

ControlLogix Analog Motion Modules

Catalog Numbers 1756-M02AE, 1756-M02AEK, 1756-M02AS, 1756-M02ASK, 1756-HYD02, 1756-HYD02K

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The 1756-M02AE/K module is a two-axis servo module for drives/actuators that need a $\pm 10V$ velocity or torque reference. Use the 1756-M02AE/K module when your equipment has quadrature encoder feedback.

The 1756-M02AS/K module is a two-axis servo module for drives/actuators that need a $\pm 10V$ velocity or torque reference input. Use the 1756-M02AS/K module when your equipment has Serial Synchronous Input (SSI) position feedback.

The 1756-HYD02/K module is typically used for accurate positioning and control of a hydraulic cylinder. The module can be wired to a linear displacement transducer (LDT) for feedback and a proportional or servo valve for control of a hydraulic axis and connects to a hydraulic system to close a high-speed position loop.



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ー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 ilave 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: 在安装、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。

包括安裝、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 provázet 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.

OBSE! 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.

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.
<p>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.</p>	<p>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.</p>
 <p>WARNING: Explosion Hazard –</p> <ul style="list-style-type: none"> 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. 	 <p>AVERTISSEMENT: Risque d'Explosion –</p> <ul style="list-style-type: none"> 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. S'assurer que l'environnement est classé non dangereux avant de changer les piles.

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 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 additional 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 additional installation requirements.
- NEMA 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.

Prevent Electrostatic Discharge



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

- Touch a grounded object to discharge potential static.
- Wear an approved grounding.
- 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.

Waste Electrical and Electronic Equipment (WEEE)



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



ATTENTION: The ControlLogix system has been agency certified using only the ControlLogix RTBs (1756-TBCH and 1756-TBS6H). Any application that requires agency certification of the ControlLogix system using other wiring termination methods may require application specific approval by the certifying agency.

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 0...60 °C (32...140 °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.

Electrical Safety Considerations



ATTENTION: Power to this equipment and all connected I/O must be supplied from a source compliant with the following:

- Isolation from Mains power via an approved Isolating Transformer constructed with Reinforced Insulation, Basic plus a Supplementary Insulation, or Basic insulation with a protective screen.



ATTENTION: Wire conductor and insulation ratings shall support minimum temperature rating of 105 °C (221 °F)

If multiple power sources are used, do not exceed the specified isolation voltage.

When using the 1756-TBCH or 1756-TBS6H, do not wire more than one 0.33...2.1 mm² (22...14 AWG) conductors on any terminal. Use only the same size wires with no intermixing of solid and stranded wire types.



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.

Installation Requirements

Before you install your module, you should:

1. Install and ground a 1756 chassis and power supply.
2. Order and receive an RTB or IFM, and its components, for your application.

Install the Module

You can install or remove the module while chassis power is applied.

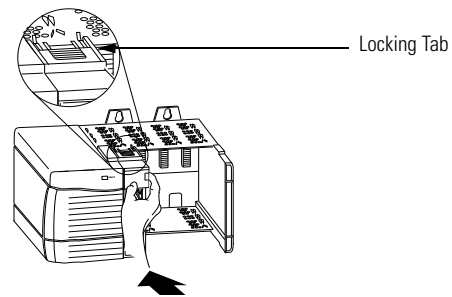
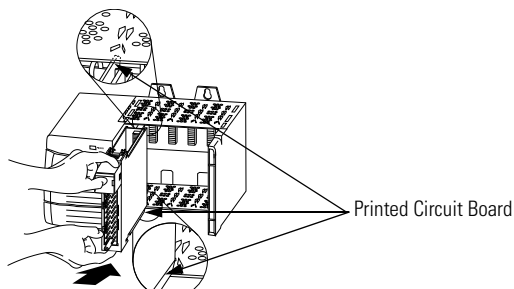


WARNING: When you insert or remove the module while backplane power is on, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

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.

Follow these steps to install the module:

1. Align the circuit board with the top and bottom chassis guides.
2. Slide the module into the chassis until module tabs 'click'.

