Allen-Bradley

XM Dynamic Measurement Module with ControlNet Adapter

Catalog Numbers 1440-DYN02-01RJ, 1440-ACNR, 1440-TBS-J

The XM® dynamic measurement module is a two-channel, general-purpose monitor that supports measurements of dynamic inputs such as vibration, pressure, and strain. The module can be used to monitor shaft, casing, and pedestal vibration in equipment that rotates. The module is designed specifically for integration with ControlLogix® controllers, who are connected through the 1440-ACNR ControlNet adapter.

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 „Literaturverweise" genannten Dokumente zur Installation, Konfiguration und Bedienung dieser Ausrüstung sorgfältig durch, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder instandsetzen. Benutzer müssen sich mit den Anweisungen zur Installation und Verdrahtung vertraut machen und müssen die Anforderungen aller geltenden Vorschriften, Gesetze und Normen kennen.

Aktivitäten wie Installation, Einstellung, Inbetriebnahme, Verwendung, Montage, Demontage und Instandsetzung müssen durch ausreichend geschultes Personal in Übereinstimmung mit den geltenden Durchführungsvorschriften ausgeführt werden.

Wenn diese Ausrüstung in einer Weise verwendet wird, die nicht vom Hersteller angegeben wurde, kann der von der Ausrüstung bereitgestellte Schutz 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 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, bediend 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.

Table 1 - Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC 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 additional installation requirements.
- NEMA 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosures.

WARNING: Do not replace components or disconnect equipment unless power has been switched off or the area is known to be free of ignitable concentrations. This product must be installed in a suitable weatherproof metal enclosure.

Table 2 - 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 only for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations. 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) can be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local authority having jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.
WARNING: **EXPLOSION HAZARD -** • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components can impair suitability for Class I, Division 2.	**WARNING:** **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.

Table 3 - European Hazardous Location Approval

The following applies to products marked **CE** (Ex) II 3 G. Such modules:

- 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 Annex II to Directive 94/9/EC. See the EC Declaration of Conformity at http://www.rockwellautomation.com/products/certification for details.
- The type of protection is Ex nA IIC T4 Gc according to EN 60079-15.
- The 1440-ACNR, and 1440-TBS-J complies to Standards EN 60079-0:2012+A11:2013, EN 60079-15:2010, reference ATEX certificate number DEMKO 14 ATEX 1361X
- 1440-DYN02-01RJ complies to Standard EN 60079-0:2012+A11:2013, EN 60079-15:2010, reference certificate number ITS13ATEX47876X.
- 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 ATEX directive 1999/92/EC.

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 ATEX/IECEx Zone 2-certified enclosure with a minimum ingress protection rating of at least IP54 (as defined in EN/IEC60529) 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 defined by Rockwell Automation.
- Any external connections that mate to this equipment shall be secured by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Equipment shall not be disconnected unless power has been removed or the area is known to be nonhazardous.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140% of the rated voltage when applied in Zone 2 environments.
- 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.
- This equipment must be used only with ATEX/IECEx-certified Rockwell Automation backplane.

Table 4 - IEC Hazardous Location Approval

The following applies to products marked 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 for the 1440-DYN02-01RJ, 1440-TBS-J, and 1440-ACNR is "Ex nA IIC T4 Gc" according to IEC 60079-15.
- The 1440-ACNR, and 1440-TBS-J comply with Standards IEC 60079-0:2011, IEC-60079-15:2010, reference IECEx certificate number IECEx UL 14.0076X.
- The 1440 DYN02 01RJ complies to Standards IEC 60079-0, IEC-60079-15, reference IECEx certificate number IECEx ETL 15.0053X.
- May have catalog numbers followed by a `K' to indicate a conformal coating option.

Table 5 - 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 wrist strap.
- 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.

ATTENTION: Electrical Safety Considerations

Power to the 1440-DYN02-01RJ must be supplied from a source compliant with:

- Limited Power Source (LPS) approved to IEC60950
- SELV Limited Energy Supply compliant with IEC61010-1

Power to the 1440-TBS-J/A or 1440-ACNR must be supplied from a source compliant with the following:

- Class 2 approved to UL1310
- SELV source approved to IEC60950-1, IEC61010-2-201 or IEC62368-1 (ES1)

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.
- 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.
- Use only a soft dry anti-static cloth to wipe down equipment. Do not use any cleaning agents.
- This equipment is certified for use only within the surrounding air temperature range of -20…70 °C (-4…158 °F). The equipment must not be used outside of this range.

