



**mitsubishi  
electric**

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# MELSECNET, MELSECNET/B Local Station Data Link Module

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User's Manual  
(Hardware)

**A1SJ71AP23Q, A1SJ71AR23Q  
A1SJ71AT23BQ**

Thank you for purchasing the Mitsubishi programmable controller MELSEC-A series.

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



MODEL	A1SJ71AP23Q-U-HW
MODEL CODE	13JY19
IB(NA)-0800372-E(1806)MEE	

## ● SAFETY PRECAUTIONS ●

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, please read the User's Manual for the CPU module used.

In this manual, the safety instructions are ranked as "⚠️ 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.

Note that the ⚠️ CAUTION level may lead to a serious consequence according to the circumstances.

Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

## [DESIGN PRECAUTIONS]

### **WARNING**

- For each station's operating status in the case of a communication error in the network, refer to the MELSECNET, MELSECNET/B Local Station Data Link Module User's Manual. A malfunction due to a communication error may result in an accident.

## [DESIGN PRECAUTIONS]

### **WARNING**

- To control a running programmable controller (data modification) by connecting GX Developer to a CPU module or connecting a personal computer to an intelligent function module (special function module), create an interlock circuit on the sequence program so that the entire system will function safely all the time.  
Also, before performing any other controls (e.g. program modification, operating status change (status control)) to the programmable controller, read the manual carefully and ensure the safety.  
Especially, in the case of controlling a remotely-located programmable controller from an external device, a programmable controller side problem could not be resolved immediately due to data communication failure.  
To prevent this, establish corrective procedures for communication failure between the external device and the programmable controller CPU, as well as creating an interlock circuit on the program.

### **CAUTION**

- Do not install the control lines and/or communication cables together with the main circuit or power cables, and also do not bring them close to each other. Keep a distance of 100mm (3.94 inch) or more between them.  
Failure to do so may cause a malfunction due to noise.

## [INSTALLATION PRECAUTIONS]

### CAUTION

- Use the programmable controller in the environment conditions given in the general specifications of the User's Manual for the CPU module used.  
Failure to do so may cause an electric shock, fire, malfunction, or damage to or deterioration of the product.
- Insert the module fixing projection into the module fixing hole in the base unit to mount the module. (For the AnS series module, fix it to the base unit with screws within the specified torque.)  
Incorrect module mounting may cause a malfunction, failure, or drop of the module.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module.  
Failure to do so may damage the module.
- Do not directly touch any conductive part or electronic component of the module. Doing so may cause a malfunction or failure of the module.

## [WIRING PRECAUTIONS]

### **WARNING**

- Be sure to shut off all phases of the external power supply before installation or wiring.  
Failure to do so may result in an electric shock or damage to the product.

### **CAUTION**

- Properly solder a connector for coaxial cable.  
Failure to do so may cause malfunction.
- Be careful to prevent foreign matter such as dust or wire chips from entering the module.  
Failure to do so may cause a fire, failure or malfunction.
- Be sure to place the communication cables or power cables in a duct or clamp them.  
If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the module or cables, or malfunctions due to poor cable contact.
- When disconnecting a communication cable or power cable, do not pull it by holding the cable part.  
To disconnect the cable, hold its connector that is plugged into the module.  
Loosen screws for a terminal block before disconnecting a cable for connecting terminal block.  
Pulling the cable part with the cable still connected to the module may damage the module and/or cable, or cause malfunctions due to poor cable contact.

## [START-UP AND MAINTENANCE PRECAUTIONS]

### CAUTION

- Do not disassemble or remodel each of the modules.  
Doing so may cause failure, malfunctions, personal injuries and/or a fire.
- When using a wireless communication device such as a mobile phone, keep a distance of 25cm (9.84inch) or more from the programmable controller in all directions.  
Failure to do so may cause malfunctions.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module.  
Not doing so may damage the product.
- Do not touch terminals during power-on.  
Doing so may cause malfunctions.
- Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screw or module mounting screw.  
Not doing so may cause a failure or malfunction of the module.  
If the screw is too loose, it may cause a drop, short circuit or malfunction.  
Excessive tightening may cause damage to the screw and/or module, resulting in a drop, short circuit or malfunction.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.  
Not doing so may cause a failure or malfunction of the module.

## [DISPOSAL PRECAUTIONS]

### CAUTION

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



## ● PRÉCAUTIONS DE SÉCURITÉ ●

(Lire ces précautions avant toute utilisation du produit.)

Avant d'utiliser ce produit, lire attentivement ce manuel ainsi que les manuels auxquels il renvoie, et toujours considérer la sécurité comme de la plus haute importance en manipulant le produit correctement.

Les précautions à observer figurant dans ce manuel ne concernent que ce produit. Pour les précautions de sécurité concernant le système d'automate programmable, prière de se reporter au Manuel de l'utilisateur du module CPU utilisé.

Dans ce manuel, les instructions de sécurité sont classées

" AVERTISSEMENT" ou " 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.

On remarquera que même au niveau  ATTENTION, les conséquences peuvent être graves dans certaines circonstances.

Toujours appliquer les consignes sur les deux niveaux car elles sont importantes pour la sécurité des personnes.

Prière de garder ce manuel à portée de main de veiller à ce que l'utilisateur final l'ait aussi à sa disposition.

## [PRÉCAUTIONS DE CONCEPTION]

### AVERTISSEMENT

- Quant à l'état opérationnel de chacune des stations en cas d'erreur de communication sur le réseau, voir MELSECNET, MELSECNET/B Local Station Data Link Module User's Manual (Manuel de l'utilisateur MELSECNET, Module de liaison de données pour station locale MELSECNET/B). Un dysfonctionnement causé par une erreur de communication peut être à l'origine d'un accident.

