

Eclipse Connect

ANSI Datasheet

Cost-Effective Carrier Ethernet and Mixed-Mode Data Transport

Harris Stratex has made it easier for network operators to meet demanding broadband requirements for establishing high-speed wireless transport of native Carrier Ethernet data.

Eclipse Connect provides a simple and cost-effective solution for establishing wireless connections that support programmable and scalable link throughputs up to 360 Mbit/s of full duplex native Ethernet data, with optional side-by-side support for up to 20 channels of native DS1 TDM traffic to support legacy voice applications.

Professional Grade

Eclipse Connect delivers professional-grade RF performance and reliability to support system availabilities that can exceed 99.999%, with guaranteed throughput available all of the time.

Carrier Ethernet

Eclipse Connect supports high-efficiency transport of Carrier Ethernet, with extremely low latency. The Eclipse Connect IDUs include an intelligent Layer 2 Ethernet switch to support advanced QoS and traffic controls, as well as port-based RMON performance statistics.

Mixed Mode

In addition to the native Ethernet transport, Eclipse Connect also supports native wayside TDM traffic, enabling software selection of between 1 and 20xDS1 channels, without the need for external adapters or proprietary emulation methods.

Capacity Expansion

Eclipse Connect enables you to grow your link capacity without hardware changes, through simple downloadable software keys. Depending upon the IDU selected, you can start with as little as 10 Mbit/s and then progressively increase the link speed of up to 360 Mbit/s of Layer 2 throughput.

Cost-Effective Options

Eclipse Connect includes a choice of indoor and outdoor units so that you can select the system that will meet your current and future capacity needs, while also fitting with your available budget.

Quick and Easy

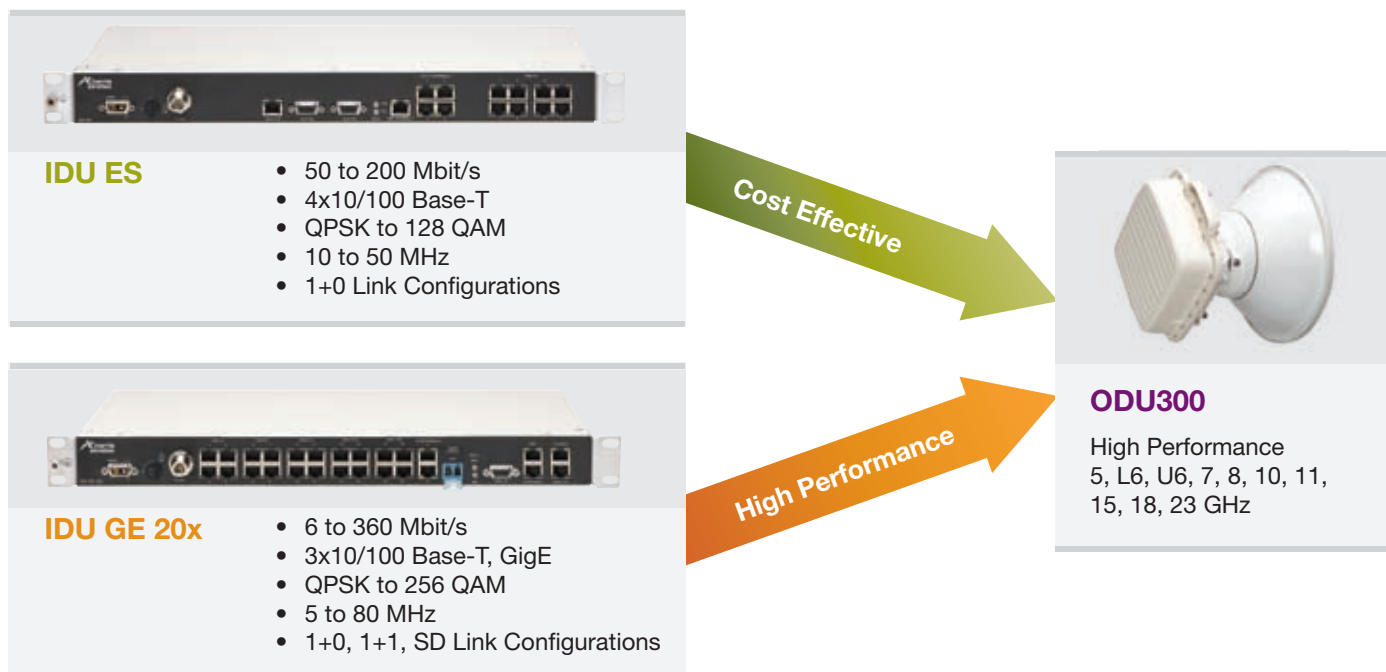
Eclipse Connect is designed to be easily installed with a minimum of radio experience. A split-mount architecture includes a compact indoor unit and a hardened outdoor unit which is directly mounted to an external antenna, all connected with a low-cost flexible coaxial cable.

