The role of optical modules in BBU



Overview

In this article, ETU-LINK will introduce the base station under the communication triangle tower and the application of optical modules in the base station.

Key Takeaways

Optical modules on a BBU are critical components that connect the Baseband Unit to the Remote Radio Unit, transmitting high-speed data over optical fibers.

Function and Role

Optical modules in a BBU serve as the transmission interface between the BBU and RRU, carrying both bearer data and physical layer information using protocols like CPRI (Common Public Radio Interface) in 4G and eCPRI (Enhanced CPRI) in 5G networks.

The BB

U is typically located indoors in a temperature-controlled environment, while the RRU is mounted outdoors on telecom towers, making optical modules essential for reliable long-distance data transmission.

Types and Specifications4

G Networks: Optical modules range from 1. 25G SFP to 10G SFP+, with wavelengths around 850nm, operating temperatures of 0–75°C, and transmission distances up to 550m via multimode fiber. 5G Networks: Higher-speed modules like 25G SFP28 are used to support eCPRI interfaces, with multimode fiber transmission distances of 70–100m depending on fiber type (OM3 or OM4) and industrial temperature ranges of -40℃ to 85℃.

© 2026 METRA FIBER MARKET - All rights reserved

Industrial Requirements: Optical modules must withstand extreme outdoor temperatures, from -40℃ in cold regions to over 45℃ in hot regions, ensuring stable operation of RRUs. Common IssuesBBU optical modules can experience transmit/receive faults, which may trigger alarms and affect the RF unit operation. Such faults are often linked to power instability or RRU board resets, requiring troubleshooting of both the optical module and connected RRU components.

Summary

In essence, optical modules are the backbone of BBU-RRU communication, enabling high-speed, reliable data transfer in both 4G and 5G networks. Their selection depends on network speed requirements, fiber type, environmental conditions, and protocol compatibility, making them a critical component in modern mobile communication base stations.

Article Content

Do you know how optical modules are used in base stations?-ETU

In this article, ETU-LINK will introduce the base station under the communication triangle tower and the application of optical modules in the base station. The communication triangular tower is composed

Why Optical Modules For CPRI Applications Need To Support

Optical modules deployed in 4G wireless networks are mandated to support industrial temperature ranges. A brief analysis is provided below. Diagram of BBU-RRU Connection in 4G

Analysis of the application of optical modules in ...

The operation of base stations requires a large number of optical modules for interconnection between devices, and we will talk about the application of optical modules in mobile...

HISILICON Optical Modules in the field of communication base stations

The optical module converts electrical signals into optical signals at the transmitter side, transmits them to the remote wireless unit through optical fiber, and then converts the received

Application of optical modules in mobile communication base stations

The base station is divided into two parts: BBU and RRU. BBU is used for signal processing, RRU is used for signal transmission and reception, and the feeder is used to connect the antenna and the

how optical modules are used in base stations?

© 2026 METRA FIBER MARKET - All rights reserved

The transmission carriers connecting BBU and RRU devices are optical modules and optical fibers. In 2/3/4G networks, 10Gbps optical modules are generally enough for CPRI interfaces.

Understanding Baseband Units in Telecom | PDF | Radio | Modulation

Key functions of the BBU include providing CPRI ports to communicate with RRUs, processing uplink and downlink baseband signals, and managing the eNodeB through operation and

How is the optical module applied in the base station?

The transmission carriers connecting BBU and RRU devices are optical modules and optical fibers. In 2/3/4G networks, optical modules of 10Gbps are generally used for CPRI interfaces.

Understanding BBU, RRU, and AAU in telecom networks

Below is a breakdown of the BBU (Baseband Unit), RRU (Remote Radio Unit), and AAU (Active Antenna Unit)—their roles, placement, connectivity, and relevance in evolving technologies.

Applications of Optical Module PCBs in AI Data Centers

Optical modules serve as core components in high-speed optical communication links within AI data centers. Inside an optical module, the PCB serves as the electrical platform for

Huawei 5900 BBU and BTS Modules Explained

These components play a key role in the operation of mobile networks. □□ Huawei 5900 BBU: The Baseband Unit (BBU) is a central element that manages signal processing and communication

AI Data Centers Are Shifting the Bottleneck from Chips to Critical ...

The winners are unlikely to be only optical module vendors. ASIC vendors, optical component makers, fiber specialists, and test/assembly companies can all capture value if CPO

The Technological Evolution and Application Trends of Modern Optical ...

As one of the core components in the telecommunications industry, optical modules play a pivotal role in driving the continuous development and innovative application of fiber-optic

Top Optical Modules for POTN Deployment: SFP, QSFP, and OSFP

© 2026 METRA FIBER MARKET - All rights reserved

Understanding the Role of Optical Modules in POTN Optical modules—often called transceivers—serve as the physical bridge between electrical equipment and optical fiber. They

Telecom Cabinet Design for Reliable Mobile Networks

□□Behind every reliable mobile network is a well-engineered telecom cabinet designed to ensure continuous power, efficient cooling, and seamless data connectivity. □□ Upper Section: Power ...

The Future of Telecommunications: Next-Generation Coherent Optical Modules

Why are optical modules indispensable for the telecommunications networks of the future? The telecommunications industry continues to work on an infrastructure that is both faster and more

The Ultimate Guide to ZTE SFP Module Distance and Wavelength

A deep understanding of ZTE SFP module distance and wavelength specs is a prerequisite for designing reliable, scalable, and high-performance networks. From the cost-effective 850 nm SR

Baseband Unit | Glossary | EXFO

A baseband unit (BBU) is a unit that processes baseband in telecomm systems. A typical wireless telecom station consists of the baseband processing unit and the RF processing unit (remote radio

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

© 2026 METRA FIBER MARKET - All rights reserved

Contact Us

Continue your research online:

Website: https://metramarket.es
Technical inquiry: https://metramarket.es/contact.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

© 2026 METRA FIBER MARKET - All rights reserved