LW4D3070N2I1-00

Installation instructions

ℹ️ Refer to installation use and maintenance manual for more information.

CE

RoHS COMPLIANT

2 phase step motor bipolar chopper drive technical data

- DC power supply: 24 ÷ 75 Vdc
- Phase current: up to 10 Apeak
- Chopper frequency: ultrasonic 40KHz
- Emulated Step angle: Full Step, ½, ¼, 1/8, 1/16, 1/32, 1/64, 1/128, 1/5, 1/10, 1/20, 1/25, 1/30, 1/36, 1/50, 1/100 configurable by means of Dip-Switches and other step angle could be defined by software
- Protections against: over current, over/under voltage, overheating, short circuit between motor phase-tophase and phase-to-ground
- Encoder input (not isolated): 5V Differential (RS422) incremental encoder
- Service SCI interface for programming and real time debugging
- Dimensions: 118 x 75.5 x 25.5 mm (without connectors)
- Protection degree: IP20
- Pollution degree: 2
- Working temperature 5°C ÷ 40°C - Storage temperature -25°C ÷ 55°C
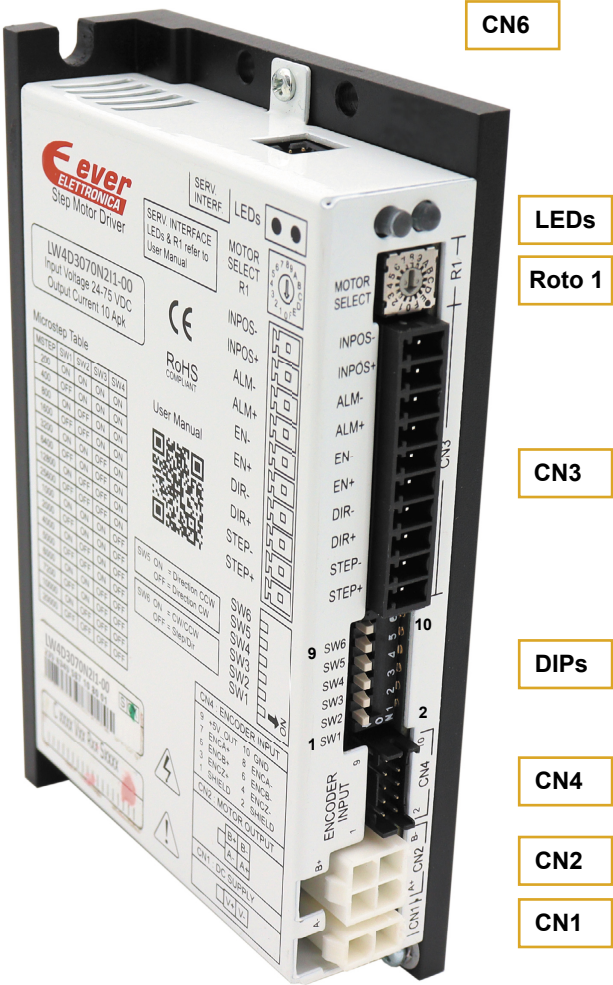- Humidity: 5% ÷ 85% not condensing

TITANIO
VECTOR · STEPPER · DRIVES

Mechanical data
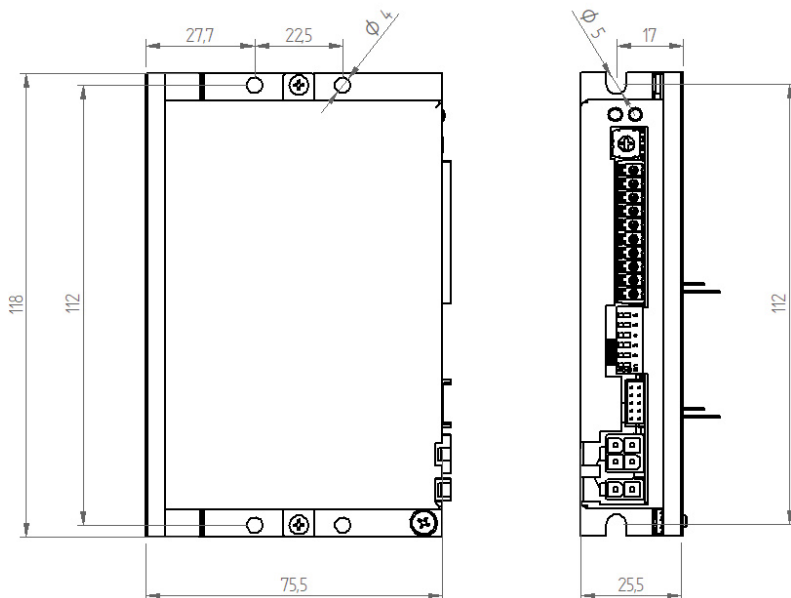
Dimensions in mm

System connections

Connectors:

