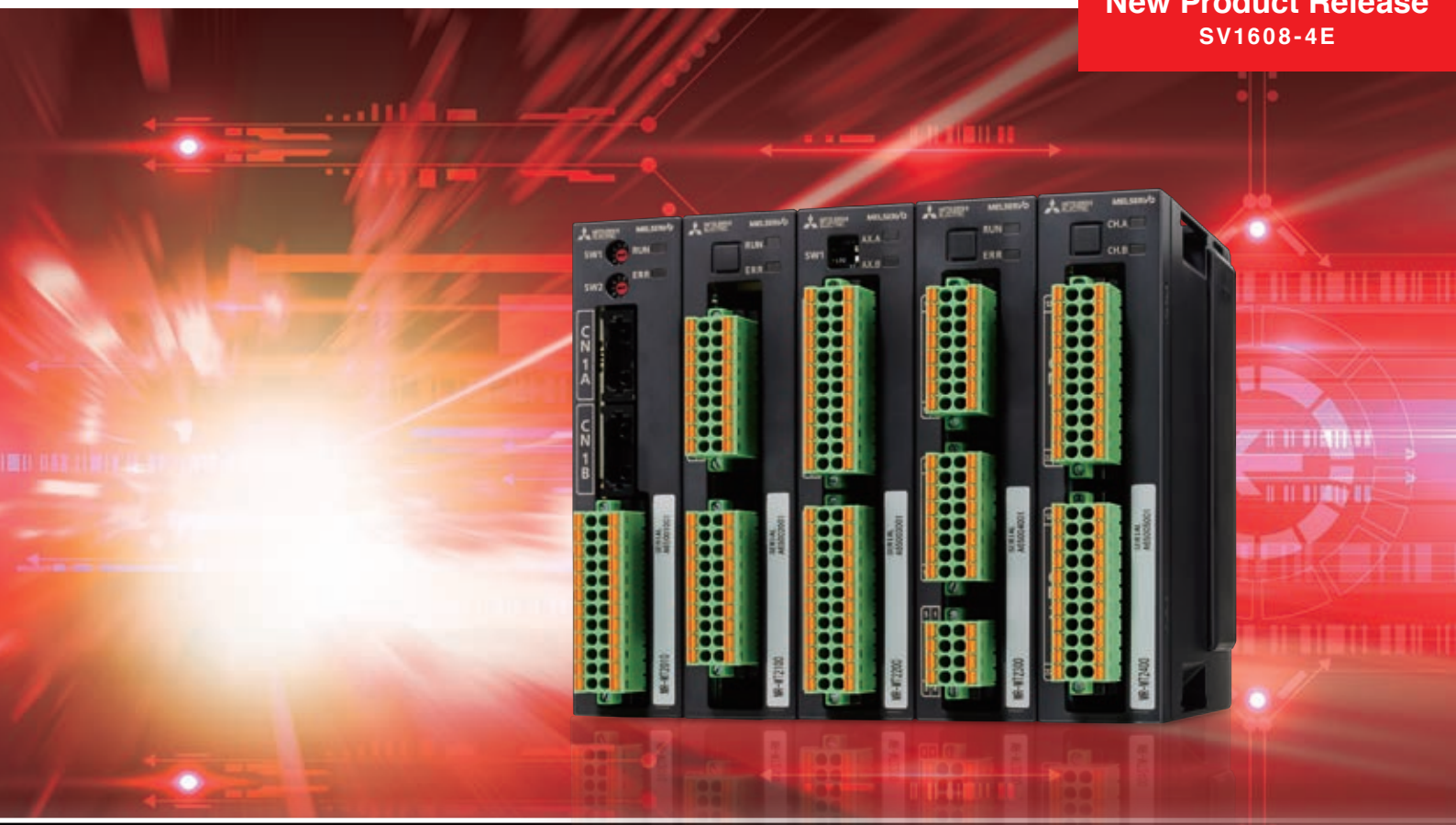
for a greener tomorrow

MITSUBISHI ELECTRIC
Changes for the Better

SSCNET III/H
Sensing Module MR-MT2000 Series

August 2016

New Product Release
SV1608-4E



High Speed and High Accuracy by Synchronization of I/O Signals with Motion Control

