runtime

To enable HART at runtime:

1. Ensure that the Enable HART check box in Configuration tab is checked.
2. Change the HART OFF Dynamic Control bit (ChxxHARTCommOff) to 1 to turn off HART dynamically.
3. Change the HART OFF Dynamic Control bit (ChxxHARTCommOff) to 0 to turn on HART dynamically again.

Edit the output controller tag ChxxHARTCommOff using a configuration software such as RSLogix 5000 version 24. To enable HART on each channel, set the tag's value to 0. To disable HART, set the value to 1 as shown below.



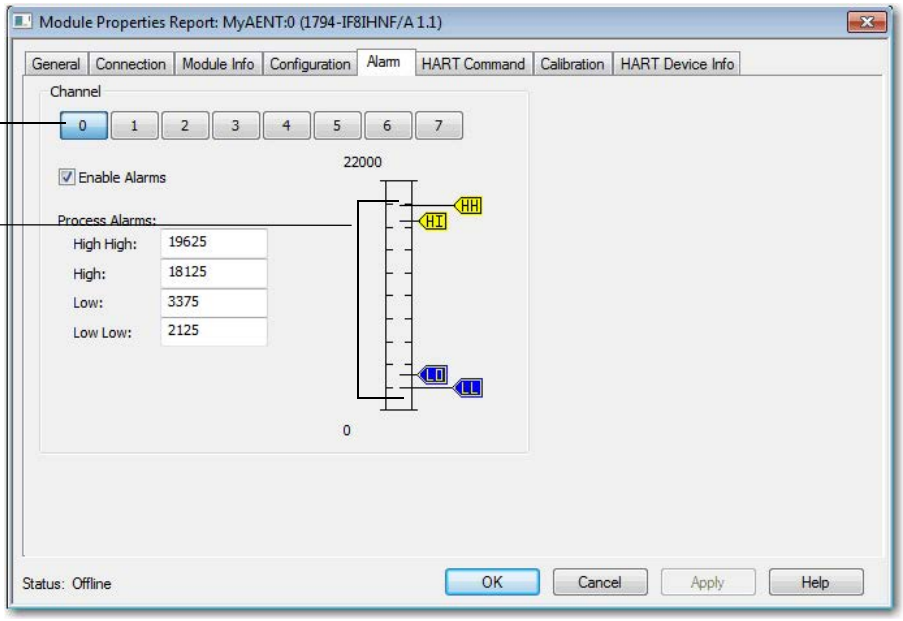
The HART OFF dynamic control output bit, along with the HART Disable configuration bit, determines if HART communication is enabled on a Channel. The HART Disable (DHn) configuration bit has priority and disables all HART communication on a channel at all times even when the HART OFF output bit is False(0). If the HART Disable configuration bit is False(0), then the HART OFF output control bit can be used to turn HART off and on dynamically at any time.

Alarm Tab

The Alarm tab on the Module Properties dialog box lets you program high and low limits, and disable and latch alarms per channel.

Click Channel button to set limits and alarm configuration for each of the 4 channels.

Use the sliders to set limits. HH slider sets High High limits; HI sets High limits; LL for Low Low; and LO for Low.



1. Choose from the options on the Alarm tab.

Alarm Configuration Tab Field Descriptions

Field	What to do	Description
Channel	Select a push button to correspond to a channel (0…7)	Click the channel that is being configured.
Process Alarms		Type a value for each of the four alarm trigger points that alert you when the module has exceeded these limitations. You also can use the respective slider icon to set a trigger value.
High High	Choose from -32,768...32,767	Select a value so that any value out of range in this field causes a profile validation error. This value also appears in the HH slider on this dialog.
High	Choose from -32,768...32,767	Select a value so that any value out of range in this field causes a profile validation error. This value also appears in the HI slider on this dialog.
Low	Choose from -32,768...32,767	Select a value so that any value out of range in this field causes a profile validation error. This value also appears in the LO slider on this dialog.
Low Low	Choose from -32,768...32,767	Select a value so that any value out of range in this field causes a profile validation error. This value also appears in the LL slider on this dialog.
Enable Alarms	Click the checkbox to enable alarms.	Check the box to enable all alarms and show the slider control. **Important**: When you disable all alarms, you disable process, and channel diagnostic alarms (for example, underrange and overrange). We recommend that you disable only unused channels so extraneous alarm bits are not set. Default: Unchecked.

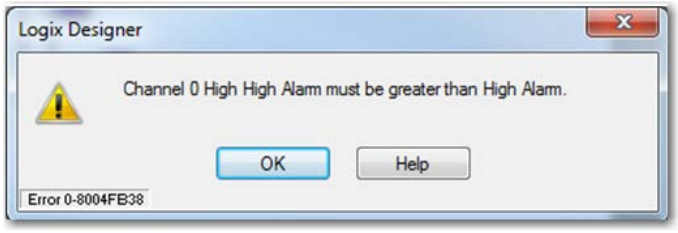
2. After the channels are configured, do one of the following:

- Click Apply to store a change but stay on the dialog box to choose another tab.
- Click OK to apply the change and close the dialog box.
- Click Cancel to close the dialog box without applying changes.

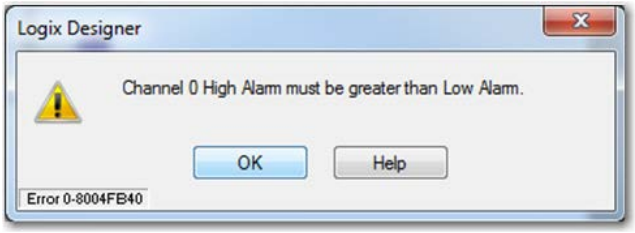
Alarm Conditions

When configuring alarms, error messages are displayed if the following conditions are not met.

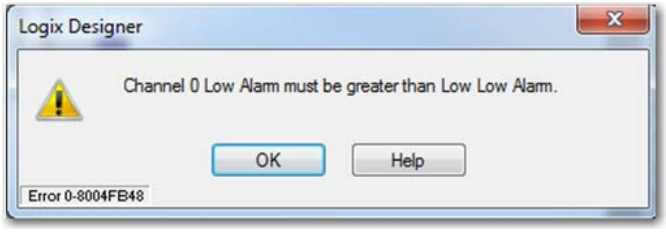
1. High high alarm must be greater than High Alarm. If the condition is not met, the following error is displayed:

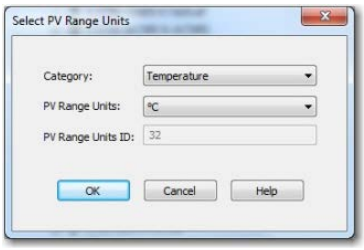


2. High Alarm value must be greater than Low Alarm. If not met, the following error message is displayed:



3. Low Alarm must be greater than Low Low Alarm. If not met, the following error message is displayed.

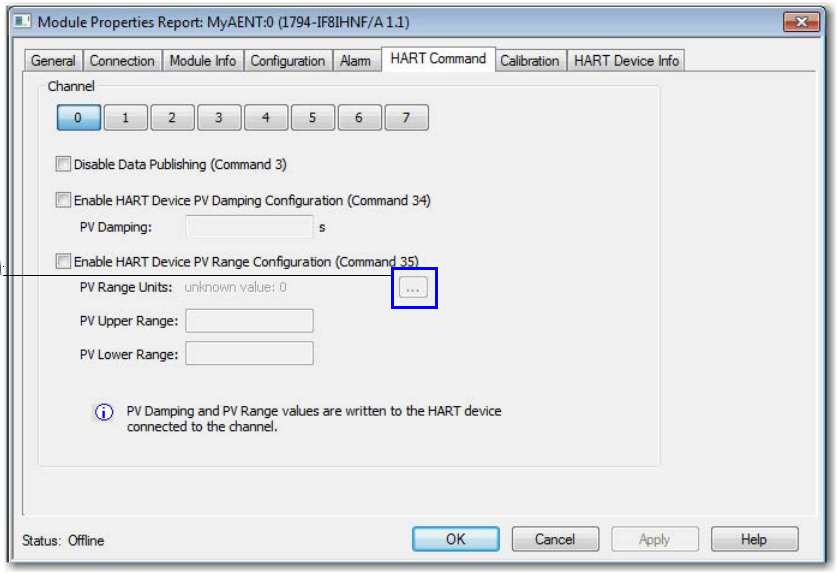




Possible Categories for PV Range Units

Field	Possible Categories
Category	Electrical
	Energy
	Length
	Mass
	Mass Flow
	Mass per volume
	Miscellaneous
	Power
	Pressure
	Radial velocity
	Temperature
	Time
	Velocity
	Viscosity
	Volume
	Volumetric flow

HART Command Tab



IMPORTANT The HART Command tab can only be edited when in RUN mode.

Configure the HART Command tab based on the following field descriptions.

HART Command Tab Field Descriptions

Field	What to do	Description
Channel	Select a push button to correspond to a channel (0…7)	Click the channel that is being configured.
Disable Data Publishing (Command 3)	Check to disable.	This option removes the channel being configured from the cyclic update lists such that the channel's HART data is no longer being published to the user. Default: Unchecked.
Enable HART Device PV Damping Configuration (Command 34)	Check to enable.	This option enables the module to automatically configure the HART device by sending the HART Command 34 during the initialization sequence that occurs when either a device is first detected on the channel or the module detects that the device's "Config Changed" bit is set. Default: Unchecked.
PV Damping	Specify 32-bit floating point value.	This field is enabled if "Enable HART Device PV Damping Configuration (Command 34)" checkbox is checked. Values allowed are 32-bit floating point value. It sets the PV Damping value for the channel. For more information about PV Damping, see Enable HART PV Damping Value (Configuration Word 105, bits 0…7) on page 45.

HART Command Tab Field Descriptions

Field	What to do	Description
Enable HART Device PV Range Configuration (Command 35)	Check to enable.	This option enables the module to automatically configure the HART device by sending the HART Command 35 during the initialization sequence that occurs when either a device is first detected on the channel or the module detects that the device's "Config Changed" bit is set. This feature requires the user to enter the upper, lower, and range units code values into the module's configuration data. Default: Unchecked.
PV Range Units	Specify value.	The field is available when "Enable HART Device PV Range Configuration (Command 35)" is checked.
Select PV Range Units (...)	Click button to bring up dialog box.	This button brings up dialog box to specify PV Range units.
PV Upper Range	Specify 32-bit floating point value.	The field is available when "Enable HART Device PV Range Configuration (Command 35)" is checked. This field specifies the PV Upper Range value for the channel being configured.
PV Lower Range	Specify 32-bit floating point value.	The field is available when "Enable HART Device PV Range Configuration (Command 35)" is checked. This field specifies the PV Lower Range value for the channel being configured.

Auto-configure HART Device with user-supplied PV Damping and Range Values

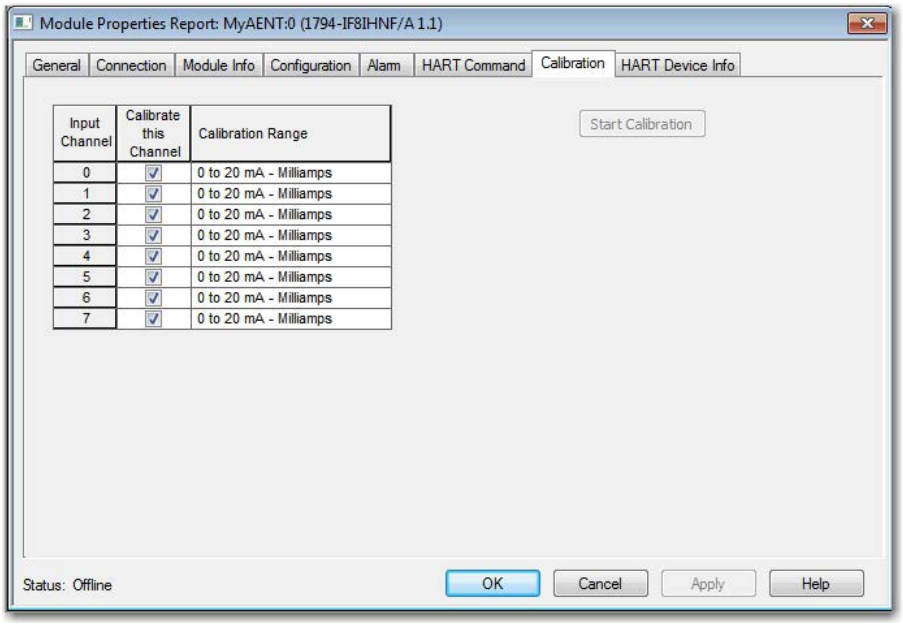
The Enable HART Device PV Damping and Enable HART Device PV Range configuration allows for automatic configuration of a HART device with user supplied PV Damping and/or PV Range values by sending HART commands 34, 35, and 44 to the device at device connection time or if the module detects that the configuration bits are set. See Enable HART PV Upper and Lower Range (Configuration Word 105, bits 8...15) on page 44 and Enable HART PV Damping Value (Configuration Word 105, bits 0...7) on page 45.

The HART commands will only be sent to the device if the feature is enabled and the module detects that the value in the device is different from what is in the configuration table. If the PV Range enable bit is set and the module detects that the PV Units Code value of the device does not match the value in the configuration table, the module will also send command 44 to the HART device. The PV Damping, PV units code, and the PV Upper and Lower Range floating point values will reside in the configuration table.

If the write operation fails (device write protected, unsupported values, etc), then a status flag will be set in bit 7 of the "HART Loop Status" byte to notify the user that the device is not configured properly. If the write is successful and no errors are returned from the device, the module will also verify the floating point values (PV Range and Damping) read back from the device are within 0.5% of the configuration table values, otherwise an error will be flagged.

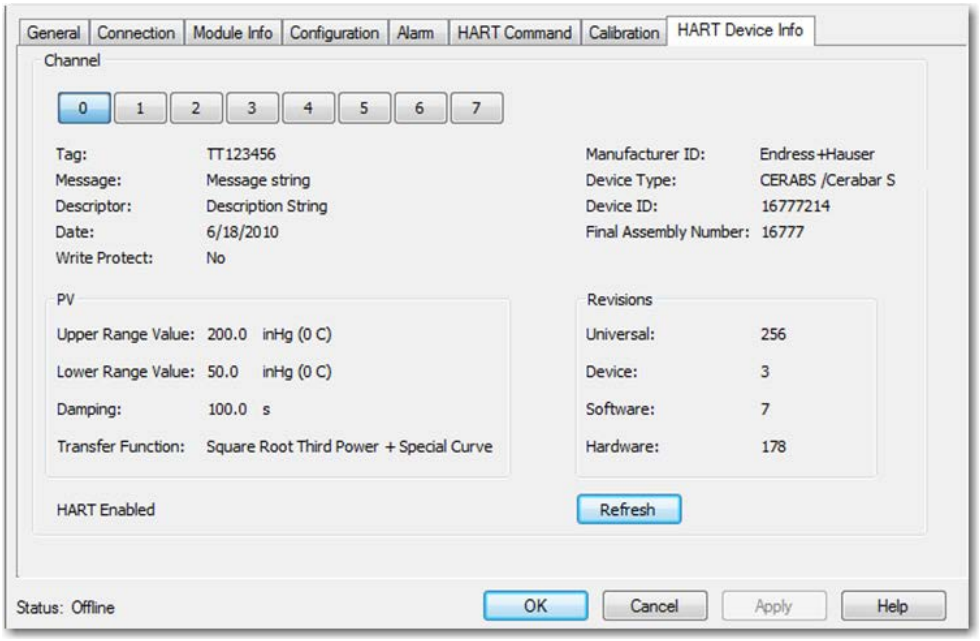
Calibration Tab

The Calibration tab on the Module Properties dialog box lets you recalibrate the module, if necessary. Calibration corrects any hardware inaccuracies on a particular channel.



HART Device Info Tab

The HART Device Info tab is used for diagnostics. It is only available when the Enable HART is checked in the Configuration tab. It allows the user to monitor and check diagnostic data for the module.



IMPORTANT The HART Device Info tab in Logix Designer can only be edited when in RUN mode.

Chapter Summary

In this chapter, you learned how to configure your HART module and how to use the RSLogix 5000/Logix Designer software to install and configure your module. The next chapter describes how to configure your module to automatically collect data from the HART field device and place it in the module's input tag.

Getting HART Data Using CIP MSG Instructions

Overview

Read this chapter to learn how to:

- configure the module to collect HART data from HART field devices.
- use MSG instructions to access additional HART data that is cached within the module
- use MSG instructions to send a HART message directly to the HART device using the HART pass-through mechanism of the module

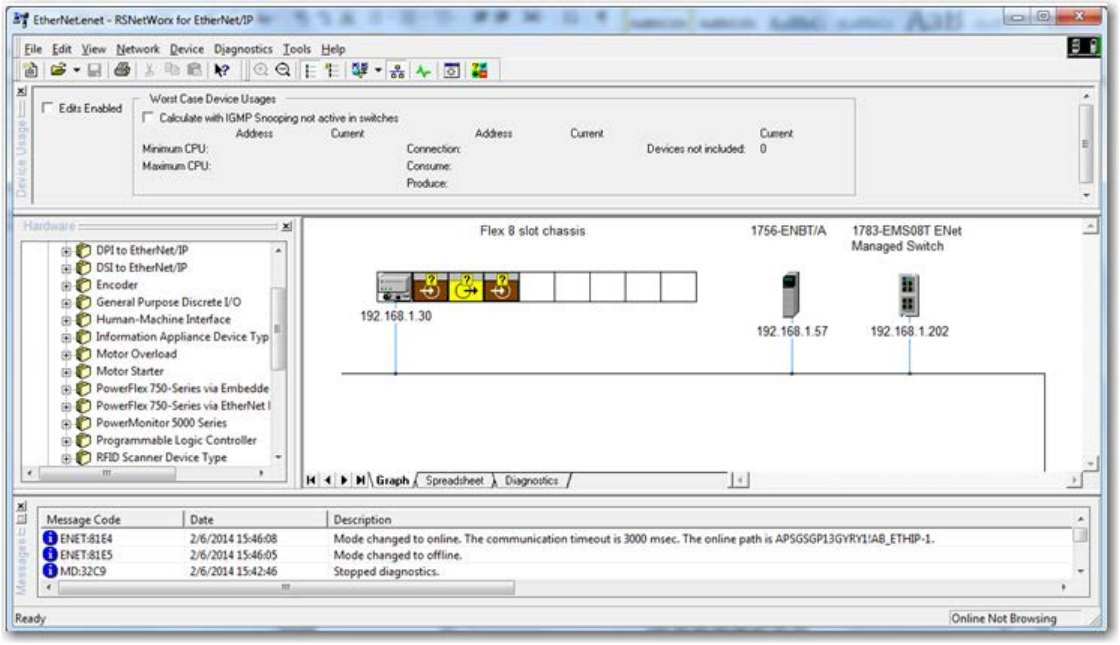
This chapter shows you how to send and receive HART data using CIP MSG instructions as well as structures and format of the messages. It includes a quickstart example that briefly illustrates how to do this.

