

Falcon-STA

Carrier Ethernet TDM Pseudowire Aggregator



- Carrier Ethernet TDM Pseudowire aggregation of up to 252xE1s or 336xT1s into channelized 4xSTM1/1xSTM4 or 4xOC3/1xOC12
- MEF compliant, supporting Ethernet Private Line (EPL) and Ethernet Virtual Private Line (EVPL) services with flexible mapping of the user traffic into Ethernet flows
- Circuit Emulation Services (SAToP, CESoPSN, MEF8) with flexible and advanced synchronization schemes, including SyncE, 1588v2 (OC, TC and BC), external and integrated GNSS receiver
- Powerful inter-system link facility (SysLink) to allow full Distributed Redundancy
- 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, RFC2544, Y.1564 and MBD for OPEX reduction
- Advanced high speed protection mechanisms for link, path (G.8031), and ring (G.8032v2) service resiliency

Product Overview

The **Falcon-STA** is a highly integrated, TDM Pseudowire aggregator/gateway for Carrier Ethernet and mobile backhaul networks. It primarily addresses the rapidly-expanding market of mobile backhauling and business access applications.

This product extensively supports aggregation of legacy services, carried over modern packet networks, by terminating up to 336 PWs and aggregating them onto SDH/SONET interfaces.

With comprehensive support for circuit emulation services, the **Falcon-STA** provides an easy migration path between legacy and packet backhaul networks.

The STA is also equipped with advanced Carrier Ethernet capabilities along with granular service monitoring tools.

The **Falcon-STA's** unique Dual Hybrid Core architecture (DHC) supports remote Data Plane Upgrades (DPU). The upgrade allows modifications of the HW core that handles packet processing functions at full wire speed performance.

The **Falcon-STA** offers a complete suite of precision timing support based on Synchronous Ethernet and 1588-2008 for LTE mobile backhaul applications. It is also available with an integrated GNSS receiver.

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The **Falcon-STA** is equipped with 4x10/100/1000BaseT (RJ45) user ports, up to 4 x SDH/SONET ports (SFP), and 4xSFP ports acting as UNIs/NNIs. All ports can be used in a flexible manner and operate at full wire speed, leading to a total processing capacity of 20Gbps (non-blocking).

Flexible support for Circuit Emulation Services (SAToP, CESoPSN and MEF8) allows seamless coexistence of 2G (based on TDM), 3G and LTE mobile networks, or legacy enterprise services.

The **Falcon-STA** 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, ELine, ELAN, ETree, etc) can be delivered with the **Falcon-STA** series and can further be protected through use of high performance mechanisms, based on G.8031 and G.8032v2, for link, path, and ring protection.

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

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

The **Falcon-STA** series is MEF CE2.0 compliant.

The **Falcon-STA** series is packaged in a robust 19"/1RU housing that allow the installation of hot swappable redundant AC and/or DC power supplies.

Technical Specifications

Interfaces & Indicators

- 4 x 10/100/1000BaseT (RJ45)
- 4 x 100BaseFX/1000BaseX (SFP)
- 4 x STM1/OC3 (SFP) or 1 x STM4/OC12 (SFP)
- Supported SFPs: MM, SM, SFS, CWDM, DWDM
- 1 x RS232 (RJ45) Console
- *LEDs:*
 - Power (per PS)
 - Link/Activity (per port)
 - Speed (per port)
 - CPU

Architecture & Forwarding

- Dual Hybrid Core (DHC) HW architecture
- Data Plane Upgradable (DPU)
- SDN and NFV ready (via expansion slot)
- 128MB RAM, 32MB flash memory
- L2 forwarding
- Flow-based forwarding
- Performance: wire-speed, on all ports, all frame sizes
- Total throughput: 20Gbps, non-blocking
- MTU: 9600 bytes
- MAC table: 8K 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

Quality of Service

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

Circuit Emulation (PW) Services

- 4 x STM1/OC3 or 1 x STM4/OC12 (SFP) interfaces
- Up to 252 x E1 or 336 x T1 PWs
- 2 x SysLink ports for inter-device redundancy
- SAToP, CESoPSN*, MEF8 support
- Multiple and flexible encapsulation over Ethernet & IP/MPLS
- Flexible synchronization schemes (adaptive, differential, line, GNSS, 1588 and more)
- Jitter buffer up to 256msec per PW

Protection

- **Link:**
 - Link aggregation: static or LACP
 - Instant Link Protection (<10msec)
- 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
- ITU-T Y.1731 PM (HW based measurements)
- RFC2544 & Y.1564* traffic generator & analyzer (HW based)
- L2/L3 loopbacks with MAC/IP swap
- Micro Burst Detection (MBD) with logging and reporting
- Throughput metering
- CopperLinkTest (TDR on Ethernet Copper ports)
- 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

