The Remote PHY Device (RPD) is a key component in ARRIS's Distributed Access Architecture (DAA) portfolio, which can provide significant operational benefits—including increased bandwidth capacity, improved fiber efficiencies (wavelengths and distance), simplified plant operations with digital optics, and decreased loads on facility space and power systems—by extending the digital portion of the headend or hub to the node and placing the digital/RF interface at the optical/coax boundary. The RPD works in conjunction with the CCAP Core to extend the PHY layer from the CCAP into an Opti Max OM6000 fiber deep node. MAC processing, provisioning, and monitoring functions remain in the headend. The RPD provides full spectrum support for digital broadcast TV, VoD, and DOCSIS 3.0 and DOCSIS 3.1, as well as strategic alignment with future NFV/SDN/FTTx systems.

FEATURES

- Industry leading RF output capability of 64 dBmV at 1.2 GHz for maximum service group size
- DOCSIS® 3.1 compliant
- Seamless upgradeability from traditional optics to distributed access architectures (DAA)
- Enhances plant performance
- Maximizes fiber utilization and reach
- Improves headend density and power efficiency
- Simplifies plant maintenance via digital optics
- Reduces transmission costs

PRODUCT OVERVIEW

The Remote PHY Device (RPD) is a key component in ARRIS's Distributed Access Architecture (DAA) portfolio, which can provide significant operational benefits—including increased bandwidth capacity, improved fiber efficiencies (wavelengths and distance), simplified plant operations with digital optics, and decreased loads on facility space and power systems—by extending the digital portion of the headend or hub to the node and placing the digital/RF interface at the optical/coax boundary. The RPD works in conjunction with the CCAP Core to extend the PHY layer from the CCAP into an Opti Max OM6000 fiber deep node. MAC processing, provisioning, and monitoring functions remain in the headend. The RPD provides full spectrum support for digital broadcast TV, VoD, and DOCSIS 3.0 and DOCSIS 3.1, as well as strategic alignment with future NFV/SDN/FTTx systems.
RPD Module Operation
The RPD takes the place of traditional optics modules, such as downstream receivers and upstream transmitters, inside the node. The RPD module operates in the same manner as a traditional forward receiver, with a standard output level and tilt that can be attenuated by installing RF attenuator pads and equalizers, respectively, in the node’s RF module. The RPD module’s channel configuration is received from the CCAP Core in the headend; no manual configuration of the module is necessary after it is optically linked to the headend. ARRIS currently supports RPD modules for a 1x1 configuration with one downstream segment and one upstream segment. The OM6000 features pluggable and switchable segmentation modules, which operators can use to quickly reconfigure additional RPD configurations as they become available.

Network Flexibility
Today’s technologies are developing at a rapid pace, which is why it is more important than ever for products to be flexible enough to support next-generation technologies, such as DAA, without major forklift. Keeping these concerns in mind, the OM6000 node allows operators to transition seamlessly from traditional node-based analog/digital optical delivery to a DAA architecture by using the OM6000 chassis as a base and leveraging current network assets. When operators are ready to transition to DAA, the node’s modular design allows them to upgrade previously deployed OM6000 nodes to support R-PHY delivery by simply removing the node’s existing receivers and transmitters and replacing them with the appropriate RPD module. The ease and simplicity of transitioning the OM6000 to support DAA operation provides operators with several benefits, including a cost-effective roadmap for upgrading their current network assets and the ability to future-proof today’s purchases for long term use.

Flexible Powering Options
As fiber is driven deeper into the network and closer to the end user, the ability to utilize all RF outputs may not fit every node placement requirement. With this in mind, the OM6000’s modular RF base design allows operators to target and remove one or more of the node’s four RF modules to save power while operating the node. If necessary, operators can easily reintroduce these same modules to support future service group requirements.

Additionally, the OM6000 node features optional fully redundant powering via a second power supply module, which can be added to provide backup to the main power supply module. This redundancy is fully load sharing during normal operation. Each power supply has the ability to support the entire node in case the other fails.

Small Form-Factor Pluggable (SFPs)
ARRIS offers temperature-hardened, high-speed 10 Gbps SFP+ modules for the RPD application. These SFP modules are carefully chosen by our design teams to ensure end-to-end performance and stability. Available in CWDM and DWDM 40 ITU wavelengths, ARRIS SFP+ modules support lengths of up to 80 km. Rigorously tested, SFP+ modules are designed to withstand the increased thermal profile of the OM6000 while providing long-term performance in the field. The modules provide both design flexibility and the ability to maximize wavelength aggregation, making them the ideal choice to guarantee the RPD’s link performance across a wide range of outdoor temperatures.
**SPECIFICATIONS**

**RF Port Configuration (RPD)**
1 DS-5G x 1 US-5G

**RF Port Configuration (Node)**
1x4

**CIN Connectivity**
Dual 10 GbE SFP+
Path Redundancy (future)
Daisy Chain (future)

**Channel Capacity**

- **Downstream**: 1x192 MHz blocks, configurable as SC-QAM or OFDM
- **Upstream**: 12 SC-QAM
  - 12 SC-QAM and 1 OFDMA (96 MHz) or 2 OFDMA (future)
- **Set Top Box Out-of-Band (OOB)**: SCTE 55-1, SCTE 55-2 (future)
- **CW Tone Generation**: AGC, Alignment, Leakage Detection (up to 10)
- **High Speed Data**: DOCSIS 3.0, DOCSIS 3.1
- **Video**: Broadcast Video, Narrowcast Video

**Designed for Compliance to CableLabs® MHAv2 Standards**
- CM-SP-R-PHY Remote PHY Specification
- CM-SP-R-DEPI Remote Downstream External PHY Interface Specification
- CM-SP-R-UEPI Remote Upstream External PHY Interface Specification
- CM-SP-R-GCP Generic Control Plane Specification
- CM-SP-R-DTI Remote DOCSIS Timing Interface Specification
- CM-SP-R-OOB Remote PHY OSS Interface Specification
- CM-SP-R-OSSI Remote PHY OSS Interface Specification
- CM-SP-DRFI Appendix D

**RF**

- **Downstream Operational Bandwidth**: 54–1218 MHz/88–1218 MHz/108–1218 MHz
- **Upstream Operational Bandwidth**: 5–42 MHz/5–65 MHz/5–85 MHz/5–204 MHz
- **Output Linear Tilt**: 22 dB (54 to 1218 MHz)
- **RF Port Impedance**: 75 Ω
- **RF Return Loss**: 15 dB
- **Test Points**: –20 dB

**Node Power**

- **Output Level (Node)**: 58 dBmV @ 1218 MHz (actual)
  - 64 dBmV @ 1218 MHz (virtual)
- **Power (Node)**: < 160 W AC
- **AC Input Voltage**: 42–90 V AC (dual redundant power supplies)
- **Power Supply Spurious**: –60 dBc
- **Hum Modulation**: –60 dBc
- **AC Bypass Current**: 15 A

**Environmental/Mechanical**

- **Dimensions**: 23.6 in L x 11.0 in W x 12.2 in H
- **Weight**: < 60 lb
- **Operating Temperature (Node)**: –40°C to +60°C
- **Operating Humidity**: 5%–95% non-condensing

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**RELATED PRODUCTS**

- **E6000® CCAP Core**
- **CHP Max5000® Optics**
- **OM6000 Fiber Deep Node**
- **Headend and Field Passives**
- **1310/CWDM/DWDM SFP+**
- **Installation Services**

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**Customer Care**

Contact Customer Care for product information and sales:
- United States: 866-36-ARRIS
- International: +1-678-473-5656

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**Note:** Specifications are subject to change without notice.

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