

# X-trodes PC app – Dev – User Guide | Ver 2.00

App version – BluetoothLE\_1.1.37.0\_Debug\_Test

Link for download: [BluetoothLE\\_1.1.37.0\\_Debug\\_Test.zip](#)

## FUNCTIONALITY

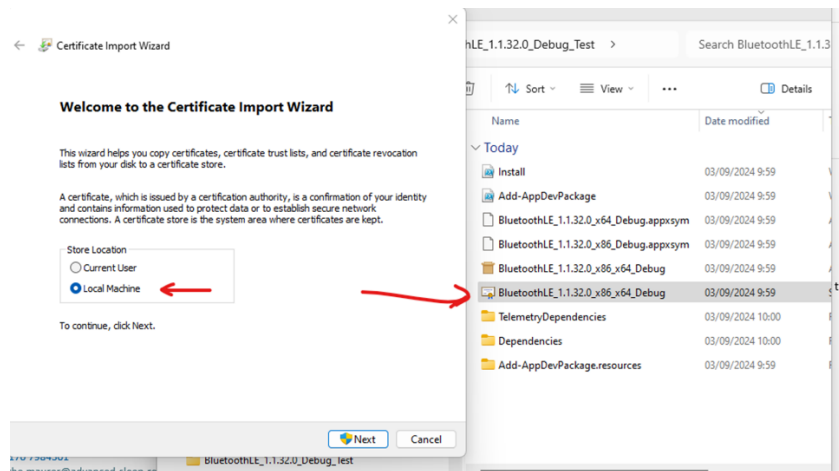
1. Stream data from a DAU to a PC
2. Save XTR2 and CSV files
3. Communicate with 3rd party applications

## INSTALLATION

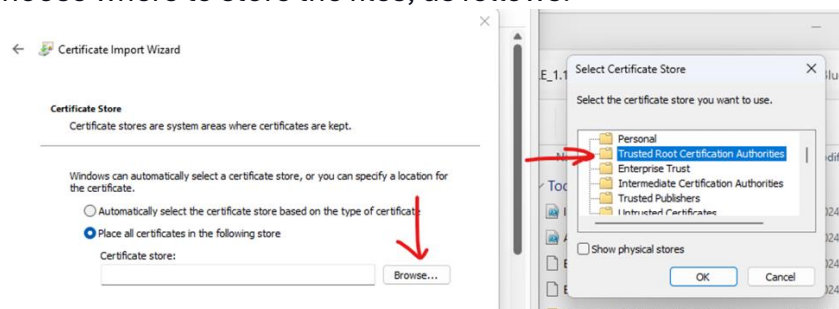
1. Windows > “Use developer features” > turn on “Developer Mode”.
2. Right-click BluetoothLE\_1.1.37.0\_x86\_x64\_Debug (file type – Security Certificate) > “Install Certificate”
3. Right-click install.ps1 > “Run with PowerShell”
4. You should see “Success: Your app was successfully installed” when complete.

## INSTALLATION TROUBLESHOOTING

1. In case the certificate failed to be installed:
  - a. Right-click BluetoothLE\_1.1.37.0\_x86\_x64\_Debug (file type – Security Certificate) > “Install Certificate”
  - b. Choose “Local Machine”



- c. Choose where to store the files, as follows:



- d. reg add  
"HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\AppModelUnlock" /t REG\_DWORD /f /v  
"AllowDevelopmentWithoutDevLicense" /d "1"

Set-ExecutionPolicy RemoteSigned -Force

e. Run script

2. Installation step 3 failed: Powershell briefly popped up then disappeared; software did not install. I resolved the issue with the following steps:

a) Run Powershell as an administrator.

