Motionnet

106-M304T User Manual

Version: V1.1 2015M02

To properly use the product, read this manual thoroughly is necessary.

Part No.: 81-02114GH-010

Revision History

Date	Revision	Description
2014/5/5	1.0	Document creation.
2014/3/2	1.1	Add MPG interface description.

Electrical safely

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. Disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension card. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the voltage available in your area.
- If the power supply is broken, contact a qualified service technician or your retailer.

Operational safely

- Please carefully read all the manuals that came with the package, before installing the new device.
- Before use ensure all cables are correctly connected and the power cables are not damaged. If you detect and damage, contact the dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- If you encounter technical problems with the product, contact a qualified service technician or the dealer.

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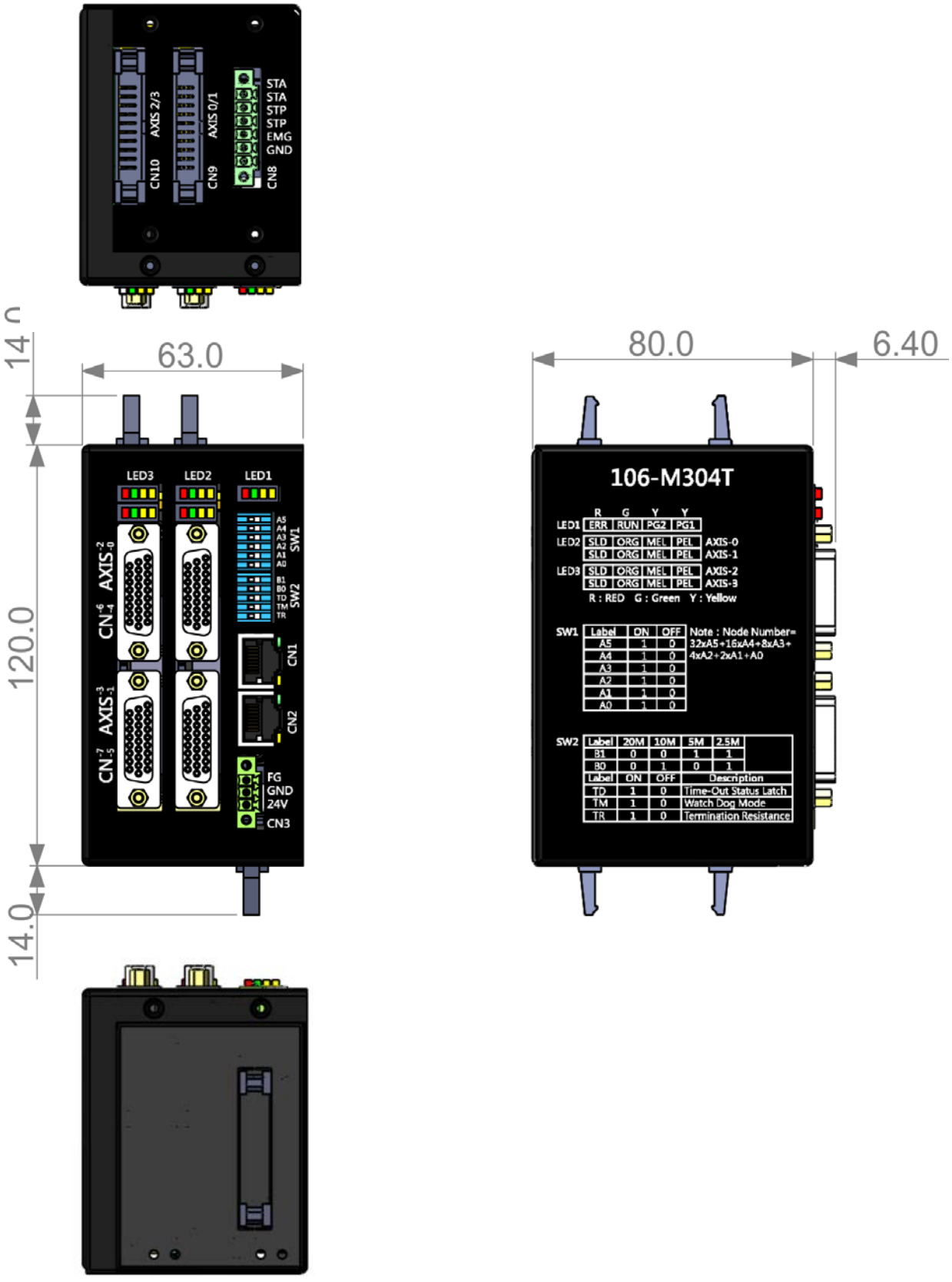
1. 106-M304T Introduction

