

MELSEC FX Series

Programmable Logic Controllers

Installation Manual

ETHERNET Communications Module COM-ET10-T

About this Manual

The texts, illustrations, diagrams, and examples contained in this manual are intended exclusively as support material for the explanation, handling, programming, and operation of the Ethernet communication module in combination with programmable logic controllers of the FX1S, FX1N, FX2N and FX2NC series.

If you have any questions concerning the programming and operation of the equipment described in this manual, please contact your relevant sales office or department (refer to back of cover).

Current information and answers to frequently asked questions are also available through the Internet (www.mitsubishi-automation.com).

MITSUBISHI ELECTRIC EUROPE B.V. reserves the right to make changes both to this manual and to the specifications and design of the hardware at any time without prior notice.

Version		Changes / Additions / Corrections
A	07/2003 pdp-cr	—

Installation Manual
COM-ET10-T
Articel No.: 151718

Safety Information

For qualified staff only

This manual is only intended for use by properly trained and qualified electrical technicians who are fully acquainted with automation technology safety standards. All work with the hardware described, including system design, installation, setup, maintenance, service and testing, may only be performed by trained electrical technicians with approved qualifications who are fully acquainted with the applicable automation technology safety standards and regulations.

Proper use of equipment

The Ethernet communication module is only intended for the specific applications explicitly described in this manual. Please take care to observe all the installation and operating parameters specified in the manual. When using the Ethernet communications module with FX1S, FX1N, and FX2N series controllers you must always use the appropriate communications adapter (FX1N-CNV-BD or FX2N-CNV-BD). Only accessories, peripherals and expansion devices specifically approved by MITSUBISHI ELECTRIC may be used with the programmable logic controllers of the FX1S, FX1N, and FX2N series.

Any other use or application of the products is deemed to be improper.

Relevant safety regulations

All safety and accident prevention regulations relevant to your specific application must be observed in the system design, installation, setup, maintenance, servicing and testing of these products.

The regulations listed below are particularly important. This list does not claim to be complete; however, you are responsible for knowing and applying the regulations applicable to you.

- VDE Standards
 - VDE 0100
(Regulations for electrical installations with rated voltages up to 1,000V)
 - VDE 0105
(Operation of electrical installations)
 - VDE 0113
(Electrical systems with electronic equipment)
 - VDE 0160
(Configuration of electrical systems and electrical equipment)
 - VDE 0550/0551
(Regulations for transformers)
 - VDE 0700
(Safety of electrical appliances for household use and similar applications)
 - VDE 0860
(Safety regulations for mains-powered electronic appliances and their accessories for household use and similar applications)
- Fire prevention regulations
- Accident prevention regulations
 - VBG No. 4 (Electrical systems and equipment)

Safety warnings in this manual

In this manual special warnings that are important for the proper and safe use of the products are clearly identified as follows:



DANGER:

Personnel health and injury warnings. Failure to observe the precautions described here can result in serious health and injury hazards.



CAUTION:

Equipment and property damage warnings. Failure to observe the precautions described here can result in serious damage to the equipment or other property.

General safety information and precautions

The following safety precautions are intended as a general guideline for using the PLC together with other equipment. These precautions must always be observed in the design, installation and operation of all control systems.



DANGER:

- ***Observe all safety and accident prevention regulations applicable to your specific application. Installation, wiring and opening of the assemblies, components and devices may only be performed with all power supplies disconnected.***
- ***Assemblies, components and devices must always be installed in a shockproof housing fitted with a proper cover and protective equipment.***
- ***Devices with a permanent connection to the mains power supply must be integrated in the building installations with an all-pole disconnection switch and a suitable fuse.***
- ***Check power cables and lines connected to the equipment regularly for breaks and insulation damage. If cable damage is found, immediately disconnect the equipment and the cables from the power supply and replace the defective cabling.***
- ***Before using the equipment for the first time check that the power supply rating matches that of the local mains power.***
- ***Residual current protective devices pursuant to DIN VDE Standard 0641 Parts 1-3 are not adequate on their own as protection against indirect contact for installations with positioning drive systems. Additional and/or other protection facilities are essential for such installations.***
- ***EMERGENCY OFF facilities pursuant to EN 60204/IEC 204 VDE 0113 must remain fully operative at all times and in all control system operating modes. The EMERGENCY OFF facility reset function must be designed so that it cannot cause an uncontrolled or undefined restart.***
- ***You must also implement hardware and software safety precautions to prevent the possibility of undefined control system states caused by signal line cable or core breaks.***
- ***All relevant electrical and physical specifications must be strictly observed and maintained for all the modules in the installation.***