Sensing Solutions to Add Extra Value to Your Machine

- I/O with a fastest response time of 1µs
- High-accuracy analog I/O
- Pulse I/O for synchronous control
- Supporting open standard encoder I/Fs

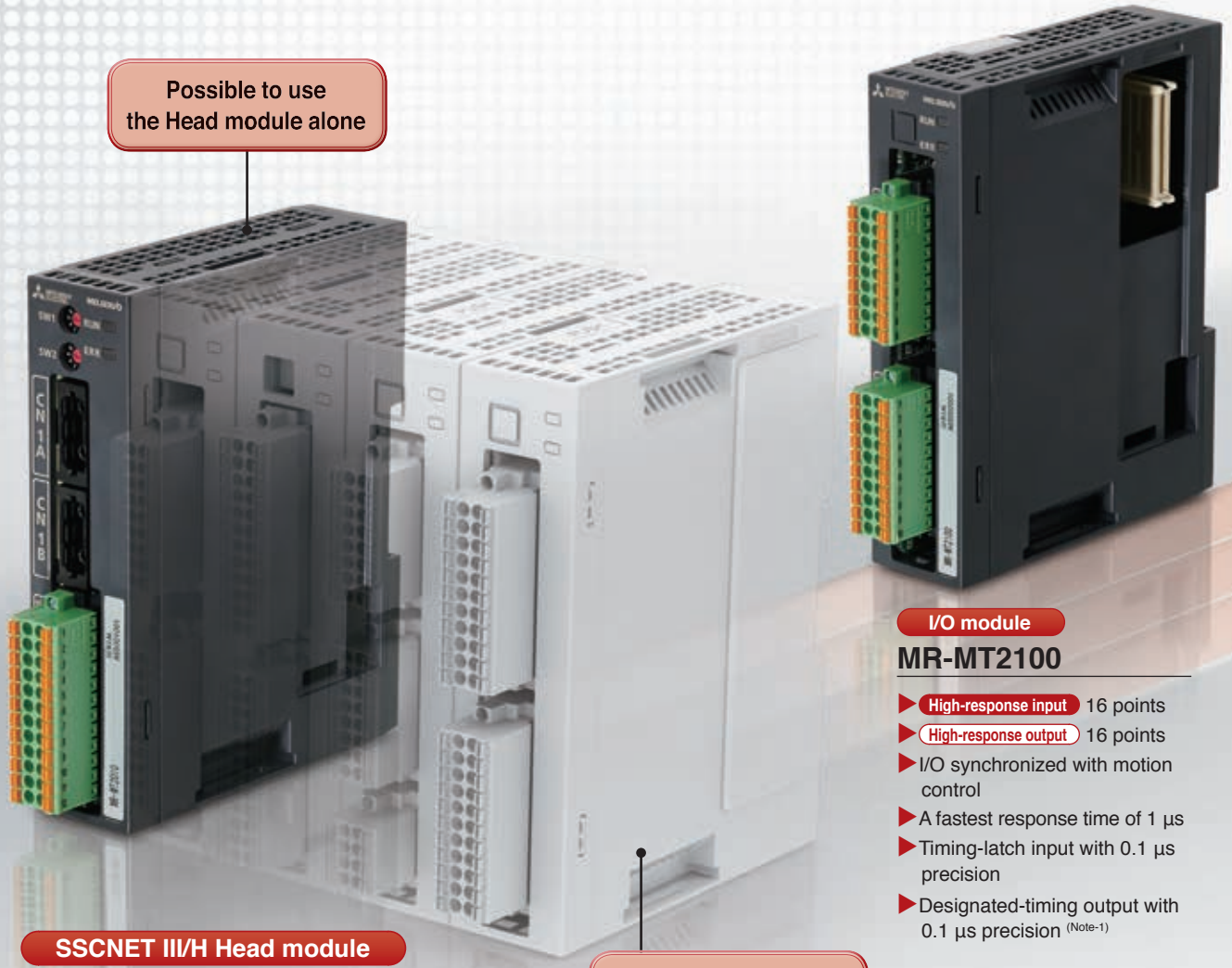
SSCNET III/H
SERVO SYSTEM CONTROLLER NETWORK

