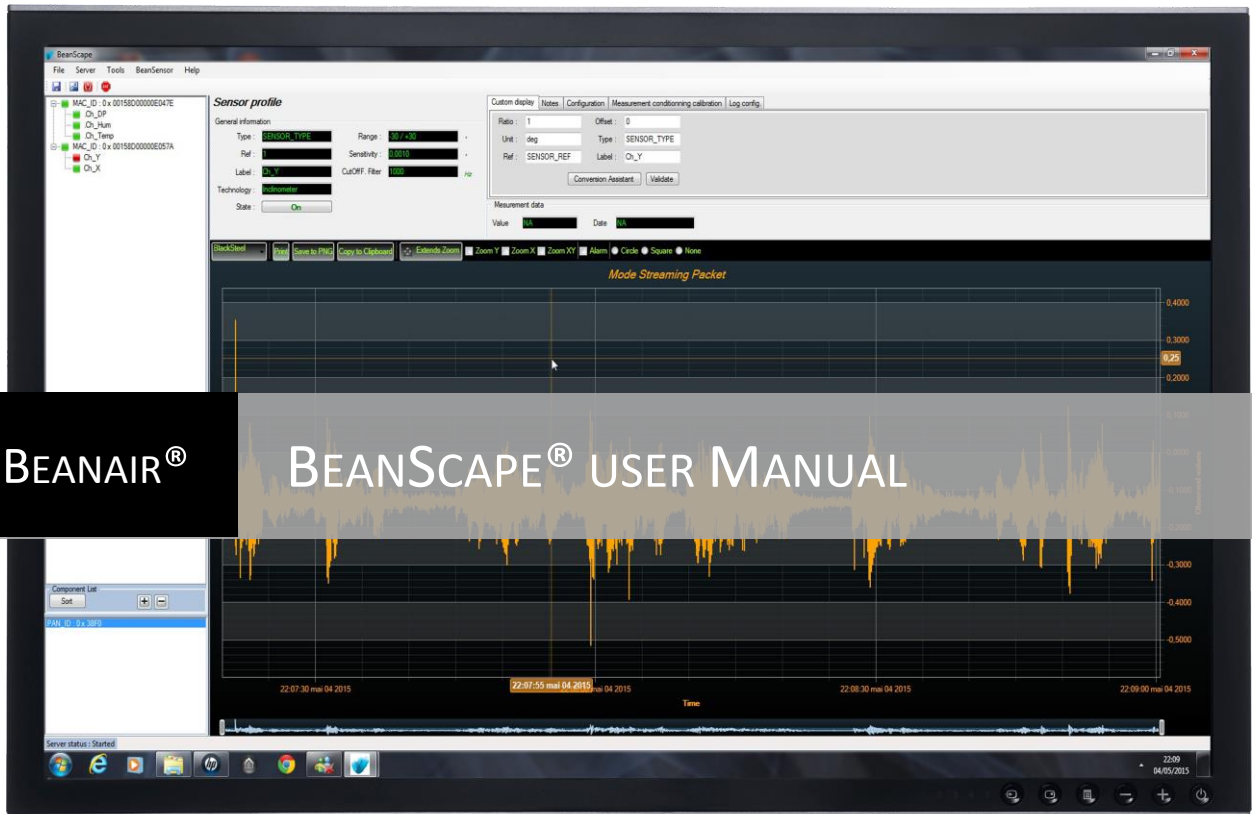




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BEANAIR®

BEANSCAPE® USER MANUAL



"Rethinking sensing technology"

Document version: 1.14

Document type : User Manual

BeanScope® User Manual

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1.15	23/09/2016	Salah Riahi	Sntp Client added
1.16	24/10/2016	Salah Riahi	Multi FFT & DIN 4150-3 / Velocity LOG files
1.17	22/12/2016	Salah Riahi	Overview of BeanScope basic/Alarm by Email/ SNTTP videos added





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BeanScape® User Manual

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## 1. TECHNICAL SUPPORT

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For general contact, technical support, to report documentation errors and to order manuals, contact **Beanair Technical Support Center** (BTSC) at:

[tech-support@Beanair.com](mailto: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](http://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. Keep us informed of your comments and suggestions for improvements.

Beanair appreciates feedback from the users of our information.



## 2. VISUAL SYMBOLS DEFINITION

---

Symbols	Definition
	<p><u>Caution or Warning</u> – 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.</p>
	<p><u>Danger</u> – This information <b>MUST</b> be followed if not you may damage the equipment permanently or bodily injury may occur.</p>
	<p><u>Tip or Information</u> – Provides advice and suggestions that may be useful when installing Beanair Wireless Sensor Networks.</p>





### 3. ACRONYMS AND ABBREVIATIONS

---

<b>AES</b>	Advanced Encryption Standard
<b>CCA</b>	Clear Channel Assessment
<b>CSMA/CA</b>	Carrier Sense Multiple Access/Collision Avoidance
<b>GTS</b>	Guaranteed Time-Slot
<b>kSps</b>	Kilo samples per second
<b>LLC</b>	Logical Link Control
<b>LQI</b>	Link quality indicator
<b>LDCDA</b>	Low duty cycle data acquisition
<b>MAC</b>	Media Access Control
<b>PAN</b>	Personal Area Network
<b>PER</b>	Packet error rate
<b>RF</b>	Radio Frequency
<b>SD</b>	Secure Digital
<b>WSN</b>	Wireless sensor Network





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## 4. RELATED DOCUMENTS & VIDEOS

In addition to this User manual, please consult the related application notes, technical notes and videos:

### 4.1 APPLICATIONS NOTES

Document name (Click on the weblink)	Related product	Description
<a href="#"><u>AN RF 007 :“ Beanair WSN Deployment”</u></a>	All BeanAir products	Wireless sensor networks deployment guidelines
<a href="#"><u>AN RF 006 – „How to extend your wireless range“</u></a>	All BeanAir products	A guideline very useful for extending your wireless range
<a href="#"><u>AN RF 005 – BeanGateway® &amp; Data Terminal Equipment Interface</u></a>	BeanGateway®	DTE interface Architecture on the BeanGateway®
<a href="#"><u>AN RF 003 - “IEEE 802.15.4 2.4 GHz Vs 868 MHz”</u></a>	All BeanAir products	Comparison between 868 MHz frequency band and a 2.4 GHz frequency band.
<a href="#"><u>AN RF 002 – “Structural Health monitoring on bridges”</u></a>	All BeanAir products	The aim of this document is to overview Beanair® products suited for bridge monitoring, their deployment, as well as their capacity and limits by overviewing various Data acquisition modes available on each BeanDevice®.



## 4.2 TECHNICAL NOTES

Document name (Click on the weblink)	Related product	Description
<a href="#"><u><b>TN RF 013 – « OPC configuration »</b></u></a>	BeanScope® Premium+	The aim of this document is to help deploying the OPC DA and all associated services.
<a href="#"><u><b>TN RF 012– « BeanDevice® battery life in streaming mode »</b></u></a>	All the products	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.
<a href="#"><u><b>TN RF 011 – « Coexistence of Beanair WSN at 2.4GHz »</b></u></a>	All the products	This document aims to highlight the issues affecting co-existence of Beanair WSN (IEEE 802.15.4) in the presence of interference.
<a href="#"><u><b>TN RF 010 – « BeanDevice® Power Management »</b></u></a>	All the BeanDevice®	This technical note describes the sleeping & active power mode on the BeanDevice®.
<a href="#"><u><b>TN RF 009 – « BeanGateway® management on LAN infrastructure »</b></u></a>	BeanGateway®	BeanGateway® integration on a LAN infrastructure
<a href="#"><u><b>TN RF 008 – “Data acquisition modes available on the BeanDevice®”</b></u></a>	All the BeanDevice®	Data acquisition modes available on the BeanDevice®
<a href="#"><u><b>TN RF 007 – “BeanDevice® DataLogger User Guide ”</b></u></a>	All the BeanDevice®	This document presents the DataLogger feature on the BeanDevice®
<a href="#"><u><b>TN RF 006 – “WSN Association process”</b></u></a>	All the BeanDevice®	Description of the BeanDevice® network association
<a href="#"><u><b>TN RF 005 – “Pulse counter &amp; binary Data acquisition on the BeanDevice® SUN-BN”</b></u></a>	BeanDevice® SUN-BN	This document presents Pulse counter (ex: energy metering application) and binary Data acquisition features on the BeanDevice® SUN-BN.
<a href="#"><u><b>RF TN 003- “Aggregation capacity of wireless sensor networks”</b></u></a>	All the products	Network capacity characterization of Beanair Wireless Sensor Networks
<a href="#"><u><b>RF TN 002 V1.0 - Current consumption in active &amp; sleeping mode</b></u></a>	BeanDevice®	Current consumption estimation of the BeanDevice in active and sleeping mode
<a href="#"><u><b>RF TN 001 V1.0- Wireless range benchmarking</b></u></a>	BeanDevice®	Wireless range benchmarking of the BeanDevice®



### 4.3 RELATED VIDEOS



*[All the videos are available on our Youtube channel](#)*

Beanair video link (Youtube)	Related products
<a href="#">Company Presentation</a>	All
<a href="#">BeanGateway® - Ethernet Outdoor version introduction</a>	BeanGateway® - Ethernet Outdoor version introduction
<a href="#">BeanGateway® – Ethernet Indoor version presentation</a>	BeanGateway® Ethernet Indoor version
<a href="#">BeanDevice® AN-XX wireless range demonstration</a>	BeanDevice® AN-XX & BeanDevice® AN-XX Extender
<a href="#">BeanDevice® AN-XX presentation</a>	BeanDevice® AN-XX & BeanDevice® AN-XX Extender
<a href="#">BeanDevice® AX-3D presentation</a>	BeanDevice® AX-3D
<a href="#">BeanDevice® HI-INC presentation</a>	BeanDevice® HI-INC
<a href="#">BeanDevice® AX-3DS presentation</a>	BeanDevice® AX-3DS
<a href="#">BeanScape® – WSN supervision software</a>	BeanScape®
<a href="#">BeanGateway® Ethernet/LAN Configuration, directly connected to the Laptop/PC</a>	BeanGateway®
<a href="#">Wireless sensors profile deletion from the BeanGateway® Database</a>	All



## 5. SYSTEM OVERVIEW



BeanScope® software is suitable for monitoring and configuring Beanair wireless sensor networks. It is designed to provide a high level of flexibility and efficiency.

BeanScope® provides the following features:

- ✓ **Monitoring wireless sensor networks.**
- ✓ **Displaying configured alarms of different wireless networks.**
- ✓ **Sensors calibration and configuration**
- ✓ **OTAC (Over-the-air-configuration)**



- ✓ *Data and diagnosis analysis through curves and statistics*
- ✓ *Ability to store measurements and diagnostic information in a database as a LOG file*
- ✓ *Tools for optimizing the installation of wireless sensor networks*

The BeanScape® is a powerful software tool with client/server architecture. This implies that the network sensor communicates with the BeanScape® through a wireless coordinator called BeanGateway®. The BeanScape® acts as the server and the BeanGateway® acts as the client.

Beanair® network is comprised of a network coordinator (BeanGateway®) and wireless sensors (BeanDevices®).

FEATURES	 BeanScape Manager	 BeanScape Basic	 BeanScape Premium	 BeanScape Premium+
<b>Number of handled wireless sensor networks</b>	1	1	Unlimited	Unlimited
<b>Period technical assistance (e-mail)</b>	1 Month	3 Months	6 Months	6 Months
<b>OPC Server DA</b>	No	No	No	Yes
<b>Number of BeanDevice®</b>	45	50	Unlimited	Unlimited
<b>Real time data base</b>	Yes	Yes	Yes	Yes
<b>GUI (Graphical User Interface)</b>	No	Yes	Yes	Yes
<b>Free of cost ?</b>	Yes	No	No	No

*Figure 1 : the different versions of BeanScape® software*

BeanScape® manager is not provided with a real-time graph display.



[See “Overview of our BeanScape Basic” Youtube video](#)



## 6. HOW THE BEANSCAPE LICENCE IS WORKING?

---

The BeanScape® license is related to the BeanGateway® device, i.e user can install the BeanScape on different PC and asynchronously connect it to the same BeanGateway®.

If a new BeanGateway® is acquired, there will be two applications cases:

- The BeanGateway® works independently, a new BeanScape® Basic should be acquired.
- The BeanGateway® is connected to the same PC (multi-WSN management), BeanScape® Premium/Premium+/Cloud should be considered.



*Figure 2: BeanScape License*



## 7. HARDWARE & SOFTWARE COMPATIBILITY

### 7.1 COMPATIBLE OPERATING SYSTEMS

The BeanScape® is compatible with many operating systems:

Operating Systems	Compatibility	Tested/Certified
Windows XP	Yes	Yes
Windows Vista	Yes	Yes
Windows 7 (32-bit)	Yes	Yes
Windows 7 (64-bit)	Yes	Yes
Windows 8 (32-bit/64-bit)	Yes	Yes
Windows 8.1 (32-bit/64-bit)	Yes	Yes

Table 1: Compatible operating systems



The BeanScape software license is linked to the BeanGateway. Therefore it can installed on different PC/Laptop.

### 7.2 RECOMMENDED MINIMUM CONFIGURATION

Operating Systems	BeanScape® Manager (Streaming packet mode not enabled)	BeanScape® Basic (Streaming packet mode not enabled)	BeanScape® Basic ( Streaming packet mode enabled)	BeanScape® Premium+	BeanScape® Premium
CPU	2.33GHz or faster x86-compatible processor				
RAM memory	1 GB	2 GB		4 GB	
Disk Space	5 GB	5 GB		10 GB	
Graphic card	128 MB	128 MB		1 GB	

Table 2: Recommended minimum configuration





## 8. INSTALLING YOUR BEANSCAPE® SOFTWARE

---

Installing the BeanScape® software is very easy:

- ✓ Double click on "setup.exe" file (shown below) to launch BeanScape®



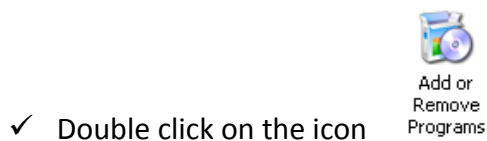
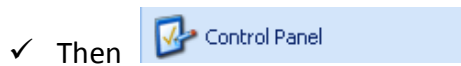
- ✓ Follow the different stages of installation
- ✓ When installing the software, a location for the log files is requested. These files are used to store all the data coming from the Wireless Sensor Network (information about the Network diagnostic, data acquisition of different wireless sensors, network acknowledgment etc.).
- ✓ Click Finish to complete the installation of **BeanScape®**.
- ✓ The installation is now complete; the **BeanScape®** shortcut icon is now available on your desktop.



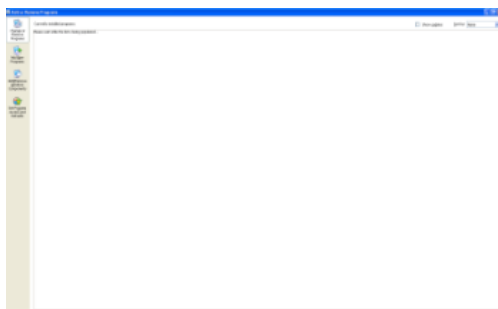
## 9. UNINSTALLING BEANSCAPE®


---

- ✓ To uninstall BeanScape®, follow these instructions:



- ✓ You will see the following window:



- ✓ Select BeanScape® and click 
- ✓ Follow the steps for uninstalling.
- ✓ Uninstall is now complete.



## 10. START YOUR APPLICATION



For further information on LAN Network configuration:

- Read the following technical note: [TN\\_RF\\_009 – « BeanGateway® management on LAN infrastructure »](#)



Related video: [BeanGateway® Ethernet/LAN Configuration, directly connected to the Laptop/PC](#)

### 10.1 ETHERNET CABLE CONNECTION

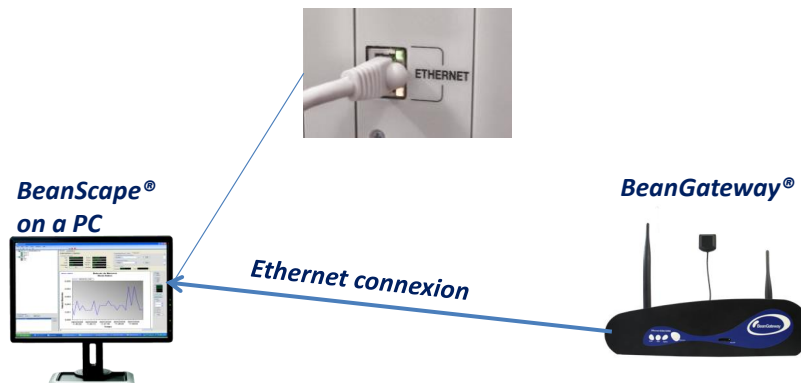


Figure 3: Typical LAN connection

To view the entire wireless sensor network from your **BeanScape®**, you must firstly connect your **BeanGateway®** to a PC where the **BeanScape®** is installed. Connection is established through an Ethernet cable.

- ✓ Make sure the Ethernet cable is connected to both your PC and **BeanGateway®**
- ✓ Make sure your **BeanGateway®** is powered and in "ON" position.
- ✓ Make sure that your **BeanScape®** is installed on your PC




## 10.2 SETTING UP A NETWORK ON YOUR COMPUTER

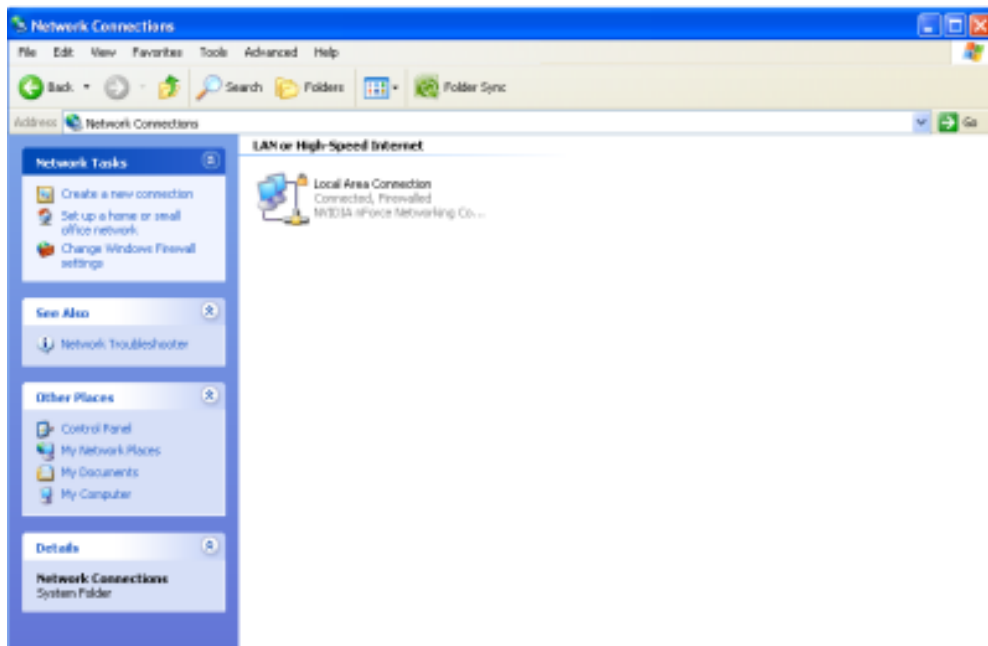
To configure the network on your computer/workstation:

- ✓ Click on 

- ✓ Then on  Control Panel

- ✓ Double-click on  Network Connections

- ✓ You will see the following window

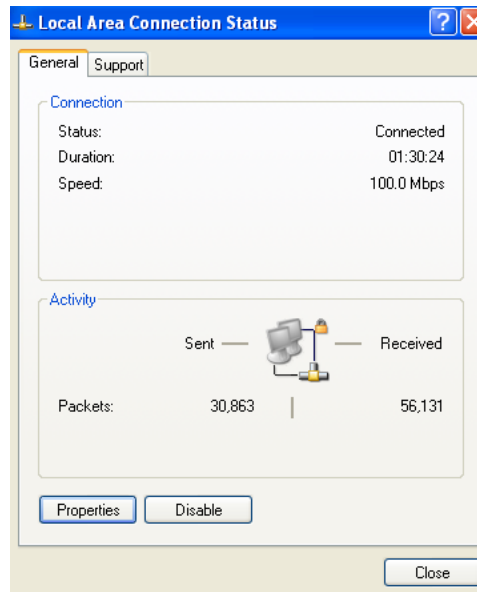



- ✓ Select the icon corresponding to the (NIC) network interface card on what you connected the

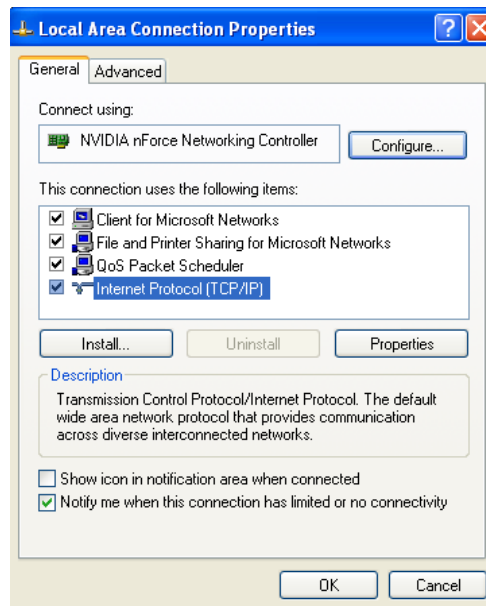


- ✓ Double-click the icon.
- ✓ You get the following window:



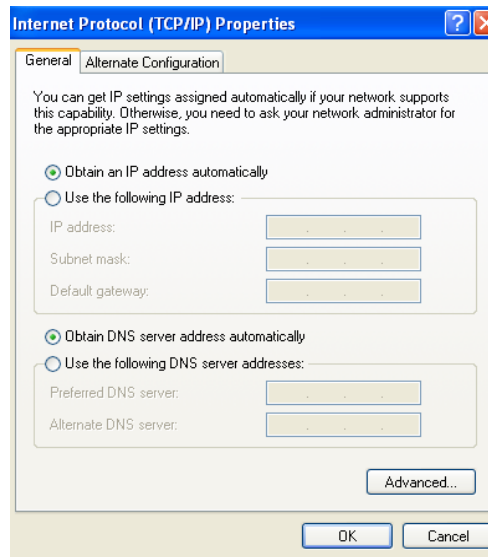


- ✓ Click on 
- ✓ You will see the following window:

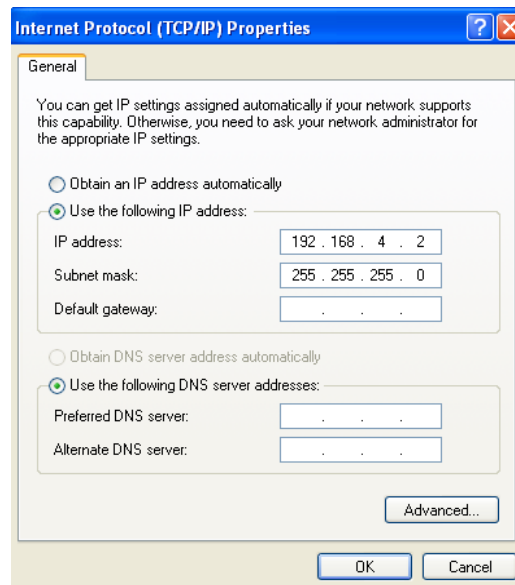


- ✓ Double click on  **Internet Protocol (TCP/IP)**
- ✓ You will see the following window :





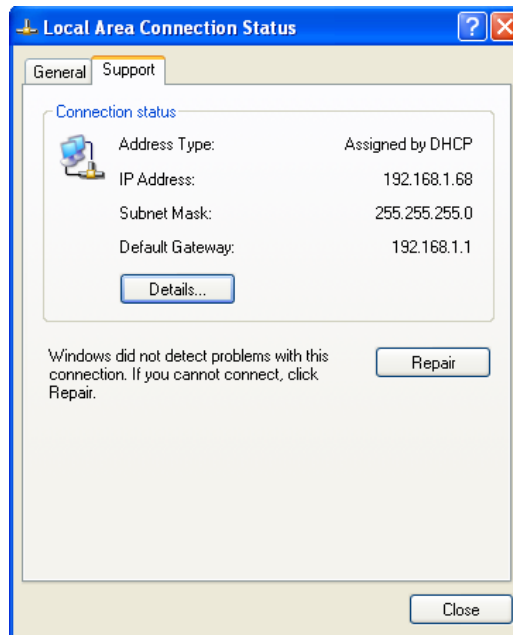
- ✓ In case you set the DHCP active on your BeanGateway®, the BeanGateway® IP is directly obtained by the network, choose the option  Obtain an IP address automatically
- ✓ If the DHCP option has not been activated, you must enter a static IP **192.168.4.2** on your PC with a subnet mask: 255.255.255.0.



