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CC-Link IE Field Network Basic Compatible Products

CC-Link IE

CC-Link IE Broadcast

Easier network integration

Mitsubishi Electric is launching CC-Link IE Field Network Basic compatible products to further leverage networking on the production floor. With recent trends of IoT*1, network connection of devices and equipment for small-scale systems are becoming more mainstream. CC-Link IE Field Network Basic realizes easier network integration, as its cyclic communications stack is software-based, without requiring a dedicated ASIC helping to reduce implementation costs for device partners.

Plant-wide seamless communication

Utilizing standard Ethernet technology, TCP/IP protocol stack for communications (such as HTTP, FTP) is supported. Based on SLMP*2, data flows transparently between the sensor level and the enterprise level across multiple industry-standard automation networks. Seamless communication can be easily realized with CC-Link IE Field Network Basic, further improving performance of the manufacturing enterprise.

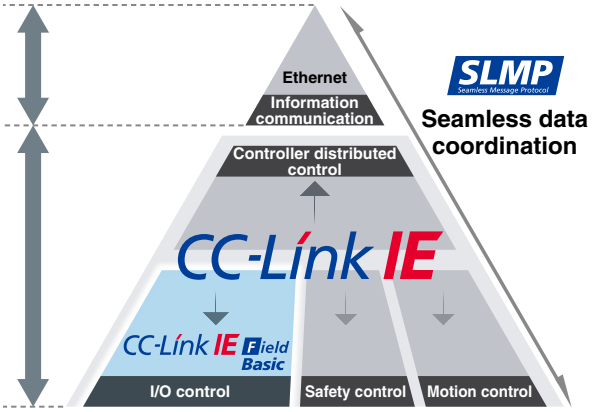
Highlights

- Small-scale network system configuration
- Simple setup and easy troubleshooting
- Combining with TCP/IP communications
- Wider range of connectable products

