Agilent AN 1200-5

Fast Characterization of Pulse Width Encoded Data

Application Note

Agilent Technologies 53310A Modulation Domain Analyzer

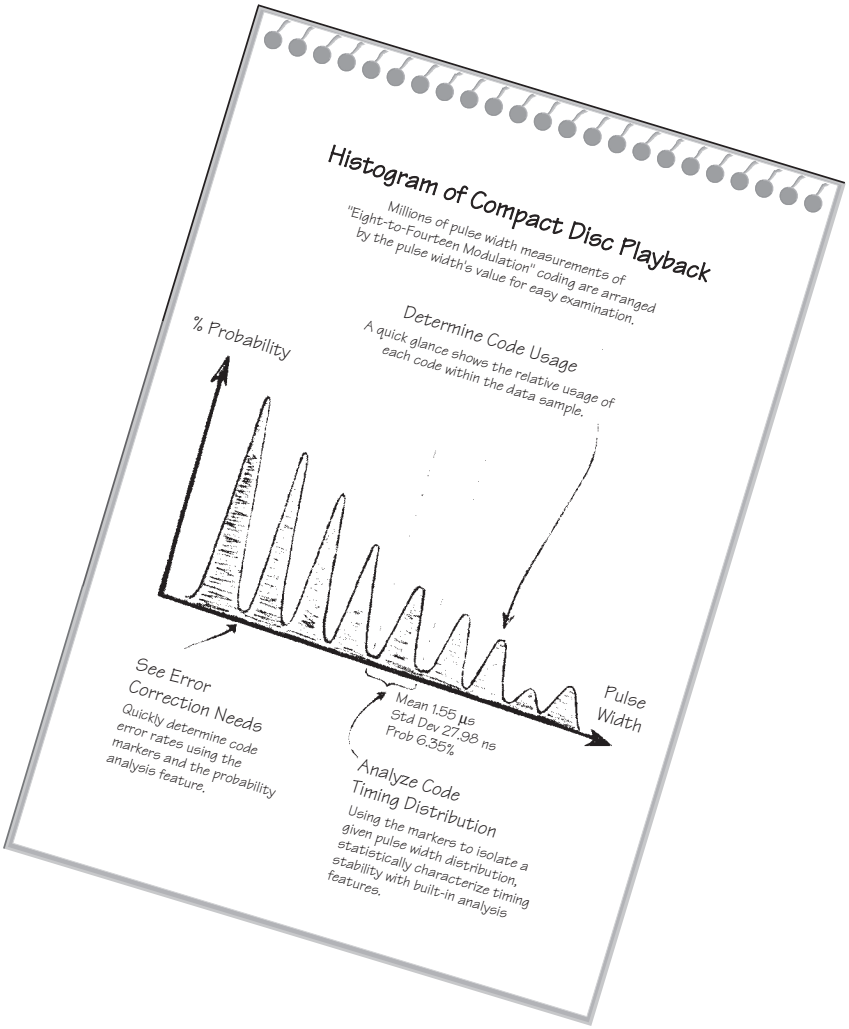
Simplifying the Analysis of Pulse Width Encoded Data

Situation

Pulse width encoding of data (also known as pulse width modulation) is used in a wide variety of applications such as compact disk players, motor speed control circuits, switching power supplies, and automotive antilock brake systems. As designers attempt to drive costs down in these products, they will make ever increasing demands on their suppliers for the same or better component performance at lower prices. Thus, both designers and suppliers will need a quick and easy method to evaluate these new lower-cost devices and their system performance.

Problem

Evaluation of pulse width encoded data requires the ability to analyze how often each code is being used well as its time value stability. Knowing the code usage distribution gives an overall indication of a system's health. The timing stability of a given code can be directly translated to the performance required of the error correction circuitry. Getting this information usually requires a complex test system composed of a time interval counter, computer, and custom software for control and analysis.



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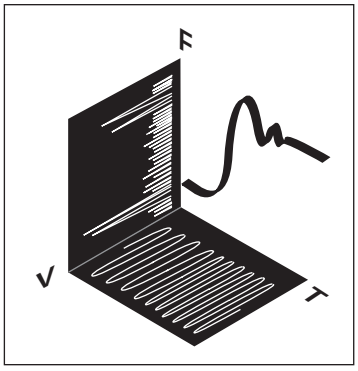
Solution
The built-in fast histogram capability of the Agilent Technologies 53310A Modulation Domain Analyzer is a simple and easy way to analyze pulse width encoded data. In less than a second, the 53310A takes a hundred thousand pulse width measurements, rearranges the measurements in value order, then displays how often a given value occurred. This not only yields the code-usage distribution, but also gives an indication of each code's timing stability– all in real time. Quantitative analysis of the stability, such as standard deviation, mean, peak-to-peak deviation, and probability-of-occurrence are built-in features.

Related Applications
- Motor speed control
- Switching power supplies
- Antilock brake systems
- Coded entry devices
- Radar staggered PRI

The Modulation Domain gives you a new way to view your complex signals
Better ways to analyze your complex signals don't come along often. Now Agilent brings you the Modulation Domain–a way of looking at frequency or time interval measurements that directly and clearly reveals both intentional and unintentional modulation.

For frequency analysis, it's the missing piece of the puzzle. The Time Domain shows you amplitude (voltage) vs. time. The Frequency Domain gives you amplitude vs. frequency. The Modulation Domain plots frequency vs. time–an intuitive and insightful way of examining your signal's dynamic frequency modulation.



For timing measurements, the Modulation Domain's view of time interval vs. time allows you to both see and quantify timing jitter directly–taking you one step beyond the Time Domain's qualitative view.

By internet, phone, or fax, get assistance with all your test and measurement needs.

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