HS++LINK/SM_SPX+

Long-Haul PtP Link

The HS++LINK/SM_SPX+ is the Long-Haul evolution of the HS++LINK/SM with a new generation of Outdoor Units with GaN or Power combining technology

HS++LINK/SM_SPX+ is the high power version of the HS++LINK/SM_SP+, designed to provide ultra-high transmit output power and fulfill the increasing demand for higher capacity, improved spectral efficiency and enhanced link reliability in modern wireless transport networks.

The system combines the advanced HS++LINK indoor modem architecture with a new generation of outdoor units, providing improved RF performance, higher modulation capabilities and extended deployment flexibility across licensed microwave bands.

Thanks to advanced adaptive modulation techniques, wide channel bandwidth support and optimized RF design, HS++LINK/SM_SPX+ enables high-capacity point-to-point microwave links suitable for telecom backhaul, broadcasting transport, private networks and critical infrastructure communications.

The renewed outdoor units introduce significant improvements in compactness, power efficiency and transmission performance, allowing operators to achieve longer link distances, higher throughput and reduced installation footprint.

Building on the reliability and flexibility of the HS++LINK platform, the system supports multiple network configurations including protected links, aggregated channels and scalable microwave transport solutions.

MAIN FEATURES

- Split-mount microwave radio architecture with high-performance indoor modem and new generation outdoor units
- High spectral efficiency transmission with advanced modulation schemes up to 2048QAM
- Adaptive Coding and Modulation (ACM) for optimal link availability and throughput
- Wide channel bandwidth support for high-capacity microwave transport links
- Designed for telecom backhaul, broadcast transport and private network applications
- Enhanced RF performance with improved receiver sensitivity and higher transmit power
- Compact and lightweight outdoor units for simplified installation and reduced tower load
- Optimized power consumption for energy-efficient network deployments
- Flexible network configurations, including protected links and channel aggregation
- Native Ethernet/IP transport for modern packet-based networks
- High reliability platform suitable for mission-critical communication infrastructures

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SPECIFICATIONS

SYSTEM ARCHITECTURE

Indoor Unit (IDU): Digital modem and network interface unit
Outdoor Unit (ODU): High-performance RF transceiver
IDU–ODU Interface: IF + control interface
Configuration: Split-mount microwave radio system
Typology: Native Ethernet with hybrid interfaces

IDU VERSIONS

Versions: HS++SDIDU-01 (single modem)
HS++SDIDU-02 (dual modem)
HS++SDIDU-0x-ADV (Dual Power Supply and GPIO)
HS++SDIDU-0x-CLC (STM-1 interface integrated)
Interface: 3 x 10/100/1000 ETH (RJ-45) for traffic and management access
4 x 1000BASE-X (SFP) for traffic, Management, estensions connection and IDU interconnection
Extensions: Up to 4 EMM cards over one SFP port
EMM-ASI Module (4 ASI ports each, Tx or Rx)
EMM-16E1 Module (16 E1/T1 each)

IDU PERFORMANCES

Modulations: QPSK up to 2048QAM
ACM: Hitless, Supported
Maximum capacity Depending on channel bandwidth
Channel bandwidths:
ETSI: 1.75 / 2 / 3.5 / 7 / 14 / 28 / 40 / 56 / 80 / 112 MHz
ANSI: 2.5 / 5 / 10 / 12 / 20 / 25 / 30 / 40 / 50 / 60 / 80 / 100 MHz
Link protection: 1+1 HSB, FD, SD, 2+0, 2+2, repeater
Co-channel: XPIC supported
Network interfaces: Gigabit Ethernet
Data Security: AES-128/256 Encryption

ETHERNET SWITCH

Number of ports: 3x 10/100/1000ETH (RJ-45)
2x WAN OverAir Interface
1x SFP Interface (shared with one WAN Interface)
1x MNG CPU
Max Frame size: Up to 2048/10240 bytes
MAC table: Up to 8192 addresses
VLAN: Up to 100 VLAN, IEEE 802.1q
QoS: Source Port, IEEE 802.1p, IPv4 TOS/DSCP, IPv6 TC, VLAN VID, SA/DA
PTP 1588: Fixed latency PTP 1588 (LPDV)

L1 Compression Efficiency:

64 byte Frames	21.5%
512 byte Frames	2.9%
1518 byte Frames	0.3 %

L1 Throughput 256QAM/56MHz Medium FEC :