CN6

LEDs

Roto 1

CN3

DIPs

CN4

CN2

CN1

System connection

CN1: Power supply

2 positions, pitch 4.2mm double row, PCB header connector

CN1.1	PGND	PWR_IN	Negative DC power supply input
CN1.2	VIN	PWR_IN	Positive DC power supply input

CN2: Motor connection
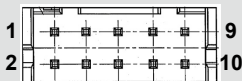
4 positions, pitch 4.2mm double row, PCB header connector

CN2.1	B/	PWR_OUT	Motor output phase B/
CN2.2	A	PWR_OUT	Motor output phase A
CN2.3	B	PWR_OUT	Motor output phase B
CN2.4	A/	PWR_OUT	Motor output phase A/
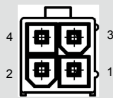
CN4: Encoder input connection

10 positions, pitch 2mm double row, PCB header connector

CN4.1	SHIELD	/	Cable shield connection
CN4.2	SHIELD	/	Cable shield connection
CN4.3	ENCZ +	DIG_IN	Encoder Zero input positive
CN4.4	ENCZ -	DIG_IN	Encoder Zero input negative
CN4.5	ENCB +	DIG_IN	Encoder Phase B input positive
CN4.6	ENCB -	DIG_IN	Encoder Phase B input negative
CN4.7	ENCA +	DIG_IN	Encoder Phase A input positive
CN4.8	ENCA -	DIG_IN	Encoder Phase A input negative
CN4.9	+5 V	PWR_OUT	+5Vdc power supply output
CN4.10	GND	PWR_OUT	Negative side of power supply

Shield is internally connected to PE

CN3: Digital I/O

10 positions, pitch 3.5mm single row, PCB header connector

CN3.1	STEP +	DIG_IN	Clock frequency + input (Clock up+)
CN3.2	STEP -	DIG_IN	Clock frequency - input (Clock up -)
CN3.3	DIR +	DIG_IN	Motor direction + input (Clock down +)
CN3.4	DIR -	DIG_IN	Motor direction - input (Clock down -)
CN3.5	EN +	DIG_IN	Enable + input
CN3.6	EN -	DIG_IN	Enable - input
CN3.7	ALM +	DIG_OUT	ALARM output collector side
CN3.8	ALM -	DIG_OUT	ALARM output emitter side
CN3.9	INPOS +	DIG_OUT	INPOS output collector side
CN3.10	INPOS -	DIG_OUT	INPOS output emitter side

CN6: Service SCI interface

4 positions, pitch 2mm double row, PCB header connector

CN6.1	TX/RX	Transmit / Receive Line
CN6.2	DE/RE	Drive Enable Negated / Receive Enable
CN6.3	+5V	+5V power out
CN6.4	GND	DNG power out
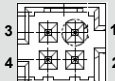
This connection is only possible with hardware and software provided by Ever.

Service SCI connection

This connection is only possible with hardware and software provided by Ever.
Kit code: SW4_SERV00-SL.

PC ── Service SCI connection KIT ── Drive

PC side

Drive side

ATTENTION!!! Correct insertion direction of the CN6: TAB UP.

Dip-Switches Settings

Microstep value	DIPs			
	SW1	SW2	SW3	SW4
20.000	**OFF**	**OFF**	**OFF**	**OFF**
10.000	ON	OFF	OFF	OFF
7.200	OFF	ON	OFF	OFF
6.000	ON	ON	OFF	OFF
5.000	OFF	OFF	ON	OFF
4.000	ON	OFF	ON	OFF
2.000	OFF	ON	ON	OFF
1.000	ON	ON	ON	OFF
25.600	OFF	OFF	OFF	ON
12.800	ON	OFF	OFF	ON
6.400	OFF	ON	OFF	ON
3.200	ON	ON	OFF	ON
1.600	OFF	OFF	ON	ON
800	ON	OFF	ON	ON
400	OFF	ON	ON	ON
200	ON	ON	ON	ON

SW5	Motor direction
OFF (default)	CW
ON	CCW

SW6	Mode
OFF (default)	Step/Dir
ON	CW/CCW

⚠️ *NOTE: the device reads the Dip-Switches only during the power up.*
If it's necessary a setting change, shut down the system, change the settings and start up the system again to make the changes operating.