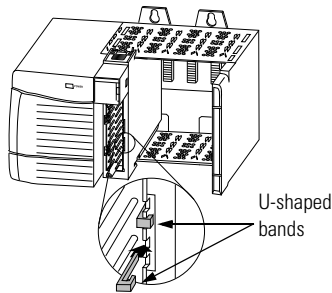


Key the Module and the Removable Terminal Block

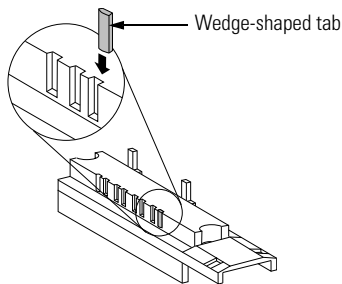
Use the wedge-shaped keying tabs and U-shaped keying bands to prevent connecting the wrong wires to your module.

Key positions on the module that correspond to unkeyed positions on the RTB. For example, if you key the first position on the module, leave the first position on the RTB unkeyed.

1. To key the module, insert the U-shaped band, as shown.



2. Push the band until it snaps in place.
3. To key the RTB or IFM, insert the wedge-shaped tab with rounded edge first, as shown.



4. Push the tab until it stops.

Reposition the tabs to re-key future module applications.

Wire a Removable Terminal Block (RTB)

The modules use two types of RTBs (each RTB comes with housing) to connect wiring.

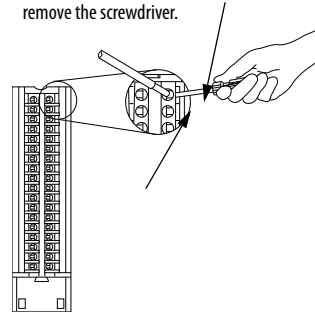
- Cage clamp - Catalog number 1756-TBCH
- Spring clamp - Catalog number 1756-TBS6H

Wire the RTB before installing it onto the module. Use a 1/8 inch (3.2 mm) maximum flat-bladed screwdriver.

- Connect the wires as shown.

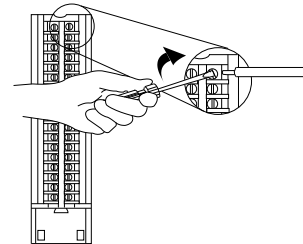
Spring Clamp RTB

1. Strip 7/16 inch (11 mm) maximum length of wire.
2. Insert the screwdriver into the inner hole of the RTB.
3. Insert the wire into the open terminal and remove the screwdriver.



Cage Clamp RTB

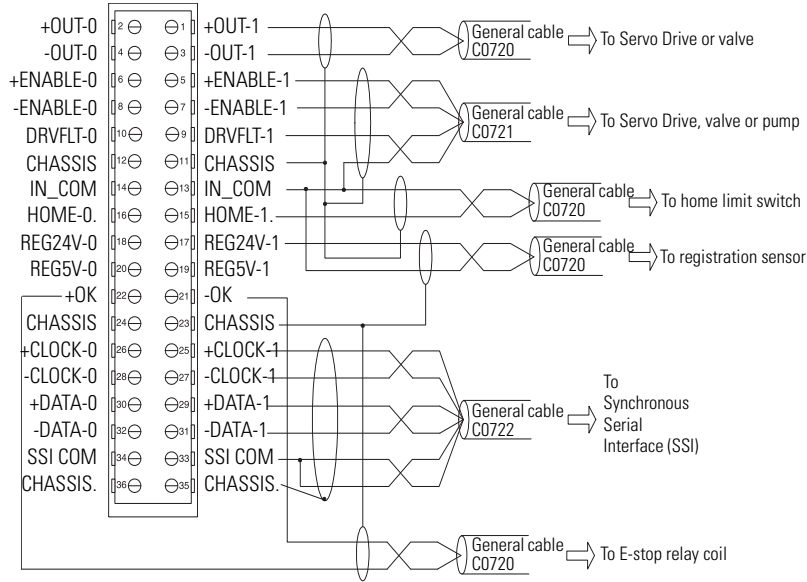
1. Strip 3/8 inch (9.5 mm) maximum length of wire.
2. Insert the wire into the open terminal.
3. Turn the screw clockwise to close the terminal on the wire.



