Installation Instructions

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

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

Catalog Numbers 1734-VHSC5, 1734-VHSC24, 1734-VHSC24K, Series C

Catalog numbers with the suffix 'K' are conformal coated and their specifications are the same as non-conformal coated catalogs.

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Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

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Rockwell Automation

ATTENTION: Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.
Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice. If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
注意：在安装、配置、操作和维护本产品前，请阅读本文档以及 “其他资源” 部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。
安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。
如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。
ATENCIÓN: Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.
El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable. Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.
ATENÇÃO: Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.
É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.
Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.
ВНИМАНИЕ: Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.
Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.
Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.
注意：本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。
設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。
本機器が製造メーカにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。
ACHTUNG: Lesen Sie dieses Dokument und die im Abschnitt „Weitere Informationen“aufgeführten Dokumente, die Informationen zu Installation, Konfiguration und Bedienung dieses Produkts enthalten, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder warten. Anwender müssen sich neben den Bestimmungen aller anwendbaren Vorschriften, Gesetze und Normen zusätzlich mit den Installations- und Verdrahtungsanweisungen vertraut machen.
Arbeiten im Rahmen der Installation, Anpassung, Inbetriebnahme, Verwendung, Montage, Demontage oder Instandhaltung dürfen nur durch ausreichend geschulte Mitarbeiter und in Übereinstimmung mit den anwendbaren Ausführungsvorschriften vorgenommen werden.
Wenn das Gerät in einer Weise verwendet wird, die vom Hersteller nicht vorgesehen ist, kann die Schutzfunktion beeinträchtigt sein.
ATTENTION : Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l'installation, la configuration et le fonctionnement de cet équipement avant d'installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d'installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.
Les activités relatives à l'installation, le réglage, la mise en service, l'utilisation, l'assemblage, le démontage et l'entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.
Si cet équipement est utilisé d'une façon qui n'a pas été définie par le fabricant, la protection fournie par l'équipement peut être compromise.
주의 : 본 제품 설치 , 설정 , 작동 또는 유지 보수하기 전에 본 문서를 포함하여 설치 , 설정 및 작동에 관한 참고 자료 섹션의 문서들을 반드시 읽고 숙지하십시오 . 사용자는 모든 관련 규정 , 법규 및 표준에서 요구하는 사항에 대해 반드시 설치 및 배선 지침을 숙지해야 합니다 .
설치 , 조정 , 가동 , 사용 , 조립 , 분해 , 유지보수 등 모든 작업은 관련 규정에 따라 적절한 교육을 받은 사용자를 통해서만 수행해야 합니다 .
본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다 .
ATTENZIONE Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione “Altre risorse”, riguardanti l'installazione, la configurazione ed il funzionamento dell'apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.
Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.
Qualora l'apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.
DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.
Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulama yönetmeliklerine uygun şekilde yapılabilir.
Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.
注意事項：在安裝、設定、操作或維護本產品前，請先閱讀此文件以及列於 「其他資源」章節中有關安裝、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。
包括安装、調整、交付使用、使用、組裝、拆卸和維護等動作都必須交由已經過適當訓練的人員進行，以符合適用的實作法規。
如果將設備用於非製造商指定的用途時，可能會造成設備所提供的保護功能受損。
POZOR: Než začnete instalovat, konfigurovat či provozovat tento výrobek nebo provádět jeho údržbu, přečtěte si tento dokument a dokumenty uvedené v části Dodatečné zdroje ohledně instalace, konfigurace a provozu tohoto zařízení. Uživatelé se musejí vedle požadavků všech relevantních vyhlášek, zákonů a norem nutně seznámit také s pokyny pro instalaci a elektrické zapojení.
Činnosti zahrnující instalaci, nastavení, uvedení do provozu, užívání, montáž, demontáž a údržbu musí vykonávat vhodně proškolený personál v souladu s příslušnými prováděcími předpisy.
Pokud se toto zařízení používá způsobem neodpovídajícím specifikaci výrobce, může být narušena ochrana, kterou toto zařízení poskytuje.
UWAGA: Przed instalacją, konfiguracją, użytkowaniem lub konserwacją tego produktu należy przeczytać niniejszy dokument oraz wszystkie dokumenty wymienione w sekcji Dodatkowe źródła omawiające instalację, konfigurację i procedury użytkowania tego urządzenia. Użytkownicy mają obowiązek zapoznać się z instrukcjami dotyczącymi instalacji oraz oprzewodowania, jak również z obowiązującymi kodeksami, prawem i normami.
Działania obejmujące instalację, regulację, przekazanie do użytkowania, użytkowanie, montaż, demontaż oraz konserwację muszą być wykonywane przez odpowiednio przeszkolony personel zgodnie z obowiązującym kodeksem postępowania.
Jeśli urządzenie jest użytkowane w sposób inny niż określony przez producenta, zabezpieczenie zapewniane przez urządzenie może zostać ograniczone.
OBS! Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfigurering och drift av denna utrustning innan du installerar, konfigurerar eller börjar använda eller utföra underhållsarbete på produkten. Användare måste bekanta sig med instruktioner för installation och kabeldragning, förutom krav enligt gällande koder, lagar och standarder.
Åtgärder som installation, justering, service, användning, montering, demontering och underhållsarbete måste utföras av personal med lämplig utbildning enligt lämpligt bruk.
Om denna utrustning används på ett sätt som inte anges av tillverkaren kan det hända att utrustningens skyddsanordningar försätts ur funktion.
LET OP: Lees dit document en de documenten die genoemd worden in de paragraaf Aanvullende informatie over de installatie, configuratie en bediening van deze apparatuur voordat u dit product installeert, configureert, bedient of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsinstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.
Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.
Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