## **[PRÉCAUTIONS DE CONCEPTION]**

### **AVERTISSEMENT**

- *Pour intervenir sur un automate programmable pendant la marche (pour une modification de données) en raccordant l'outil GX Developer à un module CPU ou en raccordant un ordinateur individuel à un module fonctionnel intelligent (module des fonctions spéciales), configurer dans le programme séquentiel un circuit de verrouillage permettant de garantir en tous temps la sécurité de fonctionnement de l'ensemble du système.  
De plus, avant d'exécuter toute autre commande (comme une modification de programme, un changement d'état opération (commande d'état)), consulter attentivement les manuels correspondants pour pouvoir garantir la sécurité.  
En particulier, s'agissant de commander un automate programmable distant à partir d'un dispositif externe, il ne serait pas possible de régler immédiatement un problème côté automate programmable du fait de l'interruption de la communication des données.  
Pour éviter une telle situation, établir les procédures correctives en cas d'interruption de la communication des données entre le dispositif externe et la CPU d'automate programmable, en plus du circuit de verrouillage incorporé au programme.*

### **ATTENTION**

- *Ne pas installer les lignes de commande et/ou les câbles de communication en les groupant avec les câbles du circuit principal et ou de l'alimentation, et ne pas les placer non plus à proximité les uns des autres.  
Les installer en maintenant entre eux une distance minimum de 100mm (3,94 pouces).  
Faute de quoi, des interférences pourrait causer des dysfonctionnements.*



## **[PRÉCAUTIONS D'INSTALLATION]**

### **ATTENTION**

- *Utiliser l'automate programmable dans dans les conditions environnementales prescrites en section Spécifications générales du Manuel de l'utilisateur du module CPU utilisé.  
Faute de quoi, il y aurait risque de choc électrique, de départ de feu, de dysfonctionnement, d'endommagement ou de détérioration du produit.*
- *À la mise en place du module, introduire l'ergot de maintien du module dans le trou de fixation contre l'unité de base. (Pour un module de la série Ans, fixer le module par ses vis en serrant au couple prescrit.)  
S'il est mal fixé, le module risque de mal fonctionner ou de tomber.*
- *Avant la mise en place ou le retrait du module, vérifier que l'alimentation externe utilisée par le système a bien été coupée sur toutes les phases.  
Faute de quoi, il y aurait risque d'endommagement du module.*
- *Éviter tout contact direct avec les parties conductrices ou les composants électroniques du module. Cela pourrait être à l'origine d'un dysfonctionnement ou d'une panne du module.*

## **[PRÉCAUTIONS DE CABLAGE]**

### **AVERTISSEMENT**

- *Toujours couper l'alimentation externe sur toutes les phases avant l'installation et le câblage.  
Faute de quoi, il y aurait risque de chocs électriques ou d'endommagement du produit.*

### **ATTENTION**

- *Souder correctement un connecteur pour câble coaxial.  
Le non-respect de cette précaution expose à des dysfonctionnements.*
- *Veiller à éviter toute pénétration de corps étrangers, poussière, copeaux métalliques ou autres, dans le module.  
Cela pourrait être à l'origine d'un départ de feu, d'un dysfonctionnements ou d'une panne.*
- *Les câbles de communications ou câbles d'alimentation doivent être placés dans une gaine ou il doivent être attachés.  
Faute de quoi, tout mouvement ou effort de traction sur les câbles mal fixés pourrait endommager le module ou les câbles ou être à l'origine de dysfonctionnements par mauvais contact.*
- *Pour débrancher un câble de communication ou un câble d'alimentation, ne jamais tirer sur le câble proprement dit.  
Pour débrancher un câble, le saisir par son connecteur enfiché dans le module.  
Avant de débrancher un câble raccordé sur une bornier, desserrer les vis du bornier.  
Tout effort de traction sur un câble encore raccordé au module risque d'endommager le module et/ou le câble et peut être à l'origine de dysfonctionnement par suite de mauvais contact.*

## **[PRÉCAUTIONS DE MISE EN SERVICE ET DE MAINTENANCE]**

### **ATTENTION**

- *Ne pas tenter de démonter ou de modifier les modules.  
Cela pourrait être à l'origine de pannes, dysfonctionnements, blessures et/ou d'un départ de feu.*
- *Pour utiliser un appareil de communication sans fil, comme un téléphone portable, le tenir éloigné de l'automate programmable d'une distance d'au moins 25cm (9,84 pouces), dans tous les sens.  
Faute de quoi, il y aurait risque de dysfonctionnements.*
- *Avant la mise en place ou le retrait du module, vérifier que l'alimentation externe utilisée par le système a bien été coupée sur toutes les phases.  
Faute de quoi, il y a risque d'endommagement du produit.*
- *Ne pas toucher aux bornes quand l'appareil est sous tension.  
Il y aurait risque de dysfonctionnements.*
- *Toujours couper l'alimentation externe utilisée par le système sur toutes les phases avant d'entreprendre le nettoyage ou avant de resserrer les vis de borne ou vis de fixation de module.  
Faute de quoi, il y aurait risque de panne ou de dysfonctionnement du module.  
Une vis trop peu serrée pourrait en cas de chute causer un court-circuit ou des dysfonctionnements.  
Un serrage excessif pourrait endommager la vis et/ou le module, avec risque de chute, de court-circuit ou de dysfonctionnement.*
- *Avant de manipuler un module, se débarrasser de la charge électrostatique qu'accumule le corps humain en touchant un objet métallique raccordé à la terre.  
Faute de quoi, il y aurait risque de panne ou de dysfonctionnement du module.*

## **[PRÉCAUTIONS DE MISE AU REBUT]**

### **ATTENTION**

- *Pour le mettre 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.

