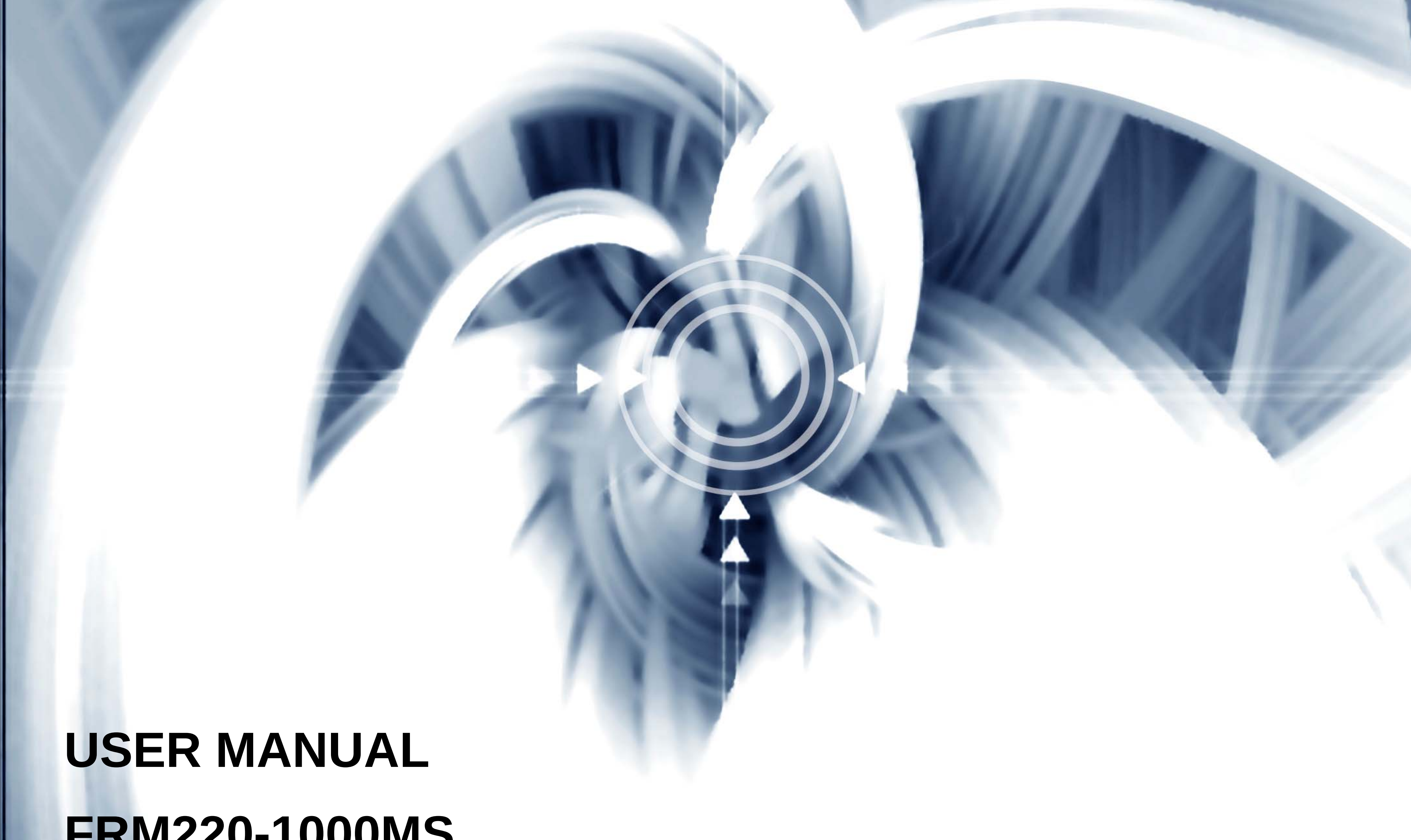

USER MANUAL

FRM220-1000MS

Gigabit Ethernet OAM/IP Web Smart Media Converter

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FRM220-1000MS Operation Manual

Gigabit Ethernet OAM/IP Web Smart Media Converter

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This Manual supports the following models:

FRM220-1000M : 1x1000Base-FX + 1x10/100/1000Base-TX
FRM220-1000MS : 1x100/1000Base-FX (SFP) + 1x10/100/1000Base-TX

ISO 9001 Quality System Certified

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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.

CISPR PUB.22 Class A COMPLIANCE:

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.

CE NOTICE

Marking by the symbol CE indicates compliance of this equipment to the EMC and LVD directives of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards: EN 55022:2006, Class A, EN55024:1998+A1:2001+A2:2003, and EN60950-1:2001

Table of Contents

Chapter 1 Introduction

1.1 Welcome

Thank you for choosing **FRM220-1000MS** Gigabit Ethernet OAM/IP Web Smart Media Converter. Throughout this document, the two different models of this family will be referred to as **FRM220-1000MS** or in an abbreviated form as just **1000MS**. If you would like to skip right to the installation of the converter, proceed to Chapter 2.

This manual is used to explain the hardware installation procedures and operation of **FRM220-1000MS**, and present its capabilities and specifications. This manual is divided into 3 chapters, the Introduction, Installation, and Provisioning Chapters.

Installers should carefully read the Chapters 1&2, Introduction and Installation. The companion document, **FRM220 NMC Configuration Manual**, is also available in electronic format, and is required when this product is used in **FRM220** rack with **NMC**. The divisions in that manual are intended for use by personnel to answer questions in general areas. Planners and potential purchasers may read the Introduction to determine the suitability of the product to its intended use; Operating Personnel would use the Console and Web Based Management Chapters and Appendices to become familiar with the line cards and settings. Network Administrators should read the chapters on Console, Web Based Management and Trouble Shooting to become familiar with the diagnostic capabilities, network settings and management strategies for both stand-alone or within the SNMP managed chassis.

1.2 Product Description

FRM220-1000MS is an electrical to optical media converter for Gigabit Ethernet. There are two models, one with fixed optical transceiver (**1000M**) and one supporting pluggable SFP transceiver (**1000MS**). These converters sport embedded stand-alone Web based management over IP networks as well as IEEE802.3ah OAM for remote in-band management. They are also fully compatible and manageable when placed in **FRM220** managed chassis such as the CH20 or CH08 with NMC card.

FRM220-1000MS is an IEEE802.3ah OAM compliant copper to fiber Gigabit Ethernet solution designed to make conversion between 10/100/1000Base-TX and 100/1000Base-FX with SC, FC ,ST connector (**FRM220-1000M**) or SFP LC connector (**FRM220-1000MS**). When deployed as a stand-alone solution, this media converter incorporates an easy to use Web user interface for operation, administration and maintenance of both local and remotely connected **FRM220-1000MS** converters. By offering 802.3ah OAM compliance, this converter can be linked to any 802.3ah compliant fiber switch and support loop back and dying gasp functions. When placed in our centrally controlled and managed **FRM220** managed rack, all functions of this converter and the remotely connected converter can be configured and monitored via in-band management, including band-width control, duplex, speed, VLAN configuration and more.

1.3 Product Features

- Auto-Cross over for MDI/MDIX at UTP port
- Auto-Negotiation or Forced Manual mode for UTP port
- Supports Dual Rate (100/1000) SFP for selectable Fast or Gigabit speed on fiber
- Supports 802.3X flow control Enable or Disable
- Supports Jumbo Frames up to 9K bytes
- Supports 16 Tag VLAN Groups
- Supports 802.1Q tagging and 802.1ad double VLAN tag (Q-in-Q)
- Ingress/Egress Bandwidth control with 64K granularity
- Supports 802.3ah-OAM loop back and dying gasp (remote power failure detection)
- Supports firmware upgrade via Web
- Supports Digital Diagnostics (DOM) for supported SFP
- Provides product information for management
- Includes RMON counters (stand-alone only)
- Supports password setting for authentication
- Supports Link Fault Pass Through (LFP) Function
- Supports Auto Laser Shutdown (ALS) Function
- Supports DHCP client for automatic TCP/IP configuration
- Supports local and in-band remote management from **FRM220** rack management

FRM220-1000MS SFP socket supports a wide range of standard SFP modules to address any network situation.

Single-mode, Multi-mode, Multi-rate, Dual Rate (100/1000), Single fiber bi-directional, Coarse and Dense Wave Division Multiplexing (CWDM and DWDM) and Copper media

WARNING: Fiber optic equipment may emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to an active laser light source.

1.4 Specifications

Optical Interface	
Connector	SFP cage (**1000MS**) or Duplex SC, ST, FC (**1000M**)
Data rate	100/1000Base-FX (125Mbps/1.25GMbps optical rate) Dual Rate Support
Duplex mode	Full duplex on fiber
Fiber	Depends on SFP
Distance	Depends on SFP
Wavelength	Depends on SFP
Electrical Interface	
Connector	RJ-45, shielded
Data rate	auto, 10Mbps (10Base), 100Mbps (100Base), or 1000Mbps (1000Base)
Duplex mode	auto, Full or Half
Cable	Cat 5e or better
Distance	100Meters maximum
Indications	LED (PWR, FX Link, LAN Link, LAN Speed)
Power	(Card supports hot-swapping)
Input	Card : 12VDC, Standalone : AC, DC options
Consumption	<5W
Dimensions	155 x 88 x 23mm (D x W x H)
Weight	110g
Temperature	0 ~ 60°C (Operating), -10 ~ 70°C (Storage)
Humidity	10 ~ 90% non-condensing
Certification	CE (EMI/LVD), FCC, RoHS Compliant
MTBF	75000 hrs

1.5 Management Features

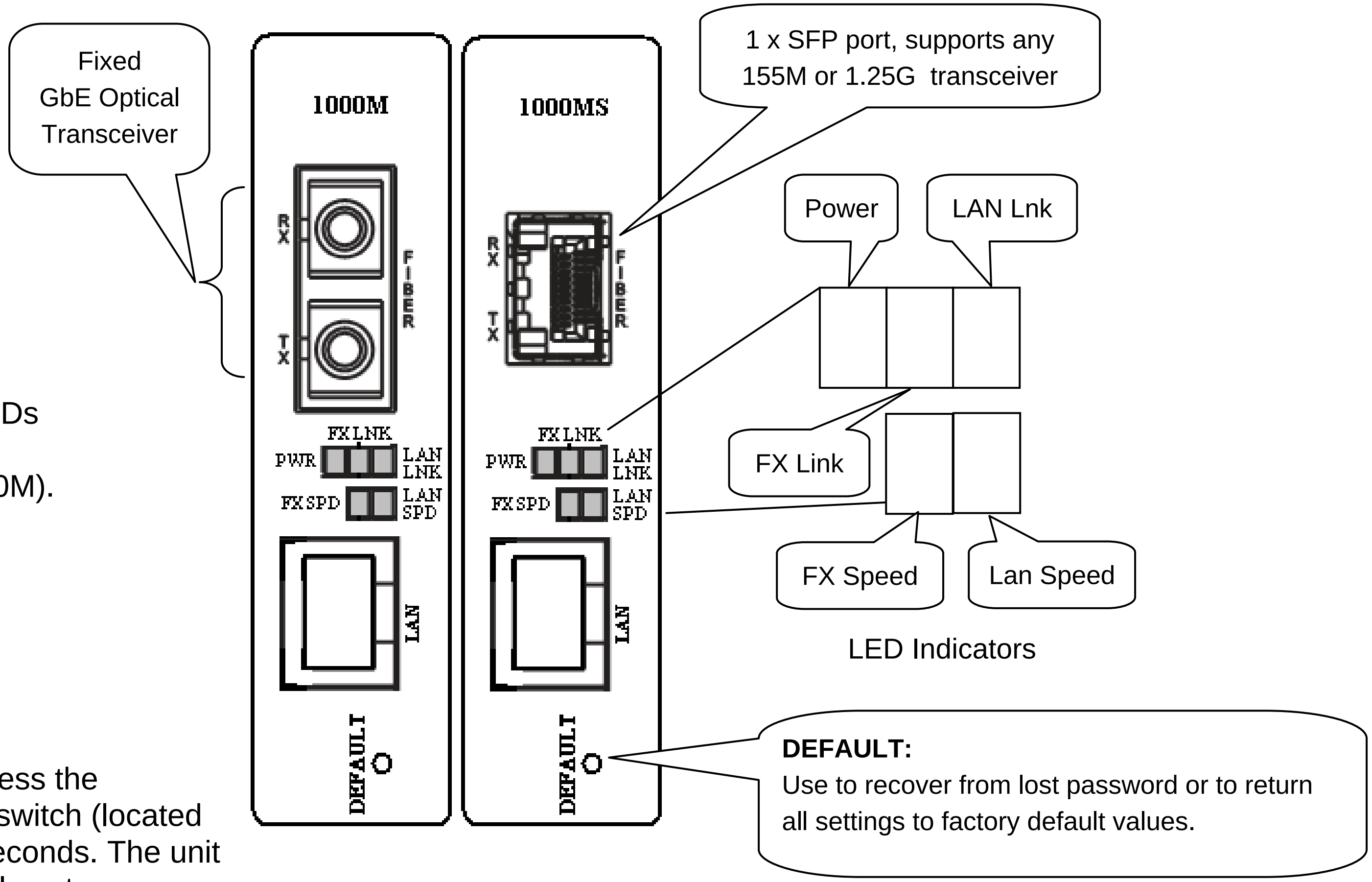
Both models may be placed in a stand-alone chassis with console port, allowing support of a text based serial terminal with an easy to use menu system for configuration. Once configured for TCP/IP access, they also support a Web Smart GUI for intuitive setting via point & click. When placed in **FRM220** managed chassis, the card is configured and monitored through the chassis **NMC** (network management controller) via console, Telnet, Web HTTP or SNMP.