Roto-Switch R1 Settings (Motor Select)

Functionality of the Roto-Switch R1 is defined by software.
Connect to a PC on Service Interface connector.

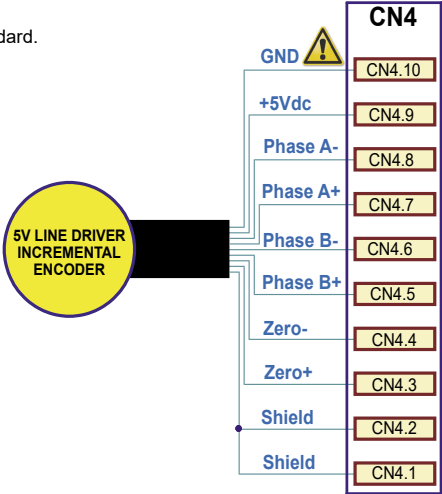| R1 Position	Configuration
0 (default)	MT11HE20015E401
1	MT17HE19020E403
2	MT17HE24018E4LC
3	MT17HE24020E401
4	MT23HE17028E401
5	MT23HE22028E4L2
6	MT23HE31028E4LC
7	MT23HE31050E402
8	MT24HE35050E402
9	MT34HE29060E401
A	MT34HE38060E404
B	MT34HE47060E4L2
C	Reserved
D	Reserved
E	Reserved
F	All configurations set by software

⚠️ *NOTE : the device reads the Roto-Switch R1 only during the Power up.*
If it's necessary a setting change, shut down the system, change the settings and start up the system again to make the changes operating.

Working Status (Led)

	Visualization status		Description
1	●	Green ON	Correct functioning, drive enable
2	◉	Green Blinking	Enable OFF, current zero
3	●	Yellow ON Red OFF	Missing setting of Inominal
4	◉	Yellow Blinking Red OFF	Warning: connect with Service SCI kit and check with software
5	●	Red ON Yellow OFF	Protection: Motor is in open phase condition
6	◉	Yellow OFF Red Blinking	Current protection
7	●◯	Red ON (2 sec) Yellow 1 Blink	Under/Over voltage protection
8	●◯◯◯	Red ON (2 sec) Yellow 3 Blink	Thermal protection
9	●◯◯◯◯	Red ON (2 sec) Yellow 4 Blink	Motor feedback error
10	●◯◯◯◯◯◯	Red ON (2 sec) Yellow 6 Blink	Motor current regulation is out of range
11	●◯◯◯◯◯◯◯	Red ON (2 sec) Yellow 7 Blink	eePLC user protection (generated by setting bit #0 of eePLC_user_settings)
12	●◯◯◯◯◯◯◯◯	Red ON (2 sec) Yellow 8 Blink	Error: connect with Service SCI and check with software

Encoder input connection

Electrically NOT-isolated digital inputs.
Differential 5Vdc that meet the RS422 standard.

CN4

GND ⚠️	CN4.10
+5Vdc	CN4.9
Phase A-	CN4.8
Phase A+	CN4.7
Phase B-	CN4.6
Phase B+	CN4.5
Zero-	CN4.4
Zero+	CN4.3
Shield	CN4.2
Shield	CN4.1

**5V LINE DRIVER INCREMENTAL ENCODER**

Maximum supply current 100 mA.

⚠️ *GND is internally in common with power ground, this is potentially dangerous. Take all necessay measures to avoid possible contacts in the final installation.*

⚠️ *Shield is internally connected to PE*

Digital inputs connection

Differential PNP, NPN and Line Driver type

5 - 24Vdc INPUTS

PNP Connection

NPN Connection

Line Driver Connection
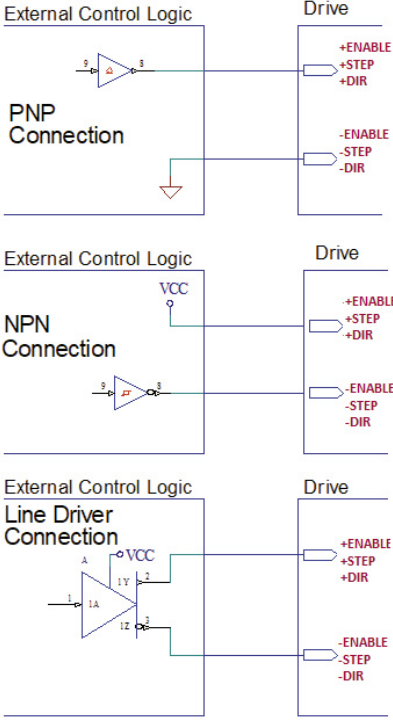
Standard (EN)			
Characteristics	MIN.	MAX.	Unit
Supply voltage	5	24	Vdc
Inputs frequency	--	2	kHz
Threshold switching voltage	–	2.5	Vdc
Current at 5 Vdc	--	6	mA
Current at 24 Vdc	--	15	mA

