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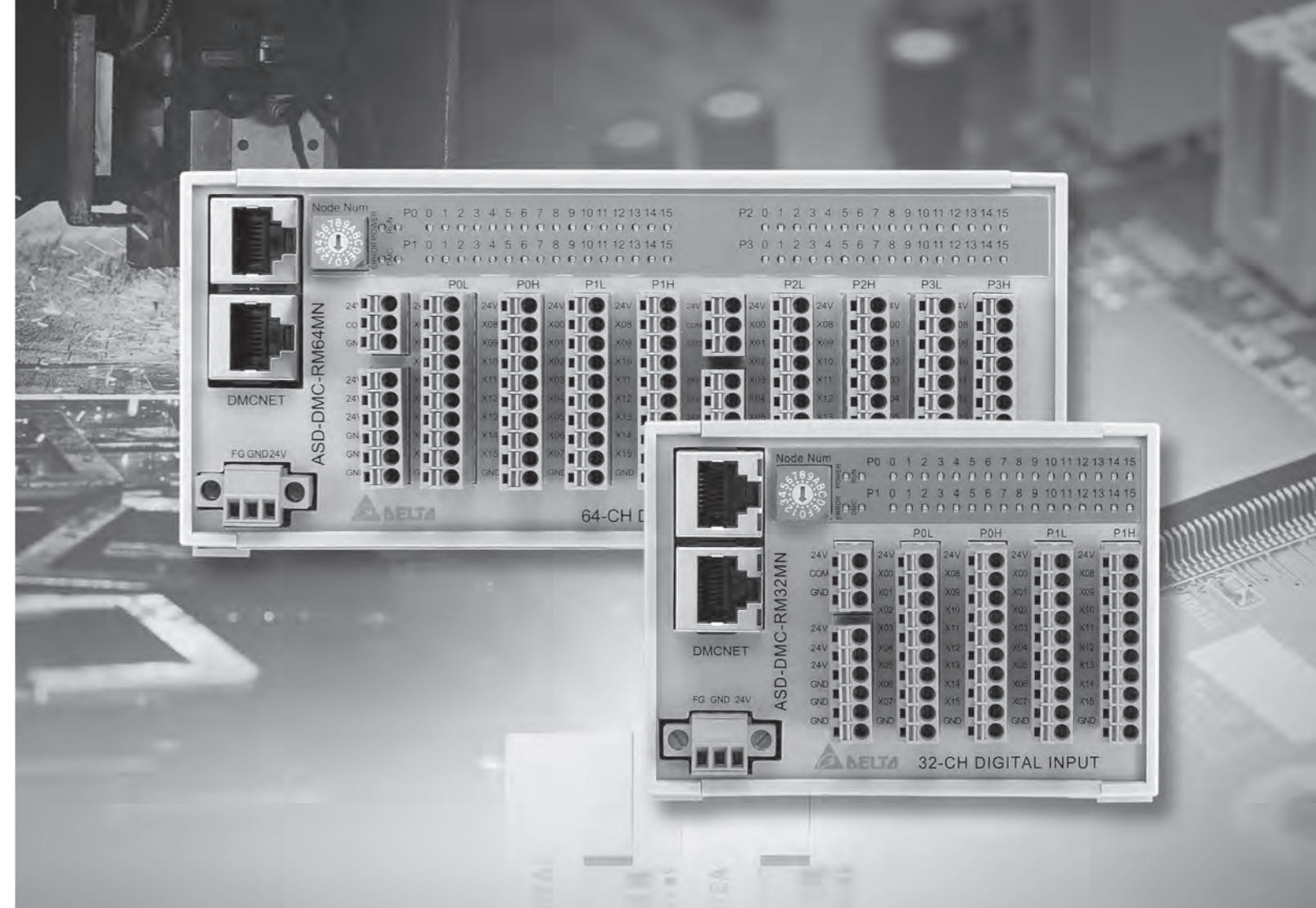
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DELTA\_IA-ASD\_DMCNET Remote Module\_UM\_EN\_20140702



# DMCNET Remote Module User Manual

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## About this Manual

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# Chapter 1 Installation Environment

## 1.1 Physical Architecture

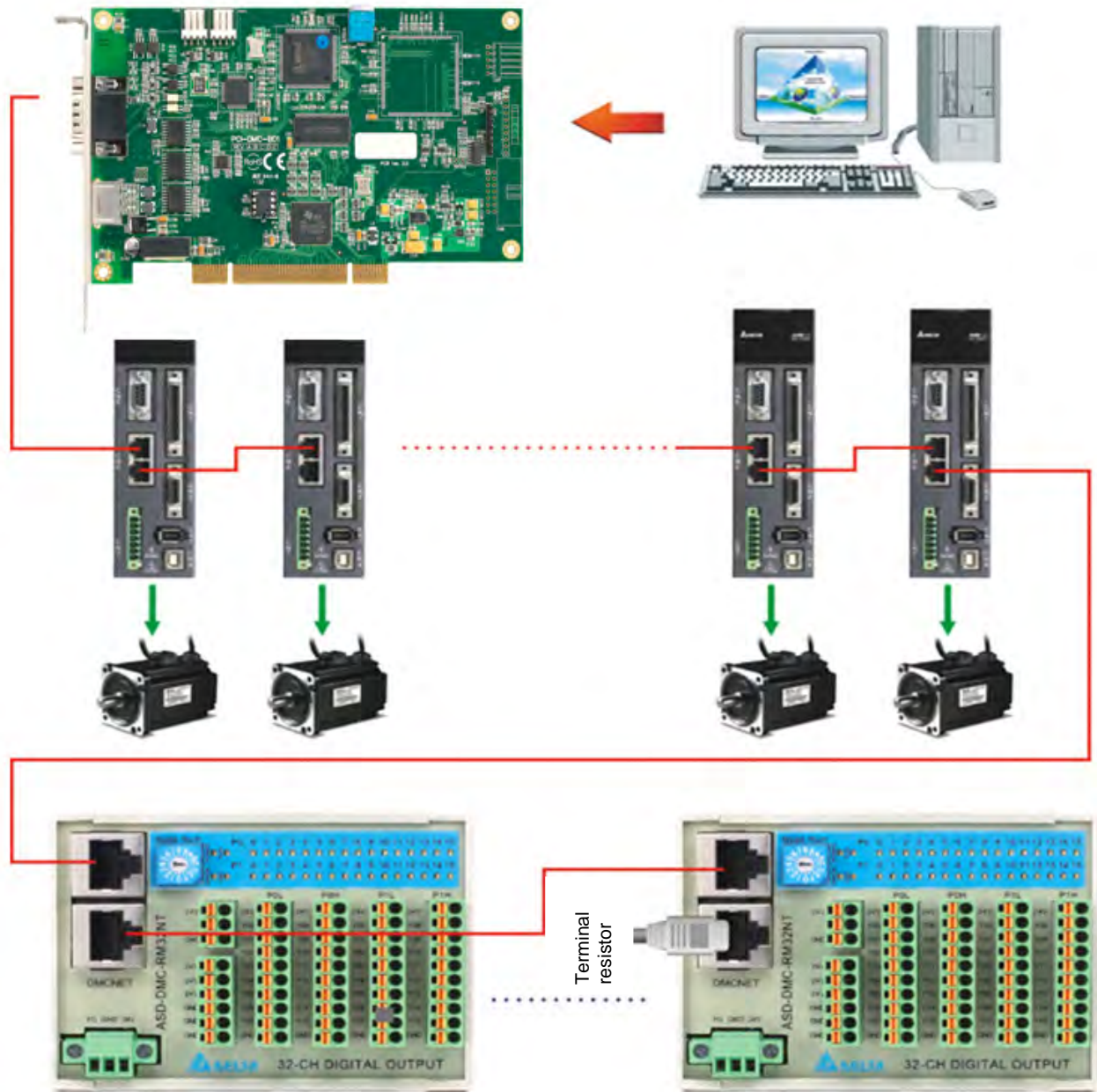


Figure 1.1 Overview of physical connection architecture (servo drive + RM32 module)

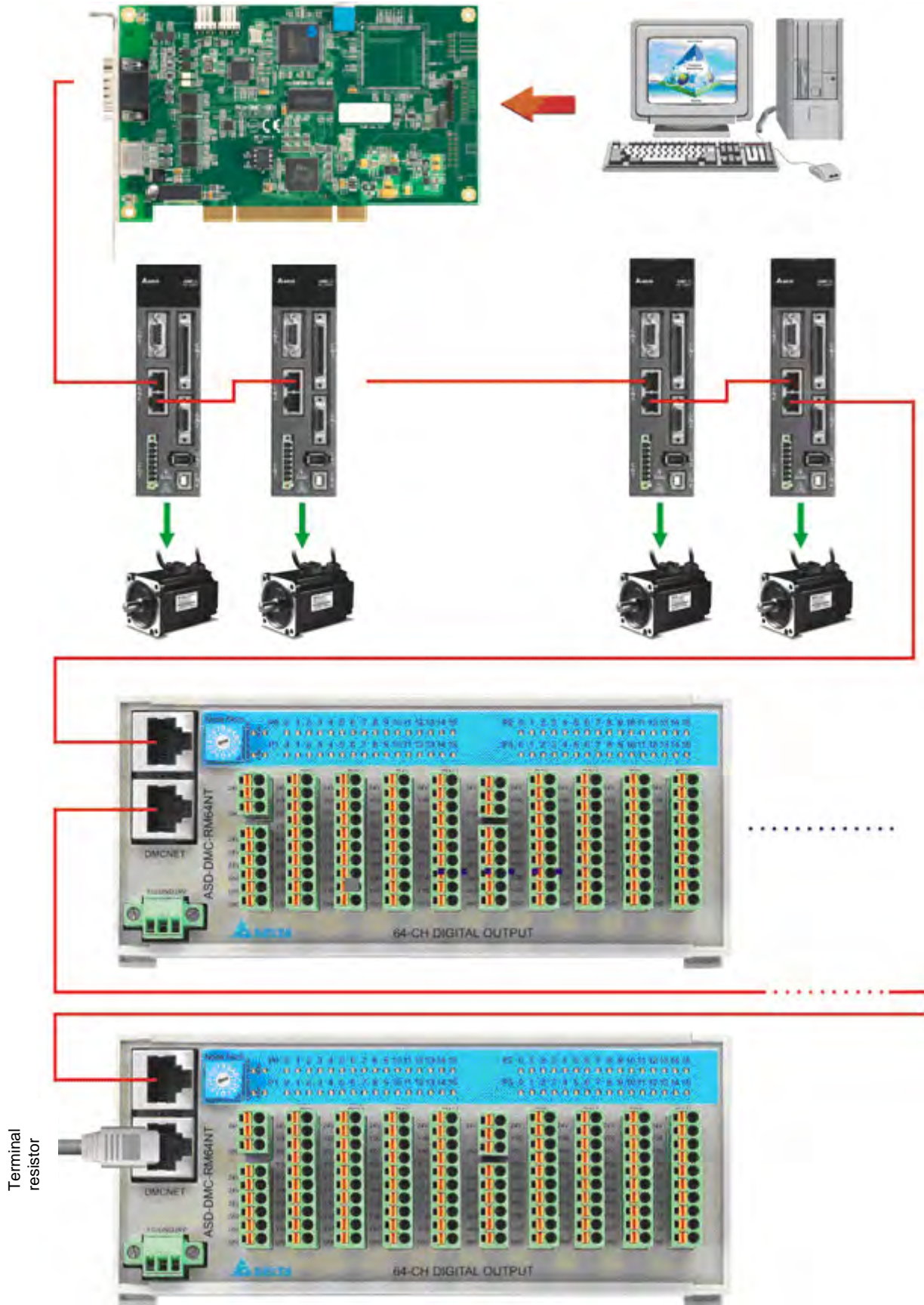


Figure 1.2 Overview of physical connection architecture (servo drive + RM64 module)

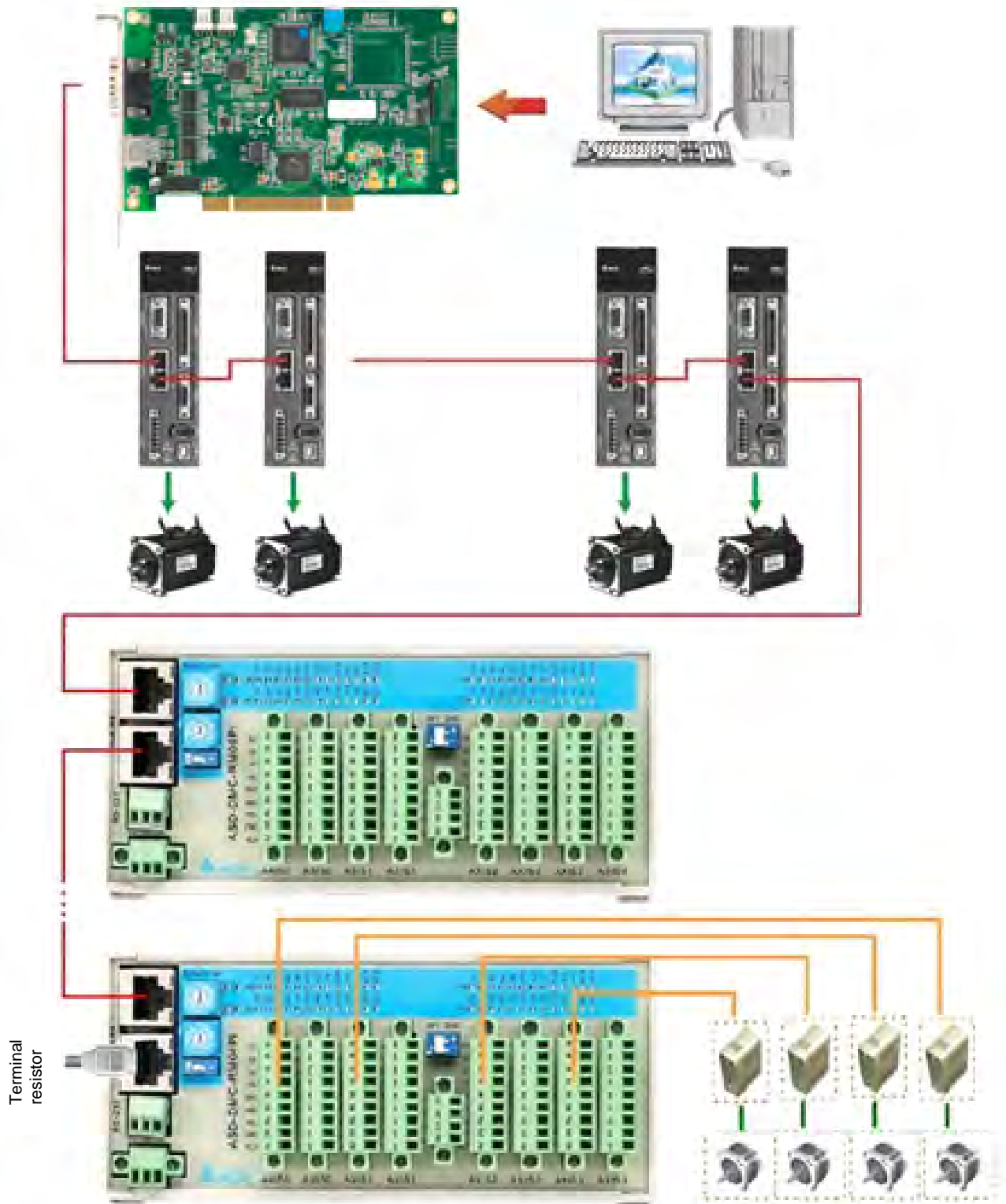


Figure 1.3 Overview of physical connection architecture (servo drive + RM04PI module)

## 1.2 Electrical Specifications

### General

- RM32 module (MN/NT/PT) dimensions: 100mm x 75mm x 43mm
- RM64 module (MN/MN1/NT/NT1) dimensions: 168mm x 75mm x 43mm
- RM04PI module dimensions: 168mm x 75mm x 40mm
- RM04DA module dimensions: 100mm x 75mm x 43mm
- RM04AD module dimensions: 100mm x 75mm x 43mm
- Supply voltage: 24VDC (15% ~ 20%)
- ESD: 8KV Air Discharge
- EFT: Power Line-2KV
- Digital I/O 1KV
- RS: 80MHz ~ 1GHz, 10V/m
- Operating temperature: 0 °C ~ 50 °C

### Digital input module

(RM32MN, RM64MN, RM32PT, RM64MN1)

- Input circuit type: single common port input
- Input signal type :SINK / SOURCE
- Input signal voltage :24VDC(5mA)
- Response time: 0 to 3ms, adjustable
- Trigger level(OFF→ON): > 16.5VDC
- Trigger level(ON→OFF): < 8VDC

### High-speed Pulse Module

Pulse Interface Input Port (RM04PI Input)

- Input circuit type: single common port input
- Input signal type: SINK / SOURCE
- Input signal voltage (Sensor): 24VDC (5mA)
- Response time: 1ms
- Action level(OFF→ON): > 16.5VDC
- Action level (ON→OFF): < 8VDC
- ◆ Input signal is 5VDC and only SINK  
Type: Max. input pulse frequency: QA, QB, QZ:200KHz (5mA/1 point) / DI1, DI2:1KHz (5mA/1 point)

### Digital output module

(RM32NT, RM64NT, RM32PT, RM64NT1)

- Output circuit type: transistor
- Output signal type: SINK
- Response frequency: 1KHz
- Current specifications: 0.1A/1 point
- Voltage specifications: 24VDC
- Response time(OFF→ON): 20us
- Response time(ON→OFF): 30us

Pulse Interface Output Port (RM04PI Output)

- Output circuit type: transistor
- Output signal type: SINK
- Output signal voltage: 5-24VDC (30mA/1 point)
- Max. output pulse frequency: CW, CCW:200KHz (30mA/1 point) / DO1, DO2:1KHz (30mA/1 point)



Digital to Analog Output Point (RM04DA)

- Channel: 4 channel/unit
- Voltage output range: -10~10 V / -5~5V / 0~10V / 0~5V
- Current output range: 0~24mA / 0~20mA / 4~20mA
- Excess limit (voltage): 10%
- Maximum output current (voltage): 24mA
- Allowable load resistance (current): 0~500Ω
- Digital data range: 0~65535
- Resolution: 16bits
- DC output resistance: 0.3Ω
- Response time: 1ms
- Digital data format: effectively 16 bits
- Isolation method: internal circuit and analog output are isolated with an optical coupler
- Protection: voltage output circuit has short-circuit protection but extended short-circuits may damage the internal circuit.

Digital to Analog Input Point (RM04AD)

- Channel: 4 channel/unit
- Voltage analog input range: -10~10V / -5~5V / 0~10V / 0~5V
- Current analog input range: 0~20mA
- Digital conversion range: 0~65535
- Resolution: 16bits
- Voltage input resistance: 140KΩ
- Current input resistance: 249Ω
- Overall precision:  $\pm 0.5\%$  at full scale within range (25°C, 77°F).  
 $\pm 1\%$  (0~55°C, 32~131°F) at full scale
- Response time: smallest 1ms, the largest 3ms x number of channel
- Isolation method: internal circuit and analog input are isolated with an optical coupler
- Current absolute input range: -15 ~ 15
- Voltage absolute input range: 32mA
- Digital data format: effectively 16 bits
- Averaging function: provides 2, 4, 8, 16, 32 modes

### 1.3 ASD-DMC-RM32MN

#### ■ ASD-DMC-RM32MN Overview

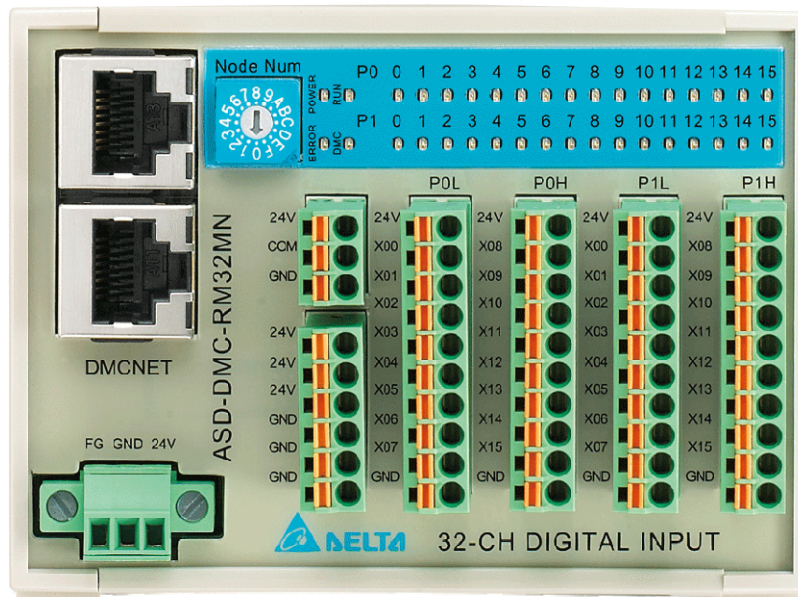


Figure 1.4 Front view

#### ■ ASD-DMC-RM32MN Connection Diagram

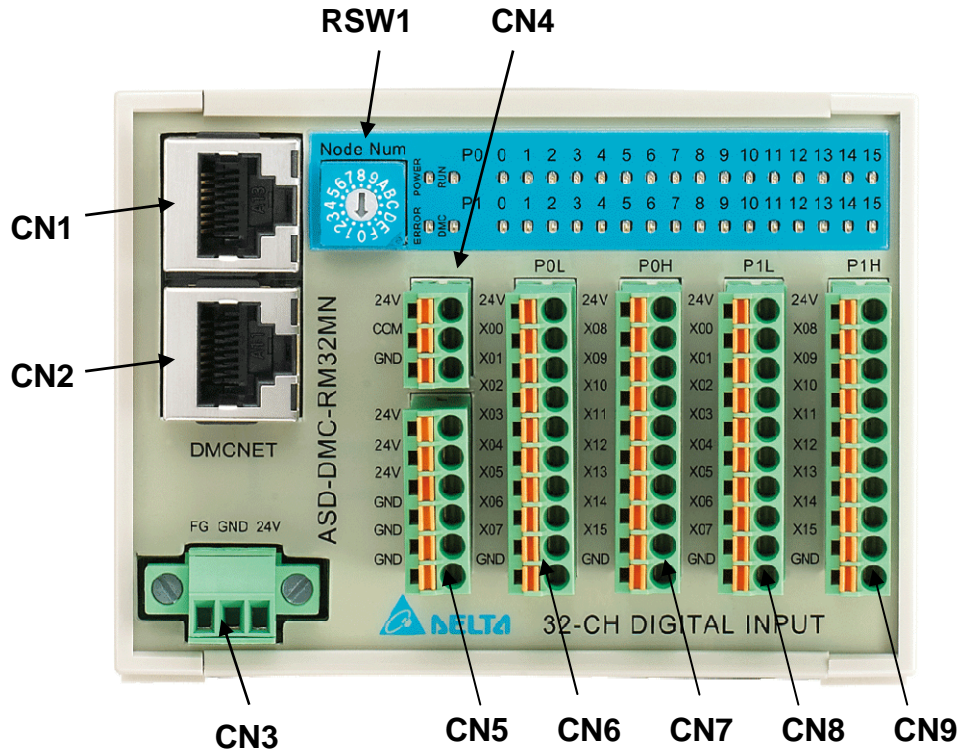


Figure 1.5 Connector diagram

■ ASD-DMC-RM32MN Module and Connectors

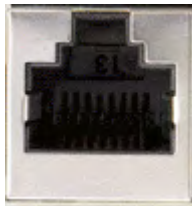


Figure 1.6 RSW1

Pin	Label	Description
1~12	Node Number	Node ID

※ Invalid when dial is turned to 0, D - F

※ Each module takes up one Node ID



1 8

Figure 1.7  
CN1 and CN2  
pin definitions

Pin	Label	Description
1	RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
2	RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
3	RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
6	RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
7	EGND	RS485 ground signal
8	EGND	RS485 ground signal



1 2 3

Figure 1.8  
CN3 pin definition

Pin	Label	Description
3	E24V	24V voltage input
2	GND	Power ground
1	FG	Case ground (earth)