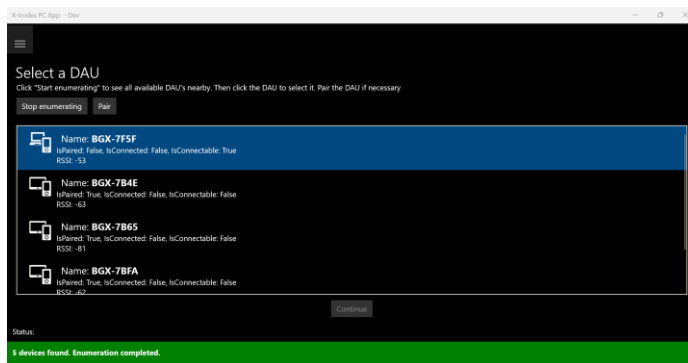
b) Run command: “cd [location of unzipped installation folder]; ./install.ps1” (without quotes). If the following error appears, go to step 3:

```
.\install.ps1 : File C:\Users\AaronGerston\Downloads\BluetoothLE_1.1.20.0_Debug_Test\BluetoothLE_1.1.20.0_Debug_Test\Install.ps1 cannot be loaded because running scripts is disabled on this system. For more information, see about_Execution_Policies at https:/go.microsoft.com/fwlink/?LinkID=135170.
At line:1 char:1
+ .\install.ps1
+ ~~~~~
+ CategoryInfo          : SecurityError: (:) [], PSSecurityException
+ FullyQualifiedErrorId : UnauthorizedAccess
```

c) This error was resolved by entering the following command: “Set-ExecutionPolicy RemoteSigned” then re-running “./install.ps1”. Install successful.

## USAGE

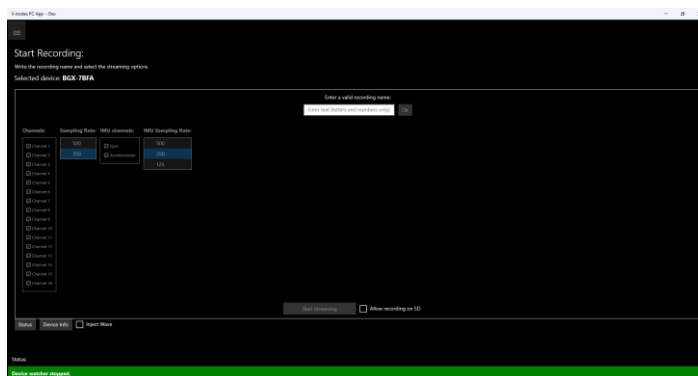
1. In the Search bar search for “**X-trodes PC App - Dev**” and run.
2. Click “Start enumerating” to find available and previously connected DAUs
3. Select DAU
4. If not yet paired, click “Pair” and “Allow”
5. Click “Continue”



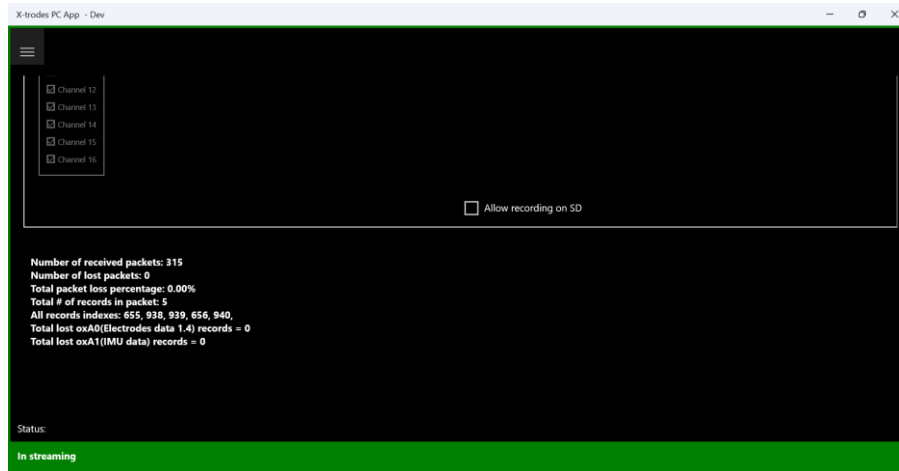
6. Choose 1.4 in case of 1.3 or 1.4 DAUs and 1.5 elsewhere.

7. Enter session name (this will be the folder name).

Note: No special characters allowed, only letters and numbers



8. This will create a folder in “C:/.../Documents/XTR files/[session name]” for XTR2 files.
9. Select relevant settings (if available).  
Note: the QA testing was done only on the configuration of all 16-channels, and sampling rate of 250 S/s for both the ADC (electrodes), and IMU.
10. Click “Start Streaming”.  
Note: You can check the box of “Allow recording on the SD”.
11. You should see changing numbers at the bottom of the screen, indicating that data is being streamed from the DAU to the PC.



## TROUBLESHOOTING

If the app stops streaming when in the background:

- a. Type **X-trodes PC App - Dev** in Windows
- b. Rather than opening it, select app settings
- c. Set “background permissions” to “Always”
- d. Then, see if the app still stops streaming

**To be able to consume data from the PC app run the next batch file under administrator privileges:**

Run as administrator the “checknetisolation” ([link](#)).

