

Expand the Analysis Capability of Your Oscilloscopes with TekScope™ PC Analysis Software

APPLICATION NOTE



Introduction

Oscilloscopes are a great tool for visualizing a signal and performing measurements, learning electrical fundamentals, debugging, or performing device characterization in electronic design. Today's more complex and capable designs require expanded capabilities such as analysis of large amounts of data collected over longer periods or viewing many signal types at the same time. Engineers may also want to compare data acquired on a device under test with simulation, perform complex analysis, or share data with other team members for further analysis.

Oscilloscopes were traditionally used for signal visualization and performing simple measurements to debug any issues during board bring-up. Today's electronic designs are more complex and capable, requiring expanded capabilities such as analysis of large amounts of data collected over longer periods or viewing many types of signals at the same time. Engineers may also want to compare data acquired on a device under test with simulation, performing complex analysis such as jitter analysis, eye diagram measurements, power analysis or protocol decode, or sharing data with other team members for further analysis.

TekScope PC paired with an oscilloscope is a perfect tool that expands the debug and analysis capabilities and speeds up the design cycle.

TekScope PC Analysis Software

TekScope PC Analysis Software is a waveform visualization and analysis software application that runs on a PC and has the same award-winning user interface found on most Tektronix oscilloscopes. It offers a wide variety of advanced analysis options, including serial bus decode, advanced math computation, and power or jitter measurement. With the subscription-based pricing model, you only pay for analysis features based on your specific needs.

TekScope PC Software is compatible with the TBS1000C, TBS2000B, 2 Series MSO, 3 Series MDO, 4 Series MSO, 5 Series B MSO, 6 Series B MSO and DPO70000 Series of Tektronix scopes.

Offline waveform viewing

Waveform viewing capability away from the oscilloscope allows engineers to perform analysis on acquired data without an oscilloscope, which is often an expensive shared resource. With offline software, you can easily share data with other team members, suppliers or customers.

Most oscilloscopes trade a large-screen display for a compact form factor. Since TekScope PC Software runs on a PC, you have the ability to view the captured waveforms anywhere without an oscilloscope. TekScope PC Software benefits the large-display real estate of today's HD monitors, allowing you to see more and do more.

With remote work culture becoming more common, TekScope PC Software expands the ability to view data acquired in the lab and shared over TekDrive.



Figure 1: Waveform visualization on a PC with TekScope PC Analysis Software.

Waveform comparison

TekScope PC Software supports a variety of different waveform file formats, allowing you to spend more time analyzing the data and less time on setup.

Supported waveform files include:

- .tss (Tektronix 2/4/5/6 Series session)
- .wfm, .isf (Tektronix)
- .bin (Keysight)
- .trc (LeCroy)
- .tr0 (SPICE)
- .csv (general purpose)

Because it supports many file formats, TekScope PC Software can display different file types in a unified user interface, allowing overlay or stacked display modes for direct waveform comparison or side-by-side comparison. This also enables you to view and compare data acquired on different instruments and simulation data on large displays, speeding up the debug process.