*1. Internet of Things
*2. SeamLess Message Protocol

Positioning within CC-Link IE Network

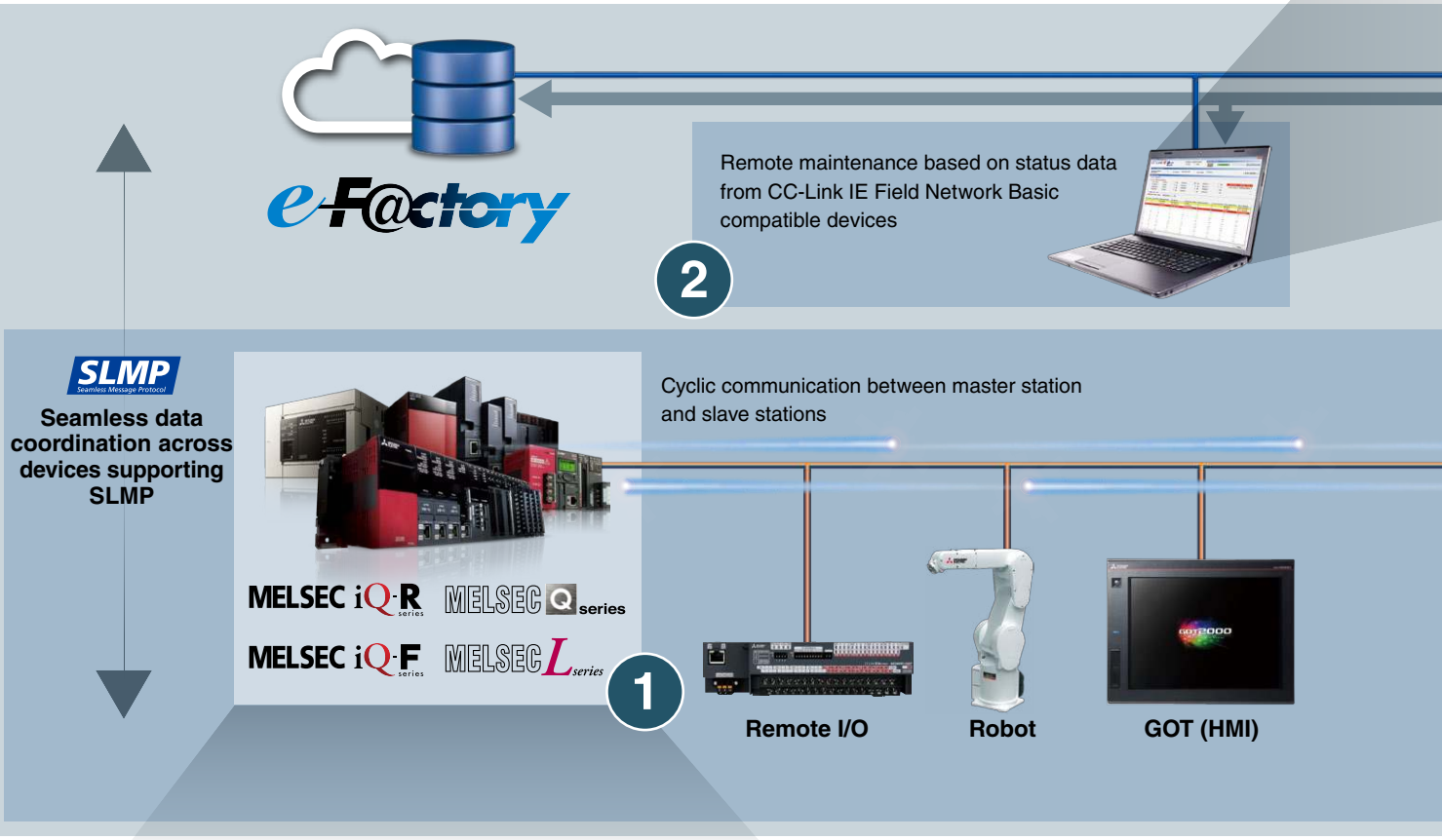
The Ethernet-based open network CC-Link IE is a high-speed and large-capacity network integrating distributed control, I/O control, safety control, and motion control. CC-Link IE Field Network Basic, which is a part of CC-Link IE, realizes easier connection of Ethernet devices. Transparent communications are achieved by utilizing SLMP that enables seamless connectivity within all levels of manufacturing.



Supporting Ethernet protocol stack realizing highly-flexible system

The protocol for CC-Link IE Field Network Basic is software-based (not requiring ASIC), realizing a wider range of compatible products. The network operates on the standard Ethernet protocol stack, which can be used together with TCP/IP communications. This feature allows CC-Link IE Field Network Basic compatible products and Ethernet compatible products to be connected on the same Ethernet communications line, enabling a highly-flexible and low cost system.

<table>
<tr><th></th><th colspan="5">Network</th></tr>
<tr><td rowspan="2">Application software</td><td rowspan="2">HTTP/
FTP
etc.</td><td colspan="4">User application
(Cyclic communication/transient communication/SLMP)</td></tr>
<tr><td>CC-Link IE Field Basic</td><td rowspan="3">CC-Link IE Field</td><td rowspan="3">CC-Link IE Control</td><td rowspan="3">CC-Link</td></tr>
<tr><td rowspan="2">Protocol stack</td><td colspan="2">TCP/UDP</td></tr>
<tr><td colspan="2">IP</td></tr>
<tr><td>Communication driver</td><td colspan="3">Ethernet</td><td>EIA-485</td></tr>
</table>



*For further details regarding this product, please directly contact 'CKD Corporation', details can be found on their website at **http://www.ckd.co.jp/english/glblinfo/global/**

Note: Some images are for illustrative purposes only.