Contents

1	Introduction	
1.1	General Description	7
1.2	Features of the COM-ET10-T Module	7
1.3	Installation	8
2	Specifications	
2.1	General Specifications	9
2.2	Performance Specifications	9
2.3	Dimensions	10
3	Components of the COM-ET10-T Module	
3.1	Overview	11
3.2	LED Indicators	11
3.3	Network Components	12
4	Procedures before Operation	
4.1	Procedures	13
5	Programming	
5.1	Program example for a connection establishment between PLC and PC	14
A	Appendix	
A.1	File Registers	15

1 Introduction

This Installation Manual includes a brief summary of the main specifications of the COM-ET10-T Ethernet communications module, which should be sufficient to enable experienced users to install and configure the module. For further information on the PLC system and detailed programming instructions please refer to the FX1S, FX1N, FX2N and FX2NC Hardware Manuals, the FX Communications Manual and the FX Programming Manual. All these manuals can be ordered or downloaded free of charge from the Mitsubishi website at "www.mitsubishi-automation.de".

1.1 General Description

The Ethernet communications module is used to connect an FX series PLC to other network devices, such as a personal computer, via an Ethernet network. The COM-ET10-T provides the same functions as those available via serial programming interfaces. You can use the TCP/IP, UDP or TFTP transfer protocols. The Ethernet module communicates via 10BASE-T network cabling.

Note

| Ethernet is a registered trademark of Xerox Co. Ltd.

1.2 Features of the COM-ET10-T Module

Selecting the communications protocol and the Ethernet stations

You can specify the communications protocol (TCP/IP, UDP or TFTP) individually for every connected station and establish the connection using that protocol. The TCP/IP protocol is connection-oriented; this means that you can only maintain a link to one partner at a time with this protocol.

It is not possible to establish Ethernet links to modular PLCs of the AnS, QnAS and System Q series.

Parameter configuration

The module is initialised with a PLC program. Its parameter settings are stored in data registers.

1.3 Installation



CAUTION:

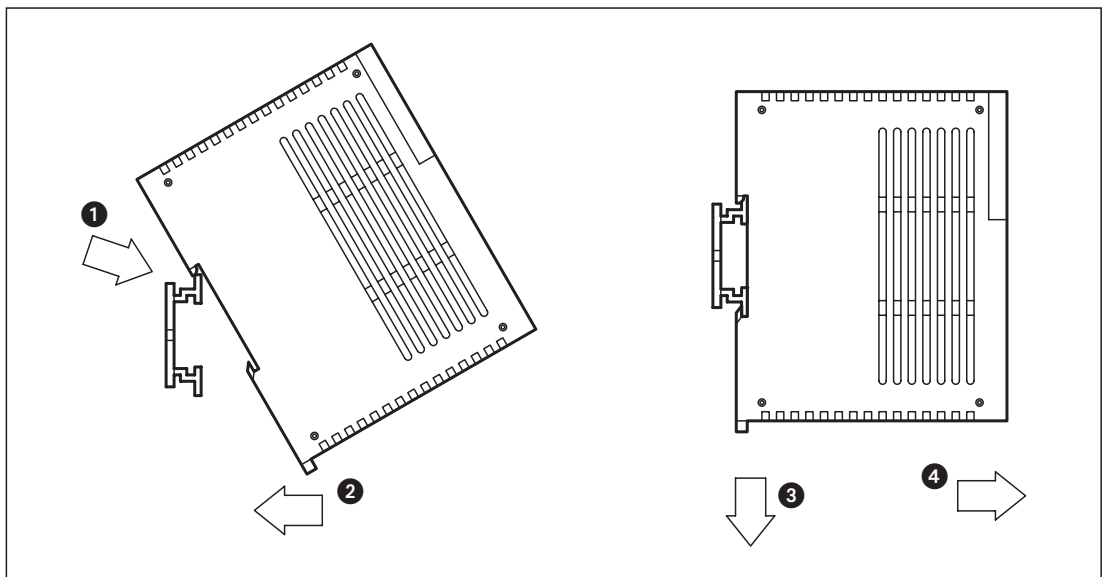
Always completely disconnect the power supply to the PLC system (all poles) before installing or uninstalling the Ethernet module. Installing or uninstalling the module while the power is connected can damage the module and/or cause malfunctions.

The interface modules are connected directly to the right side of the FX2NC controller.

