BeanScape®

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Your Automation Partner

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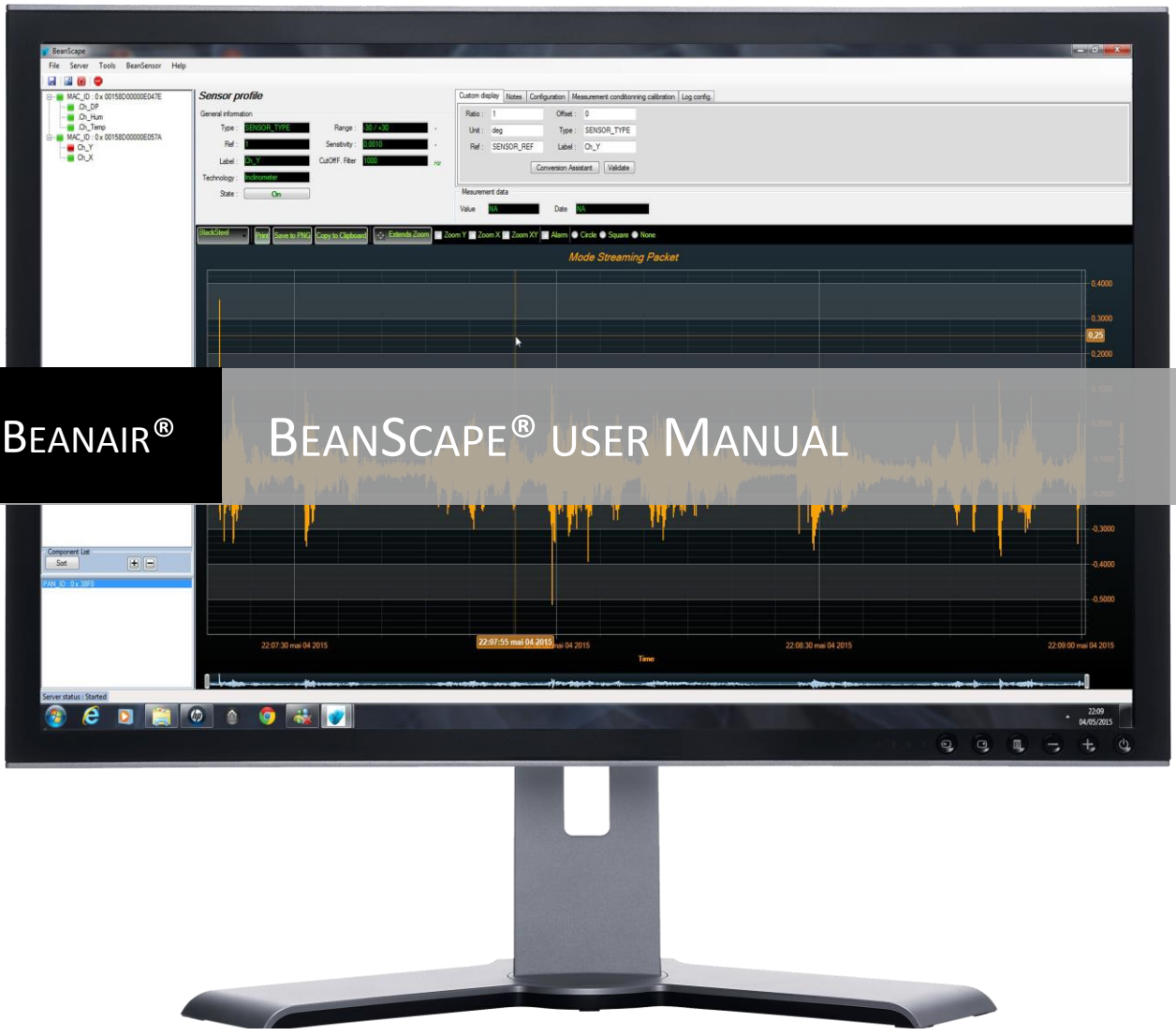

BEANAIR®

BEANSCAPE® USER MANUAL

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Reader	Mohamed Yosri, Embedded software engineer		X
Approbation	Maneli PARSY	X	

DIFFUSION

Function	Recipients	Validation	Action
Reader 1	Mohamed Yosri, Embedded Software Engineer	X	

Updates

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1.3	29/03/2010	Maneli PARSY	BeanScape® Premium+ version
1.4	28/08/2010	Christophe DONTEGREUIL	BeanDevice® profile description
1.5	25/11/2010	Christophe DONTEGREUIL	Compatibility with Windows 7 and Windows Vista
1.6	10/03/2013	Christophe DONTEGREUIL	Compatibility with Windows 8
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1.9	20/03/215	Maxime Obr.	New graph tool added, firewall compatibility section added
1.10	05/10/2015	Maxime Obr.	SMTP client added
1.11	15/11/2015	Maxime Obr.	FFT function added
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1.13	18/04/2016	Rasha FRIJI	FFT shift/ DIN/BeanScape Cloud
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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 BeanScape basic/Alarm by Email/ SNTP videos added

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Such changes will, nevertheless be incorporated into new editions of this document.

Contents

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. 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*
	***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
LLC	Logical Link Control
LQI	Link quality indicator
LDCDA	Low duty cycle data acquisition
MAC	Media Access Control
PAN	Personal Area Network
PER	Packet error rate
RF	Radio Frequency
SD	Secure Digital
WSN	Wireless sensor Network

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
AN_RF_007 :" Beanair_WSN_Deployment"	All BeanAir products	Wireless sensor networks deployment guidelines
AN_RF_006 – „How to extend your wireless range"	All BeanAir products	A guideline very useful for extending your wireless range
AN_RF_005 – BeanGateway ® & Data Terminal Equipment Interface	BeanGateway ®	DTE interface Architecture on the BeanGateway ®
AN_RF_003 - "IEEE 802.15.4 2.4 GHz Vs 868 MHz"	All BeanAir products	Comparison between 868 MHz frequency band and a 2.4 GHz frequency band.
AN_RF_002 – "Structural Health monitoring on bridges"	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
TN_RF_013 – « OPC configuration »	BeanScape® Premium+	The aim of this document is to help deploying the OPC DA and all associated services.
TN_RF_012– « BeanDevice® battery life in streaming mode »	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.
TN_RF_011 – « Coexistence of Beanair WSN at 2.4GHz »	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.
TN_RF_010 – « BeanDevice® Power Management »	All the BeanDevice®	This technical note describes the sleeping & active power mode on the BeanDevice®.
TN_RF_009 – « BeanGateway ® management on LAN infrastructure »	BeanGateway ®	BeanGateway ® integration on a LAN infrastructure
TN_RF_008 – "Data acquisition modes available on the BeanDevice®"	All the BeanDevice®	Data acquisition modes available on the BeanDevice®
TN_RF_007 – "BeanDevice® DataLogger User Guide "	All the BeanDevice®	This document presents the DataLogger feature on the BeanDevice®
TN_RF_006 – "WSN Association process"	All the BeanDevice®	Description of the BeanDevice® network association
TN_RF_005 – "Pulse counter & binary Data acquisition on the BeanDevice® SUN-BN"	BeanDevice® SUN-BN	This document presents Pulse counter (ex: energy metering application) and binary Data acquisition features on the BeanDevice® SUN-BN.
RF_TN_003- "Aggregation capacity of wireless sensor networks"	All the products	Network capacity characterization of Beanair Wireless Sensor Networks
RF_TN_002 V1.0 - Current consumption in active & sleeping mode	BeanDevice®	Current consumption estimation of the BeanDevice in active and sleeping mode
RF_TN_001 V1.0- Wireless range benchmarking	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
Company Presentation	All
BeanGateway ® - Ethernet Outdoor version introduction	BeanGateway ® - Ethernet Outdoor version introduction
BeanGateway ® – Ethernet Indoor version presentation	BeanGateway ® Ethernet Indoor version
BeanDevice® AN-XX wireless range demonstration	BeanDevice® AN-XX & BeanDevice® AN-XX Extender
BeanDevice® AN-XX presentation	BeanDevice® AN-XX & BeanDevice® AN-XX Extender
BeanDevice® AX-3D presentation	BeanDevice® AX-3D
BeanDevice® HI-INC presentation	BeanDevice® HI-INC
BeanDevice® AX-3DS presentation	BeanDevice® AX-3DS
BeanScape® – WSN supervision software	BeanScape®
BeanGateway ® Ethernet/LAN Configuration, directly connected to the Laptop/PC	BeanGateway ®
Wireless sensors profile deletion from the BeanGateway ® Database	All

5. SYSTEM OVERVIEW

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

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

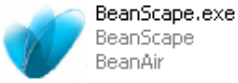
Operating Systems	*BeanScape® Manager (Streaming packet mode not enabled)*	*BeanScape® Basic (Streaming packet mode not enabled)*	*BeanScape® Basic (Streaming packet mode enabled)*	*BeanScape® Premium+*	*BeanScape® Premium*
CPU	*2.33GHz or faster x86-compatible processor*				
RAM memory	*1 GB*	*2 GB*	*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.

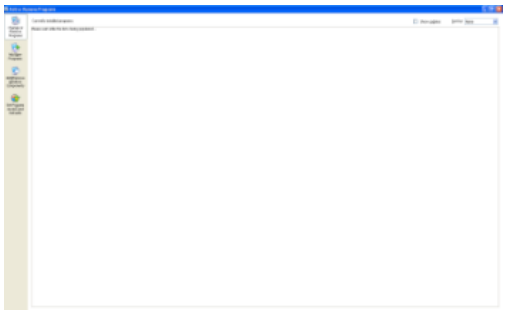
9. UNINSTALLING BEANSCAPE®

- ✓ To uninstall BeanScape®, follow these instructions:
- ✓ Click 

- ✓ Then 

- ✓ Double click on the icon 

- ✓ 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

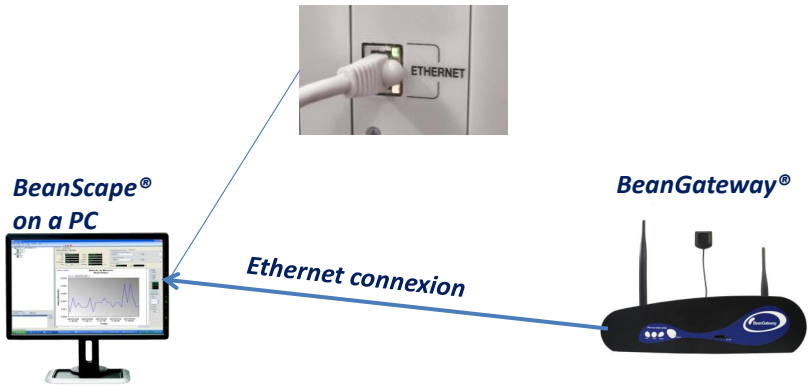


Figure 3: Typical LAN connection

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

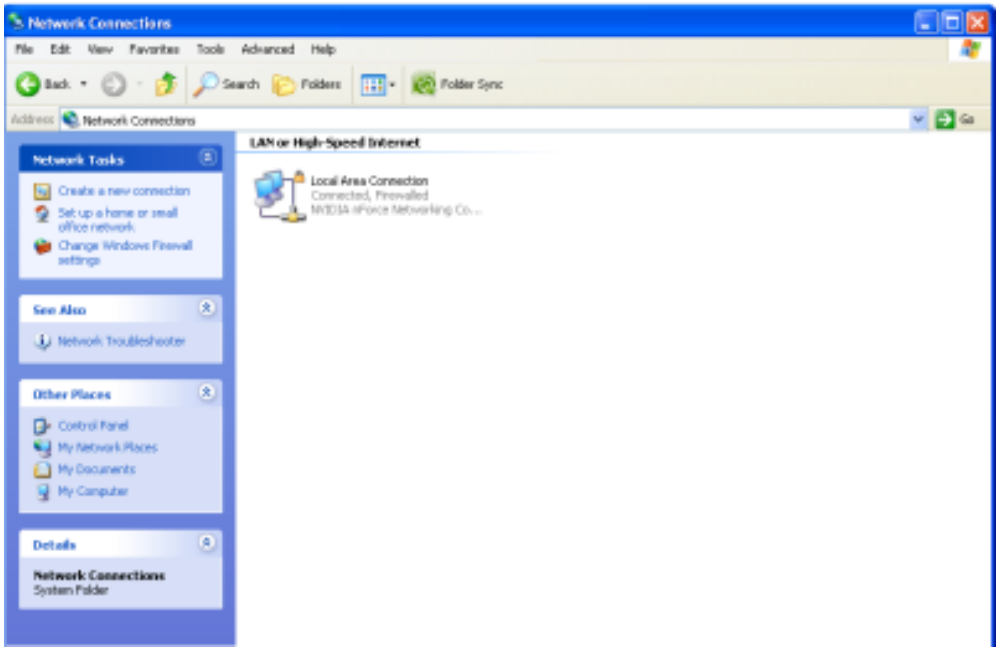
To configure the network on your computer/workstation:

- ✓ Click on 

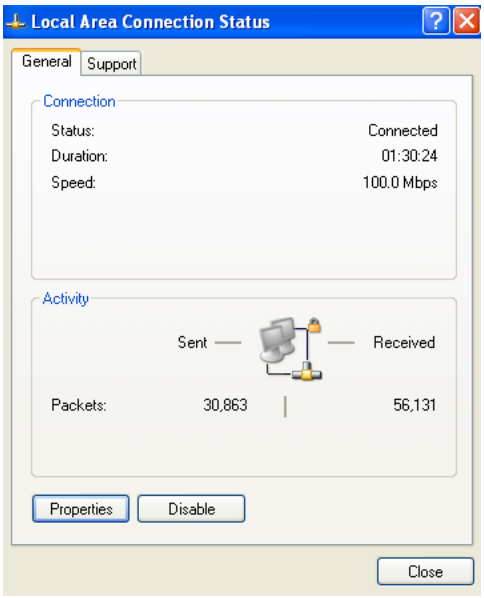
- ✓ Then on 

- ✓ Double-click on 

- ✓ You will see the following window

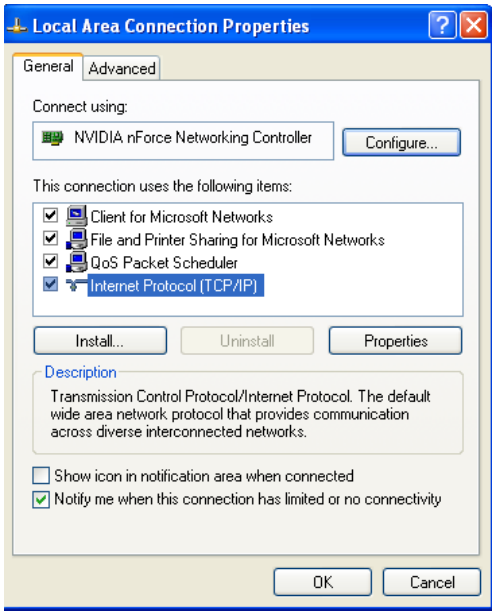


- ✓ Select the icon corresponding to the (NIC) network interface card on what you connected the BeanGateway® 
- ✓ Double-click the icon.
- ✓ You get the following window:



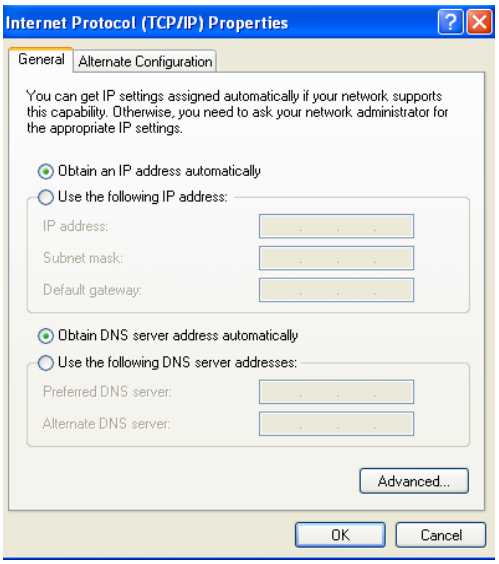
✓ Click on 

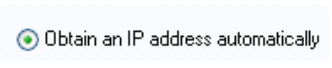
✓ You will see the following window:



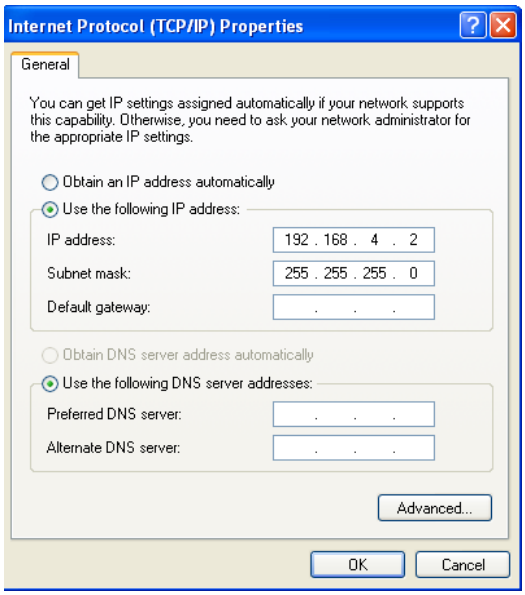
✓ Double click on 

✓ 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 

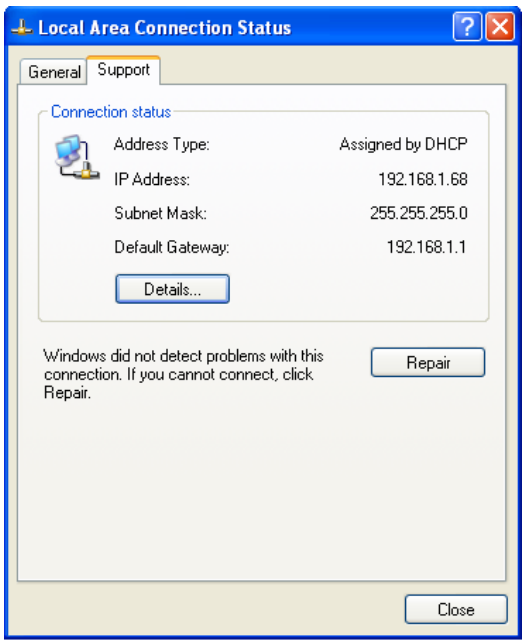
- ✓ If the DHCP option has not been activated, you must enter a static IP **192.168.4.2** on your PC with a subnet mask: 255.255.255.0.



- ✓ 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 BeanScape®.
- ✓ 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:

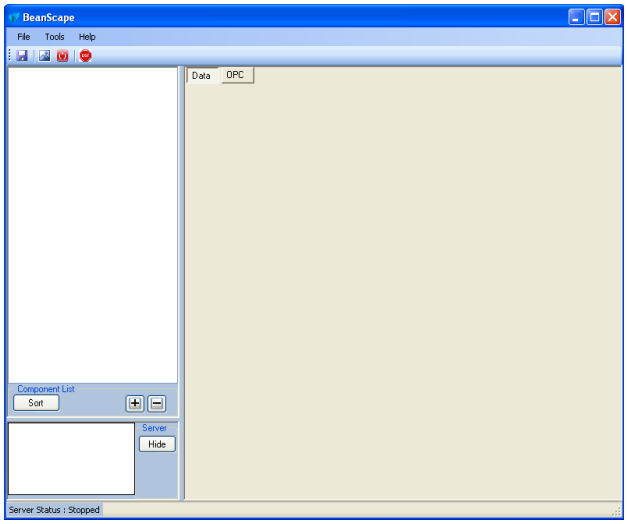
1. Make sure that your BeanScape® is not running;
2. Open your firewall. If you can't find your firewall application, check the System Tray (at the bottom-right corner of the screen) for an icon. Usually, you can right-click this icon and select to open the firewall;
3. Your firewall maintains a list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

10.4 START THE BEANSCAPE®

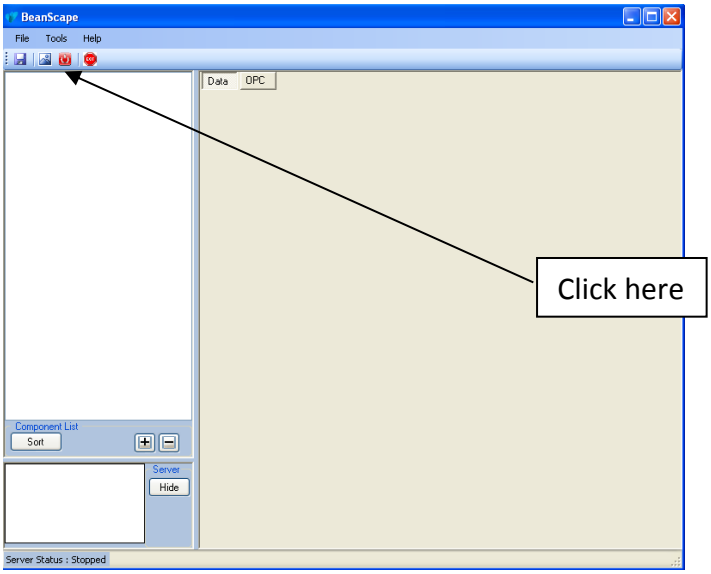
To start BeanScape ®, please follow the instructions:

- Start BeanScape ®by double-clicking the icon

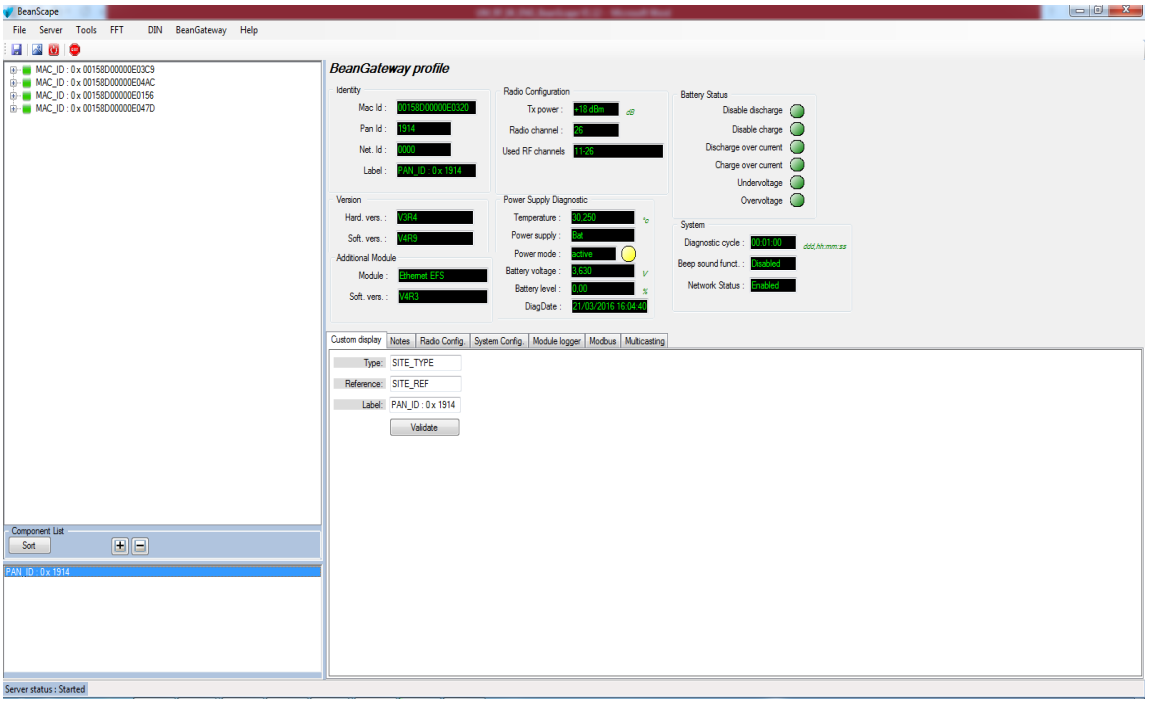
- You get the following screen:



- Start the server by clicking the Start button



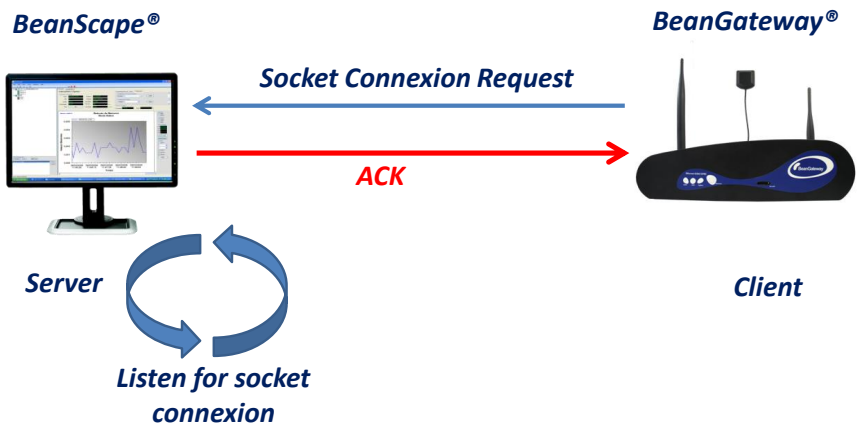
The BeanScape® server starts, and creates the BeanDevices® mapping based.



10.5 HOW THE CONNECTION IS ESTABLISHED BETWEEN THE BEANGATEWAY® AND THE BEANSCAPE® ?

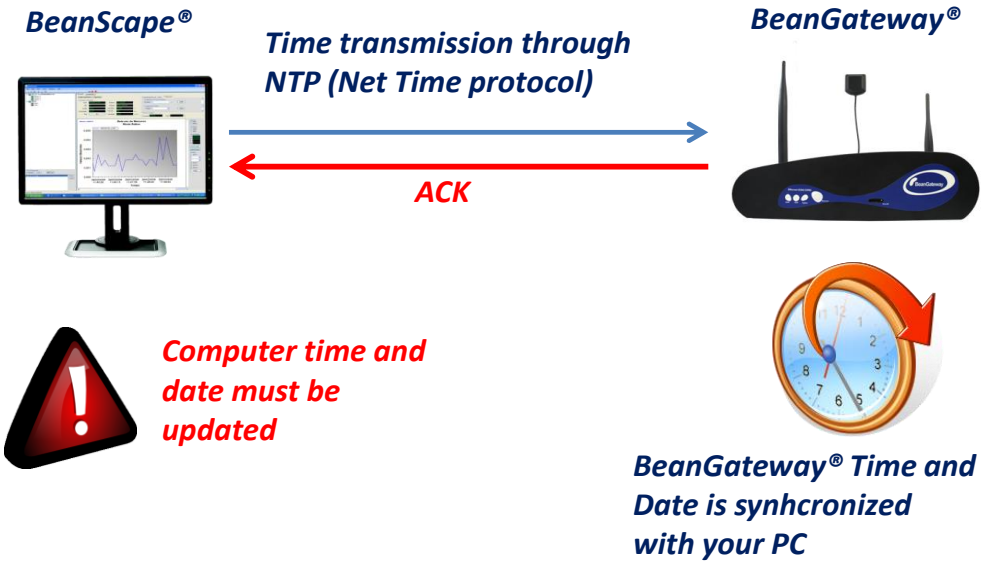
Step 1: Socket connexion

- When the BeanScape® 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 BeanGaterway®
- If this request is accepted by the BeanScape®, an ACK is transmitted to the BeanGateway®



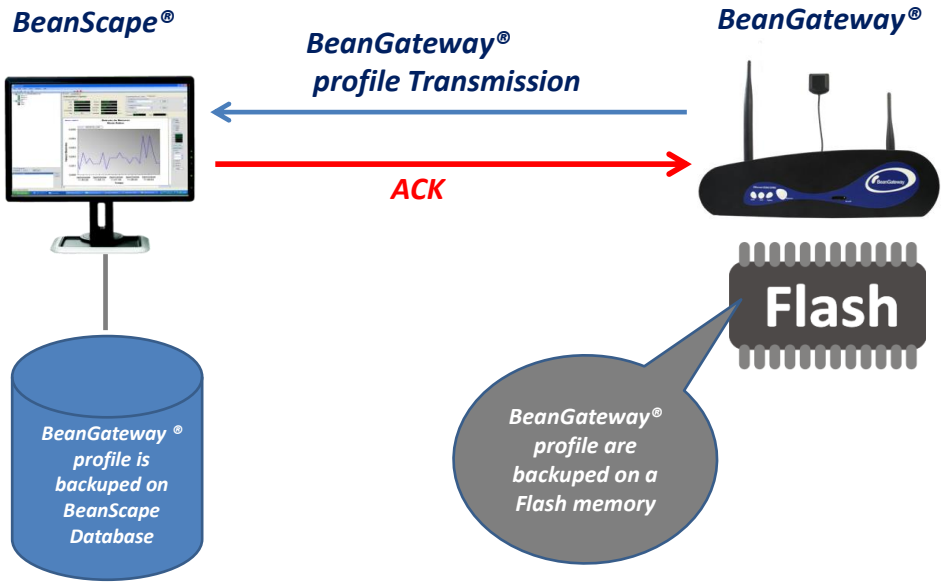
Step 2: Time & Date update

- 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 donw


BeanScape®
Time transmission through
NTP (Net Time protocol)
BeanGateway®
ACK
Computer time and
date must be
updated
BeanGateway® Time and
Date is synhcronized
with your PC

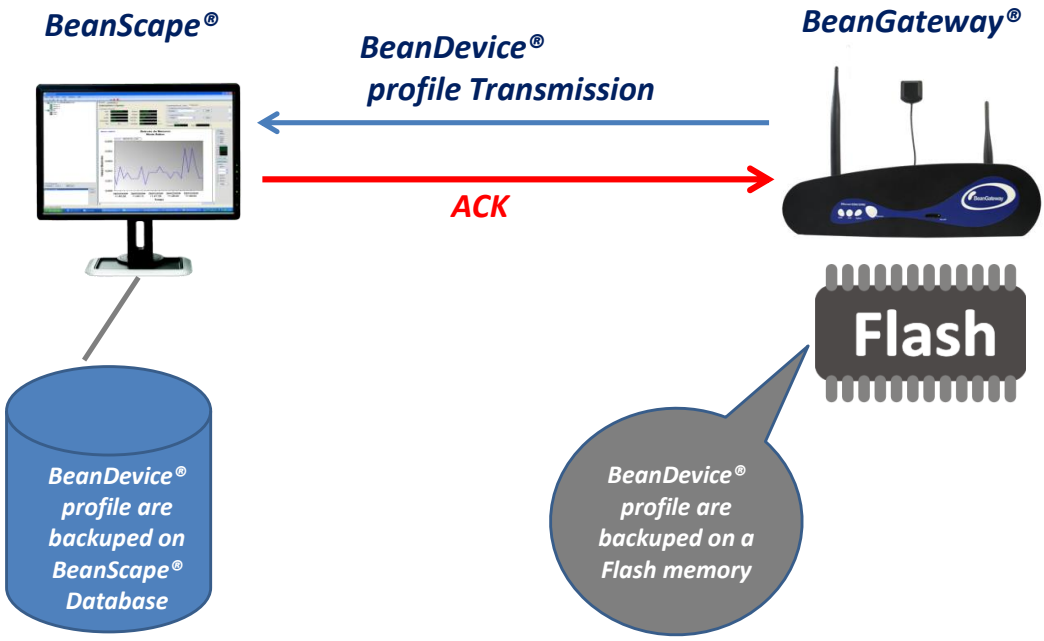
Step 3: BeanGateway® Profile Transmission

- The ***BeanGateway®*** profile is retained on its flash memory. This profile contains are 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 Beandevice® profile. The WSN mapping is backuped on the BeanGateway® flash memory. When a new BeanDevice® joins a WSN, its profile is transmitted to the BeanGateway® and the BeanScape®.
- The BeanScape® displays the WSN Mapping with the BeanDevice® profile;
- WSN Mapping is backuped 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

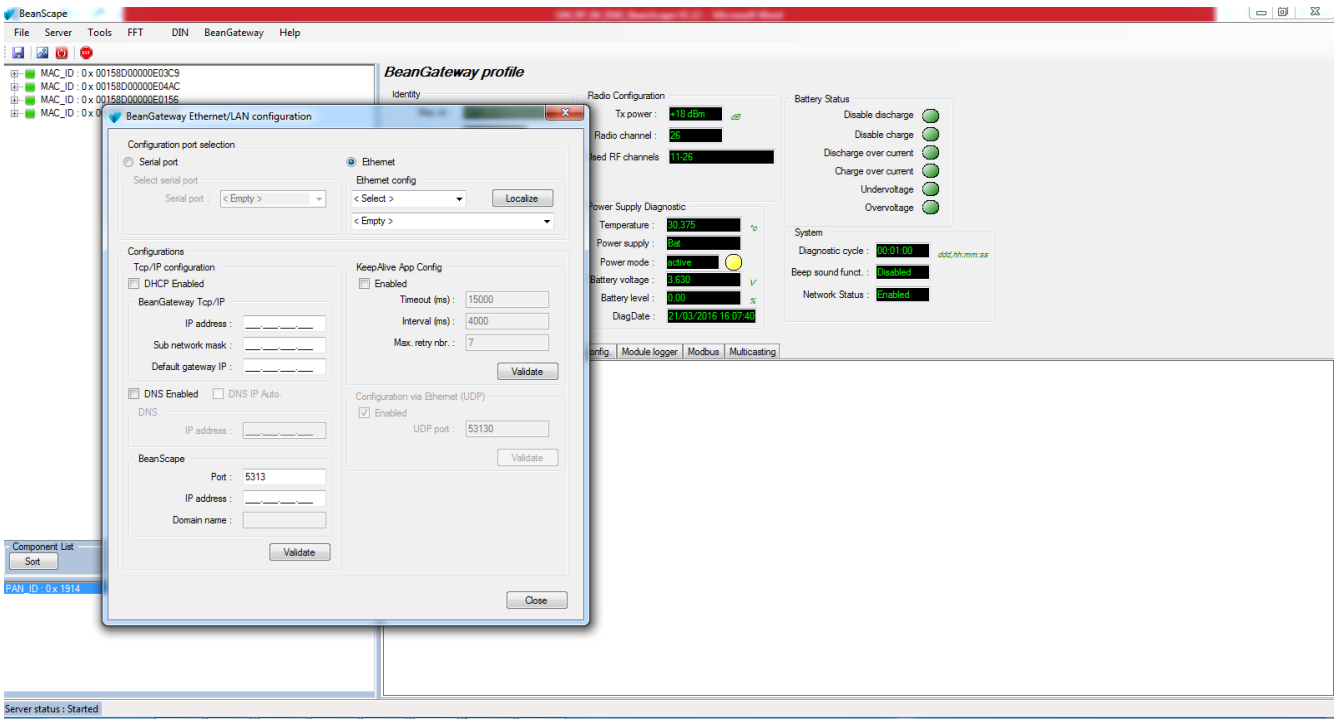
Please check your Network settings before you make any changes.

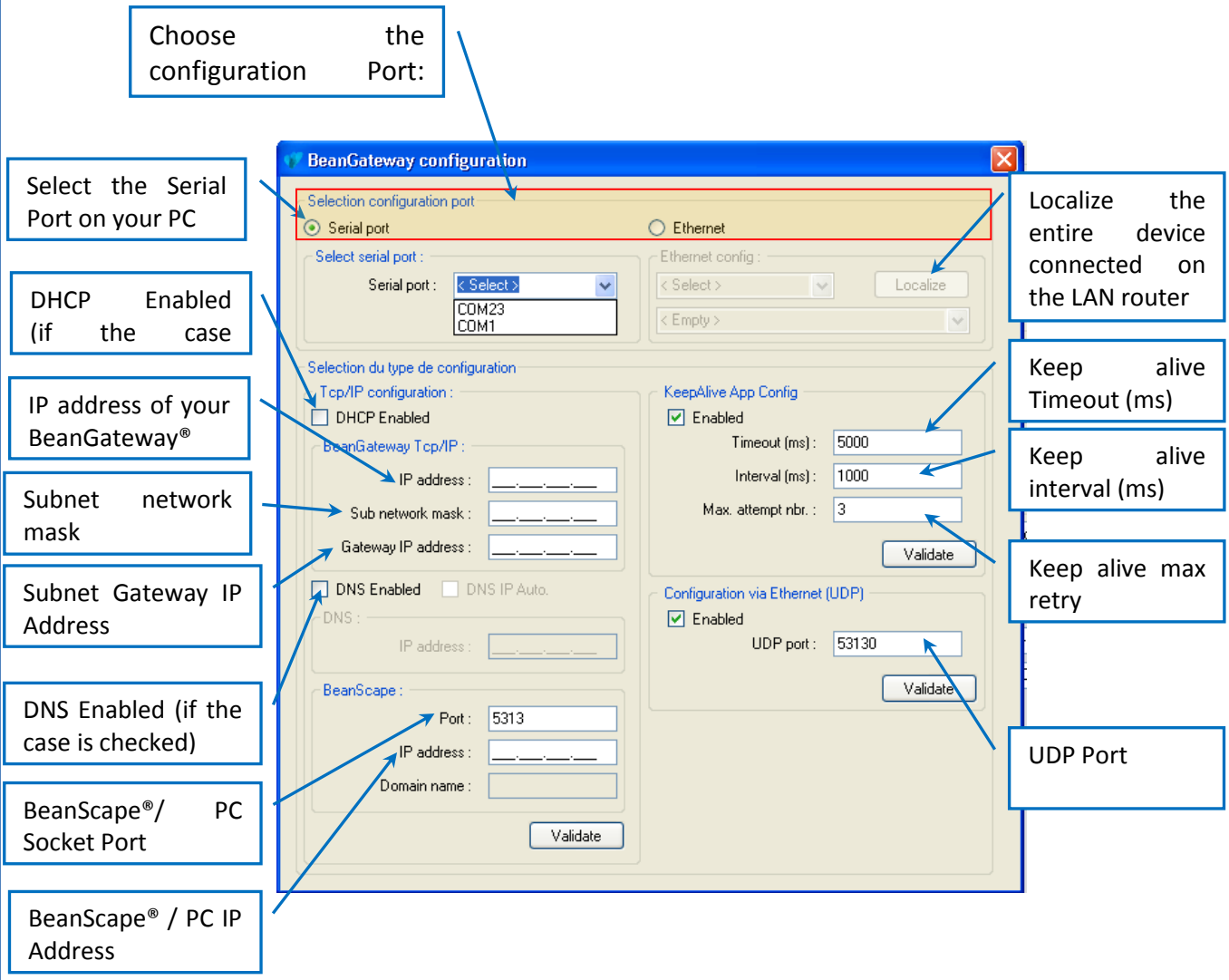
By default, the BeanGateway® is configured with a static IP address: **192.168.4.123**. This allows the user to connect fastly the BeanGateway® to a PC.

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"





- ✓ ***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

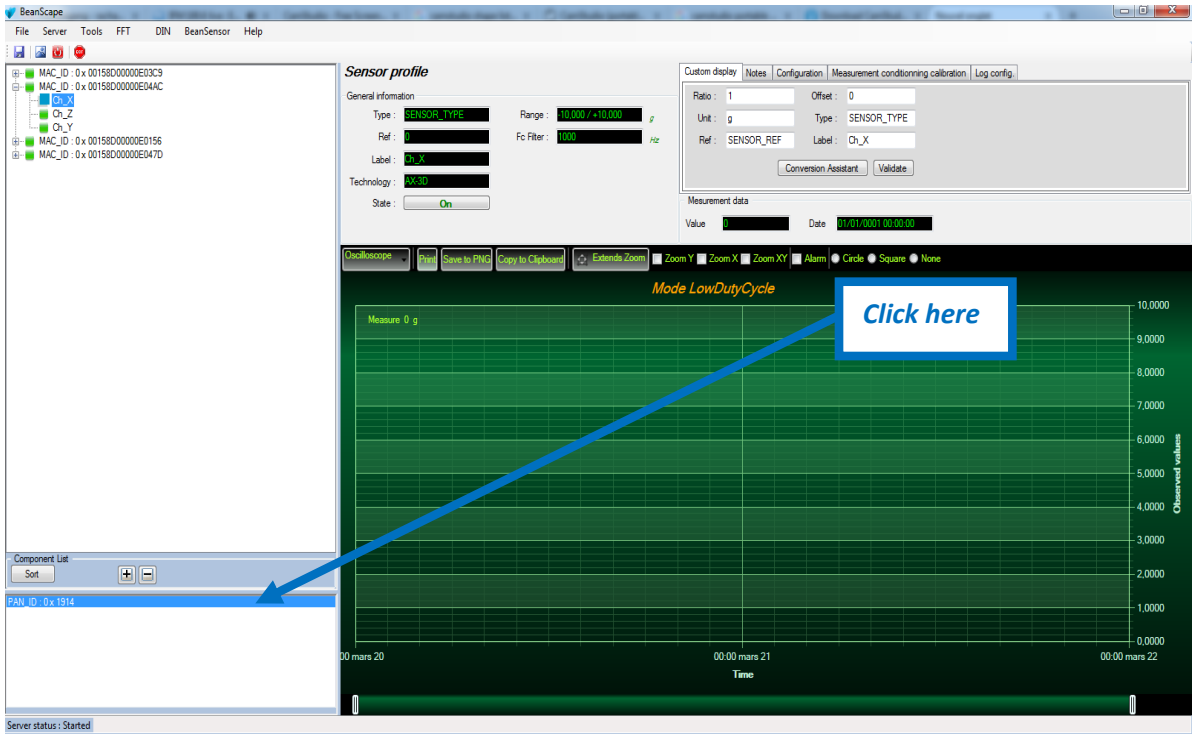
- ✓ ***DNS Enabled***: Check this case if you want to enable the DNS. For further information about DNS read the ***Technical Note "BeanGateway® management on your Local Area Network infrastructure".***
- ✓ The gateway IP address subnet is the default "X.Y.Z.1"
- ✓ ***Port***: By default, the communication 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 »

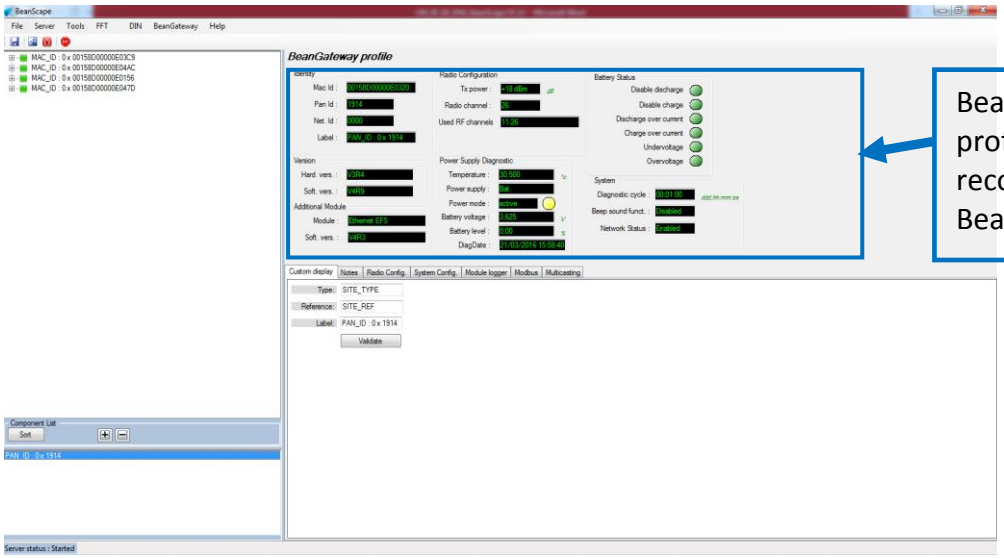
11. DEVICE PROFILE

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:



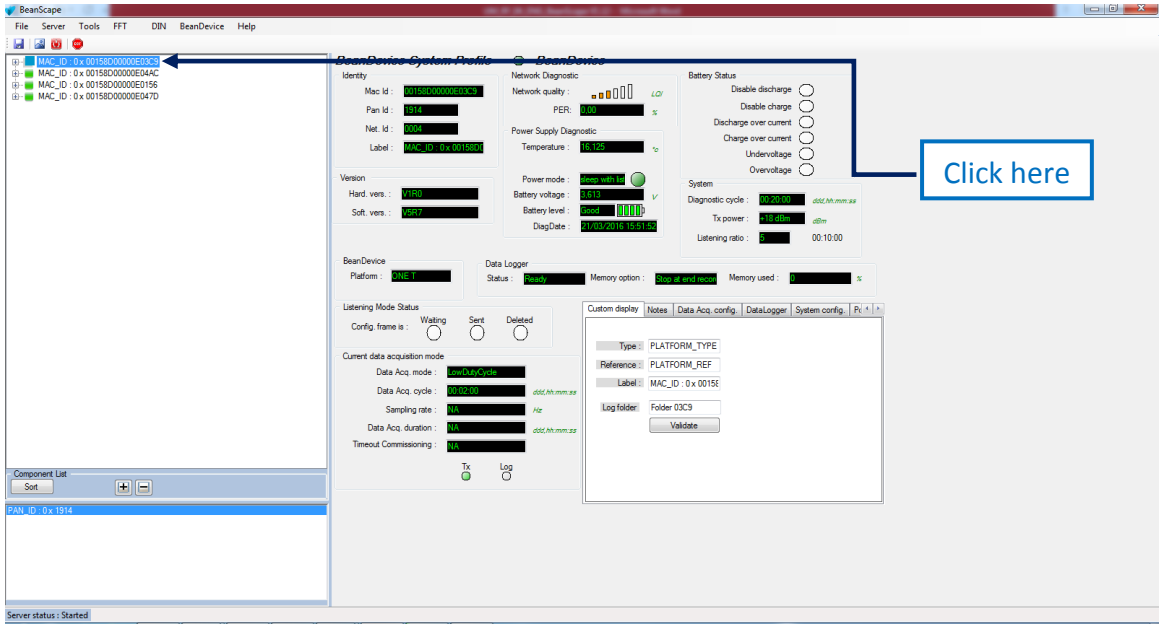
BeanGateway® profile status recorded on the BeanScape®

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.

