

## Input Ranges From $\pm 3^\circ$ to $\pm 90^\circ$ Rugged, High Precision, Low Cost, Single-Ended Power Input Inclinometer



The Jewell **Emerald Series** inclinometer is a low cost, high precision inclinometer designed with higher accuracy than comparable MEMS devices. Applications include robotics, construction equipment, industrial measurement and control, and precision machining.

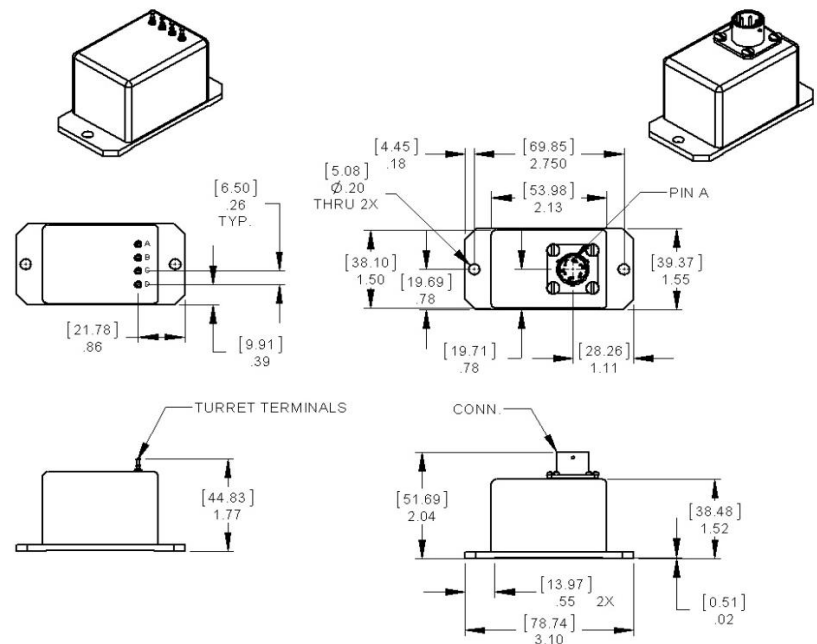
### Features

- Extremely Rugged
- Lower Cost than traditional Force-Balanced Inclinometers
- High Accuracy
- Greater Precision than MEMS Technologies
- 0-5V DC Output
- Single-Ended Power Input

### Applications

- Aerospace
- Military
- Robotics
- Academic Research
- Geotechnical Monitoring
- Track Monitoring and Testing
- Vehicle Wheel Alignment

### Outline Diagram



Dimensions in inches [mm]

### Pin Out (Options: C-connector, P-Pin)

| Pin Option |                     | Connector Option |                     |
|------------|---------------------|------------------|---------------------|
| A          | Input Power         | A                | Input Power         |
| B          | Power/Signal Common | B                | Power/Signal Common |
| C          | N/C                 | C                | N/C                 |
| D          | Signal              | D                | Signal              |
|            |                     | E                | N/C                 |
|            |                     | F                | N/C                 |

## Performance Specifications

### STATIC/DYNAMIC

|   |                |        |        |        |        |        |
|---|----------------|--------|--------|--------|--------|--------|
| Input Range, °:   | ±3             | ±14.5  | ±30    | ±45    | ±60    | ±90    |
| Full Range Output (FRO -Note 1) VDC ±0.5%:              | 0-5            | 0-5    | 0-5    | 0-5    | 0-5    | 0-5    |
| Nonlinearity (Note 2) % FRO maximum:                    | 0.05           | 0.02   | 0.02   | 0.02   | 0.4    | 0.05   |
| Scale Factor, Volts/g, nominal:                         | 47.8           | 10.0   | 5.0    | 3.5    | 2.9    | 2.5    |
| Scale Factor Temp. Sensitivity (SFTS), PPM /°C maximum: | 100            | 100    | 100    | 100    | 100    | 100    |
| Bandwidth (-3 dB), Hz nominal:                          | 5.0            | 5.0    | 5.0    | 5.0    | 5.0    | 5.0    |
| Output Axis Misalignment, ° maximum:                    | 0.25           | 0.50   | 0.50   | 0.50   | 0.50   | 0.50   |
| Pendulous Axis Misalignment, ° maximum:                 | 0.25           | 0.50   | 0.50   | 0.50   | 0.50   | 0.50   |
| 0° Output, Volts range:                                 | +2.45 to +2.55 |        |        |        |        |        |
| 0° Output Temp. Sensitivity, Volts /°C maximum:         | 0.0036         | 0.0010 | 0.0007 | 0.0005 | 0.0005 | 0.0005 |
| Resolution and Threshold, μradians maximum:             | 1              | 1      | 1      | 1      | 1      | 1      |

### ELECTRICAL

|                              |            |
|------------------------------|------------|
| Number of Axes:              | 1          |
| Input Voltage Range, (VDC):  | +15 to +30 |
| Input Current, mA, max:      | 40         |
| Output Impedance, Ohms, nom: | 10         |
| Noise, Vrms, maximum:        | 0.002      |

### ENCLOSURE

|       |      |
|-------|------|
| Seal: | IP65 |
|-------|------|

### ENVIRONMENTAL

|                       |                      |
|-----------------------|----------------------|
| Operating Temp Range: | -55°C to +85°C       |
| Storage Temp Range:   | -60°C to +90°C       |
| Shock:                | 500g, 1 msec, ½ sine |

Notes: Note 1: Full Range is defined "from negative full input angle to positive full input angle."  
 Note 2: Nonlinearity is specified as deviation of output referenced to theoretical sine function value, independent of misalignment.  
 Note 3: Full Resolution is achieved with noise reduction techniques.

## Custom Capabilities

- ±15V bipolar input option available
- Pigtail and Connector alternative options available
- Custom ranges and bandwidths available

## How to Order

| Connector Version |              | Pin Version |              |
|-------------------|--------------|-------------|--------------|
| Model #           | Part #       | Model #     | Part #       |
| SMIC-S-3          | 02550303-001 | SMIP-S-3    | 02550304-001 |
| SMIC-S-14.5       | 02550303-002 | SMIP-S-14.5 | 02550304-002 |
| SMIC-S-30         | 02550303-003 | SMIP-S-30   | 02550304-003 |
| SMIC-S-45         | 02550303-004 | SMIP-S-45   | 02550304-004 |
| SMIC-S-60         | 02550303-005 | SMIP-S-60   | 02550304-005 |
| SMIC-S-90         | 02550303-006 | SMIP-S-90   | 02550304-006 |