

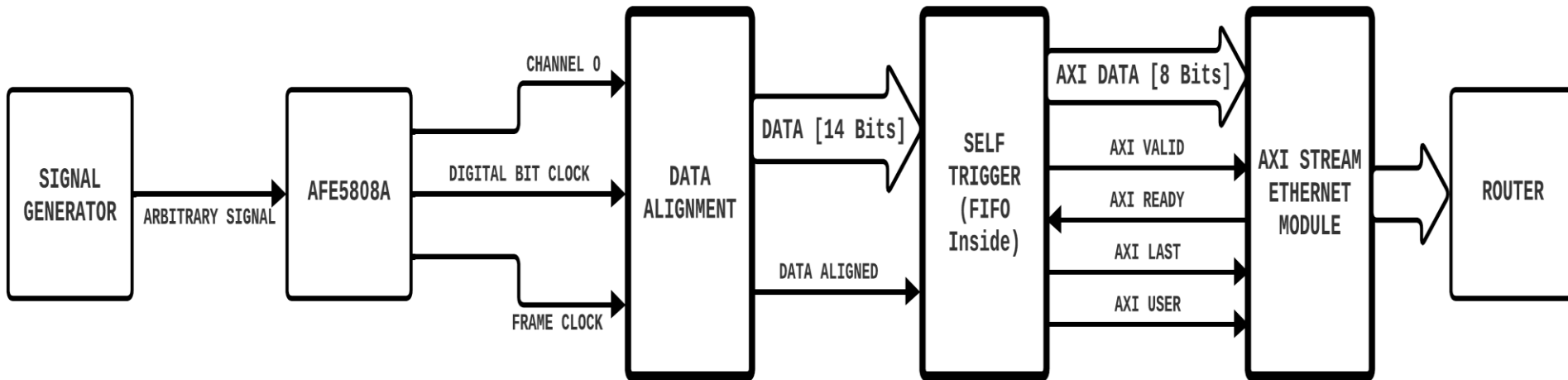
# EIA's DAPHNE V1 Firmware (VHDL) and Self trigger algorithms

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# Trigger algorithm architecture