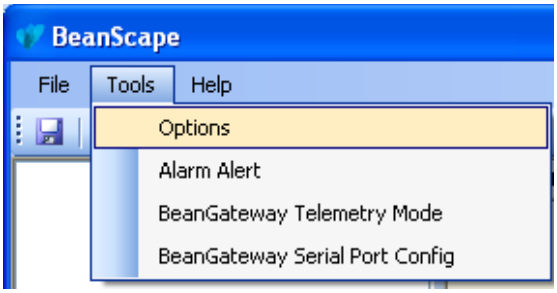


For further information about your BeanDevice®, please read the BeanDevice® user manual.

12. SYSTEM CONFIGURATION (FOR ADVANCED USER ONLY)

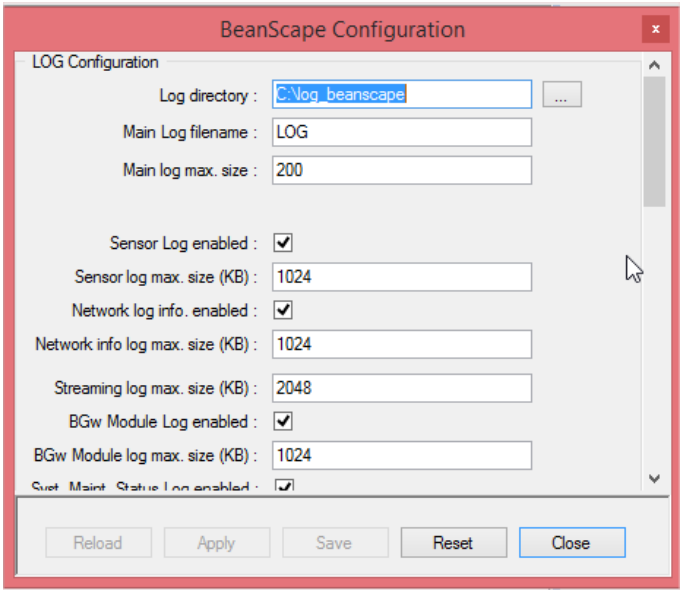
The following procedure applies only for advanced users

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



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

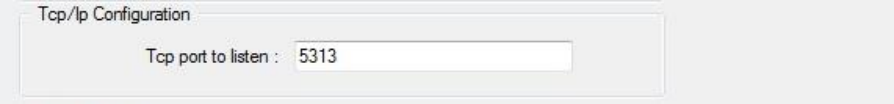
- ✓ A second window will appear:



- ✓ 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



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

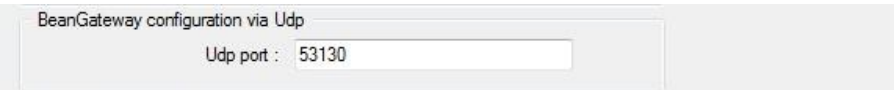
12.2 KEEP ALIVE APPLICATION

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.

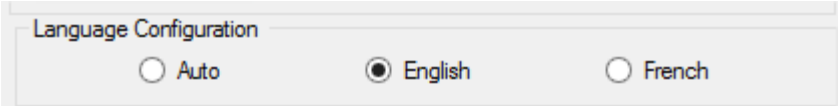
Keepalive packet contains null data. In a TCP/IP over Ethernet network, a keepalive frame is of 60 bytes, while acknowledge to this also null data frame and is of 54 bytes.

12.3 BEANGATEWAY® CONFIGURATION VIA UDP



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

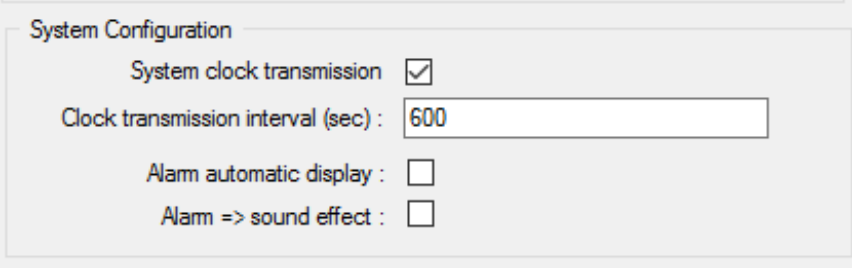
12.4 LANGUAGE CONFIGURATION



- ✓ ***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

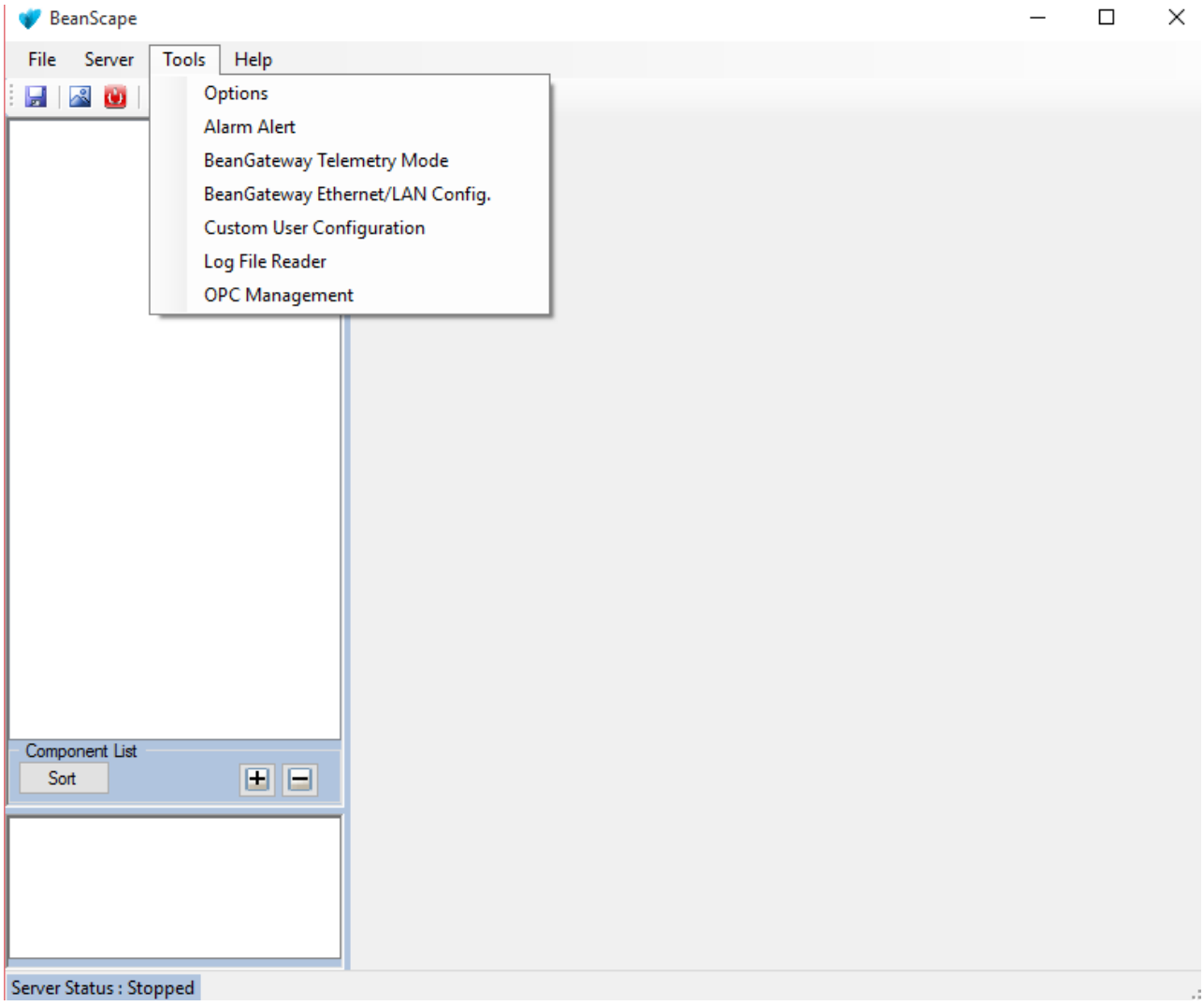


- ✓ ***Alarm automatic display***: Check this box if you want to see an alarm window displayed automatically when a window alarm threshold is exceeded.
- ✓ ***Alarm➔ Sound Effect***: Check this box if you want to hear a sound effect when a threshold is exceeded.

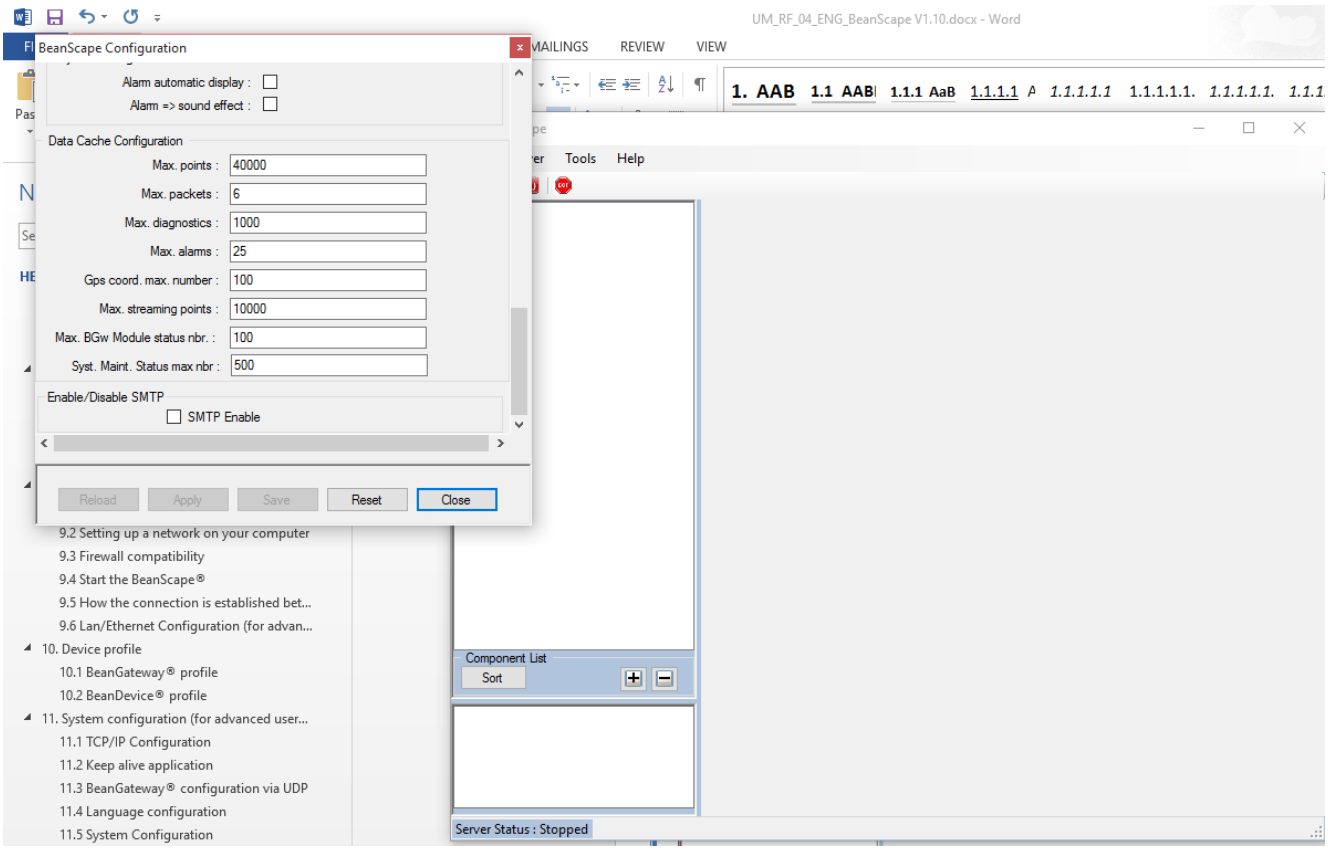
13. SMTP CLIENT

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

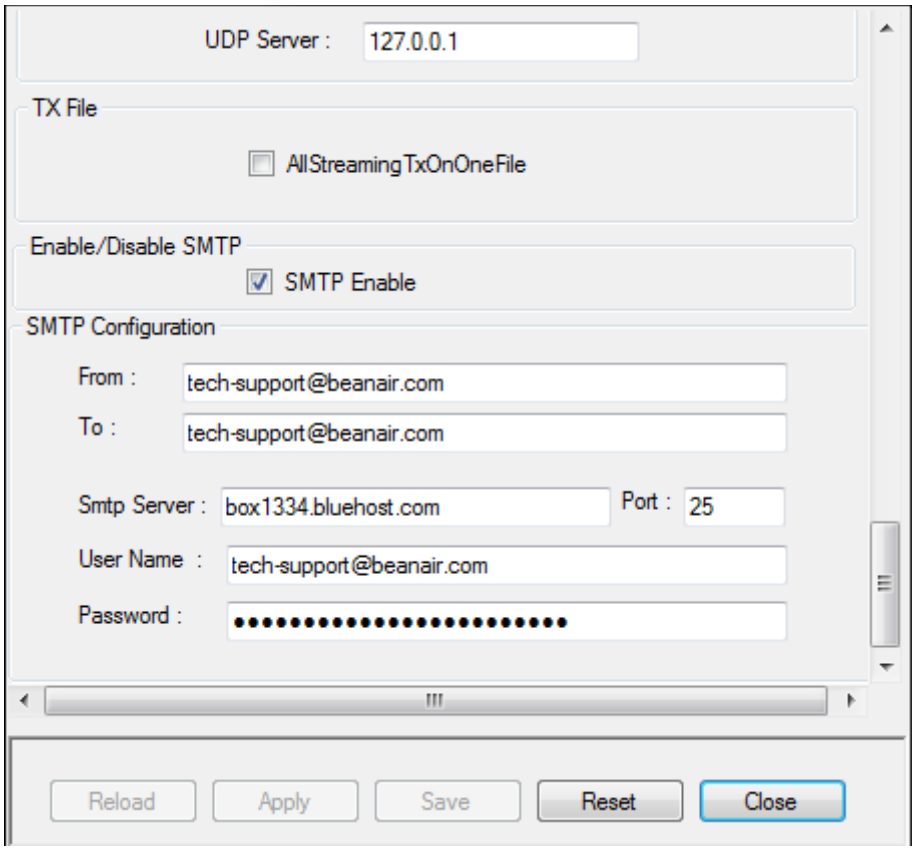
From your BeanScape® software click on "**Tools**" tab then "**options**".



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



Click on SMTP Enable check box:



Fill out the following field:

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

Click on "***Apply***" then "***Save***"

See « Alarm by email » Youtube video

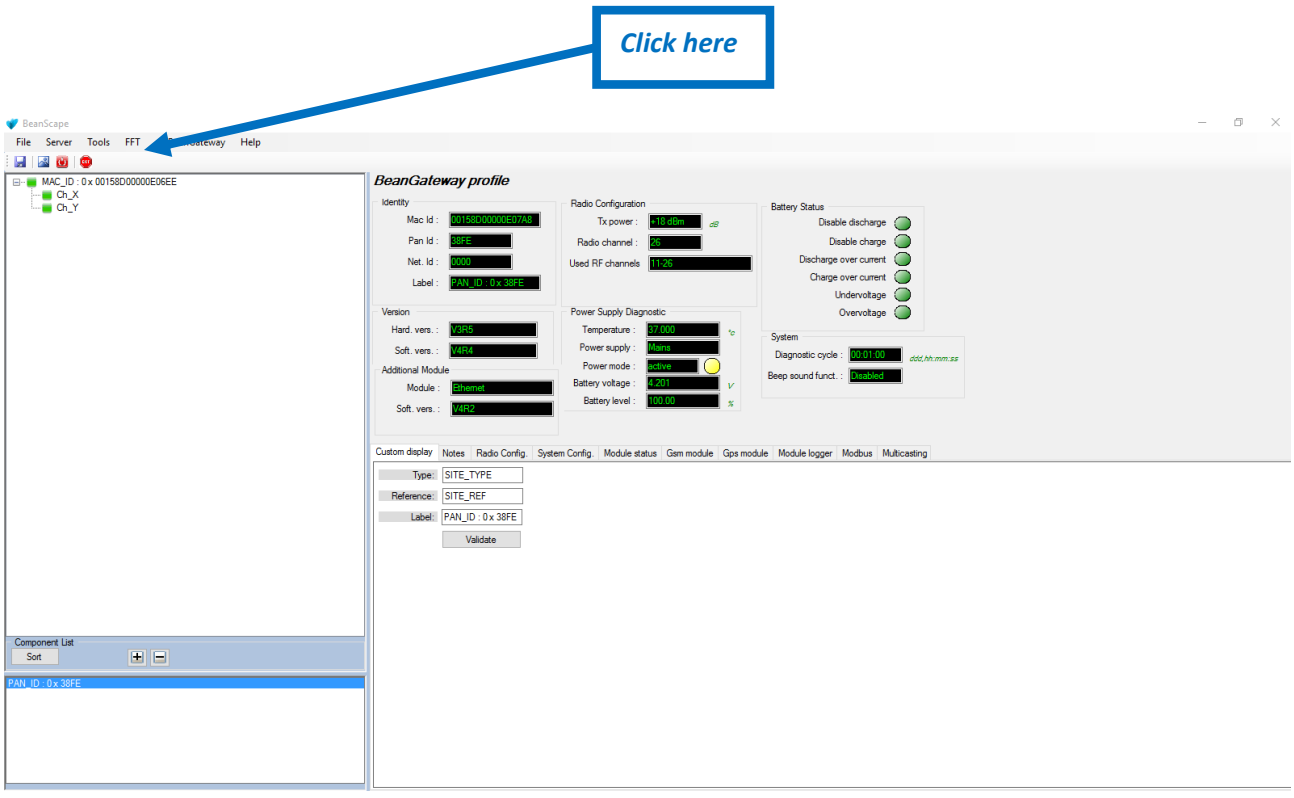
14. FFT (FAST FOURIER TRANSFORM) WAVEFORM ANALYSIS MODULE

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.