- ✓ Click "OK" to confirm and safeguard your work.
- ✓ Your computer is now connected to your wireless sensor networks. In order facilitate these exchanges you must give commands from BeanScope®.
- ✓ Reach the "Start" menu in the bottom left of the computer screen.
- ✓ The above image shows the start menu. Select the folder named "Control Panel".



- ✓ You will find more information by opening Windows "Local Area Network Connection" and clicking on the **Support** tab.
- ✓ You will see the following window:



*By default the BeanGateway® IP address is set at 192.168.4.123 with the DHCP disabled. The BeanGateway is considered as a client by the BeanScape® (server) having the IP address by default set to 192.168.4.2.*

### 10.3 FIREWALL COMPATIBILITY

Some firewalls will not permit applications such as BeanScape® (or any applications you have not specifically allowed) to access your BeanGateway®. Generally, the first time the BeanScape® or another application tries to access the BeanGateway®, you will be asked if you would like to allow that application access. If you accidentally clicked **No** on that message (or if your firewall never asked for permission to allow the BeanScape® access), you will not be able to use the BeanScape® until you configure your firewall to allow BeanScape® to access your BeanGateway®.



With most firewalls, this is easy to do. Keep in mind that all firewalls are a bit different, but the process is usually as follows:

1. Make sure that your BeanScope® is not running;
2. Open your firewall. If you can't find your firewall application, check the System Tray (at the bottom-right corner of the screen) for an icon. Usually, you can right-click this icon and select to open the firewall;
3. Your firewall maintains a list of applications installed on your computer (usually under a heading like Settings or Program Control). In this list, locate the entry for BeanScope®;
4. Configure the BeanScope® entry to allow it to connect to the BeanGateway®;
5. Save your modifications;
6. Restart the BeanScope® software

#### 10.4 START THE BEANSCOPE®

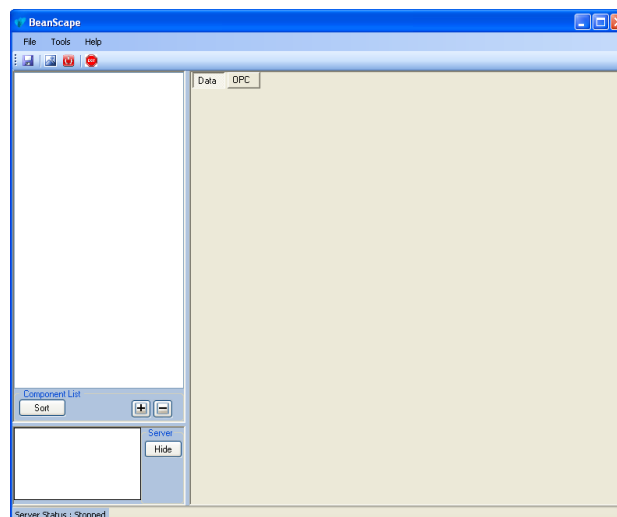
---

To start BeanScope®, please follow the instructions:

- Start BeanScope® by double-clicking the icon

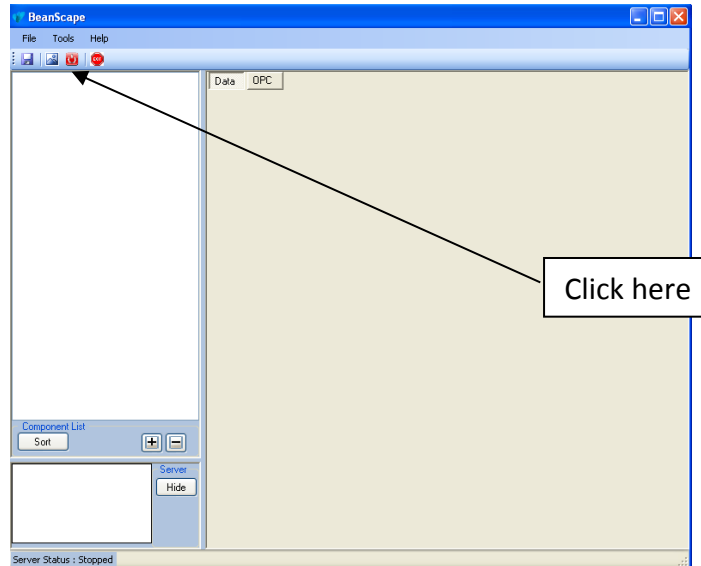


- You get the following screen:

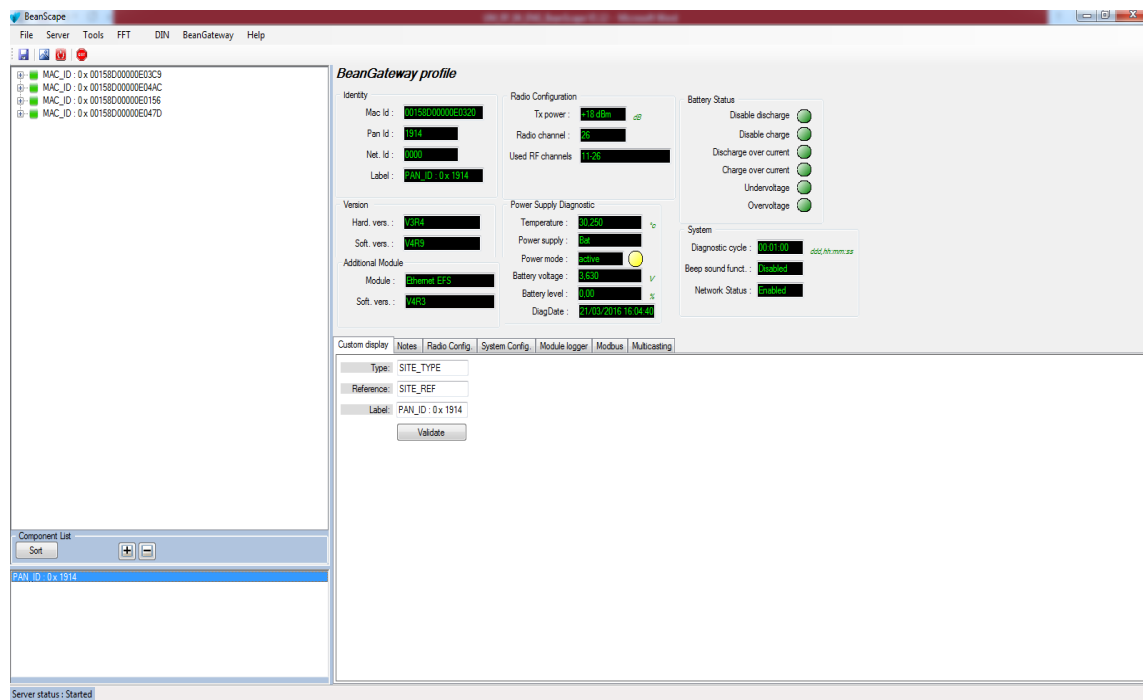




- Start the server by clicking the Start button 



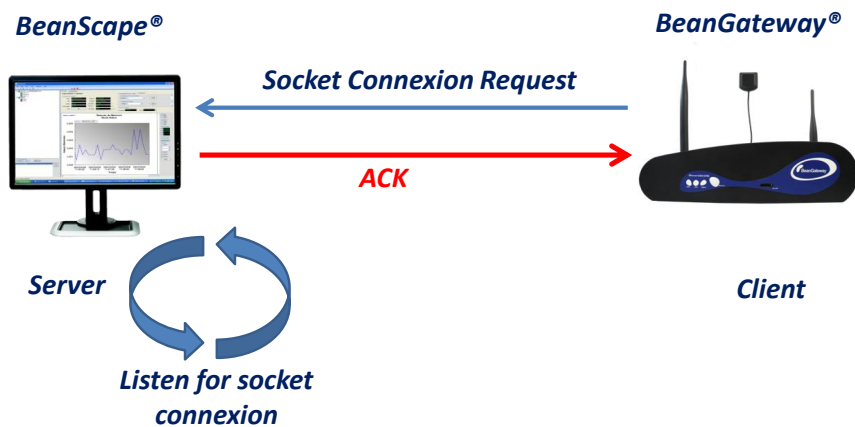
The BeanScope® server starts, and creates the BeanDevices® mapping based.



## 10.5 HOW THE CONNECTION IS ESTABLISHED BETWEEN THE BEANGATEWAY® AND THE BEANSCOPE® ?

### Step 1: Socket connexion

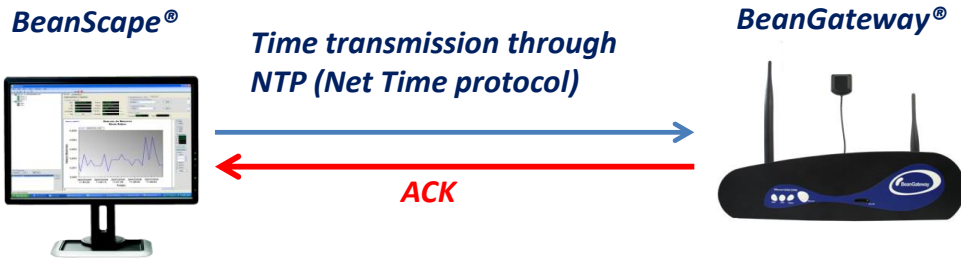
- When the BeanScope® is launched , as a server it starts with listening for a socket connexion
- When you power up the BeanGateway®, a request for socket connexion is established between the Beanscape® and the BeanGateway®
- If this request is accepted by the BeanScope®, an ACK is transmitted to the BeanGateway®



### Step 2: Time & Date update

- Date transmission by NTP (Net-Time Protocole)
- Time & Date are updated on the BeanGateway instantly
- The BeanGateway integrates a Real-Time-Clock directly powered by th internal battery which allows to maintain the Time and Date if the BeanGateway® is power down





**Computer time and date must be updated**

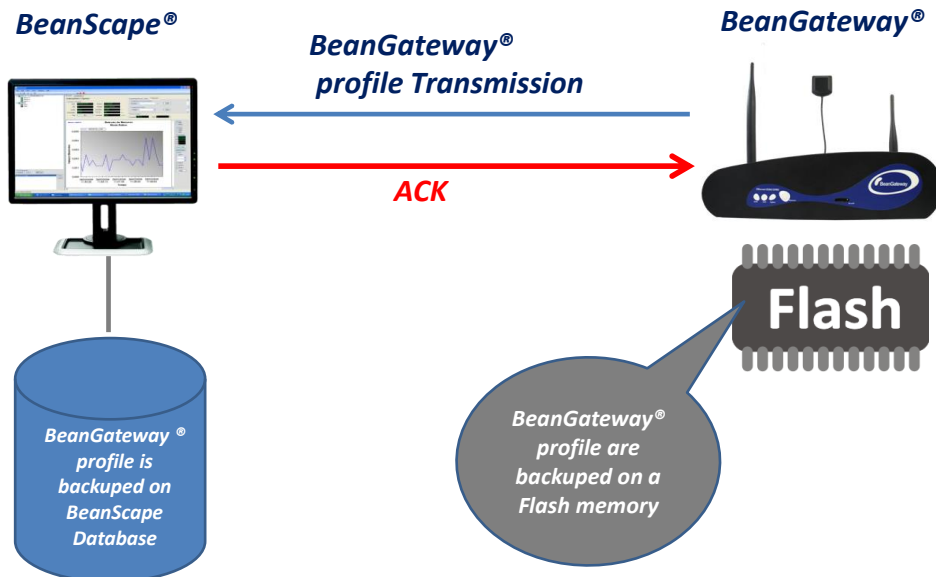


**BeanGateway® Time and Date is synchronized with your PC**



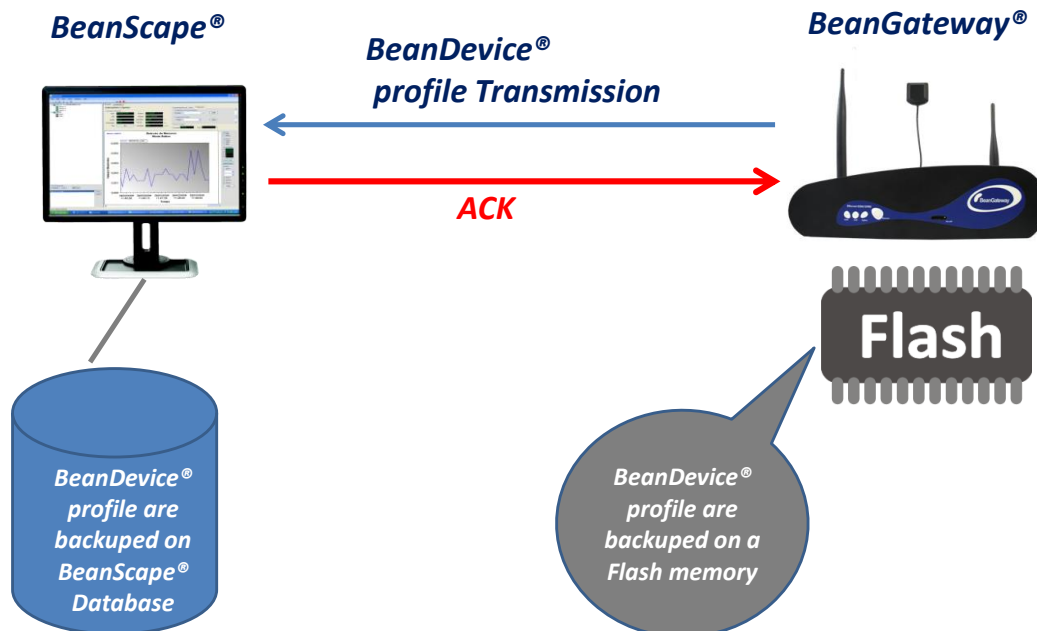
### Step 3: BeanGateway® Profile Transmission

- The **BeanGateway®** profile is retained on its flash memory. This profile contains the informations about the BeanGateway® ID (NWK Add, PAN ID, MAC ID, IP...) , versions ID (Hardware, embedded software, stack...), Radio Management parameters (Radio channel, TX Power, ....);
- The **BeanGateway®** profile is transmitted to the BeanScape®;



## Step 4: WSN Mapping transmission

- The WSN mapping concerns all the Beandevicé® profile. The WSN mapping is backed up on the BeanGateway® flash memory. When a new BeanDevicé® joins a WSN, its profile is transmitted to the BeanGateway® and the BeanScape®.
- The BeanScape® displays the WSN Mapping with the BeanDevicé® profile;
- WSN Mapping is backed up on the BeanScape® Database.



*The WSN Time & Date is synchronized with your PC. The User must make sure that the Time & Date on his computer is updated.*



## 10.6 LAN/ETHERNET CONFIGURATION (FOR ADVANCED USER ONLY)



Click on the following weblink to see the video: [BeanGateway® Ethernet/LAN Configuration, directly connected to the Laptop/PC](#)



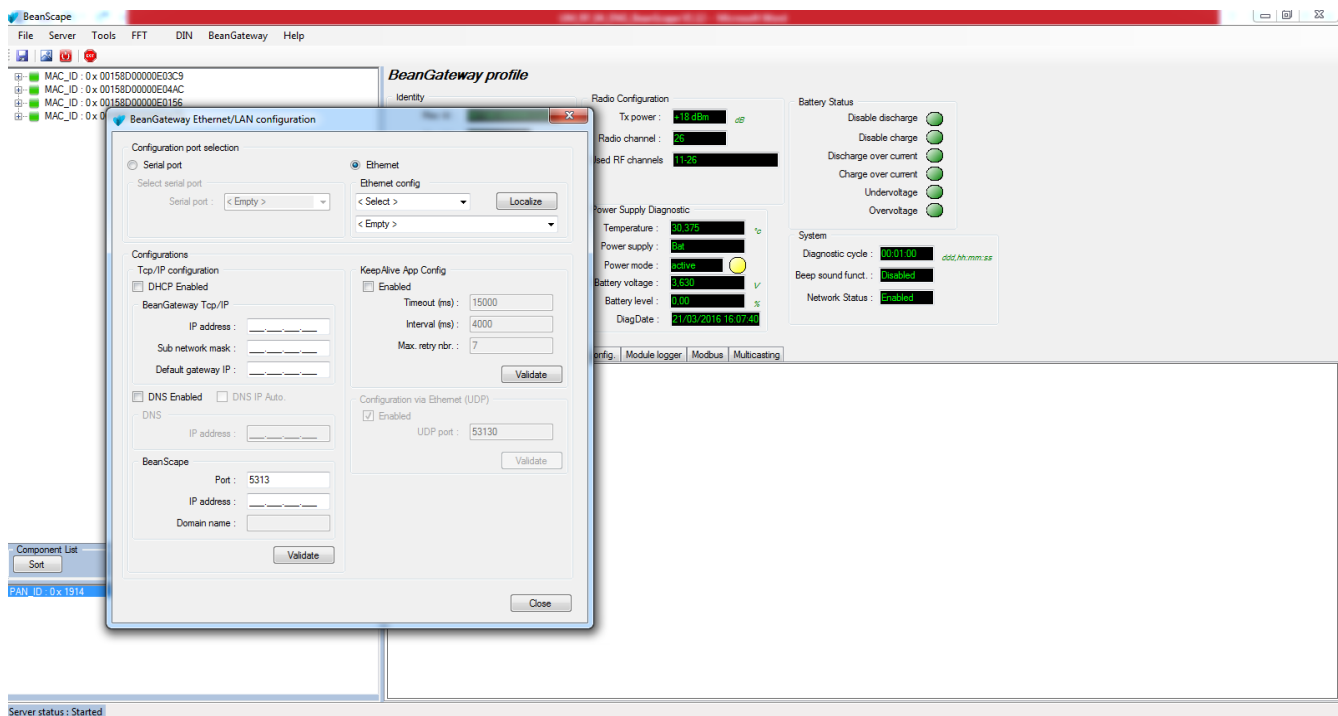
*Please check your Network settings before you make any changes.*

By default, the BeanGateway® is configured with a static IP address: **192.168.4.123**. This allows the user to connect fastly the BeanGateway® to a PC.

If you want to set the BeanGateway® IP on your business network and get a dynamic IP address (via DHCP), you can configure the BeanGateway® via a serial port or via the Ethernet.

Go on your BeanGateway® profile and click on Tools, then click on BeanGateway config.

A new window will open called “BeanGateway® configuration”



Choose the configuration Port:

Select the Serial Port on your PC

DHCP Enabled (if the case)

IP address of your BeanGateway®

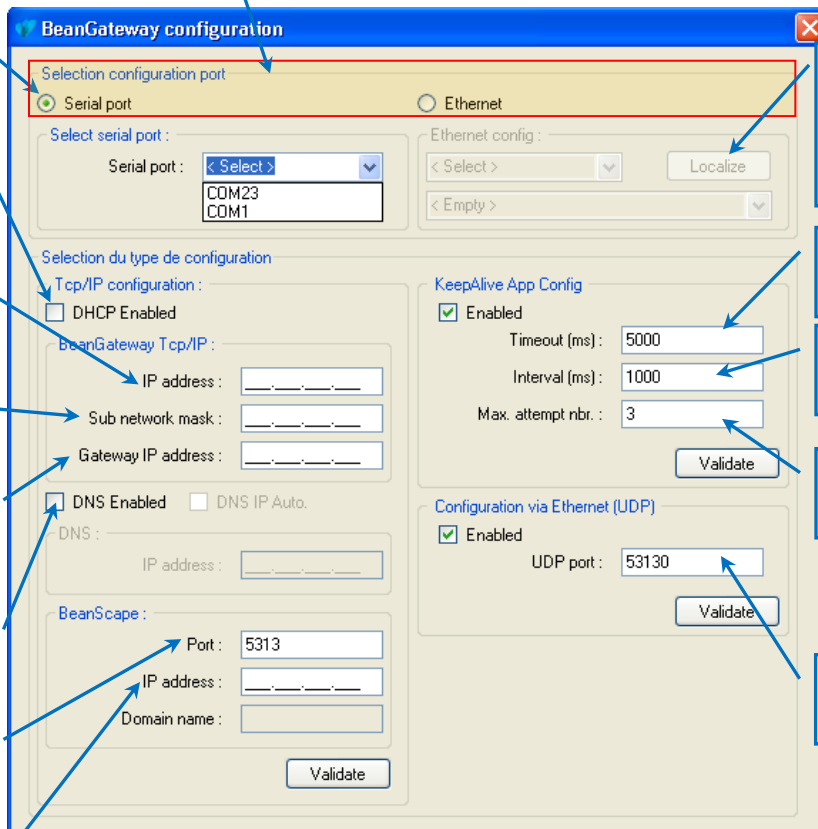
Subnet network mask

Subnet Gateway IP Address

DNS Enabled (if the case is checked)

BeanScope® / PC Socket Port

BeanScope® / PC IP Address



Localize the entire device connected on the LAN router

Keep alive Timeout (ms)

Keep alive interval (ms)

Keep alive max retry

UDP Port

- ✓ **DHCP Enabled:** Check this case if you want to enable the DHCP. For further information about DHCP read the [Technical Note "BeanGateway® management on your Local Area Network infrastructure"](#).
- ✓ **If DHCP is not activated, the user must configure the BeanGateway® IP parameters:**
  - **IP Address:** BeanGateway IP Address. The BeanGateway® IP address should have the following form: "X.Y.Z.B". With A, B, X, Y and Z numbers between 0 and 255
  - **Subnet Network mask:** The subnet mask is set to "255.255.255.0" by default
  - **Gateway IP Address:** Subnet network mask



- ✓ **DNS Enabled:** Check this case if you want to enable the DNS. For further information about DNS read the [Technical Note "BeanGateway® management on your Local Area Network infrastructure"](#).
- ✓ The gateway IP address subnet is the default "X.Y.Z.1"
- ✓ **Port:** By default, the communication port used is «5313». This port is generally free, if not choose another Socket Port.



For further information, please read the following technical note – [TN RF 009 – « BeanGateway® management on LAN infrastructure »](#)

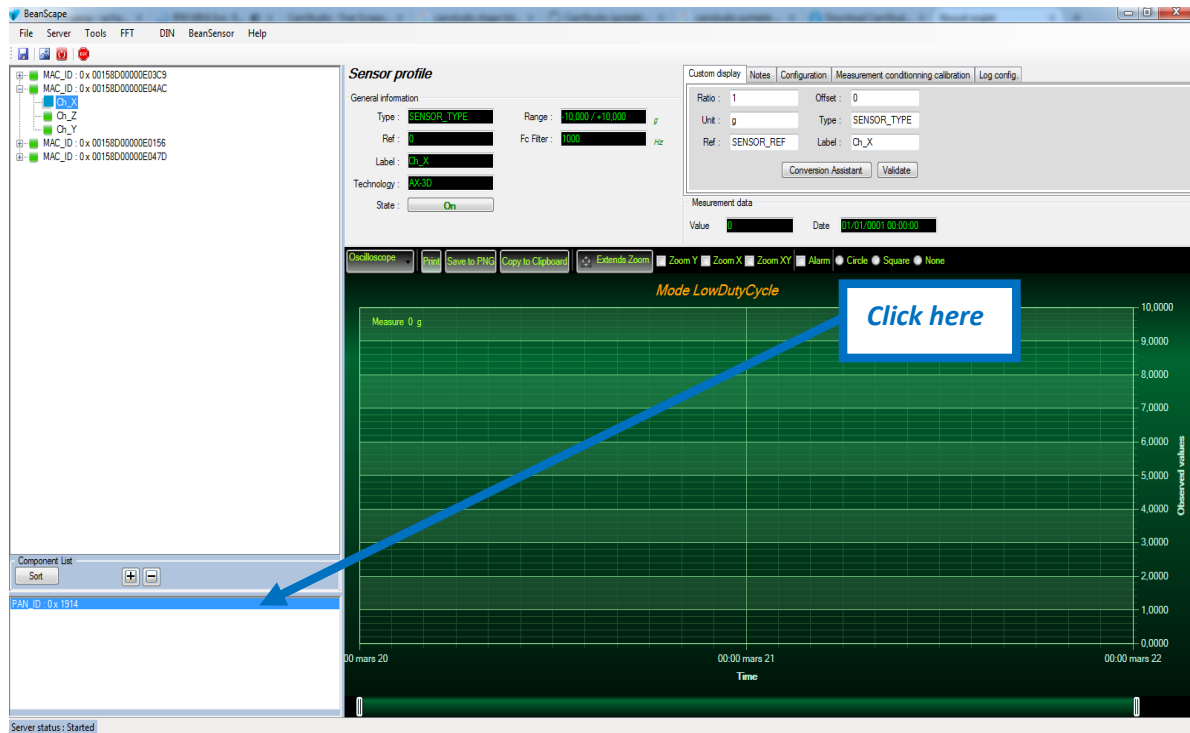




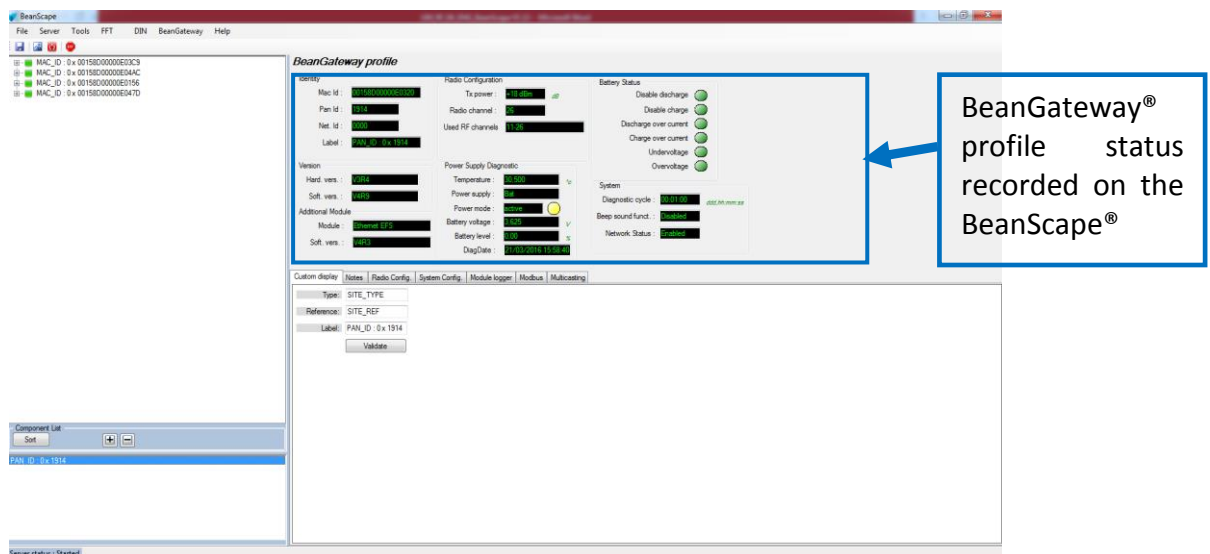
## 11. DEVICE PROFILE

### 11.1 BEANGATEWAY® PROFILE

The BeanGateway® is identified by its PAN ID and is located on the lower left window.