Figure 1.9  
CN4 pin definition

Pin	Label	Description
3	E24V	24V voltage output
2	COM	Common input signal
1	GND	Power ground

※ This connector is used with input signal common point for Pull high or Pull low

※ COM connection with 24V → Low active (Pull high, this is the default option)

※ COM connection with GND → High active (Pull low)

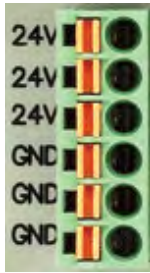


Figure 1.10  
CN5 pin definition

Label	Description
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output
GND	Power ground
GND	Power ground
GND	Power ground
24V	24V voltage output
GND	Power ground
GND	Power ground

Total voltage output at 24V is 1.5A (Max)

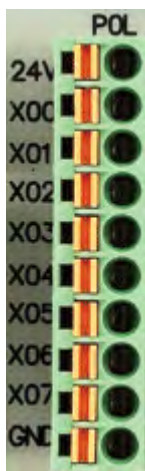


Figure 1.11  
CN6 pin definition

Label	Description
24V	24V voltage output
X00	P0 GPIO 1 input
X01	P0 GPIO 2 input
X02	P0 GPIO 3 input
X03	P0 GPIO 4 input
X04	P0 GPIO 5 input
X05	P0 GPIO 6 input
X06	P0 GPIO 7 input
X0	P0 GPIO 8 input
GND	Power ground

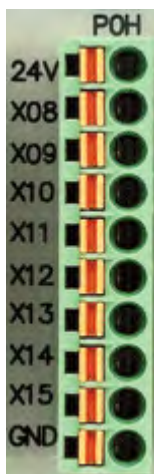


Figure 1.12  
CN7 pin definition

Label	Description
24V	24V voltage output
X08	P0 GPIO 9 input
X09	P0 GPIO 10 input
X10	P0 GPIO 11 input
X11	P0 GPIO 12 input
X12	P0 GPIO 13 input
X13	P0 GPIO 14 input
X14	P0 GPIO 15 input
X15	P0 GPIO 16 input
GND	Power ground

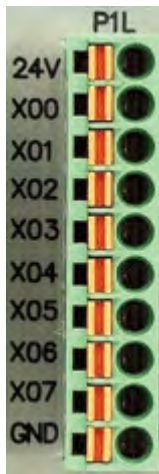


Figure 1.13  
CN8 pin definition

Label	Description
24	24V voltage output
X00	P1 GPIO 1 input
X01	P1 GPIO 2 input
X02	P1 GPIO 3 input
X03	P1 GPIO 4 input
X04	P1 GPIO 5 input
X05	P1 GPIO 6 input
X06	P1 GPIO 7 input
X07	P1 GPIO 8 input
GND	Power ground

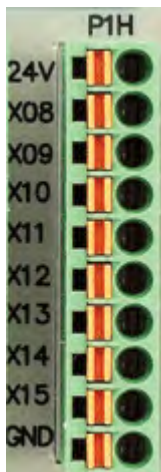


Figure 1.14  
CN9 pin definition

Label	Description
24V	24V voltage output
X08	P1 GPIO 9 input
X09	P1 GPIO 10 input
X10	P1 GPIO 11 input
X11	P1 GPIO 12 input
X12	P1 GPIO 13 input
X13	P1 GPIO 14 input
X14	P1 GPIO 15 input
X15	P1 GPIO 16 input
GND	Power ground



Figure 1.15 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator
P0 0~15	P0 0~15 signal input indicator
P1 0~15	P1 0~15 signal input indicator

## 1.4 ASD-DMC-RM32NT

### ■ ASD-DMC-RM32NT Overview

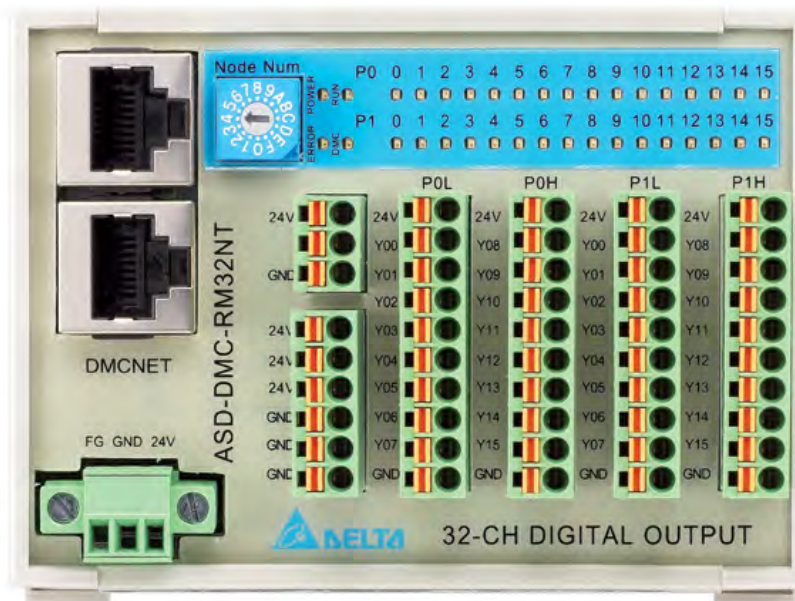


Figure 1.16 Front view

### ■ ASD-DMC-RM32NT Connection Diagram

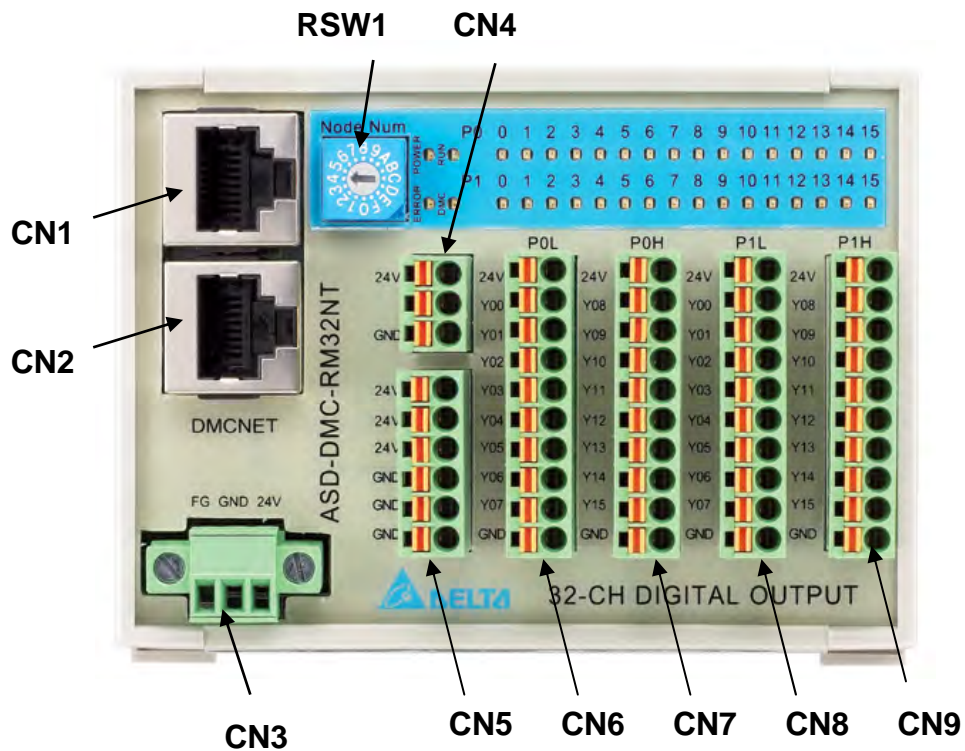


Figure 1.17 Connector diagram

■ ASD-DMC-RM32NT Module and Connectors

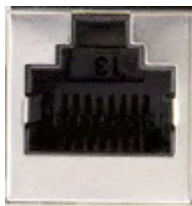


Figure 1.18  
RSW1

Pin	Label	Description
1 – 9 A – F	Node Number	Node ID

※ Invalid when dial is turned to 0, D - F

※ Each module takes up one Node ID



1 8

Figure 1.19  
CN1 and CN2  
pin definitions

Pin	Label	Description
1	RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
2	RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
3	RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
6	RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
7	EGND	RS485 ground signal
8	EGND	RS485 ground signal



1 2 3

Figure 1.20  
CN3 pin definition

Pin	Label	Description
3	E24V	24V voltage input
2	GND	Power ground
1	FG	Case ground (earth)

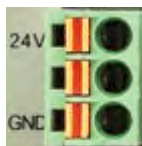


Figure 1.21  
CN4 pin definition

Label	Description
24V	24V voltage output
N/A	N/A
GND	Power ground

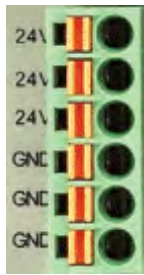


Figure 1.22

CN5 pin definition

Label	Description
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output
GND	Power ground
GND	Power ground
GND	Power ground

※ Total voltage output at 24V is 1.5A (Max)



Figure 1.23

CN6 pin definition

Label	Description
24V	24V voltage output
Y00	P0 GPIO 1 output
Y01	P0 GPIO 2 output
Y02	P0 GPIO 3 output
Y03	P0 GPIO 4 output
Y04	P0 GPIO 5 output
Y05	P0 GPIO 6 output
Y06	P0 GPIO 7 output
Y07	P0 GPIO 8 output
GND	Power ground

※ Output from one GPIO is 0.1 A(Max)

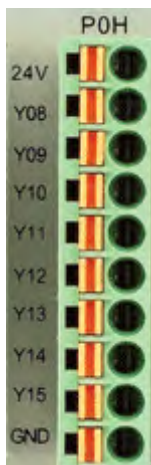


Figure 1.24

CN7 pin definition

Label	Description
24V	24V voltage output
Y08	P0 GPIO 9 output
Y09	P0 GPIO 10 output
Y10	P0 GPIO 11 output
Y11	P0 GPIO 12 output
Y12	P0 GPIO 13 output
Y13	P0 GPIO 14 output
Y14	P0 GPIO 15 output
Y15	P0 GPIO 16 output
GND	Power ground



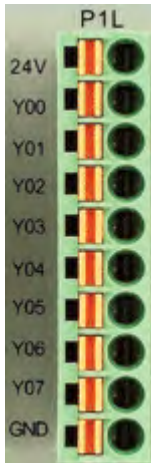


Figure 1.25 CN8 pin definition

Label	Description
24V	24V voltage output
Y00	P1 GPIO 1 output
Y01	P1 GPIO 2 input
Y02	P1 GPIO 3 output
Y03	P1 GPIO 4 output
Y04	P1 GPIO 5 output
Y05	P1 GPIO 6 output
Y06	P1 GPIO 7 output
Y07	P1 GPIO 8 output
GND	Power ground



Figure 1.26 CN9 pin definition

Label	Description
24V	24V voltage output
Y08	P1 GPIO 9 output
Y09	P1 GPIO 10 output
Y10	P1 GPIO 11 output
Y11	P1 GPIO 12 output
Y12	P1 GPIO 13 output
Y13	P1 GPIO 14 output
Y14	P1 GPIO 15 output
Y15	P1 GPIO 16 output
GND	Power ground

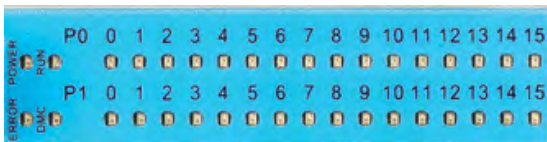


Figure 1.27 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator
P0 0~15	P0 0~15 signal output indicator
P1 0~15	P1 0~15 signal output indicator

# 1.5 ASD-DMC-RM64MN

## ■ ASD-DMC-RM64MN Overview

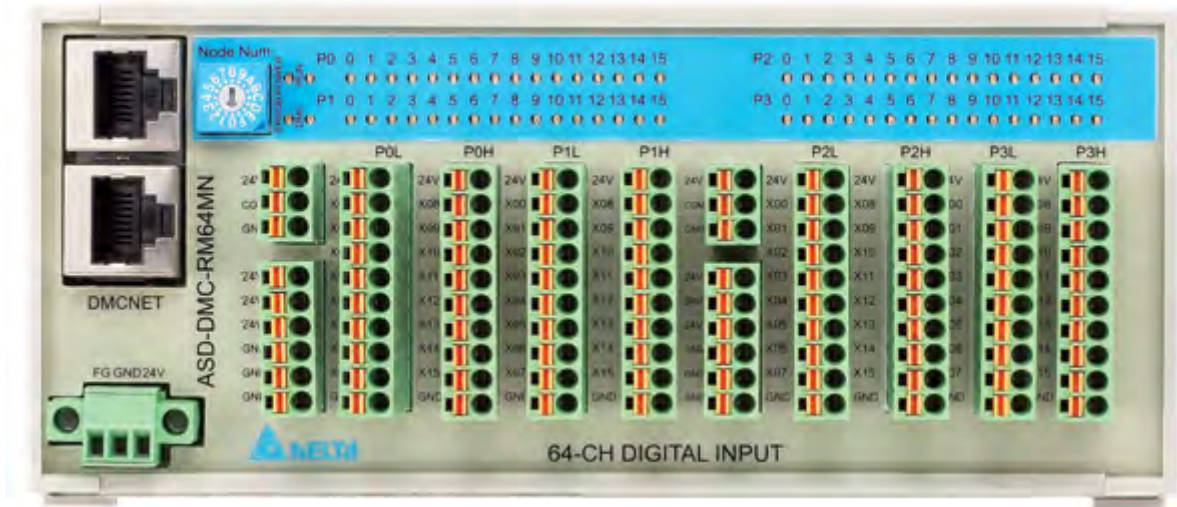


Figure 1.28 Front view

## ■ ASD-DMC-RM64MN Connection Diagram

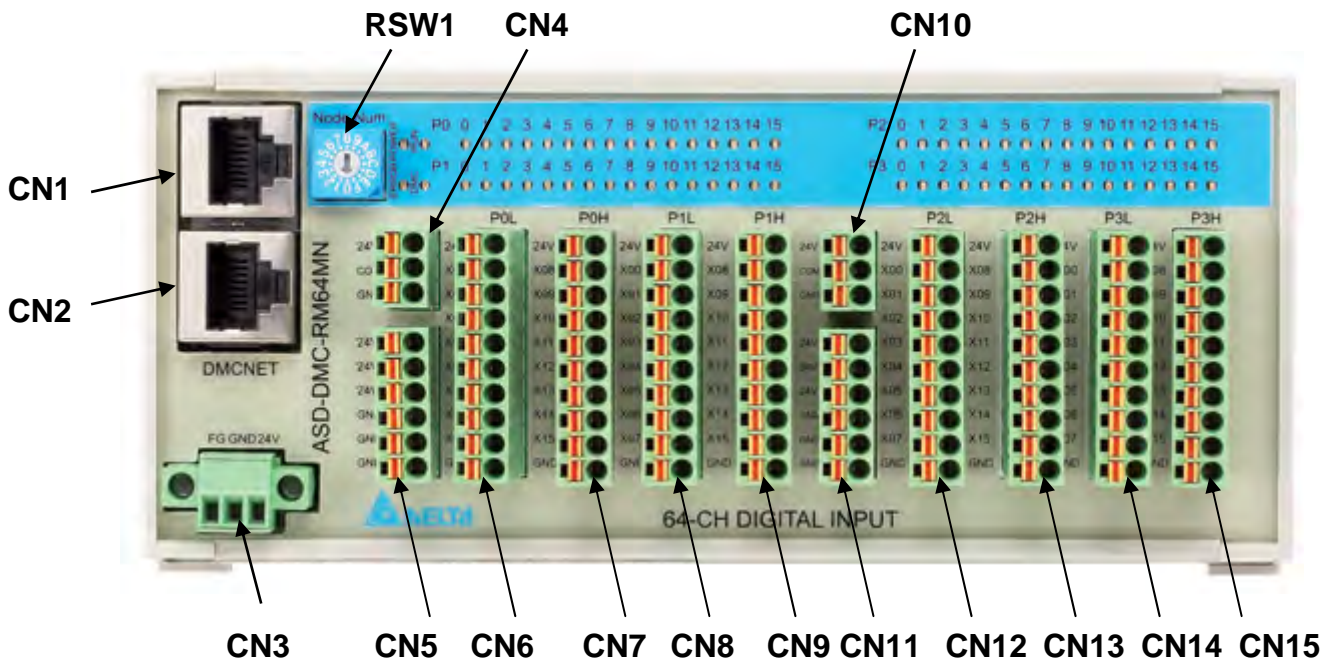


Figure 1.29 Connector diagram

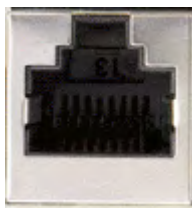
## ■ ASD-DMC-RM64MN Module and Connectors



Figure 1.30  
RSW1

Pin	Label	Description
1-9 A-F	Node Number	Node ID

- ※ Invalid when dial is turned to 0, D - F
- ※ Each module takes up one Node ID



1 8  
Figure 1.31  
CN1 and CN2  
pin definitions

Pin	Label	Description
1	RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
2	RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
3	RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
6	RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
7	GND	RS485 ground signal
8	GND	RS485 ground signal



1 2 3  
Figure 1.32  
CN3 pin definition

Pin	Label	Description
1	FG	Case ground (earth)
2	GND	Power ground
3	24V	24V voltage input

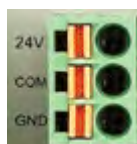


Figure 1.33 CN4 pin  
definition

Label	Description
24V	24V voltage output
COM	Common input signal
GND	Power ground

- ※ This connector is used with input signal common point for Pull high or Pull low
- ※ COM connection with 24V → Low active (Pull high, this is the default option)
- ※ COM connection with GND → High active (Pull low)
- ※ Total input voltage is 3.0A (Max)

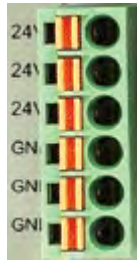


Figure 1.34  
CN5 pin definition

Label	Description
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output
GND	Power ground
GND	Power ground
GND	Power ground

Total voltage output at 24V is 1.5A (Max)



Figure 1.35  
CN6 pin definition

Label	Description
24V	24V voltage output
X00	P0 GPIO 1 input
X01	P0 GPIO 2 input
X02	P0 GPIO 3 input
X03	P0 GPIO 4 input
X04	P0 GPIO 5 input
X05	P0 GPIO 6 input
X06	P0 GPIO 7 input
X07	P0 GPIO 8 input
GND	Power ground

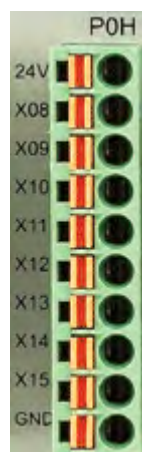


Figure 1.36 CN7 pin definition

Label	Description
24V	24V voltage output
X08	P0 GPIO 9 input
X09	P0 GPIO 10 input
X10	P0 GPIO 11 input
X11	P0 GPIO 12 input
X12	P0 GPIO 13 input
X13	P0 GPIO 14 input
X14	P0 GPIO 15 input
X15	P0 GPIO 16 input
GND	Power ground



Figure 1.37  
CN8 pin definition

Label	Description
24V	24V voltage output
X00	P1 GPIO 1 input
X01	P1 GPIO 2 input
X02	P1 GPIO 3 input
X03	P1 GPIO 4 input
X04	P1 GPIO 5 input
X05	P1 GPIO 6 input
X06	P1 GPIO 7 input
X07	P1 GPIO 8 input
GND	Power ground

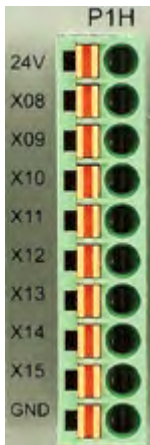


Figure 1.38  
CN9 pin definition

Label	Description
24V	24V voltage output
X08	P1 GPIO 9 input
X09	P1 GPIO 10 input
X10	P1 GPIO 11 input
X11	P1 GPIO 12 input
X12	P1 GPIO 13 input
X13	P1 GPIO 14 input
X14	P1 GPIO 15 input
X15	P1 GPIO 16 input
GND	Power ground

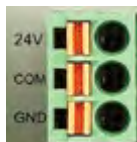


Figure 1.39  
CN10 pin definition

Label	Description
24V	24V voltage output
COM	Common input signal
GND	Power ground

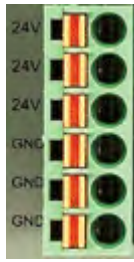


Figure 1.40  
CN11 pin definition

Label	Description
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output
GND	Power ground
GND	Power ground
GND	Power ground
24V	24V voltage output
GND	Power ground
GND	Power ground

Total voltage output at 24V is 1.5A (Max)

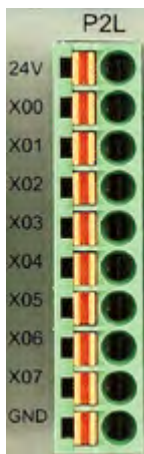


Figure 1.41 CN12 pin definition

Label	Description
24V	24V voltage output
X00	P2 GPIO 1 input
X01	P2 GPIO 2 input
X02	P2 GPIO 3 input
X03	P2 GPIO 4 input
X04	P2 GPIO 5 input
X05	P2 GPIO 6 input
X06	P2 GPIO 7 input
X07	P2 GPIO 8 input
GND	Power ground

※When P3H/P3L (3rd GPIO) is installed in MPG mode, Pin9 (P2 X00) and Pin8 (P2 X01) cannot be used.



