



autoEC

universal eddy current sensor driver

affordable precision

an innovative digital driver designed
for *high precision, high resolution*
using passive eddy current
position/displacement probes

easily calibrates with nearly any
probe-cable-target-calibration
combination



- Multiple linearity calibration options –
- Probe temperature compensation –
- Electronics temperature compensation –
- High precision, high resolution –
- Digital error correction –
- USB interface –
- Voltage outputs –
- Current outputs –
- Switched output –
- OEM versions –



About Eigel-Danielson

Founded in 1998 focusing on technology and product development for industrial, test & measurement, and laboratory applications, Eigel-Danielson has grown to include research, engineering and product development in sensor technology for high precision, high resolution position/displacement sensing. The *auto EC* is the latest in digital inductive sensor technology.

auto EC

Eigel-Danielson’s universal eddy current sensor driver is a unique design that answers market demand for a cost effective, easy to use, high performance linear position/displacement sensor.

Incorporating proprietary digital circuitry, the *autoEC* is easily configurable via standard USB interface using a PC and the included *autoEC* software.

“Universal” means the *autoEC* can work with nearly any manufacturer’s probe, and nearly any electrically conductive target material, providing unmatched flexibility for lab use.

Digital circuitry, eliminates the potentiometers used to calibrate the traditional eddy current balanced bridge analog circuit that has been in use for well over 50 years. It also allows for digital error correction to improve linearity and thermal sensitivity.

The *autoEC* is a high performance solution that doesn’t sacrifice speed for resolution, or calibrated range for linearity. The performance specifications are comparable with the traditional balanced bridge analog circuit.

Packaged in an extruded aluminum enclosure, once configured and calibrated it operates independently providing analog outputs for use in traditional analog input control/data acquisition systems. Digital output via USB is also available for integration into digital control and data acquisition systems.

OEM applications can take advantage of an OEM board level version for ease of integration.

Features

Pushbutton linearity calibration

2 point—good for short range calibrations

6 point—good linearity

21 point—excellent linearity

Pushbutton temperature compensation calibration

Analog outputs

0–5VDC, +/-5VDC,

0–10VDC, +/-10VDC,

0–20mA, 4–20mA

Output adjust

Zero (min), 2 point (min–max), 3 point (min–mid–max)

Digital filtering

Digital communication via USB

Adjustable sample rate

1–22,500 samples per second

Solid state relay with Hi-Lo limit set



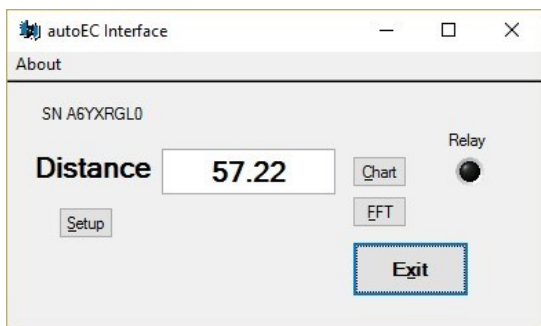
affordable precision

autoEC incorporates the latest digital technology, and proprietary algorithms, applied in ways that bring the future of inductive non-contact position/displacement sensing into the present.

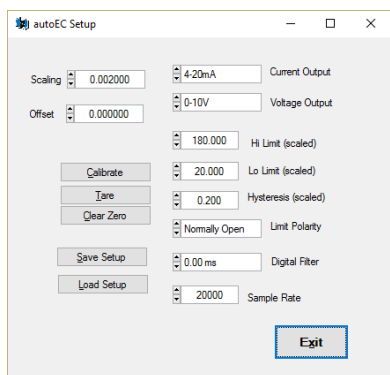
Simple to set up, the autoEC provides exceptional performance, with a long product life expectation, ideal for the single point of use as well as volume OEM applications.

autoEC Software

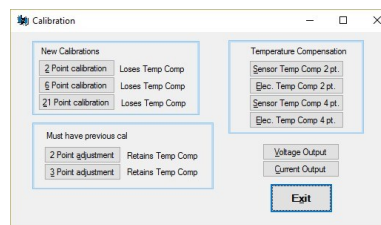
The software to access the setup, calibration and strip chart display is provided on a thumb drive included with the autoEC.



