BeanDevice®

Version 1.3

Ready for Industrial internet of things ?

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BEANAIR®	BEANDEVICE® WILOW® QUICKSTART

Rethinking Sensing Technology

DOCUMENT

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1. TECHNICAL SUPPORT

For general contact, technical support, to report documentation errors and to order manuals, contact *BeanAir Technical Support Center* (BTSC) at:
tech-support@beanair.com

For detailed information about where you can buy the BeanAir equipment/software or for recommendations on accessories and components visit:

www.beanair.com

To register for product news and announcements or for product questions contact BeanAir's Technical Support Center (BTSC).

Our aim is to make this user manual as helpful as possible. Please keep us informed of your comments and suggestions for improvements. BeanAir appreciates feedback from the users.

2. VISUAL SYMBOLS DEFINITION

Symbols	Definition
	Caution or Warning – Alerts the user with important information about BeanAir wireless sensor networks (WSN), if this information is not followed, the equipment /software may fail or malfunction.
	Danger – This information MUST be followed if not you may damage the equipment permanently or bodily injury may occur.
	Tip or Information – Provides advice and suggestions that may be useful when installing BeanAir Wireless Sensor Networks.

3. ACRONYMS AND ABBREVIATIONS

AES	Advanced Encryption Standard
CCA	Clear Channel Assessment
CSMA/CA	Carrier Sense Multiple Access/Collision Avoidance
GTS	Guaranteed Time-Slot
kSps	Kilo samples per second
LDCDA	Low duty cycle data acquisition
LLC	Logical Link Control
LQI	Link quality indicator
MAC	Media Access Control
PER	Packet error rate
POE	Power Over Ethernet
RF	Radio Frequency
SD	Secure Digital
UPS	Uninterruptible power supply
USB OTG	USB On The Go
WDAQ	Wireless DAQ
WSN	Wireless Sensor Networks

4. ACCESSORIES DESCRIPTION

The BeanDevice® WiLow® comes with additional accessories, useful for the proper functioning of the device :

- USB 2.0 Cable

- Magnet

- Four screws+Locknut

- Plastic Cup

Figure 1: BeanDevice® Wilow® AX-3D

4.1 USB 2.0 CABLE

The USB cable is used to power supply the BeanDevice® WiLow® and to setup the Network configuration. It is an M8-5 Pins plug / USB 2.0 cable, used to connect the BeanDevice® WiLow® to the computer.
It is importatnt to notice, that the M8-5 Pins side of the cable should be pluged correctly on the device connector, respecting the shape.

Figure 2: USB to M8 cable

4.2   MAGNET

To avoid any accidental misconfiguration while installing and using the BeanDevice® Wilow® ,a magnet is used to command the BeanDevice® instead of common push buttons.

To put ON/OFF the BeanDevice® or to make a Network Reset, all you have to do is to point the magnet toward one of the two white circles as shown on the next picture.
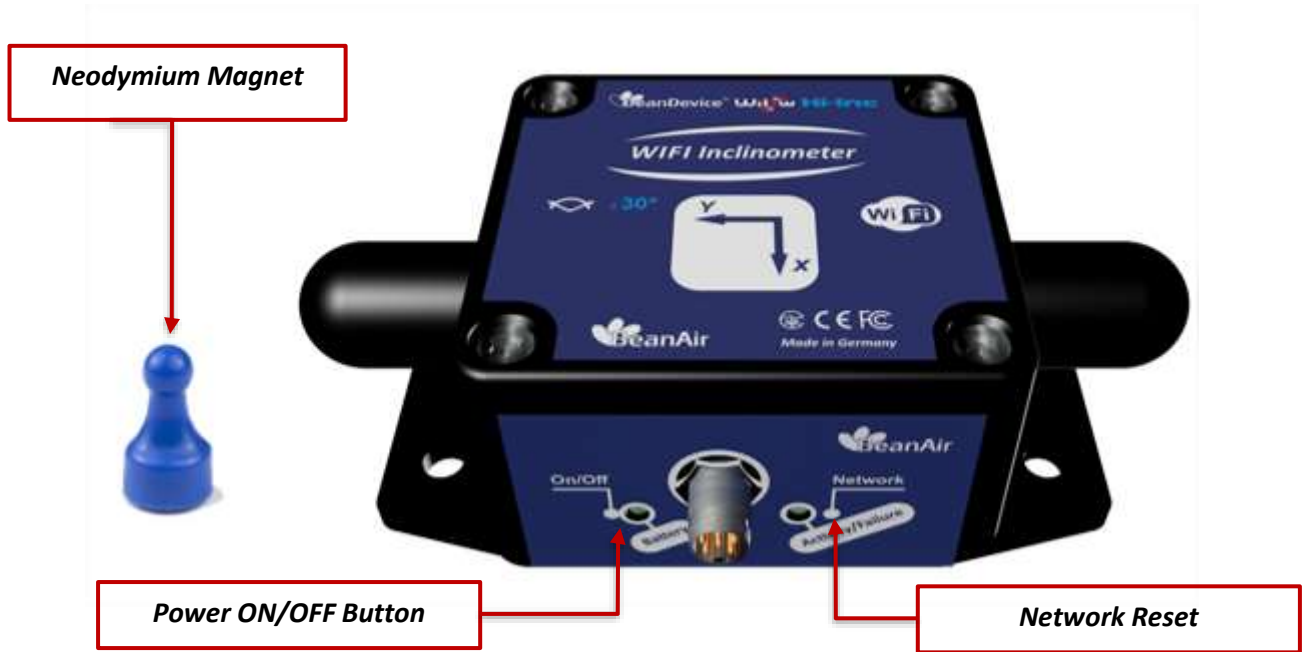

Neodymium Magnet

Power ON/OFF Button

Network Reset

Figure 3: Power on/off and Network Reset

4.3   LOCKNUTS AND SCREWS

Inside the packet, you will find four screws and four locknuts that will be used to mount the BeanDevice® WiLow® of the four sides.

