

# HA-805 | 1G/10G Carrier Grade Ethernet Demarcation

## Affordable and Seamless Support for Ethernet WAN and Wireless Mobile Backhaul

The HFR HA-805 is a cost effective, multiservice, carrier-grade compact unit designed to deliver Carrier Ethernet services in support of enterprise business and wireless mobile backhaul service applications. With its small form factor (table top or wall mount), low power, temperature-resilient, and fan-less design, the HA-805 can be installed at wireless towers (outdoor ready) or customer premises to address space and power challenges, deliver high performance scalable services, and reduce operational costs.

## Standards-based Multiservice Delivery

Designed to support Metro Ethernet Forum (MEF) specifications, HA-805 delivers Ethernet Private Line, Ethernet Virtual Private Line, Ethernet LAN, Ethernet Access and Ethernet Tree based connectivity in linear and ring topologies for high capacity business and mobile backhaul 4G services.

## Service Level Provisioning, Monitoring and Management

Graphical user interfaces based on SNMP are available to provide the full range of management support - from an individual node to an end-to-end network and service centric view. With dedicated hardware for traffic performance monitoring, the HA-805 delivers on today's requirement for hardware based Y.1731 latency, delay variation and frame loss ratio measurements. Tiered Ethernet services as well as wireless backhaul service level performance may also be monitored through the web-based SLA portal.

## Applications

- \* Mobile Backhaul (Macro / Small Cell) Service
- \* Network Wholesale Service
- \* Enterprise Ethernet Leased Line Service
- \* Broadband Backhaul Service (G-PON / WiFi Backhaul)
- \* Cloud Network Service



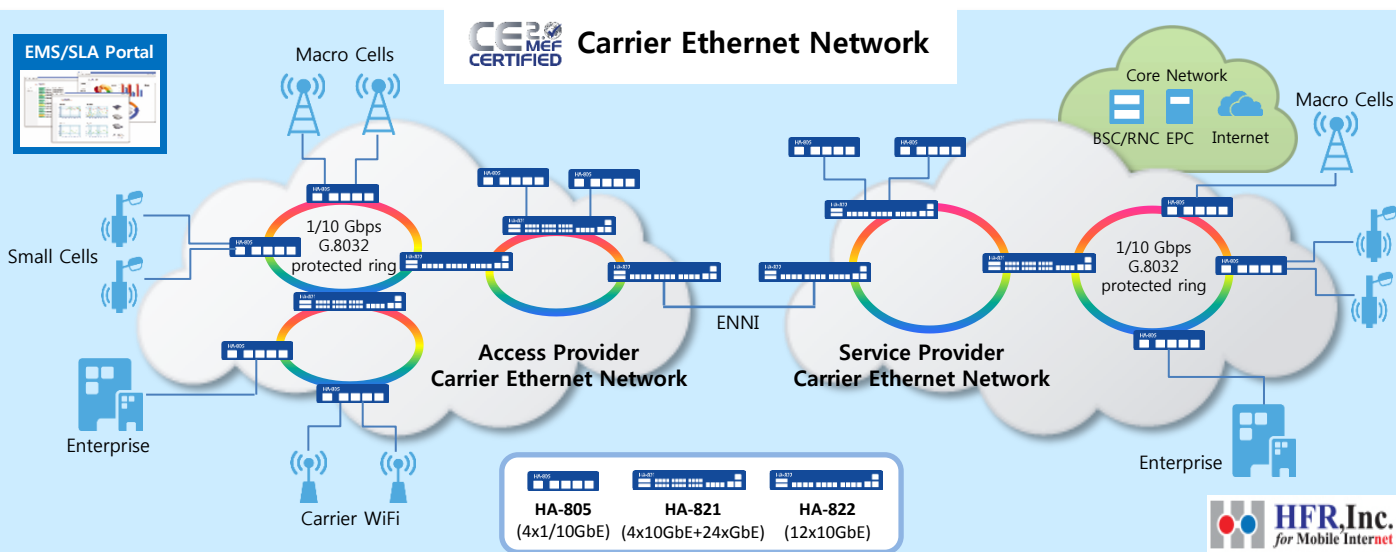
**CE<sup>2.0</sup> MEF  
CERTIFIED**

[HA-805 : 4 x 1G/10GbE]

## Flexible and Reliable Carrier Ethernet Service

In spite of its compact form factor and low power, the HA-805 packs a broad range of Ethernet Service access features including demarcation, classification, traffic management, prioritization, synchronization and service inter-working with up to 40 Gbps of switching capacity. Network resiliency is provided for Ethernet services with G.8032v2.