This chapter also includes methods to access additional HART field device data by using a MSG instruction. By using these mechanisms, your controller has easy access to some commonly used data, and with some extra effort, access to any HART feature. The chapter contains the following main sections:

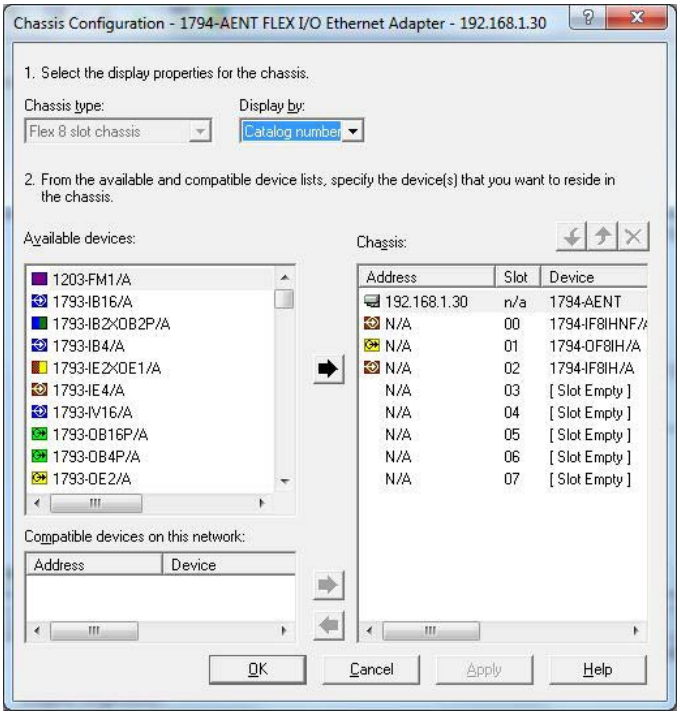
Use RSNetWorx to Send and Receive CIP MSG Instructions

Use the RSNetWorx software to connect FLEX I/O modules to a processor or scanner through a FLEX I/O Ethernet adapter (catalog number 1794-AENT). The following example shows an RSNetworx setup with the following modules in the chassis:

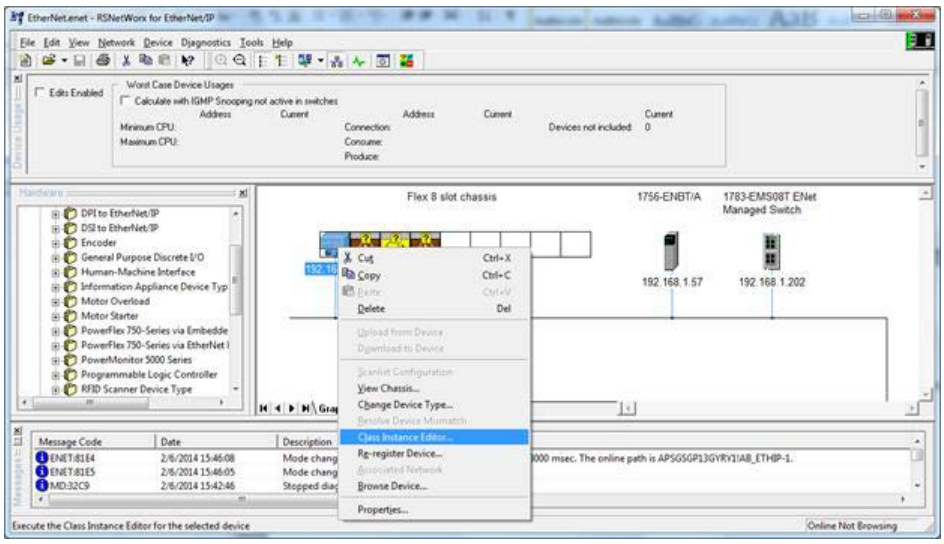
- 1794-AENT adapter
- 1794-IF8IHNFXT (Slot 0)
- 1794-OF8IH (Slot 1)
- 1794-IF8IH (Slot 2)



1. Configure your chassis through the Chassis Configuration dialog box:



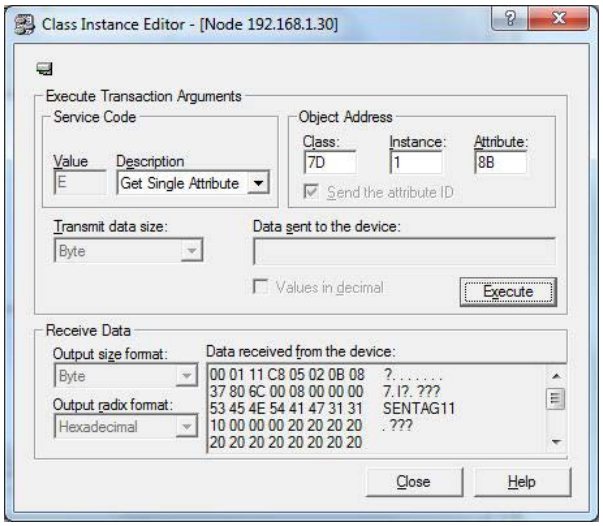
2. Send a message to a device by right-clicking the adapter and selecting Class Instance Editor.



3. Through the Class Instance Editor window, send Get Device Information Block 1 message to channel 1 of 1794-IF8IHNFXT module in Slot 0. To do this:

   a. Choose Get Single Attribute.

   b. Click Execute.



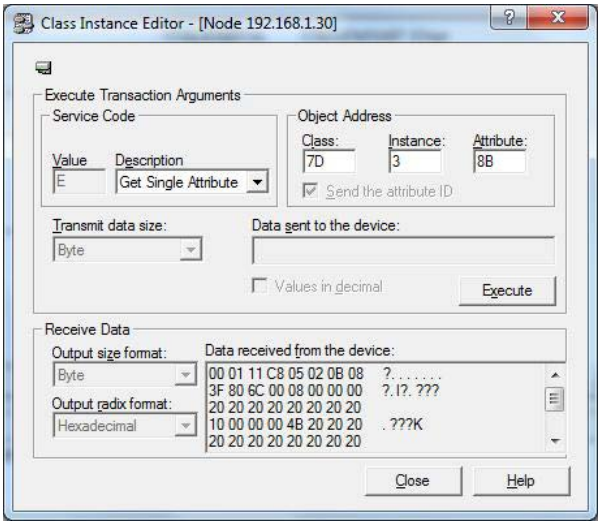
   Note that there are 56 bytes of data returned from the 1794-IF8IHNFXT device as indicated in the Receive Data section of the dialog box.

   To learn about request and reply packet structure for the 1794-IF8IHNFXT module, see:

- 1794-IF8IHNFXT Get Device Information Block 1 Message – Request Packet Structure on page 97

- 1794-IF8IHNFXTHART Get Device Information Block 1 – Reply packet structure on page 98

4. Send Block 1 message to channel 1 of 1794-IF8IH module in Slot 2.



Note that there are 48 bytes of data returned from the module. See the following tables to understand message reply and request message structure from the device:

- Get Device Information Block 1 Message – Reply Packet Structure on page 96
- Get Device Information Block 1 Message – Request Packet Structure on page 96

Access HART Data Using CIP Message Instruction (MSG)

The 1794-IF8IH, 1794-OF8IH, and 1794-IF8IHNFXT modules support these broad categories of MSG-based HART access:

- CIP formatted messages to retrieve common HART data cached in the module.
- CIP messages containing HART formatted commands that are passed directly to the HART Field Device for processing. These are called pass-through messages.

Fill in the Information Needed for a MSG Instruction

The MSG instruction is formatted as shown below.

CIP Message Format – Unconnected Message Header

Field	Value	Definition
Message Type	CIP Generic	
Service Code	0x0E Get Attribute Single-READ DATA 0x10 Set Attribute Single-WRITE DATA	
Class Name	0x007D	FLEX module object
Instance Name	1…8	Module location 1 = module adjacent to adapter
Object Attribute	0x7E…0xA7	Selects Data Assembly or function. (see Module Data Access Assemblies on page 93)
Source Length (applies to Set Attribute Single)	Depends on data assembly selected	Specifies size in bytes of data to write to module.

Select the Attribute Value for the Operation You Want to Perform

CIP message attribute values of 0x7E...0x86 are used for HART pass-through messages, values 0x87...0xA6 are used to retrieve additional HART data from the modules internal database, and attribute 0xA7 is used to reset the Secondary Input table flag, HART Update, which is bit 5 of the loop status.

Module Data Access Assemblies

Attribute	Size (Words)	R/W	Description
0x7E	1	R	Get HART Channel Status (Dev Info Valid)
0x7F	1	W	User -Select Handle For Msg Response Query
0x80	3	R	User - Get Message Response Status
0x81	24	R/W	HART Pass-through Message Request/Response Buffer
0x82	18	R/W	HART Pass-through Message Request/Response Buffer
0x83	12	R/W	HART Pass-through Message Request/Response Buffer
0x84	9	R/W	HART Pass-through Message Request/Response Buffer
0x85	6	R/W	HART Pass-through Message Request/Response Buffer
0x86	4	R/W	HART Pass-through Message Request/Response Buffer

Module Data Access Assemblies

Attribute	Size (Words)	R/W	Description
0x87	24 28[1]	R	Chan 0 - Get Device Info Block 1
0x88	28	R	Chan 0 – Get Device Info Block 2
0x89	8	R	Chan 0 – Get Device Info Block 3
0x8A	19	R	Chan 0 – Get Device Info Block 4
0x8B	24 28[1]	R	Chan 1 – Get Device Info Block 1
0x8C	28	R	Chan 1 – Get Device Info Block 2
0x8D	8	R	Chan 1 – Get Device Info Block 3
0x8E	19	R	Chan 1 – Get Device Info Block 4
0x8F	24 28[1]	R	Chan 2 – Get Device Info Block 1
0x90	28	R	Chan 2 – Get Device Info Block 2
0x91	8	R	Chan 2 – Get Device Info Block 3
0x92	19	R	Chan 2 – Get Device Info Block 4
0x93	24 28[1]	R	Chan 3 – Get Device Info Block 1
0x94	28	R	Chan 3 – Get Device Info Block 2
0x95	8	R	Chan 3 – Get Device Info Block 3
0x96	19	R	Chan 3 – Get Device Info Block 4
0x97	24 28[1]	R	Chan 4 – Get Device Info Block 1
0x98	28	R	Chan 4 – Get Device Info Block 2
0x99	8	R	Chan 4 – Get Device Info Block 3
0x9A	19	R	Chan 4 – Get Device Info Block 4
0x9B	24 28[1]	R	Chan 5 – Get Device Info Block 1
0x9C	28	R	Chan 5 – Get Device Info Block 2
0x9D	8	R	Chan 5 – Get Device Info Block 3
0x9E	19	R	Chan 5 – Get Device Info Block 4
0x9F	24 28[1]	R	Chan 6 – Get Device Info Block 1
0xA0	28	R	Chan 6 – Get Device Info Block 2
0xA1	8	R	Chan 6 – Get Device Info Block 3
0xA2	19	R	Chan 6 – Get Device Info Block 4
0xA3	24 28[1]	R	Chan 7 – Get Device Info Block 1

Module Data Access Assemblies

Attribute	Size (Words)	R/W	Description
0xA4	28	R	Chan 7 – Get Device Info Block 2
0xA5	8	R	Chan 7 – Get Device Info Block 3
0xA6	19	R	Chan 7 – Get Device Info Block 4
0xA7	1	W	Reset User Device Info Changed Status Bit (Dn)
0xCB	18[1]	R/W	User calibration.
0xCC	32[1]	R	Get PV Config Errors

(1) Applies to 1794-IF8IHNFXT.

Retrieve Additional Information About the HART Device

The module automatically acquires and then stores information about the HART device that is connected to a channel and this data can be retrieved using the MSG instruction. You can get information such as the device identity or additional status information that the device might have on its current condition. The module request is called Get Device Information and each reply data structure returns specific elements of HART data that is referenced by what HART command was issued to retrieve that piece of the HART data. Refer to the HART device user manual or the HART specification for detailed explanation of each data element.

Get Device Info Block 1 Message for 1794-IF8IH and 1794-OF8IH

Get Device Information Block 1 Message – Request Packet Structure

Field	Value	Definition
Message Type	CIP Generic	
Service Type	Get Attribute Single	Read from module.
Service Code	0x0E	
Class Name	0x7D	FLEX module object.
Instance	1…8 (Module next to Adapter = 1)	Module location
Object Attribute	0x87 = Channel 0 (Add 4 for next channel) 0x8B = Channel 1 0x8F = Channel 2 0x93 = Channel 3 0x97 = Channel 4 0x9B = Channel 5 0x9F = Channel 6 0xA3 = Channel 7	Selects channel that the data is from.
Reply Size	48 bytes	
Request Size	0	

Get Device Information Block 1 Message – Reply Packet Structure

Offset(1)	Field	Value	Definition
0	Status	00 = SUCCESS 0x86 = Channel is not HART Enabled 0x87 = No Device Found	Command status
1	Echo of Channel	0…7	Channel
2	HART ManufacturerIDCode	(1 byte)	CMD#0, Byte 1
3	HARTDeviceTypeCode	(1 byte)	CMD#0, Byte 2
4	HARTUnivCmdCode	(1 byte)	CMD#0, Byte 4
5	HARTTransSpecRev	(1 byte)	CMD#0, Byte 5
6	HARTSoftwareRevision	(1 byte)	CMD#0, Byte 6
7	HARTHardwareRevision	(1 byte)	CMD#0, Byte 7
8…11	HARTDeviceIDNumber	(4 bytes - UINT)	CMD#0, Bytes 9…11 Bytes re-ordered into Intel Format (LSB 1st) from HART format (MSB 1st)
12…15	TagSize	8 (4 bytes)	
16…23	TagString	(8 bytes unpacked ASCII)	CMD#13, Bytes 0…5

Get Device Information Block 1 Message – Reply Packet Structure

Offset[1]	Field	Value	Definition
24…27	DescriptorSize	16 (4 bytes)	
28…43	DescriptorString	(16 bytes unpacked ASCII)	CMD#13, Bytes 6…17
44	DataDay	(1 byte)	CMD#13, Byte 18
45	DataMonth	(1 byte)	CMD#13, Byte 19
46…47	DataYear	(2 bytes)	CMD#13, Byte 20 (+1900)
Total = 48 bytes			

(1) Data in offsets 2…47 are set to 0 if Status in offset 0 indicates a problem (Status = 0x86 or 0x87).

Get Device Info Block 1 Message for 1794-IF8IHNFXT

1794-IF8IHNFXT Get Device Information Block 1 Message – Request Packet Structure

Field	Value	Definition
Message type	CIP Generic	
Service type	Get Attribute Single	Read from module
Service code	0x0E	
Class name	0x7D	FLEX module object
Instance	1…8 (Module next to Adapter = 1)	Module location
Object attribute	0x87 = Channel 0 (Add 4 for next channel) 0x8B = Channel 1 0x8F = Channel 2 0x93 = Channel 3 0x97 = Channel 4 0x9B = Channel 5 0x9F = Channel 6 0xA3 = Channel 7	Selects channel that the data is from.
Reply size	56 bytes	
Request size	0	

1794-IF8IHNFXTHART Get Device Information Block 1 – Reply packet structure

Offset	Field	Value	Definition
0	Status	00 = SUCCESS 0x86 = Channel is not HART Enabled 0x87 = No Device Found	Command status
1	Echo of Channel	0…7	Channel
2	HART ManufacturerIDCode	(1 byte)	CMD#0, Byte 1
3	HARTDeviceTypeCode	(1 byte)	CMD#0, Byte 2
4	HARTUnivCmdCode	(1 byte)	CMD#0, Byte 4
5	HARTTransSpecRev	(1 byte)	CMD#0, Byte 5
6	HARTSoftwareRevision	(1 byte)	CMD#0, Byte 6
7	HARTHardwareRevision	(1 byte)	CMD#0, Byte 7
8…11	HARTDeviceIDNumber	(4 bytes - UINT)	CMD#0, Bytes 9-11 Bytes re-ordered into Intel Format(LSB 1st) from HART format(MSB 1st).
12…15	TagSize	8 (4 bytes)	
16…23	TagString	(8 bytes unpacked ASCII)	CMD#13, Bytes 0-5
24…27	DescriptorSize	16 (4 bytes)	
28…43	DescriptorString	(16 bytes unpacked ASCII)	CMD#13, Bytes 6-17
44	DataDay	(1 byte)	CMD#13, Byte 18
45	DataMonth	(1 byte)	CMD#13, Byte 19
46…47	DataYear	(2 bytes)	CMD#13, Byte 20 (+ 1900)
48…49	OEMManufacturerID16Bit	(2 bytes)	CMD#0, Byte 1 if HART rev < 7 CMD#0, Bytes 17-18 if HART rev >= 7 Bytes re-ordered into Intel Format(LSB 1st) from HART format(MSB 1st).

1794-IF8IHNFXTHART Get Device Information Block 1 – Reply packet structure

Offset	Field	Value	Definition
50…51	PrivateLabelMfg16Bit	(2 bytes)	CMD#0,Byte 1 if HART rev < 7 CMD#0,Bytes 19-20 if HART rev >= 7 Bytes re-ordered into Intel Format(LSB 1st) from HART format(MSB 1st).
52…53		(2 bytes)	CMD#0,Byte 2 if HART rev < 7 CMD#0,Bytes 1-2 if HART rev >= 7 Bytes re-ordered into Intel Format(LSB 1st) from HART format(MSB 1st).
54…55	Pad (32bit alignment)	(2 bytes)	Unused

Get Device Info Block 2 Message

Get Device Information Block 2 Message – Request Packet Structure

Field	Value	Definition
Message Type	CIP Generic	
Service Type	Get Attribute Single	Read from module.
Service Code	0x0E	
Class Name	0x7D	FLEX module object
Instance	1…8 (Module next to Adapter = 1)	Module location.
Object Attribute	0x88 = Channel 0 (Add 4 for next channel) 0x8C = Channel 1 0x90 = Channel 2 0x94 = Channel 3 0x98 = Channel 4 0x9C = Channel 5 0xA0 = Channel 6 0xA4 = Channel 7	Selects channel that the data is from.
Reply Size	56 bytes	
Request Size	0	

Get Device Information Block 2 Message – Reply Packet Structure

Offset(1)	Field	Value	Definition
0	Status	00 = SUCCESS 0x86 = Channel is not HART Enabled 0x87 = No Device Found	Command status
1	Echo of Channel	0…7	Channel
2	TransferFunction	(1 byte)	CMD#15, Byte 1
3	WriteProtectCode	(1 byte)	CMD#15, Byte 15
4…7	MessageSize	(4 bytes)	
8…39	MessageString	(32 bytes unpacked ASCII)	CMD#12, Bytes 0…23
40…43	HARTPVUpperRange	(4 bytes - UINT)	CMD#15, Bytes 3…6
44…47	HARTPVLowerRange	(4 bytes - UINT)	CMD#15, Bytes 7…10
48…51	DampingValue	(4 bytes - UINT)	CMD#15, Bytes 11…14
52…55	FinalAssemblyNumber	(4 bytes - UINT)	CMD#16, Bytes 0…2 Bytes re-ordered into Intel Format (LSB 1st) from HART Format (MSB 1st)

(1) Data in offsets 2…55 will be set to 0 if Status in offset 0 indicates a problem (Status = 0x86 or 0x87).

