

# 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 G.SHDSL.bis/VDSL copper line
- Manageable chassis: SNMP/NMS, Web GUI, CLI
- Cascaded up to 8 chassis and managed by single IP
- 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 with three types of line cards including ENTU, SNTU and VNTU. All modules are hot swappable. Also, it can be cascaded up to 8 chassis (up to 256 devices are controlled in one IP management entity through the Cascade ETH port) and 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 traffic on 10/100/1000 Base-TX over 100/1000 Base-FX optical fiber, G.SHDSL.bis line with 2W/4W/8W, VDSL line, and coaxial cable.

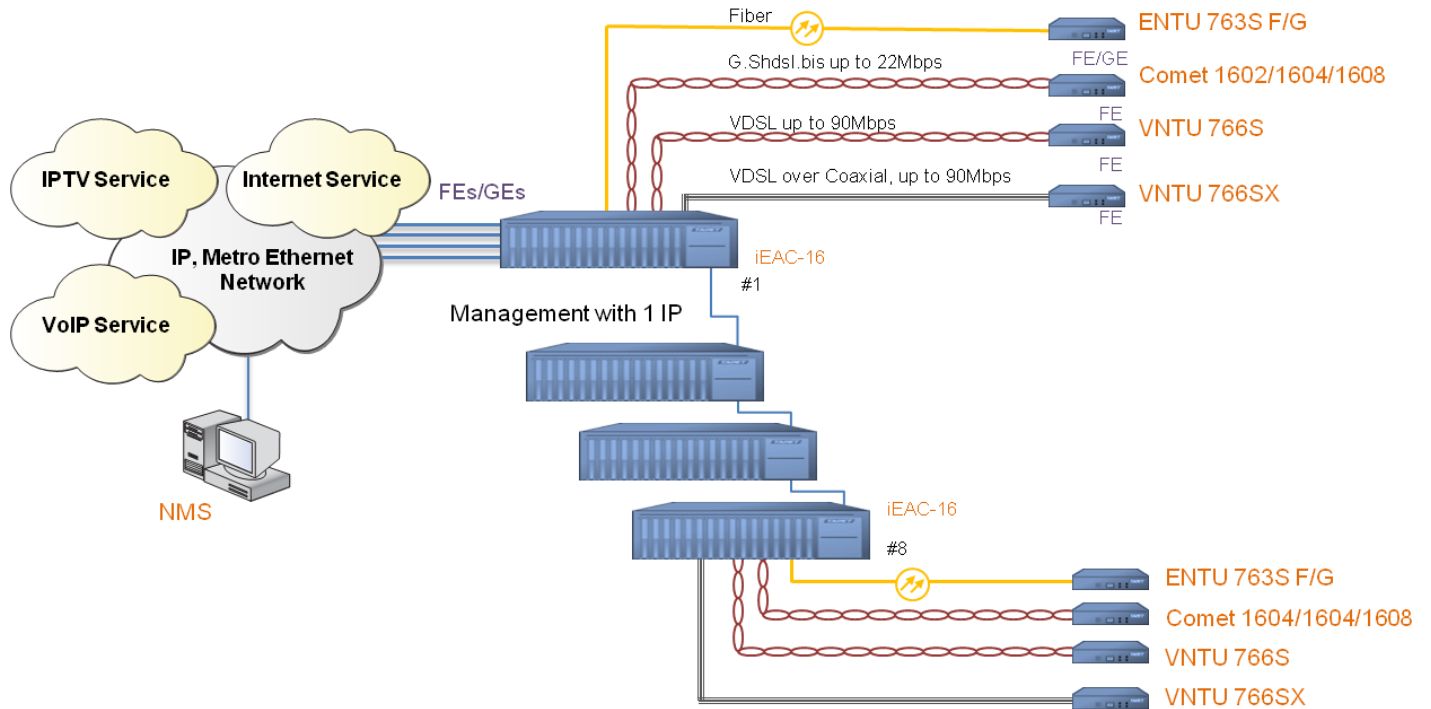
TAINET's ENTU 763 series with FE or GE allows the operator to reach customer over fiber, while still providing a standard Ethernet copper connection, and being part of the operator's network. ENTU series support IEEE 802.3ah EFM link layer OAM and TS 1000 OAM management features and enable the converter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

