Installation Instructions

POINT I/O 5V dc and 24V dc Very High Speed Counter Module

Catalog Numbers 1734-VHSC5 and 1734-VHSC24, Series C

Inside . . .

For	See Page
Important User Information	2
Preventing Electrostatic Discharge	3
Environment and Enclosure	4
European Hazardous Location Approval	5
North American Hazardous Location Approval	6
About the Modules	7
Before You Begin	9
Install the Mounting Base	10
Install the Module	11
Install the Removable Terminal Block (RTB)	13
Remove a Mounting Base	14
Wire the Module	15
Configure the Module	16
Troubleshooting	26
Specifications	29
Additional Resources	34

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Important User Information

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

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

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

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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

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

Preventing Electrostatic Discharge

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.
- When not in use, store the equipment in appropriate static-safe packaging.

Environment and Enclosure

ATTENTION

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as “open type” equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 (“Industrial Automation Wiring and Grounding Guidelines”), for additional installation requirements pertaining to this equipment.

European Hazardous Location Approval

European Zone 2 Certification (The following applies when the product bears the EEx marking.)

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC.

DEMKO certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to this Directive. The examination and test results are recorded in confidential report No 03NK30347. Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 50021.

IMPORTANT

Observe the following additional Zone 2 certification requirements.

- This equipment is not resistant to sunlight or other sources of UV radiation.
- The secondary of a current transformer shall not be open-circuited when applied in Class I, Zone 2 environments.
- Equipment of lesser Enclosure Type Rating must be installed in an enclosure providing at least IP54 protection when applied in Class I, Zone 2 environments.
- This equipment shall be used within its specified ratings defined by Allen-Bradley.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40% when applied in Class I, Zone 2 environments.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:	**Informations sur l'utilisation de cet équipement en environnements dangereux:**
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.
WARNING  **EXPLOSION HAZARD -** • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous.	**AVERTISSEMENT**  **RISQUE D'EXPLOSION –** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe 1, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

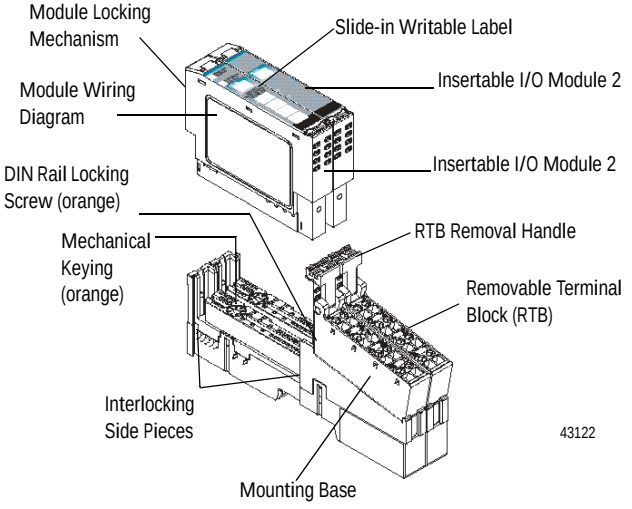
About the Modules

ATTENTION

POINT I/O is grounded through the DIN rail to chassis ground. Use zinc plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail material (e.g., aluminum, plastic, etc.) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding.
Secure DIN rail to mounting surface approximately every 200 mm (7.8 inches).

Use these Series C modules with the following.

- ControlNet adapter
  with RSLogix 5000 software, version 11 or higher
- DeviceNet adapter
- EtherNet/IP adapter
  with RSLogix 5000 software, version 11 or higher
- PROFIBUS adapter



The wiring base assembly includes terminal base, 1734-TB or 1734-TBS, which consists of mounting base, 1734-MB, and removable terminal base, 1734-RT or 1734-RTB.

Before You Begin

The modules included in this publication are the following.

- 1734-VHSC5, Series C,
  POINT I/O 5V dc Very High Speed Counter Module
- 1734-VHSC24, Series C,
  POINT I/O 24V dc Very High Speed Counter Module

The VHSC is a two-module set.

- Module 1 houses the VHSC functionality.
- Module 2 provides screw terminals necessary to access chassis ground (Chas Gnd) and common (C).
  - Module 2 connects screw 4 to 5 and screw 6 to 7 for ease of wiring power to the input device.
  - Module 2 is not necessary for VHSC functionality.
  - Module 2 serves only to ease customer wiring.
  - Module 2 does not use a node address or consume power from the POINTBus.

Mount module 2 adjacent to module 1.

