

# MODEL: R7K4FML3-6-DA32

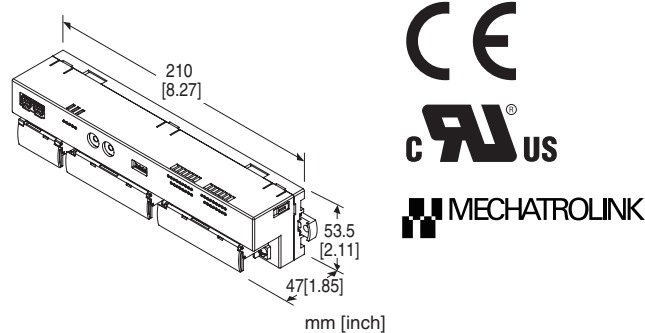
## Remote I/O R7K4F Series

### MECHATROLINK I/O MODULE

(NPN/PNP discrete input, 32 points, screw terminal block, MECHATROLINK-III use, external excitation 24V)

#### Functions & Features

- 32 points NPN/PNP discrete input module for MECHATROLINK-III



### MODEL R7K4FML3-6-DA32-R[1]

#### ORDERING INFORMATION

- Code number: R7K4FML3-6-DA32-R[1]  
Specify a code from below for [1].  
(e.g. R7K4FML3-6-DA32-R/UL/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

**DA32:** NPN/PNP discrete input, 32 points  
(24 V external input power)

#### POWER INPUT

DC power  
R: 24 V DC  
(Operational voltage range:  $\pm 10\%$ ; ripple 10 %p-p max.)

#### [1] OPTIONS (multiple selections)

Standards & Approvals  
**blank:** CE marking  
**/UL:** UL approval, CE marking  
Other Options  
**blank:** none

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

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

COATING (For the detail, refer to our web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating (UL not available)

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet  
(No. ESU-7773-DA32)

#### GENERAL SPECIFICATIONS

##### Connection

**MECHATROLINK-III:** MECHATROLINK-III connector

**Power input, input:** 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:** Input to MECHATROLINK or FE to power

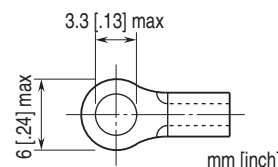
**Status indicator LEDs:** PWR, ERR, CON, LNK1, LNK2 (5 LEDs) indicate the module's operating conditions. (Refer to the instruction manual)

**Discrete input status indicator LED:** Green LED turns on with input ON

**Read rate:** 1 / 5 / 10(\*) / 20 / 50 / 70 / 100 / 200 msec.  
selectable with front DIP SW

(\*) factory default setting

■ 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 JEPMC-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

## INPUT SPECIFICATIONS

**Common:** Positive or negative common (NPN/PNP) per 32 points

**Maximum inputs applicable at once:** No limit (at 24 V DC)

**Rated input voltage:** 24 V DC  $\pm$ 10 %; ripple 5 %p-p max.

**ON voltage / current:**  $\geq$  15 V DC (input - COM) /  $\geq$  3.5 mA

**OFF voltage / current:**  $\leq$  5 V DC (input - COM) /  $\leq$  1 mA

**Input current:**  $\leq$  5.5 mA per point at 24 V DC

**Input resistance:** Approx. 4.4 k $\Omega$

**ON delay:**  $\leq$  0.2 msec.

**OFF delay:**  $\leq$  0.5 msec.

## INSTALLATION

**Current consumption**

• DC at 24 V DC:  $\leq$  100 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 (input to MECHATROLINK or FE to power)