1.1. Features

- Max. 6.5MHz, 4-Axis pulse output
- Linear, circular and continuous interpolation
- High speed position latch function
- Simultaneously start/stop on multiple axes
- Programmable acceleration and deceleration time
- Programmable pulse output and interrupt
- Position compare and trigger outputSpecifications
- 4-Axis Motion Control
- Pulse output mode: ±OUT/DIR, ±CW/CCW
- Pulse output rate: Max. 6.5Mpps / Min. 0.05pps
- Position range: 32 bits(±2,147,483,648 pulses)
- Home return mode: 13 types
- Velocity profiles: T-curve, S-curve
- Interpolation mode: linear, circular, helix and continuous
- Counter for encoder feedback signals: 32 bits up/down x 4
- Position latch input: LTC x 4
- Position compare output: CMP x4, with programmable pulse width
- Compare trigger output rate: Max. 250Kbps
- FIFO buffer for compare trigger positions: 2 axes
  250 (default), 500, 1000, 2000 points for each axis, optional.
- Incremental encoder input: ±EA x 4, ±EB x 4
- Encoder index signal input: ±EZ x 4
- Machine interface: PEL x 4, MEL x 4, ORG x 4, SLD x 4
- Servo driver interface: ALM x 4, RDY x 4, SVON x 4, INP x 4, ERC x 4

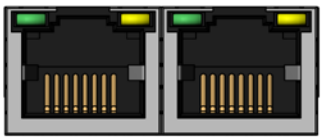
1.2. Hardware Layout



Name	Description
CN1	RJ45 Communication Control Connector
CN2	RJ45 Communication Control Connector
CN3	Power Connector
CN4	Axis0 Drive’s IO Interface Connector
CN5	Axis1 Drive’s IO Interface Connector
CN6	Axis2 Drive’s IO Interface Connector
CN7	Axis3 Drive’s IO Interface Connector
CN8	Emergency, Simultaneously Start and Simultaneously Stop Interface
CN9	Axis0 & Axis1 Machinery I/O Signals Connector
CN10	Axis2 & Axis3 Machinery I/O Signals Connector
SW1	Device Address Setting
SW2	Baud rate , Terminal Resistor and so on Setting
RUN	LED1 Green in LED：In normal communication
ERR	Red Led in LED1：error communication
PG1	Yellow Led in LED1：DC +3.3V In Normal Level
PG2	Yellow Led in LED1：DC +3.3V Supply
SLD	Red Led in LED2&LED3：Indicate SLD Input Signal
ORG	Green Led In LED2&LED3：Indicate ORG Input signal
PEL	Yellow Led In LED2&LED3：Indicate PEL Input Signal
MEL	Yellow Led In LED2&LED3：Indicate MEL Input Signal

2. I/O Interface Description

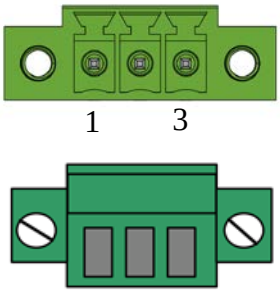
2.1. Communication connector RJ-45 CN1/CN2



8 1

Pin	Label	Function	Pin	Label	Function
1	NC	Reserved	5	NC	Reserved
2	NC	Reserved	6	RS485-	RS485 Differential Signal (-)
3	RS485+	RS485 Differential Signal (+)	7	NC	Reserved
4	NC	Reserved	8	NC	Reserved

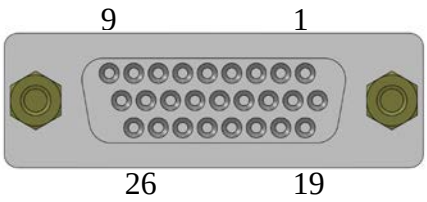
2.2. Power Connector – CN3



1 3

Pin	Label	Function			
1	FG	Field Ground			
2	GND	Ground (DC +24V)			
3	24V	＋24V Power			

2.3. Drive's IO Interface Connector CN4/CN5/CN6/CN7



Pin	Label	Function	Pin	Label	Function
1	SVON	Servo on output signal	14	BRK-	Braking signal(-)
2	INP	In-position input signal	15	EGND	I/O power ground
3	ERC	Deviation counter clear output signal	16	EB-	Encoder B-phase (-)
4	RDY	Ready input signal	17	EB+	Encoder B-phase (+)
5	OUT-	Pulse signal (-)	18	EGND	I/O power ground
6	OUT+	Pulse signal (+)	19	EMG	Emergency stop output signal
7	EA-	Encoder A-phase (-)	20	EGND	I/O power ground
8	EA+	Encoder A-phase (+)	21	EGND	I/O power ground
9	BRK+	Braking signal(+)	22	EGND	I/O power ground
10	RST	Alarm reset output signal	23	DIR-	Direction signal (-)
11	ALM	Alarm input signal	24	DIR+	Direction signal (+)
12	E24V	I/O power supply, +24V	25	EZ-	Encoder Z-phase (-)
13	EGND	I/O power ground	26	EZ+	Encoder Z-phase (+)

■ **ALM (Servo Alarm / Digital Input Signal)**

ALM- input signal from ALM signal at servo driver. Servo driver will issue ALM output when it is under abnormal operation or over-loading.

■ **INP (Axis In Position Signal / Digital Input Signal)**

INP is an input signal at 106-M304T and is used to read the INP status inside servo driver.

