USER MANUAL

SPECTRUM CONTROLS

An Allient Company

User's Manual Pub. 0300340-01 Rev. B0

PointMax™ I/O 8-Channel Sourcing 24 VDC Digital Input Module

Catalog Numbers: 5034-IV8-SC

Important Notes

1. Please read all the information in this owner's guide before installing the product.
2. The information in this owner's guide applies to hardware Series A and firmware version 1.1 or later.
3. This guide assumes that the reader has a full working knowledge of the relevant processor.

Notice

The products and services described in this owner's guide are useful in a wide variety of applications. Therefore, the user and others responsible for applying the products and services described herein are responsible for determining their acceptability for each application. While efforts have been made to provide accurate information within this owner's guide, Spectrum Controls, Inc. assumes no responsibility for the accuracy, completeness, or usefulness of the information herein.

Under no circumstances will Spectrum Controls, Inc. be responsible or liable for any damages or losses, including indirect or consequential damages or losses, arising out of either the use of any information within this owner's guide or the use of any product or service referenced herein.

No patent liability is assumed by Spectrum Controls, Inc. with respect to the use of any of the information, products, circuits, programming, or services referenced herein.

The information in this owner's guide is subject to change without notice.

Limited Warranty

Spectrum Controls, Inc. warrants that its products are free from defects in material and workmanship under normal use and service, as described in Spectrum Controls, Inc.'s literature covering this product, for a period of 1 year. The obligations of Spectrum Controls, Inc. under this warranty are limited to replacing or repairing, at its option, at its factory or facility, any product which shall, in the applicable period after shipment, be returned to the Spectrum Controls, Inc. facility, transportation charges prepaid, and which after examination is determined, to the satisfaction of Spectrum Controls, Inc. to be thus defective.

This warranty shall not apply to any such equipment which shall have been repaired or altered except by Spectrum Controls, Inc. or which shall have been subject to misuse, neglect, or accident. In no case shall the liability of Spectrum Controls, Inc. exceed the purchase price. The aforementioned provisions do not extend the original warranty period of any product which has either been repaired or replaced by Spectrum Controls, Inc.

Table of Contents

Preface

Read this preface to familiarize yourself with the rest of the manual. This preface covers the following topics:

- Who should use this manual.
- How to use this manual.
- Related documentation.
- Technical support.
- Documentation.
- Conventions used in this manual.

Who Should Use This Manual

Use this manual if you are responsible for designing, installing, programming, or troubleshooting Compact 5380™ and Compact 5480™ or ControlLogix 5580™ control systems that use the PointMax™ I/O 8-Channel Sourcing 24 VDC Digital Input Module.

NOTE	Before you access any equipment or begin to install any IO modules, review all safety material and warnings in the associated . Be sure to review the warnings provided in this document before you start installing a module in a system.

How to Use This Manual

As much as possible, we organized this manual to explain, in a task-by-task manner, how to install, configure, program, and operate a control system using the PointMax™ I/O 8-Channel Sourcing 24 VDC Digital Input Module. Make sure you are familiar with the following:

- Use of a controller in CompactLogix™ 5380, CompactLogix™ 5480, or ControlLogix™ 5580 control systems.
- Use of an Ethernet/IP™ network.
- Use of safety systems.
- Use Studio 5000 Logix Designer® environment.

Related Documentation

The table below provides a listing of publications that contain important information about the CompactLogix 5000™, ControlLogix™, and PointMax™ I/O 8-Channel Sourcing 24 VDC Digital Input Module.

For	Refer to this Document	Allen-Bradley Pub. No.
Describes how to configure, operate, and troubleshoot CompactLogix™ 5380 and Compact GuardLogix® 5380 controllers.	CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual	5069-UM001
Describes how to configure, operate, and troubleshoot CompactLogix 5480 controllers.	CompactLogix 5480 Controllers User Manual	5069-UM002

For	Refer to this Document	Allen-Bradley Pub. No.
Describes how to configure, operate, and troubleshoot ControlLogix 5580 and GuardLogix 5580 controllers.	ControlLogix 5580 and GuardLogix 5580 Controllers User Manual	1756-UM543
Provides PointMax I/O system specifications.	PointMax I/O System Specifications Technical Data	5034-TD001
Provides instructions on installing a complete PointMax I/O system.	PointMax I/O System Installation Instructions, publication	5034-IN001
Provides information on how to configure and operate PointMax I/O EtherNet/IP adapters.	PointMax I/O EtherNet/IP Adapter User Manual	5034-UM001
Provides information on how to configure and operate PointMax I/O digital I/O modules.	PointMax I/O Digital Modules User Manual provides information on how to configure and operate PointMax I/O digital modules.	5034-UM002
Provides more information on event tasks and event task configuration.	Logix 5000 Controllers Tasks, Programs, and Routines Programming Manual, publication	1756-PM005
Environment and Enclosure Information	Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1, for additional installation requirements. NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.	1770-4.1 NEMA 250-2014 IEC 60529
Declarations of conformity, certificates, and other certification details.	Product Certification website: https://spectrumcontrols.com	

Technical Support

For technical support, please contact your local Rockwell Automation TechConnect Office for all Spectrum products.

Contact numbers are as follows:

- USA 1-440-646-6900 (US/global, English only
- United Kingdom +44 0 1908 635 230 (EU phone, UK local)
- Australia, China, India, and other East Asia locations: 1-800-722-778 or +61 39757 1502
- Mexico 001-888-365-8677
- Brazil 55-11-5189-9500 (general support)
- Europe +49-0-211-41553-630 (Germany/general support)

or send an email to support@spectrumcontrols.com

Documentation

If you would like a manual, you can download a free electronic version from the Internet at www.spectrumcontrols.com

Conventions Used in This Manual

The following conventions are used throughout this manual:

- Bulleted lists (like this one) provide information not procedural steps.
- Numbered lists provide sequential steps or hierarchical information.
- *Italic* type is used for emphasis.
- **Bold** type identifies headings and sub-headings.

WARNING 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. These messages help you to identify a hazard, avoid a hazard, and recognize the consequences.

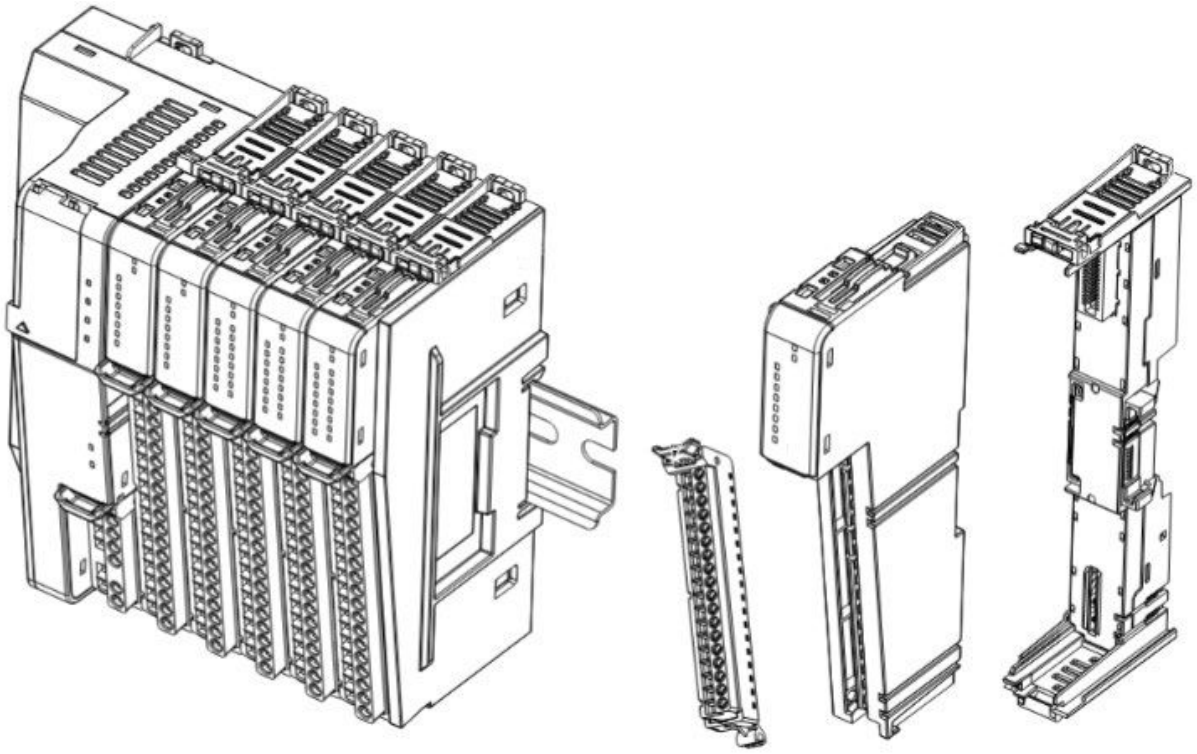
NOTE 	Identifies information that is critical for successful application and understanding of the product.

Chapter 1
Module Overview

Section 1.1 General Description

The PointMax™ I/O 5034-IV8-SC is an 8-Channel Sourcing 24 VDC Digital Input Module designed to expand the local I/O capability of Rockwell Automation PointMax™ I/O Systems.

The 5034-IV8-SC is used as remote I/O module in Logix 5000 controllers via a 5034-AENTR or 5034-AENTRXT module over an EtherNet/IP network.



You use the Studio 5000 Logix Designer® application to configure the modules. The 5034-IV8-SC module is compatible with Studio 5000 Logix Designer application, version 36 or later.

PointMax I/O digital modules use the Producer/Consumer network communication model when used with Logix 5000 controllers via an EtherNet/IP adapter. Data is processed within the module itself and communication flows through the backplane to an EtherNet/IP adapter.

The 5034-IV8-SC occupies one standard slot in a PointMax I/O system, connecting to the 5034 Mounting Base with the standard 5034 plastic enclosure and card edge finger connections.

All modules are mounted in a chassis and communicate with the dedicated EtherNet/IP adapter module via the backplane.

The module requires a PointMax I/O removable terminal block kit (5034-RTB18, 5034-RTB18S or 5034-RTB24 and 5034-RTB-24S) for 5034 series modules. The removable terminal blocks provide digital interface power, isolated SA Power, and GND. The 18-pin, spring or screw, removable terminal block kits to connect field-side wiring are not included with the I/O modules. You must order RTBs separately.

The module is designed to only sample logical inputs through the terminal block by wiring an input pin to a switch so that the controller can detect either an open or closed switch position. The inputs are IEC 61131-2 Type 1 and Type 3 inputs for industrial programmable controllers.

The module converts the inputs signals and relays the data to the 5034-MB through the appropriate bus on the backplane. The 5034-IV8-SC input terminals provide integrated protection against reversed wiring polarity and transient electrical surges. Input filtering is done in software and can be configured up to 50 ms on each input.

Section 1.2 Power and Communication

The 5034-IV8-SC module interfaces with the PLC (rack) backplane active base through two separate groups of edge finger connectors, providing both power and communications to the module. The 2×20-pin edge finger connector on the backplane controller provides communication, LED controls, and authentication of the 5034 modules.

Section 1.3 Field Side Circuitry Power

The 5034 platform provides isolated field power on a separate bus. The module uses that power source for operation of the field side circuitry and the onboard microcontroller. This isolated field power bus is designated “SA Power”. The operating range of the terminal base is 18 to 30 VDC and derating is allowed for 10 to 18 VDC and 30 to 32 VDC with an operating power limit of 1.4 W.

The power for the module that is provided by the backplane has a nominal voltage of 3.15 V and an operating power limit of 200 mW (approximately 63 mA).

The I/O modules may reside in a separate location from the controller.

The discrete module supports 8, sourcing, digital input channels. The module provides the following functions:

- Simple counting.
- Timestamps events.
- Pulse latching.
- Detects events.
- Detects sequence of events.

The Studio 5000 Logix Designer software version 36 and later also contain an add-on-profile (AOP) that provides a graphical user interface to the module’s features.

The EDS file for this module is provided by the 5034 Mounting Base and is based on the module information provided at initialization. There is no EDS file stored within the module itself or available for download from the company website.

Before you can use the module, you will need to set up a configuration within the PLC that is used to configure the module before it is able to be used.

Section 1.4 Controller Ownership of I/O Modules

For the 5034-IV8-SC to function in a CompactLogix 5000 or ControlLogix 5000 control system, a controller must own the module.

The controller that owns the input module performs the following functions:

- May reside in a location that differs from the module.
- 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.

You can connect multiple controllers to the input module. Conditions for multiple connections are:

NOTE	If the controller that owns the module configuration changes the configuration, the other controllers are not notified of the changes.

- The first controller to make a connection to the input module is the only controller that can change the connection. Therefore, it 'owns' the module configuration.
- A listening ControlLogix or CompactLogix configuration in each controller uses a Listen-only, Multicast connection to the input module over the EtherNet/IP network. This dedicated connection shares data from the input module with multiple controllers simultaneously.
- All controllers sharing the input must select the exact same configuration for the module.
- The difference between controllers is that the controllers that maintain, but do not own, the module configuration must use a Multicast connection over the EtherNet/IP network while the controller that owns the module can use a Unicast connection.

Section 1.5
Input Specifications

The 5034-IV8-SC modules have the following input specifications:

1.5.1 General Specifications

Parameter	Specification
Number of Inputs	8 (powered) sourcing Channels (1 group of 8)
Voltage Source Range	24 VDC 0 to 32 VDC
Voltage; off-state input, maximum:	5 VDC
Current; off-state input, minimum:	1.5 mA
Current; on-state, input minimum:	2 mA
Current; on state input, nominal	2.4 mA
Current; on-state input, maximum:	2.8 mA
Voltage; on-state input, maximum	32 VDC
Voltage; on-state input, nominal	24 VDC
Voltage; on-state input, minimum	10 VDC
Voltage; sensor source, maximum	Follow SA Supply
Voltage; sensor source, minimum	11 V
Maximum Input Voltage	36 VDC
Input Impedance	5 K minimum - 16 K maximum
Input Transition Delay, Screw to Backplane: Time, Off-to-On: Time On-to-Off:	 350 µSec 350 µSec
Input Pulse Width: On-Off-On: Off-On-Off:	 125 µSec 125 µSec
Power Dissipation	1.6 Watts
SA Voltage Nominal Operating Range	18–30 VDC (24 VDC Nominal)
SA Voltage Absolute Minimum	10 VDC
SA Voltage Absolute Maximum.	32 VDC
SA Power Consumption (Maximum)	1.4W
SA Reverse Polarity Protection (Maximum)	-32 VDC
Field Sensor Supply Voltage	Follow SA Supply
Field Sensor Supply Current (Maximum)	200 mA per Module
Backplane VDD voltage (Nominal)	3.15 VDC
Backplane VDD Power Consumption (Maximum)	200 mW

Parameter	Specification
Isolation voltage	250 VAC continuous (Basic) Channel-to-Backplane 250 VAC continuous (Basic) Channel-to-FGND
Backplane power ratings SA Power consumption:	Module draws no more than 1.4 Watts from SA power bus.
Module keying	Mechanical
Indicators	1 green/red SA power status indicator 1 green/red module status indicator 8 yellow/flashing red channel I/O status indicators
Slot width	1
Dimensions (L×W×H), approximately	125.35 (L) × 61.54 (W) × 15.11 (H) mm (4.94 (L) x 2.42 (W) x 0.59 (H) in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the following DIN rail sizes: EN50022 - 35 × 7.5 mm (1.38 × 0.30 in.) EN50022 - 35 × 15 mm (1.38 × 0.59 in.)
5034-RTB18-SCREW RTB only torque	0.22…0.25 N•m (1.95…2.21 lb•in.)
RTB	One of these RTB types: • 5034-RTB18-SPRING RTB/5034-RTB24-SPRING RTB • 5034-RTB18-SCREW RTB/5034-RTB24-SCREW RTB IMPORTANT : You must order PointMax I/O RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB keying	Slots 1, 4, 9
Wire category[1]	2 power ports 1 wire per terminal for each input port
Wire size	
5034-RTB18-SPRING removable terminal block, solid or stranded.	0.34…1.5 mm^2 (22…16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) maximum diameter including insulation

[1] Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Parameter	Specification
5034-RTB18-SCREW removable terminal block, solid or stranded	0.34…1.5 mm^2 (22…16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) maximum diameter including insulation
5034-RTB18-SPRING Insulation stripping length	10 ±0.4 mm (0.39 ±0.016 in.)
5034-RTB18-SPRING connections	10 mm (0.39 in.)
5034-RTB18-SCREW Insulation stripping length	6-8 ±0.4 mm (0.24-0.31 ±0.016 in.)
Weight, approx.	0.045g (0.10 lb.)
Enclosure type	None (open – style)
North American temperature code	T5
ATEX temp code	T5
IECEx temp code	T5
Certifications	UL/cUL Listed ANSI ISA 12.12.01 (Class I, Div 2, Groups ABCD), CE, ATEX, CCCEx, CMIM, UKCA, IECEx

1.5.2 Input/Performance/Environmental Requirements

Input Description	Value
Operating Temperature	-25 ºC to 60 ºC (-13 ºF to 140 ºF)
Storage/Non-Operating Temperature	-40 ºC to 85 ºC (-40 ºF to 185 ºF)
Temperature, Surrounding Air[2]	60 ºC (140 ºF)
Operating Humidity	5% to 95%, non-condensing
Storage/Non-Operating Humidity	5% to 85%, non-condensing
Vibration/Operating	10 Hz to 500 Hz, 5 G, 0.030 maximum peak-to-peak
Operating Shock	30 G, peak acceleration, 11 ms pulse, half sine
Storage/Non-Operating Shock	50 G peak acceleration, 11 ms pulse, half sine
Pollution Level	Meets Pollution Degree 2 requirements.
Reverse voltage protection	Yes, group protection
Input to backplane isolation	250 VAC working Reinforced isolation tested at 2 kVDC for 1 minute
Input to Chassis GND isolation	250 V working Reverse Polarity isolation tested at 2 kVDC for 1 minute.
Power Requirements	

[2] Horizontal orientation only, if using the AENTR adapter in the Vertical orientation follow its operating ambient temperature derating to 42 °C (108 °F) max.

