Interpolation Sampling Mode

■ Interpolation Mode

➤ Measures waveforms at max 250GS/s
- Up to 2.5TS/s when "Repetitive Mode" is off
➤ Gives more than six fold performance of 40GS/s DSO!!

As a new function in the DL9000 series, an Interpolation Mode has been newly added to the existing Repetitive Sampling Mode and Interleave Sampling Mode. It interpolates between the actual data and realizes a sampling rate equivalent to 250GS/s. Up to 2.5TS/s is available when "Repetitive Mode" is off. This is comparable to a sampling rate more than six fold of the 40GS/s DSO.

Theoretically, when measuring the signals within the analog bandwidth, waveforms can be realized if a certain amount of over-sampling is carried out. (2.5 fold of the frequency for Sin waves.)

The DL9140 Series can measure 5GS/s in the 1 GHz bandwidth (five fold of over-sampling) and the DL9240 Series can measure 10GS/s in the 1.5 GHz bandwidth (over six fold of over-sampling.) This can faithfully reproduce the measured waveform. Furthermore, as it is possible to measure high sampling rates with the Interpolation Mode, it can measure the time it crosses the vicinity of the slice level and can read time and voltage levels in more detail with the marker or cursor.

It goes without doubt that the 250G or 2.5TS/s DSO with a built-in Interpolation Mode exceeds the performances by 40GS/s DSO.
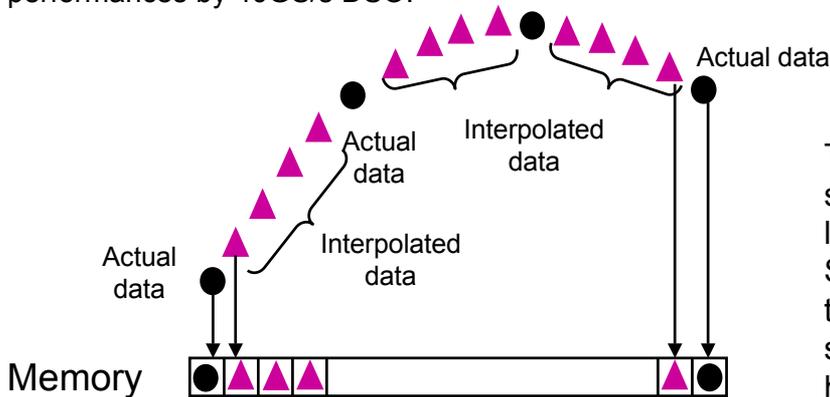

The interpolated data is stored into the memory just like real data.
Since the data is considered to be real sampling data, the sampling speed appears to have improved.

- Equivalent to a high sampling of max 250GS/s or 2.5TS/s

- Realizes parameter calculations of 4ps or 0.4ps resolution even for single shot waveforms

- Max. 0.4ps resolution enabled cursor-based timing measurement

- Maintains sufficient number of data for various calculations

Sufficient Filtering Performance

It is highly productive to have a circuit that is designed to observe signals by filtering the unwanted signal components. The DL9000 Series has two types of built-in filters; filtering in the entry stage and during the high speed calculation process. Unwanted signal components can be filtered while importing the signals as well as after importing the waveforms by carrying out high speed filtering processes.
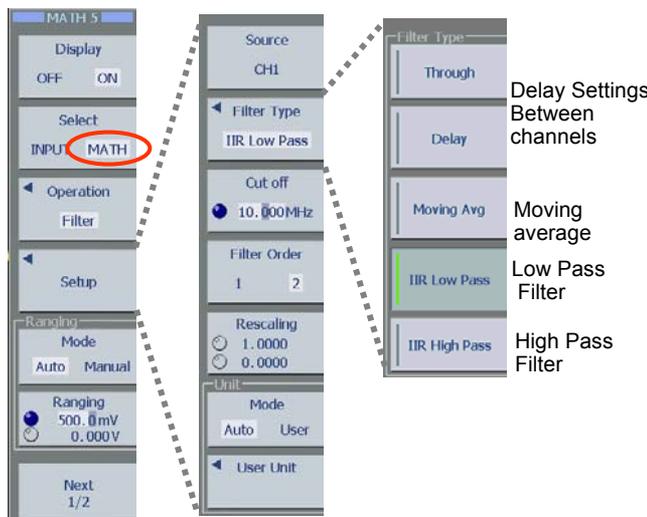
- **Filtering during the entry stage:** analog filtering and digital filtering in real time
  - 200MHz/20MHz (analog filtering
  - 8MHz/4MHz/2MHz/1MHz/500kHz/200kHz/125kHz/62.5kHz/32kHz/16kHz/8kHz (digital filtering: Yokogawa is the only company that covers the lower bandwidth)
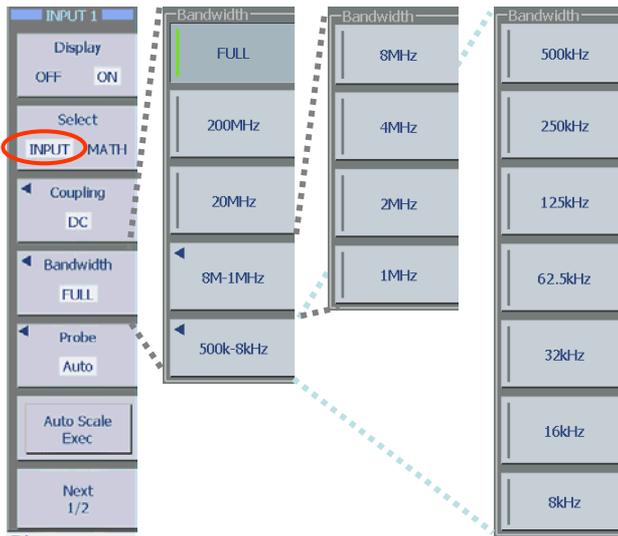
Examples of filtering in the early stages

1MHz/500kHz/250kHz/125kHz
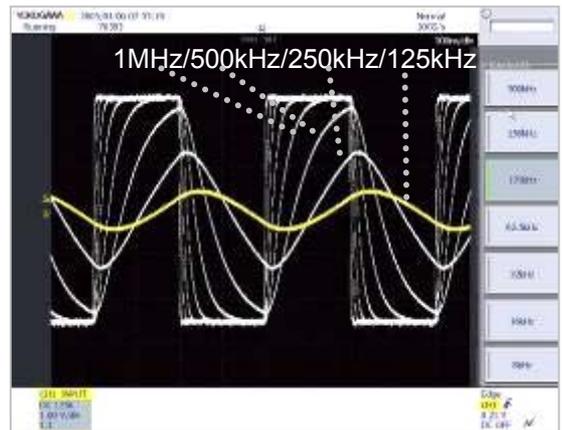
- **Filtering by calculation:** Select low pass/high pass filters and set up optional cut off frequencies
  - Checks the waveform after filtering in real time by carrying out high speed calculations of max 60 screens/sec
  - Displays the original waveforms before and after filtering at the same time
  - Optional filtering setting: low pass/high pass filtering and cut off frequencies can be set between 0.01Hz to 1.0GHz

Filtering calculation
(above: original waveform below: filtered waveform)

Delay Settings Between channels

Moving average

Low Pass Filter

High Pass Filter