



Version 1.5.1

TECHNICAL NOTE

BeanDevice® Datalogger User Guide



DOCUMENT

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1. TECHNICAL SUPPORT

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

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

www.beanair.com

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

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

2. VISUAL SYMBOLS DEFINITION

Visual	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 MUST 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. RELATED DOCUMENTS & VIDEOS

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

3.1 APPLICATIONS NOTES

Document name (Click on the weblink)	Related product	Description
<u>AN RF 007 :“ Beanair WSN Deployment”</u>	All BeanAir products	Wireless sensor networks deployment guidelines
<u>AN RF 006 – „How to extend your wireless range“</u>	All BeanAir products	A guideline very useful for extending your wireless range
<u>AN RF 005 – BeanGateway® & Data Terminal Equipment Interface</u>	BeanGateway®	DTE interface Architecture on the BeanGateway®
<u>AN RF 003 - “IEEE 802.15.4 2.4 GHz Vs 868 MHz”</u>	All BeanAir products	Comparison between 868 MHz frequency band and a 2.4 GHz frequency band.
<u>AN RF 002 – “Structural Health monitoring on bridges”</u>	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 over-viewing various Data acquisition modes available on each BeanDevice®.

3.2 TECHNICAL NOTES

Document name (Click on the weblink)	Related product	Description
<u><i>TN RF 013 – « OPC configuration »</i></u>	BeanScape® Premium+	The aim of this document is to help deploying the OPC DA and all associated services.
<u><i>TN RF 012– « BeanDevice® battery life in streaming mode »</i></u>	All the products	The aim of this document is to describe the autonomy performance of the BeanDevice® SmartSensor® and ProcessSensor® product line in streaming packet mode.
<u><i>TN RF 011 – « Coexistence of Beanair WSN at 2.4GHz »</i></u>	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.
<u><i>TN RF 010 – « BeanDevice® Power Management »</i></u>	All the BeanDevice®	This technical note describes the sleeping & active power mode on the BeanDevice®.
<u><i>TN RF 009 – « BeanGateway® management on LAN infrastructure »</i></u>	BeanGateway®	BeanGateway® integration on a LAN infrastructure
<u><i>TN RF 008 – “Data acquisition modes available on the BeanDevice®”</i></u>	All the BeanDevice®	Data acquisition modes available on the BeanDevice®
<u><i>TN RF 007 – “BeanDevice® DataLogger User Guide ”</i></u>	All the BeanDevice®	This document presents the DataLogger feature on the BeanDevice®
<u><i>TN RF 006 – “WSN Association process”</i></u>	All the BeanDevice®	Description of the BeanDevice® network association
<u><i>RF TN 003- “Aggregation capacity of wireless sensor networks”</i></u>	All the products	Network capacity characterization of Beanair Wireless Sensor Networks
<u><i>RF TN 002 V1.0 - Current consumption in active & sleeping mode</i></u>	BeanDevice®	Current consumption estimation of the BeanDevice in active and sleeping mode
<u><i>RF TN 001 V1.0- Wireless range benchmarking</i></u>	BeanDevice®	Wireless range benchmarking of the BeanDevice®

3.3 RELATED VIDEOS



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

Beanair video link (Youtube)	Related products
<u>Company Presentation</u>	All

<u>BeanGateway® - Ethernet Outdoor version introduction</u>	BeanGateway® - Ethernet Outdoor version introduction
<u>BeanGateway® – Ethernet Indoor version presentation</u>	BeanGateway® Ethernet Indoor version
<u>BeanDevice® AN-XX wireless range demonstration</u>	BeanDevice® AN-XX & BeanDevice® AN-XX Extender
<u>BeanDevice® AN-XX presentation</u>	BeanDevice® AN-XX & BeanDevice® AN-XX Extender
<u>BeanDevice® AX-3D presentation</u>	BeanDevice® AX-3D
<u>BeanDevice® HI-INC presentation</u>	BeanDevice® HI-INC
<u>BeanDevice® AX-3DS presentation</u>	BeanDevice® AX-3DS
<u>BeanScape® – WSN supervision software</u>	BeanScape®
<u>BeanGateway® Ethernet/LAN Configuration, directly connected to the Laptop/PC</u>	BeanGateway®
<u>Wireless sensors profile deletion from the BeanGateway® Database</u>	All

4. AIM OF THE DOCUMENT

This document is made to bring you all the information you could possibly need to be able to use our BeanDevice® DataDatalogger in total independence.



5. ABOUT DATADATALOGGER FUNCTION

All the BeanDevice® integrates an onboard DataDatalogger based on a flash memory. It integrates a wide spectrum of advanced features:

- ✓ A flash memory size adapted for each application field:
 - **BeanDevice® Ecosensor** products can log up to 1 million data acquisition
 - **BeanDevice® SmartSensor standard version** can log up to 1 million data acquisition
 - **BeanDevice® SmartSensor Xrange version** can log up to 8 millions data acquisition
 - **BeanDevice® ProcessSensor version** can log up to 1 million data acquisition
- ✓ Very fast download (< 5 minutes for 1 million data acquisition, <25 minutes for 8 millions data acquisition);
- ✓ A great flexibility for the user who can choose three configurations: Datalogging only **or** Datalogging + Data transmission **or** Data transmission;
- ✓ The BeanDevice® can operate in standalone mode, without the necessity to be always connected to a Wireless Sensor Networks;
- ✓ Datalogging is compatible with a maximum sampling rate of 2 Ksamples/s per channel;



Figure 1: BeanDevice flash memory

6. DATADATALOGGER CAPACITY

The following table shows the DataDatalogger capacity regarding the version of the BeanDevice®:

BeanDevice®	DataDatalogger capacity
AX-3DS	1 million data points
AX-3D	1 million data points
AX-3D XRange	8 million data points
INC	1 million data points
HI-INC	1 million data points
HI-INC XRange	8 million data points
AN-420	1 million data points
AN-420 Xtender	1 million data points
AN-V	1 million data points
AN-V Xtender	1 million data points
AN-mV	1 million data points
AN-mV Xtender	1 million data points
ONE-T	1 million data points
ONE-TH	1 million data points (500 000 data points per measurement channel)
ONE-Tir	1 million data points (500 000 data points per measurement channel)

7. DATA LOGGING PROCESS STEP-BY-STEP

Step 1

- Install your BeanDevice® on your equipment
- Configure fully your Beandevicé® before starting Data Logging