■ **RDY (Driver Ready Signal / Digital Input Signal)**

RDY is an input signal and is used to read the RDY signal at servo driver.

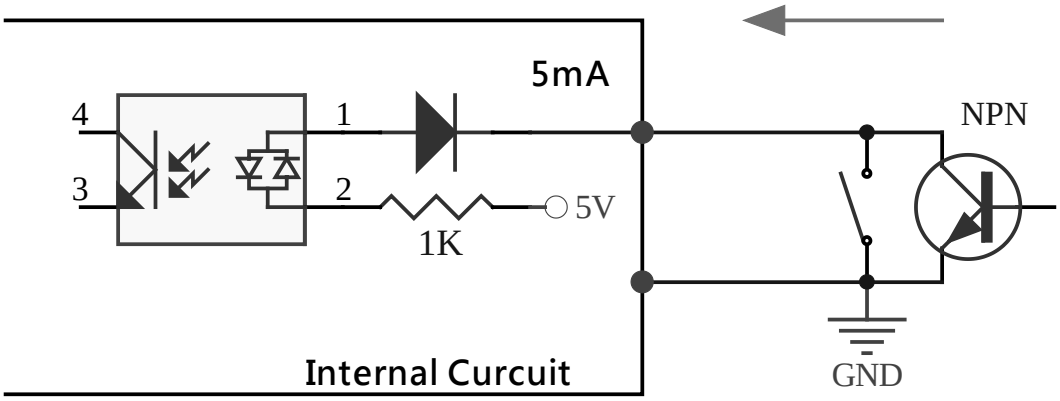


Figure 2-1: Wiring for NPN sink mode

■ **SVON(Servo On / Digital Output Signal)**

SVON is an output signal from PCI-M114-GL and is used to make driver servo-on to hold the motor.

■ **RALM(Servo Alarm Reset / Digital Output Signal)**

This RALM signal is designed to reset ALM status inside servo driver if the alarm status is able to be reset.

■ **ERC (Deviation Counter Clear / Digital Output Signal)**

ERC output will be active when the following condition is activated.

Homing is completed.

PEL/MEL is active.

ALM is active.

User issues EMG by software.

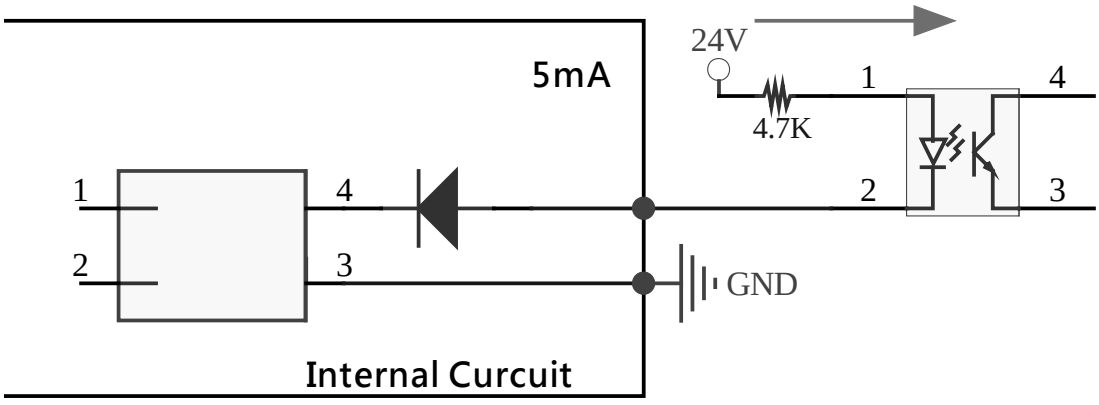


Figure 2-2: output wiring diagram

■ **OUT and DIR (Pulse Output Control / Digital Output Signal)**

There are 6 types of pulse output of 106-M304T. User has to specify the electrical spec. as differential or open collector first. Then select DIR/OUT or CW/CCW.

