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Application Note AN303

Phase Matrix, Inc. Measuring Time Varying Microwave Signals

Using the 1230A/1231A Microwave Counter and the 1911A Delaying Pulse Generator to Measure Time Varying Microwave Signals

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Using the Phase Matrix 1230A/1231A Microwave Frequency Counter and the Phase Matrix 1911A Delaying Pulse Generator to Measure Time Varying Microwave Signals

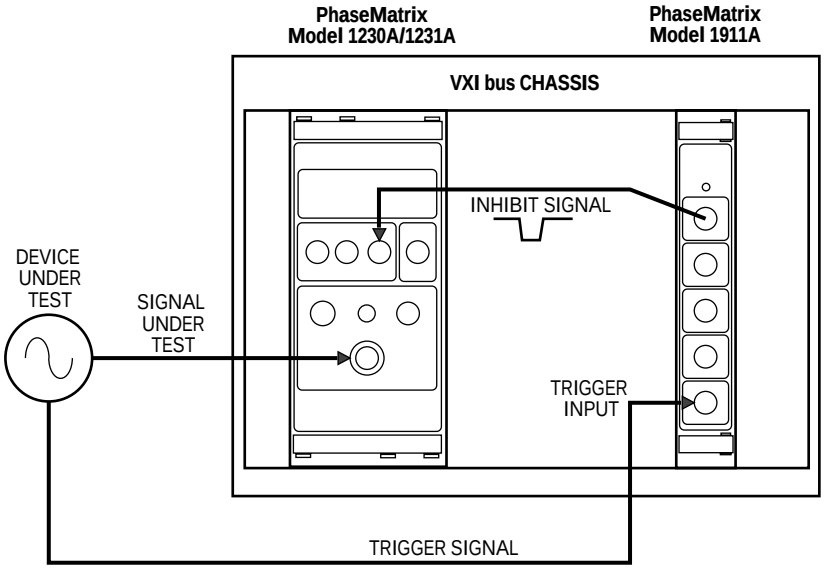
Pulse counters can be used for more than just measuring pulses. By using the Phase Matrix 1911A pulse generator and the 1230A's inhibit input, time varying signals such as agile radars and VCO's can be accurately characterized.

Introduction

The 1230A/1231A VXI Microwave Pulse/CW Counters are flexible, precise measurement tools for characterizing many different types of microwave signals. The inhibit input can be used to define the time interval in which a frequency measurement is to be made. This allows measurement of the frequency verses time characteristics of the repetitive time varying signals such as the output of VCO's, chirped radars or the pulling of microwave signals due to pulse modulation.

Measurement Setup

The setup diagram in figure 1 shows the setup for making the profile measurement. The signal from the device under test is connected to the input of the 1230A/1231A counter. The output of one channel of the 1911A pulse generator is connected to the inhibit input of the 1230A/1231A. A trigger signal from the device under test is used to trigger the 1911A.



This simple setup can fully characterize time varying microwave frequencies quickly and accurately

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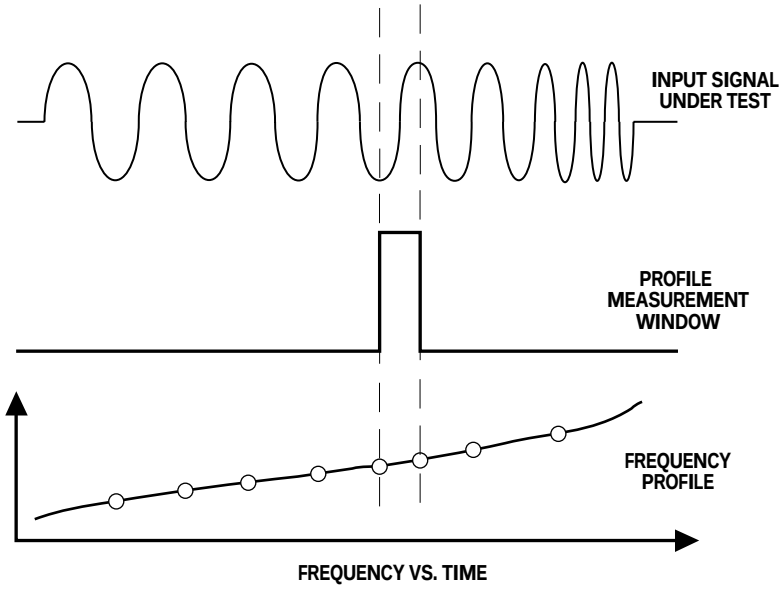
Using the Phase Matrix 1230A/1231A Microwave Frequency Counter and the Phase Matrix 1911A Delaying Pulse Generator to Measure Time Varying Microwave Signals

Measurement Setup (from page 2)

The pulse width if the 1911A can now be set to the desired sample width. For the fastest measurements, as wide as a window should be used that still captures the desired signal detail. The pulse width of the 1911A can be set anywhere from 50 ns to over 800 ms with a 50 ns resolution. The 1911A should be set to trigger externally and the delay set to the minimum value. Since the 1230A/1231A have an internal delay line the trigger produced by the device under test can be coincident with the start of the pulse, I.E. a pre-trigger is not necessary. (When the precise timing information is needed, the threshold and gate outputs from the 1230A/1231A can be used to confirm the exact relationship of the inhibit signal and the microwave signal under test.)

After the measurement at minimum delay is taken, the delay setting of the 1911A is increased (with nanosecond resolution if necessary) to move the window to the next desired position.

The measurement window, generated by the 1911A pulse generator, can be moved through the signal under test to measure frequency verses time.



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Phase Matrix / EIP 1911A

Four Channel Pulse Generation for VXIbus Systems

Phase Matrix / EIP 1230A/1231A

Pulse / CW Microwave Frequency Counter for VXIbus Systems

ORDERING INFORMATION

MODEL 1911A	VXI 4 Channel Pulse Generator
MODEL 1230A	26.5 GHz VXIbus Pulse/CW Microwave Frequency Counter
MODEL 1231A	20 GHz VXIbus Pulse/CW Microwave Frequency Counter

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