CableOS® Reef

DENSE R-PHY SHELF

The Harmonic CableOS Reef Dense Remote PHY Shelf (RPS) is a 2 RU indoor platform for networks tasked with delivering and fully converging data, voice and video services over coax and defining a new category of Distributed Access Architecture (DAA).

Fundamentally changing the business dynamics of cable delivery, CableOS introduces cable operators to unprecedented scalability, agility and cost savings. The end-to-end solution supports centralized and distributed cable access architectures that enable the fast deployment of IP-based data, voice, video and legacy services —and sustainable capacity growth. All CableOS components work together to resolve space and power constraints in the headend and hub, eliminate dependence on hardware upgrade cycles, and provide multi-dimensional scaling. The Reef Remote PHY Shelf is a new addition to Harmonic's CableOS cable access solution.

Dense, compact and cost-effective, the Reef RPS houses up to nine modular linecards, each with two independent Remote PHY devices (RPD's) of 1DSx2US ports, for a total of 18 service groups. The Reef supports complete service convergence for an end-to-end service deployment, including data, video and legacy out-of-band services. All services can be combined and transmitted from a single RF port connecting directly to lasers, saving space, power and wiring, and greatly simplifying indoor facilities by eliminating splitting and combining while leveraging the existing outdoor plant elements.

Each linecard houses two independent RPD's based on Harmonic's industry leading Pebble RPD design, supporting a spectrum of up to 1218 MHz, with DOCSIS 3.1 OFDM in the downstream or OFDMA in the upstream. With the Reef's modular architecture, each Reef can be populated with one to nine linecards, each agnostic to the other and each independently hot-swappable. Each linecard can also support configurations of 1DS x 1US or 1DS x 2US ports and can even have up to 4 US ports associated with a single DS port.

For added reliability, the Reef supports a dual redundant power supply option, which can be AC or DC, while still delivering the maximum density of 9 linecards.

HIGHLIGHTS

- 2 RU modular chassis hosting up to 18 RPD's at total density of 9RPD/RU
- 9 linecards per chassis, each with 2 RPD's
- Passive chassis with full hot-swap design
- 2 redundant, load-sharing PSU's, with AC or DC powering options
- Low power consumption: 35W per RPD, 620W for whole chassis
- Configurable DS power and tilt
- Supports DOCSIS 3.1 DS
- Complies with CableLabs MHAv2 spec for R-PHY architecture
- PTP (IEEE 1588) synchronization
- Highly reliable mechanical design, based on the field-proven NSG9000 chassis

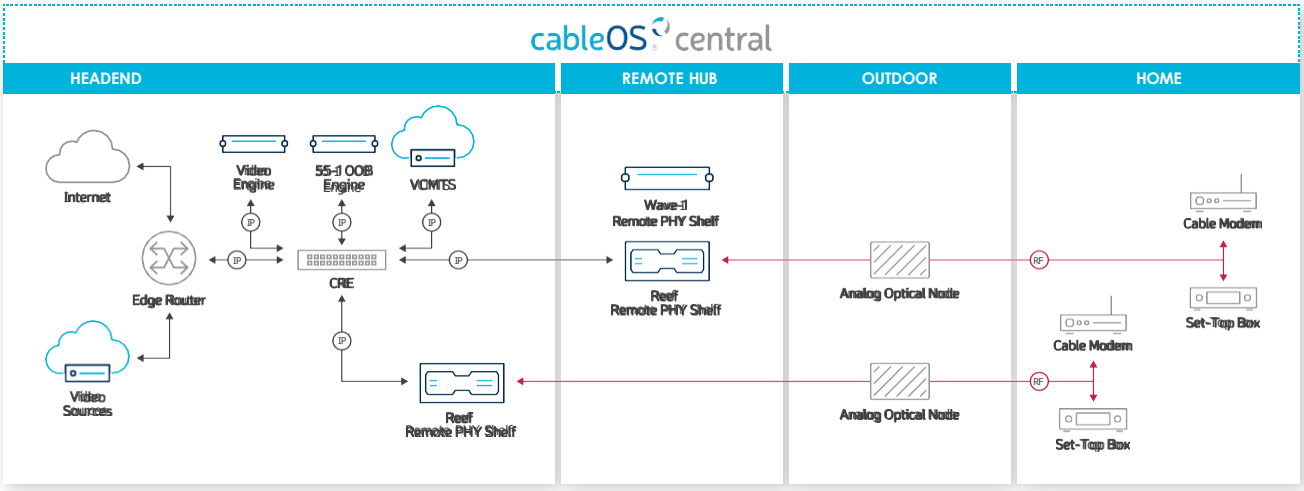
3150 SW 15th Street | Deerfield Beach, FL 33442 | 954.427.5711 | sales@amt.com

Call Us: 954.427.5711
Toll Free: 888.293.5856

CableOS® Reef DENSE R-PHY SHELF

World-Class Service and Support

With thousands of successful installations, Harmonic possesses unique, extensive knowledge of the cable edge environment and unsurpassed expertise in managing live production networks. Harmonic technical support and field engineers possess decades of experience in the cable industry and have the ability to go far beyond optimal deployment strategies and troubleshooting. The Harmonic Global Service and Support organization also understands the intricacies of every ancillary system touched by the edge network, from back-office video control planes to IP backbones to deep-fiber HFC nodes.



