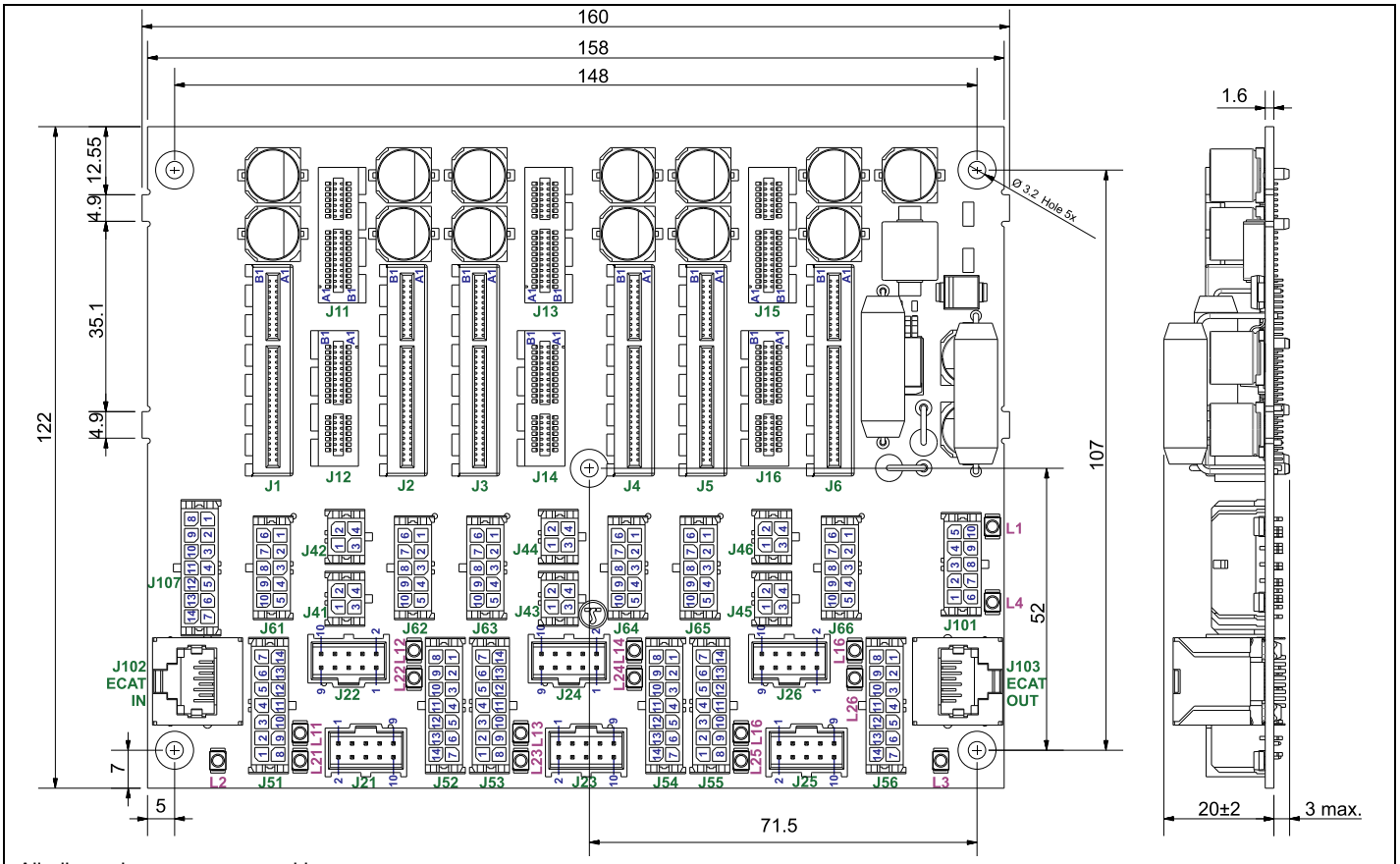

All dimensions are expressed in mm.

