

EAI32 EtherCAT[®] Analogue Input Module

Cosworth's EAI32 module offers up to 32 high precision, high speed +/-10V analogue inputs in a stand-alone and rugged IP67 aluminium housing.

Input resolution is 16bits, with outstanding accuracy and repeatability. Sampling rates go up to 2kHz.

The interface to data acquisition systems, including Cosworth's Pi Diablo, is via EtherCAT. This is an open and widely used industrial standard offering high speed and excellent time synchronisation.

Input connectors are pin-compatible (*) with Mistral IJB Type A slots. Both the power and EtherCAT connections use industry standard M8 connectors.



Individual inputs can be software configured as either single ended (up to 32) or true differential (up to 16). Each of the two input connectors also offer four 0-10V programmable excitation lines, two of which can be software configured as switchable outputs.

Specifications

Electrical Data	
Operating voltage	8 to 32VDC
Current Consumption	190mA @ 24V plus excitations
Analogue Inputs	Input connectors: 2 x microD25P Software selectable inputs: Up to 32 single ended Up to 16 true differential Ranges: +/-10V nominal; +/-12.25V FS +/-5V nominal; +/-6.125V FS Input Impedance: >1 GOhm Resolution: 16bits Accuracy: +/-0.03% FS @ 25degC Repeatability: +/-8mV over one year and typical temperatures Sampling at 2kHz Channel rates 1 Hz to 2kHz Filtering: single pole @ 500Hz, averaging over 2 channel periods
Excitations	8 in total (4 per port) Programmable +/-12.25V 150mA maximum current 4 can be switched on/off by software, max. 700mA
Data ports	2 x EtherCAT

Electrical Data	
LEDs	2 x Link Activity, 1 x Run State
Internal Sensors	Supply Voltage Monitoring Internal Temperature Excitation Voltage and Current Monitoring, all 1 to 5Hz

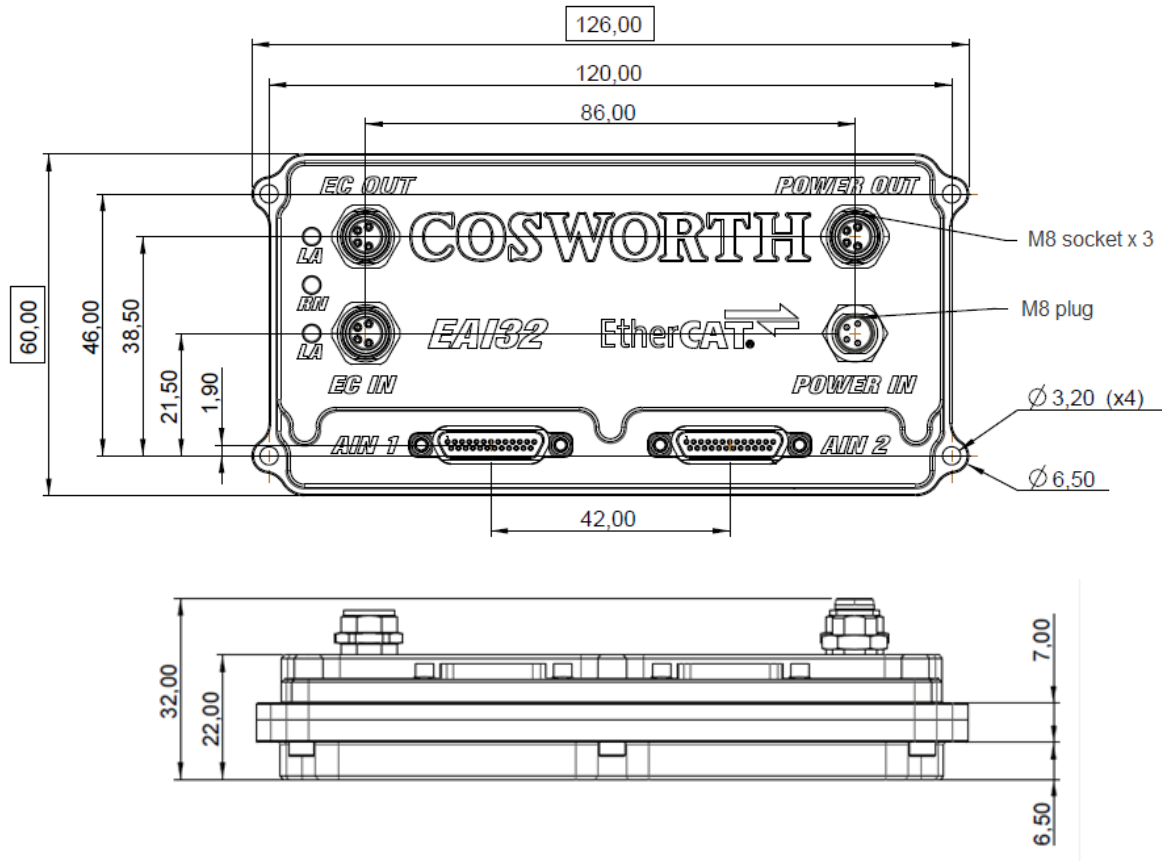
Mechanical Data	
Size excluding connectors	126 x 60 x 22 mm
Weight	197 grams
Environmental	IP67
Operating Temperature	-25°C to +60°C
Storage Temperature	-40°C to +85°C
Case Material	Anodized Aluminium