- SFP/SFP+ port flexibility
- Compact, low power, and temperature resilient unit ready for tower or CPE deployment, delivers high performance and reduces operational costs
- Standards-based MEF Carrier Ethernet 2.0 Compliance
- Synchronization source derived from Synchronous Ethernet interfaces or 1588v2 Ordinary Clock (Slave clock)
- System clock meets the accuracy, stability, and holdover specifications required for stratum 3 timing (G.813)
- Carrier-grade platform with low latency and highly reliable service delivery with sub-50ms Ethernet Ring Protection G.8032v2
- Deep Fault and Performance Management with Y.1731, embedded RFC2544, Y.1564 SAT and CIR/EIR utilization per EVC/UNI for the Customer SLA Portal access



# HA-805 SYSTEM SPECIFICATIONS

## Base System Hardware (Fanless)

- Ethernet Interface - 4 ports x 1GbE SFP / 10GbE SFP+
- Front LEDs for Alarms - Red : Critical, Major, and Minor, Green : for RUN ; Ports - Green: Link/Activity, Yellow: Speed
- Power Supply connectors - Terminal block for -48/+24VDC or DC Jack for +12VDC
- Console Port (RJ45 / RS-232c)
- Local LAN port (10/100Mbps, RJ45)
- Sync-out SMA connector - 1.544/2.048/10MHz Output & 1PPS Output SMA Connector

## Clock Synchronization

- ITU-T G.8261 / G.8262 / G.8264 SyncE on all Interfaces
- SyncE Status Message support (ESMC)
- IEEE 1588v2 Ordinary Clock (Slave Only)
- Internal Stratum-3 Clock with Holdover to meet ITU-T G.813

## Ethernet Switching

- Switching Fabric: 40 Gbps
- MAC Address Table: 32K Entries
- Jumbo Frames: 9600 Bytes
- 4094 Customer (C-tag) and 4094 Service Provider (S-tag) VLANs
- IEEE 802.1ad Provider Bridging (C-tag, S-tag)

## Ethernet Services

- MEF CE2.0 Compliant Carrier E-LINE, E-LAN, E-TREE\*, and E-Access

## Traffic Management

- Service Classification based on any fields combination of L2 to L4
- MEF compliant policing (CIR/CBS/EIR/EBS)
- 8 Classes of Service
- Large CBS up to 32768KB to guarantee SLA performance levels on bursts of frames
- Hierarchical QoS (HQoS)
- MEF HBWF (Hierarchical Bandwidth Profile) support defined by MEF 23.1\*

## Loopback Functionality

- Station loopback supports with Layer 1, Layer 2 (MAC Swap), Layer 3 (IP Swap) and Layer 4 (TCP/UDP Port Swap) per port and EVC
- Station Loopback reacts to in-band loopback requests sent from test-sets like EXFO and other test equipment
- IEEE 802.3ah and Y.1731 LBM OAM loopback command
- Latching loopback for the in-band automatic loopback request defined by MEF specification\*

## Ethernet OAM Functionality

- IEEE 802.3ah EFM OAM Link Management including Dying Gasp message for power failure alarm
- IEEE 802.1ag Connectivity Fault Management (CFM) with 1,000 concurrent CCM sessions
- ITU-T Y.1731 Fault Management and Performance Monitoring
- Highly accurate One-Way Delay Measurement using 1588v2 PTP
- Embedded RFC2544 Test Generator and Analyzer (Throughput, Latency and Frame Loss Ratio) with automatic report generation
- TWAMP (Two Way Active Measurement Protocol)-Light Reflector based on RFC5357
- MEF30.1 SOAM FM and MEF35 SOAM PM for vendor interoperability
- Y.1564 Service Activation Testing (SAT) using Y.1731 LBM/LBR

## Security

- Telnet with SSHv2
- Remote Authentication via RADIUS
- Access Control List (ACL)
- IEEE 802.1x Port Authentication
- SNMPv3 with authentication and encryption\*

