Digital Amplifier EtherCAT DA-EC

Scope of Supply

Amplifier in DIN Rail Mount enclosure
Standard: 1 channel EtherCAT

Device description file on disk

Variant

2EC: 2 channel EtherCAT
in DIN Rail Mount enclosure

Additional Options

GK: Enclosure (IP67) with terminals

M: Potted version only with option GK

F: (Potentially explosive atmospheres):
Use with safety barriers

Pic. similar

EtherCAT Strain Gauge Amplifier

Other interfaces on request,
e.g. ProfiNet, ProfiBus, EtherNet/IP

Special Features

- 24 bit Σ-Δ-AD converter for highest precision

- Very fast cycle time for time-critical applications

- Galvanic separation of bus and application up to 1.5 kV

- ETC certified

The amplifier DA-EC is used whenever full bridge strain gauge sensors (e.g. force sensors) are to be connected with EtherCAT networks. The primary field of application is web tension and force measurement.

The sensor signals are converted into digital signals with a cycle time of 0.5 ms. They are averaged and provided to the interface circuit at a distance of approx. 6 ms. From there, they are then switched in the corresponding data format.

Ordering Example

DA-2EC-GKM-1,5

└─ Nominal rating
└── Option
└─── EtherCAT
└──── 2 channel version
└───── Type
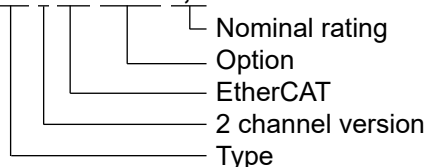
Please consider with the order:

The amplification of the DA-EC is preset and in particular correlation with the nominal rating of the *HAEHNE* sensor.

Version DA-EC	Nominal rating of the sensor
-1,5	1.5 mV/V
-1,0	1.0 mV/V
-0,75	0.75 mV/V
-0,5	0.5 mV/V

Ordering example for option F:

Indicate the total resistance from measuring chain for option F (e. g. 1000 Ohm):

DA-EC-F1000-1,5

DA-EC

HAEHNE

Technical Data

Power supply Attention: The auxiliary power must be grounded!	Power supply	24 V DC (9 ... 36 V)
	Typical current requirements with standard wiring	approx. 150 mA
Strain gauge excitation supply	Voltage (V_4)	10 V DC
	Option J	5 V DC
	Current max.	160 mA
Signal	\-160 % …0 … +160 % $\stackrel{\wedge}{=}$ 8000…0000…7FFF	
Data width		1 word
Resolution		16 bit
Enclosure protection	Standard: P20	Variant GK: IP67
Nominal temperature range		0…+60° C
Terminal cross-section		AWG 24-12

Terminal Assignment

Terminal	Assignment	
1	+24 V	
2	+24 V*	
3	0 V	Power supply
4	0 V*	
5	PE	
6	GND	Reference potential for Ex protection

Terminal	Assignment	
7	V_{4+}	
8	V_{4-}	
9	V_{1+}	Sensor A
10	V_{1-}	
11	V_{4+}	
12	V_{4-}	
13	V_{1+}	Sensor B
14	V_{1-}	

* Power supply for other devices
  The maximum current of 1 Ampere
  must not be exceeded.
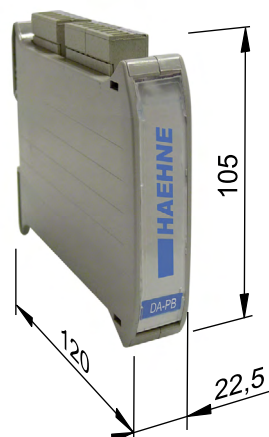
V_1: Signal voltage V_4 : Supply voltage

Upper side

Underneath

Port 1	Port 2
RJ45	RJ45

Dimensions

105

120

22,5

Option GK
Width x depth x height
170 x 123 x 67 mm

Technical modifications reserved

Digital Amplifier EtherCAT DA-EC

Technical Information

Design and Data Transmission

The analog processed and digitally converted signals are transmitted to the EtherCAT. The measuring range is ± 160 % of nominal force. If the measurement direction has a vertical component, e.g. the roll weight, these force values are already transmitted without acting web forces. In order to determine the web tension force correctly the tare value (roll weight portion) and the web geometry have to be considered.

Measurement Data Transmission

Exemplary presentation in 16 bit register as complement of two																					
Measure-ment value based on F_{nom}	Measurement value of bridge output signal V_1 [mV]		hex	dez (unsigned)	dez (signed)	MSB															LSB
						15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+150 %	Nominal rating ×	10 V / 5 V (option J) ×	1,5	7800	30720	30720	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
+100 %			1,0	5000	20480	20480	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+50 %			0,5	2800	10240	10240	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
0 %			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-50 %			-0,5	D800	55296	-10240	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0
-100 %			-1,0	B000	45056	-20480	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
-150 %			-1,5	8800	34816	-30720	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

EtherCAT Master Adjustment

The required device description file is supplied by *HAEHNE* and
must be read in the configuration tool of the PLC.
HAEHNE has integrated an ETC-certified embedded module from KUNBUS into its measuring amplifier.