BeanAir
WIRELESS IIOT SENSORS

2.4 GHz

BeanDevice® 2.4GHz AN-V

Wireless IOT Data Acquisition (DAQ) Instrument
Voltage inputs (±5V or ±10V) | built-in datalogger

PRODUCT VIDEO

USER GUIDE

QUICK START

MECHANICAL DRAWING

STEP FILE

MADE IN GERMANY

R 001A-08148

2year Warranty

CE FC

690gr

77 mm

149 mm

60 mm

MAIN FEATURES

- Analog inputs ±5V or ±10V (4 channels)
±20mV

- Integrated sensor power supply, software configurable 4.5V to 20V

- Measurement repeatability less than ± 0.01% on the full scale

- Embedded data logger up to 1 million data points

- Wireless transmission IEEE 802.15.4 with antenna diversity
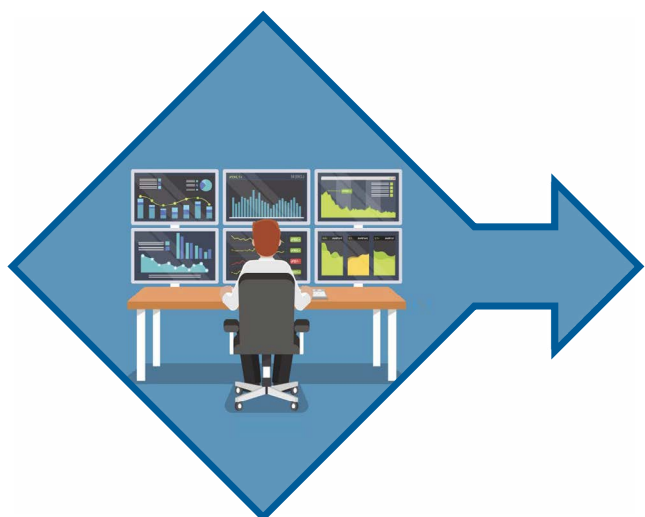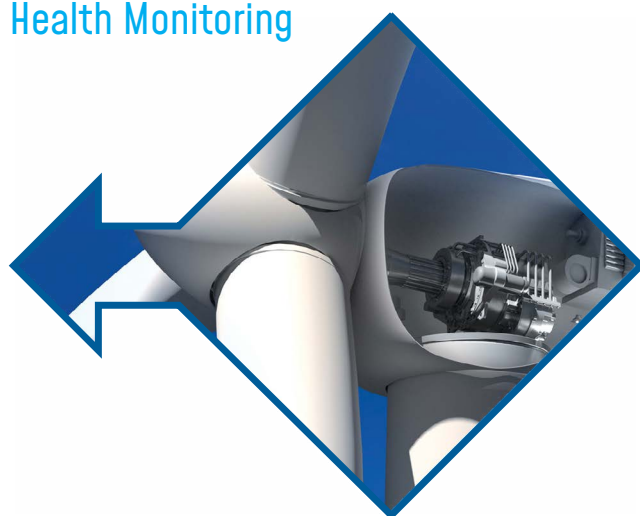
- Integrated rechargeable Lithium-Ion battery

APPLICATIONS

Structural Health Monitoring

Condition monitoring

Remote Monitoring

EMBEDDED DATA LOGGER UP TO 1 MILLION DATA POINTS

The BeanDevice® 2.4GHz AN-V integrates an embedded data logger, which can be used to log data when a Wireless Network can not be easily deployed on your site. All the data acquisitions are stored on the embedded flash and then transmitted to the Wireless receiver (BeanGateway® 2.4GHz) whenever a Wireless Networks is established.
The datalogger function is compatible with all the data acquisition mode available on your BeanDevice® 2.4GHz AN-V

• Low Duty Cycle data acquisition with a measurement heartbeat from 1s to 24h
• Alarm data acquisition with three levels of Alarms (Alert/Action/Alarm)
• Streaming measurement up to 400 samples per second

BeanDevice
2.4GHz AN-V

The Datalogger feature is activated on the BeanDevice®

BeanGateway
Wirelless IIOT Sensors Coordinator

Transmits all the data logs

Request for Logs transmission

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ℹ️ **For further information about data logger, please read the following technical note :**
TN-RF-007 – "BeanDevice® DataLogger User Guide "

REMOTE CONFIGURATION & MONITORING

The BeanScape® 2.4GHz software helps the user to view all the data measurements transmitted by the BeanDevice® 2.4GHz AN-V.

