

## 1407-CGCM Combination Generator Control Module

### Original Instructions

The Combination Generator Control Module (CGCM unit) is a microprocessor-based control and protection device. The CGCM unit is designed to integrate with a Logix family programmable controller to provide generator control, protection and synchronization functions. Programmability of system parameters, regulation settings, and protective functions enable the CGCM unit to be used in a wide range of applications.



**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を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 „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 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, ayarlar, 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 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 vhodné 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.

**OB!** 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.

### Important User Information

This document uses these symbols to make you aware of safety considerations.



**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

**IMPORTANT** This document contains important information related to agency certifications for the Combination Generator Control Module. The product is marked with all agency approvals and certifications. This document is not intended for installing, configuring, or operating this product. Do not install this product until you have first read this document and the appropriate documents under Additional Resources. For declarations of conformity, certificates, and other certification details, visit the Product Certifications page at <http://www.ab.com>.

**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.



**ATTENTION:** 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.

### Certifications

The Combination Generator Control Module has these certifications.

Region <sup>(1)</sup> (2) (3) (4) (5)	Certification/Compliance	Standard
USA and Canada	Class I, Zone 2, AEx ic nA [ic] IIC T4, Ex ic nA [ic] IIC T4 Gc	UL60079-0 6th Edition / CSA60079-0:11 UL60079-11 6th Edition / CSA60079-11:11 UL60079-15 4th Edition / CSA60079-15:12
	Class I, Division 2, Groups A, B, C, or D UL File E198348	ANSI/ISA 12.12.01-2013 / CSAC22.2 No.213-M1987
Europe	Ex II 3G Ex ic nA [ic] IIC T4 Gc (DEMKO 14 ATEX 1230U) IECEx UL 14.0018U	EN 60079-0:2012 + A11:2013 EN 60079-11:2012 EN 60079-15:2010 EN ISO/IEC-80079-34:2011

- (1) This equipment is intended to be mounted inside a suitable ATEX certified enclosure providing a minimum of IP54 protection.
- (2) This equipment is intended for use in a Pollution Degree 2 industrial environment or better.
- (3) The device is to be powered by a 24V Nominal Battery or 24 VDC Power Supply with ATEX certification.
- (4) Refer to pages 3 and 4 for additional rating and [ic] parameters.
- (5) Use wire rated to 105°C minimum.

### 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><b>WARNING:</b> <b>Explosion Hazard -</b></p> <ul style="list-style-type: none"> <li>• Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.</li> <li>• 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.</li> <li>• Substitution of components may impair suitability for Class I, Division 2.</li> <li>• If this product contains batteries, they must only be changed in an area known to be nonhazardous.</li> </ul>	<p><b>AVERTISSEMENT:</b> <b>Risque d'Explosion -</b></p> <ul style="list-style-type: none"> <li>• Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.</li> <li>• 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.</li> <li>• La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2.</li> <li>• S'assurer que l'environnement est classé non dangereux avant de changer les piles.</li> </ul>

### Environment and Enclosure Information



**ATTENTION:** This equipment is intended for use in a Pollution Degree 2 Industrial Environment, in over-voltage Category II applications (as defined by IEC publication 60664-1). Because the units contain a heat sink, they must be mounted vertically. Any other mounting angle reduces the heat dissipation capabilities of the units, possibly leading to premature failure of critical components. The unit can be mounted anywhere that the ambient temperature does not exceed the rated environmental conditions or clearance requirements. These are the clearance requirements for the CGCM unit:

- 63.5 mm (2.5 in.) of clearance is required on both sides of the unit when mounted
- 101.6 mm (4 in.) of clearance is required above and below the unit when mounted

This device is supplied as open-type equipment and is intended to be mounted inside a suitable enclosure providing a minimum of IP54 protection.

In addition to this publication, refer to these other publications:

- Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#), for additional installation requirements.
- NEMA Standards 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.

## Temperature Specifications

Attribute	1407-CGCM
Temperature, operating	-20...70 °C (-4...158 °F)
Temperature, storage	-40...85 °C (-40...185 °F)

## Wiring Specifications

### Power Wiring

Circuit	Input Voltage <sup>(1)</sup>		Wire Type	Wire Size <sup>(3)</sup>	Terminal Screw Torque
Control Power	-	18...32V DC	Cu 105 °C (221 °F) <sup>(2)</sup> stranded or solid	1.6...1.0 mm <sup>2</sup> (14...18 AWG)	N/A <sup>(4)</sup>
Generator Reference	57...208V AC	-			
Bus Reference	57...208V AC	-			
PMG Power	79...300 VAC	-		2.6...2.1 mm <sup>2</sup> (10...12 AWG)	1 N·m (9 lb-in)
Current Sense	0...5 A AC	-			

(1) See label on product for power or current requirements.

(2) Minimum required insulation temperature rating. For ambient temperatures below -10 °C and above 60 °C use field wiring suitable for both the minimum and maximum ambient temperature.

(3) Single wire size.

(4) Spring clip terminals.

### Protective Earth/Chassis Ground Wiring

The terminal labeled CH GND, located on TB4, is the chassis ground. Ground studs are additionally provided on the lower part of the mounting flanges and are internally connected to the CH GND terminal. Chassis ground should be connected to earth ground with minimum 2.6 mm<sup>2</sup> (10 AWG) copper wire attached to either stud located on the lower part of either side of the unit and with 1.6 mm<sup>2</sup> (14 AWG) to the CH GND terminal.