1.6 Panel

The LAN Speed and FX Speed LEDs use dual color to indicate speed. Green indicates Fast Ethernet (100M). Yellow indicates Gigabit Speed. When off, the LAN Speed LED indicates a 10M speed.

Factory reset procedure
Apply power to **1000M(S)**.
Allow 30 seconds to fully boot.
Using a pencil or ball-point pen, press the 'DEFAULT' recessed push-button switch (located on the face plate) and hold for 6 seconds. The unit will be restored to factory default almost immediately. The defaults are:

IP=10.1.1.1
netmask=255.255.255.0
GW=10.1.1.254
password reset to 'admin'



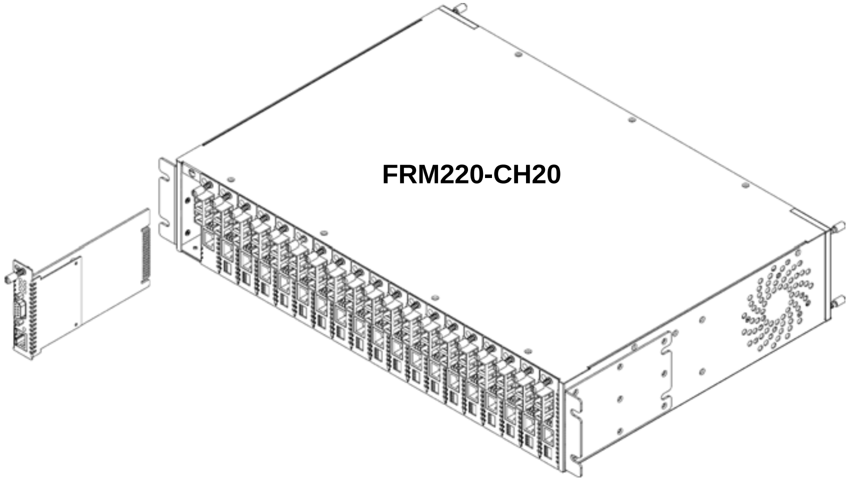
DEFAULT:
Use to recover from lost password or to return all settings to factory default values.

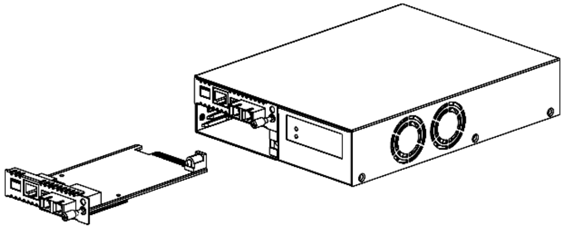
Figure 1. Panel Graphics

Chapter 2 Installation

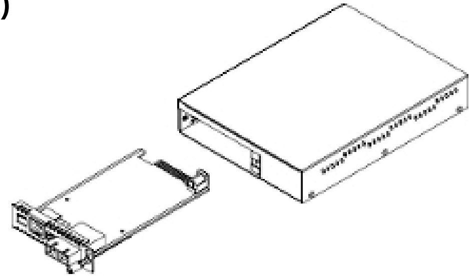
2.1 Chassis Options

Note: This converter card can be placed in any FRM220 series chassis, including the single slot CH01 or CH01M, two slot CH02M or CH02-NMC, the eight slot CH08 or the full twenty slot CH20 chassis. Chassis with built-in power are available with single AC (90-240VAC), single DC (18~75VDC), dual AC, dual DC or AC plus DC combo. The single slot chassis with external power adapter works with AC source voltage only with the provided 90~240VAC 12VDC@400mA switching adapter.

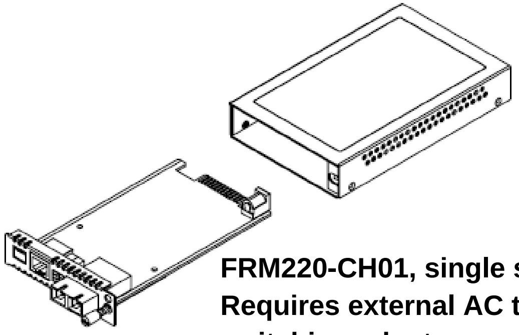




CH02-NMC-XX Chassis (XX= AC, DC, AA, DD or AD)



CH01-XX Chassis (XX= AC, DC, AA, DD or AD)

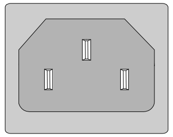


FRM220-CH01, single slot chassis Requires external AC to DC 12V switching adapter.

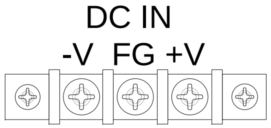
Follow all ESD precautions when handling the card and SFP modules.

2.2 Electrical Installation

With a built-in AC power chassis, AC power is supplied to the chassis through a standard IEC C14 3-prong receptacle, located on the rear of the chassis. Any national power cord with IEC C13 line plug may be used to connect AC power to the power module. With a built-in DC power chassis, DC -48V is connected to the terminal block located on the rear of the chassis, observing the proper polarity. The chassis should always be grounded through the protective earth lead of the power cable in AC installations, or via the frame ground connection for DC installations.



Left: Live line
Right: Neutral line
Middle: Ground



Left: -V (-48V)
Right: +V (0V)
Middle: Frame Ground

18~75 VDC

2.3 Installation of SFP Modules

CTC Union supplied SFP modules are of the Bale Clasp type. The bale clasp pluggable module has a bale clasp that secures the module into the SFP cage.

2.3.1 Inserting a Bale Clasp SFP Module into the Cage

Step 1 Close the bale clasp upward before inserting the pluggable module.
Step 2 Line up the SFP module with the port, and slide it into the cage. Seat it. Attach fiber cable.

2.3.2 Removing a Bale Clasp SFP Module

Step 1 Remove fiber cable. Open the bale clasp on the SFP module. Press the clasp downward with your index finger.
Step 2 Grasp the SFP module between your thumb and index finger and carefully remove it from the SFP cage.

Chapter 3 Provisioning

3.1 Console Login

Connect a serial terminal to **CH01M** DB9 and configure the terminal emulation for 38.4k, 8bit, no parity, 1 stop and no flow control. After powering on, the **1000MS** will have fully booted within 25 seconds. **The factory default password is** ‘admin’.

```
             *****************************************
             ***  CTC UNION TECHNOLOGIES CO.,LTD   ***
             ***  FRM220-1000MS   Manager          ***
             *****************************************
Model:[FRM220-1000MS  ]  Ver:[1.000-1.000-0.000-0.000]    [CH-01M   ]
      [  Local ]
 User Name : admin
 Password  :
```

3.1.0 Console Main Menu

```
             *****************************************
             ***  CTC UNION TECHNOLOGIES CO.,LTD   ***
             ***  FRM220-1000M   Manager Ver:1.00  ***
             *****************************************
Model:[FRM220-1000M   ]  Ver:[1.000-1.000-0.000-0.000]    [CH-01M   ]
      [  Local ]
<1> UTP       Status and Configure
<2> FX        Status and Configure
<3> Device    Status and Configure
<4> 802.3ah   Status and Configure
<5> VLANTag   Status and Configure
<6> Q-in-Q    Status and Configure
<7> IP        Status and Configure
<8> Converter Status and Configure
<P> Password change
```

3.1.1 UTP Configuration

```
<< UTP Status and Configuration >>
<1> Port Active [ Enable ]      Link   [ Link Up   ]
<2> Negotiation [ Auto  ]
<3> Speed       [ 1000 ]        Status [ 1000 ]
<4> Duplex      [ Full ]        Status [ Full ]
<5> Flow Control[ Enable  ]
<6> Egress Limit [ Disable ]
<7> Ingress Limit [ Disable ]
```

The UTP **Port Active** is enabled by default. If the port is disabled, all transmission through this port will be stopped. The **1000M**'s LAN Link LED will be extinguished, however any connected device will still detect an Ethernet link.

The UTP port supports auto-**negotiation** per IEEE802.3u as well as manual forced mode setting of **Speed** (10/100/1000) and **Duplex** (Half/Full). In 802.3u, speed can be auto detected, however the Duplex mode MUST be negotiated. When an 802.3u compliant device is configured in auto negotiation mode, failure to negotiate Duplex (for example, if connected to legacy equipment or to equipment configured in forced mode) will result in the Auto device assuming a Half-Duplex operating mode. <u>Do not connect forced Full mode Ethernet ports to an auto device as this will result in a Duplex-Mismatch.</u>

Ethernet **Flow Control** (IEEE802.3X) is a mechanism for temporarily stopping the transmission of data on Ethernet family computer networks. It can work in conjunction with rate limiting to avoid dropped packets from TCP. Flow control should also be used with care and with full knowledge of its effect when used to pause traffic coming from a switch.

The **rate limiting** is adjustable for both ingress (packets received into the TP port) and egress (packets transmitted from the TP port) in granularity of 64k. By default, rate limiting is disabled. Once enabled, the rate limit can be set in nx64k rates where n=1 to 16000. Entering an "n" value of zero (0) will again disable the rate limiting.

3.1.2 FX Configuration

```
<<  FX Status and Configuration >>
    FX Link     [ UP  ] Remote PWR      [ OK ]
    SFP         [ Yes ] D/D Function    [ No  ]
<1> Port Active [ Enable  ]
<2> Management  [ Enable  ]
<3> Negotiation [ Force   ]
    Speed       [ 1000    ]     Status [ 1000    ]
<5> Flow Control[ Enable  ]
<6> Egress Limit        [ Disable ]
<7> Ingress Limit       [ Disable ]
<8> SFP Digital Diagnostics
```

SFP Digital Diagnostics

```
<< Fiber D/D Function Status >>
 Vendor Name        :[ FIBERXON INC.    ]
 Vendor Part Number :[ FTM-3125C-L40    ]
 Fiber Type         :[ Single ]
 Wave Length        :[ 1310 nm ]
 Link Length        :[ 0040 Km ]
 Tx Power           :[ 01 dBm]
 Rx Power           :[-12 dBm]
 Rx Sensitivity     :[ 00 dBm]
 Temperature        :[ 046 C  ]
```

This converter supports receiving a ‘dying gasp’ indication from the remotely connected converter. If the remote should suffer a power loss, the status of “**Remote PWR**” will be shown as ‘Abnormal’ (802.3ah must be enabled in both converters). This converter can also read **SFP** information such as model, manufacturer, part number and **if the SFP supports DDOM**, the converter can read this extra information.

The FX **Port Active** is enabled by default. If the port is disabled, all transmission through this port will be stopped. The **1000M**’s FX Link LED will be extinguished; however any connected device will still detect a fiber link.

When the fiber **Management** option is disabled, all management communication with a remote converter will be stopped. Only normal Ethernet transmission will occur without any possibility of remote management, either through 802.3ah OAM or through chassis to CPE in-band management.

1000M supports 100/1000Base-FX dual speed only at full duplex. So this **Negotiation** must force **Speed** to 100 or 1000 mbps.

Ethernet **Flow Control** (IEEE802.3X) is a mechanism for temporarily stopping the transmission of data on Ethernet family computer networks. It can work in conjunction with rate limiting to avoid dropped packets from TCP. Flow control should also be used with care and with full knowledge of its effect when used to pause traffic coming from a switch.