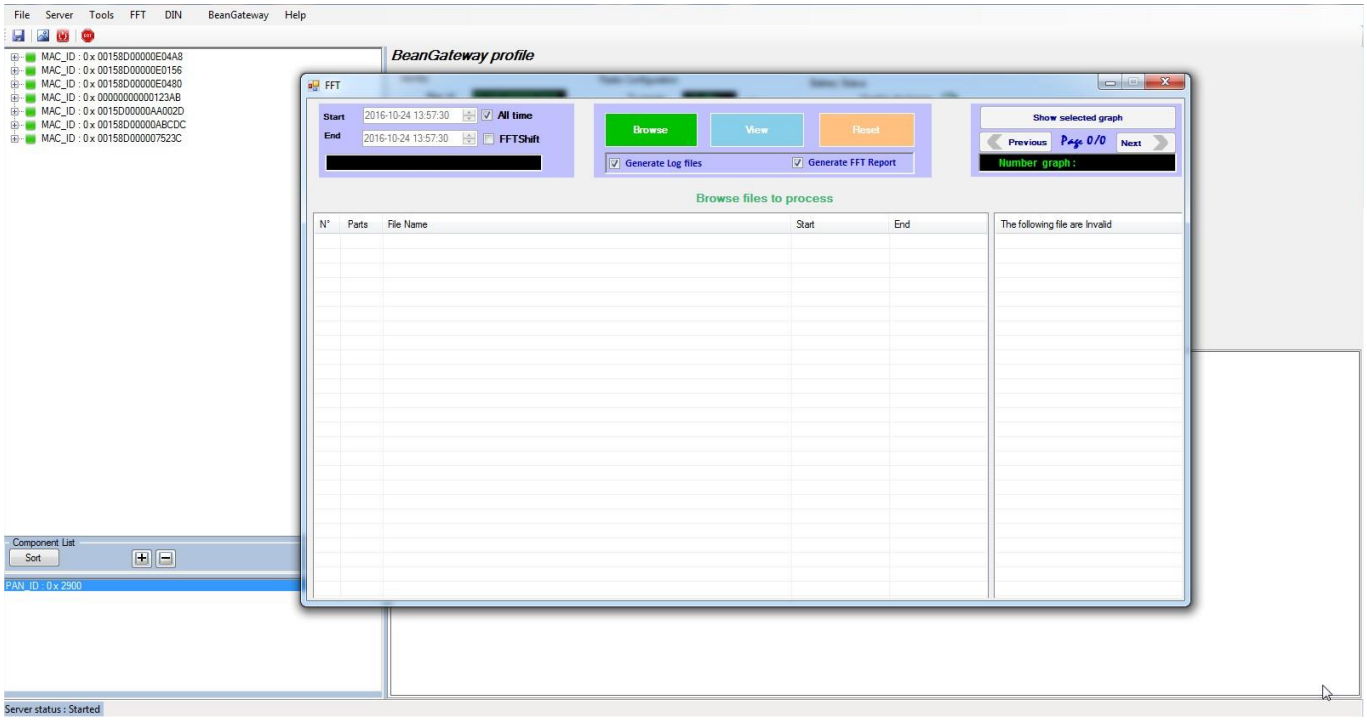
FFT (Fast Fourier transform) module is only compatible with "Streaming Packet" measurement mode.

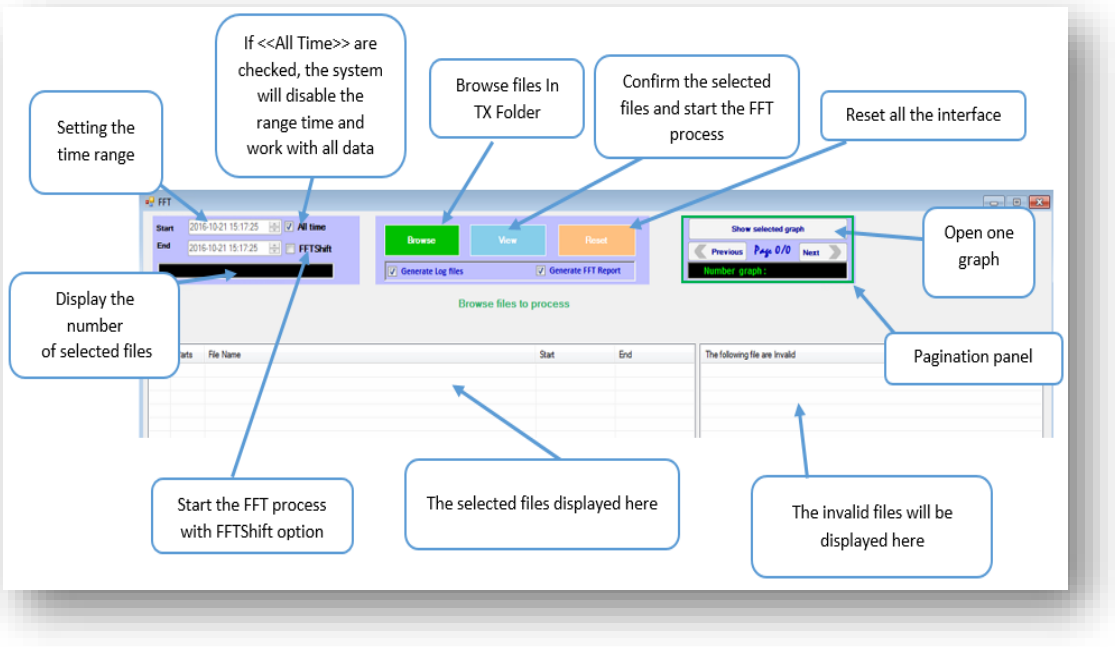
14.1 FFT GENERATION

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



A new window will open:

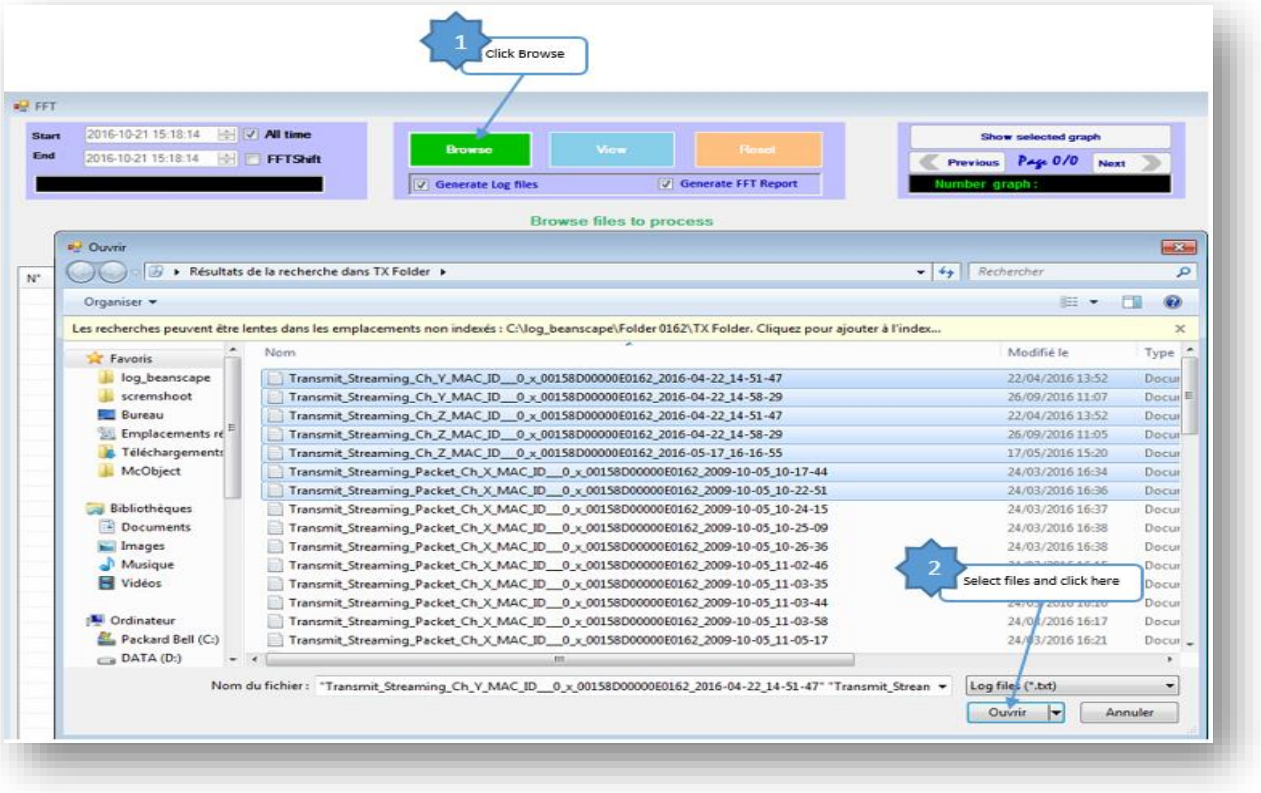




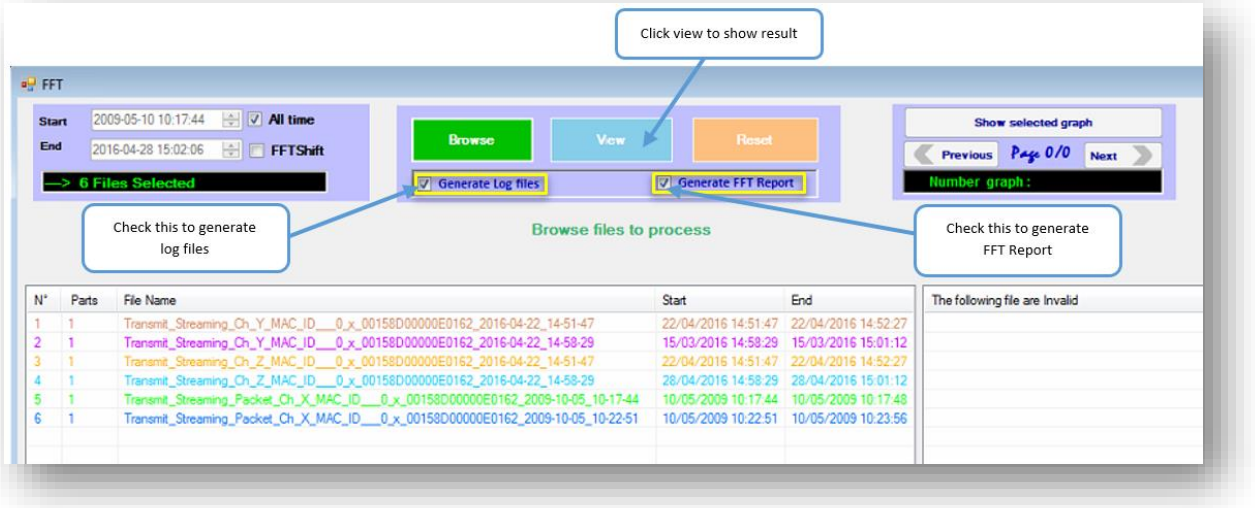
Click on browse and import file containing the logged measurement, the result will be:

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

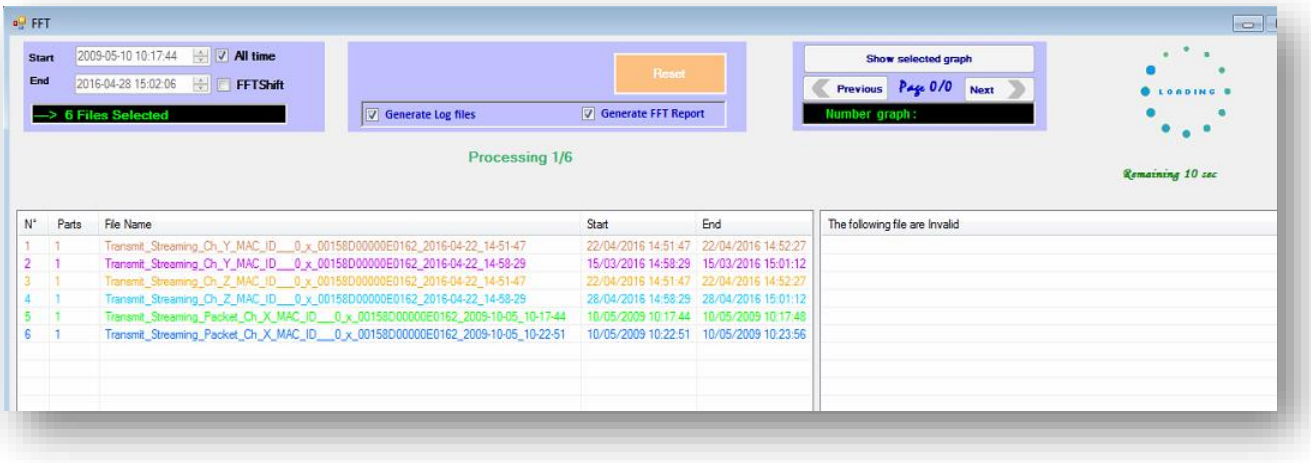
1. Click on browse to choose files



2. Overview of the selected files



3. Loading



4. FFT report generated with the following results:

   a. PPV value mm/s:

   b. Frequency

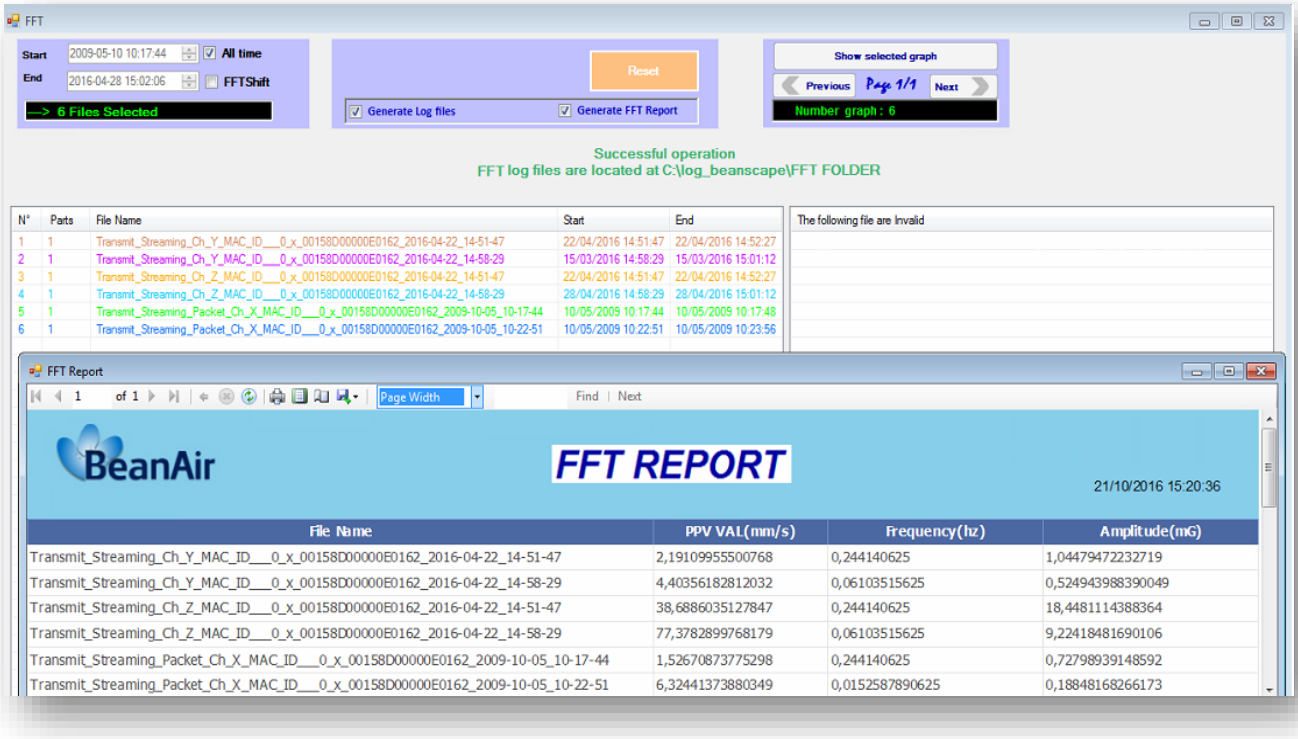
   c. Amplitude

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.

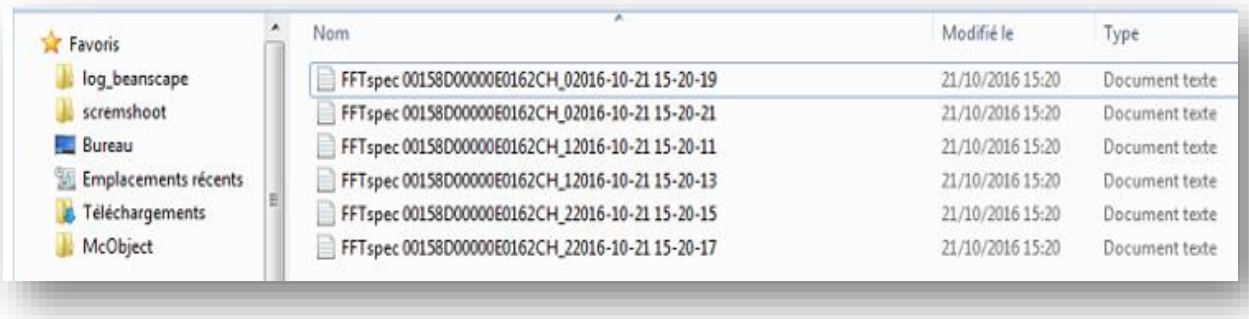
The velocity of ground vibration (particle velocity) is usually measured in millimeters/second (mm/s) or inches/second in the US.

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.

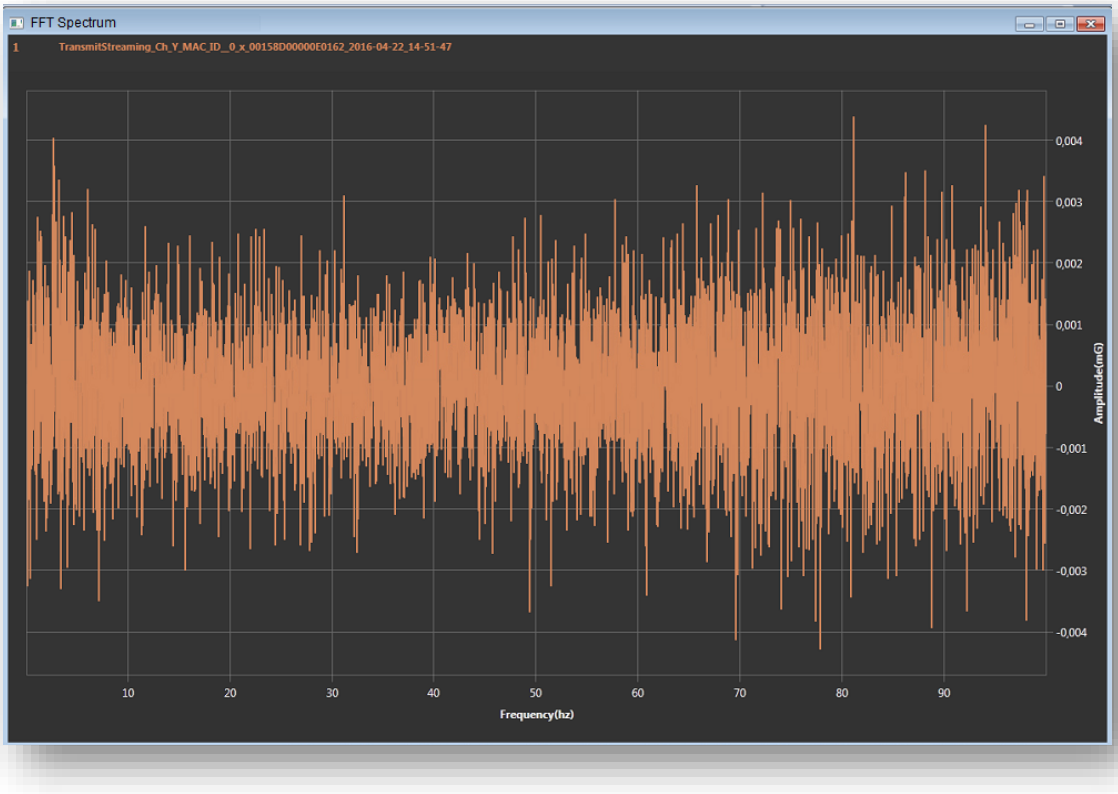
Resultant PPV is calculated by producing a vector sum of the 3 separate directional recordings ($\sqrt{(v^2+l^2+t^2)}$ where v=vertical, l=longitudinal, t=transverse) for every point on the recording.



