TSP10
Compact step motor drive
with encoder feedback

TSP10-CBE – Technical datasheet

- **Compact design**
- **Supply voltage 24-74 V_{DC}, max. motor current 7 A_{rms}**
- **Operation as speed or positioning control**
- **Microstepping capability**
- **Standstill current reduction**
- **Noiseless at standstill, quiet when running**
- **Low heat loss**
- **Galvanically isolated inputs (10) and outputs (4)**
- **Separate supply voltage for electronics and motor**
- **Motion task with adjustable ramps, programmable via CANopen**
- **Bus connection galvanically isolated**
- **CAN address adjustable with two rotary switches**

AHS Antriebstechnik GmbH
Fichtenweg 17
64319 Pfungstadt
Phone: +49 6157 9866110
Fax: +49 6157 9866112

AHS Antriebstechnik
Advanced Hybrid Stepper Systems

TSP10-CBE Compact CANopen step motor drive with encoder feedback

The TSP10 step motor drives are compact micro stepping power modules for 2-phase step motors with different configurations for the best possible adaptation to the respective application.

All TSP10 units are designed for mounting in the control cabinet and are equipped with corresponding accessories. The compact housing dimensions allow use even in very confined installation spaces. Heat dissipation is possible at the side via an optional heat sink or at the rear via the support surface.

The power supply and the motor connector are located on the bottom of the unit.
One 25-pin sub-D for digital inputs and outputs, three 9-pin sub-D for RS232, CAN and encoder connection are located at the front of the unit. The profibus address is set via two rotary switches on the top of the unit.
A two-colour LED indicates the status of the unit by its colours and flashing signals.

All digital inputs and outputs are optically separated and can be used independently of the motor control like a digital I/O module. Since only a few basic settings are necessary, the stepper motor control can be integrated into any control system with little effort.

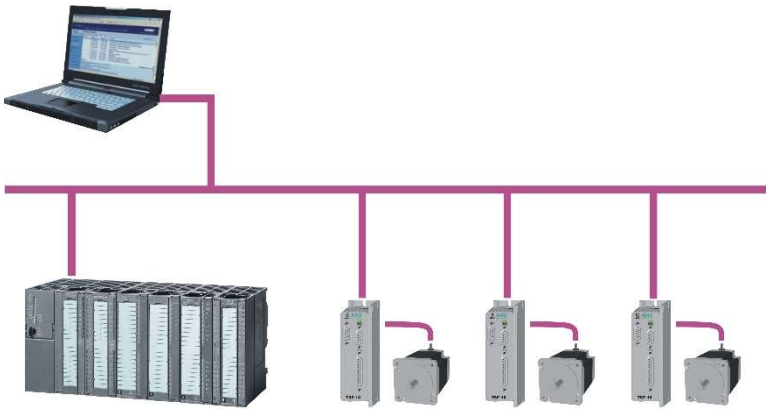
Technical data

Power supply voltage	Operating range 24 - 74V_{DC}
Motor current	max. 10 A_{peak}; 0.2 to 7 A_{rms}
	adjustable in mA
	for 2-phase step motors in 4/6/8-wire version
Power supply	In principle, only an unregulated DC voltage is required for the power supply.
Ambient temperature/motor current	<50°C without heat sink: max. 3.2A @ 25°C / 1.6A @ 45°C
	>50°C with heat sink (optional): max. 7A @ 25°C / 3.5A @ 45°C
Heat sink temperature	Max. 60°C, forced ventilation may be necessary
Humidity	10-90%, non condensing
Error monitoring	Short circuit (phase-phase, phase-neutral) and overtemperature
Standstill current reduction	Delay and current value are freely adjustable
Inputs	10 galvanically isolated inputs, free configurable
Input interface	CAN-Bus, RS232*
Max. Input frequency	Up to 12 MBaud
Outputs	4 galvanically isolated outputs, SPS compatible freely configurable
	Status LED: green = ready for operation; red = fault; yellow = motor movement

**Only for diagnostic purposes*

Motion tasks

The TSP10-CBE CANopen module is the solution when it comes to controlling individual stepper motor controllers distributed in the field via CAN bus.



The CANopen step motor drive is a compact single-axis positioning controller with integrated stepper motor output stage. It detects two limit switches, a stop switch and a reference switch. The speed mode and the positioning mode can be easily configured via CANopen.