## STANDARDS & APPROVALS

**EU conformity:**

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

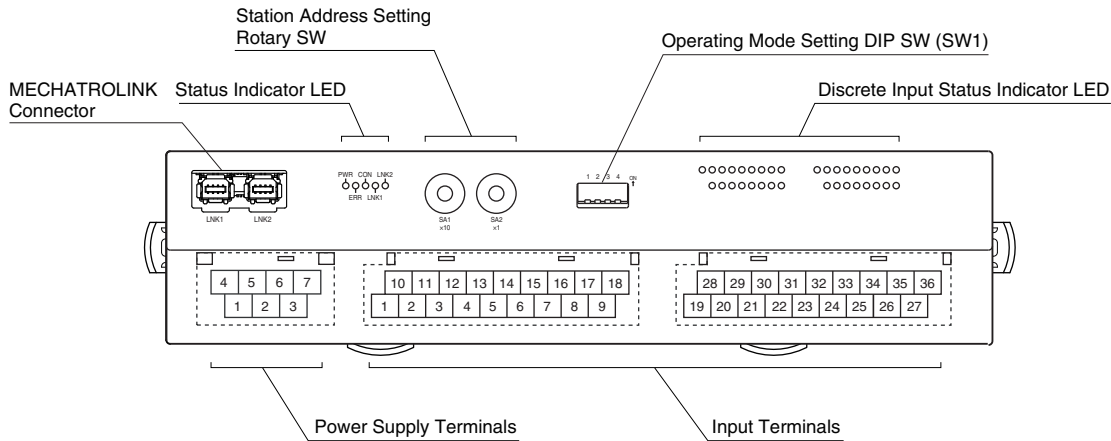
**Approval:**

UL/C-UL general safety requirements

(UL 61010-1, CAN/CSA-C22.2 No.61010-1-12)

(UL 61010-2-201, CAN/CSA-C22.2 No.61010-2-201)

## EXTERNAL VIEW



## TERMINAL ASSIGNMENTS

### INPUT TERMINAL ASSIGNMENT

10	11	12	13	14	15	16	17	18
COM	X1	X3	X5	X7	X9	X11	X13	X15
1	2	3	4	5	6	7	8	9
COM	X0	X2	X4	X6	X8	X10	X12	X14

28	29	30	31	32	33	34	35	36
COM	X17	X19	X21	X23	X25	X27	X29	X31
19	20	21	22	23	24	25	26	27
COM	X16	X18	X20	X22	X24	X26	X28	X30

NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	COM	Common	10	COM	Common
2	X0	Input 0	11	X1	Input 1
3	X2	Input 2	12	X3	Input 3
4	X4	Input 4	13	X5	Input 5
5	X6	Input 6	14	X7	Input 7
6	X8	Input 8	15	X9	Input 9
7	X10	Input 10	16	X11	Input 11
8	X12	Input 12	17	X13	Input 13
9	X14	Input 14	18	X15	Input 15

NO.	ID	FUNCTION	NO.	ID	FUNCTION
19	COM	Common	28	COM	Common
20	X16	Input 16	29	X17	Input 17
21	X18	Input 18	30	X19	Input 19
22	X20	Input 20	31	X21	Input 21
23	X22	Input 22	32	X23	Input 23
24	X24	Input 24	33	X25	Input 25
25	X26	Input 26	34	X27	Input 27
26	X28	Input 28	35	X29	Input 29
27	X30	Input 30	36	X31	Input 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

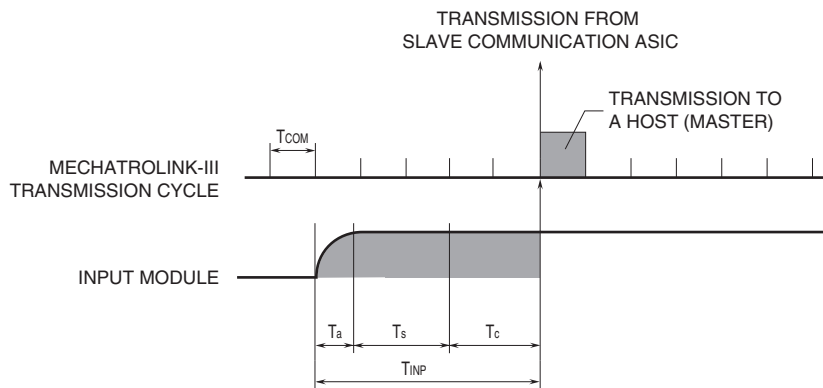
Response time of discrete input module is the time till when the communication ASIC of the module transmits input data from when input signal is applied to the module.

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

$T_{INP}$ : Response of input module  $\leq$  Delay of input circuit ( $T_a$ , ON delay time or OFF delay time) + Acquire cycle ( $T_s$ ) + input internal processing delay time ( $T_c$ , two transmission cycle)

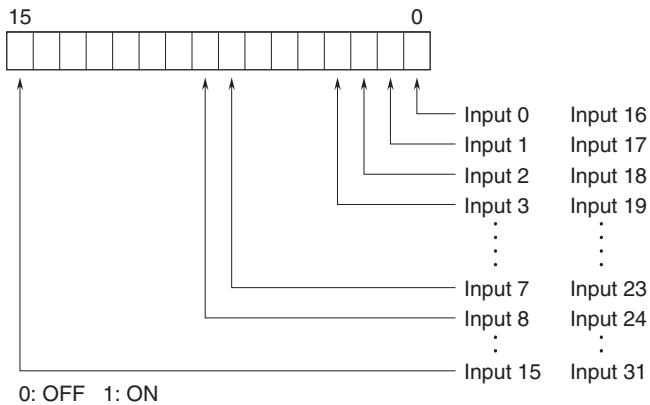
E.g.: Acquire cycle: 1 msec., MECHATROLINK-III transmission cycle: 0.125 msec., discrete input ON