Correct mounting of the BeanDevice® WiLow® is essential to the success of all measurements.

Figure 4 :Screws and Locknuts

4.4   M8 PROTECTION CAP

The plastic cap is used to cover the connector of the BeanDevice® WiLow® as a protection. It should be removed when connecting the USB 2.0 cable.

Figure 5: Protection Cap

Do not forget to tighten correctly the M8 cap otherwise you will loose the waterproofness.
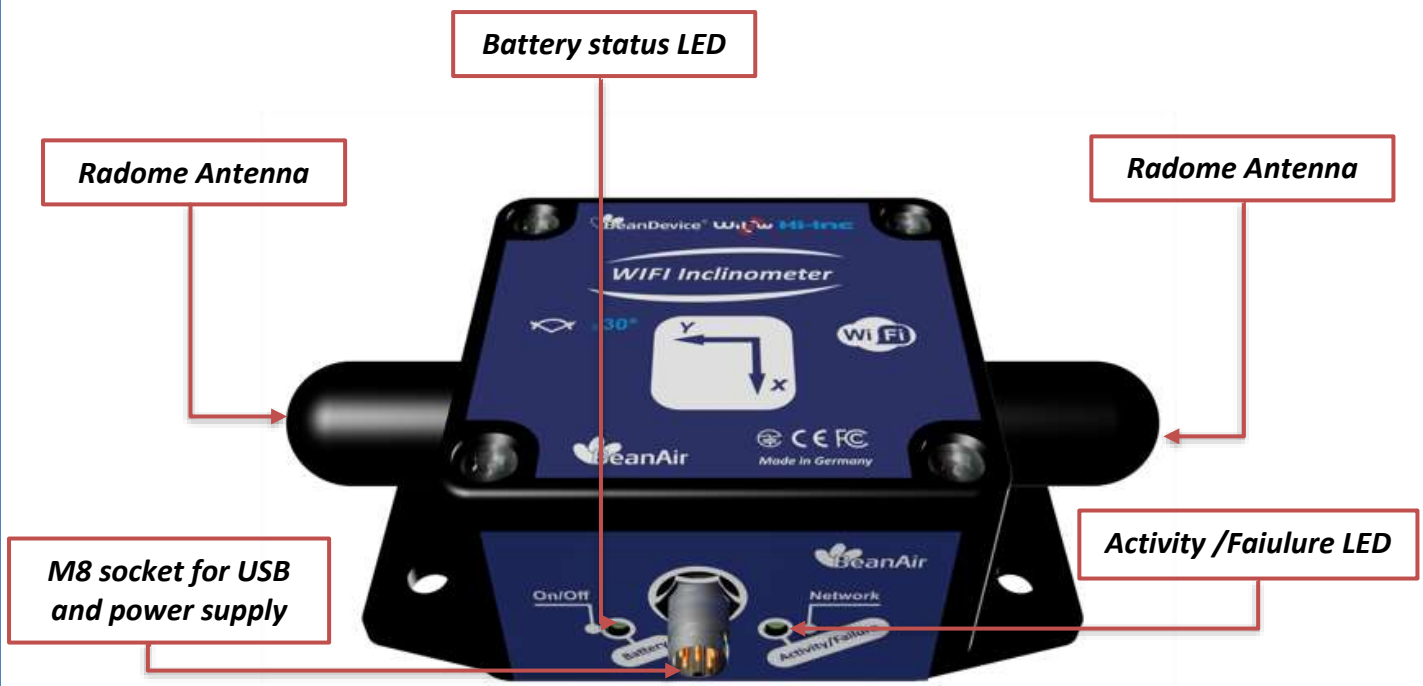
4.5   CONNECTORS AND LEDS

Figure 6: Connectors and Leds overview on BeanDevice® Wilow®

This device comes with a USB 2.0 connector for device network configuration, Two Radome antennas to connect to the Wi-Fi access points and Leds to show the battery's level and the BeanDevice status(ON or OFF).

4.6   IMPORTANT NOTICE: USB TO M8 CABLE INSERTION

Important Notice: USB to M8 cable insertion

RIGHT Connector Insertion

You can easily screw the fastening nut

Grey/White marking should be pointing to upward

WRONG Connector Insertion

You can not screw the fastening NUT

No GREY/white Marking visible, by forcing the cable in the opposite direction you will damage both connector and USB communication link

Always connect your M8 plug to your Beandevice® Wilow® before to plug it to the USB Power supply

5. HOW TO CONNECT MY BEANDEVICE® WILOW® TO MY WIFI NETWORK

To connect the BeanDevice® WiLow, for the first time or after a network reset, to your WIFI Network it is recommended to follow the next steps of configuration:

1. Firstly, install BeanScape® WiLow® software, then run it by double clicking on the BeanScape® icon on the desktop.

Figure 7: BeanScape® icon

2. The next step is to start the BeanDevice® WiLow® by pointing the magnet toward the On/off Button, and connecting it via the M8/USB cable to your computer.