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 EN/IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.
This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. 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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain more information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for more installation requirements.
- NEMA Standard 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

Prevent Electrostatic Discharge

ATTENTION: 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.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

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.
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.	**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 I Division 2.

UK and European Hazardous Location Approval

The following applies to products marked ⟨Ex⟩ II 3 G:

- Are intended for use in potentially explosive atmospheres as defined by UKEX regulation 2016 No. 1107 and European Union Directive 2014/34/EU and 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 Zone 2 potentially explosive atmospheres, given in Schedule 1 of UKEX and Annex II of this Directive.
- Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN IEC 60079-7, and EN IEC 60079-0.
- Are Equipment Group II, Equipment Category 3, and comply with the Essential Health and Safety Requirements relating to the design and construction of such equipment given in Schedule 1 of UKEX and Annex II of EU Directive 2014/34/EU. See the UKEx and EU Declaration of Conformity at rok.auto/certifications for details.
- The type of protection is Ex ec IIC T4 Gc according to EN IEC 60079-0:2018, EXPLOSIVE ATMOSPHERES - PART 0: EQUIPMENT - GENERAL REQUIREMENTS, Issue Date 07/2018, and CENELEC EN IEC 60079-7:2015+A1:2018, Explosive atmospheres. Equipment protection by increased safety "e".
- Comply with Standard EN IEC 60079-0:2018, EXPLOSIVE ATMOSPHERES - PART 0: EQUIPMENT - GENERAL REQUIREMENTS, Issue Date 07/2018, and CENELEC EN IEC 60079-7:2015+A1:2018 Explosive atmospheres. Equipment protection by increased safety "e", reference certificate number DEMKO 04 ATEX 0330347X and UL22UKEX2478X.
- Are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification according to UKEX regulation 2016 No. 1107 and ATEX directive 2014/34/EU.
- May have catalog numbers followed by a "K" to indicate a conformal coating option.

WARNING: Special Conditions for Safe Use

- This equipment is not resistant to sunlight or other sources of UV radiation.
- This equipment shall be mounted in an UKEX/ATEX/IECEx Zone 2 certified enclosure with a minimum ingress protection rating of at least IP54 (in accordance with EN/IEC 60079-0) and used in an environment of not more than Pollution Degree 2 (as defined in EN/IEC 60664-1) when applied in Zone 2 environments. The enclosure must be accessible only by the use of a tool.
- This equipment shall be used within its specified ratings that are defined by Rockwell Automation.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The instructions in the user manual shall be observed.
- This equipment must be used only with UKEX/ATEX/IECEx certified Rockwell Automation backplanes.
- Earthing is accomplished through mounting of modules on rail.
- Devices shall be used in an environment of not more than Pollution Degree 2.