SPECIFICATIONS

PHYSICAL & ENVIRONMENTAL

Dimensions (HxWxD)	2 RU, 88.1 x 482.6 x 527 mm 3.47 x 19.0 x 20.75 in
Weight	Full chassis: 26.0 kg, 57.4 lbs Chassis w/Ctrl board: 12.0 kg, 26.3 lbs Power Supply: 1.8 kg, 3.9 lbs Line-card: 1.15 kg, 2.51 lbs
Chassis characteristics	Full hot-swap design 1x Controller-board slot 2x PSU slots 9x RF Line-card slots 4x Cooling fans 12x Indication LED's
Operating Temperature	0oC to 50oC, 32oF to 122oF
Power Input	AC: 90 to 230 VAC DC: -42 to -60 VDC
Power Consumption:	Full chassis: 620W Empty chassis + Ctrl board: 44W Single Line-card: 64W Single RPD: 32W

RPD SPECIFICATIONS

DS Channels	Any combination of up to 158 SC-QAMs or 6x 192MHz OFDM channels
US Channels	Any combination of up to 12 SC-QAMs or 2x 96MHz OFDMA channels
DS ports	1(2 per line-card)
US ports	2 (4 per line-card)
RF Performance	Complies with DOCSIS DRFI Annex D
DS RF Power level	53 dBmV (composite power)
DS frequency range	54 to 1,218 MHz
DS MER	45 dB
DS power flatness	2 dB
US input power	10 to 25 dBmV/Channel
US frequency range	5 to 204 MHz

INTERFACES

Chassis	1x RS232 serial, RJ45 connector
Line-card (Network interfaces)	1x QSFP+ port, with custom QSFP-to-2xSFP breakout cable, terminated by 2x 10G SFP+ transceivers
Line-card (RF interfaces)	2x DS RF, with MCX connector 4x US RF, with MCX connector Complemented by custom RF cabling harness with 6x MCX block connector

MANAGEMENT & CONTROL

Control and Monitoring	Each individual RPD is managed via CableOS. CLI for control and monitoring Monitoring via SNMP and streaming telemetry
Debug	RS232 serial interface may be used for troubleshooting and debug (requires privileged access)

TIMING

PTP Protocol	IEEE 1588 Slave mode

OOB & NETWORK MAINTENANCE

Video OOB	SCTE 55-1, SCTE 55-2
Pilot Generation	Over operational band
PNM	Per DOCSIS PHY 3.1
Additional capabilities	ALC pilots and alignment tones FCC and LTE leakage markers

NETWORKING & SECURITY

Converged Interconnect Network (CIN) ports	1x 10G interface per RPD
Authentication	802.1X
Control-plane Encryption	IPSEC

ORDERING INFORMATION

P/N	Description
NSG-9K-CS-40	Reef/NSG chassis, without front-panel
NSG-PS-AC-03	Power supply unit, AC
NSG-PS-DC-04	Power supply unit, DC
COS-REEF-FP-01	Reef front-panel, with integrated cooling fans
COS-REEF-CB-01	Reef LED controller board
COS-REEF-BLNK-LC	Blank panel for Reef linecard slot
COS-REEF-LC2X4-ST-01	Reef RF linecard, 2DSx4US ports, Std otput power
QSFP-2SFP-C1-150CM	QSFP to 2x SFP breakout cable, high temperature grade, 150 cm long
QSFP-2SFP-C1-200CM	QSFP to 2x SFP breakout cable, high temperature grade, 200 cm long
QSFP-2SFP-C1-250CM	QSFP to 2x SFP breakout cable, high temperature grade, 250 cm long
COS-REEF-UCH6-U-2M	UCH6 RF cabling harness, unterminated, 2 meters long
COS-REEF-UCH6-F-3M	UCH6 RF cabling harness, male F-type termination, 3 meters long
COS-REEF-UCH6-F-5M	UCH6 RF cabling harness, male F-type termination, 5 meters long
COS-REEF-UCH6-F-10M	UCH6 RF cabling harness, male F-type termination, 10 meters long
COS-REEF-UCH6-2DSFF25C	UCH6 RF cabling harness, no US cables, 2x 10" DS cables with female F-type termination