Single Elements

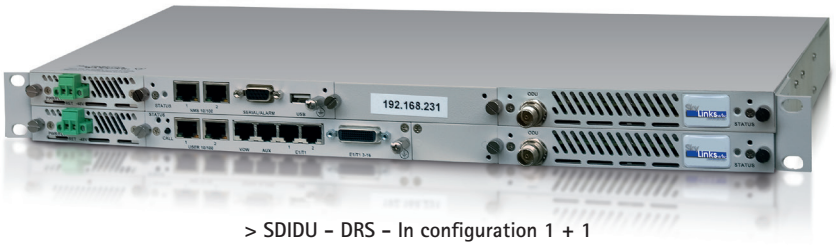
Single Elements for High Capacity Microwave Systems

Full and Half Duplex, 155/310/620Mbps, Split Mount or Full Indoor

SDIDU - DRS

Software Defined Indoor Unit (Hybrid Modem) up to 620Mbps - XPIC

> SDIDU - DRS - In configuration 1 + 0



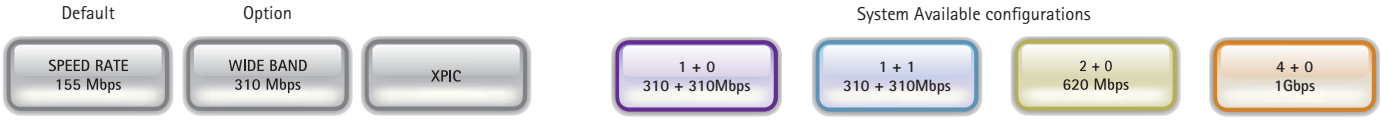
> SDIDU - DRS - In configuration 1 + 1

Main Features

- Support for multiple configurations for both PDH and SDH:
  - 1+0, 1+1 protection/diversity
  - Hot Standby
  - East/West Repeater (2 + 0)
- Selectable Spectral Efficiency of 0.8 to 6.25 bits/Hz (including FEC and spectral shaping effects).
- QPSK, 16 -256 QAM Modulation Link Provisioning.
- Powerful Trellis Coded Modulation concatenated with Reed-Solomon.
- Error Correction.
- Built-in Adaptive Equalizer.
- Support of Data Orderwire Channels:
  - Up to 19.2 kbps asynchronous RS-232
  - 64 kbps synchronous RS422
- Adaptive Power Control.
- Built-in Network Management System (NMS).
- Consecutive Point ring architecture.
- Built-in Bit Error Rate (BER) performance monitoring.

The DRS Software Defined IDU provides high capacity transmission, flexibility, features, and convenience for wireless digital communications networks. The DRS SDIDU represents a new microwave architecture that is designed to address universal applications for both PDH and SDH platforms. This advanced technology platform is designed to provide the flexibility to customers for their current and future network needs.

The DRS SDIDU family is based upon a common platform to support a wide range of network interfaces and configurations. It supports links for 16/32/42/63 x E1/T1, 1/2 x 100BaseTX Ethernet, DS-3/E-3/STS-1, 1000BaseTX Ethernet, and 1/2 x STM-1/OC-3. The SDIDU™ is spectrum and data rate scalable, enabling service providers or organizations to trade-off system gain with spectral efficiency and channel availability for optimal network connectivity. DRS SDIDU enables network operators (mobile and private), government and access service provides to offer a portfolio of secure, scalable wireless applications for data, video, and Voice over IP (VoIP).
The Software Defined IDU™ includes integrated Operations, Administration, Maintenance, and Provisioning (OAM&P) functionality and design features enabling simple commissioning when the radio network is initially set up in the field at the customer's premises. Furthermore, a highlight of DRS SDIDU is scalability and the capability to support a ring-type architecture. This ring or consecutive point radio architecture is self-healing in the event of an outage in the link and automatically re-routes data traffic, thereby ensuring that service to the end user is not interrupted.
The Software Defined IDU™ supports 1+0 and 1+1 protection and ring architectures in a single 1 RU chassis. The modem and power supply functions are supported using easily replaceable plug-in modules. An additional feature of the SDIDU™ is provision for a second plug-in modem/IF module to provide repeater or east/west network configurations.