The COM-ET10-T module must be connected with the appropriate communications adapter, either the FX1N-CNV-BD or FX2N-CNV-BD, depending on the controller you are using. Replace the cover of the FX1S, FX1N or FX2N controller after installing the communication adapter. Do not switch on the power again before the cover has been replaced.

Take great care to ensure that no pieces of wire, metal shavings or other conductive items that could cause shorts come into the housing while you are working!

Installation of the communication module



Installation procedure

- ① Turn off the PLC power supply.
- ② Tilt the module and hook the upper edge of the DIN rail slot over the top of the DIN rail ①.
- ③ Press the lower end of the module down onto the DIN rail until it locks into place ②.

NOTES

To remove the module from the rail just pull the DIN rail clip release down ③, pull the lower edge of the module forward ④ and then lift the module off the rail.

For further details on installing the module and the FX1N-CNV-BD or FX2N-CNV-BD communications adapter please refer to the FX hardware manual for your equipment.

2 Specifications

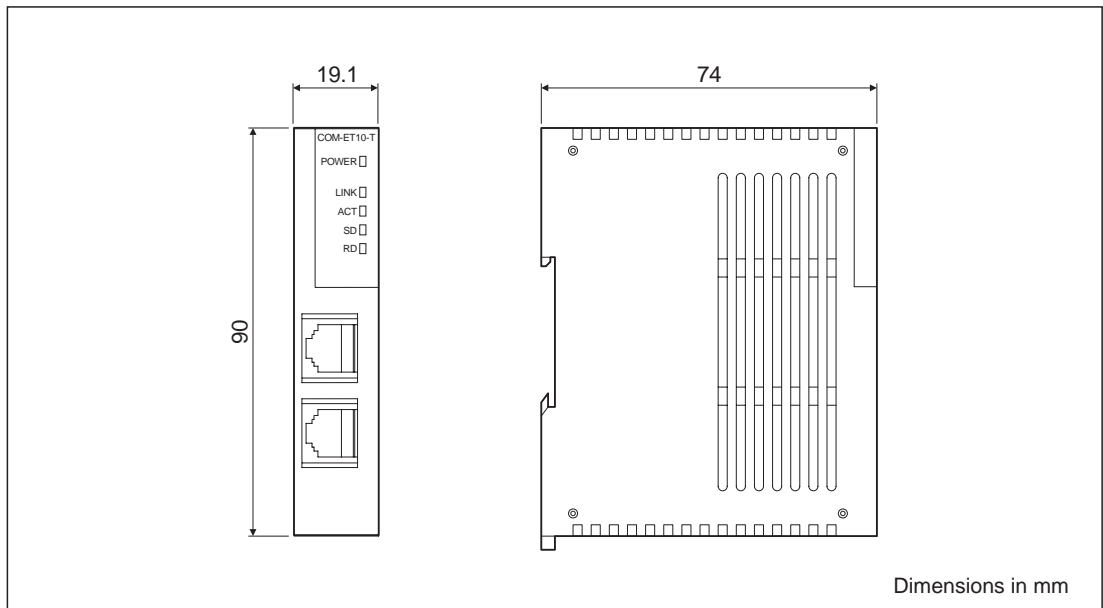
2.1 General Specifications

Item	Specifications				
Operating ambient temperature	0 to 55°C				
Operating ambient humidity	5 to 95% (non-condensing)				
Storage ambient temperature	-20 bis 75°C				
Storage ambient humidity	5 bis 95% (non-condensing)				
Vibration resistance	Conforming to JIS C0040	Frequency	Acceleration	Amplitude	Number of sweeps in X-, Y- and Z direction
		10 to 57Hz	—	0.035mm	10 times (80 minutes along all 3 axes)
		57 to 100Hz	4,9 m/s ²	—	
Shock resistance	Confirming to JIS C0041, Acceleration: 147m/s ² , Time: 11ms, 3 times each in X, Y, Z directions				
Noise durability	1000Vpp with noise generator; (1μs noise amplitude at 30 to 100Hz noise frequency)				
Dielectric withstand voltage	500V AC for 1min (between all terminals and ground)				
Insulation resistance	Min. 5MΩ at 500V DC (between all terminals and ground)				
Ground	Class 3 (R _E ≤ 100Ω)				
Environment	Avoid environments containing corrosive gases, install in a dust-free location.				