Figure 8: Connecting BeanDevice® WiLow® to a PC

3. On BeanScape® software Menu bar, select **Tools** and choose the option **LAN/WLAN Config**
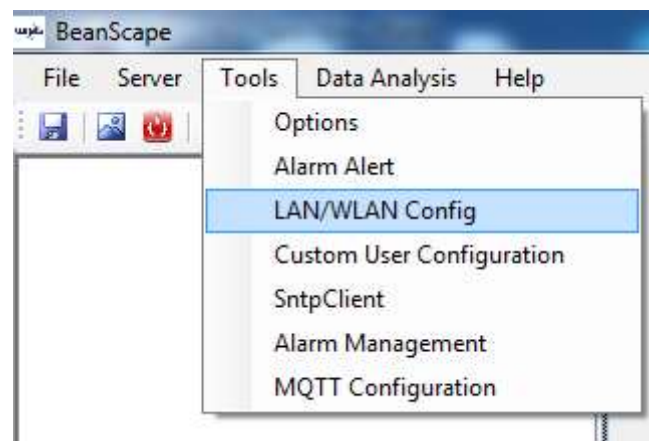

Figure 9: WLAN Configuration on BeanScape® menu

4. This configuration window will appear, and you user have to to fulfill the necessary information.
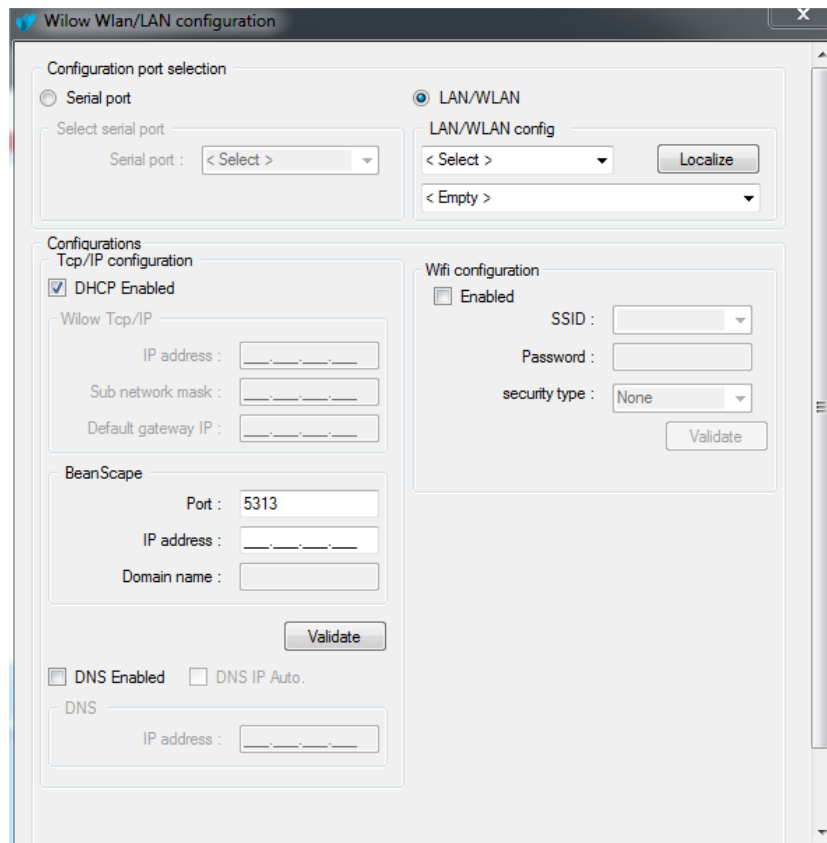

Figure 10 :Wilow Wlan/LAN Configuration

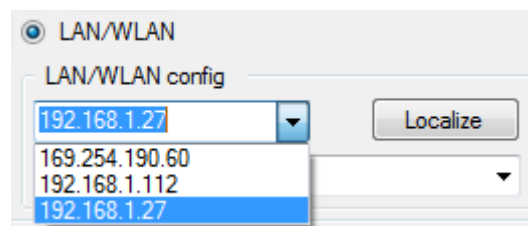5. On the **LAN/WLAN config** frame, select your Computer **IP address**

Figure 11: Frame LAN/WLAN config

6. Select the **right serial port** assigned to your BeanDevice® WiLow®. If there is more than one BeanDevice® connected to your computer, or another kind of devices using COM serial port, you have to select suitable port assigned to your BeanDevice® WiLow®.
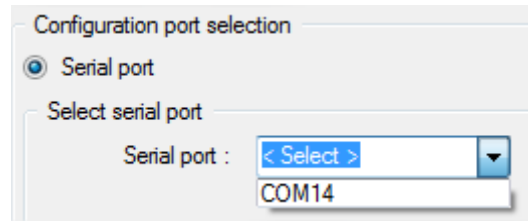
Figure 12: COM port configuration

7. **Enable DHCP** on the Tcp/IP configuration frame to let the Access Point allocate a dynamique IP address to the BeanDevice® WiLow®
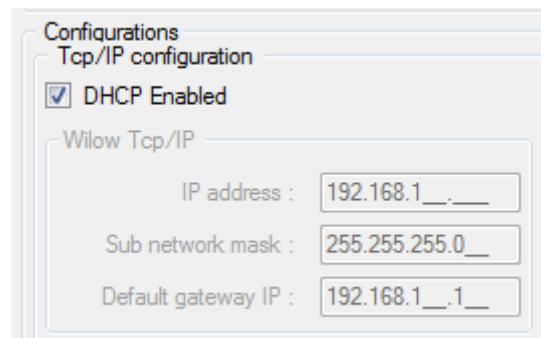

Figure 13: Enabling DHCP

8. **Enable the Wi-Fi configuration** and tape the WIFI Access Point connection parameters (SSID, Password and Security type), then click on validate
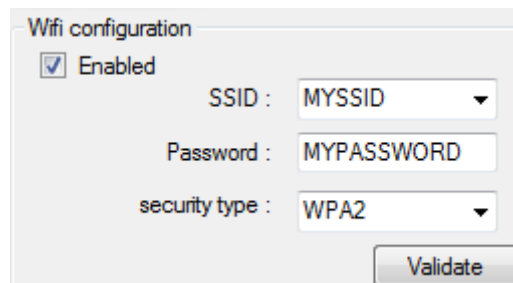

