## Current Output and Adjustment

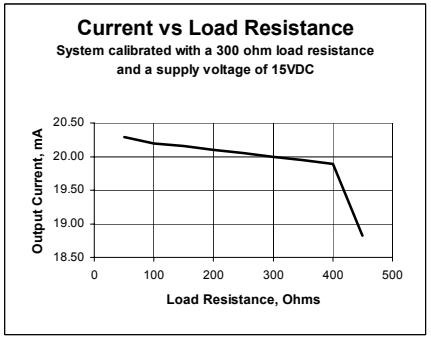
The 0-20mA current output is derived from the 0-10V output.

**Calibration:**

1. Position the probe/target gap to achieve 10.000VDC output.
2. Set the Current output to 20mA using the Current adjustment at the bottom of the enclosure.

The maximum load resistance allowable is dependent on the sensor supply voltage.

| +Vin | R load max |
|---|---|
| 12Vdc | 200 ohms |
| 15Vdc | 300 ohms |
| 18Vdc | 375 ohms |
| 24Vdc | 600 ohms |




It is possible to adjust the current output to achieve 4-20mA if required. Contact Lion Precision for details.

## Troubleshooting

If the problem is not rectified after reviewing these hints, call Lion Precision for assistance at 651-484-6544.

- **None of the range LEDs are lit.**

There is no power supplied to the unit or power connections are reversed. The range LEDs are designed such that at least one of the LEDs will be lit whenever power is applied.

- **Sudden output change and/or no response to gap change.**

Check that the probe is properly connected and that the cable is not damaged. When the probe is disconnected from the driver during operation the output will go to near -5V or +VDC supply voltage.

- **Unexpected zero shift in the output.**

Probe may be damaged. Excessive target/probe contact can result in damage to the coil in the tip of the probe. Shorted turns in the coil from such contact can cause a change in output, either positive or negative dependent on target material. Check the probe resistance at the cable connector and compare it with other probes you may have of that same model. The resistance values should be within a few tenths of an ohm. If you do not have other probes to compare, call Lion Precision for the resistance value of that probe model.

- **Electrical noise in the output**

Use clean input power from a linear supply, not a switching power supply. Also, high frequency noise can be picked up by output connection cables. Use shielded and/or twisted pair connections to the driver output. Ungrounded targets will produce more output noise than grounded targets. If the target is undgrounded, connecting a ground wire will reduce the output noise.

## More Information

For more detailed information on the theory of operation and application of eddy-current displacement sensors, visit our web site at www.lionprecision.com.

For applications assistance or customer service:
Call 651-484-6544
E-mail info@lionprecision.com

**Presented By: *A*-Tech Instruments Ltd.**
**Phone: 416 754 7008 Fax: 416 754 2351**
**Email: sales@a-tech.ca (2008)**

# USER'S GUIDE

for

# ECL100 Series Eddy-Current Displacement Sensors

from

# Lion Precision

Thank you for purchasing your measuring system(s) from Lion Precision! We appreciate your business and look forward to satisfying any measurement requirements you may have in the future.

## Quick Start Instructions

1. Verify that the probe serial number (heat shrink label on probe cable) matches the probe serial number on the driver side panel label.
2. Connect input voltage and output device per driver side panel label.
3. Install the probe and route the probe cable to the driver. Fasten probe cable in place every 18"-24". Use care not to cut or crimp the probe cable.
4. Plug probe connector into the front panel driver connector. *Do not twist probe connector*.
5. Apply power and begin making precision measurements. If a front panel LED is red, the probe is not in its calibrated range and measurement results are not guaranteed.

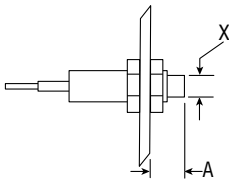
LION PRECISION

## Description

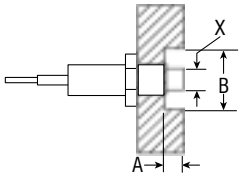
The ECL100 displacement sensor consists of a probe with integral coaxial cable and a driver which operates on 12-24VDC and produces 0-10VDC, and 0-20mA outputs which are linearly proportional to the distance between the probe and the target being sensed.

## Probe Installation

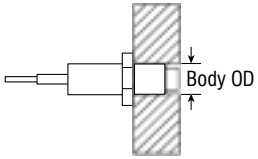
Any conductive material that engages the coil field will influence the output of the sensor. Follow the guidelines shown below for shielded and unshielded probes. Shielded probe models start with "S." Unshielded models start with "U." If it is not possible to meet these minimum guidelines, contact Lion Precision for assistance.