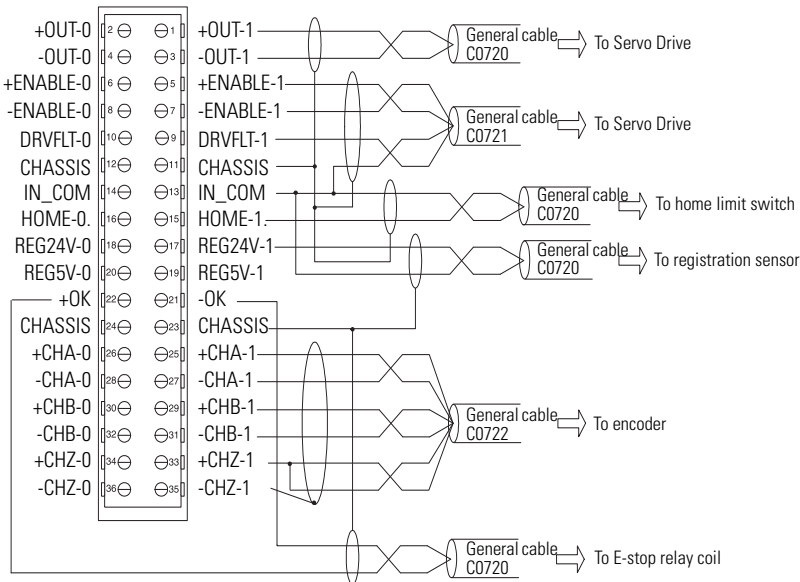
Wiring to a Servo Module

Use the wiring example in the following figures to wire to your module.

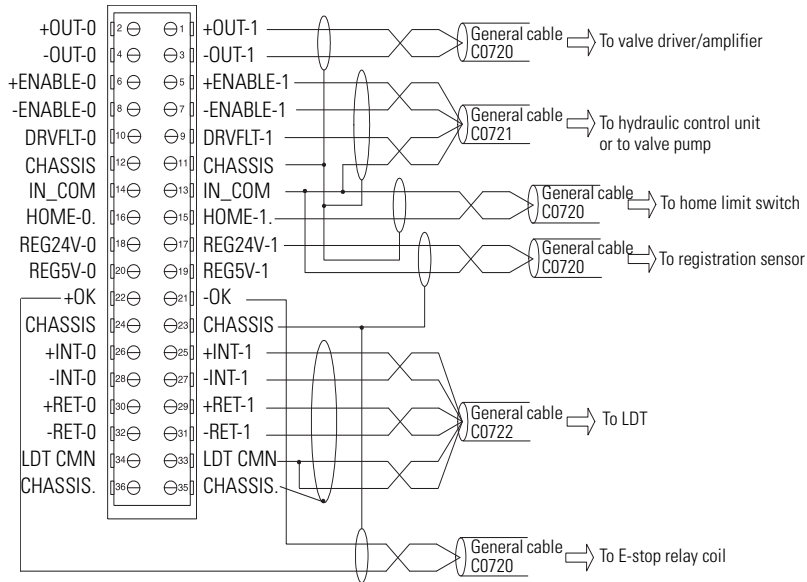
Wiring to Servo Module 1756-M02AS, 1756-M02ASK



Wiring to Servo Module 1756-M02AE, 1756-M02AEK



Wiring to Servo Module 1756-HYD02, 1756-HYD02K



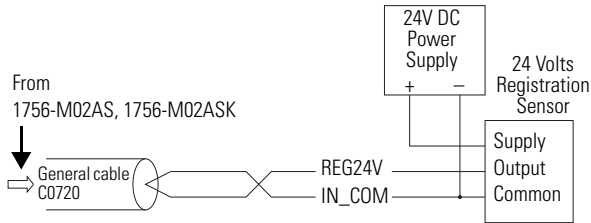
NOTE:

- These are general wiring examples illustrating Axis 1 wiring only. Other configurations are possible with Axis wiring identical to Axis 1.