Step 2

- Configure your Data Acquisition mode of your BeanDevice®, choose properly your Datalogger option: Datalogging only *or* Datalogging + Data transmission
- The BeanGateway® sends an OTAC (Over-The-Air configuration) for starting the new data acquisition mode on the BeanDevice®
- All the logs are recorded on an embedded memory flash of the Beandevicé®

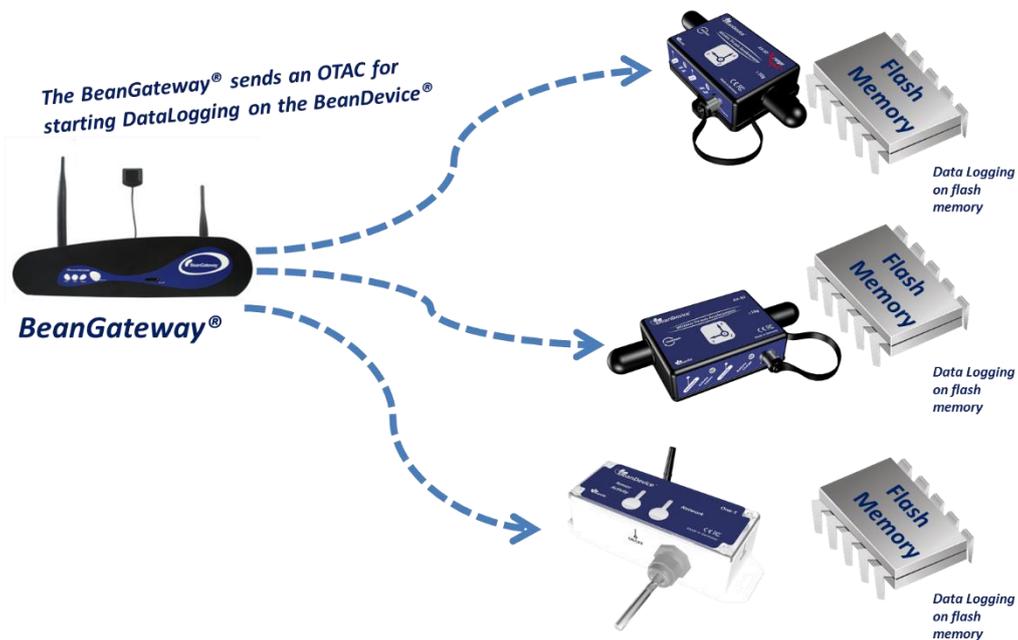


Figure 2: WSN example

Step 3

- If you choose DataLogging with data transmission, the BeanDevice transmits & records all the data simultaneously;
- If you choose DataLogging without RF transmission, the BeanDevice records all the data without any transmission

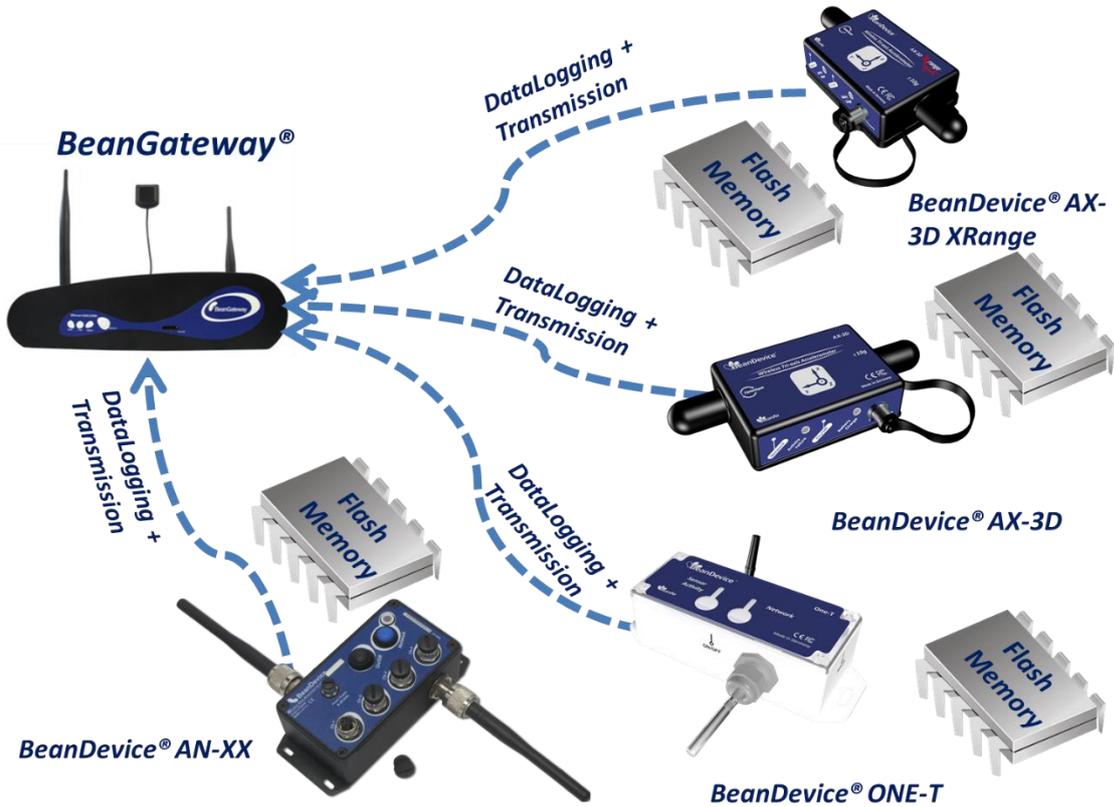


Figure 3: Data logging combined with data transmission



Figure 4: Data logging without data transmission

A standalone installation of the **BeanDevice**[®] can be done without the necessity to be connected to the BeanGateway[®].

If the Power management mode of your BeanDevice[®] is configured in sleeping with Network listening mode, every N cycle (defined by the user) the Beandevic[®] listens for a download request coming from the Beangateway[®].



If your Beangateway[®] was used to configure the DataDatalogger feature of your Beandevic[®]: Don't try to change the PAN ID or the RF channel. Your BeanDevice[®] will not be able to reach the BeanGateway[®] during the "Network Listening" process. If this is the case, you must power off then power on your Beandevic[®], a new WSN association will be done.