Network module is no longer necessary, saving on space and hardware cost

❶ Small-scale network system configuration

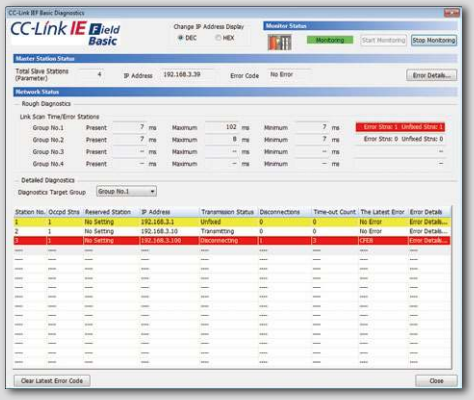
MELSEC programmable controller CPUs with an embedded Ethernet port can be used as a master station, eliminating the need for an additional network module. The network can be configured with a minimum number of modules reducing space and hardware cost.

❷ Simple setup and easy troubleshooting

Cyclic communications can be easily done just by registering parameters without requiring dedicated programs. Settings such as IP address can be easily done by automatically detecting slave devices using either the GX Works3 or GX Works 2 engineering tool. Maintenance is easier by being able to monitor the operating and communication statuses of nodes connected on the network.

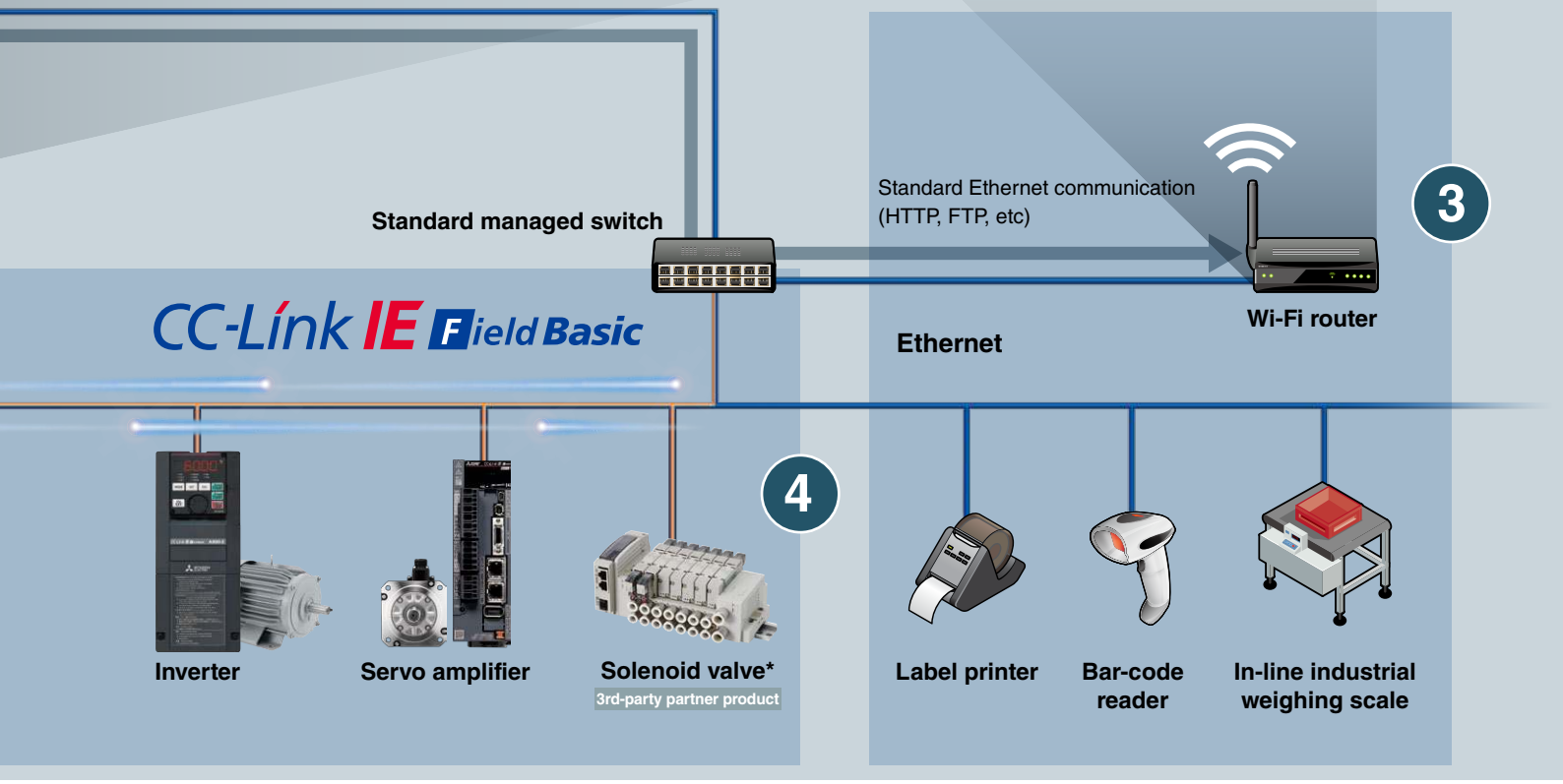
❸ Combining with TCP/IP communications

