



Stepper motor control IKS60-14SEO



Figure 1 - IKS60-14SEO

1 IKS60-14SEO – Technical data

1.1 Generals

1.2 Technical data, maximum values

Tabelle 1 1.2 Technical data, maximum values

Symbol	Parameter	Min	Typ	Max	Unit
U _{+24V}	V Logic,	23,5	24	24,5	V
U _{+48V}	V Motor	20	48	48,5	V
I _{Motor}	Maximum motor current			2,8	A
I _{OUT, Out X}	Maximum Current Out 0 Out 1			0,1	A
U _{In High, In X}	IN0/IN1 HIGH		>14		V
U _{In Low, In X}	IN0/IN1 LOW		<10		V
U _{In High, RefSw X}	RefSw0, RefSw1 HIGH		>3		V
U _{In Low, RefSw X}	RefSw0, RefSw1 LOW		<1,5		V
T _{Umgebung}			20		°C

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2 IKS60-14SEO – connections

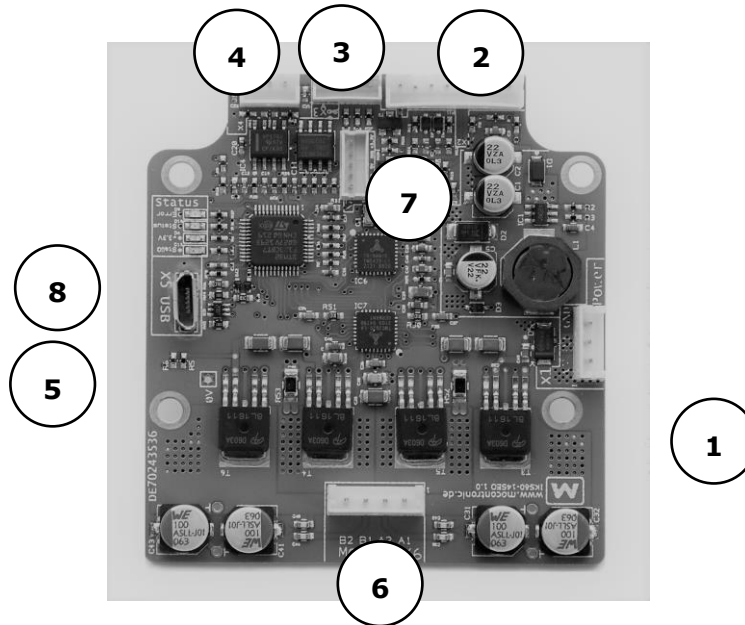


Figure 2 - Connectors

(1) Power (X1) (2) IO (X2) (3) SWD (X3)	(4) RS-485 (X4) (5) USB (X5) (6) Motor (X6)	(7) RS-232, Flash (8) Status LEDs
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2.1 Supply voltages (X1)

Please provide supply voltages at connector marked with 1 above.

Motor supply can be 24V to 48V, logic voltage must be 24V. Use a JST EH series connector !

	Important!
•	In order to stabilize the operating voltage and to filter harmful voltage peaks on the supply voltage, it is urgently necessary to install an electrolytic capacitor of sufficient size (e.g. 1000µF/35V) in the supply line near the motor controller. Operating the controller on an unfiltered supply may result in firmware crashes or hardware corruption

Tabelle 2 – Supply (X1)

	Pin	Bezeichnung	Beschreibung
	1	+V _{Motor}	Motor supply up to 48V
	2	+V _{Logic}	Logic, 24V
	3	GND	Masse, GND

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2.2 Inputs, Outputs, Reference switches (X2)

The digital inputs and outputs are made available via the connection X2 marked with number 2 in figure 2. Likewise the reference switch inputs. For the supply of sensors, the 24V supply voltage is also present at connector X2. The pinout is listed in Table 3.

! **Notice!**

- The digital outputs are not short-circuit proof.
- The digital outputs do not have a freewheeling diode.
- The digital outputs can be loaded with a maximum of 0.1A.

