



# Power Analysis Modules

Capture and analysis of power and control signals  
across a wide range of interfaces

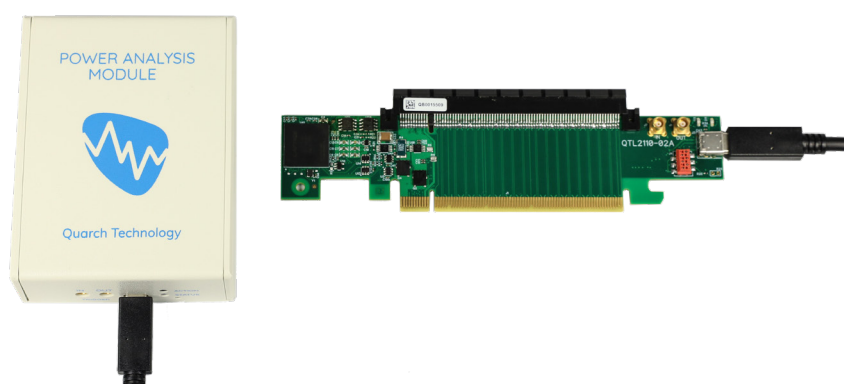
Quarch  
Data Sheet





# Power Analysis Modules

Capture and analysis of power and control signals across a wide range of interfaces



## Highlights

- ▀ Multi rail DC voltage/current/power measurement
- ▀ High power mains analysis via 3-phase PAM
- ▀ Digital side-band capture
- ▀ Oscilloscope function allows accurate power recording
- ▀ Low current measurement system, accurate at uA range
- ▀ Plug-and-play fixtures support a range of different interfaces
- ▀ Simple automation options

## Use Cases

<b>Characterisation</b>	Power consumption monitoring over long periods and different use cases
<b>Power Quality</b>	See power up ramps, voltage noise and unusual power events
<b>Sideband analysis</b>	Capture side-band transitions and timings
<b>Automation</b>	Simple scripted control for complex unsupervised testing
<b>External Triggering</b>	Link to external test equipment to increase your test options





## Measurement

Voltage and Current are simultaneously sampled, to give the most accurate possible power measurement. High resolution sideband capture allows you to see the precise time that sidebands assert in comparison to a power event.

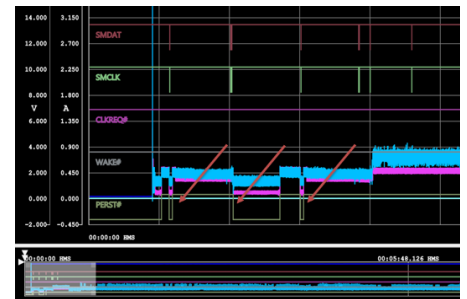
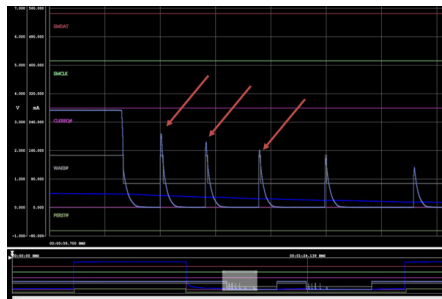
Long term recording allows hours or even days of capture at high resolution. This is an order of magnitude more than is available on most alternative capture options.

Quarch Power Studio allows you to add custom channels, annotations and comments. This provides you with a full overview of the performance of your product. Full access to raw data for your own processing is provided.

## Control and Automation

Basic capture in Power Studio can be setup and run in seconds. USB and LAN control options allow for both bench testing and remote lab environments.