✓ You will see the following window:



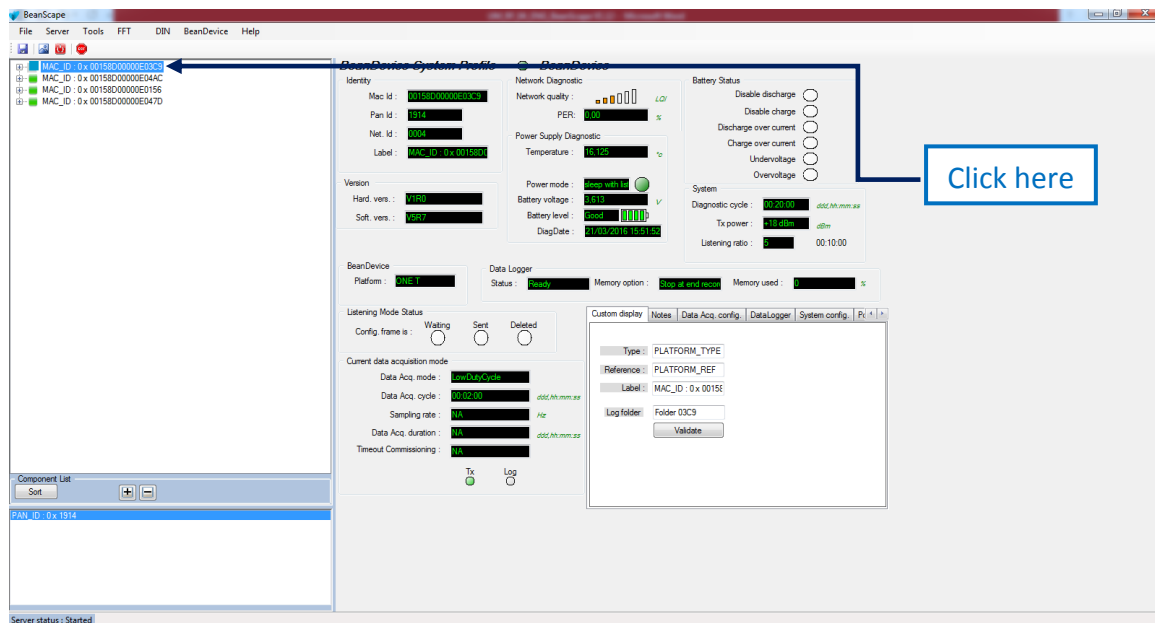
The values in green on the black background refer to the BeanGateway® current status.



For further information about the BeanGateway®, please read the BeanGateway® user manual.

## 11.2 BEANDEVICE® PROFILE

Click on the BeanDevice® folder tree on the left side pane, you will obtain all the information about your BeanDevice® connected to your network.



For further information about your BeanDevice®, please read the BeanDevice® user manual.

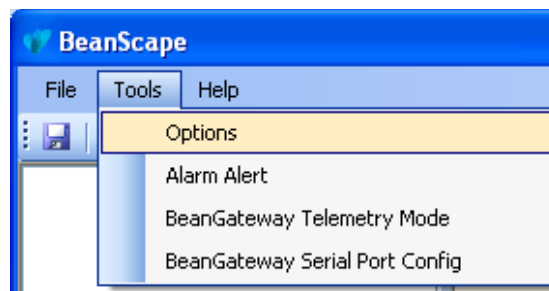


## 12. SYSTEM CONFIGURATION (FOR ADVANCED USER ONLY)



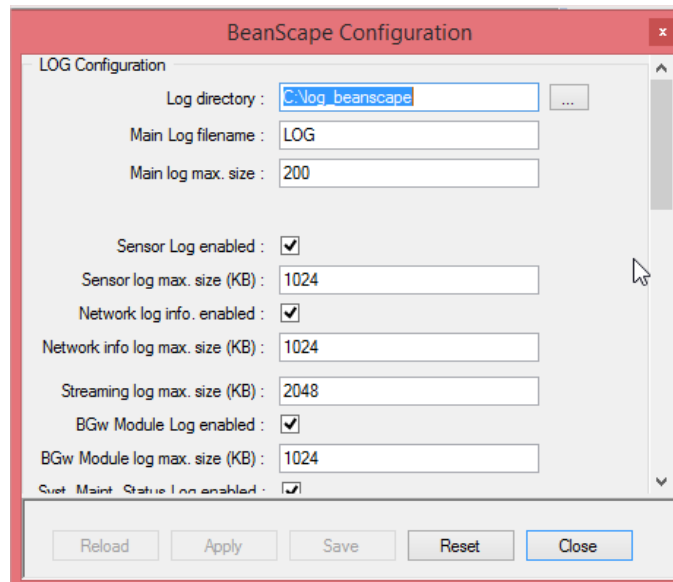
*The following procedure applies only for advanced users*

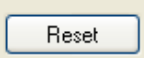
Click on the tab Tools then Options to configure advanced settings in **BeanScope®**:



This window lets you configure the logs, data cache and Ethernet/LAN link between the BeanDevice® and the BeanGateway® .

- ✓ A second window will appear:

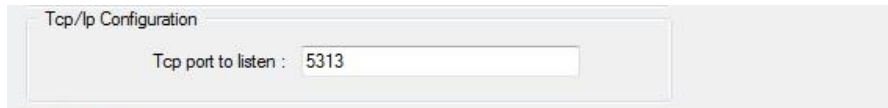


- ✓ Clicking the button  reverts back to its original configuration.
- ✓ Logs & data cache configuration are described in the **BeanDevice® user manual**.



## 12.1 TCP/IP CONFIGURATION

---




Top/Ip Configuration

Tcp port to listen : 5313

Configure the TCP port number, by default to 5313 in order to listen.

## 12.2 KEEP ALIVE APPLICATION

---



KeepAlive.App

KeepAlive.App enabled :

KAA timeout : 10000

KAA interval : 2000

Max. retry : 5

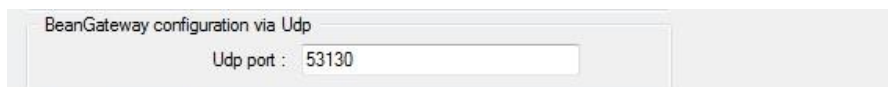
Three parameters related to Keepalive are available:

- **Keepalive time** is the duration between two keepalive transmissions in idle condition. TCP keepalive period is required to be configurable and by default is set to no less than 2 hours.
- **Keepalive interval** is the duration between two successive keepalive retransmissions, if acknowledgement to the previous keepalive transmission is not received.
- **Keepalive retry** is the number of retransmissions to be carried out before declaring that remote end is not available.

Keepalive packet contains null data. In a TCP/IP over Ethernet network, a keepalive frame is of 60 bytes, while acknowledge to this also null data frame and is of 54 bytes.

## 12.3 BEANGATEWAY® CONFIGURATION VIA UDP

---



BeanGateway configuration via Udp

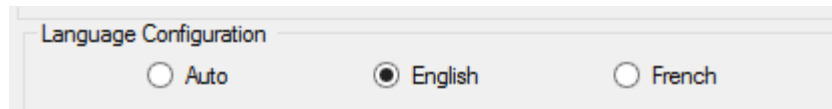
Udp port : 53130

Configure the UDP port number, by default to 53130 in order to listen.



## 12.4 LANGUAGE CONFIGURATION

---



Language Configuration

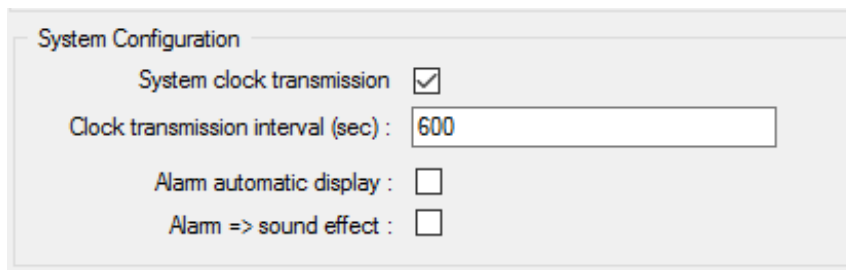
Auto       English       French

- ✓ **Auto**: The BeanScape® will use the OS language by default
- ✓ **English**: select English language
- ✓ **French**: select French language

This configuration will be updated if the BeanScape® is restarted.

## 12.5 SYSTEM CONFIGURATION

---



System Configuration

System clock transmission

Clock transmission interval (sec) :

Alarm automatic display :

Alarm => sound effect :

- ✓ **Alarm automatic display**: Check this box if you want to see an alarm window displayed automatically when a window alarm threshold is exceeded.
- ✓ **Alarm → Sound Effect**: Check this box if you want to hear a sound effect when a threshold is exceeded.

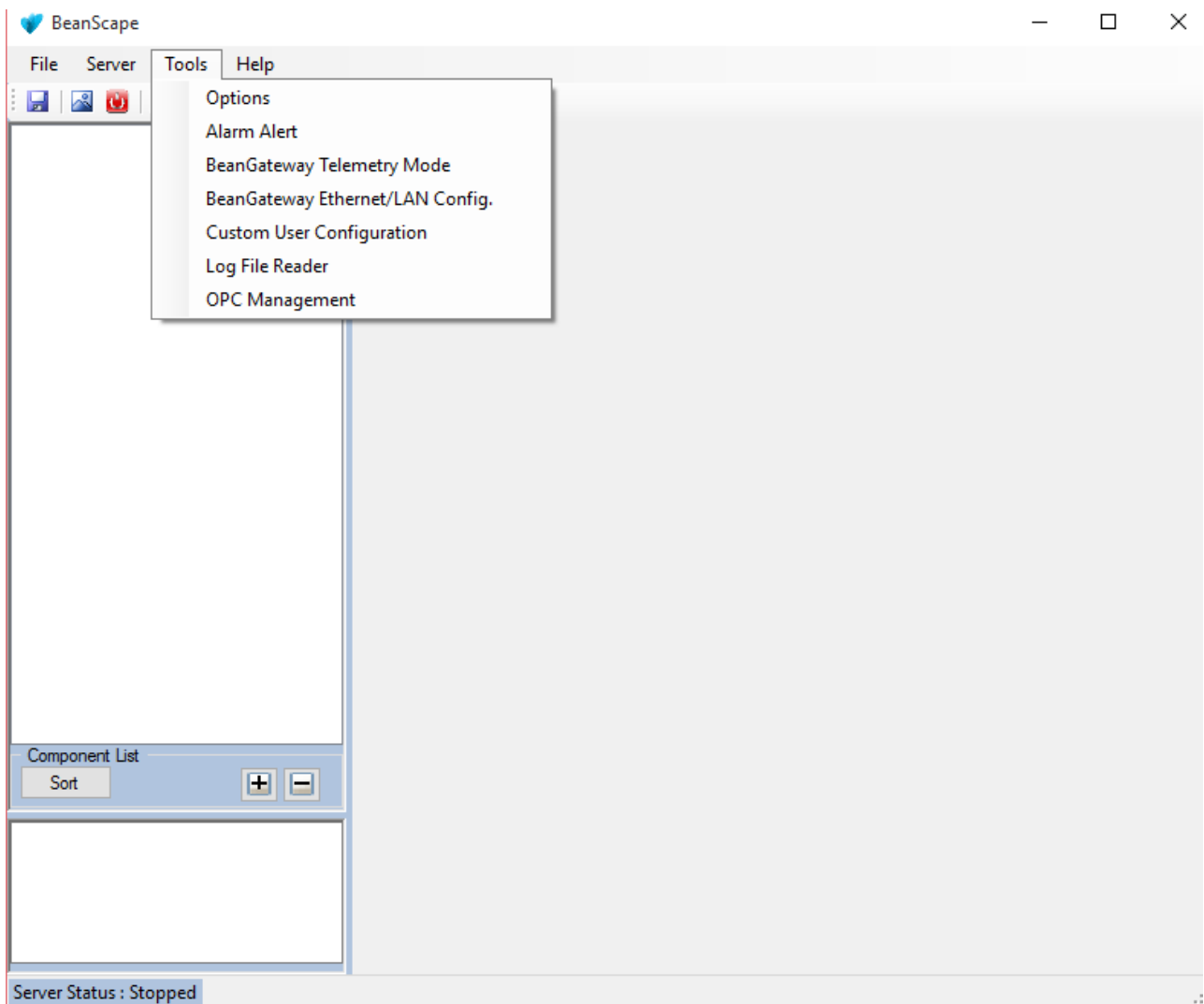


### 13. SMTP CLIENT

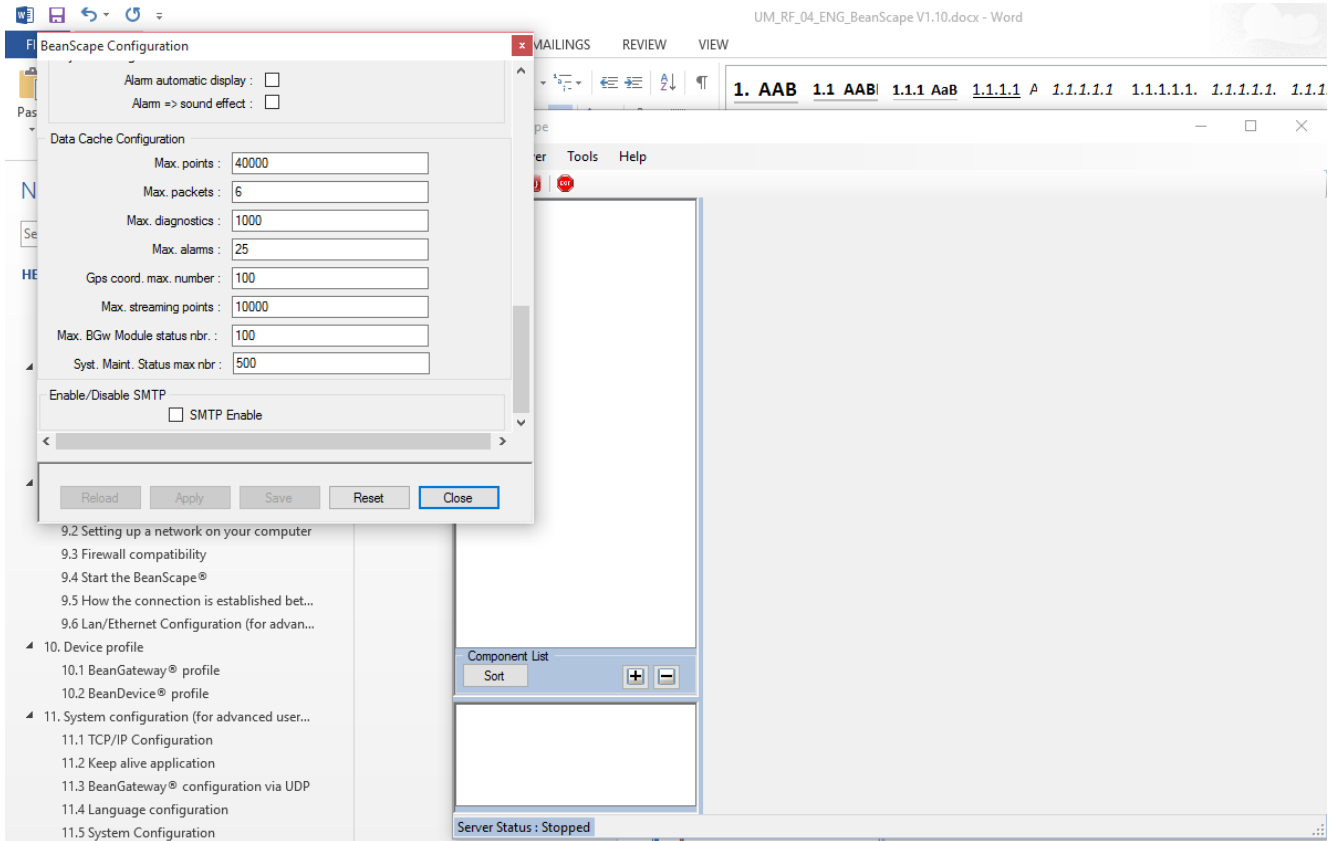
---

User can receive alarms notification by email. This function is only available with “*Survey*” data acquisition mode.

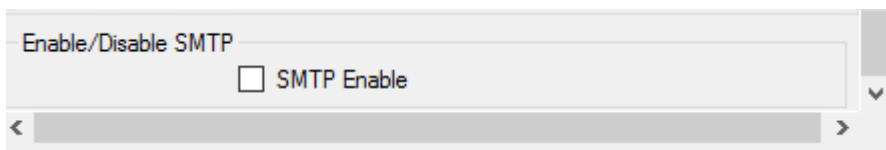
From your BeanScape® software click on “**Tools**” tab then “**options**”.



A new window will occur, use the scroll list and go to Enable/Disable SMTP field:



Click on SMTP Enable check box:



UDP Server :

TX File

AllStreamingTxOnOneFile

Enable/Disable SMTP

SMTP Enable

SMTP Configuration

From :

To :

Smtp Server :  Port :

User Name :

Password :

Fill out the following field:

Field	Description
<i>From</i>	<i>Enter the email address sending the alarm notification</i>
<i>To</i>	<i>Enter the receiver address for alarm notification</i>
<i>SMTP server</i>	<i>Enter your Outgoing SMTP server</i>
<i>Port</i>	<i>Enter your port Number for your outgoing SMTP server</i>
<i>User name</i>	<i>Enter your full email address</i>
<i>Password</i>	<i>Enter the password (case sensitive) of your email account</i>

Click on “*Apply*” then “*Save*”



[See « Alarm by email » Youtube video](#)





## 14. FFT (FAST FOURIER TRANSFORM) WAVEFORM ANALYSIS MODULE

The Fast Fourier Transform (FFT) resolves a time waveform into its sinusoidal components. The FFT takes a block of time-domain data and returns the frequency spectrum of the data. The FFT is a digital implementation of the Fourier transform. Thus, the FFT does not yield a continuous spectrum. Instead, the FFT returns a discrete spectrum, in which the frequency content of the waveform is resolved into a finite number of frequency lines, or bins.

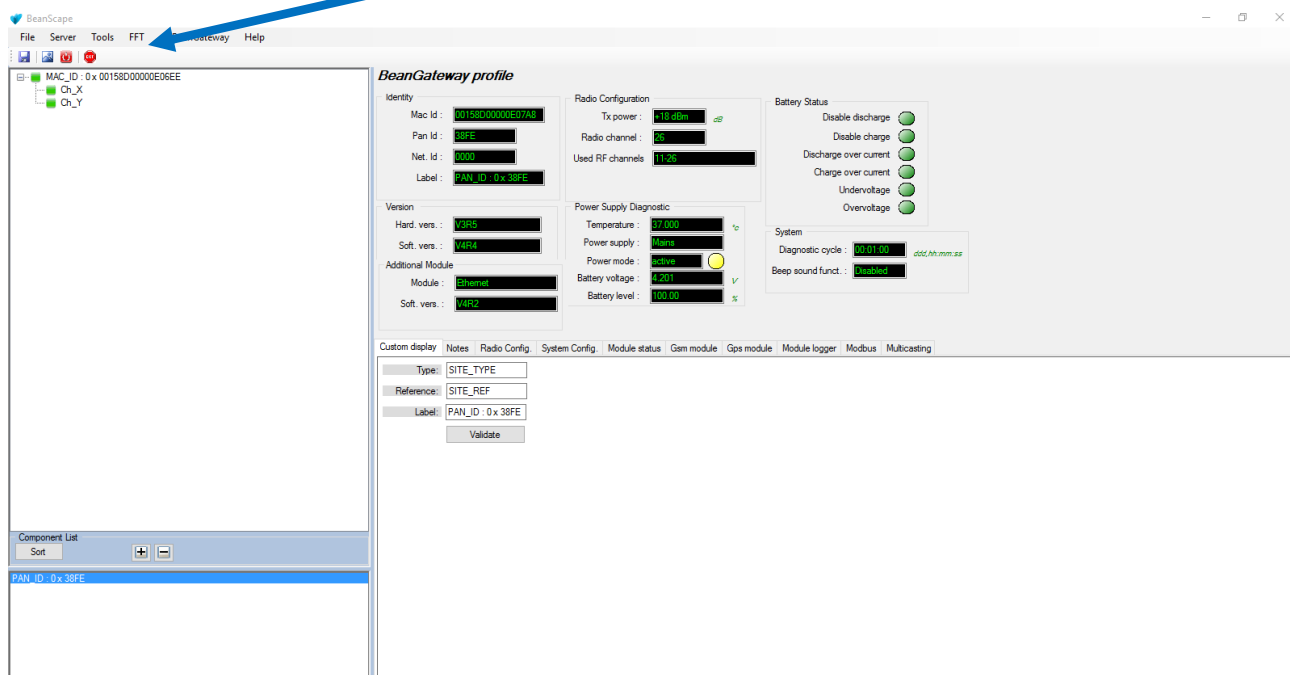


**FFT (Fast Fourier transform) module is only compatible with “Streaming Packet” measurement mode.**

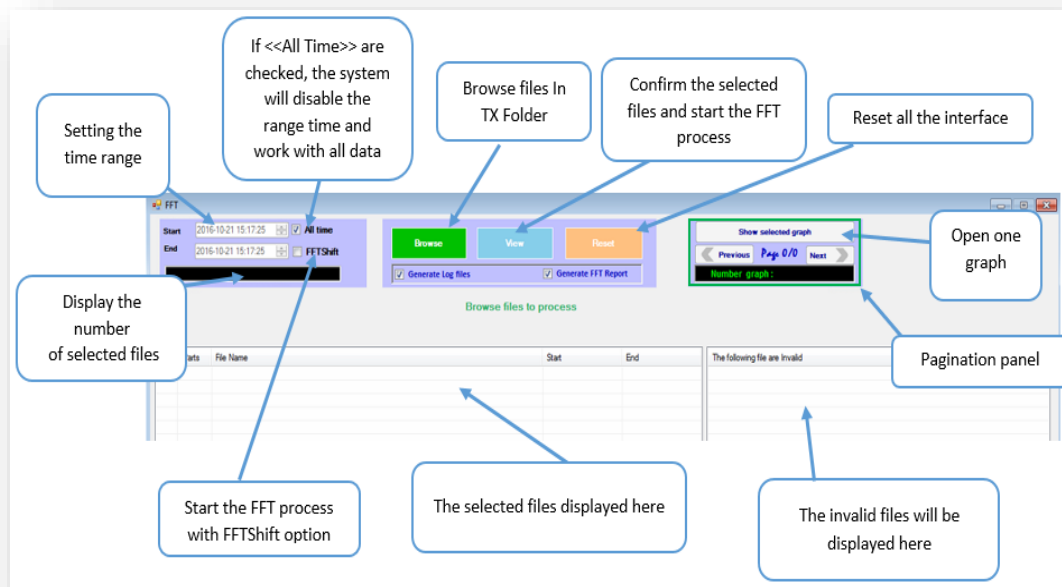
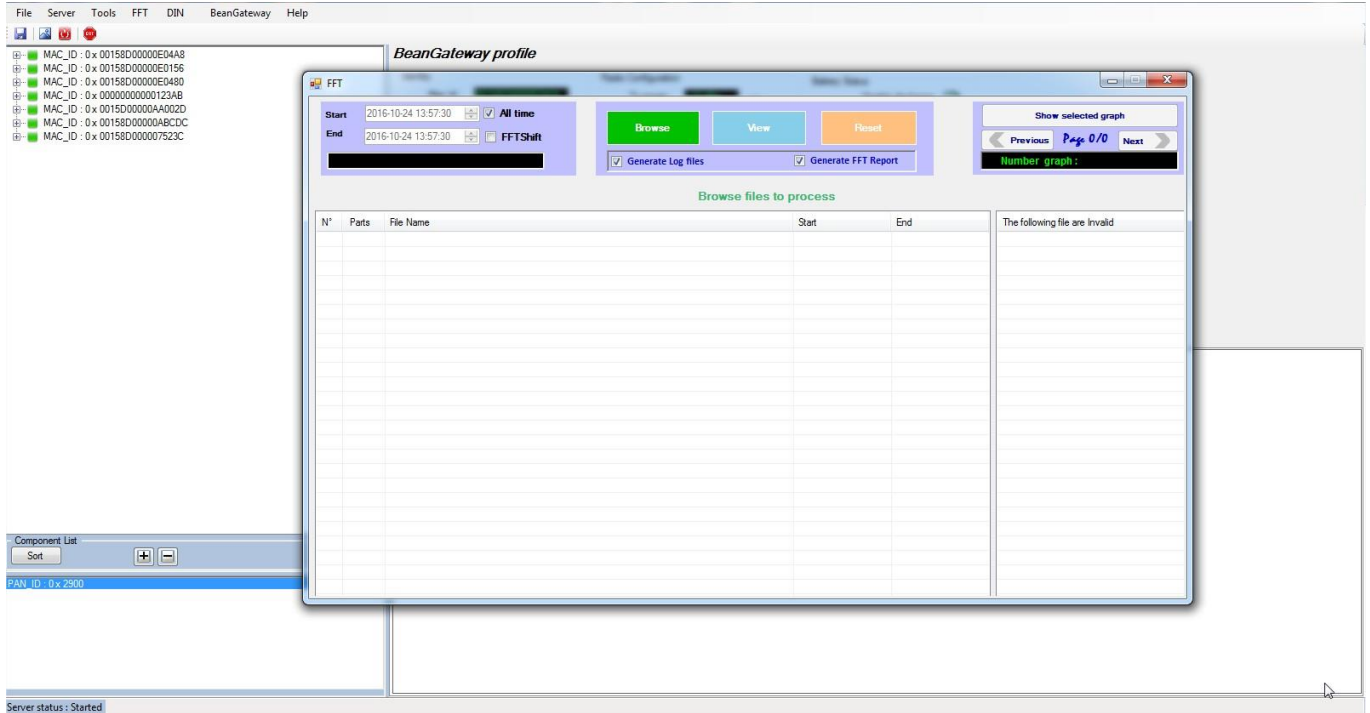
### 14.1 FFT GENERATION

The BeanScope Software includes an FFT module used for spectrum analysis. This module can be used when clicking on the FFT tab.