Step 4

- At everytime, you can send a request (through the BeanScape®) for downloading al the Data acquisition logged on the BeanDevice®
- This request is bakcuped on the BeanGateway® and will be transmitted to the BeanDevice when it starts to listen to the BeanGateway®



The BeanScape sends a request for downloading all the Data acquisition logged on the BeanDevice



Request pending

Figure 5: Request pending (Downlad)

Step 5

- The BeanGateway® must be placed near the BeanDevice®;
- **If the Power management mode of your BeanDevice® is configured in sleeping mode with Network listening**, the request will be received by the BeanDevice® when it started listening to the BeanGateway®;
- **If the Power management mode of your BeanDevice is configured in sleeping mode**, the request will be received when you power off and then power up your BeanDevice®

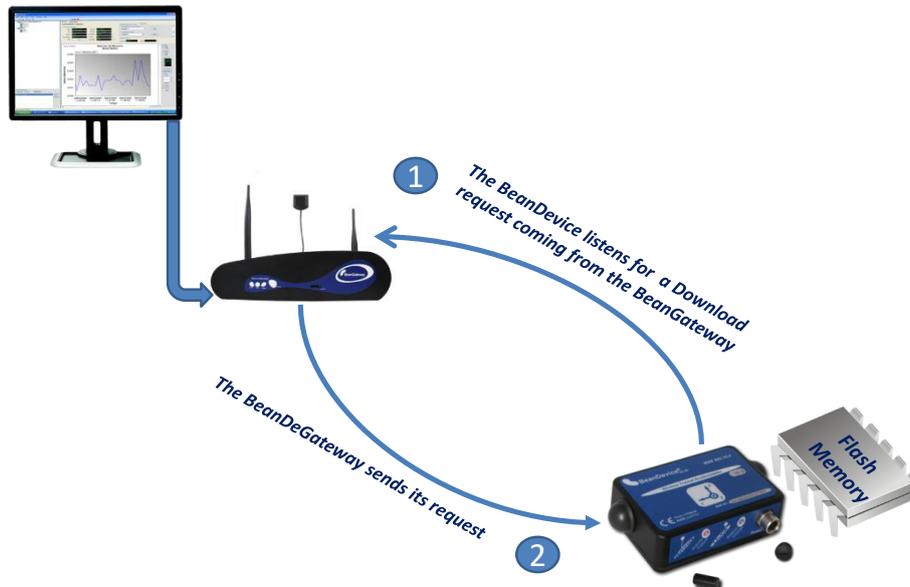


Figure 6: Download request BeanGateway®/BeanDevice®

Step 6

- The BeanDevice® starts sending its data logs
- The BeanScape® displays the download process;
- At the end of the download process: a log file is created/updated in the BeanScape log folder



Figure 7: DataLogger download process

8. EMBEDDED FLASH MEMORY MANAGEMENT

8.1 HOW A FULL MEMORY IS MANAGED?

The user can choose how the embedded flash memory must be managed if it is full:

- ✓ Data Logging process is stopped & data acquisition process is maintained.
- ✓ Data logging process is stopped.
- ✓ Data Logging process is stopped, data are downloaded then the memory is erased.

8.2 TIME PROCESSING

<i>Full Download time</i>	<i>Time processing</i>
<i>BeanDevice® ONE-T/ONE-TH/ONE-TIR/ONE-BN</i>	<i><5min</i>
<i>BeanDevice AX-3D</i>	<i><3min</i>
<i>BeanDevice AX-3DS</i>	<i><3min</i>
<i>BeanDevice HI-INC & INC</i>	<i><3min</i>
<i>Beandevicé® AX-3D Xrange</i>	<i><25min</i>
<i>BeanDevice® HI-INC Xrange</i>	<i><25min</i>
<i>BeanDevice AN-420/AN-V/AN-mV & AN-420/AN-V/AN-mV Xtender</i>	<i><3min</i>

9. DATADATALOGGER CONFIGURATION FROM THE BEANSCAPE®

9.1 DATA ACQUISITION CONFIGURATION TAB

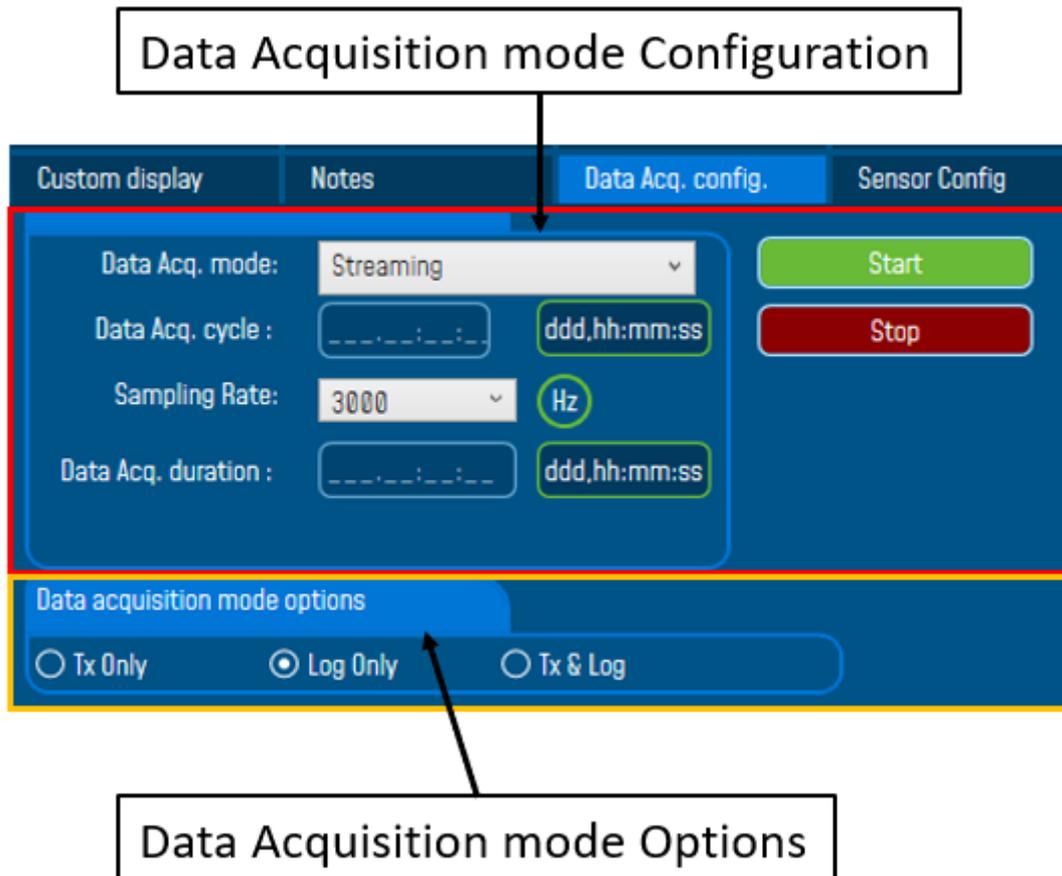


Figure 8: Data Acquisition configuration tab

- ✓ **Tx only:** The BeanDevice® transmits the data acquisition without Datalogging
- ✓ **Log only:** The Beandevicé® logs the data acquisition without wireless transmission
- ✓ **Tx & Log:** The BeanDevice® transmits and logs the data acquisition;
- ✓ **SA (Stand alone):** The Beandevicé® logs the data acquisition without wireless transmission. The Beandevicé stores all the measurements on its embedded dataDatalogger. Thus, a direct connection with the BeanGateway® is not needed.