To consume data from remote location other than the same PC we need to use **NGROK**

1. On the computer with the PC app:
  - a. Run ngrok and write: “**ngrok tcp 20001**”.
  - b. Copy the address “**6.tcp.eu.ngrok.io**” and the port “**10335**”.
2. On the remote computer add the address and the port.

## SDK













TBD

## DATA

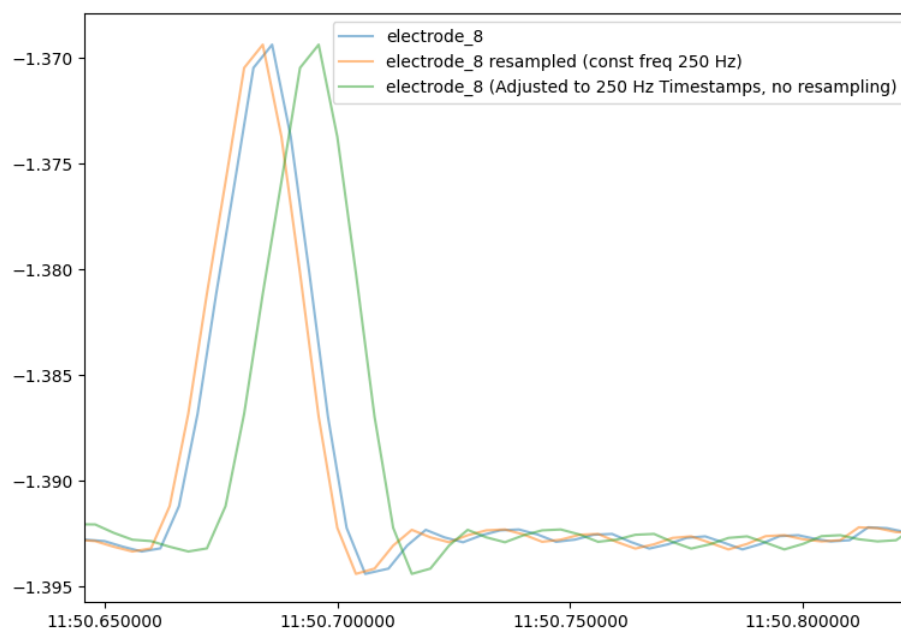
Two folders will be created upon recording: “XTR files” and “Xtrodes CSV files.” A folder with your session name will be created in both files. The xtr2 files can be converted to EDF files with a local tool. However, we recommend working with the .csv files to avoid drift created by a constant sampling rate constraint.

## CSV files

The ADC and the IMU data will be saved in 16MB sized files, with the name “Electrodes\_0X”, and “IMU\_0X” respectively.

Name	Status	Date modified	Type	Size
 IMU_01		17/06/2024 11:14	Microsoft Excel Com...	6,838 KB
 IMU_00		17/06/2024 11:05	Microsoft Excel Com...	16,384 KB
 Electordes_03		17/06/2024 11:14	Microsoft Excel Com...	3,009 KB
 Electordes_02		17/06/2024 11:12	Microsoft Excel Com...	16,384 KB
 Electordes_01		17/06/2024 11:02	Microsoft Excel Com...	16,383 KB
 Electordes_00		17/06/2024 10:52	Microsoft Excel Com...	16,383 KB

Each row is a single sample, and the first two columns represent the Unix time and the millisecond respectively. Each block of samples (for 16 channels, usually include 7 samples), shared the same millisecond. To overcome it, you should add 4 ms (250 samples/sec) from the second sample to the last one, in each block.



In the figure above, the blue line represents the signal after correction, while the orange line depicts the signal after correction followed by resampling at 250 Hz. The green line illustrates the signal generated by starting with the first timestamp and setting each subsequent timestamp at intervals of 250 samples per second. It is evident that the third method introduces drift in the data, which reduces the effectiveness of the other options due to the inconsistent sampling rate used during acquisition.

Code for the second method cab be found here: [csv\\_processor\\_pc\\_tool.py](#)