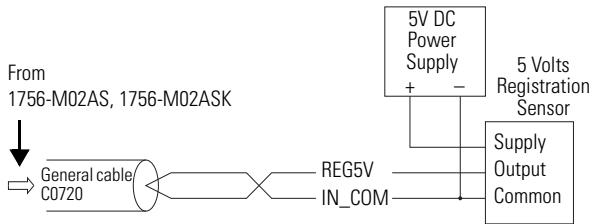
Wire Registration Sensors

The registration inputs to the servo module can support 24V DC or 5V DC registration sensors. These inputs should be wired to receive source current from the sensor. Current sinking sensor configurations are not allowed because the registration input common (IN_COM) is shared with the other 24V DC servo module inputs.

24V Registration Sensor

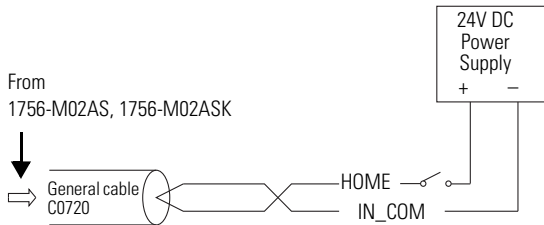


5V Registration Sensor



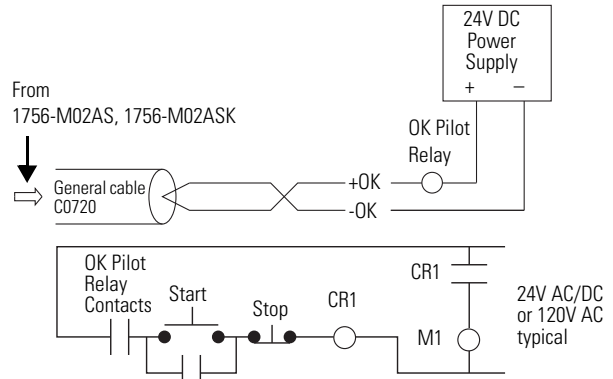
Wire the Home Limit Switch

The home limit switch inputs to the servo module are designed for 24V DC nominal operation. These inputs should be wired for current sourcing operation.



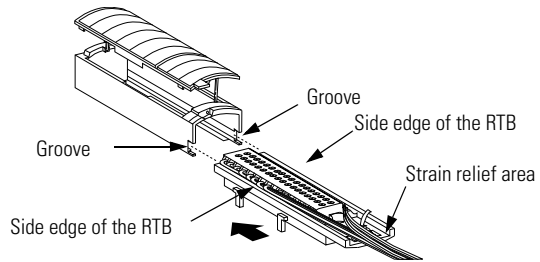
Wire the OK Contacts

A set of isolated solid-state OK relay contacts is provided for optional interface to an E-stop string, which controls power to the associated pumps. The OK contacts are rated to drive an external 24V DC pilot relay (for example, Allen-Bradley 700- HA32Z24) whose contacts can be incorporated into the E- Stop string as in the following figure.



Assemble the RTB and the Housing

1. Align the grooves at the bottom of the housing with the side edges of the RTB.
2. Slide the RTB into the housing until it snaps into place.



If additional wire routing space is required for your application, use extended-depth housing 1756-TBE.

Housing:	Used with RTB:	Allows up to This Capacity of Wires:
1756-TBCH	Cage clamp	336 sq. mm
1756-TBS6H	Spring clamp	
1756-TBE	Any RTB using heavy gauge wiring	628 sq. mm

IMPORTANT The housings use the following maximum areas:

- Standard-depth housing maximum area = 336 sq. mm
- Extended-depth housing maximum area = 628 sq. mm

IMPORTANT The depth from front of the module to the back of the chassis is as follows:

- Standard-depth housing = 147.91 mm (5.823 in)
- Extended-depth housing = 157.43 mm (6.198 in)

IMPORTANT When the OK Relay is loaded with an inductive load, use a counter-EMF suppression diode across the load. The maximum clamping voltage of the suppression diode must not exceed 60V DC.

Install or Remove the Removable Terminal Block onto the Module



WARNING: When you connect or disconnect the Removable Terminal Block (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.