Install the Mounting Base

To install the mounting base on the DIN rail, proceed as follows.

ATTENTION

Do not discard the end cap. Use this end cap to cover the exposed interconnections on the last mounting base on the DIN rail. Failure to do so could result in equipment damage or injury from electric shock

1. Position the mounting base vertically above the installed units (adapter, power supply, or existing module).
2. Slide the mounting base down to engage the interlocking side pieces with the adjacent module or adapter.
3. Press firmly to seat the mounting base on the DIN rail.

   The mounting base snaps into place.

To remove the mounting base from the DIN rail, proceed as follows.

1. Remove the module.
2. Use a small-bladed screwdriver to rotate the base locking screw to a vertical position.

   This releases the locking mechanism.
3. Lift straight up to remove.

Install the Module

ATTENTION

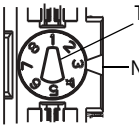
When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

Install the module before or after base installation. Be sure that you properly complete the following.

- Correctly key the mounting base before installing the module into the mounting base.
- Position the mounting base locking screw horizontal referenced to the base.

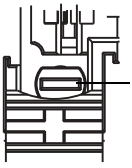
To install the module on the DIN rail, proceed as follows.

1. Use a bladed screwdriver to rotate the keyswitch on the mounting base clockwise until the number required for the type of module being installed aligns with the notch in the base.

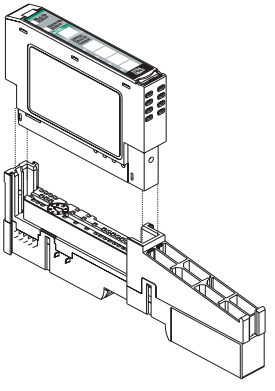


2. Place the DIN rail locking screw in the horizontal position.

   If you unlock the locking mechanism you cannot insert the module.



3. Insert the module straight down into the mounting base.



4. Press to secure.

   The module locks into place.

Install the Removable Terminal Block (RTB)

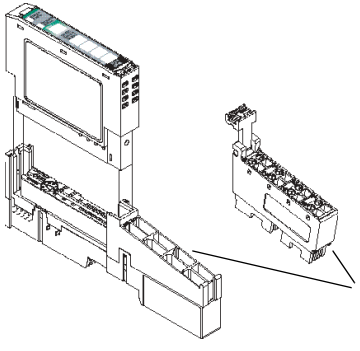
We supply a removable terminal block with your wiring base. To remove, pull up on the RTB handle. Remove or replace the mounting base without removing any of the wiring.

WARNING

When you connect or disconnect the removable terminal block (RTB) with field-side power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding.

1. Insert the end opposite the handle into the base unit. This end has a curved section that engages with the wiring base.

2. Rotate the terminal block into the wiring base until it locks itself in place.



3. If you installed an I/O module, snap the RTB handle into place on the module.

Remove a Mounting Base

To remove a module from the DIN rail, remove any installed module and the removable terminal block, if wired.

1. Unlach the RTB handle on the I/O module.

2. Pull on the RTB handle to remove the RTB.

WARNING

When you connect or disconnect the removable terminal block (RTB) with field-side power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding.

3. Press on the module lock on the top of the module.

4. Pull on the I/O module to remove from the base.

ATTENTION

When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

5. Use a small-bladed screwdriver to rotate the orange, base-locking screw to a vertical position.

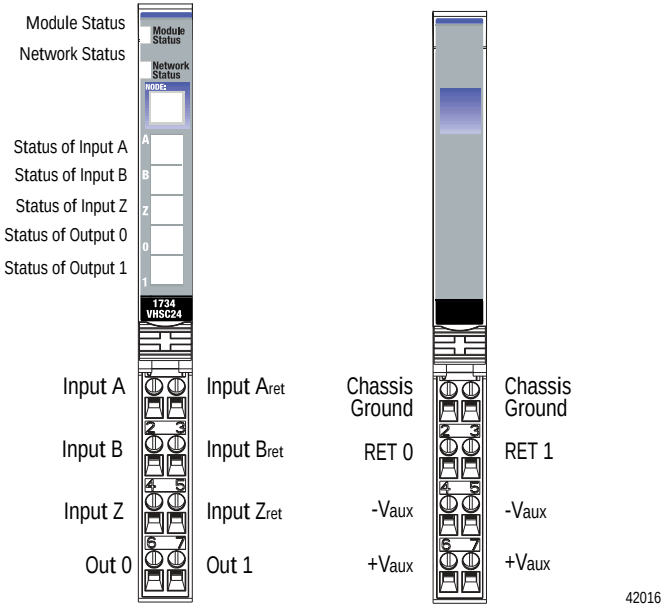
   This releases the locking mechanism.

