



PointMax Analog I/O Modules

5034-IF4, 5034-IF4XT, 5034-IF8C, 5034-IF8CXT, 5034-IF8V, 5034-IF8VXT, 5034-IRT4I, 5034-IRT4IXT, 5034-OF4, 5034-OF4XT



Allen-Bradley

by ROCKWELL AUTOMATION

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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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.

IMPORTANT: Identifies information that is critical for successful application and understanding of the product.

These labels may also be on or inside the equipment to provide specific precautions.



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.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

The following icon may appear in the text of this document.



Identifies information that is useful and can help to make a process easier to do or easier to understand.

Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

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Preface

About This Publication

This manual describes how to use PointMax™ analog I/O modules in Logix 5000® control systems.

Make sure that you are familiar with the following:

- Use of a controller in a Logix 5000 control system
- Use of an EtherNet/IP™ network
- Studio 5000 Logix Designer® application environment

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Table 1. Additional Resources

Resources	Description
PointMax I/O System Specifications Technical Data, publication 5034-TD001	Provides PointMax I/O system specifications.
PointMax I/O System Installation Instructions, publication 5034-IN001	Provides instructions on installing a complete PointMax I/O system.
PointMax EtherNet/IP Adapter User Manual, publication 5034-UM001	Provides information on how to configure and operate PointMax EtherNet/IP adapters.
PointMax Digital I/O Modules User Manual, publication 5034-UM002	Provides information on how to configure and operate PointMax digital I/O modules.
PointMax Analog I/O Modules User Manual, publication 5034-UM003	Provides information on how to configure and operate PointMax analog I/O modules.
PointMax IO-Link Master Module User Manual, publication 5034-UM004	Provides information on how to configure and operate the PointMax IO-Link master module.
PointMax Serial Module User Manual, publication 5034-UM005	Provides information on how to configure and operate the PointMax serial module.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, publication ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, publication SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation® products in a secure system, harden the control system, manage user access, and dispose of equipment.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.

Table 1. Additional Resources (continued)

Resources	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Selection and Configuration tools website, rok.auto/systemtools	Helps configure complete, valid catalog numbers and build complete quotes based on detailed product information.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Download Firmware, AOP, EDS, and Other Files

You can download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes from the Product Compatibility and Download Center at rok.auto/pcdc.

Terminology

This table defines the terms that are used in this publication.

Table 2. Terminology

Acronym	Full Term	Definition
BP	Backplane Power	Power that is generated from module power by the adapter and expansion power, then supplied to the I/O system through the backplane.
CIP™	Common Industrial Protocol	An industrial communication protocol that is used by Logix 5000 based automation systems on EtherNet/IP, ControlNet®, and DeviceNet® communication networks.
CIP Sync™	Common Industrial Protocol Synchronization	CIP Sync provides the increased control coordination needed for control applications where absolute time synchronization is vital to achieve real-time synchronization between distributed intelligent devices and systems.
CJC	Cold Junction Compensator	A device that is used in thermocouple measurements to help obtain accurate temperature readings at the hot junction.
MB	Mounting Base	A device that provides data and power connections from the backplane to the installed module.
MP	Module Power	Power that is supplied to the adapter and expansion power.
ODVA	Open DeviceNet Vendor Association	A nonprofit association of vendors that is been established for the promotion of CIP networks.
RIUP	Removal and Insertion Under Power	A feature that enables the device to be connected and disconnected from the system without having to remove power from the system.
RPI	Requested Packet Interval	Time interval (usually in milliseconds) that users are requesting their data be exchanged at
RTB	Removable Terminal Block	A component that is used for wiring field devices to.
RTD	Resistance Temperature Detector	A type of sensor whose resistances change as its temperature changes.
SA	Sensor Actuator	A term that is used to describe field-side devices.
SELV	Safety Extra Low Voltage	An electrical system where the voltage level is considered safe under normal or fault conditions, as defined in the EN and IEC standards.
TC	Thermocouple	A thermocouple is a device that measures temperature by joining two different metal wires at one end. When the junction between the wires heats or cools, it generates a voltage that can be measured. This voltage can be translated into a temperature reading.
XT	Harsh Environment	These modules have additional conformal coating and design considerations that add a greater degree of protection when exposed to harsh, corrosive environments.

Analog I/O Modules

This chapter describes the analog I/O module types and features that are common between analog input and output modules, and how to construct a PointMax I/O system.

Table 3. Analog I/O Module Types

I/O Type	Catalog Number	Description
Input modules	5034-IF4, 5034-IF4XT	4-channel voltage/current input module It supports 4 channels that accept voltage or current input.
	5034-IF8C, 5034-IF8CXT	8-channel current input module It supports 8 channels that only accept current input.
	5034-IF8V, 5034-IF8VXT	8-channel voltage input module It supports 8 channels that only accept voltage input.
	5034-IRT4I, 5034-IRT4IXT	4-channel isolated RTD/TC module It supports 4 channels that are configurable at channel level for RTD and Thermocouple inputs.
Output modules	5034-OF4, 5034-OF4XT	4-channel voltage/current output module It supports 4 channels that produce voltage or current output.

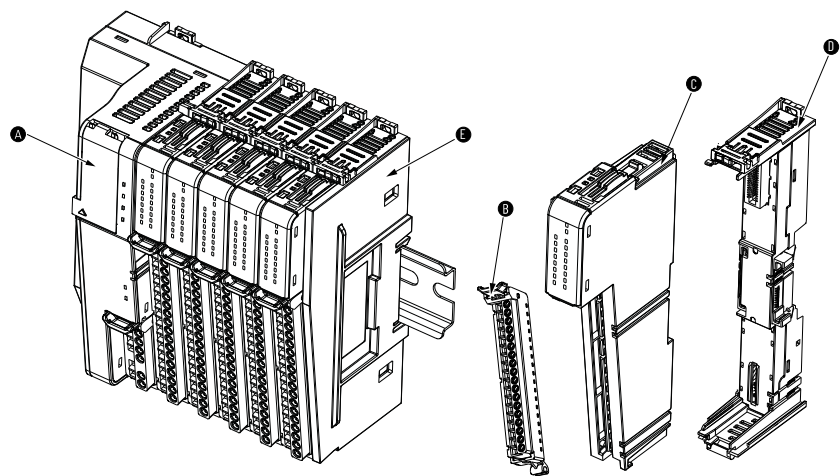
All I/O modules support removal and insertion under power (RIUP). You must remove the RTB first and then the I/O modules.

For technical and environmental specifications details, see PointMax I/O System Specifications Technical Data, publication [5034-TD001](#).

Construct a PointMax I/O System

PointMax I/O system contains the components that are pictured below.

Figure 1. PointMax I/O System



Item	Component Name	Description
A	Adapter	The adapter transfers data between the I/O module and the controller.
B	Removable Terminal Block (RTB)	The RTB contains terminals to terminate wiring for field devices. Also it has interfaces to establish the connection between the RTB and the I/O module.
C	I/O module	The I/O module contains the SA or field power interface and circuitry that is needed to perform specific functions that are related to your application.
D	Mounting Base (MB)	The MB contains mechanical and electrical interfaces to establish the connection between I/O module and the backplane.
E	End cap	It is a dust protection cap for the last module in a rack.

For PointMax I/O system power requirements, see PointMax I/O System Installation Instructions, publication [5034-IN001](#).

Secure Access to the System

To secure access to the device by authorized users only, consider these options:

- Password helps protect the source and execution of the control program
- Remove the key from the controller
- Implement physical barriers, such as locked cabinets

To secure access to the system, consider these options:

- Follow industry best practices to harden your personal computers and servers, including anti-virus/anti-malware and application allow list solutions.
The recommendations are published at the Rockwell Automation technical support center in Knowledgebase Technote [Rockwell Automation Customer Hardening Guidelines](#).
- Develop and deploy backup and disaster recovery policies and procedures. Test backups on a regular schedule.

- Minimize network exposure for all control system devices and systems, and confirm that they are not accessible from the Internet.
- Locate control system networks and devices behind firewalls and isolate them from the business network.
- Subscribe to the Knowledgebase Technote [Security Advisory Index](#), so you have access to information about security matters that affect Rockwell Automation products.

Follow recommended network practices for products with network interfaces, such as communication ports or web servers. These practices help minimize risk or exposure by unauthorized activity or users. For more information, see:

- Converged Plantwide Ethernet (CPwE) Design and Implementation Guide, publication [ENET-TD001](#)
- Ethernet/IP Network Devices User Manual, publication [ENET-UM006](#)
- Configure System Security Features User Manual, publication [SECURE-UM001](#)

PointMax I/O in a Logix 5000 Control System

IMPORTANT: Throughout this publication, the term Logix 5000 controller refers to the controllers with which you can use PointMax I/O modules in a given capacity.

You can use PointMax I/O modules with Logix 5000 controllers as remote I/O modules only.

You cannot use PointMax I/O modules with all Logix 5000 controllers. For example, you can use PointMax I/O modules with CompactLogix® 5380 and ControlLogix® 5580 controllers but not with CompactLogix 5370 and ControlLogix 5570 controllers.

Logix 5000 controllers use I/O modules to control devices in a control system. The controllers access the modules over an EtherNet/IP network.

See [Connections on page 16](#) for the communication model between controller and I/O modules.

Controller and Software Compatibility

Controller and programming software compatibility requirements apply when you use PointMax I/O modules. A module type and how it is used affect which requirements apply.

You must use Studio 5000 Logix Designer application version 36 or later. For more information, see the Product Compatibility and Download Center at rok.auto/pcdc.

If you use GuardLogix® controllers and need to use up to chassis slot 32, you must use Studio 5000 Logix Designer application version 37 or later.

Module Firmware Updates

I/O modules are manufactured with module firmware installed. If updated module firmware revisions are available in the future, you can update the firmware.

Firmware information for I/O modules is available at the Rockwell Automation Product Compatibility and Download Center (PCDC). The PCDC is available at: rok.auto/pcdc. At the PCDC, you can use the module catalog number to check for firmware updates. If the catalog number is not available, then no updates exist.

IMPORTANT: Only download firmware and access product release notes from the Rockwell Automation PCDC. Do not download firmware from non-Rockwell Automation sites.

Verify that the firmware revision of the I/O modules that you use is correct before commissioning the system. For more information on how to update your module firmware, see the ControlFLASH Plus® Quick Start Guide, publication [CFP-QS001](#).

When the firmware update is in progress, you cannot perform the following operations:

- Another firmware update request
- Module connection request
- Module reset request



WARNING: When you update the PointMax EtherNet/IP adapter firmware, the I/O modules in its chassis may reset and unable to maintain their Program Mode or Inhibit Mode states. Verify that all equipment controlled by the modules in this chassis is in a stopped state and that all safety-critical functions are unaffected.

Input Modules

Table 4. Input Modules Feature Comparison

Feature	5034-IF4, 5034-IF4XT	5034-IF8C, 5034-IF8CXT	5034-IF8V, 5034-IF8VXT	5034-IRT4I, 5034-IRT4IXT
Requested Packet Interval	✓	✓	✓	✓
Listen Only Mode	✓	✓	✓	✓
Module Inhibiting	✓	✓	✓	✓
Electronic Keying	✓	✓	✓	✓
Protected Operations	✓	✓	✓	✓
Alarm Latching	✓	✓	✓	✓
Scaling	✓	✓	✓	✓
CIP Sync Time	✓	✓	✓	✓
Rolling Timestamp of Data	✓	✓	✓	✓
Module Data Quality Reporting (Fault and Uncertain)	✓	✓	✓	✓
Notch Filter	✓	✓	✓	✓
Digital Filter	✓	✓	✓	✓
Process Alarms	✓	✓	✓	✓
Rate Alarms	✓	✓	✓	✓

Table 4. Input Modules Feature Comparison (continued)

Feature	5034-IF4, 5034-IF4XT	5034-IF8C, 5034-IF8CXT	5034-IF8V, 5034-IF8VXT	5034-IRT4I, 5034-IRT4IXT
Sensor Offset	✓	✓	✓	✓
Open Wire Detection	✓	✓	✓	✓
Field Power Loss Detection	✓	✓	✓	✓
Underrange/Overrange Detection	✓	✓	✓	✓
10 Ohm Copper Offset				✓
Cold Junction Compensation				✓
Fault and Status Reporting	✓	✓	✓	✓
Calibration (via AOP or Module Tags)	✓	✓	✓	✓

Output Module

Table 5. Output Module Features

Feature	5034-OF4, 5034-OF4XT
Requested Packet Interval	✓
Listen Only Mode	✓
Module Inhibiting	✓
Electronic Keying	✓
Protected Operations	✓
Alarm Latching	✓
Scaling	✓
CIP Sync Time	✓
Data Echo	✓
Rolling Timestamp of Data	✓
Module Data Quality Reporting (Fault and Uncertain)	✓

Table 5. Output Module Features (continued)

Feature	5034-0F4, 5034-0F4XT
Program and Inhibit Mode Handling	✓
Connection Fault Handling	✓
Channel Offset	✓
Hold for Initialization	✓
Output Clamping	✓
Output Ramping Rate Limiting	✓
Field Power Loss Detection	✓
No Load Detection	✓
Short-Circuit Protection	✓
Fault and Status Reporting	✓
Calibration (via AOP or Module Tags)	✓

Connections

A connection is a real-time data transfer link between the owner-controller and the module that occupies the slot that the configuration references.

During the module configuration, the connection type determines what data is exchanged between the controller and the module. When you uninhibit a module in online mode, or download the project with modules that are uninhibited to the controller, the controller attempts to establish a connection to each module.

The owner-controller monitors its connection with a module. Any break in the connection, for example, the loss of power to the PointMax I/O system, causes a fault. The Studio 5000 Logix Designer application can monitor the fault status tags to indicate when a fault occurs on a module.

Producer/Consumer Communication

PointMax I/O modules use the Producer/Consumer communication model to produce data without a controller polling them first. The modules produce the data and controllers consume it. That is, the owner-controller and controllers with a Listen Only connection to the module can consume it.

When an input module produces data, the controllers can consume the data simultaneously. Simultaneous data consumption eliminates the need for one controller to send the data to other controllers.

Ownership

Every I/O module in a Logix 5000 control system must be owned by a controller, also known as the owner-controller. When the PointMax I/O modules are used in a Logix 5000 control system, the owner-controller performs the following:

- Stores configuration data for every module that it owns.
- Sends the I/O module configuration data to define module behavior and begin operation in the control system.

Each PointMax I/O module must continuously maintain communication with its owner-controller during normal operation.

When the owner-controller establishes I/O connection to the module, it sends the configuration data of the module. Two possible results are:

- If the configuration is appropriate to the module, a connection is established and operation begins.
- If the configuration is not appropriate to the module, the data is rejected and the Connection view in the Module Properties indicates that an error occurred. The configuration can be inappropriate for many reasons. For example, a mismatch in electronic keying that helps prevent operation on incompatible module.

Requested Packet Interval

Requested Packet Interval (RPI) is a configurable parameter that defines a specific rate at which data is exchanged between the controller and the module.

You set the RPI value during initial module configuration and can adjust it as necessary after module operation has begun.

IMPORTANT: If you change the RPI while the project is online, the connection to the module is closed and reopened in one of the following ways:

- You inhibit the connection to the module, change the RPI value, and uninhibit the connection.
 - You change the RPI value. In this case, the connection is closed and reopened immediately after you apply the change to the module configuration.
-

Connection Optimization

PointMax I/O system supports automatic optimization for I/O connections.

The following conditions must be met for connections to be included in the optimization:

- I/O modules on the rack have the same RPI
- Unicast
- Sum of data sizes are within the packet limit

This is similar to how I/O systems such as POINT I/O™ support rack optimization or enhanced rack optimization. Functional safety modules, HART modules, and IO-Link master modules are excluded from the optimization.

Listen Only Mode

Any controller in the system can listen to the data from an I/O module. An owner-controller, as described in [Ownership on page 17](#) exchanges data with I/O modules. Other controllers can use a Listen Only connection with the I/O module. In this case, the 'listening' controller can only

listens to the data produced by the module. The listening controller does not own the module configuration or exchange other data with the module.

During the I/O configuration process, you can specify a Listen Only connection.

IMPORTANT:

Remember the following:

- The Listen Only mode applies only to standard I/O modules.
- If a controller uses a Listen Only connection, the connection must use the Multicast option. In this case, all other connections to the module, for example, the connection of the owner-controller, must also use the Multicast option.

The Listen Only connection RPI value must be the same as owner connection RPI value.

- If a controller attempts to use a Listen Only connection to a module but the owner-controller connection uses the Unicast option, the attempt at a Listen Only connection fails.
 - The Listen Only controller receives data from the module as long as a connection between an owner-controller and module is maintained.
 - RPI of the Listen Only connection must be the same as owner connection.
 - If the connection between an owner-controller and the module is broken, the module stops sending data and connections to all 'listening controllers' are also broken.
 - Due to Multicast, adding a Listen Only connection does not increase network bandwidth.
 - Only one controller can own the I/O module. The PointMax I/O modules do not support multiple owners of the same module. Other controllers must use a Listen Only connection to the module.
-

Module Inhibiting

Module inhibiting lets you indefinitely suspend a connection, including Listen Only connections, between a controller and a module without removing the module from the configuration. This process temporarily stops the connection between the controller and the module.

IMPORTANT: Whenever you inhibit a module with outputs, all outputs change to the state that is configured for Program Mode.

Use the module inhibiting in the following scenarios:

- To perform maintenance on the module.
- To update a module, for example, update the module firmware revision.
- If you use a program that includes a module that you do not physically possess yet. You do not want the controller to look for a module that does not yet exist. In this case, you can inhibit the module in your program until it physically resides in the system.

Use the following procedure to inhibit and uninhibit the module:

1. Inhibit the module:
 - a. Go to Connection view in the Module Properties dialog and select the Inhibit Module checkbox.
 - b. Select Apply or OK.
2. Perform the necessary update.
3. Uninhibit the module:
 - a. Go to Connection view in the Module Properties dialog and clear the Inhibit Module checkbox.
 - b. Select Apply or OK.

Electronic Keying

Electronic Keying reduces the possibility that you use the wrong device in a control system. It compares the device that is defined in your project to the installed device. If keying fails, a fault occurs. These attributes are compared.

Attribute	Description
Vendor	The device manufacturer
Device Type	The general type of the product, for example, an I/O module
Product Code	The specific type of the product. The Product Code maps to a catalog number
Major Revision	A number that represents the functional capabilities of a device
Minor Revision	A number that represents behavior changes in the device

Table 6. Electronic Keying Options

Keying Option	Description
Compatible Module	<p>Lets the installed device accept the key of the device that is defined in the project when the installed device can emulate the defined device. With Compatible Module, you can typically replace a device with another device that has the following characteristics:</p> <ul style="list-style-type: none">• Same or compatible catalog number• Same or higher Major Revision• Minor Revision as follows:<ul style="list-style-type: none">- If the Major Revision is the same, the Minor Revision must be the same or higher.- If the Major Revision is higher, the Minor Revision can be any number.• You can use an XT version of the module in place of a non-XT module or non-XT version of the module in place of XT module.
Disable Keying	<p>Indicates that the keying attributes are not considered when attempting to communicate with a device. With Disable Keying, communication can occur with a device other than the type specified in the project.</p> <div><p>ATTENTION: Be cautious when using Disable Keying; if used incorrectly, this option can lead to personal injury or death, property damage, or economic loss.</p><p>We strongly suggest that you do not use Disable Keying.</p><p>If you use Disable Keying, you must take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.</p></div>
Exact Match	<p>Indicates that all keying attributes must match to establish communication. If any attribute does not match precisely, communication with the device does not occur.</p>

Table 6. Electronic Keying Options (continued)

Keying Option	Description
	When XT module is configured in Studio 5000 Logix Designer application project, only XT Module residing on XT MB is considered as Exact Match. When non-XT module is configured, only non-XT module (with any MB) is considered as exact match.

Carefully consider the implications of each keying option when selecting one.

IMPORTANT: Changing Electronic Keying parameters online interrupts connections to the device and any devices that are connected through the device. Connections from other controllers can also be broken.
If an I/O connection to a device is interrupted, the result can be a loss of data.

For more detailed information on Electronic Keying, see Electronic Keying in Logix 5000 Control Systems Application Technique, publication [LOGIX-AT001](#).

Protected Operations

If one of the module I/O connections is open and running, it is considered as the module is in Protection Mode. Protection Mode is a state where the device is operational but has implemented defenses against disruptive changes that could take the product out of service. The following operations are restricted when the module is in Protection Mode:

- Firmware update request
- Module reset request
- Module calibration request
- Connection or data format change

The following operations can be applied in Studio 5000 Logix Designer application when the module is in Protection Mode but as a consequence, the I/O connections are closed and reopened:

- Change Electronic Keying
- Change RPI
- Change Unicast/Multicast

The following operations are allowed when the module is in Protection Mode:

- Listen-only connection requests from other controllers
- I/O channel configuration change. To apply configuration change without interrupting the I/O connections, there are two methods:
 - Change configurations and apply in Module Properties.
 - Change configuration tag values and send a Reconfigure Module MSG to the module to apply the changes



Inhibit the module to come out of the Protection Mode.

Unicast or Multicast Connection

During module configuration, you must configure the Connection over EtherNet/IP parameter. The configuration choice dictates how input data is broadcast over the network.

The PointMax I/O modules use one of the following methods to broadcast data:

- Multicast - Multicast connections deliver information from one sender to multiple receivers simultaneously. Copies of one transmission are passed to a selected subset of possible destinations.
- Unicast - Unicast connections are point-to-point transmissions between a source node and destination node on the network. A transmission is sent to one destination controller.

IMPORTANT: Unicast is the default setting. Use Unicast because it reduces network bandwidth usage. However, if you are using a ControlLogix 5580 controller in a high availability system, you must use Multicast.

Alarm Latching

Alarm latching lets you latch a module alarm in the set position once the alarm is triggered. The alarm remains set even if the condition that triggered the alarm disappears, until the alarm is unlatched.

Alarm latching is available on a per channel basis. You can latch the following alarms:

I/O Type	Available Alarms
Input modules	<ul style="list-style-type: none">• Process Alarms• Rate Alarm
Output modules	<ul style="list-style-type: none">• Clamp Alarms• Output Ramping Alarm

Enable Latching

You can enable alarm latching in Module Properties:

- For input modules, go to Chxx - Alarms view to enable latching for Process Alarms and Rate Alarm.
- For output modules, go to Chxx - Limits view to enable latching for Clamp Alarms and Rate Alarm.

Unlatch Alarms

IMPORTANT: Before you unlatch an alarm, make sure that the condition that triggered the alarm is no longer exists.

Once an alarm is latched, you must manually unlatch it. You can use the module tags to unlatch an alarm. The alarm type determines which module tag you must change.

For example, to unlatch a Low Low alarm on the analog input module, set the *Chxx.LLAlarmUnlatch* output tag to 1.

IMPORTANT: After an alarm is unlatched, change the module tag back from 1 to 0.

You must change the module tag from 0 to 1 to unlatch the alarm each time an alarm is triggered.

If you do not change the module tag back to 0 and the alarm is latched again in future, the alarm remains latched despite the *Unlatch* tag value being 1.

Scaling

When you scale a channel, you select two points that represent signal units, that is, a Low Signal and a High Signal. You also select two points that represent engineering units, that is, Low Engineering and High Engineering.

The Low Signal point equates to the Low Engineering point and the High Signal point matches the High Engineering point.

IMPORTANT: In choosing two points for the low and high value of your application, you do not limit the range of the module. The module range remains constant regardless of how you scale it.

Scaling lets you configure the module to return data to the controller in engineering units.

For example, if you use the 5034-IF4 module in Current mode with an input range of 4...20 mA, to receive values in Percent of Full Scale, configure the module as follows:

- Low Signal = 4 mA
- High Signal = 20 mA
- Low Engineering = 0%
- High Engineering = 100%

The returned value is indicated in the *I.Chxx.Data* tag.

The following table shows values that can appear when using Percent of Full Scale.

Table 7. Current Values Represented in Engineering Units

Current (mA)	Engineering Units Value (%) in <i>I.Chxx.Data</i> tag
0.0	-25.00
3.0	-6.00
4.0	0.0
12.0	50.0
20.0	100.0
23.0	118.75

For 5034-IRT4I module, there is a built-in scaling for following temperature units:

- Celsius
- Kelvin
- Fahrenheit
- Rankine

CIP Sync Time

I/O modules use CIP Sync for timestamps. CIP Sync is a CIP implementation of the IEEE 1588 PTP (Precision Time Protocol). CIP Sync provides accurate real-time (Real-World Time) or Universal Coordinated Time (UTC) synchronization of controllers and devices that are connected over CIP networks. This technology supports highly distributed applications that require timestamping, sequence of events recording, distributed motion control, and increased control coordination.

These modules are CIP Sync slave-only devices. There must be another module on the network that functions as a master clock.

I/O modules can be used to capture timestamps. The advantage is that CIP Sync is system-wide, so timestamp values are consistent across all modules in the system.

IMPORTANT: *I.CIPSyncValid* = 1 is not sufficient for an application to confirm that the module is ready for application requiring a system time synchronization to start operation. See [Grandmaster Clock Verification on page 23](#) for extra verification needed.

Grandmaster Clock Verification

The application must verify that the module is synchronized with the same Grandmaster Clock as the owner-controller.

If Status connection is selected in the PointMax EtherNet/IP adapter Device Definition dialog, verify that all following conditions are true:

- I/O module's *I.CIPSyncValid* is 1
- Adapter's *S.CIPSyncValid* is 1
- Adapter's *S.GrandmasterClockID* is the same as the controller's *GrandMasterClockID*

If Status connection is not selected in the PointMax EtherNet/IP adapter Device Definition dialog, verify that all following conditions are true:

- I/O module's *I.CIPSyncValid* is 1
- I/O module's *GrandmasterClockID* in *GrandMasterClockInfo* attribute of *TimeSync* object is the same as the controller's *GrandmasterClockID*
 - Class: 0x43
 - Instance: 0x01
 - Attribute: 0x08
 - Response: *GrandMasterClockInfo* (See the structure below)

GrandMasterClockInfo	STRUCT of
ClockIdentity	USINT[8]
ClockClass	UINT
TimeAccuracy	UINT
OffsetScaledLogVariance	UINT
CurrentUtcOffset	UINT

GrandMasterClockInfo	STRUCT of
TimePropertyFlags	WORD
TimeSource	UINT
Priority1	UINT
Priority2	UINT

To get controller's GrandMasterClockID, access the TIMESYNCHRONE object through the GSV instruction. See [Access the TimeSynchronize object](#).

Analog Input Modules

Analog input modules convert analog input signals to digital values. For example, the analog input modules can convert the following:

- Volts
- Millivolts
- Milliamps
- Ohms

RTD/Thermocouple modules convert Ohms or mV input analog signals into digital values.

Rolling Timestamp of Data

Rolling timestamp represents the time when the current *I.Chxx.Data* is sampled. It is a continuously running 15-bit rolling timestamp that counts in milliseconds from 0...32,767 ms. The rolling timestamp value is reported in the *I.Chxx.RollingTimestamp* tag for the analog I/O modules.

The controller program uses the last two rolling timestamp values to calculate the amount of time between the samples.

A system time change can cause a slight change in input sample timing. The rolling timestamp accurately reflects the change. There can be jitter in the timing between samples before and after the system time change.

Module Data Quality Reporting

The I/O modules indicate the quality of channel data that is returned to the owner-controller. Levels of data quality are reported via module input tags.

IMPORTANT: Once the condition that causes the Fault or Uncertain tag to change to 1 is removed, the tag automatically resets to 0. You cannot change the status of the tags. These tags are not always reset immediately after the condition is removed and typically resets after a small delay.

The following input tags indicate the level of data quality:

- *I.Chxx.Fault* - When the fault bit is set, this tag indicates that the reported channel data is inaccurate and cannot be trusted for use in your application. Do not use the reported channel data for control.

If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.

Example causes of inaccurate data include the following:

- Channel is disabled
- Connection fault is detected
- Open Wire condition
- Underrange/Overrange condition
- Field Power Loss condition

- Corresponding CJ Channel (including remote CJC) is in fault.

IMPORTANT: Only applicable to TC modes except mV.

Not applicable if fault is due to CJ Channel disable.



You must troubleshoot the module for the typical causes first.

- *I.Chxx.Uncertain* - This tag indicates that the reported channel data can be inaccurate but the degree of inaccuracy is unknown. Do not use the reported channel data for control.

If the tag is set to 1, you know that the data can be inaccurate. You must troubleshoot the module to discover what degree of inaccuracy exists.

Example causes of uncertain data include the following:

- Data signal outside the channel operating range
- Sensor Offset data is not a number
- Calibration fault on the channel
- Calibration is in process on the current channel or another channel in the module. See [Calibration Causes Uncertain Data Quality Indication on page 26](#) for more information.
- Corresponding CJ Channel (including remote CJC) is in uncertain state

IMPORTANT: Only applicable to TC modes except mV.

Not applicable if fault is due to CJ Channel disable.



You must monitor the tags in your program to make sure that the application is operating as expected with accurate channel input data.

Calibration Causes Uncertain Data Quality Indication

When a channel on the analog input module is being calibrated, the Notch Filter setting for that channel changes to 10 Hz. This results in the *I.Chxx.Uncertain* tag being set to 1 for that channel until calibration is completed.

The Notch Filter settings for the other input channels in the module are unchanged. However, since multiple input channels share an Analog to Digital converter in 5034-IF4/IF8C/IF8V module, all input channels in the same group slows during the calibration process. As a result, *I.Chxx.Uncertain* tag is set to 1 for the other input channels in that group as well.

See Connection section under chapter 5034-IF4/IF8C/IF8V Details for the grouping information of the input channels.

Notch Filter

The Notch Filter is a built-in feature of the Analog-to-Digital converter (ADC) that removes line noise in your application. The removal of line noise is also known as noise immunity.

The Notch Filter attenuates the input signal at the specified frequency.

Choose a Notch Filter based on what noise frequencies are present in the module operating environment and any sampling requirements that are needed for control. For example if the Notch Filter setting is 60 Hz, 60 Hz AC line noise and its overtones are filtered out.

Table 8. Notch Filter Settings

5034-IF4, 5034-IF8C, 5034-IF8V	5034-IRT4I
<ul style="list-style-type: none">• 10 Hz• 20 Hz• 50 Hz• 60 Hz• 100 Hz• 200 Hz• 400 Hz• 500 Hz• 1,000 Hz• 5,000 Hz• 10,000 Hz• 15,625 Hz• 31,250 Hz	<ul style="list-style-type: none">• 10 Hz• 20 Hz• 50 Hz• 60 Hz• 100 Hz• 200 Hz• 500 Hz• 1,000 Hz• 2,500 Hz• 5,000 Hz

If you want to filter lower frequency noise, you get a slower input sample rate.

Relationship between Notch Filter Settings and RPI Setting

Since the notch filter selection determines the input sample rate, you must select the RPI value based on Notch Filter settings.

Additionally, 5034-IF4/IF8C/IF8V module provides two sets of recommended RPI values for each Notch Filter setting:

- **Better Noise Rejection**

If you want greater noise suppression at the selected Notch Filter frequency and improved resolution, you use a slower input sample rate.

For example, if you choose the 60 Hz notch filter setting and need better noise suppression and resolution, the recommended module minimum RPI is 53.2 ms, if the application is configured with only one channel enabled.

- **Faster Sampling Speed**

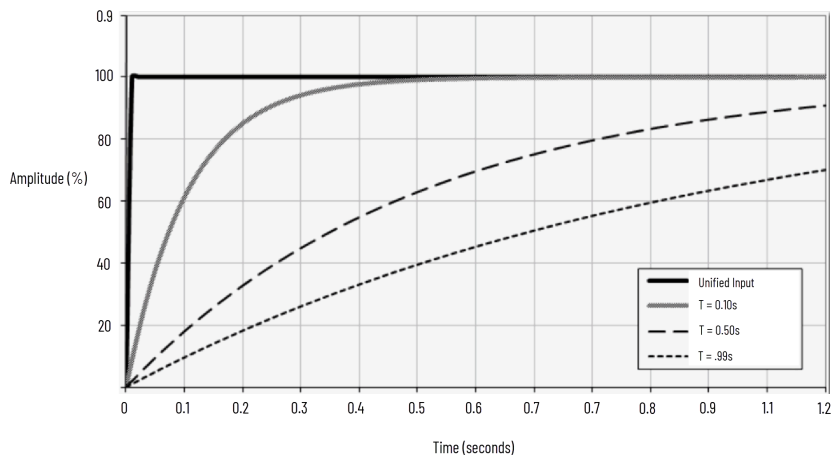
If you want a faster input sample rate at the selected Notch Filter frequency, the noise suppression and resolution is lesser.

Using the previous example, if you choose the 60 Hz notch filter setting and need faster input sampling, the recommended module minimum RPI is 18.3 ms, if the application is configured with only one channel enabled.

See the Recommended Minimum RPI Values for Notch Filters section for each module on how to determine the best RPI values based on Notch Filter settings.

Digital Filter

The Digital Filter is a first-order lag filter. It smooths input data noise transients on each input channel. This value specifies the time constant for a digital, first-order lag filter on the input. The input is 63% of the step change after the first time constant elapses.



The filter value is specified in units of milliseconds. A value of 0 (zero) disables the filter. Default value is 0. The digital filter is characterized by the following equation.

$$Y[n] = Y[n-1] + dt * (X[n] - Y[n-1]) / (dt + T)$$

Where:

T
 Configured time constant (Digital Filter in 'ms')

dt
 Length of time between samples

X[n]
 Unfiltered sample value at time n

Y[n]
 Filtered sample value at time n

IMPORTANT:

Remember the following:

- Digital Filter input data changes only when new input data is collected.
- If an Overrange or Underrange condition is detected before the Digital Filter input data is collected, the condition is indicated immediately. An immediate indication also applies to the fault data for the input.

Process Alarms

Process alarms alert you when the module has exceeded configured high or low limits for each channel. You can configure the following alarm trigger points in Engineering Units:

- High High
- High
- Low
- Low Low

To use the Process Alarms, you must complete the following tasks:

- Enable the alarms
- Configure the trigger points

Enable Process Alarms

When the module tags are created, the Process Alarm tags are disabled by default.

To enable, uncheck Disable All Alarms, and then enable individual process alarms in output tags (example, *O.Chxx.LAlarmEn* = 1).

Configure Alarm Trigger Points

You must configure the Process Alarm with a trigger point. That is, set values in Engineering Units that, once the signal reaches the value, the alarm is triggered.

Process Alarm trigger points are related to the Scaling parameters that you configure for the channel. The Engineering Units that are established in Scaling determine the Process Alarm trigger points. That is, the available trigger point values are in engineering units.

For example, consider a channel that uses the Current (mA) input type, the 4...20 mA input range, and scales the High and Low Engineering values of 100% and 0%, respectively. The available Process Alarm values range from 0...100.

In this case, if the High Limit alarm is set to 50%, when the input signal reaches 12 mA, the High Limit alarm is set. The alarm is set because Scaling was configured for Percentage of Full Scale and a signal value of 12 mA is 50% of the full scale of engineering units.

IMPORTANT: Process Alarm values are in engineering units and must be recalculated when the scaling parameters are changed. Recalculate Units in the Module Properties dialog helps to recalculate the Process Alarm values and all other configurations with engineering units. Failure to update the Process Alarm values can cause the alarm alert not to take effect that could be misinterpreted as a hardware problem.

For example, an analog input module channel that uses Current (mA) input type with Process Alarms enabled has the following configuration parameters:

- Scaling values:
 - High Engineering = 100.0000%
 - Low Engineering = 0.0000%
- Process Alarming:
 - High High Limit = 100.0000%
 - High Limit = 100.0000%
 - Low Limit = 0.0000%
 - Low Low Limit = 0.0000%

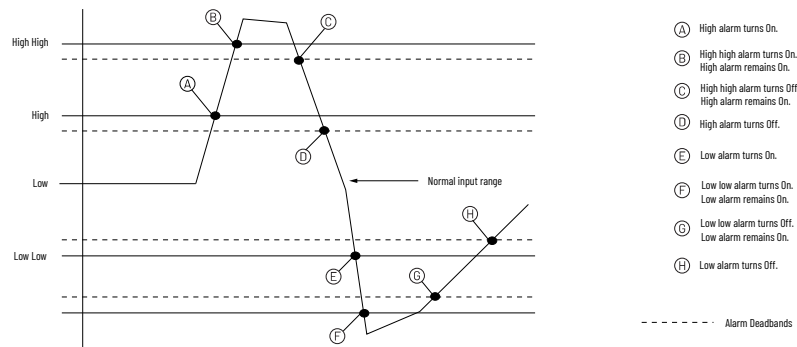
If you change the scaling High/Low Engineering values to 5 Kg/0 Kg, Recalculate Units suggest changing the Process Alarm values to 5/0 to make sure that the application continues to operate as expected.

Alarm Deadband

You can configure an alarm deadband to work with these alarms. The deadband lets the process alarm status bit remain set, despite the alarm condition disappearing, as long as the input data remains within the deadband of the process alarm.

The following graphic shows input data that sets each of the four alarms at some point during module operation. In this example, latching is disabled; therefore, each alarm turns Off when the condition that caused it to set ceases to exist.

Figure 2. Alarm Deadband Alarm Settings



Rate Alarm

The Rate Alarm defines the maximum rate of change between input samples in Engineering Units per second. If the Rate Alarm Limit is exceeded, the *I.Chxx.RateAlarm* tag is set to 1.

To enable Rate Alarm, go to Chxx - Alarms view in Module Properties, clear the Disable All Alarms checkbox, then set *O.Chxx.RateAlarmEn* tag to 1.

To enable Rate Alarm Latching, go to Chxx - Alarms view in Module Properties, select Enable Rate Alarm Latching checkbox, then Set the Rate Alarm Limit. Once the Rate Alarm is latched, you must change the *O.Chxx.RateAlarmUnlatch* tag to 1.

Sensor Types

The 5034-IF4, 5034-IF8C, and 5034-IF8V modules support 2-wire, 3-wire, and 4-wire sensors.

The 5034-IRT4I module supports RTD and TC sensor types. For RTD, the module supports 2-wire and 3-wire sensors. The available selections of sensor types are dictated by the input type configuration.

Table 9. Sensor Types - 5034-IRT4I

Input Type	Available Sensor Types
RTD	100 Ω PT 385
	200 Ω PT 385
	500 Ω PT 385
	1000 Ω PT 385
	100 Ω PT 3916
	200 Ω PT 3916
	500 Ω PT 3916
	1000 Ω PT 3916
	10 Ω CU 427
	120 Ω NI 672
	100 Ω NI 618
	120 Ω NI 618
	200 Ω NI 618

Table 9. Sensor Types – 5034-IRT4I (continued)

Input Type	Available Sensor Types
	500 Ω NI 618
Thermocouple	mV, B, C, D, E, J, K, N, R, S, T, TXK/XK (L)

Sensor Type Temperature Limits

The 5034-IRT4I module can work for different temperature ranges depending on module configuration for the following parameters:

- Input Type
- Sensor Type

To know more details about the temperature range for each RTD and Thermocouple sensor types, see PointMax I/O System Specifications Technical Data, publication [5034-TD001](#).

Sensor Offset

The Sensor Offset compensates for any known error on the sensor or channel to which the sensor is connected. The value is set in engineering units and is added to the data value.

For example, consider an application that uses the Current (mA) input type with the 4...20 mA range and scaling at 0...100%. If a sensor has an error and the channel consistently reports current signal values by 0.2 mA lower than the actual value, you must set Sensor Offset to 1.25%.

You must use the *0.Chxx.SensorOffset* tag to set the Sensor Offset. In the example above, the *0.Chxx.SensorOffset* tag = 1.25.

Open Wire Detection

Open Wire detection detects when a wire is disconnected from the channel. For 5034-IF4/IF8C/IF8V module, to enable Open Wire detection, go to Channels → Chxx view in Module Properties and select Enable Open Wire Detection checkbox. For 5034-IRT4I module, Open Wire detection is always enabled.

For 5034-IRT4I module, the value that is reported during an Open Wire detection depends on the Diagnostics selection (minimum/maximum engineering) on the channel. See [Chxx View on page 189](#) to set the diagnostic condition.

Table 10. Open Wire Conditions – 5034-IF4, 5034-IF8C, and 5034-IF8V Modules

Mode	Cause of Detection	Resulting Module Behavior
Current (mA)	The input signal for a channel is below 92 μ A.	<ul style="list-style-type: none"> • The <i>I:Chxx.OpenWire</i> tag changes to 1. • A fault occurs and the <i>I:Chxx.Fault</i> tag is set to 1. • The <i>I:Chxx.Underrange</i> tag set to 1.
Voltage (V)	The input signal value is above 11V.	<ul style="list-style-type: none"> • The <i>I:Chxx.OpenWire</i> tag changes to 1. • A fault occurs and the <i>I:Chxx.Fault</i> tag is set to 1. • The <i>I:Chxx.Ovrrange</i> tag set to 1.

Table 11. Open Wire Conditions - 5034-IRT4I Module

Mode	Cause of Detection	Resulting Module Behavior
RTD	A wire is disconnected from the channel.	<ul style="list-style-type: none"> Input data for the channel changes to Maximum/Minimum Engineering value depending on the configuration of parameter Input Value During Open Wire. The <i>I:Chxx.OpenWire</i> tag changes to 1. The <i>I:Chxx.Ovrerrange</i> or <i>I:Chxx.Underrange</i> tag may be set to 1 based on the configuration of parameter Input Value During Open Wire. A fault occurs and the <i>I:Chxx.Fault</i> tag is set to 1.
Thermocouple		

IMPORTANT: The Disable All Alarms feature does not disable the Open Wire detection feature but it disables all alarms on the module.

The Open Wire detection feature is not an alarm. It is an indicator that a wire has been disconnected from the channel but does not trigger an alarm.

For 5034-IF4, 5034-IF8C, and 5034-IF8V modules, to disable the Open Wire detection feature, you must clear the Enable Open Wire Detection checkbox in the Chxx view.

For 5034-IRT4I module, open wire detection is always enabled. You can disable the channel if it is not in use.

Field Power (SA Power) Loss Detection

The Field Power Loss Detection feature monitors for the loss of field-side power on the SA power bus. It has a corresponding channel level tag that can be examined in the user program if a fault occurs. When field power to the module is lost, the channel level field power loss bit and fault bit are set for all channels and sent to the controller.

IMPORTANT: When SA power drops below 10V, it is possible that you may encounter a rise in the analog input data. You can use the Rate Alarm to monitor the data change rate and discard the input data when Rate Alarm is set.

Underrange/Ovrerrange Detection

Underrange/Ovrerrange Detection detects when signal is operating beyond limits set by the input range.

The module can read input signal levels outside the low and high signal values for each input range. The signal limits to which the module can read are thresholds. Only when the signal is beyond a threshold is an underrange or ovrerrange condition that is detected and indicated.

The module has deadband values for each range. The deadband lets a condition remain set despite it disappearing. For example, if a module uses a Current input type in the 4...20 mA range and the signal value goes below 3 mA, the underrange condition is triggered. Because of the 0.07 mA deadband, the condition is not cleared until the signal value reaches 3.07 mA. See for more information.

The following table lists the input ranges of the input modules and the thresholds in each range before the module detects an underrange/overrange condition.

Table 12. Input Signal Threshold Ranges - 5034-IF4, 5034-IF4XT, 5034-IF8C, 5034-IF8CXT, 5034-IF8V, 5034-IF8VXT

Input Type	Range	Underrange Threshold	Overrange Threshold
Current (mA)	0...20 mA	Not Applicable	> 23.00 mA
	4...20 mA	< 3 mA	
Voltage (V)	-10...+10V	< -10.7V	>10.7V
	0...5V	Not Applicable	>5.35V
	0...10V	Not Applicable	>10.7V

Table 13. Input Signal Threshold Ranges - 5034-IRT4I and 5034-IRT4IXT

Input Type	Sensor Type	Underrange Threshold	Overrange Threshold
RTD	Pt385	< -200 °C	> 870 °C
		< -328 °F	> 1598 °F
		< 73 °K	> 1143 °K
		< 132 °R	> 2058 °R
	Pt3916	< -200 °C < -328 °F < 73 °K < 132 °R	> 630 °C > 1166 °F > 903 °K > 1626 °R
	Cu427	< -200 °C	> 260 °C
		< -328 °F	> 500 °F
		< 73 °K	> 533 °K
		< 132 °R	> 960 °R
	Ni672	< -80 °C < -112 °F < 193 °K < 348 °R	> 320 °C > 608 °F > 593 °K > 1068 °R
	Ni618	< -60 °C	> 250 °C
		< -76 °F	> 482 °F
		< 213 °K	> 523 °K
		< 384 °R	> 942 °R
	Ni618	< -60 °C < -76 °F < 213 °K < 384 °R	> 250 °C > 482 °F > 523 °K > 942 °R
Thermocouple	B	< 21 °C < 68 °F < 293 °K	> 1820 °C > 3308 °F > 2093 °K

Table 13. Input Signal Threshold Ranges - 5034-IRT4I and 5034-IRT4IXT (continued)

Input Type	Sensor Type	Underrange Threshold	Overrange Threshold
		< 528 °R	> 3768 °R
	C	< 0.00 °C < 32 °F < 273 °K < 492 °R	> 2315 °C > 4199 °F > 2588 °K > 4659 °R
	E	< -270 °C < -454 °F < 3 °K < 6 °R	> 1000 °C > 1832 °F > 1273 °K > 2292 °R
	J	< -210 °C < -346 °F < 63 °K < 114 °R	> 1200 °C > 2192 °F > 1473 °K > 2652 °R
	K	< -270 °C < -454 °F < 3 °K < 6 °R	> 1372 °C > 2502 °F > 1645 °K > 2961 °R
	N	< -270 °C < -454 °F < 3 °K < 6 °R	> 1300 °C > 2372 °F > 1573 °K > 2832 °R
	R	< -50 °C < -58 °F < 223 °K < 402 °R	> 1768 °C > 3215 °F > 2041 °K > 3674 °R
	S	< -50 °C < -58 °F < 223 °K < 402 °R	> 1768 °C > 3215 °F > 2041 °K > 3674 °R
	T	< -270 °C < -454 °F < 3 °K < 6 °R	> 400 °C > 752 °F > 673 °K > 1212 °R

Table 13. Input Signal Threshold Ranges - 5034-IRT4I and 5034-IRT4IXT (continued)

Input Type	Sensor Type	Underrange Threshold	Overrange Threshold
	TXK/XK(L)	< -200 °C < -328 °F < 73 °K < 132 °R	> 800 °C > 1472 °F > 1073 °K > 1932 °R
	D	< 0.00 °C < 32 °F < 273 °K < 492 °R	> 2315 °C > 4199 °F > 2588 °K > 4659 °R

IMPORTANT: The Disable All Alarms feature does not disable the Underrange/Overrange Detection feature but it disables alarms on the module.

Underrange/Overrange detection is not an alarm. It is an indicator that channel data has gone beyond the maximum or minimum threshold, respectively, for the channel range.

To disable the Underrange/Overrange Detection feature, you must disable the channel.

Underrange/Overrange conditions are indicated when the following tags change to 1:

- *I.Chxx.Underrange*
- *I.Chxx.Overrange*

10 Ohms Copper Offset (5034-IRT4I and 5034-IRT4IXT Only)

With 10 Ohms Copper Offset feature, you can compensate for a small offset error in a 10 Ohms copper RTD. The channel must be connected to the 10 Ohms CU 427 Sensor Type to use this feature. The offset value is indicated in units of 0.01 Ohm.

For example, if a 10 Ohms copper RTD used with a channel reports the resistance 9.74 Ω at 25 °C (77 °F), the 10 Ohms Copper Offset lets you account for the error. You must set the 10 Ohms Copper Offset field on the Configuration tab to 0.26 or by setting the *C.Chxx.TenOhmOffset* to 26.

To see where to set the 10 Ohms Copper Offset, see [Chxx View on page 189](#).

Cold Junction Compensation (5034-IRT4I and 5034-IRT4IXT Only)

The junction at which temperature is measured is the hot junction. The junction where the thermocouple wire interfaces with copper are the cold junction. The transition from thermocouple wire to copper typically happens at the RTB terminal.

The thermoelectric effect alters the input signal and must be compensated to measure temperatures accurately. To compensate the input signal from your module accurately, you must use cold junction compensation (CJC) to account for the increased voltage.

When using the 5034-IRT4I or 5034-IRT4IXT module with a thermocouple input type, the channel must account for the thermoelectric effect of a junction of the thermocouple field wires and the RTB. The cold junction temperature should be within the valid sensor range. You must also make sure that the configured thermocouple sensor operating range includes the RTB ambient temperature.

The 5034-IRT4I/5034-IRT4IXT module supports following modes for CJC.

- Onboard CJC
- RTB CJC
- Remote Cold Junction Channel (Remote CJC)

Onboard CJC

The CJC thermistor inside the I/O module is used for Cold Junction Compensation. If your application does not require high accuracy, you can choose to opt for onboard CJC mode. You must use RTB without CJC (5034-RTB18/5034-RTB18S) in your setup if you want to use the onboard CJC.

RTB CJC

The CJC thermistor inside the RTB is used for Cold Junction Compensation. You must use one of the following RTB with CJC:

- 5034-RTBT - Screw-type
- 5034-RTBTS - Push-in spring type

IMPORTANT: RTBs with CJC are not shipped with your modules. You must purchase RTBs separately and install it on your module.

Remote CJC

Another TC/RTD channel of the I/O module is used for Cold Junction Compensation. That means:

- Thermocouple sensor is connected to a remote termination block.
- TC+/TC- from local removable termination block is connected to the remote termination block through copper wire.
- Remote CJ Channel's sensor (TC/RTD) is measuring the temperature in the remote termination block.

When remote CJC is used, the module verifies that the associated remote channel has a type TC (except mV) or RTD (except Ohms) and it is not configured to use remote CJC.

For more information, see the [Configuration Tag Definitions on page 202](#) and check the tag name CJChxx.Remote.

Select CJC Mode

In the Module Properties, go to CJ Channels view to select the CJC mode.

To use Remote CJC, configure Remote Cold Junction Channel in CJ Channels view.

To use RTB CJC:

- Set the Remote Cold Junction Channel to None (default).
- Select the Use RTB CJC checkbox.
- Use the 5034-RTBT/5034-RTBTS in the setup.

To use onboard CJC:

- Set the Remote Cold Junction Channel to None (default).
- Clear the Use RTB CJC checkbox.
- Use the 5034-RTB18/5034-RTB18S in the setup.

To disable CJC, select Disable Compensation checkbox.

IMPORTANT: When Remote Cold Junction Channel is None and Use RTB CJC checkbox is cleared, the 5034-IRT4I/5034-IRT4IXT module detects which RTB is connected. If an RTB with CJC (5034-RTBT/5034-RTBTS) is inserted, RTB CJC is used. If an RTB without CJC (5034-RTB18/5034-RTB18S) is inserted, onboard CJC is used.

Fault and Status Reporting

The analog input module sends fault and status data with channel data to the owner-controller and listening controllers. The data is returned via module tags that you can monitor in your Studio 5000 Logix Designer application.

With some exceptions, the analog input module provides the fault and data status in a channel-centric format. The tag names in the following table that include Chxx represent channel-centric data. The xx represents channel number.

Table 14. Fault and Status Data Tags

Data Type	Tag Name	Description
Fault	ConnectionFaulted	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.
	Chxx.Fault	Indicates that channel data is inaccurate and cannot be trusted for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.
	CJChxx.Fault	Indicates that the cold junction data is inaccurate and cannot be trusted for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.
Status	RunMode	Channel's operating state.
	DiagnosticActive	Indicates if any diagnostics are active or if the prognostics threshold is reached.
	DiagnosticSequenceCount	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.
	Chxx.Uncertain	Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.
	CJChxx.Uncertain	The cold junction data can be inaccurate but it is not known to what degree of inaccuracy. IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.

Calibration

The analog I/O modules are calibrated during the manufacturing process. Each module's accuracy remains high throughout its lifespan. You are not required to calibrate the module.

During the manufacturing process, analog I/O modules are calibrated at room temperature. If the module is intended to operate in an environment that is different from the room

temperature, you may perform field calibration at the specific operating environment to improve the accuracy. For example, if intended operating temperature is more than 40 °C (104 °F).

There are two ways to perform calibration:

- Go to Module Properties dialog → Calibration view
- Use the input and output tags to perform calibration.

To use this method, you must select Connection type as Data with Calibration in Device Definition dialog.

Analog Output Modules

Analog output modules convert digital values to analog signals. For example, the modules can convert the following:

- Volts
- Milliamps

Output Module Operation

The controller sends data to an output module at one of the following:

- At the RPI
- After an Immediate Output (IOT) instruction is executed

IMPORTANT: An IOT instruction sends data to the module immediately, and resets the RPI timer.

Data Echo

Data Echo automatically sends channel data values that match the analog value that was sent to the module's screw terminals then. The echoed value is indicated in the *I.Chxx.Data* and is represented in Engineering Units. This data is sent at the RPI.

Rolling Timestamp of Data

For the analog output modules, the rolling timestamp value is updated only when new values are applied to the Digital to Analog Converter (DAC). The echoed data is updated at the same time.

The rolling timestamp is a continuously running 15-bit rolling timestamp that counts in milliseconds from 0...32,767 ms. The rolling timestamp value is reported in the *I.Chxx.RollingTimestamp* tag for the analog I/O modules.

Module Data Quality Reporting

The I/O modules indicate the quality of channel data that is returned to the owner-controller. Levels of data quality are reported via module input tags.

IMPORTANT: Once the condition that causes the *Fault* or *Uncertain* tag to change to 1 is removed, the tag automatically resets to 0. You cannot change the status of the tags. These tags are not always reset immediately after the condition is removed and typically resets after a small delay.

The following input tags indicate the level of data quality:

- *I.Chxx.Fault* - When the fault bit is set, this tag indicates that the reported channel data is inaccurate and cannot be trusted for use in your application. Do not use the reported channel data for control.
If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.

Example causes of inaccurate data include the following:

- Channel is disabled
- Connection fault is detected
- Short Circuit condition

- No Load condition
- Field Power Loss condition



You must troubleshoot the module for the typical causes first.

- *I.Chxx.Uncertain* - This tag indicates that the reported channel data can be inaccurate but the degree of inaccuracy is unknown. You do not use the reported channel data for control.
If the tag is set to 1, you know that the data can be inaccurate. You must troubleshoot the module to discover what degree of inaccuracy exists.
Example causes of uncertain data include the following:
 - Requested output signal is outside of maximum operating range
 - Received output data is "Not a Number"
 - Calibration data missing on the channel
 - Calibration is ongoing on the channel



You must monitor the tags in your program to make sure that the application is operating as expected.

Program and Inhibit Mode Handling

You can configure individual output channels to specific states when the module is in Program Mode or the module is Inhibited.

Output State in Program or Inhibited Mode

When the controller switches from Run Mode to Program Mode or Inhibited, the output can behave in the following ways, depending on how you configure the Output State in Program Mode parameter:

- Hold Last State - It causes the output to remain at the last value that is sent from the controller before being placed in Program Mode or Inhibit Mode.
- User Defined Value - It forces the output to transition to a specific, user-defined value.

When the module is inhibited, the output behavior follows the Output State in Program Mode configuration.

Connection Fault Handling

You can configure individual output channels to specific states when a connection fault occurs, that is, the connection between the owner-controller and the output module breaks unexpectedly.

You must define the following:

- Output Behavior Immediately After a Connection Fault
- Communication Fault State Duration After Connection Fault
- Final Communication Fault State Value

Output Behavior Immediately After a Connection Fault

When the connection between an owner-controller and output module breaks, the output can behave in the following ways depending on how the Output State in Communication Fault Mode parameter is configured:

- Hold Last State – It causes the output to remain at the last value that is sent from the controller before the connection fault occurs.
- User Defined Value – It forces the output to transition to a specific, user-defined value.