Before installing the RTB, make certain:

- Field-side wiring of the RTB has been completed.
- The RTB housing is snapped in place on the RTB.
- The RTB housing is closed.
- the locking tab at the top of the module is unlocked.

Check Status Indicators

The module uses a single bi-colored light-emitting diode to indicate module OK status and bi-colored light-emitting diode indicators to show individual feedback (FDBK) and drive (DRIVE) status for both axes.

During power-up, the module completes an indicator test. The OK indicator turns red for 1 second and then turns to flashing green if the module passes all its self-tests.

The module status indicators are shown in the table.

Module Indicators

1756-M02AE, 1756-M02AEK Indicators	1756-M02AS, 1756-M02ASK Indicators	1756-HYD02, 1756-HYD02 K Indicators																																																															
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #cccccc; margin: 0;">2 AXIS SERVO</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 50%;">CH 0</td> <td style="text-align: center; width: 50%;">CH 1</td> <td></td> </tr> <tr> <td style="text-align: center;">□</td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td style="text-align: center;">FDBK</td> <td style="text-align: center;">FDBK</td> <td style="text-align: center;">□</td> </tr> <tr> <td style="text-align: center;">□</td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td style="text-align: center;">DRIVE</td> <td style="text-align: center;">DRIVE</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">OK</td> <td></td> </tr> </table> </div>	CH 0	CH 1		□	□		FDBK	FDBK	□	□	□		DRIVE	DRIVE			□			OK		<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #cccccc; margin: 0;">2 AXIS SERVO / SSI</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 50%;">CH0</td> <td style="text-align: center; width: 50%;">CH1</td> <td></td> </tr> <tr> <td style="text-align: center;">□</td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td style="text-align: center;">FDBK</td> <td style="text-align: center;">FDBK</td> <td style="text-align: center;">□</td> </tr> <tr> <td style="text-align: center;">□</td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td style="text-align: center;">DRIVE</td> <td style="text-align: center;">DRIVE</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">OK</td> <td></td> </tr> </table> </div>	CH0	CH1		□	□		FDBK	FDBK	□	□	□		DRIVE	DRIVE			□			OK		<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #cccccc; margin: 0;">HYDRAULIC</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 50%;">AX 0</td> <td style="text-align: center; width: 50%;">AX 1</td> <td></td> </tr> <tr> <td style="text-align: center;">□</td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td style="text-align: center;">FDBK</td> <td style="text-align: center;">FDBK</td> <td style="text-align: center;">□</td> </tr> <tr> <td style="text-align: center;">□</td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td style="text-align: center;">DRIVE</td> <td style="text-align: center;">DRIVE</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">□</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">OK</td> <td></td> </tr> </table> </div>	AX 0	AX 1		□	□		FDBK	FDBK	□	□	□		DRIVE	DRIVE			□			OK	
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Module Ok Indicators

1756-M02AE, 1756-M02AEK OK Indicator

If OK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The module is not operating.	<ul style="list-style-type: none"> Apply chassis power. Verify that the module is completely inserted into the chassis and backplane.
Flashing green light	The module has passed internal diagnostics, but it is not communicating axis data over the backplane.	<ul style="list-style-type: none"> None, if you have not configured the module. If you have configured the module, check the slot number in the 1756-M02AE Properties dialog box.
Steady green light	Axis data is being exchanged with the module. The module is in the normal operating state.	<ul style="list-style-type: none"> None. The module is ready for action.
Flashing red light	A major recoverable failure has occurred. A communication fault, timer fault, or NVS update is in progress. The OK contact has opened.	<ul style="list-style-type: none"> If an NVS update is in progress, complete the NVS update. If an NVS update is not in progress: Check the Servo Fault word for the source of the error. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation. If the flashing persists, reconfigure the module.
Solid red light	A potential nonrecoverable fault has occurred. The OK contact has opened.	<p>Follow these steps:</p> <ul style="list-style-type: none"> Restart the module. If the solid red persists, replace the module.

