

# How to Control Tabor AWGs with Python

## Using SCPI Commands

In this tutorial, we will give a quick start guide on how you can communicate with the Tabor AWG with & without the use of NI-VISA to send Standard Commands for Programmable Instruments (SCPI). SCPI commands are an ASCII-based set of commands for reading and writing instrument settings.

For this tutorial, we will use win7 64bit OS, Python 2.7.12 (Anaconda2 4.2.0 64-bit) and a Tabor WX2184C using TCP/IP interface. To ensure you successfully established all the necessary settings for remote control over the Tabor instrument using LAN/USB/GPIB, please make sure you have already installed the latest [NI-VISA](#) (if you choose to use it) from the National Instruments website. Also please go over our [connectivity tutorials](#) on the Tabor's website, to make sure you installed all necessary drivers.

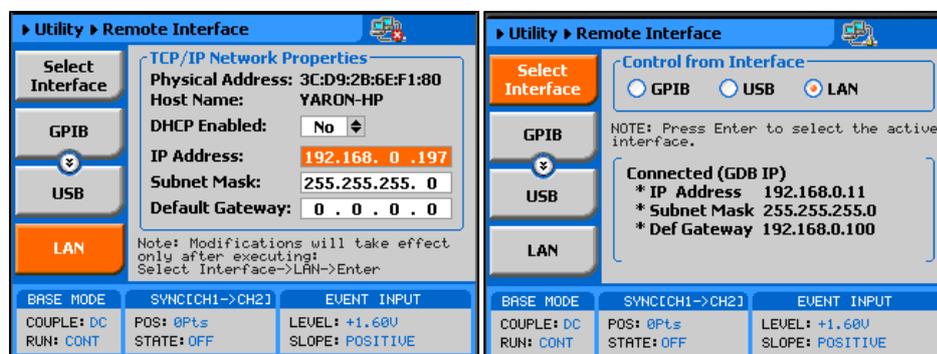
### ➔ To connect and control the Tabor Instrument using SCPI Commands

1. Set the USB/LAN/GPIB as the remote interface, using the Tabor's front panel buttons.

a. If you choose to communicate using LAN interface:

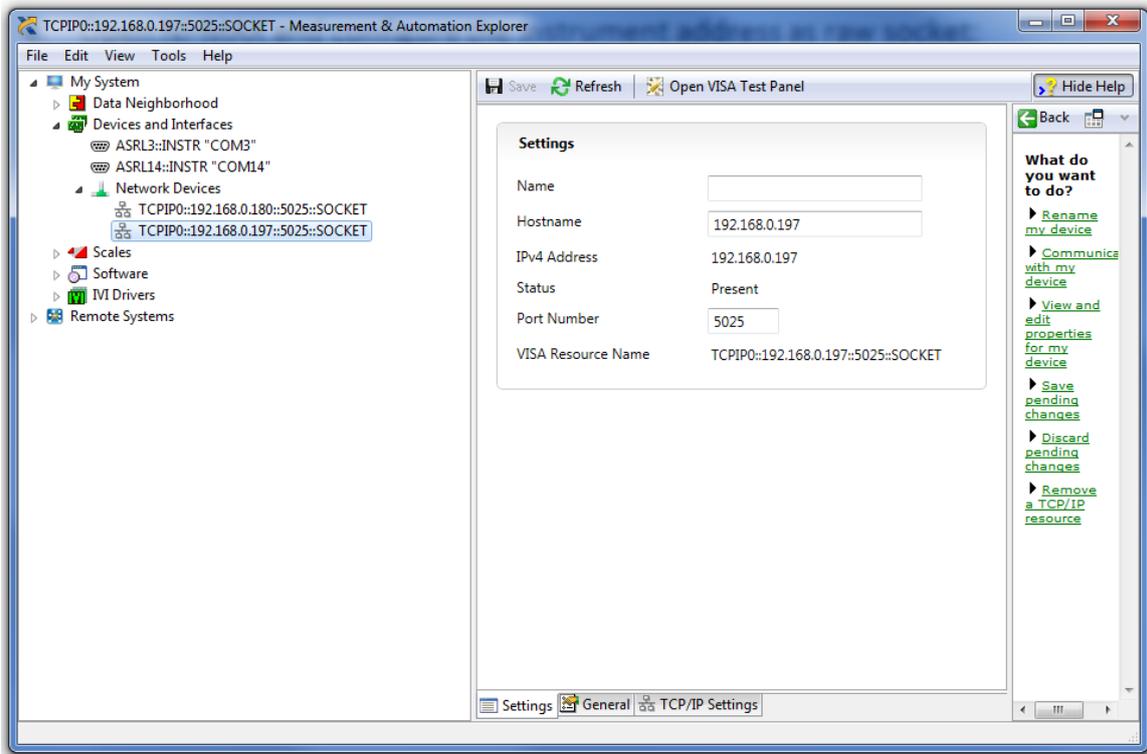
Go to "Utility" -> "Remote Interface" -> "LAN". Modify the IP Address, Subnet Mask & Default Gateway as necessary to ensure TCP/IP connectivity between the Tabor device & the PC. For more information regarding TCP/IP connectivity, please refer to [Here](#).