Bracket Mount




Flush Mount With Counterbore



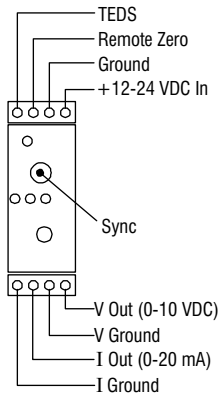

Flush Mount Without Counterbore

| Dimensions Relative to X | | |
|---|---|---|
| | A | B |
| Unshielded | 1.5X | 3X |
| Shielded | 1X | 2X |

Flush mount without counterbore recommended for shielded probes only. Requires special calibration. Contact Lion Precision for more information.

## Driver Connections

Additional details are on the following page.

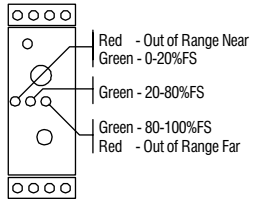



| | |
|---|---|
| TEDS | Conforms to TEDS standard for serial communication of instrument data. |
| Remote Zero | ±10VDC input shifts output voltage. Noise or ripple on this voltage will appear in the output voltage. |
| Ground | Input voltage ground reference (return) |
| VDC In | +12 to +24VDC power input. Input voltage ripple must be less than 40mV p-p to maintain specifications. |
| V Out | 0-10VDC calibrated output. Actual output voltage can range from –5 to +Vin when probe is out of range. |
| V Out Ground | Internally connected to power input ground. |
| I Out | 0-20mA current output. See Current Output section for maximum load specs. |
| I Out Ground | Internally connected to power input ground. |
| Sync | Synchronization connection. Maximum of 1 master and 8 slaves. |

## Synchronized Systems

Sensor measuring the same target should be synchronized unless the sensors are too far apart to make it practical. Short coax interconnecting cables are provided with synchronized drivers. The cables interconnect the Sync connectors on the faces of the drivers. Do not use a T-connector on the Master Driver, identified with an "M" label. Slaves are identified with an "S" (formerly Primary "P" and Secondary "S").

## Range LED Operation




Dual color LEDs indicate the relative position of the target as shown at right. One LED is illuminated whenever power is applied.

## Factory Calibration

The ECL100, when purchased with a probe, comes calibrated to either a standard or customer specified offset and range. Refer to the supplied calibration record for specific calibration information

## Zeroing the Output

The sensor is factory calibrated to produce an output of zero volts when the probe is at the offset (nearest calibrated point) and the front panel Zero adjustment is at the center of its adjustment range. The front-panel Zero provides a ±0.5V DC shift to the output.

## Remote Zero

The output voltage can also be shifted by applying ±10V to the Remote Zero input. Positive voltage input shifts the output in a positive direction.

> Note: Noise/ripple on the Remote Zero voltage will appear in the analog output.

## Field Calibration

Adjustments accessed from the bottom of the enclosure allow for field calibration. Any change in these adjustments will void the NIST traceable calibration certificate shipped with the sensor.

> These instructions are for recalibration to the original range as shipped from the factory. Calibration to a significantly different range and/or offset will adversely affect the range LEDs operation, and temperature and resolution specifications.

A suitably precise method to accurately adjust the probe/target gap is required for calibration.

1. Position the front panel Zero adjustment to the mid point (25 turns in one direction, and 12 turns back will center the adjustment).
2. Set the probe/target gap to the minimum (offset).
3. Use the calibration Zero adjustment on the bottom of the device to set the output voltage to 0.00 VDC.
4. Position the probe/target gap to the mid-point of the range.
5. Use the calibration Gain (bottom of enclosure) to set the output to 5.00VDC.
6. Position the probe/target gap to maximum.
7. Use the calibration Coarse or Fine Linearity (enclosure bottom) to set the output voltage to 10.00VDC.
8. Repeat steps 2-7 until no further adjustments are needed (see hint below).

**Hint**: When adjusting linearity, adjust the output for the same but opposite amount of error voltage. For example, if the output is 9.950VDC adjust it to 10.050VDC. This will shorten the total number of iterations of steps 2-7. As the linearity adjustment approaches 10 volts, use Fine Linearity for finer control.