# 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.

Allen-Bradley 1734-IE4S

The POINT I/O System

1734-TOP or 1734-TOPS
One-piece Terminal Base with Screw or Spring Clamp
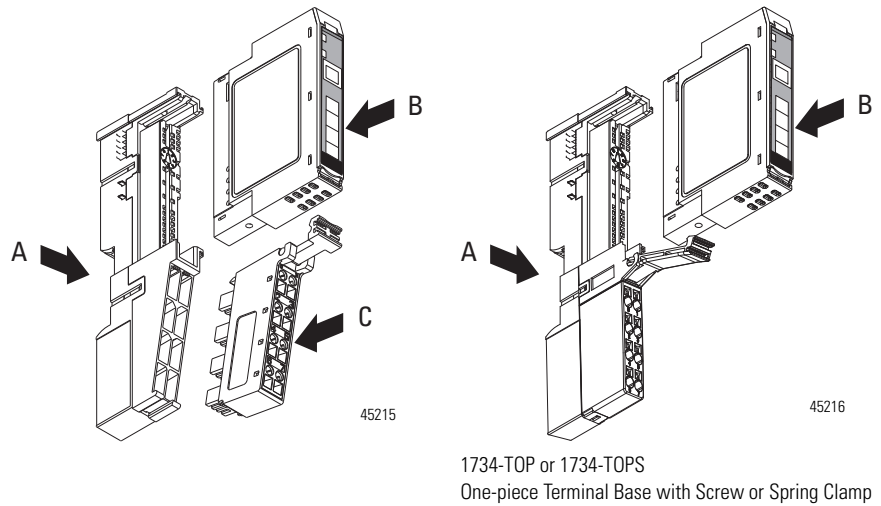
The base (A) mounts onto the DIN rail and provides the backplane. The POINT I/O module (B) snaps into the base. The removable terminal block (C) also snaps into the base and provides the wiring and terminations for field-side connections, as well as system power for the backplane.

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

Allen-Bradley 1734-IE4S

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

Analog and Temperature I/O Modules

The POINT I/O analog and temperature I/O modules support: on-board, channel-level data alarming (four set-points per channel); scaling to engineering units; channel-level diagnostics (electronic bits and LED indicators); and integer format.

Analog and temperature input modules support the following configurable parameters and diagnostics:

- open-wire detection with LED and electronic reporting
- four-alarm and annunciation set-points: low alarm; high alarm; low/low alarm; high/high alarm calibration mode detection and electronic reporting
- underrange detection and electronic reporting
- overrange detection and electronic reporting
- channel signal range and on-board scaling (scaling to any 16-bit integer under-/over-range alarms)
- filter type (notch for A/D, or first-order low-pass digital filter)
- temperature scale (Celcius, Fahrenheit, Kelvin, Rankine, or custom)
- channel update rate (step response plus 0…10,000 ms filter setting)

Choose analog or temperature I/O modules when you need:

- On-board scaling eliminates the need to scale the data in the controller, preserving controller processing time and power for more important tasks, such as I/O control, communications, or other user-driven functions.
- Over- and underrange detections and indications eliminate the need to test values in the control program, saving valuable processing power of the controller.
- Ability to individually configure each channel of the output module to hold its last value or assume a user-defined value on a fault condition.
- Ability to individually enable and disable channels improves module performance.
- Selectable input filters lets you select from several different filter frequencies for each channel that best meets the performance needs of your application based on environmental limitations
- Selectable response to broken input sensor feature provides feedback to the controller that a field device is not connected or operating properly. This lets you specify corrective action based on the bit or channel condition.
- The modules share a high accuracy rating of ±0.1% of full-scale accuracy at 25 °C (77 °F).

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Counter Modules Environmental Specifications

1734 Counter Modules Environmental Specifications

Operating temperature	-20...55 °C (-4...131 °F)
Nonoperating Temperature	-40...85 °C (-40...185 °F)
Relative humidity	5...95% non-condensing
Operating shock	30 g
Nonoperating shock	50 g
Vibration	5 g @ 10…500 Hz
Enclosure type rating	None (open-style)
Mounting type	DIN Rail
Certifications (when product is marked)	c-UL-us, CE, C-Tick, Ex

Safety I/O Modules

Use the POINT Guard I/O Safety Modules in the POINT I/O platform to distribute Safety I/O on a GuardLogix, Compact GuardLogix or SmartGuard system. You can configure the modules by using the network configuration tool, RSNetWorx software, or the GuardLogix programming tool, RSLogix 5000 software, version 17 or later.