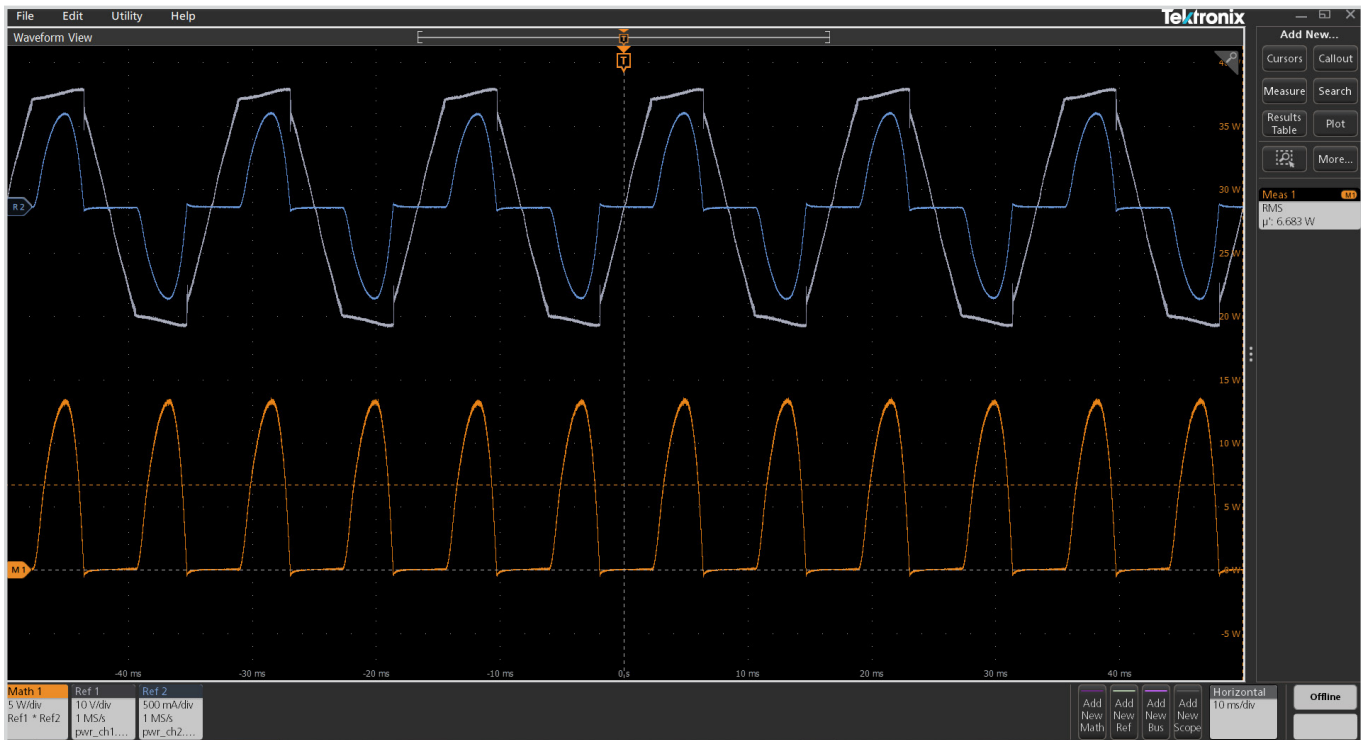


Figure 2: Prerecorded waveform file comparisons in overlay display.