## Ethernet Protection

- ITU-T G.8032v1 and G.8032v2 (2010) Ethernet Ring Protection Switching with sub-50ms Protection Switching Performance
- Link Protection with LACP as well as Static LAG using Active/Standby

## Performance Monitoring Service for SLA Metrics

- Ethernet SLA PMs
  - 24hr, 15min and 5min bins for SLA PMs
  - Y.1731 Frame Delay , Frame Delay Variation and Frame loss
  - Y.1564 Service Activation Test (SAT)
- Ethernet Services PMs
  - 24hr, 15min and 5min bins per EVC
  - Bytes counters declared Green, Yellow, and Red per EVC
  - Packets counters Received, Transmitted, and Dropped per EVC
  - Service Utilization per CIR
- Ethernet Port PMs
  - 24hr, 15min and 5min bins for Port PMs
  - Rx, Tx and Error Statistics
  - Input and Output Utilization per Port
- User-defined Threshold settings and Threshold-Crossings Alerts (TCAs) for Delay, Delay Variation and Frame Loss

## Management

- SNMPv1/v2c Get & Set and SNMPv3\*
- Serial Port (RJ45) using CLI
- Out-of-Band Management (Local LAN Port) via Telnet and SNMP
- In-band Management using management VLAN
- FTP, secureFTP and TFTP
- DHCP Client with Option 43 and 82
- Zero Touch Provisioning

## Standard Compliance

- IEEE 802.1ad(PB), 802.1ag(CFM), 802.1Q, 802.1X, 802.3ad(LACP) and 802.3ah(Link OAM)
- ITU-T Y.1731, G.8032v1/v2, G.8261/8262/8264
- MEF 6.1, 9, 10.2, 11, 14, 20, 22.1, 23.1, 25, 26.1, 30, 33 and 35
- IETF RFC2544, RFC5357, RFC2863 (IF-MIB), RFC3418 (MIB for SNMP) , RFC4188 (Bridge), RFC2922 (Physical Topology), MEF31 SOAM FM MIB, MEF36 SOAM PM MIB, MEF40 UNI/EVC MIB, MEF42 ENNI OVC MIB

## Physical Characteristics

- Dimensions: 44mm x 186mm x 187mm (H x W x D)
- Weight: 1.4Kg
- Operating Temperature: -40°C to +65°C
- Storage Temperature: -40°C to +70°C (GR-63-CORE)
- Humidity: Up to 90% non-condensing
- Power Supply: AC/DC adapter : +12 VDC or DC: -48/+24 VDC
- Redundant Power Supply: A and B Feed per DC Power Supply
- Power Consumption: Typical 20Watts/ Maximum 30Watts

## Regulatory

- FCC Part 15 Class A
- EN 300-386
- CSA
- UL 60950-1, IEC 60950-1
- CE Mark

## Compliance

- NEBS Level 3 compliance
- GR-3108-CORE Class 2
- RoHS2 : Compliance with Directive 2011/65/EU

## \* Future Software Release

# HA-821 | 1G/10G Carrier Grade Ethernet Aggregation

## Affordable and Seamless Support for Ethernet WAN and Wireless Mobile Backhaul

The HFR HA-821 is a cost effective, multiservice, carrier-grade, rack mountable 1G aggregation device designed to deliver Carrier Ethernet services in support of enterprise business and wireless mobile backhaul service applications. The HA-821 can be installed as a 1G aggregation node in a Carrier network to address space and power challenges, deliver high performance and scalable services, and reduce operational costs.

### Standards-based Multiservice Delivery

Designed to support Metro Ethernet Forum (MEF) specifications, HA-821 delivers Ethernet Private Line, Ethernet Virtual Private Line, Ethernet LAN, Ethernet Access and Ethernet Tree based connectivity in linear and ring topologies for high capacity business and mobile backhaul 4G services.

### Service Level Provisioning, Monitoring and Management

Graphical user interfaces based on SNMP are available to provide the full range of management support - from an individual node to an end-to-end network and service centric view. With dedicated hardware for traffic performance monitoring, the HA-821 delivers on today's requirement for hardware based Y.1731 latency, delay variation and frame loss ratio measurements. Tiered Ethernet services as well as wireless backhaul service level performance may also be monitored through the web-based SLA portal.