Input Description	Value
Backplane	3.15 VDC, or approximately 0.063 mA
SA (Field Power)	10-32 VDC, 45 mA
Power Dissipation	1.6 Watts
RoHS	2011/65/EU RoHS Directive and UK Statutory Instruments 2012 No. 3032, compliant with EN IEC 63000:2018; Technical documentation. 2011/65/EU RoHS Directive and its amendment EU 2015/863
REACH	Registration, Evaluation and Authorization of Chemicals (REACH) Regulation (1907/2006). EU REACH Restriction of PFAS
Module Dimensions H×W×L (RTB extends the total depth when installed).	125.35 × 61.54 × 15.11 mm (4.94 × 2.42 × 0.59 in.

1.5.3 EMC Specification Table

EMC Tests	Test Level
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharge 8 kV air discharge
Radiated RF immunity IEC 61000-4-3	10 V/m with 1 kHz sinewave 80% AM from 80…2000 MHz 10 V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10 V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3 V/m with 1 kHz sinewave 80% AM from 2000…6 GHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on power ports ±3 kV at 5 kHz on output ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on output ports
Conducted RF immunity IEC 61000-4-6	10 VRMS with 1 kHz sinewave 80% AM from 150 kHz…80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD power port

1.5.4 Regulatory Table

Certification[3]	Industry Standard
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. UL Listed for Class I, Division 2 Group A, B, C, D Hazardous Locations, certified for U.S. and Canada. • UL 61010-1, Edition 3, Issue Date 2012-05-11, Revision Date 2024-11-15 • CAN/CSA-C22.2 No. 61010-1-12, Edition 3, Issue Date 2012-05-11, Revision Date 2024-11-15 • UL 61010-2-201, Edition 2, Issue Date 2018-05-14, Revision Date 2022-08-08 • CSA C22.2 No. 61010-2-201:18, 2nd Ed., Issue Date: 2018-02-01 • UL 121201, Edition 9, Revision date 2021-04-01 • CSA C22.2 NO. 213-17, 3rd Ed., Issue Date: 2017-09-15, Revision Date: 2021-04-01
CE	European Union 2014/30/EU EMC Directive and UK Statutory Instruments 2016 No. 1101,compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU, compliant with: EN 61010-2-201; Control Equipment Safety Requirements
UKCA	EMC Regulations 2016, compliant with: • BS EN 61326-1; Meas./Control/Lab., Industrial Requirements • BS EN 61000-6-2; Industrial Immunity • BS EN 61000-6-4; Industrial Emissions • BS EN 61131-2; Programmable Controllers (Clause 8, Zone A & B). European Union 2014/35/EU LVD Directive and UK Statutory Instruments 2016 No. 1101, compliant with: • EN IEC 61010-2-201; Control Equipment Safety Requirements European Union 2011/65/EU RoHS Directive and UK Statutory Instruments 2012 No. 3032, compliant with: EN IEC 63000:2018; Technical documentation

[3] When marked.

Certification[3]	Industry Standard
CMIM	Arrêté ministériel n° 6404-15 du 29 ramadan 1436 (16 juillet 2015) NM EN 61131-2, NM EN 61000-6-4, NM EN 61000-6-2
Ex (ATEX)	European Union 2014/34/EU ATEX Directive and UK Statutory Instruments 2016 No. 1107,compliant with: • EN IEC 60079-0:2018; Explosive atmospheres - General Requirements • EN IEC 60079-7:2015 +A1:2018 /A11:2024; Explosive atmospheres - Equipment protection by increased safety 'e'
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-7:2017 Edition 5.1
CCCEx	

Hardware Features

The module has 8 LEDs for indicating the input status for each of the channels, an LED that indicates module status, and an LED that indicates power status.

1.6.1 LED Operation

The module firmware does not have direct control over the Module Status and SA Power Status LEDs.

The Module Status LED is a bicolor red/green LED and indicates the status of the module.

The table below summarizes the Module Status LED states:

Module Status LED State:	Module State:	Comments:
Off	No module power.	Confirm that the system is powered.
Solid Green	The module has a connection to the owner controller and is operating normally.	None.
Flashing Green	One of the following conditions exists: • The module has powered up successfully. • The module is OK but does not have an I/O connection to the controller. No connection can result from a missing, incomplete, or incorrect module configuration.	Troubleshoot your Logix Designer application to determine what is preventing a connection from the module to the controller and correct the issue.
Solid Red	The module experienced a nonrecoverable fault.	Cycle power to the module.

Module Status LED State:	Module State:	Comments:
Flashing Red	One of the following conditions exists: • 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.	• Let the firmware update progress complete. • Re-attempt a firmware update after one fails. • Use the Logix Designer application to determine the cause of the module fault. The Connection and Module Info categories of the module's configuration indicate the fault type.

The Channel Status LEDs is bicolor yellow/red LED and indicates the status of the module.

The table below summarizes the Module Channel LED states:

Channel LED State:	Channel State:
Off	Channel logic state zero (0) or SA power loss.
Solid Yellow	Channel logic state 1

The SA Power Status LED is a bicolor red/green LED and indicates the power status of the module.

The table below summarizes the SA Power Status LED states:

SA Power Status LED State:	Module State:	Comments:
Off	The module is not powered.	Confirm that the system is powered.
Solid Green	Power is on. The module has a connection to the owner controller and is operating normally.	None.
Sold Red	SA Power is off.	

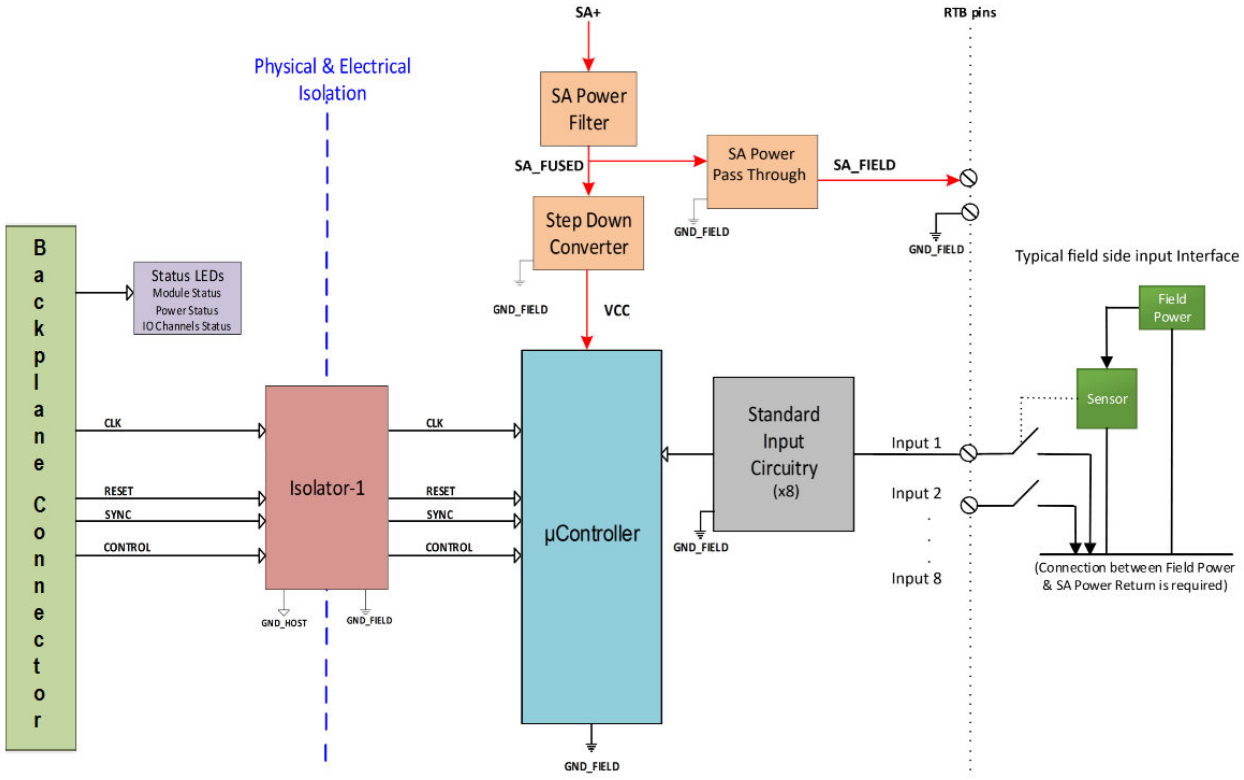
Section 1.7 System Overview and Module Operation

Each module has a unique serial number placed on the label. The module may operate attended or unattended. There are no backup or recovery operations requiring data storage and/or remote programming of the product. The module is not intended to be reset in the field and has no default IP address. The hardware may not be upgraded in the field. However, there will be firmware upgrades using ControlFLASH and ControlFLASH Plus. The module also supports downgrades to a previous version of the firmware. The 5034-IV8-SC modules are expected to operate indefinitely.

Two one-directional ports provide communication between the active base and the field-side circuitry. The control circuitry is in the field side ground domain so signals for both ports pass through digital isolators before connecting to the control circuitry on the 5034-IV8-SC. Two versions of single row, 18-pin, removable terminal blocks are available to connect between the edge fingers of the 5034-IV8-SC PCB. The available RTB connection types are screw terminal or spring cage clamp. There are no shield or earth ground pins on the terminal block.

The module receives 24 VDC from the SA power connector.

Block diagram:



Chapter 2
Installation and Wiring

Section 2.1 Compliance to European Union Directives

This product is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

The 5034-IV8-SC module is tested to meet Council Directive 2014/30/EU Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 61131-2 Programable controllers, Part 2 - Equipment requirements and tests.
- EN 61000-6-2 Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments.
- EN 61000-6-4 Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments.

European Union 2014/35/EU LVD Directive and UK Statutory Instruments 2016 No. 1101, compliant with:

- EN IEC 61010-2-201; Control Equipment Safety Requirements

UKCA Electromagnetic Compatibility Regulations 2016

- BS EN 61131-2, BS EN 61000-6-2, BS EN 61000-6-4

This product is intended for use in an industrial environment.

2.1.1 ATEX Directive

This product is tested to meet Council Directive 2014/30/U/ATEX, and the following standards, in whole or in part, documented in a technical construction file:

- EN 60079-0:2018; Explosive atmospheres – Part 0: Equipment – General requirements.
- EN IEC 60079-7:2015 +A1:2018/A11:2024; Explosive atmospheres – Part 7: Equipment protection by increased safety "e".

This module also meets the standards for the United Kingdom Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016:

- BS EN 60079-0
- BS EN 60079-7

This product also meets European Union 2011/65/EU RoHS Directive and UK Statutory Instruments 2012 No. 3032, compliant with:

- EN IEC 63000:2018; Technical documentation

Section 2.2 Power Requirements

This module is intended to operate with a SA power supply rated for SELV. The Sensor/Actuator Power Supply (SA Power) is a 10-30 VDC power supply that provides power to run the field-side circuitry, generally from the SA power input on the AENTR Ethernet adapter. The voltage provided via the backplane is 3.15 VDC, 0.63 mA maximum to provide a maximum total of 200 mW of power.

A removable terminal block provides the physical connections points for the field-side wiring from sensors and actuators.

The maximum amount of power that can be supplied from the mounting base is a maximum of 200 mW from the backplane (approximately 63 mA) and 1.4 Watts from the SA power supply.

Section 2.3 Removable Terminal Block and Housing

The module uses a Removable Terminal Block (RTB) to connect all field-side wiring. RTBs are not included with your purchase.

When ordering RTBs, specify the Allen Bradley Part Number:

- 5034-RTB18S Spring RTB
- 5034-RTB18 Screw RTB
- 5034-RTB24S Spring RTB
- 5034-RTB24 Screw RTB

You receive the following components with your RTB:

- The specified RTB housing.
- A generic RTB door label.

Use these components in all module applications.

Section 2.4 Mounting Base

The module is installed in a mounting base that is not included in your product and must be ordered separately.

When ordering a mounting base, specify the following Part Numbers:

- 5034-MB
- 5034-MBSA

Section 2.5 General Considerations

The 5034-IV8-SC modules are suitable for use in an industrial environment when installed in accordance with these instructions. Specifically, this equipment is intended for use in clean, dry environments (Pollution degree 2[4]).

2.5.1 Hazardous Location Considerations

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D hazardous locations.

2.5.2 Prevent Electrostatic Discharge

WARNING 	Electrostatic discharge can damage integrated circuits or semiconductors if you touch the module card bus connector pins or the terminal block on the output module. Follow these guidelines when you handle the module: • Touch a grounded object to discharge static potential. • Wear an approved wrist-strap grounding device. • Do not touch the bus connector or connector pins. • Do not touch circuit components inside the module. • If available, use a static-safe workstation. • When it is not in use, keep the module(s) in a static-shield bag.

2.5.3 Remove Power

WARNING 	**This module is designed to be hot-swapped.** However, when you remove or insert a module with power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by: • Sending an erroneous signal to your system's field devices, causing unintended machine motion. • Causing an explosion in a hazardous environment. • Causing an electrical arc. Electrical arcing causes excessive wear to contacts on both the module and its mating connector and may lead to premature failure.

2.5.4 Selecting a Location

Reducing Noise

Most applications require installation in an industrial enclosure to reduce the

[4] Pollution Degree 2 is an environment where, normally, only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is expected.

effects of electrical interference. Group your modules to minimize adverse effects from radiated electrical noise and heat. Consider the following conditions when selecting a location for the digital module. Position the module:

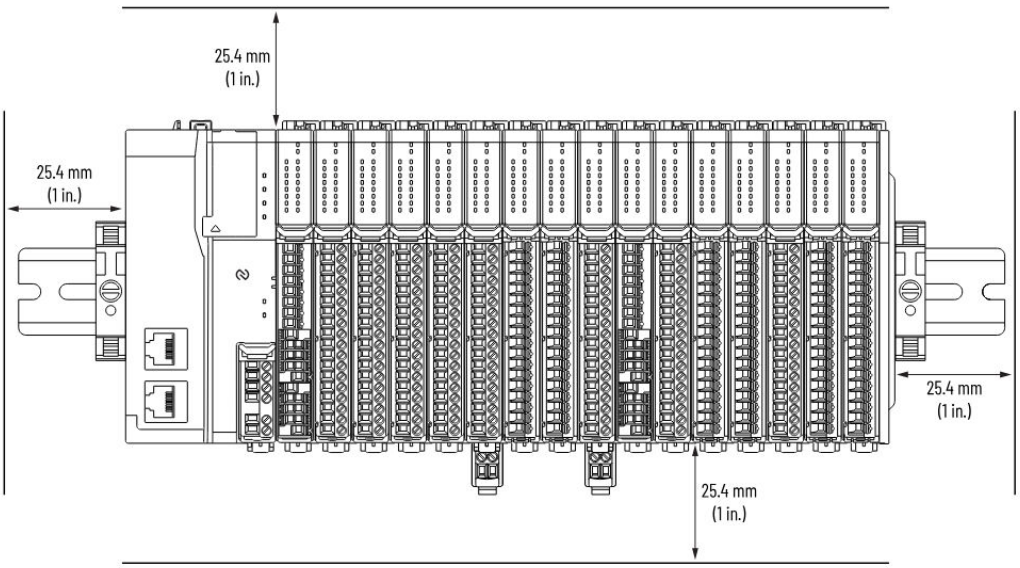
- Away from sources of electrical noise such as hard-contact switches, relays, and AC motor drives.