## REVISIONS

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

Print Date	*Manual Number	Revision		
Mar., 2007	IB(NA)-0800372-A	First edition		
Oct., 2007	IB(NA)-0800372-B	<table border="1"><tr><td>Correction</td></tr></table> Chapter 2	Correction	
Correction				
Oct., 2011	IB(NA)-0800372-C	<table border="1"><tr><td>Correction</td></tr></table> SAFETY PRECAUTIONS, Compliance with the EMC and low voltage directives, Chapter 1, 3, 5, Section 5.2 <table border="1"><tr><td>Addition</td></tr></table> SAFETY PRECAUTIONS (Chinese), CONDITIONS OF USE FOR THE PRODUCT	Correction	Addition
Correction				
Addition				
Nov., 2014	IB(NA)-0800372-D	<table border="1"><tr><td>Correction</td></tr></table> ABOUT MANUALS, COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES, Chapter 1, 2, 4, 6 <table border="1"><tr><td>Addition</td></tr></table> SAFETY PRECAUTIONS (French), HOW TO READ THIS MANUAL	Correction	Addition
Correction				
Addition				
Jun., 2018	IB(NA)-0800372-E	Descriptions are revised due to compliance with the Chinese standardized law.		

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

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## **ABOUT MANUALS**

The following manuals are also related to this product.  
Order them by referring to the table below as necessary.

### Related Manuals

Manual name	Manual number (Model code)
MELSECNET, MELSECNET/B Local Station Data Link Module User's Manual	SH-080670ENG (13JR98)
Type MELSECNET, MELSECNET/B Data Link System Reference Manual	IB-66350 (13JF70)

For the use of this module, read MELSECNET, MELSECNET/B Local Station Data Link Module User's Manual and Type MELSECNET, MELSECNET/B Data Link System Reference Manual.

### Support tool

A/QnA to Q conversion support tool (Version 1.02 or later)

This is a tool to support the creation of a program for link data refresh and program for receiving the LRDP/LWTP instruction. For details on the A/QnA to Q conversion support tool, please consult your local Mitsubishi representative.

To create a program used for L series by means of the A/QnA to Q conversion support tool, refer to the MELSECNET, MELSECNET/B Local Station Data Link Module User's Manual.



## COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- User's manual for the CPU module used
- Safety Guidelines

(This manual is included with the CPU module or base unit.)

The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

(2) Additional measures

To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the manuals listed under (1).

## HOW TO READ THIS MANUAL

When the module is used in the L series system

This manual describes the Q series only, when there is no differences between the Q series and L series. Replace "Q" with "L" in this manual as shown below.

Description in this manual (Q)	After replacement
QA1S5□B	LA1S5□B
QA1S6□B	LA1S6□B
QCPU	LCPU

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# 1. OVERVIEW

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This manual describes the specifications and part names of the data link module shown below used in the MELSECNET or MELSECNET/B data link system (hereinafter referred to as a local module).

- A1SJ71AP23Q type MELSECNET local station data link module
- A1SJ71AR23Q type MELSECNET local station data link module
- A1SJ71AT23BQ type MELSECNET/B local station data link module

- (1) The following shows the application, applicable cable, and mounting position of the local module.

Table 1.1 Application, applicable cable, and mounting position

Model name	Application	Applicable cable	Mounting position
A1SJ71AP23Q	For local station	Optical fiber cable	I/O slot of extension base unit *1
A1SJ71AR23Q		Coaxial cable	
A1SJ71AT23BQ		Shielded twisted pair cable	

\*1 A local module can be mounted to the following extension base unit.

- QA1S5□B type extension base unit
- QA1S6□B type extension base unit
- QA6□B type extension base unit + A1ADP-SP type A-A1S module conversion adapter

- (2) After unpacking, make sure that the following products are included.

Table 1.2 Products

Model name	Product name	Quantity
A1SJ71AP23Q	A1SJ71AP23Q type MELSECNET local station data link module	1
A1SJ71AR23Q	A1SJ71AR23Q type MELSECNET local station data link module	1
A1SJ71AT23BQ	A1SJ71AT23BQ type MELSECNET/B local station data link module	1
	Terminating resistor (110Ω, 1/2W)	1

- (3) The following shows the applicable modules and maximum number of mounted modules for the local module.
- (a) For the Q series
- Applicable modules  
High Performance model QCPU  
Universal model QCPU whose serial number (first five digits) is "13102" or later  
QA1S5□B, QA1S6□B, and QA6□B+A-A1S module conversion adapter
  - Maximum number of mounted modules  
Refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
- (b) For the L series
- Applicable modules  
LCPU whose serial number (first five digits) is "16112" or later  
LA1S extension base unit
  - Maximum number of mounted modules  
Refer to the MELSEC-L LA1S Extension Base Unit User's Manual.

## 2. PERFORMANCE SPECIFICATIONS

This chapter describes the performance specifications of the MELSECNET or MELSECNET/B data link system and the local module. For the general specifications, refer to the User's Manual (Hardware Design, Maintenance and Inspection) for the CPU module used.