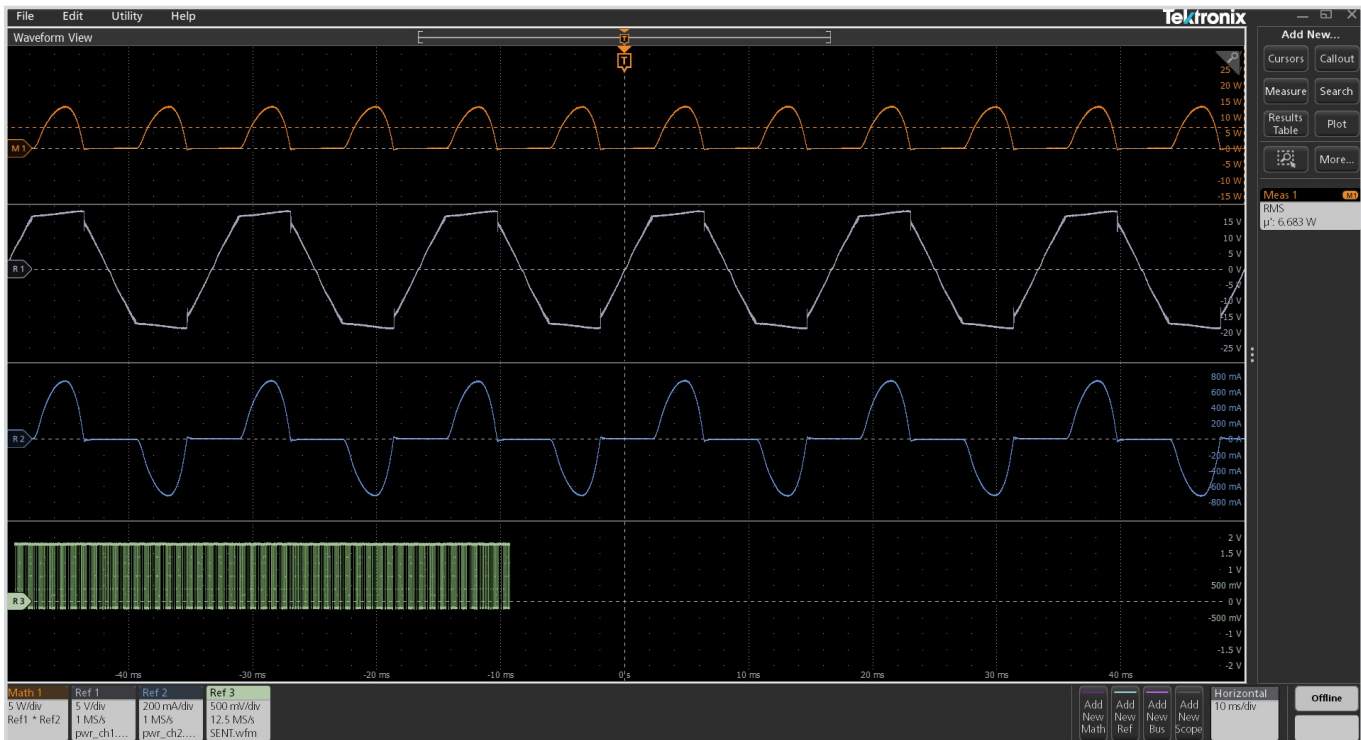


Figure 3: Prerecorded waveform file comparisons in stacked display mode.

Offline advance analysis

TekScope PC Software's ability to recall sessions files (waveforms + setup parameters) frees the user from having to perform all their measurements and data analysis while connected to the oscilloscope. Many of today's oscilloscopes can capture more than 500 M points per waveform and up to 8 channels of data. This is 4 G points to analyze. If this is done on the oscilloscope, then the oscilloscope is not available for other users. Instead, you can capture the waveform data set on the oscilloscope or use TekScope PC Software and analyze the data at your convenience.

The Starter License comes with more than 30 measurement options, and you can pick and choose other professional adder packages catered to your scope of work. This ability to add advanced packages such as Jitter Analysis, Power

Measurement or Motor Drive Analysis allows you to analyze data acquired on any oscilloscope, even ones that do not offer these analysis options.

Since TekScope PC Software has access to a lot more computing resources, it allows you to view and analyze multiple waveforms quickly and easily. Using TekScope PC Software to analyze data from multiple instruments and simulation data also eliminates any differences in the results due to differences in algorithm used or in implementation methodology on different instrument software. Measurement algorithms are also clearly documented in the Help System, which ensures confidence in your results.

Upon analysis completion, you can generate a report to share or archive the results. Options such as the ability to include plots or configuration details allow you to specify the information that goes into the report.

