

Power supply and analysis FULL RANGE MEASUREMENT AND MARGINING





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Aviemore, Scotland

POWER ANALYSIS HAS NEVER BEEN EASIER

Quarch.com Data Storage | Automotive | Telecoms | Aerospace

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Quarch

Product Guide
Programmable Power Modules

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Product Range Overview

KEY BENEFITS

The Quarch Programmable Power Module (PPM) range uses plug-and-play fixturing for fast setup. 'Power Injection Sync' ensure voltage is supplied to the drive at the same time as the host powers up.

The dual rail outputs can range from 0mV to rail nominal + 20% for a wide range of margining, ramping and brownout tests. Complex patterns can be quickly programmed for more complex scenarios. High resolution data can be captured for extended periods of time, giving you an order of magnitude more data than a traditional scope.

Quarch Power Studio provides a high quality view into the data. Our Python API allows for fully automates testing and capture.

Quarch tools are widely trusted across the industry for testing SSDs, HBAs, NICs and more.



60W DUAL RAIL PROGRAMMABLE POWER SUPPLY

Find out more 📀



12V and 3.3V/5V dual rail supply for SSDs, HDDs and beyond

Fully compatible with Power Studio and automated power capture

Plug-and-play fixturing for many interfaces

HD PPM: USB 2.0 AND 100Mb ETHERNET CONNECTIVITY, 2 PROGRAMMABLE OUTPUTS, 0-14.4V AND 0-6V. 1024 PATTERN POINTS PER CHANNEL, 1V/US NO-LOAD SLEW. SAMPLE RATE 250KS/S, VOLTAGE: 0 – 14.4V ±(1%), CURRENT: 0-1mA ±(2uA+2%) 1mA-4A ±(2mA+1%)

Programmable Power Modules

6-PORT RACK-MOUNTED UNIT

 Cuarch Technology

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HD PPM: 6 INDIVIDUAL PPM PORTS IN A 1U RACK CHASSIS. INDIVIDUAL 100Mb ETHERNET CONNECTIVITY FOR EACH PORT



GEN5 SFF FIXTURE (SAS/SATA/U.2/U.3)



Find out more



SFF FIXTURES: SUPPORTS SAS, SATA AND NVME (U.3 AND U.2) DEVICES USING SFF-8639 CONNECTORS. SUPPORTS 12V/5V AND 12V/3V3 RAILS VIA A JUMPER SELECTION. SUPPORTS POWER INJECTION SYNC.

Storage Power Analysis

GEN5 EDSFF FIXTURES





Interposer and flex cable allows power testing within a standard EDSFF enclosure.

Options available to support all major E1.x and E3.x drive sizes.



GEN5 M.2 M-KEY FIXTURES

Find out more 🔊



Vertical and horizontal versions available to fit in restricted spaces.

Supports SSDs and other M-Key compatible devices.

M.2 FIXTURES: SUPPORTS SATA AND NVME DEVICES USING M.2 M-KEY CONNECTORS. SUPPORTS 12V AND 3V3 RAIL. SUPPORTS POWER INJECTION SYNC.

Storage and beyond

GEN5 AIC X16 SLOT FIXTURE





Supports up to Gen5 speeds and x16 lane width

Power Injection Sync can be disabled by jumper on a per-rail basis

AIC FIXTURE: 12V / 3V3 RAILS SUPPORTED. 3V3 AND 3V3_AUX BOTH FED FROM THE SAME 3V3 PPM OUTPUT. SWITCH TO SELECT VOLTAGE MEASUREMENT SOURCE (3V3/3V3_AUX). JUMPERS TO DISABLE POWER INJECTION SYNC ON A PER-RAIL BASIS.



PC POWER INJECTION ADAPTERS

Find out more 📀



Vertical and horizontal versions available to fit in restricted spaces.

Find out more 📀

Find out more 📀

Supports SSDs and other M-Key compatible devices.

HD ADAPTERS: 12V/5V ADAPTERS FOR HD PPM (SUPPORTS OLDER XML PPM WITH ADDITIONAL CABLE)

Storage and beyond

BREAKER INJECTION ADAPTER



Allows a PPM to inject/ measure power on AIC x8 and x16 'Breaker' products.



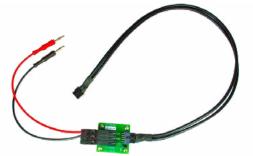
BREAKER ADAPTER: FITS AIC/SLOT BREAKERS FROM GEN3-GEN5



SCREW TERMINAL FIXTURE

Find out more 🔊





Connect a PPM into a custom wiring loom.