Ready for Next-Generation Networks

Eclipse Connect can integrate easily into any DS1, IP, or next-generation network. Scalability and high performance, with a low-cost entry point, is a combination that enables network designers to meet new and next-generation requirements using the same radio equipment.

Key Features Highlights

- Software-scalable link speeds from 10 to 360 Mbit/s, full duplex
- Ultra-low latency for VoIP and live video transport
- Integrated Layer 2 intelligent Ethernet switch
- Carrier-grade QoS policing and prioritization options (802.1p/q)
- 5, L6/U6, 7/8, 10, 11, 15, 18, and 23 GHz licensed frequency band support
- Native 10/100 Base-T and Gigabit Ethernet transport
- Native wayside NxDS1 channels for mixed-mode operation
- Built-in TDM and Ethernet interfaces in a compact 1RU unit
- Hot Standby protection and Space Diversity configuration options
- Advanced split-mount architecture
- Quick and easy to install, commission and maintain



Hardware Complete

Both the IDU ES and IDU GE 20x are hardware-complete with integrated Fast Ethernet/GigE and DS1 ports with management and alarm status connections. Capacity upgrades are simply software enabled, and operational immediately.

Scalable Capacity Options

Entry-level configuration starts at 8xDS1 ports for the IDU ES, and 16xDS1 ports for the IDU GE. Licensed increments to 50, 100, 150, 200, and 360 Mbit/s full-duplex total capacity are assigned to the DS1s and then to the Ethernet channel.

Configuration Options

Connect GE 20x can be deployed as an unprotected link, or hot-standby 1+1 using a second IDU GE where the 20x DS1 ports and both Ethernet ports are input protected.

Comparative Features

General Characteristics	IDU ES	IDU GE 20x
Throughput capacities, scalable	50 to 200 Mbit/s	6 to 360 Mbit/s
Selectable channel bandwidths	10 to 50 MHz	5 to 80 MHz
Software configurable modulation settings	QPSK, 16QAM, 32QAM, 64QAM, 128QAM	QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Native Ethernet 10/100BT	4 ports, switched	3 ports, switched
Native Gigabit Ethernet 10/100/1000BT		3 ports, switched
Gigabit Ethernet 1000Base-X Optical (SFP)		Optional
Selectable NxDS1 interfaces	Up to 8 channels	Up to 20 channels
Entry-level with base license	8xDS1	16xDS1
Advanced traffic management and control	✓	✓
NMS 10/100BT port	1 port	2 ports
Configurations		
1+0 Non-protected	✓	✓
1+1 Hot Standby		✓
Space Diversity		✓
Compatible with INU/INUe	✓	✓
ODU Support		
ODU 300 hp (High Performance)	✓	✓
ODU 300 ep (Extended Performance)	✓	✓

System Parameters

General Characteristics

Operating Frequency Range	5 to 23 GHz		
Capacity Range Options	4x, 8x, 16x, 20x DS1		
	10 - 360 Mbit/s Ethernet		
Modulation Options	QPSK, 16, 32, 64, 128, 256 QAM		
Error Correction	FEC, Reed Solomon Decoding		
Adaptive Equalisation	24 tap T/2 equalizer		
Configuration Options	IDU ES, IDU GE 20x	Non Protected, 1+0	
	IDU GE 20x	Protected MHSB (1+1), Protected Space Diversity	