The **rate limiting** is adjustable for both ingress (packets received into the TP port) and egress (packets transmitted from the TP port) in granularity of 64k. By default, rate limiting is disabled. Once enabled, the rate limit can be set in nx64k rates where n=1 to 16000. Entering an “n” value of zero (0) will again disable the rate limiting.

3.1.3 Device Configuration

```
<< Device Status and Configuration >>
<1> Device Active       [ Enable ]
<2> DHCP Client         [ Disable ]
<3> Auto Laser Shutdown [ Disable ]
<4> Link Fault Pass-Through  [ Disable ]
<5> Port Reset
<6> Factory Default
<7> Store Parameters
```

By default, the **Device Active** is enabled. If device is disabled, all activity in the device will be stopped. The **1000M**'s LAN and FX Link LEDs will be extinguished; however any connected device will still detect UTP and fiber link.

This device supports TCP/IP auto-configuration through DHCP service. By default the **DHCP Client** function is disabled.

Auto Laser Shutdown is a safety mechanism that will disable laser output when no received optical signal is sensed. By default, ALS is disabled.

Link Fault Pass-Through or LFP is a method of forwarding a link loss from copper to fiber or from fiber to copper. It is disabled by default, but it can be enabled here.

Port Reset will reset the switch, should something as unlikely as the switch hanging occurring.

Factory Default will load all the original factory default settings. This is a good way to get transmission working again if there are many VLAN or Q-in-Q settings done but the converter needs to be reset to default with all those functions disabled.

IMPORTANT

The **Store Parameter** item will write configuration to flash. After any configuration changes are made to the converter, they must be saved or the previous settings will be in effect after the next reboot.

3.1.4 802.ah Configuration

```
<< 802.3ah Status and Configuration >>
<1> 802.3ah Active      [ Enable ]
<2> 802.3ah mode        [ Active ]
<3> Link Event          [ Enable ]
<4> Loop Back           [ Enable ]
<5> Loop Back Number    [ 10 ]
<6> Loop Back Frame Size[ 1500 ]
<7> Loop Back Test Start
    Loop Back Status    [  OK  ]
```

This converter supports IEEE 802.3ah, an OAM protocol that operates at Ethernet Layer 2 (Data Link layer). OAM provides mechanisms to monitor link operation/health and to improve fault isolation. OAM only works point-to-point over the fiber link. In addition to standard 802.3ah functions like loop back and dying gasp, the 1000M also implements OAM to provide complete provisioning of the remote fiber connected converter, without using Layer 3 IP protocol. By using OAM, we can remote manage another fiber connected **1000M(S)** converter, without IP addressing. From this menu we can also perform some basic diagnostics, such as loop back test.

To use the OAM functions, the **802.3ah Active** setting must be enabled.

The **802.3ah mode** is used to configure an OAM pair. In a pair, one unit must be ‘active’, while the other must be ‘passive’. We typically place the remote converter in ‘passive’ mode and make the local converter ‘active’.

In order to do **Loop Back** test, the option must be enabled in both converters. This is a non-intrusive test which uses OAM packets and will not affect normal transmissions. The number of OAM frames used (the number of times the loop back is done) is set by the **Loop Back Number**.

The **Loop Back Frame Size** controls the packet size of the OAM frames used for loop back testing. The default is 1500 bytes.

The **Loop Back Test Start** item is just what it says. Use the “7” key to toggle the test on and off. The result of the test will be shown as either “OK” (pass) or “Fail”.

3.1.5 802.1Q VLAN Configuration

```
<< VLAN Tag Status and Configuration >>
<1> TP  Frame Egress Type [ Don't Touch Tag ]
<2> FX  Frame Egress Type [ Don't Touch Tag ]
<3> CPU Frame Egress Type [ Don't Touch Tag ]
<4> TP  VLAN Group Index Number [ 0 ]
<5> FX  VLAN Group Index Number [ 0 ]
<6> CPU VLAN Group Index Number [ 0 ]
<7> VLAN Ingress Filter [ Disable ]
<8> VLAN Group  [ Disable ]
<9> VLAN Group Table Status
```

VLAN tagging is used to create virtual LANs and to isolate traffic logically between the different virtual LANs. VLAN tagging is defined in 802.1Q. Tagging adds 32bits to an Ethernet frame between the source MAC address and the EtherType/Length fields of the original frame.

In **FRM220-1000MS** there are actually three different ports, the external copper and fiber ports, plus the internal CPU port. The first three menu items, <1>, <2>, & <3> deal with how frames exit (egress) the copper, fiber and CPU (management). These are the **Frame Egress Type**. The following operations may be performed to the outgoing frames: **<1>: Replace Tag** The switch will remove VLAN tags from packets then add new tags to them. The inserted tag is defined in ”VLAN Group Index”. **<2>: Remove Tag** The switch will remove VLAN tags from packets, if they are tagged. The switch will not modify packets received without tags **<3>: Add Tag** The switch will add VLAN tags to packets, if they are not tagged when these packets are output on this port. The switch will not add tags to packets already tagged. The inserted tag is defined in ”VLAN Group Index”. **<4>: Don't Touch Tag** Do not insert or remove VLAN tags to/from packet which is output on this port.

The next three menu items <4>, <5>, & <6> are the **VLAN Group Index Number** for the copper, fiber and CPU. These are the VID tags that would be used for adding or replacing in the above functions.

VLAN Ingress Filter is used to actually enable the VLAN aware functions. If disabled, the switch is VLAN un-aware.

When **VLAN Group** is enabled, the 16 VLAN group table may be edited, providing control of how VID packets are grouped between the FX port, TP Port and the Management (CPU) port.

Example using VID 555 for management, with access via TP port. Normal access to management not allowed.

```
<< VLAN Tag Status and Configuration >>
<1> TP  Frame Egress Type [ Don't Touch Tag ]
<2> FX  Frame Egress Type [ Don't Touch Tag ]
<3> CPU Frame Egress Type [ Add Tag         ]
<4> TP  VLAN Group Index Number [ 0 ]
<5> FX  VLAN Group Index Number [ 0 ]
<6> CPU VLAN Group Index Number [ 1 ]
<7> VLAN Ingress Filter [ Enable ]
<8> VLAN Group  [ Enable ]
<9> VLAN Group Table Status
```

```
                        TP mem   FX mem   CPU mem    PVID
<0> VLAN Table 0        [  V  ]  [  V  ]  [     ]    [ 1 ]
<1> VLAN Table 1        [     ]  [     ]  [  V  ]    [ 555 ]
<2> VLAN Table 2        [  V  ]  [  V  ]  [     ]    [ 1 ]
<3> VLAN Table 3        [  V  ]  [  V  ]  [     ]    [ 1 ]
<4> VLAN Table 4        [  V  ]  [  V  ]  [     ]    [ 1 ]
<5> VLAN Table 5        [  V  ]  [  V  ]  [     ]    [ 1 ]
<6> VLAN Table 6        [  V  ]  [  V  ]  [     ]    [ 1 ]
<7> VLAN Table 7        [  V  ]  [  V  ]  [     ]    [ 1 ]
<8> VLAN Table 8        [  V  ]  [  V  ]  [     ]    [ 1 ]
<9> VLAN Table 9        [  V  ]  [  V  ]  [     ]    [ 1 ]
<a> VLAN Table 10       [  V  ]  [  V  ]  [     ]    [ 1 ]
<b> VLAN Table 11       [  V  ]  [  V  ]  [     ]    [ 1 ]
<c> VLAN Table 12       [  V  ]  [  V  ]  [     ]    [ 1 ]
<d> VLAN Table 13       [  V  ]  [  V  ]  [     ]    [ 1 ]
<e> VLAN Table 14       [  V  ]  [  V  ]  [     ]    [ 1 ]
<f> VLAN Table 15       [  V  ]  [  V  ]  [     ]    [ 1 ]
```

3.1.6 QinQ VLAN Configuration

```
<< Q in Q Status and Configuration >>
<1> Q in Q Active       [ Disable ]
<2> Q in Q Tag Priority [ Internal ]
<3> Q in Q Direction    [ TP add tag ,FX Remove tag ]
<4> Q in Q Tag ID       [ 0x8100 ]
<5> Q in Q VID Tag      [ 1 ]
```

Q in Q or double VLAN tagging is defined in IEEE802.1ad. Double VLAN tagging is required when a service provider wishes to carry a customer’s VLAN tagged traffic through its own VLAN network. In MEF (Metro Ethernet Forum) terms, the first tag or “inner tag” is referred to as the C-tag (customer) while the second tag or “outer tag” is referred to as the S-tag (service provider). Normal VLAN tag has an EtherType (TPID or Tag Protocol Identifier) of 0x8100. The IEEE802.1ad standard recommends 0x88a8 TPID for the outer or S-tag.

Q in Q Active is used to enable or disable the double tagging function. **Q in Q Tag Priority** provides the QoS method. When selecting ‘Internal’ priority, the three bit VLAN tag priority bits are mapped to the internal 2-bit priority. When selecting ‘Remark’ 802.1P remarking QOS will be used instead.

Q in Q Direction sets up how the tagging is carried from provider to customer. If this were a CPE device with fiber facing the service provider, we would want to configure the FX add tag ,TP Remove tag option. i.e., add the outer tag heading towards service provider (out fiber) and remove the S-tag at customer side (out TP).

Q in Q Tag ID is what IEEE802.1ad refers to as TPID (Tag Protocol Identifier) or what is also referred to as the EtherType. These 2 octets follow the S-tag and C-tag in the Ethernet frame. Finally, the **Q in Q VID Tag** assigns the actual value to the S-tag from the range of 1~4094.

Example of S-tag with VID 999 configured at customer side device.

```
<< Q in Q Status and Configuration >>
<1> Q in Q Active       [ Enable ]
<2> Q in Q Tag Priority [ Internal ]
<3> Q in Q Direction    [ FX add tag ,TP Remove tag ]
<4> Q in Q Tag ID       [ 0x88a8 ]
<5> Q in Q VID Tag      [ 999 ]
```

3.1.7 IP Address Configuration

```
             *****************************************
             ***  CTC UNION TECHNOLOGIES CO.,LTD   ***
             ***  FRM220-1000MS  Manager           ***
             *****************************************
Model:[FRM220-1000MS ]  Ver:[1.000-1.000-0.000-0.000]    [CH-01M   ]
      [  Local ]
    MAC          [ 00:02:ab:03:04:05 ]
<1> IP Address   [ 10.1.1.1 ]
<2> Subnet Mask  [ 255.255.255.0 ]
<3> Gateway      [ 10.1.1.254 ]
```

The above shows the factory default TCP/IP settings for **FRM220-1000MS**.

IP Address is the dotted/decimal format for the IPv4 address to remotely manage this device.

The **Subnet Mask** defines the type of subnet the device will be on. The proper subnet setting will be defined by the network administrator.

The **Gateway** is the default path for any packets NOT belonging to the local subnet. This IP address is the address of the router on your network. It is also entered as a dotted/decimal IPv4 format address. If the device will only be managed on the local subnet, setting a gateway address is not necessary.

Do not forget to save the configuration under the ‘Device’ menu so that the settings are permanent.

3.1.8 Converter Configuration

```
<< Converter Status and Configuration >>
<1> Jumbo Frame         [ Disable ]
<2> Forward CRC Frame   [ Disable ]
<3> Forward Pause Frame [ Disable ]
<4> Qos Priority         [ Enable ]
<5> Broadcast Storm Filter [ Disable ]
<6> Multicast Storm Filter [ Disable ]
<7> Unknown DA Unicast Storm Filter [ Disable ]
```

The Converter configuration menu includes special features of **FRM220-1000MS**.

This converter is capable of supporting **Jumbo Frames** (9k byte packets) when this option is enabled. Note that in order to support jumbo frames, the TP speed and duplex must match the FX. i.e., 1000M/Full. Jumbo Frames are not typically used on a normal network, since most devices are not able to handle them and they would be truncated. Most PCs, servers, switches, DSL and WiFi do not support jumbo frames. Jumbo frames can only work on a pure Jumbo frame network, which currently only exists in data centers for server-to-server or server-to-storage connections and on some back bone networks. Jumbo frames will always be considered to be illegal, non-standard Ethernet packets, according to IEEE802.3. In most cases, the call for jumbo frame support is just marketing hype.

Forward CRC Frame option is disabled by default. The normal behavior of a switch is to read the entire Ethernet frame (store), calculate the check sum and compare to the FCS in the packet. If the checksum matches, the packet is transmitted (&forward). If the checksum does not match, the switch considers the packet to have CRC error and drops it. If this option is enabled, the packet with CRC error will still be forwarded instead of being dropped.