Sensing Module

MR-MT2000 Series

Increasing speed and accuracy of equipment by synchronization of the motion control cycle with I/Os, such as a general-purpose pulse train driver, sensor I/O, and shutter I/O

High-accuracy mark detection
High-accuracy shutter output



SSCNET III/H Head module

MR-MT2010

- High-response input 12 points
- High-response output 2 points
- SSCNET III/H connection
- I/O synchronized with motion control
- Response time of 1 µs
- Timing-latch input with 0.1 µs precision
- Designated-timing output with 0.1 µs precision (Note-1)

I/O module

MR-MT2100

- High-response input 16 points
- High-response output 16 points
- I/O synchronized with motion control
- A fastest response time of 1 µs
- Timing-latch input with 0.1 µs precision
- Designated-timing output with 0.1 µs precision (Note-1)

(Note-1): Will be available in the future

Production line - Machine synchronization
General-purpose pulse train drive

Pulse I/O module

MR-MT2200

- I/O 2CH (selectable)
- Pulse command output
- General-purpose pulse input
- Pulse-coincidence output

High-accuracy acceleration detection
High-accuracy load control

Analog I/O module

MR-MT2300

- Input 4CH
- Output 4CH
- High-resolution I/O 16 bit
- Voltage range switching function

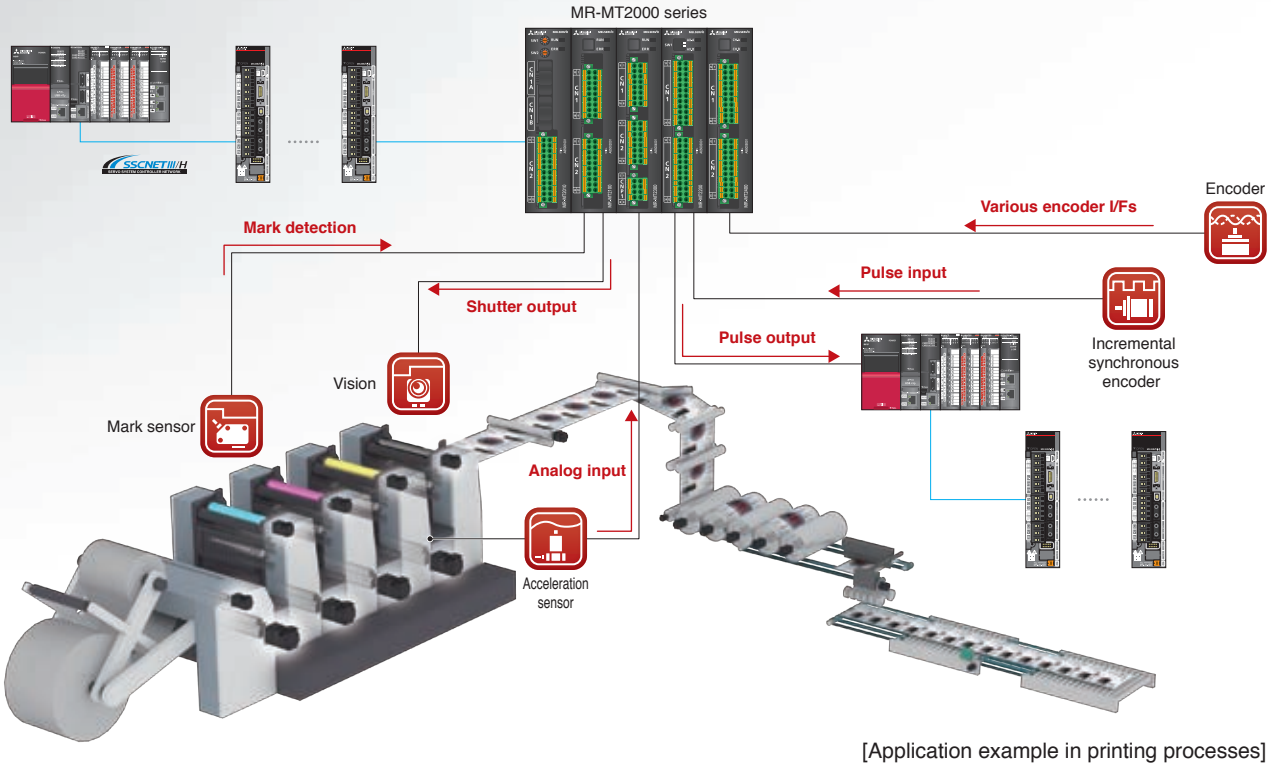
Supporting various encoder I/Fs
Fully closed loop control

