

SN4D2030x202-0x - Controller

Installation instructions



Refer to installation use and maintenance manual for more information.

ROHS

2 Axis bipolar stepper drive technical data:

- DC Supply: 24 ÷ 48 Vdc
- · Phase current: up to 4.2 Apeak for each motor
- · Chopper frequency: ultrasonic 40 kHz
- Stepless Control Technology (65536 position per turn)
- · Protections against: over current, over/under voltage, overheating, short circuit between motor phase-to-phase and phase-to-ground
- Industrial Ethernet interfaces: Powerlink or EtherCAT or Modbus TCP/IP or Profinet (see ordering code)
- Incremental Encoder (not isolated): 24V Sink or 5V Single-Ended (TTL/CMOS) (see ordering code)
- · Service SCI interface for programming and real time debugging
- Dimensions: 98.6 x 84.4 x 44 mm (without connectors)
- Protection degree: IP65
- · 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



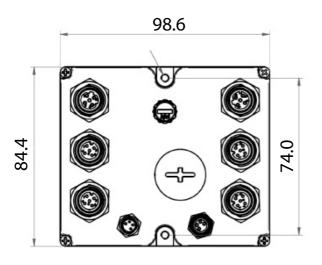


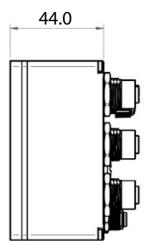






Mechanical data





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Available models

System code	Industrial ethernet interfaces	Incremental encoder type
SN4D2030 R 202-0 0	Powerlink	24V Sink
SN4D2030 R 202-01	Powerlink	5V Single-Ended (TTL/CMOS)
SN4D2030 H 202-0 0	EtherCAT	24V Sink
SN4D2030H202-01	EtherCAI	5V Single-Ended (TTL/CMOS)
SN4D2030 E 202-0 0	Modbus TCP/IP	24V Sink
SN4D2030 E 202-01	Modbus TCP/IP	5V Single-Ended (TTL/CMOS)
SN4D2030 T 202-0 0	Profinet	24V Sink
SN4D2030 T 202-0 1	Profinet	5V Single-Ended (TTL/CMOS)

System connections

Connectors:





Since electromagnetic disturbances are deflected via the base plate on the back, it is important to ensure that the mounting location has good conductivity.

The mounting location must also be connected with ground potential with good conductivity.



The supply is connected using circular connectors (M8, 4-pin). The supply is connected via connector CN1A (male). Connector CN1B (female) is used to route the supply to other modules. The maximum permissible current per pin is 4 A (in summation 8 A).

System connection

CN1A: Power supply IN M8 A-Code 4 pins Male CN1A.1 VIN PWR_IN Positive DC power supply input CN1A.2 VIN PWR_IN BOTH PINS MUST BE CONNECTED CN1A.3 PGND PWR_IN Negative DC power supply input CN1A.4 PGND PWR_IN Negative DC power supply input BOTH PINS MUST BE CONNECTED BOTH PINS MUST BE CONNECTED



Note: VIN and PGND are each available in two terminal.
Make sure that both terminal are connected in order to
split the supply current in two terminal and thereby avoid
an overload of the connector.

CN1B: Power supply OUT						
M8 A-Co	de 4 pins	Female				
CN1B.1	VIN	PWR OUT	Positive DC power supply output			
CN1B.2	VIN	FWIX_001	BOTH PINS MUST BE CONNECTED			
CN1B.3	PGND	PWR OUT	Negative DC power supply output			
CN1B.4	PGND	PWK_001	BOTH PINS MUST BE CONNECTED			



Note: VIN and PGND are each available in two terminal.
Make sure that both terminal are connected in order to
split the supply current in two terminal and thereby avoid
an overload of the connector.