The major functions of the SDIDU™ can be summarized as follows:

- I/O Processing - The SDIDU comes with a standard I/O capability that includes support for up to 16xT1/E1 and 2x100Base-TX user payloads, 2x100Base-TX for SNMP, and voice orderwire. In addition, option cards for DS-3/E3/STS-1, 1-2 x STM-1/OC-3, and 4xDS-3/E3/STS-1 may be added. The SDIDU architecture is flexible and allows for the addition of other I/ O types in the future.
- Switch/Framing - The SDIDU™ includes an Ethernet Switch and a proprietary Framer that are designed to support 1+1 protection switching, ring architecture routing, and overall network control functions.
- Network Processor - The SDIDU includes a Network Processor which performs SNMP and Network Management functions.
- Modem/IF - The SDIDU™ Modem performs forward-error-correction (FEC) encoding, PSK/QAM modulation and demodulation, equalization, and FEC decoding functions. The IF chain provides a 350 MHz carrier and receives a 140 MHz carrier. The multiplexer function is built into an appliqué that resides in the Modem/IF Module. Two modems can be used for 1+1 protection or ring architectures.
- Power Supply - The SDIDU power supply accepts -48 Vdc and supplies the SDIDU™ and ODU with power. A second redundant power supply may be added as an optional module.
- Signal Timing - STM-1 and E1/T1 signals that are received by an SDIDU over the link for transmitting out the front-panel interfaces have their Tx timing recovered from the respective STM-1 or E1/T1 signal. In this manner the STM-1 and E1/T1 signals are through-timed from the transmitting SDIDU™.

STM-1

- The SDIDU™ meets G.703, G.957 (S-1.1), G.825 for the STM-1/OC-3 signals passed across the RF link. Performance monitoring is not provided as the SDIDU™ does not act as a regenerator. The SDIDU™ does not support add/drop MUX (ADM) capability. The SDIDU™ does support terminal MUX capability.

Gigabit Ethernet

- Scalable Ethernet data rates up to 300 Mbps can be achieved with a Gigabit Ethernet scalable SDIDU™ (see Table 2-4). Data rates up to 155 Mbps are available with the Standard Modem/IF module (CCM-4900) and data rates up to 300 Mbps are available with the Wideband Modem I/F module (CCM-4960).
- The SDIDU™ may be configured to aggregate Ethernet bandwidth across two or four links when operating as 2+0 or 4+0, allowing for a total throughput of up to 600 Mbps or 1000 Mbps, respectively (Section 2.14.1).

SDIDU GigE Ethernet throughput Examples by modulation and bandwidht

Bandwidth/Modulation	30MHz	40MHz	50MHz	56MHz
QPSK	30 Mbps	45 Mbps	55 Mbps	60 Mbps
16-QAM	80 Mbps	100 Mbps	130 Mbps	160 Mbps
32-QAM	100 Mbps	130 Mbps	160 Mbps	200 Mbps
64-QAM	125 Mbps	160 Mbps	200 Mbps	250 Mbps
128-QAM	150 Mbps	200 Mbps	250 Mbps	300 Mbps

Options

- Embedded SNMP Agent with 2 port 10/100 Base-T Hub.
- Network Management System.
- Integrated Crosspoint switch up to 160E1.
- Integrated STM-1 MUX-DEMUX.
- Scalable Ethernet.
- Proprietary quick-release circular waveguide interface.
- PDH Options
  - Up to 16 x E1/T1
  - 100BaseTX/Ethernet: Scalable 1-100 Mbps
  - DS-3/E-3/STS-1 (option; consult factory for availability)
- Super PDH Options
  - Up to 32/42/63 x E1/T1
- Ethernet Options
  - 100 BaseTX/Ethernet: Scalable 1-155 Mbps
  - 1000BaseTX/Ethernet Scalable 1-300 Mbps
- SDH Options
  - 1-2 x SDH STM-1/OC-3 SONET
- Support for multiple configurations for both PDH and SDH
  - 1+0, 1+1 protection/diversity
  - Hot Standby
  - East/West Repeater (2 + 0)
- Optional STM-1 Mux/Demux: allows the SDIDU™ to extract up to 63
- E1 (or 84 T1) from an STM-1. In conjunction with an integrated
- Crosspoint Switch, up to 223 E1 (284 T1s) can be mapped any-to-any between front-panel ports, STM-1, and RF link(s).