Figure 14: WIFI configuration

9. If all parameters was filled correctly, a validation window will pop up and let you know that the configuration operation has been completed successfully .
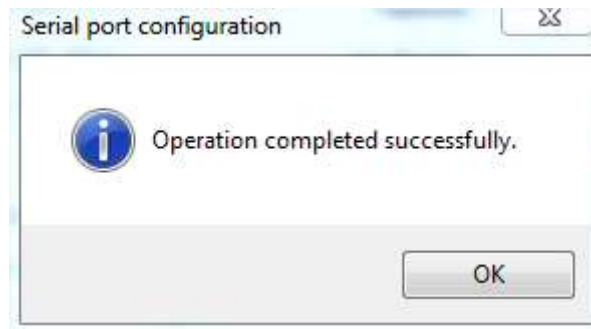
Figure 15: Configuration Success

 For more information you can watch our Video "Getting started with BeanDevice® Wilow "on our YouTbe channel.Click here!

6. A QUICK SETTINGS OVERVIEW

6.1   HOW TO SETUP A DATA ACQUISITION

Please your firewall and allow permission for BeanScape® to access your Wireless network

1. After a successful validated configuration, click OK on the pop up window and close the Wilow Wlan/LAN configuration window.
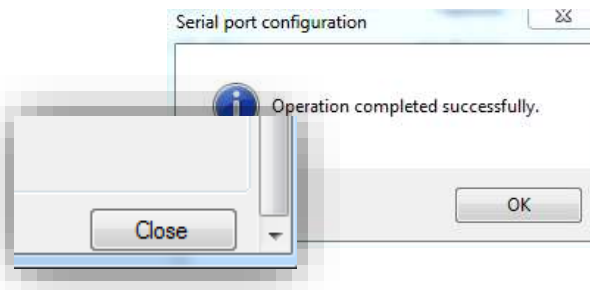

Figure 16: Closing WLAN configuration window

2. Now start the BeanScape® Server by clicking directly on the **Green** button or selecting **Start the server** from the Server option on the Menu bar
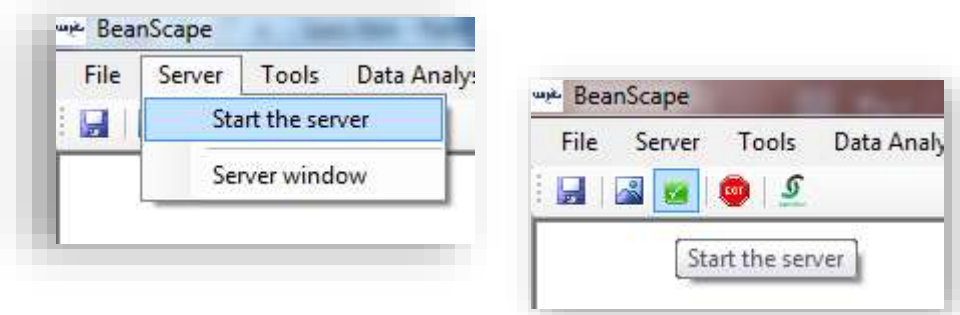

Figure 17: Starting the Server

3. The BeanDevice® WiLow identified by its MAC ID will appears in the left panel
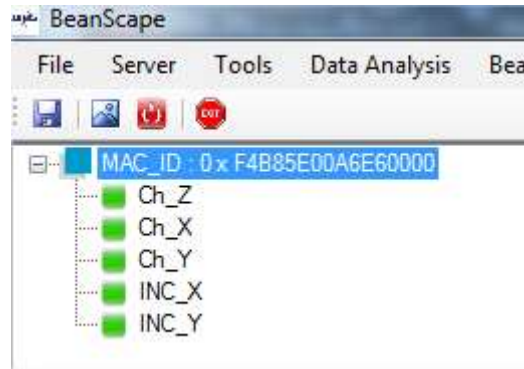
Figure 18: BeanDevice® WiLow® Profile

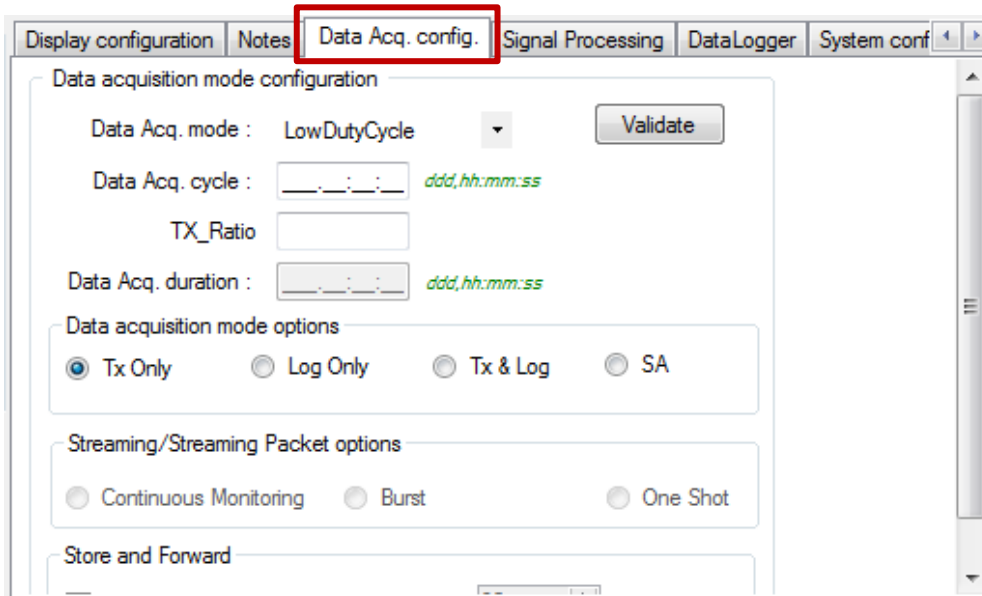4. Go to the configuration frame and select **Data Acq. Config** tab

