

BeanDevice® 2.4GHz AN-420

Wireless IOT Data Acquisition(DAQ) Instrument
4-20mA (current loop) inputs | built-in datalogger

PRODUCT VIDEO



USER GUIDE



QUICK START



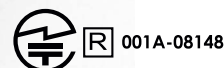
MECHANICAL DRAWING



STEP FILE



MADE IN GERMANY



2year
Warranty



690gr

77 mm



149 mm

60 mm



MAIN FEATURES



- Embedded data logger up to 1 million data points



- Wireless transmission IEEE 802.15.4 with antenna diversity



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



- Wireless data logger with 4-20mA current loop inputs (4 channels)



- Integrated rechargeable Lithium-Ion battery



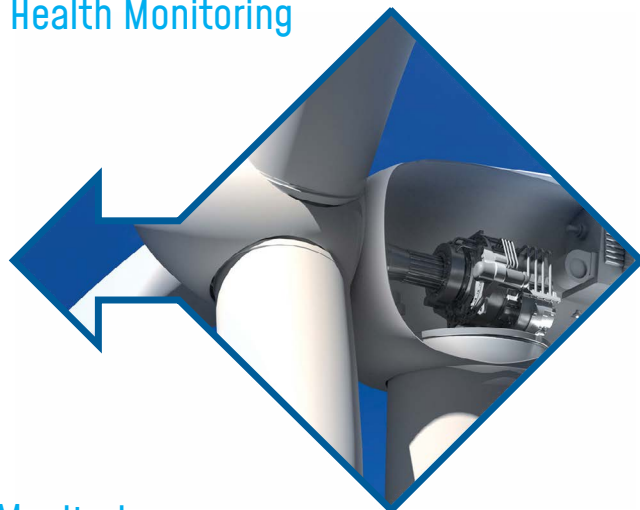
- Measurement repeatability less than $\pm 0.01\%$ on the full scale

APPLICATIONS

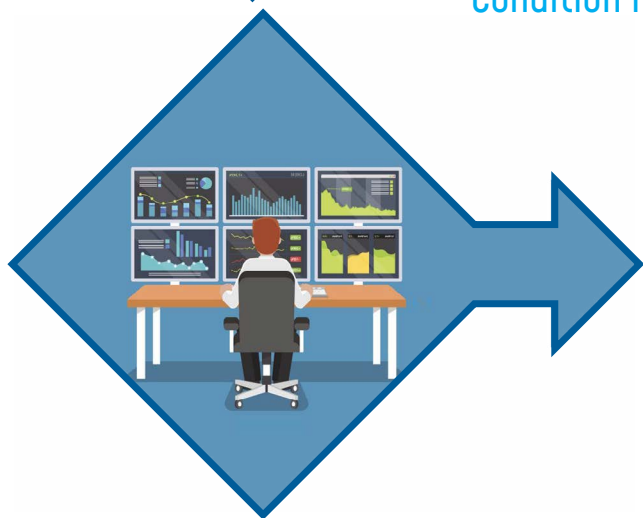


Structural Health Monitoring

Condition monitoring



Remote Monitoring



EMBEDDED DATA LOGGER UP TO 1 MILLION DATA POINTS

The **BeanDevice® 2.4GHz AN-420** 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-420**

- 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



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-420**.

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

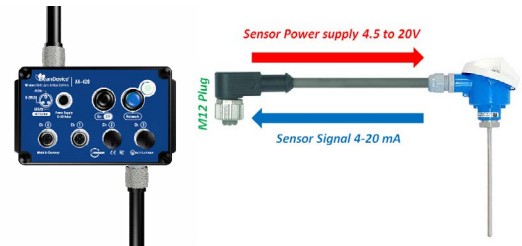


For further information about data logger, please read the following technical note :
[TN-RF-008-Data-acquisition-modes-available-on-the-BeanDevice](#)

BeanDevice® 2.4GHz AN-420

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).



