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# Safety Guidelines

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Thank you for purchasing the CC-Link IE Field Network Ethernet adapter module.

Prior to use, please read this and relevant manuals thoroughly to fully understand the product.


MODEL	NZ2GF-ETB-U-HW
MODEL CODE	13J253
IB(NA)-0800463-G(2303)MEE	

## ● SAFETY PRECAUTIONS ●

(Read these precautions before using this product.)

Before using the CC-Link IE Field Network Ethernet adapter module (hereinafter referred to as Ethernet adapter module), please read this manual and the relevant manual introduced in this manual carefully and pay full attention to safety to handle the product correctly.

In this manual, the safety precautions are classified into two levels:


" WARNING" and " CAUTION".

### **WARNING**

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.

### **CAUTION**

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under " CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

## [Design Precautions]

### **WARNING**

- Configure safety circuits external to the Ethernet adapter module to ensure that the entire system operates safely even when a fault occurs in the external power supply or the Ethernet adapter module. Incorrect output or malfunction due to a communication failure may result in an accident.  
The Ethernet adapter module stops the operation if the self-diagnostics function of the module detects an error such as a watchdog timer error.
- When changing data of a running programmable controller on another station from a peripheral connected to the Ethernet adapter module, configure an interlock circuit on the program of the station to ensure that the entire system will always operate safely.  
For other controls to a running programmable controller on another station (such as program modification or operating status change) or status control of the Ethernet adapter module, read relevant manuals carefully and ensure the safety before the operation.  
Especially, in the case of a control from an external device to a remote programmable controller on another station, immediate action cannot be taken for a problem on the programmable controller due to a communication failure. To prevent this, configure an interlock circuit on the program of another station, and determine corrective actions to be taken between the external device and a programmable controller on the station in case of a communication failure.
- Do not write any data to the "system area" or "write-protect area" of the buffer memory in the Ethernet adapter module.  
Doing so may cause malfunction of the Ethernet adapter module.

## [Design Precautions]

### **CAUTION**

- Do not install the communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.

## [Security Precautions]

 **WARNING**

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

## [Installation Precautions]

### CAUTION

- Use the Ethernet adapter module in an environment that meets the general specifications described in this manual. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- Do not directly touch any conductive parts or electronic components of the Ethernet adapter module. Doing so can cause malfunction or failure of the Ethernet adapter module.

## [Wiring Precautions]

### WARNING

- Shut off the external power supply for the system in all phases before wiring. Failure to do so may result in electric shock or cause the Ethernet adapter module to fail or malfunction.
- After wiring, attach the included terminal cover to the product before turning it on for operation. Failure to do so may result in electric shock.

## [Wiring Precautions]

### CAUTION

- Ground the FG and LG terminals to the protective ground conductor dedicated to the programmable controller. Failure to do so may result in electric shock or malfunction.
- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when a screw on the terminal block comes loose, resulting in failure.
- Check the rated voltage and terminal layout before wiring to the Ethernet adapter module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Connect the connector to the Ethernet adapter module securely.
- Do not install the communication cables together with the main circuit lines or power cables. Failure to do so may result in malfunction due to noise.

## [Wiring Precautions]

### CAUTION

- Place the cables to be connected to the Ethernet adapter module in a duct, or clamp them.  
If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the Ethernet adapter module or cables or malfunction due to poor connection.
- Tighten the screws on the terminal block within the specified torque range. Undertightening can cause short circuit, fire, or malfunction. Overtightening can damage the screw and/or Ethernet adapter module, resulting in drop, short circuit, fire, or malfunction.
- When disconnecting the communication cable from the Ethernet adapter module, do not pull the cable by the cable part.  
For a cable with connector, hold the connector by hand and pull it out. Failure to do so may result in malfunction and damage to the Ethernet adapter module or cable.
- Prevent foreign matter such as dust or wire chips from entering the Ethernet adapter module. Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the Ethernet adapter module to prevent foreign matter, such as wire chips, from entering the module during wiring. Do not remove the film during wiring. Remove it for heat dissipation before system operation.
- The Ethernet adapter module must be installed in a control panel. Connect the main power supply through a relay terminal block. Wiring and replacement of the Ethernet adapter module must be performed by qualified maintenance personnel who is familiar with protection against electric shock.  
For wiring methods, refer to "Wiring" in the CC-Link IE Field Network Ethernet Adapter Module User's Manual.

## [Startup and Maintenance Precautions]

### WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply for the system in all phases before cleaning the module or retightening the screws on the terminal block. Failure to do so may result in electric shock.

## [Startup and Maintenance Precautions]

### CAUTION

- Before performing online operations (especially, program modification, forced output, and operation status change) for a running Ethernet adapter module or a CPU module on another station from the peripheral connected, read relevant manuals carefully and ensure the safety. Improper operation may damage machines or cause accidents.
- Do not disassemble or modify the Ethernet adapter module. Doing so may cause failure, malfunction, injury, or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away in all directions from the Ethernet adapter module. Failure to do so may cause malfunction.
- Tighten the screws on the terminal block within the specified torque range. Undertightening can cause drop of parts or wires, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Before handling the Ethernet adapter module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the Ethernet adapter module to fail or malfunction.