Get Device Info Block 3 Message

Get Device Information Block 3 Message – Request Packet Structure

Field	Value	Definition
Message Type	CIP Generic	
Service Type	Get Attribute Single	Read from module.
Service Code	0x0E	
Class Name	0x7D	FLEX module object.
Instance	1…8 (Module next to Adapter = 1)	Module location
Object Attribute	0x89 = Channel 0 (Add 4 for next channel) 0x8D = Channel 1 0x91 = Channel 2 0x95 = Channel 3 0x99 = Channel 4 0x9D = Channel 5 0xA1 = Channel 6 0xA5 = Channel 7	Selects channel that the data is from.
Reply Size	16 bytes	
Request Size	0	

Get Device Information Block 3 Message – Reply Packet Structure

Offset(1)	Field	Value	Definition
0	Status	00 = SUCCESS 0x86 = Channel is not HART Enabled 0x87 = No Device Found	Command status
1	Echo of Channel	0…7	Channel
2	pad	0	
3	pad	0	
4	PVAssignmentCode	(1 byte)	CMD#50, Byte 0; Set to 0xff if HART Cmd 50 not supported by device
5	SVAssignmentCode	(1 byte)	CMD#50, Byte 1; Set to 0xff if HART Cmd 50 not supported by device
6	TVAssignmentCode	(1 byte)	CMD#50, Byte 2; Set to 0xff if HART Cmd 50 not supported by device
7	FVAssignmentCode	(1 byte)	CMD#50, Byte 3; Set to 0xff if HART Cmd 50 not supported by device
8	PVUnits	(1 byte)	CMD#3, Byte 4; Set to 0 if device does not return a value for PV.

Get Device Information Block 3 Message – Reply Packet Structure

Offset[1]	Field	Value	Definition
9	SVUnits	(1 byte)	CMD#3, Byte 9; Set to 0 if device does not return a value for SV.
10	TVUnits	(1 byte)	CMD#3, Byte 14; Set to 0 if device does not return a value for TV.
11	FVUnits	(1 byte)	CMD#3, Byte 19; Set to 0 if device does not return a value for FV.
12	PVRangeUnits	(1 byte)	CMD#15, Byte 2
13	Pad_8 alignment	(1 byte)	
14	HARTPreamble	(1 byte)	CMD#0, Byte 3
15	HARTFlages	(1 byte)	CMD#0, Byte 8

(1) Data in offsets 4…15 will be set to 0 if Status in offset 0 indicates a problem (Status = 0x86 or 0x87).

Get Device Information Block 4 Message

Get Device Information Block 4 Message – Request Packet Structure

Field	Value	Definition
Message Type	"CIP Generic"	
Service Type	Get Attribute Single	Read from module.
Service Code	0x0E	
Class Name	0x7D	FLEX module object.
Instance	1…8 (Module next to Adapter = 1)	Module location.
Object Attribute	0x8A = Channel 0 (Add 4 for next channel) 0x8E = Channel 1 0x92 = Channel 2 0x96 = Channel 3 0x9A = Channel 4 0x9E = Channel 5 0xA2 = Channel 6 0xA6 = Channel 7	Selects channel that the data is from.
Reply Size	38 bytes	
Request Size	0	

Get Device Information Block 4 Message – Reply Packet Structure

Offset[1]	Field	Value	Definition
0	Status	00 = SUCCESS 0x86 = Channel is not HART Enabled 0x87 = No Device Found	Command status
1	Echo of Channel	0…7	Channel
2	pad	0	
3	pad	0	
4…7	Loop Current	Float(4 bytes)	
8…11	Count	0…25 (DINT,4 bytes)	Number of extended status bytes that device returned.
12…36	Ext Status Bytes[25]	0…255	Extended status bytes returned by CMD48. Unused bytes are set to 0.
37	pad	0	

(1) Data in offsets 4…36 will be set to 0 if Status in offset 0 indicates a problem (Status = 0x86 or 0x87).

Reset the Device Info Changed Status Bit Message

This resets the Device Info Changed Status Bit (Bit 5 in the Loop Status Byte) located in the Secondary Input Data Table (Cyclic EDT Input Data). If this message is not sent, then the bit will remain set once the module has set this bit, after it has detected that the data has changed.

Here is an example of usage of this message.

1. Detect that the "Device Info Changed Status Bit" is set.
2. Send Reset Message.
3. Send "Get Device Info Block X" messages to refresh the data that is being used in the User's Ladder Program.

Reset Message Request Packet Structure

Field	Value	Definition
Message Type	CIP Generic	
Service Type	Set Attribute Single	Write to module.
Service Code	0x10	
Class Name	0x7D	FLEX module object.
Instance	1…8 (Module next to adapter = 1)	Module location.

Reset Message Request Packet Structure

Field	Value	Definition
Object Attribute	0xA7	
Reply Size	0	
Request Size	2 bytes	

Reset Message Reply Packet Structure

Offset	Field	Value	Definition
0	Select Channel	0…7	Channel to reset
1	Pad	NA	
Total = 2 bytes			

HART Pass-through Message Overview

FLEX I/O modules have a HART pass-through messaging mechanism that provides the user the ability to send any HART command to the HART device using MSG instructions.

There are five module commands related to pass-through:

- Pass-through Init
- Get Pass-through Message Query Status
- Read pass-through Reply
- Select Handle
- Flush Queues (rarely needed)

Pass-through init

Pass-through Init is used to instruct the module to initiate a HART pass-through operation by sending the needed information for a HART Pass through request to the module.

There are two types of HART pass-through INIT requests, one is called Easy HART, and the other is called Full HART. The Easy HART method is simpler, requires less data, and does not require you to know the details of creating a fully formatted HART message as defined by the HART specifications since the module will take care of the extra details like adding the message start delimiter, the device's address, and the checksum of the message for you. The module also supports sending the fully formatted HART message if you need the extra security of knowing that the fully formatted message contains a specific device's address and is only accepted by that device. In general, the Easy HART method is

meant for users who need to send a message using ladder to a device but do not want to spend time learning the details of the HART protocol.

IMPORTANT The native HART data returned by devices is in a different format than the one used by the Logix controllers. HART uses the Big Endian format and Logix uses Little Endian format. This means that the order of the bytes in a multi-byte value are in the opposite order so they must be reversed before use. Little Endian means that the least significant byte of a number is stored at the lowest address (array index).

Also be aware that Logix aligns multi-byte data boundaries that permit fast access and HART packs them into the smallest space. HART encodes text strings using 6 bits per letter into a format called Packed ASCII. When using pass-through messaging, your Logix program must be able to handle these data layout issues.

Get Pass-through Message Query Status

The "Get pass-through message query status" read command returns status of a pass-through operation that lets you know if the pass-through HART message reply has been received by the module from the device.

Read Pass-through Reply

Once the "Query Status" shows that the reply is ready, then you can issue a "Read Pass-through Reply buffer" operation to retrieve the reply from the module.

Each channel has a separate buffer to hold a pass-through request so you can have eight requests running at once. The module discards a reply being held in a buffer if the reply has not been retrieved from the module within 50 seconds.

Select Handles

If you are managing multiple messages, send the Select Handle for Message Response Query message to select which handle the Get pass-through message query status or read pass-through reply is associated to.

Flush Queues

Flush queues can be sent to have the module discard any pending HART replies awaiting a query command. These replies are automatically discarded after a period of time, which is configurable on the Configuration tab of the Module Properties dialog box. This value is usually 15 seconds. Unless you need to discard the replies faster than 15 seconds, you will not need to use this Flush Queue command.

Format a HART Pass-through Init Request Message

A HART Pass-through Init request consists of setting up a MSG instruction with a Service type of Set Attribute Single, which allows you to write data into the module. This data is formatted to include information about the HART command that you want to send to the HART device.

HART Pass-through Init – Message Packet Structure

Field	Value	Definition
Message Type	CIP Generic	
Service Type	Set Attribute Single	Write to module.
Service Code	0x10	
Class Name	0x7D	FLEX module object.
Instance	1…8 (Module next to Adapter = 1)	Module location.
Object Attribute	0x81…0x86 (See Module Data Access Assemblies on page 93)	Select smallest buffer size that will hold message request.
Reply Size	0	
Request Size	8...48 bytes	

HART Pass-through Init – Reply Packet Structure

Offset	Field	Value	Definition
0	Module command	1 = EASY-Hart Format 2 = FULL-Hart Protocol	Pass-through Init Command
1	Channel	0…7	Selects module channel.
2	Handle	0…255	User supplied message handle
3	Page number	0…5	Page number of this Write
4…5	Data size	0…264 (INT, 2 bytes)	Total size of HART Data bytes needed for complete message that start at byte offset = 8 (does not include the 8 header bytes)
6	HART Command [EASY Hart Format] Pad Byte [FULL Hart Protocol]	0…255 or 0	For the "EASY Hart Format", this field selects the HART Command. For the "FULL Hart Protocol" this field is an unused byte and can be set to 0.
7	Pad byte	0	Pad byte for 32 bit alignment
8…47	HART data	0…255	For the "EASY Hart Format" this data array contains only the HART Data portion of a HART message if HART command selected requires any data. For the "FULL Hart Protocol" this data array contains the complete, fully formatted HART Message excluding preamble bytes. (Preamble bytes are not supported and will cause the message to fail.)

Format a Get Pass-through Message Status Request

This message is used to query the module for status on a HART message that has already been initiated. The handle associated with the query is either the last HART message initiated or the handle selected by the "Select Handle" message, whichever occurred most recently.

Get Pass-through Message Status – Message Packet Structure

Field	Value	Definition
Message Type	CIP Generic	
Service Type	Get Attribute Single	Read from module.
Service Code	0x0E	
Class Name	0x7D	FLEX module object.

Get Pass-through Message Status – Message Packet Structure

Field	Value	Definition
Instance	1…8 (Module next to Adapter = 1)	Module location
Object Attribute	0x80	Get status
Reply Size	6 bytes	
Request Size	0	

Get Pass-through Message Status – Reply Packet Structure

Offset	Field	Value	Definition
0	Query Status	0…5	Status of command related to Handle
1	Channel	0…7 (Handle Active) 0xFF (Handle not active)	Channel associated with Status
2	Handle	0…255	Message Handle Echo
3	Next Assembly Attribute OR HART Failed Reason Code if Query Status = 3	0x81…0x86 1…0x88 HART Failed Reason Code	Recommended assembly to read next, else returns 0 if this is the last page. If Query Status is equal to 3, then this value is the Failed Reason Code.
4…5	Total Bytes in Reply	0…264 (16 bit Word)	Total bytes available in reply excluding the 8 bytes of header information returned in each read request (page).

Query Status:

0 = Success; data Available. Retrieve reply by reading next assembly index.
1 = No Data/Message Active. Handle requested not associated with any active message.
2 = Running; data reply is not available yet
3 = HART Request Failed. See Reason Code in byte 3.
4 = Incomplete Message Request. Not enough data received yet.
5 = Handle already in use.

HART Failed Reason Code

Codes 1...0x7F (127) will only be reported in EASY-HART Format and are codes that are reported directly from the HART device's Command Response status byte.

For a listing of the most common HART failure error codes, see HART Failure Error Codes on page 117.

Format a Read Pass-through Reply Request

This message returns the status of pass-through messages along with the actual reply from the device if the pass-through is completed. The handle associated with the response data is either the last HART message initiated or the handle selected by the "Select Handle" message, whichever occurred most recently.

Read Pass-through Reply – Message Packet Structure

Field	Value	Definition
Message Type	CIP Generic	
Service Type	Get Attribute Single	Read from module.
Service Code	0x0E	
Class Name	0x7D	FLEX module object
Instance	1…8 (Module next to Adapter = 1)	Module location
Object Attribute	0x81…0x86	Get status
Reply Size	8…48 bytes(1)	
Request Size	0	

(1) Depends on attribute selected.

Read Pass-through Reply – Reply Packet Structure

Offset	Field	Value	Definition
0	Query Status	0…5	Status of command related to Handle
1	Channel	0…7 (Handle active) 0xFF (Handle not active)	Channel associated with Status
2	Handle	0…255	Message Handle
3	Next Assembly Attribute OR HART Failed Reason Code if Query Status = 3	0x81…0x86 1…0x88 HART Failed Reason Code	Recommended assembly to read next, else returns 0 if this is the last page. If Query Status is equal to 3,then this value is the Failed Reason Code.
4	Number of HART Data bytes returned in this reply (this page)	0…40	Bytes in this page that are valid starting at offset 8 (page reply size excluding the 8 bytes of header).
5	Page number of this reply	0…5	Page number of this reply. After a buffer reply read, the page is incremented internal to module so that the next read contains the next page.

Read Pass-through Reply – Reply Packet Structure

Offset	Field	Value	Definition
6	HART Com Status Byte	0…255	1st Status Byte returned from Device
7	HART Field Status Byte	0…255	2nd Status Byte returned from Device
8…47 per page	HART reply Data	0…255	If request type was EASY-Hart format then this data array is the HART Data bytes from the device's reply message. If Request was FULL-Hart Protocol format, then this data array is the complete HART reply message excluding the preamble bytes. Preamble bytes are removed from the reply by the module.

Get PV Config Errors – Request Packet Structure

Field	Value	Definition
Message Type	CIP Generic	
Service Type	Get Attribute Single	Read from module
Service Code	0x0E	
Class Name	0x7D	FLEX module object
Instance	1…8 Module next to adapter = 1	Module location
Object attribute	0xCC	
Reply size	32 bytes	
Request size	0	

Get PV Config Errors Reply Data

Byte offset	Definition
0	Chan 0 Cmd 34 Response Code
1	Chan 0 Cmd 35 Response Code
2	Chan 0 Cmd 44 Response Code
3	Chan 0 Comms and Verify Errors Code
4	Chan 1 Cmd 34 Response Code
5	Chan 1 Cmd 35 Response Code
6	Chan 1 Cmd 44 Response Code
7	Chan 1 Comms and Verify Errors Code
8	Chan 2 Cmd 34 Response Code
9	Chan 2 Cmd 35 Response Code

Get PV Config Errors Reply Data

Byte offset	Definition
10	Chan 2 Cmd 44 Response Code
11	Chan 2 Comms and Verify Errors Code
12	Chan 3 Cmd 34 Response Code
13	Chan 3 Cmd 35 Response Code
14	Chan 3 Cmd 44 Response Code
15	Chan 3 Comms and Verify Errors Code
16	Chan 4 Cmd 34 Response Code
17	Chan 4 Cmd 35 Response Code
18	Chan 4 Cmd 44 Response Code
19	Chan 4 Comms and Verify Errors Code
20	Chan 5 Cmd 34 Response Code
21	Chan 5 Cmd 35 Response Code
22	Chan 5 Cmd 44 Response Code
23	Chan 5 Comms and Verify Errors Code
24	Chan 6 Cmd 34 Response Code
25	Chan 6 Cmd 35 Response Code
26	Chan 6 Cmd 44 Response Code
27	Chan 6 Comms and Verify Errors Code
28	Chan 7 Cmd 34 Response Code
29	Chan 7 Cmd 35 Response Code
30	Chan 7 Cmd 44 Response Code
31	Chan 7 Comms and Verify Errors Code

Chapter Summary

In this chapter, you learned how to configure the 1794-IF8IH, 1794-IF8IHNFXT, and 1794-OF8IH HART modules to automatically collect data from the HART field device and place it in the module's input tag. The next chapter describes how to troubleshoot your module.

Notes:

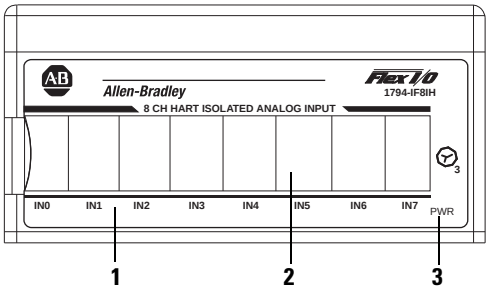
Troubleshoot Your Module

Overview

This chapter describes how to troubleshoot the FLEX I/O Isolated Input/Output HART Analog Modules.

Interpret Status Indicators

The modules have one power indicator that is on when power is applied to the module and one status indicator each for input and output.



1794-IF8IH shown

44811

	Description
1	Module Status Indicator(1)
2	Insertable labels for writing individual input designations
3	Power indicator(2)

(1) See Module Status Indicators on page 114.

(2) See Power LED Status Indicator on page 113.

Power LED Status Indicator

LED Indication	Module State	Description
Blinking Green @ 1 Hz	Powerup Module not configured	Module has not received configuration.
Solid Green	ProgramMode / Idle	Controller in Program mode. Communication is normal.
	Run Mode / Active	Controller in RUN mode. Communication is normal
Solid Red	Fault(1)	Hardware fault, ARM Watchdog Reset occurred, or at least one channel has a calibration fault.
Off	No field power.	Field power not connected.

(1) Not all hardware faults results to the OK LED going red. If ARM fails, the state of the OK LED will be indeterminate.

Module Status Indicators

Module State	Condition	LED Color and State
New	Powerup initialization complete and self-test has been passed. Loads stored configuration, if it exists. Read Module Information Block.(1)	Red, blink @ 1 Hz
No Configuration	Module has not received configuration from Master. It can Set and Get attributes.	Green, blink @ 1 Hz
Idle	Controller in Program mode. Communication is normal.	Green, blink @ 1 Hz
Active	Controller in Run mode and communication is normal.	Green, solid
Fault	FLEX I/O Comm. Fault or PU bit is one and Fault=0	Green, blink@ 1 Hz
Fatal fault	Module fails self tests or detects illegal state transition.	Red, solid
Off	External power has not been applied.	Off

(1) The status bits in the table correspond to module status bits available in the module status word.

