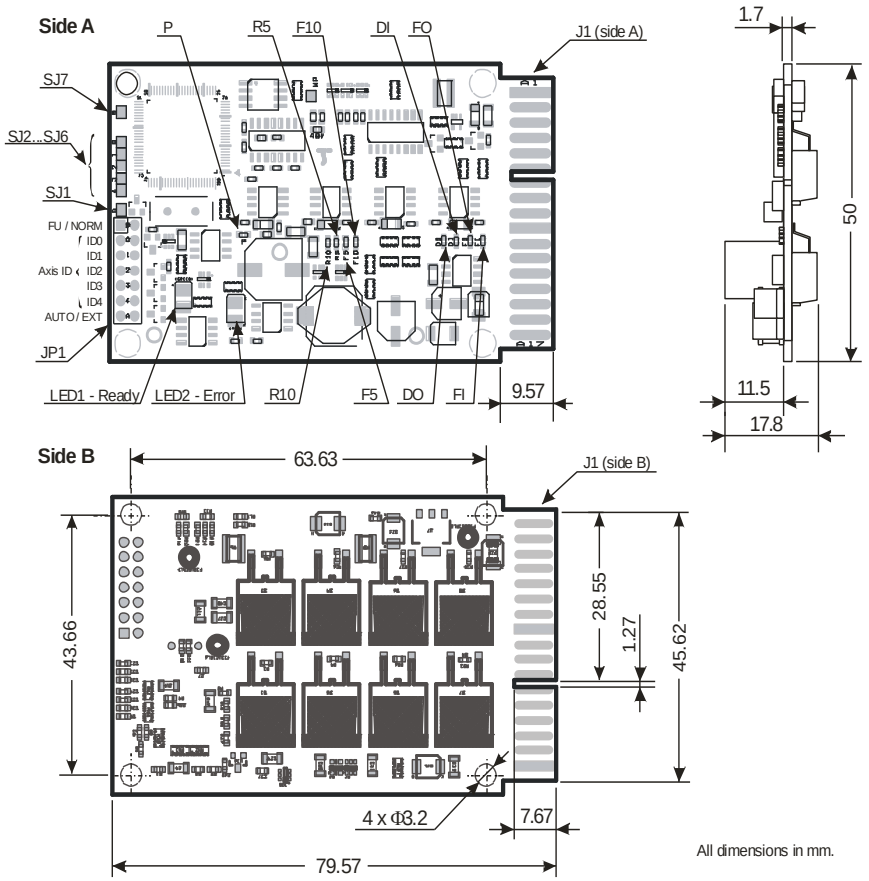

All dimensions in mm.

Motor – sensor configurations

Sensor \ Motor	PMSM	BLDC	DC BRUSH	STEP (2-ph.)	STEP (3-ph.)
Encoder	●		●	●	
Encoder + Hall	●	●			
Tacho			●		
Linear Halls	●				
Open-loop (no sensor)				●	●

Mating connector type

Reference	Producer	P/N	Description
J1	E-TEC	ECC-034-S100-01	Type: Wire crimp connector housing Description: Card Edge "Twin Leaf" connector, 0.1" pitch, 2 x 17 contacts, for wire crimp pins, with mounting ears. Requires also: 1 x intercontact keying plug (1-530030-2) Type: PCB connector

Features

- Continuous drive power – step motor: 200 W (48V; 5A)
- Motor supply: 12-80V_{DC}; 5A; 16A PEAK
- Logic supply: 12-48V_{DC}; 120 mA;
- Single-ended, differential and/or open-collector encoder interface
- Single-ended, open collector Hall sensor interface
- Differential pulse & direction
- Linear Hall sensor interface
- 7 Input-output lines:
  - 3 digital input-output lines
  - 2 digital input-output lines shared with 2 analog inputs (0 … 3.3 V)
- RESET input
- Emergency shutdown (ENABLE) input
- RS-232 serial interface, up to 115kbps communication speed
- CAN-Bus 2.0B interface up to 1Mbit/s
- Hardware Axis ID selection
- 1.5K × 16 internal SRAM memory
- 8K × 16 E^2ROM to store TML programs and data
- Operating ambient temperature: 0-40°C

