XTRAMUS

MCS-2160
Media Converter
User's Manual

USM Ver 1.2

Foreword

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Revision History

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2011/10/11	1.0	First draft version
2011/11/04	1.1	1. Modifying XC-M667 figure. (Page 12) 2. Added new figure for MCS-FANT-05. (Page 24) 3. Modifying new figure for Management interface. (Page 41-43) 4. Added new subject: “Port A/B SDFR Setting” and “Port A/B Capture View”. (Page 49 and 50)
2011/12/28	1.2	1. Updating MCS-2160 interface figure. (Page 36) 2. Updating System Information interface’s figure by adding Syslog Info. (Page 37) 3. Updating System Information interface’s figure by adding Syslog Info and descriptions. (Page 38) 4. Added Syslog Settings function and 3CDaemon software’s functions descriptions. (Page 40~42) 5. Updating the Chassis Management interface and descriptions. (Page 44) 6. Modifying the figure of Chassis Management. (Page 46 and 47) 7. Added Fan Tray interface (M) figure and description. Added note for auto-refresh of Fan Tray Temperature. (Page 45) 8. Updating Card Information interface figure, description and note of auto-refresh for Temperature, Port Wavelength and Factory. (Page 48) 9. Added Port A/B DDMI figure and descriptions. (Page 49) 10. Added note for auto-refresh of USC counter of the web interface. (page 53) 11. Adding more information about product features and main applications on page 7.

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1. MCS-2160 Overview

1.1. General Descriptions of MCS-2160

MCS-2160 media converter chassis is a complete and versatile solution for the applications such as FTTx, CWDM, and carrier Ethernet. By the diversified speeds of 1,000Mbps and 10G, Xtramus provides different XC series module cards for different applications and can be applied according to your ideal network topology.

Combined with XC series module cards, MCS-2160 media converter chassis provide various interfaces such as UTP, SFP, SFP+, XFP and CX4. All these interfaces are developed to support the protocols such as 100Base-Tx, 100Base-Fx, 1000Base-T, 1000Base-X, 10GBase-T, 10GBase-LR, 10GBase-SR and 10GBase-CX4, thus making your network more complete and solid.

Also, XC series module cards support MIB Counter Report including counters such as Packet, Byte, Broadcast packet, Pause Frame, Length: 64 Bytes, Length: 65~127 Bytes, Length: 128~255 Bytes, Length: 256~511 Bytes, Length: 512~1023 Bytes, Length: 1024~1518 Bytes, Unicast packet, Multicast packet, CRC Error, IP Checksum Error, Under size packet, and Over size packet.

All XC series module cards are equipped with real-time LEDs which display the status of each port, thus allowing users to view network status easily.

MCS-2160 media converter chassis provides an easy-to-access Management Webpage, allowing users to view system status, counters, upgrading firmware/FPGA and network statistics. Moreover, XC-CASC module card allows you to cascade multiple MCS-2160 chassis for managing these chassis at the same time.

With various interfaces, MCS-2160 provides different conversions between fibers and copper wires in 10G Ethernet.

1.2. Features, Key Advantages, and Main Applications of MCS-2160

Features

- Diversified interfaces including SFP, SFP+, UTP, XFP and CX4
- Supports 3R (Re-generation, Re-timing, Re-shaping) Performance for extending network cable coverage
- Supports Jumbo Frame
- Supports D/D (Digital Detection) functioned optical transceivers and overload protection
- Support easy-to-use Management Webpage that allows users to view system status, counters, upgrading firmware/FPGA and network statistics
- Multiple MCS-2160 chassis can be cascaded for system management
- Replaceable power modules for AC & DC power
- Supports Link Loss Forwarding
- Optional Fan Tray (MCS-FANT-05) which can be placed under MCS-2160 chassis for ventilation

Key Advantages

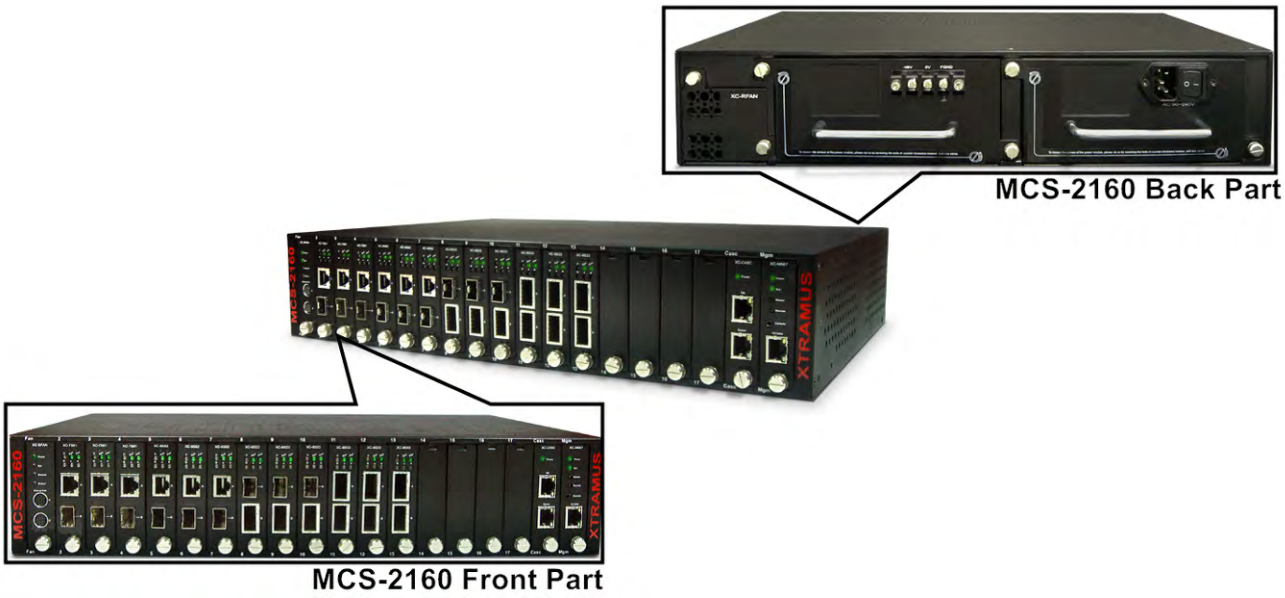
- Fast connection with multi-function
- Provide reliable long-distance connection
- Port supported: SFP, SFP+, UTP, XFP and CX4

Main Applications

- Media converter for network backbone
- Connection between fiber to copper or fiber to fiber 10G Ethernet equipment
- Providing protections against lightning and static electricity for Ethernet network and the network main system
- Providing additional network management options
- Can be applied in Telecommunication room, R&D laboratory, Data center, etc

1.3. MCS-2160 Functions Overview

1.3.1. MCS-2160 Outer Case



MCS-2160's outer case consists two parts: **Front Part** and **Back Part**. The figure above shows the outer case of MCS-2160. Outer cases of other MCS-2160 are quite the same and can be related.

MCS-2160 Outer Case Overview	
Front Part	MCS-2160 has 16 slots for installation of module cards, where each module card provides media converting platforms for different types of media. Besides, the Front Part includes 3 slots with Fan, CASC and Management module card installed. Please see "**1.3.2. MCS-2160 Front Part**" for more detailed information.
Back Part	MCS-2160's back part includes 3 different slots for installation of a DC module, AC module and a Fan module. Please see "**1.3.3. MCS-2160 Back Part**" for more detailed information.

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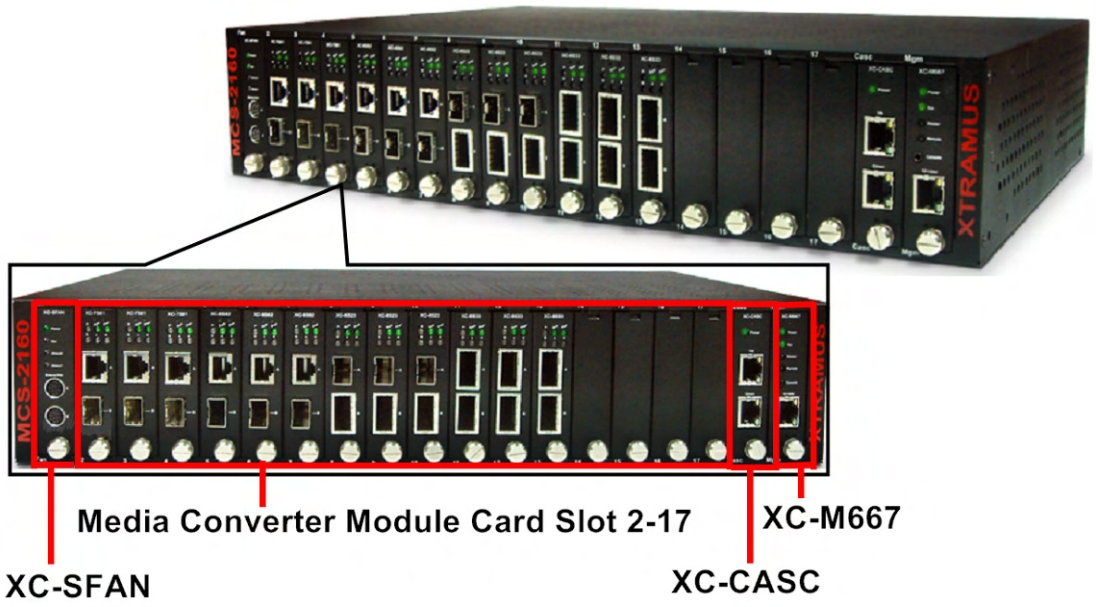
1.3.2. MCS-2160 Front Part

As mentioned in "**1.3.1. MCS-2160 Outer Case**", MCS-2160 has 16 slots for installation of media converter module cards and 3 slots comprising a Fan, CASC and Management module card installed. Please see the sections down below for more detailed information/specification for MCS-2160 and the module cards.



MCS-2160 Front Part	
XC-SFAN	It is a fan module card pre-installed in front part of MCS-2160 chassis.
XC-M667	It is a module card pre-installed in MCS-2160 chassis with 1 Management port for accessing the Management Webpage and 1 Console port for accessing the HyperTerminal settings.
XC-CASC	It is a module card pre-installed in MCS-2160 with 2 ports where each port can connect another MCS-2160 providing simultaneous access to the Management Webpage.
Media Converter Module Card Slots 2-17	Media converter module cards can be inserted in each of slot 2-17.

***Note: XC-SFAN, XC-M667 and XC-CASC do not support hot swap, please, do not withdraw the XC-SFAN, XC-M667 and XC-CASC module card when the system is power on.**

***Note2: Do not change XC-M667, XC-CASC and XC-SFAN inserting slot.**

1.3.3. Module Cards

MCS-2160's module cards can be divided into two categories: **System Module Cards** and **Media Converter Module Cards**.

Module Card Type	Module Card	Description
System Module Cards	• XC-SFAN • XC-M667 • XC-CASC	These module cards can provide ventilation for the MCS-2160 chassis, allowing users to view counters/perform system maintenance, or cascade multiple MCS-2160 chassis. Please note that **System Module Cards** do not support hot-swap, and must be installed to their designated slots on MCS-2160 chassis.
Media Converter Module Cards	• XC-7S81 • XC-8S22 • XC-8S23 • XC-8S82 • XC-8S62 • XC-8S33 • XC-8S83	Module cards for media converting. These Media Converter Cards can be installed in MCS-2160 Slot 2~17 and support hot-swap.

Please see the sections down below for more detail information regarding to MCS-2160 Module Cards.

System Module Cards

A. System Module Card – XC-SFAN

The **XC-SFAN** comes with your MCS-2160 chassis, and shall be installed on the **Fan** slot located on the far left side of MCS-2160 chassis. This module card provides ventilation for the MCS-2160 chassis.

Also, XC-SFAN's **CTRL + PWR** and **PWR** ports are designed to provide power source and gather information for MCS-FANT fan tray. When connecting XC-SFAN to MCS-FANT fan tray, please do so by connect to MCS-SFAN's **CTRL + PWR** port to MCS-FANT's **CTRL + PWR** port, and XC-SFAN's **PWR** port to MCS-FANT's **PWR** port.

If you cross connect between **CTRL + PWR** port and **PWR** port of XC-SFAN and MCS-FANT, MCS-2160 will be seriously damaged.

Interface Ports		
CTRL + PWR	8-Pin Mini-Din Port which can provide power for MCS-FANT and system information regarding to MCS-FANT	
PWR	8-Pin Mini-Din Port which can provide power for MCS-FANT	
LED		
Power	**Green ON**	XC-SFAN is power on
	Green OFF	XC-SFAN is power off
Sys	**Green ON**	XC-SFAN is powering up properly
	Green OFF	XC-SFAN is power off
Status 0	User-defined LED	
Status 1	User-defined LED	
***Note: XC-SFAN does not support hot-swap. Please do not draw the XC-SFAN module card from MCS-2160 chassis when the system is power on.**		

B. System Module Card – XM-M667

The **XC-M667** comes with your MCS-2160 chassis, and shall be installed on the **Mgm** slot located on the far right side of MCS-2160 chassis. This module card allows you to manage MCS-2160 chassis via management webpage.

To access the Management Web Page of MCS-2160 for configuration on your browser, please connect a RJ45 cable between the Management port of MCS-2160 and your PC.

To configure MCS-2160 on your PC (Telnet or Hyper Terminal), please connect a 2.5mm Phone Jack to RS232 between your PC and Console Port of MCS-2160, where the 2.5mm Phone Jack end must be plug in the Console Port of MCS-2160 and the RS232 end must be connect to your PC.

Interface Ports		
Console Port	One 2.5mm Phone Jack Port for managing MCS-2160 via HyperTerminal	
Management Port	One 10/100M RJ45 Port for managing MCS-2160 via management webpage	
LED		
Power	**Green ON**	XC-M667 is power on
	Green OFF	XC-M667is power off
Sys	**Yellow ON**	XC-M667 is booting and preparing for test
	Green ON (Blinking)	XC-M667 is booting properly and is ready for test
	Green OFF	XC-M667 is power off
Master	User defined LED	
Remote	User defined LED	

***Note: XC-M667 does not support hot-swap. Please do not draw the XC-M667 module card from MCS-2160 chassis when the system is power on.**

C. System Module Card – XC-CASC

The **XC-CASC** comes with your MCS-2160 chassis, and shall be installed on the **Casc** slot located on the right side of MCS-2160 chassis (next to **XC-M667** module card). This module card allows you to cascade multiple MCS-2160 chassis.

On a rack mount structure with numerous MCS-2160 installed, you can inter-connect a MCS-2160 with another MCS-2160 situated above or below by using a RJ45 cable connecting theirs Port (Up) or Port (Down). By doing the inter-connection, you can access the Management Web Page for all the inter-connected MCS-2160 by only linking one of theirs XC-M667 Management Port on your PC.

