NK4000
Optical transmission platform
User's Manual

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Fig.1 NK4000 optical transmission platform

NK4000 is a broadband optical transmission platform, with strong universality, high mounting density, powerful function, flexible combination and varied communication management models. The rack, CMM unit and P series built-in power supply are the basis of this product. The 19inch (4U) standard rack has 16 universal slots and Fan cooling device; the CMM unit has LCD status display and operation keys. According to optical fiber network design requirements users can select the following application modules:

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- T series forward path optical transmitter module
- FR series forward path optical receiver module
- R series four-channel return path optical receiver module
- EDFA series plug-in EDFA module
- OSW series optical switch module
- AMP series pre RF amplifier module
- RFS series RF switch module

Insert the application modules into the 4U rack and put the rack into the cabinet, thus constitute a complete master or center room equipment.

4U rack

Function: The 4U rack is a 19inch (4RU) standard rack. It provides mechanical and electrical connection mounting platform for the application modules. Each 4U rack has 19 slots, among which P series built-in power module(P1, P2) and CMM unit have the fixed position, the other 16 slots (SLOT1～SLOT16) have the same function and shape, can be mounted the various application modules arbitrarily.

Feature: Open rack design and application modules cooling design make the equipment easy to dissipate heat so improve the reliability. The rear cooling fan can be replaced without machine halt, easy to repair and maintain.

More detailed technical information, please refer to the relevant sections of 4U rack.

P series built-in power supply

Function: The P series power supply will change the AC power or DC power into +24VDC, -5VDC, then supply to the application modules in the rack.

Feature: The P series power supply adopts the newest switching power supply techniques, coordinate with cooling design, ensured high reliability. Each rack configured 2 P series built-in power supplies.

Redundancy and backup: Users can specify the backup power supply when ordering.

More detailed technical information, please refer to the relevant sections of P series power supply.

T series forward path optical transmitter module

Function: The T series plug-in AM optical transmitter module will change the RF signal into 1310nm or 1550nm optical signal, then transmit to the ONU in Hybrid Fiber Coaxial (HFC) by single mode fiber.

Features:
- The SC/APC optical connector is on the front panel, easy to connect optical fiber and clean the optical connector.
- LED display the laser work status and RF work status.
- The equipment cooling design greatly improved the reliability.

NK4000-T-VOA is the 1550nm direct modulated optical transmitter module with inter-cut function.

More detailed technical information, please refer to the relevant sections of T and T-VOA series optical transmitter module.

FR series forward path optical receiver module

Function: Receive the forward path optical signal and change it into RF signal. The FR series optical receiver module is mainly used as optical relay transmission receiving device. It output RF signal to drive the forward path optical transmitter.

Features:
- There are dual-channel backup optical receiver module and single-channel optical receiver module (optional).
  Single-channel optical receiver module: NK4000-FR
  Dual-channel backup optical receiver module: NK4000-FRB
- The SC/APC optical connector is on the front panel, easy to connect with optical fiber and clean the optical connector.
- The RF output level is manual adjustable or automatic control, and has bi-color light to indicate its work status.
- The equipment cooling design greatly improved the reliability.

More detailed technical information, please refer to the relevant sections of FR series forward path optical receiver module.

R series four-channel return path optical receiver module

Function: Receive return path optical signal and change it into RF signal.

Features:

- There is four-channel independent return path optical receiver channel or mixed single-channel RF output channel (four-channel independent output or mixed output for users' option).
  Low level four-channel independent output: NK4000-R
  High level four-channel mixed output: NK4000-RB
- The SC/APC optical connector is on the front panel, easy to connect with optical fiber and clean the optical connector.
- Automatic compensation optical link loss or manual control output level (optional).
- The output level manual adjustable range is 10dB.
- The equipment cooling design greatly improved the reliability.

More detailed technical information, please refer to the relevant sections of R series four-channel return path optical receiver module.

EDFA series plug-in EDFA module

Function: Amplify the 1550nm optical signal, mainly used in long-distance optical transmission and drive users.

Features:

- The SC/APC optical connector is on the front panel, easy to connect with optical fiber and clean the optical connector.
- The equipment cooling design greatly improved the reliability.

More detailed technical information, please refer to the relevant sections of EDFA series plug-in EDFA module.

NKOSW series optical switch module

Function: Switch the optical signal.
Features:
- The SC/APC optical connector is on the front panel, easy to connect with optical fiber and clean the optical connector.
- Monitor and indicate the input optical signal power in a wide range.

More detailed technical information, please refer to the relevant sections of NKOSW series optical switch module.

