

# MODEL: R7K4FML3-6-DC32A1

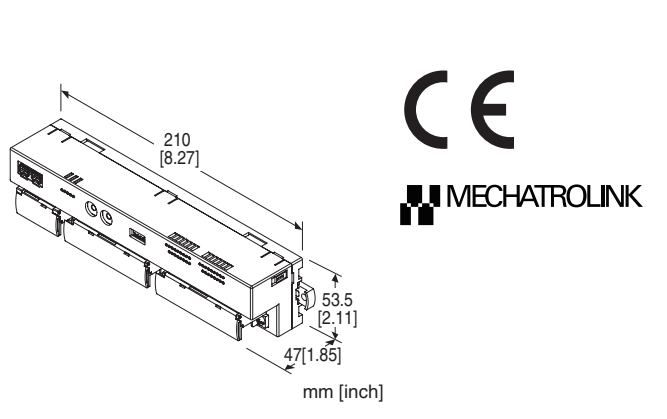
## Remote I/O R7K4F Series

### MECHATROLINK I/O MODULE

(NPN transistor output, 32 points, screw terminal block, MECHATROLINK-III use, external excitation 12V)

#### Functions & Features

- 32 points NPN transistor output module for MECHATROLINK-III



### MODEL R7K4FML3-6-DC32A1-R[1]

#### ORDERING INFORMATION

- Code number: R7K4FML3-6-DC32A1-R[1]  
Specify a code from below for [1].  
(e.g. R7K4FML3-6-DC32A1-R/Q)
- Specify the specification for option code /Q  
(e.g. /C01/SET)

#### TERMINAL BLOCK

- 6: Screw terminal block for power supply  
Connector for MECHATROLINK-III  
Screw terminal block for I/O

#### I/O TYPE

DC32A1: NPN transistor output, 32 points  
(12 V external output power)

#### POWER INPUT

##### DC power

R: 24 V DC

(Operational voltage range:  $\pm 10\%$ ; ripple 10 %p-p max.)

#### [1] OPTIONS

blank: none

/Q: Options other than the above (specify the specification)

#### SPECIFICATIONS OF OPTION: Q (multiple selections)

##### COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

##### EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet  
(No. ESU-7773-DC32)

#### GENERAL SPECIFICATIONS

##### Connection

MECHATROLINK-III: MECHATROLINK-III connector

Power input, output: M3 separable screw terminal (torque 0.5 N·m)

Solderless terminal: Refer to the drawing at the end of the section.

Recommended manufacturer: Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,Ltd

Applicable wire size: 0.25 to 1.65 mm<sup>2</sup> (AWG 22 to 16)

Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (gray)

Isolation: Output to MECHATROLINK or FE to power

##### Output at the loss of communication:

Output hold (\*), Output clear

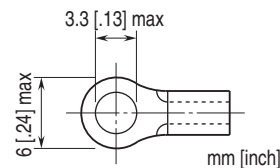
Selectable with the front DIP SW

(\* ) factory default setting

Status indicator LEDs: PWR, ERR, CON, LNK1, LNK2 (5 LEDs) indicate the module's operating conditions. (Refer to the instruction manual)

Discrete output status indicator LED: Green LED turns on with output ON

##### Recommended solderless terminal



#### MECHATROLINK-III COMMUNICATION

Baud rate: 100 Mbps

Transmission distance: 6300 m max.

Distance between stations: 100 m max.

Transmission media: MECHATROLINK cable (Model JEMC-W6013-x-E, Yaskawa Controls Co., Ltd.)

Connector: TYCO AMP Industrial mini I/O connector

Max. number of slaves: 62

(The maximum number of slaves might change depending on the master unit. Refer to the manual of the master unit)

Transmission cycle: 125  $\mu$ sec., 250  $\mu$ sec., 500  $\mu$ sec., 1 - 64 msec. (with 1 msec. increments)

Communication cycle: 125  $\mu$ sec. through 64 msec.

