

# JMI-100/200-D MEMS Inclinometer Series

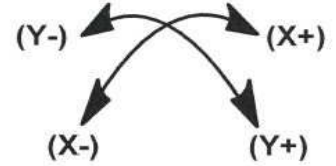
## ±5VDC Output



Making Sense out of Motion...

Jewell has a 40+ year history of providing precision force-balanced inclinometers and is pleased to provide MEMS parts with the same attention to detail that our customers demand.

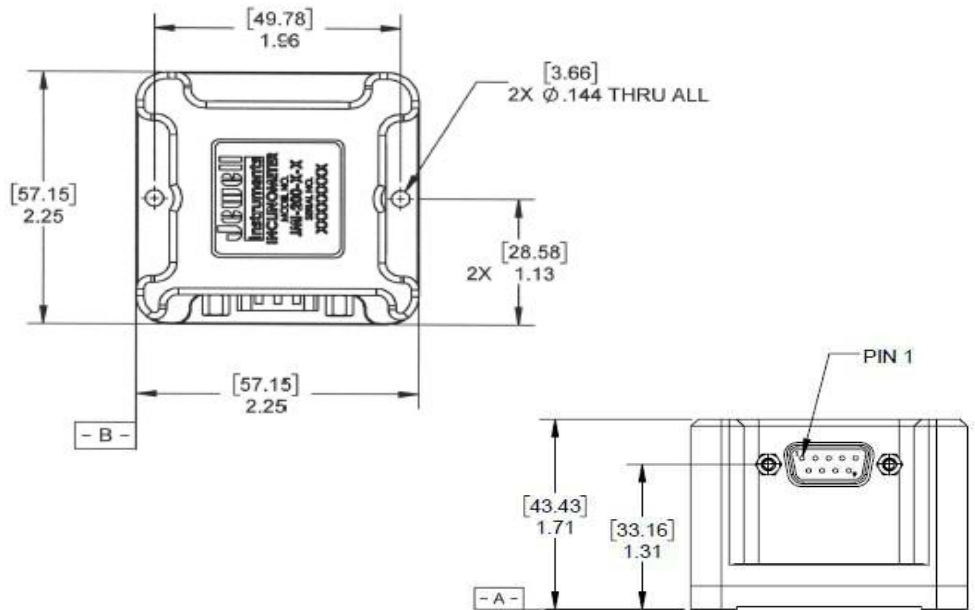
The JMI-100/200 series is available in single (JMI-100) and dual (JMI-200) axis configurations. This presents a robust and rugged design for industrial use, but with the benefit of low-cost MEMS technology.



### Features

- Robust and Rugged Enclosure
- Single and Dual Axis Models Available
- Low-Cost MEMS Technology
- RoHS Compliant
- Filtering Available
- Dual Power Input
- ±5 VDC Output
- Temperature Sensor Option Available
- IP65 Seal

### Outline Diagram



NOTES:

1. UNITS:  $\frac{[mm]}{IN}$
2. UNIT IS AVAILABLE IN TWO VERSIONS: SINGLE AXIS (X AXIS), DUAL AXIS (X & Y AXIS). DUAL AXIS SHOWN HERE
3. DATUM  $-A-$  AND  $-B-$  ARE DEFINED AS REFERENCE SURFACES.

### Applications

- Industrial Automation & Control
- Solar Tracking
- Construction & Agricultural Equipment
- Mobile Cranes
- Platform Leveling/Positioning
- Mobile Radar Equipment
- Railway Track Alignment & Maintenance

### Pin Out

Pin #	Function
1	+Vin
2	Pwr Gnd
3	-Vin
4	X Out
5	Y Out
6	N/C
7	Sig Rtn
8	Temp Out
9	N/C

Jewell Instruments LLC, 850 Perimeter Road, Manchester, NH 03103  
 sales@jewellinstruments.com • www.jewellinstruments.com • Tel (800) 227-5955