IEC Hazardous Location Approval

The following applies to products with IECEx certification:

- Are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification to IEC 60079-0.
- The type of protection is Ex eC IIC T4 Gc according to IEC 60079-0 and IEC 60079-7.
- Comply with Standards IEC 60079-0, Explosive atmospheres - Part 0: Equipment - General requirements, Edition 7, Revision Date 2017 and IEC 60079-7, 5.1 Edition revision date 2017, Explosive atmospheres - Part 7: Equipment protection by increased safety "e", reference IECEx certificate number IECEx UL 20.0072X.
- May have catalog numbers followed by a “K” to indicate a conformal coating option.

ATTENTION:

- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Read this document and the documents listed in the Additional Resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.
- Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.
  In case of malfunction or damage, no attempts at repair should be made. The module should be returned to the manufacturer for repair. Do not dismantle the module.
- This equipment is certified for use only within the surrounding air temperature range of -20...+55 °C (-4...+131 °F). The equipment must not be used outside of this range.
- Use only a soft dry anti-static cloth to wipe down equipment. Do not use any cleaning agents.

ATTENTION:

- To comply with UL restrictions, the secondary circuit (backplane) must be powered from a source compliant with Class 2 or Limited Voltage/Current.
- This equipment is not resistant to sunlight or other sources of UV radiation.

WARNING:

- If you insert or remove the module while backplane power is on, an electric 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.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

Before You Begin

The following POINT I/O modules are referred to in this publication:

- 1734-VHSC5, Series C, POINT I/O 5V DC very high-speed counter module
- 1734-VHSC24, 1734-VHSC24K, 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 screws 4 and 5 and screws 6 and 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™.

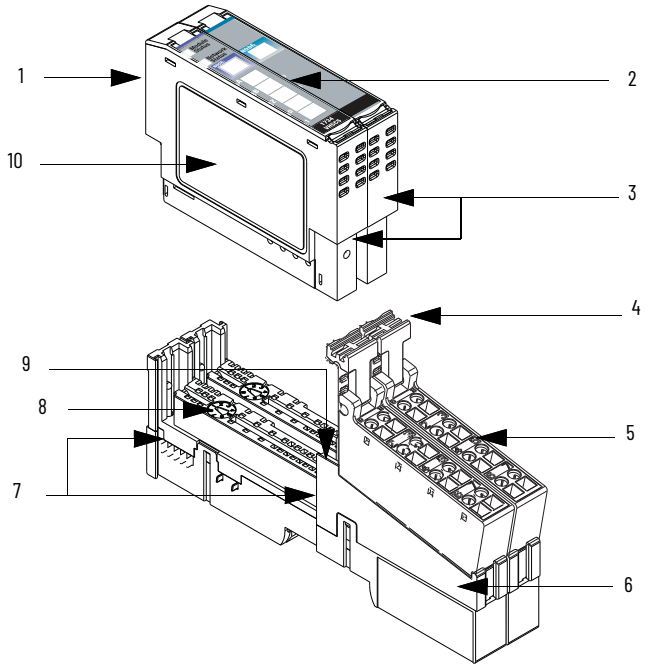
Mount module 2 adjacent to module 1.

Note that this POINT I/O series C product can be used with the following:

- DeviceNet® and PROFIBUS adapters
- ControlNet® and EtherNet/IP™ adapters, using Studio 5000 Logix Designer® application version 20 or higher

See Figure 1 to familiarize yourself with major parts of the module, noting that the wiring base assembly is the 1734-TB or 1734-TBS POINT I/O two-piece terminal base, which includes the 1734-RTB or 1734-RTBS removable terminal block, and 1734-MB mounting base.

Figure 1 - POINT I/O Very High-speed Counter Module with 1734-TB or 1734-TBS Base



	Description		Description
1	Module locking mechanism	6	1734-TB or 1734-TBS mounting base
2	Slide-in writable label	7	Interlocking side pieces
3	Insertable I/O module	8	Mechanical keying (orange)
4	Removable Terminal Block (RTB) handle	9	DIN rail locking screw (orange)
5	RTB with screw or spring clamp	10	Module wiring diagram