Different data acquisition modes can be remotely configured from the software :
• Low Duty Cycle Data Acquisition mode (LDCDA) : the data acquisition is immediately transmitted by radio.
  The transmission frequency can be configured from 1s to 24h.
• Alarm Mode : the measured value is transmitted by radio whenever an alarm threshold (fixed by the user) is detected
  (3 alarms threshold levels are available Alert-Action-Alarm).
  The device sends frequently a beacon frame informing its current status.
• Streaming : All measured values are transmitted by packet within a continuous flow at 400 samples per second

For further information about data logger, please read the following technical note :
TN-RF-008-Data-acquisition-modes-available-on-the-BeanDevice

BeanDevice® 2.4GHz AN-V

CONFIGURABLE SENSOR POWER SUPPLY

The sensor is directly powered by a high accuracy and adjustable DC/DC converter integrated inside the device. The excitation voltage is remotely configurable through the BeanScape® 2.4GHz (4.5 to 20V).

Sensor Power supply 4.5 to 20V
Sensor Signal 4-20 mA
M12 Plug

GETTING STARTED WITH A WIRELESS IOT SENSORS

The BeanDevice® 2.4GHz ANV operates only on our Wireless IIOT Sensor, you will need the BeanGateway® 2.4GHz and the BeanScape® 2.4GHz for starting a wireless IIOT sensors

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BeanDevice
AN-V

BeanGateway
INDOOR VERSION

OR

BeanScape
Wireless IIOT Sensors Supervision software

BeanGateway
OUTDOOR VERSION

Product specifications are subject to change without notice.
Contact Beanair for latest specifications.

TECHNICAL SPECIFICATIONS

PRODUCT REFERENCE

BND-2.4GHZ-ANV–4CH –MR

MR-Measurement Range
5: ±5V measurement range , 10: ±10V measurement range

Example: BND-2.4GHZ-ANV-4CH-5, BeanDevice® AN-V with four channels , measurement range: ±5V

ANALOG DATA ACQUISITION SPECIFICATIONS	
Signal Conditionning	Analog voltage measurement
Number of channels	4 Channels
A/D Converter	16 bits - SAR Architecture (Successive Approximation Register) with temperature compensation
Measurement range (analog polarity is dynamically configurable from the BeanScape® 2.4GHz)	BND-2.4GHZ-ANV-4CH –5: ±5V (bipolar) or 0-10 V (unipolar) BND-2.4GHZ-ANV-4CH –10: ±10V (bipolar) or 0-20 V (unipolar)
Non-linearity error	± 0.5 LSB
Repeatability (full scale, @ 25°C, Static Measurement Mode every 2s)	less than ± 0.01%
Repeatability (full scale, @ 25°C, Dynamic Measurement Mode 10Hz)	less than ± 0.01%
Sensor Connector	M12-4Pins coming with an IP rating IP67

SENSOR POWER SUPPLY SPECIFICATIONS	
Power Supply	4.5 Volts to 20Volts , dynamically configurable from the BeanScape® 2.4GHz software
Power Supply precision (full scale, @25°C)	±0.18%
Maximum Output Power (@25°C)	1 Watts

