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## Safety Guidelines

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Thank you for purchasing the Mitsubishi programmable controller NZ2DL BOX Data Logger. Prior to use, please read this and relevant manuals thoroughly to fully understand the product.

MODEL	NZ2DL-U-HW
MODEL CODE	13J294
IB(NA)-0800521-C(1406)KWIX	

## SAFETY PRECAUTIONS

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(Read these precautions before using this product.)

Before using the NZ2DL BOX Data Logger(hereinafter referred to as BOX Data Logger), 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.

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### **CAUTION**

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

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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.

## [Design precautions]

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### **WARNING**

- Configure safety circuits external to BOX Data Logger to ensure that the entire system operates safely even when a fault occurs in the external power supply or BOX Data Logger. Failure to do so may result in an accident due to an incorrect output or malfunction. The output may remain ON or OFF due to a failure of the output circuit. Configure an external circuit for monitoring output signals that could cause a serious accident.
- In an error output circuit, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- To maintain the safety of BOX Data Logger against unauthorized access from external devices via the network, take appropriate measures. Also, to maintain the safety of BOX Data Logger against unauthorized access from external devices via internet, take security measures such as a firewall.

## [Design precautions]

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### **CAUTION**

- BOX Data Logger must be installed in a control panel. Connect the main power supply to a BOX Data Logger installed in the control panel via a relay terminal block.
- Do not bundle or adjacently lay the Ethernet cables, RS-232 cable, or UPS connection/external trigger input/I/O cable for error output connection 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.
- When a device such as a lamp load, heater, or solenoid valve is controlled using the error output function, a large current (approximately ten times greater than normal) may flow when the output is turned ON from OFF. Configure the system that has a sufficient current rating.
- The time to start BOX Data Logger operation after powering BOX Data Logger ON, or power BOX Data Logger ON without inserting a CompactFlash card and then insert a CompactFlash card with setting files to BOX Data Logger varies depending on the system configuration and CompactFlash card capacity, etc.  
Design circuits so that the entire system will always operate safely, regardless of the time.
- During registering each setting, do not power OFF or reset BOX Data Logger. Otherwise, the setting data in the BOX Data Logger or CompactFlash card will be undefined. Therefore, resetting and reregistering data are required.  
This may also cause BOX Data Logger failure or malfunction.

## [Installation precautions]

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### **WARNING**

- Before installing BOX Data Logger, always turn OFF the external power supply for BOX Data Logger in all phases. Failure to do so may result in electric shock or product damage.
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## [Installation precautions]

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### **CAUTION**

- Use BOX Data Logger in an environment that meets the general specifications written in user's manual. Using BOX Data Logger in any other operating environments may cause electric shocks, fire or malfunction, or may damage or degrade the module.
  - Before installing BOX Data Logger, always turn OFF the external power supply for BOX Data Logger in all phases.  
Failure to do so may result in product damage.
  - Do not touch any conductive part or electronic component of BOX Data Logger directly.  
Failure to do so may result in malfunction or fail.
  - Be sure to tighten the screws using the specified torque.  
If the screws loose, it may cause the BOX Data Logger to short circuit, malfunction or fall off.  
If the screws are tightened excessively, it may damage the screws and cause the BOX Data Logger to short circuit, malfunction or fall off.
  - Be careful not to let any foreign matter such as wire chips get inside the BOX Data Logger.  
They may cause fire, as well as breakdown and malfunction of the module.
  - A protective sheet is pasted on the upper part of BOX Data Logger in order to prevent foreign matter such as wire chips to get inside the BOX Data Logger while wiring.  
Do not remove this protective sheet during wiring work.  
However, be sure to remove the protective sheet before operating BOX Data Logger to allow heat radiation during operation.
  - Push the CompactFlash card into the CompactFlash card slot and install it securely.  
After installing the CompactFlash card, check that it is inserted securely.  
Failure to do so may cause malfunction due to poor contact.
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## [Wiring precautions]

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### **WARNING**

- Before wiring BOX Data Logger, always turn OFF the external power supply for BOX Data Logger in all phases. Failure to do so may result in electric shock or product damage.
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## [Wiring precautions]

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### **CAUTION**

- For the FG and LG terminals, more than class D grounding (the third class grounding) is required. Failure to do so may result in electric shock or malfunction.
  - Be careful not to let any foreign matter such as wire chips get inside the BOX Data Logger. They may cause fire, breakdown, and malfunction of the module.
  - A protective sheet is pasted on the upper part of BOX Data Logger in order to prevent foreign matter such as wire chips to get inside the BOX Data Logger while wiring. Do not remove this protective sheet during wiring work. However, be sure to remove the protective sheet before operating the module to allow heat radiation during operation.
  - Check the rated voltage and terminal layout before wiring BOX Data Logger, and connect the cables correctly. Connecting a power supply with wrong voltage rating or incorrect wiring may cause a fire or failure.
  - Before connecting Ethernet cables, RS-232 cable, UPS connection/external trigger input/I/O cable for error output, or power cable, confirm that the type of interface to be connected is correct. Connecting a wrong interface or incorrect wiring causes failure of the external devices.
  - Ethernet cables, RS-232 cable, UPS connection/external trigger input/I/O cable for error output to be connected to BOX Data Logger must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered. If the connection is incomplete, it may cause the module to short circuit, fire, or malfunction. Do not use spade solderless terminals as power cable solderless terminals. If the screws lose and fall off, it may cause failure.
  - Be sure to tighten the screws using the specified torque. If the screws loose, it may cause the module to short circuit, malfunction or fall off. If the screws are tightened excessively, it may damage the screws and cause the module to short circuit, malfunction or fall off.
  - Connect the Ethernet cables, RS-232 cable, UPS connection/external trigger input/I/O cable for error output, and power cable to BOX Data Logger securely. If the connection is not secure, it may cause malfunction.
  - Make sure to place the Ethernet cables, RS-232 cable, UPS connection/external trigger input/I/O cable for error output, and power cable connected to BOX Data Logger in a duct, or fasten them using a clamp. If the cables are not placed in a duct or fastened with a clamp, their positions may be unstable or moved, and they may be pulled inadvertently. This may damage BOX Data Logger and the cables, or cause malfunction because of faulty cable connections.
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## [Wiring precautions]

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### CAUTION

- When disconnecting the Ethernet cables, RS-232 cable, UPS connection/external trigger input/I/O cable for error output or power cable from BOX Data Logger, do not pull the cable by the cable part.  
For Ethernet cables and RS-232 cable, hold the connector part connected to the BOX Data Logger and release a latch to remove the cable.  
For UPS connection/external trigger input/I/O cable for error output, or power cable, inset the dedicated tool in the spring cage and loosen the spring to remove the cable.  
For a power cable connected to a terminal block, loosen the terminal screws before removing it.  
If any cable is pulled while being connected to BOX Data Logger, it may cause malfunction, or damage to BOX Data Logger and the cable.

