FuturePlus Systems

Power Tools for Bus Analysis

Pixel Renderer Manual

FuturePlus Systems

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1.Introduction

This manual covers the Pixel Renderer Software and Audio Renderer Software that can be used with the FS4500 DisplayPort Protocol Analyzer.

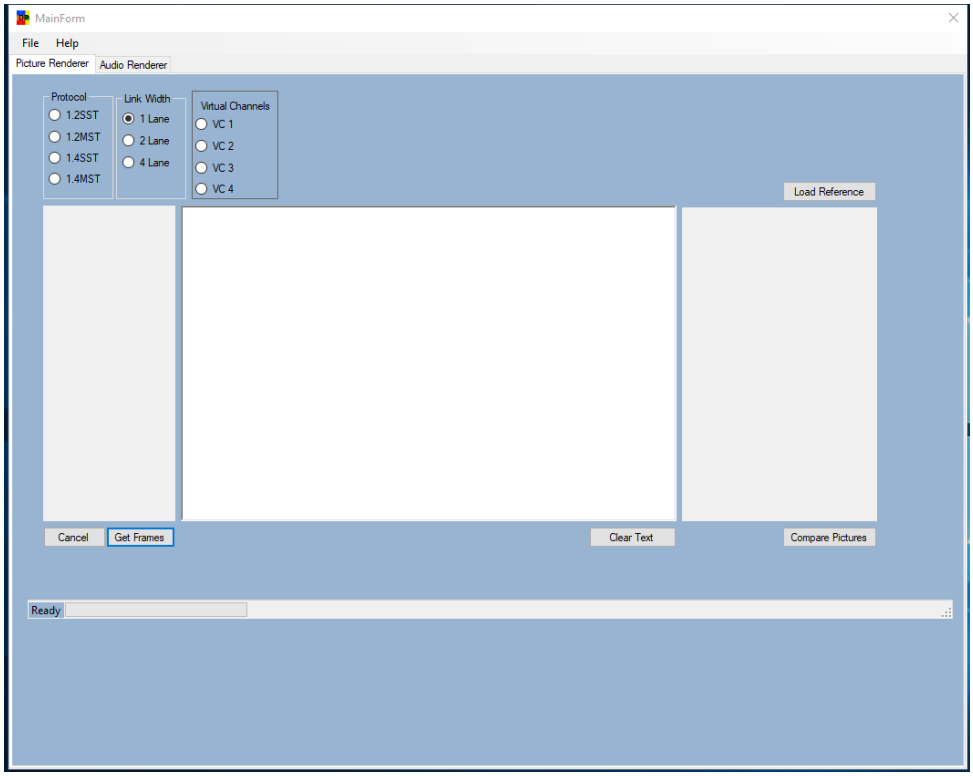
2. Pixel Renderer

The features of this software are:

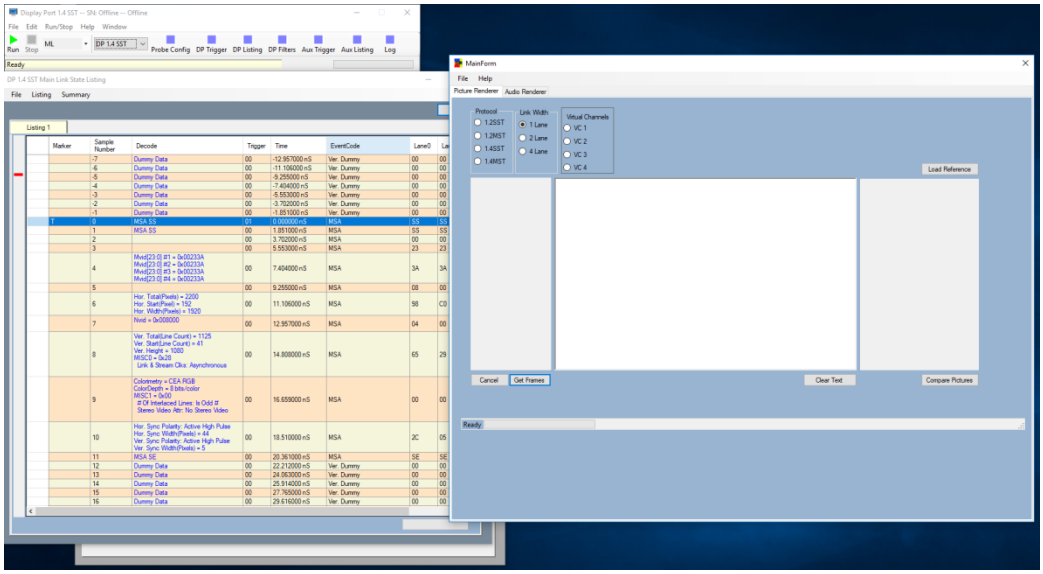
- Paint the frames as captured by the FS4500
- Analyze the number of lines and number of pixels in a line against the information in the MSA packet.
- Doing a pixel by pixel compare of two frames
- The ability to use any .jpg file as a Frame to compare against.

2.1 Getting Started

The user will be presented with this form when launching the application.



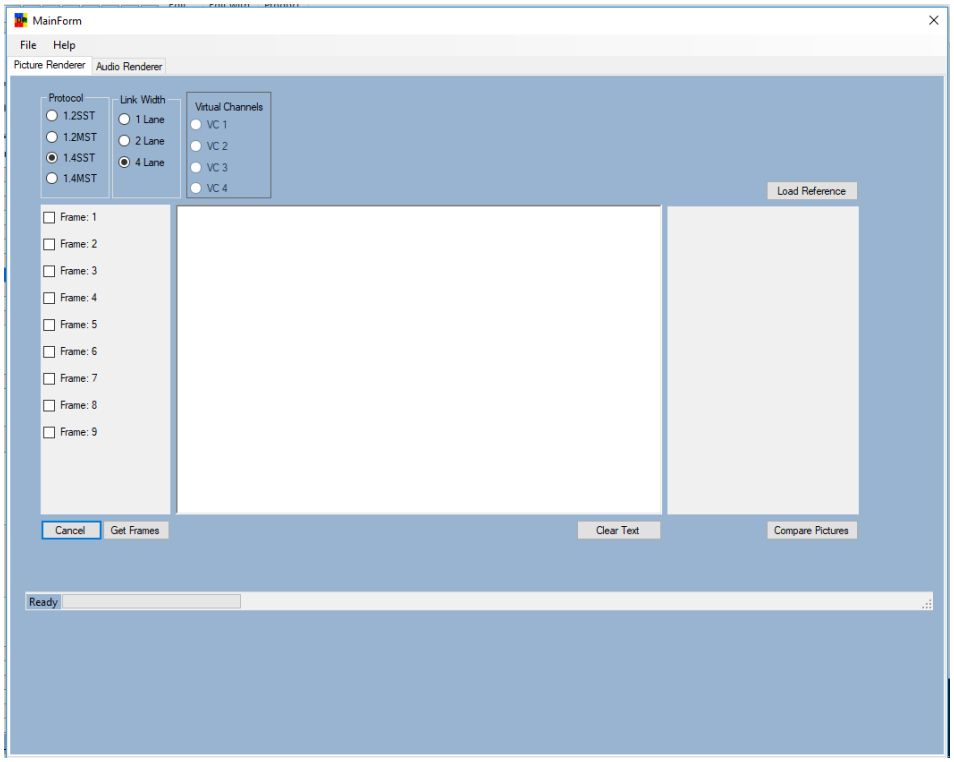
The Probe Manager, with saved data, must be opened in order for this software to work, see below.



