Modular Media Converter Center System

KC-3000 KC-1800
and
Slide-in 10/100 Media Converter Modules
Slide-in Gigabit Media Converter Modules

Operation Manual

DOC.040521-KC1800-KC3000
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WARNING:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference in which case the user will be required to correct the interference at his own expense.
NOTICE:
(1) The changes or modifications not expressively approved by the party responsible for compliance could void the user's authority to operate the equipment.
(2) Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

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This device complies with EMC directive of the European Community and meets or exceeds the following technical standard.
EN 55022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment. This device complies with CISPR Class A.
WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

CE NOTICE

Marking by the symbol CE indicates compliance of this equipment to the EMC directive of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards:
EN 55022: Limits and Methods of Measurement of Radio Interference characteristics of Information Technology Equipment.
EN 50082/1:Generic Immunity Standard -Part 1: Domestic Commercial and Light Industry.
EN 60555-2: Disturbances in supply systems caused by household appliances and similar electrical equipment - Part 2: Harmonics.

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1. Introduction

The Modular Converter System KC-3000 and KC-1800 are managed and unmanaged media converter racks that can host 16 slots and 18 slots respectively of network media converter modules. A wide range of media modules are available depending on your variety of network cabling environment. These optional media converter modules include UTP to multimode or single mode fiber cable for Ethernet, Fast Ethernet and Gigabit Ethernet networks.

The rack unit provides a centered power supply to the converter modules and serves as a converter center and wiring concentrator.

1.1 Features

Some of the key features include:

- Managed modular Media Converter Center Rack
- 19-inch rack-mountable 2U chassis
- Managed system accommodates up to 16 media converter modules
- Un-managed system accommodates up to 18 media converter modules
- Highly modularized chassis design with
  - modular media converter modules
  - modular SNMP module
  - modular system LED module
  - modular system power module
- Provides high availability and maintainability
- Visible system status and failure LED indication
- Audio buzzer for fan failure indication
- Supports in-band Telnet, SNMP and web-based management
- Supports out-of-band direct console management
- Management from anywhere and any platform using a web browser
- Easy-to-use point and click user interface
- Photographic quality interface to configure and monitor the system
- Supports in-band event SNMP trap report
- Photographic quality interface to configure and monitor the system
- TFTP Software Upgrade

1.2 Technical Specifications

System Model	KC-3000/1A	KC-1800/1A	KC-3000/1D	KC-1800/1D
19-inch rack mount	Yes	Yes	Yes	Yes
Number of slots	19	19	19	19
Management support	Managed	Un-managed	Managed	Un-managed
System LED module	Installed	Installed	Installed	Installed
Management module	Installed	No	Installed	No
Number of MC slots	16 slots	18 slots	16 slots	18 slots
Plug-in power module	Yes	Yes	Yes	Yes
Module type	AC power	AC power	DC power	DC power
Input voltage	100~240V	100~240V	48V	48V
Power supply rating	150W	150W	150W	150W
Cooling	Fan	Fan	Fan	Fan
Mechanical				
Chassis Height(2U)	88mm	88mm	88mm	88mm
Width	443mm	443mm	443mm	443mm
Depth	328mm	328mm	328mm	328mm
Weight (no MC modules)	8.2Kg	8.0Kg	7.7Kg	7.5Kg

Common Specifications	
Chassis withstand static load	60Kg
Vibration	
Vibration 1	X-Y-Z / 16.7Hz / 4mm / 1 hour
Vibration 2	X-Y-Z / 10-20Hz / 1.3mm / 20min
Environmental	
Operating temperature	-10~50°C
Storage temperature	-20~70°C
Operating humidity	10~90%RH
Emission standard	
Conducted emission	EN55022, CISPR 22
Radiated emission	EN55022, CISPR 22
Voltage harmonics	EN61000-3-2
Voltage fluctuation & flicker	EN61000-3-3
Susceptibility	
Electrostatic discharge immunity	EN61000-4-2, IEC61000-4-2
Radiated immunity	EN61000-4-3, IEC61000-4-3
EFT/Burst immunity	EN61000-4-4, IEC61000-4-4
Surge immunity	EN61000-4-5, IEC61000-4-5
Continuous wave voltage immunity	EN61000-4-6, IEC61000-4-6
Voltage DIP/Interrupt immunity	EN61000-4-11, IEC61000-4-11
Certifications	
FCC	Part 15, Class A
CE	EMC Class A, EN50081-1,EN50082-1

AC Power Chassis Module Specifications

Dimension	169.2mm x 301.8mm x 85.4mm
Installation method	Plug in from system rear panel
Maintenance	Modular design for easy maintenance
AC power switch	System power on/off switch
AC power receptacle	IEC320 type receptacle
Electric	
Input voltage rating	100 ~ 240VAC
Input voltage range	100 ~ 240VAC (+/-10%)
Input frequency	50 ~ 60Hz (+/-3%)
Input current	3A maximum
Input surge current	35A max. @115VAC cold start
Efficiency	76% @115VAC full load
Output power	150W
Over current protection	All output with short circuit protection
Safety	UL1950, CSA22.2 950, TUV EN60950
Insulation Resistance	>10M Ohm @DC500V
Dielectric withstands	1500VAC 10mA 1min.
Cooling	12V DC Fan

DC Power Chassis Module Specifications

Dimension	169.2mm x 301.8mm x 85.4mm
Installation method	Plug in from system rear panel
Maintenance	Modular design for easy maintenance
Input power switch	System power on/off switch
Input power receptacle	Terminal connector (screw type)
Electric	
Input voltage rating	48VDC
Input voltage range	36 ~76VDC
Efficiency	79% full load
Output power	150W
Protection	Over voltage protection
	Over current protection
	Over temperature protection (auto-restart)
Safety	UL1950, TUV EN60950
Insulation Resistance	>10M Ohm @DC500V
Dielectric withstands	1500VDC 1min.
Cooling	12V DC Fan

System LED Module

Dimension	148.7mm x 22mm x 86.4mm
Slot position	Slot 1
Installation method	Plug in from system front panel
Mis-insertion protection	Yes
System interface	DIN type connector
System power status	Green LED indication
System fan failure status	Red LED indication
Buzzer	Beep warning for fan failure event
Buzzer reset switch	Reset beep warning

Management Module Specifications

Dimension	156.5mm x 44.4mm x 86.4mm
Slot position	Slot 2 and 3
Installation method	Plug in from system front panel
Mis-insertion protection	Yes
CPU	RISC-based ARM7
RAM size	1M bytes
Flash size	512K bytes
System interface	
Connector	DIN type connector
Console interface	
Interface	RS-232 DTE
Connector	9-pin male D-SUB connector
Baud rate	38400, N, 8, 1, 0
Flow control	Disabled
In-band interface	
Interface	10/100M LAN port
Connector	Shielded RJ-45 MDI
Standard	IEEE 802.3 10BASE-T/100BASE-TX
Auto-negotiation	Support
LED Indicators	
Power	Green LED, module power status
CPU Init.	Green LED, CPU initialization
RS232 RX	Green LED, Console RS-232 Rx activities
TP Link/Act.	Green LED, LAN port link and activities status

Management Specifications

Management interface

Telnet	Via direct RS-232 console connection
Telnet	Via TCP/IP Telnet software
SNMP agent	Via TCP/IP SNMP manager software
HTTP server	Via browser software

Protocols

IPv4	IP version4	RFC791
TCP	Transmission Control Protocol	RFC793
UDP	User Datagram Protocol	RFC768
ICMP	Internet Control Message Protocol	RFC792
SNMP	SNMP agent v1	RFC1157
MIB-II	Standard MIB	RFC1213
TFTP	Trivial File Transfer Protocol	RFC1350
TELNET	Telnet protocol	RFC854
HTTP	HTTP server for web management	RFC1945

Management Objects

Password for access control	Set and monitor
System status : CPU, memory, flash, software	Monitor
System fan status	Monitor
IP address of the system	Set and monitor
Subnet mask of the system	Set and monitor
Default gateway IP address	Set and monitor
SNMP name information	Set and monitor
SNMP location information	Set and monitor
SNMP contact information	Set and monitor
SNMP community names (up to 4)	Set and monitor
SNMP community access right (up to 4)	Set and monitor
SNMP trap host IP address (up to 3)	Set and monitor
Slot status : MC module installed or not	Monitor
MC Module status : media type, speed, duplex	Monitor
MC Module link status of two ports	Monitor

SNMP Traps

Cold Start	System is powered on and completes initialization
Authentication failure	SNMP community authentication failure
Power On	The system is powered on.
Fan failure	System fan failure occurs.
Fan failure recovery	System fan recovery from failure
Slot # Port A link	Slot # MC module Port A link down or up
Slot # Port B link	Slot # MC module Port B link down or up

Update Firmware Via TFTP protocol

Remote boot system

2. Installation

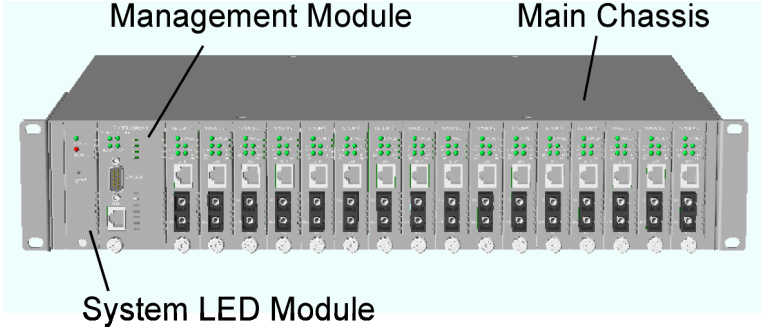
2.1 Unpacking

The product package contains:

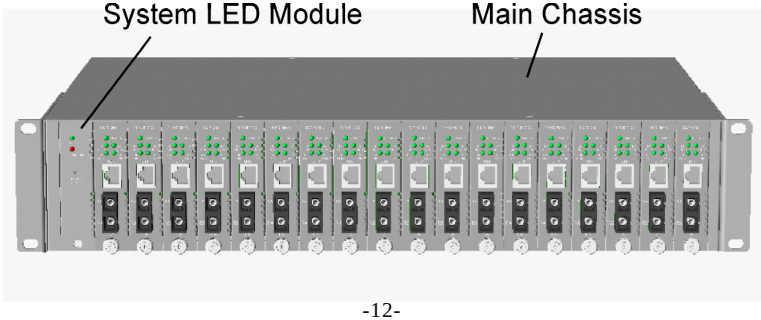
- The system unit
- One power cord
- One 19-inch rack mounting kit
- Operation Manual

2.2 System Units

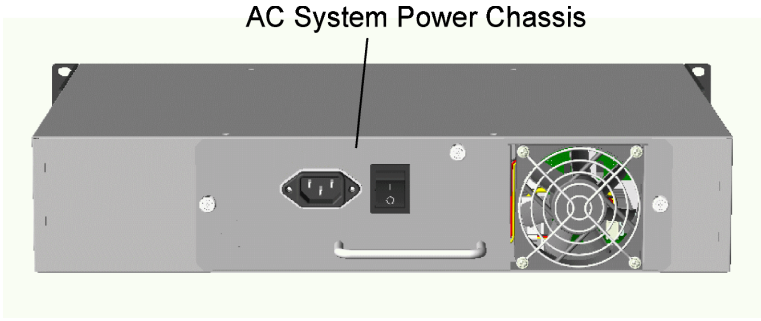
The figure below illustrates managed model **KC-3000** series.