[Click here](#)



A new window will open:

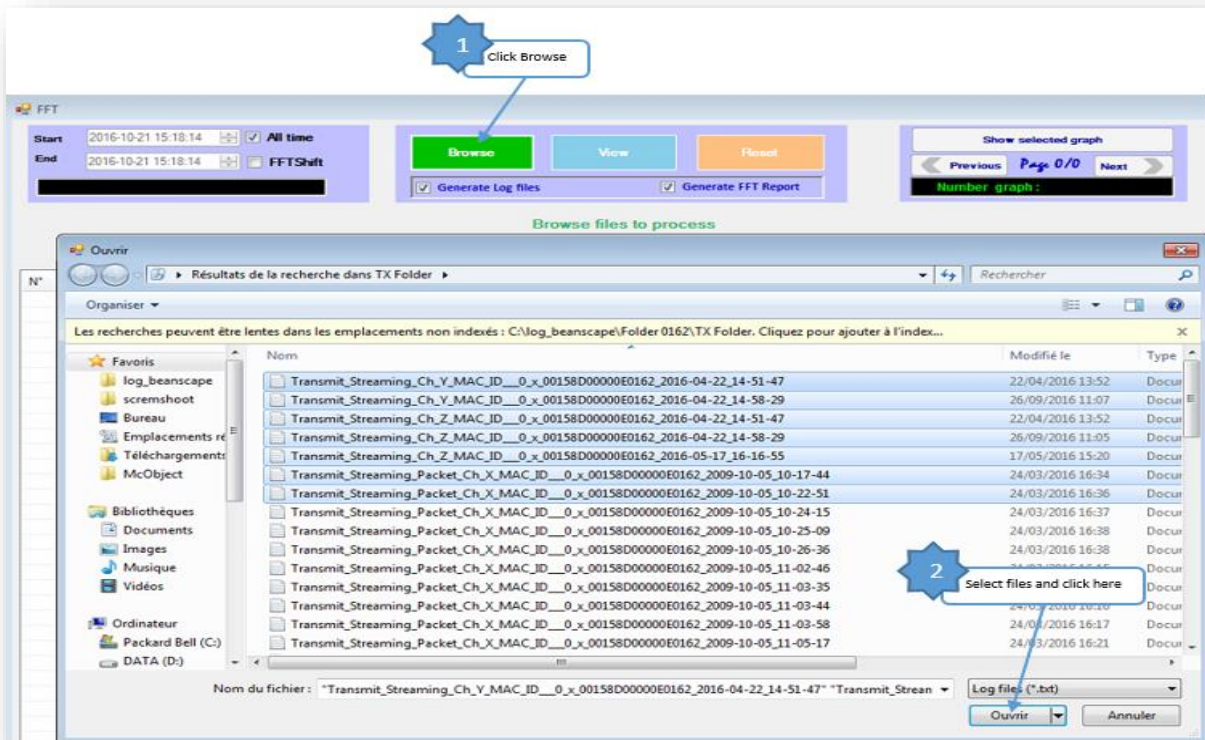


Click on browse and import file containing the logged measurement, the result will be:

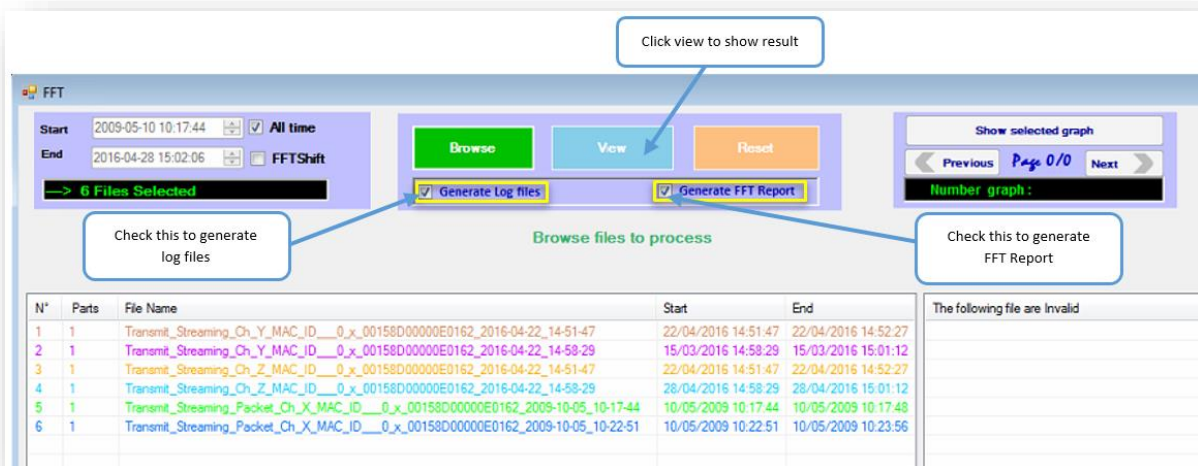
- Power spectral density and a new window displays
- PPV (peak particle velocity) calculation: PPV value in mm/s , Frequency, Amplitude



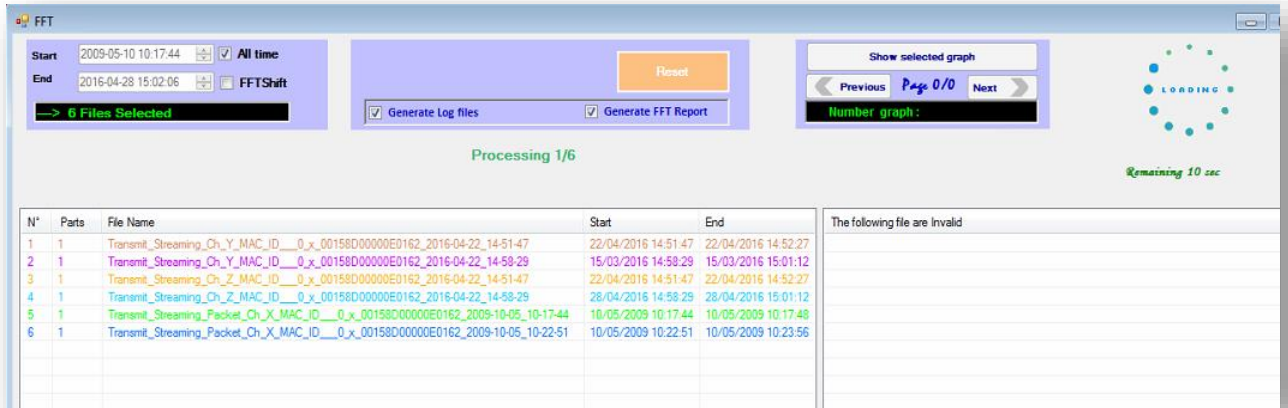
1. Click on browse to choose files



2. Overview of the selected files



### 3. Loading



N°	Parts	File Name	Start	End
1	1	Transmit_Streaming_Ch_Y_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-51-47	22/04/2016 14:51:47	22/04/2016 14:52:27
2	1	Transmit_Streaming_Ch_Y_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-58-29	15/03/2016 14:58:29	15/03/2016 15:01:12
3	1	Transmit_Streaming_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-51-47	22/04/2016 14:51:47	22/04/2016 14:52:27
4	1	Transmit_Streaming_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-58-29	28/04/2016 14:58:29	28/04/2016 15:01:12
5	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_10-17-44	10/05/2009 10:17:44	10/05/2009 10:17:48
6	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_10-22-51	10/05/2009 10:22:51	10/05/2009 10:23:56

### 4. FFT report generated with the following results:

- a. PPV value mm/s:
- b. Frequency
- c. Amplitude

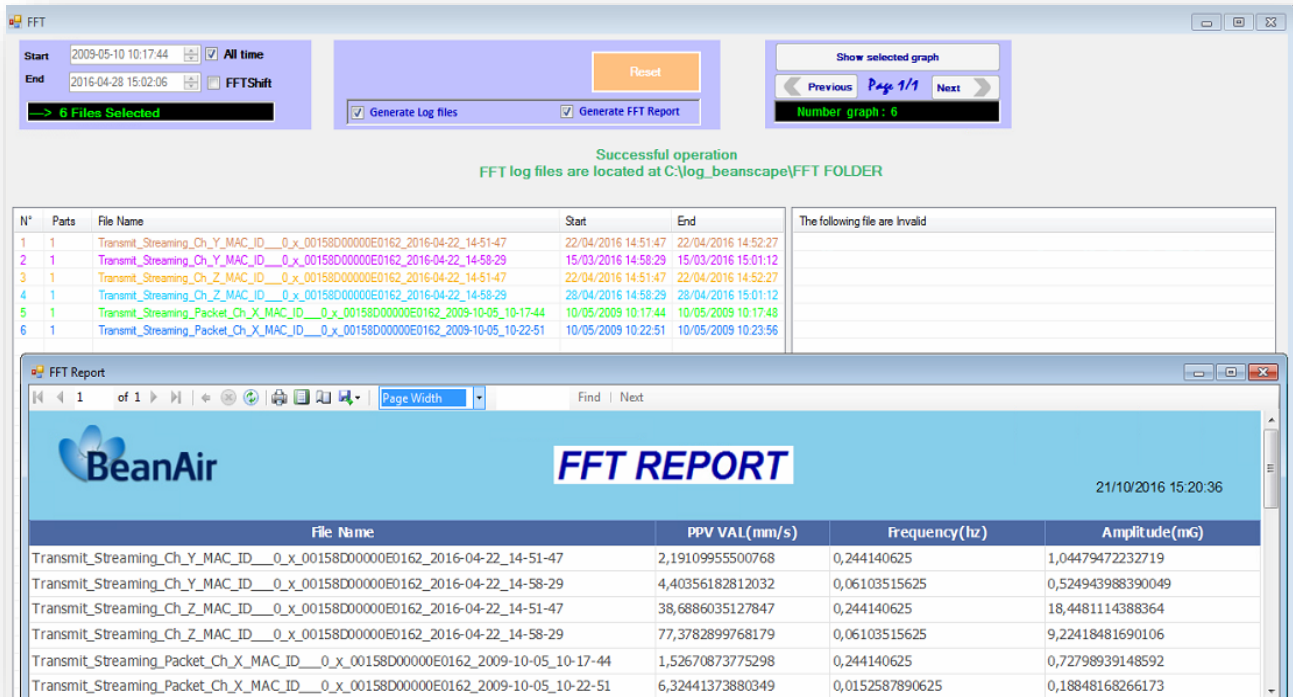
When a vibration is measured, the point at which the measurement takes place can be considered to have a “particle velocity”. This particle vibration will take place in three dimensions and will usually end up back where it started. This type of particle velocity must not be confused with the velocity with which the wave moves through the rock. The Peak Particle Velocity is the maximum velocity which is recorded during a particular event and can refer to a particular orientation (vertical or horizontal) or to the maximum.

The velocity of ground vibration (particle velocity) is usually measured in millimeters/second (mm/s) or inches/second in the US.

It should be remembered that particle velocity is not the same as the velocity of the wave through the ground; often referred to as the seismic velocity.

Resultant PPV is calculated by producing a vector sum of the 3 separate directional recordings ( $\sqrt{v^2+l^2+t^2}$  where v=vertical, l=longitudinal, t=transverse) for every point on the recording.





Successful operation  
FFT log files are located at C:\log\_beanscape\FFT FOLDER

N°	Parts	File Name	Start	End	The following file are Invalid
1	1	Transmit_Streaming_Ch_Y_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-51-47	22/04/2016 14:51:47	22/04/2016 14:52:27	
2	1	Transmit_Streaming_Ch_Y_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-58-29	15/03/2016 14:58:29	15/03/2016 15:01:12	
3	1	Transmit_Streaming_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-51-47	22/04/2016 14:51:47	22/04/2016 14:52:27	
4	1	Transmit_Streaming_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-58-29	28/04/2016 14:58:29	28/04/2016 15:01:12	
5	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_10-17-44	10/05/2009 10:17:44	10/05/2009 10:17:48	
6	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_10-22-51	10/05/2009 10:22:51	10/05/2009 10:23:56	

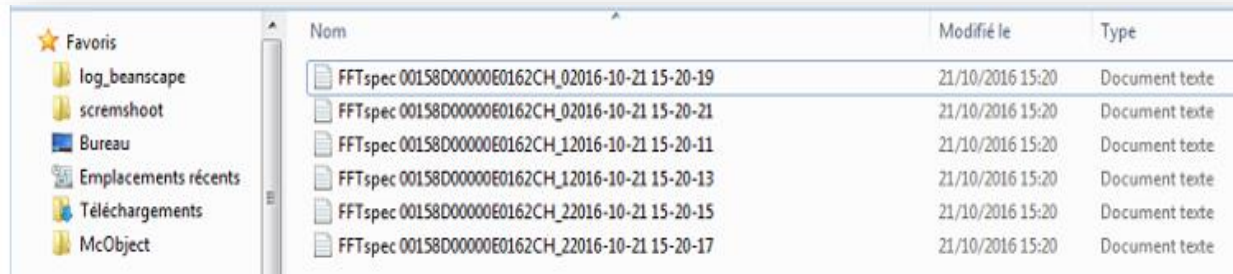
  

FFT Report

21/10/2016 15:20:36

File Name	PPV VAL(mm/s)	Frequency(hz)	Amplitude(mG)
Transmit_Streaming_Ch_Y_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-51-47	2,19109955500768	0,244140625	1,04479472232719
Transmit_Streaming_Ch_Y_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-58-29	4,40356182812032	0,06103515625	0,524943988390049
Transmit_Streaming_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-51-47	38,6886035127847	0,244140625	18,4481114388364
Transmit_Streaming_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-58-29	77,3782899768179	0,06103515625	9,22418481690106
Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_10-17-44	1,52670873775298	0,244140625	0,72798939148592
Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_10-22-51	6,32441373880349	0,0152587890625	0,18848168266173

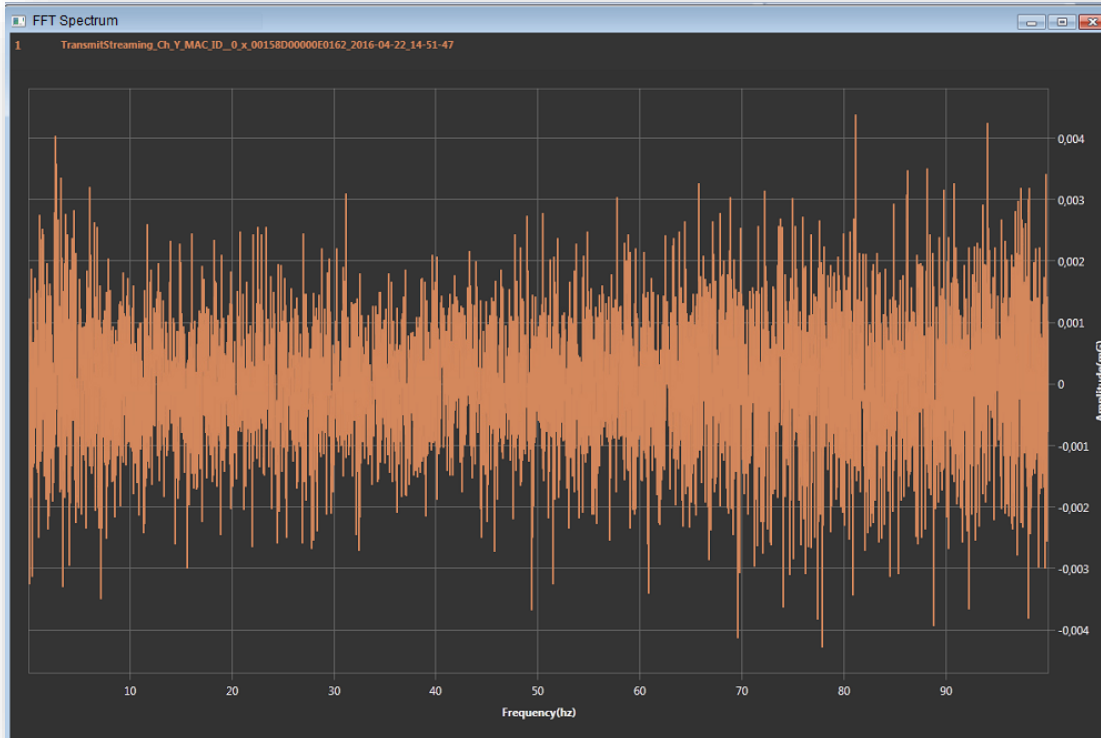
5. FFT LOG files generated



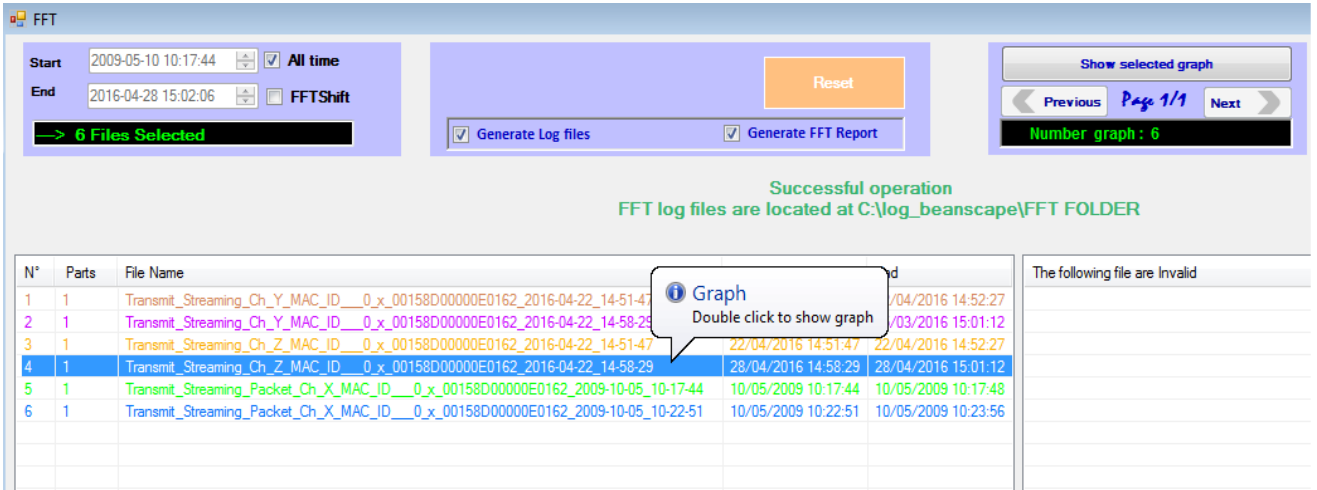
Nom	Modifié le	Type
FFTspec 00158D00000E0162CH_02016-10-21 15-20-19	21/10/2016 15:20	Document texte
FFTspec 00158D00000E0162CH_02016-10-21 15-20-21	21/10/2016 15:20	Document texte
FFTspec 00158D00000E0162CH_12016-10-21 15-20-11	21/10/2016 15:20	Document texte
FFTspec 00158D00000E0162CH_12016-10-21 15-20-13	21/10/2016 15:20	Document texte
FFTspec 00158D00000E0162CH_22016-10-21 15-20-15	21/10/2016 15:20	Document texte
FFTspec 00158D00000E0162CH_22016-10-21 15-20-17	21/10/2016 15:20	Document texte



6. The first graph will be displayed automatically if we have less than 9 graph



7. Manually select and launch graph with double click or select file and click on “Show selected graph” button

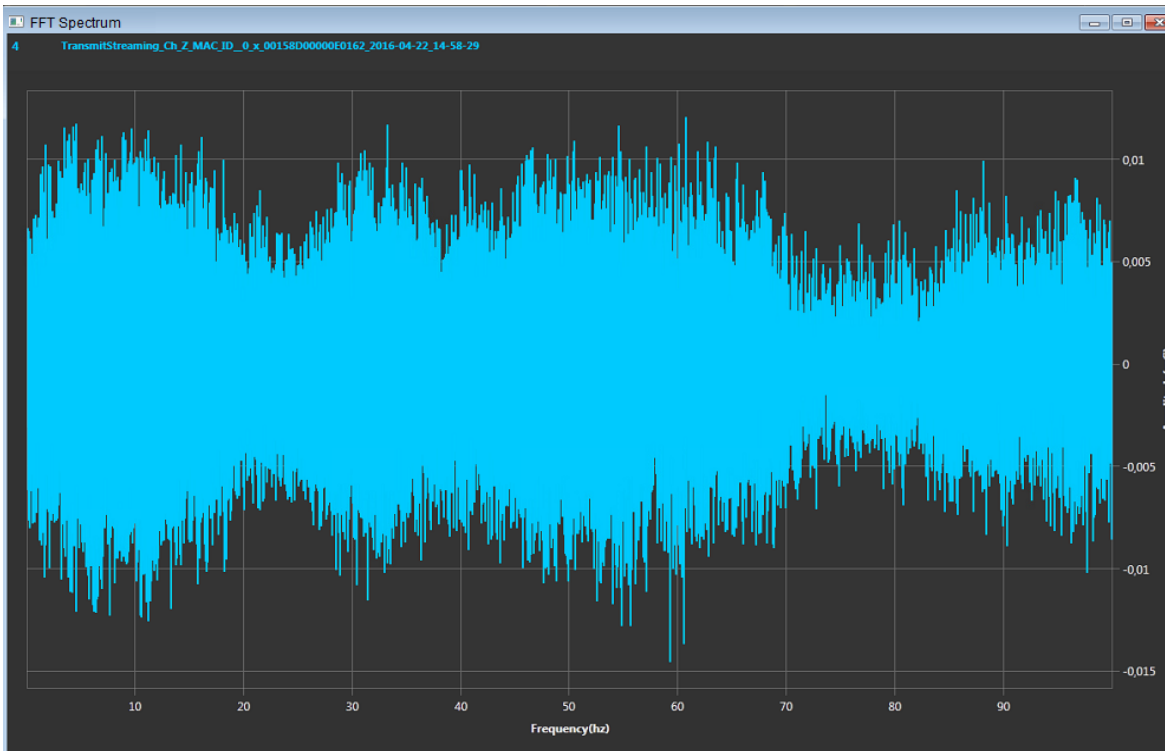


Successful operation  
FFT log files are located at C:\log\_beanscape\FFT FOLDER

N°	Parts	File Name	Time	Time	Time
1	1	Transmit_Streaming_Ch_Y_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-51-47	22/04/2016 14:52:27	22/04/2016 14:52:27	22/04/2016 14:52:27
2	1	Transmit_Streaming_Ch_Y_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-58-29	28/04/2016 14:58:29	28/04/2016 15:01:12	28/04/2016 15:01:12
3	1	Transmit_Streaming_Ch_Z_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-51-47	22/04/2016 14:51:47	22/04/2016 14:52:27	22/04/2016 14:52:27
4	1	Transmit_Streaming_Ch_Z_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-58-29	28/04/2016 14:58:29	28/04/2016 15:01:12	28/04/2016 15:01:12
5	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-17-44	10/05/2009 10:17:44	10/05/2009 10:17:48	10/05/2009 10:17:48
6	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-22-51	10/05/2009 10:22:51	10/05/2009 10:23:56	10/05/2009 10:23:56