## [Disposal Precautions]

### CAUTION

- When disposing of this product, treat it as industrial waste.

## ● PRÉCAUTIONS DE SÉCURITÉ ●

(Lire ces précautions avant toute utilisation du produit.)

Avant d'utiliser le module adaptateur Ethernet pour réseau de terrain IE CC-Link (ci-après en abrégé "le module adaptateur Ethernet"), prière de lire attentivement ce manuel ainsi que les manuels auxquels il renvoie en prêtant une attention particulière à ce qui a trait à la sécurité du produit.

Dans ce manuel, les précautions de sécurité sont classées en deux niveaux, à savoir : "AVERTISSEMENT" et "ATTENTION"

### **AVERTISSEMENT**

Attire l'attention sur le fait qu'une négligence peut créer une situation de danger avec risque de mort ou de blessures graves.

### **ATTENTION**

Attire l'attention sur le fait qu'une négligence peut créer une situation de danger avec risque de blessures légères ou de gravité moyennes ou risque de dégâts matériels.

Dans certaines circonstances, le non-respect d'une précaution de sécurité introduite sous le titre "ATTENTION" peut avoir des conséquences graves.

Les précautions de ces deux niveaux doivent être observées dans leur intégralité car elles ont trait à la sécurité des personnes et aussi du système.

Veiller à ce que les utilisateurs finaux lisent ce manuel qui doit être conservé soigneusement à portée de main pour s'y référer autant que de besoin.



## **[Précautions lors de la conception]**

### **AVERTISSEMENT**

- *Configurer les circuits de sécurité à l'extérieur du module adaptateur Ethernet pour que l'ensemble du système reste en sécurité même après survenance d'une anomalie dans l'alimentation externe ou dans le module adaptateur Ethernet. Une sortie erronée ou un dysfonctionnement suite à une erreur de communication peuvent être à l'origine d'un accident.  
Le module adaptateur Ethernet interrompt la marche quand la fonction d'auto-diagnostic du module détecte une erreur comme une erreur d'horloge de surveillance.*
- *Pour pouvoir changer des données dans un automate programmable en marche sur une autre station à partir d'un périphérique connecté au module adaptateur Ethernet, constituer dans le programme de la station un circuit de verrouillage permettant de garantir en tous temps la sécurité de l'ensemble du système.  
Pour les autres interventions sur un automate programmable en marche d'une autre station (comme par exemple une modification de programme ou un changement d'état fonctionnel), procéder comme indiqué dans les manuels correspondants et faire les contrôles de sécurité avant d'opérer.  
En particulier, dans le cas d'une action à partir d'un dispositif externe sur un automate programmable distant, aucune mesure immédiate ne pourrait être prise si la communication est interrompue par suite d'un problème entre le dispositif externe et l'automate programmable. Pour se prémunir contre cette éventualité, prévoir un circuit d'asservissement dans le programme d'une autre station et déterminer les mesures à prendre en cas de problème de communication entre le dispositif externe et un automate programmable de la station.*
- *N'introduire aucune donnée dans les zones réservées "system area" ou "write-protect area" de la mémoire-tampon du module adaptateur Ethernet. Cela pourrait être à l'origine de dysfonctionnements du module adaptateur Ethernet.*

## **[Précautions lors de la conception]**

### **ATTENTION**

- *Ne pas installer les câbles de communication avec les lignes des circuits principaux et les câbles d'alimentation. Les installer en maintenant entre eux une distance minimum de 100 mm. Faute de quoi, il y a risque de dysfonctionnement par un bruit.*

## **[Précautions de sécurité]**



### **AVERTISSEMENT**

- *Pour maintenir la sécurité (confidentialité, intégrité et disponibilité) de l'automate programmable et du système contre les accès non autorisés, les attaques par déni de service (DoS), les virus informatiques et autres cyberattaques d'appareils externes via le réseau, prendre les mesures appropriées telles que la configuration d'un pare-feu ou d'un réseau privé virtuel (VPN), ou l'installation d'un logiciel antivirus sur l'ordinateur.*

## **[Précautions d'installation]**

### **ATTENTION**

- *Utiliser l'enregistreur de données BOX dans un environnement conforme aux spécifications générales présentées dans ce manuel. Faute de quoi, il a risque d'électrocution, de départ de feu, de dysfonctionnement, d'endommagement ou de détérioration du produit.*
- *Éviter tout contact direct avec les parties conductrices et les composants électroniques du module adaptateur Ethernet. Cela pourrait être à l'origine de dysfonctionnements ou d'une panne du module adaptateur Ethernet.*