Interface Ports		
Port (Up)		One 10/100M RJ45 Port for cascading another MCS-2160 chassis
Port (Down)		One 10/100M RJ45 Port for cascading another MCS-2160 chassis
LED		
Power	**Green ON**	MCS-2160 is power on
	Green OFF	MCS-2160 is power off

***Note: XC-CASC does not support hot-swap. Please do not draw the XC-CASC module card from MCS-2160 chassis when the system is power on.**

Media Converter Module Cards

A. Media Converter Module Card – XC-7S81

XC-7S81 Front Panel Specification		
Interface	Port A	RJ45
	Port B	SFP
Data Transfer Rate		1000 Mbps
Ethernet Mode		1000Base-T 1000Base-X

LED Status		
Power	Green ON	XC-7S81 is power on.
	Green OFF	XC-7S81 is power off.
SYS	Green ON	XC-7S81 is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting XC-7S81.
A/B	Green ON	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	
Note: All LEDS will be off when upgrading FPGA/Firmware		

B. Media Converter Module Card – XC-8S22

XC-8S22 Front Panel Specification		
Interface	**Port A**	SFP+
	Port B	SFP+
Data Transfer Rate		10G Mbps
Ethernet Mode		10GBase-LR 10GBase-SR

LED Status		
Power	**Green ON**	XC-8S22 is power on.
	Green OFF	XC-8S22 is power off.
SYS	**Green ON**	XC-8S22 is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting XC-8S22.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	
Note: All LEDS will be off when upgrading FPGA/Firmware		

C. Media Converter Module Card – XC-8S23

XC-8S23 Front Panel Specification		
Interface	**Port A**	SFP+
	Port B	XFP
Data Transfer Rate		10G Mbps
Ethernet Mode		10GBase-LR 10GBase-SR

LED Status		
Power	**Green ON**	XC-8S23 is power on.
	Green OFF	XC-8S23 is power off.
SYS	**Green ON**	XC-8S23 is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting XC-8S23.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	
Note: All LEDS will be off when upgrading FPGA/Firmware		

D. Media Converter Module Card – XC-8S33

XC-8S33 Front Panel Specification		
Interface	**Port A**	XFP
	Port B	XFP
Data Transfer Rate		10G Mbps
Ethernet Mode		10GBase-LR 10GBase-SR

LED Status		
Power	**Green ON**	XC-8S33 is power on.
	Green OFF	XC-8S33 is power off.
SYS	**Green ON**	XC-8S33 is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting XC-8S33.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	
Note: All LEDS will be off when upgrading FPGA/Firmware		

E. Media Converter Module Card – XC-8S62

XC-8S62 Front Panel Specification		
Interface	**Port A**	CX4
	Port B	SFP+
Data Transfer Rate		10G Mbps
Ethernet Mode		10GBase-LR 10GBase-SR 10GBase-CX4

LED Status		
SYS	**Green ON**	XC-8S62 is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting XC-8S62.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
Note: All LEDS will be off when upgrading FPGA/Firmware		

F. Media Converter Module Card – XC-8S82

XC-8S82 Front Panel Specification		
Interface	**Port A**	RJ45
	Port B	SFP+
Data Transfer Rate		10G Mbps
Ethernet Mode		10GBase-LR 10GBase-SR 10GBase-T

LED Status		
Power	**Green ON**	XC-8S82 is power on.
	Green OFF	XC-8S82 is power off.
SYS	**Green ON**	XC-8S82 is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting XC-8S82.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	
Note: All LEDS will be off when upgrading FPGA/Firmware		

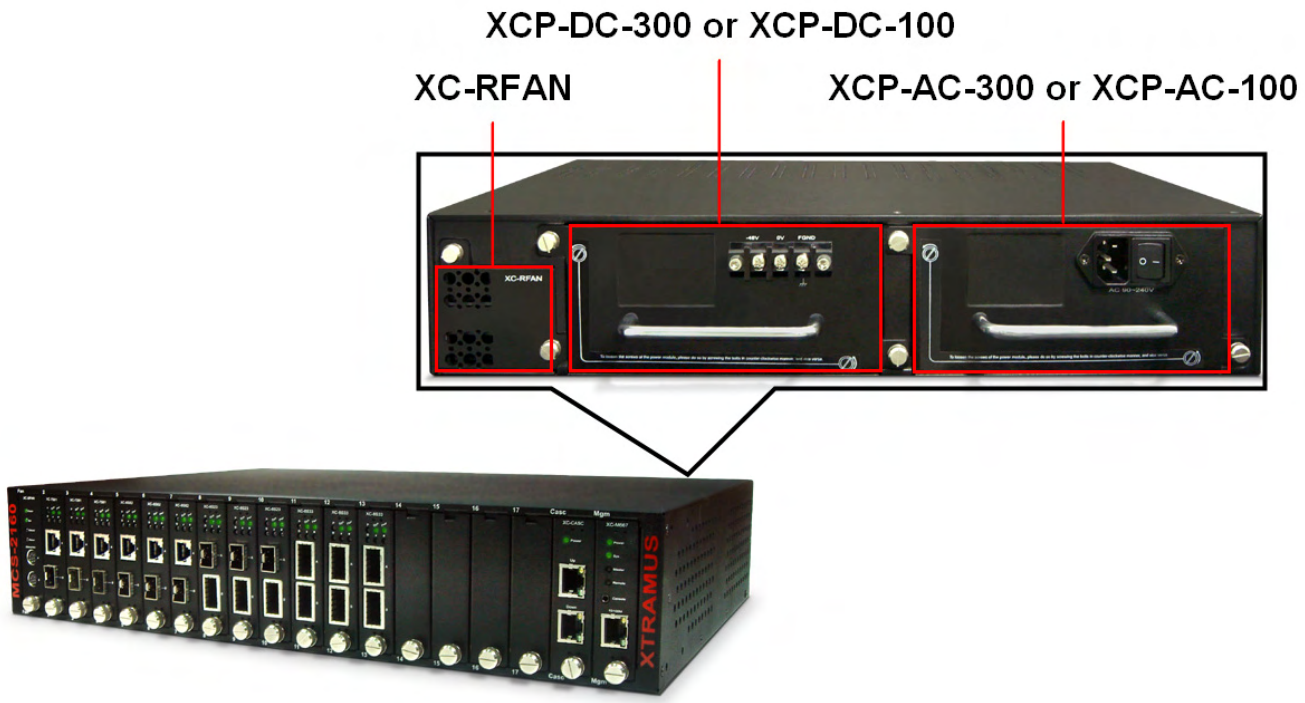
G. Media Converter Module Card – XC-8S83

XC-8S83 Front Panel Specification		
Interface	**Port A**	XFP
	Port B	XFP
Data Transfer Rate		10G Mbps
Ethernet Mode		10GBase-LR 10GBase-SR 10G-Base-T

LED Status		
Power	**Green ON**	XC-8S33 is power on.
	Green OFF	XC-8S33 is power off.
SYS	**Green ON**	XC-8S33 is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting XC-8S33.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	
Note: All LEDS will be off when upgrading FPGA/Firmware		

1.3.4. MCS-2160 Rear End

As mentioned in "**1.3.1. MCS-2160 Outer Case**", MCS-2160's rear end includes 3 different slots for installation of a DC module, AC module and a Fan module. Please see the sections down below for more detailed information/specification for MCS-2160 and modules.

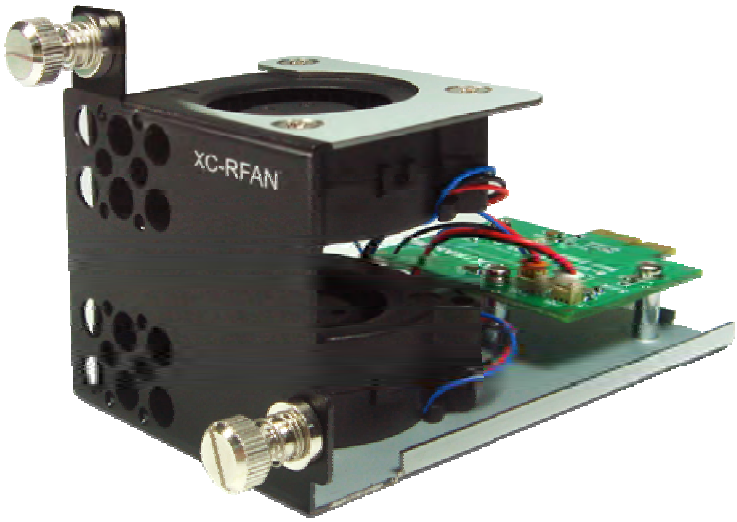


MCS-2160 Back Part Description	
XC-RFAN	It is a fan module card pre-installed in back part of MCS-2160 chassis.
XCP-DC-300 or XCP-DC-100	It is a power module card based on DC power source.
XCP-AC-300 or XCP-AC-100	It is a power module card based on AC power source.

MCS-2160 Fan/Power Module

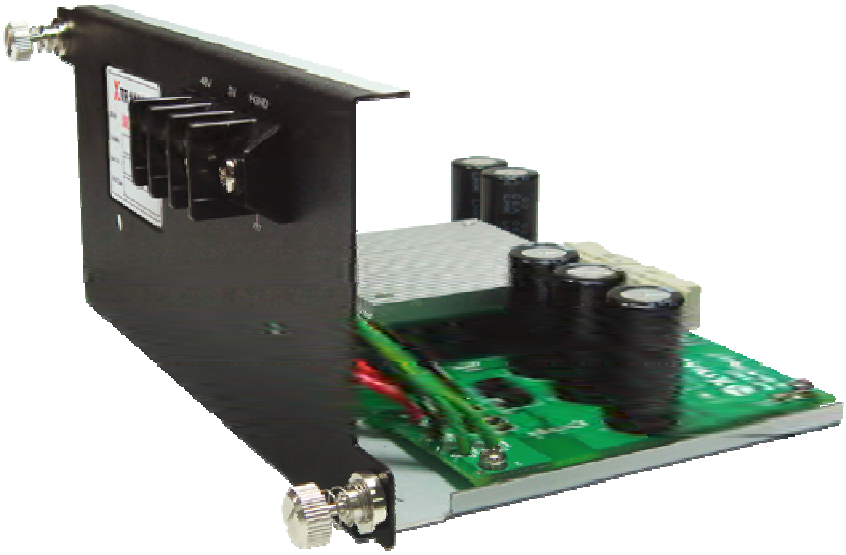
A. XC-RFAN Fan Module

The XC-RFAN consists of two fans as shown in the figure below. After installing XC-RFAN, the Management Web Page will show the operation of XC-RFAN, please see the **3.1.4. MCS-2160 Management Webpage – Management** for more information about showing the operation of XC-RFAN.



B. XCP-DC-300 & XCP-DC-100

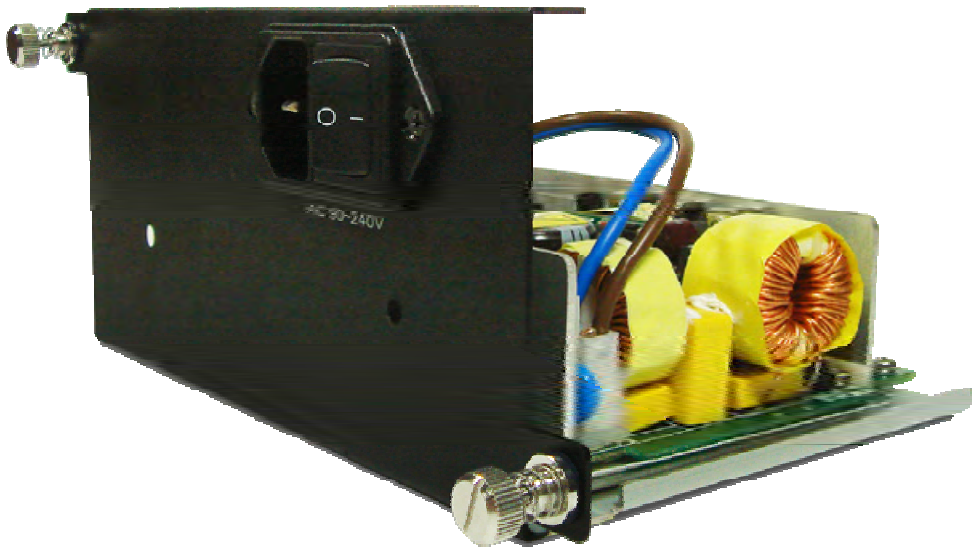
Depending on your need, there is XCP-DC-300 with power source of 300W DC Redundant SPS (Vin 36~72VDC) and XCP-DC-100 with power source of 100W DC Redundant SPS (Vin 36~72VDC) as option to purchase.



The Power Jack of XCP-DC-300 & XCP-DC-100 is 3 Terminal Connectors: -48V, OV, FGND. The Terminal Connector -48V and OV have a screw to fix an external power source cable. The FGND also has a screw, but this screw should be fixed with an external cable connected to the ground.

C. XCP-AC-300 & XCP-AC-100

Depending on your need, there is XCP-AC-300 with power source of 300W AC Redundant SPS (Vin 90~240VAC) and XCP-AC-100 with power source of 100W AC Redundant SPS (Vin 90~240VAC) as option to purchase.



The Power Jack of XCP-AC-300 & XCP-AC-100 is Male IEC 320 Receptable. To activate XCP-AC-300 & XCP-AC-100, just turn on/off the O/I button after connecting a power source cable in Male IEC 320 Receptable.

1.3.5. Optional Fan Tray – MCS-FANT-05

Set MCS-FANT-05 on the base of MCS-2160, with dimension of 441 mm x 310 mm x 29 mm.

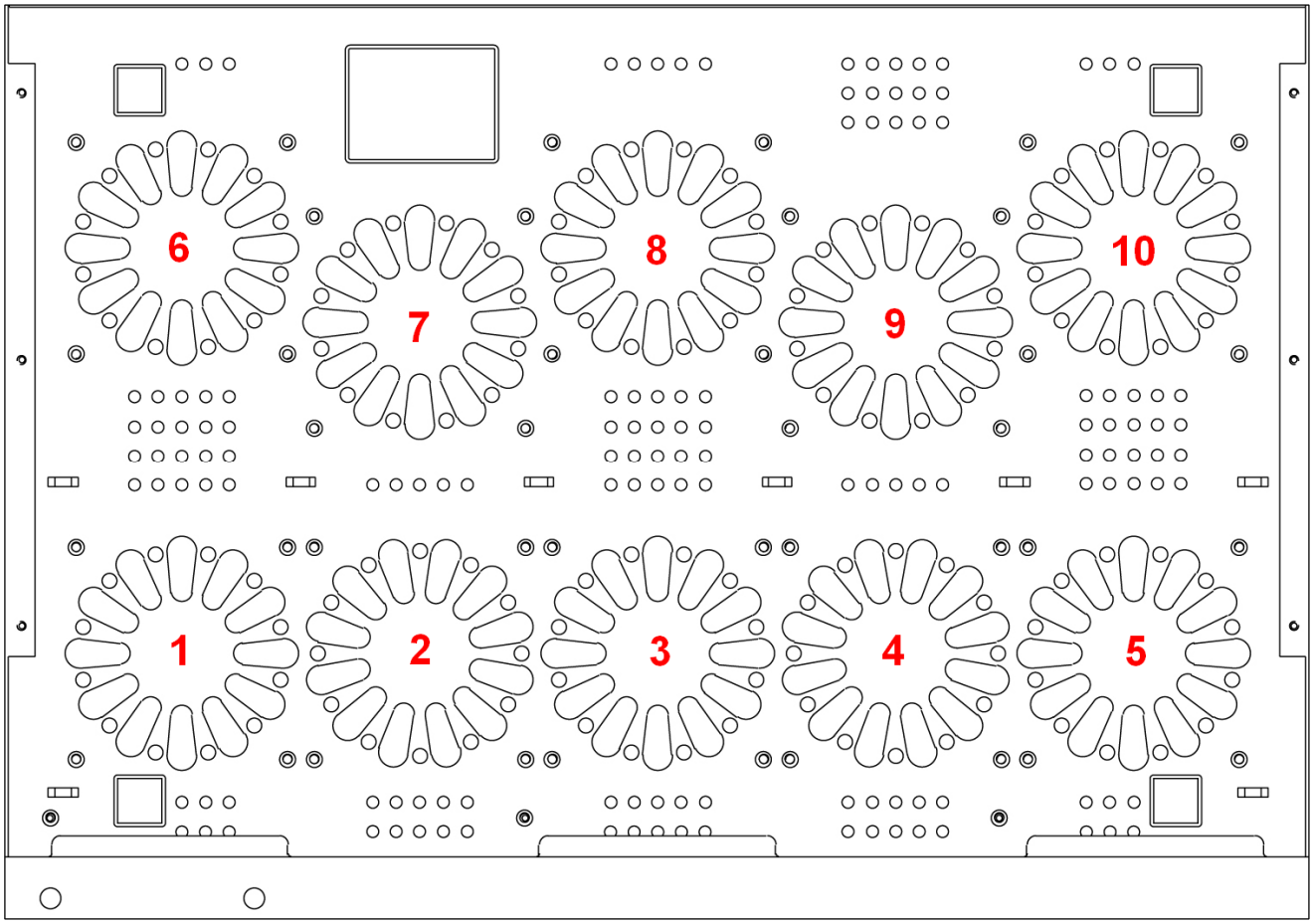
XC-SFAN's Port A and Port B are designed to provide power source and gather information for MCS-FANT fan tray. When connecting XC-SFAN to MCS-FANT fan tray, please do so by connect to MCS-SFAN's **CTRL + PWR** port to MCS-FANT's **CTRL + PWR** port, and XC-SFAN's **PWR** port to MCS-FANT's **PWR** port.

If you cross connect between **CTRL + PWR** port and **PWR** port of XC-SFAN and MCS-FANT, MCS-2160 will be seriously damaged.

Also, please note that when placing MCS-2160 on top of MCS-FANT, MCS-2160's four rubber feet must be placed properly on the MCS-FANT's four grooves, as shown in the figure down below:

To insure that MCS-FANT and MCS-2160's ventilation fans can work properly, please leave adequate space (**10 cm at least**) between the left/right sides and the buttom of MCS-FANT.

MCS-FANT contains LEDs that represent its ten fans. The figure down below shows how these fans are numbered.



2. MCS-2160 Installation

MCS-2160 is a chassis with 16 slots for installation of media converter modules. Installing MCS-2160 is very easy and simple: all you have to do is to plug the proper fiber/UTP cables into MCS-2160 ports like a general Ethernet switch without any extra configurations. However, selecting the proper physical media and applications in your network environment is crucial when installing MCS-2160. Besides, using the proper method for installing media converter modules into MCS-2160' slots is also crucial for the proper functionality of MCS-2160. Please see the sections down below for detailed information regarding to physical media types, MCS-2160 application and the proper method for installing a media converter module.