The output remains at that state value until the following occurs:

- The connection to the controller is re-established.
- The duration expired, which is based on the value that is defined in the Communication Fault Mode State Duration.

Communication Fault State Duration After Connection Fault

If you configure the output to transition to a specific value after the connection breaks, you must define how long the output remains at the specified value before it transitions to a Final Communication Fault State Value.

You can configure the output to remain at the specific value for the following times:

- Forever
- 1 second
- 2 seconds
- 5 seconds
- 10 seconds

After the Communication Fault State Duration time expires, the output transitions to user defined Final Communication Fault State Value.

Final Communication Fault State Value

The Final Communication Fault State Value defines the value to which the output goes after the Communication Fault State Duration time expires.

When Communication Fails in Program Mode

When communication fails in Program Mode, the output can behave in the following ways, depending on how you configure the When Communication Fails in Program Mode parameter:

- Leave Outputs in Program Mode State – It causes the output to behave as defined by the Output State in Program Mode selection.
- Change Outputs to Communication Fault Mode State – It causes the output to behave as defined by the Output State in Communication Fault Mode selection.

Output State Once Connection is Re-established

Once the connection between the owner-controller and output module is re-established, the output resumes normal operation if the controller is in Run mode or goes to the configured Program Mode state if the controller is in Program Mode.

Channel Offset

The Channel Offset feature compensates for any known error on the actuator or channel to which the actuator is connected. The value is set in the Engineering Units and is added to the output data.

For example, consider an application that uses the Current (mA) input type with the 4...20 mA range and scaling at 0...100%. If a channel used in the output range 4...20 mA has an error that results in it consistently outputting 7.8 mA when 0.Chxx.Data is 8 mA, you must account for the error by setting the Channel Offset to 1.25.

Hold for Initialization

Hold for Initialization causes outputs to hold present state until the value commanded by the controller matches the value at the output screw terminal within 0.1% of full scale, providing a bumpless transfer.

If Hold for Initialization is selected, outputs hold if there is an occurrence of any of these three conditions:

- Initial connection is established after power-up.
- A new connection is established after a communication fault occurs.
- There is a transition to Run mode from Program state.
- The module loses SA power. In this case, the data echo value goes to 0.0.

The *I.Chxx.InHold* tag for a channel indicates that the channel is holding.

Output Clamping

Output Clamping limits the output from the analog module to remain within a range configured by the controller, even when the controller commands an output outside that range.

IMPORTANT: Output clamping does not apply during Program Mode and Communication Fault Mode.

Once clamp values are set, if data received from the controller exceeds those clamps, the following events occur:

- The output value transitions to the clamp limit but not to the requested value.
- The appropriate limit alarm is triggered.

For example, an application can set the high clamp on a module for 8V and the low clamp for -8V. If a controller sends a value corresponding to 9V to the module, the module applies only 8V to its screw terminals.

Clamping alarms are enabled by default. You can disable the alarms or configure latching behavior of the alarms on a per channel basis.

IMPORTANT: Clamp Limit values are in engineering units and must be recalculated when the scaling parameters are changed. Recalculate Units in the Module Properties dialog helps to recalculate the Clamp Limit values and all other configurations with engineering units. Failure to update the Clamp Limit values can cause clamping not to take effect or generate a small output signal that could be misinterpreted as a hardware problem.

For example, an analog output module channel that uses Current (mA) output type with Clamping enabled has the following configuration parameters:

- Scaling values:
 - High Engineering = 100.0000%
 - Low Engineering = 0.0000%
- Clamp Limits:
 - High Clamp = 100.0000%
 - Low Clamp = 0.0000%

If you change the scaling High/Low Engineering values to 2 Bar/0 Bar, the Recalculate Units suggest changing the High/Low Clamp Limit values to 2/0 to make sure that the application continues to operate as expected.

Output Ramping Rate Limiting

Output Ramping Rate Limiting limits the speed at which an analog output signal can change. This prevents fast transitions in the output from damaging the devices that an output module controls.

Table 15. Output Ramping Types

Output Ramping	Scenario in which Output Ramping Rate Limiting applies
Ramp in Run Mode	When the output value changes to the new output value received from the owner-controller in Run Mode.
Ramp to Program Mode	When the present output value changes to the Program value after a Program command is received from the controller.
Ramp to Fault Mode and Final Fault State	When the present output value changes to the Fault value after a communication fault occurs.

In Module Properties dialog, go to Chxx - Limits view to configure the Output Ramping Rate Limiting parameters.

The maximum rate of change in outputs is expressed in engineering units per second and set in the Ramp Rate field.

Field Power (SA Power) Loss Detection

The Field Power Loss Detection feature monitors for the loss of field-side power on the SA power bus. It has a corresponding channel level tag that can be examined in the user program if a fault occurs. When field power to the module is lost, the channel level field power loss bit and fault bit are set for all channels and sent to the controller.

No Load Detection

IMPORTANT: This feature is available only in Current (mA) mode.

No Load Detection detects when a wire is disconnected from the channel or a missing load for each output channel. The output range that is used with the analog output module determines the current below which a load is considered missing.

The *I.Chxx.NoLoad* tag indicates the presence of a no load condition when it is set to 1.

The No Load Detection feature is disabled by default. You must enable the feature in your Studio 5000 Logix Designer application project. To enable No Load Detection, go to Channels, then Chxx view and select the Enable No Load Detection checkbox. Select Apply or OK to save the configuration.

Short Circuit Detection

IMPORTANT: This feature is available only in Voltage (V) mode.

Short Circuit Detection helps prevent damage that can result from a mis-wiring or driving a current from the channel greater than the maximum current level the channel can handle.

When a short circuit condition is detected, the following occurs:

- The output turns off.
- The *I.Chxx.ShortCircuit* tag is set to 1.

For more information on the maximum current that you can apply to an output, see the PointMax I/O System Specifications Technical Data, publication [5034-TD001](#).

Fault and Status Reporting

The analog output modules send fault and status data with channel data to the owner and listening controllers. The data is returned via module tags that you can monitor in your Studio 5000 Logix Designer application.

Table 16. Fault and Status Data Tags

Data Type	Tag Name	Description
Fault	ConnectionFaulted	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.
	Chxx.Fault	Indicates that channel data is inaccurate and cannot be trusted for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.
Status	RunMode	Channel's operating state.
	DiagnosticActive	Indicates if any diagnostics are active or if the prognostics threshold is reached.
	DiagnosticSequenceCount	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.
	Chxx.Uncertain	Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.

Calibration

The analog I/O modules are calibrated during the manufacturing process. Each module's accuracy remains high throughout its lifespan. You are not required to calibrate the module.

During the manufacturing process, analog I/O modules are calibrated at room temperature. If the module is intended to operate in an environment that is different from the room temperature, you may perform field calibration at the specific operating environment to improve the accuracy. For example, if intended operating temperature is more than 40 °C (104 °F).

There are two ways to perform calibration:

- Go to Module Properties dialog → Calibration view
- Use the input and output tags to perform calibration.

To use this method, you must select Connection type as Data with Calibration in Device Definition dialog.

IMPORTANT: During calibration, the screw output goes to low reference or high reference signal values. Make sure that the output module is not connected to the actuator.

Analog I/O Module Applications

This chapter describes how to configure your analog I/O modules in a Studio 5000 Logix Designer application project. You can use the default module configuration or edit the module configuration.

This chapter does not explain the user-configurable module features that you can edit on different screens in your Studio 5000 Logix Designer application project.

Add a New Module to a Studio 5000 Logix Designer Application Project

You must complete the following tasks before you configure the module:

1. Create a Studio 5000 Logix Designer application project.
2. Add a Logix 5000 controller to the project.
3. Add a PointMax EtherNet/IP adapter to the project.

For more information on how to add a PointMax EtherNet/IP adapter to the Studio 5000 Logix Designer application project, see the PointMax EtherNet/IP Adapter User Manual, publication [5034-UM001](#).

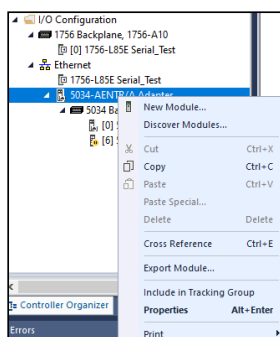
After completing above steps, add your I/O module to the project by following one of the methods:

- Discover Modules
- New Module

Discover Modules

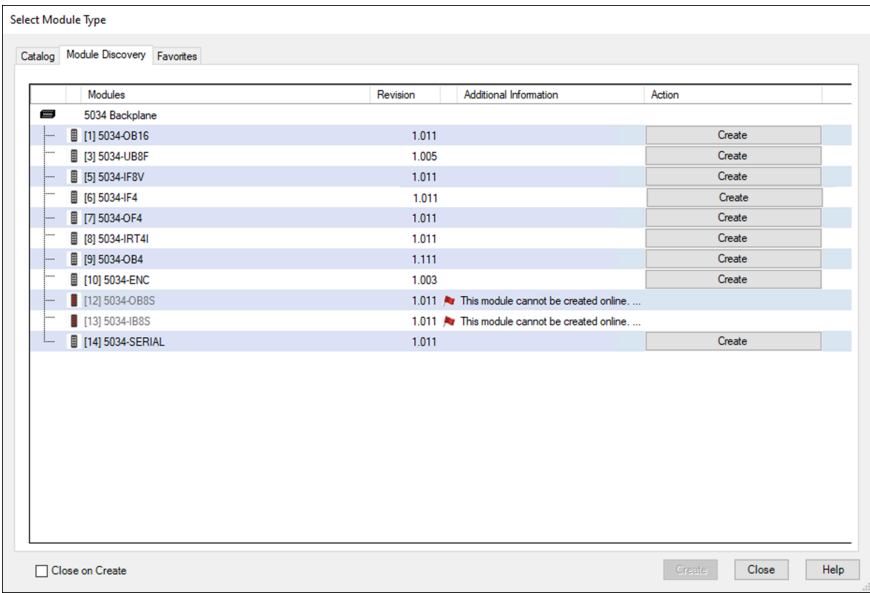
To use the Discover Modules method with PointMax I/O modules, complete these steps:

1. Go online with your Studio 5000 Logix Designer application.
The project must include a PointMax EtherNet/IP adapter.
2. Right-click the PointMax EtherNet/IP adapter and select Discover Modules.

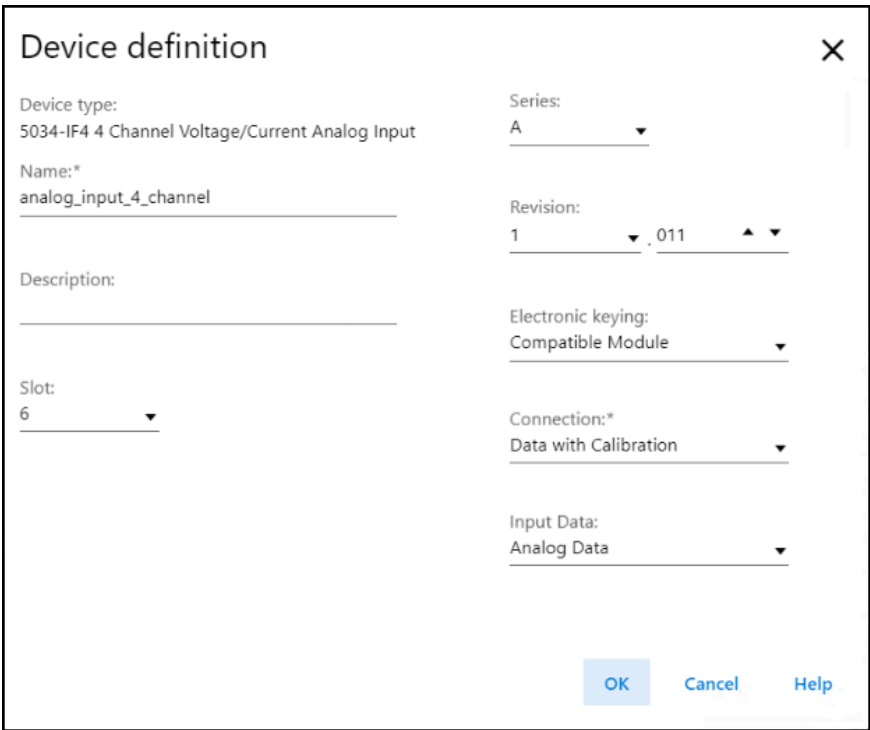


The Studio 5000 Logix Designer application automatically detects available modules that are connected to the backplane. The Select Module Type dialog appears with list of modules detected.

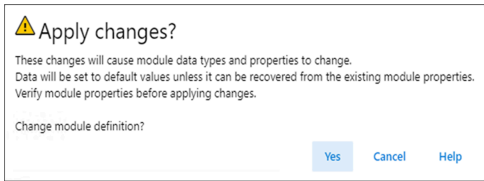
3. In the Select Module Type window, select Create in the Action column to add the module to the project.



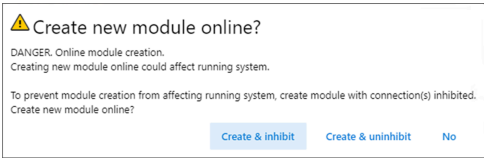
- The New Module window with Device definition dialog appears.
4. In the Device definition dialog, configure the module properties and select OK.



5. If Apply changes warning dialog appears, select Yes.



6. In the Create new module online warning dialog, select Create & inhibit.



7. After adding as many as module you need, close the Select Module Type dialog. To add additional I/O modules with this method, complete one of the following:
- If you selected the Close on Create checkbox when you created the first I/O module, repeat steps 2...6.
 - If you did not select the Close on Create checkbox when you created the first I/O module, repeat steps 3...6.

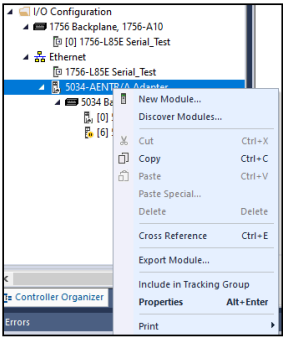
Add a New Module

To use the New Module method with PointMax I/O modules, complete these steps:

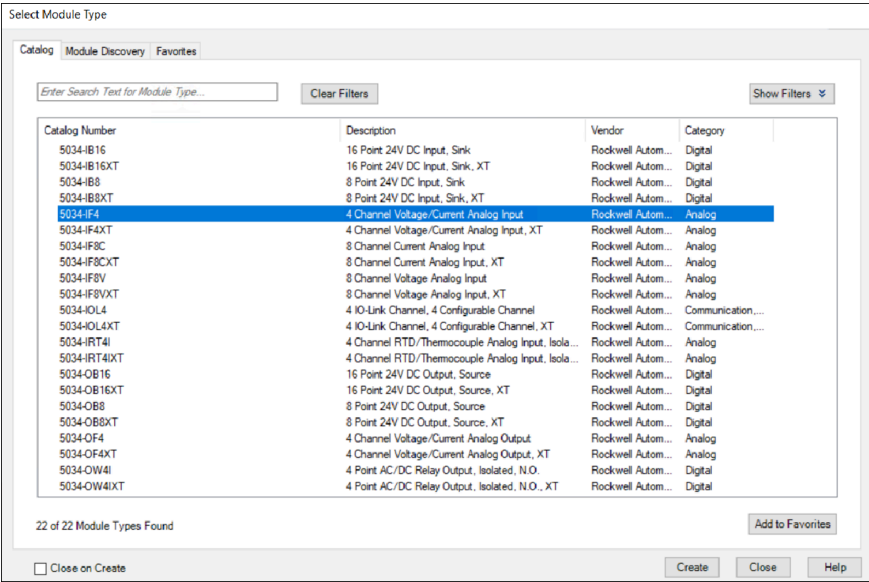


Example shows how to add a module when the Studio 5000 Logix Designer application project is offline. You can add new modules when the project is online, if desired. In this case, the steps are similar to the steps described in Discover Modules. One exception is that, in Step 1, you must choose New Module instead of Discover Modules.

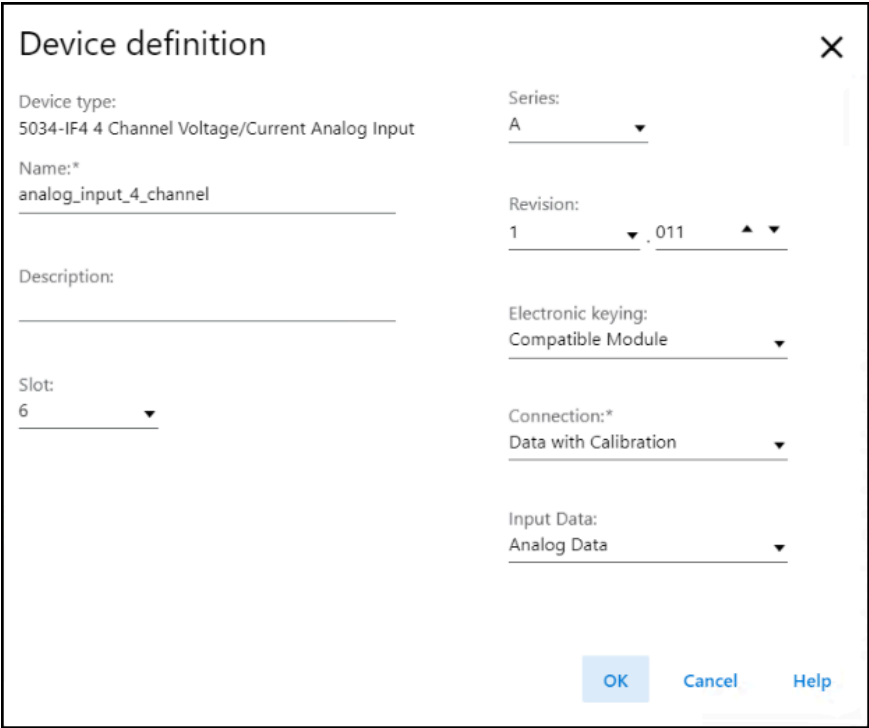
1. Right-click the PointMax EtherNet/IP adapter and select New Module.



2. In the Select Module Type dialog, choose the module you want to add and select Create.



- The New Module window appears with Device definition dialog.
3. You can select OK to use the default configuration as shown or edit the module configuration.



- To add additional remote I/O modules with this method, complete one of the following:
- If you selected the Close on Create checkbox when you created the first I/O module, repeat steps 1...3.
 - If you did not select the Close on Create checkbox when you created the first I/O module, repeat steps 2...3.

I/O Tag Name Conventions

The module tag names use defined naming conventions. The conventions are as follows:

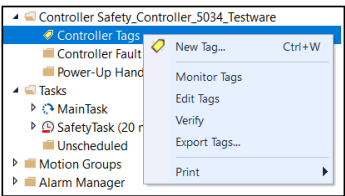
Example tag name = Adapter:1:I.Ch00.Data

- Adapter = Name of the PointMax EtherNet/IP adapter in the PointMax I/O system
- 1 = Slot number
- I = Tag type
The possible PointMax analog module tag types are C (configuration), I (input), and O (output).
- Ch00 = Module channel number
- Data = Tag function
In this case, Data represents the input data that is returned to the owner-controller.

Access I/O Tags

To access the I/O tags in the Studio 5000 Logix Designer application, proceed as follows:

1. Open your Studio 5000 Logix Designer application project.
2. Right-click Controller Tags and select Monitor Tags.



3. Open the tags as necessary to view specific tags.

A screenshot of the 'Controller Tags - Standard_Controller_5034_Testware(controller)' window. The window displays a table of tags with columns: Name, Value, Force Mask, Style, and Data Type. The 'Name' column is expanded, showing a tree structure of tags under 'Adapter6:C'. The 'Value' column shows the current value for each tag, and the 'Data Type' column shows the data type (e.g., SINT, BOOL, INT, REAL).

Name	Value	Force Mask	Style	Data Type
Adapter6:C	[...]	[...]	[...]	AB:5000_AI4:C:0
Adapter6:C.Ch00	[...]	[...]	[...]	AB:5000_AI_Channel:C:0
Adapter6:C.Ch00.Range	1		Decimal	SINT
Adapter6:C.Ch00.SensorType	0		Decimal	SINT
Adapter6:C.Ch00.NotchFilter	2		Decimal	SINT
Adapter6:C.Ch00.AlarmDisable	0		Decimal	BOOL
Adapter6:C.Ch00.ProcessAlarmLatch...	0		Decimal	BOOL
Adapter6:C.Ch00.RateAlarmLatchEn	1		Decimal	BOOL
Adapter6:C.Ch00.OpenWireEn	0		Decimal	BOOL
Adapter6:C.Ch00.Disable	0		Decimal	BOOL
Adapter6:C.Ch00.TenOhmOffset	0		Decimal	INT
Adapter6:C.Ch00.DigitalFilter	0		Decimal	INT
Adapter6:C.Ch00.LowSignal	0.0		Float	REAL
Adapter6:C.Ch00.HighSignal	5.0		Float	REAL
Adapter6:C.Ch00.LowEngineering	0.0		Float	REAL
Adapter6:C.Ch00.HighEngineering	5.0		Float	REAL
Adapter6:C.Ch00.LLAlarmLimit	0.0		Float	REAL

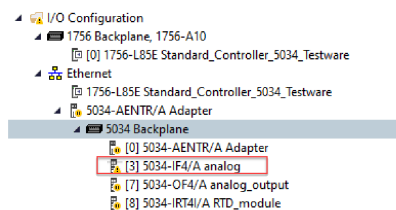
Troubleshoot Your Module

You can following the below methods to troubleshoot your module:

- Module Status Indicators
See the respective module-specific sections for more information on how to troubleshoot using module status indicators.
- Studio 5000 Logix Designer application.

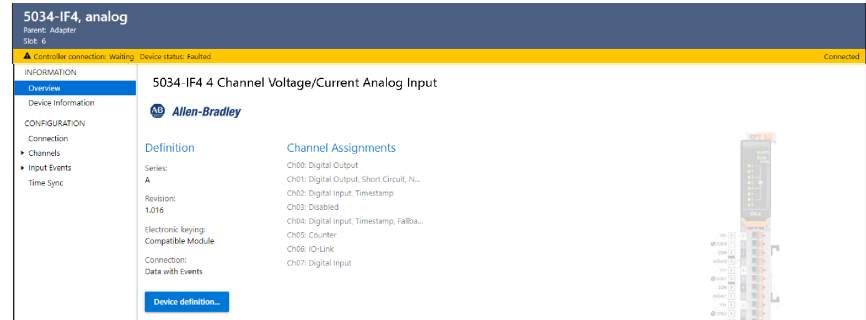
Troubleshooting using Studio 5000 Logix Designer Application
Check the Controller Organizer to see if there is a warning icon on the module.

Figure 3. Warning Icon in Controller Organizer



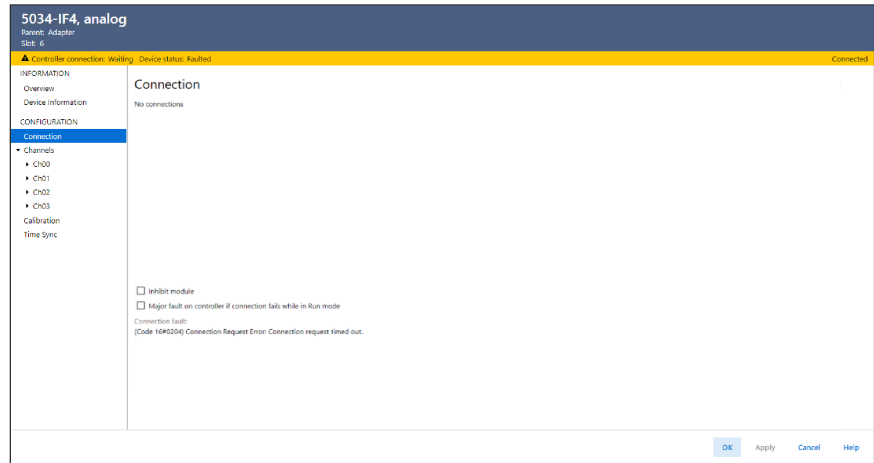
If a warning icon is present, open the Module Properties and check the status bar to identify the type of fault.

Figure 4. Fault Message in Status Bar



If connection is faulted, go to the Connection view and check the error code in the Connection Fault area.

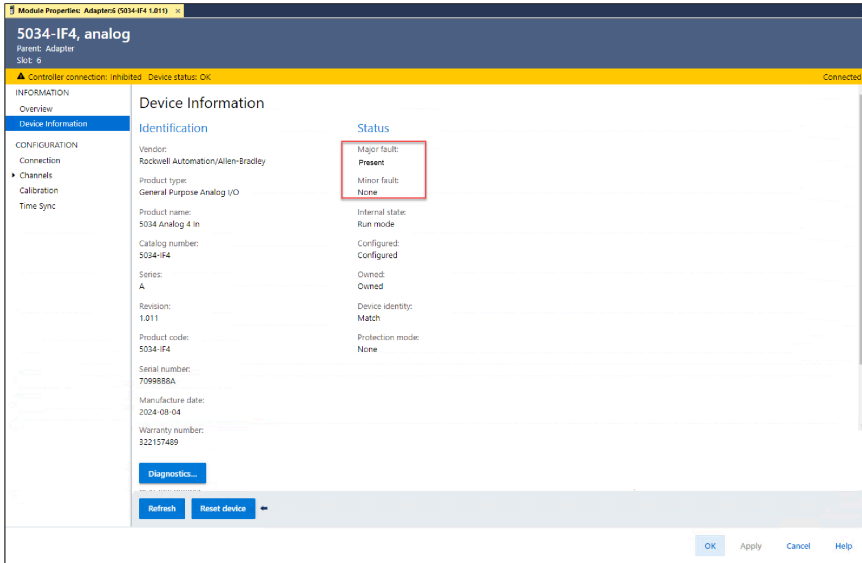
Figure 5. Connection Fault Description with Error Code



Error Code	Action
0x204	<ol style="list-style-type: none">1. Open the Module Properties of the adapter.2. Go to Chassis Information view and check the base status. If there is a fault, check the base details to identify the fault.
Keying Error	<p>Go to Device Information view to confirm that the physical module is compliant or matches the configured identity.</p> <p>For more information, see Electronic Keying in Logix 5000 Control Systems Application Technique, publication LOGIX-AT001.</p>

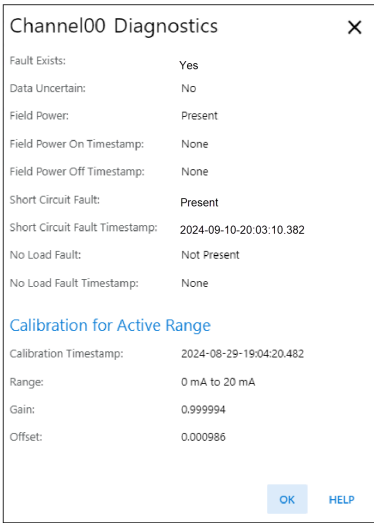
Error Code	Action
0x10	<div>Go to Device Information view and check the firmware revision and major fault status:</div> <ul style="list-style-type: none">• If firmware update is required, update the firmware.• If the major fault is recoverable, reset the module.• If the major fault is unrecoverable, replace the module.

Figure 6. Example for Device Information View with Major Fault Present



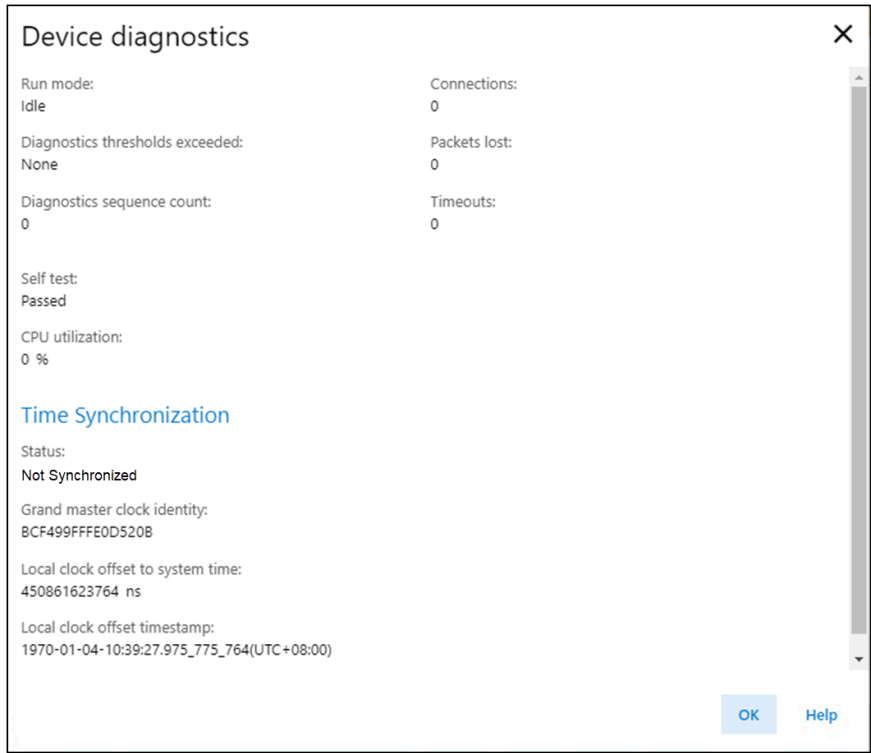
If a channel is faulted, go to the Channels → Chxx view and select the Diagnostics to see the diagnostic condition of the channel.

Figure 7. Example for Channel Diagnostics Dialog with Short Circuit Fault



If a Time Sync fault is present, go to the Device Diagnostics dialog to check the Time Synchronization status and Grandmaster clock identity.

Figure 8. Example for Device Diagnostics with Time Sync not Synchronized



The Grandmaster clock identity must match with the network Grandmaster clock identity. Also, check the Time Synchronization status of the adapter in the adapter Device Diagnostics dialog.

5034-IF4 and 5034-IF4XT Details

This chapter covers the detailed instructions on how to configure, calibrate, and troubleshoot your 5034-IF4 and 5034-IF4XT modules. It also describes the module tag definitions for input, output, and configuration tags.

5034-IF4 and 5034-IF4XT Analog 4 Input Modules

Figure 9. 5034-IF4 and 5034-IF4XT Wiring Diagram - Current Mode

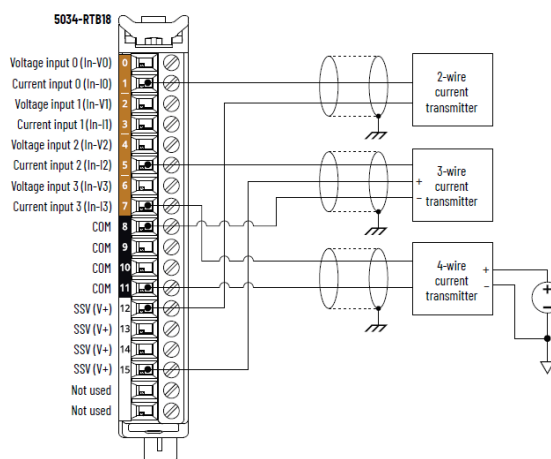


Figure 10. 5034-IF4 and 5034-IF4XT Wiring Diagram - Voltage Mode

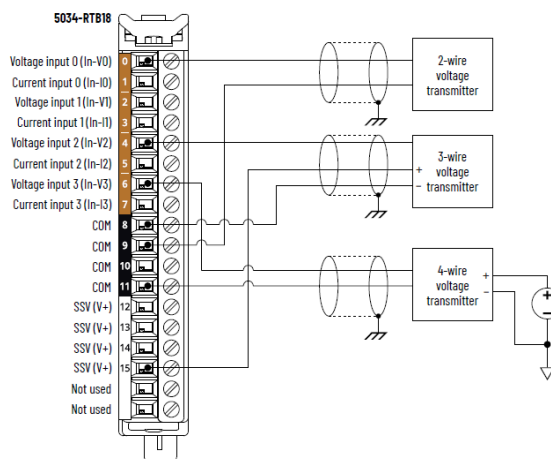


Figure 11. 5034-IF4 and 5034-IF4XT Functional Block Diagram

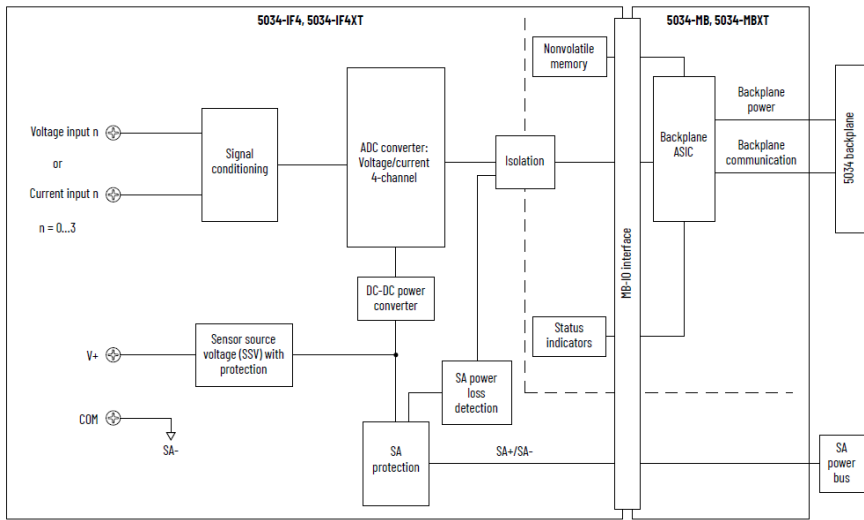


Table 17. Technical Specifications - 5034-IF4, 5034-IF4XT

Attribute	5034-IF4, 5034-IF4XT
Input range, voltage	±10V 0...10V 0...5V
Input range, current	0...20 mA 4...20 mA
Input impedance	Voltage: ≥ 1 MΩ Current: 250 Ω typical
Module conversion method	Sigma-delta
Resolution, voltage ⁽¹⁾ At 50/60 Hz notch filter	16 bits 15 bits for 0...5V range
Resolution, current ⁽¹⁾ At 50/60 Hz notch filter	16 bits
Calibrated accuracy at 25 °C (77 °F)	Voltage (±10V and 0...10V range): 0.1% full scale with 50/60 Hz filter Voltage (0...5V range): 0.2% full scale with 50/60 Hz filter Current: 0.1% full scale with 50/60 Hz filter
Calibrated accuracy over full temperature range -25...+60 °C (-13...+140 °F)	Voltage (±10V and 0...10V range): 0.2% full scale with 50/60 Hz filter Voltage (0...5V range): 0.4% full scale with 50/60 Hz filter Current: 0.2% full scale with 50/60 Hz filter
Fastest scan time per channel	0.4 ms

Table 17. Technical Specifications - 5034-IF4, 5034-IF4XT (continued)

Attribute	5034-IF4, 5034-IF4XT
Fastest scan time per module	1.2 ms
Input notch filter (Hz) selections	10, 20, 50, 60 (Default), 100, 200, 400, 500, 1000, 5000, 10000, 15625, 31250
Input digital filter	First order lag, 0 ms (Default) 0...32,767 ms (32.767 s)
HART handheld compliance	Yes
Input overvoltage protection, max	±32V DC
Overcurrent protection	Yes
Data value during overload condition	Full scale, overrange flag, data uncertain/data bad
Open wire detection time	Voltage: ≤ 2 sec Current: ≤ 1 sec
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	IEEE 754 32-bit floating point
Rolling timestamp of inputs	Yes
(1) Notch filter dependent	

Table 18. General Specifications - 5034-IF4, 5034-IF4XT

Attribute	5034-IF4, 5034-IF4XT
Number of inputs	4 channels, single-ended Configurable voltage or current mode at channel level
SA power voltage, nom	24V DC
SA power voltage range	10...30V DC
SA power current, nom	1.1 A
SA power current, max	1.2 A
SA power current at no load	11 mA
SA reverse polarity protection	Yes

Table 18. General Specifications - 5034-IF4, 5034-IF4XT (continued)

Attribute	5034-IF4, 5034-IF4XT
SSV voltage range	Follow SA supply
SSV current, max	1.0 A
SSV short-circuit protection	Yes
Power dissipation, max ⁽¹⁾	0.91 W
Thermal dissipation, max ⁽¹⁾	3.11 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type, System to Field No isolation between SA power and inputs ports No isolation between individual inputs ports
Calibration	Factory-calibrated Manual calibration supported, see PointMax Analog I/O Modules User Manual, publication 5034-UM003
RIUP support	Yes
CIP Sync	Yes, slave only ordinary clock
Electronic keying	Electronic keying via programming software
RTB key positions (slot)	2, 4, 10
RTB supported	5034-RTB18, 5034-RTB18S
Wiring category ⁽²⁾	2 - Signal ports 2 - Power ports
Wiring specification	See Wiring Specifications for Removable Terminal Blocks in the PointMax I/O System Specifications Technical Data, publication 5034-TD001
Indicators	1 green/red module status indicator 1 green/red SA power status indicator 4 yellow/red I/O status indicators
Dimensions (HxWxD), approx	123.6 x 15.0 x 66.4 mm (4.87 x 0.59 x 2.61 in.)
Weight, approx	42.0 g (1.48 oz.) - 5034-IF4 45.0 g (1.59 oz.) - 5034-IF4XT
Enclosure type	None (Open-style)
North American temp code	T4
UKEX/ATEX temp code	T4

Table 18. General Specifications - 5034-IF4, 5034-IF4XT (continued)

Attribute	5034-IF4, 5034-IF4XT
IECEX temp code	T4

(1) Value is measured at 60 °C (140 °F). Power dissipation varies with temperature.

(2) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#). Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

Module Configuration

Before you start configuring your I/O module, you must create a Studio 5000 Logix Designer application project for the Logix 5000 controller that owns the I/O module. The project includes configuration data for the module.

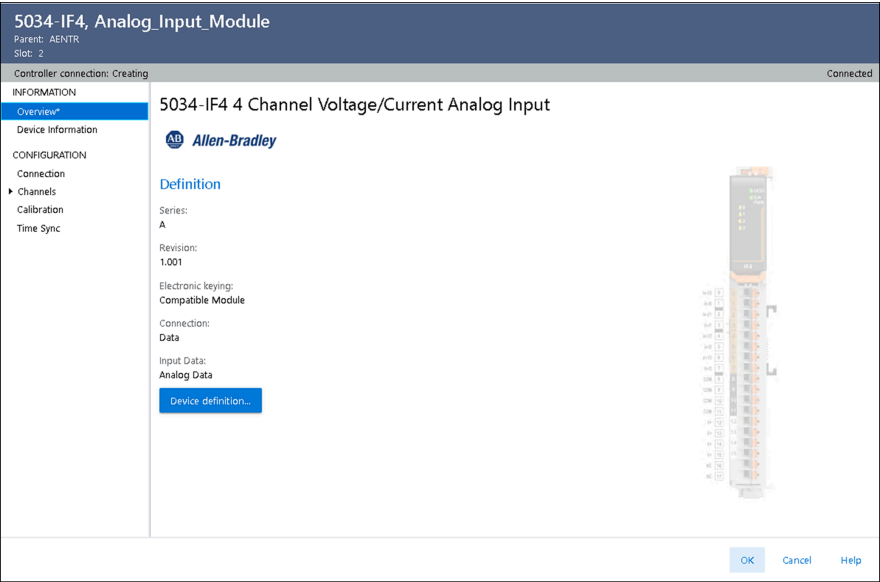
The Studio 5000 Logix Designer application transfers the project to the owner-controller during the program download. Data is then transferred to the I/O modules over the EtherNet/IP network.

The I/O modules can operate immediately after receiving and applying the configuration data.

Overview View

Use Overview to view the definition of a device, including the device type, revision, electronic keying, connection, and other device-specific values.

Figure 12. Overview View Example



Device Definition

To change the definition of a device, select Device definition in the Overview view.

Figure 13. Device Definition Example

Device definition

Device type:
5034-IF4 4 Channel Voltage/Current Analog Input

Name:
analog

Description:

Slot:
6

Series:
A

Revision:
1 011

Electronic keying:
Compatible Module

Connection:
Data with Calibration

Input Data:
Analog Data

OK

Cancel

Help

Device Definition includes these parameters:

Table 19. Device Definition Parameters

Parameter	Definition	Available Choices
Device Type	Displays the device catalog number and type.	Device-specific
Name	Enter an IEC 61131 compliant device name. If an invalid character is entered in this field, or if the name exceeds 40 characters, the software ignores the character.	All valid values
Description	Enter the description of the device.	All valid values
Slot	Specify the slot number where the device resides. Only slots between 1 and the maximum number of I/O devices are valid depending on the platform. When the device is created, the slot number defaults to the first available slot position. When the controller is changed to one supporting a smaller maximum I/O count, the current slot value may no longer be valid.	1...32
Series	Specifies the series of the device.	Device-specific
Revision	Specifies the major and minor revisions of the device. The valid range for minor revision is from 1...255.	Device-specific
Electronic Keying	Defines the electronic keying used for the device. Electronic keying compares the device defined in the project to the installed device. If keying fails, a fault occurs. For detailed information on Electronic keying, see Electronic Keying in Logix 5000	<ul style="list-style-type: none">Exact MatchCompatible ModuleDisable Keying

Table 19. Device Definition Parameters (continued)

Parameter	Definition	Available Choices
	Control Systems Application Technique, publication LOGIX-AT001 .	 ATTENTION: Be extremely cautious when using Disable Keying; if used incorrectly, this option can lead to personal injury or death, property damage, or economic loss. We strongly suggest that you do not use Disable Keying. If you use Disable Keying, you must take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.
Connection	Specify the type of data transferred between the device and controller. For the Listen Only choice, the controller and device establish communication without the controller sending any configuration or output data to the device. A full input data connection is established but depends on the connection between the owner-controller and the device.	<ul style="list-style-type: none">• Data with Calibration• Data (default)• Listen Only
Input Data	Select the input data type for the device.	Analog Data

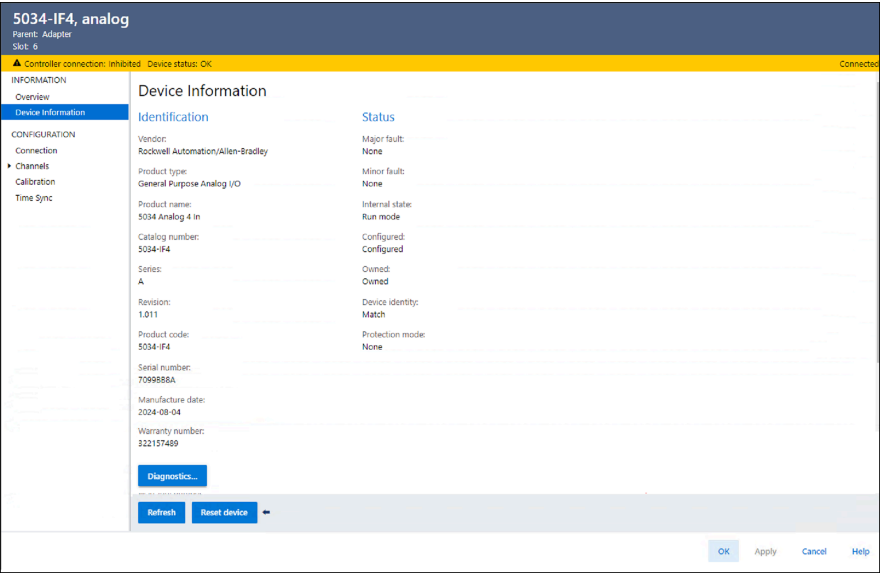
Device Information View

Use Device Information to view device and status information when the device is online.

Use Device Information to:

- Determine the identity of the device.
- View the device's current operational state.
- View whether the device was configured by the owner controller.
- View whether an owner controller is currently connected to the device.
- Retrieve the latest information from the device.
- Reset a device to its power-up state.
- If supported, view the Protection Mode of the device.

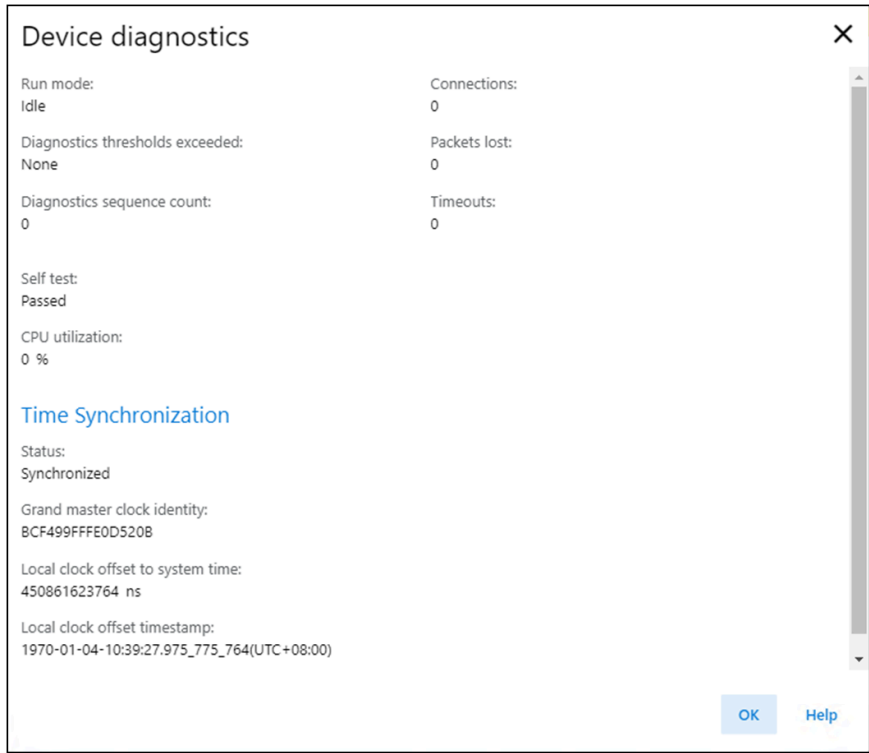
Figure 14. Device Information View Example



Device Diagnostics

To view the device diagnostics, select Diagnostics in the Device Information view.

Figure 15. Device Diagnostics Example



Connection View

Use Connection to define controller-to-device behavior:

- Set the RPI rate. For more information, see [Requested Packet Interval on page 17](#).
- Select Unicast or Multicast connection to use on the EtherNet/IP network. For more information, see [Unicast or Multicast Connection on page 21](#).
- View the reason of Connection Fault.



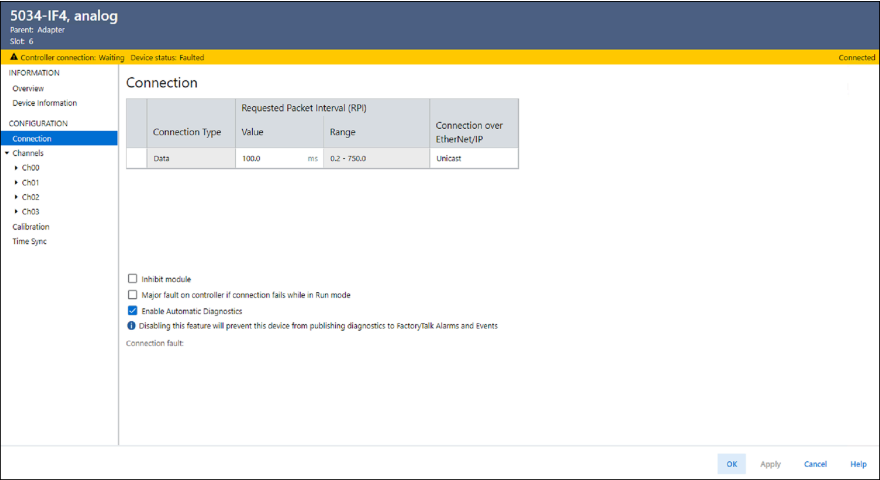
If there is a connection fault, Connection Fault area displays the error code with description that helps you to troubleshoot the module. For more information, see [Troubleshoot Your Module on page 50](#).

- Inhibit the module. For more information, see [Module Inhibiting on page 18](#).
- Configure fault response for connection failure while the controller is in Run Mode.
- Enable or disable the Automatic Diagnostics.



ATTENTION: If you do not enable Automatic Diagnostics, the device does not publish diagnostics to FactoryTalk Alarms and Events.

Figure 16. Connection View Example



Recommended Minimum RPI Values for Notch Filters

In the following table, each Notch Filter setting has two recommended minimum module RPI values that allow the required time to collect samples from each channel. One setting provides faster sample speed and the other provides slightly better resolution at slower sample speeds.

Table 20. Notch Filter and Recommended Minimum Module RPI Values

Notch Filter (Hz)	Recommended Minimum Module RPI Value			
	Application That is Configured With Only One Channel Enabled		Application With All Channels Enabled and Using the Same Notch Filter Setting on All Channels	
	Faster Sampling Speed (ms)	Better Noise Rejection (ms)	Faster Sampling Speed (ms)	Better Noise Rejection (ms)
10	106	316	422	NA
20	53.1	158.1	212	632
50	22	64	86	254
60 (default)	18.3	53.2	72	212
100	11.2	32.1	44	127

Table 20. Notch Filter and Recommended Minimum Module RPI Values (continued)

Notch Filter (Hz)	Recommended Minimum Module RPI Value			
	Application That is Configured With Only One Channel Enabled		Application With All Channels Enabled and Using the Same Notch Filter Setting on All Channels	
	Faster Sampling Speed (ms)	Better Noise Rejection (ms)	Faster Sampling Speed (ms)	Better Noise Rejection (ms)
200	5.9	16.4	22.2	65
400	3.5	8.6	12	33
500	2.8	6.9	9.3	26.5
1000	1.7	3.8	5.2	13.5
5000	1.0	1.3	2.2	3.3
10000	0.7	0.9	1.7	2.1
15625	0.8	0.8	1.7	1.7
31250	0.4	0.6	1.2	1.5

Minimum RPI Calculation When Using Different Notch Filter Selections

When input channels on the same module use different Notch Filter selections, you must consider the sample time for each channel. This helps you to find the recommended RPI that provides enough time for sampling all channels.

Because all input channels in 5034-IF4 share the same Analog to Digital Converter, the recommended minimum RPI rate for all enabled channels added together is the recommended minimum module RPI.

Table 21. Example Application That Requires Faster Sampling Speed

Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms)	Recommended Minimum Module RPI (ms)
Ch00	50	22	24.1
Ch01	1000	1.7	
Ch02 - Disabled	N/A	N/A	
Ch03	31250	0.4	

Table 22. Example Application That Requires Better Noise Rejection

Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms)	Recommended Minimum Module RPI (ms)
Ch00	50	64	68.4
Ch01	1000	3.8	

Table 22. Example Application That Requires Better Noise Rejection (continued)

Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms)	Recommended Minimum Module RPI (ms)
Ch02 - Disabled	N/A	N/A	
Ch03	31250	0.6	

Channels View

The Channels view shows an overview of the configuration values for all module channels.

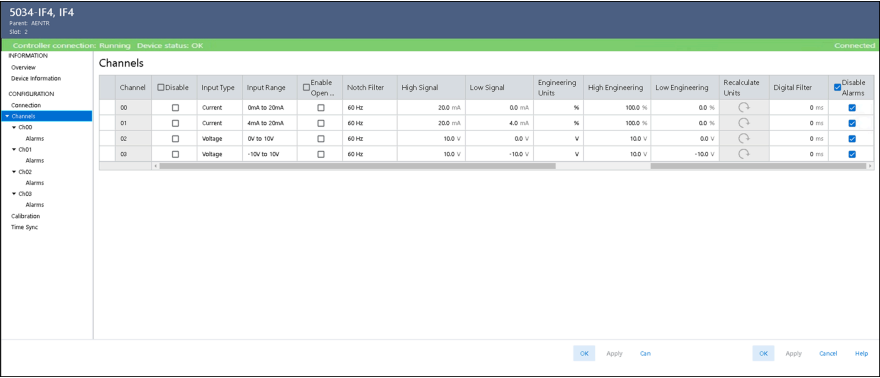


Not all channel configurations are included in Channels view. To view or change the complete set of the channel configuration and also to view the diagnostics information for the channel, use Chxx view.

You can do the following actions on this view for all the channels:

- Disable the channel, if desired
- Change the input type and input range
- Set the notch filter
- Enable or disable open wire detection
- Set the scaling and recalculate all configurations with engineering unit
- Set digital filter
- Disable alarms

Figure 17. Channels View Example



Chxx View

The Chxx view, where xx represents the channel number, shows the configuration options available for the respective channel.

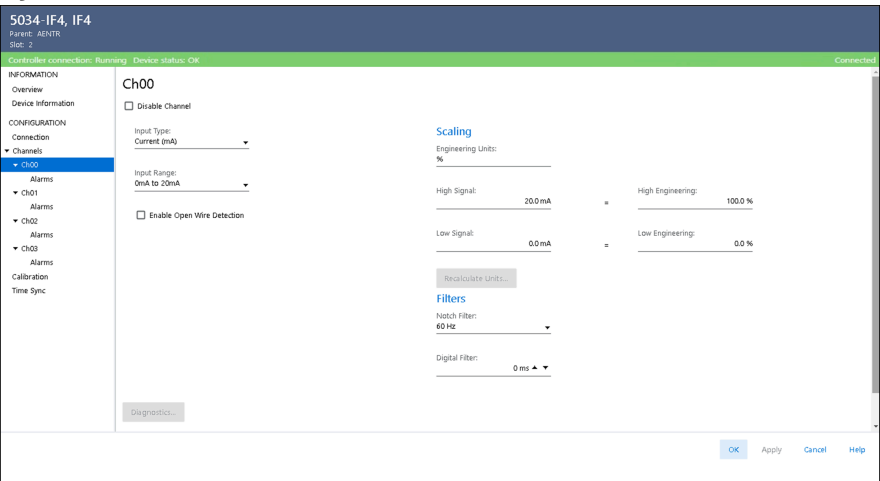
You can do the following actions on this view:

- Disable the channel, if desired
- Change the input type and input range
- Set the notch filter
- Enable or disable open wire detection
- Set the scaling and recalculate all configurations with engineering unit
- Set digital filter
- View channel diagnostics information



To latch and configure alarm parameters, go to Alarms view.

Figure 18. Chxx View Example

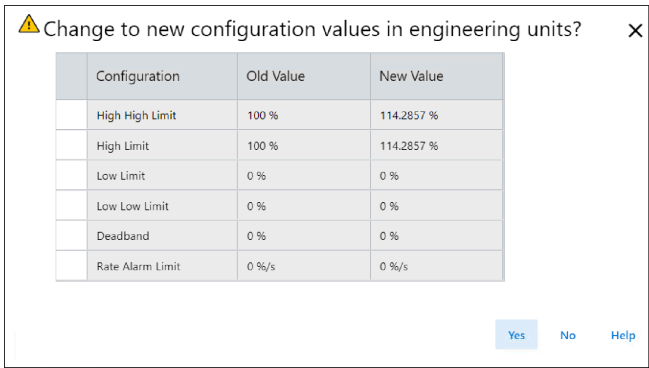


Recalculate Units

Recalculate Units lets you recalculate all configurations with engineering unit after a scaling change. Consider the following:

- The Recalculate Units option is enabled when the scaling configuration is changed.
- Upon selecting Recalculate Units option, the recalculated new values based on the new scaling configuration are displayed together with the old values for you to verify before changing.
- If you select "Yes" to proceed with the change, the new values will be set but it gets applied when you select "Apply/OK".
- If you select "No" to cancel the change, the old values are retained. You can either select the Recalculate Units again or manually change those configurations based on the new scaling.

Figure 19. Recalculate Units Example



Channelxx Diagnostics

Displays the channel diagnostics information when connected with the module. When online with the module, select the Diagnostics on the Chxx view to see the diagnostic information.