# JMI-100/200-D MEMS Inclinometer Series

## ±5VDC Output

### Performance Specifications

#### STATIC/DYNAMIC

Measurement Range <sup>1</sup> (°)	±14.5	±30	±90
Output Voltage Range (VDC)	±5.00	±5.00	±5.00
Scale Factor Tolerance (%)	±1	±1	±1
Scale Factor Temp. Coefficient (PPM/°C max)	150	150	150
0° Output (Volts max)	±0.03	±0.03	±0.03
0° Output Temp. Sensitivity (V/°C max)	±0.004	±0.004	±0.004
Transverse Axis Misalignment (° max)	±0.5	±0.5	±0.5
Resolution (° max)	0.002	0.002	0.004
Threshold (° max)	0.002	0.002	0.002
Non-linearity (% FRO max)	0.05	0.05	0.05
Nonrepeatability, Hysteresis (° max)	0.004	0.004	0.004
Bandwidth (Hz nom) (-3 dB)	5	5	5
Warm Up Time (Seconds max)	0.5	0.5	0.5
Voltage to Radian conversion <sup>2</sup>	ASIN(<voltage>/20)	ASIN(<voltage>/10)	ASIN(<voltage>/5)

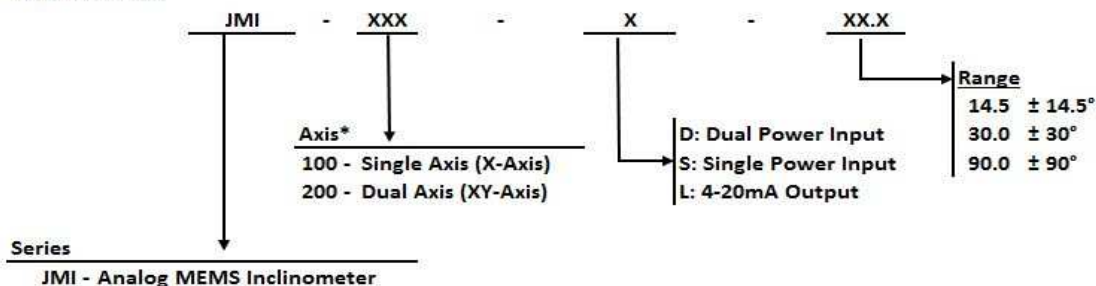
#### ELECTRICAL AND ENVIRONMENTAL

Number of Axes	1 or 2
Input Voltage Range (VDC)	±12 to ±18
Input Current (mA max)	6 (1-axis), 12 (2-axis)
Output Noise (vrms max)	0.005
Output Impedance (Ohms nom)	1
Operating Temp. Range (°C)	-40 to +85
Storage Temp. Range (°C)	-40 to +95
Shock	100 g, 0.011 sec, ½ sine
Weight (grams)	165 (1 axis), 170 (2 axes)
Seal	IP65

Notes: 1 - Custom ranges available on request.  
2 - Does not take into account any sources of error.

\*Specifications subject to change without notice on account of continued product development.