Pluggable screw terminal for easy connection.

HD ADAPTERS: 12V/5V ADAPTERS FOR HD PPM. PLUGGABLE SCREW TERMINAL FOR TWO POWER RAILS AND GROUND. JUMPER FOR 12V/5V OR 12V/3V3 SELECTION

Storage and beyond

CALIBRATION KIT





HD PPM devices can be calibrated on site, or at a certified 3rd party calibration house.

Find out more 📀

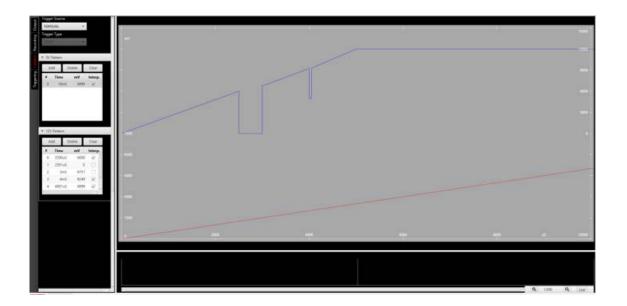
Requires Quarch Calibration Kit, Keithley 2460 SMU and a PC with Python 3.

CALIBRATION KIT: ALLOWS CALIBRATION OF QTL1999 AND QTL1995 PRODUCTS. MATCHING FACTORY CALIBRATION REQUIRES A CALIBRATED KEITHLEY 2460 (NOT SUPPLIED) AND AMBIENT TEMPERATURE CONTROLLED AT 25C



DUAL RAIL INDEPENDENT MARGINING CONTROL

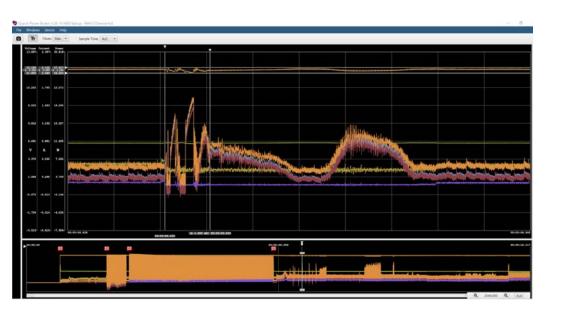
Up to 1024 pattern points per rail, at 1uS resolution for detailed power scenarios.



Quarch Power Studio (QPS)

POWER UP ANALYSIS

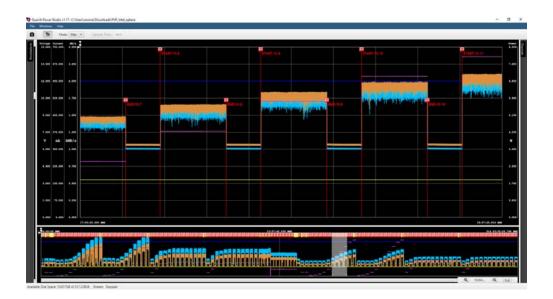
View the detailed results of a device initialization, including the effects of custom voltage ramps during power up. Find out more 📀





LONG TERM, HIGH RESOLUTION CAPTURE

Record for hours or days and still zoom in to the smallest details.Add annotations and notes



Quarch Power Studio (QPS)

VOLTAGE, CURRENT, POWER AND USER CHANNELS

See the entire picture, including custom user channels for your own data (ie: temperature, performance, speed)





SIMPLE AUTOMATION API

Automate capture, annotations, custom channels, statistic calculations and more. Code examples: www.quarch.com/support/application-note

> # If you know the name of the module you would like to talk to then you can skip module selection and hardcode the string. moduleStr = "USB:QTL1999-05-005" # Convert module to Quarch module
> print("\n\nConnecting to the selected device")
> myQuarchDevice = getQuarchDevice(myDeviceID, ConType="QPS") eate the device connection, as a QPS connected device sDevice = quarchQPS(myQuarchDevice) sDevice.openConnection() ints out connected module information
> t("\nConnected to module: " + myQpsDevice.sendCommand("hello?")) the voltage mode and enable the outputs owerOutput(myQpsDevice) t the averaging rate for the module. This sets the resolution of data to record. Is is dane via a direct command to the power module. t<mark>(myQpsDevice.sendCommand(</mark>"record:averaging 32k")) art a stream, using the local folder of the script and a time-stamp file n Name = time.strftime("%Y %m %d %H-%M %S", time.gmtime()) ream = myQpsDevice.startStream(os.path.join(filePath, fileName))) t("File output path set: " + str(os.path.join(filePath, fileName)))

Quarch Power Studio (QPS)