2.1. Choices of UTP Cable and Optical fiber

2.1.1. 10GBASE-T (Copper Wire)

10GBASE-T, or IEEE 802.3an-2006, is a standard released in 2006 to provide 10 gigabit/second connections over unshielded or shielded twisted pair cables and over distances up to 100 meters (330 ft). 10GBASE-T cable infrastructure can also be used for 1000BASE-T, allowing a gradual upgrade from 1000BASE-T, and auto-negotiation to select which speed to use.

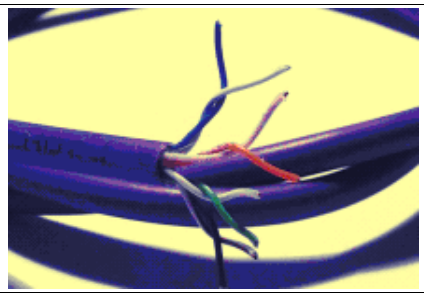
10GBASE-T Connectors

10GBASE-T uses 650 MHz versions of the venerable IEC 60603-7 8P8C (RJ-45) connectors, which is already widely used in Ethernet.

10GBASE-T Cables

10GBASE-T works up to 55 m (180 ft) with existing Category 6 cabling. In order to allow deployment at the usual 100 m (330 ft), the standard uses a new partitioned Category 6a cable specification, designed to reduce crosstalk between UTP cables.

The table down below is a reference regarding to UTP cable categories.

UTP Cable Categories References	
Cat 5	Provides performance of up to 100 MHz, and was frequently used on 100 Mbps Ethernet networks. Cat 5 may not be suitable for 1000BASE-T gigabit Ethernet.
Cat 5e	Provides performance of up to 100 MHz, and is frequently used for both 100 Mbps and Gigabit Ethernet networks.
Cat 6	Provides performance of up to 250 MHz, more than double of category 5 and 5e. It works up to 55 m (180 ft) for 10Gbps Ethernet.
Cat 6a	Provides performance of up to 500 MHz. It is suitable for 10GBASE-T and works up to 100 m (330 ft) for 10Gbps Ethernet. All the cables mentioned above do not have individually- shielded pairs as the picture here, including Cat 6a. 
Cat 7	This standard specifies four individually-shielded pairs (STP) inside an overall shield. Designed for transmission at frequencies up to 600 MHz. It has better performance than Cat 6a.

2.1.2. 10GBASE-R (Optical Fiber)

10GBASE-R is 10Gbps Ethernet connection that based on IEEE802.3ae. It uses fiber as transmission media with different specification of fiber, connector and transceiver. MCS-2160 uses two standards, 10GBASE-LR and 10GBASE-SR.

10GBASE-SR

10GBASE-SR ("Short Range") uses 64B/66B encoding and 850 nm wavelength lasers. It is designed to support short distances over deployed multi-mode fiber cabling, it has a range of between 26 meters (85 ft) and 82 meters (270 ft) depending on cable type. It also supports 300 meters (980 ft) operation over new, 50 µm 2000 MHz·km OM3 multi-mode fiber (MMF).

The transmitter can be implemented with a VCSEL (Vertical Cavity Surface Emitting Laser) which is low cost and low power. MMF has the advantage of having lower cost connectors than SMF (single-mode fiber) due to its wider core.

10GBASE-SR delivers the lowest cost, lowest power and smallest form factor optical modules.

10GBASE-LR

10GBASE-LR ("Long Range") is a Long Range Optical technology delivering serialized 10 gigabit Ethernet over a laser with 1310 nm wavelength connection on single-mode fiber via IEEE 802.3 Clause 49 64B-66B Physical Coding Sub layer (PCS) using a line rate of 10.3125.

Single-mode optical cabling is used to interconnect transceivers at a distance spaced at 10 kilometers (6.2 mi), but it can often reach distances of up to 25 kilometers (16 mi) with no data loss.

Fabry–Pérot lasers are commonly used in 10GBASE-LR optical modules. Fabry–Pérot lasers are more expensive than VCSELs (mentioned above) but their high power and focused beam allow efficient coupling into the small core of single mode fiber.

Fiber Specification

Fibers which support many propagation paths or transverse modes are called multi-mode fibers (MMF). Fibers which can only support a single mode are called single-mode fibers (SMF). Multi-mode fibers generally have a larger core diameter, and are used for short-distance communication links and for applications where high power must be transmitted. Single-mode fibers are used for most communication links longer than 200 meters.

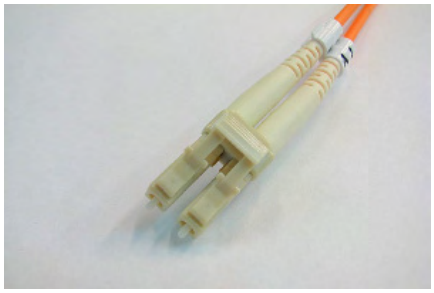
Fiber Buffer/Jacket Color	Meaning
Yellow	Single-mode optical fiber, long distance connection
Orange	Multi-mode optical fiber, short distance connection

Optical Fiber

As mentioned above, there are Single-mode and Multi-mode optical fiber. Both of them can be used for XC media converter module series.

Fiber Connector

Optical fiber connector contains two ends of fibers and can attach to SFP+ transceivers. There are two ports for one SFP+ transceiver: one fiber is for receiving and one fiber is for transmitting. The picture here is called LC connector that can attach to SFP+ transceiver.



Transceiver (Connector)

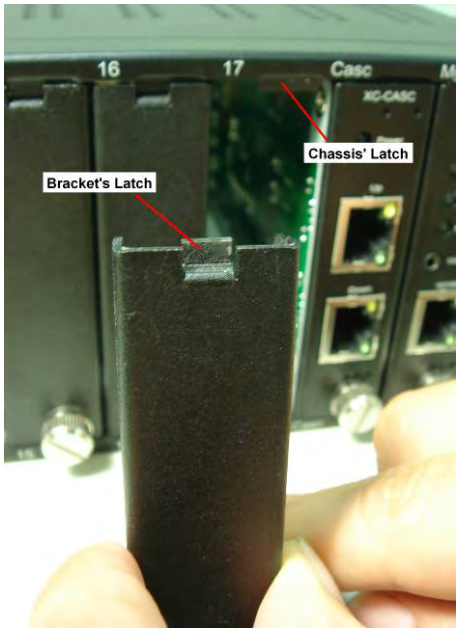
SFP+/XFP Transceivers can be plugged into XC media converter module's SFP+/XFP Ports. SFP+/XFP Transceivers are active components that consume power from XC media converter module and are capable of converting signals between optical data flow and electronic data flow.

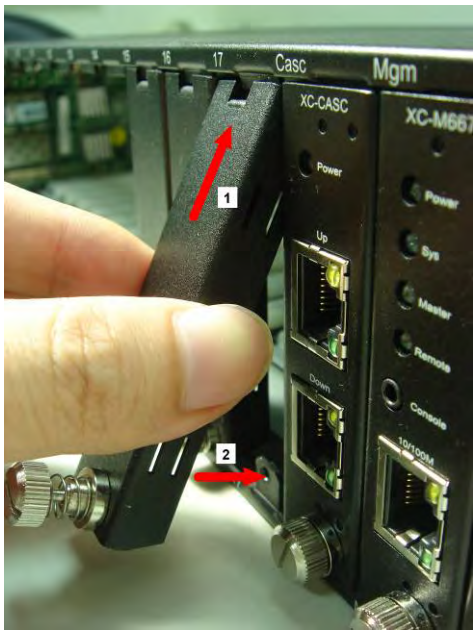
For different transmission purpose, the component inside SFP+ form factor can be 10BASE-LR or 10BAST-SR mode.

2.2. Hardware Installation

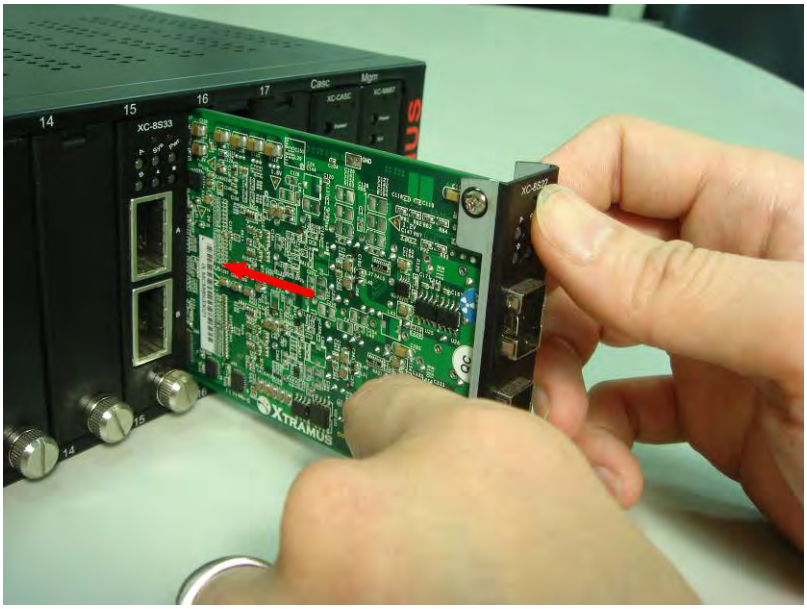
Please follow the steps shown below for a better understanding on how to install hardware in MCS-2160.

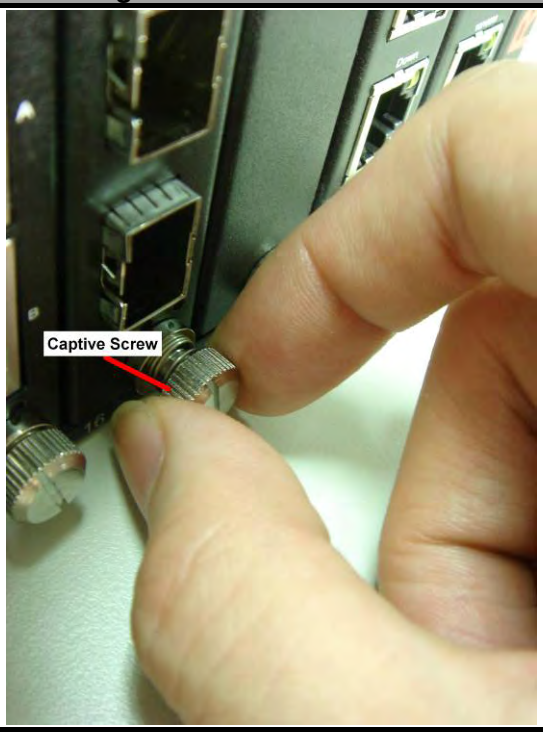
2.2.1. Bracket installation

Steps for installing a Bracket in MCS-2160	
	First of all, you must have an Empty Slot for the Installation of a Bracket.
	Attach the Bracket's Latch on the internal face of Chassis' Latch.

Steps for installing a Bracket in MCS-2160	
	After attaching the Bracket's Latch on the internal face of Chassis' Latch, let this point be a fix central rotation point and push the bottom part of Bracket into MCS-2160.
	Lock the Captive Screw into the MCS-2160 to fix the Bracket into MCS-2160.

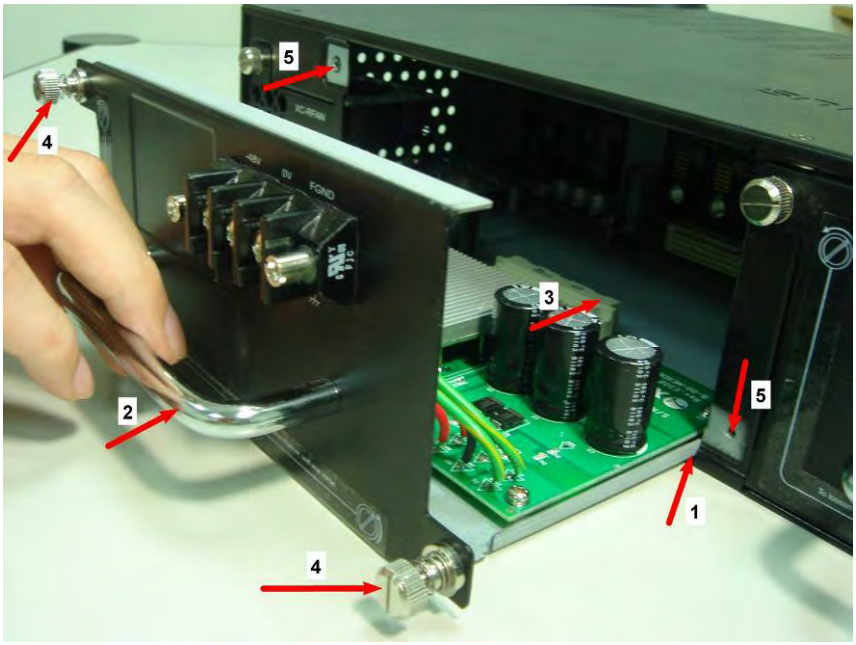
2.2.2. Module Cards Installation

Steps for installing a Media Converter Module Card in MCS-2160	
	Aim the border side of a Media converter Module Card with the MCS-2160 internal slide road, and push this Module Card into MCS-2160.
	Please, make sure if the Media Converter Module Card is well fixed into MCS-2160 by pushing the bracket of the Module Card into MCS-2160.

Steps for installing a Media Converter Module Card in MCS-2160	
	Lock the Captive Screw into the MCS-2160 to fix the Module Card into MCS-2160.

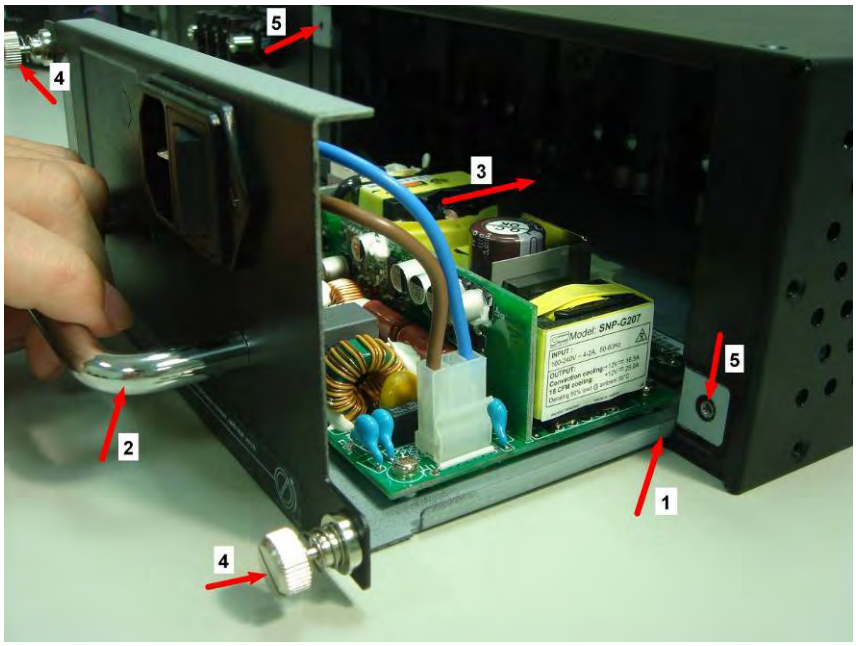
2.2.3. Power Module

2.2.3.1. XCP-DC-300 & XCP-DC-100

Steps for installing a XCP-DC-300 & XCP-DC-100	
	Installing a XCP-DC-300 & XCP-DC-100 into MCS-2160 is quite simple. First of all, attach the Power Module into the respective slot of MCS-2160 and push the handle of the Power Module into the slot. After the Bracket of the Power Module reaches the MCS-2160, lock the captive screw into MCS-2160 as shown by arrows 4 and 5. **Note: The XCP-DC-300 & XCP-DC-100 don't support hot swap. Please don't remove Power Module during System operation.**

2.2.3.2. XCP-AC-300 & XCP-AC-100

Steps for installing a XCP-AC-300 & XCP-AC-100



Installing a XCP-AC-300 & XCP-AC-100 into MCS-2160 is quite simple. First of all, attach the Power Module into the respective slot of MCS-2160 and push the handle of the Power Module into the slot. After the Bracket of the Power Module reaches the MCS-2160, lock the captive screw into MCS-2160 as shown by arrows 4 and 5.

Note: The XCP-AC-300 & XCP-AC-100 don't support hot swap. Please don't remove Power Module during System operation.