Connectors description

	Pin	Name	Type	Description
J1 (side A)	A1	+Vmot	I	Positive terminal of the motor supply: 12 to 80V_{DC}
	A2	A / A+	O	• Phase A for brushless motors • Phase A+ for 2-phases step motors • Phase U for 3-phases step motors • Motor+ for DC brush motors
	A3	B / A-	O	• Phase B for brushless motors • Phase A- for 2-phases step motors • Phase V for 3-phases step motors • Motor- for DC brush motors
	A4	C / B+	O	• Phase C for brushless motors • Phase B+ for 2-phases step motors • Phase W for 3-phases step motors
	A5	BRAKE/B -	O	• Brake output (for external brake resistor) • Phase B- for 2-phases step motors
	A6	+5 V	O	5V logic supply (internally generated)
	A7	ENCA+	I	• Single-ended encoder A signal • Differential encoder positive A input
	A8	ENCB+	I	• Single-ended encoder B signal • Differential encoder positive B input
	A9	ENCZ / CAPI+	I	• Single-ended encoder Z signal • Differential encoder positive Z input
	A10	H1	I	• Hall 1 signal for digital Hall sensor
	A11	IO#38 / PULSE	I	• 5V compatible digital input / 3.3V compatible digital output • PULSE input in Pulse & Direction mode
	A12	IN#2 / LSP	I	• 5V compatible input • Positive limit switch
	A13	ENABLE	I	5V compatible. Connect to +5 V to disable PWM outputs
	A14	IO#13 / FDBK	I/O I	• 5V compatible digital input / 3.3V compatible digital output • Unipolar 0V…+5 V analog input. May be used as analog position or tacho speed feedback
	A15	GND	-	Ground
	A16	CAN_H	I/O	Can-Bus positive line (positive during dominant bit)
	A17	TX232	O	RS-232 Data Transmission

J1 (side B)	B1	+Vmot	I	Positive terminal of the motor supply: 12 to 48 V_{DC} for ISCM4805 12 to 80 V_{DC} for ISCM8005
	B2	A / A+	O	• Phase A for brushless motors • Phase A+ for 2-phases step motors • Phase U for 3-phases step motors • Motor+ for DC brush motors
	B3	B / A-	O	• Phase B for brushless motors • Phase A- for 2-phases step motors • Phase V for 3-phases step motors • Motor- for DC brush motors
	B4	C / B+	O	• Phase C for brushless motors • Phase B+ for 2-phases step motors • Phase W for 3-phases step motors
	B5	BRAKE / B-	O	• Brake output (for external brake resistor) for brushless motors • Phase B- for 2-phases step motors
	B6	+Vlog	I	Positive terminal of the logic supply: +12 to +48 V_{DC}
	B7	ENCA- /LH1	I	• Single-ended encoder A signal • Differential encoder negative A signal • Linear Hall 1 signal
	B8	ENCB- /LH2	I	• Single-ended encoder B signal • Differential encoder negative B signal • Linear Hall 2 signal
	B9	ENCZ-/LH3	I	• Single-ended encoder Z signal • Differential encoder negative Z signal • Linear Hall 3 signal
	B10	H2	I	• Hall 2 signal for digital Hall sensor
	B11	H3	I	• Hall 3 signal for digital Hall sensor
	B12	IN#24 / LSN	I	• 5V compatible input • Negative limit switch
	B13	RESET	I	• RESET signal – connect to +5 V to reset the board
	B14	IO#14 / REF / DIR	I/O I	• 5V compatible digital input / 3.3V compatible digital output • Unipolar 0 V…+5 V analog input. May be used as analog position, speed or torque reference. • Can be used as DIRECTION input in Pulse & Direction motion mode
	B15	GND	-	Ground
	B16	CAN_L	I/O	CAN-Bus negative line (negative during dominant bit)
	B17	RX232	I	RS-232 Data Reception

Electrical characteristics

All parameters are measured under the following conditions (unless otherwise noted):

- T_{amb} = 25°C, logic supply (+Vlog) = 24V_{DC}, motor supply (+Vmot) = 80V_{DC}
- Supplies start-up / shutdown sequence: *-any-* ;
- Load current 4A_{RMS}
- External DC-bus capacitor located 10 cm from J1.