**Applicable profile:** Standard I/O profile (cyclic communication)  
Event-driven communication acquiring ID profile (event-driven communication)  
**Transmission bytes:** 16 bytes  
**Station address:** 03H through EFH (set with rotary switches)  
**Cyclic communication:** Available  
**Event-driven communication:** Available  
**Slave monitoring:** None

## OUTPUT SPECIFICATIONS

**Common:** Negative common (NPN) per 32 points  
**Maximum outputs applicable at once:** No limit (at 12 V DC)  
**Rated load voltage:** 12 V DC  $\pm 10\%$ , ripple 5 %p-p max.  
**Rated output current:** 0.1 A per point, 3.2 A (two points total) per common  
**Residual voltage:**  $\leq 1.2$  V  
**Leakage current:**  $\leq 0.1$  mA  
**ON delay:**  $\leq 0.2$  msec.  
**OFF delay:**  $\leq 0.5$  msec.  
**Overload current protection function:** Limits the current value when overcurrent is detected  
**Overheat protection function:** Turns OFF the outputs when overheat is detected  
(When driving an inductive load, connect a diode in parallel with the load.)

## INSTALLATION

**Current consumption**  
•DC at 24 V DC:  $\leq 110$  mA  
**Operating temperature:** -10 to +55°C (14 to 131°F)  
**Storage temperature:** -20 to +65°C (-4 to +149°F)  
**Operating humidity:** 30 to 90 %RH (non-condensing)  
**Atmosphere:** No corrosive gas or heavy dust  
**Mounting:** Surface or DIN rail (35 mm rail)  
**Weight:** 330 g (0.73 lb)

## PERFORMANCE

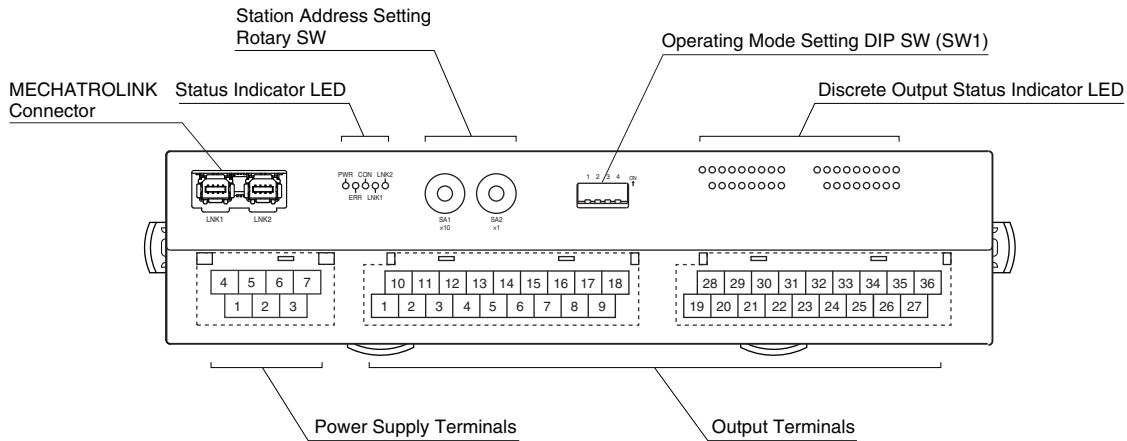
**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC  
**Dielectric strength:** 1500 V AC @ 1 minute (output to MECHATROLINK or FE to power)

## STANDARDS & APPROVALS

**EU conformity:**  
EMC Directive  
EMI EN 61000-6-4  
EMS EN 61000-6-2  
RoHS Directive

# MODEL: R7K4FML3-6-DC32A1

## EXTERNAL VIEW



## TERMINAL ASSIGNMENTS

### OUTPUT TERMINAL ASSIGNMENT

10	11	12	13	14	15	16	17	18
V+	Y1	Y3	Y5	Y7	Y9	Y11	Y13	Y15
1	2	3	4	5	6	7	8	9
V-	Y0	Y2	Y4	Y6	Y8	Y10	Y12	Y14

28	29	30	31	32	33	34	35	36
V+	Y17	Y19	Y21	Y23	Y25	Y27	Y29	Y31
19	20	21	22	23	24	25	26	27
V-	Y16	Y18	Y20	Y22	Y24	Y26	Y28	Y30