By enabling cyclic communication control on standard Ethernet, parameter setting and status monitoring can be done with peripheral devices (such as an enterprise level or tablet computer) connected via TCP/IP communications. Systems requiring several manufacturing line devices can be realized by connecting Ethernet compatible devices such as a label printer, bar-code reader, and weighing scale.



Diagnosis screen

Parameter setting and status monitoring using an embedded WEB server node.



❹ Wider range of connectable products

CC-Link IE Field Network Basic realizes cyclic communication with software implementation only. System can be easily configured using a standard managed switch and cables at a lower cost. Supported-products can be easily developed and a wider range of CC-Link IE Field Network Basic-supported devices can be readily available.

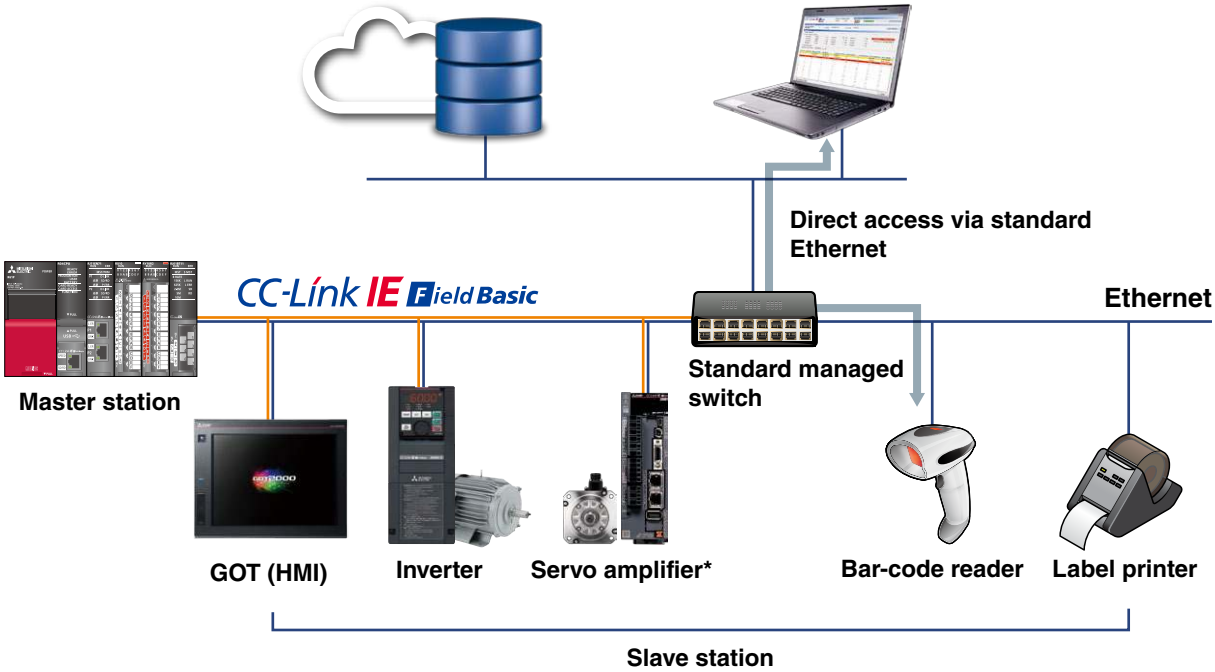
Solar panel production process

Easy data transmission to IT system

Traceability data can be sent to enterprise level devices directly from slave devices other than master station