GETTING STARTED WITH A WIRELESS IOT SENSORS

The **BeanDevice® 2.4GHz AN-420** operates only on our Wireless IIOT Sensors, you will need the **BeanGateway® 2.4GHz** and the **BeanScape® 2.4GHz** for starting a Wireless IIOT Sensors

BeanAir

BeanGateway
INDOOR VERSION



+

OR

+

BeanGateway
OUTDOOR VERSION



BeanScape
Wireless IOT Sensors Supervision software

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

TECHNICAL SPECIFICATIONS

PRODUCT REFERENCE

BND-2.4GHZ-AN420-4CH

ANALOG DATA ACQUISITION SPECIFICATIONS

Signal Conditioning	Analog current loop measurement
Number of channels	4 Channels
A/D Converter	16 bits - SAR Architecture (Successive Approximation Register) with temperature compensation
Measurement range	4-20 mA Current Loop measurement
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 , A-Coding, Waterproof IP67

SENSOR POWER SUPPLY SPECIFICATIONS

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

CONFIGURABLE SETTINGS FROM THE BEANSOPE® 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	Battery saver mode & Active power mode

EMBEDDED DATA LOGGER

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

TECHNICAL SPECIFICATIONS

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	<ul style="list-style-type: none"> • 2 omnidirectional N-Type antenna • Gain 5.5 dBi • Waterproof IP67

TIMESYNC FUNCTION : CLOCK SYNCHRONIZATION OVER THE WIRELESS SENSOR NETWORKS (WSN)

Clock synchronization accuracy	±2.5 ms (at 25°C)
Crystal specifications	Tolerance ±10ppm, stability ±10ppm

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	<ul style="list-style-type: none"> • CE Labelling Directive R&TTE (Radio) ETSI EN 300 328 • FCC (North America) • ARIB STD-T66 Ver 3.6 • ROHS - Directive 2002/95/EC

POWER SUPPLY

Integrated battery charger	Integrated Lithium-ion battery charger with high precision battery monitoring : <ul style="list-style-type: none"> • Overvoltage Protection, Overcurrent/Short-Circuit Protection, Undervoltage Protection • Battery Temperature monitoring
Current consumption @ 3.3V	<ul style="list-style-type: none"> • During data acquisition : 70mA to 130 mA (depends on external sensor power supply) • During Radio transmission : 70 mA • During Battery Saver Mode: < 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