If the Probe Manager is not open, an error will appear when the user clicks the Get Frames button.

It will be up to the user to input the Protocol, Link Width, and Virtual Channel. If either SST protocol is selected, the virtual channel buttons will be disabled since there is no virtual channel in SST. After the user has selected the Protocol, Link Width, and Virtual Channel, the Get Frames button can be clicked.

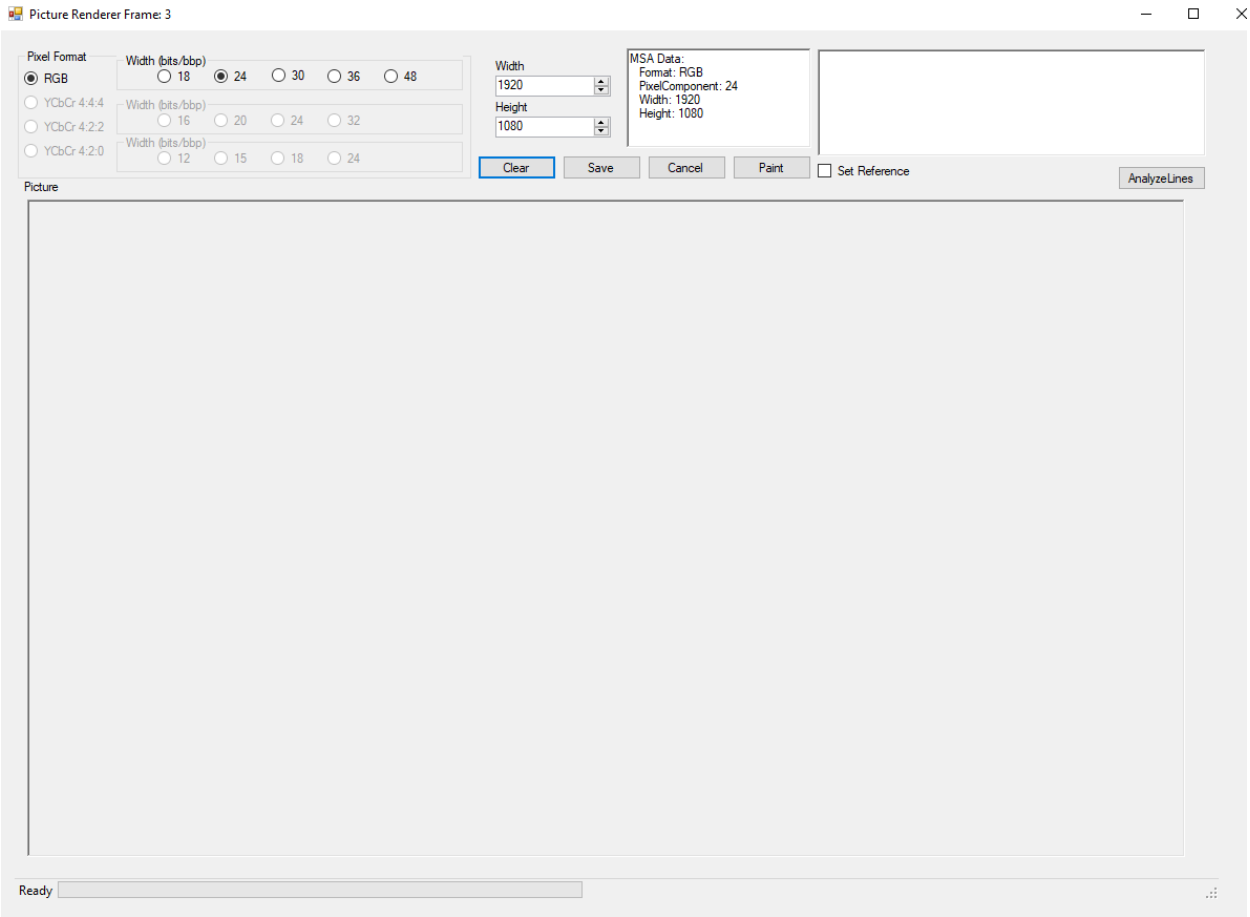
When clicked, the software will go through the entire data file and count each complete frame that is found. Each counted frame will be presented in the panel above the Get Frames button as shown below.



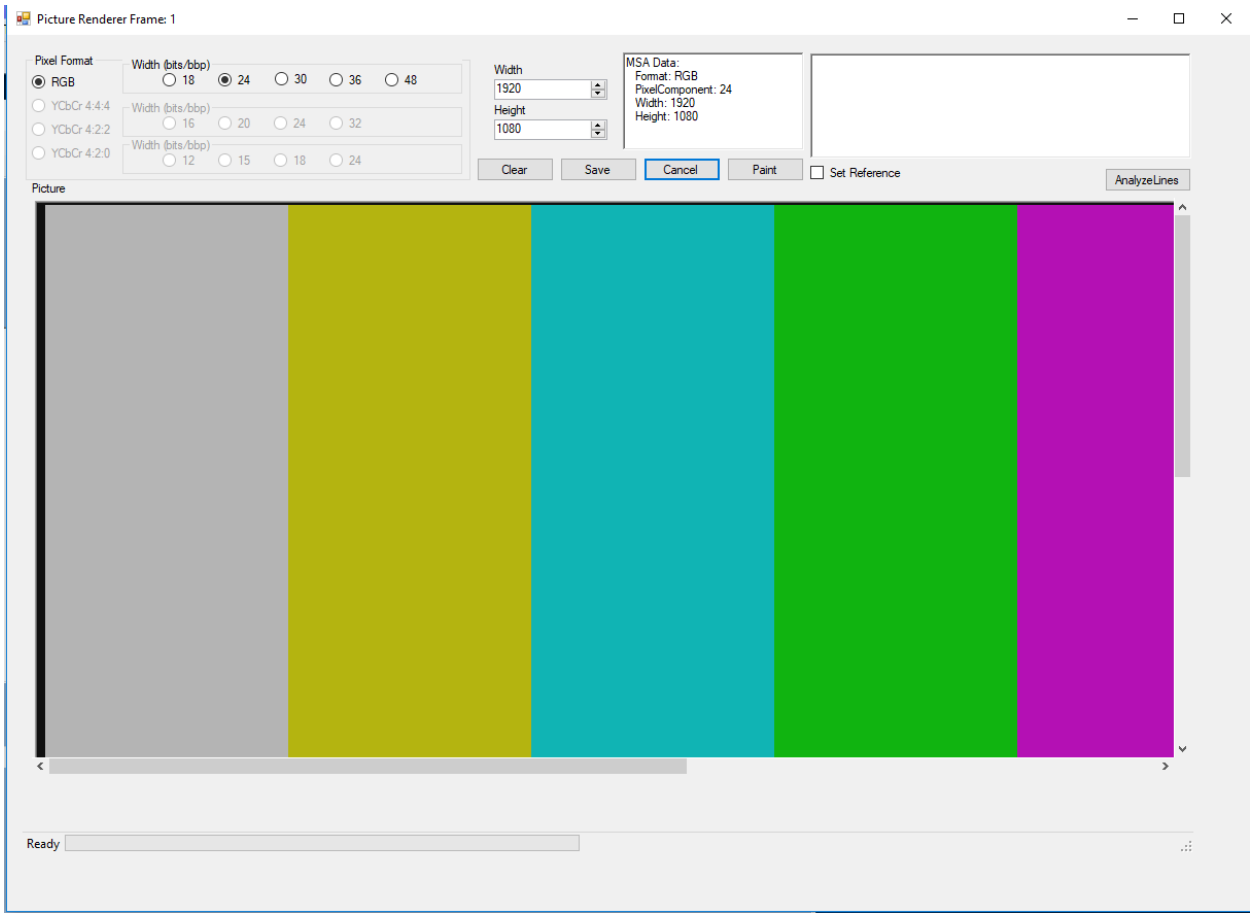
Whenever the Get Frames button is clicked, anything that was previously in the panel above will be cleared out and the new number of frames will be added in.

