The QLogic® FastLinQ® QL41232HMKR Intelligent Ethernet Adapter with RDMA leverages QLogic’s eighth generation technology to deliver 10/25Gb per second (10/25Gbps) Ethernet performance. Optimized for use across enterprises, managed service providers (MSPs), and large public and scalable public cloud deployments, the QL41232HMKR enables organizations to achieve new levels of performance in physical, virtual, and cloud environments.

The 25Gb Ethernet (25GbE) specification enables network bandwidth to be cost-effectively scaled in support of next-generation server and storage solutions residing in cloud and Web-scale data center environments. 25GbE results in a single-lane connection similar to existing 10GbE technology—but it delivers 2.5 times greater bandwidth. QLogic is a leading innovator driving 25GbE technologies across enterprise and cloud market segments.

For more effective use of the 25GbE bandwidth, the QL41232HMKR Ethernet Adapter offers Dell® Switch Independent Partitioning, which enables segmentation of each 25GbE port into eight virtual ports, with flexible allocation of bandwidth to each port. The segmentation allows IT organizations to improve resource utilization while lowering infrastructure and operational costs. Virtualization, cloud computing, High Performance Computing (HPC), convergence, and clustering initiatives are increasing workload demands. The QL41232HMKR Ethernet Adapter is the solution of choice for workload-intensive computing environments, providing a reliable, high-performance 25GbE connectivity solution.

QLogic FastLinQ QL41232HMKR 10/25GbE Adapters deliver advanced Ethernet solutions that are designed to meet requirements from leading enterprise and cloud providers. QLogic features that collectively deliver the most advanced 25GbE adapter include:

- Industry’s most advanced 25GbE adapter delivers the best price and performance ratio compared to 10GbE
- Universal RDMA delivers the ultimate choice and flexibility with concurrent support for RoCE, RoCEv2, and iWARP technologies
- Enables provisioning of 10/25GbE ports for greater deployment flexibility through switch-independent NIC partitioning
- Increases VM density and accelerates multitenant networks with full offload for tunneling protocols

QLogic FastLinQ QL41232HMKR Dual-port 10/25GbE Intelligent Ethernet Adapter with Universal RDMA for Dell PowerEdge Blade Servers
QLogic FastLinQ QL41232HMKR

- QLogic cloud-enabled management framework that orchestrates and manages hyperscale OpenStack® deployments
- Dell Switch Independent Partitioning that enables provisioning of 25GbE ports for greater deployment flexibility

REDUCE CAPITAL EXPENDITURE AND OPERATING EXPENSE
QLogic FastLinQ QL41232HMKR 25/10GbE technology delivers better price-per-gigabit versus 10GbE. The adapter is backward compatible with existing 10GbE installations while allowing an upgrade to 25GbE infrastructure. This technology enables cloud providers and large-scale data center operators to reduce operating expense while continuing to scale their network of server and storage nodes to meet increasing demands of the future. QLogic 25GbE technology is cost-efficient and power-efficient because it uses a single lane, compared to other alternatives such as quad-lane 40GbE. The QL41232HMKR Ethernet adapter is compatible with 25Gbps lanes used in 100GbE switches, paving the way to a seamless upgrade path to connect to 100GbE switches that have 4×25GbE capability.

STREAMLINING NETWORKING WITH SWITCH INDEPENDENT PARTITIONING
Switch Independent Partitioning helps simplify the data center and the network and storage infrastructure in several ways. For example, when connecting servers, administrators may need to use many cables, sometimes adding switches to reduce cable proliferation. Switch Independent Partitioning provides an alternative: consolidating connections onto significantly reduced numbers of devices. Like switches, Switch Independent Partitioning reduces the number of cables without adding workloads on the network. However, Switch Independent Partitioning requires fewer devices compared to using switches and cables, thereby reducing network sprawl, maximizing network scalability, and simplifying administration.