Diagnostic Codes

In case of configuration errors, hardware faults, and HART PV configuration errors, the module reports a diagnostic code in the RTD Input table to indicate to the user what error may have occurred.

If there are multiple errors, only one error is reported in the following order of priority: hardware error, configuration error, PV configuration error. Also multiple channels may have an error at the same time but the module can only report one error at a time. In this case, the module will report the lowest channel number with error first.

Hardware Errors

The following table shows hardware error codes that may be reported by the module.

Hardware Errors

Diagnostic Code(1)	Description
0x80	Hardware fault or field power missing. Error can be caused by a hardware failure of the module or if field power has not been applied.
0x9n (0x90-0x97)	Channel n is not calibrated.
0xAn (0xA0-0xA7)	Channel n's internal communication bus error. Communication to the channel hardware has failed.

(1) n = 0…7, represents channel 0…7.

For description of each possible diagnostic code, see the table Diagnostic Status for 1794-IF8IH and 1794-IF8IHNFXT on page 46.

Module Configuration Errors

The module validates values in the configuration data block and reports any module configuration error.

Any module configuration error results in the rejection of that configuration and the activation of the last good configuration. If no good configuration exists, the module behaves as if no configuration has been received.

The following table shows the different module configuration errors that may be reported by the module.

Module Configuration Errors

Diagnostic Code	Description	Valid Values
0x1n (0x10…0x17)	Channel n's HART Loop Tolerance Error Limit value is invalid.	0, 5…31 (%) **Note**: A value of zero disables this feature.
0x2n (0x20…0x27)	Channel n's Remote Alarm value is invalid.	RemoteLow < RemoteHigh and RemoteLow > RangeMIN and RemoteHigh < RangeMAX **Note**: 0 is valid as long as both RemoteLow and RemoteHigh are set to zero. This will disable the remote alarms.
0x4n (0x40…0x47)	Channel n's Data Format Selection is invalid.	0…1; 3…7
0x5n (0x50…0x57)	Channel n's ADC Filter Selection is invalid.	0…6
0x58	Byte Order Groups (BOA/BOB) do not match.	Configuration settings for BOA must be the same as BOB.
0x7n (0x70…0x77)	PV Config Enable selected with HART Disabled	HART Disabled channels in configuration table are not allowed with the PV Config Enable feature enabled. **Important**: This does not apply to the output control bits HART OFF which means HART can still be disabled which would prevent the PV Config feature from working until the control bit is cleared.

For description of each possible diagnostic code, see the table Diagnostic Status for 1794-IF8IH and 1794-IF8IHNFXT on page 46.

HART PV Configuration Errors

If there is a failure from any of the HART commands used to send the HART PV configuration data to a HART device, then the module sets the channel's PV Config Mismatch bit in the secondary input data table to inform the user that HART device configuration has failed.

In addition to this bit, the module decodes the response codes from the device and place a value in the Input RTD table in the diagnostic byte location. Since there is only one diagnostic byte with limited unused codes and no other available data locations to place more information, the diagnostic value reports on only the lowest channel number that has an error.

Also, due to limited available codes, only a few of the most common failure modes are decoded and which HART command the error occurred on is not reported in the diagnostics code byte. Additional error information can be obtained by sending a Get PV Config Errors CIP message to the module to retrieve the specific error(s) that occurred.

Diagnostic Codes for HART PV Configuration Errors

Diagnostic Code[1]	Description	Applies to
Bn (B0…B7)	Value set to nearest supported value	HART Cmds: 34, 35 Device Response Code: 8
Cn (C0…C7)	Device is write-protected.	HART Cmds: 34, 35, 44 Device Response Code: 7
Dn (D0…D7)	Value is out-of-limits or selection is invalid.	HART Cmds: 34, 35, 44 Device Response Codes = 2, 3, 4, 9…14
En (E0…E7)	PV Config HART command(s) not supported	HART Cmds: 34, 35, 44 Device Response Code: 64 HART Commands 34, 35, and 44 are classified as Common Practice commands and may not be supported by all devices.
Fn (F0…F7)	PV configuration general error	HART Cmds: 34, 35, 44 Device Response Codes: 6,16,18,29,32 All other device response codes not decode into more specific meaning.

(1) n = 0…7, represents channel 0…7.

HART Failure Error Codes

The following table indicates the most common HART failure error codes.

HART Failure Error Codes

Diagnostic Code	Description	Applies to HART Format
0x01	Undefined command error	EASY HART format
0x02	Invalid selection	EASY HART format
0x03	Passed parameter too large	EASY HART format
0x04	Passed parameter too small	EASY HART format
0x05	Bytes received are too few	EASY HART format
0x06	Device-specific command error.	EASY HART format
0x07	Failure due to device in write-protected mode.	EASY HART format
0x08…0x0F	Command-specific multiple meaning. See HART specification.	EASY HART format
0x10	Access restricted.	EASY HART format

HART Failure Error Codes

Diagnostic Code	Description	Applies to HART Format
0x1C	Command-specific multiple meaning. See HART specification.	EASY HART format
0x20	Device is busy.	EASY HART format
0x40	Command not implemented.	EASY HART format
0x81	No response from HART device.	EASY HART and FULL HART format
0x82	Invalid long frame address.	FULL HART format
0x83	Checksum error in request.	FULL HART format
0x84	HART Cmd not allowed.	Ladder pass-through attributes 0x81…0x86
0x85	Invalid channel selected.	EASY HART and FULL HART format
0x86	Channel is not HART enabled.	EASY HART and FULL HART format
0x87	Connection with device has not been established.	EASY HART and FULL HART format
0x88	HART message already active on this channel. Try again later.	EASY HART and FULL HART format

Repair

This module is not field repairable. Any attempt to open this module will void the warranty. If repair is necessary, return this module to the factory.

Chapter Summary

In this chapter you learned how to troubleshoot the FLEX I/O analog modules. Refer to publications 1794-IN115 and 1794-IN120 for complete specifications for your module.

Use the 1794-IF8IH Module with the Generic Profile

Overview

This appendix provides the information needed to configure the 1794-IF8IH analog input module in RSLogix 5000 software over the ControlNet network using version 16 or earlier and the FLEX module generic profile.

IMPORTANT There are two ways to configure the 1794-IF8IH input module using RSLogix 5000 software: using the FLEX generic profile and the specific profile for the module. The specific profile for 1794-IF8IH module is available with RSLogix 5000 version 17.

Using the Generic Profile, you need to map the parameters into the Configuration, Input, and Output tables. Using the specific profile, you can retrieve the tags from the configuration, input, and output tables.

See Configuration on page 27 for configuration data tables.

Background Information

Make sure that your Comm-Format is set to Input Data - INT. In the FLEX I/O generic profile, you need these sizes:

- Input – 8
- Output – Grayed out
- Config – 42
- Status – 5
- Cyclic HART input data is not available in the generic profile

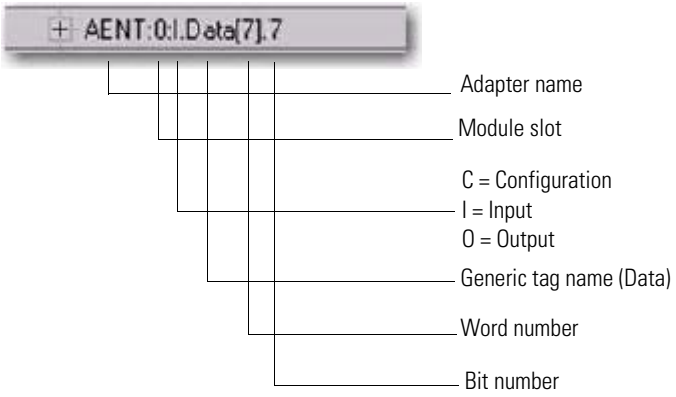
IMPORTANT HART commands will only work when the Data Format control is configured for a 4 …20 mA range.

The default configuration when using the generic profile is 0, which configures the module for the 0…20 mA range.

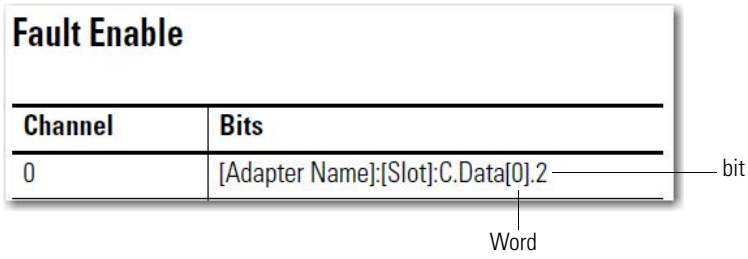
Adapter Name is what you named the ControlNet adapter when it was originally created. Slot is the position of the FLEX module in the rack, starting with zero.

Generic Profile Tag Name Structure

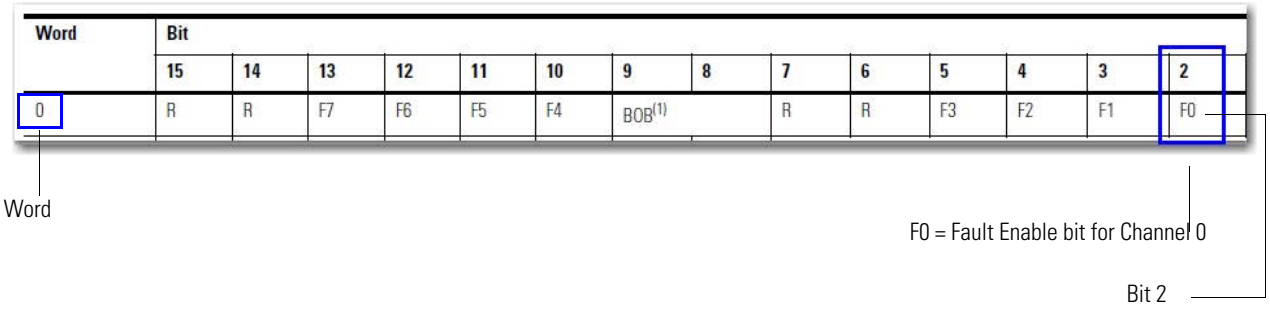
Tag names under the generic profile have the following structure:



To be able to use the generic tags, you can consult the tables in the following section for designated tag names for each bit. For example, the following tag name refers to the Fault Enable configuration bit for Channel 0.



In the configuration data table, you will see this bit as:



Configuration

1794-IF8IH Configuration Data Table

Word	Bit															
	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
0	R	R	F7	F6	F5	F4	BOB[1]		R	R	F3	F2	F1	F0	BOA[1]	
1	DH7	DH6	DH5	DH4	DH 3	DH2	DH1	DH0	Reserved[2]							
2	CH 3 Format				CH 2 Format				CH 1 Format				CH 0 Format			
3	CH 7 Format				CH 6 Format				CH 5 Format				CH 4 Format			
4	CH1 HART Current Ratio					FLTR1			CH0 HART Current Ratio					FLTR0		
5	CH3 HART Current Ratio					FLTR3			CH2 HART Current Ratio					FLTR2		
6	CH5 HART Current Ratio					FLTR5			CH4 HART Current Ratio					FLTR4		
7	CH7 HART Current Ratio					FLTR7			CH6 HART Current Ratio					FLTR6		
8	Reserved															
9	CH0 High Alarm threshold															
10	CH0 Low Alarm threshold															
11	CH0 Remote High High Alarm Limit															
12	CH0 Remote Low Low Alarm Limit															
13…16	Words 9…12 for Channel 1															
17…20	Words 9…12 for Channel 2															
21…24	Words 9…12 for Channel 3															
25…28	Words 9…12 for Channel 4															
29…32	Words 9…12 for Channel 5															
33…36	Words 9…12 for Channel 6															
37…40	Words 9…12 for Channel 7															
41	Reserved								C7	C6	C5	C4	C3	C2	C1	C0
Where:	BOA = Byte Order Group A BOB = Byte Order Group B Note: Byte order group A and B values must match each other. See the table Byte Order (Configuration Word 0 – bits 0…1, 8…9) on page 32.															
	FLTRn = Channel n Digital Filter. See the table 1794-IF8IH Channel Digital Filter on page 35.															
	Fn = Fault mode channel. 0: Local/Remote Faults disabled; 1: Enabled.															
	CHn HART Current Ratio = HART current ratio limiti on Channel n. Valid values are 0, or 5…31 percent of full scale. A value of 0 disables this feature. See table 1794-IF8IH HART Current Ratio on page 51 for more information.															
	DHn = Disable HART communication on Channel n. 0: HART communications enabled; 1: HART communications disabled.															
	Cn = HART Data Publishing Disable for Channel n. 0: HART Data Publishing Disable enabled; 1: HART Data Publishing Disable disabled.															
	R = Reserved.															
	CH N format = Data format for Channel n. See table 1794-IF8IH Channel Data Formats on page 38.															

(1) Not shown or used in the RSLogix 5000 software.

(2) Reserved data may not be shown in certain controller software.

The following tables show the structure of each configuration bit per channel.

Byte Order

Channel	Bits
0…3	[Adapter Name]:[Slot]:C.Data[0].0
	[Adapter Name]:[Slot]:C.Data[0].1
4…7	[Adapter Name]:[Slot]:C.Data[0].8
	[Adapter Name]:[Slot]:C.Data[0].9

Byte Order Group B		Byte Order Group A		
Bit 9	Bit 8	Bit 1	Bit 0	Description
0	0	0	0	Little Endian Format (default) — all data entries in true Little Endian format.
1	0	1	0	Word Swap — word swap only values requiring more than one word, for example, 32 bit float values.
0	1	0	1	Byte Swap — byte swap all words in data table.
1	1	1	1	Big Endian Format — all data entries in true Big Endian format.

Fault Enable

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[0].2
1	[Adapter Name]:[Slot]:C.Data[0].3
2	[Adapter Name]:[Slot]:C.Data[0].4
3	[Adapter Name]:[Slot]:C.Data[0].5
4	[Adapter Name]:[Slot]:C.Data[0].10
5	[Adapter Name]:[Slot]:C.Data[0].11
6	[Adapter Name]:[Slot]:C.Data[0].12
7	[Adapter Name]:[Slot]:C.Data[0].13

Fault Mode	Bit 0
Disabled	0
Enabled	1

HART Disable

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[1].8
1	[Adapter Name]:[Slot]:C.Data[1].9
2	[Adapter Name]:[Slot]:C.Data[1].10
3	[Adapter Name]:[Slot]:C.Data[1].11
4	[Adapter Name]:[Slot]:C.Data[1].12
5	[Adapter Name]:[Slot]:C.Data[1].13
6	[Adapter Name]:[Slot]:C.Data[1].14
7	[Adapter Name]:[Slot]:C.Data[1].15

Disable Mode	Bit 0
False	0
True	1

Channel Data Format

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[2].0
	[Adapter Name]:[Slot]:C.Data[2].1
	[Adapter Name]:[Slot]:C.Data[2].2
	[Adapter Name]:[Slot]:C.Data[2].3
1	[Adapter Name]:[Slot]:C.Data[2].4
	[Adapter Name]:[Slot]:C.Data[2].5
	[Adapter Name]:[Slot]:C.Data[2].6
	[Adapter Name]:[Slot]:C.Data[2].7
2	[Adapter Name]:[Slot]:C.Data[2].8
	[Adapter Name]:[Slot]:C.Data[2].9
	[Adapter Name]:[Slot]:C.Data[2].10
	[Adapter Name]:[Slot]:C.Data[2].11
3	[Adapter Name]:[Slot]:C.Data[2].12
	[Adapter Name]:[Slot]:C.Data[2].13
	[Adapter Name]:[Slot]:C.Data[2].14
	[Adapter Name]:[Slot]:C.Data[2].15

Channel	Bits
4	[Adapter Name]:[Slot]:C.Data[3].0
	[Adapter Name]:[Slot]:C.Data[3].1
	[Adapter Name]:[Slot]:C.Data[3].2
	[Adapter Name]:[Slot]:C.Data[3].3
5	[Adapter Name]:[Slot]:C.Data[3].4
	[Adapter Name]:[Slot]:C.Data[3].5
	[Adapter Name]:[Slot]:C.Data[3].6
	[Adapter Name]:[Slot]:C.Data[3].7
6	[Adapter Name]:[Slot]:C.Data[3].8
	[Adapter Name]:[Slot]:C.Data[3].9
	[Adapter Name]:[Slot]:C.Data[3].10
	[Adapter Name]:[Slot]:C.Data[3].11
7	[Adapter Name]:[Slot]:C.Data[3].12
	[Adapter Name]:[Slot]:C.Data[3].13
	[Adapter Name]:[Slot]:C.Data[3].14
	[Adapter Name]:[Slot]:C.Data[3].15

Format[1]	Bits				Format Name	Signal Range		User Range		Resolution
	15	14	13	12						
	11	10	9	8						
	7	6	5	4		LO	HI	LO	HI	
	3	2	1	0						
0	0	0	0	0	0…20 mA in Milliamps	0.00	22.00	0 (0.000 mA)	22000 (22.000 mA)	1.0 µA
1	0	0	0	1	0…20 mA in % Full Scale	0.00	22.00	0 (0%)	11000 (110.00%)	2.0 µA
3	0	0	1	1	0…20 mA in UINT	0.00	20.00	0	65535	0.3052 µA
4[2]	0	1	0	0	4…20 mA in Milliamps	2.00	22.00	2000 (2.000 mA)	22000 (22.000 mA)	1.0 µA
5[2]	0	1	0	1	4…20 mA in % Full Scale	2.00	22.00	-1250 (-12.50%)	11250 (112.50%)	1.6 µA
7[2]	0	1	1	1	4…20 mA in UINT	4.00	20.00	0	65535	0.2441 µA

(1) All other formats are invalid.

(2) HART Communications supported with these data formats only.

