Signal Trend Analysis and Deviation Detection

Dear Madam/Sir,

Have you ever wanted to analyze a large amount of waveform measurement data and could not find a way to do it?
Do you know where to start to understand the trend of signal changes? Do you want to know whether there is a large
deviation content mixed in many tested signals? The above test requirements cannot be achieved by the general oscilloscope
functions.

New-generation oscilloscopes provide the segmented memory function. The so-called segmented memory function is to allow
the oscilloscope memory to capture only the waveforms that users want to observe and ignore irrelevant signals so as to optimize
the use of memory depth. The segmented memory function can capture waveforms at high speed and then analyze them.
First, waveforms are captured and then Auto Measure is applied to calculate the segmented memory page by page. The spacing
of the sampled waveforms can reach µs the fastest.

The segmented memory function of the GW Instek oscilloscopes also provides the statistics function to allow users to understand
whether the signals captured in the segmented memory are distributed as expected or whether they are mixed with excessive
deviation signals. Two application cases are elaborated as follows:

1. When measuring the signal on an IC Pin, if the signal sends out a different number of Pulse groups within a fixed time interval,
it is expected that the Pulse Count sent each time will be Gaussian distribution or equal-difference distribution, and users can
utilize the statistics function of the segmented memory function to find out whether the distribution is generally in line with the
expectations. This is not achieved by using the general measurement function or the playback function of segmented memory to
observe the measured values page by page. Take the following display as an example, the data shows equal-difference distribution.
The distribution curve of the signal can be easily observed by the statistics function of the segmented memory.

Equal-difference distribution display

2.Users can use the statistics function of segmented memory to analyze whether the captured segmented waveforms are mixed
with a large deviation. For example, in 1,000 pages of segmented waveforms, the width of most waveforms is 100us. The statistics
function can be used to allow users to know whether there is a pulse with a large deviation without checking it page by page.
Take the following display as an example, 801 out of 1000 waveforms are concentrated in Bin5, and the range between the minimum
value and the maximum value is from 99.77us ~ 100.2us. Users can use this result to determine whether the statistics result exceeds
the allowable range.

Pulse width statistics display

GW Instek GDS-2000E / MSO-2000E / MDO-2000E and MDO-2000A oscilloscopes are equipped with segmented memory and
the statistics function as standard. Users can use these series of oscilloscopes to analyze the distribution trend and to find out
if there is any deviation signal that exceeds the expected. If you are bothered by analyzing a large amount of measurement
waveforms, please choose an oscilloscope with segmented memory and the statistics function.