### (1) Performance specifications of MELSECNET data link system and A1SJ71AP23Q

Table 2.1 Performance specifications of MELSECNET data link system and A1SJ71AP23

Item		Specifications		
		MELSECNET data link system		
		MELSECNET mode	MELSECNET II mode	MELSECNET II composite mode
Maximum applicable link points per station	Input (X)	Up to the maximum number of I/O points for the CPU module used in the master station is applicable. (The total number of link points for slave station is equal to the number of link using points for the master station)		
	Output (Y)			
Maximum link points in a system	B	1024 points (128 byte)	4096 points (512 byte)	
	W	1024 points (2048 byte)	4096 points (8192 byte)	
Maximum link points per station	Master station	1024 byte	1024 byte (First half of link parameters) 1024 byte (Latter half of link parameters)	
	Local station			
	Remote I/O station	512 byte Number of I/O points: 512 points	-	512 byte Number of I/O points: 512 points
Communication speed		1.25Mbps		
Communication method		Half duplex bit serial method		
Synchronization method		Frame synchronization method		
Transmission path		Duplex loop		
Overall cable distance		Up to 10km (Station-to-station 1km)		
Number of connected stations		Up to 65 (Master station: 1, The total number of local stations and remote I/O stations: 64)		
Modulation method		CMI method		
Transmission format		Conforming to HDLC (Frame format)		
Error control system		Retries due to CRC (generating polynomial $X^{16}+X^{12}+X^5+1$ ) and time out		
RAS function		<ul style="list-style-type: none"> <li>• Loopback function due to error detection and cable break</li> <li>• Diagnostic function including link line check of host station etc.</li> </ul>		

Table 2.1 Performance specifications of MELSECNET data link system and A1SJ71AP23  
(Continued)

Item	Specifications		
	MELSECNET data link system		
	MELSECNET mode	MELSECNET II mode	MELSECNET II composite mode
Connector <i>Connecteur</i>	2-core optical connector plug (User prepared <sup>*1</sup> ) <i>Prise de connecteur optique 2 conducteurs (À préparer par l'utilisateur<sup>*1</sup>)</i>		
Applicable cable <i>Câbles à utiliser</i>	Optical fiber cable (User prepared <sup>*1</sup> ) <i>Câble à fibre optique (À préparer par l'utilisateur<sup>*1</sup>)</i>		
Number of I/O occupied points	32 points (Intelli: 32 points)		
Internal current consumption (5VDC)	0.33A		
Weight	0.30kg		

\*1 Connecting an optical fiber cable with a connector requires professional skills and special tools. Also, a connector dedicated to an optical fiber cable is required.

For purchase, contact your local Mitsubishi Electric System Service or representative.

\*1 *Le raccordement d'un câble à fibres optiques à un connecteur ne peut être effectué que par un professionnel disposant de l'outillage spécial. De plus, il faut employer un connecteur spécial pour câble à fibres optiques.*

*Pour s'approvisionner, contacter Mitsubishi Electric System ou son représentant local.*

(2) Performance specifications of MELSECNET data link system and A1SJ71AR23Q

Table 2.2 Performance specifications of MELSECNET data link system and A1SJ71AR23Q

Item		Specifications		
		MELSECNET data link system		
		MELSECNET mode	MELSECNET II mode	MELSECNET II composite mode
Maximum applicable link points per station	Input (X)	Up to the maximum number of I/O points for the CPU module used in the master station is applicable. (The total number of link points for slave station is equal to the number of link using points for the master station)		
	Output (Y)			
Maximum link points in a system	B	1024 points (128 byte)	4096 points (512 byte)	
	W	1024 points (2048 byte)	4096 points (8192 byte)	
Maximum link points per station	Master station	1024 byte	1024 byte (First half of link parameters)	
	Local station		1024 byte (Latter half of link parameters)	
	Remote I/O station	512 byte Number of I/O points: 512 points	-	512 byte Number of I/O points: 512 points
Communication speed		1.25Mbps		
Communication method		Half duplex bit serial method		
Synchronization method		Frame synchronization method		
Transmission path		Duplex loop		
Overall cable distance		Up to 10km (Station-to-station 500m)		
Number of connected stations		Up to 65 (Master station: 1, The total number of local stations and remote I/O stations: 64)		
Modulation method		CMI method		
Transmission format		Conforming to HDLC (Frame format)		
Error control system		Retries due to CRC (generating polynomial $X^{16}+X^{12}+X^5+1$ ) and time out		
RAS function		<ul style="list-style-type: none"> <li>• Loopback function due to error detection and cable break</li> <li>• Diagnostic function including link line check of host station etc.</li> </ul>		

Table 2.2 Performance specifications of MELSECNET data link system and A1S71AR23Q  
(Continued)

Item	Specifications		
	MELSECNET data link system		
	MELSECNET mode	MELSECNET II mode	MELSECNET II composite mode
Connector <i>Connecteur</i>	Connector plug for 3C-2V (User prepared): • BNC-P-3-NiCAu-CF (DDK Ltd.) Connector plug for 5C-2V (User prepared): • BNC-P-5-NiCAu-CF (DDK Ltd.) • BNC-P-5DV SA(41) (HIROSE ELECTRIC CO., LTD.) <i>Connecteur 3C-2V (À préparer par l'utilisateur):</i> • <i>BNC-P-3-NiCAu-CF (DDK Ltd.)</i> <i>Connecteur 5C-2V (À préparer par l'utilisateur):</i> • <i>BNC-P-5-NiCAu-CF (DDK Ltd.)</i> • <i>BNC-P-5DV SA(41) (HIROSE ELECTRIC CO., LTD.)</i>		
Applicable cable <i>Câbles à utiliser</i>	Cables equivalent to 3C-2V or 5C-2V (User prepared) <i>Câbles équivalents pour 3C-2V ou 5C-2V (À préparer par l'utilisateur)</i>		
Number of I/O occupied points	32 points (Intelli: 32 points)		
Internal current consumption (5VDC)	0.80A		
Weight	0.33kg		

