Otii Ace Pro

Advance high-precision energy consumption analysis & optimization tool.

The **Otii Ace Pro** is the big brother of the **Otii Arc Pro**. Keeping the same portable and compact form with comprehensive technical features for energy optimization but with enhanced capabilities to boost battery-driven and energy-harvesting devices requiring high precision at higher voltage ranges, with a high sample rate and low step size.

An all-in-one tool with an isolated power supply unit, a constant voltage/current source and sink, and a high-precision multichannel multimeter. Making it a power analyzer/profiler that records and displays currents, voltages, and power measurements in real time. Enabling hardware, firmware, and software developers to optimize the energy consumption and battery life on any device under test.

With **Otii Ace Pro** and **Otii 3 Desktop App**, you can source the voltage of the device under test (DUT) up to 25V while simultaneously measuring and recording current, voltage, and power data in real-time for further analysis to optimize battery life throughout the development cycle. Supporting an adjustable sample rate up to 50ksps, plus a wide dynamic current measurement range (nA-5A) with 0.4nA resolution, and a current measurement accuracy of ±(0.05% + 25nA).

> (i) To take **Otii Ace Pro**'s capabilities to the next level, and make it the perfect addition for product development, test and verification, quality assurance, and maintenance, explore **Otii Toolbox** for battery profiling and simulation or automation tools features.

Key benefits

- **All-in-one functionality:** Otii hardware and Otii software integrates power supply, real-time monitoring, and detailed analysis in a single, compact, user-friendly product.

- **Quick installation & easy to use:** Download Otii 3 Desktop app, plug the Otii Ace Pro to your device under test (DUT) and start measuring energy data in less than a minute.

- **Optimal power alternatives:** Power up Otii Ace Pro based on your solution setup and power requirements via USB or an external DC adapter.

- **Versatile connection:** Power source your device under test using the Otii Ace Pro, which can deliver up to 25V at high voltage/current resolution. The DUT can be connected either through its DC input or battery connectors.

- **Real-time measurements & analysis:** Analyze and compare charts and measurements in real-time, covering currents, voltages, and power within the Otii 3 Desktop App – it allows scrolling, zooming, and selecting current consumption and debugging logs during measurement.

- **Continuous serial synchronization:** Measurements are continuously synchronized with debug logs from the device under test via UART.

- **Expandable voltage & current:** Connect multiple Otii Ace Pro in series to increase voltage and current capabilities to match your solutions needs.

- **Responsive UI:** Ensure smooth performance under heavy data measurements loads, supporting multiple streams and long recordings – optimized for high-definition displays to enhance user experience during analysis.

- **Collaborative features:** Share recordings and analyses with team members to get insights and feedback for further product releases on a recurring basis.

- **Upgradeable software:** Unlock a wider range of features and specialized functionalities, including battery profiling and automation tools.

Key features

Hardware

Current and voltage measurement

- Current measurement accuracy: ±(0.05% + 25nA) for -5A to 5A

- 0.4 nA current measurement resolution

- 24 bit ADC with automatic switching between ranges

- No burden voltage

- Voltage measurement accuracy ±(0.01% + 1 mV)

- Connect multiple Otii Ace Pro in series to increase voltage and current capabilities to match your solution needs.

Sample rate

- Adjustable sample rate up to 50 ksps for main current and voltage channel

- Up to 50 ksps for all other channels (ADC current, ADC voltage, SENSE+, SENSE-)

Power supply

- 0V-25V

- Isolated power supply, ±200V

- -5A to 5A (depends on available current from USB or DC plug)

Digital interface

- Digital IO voltage 1.2V - 5.0V

Software

- Otii software support for Microsoft Windows, Apple macOS, and Linux Ubuntu.

- Real-time graphs of currents, voltages, and power measurements and digital inputs.

- Analyze statistics and measurements while recording continues in the background.

- Connect multiple Otii Ace Pro to manage and sync multiple recordings at the same time.

- Record and manage multiple recordings for unlimited time.

- Record and sync data with UART logs.

