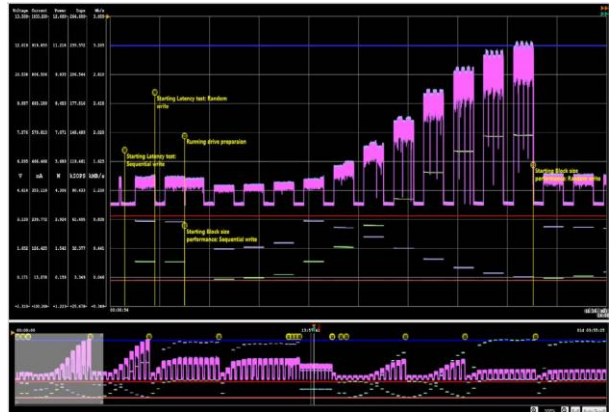


Programmable Power Modules (PPM)

Programmable Power supply + measurement for SSDs and more



Highlights

- Dual output programmable power supply (12v and 5v/3v3)
- Calibrated measurement of voltage / current / power channels
- Capture high resolution traces for hours or even days
- Wide range of plug-and-play fixtures allow for setup in seconds
- Industry leading power analysis software included with no additional cost
- Simple API and worked examples for Python allow for easy automation
- Low current measurement system, accurate at uA range
- Powers HDD, SSD, PCIe SFF, PCIe x16 Slot, SAS, SATA devices and more
- Single and multi-port option available

Use Cases

Power Margining	Hot-swap ramping, brownout, over/under voltage tolerance
Characterization	Power consumption during read/write/device sleep
Noisy Power Rails	Simulate the effect of noisy PSU on device performance
Power Loss	Data retention on power loss and crowbar
Efficiency	Capture the data needed to improve the performance of your device
Debugging	High resolution power traces give a view inside the operation of a product

Measurement

A Quarch PPM can be set up in seconds and replace a dual output programmable power supply and a 4-channel oscilloscope with 2 current probes.

Voltage and Current are simultaneously sampled at high speed, to give the most accurate power measurement possible. Our patented multi-shunt design allows us to capture across the full current range without missing a single sample.

Measurement 'streaming' allows the trace to be sent to the host PC and stored there in full. Traces can be hours or even days long providing an order of magnitude more data capture than most competing devices.

Traces can be captured and viewed in the inclusive Quarch Power Studio application. This is an industry leading cross-platform tool allowing you to easily capture and share large data sets.

Automated capture to CSV file or similar is easy with our Python library and application notes, which are open-source and available on GitHub.

Output and Control

Basic power margining tests can be run in seconds. Complex output patterns, such as ramps, curves and repeating square waves can also be quickly created and injected into your device.

Acting as a 2-quadrant supply, pulldown/crowbar tests can be run to test the resilience of a device.

Threshold current/voltage levels can be used to constantly monitor your device and trigger a recording or external trigger if the level is exceeded.

The external trigger can be used to detect host power, allowing you to trigger a precise power sequence or ramp exactly in sync with the host power up.

Most PPM injection fixtures support 'Injection Sync' by default. This ensures the voltage from the PPM is switched to the device at the same time as the host powers on. This is essential for robust enumeration of PCIe devices.

Basic Configuration

PPM	The main unit – Single and 6-port versions are available
Power Cable	IEC cable with country specific plug
USB Cable	2-meter USB-C to USB-A cable
Output Cable	60cm PPM cable to attach to your chosen fixture