Ethernet and TDM Traffic Interfaces

		IDU ES	IDU GE 20x
Ethernet Traffic Interface	Interfaces (electrical)	4x 10/100baseT Fast Ethernet	3x 10/100/1000baseT Fast Ethernet
	Connectors (electrical)	4x 8-pin RJ45	3x 8-pin RJ45
	Interfaces (optical)		1x optical IEEE 802.3z 1000BASE-LX
	Connectors (optical)		1x LC (SFP)
	Frame size	64 - 1536 bytes	64 - 9600 bytes
E1 Wayside Traffic Interface	Ethernet transport channels	2	2
	Interfaces	8x 1.544 Mbit/s (DS1)	20x 1.544 Mbit/s (DS1)
	Line code	AMI or B8ZS	AMI or B8ZS
	Connectors	8x RJ45	20x RJ45
	Impedance (configurable)	100Ω balanced	100Ω balanced

Connect Ethernet Throughput Options

	Modulation Options	Channel Bandwidth Options	Nominal Data Throughput Range, Full Duplex	Actual Data Throughput Range, Full Duplex ^[1]
Connect 50	QPSK, 16/32/64 QAM	5, 10, 20, 30, 40 MHz	10 - 50 Mbit/s	10 - 65 Mbit/s
Connect 100	QPSK, 16/32/64 QAM	5, 10, 20, 30, 40 MHz	10 - 100 Mbit/s	10 - 106 Mbit/s
Connect 150	QPSK, 16/32/64/128 QAM	5, 10, 20, 30, 40, 50 MHz	10 - 150 Mbit/s	10 - 153 Mbit/s
Connect 200	QPSK, 16/32/64/128/256 QAM	5, 10, 20, 30, 40, 50 MHz	10 - 200 Mbit/s	10 - 198 Mbit/s
Connect 360	QPSK, 16/32/64/128 QAM	5, 10, 20, 30, 40, 50, 80 MHz	10 - 360 Mbit/s	10 - 357 Mbit/s

IDU Auxiliary Functions and other Interfaces

Auxiliary Data Channel	IDU ES only	1x RS232 or RS422, 1.2 to 19.2 kbps async, or 64 kbps sync
Alarm I/O		2 - TTL inputs, 4 - Form C Relay outputs
NMS LAN interface	Type	10/100baseT Ethernet
Serial Maintenance Interface	Standard	Complies to TIA/EIA-561
IF Cable Connector		N-Type
Configuration memory, removable		Up to 128 Mbyte CompactFlash card (rear access)

General ODU Specifications

IDU-ODU IF Cable, recommended	CNT-300 Type, 50Ω - up to 150m (500ft) maximum cable length						
	CNT-400 Type, 50Ω - up to 300m (1,000ft) maximum cable length						
IF cable connector	N-Type						
AGC monitor point	BNC						
Transmit Power Tolerance	± 2 dB						
Automatic Transmitter Power Control	Configurable over full available manual attenuation range						
Manual Transmitter Power Control range		QPSK	16QAM	32QAM	64QAM	128QAM	256QAM
	5 GHz	30 dB	26 dB	25.5 dB	25 dB	24 dB	22 dB
	6 to 23 GHz	20 dB	18 dB	17.5 dB	17 dB	16 dB	14 dB
Receiver Overload, BER = 1x10 ⁻⁶	-22 dBm						
Residual (Background) Bit Error Rate	Better than 10 ⁻¹³						

Power Supply and Environmental

Power Supply	Input Voltage Range	-40.5 to -60.0 VDC					
	Power Consumption (nominal)	IDU ES/GE + ODU300hp	42 W				
		IDU ES/GE + ODU300sp	32 W				
Operating Temperature	Indoor Unit	Guaranteed	-5° to +45° C (23° to +113° F)				
		Extended ^[2]	-5° to +55° C (23° to +131° F)				
	Outdoor Unit	Guaranteed	-33° to +55° C (-27° to +131° F)				
		Extended ^[2]	-50° to +65° C (-58° to +149° F)				
Weight and Dimensions	Indoor Unit	IDU GE 20x	44mm (1RU)x 482mm (19in) x 240mm (9.4in), 1.1 kg (2.5 lb)				
		IDU ES	44mm (1RU)x 482mm (19in) x 277mm (10.9in), 1.6 kg (3.5 lb)				
	Outdoor Unit	5 GHz	287mm (11.3 in) x 287mm (11.3 in) x 175mm (6.9 in), 8.3 kg (18.7 lb)				
		6 to 23 GHz	287mm (11.3 in) x 287mm (11.3 in) x 119mm (4.7 in), 6.4 kg (14 lb)				