Response of input module ( $T_{INP}$ ): Delay of input circuit (0.2 msec.) + Acquire cycle (1 msec.) + input internal processing delay time (0.125 msec. x 2) = 1.45 [msec.]

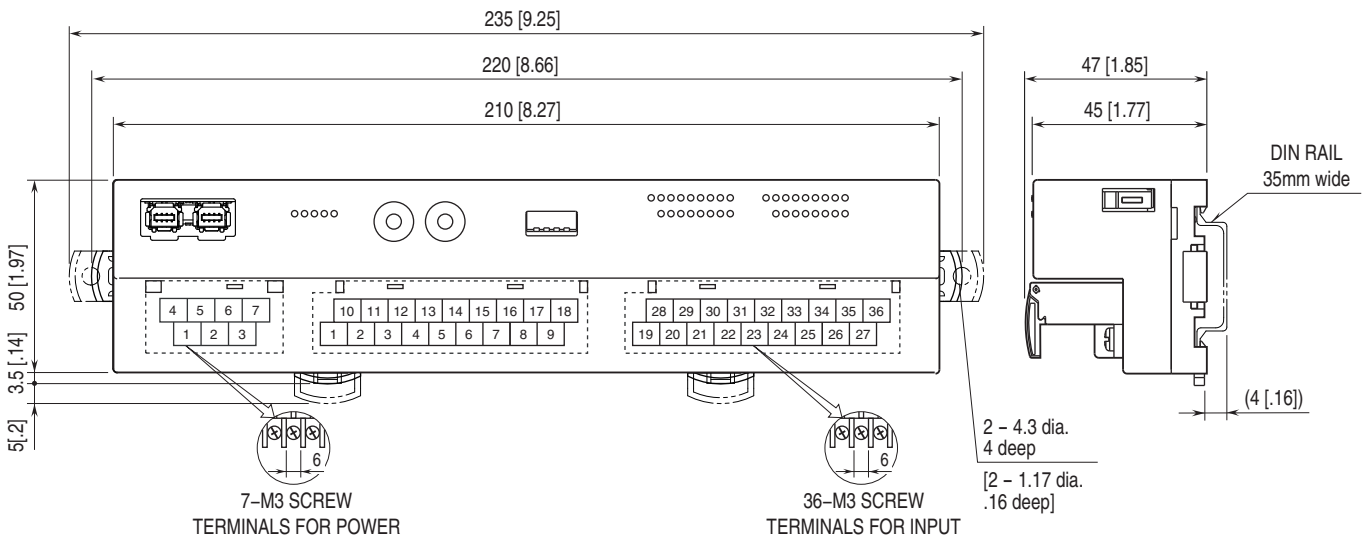


## I/O DATA DESCRIPTIONS

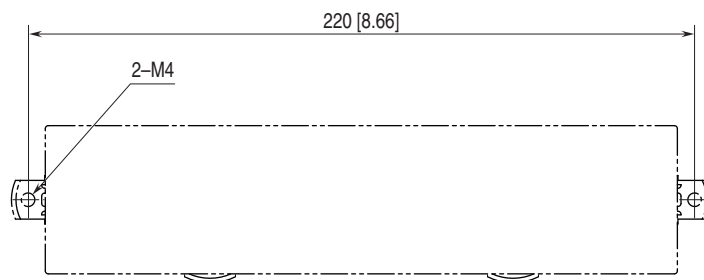
### ■ DISCRETE INPUT



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



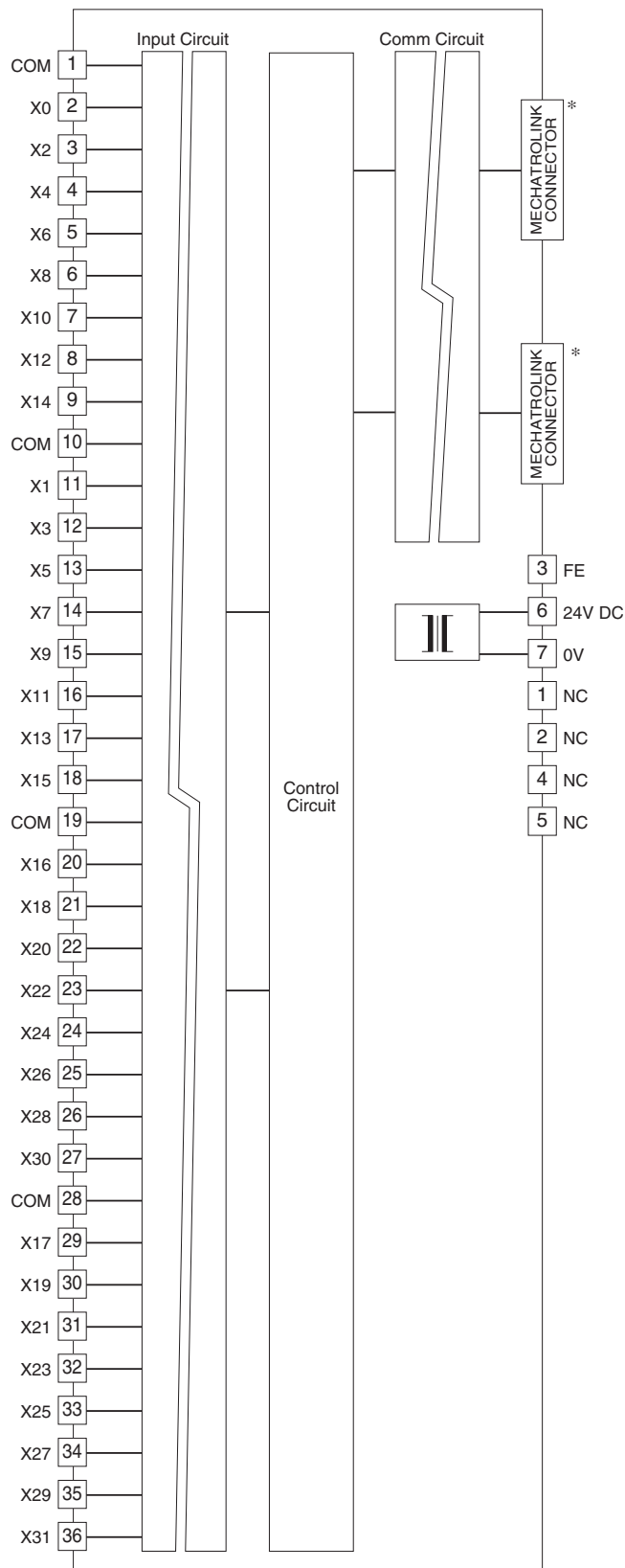
## MOUNTING REQUIREMENTS unit: mm [inch]



## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