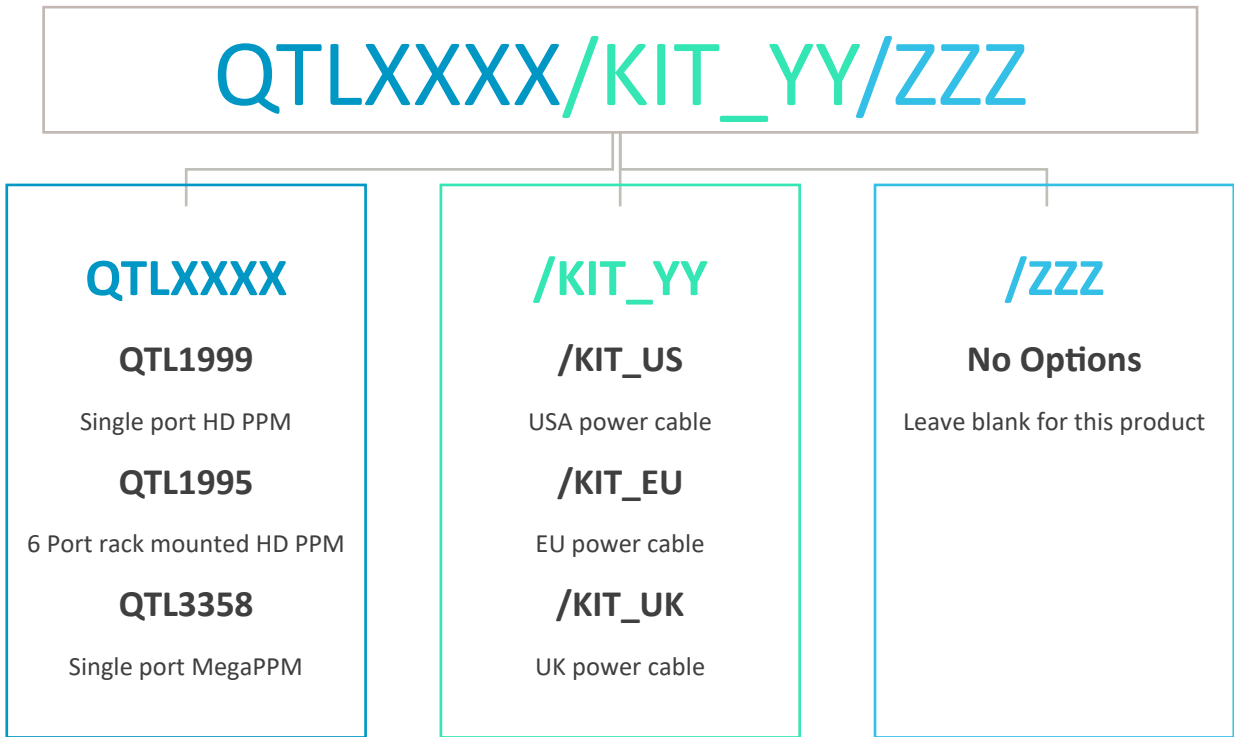
Optional Add-ons

Output Cables	Different cable lengths are available. Add QTL2181 as a separate line item to your order to add a 100cm cable or QTL2338 for a 120cm cable
PPM Fixtures	A wide range of fixtures are available for many standard interfaces such as AIC, M.2, U.2, EDSFF, Molex and Screw terminal. See the PPM fixtures datasheet or our website for a full list.
External Triggering	For a pair of 100cm MCX to SMA trigger cables, Add QTL3299 as a separate line item to your order.

Also Supplied

Downloads	Our website contains many useful downloads to help you get started Our software and automation libraries are all free to use • USB Drivers www.quarch.com/downloads/drivers • Product Details https://quarch.com/products/hd-programmable-power-module/ • Example Scripts www.quarch.com/downloads/application-note • Quarch Power Studio www.quarch.com/products/quarch-power-studio • Python Package www.quarch.com/products/quarchpy-python-package
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Products Versions



Device Option	Description
QTL1999	Single port bench-top unit, 250KHz sampling, 60W output, USB and LAN control
QTL1995	6 port rack mounted version of QTL1999, LAN control only
QTL3358	Single port bench-top unit, 1MHz sampling, 90W output, USB and LAN control

Related Products

Product Code	Description
QTL2312	Power Analysis Module (PAM) – Power analyzer with digital sideband capture
QTL2843	Single phase AC power analyzer

Technical Information - Common

Basic Characteristics	Specification	Notes
Input Supply	110-240V	IEC 3-pin input connector
Output Connector ^{*1}	10 Pin Mini Tek	For connection to injection fixtures
Triggering Ports	MCX	Individual trigger in and out for each port

