SIGNAL ACQUSITION:
THE MEASUREMENT AND I/O LEVEL

Connecting Signals and Sensors with the System

e.bloxx

The reliable measurement module

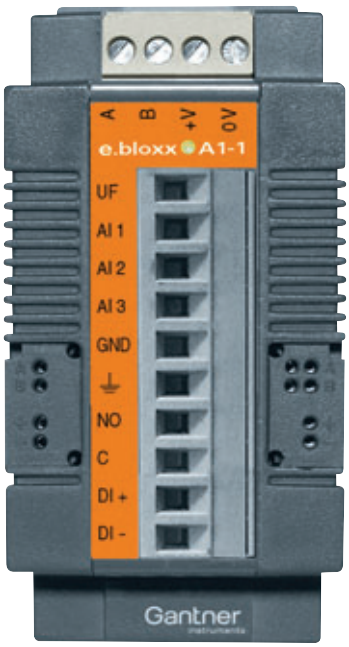
The e.bloxx modules acquire sensor and process signals with precision, speed and stability. To ensure durability the inputs, the power supply, and the interface ports are all galvanically isolated from each other. The industrial design reduces EMC and temperature influences to a minimum. We guarantee that our modules meet all specifications over a temperature range of -20°C to +60°C. All units can be powered with 10 to 30 VDC.

Complete functionality – standard fieldbus in every unit

The e.bloxx modules are fully functional, intelligent stand alone devices. Each e.bloxx module has its own RS-485 serial port that can communicate to the automation system using Profibus-DP, Modbus-RTU or ASCII strings.

PROFIBUS

Modbus



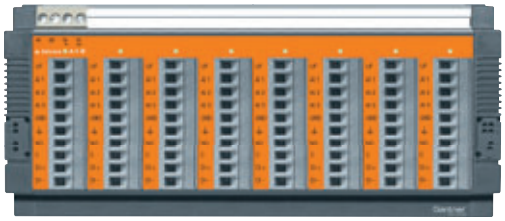
e.bloxx in full-scale

Immune to variations in temperature

One of our customers wanted to validate the overall accuracy of our units. An e.bloxx A5 was placed in a climatic chamber. A reference RTD (Pt100) signal was connected to the input of the module. The A5 was then subjected to temperature variations of -25°C and +65°C over a 40 hour period. The overall measured deviation on the output of the A5 module was less than 0.05°C. That's less than 0.005%. That's accuracy defined.

	e.bloxx Module
	INPUT TYPES
U	Voltage
I	Current
	Resistance
	Pt100, Pt1000
	Potentiometer
	Thermocouple
	Cryo Sensor
	Single Strain Gauge
	Half Bridge Strain Gauge
	Full Bridge Strain Gauge
	Inductive Half Bridge
	Inductive Full Bridge
	LVDT
	ICP Sensor
	Frequency Signal
	Pulse Width
	Counter
	Status
CAN	CAN Data
RS	Serial Sensors, SSI
	OUTPUT SIGNAL
U	Voltage
I	Current
	Frequency
	Pulse Width
	Status
	Relays
CAN	CAN Data
RS	Serial Actuators
	NUMBER OF CHANNELS
	DATA RATES MAX. PER CHANNEL PER SECOND



	A1	A2	A3	A4TC	A5	A5CR	A6-2CF	A9	D1	D2	D3
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	1 (4,8)	1	4 (16)	4 (16)	2/3/6	2	1	4	8 (32)	4	16
	1000	5000	100	100	10	1	1000	1000	1000	100	1000

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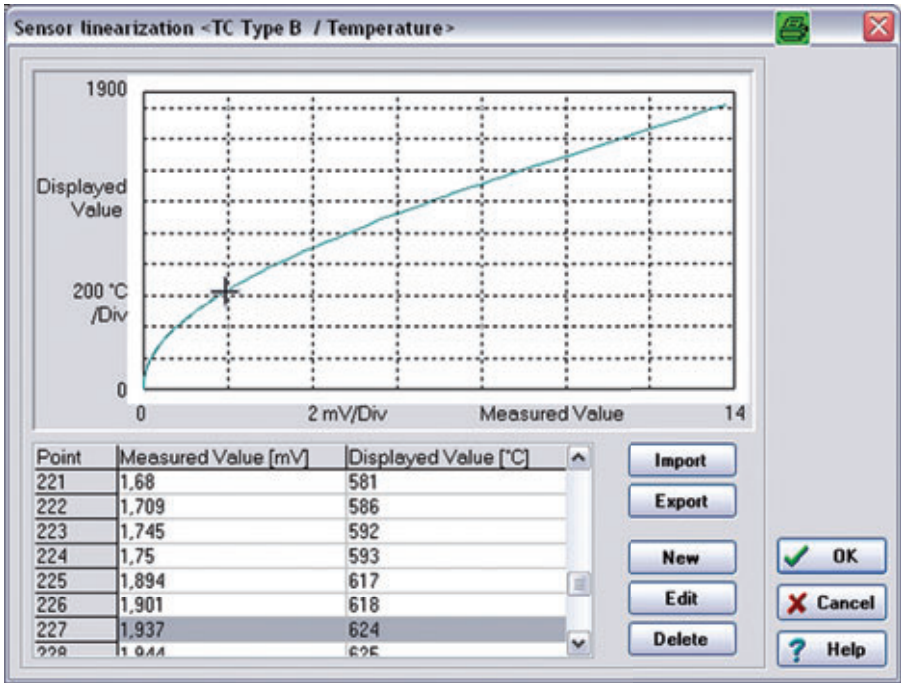
Practical resolution of the measurement signal