Encoder I/F module(Note-3)

MR-MT2400

- Input 2CH
- SSI
- EnDat 2.2(Note-2)
- HIPERFACE DSL® (Note-2)
- Analog Sin/Cos(Note-2)
- Mitsubishi Electric serial I/F(Note-2)

(Note-2): Will be supported in the future
(Note-3): Up to two encoder I/F modules are connectable per Head module.



[Application example in printing processes]

Application examples to increase speed and accuracy

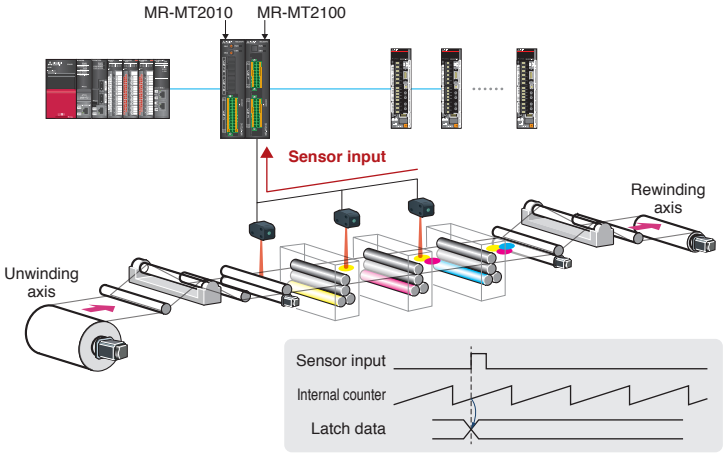
Issue: High-accuracy mark detection in high-speed movement

Solution: High-response mark detection with I/O module

The current position is inputted every 0.1 µs with the timing-latch input function.
Input and output can be synchronized with the motion control cycle even with the Head module alone.

[Modules to be used]

- Head module MR-MT2010
- I/O module MR-MT2100



Issue: High-accuracy imaging in high-speed movement

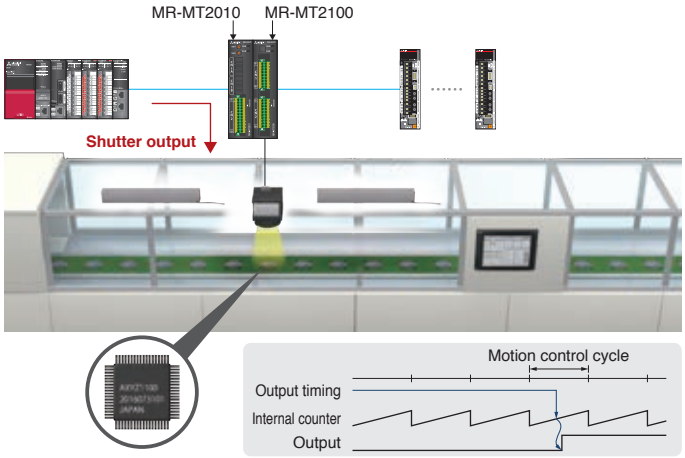
Solution: Shutter output with little variation by using I/O module

Output signals synchronized with the motion control cycle, can be outputted with the designated-timing output function(Note-1), designating timing of output with 0.1 µs precision.
The shutter output signals with 0.1 µs precision achieve the highly accurate imaging of the workpiece with little variation.
Input and output can be synchronized with the motion control cycle even with the Head module alone.