b. Go to "Utility" -> "Remote Interface" -> "Select Interface" -> "Control from Interface". Press Enter to select the active Interface you need. Wait for the answer "Done". We chose to demonstrate using LAN.

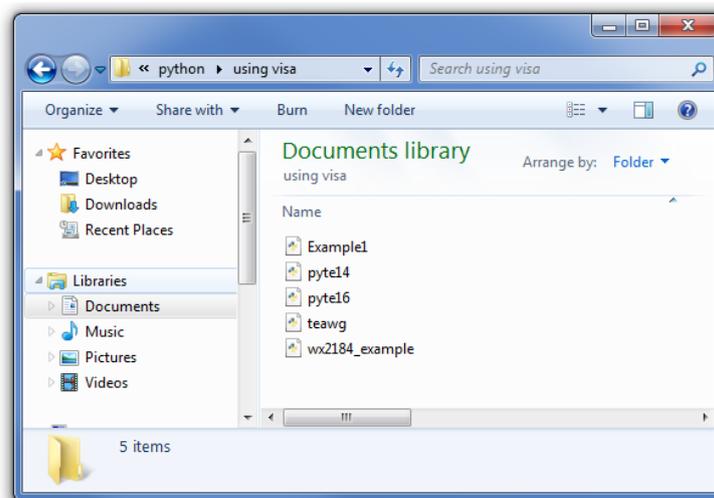


## 2. Example using PyVISA (NI-VISA wrapper) for Tabor WX instruments:

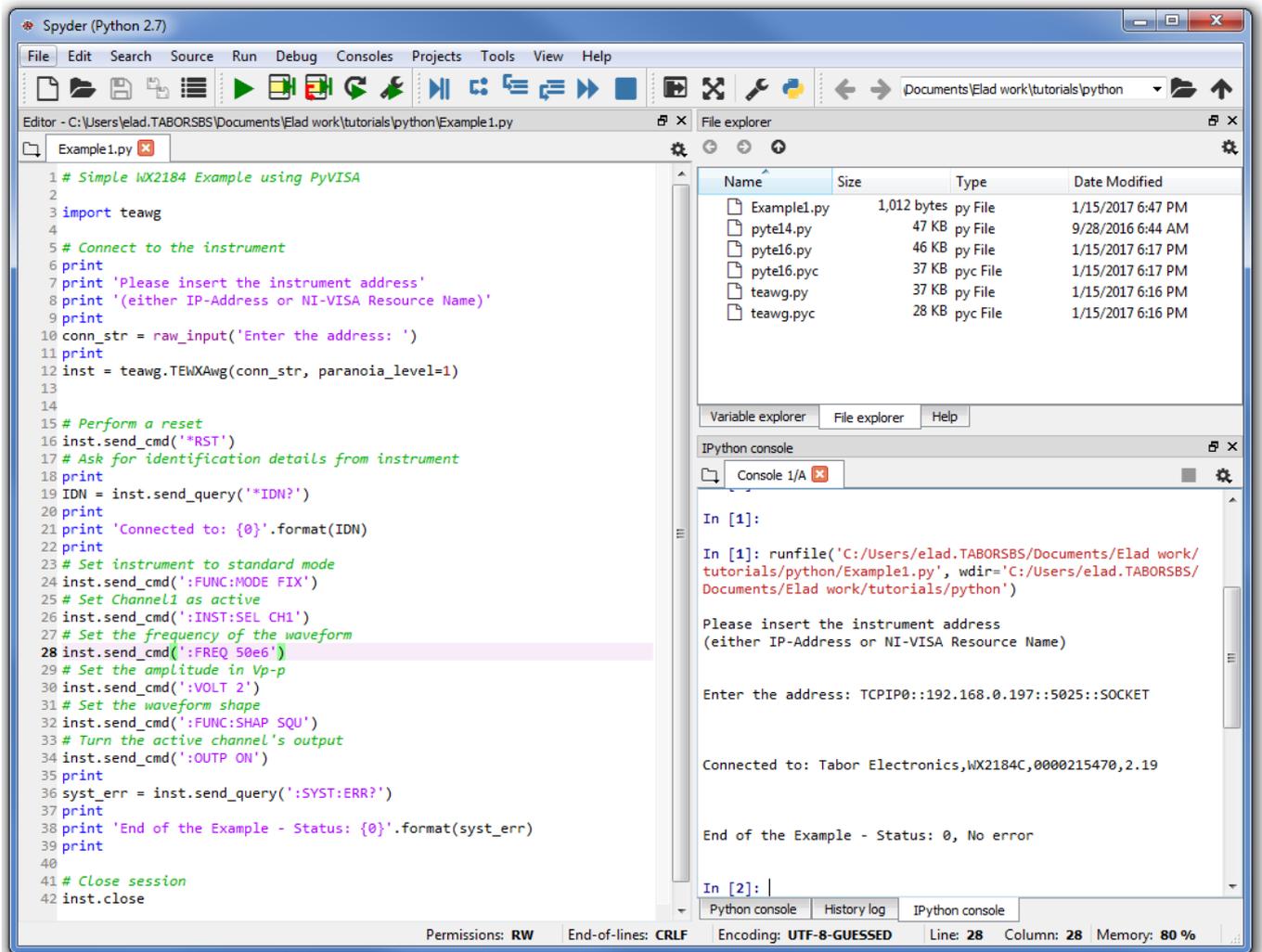