Motor – sensor configurations

Sensor \ Motor	PMSM	BLDC	DC BRUSH	STEP (2-ph)	STEP (3-ph)
Incr. Encoder	✓		✓	✓	
Incr. Encoder + Hall	✓	✓			
Analog Sin/Cos encoder	✓				
Linear Halls	✓				
Tacho			✓		
Open-loop (no sensor)				✓	✓

Features

- Motor supply: 9-36V; Logic supply 9-36V
- 6 x Digital Hall sensor interface (single-ended and open collector)
- 6 x Incremental encoder interface (differential)
- 6 x Linear Hall sensors interface
- 6 x Analogue sin/cos encoder interface (differential $1V_{pp}$)
- 6 x 5 digital inputs, 5-36V, NPN: Enable, 2 for limit switches, 2 general-purpose
- 6 x 4 digital outputs, 5-36V, 0.5A, NPN O.C.: Ready, Error, 2 general-purpose
- 6 x 2 analogue inputs: 12-bit, 0-5V: Reference, Feedback or general purpose
- 6 x RS-232 serial interface
- Dual 100Mbps RJ45 EtherCAT® interfaces
- EtherCAT® with CAN application protocol over EtherCAT (CoE)
- Operating ambient temperature: 0-40°C

Mating Connector

Connector	Producer	Part No.	Description	Wire Gauge
J41-46	**MOLEX**	43025-0400	MICROFIT RECEPTACLE HOUSING, 2x2 WAY	AWG 20...24
J51-56, J107	**MOLEX**	43025-1400	MICROFIT RECEPTACLE HOUSING, 2x7 WAY	AWG 20...24
J61-66, J101	**MOLEX**	43025-1000	MICROFIT RECEPTACLE HOUSING, 2x5 WAY	AWG 20...24
J101, J107, J6, J5x, J4x	**MOLEX**	43030-0007	CRIMP PIN, MICROFIT, 5A	AWG 20...24
J21-26	**MOLEX**	90142-0010	C-Grid III™ Crimp Housing Dual Row, 10 Circuits, with retention	AWG 22...24
		90143-0010	C-Grid III™ Crimp Housing Dual Row, 10 Circuits, without retention	
J21-26	**MOLEX**	90119-0109	CRIMP PIN, C-Grid III	AWG 22...24
J102,J103	-	-	Standard 8P8C modular jack (RJ-45) male	-

Connector Description

	Pin	Name	Type	Description
J101	**1..4**	**+V_{MOT}**	I	Positive terminals of the motor supply for all 6 boards: 9 to 36V_{DC}
	5	**+V_{LOG}**	I	Positive terminal of the logic supply for all 6 boards: 9 to 36V_{DC}
	6..10	**GND**	-	Negative return (ground) of the power supply

	Pin	Name	Type	Description
J41-46	1	232TX	O	RS-232 Data Transmission for Drive #1..6
	2	GND	-	Return ground for RS-232 pins
	3	232RX	I	RS-232 Data Reception for Drive #1..6
	4	GND	-	Return ground for RS-232 pins

	Pin	Name	Type	Description
J51-56; where 1...6 is the drive number	1	+5V$_{OUT}$	O	5V output supply for I/O usage
	2	REF	I	Analogue input, 12-bit, 0-5V. Used to read an analog position, speed or torque reference, or used as general-purpose analogue input
	3	IN0	I	5-36V general-purpose digital NPN input
	4	IN4/Enable	I	5-36V digital NPN input. Drive enable input
	5	IN3/LSN	I	5-36V digital NPN input. Negative limit switch input
	6	OUT2/Error	O	5-36V 0.5A, drive Error output, active low, NPN open-collector/TTL pull-up. Also drives the red LED
	7	+V$_{LOG}$	I/O	Positive terminal of the logic supply: 9 to 36V$_{DC}$ / Internally connected to J101 pin 5
	8	GND	-	Return ground for I/O pins
	9	FDBK	I	Analogue input, 12-bit, 0-5V. Used to read an analogue position or speed feedback (as tacho), or used as general-purpose analogue input
	10	IN1	I	5-36V general-purpose digital NPN input
	11	IN2/LSP	I	5-36V digital NPN input. Positive limit switch input
	12	OUT0	O	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
	13	OUT3/Ready	O	5-36V 0.5A, drive Ready output, active low, NPN open-collector/TTL pull-up. Also drives the green LED.
	14	OUT1	O	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up