Digital Filters

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[4].0
	[Adapter Name]:[Slot]:C.Data[4].1
	[Adapter Name]:[Slot]:C.Data[4].2
1	[Adapter Name]:[Slot]:C.Data[4].8
	[Adapter Name]:[Slot]:C.Data[4].9
	[Adapter Name]:[Slot]:C.Data[4].10
2	[Adapter Name]:[Slot]:C.Data[5].0
	[Adapter Name]:[Slot]:C.Data[5].1
	[Adapter Name]:[Slot]:C.Data[5].2
3	[Adapter Name]:[Slot]:C.Data[5].8
	[Adapter Name]:[Slot]:C.Data[5].9
	[Adapter Name]:[Slot]:C.Data[5].10
4	[Adapter Name]:[Slot]:C.Data[6].0
	[Adapter Name]:[Slot]:C.Data[6].1
	[Adapter Name]:[Slot]:C.Data[6].2
5	[Adapter Name]:[Slot]:C.Data[6].8
	[Adapter Name]:[Slot]:C.Data[6].9
	[Adapter Name]:[Slot]:C.Data[6].10
6	[Adapter Name]:[Slot]:C.Data[7].0
	[Adapter Name]:[Slot]:C.Data[7].1
	[Adapter Name]:[Slot]:C.Data[7].2
7	[Adapter Name]:[Slot]:C.Data[7].8
	[Adapter Name]:[Slot]:C.Data[7].9
	[Adapter Name]:[Slot]:C.Data[7].10

Digital Filter Frequency	Decimal Value	Bits		
		10	9	8
		2	1	0
470 Hz	0	0	0	0
62 Hz	1	0	0	1
19.6 Hz	2	0	1	0
16.7 hZ	3	0	1	1
10 hZ	4	1	0	0

Digital Filter Frequency	Decimal Value	Bits		
		10	9	8
		2	1	0
4.17 Hz	5	1	0	1
Not applicable	6	1	1	0
Not applicable	7	1	1	1

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[4].3
	[Adapter Name]:[Slot]:C.Data[4].4
	[Adapter Name]:[Slot]:C.Data[4].5
	[Adapter Name]:[Slot]:C.Data[4].6
	[Adapter Name]:[Slot]:C.Data[4].7
1	[Adapter Name]:[Slot]:C.Data[4].11
	[Adapter Name]:[Slot]:C.Data[4].12
	[Adapter Name]:[Slot]:C.Data[4].13
	[Adapter Name]:[Slot]:C.Data[4].14
	[Adapter Name]:[Slot]:C.Data[4].15
2	[Adapter Name]:[Slot]:C.Data[5].3
	[Adapter Name]:[Slot]:C.Data[5].4
	[Adapter Name]:[Slot]:C.Data[5].5
	[Adapter Name]:[Slot]:C.Data[5].6
	[Adapter Name]:[Slot]:C.Data[5].7
3	[Adapter Name]:[Slot]:C.Data[5].11
	[Adapter Name]:[Slot]:C.Data[5].12
	[Adapter Name]:[Slot]:C.Data[5].13
	[Adapter Name]:[Slot]:C.Data[5].14
	[Adapter Name]:[Slot]:C.Data[5].15
4	[Adapter Name]:[Slot]:C.Data[6].3
	[Adapter Name]:[Slot]:C.Data[6].4
	[Adapter Name]:[Slot]:C.Data[6].5
	[Adapter Name]:[Slot]:C.Data[7].6
	[Adapter Name]:[Slot]:C.Data[7].7
5	[Adapter Name]:[Slot]:C.Data[7].11
	[Adapter Name]:[Slot]:C.Data[7].12
	[Adapter Name]:[Slot]:C.Data[7].13
	[Adapter Name]:[Slot]:C.Data[7].14
	[Adapter Name]:[Slot]:C.Data[7].15

Channel	Bits
6	[Adapter Name]:[Slot]:C.Data[8].3
	[Adapter Name]:[Slot]:C.Data[8].4
	[Adapter Name]:[Slot]:C.Data[8].5
	[Adapter Name]:[Slot]:C.Data[8].6
	[Adapter Name]:[Slot]:C.Data[8].7
7	[Adapter Name]:[Slot]:C.Data[8].11
	[Adapter Name]:[Slot]:C.Data[8].12
	[Adapter Name]:[Slot]:C.Data[8].13
	[Adapter Name]:[Slot]:C.Data[8].14
	[Adapter Name]:[Slot]:C.Data[8].15

HART Current Ratio Limit	Decimal Value	Bits				
		15	14	13	12	11
		7	6	5	4	3
Disabled	0	0	0	0	0	0
Not applicable	1	0	0	0	0	1
Not applicable	2	0	0	0	1	0
Not applicable	3	0	0	0	1	1
Not applicable	4	0	0	1	0	0
5 %	5	0	0	1	0	1
6 %	6	0	0	1	1	0
7 %	7	0	0	1	1	1
8 %	8	0	1	0	0	0
9 %	9	0	1	0	0	1
10 %	10	0	1	0	1	0
…	…	…	…	…	…	…
30 %	30	1	1	1	1	0
31 %	31	1	1	1	1	1

High Alarm Limit

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[9]
1	[Adapter Name]:[Slot]:C.Data[13]
2	[Adapter Name]:[Slot]:C.Data[17]
3	[Adapter Name]:[Slot]:C.Data[21]
4	[Adapter Name]:[Slot]:C.Data[25]
5	[Adapter Name]:[Slot]:C.Data[29]
6	[Adapter Name]:[Slot]:C.Data[33]
7	[Adapter Name]:[Slot]:C.Data[37]

Low Alarm Limit

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[10]
1	[Adapter Name]:[Slot]:C.Data[14]
2	[Adapter Name]:[Slot]:C.Data[18]
3	[Adapter Name]:[Slot]:C.Data[22]
4	[Adapter Name]:[Slot]:C.Data[26]
5	[Adapter Name]:[Slot]:C.Data[30]
6	[Adapter Name]:[Slot]:C.Data[34]
7	[Adapter Name]:[Slot]:C.Data[38]

Remote High High Alarm Limit

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[11]
1	[Adapter Name]:[Slot]:C.Data[15]
2	[Adapter Name]:[Slot]:C.Data[19]
3	[Adapter Name]:[Slot]:C.Data[23]
4	[Adapter Name]:[Slot]:C.Data[27]
5	[Adapter Name]:[Slot]:C.Data[31]
6	[Adapter Name]:[Slot]:C.Data[35]
7	[Adapter Name]:[Slot]:C.Data[39]

Remote Low Low Alarm Limit

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[12]
1	[Adapter Name]:[Slot]:C.Data[16]
2	[Adapter Name]:[Slot]:C.Data[20]
3	[Adapter Name]:[Slot]:C.Data[24]
4	[Adapter Name]:[Slot]:C.Data[28]
5	[Adapter Name]:[Slot]:C.Data[32]
6	[Adapter Name]:[Slot]:C.Data[36]
7	[Adapter Name]:[Slot]:C.Data[40]

HART Command 3 Disable

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[41].0
1	[Adapter Name]:[Slot]:C.Data[41].1
2	[Adapter Name]:[Slot]:C.Data[41].2
3	[Adapter Name]:[Slot]:C.Data[41].3
4	[Adapter Name]:[Slot]:C.Data[41].4
5	[Adapter Name]:[Slot]:C.Data[41].5
6	[Adapter Name]:[Slot]:C.Data[41].6
7	[Adapter Name]:[Slot]:C.Data[41].7

Disable Mode	Bit 0
False	0
True	1

Input Data

Primary Input Data for 1794-IF8IH

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Channel 0 Input Data															
1	Channel 1 Input Data															
2	Channel 2 Input Data															
3	Channel 3 Input Data															

Primary Input Data for 1794-IF8IH

Word	Bit															
	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
4	Channel 4 Input Data															
5	Channel 5 Input Data															
6	Channel 6 Input Data															
7	Channel 7 Input Data															
8	H7	H6	H5	H4	H3	H2	H1	H0	L7	L6	L5	L4	L3	L2	L1	L0
9	R7	R6	R5	R4	R3	R2	R1	R0	P7	P6	P5	P4	P3	P2	P1	P0
10	Reserved								Diagnostic Status							
11	C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0
12	X7	X6	X5	X4	X3	X2	X1	X0	Reserved							
Where:	Hn: Channel n High Alarm Ln : Channel n Low Alarm Rn : Channel n Out of Range Alarm Pn : Channel n Second (Remote) Alarm Fn : Channel n HART Failure Cn : Channel n HART Current Fault Xn : Channel n HART Transmitter Present															

Input Data

Channel	Words
0	[Adapter Name]:[Slot]:I.Data[0]
1	[Adapter Name]:[Slot]:I.Data[1]
2	[Adapter Name]:[Slot]:I.Data[2]
3	[Adapter Name]:[Slot]:I.Data[3]
4	[Adapter Name]:[Slot]:I.Data[4]
5	[Adapter Name]:[Slot]:I.Data[5]
6	[Adapter Name]:[Slot]:I.Data[6]
7	[Adapter Name]:[Slot]:I.Data[7]

High Alarm

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[8].0
1	[Adapter Name]:[Slot]:I.Data[8].1
2	[Adapter Name]:[Slot]:I.Data[8].2
3	[Adapter Name]:[Slot]:I.Data[8].3

Channel	Bits
4	[Adapter Name]:[Slot]:I.Data[8].4
5	[Adapter Name]:[Slot]:I.Data[8].5
6	[Adapter Name]:[Slot]:I.Data[8].6
7	[Adapter Name]:[Slot]:I.Data[8].7

Low Alarm

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[8].8
1	[Adapter Name]:[Slot]:I.Data[8].9
2	[Adapter Name]:[Slot]:I.Data[8].10
3	[Adapter Name]:[Slot]:I.Data[8].11
4	[Adapter Name]:[Slot]:I.Data[8].12
5	[Adapter Name]:[Slot]:I.Data[8].13
6	[Adapter Name]:[Slot]:I.Data[8].14
7	[Adapter Name]:[Slot]:I.Data[8].15

Out of Range

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[9].0
1	[Adapter Name]:[Slot]:I.Data[9].1
2	[Adapter Name]:[Slot]:I.Data[9].2
3	[Adapter Name]:[Slot]:I.Data[9].3
4	[Adapter Name]:[Slot]:I.Data[9].4
5	[Adapter Name]:[Slot]:I.Data[9].5
6	[Adapter Name]:[Slot]:I.Data[9].6
7	[Adapter Name]:[Slot]:I.Data[9].7

Second Alarm

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[9].8
1	[Adapter Name]:[Slot]:I.Data[9].9
2	[Adapter Name]:[Slot]:I.Data[9].10
3	[Adapter Name]:[Slot]:I.Data[9].11
4	[Adapter Name]:[Slot]:I.Data[9].12
5	[Adapter Name]:[Slot]:I.Data[9].13
6	[Adapter Name]:[Slot]:I.Data[9].14
7	[Adapter Name]:[Slot]:I.Data[9].15

Diagnostic Status

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[10].0
1	[Adapter Name]:[Slot]:I.Data[10].1
2	[Adapter Name]:[Slot]:I.Data[10].2
3	[Adapter Name]:[Slot]:I.Data[10].3
4	[Adapter Name]:[Slot]:I.Data[10].4
5	[Adapter Name]:[Slot]:I.Data[10].5
6	[Adapter Name]:[Slot]:I.Data[10].6
7	[Adapter Name]:[Slot]:I.Data[10].7

HART Fault

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[11].0
1	[Adapter Name]:[Slot]:I.Data[11].1
2	[Adapter Name]:[Slot]:I.Data[11].2
3	[Adapter Name]:[Slot]:I.Data[11].3
4	[Adapter Name]:[Slot]:I.Data[11].4
5	[Adapter Name]:[Slot]:I.Data[11].5
6	[Adapter Name]:[Slot]:I.Data[11].6
7	[Adapter Name]:[Slot]:I.Data[11].7

Fault Mode	Bit 0
False	0
True	1

HART Current Fault

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[11].8
1	[Adapter Name]:[Slot]:I.Data[11].9
2	[Adapter Name]:[Slot]:I.Data[11].10
3	[Adapter Name]:[Slot]:I.Data[11].11
4	[Adapter Name]:[Slot]:I.Data[11].12
5	[Adapter Name]:[Slot]:I.Data[11].13
6	[Adapter Name]:[Slot]:I.Data[11].14
7	[Adapter Name]:[Slot]:I.Data[11].15

Fault Mode	Bit 0
False	0
True	1

HART Transmitter Present

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[12].8
1	[Adapter Name]:[Slot]:I.Data[12].9
2	[Adapter Name]:[Slot]:I.Data[12].10
3	[Adapter Name]:[Slot]:I.Data[12].11
4	[Adapter Name]:[Slot]:I.Data[12].12
5	[Adapter Name]:[Slot]:I.Data[12].13
6	[Adapter Name]:[Slot]:I.Data[12].14
7	[Adapter Name]:[Slot]:I.Data[12].15

Fault Mode	Bit 0
False	0
True	1

Use the 1794-IF8IHNFXT with the Generic and Thin Profiles

There are three profiles available for programming your 1794-IF8IHNFXT module depending on your module's firmware, software, and the desired functionality. You will use either a:

- Full profile
- Thin profile
- Generic profile

IMPORTANT Full profile support, for Logix Designer version 24 and later, include separate Configuration tab dialog boxes that make it easier to enter 1794-IF8IHNFXT operational data via a user-interface that provides error checking and user-friendly data entry. See Edit Your 1794-IF8IHNFXT Configuration with Logix Designer (Full Profile) on page 76 to configure a full profile for your 1794-IF8IHNFXT module.

This section describes procedures for using a generic profile and modifying tags with a thin profile for users with software versions prior to version 24, which do not include a user-interface that provides error checking and user-friendly data entry.

A generic profile lets a prior software version use the functionality that's available only for the latest software. For example, a 1794-IF8IHNFXT module, with software version 18, could use a generic profile to configure the module, available in software version 24.

A generic profile will create non-specific tags, with a name related to the modules slot location. The tag names created will not reference any specific 1794-IF8IHNFXT module terminology.

Edit a Thin Profile Tag

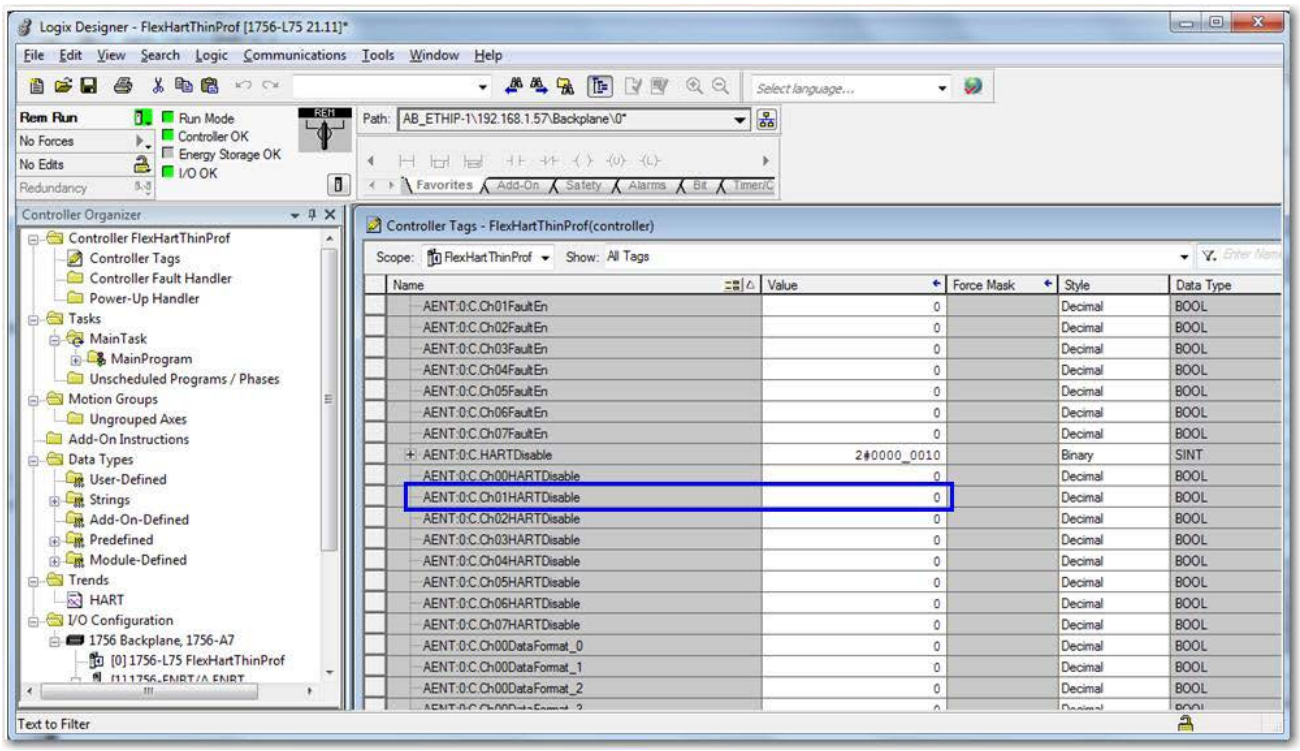
Use this section if you want your 1794-IF8IHNFXT module running the original functionality and your version of RSLogix 5000 software is earlier than version 23.

RSLogix 5000 software earlier than version 23 does not have a user-interface for data entry. A thin profile requires that you manually enter operational modes and output settings in the Controller Tags window.

IMPORTANT A global search and replace is needed only for those tags referenced in ladder logic. For example, if there is no configuration tag referenced in ladder logic, it's not necessary to perform a search and replace on the .C tags.

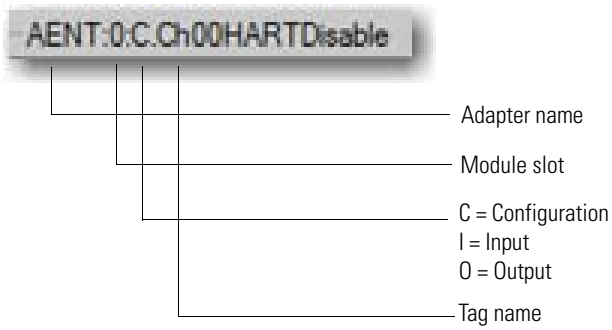
Example: How to Configure HART Enable Using Thin Profile Tags

The following steps shows you how to edit a thin profile tag. This example illustrates specifically how to enable HART using a thin profile.



Note that input and output tags are not editable using the thin profile.

1. Right-click Controller tags and click Monitor tags.
   The tags have the following structure:



2. To enable HART on channel 1, set the value of the Ch0HARTDisable tag to 0. The default value of 0 indicates that HART is enabled by default in the channels.
   To disable HART, set the tag to 1.

3. Using your monitoring tool, check that your channel can receive HART messages.

Configure a Generic Profile

You will use a generic profile if your RSLogix 5000 software is earlier than version 20. You must use the FLEX-MODULE Generic Profile as indicated in the procedures.