Install the Terminal Base

The terminal base can be DIN rail or wall/panel mounted.

WARNING: If you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

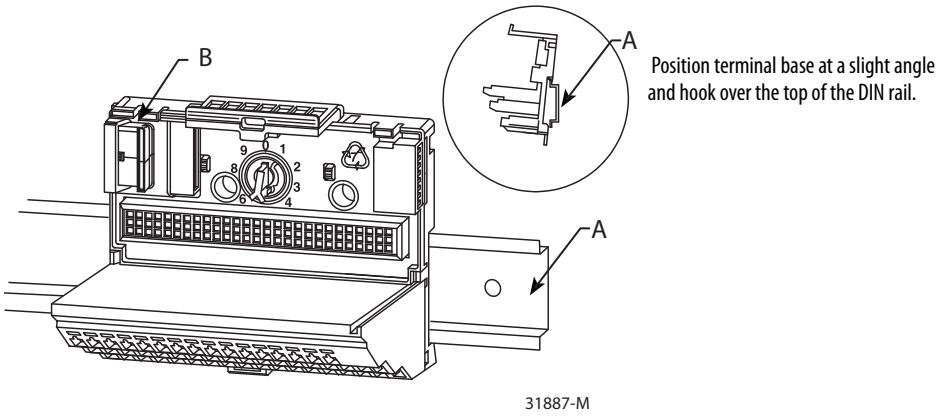
Be sure that power is removed or the area is nonhazardous before proceeding.

WARNING: Do not remove or replace a terminal base unit while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.

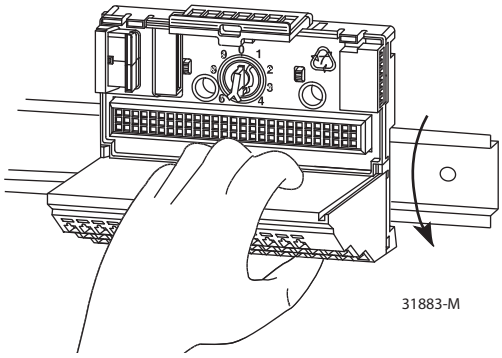
Mount on a DIN Rail

Follow these steps to mount the terminal base on the DIN rail.

1. Position the terminal base unit on the 35 x 7.5 mm DIN rail (A) (Allen-Bradley part number 199-DR1 or 199-DR4) at a slight angle.



2. Slide the terminal base unit over. Leave room for the side connector (B).
3. Hook the lip on the rear of the terminal base onto the top of the DIN rail and rotate the terminal base onto the rail.



4. Press down on the terminal base unit to lock the terminal base on the DIN rail.

   If the terminal base does not lock into place:
   a. Use a screwdriver or similar device to open the locking tab.
   b. Press down on the terminal base until flush with the DIN rail.
   c. Release the locking tab to lock the base in place.
5. Connect the wiring for the terminal base unit as described in Install the ControlNet Adapter on page 9.

Interconnect Terminal Base Units

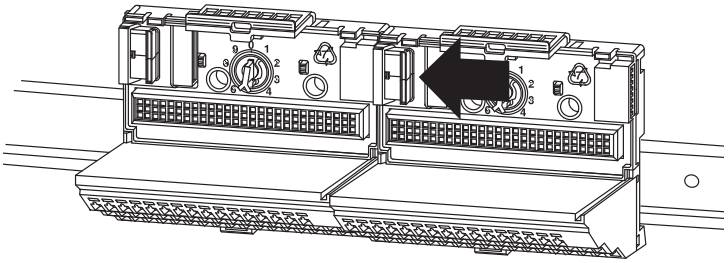
Follow the steps to install another terminal base unit.

IMPORTANT Terminal base units are mounted left to right on the DIN rail.

1. Position the terminal base on the 35 x 7.5-mm (1.38 x 0.3 in.) DIN rail (A).
2. Check to be sure that the side connector (B) is **fully retracted** into the base unit.
3. Slide the terminal base unit over tight against the neighboring terminal base.

