µFalcon-SL

Ethernet Demarcation Device

- Carrier Ethernet demarcation device delivering business-class Ethernet services and mobile backhaul over fiber infrastructure
- MEF compliant, supporting Ethernet Private Line (EPL) and Ethernet Virtual Private Line (EVPL) services with flexible mapping of the user traffic into Ethernet flows
- Robust bandwidth control mechanism and Service Level Agreement (SLA) monitoring per Ethernet flow starting at customer premises
- Complete Ethernet OAM toolbox based on IEEE 802.1ag, ITU-T Y.1731 and RFC2544 for Opex reductions
- Unique Micro-burst detection (MBD) technology for microsecond granular SLA monitoring (patent pending).
- Advanced high speed protection mechanisms for link, path, and ring service resiliency

Product Overview

The **µFalcon-SL** is a highly integrated, extremely compact, high performance, and cost-effective Network Termination Unit (NTU).

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.

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

The **µFalcon-SL**'s unique Dual Hybrid Core architecture (DHC) supports remote Data Plane Upgrades (DPU) to allow modification and addition of packet processing functions that require **full wire speed performance** that cannot be handled in SW.

The **µFalcon-SL** models are equipped with 4x10/100/1000BaseT (RJ45) user ports and 2xSFP PowerLink ports acting as NNIs. The user ports can be used in a flexible manner and can all operate at full wire speed. This leads to a total processing capacity of 12Gbps (non-blocking).

The **µFalcon-SL** offers advanced Quality of Service (QoS) features including classification and mapping based on layer 1 through layer 4 attributes, rate limiting, and shaping per port, queue, and service.

All MEF defined services (EPL, EVPL, ELAN, etc) can be delivered with the **µFalcon-SL** series and can further be protected through use of high performance mechanisms, based on G.8031 and G.8032v2, for link, path, and ring resilience.

These features, combined with a highly flexible fault propagation mechanism and unique fast failure detection algorithms yield a comprehensive and sophisticated device that can handle virtually any network topology.

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

A **unique Micro-Burst Detection** (MBD) technology for microsecond granular SLA monitoring is incorporated in the system, helping to detect, alert, and report nearly invisible traffic anomalies, which is essential in highly QoS-sensitive applications, such as financial, healthcare, etc. (patent pending).

The µFalcon-S series is MEF compliant (CE2.0 certified, MEF9, MEF14, MEF20, MEF22)

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

All the above result in a market leading system with small form factor dimensions.

Technical Specifications

Interfaces & Indicators

- 4 x 10/100/1000BaseT (RJ45)
- 2 x 100/1000BaseX (802.3z/SFP, PowerLink)
- Supported SFPs: MM, SM, SFS, CWDM
- 1 x RS232 (RJ45) Console
- *LEDs:*
  - Power
  - Alarm
  - Link/Activity (per port)
  - Speed (per port)

Architecture & Forwarding

- Dual Hybrid Core (DHC) HW architecture
- Data Plane Upgradable (DPU)
- 128MB RAM, 32MB flash memory
- L2 forwarding
- Flow-based forwarding
- Performance: wire-speed, on all ports, all frame sizes
- Switching fabric: 12Gbps, non-blocking
- MTU: 9.6K bytes
- MAC table: 8K addresses
- 802.3x Flow Control
- 802.1Q 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

Quality of Service

- Classification based on L1-L4 info
- Ingress policing per flow (MEF BW profiles)
- Two rate, 3-color marking
- 8 HW queues/port
- Egress shaping per queue (CoS)
- Egress shaping per port
- Scheduling: Strict and DWRR, hybrid
- P-bit and DSCP remarking
- Storm control: UC, MC, BC
- QoS Control Lists

Protection

- *Link*:
  - Link aggregation: static LAG or LACP (802.3ad)
  - Instant Link Protection (<100usec)*
- Linear: G.8031 (<50msec)
- Ring: G.8032v2 (<50msec)
- *Fault propagation:**
  - Port, service, combinations
  - Inverse, block actions/logic
  - Multiple concurrent rules
- Spanning tree: STP, RSTP, MSTP

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/L3 loopbacks with MAC/IP swap
- Micro Burst Detection (MBD) with logging and reporting
- Throughput metering
- Copper TDR
- SFP diagnostics (SFF-8472)
- Traffic mirroring

Management

- *Interfaces*:
  - CLI: Console (RS232), Telnet, SSH1/2
  - SNMP: v1/v2c/v3, extensive MIBs
  - 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)
  - Auto-configuration
- *Alarms:*
  - SNMP traps
  - Syslog (internal and remote server)
  - CLI events
  - Dying gasp (802.3ah or SNMP trap)
- Remote temperature reading & alarm
- Per port and CoS detailed statistics
- NTPv4