(Note-1): Will be available in the future

[Modules to be used]

- Head module MR-MT2010
- I/O module MR-MT2100



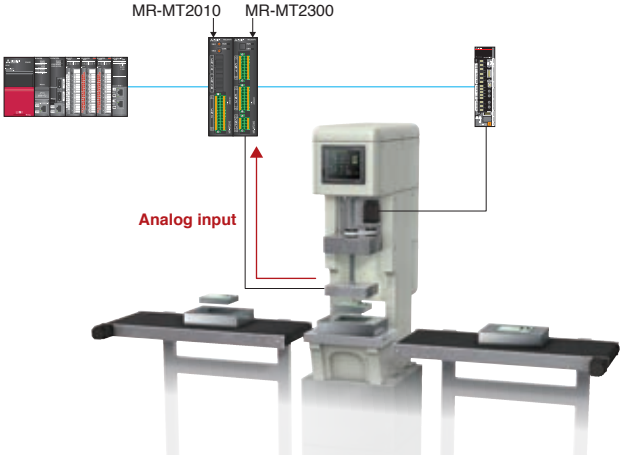
Issue: Load control by high-accuracy pressure detection

Solution: High-accuracy load control with analog I/O module

Reading pressure sensor data while synchronizing with the motion control cycle, enables I/Os with little variation and thus high-accuracy load control with a fully closed loop system.

[Modules to be used]

- Head module MR-MT2010
- Analog I/O module MR-MT2300



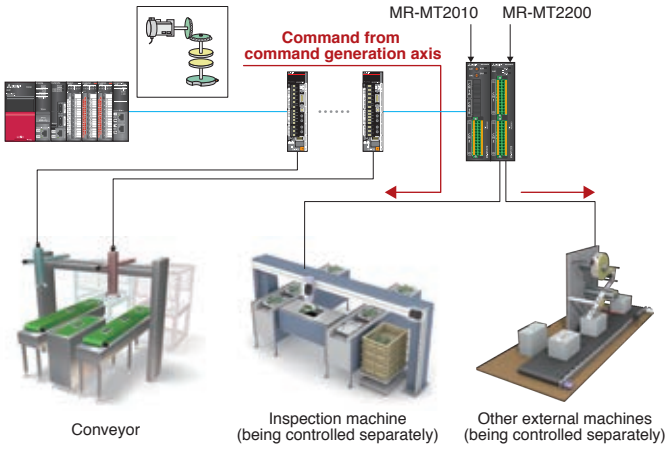
Issue Synchronization with post processes

A pulse synchronized with a command generation axis can be outputted by the current feed value of the command generation axis being transferred to a link device.
Post processes, such as an inspection machine and other external machines can be synchronized with the command generation axis even without a synchronous encoder.

[Modules to be used]

- Head module MR-MT2010
- Pulse I/O module MR-MT2200

Solution Synchronization of machines in the entire system with pulse I/O module



Issue Use of drivers not supporting SSCNET III/H

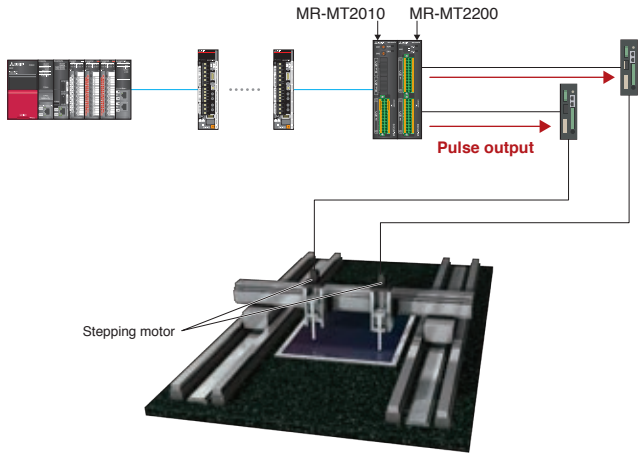
Synchronous control is possible between the general-purpose pulse train driver and the servo amplifier by SSCNET III/H connection via the SSCNET III/H Sensing modules.
(The driver is counted as a servo amplifier axis.)