- a. Open NI-MAX and configure the instrument address as raw socket:



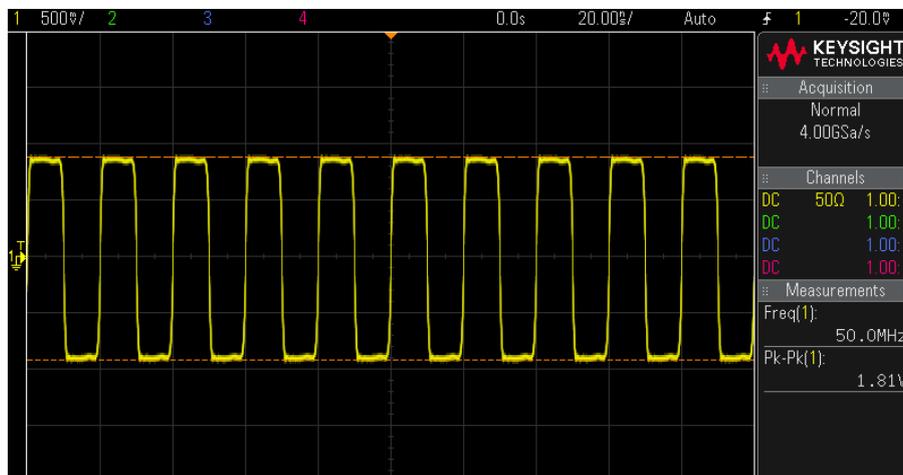
- b. Download the attached zip folder for this tutorial from the Tabor website tutorials section. Unzip & save them under the same directory on your PC's hard drive.
- c. Make sure 'teawg.py' & 'pyte16.py' ('pyte14.py' for using PyVISA 1.4) are on the same folder as the example:



d. Open Spyder or any other Python IDE. Run Example1.py:



e. Following the examples above, as can be seen on a scope, a 50MHz 2Vp-p square waveform was created:

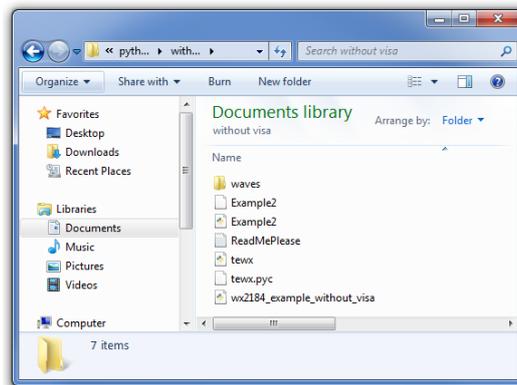


The outputted 50MHz 2Vp-p square waveform.

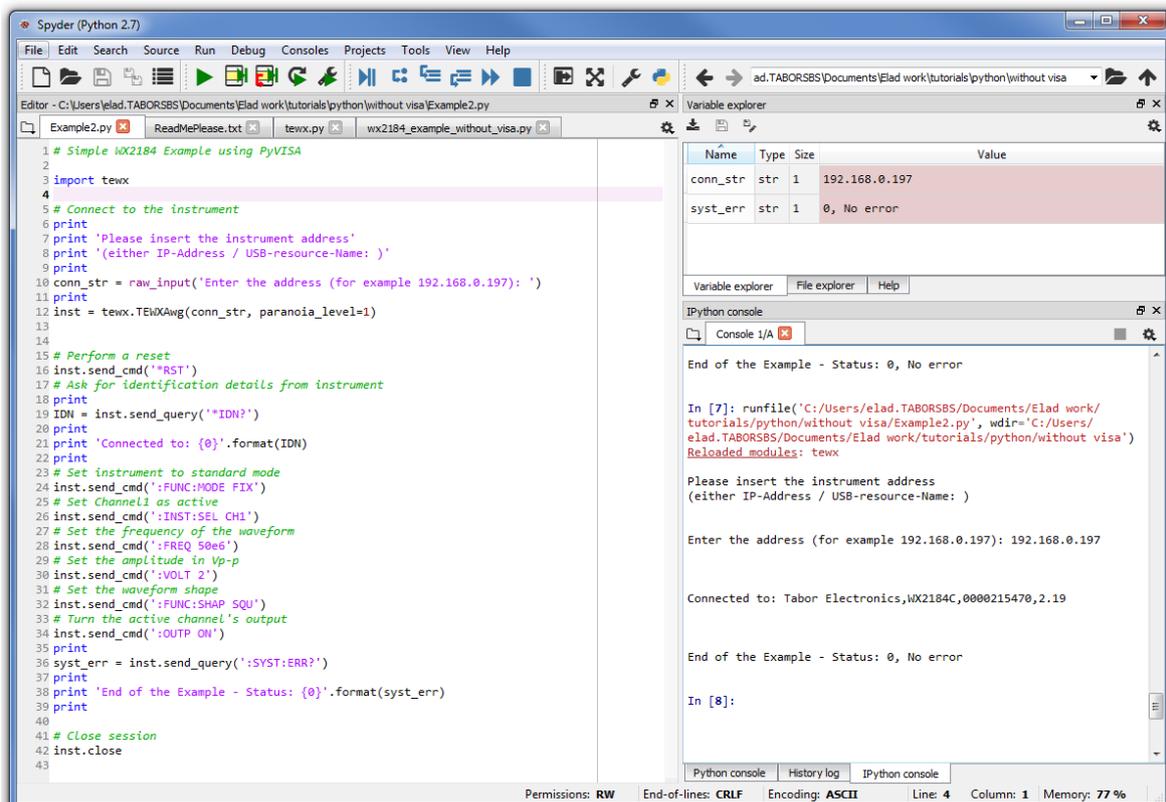
For a more advanced example using PyVISA with the WX2184C, please run 'wx2184\_example.py'.