1756-M02AS, 1756-M02ASK OK Indicator

If OK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The module is not operating.	<ul style="list-style-type: none"> Apply chassis power. Verify that the module is completely inserted in chassis and backplane.
Flashing green light	The module has passed internal diagnostics, but it is not communicating axis data over the backplane.	<ul style="list-style-type: none"> None, if you have not configured the module. If you have configured the module, check the slot number in the 1756-M02AS Properties dialog box.
Steady green light	One of the following: Module is exchanging axis data. The module is in the normal operating state.	<ul style="list-style-type: none"> None
Flashing red light	One of the following: A major recoverable failure has occurred. A communication fault, timer fault, or nonvolatile memory storage (NVS) update is in progress. The OK contact has opened.	<ul style="list-style-type: none"> If an NVS update is in progress, complete the NVS update. If an NVS update is not in progress: Check the Servo Fault word for the source of the error. Clear the servo fault condition via Motion Axis Fault Reset instruction. Resume normal operation. If the flashing persists, reconfigure the module.
Steady red light	One of the following: A potential non-recoverable fault has occurred. The OK contact has opened.	<p>Follow these steps:</p> <ul style="list-style-type: none"> Restart the module. If the solid red persists, replace the module.

1756-HYD02, 1756-HYD02K OK Indicator

If OK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The module is not operating.	<ul style="list-style-type: none"> Apply chassis power. Verify that the module is completely inserted into the chassis and backplane.
Flashing green light	The module has passed internal diagnostics, but it is not communicating axis data over the backplane.	<ul style="list-style-type: none"> Configure the module to begin communications. If you have configured the module, check the slot number in the 1756-HYD02 Properties dialog box.
Steady green light	One of the following: Axis data is being exchanged with the module. The module is in the normal operating state.	<ul style="list-style-type: none"> None
Flashing red light	One of the following: A major recoverable failure has occurred. A communication fault, timer fault, or NVS update is in progress. The OK contact has opened.	<ul style="list-style-type: none"> If a Non-Volatile Storage (NVS) update is in progress, complete the NVS update. If an NVS update is not in progress, follow these steps: Check the Servo Fault word for the source of the error. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation. If the flashing persists, reconfigure the module.
Steady red light	One of the following: A potential non-recoverable fault has occurred. The OK contact has opened.	<p>Follow these steps:</p> <ul style="list-style-type: none"> Restart the module. If the solid red persists, replace the module.

Module FDBK Indicators

1756-M02AE, 1756-M02AEK FDBK Indicator

If FDBK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The axis is not used.	<ul style="list-style-type: none"> None, if you are not using this axis. If you are using this axis, make sure that the module is configured and an axis tag has been associated with the module.
Flashing green light	The axis is in the normal servo loop inactive state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis is in the normal servo loop active state.	<ul style="list-style-type: none"> None. The servo can may be changed by executing motion instructions.
Flashing red light	The axis servo loop error tolerance has been exceeded.	<ul style="list-style-type: none"> Correct the source of the problem. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation.
Solid red light	An axis encoder feedback fault has occurred.	<ul style="list-style-type: none"> Correct the source of the problem by checking the encoder and power connections. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation.

1756-M02AS, 1756-M02ASK FDBK Indicator

If FDBK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The axis is not used.	<ul style="list-style-type: none"> None, if you are not using this axis. If you are using this axis, make sure that the module is configured and an axis tag has been associated with the module.
Flashing green light	The axis is in the normal servo loop inactive state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis is in the normal servo loop active state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Flashing red light	The axis servo loop error tolerance has been exceeded.	<ul style="list-style-type: none"> Correct the source of the problem. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation.
Steady red light	An axis SSI feedback fault has occurred.	<ul style="list-style-type: none"> Correct the source of the problem by checking the SSI device and power connections. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation.

1756-HYD02, 1756-HYD02K FDBK Indicator

If FDBK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The axis is not used.	<ul style="list-style-type: none"> If you are using this axis, make sure that the module is configured and an axis tag has been associated with the module.
Flashing green light	The axis is in the normal servo loop inactive state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis is in the normal servo loop active state.	<ul style="list-style-type: none"> None. The servo can may be changed by executing motion instructions.
Flashing red light	The axis servo loop error tolerance has been exceeded.	<p>Follow these steps:</p> <ul style="list-style-type: none"> Correct the source of the problem. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation.
Steady red light	An axis LDT feedback fault has occurred.	<p>Follow these steps:</p> <ul style="list-style-type: none"> Correct the source of the problem by checking the LDT and power connections. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation.