2.2.4. Fan Module

2.2.4.1. XC-SFAN

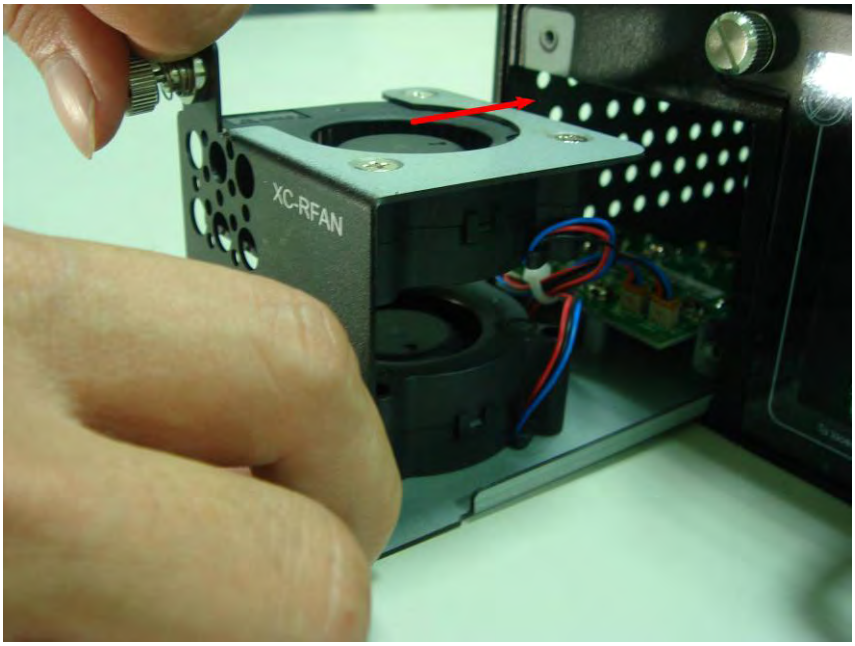
Steps for installing the XC-SFAN

The XC-SFAN comes with your MCS-2160 chassis, and shall be installed on the Fan slot located on the far left side of MCS-2160 chassis. This module card provides ventilation for the MCS-2160 chassis.

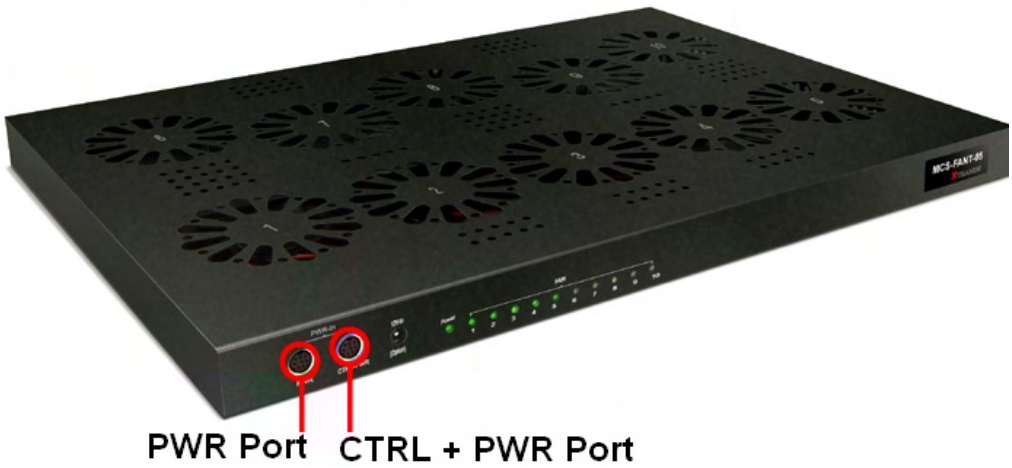
Also, XC-SFAN's CTRL + PWR and PWR ports are designed to provide power source and gather information for MCS-FANT fan tray. When connecting XC-SFAN to MCS-FANT fan tray, please do so by connect to MCS-SFAN's CTRL + PWR port to MCS-FANT's CTRL + PWR port, and XC-SFAN's PWR port to MCS-FANT's PWR port.

If you cross connect between CTRL + PWR port and PWR port of XC-SFAN and MCS-FANT, MCS-2160 will be seriously damaged.

2.2.4.2. XC-RFAN

Steps for installing the XC-RFAN	
	Installing the XC-RFAN is quite simple, just attach the XC-RFAN into the respective slot of MCS-2160, and push it into the slot. After the Bracket of the XC-RFAN reaches the MCS-2160, lock the captive screw into MCS-2160. **Note: The XC-RFAN doesn't support hot swap. Please don't remove Power Module during System operation.**

2.2.4.3. MCS-FANT-05

Steps for installing the MCS-FANT-05	
	Just set the MCS-FANT-05 on the base face of the MCS-2160, and connect the CTRL + PWR port and PWR port of XC-SFAN with the CTRL + PWR port and PWR port of XC-RFAN for power supply. **Note: Cross-connection between CTRL + PWR and PWR ports will seriously damage the MCS-2160.**

***Note: In a rack mount installation of MCS-2160, the distance between two MCS-2160 must unless be 2U (9 cm) for a better efficiency of the MCS-FANT-05.**

3. MCS-2160 Management

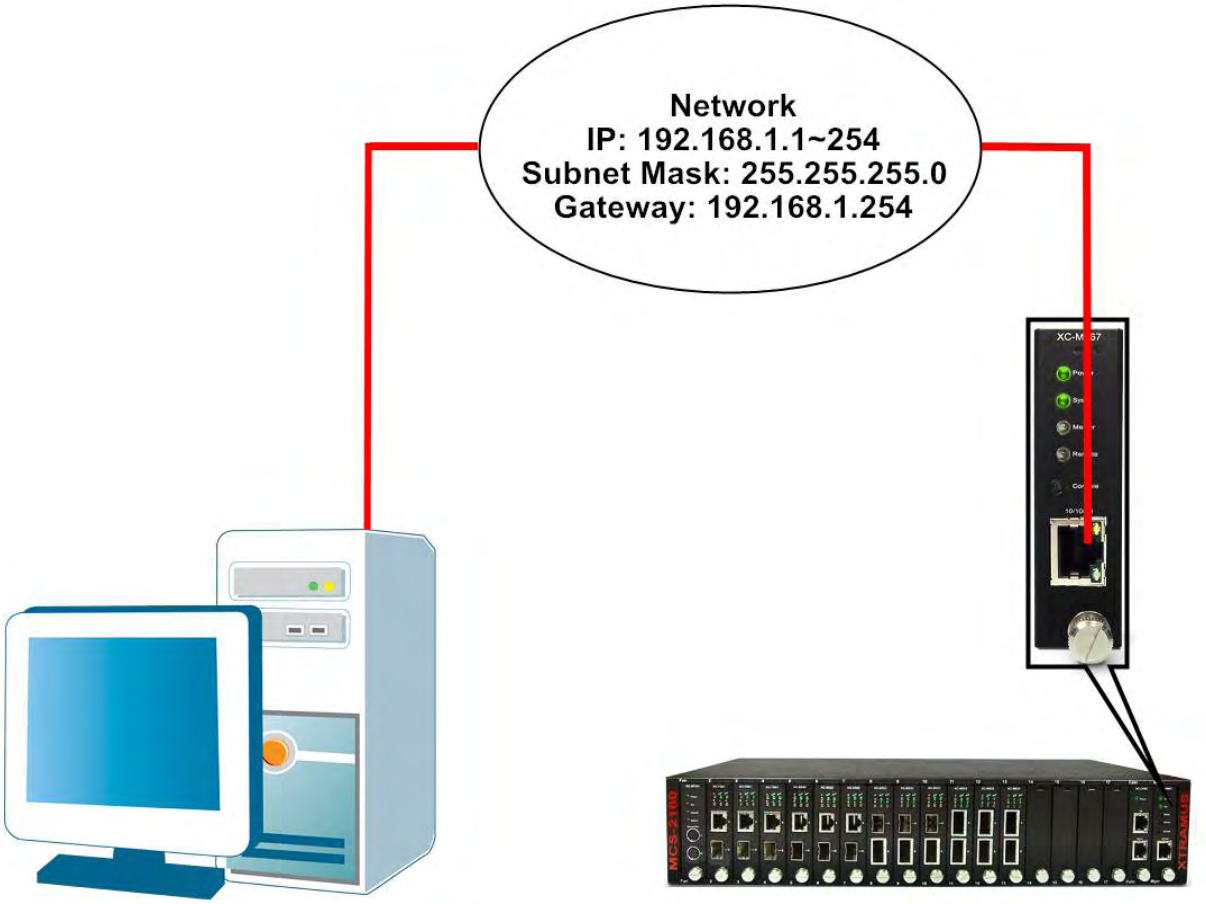
You can configure MCS-2160's settings and view statistics generated while performing media converting with MCS-2160 by connecting MCS-2160 and PC to the same network via an RJ45 cable, and accessing MCS-2160's settings/statistics with **PC's web browser**.

Please see the sections down below for more information regarding to MCS-2160 management.

3.1. Managing MCS-2160 with Management Webpage

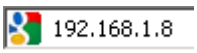
MCS-2160 is embedded with a management webpage, and can be accessed by connecting MCS-2160's **Management Port** to the network which your PC is connected to via an RJ45 cable.

Before accessing to MCS-2160's configuration webpage with your PC's web browser, please set the network according MCS-2160's default IP Address (**192.168.1.8**). The figure down below is an example of network/PC settings for accessing MCS-2160 management webpage.



3.1.1. Accessing MCS-2160 Management Webpage

To access MCS-2160's management webpage, please open your web browser, and type in MCS-2160's default IP address (**192.168.1.8**) in web browser's URL field as shown in the figure on the right side. **If you've changed MCS-2160's IP address, please input the IP address you've changed to instead.**



MCS-2160' management webpage supports web browsers such as **Microsoft Internet Explorer ® (IE7 or above)** and **Firefox**. MCS-2160's management webpage might not display correctly if you're using other web browser.

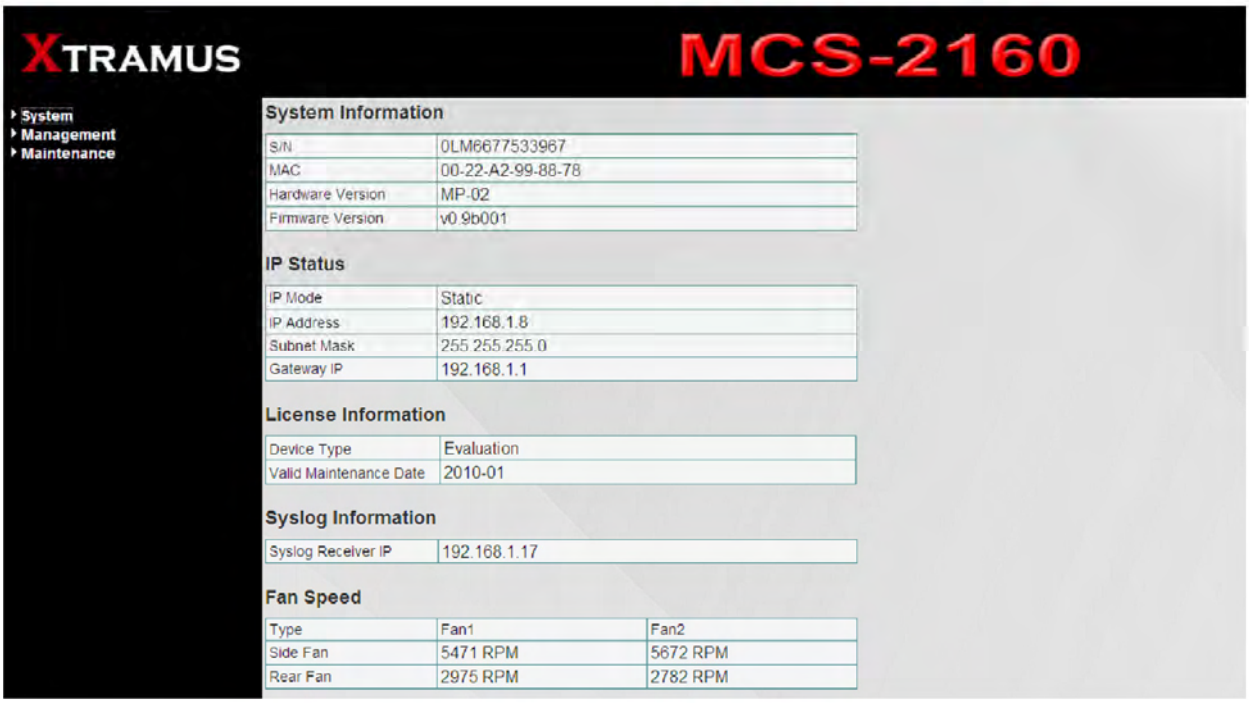
A window will pop up after you entering MCS-2160's IP address. Please enter the User Name and Password for MCS-2160's configuration webpage.

- **Default User Name: admin**
- **Default Password: admin***

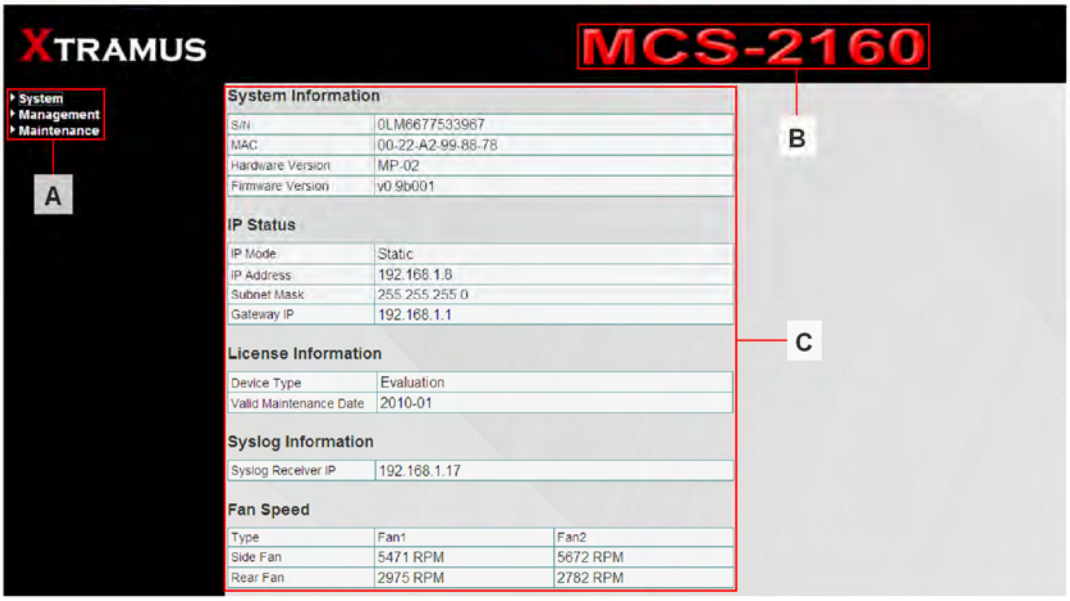
  ***Please note that the User Name and Password are case-sensitive.**

For safety issues, it is highly recommended that you should change the User name and Password when logging to MCS-2160's management webpage for the first time.

After inputting MCS-2160 management webpage's User Name and Password, you should be able to see MCS-2160's management webpage displayed on your web browser as shown in the figure down below.

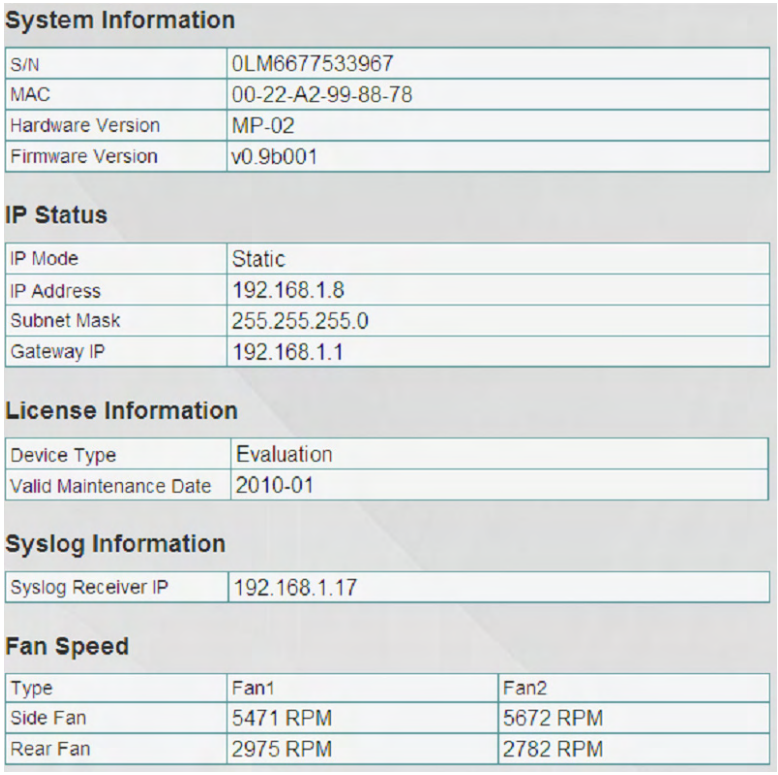


3.1.2. MCS-2160 Management Webpage – Overview



MCS-2160 Management Webpage Overview		
A	**Setting Options**	The **Setting Options** contains options for MCS-2160 settings, information, and statistics, which can be divided into: • **System:** You can view system information here in this field. • **Management:** This option allows you to make settings such as MCS-2160's IP address, SNMP, or user accounts. • **Maintenance:** This option allows you to save system settings, reboot MCS-2160, and reset all MCS-2160' settings to default value.
B	**Model Name**	This field displays the model name of your MCS-2160.
C	**Main Display Screen**	The **Main Display Screen** displays the system information, network tapping statistics, License Information, and Fans information.