(3) Performance specifications of MELSECNET/B data link system and A1SJ71AT23BQ

Table 2.3 Performance specifications of MELSECNET/B data link system and A1SJ71AT23BQ

Item		Specifications		
		MELSECNET/B data link system		
		MELSECNET mode	MELSECNET II mode	MELSECNET II composite mode
Maximum applicable link points per station	Input (X)	Up to the maximum number of I/O points for the CPU module used in the master station is applicable. (The total number of link points for slave station is equal to the number of link using points for the master station)		
	Output (Y)			
Maximum link points in a system	B	1024 points (128 byte)	4096 points (512 byte)	
	W	1024 points (2048 byte)	4096 points (8192 byte)	
Maximum link points per station	Master station	1024 byte	1024 byte (First half of link parameters)	
	Local station		1024 byte (Latter half of link parameters)	
	Remote I/O station	512 byte Number of I/O points: 512 points	-	512 byte Number of I/O points: 512 points
Communication speed		125kbps/250kbps/500kbps/1Mbps		
Communication method		Half duplex bit serial method		
Synchronization method		Frame synchronization method		
Transmission path		Bus method		
Overall cable distance		Changed due to communication speed (125kbps: 1200m, 250kbps: 600m, 500kbps: 400m, 1Mbps: 200m)		
Number of connected stations		Up to 32 (Master station: 1, The total number of local stations and remote I/O stations: 31)		
Modulation method		NRZI method		
Transmission format		Conforming to HDLC (Frame format)		
Error control system		Retries due to CRC (generating polynomial $X^{16}+X^{12}+X^5+1$ ) and time out		
RAS function		Diagnostic function including link line check of host station etc.		
Connector <i>Connecteur</i>		Terminal block <i>Plaque à bornes</i>		
Applicable cable <i>Câbles à utiliser</i>		Shielded twisted pair cable (User prepared) <i>Paire torsadée blindée (À préparer par l'utilisateur)</i>		
Number of I/O occupied points		32 points (Intelli: 32 points)		
Internal current consumption (5VDC)		0.66A		
Weight		0.22kg		



Remarks

Overall cable distance

(1) MELSECNET data link system

The overall cable distance refers to a distance from OUT of the master station to IN of the master station via a slave station.

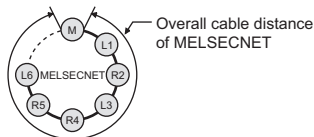


Figure 2.1 Overall cable distance of MELSECNET

(2) MELSECNET/B data link system

The overall cable distance refers to a distance between stations at both ends.

The overall cable distance of the MELSECNET/B data link system is determined depending on communication speed.

The communication speed is set by the communication speed setting switch of each link module.

Table 2.4 Communication speed and overall cable distance

Communication speed	Overall cable distance
125kbps	1200m
250kbps	600m
500kbps	400m
1Mbps	200m

Overall cable distance of MELSECNET/B



Figure 2.2 Overall cable distance of MELSECNET/B

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## 3. HANDLING

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### 3.1 Handling Precautions

- (1) Do not drop or give strong impact on the module, since its case is made of resin.
- (2) Do not remove a printed-circuit board of the module from a case. Doing so may cause failure.
- (3) Be careful to prevent foreign matter such as wire chips from entering the module top at the time of wiring.
- (4) Tighten a module mounting screw or a terminal screw within the following range.

Table 3.1 Screw tightening torque

Screw	Tightening torque range
Terminal screw for cable terminal block (M3.5 screw)	59 to 88N•cm
Mounting screw for cable terminal block (M3.5 screw)	59 to 88N•cm
Module mounting screw (M4 screw)	78 to 118N•cm

- (4) *Serrer chaque vis de fixation du module ou vis de borne dans les limites prescrites ci-après.*

Vis	Plage de couple de serrage
Vis de borne sur bornier de câble (Vis M3,5)	59 à 88 N•cm
Vis de fixation de bornier de câble (Vis M3,5)	59 à 88 N•cm
Vis de fixation du module (Vis M4)	78 à 118 N•cm

## 4. PART NAMES AND SETTINGS

This chapter describes the part names and settings of the local module.