Figure 19: Data acquisition configuration tab
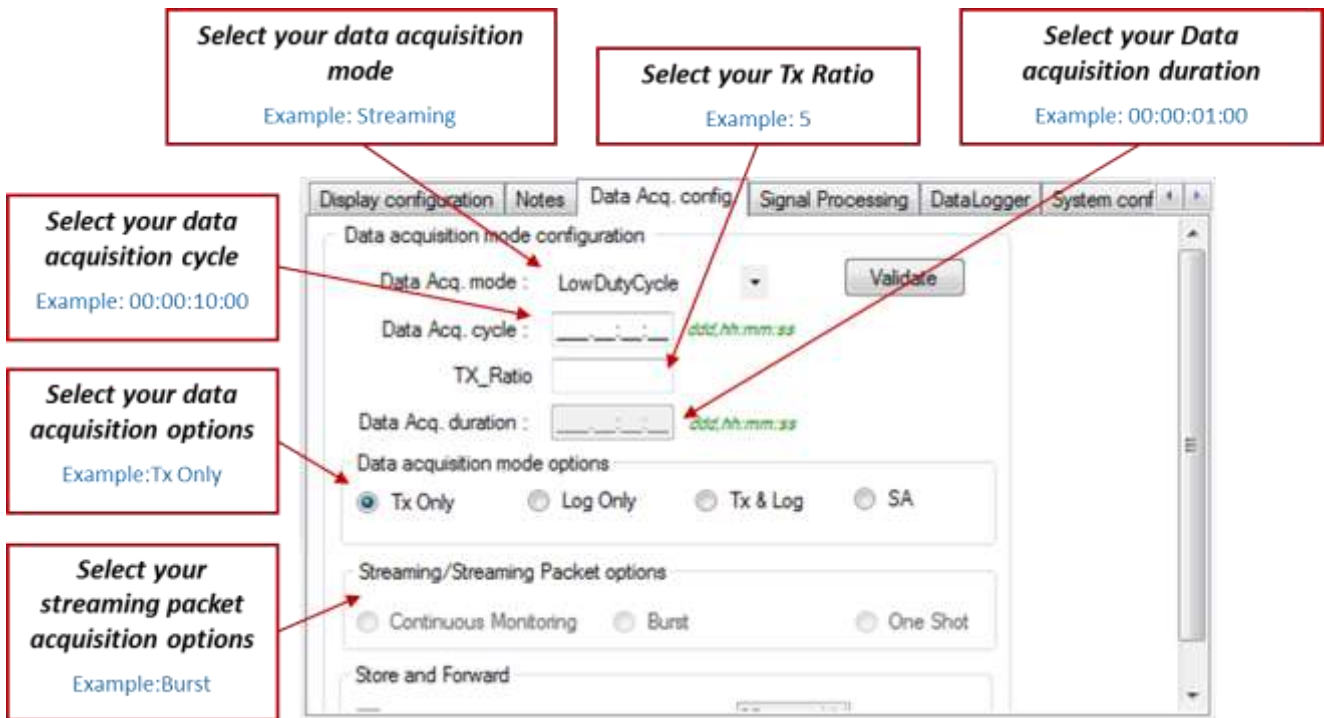
5. Setup your Acquisition mode

Figure 20: Data acquisition parameters

 Find more info on the data acquisition modes available on the BeanDevice® Wilow and how to configure it in this technical note : **Click Here**

6.2   USING THE DATALOGGER

The BeanDevice® Wilow® comes equipped with embedded datalogger of up to 5 million data points (with events dating).

You can start the datalogging from the previously demonstrated data acquisition tab, you can select **Log only** as data acquisition option for only using the embedded datalogger without transmitting data to BeanScape or you can select **TX & LOG** for jointly save data on your BeanScape® Host computer and also in the datalogger at the same time.

You can set the BeanDevice® WiLow® to **SA** (Stand Alone) in order to perform measurement on its own not relying at any WiFi network .
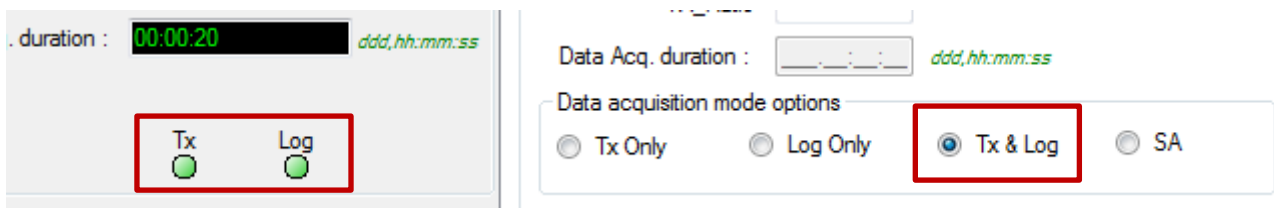

