

## Installation instructions



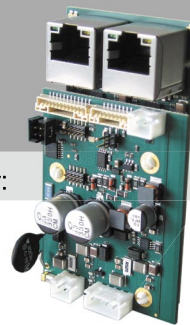
Refer to installation use and maintenance manual for more information.



## Controller bipolar open frame drive for 2 phase step motor:

- DC Power Supply: 12 ÷ 36Vdc
- DC Logic Supply: 24Vdc (mandatory)
- Phase current: up to 3 ARMS (4,2 APK)
- Chopper frequency: ultrasonic 40KHz
- Stepless Control Technology (65536 position per turn)
- Protections: over-current, over-temperature, short circuit phase-phase motor and phase-ground
- Direct feedback interface: incremental encoder (not isolated) 5Vdc TTL/CMOS or 24Vdc Push-Pull
- Ethernet communication interface (Modbus TCP/IP protocol)
- Service SCI interface for programming and real time debugging
- Enable Torque input not isolated (mandatory)
- 4 digital inputs (not isolated)
- 3 digital outputs (not isolated)
- 1 analog input
- Dimensions: 83 x 42 x 33mm (refer to picture)
- Pollution degree: 2
- Category C3 following standard EN 61800-3
- Working temperature 5°C ÷ 40°C; Storage temperature -25°C ÷ 55°C
- Humidity: 5% ÷ 85% not condensing