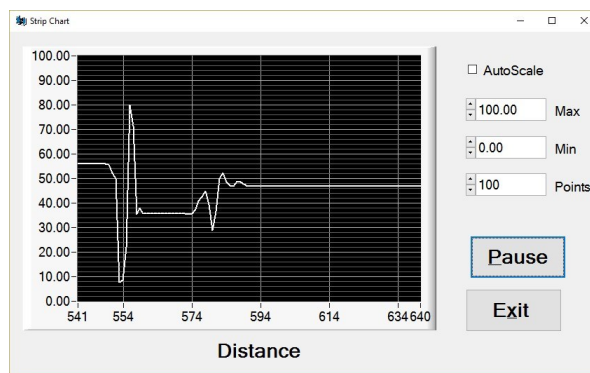
The interface screen displays the sensor output and allows access to the Setup, Calibration, Strip Chart and FFT screens.



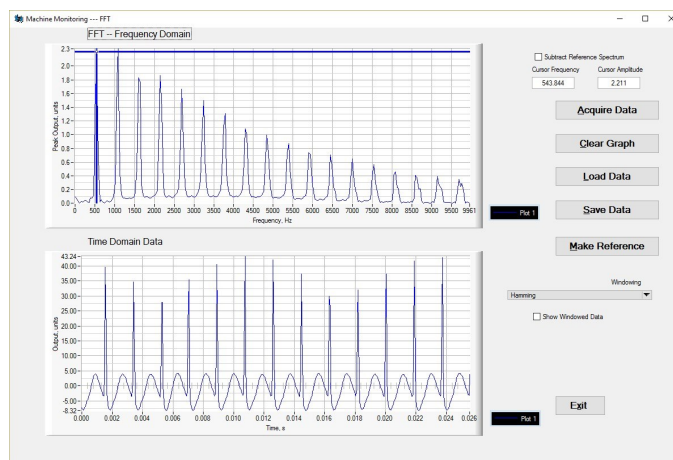
Selection of outputs, Hi-Lo limits, digital filtering and sample rate are made in the setup screen. This is also where the calibration options are accessed.



Access to the various calibrations for linearity and temperature compensation, and output adjustments are via the calibration screen.



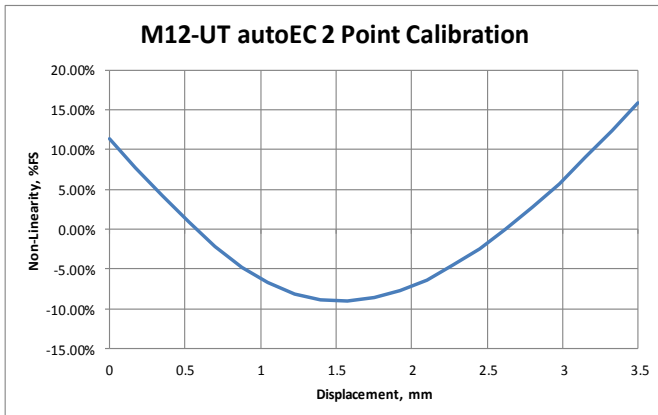
The strip chart allows graphical display of the output in real time. It can auto scale from 0–100%, or the min and max scales can be set to display whatever output is selected. If 0–10VDC is the output, simply set min to 0 and max to 10.



autoEC has the capability to collect 512 samples at the chosen sample rate, upload the data to a PC, and do an FFT on the data. This can be useful for machine monitoring and complex analysis.



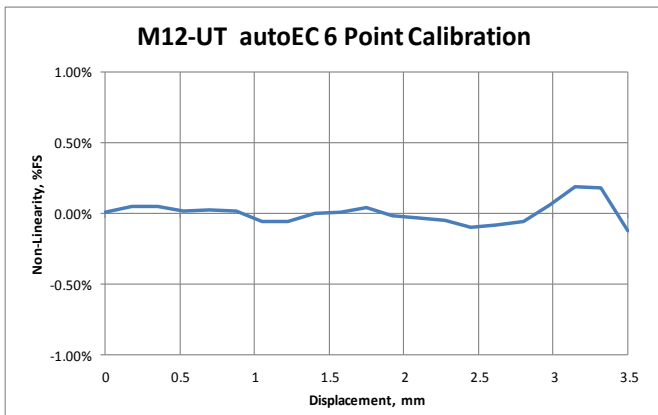
affordable flexibility



Flexibility is particularly evident in the linearity calibration options included with the *autoEC*. The charts on the left are typical output curves for the *autoEC* with the M12-UT probe.

