ever
e-MOTION SOLUTIONS

Ever Stepper Drives

The Titanio family of drives from Ever Motion Solutions (formerly Ever Elettronica) are high performance vector stepper drives that provide industryleading quality and control. The drives are available in Open Loop (no encoder feedback) and Closed Loop (motor-mounted encoder provides position feedback to the drive). Like most Closed Loop stepper drives, Ever's Titanio drives can alert the upper control system if a motor stalls (Stall Detection). However, the Ever Titanio drives also have Stall Detection capability in Open Loop control mode: the drive uses the motor's back EMF to monitor motor movement. This means the Titanio drives can detect and report Stall Detection without encoder feedback.

The Titanio drive technology is based on ELSE – Error Less Servo Efficient – technology pioneered by Ever. ELSE provides precise sinusoidal stepper motor current control. ELSE is built on the f4d2 (Fast Forward Feed Full Digital Drive) technology. The proprietary and patented f4d2 algorithms reduce the parasitic phase current harmonics that cause unnecessary motor heating and noisy/ inefficient motor operation.

The breakthrough of ELSE technology and the f4d2 algorithms result in greatly improved phase current control and near "stepless" operation of stepper motors. The benefits of better and smoother current control include:

- drastic reduction of motor noise
- extremely smooth movement of the motor, regardless of microstep resolution
- significant damping of motor vibrations and resonances
- increased positioning accuracy
- better and more constant torque output at every rotational speed
- less heating and higher efficiency of the motor and drive system
- all drives with ELSE technology also have BEMF stall detection, with or without encoder feedback

For more information on f4d2: https://www.everelettronica.com/en/technologies/f4d2-fast-forward-feed-full-digital-drive

For more information on ELSE: https://www.everelettronica.com/en/technologies/-else-technology-for-different-type-of-motors

For more information on Closed Loop stepper technology: https://www.everelettronica.com/en/technologies/closed-loop-of-torque-speed-and-position-systems

The Titanio drives are available in models with complete drive setup using DIP switches only, as well as models that can be finetuned and set up with free Ever Studio software in addition to DIP switch setup.

Features

- ELSE® (**E**rror**L**ess **S**ervo **E**fficient) step loss detection without encoder
- Quiet and smooth operation
- 36 month warranty
- Closed Loop for drive LW4D
- Protection against short circuit and open circuit
- Alarms for over/under voltage, temperature, short circuit
- Basic setup configured by DIP switches, optional advanced software setup for LW3A and LW4D drives

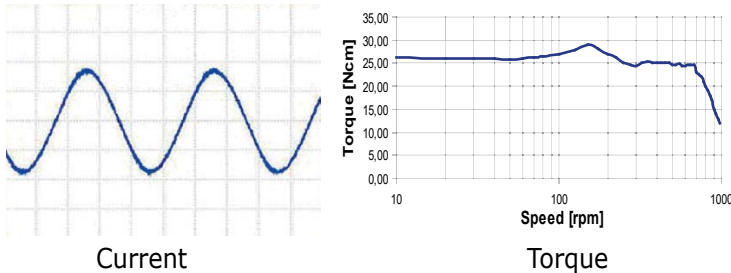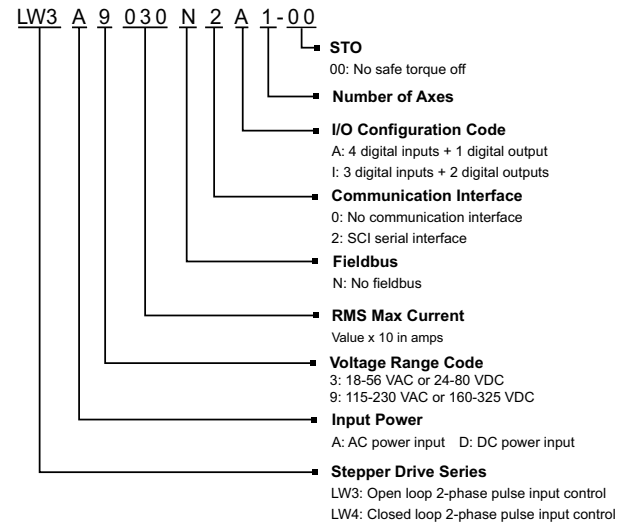| Ever Steppers – Drive Feature Comparison			
Drive Model	**LW4D3070N2I1-00**	**LW3D3070N0A1-00**	**LW3A9030N2A1-00**
Price	$105.00	$205.00	$290.00
Drawing	PDF	PDF	PDF
Drive Type	2-phase digital stepper drive for hybrid stepper motors		
Supply Voltage	24–75 VDC	24–80 VDC	100–240 VAC
Pulse Input Type	Differential, Single-ended		
Step Input Modes	Differential, Single-ended, AB Quadrature	Differential, Single-ended	
Digital Input Voltage	5–24 VDC	2–24 VDC	5–24 VDC
PPR Range	200–25600 (DIP switch) 200–65536 (software)	200–51200 (DIP switch)	200–2000 (DIP switch) 200–65536 (software)
Motor Output Current Range	0.0–7.1 (A/ph rms) 0.0–10.0 (A/ph peak)	1.7– 7.1 (A/ph rms) 2.4–10.0 (A/ph peak)	0.0–3.0 (A/ph rms) 0–4.2 (A/ph peak)
Digital Output	2 opto-isolated, 5–24 VDC, 100mA max NPN or PNP for Alarm and In Position	1 opto-isolated, 24VDC, 400mA max, , NPN or PNP for Alarm	1 opto-isolated, 24VDC, 400mA max PNP or NPN for Alarm
Self-test Capable	Software-based (internal indexing)	Pulse Input Test (LEDs signal if the incoming pulse rate is 0Hz, <1kHz, or ≥1kHz))	Software-based (internal indexing)
Special Features	Advanced software setup	–	Basic software setup