## **[Précautions de câblage]**

### **AVERTISSEMENT**

- *Couper l'alimentation externe du système sur toutes les phases avant de commencer à câbler.  
Faute de quoi, il y a risque d'électrocution et le module adaptateur Ethernet risque de tomber en panne ou de mal fonctionner.*
- *Après câblage, mettre le couvre-bornes fourni en place avant de procéder à la mise sous tension pour mettre en marche. Faute de quoi, il y a risque d'électrocution.*

## **[Précautions de câblage]**

### **ATTENTION**

- *Mettre à la masse les bornes FG et LG sur le conducteur réservé à la protection à la terre de l'automate programmable. Faute de quoi, il y a risque d'électrocution et de dysfonctionnement.*
- *Utiliser des bornes sans soudure de type approprié et serrer au couple de serrage prescrit. Si on utilise des bornes sans soudure de type embrochable, il y a risque de déconnexion et de panne au cas où une vis de borne se desserrerait.*
- *Vérifier la tension nominale et l'affectation des bornes avant le câblage du module adaptateur Ethernet et raccorder les câbles correctement. Le raccordement d'une alimentation d'une tension autre que la tension nominale ou une erreur de câblage peut être à l'origine d'un départ de feu ou d'une panne.*
- *Raccorder fermement le connecteur sur le module adaptateur Ethernet.*
- *Ne pas installer les câbles de communication avec les lignes des circuits principaux et les câbles d'alimentation. Faute de quoi, il y a risque de dysfonctionnement par un bruit.*

 **ATTENTION**

- *Les câbles à raccorder au module adaptateur Ethernet doivent être placés dans un conduit de câbles ou doivent être attachés.  
Faute de quoi, le ballottement ou le déplacement des câbles pourrait endommager le module adaptateur Ethernet ou les câbles et être à l'origine de dysfonctionnements par mauvais contact.*
- *Serrer les vis de la plaque à bornes dans les limites des couples de serrage prescrit. Si les vis sont insuffisamment serrées, il y a risque de court-circuits, départ de feu ou dysfonctionnement. Un serrage excessif peut endommager les vis et/ou le module adaptateur Ethernet, avec aussi un risque de chute, de court-circuit, de départ de feu et de dysfonctionnements.*
- *Pour débrancher le câble de communication du module adaptateur Ethernet, ne jamais tirer sur le câble proprement dit.  
Si le câble a un connecteur, saisir le connecteur au main et débrancher en tirant par le connecteur.  
Faute de quoi, il y a risque de dysfonctionnement ou panne du module adaptateur Ethernet, ou d'endommagement du module ou du câble.*
- *Veiller à ne pas laisser la poussière, les copeaux métalliques ou d'autres corps étrangers pénétrer dans le module adaptateur Ethernet. De telles corps étrangers peuvent être à l'origine d'un départ de feu, d'une panne ou d'un dysfonctionnement.*
- *Le haut du module adaptateur Ethernet est recouvert d'un film protecteur pour éviter toute pénétration de corps étrangers comme des copeaux métalliques pendant le câblage. Ne pas retirer le film protecteur avant de terminer le câblage. Il doit cependant être retiré avant la mise en service du système pour une meilleure dispersion de la chaleur.*
- *Le module adaptateur Ethernet doit être installé dans un tableau de commande. Raccorder l'alimentation principale via un bornier à relais. Le câblage et le remplacement d'un module adaptateur Ethernet doivent être effectués par un personnel de maintenance qualifié formé à la protection contre les chocs électriques.  
Quant aux méthodes de câblage, voir "Câblage" dans le manuel de l'utilisateur du module adaptateur Ethernet pour réseau de terrain IE CC-Link.*

## **[Précautions de démarrage et de maintenance]**

### **AVERTISSEMENT**

- *Ne toucher à aucun des bornes quand le système est sous tension. Faute de quoi, il y a risque d'électrocutions et de dysfonctionnements.*
- *Couper l'alimentation externe du système sur toutes les phases avant le nettoyage du module ou le resserrage des vis de bornier. Faute de quoi, il y a risque d'électrocution.*