## Class I, Zone 2 Installations

This section provides information for Class I, Zone 2 installations.

### Cable Length Determination

Capacitance and inductance of the field wiring from the intrinsically safe equipment (the 1407-CGCM unit) to the associated apparatus (for example, current transformer or load share compatible devices) shall be calculated and must be included in the system calculations shown in [Required Circuit Parameters for the Associated Apparatus on page 3](#). Cable capacitance,  $C_{\text{cable}}$ , plus intrinsically safe equipment capacitance,  $C_i$ , must be less than the marked capacitance,  $C_a$  (or  $C_o$ ), shown on any associated apparatus used. The same applies for inductance ( $L_{\text{cable}}$ ,  $L_i$  and  $L_a$  or  $L_o$ , respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used:  $C_{\text{cable}} = 60\text{pF/ft.}$ ,  $L_{\text{cable}} = 0.2\text{ uH/ft.}$

**Table 1 Required Circuit Parameters for the Associated Apparatus**

Nonincendive/Energy Limited (Intrinsically Safe) Equipment		Associated Apparatus
$V_{\text{max}}$ (or $U_i$ )	$\geq$	$V_{\text{oc}}$ or $V_t$ (or $U_o$ )
$I_{\text{max}}$ (or $I_i$ )	$\geq$	$I_{\text{sc}}$ or $I_t$ (or $I_o$ )
$P_{\text{max}}$ (or $P_i$ )	$\geq$	$P_o$ <sup>(1)</sup>
$C_i + C_{\text{cable}}$	$\leq$	$C_a$ (or $C_o$ )
$L_i + L_{\text{cable}}$	$\leq$	$L_a$ (or $L_o$ )

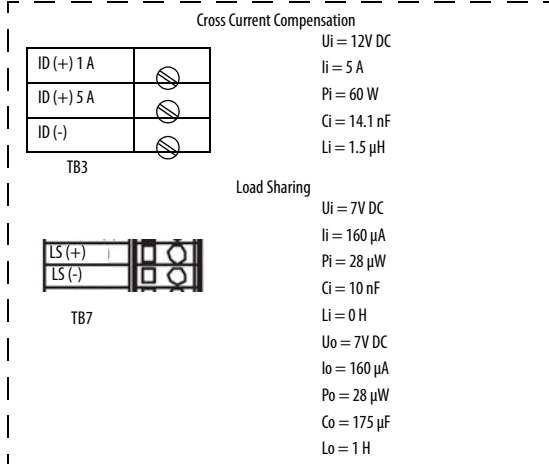
(1) If  $P_o$  of the associated apparatus is not known, it is calculated by using the formula  $P_o = (V_{\text{oc}} * I_{\text{sc}}) / 4 = (U_o * I_o) / 4$ .

**Table 2 Symbol Definitions**

Symbol	Definition
$V_{\text{max}}$ or $U_i$	Maximum voltage that can be connected to the specified terminals of the I.S. device (1407-CGCM unit)
$I_{\text{max}}$ or $I_i$	Maximum current that can be connected to the specified terminals of the I.S. device (1407-CGCM unit)
$P_{\text{max}}$ or $P_i$	Maximum power that can be connected to the specified terminals
$V_{\text{oc}}$ , $V_t$ or $U_o$	Maximum open-circuit voltage that can be present at the output terminals of the associated equipment
$I_{\text{sc}}$ , $I_t$ or $I_o$	Maximum short-circuit current that can be present at the output terminals of the associated equipment
$P_o$	Maximum output power from the output terminals of the associated equipment
$C_i$	Apparent capacitance at the specified terminals of the I.S. device
$C_a$ or $C_o$	Maximum capacitance that can be connected to the output terminals of the associated equipment
$L_i$	Apparent inductance at the specified terminals of the I.S. device
$L_a$ or $L_o$	Maximum inductance that can be connected to the output terminals of the associated equipment
$C_{\text{cable}}$	Cable capacitance
$L_{\text{cable}}$	Cable inductance

## Field Wiring Terminals and Entity Parameters

**Figure 1 - Class I, Division 2 Groups A, B, C, and D, Class I Zone 2 IIC Area**



### Installation

Associated apparatus must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electrical Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada and EN 60079-14 for European installations or in accordance with the local installation codes.

### Additional Resources

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

Resource	Description
Combination Generator Control Module User Manual, publication <a href="#">1407-UM001</a> .	Provides information on using the Combination Generator Control Module.
Combination Generator Control Module Release Notes, publication <a href="#">1407-RN001</a>	Provides information on changes and updates to the Combination Generator Control Module firmware.
Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls, publication <a href="#">SGL-1.1</a>	Describes some important differences between solid-state equipment and hard-wired electromechanical devices.
ControlNet Coax Media Planning and Installation, publication <a href="#">CNET-IN002</a>	Provides installation procedures for the ControlNet network.
Logix5000 Controllers Common Procedures, publication <a href="#">1756-PM001</a>	This publication links to a collection of programming manuals that describe how you can use procedures that are common to all Logix5000™ controller projects.
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="http://www.rockwellautomation.com/products/certification">http://www.rockwellautomation.com/products/certification</a>	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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Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

**[www.rockwellautomation.com](http://www.rockwellautomation.com)**

### Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444  
 Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640  
 Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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