

Instrumentação Virtual

Test and Measurement Solutions for Students in the

Lab and at Home

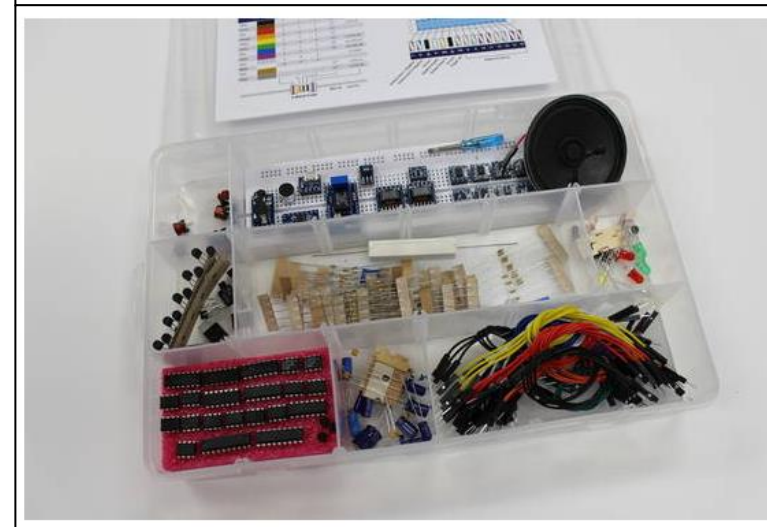
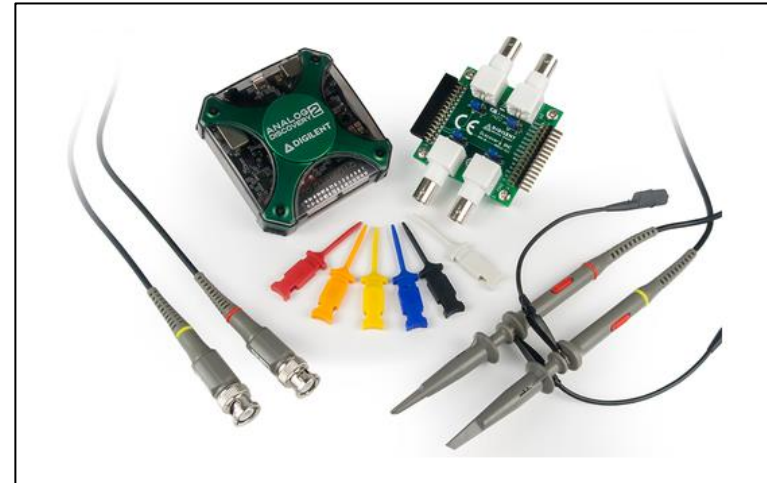


ADALM2000

Advanced Active Learning Module



1. Oscilloscope
2. Spectrum Analyzer
3. Network Analyzer
4. Signal Generator
5. Logic Analyzer
6. Pattern Generator
7. Digital IO
8. Voltmeter
9. Power Supply

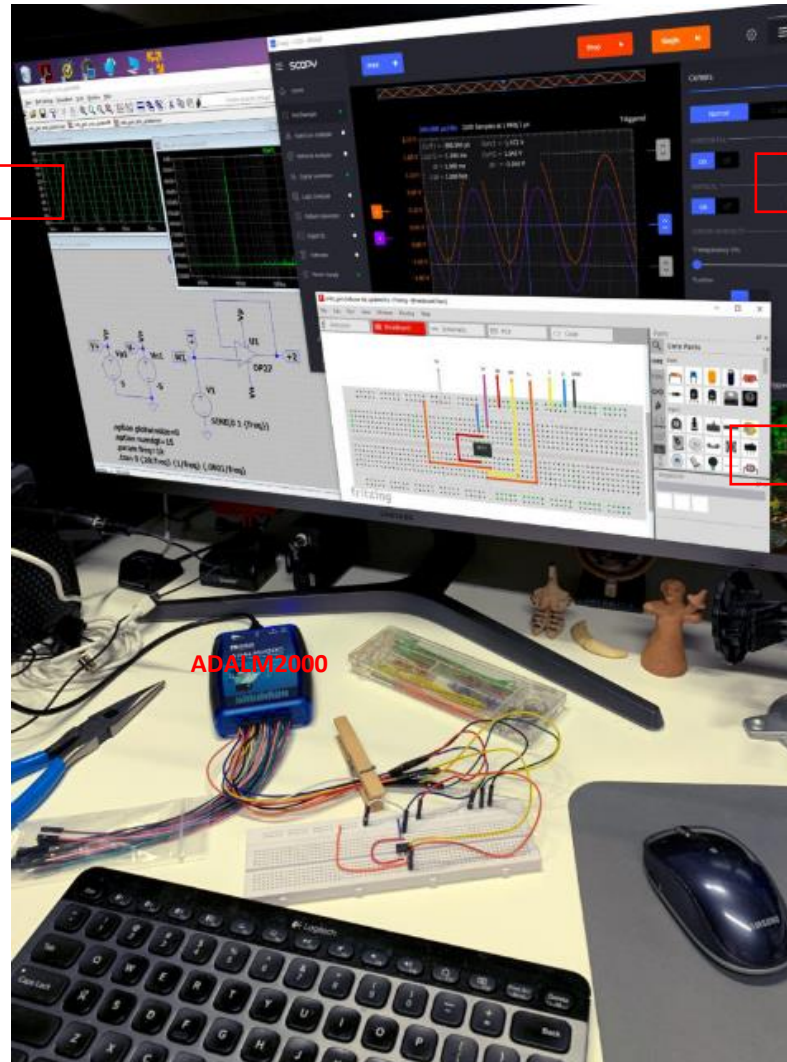
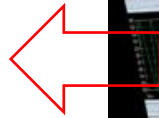


- Oscilloscope
- Waveform Generator
- Power Supplies
- Voltmeter
- Data Logger
- Logic Analyzer
- Pattern Generator
- Static I/O
- Spectrum Analyzer
- Network Analyzer
- Impedance Analyzer
- Protocol Analyzer
- Script Editor



ADALM2000 | Advanced Active Learning Module

Simulação de Circuitos (**LTSpice**)



