

**Product Overview:**

VCL-MX-5040-R, router is an intelligent MPLS (Multiprotocol Label Switching) router which can be used to securely inter-connect multiple LAN networks over a WAN link using a choice of secure routing protocols including MPLS VPN, IPsec and OpenVPN. The VCL-MX-5040-R is a ruggedized OSI model routing equipment that is embedded with advanced routing and cyber security features which make it suitable for installations in critical infrastructure such as utilities, sub-stations, smart-grid distribution systems, airports and railways that require high reliability industrial equipment. It may also be installed in IT networks of financial institutions such as banks and corporate networks for Wide Area Applications.

VCL-MX-5040-R is password protected with capabilities that meet and exceed the most demanding cyber-security requirements, including the currently applicable NERC specifications.



**Interfaces:**

- 6 x 100GE interfaces  
or
- 12 x 40GE interfaces  
or
- 24 x 10/1GE interfaces

**Or:** Any combination of the interfaces mentioned here, not exceeding an aggregate of 600G

**Throughput:**

- Router : Up to 540 Gbps**
- IPsec : Up to 450 Gbps**
- MPLS : Up to 510 Gbps**

**Highlights:**

- High-reliability hardware
- CPU based, Modular Architecture
- Suitable for installation in sub-stations, SCADA and industrial networks / harsh environments
- Supports for Ethernet, Fast Ethernet, Gigabit Ethernet, Optical Ports
- Secure Boot
- MPLS VPN
- High security across WAN connection includes IPsec Encrypted Tunneling
- DNS Forwarding, Dynamic DNS, DNS Repeater
- DHCP Server and Relay
- IP based access control
- Centralized management for easier deployment
- Network Flow Monitoring
- Easy installation and management
- LDAP user authentication support for OpenVPN Clients
- Export logs locally or on a Syslog server
- L2TPv3, L2VPN, L3VPN
- VXLAN
- Packet forwarding rate: 635.36 MPPS
- SPAN (port mirroring)
- Supports L2 & L3 service on all interfaces
- Supports frame size from 64 to 9216 bytes
- MACVLAN - Pseudo Ethernet
- Contrack Sync
- Link Aggregation
- Integrated threat control includes prevention of network attacks
- Intelligent protection of endpoints includes authentication, authorization and control
- On-demand network services
- Improved user experience
- Telnet
- SSH (Secure Access Control) with encrypted password
- High Availability & 1+1 Hardware Failover Redundancy using VCL-SafeComm-OE
- VCL-MX-5040-R offers a wide range of VPN technologies ranging from modern SSL VPN's to IPsec. Site-to-Site setups are possible and with the integrated OpenVPN client configuration exporter. The client can be configured remotely within minutes
- Transport of multiple services
- Broadband support
- Granular control over state table
- Infrastructure neutral
- Network Emulator
- Support out of band management through management port / console
- In service / remote software upgrade

**Routing Features and Capabilities:**

- CLI based
- Static and Dynamic IP addressing
- IPv4 and IPv6
- OSPFv2 and OSPFv3
- BGPv4, IS-IS
- RIP v1, RIP v2 and RIPng
- ARP, IP Forwarding, IPCP
- VRRP redundancy protocol
- Layer 2, Layer 3 Routing
- Static IPv4 routing, Static IPv6 routing, Inter-VLAN based routing
- MPLS Dynamic (LDP) & Static
- RSVP (MPLS-TE)
- TCP/IP, UDP, QoS, WRED
- Supports 802.1Q VLAN
- System access authentication via RADIUS
- Detailed system logging
- Multiple IP address supported
- LLDP, NTP, PPPoE, STP, SNMP, NAT
- BFD (Bidirectional forwarding detection)
- IP gateway routing
- DHCPv4 and DHCPv6
- PIM
- Q-in-Q
- Router Reflector (Add software Option)
- 6in4 (SIT), IPIP, IPIP6, IP6IP6
- EAPoL (802.1x)
- IGMP v1, v2 and v3, Multicast
- PIM SSM (Protocol Independent Multicast – Source Specific Multicast)
- QoS, Traffic Shaper – supported algorithms: Drop Tail, Fair Queue, FQ-CoDel

**Firewall Features and Capabilities:**

- Policy-based routing (PBR)
- Rule based firewall with IP, port-based matching criteria
- Zone based firewall for Layer 2/3 Security
- IPsec Site-to-Site Tunnels, GRE
- Access Lists
- Per Frame / Packet Authentication
- Support Voice over IP (VoIP) Protocols
- Whitelist and Blacklist Options
- Stateful Inspection Firewall
- MAC Layer Filtering
- VPN
- Protection from DDoS and SYN attacks