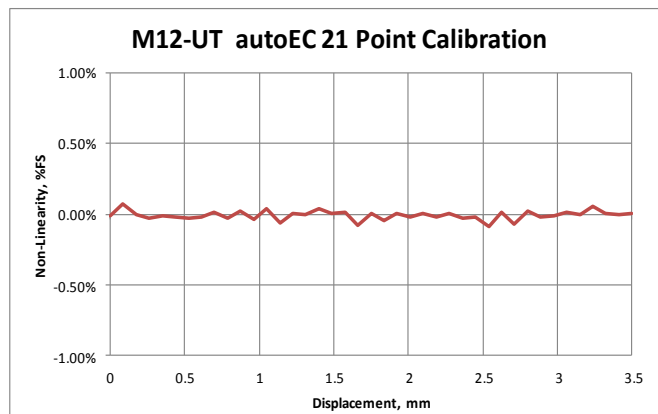
2 Point Calibration

Applications that require precision and repeatability but not a tight linearity spec can use a 2 point calibration. An example is process control triggered by a repeatable target position relative to the probe. Similar to how prox switch usage, but with much higher performance from hysteresis that is within the resolution spec.



6 Point Calibration

When good linearity is required/desired, the 6 point calibration offers a fairly quick calibration that can provide <0.3%FS linearity. Digital circuitry and software interface eliminates the typical iterative process associated with analog eddy current sensors.



21 Point Calibration

When good really isn't good enough, the 21 point calibration offers the best linearity possible with just a bit more time and effort.

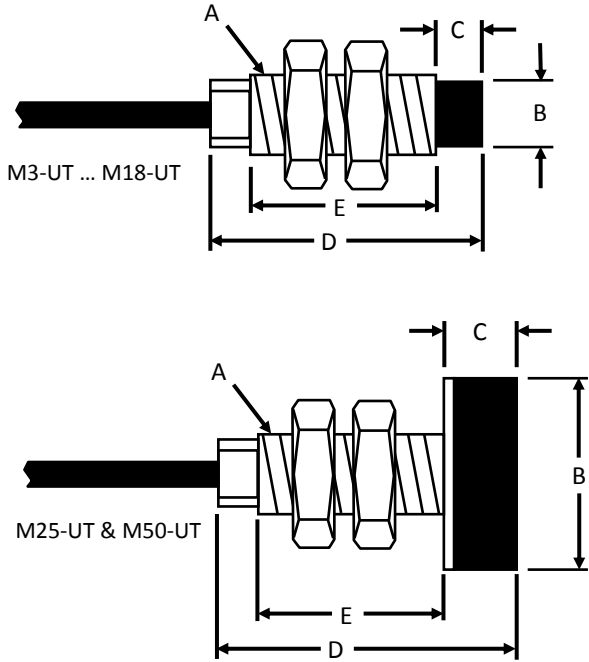
Temperature Compensation Calibration

An ideal sensor would be unaffected by thermal changes of the probe. The *autoEC* with temperature compensated calibration is as close to ideal as you can get.

Accomplished via the provided software it is simply a matter of positioning the sensor at 2 different locations P1 & P2, and 2 different temperatures T1 & T2 and thermal sensitivity is reduced by about an order of magnitude.



Standard probe options



PROBE	A	B	C	D	E
M3-UT	M3x.5	2.0/0.08	3.0/0.12	21.10.83/	13.0/0.51
M5-UT	M5x.8	3.4/0.13	3.0/0.12	23.0/0.91	18.0/0.71
M8-UT	M8x1	6.2/0.24	5.0/0.20	25.0/0.99	18.0/0.71
M12-UT	M12x1	10.0/0.39	7.0/0.28	29.0/1.15	18.0/0.71
M18-UT	M18x1	15.8/0.62	9.0/0.36	44.0/1.74	31.0/1.22
M25-UT	M18x1	25.0/0.99	15.0/0.59	61.0/2.40	42.0/1.65
M38-UT	M18x1	38.0/1.50	20.0/0.79	80.0/3.15	54.0/2.13
M50-UT	M18x1	50.0/1.97	25.0/0.99	98.0/3.86	69.0/2.72

Dimensions mm/inch

Probe-Target-Cable / Performance

The probe, cable, calibrated range and target can influence the actual performance of the *autoEC*. The specifications below are based on an aluminum target (highly conductive), a 6 ft probe cable, and a calibrated range no larger than 1/3 of the probe diameter.

