Installation Instructions

Original Instructions

A·B *Allen-Bradley*

ArmorBlock I/O 16-Channel Configurable Digital Modules

Catalog Numbers 1732E-16CFGM12P5DR, 1732E-16CFGM12M12LDR

Product Overview

The ArmorBlock® I/O 16-Channel Configurable Digital module performs the following functions:

- Supports quick connect functionality
- Rated IP65, IP67, or IP69K where marked
- Supports 16 digital configurable inputs and outputs with short circuit protection and diagnostics.

The modules are configured with the Studio 5000 Logix Designer® application. For more information on how to use ArmorBlock I/O modules, including the compatible Logix 5000™ controllers and Studio 5000 Logix Designer application versions, see the publications that are listed in .

Catalog Description

Catalog Number	I/O Channels	Power Connection	I/O Connection
1732E-16CFGM12M12LDR	16 digital inputs or outputs	(2) M12, L-coded connectors	(8) M12, A-coded connectors
1732E-16CFGM12P5DR		(2) 7/8" connectors	

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ATTENTION: Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice. If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

注意： 在安装、配置、操作和维护本产品前，请阅读本文档以及 " 其他资源 " 部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。

安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。

如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。

ATENCIÓN: Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.

El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable. Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.

ATENÇÃO: Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.

Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.

ВНИМАНИЕ: Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.

Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.

Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.

注意： 本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。

設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。

本機器が製造メーカにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。

ACHTUNG: Lesen Sie dieses Dokument und die im Abschnitt „Weitere Informationen"aufgeführten Dokumente, die Informationen zu Installation, Konfiguration und Bedienung dieses Produkts enthalten, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder warten. Anwender müssen sich neben den Bestimmungen aller anwendbaren Vorschriften, Gesetze und Normen zusätzlich mit den Installations- und Verdrahtungsanweisungen vertraut machen.

Arbeiten im Rahmen der Installation, Anpassung, Inbetriebnahme, Verwendung, Montage, Demontage oder Instandhaltung dürfen nur durch ausreichend geschulte Mitarbeiter und in Übereinstimmung mit den anwendbaren Ausführungsvorschriften vorgenommen werden.

Wenn das Gerät in einer Weise verwendet wird, die vom Hersteller nicht vorgesehen ist, kann die Schutzfunktion beeinträchtigt sein.

ATTENTION : Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l'installation, la configuration et le fonctionnement de cet équipement avant d'installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d'installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.

Les activités relatives à l'installation, le réglage, la mise en service, l'utilisation, l'assemblage, le démontage et l'entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.

Si cet équipement est utilisé d'une façon qui n'a pas été définie par le fabricant, la protection fournie par l'équipement peut être compromise.

주의 : 본 제품 설치, 설정 , 작동 또는 유지 보수하기 전에 본 문서를 포함하여 설치 , 설정 및 작동에 관한 참고 자료 섹션의 문서들을 반드시 읽고 숙지하십시오 . 사용자는 모든 관련 규정 , 법규 및 표준에서 요구하는 사항에 대해 반드시 설치 및 배선 지침을 숙지해야 합니다 .

설치 , 조정 , 가동 , 사용 , 조립 , 분해 , 유지보수 등 모든 작업은 관련 규정에 따라 적절한 교육을 받은 사용자를 통해서만 수행해야 합니다 .

본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다 .

ATTENZIONE Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione "Altre risorse", riguardanti l'installazione, la configurazione ed il funzionamento dell'apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.

Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.

Qualora l'apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.

DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.

Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulama yönetmeliklerine uygun şekilde yapılabilir.

Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.

注意事項： 在安裝、設定、操作或維護本產品前，請先閱讀此文件以及列於 「其他資源」章節中有關安裝、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。

包括安裝、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, bedient of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsinstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.

Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.

Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

Environment and Enclosure

ATTENTION: This equipment is intended for use in overvoltage Category II applications (as defined in EN/IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as enclosed equipment. It should not require additional system enclosure when used in locations consistent with the equipment Enclosure Type Ratings. Subsequent sections of this publication may contain more information regarding specific enclosure type ratings, beyond what this product provides, that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

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

WARNING: Special Conditions for Safe Use:

- Make sure that all connectors and caps are securely tightened to properly seal the connections against leaks and maintain IP enclosure type requirements.
- Do not connect or disconnect under voltage!
- Read this document and the documents listed in the Additional Resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.
- Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.
- In case of malfunction or damage, no attempts at repair should be made. The module should be returned to the manufacturer for repair. Do not dismantle the module.

Prevent Electrostatic Discharge

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

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

Electrical Safety Considerations

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

- SELV source approved to EN/IEC60950-1, EN/IEC61010-2-201 or EN/IEC62368-1 (ES1)
- PELV source approved to EN/IEC60950-1, EN/IEC61010-2-201 or EN/IEC62368-1 (ES1)
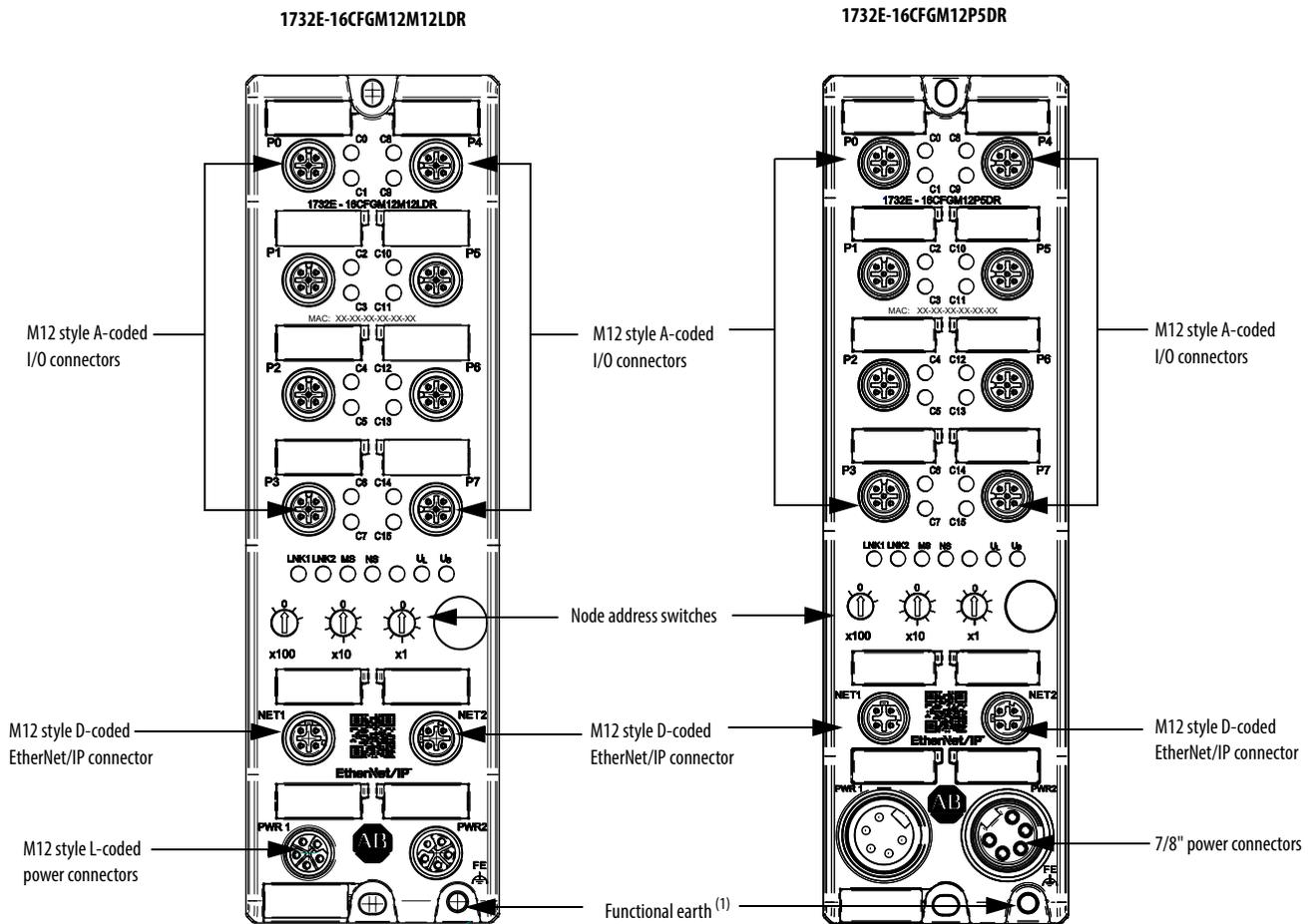
IMPORTANT Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for the purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability for actual use based upon the examples shown in this publication.