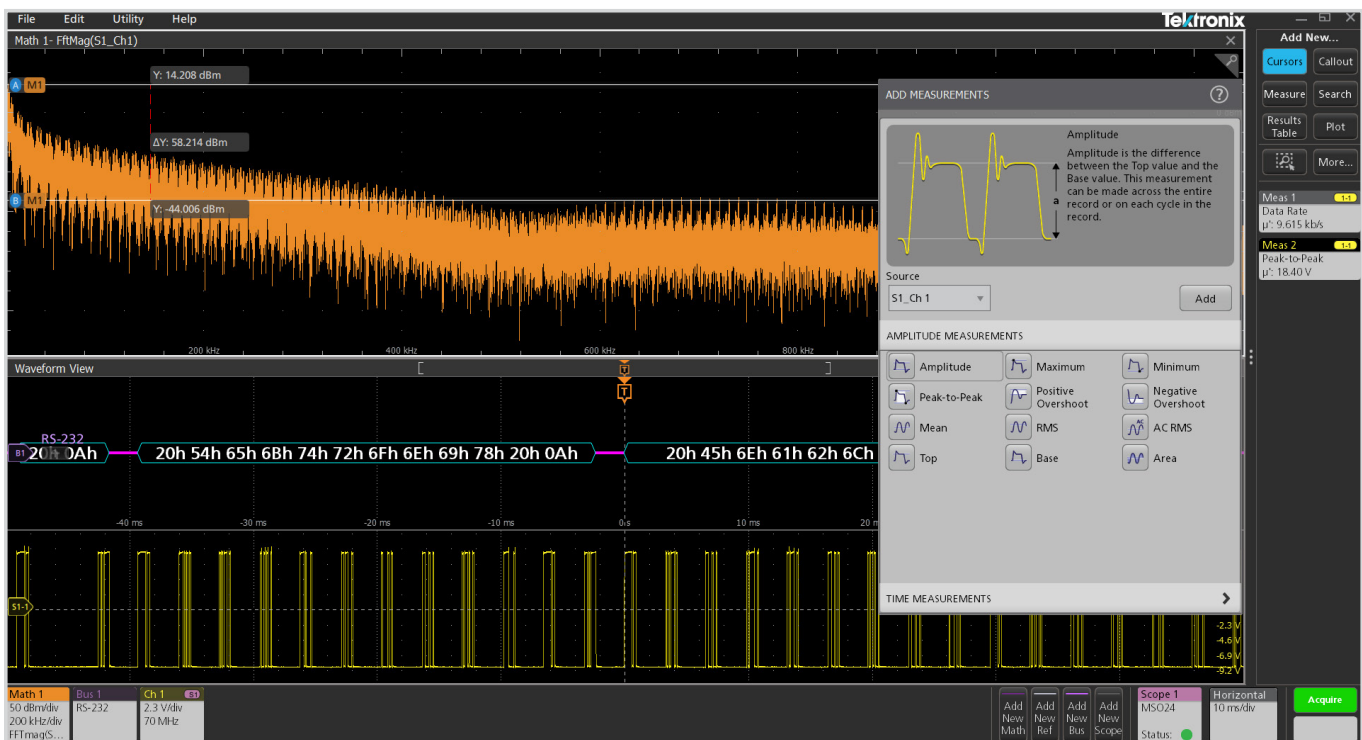


Figure 4: Auto measurement with prerecorded waveform file.

Decoding serial bus

Most embedded designs today have some type of low-speed serial bus for device configuration and communication between devices. A lot of time is spent analyzing the data between devices to root cause issues during board bring-up.

The Starter Version of TekScope PC Software includes support for the three popular serial buses: I2C, SPI and RS-232. Other decodes can be added using a serial decode package that

includes support for up to 25 different buses, including USB, ethernet, MIPI DSI and SPMI, to name a few. These span buses are used in embedded, automotive, consumer, industrial and defense industries.

Simultaneous multi-bus decode combined with search/mark capability and a different way to visualize the decoded information are enabled through analysis serial bus transactions.