GuardLogix systems are intended for the use of POINT Guard I/O modules with an EtherNet/IP adapter. SmartGuard systems are intended to use POINT Guard I/O modules with the 1734-PDN module.

Use the modules to construct a safety-control network system that meets the requirements up to Safety Integrity Level 3 (SIL 3) as defined in IEC 61508, Functional Safety of Electrical, Electronic, and Programmable Electronic Safety-related Systems, and the requirements for Safety Category 4 / Performance Level e of the EN ISO 13849-1 standard.

1734-IB8S Technical Specifications

Attribute	Value
Safety Input	
Inputs per module	8
Input type	Current sinking
Voltage, on-state input	11…30V DC
Voltage, off-state input, max	5V DC
Current, on-state input, min	3.3 mA
Current, off-state, max	1.3 mA

1734-IB8S Technical Specifications

Attribute	Value
IEC 61131-2 (input type)	Type 3
Reaction time	<16.2 ms
Pulse Test Output	
Output type	Current sourcing
Number of sources (T0, T1M, T2, T3M)	4
Test output current (each output point)	0.7 A max
Aggregate current of test outputs per module	2.8 A @ 40 °C (104 °F)
1734-IB8S temperature versus current derating for both horizontal and vertical installations	
Residual voltage, max	1.2V
Output leakage current, max	0.1 mA
Short circuit protection	Yes
Current, max (when used to control muting lamp)	25 mA (to avoid fault when used as a muted lamp output)
Current, min (when used to control muting lamp)	5 mA (at which fault indication is generated when used as a muted lamp output)

1734-IE4S – Safety Analog Input Module Specifications

Attribute	Specification
Safety Analog Input	
Inputs per module	4 single-ended
Input type	Software-configurable for voltage, current, or tachometer
Input voltage mode ranges	±5V, ±10V, 0…5V, 0…10V
Input current mode ranges	0…20 mA, 4…20 mA
Input tachometer mode ranges	0…24V with configurable ON and OFF thresholds in 1V increments

1734-IE4S – Safety Analog Input Module Specifications

Attribute	Specification	
Voltage code range	Bipolar modes: -32768/+32767 Unipolar modes: 0/+32767	
Current code range (4…20 mA mode)	-8192…32767	
Tachometer code range	0…1000	
Voltage overrange thresholds	@ ±10V: 10.0V @0 …10V: 10.0V	@±5V: 5.0V @0…5V: 5.0V
Voltage underrange thresholds	@ ±10V: -10.0V @0 …10V: 0.5V	@±5V: -5.0V @0…5V: 0.25V
Current overrange thresholds	@ 0…20 mA: 20.0 mA	@4…20 mA: 20.0 mA
Current underrange thresholds	@ 0…20 mA: 0.5 mA	@4…20 mA: 4.0 mA
Tachometer frequency range	1…1000 Hz	
Tachometer overrange threshold	1 kHz	
ADC resolution	12 bits	
Filter	Single-pole anti-aliasing filter: • Filter frequency = 10 Hz followed by four-pole digital filter Available corner frequencies, approx. • 1 Hz • 10 Hz • 5 Hz • 50 Hz	
Step response to 63% (approx.)	Filter frequency @ 1 Hz = 450 ms Filter frequency @ 5 Hz = 125 ms Filter frequency @ 10 Hz = 72 ms Filter frequency @ 50 Hz = 25 ms	
Normal mode rejection	Filter frequency @ 1 Hz: • 3 dB @ 0.7 Hz • 70 dB @ 50 Hz • 70 dB @ 60 Hz Filter frequency @ 5 Hz: • 3 dB @ 2.6 Hz • 70 dB @ 50 Hz • 70 dB @ 60 Hz	Filter frequency @ 10 Hz: • 3 dB @ 4.8 Hz • 50 dB @ 50 Hz • 50 dB @ 60 Hz Filter frequency @ 50 Hz: • 3 dB @ 10.2 Hz • 20 dB @ 50 Hz • 20 dB @ 60 Hz
Voltage mode input impedance	> 200K Ohms	
Current mode input impedance	<100 Ohms	
Tachometer mode input impedance	> 200K Ohms	
Data value format	16-bit, two's complement	