Module Drive Indicators

1756-M02AE, 1756-M02AEK DRIVE Indicator

If DRIVE Indicator Displays:	The Module Status Is:	Take This Action:
Off	The axis is not used. The axis is a position-only axis type.	<ul style="list-style-type: none"> None, if the axis is not used or is a position-only type. Otherwise, make sure that the module is configured, an axis tag has been associated with the module, and the axis type is servo.
Flashing green light	The axis drive is in the normal disabled state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis drive is in the normal enabled state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Flashing red light	The axis drive output is in the shutdown state.	<ul style="list-style-type: none"> Check for faults that may have generated this state. Execute the Shutdown Reset motion instruction. Resume normal operation.
Solid red light	The axis drive is faulted.	<ul style="list-style-type: none"> Check the drive status. Clear the Drive Fault condition at the drive. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation. Check the configuration for the Drive Fault. If configured to be normally open and there is no voltage, this is the normal condition. If configured to be normally closed and 24V is applied, this is the normal condition.

1756-M02AS, 1756-M02ASK DRIVE Indicator

If DRIVE Indicator Displays:	The Module Status Is:	Take This Action:
Off	One of the following: The axis is not used. The axis is a position-only axis type.	<ul style="list-style-type: none"> None, if the axis is not used or is a position-only type. Otherwise, make sure that the module is configured, an axis tag has been associated with the module, and the axis type is servo.
Flashing green light	The axis drive is in the normal disabled state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis drive is in the normal enabled state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Flashing red light	The axis drive output is in the shutdown state.	<ul style="list-style-type: none"> Check for faults that may have generated this state. Execute the Motion Axis Shutdown Reset instruction. Resume normal operation.
Steady red light	The axis drive is faulted.	<ul style="list-style-type: none"> Check the drive status. Clear the Drive Fault condition at the drive. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation. Check the configuration for the Drive Fault. If configured to be normally open and there is no voltage, this is the normal condition. If configured to be normally closed and 24V DC is applied, this is the normal condition.

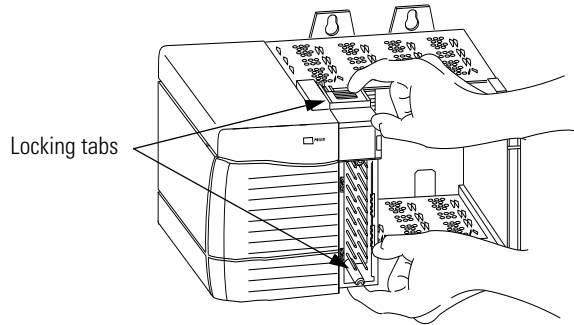
1756-HYD02, 1756-HYD02 K DRIVE Indicator

If the DRIVE Indicator Displays:	The Module Status Is:	Take This Action:
Off	One of the following: The axis is not used. The axis is a position-only axis type.	<ul style="list-style-type: none"> If the axis is being used and is not a position-only axis type, make sure that the module is configured, an axis tag has been associated with the module, and the axis type is servo.
Flashing green light	The axis drive is in the normal disabled state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis drive is in the normal enabled state.	<ul style="list-style-type: none"> None. The servo axis state can be changed by executing motion instructions.
Flashing red light	The axis drive output is in the shutdown state.	<p>Follow these steps:</p> <ul style="list-style-type: none"> Check for faults that may have generated this state. Execute the Shutdown Reset motion instruction. Resume normal operation.
Steady red light	The axis drive is faulted.	<p>Follow these steps:</p> <ul style="list-style-type: none"> Check the drive status. Clear the Drive Fault condition at the drive. Clear the servo fault condition using the Motion Axis Fault Reset instruction. Resume normal operation. Check the configuration for the Drive Fault. If configured to be normally open and there is no voltage, this is the normal condition. If configured to be normally closed and 24V is applied, this is the normal condition.

