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, requires a trunk system that 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 interface, while dual line interface with RSTP protection and line LAG is available for Gigabit Ethernet.

SOLUTION HIGHLIGHTS

- Smooth migration from legacy SDH to partial SDH/IP to full-IP via software setting on existing hardware
- Best in class footprint (16 channels in one ETSI rack)
- Double Terminal single-rack (up to 8xWG node in a rack)
- Full digital self-commissioning
- Wide band tunability for maintenance 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
- 2x(1+1) HSBY co-channel supported within the same subrack
- Multi-baseband interface: STM-1 electrical, STM-1 optical , STM-4 and Gigabit Ethernet can co-exist in the same terminal
- Gigabit Ethernet interface supported with NxRFcarriers mapping and adaptive load balancing (L1 byte-by-byte radio bonding)
- Fully outdoor version available up to 7+1/8+0 for site cost optimization

FREQUENCIES

4 GHz
U4 GHz
5 GHz
L6 GHz
U6 GHz
L7 GHz
U7 GHz
W7 GHz
L8 GHz
8 GHz
11 GHz
13 GHz

MODULATION

Native SDH mode	64QAM LDPC (40MHz) 128QAM LDPC (28-30MHz)
Native IP mode	4QAM LDPC 8QAM LDPC 16QAM LDPC 32QAM LDPC 64QAM LDPC 128QAM LDPC 256QAM LDPC 512QAM LDPC

BB INTERFACE

Native SDH mode	STM-1 electrical STM-1 optical S-1.1 STM-1 optical L-1.1 STM-4 optical S-4.1 STM-4 optical L-4.1
Native IP mode	1000BaseT 1000BaseSX 1000BaseLX

AUX CHANNELS

Native SDH & Native IP modes	2x2Mbps wayside/STM-1 1xEOW 64kbps (E1 byte) up to 3x64kbps user chs (G.703/V.11/VF)

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:	+35dBm TX: max 88W/carrier +30dBm TX: 60W/carrier with ATPC
11GHz:	+32dBm TX: max 80W/carrier +30dBm TX: 60W/carrier with ATPC
13GHz:	+29dBm TX: max 80W/carrier +27dBm TX: 60W/carrier with ATPC

MECHANICAL

Subrack	30 cm x 60 cm x 180 cm
with 1+1DTI subrack	30 cm x 60 cm x 220 cm

ENVIRONMENTAL

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 +35dBm @ 4-to-8GHz up to +32dBm @ 11GHz up to +29dBm @ 13GHz	
RX Treshold BER10-6	4-to-8GHz:	-91.5/-90dBm @ IP/4QAM -87/-86dBm @ IP/8QAM -84/-83dBm @ IP/16QAM -80.5/-79.5dBm @ IP/32QAM -77.5/-76.5dBm @ IP/64QAM -74.5/-73.5dBm @ IP/128QAM -71.5/-70dBm @ IP/256QAM -68.5/-68dBm @ IP/512QAM -75.5 dBm @ SDH/40MHz -72dBm @ SDH/28-30MHz
	11GHz:	1dB worse than 4-to-8GHz
	13GHz:	2dB worse than 4-to-8GHz

DragonWave
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