LW1D4080N0A1-01

**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

- DC power supply 48 ÷ 140Vdc;
- Phase current : 1.0 ÷ 8 ARMS (1.4 ÷ 11,3 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-tophase and phase-to-ground;
- Digital inputs (optically isolated) :: EN (Enable), STEP (Step or CLK_UP), DIR (Direction or CLK_DWN), BOOST;
- Digital output (optically isolated) : FAULT;
- Visualizations : 7 segments display;
- Dimensions and weight : 165 x 97,5 x 54,3 mm. Connectors excluded (L x D x H : refer to figure); weight : 680 gr ;
- Protection degree : IP20 ;
- Working temperature 5°C ÷ 40°C ; Storage temperature -25°C ÷ 55°C;
- Humidity : 5% ÷ 85% not condensing;

Mechanical data
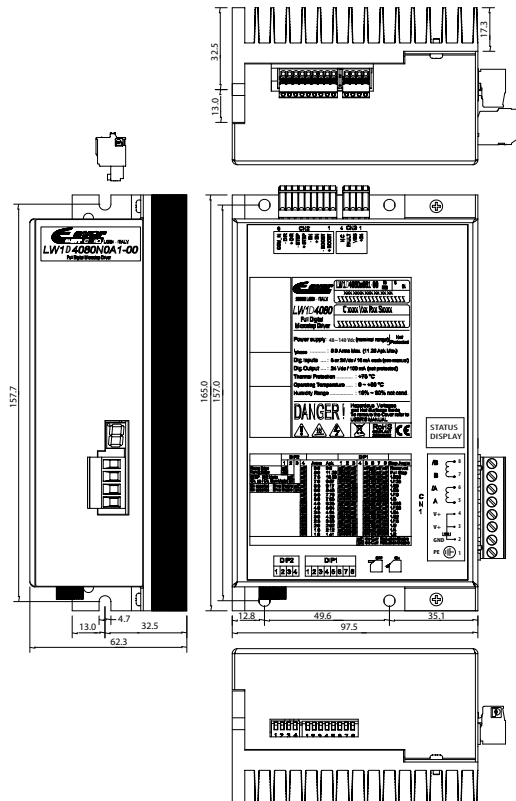
Connections

CN1: Stepper motor

CN1.1	EARTH	POWER_IN	Earthing Terminal (Earth Ground)
CN1.2	GND	POWER_IN	Negative Terminal of power supply (-)
CN1.3	V+	POWER_IN	Positive Terminal of power supply (+)
CN1.4	V+	POWER_IN	Positive Terminal of power supply (+)
CN1.5	A	POWER_OUT	Motor Output phase A
CN1.6	A/	POWER_OUT	Motor Output phase A/
CN1.7	B	POWER_OUT	Motor Output phase B
CN1.8	B/	POWER_OUT	Motor Output phase B/

CN3: Digital output

CN3.1	+24 Vdc	DIG_OUT	Positive power supply digital outputs.
CN3.2	VSS	DIG_OUT	Negative reference power supply digital
CN3.3	FAULT	DIG_OUT	Open Emitter Output (Source Current) B0_OUT0
CN3.4	n.c.	DIG_OUT	---

CN2: Digital inputs

CN2.1	+ Boost	DIG_IN	Positive terminal digital input BOOST
CN2.2	- Boost	DIG_IN	Negative terminal digital input BOOST
CN2.3	+ En	DIG_IN	Positive terminal digital input EN (ENABLE)
CN2.4	- En	DIG_IN	Negative terminal digital input EN (ENABLE)
CN2.5	+ Step	DIG_IN	Positive terminal digital input STEP (STEP or CLK_UP)
CN2.6	- Step	DIG_IN	Negative terminal digital input STEP (STEP or CLK_UP)
CN2.7	+ Dir	DIG_IN	Positive terminal digital input DIR (Direction or CLK_DWN)
CN2.8	- Dir	DIG_IN	Negative terminal digital input DIR (Direction or CLK_DWN)
CN2.9	Com_in	PWR_IN	Reference common inputs (for use at 24VDC)

