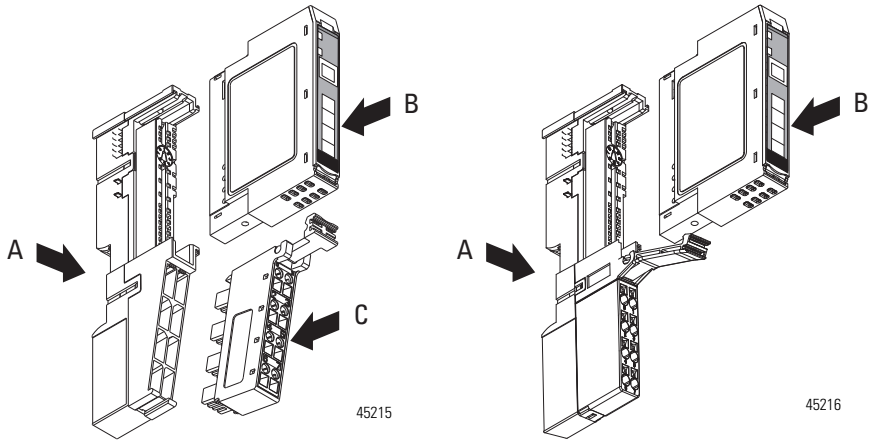
POINT I/O Family

Overview

The POINT I/O family has modular I/O modules that are ideal for applications where flexibility and low-cost of ownership are key for successful control system design and operation. As a key element in the Rockwell Automation Integrated Architecture, its comprehensive diagnostics and configurable features allow the product to be easily applied to any automation system and reduce engineering costs through standardization. It can be used in remote device panels, local control panels, and can be accessed from many locations including the Internet. This product has just-what-you-need granularity in 1 to 8 points to reduce system cost and size.

Available features include Channel Level Diagnostics for quick troubleshooting, multiple termination options and flexibility to save money, cabinet space and commissioning/troubleshooting time, the ability to mix/match Safety I/O on the same bus, and available DeviceLogix for local control, fast response time. Self-Configuring modules are also available to reduce/simplify your design and your inventory.

The POINT I/O System



1734-TOP or 1734-TOPS
One-piece Terminal Base with Screw or Spring Clamp

The base (A) mounts onto the DIN rail and provides the backplane. The POINT I/O module (B) snaps into the base. The removable terminal block (C) also snaps into the base and provides the wiring and terminations for field-side connections, as well as system power for the backplane.

POINT I/O has 4 major components:

- I/O modules provide the field interface and system-interface circuitry
- Communication interface modules provide the network-interface circuitry
- Terminal base units provide the wiring and signal termination for field-side connections and system power for the backplane
- Power distribution modules provide the expandability of the POINT I/O system and the flexibility to mix a variety of signal types

1734 POINT I/O modules offer 1 to 8 points per module. The I/O modules are interfaced to a network through a communication interface, which includes a built-in power supply that converts incoming 24V DC power to 5V DC backplane power. Each type of communication interface (Network Adaptor) supports a maximum of 13 to 17 I/O modules, with a maximum of 10 A field power. The I/O modules receive power from the power supply through the backplane. With an external power supply, you can expand a POINT I/O assembly up to a maximum of 63 I/O modules or 504 channels.

POINT I/O Features

Adapters	• ControlNet • DeviceNet • EtherNet I/P • Profibus
I/O Types	• Digital • Analog • AC/DC • Thermocouple • RTD • Specialty
Module Density	1…8 points
Specialty Modules	• Encoder • 1 MHz Counter In • Counter In with Outputs • Serial RS232 • RS485 • RS422 • Channel Isolated Thermocouple • RTD • Serial Synchronous Interface (SSI) • Address Reserve • 4 Channel IO-Link Master
Module Features	• Channel-level diagnostics (LED indicator and electronic) • Channel-level alarm and annunciation (electronic) • Channel-level open-wire detection with electronic feedback • Channel-level short-circuit detection with electronic feedback • Parameter-level explicit messaging • Removal and insertion under power (RIUP) • Horizontal or vertical mounting without derating • Automatic Device Replacement • Add-On-Profiles in RSLogix 5000
Network Connectivity	• DeviceNet (including SubNet connectivity) • ControlNet (Logix controller only) • EtherNet/IP (Logix controller only) • PROFIBUS DP • OPC/DDE Data Monitoring¨
Environmental Style	Class I, Division 2/Zone 2, Marine Certification, European ATEX Zone 2 3G
Modules per Node, max	Up to 63