### Applications

- \* Mobile Backhaul (Macro / Small Cell) Service
- \* Network Wholesale Service
- \* Enterprise Ethernet Leased Line Service
- \* Broadband Backhaul Service (G-PON / WiFi Backhaul)
- \* Cloud Network Service

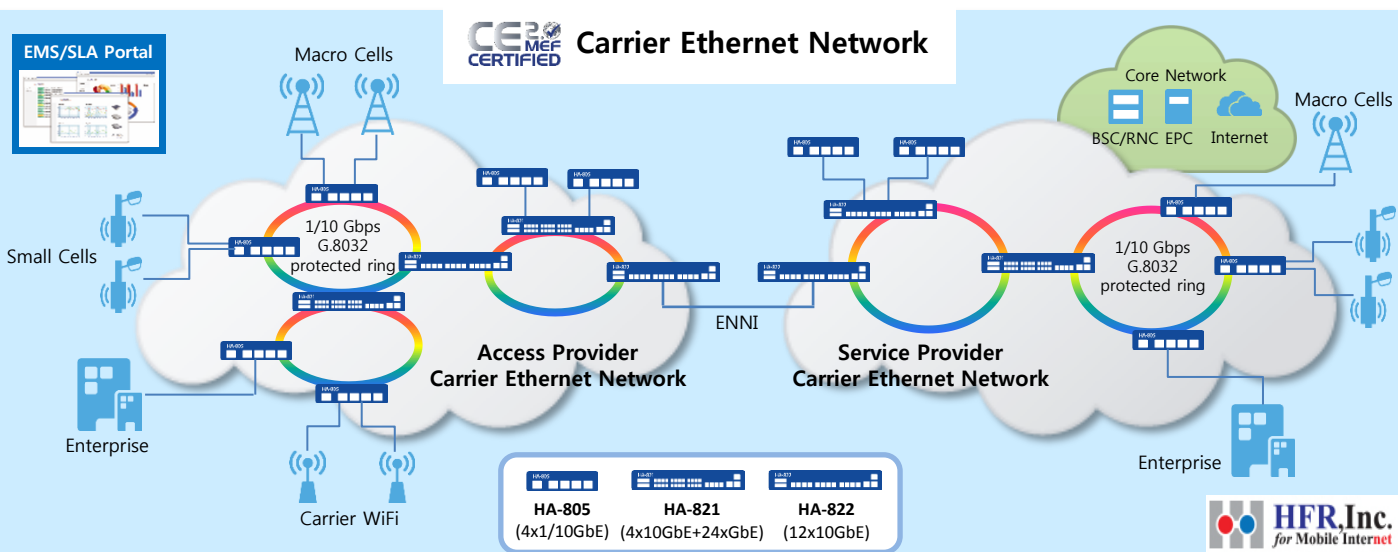


[HA-821 : 4 x 10GbE + 24 x 1GbE]

## Flexible and Reliable Carrier Ethernet Service

The HA-821 provides aggregation for Carrier Ethernet services for Network Operators in dense urban areas. Supporting business services and backhaul of radio access networks (RANs), the HA-821 implements G.8032v2 Ethernet Ring Protection, performs Ethernet services demarcation, and provides class-of-service support, traffic management, prioritization, synchronization, and service inter-working with 64Gbps of switching capacity.

- SFP/SFP+ port flexibility
- Standards-based MEF Carrier Ethernet 2.0 Compliance
- Synchronization source derived from Synchronous Ethernet interfaces and 1588v2 BC, OC and TC
- System clock meets the accuracy, stability, and holdover specifications required for stratum 3 timing (G.813)
- Carrier-grade platform with low latency and highly reliable service delivery with sub-50ms Ethernet Ring Protection G.8032v2
- Deep Fault and Performance Management with Y.1731, embedded RFC2544, Y.1564 SAT and CIR/EIR utilization per EVC/UNI for the Customer SLA Portal access



# HA-821 SYSTEM SPECIFICATIONS

## Base System Hardware

- Ethernet Interface: 4 x 10GbE SFP+ ports + 24 x 1GbE SFP ports
- Front LEDs: Alarms - Red: Critical, Major, and Minor, Green : for RUN, Ports - Green: Link/Activity, Yellow: Speed
- Power Supply connectors: Terminal block for -48/+24VDC or AC: 90VAC ~ 264VAC 47Hz to 63Hz
- Console Port (RJ45/RS-232c) & Local LAN port (10/100/1000Mbps, RJ45)
- Clock: Sync In/Out - SMA connector, BITS In/Out - RJ48c
- Fan: Field replaceable