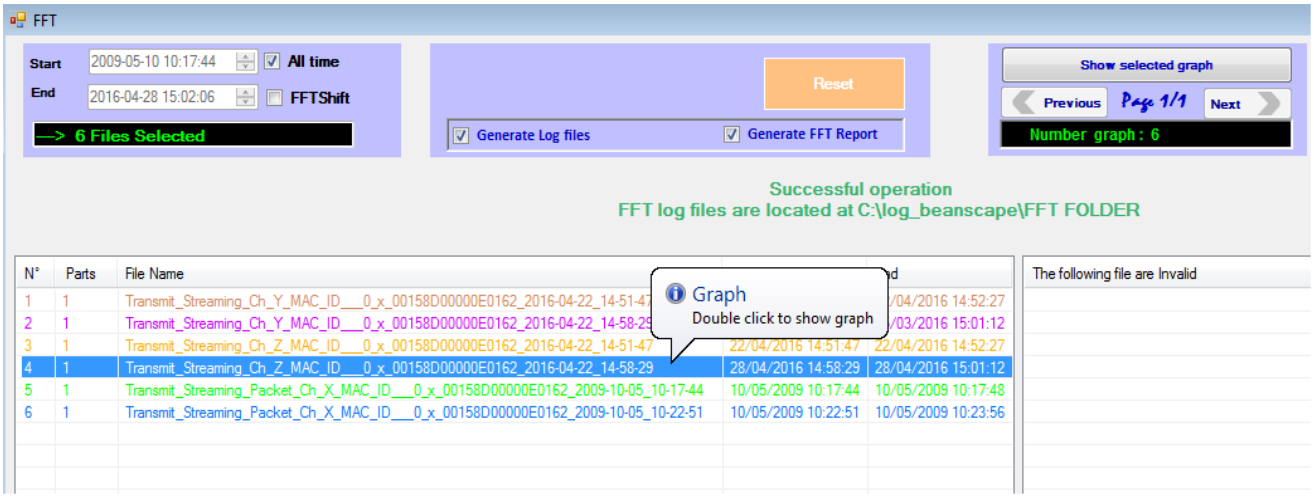
5. FFT LOG files generated



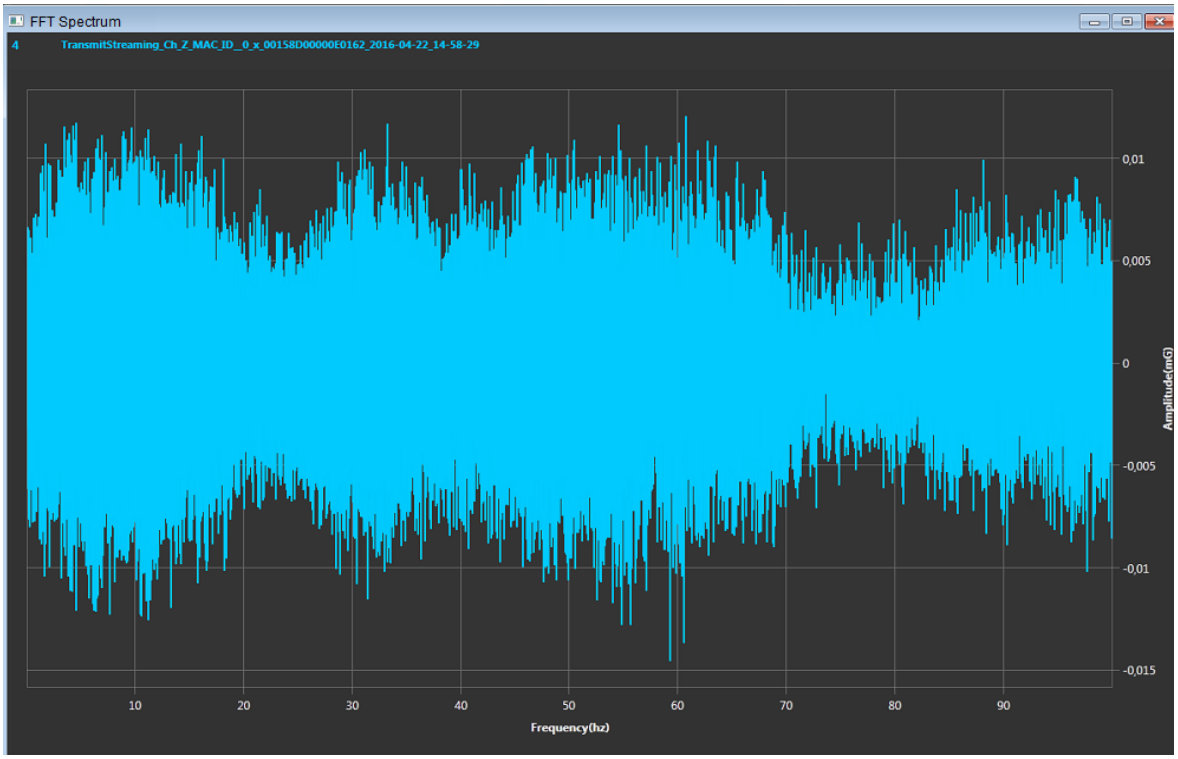
6. The first graph will be displayed automatically if we have less than 9 graph



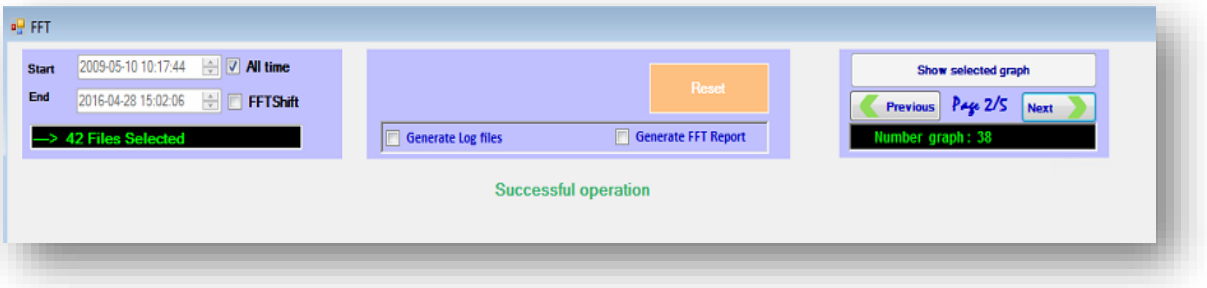
7. Manually select and launch graph with double click or select file and click on "Show selected graph" button



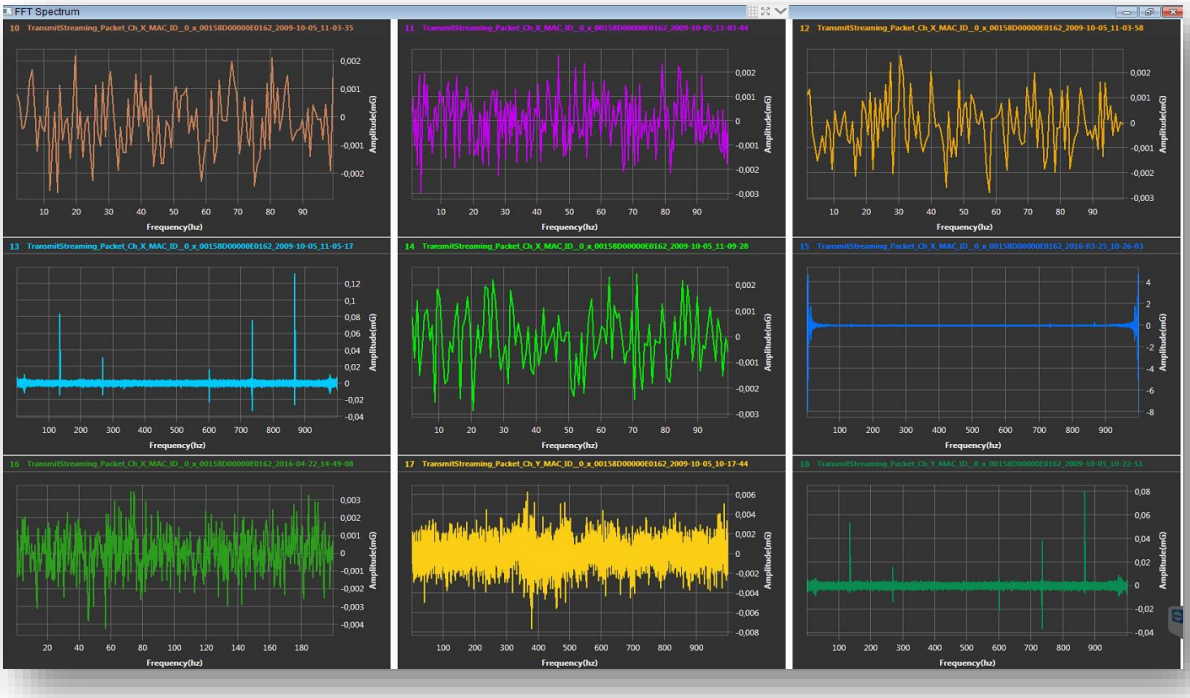
8. The selected graph is displayed



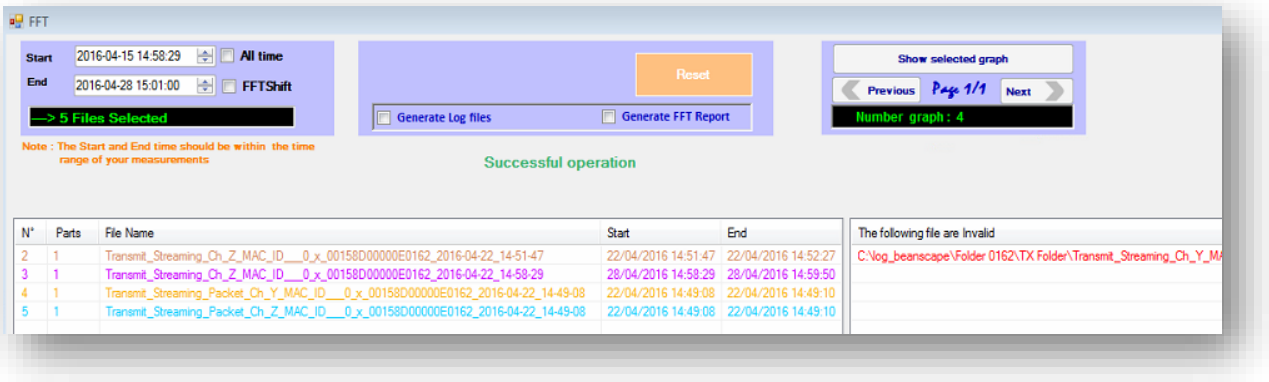
9. Repeat the same process but with more than 9 files



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



14.2 FFT SHIFT

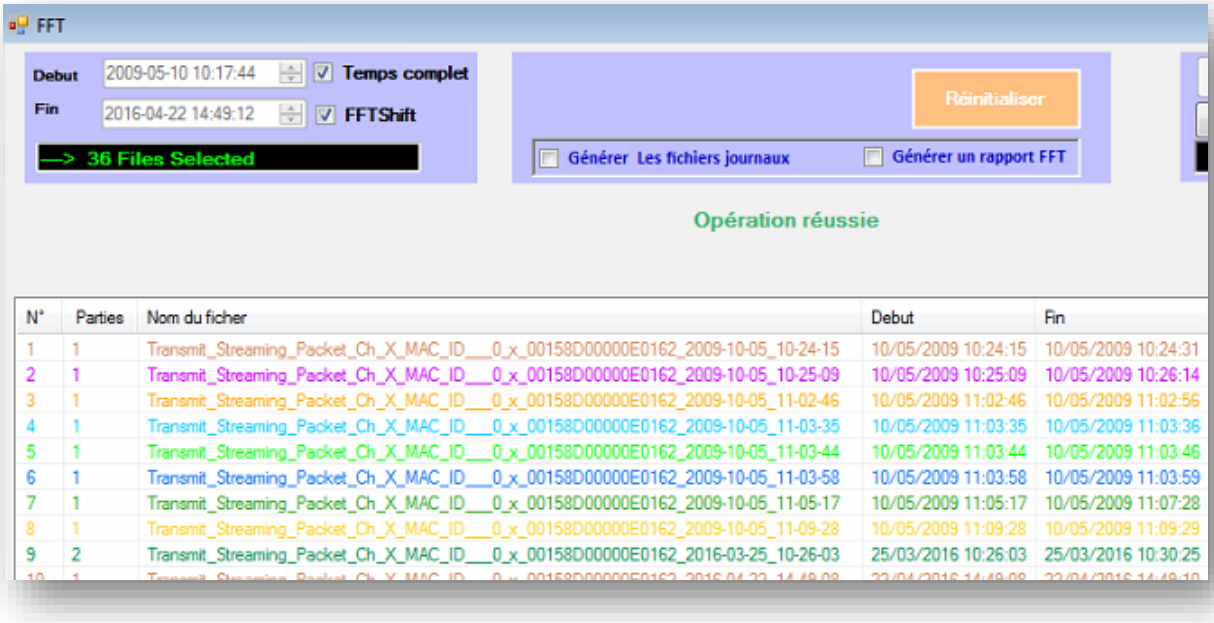
FFT shift allows to rearranges the FFT output by moving the zero-frequency component to the center of the array. It is useful for visualizing a Fourier transform with the zero-frequency component in the middle of the spectrum.

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:

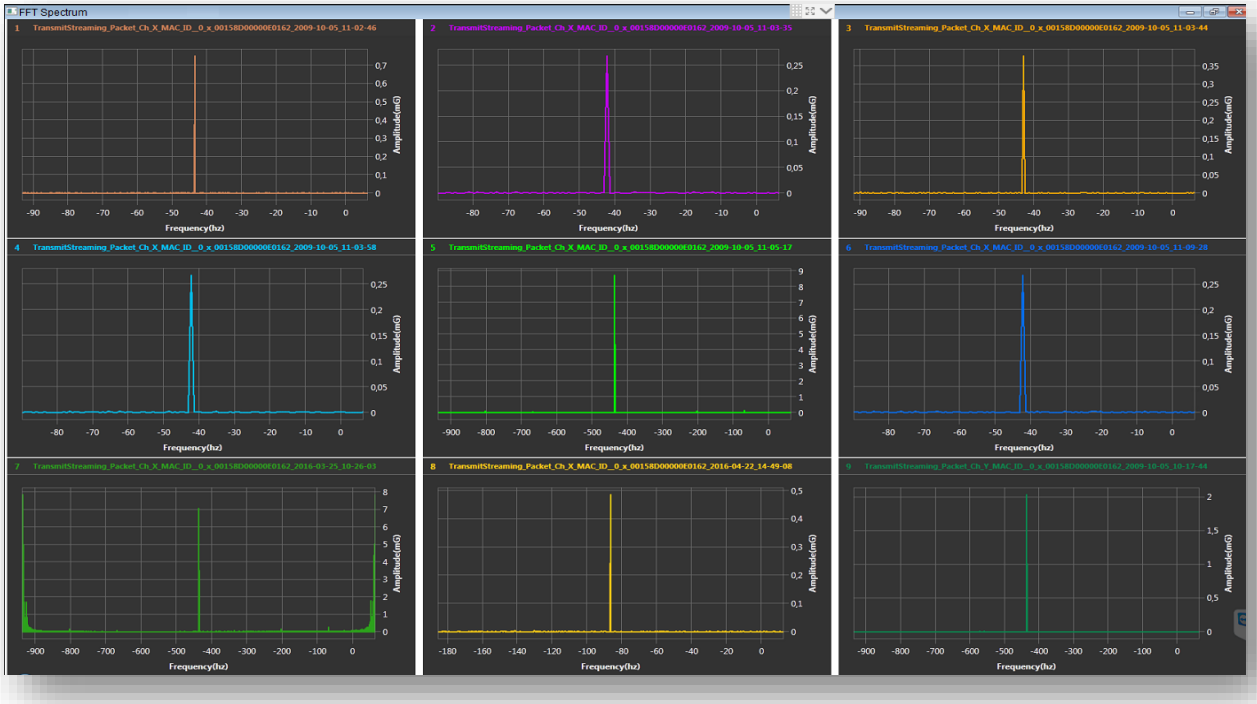
- Power spectral density and a new window displays (with zero-frequency at the center)
- PPV (peak particle velocity) calculation: PPV value in mm/s , Frequency, Amplitude

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

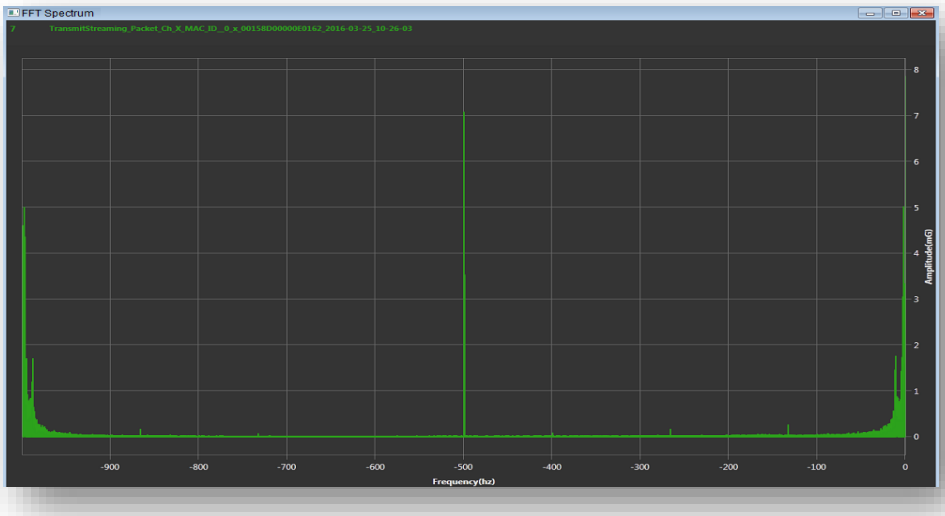


N°	Parties	Nom du ficher	Debut	Fin
1	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-24-15	10/05/2009 10:24:15	10/05/2009 10:24:31
2	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_10-25-09	10/05/2009 10:25:09	10/05/2009 10:26:14
3	1	Transmit_Streaming_Packet_Ch_X_MAC_ID___0_x_00158D00000E0162_2009-10-05_11-02-46	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

2. Grid of FFT Spectrum with FFTShift option enabled



3. Open one graph

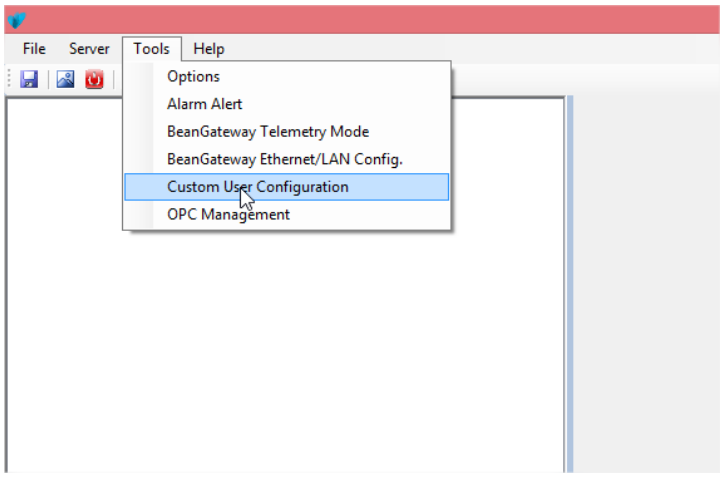


FFT and FFT shift video

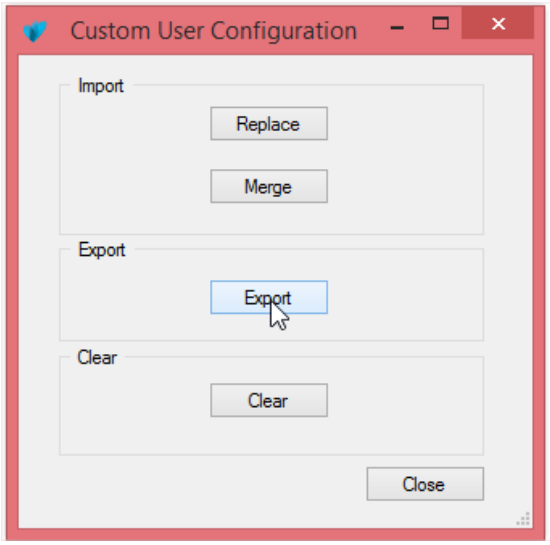
15. EXPORT/IMPORT USER CONFIGURATION (FOR ADVANCED USER ONLY)

15.1 EXPORT FUNCTION

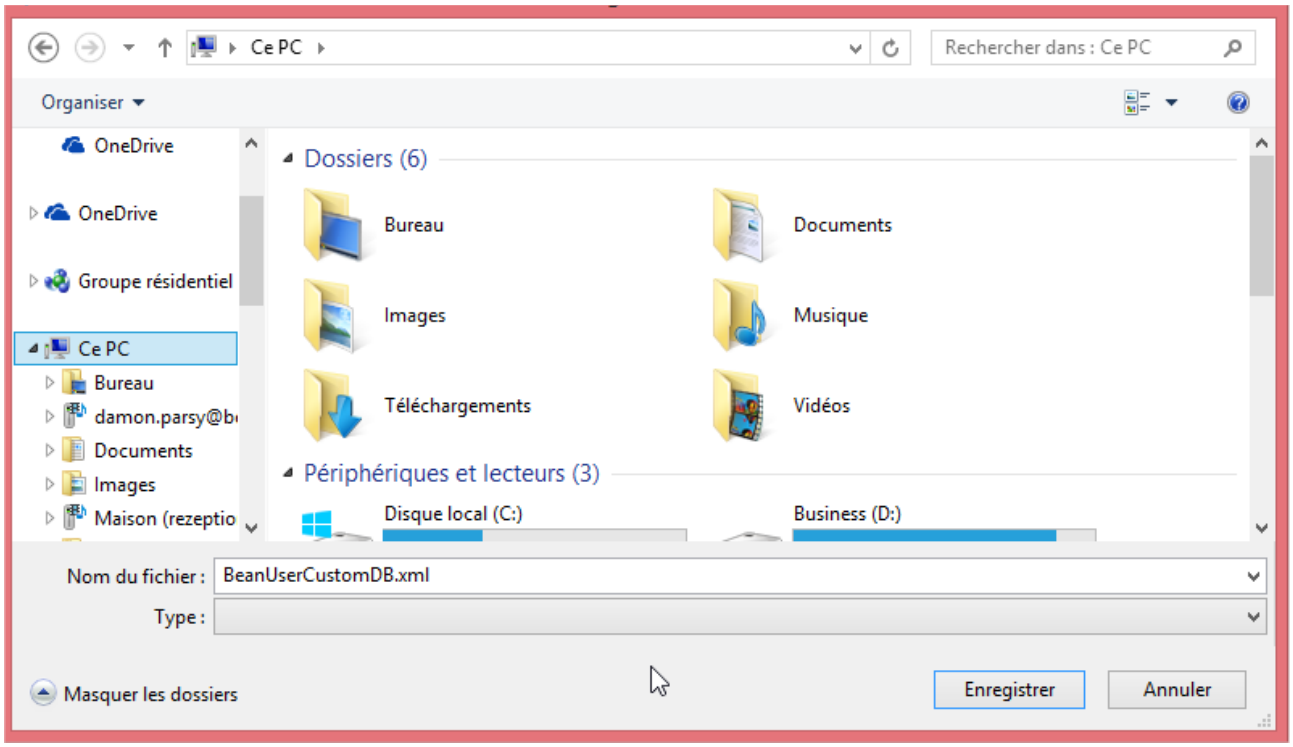
Click on the tab ***Tools*** then "***Custom user configuration***"



