

## AQtion™ AQC111U & AQC112U USB 3.1 Multi-Gig Ethernet Controller

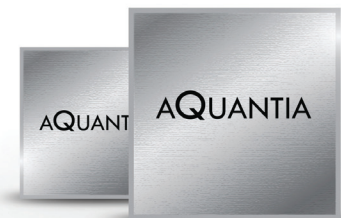
# USB to Multi-Gig Ethernet Controllers for Adapters, Docking Stations & On-board LAN

## Product Overview

The Aquantia AQtion AQC111U and AQC112U are Universal Serial Bus 3 (USB) to Multi-Gig Ethernet controllers that integrate a USB v3.1 Gen1 PHY and 5GBASE-T/2.5GBASE-T MAC/PHY in single-chip packages. These high-performance, small footprint devices enable low-cost, small form factor, docking stations and adapter for simple plug-and-play, Multi-Gig Ethernet network connection capabilities, suitable for a wide variety of applications. They will enable a new class of accessories for laptop users who want mobility combined with the reliability and performance of wired Multi-Gig Ethernet connectivity when at their desks or on the road.

These new controls enable perfect solution for notebook users. The ubiquity of the USB connection also makes the adapters and docking stations based on the AQC111U and AQC112U suitable for use with desktops, game consoles, home gateways or any system with a USB 3.x port that would benefit from a high-speed network connection.

All AQtion controllers incorporate Aquantia's AQRate PHY technology, that supports data rates of up to 5 Gbps, a USB host controller, and is compliant with USB v3.1, v3.0, v2.0, and v1.1 specifications. These devices implement multi-gigabit Ethernet functionality with the AQC111U integrating a four-speed Ethernet PHY (5GBASE-T/2.5GBASE-T/1000BASE-T/100BASE-TX), while the AQC112U integrates a three-speed Ethernet PHY (2.5GBASE-T/1000BASE-T/100BASE-TX).



## Applications

Aquantia AQtion AQC111U and AQC112U controllers are ideally suited for use in desktops, notebook PCs, ultrabooks, docking stations, game consoles, digital-home appliances, network printers, USB dongles, IP Set-Top Box (STB) and IP televisions, and virtually any embedded system that uses a standard USB port.

Features	Benefits
Single-Chip Solution	Integrated USB PHY, Ethernet MAC, and Ethernet PHY minimizes board space and power utilization
Integrated USB v3.1 Gen1 PHY	Supports line rates of up to 5 Gbps
Integrated USB Device Controller	<ul style="list-style-type: none"> <li>• USB v3.1/3.0/2.0/1.1-compliant</li> <li>• Supports USB v3.1 Gen1 power saving modes (U0/U1/U2/U3)</li> <li>• Provides USB Super/High/Full-Speed modes with bus or self-powered device</li> <li>• Supports virtual CD-ROM storage for driver</li> </ul>
USB Power Delivery (PD) v2.0	<ul style="list-style-type: none"> <li>• Provides USB Type-C port capable of operating as a Downstream Facing Port (DFP) or Upstream Facing Port (UFP)</li> <li>• Supports two USB Type-C Configuration Channel (CC) ports</li> <li>• Provides integrated Baseboard Management Controller (BMC) Encode/Decode PHY</li> </ul>
Advanced Security Features	<ul style="list-style-type: none"> <li>• Firmware anti-tampering security:                             <ul style="list-style-type: none"> <li>- Secure Hash Algorithm (SHA-2) authentication</li> <li>- RSA public-key encryption</li> </ul> </li> </ul>
128-Byte Programmable eFuse	Supports security keys and stores device-related information

SPI FLASH Interface	Supports external FLASH for storing USB ID and Ethernet MAC address
Package	<ul style="list-style-type: none"> <li>• 224-pin Ball Grid Array (BGA), 12 mm x 14 mm</li> <li>• Commercial temperature range (0°C –108°C)</li> </ul>
<b>PHY-Specific Features</b>	
AQrate PHY with NBASE-T technology	Supports 100 meters on Cat 5e at 5G/2.5G/1G/100M
Advanced Cable Diagnostics	On-chip high-resolution cable analyzer
Energy Efficient Ethernet (EEE)	Advanced PHY power savings
Power over Ethernet (PoE)	<ul style="list-style-type: none"> <li>• I<sup>2</sup>C master for external PoE controller</li> <li>• PoE AT Type-2 or AF information notice for CPU via GPIO pin</li> </ul>
<b>MAC-Specific Features</b>	
Wake-on-LAN (WoL) Power Management	Supports lower power modes
Quality of Service (QoS) support	Supports up to eight traffic classes and Data Center Bridging (DCB)
Jumbo frames (up to 16Kbyte)	Improved network performance with reduce CPU utilization
IPv4, IPv6/TCP, and IPv6/UDP checksum offload	Offloading calculations and improved CPU usage
<b>Ethernet Controller/Chip Features</b>	
Advanced Power Management Features	<ul style="list-style-type: none"> <li>• Power management offload (ARP and NS requests)</li> <li>• Multicast DNS (mDNS) offloads</li> </ul>

## AQC111U-AQC112U Block Diagram