Figure 1.42  
CN13 pin definition

Label	Description
24V	24V voltage output
X08	P2 GPIO 9 input
X09	P2 GPIO 10 input
X10	P2 GPIO 11 input
X11	P2 GPIO 12 input
X12	P2 GPIO 13 input
X13	P2 GPIO 14 input
X14	P2 GPIO 15 input
X15	P2 GPIO 16 input
GND	Power ground

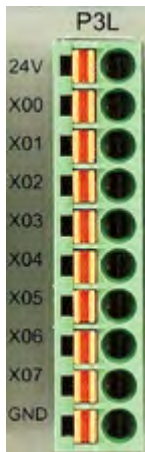


Figure 1.43  
CN14 pin definition

Label	Description	
	GPIO mode	MPG mode
24V	24V voltage output	
X00	P3 GPIO 1 input	X
X01	P3 GPIO 2 input	Y
X02	P3 GPIO 3 input	Z
X03	P3 GPIO 4 input	U
X04	P3 GPIO 5 input	x1
X05	P3 GPIO 6 input	x10
X06	P3 GPIO 7 input	x100
X07	P3 GPIO 8 input	EN
GND	Power ground	

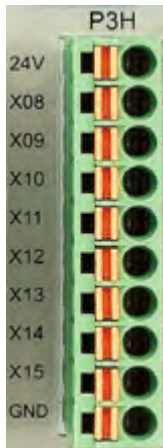


Figure 1.44  
CN15 pin definition

Label	Description	
	GPIO mode	MPG mode
E24V	24V voltage output	
X08	P3 GPIO 9 input	PA
X09	P3 GPIO 10 input	PB
X10	P3 GPIO 11 input	J1+
X11	P3 GPIO 12 input	J1-
X12	P3 GPIO 13 input	J2+
X13	P3 GPIO 14 input	J2-
X14	P3 GPIO 15 input	J3+
X15	P3 GPIO 16 input	J3-
GND	Power ground	

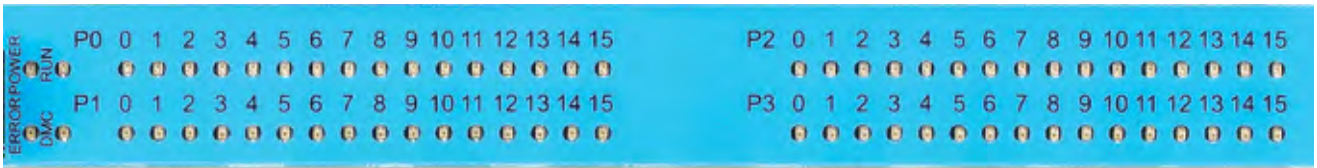


Figure 1.45 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator
P0 0~15	P0 0~15 signal input indicator
P1 0~15	P1 0~15 signal input indicator
P2 0~15	P2 0~15 signal input indicator
P3 0~15	P3 0~15 signal input indicator



# 1.6 ASD-DMC-RM64NT

## ■ ASD-DMC-RM64NT Overview

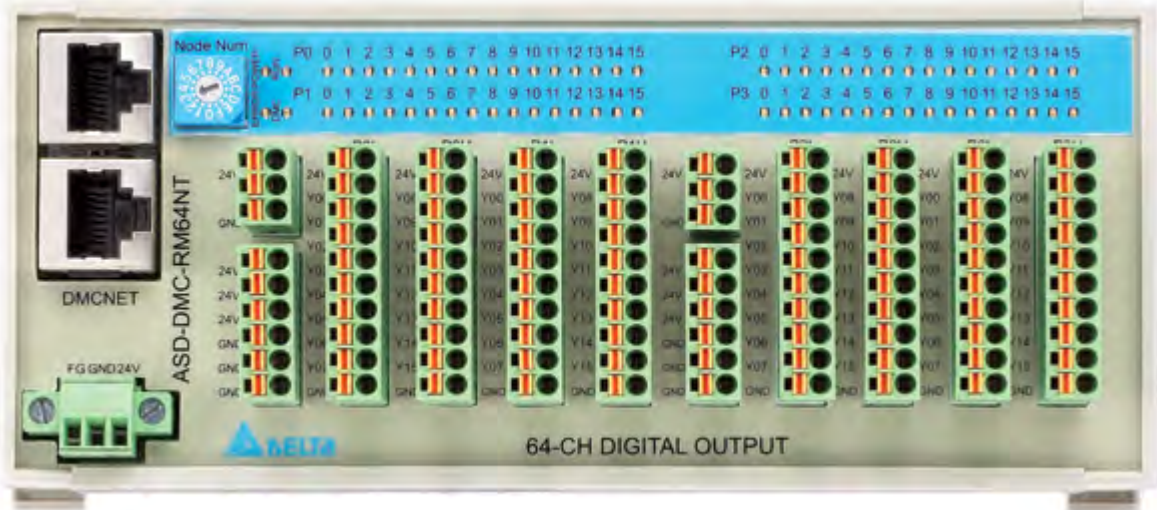


Figure 1.46 Front view

## ■ ASD-DMC-RM64NT Connection Diagram

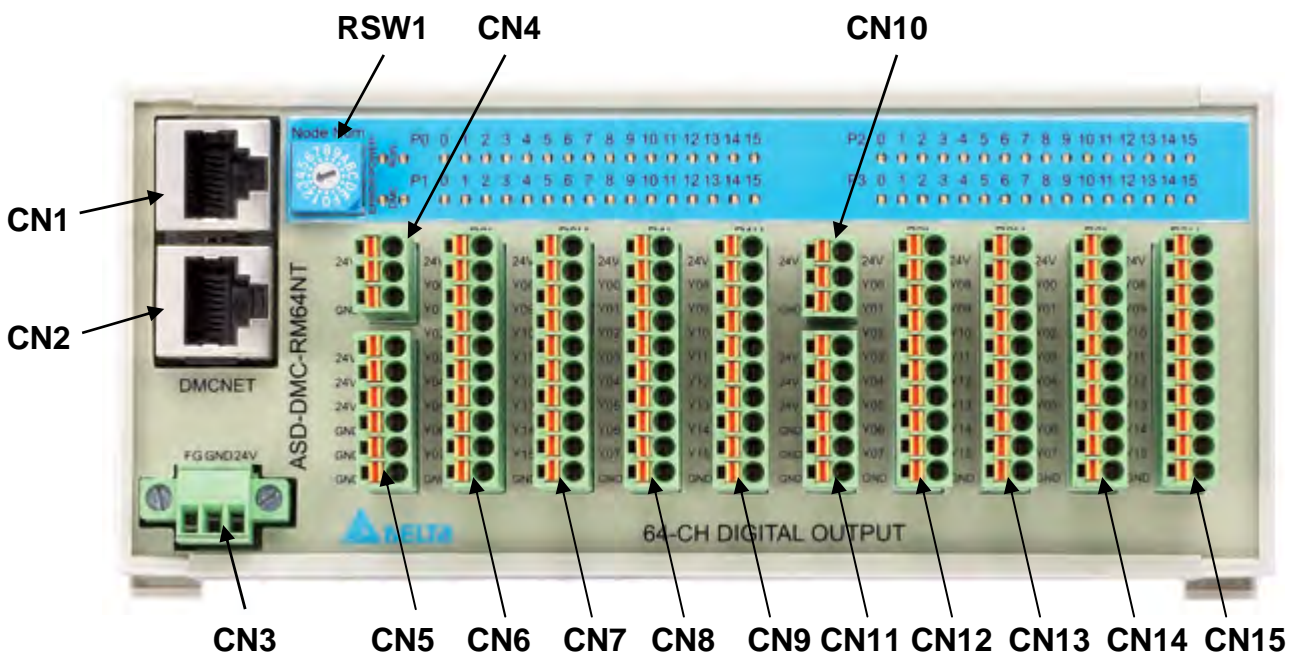


Figure 1.47 Connector diagram

■ ASD-DMC-RM64NT Module and Connectors



Figure 1.48 RSW1

Pin	Label	Description
0 ~ 9	Node Number	Node ID
A ~ F		

※ Invalid when dial is turned to 0, D - F

※ Each module takes up one Node ID



1 8

Figure 1.49  
CN1 and CN2  
pin definitions

Label	Description
RS485T_1(+)	1 <sup>st</sup> RS485 signal (+)
RS485T_1(-)	1 <sup>st</sup> RS485 signal (-)
RS485T_2(+)	2 <sup>nd</sup> RS485 signal (+)
RS485T_2(-)	2 <sup>nd</sup> RS485 signal (-)
GND	RS485 ground signal
GND	RS485 ground signal



1 2 3

Figure 1.50  
N3 pin definition

Pin	Label	Description
1	FG	Case ground (earth)
2	GND	Power ground
3	24V	24V voltage input



Figure 1.51  
CN4 pin definition

Label	Description
24V	24V voltage output
N/A	N/A
GND	Power ground

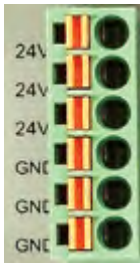


Figure 1.52

CN5 pin definition

Label	Description
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output
GND	Power ground
GND	Power ground
GND	Power ground
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output

Total voltage output at 24V is 1.5A (Max)



Figure 1.53

CN6 pin definition

Label	Description
24V	24V voltage output
Y00	P0 GPIO 1 output
Y01	P0 GPIO 2 output
Y02	P0 GPIO 3 output
Y03	P0 GPIO 4 output
Y04	P0 GPIO 5 output
Y05	P0 GPIO 6 output
Y06	P0 GPIO 7 output
Y07	P0 GPIO 8 output
GND	Power ground

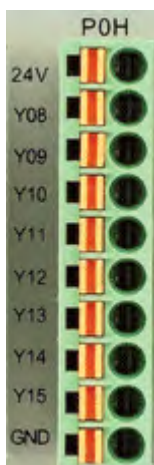


Figure 1.54

CN7 pin definition

Label	Description
24V	24V voltage output
Y08	P0 GPIO 9 output
Y09	P0 GPIO 10 output
Y10	P0 GPIO 11 output
Y11	P0 GPIO 12 output
Y12	P0 GPIO 13 output
Y13	P0 GPIO 14 output
Y14	P0 GPIO 15 output
Y15	P0 GPIO 16 output
GND	Power ground

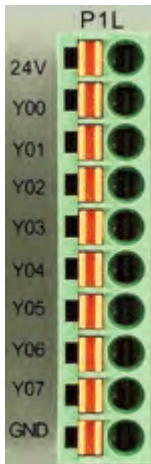


Figure 1.55  
CN8 pin definition

Label	Description
24V	24V voltage output
Y00	P1 GPIO 1 output
Y01	P1 GPIO 2 output
Y02	P1 GPIO 3 output
Y03	P1 GPIO 4 output
Y04	P1 GPIO 5 output
Y05	P1 GPIO 6 output
Y06	P1 GPIO 7 output
Y07	P1 GPIO 8 output
GND	Power ground



Figure 1.56  
CN9 pin definition

Label	Description
24V	24V voltage output
Y08	P1 GPIO 9 output
Y09	P1 GPIO 10 output
Y1	P1 GPIO 11 output
Y11	P1 GPIO 12 output
Y12	P1 GPIO 13 output
Y13	P1 GPIO 14 output
Y14	P1 GPIO 15 output
Y15	P1 GPIO 16 output
GND	Power ground

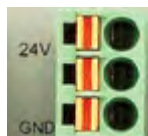


Figure 1.57  
CN10 pin definition

Label	Description
24V	24V voltage output
N/A	N/A
GND	Power ground

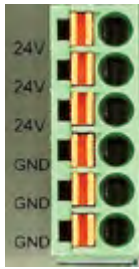


Figure 1.58 CN11 pin definition

Label	Description
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output
GND	Power ground
GND	Power ground
GND	Power ground

Total voltage output at 24V is 1.5A (Max)



Figure 1.59 CN12 pin definition

Label	Description
24V	24V voltage output
Y00	P2 GPIO 1 output
Y01	P2 GPIO 2 output
Y02	P2 GPIO 3 output
Y03	P2 GPIO 4 output
Y04	P2 GPIO 5 output
Y05	P2 GPIO 6 output
Y06	P2 GPIO 7 output
Y07	P2 GPIO 8 output
GND	Power ground



Figure 1.60 CN13 pin definition

Label	Description
24V	24V voltage output
Y08	P2 GPIO 9 output
Y09	P2 GPIO 10 output
Y10	P2 GPIO 11 output
Y11	P2 GPIO 12 output
Y12	P2 GPIO 13 output
Y13	P2 GPIO 14 output
Y14	P2 GPIO 15 output
Y15	P2 GPIO 16 output
GND	Power ground

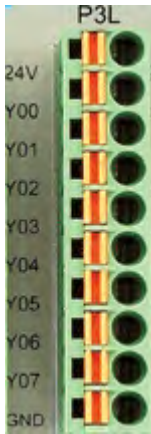


Figure 1.61  
CN14 pin definition

Label	Description
24V	24V voltage output
Y00	P3 GPIO 1 output
Y01	P3 GPIO 2 output
Y02	P3 GPIO 3 output
Y03	P3 GPIO 4 output
Y04	P3 GPIO 5 output
Y05	P3 GPIO 6 output
Y06	P3 GPIO 7 output
Y07	P3 GPIO 8 output
GND	Power ground



Figure 1.62  
CN15 pin definition

Label	Description
24V	24V voltage output
Y08	P3 GPIO 9 output
Y09	P3 GPIO 10 output
Y10	P3 GPIO 11 output
Y11	P3 GPIO 12 output
Y12	P3 GPIO 13 output
Y13	P3 GPIO 14 output
Y14	P3 GPIO 15 output
Y15	P3 GPIO 16 output
GND	Power ground

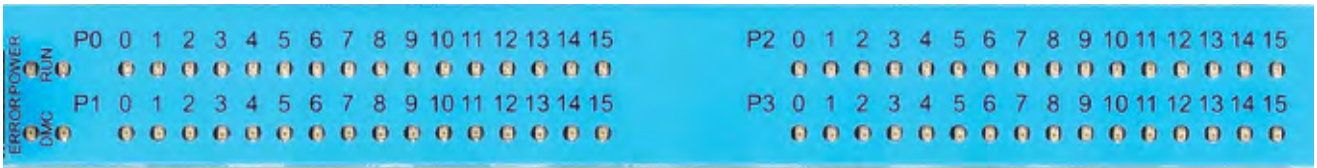


Figure 1.63 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator
P0 0~15	P0 0~15 signal output indicator
P1 0~15	P1 0~15 signal output indicator
P2 0~15	P2 0~15 signal output indicator
P3 0~15	P3 0~15 signal output indicator

## 1.7 ASD-DMC-RM04PI

### ASD-DMC-RM04PI Overview

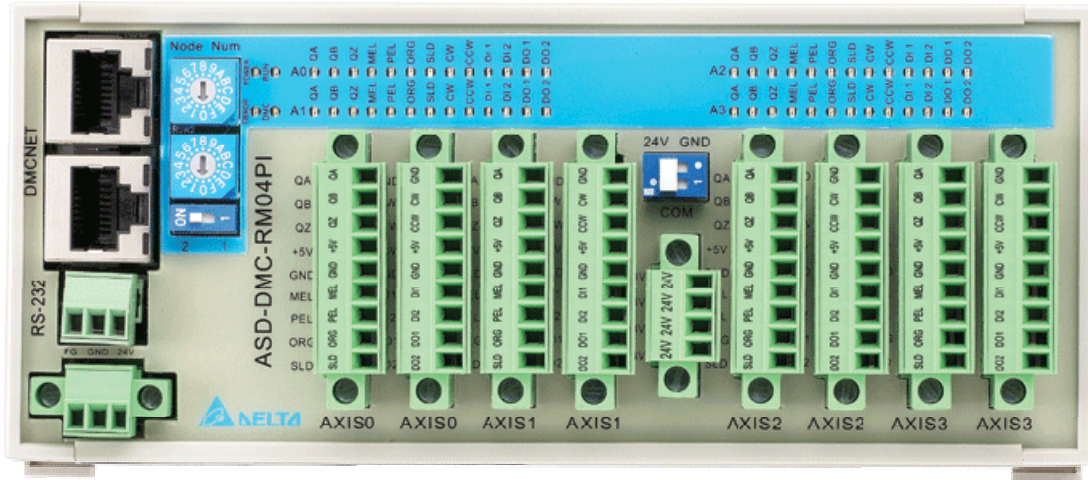


Figure 1.64 Front view

### ASD-DMC-RM04PI Connection Diagram

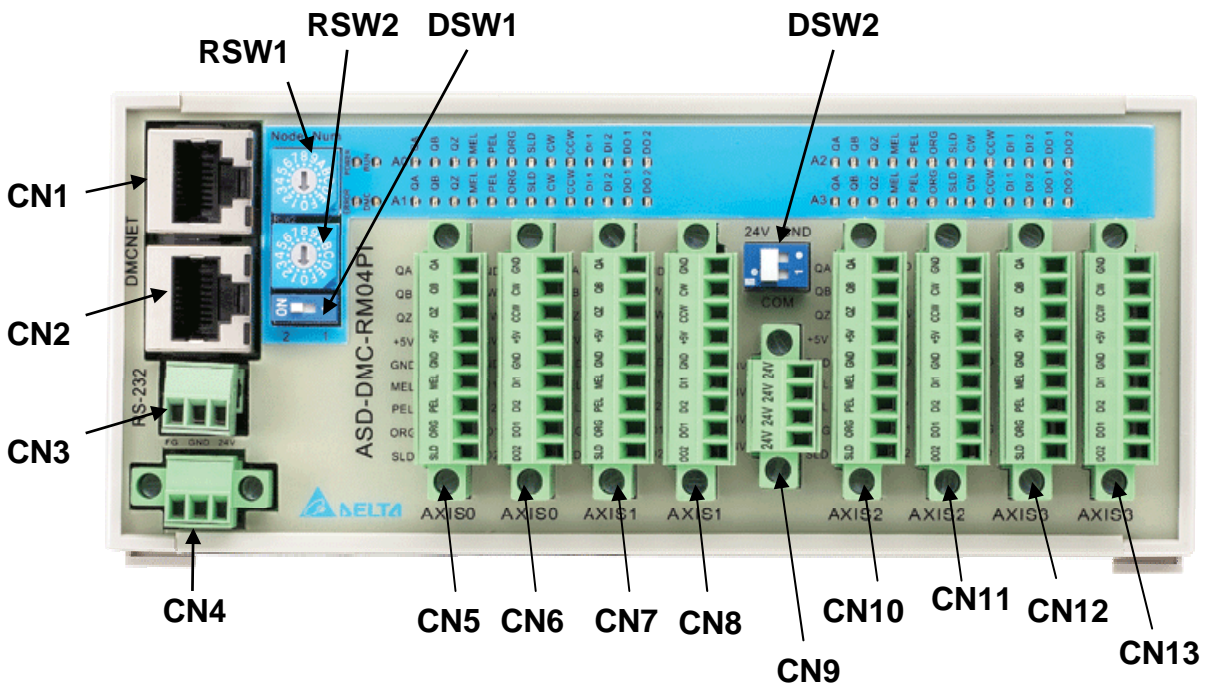


Figure 1.65 Connector diagram



■ ASD-DMC-RM04PI Module and Connectors



Figure 1.66  
RSW1 and RSW2

Pin	Label	Description
1~12	Node Number	Starting Node ID (RSW1)
1~12	Node Number	End Node ID (RSW2)

※When DSW1 is switched to 1 (mode 1), since RM04PI only takes up one node at this time, dials RSW1 and RSW2 must be set to the same value.

※When DSW1 is set to ON (mode 2), as one RM04PI can take up to 4 nodes (Axis 0 ~ Axis 3), the interval between RSW1 and RSW2 must not exceed 3. RSW1 must also be set as the starting Node and RSW2 set as the end Node. (ex. Change RSW1 to 5, change RSW2 to 8).



Figure 1.67  
DSW1

Pin	Label	Description
1	MODE_1	Operation mode 1
ON	MODE_2	Operation mode 2

※Adjust the operation mode based on operating requirements



Figure 1.68  
DSW2

Pin	Label	Description
1	GND	(Reserved)
ON	E24V	SINK type

※Set SINK type for 04PI module based on the type of circuit connection.



1 8  
Figure 1.69  
CN1 and CN2  
pin definitions

Pin	Label	Description
1	RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
2	RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
3	RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
6	RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
7	EGND	RS485 ground signal
8	EGND	RS485 ground signal



1 2 3

Figure 1.70

CN3 pin definition

Pin	Label	Description
3	GND	Port ground
2	RS232_TX	Serial port TX port
1	RS232_RX	Serial port RX port

※ DSUB9 female port is used here (cable-side)

※ This port is used for updating the module firmware program



1 2 3 4

Figure 1.71

CN4 pin definition

Pin	Label	Description
3	E24V	24V voltage input
2	GND	Power ground
1	FG	Case ground (earth)



Figure 1.72

CN5 pin definition

Label	Description
QA	0 <sup>th</sup> axis Encoder A phase signal input
QB	0 <sup>th</sup> axis Encoder B phase signal input
QZ	0 <sup>th</sup> axis Encoder Z phase signal input
+5V	5V voltage output
GND	Power ground
MEL	0 <sup>th</sup> axis negative limit signal input
PEL	0 <sup>th</sup> axis positive limit signal input
ORG	0 <sup>th</sup> axis home limit signal input
SLD	0 <sup>th</sup> axis slow down signal input



Figure 1.73  
CN6 pin definition

Label	Description
GND	Power ground
C	0 <sup>th</sup> axis motor clockwise rotation signal input
CCW	0 <sup>th</sup> axis motor CCW rotation signal input
+5V	5V voltage output
GND	Power ground
DI1	0 <sup>th</sup> axis digital signal input 1
DI2	0 <sup>th</sup> axis digital signal input 2
DO1	0 <sup>th</sup> axis digital signal output 1
DO2	0 <sup>th</sup> axis digital signal output 2



Figure 1.74  
CN7 pin definition

Label	Description
QA	1 <sup>st</sup> axis Encoder A phase signal input
QB	1 <sup>st</sup> axis Encoder B phase signal input
QZ	1 <sup>st</sup> axis Encoder Z phase signal input
+5V	5V voltage output
GND	Power ground
MEL	1 <sup>st</sup> axis negative limit signal input
PEL	1 <sup>st</sup> axis positive limit signal input
ORG	1 <sup>st</sup> axis home limit signal input
SLD	1 <sup>st</sup> axis slow down signal input



Figure 1.75  
CN8 pin definition

Label	Description
GND	Power ground
CW	1 <sup>st</sup> axis motor clockwise rotation signal input
CCW	1 <sup>st</sup> axis motor CCW rotation signal input
+5V	5V voltage output
GND	Power ground
DI1	1 <sup>st</sup> axis digital signal input 1
DI2	1 <sup>st</sup> axis digital signal input 2
DO1	1 <sup>st</sup> axis digital signal output 1
DO2	1 <sup>st</sup> axis digital signal output 2



Figure 1.76  
CN9 pin definition

Label	Description
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output

Total voltage output at 24V is 0.75A (Max)



Figure 1.77  
CN10 pin definition

Label	Description
QA	2 <sup>nd</sup> axis Encoder A phase signal input
QB	2 <sup>nd</sup> axis Encoder B phase signal input
QZ	2 <sup>nd</sup> axis Encoder Z phase signal input
+5V	5V voltage output
GND	Power ground
MEL	2 <sup>nd</sup> axis negative limit signal input
PEL	2 <sup>nd</sup> axis positive limit signal input
ORG	2 <sup>nd</sup> axis home limit signal input
SLD	2 <sup>nd</sup> axis slow down signal input



Figure 1.78  
CN11 pin definition

Label	Description
GND	Power ground
CW	2 <sup>nd</sup> axis motor clockwise rotation signal input
CCW	2 <sup>nd</sup> axis motor CCW rotation signal input
+5V	5V voltage output
GND	Power ground
DI1	2 <sup>nd</sup> axis digital signal input 1
DI2	2 <sup>nd</sup> axis digital signal input 2
DO1	2 <sup>nd</sup> axis digital signal output 1
DO2	2 <sup>nd</sup> axis digital signal output 2



Figure 1.79  
CN12 pin definition

Label	Description
QA	3 <sup>rd</sup> axis Encoder A phase signal input
QB	3 <sup>rd</sup> axis Encoder B phase signal input
QZ	3 <sup>rd</sup> axis Encoder Z phase signal input
+5V	5V voltage output
GND	Power ground
MEL	3 <sup>rd</sup> axis negative limit signal input
PEL	3 <sup>rd</sup> axis positive limit signal input
ORG	3 <sup>rd</sup> axis home limit signal input
SLD	3 <sup>rd</sup> axis slow down signal input



Figure 1.80  
CN13 pin definition

Label	Description
GND	Power ground
CW	3 <sup>rd</sup> axis motor clockwise rotation signal input
CCW	3 <sup>rd</sup> axis motor CCW rotation signal input
+5V	5V voltage output
GND	Power ground
DI1	3 <sup>rd</sup> axis digital signal input 1
DI2	3 <sup>rd</sup> axis digital signal input 2
DO1	3 <sup>rd</sup> axis digital signal output 1
DO2	3 <sup>rd</sup> axis digital signal output 2



Figure 1.81 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator
Axis 0 QA~DO2	0 <sup>th</sup> axis signal output indicator
Axis 1 QA~DO2	1 <sup>st</sup> axis signal output indicator
Axis 2 QA~DO2	2 <sup>nd</sup> axis signal output indicator
Axis 3 QA~DO2	3 <sup>rd</sup> axis signal output indicator