3.1.3. MCS-2160 Management Webpage – System



System Information

S/N	0LM6677533967
MAC	00-22-A2-99-88-78
Hardware Version	MP-02
Firmware Version	v0.9b001

IP Status

IP Mode	Static
IP Address	192.168.1.8
Subnet Mask	255.255.255.0
Gateway IP	192.168.1.1

License Information

Device Type	Evaluation
Valid Maintenance Date	2010-01

Syslog Information

Syslog Receiver IP	192.168.1.17

Fan Speed

Type	Fan1	Fan2
Side Fan	5471 RPM	5672 RPM
Rear Fan	2975 RPM	2782 RPM

System Information displays MCS-2160' system information including:

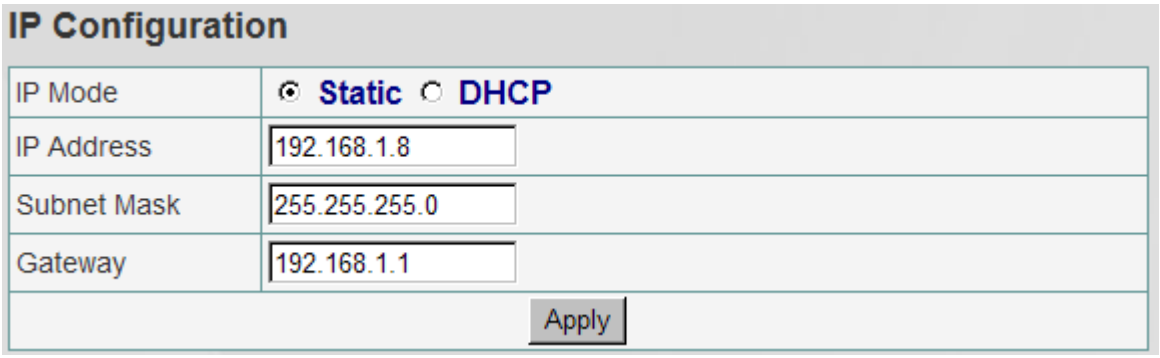
System Information	
S/N	MCS-2160' serial number.
MAC	MCS-2160's MAC address.
H/W version	Version of XC-M667's PCB.
Firmware Version	MCS-2160's current firmware version.
Management Port	
IP Mode	This field displays how MCS-2160 acquires its IP address. • **Static:** MCS-2160's IP, subnet mask, and gateway addresses are assigned manually. • **DHCP:** MCS-2160's IP, subnet mask, and gateway addresses are assigned automatically by a DHCP server.
IP Address	MCS-2160's IP address.
Subnet Mask	MCS-2160's subnet mask.
Gateway	MCS-2160's gateway address.
License Information	
Device Type	This field displays the device type of your MCS-2160: • **Normal:** for users that purchased the License of MCS-2160. • **Evaluation:** for users that are only testing the MCS-2160.
Valid Maintenance	The time limit for using the MCS-2160.
Syslog Information	
Syslog Receiver IP	This field displays the IP address for connection with 3CDaemon.
Fan Speed	
Side Fan	Shows the speed of Side Fan's Fan1 and Fan2 in Rotation Per Minute (RPM).
Rear Fan	Shows the speed of Rear Fan's Fan1 and Fan2 in Rotation Per Minute (RPM).

3.1.4. MCS-2160 Management Webpage – Management

There are 3 options available for **Management**, which includes:

- **IP Settings:** Allows you to set how MCS-2160 will acquire its IP, subnet mask, and gateway addresses. Also, you could input these addresses manually here.
- **Syslog Settings:** Shows the link status of each module on 3CDaemon.
- **User Settings:** Allows you to change MCS-2160's configuration webpage Password.
- **Chassis Management:** Displays the status of MCS-2160 and modules cards, also it allows you to see the counter, to do the FPGA / Firmware upgrading, to power on/off module card and access module card's port settings.

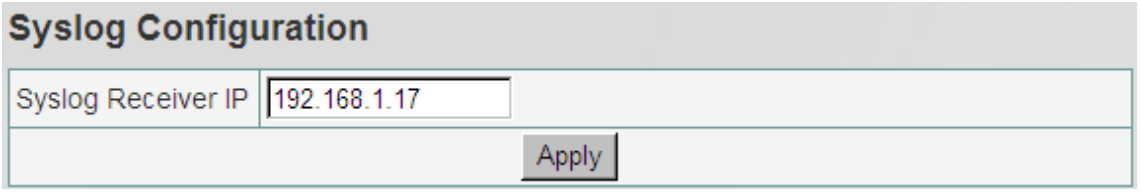
A. IP Configuration



IP Configuration	
IP Mode	You can choose how MCS-2160 acquires its IP, subnet mask, and gateway addresses. There are two modes available: • **Static:** You have to input MCS-2160's IP, subnet mask, and gateway addresses manually in the fields down below. • **DHCP:** MCS-2160 acquires its IP, subnet mask, and gateway addresses automatically from network's DHCP server.
IP Address	You can input MCS-2160's IP address here in this field.
Subnet Mask	You can input MCS-2160's subnet mask here in this field.
Gateway	You can input MCS-2160's gateway address here in this field.
Apply	Apply the changes you've made here.

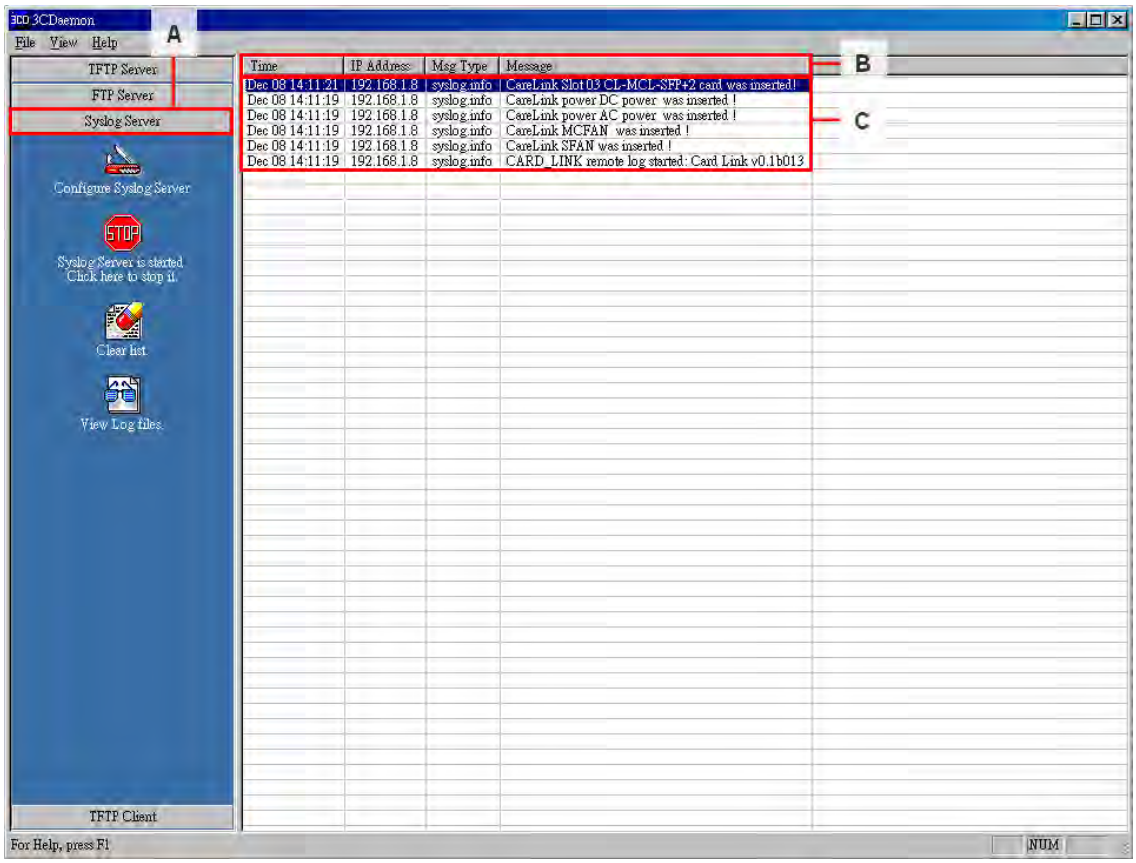
***Note1: The default IP address for MCS-2160 is 192.168.1.8.**

B. Syslog Settings

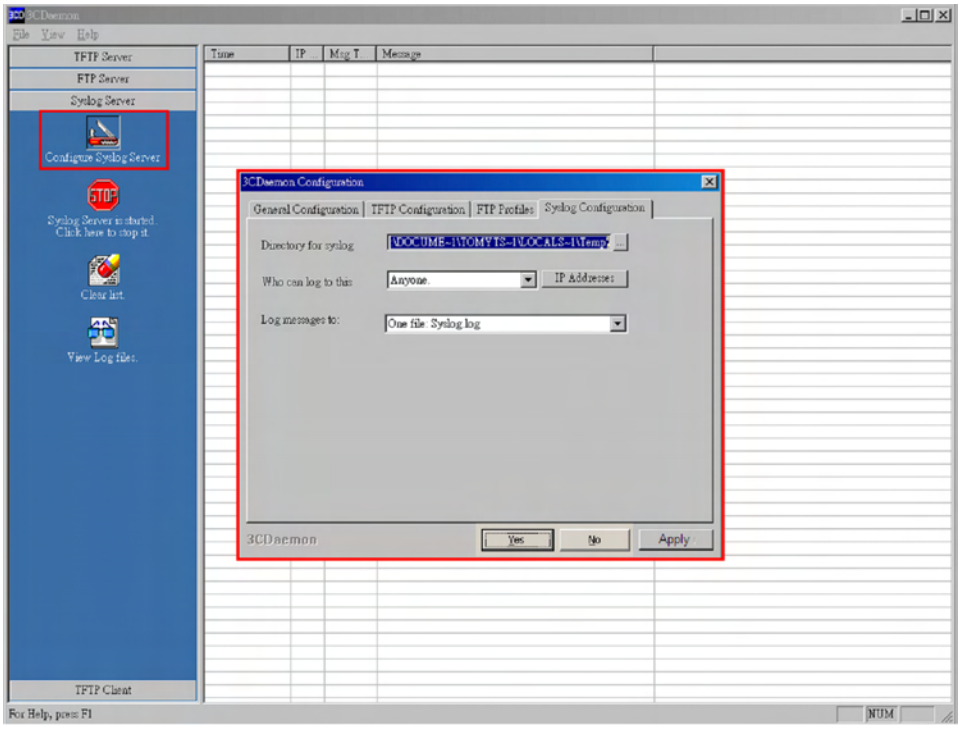


Syslog Configuration	
Syslog Receiver IP	You may set your Syslog Receiver IP in this field. The default Syslog Receiver IP is 192.168.1.17 .
Apply	Apply the changes you've made here.

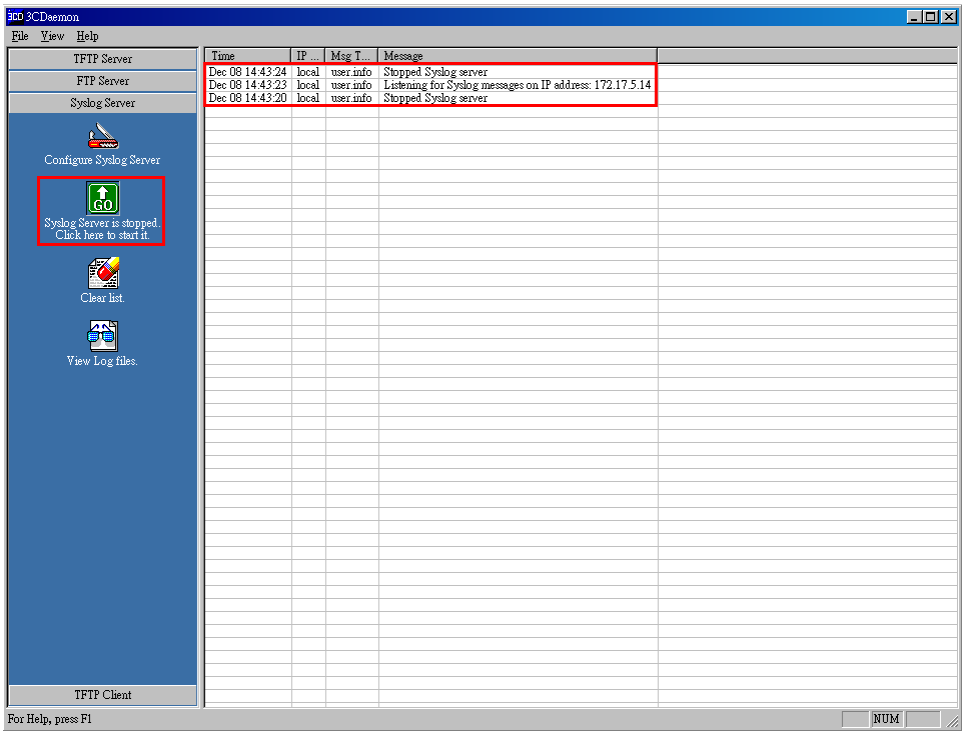
Before accessing Syslog Configuration for MCS-2160, please download and install the **3CDaemon** software. Please refer to the interface of **3CDaemon** shown below:



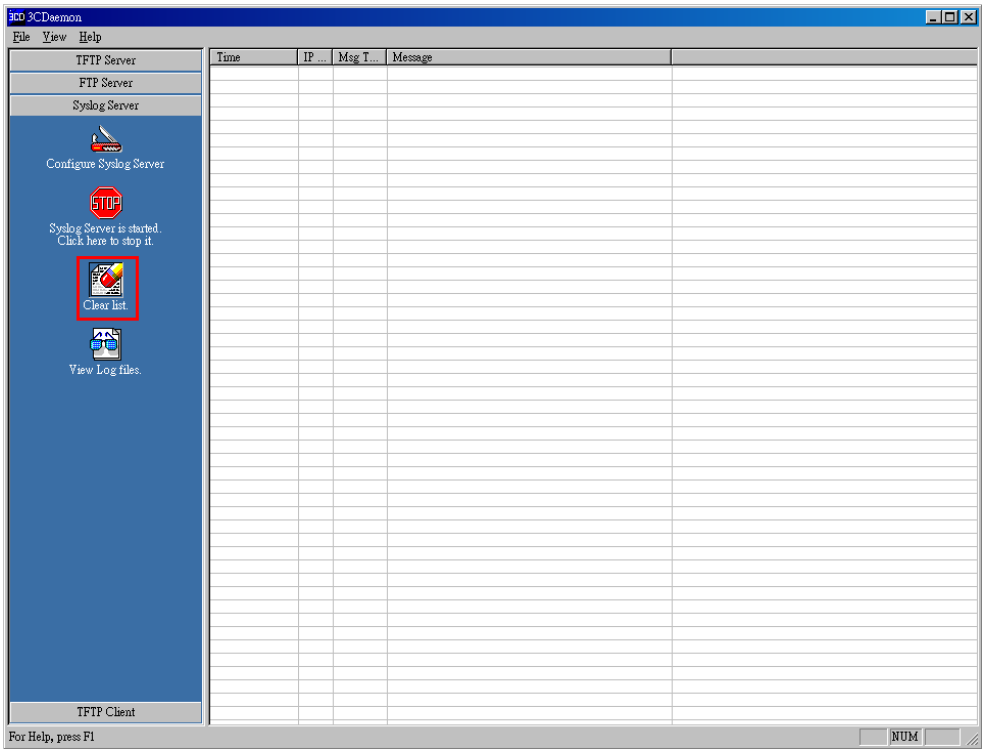
3CDaemon		
A	Please choose the Syslog Server option from the left side option of the 3CDaemon interface.	
B	**Time**	Shows the time record of each event.
	IP Address	The IP address of the source.
	Msg Type	The type of information currently displayed.
	Message	The currently status of the connected module.
C	This field shows the currently status of each module based on Time, IP Address, Msg Type and Message. The status to be shown includes: **system turn on/off, hot swap, updating F/W and module link status**.	



