# iEAC-16 Series

## Intelligent Ethernet Access Chassis

- Designed for high density Ethernet extender installations in central offices or enterprises
- Carrier Level Ethernet network over optical fiber or UTP copper lines for G.SHDSL.bis
- Manageable chassis: WEB GUI, CLI
- Provides Fiber-Optic network traffic connection and conversion
- Multi-pair copper bonding for double or quadruple bandwidth
- Enables link layer OAM on the networks and equipments
- Link Diagnostics with one push button
- Hot swappable for all cards, Redundant powers and Green FAN available

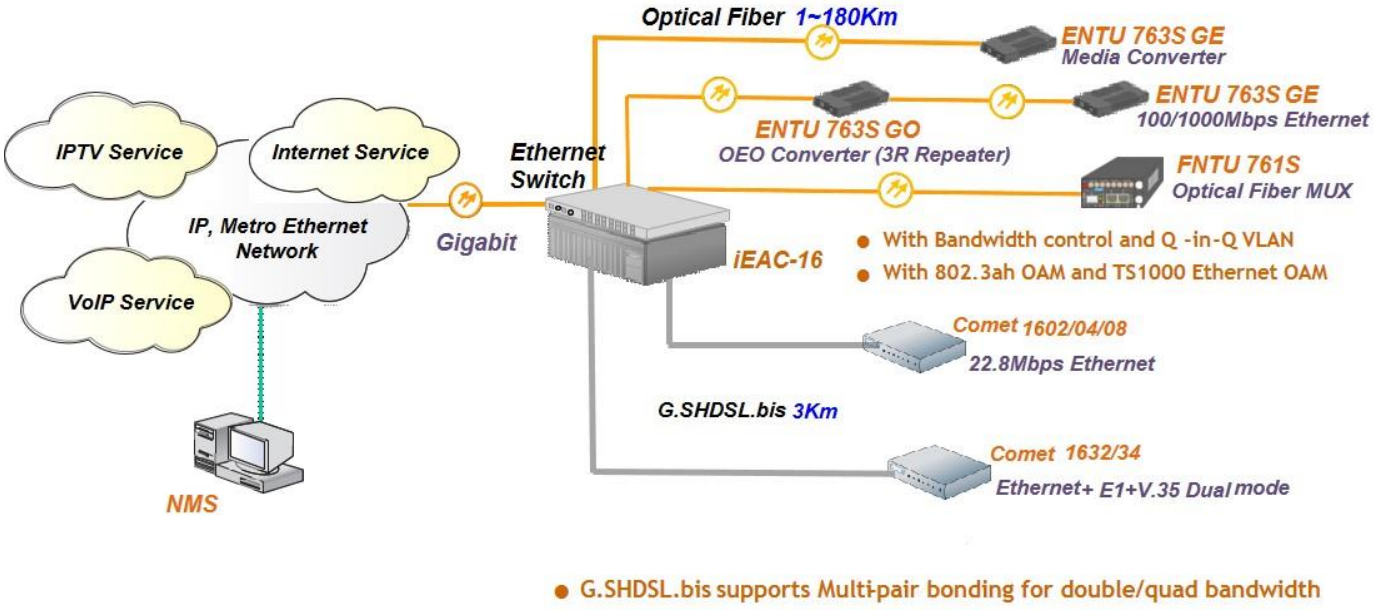
TAINET's new Intelligent Ethernet Access Chassis – iEAC-16, is a 2U high 19-inch chassis containing a controller MCU-16, redundant AC/DC power modules and 16 slots for various types of line cards. Including FNTU, ENTU and SNTU, all modules are hot swappable, managed through WEB GUI, CLI (Telnet and craft port). By using different types of line card, iEAC-16 is able to extend Fast/Gigabit Ethernet/ E1 traffics on 10/100/1000 Base-TX over 100/1000 Base-FX optical fiber and G.SHDSL.bis line with 2W/4W/8W.

TAINET's FNTU 761, ENTU 763 series with Gigabit Ethernet allows the operator to reach customer over fiber, while still providing a standard Ethernet copper connection, and being part of the operator's network. FNTU series support E1 multiplexer with Ethernet converter functions. ENTU series support IEEE 802.3ah EFM link layer OAM and TS 1000 OAM management features and enable the converter to act as a demarcation point between the operator and the customer.