Specify a POINT I/O System

Follow these steps as you specify your POINT I/O system:

	Step	Remember to select
✓	**1 Select a communication interface** Choose the interface module for your operating system.	• the appropriate interface module • a communication interface that meets the power requirements of your system
✓	**2 Select I/O devices based on field devices** • location of the device • number of points needed • appropriate catalog number • number of points available per module • number of modules	• I/O modules – some have diagnostic features, electronic fusing, isolated inputs/outputs, and unique configurable features
✓	**3 Select a wiring base assembly** Choose the appropriate wiring base assembly	• the appropriate wiring base assembly: Single piece screw, single piece spring, or RTB (Removable Terminal Base)
✓	**4 Select optional power components** Choose optional components to extend backplane power or change the field power distribution source.	• additional power components as necessary • adequate power capacity to meet I/O module backplane current requirements
✓	**5 Determine mounting requirements** Determine needed dimensions based on the communication interface chosen.	• the appropriate number of DIN rails based on the number of modules and the physical locations of those modules • horizontal or vertical mounting with no thermal derating

Temperature Input Modules

POINT I/O temperature modules can detect and communicate these electronic conditions:

Overrange alarm	• The channel overrange alarm is set if the input is greater than the maximum temperature (thermocouple or RTD range dependent), millivolt (+75V) or resistance (600 Ω) range value, or above the maximum range of the thermocouple or RTD. • The cold-junction compensator has its own over-range alarm. If the CJC temperature goes above 70 °C (158 °F), the over-range alarm is set.
Underrange alarm	• The channel underrange alarm is set if the input is less than the minimum temperature (thermocouple or RTD range dependent), millivolt (-75 mV) or resistance (10 Ω) range value, or below the minimum range of the thermocouple or RTD. • The cold-junction compensator has its own underrange alarm. If the CJC temperature goes below 0 °C (32 °F), the under-range alarm is set.
Level alarm (low-low, low, high, high-high)	• When the channel input goes below a low alarm or above a high alarm, a bit is set in the data table. All alarm status bits can be read individually or by reading the channel status byte (bits 2…5 for channel 0; bits 10…13 for channel 1). • Each channel alarm can be configured individually.
Open-wire alarm	• The module has the ability to check for a broken or detached wire. In any mode, if a broken/detached lead is detected, the data value is forced to maximum and the over-range alarm is set. Once the alarm is issued, it remains active as long as the input signal is faulted.

Cold-junction Compensation (1734-IT2I only)

When using thermocouples, cold-junction compensation is required at the termination of the thermocouple wire. Cold-junction can be accomplished in three ways:

- Enter an estimated temperature
- Use a 1734-TBCJC mounting base (recommended)
- Use external cold-junction compensators

Entering an estimated temperature is the least accurate way for cold-junction compensation. Using external compensators is the most expensive way, while using the 1734-TBCJC provides the easiest and most accurate method.

An open cold-junction compensator causes the input point to the maximum temperature value for the selected input type. This causes an alarm to be set. Once the alarm is issued, it remains active as long as the input signal is faulted (above maximum).

Set the cold-junction enable bit on the 1734-IT2I module to enable or disable the cold-junction linearization. If enabled, the proper cold-junction compensation value is applied to the selected thermocouple. If disabled, the data (CJ temperature) is still available but is not applied to the input. If the 1734-TBCJC is not available, this parameter should be set to disabled. A cold-junction value can be added using the cold-junction offset parameter.

Noise Filtering (1734-IR2)

You can select the type and amount of noise filtering on each individual channel.

- Notch filter of analog to digital converter
- First-order, low-pass digital filter

Choose the filter that provides you with the update and step response that most closely matches your system requirements.