Synchronization

- Synchronous Ethernet
- G.8261, G.8262, ESMC (G.8264)
- **GNSS receiver (option):**
 - 1 x TNC connector active antenna input
 - Generates 1PPS and 10MHz (internally)
- 2 x SMA connectors for Clock (in/out)
- 2 x ToD/1PPS (in/out) interfaces (RJ45, RS422)
- **IEEE1588-2008 (PTP):**
 - Ordinary Clock (master, slave)
 - Transparent Clock
 - Boundary Clock
 - GM option (with GNSS)
- Built-in Stratum 3 clock
- BITS interface

Power & Environmental

- Dual, redundant, hot swappable power supplies
- AC/DC: 100-240VAC, 50/60Hz or 125VDC
- DC: 20-60VDC, ST connector
- **Power consumption:**
 - Maximum: <30W
 - Typical: <25W
- **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

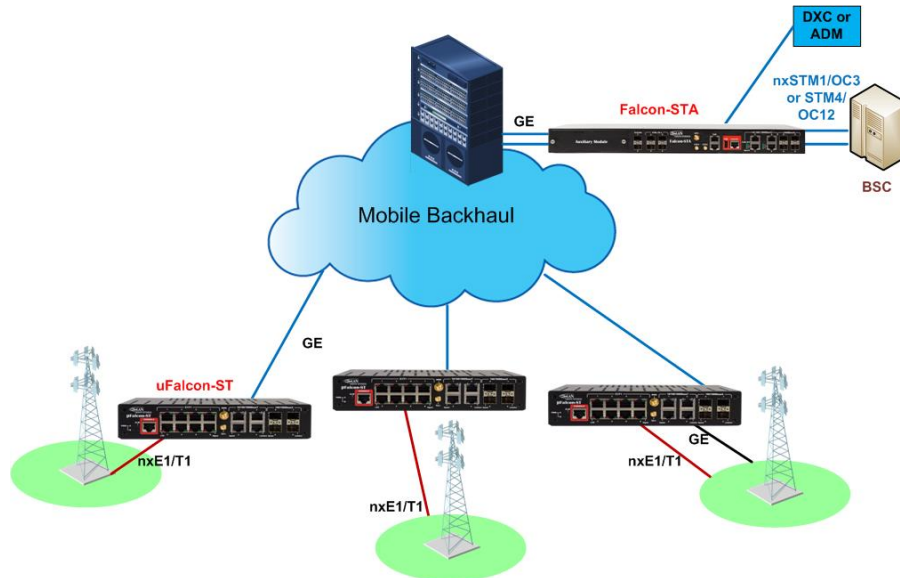
Physical

- 1RU/19", ETSI compatible
- Dimensions (HxWxD): 44x440x244mm (1.73x17.33x9.60 inch)
- Weight: ~3.3Kg (6.6 lb)
- **Mounting:**
 - Desktop
 - Rack (19", 23")
- Wall
- **Accessories:**
 - Power cable
 - Console cable
 - Rack mounting kit (optional)

Regulatory & Compliance

- **Safety:**
 - IEC EN60950-1
- **EMC:**
 - EN 300 386 V1.3.3: 05
 - FCC CFR 47 part 15, subpart B, Class A
- MEF: **CE2.0**, MEF8, MEF9, MEF14, MEF20, MEF22
- CE
- RoHS

Typical Application: Mobile Backhaul



Ordering Information

Model	Part #	Description
Falcon-STA/1	7032	Carrier Ethernet PW Aggregator, 1xSTM1/OC3 port, 4x1000BaseX SFP ports, 4x10/100/1000BaseT ports, 1 removable AC/DC (100-240VAC/125VDC) power supply
Falcon-STA/2	7033	Carrier Ethernet PW Aggregator, 2xSTM1/OC3 ports, 4x1000BaseX SFP ports, 4x10/100/1000BaseT ports, 1 removable AC/DC (100-240VAC/125VDC) power supply
Falcon-STA/4/G	7034	Carrier Ethernet PW Aggregator, 4xSTM1/OC3 (or 1xSTM4/OC12) port, 4x1000BaseX SFP ports, 4x10/100/1000BaseT ports, integrated GNSS receiver, 1 removable AC/DC (100-240VAC/125VDC) power supply
Falcon-STA/1/D	7035	Carrier Ethernet PW Aggregator, 1xSTM1/OC3 port, 4x1000BaseX SFP ports, 4x10/100/1000BaseT ports, 1 removable DC (20V÷60V) power supply
Falcon-STA/2/D	7036	Carrier Ethernet PW Aggregator, 2xSTM1/OC3 ports, 4x1000BaseX SFP ports, 4x10/100/1000BaseT ports, 1 removable DC (20V÷60V) power supply
Falcon-STA/4/D/G	7037	Carrier Ethernet PW Aggregator, 4xSTM1/OC3 (or 1xSTM4/OC12) port, 4x1000BaseX SFP ports, 4x10/100/1000BaseT ports, integrated GNSS receiver, 1 removable DC (20V÷60V) power supply

Specifications are subject to change w/o prior notice

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

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