

Eclipse Edge

ETSI Datasheet

Cost-effective Wireless Connections for the Mobile Network Edge

The new Eclipse Edge redefines cost-effective backhaul for network operators poised for future growth and seeking lowest cost of ownership.

The Eclipse Edge is a fully featured, highly reliable, Fast Ethernet plus TDM wireless transport system that will simplify your network migration to all-IP.

Multi-Service

The Eclipse Edge is a new, multi-service, Ethernet + TDM solution optimized to deliver the lowest cost of ownership and simplify network migration to all-IP. This compact, low power and simple-to-deploy microwave radio will help reduce CAPEX and OPEX for new network extensions and cell-site connections.

Low CAPEX Entry Point

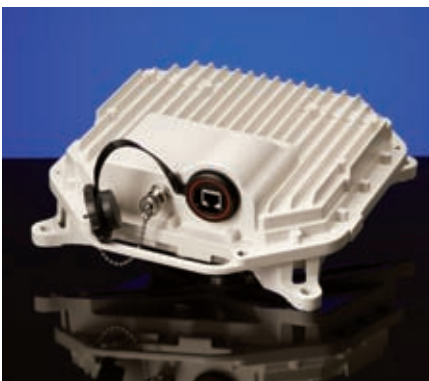
As the smallest and lightest ODU in its class, the Edge is easy to transport, install and maintain. All customer-facing ports are G.703 or IEEE 802.3 compliant so additional line equipment is not needed. The Edge installation effort has been made as simple as possible with a generic, direct antenna mount, (no waveguide or RF cable costs), using antennas that are easily available world-wide. Installation costs are further reduced using off-the-shelf Ethernet CAT 5e cabling and a built-in lightning arrestor in the ODU.

Minimal Lifetime OPEX

The Eclipse Edge's exceptionally low power consumption (under 13W) and efficient heatsink design insures that an Edge link will have extremely high reliability or MTBF. Furthermore, with its small size and low weight, site demands for power, tower loading, and space are significantly lower. Altogether, ongoing operational costs and maintenance are greatly reduced for minimal lifetime OPEX.

Key Features

- Cost-effective wireless solution for base station connections at the network edge
- Standard ITU-R licensed bands: 7, 13, 15, 18, 23, and 38 GHz
- Native Mixed Mode™ NxE1 TDM plus native Carrier Ethernet transport over the same radio path
 - User selectable throughput up to 32 Mbps
 - 10/100 Base-T Ethernet, IEEE 802.3 standard
 - Up to 16xE1 compliant to ITU-T G.703
- Robust CPM modulation
- 1+0, 1+1 protection with errorless Space Diversity as standard
- Reduced opex costs and demands for site services
 - Extremely low power consumption, <13W ODU
 - Reduced weight and size—simplifies installation
 - Low profile footprint—minimal for rack and outdoor loading
 - Single wrench install—direct antenna mount
 - Built-in lightning protection on ODU PoE port
 - Low-cost, off-the-shelf Cat 5e cabling to outdoor unit
- Carrier grade QoS policing and prioritization options (802.1p/q)
- ODU cabling supports Power-over-Ethernet (802.3af)
- Management by ProVision and Eclipse Portal
- Interoperable with Eclipse nodal INUe using new RACspe
- RoHS and WEEE compliant
- Metro Ethernet Forum (MEF) 9 compliant



Network Migration Using Native Mixed Mode™

The Eclipse Edge is the most efficient solution to support network migration that is both simple and cost-effective. Already with a low CAPEX entry point, network operators will further reduce OPEX costs with both E1 and Fast Ethernet transport in a single link.

Operators can connect directly to 16 E1 line connections as well as to two, switched 10/100Base-T ports on the Edge IDU front panel. No additional line equipment is needed, saving on added equipment, maintenance and sparing costs.

In native mixed-mode operation, as E1 tributaries are commissioned, the Ethernet bandwidth is reduced from the maximum 32 Mbit/s. Ethernet bandwidth will increase when one or more E1s are decommissioned.

Operators can easily respond to changing traffic requirements by using the Eclipse Portal or Harris Stratex Network's ProVision Element Manager to either change the link capacity or the traffic mix between TDM and Ethernet, or both.

Without any additional equipment or software upgrades, Eclipse Edge can change between support for TDM transport—up to 16 E1s—and a fast Ethernet bridge.