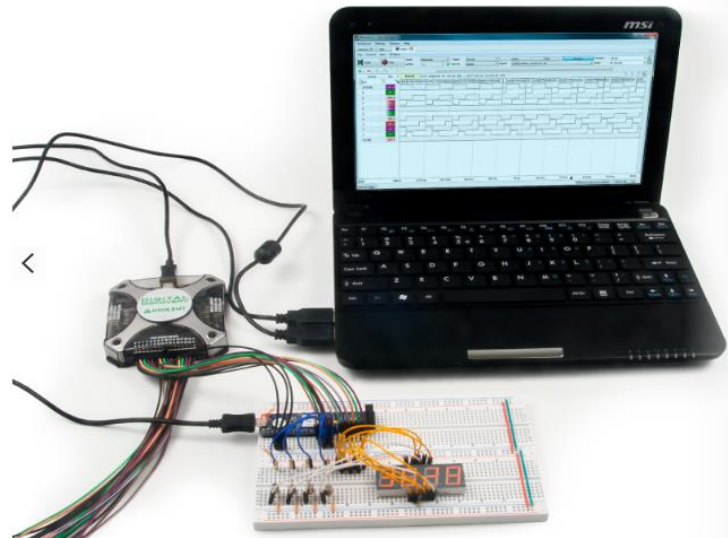
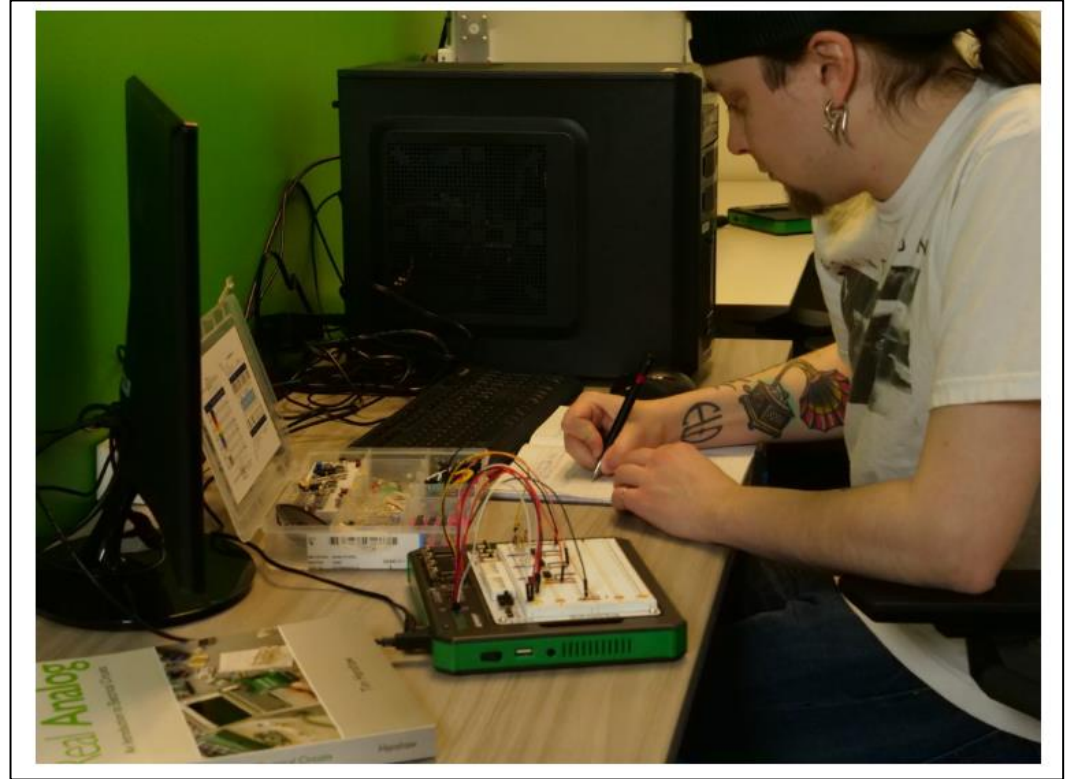
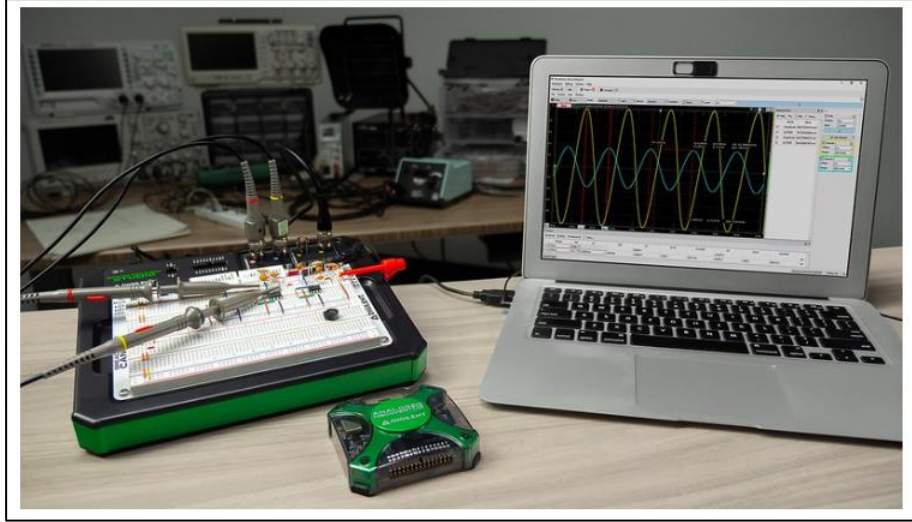
ADALM2000

Simulação de um Osciloscópio no **ADALM2000 | Software Scopy** (Analog Devices | USA)



