LW1A3050N081-01

**ever** ELETTRONICA
the clever drive

Installation instructions

ℹ️ Refer to installation use and maintenance manual for more information.
Available user manual at link http://www.everelettronica.it/manhw.html

CE
RoHS COMPLIANT

2 phase step motor bipolar chopper drive technical data

- AC power supply : 18 ÷ 56Vac;
- Output DC supply at 24 Vdc - 3 A
- Phase current : 1.0 ÷ 5,5 ARMS (1.4 ÷ 7,8 APK);
- Chopper frequency: 33KHz Ultrasonic ;
- Step angle: Full Step, ½, ¼, 1/8, 1/16, 1/32, 1/64, 1/128, 1/256, 1/5, 1/10, 1/25, 1/50, 1/125, 1/250 configurable by means of DIP-Switches;
- Current reduction: automatically at standstill motor, enabled through DIP-Switch;
- Protections against : over current, over/under voltage, overheating, short circuit between motor phase-to-phase and phase-to-ground;
- Digital inputs (optically isolated) : EN (Enable), STEP, DIR;
- Digital output (optically isolated) : FAULT;
- Visualizations : Green Led Power ON, Green Led FAULT, Green Led +24 ON;
- Dimensions and weight : 120 x 97,5 x 62,3 mm. Not including connectors (L x D x H : refer to figure);
- weight : 600 gr ;
- Protection degree : IP20 ;
- Working temperature 5°C ÷ 40°C ; Storage temperature -25°C ÷ 55°C ;
- Humidity : 5% ÷ 85% not condensing.

Mechanical data
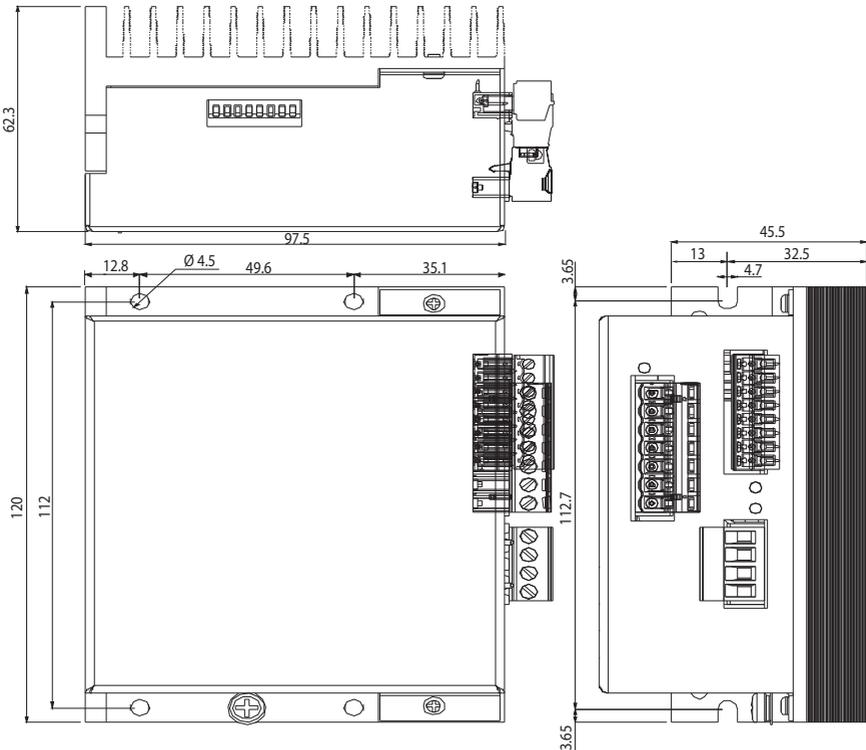
Connections

CN1: Stepper motor
4 position, pitch 3.81 mm, PCB header connector

CN1.1	A	POWER_OUT	Motor Output phase A
CN1.2	A/	POWER_OUT	Motor Output phase A/
CN1.3	B	POWER_OUT	Motor Output phase B
CN1.4	B/	POWER_OUT	Motor Output phase B/

CN10: Power supply and AUX
7 position, pitch 5.08 mm, PCB header connector

CN10.1	+24 Vdc (out)	AUX_OUT	Positive auxiliary DC power supply output (max 3 A)
CN10.2	GND (out)	AUX_OUT	Reference auxiliary DC power supply output
CN10.3	18 Vac	AUX_IN	Auxiliary AC input supply
CN10.4	18 Vac	AUX_IN	Auxiliary AC input supply
CN10.5	PE	PWR_IN	Environmental protective earthing
CN10.6	AC in	PWR_IN	Power supply AC input
CN10.7	AC in	PWR_IN	Power supply AC input

