RD2322-RXD | RD2322 Remote PHY/MACPHY Device (RxD)

Remote PHY/MACPHY Device for Distributed Access Architectures enabling high-speed data, voice over IP and video solutions over hybrid fiber coaxial (HFC) cable networks

As the newest step in the continuing evolution towards a full Distributed Access Architecture (DAA), the RD2322 Remote PHY/MACPHY Device (RxD) supports operation as either an R-PHY Device (RPD) or an R-MACPHY Device (RMD), hence the designation as an RxD. As an RPD, the RD2322 provides improved headend density and power efficiency by moving the PHY layer functionality out of the headend/hub to a fiber optic node. As an RMD, the RD2322 provides a simple, all-in-one box distributed CMTS solution that moves both the MAC and PHY layer functions out of the headend/hub to a fiber optic node. Both solutions place the digital/RF interface (i.e., the PHY layer) at the optical/coax boundary. This strategic move offers many potential benefits, including increased bandwidth capacity, improved fiber efficiencies (wavelengths and distance), simplified plant operations with digital optics, decreased loads on headend facility space and power systems, and directional alignment with NFV/SDN/FTTx systems of the future.

Benefits of the Remote MACPHY solution include:
- Simplicity – All-in-one box – no CMTS Core necessary
- Deployment Flexibility – May be deployed without requiring deployment of a Grand Master Clock
- Low Latency – Benefits from the advantages of deploying Edge Computing
- Compatibility – Compatible with already deployed Video & OOB Aux Cores
- Virtualization – Makes use of Cloud Computing for Management Plane & Video
- Fog Computing – Blends the benefits of Cloud + Edge
- Power Savings – Lowest power solution in the headend

Specific benefits of the CommScope RD2322 RMD solution include:
- Leverages the field-proven and widely-deployed software of the CommScope E6000® CCAP Core, which is re-used in the MAC layer of the RD2322 RMD
- Leverages the platform and PHY layers of the RD1322 Remote PHY product
- Support for IPv4 and IPv6
- Provides the first step towards the Flexible MAC Architecture (FMA) as defined by CableLabs

CommScope provides the full suite of products required to deploy a remote PHY/MACPHY (RPD/RMD) architecture, including:
- the RD2322 RxD
- an RPD/RMD Manager application, specifically the [ServAssure® Domain Manager](#)
- a Video Aux Core, specifically the Video Unified Edge (VUE), with native support for SCTE 55-1 STBs
as well as complimentary eCore and vCore (virtualized Core) products for RPD operation as defined by the Distributed Access Architecture.

The PHY layer of the RD2322 RxD shares the advantages of the remote PHY device solution by generating RF signals in the fiber optic node rather than in the headend to provide a cost-effective tool for:
- Improving plant signal quality
- Improving fiber utilization and reach
- Improving service group density in the headend
- Reducing space and power consumption in the headend
- Simplifying plant maintenance by using digital optics
- Reducing transmission costs by leveraging data center economies of scale for Ethernet switches and optics

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Applications for DAA include:
- Plant upgrade for DOCSIS 3.1 support
- Hub consolidation
- Enabling Fiber Deep deployment without requiring headend expansion
- Utilizing DWDM optics for long-distance links
- Supporting data services in small hubs
- Simplifying logistics for changing US/DS split or top-end frequencies

CommScope RD2322 RxD may be deployed in any of the following CommScope Optical Node products (with an associated upgrade kit):
- NC4000 S Series
- NC4000 H Series (H3, H4, HG)
- OM4100 and OM4120

- Up to 2 Downstream (DS) x 2 Upstream (US) Service Groups; programmable DSxUS service group configuration
- DS/US RF Overlay
- 1.2 GHz DS upper edge
- Support for Annex A or Annex B
- Per downstream service group:
    - Annex A: 3 OFDM (up to 192 MHz each) with up to 72 Annex A SC-QAM, of which up to 32 may be DOCSIS
    - Up to 2 OFDM (up to 192 MHz each) with up to 96 Annex A SC-QAM, of which up to 32 may be DOCSIS
    - Annex B: 3 OFDM (up to 192 MHz each) with up to 96 Annex B SC-QAM, of which up to 48 may be DOCSIS
    - Up to 2 OFDM (up to 192 MHz each) with up to 128 Annex B SC-QAM, of which up to 48 may be DOCSIS
- 42/65/85/204 MHz US split
- Up to 2 x 95 MHz OFDMA channels per US service group
- Two 10 Gbps SFP+ Ethernet interfaces, configurable as individual Ethernet interfaces or as a LAG (LAG available with RMD operation only) (Two-10Gbps-SFP)
- Compatible with NC4000 (segmentable & fiber deep) and OM4100/OM4120 series optical nodes
- DOCSIS 2.0/3.0/3.1
- Broadcast/Narrowcast video
- Support for mixed annex video: Annex A video with Annex B DOCSIS; Annex C video with Annex B DOCSIS
- Support for OFDMA Upstream Data Profile (OUDP) scheduled grants for high split leakage detection and upstream measurement

Product Classification

Regional Availability	Asia	Australia/New Zealand	EMEA	Latin America	North America
Product Type	Remote PHY device (RPD)

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