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

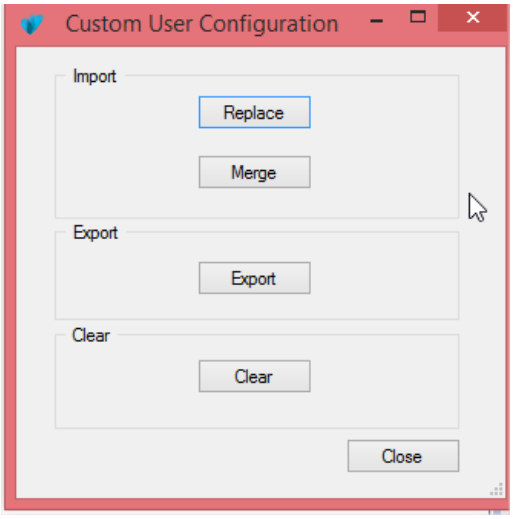


User configuration is exported in XML format:



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

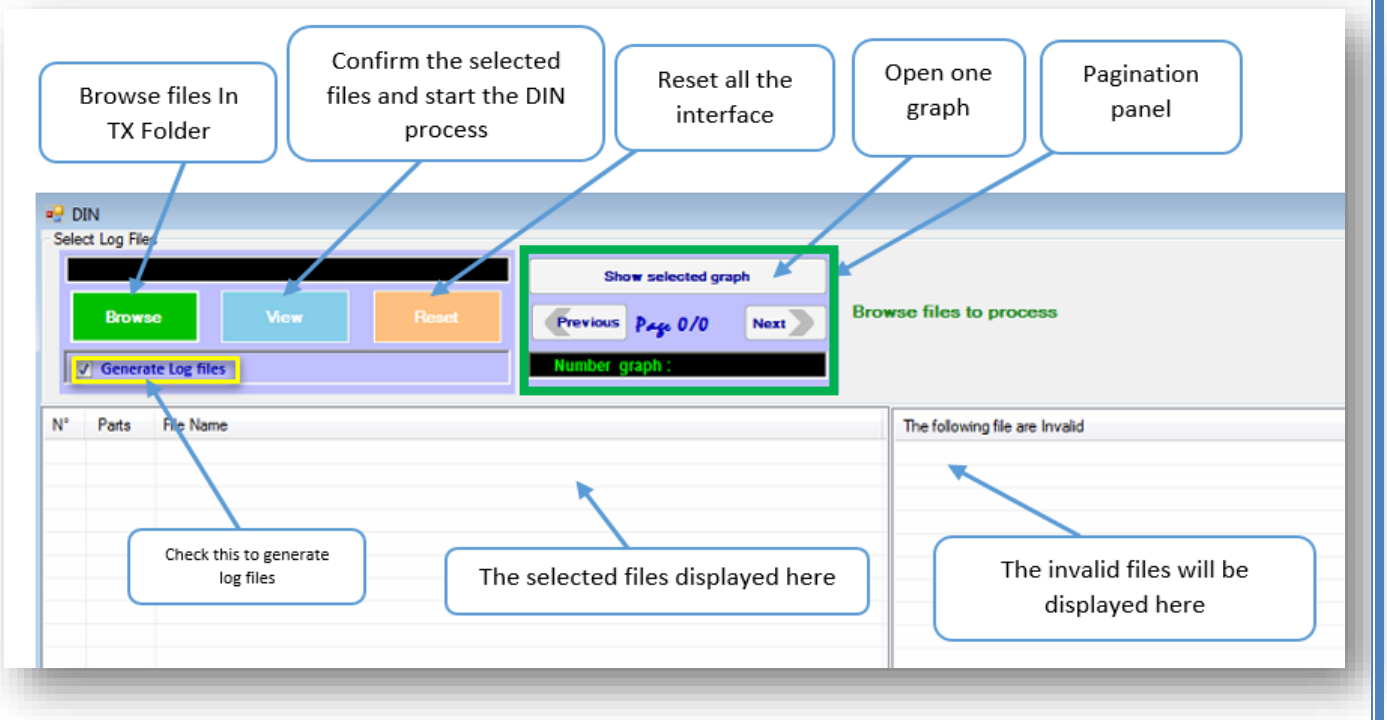
According to the DIN4150-3, the BeanScape software DIN option acts as follow:

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.

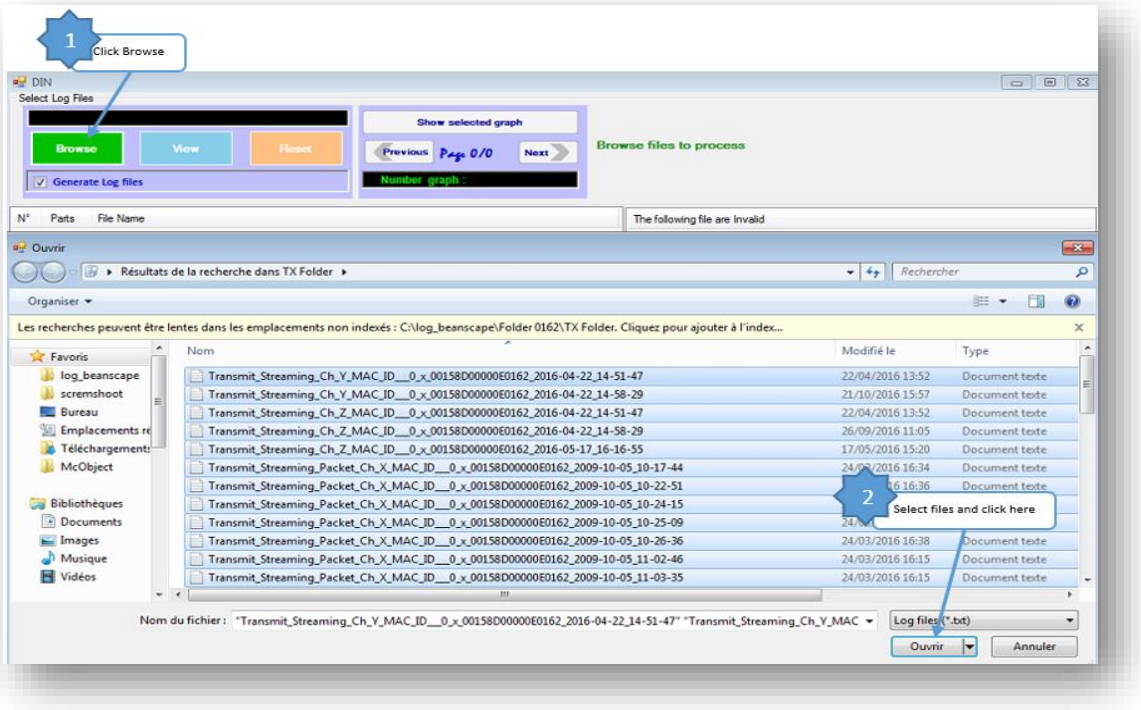
A new window is displayed.



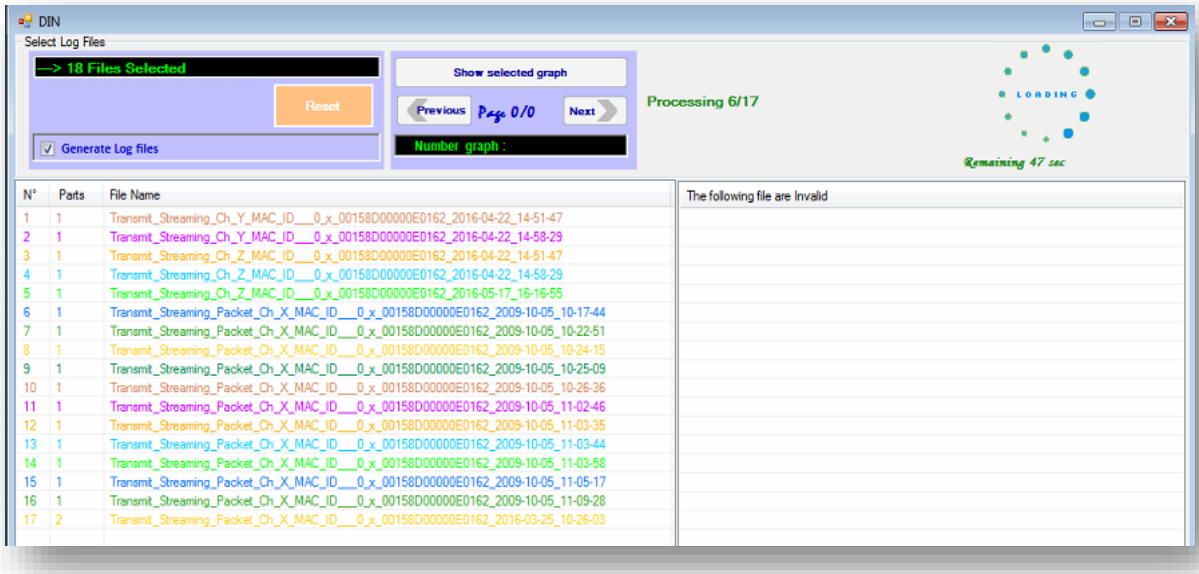
The second step is to browse and import the file containing the logged measurement. The result will be:

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

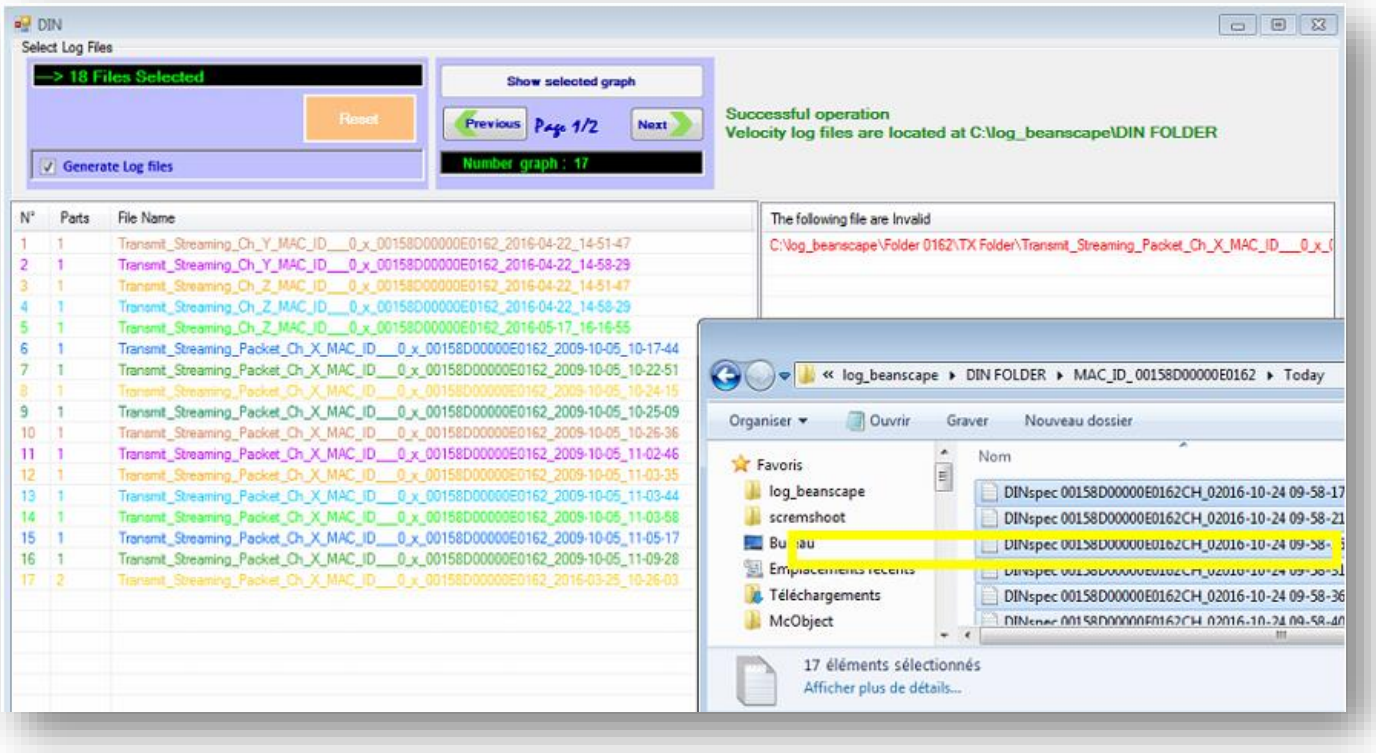
- Click on browse button to choose TX Files.



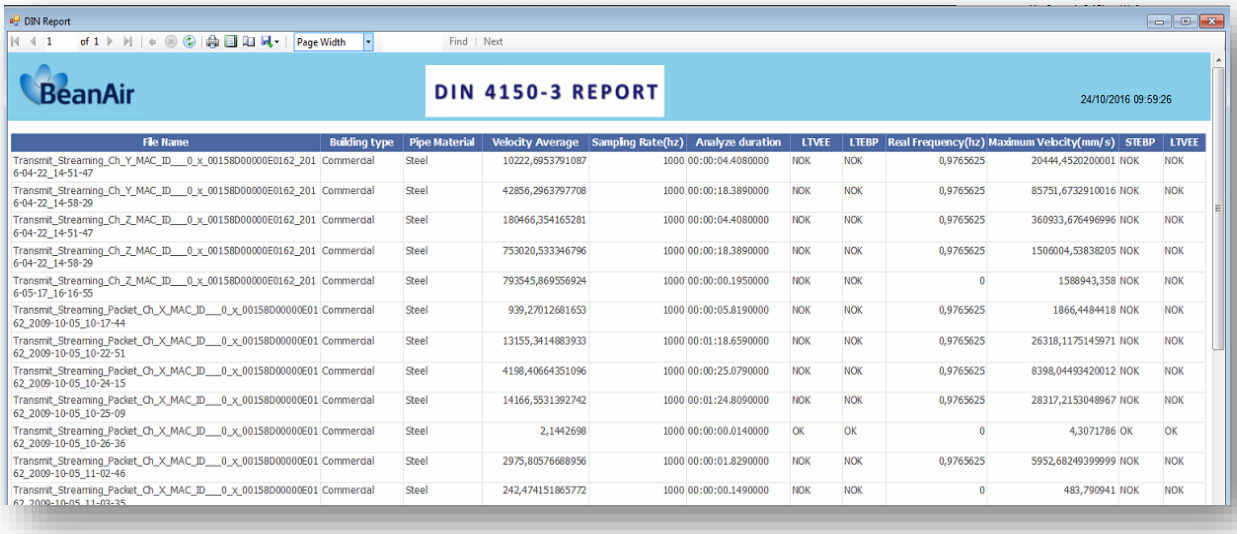
- Loading…



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

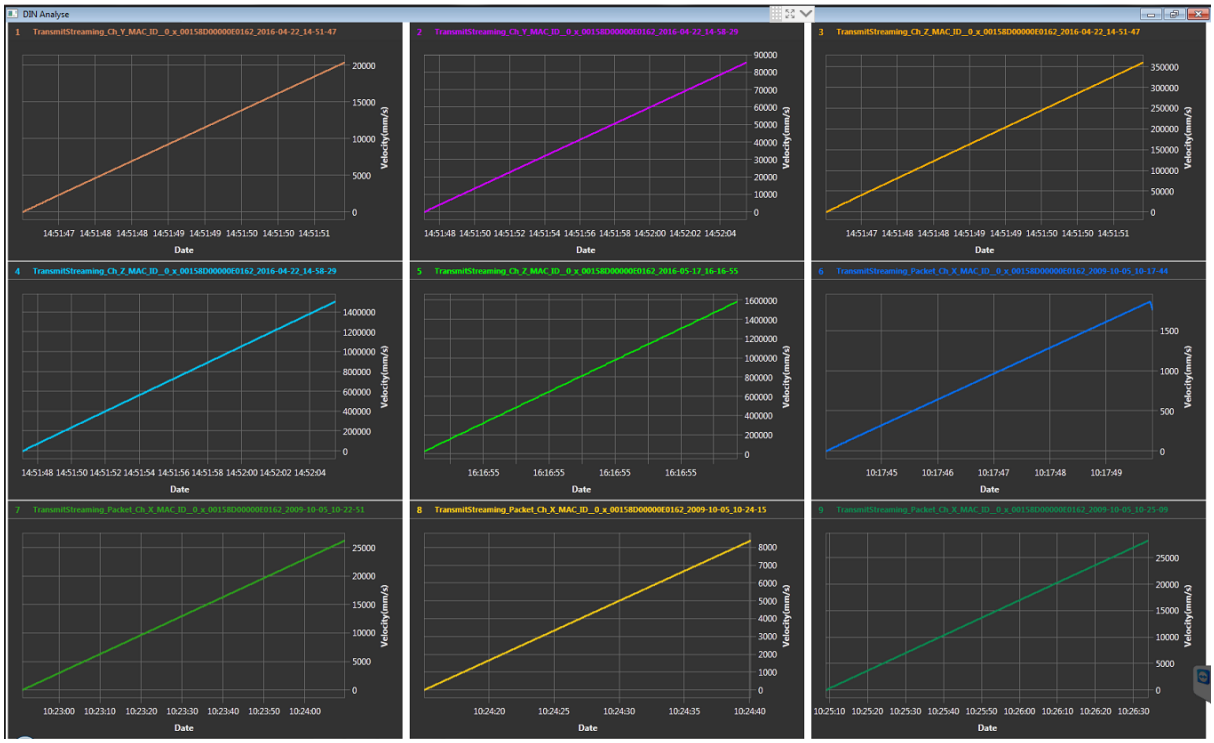


- DIN Report:

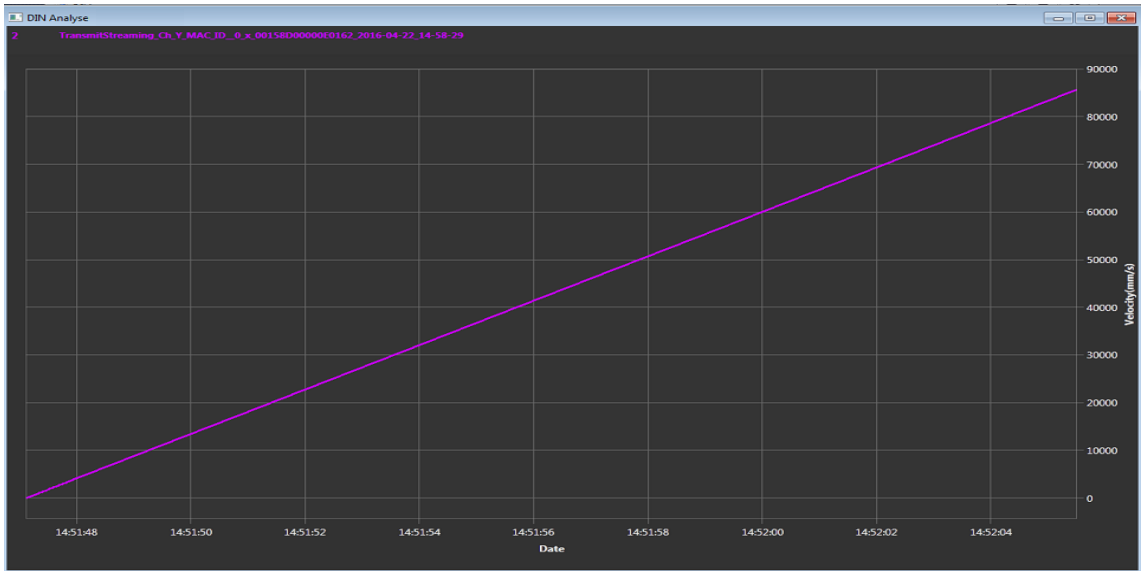


File Name	Building type	Pipe Material	Velocity Average	Sampling Rate(hz)	Analyze duration	LTVEE	LTEBP	Real Frequency(hz)	Maximum Velocity(mm/s)	STEBP	LTVEE
Transmit_Streaming_Ch_Y_MAC_ID___0_x_00158D00000E0162_2016-04-22_14-51-47	Commercial	Steel	10222,6953791087	1000	00:00:04.4080000	NOK	NOK	0,9765625	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	00:00:00.0140000	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 :



Following is an example of a generated DIN report.