Our Python API allows automation of Power Studio, or direct access to the PAM to capture raw data



Application notes are available to help you get started quickly

## Supplied Parts

- |                 |  |
|-----------------|--|
| <b>QTL2312</b>  | - External PSU, 2 meter USB cable, USB-C cable to connect to fixture |
| <b>Fixtures</b> | - No supplied parts, requires QTL2312                                |

## Also Required

- |                  |  |
|------------------|--|
| <b>Downloads</b> | - Our website contains many useful downloads to help you get started: <a href="http://www.quarch.com">www.quarch.com</a> |
|                  | USB Drivers  |
|                  | Technical Manuals  |
|                  | Quick Start Guides   |
|                  | Example Scripts  |
|                  | Power Studio Application   |





## 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 regional partners are also trained to handle many of the most common questions you might have.

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

**Email**

support@quarch.com

**Phone**

+44 1343 508 140

**Web**

www.quarch.com/support

## Ordering

Quarch have a network of specialist partners around the world. Please contact our partner in your region if you require a quote.

We recommend evaluating our products before purchase, so our partners will be happy to arrange a free evaluation unit.

## Regional Contact Details

**North America**

SerialCables LLC  
Colorado, California



Web [www.serialcables.com](http://www.serialcables.com)

**China, Hong Kong**

Saniffer  
Hong Kong



Web [www.saniffer.com](http://www.saniffer.com)

**India**

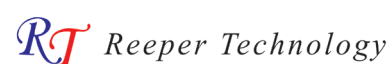
ESA Group  
Bangalore



Web [www.esaindia.com](http://www.esaindia.com)

**Taiwan**

Reeper Technology  
Taipei



Web [www.reeper.com.tw/](http://www.reeper.com.tw/)

**Israel**

EMY-Tech  
Misgav



Web [www.emy-tech.com](http://www.emy-tech.com)

**Europe and ROW**

Quarch Technology  
Scotland, UK



Web [www.quarch.com](http://www.quarch.com)

**South Korea**

JWill Technology  
Seoul



Web [www.jwill.co.kr](http://www.jwill.co.kr)

**UK & Ireland**

GCH Services  
Slough



Web [www.gch-services.com](http://www.gch-services.com)





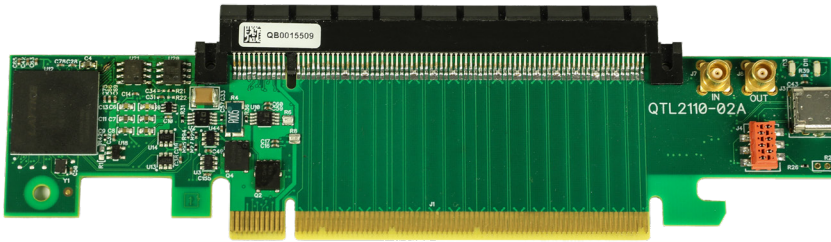
## Products Versions

Product Code	Product Options
<b>QTLXXXX</b>	<b>QTL2312/KIT_1M</b> Power Analysis Module - 1M cable to fixture <b>QTL2312/KIT_2M</b> Power Analysis Module - 2M cable to fixture <b>QTL2312/KIT_3M</b> Power Analysis Module - 3M cable to fixture

