



Rethinking Sensing Technology

Displacement Sensor Integration (Potentiometer technology) with BeanDevice® AN-V

August 2020 - Shimon Abadi V1.0
Technical Support Engineer
tech-support@beanair.com

Displacement Sensor Design and specifications

Beanair is proposing two different design:

*Sensor with spring return
(integrated inside the sensor
body for better
waterproofness)*

Sensor with ball joint





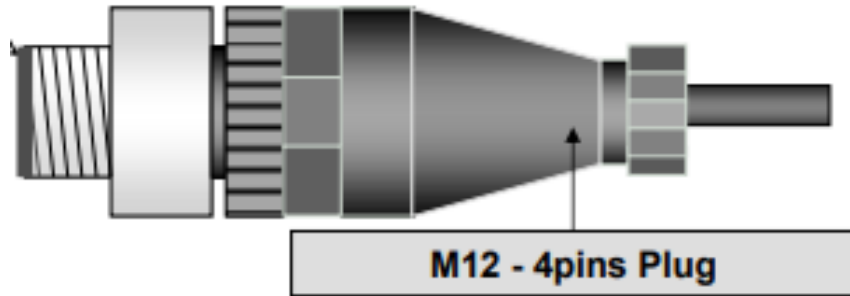
Sensor with spring return specification

Technical specifications

Measurement stroke	10 to 100 mm
Linearity	±%0,2 (75-100 mm), ±%0,5 (<75 mm)
Repeatability	< 0,01 mm
Resolution	Infinite
Resistance	2 kOhm: 10 ... 50 mm 5 kOhm: 75 ... 100 mm
Resistance tolerance	± %20
Recommended cursor current	<1 µA
Electrical connections	Connector or 1 m cable output
Displacement speed	< 5 m/s
Mechanical life	100 million movement
Case dimensions	Ø18 mm
Case material	Anodized aluminium
Rod material	Stainless steel
Rod diameter	Ø5 mm
Mechanical fixing	Variable brackets
IP degree	IP 65
Operating temperature	-20°C ... +80°C
Storage temperature	-30°C ... +90°C

The spring return is integrated inside the sensor body for better waterproofness)

[Option for IP67 sensor](#)



M12-4 Pins Wiring code

PIN1 (Pwr+): Sensor power supply

PIN4 (Sens+): Sensor signal + input

PIN2 (Sens-): Do not connect

PIN3 (Gnd): Electrical Ground



BeanAir *Sensor configuration from BeanScape® software*

Potentiometer sensors comes with a signal output which is ratio-metric, i.e. for a sensor power supply of 10 VDC the signal output is 0 to 10VDC

Summary of your configuration:

Recommended Sensor Power Supply :

- 1. 5VDC (low power operation) or 10VDC (more resolution)***
- 2. DAQ Polarity: Unipolar***
- 3. Sensor warm-up time : 40ms (default value)***
- 4. Conversion Assistant (if sensor powered with 5VDC) :***

0V => 0mm

5V => Sensor_Sroke mm

Conversion Assistant (if sensor powered with 10VDC) :

0V => 0mm

10V => Sensor_Sroke mm



BeanAir

Sensor configuration from BeanScape® software

BeanDevice Dashboard

Identity
Mac Id: 00158D00000E1106
Pan Id: 03F9
Net. Id: 0008
Label: MAC_ID : 0 x 00158D0

Version
Hard. vers.: V1R8
Soft. vers.: V7R1

BeanDevice
Platform: AN V

Network Diagnostic
Network quality: [Bar chart] LQI
PER: 0.00 %

Power Supply Diagnostic
Temperature: 26.500 °C
Power supply: Bat
Power mode: Bat Saver Disable
Battery Voltage: 4.133 V
Battery level: Good
DiagDate: 24/09/2020 17:09:21

System
Diagnostic cycle: 00:00:48 hh:mm:ss
Listening ratio: 00:00:30 hh:mm:ss

Data Logger
Status: Ready
Memory option: Stop DAQ recording
Memory used: 0 %

Listening Mode Status
Config. frame is: Waiting Sent Deleted

Current data acquisition mode
DAQ Status: Started
Data Acq. mode: LowDutyCycle
Data Acq. cycle: 00:00:06 ddd, hh:mm:ss
Sampling rate: NA Hz
Data Acq. duration: NA ddd, hh:mm:ss