# Link to the firmware repository

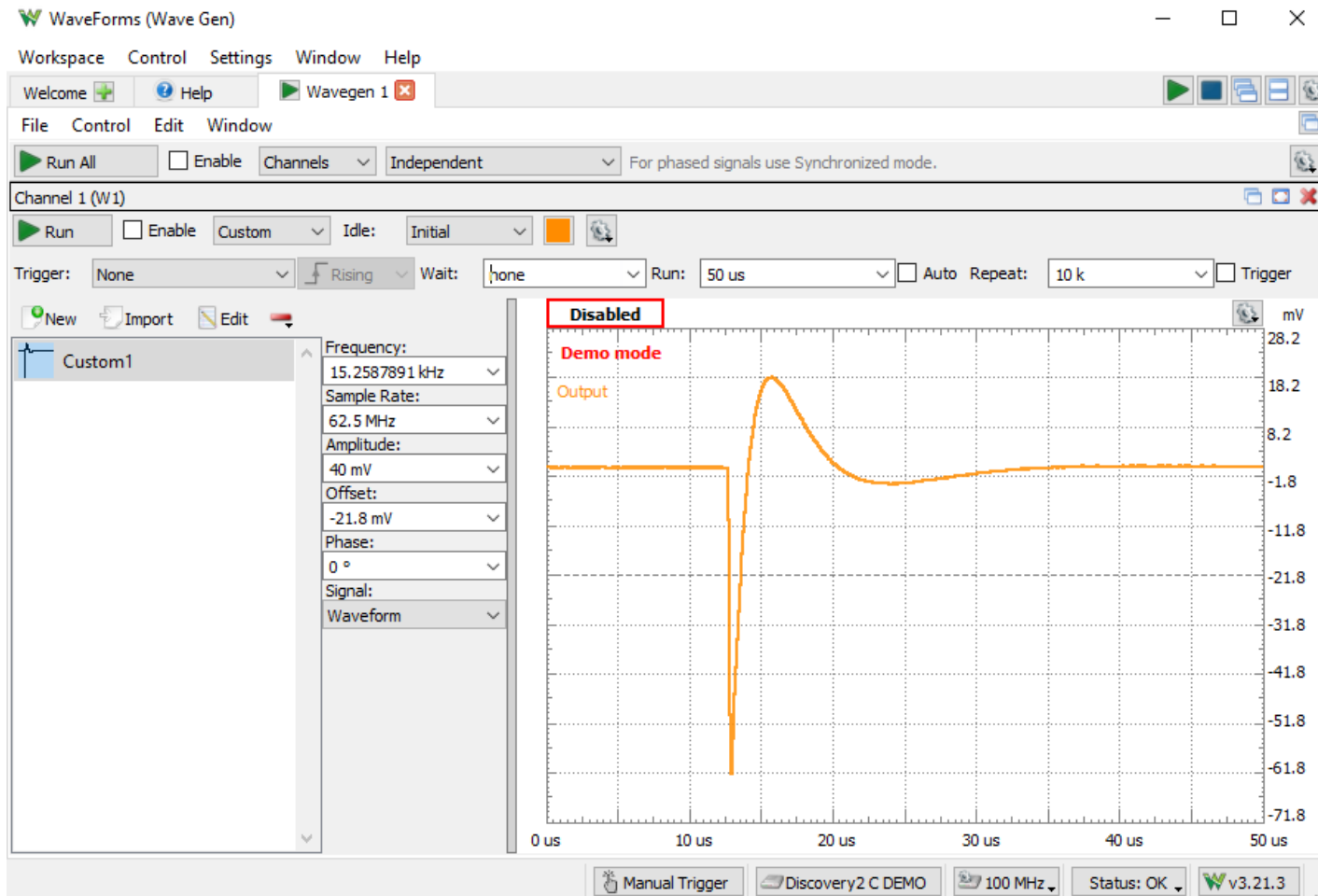
- [https://github.com/edgar-rincon-g/DAPHNE\\_V1.git](https://github.com/edgar-rincon-g/DAPHNE_V1.git)