2.2 Performance Specifications

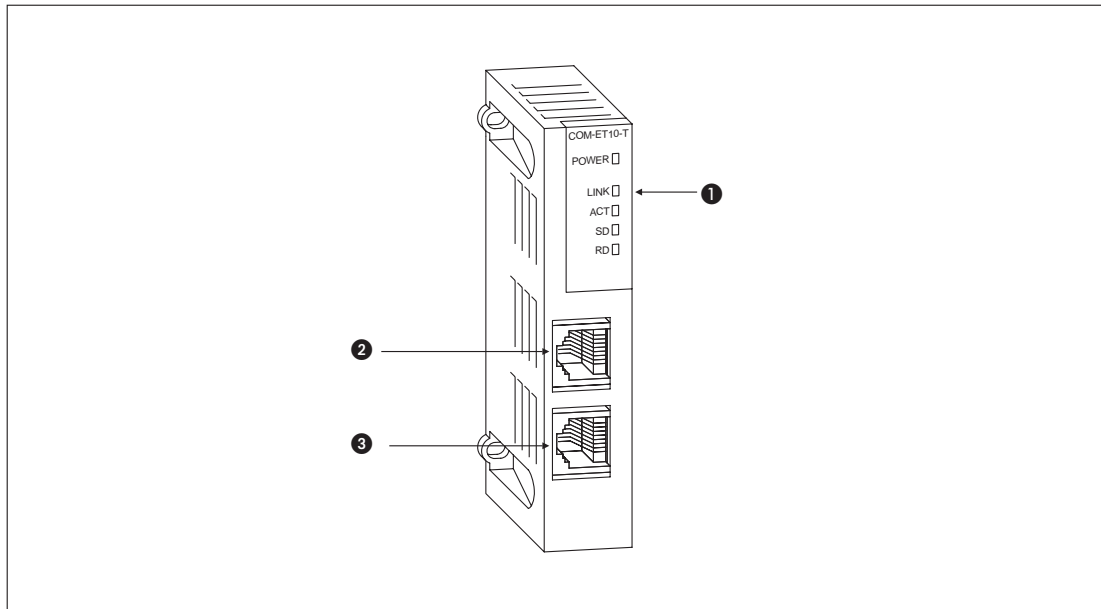
Item	COM-ET10-T	
Cable type	10BASE-T	
Connector	RJ45 (8-pin)	
Transmission specification	Max. transfer rate	10Mbit/s
	Max. segment length	100m
	Communication protocol	TCP/IP, UDP, TFTP
Number of simultaneously open connections allowed	2 (Connections usable by the sequence program)	
Internal current consumption (5V DC)	100 mA (from base unit)	
Dimensions (W × H × D)	19.1 × 90 × 74mm	
Weight	0.10kg	

2.3 Dimensions



3 Components of the COM-ET10-T Module

3.1 Overview



Number	Description
①	LED display
②	RJ45 LAN port (port 1) (Used to connect with equipment via Ethernet.)
③	RJ45 LAN port (For further expansions)

3.2 LED Indicators

LED	Description
POWER	On when 5V DC power is being supplied from main unit
LINK	On when network cable is connected to a hub or PC
ACT	On when receiving or sending LAN data
SD	On when sending data to main PLC unit
RD	On when receiving data from main PLC unit

NOTE

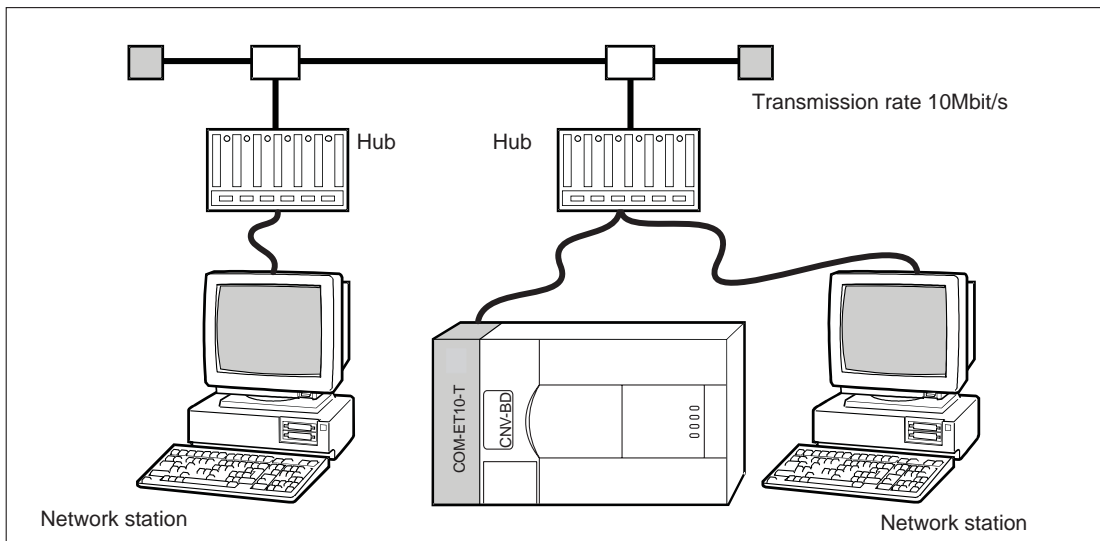
During initialisation (after a reset) the SD and RD LED indicators will both light up for around 3 seconds.