The SNTU 764 series takes advantage of the latest ITU-T G.991.2 G.SHDSL.bis standard and enables the transport of traffic from Ethernet interface with speed 5.7/11.4/22.8Mbps over EFM bonded 2/4/8 wires 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.

TAINET's VNTU series is the VDSL modem with Discrete Multi-Tone (DMT) Digital Subscriber Loop (DSL) digital modulator/demodulator processor unit for high speed Internet broadband access. VNTU series support all committee T1E1.4 and ITU-T SG15Q4 DSL discrete multi-tone based specification, as well as IEEE 802.3ah EFM 10Pass-TS.

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
- Up to 8 chassis can be cascaded and managed by single IP
- A digit rotary (0 master, 1~7 slave) to address 8 chassis
- Real Time Clock, Alarm Relay contact, ACO 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

- ENTU 763C/GE:
  - 1000Base-X SFP to 10/100/1000Base-TX RJ-45
- ENTU 763C/FE:
  - 100Base-FX SFP to 10/100Base-TX RJ-45
- SNTU 764C/2W:
  - G.shdsl.bis 2-wire RJ-45 to 10/100Base-TX RJ-45
- SNTU 764C/4W:
  - G.shdsl.bis 4-wire RJ-45 to 10/100Base-TX RJ-45
- SNTU 764C/8W:
  - G.shdsl.bis 8-wire RJ-45 to 10/100Base-TX RJ-45
- VNTU 766C:
  - VDSL RJ-11 to 10/100Base-TX RJ-45
- VNTU 766CX:
  - VDSL BNC to 10/100Base-TX RJ-45

### Management & OAM Functions

- Management with user privilege
  - SNMP V1/V2
  - Web GUI
  - CLI: Telnet, RS-232 craft port
- Up to 256 devices controlled under one IP
- 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
- Firmware upgradable for system and Line cards

### LED Indicators

- MCU-16: MAJ/MIN ALM, SLAVE, FAN, FAN ON, PWR1, PWR2, ETH LNK/SPD, USB
- ENTU: PWR, CO, LNK, TST, RF, TP, LAN LNK/SPD
- SNTU: PWR, CO, ALM, TST, L1~L4, ETH LNK/SPD
- VNTU: PWR, CO, LNK, TST, LAN 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 168(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

## ENTU 763 Series

### Model

- ENTU 763C/GE, line card type, Gigabit Ethernet NTU
- ENTU 763C/FE, line card type, Fast Ethernet NTU
- ENTU 763S/GE, stand alone, Gigabit Ethernet NTU
- ENTU 763S/FE, stand alone, Fast Ethernet NTU

### Network Interface - Optical Ethernet

- Connector type: SFP-LC
- ENTU 763S/FE: 100Base-FX SFP modules
- ENTU 763S/GE: 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 763S/FE, C/FE: 10Base-T/100Base-Tx
- ENTU 763S/GE, C/GE: 10Base-T/100Base-Tx/1000-BaseT
- 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

### Power Requirement

- AC/DC, DC/DC external power adapter (12V, 1A) for standalone

### Dimension

- ENTU 763S: 87(W) x 172(D) x 24(H) mm
- ENTU 763C: 84(W) x 168(D) x 24(H) mm

### Operating Environment

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

## SNTU 764 Series

### Model

- SNTU 764C/2W, line card type, G.shdsl.bis NTU, 2-wire, 1 FE
- SNTU 764C/4W, line card type, G.shdsl.bis NTU, 4-wire, 1 FE
- SNTU 764C/8W, line card type, G.shdsl.bis NTU, 8-wire, 1 FE
- Interoperability with stand alone Comet 160x series
  - Comet 1602, stand alone, 2-wire, 4 FE
  - Comet 1604, stand alone, 4-wire, 4 FE
  - Comet 1608, stand alone, 8-wire, 4 FE