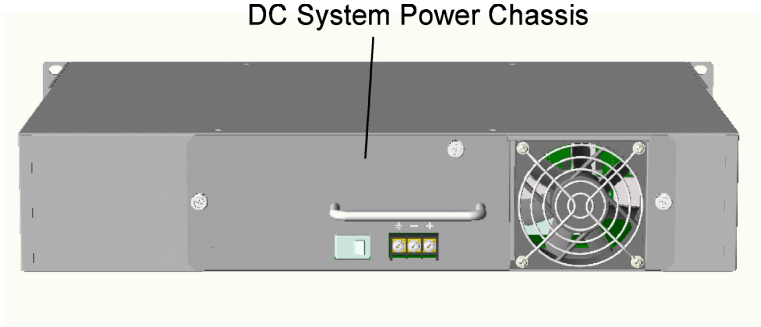
The figure below illustrates un-managed model KC-1800 series.



The following figure shows the model equipped with AC power chassis.



The following figure shows the model equipped with DC power chassis.



Main Chassis : provides insertion slots on front panel for system LED module, CPU management module, and optional add-on media converter modules. It also provides a chassis slot on rear for mounting system power chassis.

System LED Module : provides system power and fan status indicators together with one alarm buzzer for power or fan failure.

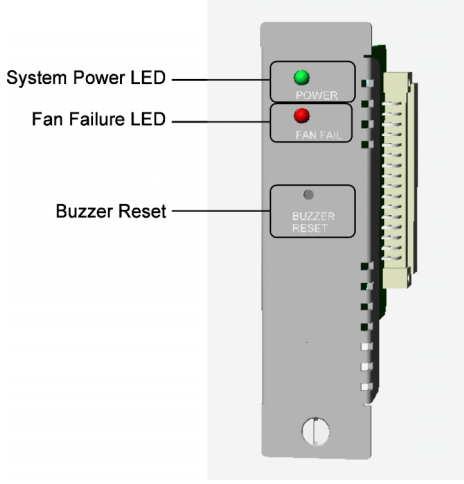
Management Module : serves as a management agent to monitor system status and add-on converter modules for in-band and out-of-band management requests.

AC System Power Chassis : provides centered power supply and cooling fan for whole system unit. It can receive and auto-detect commercial AC power in full voltage range from 90VAC to 240VAC.

DC System Power Chassis : provides centered power supply and cooling fan for whole system unit. It can receive DC 48V input.

2.2.1 System LED Module

System LED module features the following functions:



System Power Indicator (Green LED)
On : System power in normal condition
Off : System power failure

Fan Failure Indicator (Red LED)
On : Cooling fan in normal condition
Off : Cooling fan failure

Alarm Buzzer (Beep)
Beep : when system power failure or fan failure occur
Silent : no failure occurs

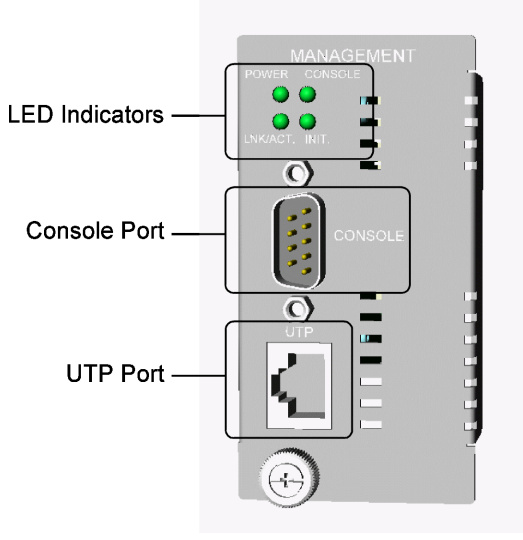
Buzzer Reset (Push button switch)
Shut down beep sound of alarm buzzer.

2.2.2 Management Module

The system unit comes with one pre-installed Management module. The module facilitates the following functions:

- Direct out-of-band management via RS-232 console port
- SNMP agent to serve in-band management via SNMP protocol
- Telnet console in-band management via TCP/IP protocol
- HTTP host to serve web-based in-band management

See figure below for major components on the panel:



Console Port

This port is a 9-pin male D-sub connector. It serves as an RS-232 DTE port. Refer to Chapter xx for the console operation. The pin definitions are:

Pin2	RXD
Pin 3	TXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR

UTP Port

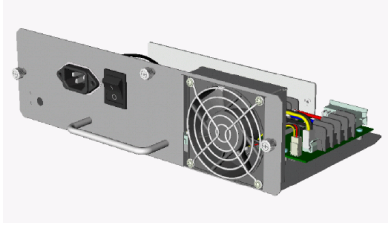
This is an auto-negotiation 10/100BASE-TX LAN port and provides a shielded RJ-45 jack with MDI definition. This port must connect to your TCP/IP network for all in-band management operations.

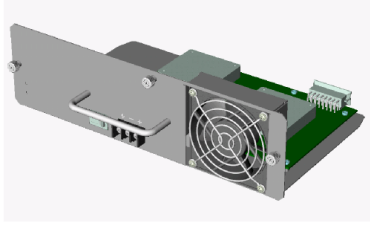
LED Indicators

LED	Color	States	Interpretation
POWER	Green	On	SNMP module is powered on
CONSOLE	Green	On	Tx activities of console port
LNK/ACT.	Green	On	UTP port link is active
	Green	Blink	Tx/Rx activities of UTP port
INIT	Green	On	Management module in initialization

2.2.3 System Power Chassis

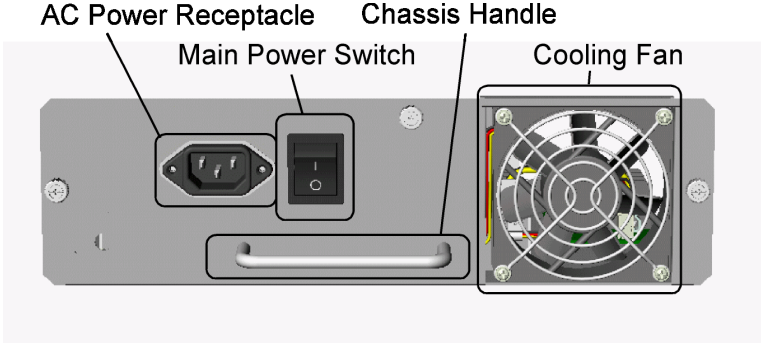
The system power supply is assembled in a plug-in chassis module with cooling fan. Two types of system power chassis are illustrated as follows:





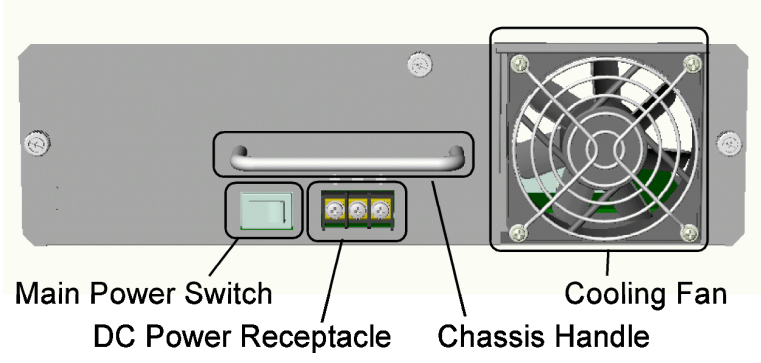
AC System Power Chassis Specifications

AC power switch	System power on/off switch
AC power receptacle	IEC320 type receptacle
Input voltage rating	100~240VAC
Input voltage range	100~240VAC (+/-10%)
Input frequency	50~60Hz (+/-3%)
Input current	3A maximum
Output power	150W
AC power cord	IEC320 type power cord

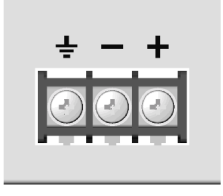


DC System Power Chassis Specifications

Input power switch	System power on/off switch
Input power receptacle	Terminal connector (screw type)
Input voltage rating	48VDC
Input voltage range	36~75VDC
Output power	150W



The connection definition of the DC power receptacle is:



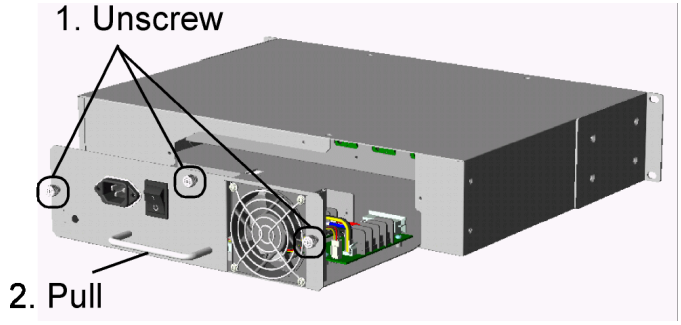
Removal of System Power Chassis

The system power chassis is pre-installed in the system unit when system unit is shipped from factory. The chassis is designed for easy uninstallation from system unit in case of any inspection purpose. However, note that this removal only can be performed by a well-trained technical person.

For safety reason before removing the power chassis, make sure:

- The system power switch is turned off.
- The power cord is disconnected from the power chassis.

To remove the chassis, unscrew three chassis screws until they are released from system chassis, hold the handle and pull the chassis out from the system chassis smoothly. See the following example figure:

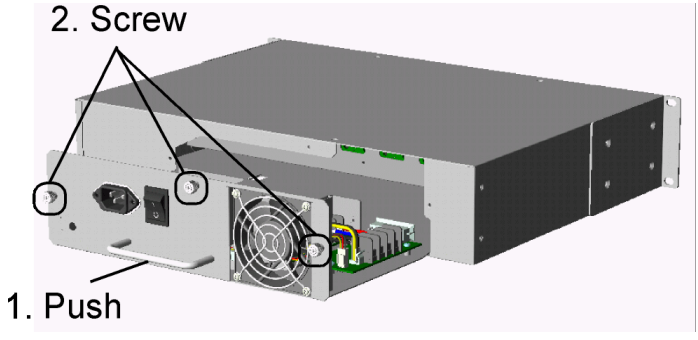


Insertion of System Power Chassis

Before inserting the power chassis into system unit, make sure:

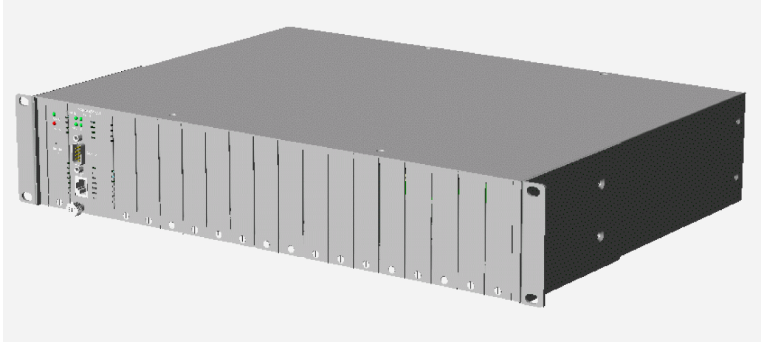
- The system power switch is turned off.
- The power cord is disconnected from the power chassis.

To insert the power chassis, hold the handle and push it into system unit until it is seated in system chassis properly. Screw the chassis securely in the system unit. See figure below:



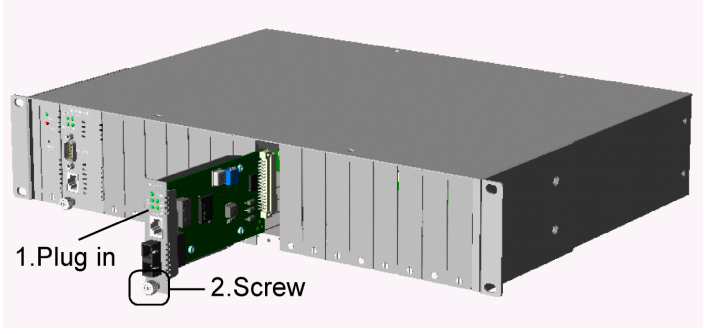
2.2.4 Media Converter Slots

The KC-3000 managed unit provides sixteen module slots for installing optional slide-in media converter modules. And KC-18000 un-managed unit provides eighteen media converter module slots.