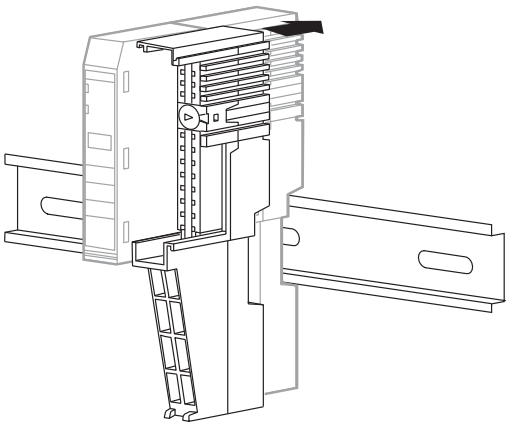
Install the Mounting Base

To install the mounting base on the DIN rail (Allen-Bradley® part number 199-DR1; 46277-3; EN50022), proceed as follows:

ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated chromate-passivated steel DIN rail to assure proper grounding. The use of other DIN rail materials (for example, aluminum or plastic) 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 in.) and use end-anchors appropriately. Be sure to ground the DIN rail properly. See the Industrial Automation Wiring and Grounding Guidelines, Rockwell Automation publication 1770-4.1, for more information.

WARNING: When used in a Class I Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring method that complies with the governing electrical codes.

1. Position the mounting base vertically above the installed units (adapter, power supply, or existing module).



2. Slide the mounting base down allowing the interlocking side pieces to engage the adjacent module or adapter.
3. Press firmly to seat the mounting base on the DIN rail. The mounting base snaps into place.

Install the Module

The module can be installed before or after base installation. Make sure that the mounting base is correctly keyed before installing the module into the mounting base. In addition, make sure that the mounting base locking screw is positioned horizontally with reference to the base.

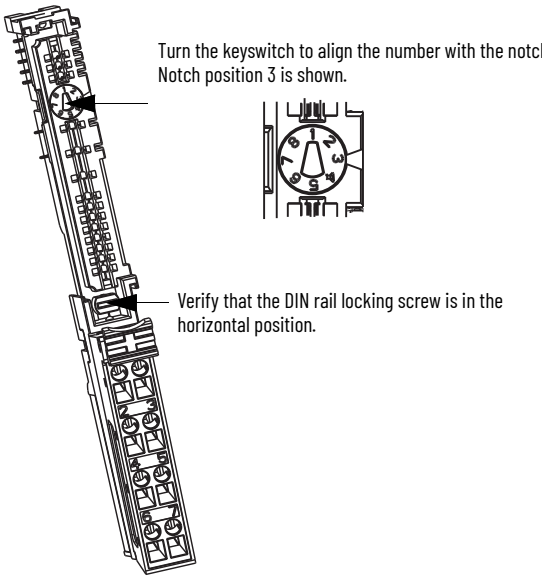
WARNING: When you insert or remove the module while backplane power is on, an electric arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts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

To install the module, proceed as follows:

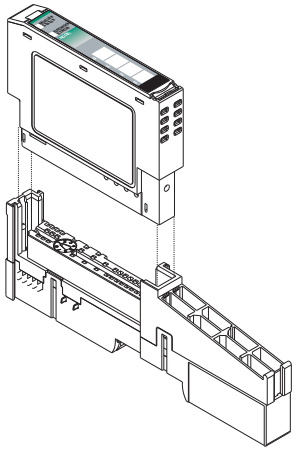
1. Use a bladed screwdriver to rotate the keyswitch on the mounting base clockwise until the number required for the type of module you are installing aligns with the notch in the base.

2. Verify that the DIN rail locking screw is in the horizontal position. You cannot insert the module if the locking mechanism is unlocked.

1734-TB Base



3. Insert the module straight down into the mounting base and press to secure. The module locks into place.



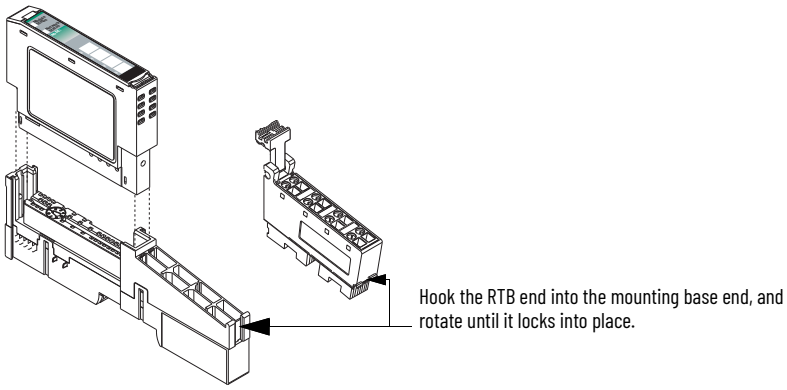
Install the Removable Terminal Block

An RTB is supplied with your wiring base assembly. To remove, pull up on the RTB handle. This allows the mounting base to be removed and replaced as necessary without removing any of the wiring. To reinsert the RTB, proceed as follows:

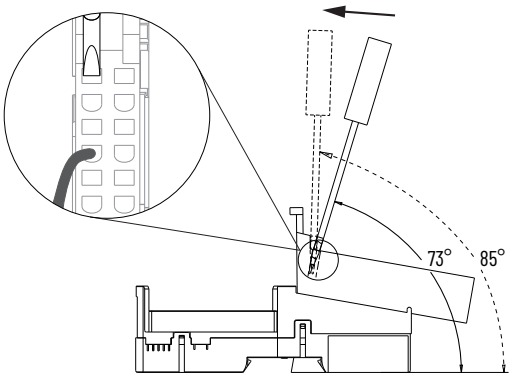
WARNING:
- When you connect or disconnect the RTB with field side power applied, an electric arc can occur. This could cause an explosion in hazardous location installations.
- Be sure that power is removed or the area is nonhazardous before proceeding.

1. Insert the end opposite to 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 an I/O module is installed, snap the RTB handle into place on the module.



WARNING: For 1734-RTBS and 1734-RTB3S, to latch and unlatch the wire, insert a bladed screwdriver (catalog number 1492-N90 – 3 mm [0.12 in.] diameter blade) into the opening at approximately 73° (blade surface is parallel with top surface of the opening) and push up gently.



Remove a Mounting Base

To remove a mounting base, you must remove any installed module, and the module installed in the base to the right. Remove the RTB, if wired.

WARNING: When you insert or remove the module while backplane power is on, an electric 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.

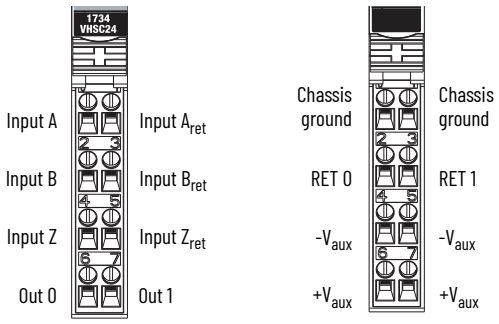
WARNING: When you connect or disconnect the RTB with field side power applied, an electric arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding.

1. Unlatch the RTB handle on the I/O module.
2. Pull on the RTB handle to remove the removable terminal block.
3. Press on the module lock on the top of the module.
4. Pull on the I/O module to remove from the base.
5. Repeat steps 1, 2, 3, and 4 for the module to the right.
6. Use a small bladed screwdriver to rotate the orange base locking screw to a vertical position. This releases the locking mechanism.
7. Lift straight up to remove.

Wire the Module

WARNING: If you connect or disconnect wiring while the field-side power is on, an electric 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.

Figure 2 - POINT I/O VHSC Module



Module 1		Module 2	
0 A	1 A_{ret}	0 Chas gnd	1 Chas gnd
2 B	3 B_{ret}	2 RET 0	3 RET 1
4 Z	5 Z_{ret}	4 $-V_{aux}$	5 $-V_{aux}$
6 Out 0	7 Out 1	6 $+V_{aux}$	7 $+V_{aux}$

Module 1 Terminations		Module 2 Terminations	
0	A	0	Chassis ground
1	A_{ret}	1	Chassis ground
2	B	2	Out 0 RET
3	B_{ret}	3	Out 1 RET
4	Z	4	V_{aux} -
5	Z_{ret}	5	V_{aux} -
6	Out 0	6	V_{aux} +
7	Out 1	7	V_{aux} +

Communicate with the Module

POINT I/O modules send (produce) and receive (consume) I/O data (messages). You map these data onto the processor memory.
These modules produce 6 or 10 bytes of input data (scanner Rx) and fault status data. These modules consume 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 re-enable 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:	LSW = Least significant word MSW = Most significant word 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															

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.