## [Startup and maintenance precautions]

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### WARNING

- Do not touch any conductive part or electronic component of BOX Data Logger directly while applying a current. Failure to do so may result in electric shock, malfunction, or fail.
- Connect the battery connector correctly.  
Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire.  
Doing so may cause the battery to produce heat, explode, or ignite, resulting in injury and fire.
- Before starting maintenance such as cleaning, fixing the screws of BOX Data Logger, or retightening the terminal screws, always turn OFF the external power supply for BOX Data Logger in all phases.  
Failure to do so may cause BOX Data Logger to fail, malfunction or product damage.  
Be sure to tighten the screws using the specified torque.  
If the screws loose, it may cause the module to short circuit, malfunction or fall off.  
If the screws are tightened excessively, it may damage the screws and cause the module to short circuit, malfunction or fall off.

## [Startup and maintenance precautions]

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### CAUTION

- Start up and maintenance of BOX Data Logger must be performed by qualified maintenance personnel with knowledge of protection against electric shock. Lock the control panel in order not to operate by the operator except the maintenance personnel.
- Before handling BOX Data Logger, touch a grounded metal object to discharge the static electricity from the body. Failure to do so may cause a failure or malfunction of BOX Data Logger.
- Do not drop or apply shock to the battery to be installed in BOX Data Logger.  
Doing so may damage the battery, causing the battery fluid to leak inside the battery. If the battery is dropped or any shock is applied to it, dispose of it without using.
- Do not disassemble or transform BOX Data Logger.  
Doing so may cause a failure, malfunction, personal injuries, or a fire.

## [Operating precautions]

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### **WARNING**

- Be sure to close the terminal cover while BOX Data Logger is in operation. Failure to do so may result in electric shock.
- Do not touch any conductive part or electronic component of BOX Data Logger directly while applying a current.

## [Operating precautions]

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### **CAUTION**

- Use any radio communication device such as a cellular phone or PHS (Personal Handy phone System) more than 25cm (9.85 inches) away in all directions from BOX Data Logger. Failure to do so may cause malfunction.

## [Transportation Precautions]

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### **CAUTION**

- The lithium battery (Q6BAT) is mounted on BOX Data Logger. When transporting BOX Data Loggers, make sure to treat them based on the transport regulations. Products are packed properly in compliance with the transportation regulations prior to shipment. When repacking any of the unpacked products to transport it to another location, make sure to observe the IATA Dangerous Goods Regulations, IMDG Code, and other local transportation regulations. The battery (Q6BAT) of BOX Data Logger is a lithium battery, and it classified as non-dangerous goods.

For details, please consult your transportation company.

## [Disposal precautions]

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### **CAUTION**

- Dispose of BOX Data Logger as an industrial waste.
- When disposing of batteries, separate them from other wastes according to the local regulations. In EU member states, there is a separate collection system for waste batteries. Dispose of batteries properly at the local community waste collection/recycling center.

The following symbol is printed on the batteries and packaging of batteries and devices with built-in batteries used for BOX Data Logger. The symbol is specified in the new EU Battery Directive (2006/66/EC) Article 20 "Information for end-users" and Annex II. The symbol indicates that batteries need to be disposed of separately from other wastes.



This symbol is for EU member states only.

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## PRÉCAUTIONS DE SÉCURITÉ


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*(Lire ces précautions avant toute utilisation du produit.)*


*Avant d'utiliser l'enregistreur de données BOX NZ2DL (ci-après en abrégé "l'enregistreur de données BOX"), 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"*

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 <b>AVERTISSEMENT</b>	<i>Attire l'attention sur le fait qu'une négligence peut créer une situation de danger avec risque de mort ou de blessures graves.</i>
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 <b>ATTENTION</b>	<i>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.</i>
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*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.*

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

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#### **AVERTISSEMENT**

- Configurer les circuits de sécurité à l'extérieur de l'enregistreur de données BOX pour que l'ensemble du système reste en sécurité même après survenance d'une anomalie dans l'alimentation externe ou dans l'enregistreur de données BOX. Faute de quoi, une instruction de sortie incorrecte ou un dysfonctionnement pourrait être à l'origine d'un accident. Selon la nature de la panne du circuit de sortie, la sortie peut rester active ou inactive. Configurer un circuit de surveillance externe pour le suivi des signaux de sortie susceptibles de provoquer un accident grave.*
- Dans un circuit de sortie d'erreur, si le courant de charge excède la valeur nominale ou si une surintensité causée par un court-circuit à la charge persiste longtemps, il peut en résulter un dégagement de fumée avec départ de feu. Pour éviter cela, il faut configurer un circuit de sécurité, avec un fusible par exemple.*
- Prendre les mesures appropriées pour maintenir la sécurité de l'enregistreur de données BOX en cas d'accès non autorisé d'un dispositif externe via le réseau. De plus, pour maintenir la sécurité de l'enregistreur de données BOX en cas d'accès non autorisé d'un dispositif externe via Internet, prendre des mesures adéquates du genre coupe-feu.*

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

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#### **ATTENTION**

- L'enregistreur de données BOX doit être installé dans un tableau de commande. Raccorder l'alimentation principale à l'enregistreur de données BOX installé dans le tableau de commande via un bornier à relais.*
  - Ne pas grouper les câbles Ethernet, le câble RS-232, le câble de connexion UPS/d'entrée de déclenchement/ de E/S pour connexion de sortie d'erreur avec les lignes des circuits principaux ou 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.*
  - Lorsque le module de sortie commande un dispositif comme une lampe, un réchauffeur ou une électrovanne, un fort courant (jusqu'à 10 fois l'intensité normale) traverse la sortie quand celle-ci passe de OFF à ON. Configurer le système avec une capacité de courant suffisante.*
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## [Précautions lors de la conception]

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### ATTENTION

- Le temps nécessaire au démarrage de l'enregistreur de données BOX après sa mise sous tension, ou partir du moment où on introduit la carte CompactFlash contenant les fichiers de paramétrage dans l'enregistreur déjà sous tension, est variable en fonction de la configuration du système, de la capacité de la carte CompactFlash, etc.  
Concevoir les circuits de manière que tout le système fonctionne en sécurité, indépendamment de ce temps.
- Pendant l'enregistrement des réglages, ne pas mettre hors tension ou réinitialiser l'enregistreur de données BOX. Sinon, les données de réglage dans l'enregistreur de données BOX ou en carte CompactFlash peut être imprécises. Il est donc nécessaire de réinitialiser et de ré-enregistrer les données.  
Cela pourrait être à l'origine d'une panne ou d'un dysfonctionnement de l'enregistreur de données BOX.

## [Précautions d'installation]

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### AVERTISSEMENT

- Avant d'installer l'enregistreur de données BOX, toujours couper l'alimentation externe de l'enregistreur de données BOX sur toutes les phases. Faute de quoi, il y a risque d'électrocution et d'endommagement du produit.