# 1.8 ASD-DMC-RM04DA

## ■ ASD-DMC-RM04DA Overview

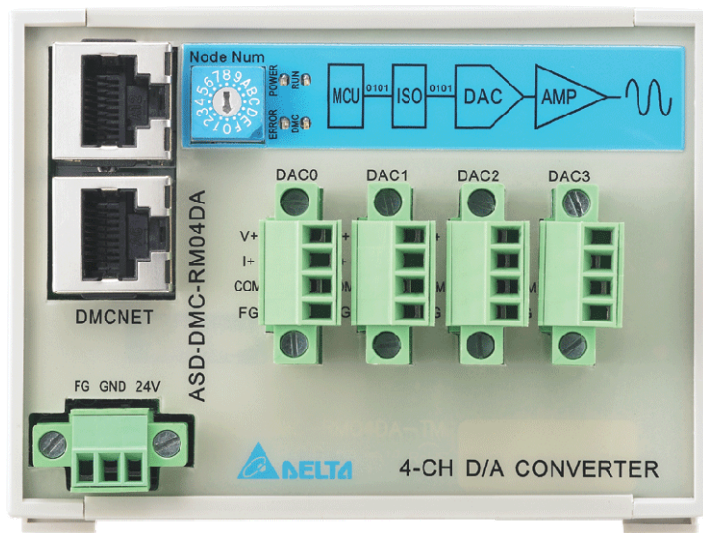


Figure 1.82 Front view

## ■ ASD-DMC-RM04DA Connection Diagram

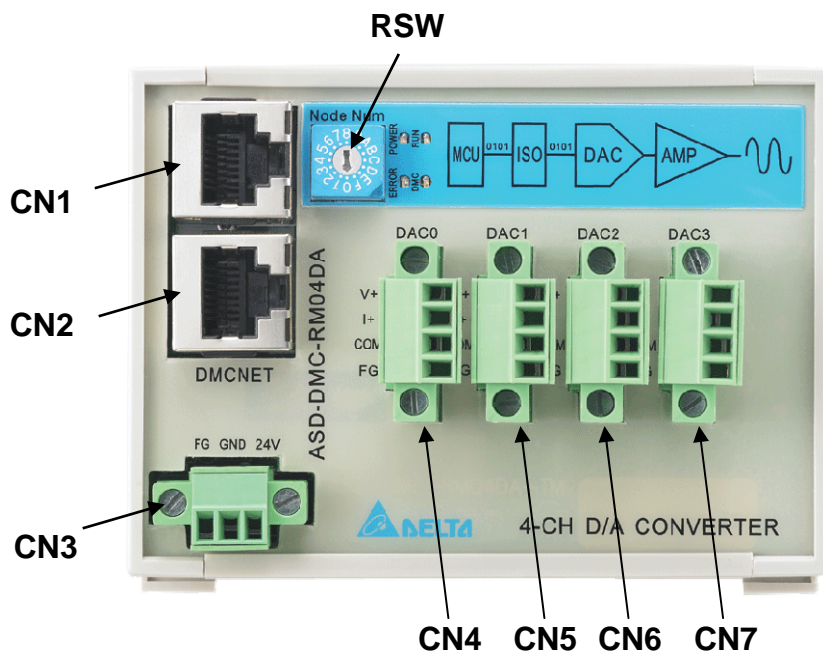


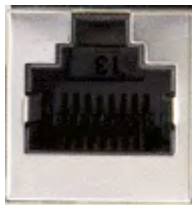
Figure 1.83 Connector name location map

■ ASD-DMC-RM04DA Module and Connectors



Figure 1.84 RSW

Pin	Label	Description
1-12	Node Number	Starting Node ID



1 8

Figure 1.85  
CN1 and CN2  
pin definitions

Pin	Label	Description
1	RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
2	RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
3	RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
6	RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
7	EGND	RS485 ground signal
8	EGND	RS485 ground signal



1 2 3

Figure 1.86  
CN3 pin definition

Pin	Label	Description
3	E24V	24V voltage input
2	GND	Power ground
1	FG	Case ground (earth)



1  
2  
3

Figure 1.87  
CN4 pin definition

Pin	Label	Description
1	V+	Voltage Output 1 (-10 ~ 10V)
2	I+	Current Output 1 (0 ~ 24mA)
3	COM	Common point
4	FG	Case ground (earth)





Figure 1.88

CN5 pin definition

Pin	Label	Description
1	V+	Voltage Output 2 (-10 ~ 10V)
2	I+	Current Output 2 (0 ~ 24mA)
3	COM	Common point
4	FG	Case ground (earth)



Figure 1.89

CN6 pin definition

Pin	Label	Description
1	V+	Voltage Output 3 (-10 ~ 10V)
2	I+	Current Output 3 (0 ~ 24mA)
3	COM	Common point
4	FG	Case ground (earth)



Figure 1.90

CN7 pin definition

Pin	Label	Description
1	V+	Voltage Output 4 (-10 ~ 10V)
2	I+	Current Output 4 (0 ~ 24mA)
3	COM	Common point
4	FG	Case ground (earth)

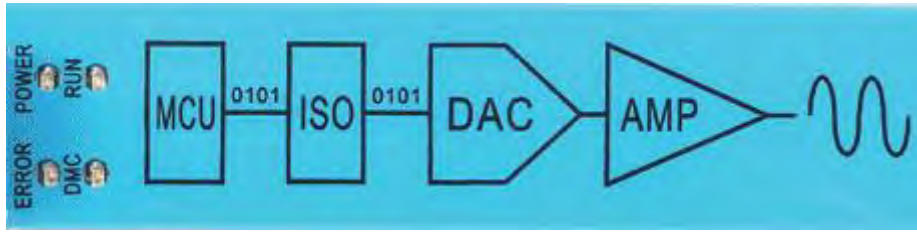


Figure 1.91 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator

## 1.9 ASD-DMC-RM04AD

### ■ ASD-DMC-RM04AD Overview

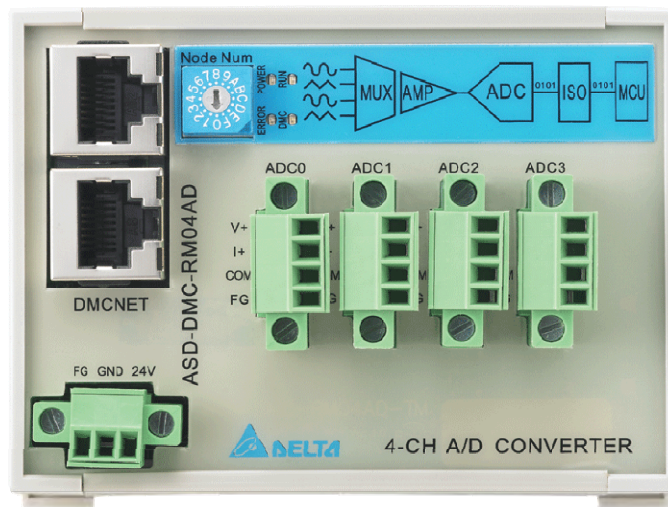


Figure 1.92 Front view

### ■ ASD-DMC-RM04AD Connection Diagram

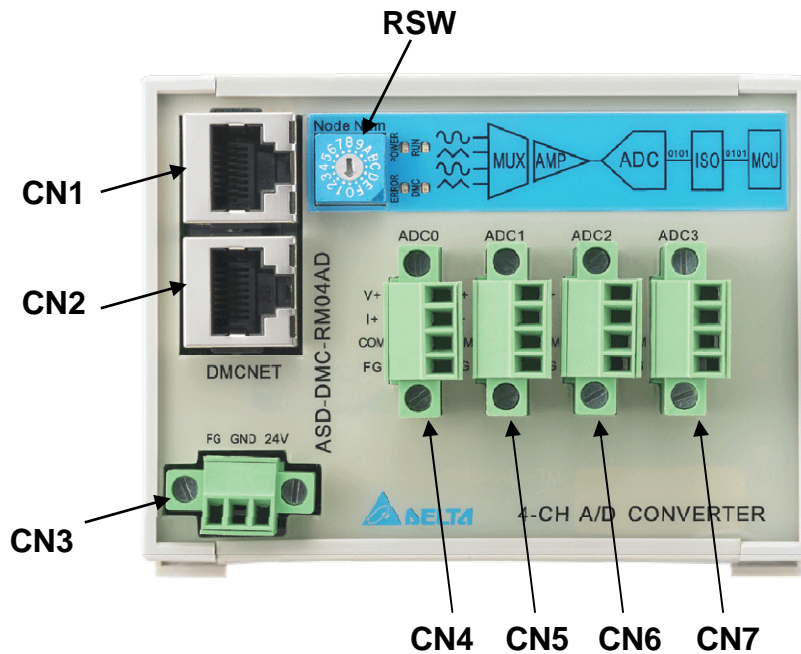


Figure 1.93 Connector diagram

■ ASD-DMC-RM04AD Module and Connectors



Figure 1.94 RSW

Pin	Label	Description
1–12	Node Number	Starting Node ID



1 8

Figure 1.95  
CN1 and CN2  
pin definitions

Pin	Label	Description
1	RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
2	RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
3	RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
6	RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
7	EGND	RS485 ground signal
8	EGND	RS485 ground signal



1 2 3

Figure 1.96  
CN3 pin definition

Pin	Label	Description
3	E24V	24V voltage input
2	GND	Power ground
1	FG	Case ground (earth)



1  
2  
3

Figure 1.97  
CN4 pin definition

Pin	Label	Description
1	V+	Voltage input 1
2	I+	Current input 1
3	COM	Common point
4	FG	Case ground (earth)



1  
2  
3

Figure 1.98  
CN5 pin definition

Pin	Label	Description
1	V+	Voltage input 2
2	I+	Current input 2
3	COM	Common point
4	FG	Case ground (earth)

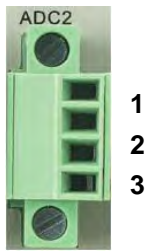


Figure 1.99

CN6 pin definition

Pin	Label	Description
1	V+	Voltage input 3
2	I+	Current input 3
3	COM	Common point
4	FG	Case ground (earth)



Figure 1.100

CN7 pin definition

Pin	Label	Description
1	V+	Voltage input 4
2	I+	Current input 4
3	COM	Common point
4	FG	Case ground (earth)

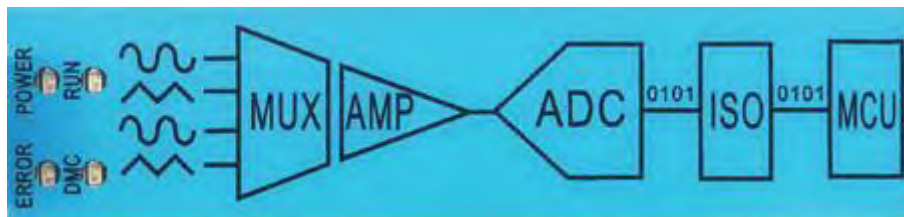


Figure 1.101 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator

# 1.10 ASD-DMC-RM32PT

## ■ ASD-DMC-RM32PT Overview

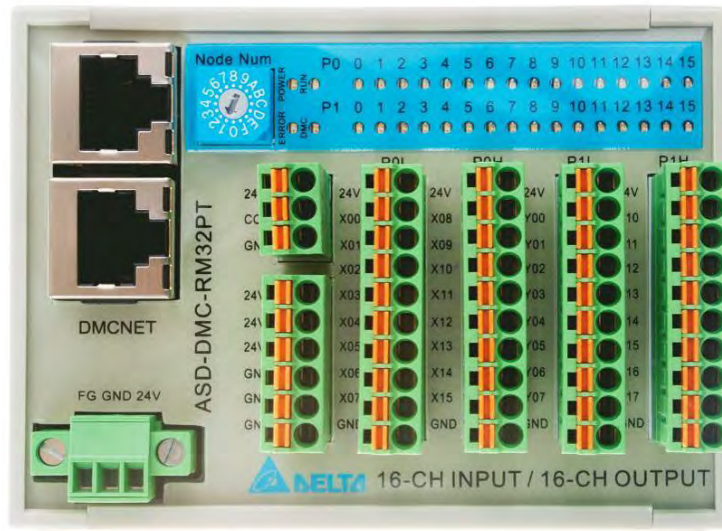


Figure 1.102 Front view

## ■ ASD-DMC-RM32PT Connection Diagram

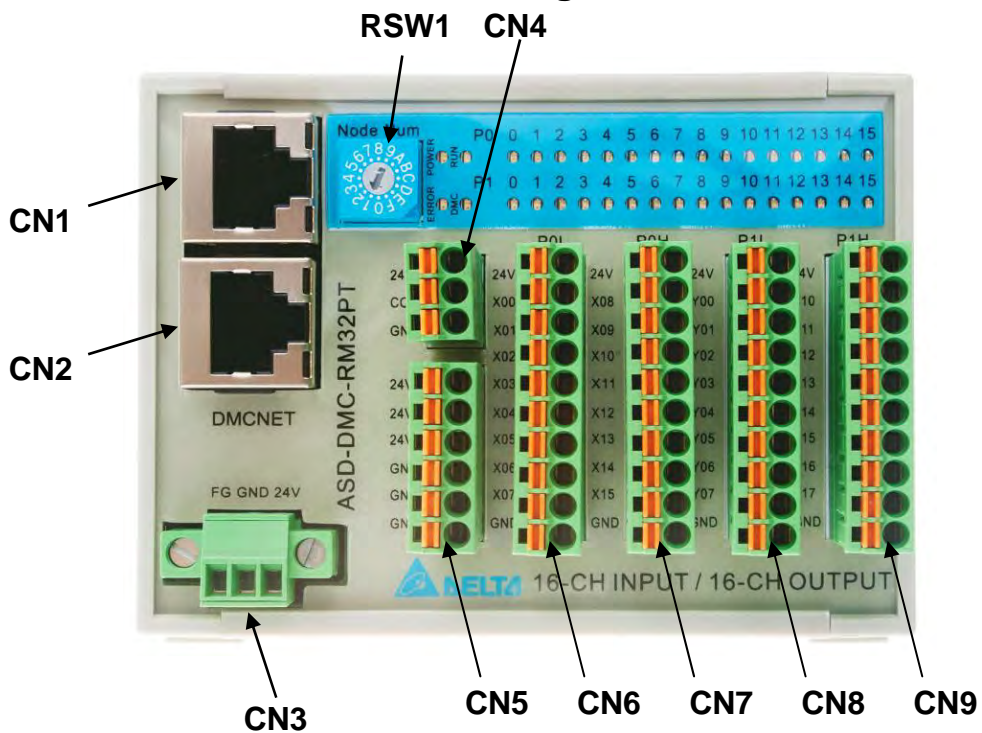


Figure 1.103 Connector diagram

■ ASD-DMC-RM32PT Module and Connectors



Figure 1.104 RSW1

Pin	Label	Description
1 – 9 A – F	Node Number	Node ID

※Invalid when dial is turned to 0, D - F

※Each module takes up one Node ID



1 8

Figure 1.105  
CN1 and CN2  
pin definitions

Pin	Label	Description
1	RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
2	RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
3	RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
6	RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
7	EGND	RS485 ground signal
8	EGND	RS485 ground signal



1 2 3

Figure 1.106  
CN3 pin definition

Pin	Label	Description
3	E24V	24V voltage input
2	GND	Power ground
1	FG	Case ground (earth)



Figure 1.107  
CN4 pin definition

Pin	Label	Description
3	E24V	24V voltage output
2	COM	Common input signal
1	GND	Power ground

※This connector is used with common point for Pull high or Pull low

※COM connection with 24V →Low active (Pull high, this is the default option)

※COM connection with GND →High active (Pull low)

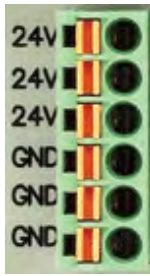


Figure 1.108

CN5 pin definition

Label	Description
24V	24V voltage output
24V	24V voltage output
24V	24V voltage output
GND	Power ground
GND	Power ground
GND	Power ground

Total voltage output at 24V is 1.5A (Max)

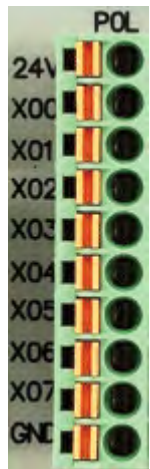


Figure 1.109

CN6 pin definition

Label	Description
24V	24V voltage output
X00	P0 GPIO 1 input
X01	P0 GPIO 2 input
X02	P0 GPIO 3 input
X03	P0 GPIO 4 input
X04	P0 GPIO 5 input
X05	P0 GPIO 6 input
X06	P0 GPIO 7 input
X07	P0 GPIO 8 input
GND	Power ground



Figure 1.110

CN7 pin definition

Label	Description
24V	24V voltage output
X08	P0 GPIO 9 input
X09	P0 GPIO 10 input
X10	P0 GPIO 11 input
X11	P0 GPIO 12 input
X12	P0 GPIO 13 input
X13	P0 GPIO 14 input
X14	P0 GPIO 15 input
X15	P0 GPIO 16 input
GND	Power ground



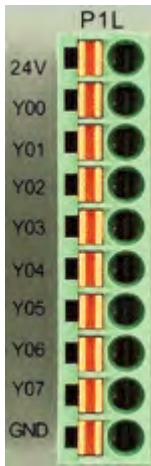


Figure 1.111

CN6 pin definition

Label	Description
24V	24V voltage output
Y00	P1 GPIO 1 output
Y01	P1 GPIO 2 output
Y02	P1 GPIO 3 output
Y03	P1 GPIO 4 output
Y04	P1 GPIO 5 output
Y05	P1 GPIO 6 output
Y06	P1 GPIO 7 output
Y07	P1 GPIO 8 output
GND	Power ground

※Output from one GPIO is 0.1 A(Max)



Figure 1.112

CN7 pin definition

Label	Description
24V	24V voltage output
Y08	P1 GPIO 9 output
Y09	P1 GPIO 10 output
Y10	P1 GPIO 11 output
Y11	P1 GPIO 12 output
Y12	P1 GPIO 13 output
Y13	P1 GPIO 14 output
Y14	P1 GPIO 15 output
Y15	P1 GPIO 16 output
GND	Power ground



Figure 1.113 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator
P0 0~15	P0 0~15 signal input indicator
P1 0~15	P1 0~15 signal input indicator

## 1.11 ASD-DMC-RM64MN1

### ■ ASD-DMC-RM64MN1 Overview

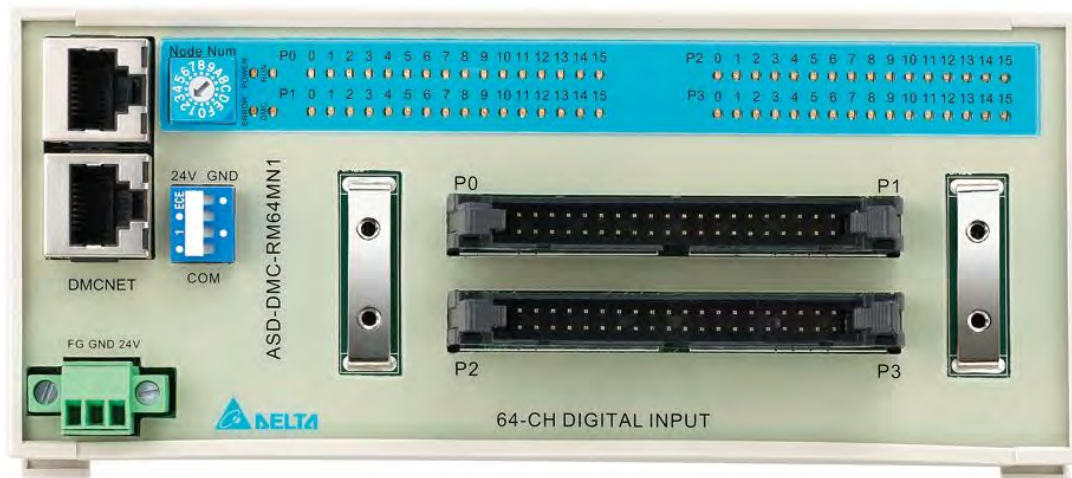


Figure 1.114 Front view

### ■ ASD-DMC-RM64MN1 Connection Diagram

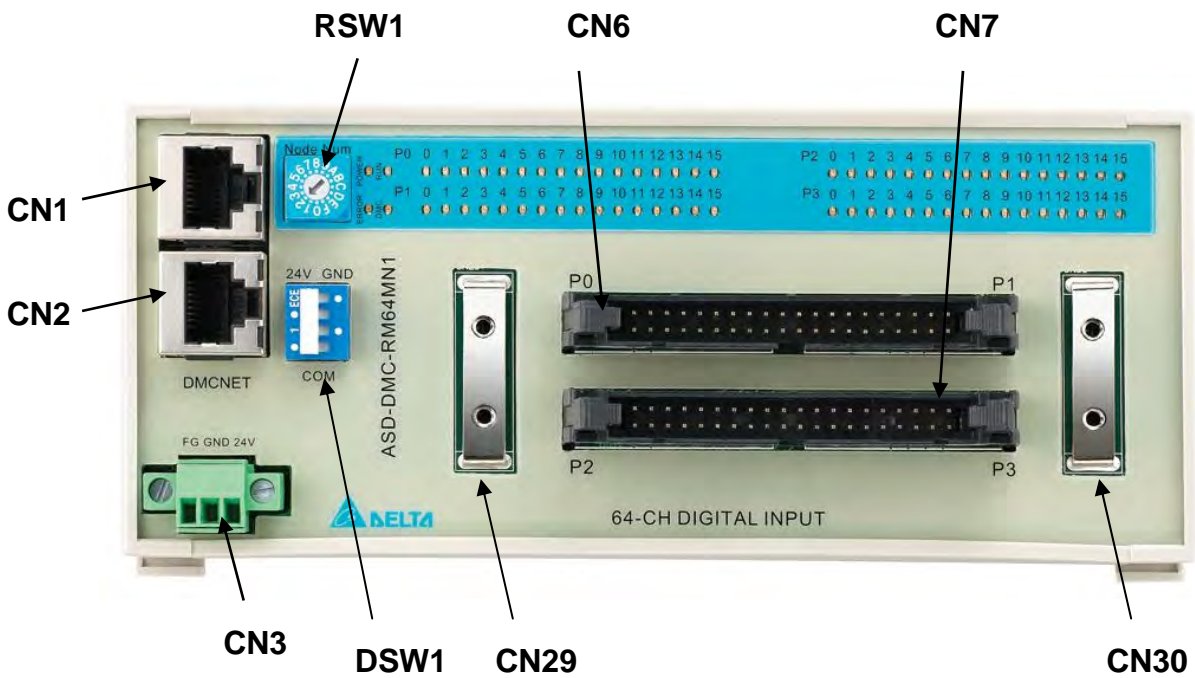


Figure 1.115 Connector diagram

■ ASD-DMC-RM64MN1 Module and Connectors



Figure 1.116 RSW1

Pin	Label	Description
1-9 A-F	Node Number	Node ID

- ※Invalid when dial is turned to 0, D - F
- ※Each module takes up one Node ID



1 8

Figure 1.117  
CN1 and CN2  
pin definitions

Pin	Label	Description
1	RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
2	RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
3	RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
6	RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
7	GND	RS485 ground signal
8	GND	RS485 ground signal



1 2 3

Figure 1.118  
CN3 pin definition

Pin	Label	Description
1	FG	Case ground (earth)
2	GND	Power ground
3	24V	24V voltage input



Figure 1.119 DSW1 pin  
definition

Label	Description
24V	24V voltage output
COM	Common input signal
GND	Power ground

- ※This connector is used with common point for Pull high or Pull low
- ※COM connected with 24V (move to location marked 1) → Low active (Pull high)
- ※COM connection with GND → High active (Pull low)
- ※Total input voltage is 3.0A (Max)



※This is a metallic fastener used for connecting and securing the customer's own terminal board.

