



Single Axis Inclometers

LSO Series



- Extreme High Resolution
- Vibration >35grms
- Responds to changes in Slope 0.000006"/ft
- High Accuracy Closed-loop (Servo)
- 1,500g Shock Capability

- Steel Processing & Casting
- Heavy Off-road Construction
- Structural Monitoring
- Train Automated Controls
- Rail Leveling & Grinding

LSOX Series



- Temperature Compensation Available
- Connector, Pin Terminals or Wired output types
- 0-5, ±5 VDC or 4-20 mA Outputs
- ROHS Compliant
- CE Certification on 0-5 V Connector

- High Precision Geotech
- Oil & Gas/Riser Tilt Monitoring
- Pavement Profiling Rigs
- Vehicle Wheel Alignment

LSR Series



- ± 1° to ± 90° Input Full Range
- 1.43" Dia x 1.60" Tall Size
- Withstands 20 grms Vibration
- Stackable for 2-axis Sensing
- Solder Pins Terminations

- Steel Mill Ladle Position
- Oil & Gas Well Bore Mapping
- Weapons Platform leveling
- Geophysical Monitoring
- Mobile Antenna Positioning

SMI Series



- Low cost with force-balanced technology
- Higher precision than most MEMS sensors
- Resolution of 3.5 μradians
- Connector or Pin Terminal output types
- 0-5, ±5 VDC or 4-20 mA output options
- ROHS compliant

- Track monitoring & testing
- Geotechnical monitoring
- Vehicle Wheel Alignment
- Educational Research

RMI Series



- Mounts horizontally or vertically
- Low cost with force-balanced technology
- Higher precision than most MEMS sensors
- Withstands up to 500g shock
- 0-5, ±5 VDC or 4-20 mA output options
- ROHS compliant

- Construction Equipment
- Antenna Positioning
- Industrial and Machining Equipment
- Cross Rail Management

LCF-100 Series



- Direct Bogie Mount
- Filtering Available 3-30 Hz Bandwidth
- Milli-g Bias & Scale Factor
- High level ±5Vdc Output
- -40°C to +80°C Temp Range

- Aircraft Flight Control
- Robot Vertical Reference
- Auto Mfging Suspension Install Testing
- Platform Orientation

LCF-300 Series



- Connector or Pin Terminal output types
- 0-5, ± 5 VDC or 4-20 mA outputs
- ±1 to ±90° Input Range
- -40°C to +80°C Temp Range
- High vibration resistance

- Vehicle Wheel Alignment
- Robotics
- Railroad MOW Equipment
- Structural Monitoring

Dual Axis Inclometers

LCF-196 Series



- Less > 0.02% Non-linearity
- Bias Temp Sens >50μg/°C
- Only 0.875" Dia Housing
- IP65 Sealed Housing
- 500g Shock Capability

- Strg Motion Data Logging
- Oil & Gas Well Logging
- Construction Monitoring
- Deviation Studies
- Test Platform Orientation

LCF-2330 Series



- ±1° to ±90° Input Full Range
- Micro Radian Resolution
- Available Internal Temp Sensor
- High level ± 5Vdc Output
- Low Impedance Output
- Fluid Damped

- 2-Axis Machine Tool Leveling
- Bridge Structural Monitoring
- Submersible Control Feedback
- Offshore Platform Stability
- Antenna Leveling & Orientation

LCF-2000 Series



- ±1° to ±90° Input Full Range
- Dual Axis
- Shock Survival of 1000g
- High level ± 5Vdc Output
- Fluid Damped for High Shock and Vibration Applications

- Antenna Leveling
- Weapons Platforms
- Barge & Offshore Platform Leveling & Control
- Data Buoy Measurement
- Missile Launchers

Triple Axis Inclometers

LCF-3000 Series



- ±1° to ±90° Input Full Range
- Tri-axis Applications
- Micro Radian Resolution
- High level ± 5Vdc Output
- Low Impedance Output
- Fluid Damped

- 3-Axis Machine Tool Leveling
- Bridge Structural Monitoring
- Antenna Leveling & Orientation
- Platform Orientation
- Geophysical Low Range Tilt Testing

Digital Inclometers

DXI-100/200 Series



- Digital Output
- Resolution 0.001°
- Mechanical Shock 1500g 1msec ½ sine
- Industry Standard RS485 & RS422 Outputs
- High Precision and Performance
- Low Noise

- Radar/Antenna Control
- Structural Monitoring
- Linear Acceleration/Deceleration Measuring
- Automatic Train Position Control
- Seismic Monitoring
- Track Leveling

Custom Applications



THE JEWELL INSTRUMENTS ENGINEERING TEAM PROVIDES THE FOLLOWING:

- Modifying or customizing an existing designed model series
- A new part number configured from existing model series part and subassemblies
- A new application-specific custom design requiring special features and specifications
- Customized sensor for harsh environments
- A first-time design solution requiring close interaction between Jewell's design engineering team and customer's engineering team
- Design qualifications to industrial, military, and aerospace standards including FAA DO-160
- Sensors designed to meet EMC requirements including lightning
- A customer proprietary sensors solution requiring non-disclosure agreement (NDA) between Jewell Instruments and our customer