The option **Forward Pause Frame** allows pause frame forwarding to occur when enabled. Pause frames are special broadcast frames defined in IEEE802.3X. Normally pause frames are used by the switch to throttle packets through a bottle neck rather than drop excess packets (for example, if **1000M** data stream is exiting a lower speed 100M port). Normally, the pause frames are not forwarded between interfaces in the switch.

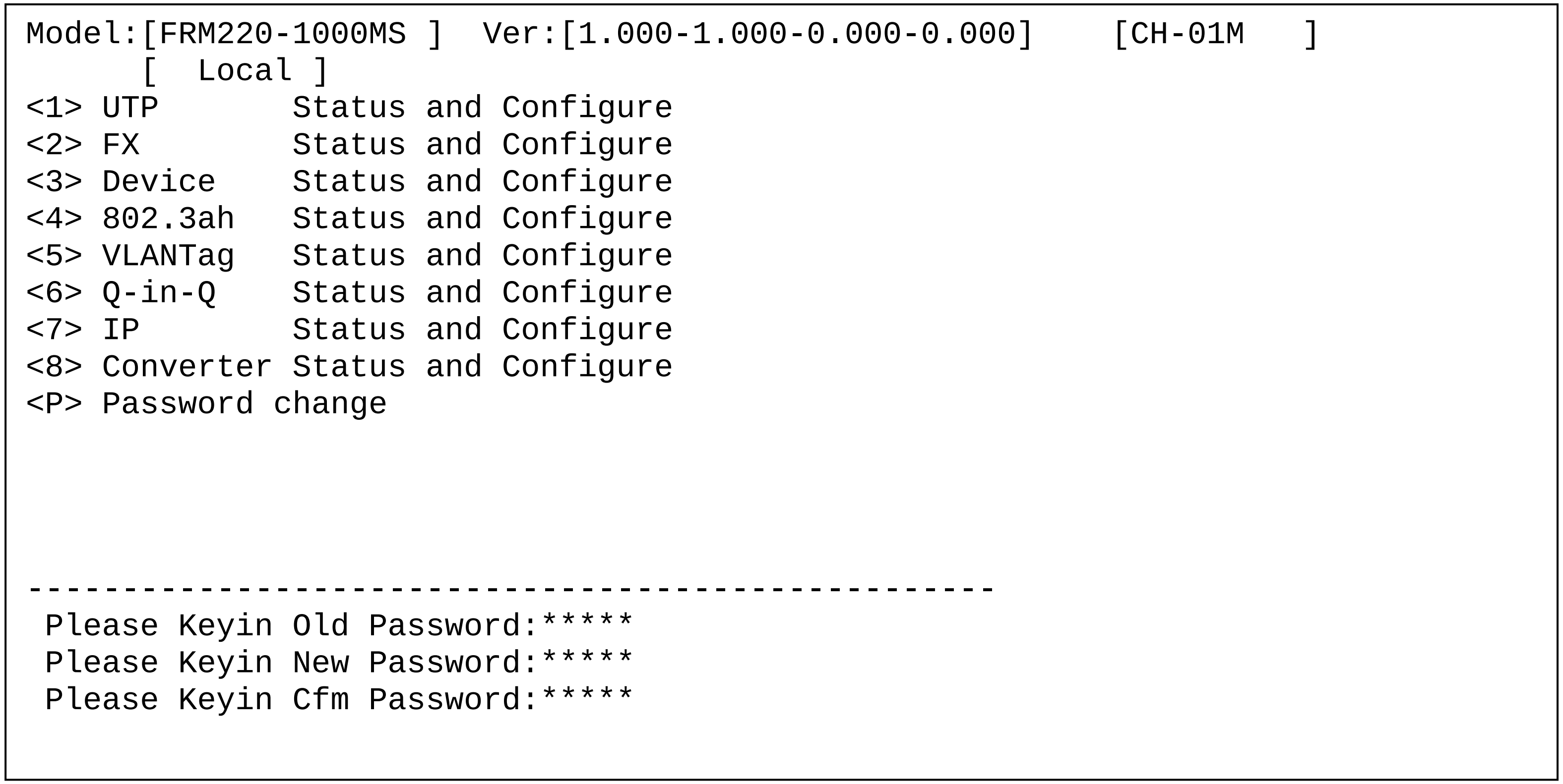
Quality of service is the ability to provide different priority levels to different applications, users, or data, or to guarantee a certain level of performance for data. Real time applications benefit the most when a system of QoS is employed. Examples are for voice and video over IP. In Ethernet, QoS is dependent on VLAN tagged packets. This is because the QoS priority bits (3 bits) are included in the VLAN tag. Without VLAN tags, there are no priority bits, and no way to set **QoS Priority**. In **FRM220-1000MS**, **QoS Priority** is enabled by default, but if there are no VLAN tagged packets, the enabled setting is meaningless.

Broadcast Storm is a condition where either a loop exists on the network or an Ethernet transceiver is bad and exhibiting jabber. In addition there are the deliberate attempts to bring a network down through virus and denial of service routines. When enabled, the **Broadcast Storm Filter** will recognize and block the forwarding of these broadcasts.

Multicast storms happen when application participants request retransmits of information they have missed in the multicast stream. There are many applications, like video streaming, IP based punch clocks, IP based surveillance trackers and camera, that come with multicast or some broadcast based protocol turned on by default. The **Multicast Storm Filter** can be enabled to filter these unwanted effects.

The **Unknown DA Unicast Storm Filter** can be used to filter the Unicast broadcasts whose objective is to cause deny-of-service. Some Trojans and virus start scanning multicast IP ranges causing excess broadcasts and reducing network performance.

3.1.9 Password Setting



```
Model:[FRM220-1000MS ]  Ver:[1.000-1.000-0.000-0.000]    [CH-01M   ]
      [  Local ]
<1> UTP       Status and Configure
<2> FX        Status and Configure
<3> Device    Status and Configure
<4> 802.3ah   Status and Configure
<5> VLANTag   Status and Configure
<6> Q-in-Q    Status and Configure
<7> IP        Status and Configure
<8> Converter Status and Configure
<P> Password change





---------------------------------------------------
 Please Keyin Old Password:*****
 Please Keyin New Password:*****
 Please Keyin Cfm Password:*****
```

The password setting protects **FRM220-1000MS** against unauthorized access to the management from serial console and HTTP. To change the password, select “p” from the main menu, next key in the old password and then key in the new password twice.

If the password is lost or forgotten, **FRM220-1000MS** must be set to factory default by using the front panel push button. With the unit already fully booted, press the default pushbutton with a pencil or ball point pen tip and hold for 6 seconds, then release. The password will be reset to ‘admin’ and all default IP and internal settings will be restored to factory defaults.

3.2 Web Login

3.2.1 Introduction

In an effort to make Networking devices easier to configure, many devices can now be configured via a Web Page, which should be familiar to all Internet users.

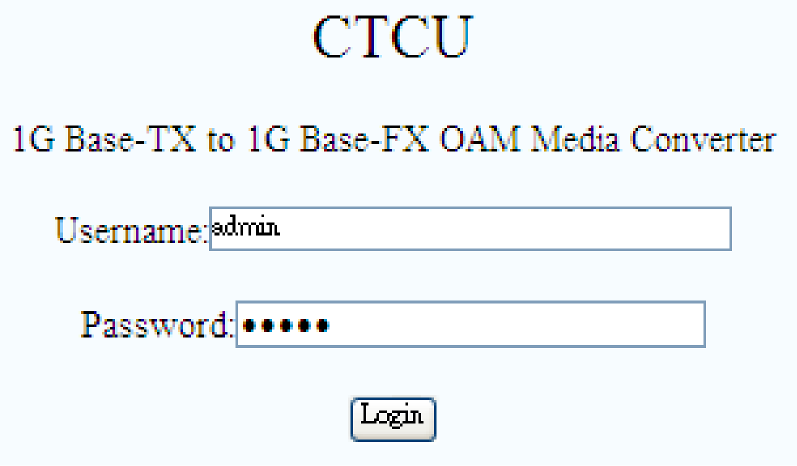
The web page is accessed by the Default IP Address of the device from a Web Browser such as Internet Explorer or Firefox in the following way:

10.1.1.1/ (Assuming the Default IP Address is 10.1.1.1)

Before accessing this device by web browser, the IP address must be known or it must be reset or changed to be used on the desired network. Please refer to Chapter 1, section 1.6 or to Chapter 2, section 3.1.9 for the factory reset procedure. To configure the IP address via console, refer to Chapter 3, section 3.1.7 for IP Address settings. If you do not have ability to access the console configuration, then you must set your PC to the default IP subnet and access this device that way. Then you can change the IP address through the web interface.

3.2.2 Web Login Page

Access the device via a web browser.
Enter the password and click “Login”.



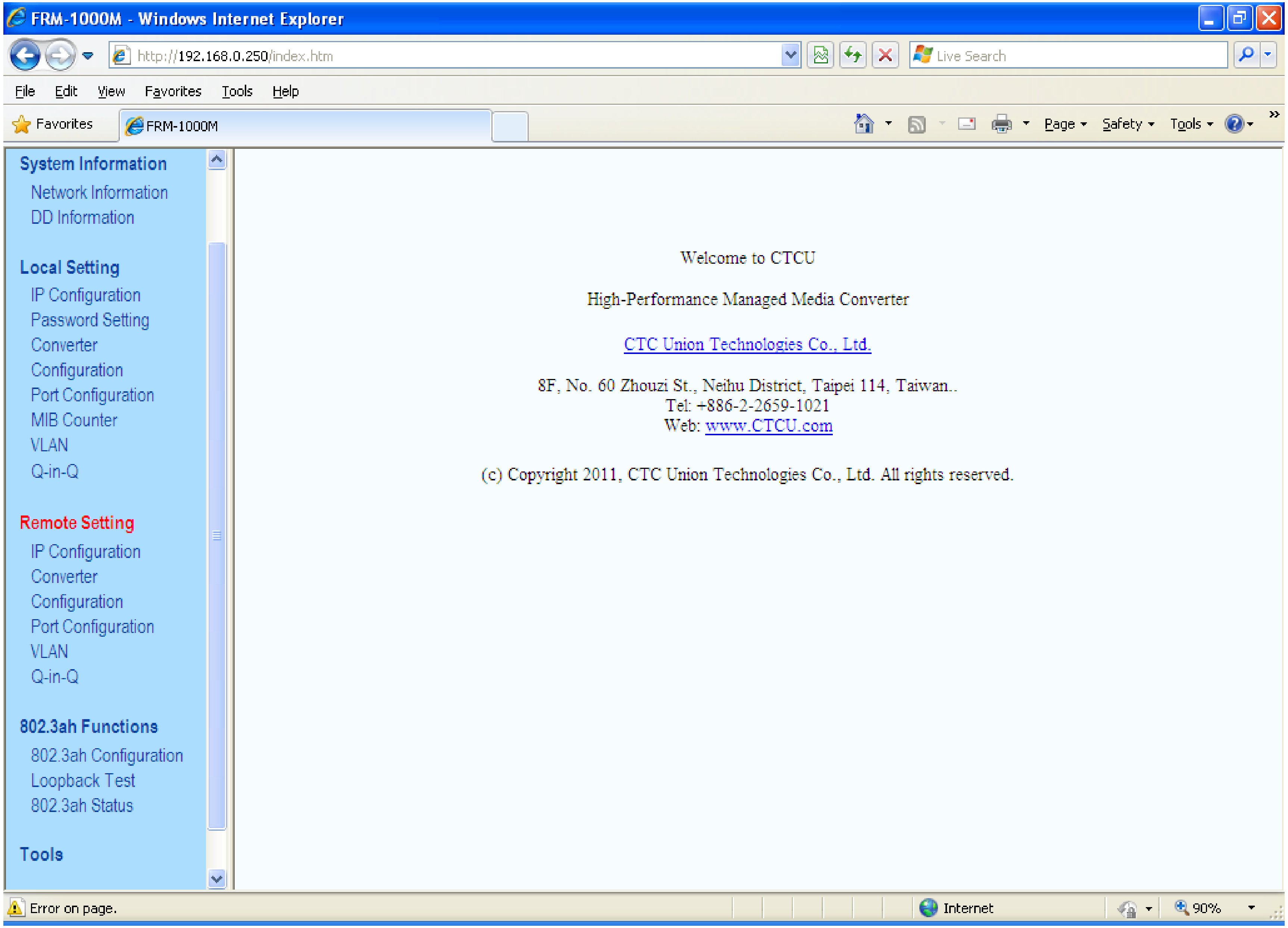
CTCU

1G Base-TX to 1G Base-FX OAM Media Converter

Username: admin

Password: ●●●●●

3.2.3 Web Main Page



Welcome to CTCU

High-Performance Managed Media Converter

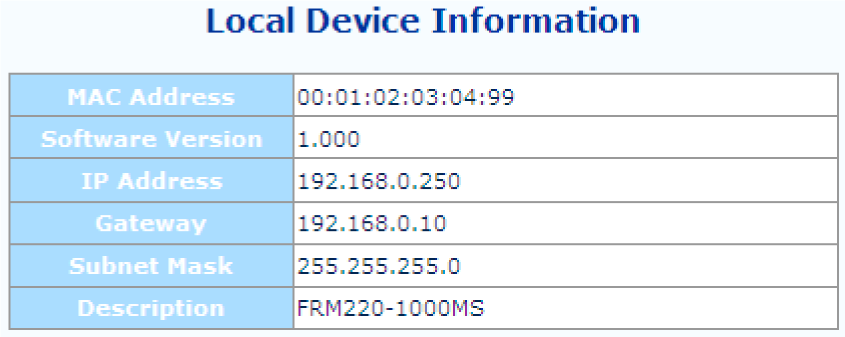
CTC Union Technologies Co., Ltd.

