The motion platform KannMOTION

Stepper motor Driver / Kann-K17i motor driver PCB — CANOPEN - Gen 2

Product description

- Stepper motor driver for bipolar motors
- Integrated magnetic position encoder
- Motor drive up to 48V / 3A [1]
- Capable for different motor and control voltages

Interfaces

- CANOPEN CIA 301 & CIA402 – Link
- 1 analog input (0..10V)
- Break interface

Benefits / Software

- Closed loop operation
- Build in PLC functions
- Variety of software functions and error handling possibilities
- DIP Switches (Factory setting, Adress setting, ..)
- Fully controllable over CANopen.
- Updates, documents, tutorials and videos at www.KannMOTION.com

Technical data (Maximum ratings)

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Rated supply voltage (Motor)	12 to 48 VDC ±10%
Max. motor phase current [1]	3 A
Ambient temperature range	-10 to +40°C
Connector J1	JST 6 pole type B6B-EH
Connector J2	JST 4 pole type B4B-EH
Connector J3,J4	1.25 mm Pitch 5 pole
Position control accuracy	±1°[2]
Motor control mode	Micro stepping / 256

1) Might be limited in time, restricted by losses! <Chip temperature>, take care about PCB cooling depending on application
2) Depending on mechanical positioning of the magnet

Ordering information

Part number	Description	Accessories
300 500 . xxx	Kann-K17i motor driver PCB <CANopen> ta=85°	
100 732 . xxx	USB - CAN converter isolated, with housing	X
300 065 . xxx	Cable harness / converter modules K17c-JST	X
300 535 . xxx	Interface cable CAN for K17i daisy-chain	X
300 534 . xxx	Power cable K17c/K17i (without CAN interface)	X

Dimensions (in mm)
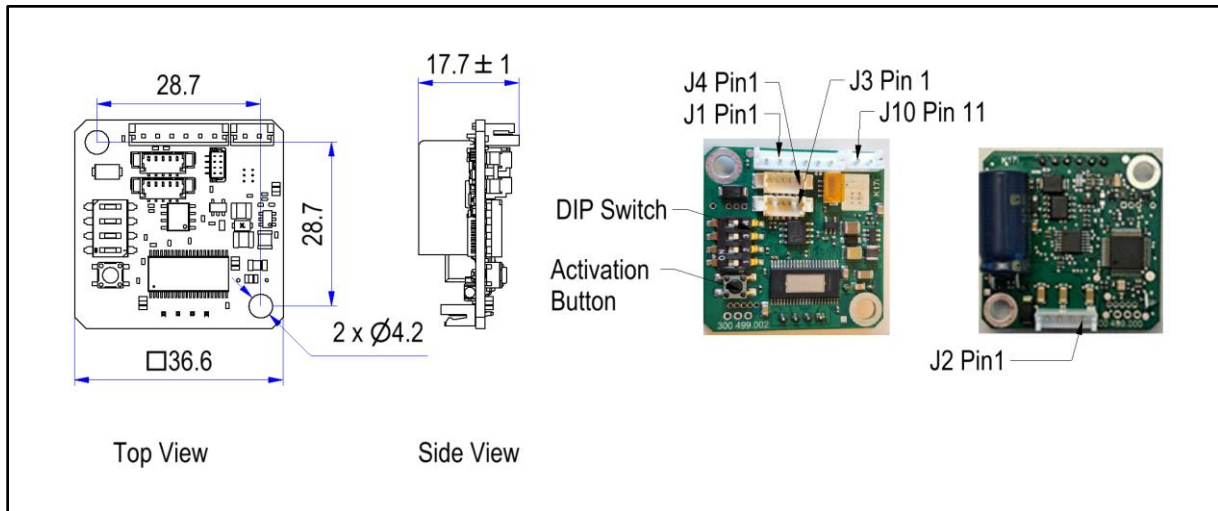
Connection terminals J1

Pin[3]	Description	Nominal	Absolute max	Comment
1	V_{motor}	48 VDC	54 VDC	Supply of motor drive (Power)
2	V_{in}[5]	48 VDC	54 VDC	Supply of PCB logic, also for logic outputs
3	CAN-H [5]	3.5 V	±24V	CAN bus signal (not terminated)
4	CAN-L [5]	1.5 V	±24V	CAN bus signal (not terminated)
5	AIN [4]	0-10VDC	54V	Analog Input
6	GND [5]	-	-	Reference

3) The pining is identical for J1 and M8 connector. -> Pin 1 on the J1 is equal to Pin 1 at the M8 connector
4) Refer to order information in this document

Connection terminals J3 & J4

Pin[3]	Description	Nominal	Absolute max	Comment
1	V_{in}[5]	48 VDC	54 VDC	Supply of PCB logic, also for logic outputs
2	Earth			
3	CAN-L [5]	1.5 V	±24V	CAN bus signal (not terminated)
4	CAN-H [5]	3.5 V	±24V	CAN bus signal (not terminated)
5	GND [5]	-	-	Reference

5) J1 Vin, J3 Vin and J4 Vin are internally connected. As is with GND, CAN-H and CAN-L