Ordering Information

Part Number	
EAI32	01M-606060

EtherCAT[®] is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Dimensions



Installation

When installing the EAI32:

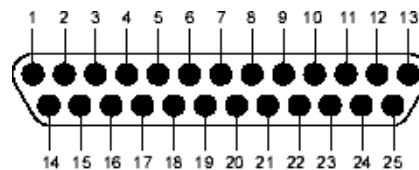
- Avoid exposing the unit to severe vibrations, if necessary use AV mounts.
- Ensure unit is positioned in an area with an ambient temperature of less than 60°C and with sufficient cooling air flow to prevent over-heating. Provision of heat-sinking is recommended where possible.
- Mount the unit away from sources of strong electrical interference and take care to route EtherCAT cable separately from high voltage power cables.
- Route analogue input cables away from strong electrical interference sources, such as motors and high voltage power cables.

Connector Information

All illustrations show device connectors.

AIN1 – Analogue Input Connector

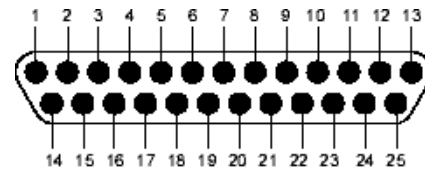
Connector	Mating Connector
microD25 P	microD25 S



Pin	Function	Signal Description
1	Analogue GND	Common ground for single ended signals (* case ground in IJB)
2	Input 1- / Input 9+	Differential input 1-, single ended input 9+
3	Input 2- / Input 10+	Differential input 2-, single ended input 10+
4	Excitation 1+	Programmable 0-10V or switchable 0-14V (or 0-Vsupply, solder link config.)
5	Input 3- / Input 11+	Differential input 3-, single ended input 11+
6	Input 4- / Input 12+	Differential input 4-, single ended input 12+
7	Excitation 2+	Programmable 0-10V or switchable 0-14V (or 0-Vsupply, solder link config.)
8	Input 5- / Input 13+	Differential input 5-, single ended input 13+
9	Input 6- / Input 14+	Differential input 6-, single ended input 14+
10	Excitation 3+	Programmable 0-10V
11	Input 7- / Input 15+	Differential input 7-, single ended input 15+
12	Input 8- / Input 16+	Differential input 8-, single ended input 16+
13	Excitation 4+	Programmable 0-10V
14	GND	Excitation1 ground / return
15	Input 1+	Differential input 1+, single ended input 1+
16	Input 2+	Differential input 2+, single ended input 2+
17	GND	Excitation 2 ground / return
18	Input 3+	Differential input 3+, single ended input 3+
19	Input 4+	Differential input 4+, single ended input 4+
20	GND	Excitation 3 ground / return
21	Input 5+	Differential input 5+, single ended input 5+
22	Input 6+	Differential input 6+, single ended input 6+
23	GND	Excitation 4 ground / return
24	Input 7+	Differential input 7+, single ended input 7+
25	Input 8+	Differential input 7+, single ended input 7+
Shell	Case GND	Case and shield