## [Précautions d'installation]

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### ATTENTION

- Utiliser l'enregistreur de données BOX dans un environnement conforme aux spécifications générales présentées dans le manuel de l'utilisateur.  
L'utilisation de l'enregistreur de données BOX dans tout autre environnement pourrait être à l'origine de chocs électriques ou d'un départ de feu, ou de l'endommagement et de la détérioration du module.
- Avant d'installer l'enregistreur de données BOX, toujours couper l'alimentation externe de l'enregistreur de données BOX sur toutes les phases.  
Faute de quoi, il y a risque d'endommagement du produit.
- Éviter tout contact direct avec les parties conductrices et les composants électroniques de l'enregistreur de données BOX.  
Faute de quoi, il y a risque de dysfonctionnement ou panne.
- Les vis doivent toujours être serrées au couple prescrit.  
Des vis desserrées peuvent être à l'origine d'un court-circuit, d'un dysfonctionnement ou d'une chute de l'enregistreur de données BOX.  
Un serrage excessif peut endommager les vis et être à l'origine d'un court-circuit, d'un dysfonctionnement ou d'une chute de l'enregistreur de données BOX.
- Veiller à ne laisser pénétrer aucun corps étrangers comme des débris de câblage dans l'enregistreur de données BOX.  
Cela pourrait être à l'origine d'un départ de feu, d'une panne du module ou de dysfonctionnement.
- La partie supérieure de l'enregistreur de données BOX est recouverte d'une feuille de protection autocollante 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.  
Cependant, ne pas oublier de retirer le film protecteur avant de mettre l'enregistreur de données BOX en marche pour permettre une bonne dissipation de la chaleur.
- Introduire la carte CompactFlash dans la fente pour carte CompactFlash en la poussant bien à fond.  
Après installation de la carte CompactFlash, vérifier qu'elle a bien pris sa place.  
Faute de quoi, un mauvais contact pourrait être à l'origine de dysfonctionnements.

## [Précautions de câblage]

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### AVERTISSEMENT

- Avant d'entreprendre le câblage de l'enregistreur de données BOX, toujours couper l'alimentation externe de l'enregistreur sur toutes les phases. Faute de quoi, il y a risque d'électrocution et d'endommagement du produit.

## [Précautions de câblage]

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### ATTENTION

- Pour les bornes FG et LG, la mise à la terre doit être mieux que de classe D (mise à la terre de troisième classe). Faute de quoi, il y a risque d'électrocution et de dysfonctionnement.
- Veiller à ne laisser pénétrer aucun corps étrangers comme des débris de câblage dans l'enregistreur de données BOX.  
Cela pourrait être à l'origine d'un départ de feu, d'une panne du module ou de dysfonctionnement.
- La partie supérieure de l'enregistreur de données BOX est recouverte d'une feuille de protection autocollante 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.  
Cependant, ne pas oublier de retirer le film protecteur avant de mettre le module en marche pour permettre une bonne dissipation de la chaleur.
- Vérifier la tension nominale et l'affectation des bornes avant le câblage de l'enregistreur de données BOX et raccorder les câbles correctement. Le raccordement d'une alimentation de tension nominale erronée ou une erreur de câblage peut être à l'origine d'un départ de feu ou d'une panne.
- Avant de raccorder des câbles Ethernet, câble RS-232, câbles de connexion UPS/d'entrée de déclenchement/ de E/S des câbles d'alimentation, s'assurer que le type d'interface à raccorder est correct. Le raccordement d'une interface erronée ou une erreur de câblage peut être à l'origine de pannes des dispositifs externes.
- Les câbles Ethernet, le câble RS-232, le câble de connexion UPS/d'entrée de déclenchement/ de E/S pour connexion de sortie d'erreur doivent être raccordés à l'enregistreur de données BOX en les serrant avec l'outil prescrit par le fabricant ou, à défaut, ils doivent être correctement brasés.  
Une connexion imparfaite pourrait mettre le module en état de court-circuit et être à l'origine d'un départ de feu ou de dysfonctionnements.  
Comme bornes sans soudure de câble d'alimentation, ne pas utiliser des bornes sans soudure de type embrochable. La chute de vis desserrées peut être à l'origine d'une panne.
- Les vis doivent toujours être serrées au couple prescrit.  
Des vis desserrées peuvent être à l'origine d'un court-circuit, d'un dysfonctionnement ou d'une chute du module.  
Un serrage excessif peut endommager les vis et être à l'origine d'un court-circuit, d'un dysfonctionnement ou d'une chute du module.
- Raccorder fermement sur l'enregistreur de données BOX les câbles Ethernet, le câble RS-232, le câble de connexion UPS/d'entrée de déclenchement/ de E/S et le câble d'alimentation. Une connexion imparfaite peut être à l'origine de dysfonctionnements.
- Les câbles Ethernet, le câble RS-232, le câble de connexion UPS/d'entrée de déclenchement/ de E/S pour connexion de sortie d'erreur, ainsi que le câble d'alimentation raccordés à l'enregistreur de données BOX doivent être placés dans un conduit ou doivent être attachés.  
Si les câbles ne sont pas sous gaine ou ne sont pas attachés, ils risquent d'être déplacés ou arrachés par inadvertance. Cela pourrait endommager l'enregistreur de données BOX ou les câbles ou être à l'origine de dysfonctionnements s'il y a faux contact.

## [Précautions de câblage]

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### ATTENTION

- Pour débrancher de l'enregistreur de données BOX les câbles Ethernet, le câble RS-232, le câble de connexion UPS / d'entrée de déclenchement / de E/S ou le câble d'alimentation, ne jamais tirer sur le câble proprement dit.  
Pour débrancher les câbles Ethernet et le câble RS-232, les saisir par le connecteur raccordé à l'enregistreur de données BOX et déverrouiller le loquet.
- Pour débrancher le câble de connexion UPS/entrée de déclenchement externe: et E/S pour sortie d'erreur, insérer l'outil spécial dans la cage à ressort pour détendre le ressort.
- Pour un câble d'alimentation raccordé à un bornier, desserrer les vis des bornes avant de l'enlever.
- Tout effort de traction sur un câble raccordé à l'enregistreur de données BOX risque d'endommager l'enregistreur ou le câble et peut être à l'origine de dysfonctionnements.