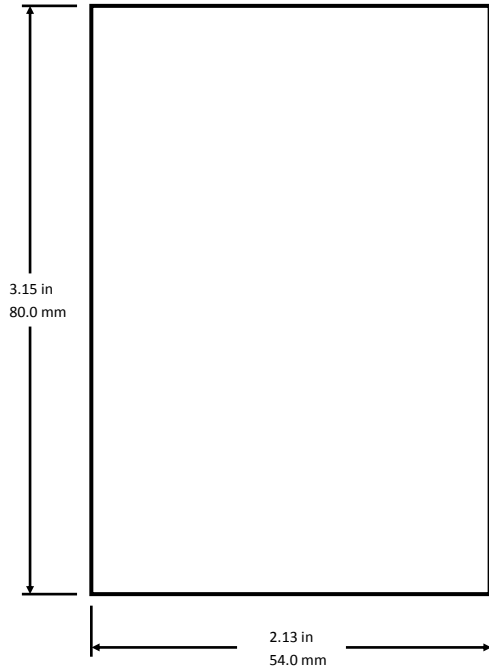
Nonlinearity	6 pt calibration	<±0.3%FS
	21 pt calibration	<±0.1%FS
Resolution	Static	<0.001%FS
	@100 Hz	<0.01%FS
	@1000 Hz	<0.02%FS
Thermal Sensitivity	Standard	0.05%FS/°F (0.1%FS/°C)
	w/temp comp cal	0.01%FS/°F (0.02%FS/°C)

See the user manual for information on potential performance impacts of probes, targets, cables and calibrations.

Probe Specifications

Integral Cable Length	2 meters
Operating Temperature Range	-25C to +125C
Cable Jacket	PUR
Probe Connector	SMA
Extension Cables	1 meter
	2 meter
	3 meter

Standard *auto* EC dimension



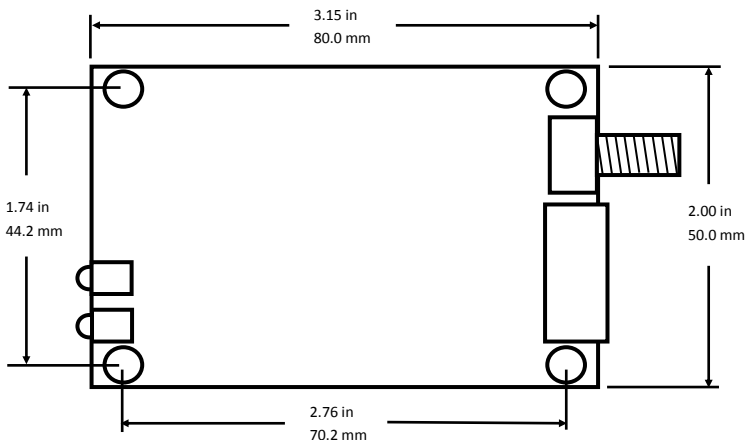
General Specifications

Input voltage	+4.5 to +5.5 VDC
Input current	470 mA (@5VDC)
Voltage output	0–5VDC, 0–10VDC ±5VDC, ±10VDC
Current output	0–20mA, 4–20mA
Operating temp range	0–50°C
Probe DC resistance range	0.5–20 ohms
Probe inductance range	10–50 µH
Power connection	USB
Sensor connection	SMA
Terminal strip connections	Pin 1 VDC out Pin 2 Ground Pin 3 I out Pin 4 Ground Pin 5 IO Bit Pin 6 Relay connection

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auto EC OEM version dimensions



Contact Eigel-Danielson today for applications assistance, price and availability.

719-481-0226

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