Figure 21: Data acquisition mode options

You can monitor the Datalogger status , actual strategy of the datalogger after getting full,download strategy and percentage of Memory used from BeanScape®.
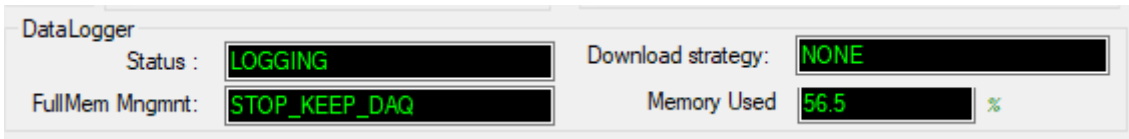

Figure 22: DataLogger information on BeanScape®

These settings can be changed from the DataLogger tab at configuration panel :
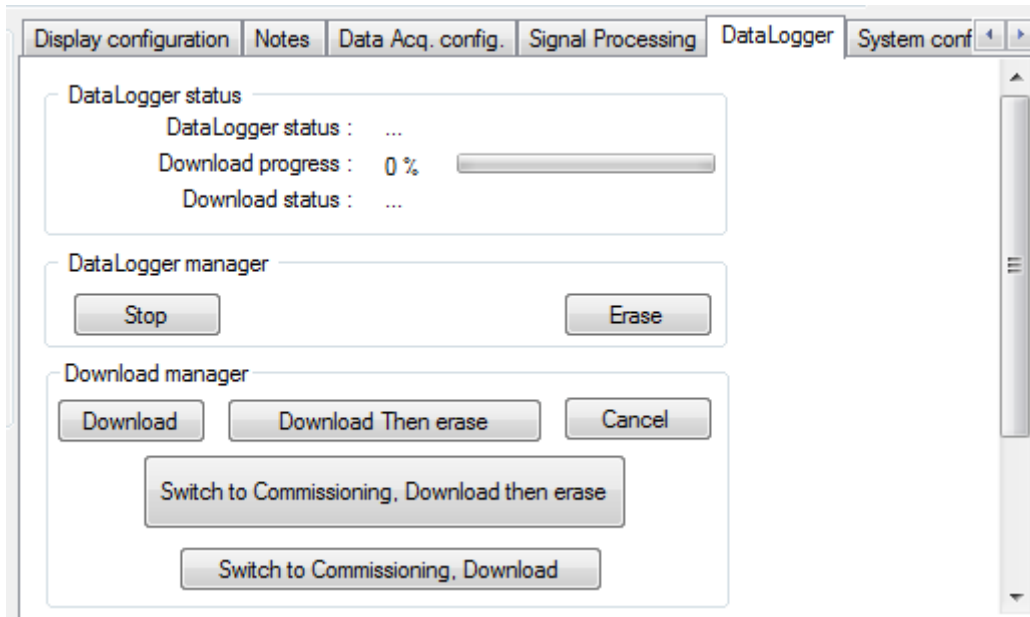
Figure 23: DataLogger tab

Brief information on the status of the datalogger and progress of download can be seen in the tab
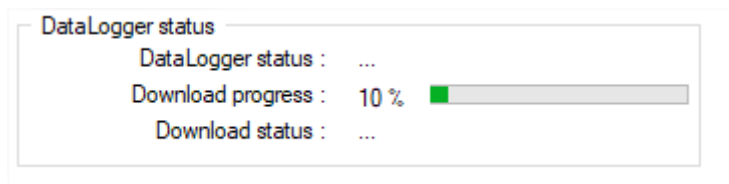
Figure 24: DataLogger status

- Four status are available:
  - o *Ready*: the Datalogger is ready to register data
  - o *NotInit*: the Datalogger is not initialized
  - o *Active logs only*: Data acquisition is logged only
  - o *Active TX and Log*: Data acquisition is logged & transmitted by Radio
  - o *Stopped*: Datalogger is stopped

Two button ,one to stop the logging and the other is to erase stored data and initialize the Datalogger .

Figure 25: DataLogger manager

Below, in the download manager, different options to control the datalogger

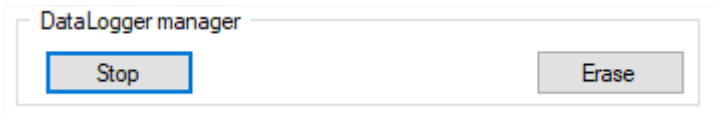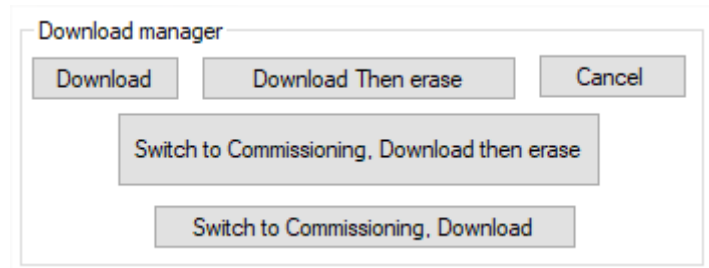*Figure 26: DataLogger download manager*

- *Download*: Starts to download all the logs on the BeanDevice® flash memory to your computer

- *Download then erase*: downloads all the logs and the erase them.