### 3. Example without the use of PyVISA for Tabor WX instruments:

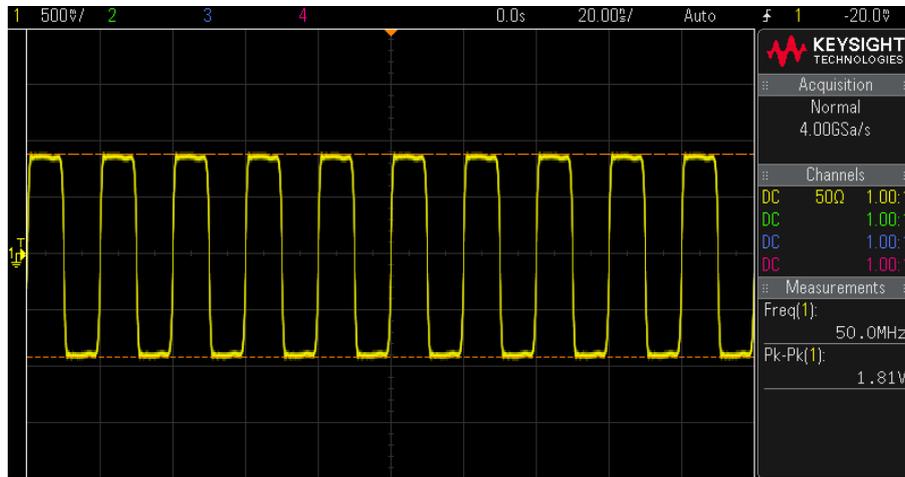
- a. Download the attached zip folder for this tutorial from the Tabor website tutorials section. Unzip & save the files under the same directory on you PC's hard drive (Make sure the 'tewx.py' is on the same folder as the example).



- b. Please read the 'ReadMePlease.txt' file before proceeding, as establishing communication without NI-VISA using USB requires installation of Python-USBTMC.
- c. Open Spyder or any other Python IDE. Open and Run Example2.py:



- d. Following the examples above, as can be seen on a scope, a 50MHz 2Vp-p square waveform was created:

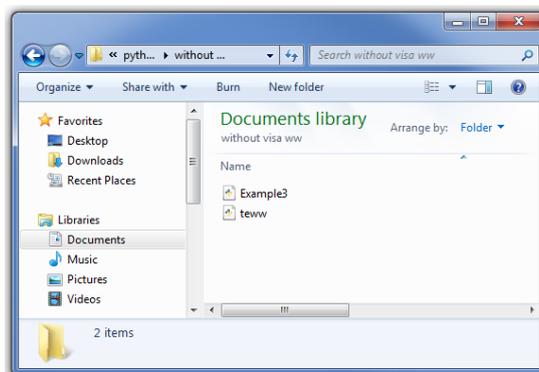


The outputted 50MHz 2Vp-p square waveform.