## **[Précautions de démarrage et de maintenance]**

### **ATTENTION**

- *Avant d'effectuer une opération en ligne (en particulier une modification de programme, une sortie forcée ou un changement d'état fonctionnel) sur module adaptateur Ethernet ou un module CPU actif d'une autre station à partie d'un périphérique connecté, consulter les manuels correspondants pour travailler en toute sécurité. Une fausse manœuvre pourrait être à l'origine d'un accident ou de dégâts matériels.*
- *Ne pas démonter ni modifier le module adaptateur Ethernet. Cela pourrait entraîner des pannes ou dysfonctionnements et être à l'origine de blessures ou de départs de feu.*
- *Tout type d'appareil de communication radio, y compris les téléphones portables et les appareils PHS (Personal handy-phone system), doit être tenu éloigné de plus de 25 cm du module adaptateur Ethernet, dans tous les sens. Le non-respect de cette précaution expose à des dysfonctionnements.*
- *Serrer les vis de la plaque à bornes dans les limites des couples de serrage prescrit. Un serrage insuffisant peut être à l'origine d'un détachement de pièces ou de fils et entraîner des dysfonctionnements. Un serrage excessif peut endommager les vis et/ou le module, avec aussi un risque de chute, de court-circuits et de dysfonctionnements.*
- *Avant de manipuler le module adaptateur Ethernet, se débarrasser de la charge électrostatique qu'accumule le corps humain en touchant un objet conducteur comme une barre de mise à la terre. Le non-respect de cette précaution peut être à l'origine de pannes ou de dysfonctionnements du module adaptateur Ethernet.*

***[Précaution de mise au rebut]***



**ATTENTION**

- *Lors de sa mise au rebut, ce produit doit être traité comme un déchet industriel.*

## ● CONDITIONS OF USE FOR THE PRODUCT ●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;

- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
- ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.

("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.



Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi representative in your region.

- (3) Mitsubishi shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

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## RELATED MANUAL

The following manual is related to this product.  
Order the manual as needed, referring to the following list.

Detailed manual

Manual name	Manual Number (Model code)
CC-Link IE Field Network Ethernet Adapter Module User's Manual Specifications, procedures before operation, system configuration, installation, wiring, settings, and troubleshooting of the Ethernet adapter module  (Sold separately)	SH-080939ENG (13JZ50)

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## 1. CHECKING THE INCLUDED ITEMS

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The following items are included in the package of this product. Before use, check that all the items are included.



Ethernet adapter module



This manual

## 2. GENERAL SPECIFICATIONS

This section provides the specifications of the Ethernet adapter module.

Item	Specifications					
Operating ambient temperature <i>Température ambiante de fonctionnement</i>	0 to 55°C 0 à 55 °C					
Storage ambient temperature	-25 to 75°C					
Operating ambient humidity	5 to 95%RH, non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	Under intermittent vibration	Frequency	Constant acceleration	Half amplitude	Sweep count
			5 to 8.4Hz	—	3.5mm	10 times each in X, Y, Z directions
		8.4 to 150Hz	9.8m/s <sup>2</sup>	—		
		Under continuous vibration	5 to 8.4Hz	—	1.75mm	—
8.4 to 150Hz	4.9m/s <sup>2</sup>	—				
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147m/s <sup>2</sup> , 3 times each in 3 directions X, Y, Z)					
Operating atmosphere	No corrosive gases					
Operating altitude <sup>*1</sup>	0 to 2000m					
Installation location	Inside a control panel					
Oversvoltage category <sup>*2</sup>	II or less					
Pollution degree <sup>*3</sup>	2 or less					
Equipment category	Class I					

- \*1 Do not use or store the Ethernet adapter module under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction.  
When using the programmable controller under pressure, please consult your local Mitsubishi Electric representative.
- \*2 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities.  
The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
- \*3 This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.  
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

POINT
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For compliance with the EMC Directive, refer to  Chapter 4.
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## 3. INSTALLATION

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This section explains installation of the Ethernet adapter module.

### 3.1 Installation Environment

For the installation environment and mounting position of the Ethernet adapter module, refer to the following.



CC-Link IE Field Network Ethernet Adapter Module User's Manual

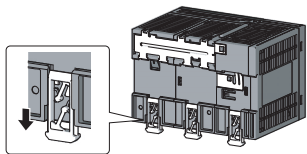
### 3.2 Precautions for Mounting the Ethernet Adapter Module

- Do not directly touch any conductive parts or electronic components of the Ethernet adapter module. Doing so can cause malfunction or failure of the Ethernet adapter module.
- Do not drop or apply strong shock to the Ethernet adapter module.
- Do not remove the printed-circuit board of the Ethernet adapter module from the case. Doing so may cause failure.
- Do not release the hooks on the upper and lower parts of the Ethernet adapter module. Doing so may cause the Ethernet adapter module to malfunction or fail.

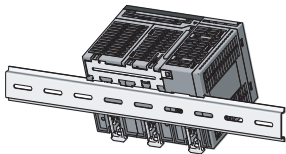
### 3.3 Mounting the Ethernet Adapter Module

The Ethernet adapter module must be mounted to a DIN rail. The following is the procedure for mounting the Ethernet adapter module to a DIN rail.

#### (1) Mounting procedure



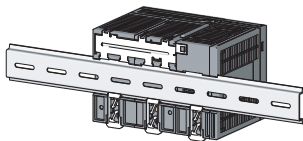
1. Pull down DIN rail hooks on the back of the Ethernet adapter module until they click.