SDIDU - DRS

PAYLOAD INTERFACE PARAMENTERS

SDH	Line Rate	1 or 2 STM-1/OC3 155.52 Mbps
	Interfaces	Optical Type SC single mode 1310nm, Electrical BNC
	Standards Compliances	Telcordia
Ethernet	Line Rate	Full Duplex, scalable up to 100 Mbps
	Interfaces	100 Base-Tx or 1000 Base Tx for Gigabit Ethernet
	Standards Compliances	IEEE 802.3

CONFIGURATION

Supported Configurations	1+0, 1+1 (1U), 2+0 (1U)
Radio Protection	Hot standby, hitless switching with frequency or space diversity

MECHANICAL/ENVIROMENTAL

Dimensions	IDU: 19" standard rack (1U), 445 x 238.5 x 44.5mm ODU: 240mm x 240mm x 70mm
Weight	IDU: 4 Kg; ODU: 6.0 Kg
Operating Temperature	IDU: -5° to +45°C; ODU: -33° to +55°C
Altitude	Up to 4500 meters
Humidity	IDU: 95% condensing; ODU: 100% all-weather
Power Inpu	-48V DC (-36V to -60V DC)
Power Consumption	IDU: < 25 watts; ODU: <25 watts
Cooling	Air forced Cooled
Coaxial Interfaces	IDU TNC female, ODU N-type female
IDU-ODU Cable	Belden 9913/RG-8, up to 300m
Antenna Interface	Antenna Interface Coaxial N-type connector (6-11 GHz); proprietary direct mount (13GHz and above)
Standards Compliance	ETSI ETS 300 019

NETWORK MANAGEMENT

Support	SNMP, Fully featured MIB, WEB based GUI, Embedded HTML server, CLI
Local Access	Ethernet 10/100 Base-T / RJ-45
Control Channel	In band

SDIDU - HS

Software Defined Indoor Unit (IP Modem) up to 620Mbps

> SDIDU - HS - In configuration 1 + 0 (Option)

> SDIDU - HS - In configuration 2 + 0 (Option)

Main Features

Up to 310Mbps data throughput, full duplex.
Available modulation schemes:
Programable QPSK/6QAM/32QAM/64QAM/128QAM/256QAM.

- Available channel bandwidth:
  > ETSI standards : 7/14/28/40 and 56 MHz
  > ANSI standards : 10/20/30/40 and 50 MHz.
- Customer network data interface:
  > 1 x Gigabit Ethernet (100/1000Base-T)
  > 1 x 10/100BaseTX for data or management
  > 1-2 x E1 / T1 plug-in extension module
  > 1 x E3 / DS3 plug-in extension moexternal mux
  > 4 x ASI In/Out (half duplex) or 2 x TX + 2 x RX (full duplex)
- Configuration:
  Mix of TDM + Ethernet / Ethernet only / TDM only
  Capacity is dynamically allocated between E1/T1/E3/DS3 channels and Ethernet
- IF/ODU interface
  N-type connector standard configuration 350 / 140 MHz IF ODUs.

HS-IDU is a software defined Indoor Unit optimized for high speed Ethernet networking with optional combination of side channels for E1/T1 or E3/T3 line interfaces, thanks to plug-in cards to add to the basic unit.
Thanks to the scalable concept, this system offers the flexibility to increase the transmission capacity depending on application needs.
The system provides full range of modulation schemes from QPSK to 256QAM, arbitrary bandwidth selection in respect to both ETSI and ANSI standards and data throughput rates up to 310 Mbps.
In the typical Split -Mount configuration ODUs can be connected to the IDU over standard intermediate Tx and Rx IF frequencies (+DC pw supply + telemetry) through a coax connections. Link management is supported via a web GUI and SNMP with custom MIB.

Applications

- Digital microwave systems optimized for Ethernet traffic transmission /mix Ethernet + TDM
- Non-standard applications based on customer specific requirements also available

Other Features

- Management
  > IP based (HTTP via web GUI, SNMP with MIB, Telnet)
  > 1 x USB A for mass storage device (FW upgrade, backup,..)
  > 1 x USB B serial port
  > 1 x RS-232 serial port

Default

SPEED RATE
155 Mbps

Option

WIDE BAND
310 Mbps

System Available configurations

1 + 0
155 or 310Mbps

2 + 0
620 Mbps

PAYLOAD INTERFACE PARAMENTERS

Gigabit Ethernet	Line Rate	Full-Duplex, scalable up to 310 Mbps
	Interfaces	1 x 10/100/1000 Base-T (RJ45) 1 x 10/100 base-T (Rj45)
	Maximum packet lenght	1632 Bytes
E1 / E3	Line Rate	1-2 x 2.048 / 1 x 34.368 Mbps
	Interfaces	G703 RJ45 / BNC
	Test Utility	Loopback, Internal BER tester
ASI	Half-Duplex-TX	4 X AS TX
	Half-Duplex-RX	4 X ASI RX
	Full-Duplex	2X ASI TX + 2X ASI RX