Figure 1.120  
CN29 & CN30



Figure 1.121  
CN6 pin definition

Pin	Description	Pin	Description
01	P0 GPIO 1 input	02	P0 GPIO 2 input
03	P0 GPIO 3 input	04	P0 GPIO 4 input
05	P0 GPIO 5 input	06	P0 GPIO 6 input
07	P0 GPIO 7 input	08	P0 GPIO 8 input
09	P0 GPIO 9 input	10	P0 GPIO 10 input
11	P0 GPIO 11 input	12	P0 GPIO 12 input
13	P0 GPIO 13 input	14	P0 GPIO 14 input
15	P0 GPIO 15 input	16	P0 GPIO 16 input
17	Power ground	18	Power ground
19	24V voltage output	20	24V voltage output
21	P1 GPIO 1 input	22	P1 GPIO 2 input
23	P1 GPIO 3 input	24	P1 GPIO 4 input
25	P1 GPIO 5 input	26	P1 GPIO 6 input
27	P1 GPIO 7 input	28	P1 GPIO 8 input
29	P1 GPIO 9 input	30	P1 GPIO 10 input
31	P1 GPIO 11 input	32	P1 GPIO 12 input
33	P1 GPIO 13 input	34	P1 GPIO 14 input
35	P1 GPIO 15 input	36	P1 GPIO 16 input
37	Power ground	38	Power ground
39	24V voltage output	40	24V voltage output



Figure 1.122  
CN7 pin definition

Pin	Description	Pin	Description
01	P2 GPIO 1 input	02	P2 GPIO 2 input
03	P2 GPIO 3 input	04	P2 GPIO 4 input
05	P2 GPIO 5 input	06	P2 GPIO 6 input
07	P2 GPIO 7 input	08	P2 GPIO 8 input
09	P2 GPIO 9 input	10	P2 GPIO 10 input
11	P2 GPIO 11 input	12	P2 GPIO 12 input
13	P2 GPIO 13 input	14	P2 GPIO 14 input
15	P2 GPIO 15 input	16	P2 GPIO 16 input
17	Power ground	18	Power ground
19	24V voltage output	20	24V voltage output
21	P3 GPIO 1 input	22	P3 GPIO 2 input
23	P3 GPIO 3 input	24	P3 GPIO 4 input
25	P3 GPIO 5 input	26	P3 GPIO 6 input
27	P3 GPIO 7 input	28	P3 GPIO 8 input
29	P3 GPIO 9 input	30	P3 GPIO 10 input
31	P3 GPIO 11 input	32	P3 GPIO 12 input
33	P3 GPIO 13 input	34	P3 GPIO 14 input
35	P3 GPIO 15 input	36	P3 GPIO 16 input
37	Power ground	38	Power ground
39	24V voltage output	40	24V voltage output

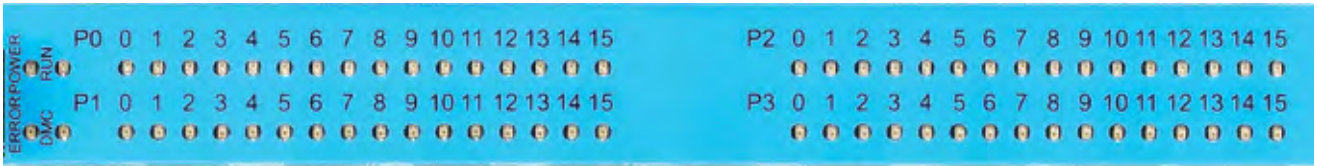


Figure 1.123 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator
P0 0~15	P0 0~15 signal input indicator
P1 0~15	P1 0~15 signal input indicator
P2 0~15	P2 0~15 signal input indicator
P3 0~15	P3 0~15 signal input indicator

## 1.12 ASD-DMC-RM64NT1

### ■ ASD-DMC-RM64NT1 Overview

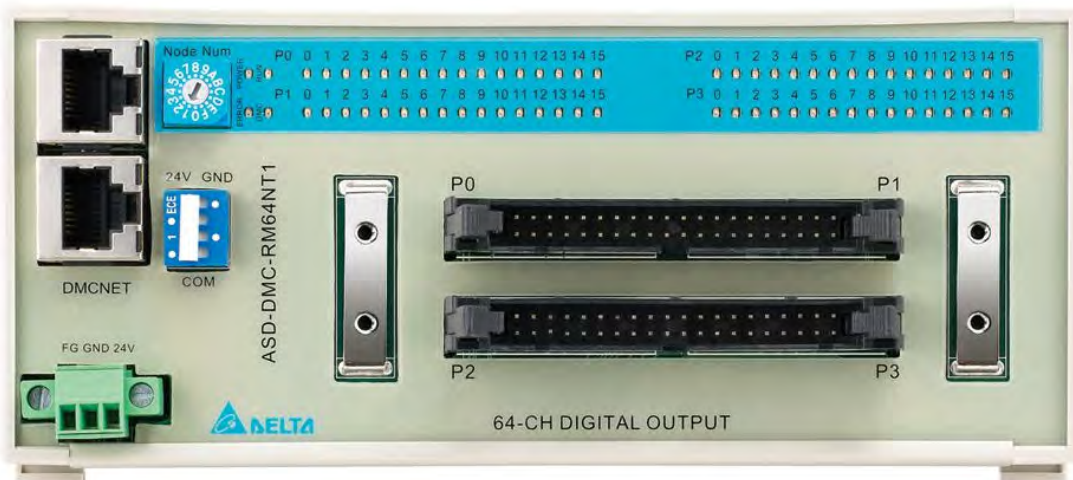


Figure 1.124 Front view

### ■ ASD-DMC-RM64NT1 Connection Diagram

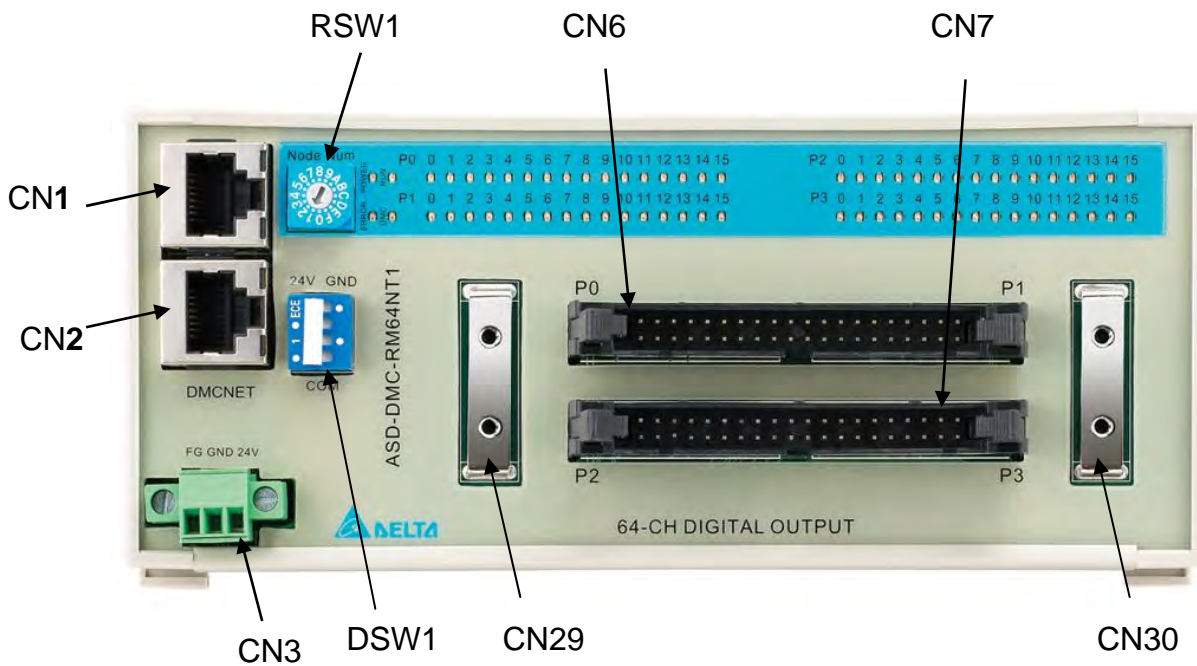


Figure 1.125 Connector diagram

■ **ASD-DMC-RM64NT1 Module and Connectors**



Figure 1.126 RSW1

Pin	Label	Description
0 – 9	Node Number	Node ID
A – F		

※Invalid when dial is turned to 0, D - F

※Each module takes up one Node ID



1 8

Figure 1.127  
CN1 and CN2  
pin definitions

Label	Description
RS485T_1(+)	1 <sup>st</sup> RS485 transmission signal (+)
RS485T_1(-)	1 <sup>st</sup> RS485 transmission signal (-)
RS485T_2(+)	2 <sup>nd</sup> RS485 transmission signal (+)
RS485T_2(-)	2 <sup>nd</sup> RS485 transmission signal (-)
GND	RS485 ground signal
GND	RS485 ground signal



1 2 3

Figure 1.128  
CN3 pin definition

Pin	Label	Description
1	FG	Case ground (earth)
2	GND	Power ground
3	24V	24V voltage input



Figure 1.129

DSW1 pin definition

Label	Description
24V	24V voltage output
N/A	N/A
GND	Power ground





※This is a metallic fastener used for connecting and securing the customer's own terminal board.

Figure 1.130  
CN29 & CN30



Figure 1.131 CN7 pin  
definition

Pin	Description	Pin	Description
01	P0 GPIO 1 output	02	P0 GPIO 2 output
03	P0 GPIO 3 output	04	P0 GPIO 4 output
05	P0 GPIO 5 output	06	P0 GPIO 6 output
07	P0 GPIO 7 output	08	P0 GPIO 8 output
09	P0 GPIO 9 output	10	P0 GPIO 10 output
11	P0 GPIO 11 output	12	P0 GPIO 12 output
13	P0 GPIO 13 output	14	P0 GPIO 14 output
15	P0 GPIO 15 output	16	P0 GPIO 16 output
17	Power ground	18	Power ground
19	24V voltage output	20	24V voltage output
21	P1 GPIO 1 output	22	P1 GPIO 2 output
23	P1 GPIO 3 output	24	P1 GPIO 4 output
25	P1 GPIO 5 output	26	P1 GPIO 6 output
27	P1 GPIO 7 output	28	P1 GPIO 8 output
29	P1 GPIO 9 output	30	P1 GPIO 10 output
31	P1 GPIO 11 output	32	P1 GPIO 12 output
33	P1 GPIO 13 output	34	P1 GPIO 14 output
35	P1 GPIO 15 output	36	P1 GPIO 16 output
37	Power ground	38	Power ground
39	24V voltage output	40	24V voltage output



Figure 1.132 CN7 pin definition

Pin	Description	Pin	Description
01	P2 GPIO 1 output	02	P2 GPIO 2 output
03	P2 GPIO 3 output	04	P2 GPIO 4 output
05	P2 GPIO 5 output	06	P2 GPIO 6 output
07	P2 GPIO 7 output	08	P2 GPIO 8 output
09	P2 GPIO 9 output	10	P2 GPIO 10 output
11	P2 GPIO 11 output	12	P2 GPIO 12 output
13	P2 GPIO 13 output	14	P2 GPIO 14 output
15	P2 GPIO 15 output	16	P2 GPIO 16 output
17	Power ground	18	Power ground
19	24V voltage output	20	24V voltage output
21	P3 GPIO 1 output	22	P3 GPIO 2 output
23	P3 GPIO 3 output	24	P3 GPIO 4 output
25	P3 GPIO 5 output	26	P3 GPIO 6 output
27	P3 GPIO 7 output	28	P3 GPIO 8 output
29	P3 GPIO 9 output	30	P3 GPIO 10 output
31	P3 GPIO 11 output	32	P3 GPIO 12 output
33	P3 GPIO 13 output	34	P3 GPIO 14 output
35	P3 GPIO 15 output	36	P3 GPIO 16 output
37	Power ground	38	Power ground
39	24V voltage output	40	24V voltage output



Figure 1.133 LED definition

Label	Description
POWER	Voltage status indicator
RUN	Operation indicator
ERROR	Error indicator
DMC	DMC communication indicator
P0 0~15	P0 0~15 signal output indicator
P1 0~15	P1 0~15 signal output indicator
P2 0~15	P2 0~15 signal output indicator
P3 0~15	P3 0~15 signal output indicator

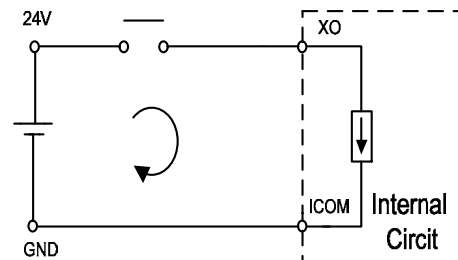
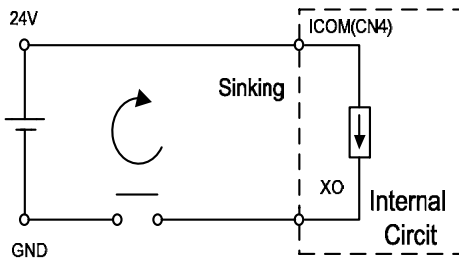
### 1.13 Wiring Example

#### ■ Wiring of RM32MN/RM32PT/RM64MN/RM64MN1 Digital Input

Connection Type

Type 1: SINK (Current flows into common point)

Type 2: SOURCE (current flows from common point)

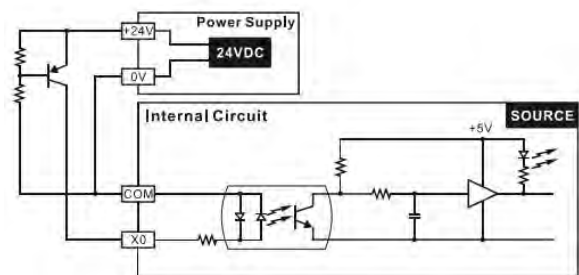
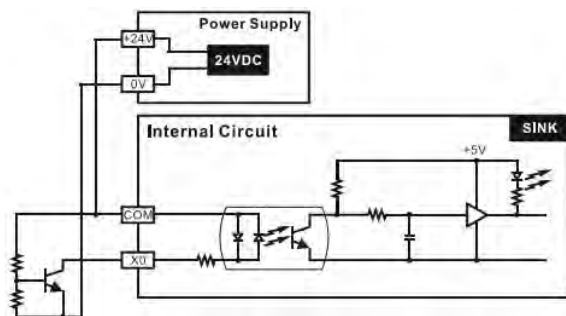


SINK type wiring

SOURCE type wiring

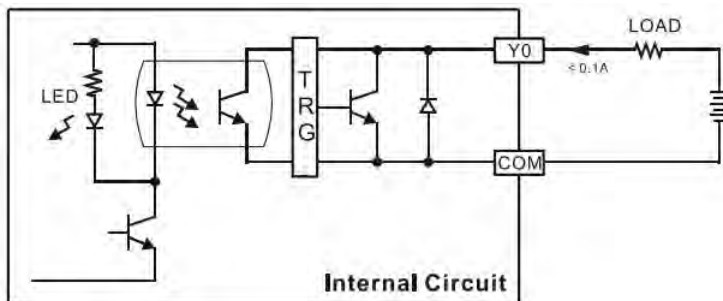
Equivalent circuit (Digital Input)

Equivalent circuit (Digital Input)



#### ■ Wiring of RM32NT/RM32PT/RM64NT/RM64NT1 Digital Output

Connection type: transistor T

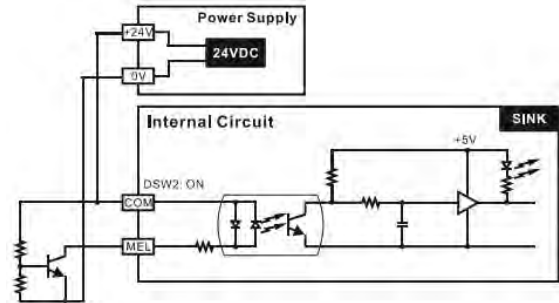
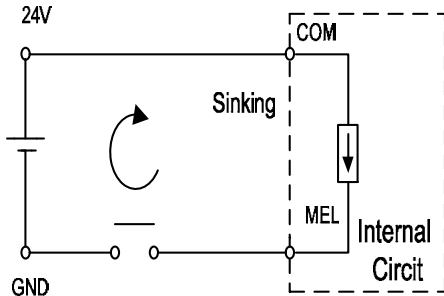


■ **Wiring of RM04PI Digital Input (MEL, PEL, ORG, SLD)**

Connection Type: SINK

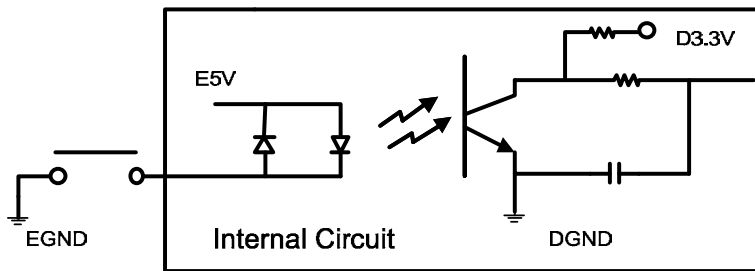
SINK (Current flows into common point)

SINK type connection (Input point loop equivalent circuit)



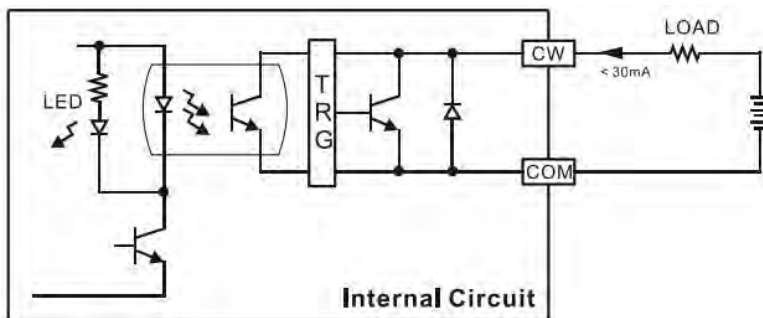
■ **Wiring of RM04PI Digital Input (DI1, DI2)**

SINK type connection (equivalent circuit (digital input))



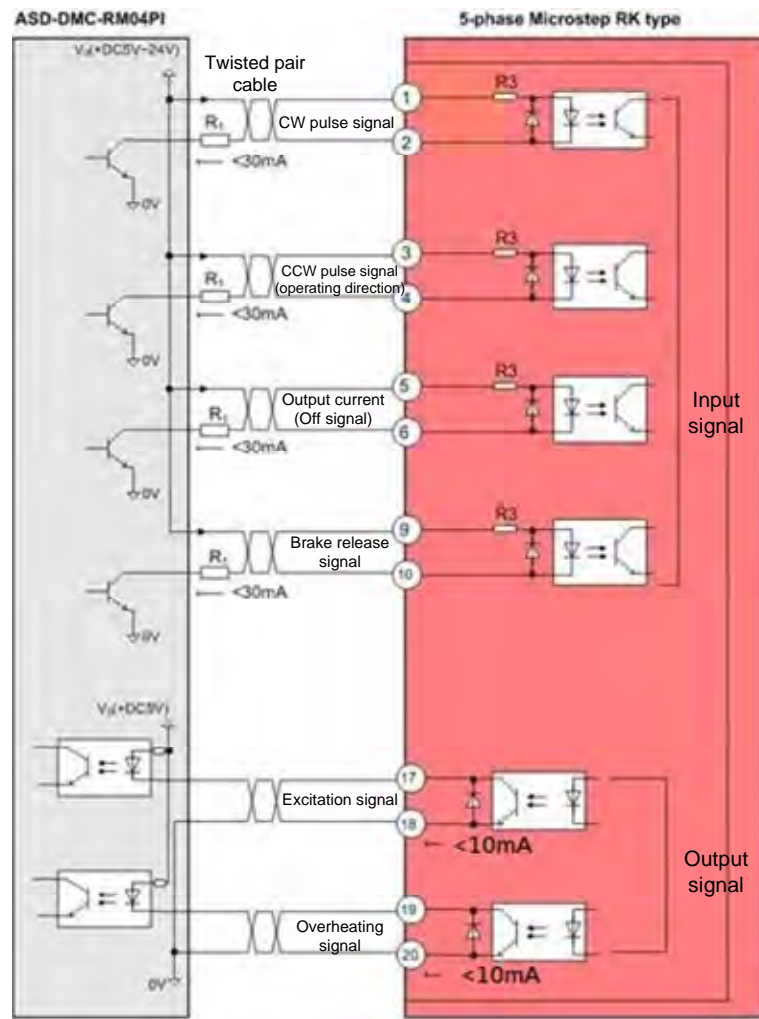
■ **Wiring of RM04PI Digital Output (CW, CCW, D01, D02)**

Connection type: transistor T



■ **RM04PI Connection to Stepping Drive**

Diagram of connection to 5-phase stepping drive



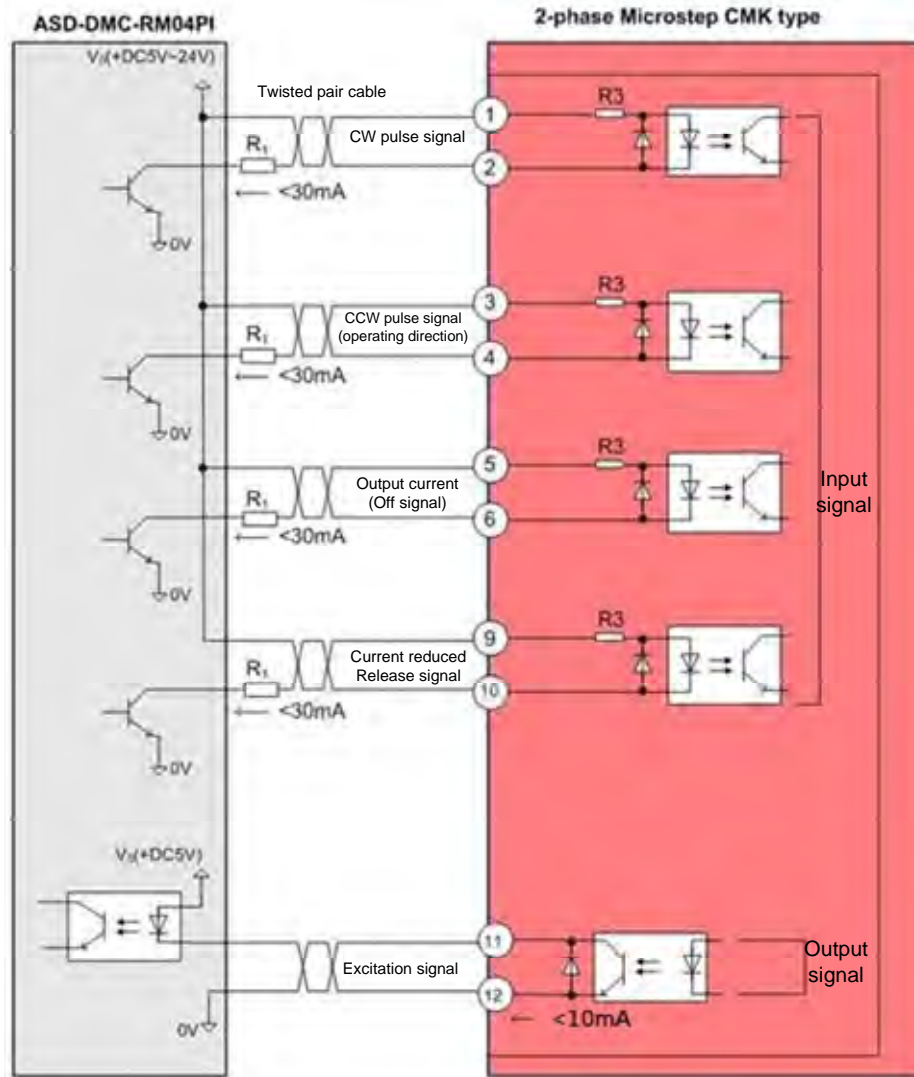
PIN	RM04PI Signal mark	Corresponding step number	PIN	RM04PI signal mark	Corresponding step number
8	CW	②	4	DI1	⑰
7	CCW	④	3	DI2	⑱
6	+5V	①, ③, ⑤, ⑨	2	DO1	⑥
5	GND	⑱, ⑳	1	DO2	⑩

The table for external power supply and corresponding series resistor is shown below:

External power voltage (Vo)	External series resistor (R1)
5V	External resistor not needed
24V	2.2KΩ/2W

If the wiring environment has more ambient noise or involves longer wiring distances, a 24V DC external power supply is recommended instead.