Fault and Configuration Management

Protocol supported	SNMP v2, Static and dynamic routing, RIP I, RIP II, OSPF		
Local/remote Configuration and Support Tool	Eclipse Portal		
Performance Monitoring	To ITU-T Rec. G.826		
Network Management	Harris Stratex Networks ProVision or NetBoss		
Engineering Ordervire	Optional VoIP handset		

Ethernet Standards Compliance

Ethernet	IEEE 802.3u		
Framing	IPv4 and IPv6, IEEE 802.3d		
Flow Control	IEEE 802.3x		
VLAN	IEEE 802.1q		
QoS	Port based, IEEE 802.1p, Diffserv (RFC 2474)		
RMON	RFC 1757		

[1] Actual throughput available for data transport will be reduced proportionally when wayside DS1 channels are used.

[2] Over full Extended Operating Temperature Eclipse may be subject to reduced performance. Contact Harris Stratex Networks for more details.

For additional specifications please refer to the main Eclipse Platform Datasheet.

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

ODU General Specifications

System RF Specifications	5 GHz	L6/U6 GHz	7/8 GHz	10 GHz	11 GHz	15 GHz	18 GHz	23 GHz
Frequency Range, GHz	4.4 - 5.0	5.925 - 7.11	7.125 - 8.275	10.5 - 10.68	10.7 - 11.7	14.4 - 15.35	17.7 - 19.7	21.2 - 23.632
T-R Spacings supported, MHz	300, 312	160, 170, 252.04, 340	150, 175, 300	65	490, 500	475, 640	1560	600, 1200
Standard	NTIA Red Book EN 302 217	FCC Part 101 SRSP 306.4	SRSP 307.1 SRSP 307.7 NTIA Red Book	FCC Part 101 SRSP 310.5	FCC Part 101 SRSP 310.7	SRSP 314.5 NTIA Red Book	FCC Part 101 SRSP 317.8	FCC Part 101 SRSP 321.8
Maximum Tuning Range (dependent upon T-R spacing), MHz	56	56	140	165	165	245	380	370

Antenna Interface

Waveguide Type	N/A	R70 (WR137)	R84 (WR112)	R100 (WR90)	R100 (WR90)	R140 (WR62)	R220 (WR42)	R220 (WR42)
Flange Type	Coax	UDR70	UDR84	UDR100	UDR100	UBR140	UBR220	UBR220
Mating Flange Type	7/16"	PDR70 or CDR70	PDR84 or CDR84	PDR100 or CDR100	PDR100 or CDR100	PBR140 or CBR140	PBR220	PBR220