Power & Environmental

- Internal power supply
- AC/DC: 100-240VAC, 50/60Hz or 125VDC
- DC: 20-60VDC, ST connector
- *Power consumption:*
  - Maximum: <15W
  - Typical: <12W
- Passive cooling (fan-less design)
- *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

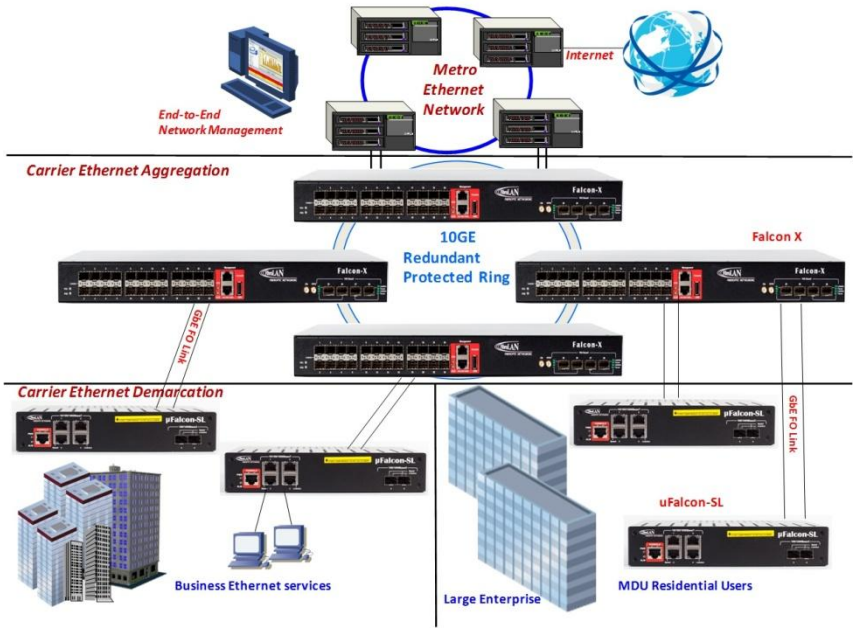
Physical

- Dimensions (HxWxD): 44x221x150mm (1.73x8.70x5.90 inch)
- Weight: ~650g (1.43 lb)
- *Mounting:*
  - Desktop
  - Rack
  - Wall
- *Accessories:*
  - Power cable
  - Console cable
  - Rack mounting kit (optional)

Regulatory & Compliance

- *Safety:*
  - IEC EN60950-1: 2006
- *EMC:*
  - EN 300 386 V1.3.3: Class B
  - FCC CFR 47 part 15, subpart B, Class A
- MEF: **CE2.0**, MEF9, MEF14, MEF20, MEF22
- CE
- RoHS

Typical Application: Metro Ethernet Access



Ordering Information

Model	Part #	Description
µFalcon-SL	7077	Ethernet Demarcation Device, 4xRJ45 (10/100/1000BaseT) ports, 2xSFP (1000BaseX) ports, internal AC/DC (100-240VAC/125VDC) Power Supply
µFalcon-SL/D	7078	Ethernet Demarcation Device, 4xRJ45 (10/100/1000BaseT) ports, 2xSFP (1000BaseX) ports, internal DC (20-60VDC) Power Supply
µFalcon-SL/ET	7079	Ethernet Demarcation Device, 4xRJ45 (10/100/1000BaseT) ports, 2xSFP (1000BaseX) ports, internal AC/DC (100-240VAC/125VDC) Power Supply, Extended Temperature (-40°C ÷ +65°C)
µFalcon-SL/D/ET	7080	Ethernet Demarcation Device, 4xRJ45 (10/100/1000BaseT) ports, 2xSFP (1000BaseX) ports, internal DC (20-60VDC) Power Supply, Extended Temperature (-40°C ÷ +65°C)

Specifications are subject to change w/o prior notice

Note: for a complete list of available Falcon models please contact Fibrolan

Fibrolan Ltd. (International)
Hacarmel 2, Yoqneam-Illit, 2066724, Israel
Tel: +972 (4) 959 1717
Fax: +972 (4) 959 1718
info@fibrolan.com

Fibrolan Inc. (North America)
350 W Passaic St., Rochelle Park, NJ 07662
Toll Free: (800) 406 6088
Tel: (201) 843 1626
Fax: (201) 843 1628
us-info@fibrolan.com

Fibrolan CEE GmbH. (Central/East Europe)
Prof.Dr.Stephan Koren Straße 10
A-2700 Wiener Neustadt Austria
Tel: +43 2622 90 990 0
Fax: +43 2622 90 990 99
office@fibrolan.at

www.fibrolan.com