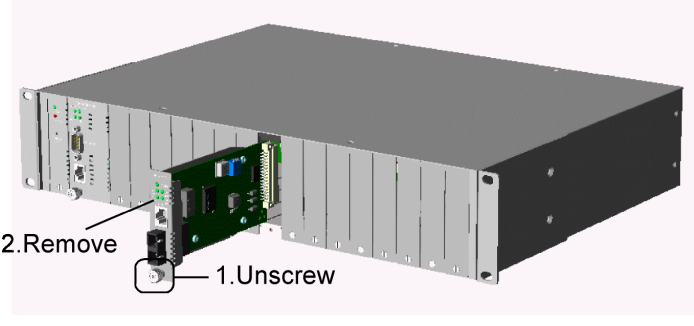


A converter module can be inserted into an available slot or removed from a slot anytime even when system unit is powered on. This hot-plug design keeps all exiting connections on the other slots running with no influence.

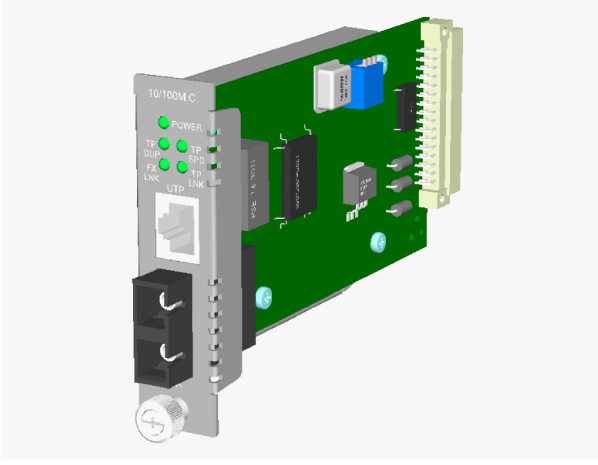
To insert a converter module into a slot, remove slot cover first and insert the module into slot slowly until it is seated in slot properly. Screw it onto system unit securely before making any cable connection.



To remove a converter module from slot, disconnect all cable connections on the module first and unscrew the module until it is released from system unit. Hold the screw and pull module slowly out from the slot.



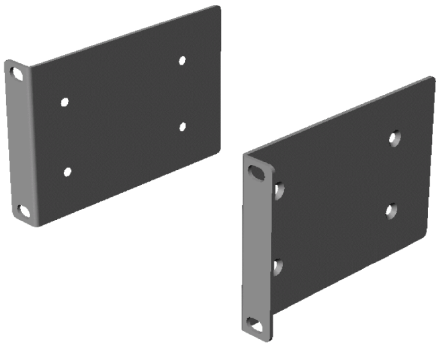
The following figure illustrates an example of a media converter module:



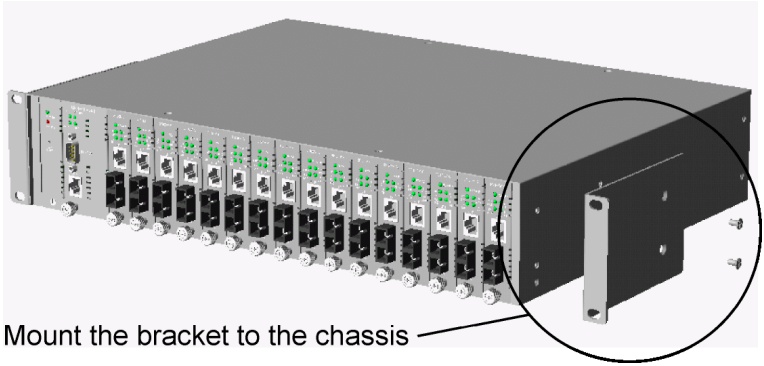
For more information about the converter slide-in module, refer to Chapter 7.

2.3 Rack Mounting

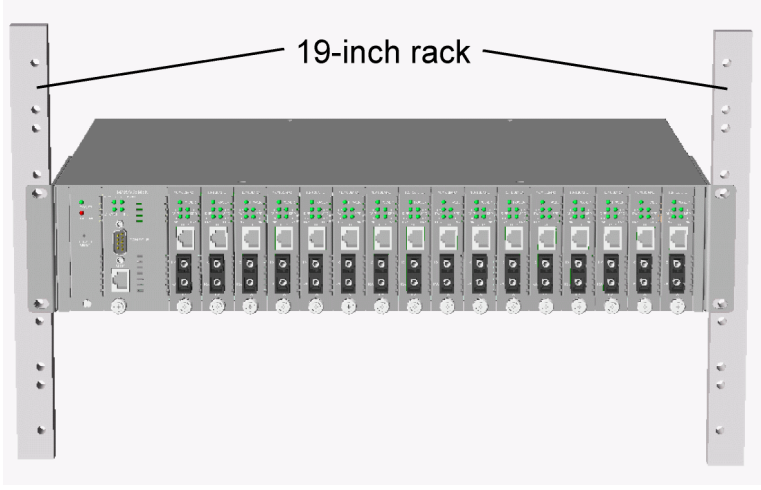
One rack mounting kit is supplied in the product package. It includes two brackets and bracket screws for installing the system unit into a 19-inch rack.



Mount both brackets onto the system unit as shown below:



Install the system unit into a 19-inch rack as shown below:



3. Network Management

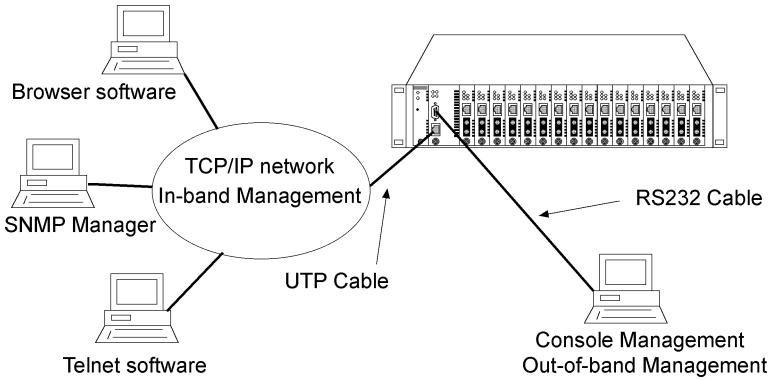
3.1 Management Functions

The managed converter rack system KC-3000 series is featured with management functions and can be managed by using the following methods:

- Direct console connection over an RS-232 cable
- Telnet software over TCP/IP network
- SNMP manager software over TCP/IP network
- Web browser software from Internet or Intranet over TCP/IP network

Management Interface	**RS-232 / Protocol**
Console operation	RS-232 console port
Console operation	Telnet over TCP/IP
SNMP management	SNMP over TCP/IP
Web browser	HTTP over TCP/IP

The following figure illustrates a management model diagram:



The system unit is equipped with one SNMP module which serves as a management agent to monitor the system status and all installed media converter modules. The agent also responses to either in-band management requests coming from network or out-of-band requests from directly connected console.

3.2 Protocols Supported

Protocols	Name	Reference
IPv4	IP version4	RFC791
TCP	Transmission Control Protocol	RFC793
UDP	User Datagram Protocol	RFC768
ICMP	Internet Control Message Protocol	RFC792
SNMP	SNMP agent v1	RFC1157
MIB-II	Standard MIB	RFC1213
TFTP	Trivial File Transfer Protocol	RFC1350
TELNET	Telnet protocol	RFC854
HTTP	HTTP server for web management	RFC1945

3.3 Setup for Out-of-band (Console) Management

Before doing any in-band management, it is necessary to perform console operation for configuring IP and SNMP related settings for the first time the system is received for installation. The console port is located on the SNMP module.

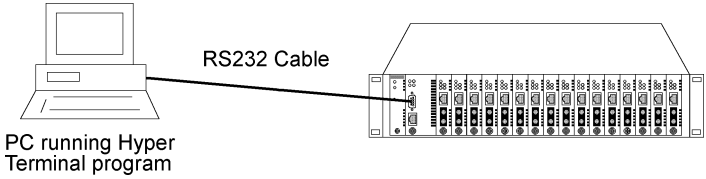
Any PC running Windows 95/98/ or NT can be used as a console via COM port. Windows Hyper Terminal program is an ideal and the most popular software for such console terminal operations.

To setup console operation, the steps are:

1. Find a proper RS-232 cable for the connection to a console terminal. If your are using PC as a terminal, make sure the cable pin assignments comply to the following requirement.

Console port			**9-pin PC COM port**
Pin2	RXD	----------	3
3	TXD	----------	2
4	DTR	----------	6
5	GND	----------	5
6	DSR	----------	4

2. Connect one end to the console port and connect the other end to the PC COM port.



3. Configure your PC COM port setting to match the RS-232 settings of the console port and start your terminal software.

Factory default settings of the Console port
Baud rate : 38400, N, 8, 1, 0
Flow control : disabled

4. Turn the system power on.
5. Press <Enter> key several times in your terminal software until a login prompt comes up. It means the connection is proper.

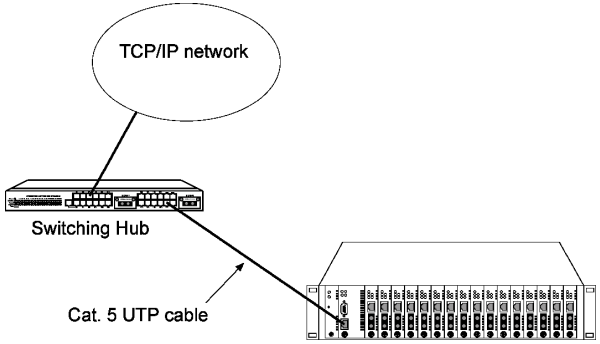
The console port does not support modem connection.

Refer to Chapter 4 for more information about Console management.

3.4 Setup for In-band Management

To perform an in-band management, it is necessary to connect the system to your TCP/IP network. The steps are:

1. Configure IP and SNMP related settings to the system using direct console management when you receive it first time for the installation.
2. Find a proper straight-through Category 5 UTP cable (maximal length 100 meters) for the connection.
3. Connect one end of the UTP cable to the UTP port on SNMP module and connect the other end to the device, such as a switching hub, in your TCP/IP network.



4. Start your in-band management operations. For different management methods, refer to:
    - Chapter 4 for Telnet management
    - Chapter 5 for SNMP management
    - Chapter 6 for Web management

4. Console and Telnet Operation

Functions supported:

- Set and display IP parameters for the system.
- Set and display SNMP parameters for the SNMP agent function.
- Monitor system fan status and other system information.
- Monitor installation status of each slots.
- Monitor the configuration and link status of each module installed.
- Restore default settings for the system
- Change administrator password for access control.
- Update system software.
- Reboot (warm start) the system remotely.