Dip-Switches Settings

DIP2 SW1	Function: Clock mode	Default
off	STEP / CLK_UP & CLK_DWN on Rising Edge	X
on	STEP / CLK_UP & CLK_DWN on Falling Edge	

DIP2 SW2	Function: Drive Control Mode	Default
off	STEP – DIR mode	X
on	STEP=CLK_UP , DIR=CLK_DWN	

DIP2 SW3	Function: ENABLE Selection	Default
off	EN asserted = Drive Disabled	X
on	EN asserted = Drive Enabled	

DIP1 SW4	Function: RWC Selection	Default
off	Idle Current reduction enabled	X
on	Idle Current reduction disabled	

#	DIP2 SW4	DIP1 SW1	SW2	SW3	Arms	Apk	Default	Function
0	off	off	off	off	0	0	X	Motor Phase Current Selection
1	off	on	off	off	8.0	11.3		
2	off	off	on	off	7.5	10.6		
3	off	on	on	off	7.0	9.9		
4	off	off	off	on	6.5	9.2		
5	off	on	off	on	6.0	8.5		
6	off	off	on	on	5.5	7.8		
7	off	on	on	on	5.0	7.0		
8	on	off	off	off	4.5	6.4		
9	on	off	off	off	4.0	5.6		
10	on	off	on	off	3.5	4.9		
11	on	on	on	off	3.0	4.2		
12	on	off	on	on	2.5	3.5		
13	on	on	off	on	2.0	2.8		
14	on	off	on	on	1.5	2.1		
15	on	on	on	on	1.0	1.4		

#	DIP1 SW5	SW6	SW7	SW8	Step angle	Default	Function
0	on	on	on	on	1/2		Step Angle Selection
1	on	off	on	on	1/4		
2	on	on	off	on	1/8		
3	on	off	off	on	1/16		
4	on	on	on	off	1/32		
5	on	off	on	off	1/64		
6	on	on	off	off	1/128		
7	on	off	off	off	1/256		
8	off	on	on	on	1/5		
9	off	off	on	on	1/10		
10	off	on	off	on	1/25		
11	off	off	off	on	1/50		
12	off	on	on	off	1/125		
13	off	off	on	off	1/250		
14	off	on	off	off	Full Step		
15	off	off	off	off	reserved (*)	X	

> ⚠️ **NOTE: the device reads the Dip-Switches only at powering up. To change the setting, shut down the drive, change the settings and power the system up again to make the new setting operating.**
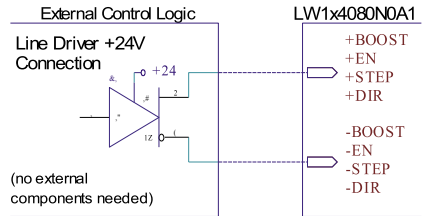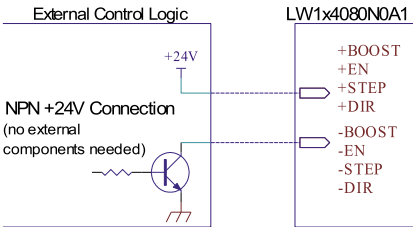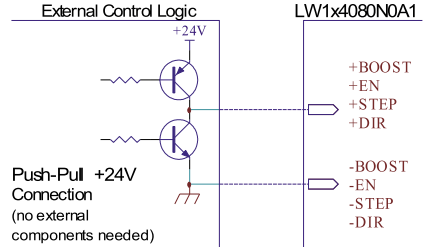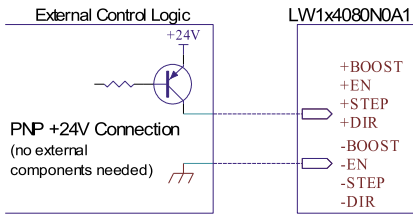
(*) = DIP1 SW5-6-7-8 = off: Activare ESM firmware confition (Enable Setup Mode – Factory Reserved).
ESM setting avoid any motor run until the user set-up the right configuration on dip-switches.