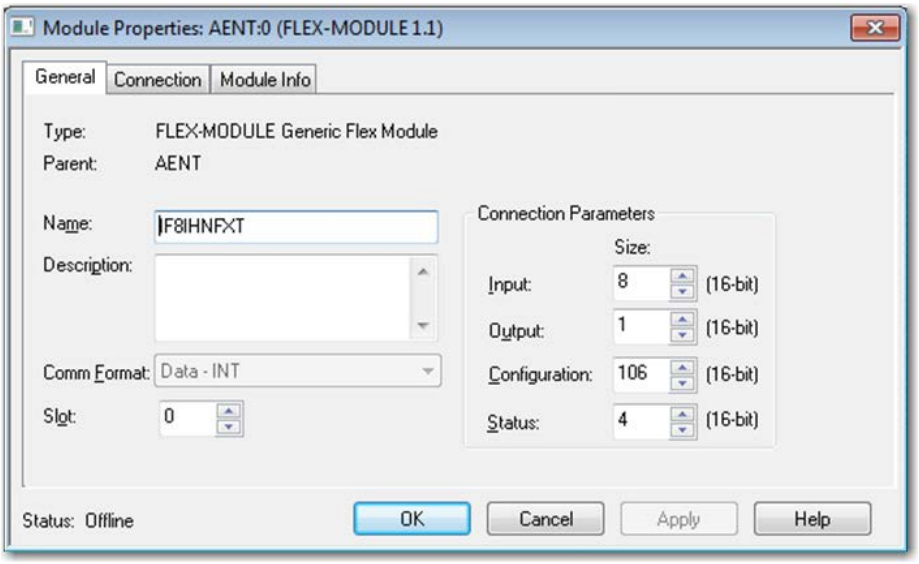
Follow these steps to create a generic profile.

1. In RSLogix 5000 software, open or create a project for your controller. From the File menu, choose New to access the New Controller dialog box to create a controller name.

2. On the Controller Organizer, right-click I/O Configuration and choose New Module. The Select Module window appears.

3. Click '+' next to Other to display a list of I/O modules.

4. Select FLEX-MODULE Generic and click OK. The Module Properties dialog box appears.



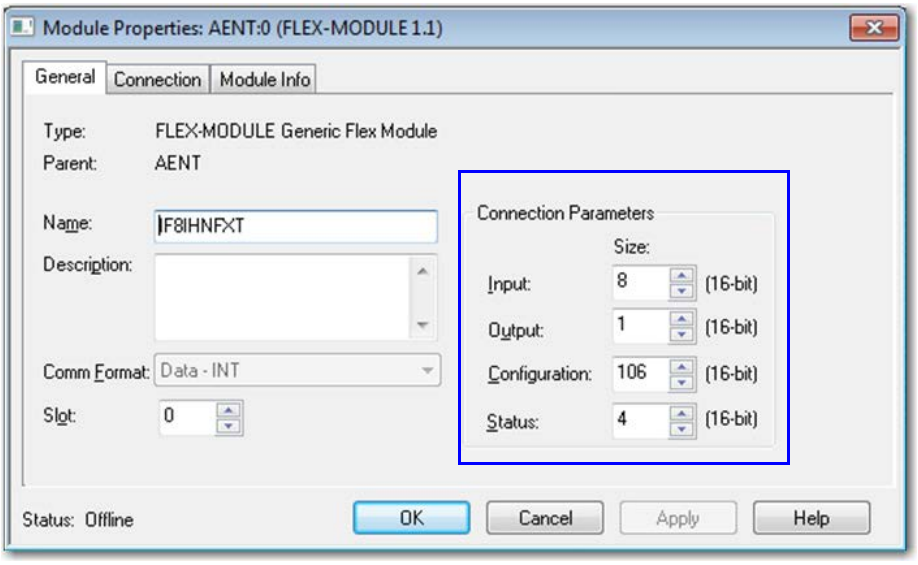
5. Type a name for the module in the Name box.

6. In the Comm Format pull-down menu, choose Data-DINT.

7. Enter a module slot number that is specific to your chassis configuration.

Connection Parameters

In the right-side column of the Module Properties dialog box, there are entry fields for the Connection Parameters. You must set connection parameters for input, output, and configuration for the owner-controller to exchange information with the 1794-IF8IHNFXT module.



The Size box determines how large the connections are between the owner-controller and the I/O module. Connections are sent in sizes matching the selected communication format data type.

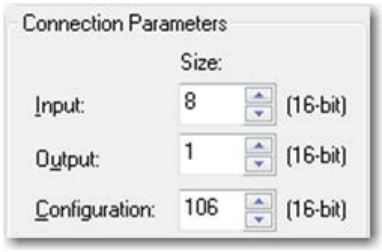
IMPORTANT	The Data-DINT communication format must be chosen to use the correct connection parameters as shown in the sample New Module dialog box.

IMPORTANT	Cyclic HART input data is not available in the generic profile.

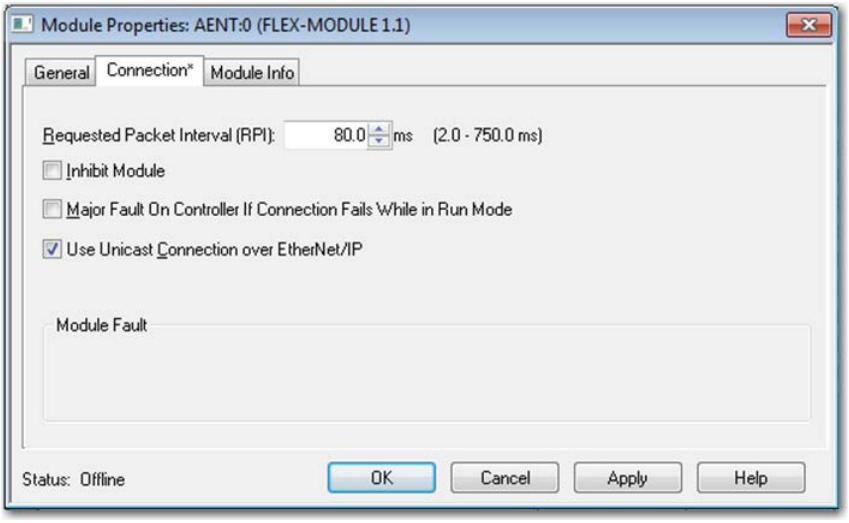
IMPORTANT	HART commands work with Data Format control configured for all ranges.The default configuration when using the generic profile is 0, which configures the module for 0…20 mA range.

Also, in the generic module configuration, configuration data is created as an array of bytes. User-defined tags are copied over the array specified by the communication format selection.

8. Enter Connection Parameters exactly as shown in the example below.



9. Click the Connection tab.



10. Set the RPI value to 80 ms and check Use Unicast Connection over EtherNet/IP.

11. Click OK.

12. On the Controller Organizer, right-click I/O Configuration and choose New Module.

    Add a 1794-IF8IHNFXT module and assign it to an unused chassis slot in your I/O Configuration tree. This module will not be used, but the configuration of this profile will aid later in the configuration of the generic module.

13. Click OK.

    The ladder logic in your RSLogix 5000 project will copy the module configuration from this profile to the generic profile.

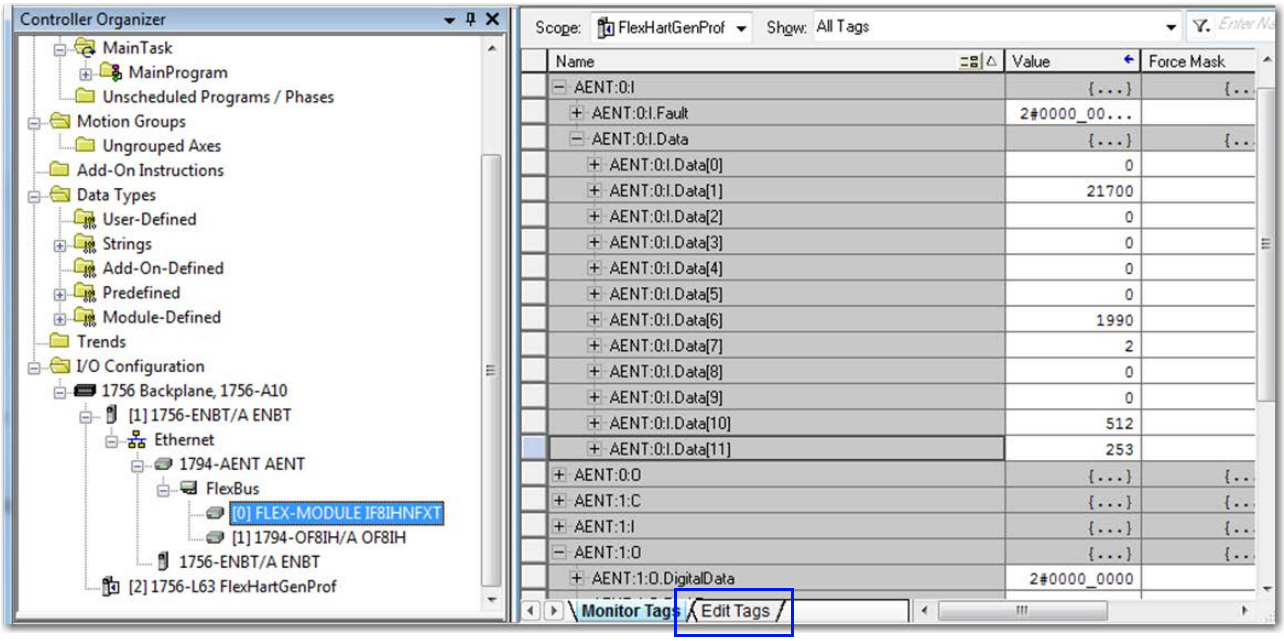
14. Click OK.

15. Save the project.

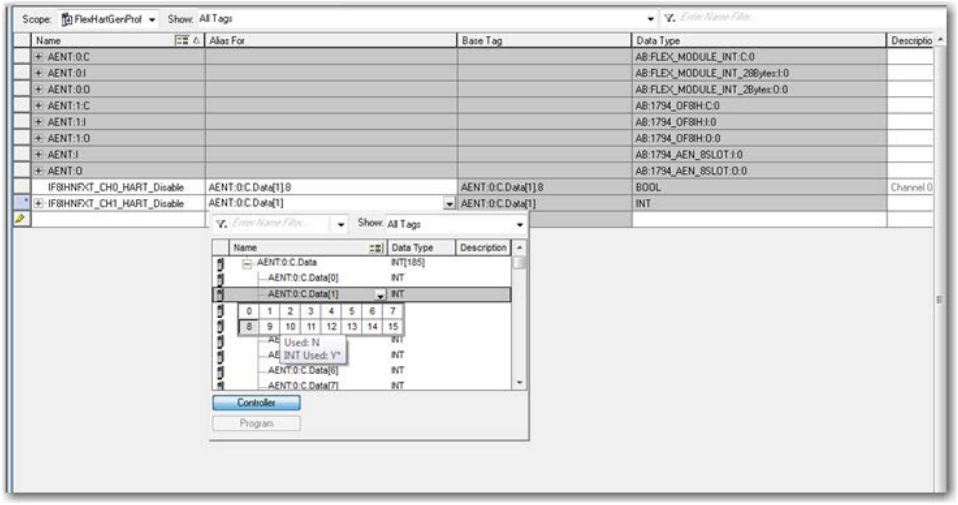
Define Your Own Tags

a. To define your own tags, double-click Controller Tags on the Controller Organizer.

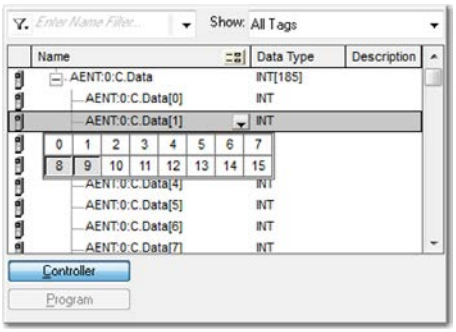
b. Click the Edit Tags tab at the bottom of the Controller Tags window.



c. In the blank entry field at the bottom of the window, enter your tag name.

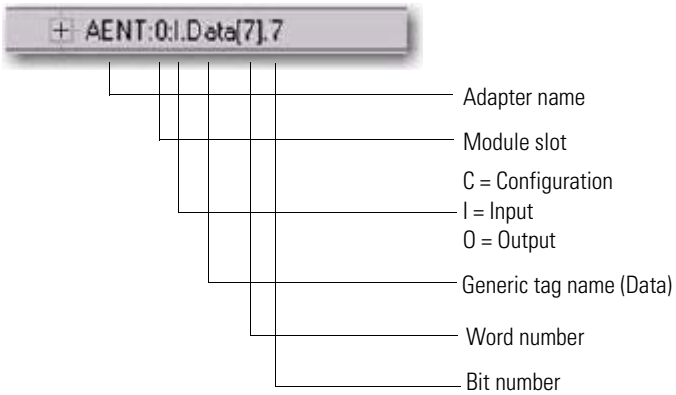


d. Click the dropdown arrow in the Alias For field and map the tag to a generic one. See the data tables as reference.



Generic Profile Tag Name Structure

Tag names under the generic profile have the following structure:



To be able to use the generic tags, you can consult the tables in the following section for designated tag names for each bit. For example, the following tag name refers to the Fault Enable configuration bit for Channel 0.

Fault Enable

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[0].2

bit

Word

In the configuration data table, you will see this bit as:

Word	Bit													
	15	14	13	12	11	10	9	8	7	6	5	4	3	2
0	R	R	F7	F6	F5	F4	BOB(1)		R	R	F3	F2	F1	F0

Word

F0 = Fault Enable bit for Channel 0, bit 2

Reference Configuration Table

Refer to the following tables for configuration information.

1794-IF8IHNFXT Configuration Data Table

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	R	R	F7	F6	F5	F4	BOB[1]		R	R	F3	F2	F1	F0	BOA[1]	
1	DH7	DH6	DH5	DH4	DH3	DH2	DH1	DH0	Reserved							
2	CH 3 Format				CH 2 Format				CH 1 Format				CH 0 Format			
3	CH 7 Format				CH 6 Format				CH 5 Format				CH 4 Format			
4	HART_Ilimit_CH1					FLTR1			HART_Ilimit_CH0					FLTR0		
5	HART_Ilimit_CH3					FLTR3			HART_Ilimit_CH2					FLTR2		
6	HART_Ilimit_CH5					FLTR5			HART_Ilimit_CH4					FLTR4		
7	HART_Ilimit_CH7					FLTR7			HART_Ilimit_CH6					FLTR6		
8	CH0 High Alarm Threshold															
9	CH0 Low Alarm Threshold															
10	CH0 Remote High High Alarm Limit															
11	CH0 Remote Low Low Alarm Limit															
12	CH0 PvDampingValue (32 bit, Floating Point, LowWord)															
13	CH0 PvDampingValue (32-bit Floating Point, HighWord)															
14	CH0 PvUpperRange (32-bit Floating Point, LowWord)															
15	CH0 PvUpperRange (32-bit Floating Point, HighWord)															
16	CH0 PvLowerRange (32-bit Floating Point, LowWord)															
17	CH0 PvLowerRange (32-bit Floating Point, HighWord)															
18	Reserved								CH0 PV Range Units Code							
19	Unused															
20…31	Words 8…19 for channel 1															
32…43	Words 8…19 for channel 2															
44…55	Words 8…19 for channel 3															
56…67	Words 8…19 for channel 4															
68…79	Words 8…19 for channel 5															
80…91	Words 8…19 for channel 6															
92…103	Words 8…19 for channel 7															
104	Reserved								C7	C6	C5	C4	C3	C2	C1	C0
105	ER7	ER6	ER5	ER4	ER3	ER2	ER1	ER0	ED7	ED6	ED5	ED4	ED3	ED2	ED1	ED0
Where:	BOA = Byte Order Group A BOB = Byte Order Group B Byte order group A and B values must match each other. SeeByte Order (Configuration Word 0 – bits 0…1, 8…9) on page 32 for more information.															
	FLTRn = Channel n Digital Filter. See table1794-IF8IHNFXT Channel Digital Filter on page 36 and .															
	Fn = Fault mode Channel n. 0: Local / Remote faults disabled; 1: Enabled.															
	HART_Ilimit_CHn = HART Loop Tolerance Error Limit for Channel n. Defines comparison limit for HART current loop to ADC compare. Valid values are 0, or from 5 to 31 percent of full scale. A value of zero disables this feature. Full scale is defined as the difference between the normal high scale and the normal low. Example: 4..20 mA: 20 - 4 = 16. 5% of 16 is 0.8 mA. Example: 4..20 mA: 20 - 0 = 20. 5% of 20 is 1.0 mA.															
	DHn = Disable HART communication on Channel n. 0: HART communications enabled; 1: HART communications disabled.															
	Cn = HART Data Publishing Disable for Channel n. 0: HART Data Publishing Disable enabled; 1: HART Data Publishing Disable disabled.															
	EDn = Enable HART PV Damping Value for Channel n. 0: True; 1: False.															
	ERn = Enable HART PV Upper and Lower Range for Channel n. 0: True; 1: False.															
	R = Reserved.															
	CH N Format = Data format for Channel n. See table 1794-IF8IHNFXT Channel Data Formats on page 39 and Data Format (Configuration Words 2, 3 – bits 0…3, 4…7, 8…11, 12…15) on page 37..															
	CHn PVDampingValue = 32-bit Float (per channel) value used in HART Cmd 34 to set the device's PV (primary value) damping value.															
	CHn PV Range Units Code = 8-bit unsigned (per channel) PV Range Units Code used in HART cmd 35. This value specifies the "Units Code" for the Upper & Lower Range value configuration parameters and also supplies the value for command 44. This value is required by command 35 to inform the device what units the Upper and Lower range values being sent in command 35 does not change the PV units of the device. Command 44 is automatically sent by the module if the module detects that the PV Units code of the device does not match the parameter in the configuration table.															
	CHn PvUpperRange = 32-bit Float (per channel) specifies the value for the PV Upper Range value used in HART Cmd 35 to set the device's PV Upper Range Value.															
	CHn PvLowerRange = 32-bit Float (per channel). Specifies the value for the PV Upper Range value used in HART Cmd 35 to set the device's PV Upper Range Value.															

(1) Not shown in RSLogix 5000 software.

The following tables show the structure of each configuration bit per channel.

Byte Order

Channel	Bits
0…3	[Adapter Name]:[Slot]:C.Data[0].0
	[Adapter Name]:[Slot]:C.Data[0].1
4…7	[Adapter Name]:[Slot]:C.Data[0].8
	[Adapter Name]:[Slot]:C.Data[0].9

Byte Order Group B		Byte Order Group A		Description
Bit 9	Bit 8	Bit 1	Bit 0	
0	0	0	0	Little Endian Format (default) — all data entries in true Little Endian format.
1	0	1	0	Word Swap — word swap only values requiring more than one word, for example, 32 bit float values.
0	1	0	1	Byte Swap — byte swap all words in data table.
1	1	1	1	Big Endian Format — all data entries in true Big Endian format.