1734-IE4S – Safety Analog Input Module Specifications

Attribute	Specification	
Accuracy	Voltage mode	@ 25° C [77° F]: ±0.5% full scale Drift: ±0.02% full scale/°C
	Current mode	@ 25° C [77° F]: ±0.6% full scale Drift: ±0.03% full scale/°C
	Tachometer mode	@ 25° C [77° F]: ±2% gain error drift: ±0.1%/°C additional gain error, due to temperature Example for a module at 100 Hz and 55 °C: Accuracy = 100 Hz x (0.02 + (0.001 x (55-25))) = 100 Hz x (0.02 + 0.03) = ±5 Hz error
Calibration	Factory-calibrated; no user-calibration	
Maximum overload on inputs	±30V	
I/O scan rate	≥ 6 ms	
Wire type	Shielded on signal ports	
POINTBus		
Field power input	19.2…28.8V DC, 65 mA, Class 2	
Sensor Output		
Output type	Sensor power supply, 24V DC	
Rated output current per point	150 mA max. per output @ 55°C (131 °F)	
On-state voltage drop	≤ 0.5V	
Leakage current, max	< 0.1 mA	
Over current detection	Yes	
Open load detection	Yes	
Aggregate current of sensor outputs per module	600 mA	
Terminal base screw torque	See terminal base specifications	

Step Response and Filter Response for 1734-IE4S Modules

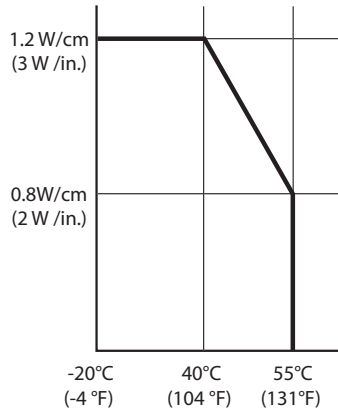| Filter Setting	Step Response to 63%	Corner Frequency-3 dB
50 Hz	~ 25 ms	10.2 Hz
10 Hz	~ 72 ms	4.75 Hz
5 Hz	~ 125 ms	2.62 Hz
1 Hz	~ 450 ms	0.68 Hz

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Environmental Specifications

Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20…55 °C (-4…131 °F)[1]
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40…85 °C (-40…185 °F)
Temperature, surrounding air, max	55 °C (131 °F)(1)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5…95% noncondensing
Vibration	IEC 60068-2-6, (Test Fc, Operating) 5 g @ 10…500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock) 30 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock) 50 g
Emissions	CISPR 11:Group 1, Class A
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80% from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100%AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100%AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80%AM from 2000…2700 MHz
EFT/B immunity	IEC 61000-4-4: ±3 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on signal ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on shielded ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80%AM from 150 kHz…80 MHz

[1] Refer to System Temperature Derating When a 1734-IE4S Module Is Used on page 46.

System Temperature Derating When a 1734-IE4S Module Is Used

1734-OB8S – Technical Specifications

Attribute	Value
Safety Output	
Outputs per module	8
Output type	Current sourcing
Output current (each output point), max	1 A
Residual voltage (drop)	<0.6V
Leakage current, max	0.1 mA
Short-circuit detection	Yes (short high and low and cross-circuit fault detect)
Short-circuit protection	Electronic
Aggregate current of outputs per module	8 A (4 A per terminal base) @ 40 °C (104 °F)
1734-OB8S temperature versus current derating for both horizontal and vertical installations	
Reaction time	<6.2 ms

1734-IB8S, 1734-OB8S, 1734-IE4S – Technical Specifications

Attribute	1734-IB8S	1734-OB8S	1734-IE4S
POINTBus			
POINTBus current, max	175 mA	190 mA	110 mA @ 5V
Power dissipation, max	2.44 W	3.02 W	2.2 W
Thermal dissipation	8.34 BTU/hrr	10.32 BTU/hr	7.5 BTU/hr
Isolation voltage	50V (continuous), Basic Insulation Type between field side and system No isolation between individual channels Type tested @ 707V DC for 60 s		50V continuous- basic Insulation Type, I/O and field power to system Type tested @ 500V AC for 60 seconds. No isolation between individual I/O or I/O to field power.
Power bus, operating supply voltage, nom	24V DC		
Power bus, operating voltage range	19.2…28.8V DC		
Input filter time, OFF to ON[1]	0…126 ms (in 6 ms increments)		
Input filter time, ON to OFF[1]			
Terminal base screw torque	See terminal base specifications		
Indicators	1 yellow lock status indicator 1 green/yellow power status indicator 8 I/O channel status indicators		4 analog input (yellow/red) 4 sensor power (green/red) 1 power (green/yellow)