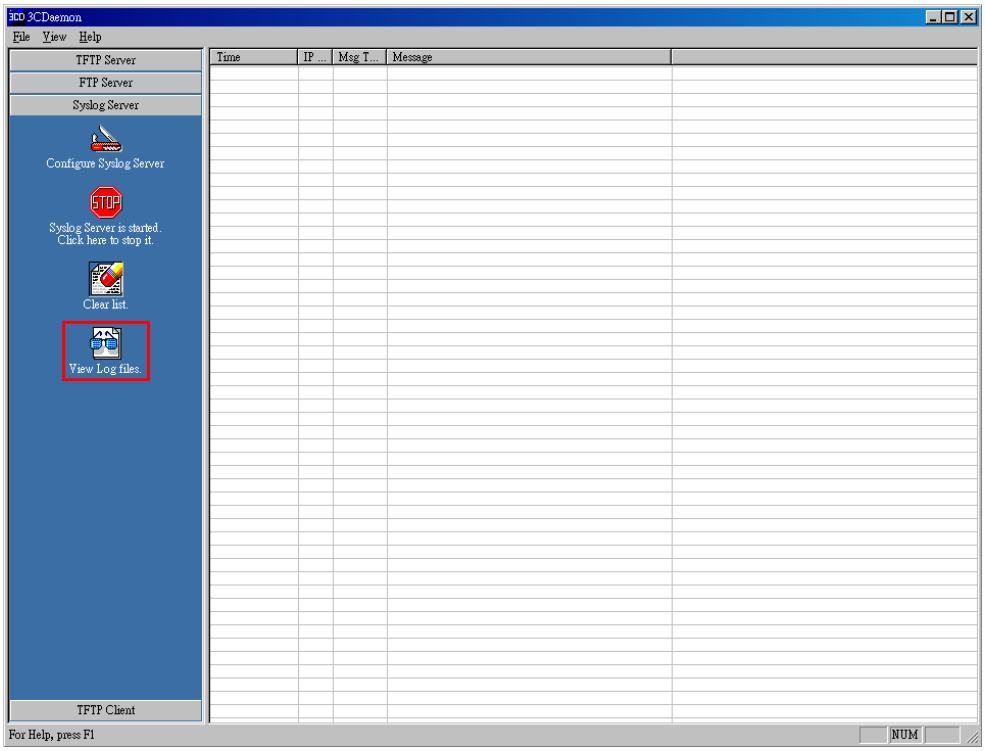
On the **Syslog Server** option, choose the **Configure Syslog Server** to pop up **3CDaemon Configuration** window. In this **3CDaemon Configuration** window, you may modify settings of: **Directory for syslog**, **Who can log to this** and **Log messages to**.



Click the button of **Stop/Start** to enable or unable 3CDaemon to receive signals from your MCS-2160.

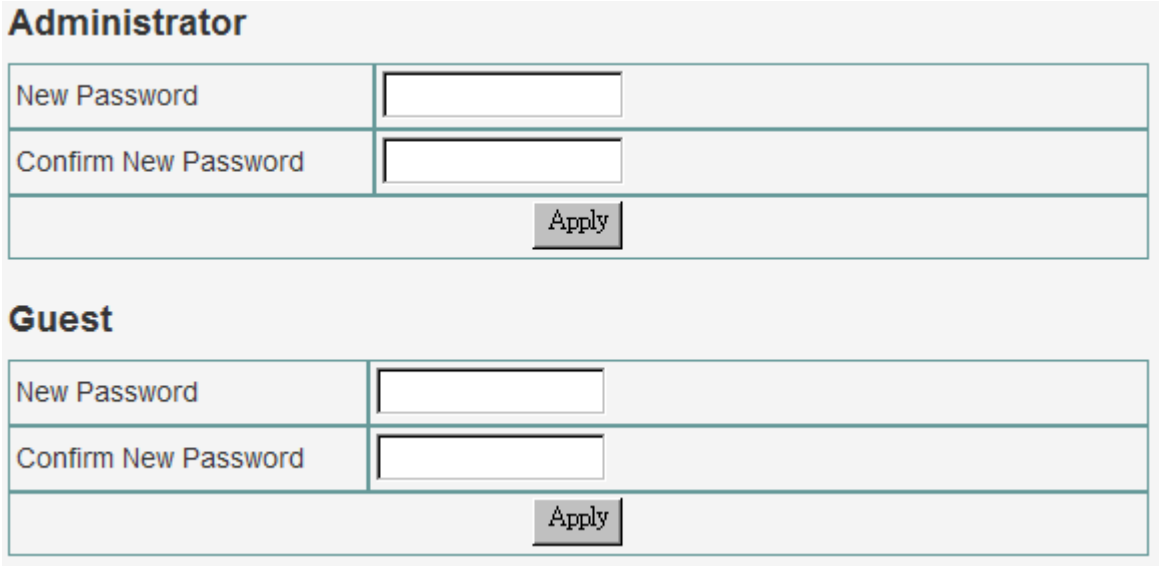


Click the **Clear list** option to delete all the records of **Time/IP Address/Msg Type/Message** of each module shown in the right field.



Choose the **View Log files** to open the saved log file from your PC.

C. User Settings

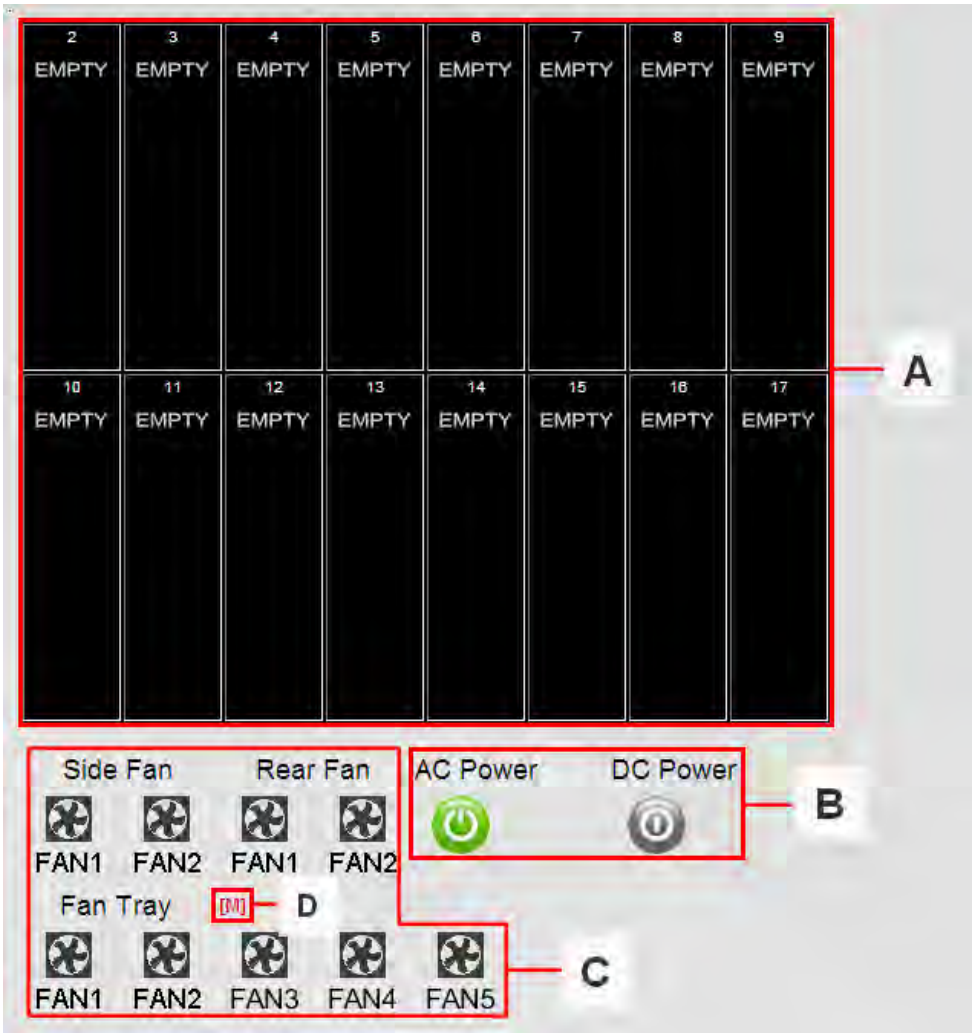


For issues regarding to system security, MCS-2160 has 2 different user security levels, which are:

- **Administrator:** User with **Administrator** privilege can change MCS-2160 system settings and view system information/statistics.
- **Guest:** User with **Guest** privilege can only view system information/statistics.

User Settings for Administrator/Guest	
New Password	Input the password here in this field. Please note that **the password must contain at least 5 alphanumeric characters and is case sensitive**.
Confirm New Password	Please input the password here again for confirmation.
Apply	Apply the changes you've made here.

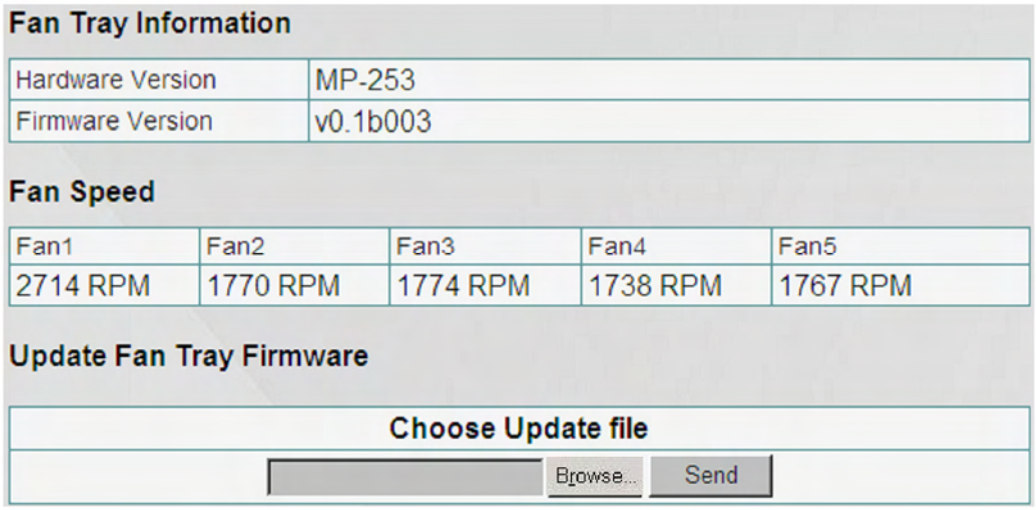
D. Chassis Management



Choosing the Chassis Management option will pop up the Port State Overview screen as shown above. In here, you will find the status of slot 2~17, XC-SFAN, XC-RFAN, Fan Tray, XCP-DC-300 & XCP-DC-100 and XCP-AC-300 & XCP-AC-100.

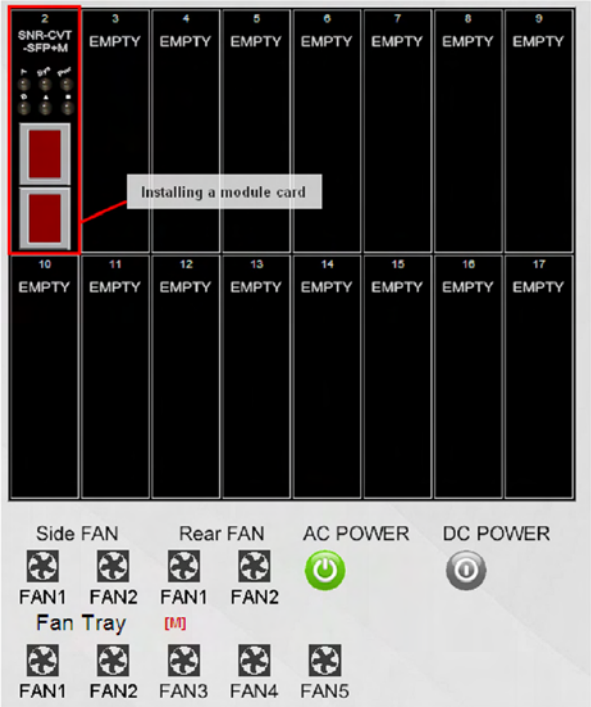
Port State Overview	
A	Shows the status of each slot 2~17, from the top left to the top right is slot 2~9, and from the bottom left to the bottom right is slot 10-17.
B	Shows the status of XCP-DC-300 & XCP-DC-100 and XCP-AC-300 & XCP-AC-100, if the left one turns green, than indicates that the MCS-2160 is power on by XCP-AC-300 or XCP-AC-100; if the right one turns green, than indicates that the MCS-2160 is power on by XCP-DC-300 or XCP-DC-100.
C	Shows the status of XC-SFAN (Side FAN), XC-RFAN (Rear FAN) and MCS-FANT, where FAN1, FAN2…FAN5 refers to the number marked on the physical MCS-FANT.
D	Click the **(M)** to pop up an interface showing Fan Tray's version information, speed and option for updating its firmware.

When you click the **(M)** button, an interface will show up as illustrated on the figure below:

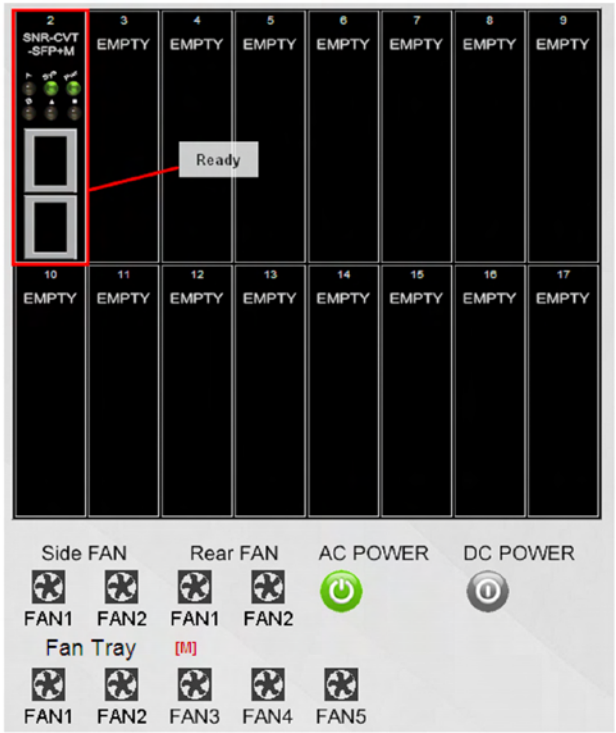


The (M) button	
Fan Tray Information	Shows the Hardware and Firmware version of your Fan Tray.
Fan Speed	Shows the speed of each fan of your Fan Tray.
Update Fan Tray Firmware	Click on the Browse… button to choose the firmware update files, and click the Send button to start updating your Fan Tray firmware.

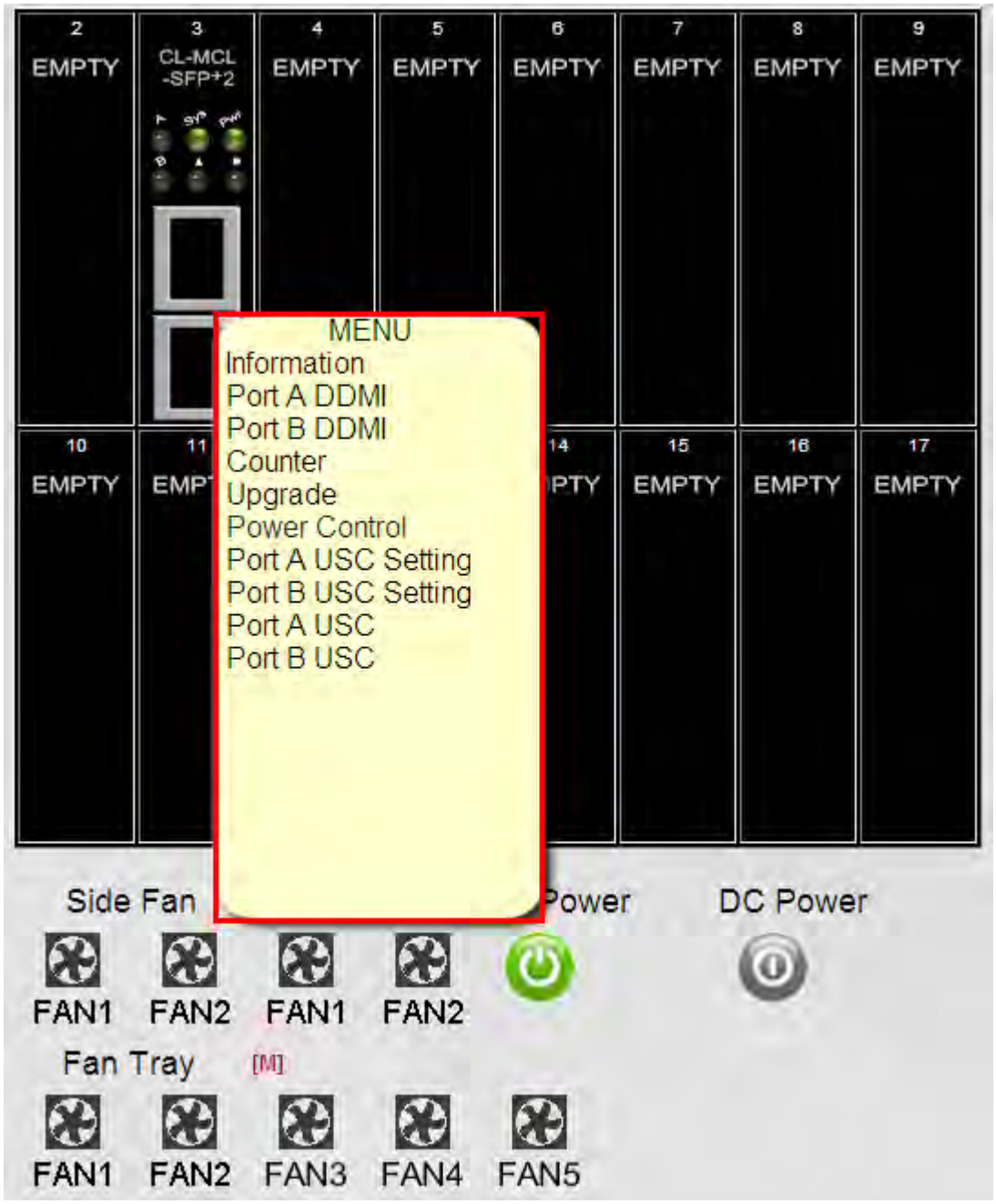
***Note: The Fan Speed will auto-refresh during the operation of the MCS-2160.**



After installing a module card in one of the slot 2-17, it will modify the inserted slot as shown above. Initially, the port of the slot will show in red color which indicates that the module card is initiating the connection with chassis. The slot will turn black when the module card completes the connection with chassis.



