µFalcon-MX

10G Service Aggregation/Demarcation

Product Overview

The **µFalcon-MX** is a compact, high performance, service aggregation and demarcation system, delivering high end Carrier Ethernet services.

This product extensively supports the evolving needs for broadband access services delivery, including high throughput, granular SLA enforcement and monitoring, flexible management capabilities, and a high degree of scalability and flexibility to cater for future requirements and technology trends.

Support for 2.5GE allows an intermediate step for high speed access (>1G) while avoiding the costs of 10G, as required in applications such as Wi-Fi access points (802.11ac Wave 2).

The **µFalcon-MX** primarily addresses the rapidly expanding market of mobile backhauling and business access applications.

The **µFalcon-MX**'s extensible hybrid (ASIC-FPGA) Hardware architecture supports remote data plane upgrades.

The **µFalcon-MX** delivers a complete toolbox for precision timing based on SyncE, and PTP, suitable for all modes of mobile backhaul applications.

The **µFalcon-MX** series is equipped with 4x triple-rate SFP ports (100/1000/2500BaseX), 2x tri-speed Copper ports (10/100/1000BaseT) and 2x 1/2.5/10G SFP+ uplink ports. All ports can operate at full wire speed, with a total processing capacity of 34Gbps (non-blocking).

The **µFalcon-MX** offers advanced Quality of Service (QoS) features including classification and mapping based on layer 1 through layer 4 attributes, rate limiting per service, with highly flexible scheduling, queuing and shaping options (including HQoS).

All MEF defined services (EPL, EVPL, ELAN, etc) can be configured on the **µFalcon-MX** series and can also be protected through use of high-performance mechanisms, based on G.8031, G.8032, etc., for link, path, and ring resilience. Future models will support SDN and NFV capabilities.

- Local service aggregation/demarcation unit for business Ethernet and mobile backhaul
- Based on 3rd generation Falcon architecture
- Full set of MEF CE2.0 compliant services
- Advanced QoS and service level traffic management
- Complete OAM toolbox (802.1ag, Y.1731, RFC2544, Y.1564) for OPEX reduction
- Advanced high-speed protection mechanisms for link, path, and ring service resilience
- 2.5Gbps support on optical ports
- Extensive Sync and Timing options with SyncE, IEEE1588-2008 (PTP)
- Compact design, low power consumption, fan-less design

These features make the **µFalcon-MX** highly comprehensive package that can handle virtually any network topology and type of service.

The system implements current OAM standards (802.3ah, 802.1ag, Y.1731with HW assist as well as proactive measurements and alarming facilities. To complete the OAM toolset, the **µFalcon-MX** has a built-in packet generator and analyzer to implement RFC2544/Y.1564 for quick service turn-up and verification.

The **µFalcon-MX** is housed in a highly compact, half-19", 1U chassis (150mm deep only), implements a fan-less design, and has an integrated internal, wide range AC or DC power supply.

The **µFalcon-MX** series is MEF CE2.0 compliant.

Technical Specifications

Interfaces & Indicators

- 4 x 100/1000/2500BaseX (SFP)
- 2 x 10/100/1000BaseT (RJ45)
- 2 x 1/2.5/10G (SFP+)
- Supported SFP/SFP+: MM, SM, SFS, xWDM, Copper
- 1 x RS232 (RJ45) Console
- LEDs
  - CPU
  - Link/Activity (per port)
  - Sync
  - Alarm
  - Power

Synchronization (S models)

- Synchronous Ethernet
- G.8261, G.8262
- ESMC (G.8264)
- Physical interfaces:
  - 2 x SMA connectors for 1PPS/Clk, in/out
- Built-in Stratum 3 clock
- IEEE1588-2008 (PTP):
  - Ordinary Clock (master, slave)
  - Transparent Clock
  - Boundary Clock
- Profiles supported:
  - Telecom Frequency (G.8265.1)
  - Telecom Phase (G.8275.1, G.8275.2)
  - Default (1588)