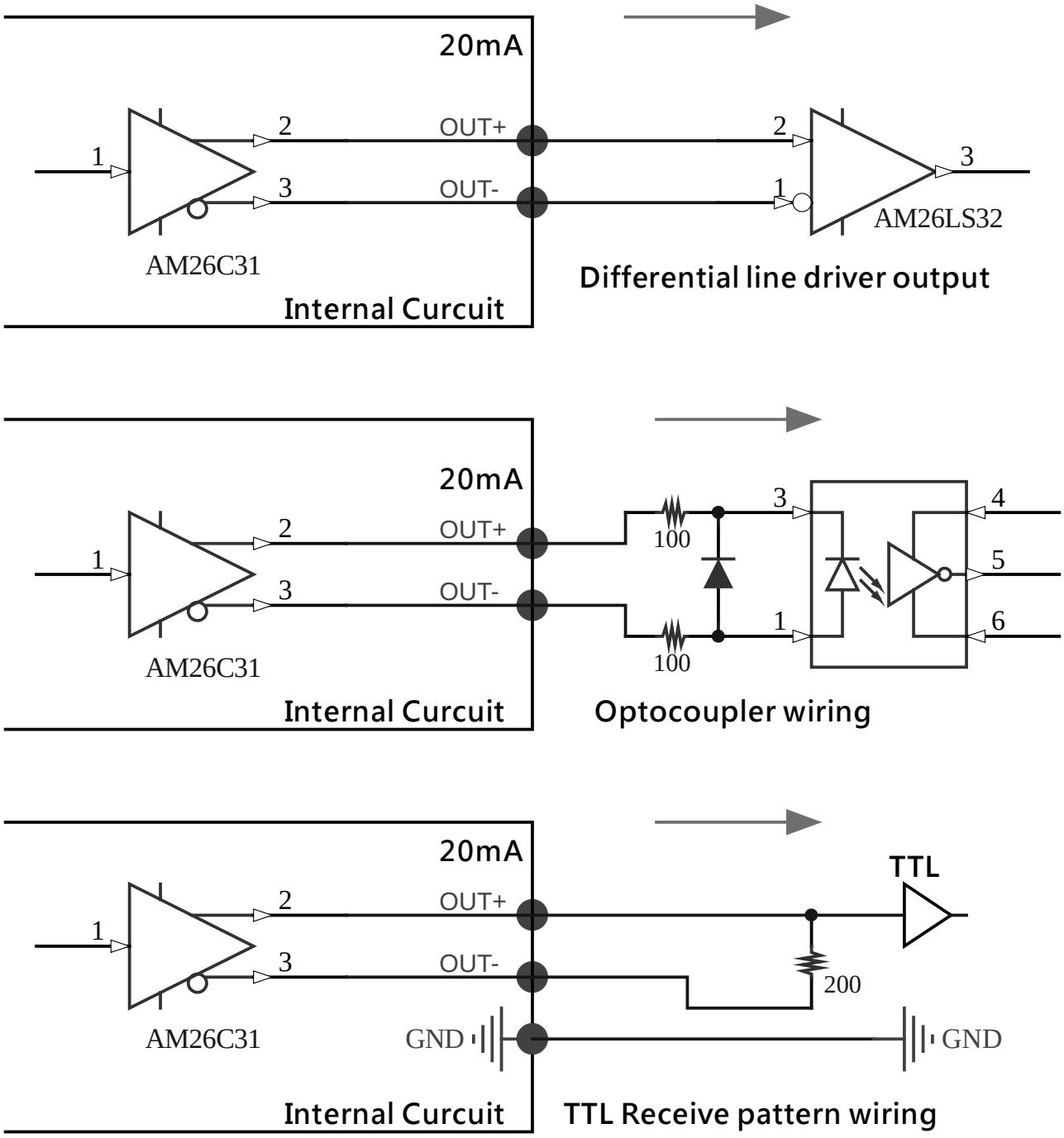


Figure 2-3: OUT and DIR output

■ **EA, EB and EZ (Encoder A, B and Z Phase)**

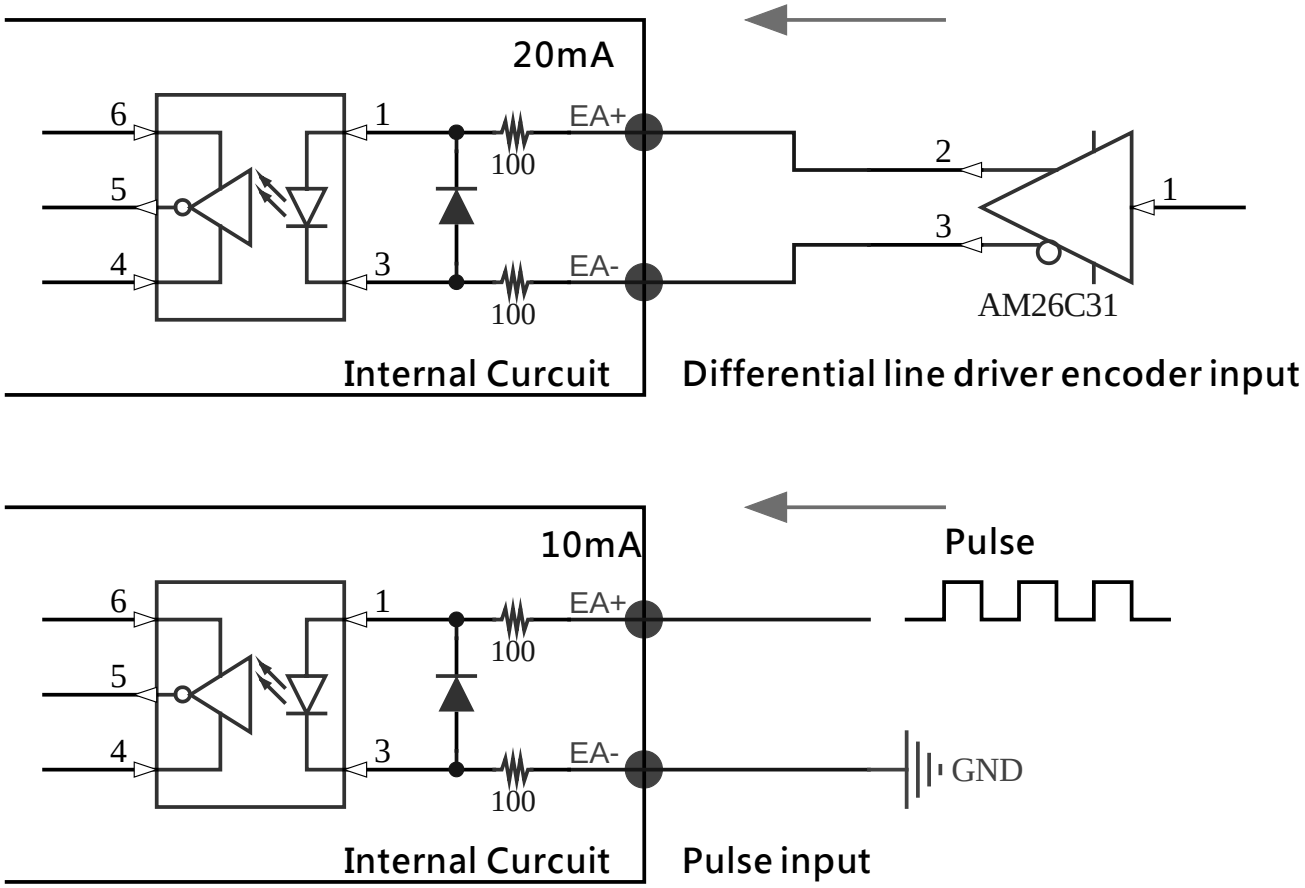
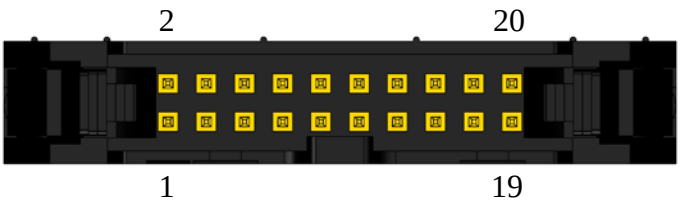