2. Hang the upper tabs of the Ethernet adapter module on the DIN rail, and push the module in position.

Applicable DIN rail model

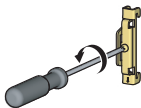
- (IEC 60715)
- TH35-7.5Fe
- TH35-7.5Al
- TH35-15Fe



3. Lock the DIN rail hooks to the DIN rail to secure the Ethernet adapter module in the position.

Pull the hooks up until they click.

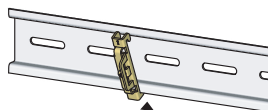
If the hooks are beyond the reach, use a tool such as a driver.



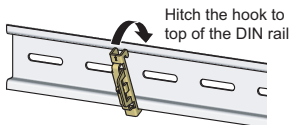
4. Loosen the screw on the DIN rail stopper.  
(Use a stopper that is attachable to the DIN rail.)

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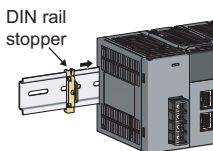




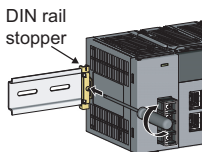
Hitch the hook to  
bottom of the DIN rail



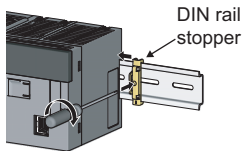
Hitch the hook to  
top of the DIN rail



DIN rail  
stopper



DIN rail  
stopper



DIN rail  
stopper

5. Hitch the bottom hook of the DIN rail stopper to the bottom of the DIN rail. Check the orientation of the DIN rail stopper according to the arrow on the front of the stopper.
6. Hitch the upper hook of the DIN rail stopper to the top of the DIN rail.
7. Slide the DIN rail stopper to the left of the Ethernet adapter module.
8. Tighten the screw on the DIN rail stopper with a screwdriver.
9. Attach a DIN rail stopper on the right of the Ethernet adapter module with the same procedure.

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## 4. EMC and Low Voltage Directives

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In each country, regulations concerning electromagnetic compatibility (EMC) and electrical safety are enacted.

For the products sold in the European countries, compliance with the EU's EMC Directive has been a legal obligation as EMC regulation since 1996, as well as the EU's Low Voltage Directive as electrical safety regulation since 1997.

Manufacturers who recognize their products are compliant to the EMC and Low Voltage Directives are required to attach a "CE marking" on their products in European countries.

In some other countries and regions, manufacturers are required to make their products compliant with applicable laws or regulations and attach a certification mark on the products as well (such as UK Conformity Assessed (UKCA) marking in the UK, and Korea Certification (KC) marking in South Korea).

Each country works to make their regulatory requirements consistent across countries based on international standards. When the requirements are consistent, measures to comply with the EMC and electrical safety regulations become common across countries.

Each country works to make their regulatory requirements consistent across countries based on international standards. When the requirements are consistent, measures to comply with the EMC and electrical safety regulations become common across countries.

The UK has also enacted electrical safety regulations whose requirements are consistent with those of the Low Voltage Directive. In this section, the requirements of the EMC and Low Voltage Directives are described as examples of those of the EMC and electrical safety regulations.

## 4.1 Requirements for Compliance with the EMC Directive

The EMC Directive specifies that "products placed on the market must be so constructed that they do not cause excessive electromagnetic interference (emissions) and are not unduly affected by electromagnetic interference (immunity)". This section summarizes the precautions on compliance with the EMC Directive of the machinery constructed with the Ethernet adapter module.

These precautions are based on the requirements and the standards of the regulation, however, it does not guarantee that the entire machinery constructed according to the descriptions will comply with the above-mentioned directives.

Machine manufacturers are required to determine the method and judgement for complying with the EMC Directive at their discretion.

### (1) Standards relevant to the EMC Directive

#### (a) Regulations regarding emission

Specification	Test item	Test details	Standard value
EN61131-2: 2007	CISPR16-2-3 Radiated emission* <sup>2</sup>	Radio waves from the product are measured.	<ul style="list-style-type: none"><li>• 30M-230MHz QP: 40dB<math>\mu</math>V/m (10m in measurement range)<sup>*1</sup></li><li>• 230M-1000MHz QP: 47dB<math>\mu</math>V/m (10m in measurement range)</li></ul>
	CISPR16-2-1, CISPR16-1-2 Conducted emission* <sup>2</sup>	Noise from the product to the power line is measured.	<ul style="list-style-type: none"><li>• 150k-500kHz QP: 79dB, Mean: 66dB<sup>*1</sup></li><li>• 500k-30MHz QP: 73dB, Mean: 60dB</li></ul>

\*1 QP: Quasi-peak value, Mean: Average value

\*2 The Ethernet adapter module is an open-type device (a device designed to be housed inside other equipment) and must be installed inside a conductive control panel. The corresponding tests were conducted with the Ethernet adapter module installed inside a control panel.