Fault Enable

Channel	Bits
4	[Adapter Name]:[Slot]:C.Data[0].10
5	[Adapter Name]:[Slot]:C.Data[0].11
6	[Adapter Name]:[Slot]:C.Data[0].12
7	[Adapter Name]:[Slot]:C.Data[0].13

Fault Mode	Bit 0
Local Remote Faults Disabled	0
Enabled	1

HART Disable

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[1].8
1	[Adapter Name]:[Slot]:C.Data[1].9
2	[Adapter Name]:[Slot]:C.Data[1].10
3	[Adapter Name]:[Slot]:C.Data[1].11
4	[Adapter Name]:[Slot]:C.Data[1].12
5	[Adapter Name]:[Slot]:C.Data[1].13
6	[Adapter Name]:[Slot]:C.Data[1].14
7	[Adapter Name]:[Slot]:C.Data[1].15

Disable Mode	Bit 0
False	0
True	1

Channel Data Format

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[2].0
	[Adapter Name]:[Slot]:C.Data[2].1
	[Adapter Name]:[Slot]:C.Data[2].2
	[Adapter Name]:[Slot]:C.Data[2].3
1	[Adapter Name]:[Slot]:C.Data[2].4
	[Adapter Name]:[Slot]:C.Data[2].5
	[Adapter Name]:[Slot]:C.Data[2].6
	[Adapter Name]:[Slot]:C.Data[2].7
2	[Adapter Name]:[Slot]:C.Data[2].8
	[Adapter Name]:[Slot]:C.Data[2].9
	[Adapter Name]:[Slot]:C.Data[2].10
	[Adapter Name]:[Slot]:C.Data[2].11
3	[Adapter Name]:[Slot]:C.Data[2].12
	[Adapter Name]:[Slot]:C.Data[2].13
	[Adapter Name]:[Slot]:C.Data[2].14
	[Adapter Name]:[Slot]:C.Data[2].15

Channel	Bits
4	[Adapter Name]:[Slot]:C.Data[3].0
	[Adapter Name]:[Slot]:C.Data[3].1
	[Adapter Name]:[Slot]:C.Data[3].2
	[Adapter Name]:[Slot]:C.Data[3].3
5	[Adapter Name]:[Slot]:C.Data[3].4
	[Adapter Name]:[Slot]:C.Data[3].5
	[Adapter Name]:[Slot]:C.Data[3].6
	[Adapter Name]:[Slot]:C.Data[3].7
6	[Adapter Name]:[Slot]:C.Data[3].8
	[Adapter Name]:[Slot]:C.Data[3].9
	[Adapter Name]:[Slot]:C.Data[3].10
	[Adapter Name]:[Slot]:C.Data[3].11
7	[Adapter Name]:[Slot]:C.Data[3].12
	[Adapter Name]:[Slot]:C.Data[3].13
	[Adapter Name]:[Slot]:C.Data[3].14
	[Adapter Name]:[Slot]:C.Data[3].15

Format[1]	Bits				Format Name	Signal Range		User Range		Resolution
	15	14	13	12						
	11	10	9	8						
	7	6	5	4		LO	HI	LO	HI	
	3	2	1	0						
0	0	0	0	0	0…20 mA in Milliamps	0.00	20.00	0 (0.000 mA)	20000 (20.000 mA)	1.0 µA
1	0	0	0	1	0…20 mA in % Full Scale	0.00	20.00	0 (0%)	10000 (100.00%)	2.0 µA
3	0	0	1	1	0…20 mA in UINT	0.00	20.00	0	65535	0.3052 µA
4	0	1	0	0	4…20 mA in Milliamps	4.00	20.00	4000	20000 (20.000 mA)	1.0 µA
5	0	1	0	1	4…20 mA in % Full Scale	4.00	20.00	0	10000 (100.00%)	1.6 µA
6	0	1	1	0	4…20 mA in Signed 2's Complement	4.00	20.00	0	30840	0.5188 µA
7	0	1	1	1	4…20 mA in UINT	4.00	20.00	0	65535	0.2441 µA

(1) All other formats are invalid.

Digital Filters

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[4].0
	[Adapter Name]:[Slot]:C.Data[4].1
	[Adapter Name]:[Slot]:C.Data[4].2
1	[Adapter Name]:[Slot]:C.Data[4].8
	[Adapter Name]:[Slot]:C.Data[4].9
	[Adapter Name]:[Slot]:C.Data[4].10
2	[Adapter Name]:[Slot]:C.Data[5].0
	[Adapter Name]:[Slot]:C.Data[5].1
	[Adapter Name]:[Slot]:C.Data[5].2
3	[Adapter Name]:[Slot]:C.Data[5].8
	[Adapter Name]:[Slot]:C.Data[5].9
	[Adapter Name]:[Slot]:C.Data[5].10
4	[Adapter Name]:[Slot]:C.Data[6].0
	[Adapter Name]:[Slot]:C.Data[6].1
	[Adapter Name]:[Slot]:C.Data[6].2
5	[Adapter Name]:[Slot]:C.Data[6].8
	[Adapter Name]:[Slot]:C.Data[6].9
	[Adapter Name]:[Slot]:C.Data[6].10
6	[Adapter Name]:[Slot]:C.Data[7].0
	[Adapter Name]:[Slot]:C.Data[7].1
	[Adapter Name]:[Slot]:C.Data[7].2
7	[Adapter Name]:[Slot]:C.Data[7].8
	[Adapter Name]:[Slot]:C.Data[7].9
	[Adapter Name]:[Slot]:C.Data[7].10

Digital Filter Frequency	Decimal Value	Bits		
		10	9	8
		2	1	0
242 Hz	0	0	0	0
123 Hz	1	0	0	1
62 Hz	2	0	1	0
19.6 Hz	3	0	1	1
16.7 Hz	4	1	0	0

Digital Filter Frequency	Decimal Value	Bits		
		10	9	8
		2	1	0
10 Hz	5	1	0	1
4.17 Hz	6	1	1	0
Not applicable	7	1	1	1

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[4].3
	[Adapter Name]:[Slot]:C.Data[4].4
	[Adapter Name]:[Slot]:C.Data[4].5
	[Adapter Name]:[Slot]:C.Data[4].6
	[Adapter Name]:[Slot]:C.Data[4].7
1	[Adapter Name]:[Slot]:C.Data[4].11
	[Adapter Name]:[Slot]:C.Data[4].12
	[Adapter Name]:[Slot]:C.Data[4].13
	[Adapter Name]:[Slot]:C.Data[4].14
	[Adapter Name]:[Slot]:C.Data[4].15
2	[Adapter Name]:[Slot]:C.Data[5].3
	[Adapter Name]:[Slot]:C.Data[5].4
	[Adapter Name]:[Slot]:C.Data[5].5
	[Adapter Name]:[Slot]:C.Data[5].6
	[Adapter Name]:[Slot]:C.Data[5].7
3	[Adapter Name]:[Slot]:C.Data[5].11
	[Adapter Name]:[Slot]:C.Data[5].12
	[Adapter Name]:[Slot]:C.Data[5].13
	[Adapter Name]:[Slot]:C.Data[5].14
	[Adapter Name]:[Slot]:C.Data[5].15
4	[Adapter Name]:[Slot]:C.Data[6].3
	[Adapter Name]:[Slot]:C.Data[6].4
	[Adapter Name]:[Slot]:C.Data[6].5
	[Adapter Name]:[Slot]:C.Data[7].6
	[Adapter Name]:[Slot]:C.Data[7].7
5	[Adapter Name]:[Slot]:C.Data[7].11
	[Adapter Name]:[Slot]:C.Data[7].12
	[Adapter Name]:[Slot]:C.Data[7].13
	[Adapter Name]:[Slot]:C.Data[7].14
	[Adapter Name]:[Slot]:C.Data[7].15

Channel	Bits
6	[Adapter Name]:[Slot]:C.Data[8].3
	[Adapter Name]:[Slot]:C.Data[8].4
	[Adapter Name]:[Slot]:C.Data[8].5
	[Adapter Name]:[Slot]:C.Data[8].6
	[Adapter Name]:[Slot]:C.Data[8].7
7	[Adapter Name]:[Slot]:C.Data[8].11
	[Adapter Name]:[Slot]:C.Data[8].12
	[Adapter Name]:[Slot]:C.Data[8].13
	[Adapter Name]:[Slot]:C.Data[8].14
	[Adapter Name]:[Slot]:C.Data[8].15

HART Current Ratio Limit	Decimal Value	Bits				
		15	14	13	12	11
		7	6	5	4	3
Disabled	0	0	0	0	0	0
Not applicable	1	0	0	0	0	1
Not applicable	2	0	0	0	1	0
Not applicable	3	0	0	0	1	1
Not applicable	4	0	0	1	0	0
5 %	5	0	0	1	0	1
6 %	6	0	0	1	1	0
7 %	7	0	0	1	1	1
8 %	8	0	1	0	0	0
9 %	9	0	1	0	0	1
10 %	10	0	1	0	1	0
…	…	…	…	…	…	…
30 %	30	1	1	1	1	0
31 %	31	1	1	1	1	1

High Alarm Limit

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[8]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

Low Alarm Limit

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[9]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

Remote High High Alarm Limit

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[10]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

Remote Low Low Alarm Limit

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[11]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

PV Damping Value (32-bit floating point, LowWord)

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[12]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

PV Damping Value (32-bit floating point, HighWord)

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[13]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

PV Upper Range (32-bit floating point, LowWord)

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[15]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

PV Lower Range (32-bit floating point, LowWord)

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[16]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

PV Lower Range (32-bit floating point, HighWord)

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[17]
1	[Adapter Name]:[Slot]:C.Data[20]
2	[Adapter Name]:[Slot]:C.Data[32]
3	[Adapter Name]:[Slot]:C.Data[44]
4	[Adapter Name]:[Slot]:C.Data[56]
5	[Adapter Name]:[Slot]:C.Data[68]
6	[Adapter Name]:[Slot]:C.Data[80]
7	[Adapter Name]:[Slot]:C.Data[92]

PV Range Units Code

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[18].7
	[Adapter Name]:[Slot]:C.Data[18].6
	[Adapter Name]:[Slot]:C.Data[18].5
	[Adapter Name]:[Slot]:C.Data[18].4
	[Adapter Name]:[Slot]:C.Data[18].3
	[Adapter Name]:[Slot]:C.Data[18].2
	[Adapter Name]:[Slot]:C.Data[18].1
	[Adapter Name]:[Slot]:C.Data[18].0

HART Command 3 Disable

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[41].0
1	[Adapter Name]:[Slot]:C.Data[41].1
2	[Adapter Name]:[Slot]:C.Data[41].2
3	[Adapter Name]:[Slot]:C.Data[41].3
4	[Adapter Name]:[Slot]:C.Data[41].4
5	[Adapter Name]:[Slot]:C.Data[41].5
6	[Adapter Name]:[Slot]:C.Data[41].6
7	[Adapter Name]:[Slot]:C.Data[41].7

Disable Mode	Bit 0
False	0
True	1

Input Map

Input Data

Channel	Words
0	[Adapter Name]:[Slot]:I.Data[0]
1	[Adapter Name]:[Slot]:I.Data[1]
2	[Adapter Name]:[Slot]:I.Data[2]
3	[Adapter Name]:[Slot]:I.Data[3]
4	[Adapter Name]:[Slot]:I.Data[4]
5	[Adapter Name]:[Slot]:I.Data[5]
6	[Adapter Name]:[Slot]:I.Data[6]
7	[Adapter Name]:[Slot]:I.Data[7]

High Alarm

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[8].0
1	[Adapter Name]:[Slot]:I.Data[8].1
2	[Adapter Name]:[Slot]:I.Data[8].2
3	[Adapter Name]:[Slot]:I.Data[8].3
4	[Adapter Name]:[Slot]:I.Data[8].4

Channel	Bits
5	[Adapter Name]:[Slot]:I.Data[8].5
6	[Adapter Name]:[Slot]:I.Data[8].6
7	[Adapter Name]:[Slot]:I.Data[8].7

Low Alarm

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[8].8
1	[Adapter Name]:[Slot]:I.Data[8].9
2	[Adapter Name]:[Slot]:I.Data[8].10
3	[Adapter Name]:[Slot]:I.Data[8].11
4	[Adapter Name]:[Slot]:I.Data[8].12
5	[Adapter Name]:[Slot]:I.Data[8].13
6	[Adapter Name]:[Slot]:I.Data[8].14
7	[Adapter Name]:[Slot]:I.Data[8].15

Out of Range

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[9].0
1	[Adapter Name]:[Slot]:I.Data[9].1
2	[Adapter Name]:[Slot]:I.Data[9].2
3	[Adapter Name]:[Slot]:I.Data[9].3
4	[Adapter Name]:[Slot]:I.Data[9].4
5	[Adapter Name]:[Slot]:I.Data[9].5
6	[Adapter Name]:[Slot]:I.Data[9].6
7	[Adapter Name]:[Slot]:I.Data[9].7

Second Alarm

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[9].8
1	[Adapter Name]:[Slot]:I.Data[9].9
2	[Adapter Name]:[Slot]:I.Data[9].10
3	[Adapter Name]:[Slot]:I.Data[9].11
4	[Adapter Name]:[Slot]:I.Data[9].12
5	[Adapter Name]:[Slot]:I.Data[9].13
6	[Adapter Name]:[Slot]:I.Data[9].14
7	[Adapter Name]:[Slot]:I.Data[9].15

Diagnostic Status

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[10].0
1	[Adapter Name]:[Slot]:I.Data[10].1
2	[Adapter Name]:[Slot]:I.Data[10].2
3	[Adapter Name]:[Slot]:I.Data[10].3
4	[Adapter Name]:[Slot]:I.Data[10].4
5	[Adapter Name]:[Slot]:I.Data[10].5
6	[Adapter Name]:[Slot]:I.Data[10].6
7	[Adapter Name]:[Slot]:I.Data[10].7

HART Fault

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[11].0
1	[Adapter Name]:[Slot]:I.Data[11].1
2	[Adapter Name]:[Slot]:I.Data[11].2
3	[Adapter Name]:[Slot]:I.Data[11].3
4	[Adapter Name]:[Slot]:I.Data[11].4
5	[Adapter Name]:[Slot]:I.Data[11].5
6	[Adapter Name]:[Slot]:I.Data[11].6
7	[Adapter Name]:[Slot]:I.Data[11].7

Fault Mode	Bit 0
False	0
True	1

HART Current Fault

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[11].8
1	[Adapter Name]:[Slot]:I.Data[11].9
2	[Adapter Name]:[Slot]:I.Data[11].10
3	[Adapter Name]:[Slot]:I.Data[11].11
4	[Adapter Name]:[Slot]:I.Data[11].12
5	[Adapter Name]:[Slot]:I.Data[11].13
6	[Adapter Name]:[Slot]:I.Data[11].14
7	[Adapter Name]:[Slot]:I.Data[11].15

Fault Mode	Bit 0
False	0
True	1

HART Transmitter Present

Channel	Bits
0	[Adapter Name]:[Slot]:I.Data[12].8
1	[Adapter Name]:[Slot]:I.Data[12].9
2	[Adapter Name]:[Slot]:I.Data[12].10
3	[Adapter Name]:[Slot]:I.Data[12].11
4	[Adapter Name]:[Slot]:I.Data[12].12
5	[Adapter Name]:[Slot]:I.Data[12].13
6	[Adapter Name]:[Slot]:I.Data[12].14
7	[Adapter Name]:[Slot]:I.Data[12].15

Fault Mode	Bit 0
False	0
True	1

Use the 1794-OF8IH Module with the Generic Profile

Overview

Overview This appendix provides the information needed to configure the 1794-OF8IH analog output module in RSLogix 5000 software over the ControlNet network using version 16 or earlier and the generic profile.

Background Information

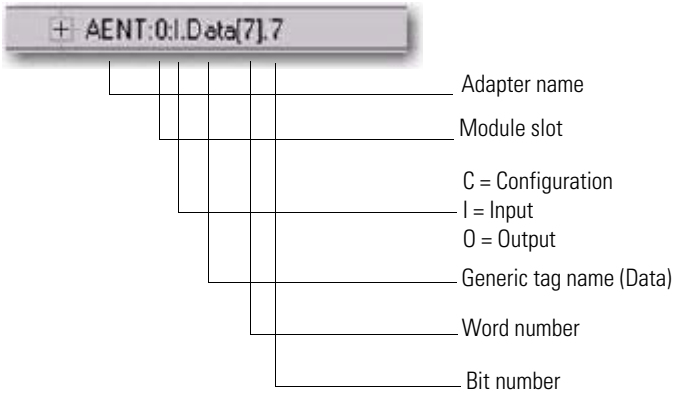
Make sure that your Comm-Format is set to Data - INT. In the FLEX generic profile, you need these sizes:

- Input – 0
- Output – 9
- Config – 18
- Status – 4
- Cyclic HART input data is not available in the generic profile

IMPORTANT HART commands will only work when the Data Format control is configured for a 4…20 mA range. The default configuration when using the generic profile is 0, which configures the module for a 0…20 mA range.

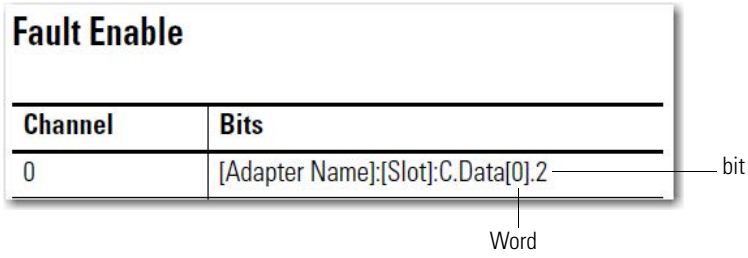
Generic Profile Tag Name Structure

Tag names under the generic profile have the following structure:

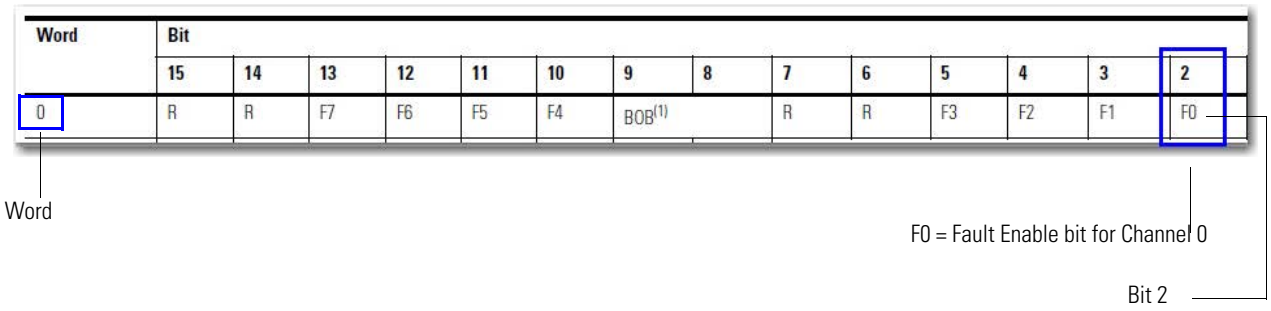


To be able to use the generic tags, you can consult the tables in the following section for designated tag names for each bit. For example, the following tag

name refers to the Fault Enable configuration bit for Channel 0.