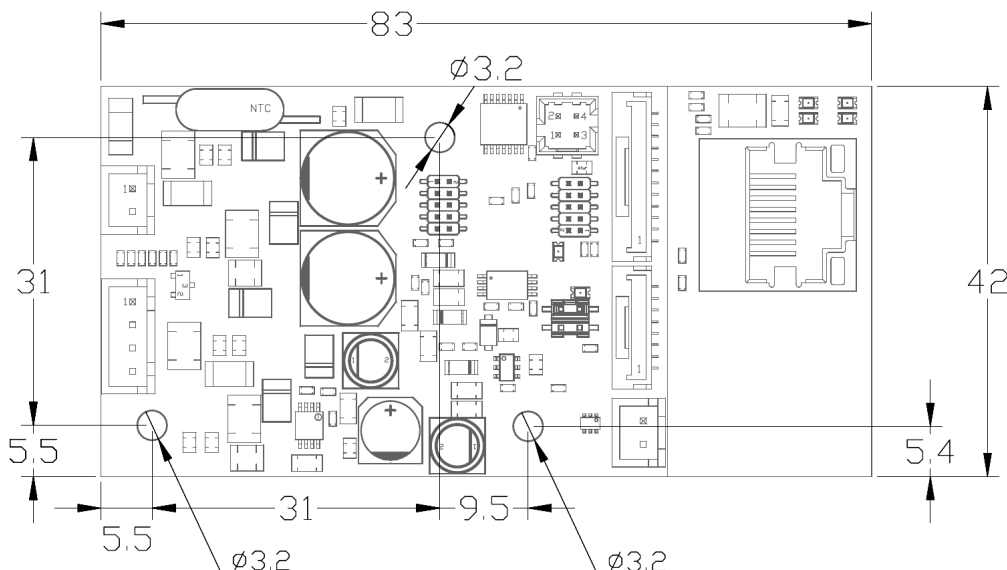
**TITANIO**  
VECTOR - STEPPER - DRIVES



error  
less  
servo  
efficient  
**else**  
by Ever Electronics

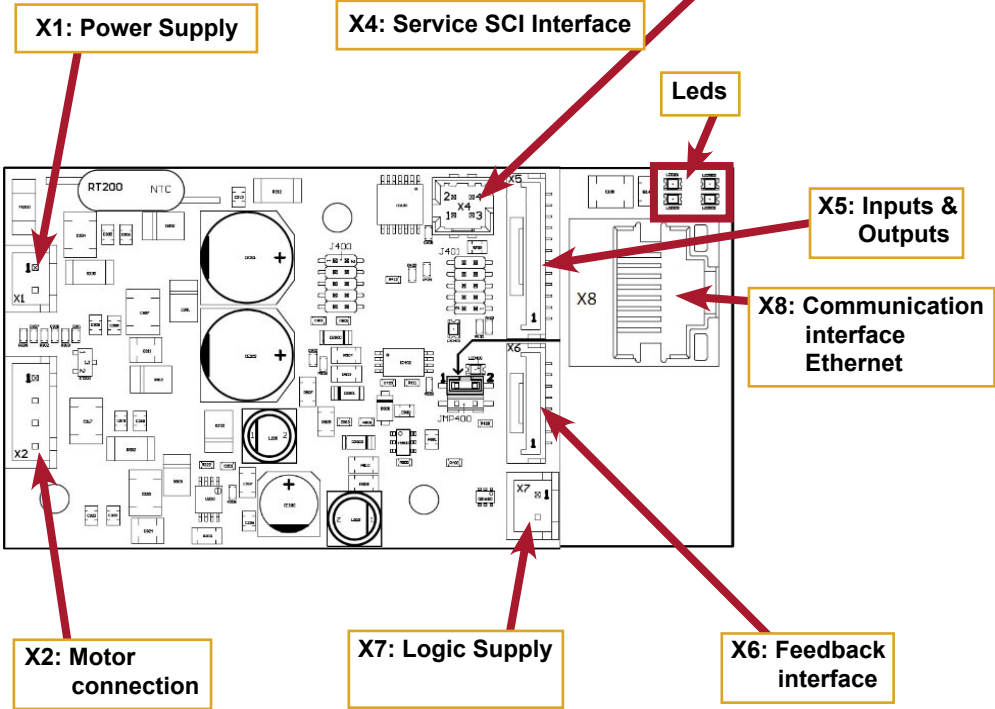
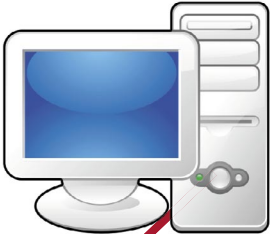


## Mechanical data



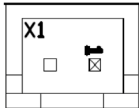
# System connections

Connectors: position, function and pinout.



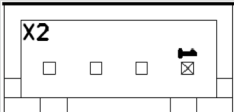
### X1: Power supply

X1.1	VPOT	PWR_IN	Positive power supply input
X1.2	PGND	PWR_IN	Negative power supply input



### X2: Motor connection

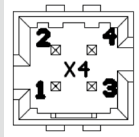
X2.1	A	PWR_OUT	Motor output phase A
X2.2	A/	PWR_OUT	Motor output phase A/
X2.3	B	PWR_OUT	Motor output phase B
X2.4	B/	PWR_OUT	Motor output phase B/



# System connections

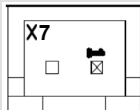
## X4: Service SCI Interface

X4.1	TX/RX	Transmit / Receive Line
X4.2	DE/RE	Drive Enable Negated / Receive Enable
X4.3	+5V	+5Vdc power out
X4.4	GND	GND power out



## X7: Logic supply

X7.1	VLOG	PWR_IN	Positive logic supply input
X7.2	GND	PWR_IN	Negative logic supply input

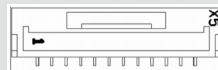


## X8: Ethernet interface

RJ45 connector  
100BASE-TX (100Mb/sec) ports  
Accept standard Ethernet cable (CAT5 or higher)

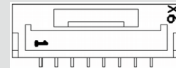
## X5: Inputs & Outputs:

5 digital inputs, 3 digital output and 1 analog input			
X5.1	V_POT	PWR_OUT	+5Vdc supply output for potentiometer
X5.2	DIG_IN0	DIG_IN	Digital input IN0
X5.3	DIG_IN1	DIG_IN	Digital input IN1
X5.4	EN_TORQUE	DIG_IN	Digital input EN_TORQUE
X5.5	DIG_IN3	DIG_IN	Digital input IN3
X5.6	DIG_IN2	DIG_IN	Digital input IN2
X5.7	IN_AN0	AN_IN	Analog input 0
X5.8	Reserved		Reserved pin (see EN_TORQUE input connection paragraph pag.5)
X5.9	DIG_OUT0	DIG_OUT	PNP digital output OUT0
X5.10	DIG_OUT1	DIG_OUT	PNP digital output OUT1
X5.11	DIG_OUT2	DIG_OUT	PNP digital output OUT2
X5.12	GND	DIG_OUT	Reference ground for potentiometer