MECHANICAL/ENVIROMENTAL

Dimensions	IDU: "HALF"19" standard rack (1U), 210 x 44 x201mm ODU: D 260mm x H 160mm
Weight	IIDU: 2 Kg; ODU: 6.0 Kg
Operating Temperature	IDU: -5° to +45°C; ODU: -33° to +55°C (Arctic option -50°C)
Altitude	Up to 4500 meters
Humidity	IDU: 95% condensing; ODU: 100% all-weather
Power Input	-48V DC (-36V to -60V DC)
Power Consumption	IDU + ODU < 45 Watts
Cooling	Natural convection
Coaxial Interfaces	IDU N-type female, ODU N-type female
IDU-ODU Cable	Belden 9913/RG-8, up to 300m
Antenna Interface	Coaxial N-type connector (6-11 GHz); proprietary direct mount (13GHz and above)
Standards Compliance	ETSI ETS 300 019, Part 1-3 Class 3.2 (IDU) - Part 1-4 Class 4.1 (ODU)

ODU

Outdoor Unit for Digital MW Radio Systems 4 to 38GHz Frequency Range

> ODU

Main Features

- High Linearity allowing highest order modulation schemes..
- Very low power Consumption.
- Compact and Lightweight.
- Very low Phase Noise.
- SW Selectable BW.
- Superior reliability - High MTBF.
- Fully Calibrated over the temperature range.
- Proprietary quick release WG Antenna Interface.

Options

- HP version (available up to 13GHz)
- WB version for 56 ch. BW operation
- -50 °C (-58 °F) Operational.
- Customized IF Frequency / Telemetry Interface.
- Customer Specific IDU Interface.
- 17 & 24GHz cross polarization versions for licence-exempt ISM bands

The Outdoor Unit provides a flexible and cost-effective solution to System Integrators for PDH and SDH radio systems; operating in the licensed bands from 4 to 38 GHz, the ODU Family is the best solution for fast time to market, highest performances and reliability.

The 17 and 24 GHz Cross ODU are specifically designed to meet the requirements of the ISM bands. They operate with Tx and Rx Crosspolarized through an OMT into a circular Waveguide.

The ODU is SW configurable ODU, settings and readings are available through Customer Specific Telemetry Protocol. A built in microcontroller provides full calibration of Transmit Power and Receive Signal Level (RSL) by means precise and reliable algorithms.
Additionally, the ODU enhanced software allows inventory modules ID, setting and fine tuning of several parameters and downloadable field upgrades.
The advanced features and enhanced capabilities of the ODU make it the ideal solution for Radio Links from 2 to 310 Mbps capacity, with modulation schemes from QPSK to 128 QAM and channel BW from 3.5 to 56 MHz.

The small size of the modules allows to eventually fit them into the customer standard ODU housing, upon request.

Default

STANDARD
28 MHz Ch BW

Option

WIDE BAND
56 MHz Ch BW

Hardware Available configurations

Full Duplex

Half Duplex
TX or RX

TX Power
Standard or High

FREQUENCY SPECIFIC ODU PARAMETERS

Frequency	Standard	Operating Frequency (GHz)	TX Output Power dBm - STD (HI)			Noise Figure
			QPSK	16, 32, 64QAM	128, 256QAM	
4GHz	ETSI/FCC	3,80 to 5,80	+27 (+32)	+24 (+29)	+22 (+27)	<4 dB
6GHz	ETSI/FCC	5.90 to 6.40				
7/8GHz	ETSI	7,10 to 8.50				
10/11GHz	ETSI/FCC	10.00 to 10.70	+26 (+31)	+23 (+28)	+21 (+26)	<4,5 dB
11GHz	ETSI/FCC	10.70 to 11.70				
13GHz	ETSI	12.75 to 13.25				
15GHz	ETSI	14.40 to 15.35	+25	+22	+20	<4.5 dB
18GHz	ETSI/FCC	17.70 to 19.70	+23	+21	+18	<5.5 dB
23GHz	ETSI/FCC	21.20 to 23.60	+22	+19	+17	<5.5 dB
26GHz	ETSI/FCC	24.50 to 26.50	+21	+18	+16	<6.0 dB
38GHz	ETSI/FCC	37.00 to 39.50	+18	+15	+13	<6.5 dB
17GHz	ISM band	17.10 to 17.30	adjustable from -24 to +7			<5.0 dB
24GHz	Unlicensed	24.00 to 24.25	adjustable from -24 to +5			<5.0 dB