   Make sure that the hook on the terminal base slides under the edge of the terminal base unit.
4. To lock the terminal base on the DIN rail, press down on the terminal base unit.

   If the terminal base does not lock into place, use a screwdriver or similar device to open the locking tab, press down on the terminal base until flush with the DIN rail and release the locking tab to lock the base in place.
5. To complete the backplane connection, gently push the side connector into the side of the neighboring terminal base.



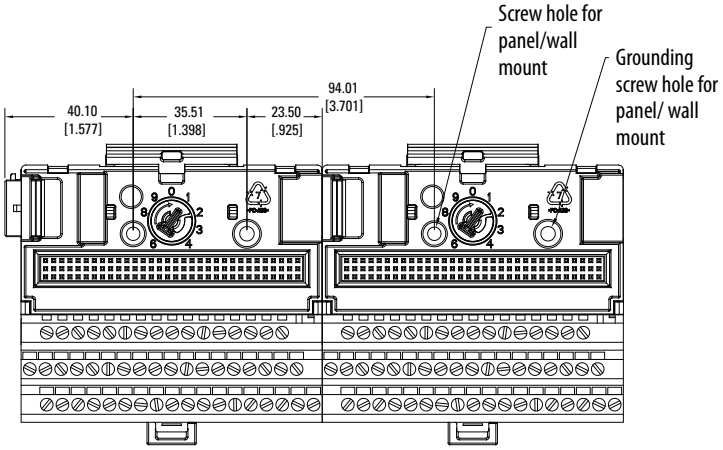
Install the Module on a Panel or Wall

To install a wall or panel you must:

- Lay out the drilling points on the wall or panel.
- Drill the pilot holes for the mounting screws.
- Install the terminal base units and secure them to the wall or panel.

Follow these steps to install the terminal base on a wall or panel.

1. Lay out the required points on the wall/panel as shown in the drilling dimension drawing.



Maintain at least 25.4 mm (1.0 in.) air space around your XM® system installation.

2. Drill the necessary holes for the #6 self-tapping mounting screws.
3. Secure the terminal base unit by using two #6 self-tapping screws.
4. To install another terminal base unit, retract the side connector into the base unit; verify that it is **fully retracted**.
5. Position the terminal base unit up tight against the neighboring terminal base; verify that the hook on the terminal base slides under the edge of the terminal base unit.
6. To complete the backplane connection, gently push the side connector into the side of the neighboring terminal base.
7. Secure the terminal base to the wall with two #6 self-tapping screws.

Terminal Assignments

IMPORTANT The terminal block assignments are different for different terminal base units. Table 6 applies only to the 1440-TBS-J. See the installation instructions for the specific terminal base unit for its terminal assignments.

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

Table 6 - Terminal Block Assignments

	No.	Desc.		No.	Desc.		No	Desc.
Channel 0	0	Xdcr 0 (+)	Channel 1	16	Xdcr 1 (+)	Tachometer	34	Tach (+)
	1	Xdcr 0 (-)		17	Xdcr 1 (-)		35	Tach (-)
	2	Functional Earth		18	Functional Earth		36	Functional Earth
	3	24V (-)		19	24V (-)		37	Tach 24V (-)
	4	24V (+)		20	24V (+)		38	Tach 24V (+)
	5	Buf 0 (+)		21	Buf 1 (+)		39	Tach buffer (+)
	6	Buf 0 (-)		22	Buf 1 (-)		40	Tach (-)
	7	Not connected		23	Not connected		41	Sig Common
	8	Not connected		24	Not connected	Power	42	Not connected
	9	Functional Earth		25	Functional Earth		43	24V common
	10	Not connected		26	Not connected		44	24V in 1
	11	Not connected	XM Bus	27	CAN_High		45	24V common
	12	Functional Earth		28	Shield	Bussed Tach	46	Tach (-)
	13	Not connected		29	CAN_Low		47	Tach (+)
	14	Not connected		30	Bus V (-)		48	Tach (-)
	15	Functional Earth		31	Not connected		49	Not connected
				32	Not connected		50	Not connected
				33	Not connected		51	Not connected

Install the ControlNet Adapter

ATTENTION:

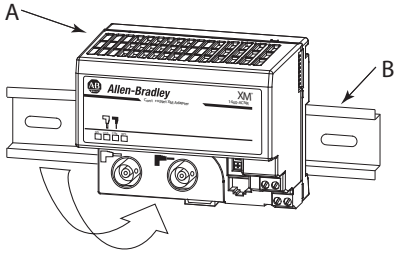
- Do not remove or replace an adapter module while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.
- This product is grounded through the DIN rail to chassis ground. Use zinc plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail 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.
- Refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.

