**DZS**

# M4000

## Flexible Front/Mid/BackHaul cell site router

The M4000 is a flexible multi-purpose router for mobile AnyHaul applications.

### Features & Benefits

+ SRv6-based Router

+ 32 ports of 1/10/25GE (SFP/SFP+/SFP28)

+ 2 ports of 100GBase-R (QSFP28)

+ 360Gb/s switching capacity

+ Operates as Timing Grand Master with integrated GNSS receiver

+ Redundant dual power interface

+ Hot swappable fan interface

The M4000 is a high-performance, flexible, packet-based mobile transport router. Optimized for AnyHaul (Fronthaul, Midhaul, Backhaul) applications, the M4000 supports the tight latency, synchronization, and QoS requirements needed for 5G networks.

The M4000 provides up to 32x1 GE (SFP)/10GbE (SFP+)/25GE (SFP28) ports for the subscriber side, and 2x4100GbE (QSFP28) ports on the network side.

The M4000 can be used for a variety of new revenue-generating applications. With support for advanced SRv6, the M4000 is ideal for packet-based network slicing applications, while simplifying the overall network architecture.

The M4000 has a multitude of critical network timing features. With its integrated GPS receiver, the M4000 can operate as a PTP Grand Master. With external timing, it can function as a high-precision PTP Class C Boundary Clock with SyncE support. The M4000 also includes local I/O clock interfaces.

The M4000 has a compact 1 RU chassis for installation in standard Telco racks that is hardened for extended-temperature deployments. It is a carrier class system with modular, redundant fan and power supply modules.

## Application flexibility and feature richness

Next generation mobile networks require switches/routers that can handle the diverse requirements of Fronthaul, Midhaul and Backhaul applications at the same time. Time-sensitive networking with low latency, extensive timing features, and service flexibility are all critical requirements. The M4000 delivers these critical features in a very cost-effective, 1 RU carrier class hardened chassis. The M4000 offers 360 Gb/s switching capacity across 32 1/10/25G ports and 2 100G ports. For network synchronization, the M4000 has an integrated GNSS receiver and can act as a PTP Telecom Grand Master. It can also receive external PTP timing for primary or secondary timing purposes and operate as a Class C PTP T-BP/TC. SyncE is also supported.

## Made for rigid performance and reliability requirements

The M4000 supports extended temperatures (-40 to 65°C) and is less than 12 inches in depth for easy installation in cabinets and telco racks. It provides two mounting slots for the dual power modules on the front panel, and two mounting slots for the fans on the rear panel. The power supply modules support 1:1 redundancy and load sharing. Fan operation is controlled by internal CPU, and fan speed is controlled based on internal system temperature. Security features include storm control for broadcast, multicast and unknown unicast packets, out-of-band management, and SSH (secure shell) support. The M4000 offers the ability to migrate to an IP/Ethernet mobile platform with traffic management and carrier class reliability.

## An asset to wireless operators

The flexibility of the M4000 makes it ideal for a wide variety of application scenarios and services. With integrated grandmaster timing support, it is capable of creating a localized timing island for the delivery of high-performance mobile applications even when the backhaul link passes through leased circuits or legacy networks that cannot support high-performance PTP Timing.

Typical applications for the M4000 Include:

- Mobile transport/grandmaster timing edge aggregation switch

- Cell site router

- Simultaneous fronthaul/midhaul/backhaul transport

- In-building small-cell aggregation switch/router

- Multi-tenant business services access

- Multi-service cabinet-based hardened high-performance switch/router

- TOR switch

# Product Specifications

## Base Features

+ 1RU design
+ Redundant dual power supply modules
+ Hot swappable Fan and power modules
+ 360Gbps switching capacity

## Interfaces

+ 32 ports 1/10/25G (SFP/SFP+/SFP28) as follows:
  - Up to 24 ports 1G
  - Up to 32 ports 10G
  - UP to 24 ports 25G
+ 2 ports for 100G (QSFP28)
+ 1 port RS-232(RJ45) for console debug
+ 1 port GE out-of-band Management
+ 1 port GNSS Antenna Input
+ 1 port TOD, 1-port 1PPS, 1-port 10MHz Timing Interfaces

## Clock Synchronization

+ IEEE1588v2
+ Integrated Grand Master with internal GNSS receiver
+ Class C T-BC/TC
+ Synchronous Ethernet
+ TOD, PPS, 10 MHz I/O

