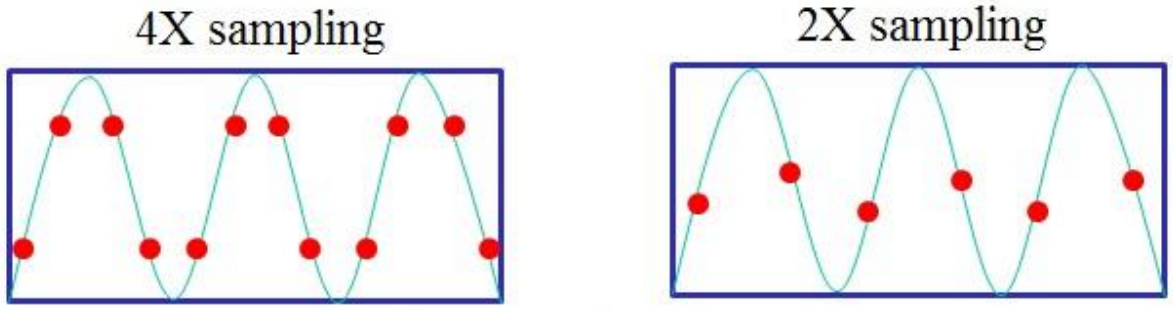
Classification	☐ tDS/tGW/tSH ☐ PETL/tET/tPET ☐ DS/PDS/PPDS ☐ tM-752N ☑ I/O Card ☐ VXC Card ☐ TouchPAD/HMIWorks ☐ VxComm				
Author	Tammy	**Date**	2017-11-23	**NO.**	FAQ-026

Q: What's difference between the signal source frequency and the AD sampling rate?

A: Even though the AD (Analog-to-Digital conversion) sampling rate can be thought of as a kind of frequency, the concept is very different from the frequency of the signal source. The frequency of the signal source refers to the **pulses** per second, while the AD sampling rate refers to the **AD samples** per second. Usually we record many AD samples for each pulse for reference.

When using an AD card to measure a 250 KHz signal source at a sampling rate of 1 MHz, approximately 4 AD samples will be recorded for each pulse (e.g., as denoted by the term "4X sampling" in the figure below).
1,000,000 samples / 250,000 pulses = 4 samples per pulse.

When the 1 MHz sampling rate is shared by 2 channels, the sampling rate for each channel is reduced to 500 KHz. Consequently, approximately 2 AD samples will be recorded for each pulse (e.g., as denoted by the term "2X sampling" in the figure below).



Signal source (green) and sampling points (red)



Redrawn Signal based on the recorded samples

Note: A higher sampling rate can be used to reduce the distortion. To obtain usable information, you first need to determine the frequency of your signal source and then select a suitable AD sampling rate.

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