The SNTU 764/765 series takes advantage of the latest ITU-T G.991.2 G.SHDSL.bis standard and enables the transport of traffics from Ethernet interface with speed 5.7/11.4/22.8Mbps over EFM bonded 2/4/8 wires G.SHDSL.bis link or Ethernet and E1 EFM/TDM dual bearer mode over 2/4 wire G.SHDSL.bis link as defined in IEEE 802.3ah EFM 2Base-TL. SNTU series line cards is able to interoperate with TAINET Comet 160x series at customer premises, it supports high-speed dedicated symmetrical data transmission and utilizes DSL bandwidth.

The various line cards enhance the flexibility and ability of iEAC-16 to provide EFM (Ethernet First Mile) service over fiber and copper at the same time and provide Ethernet in the Local Loop to reduce carrier expenses, since Ethernet ports are far less expensive than other options. TAINET's cost-effective, remotely-managed NTU series with iEAC-16 is an ideal solution for every carrier's Local Loop because it provides access regardless of the backbone technology, and cost saving which can be passed on by the carrier to consumers. It is an ideal product to provide high density Ethernet extender installation in central offices or enterprises.

# iEAC-16, Intelligent Ethernet Access Chassis




## System Feature

- 2U high, 19" chassis with 16 slots for line cards
- Real Time Clock and Reset button
- Power and Fan alarm LED indicators
- Dual Hot-Swappable AC/DC power for load sharing and redundancy
- Green Fan facility, turns ON and OFF with internal temperature
- Auto detection on available line cards and chassis
- All plug- in cards are hot swappable

## System cards

- iEAC-16: Intelligent Ethernet Access Chassis
- MCU-16: Controller of iEAC-16 with NMS/WEB agent
- iEAC-AC: AC Power Module
- iEAC-DC: DC Power Module
- iEAC-FAN: FAN Module

## Line cards

- FNTU 761C, 761CU:
  - Optical Fiber MUX, Gigabit Media Converter with 4 Balanced/ Unbalanced E1
- ENTU 763C/GO:
  - 1000Base-X SFP to 1000Base-X SFP OEO 3R Repeater
- ENTU 763C/GE:
  - 1000Base-X SFP to 10/100/1000Base-TX Ethernet
- SNTU 764C/2W, 764C/4W, 764C/8W:
  - G.shdsl.bis 2/4/8-wire RJ-45 to 10/100Base-TX Ethernet
- SNTU 765C/4W:
  - G.shdsl.bis 4-wire RJ-45 to 10/100Base-TX Ethernet and E1 interface
- SNTU 764FC/2W, 764FC/4W, 764FC/8W:
  - G.SHDSL.bis 2/4/8-wire RJ-45 to 10/100 Base-TX Ethernet

## Management & OAM Functions

- Management with user privilege
  - Web GUI
  - CLI: Telnet, RS-232 craft port
- Management IP can be set as static or dynamic IP
- Supports VLAN for 802.1Q tagging/un-tagging
- System logs and SNTP time synchronize to RTC
- Built-in non volatile memory to store line cards, remote units, PM data and chassis configurations
- DSL / Optical Link status on web management
- SNMP alarm trap
- Alarm LED indicator monitoring
- Firmware upgradable for system and Line cards

## LED Indicators

- MCU-16: MAJ/MIN ALM, FAN, FAN ON, PWR1, PWR2, ETH LNK/SPD
- FNTU 761C: PWR, LNK, TST, ALM, E1, LAN Tx/Rx, LNK/SPD
- ENTU 763C: PWR, CO, LNK, TST, RF, TP, LAN LNK/SPD
- SNTU 764C: PWR, CO, ALM, TST, L1~L4, ETH LNK/SPD
- SNTU 765C: ALM, TST, DSL1~2, E1, ETH LNK/SPD

## Power Requirement

- Hot Swappable Redundant Power Modules
  - iEAC-AC: AC Power Input: 100 ~ 240V, 50/60Hz (160W)
  - iEAC-DC: DC Power Input: -36 ~ -72V (160W)