Reduced Environmental Impact

Eclipse Edge is designed for a reduced carbon footprint in any deployed network. Because of its remarkably smaller size and low power consumption—under 13 Watts—the Edge is ideal for sites with sustainable energy supply such as solar/photovoltaic panels or wind-powered generators. This reduces the infrastructure needs for delivering power to the deployment site, and reduces ongoing expenses to support the deployment site.

Eclipse Liquid Bandwidth™—Native mixed mode operation assigns available radio capacity between the following two types of traffic:

- Native TDM
 - Guaranteed performance for delay-sensitive voice services
 - No circuit emulation or deployment of pseudo-wires
 - Configurable from 1E1 to 16E1
- Native Ethernet
 - Up to 32 Mbit/s full duplex operation
 - No encapsulation within TDM frames, so no excess overheads
 - High throughput efficiency and low latency
 - Built-in Layer 2 intelligent switch
 - Traffic prioritization using 802.1p or Diffserv priorities
 - Jumbo frame support up to 2000 bytes

Nodal and Metro Aggregation—

Eclipse Edge is fully compatible with the advanced Eclipse Nodal Network architecture.

- Interoperable with Eclipse INU using RACspe plug in
- Ideal for low- to medium-capacity network extensions in metro areas

Optimized Protection

Eclipse Edge provides an optimal solution for protected terminals:

- Single 1RU indoor unit supports a fully protected terminal
- Errorless diversity receiver switching
- Easy upgrade from non-protected 1+0 to protected 1+1 operation
- Interoperability with protected INU node



Eclipse Edge System Parameters

General

Operating Frequency Range	7, 13, 15, 18, 23, 38 GHz
Digital Line Rate (TDM)	2.048 Mbit/s (E1)
Capacity Range Options (software configurable between NxE1 and Ethernet Data)	1 to 16x E1 2 to 32 Mbit/s Ethernet Data
Modulation	CPM
Error Correction	FEC, Reed Solomon Decoding

Radio Path Protection Options

Non Protected, 1+0	7-38 GHz
Protected Hot Standby, 1+1	7-38 GHz
Space Diversity, 1+1	7-38 GHz

Standards Compliance

EMC	IDUspe	EN 301 489-1, EN 301 489-4 (EN 55022 Class B)
Operation	ODUspe	ETS 300 019, Class 4.1
	IDUspe	ETS 300 019, Class 3.2
Storage / Transportation		ETS 300 019, Class 1.2 / Class 2.3
Safety		IEC 60950-1/EN 60950-1
Radio Frequency		EN 302 217 Class 2
Water Ingress	ODUspe	IEC 60529 (IPX6)
Lightning Protection	ODUspe (built-in) and IDUspe (external accessory)	IEC 61000-4-5 Class 5

Environmental

Operating Temperature	IDUspe	Guaranteed	-5° to +45° C
	ODUspe	Guaranteed	-33° to +55° C
Humidity	IDUspe	Guaranteed	0 to 95%, non-condensing
	ODUspe	Guaranteed	0 to 100%
Altitude	ODUspe	Guaranteed	4,500 meters

Fault and Configuration Management

Protocol	SNMP v2
Interface, electrical	Ethernet 10/100 Base-T
Interface, physical	2 x RJ-45
Local/remote Configuration and Support Tool	Eclipse Portal
Network Management	Harris Stratex Networks ProVision
Engineering Orderwire	Via optional VoIP handset

Emission Designator

Bandwidth	3.5MHz	7MHz	13.75MHz	14MHz	27.5MHz	28MHz
Emission Designator	3M50F7W	7M00F7W	13M75F7W	14M0F7W	27M5F7W	28M0F7W

IDUspe Specifications

Interfaces and Indicators

LED Indicators	3x Tri-state LEDs ('IDU Status', 'ODU1 & ODU2 Status')	
Ethernet Traffic Interface, electrical	Interface Connector	10/100 Base-T 2x 8-pin RJ45
E1 Line Interface, electrical	Standards Compliance Line Code Impedance Connector	Compliant to ITU-T Rec. G.703, G.823 HDB3 75Ω unbalanced or 120Ω balanced, configurable 16xRJ45
IDU to ODU cable interface	Interface Connector	Compliant to IEEE 802.3af for Power Sourcing Equipment 100Base-T Ethernet with PoE 2 x RJ45 with MDI-X
NMS LAN interface	Type Connector	10/100 Base-T Ethernet 2xRJ45

Electrical and Mechanical

Input Voltage Range	± 20 to ± 60.0 Vdc	
Power Consumption (IDUspe only)	Single PoE (ODU) Port Two PoE (ODU) Ports	10W 13W
Protection Circuit	5A Slow-Blow Fuse	
Size / Weight	44mm (1RU) x 482mm x 160mm / 2.1 kg	

All specifications are preliminary typical values unless otherwise stated, and are subject to change without notice.