In addition, route wiring away from any high-voltage I/O wiring.

Section 2.6 Mounting

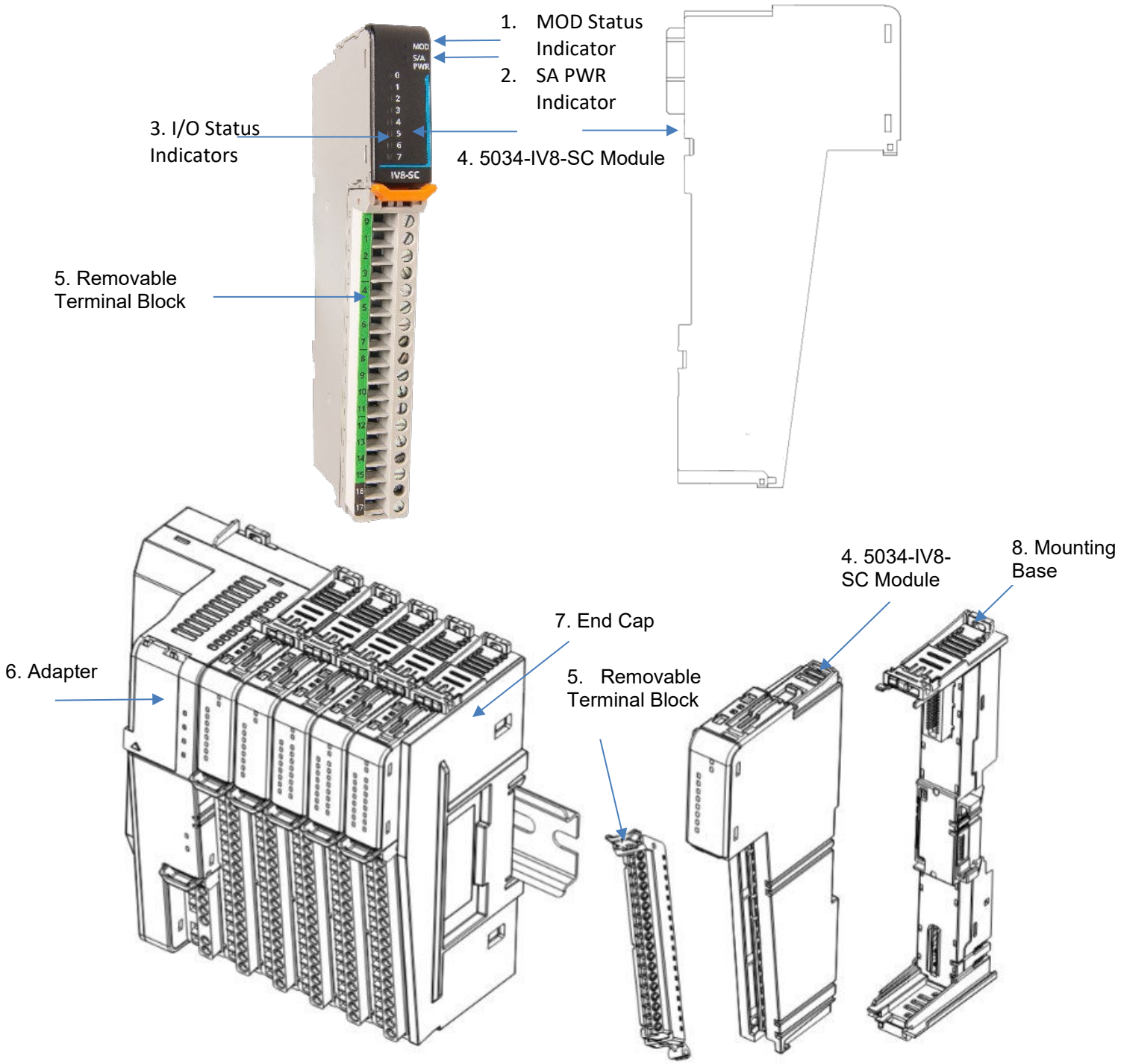
2.6.1 Minimum Spacing

Maintain spacing from enclosure walls, wire ways, adjacent equipment, etc. Allow 25.4 mm (1 in.) of space on all sides for adequate ventilation, as shown:



2.6.2 Parts List

Your package contains one PointMax I/O 5034-IV8-SC Module and one Quick Start Guide.



	Item	Description
1	Module (MOD) status indicator	Displays the status of communication and module health.
2	SA Power (PWR) status indicators	Displays whether SA power is applied to the module.

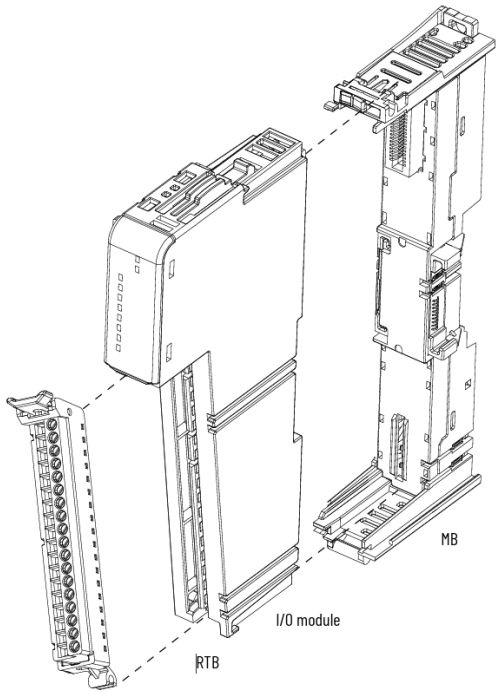
3	I/O status indicators	Displays the status of the input/output channels.
4	5034-IV8-SC Module	The I/O module contains the SA or field power interface and circuitry needed to perform specific functions related to module function.
5	Removable terminal block (RTB)	The RTB contains terminals to terminate wiring for field devices. Also it has interfaces to establish the connection between the RTB and the module.
6	Adapter	The adapter transfers data between the I/O module and the controller.
7	End Cap	It is dust protection for the last module in a rack.
8	Mounting Base (MB)	The MB contains mechanical and electrical interfaces to establish the connection between the I/O module and the backplane.

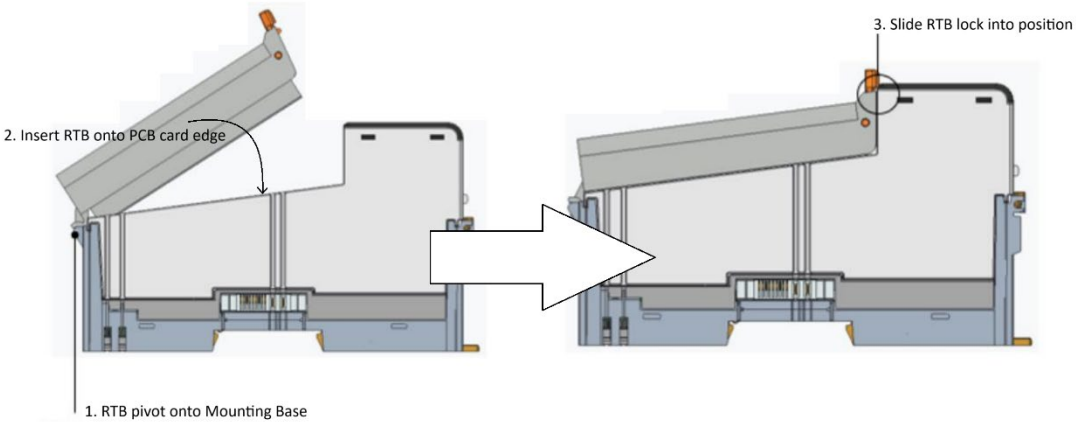
NOTE 	The module expansion may be mounted horizontally and vertically. When mounting this module vertically, the operating ambient temperature in the AENTR document states the temperature must be derated to 42 ºC (108 ºF).

2.6.3 Installing the Module

WARNING 	The end cap in a CompactLogix 5380, CompactLogix 5480, or Compact GuardLogix 5380 control system covers the exposed interconnection on the last module on the DIN rail. If you do not install an end cap on the last module on the DIN rail, injury to personnel or damage to equipment may occur.

To install the module:





1. **Mounting Base and Adapter:** Install a 5034-AENTR EtherNet/IP adapter onto a DIN rail. An adjacent 5034-MB mounting base should also be installed on the DIN rail to receive the 5034-IV8-SC module.
2. **Mounting Base Configuration:** Verify that the key switch on the mounting base is correctly set for the type of module you are installing.
3. **Install the I/O Module:** Snap the 5034-IV8-SC module onto its mounting base. The module will automatically connect to the backplane power and EtherNet/IP network via the adjacent modules and adapter.
4. **Connect the RTB:** Install the correct removable terminal block (RTB) onto the module and secure it.
5. **Wire the Module:** Connect your field device wiring to the terminals on the RTB. Ensure power is removed before connecting or disconnecting the RTB.
6. **Install End Cap:** Install the end cap on the last module in the local

system to terminate the backplane.

7. **Connect Network:** Connect the 5034-AENTR adapter to your EtherNet/IP network using the integrated RJ-45 ports.
8. **Power Up and Configure:** Apply power and then use the Studio 5000 Logix Designer application (Version 36 or later) to configure the 5034-AENTR and the 5034-IV8-SC module within your project.
9. For further information on how to install compatible controllers, adapters, and the PointMax I/O modules, see the publications that are listed at the start of this manual.

2.6.4 How Power Flows Through the Modules

Power flows through a 5034 PointMax I/O Logix system by distributing power from the backplane to the modules. The system uses a modular design with specific components for different power functions, ensuring separate power for the backplane logic and field-side devices.

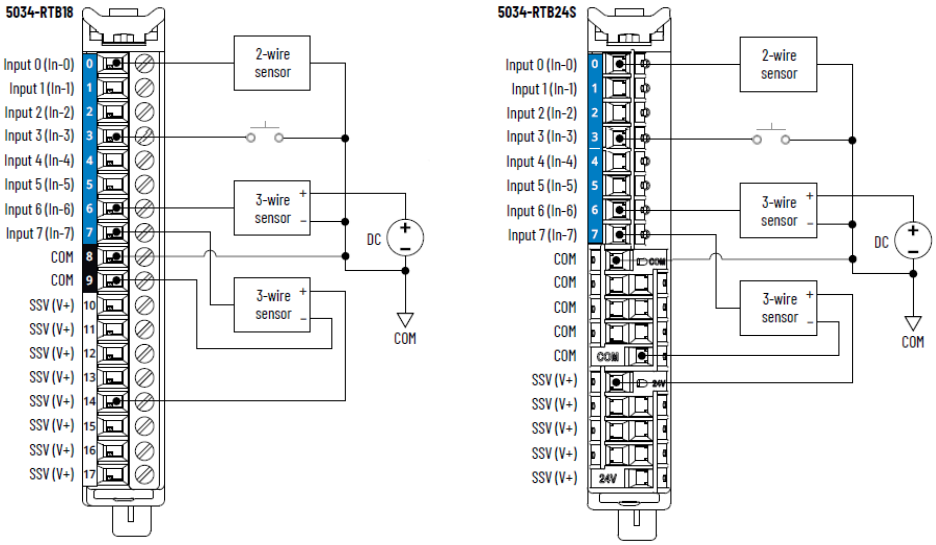
The system receives input power from an external 24 VDC power source as follows:

- Power supply module. The input power is first routed to a dedicated power supply unit, which conditions, filters, and provides isolation for the 24 VDC required by the system.
- Backplane power. The converted DC voltage from the power supply is fed into the system's backplane. The backplane then distributes two types of power to the different modules:
- Module power (MOD Power): MOD power is for the module and communications through the backplane. The low-voltage power, 3.3 VDC, is used to power the backplane-side logic domain.
- Sensor/actuator (SA) power: SA is internally routed field-side power. This higher-voltage, 24 VDC power is used to power external field devices, like sensors and actuators, which are connected to the 5034-IV8-SC module. SA power is also used to generate the module’s low-voltage system power which is used for the modules’ internal logic and processing.

2.6.5 Wiring Diagram

The RTB pins are identified by numbers that are raised above the surface of the RTB adjacent the screw or slot.

The examples show 3 devices connected to separate channels. You are not restricted to using just those channels. You may connect devices to any channel or combination of channels as needed.



Wire the module using the images. The following table explains the layout of the 18-pin terminal block:

RTB#	Name	Description
0	In-0	Channel 0 Input
1	In-1	Channel 1 Input
2	In-2	Channel 2 Input
3	In-3	Channel 3 Input
4	In-4	Channel 4 Input
5	In-5	Channel 5 Input
6	In-6	Channel 6 Input
7	In-7	Channel 7 Input
8	COM	Common connection point for DC power ground on field devices wired to the module
9	COM	Common connection point for DC power ground on field devices wired to the module
10	SSV (V+)	Power for field sensors connected to the module
11	SSV (V+)	Power for field sensors connected to the module
12	SSV (V+)	Power for field sensors connected to the module
13	SSV (V+)	Power for field sensors connected to the module
14	SSV (V+)	Power for field sensors connected to the module
15	SSV (V+)	Power for field sensors connected to the module
16	SSV (V+)	Power for field sensors connected to the module
17	SSV (V+)	Power for field sensors connected to the module

2.6.6 Connecting to SA Power

The external power supply that provides Sensor/Actuator (SA) power must be connected to the RTB on one of the following components:

- 5034-AENTR or 5034-AENTRXT EtherNet/IP Adapter.
- 5034-MBSA or 5034-MBSAXT mounting base (starts a new SA power domain).
- 5034-EXP or 5034-EXPXT Expansion power module (for systems with more than 16 modules).

Keep in mind the following:

- **SA power is isolated from MOD power**: The system's backplane has separate power buses for Module (MOD) power and SA power, which are isolated from each other.
- **DC SA power**: The 5034-IV8-SC module uses DC SA power. Therefore, you must connect a DC external power supply to the component providing SA power to the module.
- **SA power buses**: A 5034 system can have multiple, isolated SA power buses. A new SA power bus is typically started by adding a component such as a 5034-MBSA mounting base or a 5034-EXP expansion power module.
- **Current limits**: There is a 10 A current limitation for each SA power domain. You must calculate the SA power consumption to ensure you do not exceed this limit.
- **Shared common**: The 5034-IV8-SC inputs use a shared common. Sensor power comes from SA (+), and the return current from switches and sensors must go back to the external SA (-) power supply ground.

To keep the modules on separate SA Power buses, install as follows:

1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
2. Install the 5034-MBSA or 5034-EXP module to establish a second, separate SA Power bus.
3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.

NOTE	Keep the following in mind: • Either switches or variable resistance can be used as inputs. These are IEC 61131-2 type 3 inputs, and will “digitize” a resistance value, that is, if the resistance provides an input current that is lower or higher than the specification limits, the input will be reported to the controller as open or closed by the module. Unconnected pins are acceptable and will be read as open by the module. • Channel Connections: You can connect devices to any channel or combination of channels as needed. • The Field Power supply negative and the SA power negative must be connected externally to ensure a common ground reference for proper circuit operation.