After few seconds of the installation of the module card, the Sys / Pwr LED will turn green, and the port of the module card will turn in black, this indicates respectively that the module card is ready for use and the port is available for connecting a cable.

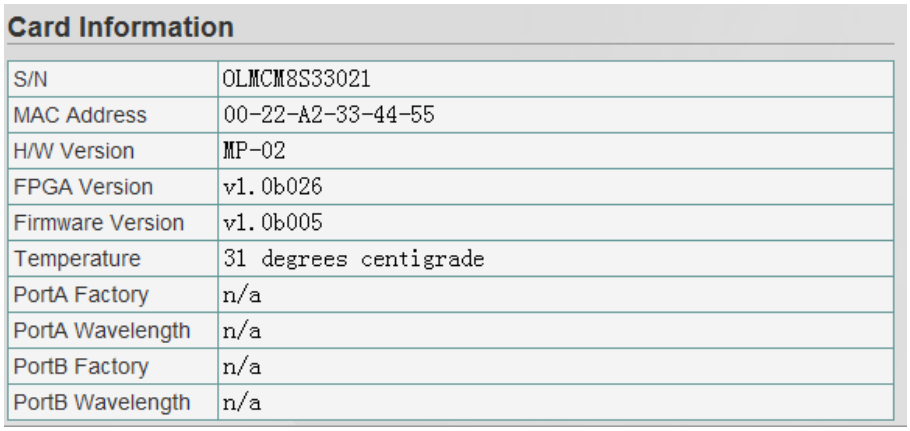


Click the slot with the module card installed to show a table of options as shown above.

Module Card Options	
Information	Shows the Module Card information
Port A/B DDMI	Shows the DDMI's parameters of PortA/B
Counter	Shows the Port Counter Statics
Upgrade	Allows you to update the Firmware and FPGA
Power Control	Allows you to turn on / off the Module Card
Port A/B USC Setting	Allows you to turn on / off and setting the Port A/B USC
Port A/B USC	Allows you to see/ refresh/ clean the Port A/B USC table

a. Information

Click the **Information** option to pop up the **Card Information** window as shown above.



Card Information

S/N	OLMCM8S33021
MAC Address	00-22-A2-33-44-55
H/W Version	MP-02
FPGA Version	v1.0b026
Firmware Version	v1.0b005
Temperature	31 degrees centigrade
PortA Factory	n/a
PortA Wavelength	n/a
PortB Factory	n/a
PortB Wavelength	n/a

Card Information	
S/N	Serial Number of Module Card
MAC Address	MAC Address of Module Card
H/W Version	Version of Module Card's PCB
FPGA Version	Version of FPGA
Firmware Version	Version Firmware
Temperature	The current Module Card's temperature
Port A/B Factory	You can view the manufacturer of your transceiver inserted in the media converter module cards.
Port A/B Wavelength	You can view the wave length of your transceiver inserted in the media converter module cards.

***Note: The Temperature may auto-refresh during the operation of the MCS-2160. The Port A/B Factory and Wavelength will auto-refresh if you change the optical transceiver of your Port A/B.**

b. Port A/B DDMI

Click the Port A/B DDMI option to access the interface showing the parameters of DDMI for Port A/B.

Port A Digital Diagnostics Monitoring Interface

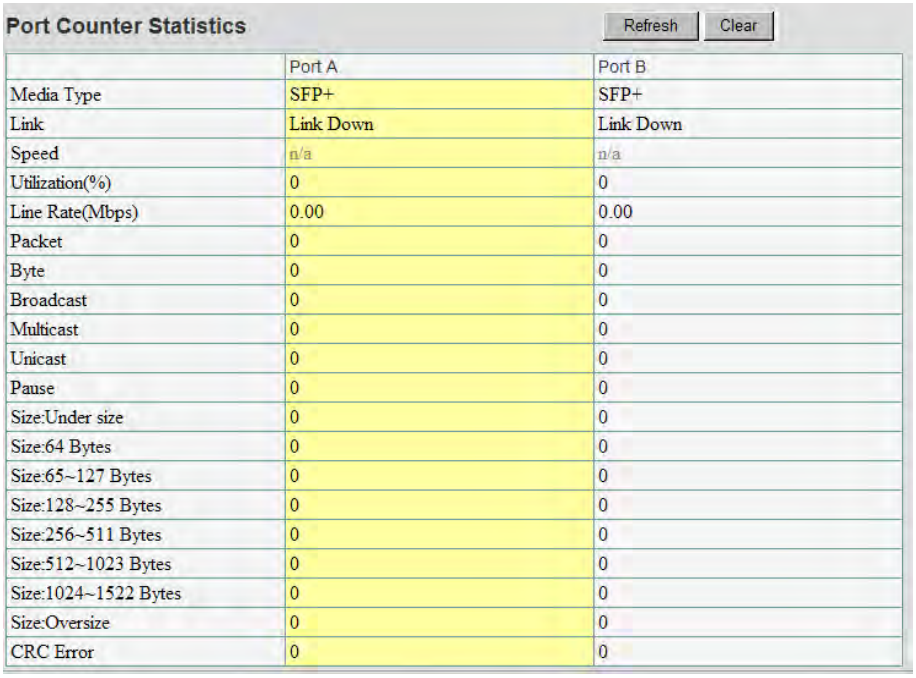
Type	Current Value	Maximum Value	Minimum Value	Warning Maximum
Temperature (°C)	n/a	n/a	n/a	n/a
Supply Voltage (mV)	n/a	n/a	n/a	n/a
Tx Bias Current (mA)	n/a	n/a	n/a	n/a
Tx Power (mW)	n/a	n/a	n/a	n/a
Rx Power (mW)	n/a	n/a	n/a	n/a

Port A/B Digital Diagnostics Monitoring Interface	
Temperature (℃)	Shows the Current temperature of the module card, and the Maximum, Minimum and Warning Maximum temperature supported.
Supply Voltage (mV)	Shows the Current voltage supplied in mV, and the Maximum, Minimum and Warning Maximum acceptable voltage.
Tx Bias Current (mA)	Shows the current Tx Bias Current in mA.
Tx Power (mW)	Shows the Current Tx Power in mW, and the Maximum, Minimum and Warning Maximum Tx Power supported.
Rx Power (mW)	Shows the Current Rx Power in mW, and the Maximum, Minimum and Warning Maximum Rx Power supported.

***Note: The DDMI's parameter will auto-refresh during the operation of MCS-2160.**

c. Counter

Click the **Counter** to pop up the **Port Counter Statistics** window as shown above. The **Port Counter Statistics** can display statistics reports of MCS-2160's **Port A/B**.



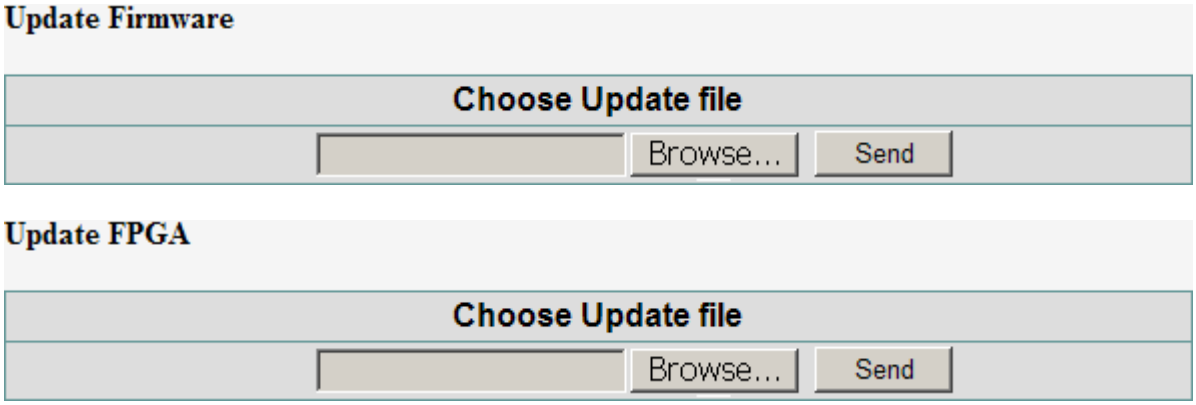
Port Counter Statistics Refresh Clear

	Port A	Port B
Media Type	SFP+	SFP+
Link	Link Down	Link Down
Speed	n/a	n/a
Utilization(%)	0	0
Line Rate(Mbps)	0.00	0.00
Packet	0	0
Byte	0	0
Broadcast	0	0
Multicast	0	0
Unicast	0	0
Pause	0	0
Size:Under size	0	0
Size:64 Bytes	0	0
Size:65~127 Bytes	0	0
Size:128~255 Bytes	0	0
Size:256~511 Bytes	0	0
Size:512~1023 Bytes	0	0
Size:1024~1522 Bytes	0	0
Size:Oversize	0	0
CRC Error	0	0

Port Counter Statistics	
Refresh	Refresh the configuration webpage and update the latest statistics.
Clear	Clear all statistics displayed in the table.

d. Upgrade

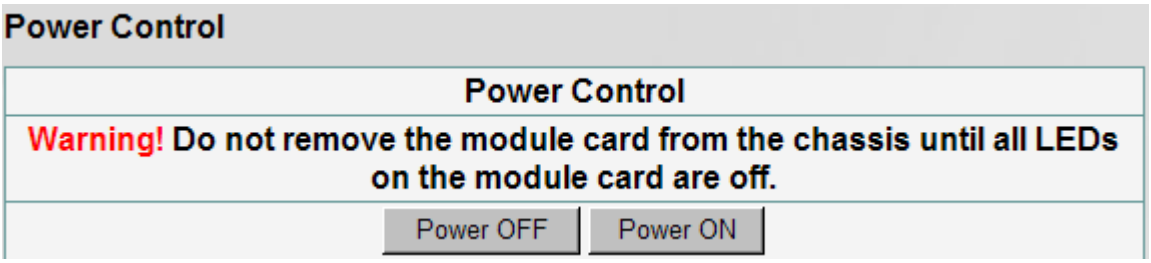
Click the **Upgrade** option to pop up the window for **Update Firmware** and **Update FPGA** as shown above.



Update F/W (Firmware)	
Browse…	Click the **Browse…** button to choose the firmware file you would like to upgrade. MCS-2160's firmware files are in the format of "***.bin**".
Send	Click this button to start upgrading MCS-2160's firmware.
Update FPGA	
Browse…	Click the **Browse…** button to choose the FPGA file you would like to upgrade. MCS-2160's FPGA files are in the format of "***.bin**".
Send	Click this button to start upgrading MCS-2160's FPGA.

e. Power Control

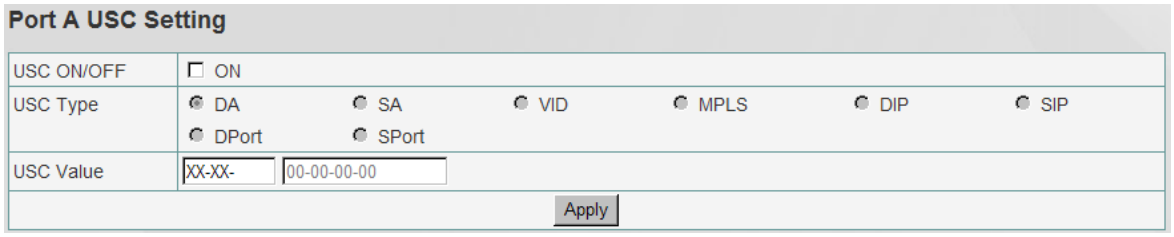
Click the **Power Control** option to pop up the **Power Control** window as shown above.



Power Control	
Power Off	Turns off the Module Card
Power On	Turns on the Module Card

f. Port A/B USC Setting

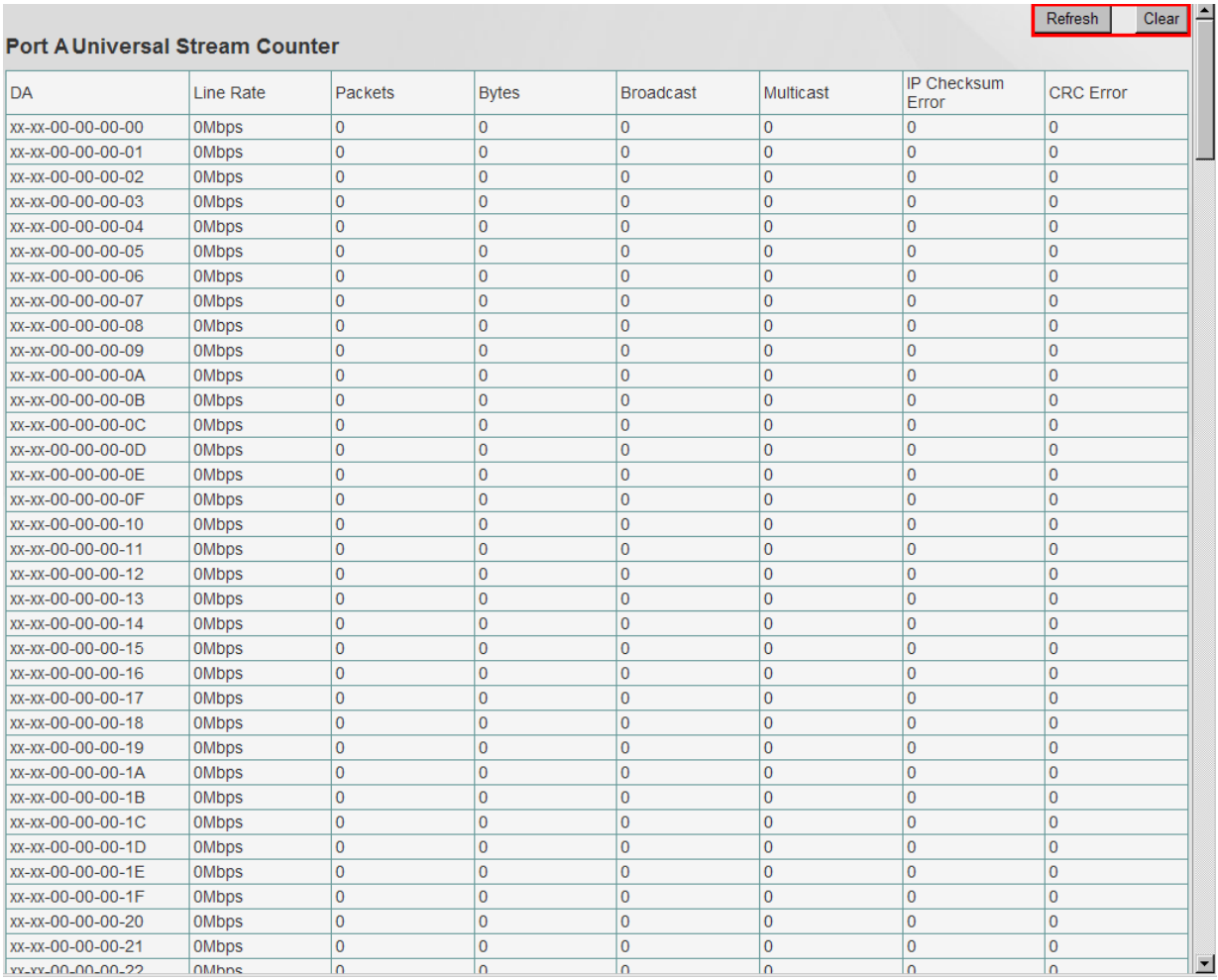
Click the **Port A/B USC Setting** option to pop up the **Port A/B USC Setting** window as shown above.



Port A/B USC Setting	
USC ON/OFF	Turns on/off the USC function.
USC Type	The types of USC includes: DA, SA, VID, MPLS, DIP, SIP, DPort, SPort.
USC Value	Allows you to input USC number.
Apply	Apply the changes you've made here.

g. Port A/B Universal Stream Counter

Click the Port A/B USC option to pop up Port A/B Universal Stream Counter window as shown below.