2.2 Painting Frames

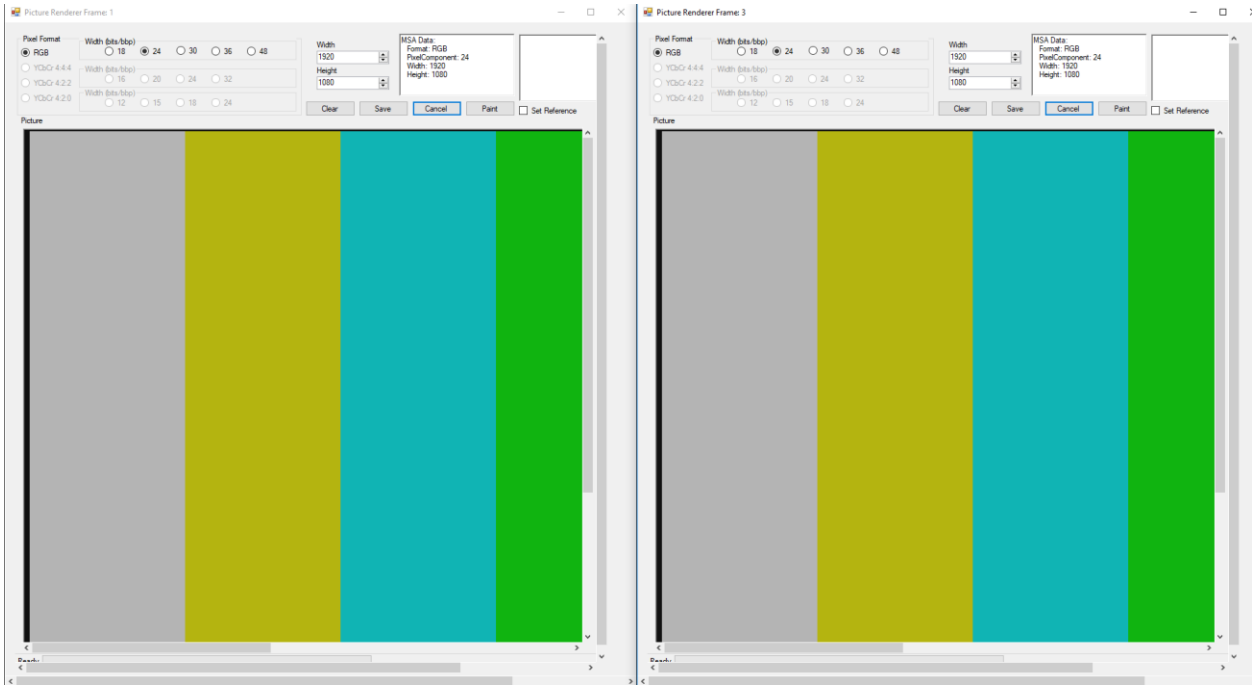
After the frames have been found the user may select any of the corresponding check boxes and a Picture Renderer Form will popup.



While the software was counting the frames, it extracted the MSA Data and the settings have been set to represent the MSA Data. When the user clicks the paint button, the picture will beginning painting and will be shown when finished.



Multiple Pixel Renderers can be popped up at the same time.



Even though multiple pixel renderers can be popped up at the same time, only one can paint at a time. The user will be able to distinguish which frame is which by looking at the title of the form at the top.

The Cancel button is used if the program for whatever reason is taking too long to paint or freezes. When the paint button is clicked, the other buttons on all other pixel renderer forms and the main form are disabled until the picture is finished painting. The Cancel button will enable the forms again and cancel the paint request.

The Save button will allow the user to save whatever is in the picture box as a .jpg to their computer.The Clear button will clear the picture box.

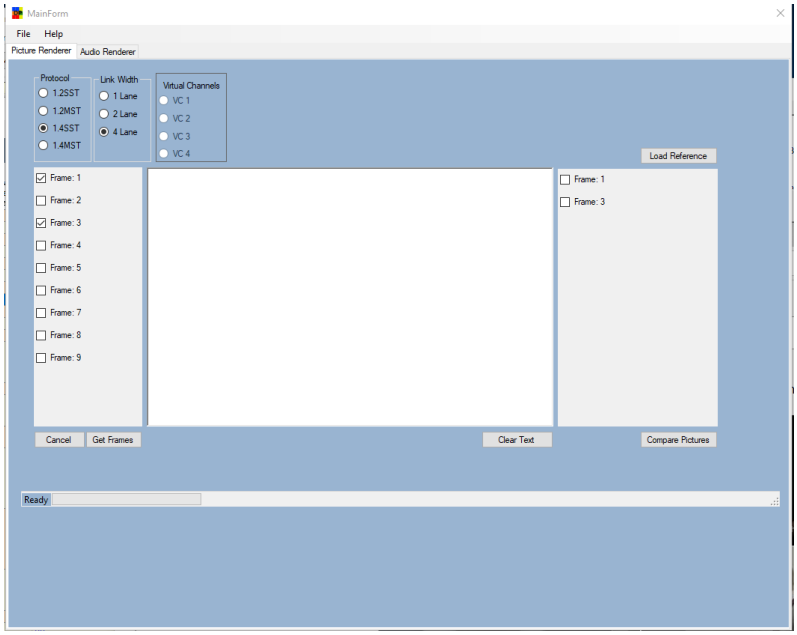
2.3 Analyzing Frames

The AnalyzeLines button will go through the frame, count the number of pixels for each line of the frame, show if the number of pixels differs from the MSA, and show the start state and end state of each line to allow the user to refer back to the state listing in the Probe Manager. The picture will still paint when AnalyzeLines is clicked but it will paint whatever data it has.