Chapter 3
Configuring the 5034-IV8-SC Using Studio 5000 Logix Designer

Section 3.1 System Introduction

The PointMax™ I/O 5034-IV8-SC module is used as a remote I/O module in CompactLogix® 5380 and Compact GuardLogix® 5480, ControlLogix® 5580 and GuardLogix® 5580 controllers. The module requires 5034-AENTR or 5034-AENTRXT adapters to connect to the EtherNet/IP network.

You use Studio 5000 Logix Designer software (version 36 and later) to configure the 5034-IV8-SC Modules. Your controller firmware must be at version 36 and later as well.

The software provides a module-specific Add-On Profile (AOP) to operate the module. Before you begin installing your module, you need to have completed the system installation steps in Chapter 2 so that you have a working system with a remote I/O module installed. Other conditions must also be met, as explained in the following sections.

Section 3.2 Controller Ownership of I/O Modules

For the 5034-IV8-SC to function in a Logix 5000 control system, a controller must own the module. Only one controlling owner is supported. Multiple Listen-Only connections are allowed.

The controller that owns the input module performs the following functions:

- May reside in a location that differs from the module.
- 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.

Conditions for **Listen Only** connections are:

- Exactly one owner must have an active **Data** connection to the module.
- **Listen Only** module configurations:
    - Must have their Connection set to **Listen Only**.
    - Must have the same **Input Data** and **Counters** configured the same as the controlling module settings.

- Must set the same RPI as the controlling module configuration.
- Must set their Connection to **Multicast**.

NOTE	If the controller that owns the module configuration changes the configuration, the other controllers are not notified of the changes.

Section 3.3 Configuration Changes in a Standard Input Module with an Owner Connection

Exercise caution when changing the configuration of a module owned by a controller. If the connection settings that differ from Listen Only connections are changed, those Listen Only connections will fault.

NOTE	A message in the Studio 5000 Logix Designer application alerts you to the possibility of a multiple owner-controller situation and lets you inhibit the connection before changing the module configuration. When changing the configuration for a module with multiple owners, we recommend that you inhibit the connection.

Any time the controlling owner drops its connection, all Listen-Only controllers will fault.

To help prevent other listener-controllers from receiving potentially erroneous data, use the following steps when changing the configuration of a module in a multiple controller scenario while online.

1. For each listener-controller, inhibit the connection to the module either in the software on the Connection tab or the message dialog box warning you of the multiple listener condition.
2. Make the appropriate configuration data changes to match the owner connection settings.

   For more information on how to use the Studio 5000 Logix Designer application to change the configuration, refer to the list of documents at the beginning of this manual.
3. Repeat step 1 and step 2 for all listener-controllers, to make the exact same changes in each.
4. Clear the **Inhibit** checkbox in each listener-controller configuration.

Section 3.4 Before You Configure the Module

You must create a Studio 5000 Logix Designer application project for the controller that owns the PointMax I/O digital modules. The project includes module 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 an EtherNet/IP network.

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

3.4.1 Connections with PointMax I/O Digital Modules

During module configuration, you must define the module. Among the Module Definition parameters with PointMax I/O digital modules, you must choose a connection type for the module. A connection is a real-time data transfer link between the owner-controller and the module that occupies the slot that the configuration references. When you download a module configuration to a controller, the controller attempts to establish a connection to each module in the configuration. Because part of module configuration includes a slot number in the system, the owner-controller checks for the presence of a module there. If a module is detected, the owner-controller sends the configuration.

One of the following occurs:

- If the configuration is appropriate to the module detected, a connection is made, and operation begins.
- If the configuration is not appropriate to the module detected, the data is rejected, and the Studio 5000 Logix Designer application indicates that an error occurred.
- The configuration can be inappropriate for many reasons. For example, a mismatch in electronic keying that helps prevent normal operation.

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

Section 3.5 Configuring the Module with Studio 5000 Logix Designer

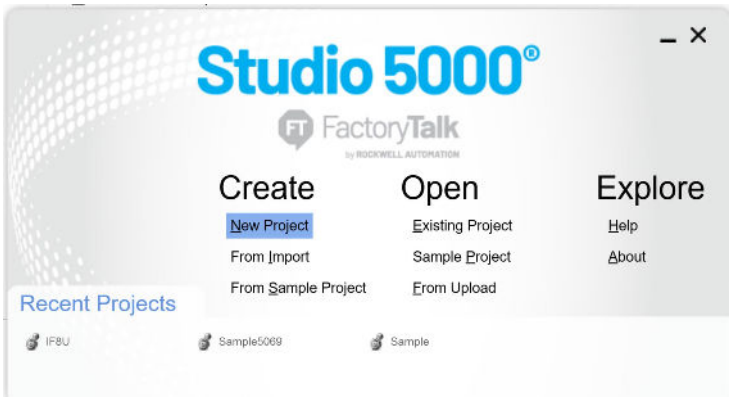
Before you start, if needed, install the latest version of Rockwell Automation's Studio 5000 Logix Designer, (version 36 and later). You use the module's built-in configuration to operate your module.

The AOP is also available for download from www.spectrumcontrols.com. If a newer revision of the AOP is released, see Appendix A about how to manually import the module AOP to Studio 5000 Logix Designer

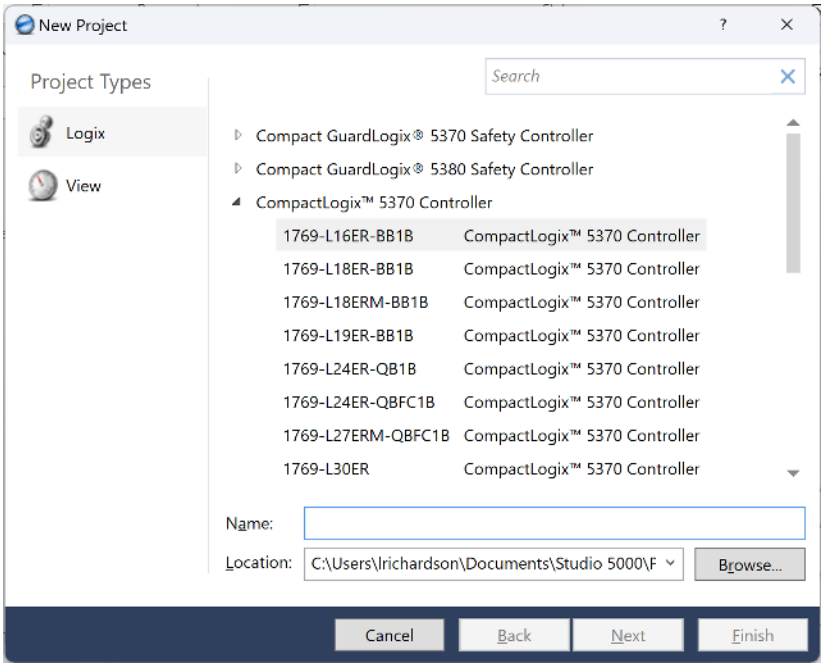
This procedure uses a ControlLogix® 5580 1756-L83E Controller as an example.

To configure the module:

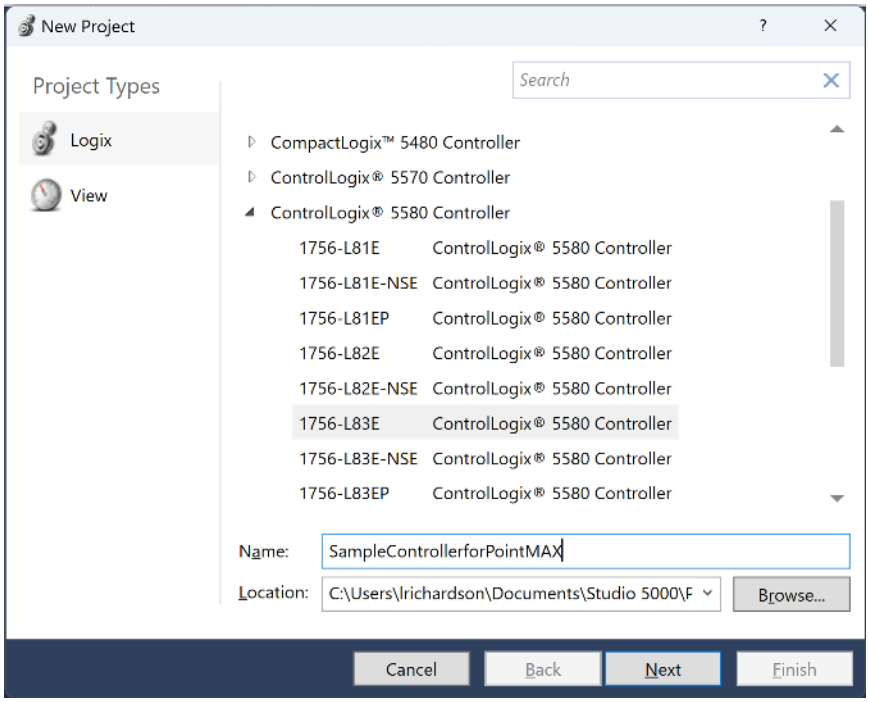
1. If using an earlier version of Studio 5000 Logix Designer than version 36, install a current copy of the correct AOP software. Refer to Appendix A, Manually Importing an AOP.
2. Start up your Studio 5000 software:



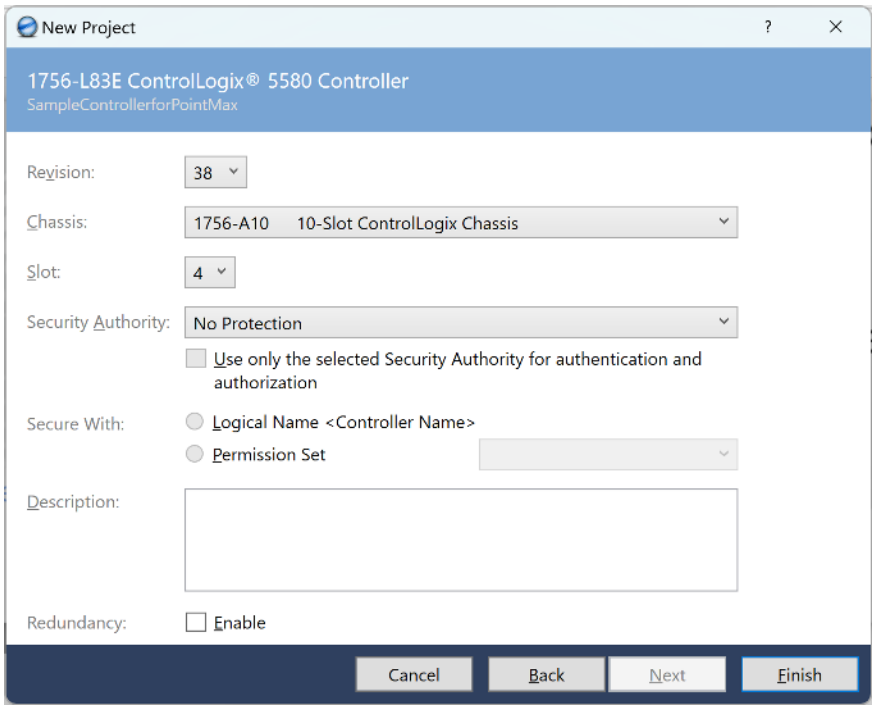
3. Click **New Project**. The New Project dialog appears:



From the CompactLogix® 5580 Controller list select the 1756-L83E controller and provide a project name:



4. Click **Next**.
   The New Project dialog appears:



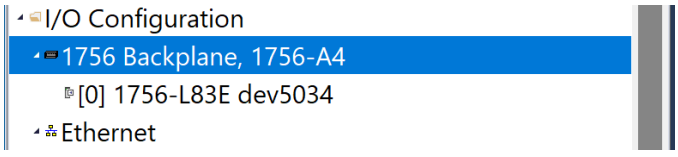
5. Select options from this dialog:
   - **Revision**. Lists current Studio 5000 Logix Designer revision. If you have more than one version of Studio 5000 installed, you can choose from the listed options.

DANGER	**Hazard of unexpected control loss that may cause injury to personnel or damage equipment.** If the number of modules entered here does not match the number of modules in the system, the system may behave in unexpected ways. Ensure that the number of the modules entered here matches the number of modules in the system.

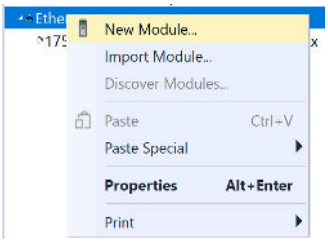
- **Chassis**. Selection tells the controller how many slots exist, ensuring I/O modules are correctly mapped to their physical locations in the hardware backplane for proper configuration and addressing.
- **Slot**. Specifies the physical location of the controller in the system.
- **Security Authority**. Choose whether to associate the new project with a specific Security Authority. Options are:
  - No Protection. Does not associate the project with any Security Authority.
  - Use only the selected Security Authority for authentication and authorization. Associates the levels of access allowed for this project with a previously defined security authority.
- **Secure With**:
  - Logical Name <Controller Name>. Associates the project with a Logical Name in FactoryTalk Services Platform. If there is no existing logical name, the Logix Designer creates a new Logical Name with the controller's name, and it inherits permissions from its parent resource.
  - Permission Set. Applies a specific set of access permissions to actions allowed for this controller.
- **Description**. Enter a description for the module here, up to 128 characters. You can use any printable character in this field. If you exceed the maximum length, the software ignores any extra character(s).

6. Select **Finish**.

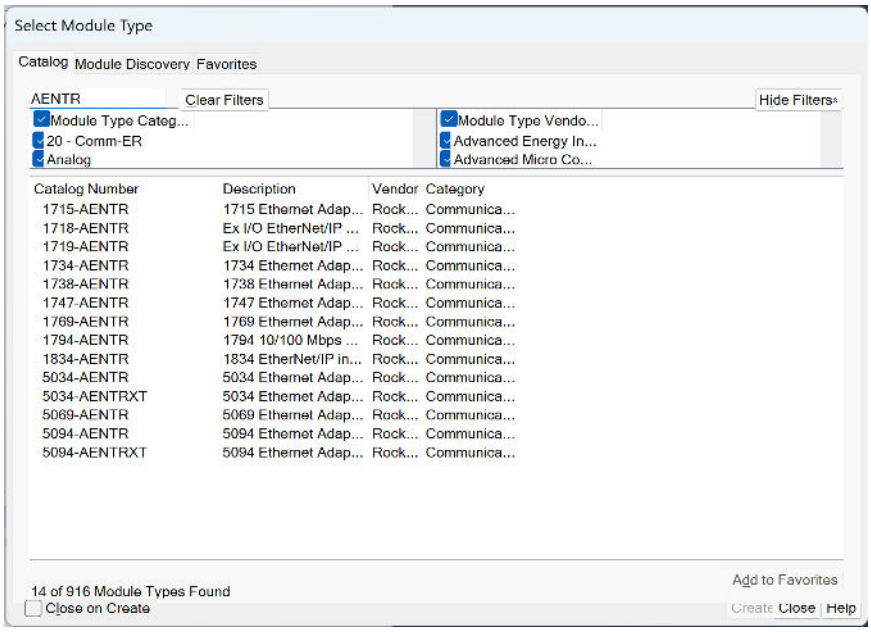
   Studio 5000 Logix Designer adds your selections and the Controller Organizer changes to show your new Controller:



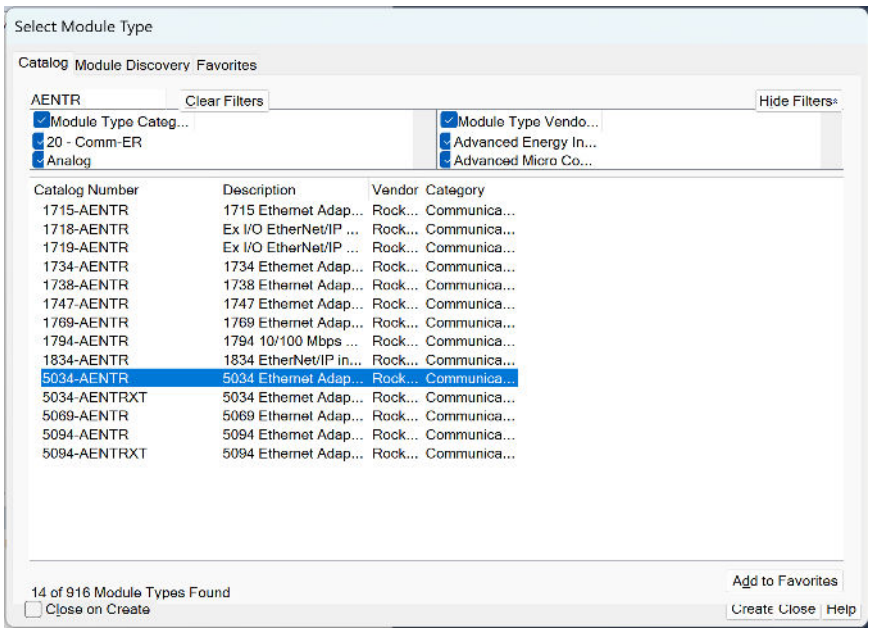
7. In the Controller Organizer panel, right click on the Ethernet network listing associated with the backplane in which you have already physically installed the new module and select **New Module**:



8. To display only AENTR listings, type AENTR in the Search field:



9. Select the 5034-AENTR from the listings:

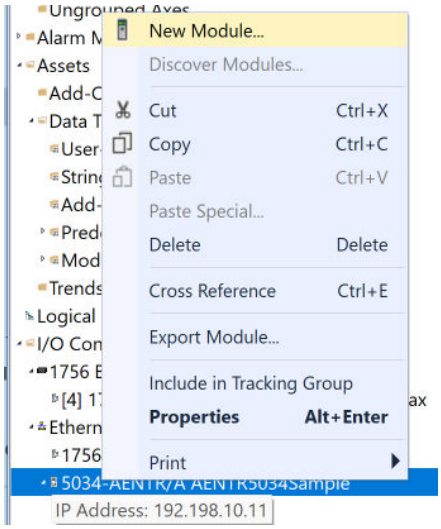


10. Click **Create**.

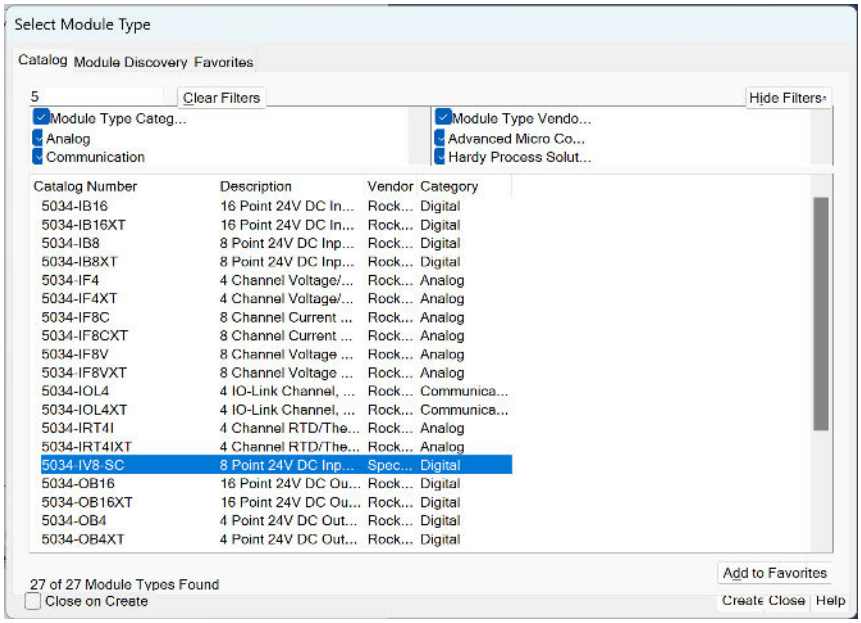
    The AENTR is added to the hierarchy below the backplane, and a Device Definition dialog appears.

11. Configure as needed for your network.

12. Once configured, right-click on the AENTR listing and select **New Module**:

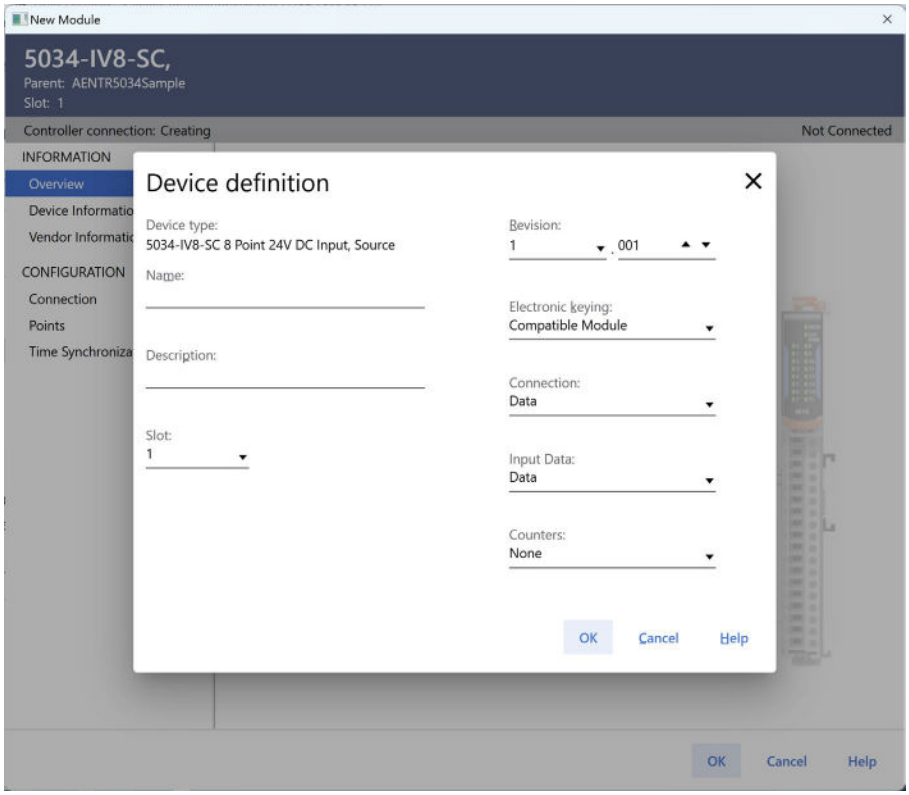


13. The Select Module Type dialog appears. From the list, select the 5034-IV8-SC listing:



14. Click **Create**.

The Device definition dialog appears under the **Overview** section:



15. View or specify the following options (scrolling down as needed to access the fields):
    - **Device Type**. Displays the device catalog number and type. Not editable.
    - **Name**. Enter the name of the module.

      The name must be IEC 1131-3 compliant, up to 40 characters. The module type determines whether this is a required field. If required, you may receive an error message when you attempt to apply your edits, if the name has not been entered. If you enter an invalid character or exceed the maximum name length allowed by the software, the invalid or extra character(s) are ignored.

NOTE	The **Name** value is enabled in the **Offline**, **Program**, **Remote Program**, and **Remote Run** states. It is disabled in **Run** modes.

    - **Description**. Enter a description for the module here, up to 128 characters. You can use any printable character in this field. If you exceed the maximum length, the software ignores any extra character(s).

NOTE	The **Description** value is always enabled, regardless of the **Offline**/**Online**/**Run**/**Program** state.

- **Slot**. Lists the slot number in which the module resides.

  Only slots between 1 and the maximum number of I/O modules is valid. When you create the module, this value defaults to the first available slot position. If you only have one module, the **Slot** option is grayed out. When the controller is changed to one supporting a smaller maximum I/O count, the current slot value may no longer be valid.

NOTE	The **Slot** value is enabled in the Offline state. It is disabled in **Program**, **Remote Program**, **Remote Run**, and **Run** modes. When the controller is changed to one supporting a smaller maximum I/O count, it is possible that the current slot value is no longer valid. In these situations, the **Slot** field should be left blank. Set the slot to a valid value before verifying and downloading the project.

- **Revision**. Displays the minor revision number of your module. To change the **Revision**, enter the correct series value.

  The revision is divided into the major revision and minor revision. The major revision is displayed statically on this dialog:

  - The major revision is used to indicate the revision of the interface to the module.
  - The minor revision is used to indicate the firmware revision.

- **Electronic Keying**. Displays the keying option for your module during initial module configuration. This option prevents inadvertent connection to a module of the wrong type:

  - Exact Match. The following criteria must be met, or the inserted module rejects the connection.

    The **Module Types**, **Catalog Number**, and **Major Revision** must match.

    The **Minor Revision** of the physical module must match the one specified in the software.

  - Compatible Module. The following criteria must be met, or else the inserted module rejects the connection:

    The **Major Revision** and **Minor Revision** of the physical module must be equal to or greater than the one specified in the software.

    The **Module Types**, **Catalog Number**, and **Major Revision** must match.

  When you insert a module into a slot in a CompactLogix chassis, Studio 5000 Logix Designer compares the following information

for the inserted module to that of the configured slot:

- Vendor. Device manufacturer information.
- Product Type. Type and description of the module being created.
- Catalog Number. Number in product catalog.
- Major Revision. Major revision of interface to the module.
- Minor Revision. Minor revision of the interface to the module.
- This feature prevents the inadvertent insertion of the wrong module in the wrong slot.

WARNING 	Hazard of personnel injury or equipment damage due to improper system operation. It is recommended that you do not disable keying. If you do disable keying, you are responsible for understanding whether the device in use can fulfil the functional requirements of the application.

- Disable Keying. Indicates that key attributes are not considered when attempting to communicate with a device. Other attributes such as data size and format are considered, and must be acceptable, before communication is established.

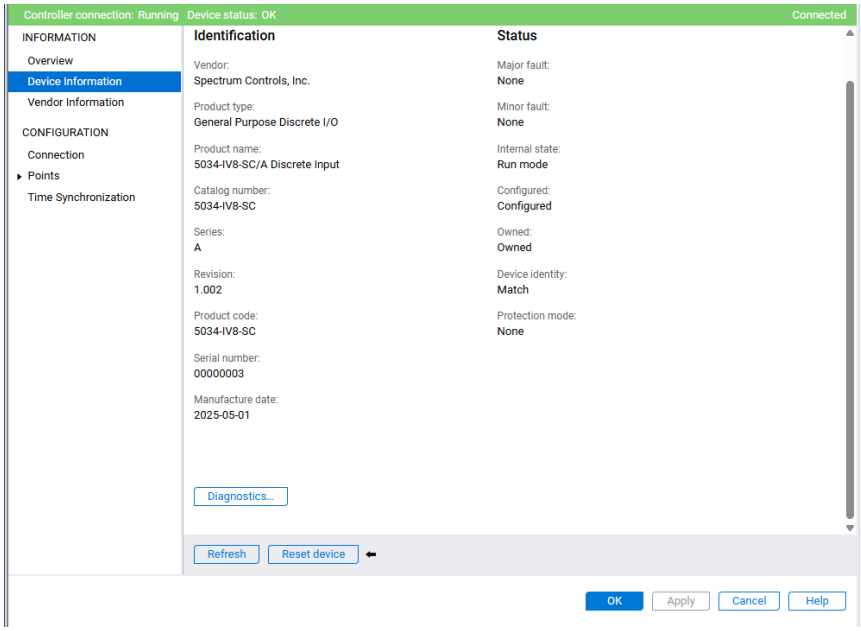
- **Connection**. Specifies the type of data being exchanged between the module and the controller. Options are:
  - Data. Specifies a real-time data transfer link between the controller and the module.
  - Listen Only. Specifies an I/O connection where another controller owns/provides the configuration data for the I/O module. A controller using a listen-only connection only monitors the module. It does not write configuration data and can only maintain a connection to the I/O module when the owner controller is actively controlling the I/O module.
- **Input Data**.
  - Data. Specifies data with an individual Boolean member.
  - Timestamp Data. Records a time reference to a change in input data. Applicable only to the Input 8 Timestamp Connection Type. For more information about how this works, see Timestamping Per Point Sequences later in this chapter.
  - Packed Data. Specifies concise data format for integer access.
- **Counters**. Specifies **None** or **4**. A module counts input pulses up to a defined maximum frequency. For more information about

how counters function, see Using Simple Count Mode later in this manual:

- Counters are only available for Data type:
  - *None. No counters are present.*
  - *4. Four counters are present.*

- **OK**. Applies any changes and adds the module to the I/O Configuration.
- **Cancel**. Cancels any changes and closes the dialog.
- **Help**. Click this button for help on this tab.

16. If needed, select the **Device Information** option. (Only shows this data when online to the module):



17. View device and status information when the module is online:
    - **Identification**. Lists information that identifies the vendor, product type and name, catalog number, series, firmware version, product code and the module's serial number and manufacture date.
    - **Status**. Displays current module operation state.
      - Major fault. Displays when there is a major fault:
        - *Comm. Lost with owner*. Communications with owner controller have been lost.
        - *Channel Fault*. There is a fault on a channel.
        - None. No major fault is present.
      - Minor fault. Displays when there is a minor fault:
        - *Comm. Lost with owner.* Communications with owner controller have been lost.
        - *Channel Fault*. There is a fault on a channel.
        - *None*. No minor fault is present.

- Internal State. Displays the device's current operational state. States may include:
  - *Self-test*
  - *Flash update*
  - *Communication fault*
  - *Unconnected*
  - *Major fault*
  - *Run mode*
  - *Program mode*
  - *(16xxxx) unknown. (Only displayed if the wrong device is selected from Add Device)*. A textual description of this state is only given when the provided device identity is a match with the actual device.
- Configured. Indicates whether the device was configured by the owner controller connected to it.
- Owned. Indicating whether an owner controller owns the device.
- Device Identity. Displays whether the physical device matches or mismatches with the configuration in the **Overview** view:
  - *Match.* The physical device agrees with what is specified in the **Overview** view, and **Vendor, Device type** (the combination of product type and product code for a particular vendor) and **Major Revision** must all agree.
  - *Mismatch*. If the physical device does not agree with what is specified in the **Overview** view.

  Protection Mode. Displays the device protection when online. When the module is offline or if a communication failure to the module occurs, the field is blank. Not editable.
- The protection mode selection provides the following options:
  - *Explicit*. Locks down the configuration of the PointMax I/O Ethernet adapter so you can change certain settings through the network (IP address, speed, or duplex settings).
  - *Implicit*. Automatically disables some configuration changes to prevent unintended disruptions during normal operation. When in implicit protection mode, features like firmware updates, or remote resets are disabled to reduce the module's vulnerability and maintain stable operation. The module enters this mode when all I/O connections are stopped and exits when those connections are restored, ensuring a secure

and stable state when actively communicating with a controller.

When the device is offline or if a communication failure to the device occurs, the field is blank.

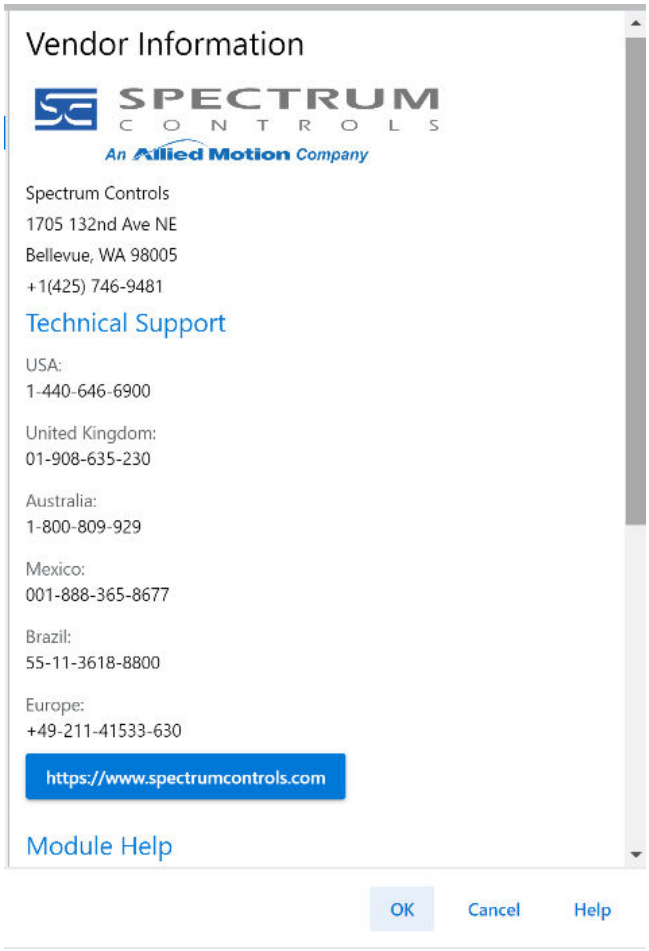
- **Diagnostics**. Module diagnostics provides information on a module-wide basis when the module is online. For example, the Module Diagnostics dialog box indicates the mode within which a module is operating, that is, **Run**, **Remote Run**, **Remote Program**, or **Program**.
- **Refresh**. Retrieves and displays the latest values from the device.
- **Reset Device**. Starts a reset operation on the device. This returns the device to its power-up state by emulating the cycling of power.