## X6: Feedback interface

X6.1	+5E	PWR_OUT	Positive +5Vdc power supply output
X6.2	ENC_PHA	DIG_IN	Encoder Phase A input
X6.3	ENC_PHB	DIG_IN	Encoder Phase B input
X6.4	ENC_ZERO	DIG_IN	Encoder Zero Signal input
X6.5	Reserved	---	Reserved pin (do not connect)
X6.6	Reserved	---	Reserved pin (do not connect)
X6.7	Reserved	---	Reserved pin (do not connect)
X6.8	GND	PWR_OUT	Negative side of supply

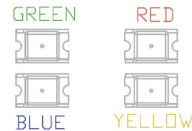


# Working Status (Led)

Visualization status		Description
1		Green ON
2		Green Blinking
3		Blue ON
4		Blue ON & Yellow ON
5		Blue ON & Red Blinking (200ms)
6		Yellow ON & Red OFF & Blue OFF
7		Yellow Blinking (500ms) & Red OFF & Blue OFF
8		Red ON
9		Red Blinking (200ms)
10		Red ON (1sec) & Yellow 1 Blink
11		Red ON (1sec) & Yellow 3 Blink
12		Red ON (1sec) & Yellow 4 Blink
13		Red ON (1sec) & Yellow 6 Blink
14		Red ON (1sec) & Yellow 7 Blink

Note: Drive could be considered in a correct status if leds Red, Yellow and Blue are all OFF.  
In general:

- Led Blue indicates a software internal fault or a non-operative condition
- Led Red indicates an alarm or a drive protection
- Led Yellow indicates a warning



Service SCI connection

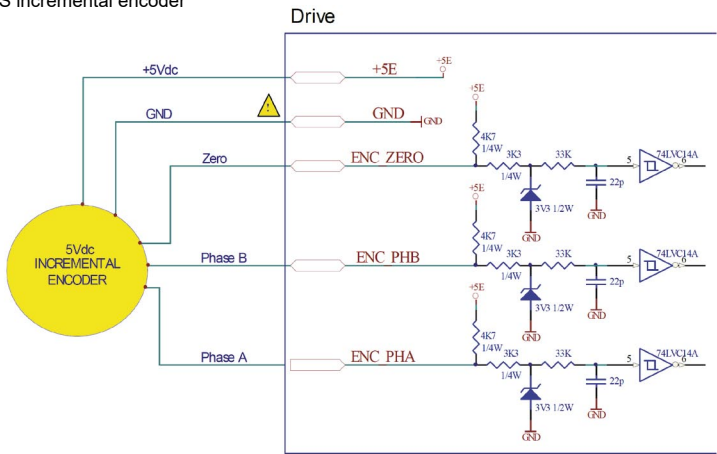


This connection is only possible with hardware and software provided by Ever.  
Kit code: SW4\_SERV00-SL or SW4-SERV00-EE.

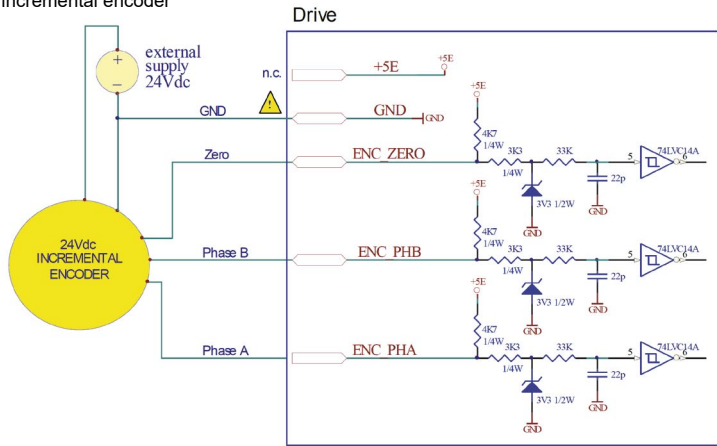


Feedback connection (not isolated)