Tabelle 3 Inputs and Outputs (X2)

	Pin	Name	Description
	1	Out 0	Output 0, Low-Side Open Drain , $I_{max} = 100\text{mA}$
	2	Out 1	Out 1, Low-Side Open Drain , $I_{max} = 100\text{mA}$
	3	In 0	Input 0 digital or 0...10V analogue
	4	In 1	Input 1 digital or 0...10V analogue
	5	RefSwL	Left Limit Switch, up to 24V input
	6	RefSwR	Right Limit Switch, up to 24V input
	7	+V _{Logic}	Bridged to logic supply, 24V
	8	0V, GND	GND

2.3 RS-485 port (X4)

The RS-485 communication connection is made available via the connection X4 marked with number 4 in figure 2. The pinout is listed in Table 4.

Danger! There is no terminating resistor on the controller. In case of bus problems, please use externally.

Tabelle 4 – RS-485 (X4)

	Pin	Name	Description
	1	B/-	RS485 B. Pin 2 of a DSUB 9
	2	A/+	RS485 A. Pin 7 of a DSUB 9
	3	GND	GND

2.4 USB-Port (X5)

With micro USB connector marked as 5 the controller can be connected to an USB-Port of the master PC.

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2.5 Connecting motors (X6)

The connection for the motors is done by connector marked with 6.


A JST EH series connector is used.



Attention!

- Do not hot plug !

Tabelle 5 Motor connector(X6)

	Pin	Name	Description
	1	A1	Motor Anschluss, Spule A1
	2	A2	Motor Anschluss, Spule A2
	3	B1	Motor Anschluss, Spule B1
	4	B2	Motor Anschluss, Spule B2

2.6 Mocontronic Debug (X3)

Internal use

2.7 Mocontronic Flash (X7)

Internal use

2.8 Status LED

Status LEDs are marked with 8.

They show the status of the supply voltage, the operating status of the TMCL interpreter and errors

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2.9 Current settings

The parameter for the motor driving and holding current (SAP/GAP, 6 and 7) allows values from 0-254. However, the actual current can only be set in 32 steps, an overview can be found in Table - 6.

Tabelle - 6 – Current steps SAP 6 and 7

Step	SAP 6/7		I Peak [A]	I RMS [A]
	von	Bis		
1	0	7	0,13	0,09
2	8	15	0,25	0,18
3	16	23	0,38	0,27
4	24	31	0,50	0,35
5	32	39	0,63	0,44
6	40	47	0,75	0,53
7	48	55	0,88	0,62
8	56	63	1,00	0,71
9	64	71	1,13	0,80
10	72	79	1,25	0,88
11	80	87	1,38	0,97
12	88	95	1,50	1,06
13	96	103	1,63	1,15
14	104	111	1,75	1,24
15	112	119	1,88	1,33
16	120	127	2,00	1,41
17	128	135	2,13	1,50
18	136	143	2,25	1,59
19	144	151	2,38	1,68
20	152	159	2,50	1,77
21	160	167	2,63	1,86
22	168	175	2,75	1,94
23	176	183	2,88	2,03
24	184	191	3,00	2,12
25	192	199	3,13	2,21
26	200	207	3,25	2,30
27	208	215	3,38	2,39
28	216	223	3,50	2,47
29	224	231	3,63	2,56
30	232	239	3,75	2,65
31	240	247	3,88	2,74
32	248	254	4,00	2,83

2.10 TMCL commands for hardware functions

2.10.1 GIO – Get Input, command 15

Motor	Typ	Description	Range	R/W
0	0..1	In0 und In1	0-1	R
0	255	Bitpattern In0 and In1	0-3	R
1	0	In 0 analogue, 2,5002 mV/Digit	0-4096	R
1	1	In 2 analogue 2,5002 mV/Digit	0-4096	R
1	2	+48V V _{Motor} 0.088623 mV/Digit	0-4096	R
1	3	+3,3V V _{Motor} 0.088623 mV/Digit	0-4096	R
1	8	+24V, V _{Logic} , 1/10 V	0-363	R
1	9	Raw CPU-Temp		R
2	0..1	State of Dout0 and Dout1	0-1	R

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3 Revision Historie

3.1 Dokument Revision

Tabelle 7 - Dokument Revision

Version	Datum	Autor	Beschreibung
1.0	21.09.2022	CR	

3.2 Hardwarerevision

Tabelle 8 - Hardwarerevision

Version	Datum	Autor	Beschreibung
1.0	21.09.2022	MOC	

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