CNT-91 + TimeView3™
Emulation of HP53310A MDA with TimeView3

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Introduction

The new TimeView 3 Control and Analysis software when used with the Pendulum CNT-91 Frequency Analyzer converts the CNT-91 into a high performance Modulation Domain Analyzer.

The TimeView 3 software is intended to make measurements easy for the current user of the HP 53310A Modulation Domain Analyzer. The new MDA mode is designed to emulate the parameters of the HP 53310A making the transition to the TimeView 3 solution seamless (see figure 1).
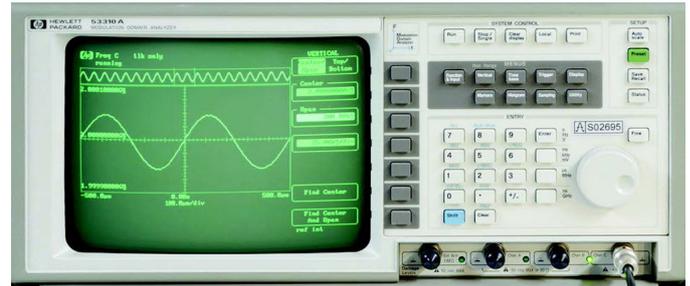

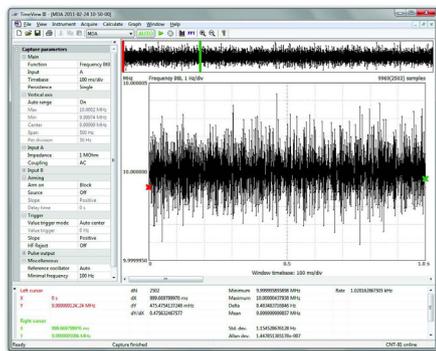**Figure 1.** The legacy and popular 54410A, Modulation Domain Analyzer

Figure 1. MDA display mode with panorama window on top.
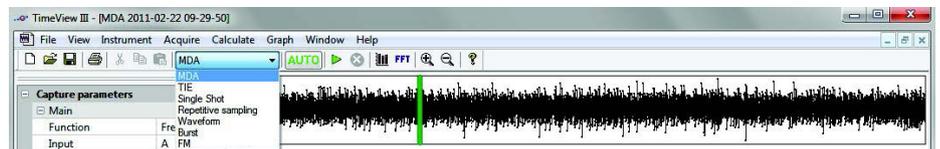

Figure 2. The capture and display mode MDA is selected from the Acquire drop-down menu

This application note details the procedure to make a measurement in MDA mode in terms that are familiar to any HP53310A user.

Figure 2. CNT-91 & TimeView3, a Modulation Domain Analyzer

Instrument Setup

When TimeView 3 is opened it will automatically detect the CNT-91 connected to either via USB or GPIB. From the menu choose make new measurement and select MDA mode from the list of options (see figure 2). Select which input the measurement is to be performed on and set the input impedance for that channel.

To have TimeView setup the measurement for you press the Auto button from the tool bar at the top of the screen. Pressing this button one time is like choosing the Auto Scale button on the HP53310A. Double clicking the button is like choosing the preset button on the HP53310A (see figure 2), and will load the default settings for the CNT-91 and TimeView 3. Both the Auto

set and Set defaults options are also available from the Acquire menu. Table 1 describes the default settings.

From the Capture parameters panel on the left set the Timebase. The Timebase operates the same as in the HP53310A, defining the sweep time. In TimeView 3 the sampling interval is set at a value based on the Timebase. The value is set at the fastest interval possible in the CNT-91. The HP53310A was limited by its 8k internal memory size. If you wanted a longer sweep time, you had to choose a greater sample interval. The CNT-91 has 3.75M internal memory and can transfer 15k samples per second to the PC so the fastest possible sample rate is used and is not user configurable.