5Vdc TTL/CMOS incremental encoder



24Vdc Push-pull incremental encoder

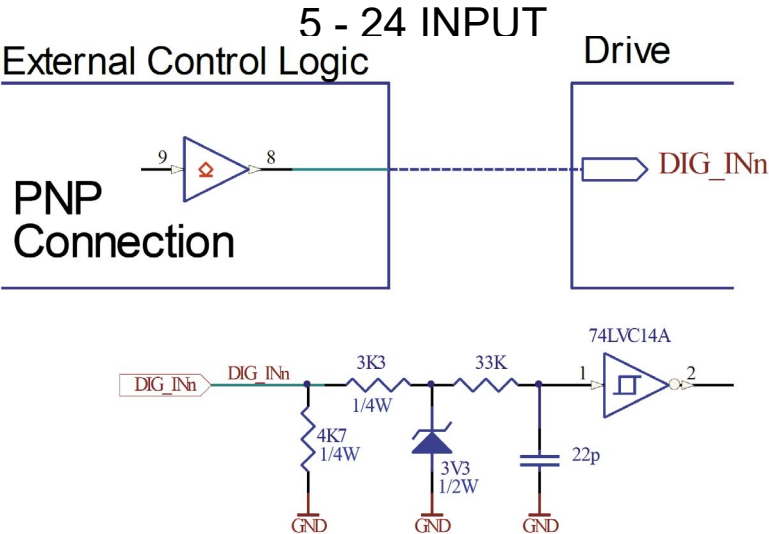


GND is internally in common with power ground, this is potentially dangerous. Take all necessary measures to avoid possible contacts in the final installation.

Digital inputs connection



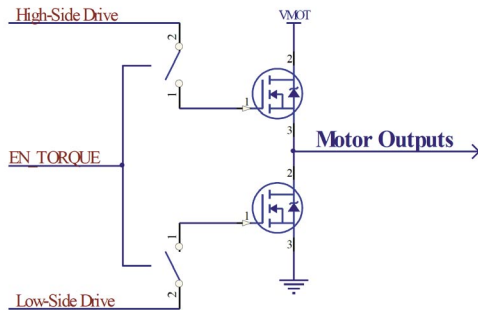
5-24Vdc single-ended PNP (TTL/CMOS compatible) digital inputs (not isolated).



EN\_TORQUE input connection



5-24Vdc single-ended PNP (TTL/CMOS compatible) digital inputs (not isolated).

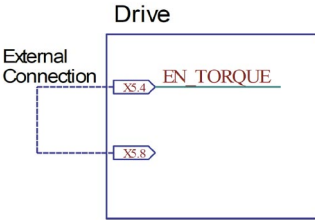


This is the enable signal for H-bridges that cannot be overridden by the control firmware:

- Input floating or connected to GND = H-bridges are open (Safe state) and the High&Low Side drive outputs cannot be activated to drive the motor (motor not powered and without torque).
- Input connected to High voltage (5-24Vdc) = the microcontroller is able to control the outputs of the High&Low side drive and also to drive the motor.



If EN\_TORQUE input is not used, it must be connected externally to pin X5.8 in order to enable the drive to control the motor.

