GEN4 PCIe Card and Drive Modules

Automate hot-plug, dual redundancy and fault injection testing for GEN4 PCIe card devices

Quarch
Data Sheet

Quarch
Technology

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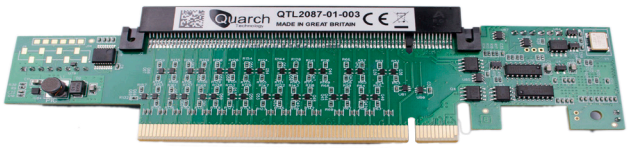

Highlights

- Supports the full range of PCIe devices
- Removes manual intervention, for fully automated testing
- Precise and consistent timing control over hot-swap scenarios
- Completely transparent at the protocol layer
- Create and test many different fault conditions
- Simple to control with your existing test automation system

Use Cases

System Qualification	Run repeated test cycles with bounds testing of all possible hot-swap and lane width scenarios
Regression Testing	Automated regression tests spot issues earlier during development
RAID Testing	Force drive rebuilds, single/double RAID faults
Failover Testing	Test dual redundancy, fault monitoring and performance during a failure
Fault Injection	Simulate a large number of fault scenarios

Hot Swap

PCIe data is switched with high speed RF switches, ensuring that our modules are almost totally transparent to the storage system. Host/Device connections will appear as if they are directly attached.

Individual control over each pin allows us to create almost any possible hot-swap or fault scenario. Precise timing ensures that every test can be exactly re-created. Versions are available with inrush current limits, to help high power devices hot-plug on hosts with limited power supply capacity.

The modules can be manually controlled for bench testing, or easily integrated into your existing test automation system as part of a fully automated test solution.

Module Range

The Gen4 range expanding rapidly as the interface gains traction. If you do not see the module you require, please let us know and we can get a time scale for you.

HS Modules also switch the PCIe lanes and have an additional injection port to allow power margining and measurement from our Programmable Power Module.

All modules support data rates up to 16GT/s.

Active signal driving is support for signals such as PERST, CLKREQ and WAKE. The exact signals driven varies from module to module

All the PCIe Card modules support some form of power monitoring; basic internal measurement in the case of the 'Lite' module while the remaining devices have an injection port for the Power Module.

Interface options depend on the controller you chose, but include simple Serial, USB and LAN options. These can be accessed from almost any scripting language. You will need to purchase a separate controller to use this module.

Drive modules can be combined with other Torridon modules as part of a full test-automation system.

Supplied Parts

Each module comes with a 40cm interface cable, for connection to a controller.

Also Required

Controller - You will require one slot on a Torridon Controller for each Cable Module

Downloads - Our website contains many useful downloads to help you get started: www.quarch.com

USB Drivers
Technical Manuals
Quick Start Guides
Example Scripts
TestMonkey GUI

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	Phone	Web
support@quarch.com	+44 1343 508 140	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

Email sales@serialcables.com
Web www.serialcables.com
Phone +1 303-495-2320

China, Hong Kong
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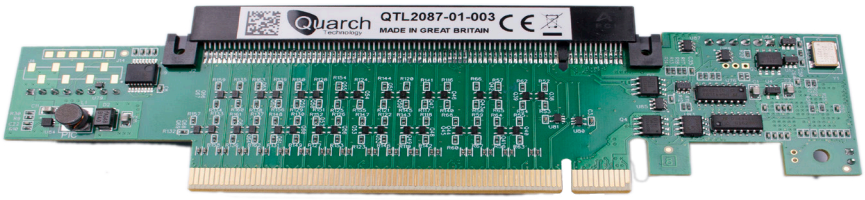
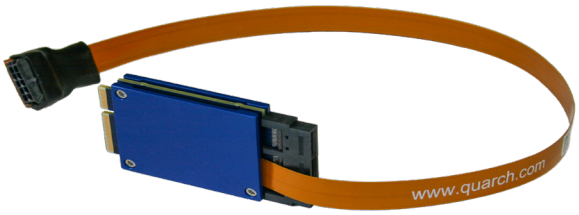
Products Versions