Figure 2-4: EA , EB and EZ intput

2.4. Machinery I/O Signals CN9/CN10



CN9			
Pin	**Label**	**Pin**	**Label**
1	ELX+	2	ELX-
3	ORGX	4	SLDX
5	COM	6	CMPX
7	LTCX	8	EGND
9	BRKX+	10	BRKX-
11	ELY+	12	ELY-
13	ORGY	14	SLDY
15	COM	16	CMPY
17	LTCY	18	EGND
19	BRKY+	20	BRKY-

CN10			
Pin	**Label**	**Pin**	**Label**
1	ELZ+	2	ELZ-
3	ORGZ	4	SLDZ
5	COM	6	CMPZ
7	LTCZ	8	EGND
9	BRKZ+	10	BRKU-
11	ELU+	12	ELU-
13	ORGU	14	SLDU
15	COM	16	CMPU
17	LTCU	18	EGND
19	BRKU+	20	BRKU-

■ **PEL and MEL (End Limit / Digital Input Signal)**

There are two end-limit signals called PEL and MEL for each axis. Usually they are Normal-Close type signals from external sensors. PEL indicates the limit of motion in the plus direction and MEL indicates the limit of motion in the minus direction.

■ **ORG (Origin / Digital Input Signal)**

The origin signals (ORG1~ORG4) are necessary when the position feedback is incremental type or without any feedback encoders. They are used to indicate the origin of the system.

■ **SLD (Slow Down / Input Signal)**

The SLD signals are used to help the axis decelerate to stop by hardware.

■ **LTC (Counter Latch)**

LTC is used to latch the value in the counter when the LTC input is active.

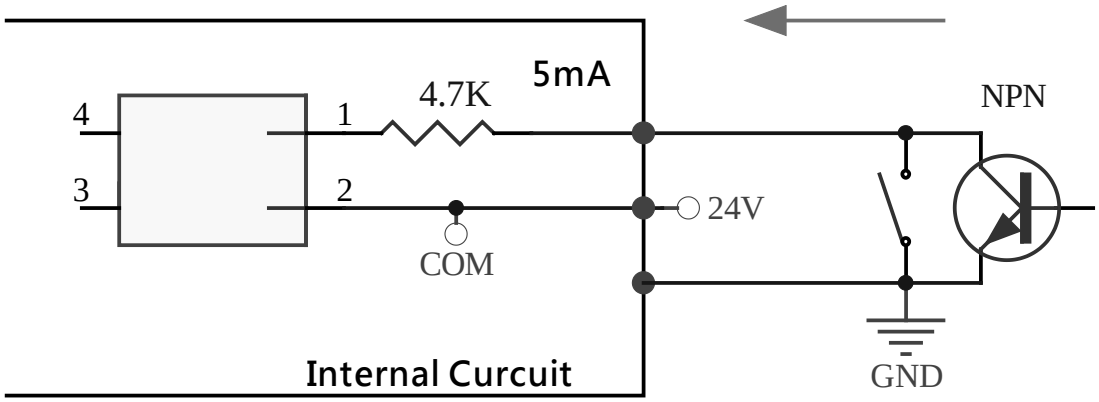


Figure 2-5: wiring for NPN sink mode

■ **CMP (Position Compare / Output Signal)**

CMP signals are used to make a comparison between target value and actual value and generate a trigger signal output.