**Typical VCL-MX-5040-R Deployments:**

- Utilities - Power, Oil and Gas Installations
- Industrial applications
- Campus IP Networks, for all types of data, voice and video over IP applications
- Meshed-networks
- Metro Ethernet and VPLS networks
- Cloud applications

**Ingress / Egress Firewall rules:**

- Port based, URL based, user based, MAC based, filtering of packets based on source address and destination address
- IP domain based, RFC filtering
- Protocol based filtering: FTP, SMTP, HTTP, RPC, SNMP, UDP, ICMP, DNS, DHCP, ARP etc.

**Hash Algorithms:**

- MD5, AES-XCBC
- SHA 1, SHA 256, SHA 512

**Encryption Algorithms:**

- AES-128, AES-192, AES-256
- 3DES, DES
- 256 bit AES-GCM with 256 bit ICV
- Camellia 128, 192, 256
- Blowfish 128, 192, 256

**Service Ports:**

1. IP Phones (Voice)
2. PMU
3. RTU
4. ICCP (Inter Control Centre Communications Protocol)
5. AMR (Automatic Meter Reading)
6. AGC (Automatic Generation Control Software) Sub-station Analysis
7. SCED (Security Constraints Economic Dispatch)
8. DTCP / Teleprotection (Distance and Differential Protection)
9. TWFL (Travelling Wave Fault Locator)
10. Video Conferencing

**Technical Specifications:**

Integrated Storage Drive	Internal, onboard 1TB High Performance SATA Drive
Additional Storage	Optional - 120GB, 240GB, 500GB and 2TB SSD
Power Supply	Dual (1+1) Redundant Power Inputs *(Power Supply Options)
Indicators	2 x Power Supply Indicators
Architecture	CPU based & Modular Architecture
Processor	12 cores or higher
Clock Speed	Normal-2.1 GHz, Burst Mode 3.2 GHz
Cache, Buffers	16MB or higher
RAM (DDR 3L)	64GB (upgradable to 128GB)
Performance	Rugged System
MTBF (hours)	210240
IP Level Protection	IP20
Max. Power Consumption @ 110/220, 50/60Hz VAC	600 Watts
Cooling	Active fan tray

**Environmental:**

Operating Temperature	-4°F ~ 131°F (-20°C ~ 55°C)
Storage Temperature	-22°F ~ 167°F (-30°C ~ 75°C)
Operating Humidity	10%~95% relative humidity, non-condensing
Storage Humidity	10%~95% @40°C; non-condensing

**EMI, EMC, Surge Withstand and other Compliances:**

EN 50081-2	EN 50082-2	IEC 60068-2-29
IEC 61000-4-6 (Conducted Immunity)	IEC 60068-2-6	IEC 60068-2-2
IEC 60068-2-78	IEC 60068-2-1	IEC 60068-2-14
CISPR 32 / EN55032 Class A (Conducted Emission and Radiated Emission)		
IS 9000 (Part II Sec. 1-4, Part III Sec. 1-5, Part IV, Part 14 Sec. 1-3)		
IEC 60870-2-1	IEC 61000-4-5	IEC 61000-4-2
IEC 61000-4-11	IEC 61000-4-8	IEC 61000-4-4

**Physical Dimension:**

- 19 inch, 4U High Rack Mount
- D x W x H: 639mm x 484mm x 176mm
- Net Weight: 17 Kgs
- Gross Weight: 21 Kgs

**Ordering Information:**

Part#	Description
VCL-MX-5040-R	VCL-MX-5040-R, Router 19 Inch 4U High Rack Mount Installation Kit: System Core Cables *Add Power supply

**CE Compliance:**

- Electromagnetic Compatibility 2014/30/EU

**Other Regulatory Compliance:**

- RoHS
- CE Marking
- Complies with FCC Part 68 and EMC FCC Part 15

**\* Power Supply Options:**

Part#	Description
AC220R	2 x 220VAC, 50Hz. Power Supply Inputs [1+1 Redundant, Hot Swappable Power Supply]
AC110R	2 x 110VAC, 60Hz. Power Supply Inputs [1+1 Redundant, Hot Swappable Power Supply]

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Technical specifications are subject to changes without notice.

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