#### How To Order:



Example: JMI-100-L-14.5 = JMI series, single axis, 4-20mA Output, ±14.5° range

\*Call factory for customized axis configurations

#### Single Axis Part Numbers

JMI-100-D-14.5	02550375-125
JMI-100-D-30	02550375-126
JMI-100-D-90	02550375-129

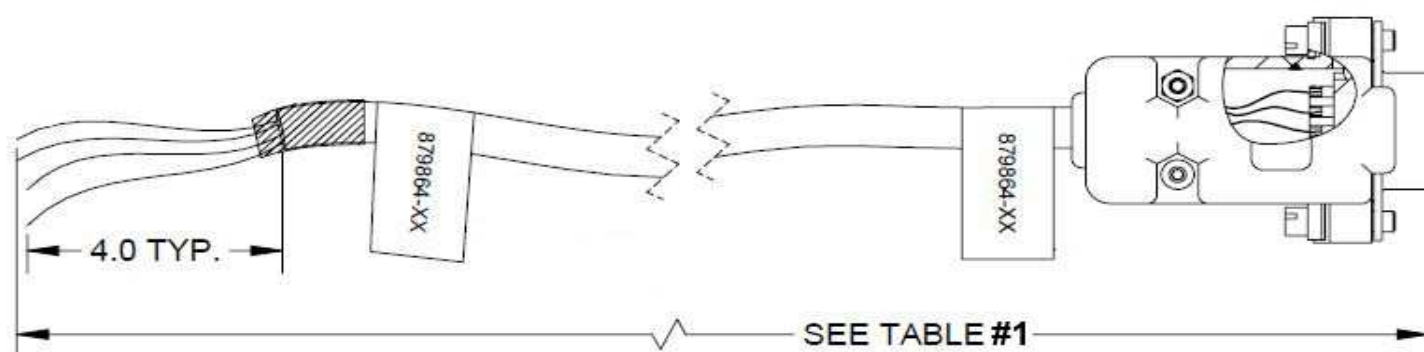
#### Dual Axis Part Numbers

JMI-200-D-14.5	02550375-225
JMI-200-D-30	02550375-226
JMI-200-D-90	02550375-229

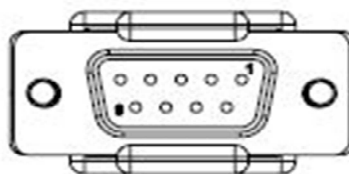
Jewell Instruments LLC, 850 Perimeter Road, Manchester, NH 03103  
sales@jewellinstruments.com • www.jewellinstruments.com • Tel (800) 227-5955

**CABLE ASSEMBLY (PN 879864-XX)**

DB9 FEMALE CONNECTOR



Dimensions in feet [m]



CONNECTOR PINOUT		
DB9 PIN	FLY LEADS	FUNCTION
1	RED	+PWR
2	BLACK	PWR RTN
3	VIOLET	N/C
4	GREEN	X OUT
5	ORANGE	Y OUT
6	YELLOW	N/C
7	BROWN	SIG RTN
8	BLUE	TEMP OUT
9	WHITE	N/C

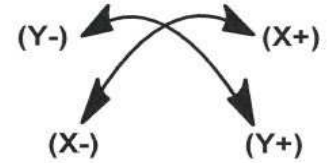
Table #1	
Cable Configuration	
Part #	Length
879864-10	[10m] 32.8 feet
879864-XX	Other lengths available (specify on order)

# JMI-100/200-S MEMS Inclinometer Series

## 0-5Vdc Output

Jewell has a 40+ year history of providing precision force-balanced inclinometers and is pleased to provide MEMS parts with the same attention to detail that our customers demand.

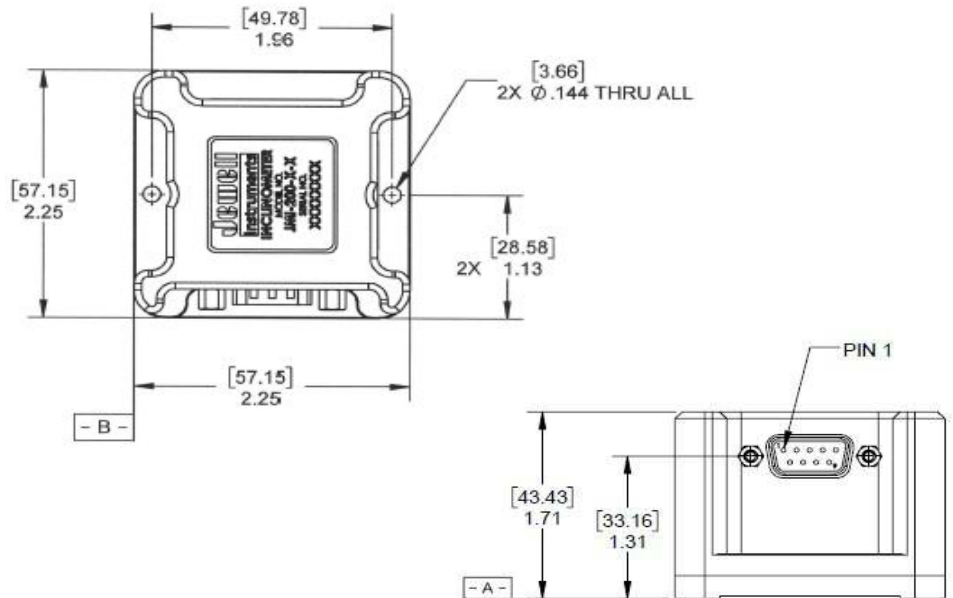
The JMI-100/200 series is available in single (JMI-100) and dual (JMI-200) axis configurations. This presents a robust and rugged design for industrial use, but with the