In the configuration data table, you will see this bit as:



Configuration

Refer to the following tables for configuration.

1794-OF8IH Configuration Data Table

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	FT	R	EW7	EW6	EW5	EW4	BOB(3)		R	R	EW3	EW2	EW1	EW0	BOA(1)	
1	DH7	DH6	DH5	DH4	DH3	DH2	DH1	DH0	Reserved(4)							
2	CH 3 Format				CH 2 Format				CH 1 Format				CH 0 Format			
3	CH 7 Format				CH 6 Format				CH 5 Format				CH 4 Format			
4	CH1 HART Current Ratio					L1	AFS1		CH0 HART Current Ratio					L0	AFS0	
5	CH3 HART Current Ratio					L3	AFS3		CH2 HART Current Ratio					L2	AFS2	
6	CH5 HART Current Ratio					L5	AFS5		CH4 HART Current Ratio					L4	AFS4	
7	CH7 HART Current Ratio					L7	AFS7		CH6 HART Current Ratio					L6	AFS6	
8	DF7	DF6	DF5	DF4	DF3	DF2	DF1	DF0	DM7	DM6	DM5	DM4	DM3	DM2	DM1	DM0
9	Channel 0 Analog Fault Value Output Data															
10	Channel 1 Analog Fault Value Output Data															
11	Channel 2 Analog Fault Value Output Data															
12	Channel 3 Analog Fault Value Output Data															
13	Channel 4 Analog Fault Value Output Data															
14	Channel 5 Analog Fault Value Output Data															
15	Channel 6 Analog Fault Value Output Data															

1794-OF8IH Configuration Data Table

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
16	Channel 7 Analog Fault Value Output Data															
17	Reserved								C7	C6	C5	C4	C3	C2	C1	C0
Where:	BOA = Byte Order Group A BOB = Byte Order Group B Byte Order Group A and B values must match each other. Refer to the Byte Order table.															
	FT = Local Fault Mode 0: Outputs set to safe value on communication faults only; 1: Outputs set to safe value on any fault															
	EWn = Fault Enable for wire fault detection on channel n.(1) 0: Disable wire off/lead break detection; 1: Enable wire off lead break detection(2)															
	CHn HART Current Ratio = HART current fault ratio on channel n Valid values are 0, 5…31 percent of full scale. A value of 0 disables this feature. See HART Current Ratio (Configuration Words 4…7 – bits 3…7, 11…15.) on page 62.															
	AFSn = Analog Fault Selection for Channel n See Analog Fault Mode Selection (Configuration Words 4…7 – bits 0…1, 8…9) on page 67.															
	Ln = Channel n Enable Latching of Wire Fault 0: Unlatched; 1: Latched															
	DFn = Channel n Digital Fault Mode Selection 0: Reset (0 mA); 1: Hold Last State															
	DMn = Channel n Enable Digital Mode 0: Analog; 1: Digital															
	Fn = Fault mode channel n 0: Local/Remote faults disabled; 1: Enabled															
	DHn = Disable HART communications on channel n 0: HART communications enabled; 1: HART communications disabled															
	Cn = HART CMD 3 Disable 0: HART CMD 3 communications enabled; 1: HART CMD 3 communications disabled															
	R = Reserved															
	CH N = Channel Data Formats. See Data Format (Configuration Words 2, 3 – bits 0…3, 4…7, 8…10, 12…15) on page 63.															

(1) Not supported in analog 0…20 mA formats.

(2) Lead break must be present for 100 ms or more.

(3) Not shown or used in RSLogix 5000 software.

(4) Reserved data may not be shown in certain controller software.

Byte Order

Channel	Bits
0…3	[Adapter Name]:[Slot]:C.Data[0].0
	[Adapter Name]:[Slot]:C.Data[0].1
4…7	[Adapter Name]:[Slot]:C.Data[0].8
	[Adapter Name]:[Slot]:C.Data[0].9

Byte Order Group B		Byte Order Group A		Description
Bit 9	Bit 8	Bit 1	Bit 0	
0	0	0	0	Little Endian Format (default) — all data entries in true Little Endian format.
1	0	1	0	Word Swap — word swap only values requiring more than one word, for example, 32 bit float values.
0	1	0	1	Byte Swap — byte swap all words in data table.
1	1	1	1	Big Endian Format — all data entries in true Big Endian format.

Fault Enable

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[0].2
1	[Adapter Name]:[Slot]:C.Data[0].3
2	[Adapter Name]:[Slot]:C.Data[0].4
3	[Adapter Name]:[Slot]:C.Data[0].5
4	[Adapter Name]:[Slot]:C.Data[0].10
5	[Adapter Name]:[Slot]:C.Data[0].11
6	[Adapter Name]:[Slot]:C.Data[0].12
7	[Adapter Name]:[Slot]:C.Data[0].13

Fault Mode	Bit 0
Disabled	0
Enabled	1

Local Fault Mode

Channel	Bits
0…	[Adapter Name]:[Slot]:C.Data[0].15

Fault Mode	Bit 0
Disabled	0
Enabled	1

HART Disable

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[1].8
1	[Adapter Name]:[Slot]:C.Data[1].9
2	[Adapter Name]:[Slot]:C.Data[1].10
3	[Adapter Name]:[Slot]:C.Data[1].11
4	[Adapter Name]:[Slot]:C.Data[1].12
5	[Adapter Name]:[Slot]:C.Data[1].13
6	[Adapter Name]:[Slot]:C.Data[1].14
7	[Adapter Name]:[Slot]:C.Data[1].15

Fault Mode	Bit 0
False	0
True	1

Channel Data Format

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[2].0
	[Adapter Name]:[Slot]:C.Data[2].1
	[Adapter Name]:[Slot]:C.Data[2].2
	[Adapter Name]:[Slot]:C.Data[2].3
1	[Adapter Name]:[Slot]:C.Data[2].4
	[Adapter Name]:[Slot]:C.Data[2].5
	[Adapter Name]:[Slot]:C.Data[2].6
	[Adapter Name]:[Slot]:C.Data[2].7
2	[Adapter Name]:[Slot]:C.Data[2].8
	[Adapter Name]:[Slot]:C.Data[2].9
	[Adapter Name]:[Slot]:C.Data[2].10
	[Adapter Name]:[Slot]:C.Data[2].11
3	[Adapter Name]:[Slot]:C.Data[2].12
	[Adapter Name]:[Slot]:C.Data[2].13
	[Adapter Name]:[Slot]:C.Data[2].14
	[Adapter Name]:[Slot]:C.Data[2].15
4	[Adapter Name]:[Slot]:C.Data[3].0
	[Adapter Name]:[Slot]:C.Data[3].1
	[Adapter Name]:[Slot]:C.Data[3].2
	[Adapter Name]:[Slot]:C.Data[3].3
5	[Adapter Name]:[Slot]:C.Data[3].4
	[Adapter Name]:[Slot]:C.Data[3].5
	[Adapter Name]:[Slot]:C.Data[3].6
	[Adapter Name]:[Slot]:C.Data[3].7
6	[Adapter Name]:[Slot]:C.Data[3].8
	[Adapter Name]:[Slot]:C.Data[3].9
	[Adapter Name]:[Slot]:C.Data[3].10
	[Adapter Name]:[Slot]:C.Data[3].11
7	[Adapter Name]:[Slot]:C.Data[3].12
	[Adapter Name]:[Slot]:C.Data[3].13
	[Adapter Name]:[Slot]:C.Data[3].14
	[Adapter Name]:[Slot]:C.Data[3].15

Format[1]	Bits				Format Name	Signal Range		User Range		Resolution
	15 11 7 3	14 10 6 2	13 9 5 1	12 8 4 0		LO	HI	LO	HI	
0	0	0	0	0	0…20 mA in Milliamps	0.00	22.00	0 (0.000 mA)	22000 (22.000 mA)	1.0 μA
1	0	0	0	1	0…20 mA in % Full Scale	0.00	22.00	0 (0%)	11000 (110.00%)	2.0 μA
3	0	0	1	1	0…20 mA in UINT	0.00	20.00	0	65535	0.3052 μA
4[2]	0	1	0	0	4…20 mA in Milliamps	2.00	22.00	2000 (2.000 mA)	22000 (22.000 mA)	1.0 μA
7	0	1	1	1	4…20 mA in UINT	4.00	20.00	0	65535	0.2441 μA
14	1	1	1	0	4…20 mA in % Full Scale	2.00	22.00	-1250 (-12.50%)	11250 (112.50%)	1.6 μA

(1) All other formats are invalid.

(2) HART Communications supported with these data formats only.

Analog Fault Mode

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[4].0
	[Adapter Name]:[Slot]:C.Data[4].1
1	[Adapter Name]:[Slot]:C.Data[4].8
	[Adapter Name]:[Slot]:C.Data[4].9
2	[Adapter Name]:[Slot]:C.Data[5].0
	[Adapter Name]:[Slot]:C.Data[5].1
3	[Adapter Name]:[Slot]:C.Data[5].8
	[Adapter Name]:[Slot]:C.Data[5].9
4	[Adapter Name]:[Slot]:C.Data[6].0
	[Adapter Name]:[Slot]:C.Data[6].1
5	[Adapter Name]:[Slot]:C.Data[6].8
	[Adapter Name]:[Slot]:C.Data[6].9
6	[Adapter Name]:[Slot]:C.Data[7].0
	[Adapter Name]:[Slot]:C.Data[7].1
7	[Adapter Name]:[Slot]:C.Data[7].8
	[Adapter Name]:[Slot]:C.Data[7].9

Analog Fault Mode	Decimal Value	Bits	
		9	8
		1	0
Min Scale	0	0	0
Max Scale	1	0	0
Hold Last State	2	1	0
User Specified Data Value	3	1	1

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[4].2
1	[Adapter Name]:[Slot]:C.Data[4].10
2	[Adapter Name]:[Slot]:C.Data[5].2
3	[Adapter Name]:[Slot]:C.Data[5].10
4	[Adapter Name]:[Slot]:C.Data[6].2
5	[Adapter Name]:[Slot]:C.Data[6].10
6	[Adapter Name]:[Slot]:C.Data[7].2
7	[Adapter Name]:[Slot]:C.Data[7].10

Latch Mode	Bit 0
Unlatched	0
Latched	1

Channel	Bits
0	[Adapter Name]:[Slot]:C.Data[4].3
	[Adapter Name]:[Slot]:C.Data[4].4
	[Adapter Name]:[Slot]:C.Data[4].5
	[Adapter Name]:[Slot]:C.Data[4].6
	[Adapter Name]:[Slot]:C.Data[4].7
1	[Adapter Name]:[Slot]:C.Data[4].11
	[Adapter Name]:[Slot]:C.Data[4].12
	[Adapter Name]:[Slot]:C.Data[4].13
	[Adapter Name]:[Slot]:C.Data[4].14
	[Adapter Name]:[Slot]:C.Data[4].15
2	[Adapter Name]:[Slot]:C.Data[5].3
	[Adapter Name]:[Slot]:C.Data[5].4
	[Adapter Name]:[Slot]:C.Data[5].5
	[Adapter Name]:[Slot]:C.Data[5].6
	[Adapter Name]:[Slot]:C.Data[5].7
3	[Adapter Name]:[Slot]:C.Data[5].11
	[Adapter Name]:[Slot]:C.Data[5].12
	[Adapter Name]:[Slot]:C.Data[5].13
	[Adapter Name]:[Slot]:C.Data[5].14
	[Adapter Name]:[Slot]:C.Data[5].15
4	[Adapter Name]:[Slot]:C.Data[6].3
	[Adapter Name]:[Slot]:C.Data[6].4
	[Adapter Name]:[Slot]:C.Data[6].5
	[Adapter Name]:[Slot]:C.Data[6].6
	[Adapter Name]:[Slot]:C.Data[6].7
5	[Adapter Name]:[Slot]:C.Data[7].11
	[Adapter Name]:[Slot]:C.Data[7].12
	[Adapter Name]:[Slot]:C.Data[7].13
	[Adapter Name]:[Slot]:C.Data[7].14
	[Adapter Name]:[Slot]:C.Data[7].15

Channel	Bits
6	[Adapter Name]:[Slot]:C.Data[8].3
	[Adapter Name]:[Slot]:C.Data[8].4
	[Adapter Name]:[Slot]:C.Data[8].5
	[Adapter Name]:[Slot]:C.Data[8].6
	[Adapter Name]:[Slot]:C.Data[8].7
7	[Adapter Name]:[Slot]:C.Data[8].11
	[Adapter Name]:[Slot]:C.Data[8].12
	[Adapter Name]:[Slot]:C.Data[8].13
	[Adapter Name]:[Slot]:C.Data[8].14
	[Adapter Name]:[Slot]:C.Data[8].15

HART Current Ratio Limit	Decimal Value	Bits				
		15	14	13	12	11
		7	6	5	4	3
Disabled	0	0	0	0	0	0
Not applicable	1	0	0	0	0	1
Not applicable	2	0	0	0	1	0
Not applicable	3	0	0	0	1	1
Not applicable	4	0	0	1	0	0
5%	5	0	0	1	0	1
6%	6	0	0	1	1	0
7%	7	0	0	1	1	1
8%	8	0	1	0	0	0
9%	9	0	1	0	0	1
10%	10	0	1	0	1	0
...	...	...	...	...	...	...
30%	30	1	1	1	1	0
31%	31	1	1	1	1	1

Digital Mode

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[8].0
1	[Adapter Name]:[Slot]:C.Data[8].1
2	[Adapter Name]:[Slot]:C.Data[8].2
3	[Adapter Name]:[Slot]:C.Data[8].3
4	[Adapter Name]:[Slot]:C.Data[8].4
5	[Adapter Name]:[Slot]:C.Data[8].5
6	[Adapter Name]:[Slot]:C.Data[8].6
7	[Adapter Name]:[Slot]:C.Data[8].7

Mode	Bit 0
Analog	0
Digital	1

Digital Fault Mode

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[8].8
1	[Adapter Name]:[Slot]:C.Data[8].9
2	[Adapter Name]:[Slot]:C.Data[8].10
3	[Adapter Name]:[Slot]:C.Data[8].11
4	[Adapter Name]:[Slot]:C.Data[8].12
5	[Adapter Name]:[Slot]:C.Data[8].13
6	[Adapter Name]:[Slot]:C.Data[8].14
7	[Adapter Name]:[Slot]:C.Data[8].15

Mode	Bit 0
Disabled	0
Enabled	1

Analog Fault Value

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[9]
1	[Adapter Name]:[Slot]:C.Data[10]
2	[Adapter Name]:[Slot]:C.Data[11]

Channel	Word
3	[Adapter Name]:[Slot]:C.Data[12]
4	[Adapter Name]:[Slot]:C.Data[13]
5	[Adapter Name]:[Slot]:C.Data[14]
6	[Adapter Name]:[Slot]:C.Data[16]
7	[Adapter Name]:[Slot]:C.Data[17]

HART Command 3 Disable

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[17].0
1	[Adapter Name]:[Slot]:C.Data[17].1
2	[Adapter Name]:[Slot]:C.Data[17].2
3	[Adapter Name]:[Slot]:C.Data[17].3
4	[Adapter Name]:[Slot]:C.Data[17].4
5	[Adapter Name]:[Slot]:C.Data[17].5
6	[Adapter Name]:[Slot]:C.Data[17].6
7	[Adapter Name]:[Slot]:C.Data[17].7

Mode	Bit 0
False	0
True	1

Output

Refer to the following tables for output information.

Digital Data

Channel	Word
0	[Adapter Name]:[Slot]:O.Data[0].0
1	[Adapter Name]:[Slot]:O.Data[0].1
2	[Adapter Name]:[Slot]:O.Data[0].2
3	[Adapter Name]:[Slot]:O.Data[0].3
4	[Adapter Name]:[Slot]:O.Data[0].4
5	[Adapter Name]:[Slot]:O.Data[0].5
6	[Adapter Name]:[Slot]:O.Data[0].6
7	[Adapter Name]:[Slot]:O.Data[0].7

Fault Reset

Channel	Word
0	[Adapter Name]:[Slot]:C.Data[0].15

Analog Data

Channel	Word
0	[Adapter Name]:[Slot]:O.Data[1]
1	[Adapter Name]:[Slot]:O.Data[2]
2	[Adapter Name]:[Slot]:O.Data[3]
3	[Adapter Name]:[Slot]:O.Data[4]
4	[Adapter Name]:[Slot]:O.Data[5]
5	[Adapter Name]:[Slot]:O.Data[6]
6	[Adapter Name]:[Slot]:O.Data[7]
7	[Adapter Name]:[Slot]:O.Data[8]

Input

Refer to the following tables for input information.

Diagnostic Status

Channel	Word
0	[Adapter Name]:[Slot]:I.Data[0].0
1	[Adapter Name]:[Slot]:I.Data[0].1
2	[Adapter Name]:[Slot]:I.Data[0].2
3	[Adapter Name]:[Slot]:I.Data[0].3
4	[Adapter Name]:[Slot]:I.Data[0].4
5	[Adapter Name]:[Slot]:I.Data[0].5
6	[Adapter Name]:[Slot]:I.Data[0].6
7	[Adapter Name]:[Slot]:I.Data[0].7

HART Current Fault

Channel	Word
0	[Adapter Name]:[Slot]:I.Data[3].8
1	[Adapter Name]:[Slot]:I.Data[3].9
2	[Adapter Name]:[Slot]:I.Data[3].10
3	[Adapter Name]:[Slot]:I.Data[3].11
4	[Adapter Name]:[Slot]:I.Data[3].12
5	[Adapter Name]:[Slot]:I.Data[3].13
6	[Adapter Name]:[Slot]:I.Data[3].14
7	[Adapter Name]:[Slot]:I.Data[3].15

Fault	Bit 0
False	0
True	1

HART Transmitter Present

Channel	Word
0	[Adapter Name]:[Slot]:I.Data[3].8
1	[Adapter Name]:[Slot]:I.Data[3].9
2	[Adapter Name]:[Slot]:I.Data[3].10
3	[Adapter Name]:[Slot]:I.Data[3].11
4	[Adapter Name]:[Slot]:I.Data[3].12

Channel	Word
5	[Adapter Name]:[Slot]:I.Data[3].13
6	[Adapter Name]:[Slot]:I.Data[3].14
7	[Adapter Name]:[Slot]:I.Data[3].15

Transmitter Present	Bit 0
False	0
True	1

Notes:

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Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products.
At http://www.rockwellautomation.com/support/, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the
best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect
support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual.
You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

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