NOTE	**IMPORTANT**: Before you can reset a module, it must be unconnected (inhibited) first. Resetting a module causes all connections to, or through, the module to be closed, which may result in loss of control. You cannot reset the module if either of the following conditions exist: • There are pending edits to the module properties. • When a safety signature exists in the controller project.

NOTE	Resetting a device interrupts all connections to, or through, the device. This may result in a loss of control.

- **OK**. Applies any changes and adds the module to the I/O Configuration.
- **Apply**. Applies any changes and allows you to continue editing.
- **Cancel**. Cancels any changes and closes the dialog.
- **Help**. Click this button for help on this tab.

18. If needed, select the **Vendor Information** option:

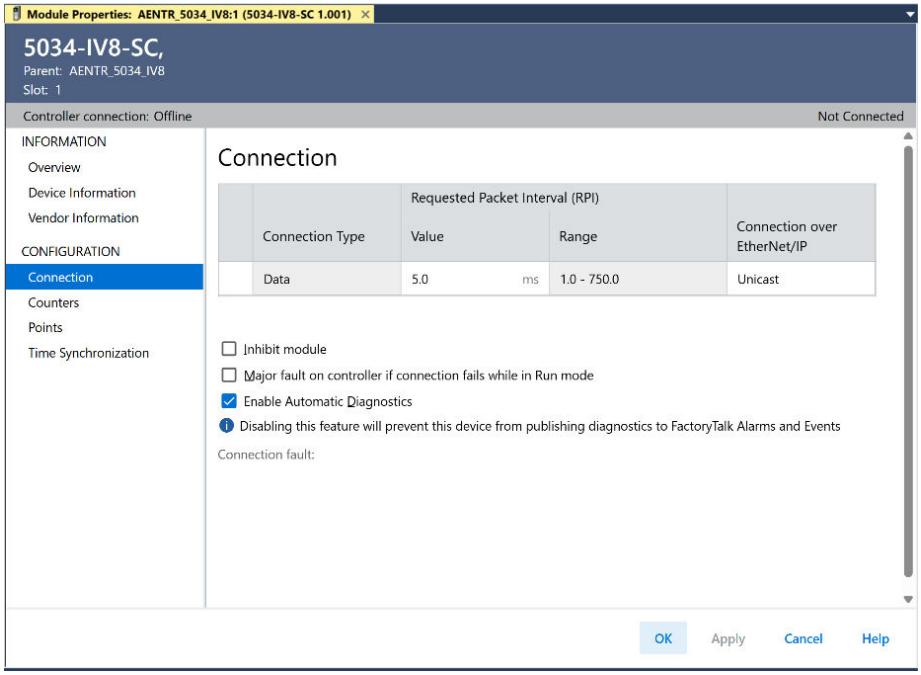


19. View or use the following options:
    - **Vendor Information**. Provides access to Vendor information. Use to:
        - View the vendor's mailing address, phone number, technical support phone numbers, website address, and module help.
        - Access the vendor's website for additional product and service information.
    - The data on this tab comes directly from the controller.

NOTE	Some Vendor Information has changed as follows, Company address and phone number: Spectrum Controls Inc. 1705 132nd Avenue NE, Bellevue, WA 98005 USA Fax: 425-641-9473 **Tel: 425-746-9481** Technical Support: • USA 1-440-646-6900 (US/global, English only) • United Kingdom +44 0 1908 635 230 (EU phone, UK local) • Australia, China, India, and other East Asia locations: 1-800-722-778 or +61 39757 1502 • Mexico 001-888-365-8677 • Brazil 55-11-5189-9500 (general support) • Europe +49-0-211-41553-630 (Germany/general support)

- **OK**. Closes the dialog.
- **Cancel**. Closes the dialog.
- **Help**. Click this button for help on this tab.

20. If needed, select the **Connection** option:



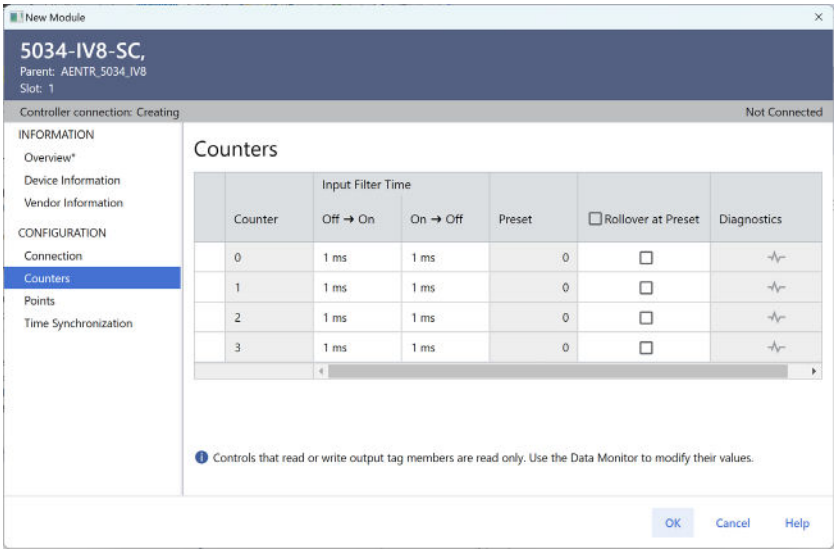
21. View or specify the following options. The configuration information is stored in the controller, and the controller configures the module:
    - **Requested Packet Interval (RPI)**. Specifies the amount of time

(interval in milliseconds) between updates of data from the remote controller. This value is scaled as a real value from the microseconds stored in the controller. The local controller receives data at least this fast.

- Connection Type. Lists the connection type specified during module setup.
- Value. Specifies Requested Packet Interval.
- Range. Specifies a range value between 1 mS to 750 µS.
- Connection over EtherNet/IP. Uses EtherNet/IP to connect to a Logix 5000 controller, forming a remote I/O network?
  - *Unicast*. Transmits data to a single destination controller.
  - *Multicast*. Transmits data to a defined group of multiple recipients.

- **Inhibit Module**. Selects or clears **Inhibit Module** to inhibit or uninhibit the connection to the module. When selected, it allows you to indefinitely suspend a connection between an owner-controller and the module without removing the module from the configuration. Inhibiting the module temporarily disables a module so you can perform an operation such as servicing it. This is the Explicit Protection Mode.
- **Major Fault on Controller if Connection Fails While in Run Mode**. Configures the controller so that failure of the connection to this module causes a major fault on the controller.
- **Enable Automatic Diagnostics**. Allows the module to publish diagnostics to FactoryTalk Alarms and Events.
- **Connection Fault**. Displays the fault code returned from the controller (related to the configured module) and the text detailing the module faults.
- **OK**. Applies any changes and adds the module to the I/O Configuration.
- **Cancel**. Cancels any changes and closes the dialog.
- **Help**. Click this button for help on this tab.

22. If needed, select the **Counters** option:



23. View or specify the following options:
    - **Counter**. Lists four counters available for configuration.
    - **Input Filter Time**. Defines time it takes for an input point to transition between on and/or off states:
        - Filter Time.
            - *Off -> On n µs*. Select to define an off-to-on state and the time for that state to transition.
            - *On -> Off n µs*. Select to define an on-to-off state and the time for that state to transition.

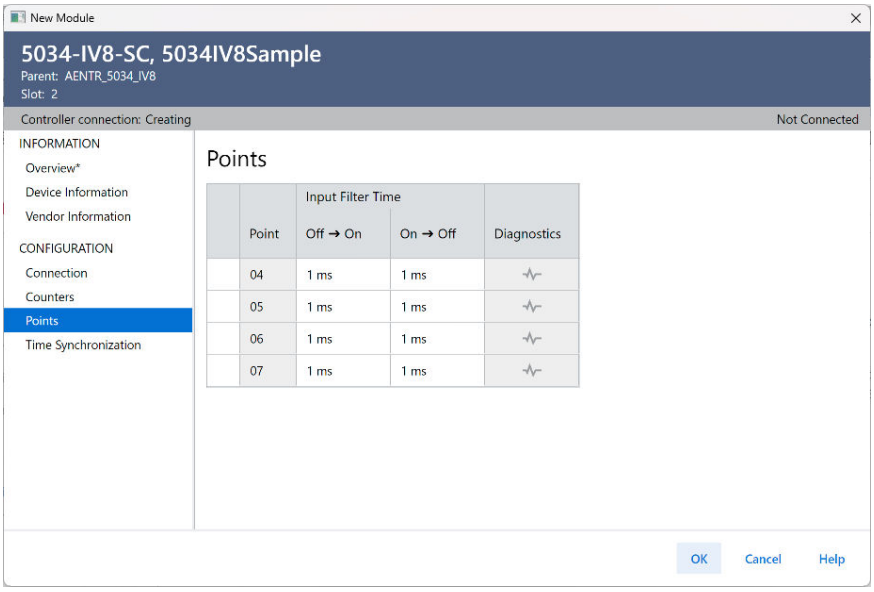
NOTE	Keep in mind the following: The input filter time defines how long an input signal transition must remain in the new state before the transition is valid and the input changes state. Input timestamps are only recorded with valid transitions. A transition is only valid if the input signal remains in the new state for the entirety of the filter duration, ±100 µS. If the input changes state again before the chosen input filter time elapses, the transition is not valid.

NOTE	**IMPORTANT**. The Studio 5000 Logix Designer application lets you choose filter time values that are invalid for some input signals. Make sure that you select a valid input filter value when you configure the module. If you select an invalid input filter value, the module can read signal levels incorrectly.

    - **Preset**. Rolls the count over to zero when the Preset value is reached.
    - **Rollover at Preset**. Enables a rollover at a user-defined preset value. Applies to counter channels.
    - **Diagnostics**. Provides real-time, per-channel monitoring of fault

conditions such as input signal inconsistencies or sensor power problems.

24. If needed, select **Points**.

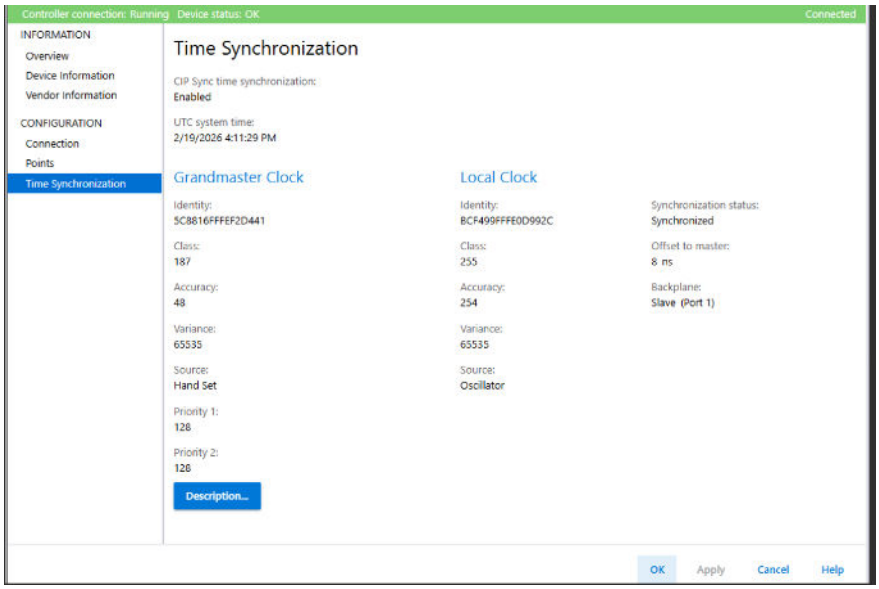


25. View or specify the following options. You can increase the time that it takes for an input point to transition from On to Off and Off to On for the modules. The increase in time is a delay of the signal from the module to the controller. The increase in the time to transition from one state to another improves noise immunity within a signal. This option also helps prevent rapid changes in the input data due to contact bounce:
    - **Point**. Lists the configuration options available for each point so that you can configure the associated point parameters.
    - **Input Filter Time**. Configures the time for each point on the module.
        - Off -> On n µs or ms. Select to define an off-to-on state and the time for that state to transition.
        - *On -> Off n µs or ms*. Select to define an on-to-off state and the time for that state to transition.

NOTE	Keep in mind the following: The input filter time defines how long an input signal transition must remain in the new state before the transition is valid and the input changes state. Input and Event timestamps are only recorded with valid transitions. A transition is only valid if the input signal remains in the new state for the entirety of the filter duration. If the input changes state again before the chosen input filter time elapses, the transition is not valid.

NOTE	**IMPORTANT**. The Logix Designer application lets you choose filter time values that are invalid for some input signals. Make sure that you select a valid input filter value when you configure the module. If you select an invalid input filter value, the module can read signal levels incorrectly.

26. If needed, select the **Time Synchronization** option:



27. Time Synchronization shows which device is currently regulating system time and to view information related to CIP Sync clocks. You can only view the full dialog information when online. Further information about the options is available from the online Help. View or specify the following options.:
    - **CIP Sync™ Synchronization**. Provides accurate real-time (Real-World Time) or Universal Coordinated Time (UTC) synchronization of controllers and devices that are connected over CIP networks.
    - **UTC System Time**. Indicates the current system time in Universal Coordinated Time (UTC). The time does not include time zone or daylight savings time offsets.
    - **Grandmaster Clock**. Shows master clock time on the module on the network that is functioning as the master clock.
    - **Local Clock**. Shows time on module.

Section 3.6
System Features

3.6.1 Requested Packet Interval

The RPI determines the rate at which connected data is exchanged between the module and base. It is user configurable and applied when a connection is established.

3.6.2 Supported Connection Types

NOTE	Strings for "**OnOff**" and "**OffOn**" elements are shown as **<OO>** within element names to avoid duplicating information for both. Example: I:Timestamp<OO>Number represents I:Timestamp**OffOn**Number and I:Timestamp**OnOff**Number.

You can configure the module with a limited number of Input/Output/Configuration instances. Element names are prefixed with "I:", "O:" or "C:" to indicate which table the element is located. Examples: O:Preset, I:Data, C:Input<OO>Filter. For individual Points (or channels), the indicator is 'Pt*XX*'.

Four connection types are supported:

- Input 8
  - All eight channels are configured for basic discrete inputs and only allow filter settings.
  - An array of channel structures is provided in the Input Assembly.
- Input 8 Packed. This is like Input 8 except all channel data are packed into a single, smaller, Input Assembly.
- Input 4, Counter 4. This type has 4 Counters (Ch. 0-3) plus 4 basic Inputs (Ch. 4-7).
  - Counters are only available with this connection type. Channels 0 to 3 are Counter.
  - Channels 4 to 7 are Basic input points.
- Input 8 Timestamp. All eight channels are configured for the Timestamp feature.

3.6.3 Data Transfer at RPI or Change of State

Digital input modules always send data at the Requested Packet Interval (RPI),

The RPI determines the rate at which connected data is exchanged between the module and base. The RPI rate is from 1 ms to 750 ms. By default, this setting is always enabled for input modules. The resolution is 0.1 ms.

3.6.4 Setting Software Configurable Input Filters and Delays

You can increase the time that it takes for an input point to transition from On to Off and Off to On for the 5034-IV8-SC module, valid filter range is from 0 µs – 50 ms. Default value is 0 µs.

The input filter not only helps to improve noise immunity in a signal but also to help prevent rapid changes of the input data due to contact bounce.

The input filter time defines how long an input signal transition must remain in the new state before the transition is valid and the input changes state. Input timestamps are only recorded with valid transitions.