9.1.1 Configure a data acquisition mode with Log only option

If the user chooses to configure the Data Acquisition mode with **Log** option activated:

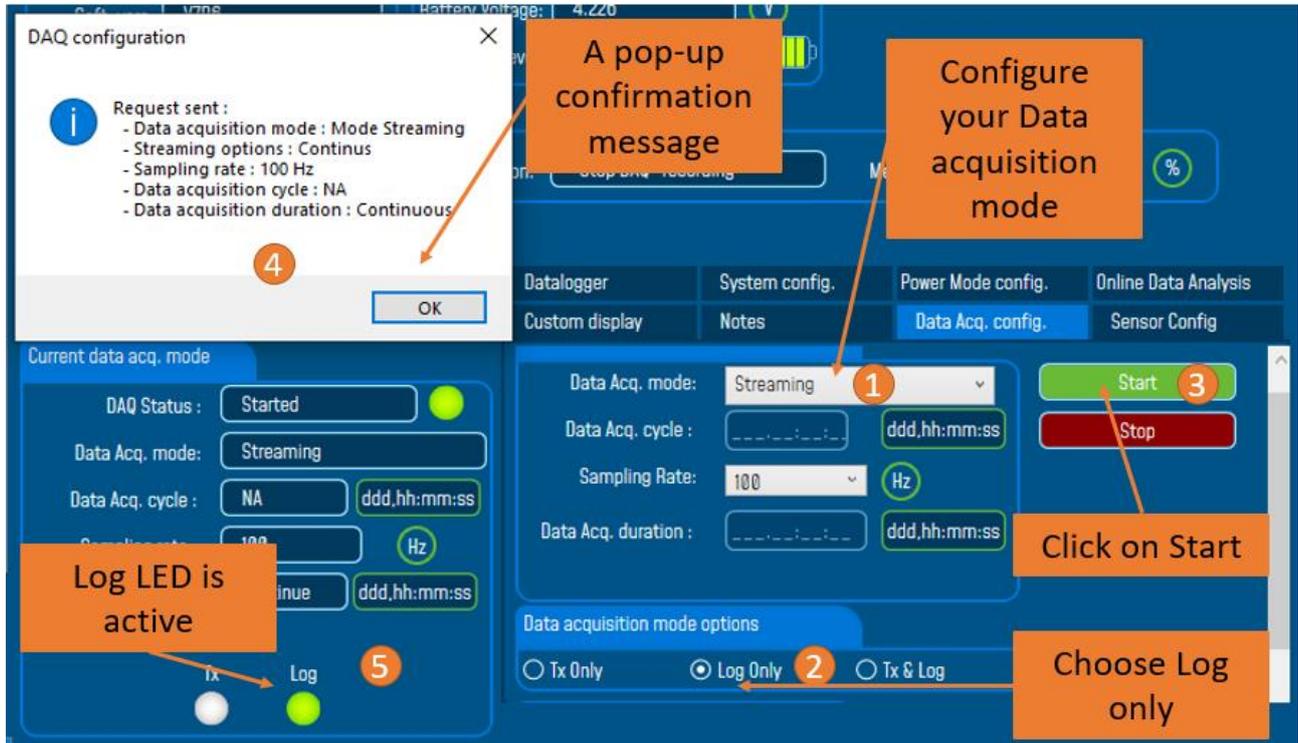


Figure 9: Configure data acquisition mode with Log only option



In LOG ONLY option, when we power on the device, it will look for the BeanGateway® which has the same PanId, if the BeanGateway® is unreachable the device will go to sleep mode.

9.1.1.1 LDCDA mode with Log only datalogging option

With LDCDA mode, when the Beandevic is restarted, the DataDatalogger should continue storing data.

Step 1: The Beandevic is configured with LDCDA mode with LOG ONLY option.



Figure 10: Configuration of LDCDA mode with Log only option

Step2:The device is powered off



Figure 11: Power down the BeanDevice® with log only option

Step3: The Beandevice is powered on.

As shown in the screenshot below, the Datalogger status is still “LOG ONLY”:



Figure 12: Log LED when powering on the BeanDevice®



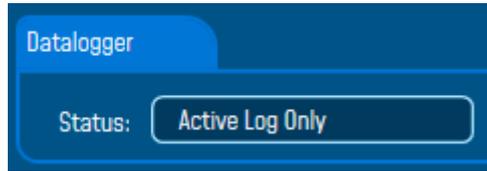
With LDCDA mode, the datalogging download is performed on the same file for each channel.



The presence of the BeanGateway® is needed when starting the BeanDevice

9.1.1.2 Streaming mode with Log only datalogging option

The same steps are to be followed as for LDCDA mode. After powering off and then on the BeanDevice®, the dataDatalogger status is “Active log only”.



In **Streaming** and **Shock Detection** mode, if we restart the device under LOG ONLY option and we click “download” we will get 2 files for each channel.

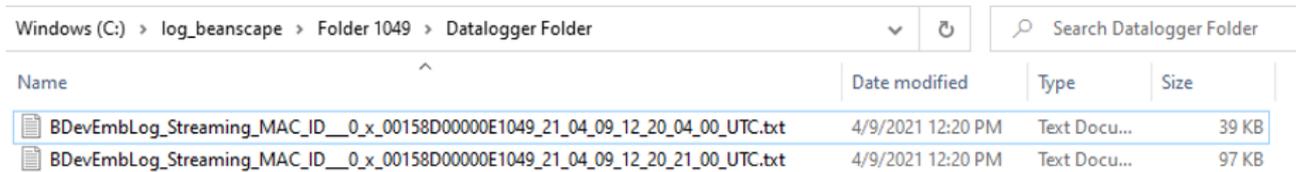
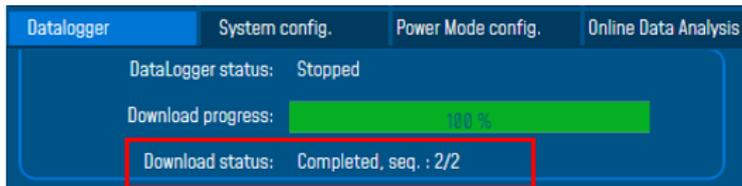


Figure 13: Generated files when restarting the BeanDevice®



With Log only option, if the Beandevic is powered on (step 3) and fails to connect to the Beangateway, it will switch to sleep power mode.