CN2: Digital inputs and output
8 position, pitch 3.81 mm, PCB header connector

CN2.1	+ EN	DIG_IN	Positive terminal digital input EN (ENABLE)
CN2.2	- EN	DIG_IN	Negative terminal digital input EN (ENABLE)
CN2.3	+ STEP	DIG_IN	Positive terminal digital input STEP (STEP or CLK_UP)
CN2.4	- STEP	DIG_IN	Negative terminal digital input STEP (STEP or CLK_UP)
CN2.5	+ DIR	DIG_IN	Positive terminal digital input DIR (DIRECTION or CLK_DOWN)
CN2.6	- DIR	DIG_IN	Negative terminal digital input DIR (DIRECTION or CLK_DOWN)
CN2.7	FAULT_C	DIG_OUT	FAULT output (Transistor Collector)
CN2.8	FAULT_E	DIG_OUT	FAULT output (Transistor Emitter)

Dip-Switches Settings

	off	off	off	off	off	off			off	off	off	off	off	off	off	off	Factory Default (**)
	DIP2 (internal)								DIP1								
	1	2	3	4	5	6	Arms	Apk	1	2	3	4	5	6	7	8	Step Angle
Rising Edge	off						5.53		off	off	off		off	off	off	off	Reserved (*)
Falling Edge	on						4.96		on	off	off		off	on	off	off	Full step
STEP-DIR Mode		off					4.54		off	on	off		off	off	on	off	1/250
CLK_UP / CLK_DOWN Mode		on					4.04		on	on	off		off	on	on	off	1/125
EN asserted = Drive Disable			off				3.48		off	off	on		off	off	off	on	1/50
EN asserted = Drive Enable			on				2.98		on	off	on		off	on	off	on	1/25
Voltage Mode Disabled				off			2.48		off	on	on		off	off	on	on	1/10
Voltage Mode Enabled				on			1.99		on	on	on		off	on	on	on	1/5
High Motor Phase Current Range					off		2.77		off	off	off	on	off	off	off	off	1/256
Low Motor Phase Current Range					on		2.48		on	off	off	on	off	on	off	off	1/128
							2.27		off	on	off	on	off	off	on	off	1/64
							2.06		on	on	off	on	off	on	on	off	1/32
							1.77		off	off	on	on	off	off	off	on	1/16
							1.49		on	off	on	on	off	on	off	on	1/8
							1.28		off	on	on	on	off	off	on	on	1/4
							0.99		on	on	on	on	off	on	on	on	1/2
																off	Idle Current Reduction Enable
																on	Idle Current Reduction Disable

⚠ *NOTE: the device reads the Dip-Switches and jumpers only during the power up. To change the setting, shut down the drive, change the settings and power the system up again to make the new setting operating.*
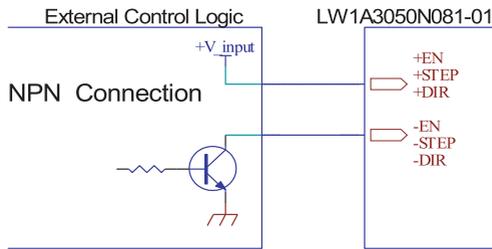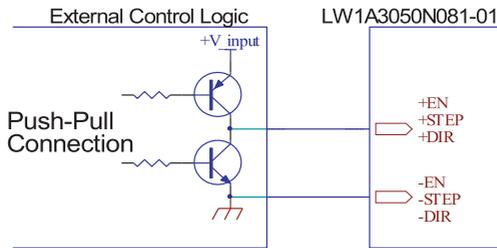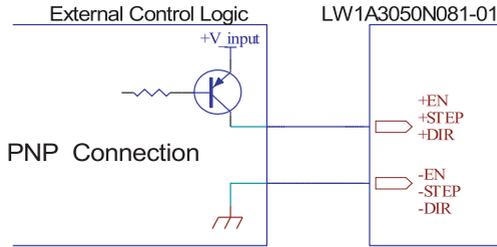
(*) = DIP1 SW5-6-7-8 = off: forces the system into ESM state (Enable Setup Mode – Factory Reserved). This state is chosen as Default because it prevents any movement of the motor until the user doesn't voluntary configure the Dip-Switches.

