NewAE Technology Inc.
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ChipWhisperer® Embedded Security Analysis Tools
Capture Hardware

CW1200: ChipWhisperer-Pro

Product Datasheet

The ChipWhisperer-Pro has been designed to remain compatible with existing ChipWhisperer-Lite interfaces, but adds new features thanks to a larger internal FPGA.

Beyond the ChipWhisperer-Lite, it has a larger internal buffer (98 Ksamples compared to 24 Ksamples), and adds a streaming mode for huge captures at slower speeds, plus a pattern-based trigger for working with real hardware targets.

It also comes with handy accessories, such as a 500 kHz high-pass and a 20 MHz low-pass filter. It's available in a convenient starter pack with a waterproof case (maybe you want to take this on your next hiking trip?).

Product Highlights

10-bit ADC with 105 MS/s sampling rate combined with up to +55 dB gain amplifier measures small signals easily.

Sample up to 10 MS/s with almost unlimited sample size using streaming mode.

Trigger on analog patterns with low-latency hardware-based pattern match trigger.

Advanced synchronous clock locking logic samples target power on related clock edges, drastically reducing sample rate requirements compared to power analysis performed with regular oscilloscopes.

Clock and voltage fault injection possible using FPGA-based pulse generation.

LCD makes monitoring status of capture and hardware easier, and detect problems such as lock jitter causing synchronization failure faster.

Programmers for XMEGA (PDI) and STM32Fx (serial bootloader) targets built in, meaning no external equipment required. For many target boards.

Complete kit includes UFO baseboard, probes for interfacing to target device, and more!

Ordering Summary

NAE-CW1200-KIT Kit of ChipWhisperer-Pro, UFO Base Board, two sample targets, and probes.

Product Links

Full Documentation https://wiki.newae.com/CW1200_ChipWhisperer-Pro
Tutorials and Examples https://wiki.newae.com/

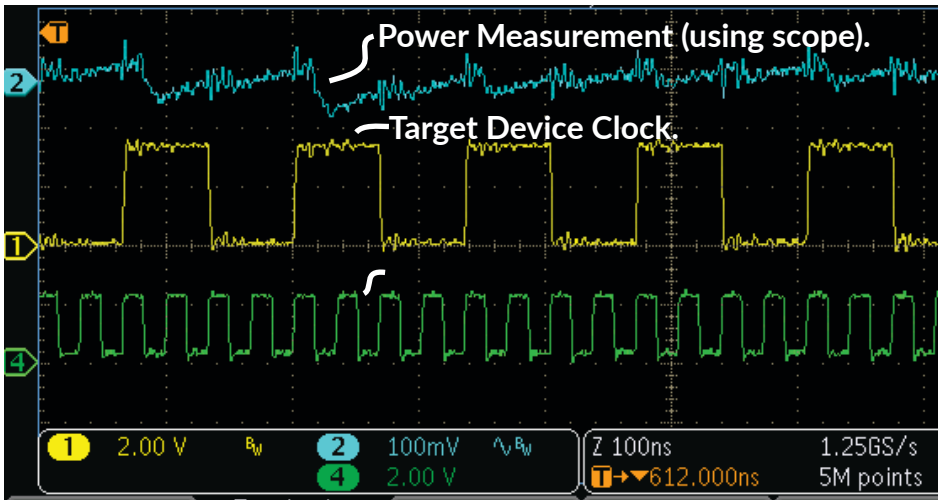
- ChipWhisperer CW1200 Capture Box
- CW308 UFO Baseboard
- CW308T-XMEGA Target
- CW308T-STM32F3 Target
- CW506 Advanced Breakout (Level Shifter)
- H-Field Probe
- Low Noise Amplifier (LNA)
- Differential Probe
- Probe Power Supply (Isolated)
- 20 MHz low-pass filter
- 500 kHz high-pass filter
- SMA to BNC Cable
- SMA to SMA Cable
- CW308T Generic PCB (0.1” spacing prototype board)
- CW308T-STM32F Blank PCB
- USB Cables
- SMA adapters
- 5V power supply

Specifications

Feature	Notes/Range
ADC Specifications	10-bit ADC, 105 MS/s maximum sample rate.
ADC Sample Clock Source	Internal generator, external input (direct or with 4x multiplier or phase adjuster).
Analog Input	AC-Coupled, up to +55dB adjustable gain.
Trigger Sources (Glitch & ADC)	Edge, Level, SPI data, UART data, analog pattern (SAD Trigger).
SAD Trigger	128-point pattern, real-time matching (approx. 4-cycle delay*).
AUX Functions	Trigger In, Trigger Out.
GPIO Types	Serial, clock, logic line (i.e., for reset pin).
GPIO Voltage	3.3V.
Clock Generation Range	5-200 MHz.
Clock Output Type	Regular, with glitch inserted, only output glitch.
Glitch Width (min)	~4nS (depends on cabling used for routing glitch output).
Glitch Offset	Adjustable in < 200pS increments.
Voltage glitch type	High-power and low-power crowbar circuitry.
Crowbar pulse current	20A.
USB Interface	Custom USB firmware, up to 25 MB/s speed.
Streaming Speed	Unlimited buffer size (limited by computer) up to 10 MS/s.
Sample Buffer Size	98119.
Programming Protocols	Atmel ISP (for AVR), Atmel PDI (for XMEGA), STM32Fx Bootloader