### Features

- $\pm 14.5^\circ$ ,  $\pm 30^\circ$  and  $\pm 90^\circ$  ranges
- Robust and Rugged Enclosure
- Single and Dual Axis Models Available
- Low-Cost MEMS Technology
- RoHS Compliant
- Filtering Available
- Single Power Input
- 0-5 VDC Output
- Temperature Sensor Option Available
- IP65 Seal

### Outline Diagram



NOTES:

1. UNITS:  $\frac{[mm]}{IN}$
2. UNIT IS AVAILABLE IN TWO VERSIONS: SINGLE AXIS (X AXIS), DUAL AXIS (X & Y AXIS). DUAL AXIS SHOWN HERE
3. DATUM  $[-A-]$  AND  $[-B-]$  ARE DEFINED AS REFERENCE SURFACES.

### Applications

- Industrial Automation & Control
- Construction & Agricultural Equipment
- Solar Tracking
- Mobile Cranes
- Platform Leveling/Positioning
- Mobile Radar Equipment
- Railway Track Alignment & Maintenance

### Pin Out

Pin #	Function
1	+Vin
2	Pwr Gnd
3	N/C
4	X Out
5	Y Out
6	N/C
7	Sig Rtn
8	Temp Out
9	N/C

# JMI-100/200-S MEMS Inclinometer Series

## 0-5Vdc Output

### Performance Specifications

#### STATIC/DYNAMIC

Measurement Range <sup>1</sup> (°)	±14.5	±30	±90
Output Voltage Range (VDC)	0-5	0-5	0-5
Scale Factor Tolerance (%)	±1	±1	±1
Scale Factor Temp. Coefficient (PPM/°C max)	150	150	150
0° Output Error (Volts max)	±0.03	±0.03	±0.03
0° Output Temp. Sensitivity (V/°C max)	±0.004	±0.004	±0.004
Transverse Axis Misalignment (° max)	±0.5	±0.5	±0.5
Resolution (° max)	0.002	0.002	0.004
Threshold (° max)	0.002	0.002	0.002
Non-linearity (% FRO max)	0.05	0.05	0.05
Nonrepeatability, Hysteresis (° max)	0.004	0.004	0.004
Bandwidth (Hz nom) (-3 dB)	5	5	5
Warm Up Time (Seconds max)	0.5	0.5	0.5
Voltage to Radian conversion <sup>2</sup>	ASIN((<voltage> - 2.5)/10)	ASIN((<voltage> - 2.5)/5)	ASIN((<voltage> - 2.5)/2.5)

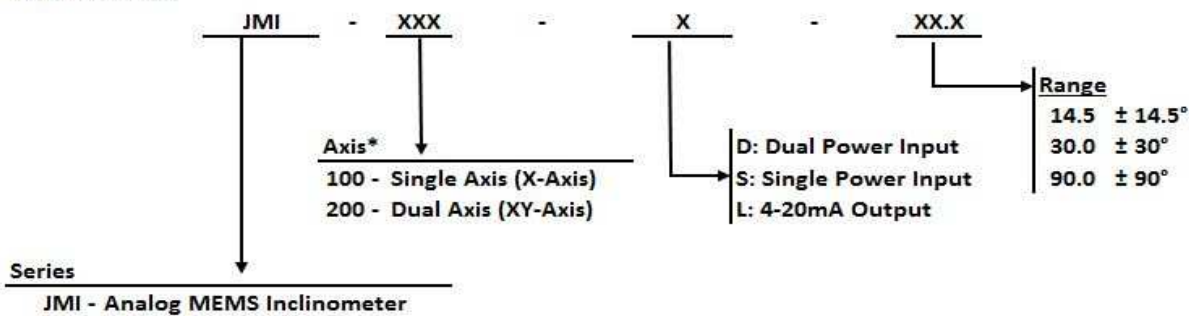
#### ELECTRICAL AND ENVIRONMENTAL

Number of Axes	1 or 2
Input Voltage Range (VDC)	12 to 30
Input Current (mA max)	7 (1-axis), 14 (2-axis)
Output Noise (vrms max)	0.005
Operating Temp. Range (°C)	-40 to +85
Storage Temp. Range (°C)	-40 to +95
Shock	100 g, 0.011 sec, ½ sine
Weight (grams)	165 (1 axis), 170 (2 axes)
Seal	IP65

Notes: 1 - Custom ranges available on request.  
2 - Does not take into account any sources of error.