## [Précautions de démarrage et de maintenance]

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### AVERTISSEMENT

- Ne toucher à aucune des parties conductrices ou composants électroniques de l'enregistreur de données BOX quand il est sous tension.  
Faute de quoi, il y a risque d'électrocutions, de dysfonctionnements ou de pannes.
- Raccorder le connecteur de batterie correctement.  
Les piles ne doivent pas être rechargées, démontées, court-circuitées ou soudées. Elles ne doivent pas non plus être jetées au feu.  
Cela pourrait entraîner une surchauffe ou un éclatement de la pile qui pourrait s'enflammer et être à l'origine de blessures ou d'un départ de feu.
- Avant toute intervention de maintenance comme le nettoyage, le contrôle des vis de fixation de l'enregistreur de données BOX ou le resserrage des vis des bornes, toujours couper l'alimentation externe de l'enregistreur de données BOX sur toutes les phases.  
Faute de quoi, il y aurait risque de panne, de dysfonctionnement ou d'endommagement de l'enregistreur de données BOX.  
Les vis doivent toujours être serrées au couple prescrit.  
Des vis desserrées peuvent être à l'origine d'un court-circuit, d'un dysfonctionnement ou d'une chute du module.  
Un serrage excessif peut endommager les vis et être à l'origine d'un court-circuit, d'un dysfonctionnement ou d'une chute du module.

## [Précautions de démarrage et de maintenance]

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### ATTENTION

- La mise en service et la maintenance de l'enregistreur de données BOX doivent être effectuées par un personnel de maintenance qualifié et formé à la protection contre les chocs électriques. Le tableau de commande doit être fermé à clé pour que les opérateurs, hormis le personnel de maintenance, ne puissent y accéder.
- Avant de manipuler l'enregistreur de données BOX, se débarrasser de la charge électrostatique qu'accumule le corps humain en touchant un objet conducteur comme une barre de mise à la terre. Faute de quoi, il y aurait risque de panne ou de dysfonctionnement de l'enregistreur de données BOX.
- Ne pas faire tomber ou soumettre à de forts chocs les piles à installer dans les modules.  
Cela pourrait endommager les piles, avec risque de fuite de liquide à l'intérieur des piles. Toute pile qu'on a laissée tomber ou qui a subi un choc violent doit être jetée avant usage.
- Ne pas démonter ni modifier l'enregistreur de données BOX.  
Cela pourrait être à l'origine de pannes, de dysfonctionnements, de blessures aux personnes ou d'un départ de feu.

## [Précautions d'utilisation]

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### **AVERTISSEMENT**

- Le couvre-bornes doit toujours être fermé quand l'enregistreur de données BOX est en service. Faute de quoi, il y a risque d'électrocution.
- Ne toucher à aucune des parties conductrices ou composants électroniques de l'enregistreur de données BOX quand il est sous tension.

## [Précautions d'utilisation]

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### **ATTENTION**

- 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 (9,85 pouces) de l'enregistreur de données BOX, dans tous les sens. Le non-respect de cette précaution expose à des dysfonctionnements.

## [Précautions de transport]

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### **ATTENTION**

- La batterie au lithium (Q6BAT) est installée dans l'enregistreur de données BOX. Pour le transport des enregistreurs de données BOX, respecter la réglementation afférente à ce transport. Avant expédition, les produits sont convenablement emballés conformément à la réglementation des transports. Quand on remballage des produits déballés pour les transporter sur un autre site, toujours respecter la réglementation IATA et les autres réglementations locales applicables au transport des marchandises dangereuses. La batterie (Q6BAT) de l'enregistreur de données BOX est une batterie au lithium classée dans la catégorie des produits non-dangereux.  
Pour le détail, prière de prendre contact avec le transporteur.

## [Précaution de mise au rebut]

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### **ATTENTION**

- Pour la mise au rebut, traiter l'enregistreur de données BOX comme un déchet industriel.
- Les piles ou batteries doivent être mises au rebut séparément des autres déchets et conformément à la réglementation locale.

Dans les états membres de l'UE, il existe pour les piles usagées un système de collecte distinct des autres déchets. Mettre les piles et batteries au rebut correctement en les déposant à la déchetterie/centre de recyclage local.

Les batteries, les emballages de batterie et les appareils incluant une batteries qui s'utilisent avec l'enregistreur de données BOX portent le logo suivant. Ce logo a été instauré par la nouvelle directive EU sur les piles et batteries (2006/66/EC), Article 20 "Information au utilisateurs finaux" et Annexe II. Le logo signifie que les batteries doivent être mises au rebut séparément des autres déchets.



Ce logo ne concerne que les états membres de l'UE.

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## CONDITIONS OF USE FOR THE PRODUCT

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- (1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
- where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
  - 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.

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## ABOUT MANUAL

The manuals related to this product are shown below.  
Refer to the following tables when ordering required manuals.

### ■ RELATED MANUALS

- BOX Data Logger User's Manual

Manual name	Manual number (Model code)
BOX Data Logger User's Manual	SH-081216ENG (13JZ90)

- CPU module user's manual

Manual name	Manual number (Model code)
QCPU User's Manual (Hardware Design, Maintenance and Inspection)	SH-080483ENG (13JR73)
Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals)	SH-080808ENG (13JZ28)
QnUCPU User's Manual (Function Explanation, Program Fundamentals)	SH-080807ENG (13JZ27)
MELSEC-L CPU Module User's Manual (Function Explanation, Program Fundamentals)	SH-080889ENG (13JZ35)
C Controller Module User's Manual (Hardware Design, Function Explanation)	SH-080766ENG (13JZ17)
MELSEC-Q C Controller Module User's Manual	SH-081130ENG (13JZ75)
Type AnN/AnA/AnUCPU User's Manual (Hardware)	IB-66542 (13JE82)
Type A2A(S1)/A3ACPU User's Manual	IB-66544 (13JE84)
Q2A(S1)/Q3A/Q4ACPU User's Manual (Hardware)	IB-66607 (13J820)

- Operating manual

Manual name	Manual number (Model code)
GX LogViewer Version 1 Operating Manual	SH-080915ENG (13JU68)
GX Works2 Version 1 Operating Manual (Common)	SH-080779ENG (13JU63)
GX Developer Version 8 Operating Manual	SH-080373E (13JU41)

• Programming manual

Manual name	Manual number (Model code)
MELSEC-Q/L Programming Manual (Common Instruction)	SH-080809ENG (13JW10)
Type ACPU/QCPU-A (A Mode) Programming Manual (Common Instructions)	IB-66250 (13J741)
QnACPU PROGRAMMING MANUAL (Common Instructions)	IB-66615 (13JF47)



# 1 OVERVIEW

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This manual explains the precautions for use BOX Data Logger safely.

## 1.1 Packing list

---

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

Item	Quantity
NZ2DL	1
Battery (Q6BAT)	1
This manual	1

## 2 GENERAL SPECIFICATIONS

This section describes the general specifications of a BOX Data Logger.

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	5 to 95%RH, non-condensing					
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	—	■Frequency	■Constant acceleration	■Half amplitude	■Sweep count
		Under intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in X, Y, and 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 X, Y, and Z directions)					
Operating atmosphere	No corrosive gases					
Operating altitude <sup>*1</sup>	0 to 2000m					
Installation location	Inside a control panel					
Overvoltage category <sup>*2</sup>	II or less					
Pollution degree <sup>*3</sup>	2 or less					
Equipment class	Class I					

\*1 Do not use or store the BOX Data Logger 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.