IMPORTANT The 1440-DYN02-01RJ Standard Dynamic Measurement module is used with the 1440-ACNR adapter. No other XM catalog number works with the 1440-ACNR adapter.

IMPORTANT The XM Bus must be terminated on each end with a 120 ohm, 1%, 1/4 W resistor. Because the adapter has an internal terminator resistor, the second resistor must be installed at the opposite end of the bus.

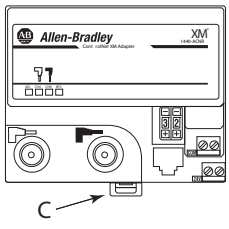
To install the adapter on the DIN rail before you install the XM terminal base units, follow these steps.

1. Position the ControlNet adapter module (A) on a 35 x 7.5 mm DIN rail (B) at a slight angle.



2. Hook the lip on the rear of the adapter onto the top of the DIN rail, and rotate the adapter module onto the rail.
3. Press the adapter module down onto the DIN rail until flush.

   Locking tab C snaps into position and lock the adapter module to the DIN rail.



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   If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab down while pressing the adapter module flush onto the DIN rail. Release the locking tab to lock the adapter module in place.

4. Connect the adapter wiring.

   See Wire the ControlNet Adapter on page 11.

Power Requirements

The ControlNet adapter module requires one Class 2 power supply. Before installing your module, calculate the power requirements of all modules in each chassis. The total current draw through the side connector cannot exceed 3 A.

The adapter provides a maximum output current of 3 A.

ATTENTION: Multiple power sources are not allowed.