9.1.2 Configure a Data Acquisition mode with Tx & Log option

If the user chooses to configure the Data Acquisition mode with *Tx & Log option* activated:

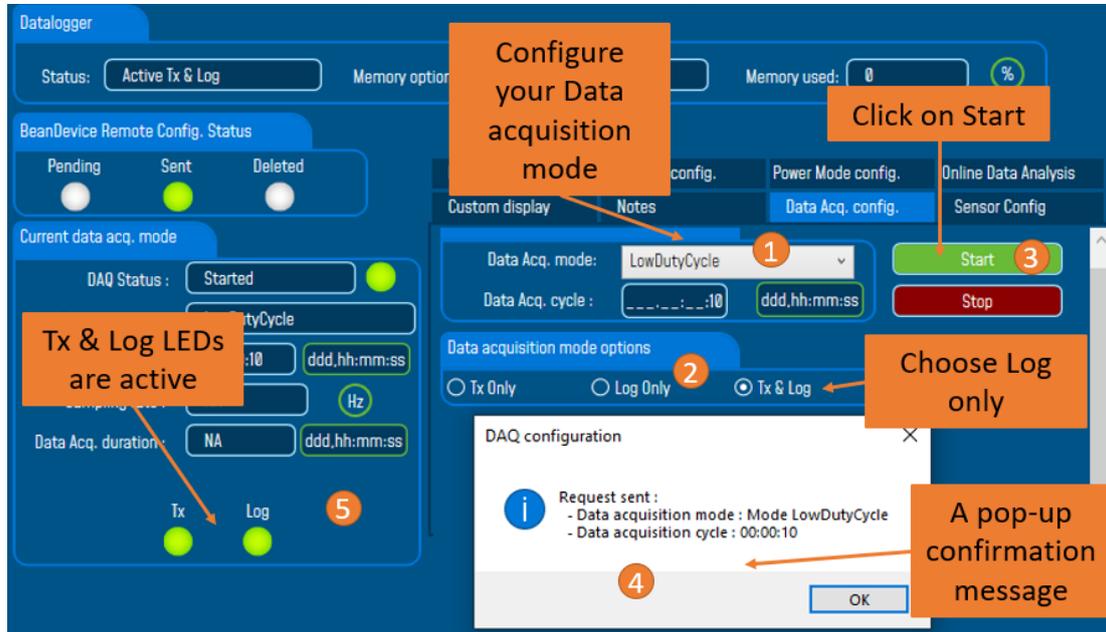


Figure 14: configuring data acquisition with Tx & Log option



Please note that with Log only, Tx&Log and SA options, if the Beandevic is reconfigured with a new acquisition mode, the DataDatalogger will be stopped . So before reconfiguring the Beandevic, the download must be stopped and the data logged on the Beandevic memory must be erased.

For further details about the two cases following a new configuration, please refer to these videos.

First case: download not stopped

Second case: download stopped and memory erased



Please note that Smart Shock Detection (SSD) mode doesn't work unless Log option is activated and the memory is not full . Once the flash memory on the Beandevic is full, transmission stops. The memory data should be erased so the transmission starts again .

9.1.3 Configure a Data Acquisition mode with Tx option

If the user chooses to configure the Data Acquisition with *Tx option* activated:

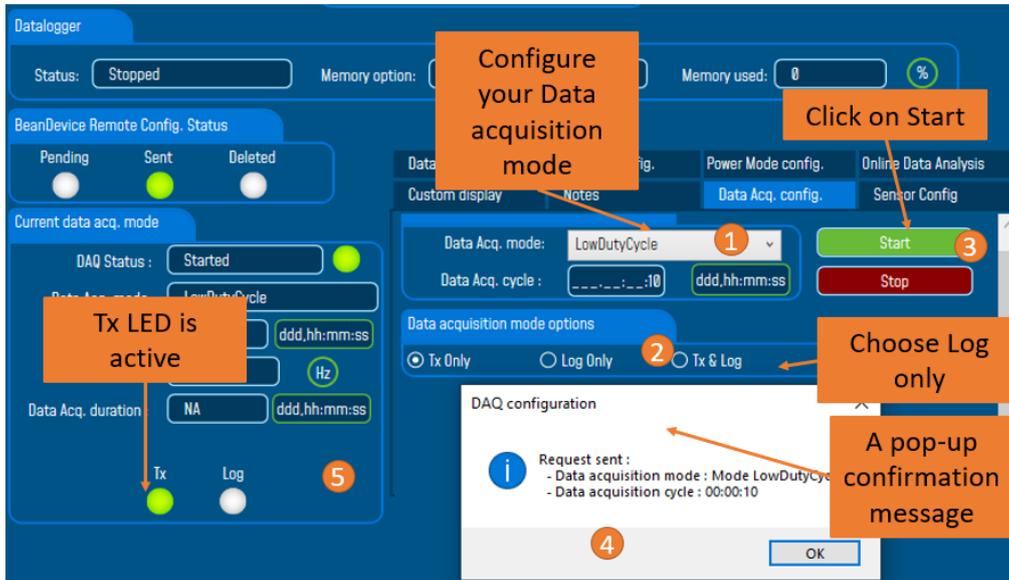


Figure 15: Configuring data acquisition with Tx Only option



If DataLogger was activated a pop up window appears asking to confirm stop logging.