(Note): MR-MT2100/2300/2400 cannot be used together with MR-MT2010/2200 when the general-purpose pulse train driver is used.

[Modules to be used]

- Head module MR-MT2010
- Pulse I/O module MR-MT2200

Solution Operating general-purpose pulse train drivers with pulse I/O module



Issue Use of open standard encoders

The encoder I/F module supports various encoder I/Fs, enabling data input of various different encoders and thus a fully closed loop system configuration.

Encoder I/Fs

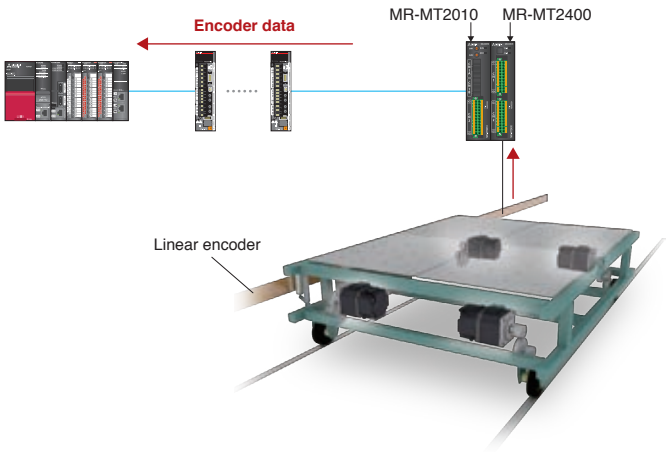
- SSI
- EnDat 2.2(Note-1)
- HIPERFACE DSL® (Note-1)
- Analog Sin/Cos(Note-1)
- Mitsubishi Electric serial I/F(Note-1)

(Note-1): Will be supported in the future

[Modules to be used]

- Head module MR-MT2010
- Encoder I/F module MR-MT2400

Solution Connecting various encoders with encoder I/F module



Specifications

Name	Item			Specification
SSCNETIII/H Head module MR-MT2010	Control circuit power supply input	Voltage		24 V DC
		Permissible voltage fluctuation		24 V DC ± 10 %
		Current capacity		1.0 A
	Communications interface			SSCNET III/H
	DI	Number of input points		12 points
		Input method		Sink input/source input (photocoupler isolation)
		Input response time		ON to OFF: within 1 μs/OFF to ON: within 1 μs
	DO	Number of output points		2 points
		Output method		Sink output (photocoupler isolation)
		Output response time		ON to OFF: within 1 μs/OFF to ON: within 1 μs
	Mass [kg]			0.2
I/O module MR-MT2100	DI	Number of input points		16 points(Note-1)
		Input method		Sink input/source input (photocoupler isolation)
		Input response time		ON to OFF: within 1 μs/OFF to ON: within 1 μs
	DO	Number of output points		16 points(Note-1)
		Output method		Sink output/source output(Note-2) (photocoupler isolation)
		Output response time	Sink output	ON to OFF: within 1 μs/OFF to ON: within 1 μs
			Source output(Note-2)	ON to OFF: within 2 μs/OFF to ON: within 1 μs
	Mass [kg]			0.2
Pulse I/O module MR-MT2200	Number of pulse I/O channels			Output 2CH, input 2CH, I/O 1CH each (selectable)
	Pulse output	Output signal		Differential line driver output/open collector output
		Output method		Forward/reverse rotation pulse train, signed pulse train, A-phase/B-phase pulse train
		Maximum frequency	Differential line driver output	4M pulse/s (A-phase/B-phase pulse train 4 multiples) 1M pulse/s (forward/reverse rotation pulse train, signed pulse train)
			Open collector output	200k pulse/s (A-phase/B-phase pulse train 4 multiples) 50k pulse/s (forward/reverse rotation pulse train, signed pulse train)
	Pulse input	Input signal		Differential line driver input
		Input method		Forward/reverse rotation pulse train, signed pulse train, A-phase/B-phase pulse train
		Maximum frequency	Differential line driver input	4M pulse/s (A-phase/B-phase pulse train 4 multiples) 1M pulse/s (forward/reverse rotation pulse train, signed pulse train)
	DI	Number of input points		7 points per axis (total of 14 points)
		Input method		Sink input/source input (photocoupler isolation)
	DO	Number of output points		5 points per axis (total of 10 points)(Note-3)
		Output method		Sink output/source output (photocoupler isolation)
	Mass [kg]			0.2
Analog I/O module MR-MT2300	Analog input	Number of input channels		4CH
		Input voltage range		-10 to 10 V DC/-5 to 5 V DC (selectable)
		Resolution		± 10 V range: 0.334 mV ± 5 V range: 0167 mV
		Conversion accuracy		± 0.1 % (at 25 °C)/± 0.3 % (at 0 °C to 60 °C)
	Analog output	Number of output channels		4CH
		Output voltage range		-10 to 10 V DC
		Resolution		± 10 V range: 0.319 mV
		Conversion accuracy		± 0.4 % (at 25 °C)/± 0.5 % (at 0 °C to 60 °C)
	Mass [kg]			0.2
Encoder I/F module MR-MT2400	Number of encoder channels			2CH(Note-4)
	Supported encoder communications			SSI, EnDat 2.2(Note-2), HIPERFACE DSL® (Note-2) , Analog Sin/Cos(Note-2), Mitsubishi Electric serial I/F(Note-2)
	Mass [kg]			0.2