* SAD match processing takes 4 ADC cycles after 128-sample match comparison. ADC and capture circuitry has approximately 8 ADC cycle delay between analog front-end and data available internally.

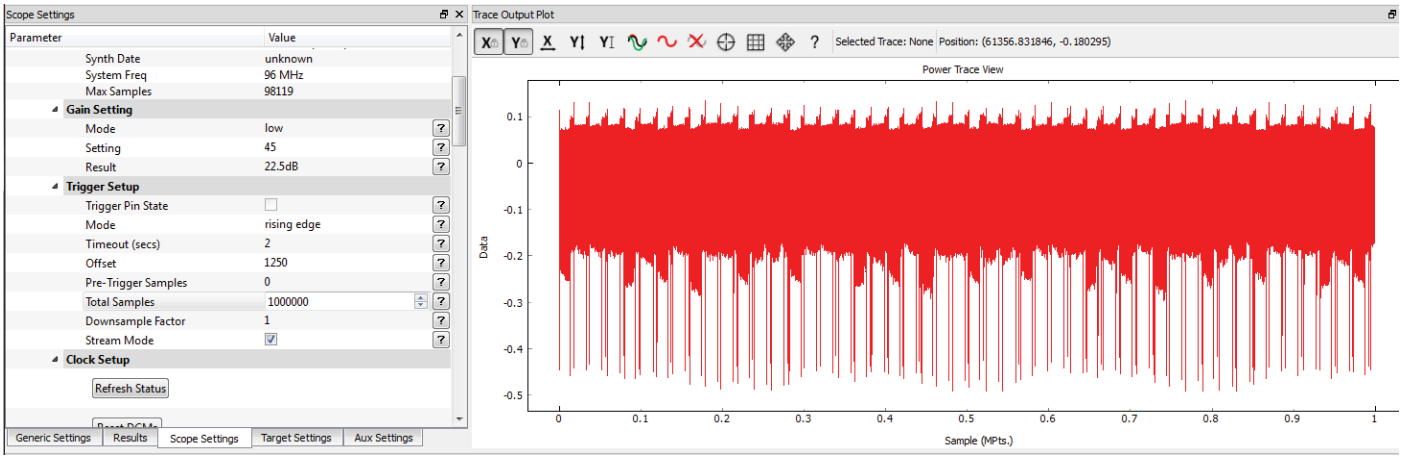
Synchronous Architecture



Our ChipWhisperer capture hardware can use a target device clock and apply multiplications and phase shifts to sample at desired point(s) during the clock cycle. This ensures sample points are directly related to the digital clock which generates the signals of interest. The result is many devices can be successfully attacked with 5-100x slower sample clock compared to a regular oscilloscope.

Stream Mode

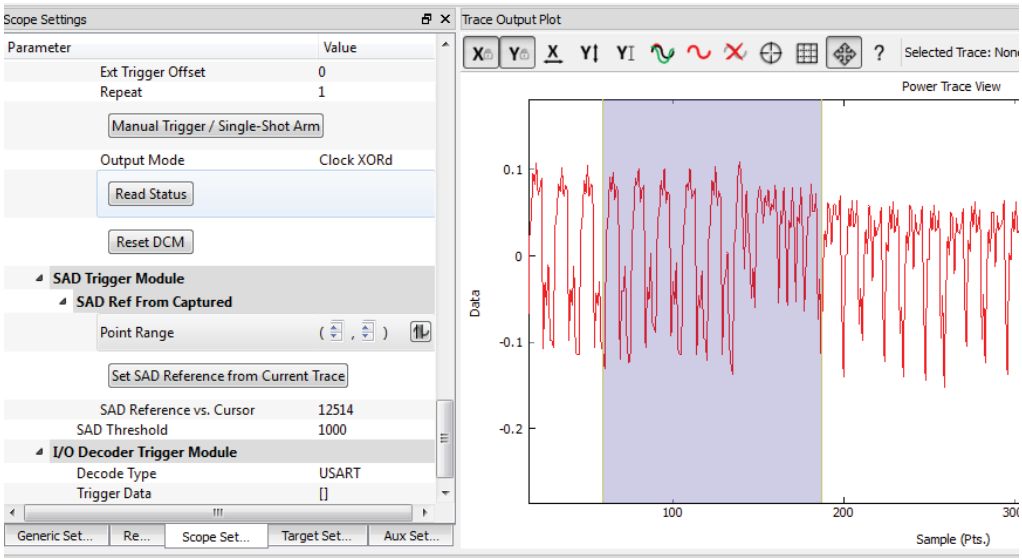
If you are running less than 10MS/s, you can stream data back over USB. Combine with the new hardware downsampling mode so you can keep the ADC perfectly synchronized with your faster target device, it simplifies exploration of asymmetric and other very long algorithms.