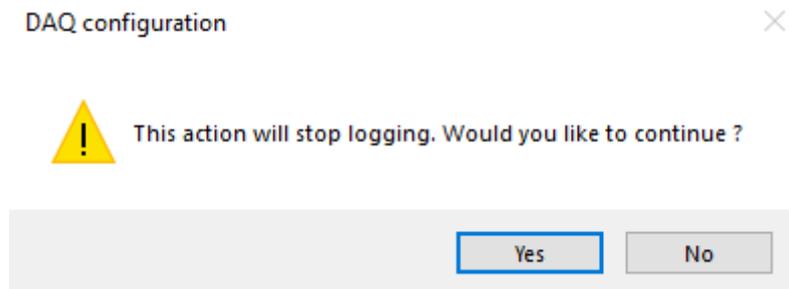


Figure 16: Stop logging pop up alert



Datalogger modes summaray

	Tx & Log	Log only	SA
Direct connection to BeanGateway®	Mandatory	Mandatory	Only for configuration and data download
Flash memory full	Keep acquisition on Tx only	Stop acquisition	Stop acquisition

9.2 DATADATALOGGER TAB

9.2.1 How to access to “DataDatalogger” Tab ?

1. Click on your BeanDevice® profile
2. Click on “DataDatalogger” tab

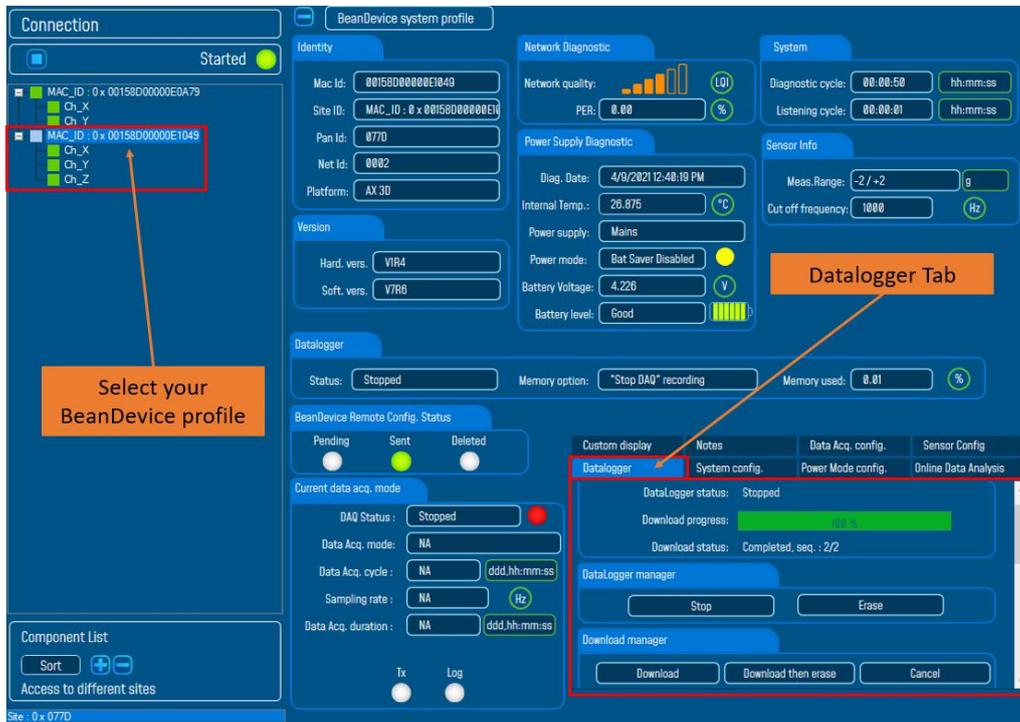


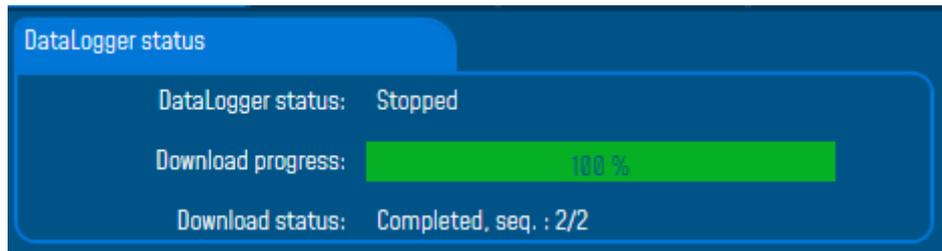
Figure 17: DataKogger tab on BeanScope®

9.2.2 Datalogger tab composition

The Datalogger tas is composed of five different fields:

- ✓ **Datalogger Status**
- ✓ **Datalogger manager**
- ✓ **Acquisition information**
- ✓ **Datalogger memory configuration**

9.2.3 Datalogger status



- **Datalogger status:** Displays Dataloggers status, five different status are available:
 - **Ready:** the DataDatalogger is ready to register data
 - **NotInit:** the DataDatalogger is not initialized;
 - **Active logs only:** Data acquisition is logged only;
 - **Active Tx and Log:** Data acquisition is logged & transmitted by Radio;
 - **Stopped:** DataDatalogger is stopped;
- **Download process:** Displays the download process 0 to 100%. If 100%, all the data logs are successfully downloaded on your PC.
- **Download status:** Displays the download status , two types of status are available:
 - **Processing:** Data logs download is under process;
 - **Completed:** Data Logs are completely downloaded on your PC;

9.2.4 Datalogger manager

- ✓ **Stop:** Stops Data Logging process
- ✓ **Erase:** Stop & Erase all the logs on flash memory IC
- ✓ **Download:** Starts to download all the logs on the flash memory
- ✓ **Stop DAQ, Download then Erase:** Start to download all the logs on the flash memory,erase all the logs on the flash memory and stop the acquisition
- ✓ **Download, Erase flash memory and Continue Datalogging:** Start to download all the logs on the flash memory,erase all the logs on the flash memory and continue datalogging
- ✓ **Cancel:** Stop the download process

When clicking on **Erase**:

The request will be performed at the end of the BeanDevice® listening cycle

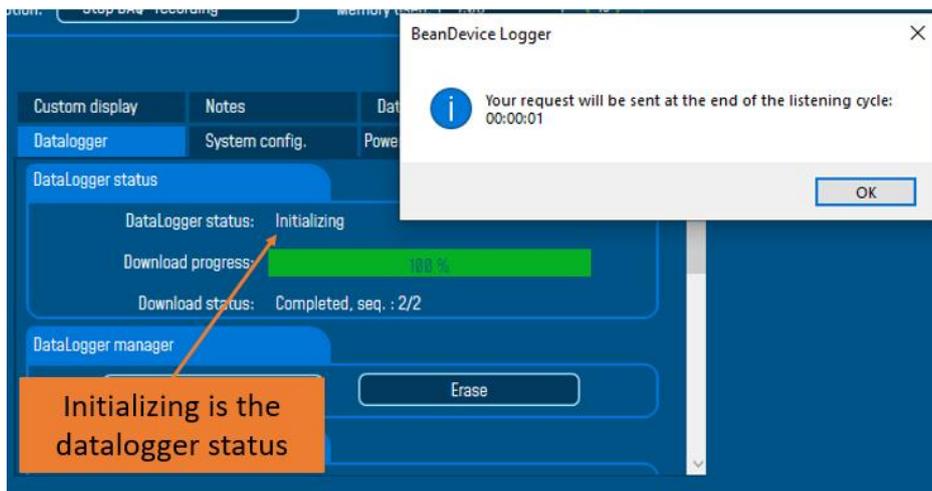


Figure 18: DataLogger Erase option

When clicking on **Download**:

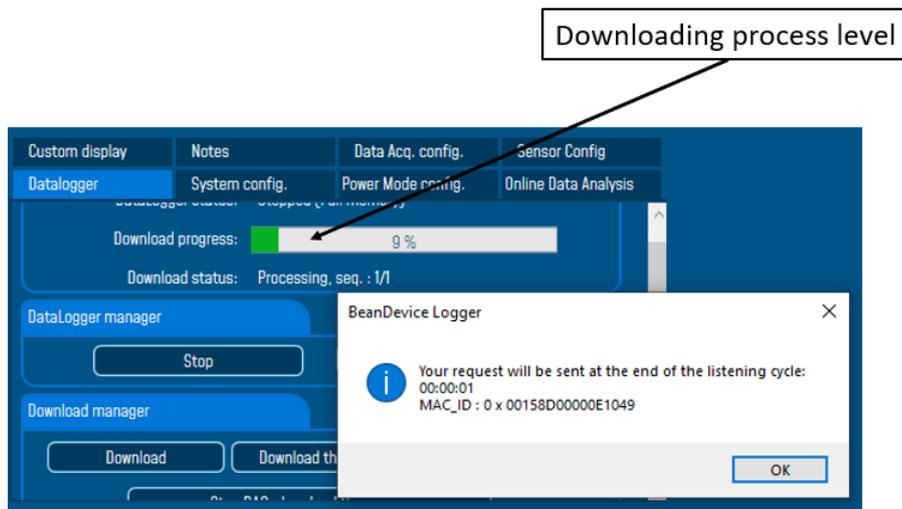


Figure 19: DataLogger Download option

When clicking on **Download then erase**

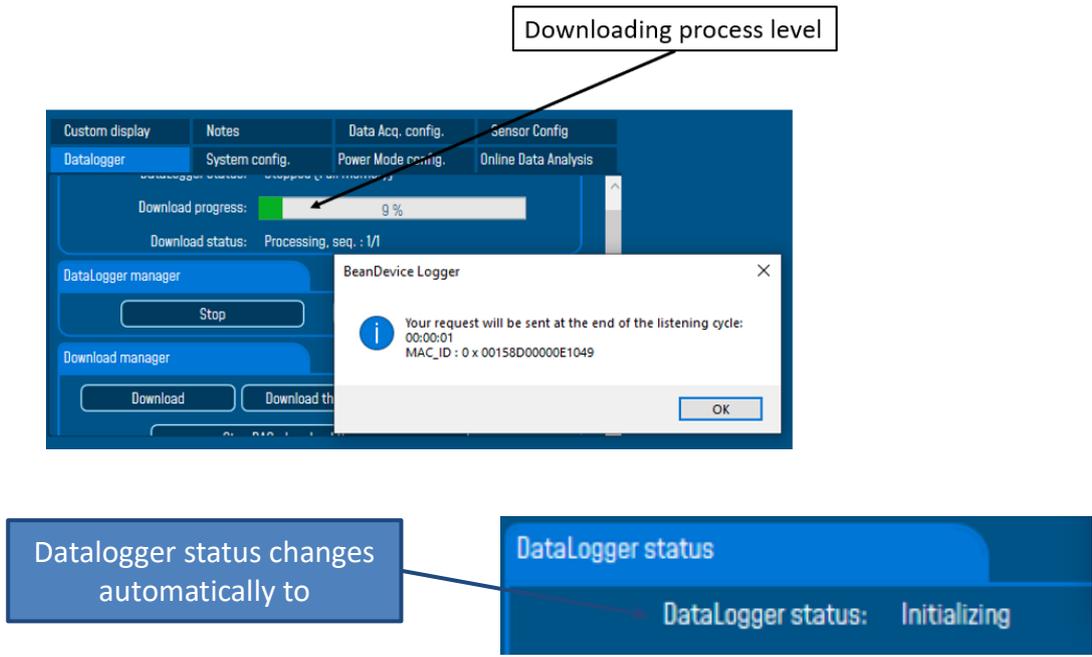


Figure 20: DataLogger Download and Erase option

When clicking on *Stop DAQ*, download then erase

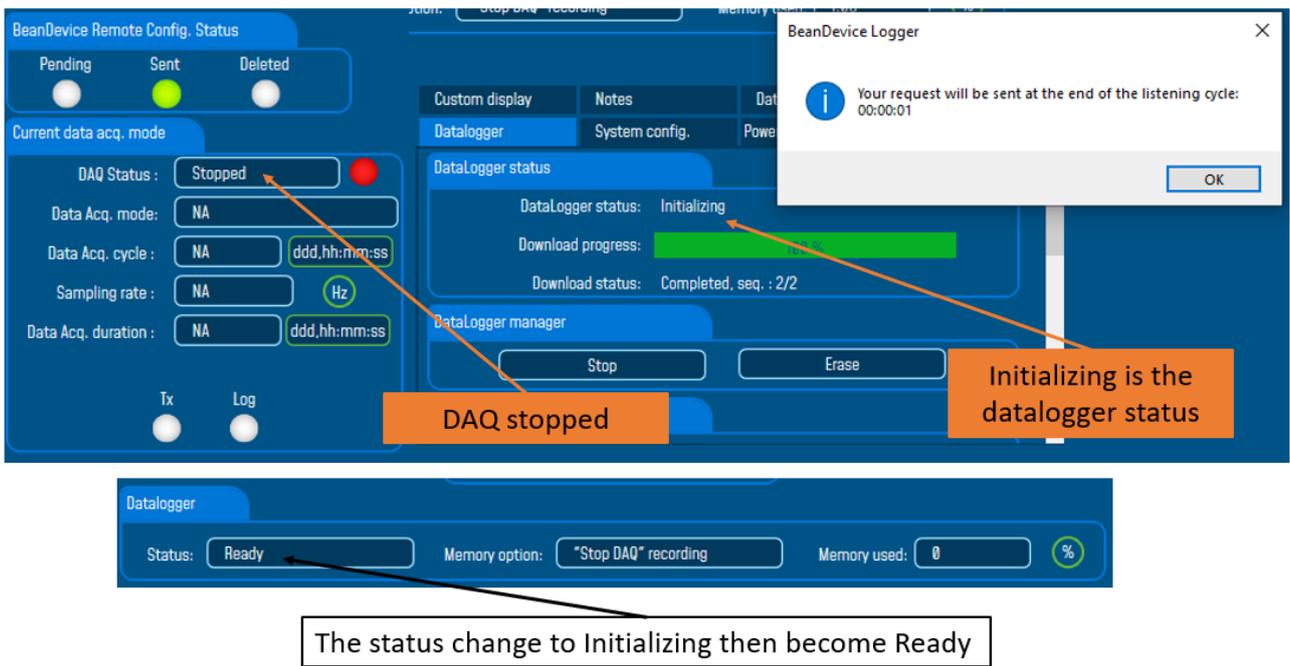
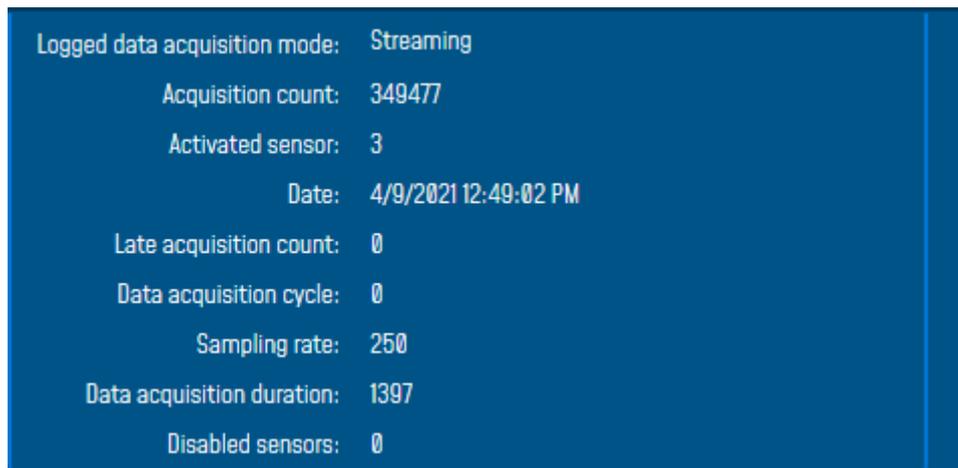


Figure 21: Stop DAQ, Download then Erase

9.2.5 Acquisition information



Logged data acquisition mode:	Streaming
Acquisition count:	349477
Activated sensor:	3
Date:	4/9/2021 12:49:02 PM
Late acquisition count:	0
Data acquisition cycle:	0
Sampling rate:	250
Data acquisition duration:	1397
Disabled sensors:	0

Figure 22: Acquisition information screen

- ✓ **Logged measure mode:** Data acquisition mode used during logging
- ✓ **Acquisition count:** Number of data acquisition logged
- ✓ **Sensor count:** Number of sensors activated
- ✓ **Date:** Data Logging startup time