CONFIGURABLE SETTINGS FROM THE BEANSCAPE® 2.4GHZ SOFTWARE	
Data Acquisition mode	Static Data Acquisition : Low Duty Cycle Data Acquisition (LDCDA) and Alarm Mode (based on alarm thresholds) . Measurement heartbeat 1s to 24 hour Dynamic data acquisition (not available on devices with ref. extension XT) Streaming and S.E.T. (Streaming with Event Trigger) Mode
Sampling Rate (SPS = samples per second)	Minimum: 1 SPS Maximum: 400 SPS maximum per channel
Alarm Threshold	3 levels of Alarm Threshold Alert-Action-Alarm
Sensor power supply	4.5 to 20 Volts
Power Mode	Sleep & Active

TECHNICAL SPECIFICATIONS

BeanDevice® 2.4GHz AN-V

RF SPECIFICATIONS	
Wireless Protocol Stack	Ultra-Power and license-free 2.4Ghz radio technology (IEEE 802.15.4E)
WSN Topology	Point-to-Point / Star
Data rate	250 Kbits/s
RF Characteristics	ISM 2.4GHz – 16 Channels
TX Power	+18 dBm
Receiver Sensitivity	-104 dBm
Maximum Radio Range (In Transmission Mode)	650m (Line of Sight) , 30-100m (Non Line of Sight) *[1]
Antenna diversity	· 2 omnidirectional N-Type antenna · Gain 5.5 dBi · Waterproof IP67

EMBEDDED DATA LOGGER	
Storage capacity	up to 1 million data points
Wireless data downloading	3 minutes to download the full memory (average time)

POWER SUPPLY	
Integrated battery charger	Integrated Lithium-ion battery charger with high precision battery monitoring : · Overvoltage Protection, Overcurrent/Short-Circuit Protection, Undervoltage Protection · Battery Temperature monitoring
Current consumption @ 3.3V	· During data acquisition : 70mA to 130 mA (depends on external sensor power supply) · During Radio transmission : 70 mA · During sleeping: < 35 µA
External power supply	External power supply : +8-28 VDC with polarity inversion protection
Rechargeable battery	High density Lithium-Ion rechargeable battery with a capacity of 2.2Ah with polyswitch protection

TIMESYNC FUNCTION : CLOCK SYNCHRONIZATION OVER THE WIRELESS IOT SENSORS (WSN)	
Clock synchronization accuracy	±2.5 ms (at 25°C)
Crystal specifications	Tolerance ±10ppm, stability ±10ppm

TECHNICAL SPECIFICATIONS

ENVIRONMENTAL AND MECHANICAL	
Casing	Aluminum, Waterproof IP67 – Fire Protection : ULV94/Getex casing dimensions (w/o antenna, w eyelets) L x l x h : 156mm x 82mm x 57mm Weight : 760g
Shocks resistancet	50g during 50 ms
Operating Temperature	-40 °C to +60 °C
Norms	· CE Labelling Directive R&TTE (Radio) ETSI EN 300 328 · FCC (North America) · ARIB STD-T66 Ver 3.6 ROHS - Directive 2002/95/EC

INCLUDED ACCESSORIES
4 x M12 Cap 1 x M8 Cap 2 x High gain antenna 5.5 dBi / V.S.W.R : 1.5 :1 / Waterproof IP67

OPTIONAL ACCESSORIES AND SERVICES	
External Power Supply	Wall plug-in, Switchmode power Supply 12V @ 1.25A with sealed M8 Plug (IP67/Nema 6) Ref: M8-PWR-12V
M8 extension cable for external power supply	Molded cable with M8-3pins male plug Material: PVC with shield protection IP Rating : IP67 | Nema 6 Cable length: 2 meters , Ref: CBL-M8-2M Cable length : 5 meters, Ref: CBL-M8-5M Cable length: 10 meters, Ref: CBL-M8-10M
M12 Plastic ABS plug for sensors	M12-4 Pins Male plug for sensor interface Coding : A , Locking type: Fix screw, Material: Plastic ABS IP Rating: IP67 in locked condition Ref: M12-PL-SENSOR
M12 Aluminum plug for sensors	M12-4 Pins Male plug for sensor interface Coding : A , Locking type: Fix screw, Material: Aluminum IP Rating: IP67 in locked condition Ref: M12-AL-SENSOR
Antenna cable	N-Type cable (Male/Male), Cable type: RF-5/H155 Cable length: 1 meter, Ref: CBL-ANT-1M Cable length: 2 meters, Ref: CBL-ANT-2M Cable length: 3 meters, Ref: CBL-ANT-3M Cable length: 5 meters, Ref: CBL-ANT-5M Cable length: 10 meters, Ref: CBL-ANT-10M