## Physical and Environmental

+ Dimensions (WxHxD):
  + 444 mm x 44 mm x 250 mm
  + 19-inch rackmount, 1RU
+ Operating Temperature:
  -40 to 149°F (-40 to 65°C)
+ Storage Temperature:
  -40 to 158°F (-40 to 70°C)
+ Operating humidity:
  5 to 95% non-condensing
+ AC power: 110 to 220VAC, 50/60 Hz
+ DC power: -48VDC
+ Dual-Power Supply Support optional
+ Maximum power consumption:
  AC:  200W      DC: 190W

## Layer 2 Capabilities

+ Standard Ethernet Bridging SVL/IVL
+ Per port/VLAN MAC limit
+ Per port L2 protocol packet processing
+ Unified Forwarding Table
+ 4K active VLANs for 802.1q tagged frame
+ Port/Subnet/Protocol/MAC-based VLAN
+ VLAN translation on ingress and egress.
+ 802.1D (STP), 802.1W (RSTP), 802.1s (MSTP)
+ LACP, MC-LAG
+ Jumbo frames up to 9KB
+ 802.1q /Q-in-Q tunneling
+ MAC filter, Max-host, Loop detection
+ L2 Multicast
+ Storm control
+ FlexE Capable (Future)

## Layer 3 Capabilities

+ IPv4/IPv6 Static & Dynamic routing
+ IS-IS, OSPFv2/v3, BGPv4
+ VRRP
+ Policing-based routing (PBR)
+ BFD
+ SRv6
+ EVPN-SRV6 (L2/L3 E-Line, E-LAN)
+ TI-LFA-FRR

## Quality of Service

+ Deep IP ACL including PBR
+ Hierarchical QOS
+ DWRR/DRR/WRR
+ Rate-shaping at egress
+ Congestion notification (802.1Qau)

## Security

+ Storm control for broadcast, multicast and unknown unicast packets
+ Out-of-band management
+ Secure Shell (SSH)

## Management

+ NETCONF/YANG
+ Serial/Telnet (CLI)
+ SNMPv1/v2/v3
+ RMON
+ RADIUS/TACACS+
+ DHCP client, relay
+ SYSLOG
+ Link layer discovery protocol (LLDP)
+ Software Download/Upgrade

## OAM / Protection

+ Ethernet OAM (LMEP/RMEP)
+ Y.1731/802.1ag
+ Y.1564
+ TWAMP Reflector

# Ordering Information

| Base Unit, Power Supply and Fan Modules | |
|---|---|
| **M4000-DC** | 32-access ports: Up to 24 1G, up to 32 10G and up to 24 25G ports |
| | 2-port 100G |
| | 2 Power supply slots: 1 DC power supply module provided |
| | 2 FAN Slots: 2 FAN modules provided |
| | Note: Order M4000-PSUMOD-DC to get a second DC power supply module |
| **M4000-AC-NA**<br>**M4000-AC-EU**<br>**M4000-AC-UK** | 32-access ports: Up to 24 1G, up to 32 10G and up to 24  25G ports |
| | 2-port 100G |
| | 2 Power supply slots: 1 AC Power supply module provided, |
| | -NA = North American Power Cord |
| | -EU = European Union Power Cord |
| | -UK = UK Power Cord |
| | 2 FAN Slots: 2 FAN modules provided |
| | Note: Order M4000-PSUMOD-AC-XX to get a second AC power supply module |
| **M4000-PSUMOD-AC-NA**<br>**M4000-PSUMOD-AC-EU**<br>**M4000-PSUMOD-AC-UK** | 1 AC Power Supply Module for M4000 |
| | -NA = North American Power Cord |
| | -EU = European Union Power Cord |
| | -UK = UK Power Cord |
| **M4000-PSUMOD-DC** | 1 DC Power Supply Module for M4000 |
| **M4000-FAN-MODULE** | 1 FAN Module for M4000 |
| | Base unit comes with 2 Fan Modules installed; this part number is for sparing purposes. |

| Software Part Numbers | |
|---|---|
| **M4000-SW-BASE** | Required Base Software License |
| **FHG-GNSS-ACTIVATION** | Optional Software License for Grandmaster Timing Support |
| **M4000-ADVANCED-SERVICES** | Optional Software Licensing for SRv6 support |