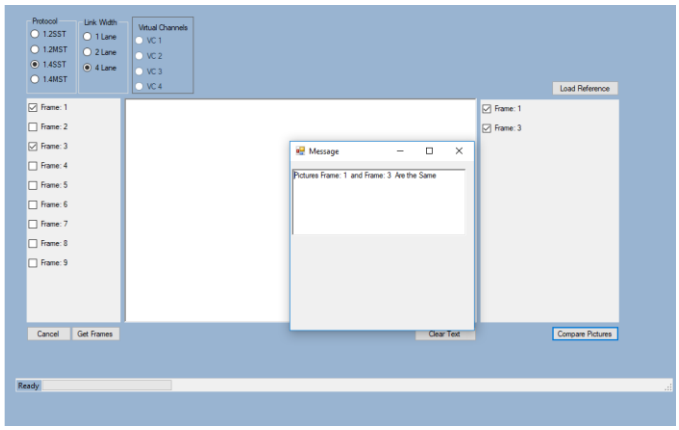
The data will be shown in the text box above the Analyze Lines frame as shown below.

2.4 Comparing Frames

When a picture is painted through the paint button, there will be an option on the main form to compare the pictures pixel by pixel.

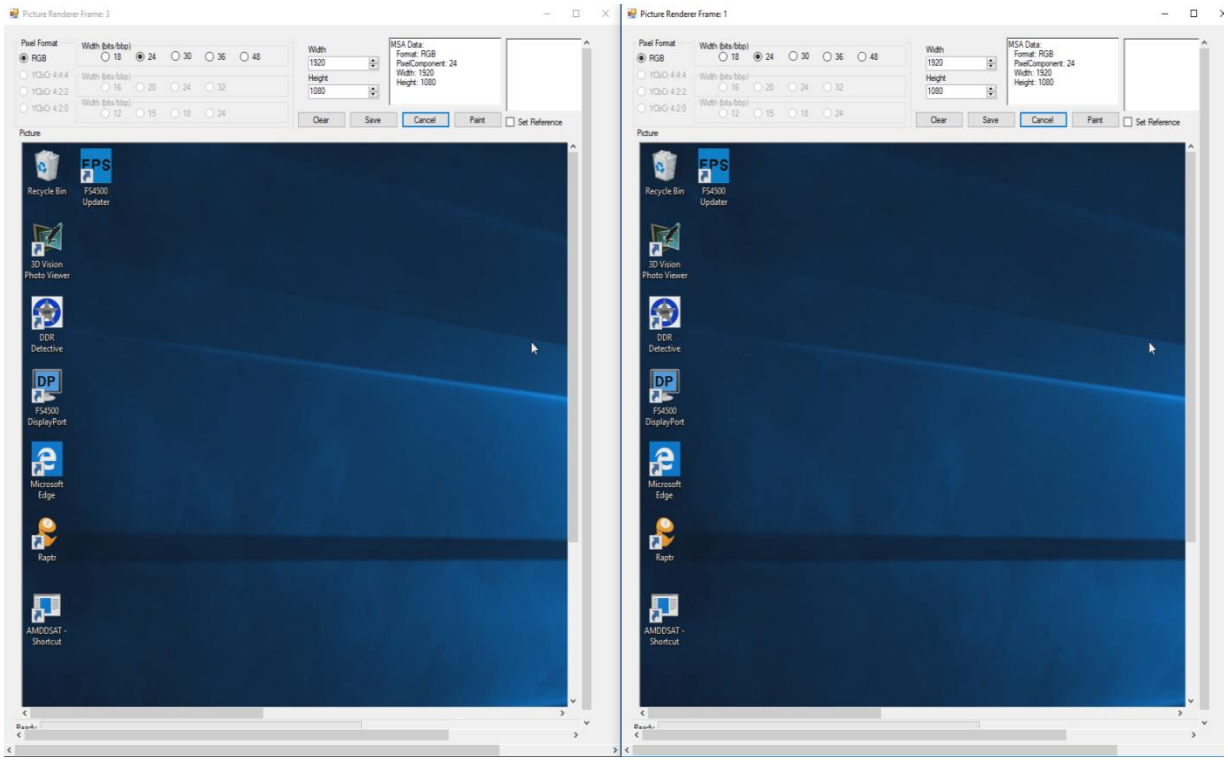


These are the same pictures that were shown above in the Painting Frame section of this document. The user can select the two frames and click Compare Pictures. If the pictures are the same, a message will appear telling they are the same.