Figure 20. Channelxx Diagnostics Example

Channel00 Diagnostics

Fault Exists:

Yes

Data Uncertain:

Yes

Field Power:

Present

Field Power On Timestamp:

None

Field Power Off Timestamp:

None

Open Wire Fault:

Not Present

Fault Timestamp:

None

Overrange Fault:

Not Present

Fault Timestamp:

None

Underrange Fault:

Present

Underrange Fault Timestamp:

2025-01-08-09:45:56.841

Calibration for Active Range

Calibration Timestamp:

2025-01-02-09:45:56.841

Range:

4 mA to 20 mA

Gain:

0.999637

Offset:

0.001097

OK

HELP

Alarms View

Each channel on the input module has an Alarms view. You can do the following actions on this view:

- Disable all the alarms.
- Enable/Disable latching and set the alarm limits for the process alarms:
 - High High
 - High
 - Low
 - Low Low
 - Deadband
- Enable/Disable latching and set limit for the rate alarm.



Rate Alarm Limit of 0.0 disables the rate alarm.

Figure 21. Chxx - Alarms View Example

5034-IF4, IF4

Parent: AENTR

Slot: 2

Controller connection: Running

Device status: OK

Connected

INFORMATION

Overview

Device Information

CONFIGURATION

Connection

Channels

Ch00

Alarms

Ch01

Alarms

Ch02

Alarms

Ch03

Alarms

Calibration

Time Sync

Ch00 - Alarms

☒ Disable All Alarms

Process Alarming

☐ Latch Process Alarms

High High Limit: 100.0 %

High Limit: 100.0 %

Low Limit: 0.0 %

Low Low Limit: 0.0 %

Deadband: 0.0 %

Rate Alarming

☐ Enable Rate Alarm Latching

Rate Alarm Limit: 0.0 %/s

OK

Apply

Cancel

Help

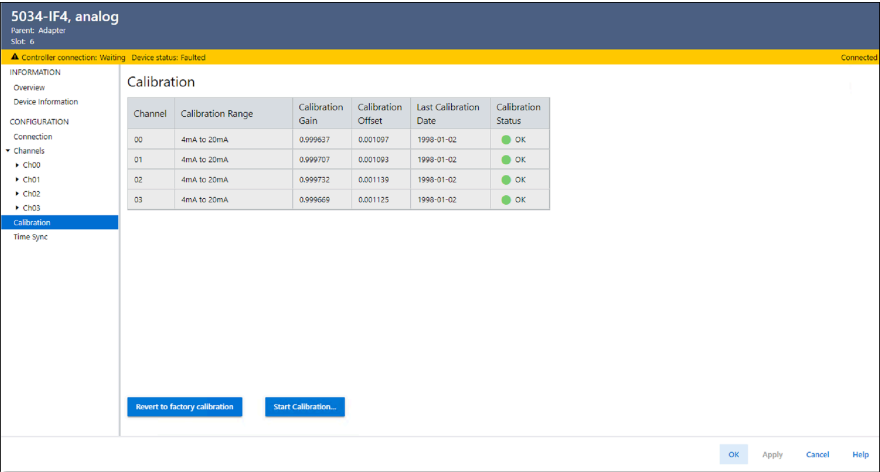
Calibration View

The Calibration view provides calibration information for all channels on the module. You can do the following actions on this view for all the channels:

- View calibration parameters and calibration status for the currently configured input ranges.
- Perform user calibration for one or multiple channels.
- Revert calibration parameters to the factory default values.

For more information on how to calibrate a module, see [Module Calibration \(Interactive\) on page 68](#)

Figure 22. Calibration View Example

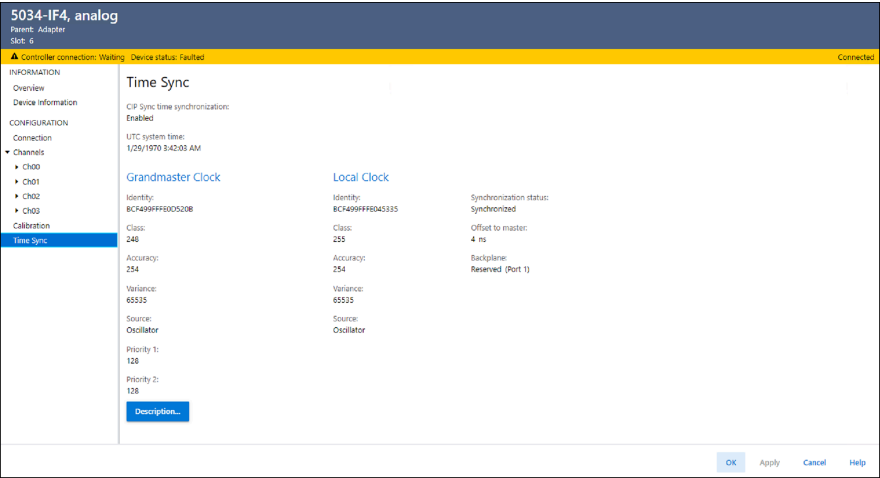


Time Sync View

The Time Sync view is read-only and displays the CIP Sync status information about the module when the project is online. The Time Sync category displays the following information:

- CIP Sync time synchronization status
- UTC system time
- Grandmaster Clock information
- Grandmaster Clock description
- Local Clock information

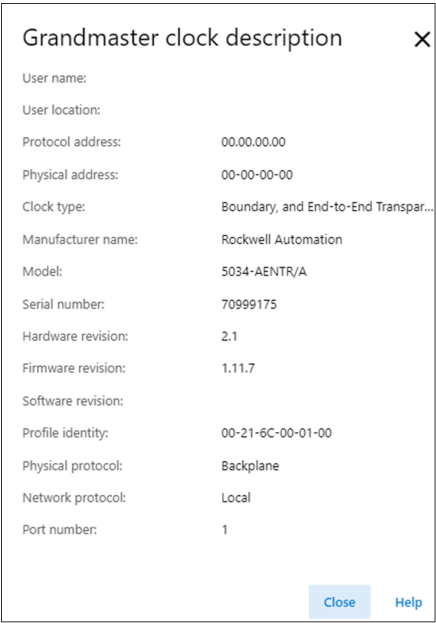
Figure 23. Time Sync View Example



Grandmaster Clock Description

The Grandmaster clock description dialog provides detailed information about the grandmaster clock. To view the Grandmaster clock description, select Description in the Time Sync view.

Figure 24. Grandmaster Clock Description Example



Module Calibration (Interactive)

You can use Calibration view in Module Properties to interactively calibrate the module on a per channel basis or in group.

Controller State During Calibration

You must add the module to your Studio 5000 Logix Designer application project before you can calibrate it.

The project must be online with the owner-controller to calibrate the PointMax analog modules. You can calibrate under any of the following conditions:

- The controller is in Program Mode, that is, either Remote Program or Program Mode.
Your module must be in Program Mode and not be actively controlling a process when you calibrate it.
- There are no connections to the module.

Calibration Impacts Data Quality

When a channel on an analog input module is being calibrated, the Notch Filter setting for that channel changes to 10 Hz. The *I.Chxx.Uncertain* tag is set to 1 for that channel until calibration is completed.

All inputs of 5034-IF4 module share an Analog-to-Digital converter. As a result when any input channel is in the calibration process, the *I.Chxx.Uncertain* tag is set to 1 for all other input channels. This is because the data sampling rate slows for all input channels.

Calibration Instrumentation Specifications

When you calibrate the analog input modules, send current or voltage reference signals to the module to calibrate it. To maintain your module's factory calibration accuracy, use the instrumentation with the specifications listed in the following table.

IMPORTANT: Do not calibrate your module with an instrument that is less accurate than those specified in following table. The following events can result:

- Calibration appears to occur normally but the module gives inaccurate data during operation.
- A calibration fault occurs, forcing you to abort calibration. When this happens, *I.Chxx.CalFault* tag is set for the channel you attempted to calibrate. You can clear this tag by completing a valid calibration or cycling power to the module.

Table 23. Instrument Specifications

Catalog Number	Channel Input Type	Calibration Instrumentation Specifications
5034-IF4, 5034-IF4XT	Current (mA)	4.00...20.00 mA source ±100 nA current
	Voltage (V)	0...10V source ±2 µV voltage

Calibration Procedure

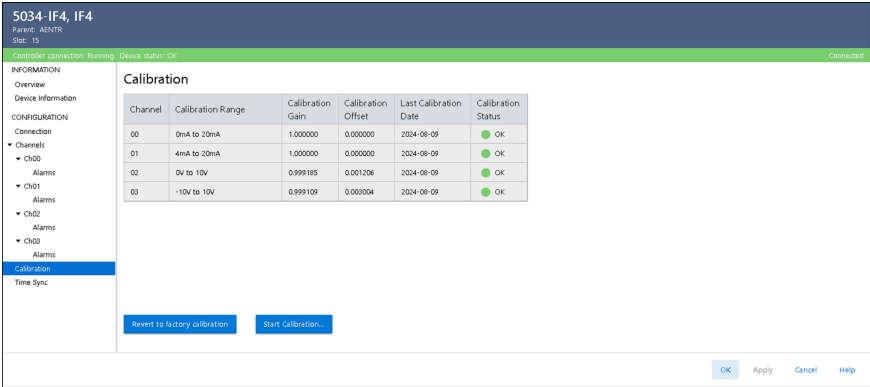
This procedure describes how to calibrate a channel on the analog input module for use with a Current (mA) input type. You can follow the same procedure for voltage input type, but make sure connect the voltage calibrator to the channel.

Apply Low and High Signal references to the analog input module to calibrate it. The references must match the input range the channel is using.

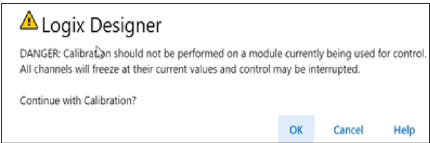
Table 24. Analog Input Module Calibration References

Input Type	Input Range	Low Calibration Reference	High Calibration Reference
Voltage (V)	-10...10V	0.0V	10.0V
	0...10V	0.5V	10.0V
	0...5V	0.5V	5.0V
Current (mA)	0...20 mA	4.0 mA	20.0 mA
	4...20 mA		

1. Connect the current calibrator to the channel being calibrated.
2. Go online with the project and make sure that the controller is in Program Mode.
3. Confirm that the channel to be calibrated is configured for the correct Input Range.
4. On the Calibration view in the Module Properties dialog, select Start Calibration.



5. When the dialog appears to confirm that you want to calibrate the channel, select OK.



6. Select the channels one at a time or in groups to calibrate and then select Next.

Calibration Wizard - Select Channels to Calibrate

Select the checkboxes of the channels to calibrate, and then select to calibrate in groups or one at a time.

	Channel	Calibrate	Calibration Range	Calibration Gain	Calibration Offset	Calibration Status
	00	☐	4mA to 20mA	0.999851	0.001057	OK
*	01	☒	4mA to 20mA	0.999948	0.001074	OK
	02	☐	4mA to 20mA	0.999979	0.001125	OK
	03	☐	4mA to 20mA	0.999924	0.001099	OK

☐ Calibrate channels in groups

☒ Calibrate channels one at a time

Back

Next

Cancel

Help

7. When the Attach Low Reference dialog appears, set the calibrator to the low reference and apply it to the channel.

Calibration Wizard - Attach Low Reference

Attach reference signals to selected channels. Select Next to continue.

Channel: 01

Channel	Calibrate	Calibration Range	Low Reference
00	☐		
01	☒	4mA to 20mA	-4.00 mA
02	☐		
03	☐		

Back

Next

Cancel

Help

8. Select Next. The Low Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - Low Reference Results

×

Select Next to continue.

Channel	Calibrate	Calibration Range	Low Reference	Status
00	☐			
01	☒	4mA to 20mA	4.00 mA	<div>OK</div>
02	☐			
03	☐			

Retry

BackNextCancelHelp

9. If the Status is OK, select Next. If the Status is not OK, repeat the calibration process.
10. When the Attach High Reference dialog appears, set the calibrator to the high reference and apply it to the channel.

Calibration Wizard - Attach High Reference

×

Attach reference signals to selected channels. Select Next to continue.

Channel: 01

Channel	Calibrate	Calibration Range	High Reference
00	☐		
01	☒	4mA to 20mA	20.00 mA
02	☐		
03	☐		

BackNextCancelHelp

11. Select Next. The High Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - High Reference Results

Select Next to continue.

Channel	Calibrate	Calibration Range	High Reference	Status
00	☐			
01	☒	4mA to 20mA	20.00 mA	<div>OK</div>
02	☐			
03	☐			

Retry

BackNextCancelHelp

12. If the Status is OK, select Next. If the Status is not OK, repeat the calibration process.
13. When the Calibration Completed dialog appears, select Finish.

Calibration Wizard - Calibration Completed

Calibration completed successfully. The calibration constants are saved.

Channel	Calibrate	Calibration Range	Low Reference	Status	High Reference	Status
00	☐					
01	☒	4mA to 20mA	4.00 mA	<div>OK</div>	20.00 mA	<div>OK</div>
02	☐					
03	☐					

BackFinishCancelHelp

Use the Status Indicators for Troubleshooting

- PointMax I/O modules use the following status indicators:
- SA Power Indicator - This indicator operates the same for all PointMax I/O modules.
 - Module Status Indicator - This indicator operates the same for all PointMax I/O modules.
 - Channel Status Indicator - This indicator operates differently based on the module type that you are using.

SA Power Status Indicator

Table 25. Interpret SA Power Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	There is SA power to the module.	None
Steady red	There is no SA power to the module or SA power voltage is not in the valid range.	Complete the following actions: 1. Confirm that SA power wiring is properly connected to the adapter, expansion power module, or 5034-MBSA mounting base. 2. Check the following: <ul style="list-style-type: none"> - Check that the SA voltage is in the correct range. - If an external power supply is used, confirm that the power supply is turned on. - Make sure that the mounting base to mounting base connection is properly secured. Go to Chassis Information view in the Module Properties of the adapter to check the Field Power status of mounting bases installed in all slots.

Module Status Indicator

Table 26. Interpret Module Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	The module is operational and all I/O connections are active.	None
Flashing green	The module has no I/O connections.	Troubleshoot your Studio 5000 Logix Designer application to determine what is preventing a connection from the module to the controller and correct the issue.
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> • A module firmware update is in progress. • A module firmware update attempt failed. • The device has experienced a recoverable fault. • A connection to the module has timed out. 	Complete one of the following: <ul style="list-style-type: none"> • Let the firmware update process complete. • Reattempt a firmware update after one fails. • Use the Studio 5000 Logix Designer application to determine whether a module recoverable fault is occurred. It is shown in Device Information view.

Table 26. Interpret Module Status Indicator (continued)

Indicator State	Description	Recommended Action
		<p>To clear a recoverable fault, complete one of the following:</p> <ul style="list-style-type: none"> - Cycle module power. - Select Reset device in the Studio 5000 Logix Designer project via the Device Information view of the Module Properties dialog. <p>If the fault does not clear after cycling power and module reset, contact Rockwell Automation Technical Support.</p> <ul style="list-style-type: none"> • Use the Studio 5000 Logix Designer application to determine if a connection has timed out. The Connection view in the Module Properties indicates whether a connection request has timed out. <p>If a connection has timed out, determine the cause and correct it. For example, a cable failure can cause a connection timeout.</p>
Steady red	The module experienced a nonrecoverable fault.	<p>Complete the following actions:</p> <ol style="list-style-type: none"> 1. Cycle power to the module. 2. If the status indicator remains in the steady red state, replace the module.

Channel Status Indicators

Table 27. Interpret Analog Input Channel Status Indicators

Indicator State	Description	Recommended Action
Off	<p>One of the following conditions exists:</p> <ul style="list-style-type: none"> • The module is not powered. • The module is powered but connection is not established from the controller to module. • The module is powered, but the input channel is disabled. 	<p>Complete one of the following:</p> <ul style="list-style-type: none"> • If you expect the module to be powered but it is not, complete the following: <ul style="list-style-type: none"> - Confirm that the system is powered. - Confirm that the module is installed properly. • If the module is powered but the channel is not operating as expected, use the Studio 5000 Logix Designer application to confirm that the channel is not disabled and the module has a connection to the controller. <p>The Connection view in the Module Properties indicates if the connection is running or faulted. If the connection is faulted, the Connection view indicates error information.</p> <ul style="list-style-type: none"> • If the channel is disabled, no action is needed.
Steady yellow	The input channel is operating normally.	None

Table 27. Interpret Analog Input Channel Status Indicators (continued)

Indicator State	Description	Recommended Action
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> There is no SA power to the module, or SA power voltage is not in the valid range. The input signal is overrange or underrange. The signal range is set in your Studio 5000 Logix Designer application project. An Open Wire condition, that is, a wire is disconnected from the input channel. 	Complete one of the following: <ul style="list-style-type: none"> If there is a SA power fault, see the recommended action given for steady red indicator state in SA Power Indicator table above. Check the input signal to determine if it is overrange or underrange. If so, make changes to return the input signal to within the range limits. Check the wiring at the input channel. If necessary, reconnect the wire.
Flashing yellow/red	Calibration is in progress.	Successfully complete the calibration process.
Steady red	An issue has occurred that is internal to the module. The following are example issues that can cause the status indicator to be steady red: <ul style="list-style-type: none"> A calibration fault occurred on the channel. The module has experienced a nonrecoverable fault. 	Complete one of the following: <ul style="list-style-type: none"> If the indicator turns steady red after a calibration process, you can either perform a successful calibration or cycle the power to recover the fault. If it is not caused by the calibration, cycle the power to recover the fault. If the condition is still present, replace the module.

Module Tag Definitions

Module tags are created when you add a module to the Studio 5000 Logix Designer application project. The set of module tags associated with a module depends on the module type and Device Definition choices made during module configuration. The tables contained in this section list all of the tags available with a module. Not all tags in the list are used when that module type is added to a project. Tag use varies by module configuration.

Configuration Tag Definitions

Table 28. Configuration Tags

Name	Data Type	Definition	Valid Values
Chxx.Range	SINT	Channel's operating range	<ul style="list-style-type: none"> 0 = -10...10V 1 = 0...5V 2 = 0...10V 4 = 0...20 mA 5 = 4...20 mA
Chxx.NotchFilter	SINT	Notch Filter removes line noise for the channel.	<ul style="list-style-type: none"> 0 = 10 Hz 16 = 20 Hz 1 = 50 Hz 2 = 60 Hz 3 = 100 Hz

Table 28. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> 4 = 200 Hz 20 = 400 Hz 5 = 500 Hz 6 = 1,000 Hz 8 = 5,000 Hz 9 = 10,000 Hz 10 = 15,625 Hz 12 = 31,250 Hz
Chxx.AlarmDisable	BOOL	<p>Disables all alarms on the channel.</p> <hr/> <p>IMPORTANT: Consider the following:</p> <ul style="list-style-type: none"> If you change this tag to 0, that is, so that the alarms are not disabled, you must also enable the individual alarms for them to work. <p>For example, if you want to use the Low Low Alarm for a channel, you must set the Chxx.AlarmDisable to 0 and set the Chxx.LLAlarmEn output tag to 1 so that the alarm is enabled.</p> <p>This applies to all alarms on the module.</p> <ul style="list-style-type: none"> Conversely, if you set this tag to 1, alarms are disabled regardless of the setting on the alarm enable tag for any alarm. <hr/>	<ul style="list-style-type: none"> 0 = Alarms are enabled 1 = Alarms are disabled
Chxx.ProcessAlarmLatchEn	BOOL	<p>Configures Process alarms to latch until they are explicitly unlatched.</p> <p>The Process alarms include:</p> <ul style="list-style-type: none"> HighHigh Alarm High Alarm Low Alarm LowLow Alarm 	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.RateAlarmLatchEn	BOOL	<p>Configures the Rate Alarm to latch until it is explicitly unlatched.</p>	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.OpenWireEn	BOOL	<p>Enables the input Open Wire diagnostic.</p>	<ul style="list-style-type: none"> 0 = Disabled 1 = Enabled
Chxx.Disable	BOOL	<p>Disables the channel.</p> <p>When a channel is disabled, the following occurs:</p> <ul style="list-style-type: none"> The I/O status indicator for the channel turns off. The Chxx.Fault input tag is set to 1. 	<ul style="list-style-type: none"> 0 = Channel is enabled 1 = Channel is disabled

Table 28. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
Chxx.TenOhmOffset	INT	Not Applicable	0
Chxx.DigitalFilter	INT	A non-zero value enables the filter, providing a time constant in milliseconds used in a first order lag filter to smooth the input signal.	0 = Filter is turned off Any value greater than zero = Filter value in milliseconds
Chxx.LowSignal	REAL	One of four points used in scaling. The low signal is in terms of the inputs signal units and corresponds to the low engineering term when scaled.	Any value less than the high signal in range
Chxx.HighSignal	REAL	One of four points used in scaling. The high signal is in terms of the inputs signal units and corresponds to the high engineering term when scaled.	Any value greater than the low signal in range
Chxx.LowEngineering	REAL	One of four points used in scaling. The low engineering helps determine the engineering units the signal values scale into. The low engineering term corresponds to the low signal value.	Any value
Chxx.HighEngineering	REAL	One of four points used in scaling. The high engineering helps determine the engineering units the signal values scale into. The high engineering term corresponds to the high signal value.	Any value
Chxx.LLAlarmLimit	REAL	The Low Low Alarm trigger point. Causes the Chxx.LLAlarm to trigger when the input signal moves beneath the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.LAlarmLimit	REAL	The Low Alarm trigger point. Causes the Chxx.LAlarm to trigger when the input signal moves beneath the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.HAlarmLimit	REAL	The High Alarm trigger point. Causes the Chxx.HAlarm to trigger when the input signal moves above the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.HHAlarmLimit	REAL	The High High Alarm trigger point. Causes the Chxx.HHAlarm to trigger when the input signal moves above the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.RateAlarmLimit	REAL	The Rate Alarm trigger point. Causes the Chxx.RateAlarm to trigger when the input signal changes at a rate faster than the configured Rate Alarm. Configured in Engineering Units per second.	0 = Rate Alarm is not used Any value greater than zero = Trigger point
Chxx.AlarmDeadband	REAL	Allows a process alarm to remain set, despite the alarm condition disappearing, as long as the input data remains within the deadband of the process alarm. The deadband value is subtracted from the High and High High Alarm Limits to calculate the deadband	Any non-negative value

Table 28. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
		thresholds for these alarms. The deadband value is added to the Low and Low Low Alarm Limits to calculate the deadband thresholds for these alarms.	

Input Tag Definitions

Table 29. Input Tags

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Module is not applying new Output tag data because the controller is in Program Mode. 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
ConnectionFaulted	BOOL	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	<ul style="list-style-type: none"> 0 = A connection exists between the module and the controller 1 = Connection is timed out or inhibited
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics are active 1 = One or more diagnostics are active or the prognostics threshold is reached.
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.	-128...+127 The value of 0 is skipped except during module powerup.
Chxx.Fault	BOOL	Indicates that channel data is inaccurate and cannot be trusted for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	<ul style="list-style-type: none"> 0 = No fault exists 1 = Fault exists
Chxx.Uncertain	BOOL	Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known.	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain

Table 29. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p> <hr/> <p>IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.</p> <hr/>	
Chxx.OpenWire	BOOL	The signal wire is disconnected from the channel or the RTB is removed from the module.	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled 1 = Open wire condition exists, which means the signal wire is disconnected from the channel or the RTB is removed from the module
Chxx.OverTemperature	BOOL	Not applicable for this module.	N/A
Chxx.FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
Chxx.NotANumber	BOOL	Indicates that the last value received for the channel output data value was not a number.	<ul style="list-style-type: none"> 0 = Last channel data received was a number 1 = Last channel data received was not a number
Chxx.Underrange	BOOL	<p>Indicates that the channel data is beneath the underrange threshold for this channel.</p> <p>For example, when the channel operates in the 4...20 mA input range, the underrange threshold on the channel is <3.0 mA. If the input signal is 0 mA, this tag is set to 1.</p>	<ul style="list-style-type: none"> 0 = Channel data is not beneath the underrange threshold 1 = Channel data is beneath the underrange threshold
Chxx.Overrange	BOOL	<p>Indicates that the channel data is above the overrange threshold for this channel.</p> <p>For example, when the channel operates in the 4...20 mA output range, the overrange threshold on the channel is >23.0 mA. If the input signal is 24 mA, this tag is set to 1.</p>	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
Chxx.LLAlarm	BOOL	<p>Triggered when the input data value is less than the Low Low Alarm value.</p> <p>If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is greater than the Low Low Limit plus the Alarm Deadband.</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.LAlarm	BOOL	<p>Triggered when the input data value is less than the Low Alarm value.</p> <p>If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered

Table 29. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		after the input data value is greater than the Low Limit plus the Alarm Deadband.	
Chxx.HAlarm	BOOL	<p>Triggered when the input data value is greater than the High Alarm value.</p> <p>If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is less than the High Limit minus the Alarm Deadband.</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.HHAlarm	BOOL	<p>Triggered when the input data value is greater than the High High Alarm value.</p> <p>If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is less than the High High Limit minus the Alarm Deadband.</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.RateAlarm	BOOL	Triggered when the change between consecutive channel samples divided by the period of time between when the samples were taken exceeds the Rate Alarm. If latched, this tag remains set until it is unlatched.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.CalFault	BOOL	<p>Indicates that the last attempted Calibration for this channel failed or there is no calibration data present.</p> <p>This tag is cleared, that is, set to 0, when power is cycled to the module or a successful calibration for the range on the channel is performed.</p>	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed
Chxx.Calibrating	BOOL	Indicates that the channel is currently being calibrated.	<ul style="list-style-type: none"> 0 = Channel is not being calibrated 1 = Channel is being calibrated
Chxx.CalGoodLowRef	BOOL	<p>Indicates that a valid Low Reference signal is sampled on this channel in the calibration process.</p> <hr/> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p> <hr/>	<ul style="list-style-type: none"> 0 = Valid Low Reference signal has not been sampled on this channel 1 = Valid Low Reference signal has been sampled on this channel
Chxx.CalBadLowRef	BOOL	<p>Indicates that an invalid Low Reference signal is sampled on this channel in the calibration process. You must correct this condition to successfully calibrate the module.</p> <p>If calibration is aborted with an invalid Low Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.</p>	<ul style="list-style-type: none"> 0 = Invalid Low Reference signal has not been sampled on this channel 1 = Invalid Low Reference signal has been sampled on this channel

Table 29. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	
Chxx.CalGoodHighRef	BOOL	<p>Indicates that a valid High Reference signal is sampled on this channel in the calibration process.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Valid High Reference signal has not been sampled on this channel 1 = Valid High Reference signal has been sampled on this channel
Chxx.CalBadHighRef	BOOL	<p>Indicates that an invalid High Reference signal is sampled on this channel in the calibration process.</p> <p>You must correct this condition to successfully calibrate the module.</p> <p>If calibration is aborted with an invalid High Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Invalid High Reference signal has not been sampled on this channel 1 = Invalid High Reference signal has been sampled on this channel
Chxx.CalSuccessful	BOOL	<p>Indicates calibration on this channel is complete and the Calibrating state has been exited.</p> <p>This tag remains set after valid calibration and until a new calibration process is started or the connection is closed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Calibration was not successful 1 = One of the following: <ul style="list-style-type: none"> Calibration was successful and calibrating state has been exited. Calibration data is present and applied.
Chxx.Data	REAL	Channel data in scaled Engineering Units.	Any value
Chxx.RollingTimestamp	INT	<p>Continuously-running 15-bit timer that counts in milliseconds.</p> <p>Whenever an input module scans its channels, it also records the value of RollingTimestamp at that time. The</p>	0...32,767

Table 29. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		user program uses the last two RollingTimestamp values and calculates the interval between receipt of data.	

Output Tag Definitions

Table 30. Output Tags

Name	Data Type	Definition	Valid Values
Chxx.LLAlarmEn	BOOL	<p>Enables the Low Low Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.LAlarmEn	BOOL	<p>Enables the Low Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.HAlarmEn	BOOL	<p>Enables the High Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.HHAlarmEn	BOOL	<p>Enables the High High Alarm.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm

Table 30. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p>	
Chxx.RateAlarmEn	BOOL	<p>Enables the Rate Alarm.</p> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.LLAlarmUnlatch	BOOL	Unlatches a latched Low Low Alarm at the first instance of the bit transitioning from 0 to 1.	<ul style="list-style-type: none"> 0 = Low Low Alarm remains latched 1 = Low Low Alarm unlatched
Chxx.LAlarmUnlatch	BOOL	Unlatches a latched Low Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = Low Alarm remains latched 1 = Low Alarm unlatched
Chxx.HAlarmUnlatch	BOOL	Unlatches a latched High Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = High Alarm remains latched 1 = High Alarm unlatched
Chxx.HHAlarmUnlatch	BOOL	Unlatches a set High High Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = High High Alarm remains latched 1 = High High Alarm unlatched
Chxx.RateAlarmUnlatch	BOOL	Unlatches a set Rate Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = Rate Alarm remains latched 1 = Rate Alarm unlatched
Chxx.Calibrate	BOOL	<p>Initiates the Calibration process.</p> <p>This tag must remain set until a valid Low Reference and High Reference values are applied to the input.</p> <p>If the tag value transitions to 0 before calibration is finished, the process stops and calibration fails.</p>	<ul style="list-style-type: none"> 0 = Not to start calibration process 1 = Start calibration process
Chxx.CalLowRef	BOOL	<p>Rising edge triggers the Low Calibration at the Low Reference Point for the current input range value.</p> <p>A valid Low Reference signal must be connected to the channel before setting this tag.</p>	<ul style="list-style-type: none"> 0 = Not to start low reference sampling 1 = Start low reference sampling

Table 30. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device Definition. If you use the Data connection type, this tag does not appear in the module tags.	
Chxx.CalHighRef	BOOL	<p>Rising edge triggers a High Calibration at the High Reference Point for the current input range value.</p> <p>A valid High Reference signal must be connected to the channel before setting tag.</p> IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device Definition. If you use the Data connection type, this tag does not appear in the module tags.	<ul style="list-style-type: none">0 = Not to start high reference sampling1 = Start high reference sampling
Chxx.SensorOffset	REAL	<p>Compensates for any known offset error on the sensor or channel to which the sensor is connected. Value is in terms of engineering units.</p> <p>The value of this tag is added to the measured value in engineering units and is used in the Chxx.Data input tag.</p>	<p>Any valid float value</p> <p>Use a value in the channel's operating range.</p>

Diagnostic Assembly

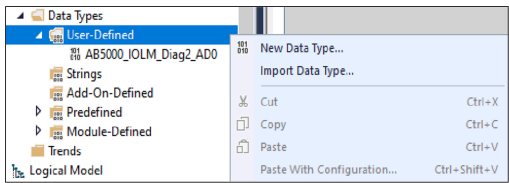
Diagnostic assembly helps you troubleshoot and diagnose the fault in your system.

Create User-defined Diagnostic Assembly Types

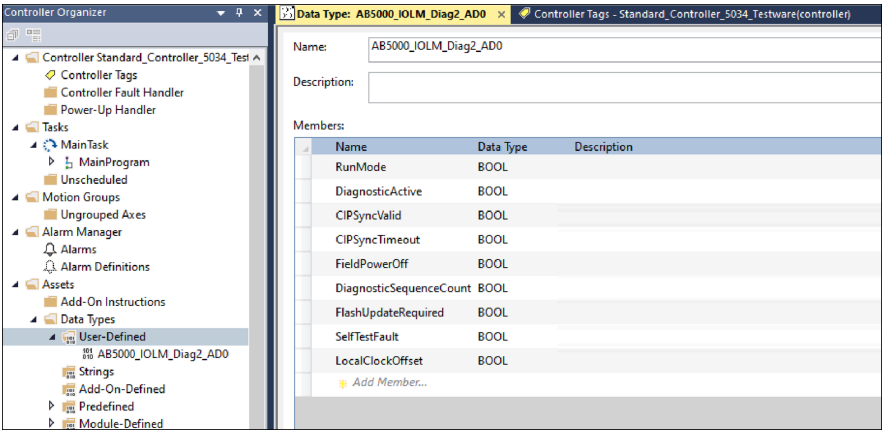
You can use the Studio 5000 Logix Designer application to create user-defined Diagnostic Assembly types.

Create user-defined diagnostic assembly by following the below steps:

1. From the Controller Organizer pane, go to Assets → Data types → User-Defined.
2. Right-click on the User-Defined folder and select New Data Type.



3. Add a Name and Description (optional) for your diagnostic assembly.
4. Under Members area, add the data members based on the diagnostic assembly detailed below.



IMPORTANT: The members indicated in the tables are arranged according to Data Alignment Rules of controllers. Strictly follow the data type and the sequence of the members that are indicated in the tables of this appendix. If the data type and the sequence are not followed, data misalignment may occur after executing Get Attribute Single Message (MSG) instruction.

Diagnostic Assemblies

- 1. Diagnostic Assembly for Analog 4 Channel Input Module
 - Instance ID: 0x801D (32797)
 - Size = 336 bytes

Follow the information in the following table to add each member.

Table 31. Diagnostic Assembly Instance 32797

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
CIPSyncValid	BOOL	
CIPSyncTimeout	BOOL	
Infobit_Pad5	BOOL	
FieldPowerOff	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
Diagbit_Pad0	BOOL	2
Diagbit_Pad1	BOOL	
Diagbit_Pad2	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	

Name	Date Type	Size in Bytes
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
FlashUpdateRequired	BOOL	
SelfTestFault	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad	DINT	4
LocalClockOffset	LINT	8
LocalClockOffsetTimestamp	LINT	8
GrandMasterClockID	SINT[8]	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8
Ch00	Diagnostic_Channel_Structure	72
Ch01	Diagnostic_Channel_Structure	72
Ch02	Diagnostic_Channel_Structure	72
Ch03	Diagnostic_Channel_Structure	72

2. Diagnostic Counters Assembly for I/O

- Instance ID: 0x301 (769)
- Size = 16 bytes

Follow the information in the following table to add each member.

Table 32. Diagnostic Assembly Instance 769

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
Infobit_Pad3	BOOL	
Infobit_Pad4	BOOL	
Infobit_Pad5	BOOL	
Infobit_Pad6	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1

Name	Date Type	Size in Bytes
CIPConnections	INT	2
CIPLostPackets	DINT	4
CIPTimeouts	DINT	4
CPUUtilization	INT	2
Pad	INT	2

Diagnostic Channel

1. Diagnostic Channel

- Size = 72 bytes

This data type is retrieved as part of the diagnostic assembly instance.

Follow the information in the following table to add each member.

Table 33. 5034-IF4 Diagnostic Channel Structure

Name	Date Type	Size in Bytes
Databit_Pad0	BOOL	2
Fault	BOOL	
Uncertain	BOOL	
OpenWire	BOOL	
Databit_Pad4	BOOL	
Databit_Pad5	BOOL	
FieldPowerOff	BOOL	
Databit_Pad7	BOOL	
Disabled	BOOL	
Databit_Pad10	BOOL	
Databit_Pad11	BOOL	
Databit_Pad12	BOOL	
Databit_Pad13	BOOL	
Databit_Pad14	BOOL	
Databit_Pad15	BOOL	
CalFault	BOOL	2
Underrange	BOOL	
Overrange	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	

Name	Date Type	Size in Bytes
Diagbit_Pad6	BOOL	
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
Diagbit_Pad12	BOOL	
Diagbit_Pad13	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad1	INT	2
InternalErrorCount	SINT	1
CalRange	SINT	1
CalOffset	REAL	4
CalGain	REAL	4
CalLastDate	LINT	8
OpenWireTimestamp	LINT	8
Pad2	LINT	8
UnderrangeTimestamp	LINT	8
OvrrangeTimestamp	LINT	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8

Definitions for Diagnostic Assembly Types

Table 34. Definition of Members in Diagnostic Assembly Data Types

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Module is not applying new Output tag data because the controller is in Program Mode.

Table 34. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics active 1 = One or more diagnostics are active or the prognostics threshold is reached.
CIPSyncValid	BOOL	Indicates if the module is synced with a 1588 master.	<ul style="list-style-type: none"> 0 = Module is not synced 1 = Module is synced
CIPSyncTimeout	BOOL	Indicates if the module was once synced with a 1588 master, but is not now due to a timeout	<ul style="list-style-type: none"> 0 = A valid time master has not timed out. 1 = A valid time master is detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.	-128...+127 The value of 0 is skipped except during module power-up.
FlashUpdateRequired	BOOL	Indicates whether flash update is required.	<ul style="list-style-type: none"> 0 = Flash update is not required 1 = Module has no application firmware
SelfTestFault	BOOL	Indicate whether the fault is present during module self-test.	<ul style="list-style-type: none"> 0 = Module initialization code did not detect an error 1 = Module initialization code detected an error
LocalClockOffset	LINT	The offset from the local clock to the system time. This value helps to detect steps in time. This value updates when a PTP update is received.	Any value
LocalClockOffsetTimestamp	LINT	Indicates the timestamp of the local clock offset.	A valid time or None if there is no recorded event time. Time format is YYYY-MMDD-HH:mm:ss_mmm_uuu_nnn(UTC-00:00) <ul style="list-style-type: none"> YYYY = year MM = month

Table 34. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds uuu = microseconds nnn = nanoseconds UTC-00:00 = Time zone
GrandMasterClockID	SINT	The EUI-64 Identity of the CIP Sync Grandmaster clock the module is synced to.	Any value
FieldPowerOnTimestamp	LINT	Indicates the timestamp of the last time field power turned on.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:SS.mmm.</p> <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
FieldPowerOffTimestamp	LINT	Indicates the timestamp of the last time field power turned off.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:SS.mmm.</p> <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
Fault	BOOL	<p>Indicates that channel data is inaccurate and cannot be trusted for use in the application.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p>	<ul style="list-style-type: none"> 0 = No fault exists 1 = Fault exists <p>The typical causes of a fault are the following:</p> <ul style="list-style-type: none"> Channel is disabled Open Wire condition Underrange/Ovrrange condition SA power loss condition <p>You must troubleshoot the module first to see if the typical causes exist.</p>
Uncertain	BOOL	Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known.	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain

Table 34. Definition of Members in Diagnostic Assembly Data Types (continued)

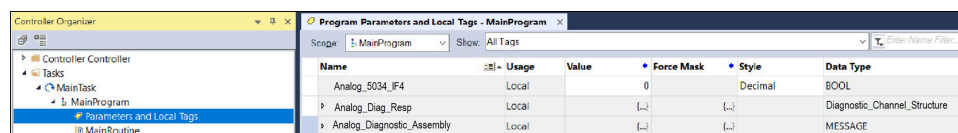
Name	Data Type	Definition	Valid Values
		If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.	
OpenWire	BOOL	The signal wire is disconnected from the channel or the RTB is removed from the module.	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled. 1 = Open wire condition exists, that means the signal wire is disconnected from the channel or the RTB is removed from the module.
CalFault	BOOL	Indicates the last attempted Calibration for this channel failed or there is no calibration data present. This tag is cleared, that is, set to 0, when power is cycled to the module.	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed
Underrange	BOOL	Indicates the channel data is beneath the underrange threshold for this channel. For example, when the channel operates in the 4...20 mA input range, the underrange threshold on the channel is < 3.0 mA. If the input signal is 0 mA, this tag is set to 1.	<ul style="list-style-type: none"> 0 = Channel data is not beneath the underrange threshold 1 = Channel data is beneath the underrange threshold
Overrange	BOOL	Indicates the channel data is above the overrange threshold for this channel. For example, when the channel operates in the 4...20 mA output range, the overrange threshold on the channel is > 23.0 mA. If the input signal is 24 mA, this tag is set to 1.	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
CalRange	SINT	Indicates the value currently configured for the channel. Values display according to the Input Type selected.	<ul style="list-style-type: none"> 0 = -10...10V 1 = 0...5V 2 = 0...10V 4 = 0...20 mA 5 = 4...20 mA
CalOffset	REAL	Indicates the offset in signal units as reported by the device.	Any value
CalGain	REAL	Indicates the calibration gain reported by the device.	Any value
CalLastDate	LINT	Indicates the time of the last calibration date for the channel.	Any value
OpenWireTimestamp	LINT	Indicates the timestamp of the last time when the open wire condition is detected.	A valid time or None if there is no recorded event time.

Table 34. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
UnderrangeTimestamp	LINT	Indicates the timestamp of the last underrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
OverrangeTimestamp	LINT	Indicates the timestamp of the last overrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
CIPConnections	INT	Indicates the number of CIP connections currently open.	0...24
CIPLostPackets	DINT	Indicates the running sum of the number of Sequenced Address Item Sequence Numbers that are skipped in Class 0 and Class 1 connections consumed by the adapter and its children.	0...2,147,483,647
CIPTimeouts	DINT	Indicates the running count of the number of connections that time out, both originated and targeted, to and through the adapter.	0...2,147,483,647
CPUUtilization	INT	Indicates the usage of the compute engine.	0...100%

Create Message Type User Tags

Create MESSAGE type user tags for requests and associated response user tags for each of the new user-defined diagnostic assembly types.



From the Controller Organizer pane, expand Tasks → MainTask → MainProgram:

1. Create MESSAGE type user tags for each request.
2. Create associated response user tags for each new user-defined diagnostic assembly type.
3. Add the user tags to your ladder program.

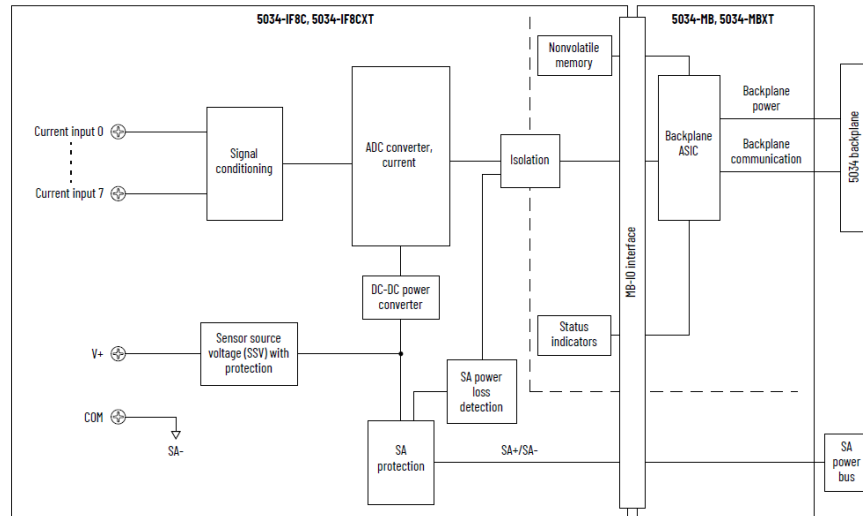


4. Expand the message tag to open the message configuration dialog.
5. On the Configuration tab, select:
 - Service type: Get Attribute Single
 - Class: 4
 - Attribute: 3
 - Instance:
 - 0x801D (32797) Diagnostic Assembly for Analog 4 Channel Input Module
 - 0x301 (769) Diagnostic Counters Base I/O Assembly
 - Destination element: User-defined data type suitable for the instance entered.
6. On the Communication tab, select the path to the module that you wish to send the messages to.
7. Download the project and set to Run Mode.
You can monitor the user-defined tag values from the Program Parameters and Local Tags window, under the MainProgram task in the Controller Organizer pane.

This chapter covers the detailed instructions on how to configure, calibrate, and troubleshoot your 5034-IF8C and 5034-IF8CXT modules. It also describes the module tag definitions for input, output, and configuration tags.

Figure 25. 5034-IF8C and 5034-IF8CXT Wiring Diagram



Figure 26. 5034-IF8C and 5034-IF8CXT Functional Block Diagram**Table 35. Technical Specifications - 5034-IF8C, 5034-IF8CXT**

Attribute	5034-IF8C, 5034-IF8CXT
Input range, current	0...20 mA 4...20 mA
Input impedance	Current: 75...115 Ω
Module conversion method	Sigma-delta
Resolution, current ⁽¹⁾ At 50/60 Hz notch filter	16 bits
Calibrated accuracy at 25 °C (77 °F)	Current: 0.1% full scale with 50/60 Hz filter
Calibrated accuracy over full temperature range -25...+60 °C (-13...+140 °F)	Current: 0.2% full scale with 50/60 Hz filter
Fastest scan time per channel	0.4 ms
Fastest scan time per module	1.2 ms
Input notch filter (Hz) selections	10, 20, 50, 60 (Default), 100, 200, 400, 500, 1000, 5000, 10000, 15625, 31250
Input digital filter	First order lag, 0 ms (Default) 0...32,767 ms (32.767 s)
HART handheld compliance	Not supported
Input overvoltage protection, max	± 32 V DC
Overcurrent protection	Yes

Table 35. Technical Specifications - 5034-IF8C, 5034-IF8CXT (continued)

Attribute	5034-IF8C, 5034-IF8CXT
Data value during overload condition	Full scale, overrange flag, data uncertain/data bad
Open wire detection time	Current: ≤ 1 sec
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	IEEE 754 32-bit floating point
Rolling timestamp of inputs	Yes

(1) Notch filter dependent.

Table 36. General Specifications - 5034-IF8C, 5034-IF8CXT

Attribute	5034-IF8C, 5034-IF8CXT
Number of inputs	8 channels, single-ended Current mode
SA power voltage, nom	24V DC
SA power voltage range	10...30V DC
SA power current, nom	1.1 A
SA power current, max	1.2 A
SA power current at no load	11 mA
SA reverse polarity protection	Yes
SSV voltage range	Follow SA supply
SSV current, max	1.0 A
SSV short circuit protection	Yes
Power dissipation, max ⁽¹⁾	0.95 W
Thermal dissipation, max ⁽¹⁾	3.24 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type, System to Field No isolation between SA power and input ports No isolation between individual input ports

Table 36. General Specifications - 5034-IF8C, 5034-IF8CXT (continued)

Attribute	5034-IF8C, 5034-IF8CXT
Calibration	Factory-calibrated Manual calibration supported, see PointMax Analog I/O Modules User Manual, publication 5034-UM003
RIUP support	Yes
CIP Sync	Yes, slave only ordinary clock
Electronic keying	Electronic keying via programming software
RTB key positions (slot)	2, 5, 8
RTB supported	5034-RTB18, 5034-RTB18S, 5034-RTB24S
Wiring category ⁽²⁾	2 - Signal ports 2 - Power ports
Wiring specification	See Wiring Specifications for Removable Terminal Blocks in the PointMax I/O System Specifications Technical Data, publication 5034-TD001
Indicators	1 green/red module status indicator 1 green/red SA power status indicator 8 yellow/red I/O status indicators
Dimensions (HxWxD), approx	123.6 x 15.0 x 66.4 mm (4.87 x 0.59 x 2.61 in.)
Weight, approx	43.0 g (1.51 oz.) - 5034-IF8C 45.0 g (1.59 oz.) - 5034-IF8CXT
Enclosure type	None (Open-style)
North American temp code	T4
UKEX/ATEX temp code	T4
IECEX temp code	T4

(1) Value is measured at 60 °C (140 °F). Power dissipation varies with temperature.

(2) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#). Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

Module Configuration

Before you start configuring your I/O module, you must create a Studio 5000 Logix Designer application project for the Logix 5000 controller that owns the I/O module. The project includes configuration data for the module.

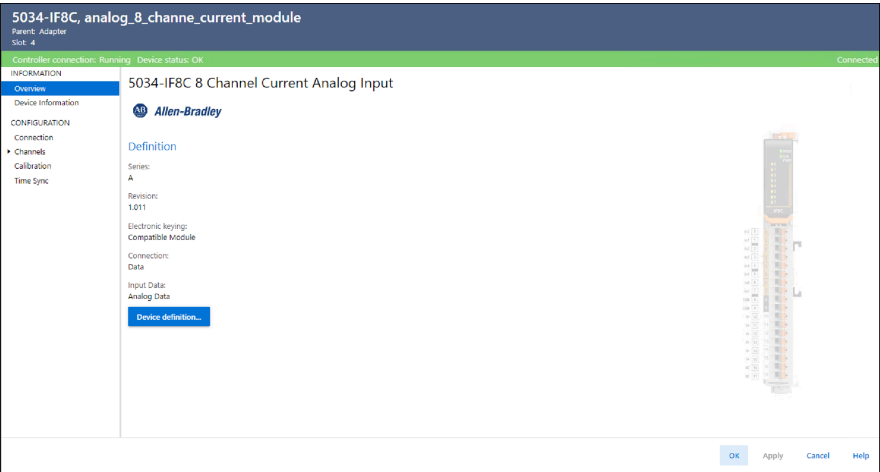
The Studio 5000 Logix Designer application transfers the project to the owner-controller during the program download. Data is then transferred to the I/O modules over the EtherNet/IP network.

The I/O modules can operate immediately after receiving and applying the configuration data.

Overview View

Use Overview to view the definition of a device, including the device type, revision, electronic keying, connection, and other device-specific values.

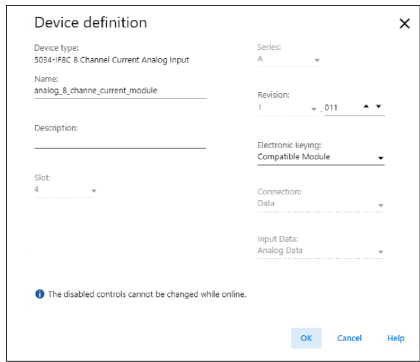
Figure 27. Overview View Example



Device Definition

To change the definition of a device, select Device definition in the Overview view.

Figure 28. Device Definition Example



Device Definition includes these parameters:

Table 37. Device Definition Parameters

Parameter	Definition	Available Choices
Device Type	Displays the device catalog number and type.	Device-specific
Name	Enter an IEC 61131 compliant device name.	All valid values

Table 37. Device Definition Parameters (continued)

Parameter	Definition	Available Choices
	If an invalid character is entered in this field, or if the name exceeds 40 characters, the software ignores the character.	
Description	Enter the description of the device.	All valid values
Slot	Specify the slot number where the device resides. Only slots between 1 and the maximum number of I/O devices are valid depending on the platform. When the device is created, the slot number defaults to the first available slot position. When the controller is changed to one supporting a smaller maximum I/O count, the current slot value may no longer be valid.	1...32
Series	Specifies the series of the device.	Device-specific
Revision	Specifies the major and minor revisions of the device. The valid range for minor revision is from 1...255.	Device-specific
Electronic Keying	Defines the electronic keying used for the device. Electronic keying compares the device defined in the project to the installed device. If keying fails, a fault occurs. For detailed information on Electronic keying, see Electronic Keying in Logix 5000 Control Systems Application Technique, publication LOGIX-AT001 .	<ul style="list-style-type: none"> Exact Match Compatible Module Disable Keying <hr/>  <p>ATTENTION: Be extremely cautious when using Disable Keying; if used incorrectly, this option can lead to personal injury or death, property damage, or economic loss.</p> <p>We strongly suggest that you do not use Disable Keying.</p> <p>If you use Disable Keying, you must take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.</p>
Connection	Specify the type of data transferred between the device and controller.	<ul style="list-style-type: none"> Data with Calibration Data (default) Listen Only

Table 37. Device Definition Parameters (continued)

Parameter	Definition	Available Choices
	For the Listen Only choice, the controller and device establish communication without the controller sending any configuration or output data to the device. A full input data connection is established but depends on the connection between the owner-controller and the device.	
Input Data	Select the input data type for the device.	Analog Data

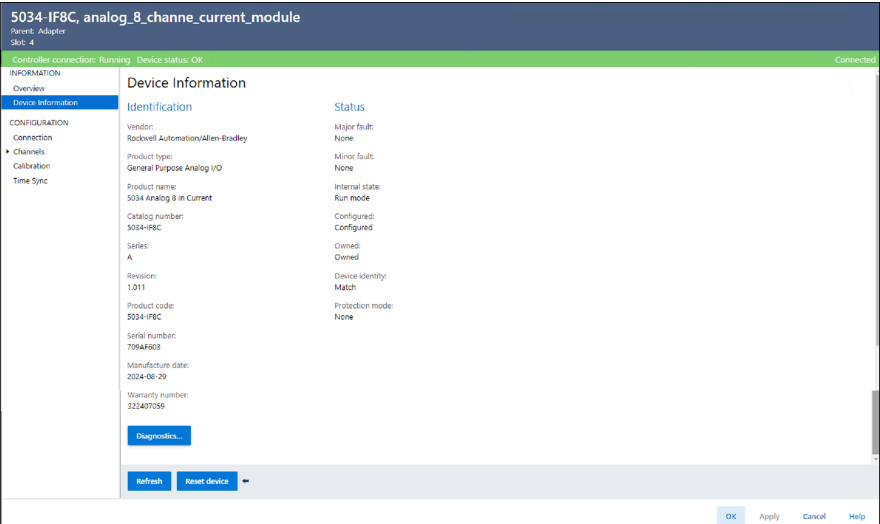
Device Information View

Use Device Information to view device and status information when the device is online.

Use Device Information to:

- Determine the identity of the device.
- View the device's current operational state.
- View whether the device was configured by the owner controller.
- View whether an owner controller is currently connected to the device.
- Retrieve the latest information from the device.
- Reset a device to its power-up state.
- If supported, view the Protection Mode of the device.

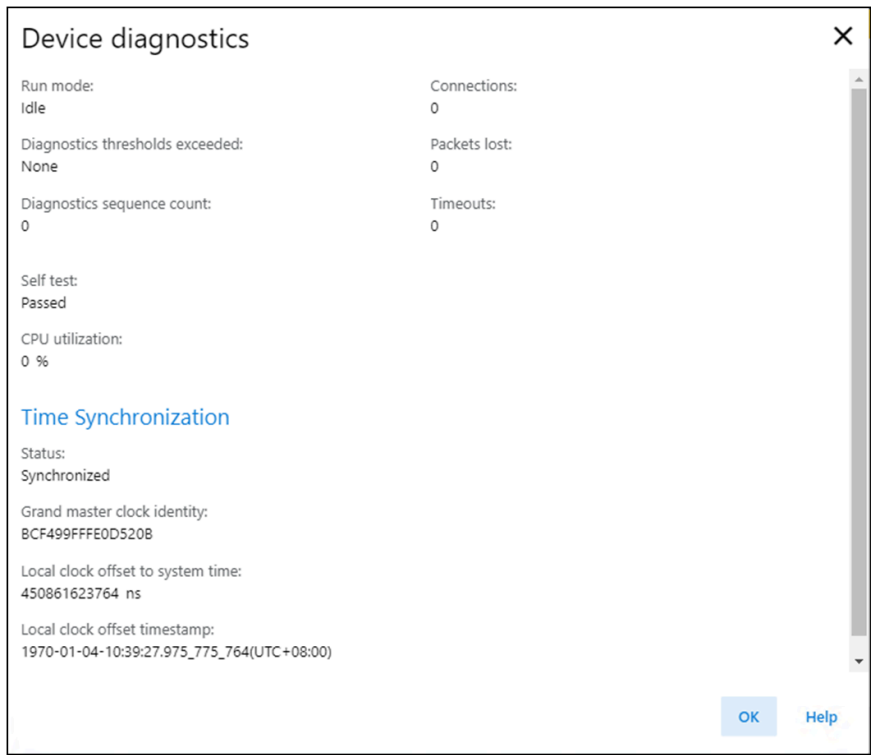
Figure 29. Device Information View Example



Device Diagnostics

To view the device diagnostics, select Diagnostics in the Device Information view.