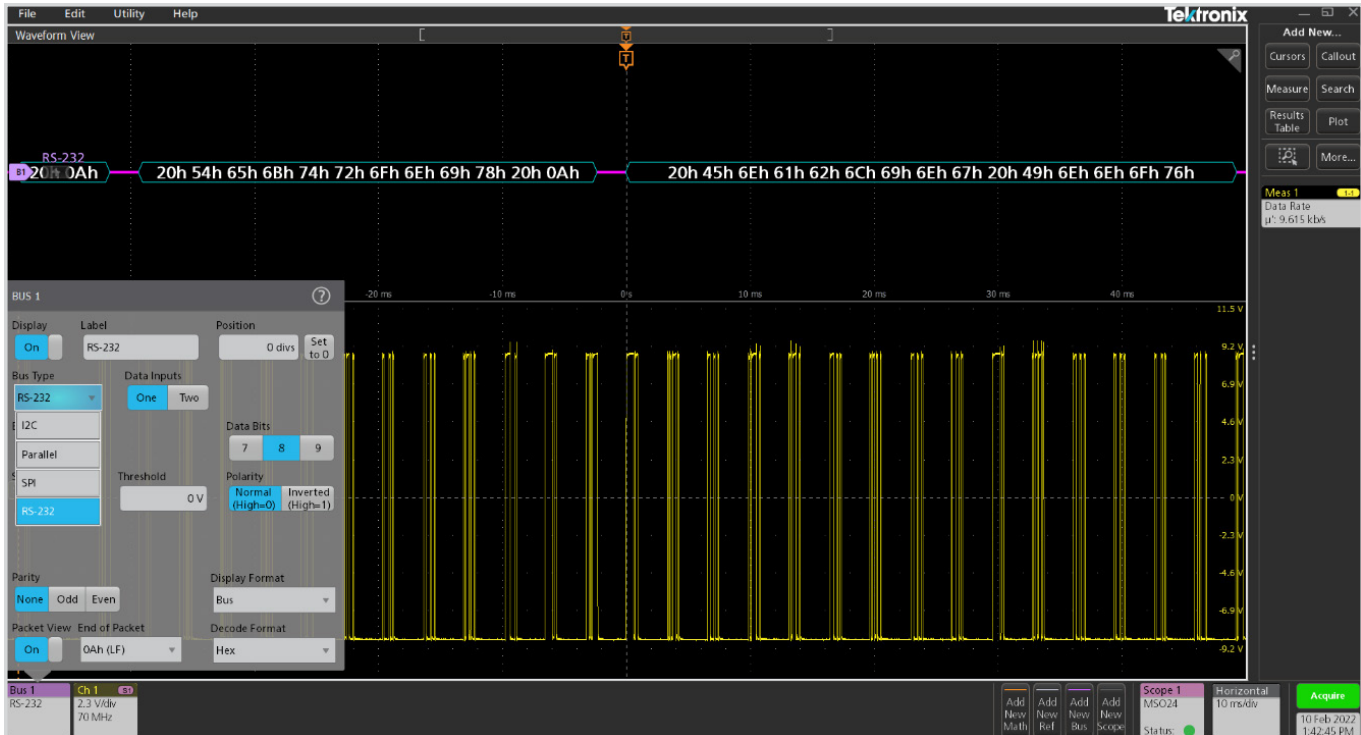


Figure 5: Serial bus decode RS-232.

Remote control and multi-scope analysis

TekScope PC Software allows you to remotely connect to your Tektronix oscilloscope and retrieve data in real time. Once the data is automatically transferred into the TekScope PC Software, you can continue to run the analysis offline.

You can also add more channels to your testing environment while setting the multi-scope system to behave as one unit and save a lot of time when analyzing many channels from different oscilloscopes and trying to synchronize them.

TekScope PC Software also allows you to view and analyze data from multiple oscilloscopes on the same screen, rearrange channel information, stack groups, zoom, and add cursors or measurements in a seamless interface. This capability supports up to four oscilloscopes and 32 channels.

The Multi-Scope Analysis Solution enables you to remotely control the acquisition settings on all oscilloscopes simultaneously without needing to set up each oscilloscope individually. Once the data is captured on TekScope PC Software, you can run measurements and analyze data across all channels from different oscilloscopes at once.