Diagram of connection to 2-phase stepping drive



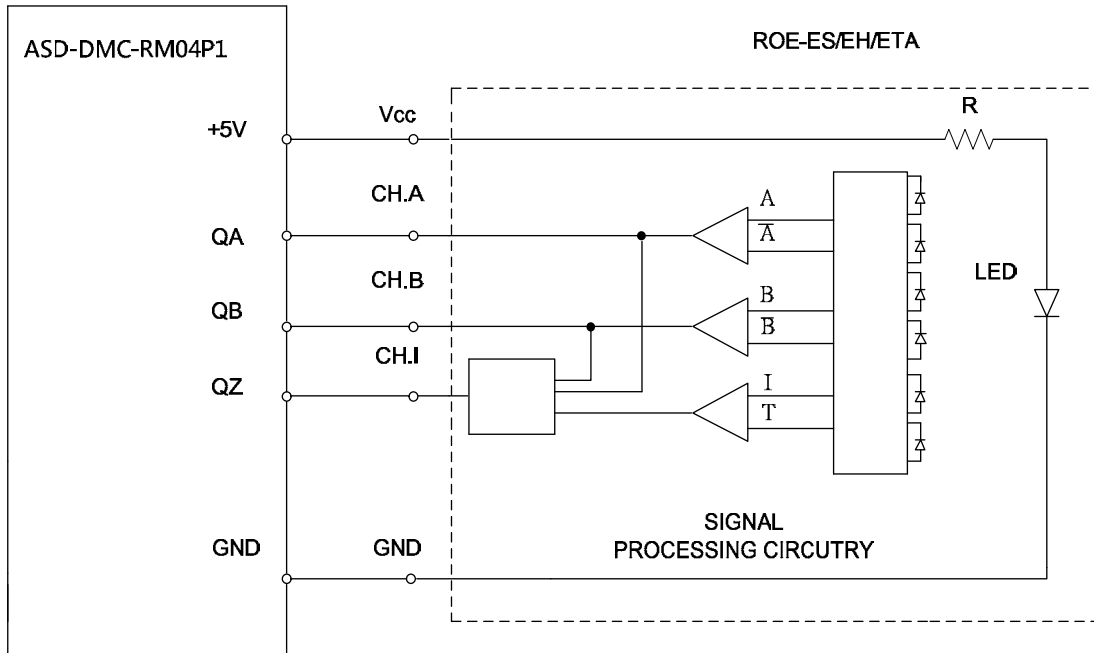
PIN	RM04PI Signal mark	Corresponding Step number	PIN	RM04PI Signal mark	Corresponding Step number
8	CW	②	4	DI1	⑪
7	CCW	④	3	DI2	
6	+5V	①, ③, ⑤, ⑨	2	DO1	⑥
5	GND	⑫	1	DO2	⑩

The table for external power supply and corresponding series resistor is shown below:

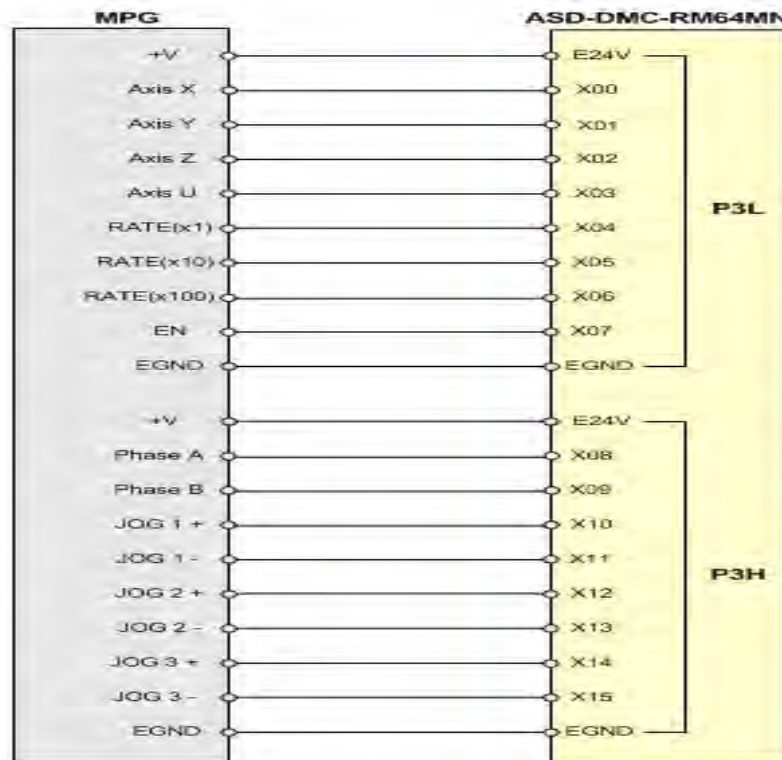
External power voltage (Vo)	External series resistor (R1)
5V	External resistor not needed
24V	2.2KΩ/2W

If the wiring environment has more ambient noise or involves longer wiring distances, a 24V DC external power supply is recommended instead.

■ **RM04PI Connection to Encoder**

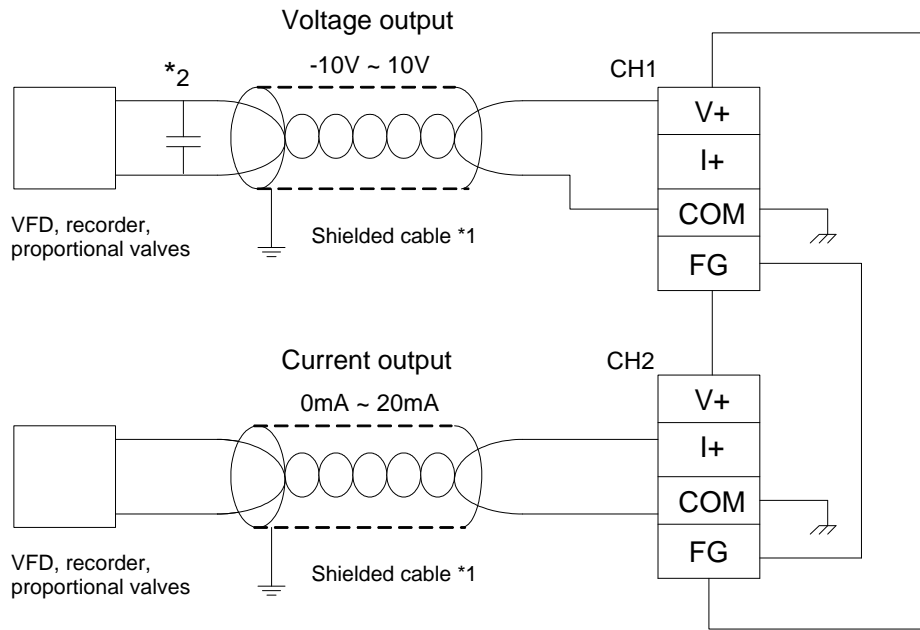


■ **RM64MN Connection to MPG**

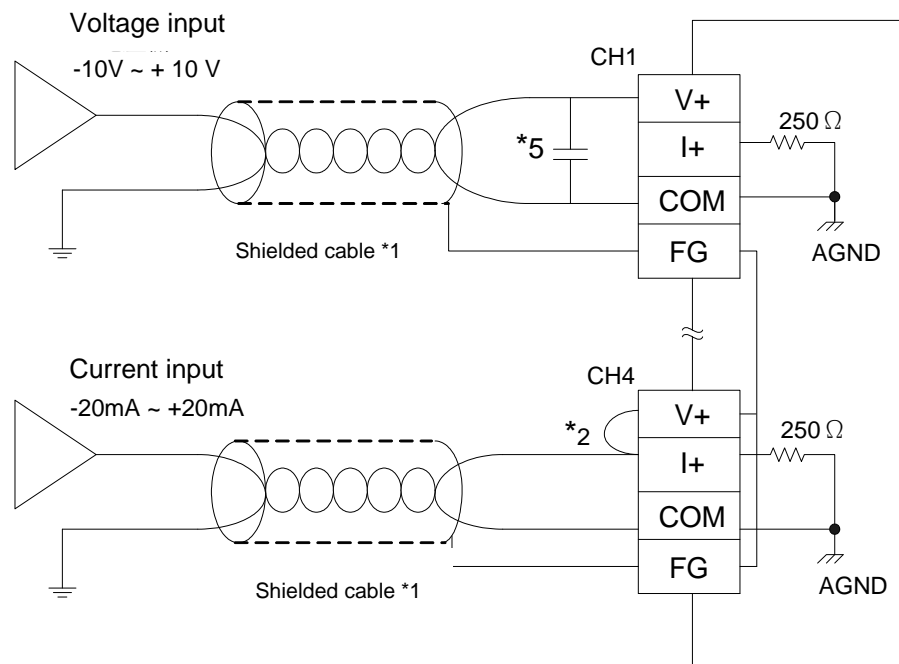




■ **Wiring Diagram for RM04DA Output Point**



■ **Wiring Diagram for RM04AD Output Point**



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# Chapter 2 Using EzDMC

## 2.1 Launching the Program

The connected device, gateway module and motion controller card must first be connected using CAT5e networking cables. The gateway module must also be provided with a 24VDC power supply.

When the connected remote DI module (RM32MN/RM64MN) device is low active, connect the COM port on DI module with 24V power (Pin2 and Pin3 on CN4) to ensure that the module has a normal display. If the device is high-active, then connect the COM port to GND.

Only turn on the power once you have checked that all the hardware is connected properly. Wait for the power indicators on the device and module to light up before running the program (EzDMC.exe) on the CD to control the module.

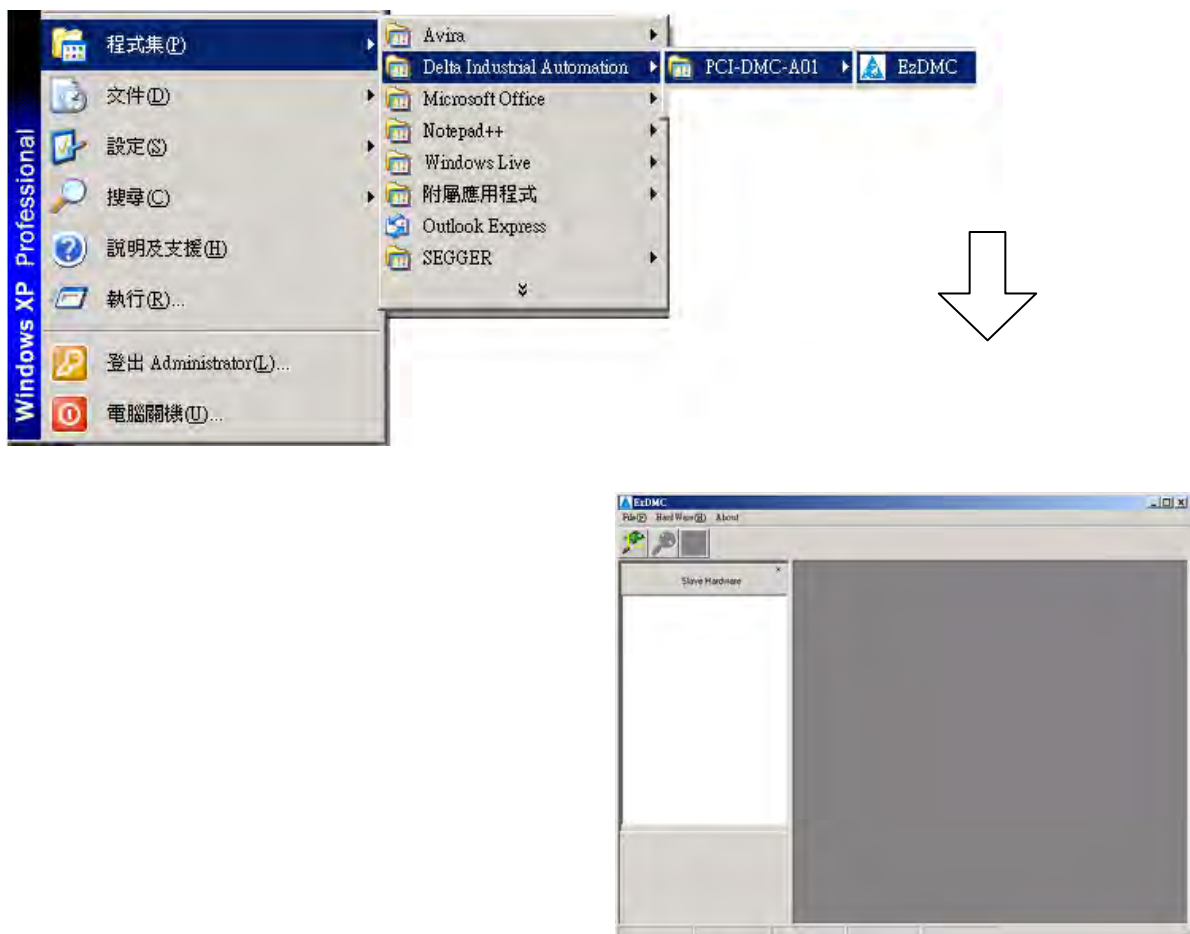


Figure 2.1 Launching the EzDMC program

## 2.2 Connecting to Gateway Module

After launching the EzDMC program, click on the “Search Card” button. When the program has found the PCI-DMC-01 interface on the system, select the icon for the card, and then click on the “Scan Slave” button to find the connected Remote module. (For a more detailed description of the EzDMC program interface and operating instructions, please refer to the “PCI-DMC-A01/PCI-DMC-B01 User Guide”).

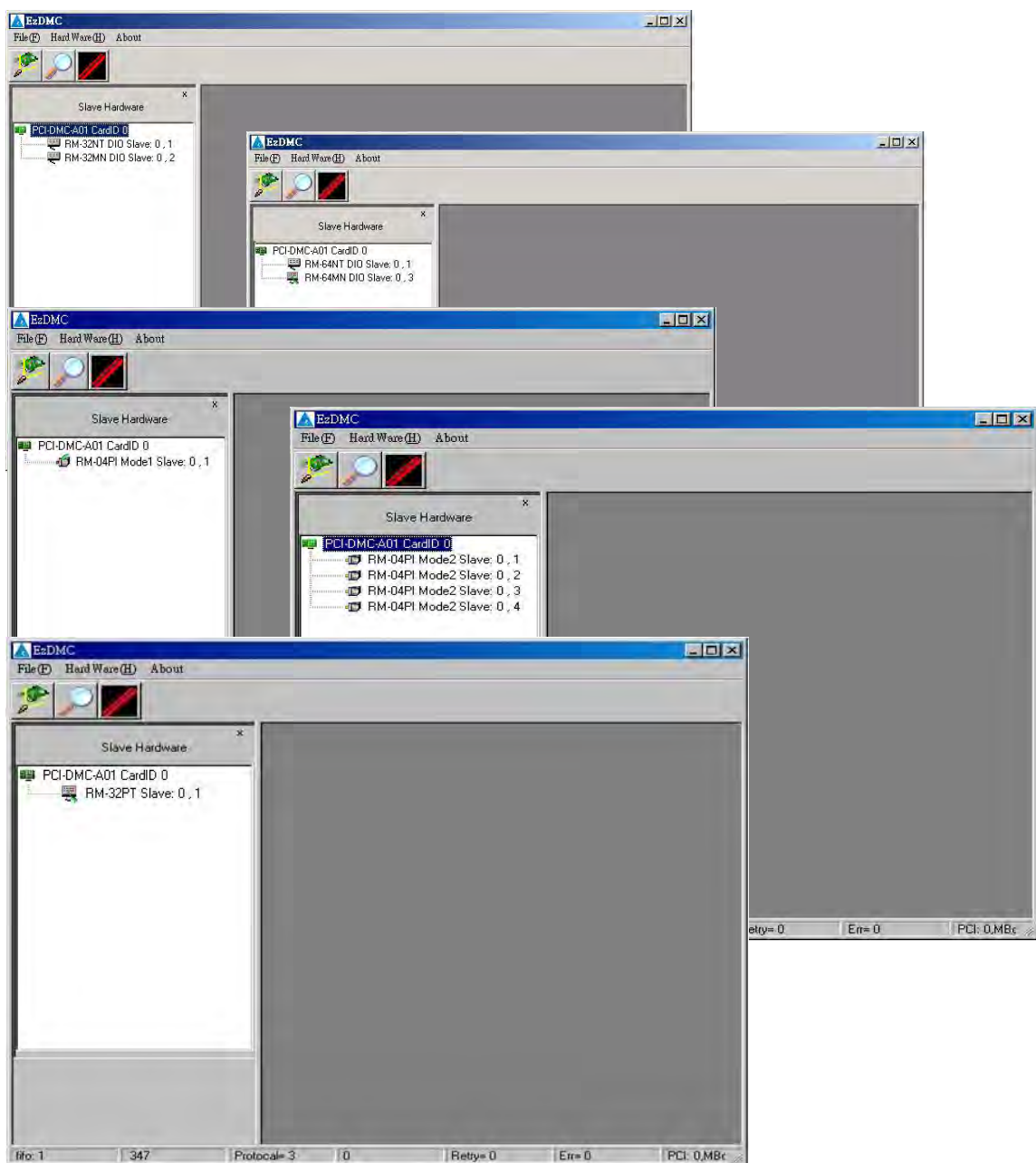


Figure 2.2 Finding the connected Remote module (RM32, RM64, RM04PI)

## 2.3 Gateway Module Interface

### 2.3.1 ASD-DMC-GE16MN / ASD-DMC-GE16NT

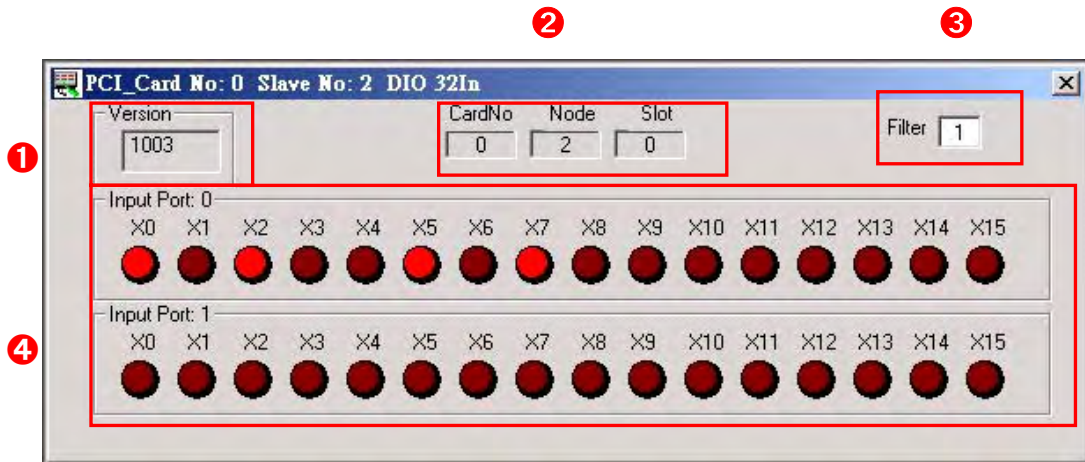


Figure 2.3 RM32MN digital input signal display

- ❶ RM32MN module's firmware version.
- ❷ RM32MN module information. (In this example, the module is Node 2 connected to Card 0)
- ❸ RM32MN module's software filter. (In this example it is set to 1 ms)
- ❹ RM32MN module's input signal display.

### 2.3.2 ASD-DMC-RM32NT

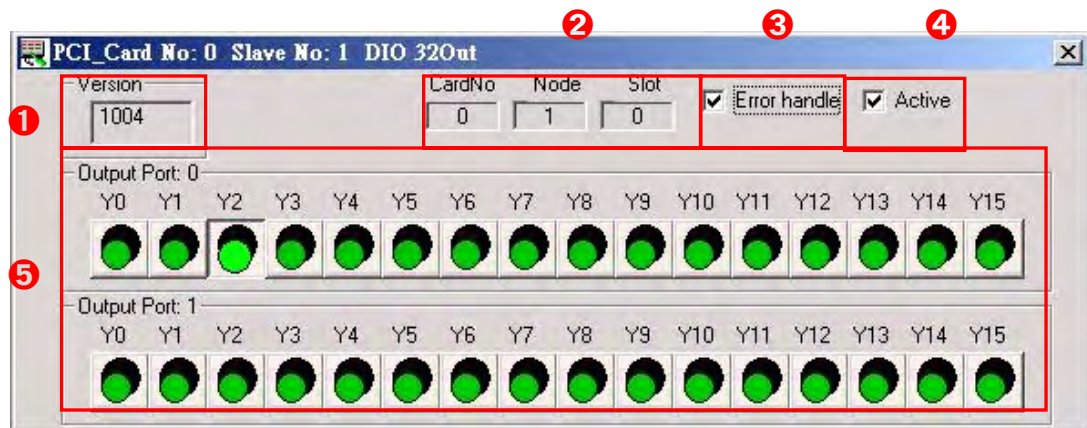


Figure 2.4 RM32NT digital output signal control

- ❶ RM32NT module's firmware version.
- ❷ RM32NT module information. (In this example, the module is Node 1 connected to Card 0)
- ❸ Error handling option: Whether this setting is retained after power off. (Check to keep record)
- ❹ Active option: Output the selected output signal to the connected device.
- ❺ Shows each bit of the RM32NT module's output signal.

### 2.3.3 ASD-DMC-RM64MN(1)

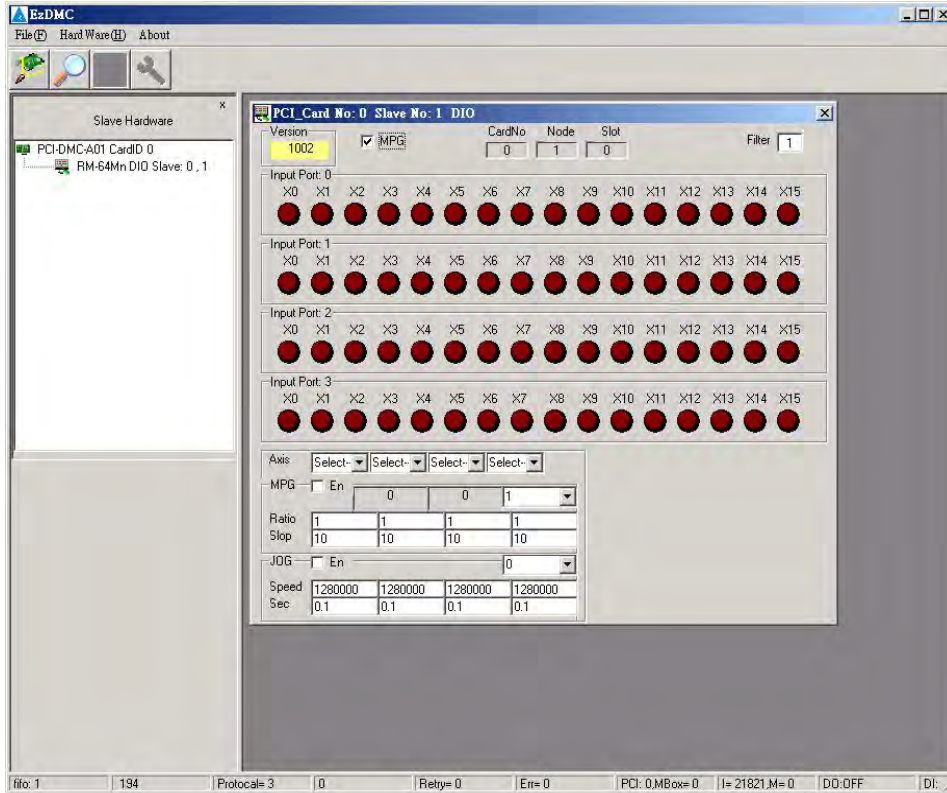


Figure 2.5 RM64MN display interface (includes MPG mode controlled Servo Drive)

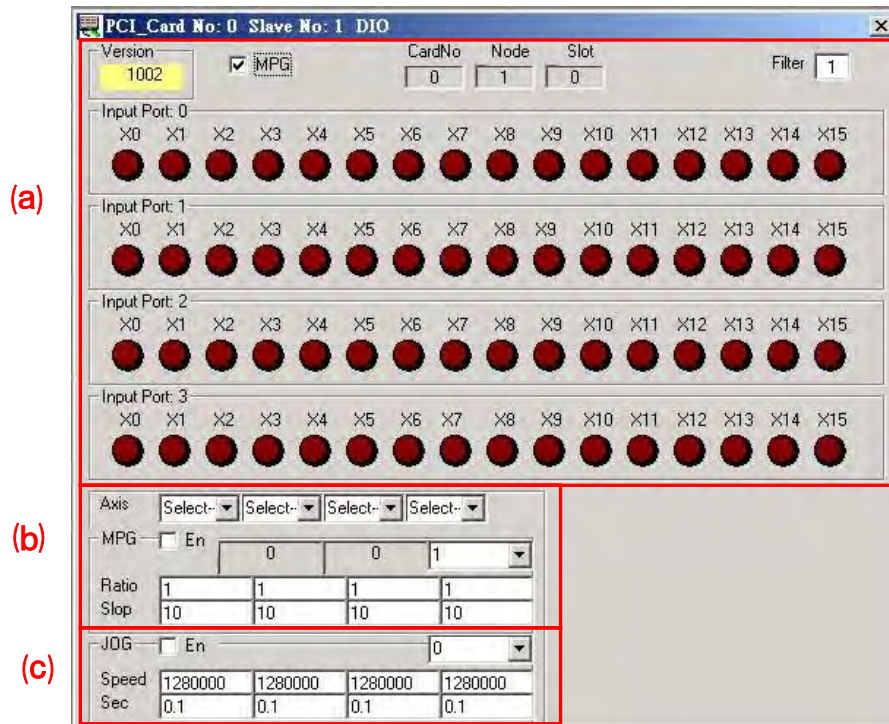


Figure 2.6 Description of RM64MN display interface

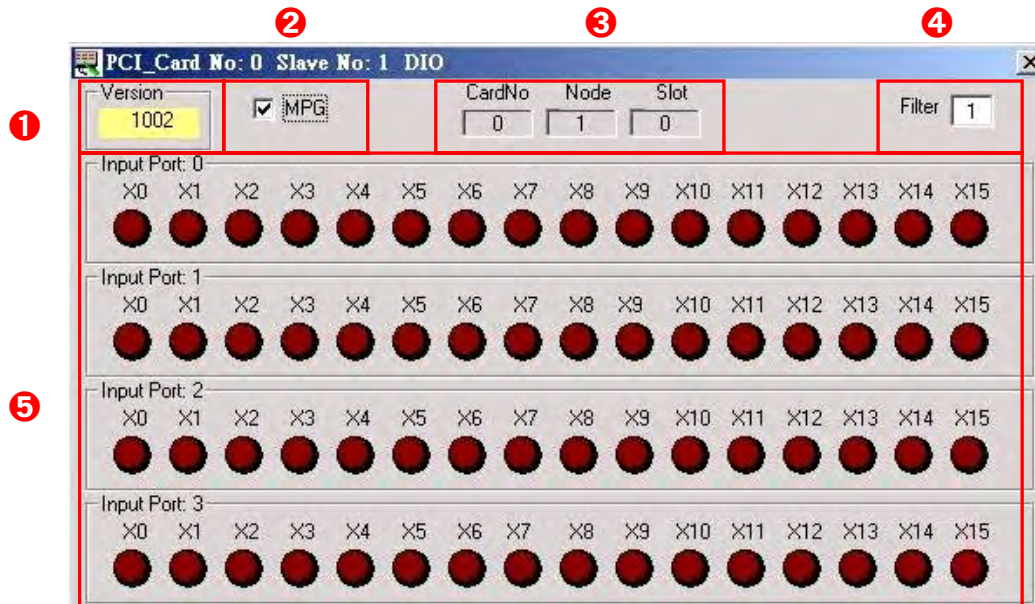


Figure 2.7 RM64MN (a) Description of block functions

- ❶ RM64MN module's firmware version.
- ❷ Checkbox for enabling RM64MN MPG interface.
- ❸ RM64MN module information. (In this example, the module is Node 12 connected to Card 0)
- ❹ RM64MN module's software filter. (In this example it is set to 1ms).
- ❺ RM64MN module's input signal display.

