

## Instructions for Running the ESC Test Harness

### Introduction

This document is a step by step set of instructions for downloading and operating the ESC Test Harness. It assumes the signal generator is controlled by LabVIEW virtual instruments. The ESC Test Harness consists of a Python web server, LabVIEW server (LabVIEW player) and a web browser. The player accepts the waveforms via HTTP; converts the binary waveform files to TDMS and plays the waveforms.

### Required Hardware

- National Instruments PXIe-1085 (chassis)
- National Instruments PXIe-8880 (controller)
- National Instruments PXIe-5646 (VST)

### Required Software

- Windows 7 or higher
- LabVIEW 2017

Download the ESC\_Test\_Harness-master

Copy the up-zipped file to a computer (PXIe-8880) hosting LabVIEW.

### Starting the ESC Tester (Python Server, LabVIEW player and web browser)

- 1) Locate and double click the "StartUp.bat" file located in the "ESC\_Test\_Harness-master" folder as in Fig. 1.
  - The Python status window will appear as in Fig. 1a.
  - The ESC Server will appear as in Fig. 2a.
  - A web browser will be launched automatically.
- 2) Start the ESC Server by right clicking on the "v1" as in Fig. 2a. Select "Start" to initiate the session (Fig. 2b). You will see Debug web service windows appears as in Fig. 3. Click "OK".
  - The ESC Test Harness interface will appear as in Fig. 4. Press "log in".
  - The default user name and password are "admin" and "default".

### Stopping the ESC Tester (Python Server, LabVIEW player)

- 3) To stop the Python web server, select the running Python screen. Select "Ctrl + C"  
To stop the LabVIEW player right click on "v1" as in Fig. 2c. Select "Stop"