## (b) Regulations regarding immunity

Specification	Test item	Test details	Standard value
EN61131-2: 2007	EN61000-4-2 Electrostatic discharge immunity <sup>*1</sup>	Immunity test in which electrostatic is applied to the cabinet of the equipment.	<ul style="list-style-type: none"> <li>• 8kV Air discharge</li> <li>• 4kV Contact discharge</li> </ul>
	EN61000-4-3 Radiated, radio-frequency, electromagnetic field immunity <sup>*1</sup>	Immunity test in which electric fields are irradiated to the product.	80% AM modulation@1kHz <ul style="list-style-type: none"> <li>• 80M-1000MHz: 10V/m</li> <li>• 1.4G-2.0GHz: 3V/m</li> <li>• 2.0G-2.7GHz: 1V/m</li> </ul>
	EN61000-4-4 Electrical fast transient/burst immunity <sup>*1</sup>	Immunity test in which burst noise is applied to the power line and signal line.	<ul style="list-style-type: none"> <li>• AC/DC main power, I/O power, AC I/O (unshielded): 2kV</li> <li>• DC I/O, analog, communication : 1kV</li> </ul>
	EN61000-4-5 Surge immunity <sup>*1</sup>	Immunity test in which lightning surge is applied to the power line and signal line.	<ul style="list-style-type: none"> <li>• AC power line, AC I/O power, AC I/O (unshielded) : 2kV CM, 1kV DM</li> <li>• DC power line, DC I/O power : 0.5kV CM, DM</li> <li>• DC I/O, AC I/O (shielded), analog<sup>*2</sup>, communication: 1kV CM</li> </ul>
	EN61000-4-6 Immunity to conducted disturbances, induced by radio-frequency fields <sup>*1</sup>	Immunity test in which high frequency noise is applied to the power line and signal line	0.15M-80MHz, 80% AM modulation @1kHz, 10Vrms
	EN61000-4-8 Power-frequency magnetic field immunity <sup>*1</sup>	Immunity test in which the product is installed in inductive magnetic field	50Hz/60Hz, 30A/m
	EN61000-4-11 Voltage dips and interruption immunity <sup>*1</sup>	Immunity test in which power supply voltage is momentarily interrupted	<ul style="list-style-type: none"> <li>• Apply at 0%, 0.5 cycles and zero-cross point</li> <li>• 0%, 250/300 cycles (50/60Hz)</li> <li>• 40%, 10/12 cycles (50/60Hz)</li> <li>• 70%, 25/30 cycles (50/60Hz)</li> </ul>

\*1 The Ethernet adapter module is an open-type device (a device designed to be housed inside other equipment) and must be installed inside a conductive control panel. The corresponding tests were conducted with the Ethernet adapter module installed inside a control panel.

\*2 The accuracy of an analog-digital converter module may temporary vary within  $\pm 10\%$ .

(2) Installation inside a control panel

The Ethernet adapter module is an open type device and must be installed inside a control panel.

This ensures safety as well as effective shielding of electromagnetic noise that is generated from the Ethernet adapter module.

(a) Control panel

- Use a conductive control panel.
- When securing the top or bottom plate using bolts, cover the grounding part on the control panel before painting so that the part will not be painted.
- To ensure electrical contact between the inner plate and control panel, take measures such as covering the bolts so that conductivity can be ensured in the largest possible area.
- Ground the control panel with a thick ground cable so that low impedance can be ensured even at high frequencies.
- Holes in the control panel must be 10cm or less in diameter. If the diameter of the holes is larger than 10cm, radio waves may be emitted. In addition, because radio waves leak through a clearance between the control panel and its door, reduce the clearance as much as possible. The leakage of radio waves can be suppressed by the direct application of an EMI gasket on the paint surface.

Our tests have been carried out on a panel having the attenuation characteristics of 37 dB (max.) and 30 dB (mean) (measured by 3m method, 30 to 300MHz).

(b) Wiring of power cables and ground cables

- Provide a ground point near the power supply part. Ground the LG and FG terminals of the power supply part with the thickest and shortest ground cable (30cm or shorter) possible.

### (3) Cables

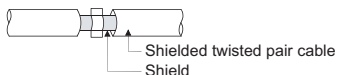
Use shielded cables for the cables which are connected to the Ethernet adapter module and run out from the control panel.

If a shielded cable is not used or not grounded correctly, the noise immunity will not meet the specified value.

#### (a) Grounding the twisted pair cable

- Always use shielded twisted pair cables for connection to 100BASE-TX and 1000BASE-T connectors.

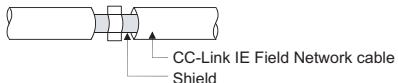
For the shielded twisted pair cable, strip a part of the jacket as shown below and ground the exposed shield section to the ground as much as possible.