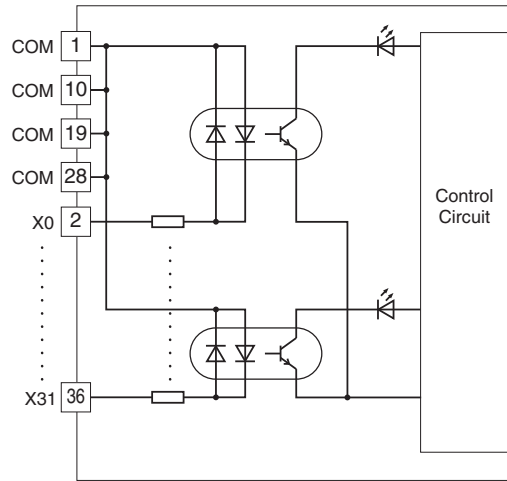
Note: In order to improve EMC performance, bond the FE terminal to ground.

Caution: FE terminal is NOT a protective conductor terminal.



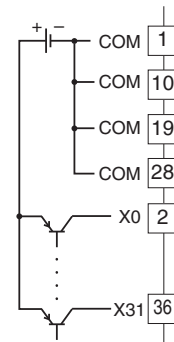
\*MECHATROLINK connectors are internally connected.  
The network cable can be connected to either one.

### Input Circuit

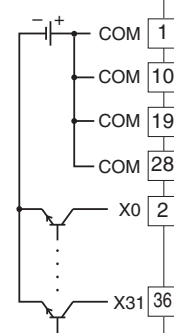


### Input Connection Examples

#### PNP Connection



#### NPN Connection





Specifications are subject to change without notice.