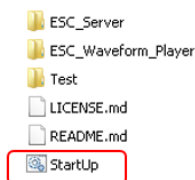


Figure 1: Start up in directory

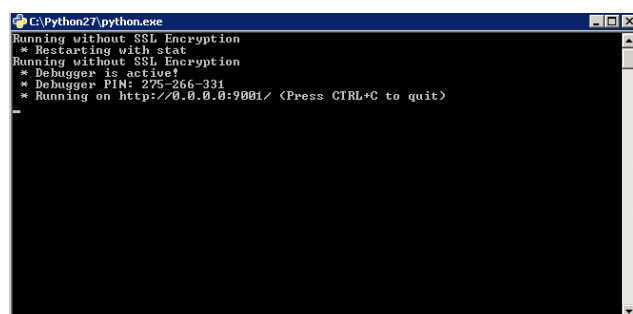


Figure. 1a: Python window

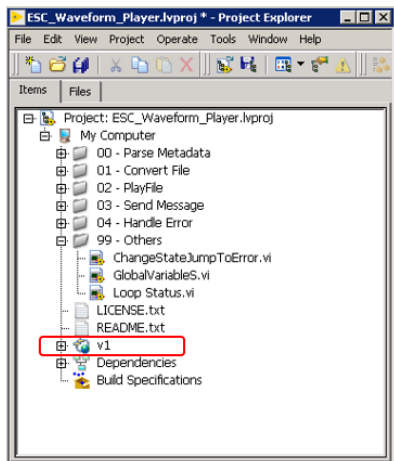


Figure 2a: LabVIEW project window

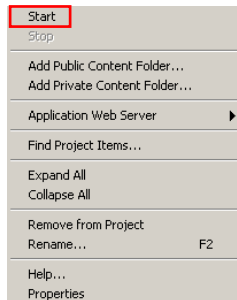


Figure 2b: Start up LabVIEW player

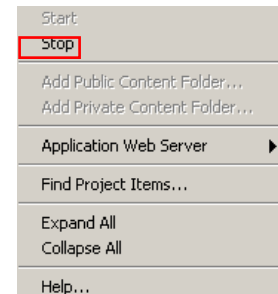


Figure 2c: Stop LabVIEW player

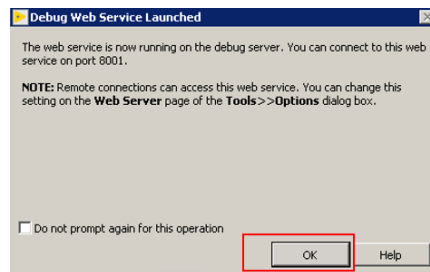


Figure 3: LabVIEW Debug window

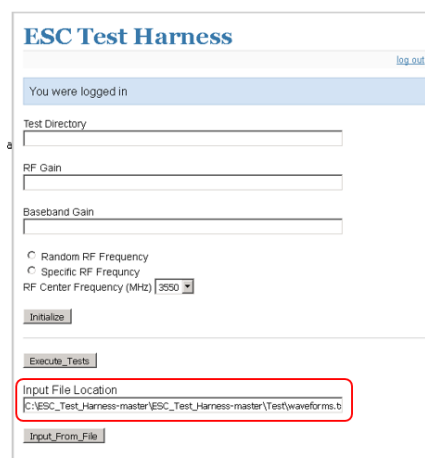
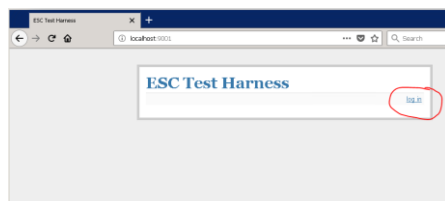
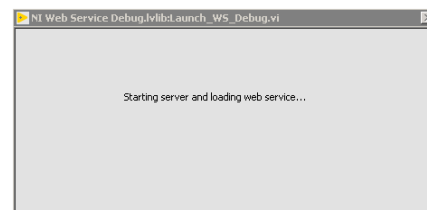


Figure 4: ESC user interface

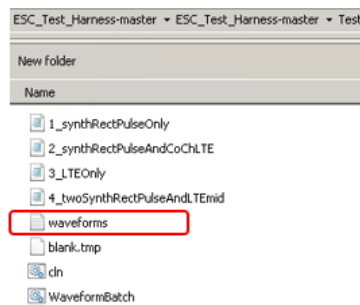


Figure 5: waveform file

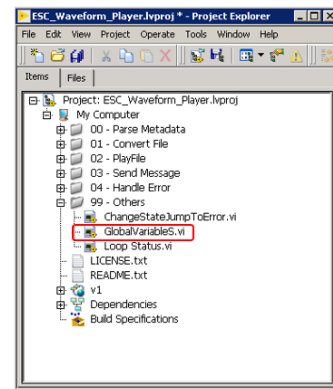


Figure 6: Location for global variables status

### Playing the waveforms

- 4) Locate the “waveforms.txt” file located in your “Test” folder. See Fig. 5. Enter the full path of the “waveform.txt” file into the “Input File Location” and press “Input\_From\_File” to play the waveforms as in Fig. 4.

The initial run of the ESC Test Harness will convert the included waveforms from binary (.dat) to .tdms format prior to playing the waveforms. As a result, there will be a 60 second delay before the waveforms plays. Once each of the waveforms are converted to .tdms, each waveform will play sequentially with no delay. The new TDMS files will appear in the “Test” directory as in Fig. 8.

The status of the waveform conversions and waveform playing can be monitored on the GlobalVariables.vi Front Panel.

- 5) Go to the LabVIEW project and expand the folder “99 – Others”. Double click the “GlobalVariables.vi”. The GlobalVariables.vi front panel will appear as in Fig. 7.

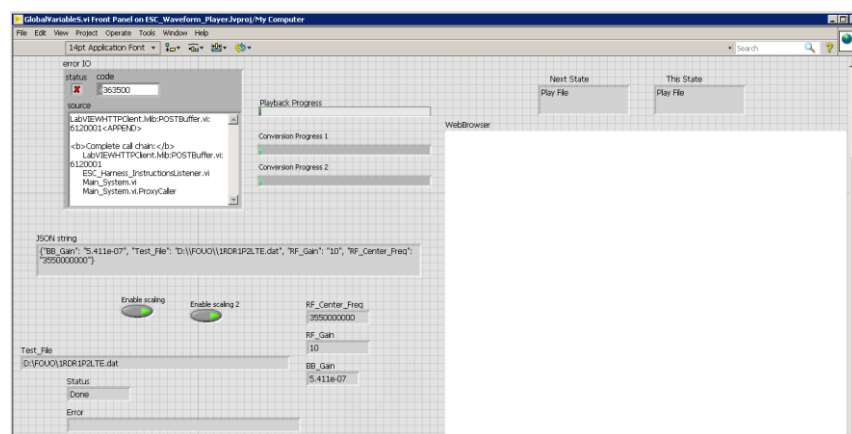


Figure 7: Status of waveform playback

**Note: the waveforms can be viewed on your spectrum analyzer. See optional step 6 for configuring your spectrum analyzer.**