3.3 Network Components

The following components are required to set up a network using 10BASE-T media:

Item	Description
Twisted pair cable	Compatible to Ethernet standard, category 3 (4, 5)
Connector	Compatible to Ethernet standard (RJ45)
Hub	Product for 10BASE-T, compatible to Ethernet standard

Example of a network configuration with 10BASE-T and an FX2N controller:



4 Procedures before Operation

Precautions



CAUTION:

Do not route the network cables close to mains power or high-voltage lines or any other lines carrying load voltages. Network cables should be routed at least 100mm from such lines. Failure to observe this requirement can cause interference and malfunctions.

Completely disconnect the PLC power supply (all poles) before connecting an Ethernet line. Failure to observe this requirement can cause malfunctions or physical damage to the hardware.

Take great care to make sure that no conductive foreign bodies enter the casings of the modules. Such foreign bodies can cause fire, malfunctions and disruption of communications.

Make sure that the torques of the module retaining screws are in the following ranges:

Screw	Torque Range
Communications module retaining screws (M4)	0.7–1.0Nm
CNV-BD communications adapter retaining screws (M3)	0.3 to 0.6Nm

4.1 Procedures

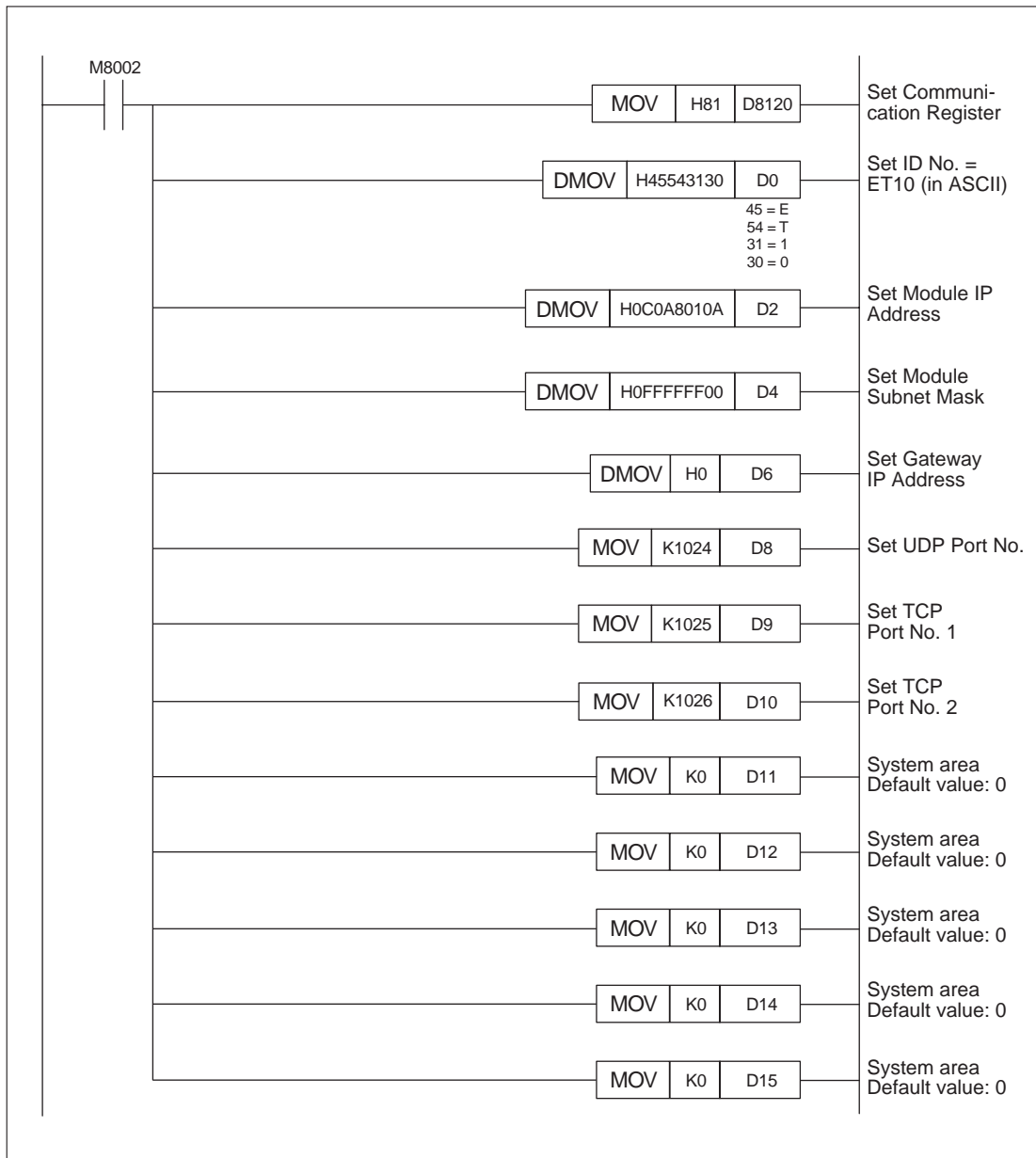
- ① Install the COM-ET10-T module on the left side of the FX controller. If you are using an FX1S, FX1N or FX2N controller make sure that the correct communications adapter (FX1N-CNV-BD or FX2N-CNV-BD) is installed.
- ② Make a connection between either the module and the personal computer via cross-over cable or between the personal computer and the hub and the module and the hub via patch cable, respectively.
- ③ Configure the module parameters with a PLC program. The parameters are stored in data registers. You can use any thousand range within the data register area, beginning with D0, D1000, D2000 and so on.
- ④ You need virtual COM port software installed on your PC to use the system. Make sure that the software is installed.
- ⑤ Once everything is in place check whether data can be transmitted and received correctly.