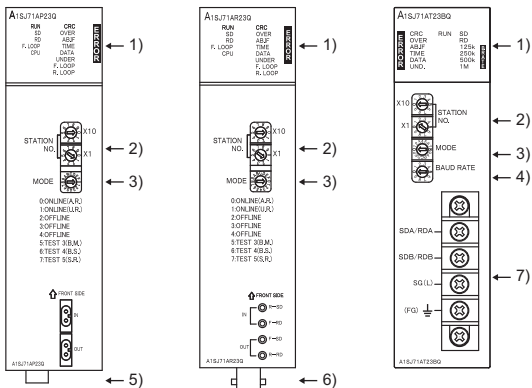


Figure 4.1 Outside drawing of local module

Table 4.1 Part names and settings

No.	Name	Description																																																	
1)	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p><b>A1SJT1AP23G</b></p> <table border="0"> <tr><td>RUN</td><td>CRC</td></tr> <tr><td>SD</td><td>OVER</td></tr> <tr><td>RD</td><td>ABJF</td></tr> <tr><td>F.LOOP</td><td>TIME</td></tr> <tr><td>CPU</td><td>DATA</td></tr> <tr><td></td><td>UNDER</td></tr> <tr><td></td><td>F.LOOP</td></tr> <tr><td></td><td>R.LOOP</td></tr> </table> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p><b>A1SJT1AR23G</b></p> <table border="0"> <tr><td>RUN</td><td>CRC</td></tr> <tr><td>SD</td><td>OVER</td></tr> <tr><td>RD</td><td>ABJF</td></tr> <tr><td>F.LOOP</td><td>TIME</td></tr> <tr><td>CPU</td><td>DATA</td></tr> <tr><td></td><td>UNDER</td></tr> <tr><td></td><td>F.LOOP</td></tr> <tr><td></td><td>R.LOOP</td></tr> </table> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>A1SJT1AT23BQ</b></p> <table border="0"> <tr><td>CRC</td><td>RUN</td><td>SD</td></tr> <tr><td>OVER</td><td>RD</td><td>125k</td></tr> <tr><td>ABJF</td><td>TIME</td><td>250k</td></tr> <tr><td>DATA</td><td>500k</td><td></td></tr> <tr><td>UND.</td><td>1M</td><td></td></tr> </table> </div>	RUN	CRC	SD	OVER	RD	ABJF	F.LOOP	TIME	CPU	DATA		UNDER		F.LOOP		R.LOOP	RUN	CRC	SD	OVER	RD	ABJF	F.LOOP	TIME	CPU	DATA		UNDER		F.LOOP		R.LOOP	CRC	RUN	SD	OVER	RD	125k	ABJF	TIME	250k	DATA	500k		UND.	1M		Name	Status	Description
		RUN	CRC																																																
		SD	OVER																																																
		RD	ABJF																																																
		F.LOOP	TIME																																																
		CPU	DATA																																																
			UNDER																																																
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		RUN	CRC																																																
		SD	OVER																																																
		RD	ABJF																																																
		F.LOOP	TIME																																																
CPU	DATA																																																		
	UNDER																																																		
	F.LOOP																																																		
	R.LOOP																																																		
CRC	RUN	SD																																																	
OVER	RD	125k																																																	
ABJF	TIME	250k																																																	
DATA	500k																																																		
UND.	1M																																																		
RUN	ON		Data link normal																																																
SD			Data sending																																																
RD			Data receiving																																																
F.LOOP			Forward loop side receives data (OFF: Reverse loop side receives data)																																																
CPU			Communication with CPU module in execution																																																
125k	ON		Setting status of communication speed (A1SJT1AT23BQ)																																																
250k																																																			
500k																																																			
1M																																																			
CRC	ON (OFF if normal)		Code check error for receive data																																																
OVER			The processing of receive data has been delayed.																																																
AB.IF			<ul style="list-style-type: none"> <li>"1" has been received consecutively more than stipulated times.</li> <li>Receive data length is shorter than stipulated length.</li> </ul>																																																

Table 4.1 Part names and settings (Continued)

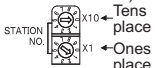


No.	Name	Description		
1)	LED (Continued)	TIME	ON (OFF if normal)	Data link monitoring time is over.
		DATA		The data of error code has been received.
		UNDER		Internal processing of send data is not executed constantly.
		UND.		Receive error at forward loop side
		F.LOOP		Receive error at reverse loop side
2)	Station No. setting switch (A1SJ71AP23Q/ A1SJ71AR23Q)  (A1SJ71AT23BQ) Tens place → X10 Ones place → X1	Sets station No. of the local module. (Factory default setting: 1) • A1SJ71AP23Q/A1SJ71AR23Q 1 to 64: Station No. (If other than above is set, the local module goes into offline status (X0=ON).) • A1SJ71AT23BQ 1 to 31: Station No. (If other than above is set, the local module goes into offline status (X0=ON).)		
	3)	Mode setting switch (A1SJ71AP23Q/ A1SJ71AR23Q)  (A1SJ71AT23BQ) 	Sets operation mode. (Factory default setting: 0)	
No.		Item	Description	
0		Online	Data link (with automatic return function)	
1		Online	Data link (without automatic return function)	
2		Offline	Disconnects host station.	
3		-	Unusable (If set, the local module goes into offline status (X0=ON).)	
4		-	Unusable (If set, the local module goes into offline status (X0=ON).)	
5		Station-to-station test (Executing station)	Checks a line between two adjacent stations.	
6		Station-to-station test (Other station)		
7		Self-loopback test	Checks the hardware including transmission circuit in a single local module.	
8 to F	-	Unusable (If set, the local module goes into offline status (X0=ON).)		

Table 4.1 Part names and settings (Continued)

No.	Name	Description	
4)	Communication speed setting switch (A1SJ71AT23BQ)	Sets communication speed.	
		No.	Communication speed
		0	125kbps
		1	250kbps
		2	500kbps
3	1Mbps		
4 to F	Unusable (If set, the local module goes into offline status (X0=ON).)		
5)	Connector (A1SJ71AP23Q) Connecteur (A1SJ71AP23Q)	Connects an optical fiber cable. <i>Raccordement par câble à fibres optiques</i>	
6)	Connector (A1SJ71AR23Q) Connecteur (A1SJ71AR23Q)	Connects a coaxial cable. <i>Raccordement par câble coaxial</i>	
7)	Terminal block (A1SJ71AT23BQ) Plaque à bornes (A1SJ71AT23BQ)	Connects a shielded twisted pair cable. <i>Raccordement par câble à paire torsadée avec blindage</i>	

English	French
Foward loop receive	Réception boucle avant
Foward loop send	Émission boucle avant
Reverse loop receive	Réception boucle retour
Reverse loop send	Émission boucle retour

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## 5. WIRING

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### 5.1 Optical Fiber Cable

This section describes how to connect an optical fiber cable with the local module.