8F, No. 60 Zhouzi St., Neihu District, Taipei 114, Taiwan..
Tel: +886-2-2659-1021
Web: www.CTCU.com

(c) Copyright 2011, CTC Union Technologies Co., Ltd. All rights reserved.

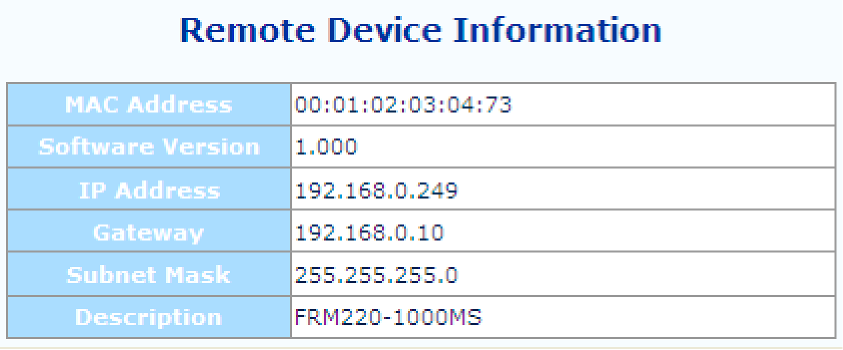
3.2.4 System Information, Network Information

The information displayed on this page gives specific device, network information, and port status for the local FRM220-1000MS and for any remote that is accessible via IEEE802.3ah OAM in-band management.



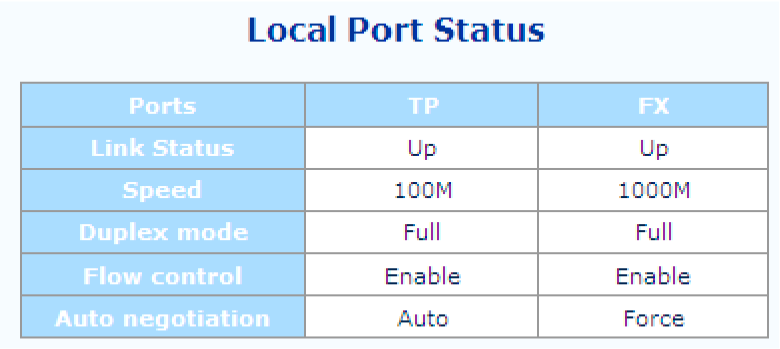
Local Device Information

MAC Address	00:01:02:03:04:99
Software Version	1.000
IP Address	192.168.0.250
Gateway	192.168.0.10
Subnet Mask	255.255.255.0
Description	FRM220-1000MS



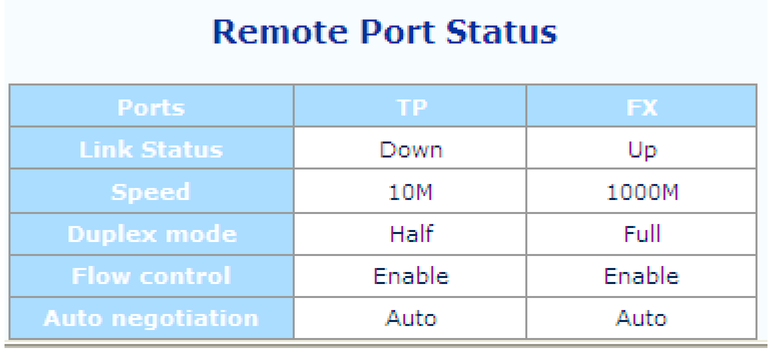
Remote Device Information

MAC Address	00:01:02:03:04:73
Software Version	1.000
IP Address	192.168.0.249
Gateway	192.168.0.10
Subnet Mask	255.255.255.0
Description	FRM220-1000MS



Local Port Status

Ports	TP	FX
Link Status	Up	Up
Speed	100M	1000M
Duplex mode	Full	Full
Flow control	Enable	Enable
Auto negotiation	Auto	Force

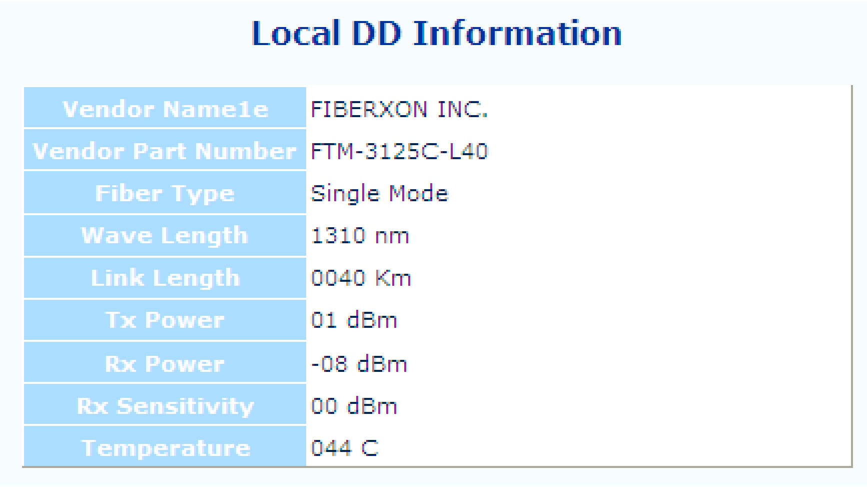


Remote Port Status

Ports	TP	FX
Link Status	Down	Up
Speed	10M	1000M
Duplex mode	Half	Full
Flow control	Enable	Enable
Auto negotiation	Auto	Auto

3.2.5 System Information, DD Information

The DD or DDOM information is read from the MSA compliant SFP module and can be displayed via the web user interface.

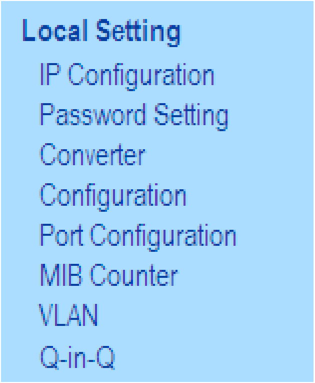


Local DD Information

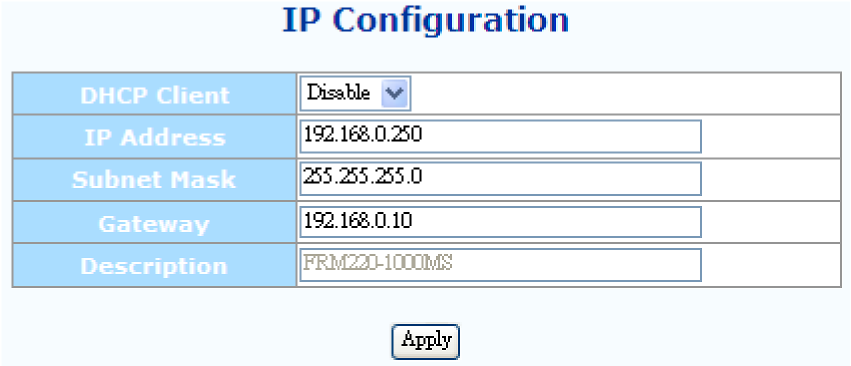
Vendor Name1e	FIBERXON INC.
Vendor Part Number	FTM-3125C-L40
Fiber Type	Single Mode
Wave Length	1310 nm
Link Length	0040 Km
Tx Power	01 dBm
Rx Power	-08 dBm
Rx Sensitivity	00 dBm
Temperature	044 C

3.2.6 Local Settings

If you have reviewed section 3.1 of this chapter, then you will already be familiar with these settings and their actions. We will go through the settings here again, but not with as much detail. For detail, please review section 3.1.



3.2.6.1 IP Configuration

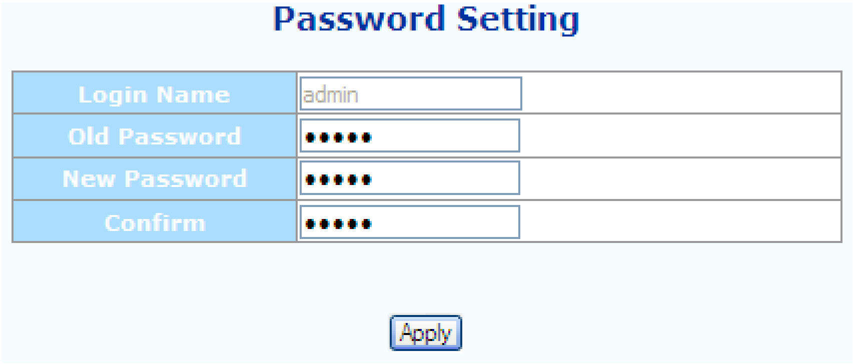


IP Configuration

DHCP Client	Disable
IP Address	192.168.0.250
Subnet Mask	255.255.255.0
Gateway	192.168.0.10
Description	FRM220-1000MS

Use this screen to set the TCP/IP configuration for the local unit. Note, that if you change the IP address you could lose remote management for this device. Remember to save settings under the “Tools” menu.

3.2.6.2 Password Setting

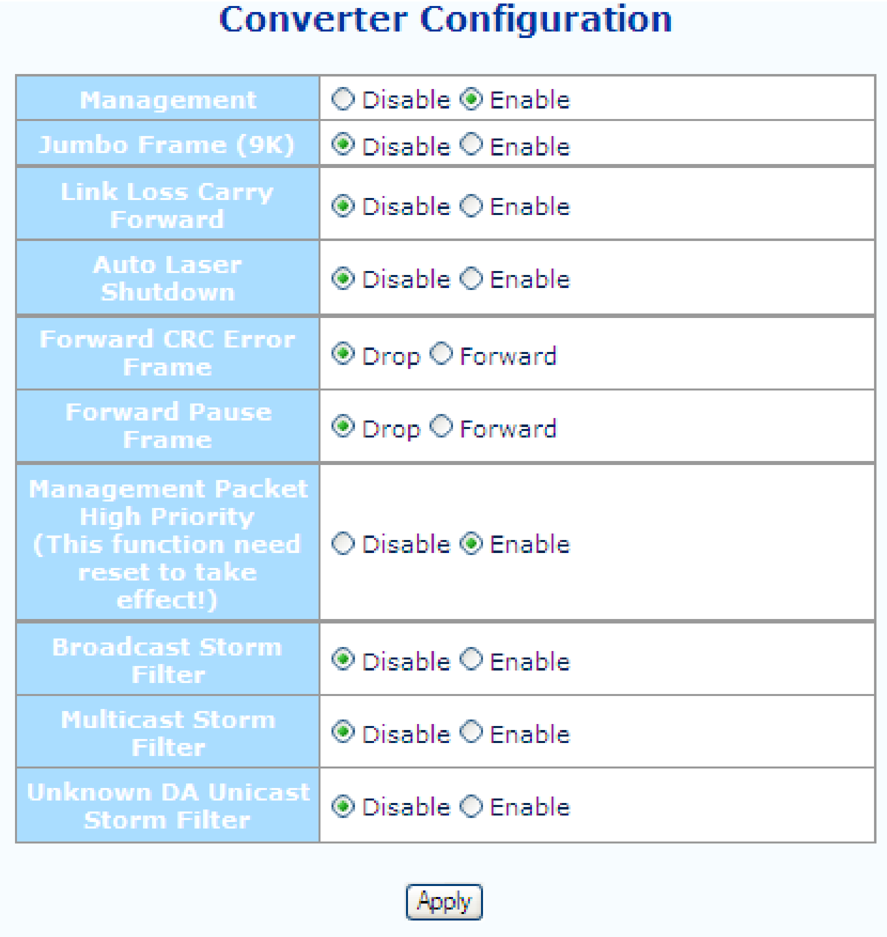


Password Setting

Login Name	admin
Old Password	●●●●●
New Password	●●●●●
Confirm	●●●●●

Key in the current password and type in the new password twice, then click the “Apply” button.