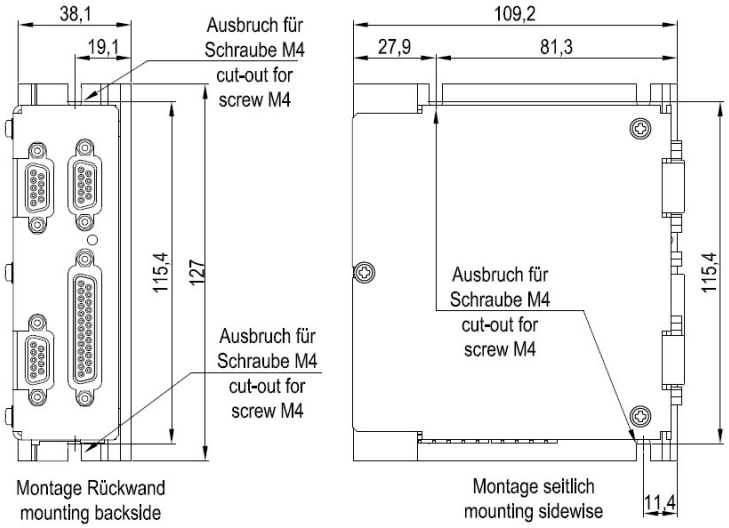
Since only a few settings are necessary, the CANopen stepper motor controller can be integrated with little effort into any control system that uses CANopen as a sensor/actuator bus. Due to the fast and simultaneous transmission of the input and output PDOs for all CANopen participants, there are many possibilities for the realisation of multi-axis drives via the bus.

Parameter data

All necessary settings of the CANopen stepper motor drive (e.g. motor current, microstep factor, etc.) can be made via the CAN bus.
Communication takes place according to the reference profile DS402 for motion controllers (for more detailed information, please refer to the appropriate fieldbus appendix).

18	16#2003:16#01	DE1	0	16	
19	16#2003:16#02	DE2	0	16	ES untern
20	16#2003:16#03	DE3	2	16	ES oben
21	16#2003:16#04	DE4	0	16	Referenzschalter
22	16#2003:16#05	DE5	0	16	Stopschalter
23	16#2003:16#06	DE6	0	16	
24	16#2003:16#07	DE7	0	16	
25	16#2003:16#08	DE8	0	16	
26	16#2003:16#09	DE9	0	16	
27	16#2003:16#0A	DE10	0	16	
28	16#6040:16#00	Controlword	16#0	16	
29	16#6060:16#00	Modes of Operation	1	8	
30	16#6061:16#00	Modes of Operation Display	0	8	
31	16#6064:16#00	Position Actual Value in User Unit	0	32	
32	16#606C:16#00	Velocity Actual Value	0	32	
33	16#6075:16#00	Motor Rated Current	2500	32	
34	16#607A:16#00	Target Position	0	32	
35	16#607C:16#00	Home_offset	0	32	
36	16#6081:16#00	Profile Velocity in pp-mode	10000	32	
37	16#6083:16#00	Profile Acceleration	10000	32	
38	16#6084:16#00	Profile Deceleration	10000	32	
39	16#6085:16#00	Quick Stop Deceleration	10000	32	
40	16#608F:16#01	Encoder Increments	16#0	32	
41	16#6092:16#01	Feed	1000	32	
42	16#6092:16#02	Shaft Revolutions	16#1	32	
43	16#6098:16#00	Homing Method	18	8	
44	16#6099:16#01	Fast Homing Speed	1000	32	
45	16#609A:16#00	Homing_acceleration	10000	32	
46	16#60A8:16#00	SI Unit Position	16#AC0000	32	
47	16#60FF:16#00	Target Velocity	0	32	

Connection / Dimensions



Connectors	
Supply voltage	4-pole plug-in terminal strip
Motor	5-pole plug-in terminal strip
Serial interface	9-pin Sub-D-socket
I/Os	25-pin Sub-D-socket
CAN according to CiA-303-1 standard	9-pin Sub-D-socket
Encoder	9-pin Sub-D-socket

All dimensions in mm

Ordering code

TSP10-CBE-00-AA = Standard version

TSP10 Type code

T	S	P	1	0	-	B	A	0	-	0	0	-	A	A

Drive Series

Max. Output Power = 10 A_{peak}

Basic Device (Step & Direction, RS232)	BA
Profibus	PB
Profinet	PN
Analog (+/- 10 Volt)	AN
ModBus	MB
CAN-Bus	CB

Standard (no feedback)	0
Encoder RS422/TTL	E
Encoder HTL	H
Encoder Biss-C	C

Digital Inputs = 24V;	Step & Direction = 5V	00
Digital Inputs = 5V;	Step & Direction = 5V	05
Digital Inputs = 24V;	Step & Direction = 24V	24

Standard	AA
Customization	XX
Follow up identifier DSM9/6410....	09

Note: Not all combinations of the type code are possible.