



## P-SERIES INCLINOMETER

### SPECIFICATIONS

- Single or Dual axis inclinometer
- Measurement range  $\pm 5^\circ$ ;  $\pm 15^\circ$  or  $\pm 45^\circ$
- High accuracy
- Digital and analogue output signal

The P-Series of conductive inclinometers offers modern technology in an environmentally protected and robust aluminium housing in IP class 65. The inclinometer achieves high accuracy over a wide temperature range. All P-type inclinometers are microprocessor controlled transducers capable of producing a linearized RS-232 digital and analog voltage  $\pm 1.5V$  or current output 4...20 mA signal. The inclinometers are an ideal choice for a variety of industrial, automotive and aerospace applications.

### FEATURES

- Measurement range up to  $\pm 45^\circ$
- High resolution
- Robust metal housing
- High accuracy
- Rugged M9 female connector
- Programmable zero point, baud rate
- Easy mounting

### APPLICATIONS

- Building control
- Road construction machines
- Weighing systems
- Mobile and stationary cranes
- Hydraulic leveling
- Platform leveling
- Drilling machines

**PERFORMANCE SPECIFICATIONS**

	Conditions	Min	Type	Max	Unit
Measurement range		-5, -15, -45		+5, +15, +45	°
Resolution		0.001		0.005	°
Accuracy, digital output	Ta = +25°C		0.02, 0.03, 0.4		°
Accuracy, analogue output	Ta = +25°C		0.05, 0.06, 0.6		°
Accuracy, digital output	Ta = -25°C to +85°C		0.2, 0.4, 0.7		°
Accuracy, analogue output	Ta = -25°C to +85°C		0.25, 0.5, 0.8		°
Noise RMS			0.002		°
Power supply		+6.5		+24	VDC
Current consumption	Sensor specific		30	40	mA
Operation temperature range		-25		+85	°C
Storage temperature range		-40		+85	°C
Transmission rate	RS 232 interface		1		Hz
Baud rate, programmable	RS 232 interface	2.4		9.6	kB
Current output (1)	NS-xx/PI	20		4	mA
Voltage output (2)	NS-xx/P	-1.5		+1.5	V
Weight	Depending on kind of sensor	210		340	g
Dimensions	Single axis unit, W x D x H		90 x 40 x 45.5		mm
Dimensions	Dual axis unit, W x D x H		90 x 60 x 45.5		mm

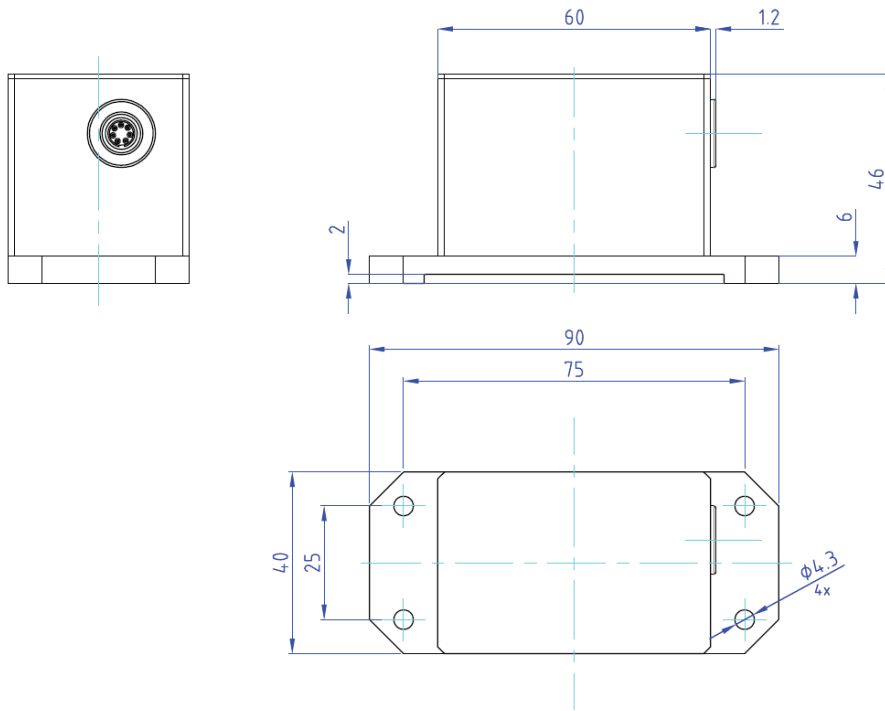
(1) Standard impedance  $Z_a < 160 \text{ Ohm}$ , special impedance  $Z_a < 260 \text{ Ohm}$  on request