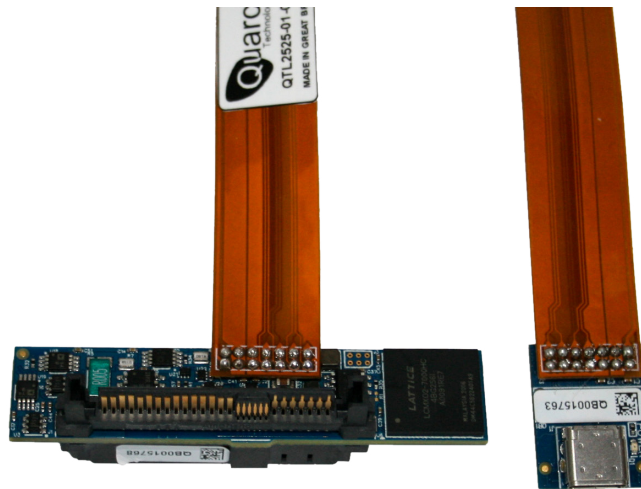
## PAM Fixtures - For QTL2312

Product Code	Description
QTL2347	Gen4 PCIe x16 PAM Fixture Test fixture for x16 PCIe Slot based devices up to Gen4 speeds
QTL2573	Gen4 M.2 PAM Fixture Test fixture for M.2 M-key based devices up to Gen4 speeds
QTL2525	Gen4 SFF Drive PAM Fixture Test fixture for U.2, U.3, SAS and SATA devices up to Gen4 speeds
QTL2608	2 Channel Custom PAM Fixture Test fixture for custom wiring looms (2 power and 16 digital channels)
QTL2623	4 Channel Custom PAM Fixture Test fixture for custom wiring looms (4 power and 16 digital channels)
QTL2628	External Shunt Custom PAM Fixture Test fixture for embedded shunts (4 power and 16 digital channels)
QTL2673	Gen4 EDSFF E1 x4 PAM Fixture Test fixtures for EDSFF E1 x4 devices us to Gen4 speeds
QTL2788	Gen5 SFF PAM Fixture Test fixtures for U.2, U.3 and SAS/SATA devices us to Gen5 speeds
QTL2980	Gen5 Vertical M.2 PAM Fixture Test fixtures for M.2 M-key devices up to Gen5 speeds
QTL2910	Gen5 AIC x16 PAM Fixture Test fixtures for Gen5 AIC x16 devices up to Gen5 speeds
QTL2983	Gen5 AIC x16 PAM Fixture with AUX power Test fixtures for Gen5 AIC x16 devices up to Gen5 speeds with AUX power requirements
QTL2887	Gen5 EDSFF E1 x4 PAM Fixture Test fixtures for EDSFF E1 x4 devices us to Gen5 speeds
QTL2888	Gen5 EDSFF E3 x4 PAM Fixture Test fixtures for EDSFF E3 x4 devices us to Gen5 speeds
QTL3024	Gen5 OCP 3.0 NIC PAM Fixture Test fixtures for OCP 3.0 NIC devices up to Gen5 speeds





QTL2347 Gen4 PCIe x16 PAM Fixture



SFF-8639 - U.2/U.2/SAS/SATA PAM Fixture



2 Channel Custom PAM Fixture



## Technical Information - PAM Controller

Output Characteristics	QTL2312
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Input Voltage	12V DC
Form Factor	Desk Unit
Control Ports	USB, LAN
Injection Fixture Cable	USB-C
External Triggering	MCX IN/OUT

## Technical Information - Injection Fixtures

Measurement Accuracy	QTL2347	QTL2573	QTL2525	QTL2608
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Form Factor	GEN4 AIC x16	Gen4 M.2	Gen4 SFF	Custom Loom
Base Sampling Rate	250 KHz			
Sample Averaging	1 to 32K Samples			
Voltage Range	40mV - 19V		40mV - 15V	
Current Range	100uA - 13A		100uA - 12A	
Typical Voltage Accuracy	±(2mV+1%)			
Current Accuracy (100uA-1mA)	±(25uA+1%)			
Current Accuracy (1mA-13A)	±(2mA+1%)			

Measurement Accuracy	QTL2623	QTL2628	QTL2673	QTL2788
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Form Factor	Custom Loom		GEN4 E1 x4	SFF
Base Sampling Rate	250 KHz			
Sample Averaging	1 to 32K Samples			
Voltage Range	40mV - 15V		40mV - 19V	
Current Range	10mA - 12A	$\mu A - kA^{*1}$	100uA - 13A	100uA - 13A
Typical Voltage Accuracy	$\pm(2mV+1\%)$			
Current Accuracy (100uA-1mA)	N/A	Shunt Dependant	$\pm(25uA+1\%)$	
Current Accuracy (1mA-13A)	$\pm(2mA+1\%)^{*2}$	Shunt Dependant	$\pm(2mA+1\%)$	

<sup>\*1</sup> Subject to your shunt resistor, 65mV max differential across shunt, see technical manual for details