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Stepping Drives

Ever Stepper Drive Feature Overview

Vector Control

The sinusoidal phase current with "ELSE" technology keeps the motor torque constant allowing smooth and noiseless movements.
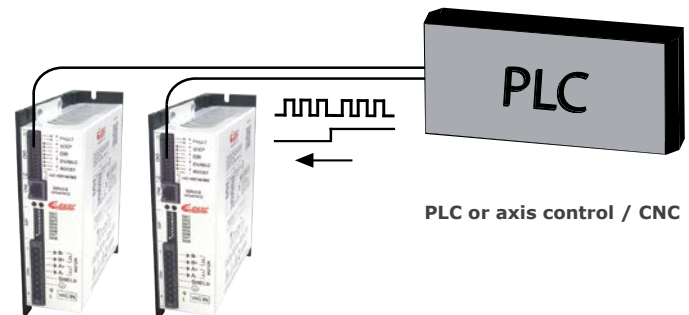

Current

Torque

Drive Model Number Explanation

LW3 A 9 030 N 2 A 1-00

STO
00: No safe torque off

Number of Axes

I/O Configuration Code
A: 4 digital inputs + 1 digital output
I: 3 digital inputs + 2 digital outputs

Communication Interface
0: No communication interface
2: SCI serial interface

Fieldbus
N: No fieldbus

RMS Max Current
Value x 10 in amps

Voltage Range Code
3: 18-56 VAC or 24-80 VDC
9: 115-230 VAC or 160-325 VDC

Input Power
A: AC power input   D: DC power input

Stepper Drive Series
LW3: Open loop 2-phase pulse input control
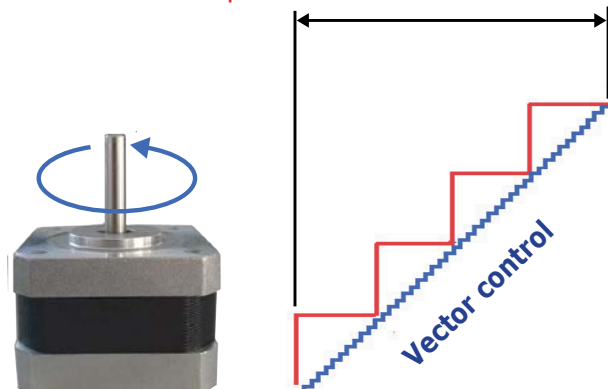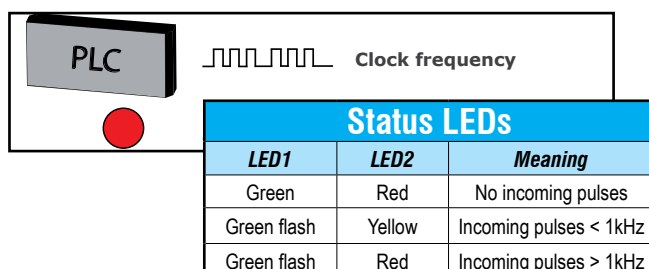LW4: Closed loop 2-phase pulse input control

Easy Drive Configuration

- Set motor current value using dip-switches. Option to set motor current with Ever Studio software (LW3A and LW4D)
- Select step angle using roto-switches. Option to set motor current with Ever Studio software. Step angles have been emulated through software to maintain compatibility with traditional drives. Current regulation is always sinusoidal.
- Enable motor stall detection with DIP switches (LW3D, LW3A) or software (LW4D)..
  By reading the motor BEMF, LWx drivers detect step loss without encoder input. Drive displays alarm status with Fault digital OUT and an LED sequence.
- DIP switches to select Step/Direction or CW/CCW control mode.
- ENABLE input can be set for active high or active low.
- 30% or 70% automatic current reduction (when motor is not moving).
- Enable "Clock Test" function during drive installation to show the presence of the high speed pulse signals via status LED flashes (LW3D).