High speed (STEP & DIR)			
Characteristics	MIN.	MAX.	Unit
Supply voltage	24	24	Vdc
Inputs frequency	--	250	kHz
Threshold switching voltage	–	2.5	Vdc
Current at 5 Vdc	--	6	mA
Current at 24 Vdc	--	15	mA

Digital outputs connection

Digital outputs are 5-24Vdc PNP/NPN, Iout=100mA, Fmax = 2 kHz

PNP Connection
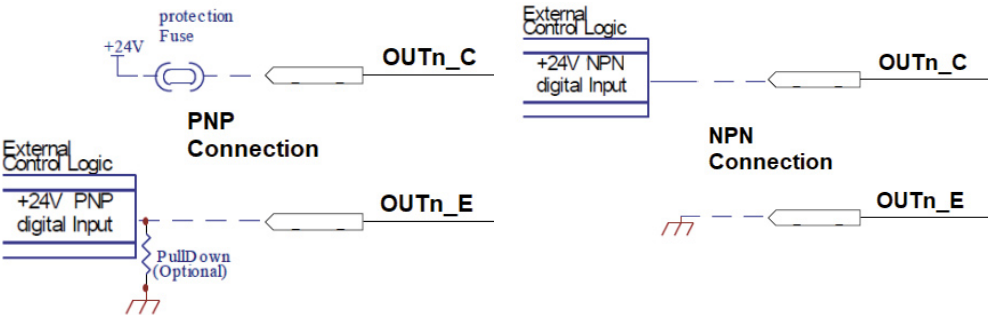
NPN Connection

Mating connectors

Connector	Description
CN1	Molex 39-01-2025
CN2	Molex 39-01-2045
CN3	Phoenix 1916371
CN4	Hirose DF11-10DS-2C

Cables selection

Function	Cable	
	Minimum	Maximum
Power supply, Motor and PE	0.5 mm² (AWG20)	1.3 mm² (AWG16)
Encoder input	0.08 mm² (AWG28)	0.2 mm² (AWG24)
Digital Inputs and Outputs	0.08 mm² (AWG28)	0.5 mm² (AWG20)

Verify the installation

- Check all connection: power supply, stepper motor and control logics.
- Make sure that all settings are correct for the application.
- Make sure that the characteristics of the DC power supply are appropriate for the drive.
- If possible, remove the load from the rotor of the motor to avoid wrong movements and eventual damages.
- Supply power and make sure that the green led is ON. If the led is OFF, shut down immediatelly and check if all connections are correct.
- Enable the current in the motor (without STEP Clock) and, if possible, verify the presence of the holding torque.
- Execute a movement of some steps and verify if the rotation direction is the deisdered one.

  i If the motion direction is not the desidered one, it is possible to change if leaving the DIR input unchanged and reversing the connection of a single phase of the motor to CN2, for example A with A/.

- Disconnect the power supply, fix the motor to the load and check the full functionality.

Analysis of malfunctions

⚠ *When any of the following situations occur, the drive is placed in a fault condition.*

DEFECT	CAUSE	ACTION
Intervention of the themal protection.	Can be caused bue a heavy working cycle or a high current in the motor.	Improve the drive cooling by decent air flow or a fun. Consider to use a motor with a higher torque vs current rating.
Intervention of the current protection.	Short circuit on the motor powering stage(s) of the drive.	Check motor windings and cables to remove the short circuits replacing faulty cables or motor if necessary.
Intervention of the over/under voltage protection	Supply voltage out of range.	Check the value for the supply voltage.
Open phase motor protection.	Open circuit from motor windings and drive.	Check motor cables and connections to the drive.

⚠ *When any of the following situations occur, the drive doesn't work and isn't placed in an error condition.*

DEFECT	CAUSE	ACTION
Noisy motor movement with vibrations.	Can be caused due to a lack of power supply to a phase of the motor or a poor regulation of the winding currents.	Check the cables and connections of the motor and/or change the motor speed to exit a resonance region.
The external fuse on the power supply of the drive is burned.	Can be caused due to a wrong connection of the power supply.	Connect the power supply correctly and replace the fuse.
At high speed, the motor torque is not enough.	Can be due to a motor current self-limitation.	Increase the motor current (always within the limits), increase the supply voltage, change motor connection from series to parallel.