Management Objects

Objects	Modify	Monitor
Password for access control	Y	-
System : CPU, memory, flash, software version	-	Y
Fan status	-	Y
IP address of the system	Y	Y
Subnet mask of the system	Y	Y
Default gateway IP address	Y	Y
SNMP name	Y	Y
SNMP location	Y	Y
SNMP contact	Y	Y
SNMP community name (up to 4)	Y	Y
SNMP community access right (up to 4)	Y	Y
SNMP trap host IP address (up to 3)	Y	Y
Slot status : module installed or not	-	Y
Module status : media type, speed, duplex	-	Y
Module link status of two ports	-	Y

Cold Start

When the power to the system is turned on, the system start initialization and self-test process. The self-test messages are displayed as follows if a console connection is established successfully.:

Power-on Self-test

```
-----------------------------------------
$$$ System LOADER Checksum O.K !!!
$$$ System IMAGE Checksum O.K !!!
$$$ System DATA Checksum O.K !!!
$$ Waiting Copy Rom to Sdram
$$$ System Power On Self Test....
$$$ ARM Reg R/W Test Success !!!
$$$ System EEPROM Checksum O.K !!
$$$ Get parameter O.K !!
My Mac Address is xxxxxxxxxxx
-----------------------------------------
```

This chapter describes the detailed console operation. It can be applied to either out-of-band console management or in-band Telnet management. Both are same in operation starting from login prompt.

Direct Console Management

When you can see the self-test messages shown on screen properly, you can press <Enter> key to start console login operation. Go to **Login Prompt** section in next page directly.

Telnet Management

Use Telnet software to perform the management operation. The most convenient solution is using the built-in Telnet function in a Windows 95/98/ or NT PC. Enter into DOS window and invoke Telnet command :

```
>telnet xxx.xxx.xxx.xxx
```

to connect to the system unit. The specified xxx.xxx.xxx.xxx is the IP address of the system unit. A welcome message and login prompt are displayed if the connection is established properly.

Login Prompt

The following figure illustrates the login screen:

```
------------------------------------------
Welcome to Console
login:admin
password:***
------------------------------------------
```

Username : admin
Factory default Password : 123

For security reason, the system supports a function to change the password in setup menu. It is recommended to change the default password immediately after a successful login.

When login successfully, a Setup menu is shown as follows:

```
-------------------------------------------
Setup Menu
TCP/IP stack for KC-3000/1, v1.03
[0] Print this menu
[1] IP Menu
[2] SNMP Menu
[3] View System status
[4] View Converter Slots Status
[5] Restore Default Value
[6] Security Manager
[7] Update Firmware
[8] Reboot System
[9] Exit
Please Select (0-9 )....
Enter Esc to abort....
INET>
-------------------------------------------
```

After prompt, type a number followed by [Enter] key for selecting an operation item to perform. See example below:

```
INET> n <Enter>
```

Select [0] to display main menu again. [Esc] key can be used to abort the operation of any item and back to main menu.

The following sections describe the detailed operation of each item.

4.1 IP Menu

Select [1] from Setup menu to set IP related settings.

```
-------------------------------------------
IP Menu
[0] Print this menu
[1] Set IP Address
[2] View IP Status
[3] Exit
Please Select (0-3)
-------------------------------------------
```

Set IP Address

```
-----------------------------------------------------------------
Enter ESC to abort.
Please Input IP Address(xxx.xxx.xxx.xxx):192.168.0.23
replacing net[0] IP address nnn.nnn.nnn.nnn with 192.168.0.23
Please Input Subnet Mask(xxx.xxx.xxx.xxx):255.255.255.0
replacing subnet mask[0] IP address nnn.nnn.nnn.nnn with 255.255.255.0
Please Input Gateway IP(xxx.xxx.xxx.xxx):192.168.0.1
replacing gateway IP addr[0] nnn.nnn.nnn.nnn with 192.168.0.1
Do you want to Change IP setting ? (Y/N)Y
Please reboot system and use new IP to connection it !
-----------------------------------------------------------------
```

IP Address : Unique IP address designated to this system
Subnet Mask : The subnet mask of the IP address specified above
Gateway : The IP address of the default gateway (router)

Note that all current in-band network management connections on the system will be killed if system IP address is changed. This change does not affect the operation of the media converter modules in slots.

View IP Status

```
-------------------------------------------------
IP Addr: 192.168.0.23 Submask: 255.255.255.0 Gateway: 192.168.0.1
-------------------------------------------------
```

4.2 SNMP Menu

Select [3] from Setup menu to perform SNMP related settings. The following figure illustrates the SNMP menu:

```
-----------------------------------------
Snmp Menu
[0] Print this menu
[1] View Snmp Setting
[2] Set Snmp Name
[3] Set Snmp Location
[4] Set Snmp Contact
[5] Set Snmp Community
[6] Set Snmp Trap Manager
[7] Exit
Please Select (0-7 )....
INET>
-----------------------------------------
```

SNMP related settings are:

Name : Logic name for the system (16 characters)
Location : Location where the system is installed (16 characters)
Contact : Contact person regarding the system (16 characters)
Community : SNMP communities to which the system belongs and access right to the system (R : read only, W : read/write) Maximum of four communities are supported.
Trap manager: IP address of the trap host to which a trap is issued and the trap community to which the system belongs. Maximum of three trap hosts are supported.

[Esc] key can be used to abort unfinished setting.

4.3 View System Status

Select [4] from Setup menu to view system status. The system status are shown as follows:

```
-----------------------------------------------
Power status: good
Fan status: good
CPU status:
Cpu Type = ARM7, Flash Size = 512K, Sdram Size = 2M Bytes
Software version 1.xx
-----------------------------------------------
```

Power status indicates the power condition of the system.
Fan status indicates the fan condition of the system fan.
CPU status and software version are static information for reference.

4.4 View Converter Slots Status

Select [5] from setup menu to view current status of all media converter modules in the system. The slot status are shown as follows:

Slot	Port	Media	Speed	Duplex	Link	Slot	Port	Media	Speed	Duplex	Link
04	A	TX	100M	Full	Up	04	B	FX	100M	Full	Up
05	A	TX	100M	Full	Up	05	B	FX	100M	Full	Up
06	A	TX	100M	Full	Up	06	B	FX	100M	Full	Up
07	A	TX	100M	Full	Up	07	B	FX	100M	Full	Up
08	A	TX	100M	Full	Up	08	B	FX	100M	Full	Up
09	A	TX	100M	Full	Up	09	B	FX	100M	Full	Up
10	A	TX	100M	Full	Up	10	B	FX	100M	Full	Up
11	A	TX	100M	Full	Up	11	B	FX	100M	Full	Up
12	A	TX	100M	Full	Up	12	B	FX	100M	Full	Up
13	A	TX	100M	Full	Up	13	B	FX	100M	Full	Up
14	A	TX	100M	Full	Up	14	B	FX	100M	Full	Up
15	A	TX	100M	Full	Up	15	B	FX	100M	Full	Up
16	A	TX	100M	Full	Up	16	B	FX	100M	Full	Up
17	A	TX	100M	Full	Up	17	B	FX	100M	Full	Up
18	A	TX	100M	Full	Up	18	B	FX	100M	Full	Up
19	A	TX	100M	Full	Up	19	B	FX	100M	Full	Up

The slot status definitions are:

Column	States	Interpretation
Slot	04-19	Slot position in the system Slot #4 - slot #19 are for media converter module
Port	N/A	No module is installed in slot
	A	Upper port of the module in slot
	B	Lower port of the module in slot
Media	N/A	No module is installed in slot.
	TX	10/100BASE-TX port, 1000BASE-T port
	FX	100BASE-FX port, 1000BASE-SX/LX port
Speed	N/A	No module is installed in slot
	10M	10Mbps
	100M	100Mbps
	1000M	1000Mbps (Gigabit)
Duplex	N/A	No module is installed in slot.
	Full	Full duplex
	Half	Half duplex
Link	N/A	No module is installed in slot.
	Up	Link up
	Down	Link down

4.5 Restore Default Values

Select [6] from Setup menu to restore factory default settings.

Factory default settings are:

```
IP Address              192.168.0.2
Subnet Mask             255.255.255.0
Default Gateway         192.168.0.1
User Name               admin
Password                123
Name                    (null)
Location                (null)
Contact                 (null)
SNMP Communities:
No.1 Community name     public
No.1 Access right       Read only
No.2 Community name     (null)
No.2 Access right       (N/A)
No.3 Community name     (null)
No.3 Access right       (N/A)
No.4 Community name     (null)
No.4 Access right       (N/A)
SNMP Trap Managers:
No.1 Trap manager IP    (null)
No.1 Community name     (null)
No.2 Trap manager IP    (null)
No.2 Community name     (null)
No.3 Trap manager IP    (null)
No.3 Community name     (null)
```

4.6 Security Manager

Select [7] from Setup menu to change login user name and password.

The steps are:

Display current user name

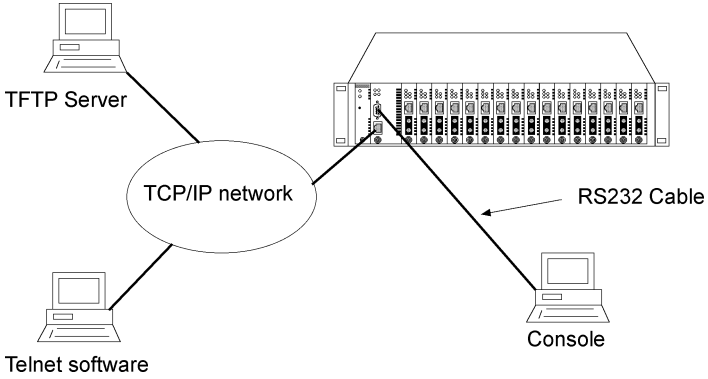
```
-------------------------------------------
Current username: admin
Current password: ********

Press Esc to abort ....
-------------------------------------------
```

Change user name and password

```
-------------------------------------------
Change username [admin]: xxxxxx
Enter password(1-8): ********
Confirm password: ********
Password updating .......
Password updated.
INET>
-------------------------------------------
```

4.7 Update Firmware

Select [7] from Setup menu to perform firmware (system software) upgrade via TFTP protocol. Before doing TFTP operation, one TFTP server is required and installed in the network to where this system connects and new firmware file **image.bin** must be placed in the TFTP server.



The following information are required for TFTP operations:

TFTP Server IP Address: IP address of the TFTP server where the firmware image.bin is downloaded from.

The steps are:

Specify TFTP server IP address

```
-----------------------------------------------
Enter ESC to abort.
Please Input TFTP Server IP Address (xxx.xxx.xxx.xxx):192.168.0.88
TFTP Server: 192.168.0.88
-----------------------------------------------
```

Confirm to start downloading

```
-----------------------------------------------
Do you want to start download new image ? (Y/N) Y
Download image and please wait........
-----------------------------------------------
```

Confirm to update system flash memory

```
-----------------------------------------------
Download new image complete, do you want to update flash ? (Y/N) Y
Update flash and please wait ....
Update flash complete and please reboot system !
INET>
-----------------------------------------------
```

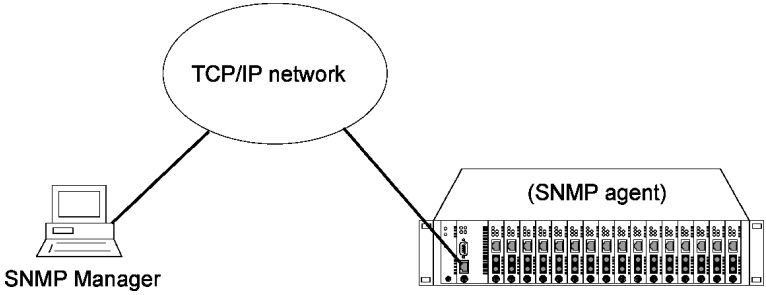
4.8 Reboot System

Select [8] from Setup menu to reboot the system. This reboot function allows you to perform a warm start to the system.

```
-----------------------------------------------
Do you want to reboot system ? (Y/N) Y
-----------------------------------------------
```

5. SNMP Management

SNMP management are performed at a network management station running SNMP network management application manager software with graphical user interface. The following figure illustrates an example model:



The system unit serves as an SNMP agent and provides the capabilities that allows network administrators via SNMP protocol to set parameters and view system status and media converter status defined in the standard MIB-II and private MIB.