PLC or axis control / CNC

Even at 1/4 stepping, Ever's vector current control results in smooth motor operation and low motor temperatures

Status LEDs		
LED1	**LED2**	**Meaning**
Green	Red	No incoming pulses
Green flash	Yellow	Incoming pulses < 1kHz
Green flash	Red	Incoming pulses > 1kHz

Clock frequency

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LW3D3070N0A1-00 Stepper Drive

The LW3D from Ever Motion Solutions (formerly Ever Elettronica) is a high-performance vector stepper drive from Ever's Titanio family. The LW3D is a two-phase stepper drive that operates in Open Loop mode (no motor encoder required). The drive accepts an incoming voltage of 24-80VDC, and can power hybrid bipolar stepper motors with up to 10A peak output current. The LW3D is completely setup via DIP switches (no software required) and can run most 2-phase hybrid stepper motors.

The LW3D stepper drive utilizes Ever's ELSE (Error Less Servo Efficient) technology that supplies the motor with sinusoidal current, resulting in reduced harmonic currents, lower motor temperature, and smoother/quieter motor operation. The LW3D has sensorless motor stall detection that detects motor missed steps (machine jams, overload conditions, etc.) without the need for encoder feedback. The drive has built-in protections that include overcurrent, under/over voltage, overheating, and motor output short circuit protection.

The DIP switches on the LW3D provide setup and configuration for the drive and motor (step angle, phase current, Step/Direction vs CW/CCW, etc.), but they also provide some unique features:

- Clock Test: This feature uses the status LEDs to show if the incoming PLC high-speed pulses are 0Hz, <1kHz, or >1kHz. This greatly simplifies troubleshooting high-speed pulses without the need for an oscilloscope.
- Torque Filter: While the LW3D results in a smoother and quieter motor than other stepper drives, the second rotary DIP switch allows each application to be fine-tuned with a built-in Torque Filter. This rotary DIP switch allows each application to find a balance between noise and power. The default setting is None (no filtering). If your system could use additional motor smoothness, simply increase the Torque Filter until the system responds as needed. Tuning, simplified.

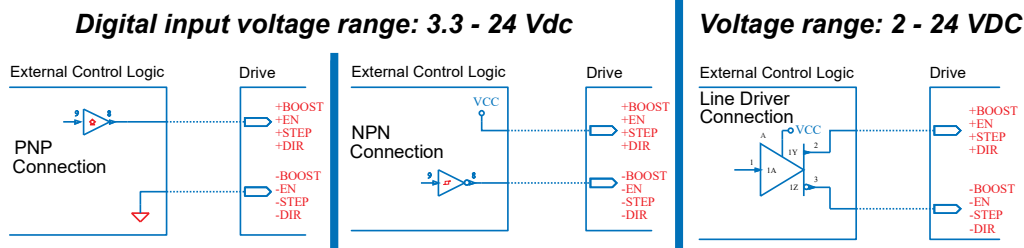| LW3D3070N0A1-00 Drive Specifications	
Drive Model	_LW3D3070N0A1-00_
Power Supply Voltage	24–80 VDC
Digital Input Voltage	2–24 VDC
Output current	1.7– 7.1 (A/ph rms) 2.4–10.0 (A/ph peak)
Control mode	Pulse + Direction, CW/CCW
Power stage	H bridge bipolar chopper at 40 kHz
Feedback Interface	n/a
Digital Inputs	4 opto isolated 2–24VDC 2 MHz NPN or PNP or Line Driver.
Digital Outputs	4 opto isolated, 2–24 VDC, NPN, PNP or Line Driver, 2 MHz
Open or Close Loop	Open
Step Resolution	From full step up to 1/256 (emulated)
PPR Range	200–51200
Safety Protections	Over/Under voltage, Over Current, Over Temperature, Short Circuit Phase/Phase and Phase/Ground
Status Monitoring	2 LEDs with guiding light (solid green and flashing red/yellow)
Operating Temperature	5 to 40 °C [41 to 1104 °F]
Storage Temperature	0 to +55 °C [32 to 131 °F]
Operating Humidity	0–90 %
Protection class	IP20
Mounting	Wall mount
Dimensions H x L x W	128.0 x 30.0 x 74.0 mm
Weight	0.29 Kg
Agency Approvals	CE