Note: HP Option output power between brckets

ODU PARAMETERS

TX IF interface	350 MHz, -5 to -33dBm	
Rx IF Interface	140 MHz, -12 +/-2 dB over the AGC Range	
Telemetry Interface	Customer specific	
Power control Range	>25 dB	
Power setting resolution	0,5 dB	
Power setting accuracy	2 dB	
Rx AGC Range	-20 to -90 dBm	
SSB tx/rx Phase Noise	4 - 6 - 7 - 8 GHz	11 - 13 -15 GHz
dBc@10KHz	-82	-80
dBc@100KHz	-103	-100
dBc@1MHz	-123	-120
Synthesizer Step	0,25 MHz	
Frequency Stability	2,5 ppm	
Standard Compliance	Radio ESTI EN 302 217, EN 301 216, EN 301 128, EN 300 198	
	Power Supply ETSI EN 300 132-2	
	EMC / Safety ETSI EN 301 489 / IEC EN 60950	

MECHANICAL / ENVIRONMENTAL

Dimensions	D 260mm, H 160mm
Weight	6.0 kg
Operating Temperature	-33° to +55°C
Altitude	Up to 4500 meters
Humidity	100% all weather
Power Input	-48V DC (-36 to -62V DC)
Power Consumption	<25watts, <35W for HP option
Cooling	Natural convection
Coaxial Interfaces	N-type female
IDU-ODU Cable	Belden 9913/RG-8, up to 300m
Antenna interface	Coaxil N-type connector (6-11 GHz); proprietary direct mount (13 GHz and above)
Standards Compliance	ETSI ETS 300 019

RFU-FI VHP

RF Unit/Full-Indoor RF Unit/Full-Indoor for Digital MW Radio Systems
Very High Power 4 to 11GHz Frequency Range

> RFU – In 1+0 Configurations

> RFU – In 1+1 Configurations

Main Features

- High linearity allows high order modulation scheme
- Very High Output Power
- Low power consumption
- Very low Phase Noise
- Superior reliability- High MTBF
- Fully calibrated over the temperature range

Options

- Custom Branchings for 1+1 HSB and FD
- SW selectable BW
- Customer specific IDU Interface
- Customized IF Frequency/Telemetry interface

The RFU – FI™ Full Indoor RF Unit provides a flexible and cost effective OEM solution to System Integrators for SDH radio systems; operating from 4 to 11 GHz, the RFU – FI™ family is your solution for fast time to market, highest performances and reliability.

RFU – FI™ is a SW configurable RF Unit for Full Indoor system available in 1+0 and 1+1 Space and Polarization Diversity. Custom solutions for 1+1 Hot Stand-by and Frequency diversity are available on application.

The advanced features and enhanced capabilities of the RFU – FI™ make it the ideal solution for Radio Links from Super PDH to 2xSTM-1 and Gigabit Ethernet, from QPSK to 128 QAM and from 10 to 56 MHz channel BW.

Default | Option

WIDE BAND
56 MHz Ch BW

Hardware Available configurations

Full Duplex | Half Duplex TX or RX | TX Power Very HI PW

FREQUENCY SPECIFIC PARAMETERS

Frequency	Standard	Operating Frequency (GHz)	TX Output Power dBm			Noise Figure
			QPSK	16, 32, 64QAM	128, 256QAM	
4Ghz	ETSI/FCC	4,40 to 5,00	+35	+32	+30	< 4,0 dB
6Ghz	ETSI/FCC	5,90 to 7.10	+35	+32	+30	<4 dB
7Ghz	ETSI	7,10 to 7,70				
8Ghz	ETSI	7,70 to 8,50				
10/11Ghz	ETSI/FCC	10,15 to 10,65 10,70 to 11,70	+34	+31	+29	<4,5 dB

VHP PARAMETERS

TX IF interface	350 MHz, -5 to -33dBm	
Rx IF Interface	140 MHz, -12 +/-2 dB over the AGC Range	
Telemetry Interface	Customer specific	
Power control Range	>25 dB	
Power setting resolution	0,5 dB	
Power setting accuracy	2 dB	
Rx AGC Range	-20 to -90 dBm	
SSB tx/rx Phase Noise	4 - 6 - 7 - 8 GHz	11 GHz
dBc@10KHz	-82	-80
dBc@100KHz	-103	-100
dBc@1MHz	-123	-120
Synthesizer Step	0,25 MHz	
Frequency Stability	2,5 ppm	
Standard Compliance	Radio ESTI EN 302 217, EN 301 216, EN 301 128, EN 300 198	
	Power Supply ETSI EN 300 132-2	
	EMC / Safety ETSI EN 301 489 / IEC EN 60950	