\*Specifications subject to change without notice on account of continued product development.

#### How To Order:



Example: JMI-100-L-14.5 = JMI series, single axis, 4-20mA Output, ±14.5° range

\*Call factory for customized axis configurations

#### Single Axis Part Numbers

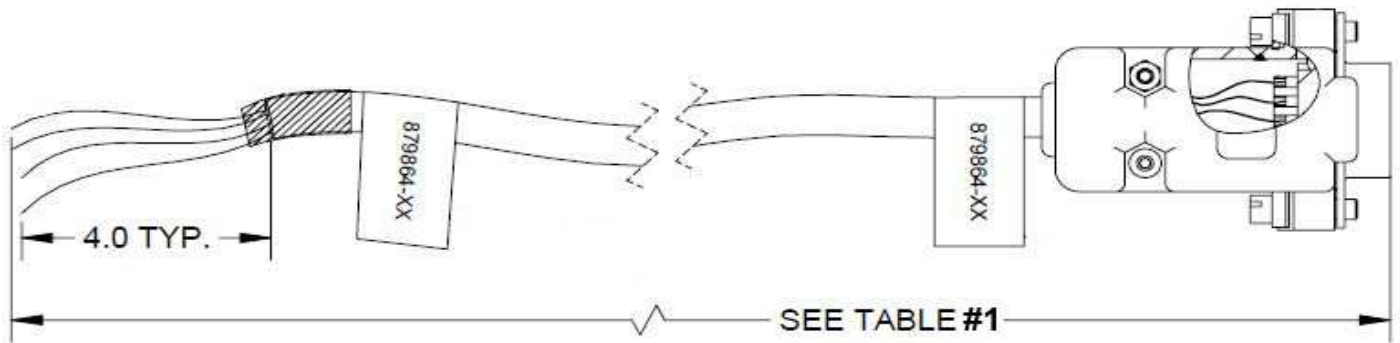
JMI-100-S-14.5	02550375-115
JMI-100-S-30	02550375-116
JMI-100-S-90	02550375-119

#### Dual Axis Part Numbers

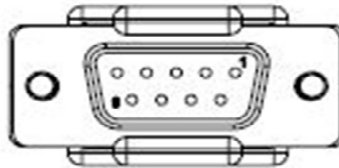
JMI-200-S-14.5	02550375-215
JMI-200-S-30	02550375-216
JMI-200-S-90	02550375-219

**CABLE ASSEMBLY (PN 879864-XX)**

DB9 FEMALE CONNECTOR



Dimensions in feet [m]



CONNECTOR PINOUT		
DB9 PIN	FLY LEADS	FUNCTION
1	RED	+PWR
2	BLACK	PWR RTN
3	VIOLET	N/C
4	GREEN	X OUT
5	ORANGE	Y OUT
6	YELLOW	N/C
7	BROWN	SIG RTN
8	BLUE	TEMP OUT
9	WHITE	N/C

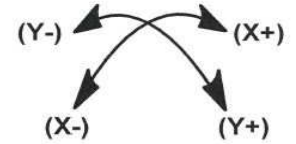
Table #1	
Cable Configuration	
Part #	Length
879864-10	[10m] 32.8 feet
879864-XX	Other lengths available (specify on order)