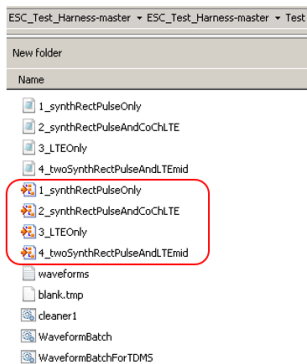


Figure 8: TDMS files

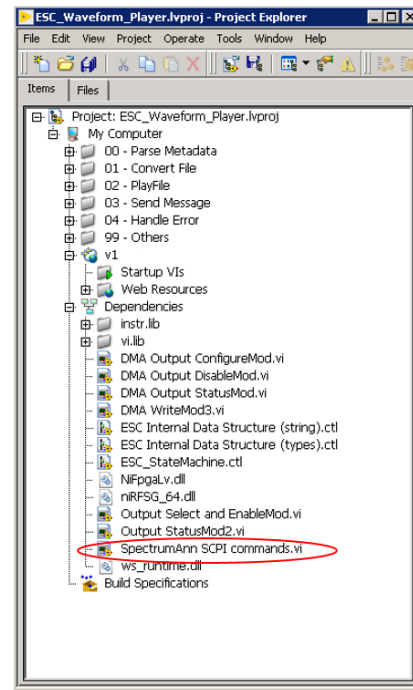


Figure 9: Location of SCPI commands

### Customizing the waveform parameters (optional)

- 6) The waveform.txt file included in the download uses the following convention:  
***Path | waveform.dat, | Center Frequency, | Scale Factor, | Waveform Gain***
  - The center frequency, scale factor and waveform gain located in the "WaveformBatch.bat" file need to be changed accordingly and saved as .bat.
  - The updated batch file can create a new waveform.txt file by double clicking "WaveformBatch.bat".
  - Repeat step 4 to play the updated waveforms.

### Configuring your spectrum analyzer (optional)

- 7) The spectrum analyzer settings are controlled with Standard Commands for Programmable Instruments (SCPI) commands. The address for the VISA connection will need to be changed.
  - To change the VISA address, go to the LabVIEW Project Explorer, expand the Dependencies tab.
  - Locate and open the "SpectrumAnn SCPI commands.vi" as in Fig. 9.
  - Enter the VISA address for your instrument. See Fig. 11.
  - Expand the menu in the case structure to reveal the spectrum analyzer settings for the different waveforms as in Fig. 12.

If manual configurations are preferred, the "local" key on the spectrum analyzer will end the remote session.