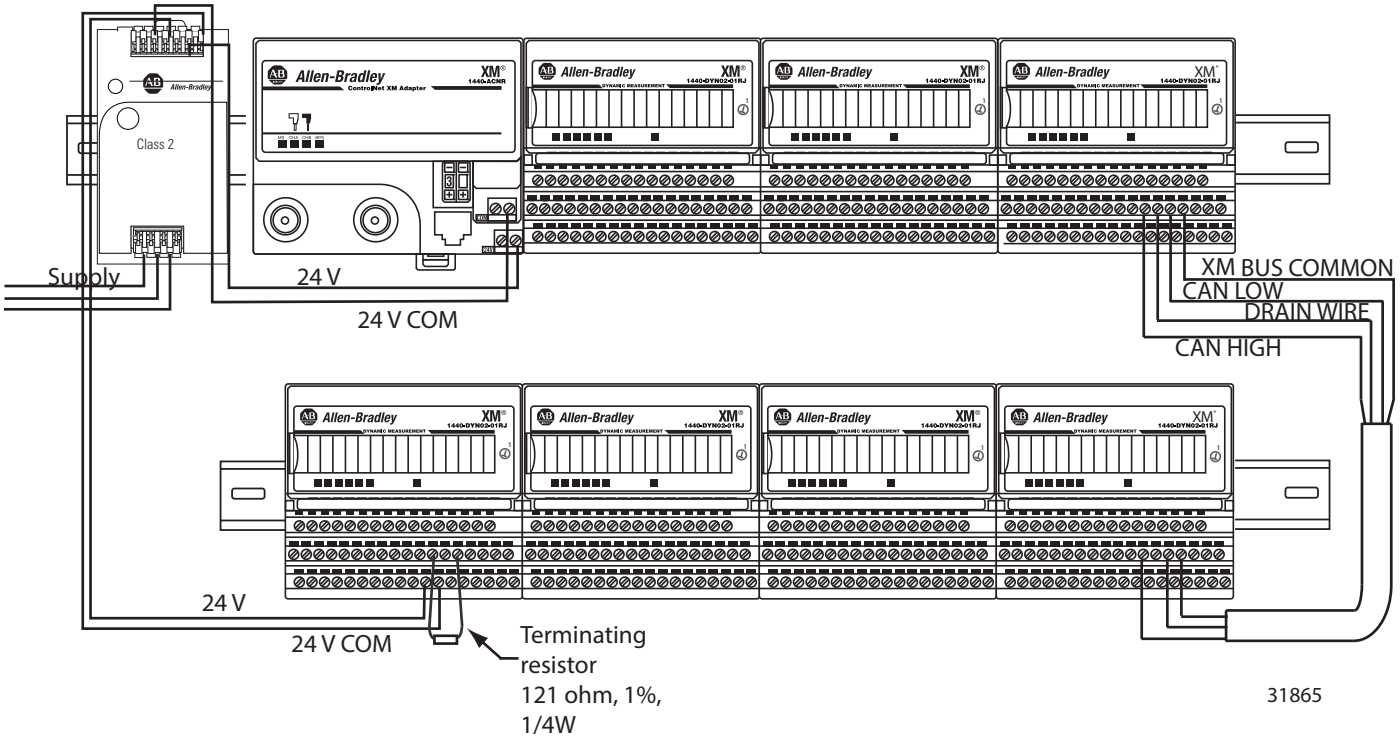
Terminating Resistors

The XM Bus operates correctly when there is a terminating resistor at each end of the XM Bus.

- Terminating resistors must be 121 ohms, 1%, 1/4 W.
- The ControlNet adapter has an internal terminating resistor. Install a second terminating resistor across the CAN_HI and CAN_LO terminals of the XM module at the other end of the XM Bus.

  For information on the XM module, see Install the Module on page 13.

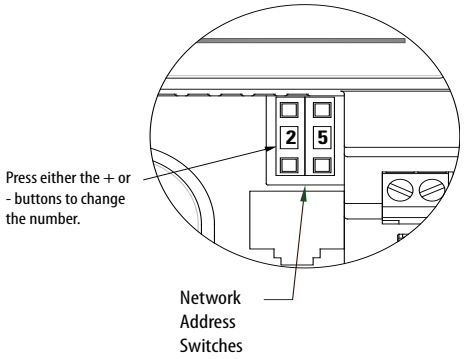
Figure 1 - Terminating Resistor Placement



Set the Node Address for the ControlNet Adapter

Set the network address using the 2-button pushwheel switch. The range of valid settings is 01...99.

Figure 2 - Set the Network Address Switches



Wire the ControlNet Adapter

ARC FLASH HAZARD: An electrical arc can occur:

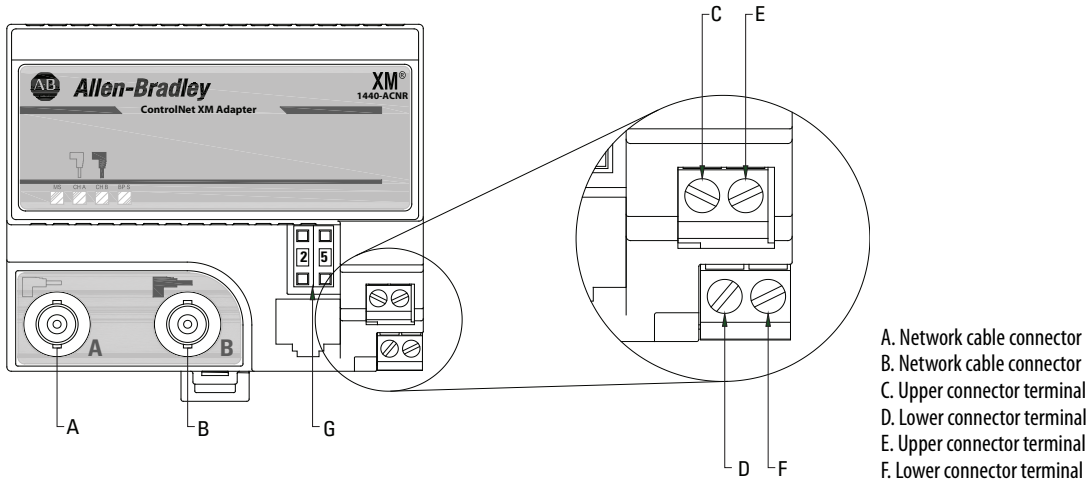
- If you connect or disconnect the communication cable with power applied to this module or any device on the network
- If you connect or disconnect wiring while the field-side power is on

An electrical arc could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

ATTENTION: Do not wire more than two conductors onto any single terminal.