## Clock Synchronization

- ITU-T G.8261 / G.8262 / G.8264 SyncE on all Interfaces
- SyncE Status Message support (ESMC)
- IEEE 1588v2 Boundary Clock (BC), Ordinary Clock (OC) and Transparent Clock (TC)
- Internal Stratum-3 Clock with Holdover to meet ITU-T G.813

## Ethernet Switching

- 64Gbps switching capacity
- MAC Address Table: 32K Entries
- 4094 Customer (C-tag) and 4094 Service Provider (S-tag) VLANs
- IEEE 802.1ad Provider Bridging (C-tag, S-tag)

## Ethernet Services

- MEF CE2.0 Compliant Carrier E-LINE, E-LAN, E-TREE\*, and E-Access

## Traffic Management

- Service Classification based on any fields combination of L2 to L4
- MEF compliant policing (CIR/CBS/EIR/EBS)
- 8 Classes of Service
- Large CBS up to 32768KB to guarantee SLA performance levels on bursts of frames
- Hierarchical QoS (HQoS)\*
- MEF HBWF (Hierarchical Bandwidth Profile) support defined by MEF 23.1\*

## Loopback Functionality

- Station loopback supports with Layer 1, Layer 2 (MAC Swap), Layer 3 (IP Swap) and Layer 4 (TCP/UDP Port Swap) per port and EVC
- Station Loopback reacts to in-band loopback requests sent from test-sets like EXFO and other test equipment.
- IEEE 802.3ah and Y.1731 LBM OAM loopback command
- Latching loopback for the in-band automatic loopback request defined by MEF specification\*

## Ethernet OAM Functionality

- IEEE 802.3ah EFM OAM Link Management including Dying Gasp message for power failure alarm
- IEEE 802.1ag Connectivity Fault Management (CFM) with 1,000 concurrent CCM sessions
- ITU-T Y.1731 Fault Management and Performance Monitoring
- Highly accurate One-Way Delay Measurement using 1588v2 PTP
- Embedded RFC2544 Test Generator and Analyzer (Throughput, Latency and Frame Loss) with automatic report generation
- TWAMP (Two Way Active Measurement Protocol)-Light Reflector based on RFC5357
- MEF 30.1 FM and MEF 35 PM for vendor interoperability
- Y.1564 Service Activation Testing (SAT) using Y.1731 LBM/LBR

## Security

- Telnet with SSHv2
- Remote Authentication via RADIUS
- Access Control List (ACL)
- IEEE 802.1x Port Authentication
- SNMPv3 with authentication and encryption\*

## Ethernet Protection

- ITU-T G.8032v1 and G.8032v2 (2010) Ethernet Ring Protection Switching with sub-50ms Protection Switching Performance
- Link Protection with LACP as well as Static LAG using Active/Standby

## Performance Monitoring Service for SLA Metrics

- Ethernet SLA PMs
  - 24hr, 15min and 5min bins for SLA PMs
  - Y.1731 Frame Delay, Frame Delay Variation and Frame loss
  - Y.1564 Service Activation Test (SAT)
- Ethernet Services PMs
  - 24hr, 15min and 5min bins per EVC
  - Bytes counters declared Green, Yellow, and Red per EVC
  - Packets counters Received, Transmitted, and Dropped per EVC
  - Service Utilization per CIR
- Ethernet Port PMs
  - 24hr , 15min and 5min bins for Port PMs
  - Rx, Tx and Error Statistics
  - Input and Output Utilization per Port
- User-defined Threshold settings and Threshold-Crossings Alerts (TCAs) for Delay, Delay Variation and Frame Loss

## Management

- SNMPv1/v2c Get & Set and SNMPv3\*
- Serial Port (RJ45) using CLI
- Out-of-Band Management (Local LAN Port) via Telnet and SNMP
- In-band Management using management VLAN
- FTP, secureFTP and TFTP
- DHCP Client with Option 43 and 82
- Zero Touch Provisioning