DAQ Info
Meas. Range: 0 / +10.000 V
Polarity: Unipolar mode
Sensor Voltage: 5.000 V
Wake up duration: 40 ms

DAQ Config
DAQ Polarity: < selection > (Unipolar mode selected)
External sensor config: < selection >
Excitation voltage (Volts):
Warm up time (ms):
Software Filters: Enable IIR Filter

DAQ status is displayed here (you can check it after validating your new configuration)

Choose Unipolar on DAQ Polarity then click on validate



BeanAir *Sensor configuration from BeanScape® software*

BeanDevice® Dashboard

Identity
Mac Id : 00158D00000E1106
Pan Id : 03F9
Net. Id : 0008
Label : MAC_ID : 0 x 00158D0

Version
Hard. vers. : V1R8
Soft. vers. : V7R1

BeanDevice
Platform : AN V

Network Diagnostic
Network quality : LQI
PER: 0.00 %

Power Supply Diagnostic
Temperature : 26.500 °C
Power supply : Bat
Power mode : Bat Saver Disable
Battery Voltage : 4.133 V
Battery level : Good
DiagDate : 24/09/2020 17:09:21

DAQ Info
Meas.Range : 0 / +10.000 V
Polarity : Unipolar mode
Sensor Voltage : 5.000 V
Wake up duration : 40 ms

System
Diagnostic cycle : 00:00:48 hh.mm.ss
Listening ratio : 00:00:30 hh.mm.ss

Data Logger
Status : Ready
Memory option : "Stop DAQ" recording
Memory used : 0 %

Listening Mode Status
Config. frame is : Waiting Sent Deleted

Current data acquisition mode
DAQ Status : Started
Data Acq. mode : LowDutyCycle
Data Acq. cycle : 00:00:06 ddd, hh.mm.ss
Sampling rate : NA Hz
Data Acq. duration : NA ddd, hh.mm.ss

DAQ Config
DAQ Polarity : < selection > Validate
External sensor configuration
Excitation voltage (Volts) : 5 Validate
Warm up time (ms) : Validate
Software Filters
 Enable IIR Filter Validate

DAQ status is displayed here (you can check it after validating your new configuration)

Enter an excitation Voltage of 5VDC for your sensor



BeanAir *Sensor configuration from BeanScope® software*

Use the conversion Assistant.

if sensor stroke is 100mm and sensor power supply 5VDC):

0 V => 0 mm (sensor probe fully out)

5 V => 100 mm (sensor probe fully in)

Click on conversion assistant

The screenshot shows the BeanScope 2.4GHz software interface. On the left, a tree view displays various channels. A 'Unit Conversion Assistant' dialog is open, showing a 'Linear Conversion' table with two rows. The first row has 'Value 1' set to 0 V and 'Output' as 'not defined'. The second row has 'Value 2' set to 5 V and 'Output' as 100. The 'Target Unit' is set to 'mm'. The 'Sensor profile' window is also visible, showing 'General information' with 'Type: SENSOR_TYPE', 'Ref: 3', and 'Label: Ch_V_3'. The 'Thresholds' section shows 'High Level Alarm' at 101.135 mm and 'Low Level Alarm' at -2.303 mm. The 'Measurement data' section shows a 'Value' of 0.006 and a 'Date' of 24/09/2020 17:13:03. A blue arrow points from the 'Conversion' button in the 'Sensor profile' window to the 'Unit Conversion Assistant' dialog.

