

Windows 10 64 Bit Z_Meter Installation Guideline

1) Copy Z_Meter Python Application File Package into User Directory

The Windows 10 version of the Z_Meter application software is in a file archive called:

Z_Meter_Win10_64bit_InstallGuide_20yymmdd.zip

(At the time of this writing: ***Z_Meter_Win10_64bit_InstallGuide_20190629***)

1.1 With 'Windows Explorer' create a folder called **Z_Meter** within your user directory which can be found via 'This PC'. With most Windows 10 installs the user directory can be found at:

C:\Users\your_user_name\AppData\Local

1.2) Download the ***Z_Meter_Win10_64bit_InstallGuide_20yymmdd.zip*** file from the ARRL QEX files website and copy it into the ***C:\Users\your_user_name\AppData\Local\Z_Meter*** folder you created in step 1.1 above.

1.3) Right click and extract ***Z_Meter_Win10_64bit_InstallGuide_20yymmdd.zip*** here. You should end up with a large number of Z_Meter files in your ***C:\Users\your_user_name\AppData\Local\Z_Meter*** folder. Keep this folder window open.

2) Download and Install Python 3, 64 bit for Windows and needed packages

It is important to install the 64 bit version of the Python interpreter as Z_Meter may not run with the 32 bit version.

2.1) obtain from www.python.org/downloads

- select 'Windows x86-64 executable installer'

- at the time of this writing the exe installer file link was:

<https://www.python.org/ftp/python/3.7.3/python-3.7.3-amd64.exe>

2.2) run installation file

2.2.1) Leave 'for all users' option selected

2.2.2) Select 'add Python to PATH' option

2.2.3) Select 'Install Now'

2.2.4) Select yes to proceed

2.2.5) Within 'Setup was Successful' window select 'Disable Path Length Limit'

2.2.6) Select 'yes' to confirm

2.3) confirm installation

2.3.1) Right click 'Start', select 'Windows PowerShell', type 'Python <return>.

2.3.2) Do not proceed until you get the Python 64 bit sign on prompt

2.3.3) Close Windows PowerShell

2.4) Install additional Python packages.

2.4.1) Run **Z_MeterInstall_PythonPkgs.bat** file which is located with the **Z_Meter** directory installed in step 1. It should execute the following instructions successfully:

python -m pip install --upgrade pip

pip3 install numpy

pip3 install scipy

pip3 install sparse

pip3 install pathlib

pip3 install serial

pip3 install pytest

2.5) Confirm current version C++ support for **scipy** package.

The **scipy** package is an extensive scientific computational package that uses extended modules that require a 2017 or more recent version of Microsoft's *C++ Redistributable* package support to run. The **scipy** package may be tested via *Window's PowerShell* or *Command Prompt* to determine if it has support to run. The typical interactive command prompt data below is a reasonable facsimile of text obtained indicating good test results.

2.5.1) Open Windows PowerShell by clicking on **Start** and entering:
"powershell"

2.5.2) Enter 'python' at the prompt to get the python sign on and prompt.

2.5.3) Enter 'import scipy'

2.5.4) Enter 'scipy.test('full')'

2.5.5) If the C++ support is proper the test procedure will start successfully as shown below after collecting the many items needed for testing the extensive **scipy** package. If successful move on to step 3. However if the test procedure is unable to find dll files that is a indication the C++ support needs to be updated as described in step 2.6 below. Note that it is only necessary to run the test until all the items are collected. The full test takes a long time and we are only interested here in determining that the items can be collected without *file not found* type errors. If there is a problem there will be many errors reported almost immediately and the test will terminate.

Screen View:

```
;;;Windows PowerShell;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
.
C:\Users\UserName\> PS python
.
.
>>>import scipy
>>>scipy.test('full')
.
.
.
===== test session starts=====
platform win32 -- Python 3.7.3, pytest-5.0.0, py-1.8.0, pluggy-0.12.0
rootdir: D:\TMA\PythonTAdat\Z_Meter
collected 17095 items

 _lib\tests\test_gcutils.py ..... [ 0%]
 _lib\tests\test_testutils.py .. [ 0%]

.....
;;;
```

2.6) Download and install the *x64:vc_redist.x64.exe* update available at:

<https://support.microsoft.com/en-ca/help/2977003/the-latest-supported-visual-c-downloads>

Go back to step 2.5 and re-test. If this does not work the installation of *Microsoft Visual Studio Community* freeware may be needed as outlined below:

Install Microsoft Visual Studio Community freeware

Information obtained from the following web site:

<https://stackoverflow.com/questions/52299542/from-sparsetools-import-csr-to-csc-csr-to-br-csr-count-blocks-importerror>

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You need to update your windows C++ redistributable compiler.

To understand if this is the solution.