(**) = Dip-Switches configuration "Factory Default"

Connection to the digital inputs

⚠️ **When a clock is applied to the STEP and/or DIR inputs, the initial frequency has to be lower then 8KHz (T>125μsec). The frequency can be increased further until the maximum value.**

24V INPUTS
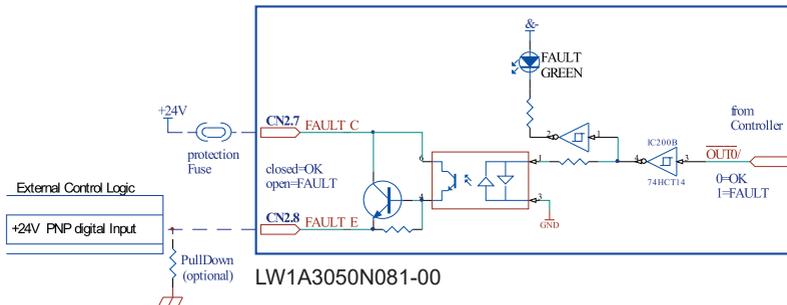
External Control Logic — LW1A3050N081-01

+V_input

PNP Connection

+EN
+STEP
+DIR

-EN
-STEP
-DIR

External Control Logic — LW1A3050N081-01

+V_input

Push-Pull Connection

+EN
+STEP
+DIR

-EN
-STEP
-DIR

External Control Logic — LW1A3050N081-01

+V_input

NPN Connection

+EN
+STEP
+DIR

-EN
-STEP
-DIR

Connection to the digital output

The output is sized to function at VOUTmax=24Vdc, IOUTmax=100mA
OK = transistor Output Closed - FAULT = transistor Output Open

&- FAULT GREEN

from Controller

+24V

CN2.7 FAULT C

protection Fuse

closed=OK
open=FAULT

IC200B

OUT0/

74HCT14

0=OK
1=FAULT

External Control Logic

+24V PNP digital Input

CN2.8 FAULT E

GND

PullDown
(optional)

LW1A3050N081-00

Mating connectors

Connector	Description	Order code
CN1	4 position, pitch 5.08mm., plug connector PHOENIX CONTACT p# MSTB 2,5/4-ST-5,08	1758377
CN10	7 position, pitch 5.08mm., plug connector PHOENIX CONTACT p# MSTB 2,5/7-ST-5,08	1757064
CN2	8 position, pitch 3.81mm., plug connector PHOENIX CONTACT p# MC 1,5/8-ST-3,81	1803633

Cables section

Function	Cable	
	Minimum	Maximum
Power supply	0.5 mm² (AWG20)	1.5 mm² (AWG15)
Motor output	0.5 mm² (AWG20)	1.5 mm² (AWG15)
Digital inputs	0.14 mm² (AWG25)	0.5 mm² (AWG20)
Digital output	0.14 mm² (AWG25)	0.5 mm² (AWG20)

Verify the installation

- Check all connections : Power supply, Stepper motor and control logics.
- Make sure that all settings are correct for the application.
- Make sure that the characteristics of the AC 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 POWER ON is on. If the led is OFF, shut down immediately 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 desired one.

i If the motion direction is not the desired one, it is possible to change it leaving the DIR input unchanged and reversing the connection of a single phase of the motor to CN1, for example A with A/.

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

Analysis of malfunctions

The green led POWER ON of the LW1A3050N081-00 indicates that the drive is correctly powered.

When any of the following situations occur, the drive is placed in an error condition and it releases the output transistor turning off the green led FAULT.

DEFECT	CAUSE	ACTION
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.
Intervention of the thermal protection.	Can be caused due to a heavy working cycle or a high current in the motor.	Improve the drive cooling by a decent air flow or a fan. Consider to use a motor with a higher torque vs current rating.
Intervention of the current protection.	Short circuit to the motor output stage(s) of the drive.	Check motor windings and cables and remove the short circuits replacing the faulty cables or the motor if necessary.

When any of the following situations occur, the drive isn't placed in an error condition, the output transistor and the green led FAULT remain closed.

DEFECT	CAUSE	ACTION
Noisy motor movement with vibrations.	Can be caused due to a lack of power supply to a phase of the motor, a poor regulation of the winding currents.	Check the cables and connections of the motor. Increase the resolution of the step angle (DIP1 SW5-6-7-8) and/or change the motor speed to exit a resonance region.
At higher speed the motor hasn't enough torque	Can be caused due to the self-limitation of the motor current.	Enable the VOLTAGE Mode (DIP2 SW4 = On).

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