Architecture & Forwarding

- Hybrid (ASIC-FPGA) HW architecture
- 256MB RAM, 256MB flash memory
- L2 forwarding (802.1D MAC bridging)
- Flow-based forwarding
- Performance: wire-speed, on all ports, all frame sizes
- Switching fabric: 34Gbps, non-blocking
- MTU: 10K bytes
- MAC table: 16K addresses
- VLANs: 4K concurrent
- Provider bridging: 802.1ad (Q-in-Q)
- Private VLANS L1-L4 ACLs
- Multicast:
  - IGMPv3 snooping
  - MLD snooping
  - Up to 8K MC groups
- Static routes

Quality of Service

- Classification based on L1-L4 information
- Ingress policing per flow (MEF BW profiles)
- Two rate, 3-color marking
- Hierarchical queuing/scheduling
- Hierarchical shaping
- Priority based flow control (802.1Qbb)
- Scheduling: Strict and DWRR (WFQ equivalent)
- 4 drop precedence levels w/ WRED and tail drop
- P-bit and DSCP remarking
- Storm control: UC, MC, BC
- QoS Control Lists
- Compliant with 3GPP QoS requirements for LTE backhaul

Protection

- Link:
  - Link aggregation: static or LACP
  - Link Protection
- Linear protection: G.8031
- Ring protection: G.8032v2
- Spanning tree: STP, RSTP, MSTP
- Loop protection

OAM & Diagnostics

- IEEE802.3ah link OAM
- IEEE802.1ag CFM (HW assisted)
- ITU-T Y.1731 PM (HW assisted)
- RFC2544 traffic generator/analyzer (up to wire speed)
- L2 loopbacks w/ MAC swap
- Throughput metering
- SFP diagnostics (SFF-8472)
- Traffic mirroring and remote mirroring
- sFlow

Management

- Interfaces:
  - CLI: Console (RS232), Telnet, SSH1/2
  - SNMP: v1/v2c/v3, extensive MIBs, trap profiles
  - Web: HTTP/HTTPS
  - Management VLAN
  - IPv6 management
- Authentication:
  - RADIUS, TACACS+
  - Multiple local users
  - User access levels (15)
  - Management ACLs
  - 802.1x (port/MAC based)
- DHCP client & relay (incl. option 82)
- Link discovery: LLDP, CDP snooping
- Operations:
  - Remote System Update (TFTP or Web)
  - Configuration upload/download (TFTP or Web)
  - Text based config files
- Alarms:
  - SNMP traps
  - Syslog (internal and remote server)
  - CLI events
  - Dying gasp (802.3ah or SNMP trap)
- Remote temperature reading & alarm
- Per port, EVC and CoS detailed statistics, RMON; NTPv4
- Integrated into the NetACE NMS

Power & Environmental

- Internal Power Supply
- AC/DC: 100-240VAC, 50/60Hz or 125VDC
- 20-60 VDC, ST connector
- Power consumption:
  - Maximum: <20W; typical: <15W
- Operating temperature:
  - Standard: -10°C ÷ +50°C (14°F ÷ 122°F)
  - Extended: -40°C ÷ +65°C (-40°F ÷ 149°F)
- Storage temperature: -40°C ÷ +80°C (-40°F ÷ 176°F)
- Humidity: 10-90%, non-condensing