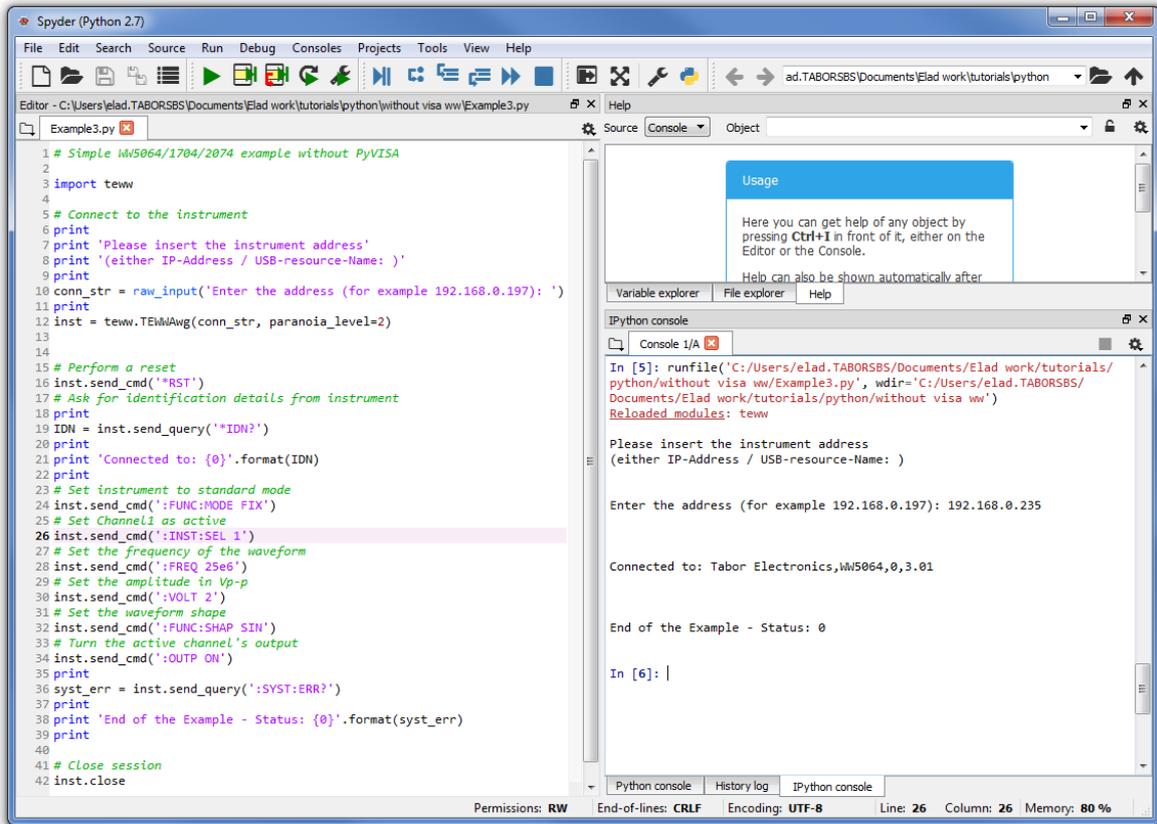
For a more advanced example of using the WX2184C, please run 'wx2184\_example\_without\_visa.py'.

#### 4. Example without the use of PyVISA for Tabor WW instruments:

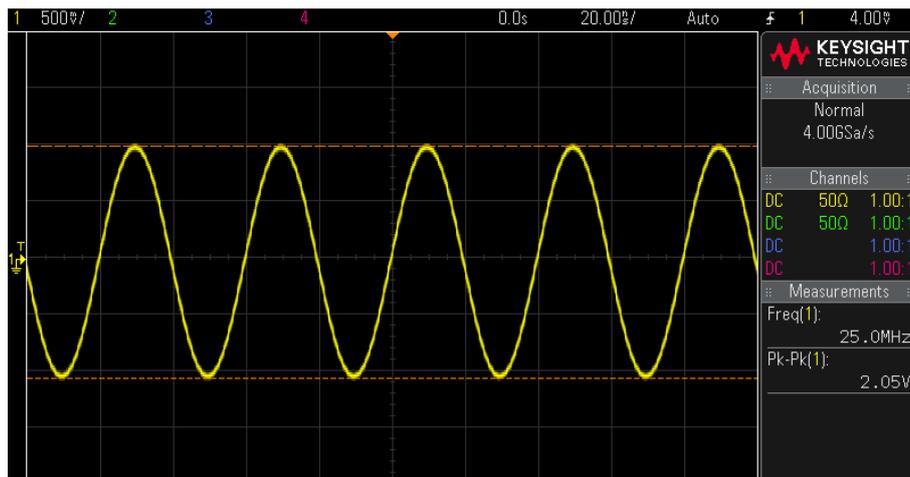
- a. Download the attached zip folder for this tutorial from the Tabor website tutorials section. Unzip & save them under the same directory on you PC's hard drive (Make sure the 'teww.py' is on the same folder as the example).