5.1 Configuring SNMP Settings via Console Operation

Before performing SNMP operation, proper SNMP settings must be configured in the system unit. The SNMP related settings are:

Name : Logic name to identify a specific system unit

Location : Location where the system is installed

Contact : Contact person regarding the system

Community : SNMP communities to which the system belongs and access right to the system (read only or read/write)

Trap hosts : IP addresses of trap hosts to which a trap is issued and the trap community to which the system belongs.

Up to four SNMP communities and up to three trap hosts are supported by the system SNMP agent.

These settings can be configured through console or telnet operation. Refer to Chapter 4 for more information.

5.2 SNMP Private MIB

Use the SNMP management application software to compile the MIB file first before performing any management operation. In addition to standard MIB-II (RFC1213), the system supports private MIB as below:

Private MIB Objects	Get	Remark
ssPowerStatus(kti.28.1.1)	Y	Power status
ssFanStatus(kti.28.1.2)	Y	Fan status
cputype(kti.28.2.1)	Y	ARM7
flashrom(kti.28.2.2)	Y	512KB
memsize(kti.28.2.3)	Y	2MB
softwarever(kti.28.2.4)	Y	1.xx
mibFileVer(kti.28.2.5)	Y	1.xx
portNumber(kti.28.3.1)	Y	Total number of slots
portTable(kti.28.3.2)	-	
portEntry(1)	-	
slotIndex(1)	Y	Slot ID 4 - 19
slotIndexDescription(2)	Y	Slot4 - Slot19
slotModuleDescription(3)	Y	
slotModuleType(4)	Y	
sotModuleStatus_PortA_Media(5)	Y	Port A media type
slotModuleStatus_PortA_LineSpeed(6)	Y	Port A line Speed
slotModuleStatus_PortA_Duplex(7)	Y	Port A duplex mode
slotModuleStatus_PortA_LinkStatus(8)	Y	Port A Link status
slotModuleStatus_PortB_Media(9)	Y	Port B media type
slotModuleStatus_PortB_LineSpeed(10)	Y	Port B line speed
slotModuleStatus_PortB_Duplex(11)	Y	Port B duplex mode
slotModuleStatus_PortB_LinkStatus(12)	Y	Port B link status

Port A : the upper port of the converter module
Port B : the lower port of the converter module

Refer to MIB file, KTI-KC-3000-v1.05.mib for the details. This file can be used for MIB compiler.

5.3 SNMP Traps

The system also supports the following SNMP traps. When the trap event occurs, the SNMP agent will generate a trap notification to SNMP management station.

Trap Name	**Event of Trap Generated**
Cold Start	The system is powered on and complete initialization
Authentication failure	SNMP community authentication failure
Power On	The system is powered on.
Fan failure	System fan failure occurs.
Fan failure recovery	System fan recovery from failure
Slot # Port A link	Slot # module Port A link down or up
Slot # Port B link	Slot # module Port B link down or up

The binding information together with a trap is :

Trap Name	**VarBind**
Cold Start	sysDescr, ie KC-3000
Authentication failure	sysDescr, ie, KC-3000
Power On	power status
Fan failure	fan status
Fan failure recovery	fan status
Slot # Port A link	Slot description and Port A link status
Slot # Port B link	Slot description and Port B link status

The slot # can be slot 4 up to slot 19.
Port A : the upper port of the module installed in slot.
Port B : the lower port of the module installed in slot.

6. Web Management

The system features an http server which can serve the management requests coming from any web browser software over internet or intranet network.

Web Browser
Compatible web browser software with JAVA support
Microsoft Internet Explorer 4.0 or later
Netscape Communicator 4.x or later

Set IP Address for the System Unit
Before the system can be managed from a web browser software, make sure a unique IP address is configured to the system. Refer to Chapter 4 for how to set IP address.

6.1 Start Browser Software and Making Connection

Start your browser software and enter the IP address of the system unit to which you want to connect. The IP address is used as URL for the browser software to search the device.

URL : http://xxx.xxx.xxx.xxx/

Factory default IP address : 192.168.0.2

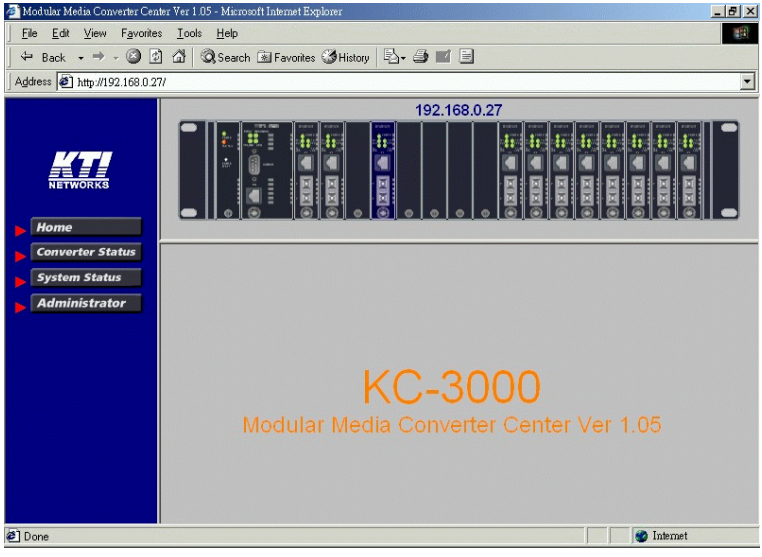
6.2 Login to the System Unit

When browser software connects to the system unit successfully, a Login screen is provided for you to login to the device as follows:

Login

Username : Admin
Factory default Password : 123

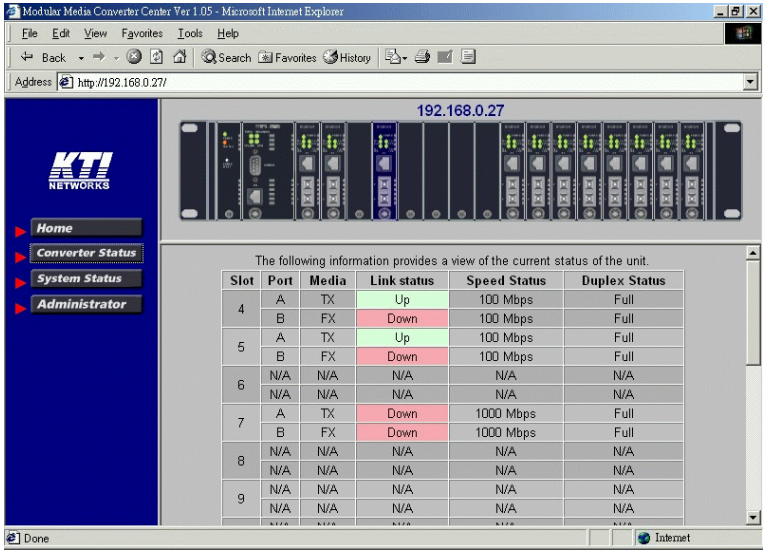
The following screen shows welcome screen when a successful login is performed.



In addition to the device image, the screen supports the following functions on the right side:

1. Home : home page and device image
2. Converter Status : view all slot status
3. System Status : view system related status
4. Administrator : other management functions

6.3 Converter Status



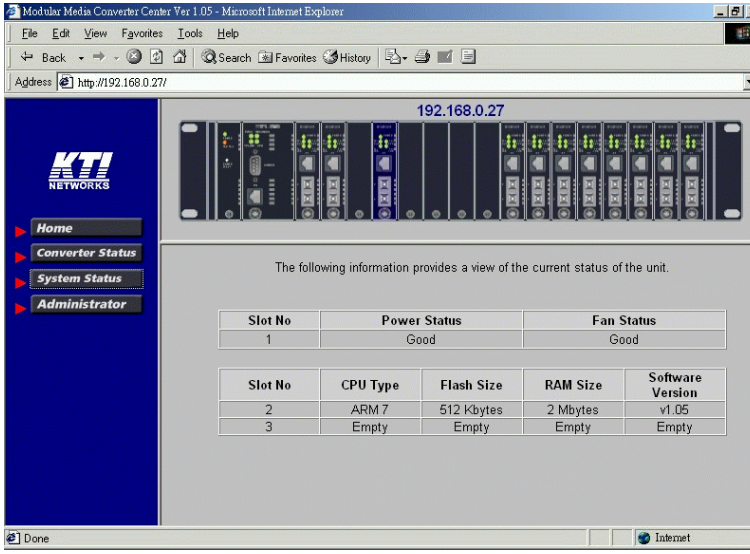
The types of the media converter modules can be identified by the color as follows:

Black 10/100 Fast Ethernet media converter modules
Black/purple 1000M Gigabit Ethernet media converter modules

Click [**Converter Status**] to view all slot status in a table list. The information includes:

Column	States	Interpretation
Slot	4-19	Slot position in the system Slot #4 - slot #19 are for media converter module
Port	A	Upper port of the module in slot
	B	Lower port of the module in slot
Media	TX	10/100BASE-TX port, 1000BASE-T port
	FX	100BASE-FX port, 1000BASE-SX/LX port
Link	Green	Link up
	Red	Link down
Speed	10Mbps	10BASE-T
	100Mbps	100BASE-TX or 100BASE-FX
	1000Mbps	1000BASE-T
Duplex	Full	Full duplex
	Half	Half duplex

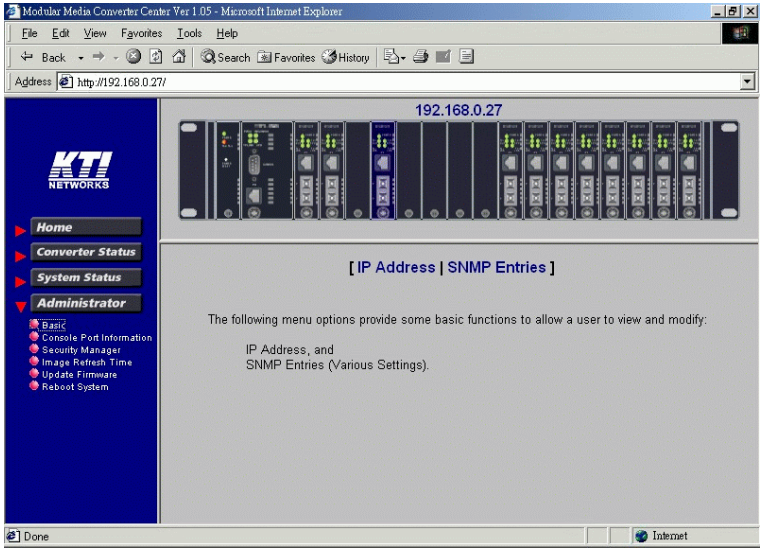
6.4 System Status



Click [**System Status**] to view system related status in a table list. The information includes:

Slot Number : slot number where the status belongs to
Power Status : system power condition
Fan Status : system cooling fan
CPU type : CPU model equipped in management module
RAM size : Memory size equipped in management module
Flash size : Flash memory equipped in management module
Software version : Software version built in management module

6.5 Administrator Menu



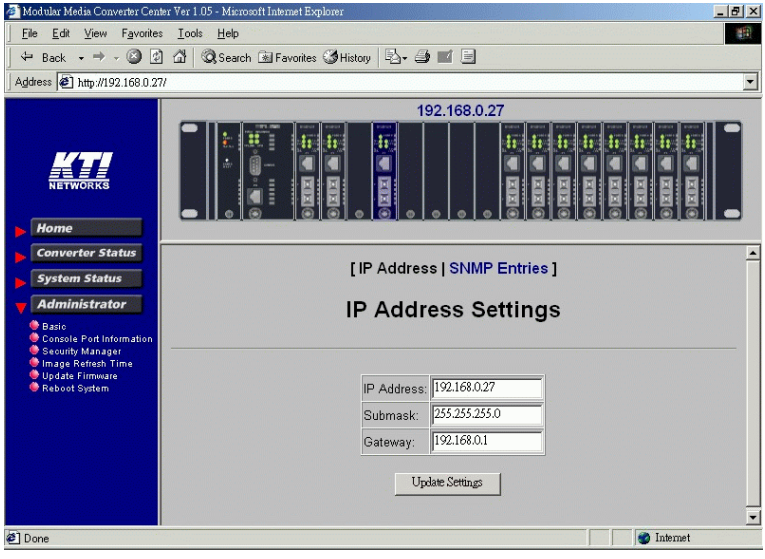
Click [**Administrator**] to show administrator menu. The menu includes the following options:

1. Basic : Set / View IP and SNMP related settings
2. Console Port Information : View RS-232 console configuration
3. Security Manager : Change login user name and password
4. Image Refresh Time : Set refresh time interval of the image
5. Update Firmware : Update the software built in SNMP module
6. Reboot System : Reboot the system remotely

Refer to the following sections for the details.