## Dimension

- Line cards: 84(W) x 172(D) x 24(H) mm
- iEAC-16: 480(W) x 366(D) x 89(H) mm

## Operating Environment

- Operation Temperature: 0 ° C ~ 50 ° C
- Storage Temperature: -20 ° C ~ 70 ° C
- Humidity: 90%, non-condensing

# FNTU 761 Line Card

## Model

- FNTU 761C, Optical Fiber MUX, 2 GE + 4 E1 (RJ-48C)
- FNTU 761CU, Optical Fiber MUX, 2 GE + 4 E1 (BNC)

## Network Interface - Optical Ethernet

- Connector type: SFP-LC
- 1000Base-X SFP modules
- Support SFP DDM (Digital Diagnostic Monitoring)
  - Temperature, Voltage, Current, Tx Power, Rx Power
- For detailed wavelength and distance of SFP modules, please refer to SFP Transceivers datasheet

## Ethernet Interface

- Ethernet Connector: 2 x RJ-45, 10/100/1000 Base-Tx
- Support Ethernet cable diagnostics features
- Auto-MDI/MDIX detection, Full duplex / Half duplex support
- Auto-negotiation for speed and duplex
- Support 802.1d transparent bridge function
- Support 802.3x flow control, and 2K MAC learning address
- Bandwidth control and support 9K Jumbo frames
- Provide 802.1q Tag VLAN (including Q-in-Q),
- Support QoS by 802.1p priority queue control
- Support IGMP Snooping

## Timing Source Function

- Adaptive, Internal, Receive or DCR (Differential Clock Recovery)

## E1 interface

- Comply with G.703 Standard.
- Bit Rate: 2,048 Kbit / s ± 50 ppm.
- Frame Format: G.704 Framing with CRC or Unframe mode
- Line Code: HDB3
- Jitter performance: Meet ITU-T G.823.
- Line Impedance: 120 Ω (RJ-45 / RJ48C) or 75 Ω (BNC).
- DS0 Bypass On/Off

## System Function

- SAToP/CESoPSN technology, according to IETF RFC 4533, MPLS/FR Alliance, ITU-T and MEF8 1A standards PWE3
- Configuration via DIP switch, Telnet CLI, WEB GUI or SNMP
- TFTP/HTTP firmware upgrade
- RMON counters
- Front panel test button for easy loop healthy testing
- Reset button back to factory default
- Ethernet port mirror
- Support IEEE 802.3ah Link Layer OAM
  - Remote loopback test
  - Link Fault Reflection
  - Dying Gasp

## LED Indicators

- PWR, LNK, TST, ALM, E1, LAN TX, RX, LNK/SP

## Dimension

- FNTU 761C/CU: 87(W) x 172(D) x 48(H) mm

## Operating Environment

- Operation Temperature: 0 ° C ~ 50 ° C
- Storage Temperature: -20 ° C ~ 70 ° C
- Humidity: 90%, non-condensing

# ENTU 763 Line Card

## Model

- ENTU 763C/GO, Gigabit Ethernet NTU Repeater
- ENTU 763C/GE, Gigabit Ethernet NTU, Media Converter
- ENTU 763C/FE, Fast Ethernet NTU, Media Converter

## Network Interface - Optical Ethernet

- Connector type: SFP-LC
- ENTU 763C/FE: 100Base-FX SFP modules
- ENTU 763C/GE: 1000Base-X SFP modules
- ENTU 763C/GO: 1000Base-X SFP modules
- Support SFP DDM (Digital Diagnostic Monitoring)
  - Temperature, Voltage, Current, Tx Power, Rx Power
- For detailed wavelength and distance of SFP modules, please refer to SFP Transceivers datasheet

## User Interface

- ENTU 763C/FE: 10Base-T/100Base-Tx
- ENTU 763C/GE: 10Base-T/100Base-Tx/1000-BaseT
- ENTU 763C/GO: 1000Base-X SFP modules
- Connector: 1 x RJ-45
- Auto-MDI/MDIX detection
- Auto-negotiation for speed and duplex
- Full duplex / Half duplex support
- Support copper line cable diagnostics feature
- Complies with IEEE 802.1q Tag VLAN (including Q-in-Q)
- Ethernet bandwidth control and support Jumbo frame