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Stepping Drives
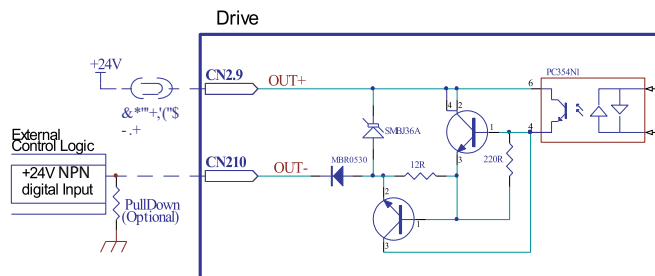
LW3D3070N0A1-00 Input/Output Wiring

Digital Input Wiring

Differential PNP, NPN, and Line Driver type.

Digital input voltage range: 3.3 - 24 Vdc

Voltage range: 2 - 24 VDC

External Control Logic | Drive

PNP Connection

+BOOST
+EN
+STEP
+DIR

-BOOST
-EN
-STEP
-DIR

External Control Logic | Drive

VCC

NPN Connection

+BOOST
+EN
+STEP
+DIR

-BOOST
-EN
-STEP
-DIR

External Control Logic | Drive

Line Driver Connection

VCC
A
1A
1Y
1Z

+BOOST
+EN
+STEP
+DIR

-BOOST
-EN
-STEP
-DIR

Digital Output Wiring

Drive

+24V

&·*'"+;'("$ - . +

CN2.9   OUT+

PC354N1

6

1

SMB336A

External Control Logic
+24V NPN digital Input

CN210   OUT-

MBR0530

12R

220R

3

PullDown (Optional)

⚠ CAUTION: THE FAULT OUTPUT IS NOT PROTECTED IN CURRENT. PROVIDE AN EXTERNAL CURRENT LIMITATION DEVICE (I_{OUTMAX}=100MA). THE PROTECTIVE DEVICE MAY BE PLACED ON THE POWER CONDUCTOR +24VDC (CN2.10).

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Ever Stepper Drive Accessories

Ever Stepper Drive Accessories				
Part Number	**Price**	**Description**	**Drawing Links**	**Use With**
EVER-PGM-1	$89.00	Ever Motion Solutions programming cable, USB A connector to 4-pin connector, 6ft cable length. For use with Ever Motion Solutions LW4D3070N2I1-00 microstepping drive.	n/a	LW4D3070N2I1-00
EVER-PGM-2	$89.00	Ever Motion Solutions programming cable, USB A connector to RJ11, 6ft cable length. For use with Ever Motion Solutions LW3A9030N2A1-00 microstepping drive.	n/a	LW3A9030N2A1-00
LW4D3KIT-C0	$8.00	Ever Motion Solutions connector kit, for use with Ever Motion Solutions LW4D3070N2I1-00 microstepping drive, includes (1) drive power connector, (1) motor power connector, (1) encoder connector and (1) control signal connector.	n/a	LW4D3070N2I1-00
LW4D3KIT-050	$60.00	Ever Motion Solutions cable kit, for use with Ever Motion Solutions LW4D3070N2I1-00 microstepping drive, includes (1) 1.6ft/0.5m power cable, (1) 1.6ft/0.5m motor extension cable, (1) 1.6ft/0.5m encoder cable and (1) control signal connector.	n/a	LW4D3070N2I1-00
LW3D-CON-A	$10.00	Ever Motion Solutions drive/motor power connector, replacement. For use with Ever Motion Solutions LW3D3070N0A1-00 microstepping drive.	PDF	LW3D3070N0A1-00
LW3D-CON-B	$18.00	Ever Motion Solutions control signal connector, replacement. For use with Ever Motion Solutions LW3D3070N0A1-00 microstepping drive.	PDF	LW3D3070N0A1-00
LW3A-CON-A	$13.00	Ever Motion Solutions drive/motor power connector, replacement. For use with Ever Motion Solutions LW3A9030N2A1-00 microstepping drive.	PDF	LW3A9030N2A1-00
LW3A-CON-B	$26.00	Ever Motion Solutions control signal connector, replacement. For use with Ever Motion Solutions LW3A9030N2A1-00 microstepping drive.	PDF	LW3A9030N2A1-00

EVER-PGM-1

EVER-PGM-1 connection to drive

EVER-PGM-2

LW4D3KIT-C0

LW4D3KIT-050

LW3D-CON-A

LW3D-CON-B

LW3A-CON-A

LW3A-CON-B