6.5.1 Basic

Click [Basic] to perform IP setting and SNMP settings.



Click [**IP Address**] button to set IP settings.

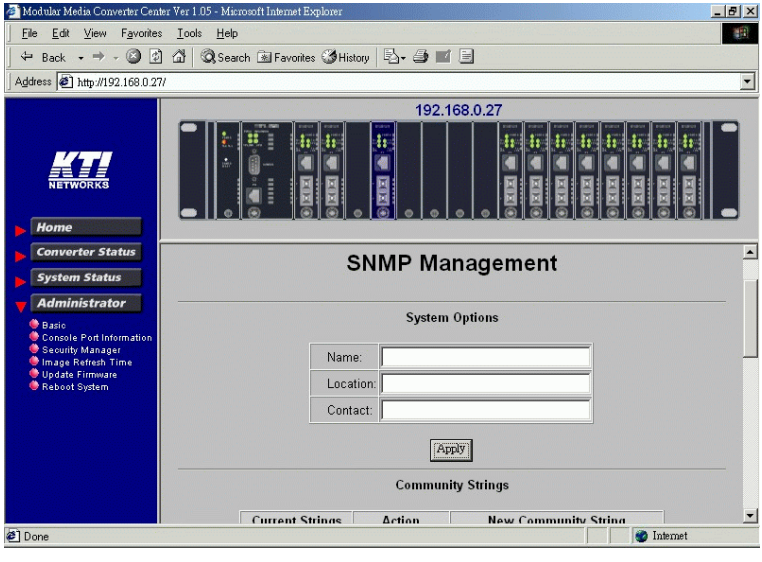
IP settings include:

IP Address : Unique IP address designated to this system
Subnet Mask : The subnet mask of the IP address specified above
Gateway : The IP address of the default gateway (router)

Click [Update Settings] to make new settings effective. However, a new IP address change will make your current connection invalid. Restart your web link with new IP address to connect the system.

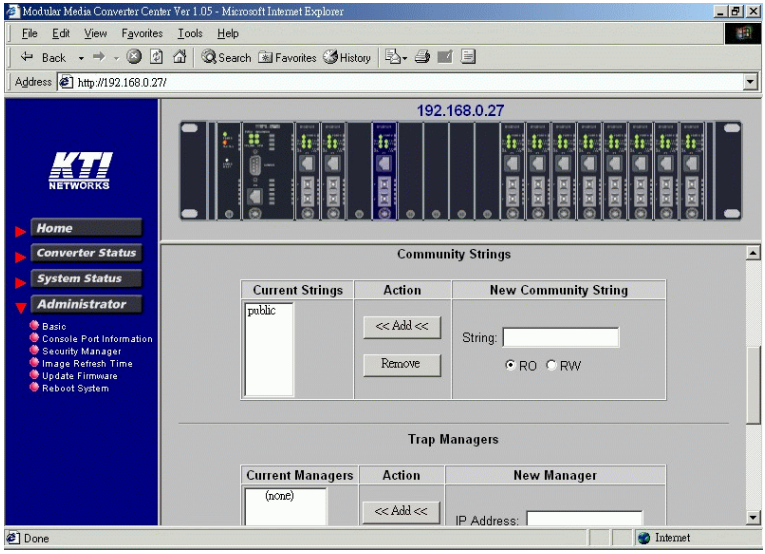
Click [**SNMP Entries**] button to set SNMP settings.

SNMP Entries - System options



Name : Logic name for the system
Location : Location where the system is installed
Contact : Contact person regarding the system

SNMP Entries - Community Strings



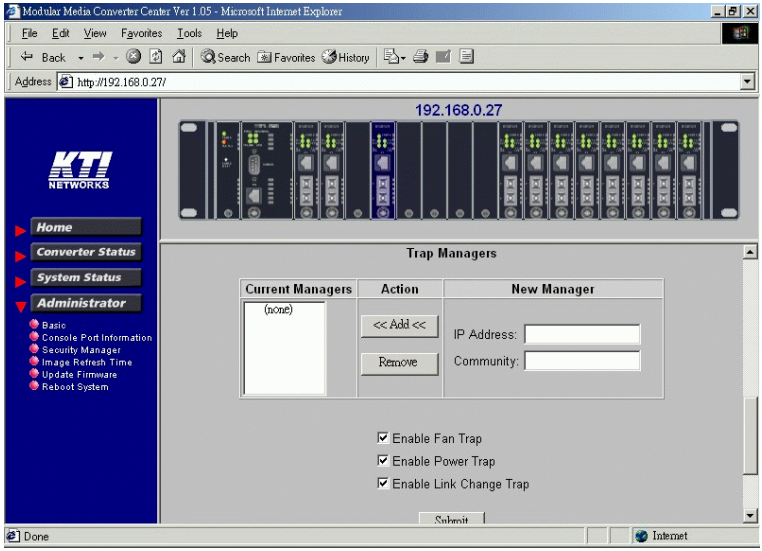
One community contains two settings:

Community name : SNMP communities to which the system belongs
Access right : Access right associated with the community name
Click [**RO**] or [**RW**] to set access right for Read Only or Read / Write.

Click [**Add**] button to add one new community into the community list.
Click [**Remove**] button to remove one community from the community list.

Up to four entries are supported in the community list.

SNMP Entries - Trap Managers

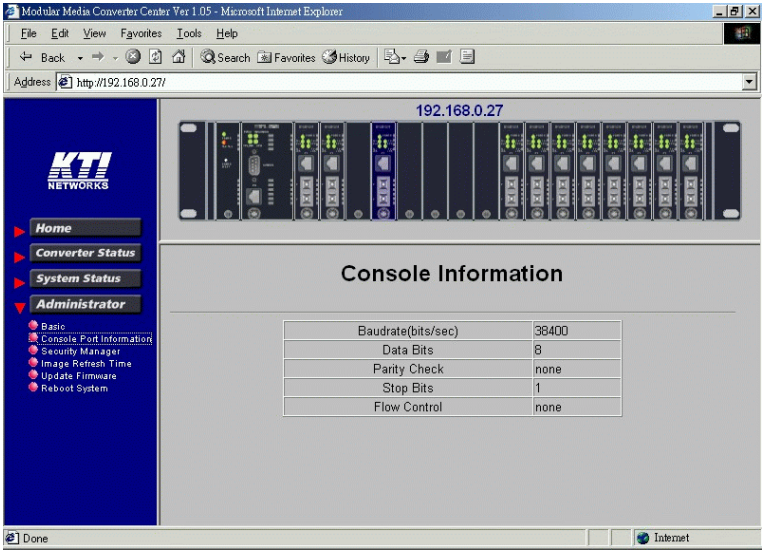


One Trap Manager contains the following settings:

IP Address : IP address of the trap host to which a trap is issued
Community : The trap community to which the system belongs
Enable Fan Trap: Enable trap for Fan failure events
Enable Power Trap: Enable trap for power failure events
Enable Link Change Trap: Enable trap for any link change events

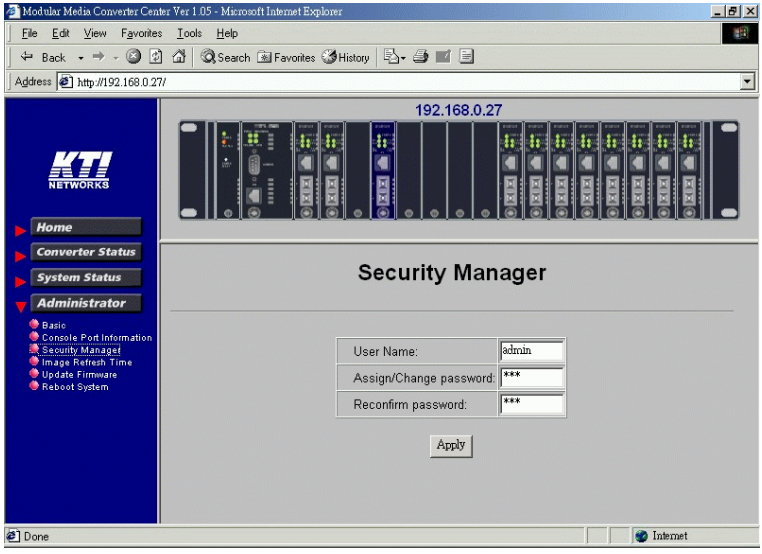
Click [**Add**] to add one trap manager into the manager list.
Click [**Remove**] to remove one trap manager from the manager list.

6.5.2 Console Port Information



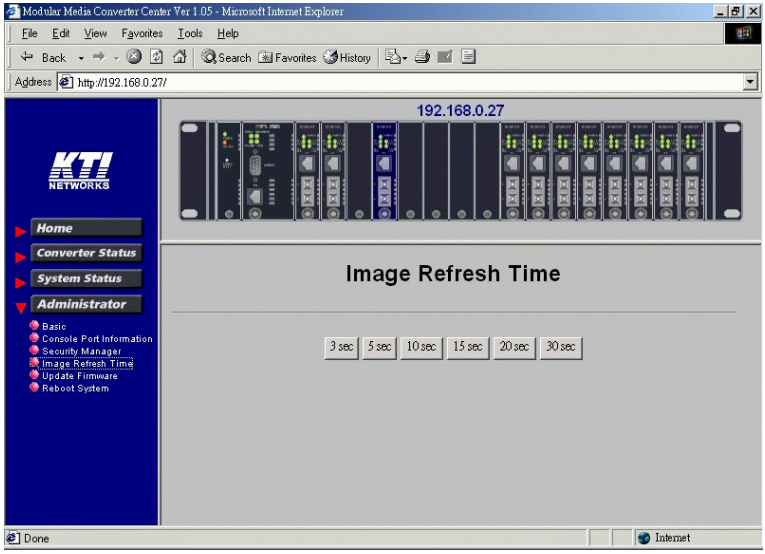
This screen displays configuration of RS-232 console port.