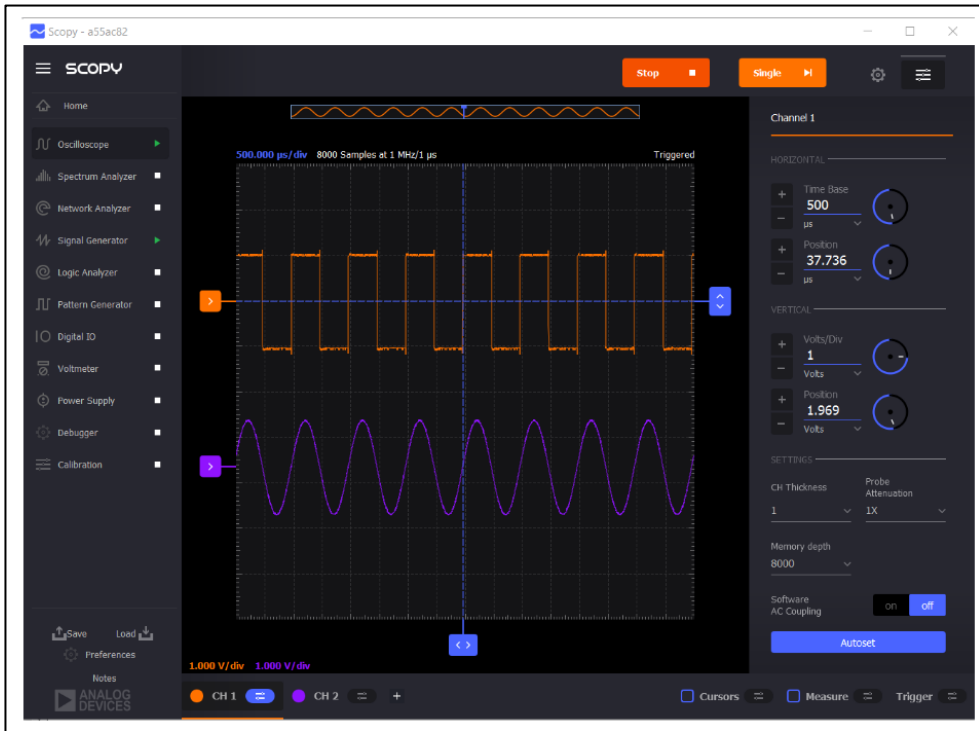
Simulação de Protoboard (**Fritzing**)