# JMI-100/200-L MEMS Inclinometer Series

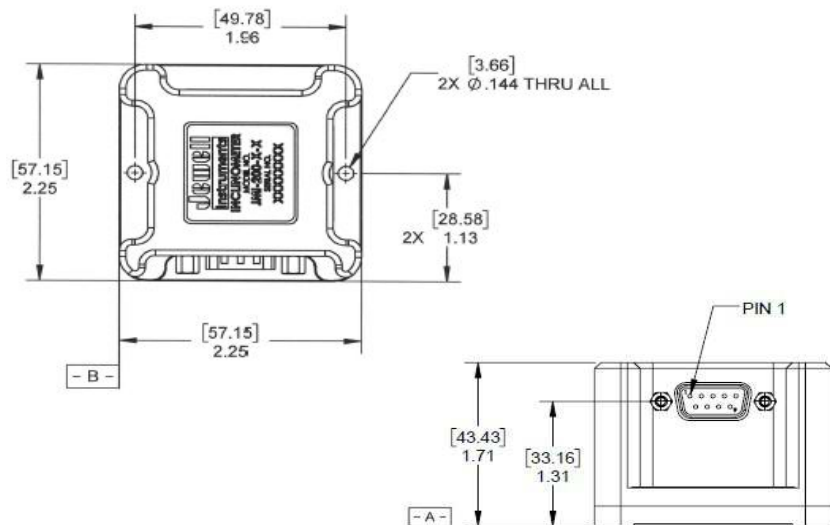
## 4-20mA Output

Jewell has a 40+ year history of providing precision force-balanced inclinometers and is pleased to provide MEMS parts with the same attention to detail that our customers demand.

The JMI-100/200 series is available in single (JMI-100) and dual (JMI-200) axis configurations. This presents a robust and rugged design for industrial use, but with the benefit of low-cost MEMS technology.



### Outline Diagram



NOTES:

1. UNITS:  $\frac{[mm]}{IN}$
2. UNIT IS AVAILABLE IN TWO VERSIONS; SINGLE AXIS (X AXIS), DUAL AXIS (X & Y AXIS). DUAL AXIS SHOWN HERE
3. DATUM  $-A-$  AND  $-B-$  ARE DEFINED AS REFERENCE SURFACES.

### Pin Out

Pin #	Function
1	+Vin
2	Pwr Gnd
3	N/C
4	X Out
5	Y Out
6	N/C
7	Sig Rtn
8	Temp Out
9	N/C

### Features

- $\pm 14.5^\circ$ ,  $\pm 30^\circ$  and  $\pm 90^\circ$  ranges
- Robust and Rugged Enclosure
- Single and Dual Axis Models Available
- Low-Cost MEMS Technology
- RoHS Compliant
- Filtering Available
- Single Power Input
- 4-20 mA Output
- Temperature Sensor Option Available
- IP65 Seal

### Applications

- Industrial Automation & Control
- Construction & Agricultural Equipment
- Solar Tracking
- Mobile Cranes
- Platform Leveling/Positioning
- Mobile Radar Equipment
- Railway Track Alignment & Maintenance

### Performance Specifications

#### STATIC/DYNAMIC

Measurement Range <sup>1</sup> (°)	±14.5	±30	±90
Output Current Range (mA)	4-20	4-20	4-20
Scale Factor Tolerance (%)	±1	±1	±1
Scale Factor Temp. Coefficient (PPM/°C max)	150	150	150
0° Output (mA)	12 ±0.3	12 ±0.3	12 ±0.3
0° Output Temp. Sensitivity (mA/°C max)	±0.004	±0.004	±0.004
Transverse Axis Misalignment (° max)	±0.5	±0.5	±0.5
Resolution (° max)	0.002	0.002	0.004
Threshold (° max)	0.002	0.002	0.002
Non-linearity (% FRO max)	0.05	0.05	0.05
Nonrepeatability, Hysteresis (° max)	0.004	0.004	0.004
Bandwidth (Hz nom) (-3 dB)	5	5	5
Warm Up Time (Seconds max)	0.5	0.5	0.5
Current to Radian conversion <sup>2</sup>	$\arcsin((\text{output} - 12\text{mA}) / 32\text{mA})$	$\arcsin((\text{output} - 12\text{mA}) / 16\text{mA})$	$\arcsin((\text{output} - 12\text{mA}) / 8\text{mA})$