Figure 30. Device Diagnostics Example



Connection View

Use Connection to define controller-to-device behavior:

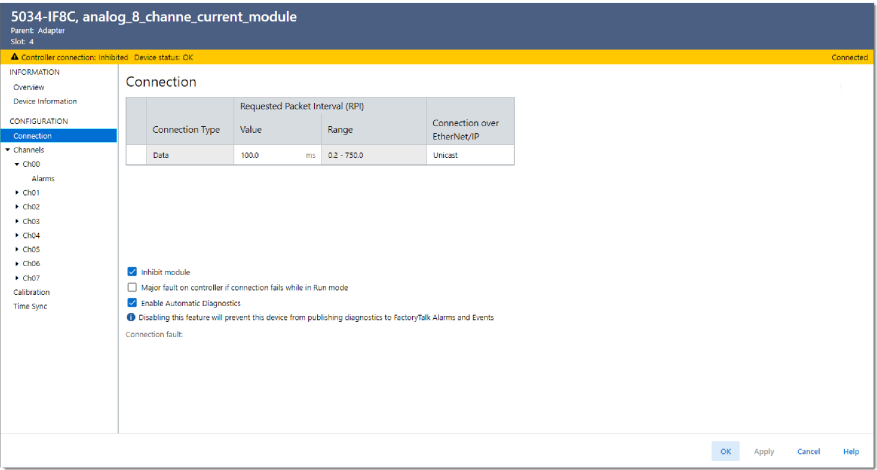
- Set the RPI rate. For more information, see [Requested Packet Interval on page 17](#).
- Select Unicast or Multicast connection to use on the EtherNet/IP network. For more information, see [Unicast or Multicast Connection on page 21](#).
- View the reason of Connection Fault.

 If there is a connection fault, Connection Fault area displays the error code with description that helps you to troubleshoot the module. For more information, see [Troubleshoot Your Module on page 50](#).

- Inhibit the module. For more information, see [Module Inhibiting on page 18](#).
- Configure fault response for connection failure while the controller is in Run Mode.
- Enable or disable the Automatic Diagnostics.

 **ATTENTION:** If you do not enable Automatic Diagnostics, the device does not publish diagnostics to FactoryTalk Alarms and Events.

Figure 31. Connection View Example



Recommended Minimum RPI Values for Notch Filters

In the following table, each Notch Filter setting has two recommended minimum module RPI values that allow the required time to collect samples from each channel. One setting provides faster sample speed and the other provides slightly better resolution at slower sample speeds.

Table 38. Notch Filter and Recommended Minimum Module RPI Values

Notch Filter (Hz)	Recommended Minimum Module RPI Value			
	Application That is Configured With Only One Channel Enabled		Application With All Channels Enabled and Using the Same Notch Filter Setting on All Channels	
	Faster Sampling Speed (ms)	Better Noise Rejection (ms)	Faster Sampling Speed (ms)	Better Noise Rejection (ms)
10	106	316	422	NA
20	53.1	158.1	212	632
50	22	64	86	254
60 (default)	18.3	53.2	72	212
100	11.2	32.1	44	127
200	5.9	16.4	22.2	65
400	3.5	8.6	12	33
500	2.8	6.9	9.3	26.5
1000	1.7	3.8	5.2	13.5
5000	1.0	1.3	2.2	3.3
10000	0.7	0.9	1.7	2.1
15625	0.8	0.8	1.7	1.7
31250	0.4	0.6	1.2	1.5

Minimum RPI Calculation When Using Different Notch Filter Selections

When input channels on the same module use different Notch Filter selections, you must consider the sample time for each channel. This helps you to find the recommended RPI that provides enough time for sampling all channels.

The eight input channels on the module are grouped into two groups. Channels 00...03 are grouped, and channels 04...07 are grouped. When you determine the recommended minimum module RPI value, remember:

- The recommended minimum module RPI value when channels use different Notch Filter selections is determined by group.

The recommended minimum RPI rates for all enabled channels added together. If any channel in the other group is enabled, the recommended minimum RPI rate for each enabled channel is increased by 0.2 ms.

- If the groups have different recommended minimum RPI values, use the higher RPI value when you configure the module.

Table 39. Example Application That Requires Faster Sampling Speed

Channel Group	Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms) ⁽¹⁾	Recommended Minimum Module RPI (ms)	Recommended Minimum Module RPI to Use in Module Configuration (ms)
Grouped together	Ch00	50	22.2	24.7	74.0
	Ch01	1000	1.9		
	Ch02 - Disabled	N/A	N/A		
	Ch03	31250	0.6		
Grouped together	Ch04	60	18.5	74.0	
	Ch05	60	18.5		
	Ch06	60	18.5		
	Ch07	60	18.5		

(1) The values in this column represent the corresponding recommended minimum RPI value listed in [Table 38: Notch Filter and Recommended Minimum Module RPI Values on page 103](#) with an additional 0.2 ms added to it because at least one channel is enabled in the other group.

Table 40. Example Application That Requires Better Noise Rejection

Channel Group	Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms) ⁽¹⁾	Recommended Minimum Module RPI (ms)	Recommended Minimum Module RPI to Use in Module Configuration (ms)
Grouped together	Ch00	50	64.2	69.0	213.6
	Ch01	1000	4		

Table 40. Example Application That Requires Better Noise Rejection (continued)

Channel Group	Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms) ⁽¹⁾	Recommended Minimum Module RPI (ms)	Recommended Minimum Module RPI to Use in Module Configuration (ms)
Grouped together	Ch02 - Disabled	N/A	N/A	213.6	
	Ch03	31250	0.8		
	Ch04	60	53.4		
	Ch05	60	53.4		
	Ch06	60	53.4		
	Ch07	60	53.4		

(1) The values in this column represent the corresponding recommended minimum RPI value listed in [Table 38: Notch Filter and Recommended Minimum Module RPI Values on page 103](#) with an additional 0.2 ms added to it because at least one channel is enabled in the other group.

Channels View

The Channels view shows an overview of the configuration values for all module channels.

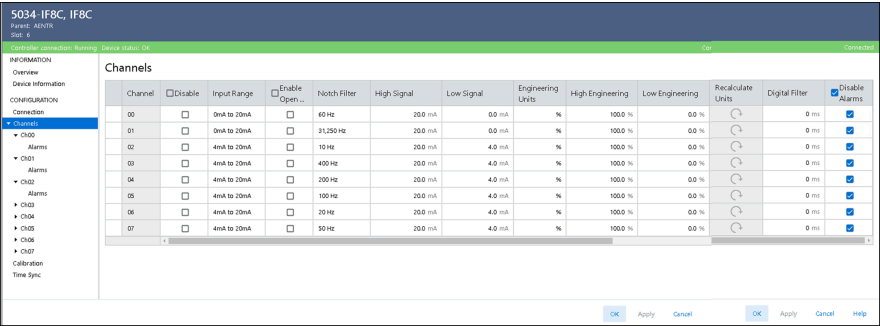


Not all channel configurations are included in Channels view. To view or change the complete set of the channel configuration and also to view the diagnostics information for the channel, use Chxx view.

You can do the following actions on this view for all the channels:

- Disable the channel, if desired
- Change the input range
- Set the notch filter
- Enable or disable open wire detection
- Set the scaling and recalculate all configurations with engineering unit
- Set digital filter
- Disable alarms

Figure 32. Channels View Example



Chxx View

The Chxx view, where xx represents the channel number, shows the configuration options available for the respective channel.

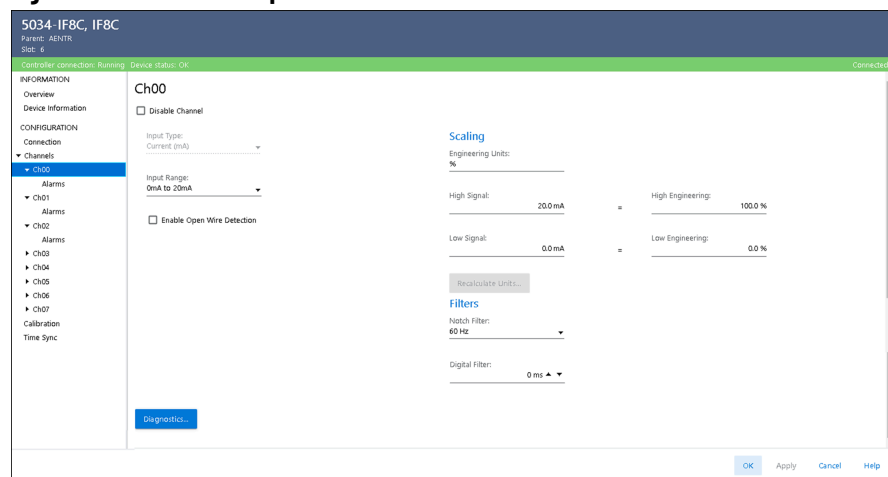
You can do the following actions on this view:

- Disable the channel, if desired
- Change the input range
- Set the notch filter
- Enable or disable open wire detection
- Set the scaling and recalculate all configurations with engineering unit
- Set digital filter
- View channel diagnostics information



To latch and configure alarm parameters, go to Alarms view.

Figure 33. Chxx View Example

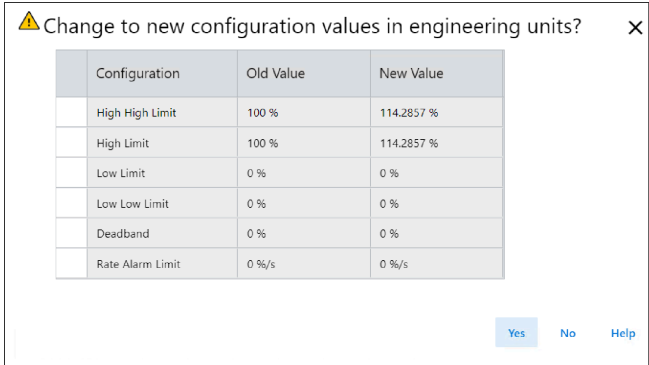


Recalculate Units

Recalculate Units lets you recalculate all configurations with engineering unit after a scaling change. Consider the following:

- The Recalculate Units option is enabled when the scaling configuration is changed.
- Upon selecting Recalculate Units option, the recalculated new values based on the new scaling configuration are displayed together with the old values for you to verify before changing.
- If you select "Yes" to proceed with the change, the new values will be set but it gets applied when you select "Apply/OK".
- If you select "No" to cancel the change, the old values are retained. You can either select the Recalculate Units again or manually change those configurations based on the new scaling.

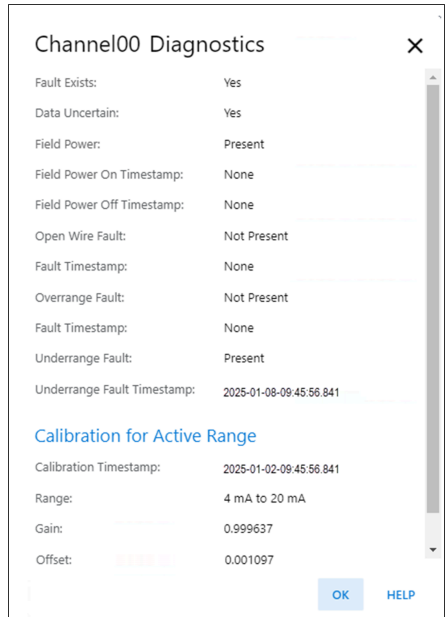
Figure 34. Recalculate Units Example



Channelxx Diagnostics

Displays the channel diagnostics information when connected with the module. When online with the module, select the Diagnostics on the Chxx view to see the diagnostic information.

Figure 35. Channelxx Diagnostics Example



Alarms View

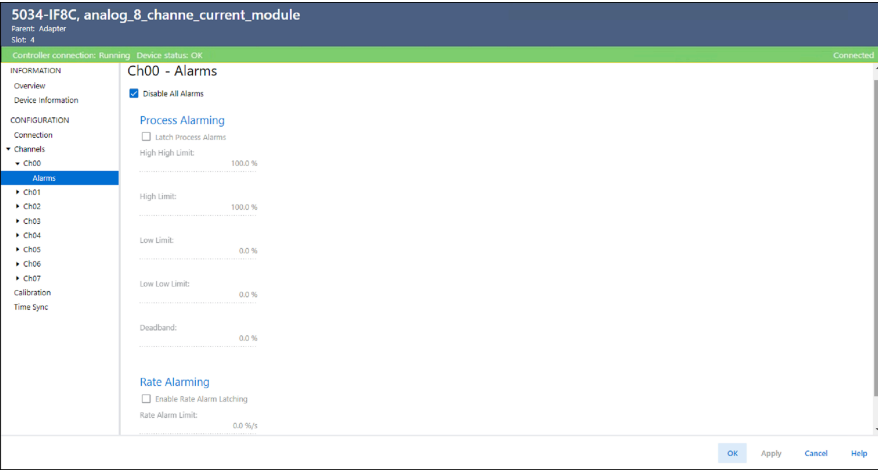
Each channel on the input module has an Alarms view. You can do the following actions on this view:

- Disable all the alarms.
- Enable/Disable latching and set the alarm limits for the process alarms:
 - High High
 - High
 - Low
 - Low Low
 - Deadband
- Enable/Disable latching and set limit for the rate alarm.



Rate Alarm Limit of 0.0 disables the rate alarm.

Figure 36. Chxx - Alarms View Example



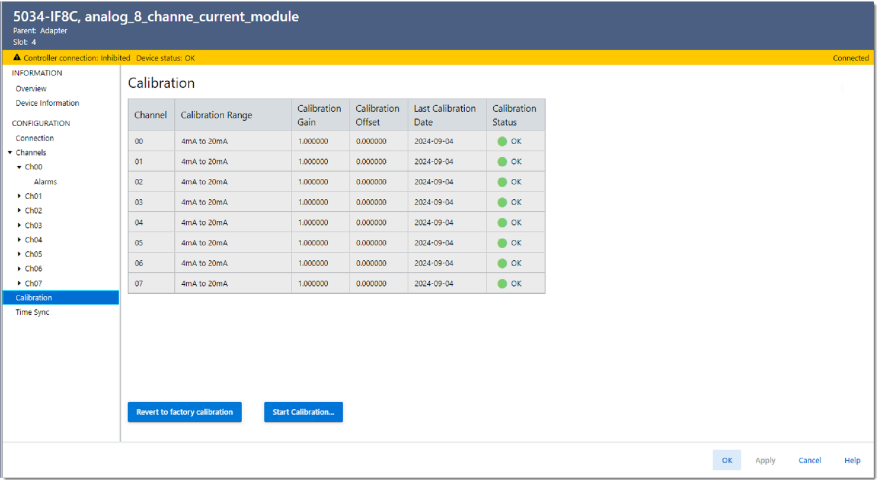
Calibration View

The Calibration view provides calibration information for all channels on the module. You can do the following actions on this view for all the channels:

- View calibration parameters and calibration status for the currently configured input ranges.
- Perform user calibration for one or multiple channels.
- Revert calibration parameters to the factory default values.

For more information on how to calibrate a module, see [Module Calibration \(Interactive\) on page 109](#)

Figure 37. Calibration View Example



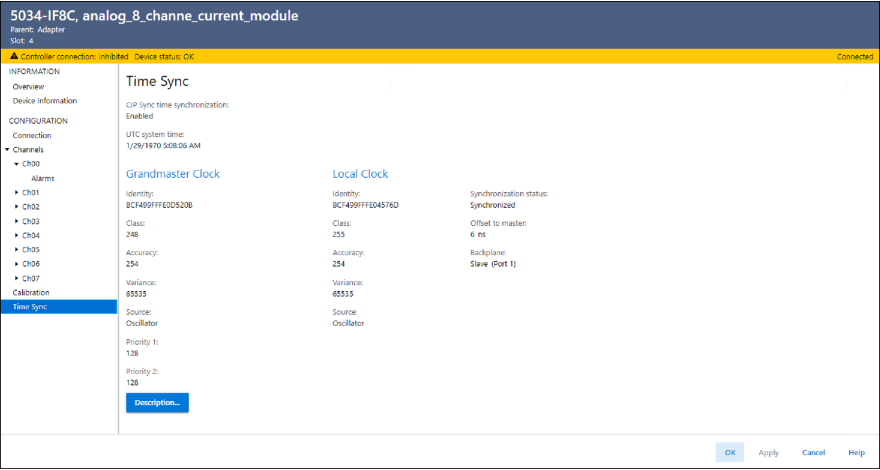
Time Sync View

The Time Sync view is read-only and displays the CIP Sync status information about the module when the project is online. The Time Sync category displays the following information:

- CIP Sync time synchronization status
- UTC system time
- Grandmaster Clock information

- Grandmaster Clock description
- Local Clock information

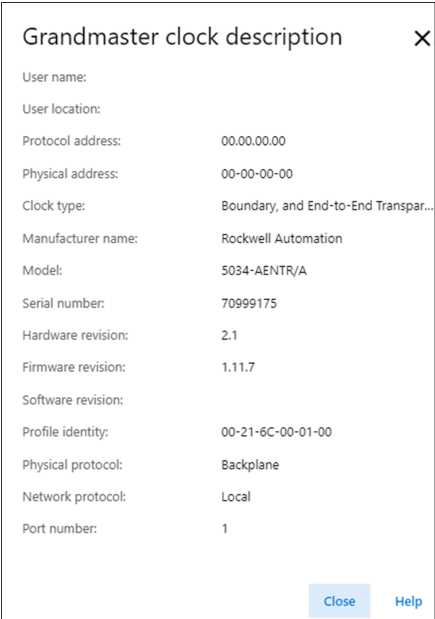
Figure 38. Time Sync View Example



Grandmaster Clock Description

The Grandmaster clock description dialog provides detailed information about the grandmaster clock. To view the Grandmaster clock description, select Description in the Time Sync view.

Figure 39. Grandmaster Clock Description Example



Module Calibration (Interactive)

You can use Calibration view in Module Properties to interactively calibrate the module on a per channel basis or in group.

Controller State During Calibration

You must add the module to your Studio 5000 Logix Designer application project before you can calibrate it.

The project must be online with the owner-controller to calibrate the PointMax analog modules. You can calibrate under any of the following conditions:

- The controller is in Program Mode, that is, either Remote Program or Program Mode.
Your module must be in Program Mode and not be actively controlling a process when you calibrate it.
- There are no connections to the module.

Calibration Impacts Data Quality

When a channel on an analog input module is being calibrated, the Notch Filter setting for that channel changes to 10 Hz. The *I.Chxx.Uncertain* tag is set to 1 for that channel until calibration is completed.

Grouped inputs share an Analog-to-Digital converter. As a result when any input channel is in the calibration process, the *I.Chxx.Uncertain* tag is set to 1 for other input channels in that group. This is because the data sampling rate slows for all input channels in the group.

Calibration Instrumentation Specifications

When you calibrate the analog input modules, send current reference signal to the module to calibrate it. To maintain your module's factory calibration accuracy, use the instrumentation with the specifications listed in the following table.

- IMPORTANT:** Do not calibrate your module with an instrument that is less accurate than those specified in following table. The following events can result:
- Calibration appears to occur normally but the module gives inaccurate data during operation.
 - A calibration fault occurs, forcing you to abort calibration. When this happens, *I.Chxx.CalFault* tag is set for the channel you attempted to calibrate. You can clear this tag by completing a valid calibration or cycling power to the module.

Table 41. Instrument Specifications

Catalog Number	Channel Input Type	Calibration Instrumentation Specifications
5034-IF8C and 5034-IF8CXT	Current (mA)	4.00...20.00 mA source ±100 nA current

Calibration Procedure

This procedure describes how to calibrate a channel on the analog input module for use with a Current (mA) input type.

Apply Low and High Signal references to the analog input module to calibrate it. The references must match the input range the channel is using.

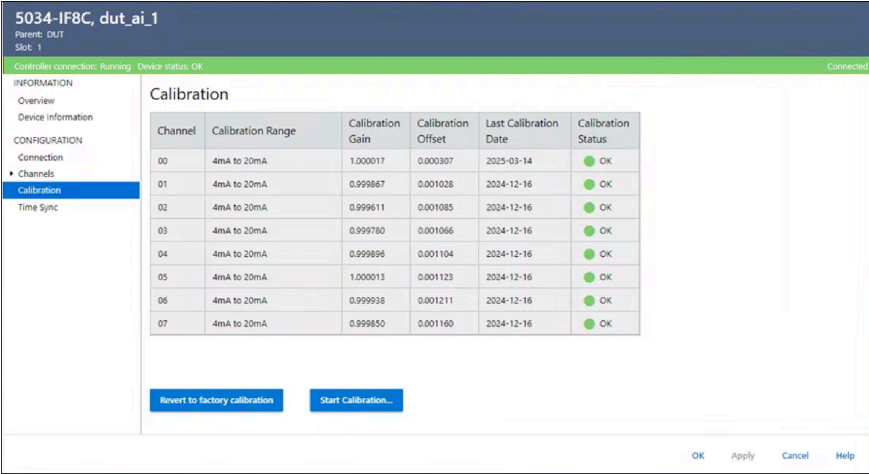
Table 42. Analog Input Module Calibration References

Input Type	Input Range	Low Calibration Reference	High Calibration Reference
Current (mA)	0...20 mA	4.0 mA	20.0 mA

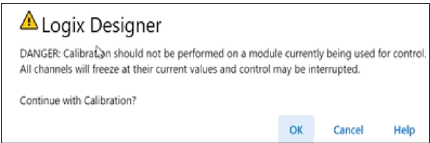
Table 42. Analog Input Module Calibration References (continued)

Input Type	Input Range	Low Calibration Reference	High Calibration Reference
	4...20 mA		

1. Connect the current calibrator to the channel being calibrated.
2. Go online with the project and make sure that the controller is in Program Mode.
3. Confirm that the channel to be calibrated is configured for the correct Input Range.
4. On the Calibration view in the Module Properties dialog, select Start Calibration.



5. When the dialog appears to confirm that you want to calibrate the channel, select OK.



6. Select the channels one at a time or in groups to calibrate and then select Next.

Calibration Wizard - Select Channels to Calibrate

Select the checkboxes of the channels to calibrate, and then select to calibrate in groups or one at a time.

	Channel	Calibrate	Calibration Range	Calibration Gain	Calibration Offset	Calibration Status
*	00	☒	4mA to 20mA	1.000017	0.000307	<div>OK</div>
	01	☐	4mA to 20mA	0.999867	0.001028	<div>OK</div>
	02	☐	4mA to 20mA	0.999611	0.001085	<div>OK</div>
	03	☐	4mA to 20mA	0.999780	0.001066	<div>OK</div>
	04	☐	4mA to 20mA	0.999896	0.001104	<div>OK</div>
	05	☐	4mA to 20mA	1.000013	0.001123	<div>OK</div>
	06	☐	4mA to 20mA	0.999938	0.001211	<div>OK</div>
	07	☐	4mA to 20mA	0.999850	0.001160	<div>OK</div>

☐ Calibrate channels in groups

☒ Calibrate channels one at a time

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Next

Cancel

Help

7. When the Attach Low Reference dialog appears, set the calibrator to the low reference and apply it to the channel.

Calibration Wizard - Attach Low Reference

Attach reference signals to selected channels. Select Next to continue.

Channel: 00

Channel	Calibrate	Calibration Range	Low Reference
00	☒	4mA to 20mA	4.00 <div>mA</div>
01	☐		
02	☐		
03	☐		
04	☐		
05	☐		
06	☐		
07	☐		

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Cancel

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8. Select Next. The Low Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - Low Reference Results

✕

Select Next to continue.

Channel	Calibrate	Calibration Range	Low Reference	Status
00	☒	4mA to 20mA	4.00 mA	<div><div></div>OK</div>
01	☐			
02	☐			
03	☐			
04	☐			
05	☐			
06	☐			
07	☐			

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9. If the Status is OK, select Next. If the Status is not OK, repeat the calibration process.
10. When the Attach High Reference dialog appears, set the calibrator to the high reference and apply it to the channel.

Calibration Wizard - Attach High Reference

✕

Attach reference signals to selected channels. Select Next to continue.

Channel: 00

Channel	Calibrate	Calibration Range	High Reference
00	☒	4mA to 20mA	20.00 mA
01	☐		
02	☐		
03	☐		
04	☐		
05	☐		
06	☐		
07	☐		

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Cancel

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11. Select Next. The High Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - High Reference Results

Select Next to continue.

Channel	Calibrate	Calibration Range	High Reference	Status
00	☒	4mA to 20mA	20.00 mA	OK
01	☐			
02	☐			
03	☐			
04	☐			
05	☐			
06	☐			
07	☐			

Retry

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12. If the Status is OK, select Next. If the Status is not OK, repeat the calibration process.
13. When the Calibration Completed dialog appears, select Finish.

Calibration Wizard - Calibration Completed

Calibration completed successfully. The calibration constants are saved.

Channel	Calibrate	Calibration Range	Low Reference	Status	High Reference	Status
00	☒	4mA to 20mA	4.00 mA	OK	20.00 mA	OK
01	☐					
02	☐					
03	☐					
04	☐					
05	☐					
06	☐					
07	☐					

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Use the Status Indicators for Troubleshooting

- PointMax I/O modules use the following status indicators:
- SA Power Indicator - This indicator operates the same for all PointMax I/O modules.
 - Module Status Indicator - This indicator operates the same for all PointMax I/O modules.
 - Channel Status Indicator - This indicator operates differently based on the module type that you are using.

SA Power Status Indicator

Table 43. Interpret SA Power Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	There is SA power to the module.	None
Steady red	There is no SA power to the module or SA power voltage is not in the valid range.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that SA power wiring is properly connected to the adapter, expansion power module, or 5034-MBSA mounting base. 2. Check the following: <ul style="list-style-type: none"> - Check that the SA voltage is in the correct range. - If an external power supply is used, confirm that the power supply is turned on. - Make sure that the mounting base to mounting base connection is properly secured. <p>Go to Chassis Information view in the Module Properties of the adapter to check the Field Power status of mounting bases installed in all slots.</p>

Module Status Indicator

Table 44. Interpret Module Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	The module is operational and all I/O connections are active.	None
Flashing green	The module has no I/O connections.	Troubleshoot your Studio 5000 Logix Designer application to determine what is preventing a connection from the module to the controller and correct the issue.
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> • A module firmware update is in progress. • A module firmware update attempt failed. • The device has experienced a recoverable fault. • A connection to the module has timed out. 	Complete one of the following: <ul style="list-style-type: none"> • Let the firmware update process complete. • Reattempt a firmware update after one fails. • Use the Studio 5000 Logix Designer application to determine whether a module recoverable fault is occurred. It is shown in Device Information view.

Table 44. Interpret Module Status Indicator (continued)

Indicator State	Description	Recommended Action
		<p>To clear a recoverable fault, complete one of the following:</p> <ul style="list-style-type: none"> - Cycle module power. - Select Reset device in the Studio 5000 Logix Designer project via the Device Information view of the Module Properties dialog. <p>If the fault does not clear after cycling power and module reset, contact Rockwell Automation Technical Support.</p> <ul style="list-style-type: none"> • Use the Studio 5000 Logix Designer application to determine if a connection has timed out. The Connection view in the Module Properties indicates whether a connection request has timed out. <p>If a connection has timed out, determine the cause and correct it. For example, a cable failure can cause a connection timeout.</p>
Steady red	The module experienced a nonrecoverable fault.	<p>Complete the following actions:</p> <ol style="list-style-type: none"> 1. Cycle power to the module. 2. If the status indicator remains in the steady red state, replace the module.

Channel Status Indicators

Table 45. Interpret Analog Input Channel Status Indicators

Indicator State	Description	Recommended Action
Off	<p>One of the following conditions exists:</p> <ul style="list-style-type: none"> • The module is not powered. • The module is powered but connection is not established from the controller to module. • The module is powered, but the input channel is disabled. 	<p>Complete one of the following:</p> <ul style="list-style-type: none"> • If you expect the module to be powered but it is not, complete the following: <ul style="list-style-type: none"> - Confirm that the system is powered. - Confirm that the module is installed properly. • If the module is powered but the channel is not operating as expected, use the Studio 5000 Logix Designer application to confirm that the channel is not disabled and the module has a connection to the controller. <p>The Connection view in the Module Properties indicates if the connection is running or faulted. If the connection is faulted, the Connection view indicates error information.</p> <ul style="list-style-type: none"> • If the channel is disabled, no action is needed.
Steady yellow	The input channel is operating normally.	None

Table 45. Interpret Analog Input Channel Status Indicators (continued)

Indicator State	Description	Recommended Action
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> There is no SA power to the module, or SA power voltage is not in the valid range. The input signal is overrange or underrange. The signal range is set in your Studio 5000 Logix Designer application project. An Open Wire condition, that is, a wire is disconnected from the input channel. 	Complete one of the following: <ul style="list-style-type: none"> If there is a SA power fault, see the recommended action given for steady red indicator state in SA Power Indicator table above. Check the input signal to determine if it is overrange or underrange. If so, make changes to return the input signal to within the range limits. Check the wiring at the input channel. If necessary, reconnect the wire.
Flashing yellow/red	Calibration is in progress.	Successfully complete the calibration process.
Steady red	An issue has occurred that is internal to the module. The following are example issues that can cause the status indicator to be steady red: <ul style="list-style-type: none"> A calibration fault occurred on the channel. The module has experienced a nonrecoverable fault. 	Complete one of the following: <ul style="list-style-type: none"> If the indicator turns steady red after a calibration process, you can either perform a successful calibration or cycle the power to recover the fault. If it is not caused by the calibration, cycle the power to recover the fault. If the condition is still present, replace the module.

Module Tag Definitions

Module tags are created when you add a module to the Studio 5000 Logix Designer application project. The set of module tags associated with a module depends on the module type and Device Definition choices made during module configuration. The tables contained in this section list all of the tags available with a module. Not all tags in the list are used when that module type is added to a project. Tag use varies by module configuration.

Configuration Tag Definitions

Table 46. Configuration Tags

Name	Data Type	Definition	Valid Values
Chxx.Range	SINT	Channel's operating range	<ul style="list-style-type: none"> 4 = 0...20 mA 5 = 4...20 mA
Chxx.NotchFilter	SINT	Notch Filter removes line noise for the channel.	<ul style="list-style-type: none"> 0 = 10 Hz 16 = 20 Hz 1 = 50 Hz 2 = 60 Hz 3 = 100 Hz 4 = 200 Hz 20 = 400 Hz 5 = 500 Hz

Table 46. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> 6 = 1,000 Hz 8 = 5,000 Hz 9 = 10,000 Hz 10 = 15,625 Hz 12 = 31,250 Hz
Chxx.AlarmDisable	BOOL	<p>Disables all alarms on the channel.</p> <hr/> <p>IMPORTANT: Consider the following:</p> <ul style="list-style-type: none"> If you change this tag to 0, that is, so that the alarms are not disabled, you must also enable the individual alarms for them to work. <p>For example, if you want to use the Low Low Alarm for a channel, you must set the Chxx.AlarmDisable to 0 and set the Chxx.LLAlarmEn output tag to 1 so that the alarm is enabled.</p> <p>This applies to all alarms on the module.</p> <ul style="list-style-type: none"> Conversely, if you set this tag to 1, alarms are disabled regardless of the setting on the alarm enable tag for any alarm. <hr/>	<ul style="list-style-type: none"> 0 = Alarms are enabled 1 = Alarms are disabled
Chxx.ProcessAlarmLatchEn	BOOL	<p>Configures Process alarms to latch until they are explicitly unlatched.</p> <p>The Process alarms include:</p> <ul style="list-style-type: none"> HighHigh Alarm High Alarm Low Alarm LowLow Alarm 	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.RateAlarmLatchEn	BOOL	Configures the Rate Alarm to latch until it is explicitly unlatched.	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.OpenWireEn	BOOL	Enables the input Open Wire diagnostic.	<ul style="list-style-type: none"> 0 = Disabled 1 = Enabled
Chxx.Disable	BOOL	<p>Disables the channel.</p> <p>When a channel is disabled, the following occurs:</p> <ul style="list-style-type: none"> The I/O status indicator for the channel turns off. The Chxx.Fault input tag is set to 1. 	<ul style="list-style-type: none"> 0 = Channel is enabled 1 = Channel is disabled
Chxx.TenOhmOffset	INT	Not Applicable	0
Chxx.DigitalFilter	INT	A non-zero value enables the filter, providing a time constant in milliseconds used in a first order lag filter to smooth the input signal.	<p>0 = Filter is turned off</p> <p>Any value greater than zero = Filter value in milliseconds</p>

Table 46. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
Chxx.LowSignal	REAL	One of four points used in scaling. The low signal is in terms of the inputs signal units and corresponds to the low engineering term when scaled.	Any value less than the high signal in range
Chxx.HighSignal	REAL	One of four points used in scaling. The high signal is in terms of the inputs signal units and corresponds to the high engineering term when scaled.	Any value greater than the low signal in range
Chxx.LowEngineering	REAL	One of four points used in scaling. The low engineering helps determine the engineering units the signal values scale into. The low engineering term corresponds to the low signal value.	Any value
Chxx.HighEngineering	REAL	One of four points used in scaling. The high engineering helps determine the engineering units the signal values scale into. The high engineering term corresponds to the high signal value.	Any value
Chxx.LLAlarmLimit	REAL	The Low Low Alarm trigger point. Causes the Chxx.LLAlarm to trigger when the input signal moves beneath the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.LAlarmLimit	REAL	The Low Alarm trigger point. Causes the Chxx.LAlarm to trigger when the input signal moves beneath the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.HAlarmLimit	REAL	The High Alarm trigger point. Causes the Chxx.HAlarm to trigger when the input signal moves above the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.HHAlarmLimit	REAL	The High High Alarm trigger point. Causes the Chxx.HHAlarm to trigger when the input signal moves above the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.RateAlarmLimit	REAL	The Rate Alarm trigger point. Causes the Chxx.RateAlarm to trigger when the input signal changes at a rate faster than the configured Rate Alarm. Configured in Engineering Units per second.	0 = Rate Alarm is not used Any value greater than zero = Trigger point
Chxx.AlarmDeadband	REAL	Allows a process alarm to remain set, despite the alarm condition disappearing, as long as the input data remains within the deadband of the process alarm. The deadband value is subtracted from the High and High High Alarm Limits to calculate the deadband thresholds for these alarms. The deadband value is added to the Low and Low Low Alarm Limits to calculate the deadband thresholds for these alarms.	Any non-negative value

Input Tag Definitions

Table 47. Input Tags

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Module is not applying new Output tag data because the controller is in Program Mode. 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
ConnectionFaulted	BOOL	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	<ul style="list-style-type: none"> 0 = A connection exists between the module and the controller 1 = Connection is timed out or inhibited
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics are active 1 = One or more diagnostics are active or the prognostics threshold is reached.
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.	-128...+127 The value of 0 is skipped except during module powerup.
Chxx.Fault	BOOL	Indicates that channel data is inaccurate and cannot be trusted for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. <hr/> IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	<ul style="list-style-type: none"> 0 = No fault exists 1 = Fault exists
Chxx.Uncertain	BOOL	Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain

Table 47. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	
Chxx.OpenWire	BOOL	The signal wire is disconnected from the channel or the RTB is removed from the module.	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled 1 = Open wire condition exists, which means the signal wire is disconnected from the channel or the RTB is removed from the module
Chxx.OverTemperature	BOOL	Not applicable for this module.	N/A
Chxx.FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
Chxx.NotANumber	BOOL	Indicates that the last value received for the channel output data value was not a number.	<ul style="list-style-type: none"> 0 = Last channel data received was a number 1 = Last channel data received was not a number
Chxx.Underrange	BOOL	Indicates that the channel data is beneath the underrange threshold for this channel. For example, when the channel operates in the 4...20 mA input range, the underrange threshold on the channel is <3.0 mA. If the input signal is 0 mA, this tag is set to 1.	<ul style="list-style-type: none"> 0 = Channel data is not beneath the underrange threshold 1 = Channel data is beneath the underrange threshold
Chxx.Overrange	BOOL	Indicates that the channel data is above the overrange threshold for this channel. For example, when the channel operates in the 4...20 mA output range, the overrange threshold on the channel is >23.0 mA. If the input signal is 24 mA, this tag is set to 1.	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
Chxx.LLAlarm	BOOL	Triggered when the input data value is less than the Low Low Alarm value. If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is greater than the Low Low Limit plus the Alarm Deadband.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.LAlarm	BOOL	Triggered when the input data value is less than the Low Alarm value. If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is greater than the Low Limit plus the Alarm Deadband.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.HAlarm	BOOL	Triggered when the input data value is greater than the High Alarm value.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered

Table 47. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is less than the High Limit minus the Alarm Deadband.	
Chxx.HHAlarm	BOOL	Triggered when the input data value is greater than the High High Alarm value. If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is less than the High High Limit minus the Alarm Deadband.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.RateAlarm	BOOL	Triggered when the change between consecutive channel samples divided by the period of time between when the samples were taken exceeds the Rate Alarm. If latched, this tag remains set until it is unlatched.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.CalFault	BOOL	Indicates that the last attempted Calibration for this channel failed or there is no calibration data present. This tag is cleared, that is, set to 0, when power is cycled to the module or a successful calibration for the range on the channel is performed.	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed
Chxx.Calibrating	BOOL	Indicates that the channel is currently being calibrated.	<ul style="list-style-type: none"> 0 = Channel is not being calibrated 1 = Channel is being calibrated
Chxx.CalGoodLowRef	BOOL	Indicates that a valid Low Reference signal is sampled on this channel in the calibration process. IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.	<ul style="list-style-type: none"> 0 = Valid Low Reference signal has not been sampled on this channel 1 = Valid Low Reference signal has been sampled on this channel
Chxx.CalBadLowRef	BOOL	Indicates that an invalid Low Reference signal is sampled on this channel in the calibration process. You must correct this condition to successfully calibrate the module. If calibration is aborted with an invalid Low Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.	<ul style="list-style-type: none"> 0 = Invalid Low Reference signal has not been sampled on this channel 1 = Invalid Low Reference signal has been sampled on this channel

Table 47. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	
Chxx.CalGoodHighRef	BOOL	<p>Indicates that a valid High Reference signal is sampled on this channel in the calibration process.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Valid High Reference signal has not been sampled on this channel 1 = Valid High Reference signal has been sampled on this channel
Chxx.CalBadHighRef	BOOL	<p>Indicates that an invalid High Reference signal is sampled on this channel in the calibration process.</p> <p>You must correct this condition to successfully calibrate the module.</p> <p>If calibration is aborted with an invalid High Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Invalid High Reference signal has not been sampled on this channel 1 = Invalid High Reference signal has been sampled on this channel
Chxx.CalSuccessful	BOOL	<p>Indicates calibration on this channel is complete and the Calibrating state has been exited.</p> <p>This tag remains set after valid calibration and until a new calibration process is started or the connection is closed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Calibration was not successful 1 = One of the following: <ul style="list-style-type: none"> Calibration was successful and calibrating state has been exited. Calibration data is present and applied.
Chxx.Data	REAL	Channel data in scaled Engineering Units.	Any value
Chxx.RollingTimestamp	INT	<p>Continuously-running 15-bit timer that counts in milliseconds.</p> <p>Whenever an input module scans its channels, it also records the value of RollingTimestamp at that time. The</p>	0...32,767

Table 47. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		user program uses the last two RollingTimestamp values and calculates the interval between receipt of data.	

Output Tag Definitions

Table 48. Output Tags

Name	Data Type	Definition	Valid Values
Chxx.LLAlarmEn	BOOL	<p>Enables the Low Low Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.LAlarmEn	BOOL	<p>Enables the Low Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.HAlarmEn	BOOL	<p>Enables the High Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.HHAlarmEn	BOOL	<p>Enables the High High Alarm.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm

Table 48. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p>	
Chxx.RateAlarmEn	BOOL	<p>Enables the Rate Alarm.</p> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.LLAlarmUnlatch	BOOL	Unlatches a latched Low Low Alarm at the first instance of the bit transitioning from 0 to 1.	<ul style="list-style-type: none"> 0 = Low Low Alarm remains latched 1 = Low Low Alarm unlatched
Chxx.LAlarmUnlatch	BOOL	Unlatches a latched Low Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = Low Alarm remains latched 1 = Low Alarm unlatched
Chxx.HAlarmUnlatch	BOOL	Unlatches a latched High Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = High Alarm remains latched 1 = High Alarm unlatched
Chxx.HHAlarmUnlatch	BOOL	Unlatches a set High High Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = High High Alarm remains latched 1 = High High Alarm unlatched
Chxx.RateAlarmUnlatch	BOOL	Unlatches a set Rate Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = Rate Alarm remains latched 1 = Rate Alarm unlatched
Chxx.Calibrate	BOOL	<p>Initiates the Calibration process.</p> <p>This tag must remain set until a valid Low Reference and High Reference values are applied to the input.</p> <p>If the tag value transitions to 0 before calibration is finished, the process stops and calibration fails.</p>	<ul style="list-style-type: none"> 0 = Not to start calibration process 1 = Start calibration process
Chxx.CalLowRef	BOOL	<p>Rising edge triggers the Low Calibration at the Low Reference Point for the current input range value.</p> <p>A valid Low Reference signal must be connected to the channel before setting this tag.</p>	<ul style="list-style-type: none"> 0 = Not to start low reference sampling 1 = Start low reference sampling

Table 48. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		<div> IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device Definition. If you use the Data connection type, this tag does not appear in the module tags. </div>	
Chxx.CalHighRef	BOOL	<div> Rising edge triggers a High Calibration at the High Reference Point for the current input range value. A valid High Reference signal must be connected to the channel before setting tag. </div> <div> IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device Definition. If you use the Data connection type, this tag does not appear in the module tags. </div>	<ul style="list-style-type: none"> 0 = Not to start high reference sampling 1 = Start high reference sampling
Chxx.SensorOffset	REAL	<div> Compensates for any known offset error on the sensor or channel to which the sensor is connected. Value is in terms of engineering units. The value of this tag is added to the measured value in engineering units and is used in the Chxx.Data input tag. </div>	<div>Any valid float value</div> <div>Use a value in the channel's operating range.</div>

Diagnostic Assembly

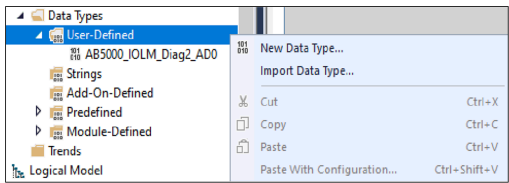
Diagnostic assembly helps you troubleshoot and diagnose the fault in your system.

Create User-defined Diagnostic Assembly Types

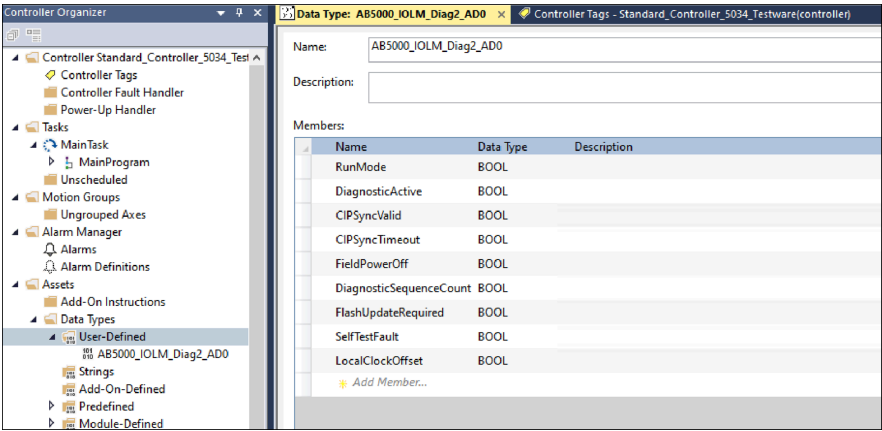
You can use the Studio 5000 Logix Designer application to create user-defined Diagnostic Assembly types.

Create user-defined diagnostic assembly by following the below steps:

- From the Controller Organizer pane, go to Assets → Data types → User-Defined.
- Right-click on the User-Defined folder and select New Data Type.



- Add a Name and Description (optional) for your diagnostic assembly.
- Under Members area, add the data members based on the diagnostic assembly detailed below.



IMPORTANT: The members indicated in the tables are arranged according to Data Alignment Rules of controllers. Strictly follow the data type and the sequence of the members that are indicated in the tables of this appendix. If the data type and the sequence are not followed, data misalignment may occur after executing Get Attribute Single Message (MSG) instruction.

Diagnostic Assemblies

- Diagnostic Assembly A for Analog 8 Channel Input Module
 - Instance ID: 0x8019 (32793)
 - Size = 336 bytes

Follow the information in the following table to add each member.

Table 49. Diagnostic Assembly Instance 32793

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
CIPSyncValid	BOOL	
CIPSyncTimeout	BOOL	
Infobit_Pad5	BOOL	
FieldPowerOff	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
Diagbit_Pad0	BOOL	2
Diagbit_Pad1	BOOL	
Diagbit_Pad2	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	

Name	Date Type	Size in Bytes
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
FlashUpdateRequired	BOOL	
SelfTestFault	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad	DINT	4
LocalClockOffset	LINT	8
LocalClockOffsetTimestamp	LINT	8
GrandMasterClockID	SINT[8]	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8
Ch00	Diagnostic_Channel_Structure	72
Ch01	Diagnostic_Channel_Structure	72
Ch02	Diagnostic_Channel_Structure	72
Ch03	Diagnostic_Channel_Structure	72

2. Diagnostic Assembly B for Analog 8 Channel Input Module

- Instance ID: 0x801E (32798)
- Size = 288 bytes

Follow the information in the following table to add each member.

Table 50. Diagnostic Assembly Instance 32798

Name	Date Type	Size in Bytes
Ch04	Diagnostic_Channel_Structure	72
Ch05	Diagnostic_Channel_Structure	72
Ch06	Diagnostic_Channel_Structure	72
Ch07	Diagnostic_Channel_Structure	72

3. Diagnostic Counters Assembly for I/O

- Instance ID: 0x301 (769)
- Size = 16 bytes

Follow the information in the following table to add each member.

Table 51. Diagnostic Assembly Instance 769

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
Infobit_Pad3	BOOL	
Infobit_Pad4	BOOL	
Infobit_Pad5	BOOL	
Infobit_Pad6	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
CIPConnections	INT	2
CIPLostPackets	DINT	4
CIPTimeouts	DINT	4
CPUUtilization	INT	2
Pad	INT	2

Diagnostic Channels

1. Diagnostic Channel

- Size = 72 bytes

This data type is retrieved as part of the diagnostic assembly instance.

Follow the information in the following table to add each member.

Table 52. 5034-IF8C Diagnostic Channel Structure

Name	Date Type	Size in Bytes
Databit_Pad0	BOOL	2
Fault	BOOL	
Uncertain	BOOL	
OpenWire	BOOL	
Databit_Pad4	BOOL	
Databit_Pad5	BOOL	
FieldPowerOff	BOOL	
Databit_Pad7	BOOL	
Disabled	BOOL	
Databit_Pad10	BOOL	
Databit_Pad11	BOOL	

Name	Date Type	Size in Bytes
Databit_Pad12	BOOL	
Databit_Pad13	BOOL	
Databit_Pad14	BOOL	
Databit_Pad15	BOOL	
CalFault (DIAG 4)	BOOL	2
Underrange (DIAG 1)	BOOL	
Overrange (DIAG 1)	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
Diagbit_Pad12	BOOL	
Diagbit_Pad13	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad1	INT	2
InternalErrorCount	SINT	1
CalRange	SINT	1
CalOffset	REAL	4
CalGain	REAL	4
CalLastDate	LINT	8
OpenWireTimestamp	LINT	8
Pad2	LINT	8
UnderrangeTimestamp	LINT	8
OverrangeTimestamp	LINT	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8

Definitions for Diagnostic Assembly Types

Table 53. Definition of Members in Diagnostic Assembly Data Types

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Module is not applying new Output tag data because the controller is in Program Mode. 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics active 1 = One or more diagnostics are active or the prognostics threshold is reached.
CIPSyncValid	BOOL	Indicates if the module is synced with a 1588 master.	<ul style="list-style-type: none"> 0 = Module is not synced 1 = Module is synced
CIPSyncTimeout	BOOL	Indicates if the module was once synced with a 1588 master, but is not now due to a timeout	<ul style="list-style-type: none"> 0 = A valid time master has not timed out. 1 = A valid time master is detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.	<p>-128...+127</p> <p>The value of 0 is skipped except during module power-up.</p>
FlashUpdateRequired	BOOL	Indicates whether flash update is required.	<ul style="list-style-type: none"> 0 = Flash update is not required 1 = Module has no application firmware
SelfTestFault	BOOL	Indicate whether the fault is present during module self-test.	<ul style="list-style-type: none"> 0 = Module initialization code did not detect an error 1 = Module initialization code detected an error

Table 53. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
LocalClockOffset	LINT	The offset from the local clock to the system time. This value helps to detect steps in time. This value updates when a PTP update is received.	Any value
LocalClockOffsetTimestamp	LINT	Indicates the timestamp of the local clock offset.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MMDD-HH:mm:ss_mmm_uuu_nnn(UTC-00:00)</p> <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds • uuu = microseconds • nnn = nanoseconds • UTC-00:00 = Time zone
GrandMasterClockID	SINT	The EUI-64 Identity of the CIP Sync Grandmaster clock the module is synced to.	Any value
FieldPowerOnTimestamp	LINT	Indicates the timestamp of the last time field power turned on.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:ss.mmm.</p> <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
FieldPowerOffTimestamp	LINT	Indicates the timestamp of the last time field power turned off.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:ss.mmm.</p> <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
Fault	BOOL	Indicates that channel data is inaccurate and cannot be trusted for use in the application.	<ul style="list-style-type: none"> • 0 = No fault exists • 1 = Fault exists

Table 53. Definition of Members in Diagnostic Assembly Data Types (continued)

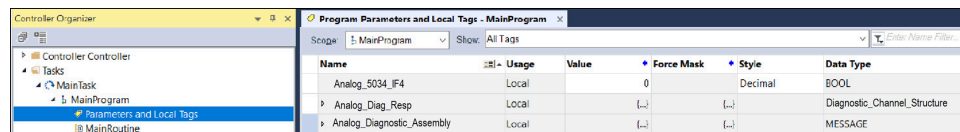
Name	Data Type	Definition	Valid Values
		If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.	<p>The typical causes of a fault are the following:</p> <ul style="list-style-type: none"> Channel is disabled Open Wire condition Underrange/Ovrange condition SA power loss condition <p>You must troubleshoot the module first to see if the typical causes exist.</p>
Uncertain	BOOL	<p>Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p>	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain
OpenWire	BOOL	The signal wire is disconnected from the channel or the RTB is removed from the module.	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled. 1 = Open wire condition exists, that means the signal wire is disconnected from the channel or the RTB is removed from the module.
CalFault	BOOL	Indicates the last attempted Calibration for this channel failed or there is no calibration data present. This tag is cleared, that is, set to 0, when power is cycled to the module.	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed
Underrange	BOOL	<p>Indicates the channel data is beneath the underrange threshold for this channel.</p> <p>For example, when the channel operates in the 4...20 mA input range, the underrange threshold on the channel is < 3.0 mA. If the input signal is 0 mA, this tag is set to 1.</p>	<ul style="list-style-type: none"> 0 = Channel data is not beneath the underrange threshold 1 = Channel data is beneath the underrange threshold
Ovrange	BOOL	<p>Indicates the channel data is above the overrange threshold for this channel.</p> <p>For example, when the channel operates in the 4...20 mA output range, the overrange threshold on the channel is > 23.0 mA. If the input signal is 24 mA, this tag is set to 1.</p>	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
CalRange	SINT	Indicates the value currently configured for the channel. Values display according to the Input Type selected.	<ul style="list-style-type: none"> 0 = -10...10V 1 = 0...5V 2 = 0...10V 4 = 0...20 mA 5 = 4...20 mA

Table 53. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
CalOffset	REAL	Indicates the offset in signal units as reported by the device.	Any value
CalGain	REAL	Indicates the calibration gain reported by the device.	Any value
CalLastDate	LINT	Indicates the time of the last calibration date for the channel.	Any value
OpenWireTimestamp	LINT	Indicates the timestamp of the last time when the open wire condition is detected.	A valid time or None if there is no recorded event time.
UnderrangeTimestamp	LINT	Indicates the timestamp of the last underrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
OverrangeTimestamp	LINT	Indicates the timestamp of the last overrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
CIPConnections	INT	Indicates the number of CIP connections currently open.	0...24
CIPLostPackets	DINT	Indicates the running sum of the number of Sequenced Address Item Sequence Numbers that are skipped in Class 0 and Class 1 connections consumed by the adapter and its children.	0...2,147,483,647
CIPTimeouts	DINT	Indicates the running count of the number of connections that time out, both originated and targeted, to and through the adapter.	0...2,147,483,647
CPUUtilization	INT	Indicates the usage of the compute engine.	0...100%

Create Message Type User Tags

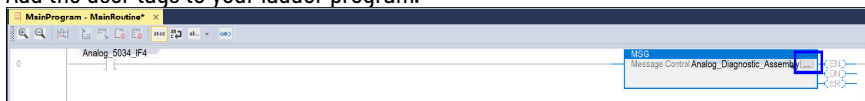
Create MESSAGE type user tags for requests and associated response user tags for each of the new user-defined diagnostic assembly types.



Name	Usage	Value	Force Mask	Style	Data Type
Analog_5034_IF4	Local	0		Decimal	BOOL
Analog_Diag_Resp	Local	[...]	[...]		Diagnostic_Channel_Structure
Analog_Diagnostic_Assembly	Local	[...]	[...]		MESSAGE

From the Controller Organizer pane, expand Tasks → MainTask → MainProgram:

1. Create MESSAGE type user tags for each request.
2. Create associated response user tags for each new user-defined diagnostic assembly type.
3. Add the user tags to your ladder program.



4. Expand the message tag to open the message configuration dialog.
5. On the Configuration tab, select:
 - Service type: Get Attribute Single
 - Class: 4
 - Attribute: 3
 - Instance:
 - 0x8019 (32793) Diagnostic Assembly A for Analog 8 Channel Input Module
 - 0x801E (32798) Diagnostic Assembly B for Analog 8 Channel Input Module
 - 0x301 (769) Diagnostic Counters Base I/O Assembly
 - Destination element: User-defined data type suitable for the instance entered.
6. On the Communication tab, select the path to the module that you wish to send the messages to.
7. Download the project and set to Run Mode.
You can monitor the user-defined tag values from the Program Parameters and Local Tags window, under the MainProgram task in the Controller Organizer pane.

5034-IF8V and 5034-IF8VXT Details

This chapter covers the detailed instructions on how to configure, calibrate, and troubleshoot your 5034-IF8V and 5034-IF8VXT modules. It also describes the module tag definitions for input, output, and configuration tags.