6.5.3 Security Manager



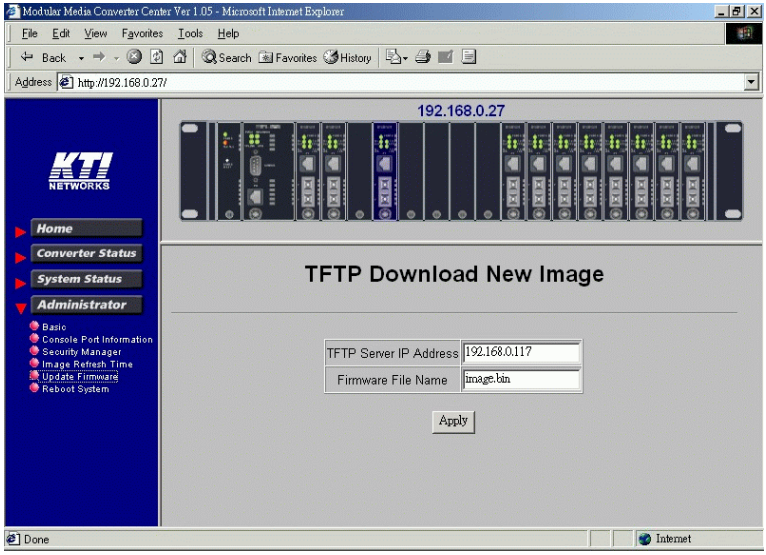
Security Manager allows you to change login user name and password. Click [**Apply**] to make the changes effective.

6.5.4 Image Refresh Time



The system image is updated periodically to present the latest status. The default time interval of refreshing the image is 20 seconds. It can be changed by clicking any of the time buttons displayed. This is a run time setting and not a permant setting.

6.5.5 Update Firmware

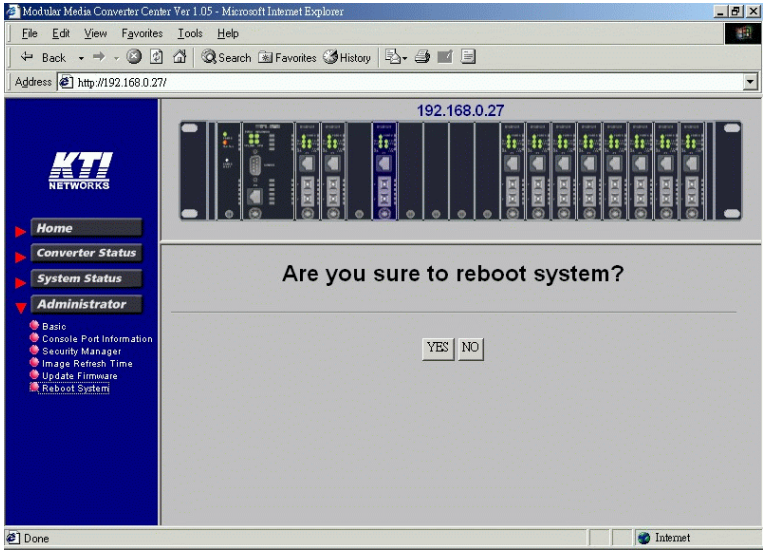


[Update Firmware] allows you to perform firmware (system software) upgrade via TFTP protocol. Before doing TFTP operation, one TFTP server is required and installed in the network to where this system connects and new firmware file **image.bin** must be placed in the TFTP server.

Set IP address for the TFTP server from where the firmware image is to be downloaded. Specify the file name as Image.bin.

Click [**Apply**] to start the file transfer operation.

6.5.6 Reboot System

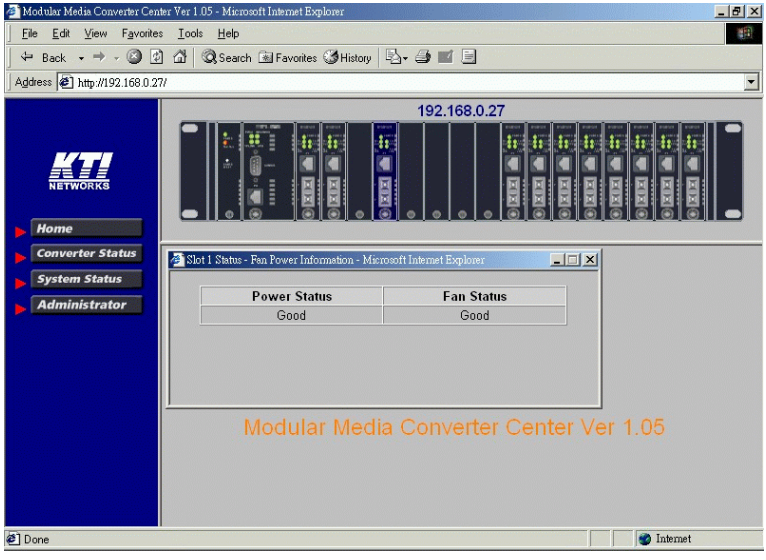


[Reboot System] allows you to reboot the system unit remotely. Starting this command will make your current http connection lost. You must rebuild the connection to perform any management operation to the unit.

6.6 Slot Icon Operations

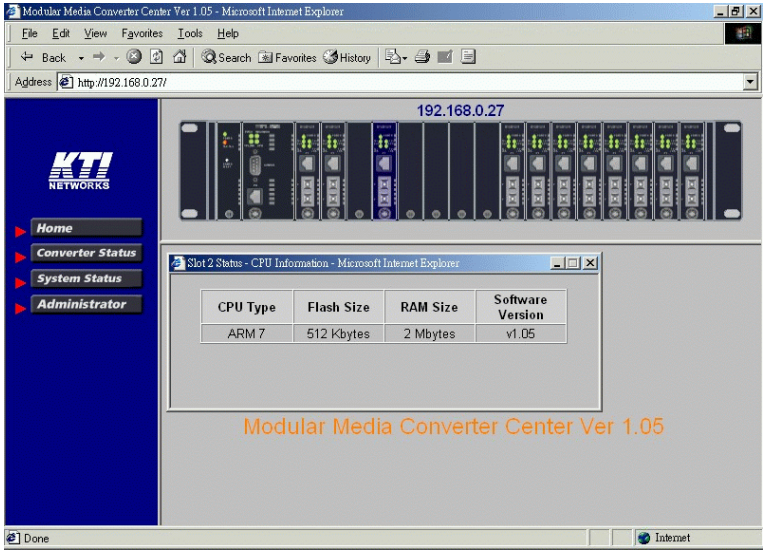
In addition to the menu supported, you may click the following image icons to show specific status.

Click slot 1 (LED module) on the system image shown on screen



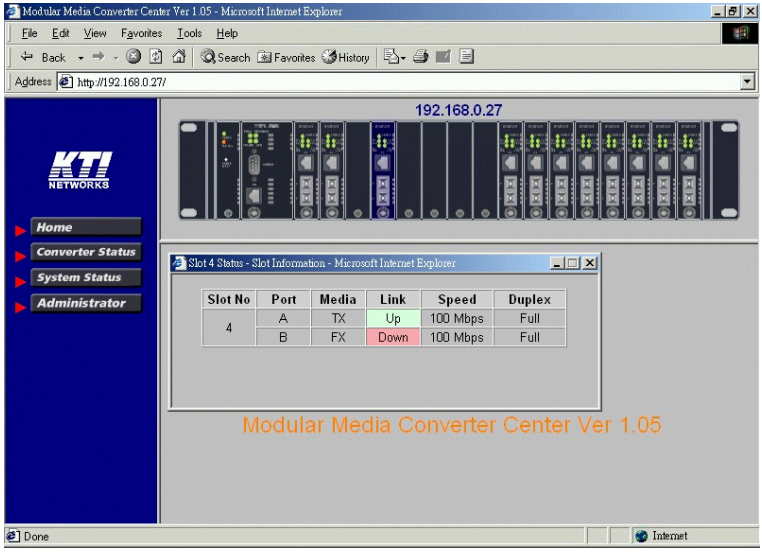
Power Status : system power condition
Fan Status : system cooling fan

Click slot 2 (SNMP module) to view system status.



CPU type : CPU model equipped in management module
RAM size : Memory size equipped in management module
Flash size : Flash memory equipped in management module
Software version : Software version built in management module

Click any one slot in slot 4 to slot 19 to view one specific slot status. The following figure illustrates slot 9 status:



Column	States	Interpretation
Slot	4-19	Slot position in the system
		Slot #4 - slot #19 are for media converter module
Port	A	Upper port of the module in slot
	B	Lower port of the module in slot
Media	TX	TP port (10/100BASE-TX or 1000BASE-T)
	FX	Fiber port (100BASE-FX or 1000BASE-SX/LX)
Link	Green	Link up
	Red	Link down
Speed	10Mbps	10BASE-T
	100Mbps	100BASE-TX or 100BASE-FX
	1000Mbps	1000BASE-T or 1000BASE-SX/LX
Duplex	Full	Full duplex
	Half	Half duplex

7. Fast Ethernet Media Converter Modules

The 10/100BASE-TX to 100BASE-FX Fast Ethernet media converter slide-in modules provide a media conversion allowing high-speed integration of fiber optic and twisted-pair segments. With 10BASE-T and 100BASE-TX support, the converters provide seamless translation between Ethernet and Fast Ethernet networks. A complete set of LEDs allows for quick status verification.

The converter modules also provide the following key features:

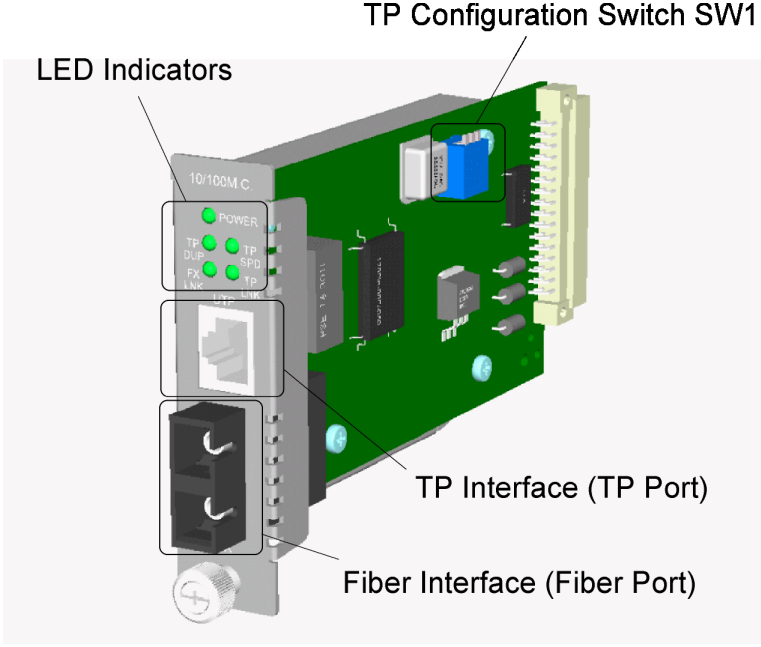
- Store-and-forward switching to improve overall network performance by buffering packets during times of heavy congestion and to prevent dropping packets and forwarding of corrupted packets
- High-performance switching engine that performs forwarding and filtering at full wire speed.
- Built-in flow control mechanism to prevent heavy data congestion and degrading system performance
- Auto-negotiation function built in twisted-pair port that allows to auto sense the speed and duplex configuration when connecting to an auto-negotiation capable device.
- Auto speed sensing that allows to sense the connection speed of either 10Mbps or 100Mbps when connecting to an auto-negotiation incapable devices

The converter series support the following configuration needs:

KC-3000-TFMC	10/100BASE-TX to 100BASE-FX MM 2Km 2 SC
KC-3000-TFS20	10/100BASE-TX to 100BASE-FX SM 20Km 2 SC
KC-3000-TFS40	10/100BASE-TX to 100BASE-FX SM 40Km 2 SC
KC-3000-WDM320	10/100BASE-TX to 100BASE-FX SM 20Km 1 SC
KC-3000-WDM520	10/100BASE-TX to 100BASE-FX SM 20Km 1 SC