	Pin	Name	Type	Description
J107	1	GND	-	Return ground for I/O pins
	2	#1 IN3/LSN	I	5-36V digital NPN input. Negative limit switch input for Drive #1. Alternative to J51 pin 5
	3	#2 IN3/LSN	I	5-36V digital NPN input. Negative limit switch input for Drive #2. Alternative to J52 pin 5
	4	#3 IN3/LSN	I	5-36V digital NPN input. Negative limit switch input for Drive #3. Alternative to J53 pin 5
	5	#4 IN3/LSN	I	5-36V digital NPN input. Negative limit switch input for Drive #4. Alternative to J54 pin 5
	6	#5 IN3/LSN	I	5-36V digital NPN input. Negative limit switch input for Drive #5. Alternative to J55 pin 5
	7	#6 IN3/LSN	I	5-36V digital NPN input. Negative limit switch input for Drive #6. Alternative to J56 pin 5
	8	+V$_{LOG}$	I/O	Positive terminal of the logic supply: 9 to 36V$_{DC}$ / Internally connected to J101 pin 5
	9	#1 IN2/LSP	I	5-36V digital NPN input. Positive limit switch input for Drive #1. Alternative to J51 pin 11
	10	#2 IN2/LSP	I	5-36V digital NPN input. Positive limit switch input for Drive #2. Alternative to J52 pin 11
	11	#3 IN2/LSP	I	5-36V digital NPN input. Positive limit switch input for Drive #3. Alternative to J53 pin 11
	12	#4 IN2/LSP	I	5-36V digital NPN input. Positive limit switch input for Drive #4. Alternative to J54 pin 11
	13	#5 IN2/LSP	I	5-36V digital NPN input. Positive limit switch input for Drive #5. Alternative to J55 pin 11
	14	#6 IN2/LSP	I	5-36V digital NPN input. Positive limit switch input for Drive #6. Alternative to J56 pin 11

	Pin	Name	Type	Description
J61-66; where 1...6 is the drive number	1	A/A+	O	**Phase A** for 3-ph motors, A+ for 2-ph steppers, Motor+ for DC brush motors
	2	C/B+	O	**Phase C** for 3-ph motors, B+ for 2-ph steppers
	3	Hall 1	I	Digital input Hall 1 sensor
	4	Hall 2	I	Digital input Hall 2 sensor
	5	Hall 3	I	Digital input Hall 3 sensor
	6	B/A-	O	**Phase B** for 3-ph motors, A- for 2-ph steppers, Motor- for DC brush motors
	7	Cr/B-	O	**Chopping resistor / Phase B-** for step motors
	8	+5V$_{OUT}$	O	5V output supply - internally generated
	9	GND	-	Negative return (ground) of the motor supply
	10	GND	-	Negative return (ground) of the motor supply

	Pin	Name	Type	Description
J21-26; where 1...6 is the drive number	1	Z- /LH3	I	Incr. encoder (index) Z- diff. input, or linear Hall 3 input
	2	Z+	I	Incr. encoder (index) Z+ diff. input
	3	B-/Cos-/LH2	I	Incr. encoder B- diff. input, or analogue encoder Cos- diff. input, or linear Hall 2 input
	4	B+/Cos+	I	Incr. encoder B+ diff. input, or analogue encoder Cos+ diff. input
	5	A- /Sin-/LH1	I	Incr. encoder A- diff. input, or analogue encoder Sin- diff. input, or linear Hall 1 input
	6	A+/Sin+	I	Incr. encoder A+ diff. input, or analogue encoder Sin+ diff. input
	7	GND	-	Return ground for sensors supply
	8	+5V$_{OUT}$	O	5V output supply for I/O usage
	9	GND	-	Return ground for sensors supply
	10	+5V$_{OUT}$	O	5V output supply for I/O usage