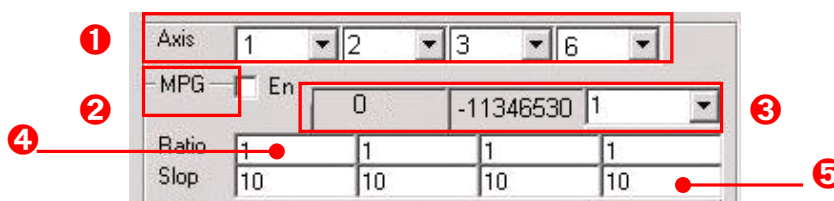


Figure 2.8 RM64MN (b) Block function description

- ❶ Select servo drive node to control using RM64MN module's MPG mode. (Max. 4)
- ❷ RM64MN MPG enable.
- ❸ MPG mode operation information. (the following is a description from left to right)
  - Encoder increment.
  - Target position for selected axis ID.
  - Output pulse ratio for each click of MPG.
- ❹ Set ratio of one full MPG turn to pulse output (motor rotations). (When ratio is set to 1, this means 1 click of MPG is equal to 1/100 of motor rotation).
- ❺ Set maximum allowable MPG speed (PPS/sec, Max=1000).

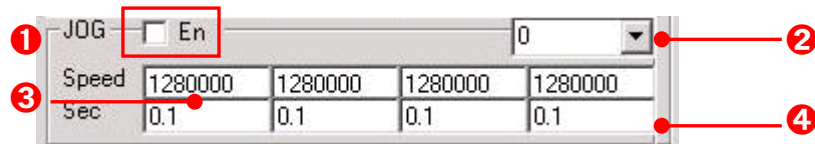


Figure 2.9 RM64MN (c) block function description

- ❶ RM64MN JOG function enable or not.
- ❷ Set JOG operation mode.  
Mode 0: Each JOG corresponding to each axis. (X→J1+/J1-, Y→J2+/J2-, Z→J3+/J3-)  
Mode 1: Axis selection (X/Y/Z) and the corresponding J1+/J1-.
- ❸ Maximum velocity used by each axis during operation.
- ❹ Acceleration/deceleration time used by each axis during operation.

### 2.3.4 ASD-DMC-RM64NT(1)

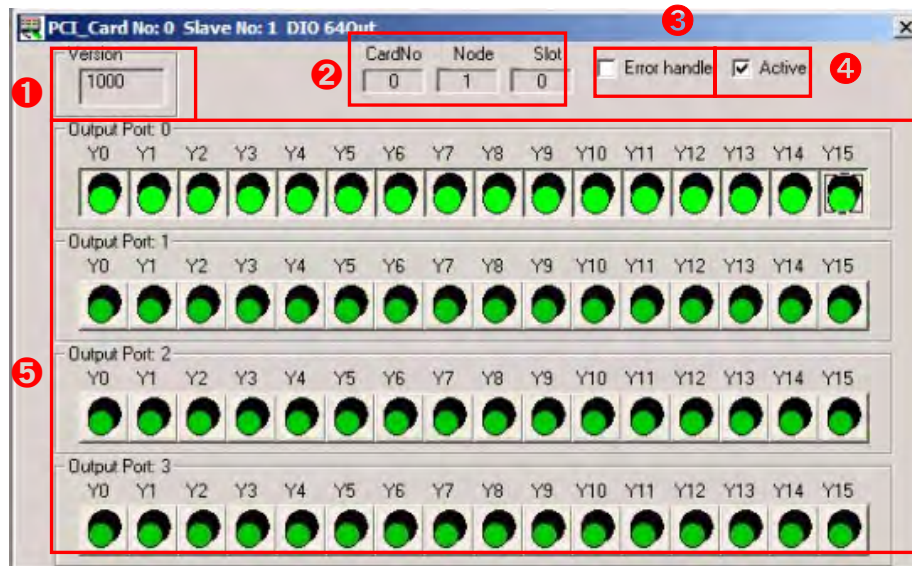


Figure 2.10 RM64NT Control Interface

- ❶ RM64NT module's firmware version.
- ❷ RM64NT module information. (In this example, the module is Node 1 connected to Card 0.)
- ❸ Error handling option: Whether this setting is retained after power off. (Check to keep record.)
- ❹ Active option: Outputs the set output signal to connected devices.
- ❺ Shows each bit of the RM64NT module's output signal. (This lists Port0 bit 0~15 as ON.)



### 2.3.5 ASD-DMC-RM04PI (MODE 1)

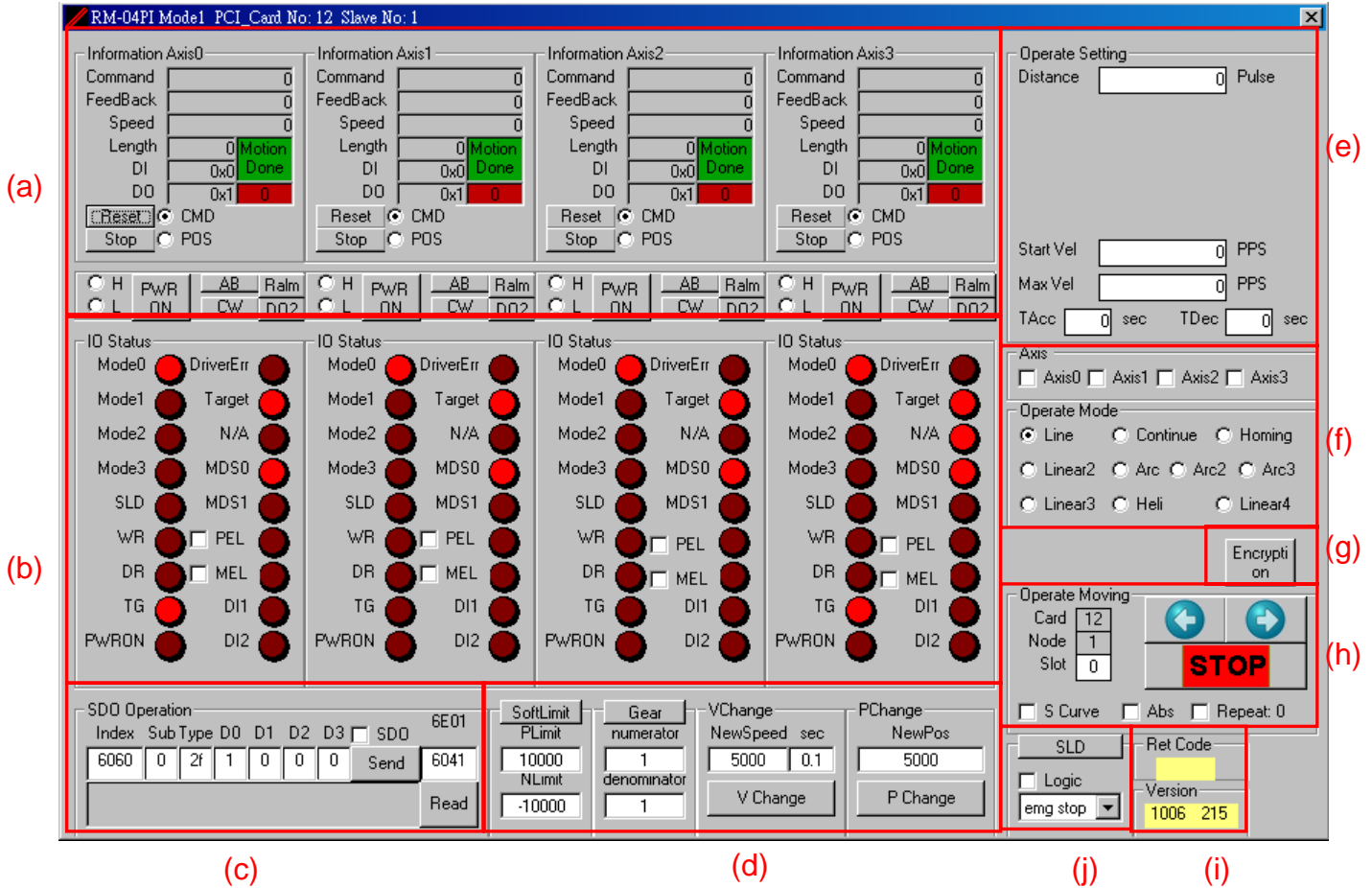


Figure 2.11 RM04PI MODE 1 Control Interface

- (a) Displays the status values, excite and reset of each axis during operation.
- (b) Displays the status indicators of each IO port on RM04PI.
- (c) Set CANOpen command. User can control the module by using this to read/send CANOpen commands.
- (d) Set the motion and software limit settings for motion.
- (e) Motion parameter settings. (Parameters will vary depending on the mode selected in block F)
- (f) Operating axis and operating motion mode selection (Operate Mode).
- (g) Open Slave Encryption interface. (Please see section 2.3.7)
- (h) Execute motion commands such as clockwise rotation, CCW rotation and stop. (includes S-curve, reference coordinates selection, and repeat option)
- (i) Error return value and the firmware version of the connected RM04PI module.
- (j) Set SLD port functions.

Blocks (a) and (d) are described in greater detail below

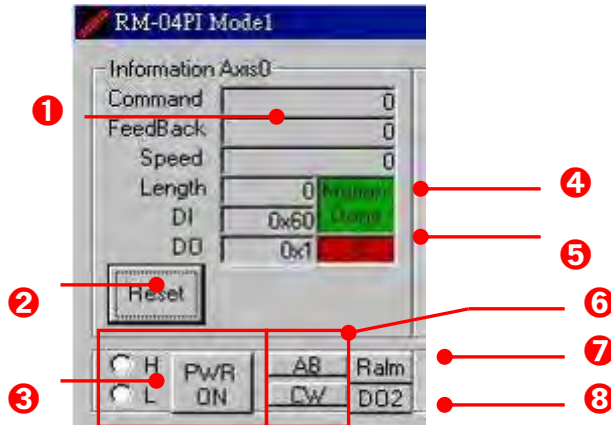


Figure 2.12 RM04PI MODE 1 (a) block function description

- ❶ Display the motion commands for each axis and other information.
- ❷ Clear all current motion commands.
- ❸ Set module's output level when "SVON" button is pressed. Select "H" for High active. Select "L" to set output as Low active.
- ❹ Display current motion status.
- ❺ Buffer Length counter. If more data is being added when the buffer is full, the value "299" is displayed.
- ❻ Set the module's input/output phase. The phase can be changed according to user requirements.  
(AB-phase: Speed may not be set at more than **500Kpps**; CW phase: speed may not be set at more than **200Kpps**)
- ❼ Reset IO error on module.
- ❽ Control the second set of Digital Outputs.

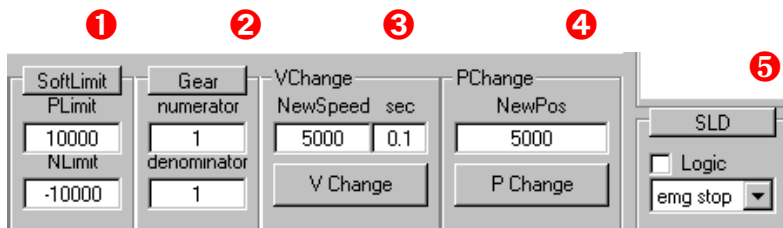


Figure 2.13 RM04PI MODE 1 (d) block function description

- ❶ Set software limit. First, set the positive limit (PLimit) and negative limit (NLimit) then click on "SoftLimit" button to set the software limit.

- ② "Gear" function is similar to an electronic gear ratio function;  
When set, moving distance = originally set moving distance x numerator value/denominator value.
- ③ This function is used to set the new velocity value (NewSpeed) and the new acceleration/deceleration time (sec). Click on "V Change" button to change to the new velocity settings.
- ④ This changes the moving position. First, set the new position (NewPos) then click on "P Change" to apply the new setting.
- ⑤ Sets the SLD, First, select emg stop or sd stop mode then set the Logic. 0 is always on (Normal high) and 1 is always off (Normal low).

## 2.3.6 ASD-DMC-RM04PI (MODE 2)

### Single-Axis Control Interface

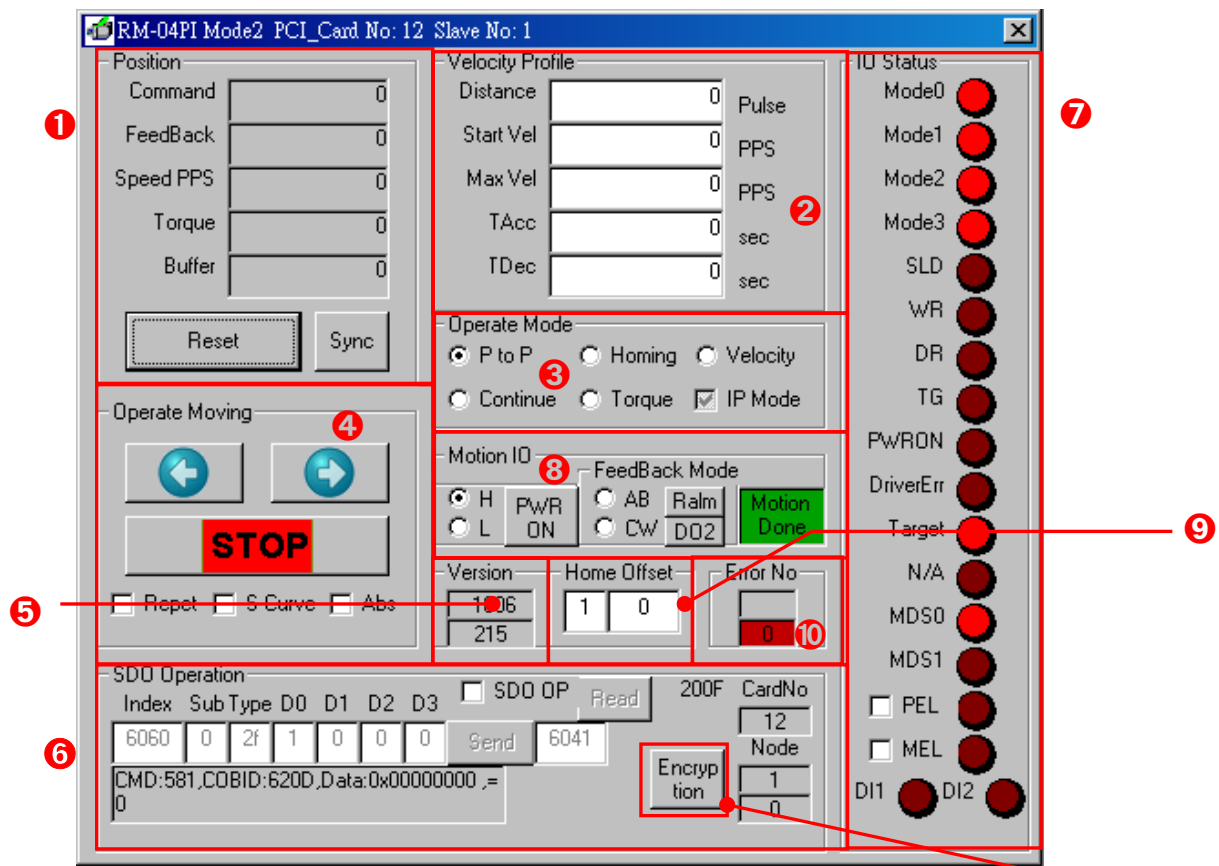


Figure 2.14 RM04PI MODE 2 1-Axis Control Interface

- ❶ Display the counter values of motion. These include position, velocity, torque, number of buffered commands, position reset and sync motion (this function matches the values of Command and Feedback).
- ❷ Sets the motion command. This includes motion distance, starting velocity, maximum velocity and acceleration/deceleration time.
- ❸ Operating motion mode selection (Operate Mode).
- ❹ Execute motion commands such as clockwise rotation, CCW rotation and stop. (includes S-curve, reference coordinates selection, and repeat option)
- ❺ Firmware version of connected RM04PI
- ❻ Set CANOpen command. User can control the module by using this to read/send CANOpen commands.
- ❼ Displays the status indicators of the IO port for that axis on RM04PI.
- ❽ Set the excite, reset alarm and motion status functions for that axis. (Instructions are the same as those for section 2.3.5 block a)
- ❾ Set the homing mode and offset value.
- ❿ Display error indicator. (See following table)

11 Open Slave Encryption interface. (Please see section 2.3.7)

Indicator	Description	How to clear the indicator	Indicator	Description	How to clear the indicator
0	Normal	None (Indicator does not come ON)	15	Collision with machine positive limit	Move away from positive limit
9	Velocity limit exceeded	Reset the velocity	283	Collision with software positive limit	Move away from software positive limit
13	EMG	Press the "RALM" button	285	Collision with software negative limit	Move away from software negative limit
14	Collision with machine negative limit	Move away from negative limit	299	Invalid operation	Press the "RALM" button

Multi-axis Control Interface (Up to 3 axes can currently be controlled simultaneously)

(Please see section 3.7 of the User Manual for instructions on switching from single-axis to multi-axis operating interface)

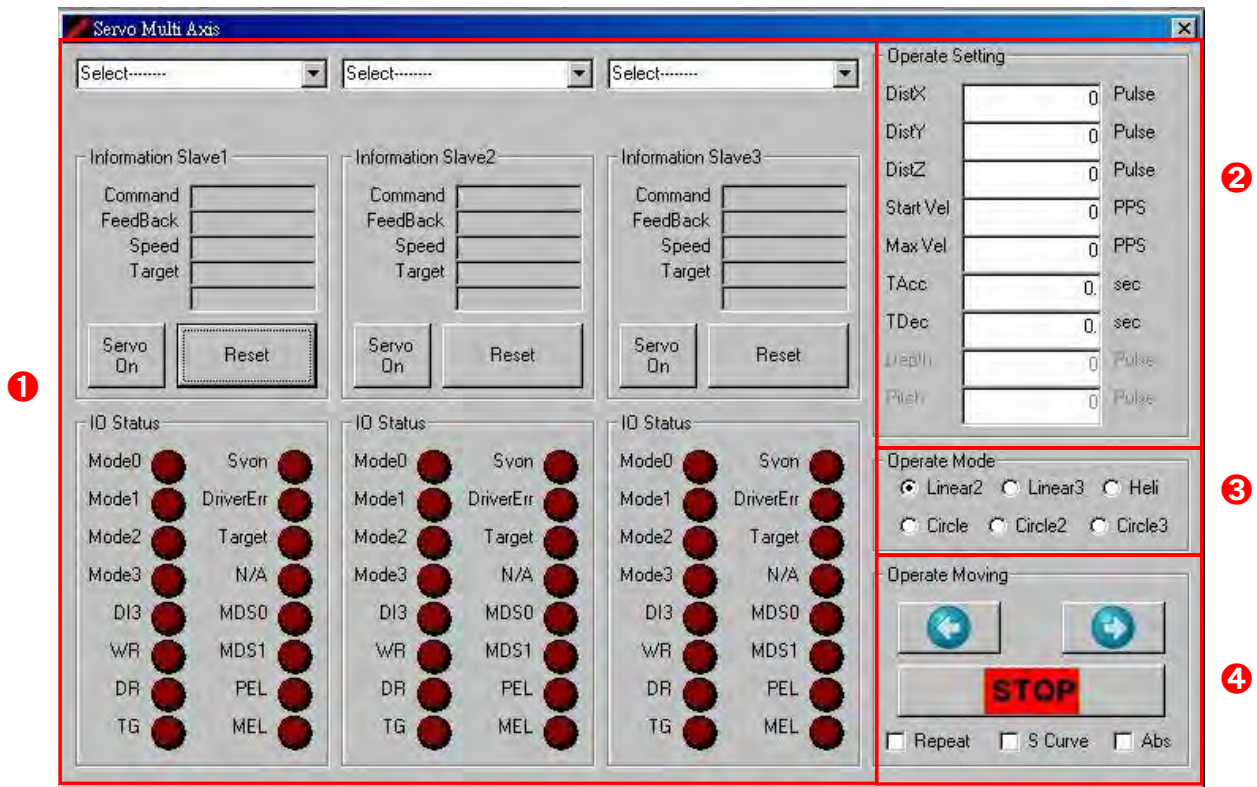


Figure 2.15 RM04PI MODE 2 Multi-Axis Operating Interface

- ❶ Select the operating axis, displays counter values of motion, including excite function, position reset and the status indicators for that axis' IO port.
- ❷ Motion parameter settings. (The selection mode in Block ❸ will change the parameters displayed)
- ❸ Operating motion mode selection (Operate Mode).
- ❹ Execute motion commands such as clockwise rotation, CCW rotation and stop. (including S-curve, reference coordinates selection, repeated implementation selection)

Checking "Repeat" will implement continuous forward and backward operation depending on the Distance value.

Checking "S Curve" will use the S-curve during acceleration/deceleration. The T-curve is used otherwise.