- ✓ **Late acquisition count:** Data acquisition lost during the download process of the data logs
- ✓ **Measure cycle:** Last acquisition cycle
- ✓ **Sampling frequency:** Last sampling frequency during data logging (displayed if Streaming mode is activated)
- ✓ **Sampling duration:** Last sampling duration during data logging (displayed if Streaming mode is activated)
- ✓ **Disabled sensors:** Number of sensors disabled during data logging

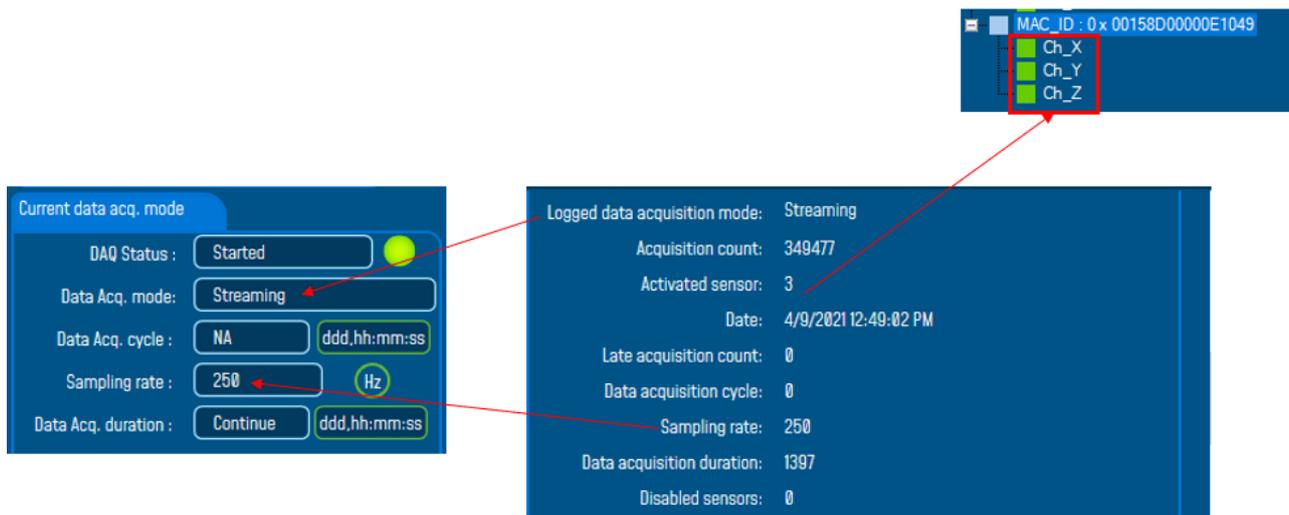
Example:

Figure 23: DataLogger Acquisition Information

9.2.6 Datalogger memory configuration

When the flash memory is full:

- “Stop DAQ” :Data logging is stopped
- "Stop at end" :Data Logging is stopped
- "Stop DAQ DE" : Data logging is stopped ,downloads the data if there is a Wireless connection and erase the data in the datalogger.
- Click on “**Validate**” to validate your choice.



[How to use DataDatalogger Demonstration Video on Youtube](#)