5034-IF8V and 5034-IF8VXT Analog 8 Input Voltage Modules

Figure 40. 5034-IF8V and 5034-IF8VXT Wiring Diagram

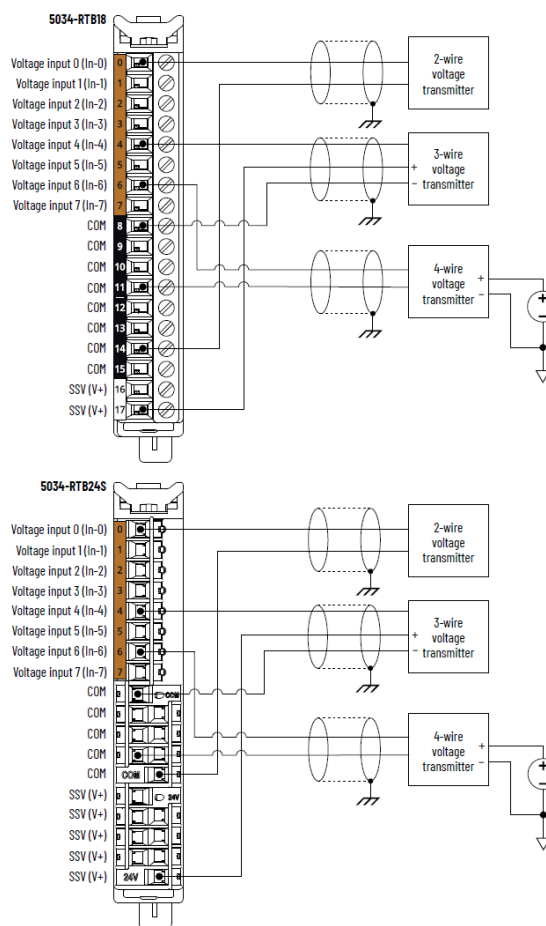


Figure 41. 5034-IF8V and 5034-IF8VXT Functional Block Diagram

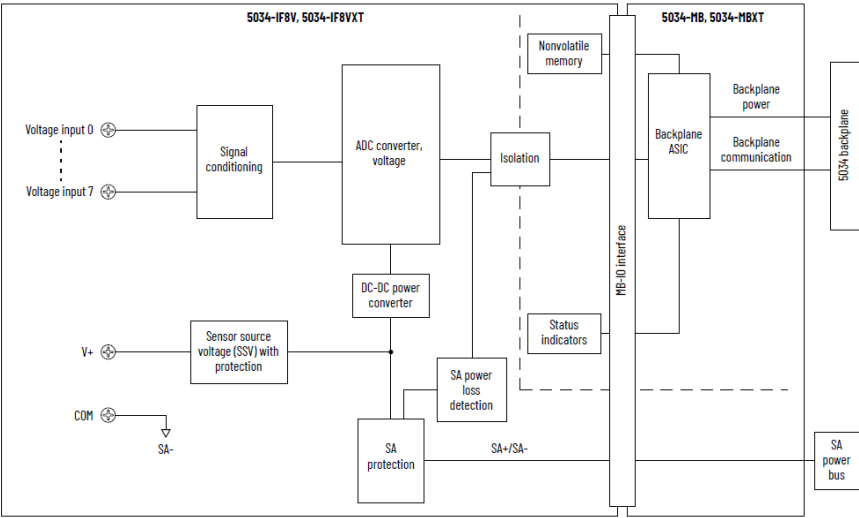


Table 54. Technical Specifications - 5034-IF8V, 5034-IF8VXT

Attribute	5034-IF8V, 5034-IF8VXT
Input range, voltage	±10V 0...10V 0...5V
Input impedance	Voltage: ≥ 1 MΩ
Module conversion method	Sigma-delta
Resolution, voltage ⁽¹⁾ At 50/60 Hz notch filter	16 bits 15 bits for 0...5V range
Calibrated accuracy at 25 °C (77 °F)	Voltage (±10V and 0...10V range): 0.1% full scale with 50/60 Hz filter Voltage (0...5V range): 0.2% full scale with 50/60 Hz filter
Calibrated accuracy over full temperature range -25...+60 °C (-13...+140 °F)	Voltage (±10V and 0...10V range): 0.2% full scale with 50/60 Hz filter Voltage (0...5V range): 0.4% full scale with 50/60 Hz filter
Fastest scan time per channel	0.4 ms
Fastest scan time per module	1.2 ms
Input notch filter (Hz) selections	10, 20, 50, 60 (Default), 100, 200, 400, 500, 1000, 5000, 10000, 15625, 31250
Input digital filter	First order lag, 0 ms (Default) 0...32,767 ms (32.767 s)
Input overvoltage protection, max	±32V DC
Data value during overload condition	Full scale, overrange flag, data uncertain/data bad

Table 54. Technical Specifications - 5034-IF8V, 5034-IF8VXT (continued)

Attribute	5034-IF8V, 5034-IF8VXT
Open wire detection time	Voltage: ≤ 2 sec
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	IEEE 754 32-bit floating point
Rolling timestamp of inputs	Yes
(1) Notch filter dependent.	

Table 55. General Specifications - 5034-IF8V, 5034-IF8VXT

Attribute	5034-IF8V, 5034-IF8VXT
Number of inputs	8 channels, single-ended Voltage mode
SA power voltage, nom	24V DC
SA power voltage range	10...30V DC
SA power current, nom	1.1 A
SA power current, max	1.2 A
SA power current at no load	15 mA
SA reverse polarity protection	Yes
SSV voltage range	Follow SA supply
SSV current, max	1.0 A
SSV short circuit protection	Yes
Power dissipation, max	0.49 W
Thermal dissipation, max	1.67 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type, System to Field No isolation between SA power and input ports No isolation between individual input ports
Calibration	Factory-calibrated

Table 55. General Specifications - 5034-IF8V, 5034-IF8VXT (continued)

Attribute	5034-IF8V, 5034-IF8VXT
	Manual calibration supported, see PointMax Analog I/O Modules User Manual, publication 5034-UM003
RIUP support	Yes
CIP Sync	Yes, slave only ordinary clock
Electronic keying	Electronic keying via programming software
RTB key positions (slot)	2, 6, 8
RTB supported ⁽²⁾	5034-RTB18, 5034-RTB18S, 5034-RTB24S
Wiring category ⁽²⁾	2 - Signal ports 2 - Power ports
Wiring specification	See Wiring Specifications for Removable Terminal Blocks in the PointMax I/O System Specifications Technical Data, publication 5034-TD001
Indicators	1 green/red module status indicator 1 green/red SA power status indicator 8 yellow/red I/O status indicators
Dimensions (HxWxD), approx	123.6 x 15.0 x 66.4 mm (4.87 x 0.59 x 2.61 in.)
Weight, approx	44.0 g (1.55 oz.) - 5034-IF8V 47.0 g (1.66 oz.) - 5034-IF8VXT
Enclosure type	None (Open-style)
North American temp code	T4
UKEX/ATEX temp code	T4
IECEX temp code	T4

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#). Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

Module Configuration

Before you start configuring your I/O module, you must create a Studio 5000 Logix Designer application project for the Logix 5000 controller that owns the I/O module. The project includes configuration data for the module.

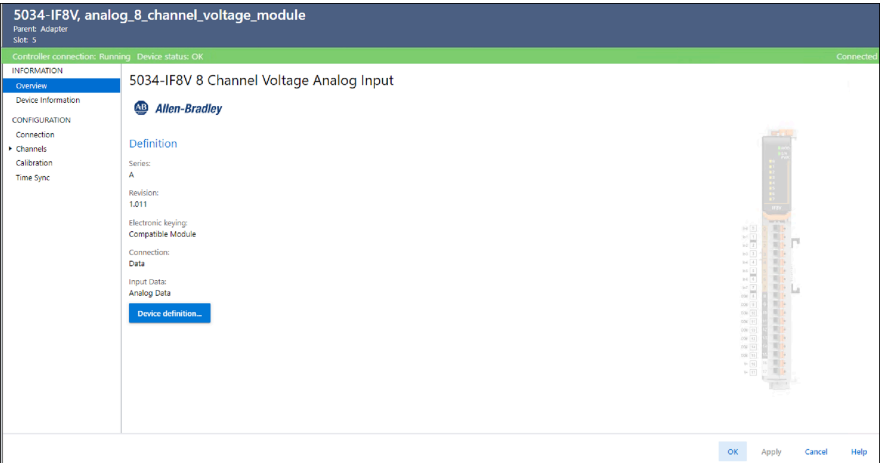
The Studio 5000 Logix Designer application transfers the project to the owner-controller during the program download. Data is then transferred to the I/O modules over the EtherNet/IP network.

The I/O modules can operate immediately after receiving and applying the configuration data.

Overview View

Use Overview to view the definition of a device, including the device type, revision, electronic keying, connection, and other device-specific values.

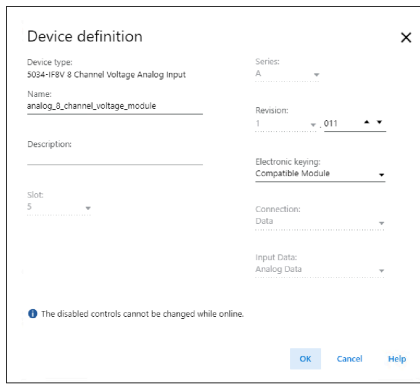
Figure 42. Overview View Example



Device Definition

To change the definition of a device, select Device definition in the Overview view.

Figure 43. Device Definition Example



Device Definition includes these parameters:

Table 56. Device Definition Parameters

Parameter	Definition	Available Choices
Device Type	Displays the device catalog number and type.	Device-specific
Name	Enter an IEC 61131 compliant device name. If an invalid character is entered in this field, or if the name exceeds 40 characters, the software ignores the character.	All valid values
Description	Enter the description of the device.	All valid values

Table 56. Device Definition Parameters (continued)

Parameter	Definition	Available Choices
Slot	<p>Specify the slot number where the device resides. Only slots between 1 and the maximum number of I/O devices are valid depending on the platform.</p> <p>When the device is created, the slot number defaults to the first available slot position.</p> <p>When the controller is changed to one supporting a smaller maximum I/O count, the current slot value may no longer be valid.</p>	1...32
Series	Specifies the series of the device.	Device-specific
Revision	Specifies the major and minor revisions of the device. The valid range for minor revision is from 1...255.	Device-specific
Electronic Keying	<p>Defines the electronic keying used for the device. Electronic keying compares the device defined in the project to the installed device. If keying fails, a fault occurs.</p> <p>For detailed information on Electronic keying, see Electronic Keying in Logix 5000 Control Systems Application Technique, publication LOGIX-AT001.</p>	<ul style="list-style-type: none"> Exact Match Compatible Module Disable Keying <div>  <p>ATTENTION: Be extremely cautious when using Disable Keying; if used incorrectly, this option can lead to personal injury or death, property damage, or economic loss.</p> <p>We strongly suggest that you do not use Disable Keying.</p> <p>If you use Disable Keying, you must take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.</p> </div>
Connection	<p>Specify the type of data transferred between the device and controller.</p> <p>For the Listen Only choice, the controller and device establish communication without the controller sending any configuration or output data to the device. A full input data connection is established but</p>	<ul style="list-style-type: none"> Data with Calibration Data (default) Listen Only

Table 56. Device Definition Parameters (continued)

Parameter	Definition	Available Choices
	depends on the connection between the owner-controller and the device.	
Input Data	Select the input data type for the device.	Analog Data

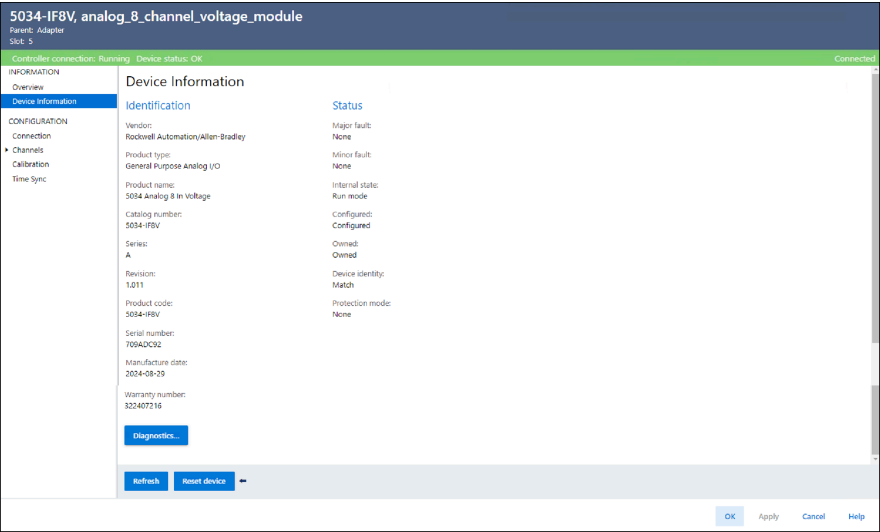
Device Information View

Use Device Information to view device and status information when the device is online.

Use Device Information to:

- Determine the identity of the device.
- View the device's current operational state.
- View whether the device was configured by the owner controller.
- View whether an owner controller is currently connected to the device.
- Retrieve the latest information from the device.
- Reset a device to its power-up state.
- If supported, view the Protection Mode of the device.

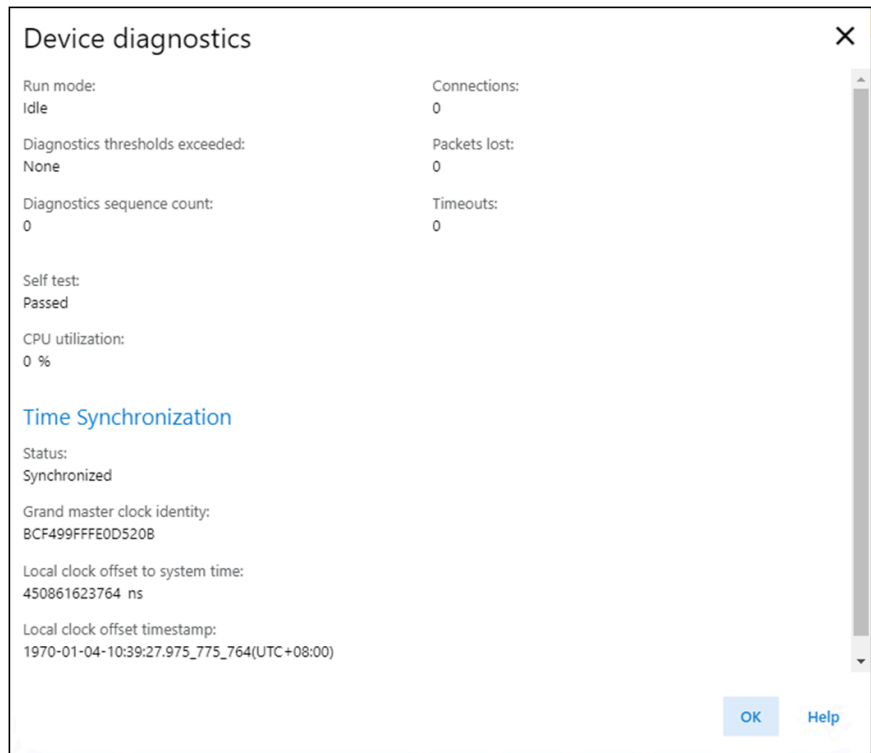
Figure 44. Device Information View Example



Device Diagnostics

To view the device diagnostics, select Diagnostics in the Device Information view.

Figure 45. Device Diagnostics Example



Connection View

Use Connection to define controller-to-device behavior:

- Set the RPI rate. For more information, see [Requested Packet Interval on page 17](#).
- Select Unicast or Multicast connection to use on the EtherNet/IP network. For more information, see [Unicast or Multicast Connection on page 21](#).
- View the reason of Connection Fault.



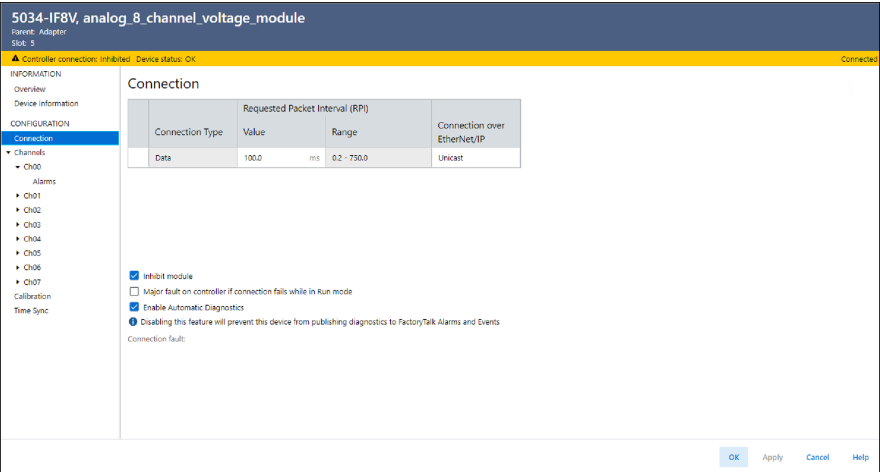
If there is a connection fault, Connection Fault area displays the error code with description that helps you to troubleshoot the module. For more information, see [Troubleshoot Your Module on page 50](#).

- Inhibit the module. For more information, see [Module Inhibiting on page 18](#).
- Configure fault response for connection failure while the controller is in Run Mode.
- Enable or disable the Automatic Diagnostics.



ATTENTION: If you do not enable Automatic Diagnostics, the device does not publish diagnostics to FactoryTalk Alarms and Events.

Figure 46. Connection View Example



Recommended Minimum RPI Values for Notch Filters

In the following table, each Notch Filter setting has two recommended minimum module RPI values that allow the required time to collect samples from each channel. One setting provides faster sample speed and the other provides slightly better resolution at slower sample speeds.

Table 57. Notch Filter and Recommended Minimum Module RPI Values

Notch Filter (Hz)	Recommended Minimum Module RPI Value			
	Application That is Configured With Only One Channel Enabled		Application With All Channels Enabled and Using the Same Notch Filter Setting on All Channels	
	Faster Sampling Speed (ms)	Better Noise Rejection (ms)	Faster Sampling Speed (ms)	Better Noise Rejection (ms)
10	106	316	422	NA
20	53.1	158.1	212	632
50	22	64	86	254
60 (default)	18.3	53.2	72	212
100	11.2	32.1	44	127
200	5.9	16.4	22.2	65
400	3.5	8.6	12	33
500	2.8	6.9	9.3	26.5
1000	1.7	3.8	5.2	13.5
5000	1.0	1.3	2.2	3.3
10000	0.7	0.9	1.7	2.1
15625	0.8	0.8	1.7	1.7
31250	0.4	0.6	1.2	1.5

Minimum RPI Calculation When Using Different Notch Filter Selections

When input channels on the same module use different Notch Filter selections, you must consider the sample time for each channel. This helps you to find the recommended RPI that provides enough time for sampling all channels.

The eight input channels on the module are grouped into two groups. Channels 00...03 are grouped, and channels 04...07 are grouped. When you determine the recommended minimum module RPI value, remember:

- The recommended minimum module RPI value when channels use different Notch Filter selections is determined by group.

The recommended minimum RPI rates for all enabled channels added together. If any channel in the other group is enabled, the recommended minimum RPI rate for each enabled channel is increased by 0.2 ms.

- If the groups have different recommended minimum RPI values, use the higher RPI value when you configure the module.

Table 58. Example Application That Requires Faster Sampling Speed

Channel Group	Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms) ⁽¹⁾	Recommended Minimum Module RPI (ms)	Recommended Minimum Module RPI to Use in Module Configuration (ms)	
Grouped together	Ch00	50	22.2	24.7	74.0	
	Ch01	1000	1.9			
	Ch02 - Disabled	N/A	N/A			
	Ch03	31250	0.6			
Grouped together	Ch04	60	18.5	74.0		
	Ch05	60	18.5			
	Ch06	60	18.5			
	Ch07	60	18.5			

(1) The values in this column represent the corresponding recommended minimum RPI value listed in [Table 57: Notch Filter and Recommended Minimum Module RPI Values on page 144](#) with an additional 0.2 ms added to it because at least one channel is enabled in the other group.

Table 59. Example Application That Requires Better Noise Rejection

Channel Group	Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms) ⁽¹⁾	Recommended Minimum Module RPI (ms)	Recommended Minimum Module RPI to Use in Module Configuration (ms)
Grouped together	Ch00	50	64.2	69.0	213.6
	Ch01	1000	4		

Table 59. Example Application That Requires Better Noise Rejection (continued)

Channel Group	Channel	Notch Filter (Hz)	Recommended Minimum Module RPI for Each Channel (ms) ⁽¹⁾	Recommended Minimum Module RPI (ms)	Recommended Minimum Module RPI to Use in Module Configuration (ms)
Grouped together	Ch02 - Disabled	N/A	N/A	213.6	
	Ch03	31250	0.8		
	Ch04	60	53.4		
	Ch05	60	53.4		
	Ch06	60	53.4		
	Ch07	60	53.4		

(1) The values in this column represent the corresponding recommended minimum RPI value listed in [Table 57: Notch Filter and Recommended Minimum Module RPI Values on page 144](#) with an additional 0.2 ms added to it because at least one channel is enabled in the other group.

Channels View

The Channels view shows an overview of the configuration values for all module channels.



Not all channel configurations are included in Channels view. To view or change the complete set of the channel configuration and also to view the diagnostics information for the channel, use Chxx view.

You can do the following actions on this view for all the channels:

- Disable the channel, if desired
- Change the input range
- Set the notch filter
- Enable or disable open wire detection
- Set the scaling and recalculate all configurations with engineering unit
- Set digital filter
- Disable alarms

Figure 47. Channels View Example



Chxx View

The Chxx view, where xx represents the channel number, shows the configuration options available for the respective channel.

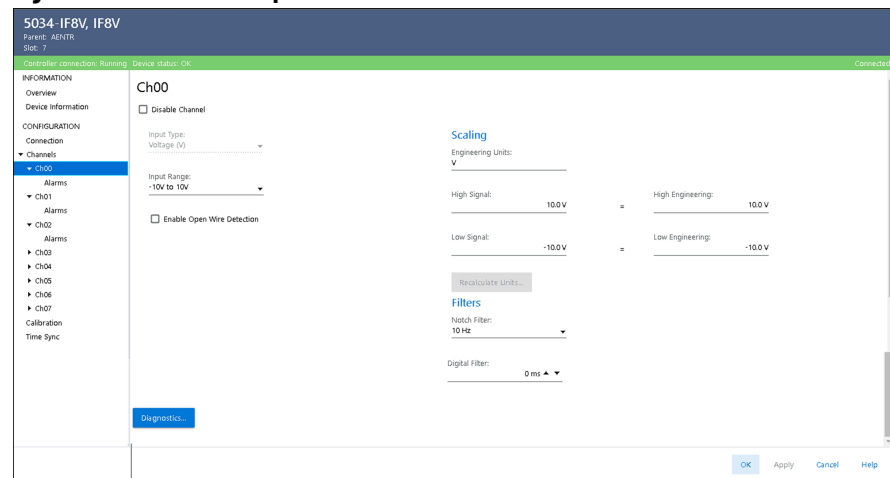
You can do the following actions on this view:

- Disable the channel, if desired
- Change the input range
- Set the notch filter
- Enable or disable open wire detection
- Set the scaling and recalculate all configurations with engineering unit
- Set digital filter
- View channel diagnostics information



To latch and configure alarm parameters, go to Alarms view.

Figure 48. Chxx View Example



Recalculate Units

Recalculate Units lets you recalculate all configurations with engineering unit after a scaling change. Consider the following:

- The Recalculate Units option is enabled when the scaling configuration is changed.
- Upon selecting Recalculate Units option, the recalculated new values based on the new scaling configuration are displayed together with the old values for you to verify before changing.
- If you select "Yes" to proceed with the change, the new values will be set but it gets applied when you select "Apply/OK".
- If you select "No" to cancel the change, the old values are retained. You can either select the Recalculate Units again or manually change those configurations based on the new scaling.

Figure 49. Recalculate Units Example

⚠ Change to new configuration values in engineering units? X

	Configuration	Old Value	New Value
	High High Limit	100 %	114.2857 %
	High Limit	100 %	114.2857 %
	Low Limit	0 %	0 %
	Low Low Limit	0 %	0 %
	Deadband	0 %	0 %
	Rate Alarm Limit	0 %/s	0 %/s

Yes No Help

Channelxx Diagnostics

Displays the channel diagnostics information when connected with the module. When online with the module, select the Diagnostics on the Chxx view to see the diagnostic information.

Figure 50. Channelxx Diagnostics Example

Channel00 Diagnostics X

Fault Exists:

Yes

Data Uncertain:

Yes

Field Power:

Present

Field Power On Timestamp:

None

Field Power Off Timestamp:

None

Open Wire Fault:

Not Present

Fault Timestamp:

None

Overrange Fault:

Not Present

Fault Timestamp:

None

Underrange Fault:

Present

Underrange Fault Timestamp:

2025-01-08-09:45:56.841

Calibration for Active Range

Calibration Timestamp:

2025-01-02-09:45:56.841

Range:

4 mA to 20 mA

Gain:

0.999637

Offset:

0.001097

OK HELP

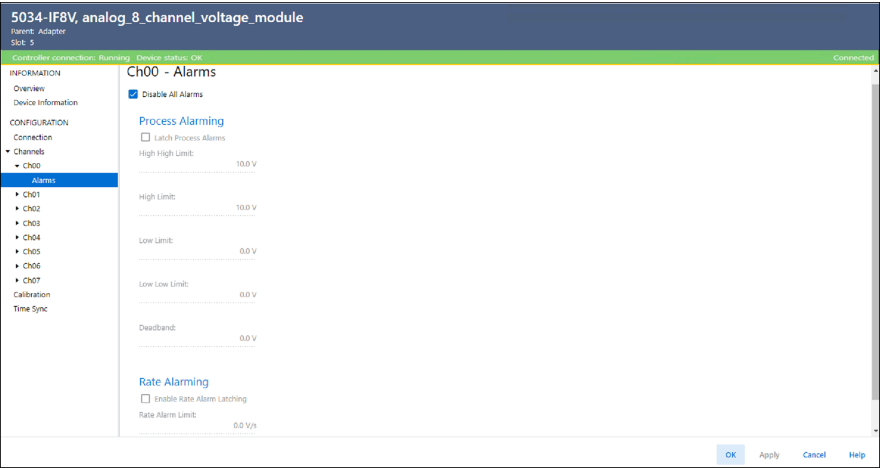
Alarms View

Each channel on the input module has an Alarms view. You can do the following actions on this view:

- Disable all the alarms.
- Enable/Disable latching and set the alarm limits for the process alarms:
 - High High
 - High
 - Low
 - Low Low
 - Deadband
- Enable/Disable latching and set limit for the rate alarm.

 Rate Alarm Limit of 0.0 disables the rate alarm.

Figure 51. Chxx - Alarms View Example



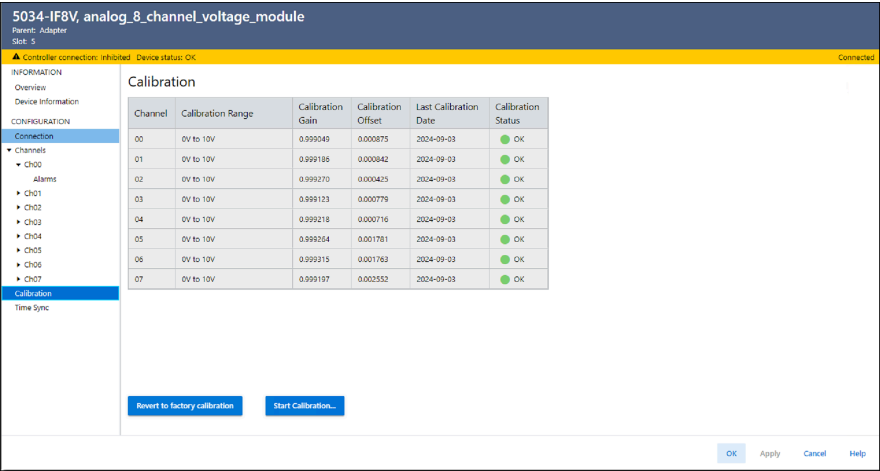
Calibration View

The Calibration view provides calibration information for all channels on the module. You can do the following actions on this view for all the channels:

- View calibration parameters and calibration status for the currently configured input ranges.
- Perform user calibration for one or multiple channels.
- Revert calibration parameters to the factory default values.

For more information on how to calibrate a module, see [Module Calibration \(Interactive\) on page 150](#)

Figure 52. Calibration View Example

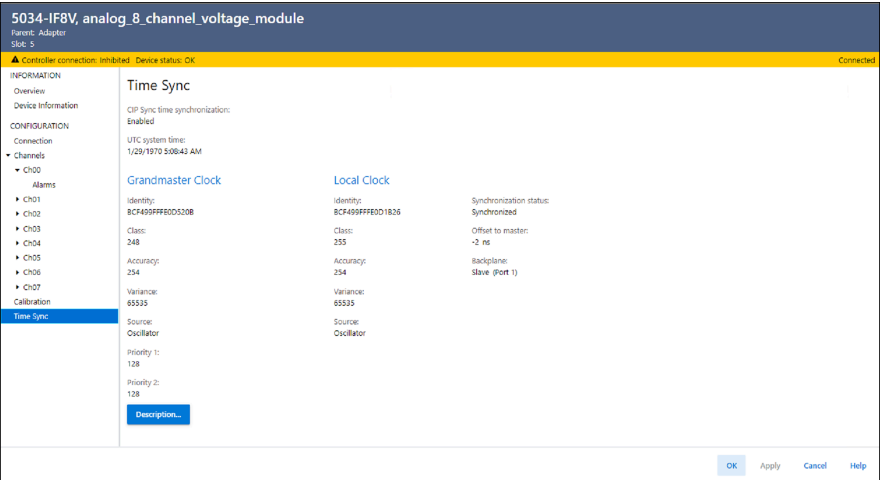


Time Sync View

The Time Sync view is read-only and displays the CIP Sync status information about the module when the project is online. The Time Sync category displays the following information:

- CIP Sync time synchronization status
- UTC system time
- Grandmaster Clock information
- Grandmaster Clock description
- Local Clock information

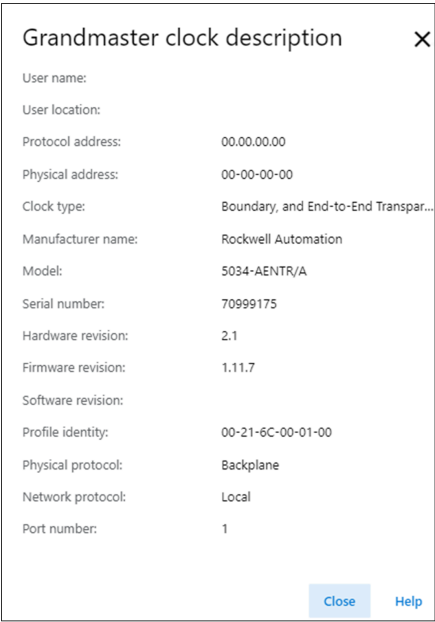
Figure 53. Time Sync View Example



Grandmaster Clock Description

The Grandmaster clock description dialog provides detailed information about the grandmaster clock. To view the Grandmaster clock description, select Description in the Time Sync view.

Figure 54. Grandmaster Clock Description Example



Module Calibration (Interactive)

You can use Calibration view in Module Properties to interactively calibrate the module on a per channel basis or in group.

Controller State During Calibration

You must add the module to your Studio 5000 Logix Designer application project before you can calibrate it.

The project must be online with the owner-controller to calibrate the PointMax analog modules. You can calibrate under any of the following conditions:

- The controller is in Program Mode, that is, either Remote Program or Program Mode.
Your module must be in Program Mode and not be actively controlling a process when you calibrate it.
- There are no connections to the module.

Calibration Impacts Data Quality

When a channel on an analog input module is being calibrated, the Notch Filter setting for that channel changes to 10 Hz. The *I.Chxx.Uncertain* tag is set to 1 for that channel until calibration is completed.

Grouped inputs share an Analog-to-Digital converter. As a result when any input channel is in the calibration process, the *I.Chxx.Uncertain* tag is set to 1 for other input channels in that group. This is because the data sampling rate slows for all input channels in the group.

Calibration Instrumentation Specifications

When you calibrate the analog input modules, send voltage reference signal to the module to calibrate it. To maintain your module's factory calibration accuracy, use the instrumentation with the specifications listed in the following table.

- IMPORTANT:** Do not calibrate your module with an instrument that is less accurate than those specified in following table. The following events can result:
- Calibration appears to occur normally but the module gives inaccurate data during operation.
 - A calibration fault occurs, forcing you to abort calibration. When this happens, *I.Chxx.CalFault* tag is set for the channel you attempted to calibrate. You can clear this tag by completing a valid calibration or cycling power to the module.

Table 60. Instrument Specifications

Catalog Number	Channel Input Type	Calibration Instrumentation Specifications
5034-IF8V and 5034-IF8VXT	Voltage (V)	0...10V source ±2 µV voltage

Calibration Procedure

This procedure describes how to calibrate a channel on the analog input module for use with a Voltage (V) input type.

Apply Low and High Signal references to the analog input module to calibrate it. The references must match the input range the channel is using.

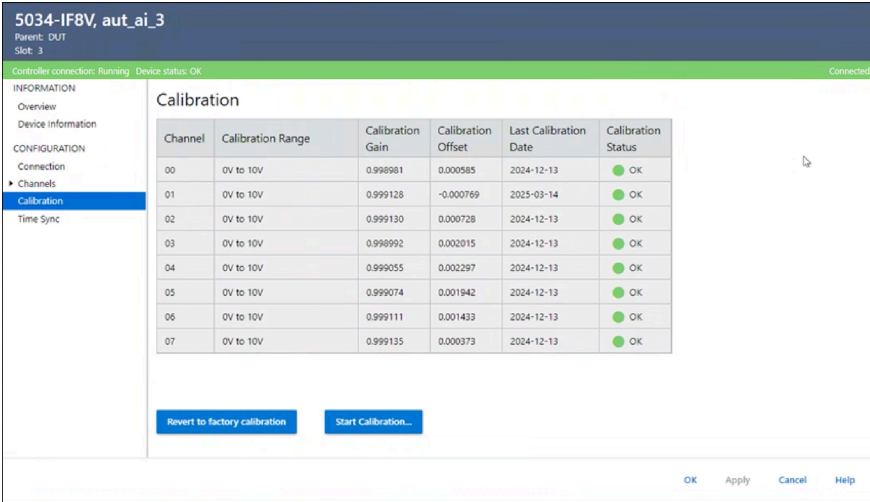
Table 61. Analog Input Module Calibration References

Input Type	Input Range	Low Calibration Reference	High Calibration Reference
Voltage (V)	-10...10V	0.0V	10.0V

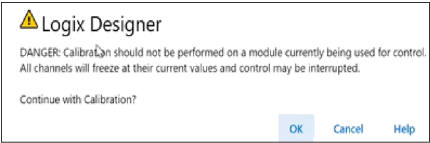
Table 61. Analog Input Module Calibration References (continued)

Input Type	Input Range	Low Calibration Reference	High Calibration Reference
	0...10V	0.5V	10.0V
	0...5V	0.5V	5.0V

1. Connect the voltage calibrator to the channel being calibrated.
2. Go online with the project and make sure that the controller is in Program Mode.
3. Confirm that the channel to be calibrated is configured for the correct Input Range.
4. On the Calibration view in the Module Properties dialog, select Start Calibration.



5. When the dialog appears to confirm that you want to calibrate the channel, select OK.



6. Select the channels one at a time or in groups to calibrate and then select Next.

Calibration Wizard - Select Channels to Calibrate

Select the checkboxes of the channels to calibrate, and then select to calibrate in groups or one at a time.

	Channel	Calibrate	Calibration Range	Calibration Gain	Calibration Offset	Calibration Status
*	00	☒	0V to 10V	0.998981	0.000585	<div>OK</div>
	01	☐	0V to 10V	0.999128	-0.000769	<div>OK</div>
	02	☐	0V to 10V	0.999130	0.000728	<div>OK</div>
	03	☐	0V to 10V	0.998992	0.002015	<div>OK</div>
	04	☐	0V to 10V	0.999055	0.002297	<div>OK</div>
	05	☐	0V to 10V	0.999074	0.001942	<div>OK</div>
	06	☐	0V to 10V	0.999111	0.001433	<div>OK</div>
	07	☐	0V to 10V	0.999135	0.000373	<div>OK</div>

☐ Calibrate channels in groups

☒ Calibrate channels one at a time

Back

Next

Cancel

Help

7. When the Attach Low Reference dialog appears, set the calibrator to the low reference and apply it to the channel.

Calibration Wizard - Attach Low Reference

Attach reference signals to selected channels. Select Next to continue.

Channel: 00

Channel	Calibrate	Calibration Range	Low Reference
00	☒	0V to 10V	0.50 V
01	☐		
02	☐		
03	☐		
04	☐		
05	☐		
06	☐		
07	☐		

Back

Next

Cancel

Help

8. Select Next. The Low Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - Low Reference Results

✕

Select Next to continue.

Channel	Calibrate	Calibration Range	Low Reference	Status
00	☒	0V to 10V	0.50 V	<div><div></div>OK</div>
01	☐			
02	☐			
03	☐			
04	☐			
05	☐			
06	☐			
07	☐			

Retry

Back

Next

Cancel

Help

9. If the Status is OK, select Next. If the Status is not OK, repeat the calibration process.
10. When the Attach High Reference dialog appears, set the calibrator to the high reference and apply it to the channel.

Calibration Wizard - Attach High Reference

✕

Attach reference signals to selected channels. Select Next to continue.

Channel: 00

Channel	Calibrate	Calibration Range	High Reference
00	☒	0V to 10V	10.00 V
01	☐		
02	☐		
03	☐		
04	☐		
05	☐		
06	☐		
07	☐		

Back

Next

Cancel

Help

11. Select Next. The High Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - High Reference Results

Select Next to continue.

Channel	Calibrate	Calibration Range	High Reference	Status
00	☒	0V to 10V	10.00 V	OK
01	☐			
02	☐			
03	☐			
04	☐			
05	☐			
06	☐			
07	☐			

Retry

BackNextCancelHelp

12. If the Status is OK, select Next. If the Status is not OK, repeat the calibration process.
13. When the Calibration Completed dialog appears, select Finish.

Calibration Wizard - Calibration Completed

Calibration completed successfully. The calibration constants are saved.

Channel	Calibrate	Calibration Range	Low Reference	Status	High Reference	Status
00	☒	0V to 10V	0.50 V	OK	10.00 V	OK
01	☐					
02	☐					
03	☐					
04	☐					
05	☐					
06	☐					
07	☐					

BackFinishCancelHelp

Use the Status Indicators for Troubleshooting

- PointMax I/O modules use the following status indicators:
- SA Power Indicator - This indicator operates the same for all PointMax I/O modules.
 - Module Status Indicator - This indicator operates the same for all PointMax I/O modules.
 - Channel Status Indicator - This indicator operates differently based on the module type that you are using.

SA Power Status Indicator

Table 62. Interpret SA Power Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	There is SA power to the module.	None
Steady red	There is no SA power to the module or SA power voltage is not in the valid range.	Complete the following actions: 1. Confirm that SA power wiring is properly connected to the adapter, expansion power module, or 5034-MBSA mounting base. 2. Check the following: <ul style="list-style-type: none"> - Check that the SA voltage is in the correct range. - If an external power supply is used, confirm that the power supply is turned on. - Make sure that the mounting base to mounting base connection is properly secured. Go to Chassis Information view in the Module Properties of the adapter to check the Field Power status of mounting bases installed in all slots.

Module Status Indicator

Table 63. Interpret Module Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	The module is operational and all I/O connections are active.	None
Flashing green	The module has no I/O connections.	Troubleshoot your Studio 5000 Logix Designer application to determine what is preventing a connection from the module to the controller and correct the issue.
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> • A module firmware update is in progress. • A module firmware update attempt failed. • The device has experienced a recoverable fault. • A connection to the module has timed out. 	Complete one of the following: <ul style="list-style-type: none"> • Let the firmware update process complete. • Reattempt a firmware update after one fails. • Use the Studio 5000 Logix Designer application to determine whether a module recoverable fault is occurred. It is shown in Device Information view.

Table 63. Interpret Module Status Indicator (continued)

Indicator State	Description	Recommended Action
		<p>To clear a recoverable fault, complete one of the following:</p> <ul style="list-style-type: none"> - Cycle module power. - Select Reset device in the Studio 5000 Logix Designer project via the Device Information view of the Module Properties dialog. <p>If the fault does not clear after cycling power and module reset, contact Rockwell Automation Technical Support.</p> <ul style="list-style-type: none"> • Use the Studio 5000 Logix Designer application to determine if a connection has timed out. The Connection view in the Module Properties indicates whether a connection request has timed out. <p>If a connection has timed out, determine the cause and correct it. For example, a cable failure can cause a connection timeout.</p>
Steady red	The module experienced a nonrecoverable fault.	<p>Complete the following actions:</p> <ol style="list-style-type: none"> 1. Cycle power to the module. 2. If the status indicator remains in the steady red state, replace the module.

Channel Status Indicators

Table 64. Interpret Analog Input Channel Status Indicators

Indicator State	Description	Recommended Action
Off	<p>One of the following conditions exists:</p> <ul style="list-style-type: none"> • The module is not powered. • The module is powered but connection is not established from the controller to module. • The module is powered, but the input channel is disabled. 	<p>Complete one of the following:</p> <ul style="list-style-type: none"> • If you expect the module to be powered but it is not, complete the following: <ul style="list-style-type: none"> - Confirm that the system is powered. - Confirm that the module is installed properly. • If the module is powered but the channel is not operating as expected, use the Studio 5000 Logix Designer application to confirm that the channel is not disabled and the module has a connection to the controller. <p>The Connection view in the Module Properties indicates if the connection is running or faulted. If the connection is faulted, the Connection view indicates error information.</p> <ul style="list-style-type: none"> • If the channel is disabled, no action is needed.
Steady yellow	The input channel is operating normally.	None

Table 64. Interpret Analog Input Channel Status Indicators (continued)

Indicator State	Description	Recommended Action
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> There is no SA power to the module, or SA power voltage is not in the valid range. The input signal is overrange or underrange. The signal range is set in your Studio 5000 Logix Designer application project. An Open Wire condition, that is, a wire is disconnected from the input channel. 	Complete one of the following: <ul style="list-style-type: none"> If there is a SA power fault, see the recommended action given for steady red indicator state in SA Power Indicator table above. Check the input signal to determine if it is overrange or underrange. If so, make changes to return the input signal to within the range limits. Check the wiring at the input channel. If necessary, reconnect the wire.
Flashing yellow/red	Calibration is in progress.	Successfully complete the calibration process.
Steady red	An issue has occurred that is internal to the module. The following are example issues that can cause the status indicator to be steady red: <ul style="list-style-type: none"> A calibration fault occurred on the channel. The module has experienced a nonrecoverable fault. 	Complete one of the following: <ul style="list-style-type: none"> If the indicator turns steady red after a calibration process, you can either perform a successful calibration or cycle the power to recover the fault. If it is not caused by the calibration, cycle the power to recover the fault. If the condition is still present, replace the module.

Module Tag Definitions

Module tags are created when you add a module to the Studio 5000 Logix Designer application project. The set of module tags associated with a module depends on the module type and Device Definition choices made during module configuration. The tables contained in this section list all of the tags available with a module. Not all tags in the list are used when that module type is added to a project. Tag use varies by module configuration.

Configuration Tag Definitions

Table 65. Configuration Tags

Name	Data Type	Definition	Valid Values
Chxx.Range	SINT	Channel's operating range	<ul style="list-style-type: none"> 0 = -10...10V 1 = 0...5V 2 = 0...10V
Chxx.NotchFilter	SINT	Notch Filter removes line noise for the channel.	<ul style="list-style-type: none"> 0 = 10 Hz 16 = 20 Hz 1 = 50 Hz 2 = 60 Hz 3 = 100 Hz 4 = 200 Hz 20 = 400 Hz

Table 65. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> 5 = 500 Hz 6 = 1,000 Hz 8 = 5,000 Hz 9 = 10,000 Hz 10 = 15,625 Hz 12 = 31,250 Hz
Chxx.AlarmDisable	BOOL	<p>Disables all alarms on the channel.</p> <hr/> <p>IMPORTANT: Consider the following:</p> <ul style="list-style-type: none"> If you change this tag to 0, that is, so that the alarms are not disabled, you must also enable the individual alarms for them to work. <p>For example, if you want to use the Low Low Alarm for a channel, you must set the Chxx.AlarmDisable to 0 and set the Chxx.LLAlarmEn output tag to 1 so that the alarm is enabled.</p> <p>This applies to all alarms on the module.</p> <ul style="list-style-type: none"> Conversely, if you set this tag to 1, alarms are disabled regardless of the setting on the alarm enable tag for any alarm. <hr/>	<ul style="list-style-type: none"> 0 = Alarms are enabled 1 = Alarms are disabled
Chxx.ProcessAlarmLatchEn	BOOL	<p>Configures Process alarms to latch until they are explicitly unlatched.</p> <p>The Process alarms include:</p> <ul style="list-style-type: none"> HighHigh Alarm High Alarm Low Alarm LowLow Alarm 	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.RateAlarmLatchEn	BOOL	<p>Configures the Rate Alarm to latch until it is explicitly unlatched.</p>	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.OpenWireEn	BOOL	<p>Enables the input Open Wire diagnostic.</p>	<ul style="list-style-type: none"> 0 = Disabled 1 = Enabled
Chxx.Disable	BOOL	<p>Disables the channel.</p> <p>When a channel is disabled, the following occurs:</p> <ul style="list-style-type: none"> The I/O status indicator for the channel turns off. The Chxx.Fault input tag is set to 1. 	<ul style="list-style-type: none"> 0 = Channel is enabled 1 = Channel is disabled
Chxx.TenOhmOffset	INT	Not Applicable	0

Table 65. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
Chxx.DigitalFilter	INT	A non-zero value enables the filter, providing a time constant in milliseconds used in a first order lag filter to smooth the input signal.	0 = Filter is turned off Any value greater than zero = Filter value in milliseconds
Chxx.LowSignal	REAL	One of four points used in scaling. The low signal is in terms of the inputs signal units and corresponds to the low engineering term when scaled.	Any value less than the high signal in range
Chxx.HighSignal	REAL	One of four points used in scaling. The high signal is in terms of the inputs signal units and corresponds to the high engineering term when scaled.	Any value greater than the low signal in range
Chxx.LowEngineering	REAL	One of four points used in scaling. The low engineering helps determine the engineering units the signal values scale into. The low engineering term corresponds to the low signal value.	Any value
Chxx.HighEngineering	REAL	One of four points used in scaling. The high engineering helps determine the engineering units the signal values scale into. The high engineering term corresponds to the high signal value.	Any value
Chxx.LLAlarmLimit	REAL	The Low Low Alarm trigger point. Causes the Chxx.LLAlarm to trigger when the input signal moves beneath the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.LAlarmLimit	REAL	The Low Alarm trigger point. Causes the Chxx.LAlarm to trigger when the input signal moves beneath the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.HAlarmLimit	REAL	The High Alarm trigger point. Causes the Chxx.HAlarm to trigger when the input signal moves above the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.HHAlarmLimit	REAL	The High High Alarm trigger point. Causes the Chxx.HHAlarm to trigger when the input signal moves above the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.RateAlarmLimit	REAL	The Rate Alarm trigger point. Causes the Chxx.RateAlarm to trigger when the input signal changes at a rate faster than the configured Rate Alarm. Configured in Engineering Units per second.	0 = Rate Alarm is not used Any value greater than zero = Trigger point
Chxx.AlarmDeadband	REAL	Allows a process alarm to remain set, despite the alarm condition disappearing, as long as the input data remains within the deadband of the process alarm. The deadband value is subtracted from the High and High High Alarm Limits to calculate the deadband thresholds for these alarms. The deadband value is	Any non-negative value

Table 65. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
		added to the Low and Low Low Alarm Limits to calculate the deadband thresholds for these alarms.	

Input Tag Definitions

Table 66. Input Tags

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Module is not applying new Output tag data because the controller is in Program Mode. 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
ConnectionFaulted	BOOL	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	<ul style="list-style-type: none"> 0 = A connection exists between the module and the controller 1 = Connection is timed out or inhibited
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics are active 1 = One or more diagnostics are active or the prognostics threshold is reached.
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.	-128...+127 The value of 0 is skipped except during module powerup.
Chxx.Fault	BOOL	Indicates that channel data is inaccurate and cannot be trusted for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. <hr/> IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	<ul style="list-style-type: none"> 0 = No fault exists 1 = Fault exists
Chxx.Uncertain	BOOL	Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known.	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain

Table 66. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p> <hr/> <p>IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.</p> <hr/>	
Chxx.OpenWire	BOOL	The signal wire is disconnected from the channel or the RTB is removed from the module.	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled 1 = Open wire condition exists, which means the signal wire is disconnected from the channel or the RTB is removed from the module
Chxx.OverTemperature	BOOL	Not applicable for this module.	N/A
Chxx.FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
Chxx.NotANumber	BOOL	Indicates that the last value received for the channel output data value was not a number.	<ul style="list-style-type: none"> 0 = Last channel data received was a number 1 = Last channel data received was not a number
Chxx.Underrange	BOOL	Indicates that the channel data is beneath the underrange threshold for this channel.	<ul style="list-style-type: none"> 0 = Channel data is not beneath the underrange threshold 1 = Channel data is beneath the underrange threshold
Chxx.Ovrange	BOOL	Indicates that the channel data is above the overrange threshold for this channel.	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
Chxx.LLAlarm	BOOL	<p>Triggered when the input data value is less than the Low Low Alarm value.</p> <p>If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is greater than the Low Low Limit plus the Alarm Deadband.</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.LAlarm	BOOL	<p>Triggered when the input data value is less than the Low Alarm value.</p> <p>If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is greater than the Low Limit plus the Alarm Deadband.</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.HAlarm	BOOL	Triggered when the input data value is greater than the High Alarm value.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered

Table 66. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is less than the High Limit minus the Alarm Deadband.	
Chxx.HHAlarm	BOOL	Triggered when the input data value is greater than the High High Alarm value. If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is less than the High High Limit minus the Alarm Deadband.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.RateAlarm	BOOL	Triggered when the change between consecutive channel samples divided by the period of time between when the samples were taken exceeds the Rate Alarm. If latched, this tag remains set until it is unlatched.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.CalFault	BOOL	Indicates that the last attempted Calibration for this channel failed or there is no calibration data present. This tag is cleared, that is, set to 0, when power is cycled to the module or a successful calibration for the range on the channel is performed.	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed
Chxx.Calibrating	BOOL	Indicates that the channel is currently being calibrated.	<ul style="list-style-type: none"> 0 = Channel is not being calibrated 1 = Channel is being calibrated
Chxx.CalGoodLowRef	BOOL	Indicates that a valid Low Reference signal is sampled on this channel in the calibration process. IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.	<ul style="list-style-type: none"> 0 = Valid Low Reference signal has not been sampled on this channel 1 = Valid Low Reference signal has been sampled on this channel
Chxx.CalBadLowRef	BOOL	Indicates that an invalid Low Reference signal is sampled on this channel in the calibration process. You must correct this condition to successfully calibrate the module. If calibration is aborted with an invalid Low Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.	<ul style="list-style-type: none"> 0 = Invalid Low Reference signal has not been sampled on this channel 1 = Invalid Low Reference signal has been sampled on this channel

Table 66. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	
Chxx.CalGoodHighRef	BOOL	<p>Indicates that a valid High Reference signal is sampled on this channel in the calibration process.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Valid High Reference signal has not been sampled on this channel 1 = Valid High Reference signal has been sampled on this channel
Chxx.CalBadHighRef	BOOL	<p>Indicates that an invalid High Reference signal is sampled on this channel in the calibration process.</p> <p>You must correct this condition to successfully calibrate the module.</p> <p>If calibration is aborted with an invalid High Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Invalid High Reference signal has not been sampled on this channel 1 = Invalid High Reference signal has been sampled on this channel
Chxx.CalSuccessful	BOOL	<p>Indicates calibration on this channel is complete and the Calibrating state has been exited.</p> <p>This tag remains set after valid calibration and until a new calibration process is started or the connection is closed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Calibration was not successful 1 = One of the following: <ul style="list-style-type: none"> Calibration was successful and calibrating state has been exited. Calibration data is present and applied.
Chxx.Data	REAL	Channel data in scaled Engineering Units.	Any value
Chxx.RollingTimestamp	INT	<p>Continuously-running 15-bit timer that counts in milliseconds.</p> <p>Whenever an input module scans its channels, it also records the value of RollingTimestamp at that time. The</p>	0...32,767

Table 66. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		user program uses the last two RollingTimestamp values and calculates the interval between receipt of data.	

Output Tag Definitions

Table 67. Output Tags

Name	Data Type	Definition	Valid Values
Chxx.LLAlarmEn	BOOL	<p>Enables the Low Low Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.LAlarmEn	BOOL	<p>Enables the Low Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.HAlarmEn	BOOL	<p>Enables the High Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.HHAlarmEn	BOOL	<p>Enables the High High Alarm.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm

Table 67. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p>	
Chxx.RateAlarmEn	BOOL	<p>Enables the Rate Alarm.</p> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.LLAlarmUnlatch	BOOL	Unlatches a latched Low Low Alarm at the first instance of the bit transitioning from 0 to 1.	<ul style="list-style-type: none"> 0 = Low Low Alarm remains latched 1 = Low Low Alarm unlatched
Chxx.LAlarmUnlatch	BOOL	Unlatches a latched Low Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = Low Alarm remains latched 1 = Low Alarm unlatched
Chxx.HAlarmUnlatch	BOOL	Unlatches a latched High Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = High Alarm remains latched 1 = High Alarm unlatched
Chxx.HHAlarmUnlatch	BOOL	Unlatches a set High High Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = High High Alarm remains latched 1 = High High Alarm unlatched
Chxx.RateAlarmUnlatch	BOOL	Unlatches a set Rate Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = Rate Alarm remains latched 1 = Rate Alarm unlatched
Chxx.Calibrate	BOOL	<p>Initiates the Calibration process.</p> <p>This tag must remain set until a valid Low Reference and High Reference values are applied to the input.</p> <p>If the tag value transitions to 0 before calibration is finished, the process stops and calibration fails.</p>	<ul style="list-style-type: none"> 0 = Not to start calibration process 1 = Start calibration process
Chxx.CalLowRef	BOOL	<p>Rising edge triggers the Low Calibration at the Low Reference Point for the current input range value.</p> <p>A valid Low Reference signal must be connected to the channel before setting this tag.</p>	<ul style="list-style-type: none"> 0 = Not to start low reference sampling 1 = Start low reference sampling

Table 67. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		<div> IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device Definition. If you use the Data connection type, this tag does not appear in the module tags. </div>	
Chxx.CalHighRef	BOOL	<div> Rising edge triggers a High Calibration at the High Reference Point for the current input range value. A valid High Reference signal must be connected to the channel before setting tag. </div> <div> IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device Definition. If you use the Data connection type, this tag does not appear in the module tags. </div>	<ul style="list-style-type: none"> 0 = Not to start high reference sampling 1 = Start high reference sampling
Chxx.SensorOffset	REAL	<div> Compensates for any known offset error on the sensor or channel to which the sensor is connected. Value is in terms of engineering units. The value of this tag is added to the measured value in engineering units and is used in the Chxx.Data input tag. </div>	<div>Any valid float value</div> <div>Use a value in the channel's operating range.</div>

Diagnostic Assembly

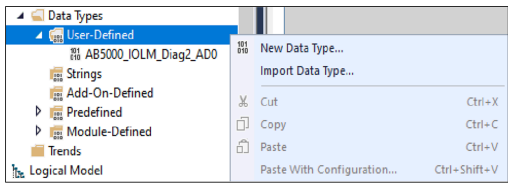
Diagnostic assembly helps you troubleshoot and diagnose the fault in your system.

Create User-defined Diagnostic Assembly Types

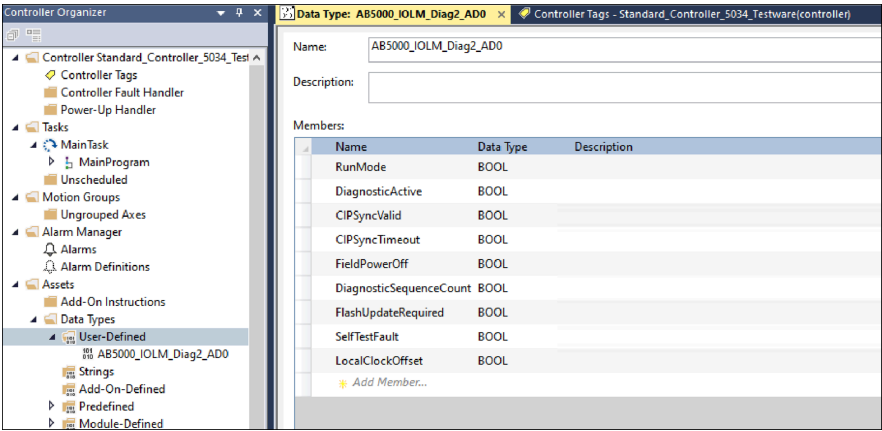
You can use the Studio 5000 Logix Designer application to create user-defined Diagnostic Assembly types.