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

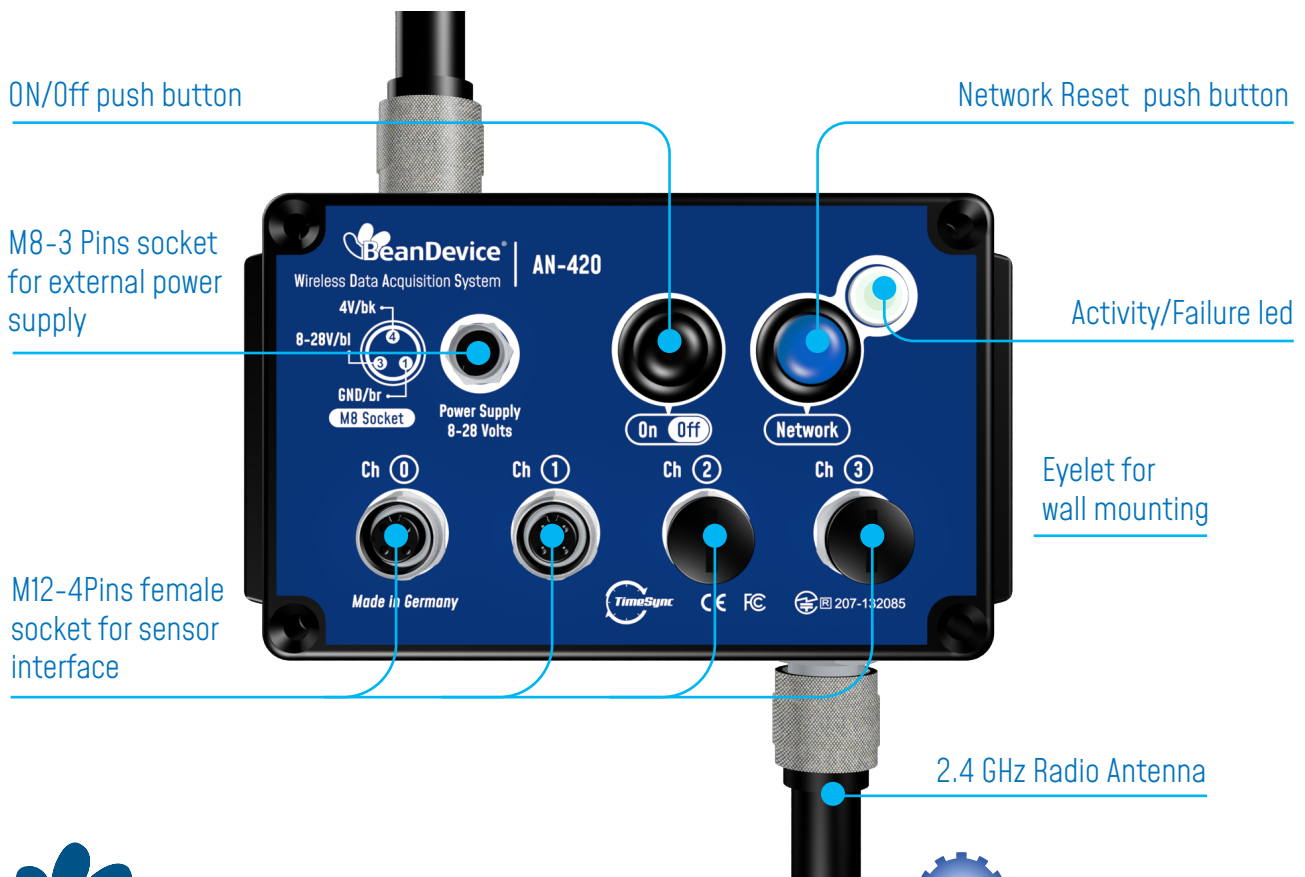
OPTIONAL ACCESSORIES AND SERVICES

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
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) REF: CERT-CAL-PROCESS

* 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 on gateway side.
- On sensor side : Radome Antenna should point to Vertical Direction for better Coverity