Message size: 2 Bytes or 4 Bytes

	08...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	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
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	Counter 0
ZI		MD		CF				
				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

Counter Configuration (Continued)

07	06	05	04	03	02	01	00	Counter 0
ZI		MD		CF				
	1	0	0					Mode 4 – Store, reset/start
	1	0	1					Reserved
	1	1	0					Reserved
				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	Counter 0
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						B input filtered
	0							Z input not filtered
	1							Z input filtered

(1) Where F_{min} indicates the frequency at which the zero frequency detect is asserted due to counter overflow.

The module uses several words to communicate real-time input and output data as well as non-real time module information (for example, description, and revision) and configuration. The table shows the words that you can exchange. You can read (Get) or write (Set) data using an Explicit Message.

Assemblies

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
		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
		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

Assemblies (Continued)

Instances (Dec/Hex)	Services	Field	Bytes
		ON value #4	4
		OFF value #4	4
		PWM safe state value	2
		Counter control SSV	1
		Output control SSV	1

Interpret Status Indicators

See the Figure 3 and Table 1 for information on how to interpret the status indicators.

Figure 3 - POINT I/O VHSC Module Status Indicators

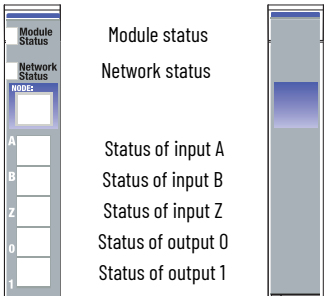


Table 1 - Indicator Status for Modules

State	Status	Description
Module status	Off	No power is applied to the device.
	Flashing green	The device needs commissioning due to missing, incomplete, or incorrect configuration.
	Green	The device is operating normally.
	Flashing red	Recoverable fault
	Red	An unrecoverable fault that requires device replacement.
	Flashing red/green	The device is in self-test mode.
Network status	Off	The device is not online: - The device has not completed the dup_MAC-id test. – The device is not powered – Check the module status indicator.
	Flashing green	The device is online but has no connections in the established state.
	Green	The device is online and has connections in the established state.
	Flashing red	One or more I/O connections are in a timed-out state.
	Red	Critical link failure – Failed communication device. The device has detected an error that prevents it from communicating on the network.
	Flashing red/green	Communication faulted device – The device has detected a network access error and is in communication faulted state. The device has received and accepted an Identity Communication Faulted Request – Long protocol message.
Input status	Off	The input is inactive.
	Flashing yellow	The input is toggling On and Off.
	Yellow	The input is active and under control.
Output status	Off	The output is inactive.
	Flashing yellow	The output is toggling.
	Yellow	The output is active and under control.
	Flashing red	The output is faulted (open, short, or no output power).
	Flashing red/yellow	The output is toggling and faulted (possibly open).

Specifications

Input Specifications

Attribute	1734-VHSC5	1734-VHSC24, 1734-VHSC24K
Number of inputs	1 – 1 group of A/A_{ret}, B/B_{ret} and Z/Z_{ret}	
Input voltage	5V DC	24V DC
Input current	19.1 mA @ 5V DC 25.7 mA @ 6V DC	6.1 mA @ 15V DC 10.2 mA @ 24V DC
Input OFF-state current, max	≤ 0.250 mA	
Input OFF-state voltage	≤ 1.25V DC	≤ 1.8V DC
Input ON-state current	≥ 5 mA	
Input ON-state voltage	≥ 2.6V DC	≥ 12.5V DC
Maximum ON-state voltage	± 6V	See Figure 4
Input filter selections	50 Hz 500 Hz 5 kHz 50 kHz No filter	
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)	

Output Specifications

Attribute	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, max	0.5 A, Pilot Duty
Short-circuit current	6 A – Outputs are short-circuit protected and either cycle until you correct the fault or latch off, depending on programming. Short circuit is detected when the output turns On.
Open-wire detection	Open wire is detected when the output is turned Off.
Delay time[1] OFF to ON ON to OFF	 25 µs (load dependent) 150 µs (load dependent)

(1) OFF to ON delay is time from a valid output "On" signal to output energization. ON to OFF delay is time from a valid output "Off" signal to output de-energization.