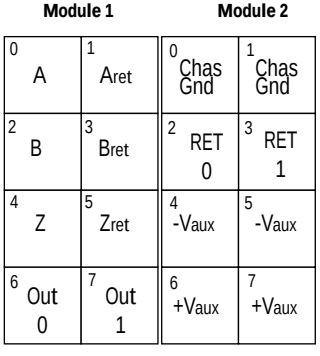
6. Lift straight up to remove.

Wire the Module

WARNING

If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.





Module 1 Terminations		Module 2 Terminations	
0	A	0	Chassis Ground
1	Aret	1	Chassis Ground
2	B	2	Out 0 RET
3	Bret	3	Out 1 RET
4	Z	4	Vaux -
5	Zret	5	Vaux -
6	Out 0	6	Vaux +
7	Out 1	7	Vaux +

Configure the Module

POINT I/O modules send (consume) and receive (produce) I/O messages. You map these messages into processor memory.

This module produces 6 or 10 bytes of input data (scanner Rx) (status). It consumes 2 or 4 bytes of I/O data (scanner Tx).

Use Parameter	To Select Assembly	For Data
23 and 24	101, 102, or 103	Produced
25	105, 106, or 107	Consumed

Set parameter 25 to zero to reenable parameter 4, Active Output.

Default Data Map

Message size: 6 or 10 Bytes																
	15	**14**	**13**	**12**	**11**	**10**	**09**	**08**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Produces (scanner Rx)	Channel 0 value of present counter state (LSW)															
	Channel 0 value of present counter state (MSW)															
	PE	EF	NR	0	FS	FS	OS	OS	0	ZS	BS	AS	C1	C0	ZD	0
	Where: PE = Programming error EF = EEPROM fault status NR = Not ready status bit FS = Output fault status bit - bit 10 for output 0, bit 11 for output 1 OS = Output on/off status bit - bit 8 for output 0, bit 9 for output 1 ZS = Z input status BS = B input status AS = A input status C = Stored data count ZD = Zero frequency detected LSW = Least significant word MSW = Most significant word															

When you send a configuration to the module, you check it for consistency before applying it.

Monitor this PE bit with your user program to isolate any problems with an improperly configured module. If the configuration is acceptable, the counter ASIC is disabled while the ASIC is loaded with new operational parameters. Outputs can turn off during this reconfiguration.

	08 thru 15	07	06	05	04	03	02	01	00
Consumes (scanner Tx)	0	0	0	0	0	0	VR	CP	CR
	0	DS	ES	OE	FO	DS	ES	OE	FO
	Where: VR = Value reset of stored/accumulated count CP = Counter preset CR = Counter reset DS = Diagnostic speed ES = Electronic fuse select OE = Output enable FO = Force output								

Module Configuration

Parameter	Set/Get	Description	Bytes
1	Set/Get	Counter Configuration	1
2	Set/Get	Filter Selection	1
3	Set/Get	Decimal Position	1
4	Set/Get	Active Output Assembly	1
5	Set/Get	Time Base Value/PWM Period	2
6	Set/Get	Gate Interval	1
7	Set/Get	Channel Scalar	1
8	Set/Get	Output 0 Ties	1
9	Set/Get	Output 1 Ties	1
10	Set/Get	Channel Rollover Value	4
11	Set/Get	Channel Preset Value	4

Module Configuration

12	Set/Get	ON Value 1	4
13	Set/Get	OFF Value 1	4
14	Set/Get	ON Value 2	4
15	Set/Get	OFF Value 2	4
16	Set/Get	ON Value 3	4
17	Set/Get	OFF Value 3	4
18	Set/Get	ON Value 4	4
19	Set/Get	OFF Value 4	4
20	Set/Get	PWM Safe State Value	2
21	Set/Get	Counter Control Safe State	1
22	Set/Get	Output Control Safe State	1
23	Set/Get	Requested Poll Produce Assembly	1
24	Set/Get	Requested COS Produce Assembly	1
25	Set/Get	Requested Poll Consume Assembly	1