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

About the Module

ArmorBlock I/O 16-Channel Configurable Digital Module

1732E-16CFGM12M12LDR **1732E-16CFGM12P5DR**

M12 style A-coded I/O connectors

M12 style A-coded I/O connectors

M12 style A-coded I/O connectors

Node address switches

M12 style D-coded EtherNet/IP connector

M12 style D-coded EtherNet/IP connector

M12 style D-coded EtherNet/IP connector

M12 style L-coded power connectors

7/8" power connectors

Functional earth [1]

[1] Functional Earth grounds the I/O block EtherNet/IP communication circuitry, which is designed to mitigate the effect of noise on the network. The device requires a solid earth ground connection, either through a metal screw to a grounded metal panel or through a wire. See EtherNet/IP Connectors on page 7 for connections.

Before You Begin

Before you install the module, verify that you have the following:

Components Needed to Install a Digital Module

Component	Description
Tools	You need the following tools: • Screwdriver

Install the Module

To install the module:

- Mount the module
- Connect the EtherNet/IP, I/O, and auxiliary power cables to the module.
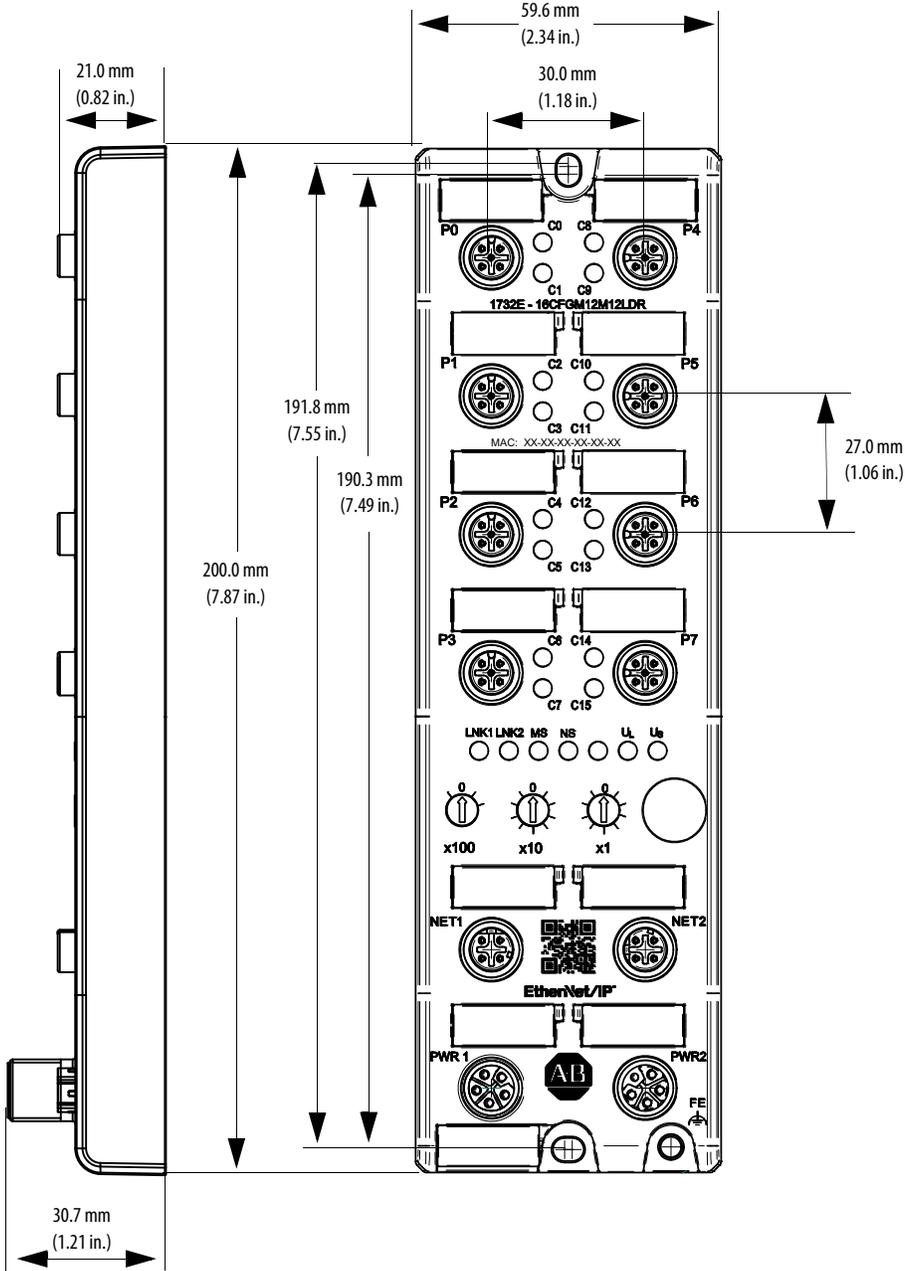
Mount the Module

Two sets of mounting holes are used to mount the module directly to a machine. Mounting holes accommodate M4 x 25/30-mm screws with toothed lock washer (for example, a DIN 125 screw) and self-locking nuts. The torque specification is 1.0 N•m (8.85 lb-in.).
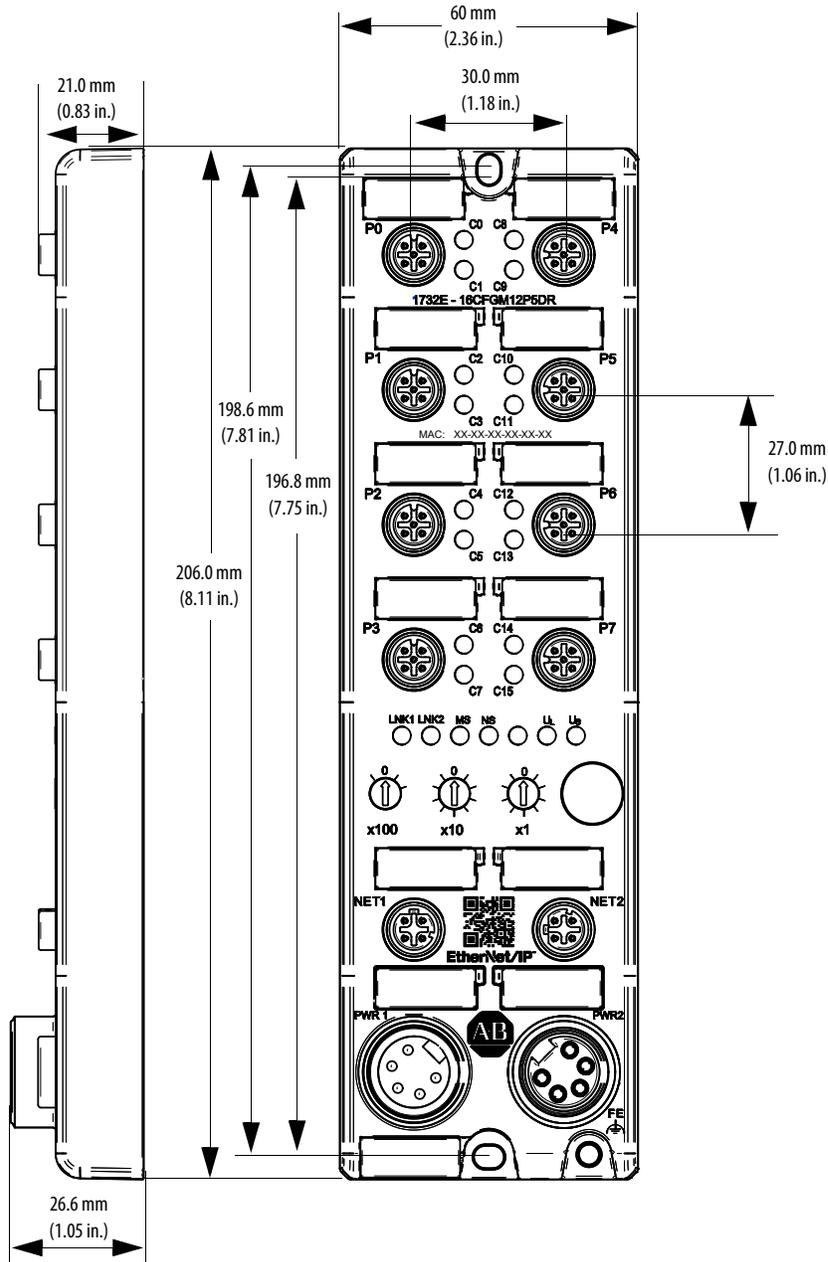
Module Dimensions