MECHANICAL / ENVIRONMENTAL

Dimensions	19" Rack 6U 482 mm x266mm x 126mm			
Weight	8,5 Kg			
Operatimng Temperature	-5 to +45° C			
Altitude	Up to 4500 meters			
Humidity	0 to 95% non-condensing			
Power Input	-48V DC (-36V to -62V DC)			
Power Consumption	< 55W for each TX/RX			
Cooling	Natural convection			
IF/Telemetry Interface	N-type female			
Antenna Interface	4 GHz	6GHz	7/8 GHz	11 GHZ
	UDR48/N-Type	UDR70 (CPR137)	UDR84	UDR120
Standards Compliance	ETSI ETS 300 019			

RFU-FI UHP

RF Unit/Full-Indoor for Digital MW Radio Systems
Ultra High Power 4 to 11GHz Frequency Range

> RFU - In 1+1 configuration

Main Features

- High linearity allows high order modulation scheme
- Ultra High Output Power
- Low current consumption
- Very low Phase Noise
- Superior reliability- High MTBF
- Fully calibrated over the temperature range

Options

- Custom Branchings for 1+1 HSB and FD
- SW selectable BW
- Customer specific IDU Interface
- Customized IF Frequency/Telemetry interface

The RFU – FI™ Full Indoor RF Unit provides a flexible and cost effective OEM solution to System Integrators for SDH radio systems; operating from 4 to 11 GHz, the RFU – FI™ family is your solution for fast time to market, highest performances and reliability.

RFU – FI™ is a SW configurable RF Unit for Full Indoor system available in 1+0 and 1+1 Space and Polarization Diversity. Custom solutions for 1+1 Hot Stand-by and Frequency diversity are available on application.

The advanced features and enhanced capabilities of the RFU – FI™ make it the ideal solution for Radio Links from Super PDH to 2xSTM-1 and Gigabit Ethernet, from QPSK to 128 QAM and from 10 to 56 MHz channel BW.

Default

STANDARD
28 MHz Ch BW

Option

WIDE BAND
56 MHz Ch BW

Hardware Available configurations

Full Duplex

Half Duplex
TX or RX

TX Power
Ultra HI PW

FREQUENCY SPECIFIC PARAMETERS

Frequency	Standard	Operating Frequency (GHz)	TX Output Power dBm			Noise Figure
			QPSK)	16, 32, 64QAM	128, 256QAM	
4Ghz	ETSI/FCC	4,40 to 5,00	+40	+37	+35	< 4,0 dB
6Ghz	ETSI/FCC	5,90 to 7.10	+40	+37	+35	<4 dB
7Ghz	ETSI	7,10 to 7,70				
8Ghz	ETSI	7,70 to 8,50				
10/11Ghz	ETSI/FCC	10,15 to 10,65 10,70 to 11,70	+38	+35	+33	<4,5 dB

RFU-FI-PARAMETERS

TX IF interface	350 MHz, -5 to -33dBm	
Rx IF Interface	140 MHz, -12 +/-2 dB over the AGC Range	
Telemetry Interface	Customer specific	
Power control Range	>25 dB	
Power setting resolution	0,5 dB	
Power setting accuracy	2 dB	
Rx AGC Range	-20 to -90 dBm	
SSB tx/rx Phase Noise	4 - 6 - 7 - 8 GHz	11 GHz
dBc@10KHz	-82	-80
dBc@100KHz	-103	-100
dBc@1MHz	-123	-120
Synthesizer Step	0,25 MHz	
Frequency Stability	2,5 ppm	
Standard Compliance	Radio ESTI EN 302 217, EN 301 216, EN 301 128, EN 300 198	
	Power Supply ETSI EN 300 132-2	
	EMC / Safety ETSI EN 301 489 / IEC EN 60950	

MECHANICAL / ENVIRONMENTAL

Dimensions	19" Rack 6U 482 mm x266mm x 126mm			
Weight	9,8 Kg			
Operatimng Temperature	-5 to +45° C			
Altitude	Up to 4500 meters			
Humidity	0 to 95% non-condensing			
Power Input	-48V DC (-36V to -62V DC)			
Power Consumption	< 155 W			
Cooling	Natural convection			
IF/Telemetry Interface	N-type female			
Antenna Interface	4GHz	6GHz	7/8GHz	11GHZ
	UDR48/N-Type	UDR70 (CPR137)	UDR84	UDR120
Standards Compliance	ETSI ETS 300 019			