[1] Input off-to-on filter time is the time from a valid input signal to recognition by the module. Input on-to-off time is the time from a valid input signal to recognition by the module.

1734-IB8S, 1734-OB8S, and 1734-IE4S Physical Specifications

Attribute	Value
Keyswitch positions (left and right)	1734-IB8S: Key 1 = 8 (left); Key 2 = 1 (right) 1734-OB8S: Key 1 = 8 (left); Key 2 = 2 (right) 1734-IE4S: Key 1 = 8 (left); Key 2 = 3 (right)
Terminal base unit	1734-TB, 1734-TBS, 1734-TOP, 1734-TOPS, 1734-TOP3, 1734-TOP3S
Pilot duty rating	Not rated (1734-OB8S and 1734-IE4S)
North America temp code	T4 (1734-OB8S and 1734-IB8S) T4A (1734-IE4S)
IEC temp code	T4
Enclosure type rating	None (open-style)
Wiring category[1]	2 – on signal ports (1734-IB8S, 1734-OB8S, 1734-IE4S) 1 – on power ports (1734-IE4S only)

1734-IB8S, 1734-OB8S, and 1734-IE4S Physical Specifications

Attribute	Value
Wire size	Determined by installed terminal block.
Weight, approx.	62.4 g (2.2 oz) – 1734-IB8S and 1734-OB8S 68 g (2.4 oz) – 1734-IE4S
Dimensions (HxWxD), approx. (without terminal block)	77 x 24 x 55 mm (3.03 x 0.94 x 2.17 in.)

(1)   Use this conductor category information for planning conductor routing. Refer to the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

POINT I/O Accessories

POINT I/O Marker Card

The POINT I/O Marker Card is available under catalog number 1492-SM5X5. Each kit contains five 12.7 x 12.7 cm (5 x 5 in.) cards with 100 markers per card. You can enter text on the marker cards using different font sizes and text widths; you can print multiple lines on one marker card; you can even print common symbols.

Allen-Bradley 1734-IE4S

Mounting Requirements

Step 5 - Select:

- appropriate number of DIN rails based on the number of modules
  and the physical requirements

The producer/consumer model multicasts messages. This means that multiple nodes can consume the same data at the same time from a single device. Where you place POINT I/O modules in the control system determines how the modules exchange data.

For a Rockwell Automation controller to control 1734 I/O, the I/O must be on one of the following:

- the same network as the controller.
- a ControlNet network that is local to that controller.
- an EtherNet/IP network that is local to that controller.

Power Supply Distance Rating

Place modules to the right of the power supply. Each 1734 I/O module can be placed in any of the slots right of the power supply until the usable backplane current of that supply has been exhausted. An adapter provides 1000 mA current to the POINTBus backplane. The 1734-EP24DC or 1734-EPAC Expansion power supply provides up to 1300 mA. I/O modules require from 75 mA (typical for the digital and analog I/O modules) up to 220 mA or more.

Use the following table to plan the maximum size layout of your POINT I/O system.