See the mounting dimensions illustration to help you mount the module.

ArmorBlock I/O 16-Channel Digital Module Dimensions – 1732E-16C FGM12M12LDR

ArmorBlock I/O 16-Channel Digital Module Dimensions – 1732E-16CFGM12P5DR

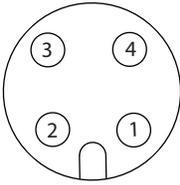## Connect the EtherNet/IP, I/O, and Auxiliary Power Cables to the Module

The modules have:

- Two 4-pin M12 style EtherNet/IP connectors
- Eight 5-pin M12 style I/O ports for sensors
- Two 5-pin power connectors
    - 1732E-16CFGM12M12LDR – M12 style
    - 1732E-16CFGM12P5DR – 7/8"

All connectors need to be covered or cable-terminated to maintain the IP rating. Connect the cordsets that you selected for your module to the appropriate connectors.

EtherNet/IP Connectors

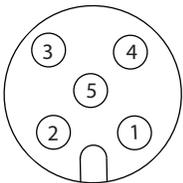**D-Code, 4-pin, Micro Network Female Connector**

Pin	Value	Function
1	TD+	Transmit data +
2	RD+	Receive data +
3	TD-	Transmit data -
4	RD-	Receive data -

View into Connector

I/O Ports

M12 Style, 5-pin, A-Coded I/O Female Connector

Pin	Value	Function
1	+24V DC	Sensor source
2	In/out B	Digital I/O (odd channels)
3	GND 0V	Reference potential
4	In/out A	Digital I/O (even channels)
5	FE	Functional earth

View into Connector

Auxiliary Power Connectors

M12 Style, 5-pin, L-Coded Power Male Connector – PWR 1 — 1732E-16CFGM12M12LDR

Pin	Value	Function
1	+24V	Sensor/module power +
2	GND U_L	Output power reference ground
3	GND 0V	Sensor/module power reference ground
4	+24V U_L	Output power +
5	FE	Functional earth