## 3 INSTALLATION AND WIRING

---

This chapter explains installation of the BOX Data Logger and the wiring method.

### 3.1 Installation Environment

---

Install the BOX Data Logger in an environment that meets the general specifications.

Do not install the BOX Data Logger in the place where:

- The ambient temperature is outside the range of 0°C to 55°C
- The ambient humidity is outside the range of 5%RH to 95%RH.
- Condensation occurs due to a rapid temperature change.
- Corrosive or combustible gas is present.
- There is conductive powder such as dust and iron powder, oil mist, salinity, or organic solvent.
- The module is exposed to direct sunlight.
- A strong electric or magnetic field is generated.
- The module is directly subject to vibrations or shocks.

### 3.2 Installation

---

When installing the BOX Data Logger to a control panel or any other place, consider the operability, maintainability, and environmental resistance.

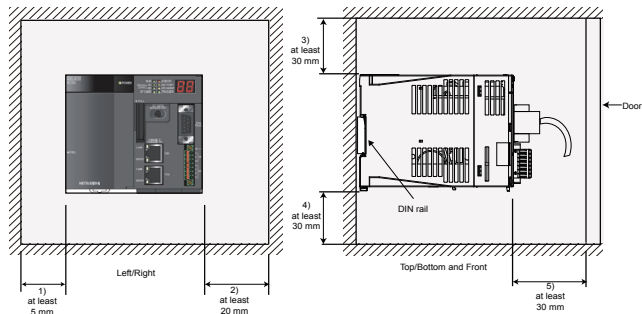
#### Installation precautions

---

- Do not directly touch any conductive part or electronic component of the BOX Data Logger. This may cause the BOX Data Logger to malfunction or fail.
- BOX Data Logger case is made of plastic. Do not drop or apply strong shock to it.
- Do not remove the printed-circuit board of BOX Data Logger from the case. Doing so may cause failure.
- Do not release the levers located at the top and bottom of BOX Data Logger. Doing so may cause malfunction or failure of BOX Data Logger.
- BOX Data Logger must be installed on the front of the control panel. Do not install it by rotating. Do not install it on the ceiling, bottom, or by rotating in the control panel.

## Mounting the module to a control panel

To ensure good ventilation and to make replacement of BOX Data Logger easy, provide a distance between the top or bottom of the module and other structures or parts as shown below. The installation method of BOX Data Logger is using screwdriver and DIN rail.



1) Left: More than 5mm is required. The operation space is required when performing installation.

2) More than 20mm is required for open/close the cover. The operation space is required when performing installation.

3) Upper: More than 30mm is required to allow the inclination when installing BOX Data Logger to DIN rail. The operation space is required when performing installation.

4) Lower: More than 30mm is required for changing the battery.

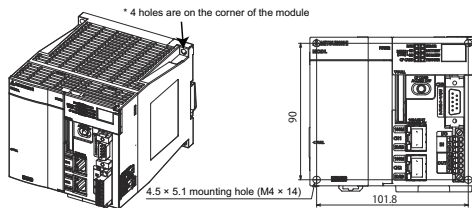
5) Front: More than 80mm is required to connect a serial cable.

## Installation by screws

---

### ■ Mounting procedure

1. Check if there are screw holes with the following measurements.
2. Set the BOX Data Logger on adjusting 4 screw holes to the site be installed and tighten the 4 pieces of M4 screws. (Specified torque: 0.78 to 1.08N·m) Prepare the screws of suitable length for installation situation.



## Installation by DIN rail

---

### ■ Mounting procedure

The following shows the procedure to install BOX Data Logger on DIN rail.

1. Pull down all of the DIN rail hooks on the back of the BOX Data Logger. Pull it until a click sound is heard.
2. Hang the upper tabs of the BOX Data Logger on the DIN rail, and push the module in position.
3. Lock the DIN rail hooks of the BOX Data Logger to secure it in position. Push each hook until a click sound is heard.  
If you cannot reach the hooks, use a tool such as a screwdriver.

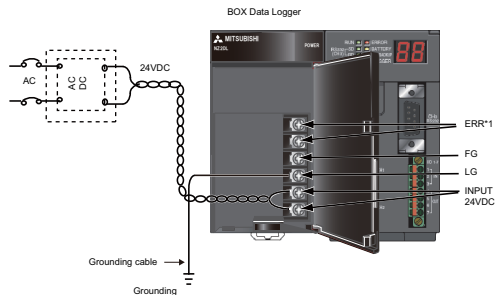
### 3.3 Wiring

#### Wiring of the power supply part

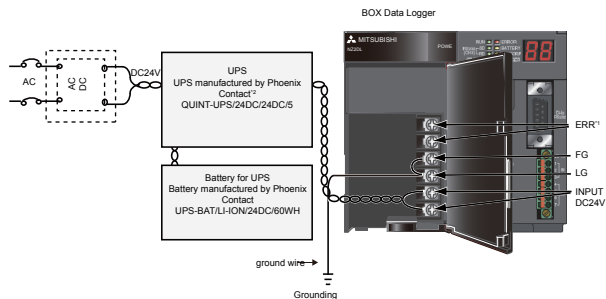
##### ■ Wiring method

The following figure shows an example of wiring to the power supply part.

- an example of wiring



- Example for UPS connection wiring



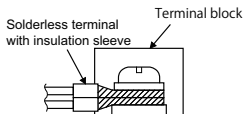
\*1 The ERR terminal is OFF (release) when the power is not ON, BOX Data Logger stop error (including reset) occurs, or fuse blows in the power supply.

\*2 Refer to the specification of UPS when wiring for UPS ground cable.

## ■ Precautions

Take the following precautions when wiring the power supply.

- Considering the rated current and inrush current of the power supply part, connect a circuit breaker having an appropriate sensing property or an external fuse causing proper blowout. (A 10A circuit breaker or external fuse is recommended.)
- To minimize a voltage drop, use thickest possible power cables (up to 2mm<sup>2</sup>), and connect them in the shortest distance by finely twisting them.
- Do not install the power cables together with the main circuit lines (high voltage and large current) and Ethernet cables.  
Keep a distance of 100mm or more between them.
- After wiring, always attach the included terminal cover to the power supply part, and do not touch any terminal while the power is on or the module is operating.
- Use a Class 2 power supply for the external power supply which inputs power to the power supply part.
- Use solderless terminals when wiring the terminal block of the power supply part. To prevent short-circuit that may occur when a screw become loose, use a solderless terminal with insulation sleeve, of which thickness is 0.8mm or less. Up to two solderless terminals can be connected to one terminal block.



- Use UL-approved solderless terminals and, for processing, use a tool recommended by their manufacturer.
- Tighten the terminal screws on the power supply part within the applicable torque range of 0.66 to 0.89N·m.
- *Serre les vis de bornes de la partie alimentation dans les limites du couple prescrit (0,66 à 0,89 N·m).*
- Use the following wires for connection to the power supply part.

