

e.bloxx A6-2CF

Carrier Frequency Bridge and LVDT Module



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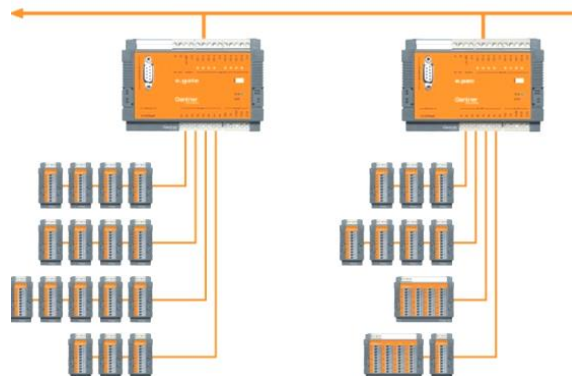
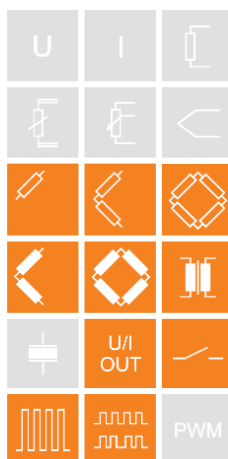
The e.bloxx series is designed for industrial and experimental test systems requiring precise high speed measurement of electrical, thermal, and mechanical quantities in engine and component test beds.

All units are based on a clean modular design, and easily connect to the wide variety of field devices used in today's test beds. Sample rates up to 1000 Hz and resolutions up to 19 bit are possible depending on the module and signal type used. Standardized communication protocols (Profibus-DP and Modbus-RTU) allow the e.bloxx family to work with a wide variety of application hardware and software.

Adding an e.series Test Controller dramatically increases the system's throughput and connectivity options. An e.series Test Controller is a data concentrator, communication gateway, and optionally a Programmable Automation Controller (PAC) with 100Mbps Ethernet, Profibus-DP, EtherCAT, or CANopen.

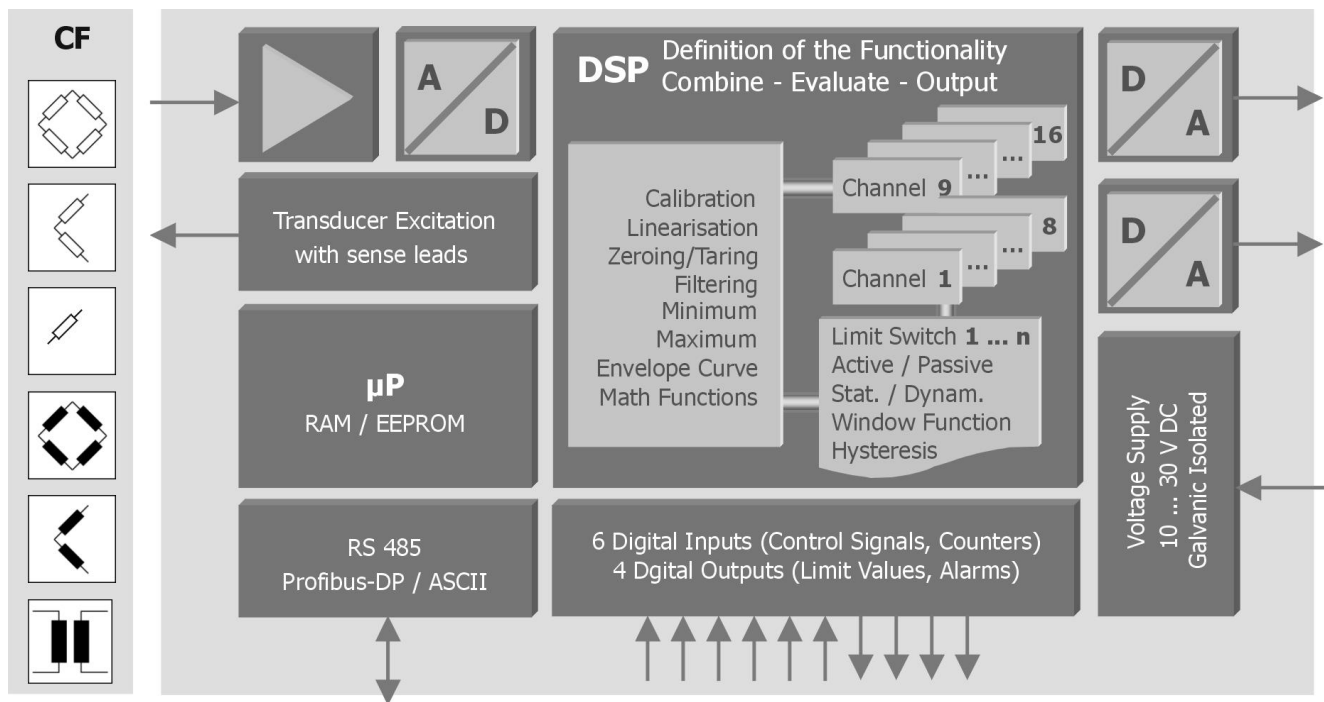
Most important features:

- **Accuracy 0.05**
- **Universal bridge input**
Strain gauge full, half, and quarter, inductive bridges, LVDT, etc. Supports 3, 4, 5, and 6 lead connection (excitation sense), wide measuring range 2.5 to 1250 mV/V
- **High accuracy digitalization**
19 bit ADC, 5000 Hz sampling rate
- **2 analog outputs**
 ± 10 V, user configurable (e.g. maximum, envelope curve, etc.)
- **6 digital input and 4 digital output**
Status, tare, reset peak hold, counter, frequency measurement Status, alarm, limit value, tolerance band
- **Signal conditioning**
Linearization, digital filtering, averaging, scaling, minimum/maximum, run/hold, envelope curve, arithmetic, alarm
- **RS 485 fieldbus interface**
Profibus-DP, Modbus-RTU, ASCII as well as connectable to any e.series Test Controller
- **Galvanic isolation**
of I/O-signals, power supply and interface
Isolation voltage 500 VDC
- **Electromagnetic Compatibility**
according EN 61000-4 and EN 55011
- **Power supply 10...30 VDC**
- **DIN rail mounting (EN50022)**



Channel Name	Type	Connection	Data Direction	Data Format	Range	Unit
U1	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U2	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U3	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U4	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U5	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U6	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U7	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U8	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U9	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U10	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U11	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U12	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U13	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U14	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U15	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U16	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U17	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U18	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U19	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C
U20	Thermocouple	Colt A...	INPUT	FLSAT	-100...100	°C

Block Diagram



Analog Input

Accuracy	0.05 % typical 0.1 % in controlled Environment ¹ 0.5 % in industrial area ²		
Carrier frequency	4800 Hz		
Connectable sensors	Strain gauges, inductive, LVDT, RVDT, piezoresistive, half and full bridge, single strain gauges with terminal B14		
Connection technique	with or without sense leads		
Cable length	max. 100 m		
Repeatability	0.005 % typical (within 24 h)		
Transducer excitation U _{exc}	±5.0 V _{eff}	±2.5 V _{eff}	±1.0 V _{eff}
Min. perm. transducer resistance	350 Ω	175 Ω	70 Ω
Measuring range (dep. on U _{exc})	at U _{exc} ±5,0 V _{eff}	at U _{exc} ±2,5 V _{eff}	at U _{exc} ±1,0 V _{eff}
Low	±2.5 mV/V	±5.0 mV/V	±12.5 mV/V
Medium	±50 mV/V	±100 mV/V	±250 mV/V
High	±250 mV/V	±500 mV/V	±1,250 mV/V
Temperature influence in range	low	medium	high
on zero (TCO)	10 µV/V / 10 K	20 µV/V / 10 K	50 µV/V / 10 K
on sensitivity (TCC)	0.05 % / 10 K	0.05 % / 10 K	0.05 % / 10 K
Noise voltage in range (related to the Input)	low	medium	high
at 0 ... 10 Hz	0.2 µV/V	4 µV/V	10 µV/V
at 0 ... 1,000 Hz	2 µV/V	40 µV/V	100 µV/V
Input resistance	> 10 MΩ		
Long time drift	1 µV/V / 48 h, 2.5 µV/V / 8000 h		
Common mode voltage	100 V permanent		
Linearity deviation	0.02 % of final value		