The following file are invalid

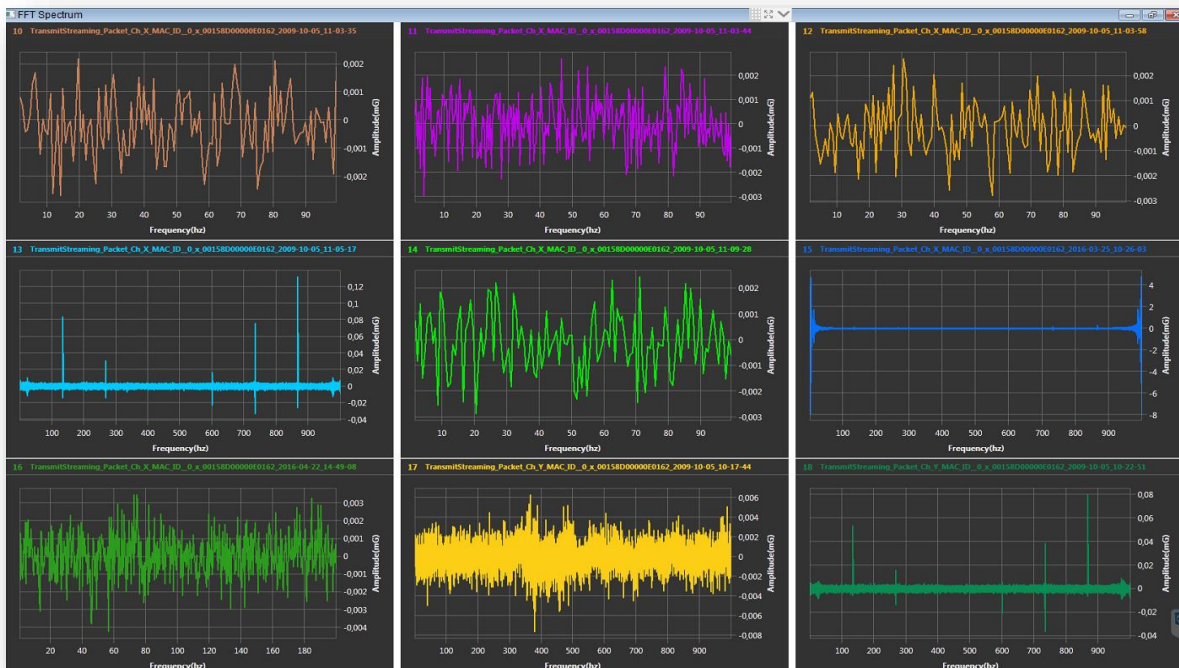
8. The selected graph is displayed



9. Repeat the same process but with more than 9 files

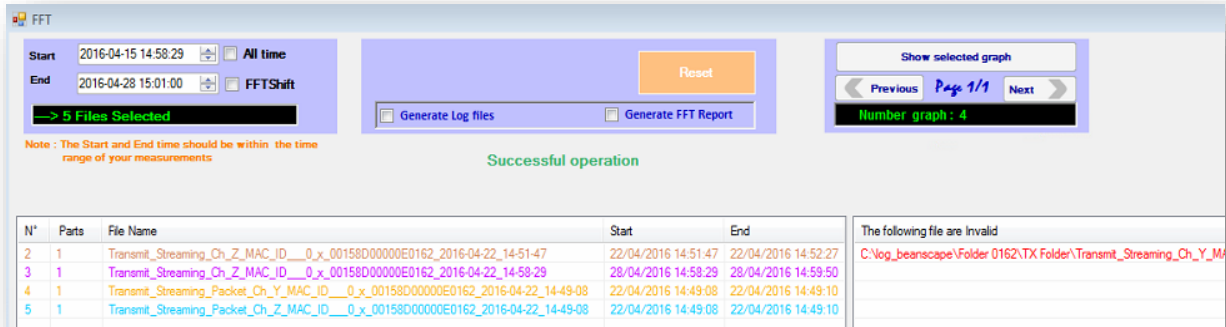


10. The grid of graph will be displayed, here we navigate to the second page by clicking on “Next” button





11. Make sure your time range is within your measurements, otherwise your file is considered as invalid



The screenshot shows the FFT software interface. At the top, there are input fields for 'Start' (2016-04-15 14:58:29) and 'End' (2016-04-28 15:01:00), with checkboxes for 'All time' and 'FFTShift'. A 'Reset' button is visible. Below these are checkboxes for 'Generate Log files' and 'Generate FFT Report'. A 'Show selected graph' button and navigation controls (Previous, Page 1/1, Next) are also present. A green message 'Successful operation' is displayed. Below the message is a table with the following data:

N°	Parts	File Name	Start	End
2	1	Transmit_Streaming_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-51-47	22/04/2016 14:51:47	22/04/2016 14:52:27
3	1	Transmit_Streaming_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-58-29	28/04/2016 14:58:29	28/04/2016 14:59:50
4	1	Transmit_Streaming_Packet_Ch_Y_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-49-08	22/04/2016 14:49:08	22/04/2016 14:49:10
5	1	Transmit_Streaming_Packet_Ch_Z_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-49-08	22/04/2016 14:49:08	22/04/2016 14:49:10

To the right of the table, a message states: 'The following file are Invalid' followed by the file path: 'C:\Vog\_beanscape\Folder 0162\TX Folder\Transmit\_Streaming\_Ch\_Y\_M'.

## 14.2 FFT SHIFT

FFT shift allows to rearranges the FFT output by moving the zero-frequency component to the center of the array. It is useful for visualizing a Fourier transform with the zero-frequency component in the middle of the spectrum.

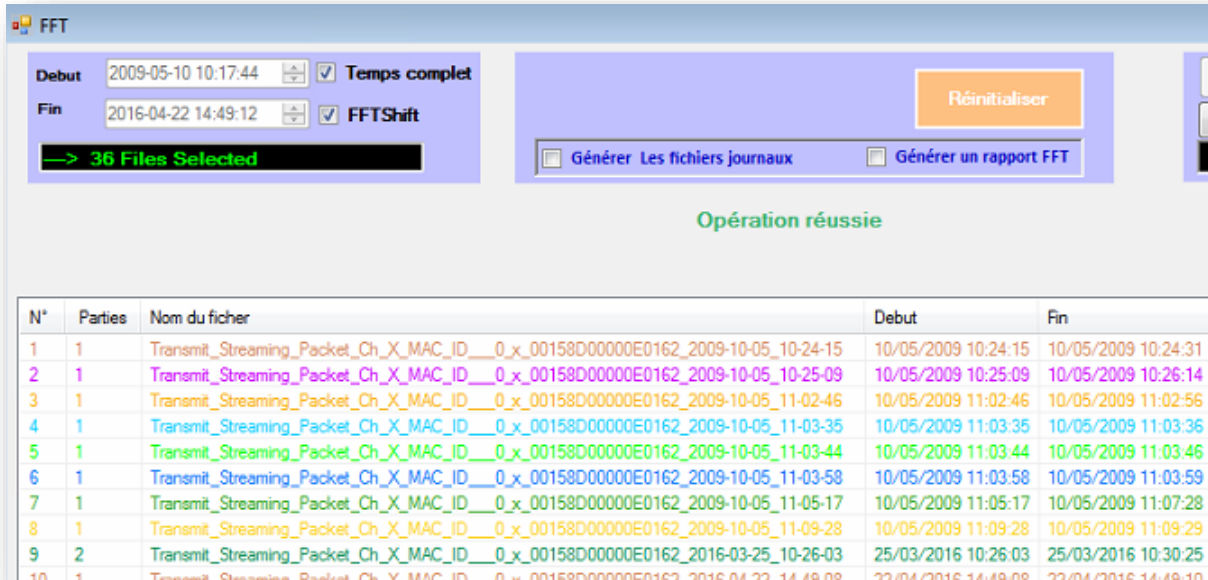
FFT shift option is activated when the checkbox “FFT shift” is checked.

Click on browse and import file containing the logged measurement, the result will be:

- Power spectral density and a new window displays ( with zero-frequency at the center)
- PPV (peak particle velocity) calculation: PPV value in mm/s , Frequency, Amplitude



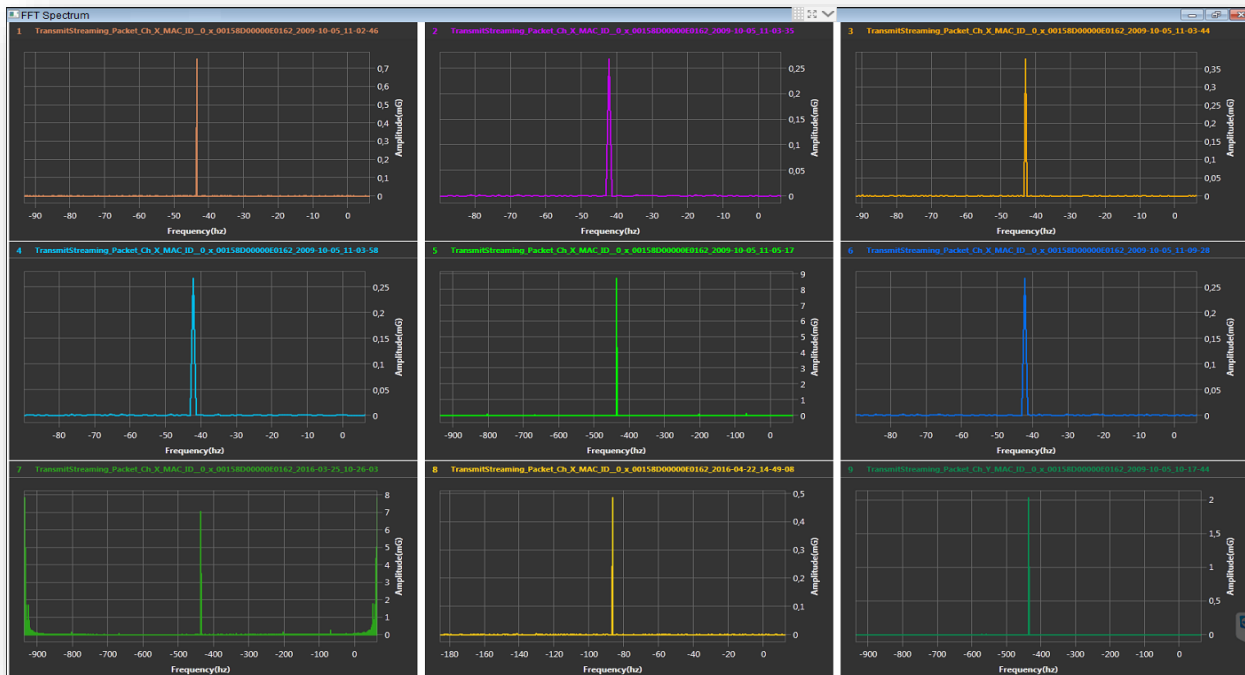
1. To use FFTShift: check FFTShift, Select files and click the “View” button:



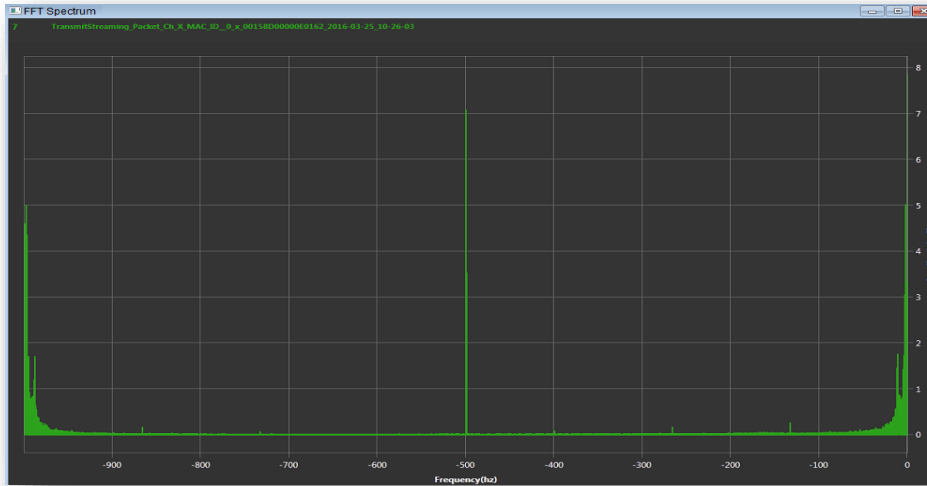
The screenshot shows the FFT application window. At the top, there are input fields for 'Debut' (2009-05-10 10:17:44) and 'Fin' (2016-04-22 14:49:12). Checkboxes for 'Temps complet' and 'FFTShift' are checked. A 'Réinitialiser' button is visible. Below these, a status bar indicates '36 Files Selected'. There are two buttons: 'Générer Les fichiers journaux' and 'Générer un rapport FFT'. A green message 'Opération réussie' is displayed. At the bottom, a table lists the processed files.

N°	Parties	Nom du fichier	Debut	Fin
1	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_10-24-15	10/05/2009 10:24:15	10/05/2009 10:24:31
2	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_10-25-09	10/05/2009 10:25:09	10/05/2009 10:26:14
3	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_11-02-46	10/05/2009 11:02:46	10/05/2009 11:02:56
4	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_11-03-35	10/05/2009 11:03:35	10/05/2009 11:03:36
5	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_11-03-44	10/05/2009 11:03:44	10/05/2009 11:03:46
6	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_11-03-58	10/05/2009 11:03:58	10/05/2009 11:03:59
7	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_11-05-17	10/05/2009 11:05:17	10/05/2009 11:07:28
8	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2009-10-05_11-09-28	10/05/2009 11:09:28	10/05/2009 11:09:29
9	2	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2016-03-25_10-26-03	25/03/2016 10:26:03	25/03/2016 10:30:25
10	1	Transmit_Streaming_Packet_Ch_X_MAC_ID__0_x_00158D00000E0162_2016-04-22_14-49-08	22/04/2016 14:49:08	22/04/2016 14:49:10

2. Grid of FFT Spectrum with FFTShift option enabled



### 3. Open one graph



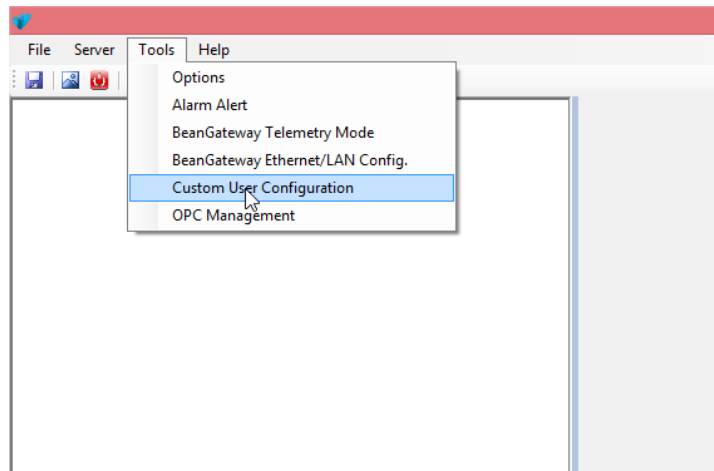
[FFT and FFT shift video](#)



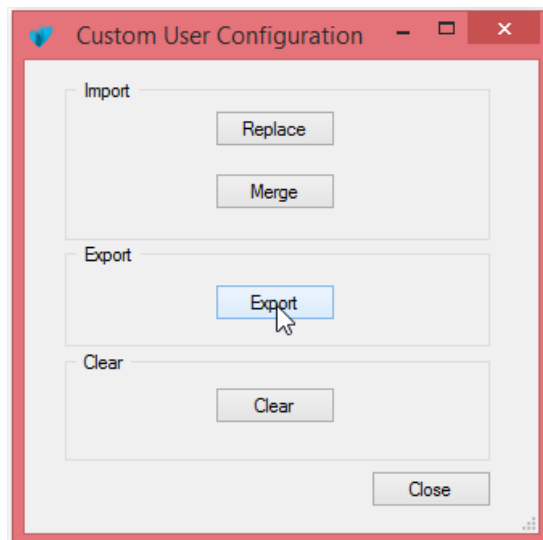
## 15. EXPORT/IMPORT USER CONFIGURATION (FOR ADVANCED USER ONLY)

### 15.1 EXPORT FUNCTION

Click on the tab *Tools* then “*Custom user configuration*”

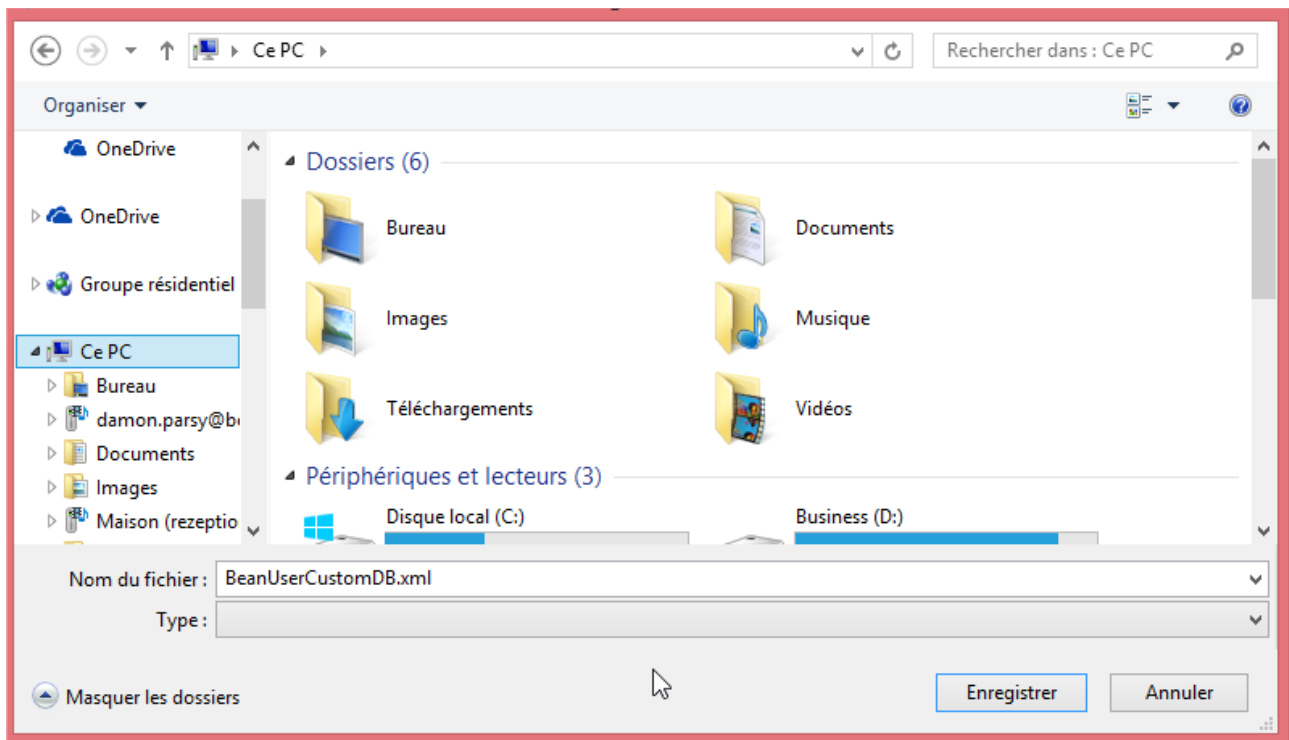


A new window will appear, click on *export*:



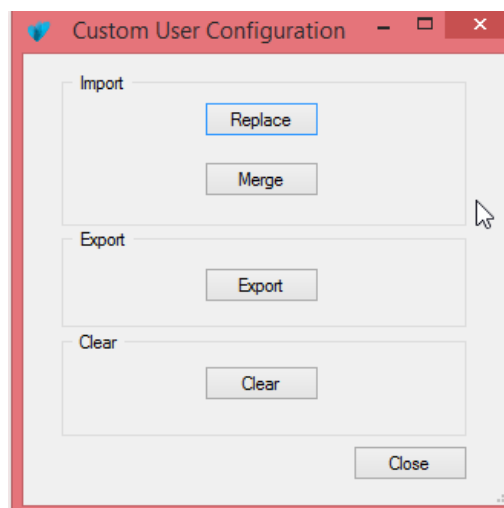
User configuration is exported in XML format:





## 15.2 IMPORT FUNCTION

Click on “**Replace**” to import user configuration:



*Don't try to change manually the XML file, there is a high risk to corrupt it.*



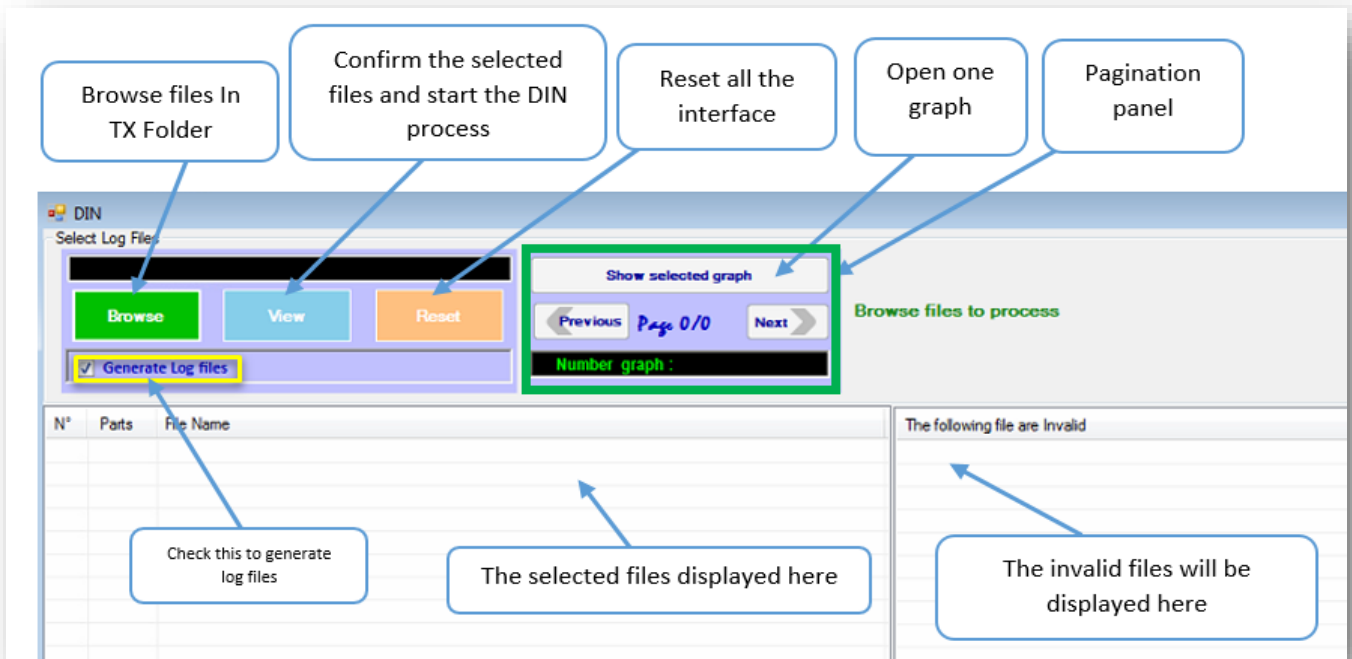
## 16. DIN 4150-3 INTERPRETATION

According to the DIN4150-3, the BeanScope software DIN option acts as follow:

- 1-Display the velocity which is calculated from the acceleration.
- 2-Implement an analysis report.

The first step is to click on the “DIN” tab.