Parameter	Default
Timebase	1 ms/div
Persistence	Single
Auto range	On
Coupling A/B	AC
Arm On Value trigger mode	Block Auto center
Slope	Positive
HF Reject	Off
Reference Osc	Auto
Min Frequency	100 Hz
Interpolators	On

Table 1. Default settings

The trigger parameters on the left capture parameters options are designed to emulate the options available in the trigger menu of the HP53310A. This value arming feature allows you to set the frequency (along with the slope) to start the data acquisition. The default is auto center which sets the value trigger to the average of minimal and maximal frequency.

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Making a Measurement

To start the measurement in TimeView 3 you press the green triangle from the tool bar at the top of the screen. This action captures and displays a single shot acquisition and then displays it on the PC screen. Changing the persistence setting from the left menu to infinite will enable continuous mode, enabling repetitive measurements with the last 15 measurements shown on the PC screen. All measurements are taken and displayed in a frequency versus time graph. The histogram option available in the HP53310A is available as a post processing option, along with Smoothing and Fast Fourier Transform (FFT) calculations.

Post Processing Options

To view the collected data as a histogram, choose the histogram option in the Calculate menu. A new window will open displaying the histogram of the frequency vs. time graph. To change the number of bins in the histogram choose Options in the Calculate menu (see figure 3).
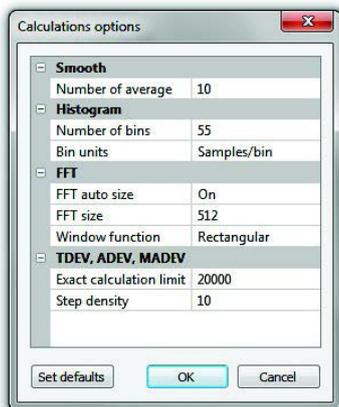
Figure 3. Optional settings for post-processing functions.

There are settings for all post processing data views in this menu. When you change the number of bins for the histogram it is necessary to go back to the original measurement data and calculate the histogram again. This time it will appear with the new number of bins. This setting will remain for all future histograms until changed or defaults are reset in the Calculate > Options menu.
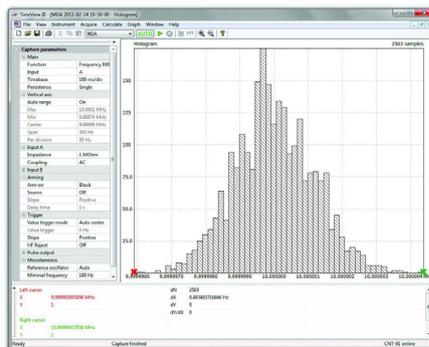
Figure 4. Distribution histogram.

Smoothing displays a waveform based on the averaging of a user definable number of coincident points (see figure 4). To set the number of coincident points to use when finding the average value for a particular point, open the Calculate > Options dialog and change the Number of Average setting. The default is 10. This will affect the total number of points displayed on the graph. For example with 100 samples a "Number of Average" =50 would reduce the total number of points on the graph to 50.
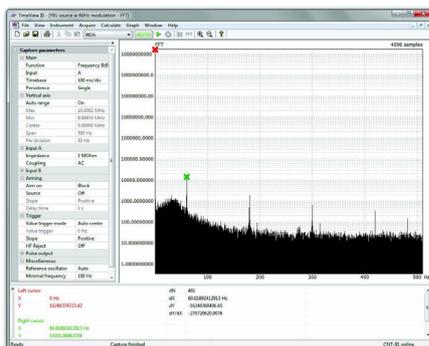
Figure 5. FFT reveals modulation.

FFT displays the data in its frequency spectrum (see figure 5). The options for the FFT are also in the Calculate > Options menu. The FFT auto size option, when on, allows the application to make the decision of the ideal number of points to compute the FFT. Alternatively a fixed number can be set in the FFT size field. The window function for FFT can be set to Rectangular, Hamming, or Hanning.

These additional functions along with the familiar histogram allows for an even greater detail of measurements than the HP53310A.

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