BeanAir 4/18/2016 5:17:47 PM

DIN 4150-3 REPORT

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

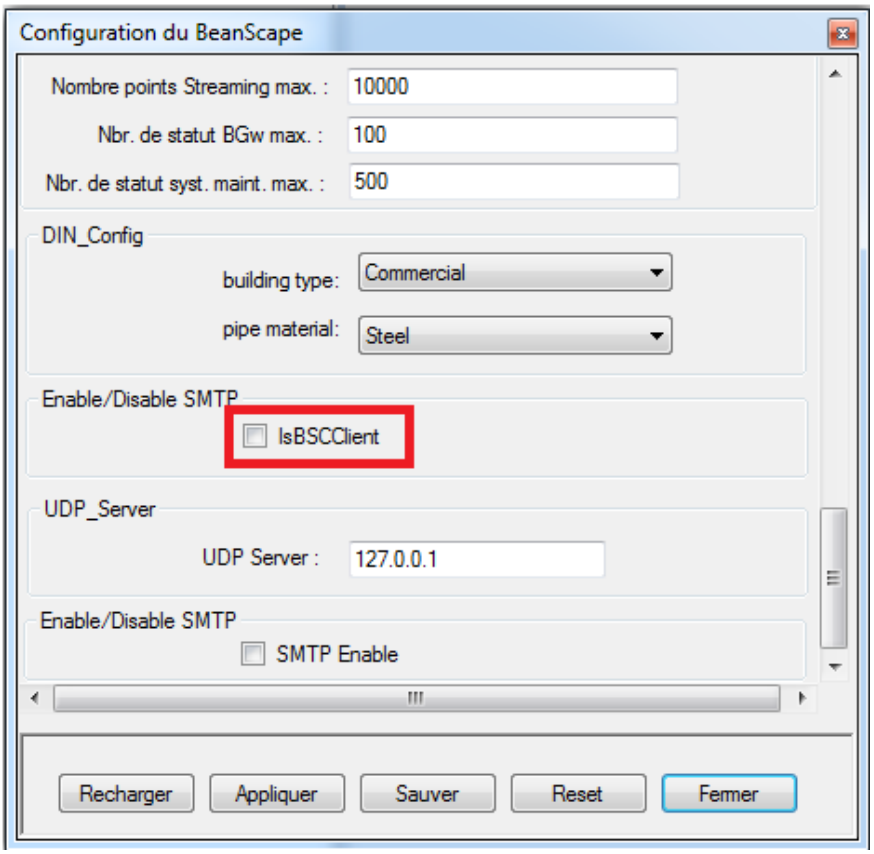
BeanScape Cloud version offers a multi-user interface. It enables real time remote access from a BeanScape Client to the network configuration performed on BeanScape Server.

This new version of BeanScape 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 BeanScape is configured as Server.

17.1 SET BEANSCAPE ON SERVER OR CLIENT

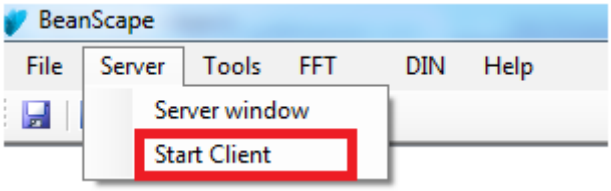
- Go to tools-> Options-> IsBCSClient
- Deactivate the checkbox in the BeanScape server
- Activate the checkbox in the BeanScape client



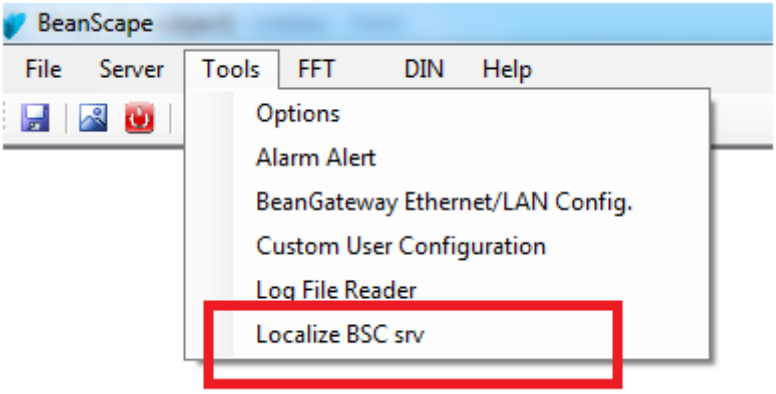
17.2 LOCALIZE BEANCAPE SERVER

On BeanScape Client:

- Go to Server-> Start Client

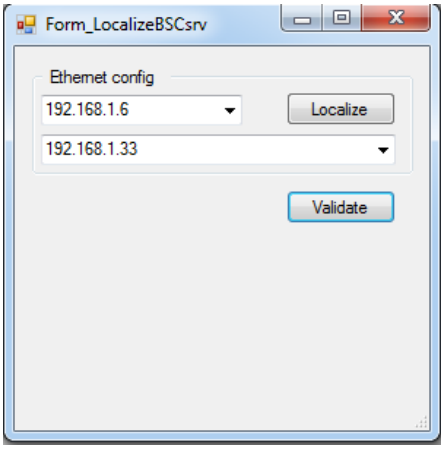


- Go to tools-> Localize BSC srv



The following window will appear.

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

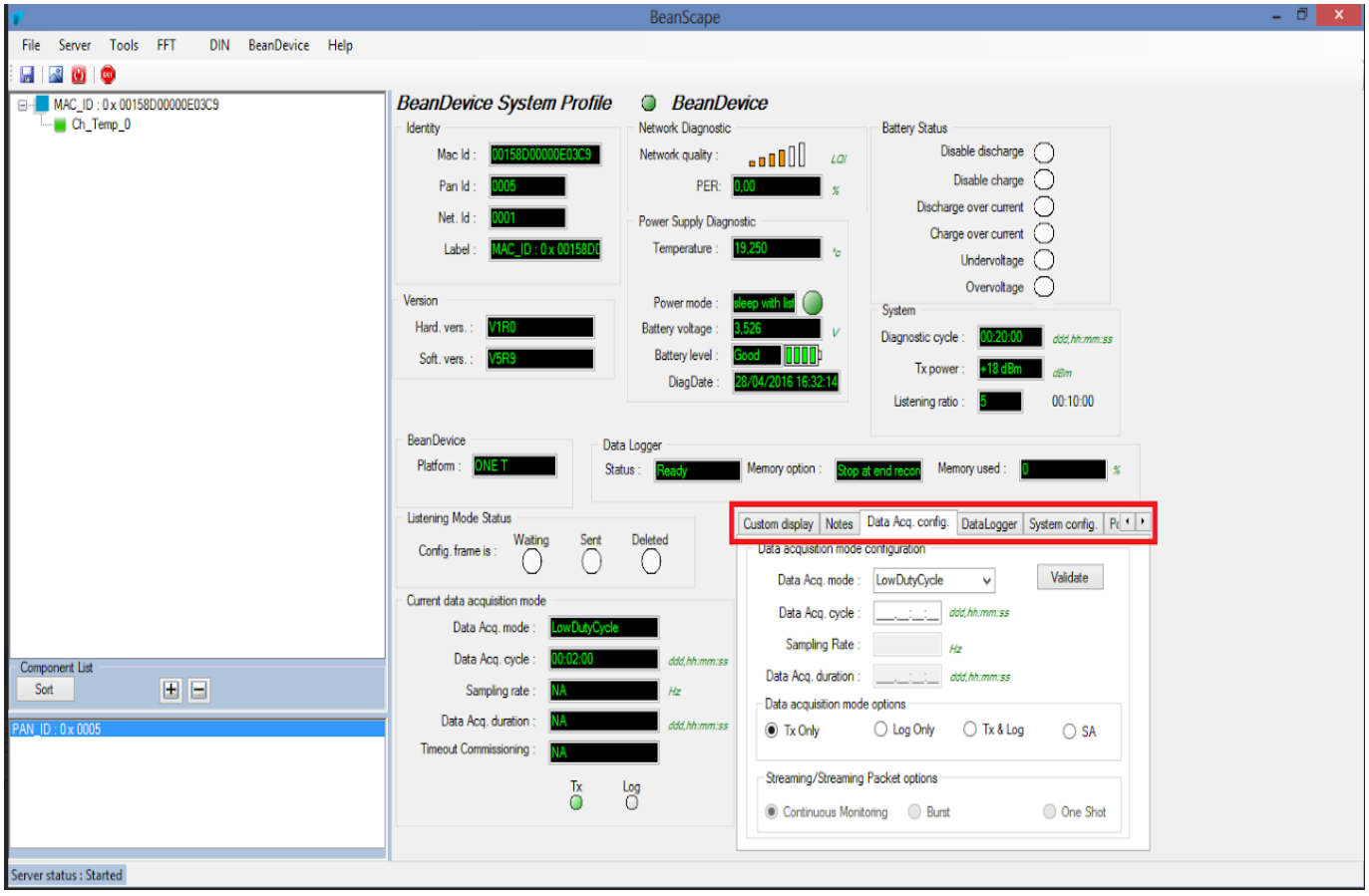


17.3 BEANSCAPE SERVER

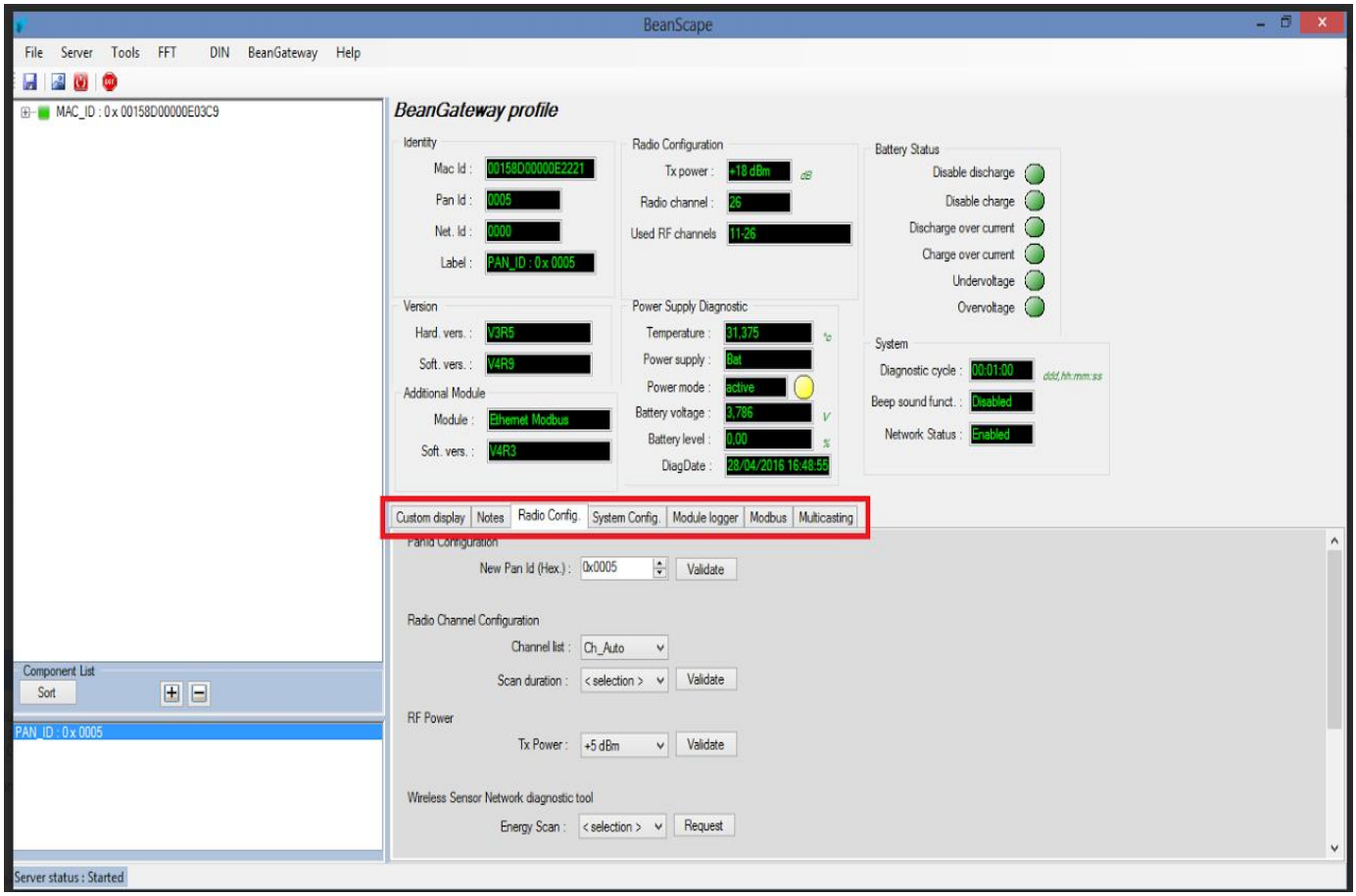
The BeanScape configured as server is similar to the normal BeanScape version.

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 BeanScape Server



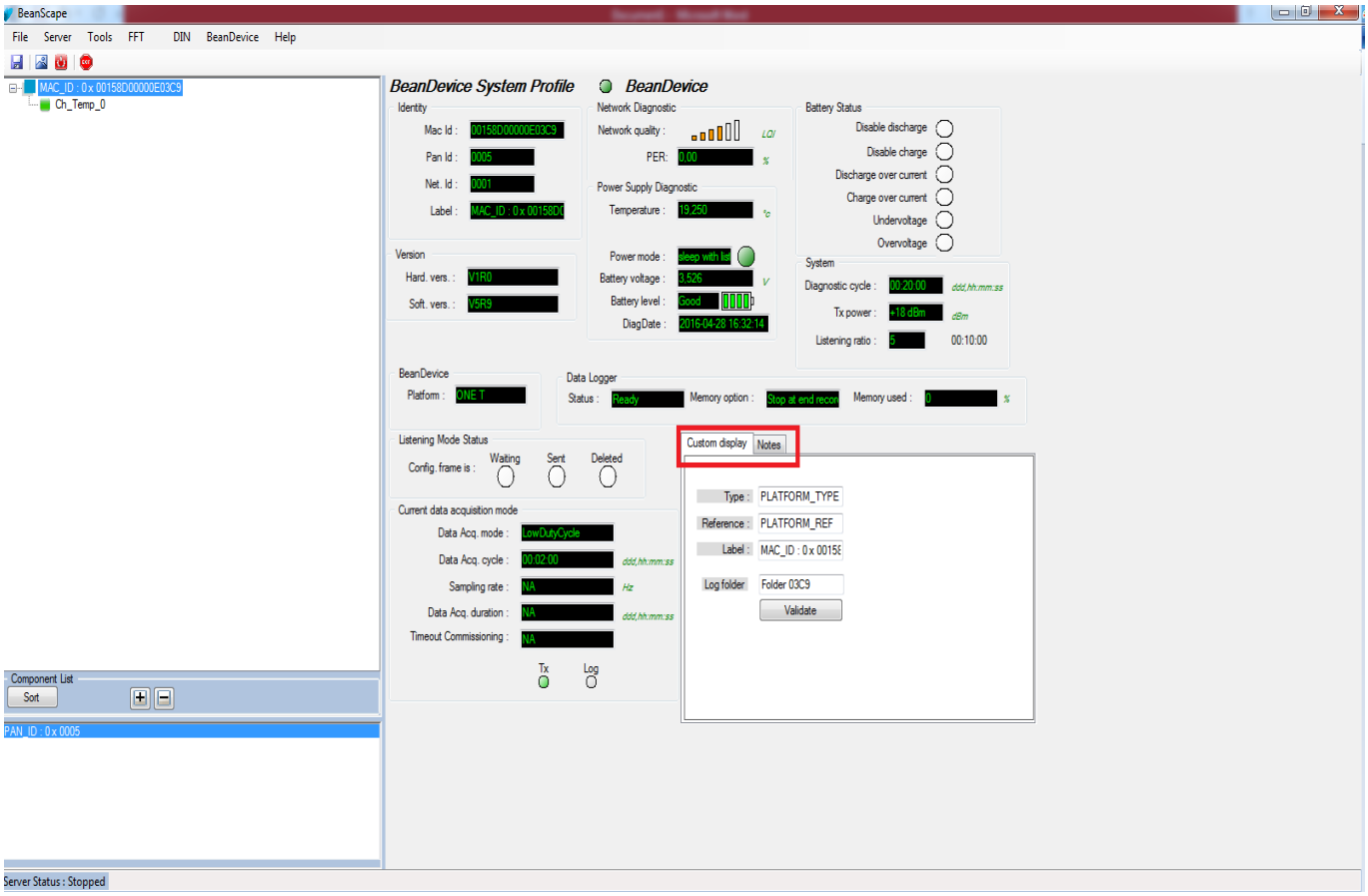
17.3.2 BeanGateway profile on BeanScape Server



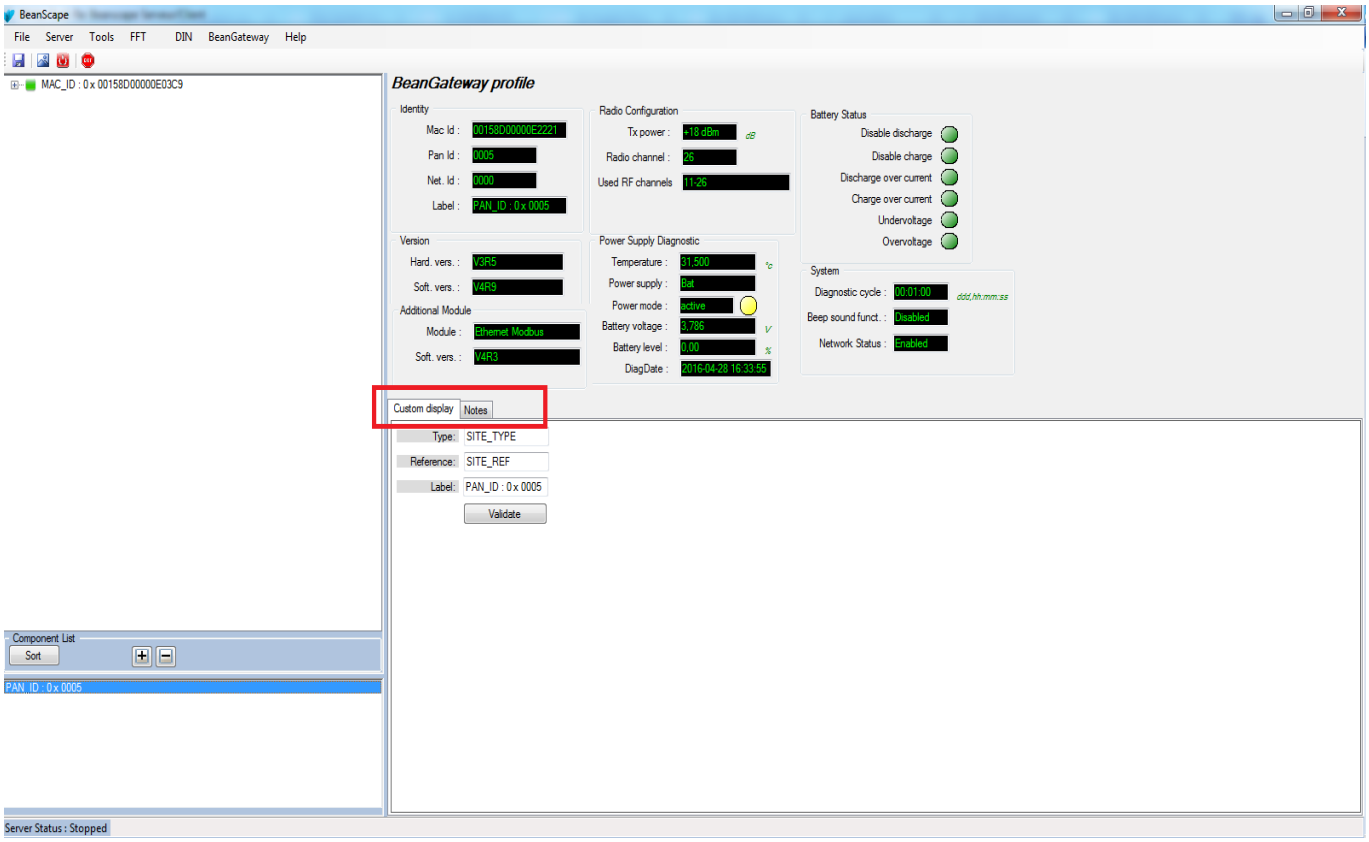
17.4 BEANSCAPE CLIENT

The BeanScape 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 BeanScape Client



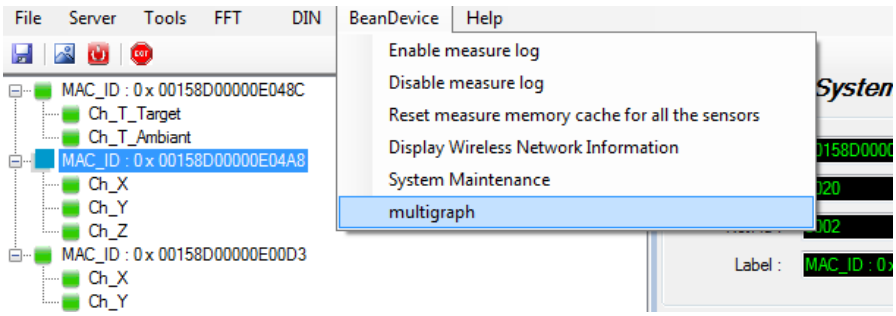
17.4.2 BeanGateway profile on BeanScape Client



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 BeanScape Basic, BeanScape Premium, BeanScape Premium+ and BeanScape Cloud.