## Standard Compliance

- IEEE 802.1ad(PB), 802.1ag(CFM), 802.1Q, 802.1X, 802.3ad(LACP) and 802.3ah(Link OAM)
- ITU-T Y.1731, G.8032v1/v2, G.8261/8262/8264
- MEF 6.1, 9, 10.2, 11, 14, 20, 22.1, 23.1, 25, 26.1, 30, 33 and 35
- IETF RFC2544, RFC5357, RFC2863 (IF-MIB), RFC3418 (MIB for SNMP), RFC4188 (Bridge), RFC2922 (Physical Topology)
- MEF31 SOAM FM MIB, MEF36 SOAM PM MIB, MEF40 UNI/EVC MIB, MEF42 ENNI OVC MIB

## Physical Characteristics

- Dimensions: 44mm x 440mm x 255mm (H x W x D)
- Weight: 2.4Kg
- Operating Temperature: -40°C to +65°C
- Storage Temperature: -40°C to +70°C (GR-63-CORE)
- Humidity: Up to 90% non-condensing
- Power Supply:
  - -48/+24 VDC Two Redundant Hot Swappable DC or
  - 220VAC One Swappable AC (90 to 264 VAC)
- Power Consumption: Typical 50Watts / Maximum 67Watts

## Regulatory

- FCC Part 15 Class A
- EN 300-386
- CSA
- UL 60950-1, IEC 60950-1
- CE Mark

## Compliance

- NEBS Level 3 compliance
- GR-3108-CORE Class 2
- RoHS2 : Compliance with Directive 2011/65/EU

\* Future Software Release

# HA-822 | 10G Carrier Grade Ethernet Aggregation

## Affordable and Seamless Support for Ethernet WAN and Wireless Mobile Backhaul

The HFR HA-822 is a cost effective, multiservice, carrier-grade, rack mountable 10G aggregation device designed to deliver Carrier Ethernet services in support of enterprise business and wireless mobile backhaul service applications. The HA-822 can be installed as a 10G aggregation node in a Carrier network to address space and power challenges, deliver high performance and scalable services, and reduce operational costs.

## Standards-based Multiservice Delivery

Designed to support Metro Ethernet Forum (MEF) specifications, HA-822 delivers Ethernet Private Line, Ethernet Virtual Private Line, Ethernet LAN, Ethernet Access and Ethernet Tree based connectivity in linear and ring topologies for high capacity business and mobile backhaul 4G services.

## Service Level Provisioning, Monitoring and Management

Graphical user interfaces based on SNMP are available to provide the full range of management support - from an individual node to an end-to-end network and service centric view. With dedicated hardware for traffic performance monitoring, the HA-822 delivers on today's requirement for hardware based Y.1731 latency, delay variation and frame loss ratio measurements. Tiered Ethernet services as well as wireless backhaul service level performance may also be monitored through the web-based SLA portal.

## Applications

- \* Mobile Backhaul (Macro / Small Cell) Service
- \* Network Wholesale Service
- \* Enterprise Ethernet Leased Line Service
- \* Broadband Backhaul Service (G-PON / WiFi Backhaul)
- \* Cloud Network Service