Easy connection with IT sytem

Direct access to slave devices from enterprise level devices



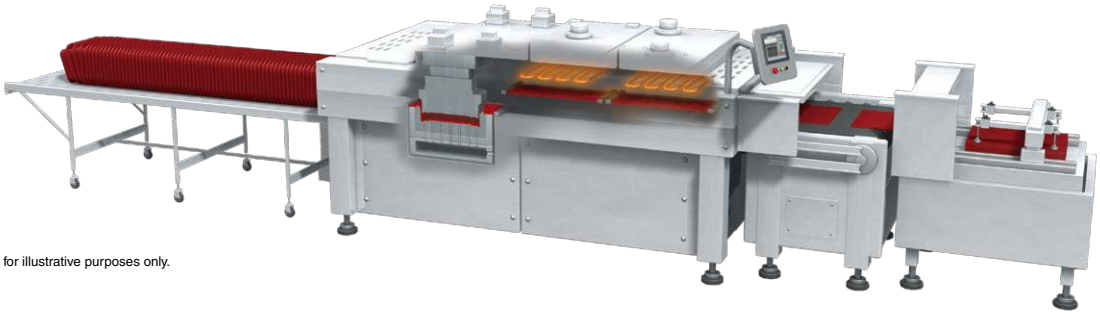


*Image is for illustrative purposes only.

CC-Link IE Field Network Basic embedded CPU modules

- CPU module with CC-Link IE Field Network Basic embedded
- The Ethernet port enables the module to operate as an Ethernet or CC-Link IE Field Network master station

MELSEC iQ-R Series
R□□CPU
R□□ENCPU

64 slave stations can be connected per network

R32CPU

MELSEC iQ-F Series
FX5U-□□□□/□□□
FX5UC-□□□□/□□□

6 slave stations can be connected per network

FX5U-32MR

MELSEC-Q Series
Q□□UDVCPU

64 slave stations can be connected per network

Q03UDVCPU

MELSEC-L Series
L□□CPU(-P/-BT/-PBT)

16 slave stations can be connected per network

L02CPU

CC-Link IE Field Network Basic performance specifications

Item		MELSEC iQ-R Series	MELSEC-Q Series	MELSEC-L Series	MELSEC iQ-F Series
		R□CPU R□ENCPU	Q□UDVCPU	L□CPU	FX5U FX5UC
Communication speed		100 Mbps			
Maximum stations per network*1		64 stations (16 stations × 4 groups)		16 stations	6 stations
Connection cable		Ethernet standard compatible cable, Category 5e or higher (STP cable)			
Maximum station-to-station distance		100 m (between a hub and node)*2			
Network topology		Star type			
Communication method		UDP			
Maximum link points per network*3					
RX		4096 points		1024 points	384 points
RY		4096 points		1024 points	384 points
RWr		2048 points		512 points	192 points
RWw		2048 points		512 points	192 points
Maximum link points per station*3					
Master station	RX	4096 points		1024 points	384 points
	RY	4096 points		1024 points	384 points
	RWr	2048 points		512 points	192 points
	RWw	2048 points		512 points	192 points
Slave station*4	RX	64 points; up to 256 points can be allocated according to the number of stations			
	RY	64 points; up to 256 points can be allocated according to the number of stations			
	RWr	32 points; up to 128 points can be allocated according to the number of stations			
	RWw	32 points; up to 128 points can be allocated according to the number of stations			

*1. Maximum number of slave stations controlled by the master station, depending on the number of allocated slave stations. The total number of allocated stations should not exceed the maximum number of slave stations.
*2. The maximum distance between stations depends on the actual hub used. Please refer to the hub manufacturer's specifications.
*3. Remote input RX: Bit data input from a slave station to the master station
Remote output RY: Bit data output from the master station to a slave station
Remote register RWr: 16-bit (word) unit data output from the master station to a slave station
Remote register RWw: 16-bit (word) unit data output from the master station to a slave station
*4. Number of link points allocated by the master station.