#### (b) Cables for the CC-Link IE Field Network

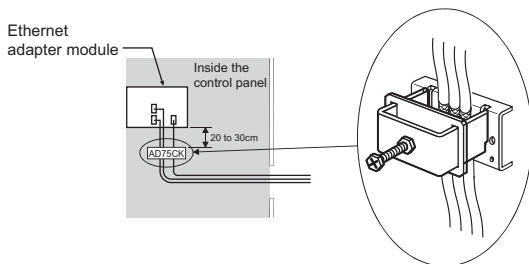
Be sure to use the cables for the CC-Link IE Field Network (manufactured by Mitsubishi Electric System & Service Co., Ltd.: SCE5EW-S□M).

- Shielded cables should be used for the CC-Link IE Field Network. Strip a part of the jacket as shown below and ground the exposed shield in the largest possible area.



(c) Grounding the cable clamp

Use shielded cables for external wiring and ground the shields of the external wiring cables to the control panel with the AD75CK-type cable clamping (Mitsubishi). (Ground the shield section 20 to 30cm away from the Ethernet adapter module.)



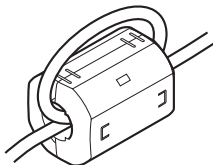
For details of the AD75CK, refer to the following.



AD75CK-type Cable Clamping Instruction Manual

- (4) External power supply  
Use a CE-marked product for an external power supply and always ground the FG terminal.  
(External power supply used for the tests conducted by Mitsubishi: TDK-Lambda DLP-120-24-1, IDEC PS5R-SF24)
- (5) Power supply part  
Always ground the LG and FG terminals after shunting them.
- (6) Others
- (a) Ferrite core  
A ferrite core has the effect of reducing radiated noise in the 30MHz to 100MHz band.  
It is recommended to attach ferrite cores if shield cables coming out from pulled out of the control panel do not provide sufficient shielding effects.  
Note that the ferrite cores must be attached at the position closest to the cable hole inside the control panel. If attached at an improper position, the ferrite core will not produce any effect.  
Attach a ferrite core to each power line as illustrated below.

Example





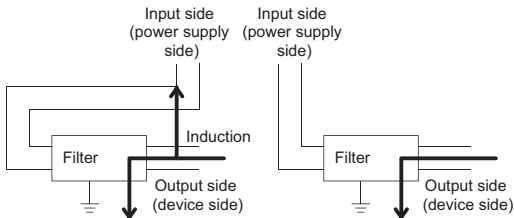
(b) Noise filter (power supply line filter)

A noise filter is a component which has an effect on conducted noise.

Attaching the filter can suppress more noise. (The noise filter has the effect of reducing conducted noise of 10 MHz or less.)

The precautions for attaching a noise filter are described below.

- Do not bundle the cables on the input side and output side of the noise filter. If bundled, the output side noise will be induced into the input side cables from which the noise was filtered.



Noise will be induced when the input and output wires are bundled.

Separately install the input and output wires.

- Ground the noise filter grounding terminal to the control panel with the shortest cable possible (approx. 10cm).

## 4.2 Requirements to Compliance with the Low Voltage Directive

The Ethernet adapter module operates at the rated voltage of 24VDC. The Low Voltage Directive is not applied to the modules that operate at the rated voltage of less than 50VAC and 75VDC.

## **REVISIONS**

\* The manual number is given on the bottom right of the cover.

Print Date	*Manual Number	Revision	
May, 2010	IB(NA)-0800463-A	First edition	
Dec., 2011	IB(NA)-0800463-B	Addition of descriptions of SAFETY PRECAUTIONS (Chinese)	
Jun., 2014	IB(NA)-0800463-C	Addition of descriptions of cUL	
Dec., 2016	IB(NA)-0800463-D	<table border="1"><tr><td>Partial correction</td></tr></table> Chapter 1	Partial correction
Partial correction			
Jun., 2018	IB(NA)-0800463-E	Descriptions are revised due to compliance with the Chinese standardized law.	
Sep., 2021	IB(NA)-0800463-F	<table border="1"><tr><td>Partial correction</td></tr></table> Addition of descriptions of SAFETY, CONDITIONS OF USE FOR THE PRODUCT, Chapter 4	Partial correction
Partial correction			
Mar.,2023	IB(NA)-0800463-G	<table border="1"><tr><td>Partial correction</td></tr></table> Front cover, back cover	Partial correction
Partial correction			

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## **WARRANTY**

Please confirm the following product warranty details before using this product.

### **1. Gratis Warranty Term and Gratis Warranty Range**

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

#### **[Gratis Warranty Term]**

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

#### **[Gratis Warranty Range]**

- (1)The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2)Even within the gratis warranty term, repairs shall be charged for in the following cases.
  - 1.Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
  - 2.Failure caused by unapproved modifications, etc., to the product by the user.
  - 3.When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
  - 4.Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
  - 5.Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
  - 6.Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
  - 7.Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

## **2. Onerous repair term after discontinuation of production**

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.

Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

## **3. Overseas service**

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

## **4. Exclusion of loss in opportunity and secondary loss from warranty liability**

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

## **5. Changes in product specifications**

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.