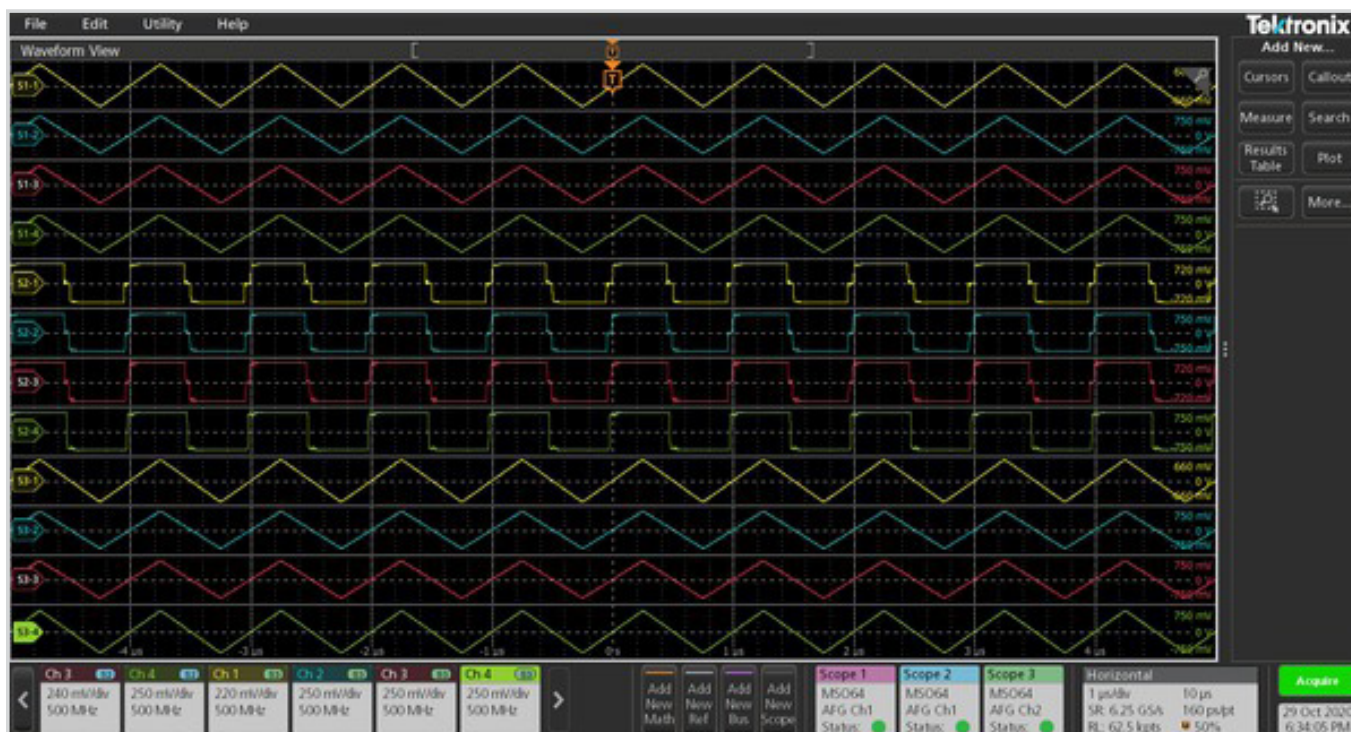


Figure 6: Simultaneously perform three-unit remote oscilloscope analysis across 12 channels.

Programmatic control with TekScope PC

If you are new to test automation, TekScope PC Software is a great starting platform. A variety of setup commands work with TekScope PC Software. The platform supports querying the measurement values and can be used to process a batch

of waveform files. This allows your scripts to work with an oscilloscope directly, instead of having the work and process data shown on the TekScope PC Software. There is even a hidden feature where the TekScope PC Software responds to most of the PI commands from the 2/4/5/6 Series MSOs.