Counter Configuration

07	06	05	04	03	02	01	00	
ZI	**MD**			**CF**				**Counter 0**
				0	0	0	0	Counter
				0	0	0	1	Encoder X1
				0	0	1	0	Encoder X2
				0	0	1	1	PWM
				0	1	0	0	Encoder X4
				0	1	0	1	Period/Rate
				0	1	1	0	Continuous/Rate
				0	1	1	1	Rate Measurement
				1	0	0	0	Pulse Generator
	0	0	0					Store Count Disabled
	0	0	1					Mode 1 - store/continue
	0	1	0					Mode 2 - store/wait/resume
	0	1	1					Mode 3 - store, reset/wait/start
	1	0	0					Mode 4 - store, reset/start
	1	0	1					Reserved
	1	1	0					Reserved
	1	1	1					Reserved
0								Z input - 0 = not inverted
1								Z input - 1 = inverted

Filter Selection

07	06	05	04	03	02	01	00	
0	**ZF**	**BF**	**AF**	**FS**				
				0	0	0	0	No Filter
				0	0	0	1	50 kHz (10 µs + 0 µs/-1.6 µs)
				0	0	1	0	5 kHz (100 µs + 0 µs/-13.2 µs)
				0	1	0	0	500 Hz (1.0 ms + 0 ms/-125 µs)
				1	0	0	0	50 Hz (10 ms + 0 ms/-1.25 ms)
			0					A input not filtered
			1					A input filtered
		0						B input not filtered
		1						B input filtered
	0							Z input not filtered
	1							Z input filtered

Assumes a 50% duty cycle signal.

Scalar Selection

07	06	05	04	03	02	01	00	Scalar[1]
0	0	0	0	0	0	0	1	Z - F_{min} = 0.149 Hz
0	0	0	0	0	0	1	0	Z/2 - F_{min} = 0.298 Hz
0	0	0	0	0	1	0	0	Z/4 - F_{min} = 0.596 Hz
0	0	0	0	1	0	0	0	Z/8 - F_{min} = 1.192 Hz
0	0	0	1	0	0	0	0	Z/16 - F_{min} = 2.384 Hz
0	0	1	0	0	0	0	0	Z/32 - F_{min} = 4.768 Hz
0	1	0	0	0	0	0	0	Z/64 - F_{min} = 9.537 Hz
1	0	0	0	0	0	0	0	Z/128 - F_{min} = 19.073 Hz

(1) Where Fmin indicates the frequency at which the zero frequency detect is asserted due to counter overflow.

Assemblies

The module uses several words to communicate real-time input and output data as well as non-real-time module information (i.e. description, revision, etc) and configuration. The table shows the words you can exchange. You can read (get) or write (set) data using an Explicit Message.

Instances (Dec/Hex)	**Services**	**Field**	**Bytes**
#101 (0x65)	Get	Present Channel Data	4
		Status	2
#102 (0x66)	Get	Stored Channel Data	4
		Status	2
#103 (0x67)	Get	Present Channel Data	4
		Stored Channel Data	4
		Status	2
#104 (0x68)	Get	Programming Error Code	2
#105 (0x69)	Set/Get	Counter Control	1
		Output Control	1
#106 (0x6a)	Set/Get	PWM Value	2
#107 (0x6b)	Set/Get	PWM Value	2
		Counter Control	1
		Output Control	1
#108 (0x6c)	Set/Get	Counter Configuration	1
		Filter Selection	1
		Decimal Position	1
		Active Output Assembly	1
		Time Base or PWM Period	2
		Gate Interval	1

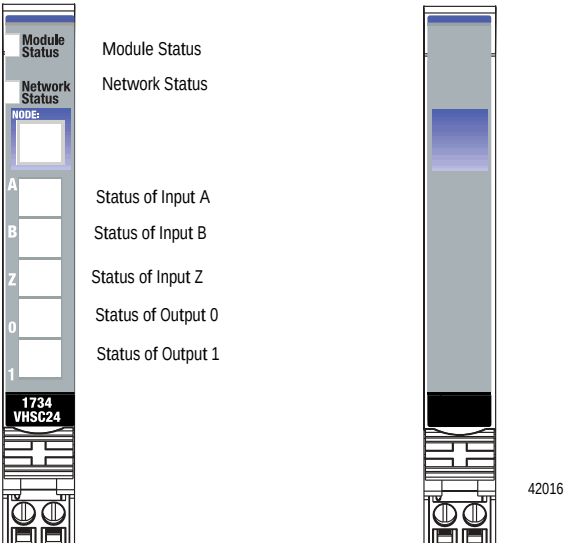
Assemblies

		Scalar	1
		Output 0 Ties	1
		Output 1 Ties	1
		Rollover Value	4
		Preset Value	4
		ON Value # 1	4
		OFF Value #1	4
		ON Value # 2	4
		OFF Value #2	4
		ON Value # 3	4
		OFF Value #3	4
		ON Value # 4	4
		OFF Value #4	4
		PWM Safe State Value	2
		Counter Control SSV	1
		Output Control SSV	1
#123 (0x7b)	Set/Get	Counter Configuration	1
		Filter Selection	1
		Decimal Position	1
		Reserved (set to 0)	1
		Time Base or PWM Period	2
		Gate Interval	1
		Scalar	1
		Output 0 Ties	1
		Output 1 Ties	1
		Alignment (reserved = 0)	2