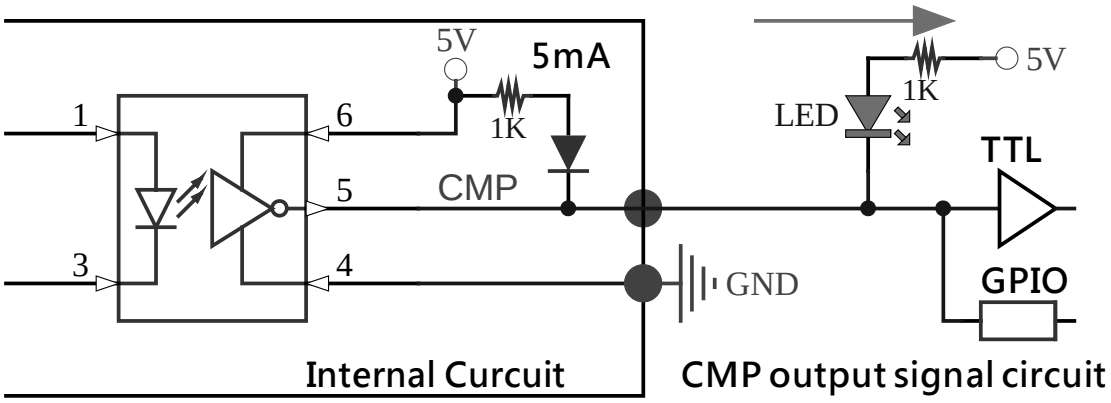
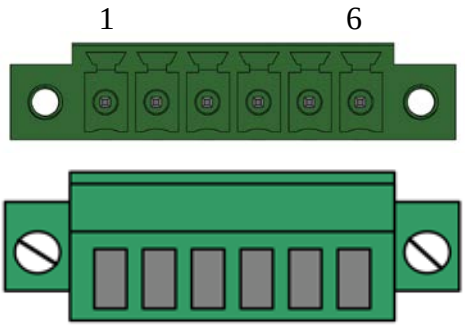


Figure 2-6: output wiring diagram

2.5. Emergency, Simultaneously Start and Simultaneously Stop

Interface CN8



Pin	Label	Pin	Label
1	STA	4	STP
2	STA	5	EMG
3	STP	6	GND

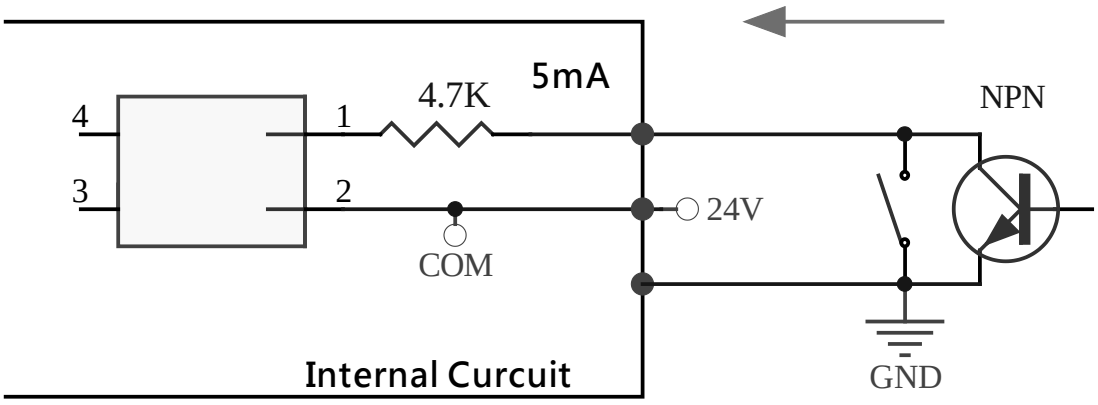


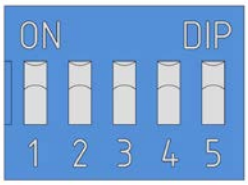
Figure 2-7: wiring for EMG

2.6. Slave ID Setting DIP Switch SW1

Pin	Label	ON	OFF
1	A5	1	0
2	A4	1	0
3	A3	1	0
4	A2	1	0
5	A1	1	0
6	A0	1	0

Note: Address = 32xA5+16xA4+8xA3+4xA2+2xA1+A0

2.7. Configuration Setting SW2



Pin	Label	Description	ON	OFF
1	B1	Baud-Rate Setting	1	0
2	B0		1	0
3	TD	Time-Out Status Latch	1	0
4	TM	Watch Dog Mode	1	0
5	TR	Terminate Resistance	Enable	Disable