All-in-One, VHP

All-in-One, for MW Radio System (IP native)
Very High Power

> HS/FI All-in-One

System Features

- Complete Digital Microvwave System placed into a 2U 19" std. rack module.
- QPSK, 16 –256 QAM Modulation
- FEC – Forward Error Correction with Reed-Solomon Coding
- Built-in Adaptive Modulation system with dynamic capacity allocation and priority data transmission (PBPS – Packet Based Priority System)
- Asymmetrical data rates – different modulation setup for upstream and downstream
- On-line Ethernet packet compression with reduced length of frames allowing throughput efficiency increase up to 25%
- Two USB ports for connecting USB-flash disk or PC
- "In-Band"/"Out-of-Band" Management
- NAT, Proxy ARP support for effective IP management setup
- Large range of System and Ethernet Counters
- Adaptive Power Control ATCP
- Built-in Network Management System (NMS) – Web, SNMP, TELNET
- Built-in Bit Error Rate (BER) Tester + Built-in Spectrum analyzer

The SKYLINKS Digital Radio System All-in-One provides a cost-effective solution to high capacity data transmission requirements. Operating in the licensed bands from 4 to11 GHz, it is fitted into a 2RU chassis where both modem and RF units are included. The result is a brand new equipment specifically designed for application where room saving is a constraint.
It has enhanced features that include line interface, alarms and diagnostics and network management interfaces.
The ASI interface is a PLUS that enhance this complete radio terminal into the broadcasting market as a top level, brilliant star.

Easy-to-install, All-in-One provides user accessibility functions including Transmit Power, Receive Signal Level (RSL), and operating frequency. Additionally, All-in-One features enhanced software allowing capacity/configuration upgrade, downloadable field upgrades and an optional embedded SNMP agent for advanced network management capabilities, making it the ideal solution for networks operated by mobile service providers, internet service providers (ISP), utilities, public telephone operators, local governments, TV networks and corporate users. These SKYLINKS Digital Radios represent a new microwave architecture designed to address universal applications for GE platforms and thanks to the ASI interface to meet the most evolved broadcasters. The advanced technology is designed to provide flexibility to customers for their current and future networking needs.

It supports links for high speed wireless Ethernet networking, through the optional sw upgrade that delivers up to 310Mbps in a 56MHz ch BW (for this option a specific license has to be acquired).
It is spectrum and data rate scalable from 5 to 310Mbps, giving opportunity to service providers and companies to trade-off system gain with spectral efficiency and channel availability for optimal network connectivity.
SKYLINKS All-in-One enables broadcasters and network operators (mobile and private), access service providers and government to provide a portfolio of secure, scalable wireless applications for data, video, and voice over IP (VoIP).

Default

155 Mbps @ 128 QAM
28 MHz Ch BW

Option

310Mbps @ 256QAM
56Mhz Ch BW

Hardware Available configurations

Full Duplex

Half Duplex
TX or RX

TX Power
Very HI PW

SYSTEM PARAMETERS

Frequency	4 GHz	6/7/8 GHz	10/11 GHz
Standards	ETSI/FCC	ETSI	ETSI/FCC
Operating Frequency (GHz)	3.8 to 4.2, 4.40 to 5.00 5.90 to 7.10	7.10 to 8.50	10.70 to 11.70
Channel BW 28 MHz **Channel BW 56 MHz**	128 QAM 157Mbps 32QAM 157Mbps / 128QAM 310Mbps		
Tx Power (dBm) **QPSK** **16, 32, 64QAM** **128, 256QAM**	 +35 +32 +30		 +34 +31 +29
Rx Sensitivity (dBm) @ 10-6 BER **28 MHz, 157 Mbps** **56 MHz, 157 / 310 Mbps**	 -70 -72		 -69 -71
Frequency Stability	0.0010%		
Background BER	< 10-12		
Standards Compliance	Radio ETSI EN 302 217, EN 301 216, EN 301 128, EN 300 198		
	Power Supply ETSI EN 300 132-2		
	EMC / Safety ETSI EN 301 489 / IEC EN 60950		

PAYLOAD INTERFACE PARAMENTERS

Gigabit Ethernet	Line Rate	Full-Duplex, scalable up to 310 Mbps
	Interfaces	1 x 10/100/1000 Base-T (RJ45) 1 x 10/100 base-T (Rj45)
	Maximum packet lenght	1632 Bytes
E1 / E3	Line Rate	1-2 x 2.048 / 1 x 34.368 Mbps
	Interfaces	G703 RJ45 / BNC
	Test Utility	Loopback, Internal BER tester
ASI	Half-Duplex-TX	4 X AS TX
	Half-Duplex-RX	4 X ASI RX
	Full-Duplex	2X ASI TX + 2X ASI RX