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



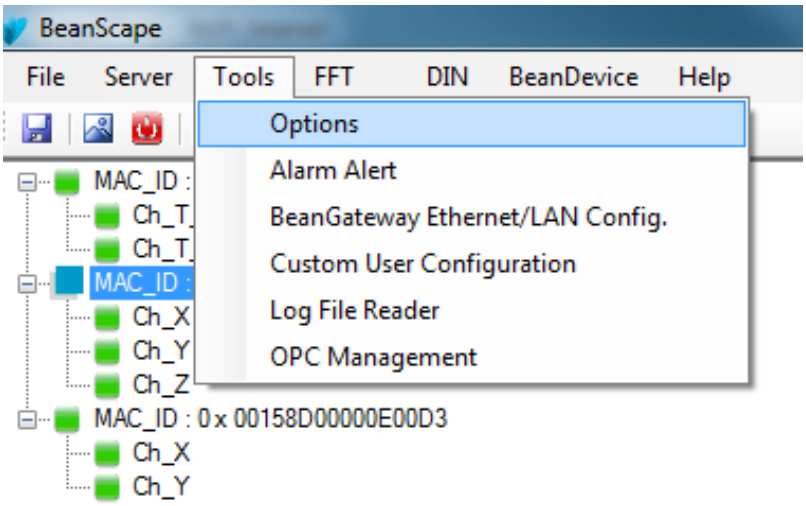
- The following window representing the time plot of different channels will be displayed:

Multigraph Video

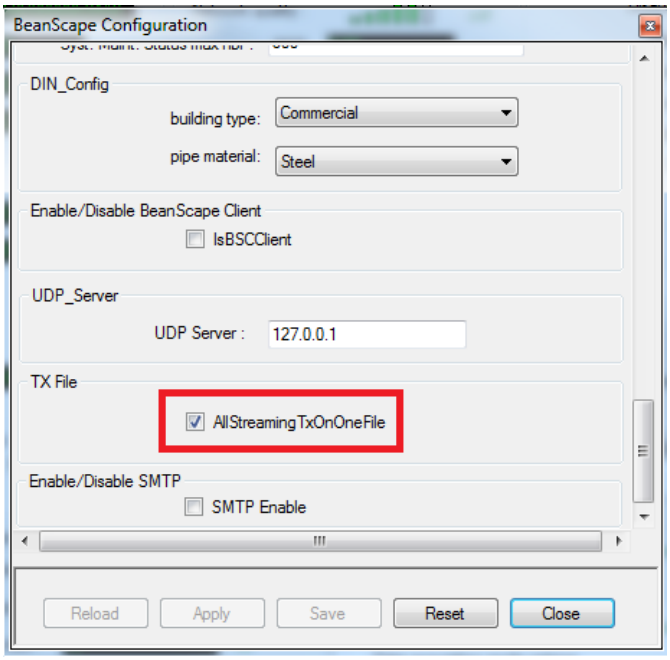
19. IMPORTING A SINGLE TX FILE WITH MULTIPLE CHANNELS

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

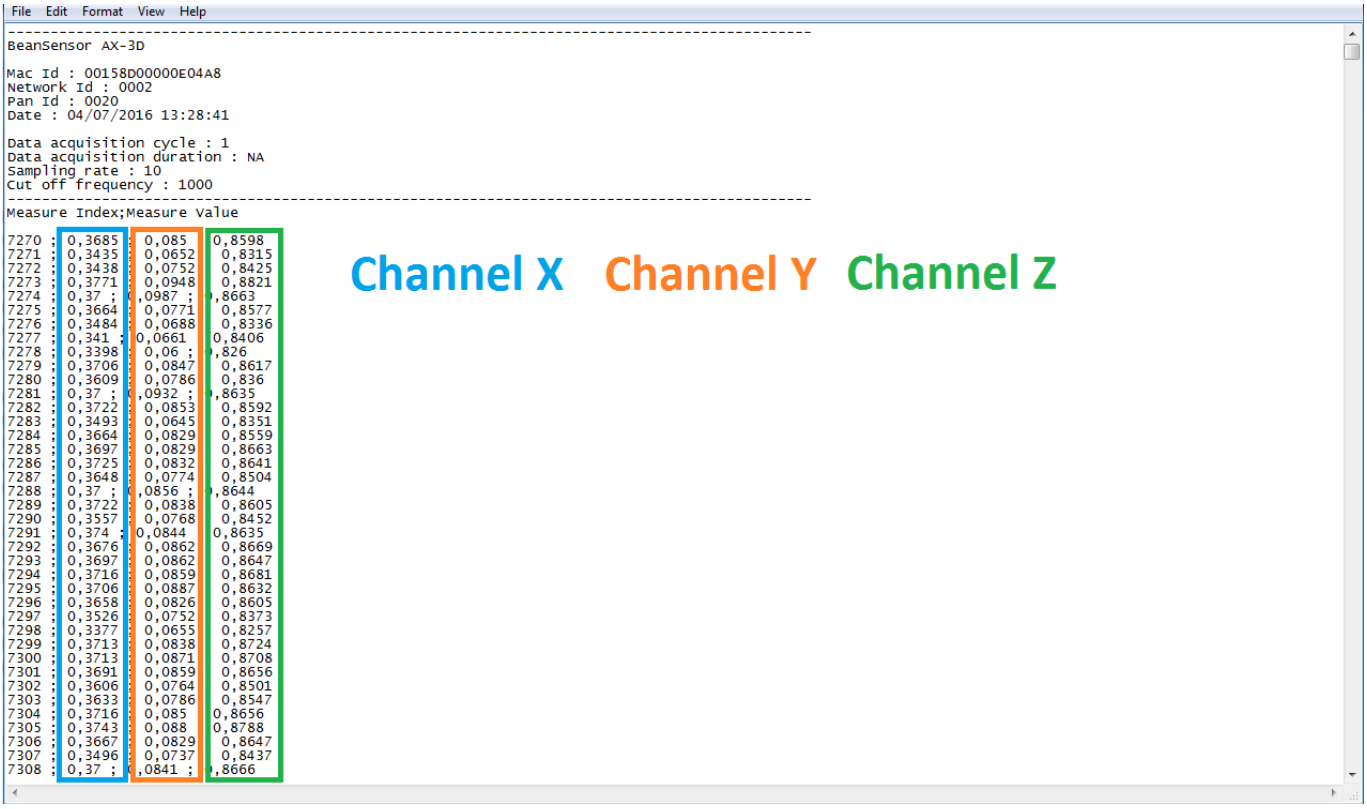
- On BeanScape, click: Tools -> Options



- 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



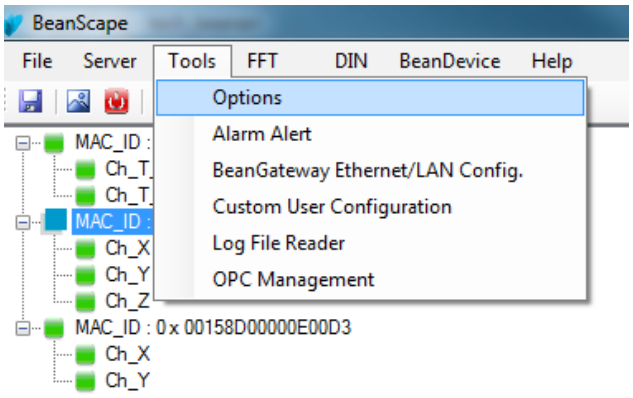
20. BEANSCAPE AUTO-START

Auto-starting BeanScape 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.

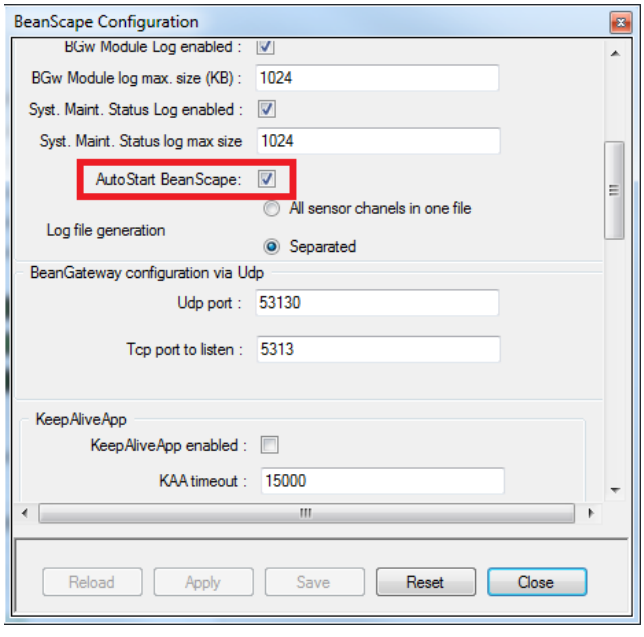
Here we provide a quick solution:

20.1 AUTO-START SOFTWARE

- On BeanScape, click: Tools -> Options



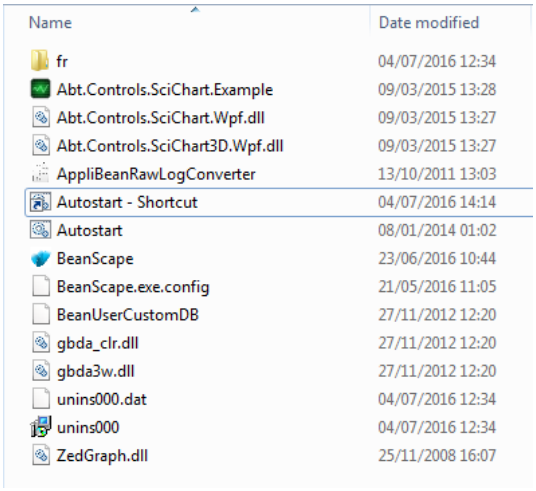
- Check "AutoStart BeanScape" box. This would start automatically the software.

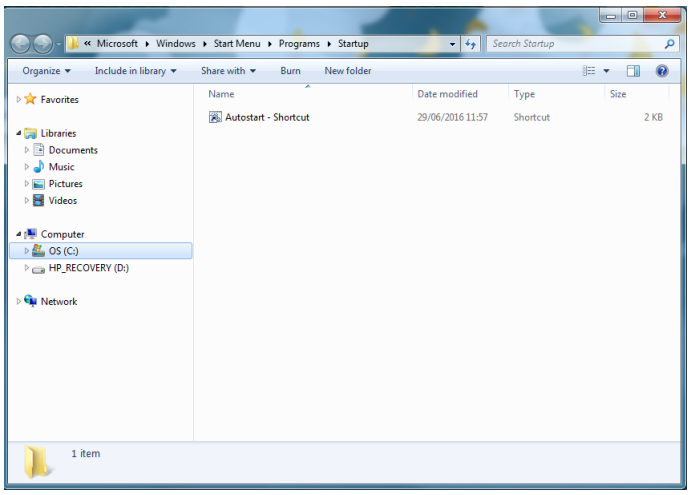


20.2 AUTO-START SERVER

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

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





- 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

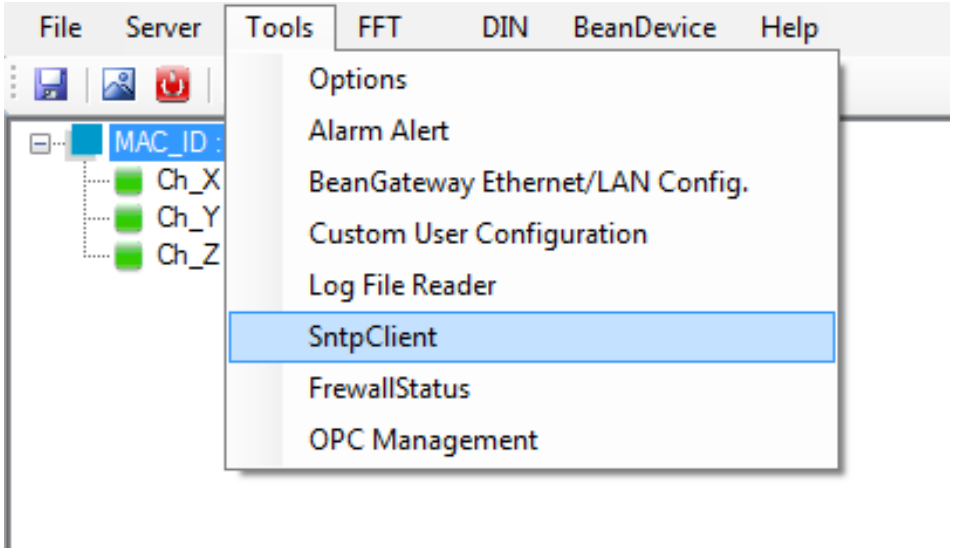
21. SNTP CLIENT

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.

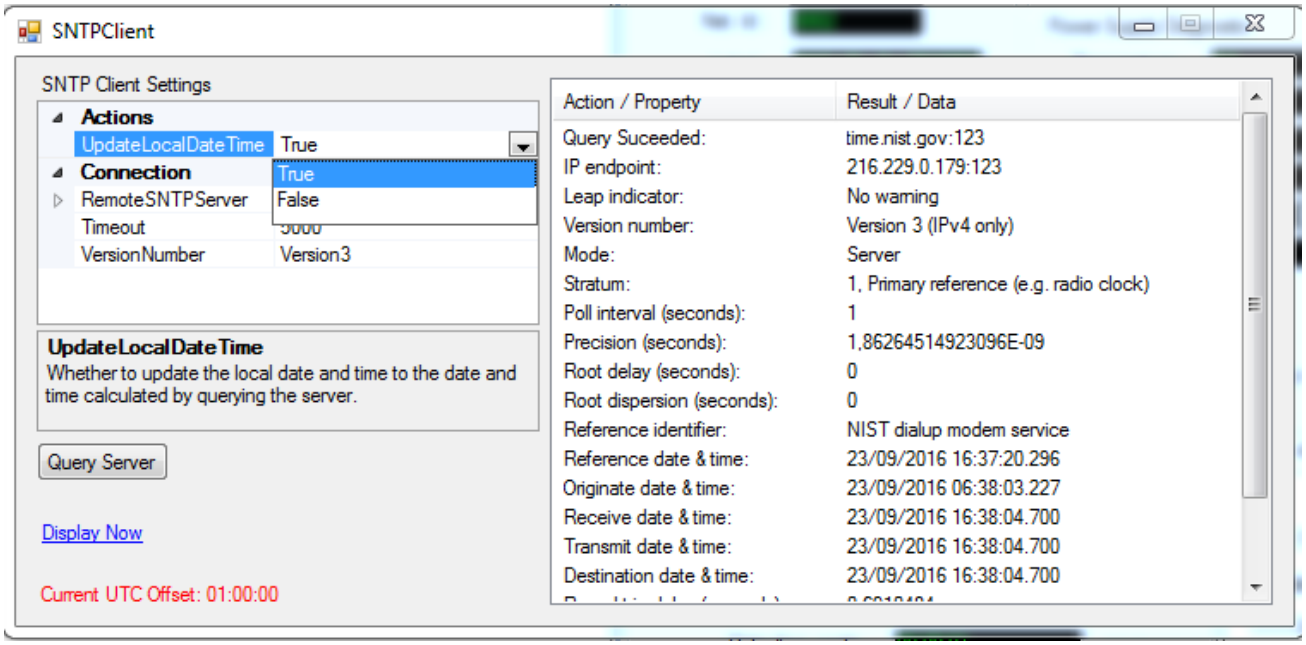
In order to correct the clock of your system, please follow the instructions below:

- Make sure to run your BeanScape as an administrator

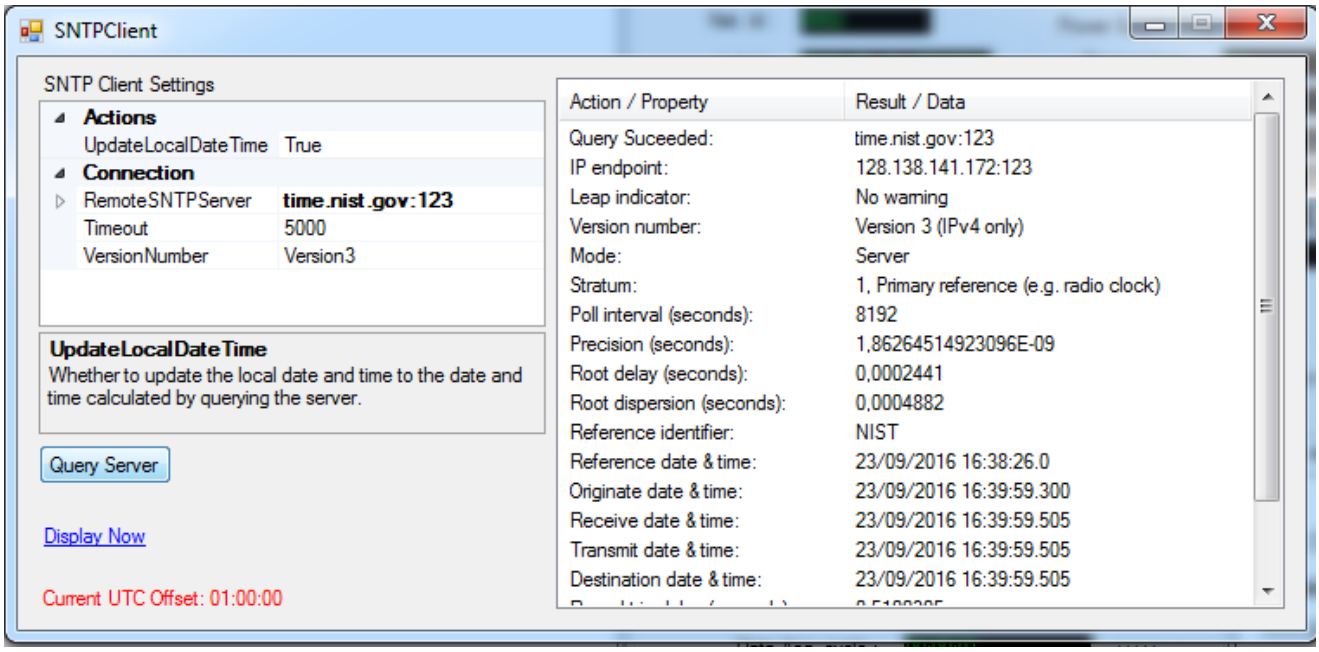
- Tools -> SntpClient



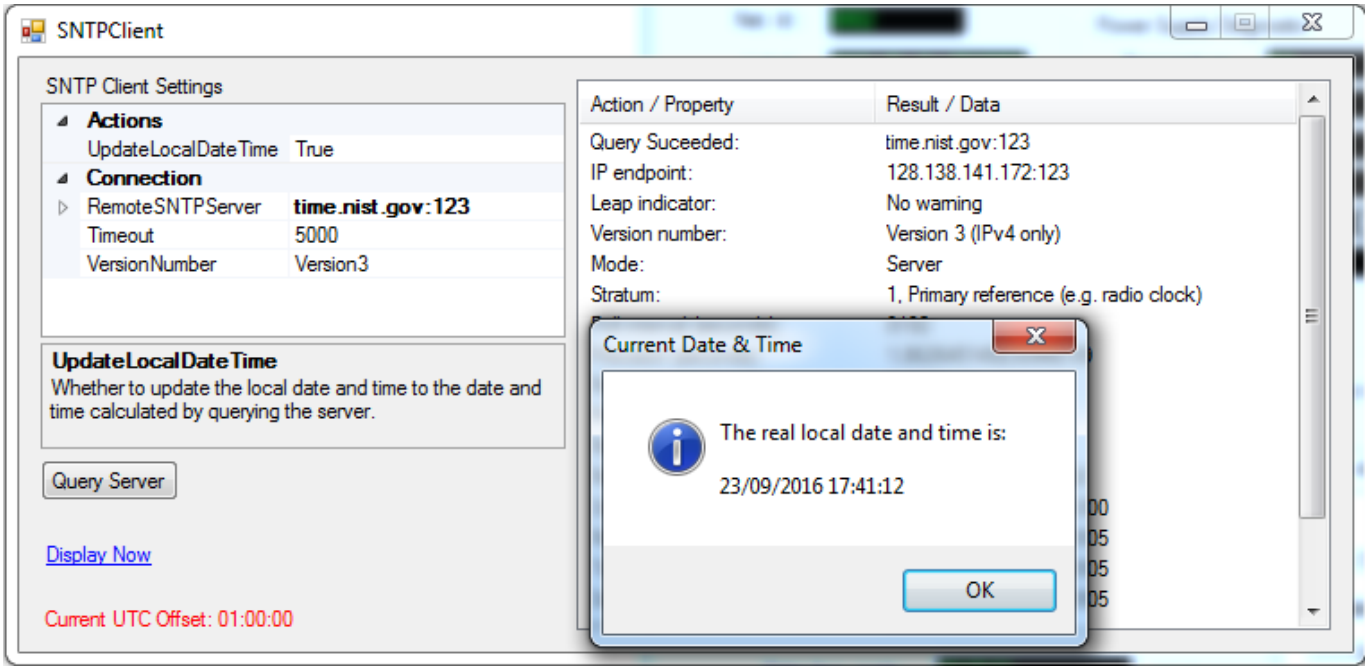
- Set "UpdateLocalDate Time" to **True**



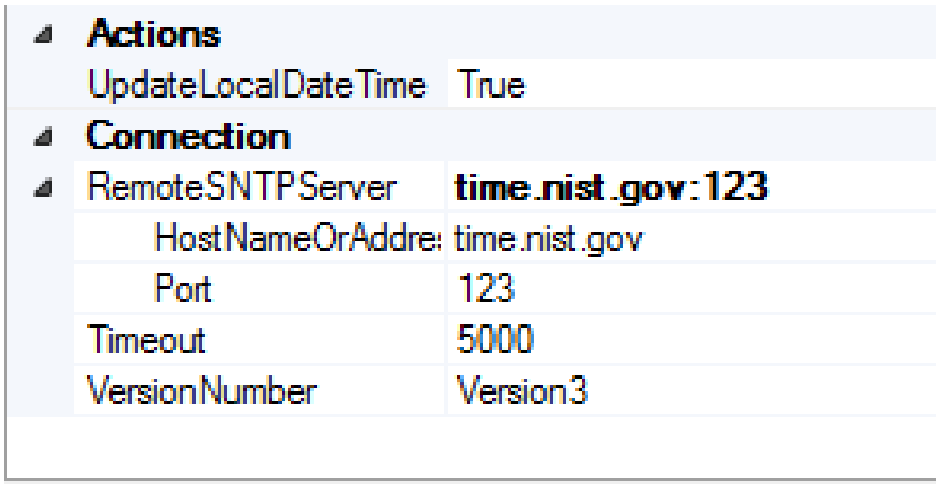
- Press Query Server to update the clock of your computer based on network clock



- You can display also the current server time



- We use the following settings for the Sntp server:



See "Configuring SNTP client" Youtube video