NO.	ID	FUNCTION	NO.	ID	FUNCTION	NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	V-	Out. Common	10	V+	External excitation	19	V-	Out. Common	28	V+	External excitation
2	Y0	Output 0	11	Y1	Output 1	20	Y16	Output 16	29	Y17	Output 17
3	Y2	Output 2	12	Y3	Output 3	21	Y18	Output 18	30	Y19	Output 19
4	Y4	Output 4	13	Y5	Output 5	22	Y20	Output 20	31	Y21	Output 21
5	Y6	Output 6	14	Y7	Output 7	23	Y22	Output 22	32	Y23	Output 23
6	Y8	Output 8	15	Y9	Output 9	24	Y24	Output 24	33	Y25	Output 25
7	Y10	Output 10	16	Y11	Output 11	25	Y26	Output 26	34	Y27	Output 27
8	Y12	Output 12	17	Y13	Output 13	26	Y28	Output 28	35	Y29	Output 29
9	Y14	Output 14	18	Y15	Output 15	27	Y30	Output 30	36	Y31	Output 31

### POWER SUPPLY TERMINAL ASSIGNMENT

4	5	6	7
NC	NC	+24V	0V
1	2	3	
NC	NC	FE	

- 1. NC -
- 2. NC -
- 3. FE Functional earth
- 4. NC -
- 5. NC -
- 6. +24V Power supply (24V DC)
- 7. 0V Power supply (0V)

## MECHATROLINK RELATED COMMANDS

Commands available with this unit are the following.

PROFILE	COMMAND	CODE	FUNCTION
Common command	NOP	00H	No operation command
	ID_RD	03H	Read ID command
	CONFIG	04H	Setup device command
	ALM_RD	05H	Read alarm or warning command
	ALM_CLR	06H	Clear alarm or warning command
	CONNECT	0EH	Establish connection command
	DISCONNECT	0FH	Release connection command
Standard I/O profile	DATA_RWA	20H	Transmit I/O data

## RESPONSE TIME

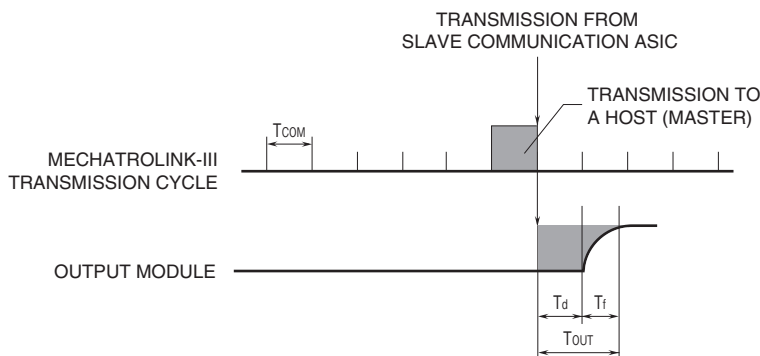
Response time of discrete output module is the time till when the module output the signal from when output data is received by the communication ASIC of the module.

$T_{COM}$ : MECHATROLINK-III transmission cycle set at master  
(depends on system and configuration)

$T_{OUT}$ : Response of output module  $\leq$  Output internal processing delay time ( $T_d$ , one minimum transmission cycle the unit can handle) + Conversion time ( $T_e$ ) + Delay of output circuit ( $T_f$ , ON delay time or OFF delay time)

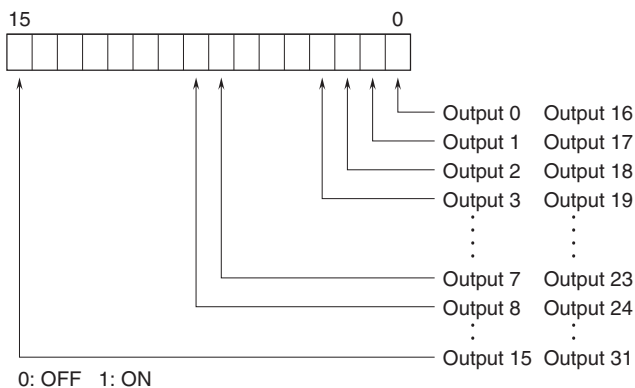
E.g.: MECHATROLINK-III transmission cycle: 0.5 msec., discrete output OFF

Response of output module ( $T_{OUT}$ ): Output internal processing delay time (0.125 msec.) + Delay of output circuit (0.5 msec.)  
= 0.625 [msec.]