ACCELERATE ANY NETWORK WITH UNIVERSAL RDMA OFFLOAD
QLogic FastLinQ QL41232HMKR 10/25GbE Adapters support RoCE and iWARP acceleration to deliver low latency, low CPU utilization, and high performance on Windows Server® Message Block (SMB) Direct 3.0 and 3.0.2, Windows Server Storage Spaces Direct (S2D), and iSER. The QL41232HMKR 10/25GbE adapter has the unique capability to deliver Universal RDMA that enables RoCE, RoCEv2, and iWARP. QLogic Universal RDMA and emerging low latency I/O bus mechanisms such as Network File System over RDMA (NFSoRDMA) allow customers to accelerate access to data. QLogic’s cutting-edge offloading technology increases cluster efficiency and scalability to many thousands of nodes.

HIGH-DENSITY SERVER VIRTUALIZATION
The latest hypervisors and multicore systems use several technologies to increase the scale of virtualization. The QLogic FastLinQ QL41232HMKR 10/25GbE Adapters support:
- VMware® NetQueue
- Windows® Hyper-V virtual machine queue (VMQ)
- Linux® Multiqueue
- Windows, Linux, and VMware switch-independent NIC partitioning (NPAR)
- Windows Hyper-V, Linux Kernel-based Virtual Machine (KVM), and VMware ESXi SR-10V

These features provide ultimate flexibility, quality of service (QoS), and optimized host and virtual machine (VM) performance while providing full 25GbE bandwidth per port. Public and private cloud virtualized server farms can now achieve 2.5 times the VM density for the best price and VM ratio.

WIRE-SPEED NETWORK VIRTUALIZATION
Enterprise-class data centers can be scaled using overlay networks to carry VM traffic over a logical tunnel using NVGRE, VXLAN, and GENEVE. Although overlay networks can resolve virtual LAN (VLAN) limitations, native stateless offloading engines are bypassed, which places a higher load on the system’s CPU.

QLogic FastLinQ QL41232HMKR 10/25GbE Adapters efficiently handle this load with advanced NVGRE, VXLAN, and GENEVE stateless offload engines that access the overlay protocol headers. This access enables traditional stateless offloads of encapsulated traffic with native-level performance in the network. Additionally, FastLinQ QL41232HMKR 10/25GbE Adapters support VMware NSX® and Open vSwitch (OVS).

HYPER-SCALE ORCHESTRATION WITH OPENSTACK
QLogic FastLinQ QL41232HMKR 10/25GbE Adapters support the OpenStack open source infrastructure for constructing and supervising public, private, and hybrid cloud computing platforms. They provide for both networking and storage services (block, file, and object) for iSER. These platforms allow providers to rapidly and horizontally scale VMs over their entire, diverse, and widely spread network architecture to meet the real-time needs of their customers. QLogic’s integrated, multiprotocol management utility, QConvergeConsole® (QCC), provides breakthrough features that allow customers to visualize the OpenStack-orchestrated data center using autodiscovery technology.

ACCELERATE TELCO NETWORK FUNCTION VIRTUALIZATION (NFV) WORKLOADS
In addition to OpenStack, The QL41232HMKR Adapter supports NFV, which allows decoupling of network functions and services from dedicated hardware (such as routers, firewalls, and load balancers) into hosted VMs. NFV enables network administrators to flexibly create network functions and services as they need them, reducing capital expenditure and operating expenses, and enhancing business and network services agility. QLogic 25GbE technology is integrated into the DPDK and can deliver up to 38 million packets per second to host the most demanding NFV workloads.
TRUSTED, RELIABLE, AND INTEROPERABLE

QLogic is an industry leader in 25GbE and was the first to demonstrate end-to-end interoperability for 25Gb and 100Gb Ethernet solutions. QLogic FastLinQ QL41232HMKR 10/25GbE Adapters adhere to standards that ensure interoperability. In addition, QLogic technology provides an easy upgrade path to 100GbE networks that utilize multiple 25GbE lanes.
**Host Bus Interface Specifications**

- **Bus Interface**
  - PCI Express® (PCIe®) Gen3 x8, Gen2 x8 (electrical)

- **Host Interrupts**
  - MSI-X supports independent queues

- **I/O Virtualization**
  - SR-IOV (up to 192 virtual functions)
  - NIC extended partitioning (NPAReP) (up to 16 physical functions)