CC-Link IE Field Network Basic compatible inverter

Inverter FREQROL-A800/F800/E700 Series

FR-A800-E FR-F800-E FR-E700-NE NEW

- CC-Link IE Field Network Basic function embedded
- CC-Link IE Field Network Basic realizes various inverter operations to be monitored at a fast rate (multiple monitoring and parameter reading/writing can also be executed simultaneously improving maintainability)
- Seamless network environment enables monitoring and setup of inverters from the IT system
- Standard Ethernet is supported without installing a plug-in option, realizing a low cost system easily

FR-A800-E

CC-Link IE Field Network Basic compatible servo

AC Servo MELSERVO-JE Series

MR-JE-C

- CC-Link IE Field Network Basic function embedded
- Supports CiA402 drive profile
  Profile position mode: pp
  Profile velocity mode: pv
  Profile torque mode: tq
  Homing mode: hm
- Pulse train command/analog voltage command are available

MR-JE-□C

CC-Link IE Field Network Basic compatible GOT (HMI)

HMI GOT2000 Series

GT27□□-□□□□ GT25□□□-□□□□ GT210□-□□BD

- Cyclic communication is possible with CC-Link IE Field Network Basic compatible devices via Ethernet interface of GOT (HMI)
- TCP/IP communications are supported, enabling a highly-flexible system

FA sensor MELSENSOR

Laser displacement sensor

MH11CTMF-□□□

- CC-Link IE Field Network Basic interface is included, enabling connection without adding a network interface module to a PLC
- Measured value, amount of incoming light, judgment output data can be collected via network

MH11CTMF-N

CC-Link IE Field Network Basic Block type remote modules

- CC-Link IE Field Network Basic slave station. These modules are useful when installation positions close to I/O devices are required
- Supports CC-Link IE Field Network Basic diagnostic function. Network error and I/O module fault can be checked using the engineering software
- Enables CC-Link parameters to be set with simple switch operations

Input modules

Screw terminal block

NZ2MFB1-32D NEW

NZ2MFB1-32D

Model	Input type DC input	Input points	Rated input voltage/current	Wiring type
NZ2MFB1-32D	Positive common / Negative common	32 points	24 V DC (6 mA)	1-wire

NZ2MFB2-16A NEW

Model	Input type	Input points	Rated input voltage, frequency	Rated input current	Wiring type
NZ2MFB2-16A	AC input	16 points	100...120 V AC	8.2 mA (100 V AC, 60 Hz) 6.8 mA (100 V AC, 50 Hz)	2-wire

Output modules

Screw terminal block

NZ2MFB1-32T NEW
NZ2MFB1-32TE1 NEW

NZ2MFB1-32T

Model	Output type Transistor output	Output points	Rated load voltage/ Max. load current	Wiring type
NZ2MFB1-32T	Sink type	32 points	12/24 V DC (0.5 A)	1-wire
NZ2MFB1-32TE1	Source type	32 points	12/24 V DC (0.1 A)	1-wire

NZ2MFB2-16R NEW

Model	Output type	Output points	Rated load voltage/ Max. load current	Wiring type
NZ2MFB2-16R	Contact output	16 points	24 V DC (2 A) / 240 V AC (2 A)	2-wire