Assemblies

		Rollover Value	4
		Preset Value	4
		ON Value # 1	4
		OFF Value #1	4
		ON Value # 2	4
		OFF Value #2	4
		ON Value # 3	4
		OFF Value #3	4
		ON Value # 4	4
		OFF Value #4	4
		PWM Safe State Value	2
		Counter Control SSV	1
		Output Control SSV	1

Troubleshooting



Indication	Probable Cause
Module Status	
Off	No power applied to device.
Green	Device is operating normally.
Flashing Green	Device needs commissioning due to configuration missing, incomplete, or incorrect.
Flashing Red	Recoverable fault is present.
Red	Unrecoverable fault may require device replacement.
Flashing Red/Green	Device is in self-test.

Indication	Probable Cause
Network Status	
Off	Device is not online. - Device has not completed dup_MAC_id test. - Device is not powered. Check module status indicator.
Flashing Green	Device is online but has no connections in the established state.
Green	Device is online and has connections in the established state.
Flashing Red	One or more I/O connections are in timed-out state.
Red	Critical link failure is present with failed communication device. Device detected error that prevents it communicating on the network.
Flashing Red/Green	Communication faulted device is present with device detecting a network access error and in communication faulted state. Device received and accepted an Identify Communication Faulted Request - long protocol message.

Indication	Probable Cause
Input Status	
Off	Input is inactive.
Yellow	Input is active and under control.
Flashing Yellow	Input is toggling on and off.

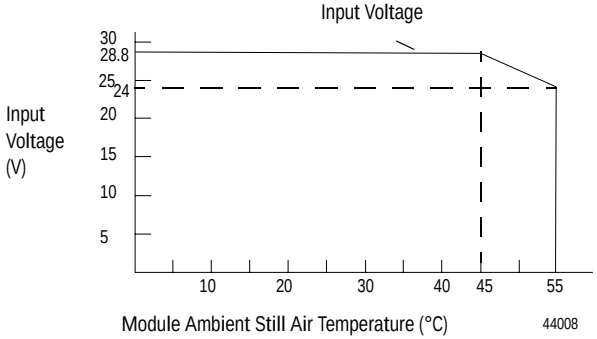
Indication	Probable Cause
Output Status	
Off	Output is inactive.
Yellow	Output is active and under control.
Flashing Yellow	Output is toggling.
Flashing Red	Output is faulted (open, short or no output power).
Flashing Red/Yellow	Output is toggling and faulted (possibly open).

Specifications

Input Specifications

Specification	1734-VHSC24	1734-VHSC5
Number of Inputs	1 - 1 group of A/Areturn, B/Breturn and Z/Zreturn	
Input Voltage	15…24V dc	5V dc
Input Current	6.1 mA @ 15V dc 10.2 mA @ 24V dc	19.1 mA @ 5V dc 25.7 mA @ 6V dc
Input OFF-State Current	≤0.250 mA max.	
Input OFF-State Voltage	≤1.8V dc	≤1.25V dc
Input ON-State Current	≥5 mA	
Input OFF-State Voltage	≥12.5V dc	≥2.6V dc
Maximum ON-State Voltage	Refer to Input Derating Curve.	±6V
Input Filter Selections	Off 10 µs 100 µs 1.0 ms 10.0 ms	
Maximum Input Frequency	1.0 MHz counter and encoder X1 configurations 500 kHz encoder X2 configuration (no filter) 250 kHz encoder X4 configuration (no filter)	

Input Derating Curve for 1734-VHSC24



IMPORTANT Exceeding the maximum input voltage can cause permanent damage to the input.