<sup>\*2</sup> Accuracy applies to unit current range which is 10mA to 12A





Measurement Accuracy	QTL2980	QTL2910	QTL2983	QTL2887	QTL2888
Form Factor	Gen5 M.2	Gen5 x16 AIC	Gen5 x16 AIC +AUX	Gen5 EDSFF E1	Gen5 EDSFF E3
Base Sampling Rate	250 KHz				
Sample Averaging	1 to 32K Samples				
Voltage Range	40mV - 19V		500mV - 16V	40mV - 19V	
Current Range	100uA - 13A		±162.5A*1	100uA - 13A	
Typical Voltage Accuracy	±(2mV+1%)				
Current Accuracy (100uA-1mA)	±(25uA+1%)		N/A	±(25uA+1%)	
Current Accuracy (1mA-13A)	±(2mA+1%)		±(25mA + 1%)`2	±(2mA+1%)	

<sup>\*1</sup> Max range for 12Vaux channel, other channels: 12V= $\pm 32.5A$ , 3v3= $\pm 13A$ , 3v3Aux= $\pm 3.25A$

<sup>\*2</sup> This is the worst case on the 12Vaux channel, other channels are more accurate (3v3 is 2mA+1%)

Measurement Accuracy	QTL3024
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Form Factor	OCP 3.0 NIC
Base Sampling Rate	250 KHz
Sample Averaging	1 to 32K Samples
Voltage Range	40mV - 15V
Current Range	100uA - 12A
Typical Voltage Accuracy	$\pm(2mV+1\%)$
Current Accuracy (100uA-1mA)	$\pm(25uA+1\%)$
Current Accuracy (1mA-13A)	$\pm(2mA+1\%)$







Monitored Rails	QTL2347	QTL2573	QTL2525	QTL2608
Power Monitoring	3v3, 12v, 3v3_Aux	3v3	12v, 5v, 3v3_Aux	2 Power Rails
Digital Monitoring	PERST, WAKE, CLKREQ, SMDAT, SMCLK	CLKREQ, PERST, PEWAKE, SUSCLK, PEDET, ALERT, SMB_DATA, SMB, CLK, LED_1, DEVSLP, MFG_DATA, MFG_CLK	PERST, WAKE, PERSTB, SMBCLK, SMBDAT	16 Digital Channels

Monitored Rails	QTL2623	QTL2628	QTL2673	QTL2788
Power Monitoring	4 Power Rails	4 Power Rails	12v, 3v3_Aux	12v, 5v, 3v3_Aux
Digital Monitoring	16 Digital Channels	16 Digital Channels	PRSNT0, PERST0, PERST1/CLKREQ, LED, SMBRST, SMBCLK, SMBDAT, PWRDIS, MFG, DUALPORTEN, RFU	PERST, WAKE, PERSTB, SMBCLK, SMBDAT

Monitored Rails	QTL2980	QTL2910	QTL2983	QTL2887/ QTL2888
Power Monitoring	3v3	3v3, 12v, 3v3_Aux	12v, 3v3, 12v_Aux, 3v3_Aux	12v, 3v3_Aux
Digital Monitoring	CLKREQ, PERST, PEWAKE, SUSCLK, PEDET, ALERT, SMB_DATA, SMB, CLK, LED_1, DEVSLP, MFG_DATA, MFG_CLK	PERST, WAKE, CLKREQ, SMDAT, SMCLK	PERST, WAKE, CLKREQ,, PWRBRK SMDAT, SMCLK, REFCLK_LOS	PRSNT0, PERST0, PERST1/CLKREQ, LED, SMBRST, SMBCLK, SMBDAT, PWRDIS, MFG, DUALPORTEN, RFU

Monitored Rails	QTL3024
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Power Monitoring	3v3, 12v
Digital Monitoring	BIF0#, BIF1#, BIF2#, PWRBRK#, WAKE#, NIC_PWR_GOOD, MAIN_PWR_EN, AUX_PWR_EN, PERST0#, PERST1#, PERST2#, PERST3# REFCLK_OK



