Digital Radio System/Split Mount

System Features

- Frequency range from 6 to 38GHz
- Channel Bandwidth from 7 to 56MHz ETSI, from 10 to 60MHz ANSI
- 1+0, 1+1 HSB protection, 1+1 Space and Frequency Diversity, 2+0 (double capacity)
- Modulation from QPSK to 256 QAM
- Capacity up to 310Mbps Full-Duplex
- Low latency, ATCP, ACM
- Support for multiple configurations for both PDH and SDH 1+0, 1+1 protection/diversity East/West Repeater (2+0) or East/East capacity doubler.
- Selectable Spectral Efficiency of 0.8 to 6.25 bits/Hz (including FEC and spectral shaping effects)
- QPSK, 16–256 QAM Modulation
- Powerful Trellis Coded Modulation concatenated with Reed-Solomon Error Correction
- Built-in Adaptive Equalizer
- Support of Voice Orderwire Channels
- Adaptive Power Control
- Built-in Network Management System (NMS)
- Consecutive Point ring architecture
- Built-in Bit Error Rate (BER) performance monitoring
- Integrated Crosspoint switch: allows a total of 160 E1s (200 T1s) to be mapped any-to-any between front-panel ports and RF link(s).
- Optional STM-1Mux/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).

Overview

The DRS provides a cost-effective solution to high capacity data transmission requirements. Operating from 6 to 38 GHz, it features compact/easy to install IDU and ODU.
The DRS provides user accessibility functions including Transmit Power, Receive Signal Level (RSL), and operating frequency. Additionally, it 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.
The DRS represent a new microwave architecture designed to address universal applications.
The same ODU can be used for PDH, SDH and IP applications offering modulation schemes from QPSK up to 256-QAM, and selectable channel BW of 3.5, 7, 14 and 28 MHz (from 10 to 56 MHz in the WB option). The Software Defined Indoor Unit (SDIDU) offers a basic configuration, suitable for PDH application and can be upgraded with simple FW and plug-in HW modules for Super PDH, SDH, FE, GE and ASI options.
This advanced technology platform is designed to provide the flexibility to customers for their current and future network needs.
The ODU supports all applications within the same HW platform covering from QPSK up to 256-QAM with very low Phase Noise and superior reliability (high MTBF).
The IDU supports both 1+0 and 1+1 protection and Ring architectures, it is provided in a chassis arrangement 1U 19 inch standard rack.
The modem and power supply functions are supported using easily replaceable plug-in modules. An additional feature of the IDU is provision for a second plug-in modem / IF module to provide repeater or transit network configurations (East/West) or Capacity Doubling (East/East).
DRS includes integrated Operations, Administration, Maintenance, and Provisioning (OAM&P) functionality and also Design features enabling simple commissioning for the radio network installation in the customer's premises.
Another highlight is the scalability and the capability to support a Ring 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 the continuity of service to the end user.
The overall architecture consists of a single 1U rack mount Indoor Unit (IDU) with a cable connecting to an Outdoor Unit (ODU) with an external antenna.

SystemParameters

Frequency Bands	6	7	8	11	13	15	18	23	26	32	38
Frequency Range (GHz)	6.4 to 7.1	7.1 to 7.9	7.7 to 8.5	10.7 to 11.7	12.7 to 13.3	14.4 to 15.4	17.7 to 19.7	21.2 to 23.6	24.2 to 26.5	31.8 to 33.4	37.0 to 40.0
T/R Spacing (MHz)	150 160 170 340	154 160 161 168 196 245 300	119 126 151.614 208 266 310 311.32 360	490 500 530	200 225 266	315 322 420 475 490 640 644 728	1008 1010 1092.5 1120 1560	1008 1200 1232	800 1008	812	700 1260
Transmitter Power by Modulation Type											
QPSK	30.0	30.0	30.0	28.0	26.0	26.0	26.0	25.0	25.0	23.0	23.0
16/32 QAM	28.0	28.0	28.0	26.0	24.0	24.0	23.0	23.0	22.0	21.0	20.0
64/128 QAM	25.0	25.0	25.0	22.0	20.0	20.0	19.0	19.0	19.0	17.0	17.0
256 QAM	23.0	23.0	23.0	20.0	18.0	18.0	17.0	17.0	17.0	15.0	15.0
Transmitter Minimum Power (dBm)	8.0	8.0	8.0	5.0	3.0	3.0	2.0	2.0	2.0	0.0	0.0
TX Power Accuracy over Command Range	± 1.5dB for QPSK max - 10dB < P COMMAND < QPSK max , All modulations ± 2.0dB for Tx min< P COMMAND < QPSK max - 10dB, All modulations										
TX Spectrum Mask	Per applicable ETSI										
Output Power Muted (dBm)	<-50										
Frequency Accuracy	± 7 ppm maximum, includes temp variation and aging, ± 8 ppm for 8GHz TR311.32 & TR151.614										
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										

Sensitivity Threshold (dBm)				
Modulation Type	7MHz	14MHz	28MHz	56MHz
QPSK	-93	-90	-86	-83
16-QAM	-87	-83	-80	-77
32-QAM	-82	-79	-76	-73
64-QAM	-78	-75	-72	-69
128-QAM	-75	-72	-68	-65
256-QAM	-71	-68	-65	-62

GigE Ethernet Throughput Examples by Modulation and Bandwidth				
Bandwidth Modulation	7MHz	14MHz	28MHz	56MHz
QPSK	10 Mbps	19,5 Mbps	39 Mbps	60 Mbps
16-QAM	19,5 Mbps	39 Mbps	78 Mbps	160 Mbps
32-QAM	25 Mbps	50 Mbps	100 Mbps	200 Mbps
64-QAM	30 Mbps	61 Mbps	123 Mbps	250 Mbps
128-QAM	36 Mbps	72 Mbps	145 Mbps	300 Mbps
256-QAM	42 Mbps	84 Mbps	168 Mbps	336 Mbps

Payload InterfaceParameters

PDH	Line Rate	1 to 32 x E1/T1
	Interfaces	120 Ω balanced or 75 Ω unbalanced
	Standards Compliance	ITU-T G.703, G783
Fast Ethernet	Line Rate	Full-Duplex, scalable up to 150 Mbps
	Interfaces	2 x 100 Base-Tx
	Standards Compliance	IEEE 802.3
SDH	Line Rate	1 or 2 STM -1/ OC3 155.52 Mbps
	Interfaces	Optical Type Sc Single mode 1310nm, Electrical BNC
	Standards Compliance	Telcordia
Gigabit Ethernet	Line Rate	Full-Duplex, scalable up to 300 Mbps
	Interfaces	4 x 1000 Base-Tx
	Standards Compliance	IEEE 802.3

Mechanical /Enviromental

Dimensions	IDU: 19” standard rack (1U), 445 x 238.5 x 44.5mm ODU: D 240mm x 240mm x 92.5mm
Weight	IDU: 4 Kg; ODU: 3.9 Kg
Operating Temperature	IDU: -5° to +55°C; ODU: -33° to +55°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: <25 watts; ODU ≤38W
Cooling	Natural convection
Coaxial Interfaces	IDU TNC-type female, ODU N-type female
Antenna Interface	Standard Remec circular or rectangular WG interface, according to ODU RF operating frequency
Standards Compliance	ETSI ETS 300 019

Network Management &Configurations

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

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