B0	B1	Baud-Rate Setting
OFF	OFF	20Mbps
ON	OFF	10Mbps
OFF	ON	5Mbps
ON	ON	2.5Mbps

2.8. Manual Pulse Generator Connector

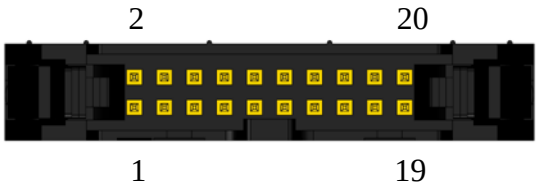


Figure 2-8: MPG pin definition

Pin	Label	Description	Pin	Label	Description
1	+24V/200mA	Power	2	G24	Ground
3	X Select	Input signal	4	Y Select	Input signal
5	Z Select	Input signal	6	U Select	Input signal
7	X1	Input signal	8	X10	Input signal
9	X100	Input signal	10	IOCOM	
11	+5V/200mA	Power	12	DGND	Ground
13	PA	Input signal	14	PB	Input signal
15	IOCOM		16	Enable	Input signal
17	JOG+	Input signal	18	JOG-	Input signal
19	Reserved		20	Reserved	

Table 2-1: MPG pin definition

The logic circuit is illustrated below.

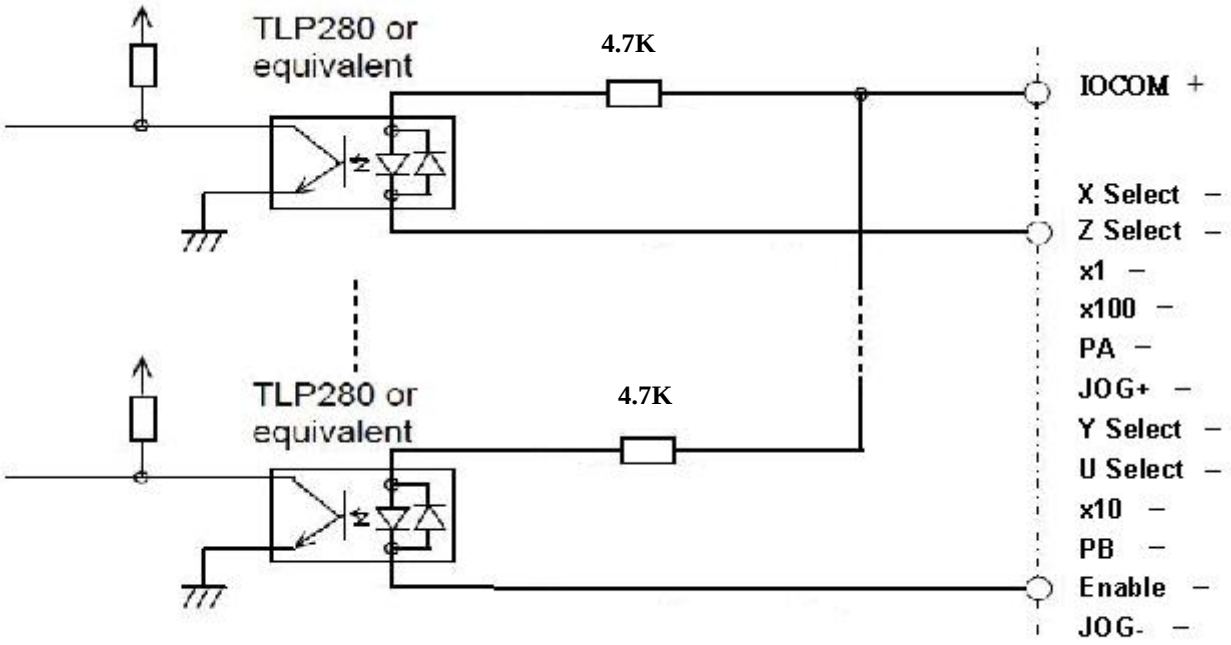


Figure 2-9: hand wheel NPN logic circuit

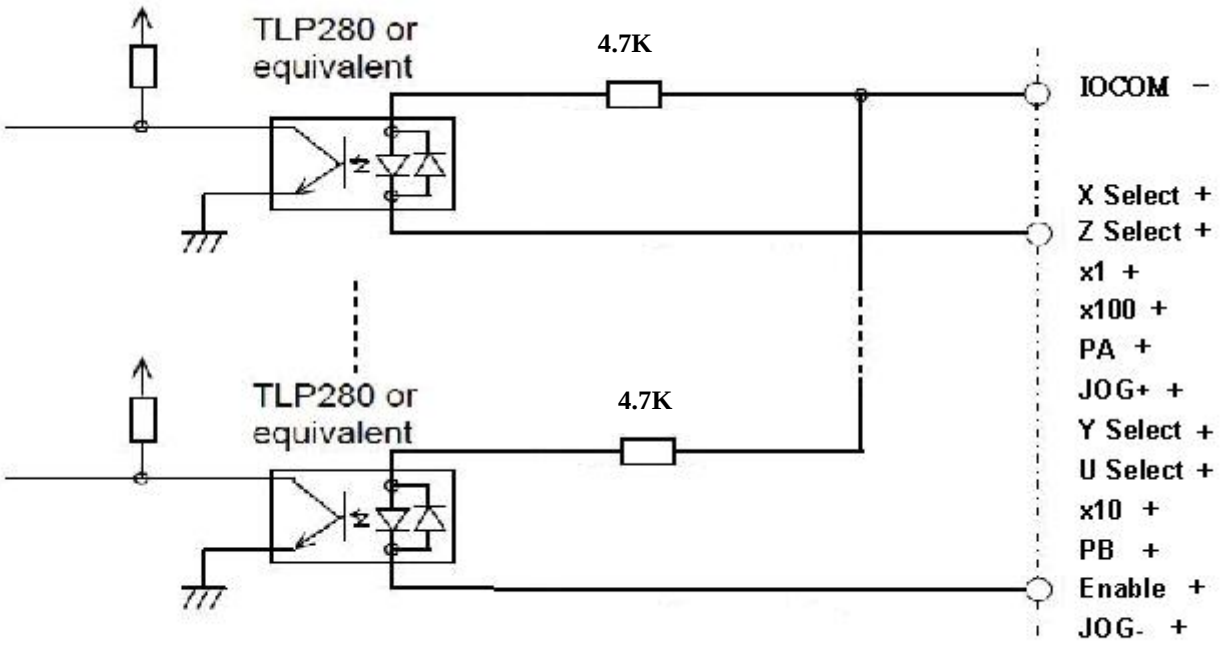
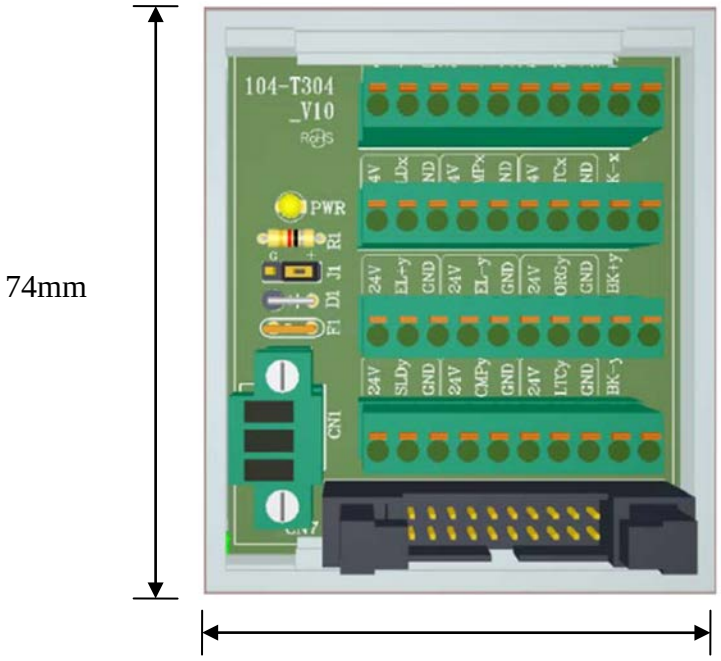