- Check what versions of microsoft C++ redistributable you have installed
 - if you're using windows 10 type apps and features into the start bar and scroll down to where it says microsoft visual C++ and look at the year. In my case I was using a version from 2010
- If you aren't running the latest version download microsoft visual studio 2019
- Select the visual studio community 2019
 - Once prompted to install specific packages, click on the menu item that says "individual components", it is located next to the menu item "Workloads"
 - Scroll down and look for **Visual C++ 2019 Redistributable Update**
 - Install that restart your machine
 - You'll be able to verify that this worked by running the following code in your console

Visual Studio Installer

Visual Studio Community>modify>Individual components

scroll down and find title 'compilers, build tools and run times'

check:

"C++ redistributable MSMs"

"C++ redistributable Update"

Scroll down and click on **Install While Downloading**

3) Download and Install "123 Photo Viewer" for Windows

Several Photo Viewer apps were tested and *123 Photo Viewer* was found to be the best of the lot for Z_Meter as it works well and offers some very nice features. Some other viewers tested would not allow multiple views and others that worked OK lacked features. A disadvantage of the freeware version of *123 Photo Viewer* is that a pesky ad nag pops up until it is acknowledged once per day by going to the website with a browser. Once acknowledged it does not pop again for the rest of the day thus it is not very much of an issue as it only takes about 10 seconds to open and close the website. A small registration payment of less than \$5 apparently will prevent it from coming back. There may be other suitable viewers that could be used.

- 3.1) Install "123 Photo Viewer" from Microsoft Store:
 - 3.1.1) Click Start and type microsoft store
 - 3.1.2) MicroSoft Store > Apps > Search > 123 Photo Viewer >
 - 3.1.3) Jump through MS hoops to sign in and install
- 3.2) set "123 Photo Viewer" as default app for 'png' file types
 - 3.2.1) control panel > Default Programs
 - 3.2.2) Associate a file type with a program
 - > Scroll to bottom and select 'Choose default apps by file type' and wait for list
 - > Scroll down list to '.png' line
 - > click on the present default viewer icon on same line for popup list
 - > select 123 Photo Viewer as default for '.png' graphics file types.
- 3.3) close and test by opening 'W10test1.png' in the Zmeter install director
 - 3.3.1) ensure the file opens with "123 Photo Viewer" before continuing
 - 3.3.2) if requested take the link to settings > privacy > file system and authorize 123 ON

4) Download and Install GNUPlot for Windows.

GNUPlot is used to plot the impedance data graphically and it generates PNG format files which are suitable for displaying the measurement graphs in a photo viewer app.

- 4.1) Download the 64 bit *GNUPlot for Windows* installer. At the time of this writing the current release was version 5.2.7 and was available for download from the SourceForge repository via the following link:

<https://sourceforge.net/projects/gnuplot/files/gnuplot/5.2.7/gp527-win64-mingw.exe/download>

- 4.2) Install GNUPlot in the default C:\Program Files\gnuplot\ directory and accept all default installation settings.
- 4.3) Add the path for *wgnuplot.exe* to your username path environment variable. Assuming *gnuplot* has been installed in the "C:\Program Files\gnuplot\bin\" directory.
 - 4.3.1) Press and hold the *Windows* key then press *pause* to open the *Control Panel > System* window.
 - 4.3.2) Click on *Advanced System Settings* then *Environmental Variables*
 - 4.3.3) Within the *User Variables* list select *Path > Edit > New*
 - 4.3.4) Add *C:\Program Files\gnuplot\bin* to the list then exit by clicking *OK > OK > OK*

5) Install Z_Meter USB COM port environment variable

The Z_Meter data acquisition bridge is connected via a USB COM port. The comm port number is assigned by the operating system when the USB connection is made to the Z_Meter device. The COM number assignment may vary depending on any com ports currently assigned for other uses. Thus there is a need to convey the number of your specific com port assignment to the Z_Meter application. This is done here via a user environment variable called "Z_METER_COM". This variable must be established and set to the name of the com port assigned to Z_Meter.

Environment variables can be viewed and added via:

Windows 10 'Control Panel>System>Advanced system settings'

Run the batch file named '*Z_MeterInstall_ComPort.bat*' that can be found in the *Z_Meter* file directory. This batch file which provides step-by-step instructions makes setting of the variable name very easy. It can be ran by simply clicking the filename within Windows Explorer. Confirm the setting by opening the *Command Prompt* within the *Z_Meter* directory and at the prompt enter:

```
echo %Z_METER_COM%
```

It should read the variable and echo the COM# you entered....(eg. COM5)

6) Install Z_Meter Launch Shortcut on Desktop

Open the *Z_Meter* directory with Windows Explorer and right click and drag the *W10_zed_all.py* icon to the Desktop. Then select *Create shortcuts here*. This shortcut will provide access to all the Z_Meter applications.

7) Calibrate Z_Meter Using 50 Ohm Precision References

After the basic functionality of the Z_meter has been confirmed OK then it is necessary to perform calibration which is necessary for each Z_Meter impedance acquisition bridge module because of normal manufacturing tolerances. This is done by first connecting a known precision 50 Ohm termination to the impedance test port. The termination should have a minimum bandwidth of 600 MHz and must have a BNC or N type connector. To perform this calibration run the *cal_Levels.bat* file within the *Z_Meter* directory which will provide further instructions.