A new window is displayed.



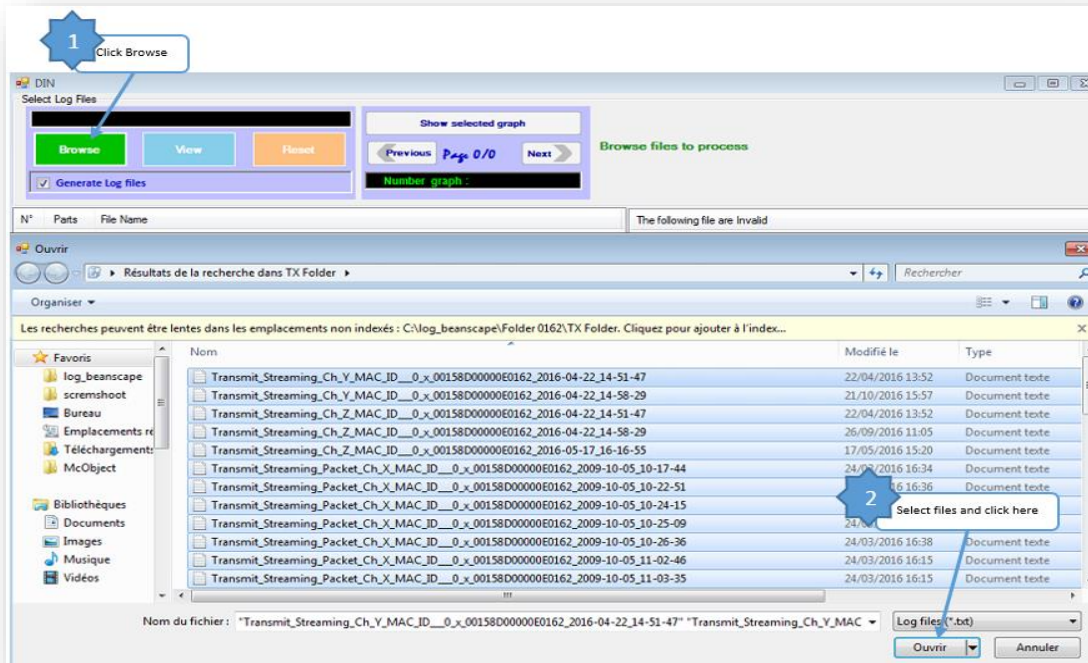
The screenshot shows the 'DIN' software interface. At the top, there are five callout boxes: 'Browse files In TX Folder' pointing to the 'Browse' button; 'Confirm the selected files and start the DIN process' pointing to the 'View' button; 'Reset all the interface' pointing to the 'Reset' button; 'Open one graph' pointing to the 'Show selected graph' dialog; and 'Pagination panel' pointing to the 'Page 0/0' and 'Next' buttons. Below these, there is a 'Generate Log files' checkbox with a callout 'Check this to generate log files'. A table with columns 'N°', 'Parts', and 'File Name' is shown, with a callout 'The selected files displayed here' pointing to it. To the right, there is a section titled 'The following file are invalid' with a callout 'The invalid files will be displayed here'. The 'Show selected graph' dialog is highlighted with a green box and contains 'Previous', 'Page 0/0', and 'Next' buttons, along with a 'Number graph' field.

The second step is to browse and import the file containing the logged measurement. The result will be:

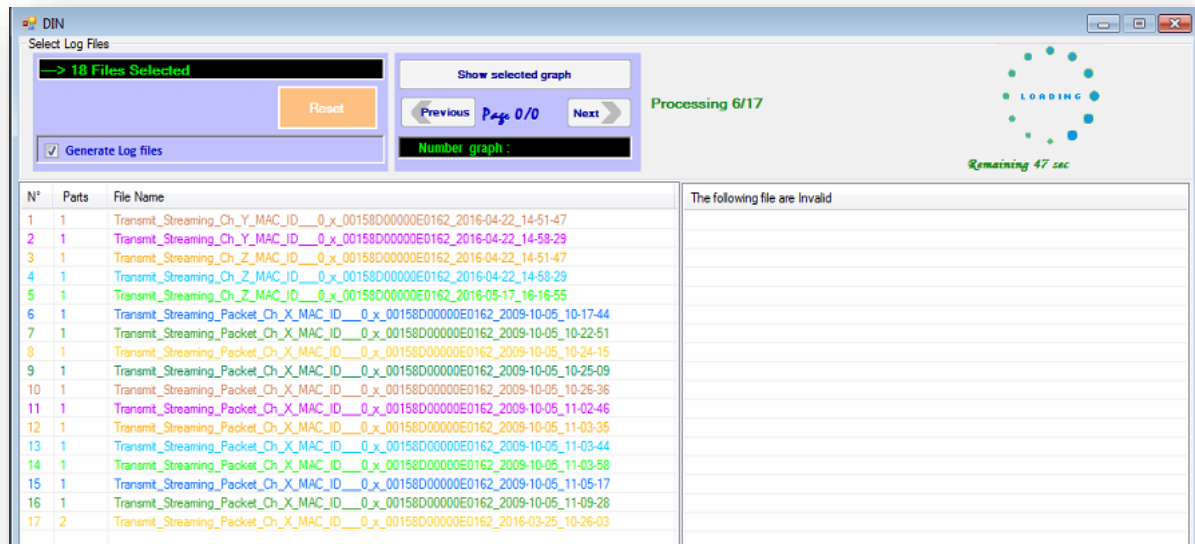
- Velocity display window
- DIN report generated
- Velocity files created



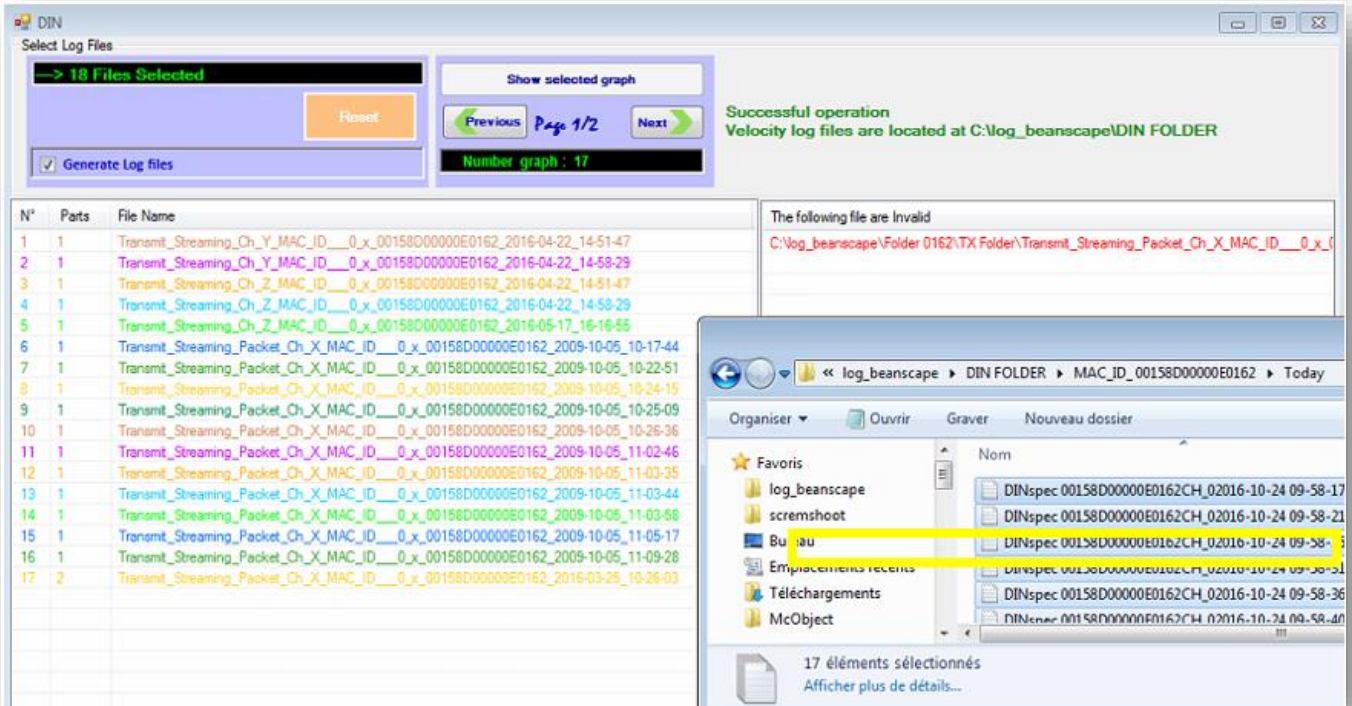
➤ Click on browse button to choose TX Files.



➤ Loading...



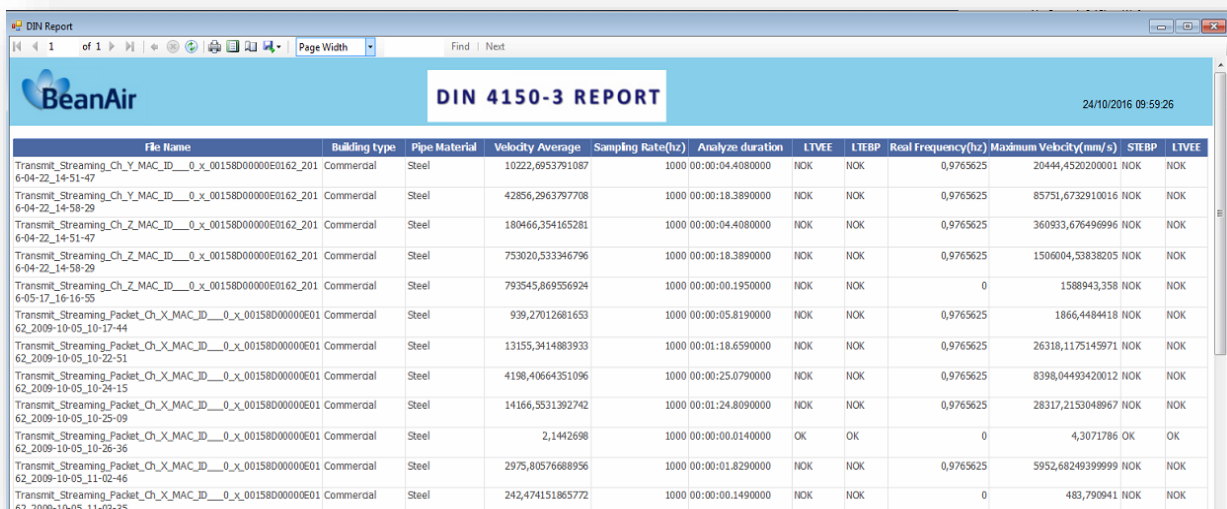
- Result showing: you can navigate between pages using “Previous” and “Next” button:



The screenshot shows the 'DIN' application window. On the left, there's a 'Select Log Files' panel with a 'Reset' button and a 'Generate Log files' checkbox. In the center, there are 'Previous', 'Page 1/2', and 'Next' navigation buttons, along with a 'Show selected graph' button and a 'Number graph : 17' indicator. On the right, a message states: 'Successful operation Velocity log files are located at C:\log\_beanscape\DIN FOLDER'. Below this is a table of 17 log files with columns for 'N°', 'Parts', and 'File Name'. A file explorer window is open over the table, showing the selected files in the 'log\_beanscape' folder.

N°	Parts	File Name
1	1	Transmit_Streaming_Ch_Y_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-51-47
2	1	Transmit_Streaming_Ch_Y_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-58-29
3	1	Transmit_Streaming_Ch_Z_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-51-47
4	1	Transmit_Streaming_Ch_Z_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-58-29
5	1	Transmit_Streaming_Ch_Z_MAC_ID___0_x_00158D00000E0162_2016-05-17_16-16-55
6	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-17-44
7	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-22-51
8	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-24-15
9	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-25-09
10	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-26-36
11	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-02-46
12	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-03-35
13	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-03-44
14	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-03-58
15	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-05-17
16	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-09-28
17	2	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2016-03-25_10-26-03

- DIN Report:



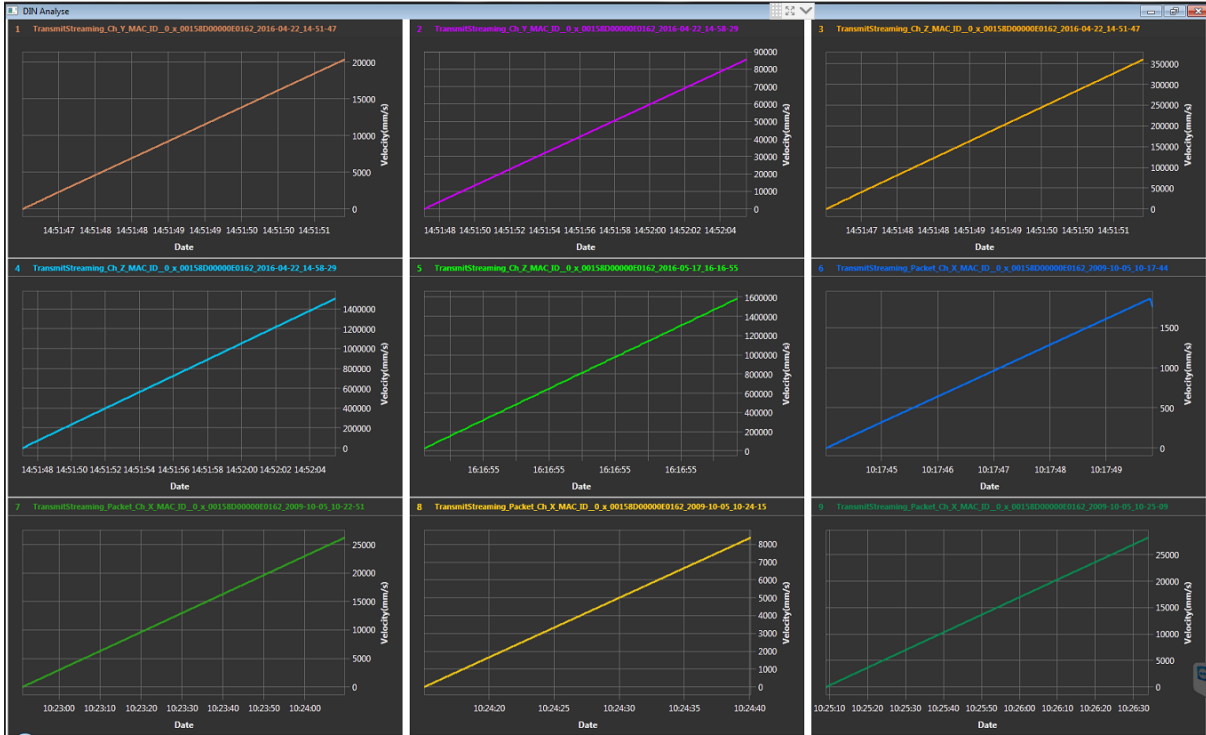
The screenshot shows the 'DIN Report' window with the title 'DIN 4150-3 REPORT' and a date of '24/10/2016 09:59:26'. The table below contains the following data:

File Name	Building type	Pipe Material	Velocity Average	Sampling Rate(hz)	Analyze duration	LTVEE	LTEBP	Real Frequency(hz)	Maximum Velocity(mm/s)	STIEBP	LTVEE
Transmit_Streaming_Ch_Y_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-51-47	Commercial	Steel	10222,6953791087	1000	00:00:04.4080000	NOK	NOK	0,9765625	20444,4520200001	NOK	NOK
Transmit_Streaming_Ch_Y_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-58-29	Commercial	Steel	42856,2963797708	1000	00:00:18.3890000	NOK	NOK	0,9765625	85751,6732910016	NOK	NOK
Transmit_Streaming_Ch_Z_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-51-47	Commercial	Steel	180466,354165281	1000	00:00:04.4080000	NOK	NOK	0,9765625	360933,676496996	NOK	NOK
Transmit_Streaming_Ch_Z_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-58-29	Commercial	Steel	753020,533346796	1000	00:00:18.3890000	NOK	NOK	0,9765625	1506004,53838205	NOK	NOK
Transmit_Streaming_Ch_Z_MAC_ID___0_x_00158D00000E0162_2016-05-17_16-16-55	Commercial	Steel	793545,869556924	1000	00:00:00.1950000	NOK	NOK	0	1588943,358	NOK	NOK
Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-17-44	Commercial	Steel	939,27012681653	1000	00:00:05.8190000	NOK	NOK	0,9765625	1866,4484418	NOK	NOK
Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-22-51	Commercial	Steel	13155,3414883933	1000	00:01:18.6590000	NOK	NOK	0,9765625	26318,1175145971	NOK	NOK
Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-24-15	Commercial	Steel	4198,40664351096	1000	00:00:25.0790000	NOK	NOK	0,9765625	8398,04493420012	NOK	NOK
Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-25-09	Commercial	Steel	14166,5531392742	1000	00:01:24.8090000	NOK	NOK	0,9765625	28317,2153048967	NOK	NOK
Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-26-36	Commercial	Steel	2,1442698	1000	00:00:00.8140000	OK	OK	0	4,3071786	OK	OK
Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-02-46	Commercial	Steel	2975,80576688956	1000	00:00:01.8290000	NOK	NOK	0,9765625	5952,68249399999	NOK	NOK
Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-03-35	Commercial	Steel	242,474151865772	1000	00:00:00.1490000	NOK	NOK	0	483,790941	NOK	NOK

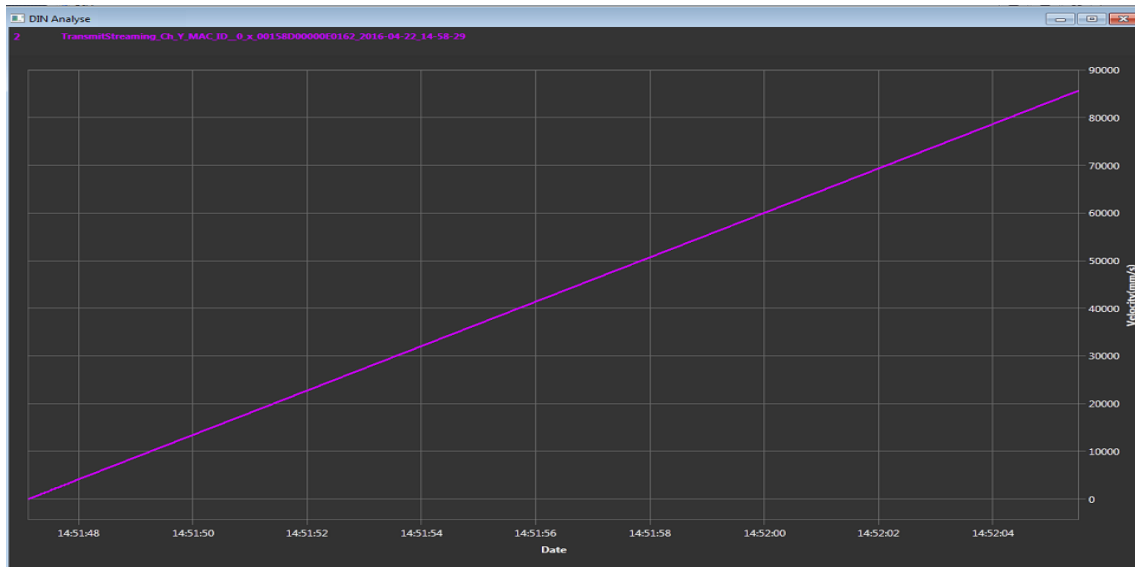




➤ Grid of DIN Analysis:



➤ Display one graph :





“Rethinking sensing technology”

Document version: 1.14

Document type : User Manual

BeanScape® User Manual

Following is an example of a generated DIN report.



4/18/2016 5:17:47 PM

## DIN 4150-3 REPORT

<b>Building Type</b>	Commercial
<b>Pipeline Material</b>	Steel
<b>Velocity Average(mm/s)</b>	245.706031530612
<b>Sampling Rate(hz)</b>	100
<b>Analyze Duration(hh:mm:ss)</b>	00:00:01.4700000
<b>LTVEE</b>	NOK
<b>LTEBP</b>	NOK
<b>Velocity Frequency(hz)</b>	0
<b>Maximum Velocity(mm/s)</b>	485.410572
<b>STEBP</b>	NOK
<b>STVEE</b>	OK

KeyWord	Meaning
LTVEE	Long Term Vibration Evaluation Effect
LTEBP	Long Term Effect on Buired Pipework
STEBP	Short Term Effect on Buired Pipework
STVEE	Short Term Effect Evaluation



INFORMATION	DETAILS
Building type	User configurable
Pipeline Material	User Configurable
Velocity Average	Get the average of the signal after transforming the acceleration signal into velocity signal
Sampling Rate	In Hz
Analyze duration	BeanScape property
Long term vibration evaluation effect	1-Find the maximum velocity values over the Time 2- Compare the maximum velocity to the guideline value described on the Norm DIN 4150. 3-Display if the result is OK or not (guideline respected or not)
Long term Effect on buried pipework	1-Find the maximum velocity values over the Time 2- Compare the maximum velocity to the guideline value described on the Norm DIN 4150. 3-Display if the result is OK or not (guideline respected or not)
Velocity Frequency	Get the signal frequency (FFT + windowing)
Maximum velocity (mm/s)	BeanScape Property
Short term Effect on buried pipework	1-Find the maximum velocity values over the Time 2- Compare the maximum velocity to the guideline value described on the Norm DIN 4150. 3-Display if the result is OK or not (guideline respected or not)
Short term vibration effect evaluation	1-find the maximum velocity value over the time. 2-Determine the significant frequency (use the FFT + windowing). 3-compare the maximum velocity to the guideline value described on the Norm DIN 4150 5-Display if the result is OK or not (guideline respected or not)



**Signal windowing is used in this analysis. Windowing is a technique used to cut out a section of your data to measure, in order to minimize distortions that cause spectral leakage of the FFT.**



[DIN 4150-3 Interpretation video](#)



## 17. BEANSCAPE CLOUD

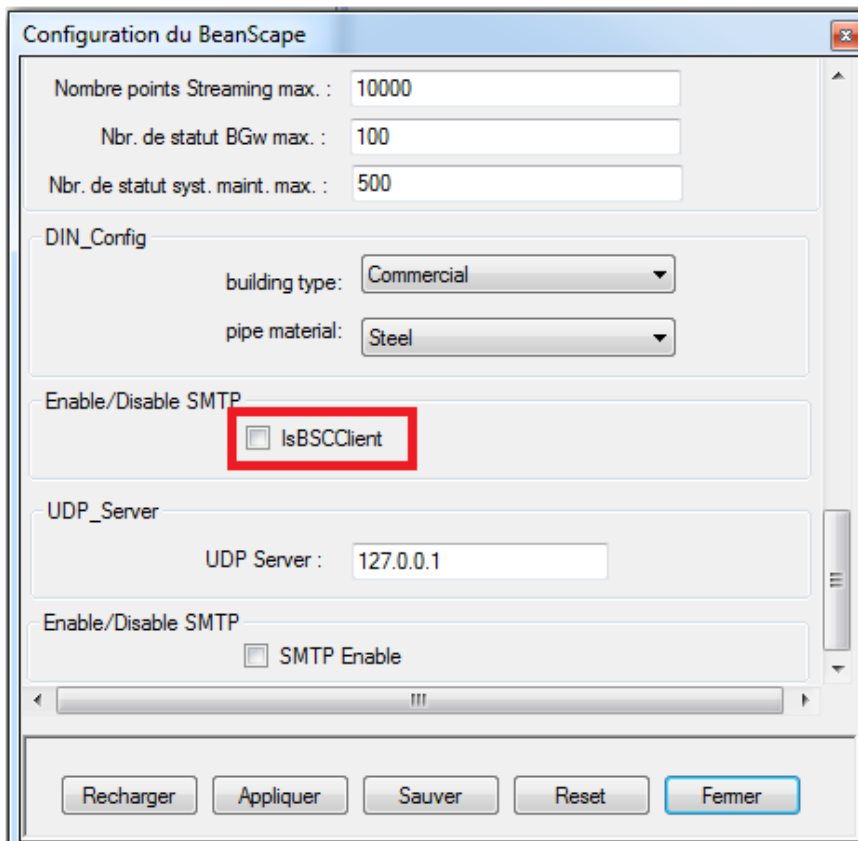
BeanScope Cloud version offers a multi-user interface. It enables real time remote access from a BeanScope Client to the network configuration performed on BeanScope Server.

This new version of BeanScope software can be installed in two PCs, configured as a server in one of them and configured as Client in the other.

The BeanGateway must be connected with an Ethernet cable (directly or via a switch) to the PC where BeanScope is configured as Server.