I/O combined modules

Screw terminal block

NZ2MFB1-32DT NEW
NZ2MFB1-32DTE1 NEW

NZ2MFB1-32DT

Model	Input type DC input	Input points	Rated input voltage/ current	Output type Transistor output	Output points	Rated load voltage/ Max. load current	Wiring type
NZ2MFB1-32DT	Positive common	16 points	24 V DC (6 mA)	Sink type	16 points	24 V DC (0.5 A)	1-wire
NZ2MFB1-32DTE1	Negative common	16 points	24 V DC (6 mA)	Source type	16 points	24 V DC (0.1 A)	1-wire

CC-Link IE Field Network Basic compatible products

Type	Model	Outline
CC-Link IE Field Network Basic embedded CPU modules		
R□□CPU		MELSEC iQ-R Series CPU module master station
R□□ENCPU		MELSEC iQ-R Series CC-Link IE embedded CPU module master station
Q□□UDVCPU		MELSEC-Q Series High-speed Universal model QCPU module master station
L□□CPU (-P/-BT/-PBT)		MELSEC-L Series CPU module master station
FX5U-□□□□/□□□		MELSEC iQ-F Series FX5U CPU module master station
FX5UC-□□□□/□□□		MELSEC iQ-F Series FX5UC CPU module master station
Inverters		
FR-A800-E		FREQROL-A800 Series Inverter slave station
FR-F800-E		FREQROL-F800 Series Inverter slave station
FR-E700-NE NEW		FREQROL-E700 Series Inverter slave station
AC servos		
MR-JE-C		MELSERVO-JE Series Servo slave station
HMI GOT2000 Series		
GT27□□-□□□□		GT27 model slave station
GT25□□□-□□□□		GT25 model slave station
GT210□-□□BD		GT21 model slave station
FA sensor MELSENSOR		
MH11CTMF-□□□		Laser displacement sensor MH11 controller slave station
Block type remote modules		
DC input	NZ2MFB1-32D NEW	32 points, 24 V DC, response time 0…70 ms, positive/negative common shared, screw terminal block, 1-wire
AC input	NZ2MFB2-16A NEW	16 points, 100…120 V AC, 50/60 Hz, screw terminal block, 2-wire
Transistor output	NZ2MFB1-32T NEW	32 points, 12/24 V DC (0.5 A), sink type, screw terminal block, 1-wire
	NZ2MFB1-32TE1 NEW	32 points, 12/24 V DC (0.1 A), source type, screw terminal block, 1-wire
Contact output	NZ2MFB2-16R NEW	16 points, 24 V DC/240 V AC (2 A), screw terminal block, 2-wire
I/O combined	NZ2MFB1-32DT NEW	Input 16 points, 24 V DC, response time 0…70 ms, positive common Output 16 points, 24 V DC (0.5 A), sink type screw terminal block, 1-wire
	NZ2MFB1-32DTE1 NEW	Input 16 points, 24 V DC, response time 0…70 ms, negative common Output 16 points, 24 V DC (0.1 A), source type screw terminal block, 1-wire

Third-party partner product

Company	Type	Series	Specifications
CKD Corporation	Solenoid valve Future support	4G/W4G Series	Power consumption: 0.35 W, NPN/PNP: 16 points/32 points Protective structure: 4G (IP40), W4G (IP65)

Country/Region Sales Office

USA ····· +1-847-478-2100
Mexico ····· +52-55-3067-7500
Brazil····· +55-11-4689-3000
Germany····· +49-2102-486-0
UK····· +44-1707-28-8780
Ireland····· +353-1-4198800
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South Africa ····· +27-11-658-8100
China ····· +86-21-2322-3030
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Korea ····· +82-2-3660-9530
Singapore ····· +65-6473-2308
Thailand····· +66-2682-6522
Vietnam ····· +84-4-3937-8075
Indonesia····· +62-21-3192-6461
India····· +91-20-2710-2000
Australia····· +61-2-9684-7777

⚠ For safe use

• To use the products listed in this publication properly, always read the relevant manuals before use.

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

www.MitsubishiElectric.com

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