(1) Precautions for wiring

(a) Securing of wiring space

When an optical fiber cable is connected with the local module, a cable bend radius is restricted.

For details, check the specifications of the cable to be used.

(b) Laying an optical fiber cable

When laying an optical fiber cable, do not directly touch an optical fiber core of a plug or jack, and prevent dirt or dust from attaching it.

If oil from hand, dirt, or dust is attached, transmission loss may increase, resulting in failure at data link.

In addition, do not remove the cover from a connector of the module before installing an optical fiber cable.

(c) Installing/removing an optical fiber cable

Be sure to shut off all phases of the external power supply used by the system.

(2) Connection of cable

An optical fiber cable connects OUT and IN as shown below. (OUT of the last station is connected to IN of the master station.)

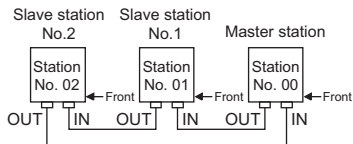


Figure 5.1 Connection method

## 5.2 Coaxial Cable

This section describes how to connect a coaxial cable with the local module.

### (1) Precautions for wiring

#### (a) Securing of wiring space

When a coaxial cable is connected with the local module, a cable bend radius is restricted.

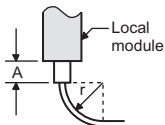


Figure 5.2 Allowable bend radius of coaxial cable

Table 5.1 Allowable bend radius of coaxial cable

Applicable cable	Connector part A	Allowable bend radius r
Coaxial cable	3C-2V	23mm
	5C-2V	30mm

#### (b) Laying a coaxial cable

When laying a coaxial cable, keep a distance of 100mm (3.94 inch) or more from other power cables or control cables. In addition, connecting FGs of the power supply module of the base unit where the local module is mounted strengthens measures against noise.

#### (c) Installing/removing a coaxial cable

Be sure to shut off all phases of the external power supply used by the system.

### (2) Connection of cable

A coaxial cable connects OUT(F-SD, R-RD) and IN (F-RD, R-SD) as shown below. (OUT(F-SD, R-RD) of the last station is connected to IN (F-RD, R-SD) of the master station.)

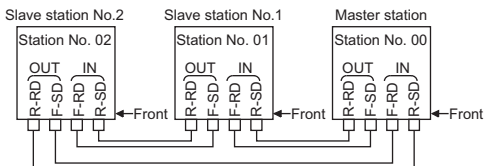


Figure 5.3 Connection method

(3) Connection of cable for coaxial cable

The following shows how to connect a BNC connector (connector plug for coaxial cable) and a cable.

(a) Components of BNC connector and coaxial cable

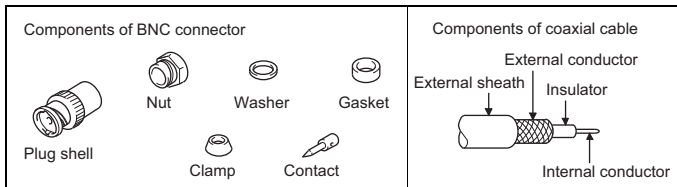
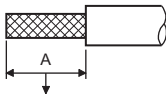


Figure 5.4 Components of BNC connector and coaxial cable

(b) How to connect BNC connector and coaxial cable

- 1) Remove external sheath of a coaxial cable as shown below.

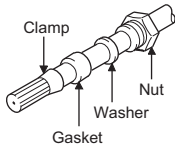
Be careful not to damage an external conductor.



Measures for removing external sheath

Applicable cable	A
3C-2V	15mm (0.59 in.)
5C-2V	10mm (0.4 in.)

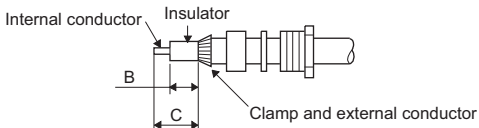
- 2) Put a nut, washer, gasket, and clamp through the coaxial cable and unravel the external conductor.



- 3) Cut the external conductor, insulator, and internal conductor in the following dimensions.

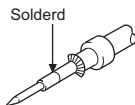
As for the external conductor, cut it in the same dimensions as taper part of the clamp, and smooth it down to the clamp.



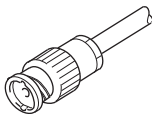


Applicable cable	B	C
3C-2V	6mm (0.24 in. )	3mm (0.12 in.)
5C-2V	7mm (0.28 in.)	5mm (0.2 in.)

4) Solder a contact to the internal conductor.



5) Insert a contact assembly in 4) to a plug shell and screw a nut into the plug shell.



**POINT**

- (1) When soldering an internal conductor and a contact, pay attention to the following points.
  - Do not swell up the soldered part.
  - Properly solder a contact and an insulator of the cable without making space between them or soldering them too tight.
  - Perform soldering immediately so as not to modify the insulator.
- (2) Before removing/mounting the coaxial cable connector, be sure to touch a grounded metal object to discharge the static electricity from the human body.  
 Not doing so may cause failure of the module.

## 5.3 Shielded Twisted Pair Cable

This section describes how to connect a shielded twisted pair cable with the local module.

### (1) Precautions for wiring

#### (a) Laying shielded twisted pair cable

When laying a shielded twisted pair cable, pay attention to the following points so that it will not be affected by noise or surge induction.