System Gain

System Gain at 10 ⁻⁶ BER ⁽¹⁾	6 Mbit/s, 4xDS1	5 MHz	QPSK	124.0 dBm	122.5 dB	122.5 dB		115.5 dB	112.5 dB	112.5 dB
	12 Mbit/s, 8xDS1	10 MHz	QPSK	121.5 dBm		120.0 dB		113.0 dB	110.0 dB	110.0 dB
	12 Mbit/s, 8xDS1	5 MHz	16 QAM				109.5 dB	107.0 dB	104.5 dB	104.0 dB
	25 Mbit/s, 16xDS1	20 MHz	QPSK	118.5 dBm		116.5 dB		109.5 dB	107.0 dB	106.5 dB
	25 Mbit/s, 16xDS1	10 MHz	16 QAM	110.5 dBm		111.0 dB		106.0 dB	104.0 dB	101.0 dB
	25 Mbit/s, 16xDS1	5 MHz	128 QAM		102.0 dB		98.0 dB	97.5 dB		
	43 Mbit/s	30 MHz	QPSK			114.5 dB		107.5 dB	104.5 dB	104.5 dB
	43 Mbit/s	20 MHz	16 QAM	108.5 dBm		108.5 dB		101.5 dB	99.0 dB	98.5 dB
	43 Mbit/s	10 MHz	64 QAM	103.0 dBm	103.0 dB	103.0 dB	98.5 dB	96.0 dB	93.5 dB	93.0 dB
	50 Mbit/s	40 MHz	QPSK					109.0 dB	106.5 dB	106.0 dB
	50 Mbit/s	20 MHz	16 QAM	107.5 dBm		108.0 dB		101.0 dB	98.0 dB	98.0 dB
	94 Mbit/s	20 MHz	64 QAM	99.5 dBm	99.5 dB	99.5 dB	95.0 dB	92.5 dB	90.0 dB	89.5 dB
	108 Mbit/s	40 MHz	16 QAM					100.0 dB	97.5 dB	97.0 dB
	108 Mbit/s	30 MHz	32 QAM	101.5 dBm		101.5 dB		97.0 dB	94.5 dB	92.0 dB
	108 Mbit/s	20 MHz	128 QAM	95.5 dBm	96.0 dB	96.0 dB	91.0 dB	89.0 dB	86.0 dB	86.0 dB
	130 Mbit/s	30 MHz	64 QAM	98.0 dBm	98.0 dB	98.0 dB	93.5 dB	91.0 dB	88.5 dB	88.0 dB
	154 Mbit/s	50 MHz	16 QAM						92.5 dB	92.5 dB
	154 Mbit/s	40 MHz	32 QAM				96.0 dB	94.0 dB	91.0 dB	91.0 dB
	154 Mbit/s	30 MHz	128 QAM	94.0 dBm	94.0 dB	94.0 dB	89.5 dB	87.0 dB	84.5 dB	84.0 dB
	196 Mbit/s	50 MHz	64 QAM						88.0 dB	87.5 dB
	196 Mbit/s	40 MHz	128 QAM				89.5 dB	87.5 dB	84.5 dB	84.5 dB
	196 Mbit/s	30 MHz	256 QAM	88.0 dBm	88.0 dB	88.0 dB	83.0 dB	81.0 dB	78.0 dB	78.0 dB
	260 Mbit/s	40 MHz	256 QAM				90.5 dB	88.5 dB	85.5 dB	85.5 dB
	326 Mbit/s	50 MHz	256 QAM						77.0 dB	13.5 dB
	360 Mbit/s	80 MHz	256 QAM						75.5 dB	

Transmitter Specifications

Power Output, nominal	QPSK	30.5 dBm	28.5 dBm	28.5 dBm	26.0 dBm	24.0 dBm	22.0 dBm	19.5 dBm	19.5 dBm
	16 QAM	26.5 dBm	26.5 dBm	26.5 dBm	24.0 dBm	22.0 dBm	20.0 dBm	17.5 dBm	17.5 dBm
	32 QAM	26.0 dBm	26.0 dBm	26.0 dBm	23.5 dBm	21.5 dBm	19.5 dBm	17.0 dBm	17.0 dBm
	64 QAM	25.5 dBm	25.5 dBm	25.5 dBm	23.0 dBm	21.0 dBm	19.0 dBm	16.5 dBm	16.5 dBm
	128 QAM	24.5 dBm	24.5 dBm	24.5 dBm	22.0 dBm	20.0 dBm	18.0 dBm	15.5 dBm	15.5 dBm
	256 QAM	22.5 dBm	22.5 dBm	22.5 dBm		18.0 dBm	16.0 dBm	13.5 dBm	13.5 dBm