**Compliance**

- PCI Express Base Specification, rev. 3.1
- PCI Express Card Electromechanical Specification, rev. 3.0
- PCI Bus Power Management Interface specification, rev. 1.2
- Advanced Configuration and Power Interface (ACPI), v2.0

**Ethernet Specifications**

- **Throughput**
  - 10Gbps line rate per-port in 10GbE mode
  - 25Gbps line rate per-port in 25GbE mode

- **Ethernet Frame**
  - Standard MTU sizes and jumbo frames up to 9,600 bytes

- **Stateless Offload**
  - IP, TCP, and user datagram protocol (UDP) checksum offloads
  - TCP segmentation offload (TSO)
  - Large send offload (LSO)
  - Gigantic send offload (GSO)
  - Large receive offload (LRO)
    - LRO (Linux)
    - Receive segment coalescing (RSC) (Windows)
  - Receive side scaling (RSS)
  - Transmit side scaling (TSS)
  - Interrupt coalescing
  - VMware® NetQueue, Microsoft® Hyper-V® VMQ (up to 208 dynamic queues), and Linux Multiqueue
  - Universal RDMA

- **Compliance**
  - IEEE Specifications:
    - 802.3-2015 (1Gb, 10Gb, and 25Gb Ethernet Flow Control)
    - 802.3-2015 Clause 72 (10Gb Backplane)
    - 802.3by-2016 (25G Ethernet)
    - 802.3ad (Link Aggregation)
    - 802.1Qbb (Priority-based Flow Control)
    - 802.10az (DCBX and ETS)
    - 802.1q (VLAN)
    - IPv4 (RFC 791)
    - IPv6 (RFC 2460)
    - 1588-2002 PTPv1 (Precision Time Protocol)
    - 1588-2008 PTPv2

**Tunneling Offloads**

- VXLAN
- NVGRE
- GENEVE

**RDMA Specifications**

- **Universal RDMA**
  - RoCE
  - RoCEv2
  - iWARP
  - Storage over RDMA: iSER, S2D, and SMB Direct
  - NFSoRDMA

- **Tools and Utilities**

**Management Tools and Device Utilities**

- QLogic Control Suite integrated network adapter management utility (CU) for Linux and Windows
- QConvergeConsole (QCC) integrated network management utility (GUI) for Linux and Windows
- QCC Plug-ins for vSphere (GUI) and ESXCLI plug-in for VMware
- QCC PowerKit (Windows PowerShell®) cmdlets for Linux and Windows
- Pre-boot unified extensible firmware interface (UEFI) Device Configuration pages in system BIOS
- Native OS management tools for networking

- **Boot Support**
  - Unified extensible firmware interface (UEFI)
  - Pre-execution environment (PXE) 2.0
  - iSCSI remote boot
  - SMI-S

**Operating Systems**

- For the latest applicable operating system information, see http://www.dell.com/support/home/us/en/

**Physical Specifications**

- **Ports**
  - Dual 25/10Gbps Ethernet: KR backplane interface for PowerEdge servers

**Form Factor**

- Custom Mezzanine form factor for the Dell PowerEdge® blade system

**Environment and Equipment Specifications**

- **Temperature**
  - Operating: 0°C to 55°C (32°F to 131°F)
  - Storage: –40°C to 65°C (–40°F to 149°F)

- **Humidity (Relative, Non-condensing)**
  - Operational: 10% to 80%
  - Non-operational: 93% maximum at 65°C

**Agency Approvals—Safety**

- **US and Canada**
  - UL 60950-1
  - CSA C22.2

- **Europe**
  - TUV EN60950-1
  - TUV IEC 60950-1
  - CB Certified

**Agency Approvals†—EMI and EMC (Class A)**

- **US and Canada**
  - FCC Rules, CFR Title 47, Part 15, Subpart Class A
  - Industry Canada, ICES-003: Class A

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1 Agency approvals have not been authorized at the time of publication; this list is preliminary.
Europe
- EN55032
- EN55024
- EN61000-3-2
- EN61000-3-3

Japan
- VCCI: Class A

New Zealand and Australia
- AS/NZS: Class A

Korea
- KC-RRA Class A

Ordering Information

QL41232HMKR-DE-BK
- Dell part number: HJ3FX