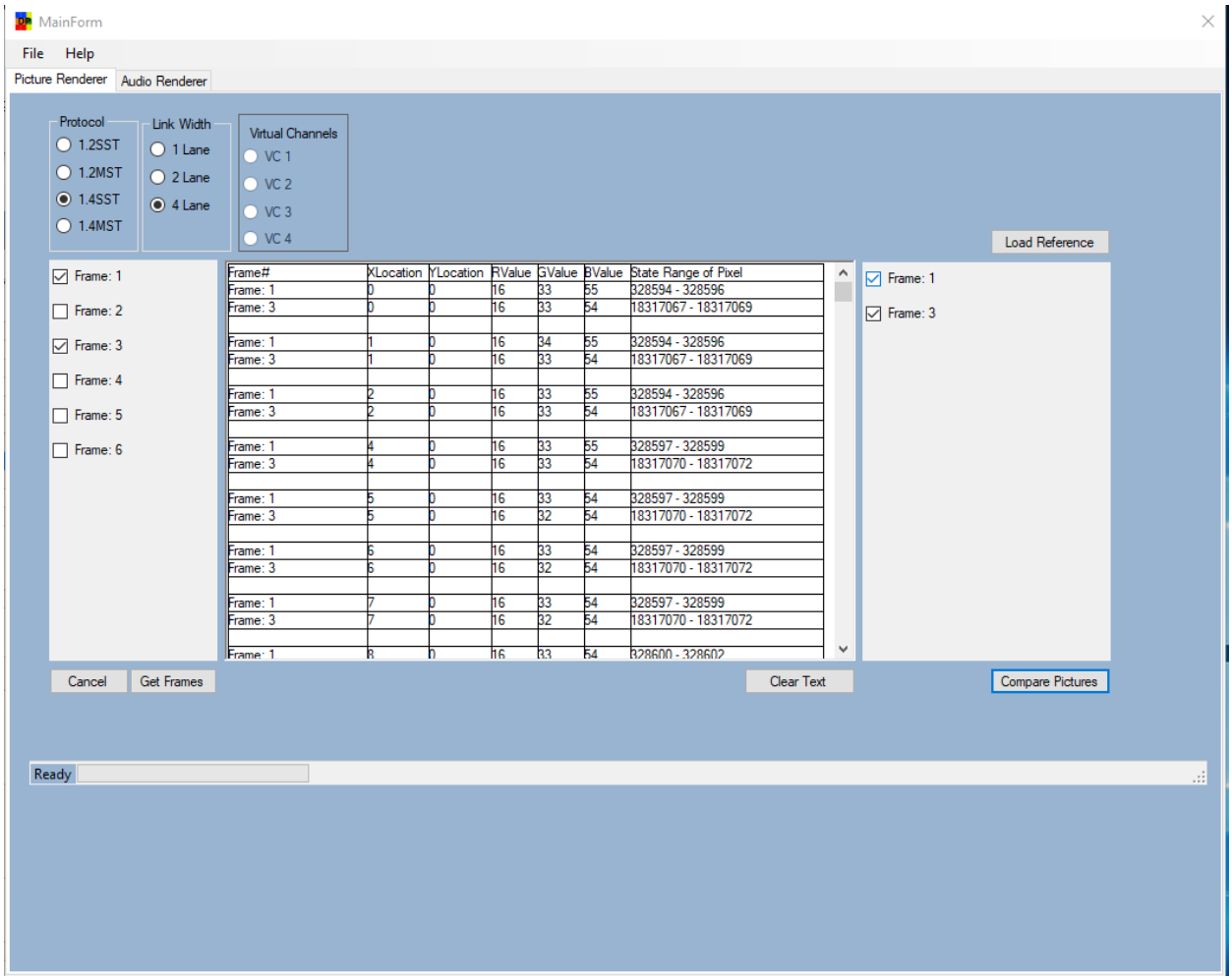


The compare pictures will only compare two frames, and the pictures must have the same number of pixels, or an error will appear. If there are any differences, a table will be created in the text box to the left to show which pixels were different.

In order for this document to show what will appear when the frames are different, a new configuration file will be loaded. In this new file, frames 1 and 3 have been painted and are shown below.



They might appear the same, but when the pixels are compared, differences will be shown. Below is the result when these two pictures are compared.

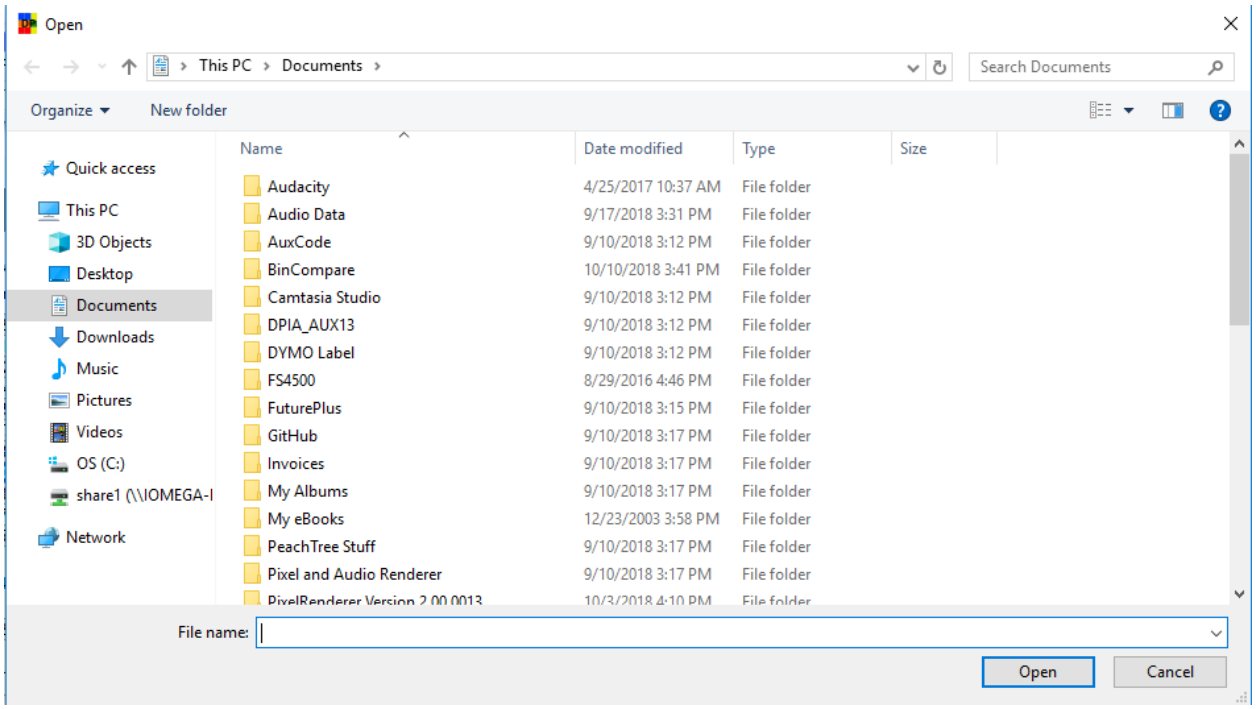


The table outputs all the pixels that are different between the two frames and will show the X and Y location, and RGB Values. The State Range of the Pixel is shown as well so the user can refer back to state listing and know which states refer to that particular pixel.