Create user-defined diagnostic assembly by following the below steps:

- From the Controller Organizer pane, go to Assets → Data types → User-Defined.
- Right-click on the User-Defined folder and select New Data Type.



- Add a Name and Description (optional) for your diagnostic assembly.
- Under Members area, add the data members based on the diagnostic assembly detailed below.



IMPORTANT: The members indicated in the tables are arranged according to Data Alignment Rules of controllers. Strictly follow the data type and the sequence of the members that are indicated in the tables of this appendix. If the data type and the sequence are not followed, data misalignment may occur after executing Get Attribute Single Message (MSG) instruction.

Diagnostic Assemblies

- 1. Diagnostic Assembly A for Analog 8 Channel Input Module
 - Instance ID: 0x8019 (32793)
 - Size = 336 bytes

Follow the information in the following table to add each member.

Table 68. Diagnostic Assembly Instance 32793

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
CIPSyncValid	BOOL	
CIPSyncTimeout	BOOL	
Infobit_Pad5	BOOL	
FieldPowerOff	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
Diagbit_Pad0	BOOL	2
Diagbit_Pad1	BOOL	
Diagbit_Pad2	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	

Name	Date Type	Size in Bytes
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
FlashUpdateRequired	BOOL	
SelfTestFault	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad	DINT	4
LocalClockOffset	LINT	8
LocalClockOffsetTimestamp	LINT	8
GrandMasterClockID	SINT[8]	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8
Ch00	Diagnostic_Channel_Structure	72
Ch01	Diagnostic_Channel_Structure	72
Ch02	Diagnostic_Channel_Structure	72
Ch03	Diagnostic_Channel_Structure	72

2. Diagnostic Assembly B for Analog 8 Channel Input Module

- Instance ID: 0x801E (32798)
- Size = 288 bytes

Follow the information in the following table to add each member.

Table 69. Diagnostic Assembly Instance 32798

Name	Date Type	Size in Bytes
Ch04	Diagnostic_Channel_Structure	72
Ch05	Diagnostic_Channel_Structure	72
Ch06	Diagnostic_Channel_Structure	72
Ch07	Diagnostic_Channel_Structure	72

3. Diagnostic Counters Assembly for I/O

- Instance ID: 0x301 (769)
- Size = 16 bytes

Follow the information in the following table to add each member.

Table 70. Diagnostic Assembly Instance 769

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
Infobit_Pad3	BOOL	
Infobit_Pad4	BOOL	
Infobit_Pad5	BOOL	
Infobit_Pad6	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
CIPConnections	INT	2
CIPLostPackets	DINT	4
CIPTimeouts	DINT	4
CPUUtilization	INT	2
Pad	INT	2

Diagnostic Channels

1. Diagnostic Channel

- Size = 72 bytes

This data type is retrieved as part of the diagnostic assembly instance.

Follow the information in the following table to add each member.

Table 71. 5034-IF8V Diagnostic Channel Structure

Name	Date Type	Size in Bytes
Databit_Pad0	BOOL	2
Fault	BOOL	
Uncertain	BOOL	
OpenWire	BOOL	
Databit_Pad4	BOOL	
Databit_Pad5	BOOL	
FieldPowerOff	BOOL	
Databit_Pad7	BOOL	
Disabled	BOOL	
Databit_Pad10	BOOL	
Databit_Pad11	BOOL	

Name	Date Type	Size in Bytes
Databit_Pad12	BOOL	
Databit_Pad13	BOOL	
Databit_Pad14	BOOL	
Databit_Pad15	BOOL	
CalFault (DIAG 4)	BOOL	2
Underrange (DIAG 1)	BOOL	
Overrange (DIAG 1)	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
Diagbit_Pad12	BOOL	
Diagbit_Pad13	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad1	INT	2
InternalErrorCount	SINT	1
CalRange	SINT	1
CalOffset	REAL	4
CalGain	REAL	4
CalLastDate	LINT	8
OpenWireTimestamp	LINT	8
Pad2	LINT	8
UnderrangeTimestamp	LINT	8
OverrangeTimestamp	LINT	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8

Definitions for Diagnostic Assembly Types

Table 72. Definition of Members in Diagnostic Assembly Data Types

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Module is not applying new Output tag data because the controller is in Program Mode. 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics active 1 = One or more diagnostics are active or the prognostics threshold is reached.
CIPSyncValid	BOOL	Indicates if the module is synced with a 1588 master.	<ul style="list-style-type: none"> 0 = Module is not synced 1 = Module is synced
CIPSyncTimeout	BOOL	Indicates if the module was once synced with a 1588 master, but is not now due to a timeout	<ul style="list-style-type: none"> 0 = A valid time master has not timed out. 1 = A valid time master is detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.	-128...+127 The value of 0 is skipped except during module power-up.
FlashUpdateRequired	BOOL	Indicates whether flash update is required.	<ul style="list-style-type: none"> 0 = Flash update is not required 1 = Module has no application firmware
SelfTestFault	BOOL	Indicate whether the fault is present during module self-test.	<ul style="list-style-type: none"> 0 = Module initialization code did not detect an error 1 = Module initialization code detected an error

Table 72. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
LocalClockOffset	LINT	The offset from the local clock to the system time. This value helps to detect steps in time. This value updates when a PTP update is received.	Any value
LocalClockOffsetTimestamp	LINT	Indicates the timestamp of the local clock offset.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MMDD-HH:mm:ss_mmm_uuu_nnn(UTC-00:00)</p> <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds • uuu = microseconds • nnn = nanoseconds • UTC-00:00 = Time zone
GrandMasterClockID	SINT	The EUI-64 Identity of the CIP Sync Grandmaster clock the module is synced to.	Any value
FieldPowerOnTimestamp	LINT	Indicates the timestamp of the last time field power turned on.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:ss.mmm.</p> <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
FieldPowerOffTimestamp	LINT	Indicates the timestamp of the last time field power turned off.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:ss.mmm.</p> <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
Fault	BOOL	Indicates that channel data is inaccurate and cannot be trusted for use in the application.	<ul style="list-style-type: none"> • 0 = No fault exists • 1 = Fault exists

Table 72. Definition of Members in Diagnostic Assembly Data Types (continued)

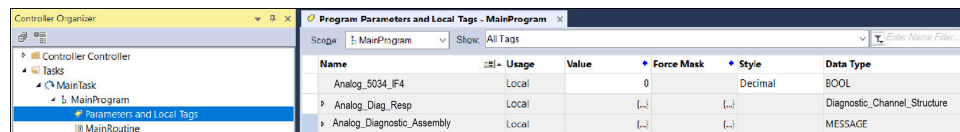
Name	Data Type	Definition	Valid Values
		If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.	<p>The typical causes of a fault are the following:</p> <ul style="list-style-type: none"> Channel is disabled Open Wire condition Underrange/Ovrange condition SA power loss condition <p>You must troubleshoot the module first to see if the typical causes exist.</p>
Uncertain	BOOL	<p>Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p>	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain
OpenWire	BOOL	The signal wire is disconnected from the channel or the RTB is removed from the module.	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled. 1 = Open wire condition exists, that means the signal wire is disconnected from the channel or the RTB is removed from the module.
CalFault	BOOL	Indicates the last attempted Calibration for this channel failed or there is no calibration data present. This tag is cleared, that is, set to 0, when power is cycled to the module.	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed
Underrange	BOOL	<p>Indicates the channel data is beneath the underrange threshold for this channel.</p> <p>For example, when the channel operates in the 4...20 mA input range, the underrange threshold on the channel is < 3.0 mA. If the input signal is 0 mA, this tag is set to 1.</p>	<ul style="list-style-type: none"> 0 = Channel data is not beneath the underrange threshold 1 = Channel data is beneath the underrange threshold
Ovrange	BOOL	<p>Indicates the channel data is above the overrange threshold for this channel.</p> <p>For example, when the channel operates in the 4...20 mA output range, the overrange threshold on the channel is > 23.0 mA. If the input signal is 24 mA, this tag is set to 1.</p>	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
CalRange	SINT	Indicates the value currently configured for the channel. Values display according to the Input Type selected.	<ul style="list-style-type: none"> 0 = -10...10V 1 = 0...5V 2 = 0...10V 4 = 0...20 mA 5 = 4...20 mA

Table 72. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
CalOffset	REAL	Indicates the offset in signal units as reported by the device.	Any value
CalGain	REAL	Indicates the calibration gain reported by the device.	Any value
CalLastDate	LINT	Indicates the time of the last calibration date for the channel.	Any value
OpenWireTimestamp	LINT	Indicates the timestamp of the last time when the open wire condition is detected.	A valid time or None if there is no recorded event time.
UnderrangeTimestamp	LINT	Indicates the timestamp of the last underrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
OverrangeTimestamp	LINT	Indicates the timestamp of the last overrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
CIPConnections	INT	Indicates the number of CIP connections currently open.	0...24
CIPLostPackets	DINT	Indicates the running sum of the number of Sequenced Address Item Sequence Numbers that are skipped in Class 0 and Class 1 connections consumed by the adapter and its children.	0...2,147,483,647
CIPTimeouts	DINT	Indicates the running count of the number of connections that time out, both originated and targeted, to and through the adapter.	0...2,147,483,647
CPUUtilization	INT	Indicates the usage of the compute engine.	0...100%

Create Message Type User Tags

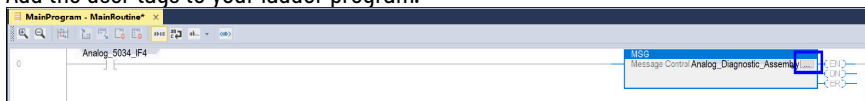
Create MESSAGE type user tags for requests and associated response user tags for each of the new user-defined diagnostic assembly types.



Name	Usage	Value	Force Mask	Style	Data Type
Analog_5034_IF4	Local	0		Decimal	BOOL
Analog_Diag_Resp	Local	[...]	[...]		Diagnostic_Channel_Structure
Analog_Diagnostic_Assembly	Local	[...]	[...]		MESSAGE

From the Controller Organizer pane, expand Tasks → MainTask → MainProgram:

1. Create MESSAGE type user tags for each request.
2. Create associated response user tags for each new user-defined diagnostic assembly type.
3. Add the user tags to your ladder program.



4. Expand the message tag to open the message configuration dialog.
5. On the Configuration tab, select:
 - Service type: Get Attribute Single
 - Class: 4
 - Attribute: 3
 - Instance:
 - 0x8019 (32793) Diagnostic Assembly A for Analog 8 Channel Input Module
 - 0x801E (32798) Diagnostic Assembly B for Analog 8 Channel Input Module
 - 0x301 (769) Diagnostic Counters Base I/O Assembly
 - Destination element: User-defined data type suitable for the instance entered.
6. On the Communication tab, select the path to the module that you wish to send the messages to.
7. Download the project and set to Run Mode.

You can monitor the user-defined tag values from the Program Parameters and Local Tags window, under the MainProgram task in the Controller Organizer pane.

5034-IRT4I and 5034-IRT4IXT Details

This chapter covers the detailed instructions on how to configure, calibrate, and troubleshoot your 5034-IRT4I and 5034-IRT4IXT modules. It also describes the module tag definitions for input, output, and configuration tags.

5034-IRT4I and 5034-IRT4IXT Analog 4 Input Isolated RTD/TC Modules

Figure 55. 5034-IRT4I and 5034-IRT4IXT Wiring Diagram – RTD Mode

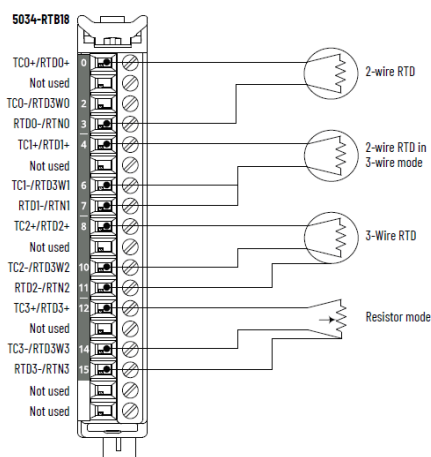


Figure 56. 5034-IRT4I and 5034-IRT4IXT Wiring Diagram – Thermocouple Mode

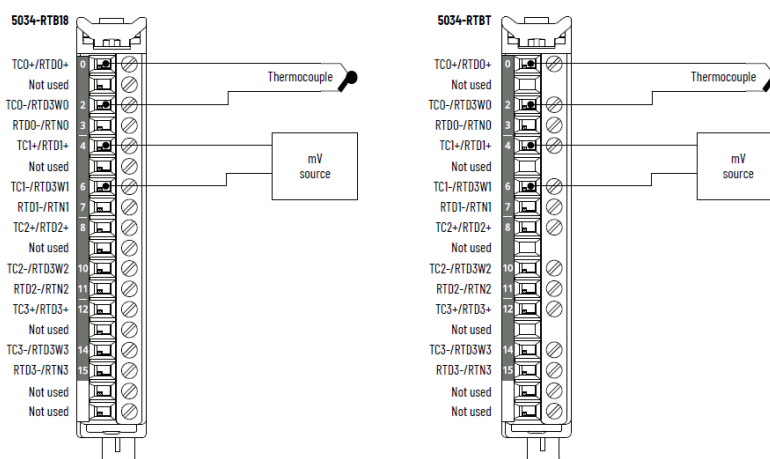


Figure 57. 5034-IRT4I and 5034-IRT4IXT Functional Block Diagram

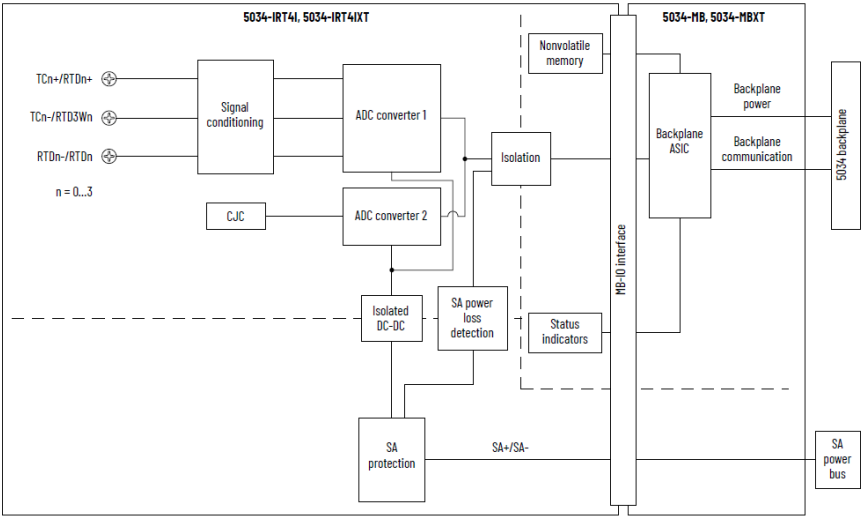


Table 73. Technical Specifications - 5034-IRT4I, 5034-IRT4IXT

Attribute	5034-IRT4I, 5034-IRT4IXT
Input range, resistive	1...500 Ω 2...1000 Ω 4...2000 Ω 8...4000 Ω
Input type, RTD	100, 200, 500, 1000 Ω platinum, alpha = 385 100, 200, 500, 1000 Ω platinum, alpha = 3916 120 Ω nickel, alpha = 672 100, 120, 200, 500 Ω nickel, alpha = 618 10 Ω copper 427
Input range, thermocouple/millivolt	±100 mV
Input type, thermocouple	B, C, D, E, J, K, N, R, S, T, TXK/XK(L)
Input impedance	Thermocouple/millivolt: > 1 MΩ RTD: > 1 MΩ
Common mode voltage (channel to channel)	250V (continuous), Basic Isolation
Module conversion method	Sigma-delta, 24-bit multiplexed ADC
Resolution, RTD/resistive At 50/60 Hz notch filter	16 bit
Resolution, thermocouple/millivolt At 50/60 Hz notch filter	16 bit

Table 73. Technical Specifications - 5034-IRT4I, 5034-IRT4IXT (continued)

Attribute	5034-IRT4I, 5034-IRT4IXT
RTD excitation current	250 μ A for 1000, 2000, 4000 Ω range 500 μ A for 500 Ω range
Thermocouple linearization	ITS-90
CJ mode	Onboard CJC, RTB CJC, remote CJC
Onboard CJC inputs (for thermocouple mode use only)	CJC sensors Four thermistors embedded in 5034-IRT4I and 5034-IRT4IXT Vishay NTC50805E3103FHT
Onboard CJC sensor accuracy	± 3.0 $^{\circ}$ C, 0 $^{\circ}$ C $< T_{amb} < 60$ $^{\circ}$ C (± 5.4 $^{\circ}$ F, 32 $^{\circ}$ F $< T_{amb} < 140$ $^{\circ}$ F) ± 4.0 $^{\circ}$ C, -25 $^{\circ}$ C $< T_{amb} < 0$ $^{\circ}$ C (± 7.2 $^{\circ}$ F, -13 $^{\circ}$ F $< T_{amb} < 32$ $^{\circ}$ F)
RTB CJC inputs (for thermocouple mode use only)	CJC sensors Four thermistors embedded in 5034-RTBT and 5034-RTBTS TE Connectivity TE 10K3A1A
RTB CJC sensor accuracy	± 0.6 $^{\circ}$ C, 0 $^{\circ}$ C $< T_{amb} < 60$ $^{\circ}$ C (± 1.1 $^{\circ}$ F, 32 $^{\circ}$ F $< T_{amb} < 140$ $^{\circ}$ F) ± 1.2 $^{\circ}$ C, -25 $^{\circ}$ C $< T_{amb} < 0$ $^{\circ}$ C (± 2.2 $^{\circ}$ F, -13 $^{\circ}$ F $< T_{amb} < 32$ $^{\circ}$ F)
CJC conversion method	12-bit SAR
Calibrated accuracy at 25 $^{\circ}$ C (77 $^{\circ}$ F)	Thermocouple/millivolt: 0.1% full scale with 50/60 Hz filter RTD: 500 Ω , 1 k Ω , 2 k Ω , 4 k Ω range, 0.1% full scale with 50/60 Hz filter
Calibrated accuracy over full temperature range -25...+60 $^{\circ}$ C (-13...+140 $^{\circ}$ F)	Thermocouple/millivolt: 0.25% full scale with 50/60 Hz filter RTD: 500 Ω , 1 k Ω , 2 k Ω , 4 k Ω range, 0.25% full scale with 50/60 Hz filter
Fastest scan time per channel	0.36 ms
Fastest scan time per module	0.36 ms
Input notch filter selections (Hz)	10, 20, 50, 60 (Default), 100, 200, 500, 1000, 2500, 5000
Hardware input filter	1 kHz
Input digital filter	First order lag, 0 ms (Default) 0...32,767 ms (32.767 s)
Normal mode noise rejection ratio	65 dB @ 50/60 Hz, notch filter dependent
Open wire detection time	< 200 ms
Overvoltage protection, max	32V DC

Table 73. Technical Specifications - 5034-IRT4I, 5034-IRT4IXT (continued)

Attribute	5034-IRT4I, 5034-IRT4IXT
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Rolling timestamp of inputs	Yes
Data format	IEEE 754 32-bit floating point

Table 74. Technical Specifications - 5034-IRT4I, 5034-IRT4IXT - RTD Sensors

RTD Sensor Types ⁽¹⁾	Temperature Range
100, 200, 500, 1000 Ω PT 385	-200...+870 °C -328...+1598 °F 73...1143 K 132...2058 °R
100, 200, 500, 1000 Ω PT 3916	-200...+630 °C -328...+1166 °F 73...903 K 132...1626 °R
10 Ω CU 427	-200...+260 °C -328...+500 °F 73...533 K 132...960 °R
120 Ω NI 672	-80...+320 °C -112...+608 °F 193...593 K 348...1068 °R
100, 120, 200, 500 Ω NI 618	-60...+250 °C -76...+482 °F 213...523 K 384...942 °R

(1) Each sensor type supports all temperature ranges listed.

Table 75. Technical Specifications - 5034-IRT4I, 5034-IRT4IXT - Thermocouples

Thermocouple Type	Temperature Range
Thermocouple type B	21...1820 °C 68...3308 °F 293...2093 K 528...3768 °R
Thermocouple type C	0...2315 °C 32...4199 °F 273...2588 K 492...4659 °R
Thermocouple type D	0...2315 °C 32...4199 °F 273...2588 K 492...4659 °R
Thermocouple type E	-270...+1000 °C -454...+1832 °F 3...1273 K 6...2292 °R
Thermocouple type J	-210...+1200 °C -346...+2192 °F 63...1473 K 114...2652 °R
Thermocouple type K	-270...+1372 °C -454...+2502 °F 3...1645 K 6...2961 °R
Thermocouple type N	-270...+1300 °C -454...+2372 °F 3...1573 K 6...2832 °R
Thermocouple type R	-50...+1768 °C -58...+3215 °F 223...2041 K 402...3674 °R
Thermocouple type S	-50...+1768 °C

Table 75. Technical Specifications - 5034-IRT4I, 5034-IRT4IXT - Thermocouples (continued)

Thermocouple Type	Temperature Range
	-58...+3215 °F 223...2041 K 402...3674 °R
Thermocouple type T	-270...+400 °C -454...+752 °F 3...673 K 6...1212 °R
Thermocouple type TXK/XK(L)	-200...+800 °C -328...+1472 °F 73...1073 K 132...1932 °R

Table 76. General Specifications - 5034-IRT4I, 5034-IRT4IXT

Attribute	5034-IRT4I, 5034-IRT4IXT
Number of inputs	4 channels (4 isolated group)
SA power voltage, nom	24V DC
SA power voltage range	10...30V DC
SA power current, nom	50 mA
SA power current, max	0.1 A
SA power current at no load	11 mA
SA reverse polarity protection	Yes
Power dissipation, max ⁽¹⁾	0.42 W
Thermal dissipation, max ⁽¹⁾	1.43 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type, System to Field 250V (continuous), Basic Insulation Type, SA power and input ports 250V (continuous), Basic Insulation Type, between individual input ports
Calibration	Factory-calibrated Manual calibration supported, see PointMax Analog I/O Modules User Manual, publication 5034-UM003
RIUP support	Yes

Table 76. General Specifications - 5034-IRT4I, 5034-IRT4IXT (continued)

Attribute	5034-IRT4I, 5034-IRT4IXT
CIP Sync	Yes, slave only ordinary clock
Electronic keying	Electronic keying via programming software
RTB key positions (slot)	2, 7, 10
RTB supported	5034-RTB18, 5034-RTB18S, 5034-RTBT, 5034-RTBTS To help achieve better accuracy, use the CJC thermistors that are embedded in 5034-RTBT and 5034-RTBTS.
Wiring category ⁽²⁾	2 - Signal ports 2 - Power ports
Wiring specification	See Wiring Specifications for Removable Terminal Blocks in the PointMax I/O System Specifications Technical Data, publication 5034-TD001
Indicators	1 green/red module status indicator 1 green/red SA power status indicator 4 yellow/red I/O status indicators
Dimensions (HxWxD), approx	123.6 x 15.0 x 66.4 mm (4.87 x 0.59 x 2.61 in.)
Weight, approx	45.0 g (1.59 oz.) - 5034-IRT4I 48.0 g (1.69 oz.) - 5034-IRT4IXT
Enclosure type	None (Open-style)
North American temp code	T4
UKEX/ATEX temp code	T4
IECEX temp code	T4

(1) Value is measured at 60 °C (140 °F). Power dissipation varies with temperature.

(2) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#). Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

Module Configuration

Before you start configuring your I/O module, you must create a Studio 5000 Logix Designer application project for the Logix 5000 controller that owns the I/O module. The project includes configuration data for the module.

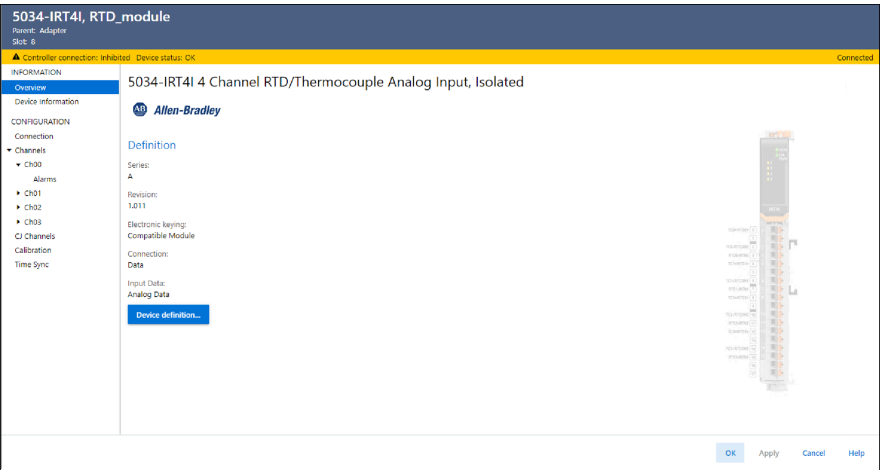
The Studio 5000 Logix Designer application transfers the project to the owner-controller during the program download. Data is then transferred to the I/O modules over the EtherNet/IP network.

The I/O modules can operate immediately after receiving and applying the configuration data.

Overview View

Use Overview to view the definition of a device, including the device type, revision, electronic keying, connection, and other device-specific values.

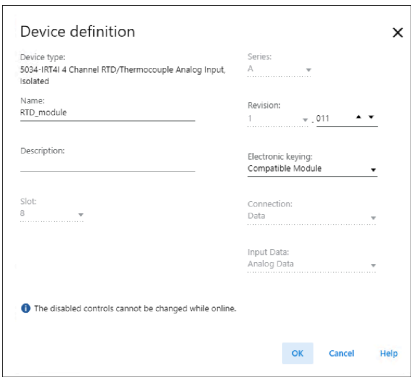
Figure 58. Overview View Example



Device Definition

To change the definition of a device, select Device definition in the Overview view.

Figure 59. Device Definition Example



Device Definition includes these parameters:

Table 77. Device Definition Parameters

Parameter	Definition	Available Choices
Device Type	Displays the device catalog number and type.	Device-specific
Name	Enter an IEC 61131 compliant device name. If an invalid character is entered in this field, or if the name exceeds 40 characters, the software ignores the character.	All valid values
Description	Enter the description of the device.	All valid values

Table 77. Device Definition Parameters (continued)

Parameter	Definition	Available Choices
Slot	<p>Specify the slot number where the device resides. Only slots between 1 and the maximum number of I/O devices are valid depending on the platform.</p> <p>When the device is created, the slot number defaults to the first available slot position.</p> <p>When the controller is changed to one supporting a smaller maximum I/O count, the current slot value may no longer be valid.</p>	1...32
Series	Specifies the series of the device.	Device-specific
Revision	Specifies the major and minor revisions of the device. The valid range for minor revision is from 1...255.	Device-specific
Electronic Keying	<p>Defines the electronic keying used for the device. Electronic keying compares the device defined in the project to the installed device. If keying fails, a fault occurs.</p> <p>For detailed information on Electronic keying, see Electronic Keying in Logix 5000 Control Systems Application Technique, publication LOGIX-AT001.</p>	<ul style="list-style-type: none"> Exact Match Compatible Module Disable Keying <hr/> <div>  <p>ATTENTION: Be extremely cautious when using Disable Keying; if used incorrectly, this option can lead to personal injury or death, property damage, or economic loss.</p> <p>We strongly suggest that you do not use Disable Keying.</p> <p>If you use Disable Keying, you must take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.</p> </div> <hr/>
Connection	<p>Specify the type of data transferred between the device and controller.</p> <p>For the Listen Only choice, the controller and device establish communication without the controller sending any configuration or output data to the device. A full input data connection is established but</p>	<ul style="list-style-type: none"> Data with Calibration Data (default) Listen Only

Table 77. Device Definition Parameters (continued)

Parameter	Definition	Available Choices
	depends on the connection between the owner-controller and the device.	
Input Data	Select the input data type for the device.	Analog Data

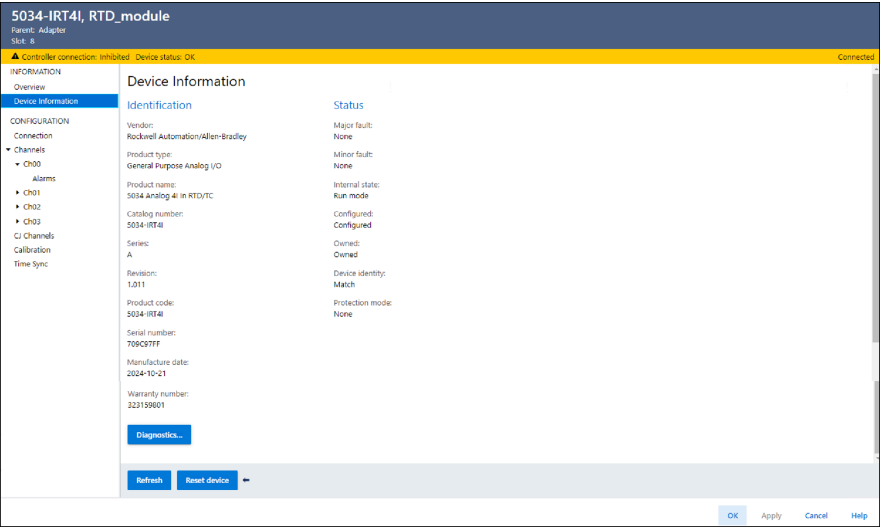
Device Information View

Use Device Information to view device and status information when the device is online.

Use Device Information to:

- Determine the identity of the device.
- View the device's current operational state.
- View whether the device was configured by the owner controller.
- View whether an owner controller is currently connected to the device.
- Retrieve the latest information from the device.
- Reset a device to its power-up state.
- If supported, view the Protection Mode of the device.

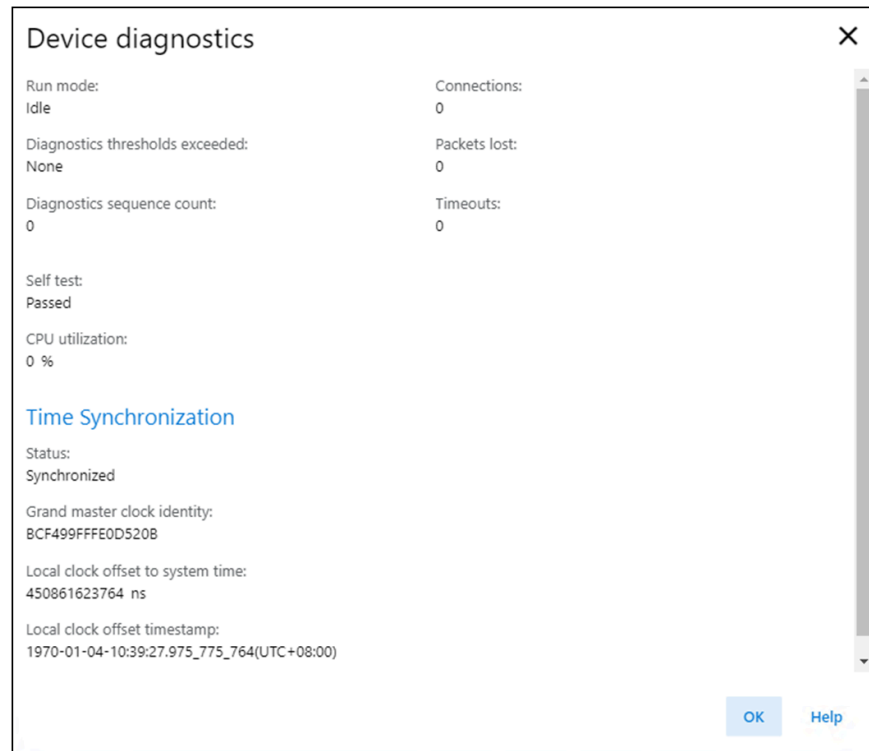
Figure 60. Device Information View Example



Device Diagnostics

To view the device diagnostics, select Diagnostics in the Device Information view.

Figure 61. Device Diagnostics Example



Connection View

Use Connection to define controller-to-device behavior:

- Set the RPI rate. For more information, see [Requested Packet Interval on page 17](#).
- Select Unicast or Multicast connection to use on the EtherNet/IP network. For more information, see [Unicast or Multicast Connection on page 21](#).
- View the reason of Connection Fault.



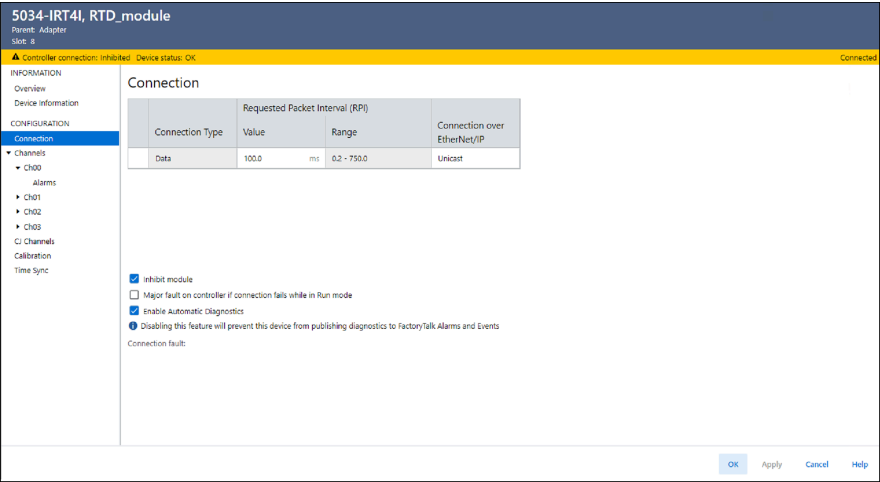
If there is a connection fault, Connection Fault area displays the error code with description that helps you to troubleshoot the module. For more information, see [Troubleshoot Your Module on page 50](#).

- Inhibit the module. For more information, see [Module Inhibiting on page 18](#).
- Configure fault response for connection failure while the controller is in Run Mode.
- Enable or disable the Automatic Diagnostics.



ATTENTION: If you do not enable Automatic Diagnostics, the device does not publish diagnostics to FactoryTalk Alarms and Events.

Figure 62. Connection View Example



Recommended Minimum RPI Values for Notch Filters

In the following table, each Notch Filter setting has recommended minimum module RPI value that allow the required time to collect samples from each channel. The recommended minimum RPI for the module is the maximum one of all recommended values per channel.

Table 78. Notch Filter and Recommended Minimum Module RPI Values

Notch Filter (Hz)	Recommended Minimum Module RPI Value
10	106
20	53.1
50	22
60 (default)	18.3
100	9
200	5.9
500	2.2
1000	1.1
2500	0.5
5000	0.3

Channels View

The Channels view shows an overview of the configuration values for all module channels.



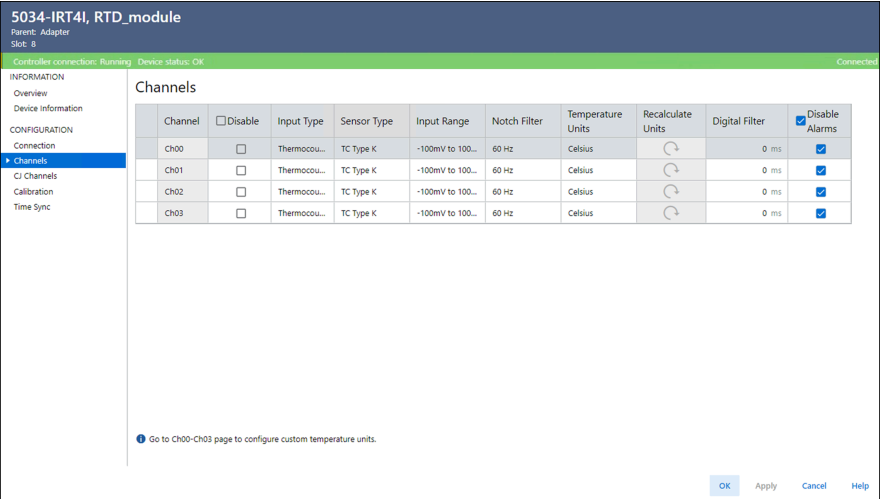
Not all channel configurations are included in Channels view. To view or change the complete set of the channel configuration and also to view the diagnostics information for the channel, use Chxx view.

You can do the following actions on this view for all the channels:

- Disable the channel, if desired
- Change the input type, wiring method, sensor type, and input range
- Set the notch filter
- Set the scaling and recalculate all configurations with engineering unit

- Set digital filter
- Disable alarms

Figure 63. Channels View Example



Chxx View

The Chxx view, where xx represents the channel number, shows the configuration options available for the respective channel.

You can do the following actions on this view:

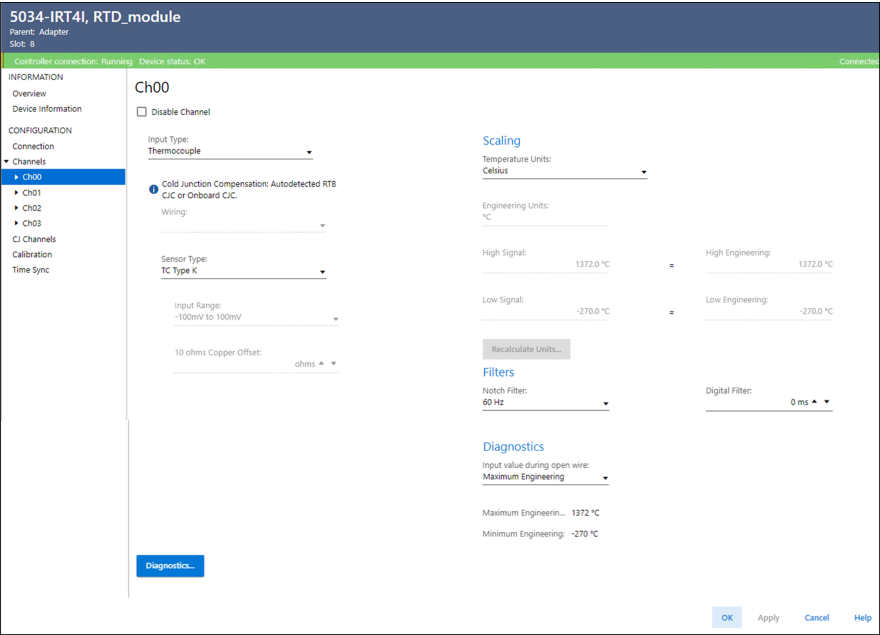
- Disable the channel, if desired
- Change the input type, wiring method, sensor type, input range, and 10 ohms copper offset
- Set the notch filter
- Set the scaling and recalculate all configurations with engineering unit
- Set digital filter
- View channel diagnostics information

You cannot see the option to enable the Open Wire detection as it is always enabled for this module.



To latch and configure alarm parameters, go to Alarms view.

Figure 64. Chxx View Example

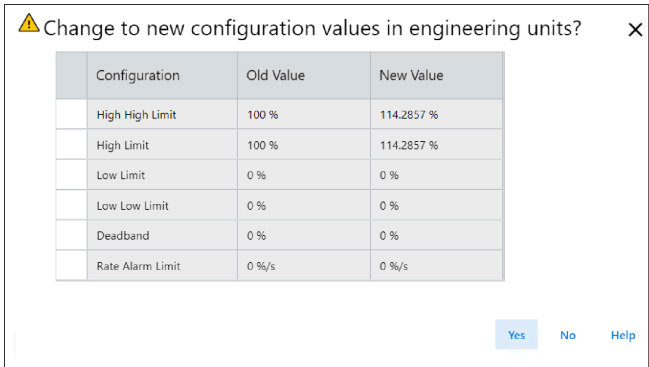


Recalculate Units

Recalculate Units lets you recalculate all configurations with engineering unit after a scaling change. Consider the following:

- The Recalculate Units option is enabled when the scaling configuration is changed.
- Upon selecting Recalculate Units option, the recalculated new values based on the new scaling configuration are displayed together with the old values for you to verify before changing.
- If you select "Yes" to proceed with the change, the new values will be set but it gets applied when you select "Apply/OK".
- If you select "No" to cancel the change, the old values are retained. You can either select the Recalculate Units again or manually change those configurations based on the new scaling.

Figure 65. Recalculate Units Example



Channelxx Diagnostics

Displays the channel diagnostics information when connected with the module. When online with the module, select the Diagnostics on the Chxx view to see the diagnostic information.

Figure 66. Channelxx Diagnostics Example

Channel00 Diagnostics

Data Uncertain:

Yes

Field Power:

Present

Field Power On Timestamp:

None

Field Power Off Timestamp:

None

Open Wire Fault:

Present

Open Wire Fault Timestamp:

1970-01-01-11:06:45.377

Overrange Fault:

Present

Overrange Fault Timestamp:

1970-01-01-11:06:45.377

Underrange Fault:

Not Present

Underrange Fault Timestamp:

None

Calibration for Active Range

Calibration Timestamp:

2024-10-21-23:28:20.825

Range:

-100 mV to 100 mV

Gain:

1.002143

Offset:

-0.618919

OK

HELP

Alarms View

Each channel on the input module has an Alarms view. You can do the following actions on this view:

- Disable all the alarms.
- Enable/Disable latching and set the alarm limits for the process alarms:
 - High High
 - High
 - Low
 - Low Low
 - Deadband
- Enable/Disable latching and set limit for the rate alarm.



Rate Alarm Limit of 0.0 disables the rate alarm.

Figure 67. Chxx - Alarms View Example

5034-IRT4I, RTD_module

Parent: Adapter

Slot: 8

Controller connection: Running

Device status: OK

Connected

INFORMATION

Overview

Device Information

CONFIGURATION

Connection

Channels

- Ch00

Alarms

- Ch01
- Ch02

CJ Channels

Calibration

Time Sync

Ch00 - Alarms

☒ Disable All Alarms

Process Alarming

☐ Latch Process Alarms

High High Limit: 870.0 °C

High Limit: 870.0 °C

Low Limit: -200.0 °C

Low Low Limit: -200.0 °C

Deadband: 0.0 °C

Rate Alarming

☐ Enable Rate Alarm Latching

Rate Alarm Limit: 0.0 °C/s

OK

Apply

Cancel

Help

CJ Channels View

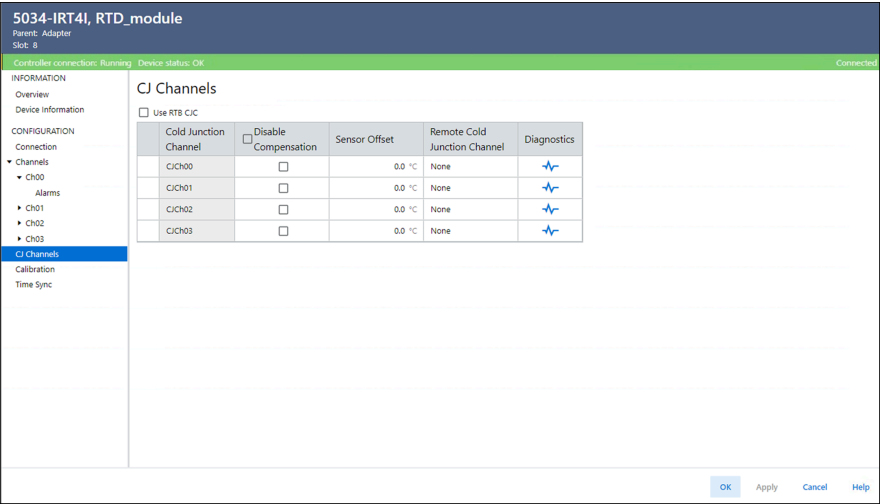
Use the CJ Channels view to select Cold Junction Compensation, when you connect a module channel to a Thermocouple input type.

You can do the following actions on this view:

- Select the one of the following CJC modes for CJ compensation:
 - Onboard CJC - You cannot see this option in this view. If None is selected in the Remote Cold Junction Channel column, Use RTB CJC checkbox is not selected, and a standard RTB (without CJC) is used, then you can assume that the channel is using onboard CJC for CJ compensation.
 - RTB CJC - If None is selected in the Remote Cold Junction Channel column and an RTB with CJC is used, then you can assume that the channel is using the RTB CJC for CJ compensation.
- Remote Cold Junction Channel (Remote CJC) - If Chxx is selected in Remote Cold Junction Channel column, then you can assume that the channel is using the remote Chxx for CJ compensation.
- Disable the compensation for the channel.
- View the diagnostics details of the CJ channel.

IMPORTANT: If using RTB CJC is a must for your application due to the accuracy requirement, make sure that Use RTB CJC checkbox is selected and you are using an RTB with CJC. If you are using standard RTB (without CJC) with Use RTB CJC checkbox selected, the channel gets faulted.

Figure 68. CJ Channels View Example



CJ Channelxx Diagnostics

Displays the diagnostics information for the CJ channel when there is a CJ connection. When online with the module, select the icon on the CJ Channels view to see the diagnostic information.

Figure 69. CJ Channelxx Diagnostics Example

CJ Channel00 Diagnostics

Fault Exists:	Yes
Data Uncertain:	No
CJ Mode:	Disabled
Field Power:	Present
Field Power On Timestamp:	None
Field Power Off Timestamp:	None
Open Wire Fault:	Present
Open Wire Fault Timestamp:	1970-01-01-11:06:45.509
Overrange Fault:	Not Present
Overrange Fault Timestamp:	None
Underrange Fault:	Present
Underrange Fault Timestamp:	1970-01-01-11:06:45.493

OK

HELP

Calibration View

The Calibration view provides calibration information for all channels on the module. You can do the following actions on this view for all the channels:

- View calibration parameters and calibration status for the currently configured input ranges.
- Perform user calibration for one or multiple channels.
- Revert calibration parameters to the factory default values.

For more information on how to calibrate a module, see [Module Calibration \(Interactive\) on page 194](#)

Figure 70. Calibration View Example

5034-IRT4I, RTD_module

Parent: Adapter

Slot: 8

▲ Controller connection: inhibited Device status: OK

Connected

INFORMATION

Overview

Device Information

CONFIGURATION

Connection

▼ Channels

Alarms

► CH01

► CH02

► CH03

CJ Channels

Calibration

Time Sync

Calibration

Channel	Calibration Range	Calibration Gain	Calibration Offset	Last Calibration Date	Calibration Status
CH00	1 ohm to 500 ohms 2-Wire	1.002143	-0.618919	2024-10-21	OK
CH01	8 ohms to 4000 ohms 2-Wire	1.000011	-0.590096	2024-10-21	OK
CH02	-100mV to 100mV	0.999773	-0.607880	2024-10-21	OK
CH03	-100mV to 100mV	1.000312	-0.586861	2024-10-21	OK

Revert to factory calibration

Start Calibration...

OK

Apply

Cancel

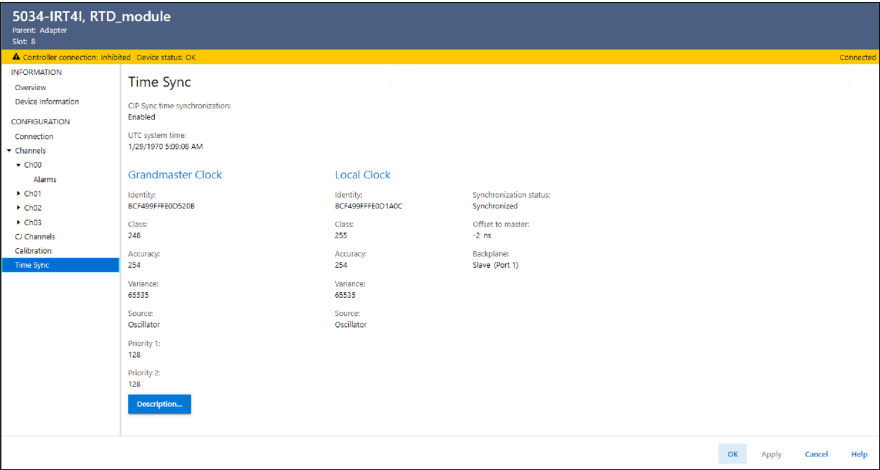
Help

Time Sync View

The Time Sync view is read-only and displays the CIP Sync status information about the module when the project is online. The Time Sync category displays the following information:

- CIP Sync time synchronization status
- UTC system time
- Grandmaster Clock information
- Grandmaster Clock description
- Local Clock information

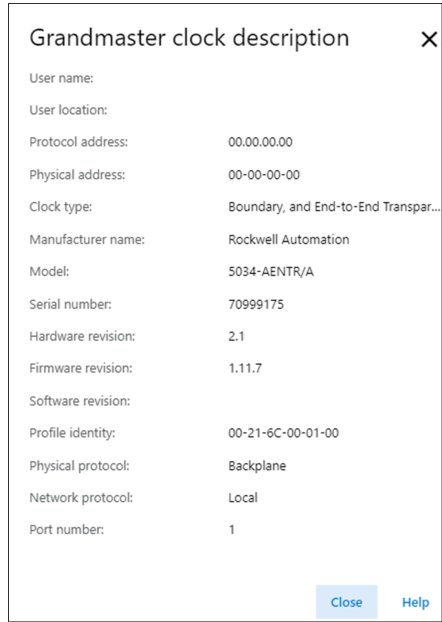
Figure 71. Time Sync View Example



Grandmaster Clock Description

The Grandmaster clock description dialog provides detailed information about the grandmaster clock. To view the Grandmaster clock description, select Description in the Time Sync view.

Figure 72. Grandmaster Clock Description Example



Module Calibration (Interactive)

You can use Calibration view in Module Properties to interactively calibrate the module on a per channel basis or in group.

Controller State During Calibration

You must add the module to your Studio 5000 Logix Designer application project before you can calibrate it.

The project must be online with the owner-controller to calibrate the PointMax analog modules. You can calibrate under any of the following conditions:

- The controller is in Program Mode, that is, either Remote Program or Program Mode.
Your module must be in Program Mode and not be actively controlling a process when you calibrate it.
- There are no connections to the module.

Calibration Impacts Data Quality

When a channel on an analog input module is being calibrated, the Notch Filter setting for that channel changes to 10 Hz. The I.Chxx.Uncertain tag is set to 1 for that channel until calibration is completed.

Calibration Instrumentation Specifications

When you calibrate the analog input modules, send current or ohms reference signals to the module to calibrate it. To maintain your module's factory calibration accuracy, use the instrumentation with the specifications listed in the following table.

IMPORTANT: Do not calibrate your module with an instrument that is less accurate than those specified in following table. The following events can result:

- Calibration appears to occur normally but the module gives inaccurate data during operation.
- A calibration fault occurs, forcing you to abort calibration. When this happens, I.Chxx.CalFault tag is set for the channel you attempted to calibrate. You can clear this tag by completing a valid calibration or cycling power to the module.

Table 79. Instrument Specifications

Catalog Number	Channel Input Type	Calibration Instrumentation Specifications
5034-IRT4I and 5034-IRT4IXT	RTD	1.0...448.0 Ω resistors ±0.01%
	Thermocouple (mV)	0...100 mV source ±0.5 μV

Calibration Procedure

This example describes how to calibrate a channel on the 5034-IRT4I module for use with the RTD input type. The 5034-IRT4I module uses the following resistors to calibrate in ohms:

- 1 Ω resistor for low reference calibration
- 448 Ω resistor for high reference calibration

Apply Low and High Signal references to the analog input module to calibrate it. The references must match the input range the channel is using.

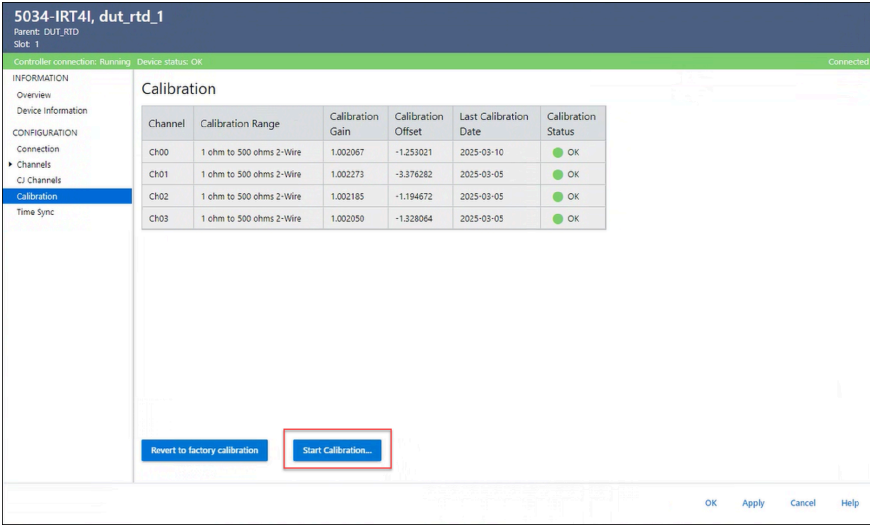
Table 80. Analog Input Module Calibration References

Input Type	Input Range	Low Calibration Reference	High Calibration Reference
RTD	1...500 Ω	1 Ω	448 Ω

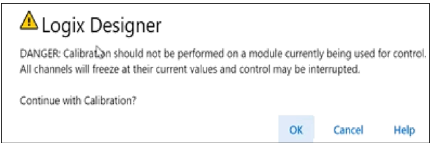
Table 80. Analog Input Module Calibration References (continued)

Input Type	Input Range	Low Calibration Reference	High Calibration Reference
Thermocouple	-100...+100 mV	0.0 mV	100.0 mV

1. Connect the low reference resistor to the channel being calibrated.
2. Go online with the project and make sure that the controller is in Program Mode.
3. Confirm that the channel to be calibrated is configured for the correct Input Range.
4. On the Calibration view in the Module Properties dialog, select Start Calibration.



5. When the dialog appears to confirm that you want to calibrate the channel, select OK.



6. Select the channels one at a time or in groups to calibrate and then select Next.

Calibration Wizard - Select Channels to Calibrate

Select the checkboxes of the channels to calibrate, and then select to calibrate in groups or one at a time.

	Channel	Calibrate	Calibration Range	Calibration Gain	Calibration Offset	Calibration Status
	Ch00	☐	1 ohm to 500 ohms 2-Wire	1.002067	-1.253021	OK
*	Ch01	☒	1 ohm to 500 ohms 2-Wire	1.002273	-3.376282	OK
	Ch02	☐	1 ohm to 500 ohms 2-Wire	1.002185	+1.194672	OK
	Ch03	☐	1 ohm to 500 ohms 2-Wire	1.002050	-1.328064	OK

☐ Calibrate channels in groups
☒ Calibrate channels one at a time

BackNextCancelHelp

7. When the Attach Low Reference dialog appears, connect a 1 Ω resistor to the channel being calibrated.

Calibration Wizard - Attach Low Reference

Attach reference signals to selected channels. Select Next to continue.

Channel: Ch01

Channel	Calibrate	Calibration Range	Low Reference
Ch00	☐		
Ch01	☒	1 ohm to 500 ohms 2-Wire	1.00 ohm
Ch02	☐		
Ch03	☐		

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8. Select Next.
The Low Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - Low Reference Results

Select Next to continue.

Channel	Calibrate	Calibration Range	Low Reference	Status
Ch00	☐			
Ch01	☒	1 ohm to 500 ohms 2-Wire	1.00 ohm	OK
Ch02	☐			
Ch03	☐			

Retry

BackNextCancelHelp

9. If the Status is OK, select Next.
If the Status is not OK, repeat the calibration procedure.
10. When the Attach High Reference dialog appears, connect a 448 Ω resistor to the channel being calibrated.

Calibration Wizard - Attach High Reference

Attach reference signals to selected channels. Select Next to continue.

Channel: Ch01

Channel	Calibrate	Calibration Range	High Reference
Ch00	☐		
Ch01	☒	1 ohm to 500 ohms 2-Wire	448.00 ohm
Ch02	☐		
Ch03	☐		

BackNextCancelHelp

11. Select Next.
The High Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - High Reference Results

Select Next to continue.