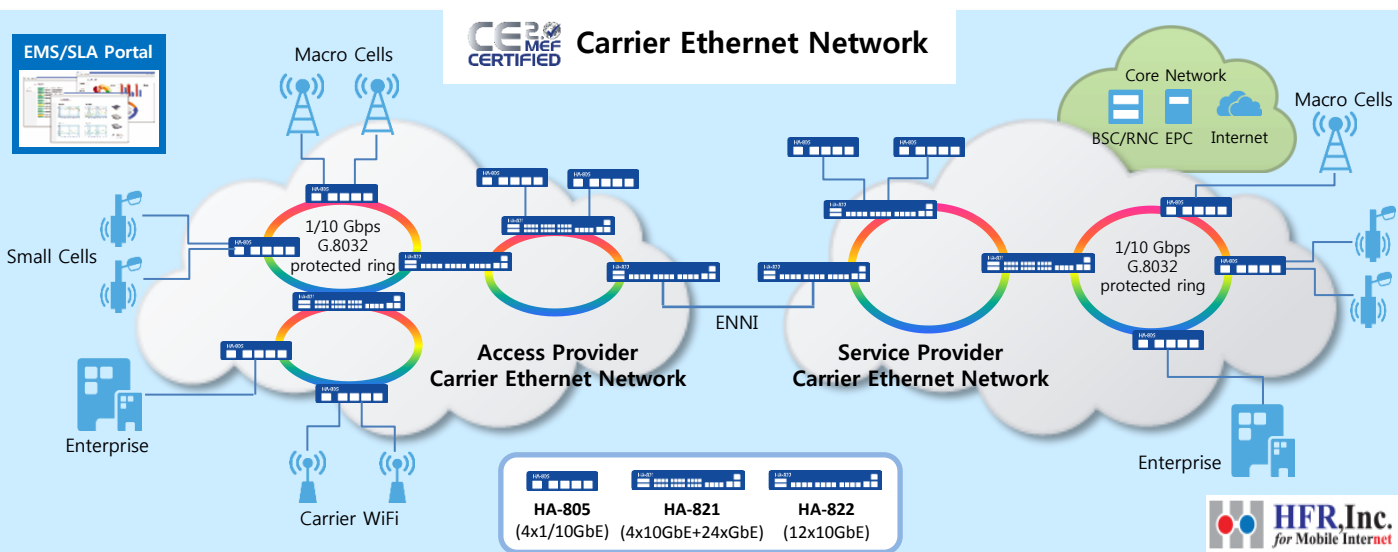


[HA-822 : 12 x 10GbE]

## Flexible and Reliable Carrier Ethernet Service

The HA-822 provides aggregation for Carrier Ethernet services for Network Operators in dense urban areas. Supporting business services and backhaul of radio access networks (RANs), the HA-822 implements G.8032v2 Ethernet Ring Protection, performs Ethernet services demarcation, and provides class-of-service support, traffic management, prioritization, synchronization, and service inter-working with 120 Gbps of switching capacity.

- SFP/SFP+ port flexibility
- Standards-based MEF Carrier Ethernet 2.0 Compliance
- Synchronization source derived from Synchronous Ethernet interfaces or 1588v2 BC, OC and TC
- System clock meets the accuracy, stability, and holdover specifications required for stratum 3 timing (G.813)
- Carrier-grade platform with low latency and highly reliable service delivery with sub-50ms Ethernet Ring Protection G.8032v2
- Deep Fault and Performance Management with Y.1731, embedded RFC2544, Y.1564 SAT and CIR/EIR utilization per EVC/UNI for the Customer SLA Portal access



# HA-822 SYSTEM SPECIFICATIONS

## Base System Hardware

- Ethernet Interface: 12 x 10GbE SFP+ ports
- Front LEDs: Alarms - Red: Critical, Major, and Minor, Green : for RUN, Ports - Green: Link/Activity, Yellow: Speed
- Power Supply connectors: Terminal block for -48/+24VDC or AC: 90VAC ~ 264VAC 47Hz to 63Hz
- Console Port (RJ45/RS-232c) & Local LAN port (10/100/1000Mbps, RJ45)
- Clock: Sync In/Out - SMA connector, BITS In/Out - RJ48c
- Fan: Field replaceable

## Clock Synchronization

- ITU-T G.8261 / G.8262 / G.8264 SyncE on all Interfaces
- SyncE Status Message support (ESMC)
- IEEE 1588v2 Boundary Clock (BC), Ordinary Clock (OC) and Transparent Clock (TC)
- Internal Stratum-3 Clock with Holdover to meet ITU-T G.813

## Ethernet Switching

- 120Gbps Switching Capacity
- MAC Address Table: 32K Entries
- 4094 Customer (C-tag) and 4094 Service Provider (S-tag) VLANs
- IEEE 802.1ad Provider Bridging (C-tag, S-tag)

## Ethernet Services

- MEF CE2.0 Compliant Carrier E-LINE, E-LAN, E-TREE\*, and E-Access

## Traffic Management

- Service Classification based on any fields combination of L2 to L4
- MEF compliant policing (CIR/CBS/EIR/EBS)
- 8 Classes of Service
- Large CBS up to 32768KB to guarantee SLA performance levels on bursts of frames
- Hierarchical QoS (HQoS)\*
- MEF HBWF (Hierarchical Bandwidth Profile) support defined by MEF 23.1\*