- 1) Do not install a shielded twisted pair cable together with the main circuit, high-voltage cable, or load line, and also do not bring them closer to each other. (Keep a distance of 100mm (3.94 inch) or more between them.)
- 2) Do not use a part of shielded twisted pair cable (for example, one pair among three pairs) as a cable for power supply.

#### (b) Connection of terminating resistor

For the stations at both ends of the MELSECNET/B data link system, connect SDA/RDA and SDB/RDB with an attached terminating resistor ( $110\Omega$ , 1/2W).

#### (c) Installing/removing shielded twisted pair cable

Be sure to shut off all phases of the external power supply used by the system.

### (2) Connection of cable

A shielded twisted pair cable is connected as shown below.

In addition, use a terminating resistor for stations at both ends.

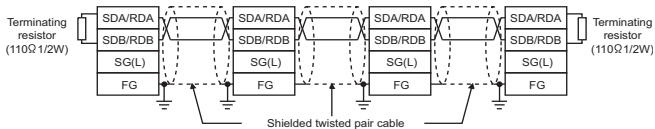
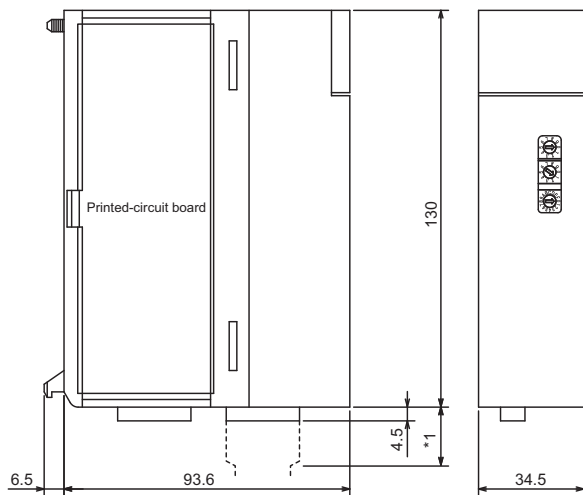


Figure 5.5 Connection method

## 6. EXTERNAL DIMENSIONS

### 6.1 A1SJ71AP23Q



Unit: mm

Figure 6.1 A1SJ71AP23Q

- \*1 For details, contact your local Mitsubishi Electric System Service or representative.

## 6.2 A1SJ71AR23Q

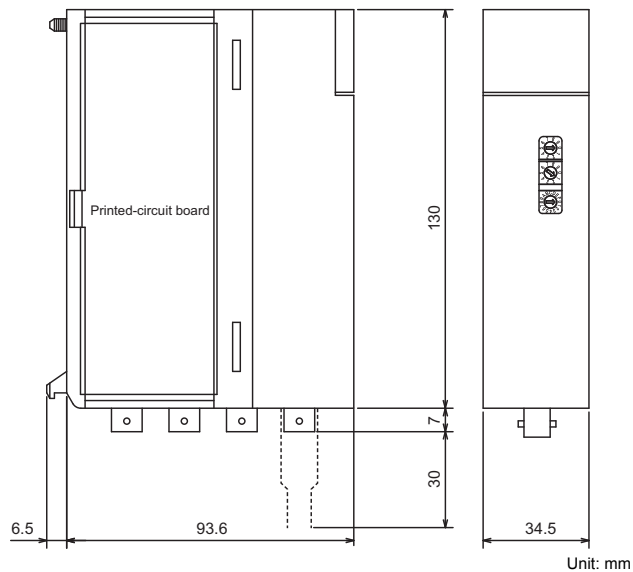


Figure 6.2 A1SJ71AR23Q

### 6.3 A1SJ71AT23BQ

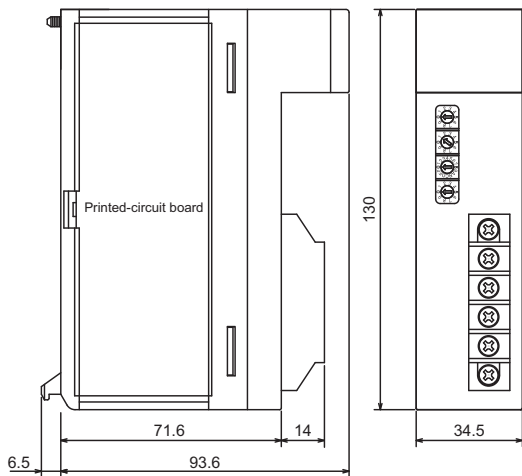


Figure 6.3 A1SJ71AT23BQ

Unit: mm

# Memo

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## WARRANTY

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

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UK	MITSUBISHI ELECTRIC EUROPE B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, U.K. Tel : +44-1707-28-8780	Taiwan	SETSUYO ENTERPRISE CO., LTD. 6F, No.105, Wugong 3rd Road, Wugu District, New Taipei City 24889, Taiwan Tel : +886-2-2299-2499
Ireland	MITSUBISHI ELECTRIC EUROPE B.V. Irish Branch Westgate Business Park, Ballymount, Dublin 24, Ireland Tel : +353-1-4198800	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
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Spain	MITSUBISHI ELECTRIC EUROPE, B.V. Spanish Branch Carretera de Rubi, 76-80-Appdo. 420, 08190 Sant Cugat del Vallés (Barcelona), Spain Tel : +34-935-65-3131	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 Bangpoo, Khet Yannawa, Bangkok 10120, Thailand Tel : +66-2682-6522
France	MITSUBISHI ELECTRIC EUROPE B.V. French Branch 25, Boulevard des Bouvets, 92741 Nanterre Cedex, France Tel : +33-1-55-68-55-68	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
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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 BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN  
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