CN5A and CN5B: Industrial ethernet interface							
100 BASE-TX (100Mb/sec) ports							
Dual M12 D-Code 4 pins Female (P0-P1)							
TD+	DIG_OUT	Transmit Data +					
RD+	DIG_IN	Receive Data +					
TD-	DIG_OUT	Transmit Data -					
RD- DIG_IN Receive Data -							
sing Connected to base plate							
	E-TX (100Mb/ 2 D-Code 4 pi TD+ RD+ TD-	E-TX (100Mb/sec) ports 2 D-Code 4 pins Female (Pi TD+ DIG_OUT RD+ DIG_IN TD- DIG_OUT RD- DIG_IN					



CN6: Ser	CN6: Service SCI interface						
M8 A-Co	M8 A-Code 4 pins Male						
CN6.1	GND	GND Power out					
CN6.2	+5L	+5V power out					
CN6.3	DE/RE	Drive Enable Negated / Receive Enable					
CN6.4	TX/RX	Transmit / Receive Line					

CN21: Motor M1 connection								
M12 A-C	ode 5 pins F	emale						
CN21.1	Phase A	PWR_OUT	Motor M1 output phase A					
CN21.2	Phase A/	PWR_OUT	Motor M1 output phase A/					
CN21.3	Phase B	PWR_OUT	Motor M1 output phase B					
CN21.4	Phase B/	PWR_OUT	Motor M1 output phase B/					
CN21.5	N.C.		Not connected					



CN22: Motor M2 connection							
M12 A-C	ode 5 pins F	emale					
CN22.1	Phase A	PWR_OUT	Motor M2 output phase	Α			
CN22.2	Phase A/	PWR_OUT	Motor M2 output phase	A/			
CN22.3	Phase B	PWR_OUT	Motor M2 output phase	В			
CN22.4	Phase B/	PWR_OUT	Motor M2 output phase	B/			
CN22.5	N.C.		Not connected				



CN41: EI	CN41: Encoder wit input						
M12 A-C	M12 A-Code 5 pins Female						
	24 V Sink version	5 V Single-Ended version					
CN41.1	+24 Vdc	+5 Vdc					
CN41.2		ENCA					
CN41.3		GND					
CN41.4		ENCB					
CN41.5		ENCZ					



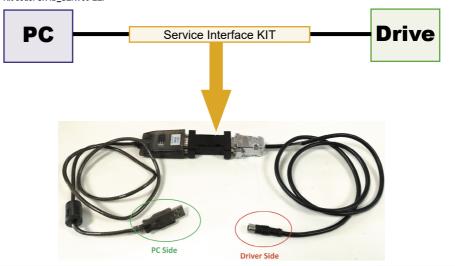
CN42: Encoder M2 input							
M12 A-C	M12 A-Code 5 pins Female						
	24 V Sink version	5 V Single-Ended version					
CN42.1	+24 Vdc	+5 Vdc					
CN42.2		ENCA					
CN42.3		GND					
CN42.4		ENCB					
CN42.5		ENCZ					



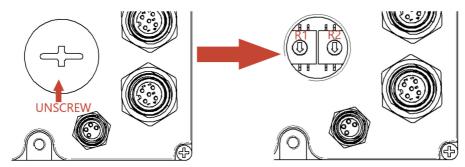
Service SCI connection



This connection is $\underline{\textit{only}}$ possible with hardware and software provided by Ever. Kit code: SN4D_SERV00-EE.



Roto-Switches settings



Node ID Selection (Hexadecimal Value)									
R1 x 16 (MSD)	0	0	0	0		2	2	 F	F
R2 x 1 (LSD)	0	1	2	3		С	D	 Е	F
NODE ID#	SW settings (default)	1	2	3		44	45	 254	255

x 16 x 1 (MSD) R1 DCBA

R1 (MSD): Most Significant Digit that must by multiplied per 16 R2 (LSD): Least Significant Digit that must by multiplied per 1

Example:

R1 = 5 ----> 5 x 16 = 80 R2 = C ----> 12 x 1 = 12

Node ID = 92

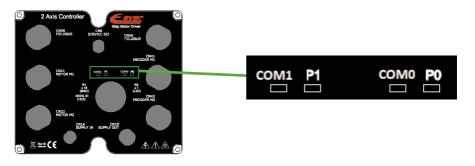


Node-ID selection from Roto-Switches are not used in all industrial ethernet protocol. Refer to the software manual for more details.