General Specifications

Attribute	1734-VHSC5	1734-VHSC24, 1734-VHSC24K
Terminal base	1734-TB, 1734-TBS wiring base assembly	
Terminal base screw torque	0.6 N•m (7 lb•in)	
Keyswitch position	2	
POINTBus current, max	180 mA	
Power dissipation, max @ rated load	1.5 W	1.9 W
Thermal dissipation, max @ rated load	5.1 BTU/hr	6.5 BTU/hr
Isolated voltage	50V (continuous), Basic Insulation Type, Tested @ 1100V DC for 60 s, field to system	
External DC power (does not represent power required to supply outputs)	No additional external power is required to power the module.	
Field power bus, nom	24V	
Field power bus, range	10…28.8V DC	
Dimensions (H x W x D), approx.	56.0 x 12.0 x 75.5 mm (2.21 x 0.47 x 2.97 in.)	
Weight	0.03 kg (0.07 lb)	
Wiring category[1] [2]	1 – on signal ports	
Wire size	0.34…2.1 mm^2 (22…14 AWG) solid or stranded copper wire rated @ 75 °C (167 °F), or greater, 1.2 mm (3/64 in.) insulation max	
Enclosure type rating	None (open-style)	

General Specifications (Continued)

Attribute	1734-VHSC5	1734-VHSC24, 1734-VHSC24K
North American temp code	T4A	
UKEX/ATEX temp code	T4	
IECEx temp code	T4	

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

Environmental Specifications

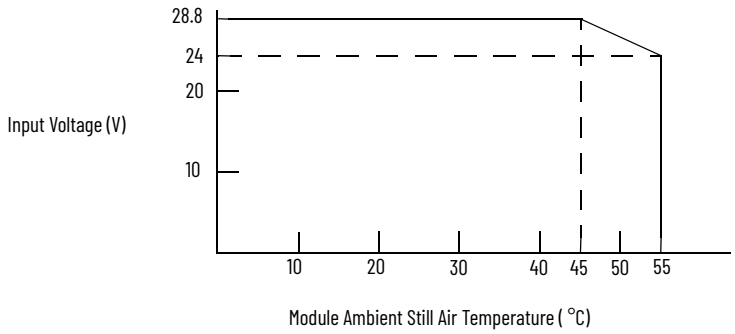
Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20 °C ≤ Ta ≤ +55 °C (-4 °F ≤ Ta ≤ +131 °F)
Temperature, surrounding air, max	55 °C (131 °F)
Temperature, nonoperating	IEC 60068-2-1 (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)
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	IEC60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g
Emissions	IEC 61000-6-4
ESD immunity	IEC6100-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...6000 MHz
EFT/B immunity	IEC 61000-4-4: ±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 signal ports ±2 kV line-earth (CM) on shielded ports
Conducted RF immunity	IEC61000-4-6: 10V rms with 1 kHz sine-wave 80% AM @ 150 kHz...80 MHz

Certifications

Certification (when product is marked)[1]	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
UK and CE	UK Statutory Instrument 2016 No. 1091 and European Union 2014/30/EU EMC Directive, 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) UK Statutory Instrument 2012 No. 3032 and European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical documentation
RCM	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	UK Statutory Instrument 2016 No. 1107 and European Union 2014/34/EU ATEX Directive, compliant with: EN IEC 60079-0; General Requirements EN IEC 60079-7; Explosive Atmospheres, Protection "e" II 3 G Ex ec IIC T4 Gc DEMKO 04 ATEX 0330347X UL22UKEX2478X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436
CCC	CNCA-C23-01 强制性产品认证实施规则 防爆电气 CNCA-C23-01 CCC Implementation Rule Explosion-Proof Electrical Products CCC: 2020122309111607
IECEx	IECEx System, compliant with: IEC 60079-0; General Requirements IEC 60079-7; Explosive Atmospheres, Protection "e" II 3 G Ex ec IIC T4 Gc IECEx UL 20.0072X

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

Figure 4 - Input Derating Curve for 1734-VHSC24 and 1734-VHSC24K



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

Additional Resources

For more information on the products that are described in this publication, use these resources. You can view or download publications at rok.auto/literature.

Resource	Description
POINT I/O Modules Selection Guide, publication 1734-SG001	Provides POINT I/O adapters and module specifications.
POINT I/O Very High-speed Counter Modules User Manual, publication 1734-UM003	Describes how to install, configure, and troubleshoot your POINT I/O very high-speed counter modules.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Notes:

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

Documentation Feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

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