Country/ Region	Sales office/ Tel	Country/ Region	Sales office/ Tel
USA	MITSUBISHI ELECTRIC AUTOMATION, INC. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A. Tel : +1-847-478-2100	Turkey	MITSUBISHI ELECTRIC TURKEY A.Ş Umraniye Branch Serifali Mah. Kale Sok. No:41 34775 Umraniye - Istanbul, Turkey Tel : +90-216-969-2500
Mexico	MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch Mariano Escobedo #69, Col. Zona Industrial, Tlalnepantla Edo. Mexico, C.P.54030 Tel : +52-55-3067-7500	UAE	MITSUBISHI ELECTRIC EUROPE B.V. Dubai Branch Dubai Silicon Oasis, P.O.BOX 341241, Dubai, U.A.E. Tel : +971-4-3724716
Brazil	MITSUBISHI ELECTRIC DO BRASIL COMÉRCIO E SERVIÇOS LTDA. Avenida Adélino Cardana, 293, 21 andar, Bethaville, Barueri SP, Brazil Tel : +55-11-4689-3000	South Africa	ADROIT TECHNOLOGIES 20 Waterford Office Park, 189 Witkoppen Road, Fourways, South Africa Tel : +27-11-658-8100
Germany	MITSUBISHI ELECTRIC EUROPE B.V. German Branch Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany Tel : +49-2102-486-0	China	MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. No.1386 Hongqiao Road, Mitsubishi Electric Automation Center, Shanghai, China Tel : +86-21-2322-3030
UK	MITSUBISHI ELECTRIC EUROPE B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, U.K. Tel : +44-1707-28-8780	Korea	MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD. 7F-9F, Gangseo Hangang XI-tower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 07528, Korea Tel : +82-2-3660-9530
Ireland	MITSUBISHI ELECTRIC EUROPE B.V. Irish Branch Westgate Business Park, Ballymount, Dublin 24, Ireland Tel : +353-1-4198800	Singapore	MITSUBISHI ELECTRIC ASIA PTE. LTD. 307, Alexandra Road, Mitsubishi Electric Building, Singapore 159943 Tel : +65-6473-2308
Italy	MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch Centro Direzionale Colleoni-Palazzo Sirio Viale Colleoni 7, 20864 Agrate Brianza(Milano) Italy Tel : +39-039-60531	Thailand	MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD. 12th Floor, SV.City Building, Office Tower 1, No. 896/19 and 20 Rama 3 Road, Kwaeng Bangongpang, Khet Yannawa, Bangkok 10120, Thailand Tel : +66-2682-6522
Spain	MITSUBISHI ELECTRIC EUROPE, B.V. Spanish Branch Carretera de Rubí, 76-80-Appdo. 420, 08190 Sant Cugat del Vallés (Barcelona), Spain Tel : +34-935-65-3131	Vietnam	MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED Hanoi Branch 6th Floor, Detech Tower, 8 Ton That Thuyet Street, My Dinh 2 Ward, Nam Tu Liem District, Hanoi, Vietnam Tel : +84-4-3937-8075
France	MITSUBISHI ELECTRIC EUROPE B.V. French Branch 25, Boulevard des Bouvets, 92741 Nanterre Cedex, France Tel : +33-1-55-68-55-68	Malaysia	MITSUBISHI ELECTRIC SALES MALAYSIA SDN. BHD. Lot 11, Jalan 219, 46100 Petaling Jaya, Selangor Darul Ehsan, Malaysia Tel : +60-3-7626-5000
Czech Republic	MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch Avenir Business Park, Radlicka 751/113e, 158 00 Praha5, Czech Republic Tel : +420-251-551-470	Indonesia	PT. MITSUBISHI ELECTRIC INDONESIA Gedung Jaya 11th Floor, JL. MH. Thamrin No.12, Jakarta Pusat 10340, Indonesia Tel : +62-21-3192-6461
Poland	MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch ul. Krakowska 50, 32-083 Balice, Poland Tel : +48-12-347-65-00	India	MITSUBISHI ELECTRIC INDIA PVT. LTD. Pune Branch Emerald House, EL-3, J Block, M.I.D.C., Bhosari, Pune-411026, Maharashtra, India Tel : +91-20-2710-2000
Sweden	MITSUBISHI ELECTRIC EUROPE B.V. (Scandinavia) Fjellievägen 8, SE-22736 Lund, Sweden Tel : +46-8-625-10-00	Australia	MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD. 348 Victoria Road, P.O. Box 11, Rydalmere, N.S.W 2116, Australia Tel : +61-2-9684-7777
Russia	MITSUBISHI ELECTRIC (RUSSIA) LLC St. Petersburg Branch Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; 195027 St. Petersburg, Russia Tel : +7-812-633-3497		

## MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN  
NAGOYA WORKS: 1-14, YADA-MINAMI 5-CHOME, HIGASHI-KU, NAGOYA 461-8670, JAPAN

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