- *Cancel*: Stops the download process

- *Switch to commissioning, download then erase*: switch to commissioning mode ,download the data logged then erase it

- *Switch to commissioning,Download*:switch to commissioning then download(without erasing the data logged)

Below, we configure datalogger strategies when the Memory if full and these different choices are available :

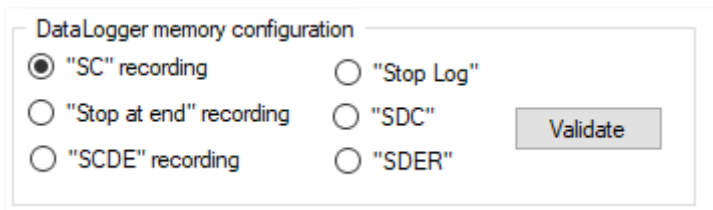*Figure 27: DataLogger memory configuration*

- *"SC" recording* : Switch to commissioning mode when the memory is full

- *"stop at end" recording:* Data recording stops when the memory is full

- *"SCDE"recording:* Switch to commissioning ,Download then erase the recording

- *"Stop Log":* Stop logging and recording(switch to TX recording)

- *"SDC":*Switch commissioning mode and then download recording

■ *"SDER":*Download the recording then erase the data logged then restart recording again

After download completion ,all the logs will be located inside the BeanDevice® Wilow® folder in C:\log_beanscape
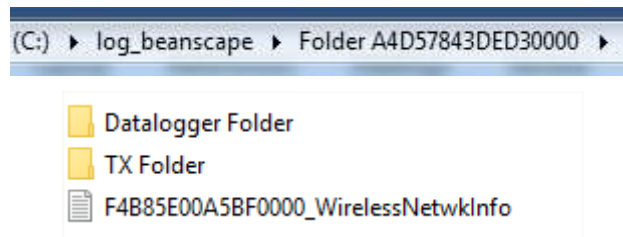
Figure 28: Datalogger Folder on PC

6.3 FIRMWARE UPDATE

Watch the following video on how to upload the firmware:

https://www.youtube.com/watch?v=HblZnW_ri38

6.4 MQTT MODULE

The BeanDevice® Wilow® comes with integrated MQTT module for lightweight data exchange with Internet third party softwares,also to remotely communicate with BeanScape® WiLow RA.

To configure the module of each BeanDevice®, select the BeanDevice® WiLow® from the left panel then go to **BeanDevice** on the **Menu bar** and select **MQTT**.

Figure 29 :BeanDevice MQTT module configuration
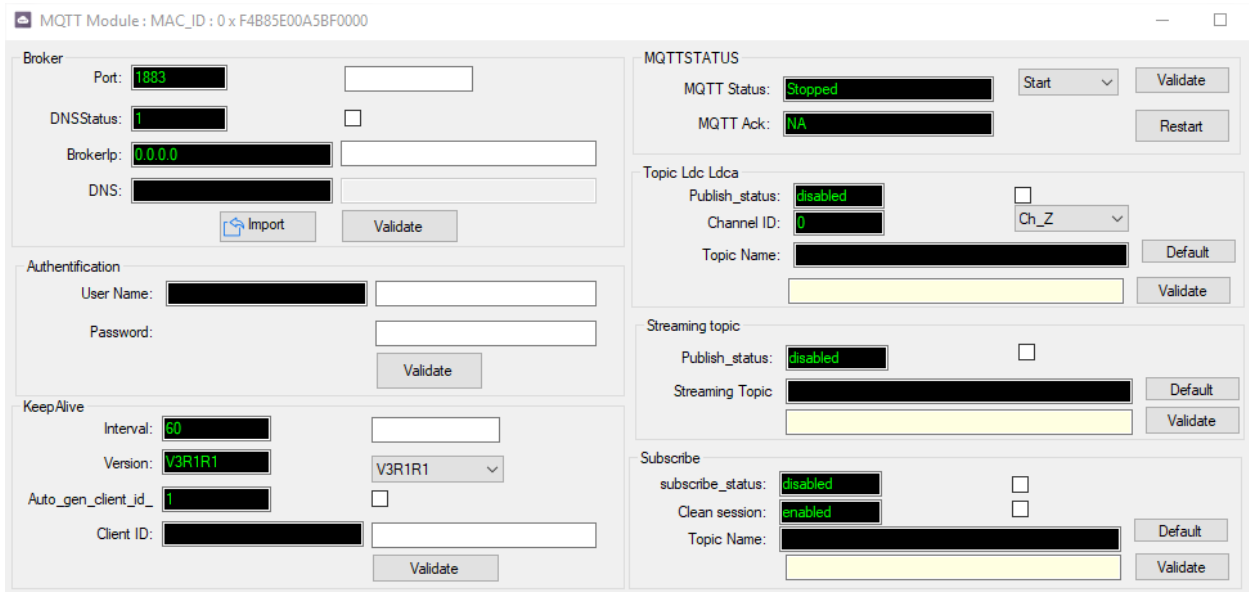
Figure 30 :MQTT configuration window