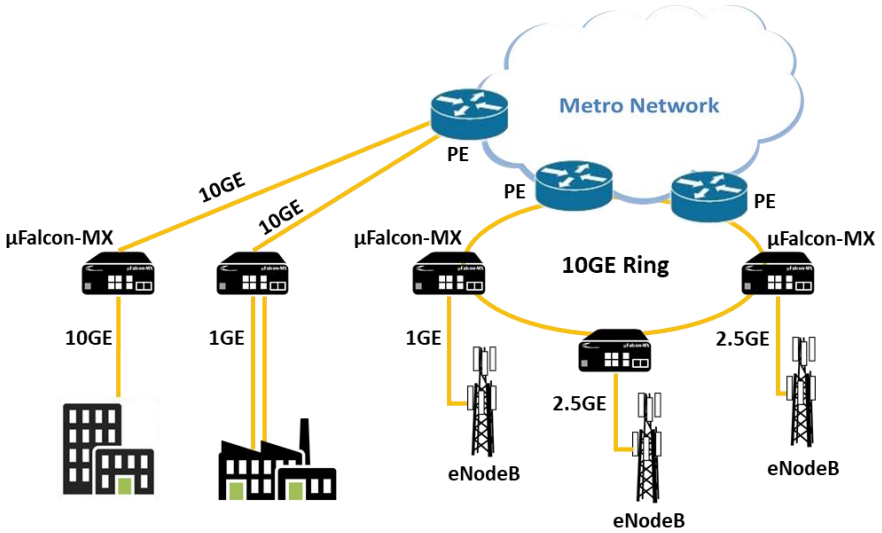
Physical

- Dimensions (HxWxD):
  - 44x221x150mm (1.73x8.70x5.90 inch)
- Mounting:
  - Desktop
  - Rack
  - Wall
- Weight: ~0.8Kg (1.76 lb)
- Accessories:
  - Power cable
  - RS232 cable (console)
  - Rack mounting kit (optional)

Regulatory & Compliance

- Safety:
  - IEC EN60950-1
- CE
- RoHS
- EMC:
  - FCC CFR 47 part 15, subpart B, Class A
  - EN 300 386 V1.3.3: 05
- MEF: CE2.0

Typical Application: Fixed Mobile Convergence



Ordering Information

Model	P/N	Description
µFalcon-MX/A	7083	Access Service Gateway, 4x100/1000/2500BaseX (SFP), 2x10/100/1000BaseT, 2x 1/10GE (SFP+), internal AC power supply ,CE SW license
µFalcon-MX/D	7084	Access Service Gateway, 4x100/1000/2500BaseX (SFP), 2x10/100/1000BaseT, 2x 1/10GE (SFP+), internal DC (20-60VDC) power supply, CE SW license
µFalcon-MX/S/A	7085	Access Service Gateway, 4x100/1000/2500BaseX (SFP), 2x10/100/1000BaseT, 2x 1/10GE (SFP+), Advanced Timing, internal AC power supply, CE SW license
µFalcon-MX/S/D	7086	Access Service Gateway, 4x100/1000/2500BaseX (SFP), 2x10/100/1000BaseT, 2x 1/10GE (SFP+), Advanced Timing, internal DC (20-60VDC) power supply, CE SW license
µFalcon-MX/S/A/ET	7085E	Access Service Gateway, 4x100/1000/2500BaseX (SFP), 2x10/100/1000BaseT, 2x 1/10GE (SFP+), Advanced Timing, internal AC power supply, CE SW license, extended temperature range
µFalcon-MX/S/D/ET	7086E	Access Service Gateway, 4x100/1000/2500BaseX (SFP), 2x10/100/1000BaseT, 2x 1/10GE (SFP+), Advanced Timing, internal DC (20-60VDC) power supply, CE SW license, extended temperature range

Specifications are subject to change w/o prior notice

We've got Timing for you!

Intl. Headquarters
Fibrolan Ltd.
Tel: +972-4-959-1717
Fax: +972-4-959-1718
info@fibrolan.com
www.fibrolan.com

North America
Fibrolan Inc.
Tel: +1-201-843-1626
Fax: +1-201-843-1628
us.info@fibrolan.com
www.fibrolan.com

Central-Eastern Europe
Fibrolan CEE GmbH.
Tel: +43-2253-21188-0
Fax: +43-2253-21188-99
office@fibrolan.at
www.fibrolan.at

Revision: uFalcon-MX_DS_2020-11-04_v1-1