Connection to the digital inputs

- 4 24Vdc PNP, NPN, Line Drive digital input;
- COM_IN connection on CN2.9 not used;
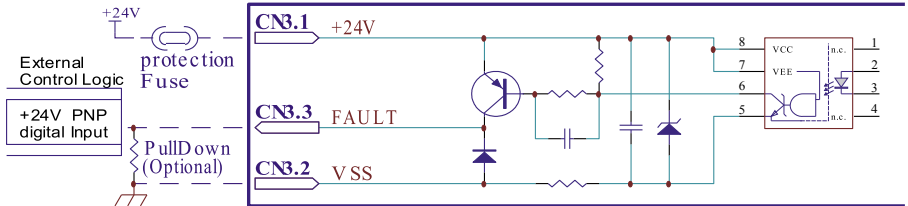- it's not possible use 5Vdc digital inputs;

⚠️ **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 — LW1x4080N0A1
+24V
PNP +24V Connection
(no external components needed)
+BOOST / +EN / +STEP / +DIR / -BOOST / -EN / -STEP / -DIR

External Control Logic — LW1x4080N0A1
+24V
Push-Pull +24V Connection
(no external components needed)
+BOOST / +EN / +STEP / +DIR / -BOOST / -EN / -STEP / -DIR

External Control Logic — LW1x4080N0A1
+24V
NPN +24V Connection
(no external components needed)
+BOOST / +EN / +STEP / +DIR / -BOOST / -EN / -STEP / -DIR

External Control Logic — LW1x4080N0A1
Line Driver +24V Connection
+24
(no external components needed)
+BOOST / +EN / +STEP / +DIR / -BOOST / -EN / -STEP / -DIR

Connection to the digital output

The FAULT output is dimensioned to function at VOUTmax=24Vdc, IOUTmax=100mA
OK Status= transistor Output Closed, Led FAULT on -
FAULT stauts = transistor Output Open, Led FAULT off

+24V
External Control Logic
+24V PNP digital Input
protection Fuse
PullDown (Optional)
CN3.1 +24V
CN3.3 FAULT
CN3.2 VSS
VCC / VEE
8 / 7 / 6 / 5
n.c. / 1 / 2 / 3 / 4 / n.c.

Mating connectors

Connector	Description	Order code
CN1	8 position, pitch 5.08mm., plug connector PHOENIX CONTACT p# MSTB 2,5/8-ST-5,08	1757077
CN2	9 position, pitch 2.5mm., plug connector PHOENIX CONTACT p# FK MC0,5/9-ST-2,5	1881396
CN3	4 position, pitch 2.5mm., plug connector PHOENIX CONTACT p# FK MC0,5/4-ST-2,5	1881341

Cables section

Function	Cable	
	Minimum	Maximum
Power supply	0.5 mm² (AWG20)	2.5 mm² (AWG12)
Motor output	0.5 mm² (AWG20)	2.5 mm² (AWG12)
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 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 7-segments display is ON. If the 7-segments display 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 7-segments indicates **5.** that the drive is correctly powered.

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.
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.

Operational statuses

The following statuses can be displayed:.

DISPLAY SIMBOL	DESCRIPTION	DISPLAY SIMBOL	DESCRIPTION
" 5. "	Correct functioning;	" P. " + " 1. "	**Alarm:** over/under voltage (1);
" 5. " + " 5. "	**Attention:** Inominal not allocated;	" P. " + " 2. "	**Protection:** over current on the motor output
" 5. " + " 1. "	**Attention:** drive temperature is near to the maximum value;	" P. " + " 3. "	**Protection:** over temperature of the drive;
" 5. " + " 3. "	**Attention:** Voltage of the DC bus near the maximal value (1);	" F. "	**Error:** an internal Software Error occurred in the drive;
" 5. "	**Flashing:** Enable OFF, current zero;	" F. " + " 0. "	**Error:** Security intervention of watchdog; **Action:** shut down to exit the memorized protection status or activate the RESET input;
" L. "	**Missing Operating System:** no software application stored on drive;	" F. " + " 1. "	**Error:** Internal Software Error;Action: contact EVER;
" U. "	**Firmware update:** update the new software in progress	" F. " + " 2. "	**Error:** missing calibration values; Action: contact EVER;
" P. "	**Protection statuses:** the drive has detected a protection;	" F. " + " 4. "	**Error:** management EEPROM;Action: contact EVER;