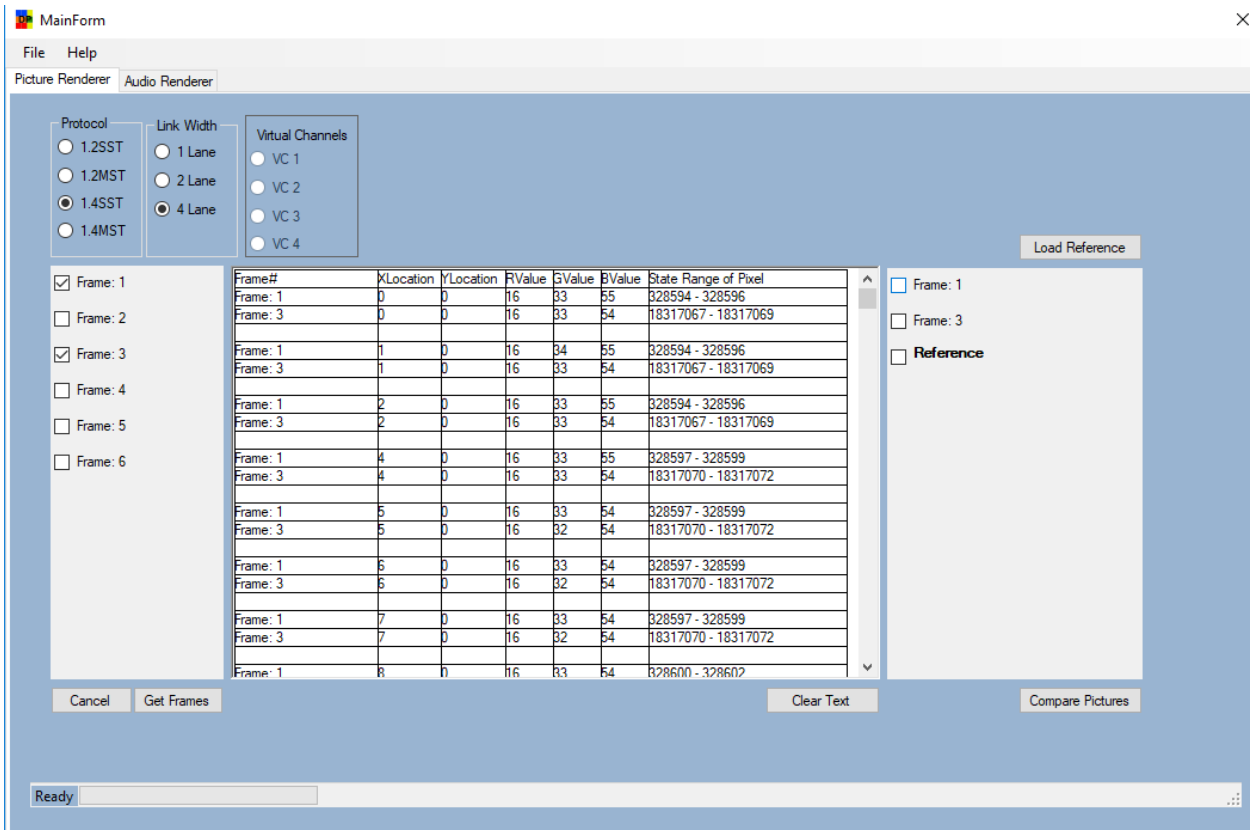
The program will time out when it sees 10,000 pixels that are different due to memory constraints, however, as shown, the pixels may have very minor differences. The program will capture any differences in the RGB value and output that pixel into the table. The user can click Clear Text in order to clear the table.

2.5 Load Reference

The user can add their own pictures if they would like to compare to the Probe Manager data. When the Load Reference button is clicked, a browse window will appear.



The user can search through his personal machine and select a picture. This picture will be loaded into the software and ready to be selected for compare.



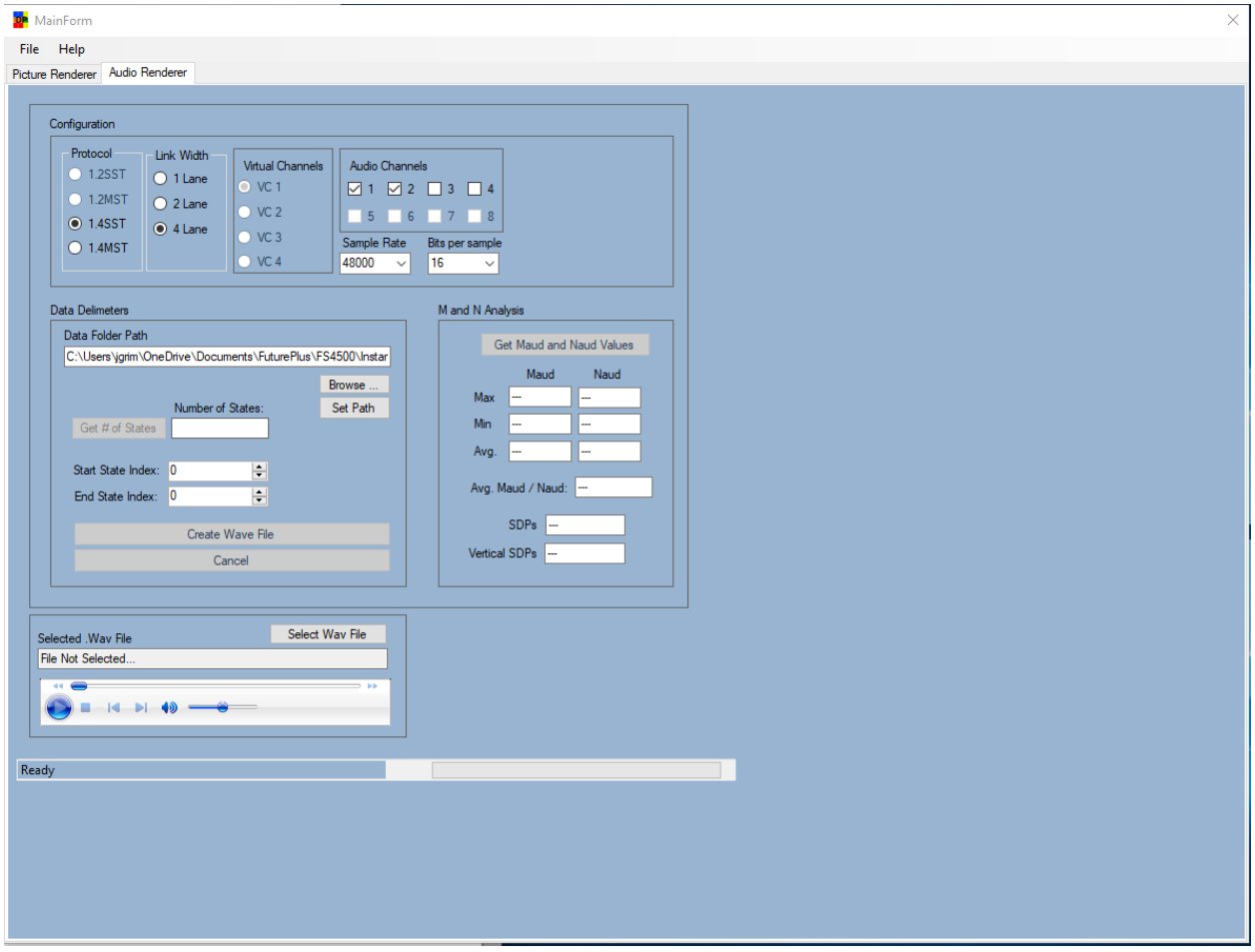
3. Audio Renderer

The features of this software are:

- Create Wav file from Audio Data captured by the FS4500
- Playback the created Wav files
- Outputs Max, Min, and Avg Maud and Naud Values while counting Time Stamp packets both horizontal and vertical