MECHANICAL/ENVIROMENTAL

Dimensions	standard rack (2U), 210 x 88 x201mm			
Weight	Kg: 9,8 Kg			
Operating Temperature	-5° to +45°C			
Altitude	Up to 4500 meters			
Humidity	IDU: 95% non condensing			
Power Input	-48V DC (-36V to -60V DC)			
Power Consumption	< 75 Watts			
Cooling	Air Force Cooled			
Standards Compliance	ETSI ETS 300 019, Part 1-3 Class 3.2			
Antenna Interface	4GHz	6GHz	7/8GHz	11GHZ
	UDR48/N-Type	UDR70 (CPR137)	UDR84	UDR120

All-in-One, UHP

All-in-One, for MW Radio System (IP native)
Ultra High Power

> HS/FI All-in-One

System Features

- Complete Digital Microvwave System placed into a 2U 19" std. rack module.
- QPSK, 16 –256 QAM Modulation
- FEC – Forward Error Correction with Reed-Solomon Coding
- Built-in Adaptive Modulation system with dynamic capacity allocation and priority data transmission (PBPS – Packet Based Priority System)
- Asymmetrical data rates – different modulation setup for upstream and downstream
- On-line Ethernet packet compression with reduced length of frames allowing throughput efficiency increase up to 25%
- Two USB ports for connecting USB-flash disk or PC
- "In-Band"/"Out-of-Band" Management
- NAT, Proxy ARP support for effective IP management setup
- Large range of System and Ethernet Counters
- Adaptive Power Control ATCP
- Built-in Network Management System (NMS) – Web, SNMP, TELNET
- Built-in Bit Error Rate (BER) Tester + Built-in Spectrum analyzer

The SKYLINKS Digital Radio System All-in-One provides a cost-effective solution to high capacity data transmission requirements. Operating in the licensed bands from 4 to11 GHz, it is fitted into a 2RU chassis where both modem and RF units are included. The result is a brand new equipment specifically designed for application where room saving is a constraint.
It has enhanced features that include line interface, alarms and diagnostics and network management interfaces.
The ASI interface is a PLUS that enhance this complete radio terminal into the broadcasting market as a top level, brilliant star.

Easy-to-install, All-in-One provides user accessibility functions including Transmit Power, Receive Signal Level (RSL), and operating frequency.
Additionally, All-in-One features enhanced software allowing capacity/configuration upgrade, downloadable field upgrades and an optional embedded SNMP agent for advanced network management capabilities, making it the ideal solution for networks operated by mobile service providers, internet service providers (ISP), utilities, public telephone operators, local governments, TV networks and corporate users.
These SKYLINKS Digital Radios represent a new microwave architecture designed to address universal applications for GE platforms and thanks to the ASI interface to meet the most evolved broadcasters. The advanced technology is designed to provide flexibility to customers for their current and future networking needs.

It supports links for high speed wireless Ethernet networking, through the optional sw upgrade that delivers up to 310Mbps in a 56MHz ch BW (for this option a specific license has to be acquired).
It is spectrum and data rate scalable from 5 to 310Mbps, giving opportunity to service providers and companies to trade-off system gain with spectral efficiency and channel availability for optimal network connectivity.
SKYLINKS All-in-One enables broadcasters and network operators (mobile and private), access service providers and government to provide a portfolio of secure, scalable wireless applications for data, video, and voice over IP (VoIP).

Default

155 Mbps @ 128 QAM
28 MHz Ch BW

Option

310Mbps @ 256QAM
56Mhz Ch BW

Hardware Available configurations

Full Duplex

Half Duplex
TX or RX

TX Power
Ultra HI PW

SYSTEM PARAMETERS

Frequency	4 GHz	6/7/8 GHz	10/11 GHz
Standards	ETSI/FCC	ETSI	ETSI/FCC
Operating Frequency (GHz)	3.8 to 4.2, 4.40 to 5.00 5.90 to 7.10	7.10 to 8.50	10.70 to 11.70
Channel BW 28 MHz **Channel BW 56 MHz**	128 QAM 157 Mbps 32 QAM 157 Mbps / 128 QAM 310 Mbps		
Tx Power (dBm) **QPSK** **16, 32, 64QAM** **128, 256QAM**	 +40 +37 +35		 +39 +35 +33
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Power Consumption	< 175 Watts			
Cooling	Air Force Cooled			
Standards Compliance	ETSI ETS 300 019, Part 1-3 Class 3.2			
Antenna Interface	4GHz	6GHz	7/8GHz	11GHZ
	UDR48/N-Type	UDR70 (CPR137)	UDR84	UDR120