AIN2 – Analogue Input Connector

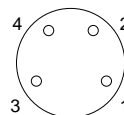
Connector	Mating Connector
microD25 P	microD25 S



Pin	Function	Signal Description
1	Analogue GND	Common ground for single ended signals (* case ground in IJB)
2	Input 17- / Input 25+	Differential input 17-, single ended input 25+
3	Input 18- / Input 26+	Differential input 18-, single ended input 26+
4	Excitation 5+	Programmable 0-10V or switchable 0-14V (or 0-Vsupply, solder link config.)
5	Input 19- / Input 27+	Differential input 19-, single ended input 27+
6	Input 20- / Input 28+	Differential input 20-, single ended input 28+
7	Excitation 6+	Programmable 0-10V or switchable 0-14V (or 0-Vsupply, solder link config.)
8	Input 21- / Input 29+	Differential input 21-, single ended input 29+
9	Input 22- / Input 30+	Differential input 22-, single ended input 30+
10	Excitation 7+	Programmable 0-10V
11	Input 23- / Input 31+	Differential input 23-, single ended input 31+
12	Input 24- / Input 32+	Differential input 24-, single ended input 32+
13	Excitation 8+	Programmable 0-10V
14	GND	Excitation 5 ground / return
15	Input 17+	Differential input 17+, single ended input 17+
16	Input 18+	Differential input 18+, single ended input 18+
17	GND	Excitation 6 ground / return
18	Input 19+	Differential input 19+, single ended input 19+
19	Input 20+	Differential input 20+, single ended input 20+
20	GND	Excitation 7 ground / return
21	Input 21+	Differential input 21+, single ended input 21+
22	Input 22+	Differential input 22+, single ended input 22+
23	GND	Excitation 8 ground / return
24	Input 23+	Differential input 23+, single ended input 23+
25	Input 24+	Differential input 24+, single ended input 24+
Shell	Case GND	Case and shield

EC IN, EC OUT – EtherCAT In / Out Connectors

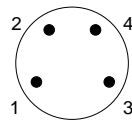
Connector	Mating Connector
M8 4 way S	M8 4 way P



Pin	Function	Signal Description
1	Tx +	EtherCAT transmit +
2	Rx +	EtherCAT receive+
3	Rx -	EtherCAT receive -
4	Tx -	EtherCAT transmit -

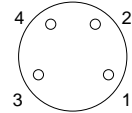
POWER IN

Connector	Mating Connector
M8 4 way P	M8 4 way S



POWER OUT

Connector	Mating Connector
M8 4 way S	M8 4 way P



Pin	Function	Signal Description
1	Vsupply+ Control	Main 9-30V supply for module electronics
2	Vsupply+ Aux	Auxiliary power, not used in this module
3	GND Control	Main supply ground
4	GND Aux	Auxiliary power, not connected in this module

Recycling and Environmental Protection

Cosworth Electronics is committed to conducting its business in an environmentally responsible manner and to strive for high environmental standards.

Manufacture

Cosworth products comply with the appropriate requirements of the Restriction of Hazardous Substances (RoHS) directive (where applicable).

Disposal

Electronic equipment should be disposed of in accordance with regulations in force and in particular in accordance with the Waste in Electrical and Electronic Equipment directive (WEEE).