Frequency Validation for device1

This is the validation for the sampling frequency. This report was generated automatically.

Methods

A senoidal signal with a **500.000 Hz** frequency, amplitude of **1.00 V**, and offset of **0.500V** was given to the transmitter and its frequency was measured at the receiver.

The supposed sampling frequency was **2040.000 Hz**, the signal was sampled for **600.000 seconds**, and the FFT (to calculate the frequency) was calculated every **2.000 seconds**.

In order to calculate the sampling frequency, the signal frequency was supposed to be static (even though it is widely known that it admits a little fluctuation, which is also shown in the results).

The sampled signal was generated by a SIGLENT SDG 830 function generator.

Results and discussion

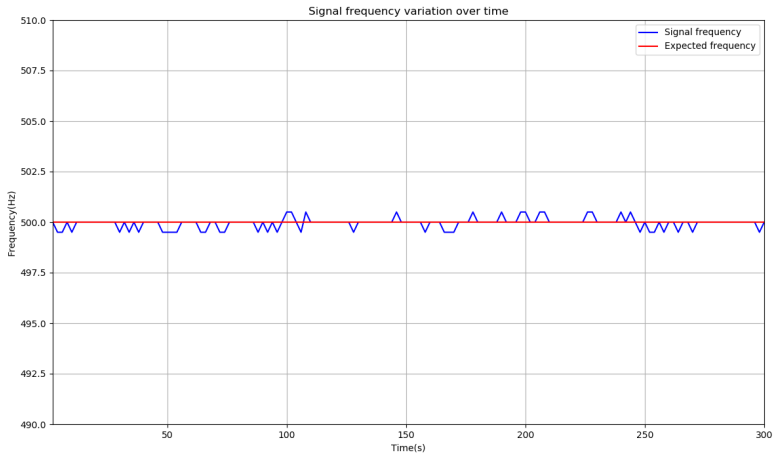
Signal frequency variation

The following table analyzes the signal frequency that was measured.

Unit	Value
Expected frequency	**500.000Hz**
Mean frequency ± std*	**499.947±0.266Hz**
Maximum measured frequency	**500.500Hz**
Mininum measured frequency	**499.500Hz**

* Unbiased standard deviation. Same as Matlab's one.

It is important to notice that the maximum deviation from the expected valued of ***500.000Hz*** was **0.100%** for values below it, **0.100%** for values above it, and **0.011%** for the mean. The following plot shows this variation



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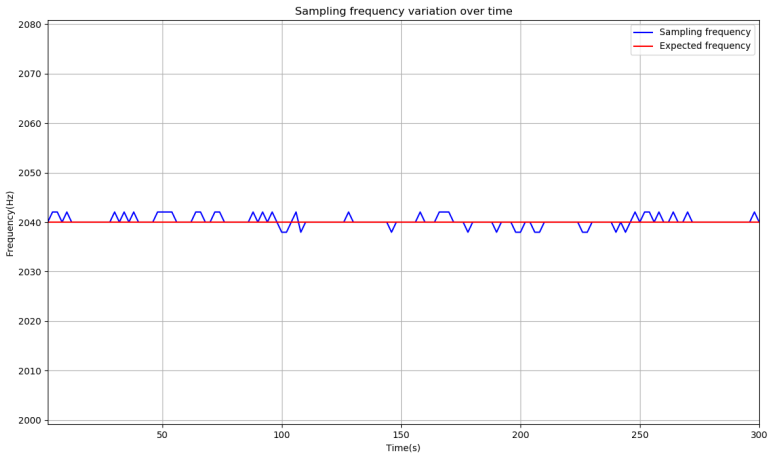
Sampling frequency variation

The following table analyzes the sampling frequency that was measured.

Unit	Value
Expected frequency	**2040.000Hz**
Mean frequency ± std*	**2040.218±1.087Hz**
Maximum measured frequency	**2042.042Hz**
Minimim measured frequency	**2037.962Hz**

* Unbiased standard deviation. Same as Matlab's one.

It is important to notice that the maximum deviation from the expected valued of ***500.000Hz*** was **0.100%** for values below it, **0.100%** for values above it, and **0.011%** for the mean. The following plot shows this variation


Sampling frequency variation over time
Sampling frequency
Expected frequency
Frequency(Hz)
Time(s)
2080
2070
2060
2050
2040
2030
2020
2010
2000
50
100
150
200
250
300

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