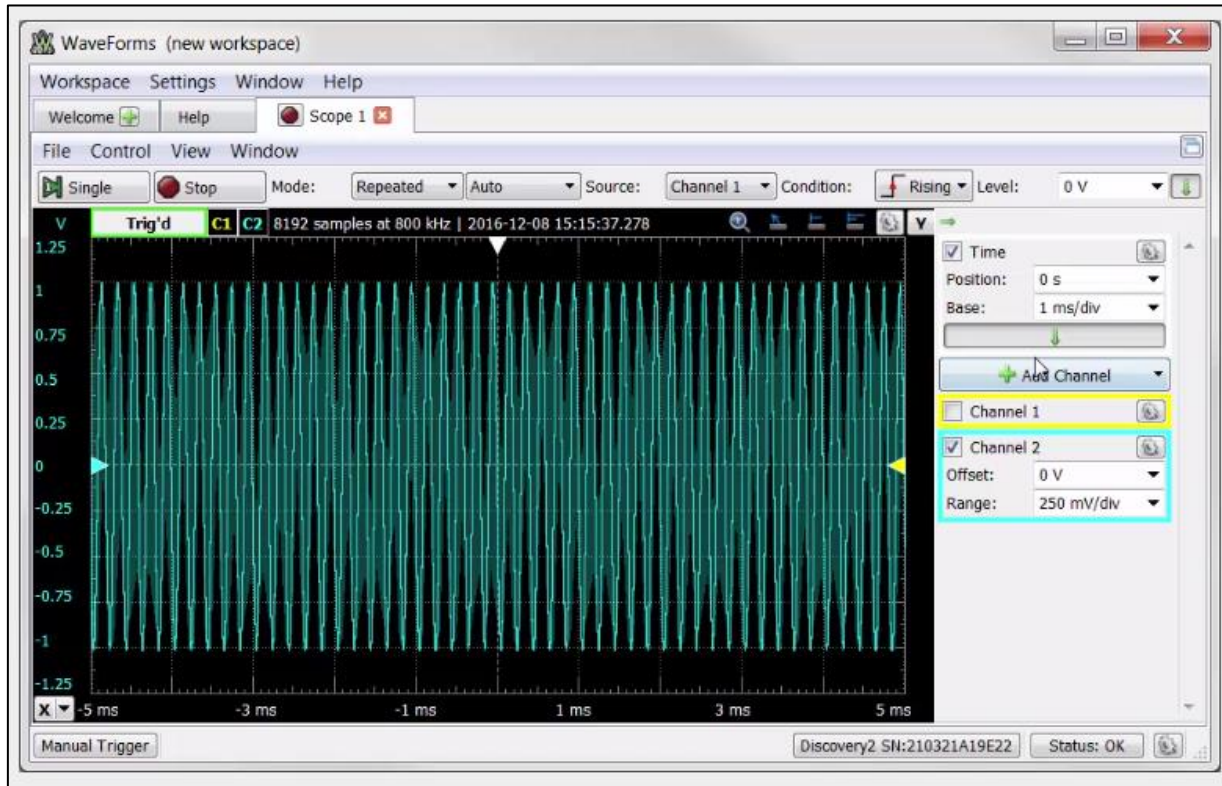


Oscilloscope

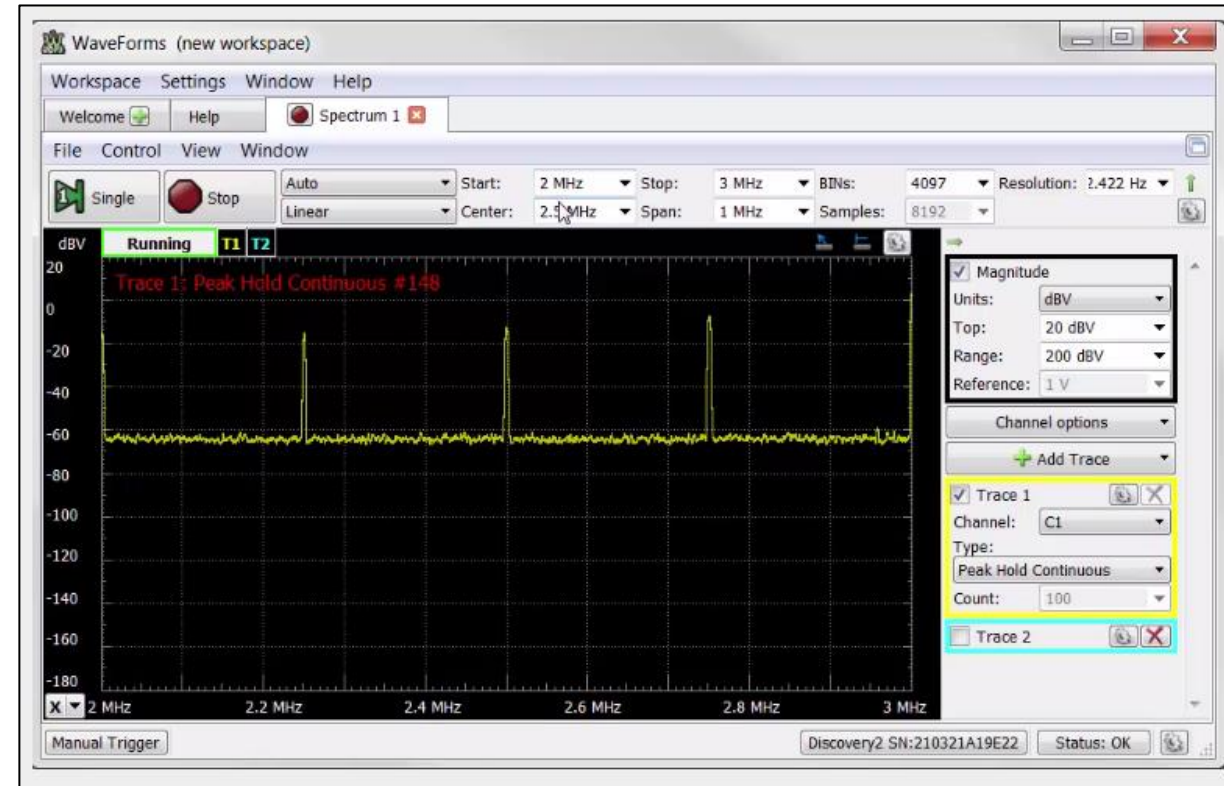
Spectrum Analyzer

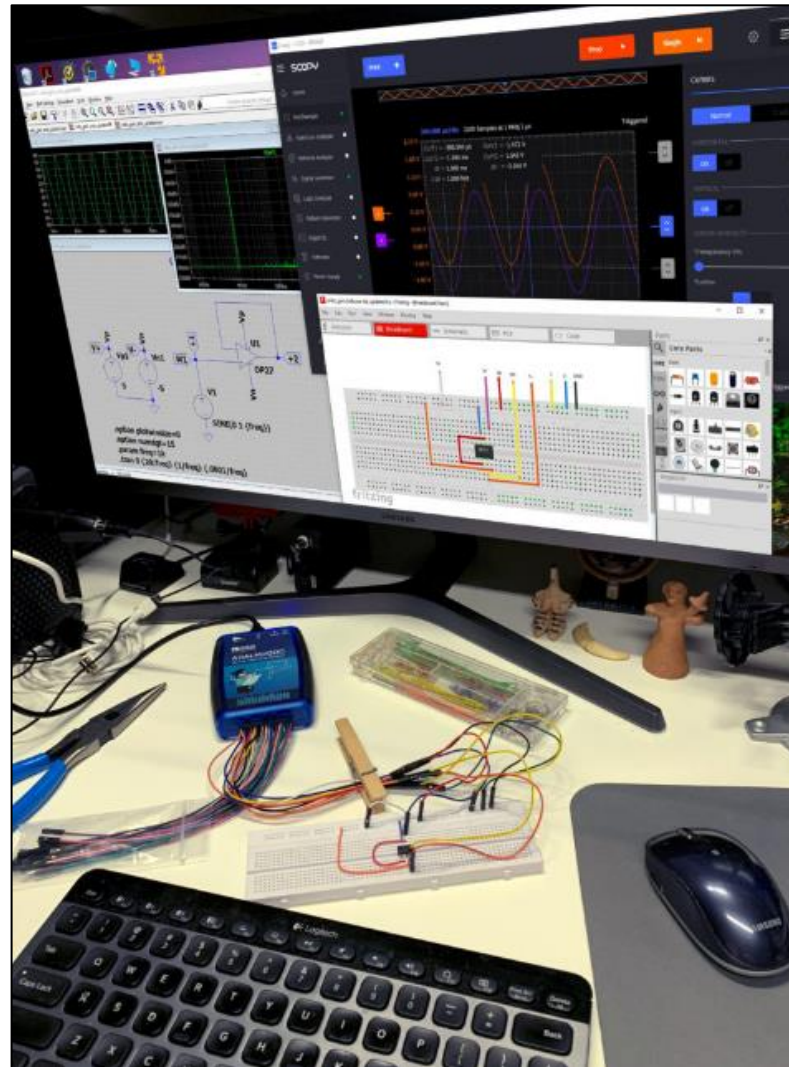