3.2.6.3 Converter Configuration

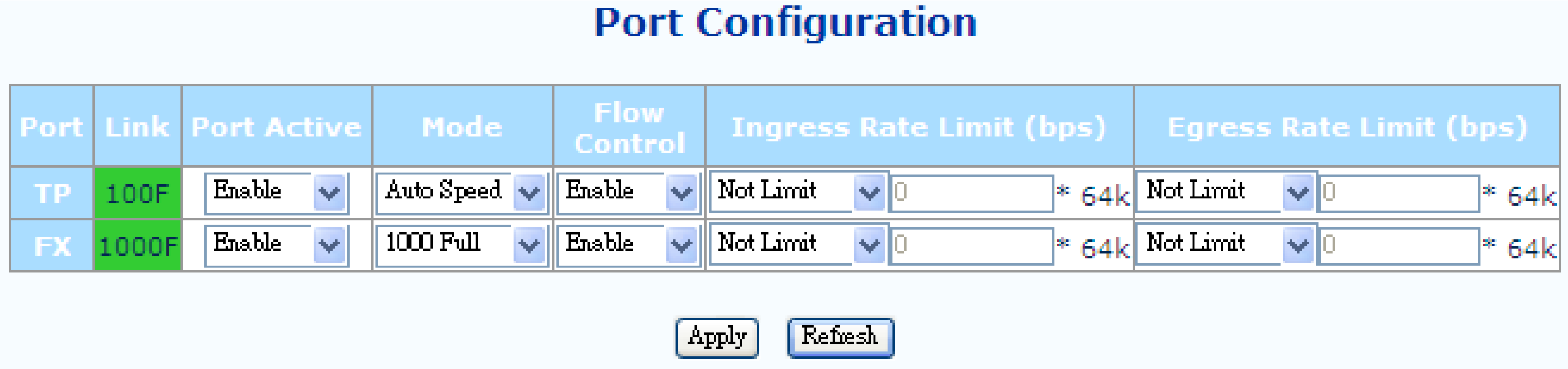


Converter Configuration

Management	○ Disable ● Enable
Jumbo Frame (9K)	● Disable ○ Enable
Link Loss Carry Forward	● Disable ○ Enable
Auto Laser Shutdown	● Disable ○ Enable
Forward CRC Error Frame	● Drop ○ Forward
Forward Pause Frame	● Drop ○ Forward
Management Packet High Priority (This function need reset to take effect!)	○ Disable ● Enable
Broadcast Storm Filter	● Disable ○ Enable
Multicast Storm Filter	● Disable ○ Enable
Unknown DA Unicast Storm Filter	● Disable ○ Enable

All of these special functions are explained in Section 3.1.8 of this chapter. Select the proper radio buttons and the click the “Apply” button. Remember to save settings under the “Tools” menu.

3.2.6.4 Port Configuration

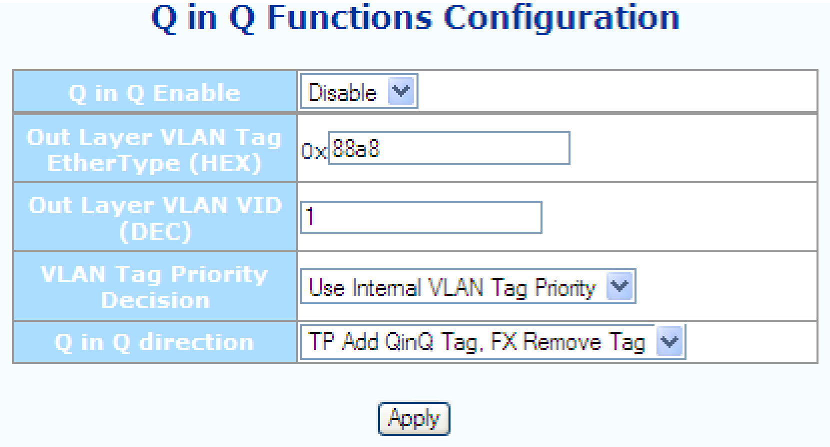


Port Configuration

Port	Link	Port Active	Mode	Flow Control	Ingress Rate Limit (bps)	Egress Rate Limit (bps)
TP	100F	Enable	Auto Speed	Enable	Not Limit 0 * 64k	Not Limit 0 * 64k
FX	1000F	Enable	1000 Full	Enable	Not Limit 0 * 64k	Not Limit 0 * 64k

This screen is for the configuration of the electrical Ethernet port (TP) and the optical port (FX). The options include enabling or disabling the port, setting auto or forced Ethernet mode, enabling 802.3X (flow control), and setting ingress and egress rate limiting. Note that rate limiting has a granularity of 64K so the rate can be set from 64k to 1000M in 64K steps.

3.2.6.5 Q-in-Q Configuration

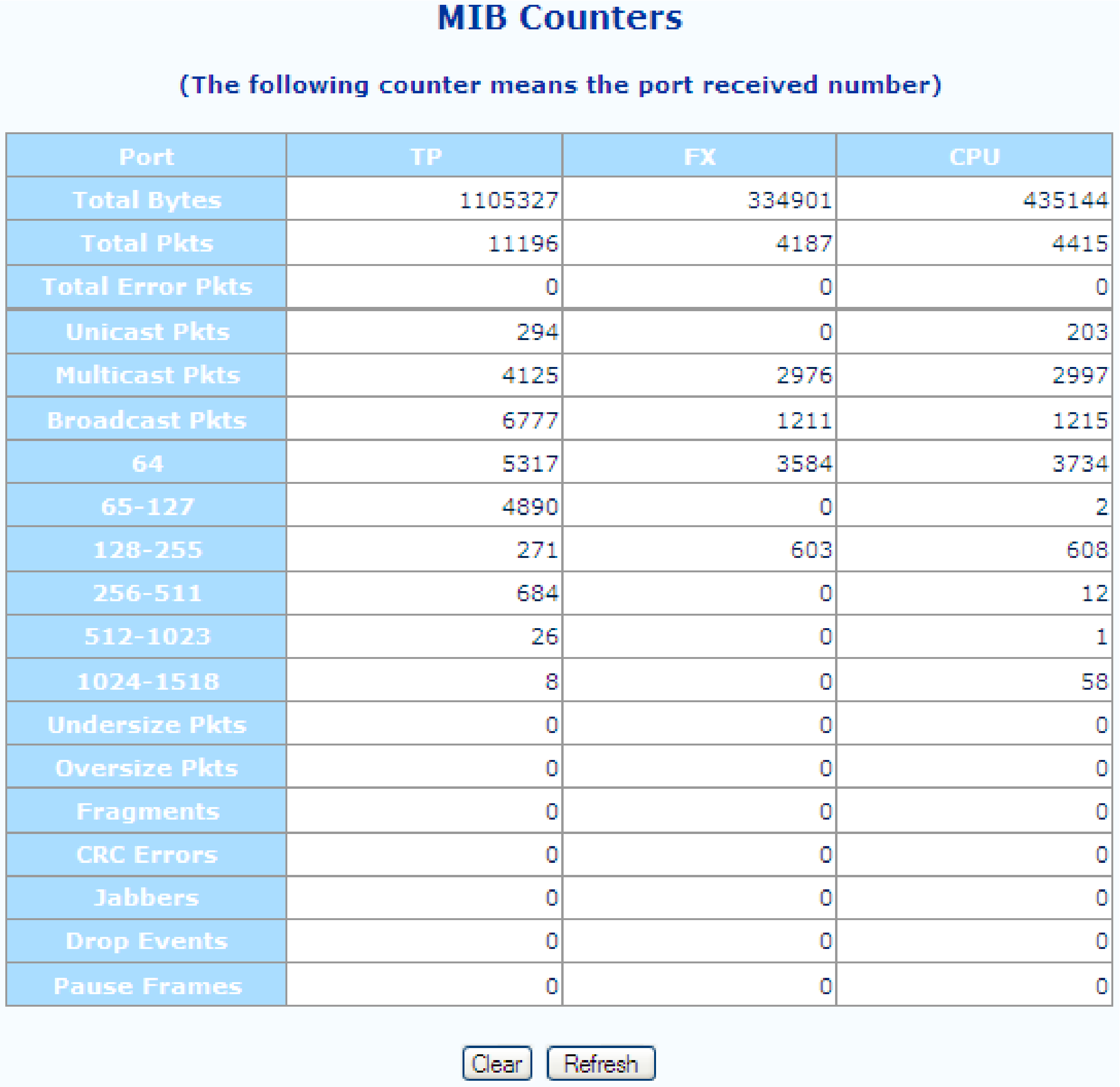


Q in Q Functions Configuration

Q in Q Enable	Disable
Out Layer VLAN Tag EtherType (HEX)	0x 88a8
Out Layer VLAN VID (DEC)	1
VLAN Tag Priority Decision	Use Internal VLAN Tag Priority
Q in Q direction	TP Add QinQ Tag, FX Remove Tag

The Q-in-Q function sets the S-tag or outer VLAN tag which is typically used by the service provider. For more explanation please see Section 3.1.6.

3.2.6.6 RMON Counters



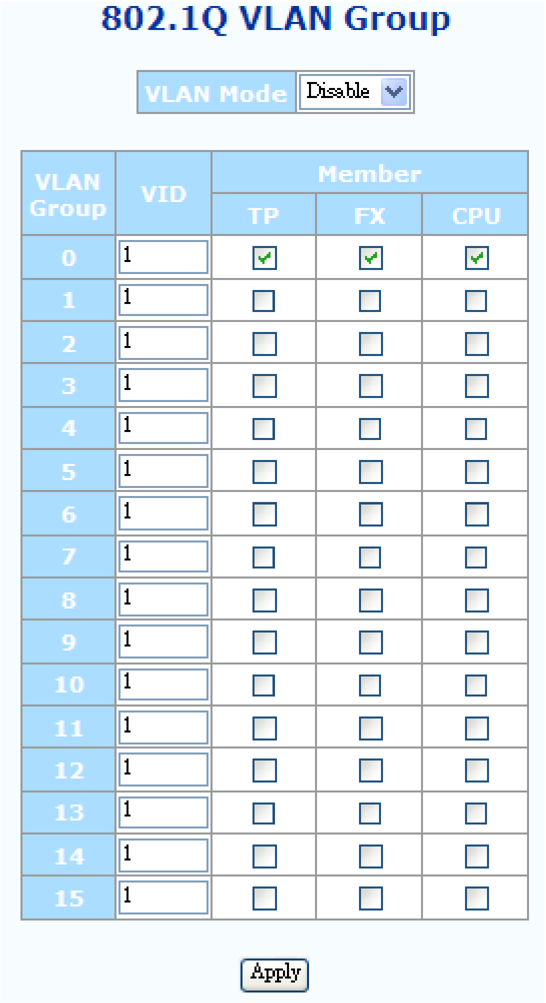
MIB Counters

(The following counter means the port received number)

Port	TP	FX	CPU
Total Bytes	1105327	334901	435144
Total Pkts	11196	4187	4415
Total Error Pkts	0	0	0
Unicast Pkts	294	0	203
Multicast Pkts	4125	2976	2997
Broadcast Pkts	6777	1211	1215
64	5317	3584	3734
65-127	4890	0	2
128-255	271	603	608
256-511	684	0	12
512-1023	26	0	1
1024-1518	8	0	58
Undersize Pkts	0	0	0
Oversize Pkts	0	0	0
Fragments	0	0	0
CRC Errors	0	0	0
Jabbers	0	0	0
Drop Events	0	0	0
Pause Frames	0	0	0

The counters have an accumulation of received bytes for each port (UTP, Fiber and Management) and more detailed distribution of those packets

3.2.6.7 VLAN Group Configuration



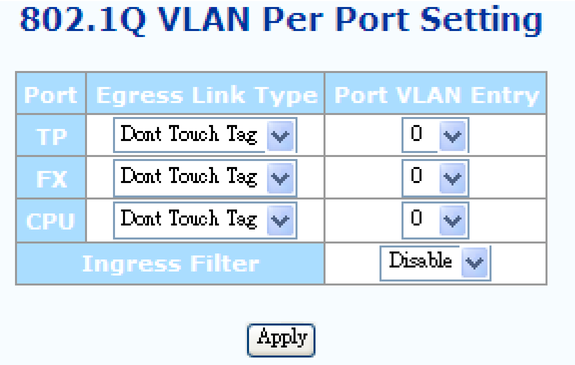
802.1Q VLAN Group

VLAN Mode: Disable

VLAN Group	VID	Member		
		TP	FX	CPU
0	1	☑	☑	☑
1	1	□	□	□
2	1	□	□	□
3	1	□	□	□
4	1	□	□	□
5	1	□	□	□
6	1	□	□	□
7	1	□	□	□
8	1	□	□	□
9	1	□	□	□
10	1	□	□	□
11	1	□	□	□
12	1	□	□	□
13	1	□	□	□
14	1	□	□	□
15	1	□	□	□

FRM220-1000MS supports up to 16 VLAN groups. By using the check boxes for each port, the access to different VIDs can be controlled.