# Testbench setup



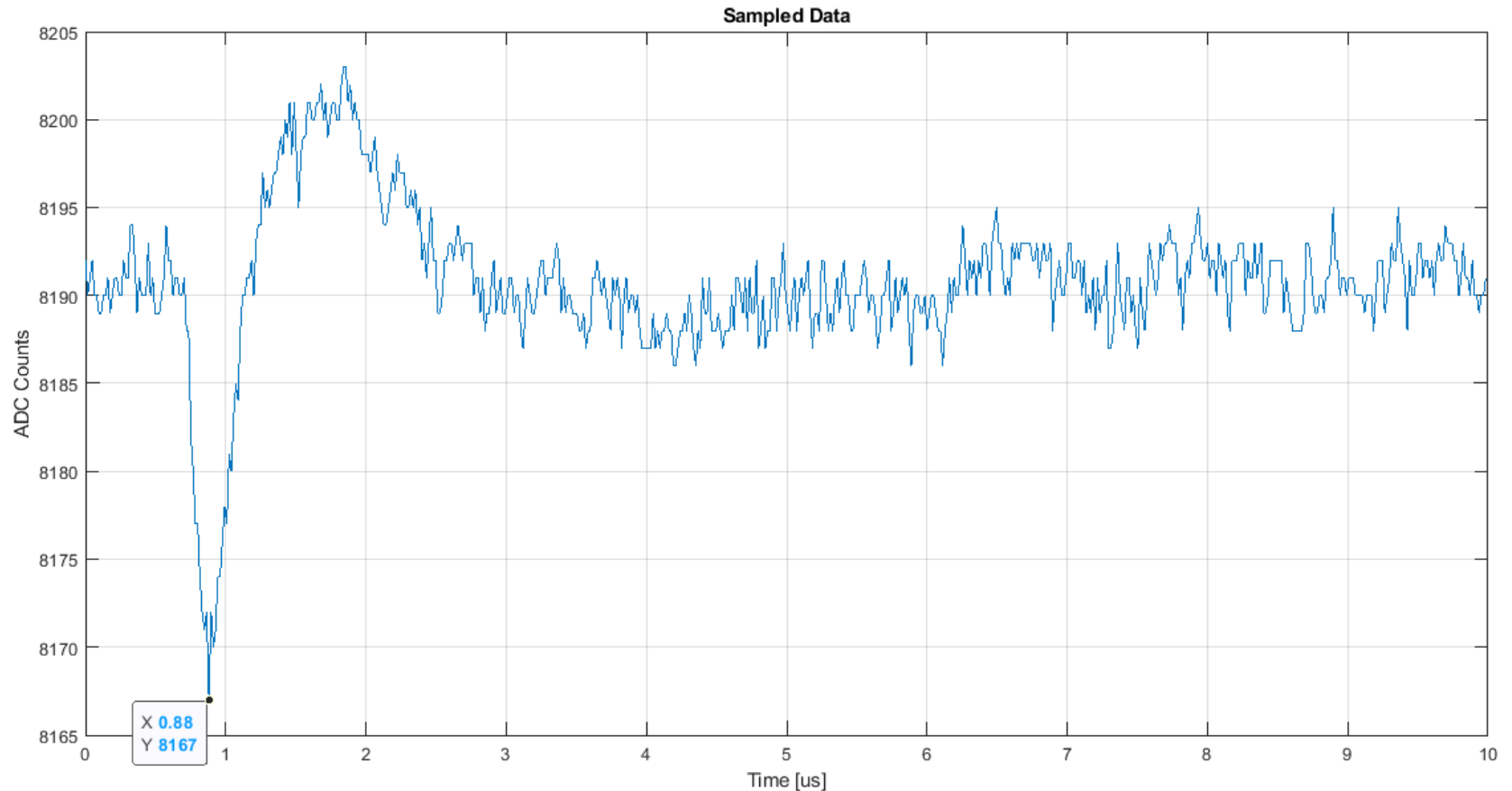
# Configuring the event template



# Statistical tests using matching filters

<b>Board</b>	DAPHNE V1		
<b>Signal Type</b>	Amplitude 40 mV - Offset -21,8 mV (Approx. 25 ADC Counts)		
<b>Signal Generator</b>	Analog Discovery 2 Digilent		
<b>AFE5808A Config</b>	100 Ohms Actv. Resistor + Clamp 1,5Vpp + LNA Integrator Enabled 12 dB + PGA Integrator Enabled PGA Gain 24 dB + VGAIN 4000		
<b>Threshold Level</b>	XCorr Value Above 5000		
<b>Quantity of Generated Events</b>	10000 Events		
<b>Medida</b>	<b>Description</b>	<b>Range</b>	<b>Result</b>
Events detected	How many events were detected with the above conditions	[0-100]	100,00%
Time for detection	How much time since the data arrives at the entrance of the detection module passes before asserting a trigger	[sec]	0,00000032
DSP's usage	How much available DSP resources were used	[0 - 100]	90,00%
FF o Lookup tables usage	How much FF's and lookup tables available resources were used	[0 - 100]	0,00%