ODUspe Specifications

General	
Frequency Band options	7, 13, 15, 18, 23, 38 GHz
ODU Interfaces	
IDU to ODU cable (50m & 90m options available with one preterminated end)	Shielded Weatherized Cat 5e 100 Meters (Maximum)
Connector	Weatherproof RJ45 with MDI-X
AGC monitor point	BNC
Antenna port Interface	ODUspe standard
Polarisation, field selectable	ODU rotation
Transmitter Specifications	
Transmit Power Tolerance	± 2dB
Transmitter Source	Synthesized
Frequency Stability	± 10 ppm
Manual Transmitter Power Control range	15dB
	Resolution 1 dB
	Accuracy ± 2dB
Automatic Transmitter Power Control	Configurable over full manual attenuation
Synthesizer Resolution	250 KHz

Receiver Specifications	
Receiver Source	Synthesized
Frequency Stability	10 PPM
Residual (Background) Bit Error Rate	10 ⁻¹³
RSSI Accuracy ^[1]	-40 to -70 dBm, 0 to +35° C, ± 2dB -25 to -85 dBm, -33 to +55° C, ± 4dB

Electrical and Mechanical	
Power	IEEE 802.3af PoE standard, Class 3 PD, maximum of 12.95W
Size / Weight	255mm x 250 mm x 110 mm / 2.6 kg

ODUspe RF Performance Specifications

System	7 GHz	13 GHz	15 GHz	18 GHz	23 GHz	38 GHz
Frequency Range, GHz	7.125 - 7.9	12.75 - 13.25	14.4 - 15.35	17.7 - 19.7	21.2 - 23.632	37.0 - 39.46
T-R Spacings supported, MHz	150, 154, 161, 168, 175, 196, 245	266	315, 420, 490, 644, 728	1010, 1092.5, 1120	1008, 1200, 1232	1260
Maximum Tuning Range (dependent upon T-R spacing), MHz	56	84	245	380	370	340

System Gain ^[2]	
System Gain at 10 ⁻⁶ BER	4 Mbit/s /2xE1 3.5 MHz 116.0 dB 112.0 dB 112.0 dB 110.0 dB 110.0 dB 106.0 dB
	8 Mbit/s /4xE1 7 MHz 114.0 dB 110.0 dB 110.0 dB 108.0 dB 108.0 dB 104.0 dB
	16 Mbit/s /8xE1 13.75 / 14 MHz 111.0 dB 107.0 dB 107.0 dB 105.0 dB 105.0 dB 101.0 dB
	32 Mbit/s /16xE1 27.5 / 28 MHz 107.0 dB 103.0 dB 103.0 dB 101.0 dB 101.0 dB 97.0 dB

Transmitter Specifications	
Power Output, nominal	24.0 dBm 20.0 dBm 20.0 dBm 19.0 dBm 19.0 dBm 17.0 dBm

Receiver Specifications ^[2]	
Threshold at 10 ⁻⁶ BER	4 Mbit/s /2xE1 3.5 MHz -92.0 dBm -92.0 dBm -92.0 dBm -91.0 dBm -91.0 dBm -89.0 dBm
	8 Mbit/s /4xE1 7 MHz -90.0 dBm -90.0 dBm -90.0 dBm -89.0 dBm -89.0 dBm -87.0 dBm
	16 Mbit/s /8xE1 13.75 / 14 MHz -87.0 dBm -87.0 dBm -87.0 dBm -86.0 dBm -86.0 dBm -84.0 dBm
	32 Mbit/s /16xE1 27.5 / 28 MHz -83.0 dBm -83.0 dBm -83.0 dBm -82.0 dBm -82.0 dBm -80.0 dBm

All specifications are preliminary typical values unless otherwise stated, and are subject to change without notice.
 [1] RSSI accuracy is only valid when there is no unwanted signal or potential interferer present within ±28MHz of the RX frequency.
 [2] System Gain and Rx Threshold values are for BER=10⁻⁶. Values for BER=10⁻³ are improved by 1dB.



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