		Min.	Typ.	Max.	Units
Logic Supply Input	Measured between +5V and GND.				
Supply voltage	Nominal values	12	24	48	V_{DC}
	Absolute maximum values, continuous †	-0.5		50	V_{DC}
Supply current	Normal operating		100	250	mA
Motor Supply Input	Measured between +V_{MOT} and GND.				
Supply voltage	Operating voltages, including ripple & braking-induced over-voltage	12		80	V
	Absolute maximum values, continuous †	0		95	V
	Absolute maximum values, surge (duration ≤ 10mS) †	-0.5		105	V
Supply current	Idle			1	mA
	Operating	-16.5	±5	+16.5	A
DC-bus capacitor value	DC-bus capacitor connected between +V_{MOT} and GND	100			µF
DC-bus capacitor location	Wire length from DC-bus capacitor to J1 pins	0	10	20	cm
Motor Outputs	All voltages referenced to GND.				
Motor output current	Continuous operation	-5		+5	A_{RMS}
Motor output current, peak	Thermal limited to <= 0.5 s	-16.5		+16.5	A
On-state voltage drop	Output current = ±5A	-800	±150	+250	V
Off-state leakage current		-1	±0.1	+1	mA
Motor inductance	F_{PWM} = 20kHz, +V_{MOT} = 12V	50			µH
	F_{PWM} = 20kHz, +V_{MOT} = 80V	400			µH
5V Digital Inputs	All voltages referenced to GND.				
Input voltage	Logic "LOW"	-	-	0.8	V
	Logic "HIGH"	2	-	5	V
	Absolute maximum, surge (duration ≤ 1S) †	-		+5.6	V
Input current	IO#35, IO#36 Logic "HIGH"; Internal pull-up to +5V	0	0	0	µA
	IO#35, IO#36 Logic "LOW"	-	-	20	µA
	PULS+, DIR+, ENCA, ENCB, RESET Logic "HIGH"; Internal pull-up to +5V	0	0	0	µA
	PULS+, DIR+, ENCA, ENCB, RESET Logic "LOW"	-	-	1000	µA
	PULS-, DIR- Logic "HIGH"			1500	µA
	PULS-, DIR- Logic "LOW"			700	µA
Input frequency		0		5	MHz
Minimum pulse width		150			nS
ESD Protection	Human Body Model (100 pF, 1.5KΩ)			±2	KV

Analog Inputs	All voltages referred to GND.				
Resolution			10		bits
Differential linearity	Guaranteed 10-bits no-missing-codes			0.09	% FS[1]
Offset error	Common-mode voltage = 0…10V		±0.1	±0.3	% FS[1]
Gain error	Common-mode voltage = 0…10V		±0.5	±1	% FS[1]
Bandwidth (-3dB)			1		KHz
Input voltage Operating range		0		3.3	V
Input impedance			50		KΩ
ESD Protection	Human Body Model (100 pF, 1.5 KΩ)			±2	KV
RS-232	All voltages referred to GND.				
Standards compliance		TIA/EIA-232-C			
Bit rate	Depending on software settings	9600		115200	Baud
ESD Protection	Human Body Model (100 pF, 1.5 kΩ)			±15	KV
Input voltage	RX232 input	-25	-	+25	V
Output short-circuit withstand	TX232 output to GND	Guaranteed			
CAN-Bus	All voltages referred to GND.				
Standards compliance		CAN-Bus 2.0B error active; ISO 11898-2			
Transmission line impedance	Recommended; Measured at 1MHz	90	120	150	Ω
Bit rate	Depending on SW settings	125		1000	Kbps
Number of network nodes	Depending on SW settings			64	-
ESD Protection	Human Body Model			±15	KV
Others					
Operating temperature		0		+40	°C
Weight			50		g
Storage temperature	Not powered	-40		85	°C
Humidity	Non-condensing	0		90	%RH

[1] "FS" stands for "Full Scale"

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Specifications can change without prior notification.