View into Connector

M12 Style, 5-pin, L-Coded Power Female Connector – PWR 2 — 1732E-16CFGM12M12LDR

Pin	Value	Function
1	+24V	Sensor/module power +
2	GND U_L	Output power reference ground
3	GND 0V	Sensor/module power reference ground
4	+24V U_L	Output power +
5	FE	Functional earth

View into Connector

M12 Style, 5-pin, 7/8" Power Male Connector – PWR 1 — 1732E-16CFGM12P5DR

Pin	Value	Function
1	GND UL	Output power reference ground
2	GND 0V	Sensor/module power reference ground
3	FE	Functional earth
4	+24V U_S	Sensor/module power +
5	+24V U_L	Output power +

View into Connector

M12 Style, 5-pin, 7/8" Power Female Connector – PWR 2 — 1732E-16CFGM12P5DR
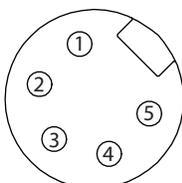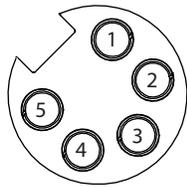
View into Connector

Pin	Value	Function
1	GND U$_L$	Output power reference ground
2	GND 0V	Sensor/module power reference ground
3	FE	Functional earth
4	+24V U$_S$	Sensor/module power +
5	+24V U$_L$	Output power +

> **ATTENTION:** Only use power supply units for the system/sensor and actuator supply that correspond to PELV (protective extra low voltage) or SELV (safety extra low voltage). Power supplies according to EN 61558-2-6 (transformers) or EN 60950-1 (switching power supply units) fulfill these requirements.

Specifications

This table includes a subset of specifications for the IO-Link modules. For a complete list of specifications, see the 1732 ArmorBlock I/O Modules Selection Guide, publication 1732-SG001.

Attribute	1732E-16CFGM12M12LDR	1732E-16CFGM12P5DR
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold) IEC 60068-2-2 (Test Bd, Operating Dry Heat) IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-20 °C < Ta < +70 °C (-4 °F < Ta < +158 °F)	
Temperature, ambient max	70 °C (158 °F)	
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold) IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat) IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)	
Relative humidity IEC 60068-2-30 (Test dB, Unpackaged Damp Heat)	5…95% noncondensing	
Vibration IEC 60068-2-6 (Test Fc, Operating)	15 g @ 5…500 Hz	
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g	
Emissions	IEC 61000-6-4	
ESD Immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges	
Radiated RF Immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz	
EFT/B Immunity IEC 61000-4-4	±3 kV at 5 kHz on signal ports	
Surge Transient Immunity IEC 61000-4-5	±500V line-line(DM) and ±1 kV line-earth(CM) on 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	Meets IP65/67/69K (when marked)[3]	Meets IP65/67 (when marked)[3]
Voltage and current ratings	24V DC, 5 mA	
All supply power and/or current ratings	24V DC (SELV/PELV), 120 mA	

Attribute	1732E-16CFGM12M12LDR	1732E-16CFGM12P5DR
Isolation voltage	500V DC Basic	
Wiring Category[(1)(2)]	2 - on signal ports	
Weight, approx.	500 g (17.64 oz.)	520 g (18.34 oz.)

(1)   Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

(2)   Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

(3)   When sealing caps and cable termination are used. See the 1732 ArmorBlock I/O Modules Selection Guide, publication 1732-SG001 for a list of appropriate cables to meet IP rating.

Additional Resources

For more information on the products that are described in this publication, use these resources.

Resource	Description
1732 ArmorBlock I/O Modules Selection Guide, publication 1732-SG001	Provides all 1732 ArmorBlock I/O modules specifications.
ArmorBlock 16-Channel Configurable Digital Module User Manual, publication 1732E-UM001	Provides detailed information on how to install, configure, and operate the ArmorBlock I/O 16-Channel Configurable Digital Module.
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/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley® distributor or Rockwell Automation sales representative.

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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