3.2.6.8 VLAN Per Port Configuration

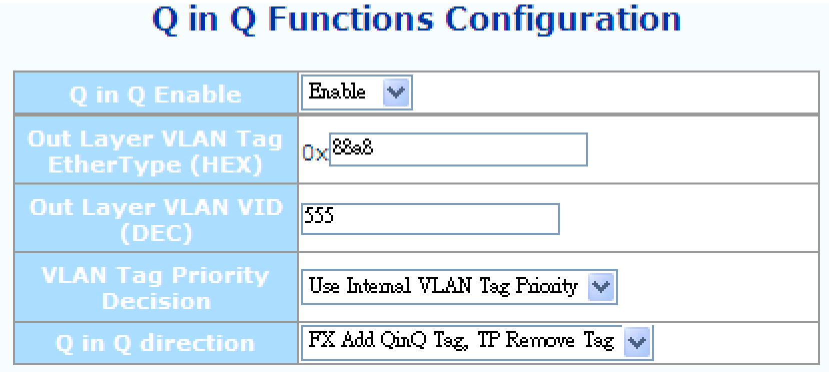


802.1Q VLAN Per Port Setting

Port	Egress Link Type	Port VLAN Entry
TP	Dont Touch Tag	0
FX	Dont Touch Tag	0
CPU	Dont Touch Tag	0
Ingress Filter		Disable

In **FRM220-1000MS** there are actually three different ports, the external copper and fiber ports, plus the internal CPU port. The VLAN Per Port Setting page deals with how frames exit (egress) the copper, fiber and CPU (management). These are the **Frame Egress Type**. The following operations may be performed to the outgoing frames: **<1>: Replace Tag** The switch will remove VLAN tags from packets then add new tags to them. The inserted tag is defined in ”VLAN Group Index”. **<2>: Remove Tag** The switch will remove VLAN tags from packets, if they are tagged. The switch will not modify packets received without tags **<3>: Add Tag** The switch will add VLAN tags to packets, if they are not tagged when these packets are output on this port. The switch will not add tags to packets already tagged. The inserted tag is defined in ”VLAN Group Index”. **<4>: Don't Touch Tag** Do not insert or remove VLAN tags to/from packet which is output on this port.

3.2.6.9 Q in Q Configuration



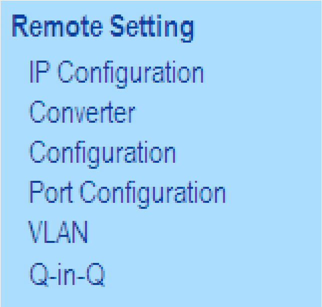
Q in Q Functions Configuration

Q in Q Enable	Enable
Out Layer VLAN Tag EtherType (HEX)	0x 88a8
Out Layer VLAN VID (DEC)	555
VLAN Tag Priority Decision	Use Internal VLAN Tag Priority
Q in Q direction	FX Add QinQ Tag, TP Remove Tag

Q in Q or double VLAN tagging is defined in IEEE802.1ad. Double VLAN tagging is required when a service provider wishes to carry a customer’s VLAN tagged traffic through its own VLAN network. In MEF (Metro Ethernet Forum) terms, the first tag or “inner tag” is referred to as the C-tag (customer) while the second tag or “outer tag” is referred to as the S-tag (service provider). Normal VLAN tag has an EtherType (TPID or Tag Protocol Identifier) of 0x8100. The IEEE802.1ad standard recommends 0x88a8 TPID for the outer or S-tag.

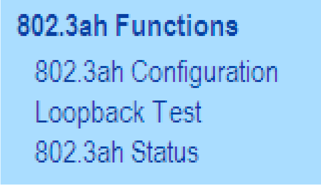
3.2.7 Remote Settings

When 802.3ah is active in both the local and remote unit (with fiber connection), the in-band management provides an embedded channel to control and configure the remote by using OAM (layer 2) Ethernet packets. The same settings available to the local unit are available under the **Remote Setting** menu, with the exception of password setting and Counters.

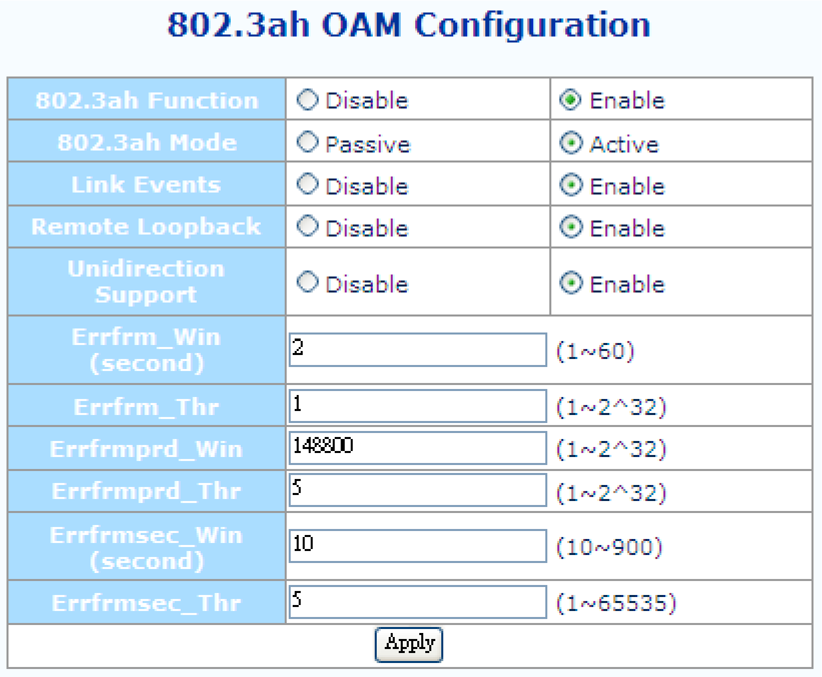


3.2.8 802.3ah OAM Functions

This converter supports IEEE 802.3ah, an OAM protocol that operates at Ethernet Layer 2 (Data Link layer). OAM provides mechanisms to monitor link operation / health and to improve fault isolation. OAM only works point-to-point over the fiber link. In addition to standard 802.3ah functions like loop back and dying gasp, **FRM220-1000MS** also implements OAM to provide complete provisioning of the remote fiber connected converter, without using Layer 3 IP protocol. By using OAM, we can remote manage another fiber connected **1000M(S)** converter, without IP addressing. From this menu we can also perform some basic diagnostics, such as loop back test.



3.2.8.1 802.3ah Configuration

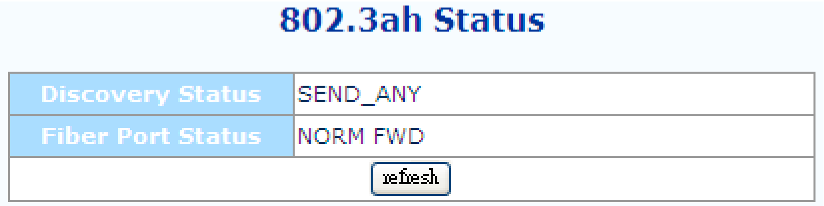


802.3ah OAM Configuration

802.3ah Function	○ Disable	● Enable
802.3ah Mode	○ Passive	● Active
Link Events	○ Disable	● Enable
Remote Loopback	○ Disable	● Enable
Unidirection Support	○ Disable	● Enable
Errfrm_Win (second)	2	(1~60)
Errfrm_Thr	1	(1~2^32)
Errfrmprd_Win	148800	(1~2^32)
Errfrmprd_Thr	5	(1~2^32)
Errfrmsec_Win (second)	10	(10~900)
Errfrmsec_Thr	5	(1~65535)

To use the OAM functions, the **802.3ah Functions** setting must be enabled. It is not enabled by default. The **802.3ah mode** is used to configure an OAM pair. In a pair, one unit must be ‘active’, while the other must be ‘passive’. We typically place the remote converter (CPE) in ‘passive’ mode and make the local converter ‘active’. ‘Passive’ is the default setting when 802.3ah function is enabled.

In order to do **Remote Loop Back** test, the option must be enabled in both converters. By default it is not enabled.

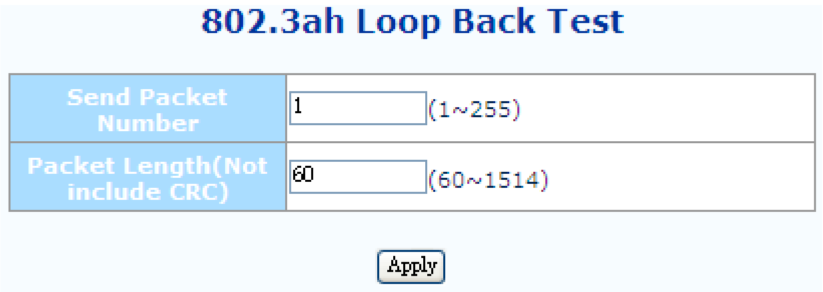


802.3ah Status

Discovery Status	SEND_ANY
Fiber Port Status	NORM FWD

The normal status when OAM is working is shown above. If OAM is not passing due to fiber disconnect, Discovery Status will be Fault. If OAM is not enabled, this status window will not even be shown.

3.2.8.2 Loop back Test



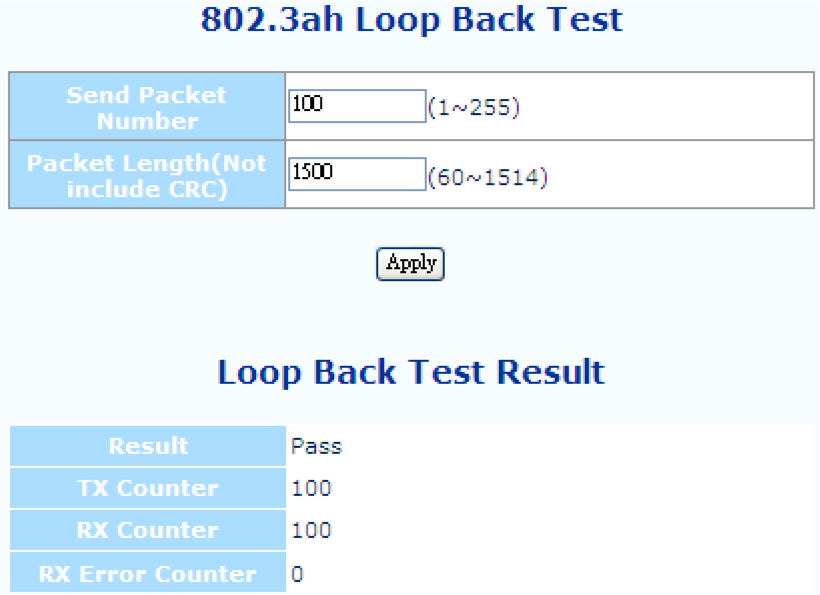
802.3ah Loop Back Test

Send Packet Number	1 (1~255)
Packet Length(Not include CRC)	60 (60~1514)

The loop back test is a non-intrusive test which uses OAM packets and will not affect normal transmissions. The number of OAM frames used (the number of times the loop back is done) is set by the **Send Packet Number**. The default is 1 packet.