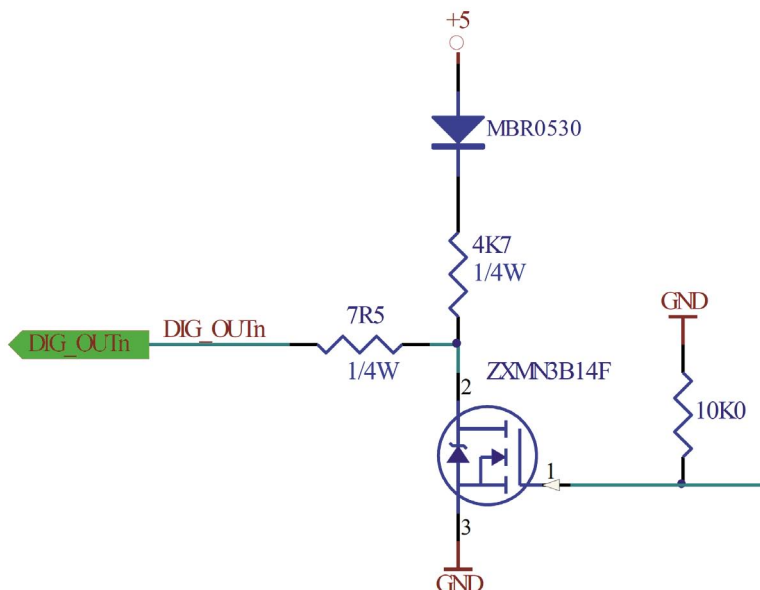


## Digital outputs connection

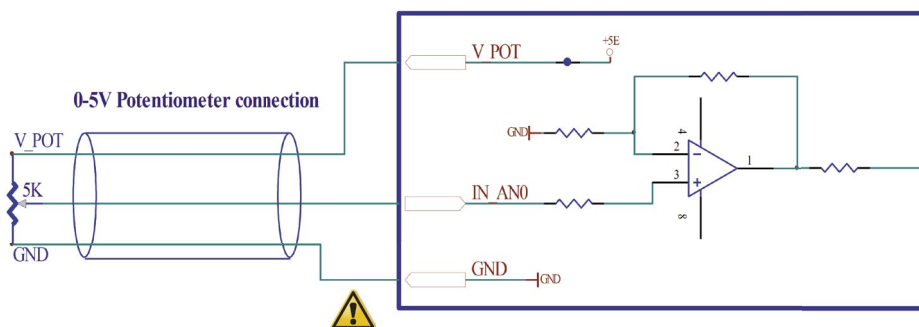


Digital output Open-Drain digital outputs (not isolated).

They can sink up to 100mA from external loads operating from power supplies to +24Vdc. The internal diode in the output is for driving inputs that are opto-isolated and connected to +24Vdc. The diode prevents conduction from +24Vdc through the 4,7 kΩ resistor to +5Vdc in the drive. This could turn the input on, giving a false indication of the drive output state.



## Analog input connection



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## Mating connector kit

Connector	Description	
X1, X7	JST cod. XHP-2	con crimp SXH-001T-P0.6
X2	JST cod. XHP-4	con crimp SXH-001T-P0.6
X5	JST cod. GHR-12V-S	con crimp SSSL-002T-P0.2
X6	JST cod. GHR-08V-S	con crimp SSSL-002T-P0.2
X8	Ethernet standard cables CAT5 or higher.	

## Section of the cables

Function	Cable	
	Minimum	Maximum
Power supply	0.3 mm <sup>2</sup> (AWG22)	
Motor outputs	0.3 mm <sup>2</sup> (AWG22)	
Feedback interface	0.05 mm <sup>2</sup> (AWG30)	0.12 mm <sup>2</sup> (AWG26)
Inputs and Outputs	0.05 mm <sup>2</sup> (AWG30)	0.12 mm <sup>2</sup> (AWG26)
Ethernet interface	Ethernet standard cables CAT5 or higher.	

## Verify the installation

- Check all connection: power supply, logic supply and inputs/outputs.
- Make sure all settings right for the application.
- Make sure the power and logic supplies are suitable for the drive.
- If possible, remove the load from the motor shaft to avoid that wrong movements cause damage.
- Enable the current to the motor and verify the applied torque.
- Enable a movement of some steps and verify if the rotation direction is the desired one.
- Disconnect the power supply, connect the load on the motor and check the full functionality.

## Check the detected fail fuction



*When any of the following situations occur, the drive doesn't fuction correctly and it is reported an error.*

DEFECT	CAUSE	ACTION
The external fuse to the drive burns.	May be due to a wrong connection of the power supply.	Adjust the connection and recover the fuse. Use a fuse suitable for the application.
Over temperature protection.	May be due to a duty cycle.	Increase the air flux and if it is possible chose a motor with higher torque at same current value.
Over current protection.	May be due to a short circuit on the motor power stage.	Shut down the power supply and check if the motor is damaged.
Noisy motor movement with vibrations.	May be caused due to a state of resonance.	Increase the resolution of the step angle and/or change the motor velocity to avoid resonance area.
The motor produce torque but doesn't rotate.	May be caused due to a wrong connection of the I/O's.	Check the connection of the I/O's.

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