FASY SHARING AND POST PROCESSING

Share full traces or smaller sections. Export to CSV format for custom post-processing

| 4 | 1933320000 | 11577 | 1785342 | 4863 | 260391 | 20668904 | 1266281 | 21935185 |
|------|------------|-------|---------|------|--------|----------|---------|----------|
| 5 | 1933324000 | 11761 | 1771129 | 4858 | 352647 | 20830248 | 1713159 | 22543407 |
| 6 | 1933328000 | 11544 | 1616204 | 4839 | 283075 | 18657458 | 1369799 | 20027257 |
| 7 | 1933332000 | 12094 | 1986319 | 4848 | 565698 | 24022541 | 2742503 | 26765044 |
| 8 | 1933336000 | 12026 | 816755 | 4902 | 639467 | 9822295 | 3134667 | 12956962 |
| 9 | 1933340000 | 11500 | 98024 | 4892 | 222446 | 1127276 | 1088205 | 2215481 |
| 10 | 1933344000 | 11655 | 1621986 | 4868 | 256749 | 18904246 | 1249854 | 20154100 |
| 11 | 1933348000 | 11775 | 1593033 | 4844 | 273577 | 18757963 | 1325206 | 20083169 |
| 12 | 1933352000 | 11558 | 1888446 | 4834 | 321572 | 21826658 | 1554479 | 23381137 |
| 13 | 1933356000 | 11987 | 1831120 | 4844 | 479390 | 21949635 | 2322165 | 24271800 |
| 14 | 1933360000 | 12147 | 1289066 | 4873 | 673031 | 15658284 | 3279680 | 18937964 |
| 15 | 1933364000 | 11582 | 158014 | 4906 | 353108 | 1830118 | 1732347 | 3562465 |
| 16 | 1933368000 | 11775 | 1083744 | 4877 | 264079 | 12761085 | 1287913 | 14048998 |
| 17 | 1933372000 | 11529 | 1585082 | 4853 | 214931 | 18274410 | 1043060 | 19317470 |
| 18 | 1933376000 | 11630 | 1997881 | 4848 | 326044 | 23235356 | 1580661 | 24816017 |
| 19 | 1933380000 | 11809 | 1708884 | 4829 | 352416 | 20180211 | 1701816 | 21882027 |
| 20 | 1933384000 | 12127 | 1804635 | 4858 | 663395 | 21884808 | 3222772 | 25107580 |
| 21 | 1933388000 | 11756 | 418725 | 4911 | 517335 | 4922531 | 2540632 | 7463163 |
| 22 | 1933392000 | 11717 | 505277 | 4887 | 220372 | 5920330 | 1076957 | 6997287 |
| 23 | 1933396000 | 11577 | 1775184 | 4863 | 273254 | 20551305 | 1328834 | 21880139 |
| 24 | 1933400000 | 11741 | 1753029 | 4853 | 342688 | 20582313 | 1663064 | 22245377 |
| 25 | 1933404000 | 11534 | 1645339 | 4839 | 273116 | 18977340 | 1321608 | 20298948 |
| 26 | 1933408000 | 12084 | 2008944 | 4848 | 559290 | 24276079 | 2711437 | 26987516 |
| 27 | 1933412000 | 12050 | 828208 | 4902 | 655972 | 9979906 | 3215574 | 13195480 |
| 28 | 1933416000 | 11500 | 74800 | 4897 | 222538 | 860200 | 1089768 | 1949968 |
| 29 | 1933420000 | 11659 | 1576782 | 4868 | 279708 | 18383701 | 1361618 | 19745319 |
| 30 | 1933424000 | 11766 | 1574194 | 4848 | 263756 | 18521966 | 1278689 | 19800655 |
| 31 | 1933428000 | 11558 | 1888261 | 4834 | 321619 | 21824520 | 1554706 | 23379226 |
| 32 | 1933432000 | 11978 | 1825486 | 4834 | 469846 | 21865671 | 2271235 | 24136906 |
| 1000 | | | | | | | | |