Product Code	Product Options
QTLXXXX	Product code, made up from options below
	QTL2087 Gen4 PCIe x16 HS Card Module + Triggering
	QTL2128 Gen4 PCIe x16 HS Card Module
	QTL2207 Gen4 PCIe U.2 Drive Module
	QTL2266 Gen4 PCIe U.2 Drive Module + Triggering
	QTL2245 Gen4 PCIe U.3 Drive Module
	QTL2270 Gen4 PCIe U.3 Drive Module +Triggering
	QTL2161 Gen4 EDSFF x8 Card Module
	QTL2272 Gen4 EDSFF x8 Card Module +Triggering
	QTL2341 Gen4 External PCIe Cable Module (Available Q4 2019)
	QTL2322 Gen4 M.2 M-Key Card Module (Available Q4 2019)

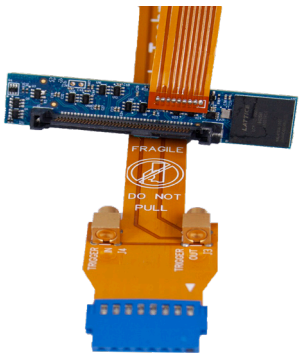


x16 Card Module



EDSFF x8 Module

External Cable Module



U.2 Drive Module

Required Controllers - One port on a controller is required for each module

Product Code	Description	
QTL1260	Torridon Interface Kit Simple USB and Serial control options for bench testing	
QTL1461	4 Port Torridon Controller Control up to 4 modules via Serial/LAN/ USB connection	
QTL1079	28 Port Torridon Controller Control up to 28 modules via Serial, LAN or USB connection	

Accessories

Product Code	Description
QTL999	HD Programmable Power Module Power margining any uA range power measurement, ideal for PCIe devices
QTL1558	40cm Torridon Double Ended Interface Cable (Female to Female) Replacement cable for Card Modules, connects Module to Controller
QTL1870	100cm Torridon Double Ended Interface Cable (Female to Female) Replacement cable for Card Modules, connects Module to Controller
QTL1381	100cm Torridon Extension Cable (Male to Female) Extends an existing Double Ended Torridon cable or fixed Drive Module Cable

Technical Information

Connections	QTL2087	QTL2128	QTL2161	QTL2272	QTL2207	QTL2266	QTL2245	QTL2270
Host Side Connector	PCIe x16		EDSFF x8		U.2		U.3	
Device Side Connector	PCIe x16		EDSFF x8		U.2		U.3	
Max Speed	16GT/s							
Protocols	PCIe						PCIe/SAS/SATA/GENz	
Signals Switched	All[*1]							

[*1] All power, high speed data, mated and sideband pins are individually switched. GND pins are directly routed through the module.

Control	QTL2087	QTL2128	QTL2161	QTL2273	QTL2207	QTL2266	QTL2245	QTL2270
Power Supply	Via Torridon Controller							
Control Ports	Torridon Connector							
Triggering	SMA	X	X	√	X	MCX	X	MCX
Power Injection Port	√	√	X	X	X	X	X	X

Dimensions	QTL2087	QTL2128	QTL2161	QTL2272	QTL2207	QTL2266	QTL2245	QTL2270
Offsets Drive By	41.94mm		52.02mm		11.86mm			
Length/Width	167.67mm		38.4mm		69.05mm			
Height	-				15.9mm			
Compatible Devices	x1 - x16 PCIe Cards		x4 - x8		SSDs,HDDs			

Features	QTL2087	QTL2128	QTL2161	QTL2272	QTL2207	QTL2266	QTL2245	QTL2270
Basic (power) hot/swap	√	√	√	√	√	√	√	√
Full hot-swap	√	√	√	√	√	√	√	√
Pin Bounce Simulation	Simple/Custom. 10uS minimum period		Simple/Custom. 1uS minimum period					
Signal Glitch	Single/Cycle/PRBS. 50nS minimum length							
Voltage Monitoring	√	√	√	X	√	√	√	√
Power Monitoring	Requires Power Module		X	X	X	X	X	X
Active Signal Driving	CLKREQ, WAKE, PERST and similar (depending on the interface)							

Controllers	QTL2087	QTL2128	QTL2161	QTL2272	QTL2207	QTL2266	QTL2245	QTL2270
Serial Control	Supported on all Controllers							
USB Control	Supported on all Controllers							
REST Control	Supported on QTL1079 and QTL1461							
Telnet Control	Supported on QTL1079 and QTL1461							

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