Receiver Specifications

Threshold at 10 ⁻⁶ BER ⁽¹⁾	6 Mbit/s, 4xDS1	5 MHz	QPSK	-93.5 dBm	-94.0 dBm	-94.0 dBm		-93.5 dBm	-93.0 dBm	-93.0 dBm
	12 Mbit/s, 8xDS1	10 MHz	QPSK	-91.0 dBm		-91.5 dBm		-91.0 dBm	-90.5 dBm	-90.5 dBm
	12 Mbit/s, 8xDS1	5 MHz	16 QAM				-87.5 dBm	-87.0 dBm	-87.0 dBm	-86.5 dBm
	25 Mbit/s, 16xDS1	20 MHz	QPSK	-88.0 dBm		-88.0 dBm		-87.5 dBm	-87.5 dBm	-87.0 dBm
	25 Mbit/s, 16xDS1	10 MHz	16 QAM	-84.0 dBm		-84.5 dBm		-84.0 dBm	-83.5 dBm	-83.5 dBm
	25 Mbit/s, 16xDS1	5 MHz	128 QAM		-77.5 dBm		-76.0 dBm	-77.5 dBm		
	43 Mbit/s	30 MHz	QPSK			-86.0 dBm		-85.5 dBm	-85.0 dBm	-85.0 dBm
	43 Mbit/s	20 MHz	16 QAM	-82.0 dBm		-82.0 dBm		-81.5 dBm	-81.5 dBm	-81.0 dBm
	43 Mbit/s	10 MHz	64 QAM	-77.5 dBm	-77.5 dBm	-77.5 dBm	-77.5 dBm	-77.0 dBm	-77.0 dBm	-76.5 dBm
	50 Mbit/s	40 MHz	QPSK					-87.0 dBm	-87.0 dBm	-86.5 dBm
	50 Mbit/s	20 MHz	16 QAM	-81.0 dBm		-81.5 dBm		-81.0 dBm	-80.5 dBm	-80.5 dBm
	94 Mbit/s	20 MHz	64 QAM	-74.0 dBm	-74.0 dBm	-74.0 dBm	-74.0 dBm	-73.5 dBm	-73.5 dBm	-73.0 dBm
	108 Mbit/s	40 MHz	16 QAM					-80.0 dBm	-80.0 dBm	-79.5 dBm
	108 Mbit/s	30 MHz	32 QAM	-75.5 dBm		-75.5 dBm	-75.5 dBm	-75.0 dBm	-75.0 dBm	-74.5 dBm
	108 Mbit/s	20 MHz	128 QAM	-71.0 dBm	-71.5 dBm	-71.5 dBm	-71.0 dBm	-71.0 dBm	-70.5 dBm	-70.5 dBm
	130 Mbit/s	30 MHz	64 QAM	-72.5 dBm	-72.5 dBm	-72.5 dBm	-72.5 dBm	-72.0 dBm	-72.0 dBm	-71.5 dBm
	154 Mbit/s	50 MHz	16 QAM					-75.0 dBm	-75.0 dBm	-75.0 dBm
	154 Mbit/s	40 MHz	32 QAM				-74.5 dBm	-74.5 dBm	-74.0 dBm	-74.0 dBm
	154 Mbit/s	30 MHz	128 QAM	-69.5 dBm	-69.5 dBm	-69.5 dBm	-69.5 dBm	-69.0 dBm	-69.0 dBm	-68.5 dBm
	196 Mbit/s	50 MHz	64 QAM					-71.5 dBm	-71.5 dBm	-71.0 dBm
	196 Mbit/s	40 MHz	128 QAM				-69.5 dBm	-69.5 dBm	-69.0 dBm	-69.0 dBm
	196 Mbit/s	30 MHz	256 QAM	-65.5 dBm	-65.5 dBm	-65.5 dBm	-65.0 dBm	-65.0 dBm	-64.5 dBm	-64.5 dBm
	260 Mbit/s	40 MHz	256 QAM				-72.5 dBm	-72.5 dBm	-72.0 dBm	-72.0 dBm
	326 Mbit/s	50 MHz	256 QAM						-63.5 dBm	
	360 Mbit/s	80 MHz	256 QAM						-62.0 dBm	

All specifications are referenced to the ODU antenna flange, and are typical values unless otherwise stated, and are subject to change without notice.

For Guaranteed values (over time and operational range), subtract 2dB from Power Output, add 2dB to Threshold values, and subtract 4 dB from System Gain values.

[1] System Gain & Threshold values are for BER=10⁻⁶. Values for BER=10⁻³ are improved by 1dB.

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