BeanDevice® 2.4GHz AN-V

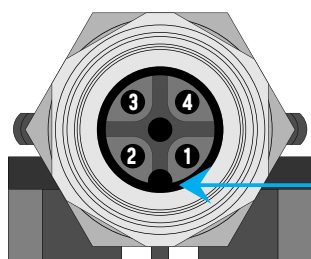| High Gain antenna option	High Gain Omnidirectional antenna Frequency range 2400-2500MHz VSWR < 1.4, Impedance 50 Ohm, Polarization Vertical Vertical plane 24°(7dBi Gain version) 16°(7dBi Gain version) 6°(12dBi Gain version), Horizontal plane 360° Connector N female, Wind load (170km/h) 7.3N Included: N-Type cable (Male/Male), length: 1 meter Gain: 7dBi, Dimensions 360mm x 23mm, Weight 0.44 kg Ref: HG-OMNI-OUT-7DBI Gain: 9dBi , Dimensions 540x23 mm, Weight 0.61 kg Ref: HG-OMNI-OUT-9DBI Gain: 12dBi , Dimensions: 1125mm x 19 mm, Weight 1.06 kg Ref: HG-OMNI-OUT-12DBI
Calibration certificate	Calibration certificate linked to German Accreditation Body (DAkkS)

*1   650m L.O.S conditions is reached:
  • Beangateway is positioned in Line Of Sight toward sensor (no obstacles, no radio interferences) with High Gain Antenna, with a Height of 3 meters minimum. 26dBm High Gain Directional Antenna is used om gateway side.
  • On sensor side : Radome Antenna should point to Vertical Direction for better Coverity
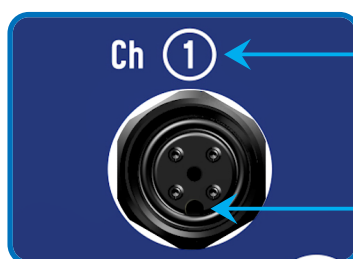
PRODUCT OVERVIEW

ON/Off push button

Network Reset push button

M8-3 Pins socket for external power supply

Activity/Failure led

M12-4 Pins female socket for sensor interafce

Eyelet for wall mounting

2.4GHz Radio Antenna

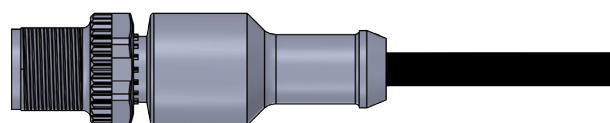## SENSOR WIRING CODE

M12 Socket Pin assignation

Notch

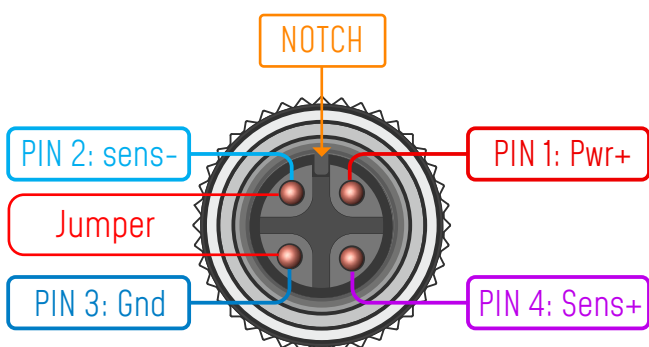**M12 Socket Positioning Notch**

Ch ①

Sensor Chanel Label

positioning notch

Wiring Code (Sensor Side)-Sensor with Analog **Unipolar** Output

NOTCH

PIN 2: sens-

Jumper

PIN 3: Gnd

PIN 1: Pwr+

PIN 4: Sens+

M12-4Pins Plug

CAPTION
PIN 2 : Connected to Electrical Ground
PIN 3 (Gnd) : Electrical Ground
PIN1 (Pwr+) : Sensor power supply
PIN 4 (Sens +) : Sensor Signal + input