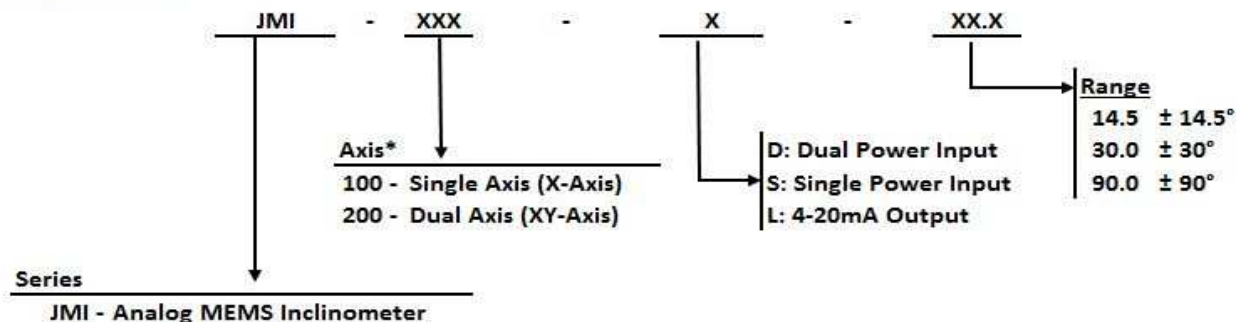
#### ELECTRICAL AND ENVIRONMENTAL

Number of Axes	1 or 2
Input Voltage Range (VDC)	12 to 30
Input Current (mA max)	28 (1-axis), 56 (2-axis)
Output Noise (vrms max)	0.01
Operating Temp. Range (°C)	-40 to +85
Storage Temp. Range (°C)	-40 to +95
Shock	100 g, 0.011 sec, ½ sine
Weight (grams)	165 (1 axis), 170 (2 axes)
Seal	IP65

Notes: 1 - Custom ranges available on request.  
2 - Does not take into account any sources of error.

\*Specifications subject to change without notice on account of continued product development.

#### How To Order:



Example: JMI-100-L-14.5 = JMI series, single axis, 4-20mA Output, ±14.5° range

\*Call factory for customized axis configurations

#### Single Axis Part Numbers

JMI-100-L-14.5	02550375-135
JMI-100-L-30	02550375-136
JMI-100-L-90	02550375-139

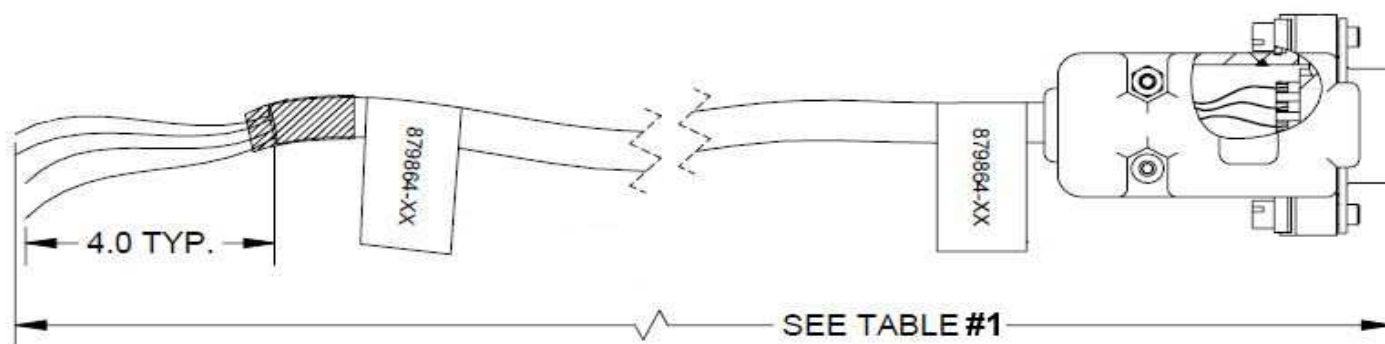
#### Dual Axis Part Numbers

JMI-200-L-14.5	02550375-235
JMI-200-L-30	02550375-236
JMI-200-L-90	02550375-239

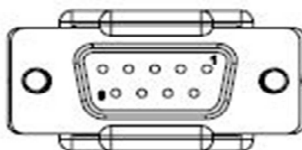


**CABLE ASSEMBLY (PN 879864-XX)**

DB9 FEMALE CONNECTOR



Dimensions in feet [m]



CONNECTOR PINOUT		
DB9 PIN	FLY LEADS	FUNCTION
1	RED	+PWR
2	BLACK	PWR RTN
3	VIOLET	N/C
4	GREEN	X OUT
5	ORANGE	Y OUT
6	YELLOW	N/C
7	BROWN	SIG RTN
8	BLUE	TEMP OUT
9	WHITE	N/C

Table #1	
Cable Configuration	
Part #	Length
879864-10	[10m] 32.8 feet
879864-XX	Other lengths available (specify on order)