Maximum Size Layout

	POINTBus current	No. of I/O Modules with 24V DC Backplane Current (@ 75 mA each), max	No. of I/O Modules with Expansion Power Supplies, max	No. of I/O Module Connections, max
1734-PDN on DeviceNet network	1300 mA	Up to 17	Expansion power supply not allowed	Not to exceed scanner capacity
1734-ADN(X) on DeviceNet network	1000 mA	Up to 13	63	Not to exceed scanner capacity
1734-ACNR on ControlNet network	1000 mA	Up to 13	63	5 rack and 25 direct
1734-AENT on EtherNet/IP network	1000 mA	Up to 13	63	31 total connections (reduced to 20 with safety connections present) including 5 rack/enhanced rack
1734-APB on PROFIBUS network	1000 mA	Up to 13	63	Not to exceed scanner capacity
1734-EP24DC Expansion Power	Horizontal mounting: 1000 mA @ 5V DC for 10…19.2V 1300 mA @ 5V DC for 19.2…28.8V	Up to 17	63	Not to exceed scanner capacity
	Vertical mounting: 1000 mA @ 5V DC for 10…28.8V	Up to 17	63	Not to exceed scanner capacity
1734-EPAC Expansion Power	Horizontal mounting: 1300 mA@ 5.2V DC	Up to 17	63	Not to exceed scanner capacity
	Vertical mounting: 1000 MA @ 5.2V DC	Up to 17	63	Not to exceed scanner capacity

Mount the POINT I/O System

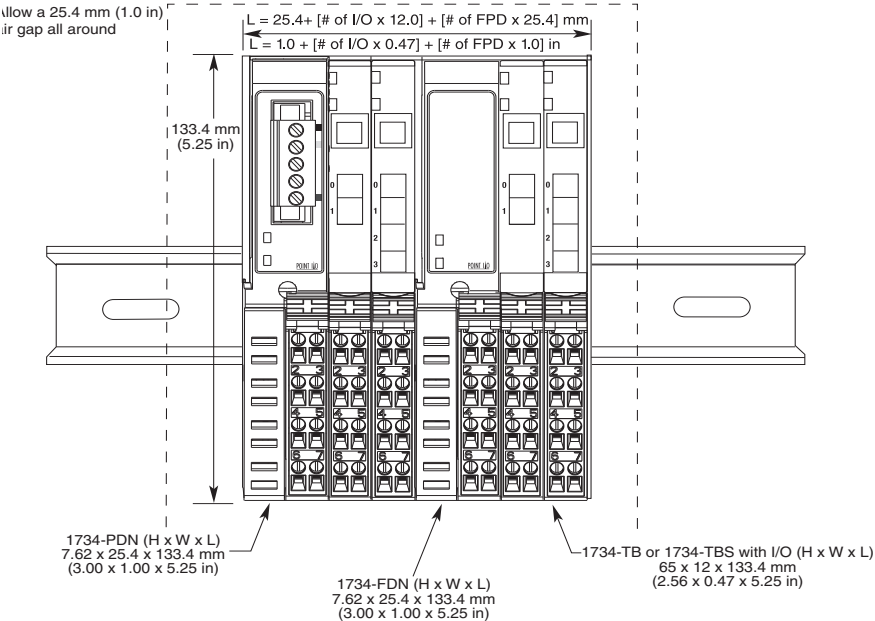Mount the POINT I/O system on a DIN rail in the horizontal or vertical orientation. Use steel, 35 x 75.5 mm DIN rails (Cat. No. 199-DR1; 46277-3; EN 50022). The DIN rails for all POINT I/O system components must be mounted on a common, conductive surface to ensure proper electro-magnetic interference (EMI) performance. Secure DIN rail approximately every 200 mm (7.87 in).

Allen-Bradley 1734-IE4S

Approximate Mounting Dimensions

POINT I/O with 1734-PDN Mounting Dimensions

Allow a 25.4 mm (1.0 in) air gap all around

L = 25.4+ [# of I/O x 12.0] + [# of FPD x 25.4] mm
L = 1.0 + [# of I/O x 0.47] + [# of FPD x 1.0] in

133.4 mm (5.25 in)

1734-PDN (H x W x L)
7.62 x 25.4 x 133.4 mm
(3.00 x 1.00 x 5.25 in)

1734-FDN (H x W x L)
7.62 x 25.4 x 133.4 mm
(3.00 x 1.00 x 5.25 in)