A transition is only valid if the input signal remains in the new state for the entirety of the filter duration. If the input changes state again before the chosen input filter time elapses, the transition is not detected.

3.6.5 Timestamping Per Point Sequences of Events

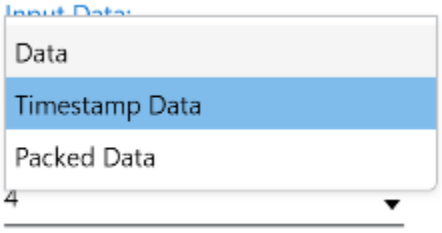
NOTE	
	The Timestamp option applies only to the Input 8 Timestamp Connection Type.

Timestamping registers a time reference to a change in input data. CIP Sync™ is used for timestamping.

The 5034-IV8-SC Discrete input modules offer sub-millisecond timestamping on a per point basis. Timestamp values have ±200 µS accuracy and ±1 ns resolution.

You can use CIP Sync to establish a sequence of events occurring at an input module point by timestamping the input data. To determine a sequence of events, you must perform the following:

- On the Module Device definition dialog box in the Logix Designer application project, set the **Input Data** parameter to **Timestamp Data**:



For more information on Timestamping, see the section on timestamping later in this chapter.

Section 3.7 Assembly Data

The module supports the following set of assembly ID combinations used for connections.

3.7.1 CIP Assembly Combinations

	Input Assy. (Producer)	Output Assembly (Consumer)	Configuration Assembly
1	Input 8	Output Controlling Heartbeat	Configuration Input 8
2	Input 8 Packed	Output Controlling Heartbeat	Configuration Input 8
3	Input 4, Counter 4	Output Counter 4	Configuration Input 4, Counter 4
4	Input 8 Timestamp	Output 8 Timestamp	Configuration Input 8 Timestamp

	Input Assy. (Producer)	Output Assembly (Consumer)	Configuration Assembly
Listen-Only Connections[5]			
5	Input 8	Output Listen Only	NA
6	Input 8 Packed	Output Listen Only	NA
7	Input 4, Counter 4	Output Listen Only	NA
8	Input 8 Timestamp	Output Listen Only	NA

3.7.2 Module Status

All Input Assemblies provide the same Module Status information except for the Input 8 Timestamp Input Assembly, which contains additional Module Status information.

- Common Module Status information is provided by all Connection Types at the beginning of the Input Assembly.
- The Common Module Status data elements are aligned the same for all Input Assembly Types.

Tag	Description	Valid Values
I:RunMode[6]	Module operating state. Mirrors controller state.	0 = Idle 1 = Run
I:ConnectionFaulted	Indicates if a connection is running.	0 = Connection running. 1 = Connection not running.
I:DiagnosticActive	Indicates if any diagnostics are active or if the prognostic threshold is reached.	0 = Not active 1 = Active
I:DiagnosticSequenceCount	Increments each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. This is useful when one or more diagnostic events are set/cleared between RPIs.	-128…+127 The value of 0 is skipped except during module power-up. Set to zero by product reset or power cycle. Wraps from -1 to 1 skipping zero, or from 255 (unsigned) to 1.

[5] [1]Listen Only connections are managed directly by the 5034-MB and not in module firmware
[6] Run/Idle Status is only provided with Connection Types that include Output Data. Connections with Heartbeat Only connections only show Run Status when connected.

Tag	Description	Valid Values
I:CIPSyncValid	Indicates whether the module is synchronized with a 1588 master.	0 = CIP Sync is not available 1 = CIP Sync is available
I:CIPSyncTimeout	Indicates the module was once synchronized with a 1588 master but is not now due to a timeout.	0 = A valid time master has not timed out. 1 = A valid time master was detected on the backplane, but the time master has timed out. The module uses its local clock and can drift from the last known time master.

3.7.3 Input Filtering

Input Filtering is common for all Connection Types. Multiple, user-configurable, filter settings are available for On-to-Off and Off-to-On time for each channel. Input filtering determines how long an input signal at the screw must be set to allow a logical transition. For instance, if the Off-to-On filter is set to 1 mS and the initial logical state is 0, the signal at the screw would need to remain at 1 for at least 1 mS to change the logical state to 1.

The minimum pulse width that can be detected for each filter is the filter value plus 100 µS.

Input filtering functions as follows:

- Filter settings are available per channel for all Connection Types.
- Pulse widths less than or equal to the Filter Time - 100 µS are not detected.
- Pulse widths greater than or equal to the Filter Time + 100 µS are detected.

3.7.4 Input 8 and Input 8 Packed Connection Types

The module provides discrete input point functionality for Input 8 and Input 8 Packed Connection Types.

The module:

- Reports the input state of a point on the screw after filtering via I:Data.
- Reports point I:Fault state when SA power loss occurs.
- Reports point I:Uncertain state when the data is invalid. This is always set to 0.
- The logical state of the signal at the screw is represented in the I:Data member of the Input Assembly for the connection.

  This data is only updated when a connection is established.

3.7.5 Input 4, Counter 4 Connection Type

Counters are only available with the Input 4, Counter 4 Connection Type.

This type has 4 Counters (Ch. 0-3) plus 4 basic Inputs (Ch. 4-7). The Connection type functions as follows:

- The current logical state of a point on any channel is reported in I:Data.
- I:Count is provided for each channel and increments only on **rising** transitions (0 greater than, or equal to1).
- The valid range for I:Count (DINT) is 0-2^31-1 (0x7FFFFFFF).
- The maximum input frequency that can be counted is 4000 Hz when the input filter is set to 0 µS.
- I:Uncertain is set when the input frequency has exceeded 1.25 times the maximum. (5000 Hz).
- When I:Count rolls over to 0, I:Rollover is set.
- Reports point I:Done state when I:Count is not set to roll over at a preset number AND is equal or greater than the pre-set value.
- Reports point I:Fault state when SA power loss occurs.
- Reports non-counter discrete input point status: Data, Fault, Uncertain.
- To enable a rollover at a preset value, a configuration parameter (C:RolloverAtPreset) is available for each Counter channel.
- On->Off and Off->On filter settings are available per channel.

The Output Assembly for this Connection Type provides controls for the four Counter channels:

- A Reset bit is provided to reset the Count and Rollover values in the Input Assembly to 0.
- A RolloverAck bit is provided to acknowledge a rollover and reset the Rollover bit in the Input Assembly.
- A Preset DINT is provided to allow a user-defined rollover value.

When C:RolloverAtPreset = 1, the I:Count rolls over to zero when the O:Preset value is reached. The I:Rollover bit is then set. The I:Rollover bit is cleared only when the O:RolloverAck bit transitions from 0 to 1. The I:Done bit is always set to 0 when C:RolloverAtPreset is set:

- When RolloverAtPreset = 0, the Done bit is set and continues counting to Max DINT: 2,147,483,647 (0x7FFFFFFF).
- If RolloverAtPreset = 0, then if Count is greater than or equal to Preset, Done = 1, else Done = 0. Set Rollover bit when I:Count transitions from 2,147,483,647 to 0.

3.7.6 Timestamp Connection Type

NOTE	The Timestamp feature applies only to the Input 8 Timestamp Connection Type. The functions for this Connection type are only available when a connection is active.

Timestamps record a time reference when a change in input data occurs. CIP Sync is used for the time stamp value:

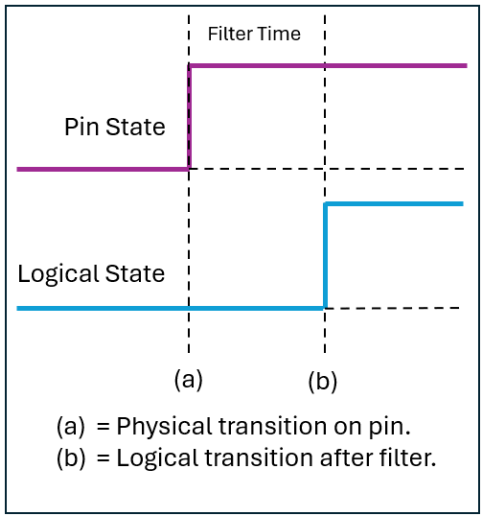
- Report the input state of a point on the screw via I:Data after filtering.
- Configure per point enable/disable of timestamp capture for On->Off / Off->On via Capture<OO>En.
- Configure per point enable/disable of timestamp latch via TimestampLatchEn.
- When I: Capture<OO>En enabled, report the timestamp for an input point via I:Timestamp<OO>:
  - Report an identification number via Timestamp<OO>Number when a timestamp event is captured. Valid numbers are 1-65535.
- When C:TimestampLatchEn and I: Capture<OO>En enabled, latch I:Timestamp<OO> and I:Timestamp<OO>Number value until O:Timestamp<OO>NumberAck equals I:Timestamp<OO>Number.
- Report a timestamp overflow when a timestamp is discarded via TimestampOverflow<OO>:
  - When there is a latched timestamp that is not yet acknowledged and a new timestamp is detected, the new timestamp is discarded.
- When C:TimestampLatchEn disabled and I: Capture<OO>En enabled, update I:Timestamp<OO> and I:Timestamp<OO>Number value.
  - I:Timestamp<OO>Number is 0 when reset. It is incremented to 32767 and will roll over to 1.
- Report chatter detection on an input point via Chatter.
- Report point Fault state when SA power loss occurs.
- Report point status: CIPSyncValid and CIPSyncTimeout.
- Report the module status: RunMode, ConnectionFaulted, DiagnosticActive, DiagnosticSequenceCount, CIPSyncValid and CIPSyncTimeout.
- Configure per point chatter detection with the specified number of input state changes ChatterCount within a specified duration window ChatterTime.
  - This feature is disabled when ChatterCount is set to zero since its minimum valid value is non-zero. Both must be a valid non-zero value to be enabled. Otherwise, a configuration error is set.
- Configure per point input filter time.

- When O:ResetTimestamps transitions from 0->1, the following tags are set to zero:
  - I:TimestampOverflow<OO>, I:Timestamp<OO>Number, I:Timestamp<OO>.
  - The reset is executed once for each 0->1 transition.

3.7.7 Timestamp Capture Timing

The following diagram shows the sequence for capturing the timestamp to be reported in the channel data. This shows a transition from low to high but the same applies to transitions from high to low.

The reported timestamp is at the last recorded physical transition (a). It does not report the timestamp at (b) when the logical state changes.



3.7.8 Timestamp Latch Sequencing

Timestamp latch sequencing records the exact time an input signal changes state from off to on or on to off. The module captures the time in an input transition (change of state). It uses the module's internal clock to capture the change. The recorded timestamp data is then sent to the controller with the input status data, allowing the controller to know precisely when the field event happened.

3.7.9 Timestamp Chatter Detection

NOTE	The Timestamp Chatter feature applies only to the Input 8 Timestamp connections. The functions for this Connection type are only available when a connection is active.

You use Chatter Detection to detect when a device that is connected to an input module causes chatter.

Chatter occurs when the device causes the inputs to transition falsely many times in a relatively short period. As a result, the module timestamps invalid input

transitions.

NOTE	It is possible to configure the Chatter Detection settings so they never detect chatter. The filter setting may prevent the appropriate number of transitions within ChatterTime. For example, a filter setting of 50 mS, ChatterCount of 100, ChatterTime of 1000. A count of 100 would never be reached within 1000 ms.

You can configure the following:

- **C:ChatterCount (SINT)**. Chatter count determines the number of acceptable input transitions that can occur in each time-period before considering the input to be chatter:
  - Valid chatter count values range from 2…127.
  - Chatter detection is disabled with a value of zero (0).
  - All other values produce a channel configuration error.
  - The AOP restricts input values.
- **C:ChatterTime (INT)**. Chatter Time determines the amount of time within which the number of input transitions are counted:
  - Valid chatter time values range from 1…10000 ms.
  - Ignored if Chatter Detection disabled (ChatterCount is 0).
  - All other values will produce a channel configuration error.

  The Chatter bit is set in the Input Assembly when the detected number of transitions is greater than or equal to ChatterCount within the ChatterTime period.

  When the Chatter bit is set, the following stop updating:
  - Timestamp<OO>, TimestampOverflow<OO>, and Timestamp<OO>Number.

  The Chatter bit is cleared when the detected number of transitions is less than ChatterCount within the ChatterTime period.

3.7.10 Electronic Keying

Electronic keying allows an installed device to accept the key of a device that is defined in the project when the installed device can emulate the defined device.

When you insert a module into a slot in a CompactLogix chassis, Studio 5000 Logix Designer compares the following information for the inserted module to that of the configured slot. This feature prevents the inadvertent insertion of the wrong module in the wrong slot.

The following criteria are considered:

Attribute	Description
Vendor	The device manufacturer.
Device Type	The general type of the product, for example, digital I/O module.
Product Code	The specific product type. The Product Code maps to a catalog number.

Attribute	Description
Major Revision	A number that represents the functional capabilities of a device.
Minor Revision	A number that represents behavior changes in the device.

Exact Match. Indicates that all keying attributes must match the established Communication Type. If any of the attributes do not match precisely, communication with the device does not occur. See Description and Priority for attributes.

Compatible Module. Allows the installed device to accept the key of a device that is defined in the project when the installed device can emulate the defined device.

The following attributes are checked:

- Catalog number must match.
- The installed module's Major Revision must be greater than or equal to the one defined in the project.
- Minor Revision as follows:
  - If the Major Revisions are equal, the module's Minor Revision must be greater than or equal to the one defined in the project.
  - If the module's Major Revision is higher than the one defined in the project, the Minor Revision can be any number.

WARNING 	Hazard of personnel injury or equipment damage due to improper system operation. It is recommended that you do not disable keying. If you do disable keying, you are responsible for understanding whether the device in use can fulfil the functional requirements of the application.

Disable Keying. Indicates that key attributes are not considered when attempting to communicate with a device. Other attributes such as data size and format are considered, and must be acceptable, before communication is established.

3.7.11 Time Synchronization

NOTE 	The module does not directly implement CIP Sync. It is managed by the Mounting Base. Instead, the module synchronizes its time via internal commands with the Base.

NOTE 	The Time Synchronization feature applies only to the Input 8 Timestamp Connection Type.

The module receives periodic updates of the time from the controller.

Section 3.8 PLC Interfaces

This section provides information about the Data Structure Layout and Assembly Instance IDs for the Connection types.

3.8.1 Identify Object and Services

NOTE	The module firmware does not directly handle the ID Object. Handling takes place within the Base.

Name	Instance ID	Data Type	Value (dec.)	Description
Vendor ID	1	UINT16	58	Part unique CIP device identifier. Spectrum Controls
Device Type	2	UINT16	7 (Discrete)	CIP device type of IO module
Product Code	3	UINT16	500	Vendor specific product line code
FW Revision	4	STRUCT	-	Structure
(Major)	-	UINT8	1	Major revision
(Minor)	-	UINT8	1	Minor revision.
Status	5	WORD	<varies>	Depends on module status.
Serial Number	6	UINT32	<set by manufacturing>	Part unique CIP device identifier.
Product Name	7	SHORT_STRING	-	Structure
(Length)	-	UINT8	11	Number of characters in string.
(Text)	-	UINT8[]	“5034-IV8-SC”	String. Max 32 bytes.
Catalog Number	21	SHORT_STRING	-	Structure
(Length)	-	UINT8	11	Number of characters in string.
(Text)	-	UINT8[]	“5034-IV8-SC”	String. Max 32 bytes.
Manufacture Date	22	UINT16	<set by manufacturing>	Days since 1/1/1972
Hardware Revision	101		-	Structure

Name	Instance ID	Data Type	Value (dec.)	Description
(Major)	-	UINT8	1	Major Revision
(Minor)	-	UINT8	1	Minor Revision
FW Sub-Minor	102	UDINT	<varies>	
Warranty Number	113	SHORT_STRING	-	Structure
(Length)	-	UINT8	1	Number of characters in string.
(Text)	-	UINT8	" "	String. Max 18 bytes. Space only. This is not used in SC products.
Series	114	SHORT_STRING	-	Structure
(Length)	-	UINT8	1	Number of characters in string.
(Text)	-	UIN8	"A"	String. Max 2 bytes.
The following items are managed internally and not directly provided by the ID Object Class. These strings are provided for the base for the dynamic EDS file.				
Vendor Name		SHORT_STRING	-	Structure
(Length)	-	UINT8	23	Number of characters in string.
(Text)	-	UIN8	"Spectrum Controls, Inc."	String. Max 32 bytes.
Device Type String		SHORT_STRING	-	Structure
(Length)	-	UINT8	8	Number of characters in string.
(Text)	-	UIN8	"Discrete"	String. Max 32 bytes.