AMP series pre RF amplifier module

Function: Amplify the RF signal to drive the optical transmitter device.
Features:
- The equipment cooling design greatly improved the reliability.

More detailed technical information, please refer to the relevant sections of AMP series pre RF amplifier module.

RFS series RF switch module

Function: Switch the RF signal.
Features:
- Monitor and indicate the input RF signal level in a wide range.

More detailed technical information, please refer to the relevant sections of RFS series RF switch module.

CMM status control and display unit

Function: Four panel buttons control the functions and status of all modules. LCD displays the detail work status of power and application modules, and display failure alarm.

Features:

- Automatic alarm when any module or fan has fault, LCD display the corresponding alarm.
- The operation button with clear function, easy to operate.
- LCD displays the work status of all devices in the rack.
- Panel buttons control the functions and status of all devices in the rack.
- Front panel has a local RS232 communication port, which is used to download and update the control software.
- Rear panel has Ethernet interface and RS485 communication port, which is used to manage the network.

More detailed technical information, please refer to the relevant sections of CMM status control and display unit.
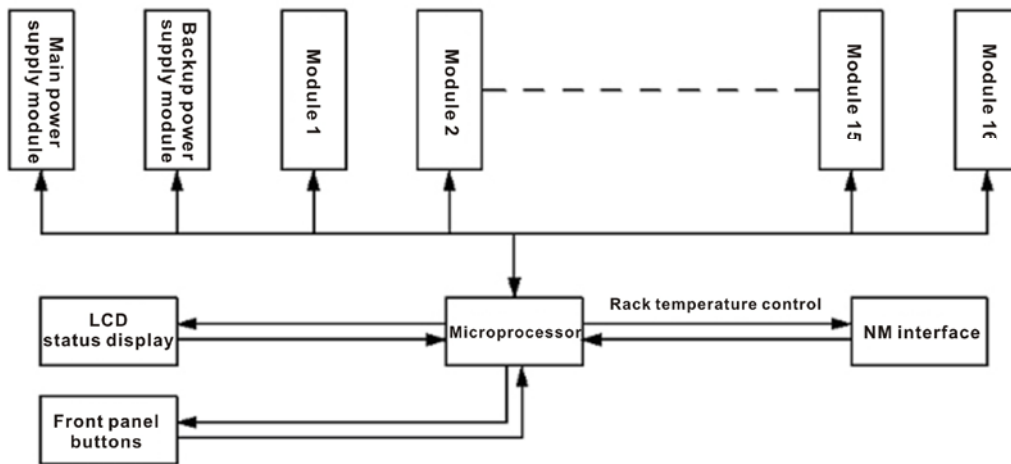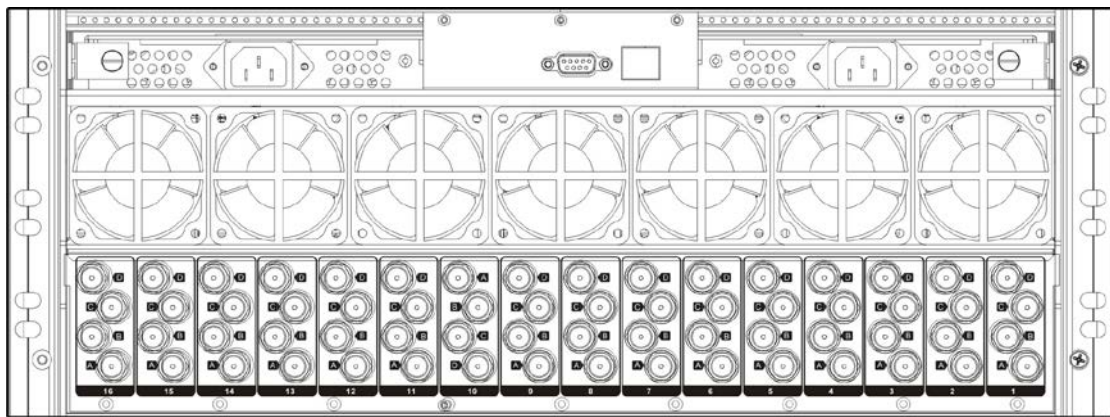
Block Diagram

Fig.2 The block diagram of NK4000 optical transmission platform

The composition of NK4000 optical transmission platform

Each rack configure two P series built-in power module(have the fixed positions P1, P2), the other 16 slots (SLOT1～SLOT16) have the same shape and electrical interface, used to install the application modules. As shown below:

The rear panel of NK4000 optical transmission platform

The composition of rack

To ensure high reliability work and save space, we recommend you install six racks at most in each standard (EIA) equipment cabinet. And there should be 1U space between each rack to keep ventilated.