## Management & OAM Functions

- Configuration via craft port VT-100 and WEB GUI
- Console: RJ45 connector (RS232C)
- HTTP firmware upgrade
- RMON counter
- Front panel test button for easy loop healthy testing
- Reset button back to factory default
- Support IEEE 802.3ah Link Layer OAM
  - Auto discovery
  - Link monitoring
  - Remote loopback test
  - Remote fault detection
    - Link Fault Reflection
    - Dying Gasp
    - Critical Event
- Support TS-1000 OAM
  - Loopback test
  - Reset remote device
  - Get remote device information
  - Remote port setting

## LED Indicators

- ENTU series:
  - PWR, LNK, CO, TST, TP, RF, LAN LNK/SPD

## Dimension

- ENTU 763C: 84(W) x 172(D) x 24(H) mm

## Operating Environment

- Operation Temperature: 0 ° C ~ 50 ° C
- Storage Temperature: -20 ° C ~ 70 ° C
- Humidity: 90%, non-condensing

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# SNTU 764/765 Line Card

## Model

- SNTU 764C/2W, 2-wire G.shdsl.bis, 1 FE
- SNTU 764C/4W, 4-wire G.shdsl.bis, 1 FE
- SNTU 764C/8W, 8-wire G.shdsl.bis, 1 FE
- SNTU 765C/4W, 4-wire G.shdsl.bis, 1 FE+ 1 E1 (RJ-48)
- Interoperable with stand alone Comet 16xx series

## Network Interface - G.SHDSL.bis

- Type: 2/4/8-wire
- Standard: ITU-T G.991.2, ETSI 101 524
- Bonding protocol: IEEE 802.3ah EFM 2Base-TL
- Line rate: n x 64Kbps, n=3~89 (2w), 6~178 (4w), 12~356 (8w)
- Connector: 1xRJ-45
- Line coding: TC-PAM 16/32/64/128
- Impedance: 135 Ω
- ITU K.21 compliant

## Ethernet L2 function

- Support 802.1d transparent bridge function
- Supporting Bridge filter function based on source MAC addresses
- Scalable per port bandwidth control (Step = 64K, up to 100M)
- Support 802.3x flow control, and 2K MAC learning address
- Ethernet packet length up to 1664 bytes
- Provide 802.1q VLAN tagging, support 802.1p QoS facility

## Timing Source Function

- Synchronous and Plesiochronous dual clock mode
- Internal clock, Received clock from DSL line

## E1 interface

- Comply with G.703 Standard.
- Bit Rate: 2,048 Kbit / s ± 50 ppm.
- Frame Format: Unstructured or Structured framing, field selectable.
- Line Code: High Density Bipolar of Order 3 (HDB3).
- Impedance: Normal 120 ohms ± 5% resistive, symmetrical pair.
- Jitter performance: Meet ITU-T G.823 requirements.
- Line Interface: 120 Ω (RJ-45 / RJ48C) balanced, 75 Ω (BNC).
- Physical Connection Type: Standard RJ-48C/RJ-45 jack (Balance) or BNC (Unbalance).
- Signal of input port was defined as above and can be modified by the characteristics of the interconnecting pair. The insertion loss of this pair at a frequency of 1024 kHz is in the range of 0 to 6 dB.
- Minimum Return Loss at the Input Port: 12 dB for 51 to 102 kHz, 18 dB for 102 to 2,048 kHz 14 dB for 2,048 to 3,072 kHz.

## LED Indicators

- SNTU 764C: PWR, CO, ALM, TST, L1~L4, ETH LNK/SPD
- SNTU 765C: ALM, TST, DSL1~2, E1, ETH LNK/SPD

## Dimension

- 84(W) x 172(D) x 24(H) mm

## Operating Environment

- Operation Temperature: 0 ° C ~ 50 ° C
- Storage Temperature: -20 ° C ~ 70 ° C
- Humidity: 90%, non-condensing