3.1 Getting Started

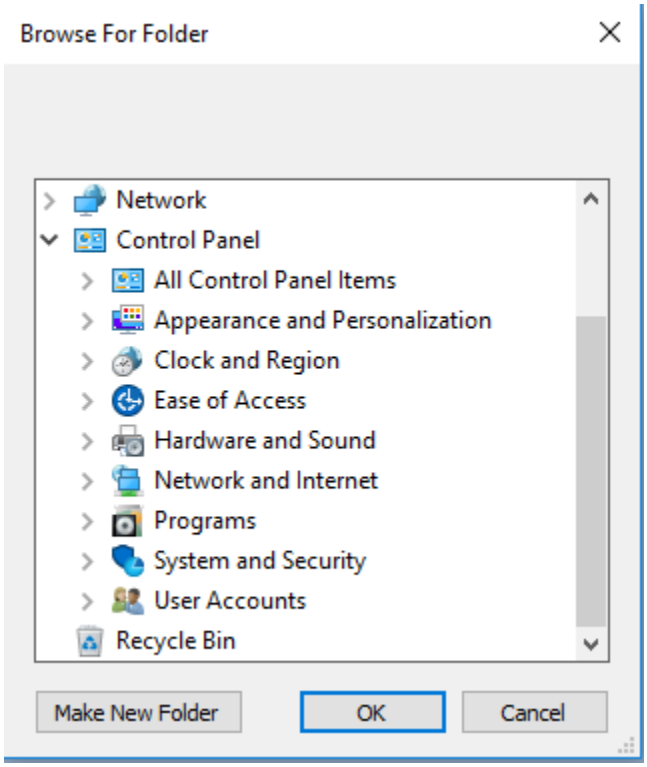
The Audio Renderer is packaged with the Pixel Renderer. On the top of the main form, there is a tab that says “Audio Renderer.” When clicked, the user will be presented with the following form.



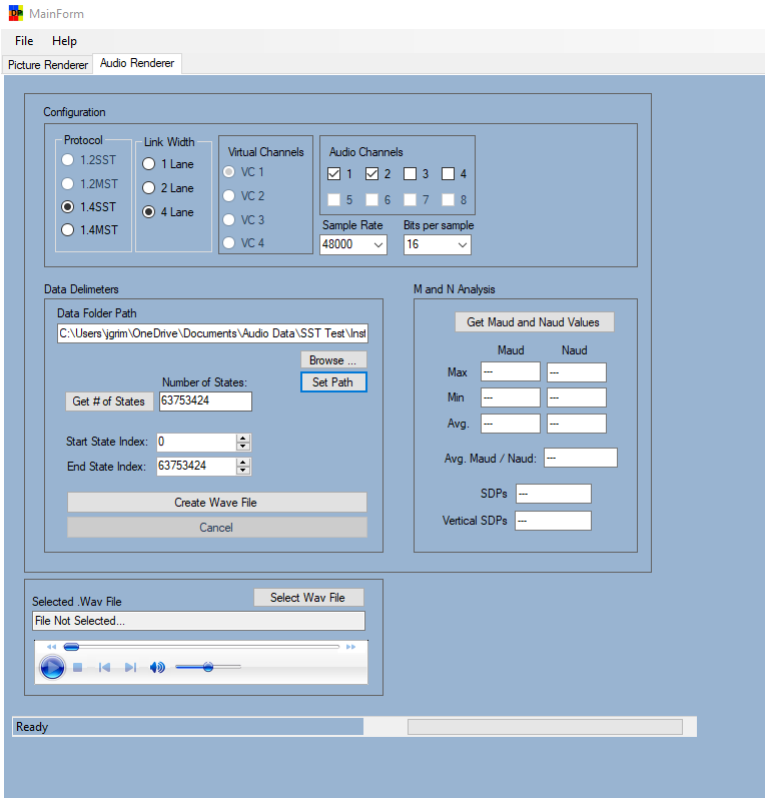
The user may select which Audio Channels they would like, Sample Rate, and Bits per sample, although what is shown above is the most common set up for capturing audio.

The Data Folder Path text is a default path that will allow the Audio Renderer to access the configuration file with the stored data loaded in the Probe Manager, however, unlike the Pixel Renderer, the user

does not need to have the Probe Manager open and the configuration file loaded. When the user clicks Browse, a popup window appears.

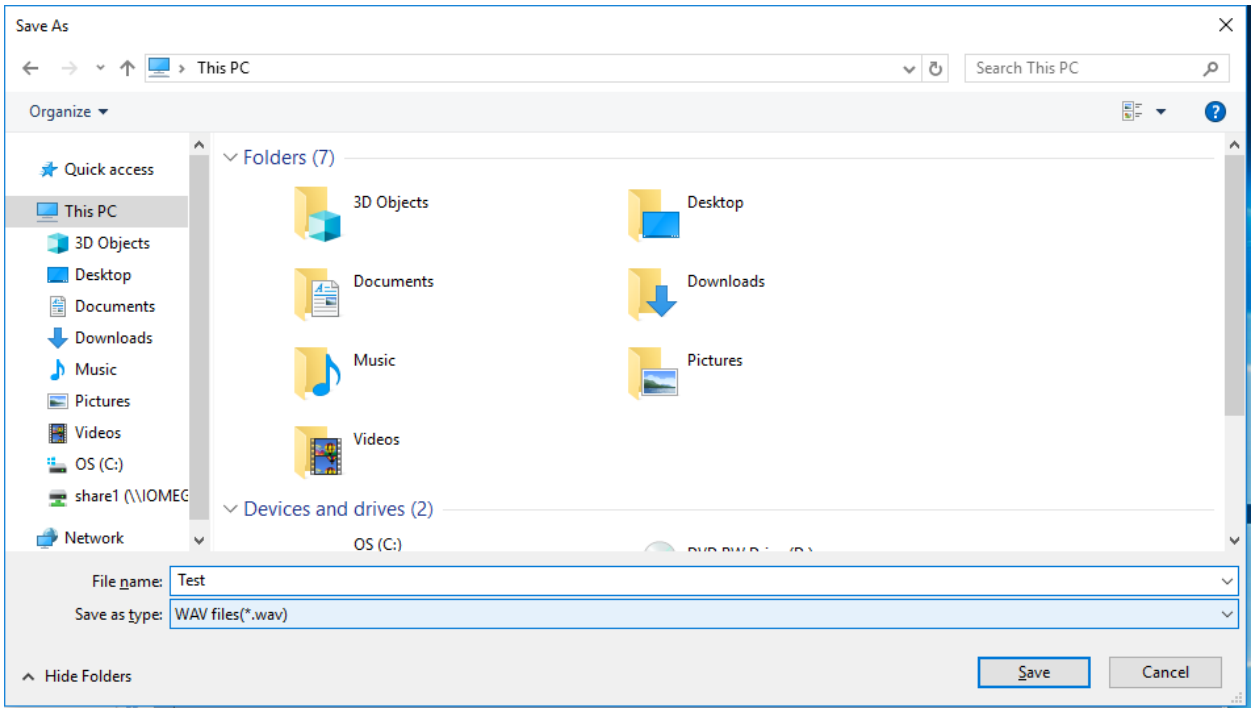


After a folder is selected, the user will click Set Path. After Set Path is clicked, the user will have the ability to create a wav file.