Wiring Code (Sensor Side)-Sensor with Analog **Bipolar** Output

NOTCH

PIN2: sens-

PIN3: Gnd
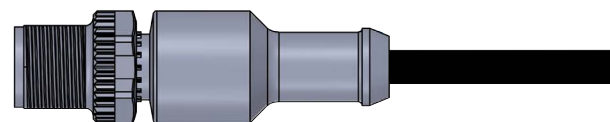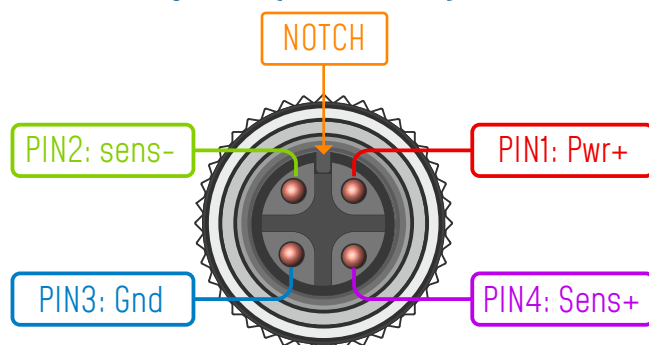
PIN1: Pwr+

PIN4: Sens+

M12-4Pins Plug

CAPTION
PIN2 : Sensor signal - input
PIN3 (Gnd) : Electrical Ground
PIN1 (Pwr+) : Sensor power supply
PIN4 (Sens +) : Sensor Signal + input

ⓘ If you use a unipolar analog sensor, Sens- pin must be connected to the electrical ground

❗ You can damage your sensor and/or your BeanDevice® if you don't respect the wiring code.

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AC/DC Power supply with M8 Plug

Ref:M8-PWR-12V
- Wall plug-in power supply,
  Output: 12VDC, M8-3Pins plug
- AC Power plug: Europe/UK
  Northamerica /China/Australia
- Waterproof - IP67
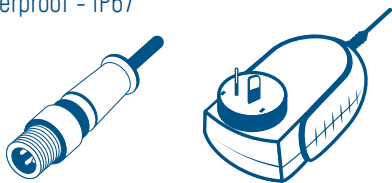
N-Type cable (Male/Male)

Ref: CBL_ANT_XXM
. length: 1 meter / 2 meters / 5 meters
. Cable type: RF-5/H155

Omnidirectiona antenna 5dBi for outdoor use

Ref: HG_OMNI_5_OUT_DBI
- Waterproof design
- Outoor use
- Professional N-type design
  reduces stress
- N-type, Male, Reverse Polarity,
- VSWR < 2.0 / Length=95mm
- Wind survival: up to 180Mph
  Watertight IP65
- Waterproof - IP67

Molded Cable with M8 plug

Ref:CBL-M8-2M
(cable length : 2 meters)
- CBL-M8-5M
(cable length : 5 meters)
- CBL-M8-10M
(cable length : 10 meters)

M12-4 Pins plug for sensor interface
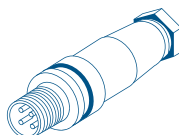
M12-5 Pins plug for sensor interface
Ref: M12-PL-SENSOR
watertight IP67 - Material: Plastic ABS
M12-4 Pins plug for sensor interface
Ref: M12-AL-SENSOR
watertight IP67 - Material: Aluminum case

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