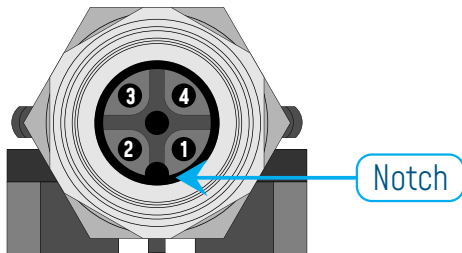
PRODUCT OVERVIEW



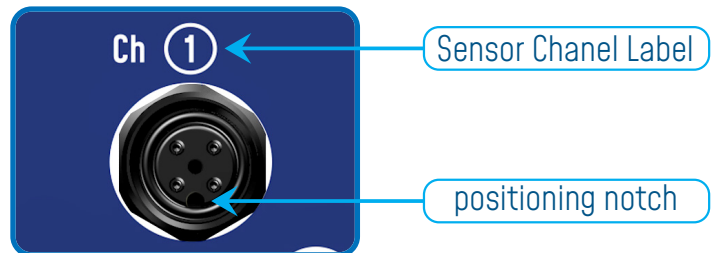
ProcessSensor

SENSOR WIRING CODE

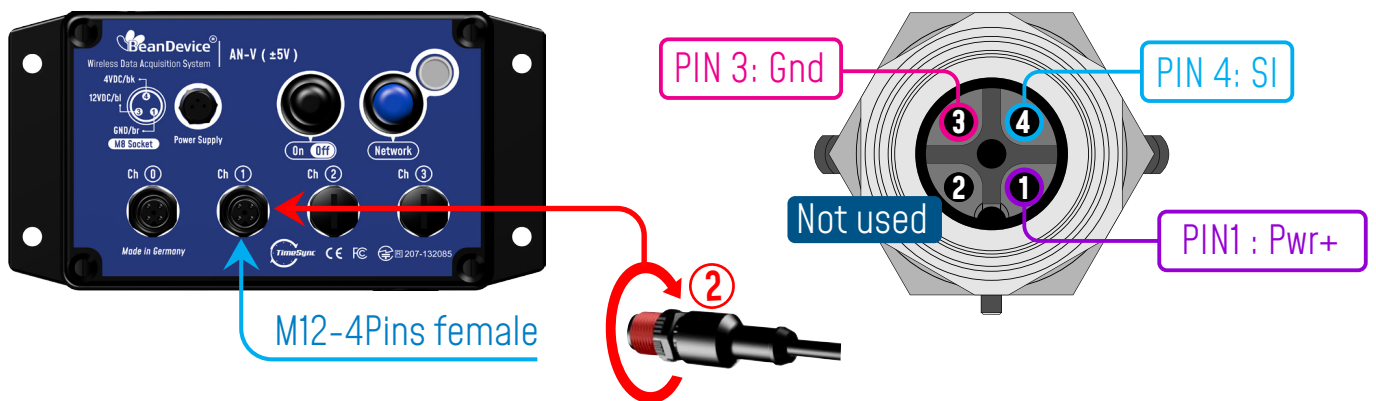
M12 Socket Pin assignation



M12 Socket Positioning Notch



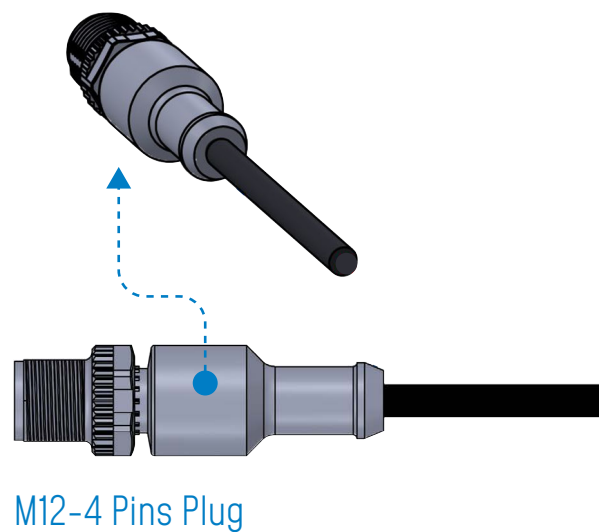
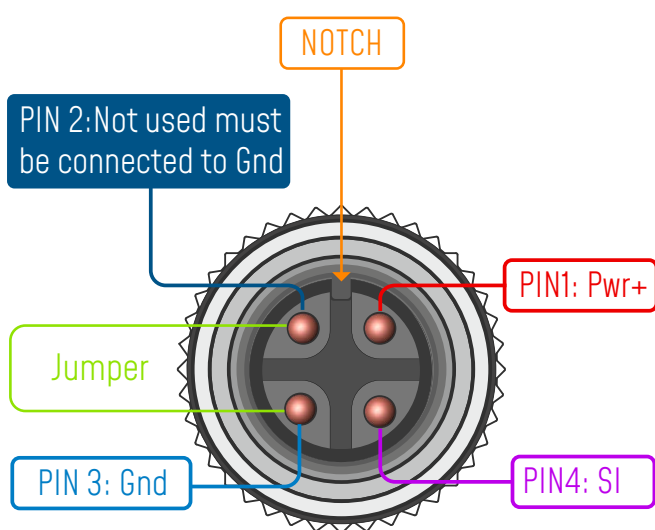
M12 4pins Female Wiring code [BeanDevice® AN-420 side]



CAPTION PIN1 [Pwr+] : Sensor power supply
PIN 4 [SI] : Signal input

PIN 2 : Not used
PIN 3 [Gnd] : Electrical Ground

M12-4pins Male Plug Wiring code (sensor side)



CAPTION PIN1 [Pwr+] : Sensor power supply
PIN4 [SI] : Signal input
PIN2 : Not used must be connected to Gnd
PIN3 [Gnd] : Electrical Ground

Instructions for connecting a 2-wire sensor :

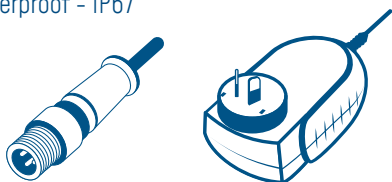
- Connect the sensor wire "Loop Supply" to PIN1 (Pwr+)
- Connect the sensor wire "Current output" 4-20mA to PIN4 (SI)
- Use a jumper cable to connect PIN3(Gnd) to PIN2

ACCESSORIES

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



Omnidirectional antenna 5dBi for outdoor use

Ref: HG_OMNI_5_OUT_DBI

- Waterproof design
- Outdoor 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

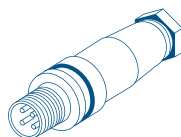
Ref: M12-PL-SENSOR

watertight IP67 - Material: Plastic ABS

M12-4 Pins plug for sensor interface

Ref: M12-AL-SENSOR

watertight IP67 - Material: Aluminum case



CONTACT US

Headquarter:

Buchholzer Straße 65, 13156
Berlin, Germany

Email:

info@beanair.com

Phone number:

+493066405051



www.industrial-wsn.com



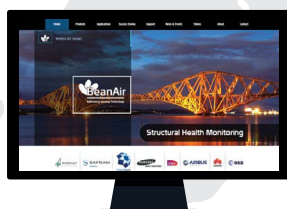
WWW.BEANAIR.COM



www.youtube.com/user/BeanairSensors



www.facebook.com/BeanAir



www.twitter.com/beanair



Above given technical data are only for information purpose.

BeanAir® Sensors has right to change product specifications without notice.