(Note-1): When the module is used at the temperature exceeding 55 °C and up to 60 °C, keep the number of points turned on simultaneously to be 14 for each DI and DO.
(Note-2): Will be supported in the future
(Note-3): Two of the five points and the pulse output (open collector output) are mutually exclusive.
(Note-4): Different encoder interfaces cannot be inputted for each channel. The same encoder interface should be used for both two channels.

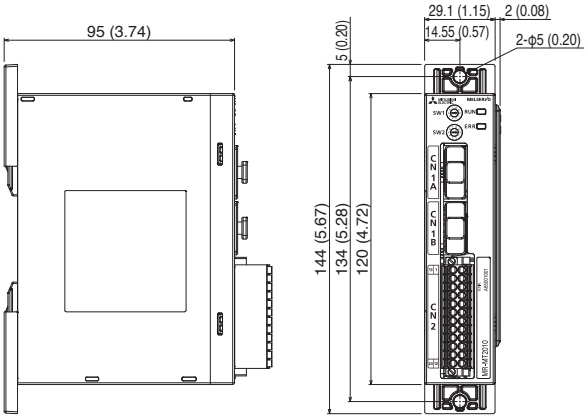
Applicable controllers

Motion CPU module	R64MTCPU, R32MTCPU, R16MTCPU
Position board(Note-5)	MR-MC211, MR-MC210, MR-MC241, MR-MC240
C Controller interface module(Note-5)	Q173SCCF

(Note-5): Will be applicable soon

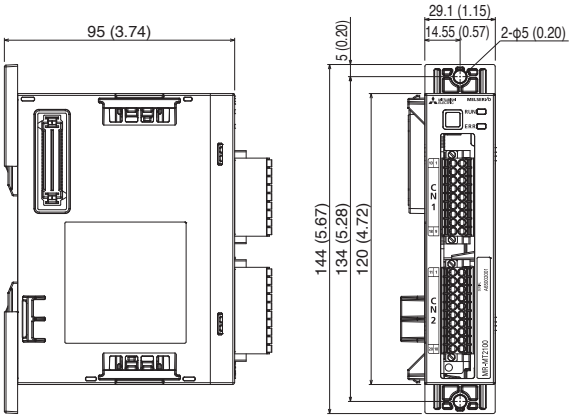
Exterior Dimensions

SSCNET III/H Head module MR-MT2010



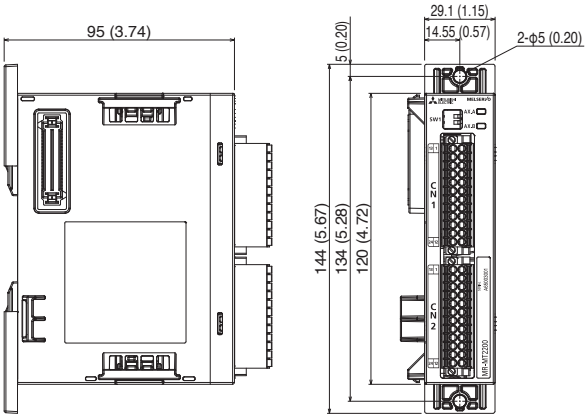
[Unit: mm (inch)]