The following figure illustrates the module example which provides 2 SC connectors. All available models are similar except the fiber transceiver equipped. The figure shows the some important components as follows:

- Twisted-Pair Interface (TP Port)
- Fiber Interface (Fiber Port)
- TP Configuration Switch (SW1)
- LED Indicators



7.1 Specifications

Twisted-Pair Interface

Connector	Shielded RJ-45
Pin Assignments	MDI
Compliance	IEEE 802.3 10BASE-T, 802.3u 100BASE-TX
Data Speed	10Mbps or 100Mbps
Duplex Mode	Half-duplex or Full-duplex
Cable Type	10Mbps - Category 3, 4, or 5 UTP 100Mbps - Category 5 UTP
Supported Link Length	100 meters

Fiber Optic Interface

Compliance	IEEE 802.3u 100BASE-FX
Connector	Duplex SC or Single SC
Laser safety	Class 1 FDA and IEC-825 compliant
Data Speed	100Mbps
Duplex Mode	Full-duplex
Cable Types	Multimode (MM) - 50/125, 62.5/125 mm Single mode (SM) - 8.7/125, 9/125, 10/125 mm

General Information

Forwarding & Filtering	10Mbps - 14,880 pps (full wire speed) 100Mbps - 148,800pps (full wire speed)
MAC Address Table	4K entries
Frame Types Supported	IEEE 802.3 Std. 64Bytes ~ 1518Bytes frames & VLAN tagged frames (4 bytes tag)
TP Configuration Switch	Enable/Disable Auto-negotiation mode 10M/100M Speed setting for non-auto mode Full/Half duplex setting for non-auto mode
LED Indications	Power, TP Link/Activity, TP Speed, TP duplex, FX Link/Activity

7.2 Fiber Optic Specifications

Model	Fiber	Wavelength
KC-3000-TFMC	Duplex MM 2 SC	1310nm
KC-3000-TFS20	Duplex SM 2 SC	1310nm
KC-3000-TFS40	Duplex SM 2 SC	1310nm
KC-3000-WDM320	Single SM 1 SC	Tx 1310nm / Rx 1550nm
KC-3000-WDM520	Single SM 1 SC	Tx 1550nm / Rx 1310nm

Model	Tx Optic Power	Rx Sensitivity	Support Distance
KC-3000-TFMC	-19dBm	-32.5dBm	2Km
KC-3000-TFS20	-15dBm	-31dBm	20Km
KC-3000-TFS40	-5dBm	-34dBm	40Km
KC-3000-WDM320	-14dBm	-33dBm	20Km
KC-3000-WDM520	-14dBm	-33dBm	20kM

7.3 Configuration Switch Settings for TP Interface

The configuration switch SW1 located on the module is used for configuring the TP interface as follows:

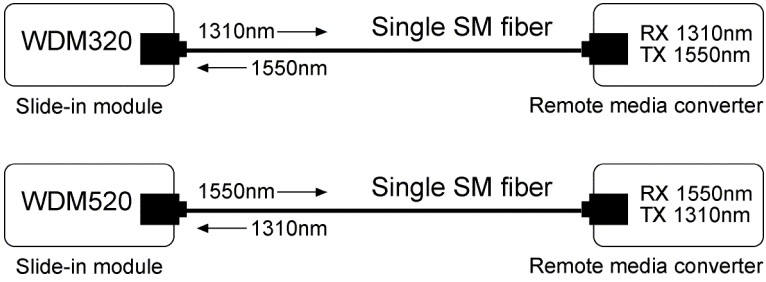
SW1	Setting	Function
SW1-1	On	Enable auto-negotiation function
	Off	Disable auto-negotiation (manual mode)
SW1-2	On	100M speed for manual mode
	Off	10M speed for manual mode
SW1-3	On	Full duplex for manual mode
	Off	Half duplex for manual mode

When auto-negotiation function is enabled, the final configuration is dependent on the link partner device of the TP port as follows:

TP Link Partner	Speed / Duplex used
Auto-negotiation device	Determined by negotiation
10M Non-auto-negotiation device	10M, Half duplex
100M Non-auto-negotiation device	100M, Half duplex

7.4 Making Single Fiber Connection

Since the single fiber media converter modules use different wavelengths for transmission and receiving respectively, the link partner device located on the remote end of the single fiber should match the wavelength used on the slide-in module. The following two figures illustrate two connection examples:



7.5 LED Indications

The module provides five green LEDs to indicate the following status:

LED	Function	State	Interpretation
PWR	Power status	On	The power is on.
		Off	The power is off.
TP SPD	TP Speed	On	100Mbps connection speed
		Off	10Mbps connection speed
TP DUP	TP Duplex	On	Full duplex
		Off	Half duplex
TP LNK	TP Link/Act.	On	TP port link up
		Off	TP port link down
		Blink	TP port Tx/Rx activities
FX LNK	FX Link/Act.	On	Fiber port link up
		Off	Fiber port link down
		Blink	TP port Tx/Rx activities

8. Gigabit Ethernet Media Converter Modules

The 1000BASE-T to 1000BASE-SX/LX media converter modules provide a media conversion allowing Gigabit integration of fiber optic and copper (twisted-pair) segments. It is used to extend the connection distance between two copper Gigabit Ethernet devices via fiber optic cable transparently with no performance degradation.

The converters also provide the following key features:

- Compliance with IEEE 802.3ab 1000BASE-T and IEEE 802.3z 1000BASE-SX, 1000BASE-LX standard
- Auto-negotiation function built in twisted-pair port that allows to operate at optimal configuration connecting to an auto-negotiation capable device
- Auto MDI/MDI-X crossover configuration and receiving polarity error correction on twisted-pair interface
- Supporting low cost multimode fiber and single mode fiber cable when long reach connection is needed
- Extending network span up to 10Km over duplex single mode fiber cabling
- Setting switch to enable or disable auto-negotiation function of the fiber port when connecting non-auto legacy 1000BASE-X device
- Full LED indicators for monitoring port and connection status

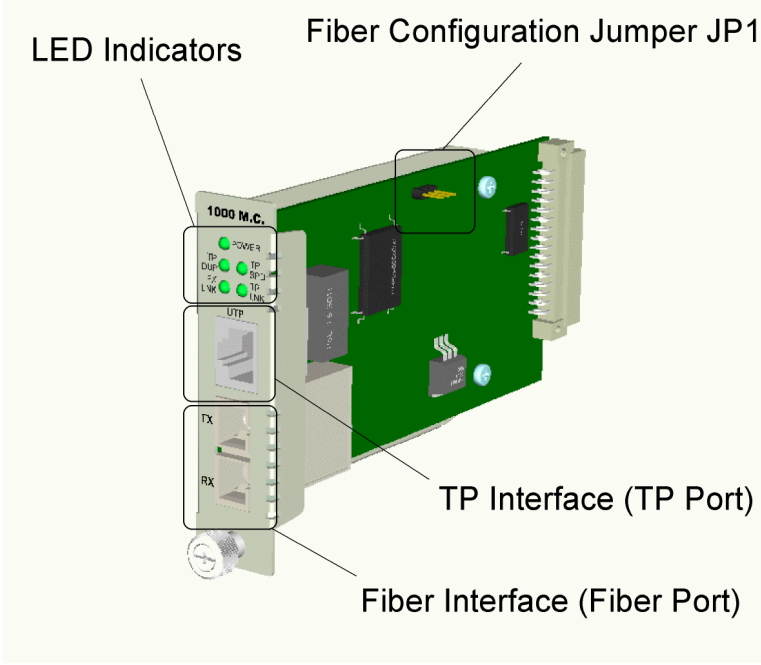
The converter module series support the following configuration needs:

1000BASE-T to 1000BASE-SX / LX

KC-3000-SXC	Copper to SX fiber SC
KC-3000-LXC	Copper to LX fiber SC
KC-3000-LXC40	Copper to LX fiber SC long reach

The following figure illustrates the module example which provides 2 SC connectors. All available models are similar except the fiber transceiver equipped. The figure shows the some important components as follows:

- Twisted-Pair Interface (TP Port)
- Fiber Interface (Fiber Port)
- Fiber Configuration Jumper (JP1)
- LED Indicators



8.1 Specifications

Twisted-Pair Interface

Compliance	IEEE 802.3ab 1000BASE-T
Connector	Shielded RJ-45 jack
Pin assignments	Auto-crossover for MDI and MDI-X
Data speed	1000Mbps
Duplex mode	Auto-negotiation for half-duplex or full-duplex
Cable type	4-pair Category 5 UTP
Supported cable length	100 meters

Fiber Optic Interface

Compliance	IEEE 802.3z 1000BASE-SX or LX
Connector	Duplex SC
Data speed	1000Mbps
Duplex mode	Forced full-duplex or auto-negotiation (by Auto SW)
Auto SW	Auto-negotiation Enable/Disable switch
Cable types	Multimode (MM) - 50/125, 62.5/125 mm Single mode (SM) - 8.7/125, 9/125, 10/125 mm
Optical	Class 1 FDA and IEC-825 laser safety compliant.

General Information

Frame Types Supported	IEEE 802.3 Std. 64Bytes ~ 1518Bytes frames VLAN tagged frames (plus 4 bytes tag) Jumbo packets (up to 9K bytes)
LED Indications	Power, TP Link, TP Transmit, TP Receive, FX Link

8.2 Functions

Functions of 1000BASE-T Port (Twisted-Pair Interface)

- Auto-negotiation support for connecting to auto-negotiation devices
- Supports both of half duplex and full duplex operations
- Auto MDI/MDI-X crossover configuration and receiving polarity correction for UTP connection

Pin Assignments

Pin	MDI	MDI-X
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC-	BI_DD-
5	BI_DC+	BI_DD+
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-

Functions of 1000BASE-X Fiber Port (Fiber Optic Interface)

- Full data rate of 1000Mbps for full duplex operation
- Configuration Jumper JP1 is used to enable or disable auto negotiation function as follows:

NON-AUTO Disable auto negotiation function (and forced full duplex)

AUTO Enable auto negotiation function

Note:

1. For connecting to early 1000BASE-X devices which do not provide auto negotiation capability, you might need to set the SW to NON-AUTO position to prevent unexpected link failure occurrence.
2. In most of the cases, setting AUTO would make the link worked.
3. When installing two of these converters on both ends of a fiber connection, set the switch to NON-AUTO (forced full duplex mode) to achieve the best performance.

8.3 Supported Fiber Cables

Model	Fiber	Wavelength	Output power	Input Sensitivity
KC-3000-SXC	SX	850nm	-9.5~ -4dBm	-12.5dBm max.
KC-3000-LXC	LX	1310nm	-9.5~ -3dBm	-14.4dBm max.
KC-3000-LXC40	LX	1310nm	-5~ 0dBm	-22dBm max.

Model	Fiber Used	Supported Distance
KC-3000-SXC	MM 62.5/125㎜	220 meters
	MM 50/125㎜	500 meters
KC-3000-LXC	MM 62.5/125㎜	550 meters
	MM 50/125㎜	550 meters
	SM 9/125㎜	10Km
KC-3000-LXC40	SM 9/125㎜	40Km

Remark: MM:Multimode, SM: Single mode

8.4 LED Indicators

Name	Status	State	Interpretation
PWR	Power status	On	Power on
		Off	Power off
TP-LNK	UTP link status	On	TP Link up
		Off	TP Link down
TP-RX	UTP Rx status	On	TP Receiver in operation
		Off	TP no receiving operation
TP-TX	UTP Tx status	On	TP Transmitter in operation
		Off	TP no transmission
FX-LNK	Fiber link status	On	Fiber link up
		Off	Fiber link down