Figure 3 - XM1440-ACNR Wiring Terminals



A. Network cable connector
B. Network cable connector
C. Upper connector terminal
D. Lower connector terminal
E. Upper connector terminal
F. Lower connector terminal

WARNING: The NAP port is intended for temporary local programming purposes only and not intended for permanent connection. If you connect or disconnect the NAP cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

1. Connect the ControlNet network cable to connector A.
2. Connect the redundant ControlNet network cable to connector B.

ATTENTION: When you connect wiring, torque terminal screws C, D, E, and F to 0.8 N•m (7 lb•in.).

3. Connect +V DC power to the lower connector, terminal F or D.
4. Connect -V common to the upper connector, terminal E or C.

Install a Replacement ControlNet Adapter into an Existing System

ARC FLASH HAZARD: An electrical arc can occur:

- If you connect or disconnect the communications cable with power applied to this module or any device on the network
- If you insert or remove the module while backplane power is on

An electrical arc could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

ATTENTION: Do not remove or replace an adapter module while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.

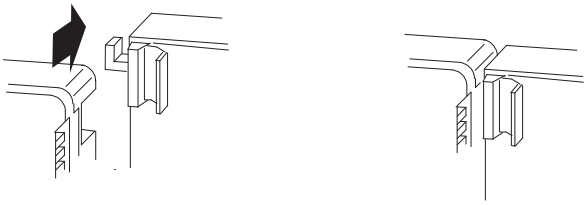
WARNING: If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

Remove the existing adapter from the DIN rail as follows.

1. Disconnect any wiring jumpered to the adjacent terminal base.
2. Disconnect the BNC connector(s) from the front of the adapter.
3. On the XM module that is next to the adapter, open the latching mechanism and remove the module from the terminal base unit that is attached to the adapter.
4. To unplug the backplane connection, push the XM Bus connector toward the right side of the terminal base.
5. Release the locking tab and remove the adapter module.

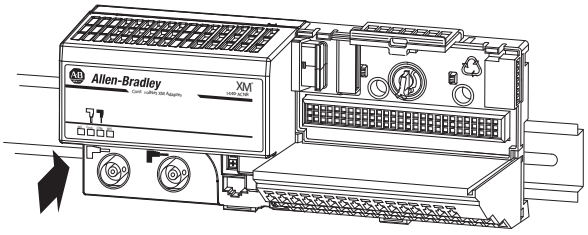
Install the replacement adapter on the DIN rail as follows.

1. Before installing the replacement adapter, verify that the XM Bus connector of the terminal base is fully retracted into the base unit.
2. Position the replacement adapter on the DIN rail. The hook on the terminal base slides under the edge of the adapter.



3. Push down and in simultaneously to lock the adapter to the DIN rail.

   If the adapter does not lock in place, follow these steps.
   a. Use a screwdriver or similar device to move the locking tab down while pressing the adapter flush onto the DIN rail.
   a. Release the locking tab to lock the adapter module in place.
4. Gently push the XM Bus connector into the side of the adapter to complete the backplane.



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5. Reinstall the XM module in the adjacent terminal base.
6. Connect the wiring to the adjacent terminal base.
7. Connect the ControlNet cable to the adapter.

Install the Module

The module mounts on a 1440-TBS-J terminal base unit. We recommend that you insert the module after you have connected the wiring on the terminal base unit. See the Install the Terminal Base on page 5 for wiring information.

ATTENTION: The 1440-DYN02-01RJ module is compatible only with the 1440-TBS-J terminal base unit. The keyswitch on the terminal base unit is at position 1 for the module.

Do not attempt to install the 1440-DYN02-01RJ module on other terminal base units.

Do not change the position of the keyswitch after wiring the terminal base units.