Applicable wire size	Material	Temperature rating
0.75 to 2mm <sup>2</sup> (18 to 14AWG) (stranded wire)	Copper	75°C or higher

- *Pour le raccordement de la partie alimentation, utiliser les fils suivants.*

Taille du fil à utiliser	Matériau	Gamme de température
0,75 à 2 mm <sup>2</sup> (18 à 14 AWG) (fil torsadé)	Cuivre	75°C ou mieux

- An input of a signal of a different voltage level may cause malfunction or equipment failure.
- When supplying power to the power supply part, select a power supply having sufficient power capacity. (Double power capacity or more is recommended.)

### Point

For compliance with the EMC directive, refer to the following section.

☞ Page 30 EMC AND LOW VOLTAGE DIRECTIVES

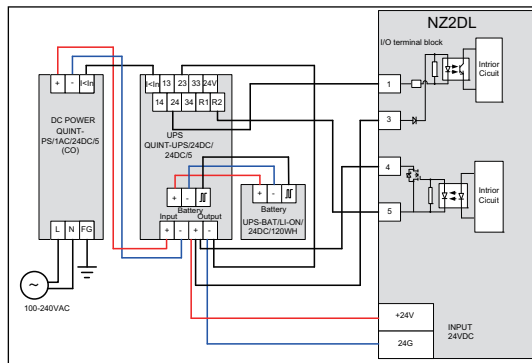
## Connecting UPS

### ■ Wiring method

Manufactured by Phoenix Contact: Indicate example for when connecting QUINT-UPS/24DC/24DC/5.

Box Data Logger can be turned OFF safely by the shutdown process using UPS to stop accessing to CompactFlash card.

- Operation when power failure occurred  
When UPS BACKUP (IN) terminal stops more than 5 seconds, BOX Data Logger recognizes that the power failure occurred and executes the shutdown process.  
After the shutdown process is complete, BOX Data Logger requests UPS to stop the output by turning OFF the UPS SHUT DOWN (OUT) terminal.
- Operation after shut down  
When UPS BACKUP (IN) terminal stops more than 5 seconds after the shutdown process of BOX Data Logger is completed, BOX Data Logger recognizes the module itself is recovered from power failure and restart itself automatically.



### ■ Considerations

- UPS connection terminal (UPS BACKUP terminal, UPS SHUT DOWN terminal) can not be directly connected to BOX Data Logger depending on the UPS specification. When BOX Data Logger is connected to UPS, check the UPS specification which connects to BOX Data Logger and rate. Connect each terminal and cable according to each specification and rate.
- Use the external trigger input terminal and error output terminal within the rate. Connecting a power supply with wrong voltage rating or incorrect wiring may cause a fire or failure.



## Fuse to be attached to external terminal

---

When a load short-circuit occurred on the UPS SHUT DOWN terminal or ERROR terminal, installing a fuse for each external terminal is recommended to prevent burnout of the external devices or module.

The fuse we have confirmed the operation is shown below.

Fuse Model*1	216 3.15	312 003
Rated current	3.15A	3A
Manufacturer	Littelfuse Corporation	

\*1 Recommended rate power 3A fastest type fuse

## Ethernet cable wiring

Ethernet port has two of ports; CH1 and CH2. Use according to the purpose.

Ethernet port	Connection target
Ethernet port (CH1)	<ul style="list-style-type: none"><li>• Programmable controller</li><li>• Server (FTP server, etc.)</li><li>• Personal computer to which BOX Data Logger Configuration Tool is installed (Direct connection is available.)</li></ul>
Ethernet port (CH2)	<ul style="list-style-type: none"><li>• Programmable controller</li><li>• Server (FTP server, etc.)</li><li>• Personal computer to which BOX Data Logger Configuration Tool is installed (Direct connection is available.)</li></ul>

### ■ Connecting the Ethernet cable

1. Turn OFF the power.
2. Insert the Ethernet cable connector into the port until a click sound is heard. Pay attention to the orientation of the connector.
3. Turn ON the power.
4. Turn ON the external device connected to the port.

### ■ Disconnection

1. Turn OFF the power.
2. Pull out the Ethernet cable while pinching the retaining clip on the connector.

### ■ Wiring precautions

- The external diameter  $\times 4$  is required for the bend radius of the cable around the connector.
- For the connection of the devices, confirm the specifications of the devices to be connected.
- Connecting or disconnecting the Ethernet cable

When connecting or disconnecting the Ethernet cable, hold the connector part of the cable. Failure to do so may result in damage to the BOX Data Logger or the cable or malfunction due to poor contact.

- If the retaining clip is broken  
Do not use any Ethernet cable that has a broken retaining clip. Doing so may cause cable disconnection or malfunction.
- Unused Ethernet ports  
To prevent dust from entering the module, attach the provided connector cover.
- Maximum distance between the stations of Ethernet cable (maximum Ethernet cable length)  
The maximum distance between the stations is 100m. However, it may be shorter depending on the environment. For details, contact the manufacturer of the cables used.

---

During high speed communication (100 Mbps) via 100BASE-TX connection, communication errors may occur due to the effect of high frequency noise generated from the equipment other than programmable controller, depending on the installation environment. Take the following countermeasures on the BOX Data Logger side to eliminate the effect of high frequency noise when constructing the network system.

- Wiring

When wiring twisted pair cables, do not bundle or adjacently lay the main circuit or power line.

Make sure to place the twisted pair cable in a duct.

- Cable

In the environment where the cable is susceptible to noise, use the shielded twisted pair cable (STP cable).

- 10 Mbps communication

Connect the 10 Mbps-compatible equipment with BOX Data Logger and transmit the data to the equipment at a transmission speed of 10 Mbps.

- Hub

• BOX Data Logger discriminates 10BASE-T/100BASE-TX and full duplex/half duplex communication mode according to hub.

When connecting to hub without auto-negotiation function, set up hub for half duplex communication mode.

• CH1 and CH2 have a different sub network. Therefore, do not connect to CH1 and CH2 to same hub (except switching hub).

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## RS-232 cable wiring

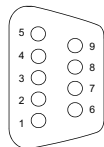
### Câblage par câble RS-232

RS-232 cable which is comply with the RS-232 regulation must be used within 15m.

The following shows the specifications of RS-232 connector.