1734 Analog Temperature Input Modules Technical Specifications

	1734-IR2	**1734-IR2E**	**1734-IT2I**
Number of inputs	2 RTD	2 high resolution RTD	2 thermocouple
Input signal range	0…600 Ω	0…220 Ω	±75 mV
Input resolution	16 bits 9.5 mΩ/cnt 0.03 °C/cnt (pt 385 @ 25 °C)	16 bits 2.4 mΩ/cnt 0.006 °C/cnt (Pt385 @ 25 °C)	15 bits + sign 2.5 mV/cnt(1)
Data format	Signed integer		
Thermocouple resolution	—		Type B, 30…1820 °C (86…3308 °F) 3 counts/°C Type C, 0…2315 °C (32…4199 °F) 6 counts/°C Type E, -270…1000 °C (-454…1832 °F) 24 counts/°C Type J, -210…1200 °C (-454…2192 °F) 21 counts/°C Type K, -270…1372 °C (-454…2502 °F) 13 counts/°C Type N, -270…1300 °C (-454…2373 °F) 11 counts/°C Type R, -50…1768.1 °C(-58…3214 °F) 4 counts/°C Type S, -50…1768.1 °C (-58…3214 °F) 4 counts/°C Type T, -270…400 °C (-454…752 °F) 15 counts/°C
Cold junction compensation	—		Included in 1734-RTBCJC Remote Termination Block
Cold junction compensation range	—		0…70 °C

Select a Terminal Base Assembly

Step 3 - Select:

- the appropriate terminal base unit for your module

The POINT I/O system follows a No Tools design approach. The I/O mounting base, removable terminal block (RTB), and I/O module may be assembled as a system without tools.

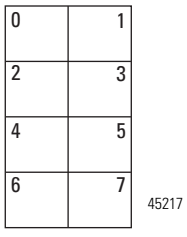
Terminal Base Assembly

The POINT I/O mounting base mounts directly on the DIN-rail, either vertically or horizontally, and forms the interconnect for the POINTBus backplane communication and field power-bus distribution. The mechanical keying of the mounting base prevents incorrect module placement. The I/O mounting base and removable terminal block are sold together (pre-assembled) as a single unit called a Terminal Base Assembly.

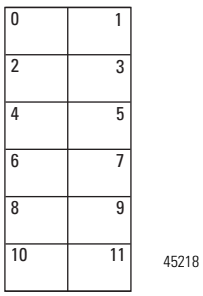
The pins on the 1734-TB terminal base assembly are independent of each other. The connections for the 1734-TB and 1734-TB3 are determined by the 1734 module being used.

Terminal Base Pins

1734-TB, -TBS, -TOP, -TOPS



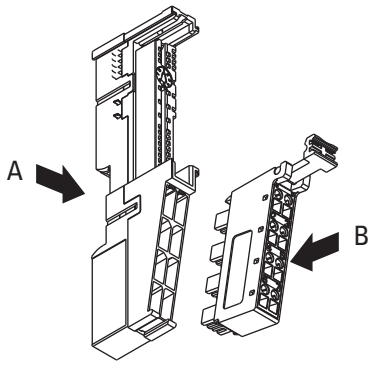
1734-TB3, -TB3S, -TOP3, -TOP3S



Pins 4, 5, 8, and 9 are connected together.
Pins 6, 7, 10, and 11 are connected together.

Each assembly includes a removable terminal block (RTB) provides 8 or 12 separate terminal locations for field wiring. The RTB also provides vertical access to wire and screw terminations. A separate terminal point is provided for each wire, including a shield ground terminal point for 2-point analog modules.

POINT I/O Removable Terminal Base Assembly



Each terminal base assembly includes a base (A) that mounts onto the DIN-rail and a removable terminal block (B) for I/O wiring.

Once the RTB is wired properly, you never need to rewire terminations. The RTB separates independently of the I/O mounting base and I/O module to facilitate rapid installation and commissioning of the system. Each terminal is numbered on the bottom of the RTB to simplify troubleshooting during commissioning or maintenance cycles. Spare or replacement RTBs can be ordered separate from the terminal base assembly.

Terminal Base Assemblies

Terminal Base Assembly Cat. No.	Description	Terminal Base Screw Torque	Replacement RTB Cat. No.
1734-TB	Mounting base with 8-terminal cage-clamp RTB	0.6 Nm (7 lb-in)	1734-RTB
1734-TBS	Mounting base with 8-terminal spring-clamp RTB		1734-RTBS
1734-TB3	Mounting base with 12-terminal cage-clamp RTB		1734-RTB3
1734-TB3S	Mounting base with 12-terminal spring-clamp RTB		1734-RTB3S
1734-TBCJC(1)	Mounting base with cold-junction compensation RTB	0.5…0.6 Nm (5…7 lb-in)	1734-RTBCJC(1)

(1) For use with the 1734-IT2I thermocouple input module.