Figure 2-10: hand wheel PNP logic circuit

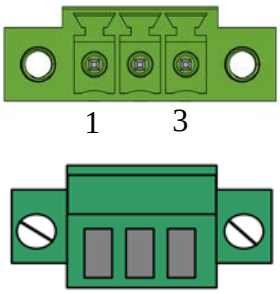
3. Introduction of the Terminal Board for 106-M304T

3.1. 104-T304



Name	Description
CN1	Power Connector
CN2	See Details below
CN3	See Details below
CN4	See Details below
CN5	See Details below
CN7	Axis0 & Axis1 / Axis2 & Axis3 Machinery I/O Signals Connector

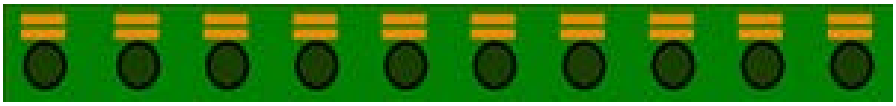
CN1



Pin	Label	Function			
1	FG	Field Ground			
2	GND	Ground (DC +24V)			
3	24V	＋24V Power			

CN2/CN3/CN4/CN5

1 10



CN2			
Pin	**Label**	**Pin**	**Label**
1	+24V	7	+24V
2	ELX+	8	ORGX
3	EGND	9	EGND
4	+24V	10	BRKX+
5	ELX-		
6	EGND		
CN3			
1	+24V	7	+24V
2	SLDX	8	LTCX
3	EGND	9	EGND
4	+24V	10	BRKX-
5	CMPX		
6	EGND		
CN4			
1	+24V	7	+24V
2	ELY+	8	ORGY
3	EGND	9	EGND
4	+24V	10	BRKY+
5	ELY-		
6	EGND		
CN5			
1	+24V	7	+24V
2	SLDY	8	LTCY
3	EGND	9	EGND
4	+24V	10	BRKY-
5	CMPY		
6	EGND		