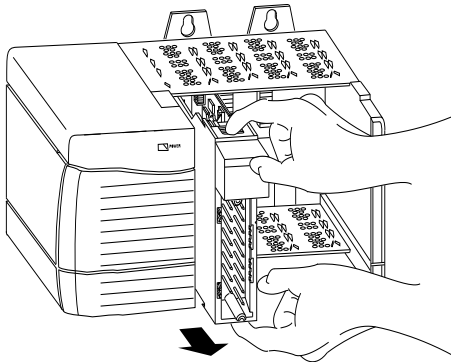
Remove the Module from the Chassis

Follow the steps to remove the module from the ControlLogix® chassis:

1. If the RTB is on the module, unlock the RTB and remove it. For more information, see [Install or Remove the Removable Terminal Block onto the Module on page 9](#).
2. Push in and hold the top and bottom locking tabs on the module.



3. Pull module out of the chassis.



Specifications

Attribute	1756-M02AE, 1756-M02AEK	1756-M02AS, 1756-M02ASK	1756-HYD02, 1756-HYD02K
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)	0...60 °C (32...140 °F)		
Temperature, storage IEC 60068-2-1 (Test Allen-Bradley, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test N/A, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)		
Temperature, surrounding air, max.	60 °C (140 °F)		
EFT/B immunity IEC 61000-4-4	—	±1 kV at 5 kHz on shielded signal ports	
Surge transient immunity IEC 61000-4-5	—	±1 kV line-earth(CM) on shielded signal ports	
Conducted RF immunity IEC 61000-4-6	—	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz	
Enclosure Type Rating	None (open-style)		None (open-style)
Voltage and Current Ratings	Backplane: 5.1V DC, 700 mA max. 24V DC, 2.5 mA max. Input: Registration 5/24V DC, 2 mA Encoder: 5V DC, 80 mA Home/Ready: 24V DC, 3.4 mA Output: Servo: +/- 10V DC, 50 mA Relay: 24V DC, 2VA, CL2	Backplane: 5.1Vdc, 0.7 A; 24V DC, 2.5 mA Input: Registration - 5V DC, 5 mA; 24V DC, 5 mA SSI - 5V DC, 30 mA All others: 24V DC, 3.2 mA Output: Servo - +/-10V, 2 mA SSI - 5.5V DC, 50 mA All other: 24V DC, 75 mA	Backplane: 5.1V DC, 0.7 A; 24V DC, 2.5 mA Input: Registration - 5V DC, 5 mA; 24V DC, 5 mA LDT - 5V DC, 30 mA All others: 24V DC, 3.2 mA Output: Servo - +/-10V, 2 mA LDT - 5.5V DC, 50 mA All other: 24V DC, 75 mA
Isolation Voltage	30V (continuous), Basic insulation type, Inputs to Backplane. No isolation between individual field side outputs and Inputs.	30V (continuous), Basic insulation type, Inputs to Backplane. No isolation between individual field outputs and Inputs.	
Wire Size	1756-TBCH Single wire connection: 0.33...2.1 mm ² (22...14 AWG) solid or stranded shielded copper wire that is rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33...2.1 mm ² (22...14 AWG) solid or stranded shielded copper wire that is rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max		
Terminal Block Torque Specs	1756-TBCH: 0.5 Nm (4.4 pound-inches)		
Pilot Duty Rating	Relay: 24V DC, 2VA	—	—
North American Temp Code	T4A		

Notes:

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
ControlLogix Integrated Motion Modules Specifications, publication 1756-TD004	Provides specifications for analog motion catalog numbers 1756-M02AE, 1756-M02AEK, 1756-M02AS, 1756-M02ASK, 1756-HYD02 and 1756-HYD02K.
ControlLogix Hydraulic Servo Module User Manual, publication 1756-UM525	Describes how to set up, configure and troubleshoot the 1756-HYD02 and 1756-HYD02K modules.
Sercos and Analog Motion Configuration and Startup, publication MOTION-UM001	Provides configuration and operation information for analog and Sercos motion modules.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/global/literature-library/overview.page>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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