### Network Interface - G.SHDSL.bis

- Type: 2, 4 or 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 W
- ITU K.21 compliant

### User Interface

- Ethernet type: 10/100 Base-T
- Connector: 1 x RJ-45
- Support 802.3x flow control
- Auto-MDI/MDIX detection, Full duplex / Half duplex support
- Auto-negotiation for speed and duplex

### Timing Source Function

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

### 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 1522\*/1664 bytes
- Provide 802.1q VLAN tagging, support 802.1p QoS facility

### Management

- Configuration via craft port VT-100, Telnet, WEB GUI and SNMP\*
- Multiple Web browsers supported: IE, Firefox, Chrome
- Support remote management
- Local and Remote loopback for diagnostic
- Support Performance Monitoring function
- Front panel test button for easily loop healthy testing
- Front panel reset to default button

### LED Indicators

- SNTU series:
  - PWR, CO, ALM, TST, L1~L4, ETH LNK/SPD
- Comet 160x series:
  - PWR, TST, ALM, CPE, DSL1~4, LAN1~4

### Power Requirement

- AC/DC, DC/DC external power adapter (12V, 1A) for Comet 160x

### Dimension

- SNTU 764C: 84(W) x 168(D) x 24(H) mm
- Comet 160x: 200(W) x 150(D) x 39(H) mm

### Operating Environment

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



## VNTU 766 Series

### Model

- VNTU 766C, line card type, VDSL NTU, 2-wire (RJ-11), 1 FE
- VNTU 766CX, line card type, VDSL NTU, Coaxial (BNC), 1 FE
- VNTU 766S, stand alone, VDSL NTU, 2-wire (RJ11), 1 FE
- VNTU 766SX, stand alone, VDSL NTU, Coaxial (BNC), 1 FE

### Network Interface - VDSL

- Connector: 1 x RJ-11 or 1 x BNC
- Type: 2 wire copper line or 1 coaxial cable
- Standard: T1E1.4 and ITU-T SG15Q4 VDSL
- Modulation: DMT (Discrete Multi-Tone)
- Trellis coding support for up to 1024 DMT bins
- Frequency: 12M (non-standard 17M)
- Band plan:
  - 998 ISDN: DS 100Mbps/ US 60Mbps
  - 997/symmetric ISDN: DS 85Mbps/ US 90Mbps
- Rate Limit, SNR, band plan can be configured
- ITU K.21 compliant

### User Interface

- Ethernet type: 10/100 Base-T
- Connector: 1 x RJ-45
- Support 802.3x flow control
- Auto-MDI/MDIX detection, Full duplex / Half duplex support
- Auto-negotiation for speed and duplex
- Support auto-polarity for 10Mbps

### Ethernet L2 function

- Support 802.1d transparent bridge function
- 2K MAC learning address, Support 802.3x flow control
- Provide In/Out port rate control
- Support Broadcast storm protection
- Class of Service support port based, MAC based, VID, VLAN priority, IPv4 ToS, TCP/UDP logical port and Multi-Field
- Support policy-based QoS
- Support 4-level priority queues per port
- Support 16 VLAN tables for port-based and tagged-based

### Management

- Configuration via craft port VT-100, and WEB GUI
- Console: RJ45 connector (RS232C)
- Support remote management
- Local and Remote loopback for diagnostic
- Support Performance Monitoring function
- Front panel test button for easy loop healthy testing
- Front panel reset to default button

### LED Indicators

- VNTU series:
  - PWR, TST, LNK, CO, DSL, LAN LNK, LAN SPD

### Power Requirement

- AC/DC, DC/DC external power adapter (12V, 1A) for standalone

### Dimension

- ENTU 766S/SX: 87(W) x 172(D) x 24(H) mm
- ENTU 763C/CX: 84(W) x 168(D) x 24(H) mm

### Operating Environment

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

### Note:

1. "\*" for future release
2. Features and specifications are subjects to change without prior notice.