I/O module MR-MT2100



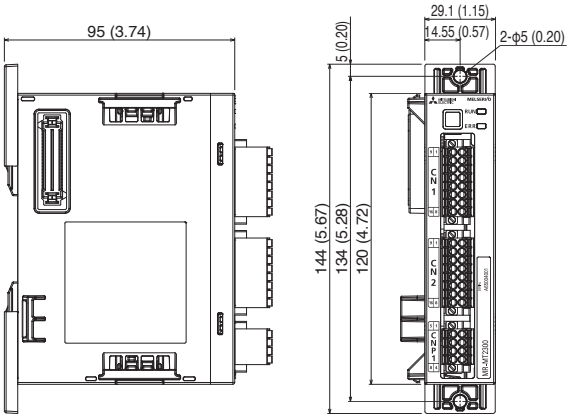
[Unit: mm (inch)]

Pulse I/O module MR-MT2200



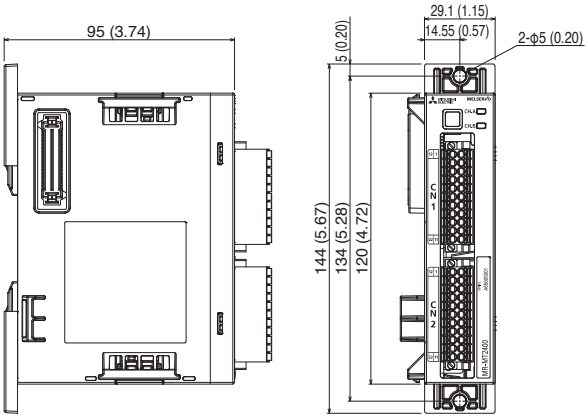
[Unit: mm (inch)]

Analog I/O module MR-MT2300



[Unit: mm (inch)]

Encoder I/F module MR-MT2400



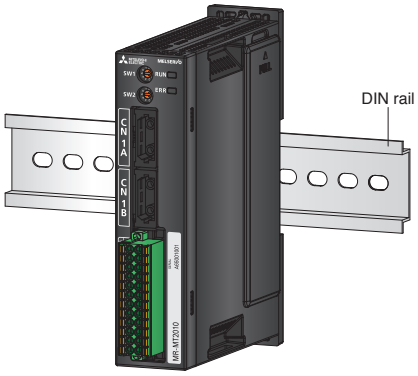
[Unit: mm (inch)]

SSCNET III/H
Sensing Module MR-MT2000 Series

Mounting

The module is mounted either with a DIN rail or with screws.

With DIN rail



With screws

Product list

Name	Model	Description	Standard
SSCNET III/H Head module	MR-MT2010	SSCNET III/H communications, input: 12points, output: 2 points	UL, CE, KC, EAC
I/O module	MR-MT2100	Input 16 points, output 16 points	UL, CE, KC, EAC
Pulse I/O module	MR-MT2200	Total pulse I/O: 2CH	UL, CE, KC, EAC
Analog I/O module	MR-MT2300	Analog input: 4CH, analog output: 4CH	UL, CE, KC, EAC
Encoder I/F module	MR-MT2400	Encoder I/F: 2CH	UL, CE, KC, EAC

⚠ Safety Warning

To ensure proper use of the products listed in this catalog, please be sure to read the instruction manual prior to use.

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001(standards for quality assurance management systems)

ISO 14001 JACO EC97J1113 UKAS MANAGEMENT SYSTEMS 051

ISO 9001 BUREAU VERITAS Certification UKAS MANAGEMENT SYSTEMS 008

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Specifications are subject to change without notice.