6.4.1 MQTT broker

The Broker is responsible for distributing messages to interested clients based on the topic of a message.
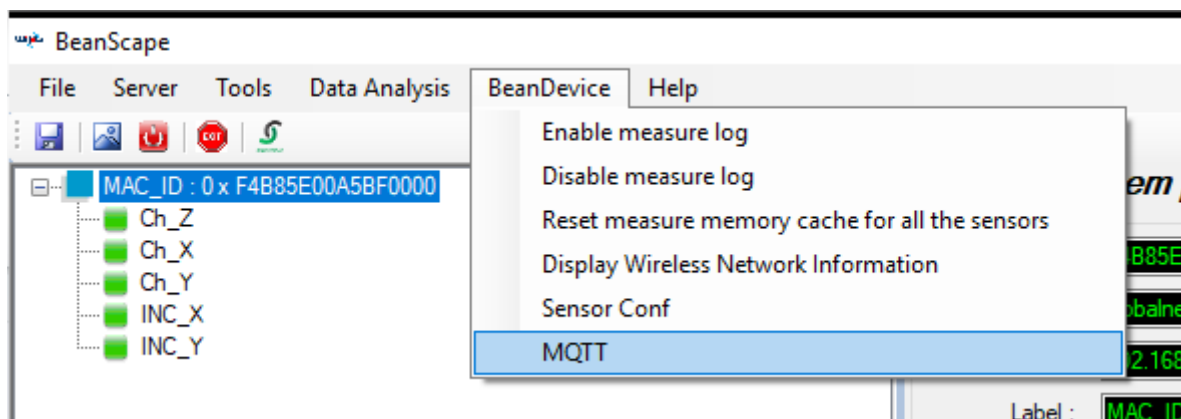There are two categories of brokers, one that is hosted on the Internet, the other is running on internal network.
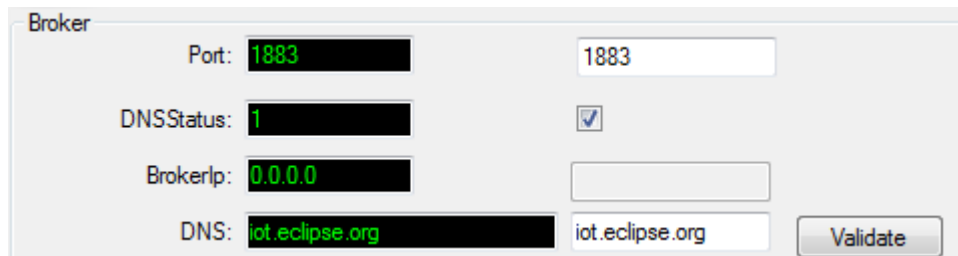
Figure 31: Broker configuration frame

- **Port**: TCP/IP port to use with MQTT .1883 and 8883 are the reserved ports for use with MQTT

- **DNSStatus**: check if you want to enter your broker DNS.DNSStaus is 1

- **Brokerlp**: enter your broker IP address after unchecking DNSStatus .DNSStatus is 0

- **DNS**:domain name server of your Broker

6.4.2 MQTT STATUS

From the MQTTSTATUS frame you can **Start/Stop** your connection and check your MQTT different status (connected ,stopped , connecting or disconnecting).

Figure 32: MQTT Status frame

■ *MQTT Status:* shows the current status of the MQTT module:

- Connecting: trying to establish a connection

- Connected: connection established

- Disconnecting: disconnecting the Client

- Stopped: the connection is stopped

■ *Start/Stop:* select and **Validate** to start or stop your MQTT Client connection

■ *Restart:* restart your connection

6.4.3 topic for static measurement

This topic is used to allow user in the other end connecting on the same MQTT broker to monitor and receive all the measurement data on LowDutyCycle and Alarm acquisition modes (static measurement) .

Figure 33: Topic for static measurement configuration frame

■ *Publish_status:* check and **validate** to enable publishing

■ *Retain Flag:* Check and **validate** to enable retain flag

■ *Channel ID :* channel identification

■ *Topic Name:* Field to enter your topic's name or you can chose default

6.4.4 topic for Dynamic measurement

Same as for static measurements, this topic is used to receive measurements on Streaming, S.E.T and Shock Detection modes .

Figure 34: Topic for dynamic measurement configuration frame

- *Publish_status:* check and **validate** to enable publishing

- *Retain Flag:* Check and **validate** to enable retain flag

- *Streaming Topic:* Text field to enter your streaming topic's name

6.4.5 Subscribe

Subscribe will be used to connect to this BeanDevice® Wilow® and send OTACs from third party software or from BeanScape® Wilo RA .

Figure 35: Subscribe frame

- *Subscribe_status:* check and **validate** to enable subscribing

- *Clean session:* check and validate to enable, then the client does not have a persistent session and all information are lost when the client disconnects for any reason

- *Topic Name:* Field to enter your topic's name .

 Please refer to the BeanDevice® Wilow® user manual section for more information about MQTT, **"click here"**

 For detailed information on the MQTT exchanged frames ,please refer to our technical note on the MQTT communication protocol ,"click here"

 Several information on using MQTT in IoT connected world with examples can be found in our technical note : BeanDevice® Wilow® IoT starter Guidelines using MQTT protocol, "click here"

7. TECHNICAL NOTES AND VIDEOS

In addition to this quickstart paper, please consult the user guide of the BeanDevice® Wilow and all related technical notes and videos

Document name (Click on the web link)	Related product	Description
Wilow WiFi sensor user manual	Wilow® products line	BEANDEVICE® WILOW® user manual
Wilow Battery life in Streaming mode	Wilow® products line	Wilow wireless sensors battery life in streaming mode
Wilow Data acquisition modes	Wilow® products line	Data acquisition modes available on the BeanDevice® Wilow
TN_RF_004- «MQTT Communication Protocol »	Wilow® products line	MQTT Communication Protocol for a seamless integration into a third-party IOT software
TN RF 005 «Building a reliable Wi-Fi network with Wilow sensors»	Wilow® products line	The aim of this document is to describe the autonomy performance of the BeanDevice® SmartSensor® and ProcessSensor® product line in streaming and streaming packet mode.

Beanair video link (YouTube)	Related products
Getting started with BeanDevice® Wilow - Wi-Fi Low Power Sensors	**BeanDevice® Wilow**
Wilow - Wi-Fi Sensors-Low duty cycle data acquisition mode on BeanDevice® Wilow	**BeanDevice® Wilow**
Wilow - Wi-Fi Sensors-Streaming mode with continuous monitoring on BeanDevice® Wilow	**BeanDevice® Wilow**
Wilow - Wi-Fi Sensors-How to setup Wilow Datalogger	**BeanDevice® Wilow**
Wilow - Wi-Fi Sensors-Smart Shock Detection (SSD) mode	**BeanDevice® Wilow®**

All the videos are available on our YouTube channel

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