Channel	Calibrate	Calibration Range	High Reference	Status
Ch00	☐			
Ch01	☒	1 ohm to 500 ohms 2-Wire	448.00 ohm	OK
Ch02	☐			
Ch03	☐			

Retry

BackNextCancelHelp

12. If the Status is OK, select Next.
If the Status is not OK, repeat the calibration procedure.
13. When the Calibration Completed dialog appears, select Finish.

Calibration Wizard - Calibration Completed

Calibration completed successfully. The calibration constants are saved.

Channel	Calibrate	Calibration Range	Low Reference	Status	High Reference	Status
Ch00	☐					
Ch01	☒	1 ohm to 500 ohm...	1.00 ohm	OK	448.00 ohm	OK
Ch02	☐					
Ch03	☐					

BackFinishCancelHelp

Use the Status Indicators for Troubleshooting

- PointMax I/O modules use the following status indicators:
- SA Power Indicator - This indicator operates the same for all PointMax I/O modules.
 - Module Status Indicator - This indicator operates the same for all PointMax I/O modules.
 - Channel Status Indicator - This indicator operates differently based on the module type that you are using.

SA Power Status Indicator

Table 81. Interpret SA Power Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	There is SA power to the module.	None
Steady red	There is no SA power to the module or SA power voltage is not in the valid range.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that SA power wiring is properly connected to the adapter, expansion power module, or 5034-MBSA mounting base. 2. Check the following: <ul style="list-style-type: none"> - Check that the SA voltage is in the correct range. - If an external power supply is used, confirm that the power supply is turned on. - Make sure that the mounting base to mounting base connection is properly secured. <p>Go to Chassis Information view in the Module Properties of the adapter to check the Field Power status of mounting bases installed in all slots.</p>

Module Status Indicator

Table 82. Interpret Module Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	The module is operational and all I/O connections are active.	None
Flashing green	The module has no I/O connections.	Troubleshoot your Studio 5000 Logix Designer application to determine what is preventing a connection from the module to the controller and correct the issue.
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> • A module firmware update is in progress. • A module firmware update attempt failed. • The device has experienced a recoverable fault. • A connection to the module has timed out. 	Complete one of the following: <ul style="list-style-type: none"> • Let the firmware update process complete. • Reattempt a firmware update after one fails. • Use the Studio 5000 Logix Designer application to determine whether a module recoverable fault is occurred. It is shown in Device Information view.

Table 82. Interpret Module Status Indicator (continued)

Indicator State	Description	Recommended Action
		<p>To clear a recoverable fault, complete one of the following:</p> <ul style="list-style-type: none"> - Cycle module power. - Select Reset device in the Studio 5000 Logix Designer project via the Device Information view of the Module Properties dialog. <p>If the fault does not clear after cycling power and module reset, contact Rockwell Automation Technical Support.</p> <ul style="list-style-type: none"> • Use the Studio 5000 Logix Designer application to determine if a connection has timed out. The Connection view in the Module Properties indicates whether a connection request has timed out. <p>If a connection has timed out, determine the cause and correct it. For example, a cable failure can cause a connection timeout.</p>
Steady red	The module experienced a nonrecoverable fault.	<p>Complete the following actions:</p> <ol style="list-style-type: none"> 1. Cycle power to the module. 2. If the status indicator remains in the steady red state, replace the module.

Channel Status Indicators

Table 83. Interpret Analog Input Channel Status Indicators

Indicator State	Description	Recommended Action
Off	<p>One of the following conditions exists:</p> <ul style="list-style-type: none"> • The module is not powered. • The module is powered but connection is not established from the controller to module. • The module is powered, but the input channel is disabled. 	<p>Complete one of the following:</p> <ul style="list-style-type: none"> • If you expect the module to be powered but it is not, complete the following: <ul style="list-style-type: none"> - Confirm that the system is powered. - Confirm that the module is installed properly. • If the module is powered but the channel is not operating as expected, use the Studio 5000 Logix Designer application to confirm that the channel is not disabled and the module has a connection to the controller. <p>The Connection view in the Module Properties indicates if the connection is running or faulted. If the connection is faulted, the Connection view indicates error information.</p> <ul style="list-style-type: none"> • If the channel is disabled, no action is needed.
Steady yellow	The input channel is operating normally.	None

Table 83. Interpret Analog Input Channel Status Indicators (continued)

Indicator State	Description	Recommended Action
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> There is no SA power to the module, or SA power voltage is not in the valid range. The input signal is overrange or underrange. The signal range is set in your Studio 5000 Logix Designer application project. An Open Wire condition, that is, a wire is disconnected from the input channel. 	Complete one of the following: <ul style="list-style-type: none"> If there is a SA power fault, see the recommended action given for steady red indicator state in SA Power Indicator table above. Check the input signal to determine if it is overrange or underrange. If so, make changes to return the input signal to within the range limits. Check the wiring at the input channel. If necessary, reconnect the wire.
Flashing yellow/red	Calibration is in progress.	Successfully complete the calibration process.
Steady red	An issue has occurred that is internal to the module. The following are example issues that can cause the status indicator to be steady red: <ul style="list-style-type: none"> A calibration fault occurred on the channel. The module has experienced a nonrecoverable fault. 	Complete one of the following: <ul style="list-style-type: none"> If the indicator turns steady red after a calibration process, you can either perform a successful calibration or cycle the power to recover the fault. If it is not caused by the calibration, cycle the power to recover the fault. If the condition is still present, replace the module.

Module Tag Definitions

Module tags are created when you add a module to the Studio 5000 Logix Designer application project. The set of module tags associated with a module depends on the module type and Device Definition choices made during module configuration. The tables contained in this section list all of the tags available with a module. Not all tags in the list are used when that module type is added to a project. Tag use varies by module configuration.

Configuration Tag Definitions

Table 84. Configuration Tags

Name	Data Type	Definition	Valid Values								
Chxx.Range	SINT	Channel's operating range	<div>If the input type is Thermocouple, the range is:<ul style="list-style-type: none">6 = -100...+100 mVIf the input type is RTD, the range values vary based on sensor type:</div> <table><tr><th>Sensor Type</th><th>Available Range Selection</th></tr><tr><td>100 Ohms Platinum 385</td><td rowspan="5">8 = 1...500 Ohms 2-wire 12 = 1...500 Ohms 3-wire</td></tr><tr><td>100 Ohms Platinum 3916</td></tr><tr><td>10 Ohms Copper 427</td></tr><tr><td>120 Ohms Nickel 672</td></tr><tr><td>100 Ohms Nickel 618</td></tr></table>	Sensor Type	Available Range Selection	100 Ohms Platinum 385	8 = 1...500 Ohms 2-wire 12 = 1...500 Ohms 3-wire	100 Ohms Platinum 3916	10 Ohms Copper 427	120 Ohms Nickel 672	100 Ohms Nickel 618
Sensor Type	Available Range Selection										
100 Ohms Platinum 385	8 = 1...500 Ohms 2-wire 12 = 1...500 Ohms 3-wire										
100 Ohms Platinum 3916											
10 Ohms Copper 427											
120 Ohms Nickel 672											
100 Ohms Nickel 618											

Table 84. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values	
			Sensor Type	Available Range Selection
			120 Ohms Nickel 618	
			200 Ohms Platinum 385	9 = 2...1,000 Ohms 2-wire
			200 Ohms Platinum 3916	13 = 2...1,000 Ohms 3-wire
			200 Ohms Nickel 618	
			500 Ohms Platinum 385	10 = 4...2,000 Ohms 2-wire
			500 Ohms Platinum 3916	14 = 4...2,000 Ohms 3-wire
			500 Ohms Nickel 618	
			1000 Ohms Platinum 385	11 = 8...4,000 Ohms 2-wire
			1000 Ohms Platinum 3916	15 = 8...4,000 Ohms 3-wire
			Resistance (Ohms)	8 = 1...500 Ohms 2-wire 9 = 2...1,000 Ohms 2-wire 10 = 4...2,000 Ohms 2-wire 11 = 8...4,000 Ohms 2-wire 12 = 1...500 Ohms 3-wire 13 = 2...1,000 Ohms 3-wire 14 = 4...2,000 Ohms 3-wire 15 = 8...4,000 Ohms 3-wire
Chxx.SensorType	SINT	Type of sensor	If the input type is RTD: <ul style="list-style-type: none"> 0 = No linearization, Ohms 1 = 100 Ohms Platinum 385 2 = 200 Ohms Platinum 385 3 = 500 Ohms Platinum 385 4 = 1000 Ohms Platinum 385 5 = 100 Ohms Platinum 3916 6 = 200 Ohms Platinum 3916 7 = 500 Ohms Platinum 3916 8 = 1000 Ohms Platinum 3916 	

Table 84. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> 9 = 10 Ohms Copper 427 10 = 120 Ohms Nickel 672 11 = 100 Ohms Nickel 618 12 = 120 Ohms Nickel 618 13 = 200 Ohms Nickel 618 14 = 500 Ohms Nickel 618 <p>If input type is Thermocouple:</p> <ul style="list-style-type: none"> 0 = mV 1 = B 2 = C 3 = E 4 = J 5 = K 6 = N 7 = R 8 = S 9 = T 10 = TXK/XK (L) 11 = D
Chxx.NotchFilter	SINT	Notch Filter removes line noise for the channel.	<ul style="list-style-type: none"> 0 = 10 Hz 16 = 20 Hz 1 = 50 Hz 2 = 60 Hz 3 = 100 Hz 4 = 200 Hz 5 = 500 Hz 6 = 1,000 Hz 7 = 2,500 Hz 8 = 5,000 Hz
Chxx.AlarmDisable	BOOL	Disables all alarms on the channel.	<ul style="list-style-type: none"> 0 = Alarms are enabled 1 = Alarms are disabled

Table 84. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: Consider the following:</p> <ul style="list-style-type: none"> If you change this tag to 0, that is, so that the alarms are not disabled, you must also enable the individual alarms for them to work. <p>For example, if you want to use the Low Low Alarm for a channel, you must set the Chxx.AlarmDisable to 0 and set the Chxx.LLAlarmEn output tag to 1 so that the alarm is enabled.</p> <p>This applies to all alarms on the module.</p> <ul style="list-style-type: none"> Conversely, if you set this tag to 1, alarms are disabled regardless of the setting on the alarm enable tag for any alarm. 	
Chxx.ProcessAlarmLatchEn	BOOL	<p>Configures Process alarms to latch until they are explicitly unlatched.</p> <p>The Process alarms include:</p> <ul style="list-style-type: none"> HighHigh Alarm High Alarm Low Alarm LowLow Alarm 	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.RateAlarmLatchEn	BOOL	Configures the Rate Alarm to latch until it is explicitly unlatched.	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.OpenWireDataMinEn	BOOL	Selects the Data value in the input tag when the channel is in Open Wire.	<ul style="list-style-type: none"> 0 = Minimum Engineering value is selected 1 = Maximum Engineering value is selected
Chxx.Disable	BOOL	Disables the channel.	<ul style="list-style-type: none"> 0 = Channel is enabled 1 = Channel is disabled
Chxx.EnforceRTBCJCEn	BOOL	Determines whether it is required to use RTB CJC.	<ul style="list-style-type: none"> 0 = An RTB cold junction compensation is used when RTB with CJC is detected. Onboard cold junction compensation (lower accuracy) is used when RTB with CJC is not detected 1 = The CJ and main channels are faulted when RTB with CJC is not detected
Chxx.TenOhmOffset	INT	Offset used to linearize a 10 Ohms copper sensor type's input	-1.00...+1.00 Ohms

Table 84. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
Chxx.DigitalFilter	INT	A non-zero value enables the filter, providing a time constant in milliseconds used in a first order lag filter to smooth the input signal.	All positive values
Chxx.LowSignal	REAL	One of four points used in scaling. The low signal is in terms of the inputs signal units and corresponds to the low engineering term when scaled.	<ul style="list-style-type: none"> For RTD input type - By default, this tag value is the lowest temperature supported by the Sensor Type connected to the channel. You can change the value, if necessary. The value is always Celsius units. For Thermocouple input type - By default, this tag value is the lowest temperature supported by the Thermocouple type connected to the channel. You can change the value, if necessary. The value is always in Celsius units.
Chxx.HighSignal	REAL	One of four points used in scaling. The high signal is in terms of the inputs signal units and corresponds to the high engineering term when scaled.	<ul style="list-style-type: none"> For RTD input type - By default, this tag value is the highest temperature supported by the Sensor Type connected to the channel. You can change the value, if necessary. The value is always Celsius units. For Thermocouple input type - By default, the tag value is the highest temperature supported by the Thermocouple type connected to the channel. You can change the value, if necessary. The value is always in Celsius units.
Chxx.LowEngineering	REAL	One of four points used in scaling. The low engineering helps determine the engineering units the signal values scale into. The low engineering term corresponds to the low signal value.	Any value
Chxx.HighEngineering	REAL	One of four points used in scaling. The high engineering helps determine the engineering units the signal values scale into. The high engineering term corresponds to the high signal value.	Any value
Chxx.LLAlarmLimit	REAL	The Low Low Alarm trigger point. Causes the Chxx.LLAlarm to trigger when the input signal moves beneath the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.LAlarmLimit	REAL	The Low Alarm trigger point. Causes the Chxx.LAlarm to trigger when the input signal moves beneath the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.HAlarmLimit	REAL	The High Alarm trigger point. Causes the Chxx.HAlarm to trigger when the input signal moves above the	Any value

Table 84. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
		configured trigger point. Value is in terms of engineering units.	
Chxx.HHAlarmLimit	REAL	The High High Alarm trigger point. Causes the Chxx.HHAlarm to trigger when the input signal moves above the configured trigger point. Value is in terms of engineering units.	Any value
Chxx.RateAlarmLimit	REAL	The Rate Alarm trigger point. Causes the Chxx.RateAlarm to trigger when the input signal changes at a rate faster than the configured Rate Alarm. Configured in Engineering Units per second.	0 = Rate Alarm is not used Any value greater than zero = Trigger point
Chxx.AlarmDeadband	REAL	Allows a process alarm to remain set, despite the alarm condition disappearing, as long as the input data remains within the deadband of the process alarm. The deadband value is subtracted from the High and High High Alarm Limits to calculate the deadband thresholds for these alarms. The deadband value is added to the Low and Low Low Alarm Limits to calculate the deadband thresholds for these alarms.	Any non-negative value
CJChxx.Disable	BOOL	If this tag set to 1, the embedded Cold Junction measurement is not used when the module calculates the compensation. There is a CJC embedded in each input channels. Consider the following: <ul style="list-style-type: none"> If you enable each CJChxx without remote CJ channel, it can be used as CJ measurement for the corresponding input channel. If you disable CJChxx measurement, it is assumed that the cold junction temperature is 0 in the CJ compensation. 	<ul style="list-style-type: none"> 0 = Enable Cold Junction compensation 1 = Disable Cold Junction compensation
CJChxx.Remote	BOOL	Indicates if the cold junction sensor is mounted on a remote termination block when set, rather than using onboard CJC or RTB with CJC for the corresponding main channel. If the cold junction sensor is mounted on remote termination block, the module uses the respective remote CJC measurement on the chosen channel to calculate the CJC compensation.	<ul style="list-style-type: none"> 0 = Cold junction sensor is not mounted on a remote termination block 1 = Cold junction sensor is mounted on a remote termination block
CJChxx.RemoteCJChannel		Sets the main channel number where remote Cold Junction sensor is connected to.	Main channel numbers (00...03)
CJChxx.SensorOffset	REAL	Offset added directly to the measured CJ temperature. Used to compensate for cold junction temperature sensor error.	Any value

Input Tag Definitions

Table 85. Input Tags

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Module is not applying new Output tag data because the controller is in Program Mode. 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
ConnectionFaulted	BOOL	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	<ul style="list-style-type: none"> 0 = A connection exists between the module and the controller 1 = Connection is timed out or inhibited
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics are active 1 = One or more diagnostics are active or the prognostics threshold is reached.
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.	-128...+127 The value of 0 is skipped except during module powerup.
Chxx.Fault	BOOL	Indicates that channel data is inaccurate and cannot be trusted for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. <hr/> IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	<ul style="list-style-type: none"> 0 = No fault exists 1 = Fault exists
Chxx.Uncertain	BOOL	Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain

Table 85. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	
Chxx.OpenWire	BOOL	The signal wire is disconnected from the channel or the CJChxx.OpenWire tag is set.	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled 1 = Open wire condition exists which means the signal wire is disconnected from the channel or the RTB is removed from the module
Chxx.OverTemperature	BOOL	Not applicable for this module.	N/A
Chxx.FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
Chxx.NotANumber	BOOL	Indicates that the last value received for the channel output data value was not a number.	<ul style="list-style-type: none"> 0 = Last channel data received was a number 1 = Last channel data received was not a number
Chxx.Underrange	BOOL	Indicates that the channel data is beneath the underrange threshold for this channel.	<ul style="list-style-type: none"> 0 = Channel data is not beneath the underrange threshold 1 = Channel data is beneath the underrange threshold
Chxx.Overrange	BOOL	Indicates that the channel data is above the overrange threshold for this channel.	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
Chxx.LLAlarm	BOOL	Triggered when the input data value is less than the Low Low Alarm value. If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is greater than the Low Low Limit plus the Alarm Deadband.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.LAlarm	BOOL	Triggered when the input data value is less than the Low Alarm value. If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is greater than the Low Limit plus the Alarm Deadband.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.HAlarm	BOOL	Triggered when the input data value is greater than the High Alarm value. If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered

Table 85. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		after the input data value is less than the High Limit minus the Alarm Deadband.	
Chxx.HHAlarm	BOOL	<p>Triggered when the input data value is greater than the High High Alarm value.</p> <p>If latching is enabled, this alarm remains triggered until unlatched. If latching is not enabled, the alarm clears after the input data value is less than the High High Limit minus the Alarm Deadband.</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.RateAlarm	BOOL	Triggered when the change between consecutive channel samples divided by the period of time between when the samples were taken exceeds the Rate Alarm. If latched, this tag remains set until it is unlatched.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.CalFault	BOOL	<p>Indicates that the last attempted Calibration for this channel failed or there is no calibration data present.</p> <p>This tag is cleared, that is, set to 0, when power is cycled to the module or a successful calibration for the range on the channel is performed.</p>	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed
Chxx.Calibrating	BOOL	Indicates that the channel is currently being calibrated.	<ul style="list-style-type: none"> 0 = Channel is not being calibrated 1 = Channel is being calibrated
Chxx.CalGoodLowRef	BOOL	<p>Indicates that a valid Low Reference signal is sampled on this channel in the calibration process.</p> <hr/> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p> <hr/>	<ul style="list-style-type: none"> 0 = Valid Low Reference signal has not been sampled on this channel 1 = Valid Low Reference signal has been sampled on this channel
Chxx.CalBadLowRef	BOOL	<p>Indicates that an invalid Low Reference signal is sampled on this channel in the calibration process. You must correct this condition to successfully calibrate the module.</p> <p>If calibration is aborted with an invalid Low Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.</p>	<ul style="list-style-type: none"> 0 = Invalid Low Reference signal has not been sampled on this channel 1 = Invalid Low Reference signal has been sampled on this channel

Table 85. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	
Chxx.CalGoodHighRef	BOOL	<p>Indicates that a valid High Reference signal is sampled on this channel in the calibration process.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Valid High Reference signal has not been sampled on this channel 1 = Valid High Reference signal has been sampled on this channel
Chxx.CalBadHighRef	BOOL	<p>Indicates that an invalid High Reference signal is sampled on this channel in the calibration process.</p> <p>You must correct this condition to successfully calibrate the module.</p> <p>If calibration is aborted with an invalid High Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Invalid High Reference signal has not been sampled on this channel 1 = Invalid High Reference signal has been sampled on this channel
Chxx.CalSuccessful	BOOL	<p>Indicates calibration on this channel is complete and the Calibrating state has been exited.</p> <p>This tag remains set after valid calibration and until a new calibration process is started or the connection is closed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Calibration was not successful 1 = One of the following: <ul style="list-style-type: none"> Calibration was successful and calibrating state has been exited. Calibration data is present and applied.
Chxx.Data	REAL	Channel data in scaled Engineering Units.	Any value
Chxx.RollingTimestamp	INT	<p>Continuously-running 15-bit timer that counts in milliseconds.</p> <p>Whenever an input module scans its channels, it also records the value of RollingTimestamp at that time. The</p>	0...32,767

Table 85. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		user program uses the last two RollingTimestamp values and calculates the interval between receipt of data.	
CJChxx.Fault	BOOL	<p>Indicates that the cold junction data is inaccurate and cannot be trusted for use in the application.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p> <hr/> <p>IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.</p> <hr/>	<ul style="list-style-type: none"> 0 = No fault exists 1 = Fault exists
CJChxx.Uncertain	BOOL	<p>Indicates that the cold junction data can be inaccurate but the degree of inaccuracy is not known.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p> <hr/> <p>IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.</p> <hr/>	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain
CJChxx.OpenWire	BOOL	<p>Open wire condition of the CJ channel. It can be caused by one of the following:</p> <ul style="list-style-type: none"> An RTB without CJC is used. An RTB with CJC is removed. An RTB with CJC is spoiled. <p>If this condition exists, confirm that you are using one of the following RTBs with CJC:</p> <ul style="list-style-type: none"> 5034-RTBT 5034-RTBTS 	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled 1 = Open wire condition exists which means the signal wire is disconnected from the channel or the RTB is removed from the module
CJChxx.FieldPowerOff	BOOL	Field power is present at the cold junction.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
CJChxx.Underrange	BOOL	The cold junction temperature at the channel is below the minimum of its operating range.	<ul style="list-style-type: none"> 0 = Channel data is not above the underrange threshold 1 = Channel data is above the underrange threshold
CJChxx.Ovrange	BOOL	The cold junction temperature at the channel is above the maximum of its operating range.	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
CJChxx.Temperature	REAL	Current temperature of the cold junction in Celsius.	Any value

Output Tag Definitions

Table 86. Output Tags

Name	Data Type	Definition	Valid Values
Chxx.LLAlarmEn	BOOL	<p>Enables the Low Low Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.LAlarmEn	BOOL	<p>Enables the Low Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.HAlarmEn	BOOL	<p>Enables the High Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.HHAlarmEn	BOOL	<p>Enables the High High Alarm.</p> <hr/> <p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm
Chxx.RateAlarmEn	BOOL	<p>Enables the Rate Alarm.</p> <hr/>	<ul style="list-style-type: none"> 0 = Disable alarm 1 = Enable alarm

Table 86. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: To use this alarm, set this tag to 1 and confirm that the Chxx.AlarmDisable configuration tag for the same channel is set to 0.</p> <p>If the Chxx.AlarmDisable configuration tag is set to 1, that is, alarms are disabled, this alarm does not work regardless of the tag value.</p>	
Chxx.LLAlarmUnlatch	BOOL	Unlatches a latched Low Low Alarm at the first instance of the bit transitioning from 0 to 1.	<ul style="list-style-type: none"> 0 = Low Low Alarm remains latched 1 = Low Low Alarm unlatched
Chxx.LAlarmUnlatch	BOOL	Unlatches a latched Low Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = Low Alarm remains latched 1 = Low Alarm unlatched
Chxx.HAlarmUnlatch	BOOL	Unlatches a latched High Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = High Alarm remains latched 1 = High Alarm unlatched
Chxx.HHAlarmUnlatch	BOOL	Unlatches a set High High Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = High High Alarm remains latched 1 = High High Alarm unlatched
Chxx.RateAlarmUnlatch	BOOL	Unlatches a set Rate Alarm at the first instance of the bit transition from 0 to 1.	<ul style="list-style-type: none"> 0 = Rate Alarm remains latched 1 = Rate Alarm unlatched
Chxx.Calibrate	BOOL	<p>Initiates the Calibration process.</p> <p>This tag must remain set until a valid Low Reference and High Reference values are applied to the input.</p> <p>If the tag value transitions to 0 before calibration is finished, the process stops and calibration fails.</p>	<ul style="list-style-type: none"> 0 = Not to start calibration process 1 = Start calibration process
Chxx.CalLowRef	BOOL	<p>Rising edge triggers the Low Calibration at the Low Reference Point for the current input range value.</p> <p>A valid Low Reference signal must be connected to the channel before setting this tag.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device Definition. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Not to start low reference sampling 1 = Start low reference sampling
Chxx.CalHighRef	BOOL	<p>Rising edge triggers a High Calibration at the High Reference Point for the current input range value.</p> <p>A valid High Reference signal must be connected to the channel before setting tag.</p>	<ul style="list-style-type: none"> 0 = Not to start high reference sampling 1 = Start high reference sampling

Table 86. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device Definition. If you use the Data connection type, this tag does not appear in the module tags.	
Chxx.SensorOffset	REAL	Compensates for any known offset error on the sensor or channel to which the sensor is connected. Value is in terms of engineering units. The value of this tag is added to the measured value in engineering units and is used in the Chxx.Data input tag.	Any valid float value Use a value in the channel's operating range.

Diagnostic Assembly

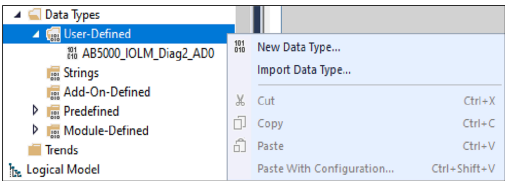
Diagnostic assembly helps you troubleshoot and diagnose the fault in your system.

Create User-defined Diagnostic Assembly Types

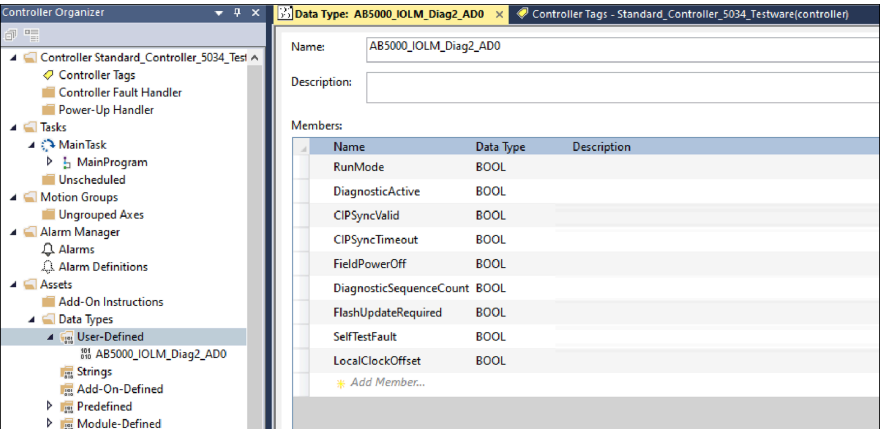
You can use the Studio 5000 Logix Designer application to create user-defined Diagnostic Assembly types.

Create user-defined diagnostic assembly by following the below steps:

- From the Controller Organizer pane, go to Assets → Data types → User-Defined.
- Right-click on the User-Defined folder and select New Data Type.



- Add a Name and Description (optional) for your diagnostic assembly.
- Under Members area, add the data members based on the diagnostic assembly detailed below.



IMPORTANT: The members indicated in the tables are arranged according to Data Alignment Rules of controllers. Strictly follow the data type and the sequence of the members that are indicated in the tables of this appendix. If the data type and the sequence are not followed, data misalignment may occur after executing Get Attribute Single Message (MSG) instruction.

Diagnostic Assemblies

1. Diagnostic Assembly A for Analog 4 Channel Input RTD/TC Module
 - Instance ID: 0x8019 (32793)
 - Size = 336 bytes

Follow the information in the following table to add each member.

Table 87. Diagnostic Assembly Instance 32793

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
CIPSyncValid	BOOL	
CIPSyncTimeout	BOOL	
Infobit_Pad5	BOOL	
FieldPowerOff	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
Diagbit_Pad0	BOOL	2
Diagbit_Pad1	BOOL	
Diagbit_Pad2	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
FlashUpdateRequired	BOOL	
SelfTestFault	BOOL	
Diagbit_Pad14	BOOL	

Name	Date Type	Size in Bytes
Diagbit_Pad15	BOOL	
Pad	DINT	4
LocalClockOffset	LINT	8
LocalClockOffsetTimestamp	LINT	8
GrandMasterClockID	SINT[8]	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8
Ch00	Diagnostic_Channel_Structure	72
Ch01	Diagnostic_Channel_Structure	72
Ch02	Diagnostic_Channel_Structure	72
Ch03	Diagnostic_Channel_Structure	72

2. Diagnostic Assembly B for Analog 4 Channel RTD/TC Module

- Instance ID: 0x80A1 (32929)
- Size = 288 bytes

Follow the information in the following table to add each member.

Table 88. Diagnostic Assembly Instance 32929

Name	Date Type	Size in Bytes
CJ Ch00	Diagnostic_CJChannel_Structure	72
CJ Ch01	Diagnostic_CJChannel_Structure	72
CJ Ch02	Diagnostic_CJChannel_Structure	72
CJ Ch03	Diagnostic_CJChannel_Structure	72

3. Diagnostic Counters Assembly for I/O

- Instance ID: 0x301 (769)
- Size = 16 bytes

Follow the information in the following table to add each member.

Table 89. Diagnostic Assembly Instance 769

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
Infobit_Pad3	BOOL	
Infobit_Pad4	BOOL	
Infobit_Pad5	BOOL	
Infobit_Pad6	BOOL	

Name	Date Type	Size in Bytes
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
CIPConnections	INT	2
CIPLostPackets	DINT	4
CIPTimeouts	DINT	4
CPUUtilization	INT	2
Pad	INT	2

Diagnostic Channels

1. Diagnostic Channel

- Size = 72 bytes

This data type is retrieved as part of the diagnostic assembly instance.

Follow the information in the following table to add each member.

Table 90. 5034-IRT4I Diagnostic Channel Structure

Name	Date Type	Size in Bytes
Databit_Pad0	BOOL	2
Fault	BOOL	
Uncertain	BOOL	
OpenWire	BOOL	
Databit_Pad4	BOOL	
Databit_Pad5	BOOL	
FieldPowerOff	BOOL	
Databit_Pad7	BOOL	
Databit_Pad8	BOOL	
Disabled	BOOL	
Databit_Pad10	BOOL	
Databit_Pad11	BOOL	
Databit_Pad12	BOOL	
Databit_Pad13	BOOL	
Databit_Pad14	BOOL	
Databit_Pad15	BOOL	2
CalFault	BOOL	
Underrange	BOOL	
Ovrange	BOOL	

Name	Date Type	Size in Bytes
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
Diagbit_Pad12	BOOL	
Diagbit_Pad13	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad1	INT	2
InternalErrorCount	SINT	1
CalRange	SINT	1
CalOffset	REAL	4
CalGain	REAL	4
CalLastDate	LINT	8
OpenWireTimestamp	LINT	8
Pad2	LINT	8
UnderrangeTimestamp	LINT	8
OverrangeTimestamp	LINT	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8

2. Diagnostic CJ Channel

- Size = 72 bytes

This data type is retrieved as part of the diagnostic assembly instance.

Follow the information in the following table to add each member.

Table 91. 5034-IRT4I Diagnostic CJ Channel Structure

Name	Date Type	Size in Bytes
Databit_Pad0	BOOL	2
Fault	BOOL	
Uncertain	BOOL	

Name	Date Type	Size in Bytes
OpenWire	BOOL	
Databit_Pad4	BOOL	
Databit_Pad5	BOOL	
FieldPowerOff	BOOL	
Databit_Pad7	BOOL	
Databit_Pad8	BOOL	
Disabled	BOOL	
Databit_Pad10	BOOL	
Databit_Pad11	BOOL	
Databit_Pad12	BOOL	
Databit_Pad13	BOOL	
Databit_Pad14	BOOL	
Databit_Pad15	BOOL	
CalFault	BOOL	2
Underrange	BOOL	
Overrange	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
Diagbit_Pad12	BOOL	
Diagbit_Pad13	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad1	SINT	1
CJModeStatus	SINT	1
InternalErrorCount	SINT	1
CalRange	SINT	1
CalOffset	REAL	4

Name	Date Type	Size in Bytes
CalGain	REAL	4
CallLastDate	LINT	8
OpenWireTimestamp	LINT	8
Pad2	LINT	8
UnderrangeTimestamp	LINT	8
OverrangeTimestamp	LINT	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8

Definitions for Diagnostic Assembly Types

Table 92. Definition of Members in Diagnostic Assembly Data Types

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Module is not applying new Output tag data because the controller is in Program Mode. 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics active 1 = One or more diagnostics are active or the prognostics threshold is reached.
CIPSyncValid	BOOL	Indicates if the module is synced with a 1588 master.	<ul style="list-style-type: none"> 0 = Module is not synced 1 = Module is synced
CIPSyncTimeout	BOOL	Indicates if the module was once synced with a 1588 master, but is not now due to a timeout	<ul style="list-style-type: none"> 0 = A valid time master has not timed out. 1 = A valid time master is detected on the backplane, but the time master has timed

Table 92. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
			out. The module is using its local clock and can be drifting away from the last known time master.
FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.	-128...+127 The value of 0 is skipped except during module power-up.
FlashUpdateRequired	BOOL	Indicates whether flash update is required.	<ul style="list-style-type: none"> 0 = Flash update is not required 1 = Module has no application firmware
SelfTestFault	BOOL	Indicate whether the fault is present during module self-test.	<ul style="list-style-type: none"> 0 = Module initialization code did not detect an error 1 = Module initialization code detected an error
LocalClockOffset	LINT	The offset from the local clock to the system time. This value helps to detect steps in time. This value updates when a PTP update is received.	Any value
LocalClockOffsetTimestamp	LINT	Indicates the timestamp of the local clock offset.	A valid time or None if there is no recorded event time. Time format is YYYY-MMDD-HH:mm:ss.mmm_uuu_nnn(UTC-00:00) <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds uuu = microseconds nnn = nanoseconds UTC-00:00 = Time zone
GrandMasterClockID	SINT	The EUI-64 Identity of the CIP Sync Grandmaster clock the module is synced to.	Any value
FieldPowerOnTimestamp	LINT	Indicates the timestamp of the last time field power turned on.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> YYYY = year MM = month

Table 92. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
FieldPowerOffTimestamp	LINT	Indicates the timestamp of the last time field power turned off.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:ss.mmm.</p> <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
Fault	BOOL	<p>Indicates that channel data is inaccurate and cannot be trusted for use in the application.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p>	<ul style="list-style-type: none"> 0 = No fault exists 1 = Fault exists <p>The typical causes of a fault are the following:</p> <ul style="list-style-type: none"> Channel is disabled Open Wire condition Underrange/Ovrange condition SA power loss condition <p>You must troubleshoot the module first to see if the typical causes exist.</p>
Uncertain	BOOL	<p>Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p>	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain
OpenWire	BOOL	The signal wire is disconnected from the channel or the RTB is removed from the module.	<ul style="list-style-type: none"> 0 = Open wire condition does not exist or open wire detection is disabled. 1 = Open wire condition exists, that means the signal wire is disconnected from the channel or the RTB is removed from the module.
CalFault	BOOL	Indicates the last attempted Calibration for this channel failed or there is no calibration data	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed

Table 92. Definition of Members in Diagnostic Assembly Data Types (continued)

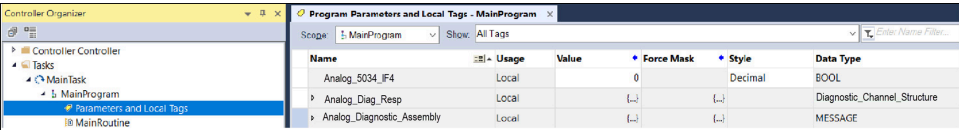
Name	Data Type	Definition	Valid Values
		present. This tag is cleared, that is, set to 0, when power is cycled to the module.	
Underrange	BOOL	Indicates the channel data is beneath the underrange threshold for this channel. For example, when the channel operates in the 4...20 mA input range, the underrange threshold on the channel is < 3.0 mA. If the input signal is 0 mA, this tag is set to 1.	<ul style="list-style-type: none"> 0 = Channel data is not beneath the underrange threshold 1 = Channel data is beneath the underrange threshold
Overrange	BOOL	Indicates the channel data is above the overrange threshold for this channel. For example, when the channel operates in the 4...20 mA output range, the overrange threshold on the channel is > 23.0 mA. If the input signal is 24 mA, this tag is set to 1.	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
CalRange	SINT	Indicates the value currently configured for the channel. Values display according to the Input Type selected.	<ul style="list-style-type: none"> 0 = -10...10V 1 = 0...5V 2 = 0...10V 4 = 0...20 mA 5 = 4...20 mA
CalOffset	REAL	Indicates the offset in signal units as reported by the device.	Any value
CalGain	REAL	Indicates the calibration gain reported by the device.	Any value
CalLastDate	LINT	Indicates the time of the last calibration date for the channel.	Any value
OpenWireTimestamp	LINT	Indicates the timestamp of the last time when the open wire condition is detected.	A valid time or None if there is no recorded event time.
UnderrangeTimestamp	LINT	Indicates the timestamp of the last underrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
OverrangeTimestamp	LINT	Indicates the timestamp of the last overrange fault.	A valid time or None if there is no recorded event time.

Table 92. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
			Time format is YYYY-MM-DD-HH:mm:ss.mmm. <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
CJModeStatus	SINT	Indicates the Cold Junction Channel mode currently used.	<ul style="list-style-type: none"> • 0 = Disabled • 1 = Onboard • 2 = RTB • 3 = Remote
CIPConnections	INT	Indicates the number of CIP connections currently open.	0...24
CIPLostPackets	DINT	Indicates the running sum of the number of Sequenced Address Item Sequence Numbers that are skipped in Class 0 and Class 1 connections consumed by the adapter and its children.	0...2,147,483,647
CIPTimeouts	DINT	Indicates the running count of the number of connections that time out, both originated and targeted, to and through the adapter.	0...2,147,483,647
CPUUtilization	INT	Indicates the usage of the compute engine.	0...100%

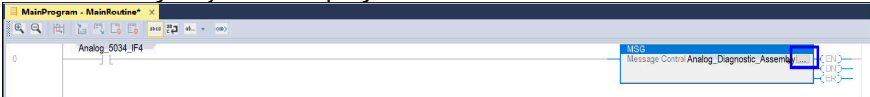
Create Message Type User Tags

Create MESSAGE type user tags for requests and associated response user tags for each of the new user-defined diagnostic assembly types.



From the Controller Organizer pane, expand Tasks → MainTask → MainProgram:

1. Create MESSAGE type user tags for each request.
2. Create associated response user tags for each new user-defined diagnostic assembly type.
3. Add the user tags to your ladder program.



4. Expand the message tag to open the message configuration dialog.

5. On the Configuration tab, select:
 - Service type: Get Attribute Single
 - Class: 4
 - Attribute: 3
 - Instance:
 - 0x8019 (32793) Diagnostic Assembly A for Analog 4 Channel Input RTD/TC Module
 - 0x80A1 (32929) Diagnostic Assembly B for Analog 4 Channel Input RTD/TC Module
 - 0x301 (769) Diagnostic Counters Base I/O Assembly
 - Destination element: User-defined data type suitable for the instance entered.
6. On the Communication tab, select the path to the module that you wish to send the messages to.
7. Download the project and set to Run Mode.

You can monitor the user-defined tag values from the Program Parameters and Local Tags window, under the MainProgram task in the Controller Organizer pane.

5034-OF4 and 5034-OF4XT Details

This chapter covers the detailed instructions on how to configure, calibrate, and troubleshoot your 5034-OF4 and 5034-OF4XT modules. It also describes the module tag definitions for input, output, and configuration tags.

5034-OF4 and 5034-OF4XT Analog 4 Output Modules

Figure 73. 5034-OF4 and 5034-OF4XT Wiring Diagram – Current Mode

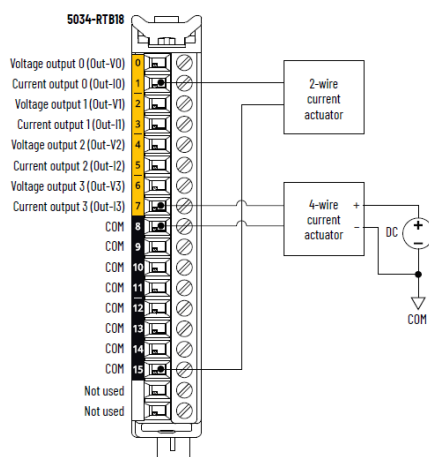


Figure 74. 5034-OF4 and 5034-OF4XT Wiring Diagram – Voltage Mode

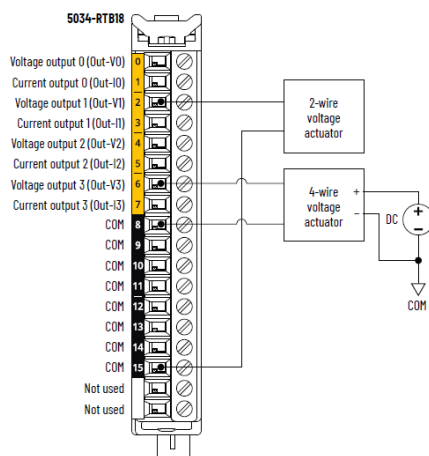


Figure 75. 5034-OF4 and 5034-OF4XT Functional Block Diagram

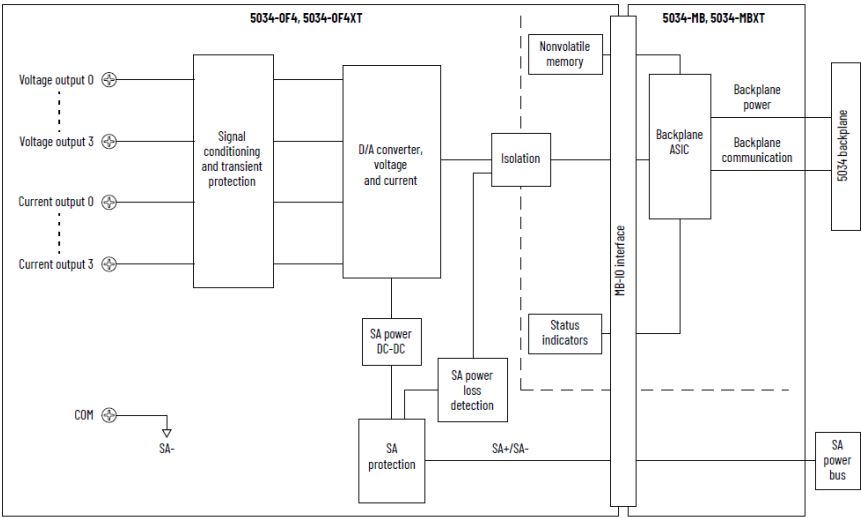


Table 93. Technical Specifications - 5034-OF4, 5034-OF4XT

Attribute	5034-OF4, 5034-OF4XT
Output range, voltage	$\pm 10\text{V}$ 0...10V 0...5V
Output range, current	0...20 mA 4...20 mA
Resolution, voltage	$\pm 10\text{V}$: 15 bits 0...10V: 16 bits 0...5V: 16 bits
Resolution, current	16 bits
Calibrated accuracy at 25 °C (77 °F)	Voltage: 0.10% full scale Current: 0.10% full scale
Calibrated accuracy over full temperature range -25...+60 °C (-13...+140 °F)	Voltage: 0.2% full scale Current: 0.2% full scale
Drive capability	Voltage: 3000 Ω min Current: 500 Ω max
Capacitive load, max (voltage mode only)	1 μF
Inductive load, max (current mode only)	1 mH

Table 93. Technical Specifications - 5034-OF4, 5034-OF4XT (continued)

Attribute	5034-OF4, 5034-OF4XT
HART handheld compliance	Yes
Open wire detection	Current mode only
Short circuit detection	Voltage mode only – Output electronically limited to 16 mA or less
Data format	IEEE 754 32-bit floating point
Module conversion method	DAC
Update rate	1 channel: 0.2 ms All channels: 0.4 ms
Step response time to 63% of full scale per channel	Voltage mode: 0.07 ms typical Current mode: 0.4 ms typical
Backplane to screw response time (63% of full scale)	Voltage mode 1 channel: 0.5 ms typical All channels: 1 ms typical Current mode: 1 channel: 0.9 ms typical All channels: 1.4 ms typical
Overvoltage protection, max	32V DC

Table 94. General Specifications - 5034-OF4, 5034-OF4XT

Attribute	5034-OF4, 5034-OF4XT
Number of outputs	4 channels, single-ended Configurable voltage or current mode at channel level
SA power voltage, nom	24V DC
SA power voltage range	10...30V DC
SA power current, nom	100 mA
SA power current, max	0.25 A
SA power current at no load	40 mA
SA reverse polarity protection	Yes
Power dissipation, max	0.95 W

Table 94. General Specifications - 5034-OF4, 5034-OF4XT (continued)

Attribute	5034-OF4, 5034-OF4XT
Thermal dissipation, max	3.24 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type, System to Field No isolation between SA power and output ports No isolation between individual output ports
Calibration	Factory-calibrated Manual calibration supported, see PointMax Analog I/O Modules User Manual, publication 5034-UM003
RIUP support	Yes
Electronic keying	Electronic keying via programming software
RTB key positions (slot)	2, 5, 10
RTB supported	5034-RTB18, 5034-RTB18S
Wiring category ⁽¹⁾	2 - Signal ports 2 - Power ports
Wiring specification	See Wiring Specifications for Removable Terminal Blocks in the PointMax I/O System Specifications Technical Data, publication 5034-TD001
Indicators	1 green/red module status indicator 1 green/red SA power status indicator 4 yellow/red I/O status indicators
Dimensions (HxWxD), approx	123.6 x 15.0 x 66.4 mm (4.87 x 0.59 x 2.61 in.)
Weight, approx	47.0 g (1.66 oz.) - 5034-OF4 49.0 g (1.73 oz.) - 5034-OF4XT
Enclosure type	None (Open-style)
North American temp code	T4
UKEX/ATEX temp code	T4
IECEx temp code	T4

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#). Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

Module Configuration

Before you start configuring your I/O module, you must create a Studio 5000 Logix Designer application project for the Logix 5000 controller that owns the I/O module. The project includes configuration data for the module.

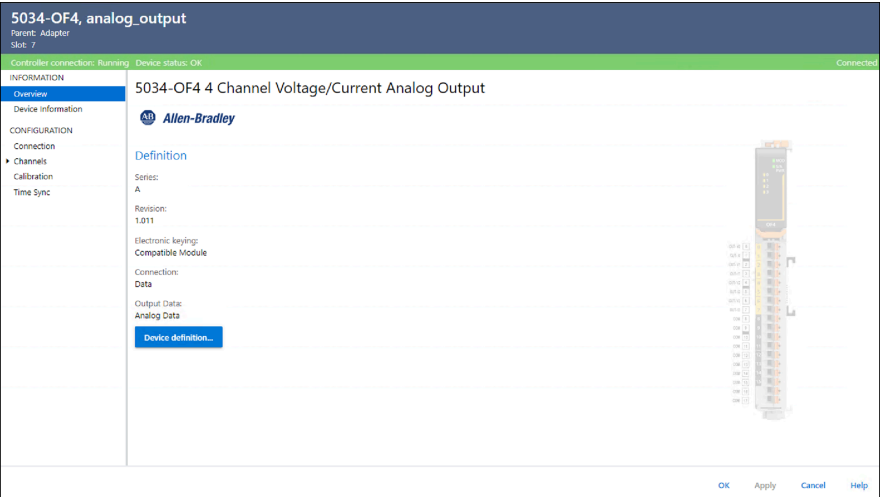
The Studio 5000 Logix Designer application transfers the project to the owner-controller during the program download. Data is then transferred to the I/O modules over the EtherNet/IP network.

The I/O modules can operate immediately after receiving and applying the configuration data.

Overview View

Use Overview to view the definition of a device, including the device type, revision, electronic keying, connection, and other device-specific values.

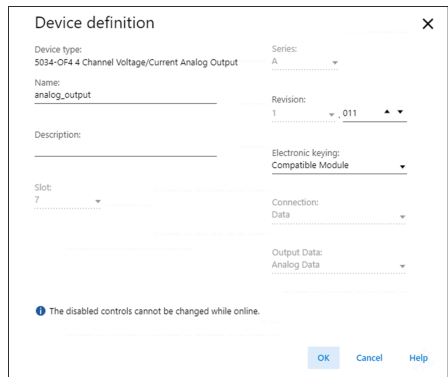
Figure 76. Overview View Example



Device Definition

To change the definition of a device, select Device definition in the Overview view.

Figure 77. Device Definition Example



Device Definition includes these parameters:

Table 95. Device Definition Parameters

Parameter	Definition	Available Choices
Device Type	Displays the device catalog number and type.	Device-specific
Name	Enter an IEC 61131 compliant device name. If an invalid character is entered in this field, or if the name exceeds 40 characters, the software ignores the character.	All valid values
Description	Enter the description of the device.	All valid values
Slot	Specify the slot number where the device resides. Only slots between 1 and the maximum number of I/O devices are valid depending on the platform. When the device is created, the slot number defaults to the first available slot position. When the controller is changed to one supporting a smaller maximum I/O count, the current slot value may no longer be valid.	1...32
Series	Specifies the series of the device.	Device-specific
Revision	Specifies the major and minor revisions of the device. The valid range for minor revision is from 1...255.	Device-specific
Electronic Keying	Defines the electronic keying used for the device. Electronic keying compares the device defined in the project to the installed device. If keying fails, a fault occurs. For detailed information on Electronic keying, see Electronic Keying in Logix 5000	<ul style="list-style-type: none"> Exact Match Compatible Module Disable Keying

Table 95. Device Definition Parameters (continued)

Parameter	Definition	Available Choices
	Control Systems Application Technique, publication LOGIX-AT001 .	<div>  <p>ATTENTION: Be extremely cautious when using Disable Keying; if used incorrectly, this option can lead to personal injury or death, property damage, or economic loss.</p> <p>We strongly suggest that you do not use Disable Keying.</p> <p>If you use Disable Keying, you must take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.</p> </div>
Connection	<p>Specify the type of data transferred between the device and controller.</p> <p>For the Listen Only choice, the controller and device establish communication without the controller sending any configuration or output data to the device. A full input data connection is established but depends on the connection between the owner-controller and the device.</p>	<ul style="list-style-type: none"> • Data with Calibration • Data (default) • Listen Only
Output Data	Select the output data type for the device.	Analog Data

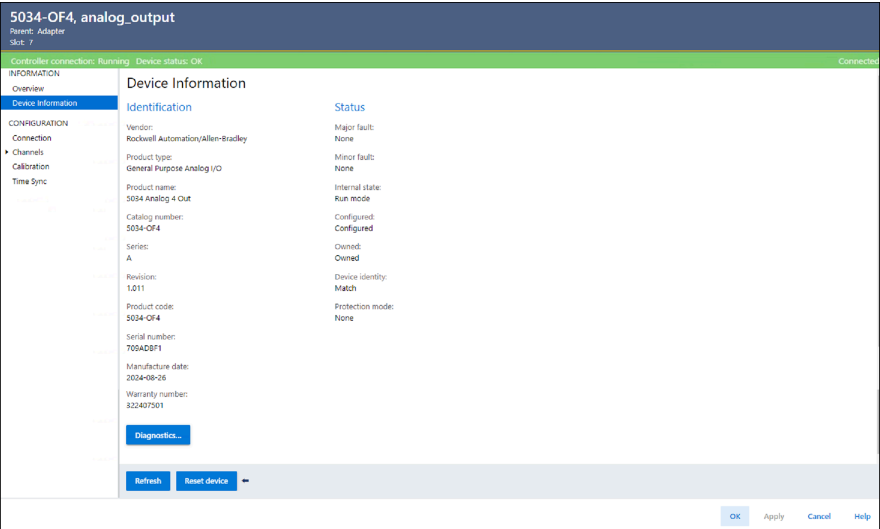
Device Information View

Use Device Information to view device and status information when the device is online.

Use Device Information to:

- Determine the identity of the device.
- View the device's current operational state.
- View whether the device was configured by the owner controller.
- View whether an owner controller is currently connected to the device.
- Retrieve the latest information from the device.
- Reset a device to its power-up state.
- If supported, view the Protection Mode of the device.

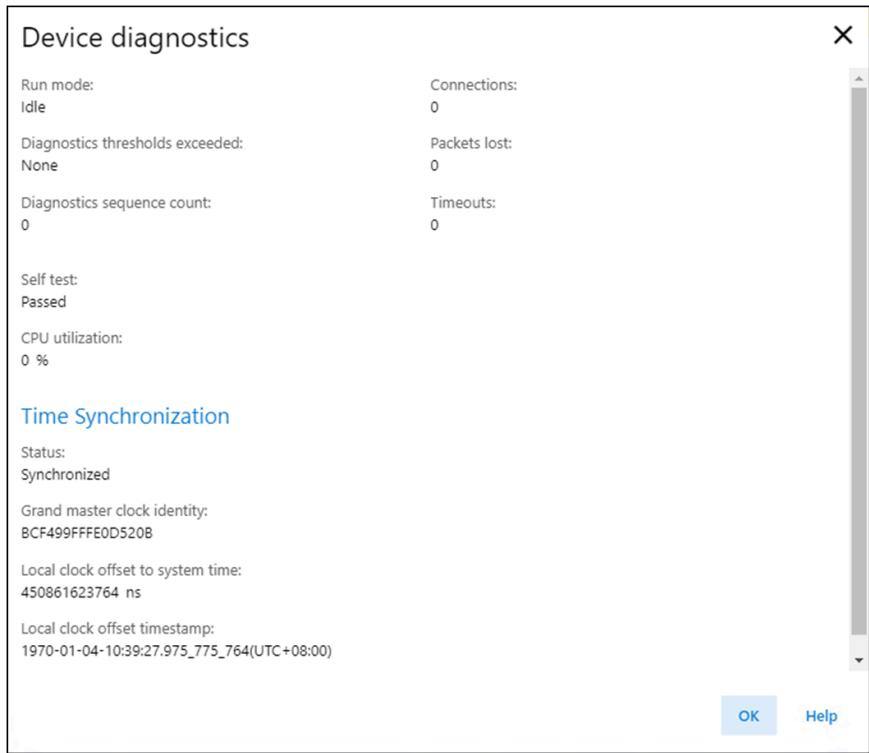
Figure 78. Device Information View Example



Device Diagnostics

To view the device diagnostics, select Diagnostics in the Device Information view.

Figure 79. Device Diagnostics Example



Connection View

Use Connection to define controller-to-device behavior:

- Set the RPI rate. For more information, see [Requested Packet Interval on page 17](#).
- Select Unicast or Multicast connection to use on the EtherNet/IP network. For more information, see [Unicast or Multicast Connection on page 21](#).
- View the reason of Connection Fault.



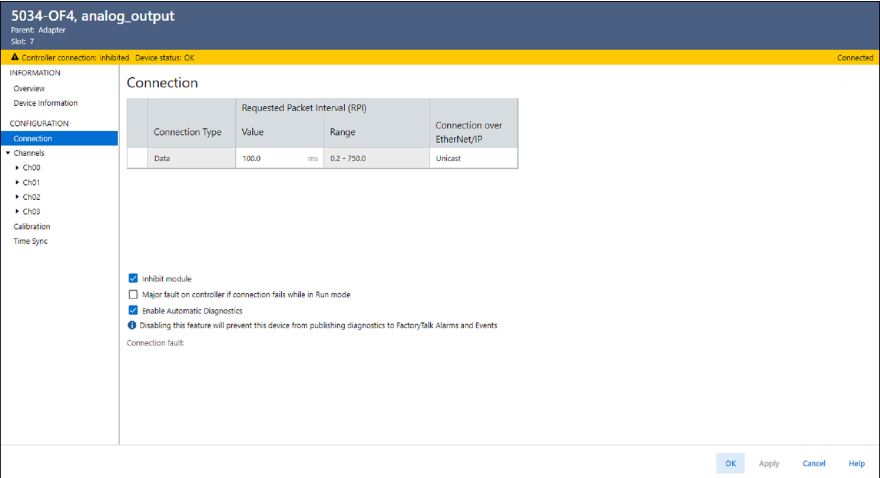
If there is a connection fault, Connection Fault area displays the error code with description that helps you to troubleshoot the module. For more information, see [Troubleshoot Your Module on page 50](#).