5 Programming

5.1 Program example for a connection establishment between PLC and PC

Ethernet Initialisation Parameter

Item	File register	Value	Item	File register	Value
PLC IP Address	D2	192.168.001.010	System area	D11	0
Subnet Mask	D4	255.255.255.000		D12	0
Gateway IP	D6	000.000.000.000		D13	0
UDP Port	D8	1024		D14	0
TCP Port 1	D9	1025		D15	0
TCP Port 2	D10	1026			



A Appendix

A.1 File Registers

Example of file register assignments starting with D0:

File register	Item	Value
D0	Module code	69 84 49 48 (fixed for COM-ET10-T)
D2	IP address	192.168.001.010
D4	Subnet mask	255.255.255.000
D6	Gateway IP	000.000.000.000
D8	UDP port number	1024
D9	TCP port number 1	1025
D10	TCP port number 2	1026
D11	System area	0 (default setting)
D12		
D13		
D14		
D15		

HEADQUARTERS		EUROPEAN REPRESENTATIVES		EUROPEAN REPRESENTATIVES		AFRICAN REPRESENTATIVE	
MITSUBISHI ELECTRIC EUROPE B.V. German Branch Gothaer Straße 8 D-40880 Ratingen Phone: +49 (0) 21 02 / 486-0 Fax: +49 (0) 21 02 / 4 86-11 20 E-mail: megfamail@meg.mee.com	EUROPE	TELECON CO. 4, A. Ljapchev Blvd. BG-1756 Sofia Phone: +359 (0) 2 / 97 44 05 8 Fax: +359 (0) 2 / 97 44 06 1	BULGARIA	INTEHSIS SRL Cuza-Voda 36/1-81 MD-2061 Chisinau Phone: +373 (0)2 / 562 263 Fax: +373 (0)2 / 562 263 E-mail: intehsis@mdl.net	MOLDOVA	CBI Ltd Private Bag 2016 ZA-1600 Isando Phone: +27 (0) 11 / 928 2000 Fax: +27 (0) 11 / 392 2354 E-mail: cbi@cbi.co.za	SOUTH AFRICA
MITSUBISHI ELECTRIC EUROPE B.V. French Branch 25, Boulevard des Bouvets F-92741 Nanterre Cedex Phone: +33 1 55 68 55 68 Fax: +33 1 55 68 56 85 E-mail: factory.automation@framee.com	FRANCE	INEA CR d.o.o. Drvinje 63 HR-10000 Zagreb Phone: +385 (0) 1 / 36 67 140 Fax: +385 (0) 1 / 36 67 140	CROATIA	Getronics b.v. Control Systems Donauweg 2 B NL-1043 AJ Amsterdam Phone: +31 (0) 20 / 587 67 00 Fax: +31 (0) 20 / 587 68 39 E-mail: info.gia@getronics.com	NETHERLANDS	MIDDLE EAST REPRESENTATIVES	
MITSUBISHI ELECTRIC EUROPE B.V. UK Branch Travellers Lane GB-Hatfield Herts. AL10 8 XB Phone: +44 (0) 1707 / 27 61 00 Fax: +44 (0) 1707 / 27 86 95	UK	AutoCont Control Systems s.r.o. Nemocnicni 12 CZ-702 00 Ostrava 2 Phone: +420 59 / 6152 111 Fax: +420 59 / 6152 562 E-mail: consys@autocont.cz	CZECH REPUBLIC	Beijer Electronics AS Teglverksveien 1 N-3002 Drammen Phone: +47 (0) 32 / 24 30 00 Fax: +47 (0) 32 / 84 85 77 E-mail: info@beijer.no	NORWAY	ILAN & GAVISH LTD Automation Service 24 Shenkar St., Kiryat Arie IL-49001 Petah-Tiqva Phone: +972 (0) 3 / 922 18 24 Fax: +972 (0) 3 / 924 07 61 E-mail: iandg@internet-zahav.net	ISRAEL
MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch Via Paracelso 12 I-20041 Agrate Brianza (MI) Phone: +39 039 6053 1 Fax: +39 039 6053 312 E-mail: factory.automation@it.mee.com	ITALY	louis poulsen industri & automation Geminivej 32 DK-2670 Greve Phone: +45 (0) 43 / 95 95 95 Fax: +45 (0) 43 / 95 95 91 E-mail: lpia@lpmail.com	DENMARK	MPL Technology Sp. z o.o. ul. Sliczna 36 PL-31-444 Kraków Phone: +48 (0) 12 / 632 28 85 Fax: +48 (0) 12 / 632 47 82 E-mail: krakow@mpl.pl	POLAND	TEXEL Electronics LTD. Box 6272 IL-42160 Netanya Phone: +972 (0) 9 / 863 08 91 Fax: +972 (0) 9 / 885 24 30 E-mail: texel_me@netvision.net.il	ISRAEL
MITSUBISHI ELECTRIC EUROPE B.V. Spanish Branch Carretera de Rubí 76-80 E-08190 Sant Cugat del Vallés Phone: +34 9 3 / 565 3131 Fax: +34 9 3 / 589 2948 E-mail: industrial@sp.mee.com	SPAIN	UTU Elektrotehnika AS Pärnu mnt.160i EE-11317 Tallinn Phone: +372 (0) 6 / 51 72 80 Fax: +372 (0) 6 / 51 72 88 E-mail: utu@utu.ee	ESTONIA	Sirius Trading & Services srl Bd. Lacul Tei nr. 1 B RO-72301 Bucuresti 2 Phone: +40 (0) 21 / 201 7147 Fax: +40 (0) 21 / 201 7148 E-mail: sirius_t_s@fx.ro	ROMANIA	EURASIAN REPRESENTATIVES	
MITSUBISHI ELECTRIC EUROPE B.V. Japanese Branch Office Tower "Z" 14 F 8-12,1 chome, Harumi Chuo-Ku Tokyo 104-6212 Phone: +81 3 6221 6060 Fax: +81 3 6221 6075	JAPAN	Beijer Electronics OY Ansatie 6a FIN-01740 Vantaa Phone: +358 (0) 9 / 886 77 500 Fax: +358 (0) 9 / 886 77 555 E-mail: info@beijer.fi	FINLAND	ACP Autocomp a.s. Chalupkova 7 SK-81109 Bratislava Phone: +421 (02) / 5292-22 54, 55 Fax: +421 (02) / 5292-22 48 E-mail: info@acp-autocomp.sk	SLOVAKIA	Avtomatika Sever Ltd. Lva Tolstogo St. 7, Off. 311 RU-197376 St Petersburg Phone: +7 812 / 11 83 238 Fax: +7 812 / 11 83 239 E-mail: as@avtsev.spb.ru	RUSSIA
MITSUBISHI ELECTRIC CORPORATION Office Tower "Z" 14 F 8-12,1 chome, Harumi Chuo-Ku Tokyo 104-6212 Phone: +81 3 6221 6060 Fax: +81 3 6221 6075	JAPAN	PROVENDOR OY Teljänkatu 8 A 3 FIN-28130 Pori Phone: +358 (0) 2 / 522 3300 Fax: +358 (0) 2 / 522 3322	FINLAND	INEA d.o.o. Stegne 11 SI-1000 Ljubljana Phone: +386 (0) 1-513 8100 Fax: +386 (0) 1-513 8170 E-mail: inea@inea.si	SLOVENIA	CONSYS Promyshlennaya St. 42 RU-198099 St Petersburg Phone: +7 812 / 325 36 53 Fax: +7 812 / 325 36 53 E-mail: consys@consys.spb.ru	RUSSIA