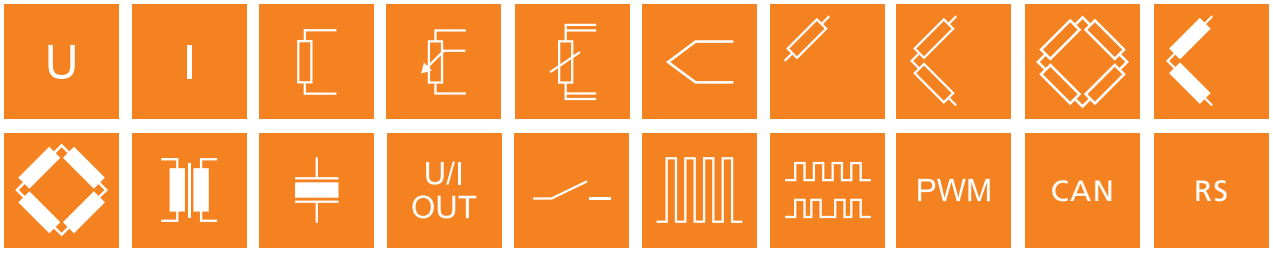
All channels are digitized with 24-bit (>16 million steps) resolution. However, in practice, 24-bit resolution is seldom ever needed. In the e.series products we have reduced the precision to 19-bit to optimize the acquisition speed and signal stability.

With a resolution of 19-bit the input signal is divided into +/- 250,000 steps. For example: a voltage of 10 volts can be measured to a resolution of 40 microvolts.

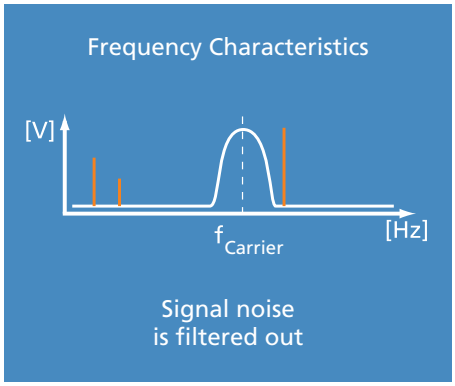
Signal conditioning – remote and intelligent



- Linearization of all sensors using standard (or custom) look up files
- Converting the sensor input into engineering units right from the start
- Digital low pass filter and averaging
- Signal processing such as: alarms, limits, tolerance bands, min and max values, arithmetics, etc.



Analog and digital – Inputs for all common signals and sensors



The advantage of carrier frequency when measuring strain gauges

Because of band-pass characteristics of carrier frequency (CF) measurements, the result is a low sensitivity to noise and an excellent long term stability. Carrier frequency amplifiers can accommodate a variety of sensors; such as: strain gauges, strain gauge based transducers, inductive bridges, LVDTs, as well as, piezo-resistive sensors.

TEDS – Transducer Electronic Data Sheet

The e.bloxx product family can accommodate sensors with TEDS (Transducer Electronic Data Sheet) based on the IEEE 1451.3/4 standard. Certain amplifiers in the e.bloxx family automatically recognize a sensor with TEDS. When connected, the amplifier reads the TEDS data, such as the manufacturer ID, serial number, sensor type, and determines whether the sensor corresponds to a standard template. This information is used to setup the e.bloxx module with the connected sensor. The configuration of the module is overwritten with the TEDS data. This information is transferred to the test controller (e.g. e.gate) The user no longer needs to worry about the channel setup, channel name, measuring range, amplification, or signal offsets. This is all done automatically. The benefit of TEDS is that it reduces the setup time, reduces human error and increases the process integrity.

Chronos – The precise way to measure frequency signals

To measure a very low frequency (1 Hz) and a very high frequency (2 MHz) without modification to the measuring method, the digital inputs of the e.bloxx module D1 and e.rack D1 employ the Chronos method to measure frequencies accurately. The Chronos method precisely measures in parallel, both the number of pulse edges "n" and the time "T" from the first edge to the last edge within a selectable time window. This is why frequency from 1Hz to 2 MHz can be measured with high accuracy. The frequency is calculated from the Time "T" and the number of edges "n" combined (e.g. 126,887 Hz).