1734-TB or 1734-TBS with I/O (H x W x L)
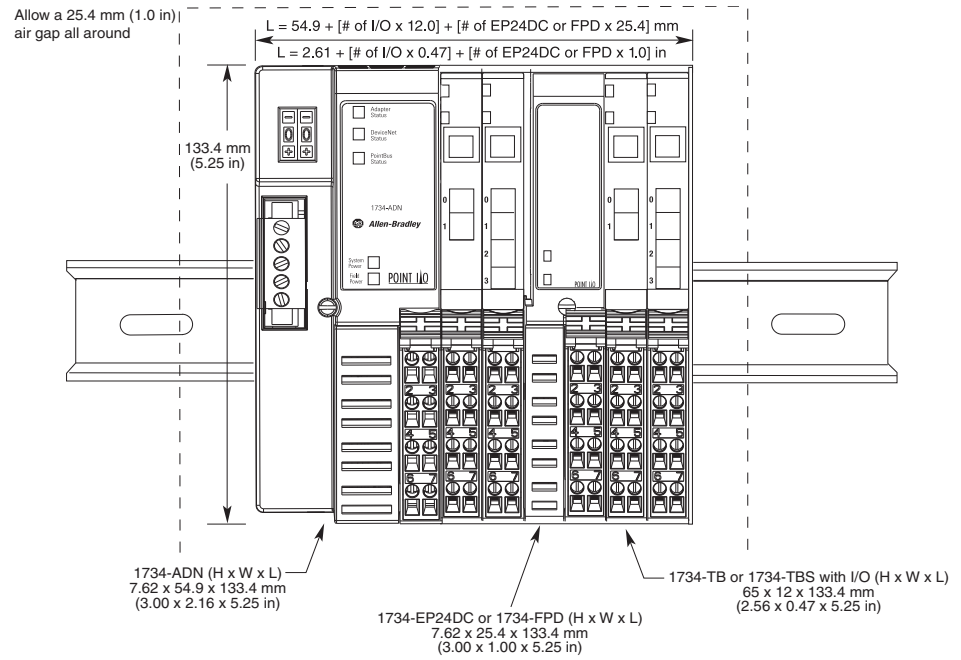65 x 12 x 133.4 mm
(2.56 x 0.47 x 5.25 in)

| **IMPORTANT** | When mounting the 1734-IB8S, 1734-OB8S, and 1734-IE4S modules, ensure that there is 2 in. of clearance space above the POINT rail. |

POINT I/O with 1734-ADN(X), 1734-ACNR, 1734-AENT, 1734-APB Mounting Dimensions

Allow a 25.4 mm (1.0 in) air gap all around

L = 54.9 + [# of I/O x 12.0] + [# of EP24DC or FPD x 25.4] mm
L = 2.61 + [# of I/O x 0.47] + [# of EP24DC or FPD x 1.0] in

133.4 mm (5.25 in)

1734-ADN (H x W x L)
7.62 x 54.9 x 133.4 mm
(3.00 x 2.16 x 5.25 in)

1734-EP24DC or 1734-FPD (H x W x L)
7.62 x 25.4 x 133.4 mm
(3.00 x 1.00 x 5.25 in)

1734-TB or 1734-TBS with I/O (H x W x L)
65 x 12 x 133.4 mm
(2.56 x 0.47 x 5.25 in)

IMPORTANT	When mounting the 1734-IB8S, 1734-OB8S, and 1734-IE4S modules, ensure that there is 2 in. of clearance space above the POINT rail.

Allen-Bradley 1734-IE4S

	Cat. No.	Description
Bases	1734-TB, 1734-TBS	Wiring Base Assembly with 8 Point Cage-Clamp Removable Terminal Block Installation Instructions, publication <u>1734-IN511</u>
	1734-TBS, 1734-TB3S, 1734-RTBS, 1734-RTB3S	Wiring Base Assembly with 12 Point Cage-Clamp Removable Terminal Block Installation Instructions, publication <u>1734-IN013</u>
	1734-TOP, 1734-TOPS, 1734-TOP3, 1734-TOP3S	POINT I/O One-piece Terminal Bases Installation Instructions, publication <u>1734-IN028</u>
	1734-TBCJC	Cold Junction Compensation Wiring Base Assembly Installation Instructions, publication <u>1734-IN583</u>
Power Units	1734-FPD	Field Potential Distributor Module Installation Instructions, publication <u>1734-IN059</u>
	1734-EP24DC	24V DC Expansion Power Supply Installation Instructions, publication <u>1734-IN058</u>
	1734-EPAC	120/240V AC Expansion Power Supply Installation Instructions, publication <u>1734-IN017</u>
Safety	1734-IB8S, 1734-OB8S, 1734-IE4S	POINT Guard I/O Safety Modules Installation and User Manual, publication <u>1734-UM013</u>