(2) Ratiometric to GNDx

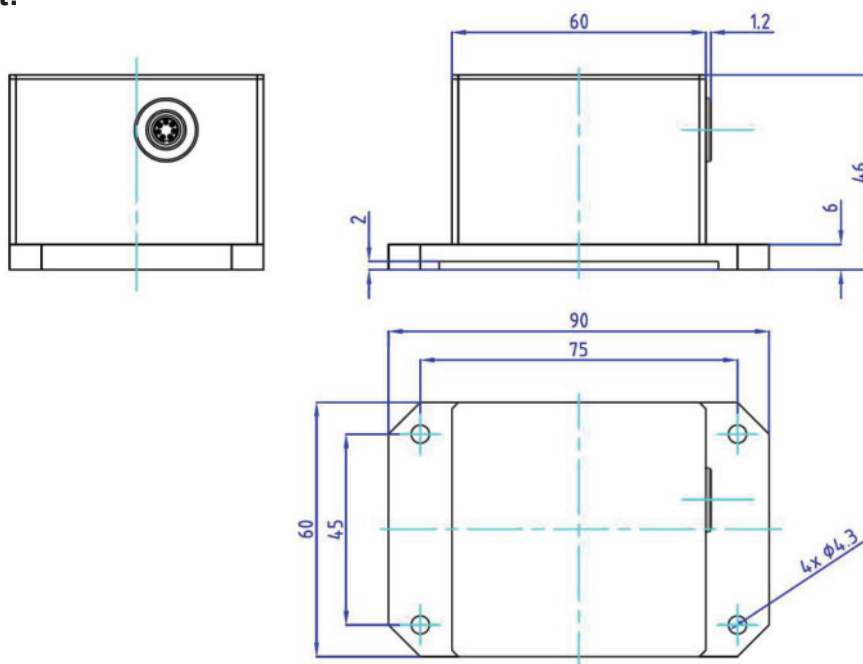
## P-SERIES INCLINOMETER

### DIMENSIONS [MM]

#### Single axis unit:



#### Dual axis unit:

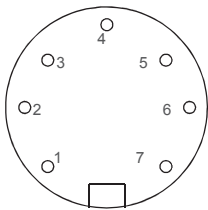


## P-SERIES INCLINOMETER

### PINNING – SINGLE AXIS UNIT WITH RS 232 INTERFACE AND CURRENT OUTPUT

Pin	Name	Description	Type	Color schema <sup>(1)</sup>
1	Vcc	power supply +6.5 to +24VDC	supply	white
2	GND	power supply ground, RS 232 ground	supply	brown
3	Earth	earth	supply	green
4	GNDx	signal ground for current output	supply	yellow
5	Out x	x-axis current output 4 to 20mA	output	grey
6	RxD	input digital signal RS232	input	pink
7	TxD	output digital signal RS 232	output	blue

(1) By using a Measurement Specialties cable



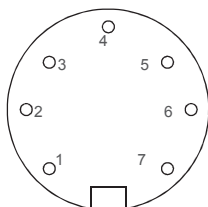
Front view of housing connector inclinometer

For more details please use the product specification / application note / instruction manual.

### PINNING – SINGLE AXIS UNIT WITH RS 232 INTERFACE AND VOLTAGE OUTPUT

Pin	Name	Description	Type	Color schema <sup>(1)</sup>
1	Vcc	power supply +6.5 to +24VDC	supply	white
2	GND	power supply ground, RS 232 ground	supply	brown
3	Earth	earth	supply	green
4	GNDx	signal ground for voltage output	supply	yellow
5	Out x	x-axis voltage output +/-1.5V	output	grey
6	RxD	input digital signal RS232	input	pink
7	TxD	output digital signal RS 232	output	blue

(1) By using a Measurement Specialties cable



Front view of housing connector inclinometer

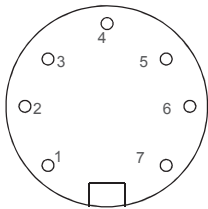
For more details please use the product specification / application note / instruction manual.