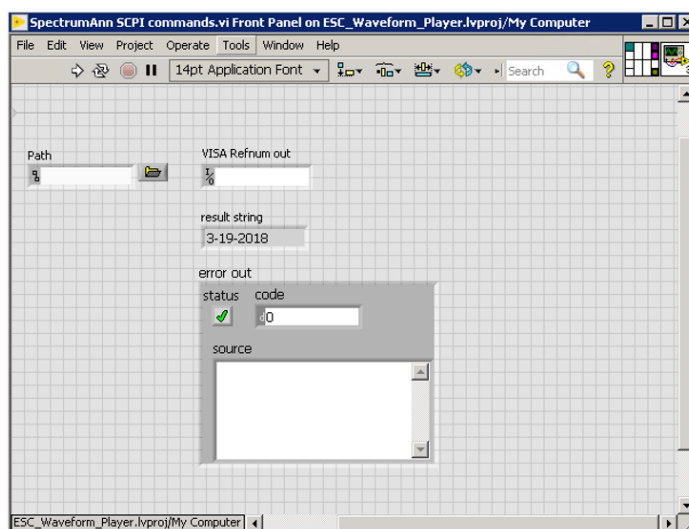


Figure 10: Spectrum analyzer configuration front panel

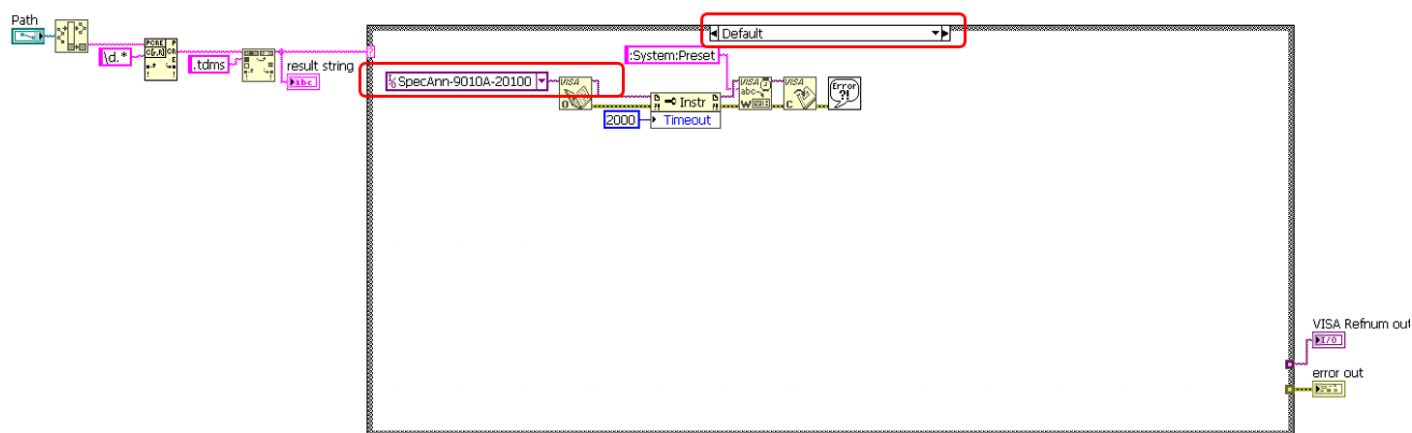


Figure 11: Spectrum analyzer settings

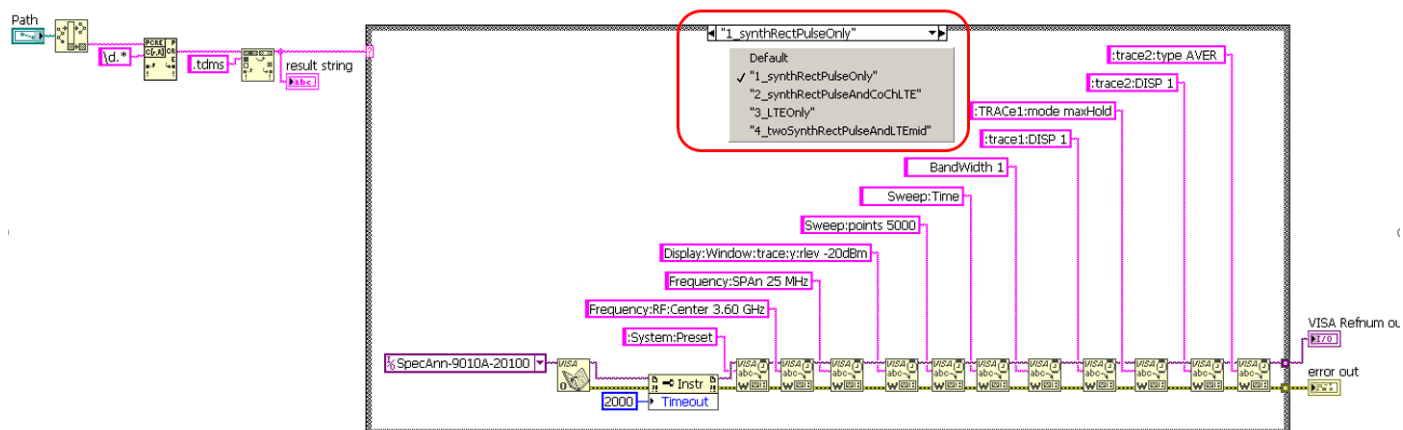


Figure 12: Spectrum analyzer settings