- Customize recordings and channels names to make the change logs easy to trace during your solution's development cycle.

- Save, load, and export projects as a zip-archive, or recording data as CSV for further analysis in collaboration with your team.

- In-line and 4-wire measurement support.

- Unlimited changes with do/undo functionality.

Applications

Use **Otii Ace Pro** every day to:

- Power your devices under development.

- Energy profile microcontrollers, sensors, devices and electronics up to 25V in real-time and over time.

- Optimize sleep current and extend battery life.

- Measure inrush current.

- Measure component leakage current over time.

- Design power-efficient hardware, firmware and software through regression testing.

- Troubleshoot your hardware and software.

- Sync UART logs with power measurements to see what drains the energy

Datasheet

General

OPERATING ENVIRONMENT	Min	Typical	Max
Temperature	10°C / 50°F		30°C / 86°F
Humidity	30 %		60 %

Main

POWER SUPPLY	Min	Typical	Max
Output voltage	0 V		25 V
Output voltage setting resolution		1 mV	
Self-consumption		3.5 W	
Output power, max continuous		30W [1–5]	

POWER SUPPLY	Min	Typical	Max
Output power, max peak		50W [1]	
Voltage between USB/DC jack and Main –	-200V [2–3]		-200V [2–3]
Voltage between DGND/AGND and Main –	-200V [2–3]		-200V [2–3]

PROGRAMMABLE CURRENT SINK (requires an Otii Toolbox)	Min	Typical	Max
Sink current	0 A		5 A
Sink current, setting resolution		1 µA	
Sink voltage	0 V		25 V
Sink power, max continuous		15W	
Sink power, max peak		125W	

CURRENT MEASUREMENT	Min	Typical	Max
Accuracy -5A to 5 A		±(0.05% + 25nA)	
Resolution		0.4nA	
Internal sample rate		250ksps	
Analog bandwidth (3 dB)		50kHz	

VOLTAGE MEASUREMENT	Min	Typical	Max
Accuracy		±(0.01% + 1 mV)	
Internal sample rate		250ksps	
Analog bandwidth (3 dB)		50kHz	
Output voltage readback resolution		3.5µV	

Expansion port

UART	Min	Typical	Max
Bitrate	50 bps		5.25 Mbps

DIGITAL I/O	Min	Typical	Max
Digital IO operating voltage	1.2 V	Vio [7]	5 V
VIL Low-level input voltage			Vio*0.2V
VIH High-level input voltage	Vio*0.8V		
Imax, Max sink/source current (total for GPIOs)	-10 mA		10 mA

Differential ADC, pins ADC- and ADC+	Min	Typical	Max
Voltage input	-10 V		25 V
Shunt voltage range	-102.4 mV		102.4 mV
Resolution		12.2nV	
Accuracy		$\pm(0.1\% + 1\mu V)$	
Input impedance		>100Mohm	

Single ended ADC, pins ADC- and ADC+	Min	Typical	Max
Voltage input	-10 V		25 V
Resolution		3.1µV	
Accuracy		$\pm(0.1\% + 250\ \mu V)$	
Input impedance		>100Mohm	

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SENSE, pins SENSE- and SENSE+	Min	Typical	Max
Voltage input	-10V		25 V
Resolution		3.1µV	
Accuracy		±(0.1% + 250µV)	
Input impedance		>100Mohm	

EXPANSION PORT POWER SUPPLY	Min	Typical	Max
Output voltage	0V		15V
Output voltage setting resolution		5mV	
Output current			600mA
Voltage between USB/DC jack & DGND/AGND	-200V [2-3]		-200V [2-3]

USB and DC JACK

DC JACK	Min	Typical	Max
Input voltage	7 V		20 V
Input current			5 A

USB	Min	Typical	Max
VBUS voltage [4]	4.75 V		20 V
VBUS current [4]			3 A

[1] Depends on available input power

[2] USB and DC jack GND is connected internally to chassis GND

[3] DGND and AGND are internally connected

[4] USB PD 2.0

[5] Max 3A in on DC plug-in and max 4A output current