Checking "Abs" means motion commands will use absolute coordinates. Relative coordinates will be used otherwise.

## 2.3.7 ASD-DMC-RM04PI Interrupt Factor Operating Interface

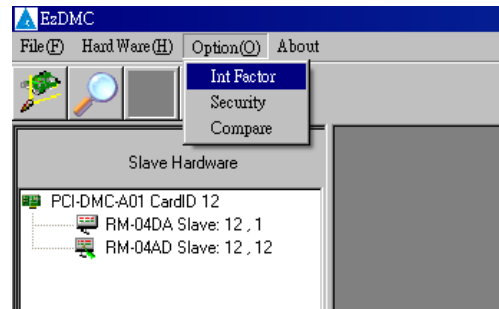


Figure 2.16 Open ASD-DMC-RM04PI Interrupt Factor Operating Interface

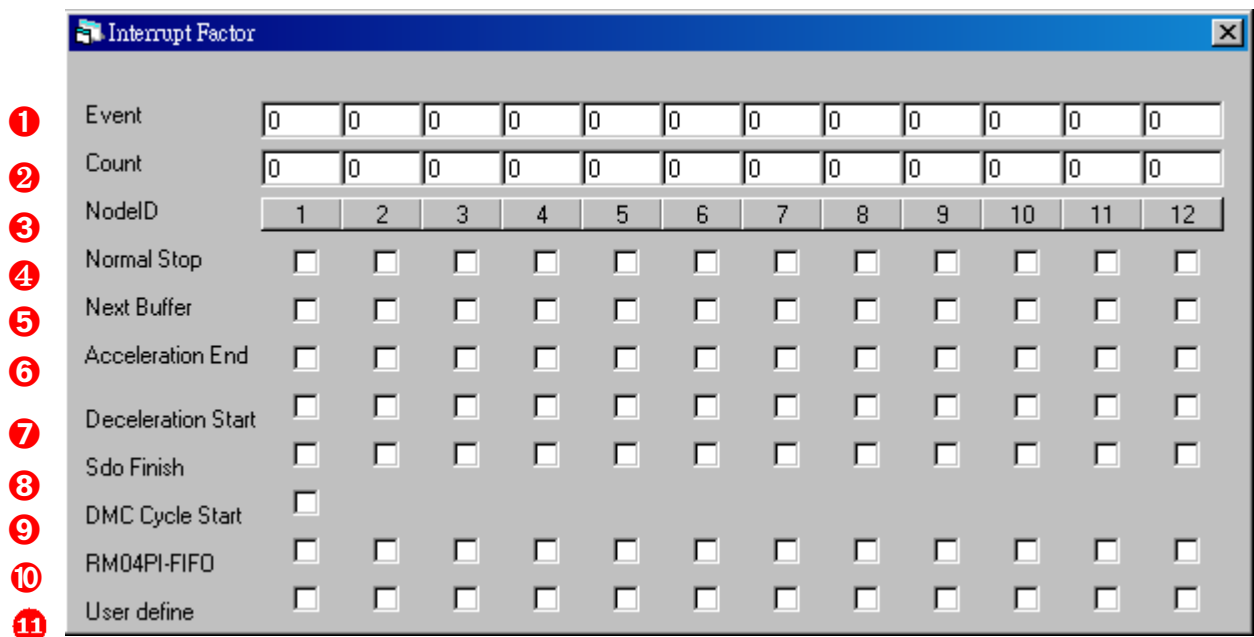


Figure 2.17 RM04PI Operating Interface

- ❶ Event: Type of trigger event.
- ❷ Count: Event trigger counter.
- ❸ Node ID: Select Node to enable Interrupt. (This event can only be used in Mode 2)
- ❹ Normal Stop: Triggers at the end of any motion. (This event can only be used in Mode 2)
- ❺ Next Buffer: It will be triggered when buffer action is performed. (This event can only be used in Mode 2)
- ❻ Acceleration End: It is triggered when acceleration ends. (This event can only be used in Mode 2)
- ❼ Deceleration Start: It is triggered when deceleration begins. (This event can only be used in Mode 2)
- ❽ Sdo Finish: (This function is not yet available)
- ❾ DMC Cycle Start: It is triggered when entering DMC Cycle.

- ⑩ RM04PI-FIFO: It is triggered when entering 04PI FIFO. (This event can only be used in Mode 1)
- ⑪ User define: (This function is not yet available.)

### 2.3.8 ASD-DMC-RM04PI Slave Encryption Operating Interface

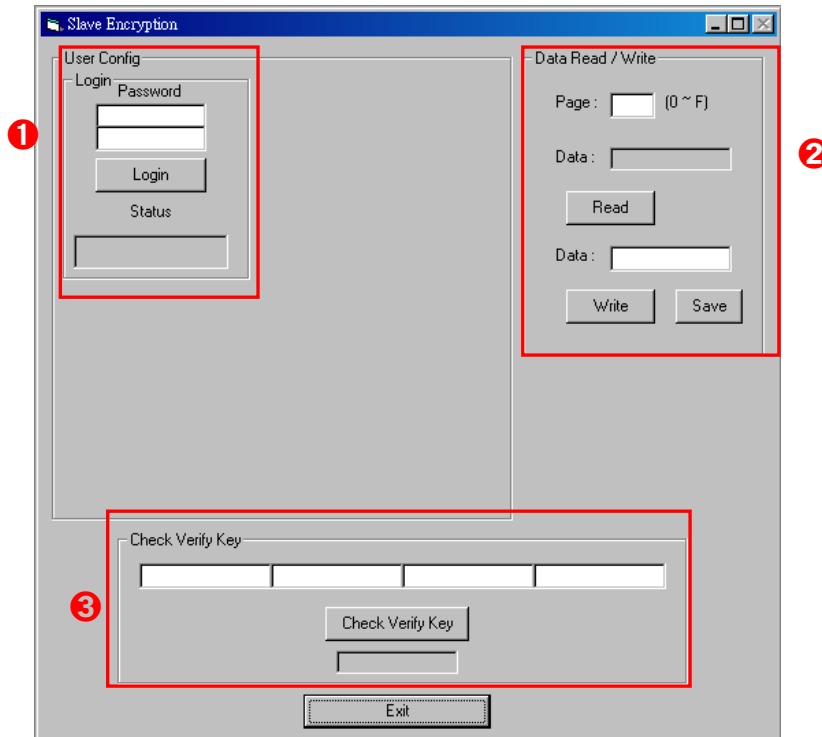


Figure 2.18 RM04PI Slave Encryption User Login Interface

Input fields in Blocks ①, ③, ④, ⑤ are all 1-8 bits and take hexadecimal values between 0-F.

- ① User login and status display field.

Default password	
Password1	abcd
Password2	abcd

(If login is successful, status will display "Pass" and grant access to the functions in Figure 2.19 Blocks ④, ⑤; If login fails then "Error!" is displayed. User must attempt to login again)

**If password is incorrect, the correct password must be entered twice to login. After logging in, user must change password or change verify key before they can leave this page.**

- ② Data Read: Select Page then click on "Read" to read data.  
Data Write: Select Page to write to, input data, click on "Write" to write to register then click on "Save" to save data to the 04PI module.



- ③ Verify key confirmation field and status display. Enter the 4 sets of Verify Key in Figure 2.19 block ⑤ into the 4 fields of Check Verify Key then click on "Check Verify Key". (If verification is successful then "Pass" is displayed on the status bar below. "Lock!" is displayed otherwise.)

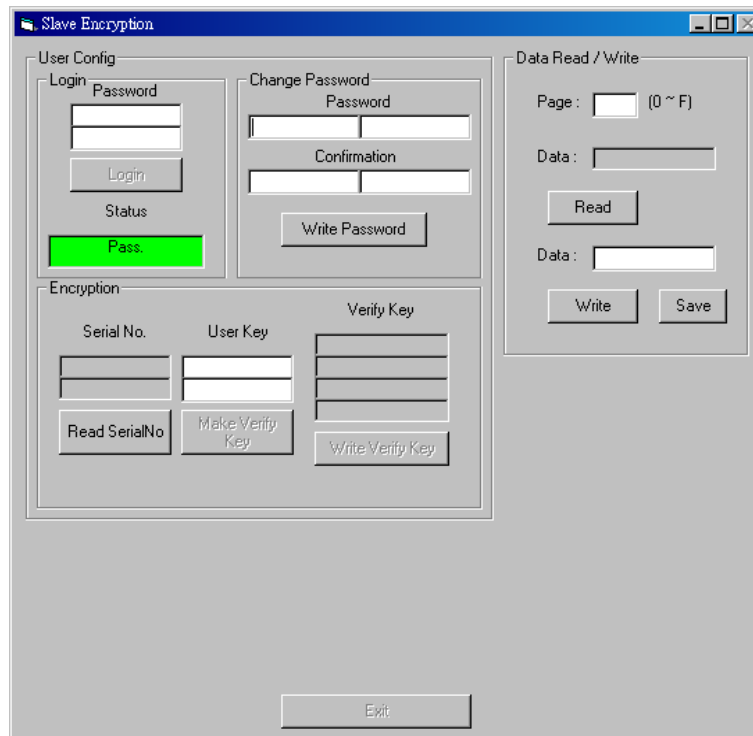


Figure 2.19 RM04PI Slave Encryption User Post-Login Interface

- ① User login and status display field.
- ② Data Read: Select Page then click on "Read" to read data.  
Data Write: Select Page to write to, input data, click on "Write" to write to register then click on "Save" to save data to the 04PI module.
- ③ Change password field:
  - Step1: Enter two new passwords in the "Password" field. Each is 1~8 bits in length and takes hexadecimal values between 0~F.
  - Step2: Enter the same password from "Password" in "Confirmation" again for verification.
  - Step3: If the two passwords in "Password" and "Confirmation" match, clicking on "Write" will change the password. If the passwords do not match, then block ①'s status will show the error message "Confirmation Error". The change password procedure must now be repeated again.

**4** Generate verify key:

Step1: Click on "Read SerialNO." button read the product serial number. This gives two sets of 1~8 bit values made up of hexadecimal values between 0~F.

Step2: User enters a custom User Key then click on "Make Verify Key" to generate a verify key. (The input and output will be 1~8 bits made up hexadecimal values between 0 ~F)

Step3: Click on "Write Verify Key" to write the generated Verify Key to the module. (If write is successful, block **1**'s status will display "Done." "Failed" is displayed otherwise)

## 2.3.9 ASD-DMC-RM04DA

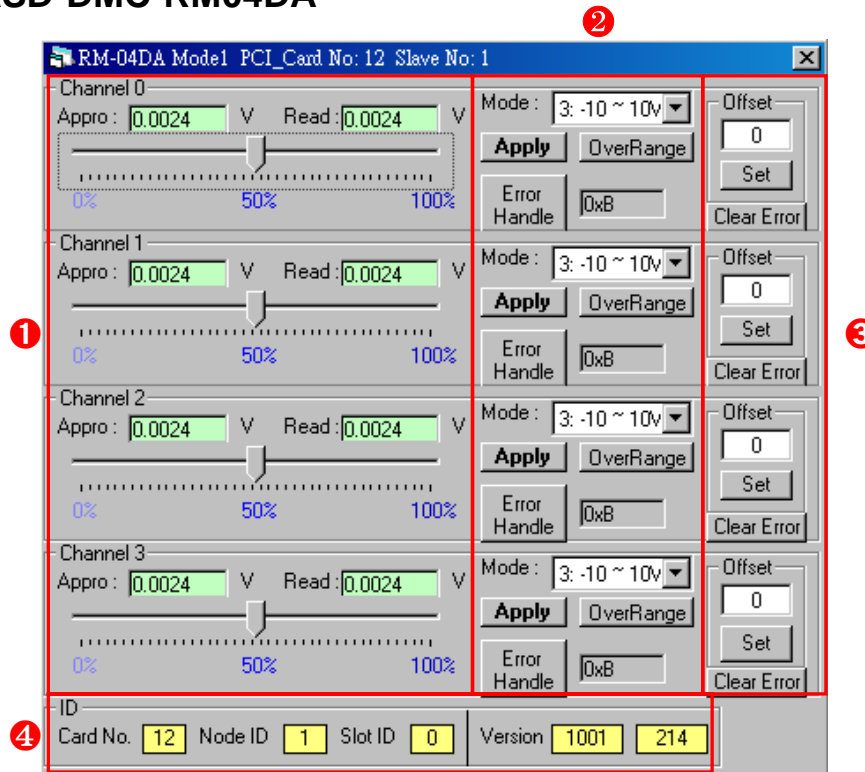


Figure 2.20 RM04DA Control Interface

- ❶ The voltage/current return values and output mode percentage settings for each Channel.  
Appro: Approximate output voltage/current based on the percentage setting.  
Read: Actual output voltage/current. Must click on "Apply" button to sync with Appro. (The values will differ slightly)
- ❷ The settings and returned status for each Channel.  
(A detailed description is provided on the next page)
- ❸ Offset setting (-128-127); Clear error status.  
(When an error occurs, set Offset to 0 then click on "Clear Error" to clear the error.)
- ❹ RM04DA module information.

Below is a more detailed description of block ② in Figure 2.20

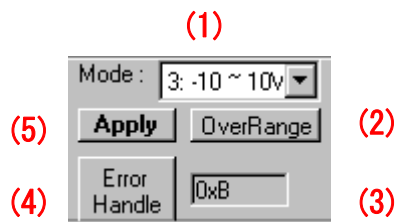


Figure 2.21 RM04DA block ② function description

- (1) Mode: Set voltage/current output mode.
- (2) OverRange: Increase the maximum value by 10% based on output mode.
- (3) Display field for returned status.
- (4) Error handle: Choose whether to keep the record after power off or not. (Click to keep record)
- (5) Apply: Change actual voltage/current output to Appro value.

### 2.3.10 ASD-DMC-RM04AD

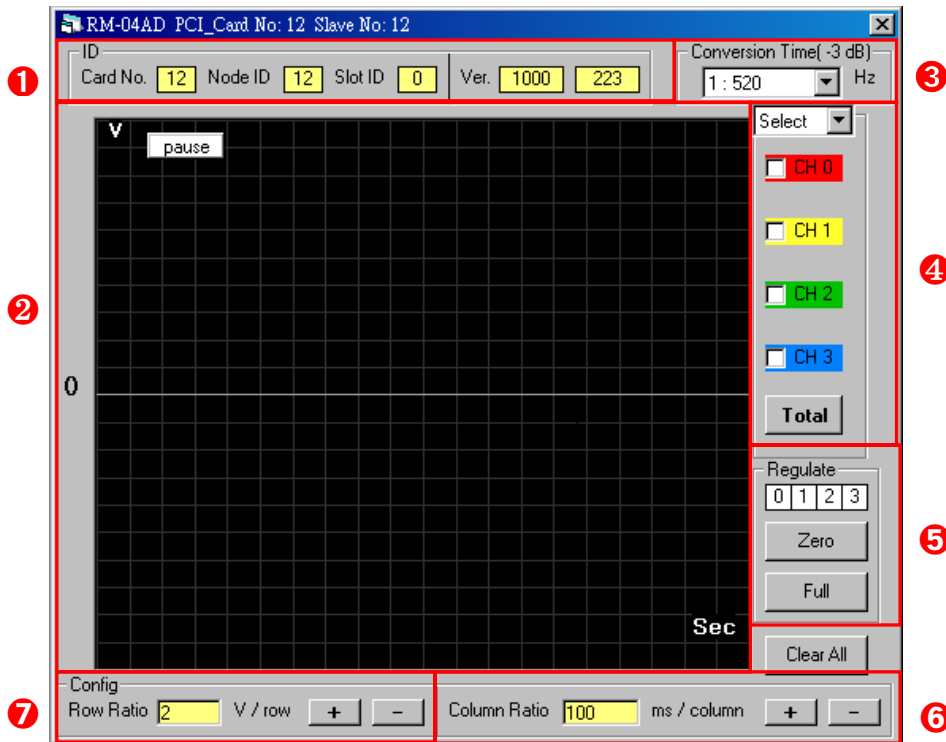


Figure 2.22 RM04AD Control Interface

❶ RM04AD module information.

❷ Display current voltage.

Clear all: Clear the voltage display.

Pause: Pause to get the current voltage using coordinate position.

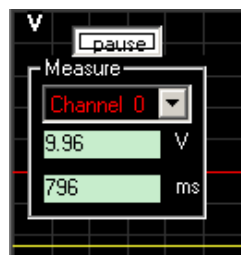


Figure 2.23 RM04AD pause and measurement interface

❸ Set AD conversion time.

❹ Function settings. (A detailed description is provided on the next page)

❺ Zero calibration

Zero: Zero calibration. (Only the selected Channel will be calibrated)

Full: Full scale calibration. (Only the selected Channel will be calibrated)

❻ Set the display time for each click of X-axis.

❼ Set the voltage difference for each click of the Y-axis.

Below is a more detailed description of block 4 in Figure 2.26

Figure	Description
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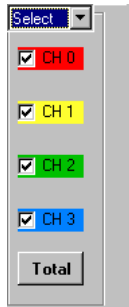


Figure 2.24  
RM04 AD select  
Channel operating  
interface

Select the Channel to display and check to enable Channel Input. Input is disabled otherwise.  
Total: Check all Channels.

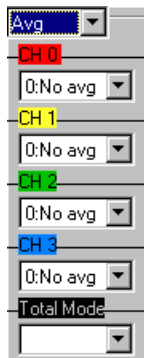


Figure 2.25  
RM04 AD Avg Control  
Interface

Set the average mode.  
Total: Set all channels.

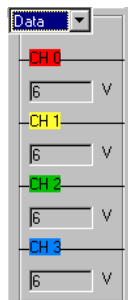


Figure 2.26  
RM04 AD Data (Read  
Value) Display  
Interface

Display current voltage

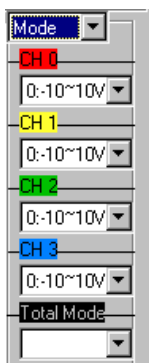


Figure 2.27  
Operating Interface of  
RM04 AD Mode

Set AD voltage read range

### 2.3.11 ASD-DMC-RM32PT

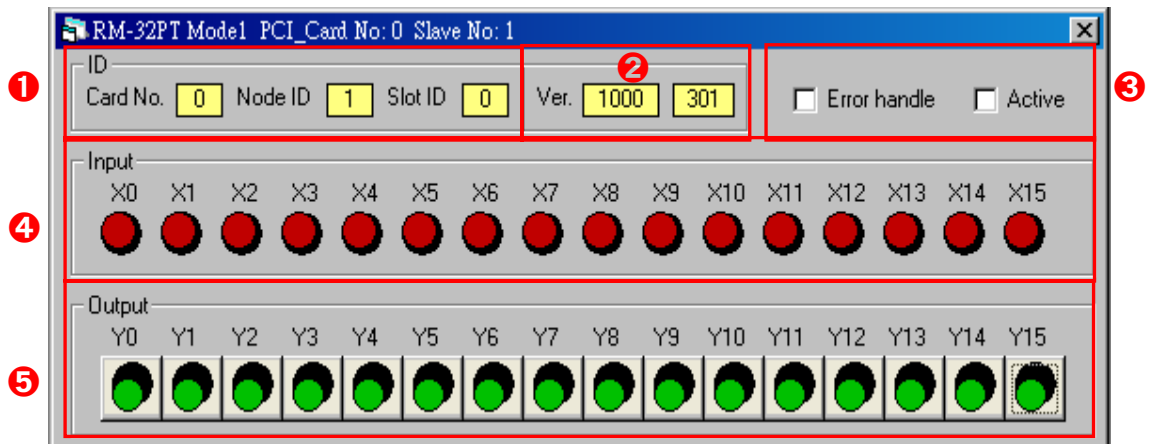


Figure 2.28 RM32PT digital input signal display

- ❶ RM32PT module information. (In this example, the module is Node 1 connected to Card 0.)
- ❷ RM32PT module's firmware version.
- ❸ Error handling option: Whether this setting is retained after power off. (Check to keep record.)  
Active option: Output the selected output signal to the connected device.
- ❹ RM32PT module's input signal display.
- ❺ One bit of the RM32PT module's output signal.

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# Appendix A Q&A

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**Q1: How come I can't find a Remote module after changing its Node ID or mode when I use the "Search Slave" function of EzDMC again?**

**A:** If the Node ID or mode of a Remote module (RM32/64/04PI) is changed, please turn off the power before making the changes then use the search slave function again after turning on the power again.

**Q2: How come other connected servo drives stop working when power to a RMP04PI module is cut?**

**A:** If servo drives and RM04PI modules are connected as slaves and power is cut to one module, other slave modules will not be able to continue performing motion commands.

**Q3: How come the value of motion command that currently being executed disappears when I open another EzDMC window?**

**A:** You must open all control (viewing) windows before executing any motion commands for single- or multi-axis. Performing any other actions (opening another window) while motion commands are being executed may lead to the loss of all command values.

**Q4: I have set and executed the motion commands for RM04PI module in EzDMC. Instead of executing the motion command, it stops and generates the alarm indicator "9"?**

**A:** Please stop the execution of the motion command then check the settings for initial velocity and maximum velocity.

When output phase is in AB mode, please set velocity to less than 500K pps; when output phase is CW, please set velocity to less than 200K pps. If the initial settings exceed the above limits, then current motion will be stopped. Driver Error light will light up and the alarm indicator "9" shown.

**Q5: How come the current velocity for each axis is the same even though they have different settings of moving distance during multi-axis linear interpolation?**

**A:** In EzDMC, the velocity displayed for each axis is the resultant velocity. During this multi-axis "linear interpolation" motion, the actual velocity will be less than or equal to the displayed velocity depending on the distance set for each axis. During "arc interpolation" or "spiral interpolation" motions, however the displayed velocity will be the actual velocity of that axis.

**Q6: How come only the Command value moves while Feedback fluctuates in single digits after setting and executing motion commands for RM04PI through EzDMC?**

**A:** Please cancel the current motion command then check the fields of the output and input modes (AB phase, CW/CCW) to make sure they have been properly selected. Next, check to see if wires QA and QB are properly connected.

**Q7: Why does the current motion command being executed stop when motion mode is changed in the EzDMC single-axis control window (i.e., servo drive and MODE2 of RM04PI)?**

**A:** This is normal. Manually changing the motion mode will interrupt the current motion command.

**Q8: Why does the error light and IO status light in the control window blink when using EzDMC to control the RM04PI module?**

**A:** This indicates a signal anomaly in the connected Slave module. Please cut the power then check the CAT5e cable connection for the Slave devices. Make sure that the module (server) at the last stop (node) has a terminal resistor attached to the RJ45 port.

**Q9: If SLD port is enabled on RM04PI module with EzDMC, why does SLD enable stop working if soft limit is enabled during motion displacement?**

**A:** To use the soft limit function, please set and enable the soft limit function before executing any motion commands. There is no restriction on whether SLD port is enabled or not during operation.

**Q10: If SLD port is enabled on RM04PI module with EzDMC during multi-axis motion, how come one axis can't move backwards when it comes into contact with SLD port signal?**

In the situation, use the "Line" motion mode to reverse away from the SLD port signal. Please check the direction first. (This can be confirmed by the N/A light)

**Q11: Why does an error occur with the Gear function when using EzDMC to control the RM04PI module?**

**A:** The gear function is the originally set position value \* Numerator value/denominator value; the result of this operation is final, and it must be walked to the position value. In other words, the value of the "P Change" field in EzDMC is the original Position value. The new position will be the calculated target position.

Even if the distance of the final position is longer than the original distance, it must still be completed in the same amount of time.

Motion velocity will be automatically increased but if this exceeds the module limit (AB: 500K pps, CW: 200K pps) an error is thrown. The above limitations must be taken into account when setting motion parameters to avoid errors.

※ When Gear is changed from enabled to disabled, make sure that the value of Position is Reset to zero as well.

**Q12: How come \_DMC\_01\_set\_command API functions sometimes don't work and return error messages like Alarm 9 and Driver Error?**

**A:** If this function is not working correctly, please check that the value of Position is correct. If it is not in the right position, please use the \_DMC\_01\_set\_position function to adjust the position before using the \_DMC\_01\_set\_command function again.

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