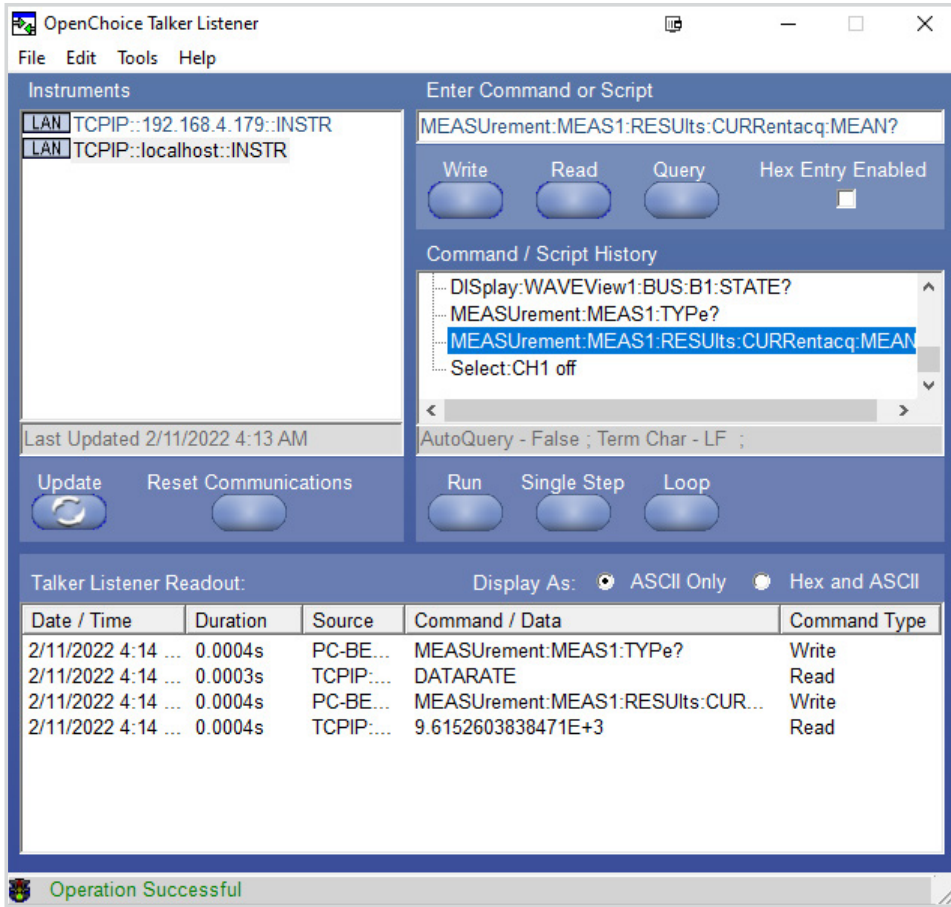


Figure 7: Using localhost as the loopback to communicate with TekScope PC Software in TekVISA. This example uses the PI command to query the MEAS1 result.

To use programmatic control commands with TekScope PC Software, you could connect to the local instance that resides on the PC. In the Search Criteria for TekVISA, go to LAN and enter “localhost” in the Hostname for the search list.

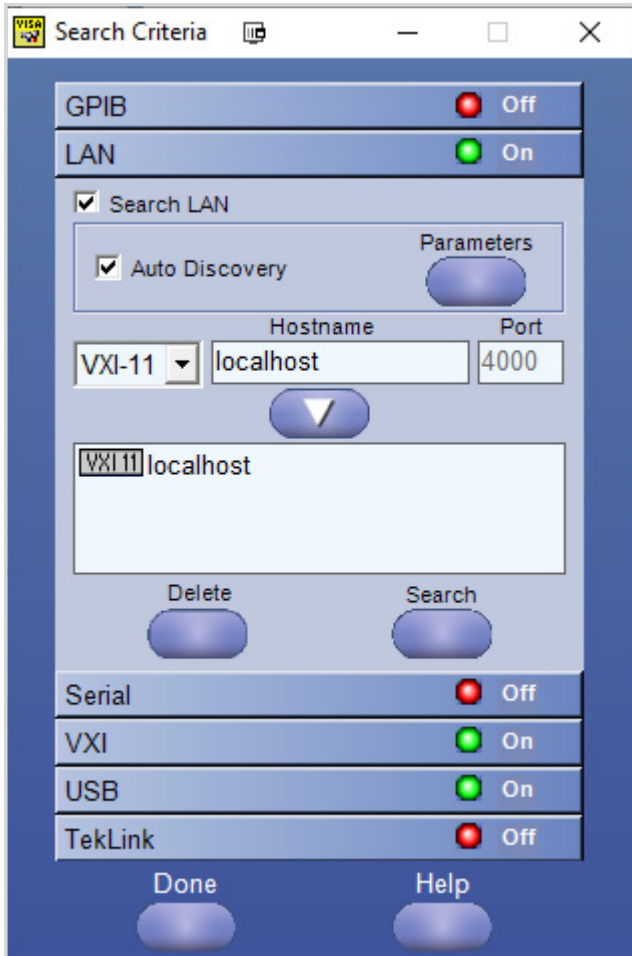


Figure 8: Search for localhost to communicate with the local instance.

Summary

TekScope PC Analysis Software provides a very flexible environment for waveform visualization, advanced measurements, serial protocol decode of a wide variety of buses, and many analysis tools. It harnesses the power of the PC to expand an oscilloscope’s signal analysis capabilities, freeing up the oscilloscope to be exclusively available for data acquisition.

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