DragonWave

HARMONY TRUNK

LONG HAUL MICROWAVE SYSTEM

DRAGONWAVE'S HARMONY TRUNK IS A LONG HAUL TRUNKING MICROWAVE SYSTEM THAT OFFERS A SMOOTH, SOFTWARE-DEFINABLE MIGRATION FROM LEGACY SDH NETWORKS TO HYBRID SDH/IP AND ALL-IP.

The rapid evolution occurring in mobile networks is driving the need for a new generation of point-to-point radio systems for trunk applications, offering a simple expansion and reduced footprint. Handling existing traffic, while meeting the increasingly data-centric demands of mobile networks, the trunk system can support both TDM and Ethernet traffic seamlessly.

The Harmony Trunk delivers native TDM and native IP transmission within the same hardware platform, providing multiple hybrid modes via a simple software selection.

The system's compact design and flexibility enables rapid and simple installation and fast network roll-out with simple civil works and an outage-less expansion/upgrade process. The competitive features of the Harmony Trunk strongly position this solution for backbone applications in addition to spur, access and aggregation layer communications.

Adaptive modulation from 4QAM to 512QAM with Low Density Parity Check (LDPC) coding ensures the highest throughput and efficiency. Alternated pattern and co-channel operation with XPIC equalization, provides double the spectral efficiency of the system. A power boost option allows operators to increase the Harmony Trunk's Tx power up to +35dBm.

As with all Harmony solutions, the Trunk offers multiple protection options including N+1 Radio Protection Switching (RPS) up to 15+1, which is implemented on the radio side using a single controller card. Hitless switching, with very early warning detection and multiple switching criteria, is implemented in response to propagation impairments such as multipath fading. Line side, (1+1) multiplex section protection can be implemented for the STM-1/OC-3 interface, while dual line interface with RSTP protection and line LAG is available for Gigabit Ethernet.

SOLUTION HIGHLIGHTS

- Smooth migration from legacy TDM to partial TDM/IP to full-IP via software setting on existing hardware
- Best in class footprint (16 channels in one rack)
- Double Terminal single-rack (up to 8xWG node in one rack)
- Full digital self-commissioning
- Wide band tunability for maintenance and spare log optimization
- Flexible modulation from 4QAM to 512QAM with LDPC coding
- XPIC support
- High Power and extra boost up to +35dBm (software upgradable)
- ATPC and RTPC/MTPC 20dB range
- Diversity available: FD, RX SD, TX+RX SD, Hybrid SD
- Baseband interface: STM-1/OC-3 electrical or optical
- Gigabit Ethernet interface supported with Nx RFcarriers mapping and adaptive load balancing (L1 byte-by-byte radio bonding)
- Carrier grade Ethernet Features

HARMONY TRUNK

PRODUCT SPECIFICATIONS

FREQUENCIES

4 to 8 GHz

11 GHz

13 GHz

MODULATION

Native SDH mode: 64QAM LDPC (40 MHz)
128QAM LDPC (28-30 MHz)

Throughput per channel (Mbps)

		28/30 MHz	40 MHz
Native IP mode	QPSK	24	34
	8QAM	47	66
	16QAM	71	97
	32QAM	95	129
	64QAM	119	160
	128QAM	142	192
	256QAM	166	222
	512QAM	190	254

EHTERNET FEATURES

VLAN 802.1q
RSTP 802.1w
ITU-T G.8261/Y1361 (SyncE)
IEEE1588 PTP (Transparent Mode)
802.1p/q, DSCP ToS Bits
8 Queues with DWRR and Strict Priority

ALARM REPORT

External alarms	16 station alarms 8 remote controls
Equipment alarms	general alarm with reset function severity Critical/Major/Minor/Warning

POWER CONSUMPTION

4 to 8GHz:	+35 dBm TX:	max 88W/carrier
	+30 dBm TX:	60W/carrier with XPIC, SD
11 GHz:	+32 dBm TX:	max 80W/carrier
	+30 dBm TX:	60W/carrier with XPIC, SD
13 GHz:	+29 dBm TX:	max 80W/carrier
	+27 dBm TX:	60W/carrier with XPIC, SD

MECHANICAL

Subrack	30 x 60 x 180 cm 30 x 60 x 220 cm
Temperature limits:	-5 to 55 °C
Humidity limits:	5% to 95% at 30 °C
Altitude:	Up to 4500m
Interfaces	STM-1/OC-3 electrical STM-1/OC-3 optical S-1.1 STM-1/OC-3 optical L-1.1 1000BaseT 1000BaseSX 1000BaseLX

RADIO PROTECTION SWITCHING

Single protection	N+1 ACAP/ACCP/CCDP up to N=15
Double protection	N+1/M+1 ACAP/ACCP/CCDP up to N+M=14
Method	Two errorless and hitless criteria with early warning detection

SYSTEM GAIN

TX output power	up to +35 dBm @ 4 to 8 GHz up to +32 dBm @ 11 GHz up to +30 dBm @ 13 GHz
RX Threshold BER10-6 (30/40 MHz)	
4 to 8 GHz:	-90/-89 dBm @ IP/4QAM -87/-86 dBm @ IP/8QAM -84/-83 dBm @ IP/16QAM -81/-80 dBm @ IP/32QAM -78/-76 dBm @ IP/64QAM -74/-72 dBm @ IP/128QAM -70/-68 dBm @ IP/256QAM -64/-62 dBm @ IP/512QAM -75.5 dBm @ SDH/40 MHz -72 dBm @ SDH/28-30 MHz
11 GHz:	0.5 dB worse for IP 1.0 dB worse for SDH
13 GHz:	1.5 dB worse for IP 2 dB worse for SDH

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