Oscilloscope

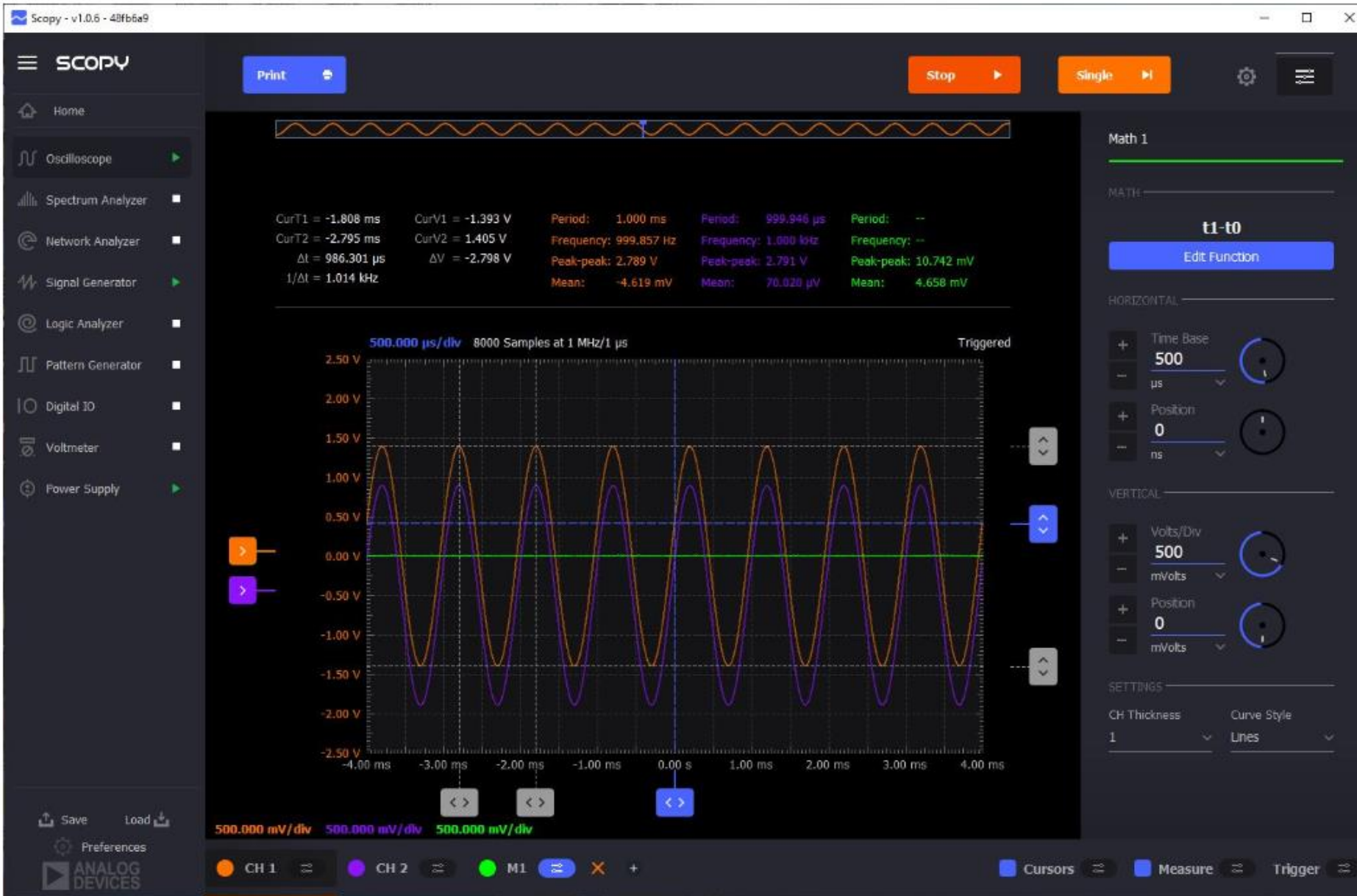


Spectrum Analyzer



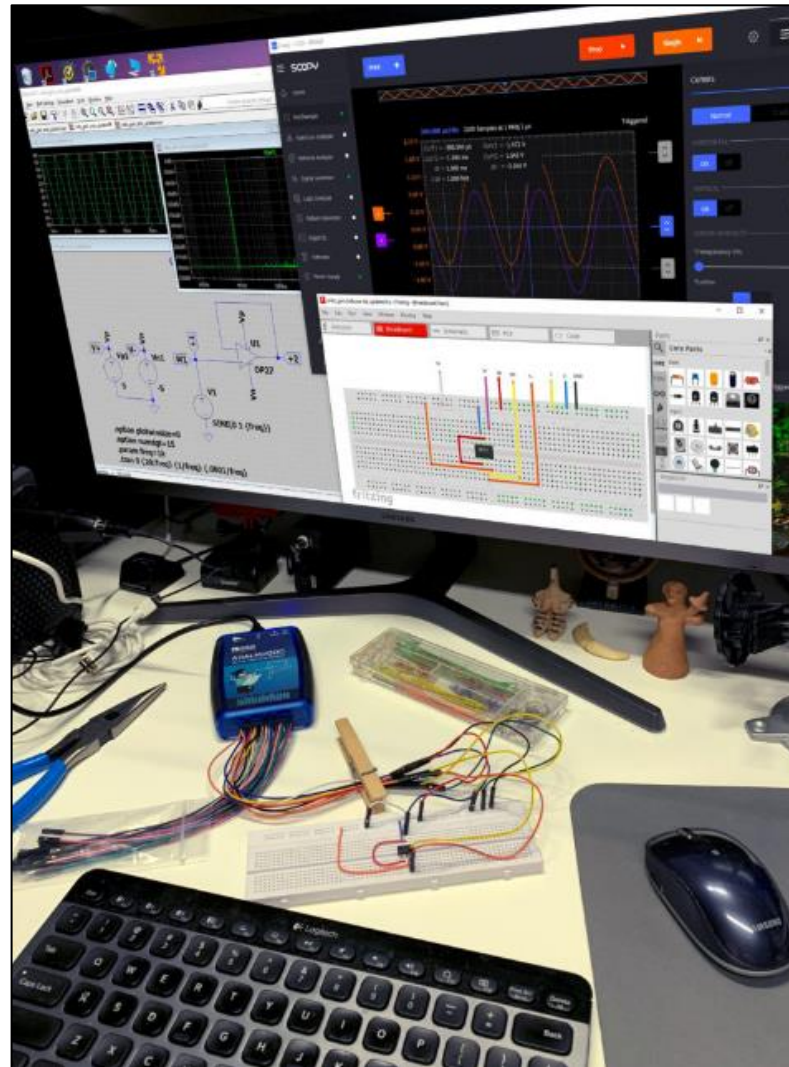


**Osciloscópio Virtual
(ADALM2000)**