LED	Name	Color	Description
L1	+Log	Green	+Vlog power presence
L2	E-CAT IN L/A	Green	EtherCAT IN Link/Activity
L3	E-CAT OUT L/A	Green	EtherCAT OUT Link/Activity
L4	+Mot	Yellow	+Vmot power presence
L11-16	#1...6 E-CAT RUN	Green	EtherCAT RUN for drive #1...6
L21-26	#1...6 E-CAT ERR	Red	EtherCAT Error for drive #1...6

Electrical characteristics

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

- Tamb = 0…40ºC, +Vlog supply = 24.0V DC
- Both Ethernet ports active, all iPOS360x and E-CAT VX adapters plugged in

Operating Conditions		Min.	Typ.	Max.	Units
Ambient temperature		0		+60	ºC
Ambient humidity	Non-condensing	0		90	% Rh
Altitude / pressure	Altitude (vs. sea level)	-0.1		2.5	Km
	Ambient Pressure	0.75		10.0	atm
Storage Conditions		**Min.**	**Typ.**	**Max.**	**Units**
Ambient temperature		-40		+85	ºC
Ambient humidity	Non-condensing	0		100	%Rh
Ambient Pressure		0		10.0	atm
ESD capability (Human body model)	Not powered; applies to any accessible part			±0.5	kV
	Original packaging			±15	kV
Mechanical Mounting		**Min.**	**Typ.**	**Max.**	**Units**
Airflow		natural convection			
Insertion force	J1...J6 (iPOS360x)		20	36	N
	J11...J16 (E-CAT VX)		11	22	
Extraction force	J1...J6 (iPOS360x)	5	10		
	J11...J16 (E-CAT VX)	3	7		N
Environmental Characteristics		**Min.**	**Typ.**	**Max.**	**Units**
Size (Length x Width x Height)	Without mating connector	160 x 122 x 22			mm
		~4.30 x 4.80 x 0.86			inch
Weight		200			g
Power dissipation	Operating		15	35	W
Cleaning agents	Dry cleaning is recommended	Only Water- or Alcohol- based			
Protection degree	According to IEC60529, UL508	IP00			-

Supply Input			Min.	Typ.	Max.	Units
Logic Supply voltage	Operating		9	24	36	V_{DC}
	Absolute maximum values, continuous†		7		39	
Motor Supply voltage	Operating		9	24	36	V_{DC}
	Absolute maximum values, continuous†		8.5		40	
Logic supply current	No Load on Digital Outputs	$+V_{LOG}$ = 12V		1.2	2.3	A
		$+V_{LOG}$ = 24V		0.7	1.4	
		$+V_{LOG}$ = 36V		0.5	1.1	
Motor supply current	Idle			10	40	mA
	Operating		-60		60	A

Ethernet Ports		Min.	Typ.	Max.	Units
Standard Compliance		EtherCAT (IEC61158-3/4/5/6-12)			
		Fast Ethernet 100BASE-TX (IEEE802.3u)			
		Auto-negotiation for 100Mbps/s full-duplex			
		Auto-detect MDI/MDI-X			
Power over Ethernet	NOT used by ECAT VX, separate logic supply	compliant to IEEE802.3af mode A “Mixed DC & Data”			
		NOT compliant to IEEE802.3af mode B “DC on Spares”			
Maximum cable length	2-pair UTP Cat5	100	150		m
ESD protection	Human body model	±4			KV

† Stresses beyond values 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.