ATTENTION: Power to this equipment must be supplied from a source compliant with the following:

- Limited Power Source (LPS) approved to IEC60950
- SELV Limited Energy Supply compliant with IEC61010-1

ARC FLASH HAZARD: An electrical arc can occur:

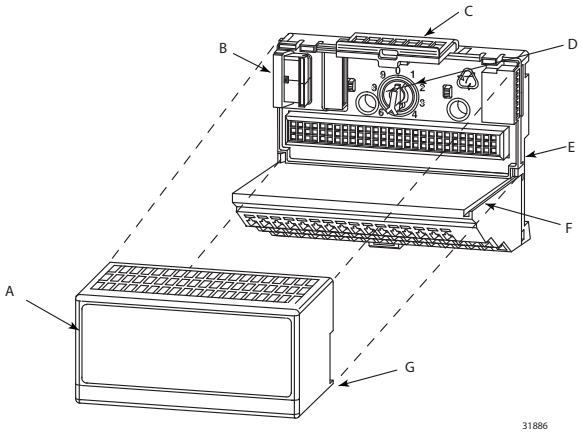
- If you connect or disconnect the communications cable with power applied to this module or any device on the network
- If you insert or remove the module while backplane power is on

An electrical arc could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

ATTENTION: Multiple power sources are not allowed.

1. Verify that the keyswitch (D) on the terminal base unit (E) is at position 1 as required for the module.

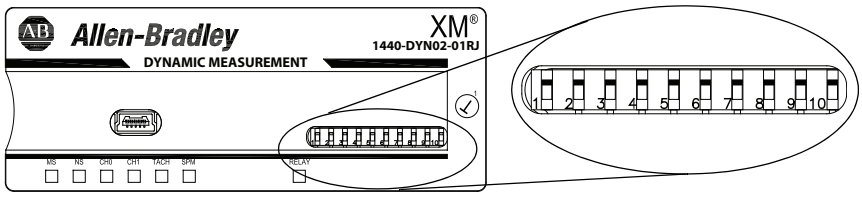


2. Verify that the side connector (B) is pushed completely to the left.
   You cannot install the module unless the connector is fully extended.
3. Verify that the pins on the bottom of the module are straight so they align properly with the connectors in the terminal base unit.
4. Position the module (A) with its alignment bar (G) aligned with the groove (F) on the terminal base.
5. Press firmly and evenly to seat the module in the terminal base unit. The module is seated when the latching mechanism (C) is locked into the module.
6. To install the next module in its terminal base, repeat step 1 to step 5.

Set the Node Address for the Module

The module has a DIP switch for setting the network node address. DIP switches 5...10 set the node address by using binary addressing. The module is shipped from the factory with the node address set to 63, as shown in Figure 4.

Figure 4 - Module DIP Switches.



TIP DIP switches 1…4 are not used.

TIP The node addresses start with one for the combined module closest to the ACNR, and increase for each consecutive module.

Using a pointed tool, slide switches 5...10 to the appropriate positions (1 or 0).

Figure 5 - DIP Switch Positions

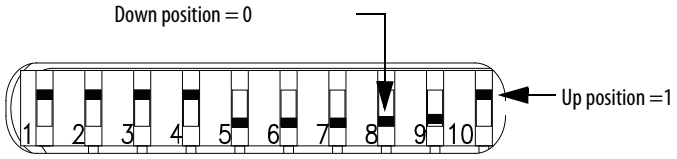


Table 7 - Switch Settings for Node Address

Node Addr	Switch Setting SW5->SW10	Node Addr	Switch Setting SW5->SW10	Node Addr	Switch Setting SW5->SW10	Node Addr	Switch Setting SW5->SW10
0(1)	000000	16	010000	32	100000	48	110000
1	000001	17	010001	33	100001	49	110001
2	000010	18	010010	34	100010	50	110010
3	000011	19	010011	35	100011	51	110011
4	000100	20	010100	36	100100	52	110100
5	000101	21	010101	37	100101	53	110101
6	000110	22	010110	38	100110	54	110110
7	000111	23	010111	39	100111	55	110111
8	001000	24	011000	40	101000	56	111000
9	001001	25	011001	41	101001	57	111001
10	001010	26	011010	42	101010	58	111010
11	001011	27	011011	43	101011	59	111011
12	001100	28	011100	44	101100	60	111100
13	001101	29	011101	45	101101	61	111101
14	001110	30	011110	46	101110	62	111110
15	001111	31	011111	47	101111	63	111111

(1) Do not set the node address to 0. Node addresses start with 1 for the module closest to the ACNR.

Self-test

The XM module performs a self-test when it powers up. The self-test includes a status indicator test and a device test. During the status indicator test, the indicators turn on independently and in sequence for approximately 0.25 second.