## P-SERIES INCLINOMETER

### PINNING – DUAL AXIS UNIT WITH RS 232 INTERFACE

Pin	Name	Description	Type	Color schema <sup>(1)</sup>
1	Vcc	power supply +6.5...+24VDC	supply	white
2	GND	power supply ground, RS 232 ground	supply	brown
3	Earth	earth	supply	green
4	n.c.	n.c.	-	yellow
5	n.c.	n.c.	-	grey
6	RxD	input digital signal RS232	input	pink
7	TxD	output digital signal RS 232	output	blue

(1) By using a Measurement Specialties cable



Front view of housing connector inclinometer

For more details please use the product specification / application note / instruction manual.

### DESCRIPTION DIGITAL RS 232 INTERFACE

	Single axis unit	Dual axis unit
<b>Baud rate:</b>	2400(*)/9600 baud	2400(*)/9600 baud
<b>Format:</b>	ASCII, 8 data bits, 1 stop bit, no parity	ASCII, 8 data bits, 1 stop bit, no parity
<b>String length:</b>	9 byte	22 byte
<b>Layout:</b>	< D <sub>0</sub> ,D <sub>1</sub> ,D <sub>2</sub> ,D <sub>3</sub> ,D <sub>4</sub> ,D <sub>5</sub> ,D <sub>6</sub> ,D <sub>7</sub> ,D <sub>8</sub> >	< D <sub>0</sub> ... D <sub>21</sub> >
	D <sub>0</sub> = sign	D <sub>0</sub> ... D <sub>8</sub> = "X"; "=" + (-); "xx.xxx"
	D <sub>1</sub> ...D <sub>6</sub> = angle (XX.XXX)	D <sub>2</sub> = sign (+ or -)
	D <sub>3</sub> = point	D <sub>5</sub> = point
	D <sub>7</sub> =<CR>	D <sub>9</sub> =<CR>
	D <sub>8</sub> =<LF>	D <sub>10</sub> =<LF>
		D <sub>11</sub> ... D <sub>21</sub> = "Y"; "=" + (-); "yy.yyy"
		D <sub>13</sub> = sign (+ or -)
		D <sub>16</sub> = point
		D <sub>20</sub> =<CR>
		D <sub>21</sub> =<LF>

(\*) default value

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### ORDERING INFORMATION

PART NUMBERING	UNIT	SHORT DESCRIPTION
<b>Single axis unit</b>		
G-NSP-001	NS-5/P	single axis, +/-5° angle, Vcc +6.5 to 24VDC, output +/-1.5V,RS232
G-NSPI-001	NS-5/PI	single axis, +/-5° angle, Vc c +6.5 to 24VDC, output 4 to 20 mA,RS232
G-NSP-002	NS-15/P	single axis, +/-15° angle, Vcc +6.5 to 24VDC, output +/-1.5V,RS232
G-NSPI-002	NS-15/PI	single axis, +/-15° angle, Vc c +6.5 to 24VDC, output 4 to 20 mA,RS232
G-NSP-005	NS-45/P	single axis, +/-45° angle, Vcc +6.5 to 24VDC, output +/-1.5V,RS232
G-NSPI-006	NS-45/PI	single axis, +/-45° angle, Vc c +6.5 to 24VDC, output 4 to 20 mA,RS232
<b>Dual axis unit</b>		
G-NSP2-001	NS-5/P2	dual axis, +/-5° angle, Vcc +6.5 to 24VDC, output RS232
G-NSP2-003	NS-15/P2	dual axis, +/-15° angle, Vcc +6.5 to 24VDC, output RS232
G-NSP2-006	NS-45/P2	dual axis, +/-45° angle, Vcc +6.5 to 24VDC, output RS232
<b>Accessories</b>		
G-NSMIS-001	connection	connector, straight, Submin.712-series
G-NSMIS-015	connection	connector, angle 90°, Subm in.712-series
G-NSMIS-002	connection	2 m cable, straight connector Submin.702-series
G-NSMIS-003	connection	2 m cable, angle 90°conne ctor Submin.702-series

Other cable lenght on request



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