- Inhibit the module. For more information, see [Module Inhibiting on page 18](#).
- Configure fault response for connection failure while the controller is in Run Mode.
- Enable or disable the Automatic Diagnostics.



ATTENTION: If you do not enable Automatic Diagnostics, the device does not publish diagnostics to FactoryTalk Alarms and Events.

Figure 80. Connection View Example



Channels View

The Channels view shows an overview of the configuration values for all module channels.



Not all channel configurations are included in Channels view. To view or change the complete set of the channel configuration and also to view the diagnostics information for the channel, use Chxx view.

You can do the following actions on this view for all the channels:

- Disable the channel, if desired.
- Change the output type and output range.
- Enable or disable no load detection
- Enable or disable hold for initialization
- Set the scaling and recalculate all configurations with engineering unit.
- Configure the connection fault handling

You can use this view to monitor the configuration for all channels in the module. To view the diagnostics information for the channel, go to respective Chxx view.

Figure 81. Channels View Example

5034-OF4, Analog Output Module
Parent: ADXTR
Inst: 1

Controller connection Running Device status: OK

Connected

INFORMATION
Overview
Device Information
CONFIGURATION
Connection
Channels
Limits
Ch01
Limits
Ch02
Limits
Ch03
Limits
Calibration
Time Sync

Channels

Channel	☐ Disable	Output Type	Output Range	Output State During Program Mode	Communication Fault Mode	☐ Enable No Load Detection	High Signal	Low Signal	Engineering Units	High Engineering	Low Engineering	Recalculate Units
00	☐	Current	0mA to 20mA	Hold Last State	Hold Last State	☐	20.0 mA	0.0 mA	%	100.0 %	0.0 %	
01	☐	Current	0mA to 20mA	Hold Last State	Hold Last State	☐	20.0 mA	0.0 mA	%	100.0 %	0.0 %	
02	☐	Current	0mA to 20mA	Hold Last State	Hold Last State	☐	20.0 mA	0.0 mA	%	100.0 %	0.0 %	
03	☐	Current	0mA to 20mA	Hold Last State	Hold Last State	☐	20.0 mA	0.0 mA	%	100.0 %	0.0 %	

OK Apply Cancel Help

Chxx View

The Chxx view, where xx represents the channel number, shows the configuration options available for the respective channel.

You can do the following actions on this view:

- Disable the channel, if desired
- Change the output type and output range.
- Enable or disable no load detection
- Enable or disable hold for initialization
- Set the scaling settings.
- Recalculate the engineering units if configuration is changed.
- Configure the connection fault handling
- View channel diagnostics information

Figure 82. Chxx View Example

5034-OF4, Analog Output Module
Parent: ADXTR
Inst: 1

Controller connection Running Device status: OK

Connected

INFORMATION
Overview
Device Information
CONFIGURATION
Connection
Channels
Limits
Ch01
Limits
Ch02
Limits
Ch03
Limits
Calibration
Time Sync

Ch00

☐ Disable Channel

Output Type:

Current (mA)

Output Range:

0mA to 20mA

Channel Offset:

0.0 %

☐ Hold for Initialization

☐ Enable No Load Detection

Output State in Program Mode
☒ Hold Last State
☐ User Defined Value

0.0 %

When Communication Fails in Program Mode
☒ Leave outputs in Program Mode state
☐ Change outputs to Communication Fault Mode state

Diagnosics...

Scaling

Engineering Units:

%

High Signal:

20.0 mA

 = High Engineering:

100.0 %

Low Signal:

0.0 mA

 = Low Engineering:

0.0 %

Recalculate Units

Output State in Communication Fault Mode
☒ Hold Last State
☐ User Defined Value

0.0 %

Communication Fault State Duration:

Forever

Final Communication Fault State:

0.0 %

OK Apply Cancel Help

Recalculate Units

Recalculate Units lets you recalculate all configurations with engineering unit after a scaling change. Consider the following:

- The Recalculate Units option is enabled when the scaling configuration is changed.
- Upon selecting Recalculate Units option, the recalculated new values based on the new scaling configuration are displayed together with the old values for you to verify before changing.

- If you select "Yes" to proceed with the change, the new values will be set but it gets applied when you select "Apply/OK".
- If you select "No" to cancel the change, the old values are retained. You can either select the Recalculate Units again or manually change those configurations based on the new scaling.

Figure 83. Recalculate Units Example


Change to new configuration values in engineering units?
×

	Configuration	Old Value	New Value
☐	Low Clamp	0 %	0 %
☐	High Clamp	5 %	10 %
☐	User Defined Value in Pr...	0 %	0 %
☐	User Defined Value in F...	0 %	0 %
☐	Final Communication Fa...	0 %	0 %
☐	Ramp Rate	0 %/s	0 %/s
☐	Channel Offset	0 %	0 %

Yes
No
Help

Channelxx Diagnostics

Displays the channel diagnostics information when connected with the module. When online with the module, select the Diagnostics on the Chxx view to see the diagnostic information.

Figure 84. Channelxx Diagnostics Example

Channel00 Diagnostics
×

Fault Exists:

No

Data Uncertain:

No

Field Power:

Present

Field Power On Timestamp:

None

Field Power Off Timestamp:

None

Short Circuit Fault:

Not Present

Short Circuit Fault Timestamp:

None

No Load Fault:

Not Present

No Load Fault Timestamp:

None

Calibration for Active Range

Calibration Timestamp:

2024-08-29-19:04:20.482

Range:

0 mA to 20 mA

Gain:

0.999994

Offset:

0.000986

OK
HELP

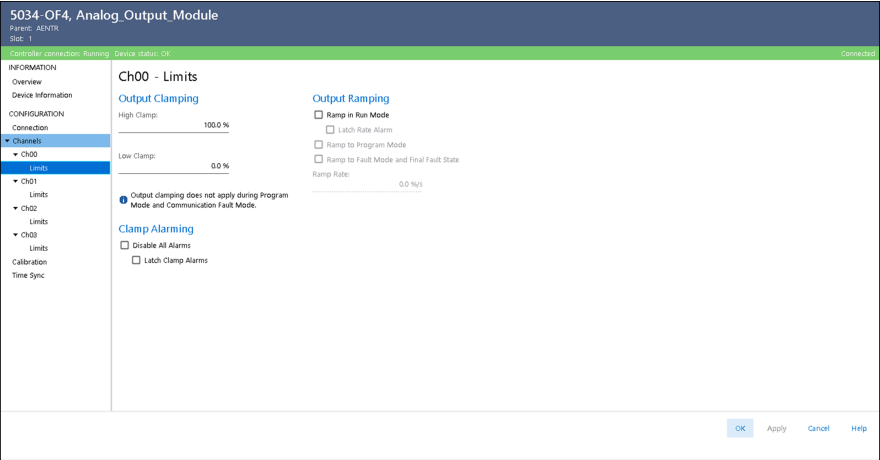
Limits View

Each channel on the analog output module has a Limits view with which it is associated. The Signal Units options correspond to the output type and range for the channel.

You can do the following actions on this view:

- Disable all the alarms.
- Latch clamp alarms and configure output clamping
- Enable/disable the output ramping in different modes and configure the ramp rate (if any ramp mode is enabled).

Figure 85. Chxx - Limits View Example



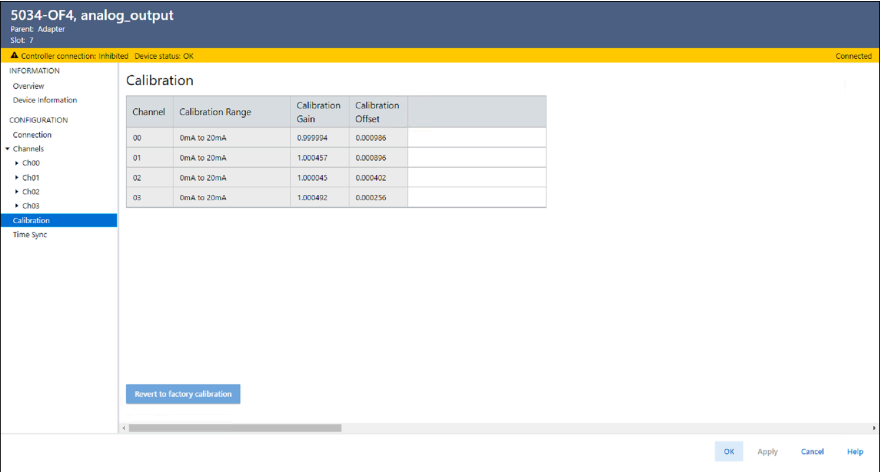
Calibration View

The Calibration view provides calibration information for all channels on the module. You can do the following actions on this view for all the channels:

- View calibration parameters and calibration status for the currently configured input ranges.
- Perform user calibration for one or multiple channels.
- Revert calibration parameters to the factory default values.

For more information on how to calibrate a module, see [Module Calibration \(Interactive\) on page 240](#)

Figure 86. Calibration View Example

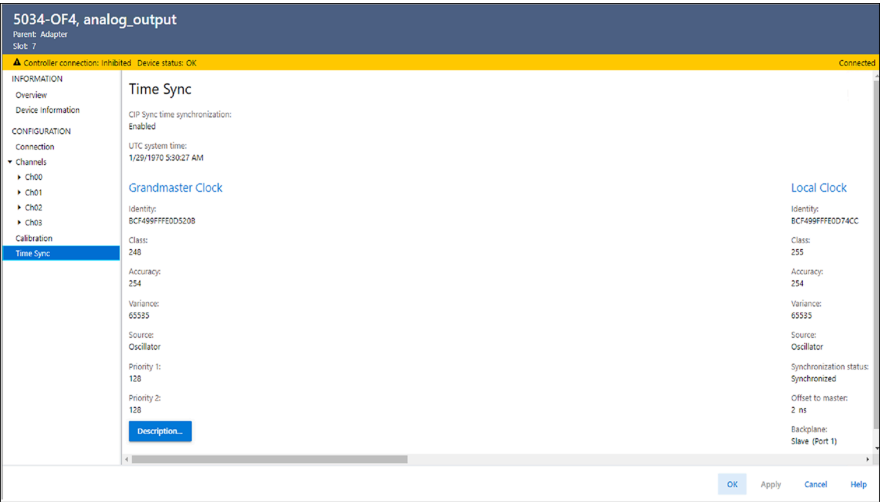


Time Sync View

The Time Sync view is read-only and displays the CIP Sync status information about the module when the project is online. The Time Sync category displays the following information:

- CIP Sync time synchronization status
- UTC system time
- Grandmaster Clock information
- Grandmaster Clock description
- Local Clock information

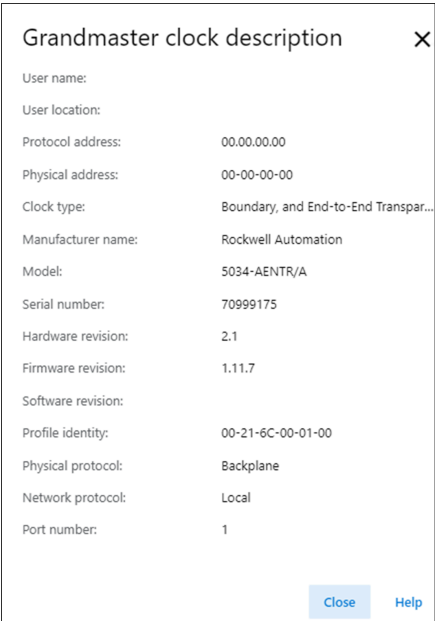
Figure 87. Time Sync View Example



Grandmaster Clock Description

The Grandmaster clock description dialog provides detailed information about the grandmaster clock. To view the Grandmaster clock description, select Description in the Time Sync view.

Figure 88. Grandmaster Clock Description Example



Module Calibration (Interactive)

You can use Calibration view in Module Properties to interactively calibrate the module on a per channel basis or in group.

Controller State During Calibration

You must add the module to your Studio 5000 Logix Designer application project before you can calibrate it.

The project must be online with the owner-controller to calibrate the PointMax analog modules. You can calibrate under any of the following conditions:

- The controller is in Program Mode, that is, either Remote Program or Program Mode.
Your module must be in Program Mode and not be actively controlling a process when you calibrate it.
- There are no connections to the module.

Calibration Instrumentation Specifications

When you calibrate output modules, use a digital multimeter (DMM) to measure the current or voltage signal the module is sending out. To maintain your module's factory calibration accuracy, use the instrumentation with the specifications listed in the following table.

IMPORTANT: Do not calibrate your module with an instrument that is less accurate than those specified in following table. The following events can result:

- Calibration appears to occur normally but the module gives inaccurate data during operation.
- A calibration fault occurs, forcing you to abort calibration. When this happens, I.Chxx.CalFault tag is set for the channel you attempted to calibrate. You can clear this tag by completing a valid calibration or cycling power to the module.

Table 96. Calibration Instrument Specifications

Catalog Number	Channel Output Type	Calibration Instrumentation Specifications
5034-OF4 and 5034-OF4XT	Current (mA)	DMM with resolution better than 0.15 μ A
	Voltage (V)	DMM with resolution better than 1.0 μ V

Calibration Procedure

When calibrating an analog output channel, the Studio 5000 Logix Designer application commands the module to output specific signal levels. The signal type is determined by the output type being used by the channel.

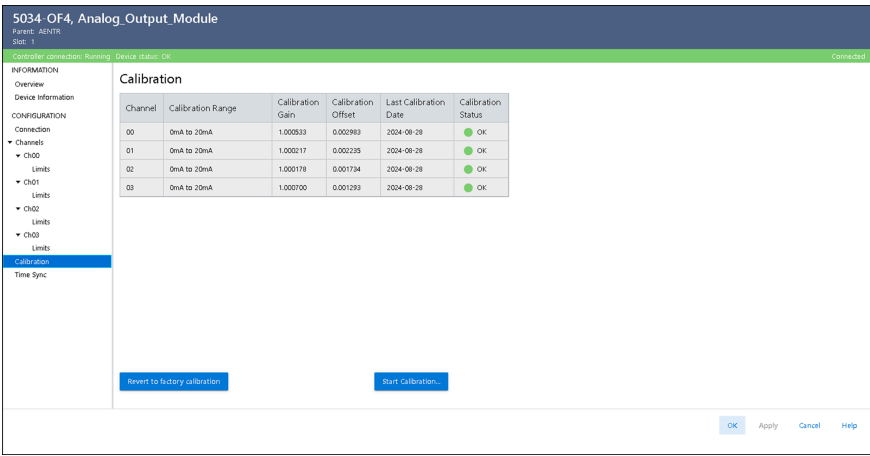
Table 97. Analog Output Module Calibration References

Output Type	Output Range	Low Calibration Reference Level	High Calibration Reference Level
Voltage (V)	-10...10V	-10.0V	10.0V
	0...10V	1.0V	10.0V
	0...5V	1.0V	5.0V
Current (mA)	0...20 mA	1.0 mA	20.0 mA
	4...20 mA	5.0 mA	20.0 mA

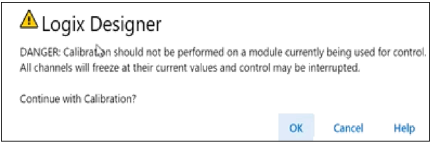
You must measure the actual level and record the results to account for any module inaccuracies.

This example describes how to calibrate a channel on the analog output module for use with a Current (mA) output type. Complete the following steps:

- 1. Connect the DMM to the channel being calibrated.
- 2. Go online with the project and make sure that the controller is in Program Mode.
- 3. Confirm that the channel to be calibrated is configured for the correct Output Range.
- 4. On the Calibration view in the Module Properties dialog, select Start Calibration.



- 5. When the dialog appears to confirm that you want to calibrate the channel, select OK.



- 6. Select the channels one at a time or in groups to calibrate and then select Next.

Calibration Wizard - Select Channels to Calibrate

Select the checkboxes of the channels to calibrate, and then select to calibrate in groups or one at a time.

	Channel	Calibrate	Calibration Range	Calibration Gain	Calibration Offset	Calibration Status
	00	☐	0mA to 20mA	0.999851	0.001057	OK
*	01	☒	0mA to 20mA	0.999948	0.001074	OK
	02	☐	0mA to 20mA	0.999979	0.001125	OK
	03	☐	0mA to 20mA	0.999924	0.001099	OK

☐ Calibrate channels in groups

☒ Calibrate channels one at a time

Back

Next

Cancel

Help

7. When the Output Reference dialog appears and indicates the channel to be calibrated for the low reference, select Next.

Calibration Wizard - Output Reference

Select Next to continue.

Channel: 00

Channel	Calibrate	Calibration Range	Low Reference
00	☒	0mA to 20mA	4.00 mA
01	☐		
02	☐		
03	☐		

Back

Next

Cancel

Help

The Measure and Record Values dialog appears for low reference value.

Calibration Wizard - Measure and Record Values

Use multimeter to measure the output values for selected channels. The multimeter accuracy must be at least 4 decimal places. Enter the measured value as Recorded Reference, and then select Next to continue.

Channel: 00

	Channel	Calibrate	Calibration Range	Low Reference	Recorded Reference
*	00	☒	0mA to 20mA	4.00 mA	3.9988000 mA
	01	☐			
	02	☐			
	03	☐			

Back

Next

Cancel

Help

8.

Use a multimeter to measure the low reference value of the channel.
9.

In the Recorded Reference column, record the measured value and select Next. The Low Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - Low Reference Results

Select Next to continue.

Channel	Calibrate	Calibration Range	Low Reference	Recorded Reference	Status
00	☒	0mA to 20mA	4.00 mA	3.9988000 mA	<div>OK</div>
01	☐				
02	☐				
03	☐				

Retry

Back

Next

Cancel

Help

10.

If the Status is OK, select Next.
If the Status is not OK, repeat the calibration process.
11.

When the Output Reference dialog appears and indicates the channel to be calibrated for the high reference, select Next.

Calibration Wizard - Output Reference

Select Next to continue.

Channel: 00

Channel	Calibrate	Calibration Range	High Reference
00	☒	0mA to 20mA	20.00 mA
01	☐		
02	☐		
03	☐		

Back

Next

Cancel

Help

The Measure and Record Values dialog appears.

Calibration Wizard - Measure and Record Values

Use multimeter to measure the output values for selected channels. The multimeter accuracy must be at least 4 decimal places.
Enter the measured value as Recorded Reference, and then select Next to continue.

Channel: 00

	Channel	Calibrate	Calibration Range	High Reference	Recorded Reference
*	00	☒	0mA to 20mA	20.00 mA	19.9968000 mA
	01	☐			
	02	☐			
	03	☐			

Back

Next

Cancel

Help

12. Use a multimeter to measure the high reference value of the channel.
13. In the Recorded Reference column, record the measured value and select Next.
The High Reference Results dialog appears and indicates the status of the calibrated channel.

Calibration Wizard - High Reference Results

×

Select Next to continue.

Channel	Calibrate	Calibration Range	High Reference	Recorded Reference	Status
00	☒	0mA to 20mA	20.00 mA	19.9968000 mA	<div>OK</div>
01	☐				
02	☐				
03	☐				

Retry

BackNextCancelHelp

14. If the Status is OK, select Next.
If the Status is not OK, repeat the calibration process.
15. When the Calibration Completed dialog appears, select Finish.

Calibration Wizard - Calibration Completed

×

Calibration completed successfully. The calibration constants are saved.

Channel	Calibrate	Calibration Range	Low Recorded	Status	High Recorded	Status
00	☒	0mA to 20mA	3.9988000 mA	<div>OK</div>	19.9968000 mA	<div>OK</div>
01	☐					
02	☐					
03	☐					

BackFinishCancelHelp

Use the Status Indicators for Troubleshooting

- PointMax I/O modules use the following status indicators:
- SA Power Indicator - This indicator operates the same for all PointMax I/O modules.
 - Module Status Indicator - This indicator operates the same for all PointMax I/O modules.
 - Channel Status Indicator - This indicator operates differently based on the module type that you are using.

SA Power Status Indicator

Table 98. Interpret SA Power Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	There is SA power to the module.	None
Steady red	There is no SA power to the module or SA power voltage is not in the valid range.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that SA power wiring is properly connected to the adapter, expansion power module, or 5034-MBSA mounting base. 2. Check the following: <ul style="list-style-type: none"> - Check that the SA voltage is in the correct range. - If an external power supply is used, confirm that the power supply is turned on. - Make sure that the mounting base to mounting base connection is properly secured. <p>Go to Chassis Information view in the Module Properties of the adapter to check the Field Power status of mounting bases installed in all slots.</p>

Module Status Indicator

Table 99. Interpret Module Status Indicator

Indicator State	Description	Recommended Action
Off	The module is not powered.	Complete the following actions: <ol style="list-style-type: none"> 1. Confirm that the system is powered. 2. Confirm that the module is installed properly.
Steady green	The module is operational and all I/O connections are active.	None
Flashing green	The module has no I/O connections.	Troubleshoot your Studio 5000 Logix Designer application to determine what is preventing a connection from the module to the controller and correct the issue.
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> • A module firmware update is in progress. • A module firmware update attempt failed. • The device has experienced a recoverable fault. • A connection to the module has timed out. 	Complete one of the following: <ul style="list-style-type: none"> • Let the firmware update process complete. • Reattempt a firmware update after one fails. • Use the Studio 5000 Logix Designer application to determine whether a module recoverable fault is occurred. It is shown in Device Information view.

Table 99. Interpret Module Status Indicator (continued)

Indicator State	Description	Recommended Action
		<p>To clear a recoverable fault, complete one of the following:</p> <ul style="list-style-type: none"> - Cycle module power. - Select Reset device in the Studio 5000 Logix Designer project via the Device Information view of the Module Properties dialog. <p>If the fault does not clear after cycling power and module reset, contact Rockwell Automation Technical Support.</p> <ul style="list-style-type: none"> • Use the Studio 5000 Logix Designer application to determine if a connection has timed out. The Connection view in the Module Properties indicates whether a connection request has timed out. <p>If a connection has timed out, determine the cause and correct it. For example, a cable failure can cause a connection timeout.</p>
Steady red	The module experienced a nonrecoverable fault.	<p>Complete the following actions:</p> <ol style="list-style-type: none"> 1. Cycle power to the module. 2. If the status indicator remains in the steady red state, replace the module.

Channel Status Indicators

Table 100. Interpret Output Channel Status Indicators

Indicator State	Description	Recommended Action
Off	<p>One of the following conditions exists:</p> <ul style="list-style-type: none"> • The module is not powered. • The module is powered but connection is not established from the controller to module. • The module is powered, but the input channel is disabled. 	<p>Complete one of the following:</p> <ul style="list-style-type: none"> • If you expect the module to be powered but it is not, complete the following: <ul style="list-style-type: none"> - Confirm that the system is powered. - Confirm that the module is installed properly. • If the module is powered but the channel is not operating as expected, use the Studio 5000 Logix Designer application to confirm that the channel is not disabled and the module has a connection to the controller. <p>The Connection view in the Module Properties indicates if the connection is running or faulted. If the connection is faulted, the Connection view indicates error information.</p> <ul style="list-style-type: none"> • If the channel is disabled, no action is needed.
Steady yellow	The output channel is operating normally.	None

Table 100. Interpret Output Channel Status Indicators (continued)

Indicator State	Description	Recommended Action
Flashing red	One of the following conditions exists: <ul style="list-style-type: none"> There is no SA power to the module, or SA power voltage is not in the valid range. A wire is disconnected from the output. That is, a No Load condition exists. The module is driving a current from the channel greater than the maximum current level the channel can handle. That is, a Short Circuit condition exists. 	One of the following: <ul style="list-style-type: none"> If there is a SA power fault, see the recommended action given for steady red indicator state in SA Power Indicator table above. Check the wiring at the output channel. If necessary, reconnect the wire. Troubleshoot the application to make sure an acceptable level of current is driven from the channel.
Alternating yellow/red	Calibration is in progress.	Successfully complete the calibration process.
Steady red	An issue has occurred that is internal to the module. The following are example issues that can cause the status indicator to be steady red: <ul style="list-style-type: none"> A calibration fault occurred on the channel. The module has experienced a nonrecoverable fault. 	Complete one of the following: <ul style="list-style-type: none"> If the indicator turns steady red after a calibration process, you can either perform a successful calibration or cycle the power to recover the fault. If it is not caused by the calibration, cycle the power to recover the fault. If the condition is still present, replace the module.

Module Tag Definitions

Module tags are created when you add a module to the Studio 5000 Logix Designer application project. The set of module tags associated with a module depends on the module type and Device Definition choices made during module configuration. The tables contained in this section list all of the tags available with a module. Not all tags in the list are used when that module type is added to a project. Tag use varies by module configuration.

Configuration Tag Definitions

Table 101. Configuration Tags

Name	Data Type	Definition	Valid Values
Chxx.Range	SINT	Channel's operating range	<ul style="list-style-type: none"> 0 = -10...+10V 1 = 0...5V 2 = 0...10V

Table 101. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> 4 = 0...20 mA 5 = 4...20 mA
Chxx.AlarmDisable	BOOL	Disables all alarms on the channel.	<ul style="list-style-type: none"> 0 = Alarms are enabled 1 = Alarms are disabled
Chxx.LimitAlarmLatchEn	BOOL	Configures Limit alarms to latch until they are explicitly unlatched.	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.RampAlarmLatchEn	BOOL	Latches Ramp Alarm when set so that it does not clear until explicitly unlatched.	<ul style="list-style-type: none"> 0 = Latching disabled 1 = Latching enabled
Chxx.NoLoadEn	BOOL	Enables the input No Load diagnostic.	<ul style="list-style-type: none"> 0 = Disabled 1 = Enabled
Chxx.Disable	BOOL	Disables the channel.	<ul style="list-style-type: none"> 0 = Channel is enabled 1 = Channel is disabled
Chxx.FaultMode	BOOL	<p>Determines output action when a connection fault occurs.</p> <p>At the fault occurrence, the output holds its last state or transitions to the value set in the Fault Value parameter. The channel continues the Fault Mode for the length of time set in the Fault Value State Duration parameter.</p>	<ul style="list-style-type: none"> 0 = Transition to user-defined value 1 = Hold Last State
Chxx.ProgMode	BOOL	<p>Determines output action when the controller transitions to Program Mode or Inhibit mode.</p> <p>At the transition to Program Mode or Inhibit mode, the output holds its last state or transitions to the value set in the Program Value parameter.</p>	<ul style="list-style-type: none"> 0 = Transition to user-defined value 1 = Hold Last State
Chxx.ProgramToFaultEn	BOOL	<p>Determines channel action if a connection faults while the module is in a safe state for Program Mode.</p> <p>The channel can remain in a safe state for Program Mode or transition to a safe state for Communication Fault mode.</p> <p>If the channel remains in a safe state for Program Mode, the Final Fault State parameter is ignored.</p>	<ul style="list-style-type: none"> 0 = Remains in the Program state 1 = Transitions to the safe state for the Fault mode
Chxx.FaultValueStateDuration	SINT	Determines the length of time the FaultMode or FaultValue parameter value is held prior to the Final Fault State.	<ul style="list-style-type: none"> 0 = Forever 1 = 1 s 2 = 2 s 5 = 5 s 10 = 10 s

Table 101. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
Chxx.FaultValue	REAL	Value to which the output changes if the following events exist: <ul style="list-style-type: none"> Fault Mode = 0 Either of the following: <ul style="list-style-type: none"> Controller is in Run Mode and the connection is lost Controller is in Program Mode, the connection is lost, and the ProgToFaultEn tag is set 	Any value
Chxx.ProgValue	REAL	Value to which the channel changes if the following events exist: <ul style="list-style-type: none"> Program Mode = 0 Controller transitions to Program Mode 	Any value
Chxx.FaultFinalState	REAL	If FaultValueStateDuration is nonzero, this value determines the final Output state after the configured FaultValueStateDuration timeout occurs.	Any value
Chxx.RampInRun	BOOL	Enables Output Ramping when the module is in Run Mode. Output changes during Run Mode are limited to the Maximum Ramp Rate value.	<ul style="list-style-type: none"> 0 = Ramping disabled 1 = Ramping enabled in Run Mode
Chxx.RampToProg	BOOL	Enables Output Ramping when the controller transitions to Program Mode. Output changes during Program Mode are limited to the Maximum Ramp Rate value.	<ul style="list-style-type: none"> 0 = Ramping disabled 1 = Ramping enabled to Program Mode state
Chxx.RampToFault	BOOL	Enables Output Ramping when the connection to the module faults. Output transitions to FaultValue and FaultFinalState are limited to the MaximumRampRate.	<ul style="list-style-type: none"> 0 = Ramping disabled 1 = Ramping enabled to Fault mode state
Chxx.HoldForInit	BOOL	When set, configures the channel to hold, or not change, until initialized with a value within 0.1% of full scale of its current value when one of the following conditions occurs. <ul style="list-style-type: none"> Module initial connection (powerup) Controller transition from Program Mode back to Run Mode Module re-establishes communication after a fault SA power is restored after being lost. 	<ul style="list-style-type: none"> 0 = Output 0.Chxx.Data signal immediately 1 = Hold last signal until initialization match
Chxx.MaxRampRate	REAL	Maximum rate at which the channel can transition to in Engineering Units/Second.	<p>If the MaxRampRate = 0.0, the ramp rate is limited to ramping the range full scale in one RPI.</p> <p>Any value greater than zero = Trigger point</p>

Table 101. Configuration Tags (continued)

Name	Data Type	Definition	Valid Values
		This tag is used only if at least one of the following output ramping modes is enabled: <ul style="list-style-type: none"> • Ramp In Run • Ramp To Fault • Ramp To Program 	
Chxx.LowSignal	REAL	One of four points used in scaling. The low signal is in terms of the inputs signal units and corresponds to the low engineering term when scaled.	Any value less than the high signal in range
Chxx.HighSignal	REAL	One of four points used in scaling. The high signal is in terms of the inputs signal units and corresponds to the high engineering term when scaled.	Any value greater than the low signal in range
Chxx.LowEngineering	REAL	One of four points used in scaling. The low engineering helps determine the engineering units the signal values scale into. The low engineering term corresponds to the low signal value.	Any value
Chxx.HighEngineering	REAL	One of four points used in scaling. The high engineering helps determine the engineering units the signal values scale into. The high engineering term corresponds to the high signal value.	Any value
Chxx.LowLimit	REAL	Lowest value to which the output can go. The tag value is engineering units.	Any value lower than the HighLimit
Chxx.HighLimit	REAL	Highest value to which the output can go. The tag value is engineering units.	Any value higher than the LowLimit
Chxx.Offset	REAL	Compensates for any known error on the sensor or channel to which the sensor is connected. The value is set in engineering units.	Any value Use a small value.

Input Tag Definitions

Table 102. Input Tags

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> • 0 = Idle – It means one of the following: <ul style="list-style-type: none"> - Connection is not up. - Connection has been opened but the module has not started producing data for the connection. - Because the controller is in Program Mode, the module is not applying the Output tag data but is applying the Program Mode state of the channels instead.

Table 102. Input Tags (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
ConnectionFaulted	BOOL	<p>Indicates if a connection is running.</p> <p>The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.</p>	<ul style="list-style-type: none"> 0 = A connection exists between the module and the controller 1 = Connection is timed out or inhibited
DiagnosticActive	BOOL	<p>Indicates if any diagnostics are active or if the prognostics threshold is reached.</p>	<ul style="list-style-type: none"> 0 = No diagnostics are active 1 = One or more diagnostics are active or the prognostics threshold is reached.
DiagnosticSequenceCount	SINT	<p>Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected.</p>	<p>-128...+127</p> <p>The value of 0 is skipped except during module powerup.</p>
Chxx.Fault	BOOL	<p>Indicates that channel data is inaccurate and cannot be trusted for use in the application.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p> <hr/> <p>IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.</p> <hr/>	<ul style="list-style-type: none"> 0 = No fault exists 1 = Fault exists
Chxx.Uncertain	BOOL	<p>Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p> <hr/> <p>IMPORTANT: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.</p> <hr/>	<ul style="list-style-type: none"> 0 = Valid data 1 = Data validity uncertain
Chxx.NoLoad	BOOL	<p>The signal wire is disconnected from the channel or the RTB is removed from the module.</p> <p>This condition is detected only when the channel is used in current mode.</p>	<ul style="list-style-type: none"> 0 = No Load condition does not exist 1 = No Load condition exists
Chxx.ShortCircuit	BOOL	<p>A Short Circuit or Overcurrent condition exists.</p> <p>This condition is detected only when the channel is used in voltage mode.</p>	<ul style="list-style-type: none"> 0 = No Short Circuit or Overcurrent condition exists 1 = Short Circuit or Overcurrent condition exists

Table 102. Input Tags (continued)

Name	Data Type	Definition	Valid Values
Chxx.OverTemperature	BOOL	Not applicable for this module.	N/A
Chxx.FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
Chxx.NotANumber	BOOL	Indicates that the last value received for the channel output data value was not a number.	<ul style="list-style-type: none"> 0 = Last channel data received was a number 1 = Last channel data received was not a number
Chxx.InHold	BOOL	Indicates that the channel is currently holding until the received data value is within 0.1% range full scale of the current data value.	<ul style="list-style-type: none"> 0 = Channel is not holding 1 = Channel is holding
Chxx.Underrange	BOOL	Indicates that the commanded output data in output tag is below the Underrange threshold. When it happens, the actual output signal is limited at the threshold or the configured Low Limit (whichever is higher).	<ul style="list-style-type: none"> 0 = Commanded output data is not below the underrange threshold 1 = Commanded output data is below the underrange threshold
Chxx.Overrange	BOOL	Indicates that the commanded output data in output tag is above the Overrange threshold. When it happens, the actual output signal is limited at the threshold or the configured High Limit (whichever is lower).	<ul style="list-style-type: none"> 0 = Commanded output data is not above the overrange threshold 1 = Commanded output data is above the overrange threshold
Chxx.LLimitAlarm	BOOL	<p>Triggered when the requested output value is below the configured Low Limit value. It remains set until the requested output is above the Low Limit.</p> <p>If the Chxx.AlarmDisable tag is set to 1, that is, the output signal is still clamped at the Low Limit value. But the Low Limit alarm is not triggered.</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.HLimitAlarm	BOOL	<p>Triggered when the requested output value is above the configured High Limit value. It remains set until the requested output is below the High Limit.</p> <p>If the Chxx.AlarmDisable tag is set to 1, that is, the output signal is still clamped at the High Limit value. But the High Limit alarm is not triggered.</p>	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.RampAlarm	BOOL	Indicates that the analog output has been commanded to change value in a way such that the Maximum Ramp Rate is exceeded.	<ul style="list-style-type: none"> 0 = Alarm is not triggered 1 = Alarm is triggered
Chxx.CalFault	BOOL	Indicates that the last attempted Calibration for this channel failed or there is no calibration data present.	<ul style="list-style-type: none"> 0 = Calibration did not fail 1 = Calibration failed

Table 102. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		This tag is cleared, that is, set to 0, when power is cycled to the module or a successful calibration for the range on the channel is performed.	
Chxx.Calibrating	BOOL	Indicates that the channel is currently being calibrated.	<ul style="list-style-type: none"> 0 = Channel is not being calibrated 1 = Channel is being calibrated
Chxx.CalGoodLowRef	BOOL	<p>Indicates that a valid Low Reference signal is sampled on this channel in the calibration process.</p> <hr/> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Valid Low Reference signal has not been sampled on this channel 1 = Valid Low Reference signal has been sampled on this channel
Chxx.CalBadLowRef	BOOL	<p>Indicates that an invalid Low Reference signal is sampled on this channel in the calibration process. You must correct this condition to successfully calibrate the module.</p> <p>If calibration is aborted with an invalid Low Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.</p> <hr/> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Invalid Low Reference signal has not been sampled on this channel 1 = Invalid Low Reference signal has been sampled on this channel
Chxx.CalGoodHighRef	BOOL	<p>Indicates that a valid High Reference signal is sampled on this channel in the calibration process.</p> <hr/> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Valid High Reference signal has not been sampled on this channel 1 = Valid High Reference signal has been sampled on this channel
Chxx.CalBadHighRef	BOOL	<p>Indicates that an invalid High Reference signal is sampled on this channel in the calibration process.</p> <p>You must correct this condition to successfully calibrate the module.</p> <p>If calibration is aborted with an invalid High Reference signal, the Chxx.CalFault tag is set for this channel until a successful calibration is performed.</p>	<ul style="list-style-type: none"> 0 = Invalid High Reference signal has not been sampled on this channel 1 = Invalid High Reference signal has been sampled on this channel

Table 102. Input Tags (continued)

Name	Data Type	Definition	Valid Values
		<p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	
Chxx.CalSuccessful	BOOL	<p>Indicates calibration on this channel is complete and the Calibrating state has been exited.</p> <p>This tag remains set after valid calibration and until a new calibration process is started or the connection is closed.</p> <p>IMPORTANT: This tag is available only when you use the Data with Calibration connection type in the Device definition dialog. If you use the Data connection type, this tag does not appear in the module tags.</p>	<ul style="list-style-type: none"> 0 = Calibration was not successful 1 = One of the following: <ul style="list-style-type: none"> Calibration was successful and calibrating state has been exited. Calibration data is present and applied.
Chxx.Data	REAL	Indicates the signal value currently output at the RTB in scaled Engineering Units.	Any value
Chxx.RollingTimestamp	INT	<p>Continuously-running 15-bit timer that counts in milliseconds.</p> <p>Whenever the data echo value changes, the output module updates the value of the RollingTimestamp.</p>	0...32767

Output Tag Definitions

Table 103. Output Tags

Name	Data Type	Definition	Valid Values
Chxx.LLimitAlarmUnlatch	BOOL	Unlatches a latched Low Limit Alarm at the first instance of the bit transitioning from 0 to 1.	<ul style="list-style-type: none"> 0 = Alarm remains latched 1 = Alarm is unlatched
Chxx.HLimitAlarmUnlatch	BOOL	Unlatches a latched High Limit Alarm at the first instance of the bit transitioning from 0 to 1.	<ul style="list-style-type: none"> 0 = Alarm remains latched 1 = Alarm is unlatched
Chxx.RampAlarmUnlatch	BOOL	Unlatches a latched Ramp Alarm at the first instance of the bit transitioning from 0 to 1.	<ul style="list-style-type: none"> 0 = Alarm remains latched 1 = Alarm is unlatched
Chxx.Calibrate	BOOL	Initiates the Calibration process.	<ul style="list-style-type: none"> 0 = Not to start calibration process 1 = Start calibration process

Table 103. Output Tags (continued)

Name	Data Type	Definition	Valid Values
		This tag must remain set until a valid Low Reference and High Reference values are applied to the channel.	
Chxx.CalOutputLowRef	BOOL	A 0 to 1 transition commands the channel to produce the Low Calibration Reference Point for the chosen current or voltage output range.	<ul style="list-style-type: none"> 0 = Do not output Calibration Low Reference Signal 1 = Output Calibration Low Reference Signal <p>Do not set this tag and the CalOutputHighRef tag to 1 simultaneously.</p>
Chxx.CalOutputHighRef	BOOL	A 0 to 1 transition commands the channel to produce the High Calibration Reference Point for the chosen current or voltage output range.	<ul style="list-style-type: none"> 0 = Do not Output Calibration High Reference Signal 1 = Output Calibration High Reference Signal <p>Do not set this tag and the CalOutputLowRef tag to 1 simultaneously.</p>
Chxx.CalLowRefPassed	BOOL	A 0 to 1 transition indicates that the Chxx.Data output tag data contains the recorded Low Reference value for the channel that is used by the module in Calibration.	<ul style="list-style-type: none"> 0 = Not sending recorded Calibration Low Reference Signal in Output Data 1 = Sending recorded Calibration Low Reference Signal in Output Data for Calibration Verification
Chxx.CalHighRefPassed	BOOL	A 0 to 1 transition indicates that the Chxx.Data output tag data contains the recorded High Reference value for the channel that is used by the module in Calibration.	<ul style="list-style-type: none"> 0 = Not sending recorded Calibration High Reference Signal in Output Data 1 = Sending recorded Calibration High Reference Signal in Output Data for Calibration Verification
Chxx.CalFinish	BOOL	Data value change that triggers the channel to complete the Calibration procedure, applying the valid Low and High References received. Channel exits the Calibration state if successful.	<ul style="list-style-type: none"> 0 = Do not complete the calibration procedure 1 = Complete the calibration procedure
Chxx.Data	REAL	The value that is converted to the signal on the RTB in scaled Engineering Units.	Any value

Diagnostic Assembly

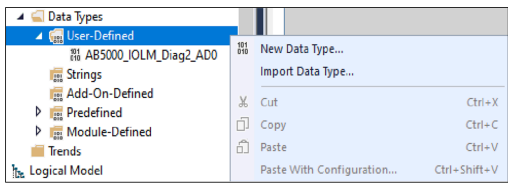
Diagnostic assembly helps you troubleshoot and diagnose the fault in your system.

Create User-defined Diagnostic Assembly Types

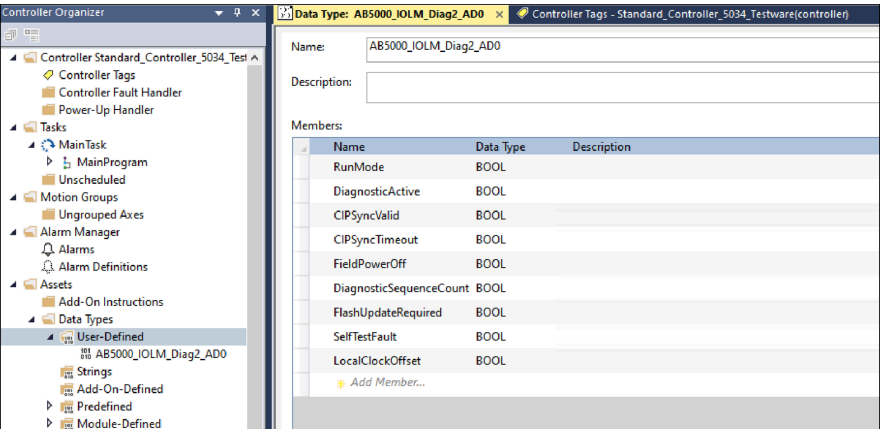
You can use the Studio 5000 Logix Designer application to create user-defined Diagnostic Assembly types.

Create user-defined diagnostic assembly by following the below steps:

- 1. From the Controller Organizer pane, go to Assets → Data types → User-Defined.
- 2. Right-click on the User-Defined folder and select New Data Type.



- 3. Add a Name and Description (optional) for your diagnostic assembly.
- 4. Under Members area, add the data members based on the diagnostic assembly detailed below.



IMPORTANT: The members indicated in the tables are arranged according to Data Alignment Rules of controllers. Strictly follow the data type and the sequence of the members that are indicated in the tables of this appendix. If the data type and the sequence are not followed, data misalignment may occur after executing Get Attribute Single Message (MSG) instruction.

Diagnostic Assemblies

- 1. Diagnostic Assembly for Analog 4 Channel Output Module
 - Instance ID: 0x8020 (32800)
 - Size = 304 bytes

Follow the information in the following table to add each member.

Table 104. Diagnostic Assembly Instance 32800

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
CIPSyncValid	BOOL	
CIPSyncTimeout	BOOL	
Infobit_Pad5	BOOL	

Name	Date Type	Size in Bytes
FieldPowerOff	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
Diagbit_Pad0	BOOL	2
Diagbit_Pad1	BOOL	
Diagbit_Pad2	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
FlashUpdateRequired	BOOL	
SelfTestFault	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad	DINT	4
LocalClockOffset	LINT	8
LocalClockOffsetTimestamp	LINT	8
GrandMasterClockID	SINT[8]	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8
Ch00	Diagnostic_Channel_Structure	64
Ch01	Diagnostic_Channel_Structure	64
Ch02	Diagnostic_Channel_Structure	64
Ch03	Diagnostic_Channel_Structure	64

2. Diagnostic Counters Assembly for I/O
 - Instance ID: 0x301 (769)
 - Size = 16 bytes

Follow the information in the following table to add each member.

Table 105. Diagnostic Assembly Instance 769

Name	Date Type	Size in Bytes
RunMode	BOOL	1
Infobit_Pad1	BOOL	
DiagnosticActive	BOOL	
Infobit_Pad3	BOOL	
Infobit_Pad4	BOOL	
Infobit_Pad5	BOOL	
Infobit_Pad6	BOOL	
Infobit_Pad7	BOOL	
DiagnosticSequenceCount	SINT	1
CIPConnections	INT	2
CIPLostPackets	DINT	4
CIPTimeouts	DINT	4
CPUUtilization	INT	2
Pad	INT	2

Diagnostic Channels

1. Diagnostic Channel

- Size = 64 bytes

This data type is retrieved as part of the diagnostic assembly instance.

Follow the information in the following table to add each member.

Table 106. 5034-OF4 Diagnostic Channel Structure

Name	Date Type	Size in Bytes
Databit_Pad0	BOOL	2
Uncertain	BOOL	
NoLoad	BOOL	
ShortCircuit	BOOL	
Databit_Pad4	BOOL	
FieldPowerOff	BOOL	
Databit_Pad7	BOOL	
Databit_Pad8	BOOL	
Disabled	BOOL	
Databit_Pad10	BOOL	
Databit_Pad11	BOOL	

Name	Date Type	Size in Bytes
Databit_Pad12	BOOL	
Databit_Pad13	BOOL	
Databit_Pad14	BOOL	
Databit_Pad15	BOOL	
CalFault	BOOL	2
Diagbit_Pad1	BOOL	
Diagbit_Pad2	BOOL	
Diagbit_Pad3	BOOL	
Diagbit_Pad4	BOOL	
Diagbit_Pad5	BOOL	
Diagbit_Pad6	BOOL	
Diagbit_Pad7	BOOL	
Diagbit_Pad8	BOOL	
Diagbit_Pad9	BOOL	
Diagbit_Pad10	BOOL	
Diagbit_Pad11	BOOL	
Diagbit_Pad12	BOOL	
Diagbit_Pad13	BOOL	
Diagbit_Pad14	BOOL	
Diagbit_Pad15	BOOL	
Pad1	INT	2
InternalErrorCount	SINT	1
CalRange	SINT	1
CalOffset	REAL	4
CalGain	REAL	4
CalLastDate	LINT	8
NoLoadTimestamp	LINT	8
ShortCircuitTimestamp	LINT	8
Pad2	LINT	8
FieldPowerOnTimestamp	LINT	8
FieldPowerOffTimestamp	LINT	8

Definitions for Diagnostic Assembly Types

Table 107. Definition of Members in Diagnostic Assembly Data Types

Name	Data Type	Definition	Valid Values
RunMode	BOOL	Channel's operating state	<ul style="list-style-type: none"> 0 = Idle – It means one of the following: <ul style="list-style-type: none"> Connection is not up. Connection has been opened but the module has not started producing data for the connection. Because the controller is in Program Mode, the module is not applying the Output tag data but is applying the Program Mode state of the channels instead. 1 = Run – It means the following: <ul style="list-style-type: none"> Connection is up. Module is producing data for the connection. Output tag data is being applied.
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	<ul style="list-style-type: none"> 0 = No diagnostics active 1 = One or more diagnostics are active or the prognostics threshold is reached.
CIPSyncValid	BOOL	Indicates if the module is synced with a 1588 master.	<ul style="list-style-type: none"> 0 = Module is not synced 1 = Module is synced
CIPSyncTimeout	BOOL	Indicates if the module was once synced with a 1588 master, but is not now due to a timeout	<ul style="list-style-type: none"> 0 = A valid time master has not timed out. 1 = A valid time master is detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
FieldPowerOff	BOOL	Field power is not present at the channel.	<ul style="list-style-type: none"> 0 = Field power is present 1 = Field power is not present
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct	<p>-128...+127</p> <p>The value of 0 is skipped except during module power-up.</p>

Table 107. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
		diagnostic condition transitions from detected to not detected.	
FlashUpdateRequired	BOOL	Indicates whether flash update is required.	<ul style="list-style-type: none"> 0 = Flash update is not required 1 = Module has no application firmware
SelfTestFault	BOOL	Indicate whether the fault is present during module self-test.	<ul style="list-style-type: none"> 0 = Module initialization code did not detect an error 1 = Module initialization code detected an error
LocalClockOffset	LINT	The offset from the local clock to the system time. This value helps to detect steps in time. This value updates when a PTP update is received.	Any value
LocalClockOffsetTimestamp	LINT	Indicates the timestamp of the local clock offset.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MMDD-HH:mm:ss_mmm_uuu_nnn(UTC-00:00)</p> <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds uuu = microseconds nnn = nanoseconds UTC-00:00 = Time zone
GrandMasterClockID	SINT	The EUI-64 Identity of the CIP Sync Grandmaster clock the module is synced to.	Any value
FieldPowerOnTimestamp	LINT	Indicates the timestamp of the last time field power turned on.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:ss.mmm.</p> <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
FieldPowerOffTimestamp	LINT	Indicates the timestamp of the last time field power turned off.	A valid time or None if there is no recorded event time.

Table 107. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
			<p>Time format is YYYY-MM-DD-HH:mm:ss.mmm.</p> <ul style="list-style-type: none"> • YYYY = year • MM = month • DD = day • HH = hour (24 hour) • mm = minutes • SS = seconds • mmm = milliseconds
Fault	BOOL	<p>Indicates that channel data is inaccurate and cannot be trusted for use in the application.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p>	<ul style="list-style-type: none"> • 0 = No fault exists • 1 = Fault exists <p>The typical causes of a fault are the following:</p> <ul style="list-style-type: none"> • Channel is disabled • Open Wire condition • Underrange/Ovrange condition • SA power loss condition <p>You must troubleshoot the module first to see if the typical causes exist.</p>
Uncertain	BOOL	<p>Indicates that the channel data can be inaccurate but the degree of inaccuracy is not known.</p> <p>If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy.</p>	<ul style="list-style-type: none"> • 0 = Valid data • 1 = Data validity uncertain
OpenWire	BOOL	The signal wire is disconnected from the channel or the RTB is removed from the module.	<ul style="list-style-type: none"> • 0 = Open wire condition does not exist or open wire detection is disabled. • 1 = Open wire condition exists, that means the signal wire is disconnected from the channel or the RTB is removed from the module.
CalFault	BOOL	Indicates the last attempted Calibration for this channel failed or there is no calibration data present. This tag is cleared, that is, set to 0, when power is cycled to the module.	<ul style="list-style-type: none"> • 0 = Calibration did not fail • 1 = Calibration failed
Underrange	BOOL	<p>Indicates the channel data is beneath the underrange threshold for this channel.</p> <p>For example, when the channel operates in the 4...20 mA input range, the underrange threshold</p>	<ul style="list-style-type: none"> • 0 = Channel data is not beneath the underrange threshold • 1 = Channel data is beneath the underrange threshold

Table 107. Definition of Members in Diagnostic Assembly Data Types (continued)

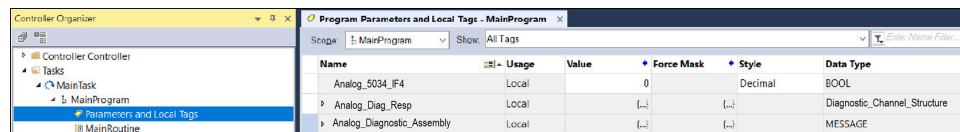
Name	Data Type	Definition	Valid Values
		on the channel is < 3.0 mA. If the input signal is 0 mA, this tag is set to 1.	
Overrange	BOOL	Indicates the channel data is above the overrange threshold for this channel. For example, when the channel operates in the 4...20 mA output range, the overrange threshold on the channel is > 23.0 mA. If the input signal is 24 mA, this tag is set to 1.	<ul style="list-style-type: none"> 0 = Channel data is not above the overrange threshold 1 = Channel data is above the overrange threshold
CalRange	SINT	Indicates the value currently configured for the channel. Values display according to the Input Type selected.	<ul style="list-style-type: none"> 0 = -10...10V 1 = 0...5V 2 = 0...10V 4 = 0...20 mA 5 = 4...20 mA
CalOffset	REAL	Indicates the offset in signal units as reported by the device.	Any value
CalGain	REAL	Indicates the calibration gain reported by the device.	Any value
CalLastDate	LINT	Indicates the time of the last calibration date for the channel.	Any value
OpenWireTimestamp	LINT	Indicates the timestamp of the last time when the open wire condition is detected.	A valid time or None if there is no recorded event time.
UnderrangeTimestamp	LINT	Indicates the timestamp of the last underrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:SS.mmm. <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
OverrangeTimestamp	LINT	Indicates the timestamp of the last overrange fault.	A valid time or None if there is no recorded event time. Time format is YYYY-MM-DD-HH:mm:SS.mmm. <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes

Table 107. Definition of Members in Diagnostic Assembly Data Types (continued)

Name	Data Type	Definition	Valid Values
			<ul style="list-style-type: none"> SS = seconds mmm = milliseconds
NoLoad	BOOL	Indicates whether a load fault is present.	<ul style="list-style-type: none"> 0 = No Load condition does not exist. 1 = No Load condition exists.
NoLoadTimestamp	LINT	Indicates the timestamp of the last time a no load fault has occurred.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:SS.mmm.</p> <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
ShortCircuit	BOOL	Indicates whether an output short circuit or overcurrent fault is present on the point.	<ul style="list-style-type: none"> 0 = No Short Circuit condition exists. 1 = Short Circuit condition is present.
ShortCircuitTimestamp	LINT	Indicates the timestamp of the last time short-circuit fault has occurred.	<p>A valid time or None if there is no recorded event time.</p> <p>Time format is YYYY-MM-DD-HH:mm:SS.mmm.</p> <ul style="list-style-type: none"> YYYY = year MM = month DD = day HH = hour (24 hour) mm = minutes SS = seconds mmm = milliseconds
CIPConnections	INT	Indicates the number of CIP connections currently open.	0...24
CIPLostPackets	DINT	Indicates the running sum of the number of Sequenced Address Item Sequence Numbers that are skipped in Class 0 and Class 1 connections consumed by the adapter and its children.	0...2,147,483,647
CIPTimeouts	DINT	Indicates the running count of the number of connections that time out, both originated and targeted, to and through the adapter.	0...2,147,483,647
CPUUtilization	INT	Indicates the usage of the compute engine.	0...100%

Create Message Type User Tags

Create MESSAGE type user tags for requests and associated response user tags for each of the new user-defined diagnostic assembly types.



Name	Usage	Value	Force Mask	Style	Data Type
Analog_5034_IF4	Local	0		Decimal	BOOL
Analog_Diag_Resp	Local	[...]	[...]		Diagnostic_Channel_Structure
Analog_Diagnostic_Assembly	Local	[...]	[...]		MESSAGE

From the Controller Organizer pane, expand Tasks → MainTask → MainProgram:

1. Create MESSAGE type user tags for each request.
2. Create associated response user tags for each new user-defined diagnostic assembly type.
3. Add the user tags to your ladder program.



4. Expand the message tag to open the message configuration dialog.
5. On the Configuration tab, select:
 - Service type: Get Attribute Single
 - Class: 4
 - Attribute: 3
 - Instance:
 - 0x8020 (32800) Diagnostic Assembly for Analog 4 Channel Output Module
 - 0x301 (769) Diagnostic Counters Base I/O Assembly
 - Destination element: User-defined data type suitable for the instance entered.
6. On the Communication tab, select the path to the module that you wish to send the messages to.
7. Download the project and set to Run Mode.

You can monitor the user-defined tag values from the Program Parameters and Local Tags window, under the MainProgram task in the Controller Organizer pane.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at rok.auto/pec.

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