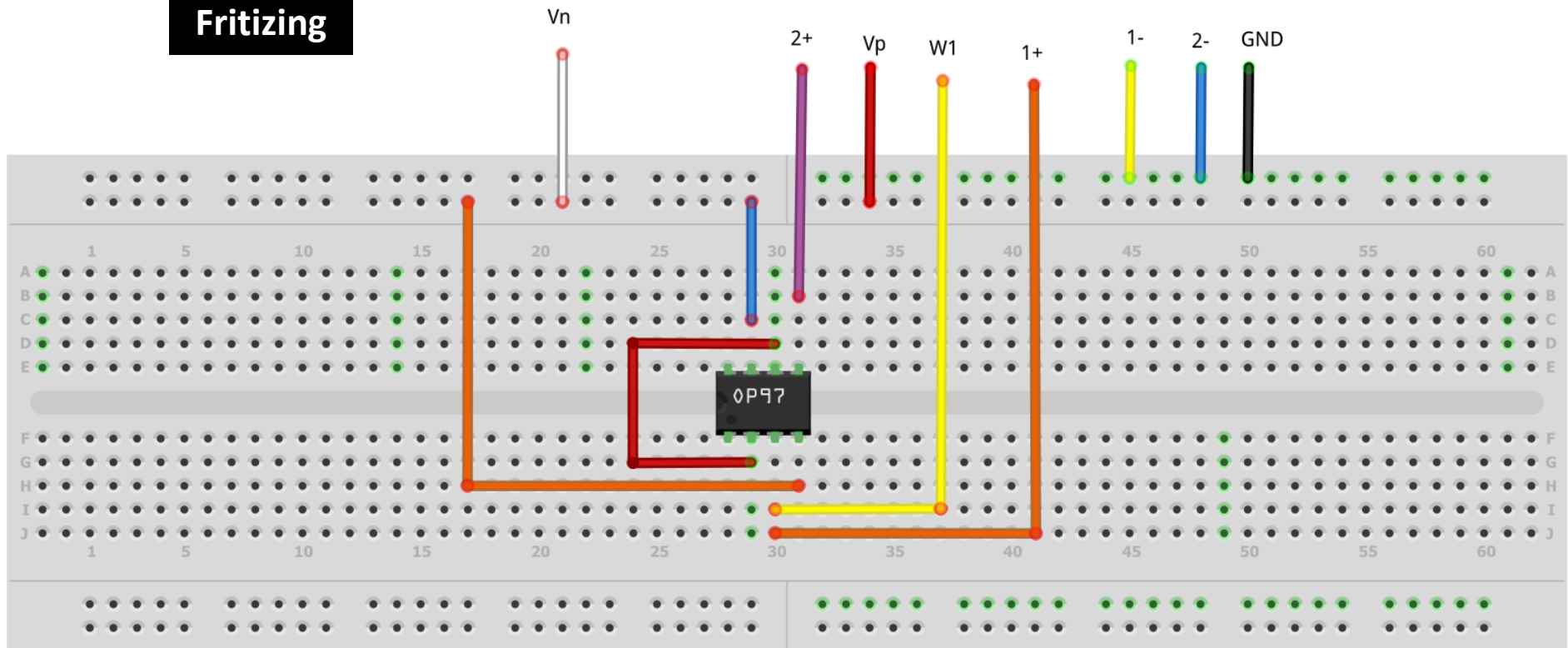
Osciloscópio Virtual (ADALM2000)

Scopy Oscilloscope Traces for OP97 Unity Gain Follower: Input, Output and math (Output - Input)