*Selon les règles RS-232, la longueur du câble RS-232 utilisé doit être de moins de de 15m.*

*Les caractéristiques du connecteur RS-232 sont indiquées ci-après.*



Pin number	Signal (abbreviation)	Signal name	Signal direction	
			NZ2DL	RS-232 device
1	CD(DCD)	Data Carrier Detect	←	←
2	RD(RXD)	Received Data	←	←
3	SD(TXD)	Send Data	→	→
4	ER(DTR)	Data Terminal READY	→	→
5	SG(GND)	Signal Ground	←	←
6	DR(DSR)	Data Set READY	←	←
7	RS(RTS)	Request to Send	→	→
8	CS(CTS)	Clear to Send	←	←
9	CI(RI)	Call Indicator	←	←

English	French
Pin number	Broche N°
Signal(abbreviation)	Signal (abréviation)
Signal name	Nom de signal
Signal direction	Sens du signal
RS-232 device	Dispositif RS-232
Data Carrier Detect	Détection porteuse de données
Received Data	Données reçues
Send Data	Send Data (transmission de données)
Data Terminal READY	Prêt à émettre
Signal Ground	Masse signal
Data Set READY	Ensemble de données prêt
Request to Send	Demande d'envoi
Clear to Send	Réponse à demande d'envoi
Call Indicator	Indicateur d'appel

#### Point

Connector specification which is used for RS-232 interface of BOX Data Logger is shown below.

Manufacturer name: DDK Ltd.

Model name: 17LE-23090-27(D4CK) or equivalent models

*Les caractéristiques du connecteur à utiliser pour l'interface RS-232 de l'enregistreur de données BOX sont indiquées ci-dessous.*

*Nom du fabricant : DDK Ltd.*

*Nom de modèle : 17LE-23090-27(D4CK) ou modèle équivalent*

## ■ Wiring precautions

- Perform 1 point grounding for RS-232 connection cable shield.
- The external diameter  $\times 4$  is required for the bend radius of the cable around the connector.
- For the connection of the devices, confirm the specifications of the devices to be connected.
- Do not short-circuit FG and SG signal of RS-232 cable.
- Do not connect FG signal to BOX Data Logger when FG and SG signals are connected inside the connected device.
- When connecting the cable, the space for wiring is required.
- For RS-232 cable to be pulled out of the control panel, be sure to ground the shield part of a shield cable.

Also, install a ferrite core.

A ferrite core must be passing two turns of the wire conductor through the ferrite cable core.  
(Ferrite core used for the test: TDK Corporation ZCAT3035-1330)

- For EMC direction, refer to the following section.

 Page 30 EMC AND LOW VOLTAGE DIRECTIVES

---

### Point

For the communication of RS-232 connection, the communication errors may occur due to the effect of high frequency noise generated from the equipment other than programmable controller.

Take the following countermeasures on the BOX Data Logger side to eliminate the effect of high frequency noise when constructing the network system.

- Wiring

When connecting RS-232, do not bundle or adjacently lay the main circuit or power line.

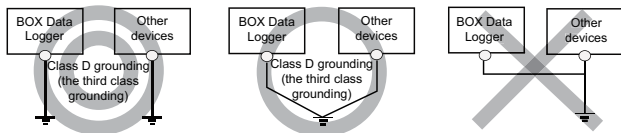
Make sure to place the RS-232 cable in a duct.

---

## Grounding

Perform the following grounding.

- Dedicated grounding is recommended. Perform D class grounding (the third grounding). (Grounding resistance of  $100\Omega$  or less)
- When a dedicated grounding cannot be provided, use the shared grounding shown below.



1) Dedicated grounding...Recommend 2) Shared grounding...Available 3) Common grounding...Not available

- Use thick cables for grounding up to  $2\text{mm}^2$ . Bring the grounding point close to the BOX Data Logger as much as possible so that the ground cable can be shortened

## 4 EMC AND LOW VOLTAGE DIRECTIVES

Compliance with the EMC Directive, which is one of the EU directives, has been mandatory for the products sold within EU member states since 1996 as well as compliance with the Low Voltage Directive since 1997.

To prove the compliance, manufactures must issue an EC Declaration of Conformity and the products must bear a CE marking.

### Sales representative in EU member states

The authorized representative in EU member states will be:

Company name: Mitsubishi Electric Europe BV

Address: Gothaer Strasse 8,40880 Ratingen,Germany

### 4.1 Measures to comply with the EMC Directive

The EMC Directive sets two requirements for compliance: emission (conducted and radiated electromagnetic energy emitted by a product) and immunity (the ability of a product to not be influenced by externally generated electromagnetic energy).

This section summarizes the precautions for machinery constructed with the BOX Data Logger to comply with the EMC Directive.

These precautions are based on the requirements of the EMC Directive and the harmonized standards. However, they do not guarantee that the entire machinery constructed according to the descriptions complies with the EMC Directive.

The manufacturer of the machinery must determine the testing method for compliance and declare conformity to the EMC Directive.

### EMC Directive related standards

#### ■ Emission requirements

Standard: EN61131-2:2007

Test item	Test description	Value specified in standard
CISPR16-2-3 Radiated emission* <sup>1</sup>	The electromagnetic wave which the product emits to the external space is measured.	30 to 230MHz QP: 40dB $\mu$ V/m(measured at 10m distance)* <sup>2</sup> 230 to 1000MHz QP: 47dB $\mu$ V/m(measured at 10m distance)
CISPR16-2-1, CISPR16-1-2 Conducted emission* <sup>1</sup>	The noise level which the product emits to the power line is measured.	0.15 to 0.5MHz QP: 79dB, Mean: 66dB * <sup>2</sup> 0.5 to 30MHz QP: 73dB, Mean: 60dB

\*1 BOX Data Logger is an open type device (a device designed to be housed in other equipment) and must be installed inside a conductive control panel. The tests were conducted with the programmable controller installed in a control panel.

\*2 QP: Quasi-Peak value, Mean: Average value

## ■ Immunity requirements

Standard:EN61131-2:2007

Test item	Test description	Value specified in standard
EN61000-4-2 Electrostatic discharge immunity <sup>*1</sup>	An electrostatic discharge is applied to the enclosure of the equipment.	8kV Air discharge 4kV Contact discharge
EN61000-4-3 Radiated, radio-frequency, electromagnetic field immunity <sup>*1</sup>	An electric field is radiated to the product.	80%AM modulation@ 1kHz 80 to 1000MHz: 10Vm 1.4 to 2.0GHz: 3Vm 2.0 to 2.7GHz: 1Vm
EN61000-4-4 Fast transient/burst immunity <sup>*1</sup>	Burst noise is applied to power lines and signal lines.	AC/DC power, I/O power, AC I/O(unshielded) lines: 2kV DC I/O, analog, Communication lines: 1kV
EN61000-4-5 Surge immunity <sup>*1</sup>	Lightning surge is applied to power lines and signal lines.	AC power, AC I/O power, (unshielded) lines: 2kV CM, 1kV DM DC power and DC I/O power lines:0.5kV CM, 0.5kV DM DC I/O, AC I/O (shielded), analog, Communication lines: 1kV CM
EN61000-4-6 Conducted RF immunity <sup>*1</sup>	High-frequency noise is applied to power lines and signal lines.	0.15 to 80MHz, 80% AM modulation@1kHz, 10Vrms
EN61000-4-8 Power-frequency magnetic field immunity <sup>*1</sup>	The product is immersed in the magnetic field of an induction coil.	50Hz/60Hz, 30A/m
EN61000-4-11 Voltage dips and interruption immunity <sup>*1</sup>	Power voltage is momentarily interrupted.	0%, 0.5 period, starting at zerocrossing 0%, 250/300 period (50/60Hz) 40%, 10/12 period (50/60Hz) 70%, 25/30 period (50/60Hz)

\*1 BOX Data Logger is an open type device (a device designed to be housed in other equipment) and must be installed inside a conductive control panel. The tests were conducted with the programmable controller installed in a control panel.