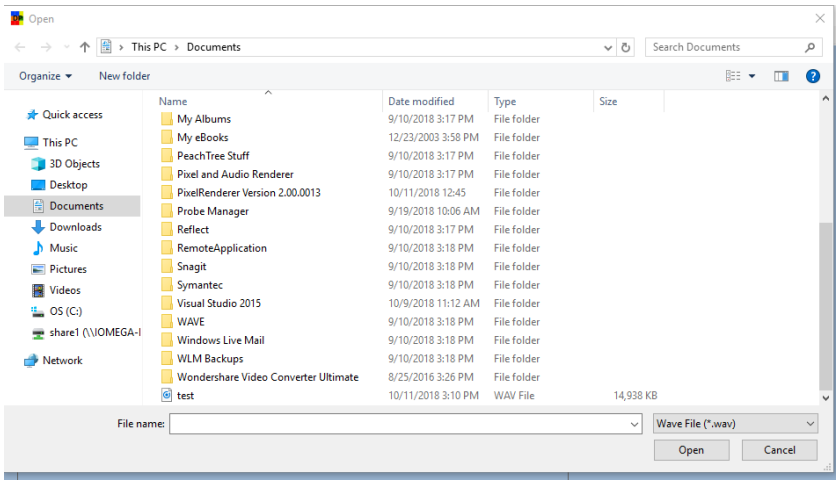
3.2 Create Wav File

After Set Path has been clicked, the user can click Create Wave File. After clicked, the Audio Renderer will rip through all the data in the stored configuration file and compile a wav file with all the audio data found. This may take a couple of minutes, the cancel button when clicked will end the process of creating a wav file. When finished, the user will be able to save the file on their local computer.

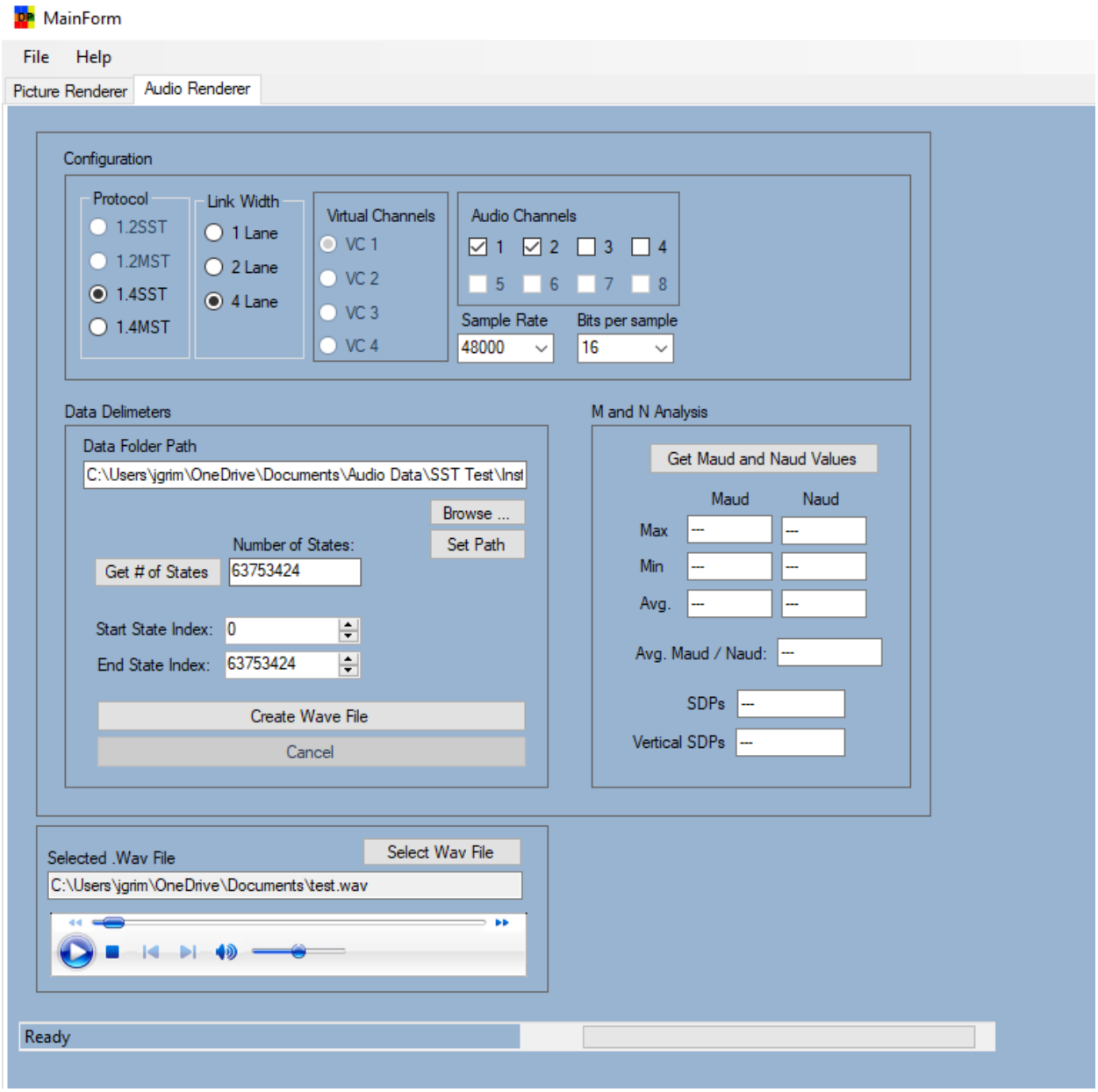


3.3 Play Wav Files

The user can click Select Wav File and another browse window will popup for the user to select a file to be played. This could either be the file that was just created, or any other wav file saved on their computer.

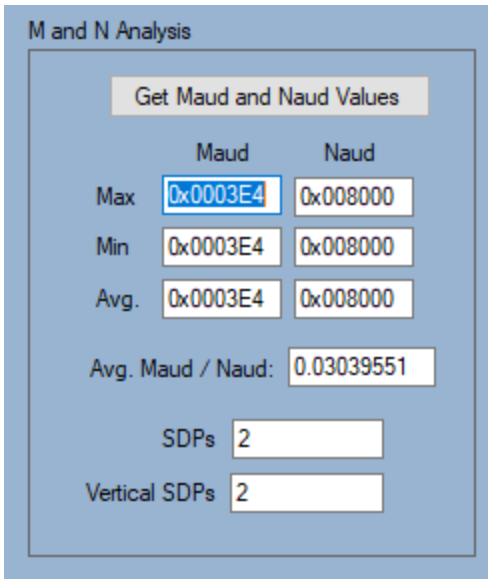


When the user selects the file, the selected wav file will be loaded into the Windows Media Player as shown below.



3.4 Maud and Naud

When the user clicks Set Path, the option to click Get Maud and Naud Values will be enabled. When clicked, the program will go through the state data and calculate the Maud and Naud average as well as saving the Max and Min values. The Time Stamp packets will also be counted. When the program is finished, the following will be shown.


M and N Analysis
Get Maud and Naud Values
Maud
Naud
Max
0x0003E4
0x008000
Min
0x0003E4
0x008000
Avg.
0x0003E4
0x008000
Avg. Maud / Naud:
0.03039551
SDPs
2
Vertical SDPs
2