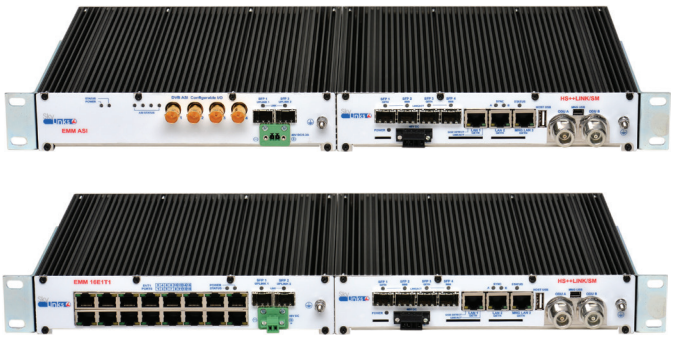
64 byte Frames	477.3 Mbps
512 byte Frames	387.8 Mbps
1518 byte Frames	375.0 Mbps

L1 CT Latency 256QAM/56MHz Medium FEC :

64 byte Frames	82.1 us
512 byte Frames	100.9 us
1518 byte Frames	141.3 us

ODU INTERFACE

Connector: N-type
Receive IF: 140 MHz ± 30 ppm
Transmit IF: 350 MHz ± 30 ppm
Telemetry: ASK 5.5 MHz Tx - 10 MHz Rx



CONTROL

Protocols: HTTPS, SNMP v.1/v.2c/v.3, TELNET, SSH
In-band mgmt: Via VLAN
OoB mgmt: 115 Kbps
Primary IP/ Secondary IP / RFI / USB

POWER SUPPLY

Input Voltage: -36 ÷ -60 V DC
Consumption: HS++SDIDU-01 < 23 W
HS++SDIDU-02 < 33 W
IDU and 1 x ODU < 58 W
IDU and 1 x ODU < 88 W

MECHANICAL

Chassis: 1/2 U Rack 19”
Dimensions: 220 x 44 x 240 mm (W x D x H)
Weight: 2.2 Kg

ENVIRONMENTAL

Operative Temp.: -5 ÷ 45°C
Relative humidity: 0 - 95% non condensing
Altitude: 4500 meters

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ODU PERFORMANCES

Frequency bands: L6, U6, 7, 8, 10, 10.5, 11, 13, 15, 18, 23 GHz
Modulation: QPSK,16,32,64,128,256,512,1024,2048 QAM
ATPC: Configurable
Muting: > 50 dB
Frequency stab.: ± 5 ppm
Antenna interface: Direct Mount or Remote Mount

MECHANICAL

Dimension: 276 x 241.5 x 123 mm
Weight: < 5 Kg

ENVIRONMENTAL

Operative Temp.: -40÷ 55°C
Relative humidity: 0 - 95% non condensing
Altitude: 4500 meters

Frequency Band	L6	U6	7	8	11	13	15	18	23
Operating Frequency [GHz]	5.85 - 6.425	6.425 - 7.125	7.125 - 7.875	8.000 - 8.500	10.700 - 11.700	12.750 - 13.250	14.500 - 15.500	17.7 - 19.7	21.2 - 23.6
Transmitter Power (dBm)									
QPSK	32	32	32	32	30	29	29	29	29
16, 32	32	32	32	32	29	28	28	27	27
64, 128 QAM	31.5	31.5	31.5	31.5	28	27	27	25	25
256 QAM	30.5	30.5	30.5	30.5	26.5	26	26	25.5	25.5
512 QAM	30.5	30.5	30.5	30.5	26.5	26	26	25.5	25.5
1024 QAM	30	30	30	30	25.5	25	25	25	25
2048 QAM	30	30	30	30	25.5	25	25	25	25
Rx Sensitivity (dBm) @10^{-6} BER									
QPSK (28/56 MHz)	-88/-85	-88/-85	-88/-85	-88/-85	-88/-85	-88/-85	-88/-85	-87/-84	-86/-83
32 QAM (28/56 MHz)	-78/-74	-78/-74	-78/-74	-78/-74	-78/-74	-78/-74	-78/-74	-77/-73	-76/-72
128 QAM (28/56 MHz)	-70/-66	-70/-66	-70/-66	-70/-66	-70/-66	-70/-66	-70/-66	-69/-66	-68/-65
256 QAM (28/56 MHz)	-67/-63	-67/-63	-67/-63	-67/-63	-67/-63	-67/-63	-67/-63	-64/-61	-63/-60
512 QAM (28/56 MHz)	-64/-60	-64/-60	-64/-60	-64/-60	-64/-60	-64/-60	-64/-60	-61/-57	-60/-56
1024 QAM (28/56 MHz)	-61/-57	-61/-57	-61/-57	-61/-57	-61/-57	-61/-57	-61/-57	-58/-54	-57/-53
2048 QAM (28/56 MHz)	-58/-54	-58/-54	-58/-54	-58/-54	-58/-54	-58/-54	-58/-54	-55/-50	-54/-49
Antenna Port Interface	WR137	WR112	WR112	WR112	WR75	WR75	WR62	WR42	WR42

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