## Installation in a control panel

BOX Data Logger is an open type device and must be installed inside a control panel. This ensures safety as well as effective shielding of BOX Data Logger-emitted electromagnetic noise.

### ■ Control panel

- Use a conductive control panel.
- Mask off the area used for grounding when securing the top or bottom plate to the control panel using bolts.
- To ensure electrical contact between the inner plate and the control panel, mask off the bolt installation areas of an inner plate 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.
- Keep the diameter of the holes on the control panel to 10cm or less. If the diameter is larger than 10cm, electromagnetic wave may be emitted. In addition, because electromagnetic wave leaks through a clearance between the control panel and its door, reduce the clearance as much as possible.

Use of EMI gaskets (sealing the clearance) can suppress undesired radiated emissions.

The tests by Mitsubishi were conducted using a control panel having the damping characteristics of 37dB (maximum) and 30dB (average) (measured at 3m distance, 30 to 300MHz).

### ■ Wiring power cables

Ground wire and power supply cable for the BOX Data Logger must be connected as described below.

- Provide an grounding point near the power supply module. Ground the power supply's LG and FG terminals (LG : Line Ground, FG : Frame Ground) with the thickest and shortest wire possible. (The wire length must be 30cm (11.81 inches) or shorter.)  
The LG and FG terminals function is to pass the noise generated in the BOX Data Logger to the ground, so an impedance that is as low as possible must be ensured.  
Ground the LG and FG terminals with the thickest and shortest wire (2mm) possible, and always connect to the ground. Wire the ground cable should be kept short when wiring.  
As the wires are used to relieve the noise, the wire itself carries a large noise content and thus short wiring means that the wire is prevented from acting as an antenna.
- The ground wire led from the grounding point must be twisted with the power supply wires. By twisting with the ground wire, noise flowing from the power supply wires can be relieved to the ground. However, if a filter is installed on the power supply wires, the wires and the ground wire may not need to be twisted.

## Cables

Use a shielded cable for the cable connected to the BOX Data Logger and may be extended out of the control panel.

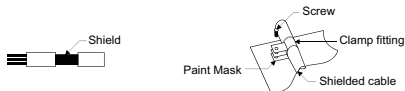
If a shielded cable is not used or not grounded correctly, the noise immunity will not meet the required value.

### ■ Grounding a shielded cable

Ground the shield of a shielded cable as close to the BOX Data Logger as possible so that the grounded cable will not be affected by electromagnetic induction from ungrounded cables.

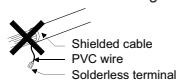
Ground the exposed shield to large area on the control panel.

A clamp fitting can be used as shown below. In this case, apply a cover on the painted inner wall surface of the control panel, which comes in contact with the clamp.



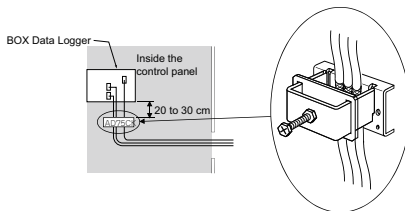
### Caution

Grounding with a vinyl-coated wire (PVC wire) soldered onto the shield of the shielded cable as shown below is not recommended. Doing so will raise the high-frequency impedance, resulting in loss of the shielding effect.



### ■ Grounding cables with a cable clamp

Use a shielded cable for external wiring and ground the shield of the shielded cable to the control panel with the AD75CK cable clamp (Mitsubishi). (Ground the shield within 20 to 30cm from the BOX Data Logger.)



For details on the AD75CK, refer to the following.

AD75CK-type Cable Clamping Instruction Manual

### External power supply

For the external power supply terminals for the UPS connection/external trigger input/error output, use the DC power supply compliant to the CE.

Place the DC power supply in the same control panel as the BOX Data Logger. Also the power cable connected to the external power supply should be 30m or shorter.

## Power supply part

Ground the LG and FG terminals after short-circuiting them.

### Other measures

#### ■ Ferrite core

Ferrite core is effective for reducing radiated noise in the 30MHz to 100MHz frequency band. It is recommended to install a ferrite core if a shield cable extended out of the control panel does not provide sufficient shielding effects.

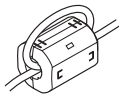
Install a ferrite core to the cable in the position immediately before the cable is extended out of the control panel.

If the installation position is not appropriate, the ferrite core will not produce any effect.

Install a ferrite core to each power cable as shown below.

(Ferrite core used for the tests conducted by Mitsubishi: TDK ZCAT3035-1330)

Example:



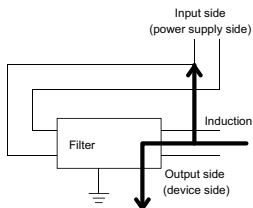
#### ■ Noise filter (power supply line filter)

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

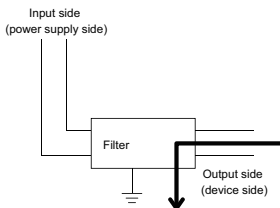
Attaching the filter can suppress more noise. (The noise filter has the effect of reducing conducted noise of 10MHz or less.)

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 (approximately 10cm).

Examples of noise filters are as follows:

Noise filter model name	FN343-3/01	FN660-6/06	ZHC2203-11
Manufacturer	SCHAFFNER	SCHAFFNER	TDK
Rated current	3A	6A	3A
Rated voltage	250V		

## **4.2 Measures to comply with the Low Voltage Directive**

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BOX Data Logger operates at the rated voltage of 24VDC. However, the modules which operate at less than 50VAC/75VDC rated input voltage are not targeted for the Low Voltage Directive compliance.

## REVISIONS

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

Print date	*Manual number	Revision
Mar., 2014	IB(NA)-0800521-B	First edition
Jun., 2014	IB(NA)-0800521-C	Addition of descriptions of cUL

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# WARRANTY

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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.



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Brazil	MELCO-TEC Representacao Comercial e Assessoria Tecnica Ltda. Av. Paulista, 1439, cj74, Bela Vista, Sao Paulo CEP: 01311-200-SP Brazil Tel : +55-11-3146-2200	China	Mitsubishi Electric Automation (China) Ltd. No.1386 Hongqiao Road, Mitsubishi Electric Automation Center, Changning District, Shanghai, China Tel : +86-21-2322-3030
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