SAD Match

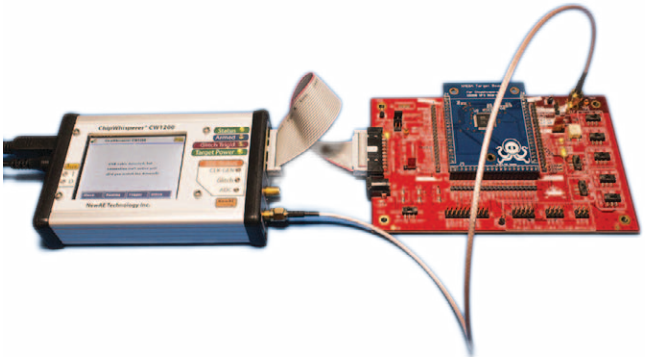
Easily take a portion of your capture waveform, and use that to trigger both capture and glitch systems.

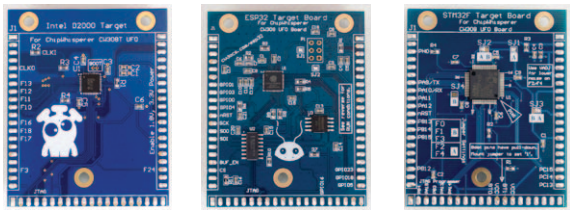
Perfect for synchronizing in hardware.



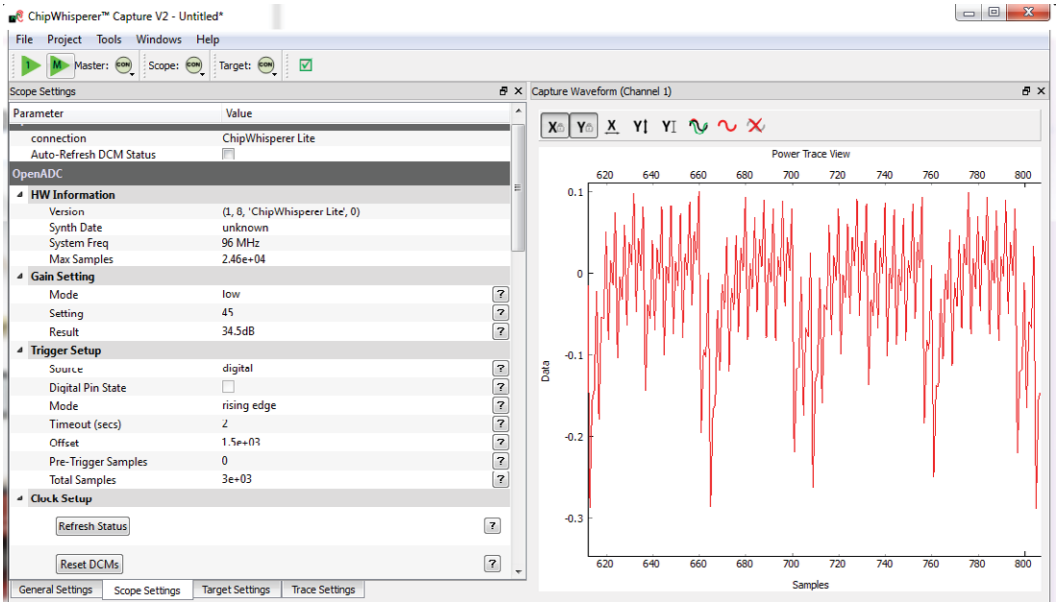
Supported Targets

The CW308 UFO Target has a wide variety of targets available (not included) such as FPGA, x86 microcontrollers, and devices with hardware cryptography support.





Software Support



The ChipWhisperer project is an open-source toolchain for embedded security research. All of the targets and capture hardware in this catalog are supported by a Python-based capture application. The open-source nature means you can modify for your specific needs – whether you are developing your own algorithms or want to perform validation on a proprietary targets, ChipWhisperer has you covered.

ChipWhisperer runs on most computer platforms (Windows, Mac, Linux). You can freely download and use the open-source software to confirm functionality.

Disclaimers

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