Fritizing

Fritzing



Componentes

Core Parts

CORE Básico

MINE

Entrada

Seed

Intel

PA

Salida

CON TRIB

Arduino

Propriedades

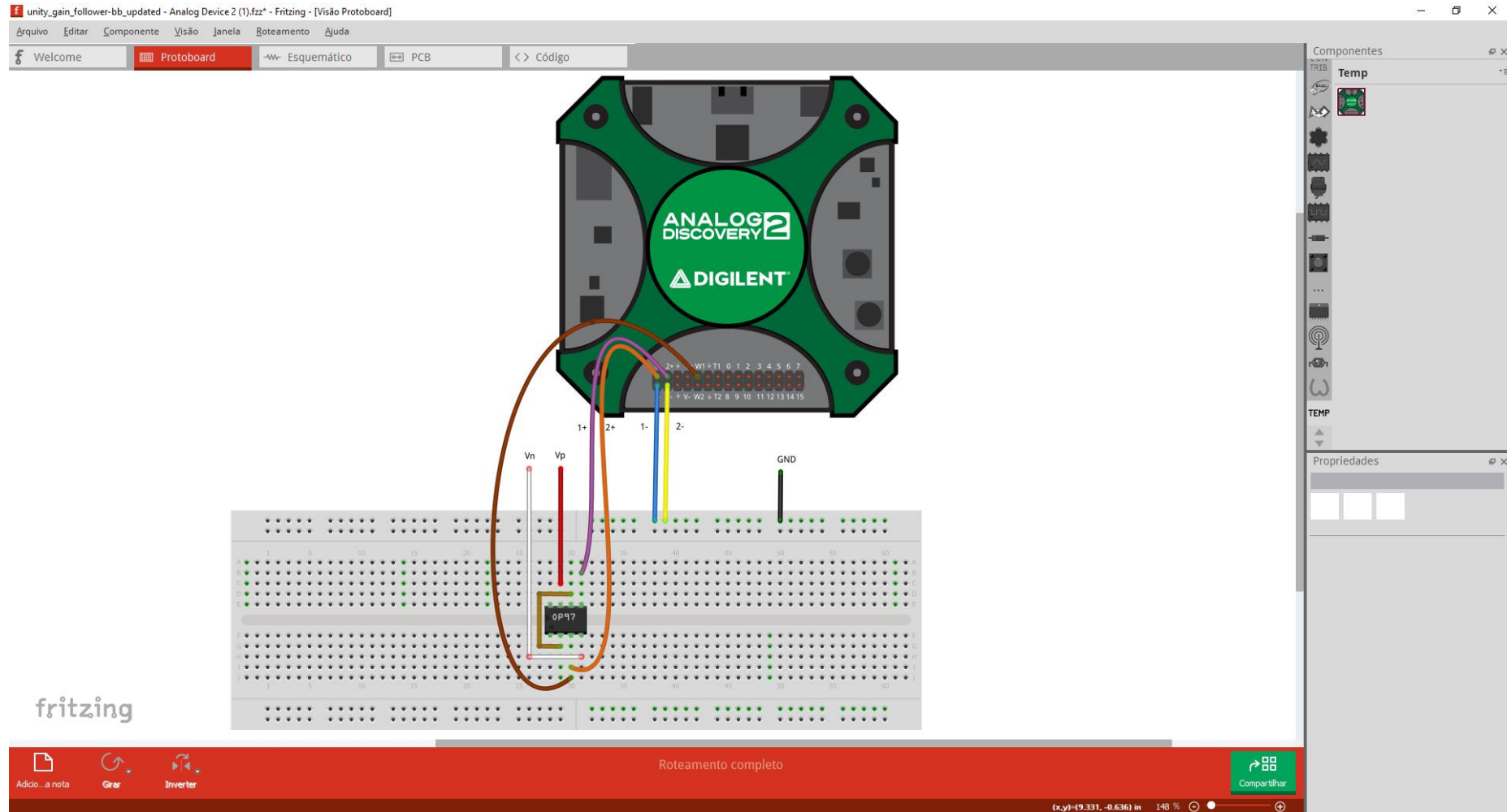
fritzing

Adição...a nota Girar Inverter

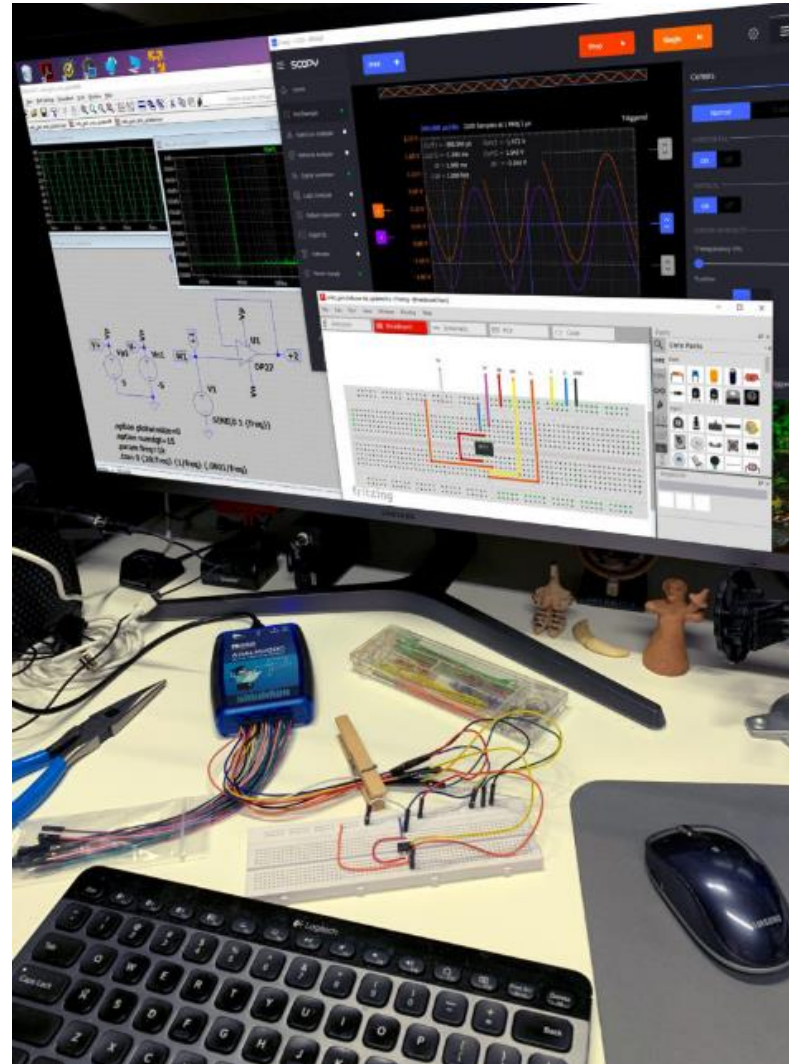
Não existem ligações para rotear

Compartilhar

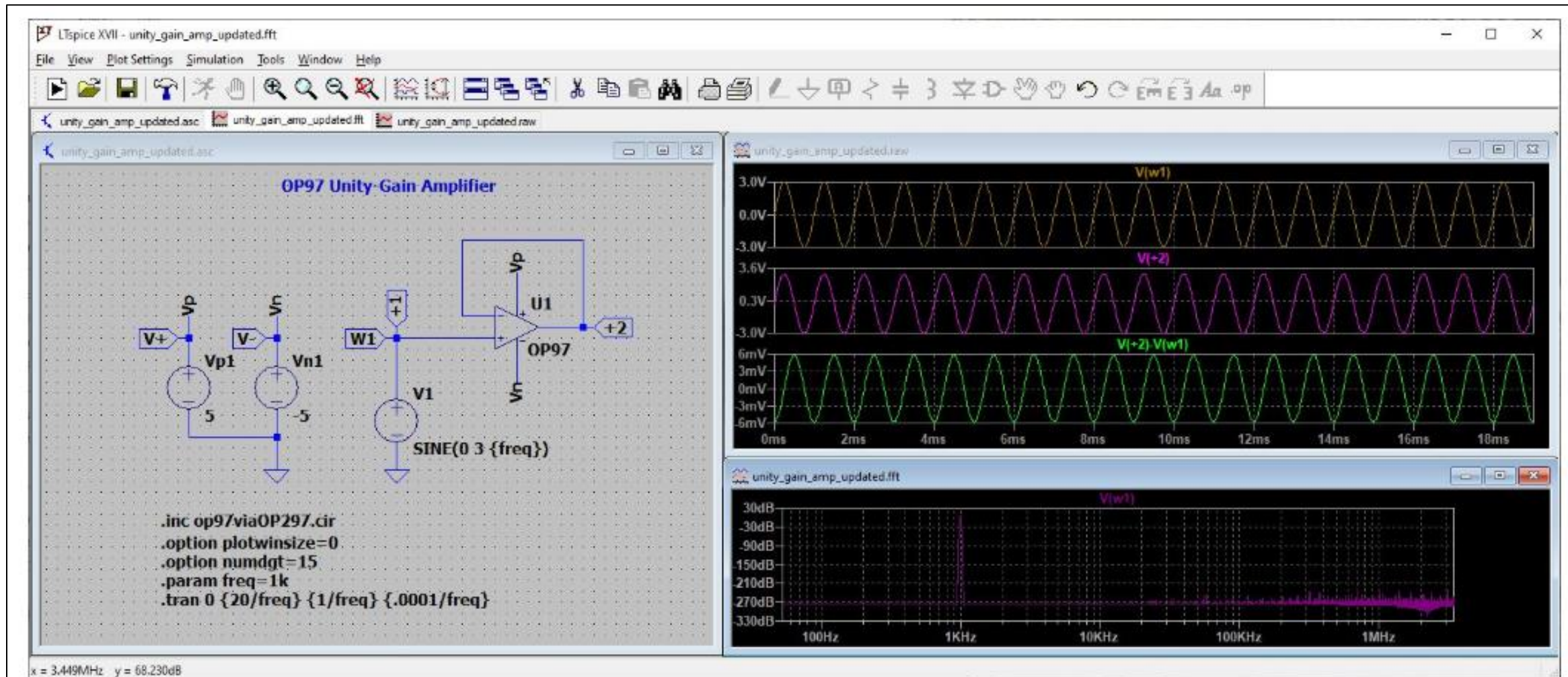
É importante mostrar as conexões entre a instrumentação virtual e o protoboard ! O símbolo do Analog Discovery 2 pode ser inserido na biblioteca de componentes.