The device test occurs after the status indicator test. The Module Status (MS) indicator is used to indicate the status of the device self-test.

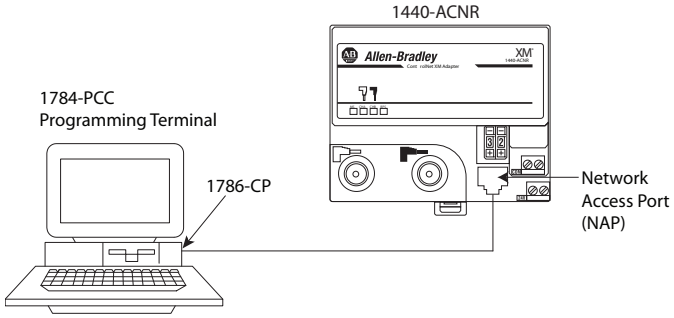
Table 8 - MS Indicator State Descriptions

MS Indicator State	Description
Flashing Red and Green	Device self-test is in progress.
Solid Green or Flashing Green	Device self-test completed successfully, and the firmware is valid and running.
Flashing Red	• Device self-test completed, the hardware is OK, but the firmware is invalid. • The firmware download is in progress.
Solid Red	Unrecoverable fault, hardware failure, or Boot Loader program can be corrupted.

Connect a Programming Terminal to the Network

You can connect the programming terminal to the ControlNet network by connecting to the network access port (NAP), as shown in Figure 6.

Figure 6 - NAP Connection Via 1786 Cable



The 1786-CP cable can be plugged into any ControlNet NAP port to provide programming capability on the ControlNet network.A programming terminal connected through this cable is counted as a node and must have a unique address.

ATTENTION: Use the 1786-CP cable when connecting a programming terminal to the network through NAPs. Using a commercially available RJ-style cable could result in possible network failures.

WARNING: The NAP port is intended for temporary local programming purposes only and not intended for permanent connection. If you connect or disconnect the NAP cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Verify that power is removed or the area is nonhazardous before proceeding.

Table 9 - Specifications

Attribute	1440-DYN02-01RJ	1440-ACNR	1440-TBS-J
Enclosure type rating	None (open style)		
Isolation voltage	Not Rated (SELV Limited Energy source required) No isolation between I/O or backplane	50V (continuous), Basic Insulation Type tested at 900V AC for 60 s, between ControlNet to system and ControlNet to power	Established by installed module
Voltage ratings	Supply: 24 Vdc, 250 mA Output: 24 Vdc, 60 mA	Supply: 24 Vdc, 120 mA, Class 2 or SELV/PELV limited to 5A Max (See publication ICM-IN005) XMBUS: 24 Vdc, 3A Max	XM Bus: 24V DC, 3 A max, Class 2/SELV/PELV Power Terminals: 24V DC, 3 A Class 2/SELV/PELV I/O Terminals 24V DC, 60 mA, Class 2/SELV/PELV
Wire size	Determined by installed terminal base	0.34…2.1 mm^2 (22…14 AWG) solid or stranded copper wire rated at 75 °C (167 °F) or greater 1.2 mm (3/64 in.) insulation max	
Wiring category(1)	2 - on signal ports 1 - on power ports 2 - on communication ports	1 - on power ports 2 - on communication ports	Established by installed module
Torque		Terminal block: 0.8 N•m (7 lb•in.)	Terminal screw: 0.8 N•m (7 lb•in.)
Operating temperature IEC 60068-2-1 (Test ad operating cold) IEC 60068-2-2 (Test ad operating dry heat) IEC 60068-2-14 (Test ad operating thermal shock)	-20…70 °C (-4…158 °F)		
Temperature, surrounding air, max.	70 °C (158 °F)		
North American Temp Code	T4	T4A	T5
ATEX Temp Code	T4		
IECEx Temp Code	T4		

(1) Use this Conductor Category information to plan conductor routing. See industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Additional Resources

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

Resource	Description
XM® Monitoring Modules Specifications Technical Data, publication 1440-TD001	Provides specifications for the 1440 series of Rockwell Automation monitoring 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://ab.com	Provides declarations of conformity, certificates, and other certification details.

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

Notes:

Notes:

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.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	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.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

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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/sustainability1440-IN001B-ethics/product-environmental-compliance.page.

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