Software Configuration of Input Thresholds

Setting	V_{iH} (High level input voltage)	V_{iL} (Low level input voltage)
SPS_24V	>15.0	<5.0
SPS_12V	>7.5	<2.5
TTL_5V	>2.7	<1.5
TTL_3V3	>2.0	<1.0

Connection terminals J2

Pin	Description	Comment
1	A-	Motor phase A+
2	A+	Motor phase A-
3	B+	Motor phase B+
4	B-	Motor phase B-

Connection terminals J10 / Break

Pin[3]	Description	Nominal	Absolute max	Comment
1	Out+	8 – 52 VDC	54 VDC	I_{max} 0.2A RMS
2	Out-			

DIP Switch & Activation Button

The K17i features a 4-DIP switch and an activation button. Depending on the setting, the node address can be altered, or the factory setting can be restored. To activate the designated DIP switch configuration, you must press the activation button in a certain order.

Dip 1	Dip 2	Dip 3	Dip 4	Comment
0	x	x	x	Set Node Adress (Base-Adress + xxx)
1	0	0	0	Restore CAN communication settings to factory default
1	0	0	1	Restore CAN application settings to factory default
1	0	1	0	Restore KANN driver settings to factory default
1	1	x	x	Reserved

Note: All 'Restores' can also be performed sequentially before a Power On/Off activates them.

Factory setting

Factory node address = 0x7F (127)

Factory base address = 0x08 the base address can be adjusted with CANopen

Activation sequence:

1. Set the desired code on the DIP switch.

2. Press and hold the activation button for 3 seconds until the green LED stays on continuously.

3. Release the activation button within 2 seconds; the LED will turn off, indicating that the new settings are now active. If the attempt to save a setting fails, the red LED will briefly light up.

Settings are active after restart (Power OFF/ON).

Tools, further documents

Adlos provides its customers with supportive tools and resources for design integration.

### Communication Description (100570)

Document on Serial Protocol Description, reference number 100570.

KannMotion Manager tool (190081), manage your drives

The KannMOTION Manager serves as the comprehensive software suite for our Generation 2 (GEN2) drives, featuring an integrated C-coder alongside a user-friendly visual drag-and-drop interface for personalized drive customization. Access to the tool is available in the download section. https://www.kannmotion.com/en/downloads/

ComWatch Communication Tool (190077), for Life values
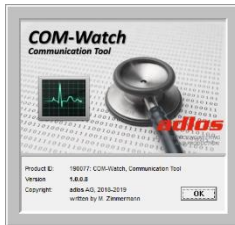
ComWatch is a free, specialized tool for engineers and technicians to check device details, get tracking data and settings, and update firmware. It's designed for kannMOTION customers and best for those familiar with Windows software. Users should have some technical knowledge.

For access, please refer to the download section.
https://www.kannmotion.com/en/downloads/

Additional Documentation and important information

The document Security Manual KannMOTION (you find the document in the download section of https://www.kannmotion.com/en/downloads/ specifies the intended use of the KannMOTION. It also has useful information related to all KannMOTION products and defines the laws and standard the KannMOTION is designed for and with. Please read this document carefully and comply with the information given in this document.

Proper use

Do not connect or disconnect motor during operation

The motor cable and motor inductance might lead to voltage spikes when the motor is disconnected or connected while energized. These voltage spikes could exceed the voltage limits of the driver MOSFETs and may permanently damage them. Therefore, always disconnect the power supply before connecting or disconnecting the motor.

Ensure the power supply voltage remains below the upper limit

If the supply voltage exceeds the upper limit, the driver electronics can be seriously damaged. Especially when operating near the upper voltage limit, using a regulated power supply is strongly recommended.

Check your mechanical system, is it able to drive the motor, avoid motor being used as generator

Every motor can operate as a voltage generator; therefore, be mindful of the generated voltage, as this might damage your electronics through overvoltage. Incorporate voltage limiter units to maintain the supply voltage within the acceptable range.

Back-EMF

Back-EMF occurs when a motor rapidly decelerates, acting like a generator and sending a reverse current back to the power source. If the power source cannot absorb this surplus current, it could damage the motor's power supply and output pins. To prevent such damage, it is crucial to incorporate back-EMF considerations into the system's design.

Do not Powerup without GND connection / Do not remove GND connection before Vin/Vmot

Only switch on your supply when you are certain that GND is correctly connected. Do not remove GND while the system is running; in both situations, you risk damaging your electronics.

Aout shall be connected with minimum output impedance of 50 Ω

Aout must be connected with a minimum output impedance of over 50Ω to ensure safe operation. Directly connecting Aout to GND, especially when combined with 'hot-plugging' or incorrect GND connections, can damage the output under certain conditions. To prevent damage to the Aout output circuit, maintaining an impedance of at least 50Ω on the analog output is crucial.

Wiring Materials / Fuse

Use a wire size appropriate for the rated output current of the Power Supply. Extra caution is necessary if the output current from one Power Supply is distributed among multiple loads, as the Power Supply's overload protection circuit may not function properly in such cases. Therefore, incorporating a fuse in the line or other protective measures should be considered.

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