**LTSpice
(Simulator Circuit)**



LTSpice (Simulator Circuit)



LTSpice Simulation of OP97 Unity Gain Follower Circuit: Input $V(w1)$, Output $V(+2)$, Difference $V(+2)-V(w1)$ and FFT on Input $V(w1)$

Tutorials

- **Analog Electronics**
- Mixed Signal Electronics Systems
- Signals and Systems

Analog Electronics

Table of Contents:

Operational Amplifiers:

1. Ideal Voltage Feedback (VFB) Op Amp (MT-032)
 - I. Inverting Amplifier (MT-213)
 - II. Inverting Summing Amplifier (MT-214)
 - III. Half Wave Rectifier (MT-212)
 - IV. Full Wave Rectifier (MT-211)
2. Current Feedback (CFB) Op Amps (MT-034)
3. Voltage Feedback Op Amp Gain and Bandwidth (MT-033)
4. Open Loop Gain and Open Loop Gain Nonlinearity (MT-044)
5. Bandwidth and Bandwidth Flatness (MT-045)
6. Settling Time (MT-046)
7. High Speed Voltage Feedback Op Amps (MT-056)
8. Input Offset Voltage (MT-037)
9. Total Output Offset Voltage Calculations (MT-039)
10. Chopper Stabilized (Auto-Zero) Precision Op Amps (MT-055)
11. Input Bias Current (MT-038)
12. Input Impedance (MT-040)
13. Power Supply Rejection Ratio (PSRR) and Supply Voltages (MT-043)
14. Input and Output Common-Mode and Differential Voltage Range (MT-041)
15. Common-Mode Rejection Ratio (CMRR) (MT-042)
16. Outputs, Single-Supply, and Rail-to-Rail Topics (MT-035)
17. Output Phase-Reversal and Input Over-Voltage Protection (MT-036)

Instrumentation Amplifiers

1. Basic Two Op Amp In-Amp Configuration (MT-062)
2. Basic Three Op Amp In-Amp Configuration (MT-063)
3. In-Amp DC Error Sources (MT-064)
4. Auto-Zero In Amps (MT-067)
5. In-Amp Noise (MT-065)
6. In-Amp Bridge Circuit Error Budget Analysis (MT-066)
7. Difference and Current Sense Amplifiers (MT-068)
8. In-Amp Input Overvoltage Protection (MT-069)
9. In-Amp Input Radio Frequency Interference Protection (MT-070)
10. A Deeper Look into Difference Amplifiers

Variable Gain Amplifiers (VGAs)

1. Precision Variable Gain Amplifiers (MT-072)
2. High Speed Variable Gain Amplifiers (MT-073)

Comparators

1. Comparator Basics (MT-083)
2. Op Amps As Comparators (MT-084)
 - I. Op Amps as Comparators (PowerPoint Slides)

Logarithmic Amplifiers

1. Log Amp Basics (MT-077)
2. High Frequency Log Amps (MT-078)

Tutorials

- **Analog Electronics**
- Mixed Signal Electronics Systems
- Signals and Systems

Logarithmic Amplifiers

1. Log Amp Basics ([MT-077](#))
2. High Frequency Log Amps ([MT-078](#))

Analog Multipliers

1. Analog Multipliers Basics ([MT-079](#))
2. Mixers and Modulators Overview ([MT-080](#))

Sample / Hold Amplifiers

1. Sample-and-Hold Amplifiers ([MT-090](#))
2. Applying IC Sample-Hold Amplifiers ([AN-270](#))

Analog Switches and Multiplexing

1. Analog Switches and Multiplexers Basics ([MT-088](#))
2. Video Multiplexers and Crosspoint Switches ([MT-089](#))

Voltage References:

1. Voltage References ([MT-087](#))

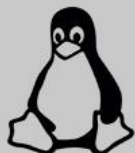
Analog Circuit Simulation

1. Analog Circuit Simulation ([MT-099](#))
2. SPICE-Compatible Op Amp Macro-Models ([AN-138](#))

Tutorials



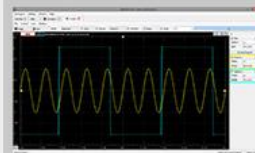
WaveForms Installation:
Windows



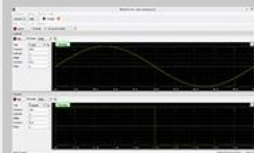
WaveForms Installation:
Linux



WaveForms Installation:
Mac



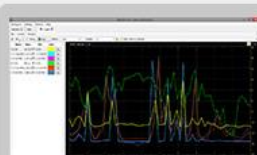
WaveForms Tool:
Oscilloscope



WaveForms Tool:
Waveform Generator



WaveForms Tool:
Power Supplies



WaveForms Tool:
Data Logger



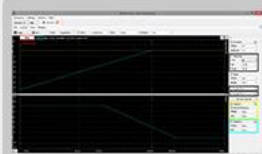
WaveForms Tool:
Logic Analyzer



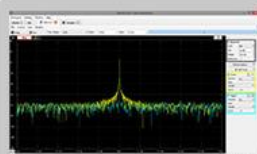
WaveForms Tool:
Pattern Generator



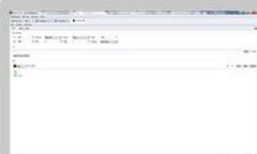
WaveForms Tool:
Static I/O



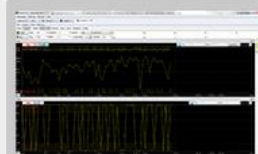
WaveForms Tool:
Network Analyzer



WaveForms Tool:
Spectrum Analyzer



WaveForms Tool:
Protocol Analyzer



WaveForms Tool:
Impedance Analyzer



WaveForms Tool:
Voltmeter



Calibration



Analog Discovery 2
Quick-Start
AD2
Quick-Start
Video Tutorials