Output Specifications

Specficication	Value
Number of Outputs	1 isolated group of 2 capable of 0.5 A @ 24V dc
Output Control	Outputs can be tied to any of 4 compare windows
Output Supply Voltage Range	10…28.8V dc
OFF-State Leakage Current	≤0.5 mA
ON-State Voltage Drop	≤0.3V dc @ 0.5 A
ON-State Current	0.5 A maximum

Output Specifications

Short Circuit Current	6 A - Outputs are short circuit protected and either cycle until you correct the fault or latch off (depending upon programming). Short circuit is detected when output turns on.
Open Wire Detection	Open wire is detected when output is turned off.
Delay Time[1] OFF to ON ON to OFF	 25 µs (load dependent) 150 µs (load dependent)

(1) Off/on delay is time from a valid output "on" signal to output energization.
On/off delay is time from a valid output "off" signal to output deenergization.

General Specifications

Specification	**1734-VHSC24**	**1734-VHSC5**
Module Location	1734-TB, 1734-TBS, 1734-TB3, 1734-TB3S wiring base assembly	
Keyswitch Position	2	
POINTBus Current	180 mA maximum	
Power Dissipation	1.9 W maximum @ rated load	1. 5W maximum @ rated load
Thermal Dissipation	6.5 BTU/hr maximum @ rated load	5.1 BTU/hr maximum @ rated load
Isolation Voltage (Continuous-voltage Withstand Rating)	50V continuous Tested to withstand 1100V dc for 60 s	
External dc Power (does not represent power required to supply outputs)	No additional external power required to power module	
Field Power Bus	24V nominal; range 10…28.8V dc	

General Specifications

Weight	0.03 kg (0.07 lb)
Terminal Base Screw Torque	0.6 Nm (7 in-lb)
Dimensions Millimeters Inches	56.0H x 12.0W x 75.5L mm 2.21H x 0.47W x 2.97L in

Environmental Specifications

Specification	Value
Operational Temperature	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)
Storage Temperature	IEC60068-2-1 (Test Ab, Unpackaged Non-operating Cold) IEC60068-2-2 (Test Bb, Unpackaged Non-operating Dry Heat) IEC60068-2-14 (Test Na, Unpackaged Non-operating Thermal Shock) -40...85 °C (-40...185 °F)
Relative Humidity	IEC60068-2-30 (Test Db, Unpackaged Non-operating Damp Heat) 5...95% non-condensing
Vibration	IEC 60068-2-6 (Test Fc, Operating) 5 g @ 10-500 Hz
Shock Operating	IEC60068-2-27 (Test Ea, Unpackaged Shock) 30 g
Shock Non-operating	IEC60068-2-27 (Test Ea, Unpackaged Shock) 50 g
Emissions	CISPR 11: Group 1, Class A
ESD Immunity	IEC6100-4-2 6 kV contact discharges 8 kV air discharges

Environmental Specifications

Radiated RF Immunity	IEC 61000-4-3 10 V/m with 1KHz sine-wave 80%AM from 30 MHz to 2000 MHz 10 V/m with 200 Hz 50% Pulse 100%AM at 900 MHz
EFT/B Immunity	IEC 61000-4-4 ±4 kV at 2.5 kHz on signal ports
Surge Transient Immunity	IEC 61000-4-5 ±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF Immunity	IEC61000-4-6 10 Vrms with 1 kHz sine-wave 80%AM from 150 kHz to 80 MHz
Enclosure Type Rating	None (open-style)
Wire Size	#22…#14 AWG (0.324…2.08 sq. mm) solid or stranded copper wire rated @ 75 °C or greater 3/64 inch (1.2 mm) insulation maximum
Wiring Category(1)	1 - on signal ports

(1) Use this conductor category information for planning conductor routing as described in publication 1770-4.1, “Industrial Automation Wiring and Grounding Guidelines.”

Certifications

Certifications	Value	
Certification[1]	c-UL-us	UL Listed Industrial Control Equipment, certified for U.S. and Canada
(when product is marked)	c-UL-us	UL Listed for Class I, Division 2, Group A,B,C,D Hazardous Locations, certified for U.S. and Canada
	CE	European Union 89/336/EEC EMC Directive, compliant with: EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions
	C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR11; Industrial Emissions
	EEx	European Union 94/9/EC ATEX Directive, compliant with: EN 50021; Potentially Explosive Atmospheres, Protection “n” (Zone 2)

(1) See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Additional Resources

For related information, refer to the Very High Speed Counter Module User Manual, publication number 1734-UM003. It is available from http://literature.rockwellautomation.com.

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using its products. At http://support.rockwellautomation.com, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://support.rockwellautomation.com.

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running:

United States	1.440.646.3223 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

Rockwell tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned:

United States	Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for return procedure.

www.rockwellautomation.com

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