## Ordering Information

Product Code	Part/Ordering No.	Description
<b>iEAC-16 Series</b>		
iEAC-16/@/!/&J^	000-115-0001L	19" chassis shelf for 16 xNTU 76xC line card, support 1 slot for MCU-16, 1 slot for FAN module, 2 slots for Power module <b>/Supplied Accessories: 1xPower card blank panel and 3xLine card blank panels</b>
<b>/@, Controller Module</b>		
MCU-16	000-115-0002L	Control Unit of iEAC-16 chassis
<b>/!, Power Module</b>		
If needed redundant capability for power supply, an additional iEAC-AC or iEAC-DC have to be ordered		
iEAC-AC/?	000-115-0003L	AC power module, 140W, 90~260VAC, <b>please specify the AC power cord type</b>
iEAC-DC	000-115-0004L	DC power module, 140W, -36 ~ -72VDC,
<b>/&amp;, FAN Module</b>		
iEAC-FAN	000-115-0005L	FAN Module of iEAC-16
<b>ENTU 763 Series</b>		
ENTU 763C/FE/#	000-108-1001L	Line Card type for iEAC-16, Ethernet Network Termination Unit, 100Base-FX (SFP module, LC connector) to 10/100Base-Tx (RJ45 connector), with in-band 802.3ah OAM, support DDM SFP
ENTU 763C/GE/@	000-108-1002L	Line Card type for iEAC-16, Ethernet Network Termination Unit, 1000Base-FX (SFP module, LC connector) to 10/100/1000Base-Tx (RJ45 connector), with in-band 802.3ah OAM, support DDM SFP
ENTU 763S/FE/AC/#	000-108-0010L-0001	Standalone type Ethernet Network Termination Unit, 100Base-FX (SFP module, LC connector) to 10/100Base-Tx (RJ45 connector), with in-band 802.3ah OAM, support DDM SFP <b>/Supplied Accessories: please specify AC power adapter type</b>
ENTU 763S/FE/DC/#	000-108-0010L-0002	Standalone type Ethernet Network Termination Unit, 100Base-FX (SFP module, LC connector) to 10/100/1000Base-Tx (RJ45 connector), with in-band 802.3ah OAM, support DDM SFP <b>/Supplied Accessories: please specify DC power adapter type</b>
ENTU 763S/GE/AC/@	000-108-0011L-0001	Standalone type Ethernet Network Termination Unit, 1000Base-FX (SFP module, LC connector) to 10/100/1000Base-Tx (RJ45 connector), with in-band 802.3ah OAM, support DDM SFP <b>/Supplied Accessories: please specify AC power adapter type</b>
ENTU 763S/GE/DC/@	000-108-0011L-0002	Standalone type Ethernet Network Termination Unit, 1000Base-FX (SFP module, LC connector) to 10/100/1000Base-Tx (RJ45 connector), with in-band 802.3ah OAM, support DDM SFP <b>/Supplied Accessories: please specify DC power adapter type</b>
<b>SNTU 764 Series</b>		
SNTU 764C/2W	000-108-1007L-0001	Line card type for iEAC-16, G.SHDSL.bis Network Termination Unit, support 2-wires G.SHDSL.bis to 10/100BaseT Fast Ethernet extension, support tone touch loopback test function <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection</b>
SNTU 764C/4W	000-108-1006L-0001	Line card type for iEAC-16, G.SHDSL.bis Network Termination Unit, support 4-wires G.SHDSL.bis to 10/100BaseT Fast Ethernet extension, support tone touch loopback test function <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection</b>
SNTU 764C/8W	000-108-1005L-0001	Line card type for iEAC-16, G.SHDSL.bis Network Termination Unit, support 8-wires G.SHDSL.bis to 10/100BaseT Fast Ethernet extension, support tone touch loopback test function <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection</b>