CUSTOM CAPABILITIES

- 4-20mA Output signal with single-ended 24 Vac Input
- Internal temperature sensor and thermal modeling for the highest levels of accuracy over a wide temperature range
- Factory set zero biasing for non-horizontal measurements
- Solder terminals and flying leads in place of circular connector
- Custom inclinometer input ranges from +/-0.5 to +/-90.0 degrees available
- Custom accelerometer input ranges from +/- 0.017g to +/- 20,000g available
- Custom output impedance available
- Custom filtering to provide a bandwidth and response tailored to the application
- Custom mounting plates and mechanical assemblies

Features & Benefits

Applications

Performance Specs

Input Range (°):	±1.0	±3.0	±14.5	±30.0	±90.0
Full Range Output (FRO V± 1.0%)²:	±5.0	±5.0	±5.0	±5.0	±5.0
Non Linearity (%FRO², Max.):	0.05	0.05	0.02	0.02	0.05
Scale Factor (V/g, Nom), %:	286.5	95.5	20.0	10.0	5.0
Scale Factor Temp Sens (PPM, %/°C, Max):	400	300	100	60	60
Natural Frequency (Hz, Nom.⁴):	0.5	2.0	15.0	20	40.0
Bandwidth (-3db) (Hz, Nom.):	0.5	2.0	15.0	20.0	40.0
Transverse Axis Misalignment (° Max.):	±0.10	±0.15	±0.25	±0.50	±1.00
Output @ 0° Tilt (Bias) (V, Max), %/°C, m°/°C:	0.10	0.04	0.02	0.02	0.02
0° Output Temp Sensitivity (V/°C, Max.):	.005	.003	.001	.0005	.0003
Resolution and Threshold (μrad, Max.):	1.0	1.0	1.0	1.0	1.0

Electrical

Number of Axes	1	1	1	1	1	1	1	2	2	2	3	1 or 2
Input Voltage (Vdc)	±12 to ±18	+9 to +18, ±12 to ±18 or +20 to +30	±12 to ±18	+15 to +30, ±12 to ±18 or ±12 to ±28	+15 to +30, ±12 to ±18 or +12 to +28	±12 to ±18	+9 to +18, ±12 to ±18 or +20 to +30	±12 to ±19	±12 to ±18	±12 to ±18	±12 to ±18	±10 to ±30
Input Current (mA, Nom.)	±15	40	±15	40 or 55	40 or 55	±15	40	±15	±30	±30	100	DXI-100 ±80 mA/DXI-200 ±100 mA
Output Impedance (Ohms, Nom.)	100	1	15000	10	10	100	1	100	100	100	100	-
Noise (Vrms, μArms, Max.)	0.0020	0.002	0.0020	0.002 or 0.006	0.002 or 0.006	0.0020	0.002	0.002 0.001 0.001	0.0020	0.0020	0.0020	0.005

Environmental

Operating Temperature Range	-18°C to +71°C	-40°C to +80°C	-18°C to +71°C	-55°C to +85°C	-55°C to +85°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +70°C
Survival Temperature Range	-40°C to +71°C	-60°C to +90°C	-60°C to +90°C	-60°C to +90°C	-60°C to +90°C	-60°C to +90°C	-60°C to +90°C	-60°C to +90°C	-60°C to +90°C	-60°C to +90°C	-60°C to +90°C	-40°C to +70°C
Vibration	20 g	-	20 g	-	-	20 g	-	10 g	20 g	20 g	20 g	20 g
Shock	1500g, 0.5 msec, 1/2 sine	1500g, 0.5 msec, 1/2 sine	1500g, 0.5 msec, 1/2 sine	500g, 1 msec, 1/2 sine	500g, 1 msec, ½ sine	1000g, 1 msec, 1/2 sine	1500g, 0.5 msec, ½ sine	500g, 1 msec, 1/2 sine	1000g, 1 msec, 1/2 sine	1000g, 0.001 msec, 1/2 sine	1000g, 1msec, 1/2 sine	1500g, 1msec, 1/2 sine
Seal	MIL-STD-202, Method 112	IP66	MIL-STD-202, Method 112	IP65	IP65	MIL-STD-202, Method 112	IP65	MIL-STD-202, Method 112	MIL-STD-202, Method 112	MIL-STD-202, Method 112	MIL-STD-202, Mtd 112	MIL-STD-202, Mtd 112

Mechanical

Weight	13.0 oz.	13 oz.	4.0 oz.	4.0 oz.	4.2 oz.	4.0 oz.	8.1 oz.	11 oz.	8.0 oz.	16 oz.	16.0 oz.	DXI-100 8.0 oz./DXI-200 10.0 oz.
Dimensions	1.60" W x 2.94" L x 1.70" H	1.60" W x 3.64" L x 1.68" H	1.43" Dia. x 1.60" H	1.55" W x 3.10" L x 2.04" H	2.27" Dia. x 1.72" H	1.50" W x 3.10" L x 1.50" H	1.38" W x 3.10" L x 2.18" H	0.875" Dia x 9.420" Lg. Tube	1.61" W x 3.609" L x 1.83" H	2.88" W x 3.75" L x 2.75" H	2.88" W x 3.75" L x 2.75" H	1.62" W x 3.609" L x 1.83" H
Custom Ability	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: 1 - Other ranges available upon request 2 - Full range is defined as "from negative full input angle to positive full input angle." The inclinometer output is proportional to the sine of the tilt angle., 3 - Referenced to theoretical sine value independent of misalignment., 4 - Output phase angle = -90°