Signal Conditioning

Resolution ADC	19 bit
Sample rate	5,000 samples/sec
Sample method	Sigma-Delta
Accuracy	19 bit
Real time performance	
Signal conditioning	0.2 ms
Arithmetic	1 ms
Linearization of transducers	
Characteristic curve	8 points
Input Mode	Edit Import (e.g. from Excel) Teach in
Zero balance	over entire measurement range
Balancing time	approx. 200 ms, non-volatile memory (secured against power failure)
Tare	over entire measurement range
Balancing time	ca. 1 ms, selectable volatile or non-volatile memory
Low pass filter	Bessel 4 th order 0.1 Hz up to 1,000 Hz (-3 dB) adjustable in steps
Peak value store	Minimum, maximum
Refresh time	0.5 ms
Delete time	0.3 ms
Momentary value	run/hold
Refresh time	0.5 ms
Envelope curve	
Slew time constant	free selectable
Limit switch	
Function	Switching threshold, tolerance band, hysteresis (2-point-control), all can switch actively or passively, logical combination
Signal to be processed	selectable (Gross, net, min/max, peak-peak, envelope curve, math. calculation)
Reference signal	selectable Constant value, conditioned signal, pre-set value
Response time	1 ms per channel
Hysteresis	selectable
Conditioning	Formula generator e. g. peak-to-peak value, envelope curve, run/hold, scaling, addition, multi- plication, subtraction, Division

Complex coherences can easily be indicated by using combinations of measured values, conditioned values, and I/O-signals.

Analog Outputs

Number	2
Output voltage	±10.2 V, freely scalable
Max. load resistance	> 5 kΩ
Resolution DAC	16 bit
Frequency range	0 to 1,000 Hz (-3 dB)
Signal source	each output can be controlled with a measurement or a conditioned signal (variable)
Temperature influence	
on zero (TC0)	2 mV / 10 °K
on sensitivity (TCC)	0.05 % / 10 °K
Noise voltage for ranges	
0 ... 10 Hz	2 mV
0 ... 1,000 Hz	10 mV
Long time drift	1 mV / 48 h, 2.5 mV / 8000 h
Linearity deviation	0.01 %

Digital Inputs

Number	6, active circuit (high/low)
Function	6 x status Tare, reset, run/hold a.s.o. or single counter, 5 x status or up/down, quadrature, 4 x status max. 50 kHz 32 Bit or Frequency measurement, 5 x status Time base 0.01 to 10 s
Input voltage	max. 30 VDC
Input current	max. 6 mA
Reaction time	
Inputs 1 and 2	1 ms
Inputs 3 to 6	1 up to 10 ms, depends on number of variables
Higher switching threshold	> 10 V (high)
Lower switching threshold	< 2.0 V (low)

Digital Outputs

Number	4
Output	Process or host controlled
Type of output	Open Collector
Output voltage	max. 30 V
Output current	max. 100 mA
Reaction time	1 up to 10 ms, depends on number of variables

Communication Interface

Standard	RS 485, 2-wire
Data format	8E1
Protocols	ASCII, Modbus-RTU, Profibus-DP Local-Bus
Baud rate	
ASCII and ModBus-RTU	19.2; 38.4; 57.6; 93.75; 115.2 kBaud
Profibus-DP	19.2; 93.75; 187.5; 500; 1500 kBaud
Local-Bus	19.2; 38.4; 57.6; 93.75; 115.2; 187.5; 500; 1500 kBaud
Connectable devices	up to 32
Galvanic isolation	500 V
Data rate over interface	1000/sec In case more variables are defined (e.g. Min, Max, Alarm) the total data rate is 1000/sec.

Power Supply

Power supply	10 to 30 VDC overvoltage and overload protection
Power consumption	approx. 1.5 W
Influence of the voltage	0.001 % / V

Mechanical

Case	Aluminium and ABS
Dimensions (W x H x D)	70 x 90 x 83 mm (2.76 x 3.54 x 3.27 in)
Weight	250 g (0.55 lb)
Mounting	DIN EN-Rail

Environmental

Operating temperature	-20 °C to +60 °C
Storage temperature	-40 °C to +85 °C
Relative humidity	5 % to 95 % at 50 °C non condensing

Warm Up Time

All declarations are valid after a warm up time of 45 minutes.

¹ according to EN 61326: 1997, appendix B

² according to EN 61326: 1997, appendix A

Valid from Nov. 2010. Specification subject to change without notice.

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