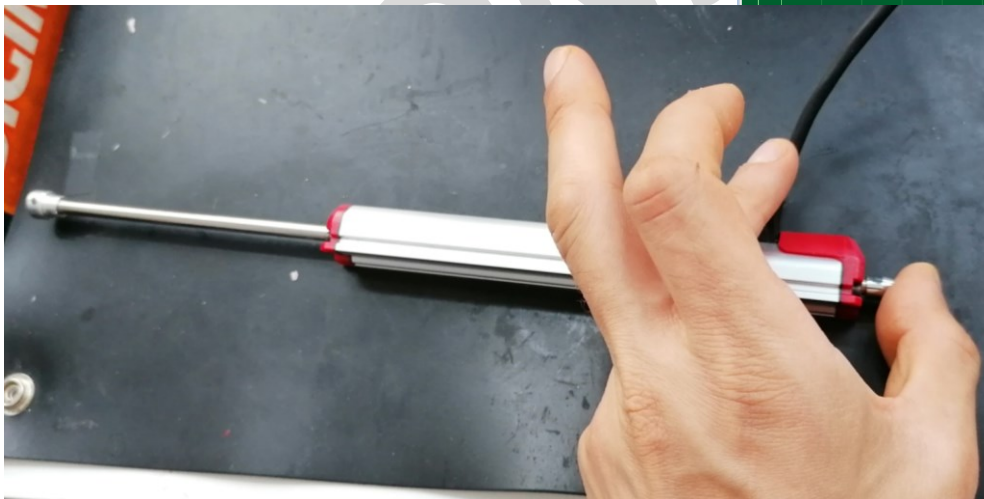
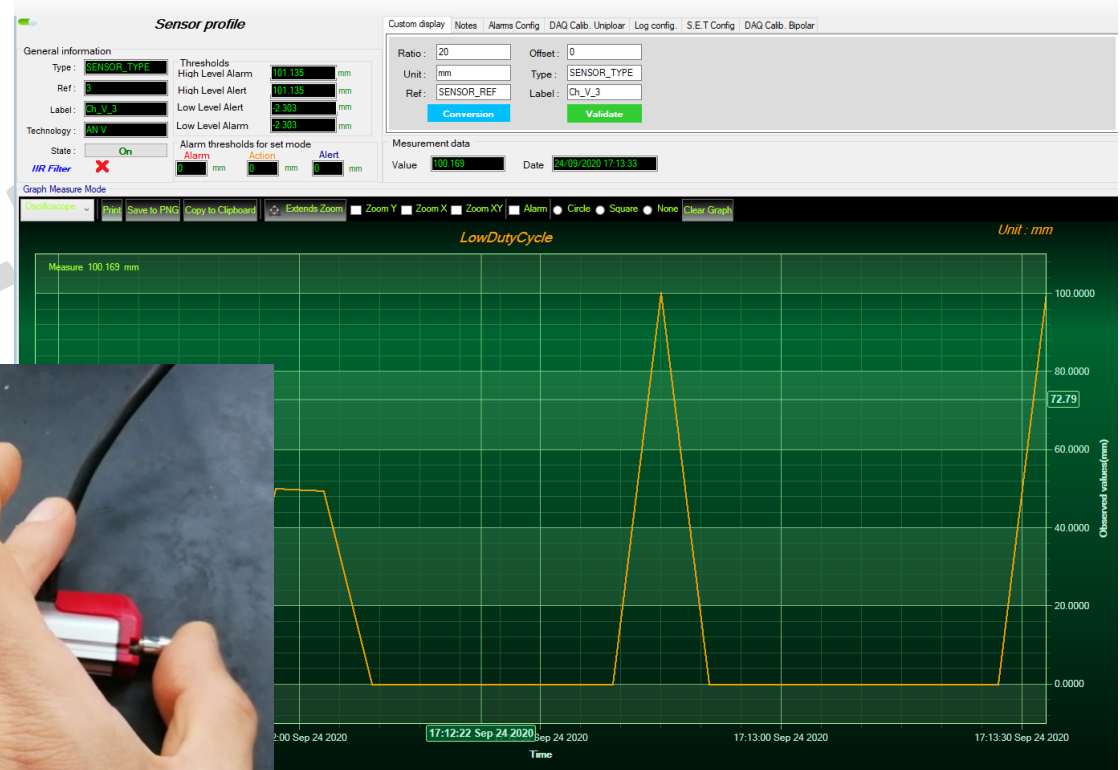
if sensor stroke is 100mm and sensor power supply 10VDC):

0 V => 0 mm (sensor probe fully out)

10 V => 100 mm (sensor probe fully in)

Check your settings

Example of a 100 mm stroke sensor : When the sensor probe is fully in, you should have approx. 100 mm. To provide a good reading on the sensor full scale, the real stroke can be a bit higher than the stroke displayed on the datasheet. In our example we can go up to 100.169 mm but only the measurements between [0mm and 100 mm] are tested, calibrated and warranted.



Sensor Installation on the field