MITSUBISHI ELECTRIC AUTOMATION 500 Corporate Woods Parkway Vernon Hills, IL 60061 Phone: +1 847 / 478 21 00 Fax: +1 847 / 478 22 83	USA	UTEKO A.B.E.E. 5, Mavrogenous Str. GR-18542 Piraeus Phone: +302 (0) 10 / 42 10 050 Fax: +302 (0) 10 / 42 12 033 E-mail: uteco@uteco.gr	GREECE	Beijer Electronics AB Box 426 S-20124 Malmö Phone: +46 (0) 40 / 35 86 00 Fax: +46 (0) 40 / 35 86 02 E-mail: info@beijer.se	SWEDEN	ELEKTROSTYLE ul. Garschina 11 RU-140070 Moscow Oblast Phone: +7 095 / 557 9756 Fax: +7 095 / 746 8880 E-mail: mjuly@elektrostyle.ru	RUSSIA
EUROPEAN REPRESENTATIVES		Meltrade Automatika Kft. 55, Harmat St. HU-1105 Budapest Phone: +36 (0)1 / 2605 602 Fax: +36 (0)1 / 2605 602 E-mail: office@meltrade.hu	HUNGARY	ECONOTEC AG Postfach 282 CH-8309 Nürensdorf Phone: +41 (0) 1 / 838 48 11 Fax: +41 (0) 1 / 838 48 12 E-mail: info@econotec.ch	SWITZERLAND	ICOS Industrial Computer Systems Zoo Ryazanskij Prospekt 8a, Office 100 RU-109428 Moscow Phone: +7 095 / 232 - 0207 Fax: +7 095 / 232 - 0327 E-mail: mail@icos.ru	RUSSIA
GEVA Wiener Straße 89 A-2500 Baden Phone: +43 (0) 2252 / 85 55 20 Fax: +43 (0) 2252 / 488 60 E-mail: office@geva.at	AUSTRIA	MITSUBISHI ELECTRIC EUROPE B.V. - Irish Branch Westgate Business Park IRL-Dublin 24 Phone: +353 (0) 1 / 419 88 00 Fax: +353 (0) 1 / 419 88 90 E-mail: sales.info@meir.mee.com	IRELAND	GTS Darülaceze Cad. No. 43 KAT: 2 TR-80270 Okmeydani-Istanbul Phone: +90 (0) 212 / 320 1640 Fax: +90 (0) 212 / 320 1649 E-mail: gts@turk.net	TURKEY	NPP Uralelektra ul. Sverdlowa 11a RU-620027 Ekaterinburg Phone: +7 34 32 / 53 27 45 Fax: +7 34 32 / 53 27 45 E-mail: elektra@etel.ru	RUSSIA
TEHNIKON Oktjabrskaya 16/5, Ap 704 BY-220030 Minsk Phone: +375 (0) 17 / 22 75 704 Fax: +375 (0) 17 / 22 76 669 E-mail: tehnikon@belsonet.net	BELARUS	SIA POWEL Lienes iela 28 LV-1009 Riga Phone: +371 784 / 22 80 Fax: +371 784 / 22 81 E-mail: utu@utu.lv	LATVIA	CSC Automation Ltd. 15, M. Raskova St., Fl. 10, Office 1010 UA-02002 Kiev Phone: +380 (0) 44 / 238-83-16 Fax: +380 (0) 44 / 238-83-17 E-mail: csc-a@csc-a.kiev.ua	UKRAINE	STC Drive Technique Poslannikov Per. 9, str.1 RU-107005 Moscow Phone: +7 095 / 786 21 00 Fax: +7 095 / 786 21 01 E-mail: info@privod.ru	RUSSIA
Getronics b.v. Control Systems Pontbeeklaan 43 B-1731 Asse-Zellik Phone: +32 (0) 2 / 467 17 51 Fax: +32 (0) 2 / 467 17 45 E-mail: infoautomation@getronics.com	BELGIUM	UAB UTU POWEL Savanoriu pr. 187 LT-2053 Vilnius Phone: +370 (0) 52323-101 Fax: +370 (0) 52322-980 E-mail: powel@utu.lt	LITHUANIA				