# Event detected using matching filter algorithm



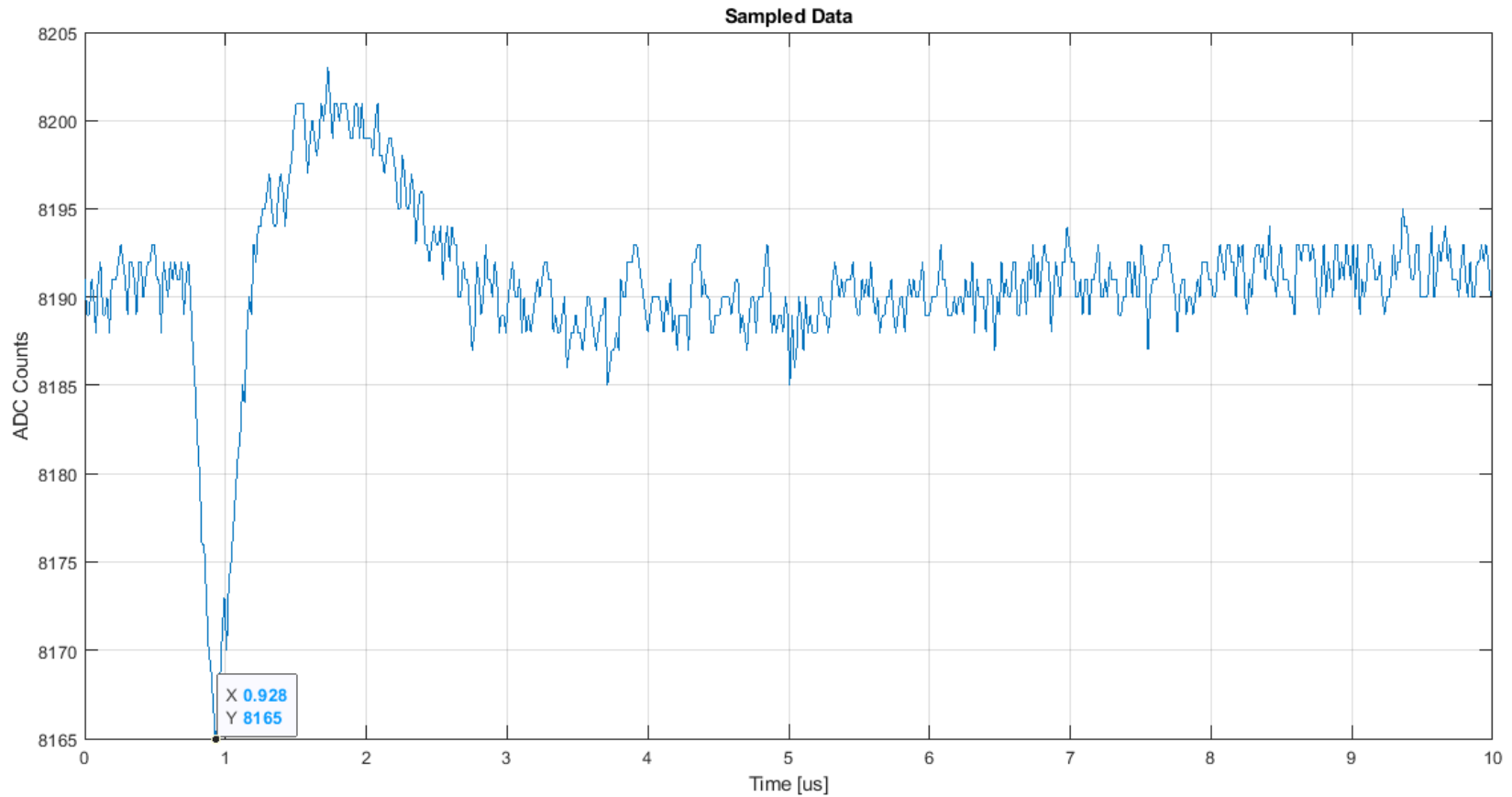
# Statistical tests using neural networks

<b>Board</b>	DAPHNE V1		
<b>Signal Type</b>	Amplitude 40 mV - Offset -21,8 mV (Approx. 25 ADC Counts)		
<b>Signal Generator</b>	Analog Discovery 2 Digilent		
<b>AFE5808A Config</b>	100 Ohms Actv. Resistor + Clamp 1,5Vpp + LNA Integrator Enabled 12 dB + PGA Integrator Enabled PGA Gain 24 dB + VGAIN 4000		
<b>Threshold Level</b>	Neural Network Sigmoid Prediction Above 1, which means above $2^{(24)} = 16.777.216$		
<b>Quantity of Generated Events</b>	10000 Events		
<b>Medida</b>	<b>Description</b>	<b>Range</b>	<b>Resultado</b>
Events detected	How many events were detected with the above conditions	[0-100]	100,00%
Time for detection	How much time since the data arrives at the entrance of the detection module passes before asserting a trigger	[sec]	0,000000608
DSP's usage	How much available DSP resources were used	[0 - 100]	151351,35%
FF o Lookup tables usage	How much FF's and lookup tables available resources were used	[0 - 100]	0,00%





# Event detected using neural network algorithm



**Thanks!**