3.8.2 Services

Service:	Service Code:	Notes:
Get_Attributes_All	0×01	Returns attributes 1-7
Get_Attribute_Single	0×0E	Returns requested attribute
Reset	0×05	Supported Types: 0, 1 Type 0: power-on Type 1: out-of-box;

Section 3.9 Diagnostics

The module provides two diagnostic assemblies for Point Diagnostics and Module Diagnostics. These assemblies will contain a subset of information that can normally be found in the Input Assembly.

The following messages may be used:

Name	Class	Instance	Service Code	Attribute	Destination Size (Bytes)
Channel Diagnostics	4	200 (0×C8)	14 (0×0E)	1	36[1]
Module Diagnostics	4	201 (0×C9)	14 (0×0E)	1	4[1]

3.9.1 Module Health Diagnostics

The digital module has a status indicator on the front of the module that indicates module health. Indicators for the whole module (diagnostics and/or counters) are as follows:

Name	Type	Bytes
InfoBits	SINT	1
RunMode	InfoBits:0	-
<unused>	InfoBits:1	
DiagnosticActive	InfoBits:2	
<unused>	InfoBits:7	
DiagnosticSequenceCount	SINT	1
Pad	INT	2

3.9.2 Changes in Fault and Status Reporting

Digital input modules provide reporting on changes in fault and data status in a point-centric format. For more information, refer to Appendix B.

3.9.3 Using Simple Count Mode

When using the simple counter function, a module counts input pulses up to a defined maximum frequency. The simple counter maximum frequency for the 5034-IV8F-SC modules is 4 kHz (inv. period 250 µS).

The maximum number of counters on the 5034-IV8 module is 4.

You may configure channels 0…3 to be counters.

When counting, the module compares total count to previously programmed values and may then be configured to activate an associated output. The modules only provide count up (Off->On transitions) functionality and counter overflow.

3.9.4 EDS File

A dynamically generated EDS file is provided by the 5034-MB host based on the module information provided during initialization. There is no EDS file stored within the module. There is no external EDS file provided for download.

Section 3.10 Technical Assistance

Note that your module contains electronic components which are susceptible to damage from electrostatic discharge (ESD). An electrostatic charge can accumulate on the surface of ordinary plastic wrapping or cushioning material**. In the unlikely event that the module should need to be returned to Spectrum Controls, please ensure that the unit is enclosed in approved ESD packaging (such as static shielding / metalized bag or black conductive container).** Spectrum Controls reserves the right to void the warranty on any unit that is improperly packaged for shipment.

RMA (Return Merchandise Authorization) form required for all product returns.

For further information or assistance, please contact your local distributor, or call the Spectrum Controls Technical Support at +1 (425) 746-9481:

For Rockwell Automation Compatible I/O Products:

- USA 1-440-646-6900 (US/global, English only
- United Kingdom +44 0 1908 635 230 (EU phone, UK local)
- Australia, China, India, and other East Asia locations: 1-800-722-778 or +61 39757 1502
- Mexico 001-888-365-8677
- Brazil 55-11-5189-9500 (general support)
- Europe +49-0-211-41553-630 (Germany/general support)

or send an email to support@spectrumcontrols.com.

Section 3.11 Declaration of Conformity

Available upon request.

Section 3.12 Third-Party Software Components

The following information is provided to meet the requirements for attributing third-party software used in the product:

Component: STM32 HAL

Version: v1.5.0

Source: https://github.com/STMicroelectronics/STM32CubeH5/tree/v1.5.0/Drivers

License: BSD-Clause

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:
1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND
ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED
WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE
DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR
ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES
(INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON
ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
(INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS
SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Component: bigdigits
Version: v2.6.1
Source: http://www.di-mgt.com.au/bigdigits.html
License:
/***** BEGIN LICENSE BLOCK *****
 *
 * This Source Code Form is subject to the terms of the Mozilla Public
 * License, v. 2.0. If a copy of the MPL was not distributed with this
 * file, You can obtain one at http://mozilla.org/MPL/2.0/.

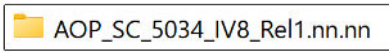
Appendix A
Manually Importing an AOP

You may configure your module in two ways:

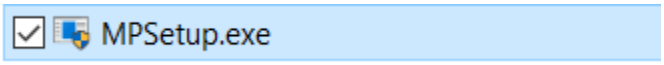
- Use a Studio 5000 Logix Designer Generic AOP. If you choose this method, you must ensure all parameters are set correctly. Assembly IDs and sizes are provided in Chapter 3.
- Use the 5034-IV8-SC AOP and manually import it into Studio 5000 Logix Designer version 36 or later. The AOP can be downloaded from www.spectrumcontrols.com

This appendix explains how to manually import an AOP .ACD file into Studio 5000 Logix Designer software:

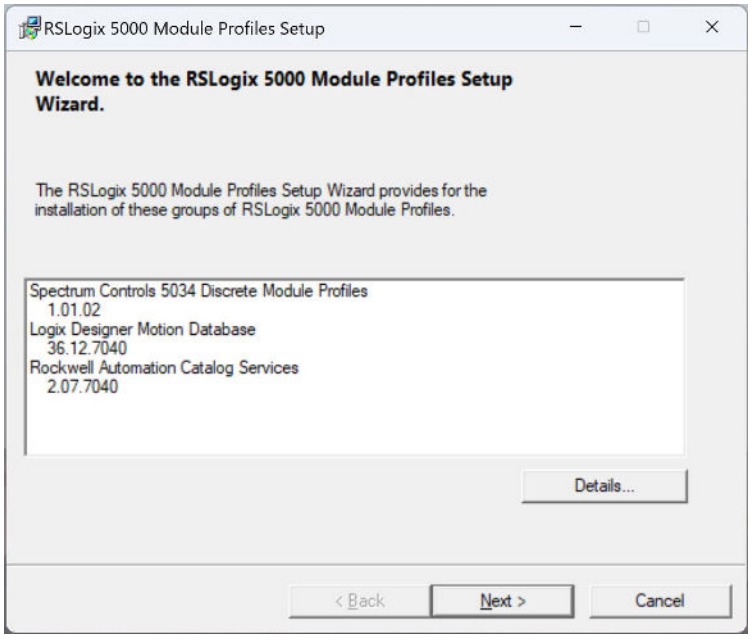
1. Download the latest, zipped, module AOP from Spectrum Controls website, and save the file to a local folder on your computer (normally the Downloads folder).
2. Extract the contents of the zipped folder using the default folder name and location.



3. Open the folder and run MPSetup.exe:



4. Confirm that you wish to run this software when asked if you wish to do so by your Windows operating system.
5. Follow the prompts provided by the RSLogix5000 Module Profiles Setup Wizard:



These prompts include accepting the license agreement, choosing to install the module profiles, and selecting which module profiles you wish to install.

6. Click **Finish** to complete the installation.

   The newly imported module(s) are now available as a selection from the Expansion Modules list.

Appendix B
Module Tag Tables

This section provides data type, definition, and valid value information for System Tags.

Module tags are created when you add a module to the Logix Designer application project.

The set of tags that are associated with the 5034-IV8-SC module are listed below. However, the choices that you make in the Module Definition dialog box define the connection and the tags. For example, if you use a Listen Only Connection, the Logix Designer application creates only Input tags for that module.

The following types of tags are described in this Appendix.

- Configuration
- Input
- Output

Module Configuration Tags

Name	Data Type	Definition	Valid Values
Counter*xx*.InputOffOnFilter	SINT	The amount of time that a signal must be in the On state before the input data indicates the On state. The amount of time is indicated using an enumeration.	5 = 0 µS 12 = 500 µS 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Counter*xx*.InputOnOffFilter	SINT	The amount of time that a signal must be in the Off state before the input data indicates the Off state. The amount of time is indicated using an enumeration.	5 = 0 µS 12 = 500 µS 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Counter*xx*.RolloverAtPreset	BOOL	Determines whether the simple counter will rollover to 0 at the Preset value.	0 = No rollover at the Preset value When the counter counts to the Preset value, the Done bit is set. When the counter reaches maximum DINT (2,147,483,647) and continues counting, it rolls over to 0 and the Rollover bit is set. 1 = Rollover at the Preset value When the counter reaches Preset-1 and continues counting, it rolls over to 0 and the Rollover bit is set. The Done bit is always 0.

Name	Data Type	Definition	Valid Values
Pt*xx*.InputOffOnFilter	SINT	The amount of time that a signal must be in the On state before the input data indicates the On state. The amount of time is indicated using an enumeration.	5 = 0 µS 12 = 500 µS 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Pt*xx*.InputOnOffFilter	SINT	The amount of time that a signal must be in the Off state before the input data indicates the Off state. The amount of time is indicated using an enumeration.	5 = 0 µS 12 = 500 µS 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms

Input Tag Definitions

Name	Data Type	Definition	Valid Values
RunMode	BOOL	The module's operating state	0 = Idle – It means one of the following: 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: Connection is up. Module is producing data for the connection. Output tag data is being applied or there is no output tag data for the connection (For example, all points configured as digital input without timestamp).
ConnectionFaulted	BOOL	Indicates if a connection to the target is running. The module always returns a zero in this member. The controller overwrites the zero with a one when the connection is not up.	0 = Connection is running. 1 = Connection is not running.

Name	Data Type	Definition	Valid Values
DiagnosticActive	BOOL	Indicates if any diagnostics are active or if the prognostics threshold is reached.	0 = No diagnostics are active. 1 = One or more diagnostics are active or the prognostics threshold is reached.
Uncertain (Packed data)	BOOL	Indicates that the data can be inaccurate, but the degree of inaccuracy is not known. If the tag is set to 1, you must troubleshoot the module.	0 = Good data 1 = Uncertain data
CIPSyncValid	BOOL	Indicates whether the module is synchronized with a 1588 master. A set bit alone cannot indicate that it is synced to the same master clock of the owner controller. You must compare the Grandmaster Clock ID of both the module and the owner controller.	0 = CIP Sync is not available. 1 = CIP Sync is available.
CIPSyncTimeout	BOOL	Indicates that the module was once synchronized with a 1588 master, but the module is not synced now due to a timeout.	0 = A valid time master has not timed out. 1 = A valid time master was 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 master time.
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. Set to zero by product reset or power cycle. Wraps from -1 to 1 skipping zero. Or from 255 (unsigned) to 1.
Counter*xx*.Data	BOOL	Indicates the current digital input value.	0 = Off 1 = On
Counter*xx*.Fault	BOOL	Indicates that counter 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.	0 = Good 1 = Bad, causing fault

Name	Data Type	Definition	Valid Values
Counter*xx*.Uncertain	BOOL	Indicates that the counter 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.	0 = Good data 1 = Uncertain data
Counter*xx*.Done	BOOL	If RolloverAtPreset is set, indicates if Count ≥ Preset. If RolloverAtPreset is not set, always 0.	0 = Counter has not reached the Preset value 1 = Counter has reached the Preset value
Counter*xx*.Rollover	BOOL	The counter counted up to Preset -1 and continued counting from 0. The RolloverAck bit transitioning from 0 to 1 or the Reset bit transitioning from 0 to 1 clears this bit.	0 = Counter has not rolled over from Preset -1 to 0 1 = Counter counted up to Preset -1 and continued counting from 0
Counter*xx*.Count	DINT	The number of rising edge of input signal counted by the counter	All values
Pt*xx*.Data Pt*xx*Data (Packed data)	BOOL	Indicates the current digital input value.	0 = Off 1 = On
Data (Packed data)	INT	Indicates the current values for all points of the module. Each bit represents 1 point. For example, Bit.3 represents the Data of Pt03.	For each point: 0 = Off 1 = On
Pt*xx*.Fault Pt*xx*Fault (Packed data)	BOOL	Indicates that point 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.	0 = Good 1 = Bad, causing fault

Name	Data Type	Definition	Valid Values
Fault (Packed data)	INT	Indicates the fault state for all points of the module. Each bit represents 1 point. For example, Bit.3 represents Fault status of Pt03. Fault state indicates that point 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.	For each point: 0 = Good 1 = Bad, causing fault
Pt*xx*.Uncertain	BOOL	Indicates that the point 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.	0 = Good data 1 = Uncertain data
Pt*xx*.Chatter	BOOL	Indicates if the input is chattering per the ChatterTime and ChatterCount settings.	0 = Normal 1 = Input is chattering
Pt*xx*.TimestampOverflowOffOn	BOOL	Indicates an Off to On timestamp was lost. A timestamp can be lost when TimestampLatchEn is set but the reported timestamp is not acknowledged in time.	0 or 1
Pt*xx*.TimestampOverflowOnOff	BOOL	Indicates an On to Off timestamp was lost. A timestamp can be lost when TimestampLatchEn is set but the reported timestamp is not acknowledged in time.	0 or 1
Pt*xx*.CIPSyncValid	BOOL	Indicates whether the module is synchronized with a 1588 master. A set bit alone cannot indicate that it is synchronized to the same master clock of the owner controller. You must compare the Grandmaster	0 = CIP Sync is not available. 1 = CIP Sync is available.

Name	Data Type	Definition	Valid Values
		Clock ID of both the module and the owner controller.	
Pt*xx*.CIPSyncTimeout	BOOL	Indicates that the module was once synchronized with a 1588 master, but the module is not synchronized now due to a timeout.	0 = A valid time master has not timed out. 1 = A valid time master was 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 master time.
Pt*xx*.TimestampOffOnNumber	INT	An Off to On timestamp identifier for the currently produced timestamp	All values
Pt*xx*.TimestampOnOffNumber	INT	An On to Off timestamp identifier for the currently produced timestamp	All values
Pt*xx*.TimestampOffOn	LINT	64-bit timestamp corresponding to when a change of state Off to On was recorded at the input	All values
Pt*xx*.TimestampOnOff	LINT	64-bit timestamp corresponding to when a change of state On to Off was recorded at the input	All values

Output Tag Definitions

Name	Data Type	Definition	Valid Values
Counter*xx*.Reset	BOOL	When this bit transitions from 0 to 1, Count and Rollover are set to zero.	0 = Count and Rollover values are not set to 0 1 = Count and Rollover values are set to 0
Counter*xx*.RolloverAck	BOOL	Clears the Rollover bit in the input tag when it transitions from 0 to 1.	0 = Rollover bit is not cleared 1 = Rollover bit is cleared

Name	Data Type	Definition	Valid Values
Counter*xx*.Preset	DINT	If RolloverAtPreset is set, when the counter reaches Preset-1 and continues counting, it rolls over to 0 and the Rollover bit is set. The Done bit is always 0. If RolloverAtPreset is not set, when the counter counts to the Preset value, the Done bit is set. When the counter reaches maximum DINT (2,147,483,647) and continues counting, it rolls over to 0 and the Rollover bit is set.	0…2,147,483,647
Pt*xx*.ResetTimestamps	BOOL	Erases all recorded timestamps for the input point when it transitions from 0 to 1.	0 = Timestamps are not erased 1 = Timestamps are erased
Pt*xx*.TimestampOffOnNumberAck	INT	An Off to On timestamp identifier that the controller writes to indicate that the identified timestamp has been seen and acted on. When Latching is enabled and the Timestamp Number that is received from the controller matches the most recent timestamp that is produced, the module is then allowed to produce a new timestamp.	All values
Pt*xx*.TimestampOnOffNumberAck	INT	An On to Off timestamp identifier that the controller writes to indicate that the identified timestamp has been seen and acted on. When Latching is enabled and the Timestamp Number that is received from the controller matches the most recent timestamp that is produced, the module is then allowed to produce a new timestamp.	All values

Index

Corporate Headquarters
Spectrum Controls Inc.
1705 132nd Ave NE, Bellevue, WA 98005
Fax: 425-641-9473
Tel: 425-746-9481

Web Site: www.spectrumcontrols.com
E-mail: spectrum@spectrumcontrols.com