### 17.1 SET BEANSCAPE ON SERVER OR CLIENT

- Go to tools-> Options-> IsBCSClient
- Deactivate the checkbox in the BeanScope server
- Activate the checkbox in the BeanScope client



The screenshot shows the 'Configuration du BeanScope' dialog box. It contains several configuration options:

- Nombre points Streaming max. : 10000
- Nbr. de statut BGw max. : 100
- Nbr. de statut syst. maint. max. : 500
- DIN\_Config
  - building type: Commercial
  - pipe material: Steel
- Enable/Disable SMTP
  - IsBCSClient (highlighted with a red box)
- UDP\_Server
  - UDP Server : 127.0.0.1
- Enable/Disable SMTP
  - SMTP Enable

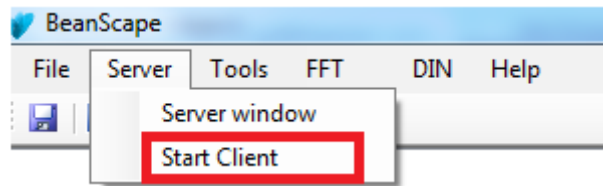
At the bottom, there are buttons for 'Recharger', 'Appliquer', 'Sauver', 'Reset', and 'Fermer'.



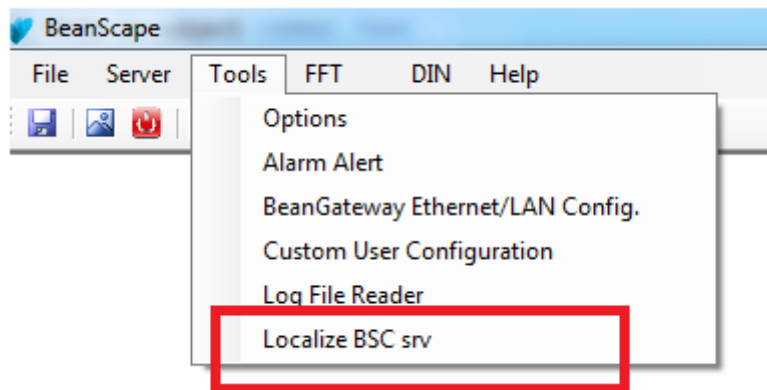
## 17.2 LOCALIZE BEANCAPE SERVER

On BeanScope Client:

- Go to Server-> Start Client

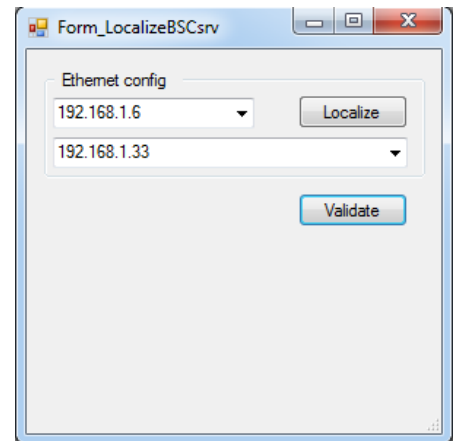


- Go to tools-> Localize BSC srv



The following window will appear.

- In Ethernet config, select the IPv4 address of the PC where the BeanScope Client is installed.
- Click Localize
- Select the the IP address which corresponds to BeanScope Server
- Click validate

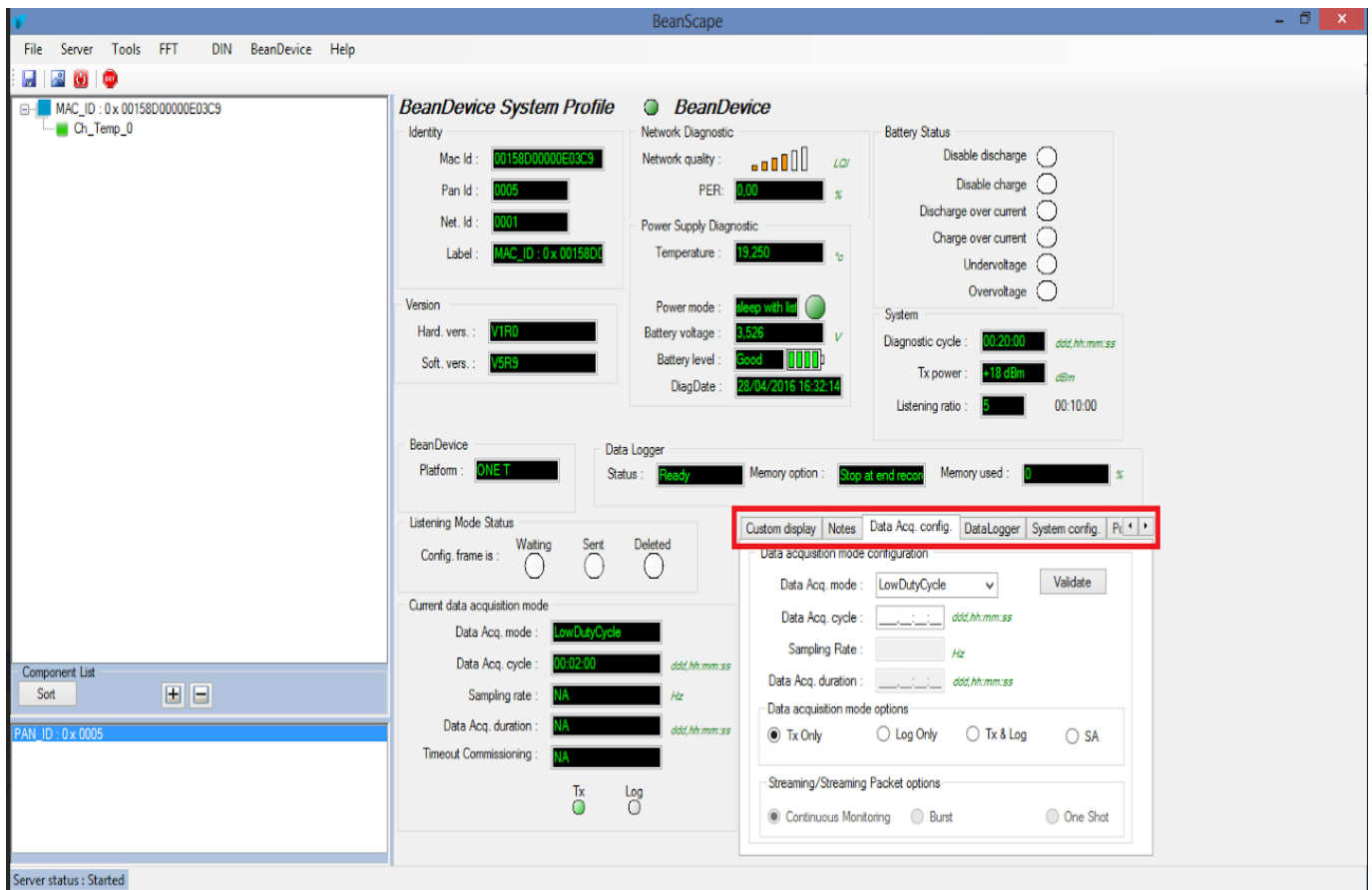


### 17.3 BEANSCOPE SERVER

The BeanScope configured as server is similar to the normal BeanScope version.

The user has access to all the profile details of the BeanDevice and the BeanGateway as well as as all the configuration tabs of the BeanDevice (data acquisition configuration, Datalogger, power mode management...) and of the BeanGateway (Radio Config, System Config, Modbus, Multicasting...).

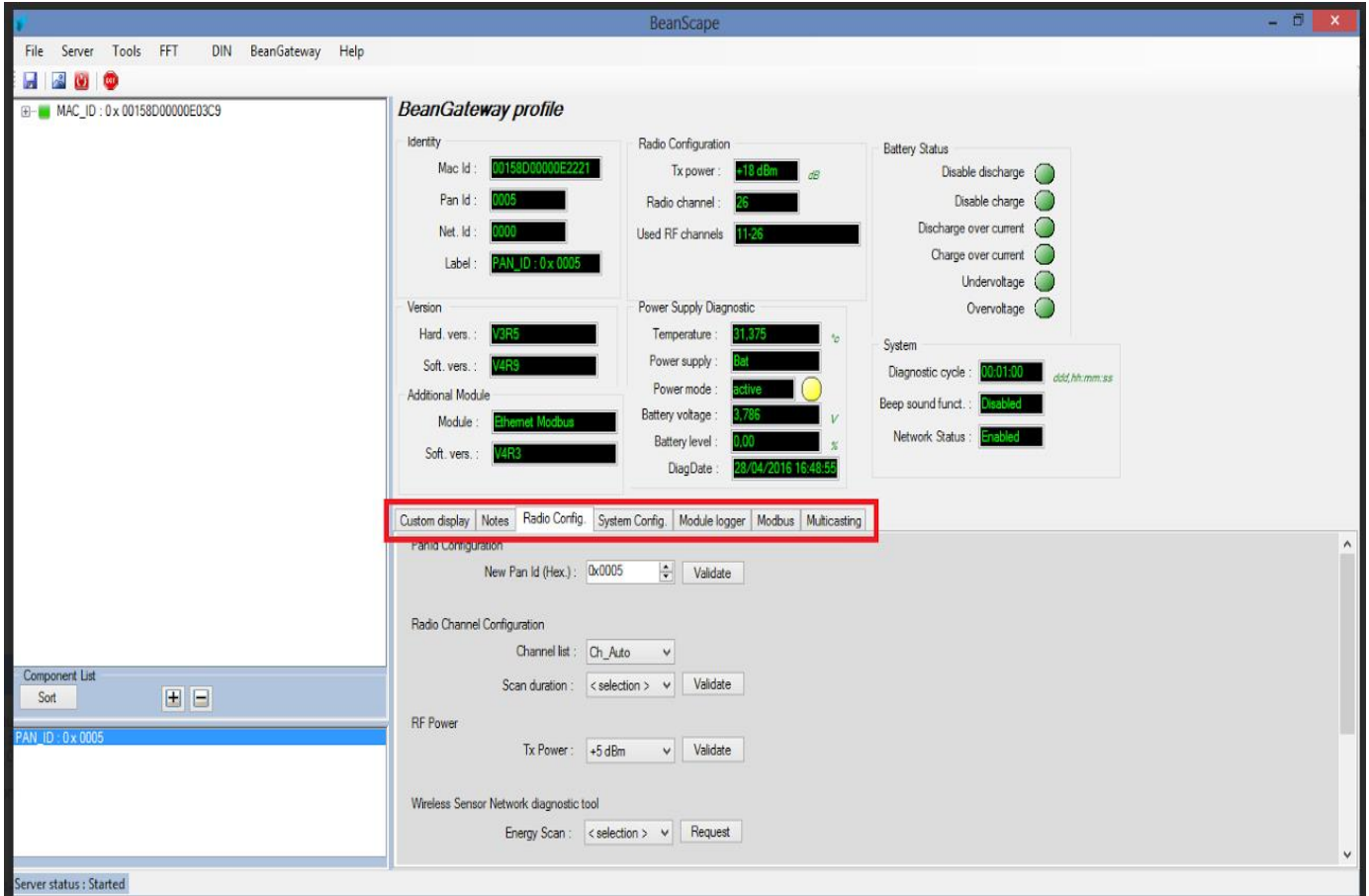
#### 17.3.1 BeanDevice profile on BeanScope Server



The screenshot displays the BeanScope software interface. The main window is titled "BeanScope" and shows a "BeanDevice System Profile" for a device with MAC ID 00158D0000E03C9. The profile includes sections for Identity (Mac Id, Pan Id, Net. Id, Label), Version (Hard. vers., Soft. vers.), Network Diagnostic (Network quality, PER), Power Supply Diagnostic (Temperature, Power mode, Battery voltage, Battery level, DiagDate), Battery Status (Disable discharge, Disable charge, Discharge over current, Charge over current, Undervoltage, Overvoltage), System (Diagnostic cycle, Tx power, Listening ratio), BeanDevice (Platform), Data Logger (Status, Memory option, Memory used), and Listening Mode Status (Config. frame is: Waiting, Sent, Deleted). A "Data acquisition mode configuration" dialog box is open, showing options for Data Acq. mode (LowDutyCycle), Data Acq. cycle (00:02:00), Sampling Rate (Hz), Data Acq. duration (NA), and Data acquisition mode options (Tx Only, Log Only, Tx & Log, SA). The dialog also includes Streaming/Streaming Packet options (Continuous Monitoring, Burst, One Shot). The "Data Acq. config." tab is highlighted in the dialog's tab bar.



### 17.3.2 BeanGateway profile on BeanScope Server



BeanScope

File Server Tools FFT DIN BeanGateway Help

MAC\_ID : 0x 00158D0000E03C9

#### BeanGateway profile

**Identity**

Mac Id : 00158D0000E2221  
Pan Id : 0005  
Net. Id : 0000  
Label : PAN\_ID : 0x 0005

**Radio Configuration**

Tx power : +18 dBm  
Radio channel : 26  
Used RF channels : 11-26

**Battery Status**

Disable discharge  
Disable charge  
Discharge over current  
Charge over current  
Undervoltage  
Overvoltage

**Version**

Hard vers. : V4R6  
Soft. vers. : V4R6

**Additional Module**

Module : Ethernet Modbus  
Soft. vers. : V4R3

**Power Supply Diagnostic**

Temperature : 31.375  
Power supply : Bat  
Power mode : active  
Battery voltage : 3.786 V  
Battery level : 0.00 %  
DiagDate : 20/04/2016 16:48:55

**System**

Diagnostic cycle : 00:01:00  
Beep sound funct. : Disabled  
Network Status : Enabled

Custom display | Notes | Radio Config. | System Config. | Module logger | Modbus | Multicasting

**PanId Configuration**

New Pan Id (Hex.) : 0x0005 Validate

**Radio Channel Configuration**

Channel list : Ch\_Auto  
Scan duration : <selection> Validate

**RF Power**

Tx Power : +5 dBm Validate

**Wireless Sensor Network diagnostic tool**

Energy Scan : <selection> Request

Component List

Sort

PAN\_ID : 0x 0005

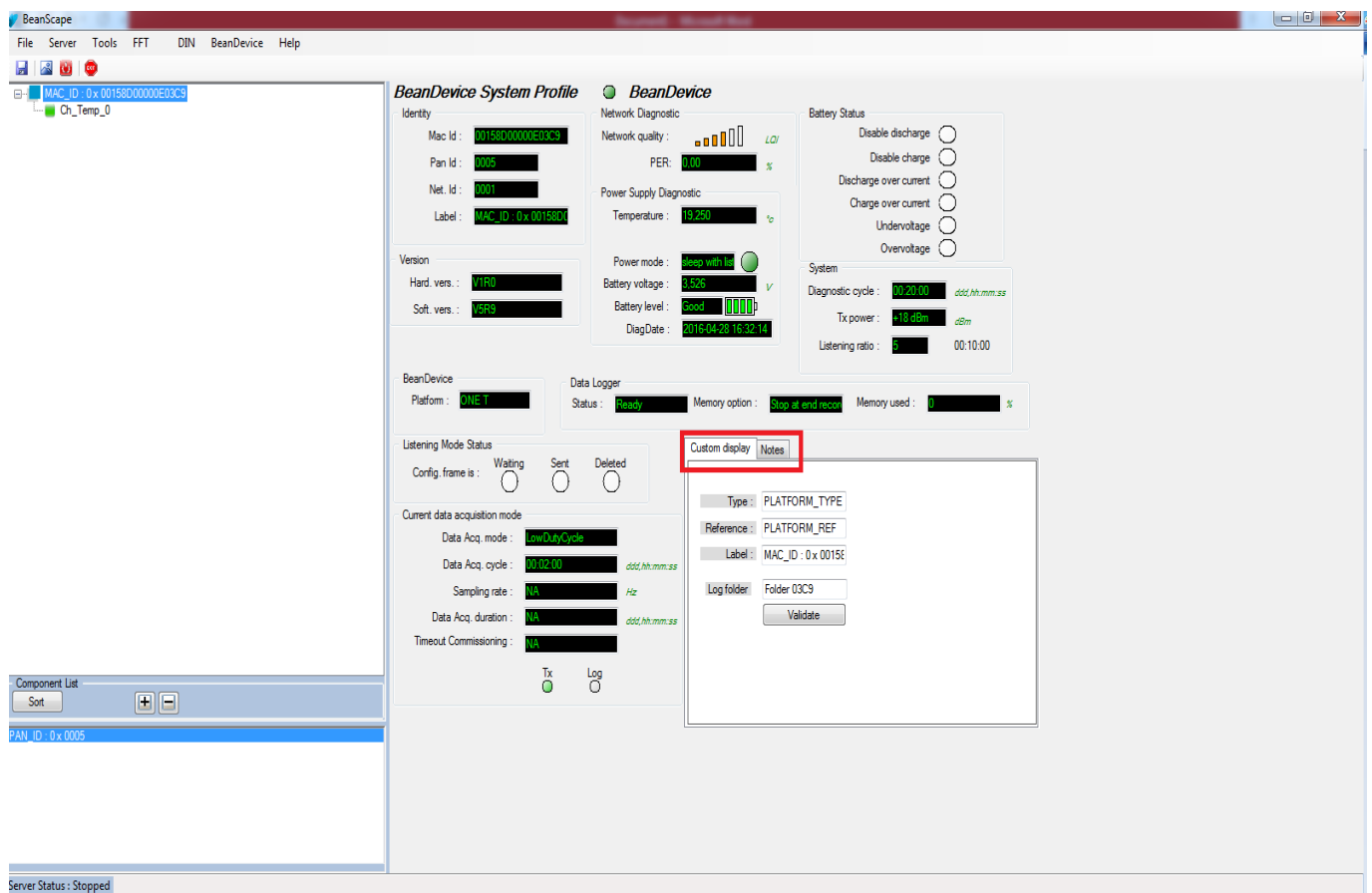
Server status : Started



## 17.4 BEANSCOPE CLIENT

The BeanScope configured as Client gives access only to the profiles details of the BeanDevice and the the BeanGateway. The user cannot change the configurations.

### 17.4.1 BeanDevice profile on BeanScope Client



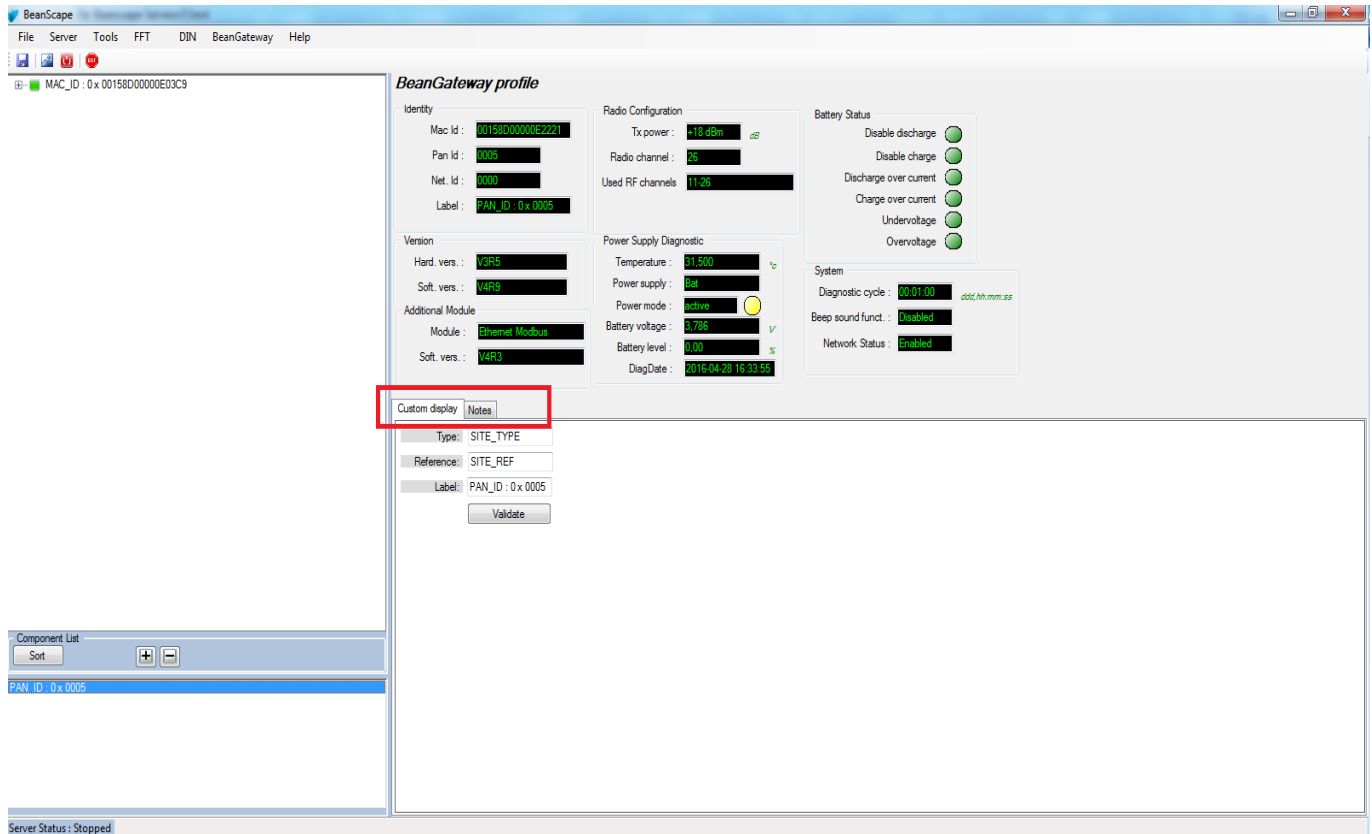
The screenshot displays the BeanScope Client interface for configuring a BeanDevice profile. The main window is titled "BeanScope" and contains several panels:

- BeanDevice System Profile:** This panel is divided into several sub-sections:
  - Identity:** Fields for Mac Id (0015800000E03C3), Pan Id (0005), Net. Id (0001), and Label (MAC\_ID : 0x 001580).
  - Version:** Fields for Hard. vers. (V1R0) and Soft. vers. (V6R9).
  - Network Diagnostic:** Shows Network quality (LQI) and PER (0.00 %).
  - Power Supply Diagnostic:** Shows Temperature (19.250 °C) and Power mode (sleep with led).
  - Battery Status:** Shows Battery voltage (3.62V) and Battery level (Good). It also includes radio buttons for "Disable discharge", "Disable charge", "Discharge over current", "Charge over current", "Undervoltage", and "Overvoltage".
  - System:** Shows Diagnostic cycle (00:20:00), Tx power (19.49m dBm), and Listening ratio (6).
  - BeanDevice:** Shows Platform (SWE-T) and Status (Ready).
  - Data Logger:** Shows Memory option (Stop at end record) and Memory used (0 %).
  - Listening Mode Status:** Includes radio buttons for "Waiting", "Sent", and "Deleted".
  - Current data acquisition mode:** Shows Data Acq. mode (lowDutyCycle), Data Acq. cycle (00:02:00), Sampling rate (NA), Data Acq. duration (NA), and Timeout Commissioning (NA).
- Custom display:** A window with a red border containing fields for Type (PLATFORM\_TYPE), Reference (PLATFORM\_REF), Label (MAC\_ID : 0x 00158), and Log folder (Folder 03C9), with a "Validate" button.
- Component List:** A list showing PAN\_ID : 0x 0005.
- Server Status:** Stopped.





### 17.4.2 BeanGateway profile on BeanScope Client



**BeanGateway profile**

MAC\_ID : 0x00158D0000E03C9

**Identity**

- Mac Id : 00158D0000E221
- Pan Id : 0005
- Net. Id : 0000
- Label : PAN\_ID : 0x0005

**Radio Configuration**

- Tx power : 119 dBm
- Radio channel : 25
- Used RF channels : 11-25

**Battery Status**

- Disable discharge
- Disable charge
- Discharge over current
- Charge over current
- Undervoltage
- Overvoltage

**Version**

- Hard. vers. : V3R5
- Soft. vers. : V4R9

**Power Supply Diagnostic**

- Temperature : 31.500 °C
- Power supply : Bat
- Power mode : active
- Battery voltage : 3.785 V
- Battery level : 100 %
- DiagDate : 2016-04-28 16:23:55

**System**

- Diagnostic cycle : 00:01:00 ddd.hk:mm:ss
- Beep sound funct. : Disabled
- Network Status : Enabled

**Additional Module**

- Module : Ethernet Modbus
- Soft. vers. : V4R3

**Custom display** | **Notes**

Type: SITE\_TYPE  
Reference: SITE\_REF  
Label: PAN\_ID : 0x0005  
Validate

Component List  
Sort

PAN\_ID : 0x0005

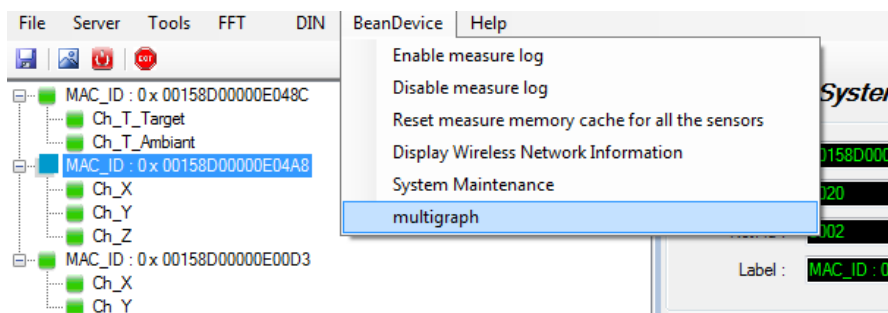
Server Status : Stopped



## 18. MULTIGRAPH DISPLAY

The Multigraph function is very helpful to correlate several measurements at the same time. User can change the measurement plots color, make a zoom or change the graph background. This update is free of cost for our customers who are already using the BeanScope Basic, BeanScope Premium, BeanScope Premium+ and BeanScope Cloud.