b. Open Spyder or any other Python IDE. Open and Run Example3.py:



c. Following the examples above, as can be seen on a scope, a 25MHz 2Vp-p square waveform was created:



The outputted 25MHz 2Vp-p square waveform.

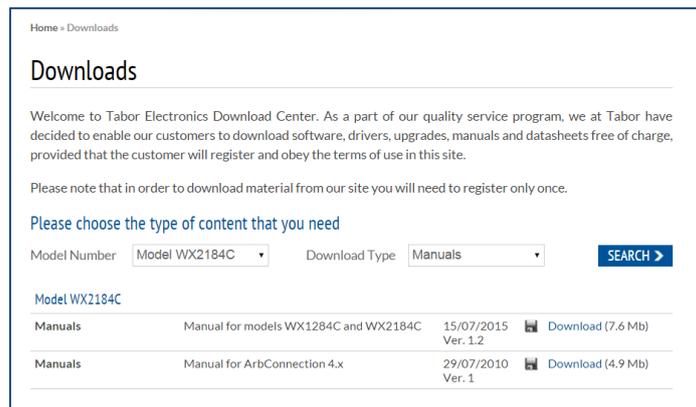
Inside the 'teww.py' file, you will find another example of how to download 3 segments, & define a simple 3 step sequence.

For a full list of the SCPI commands, you can use to control the AWG with, go to the Programming Reference chapter in the Tabor AWG's User Manual.

Table 4-1, Model WX2184C Commands List Summary

1. Channel and Group Control Commands			
Keyword	Parameter Form	Default	Notes
:FORMat			
:DATA	SEParate   COMMon	SEParate	Common will download the waveform into both of the memories, Arbitrary and Digital
:ARBitrary			
:RESolution	1P   2P	1P	2P will duplicate any arbitrary wave for sync between Arb and Dig frequency
:INSTRument			
[:SElect]	CH1   CH2   CH3   CH4   1   2   3   4	CH1	Select channel for prog
:SKEW	-100e-12 to 100e-12	0	Channels Skew in same part
:COUPle			Couple 1&2 with 3&4
:OFFSet	0 to s(n-128) (n = waveform length)	0	Course offset adjustment
:SKEW	-3e-9 to 3e-9	0	Fine skew adjustment
:STATe	OFF   ON   0   1	0	
:XINSTRument			
:MODE	MASTer   SLAVe   MSLave	MAST	System configuration
:OFFSet	0 to n (n = waveform length)	0	Multi-instrument offset
:SKEW	-5e-9 to 5e-9	0	
:STATe	OFF   ON   0   1	0	

The User Manual can be downloaded from the [Tabor website](#) (you must be registered first):



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Model Number  Download Type

Model WX2184C

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Manuals	Manual for ArbConnection 4.x	29/07/2010	Ver. 1	Download (4.9 Mb)

In the next tutorials of the series “How to Control Tabor AWGs Using Python”, we will show how to communicate with the Tabor AWG using the IVI driver functions.

## For More Information

To learn more about how to remote control Tabor instruments using Python, visit our website Support & Tutorials zone. If you encounter difficulties with connecting to Tabor units using Python, please contact us at [support@taborelec.com](mailto:support@taborelec.com) and our support team will gladly help. For more of Tabor's solutions or to schedule a demo, please contact your local Tabor representative or email your request to [info@tabor.co.il](mailto:info@tabor.co.il). More information can be found at our website at [www.taborelec.com](http://www.taborelec.com)

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