Refresh Clear

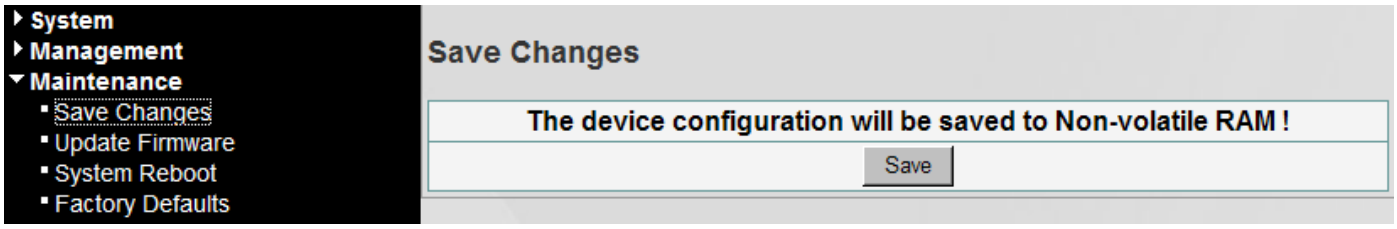
Port A Universal Stream Counter

DA	Line Rate	Packets	Bytes	Broadcast	Multicast	IP Checksum Error	CRC Error
xx-xx-00-00-00-00	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-01	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-02	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-03	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-04	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-05	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-06	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-07	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-08	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-09	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-0A	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-0B	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-0C	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-0D	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-0E	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-0F	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-10	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-11	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-12	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-13	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-14	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-15	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-16	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-17	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-18	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-19	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-1A	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-1B	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-1C	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-1D	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-1E	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-1F	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-20	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-21	0Mbps	0	0	0	0	0	0
xx-xx-00-00-00-22	0Mbps	0	0	0	0	0	0

Port A/B Universal Stream Counter	
Refresh	Refresh the Counter and update the latest statistics.
Clear	Clear all statistics displayed in the table.

***Note: The results of each parameters will auto-refresh during the operation of MCS-2160.**

3.1.5. MCS-2160 Management Webpage – Maintenance

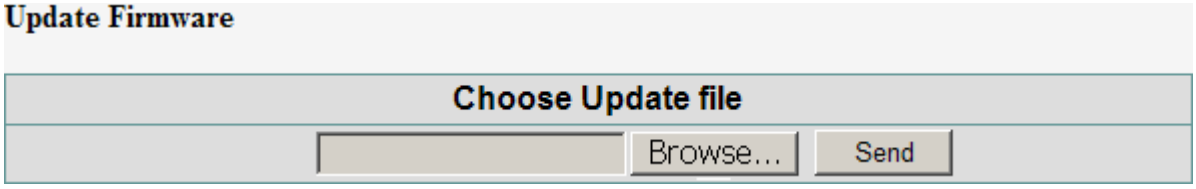


Four options are available in the **Maintenance** configuration webpage: **Save Changes**, **Update F/W**, **System Reboot**, and **Factory Defaults**.

A. Save Changes

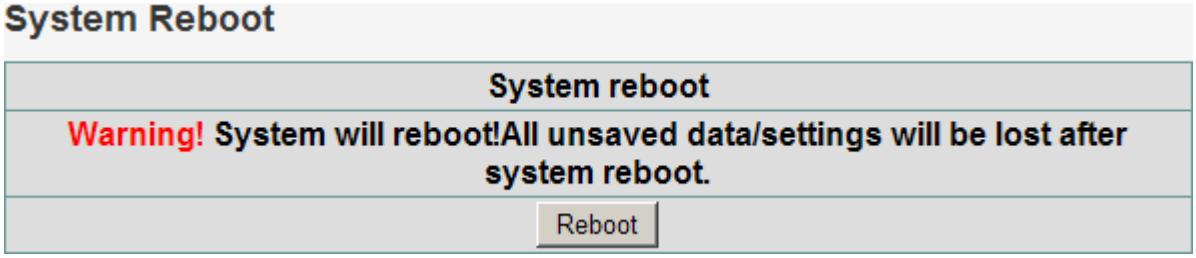
Save Changes	
Save	If you don't save the setting you've made via MCS-2160's configuration webpage, all settings will be erased after rebooting MCS-2160. Please click the "**Save**" button to save the settings to MCS-2160's NV-RAM.

B. Update F/W (Firmware)



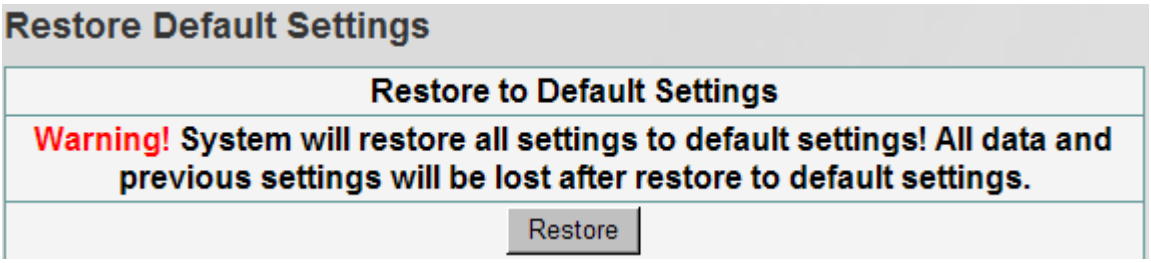
Update F/W (Firmware)	
Browse…	Click the **Browse…** button to choose the firmware file you would like to upgrade. MCS-2160's firmware files are in the format of "***.bin**".
Send	Click this button to start upgrading MCS-2160's firmware.

C. System Reboot



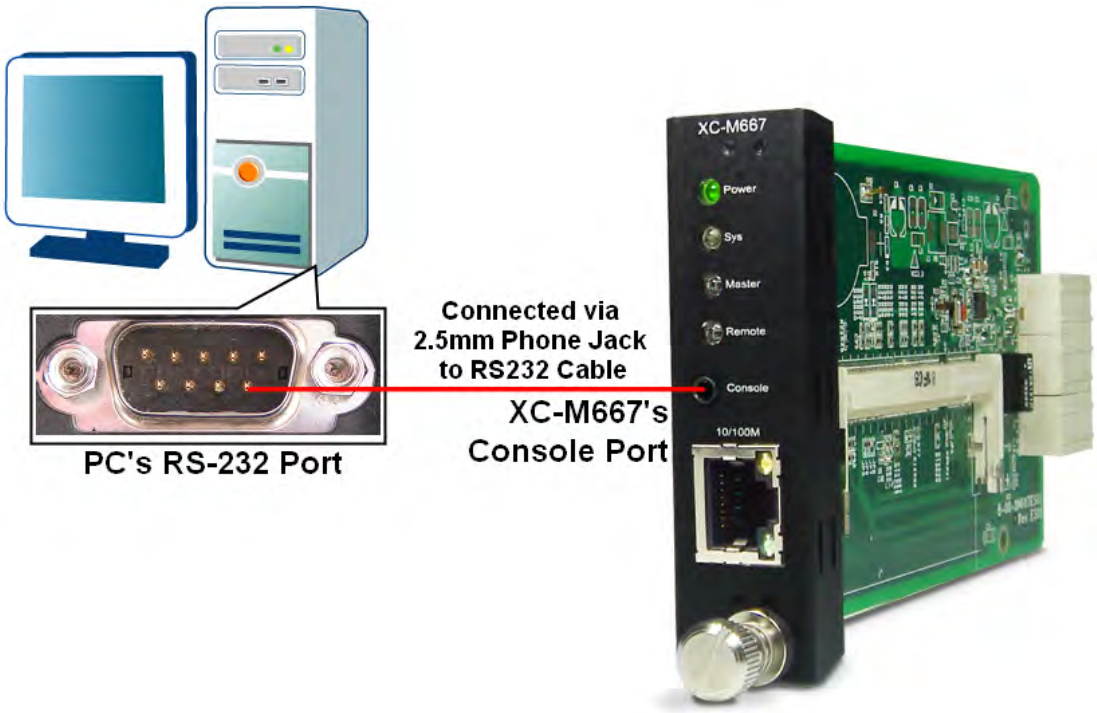
System Reboot	
Reboot	You can reboot MCS-2160 by clicking the "**Reboot**" button. Please note that all unsaved settings will be lost after system reboot.

D. Factory Defaults



Factory Defaults	
Restore	You can set all MCS-2160's settings to the default value by clicking the "**Restore**" button.

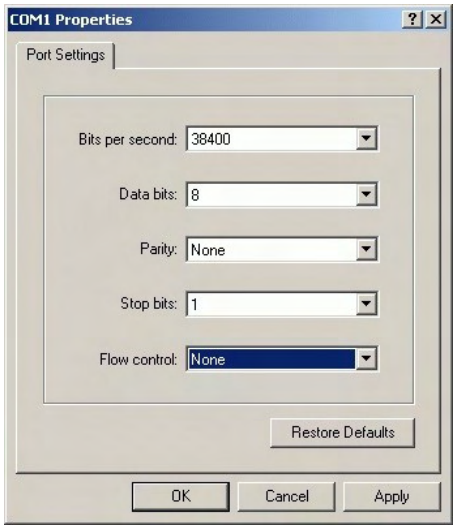
3.2. Managing MCS-2160 with HyperTerminal



MCS-2160 allows users to make system configurations and view test statistics/system information with **HyperTerminal**. To access MCS-2160 via **HyperTerminal**, you have to connect XC-M667's **Console Port** with **PC's RS-232 Port** via a 2.5mm Phone Jack to RS-232 cable as shown in the figure above.

3.3.1. HyperTerminal Settings for MCS-2160

After connecting the **PC's serial port** to XC-M667's **Console Port** via a **2.5mm Phone Jack to RS-232 cable**, please start the **HyperTerminal** software installed on your PC and establish connection according to the steps listed down below.

Establishing Connection with MCS-2160
1. Input a name for this connection, such as MCS-2160, and also select an icon for this connection. Click "**OK**" to continue.
2. Select the COM port of PC for this connection. Click "**OK**" to continue.

3. Set the COM port parameters according to the settings listed down below: • **Bits per second:** 38400 • **Data bits:** 8 • **Parity:** None • **Stop bits:** 1 • **Flow control:** None Click "**OK**" to continue.

Establishing Connection with MCS-2160
Click the "**Enter**" key on your keyboard to start setting MCS-2160 via HyperTerminal. To log in, please type MCS-2160's user name and password: • **Default User Name: admin** • **Default Password: admin (Both the User Name and Password are case-sensitive.)** If you change MCS-2160's user name and password with MCS-2160's configuration webpage, please log in with the new user name and password here.

3.3.2. MCS-2160 HyperTerminal Commands

After logging in MCS-2160 via HyperTerminal, a **MCS-2160 Command Menu** will be displayed, showing MCS-2160's HyperTerminal commands. Please see the table down below for brief descriptions of MCS-2160 commands:

Command	Alias	Command Description
system	**sys**	The **system** command allows you to view MCS-2160's system information, make system configurations, and upgrade MCS-2160's firmware/FPGA.
counter	**cnt**	The **counter** command allows you to view MCS-2160's counter information.
ip	**ip**	The **ip** command allows you to view MCS-2160's current IP settings or configure these settings.
cls	**cls**	The **cls** command allows you to clear HyperTerminal screen.
logout	**logout**	The **logout** command allows you to log out. For security issues, it is recommended that you should log out if you're not using the HyperTerminal anymore.

Please see sections down below for more detailed information regarding to MCS-2160's command.

A. MCS-2160 HyperTerminal Command – system

Command Descriptions – system			
system	show		The **system show** allows you to view MCS-2160's PCB/firmware/FPGA versions, as well as hardware temperature.
	user	show	The **system user show** command allows you to view the current users and their passwords.
		admin	The **system user admin [name | password] <name | password>** command allows you to change the user name and its password of the user with administrator privilege. For example, if you type in **system user admin name test123** and press enter, a user named **test123** with **administrator privilege** will be created.
		guest	The **system user guest [name | password] <name | password>** command allows you to change the user name and its password of the user with guest privilege. For example, if you type in **system user guest name test123** and press enter, a user named **test123** with **guest privilege** will be created.
	devname	show	The **system devname show** command allows you to view the device name assigned to MCS-2160.
		set	The **system devname set [device name]** command allows you to view the device name assigned to MCS-2160.
	snmp	show	The **system snmp show** command will show the current SNMP (Simple Network Management Protocol) settings.
		writecommunity	The **system snmp writecommunity <parameter>** allows you to set the community with write privilege. The **<parameter>** can be **public**, **private**, or **user names**.
		readcommunity	The **system snmp readcommunity <parameter>** allows you to set the community with read privilege. The **<parameter>** can be **public**, **private**, or **user names**.
	save		The **system save** command allows you to save the current settings to MCS-2160's NV-RAM. Please note that all unsaved settings will be lost after system reboot.
	update	firmware/FPGA	The **system update [firmware/FPGA]** commands allow you to upgrade MCS-2160's firmware/FPGA. The following descriptions are for upgrading MCS-2160's firmware. However, procedures for upgrading MCS-2160's FPGA are quite the same and can be related. 1. Type in "**system update firmware**" and click **enter**. Press **Y** to proceed and start upgrading firmware, or press **N** to cancel. 2. Press **Transfer** on HyperTerminal's menu bar and choose "**Send File**". 3. A **Send File** window will pop up. Please set the **Protocol** to **Xmodem**, and click the **Browse** button. 4. Choose the firmware you would like to upgrade to and click **Open**. 5. Click the **Send** button to start sending firmware. 6. System is sending firmware to MCS-2160. 7. MCS-2160 will reboot when finishing upgrading its firmware.
	reset		The **system reset** command allows you to reset all MCS-2160's settings back to the default values.
	reboot		The **system reboot** command allows you to reboot MCS-2160. Please note that all unsaved settings will be lost after rebooting.

B. MCS-2160 HyperTerminal Command – counter

Command Descriptions – counter			
counter	**show**	The **counter show** command allows you to view all MCS-2160's counter report. ➢ **C:** Press **C** to clear all counters. ➢ **S:** Press **S** to stop/start refreshing counters. ➢ **P:** Press **P** to switch pages. MCS-2160's counter report has 2 pages. ➢ **Esc:** Press the **Esc** key to exit MCS-2160's counter report.	
	clear	**0**	Clear all counter reports of MCS-2160's Port A.
		1	Clear all counter reports of MCS-2160's Port B.
		all	Clear all counter reports of MCS-2160's Port A and Port B.
	refreshtime	**show**	The **refreshtime show** command allows you to view the refresh time for the report.
		set	The **refreshtime set** command allows you to set the refresh time (in seconds) for the report.

C. MCS-2160 HyperTerminal Command – ip

Command Descriptions – ip			
ip	**show**	The **ip show** command allows you to view information of MCS-2160's IP configuration.	
	status	The **ip status** command allows you to view information of MCS-2160's IP status.	
	mode	**dhcp**	The **ip mode dhcp** command allows you to set MCS-2160's IP acquiring mode to DHCP, allowing MCS-2160 to acquire IP automatically from DHCP server.
		static	The **ip mode static** command allows you to set MCS-2160's IP acquiring mode to Static, allowing you to set IP/Subnet Mask/Gateway IP manually.
	address*	The **ip address <IP Address>** command allows you to set MCS-2160's IP address. For example, to set MCS-2160's IP address to 192.168.1.20, please input the command "**ip address 192.168.1.20**".	
	mask*	The **ip mask <Subnet Mask Address>** command allows you to set MCS-2160's subnet mask address. For example, to set MCS-2160's subnet mask address to 255.255.255.0, please input the command "**ip mask 255.255.255.0**".	
	gateway*	The **ip gateway <Gateway Address>** command allows you to set MCS-2160's gateway address. For example, to set MCS-2160's subnet gateway address to 192.168.1.254, please input the command "**ip gateway 192.168.1.254**".	

***MCS-2160's default IP address/subnet mask/default gateway are 192.168.1.8/255.255.255.0/192.168.1.1**

D. MCS-2160 HyperTerminal Command – cls

Command Descriptions – cls	
cls	The **cls** command allows you to clear HyperTerminal screen.

E. MCS-2160 HyperTerminal Command – logout

Command Descriptions – logout	
logout	The **logout** command allows you to log out of MCS-2160's HyperTerminal configuration session.

4. MCS-2160 General Specifications

Model	MCS-2160
Slot	**16** Slots for Installing XC Series Module Cards
Dimension	441 mm x 310 mm x 88 mm
Temperature	➢ Operating: 0°C ~ 40°C (32°F ~ 104°F) ➢ Storage: 0°C ~ 50°C (32°F ~ 122°F)
Humidity (non-condensing)	➢ Operating: 0% ~ 85% RH ➢ Storage: 0% ~ 85% RH
Built-in Sensors	Detecting system temperatures, rotation speed of fans, and system voltage

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