QUARCH COMPLIANCE SUITE

Find out more 📀

Run standard automated workload, voltage margining tests and more

| Quarch Complianc Tile Hielp | ce Suite v1.01 | | | |
|--------------------------------|---|--|-----------------------|---|
| Setup | Results | Customice | | Stop Tests |
| | | | | Equadro |
| | ype line | | Test Source | Details |
| debug | | 6 cii Hotolog Cycle I 6 _ Ouarch Commandi rumpowar down - Response OK | Activity Test py - si | (hertDetailseExecuting command on module, debugLevels1) |
| La ketties | | 6 HOT_PLUG Drive removed within 10vecands, as expected | ket/ligTextpy is | |
| debug | | 6 Quarch Command: numpower up - Response: DK | | Devotes and the command on module, debugLevels 11 |
| t_ heather | | 0 | hutfhagTestay - il | |
| + 112 sector | | A | norPugTest py < 1 | |
| t. testing | | 6. Kitplug het passed all republions | NithigTetty - 1 | |
| 1_ tettion | | 6 | hatPlugTestay - si. | |
| | | 6 Starting Hetping test at 75m5 on device: Drive Lover 1 repetitions | hat/hugTestay si. | |
| * 120 testDes | | 6 Setting no module for hotaling test | hatProoTestay - sk | |
| debug | | Our Command: confidefatate - Response: OK | | ItenDetails:sfaecuting command on module, debugGavets 1) |
| debug | | 6 Quarch Command: source Entelay 6 - Response: OK | | (textDetails=Recuting command on module, debug(avela 1) |
| debug | | 6 Quarch Command: source.2delay 75 - Response CK. | | (tertDetails=tsecuting command on module, debugLavel=1) |
| debug | | 6 _ Quarch Commandi saurce/Julelay 150 - Response: OK | | (tentDetails+Executing command on module, debugLevel=1) |
| debug | | 6 Quarch Command: source:Adelay 225 - Response: OK | | (textDetails=Executing command on module, debugLevel=1) |
| debrez | | 6 Quarch Command: yource 5 delay 300 - Response: OK | | (testDetails+Executing command on module; debugLevel+1) |
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| Too Bestline | | B HOT, PLUG Drive removed within Toreconds, as expected | hit/hug lettpy - 11. | Contraction of the second s |
| debug | and the second second | 6 Quarth Command: runpower up - Response: OK | | (textDetails+Executing command on module, debugLevel+1) |
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| * 122 InstDes | DATE: 2019-09-24 | 6 - Results of hotplay test | hitPhyTestay - a. | |
| 1 testfier | | 0 Hotolug sweep test failed: 1 sub-test poorts | hotPlugTestay - si. | |
| 1_ betfor | mmary 2019-09-21 | 6 - Total TestTime Elapsett 35s, Error count # 1 | hotPlugTest.py - si. | |
| • 1.3 textDes | surge. 2019-09-21 | Starting Hatplug test at 200mS on denies DriveT, over 1 repetitions | NotPlugTest.py - si. | |
| · 130 testDes | ala 1015 00-21 | 8 Setting up module for hotpilug test | had hug Testing - sk | |
| debug | 2019-09-21 | 6 Quarch Command: confidefatate - Response: OK | NotPlugTestpy - e. | (textDetails=Executing command on module, debugLevel=1) |
| debug | 2019-09-21 | 6 - Quanch Command source Totelay 8 + Response: OK | hotPlugTestuy - e | (textDetails+Executing command on module, detaug(avers1) |
| debug | 2019-09-21 | 6 Quarch Command: source2:delay 250 - Response: OK | hotPlugTest.py - e | ItentDetails+Executing command on module debugLevel+1) |
| debug | 2019-09-21 | 6 Quarch Command: source Edelay 500 - Response: OK | hotPlugTest.py - e | (InstDetails=Executing command on module, debugLevels1) |
| dabuig | 2019-09-21 | 6 Duarch Command! source@delay 750 - Response CK | hotPlugTest.py - e. | [BertDefails=Executing command on module, debug(avail=1) |
| debug | 2019 09-21 | 6 - Quarch Commandi source-Bidelay 1000 - Response: DK | hat/RugTestay e- | (textDetails+Executing command on module, debugUevel+1) |
| + 131 beitDer | mungel. 2018-08-24 | E Housey Code 1 | hetPlugTestay : e- | |
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Automation options

QIS & QUARCHPY

Java Instrumentation Server allowing simple TCP based control of any Quarch Power Device. Full Python API available for fast integration

Find out more 📀

from quarchpy.device import *

from quarchpy.device import *

from quarchpy.device import *

from quarchpy.device import *

from quarchpy.device to control
myDeviceID = "USB:QTL1999-05-005"

from and the module
myQuarchDevice = getQuarchDevice(myDeviceID, ConType = "QIS")

from and the start the base device class to a power device, which provides additional controls, such as data streaming
myPowerDevice = quarchPPM(myQuarchDevice)
module.startStream('Stream1.csv')

Download QIS from: **<u>quarch.com/downloads</u>** Download quarchpy from: **<u>pypi.org/project/quarchpy/</u>**