^{*1} The Pinout for the output connector is available in the technical manual if you want to make your own fixtures

Voltage Supply	Specification	Notes
Output Voltage	Dual Channel	0 - 14.4V on 12V Output, 0 - 6V on 5V/3V3 Output
Voltage Output Resolution	3.54 mV	-
Voltage Patterns	1024 points per channel	1024 point programmable pattern at 1uS resolution
Pattern Repeats	1-65534	Repeat count or continuous loop option
Voltage Output Accuracy	1%	(At nominal output)
Voltage slew rate	1V per uS	(With no load)
Output Pull-down	Switchable	Voltage pull-down mode enables current sink
FET Dissipation	30W	Max total FET dissipation during voltage margining

Measurement ^{*1}	Specification	Notes
Method	Shunt Based	Simultaneous dual-shunt measurement
Voltage Accuracy	1%	+/- 1% typical accuracy for voltage measurement
Current Accuracy	2mA + 1%	From 1mA to 4000mA
Low Current Accuracy	2uA + 2%	From 100uA to 1mA
Measurement Resolution	3.36 mA, 3.54 mV	-
Low Current Resolution	24.89 uA	-
Measurement Length	Minutes, hours or days	Limited by host disk space on host PC

^{*1} Accuracy figures based on 32k sample averaging and an ambient operating temperature of 20C to 30C

Technical Information – QTL1999

Product Characteristic	Specification	Notes
Output Ports	1	Bench unit for use with a single DUT
Control Ports	USB, LAN	LAN: 100-BaseT, USB: Type-B
Sampling Rate	250 KHz	One sample every 4uS on all channels
Output Current (12V)	4.3A	4.3A Constant, unlimited for 1mS
Output Current (5V/3V3)	5A	5A Constant, 9.2A for 10S, unlimited for 1mS
Output Power Limit	60W	60W Constant, 75W for 10S, unlimited for 1mS
Weight	1.3KG	-
Size	200 x 100 x 54mm	-

Technical Information – QTL1995

Product Characteristic	Specification	Notes
Output Ports	6	1U rackmount unit with 6 independent ports
Control Ports	LAN	LAN: 6x 100-BaseT
Sampling Rate	250 KHz	One sample every 4uS on all channels
Output Current (12V)	4.3A	4.3A Constant, unlimited for 1mS
Output Current (5V/3V3)	5A	5A Constant, 9.2A for 10S, unlimited for 1mS
Output Power Limit	60W	60W Constant, 75W for 10S, unlimited for 1mS
Weight	8.2KG	-
Size	505 x 430 x 45mm	19" 1U Rack mountable

Technical Information – QTL3358

Product Characteristic	Specification	Notes
Output Ports	1	Bench unit for use with a single DUT
Control Ports	USB, LAN	LAN: 100-BaseT, USB: Type-B
Sampling Rate	1 MHz	One sample every 1uS on all channels
Output Current (12V)	7.5A	7.5A Constant, 8.25A for 10S, unlimited for 1mS
Output Current (5V/3V3)	10A	10A Constant, 11A for 10S, unlimited for 1mS
Output Power Limit	90W	90W Constant. Unlimited for 1mS
Weight	1.5KG	-
Size	200 x 100 x 54mm	-

Next Steps

See the product page

www.quarch.com/products/desktop-drive-enclosure

Request a quote, lead time or free evaluation from your local partner

www.quarch.com/resellers

Support

Quarch provides direct support to all customers, regardless of the sales channel you use to purchase our equipment. We are available over email, or by phone during UK office hours. Our experienced regional partners are also able to handle many of the most common questions you might have.

We do our best to repair any Quarch products, even if they are long out of warranty. Repair prices are based on the cost to us, so are as affordable as possible. Contact our support team below to get started.

Our support is normally free, though there may be charges if you require on-site training or significant development work. Please contact us if there is anything we can do to help.

Please see our website for access to drivers, technical manuals, quick-start guides, example scripts and more.



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