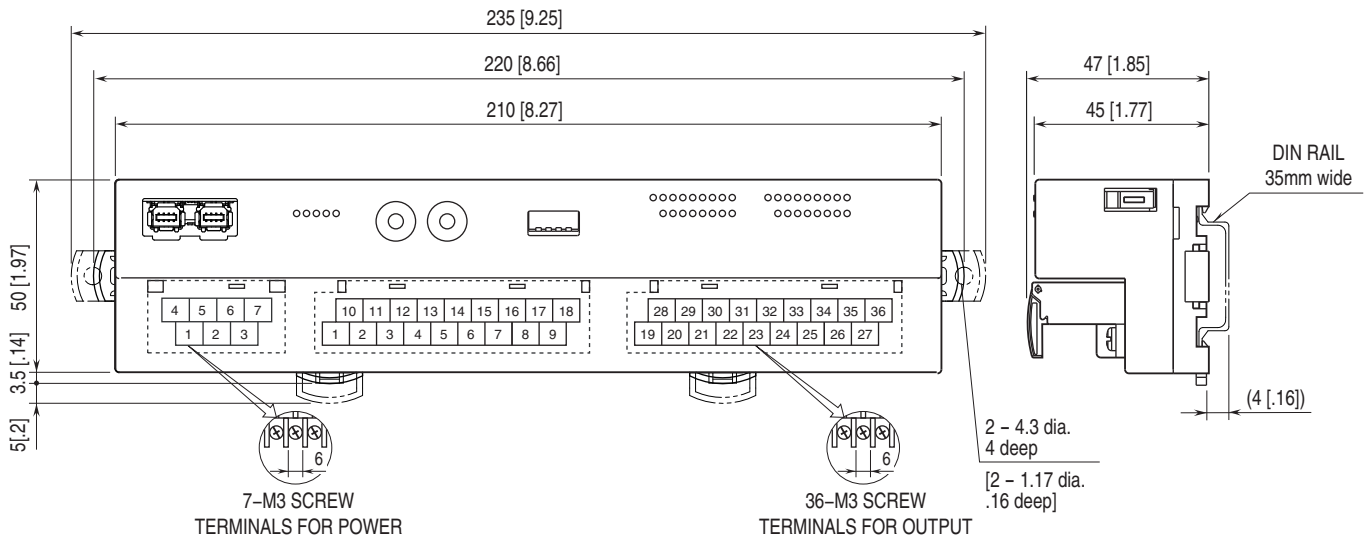
## I/O DATA DESCRIPTIONS

### ■ DISCRETE OUTPUT

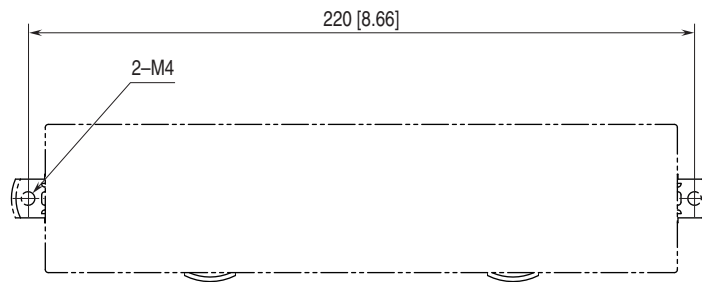


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## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