- On BeanScope, choose your device and then click on: BeanDevice -> multigraph



- The following window representing the time plot of different channels will be displayed:



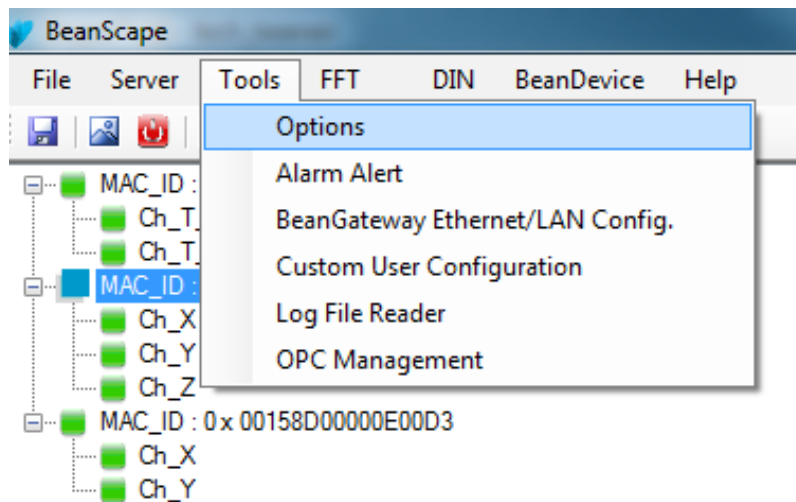
[Multigraph Video](#)



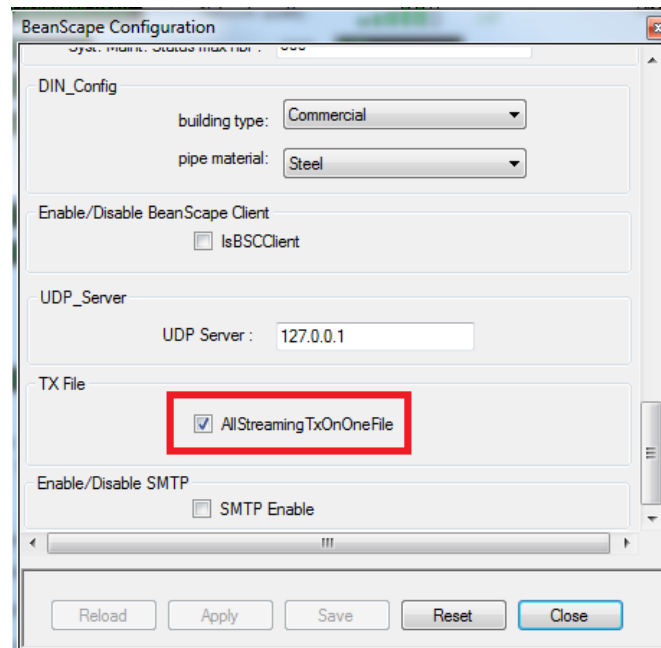
## 19. IMPORTING A SINGLE TX FILE WITH MULTIPLE CHANNELS

Some users would recommend importing one single Tx file containing Data from all channels. This feature is developed for file management purposes.

- On BeanScope, click: Tools -> Options



- Check the “AllStreamingTxOnOneFile” box, then apply, save and close





- You should have all channels data recorded in one single file located in your C:\log\_beanscape directory

```
File Edit Format View Help
-----
Beansensor AX-3D
Mac Id : 00158D0000E04A8
Network Id : 0002
Pan Id : 0020
Date : 04/07/2016 13:28:41
Data acquisition cycle : 1
Data acquisition duration : NA
Sampling rate : 10
Cut off frequency : 1000
-----
Measure Index;Measure value
7270 : 0,3685 ; 0,085 ; 0,8598
7271 : 0,3435 ; 0,0652 ; 0,8315
7272 : 0,3438 ; 0,0752 ; 0,8425
7273 : 0,3771 ; 0,0948 ; 0,8821
7274 : 0,37 ; 0,0987 ; 0,8663
7275 : 0,3664 ; 0,0771 ; 0,8577
7276 : 0,3484 ; 0,0688 ; 0,8336
7277 : 0,341 ; 0,0661 ; 0,8406
7278 : 0,3398 ; 0,06 ; 0,826
7279 : 0,3706 ; 0,0847 ; 0,8617
7280 : 0,3609 ; 0,0786 ; 0,836
7281 : 0,37 ; 0,0932 ; 0,8635
7282 : 0,3722 ; 0,0853 ; 0,8592
7283 : 0,3493 ; 0,0645 ; 0,8351
7284 : 0,3664 ; 0,0829 ; 0,8559
7285 : 0,3697 ; 0,0829 ; 0,8663
7286 : 0,3725 ; 0,0832 ; 0,8641
7287 : 0,3648 ; 0,0774 ; 0,8504
7288 : 0,37 ; 0,0856 ; 0,8644
7289 : 0,3722 ; 0,0838 ; 0,8605
7290 : 0,3557 ; 0,0768 ; 0,8452
7291 : 0,374 ; 0,0844 ; 0,8635
7292 : 0,3676 ; 0,0862 ; 0,8669
7293 : 0,3697 ; 0,0862 ; 0,8647
7294 : 0,3716 ; 0,0859 ; 0,8681
7295 : 0,3706 ; 0,0887 ; 0,8632
7296 : 0,3658 ; 0,0826 ; 0,8605
7297 : 0,3526 ; 0,0752 ; 0,8373
7298 : 0,3377 ; 0,0655 ; 0,8257
7299 : 0,3713 ; 0,0838 ; 0,8724
7300 : 0,3713 ; 0,0871 ; 0,8708
7301 : 0,3691 ; 0,0859 ; 0,8656
7302 : 0,3606 ; 0,0764 ; 0,8501
7303 : 0,3633 ; 0,0786 ; 0,8547
7304 : 0,3716 ; 0,085 ; 0,8656
7305 : 0,3743 ; 0,088 ; 0,8788
7306 : 0,3667 ; 0,0829 ; 0,8647
7307 : 0,3496 ; 0,0737 ; 0,8437
7308 : 0,37 ; 0,0841 ; 0,8666
```

Channel X Channel Y Channel Z



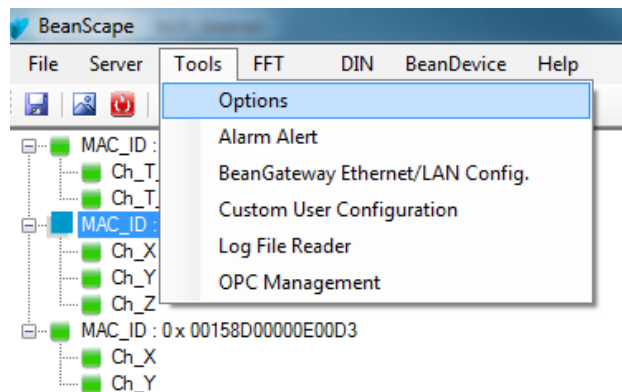
## 20. BEANSCOPE AUTO-START

Auto-starting BeanScope monitoring software is highly recommended for users who need to run test on times of the day with no human intervention. For example, when you need to take temperature measures during the night and no employee is available to open the software and run the server.

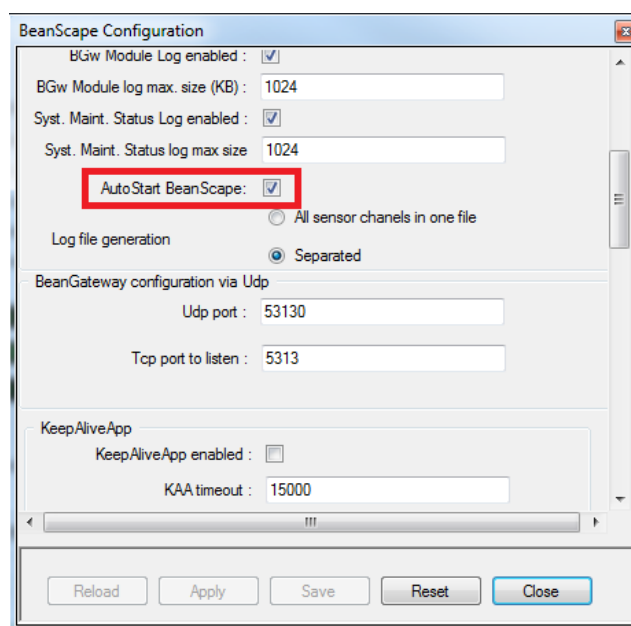
Here we provide a quick solution:

### 20.1 AUTO-START SOFTWARE

- On BeanScope, click: Tools -> Options



- Check “AutoStart BeanScope” box. This would start automatically the software.

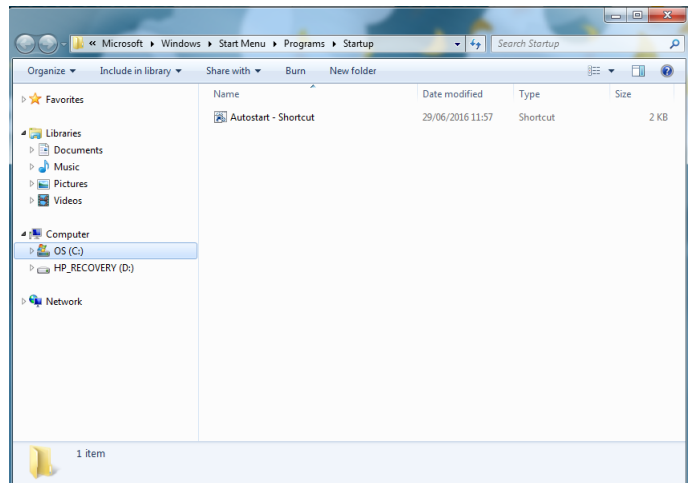


## 20.2 AUTO-START SERVER

### 20.2.1 Windows 98, XP, NT, 2000, Vista and later users

- Create a shortcut to the batch file (Autostart.bat) located in the BeanScope installation folder

Name	Date modified
fr	04/07/2016 12:34
Abt.Controls.SciChart.Example	09/03/2015 13:28
Abt.Controls.SciChart.Wpf.dll	09/03/2015 13:27
Abt.Controls.SciChart3D.Wpf.dll	09/03/2015 13:27
AppliBeanRawLogConverter	13/10/2011 13:03
Autostart - Shortcut	04/07/2016 14:14
Autostart	08/01/2014 01:02
BeanScope	23/06/2016 10:44
BeanScope.exe.config	21/05/2016 11:05
BeanUserCustomDB	27/11/2012 12:20
gbda_clr.dll	27/11/2012 12:20
gbda3w.dll	27/11/2012 12:20
unins000.dat	04/07/2016 12:34
unins000	04/07/2016 12:34
ZedGraph.dll	25/11/2008 16:07



- Once the shortcut has been created right-click the file and select Cut.
- Click Start, Programs, right-click the Startup folder and click Open
- Once the Startup folder has been opened click Edit and paste the shortcut into the startup. Any shortcuts in the startup folder will automatically start each time Windows starts.

### 20.2.2 Windows 95, 3.x and MS-DOS users

- Place a line in your autoexec.bat that calls the batch file each time you want to boot the computer, as shown below.
- CALL C:\ Autostart.bat



## 21. SNTP CLIENT

---

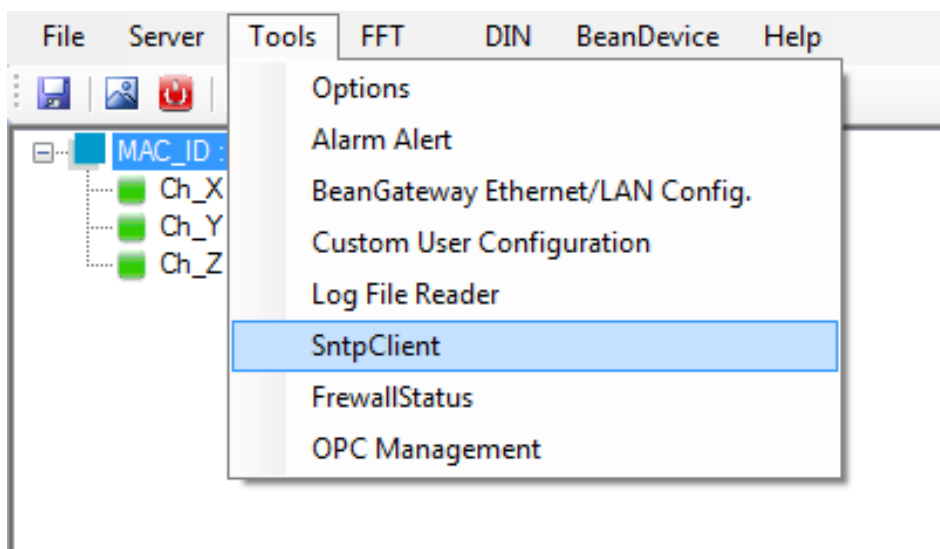
SNTP refers to Simple Network Time Protocol. This function could be used to query a Network Time Protocol (NTP) server and give the time drift of the computer clock relative to the server clock.

In order to correct the clock of your system, please follow the instructions below:

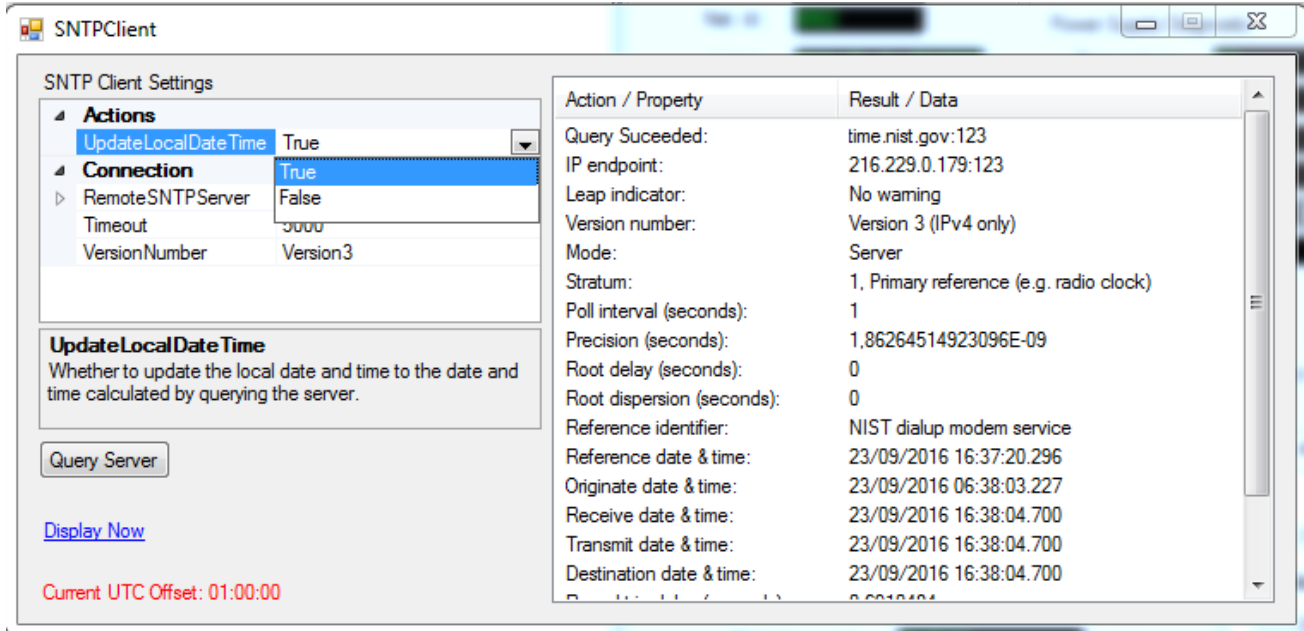
- Make sure to run your BeanScape as an administrator



- Tools -> SntpClient



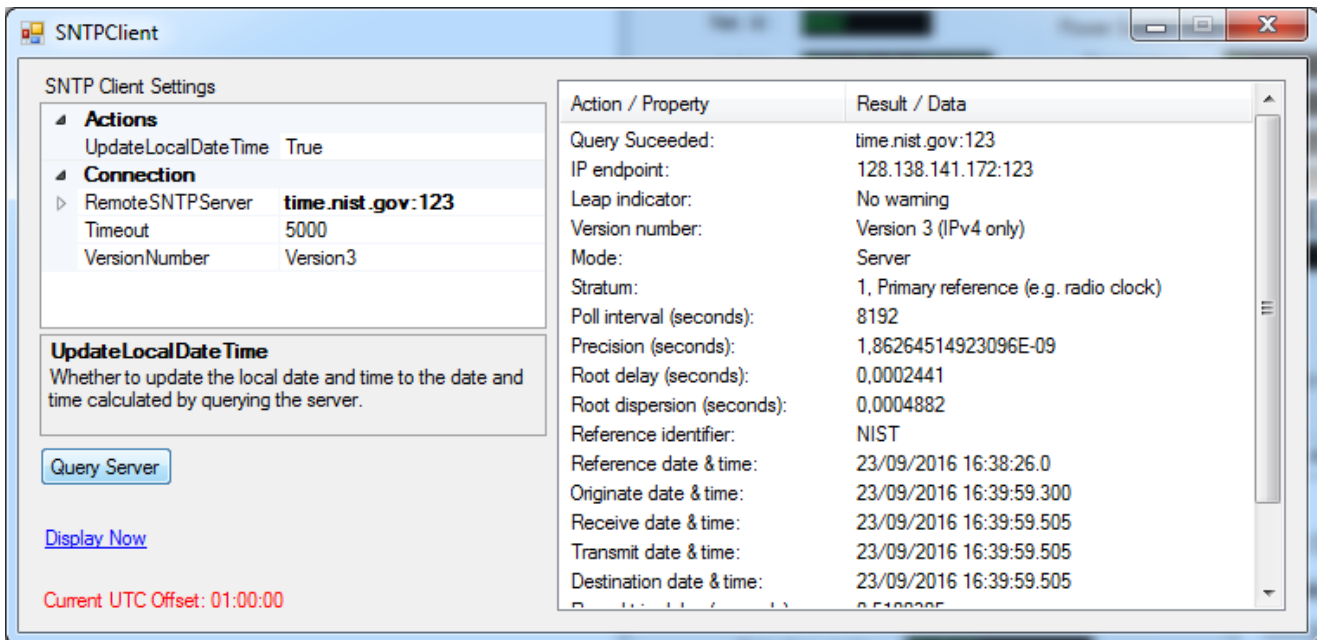
- Set “UpdateLocalDate Time” to **True**



The screenshot shows the SNTPClient application window. On the left, the 'SNTP Client Settings' panel is visible. Under the 'Actions' section, 'UpdateLocalDate Time' is set to 'True'. Under the 'Connection' section, 'RemoteSNTP Server' is set to 'True', 'Timeout' is '5000', and 'VersionNumber' is 'Version3'. Below the settings, there is a 'Query Server' button and a 'Display Now' link. At the bottom, it shows 'Current UTC Offset: 01:00:00'. On the right, a table displays the results of a query to time.nist.gov:123.

Action / Property	Result / Data
Query Succeeded:	time.nist.gov:123
IP endpoint:	216.229.0.179:123
Leap indicator:	No warning
Version number:	Version 3 (IPv4 only)
Mode:	Server
Stratum:	1, Primary reference (e.g. radio clock)
Poll interval (seconds):	1
Precision (seconds):	1,86264514923096E-09
Root delay (seconds):	0
Root dispersion (seconds):	0
Reference identifier:	NIST dialup modem service
Reference date & time:	23/09/2016 16:37:20.296
Originate date & time:	23/09/2016 06:38:03.227
Receive date & time:	23/09/2016 16:38:04.700
Transmit date & time:	23/09/2016 16:38:04.700
Destination date & time:	23/09/2016 16:38:04.700

- Press Query Server to update the clock of your computer based on network clock



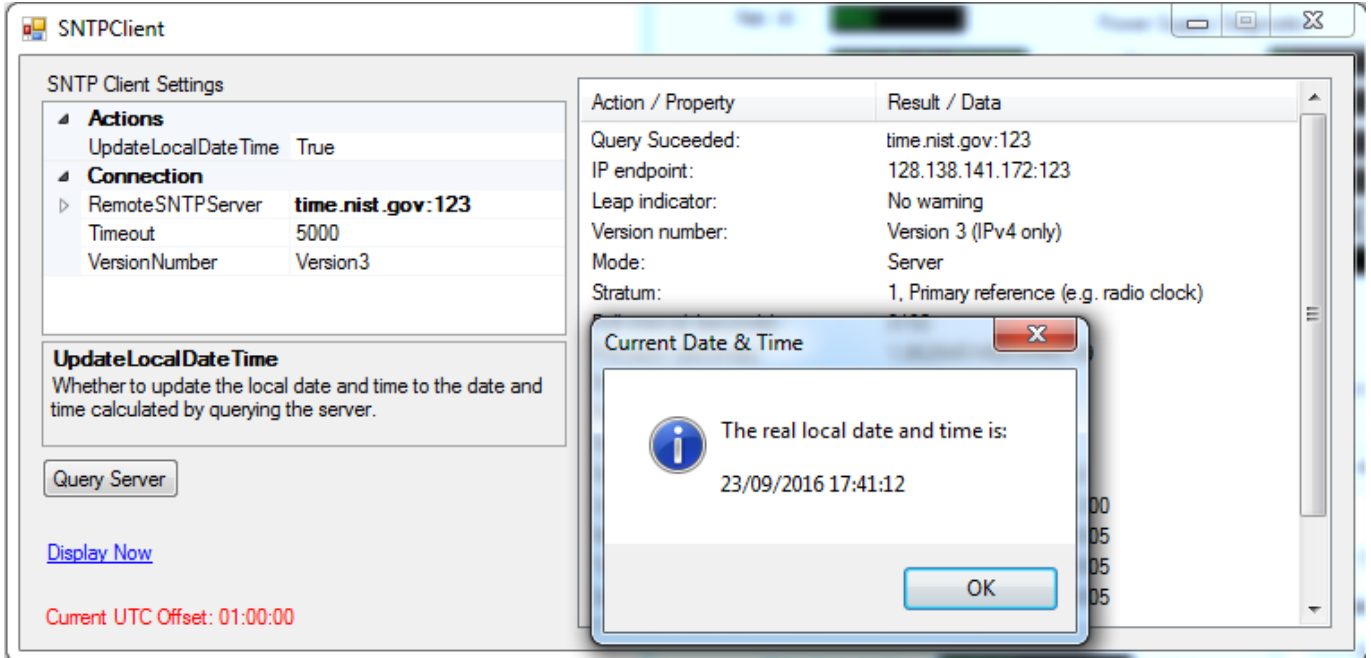
The screenshot shows the SNTPClient application window after the 'Query Server' button has been pressed. The 'RemoteSNTP Server' setting is now 'time.nist.gov:123'. The 'Query Server' button is disabled. The results table on the right shows updated data from the query.

Action / Property	Result / Data
Query Succeeded:	time.nist.gov:123
IP endpoint:	128.138.141.172:123
Leap indicator:	No warning
Version number:	Version 3 (IPv4 only)
Mode:	Server
Stratum:	1, Primary reference (e.g. radio clock)
Poll interval (seconds):	8192
Precision (seconds):	1,86264514923096E-09
Root delay (seconds):	0,0002441
Root dispersion (seconds):	0,0004882
Reference identifier:	NIST
Reference date & time:	23/09/2016 16:38:26.0
Originate date & time:	23/09/2016 16:39:59.300
Receive date & time:	23/09/2016 16:39:59.505
Transmit date & time:	23/09/2016 16:39:59.505
Destination date & time:	23/09/2016 16:39:59.505





- You can display also the current server time



Action / Property	Result / Data
Query Succeeded:	time.nist.gov:123
IP endpoint:	128.138.141.172:123
Leap indicator:	No warning
Version number:	Version 3 (IPv4 only)
Mode:	Server
Stratum:	1, Primary reference (e.g. radio clock)

**Current Date & Time**

The real local date and time is:  
23/09/2016 17:41:12

OK

- We use the following settings for the Sntp server:

<b>Actions</b>	
UpdateLocalDateTime	True
<b>Connection</b>	
RemoteSNTPServer	<b>time.nist.gov:123</b>
HostNameOrAddress	time.nist.gov
Port	123
Timeout	5000
VersionNumber	Version3



[See “Configuring SNTP client” Youtube video](#)