## Loopback Functionality

- Station loopback supports with Layer 1, Layer 2 (MAC Swap), Layer 3(IP Swap) and Layer 4(TCP/UDP Port Swap) per port and EVC
- Station Loopback reacts to in-band loopback requests sent from test-sets like EXFO and other test equipment
- IEEE 802.3ah and Y.1731 LBM OAM loopback command
- Latching loopback for the in-band automatic loopback request defined by MEF specification\*

## Ethernet OAM Functionality

- IEEE 802.3ah EFM OAM Link Management including Dying Gasp message for power failure alarm
- IEEE 802.1ag Connectivity Fault Management (CFM) with 1,000 concurrent CCM sessions
- ITU-T Y.1731 Fault Management and Performance Monitoring
- Highly accurate One-Way Delay Measurement using 1588v2 PTP
- Embedded RFC2544 Test Generator and Analyzer (Throughput, Latency and Frame Loss) with automatic report generation
- TWAMP (Two Way Active Measurement Protocol)-Light Reflector based on RFC5357
- MEF 30.1 FM and MEF 35 PM for vendor interoperability
- Y.1564 Service Activation Testing (SAT) using Y.1731 LBM/LBR

## Security

- Telnet with SSHv2
- Remote Authentication via RADIUS
- Access Control List (ACL)
- IEEE 802.1x Port Authentication
- SNMPv3 with authentication and encryption\*

## Ethernet Protection

- ITU-T G.8032v1 and G.8032v2 (2010) Ethernet Ring Protection Switching with sub-50ms Protection Switching Performance
- Link Protection with LACP as well as Static LAG using Active/Standby

## Performance Monitoring Service for SLA Metrics

- Ethernet SLA PMs
  - 24hr, 15min and 5min bins for SLA PMs
  - Y.1731 Frame Delay, Frame Delay Variation and Frame loss
  - Y.1564 Service Activation Test (SAT)
- Ethernet Services PMs
  - 24hr, 15min and 5min bins per EVC
  - Bytes counters declared Green, Yellow, and Red per EVC
  - Packets counters Received, Transmitted, and Dropped per EVC
  - Service Utilization per CIR
- Ethernet Port PMs
  - 24hr, 15min and 5min bins for Port PMs
  - Rx, Tx and Error Statistics
  - Input and Output Utilization per Port
- User-defined Threshold settings and Threshold-Crossings Alerts (TCAs) for Delay, Delay Variation and Frame Loss

## Management

- SNMPv1/v2c Get & Set and SNMPv3\*
- Serial Port (RJ45) using CLI
- Out-of-Band Management (Local LAN Port) via Telnet and SNMP
- In-band Management using management VLAN
- FTP, secureFTP and TFTP
- DHCP Client with Option 43 and 82
- Zero Touch Provisioning

## Standard Compliance

- IEEE 802.1ad(PB), 802.1ag(CFM), 802.1Q, 802.1X, 802.3ad(LACP) and 802.3ah(Link OAM)
- ITU-T Y.1731, G.8032v1/v2, G.8261/8262/8264
- MEF 6.1, 9, 10.2, 11, 14, 20, 22.1, 23.1, 25, 26.1, 30, 33 and 35
- IETF RFC2544, RFC5357, RFC2863 (IF-MIB), RFC3418 (MIB for SNMP), RFC4188 (Bridge), RFC2922 (Physical Topology)
- MEF31 SOAM FM MIB, MEF36 SOAM PM MIB, MEF40 UNI/EVC MIB, MEF42 ENNI OVC MIB

## Physical Characteristics

- Dimensions: 44mm x 440mm x 255mm (H x W x D)
- Weight: 2.4Kg
- Operating Temperature: -40°C to +65°C
- Storage Temperature: -40°C to +70°C (GR-63-CORE)
- Humidity: Up to 85% non-condensing
- Power Supply:
  - -48/+24VDC Two Redundant Hot Swappable DC
  - 220VAC One Swappable AC (90 to 264 VAC)
- Power Consumption: Typical 40Watts / Maximum 60Watts

## Regulatory

- FCC Part 15 Class A
- EN 300-386
- CSA
- UL 60950-1, IEC 60950-1
- CE Mark

## Compliance

- NEBS Level 3 compliance
- GR-3108-CORE Class 2
- RoHS2 : Compliance with Directive 2011/65/EU

\* Future Software Release