<b>VNTU 766 Series</b>		
VNTU 766C	000-108-1008L-0001	Line card type for iEAC-16, VDSL Network Termination Unit, support twisted copper pair RJ-11 connector to 10/100BaseT Fast Ethernet extension <b>/Supplied Accessories: 1xRJ11 cable and 1xPhoneBox for DSL connection</b>
VNTU 766CX	000-108-1009L	Line card type for iEAC-16, VDSL Network Termination Unit, coaxial cable BNC connector to 10/100BaseT Fast Ethernet extension
VNTU 766S/AC	000-108-0017L-0001	Standalone type VDSL Network Termination Unit, twisted copper pair RJ-11 connector to 10/100BaseT Fast Ethernet extension <b>/Supplied Accessories: 1xRJ11 cable and 1xPhoneBox for DSL connection, please specify AC power adapter type</b>
VNTU 766S/DC	000-108-0017L-0002	Standalone type VDSL Network Termination Unit, twisted copper pair RJ-11 connector to 10/100BaseT Fast Ethernet extension <b>/Supplied Accessories: 1xRJ11 cable and 1xPhoneBox for DSL connection, please specify DC power adapter type</b>
VNTU 766SX/AC	000-108-0018L-0001	Standalone type VDSL Network Termination Unit, coaxial cable BNC connector to 10/100BaseT Fast Ethernet extension <b>/Supplied Accessories: please specify AC power adapter type</b>
VNTU 766SX/DC	000-108-0018L-0002	Standalone type VDSL Network Termination Unit, coaxial cable BNC connector to 10/100BaseT Fast Ethernet extension <b>/Supplied Accessories: please specify DC power adapter type</b>
<b>Comet 160x Series</b>		
Comet 1602/AC /?2/^/>	000-117-0004L-0001	2-wire G.SHDSL.bis EFM bonded standalone unit, support 4 Ethernet (RJ45) interfaces, dual 12VDC power jacks for power redundancy <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection, please specify the 1st AC power adapter type</b>
Comet 1602/DC /?2/^/>	000-117-0004L-0002	2-wire G.SHDSL.bis EFM bonded standalone unit, support 4 Ethernet (RJ45) interfaces, dual 12VDC power jacks for power redundancy <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection, please specify the 1st DC power adapter type</b>
Comet 1604/AC /?2/^/>	000-117-0003L-0001	4-wire G.SHDSL.bis EFM bonded standalone unit, support 4 Ethernet (RJ45) interfaces, dual 12VDC power jacks for power redundancy <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection, please specify the 1st AC power adapter type</b>
Comet 1604/DC /?2/^/>	000-117-0003L-0002	4-wire G.SHDSL.bis EFM bonded standalone unit, support 4 Ethernet (RJ45) interfaces, dual 12VDC power jacks for power redundancy <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection, please specify the 1st DC power adapter type</b>
Comet 1608/AC /?2/^/>	000-117-0002L-0001	8-wire G.SHDSL.bis EFM bonded standalone unit, support 4 Ethernet (RJ45) interfaces, dual 12VDC power jacks for power redundancy <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection, please specify the 1st AC power adapter type</b>
Comet 1608/DC /?2/^/>	000-117-0002L-0002	8-wire G.SHDSL.bis EFM bonded standalone unit, support 4 Ethernet (RJ45) interfaces, dual 12VDC power jacks for power redundancy <b>/Supplied Accessories: 1xRJ45 cable and 1xPhoneBox for DSL connection, please specify the 1st DC power adapter type</b>