Leds description

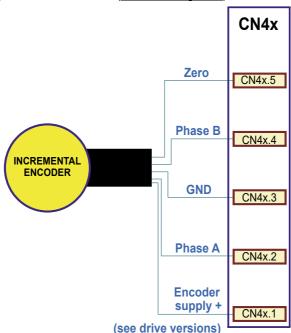
The meaning of LED's is defined by the industrial ethernet protocol used (<u>see ordering code</u>). Refer to software manual for more details.

Led name	Powerlink	EtherCAT	Modbus TCP/IP	Profinet
COM0	BS - Green	RUN - Green	RUN - Green	SF - Red
COM1	BE - Red	ERR - Red	ERR - Red	BF - Red
P0	L/A P0 - Green	L/A IN - Green	LINK - Green ACT - Yellow	LINK - Green RX/TX - Yellow
P1	LA/P1 - Green	L/A OUT - Green	LINK - Green ACT - Yellow	LINK - Green RX/TX - Yellow



Encoder input connection (NOT isolated)

24V Sink or Single-Ended 5 Vdc TTL/CMOS (see the ordering codes)



Maximum supply current 20 mA for each encoder (24V version). Maximum supply current 100 mA for each encoder (5V version).

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Mating cables kit

Connector	Connetor type	Ever code	Characteristics		Pinout
			Length : 1 mt.	Pin #	Cable color
			Conductors : UL2464 AWG#2	1	Brown
CN1A	M8 A-Code 4 pins Female	CA/LTW0804BF01		2	White
	·		Jacket : Black PVC	3	Blue
			Waterproof rate: IP67	4	Black
			Length : 1 mt.	Pin #	Cable color
			Conductors : UL2464 AWG#2	1	Brown
CN1B	M8 A-Code 4 pins Male	CA/LTW0804BM01		2 2	White
			Jacket : Black PVC	3	Blue
		Waterproof rate: IP67	4	Black	
		CA/LTW1205BM01		Pin #	Cable color
ONIOA			Length : 1 mt.	1	Brown
CN21			Conductors : UL2517 AWG#2	2 2	White
ONIOO	M12 A-Code 5 pins Male		Jacket : Black PVC	3	Blue
CN22			Waterproof rate: IP68	4	Black
			Waterproof fate. If oo	5	Grey
			Length : 1 mt.	Pin #	Cable color
CN41			3	. 1	Brown
01111	M12 A-Code 5 pins Male	CA/LTW1205BM01	Conductors : UL2517 AWG#2		White
CN41	W12 A-Oode 5 pins Wale	OA/ETW 1203BINOT	Jacket : Black PVC	3	Blue
CIN4I			Waterproof rate: IP68	4	Black
			Tratorproof rate: II co	5	Grey
			Length : 1 mt.	Pin #	Cable color
CN5A	M12 D-Code 4 pins Male		Conductors : UL2517 AWG#2	2 1	Brown
	·	CA/LTW1204BMD01	Jacket : Black PVC	2	White
CN5B	Shielded			3	Blue
			Waterproof rate: IP68	4	Black

Verify the installation

- Check all connection: power supply and inputs/outputs.
- Make sure all settings right for the application.
- Make sure the power supply is 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.

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 by a heavy working cycle or a high current in the motor.	Improve the drive cooling by a natural or fan air flow. 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.	Motor windings to drive not proper connection.	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 by 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 avoid a resonance region.
The external fuse on the power supply of the drive is burned.	Can be caused by 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 'self-limitation' of motor current and torque.	Increase the motor current (always within the limits), increase the supply voltage, change motor connection from series to parallel.

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