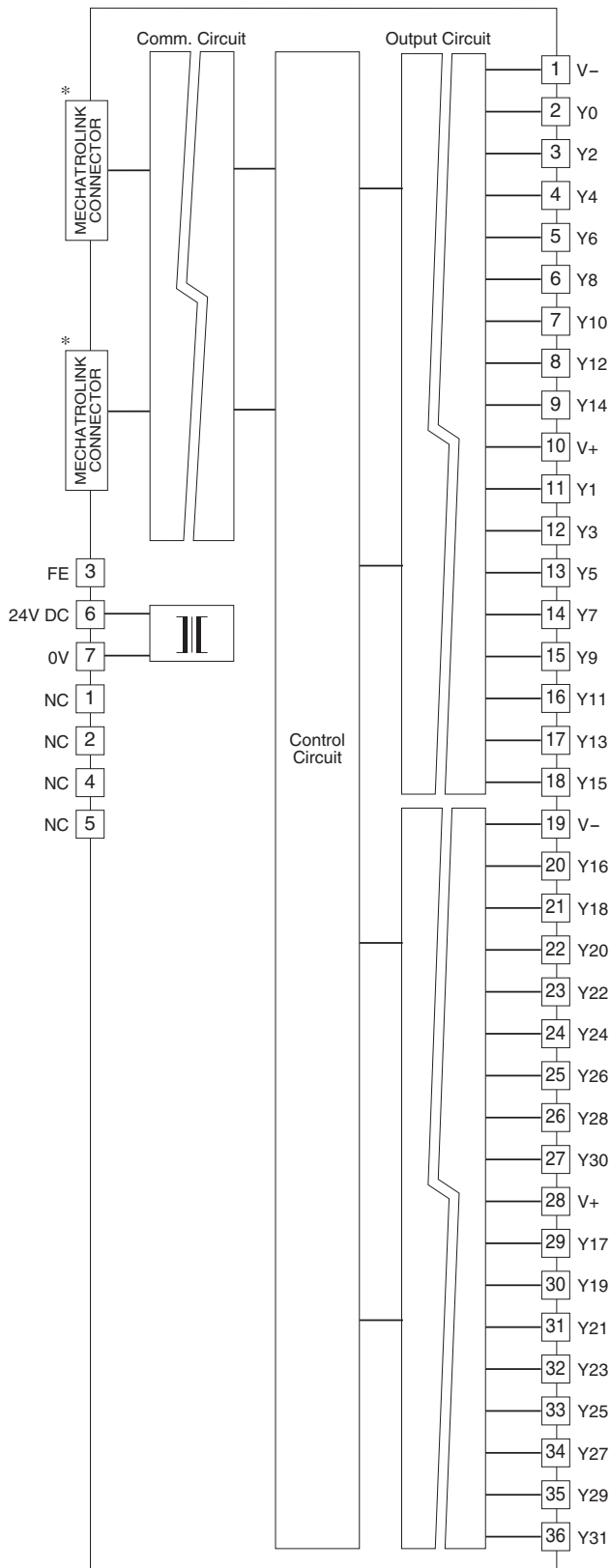
## MOUNTING REQUIREMENTS unit: mm [inch]



## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

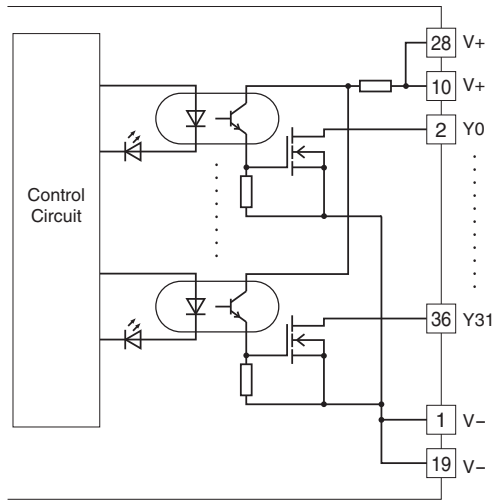
Note: In order to improve EMC performance, bond the FE terminal to ground.

Caution: FE terminal is NOT a protective conductor terminal.

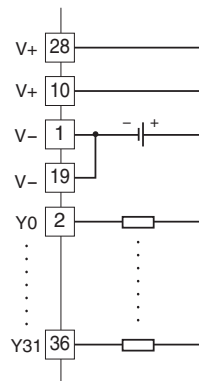


\*MECHATROLINK connectors are internally connected.  
The network cable can be connected to either one.

### Output Circuit



### Output Connection Examples





Specifications are subject to change without notice.