The **Packet Length (Not including CRC)** controls the packet size of the OAM frames used for loop back testing. The default is 60 bytes. The CRC of Ethernet packets uses 4 bytes. Valid Ethernet packets range in size from 64 bytes to 1518 bytes. VLAN tag adds another 4 bytes for a maximum size of 1522 bytes. Q in Q adds yet another 4 bytes, bringing the packet size to 1526 bytes. Any frame size larger than this is technically called a jumbo frame.

The **Loop Back Test Start** is accomplished by clicking the “Apply” button.



802.3ah Loop Back Test

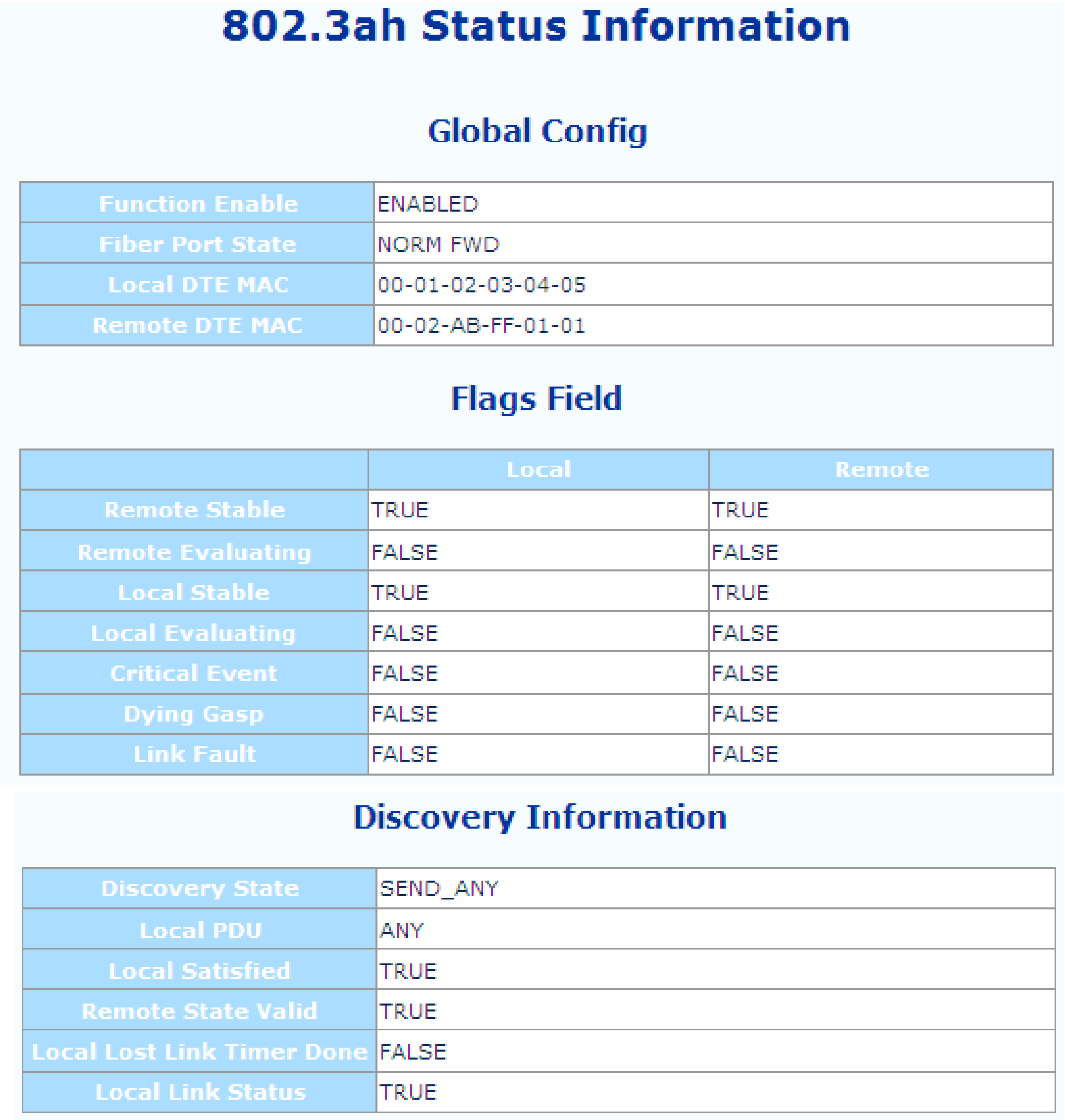
Send Packet Number	100 (1~255)
Packet Length(Not include CRC)	1500 (60~1514)

Loop Back Test Result

Result	Pass
TX Counter	100
RX Counter	100
RX Error Counter	0

802.3ah is a slow protocol with a maximum speed of 10 packets per second. The test above takes 10 seconds for 100 packets.

3.2.8.3 802.3ah Status



802.3ah Status Information

Global Config

Function Enable	ENABLED
Fiber Port State	NORM FWD
Local DTE MAC	00-01-02-03-04-05
Remote DTE MAC	00-02-AB-FF-01-01

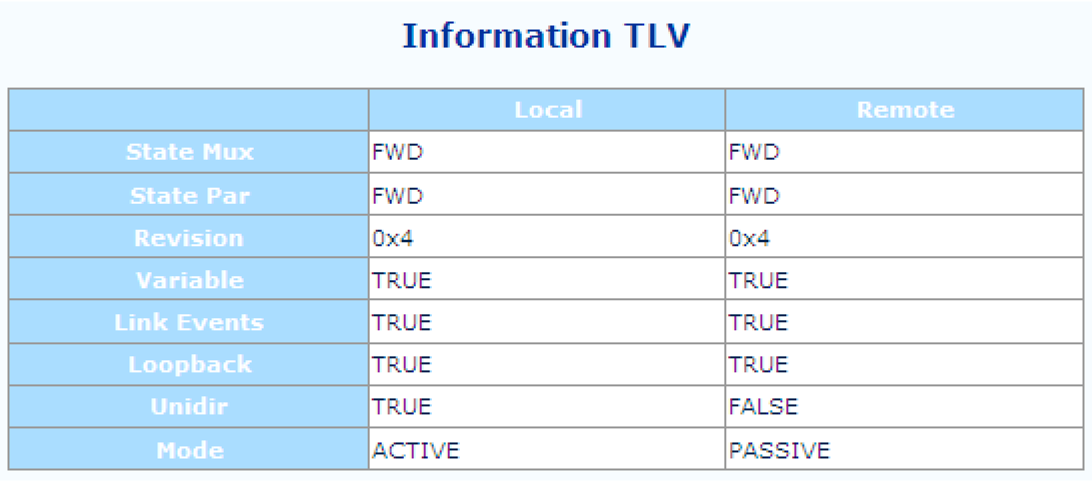
Flags Field

	Local	Remote
Remote Stable	TRUE	TRUE
Remote Evaluating	FALSE	FALSE
Local Stable	TRUE	TRUE
Local Evaluating	FALSE	FALSE
Critical Event	FALSE	FALSE
Dying Gasp	FALSE	FALSE
Link Fault	FALSE	FALSE

Discovery Information

Discovery State	SEND_ANY
Local PDU	ANY
Local Satisfied	TRUE
Remote State Valid	TRUE
Local Lost Link Timer Done	FALSE
Local Link Status	TRUE

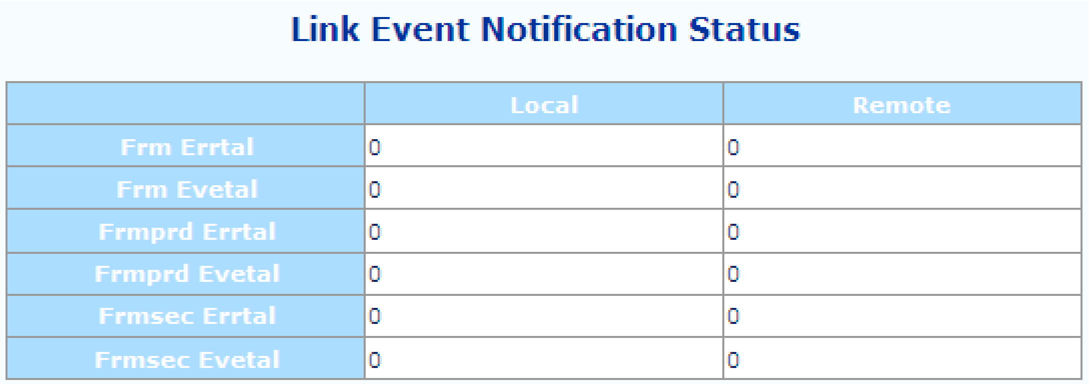
The **Global Config** fields display the state of OAM, if OAM is enabled. We can also see the MAC addresses of the local and remote units in the OAM manageable pair. The **Flags Field** list the results of individual events based on the results of OAM protocol data units (OAMPDUs). Lastly, when two OAM devices start negotiation, there is **Discovery Information** passed between them. The results are shown here.



Information TLV

	Local	Remote
State Mux	FWD	FWD
State Par	FWD	FWD
Revision	0x4	0x4
Variable	TRUE	TRUE
Link Events	TRUE	TRUE
Loopback	TRUE	TRUE
Unidir	TRUE	FALSE
Mode	ACTIVE	PASSIVE

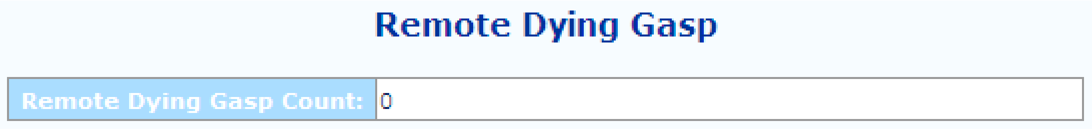
Most information carried by OAMPDU is encoded using type-length-value (TLV) format. The first octet (or byte) of the OAMPDU indicates the type. This type is used to let the OAM client know how to decode the bytes containing the information. The next octet carries the length of the information. This display has **TLV information** for both the local and remote OAM units.



Link Event Notification Status

	Local	Remote
Frm Errtal	0	0
Frm Evetal	0	0
Frmprd Errtal	0	0
Frmprd Evetal	0	0
Frmsec Errtal	0	0
Frmsec Evetal	0	0

Ethernet OAM also defines a set of standard event conditions that Ethernet links should monitor in normal operation, and if detected, should be signaled to a peer entity. The **Link Event Notification Status** conditions reflect a degraded, but not yet inoperable, Ethernet connection. These conditions include threshold-crossing alarms on the frequency of symbol errors and frame errors.

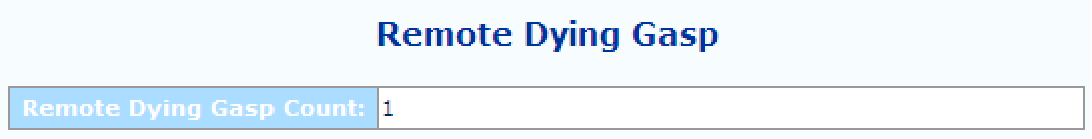


Remote Dying Gasp

Remote Dying Gasp Count: 0

One of the most critical problems in an access network for carriers is differentiating between a simple power failure at the customer premise and an equipment or facility failure. Dying gasp provides this information by having a station indicate to the network that it is having a power failure.

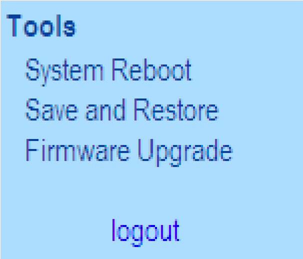
If remote management is lost, we simply need to check the **Remote Dying Gasp Count** register to see if it has been incremented.



Remote Dying Gasp

Remote Dying Gasp Count: 1

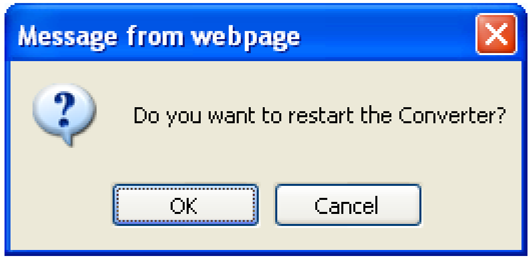
3.2.9 Tools



The **Tools** menu includes the **System Reboot**, **Save and Restore** settings and **Firmware Upgrade** functions.

3.2.9.1 System Reboot

When the converter is rebooted, all counters and registers are cleared and the converter starts fresh. If OAM is enabled, the discovery process will start. After selecting the System Reboot menu item, a confirmation dialogue box will pop up. Click “OK” to reboot the converter or click “Cancel” to leave without rebooting. The converter requires about 20~25 seconds to fully reboot.

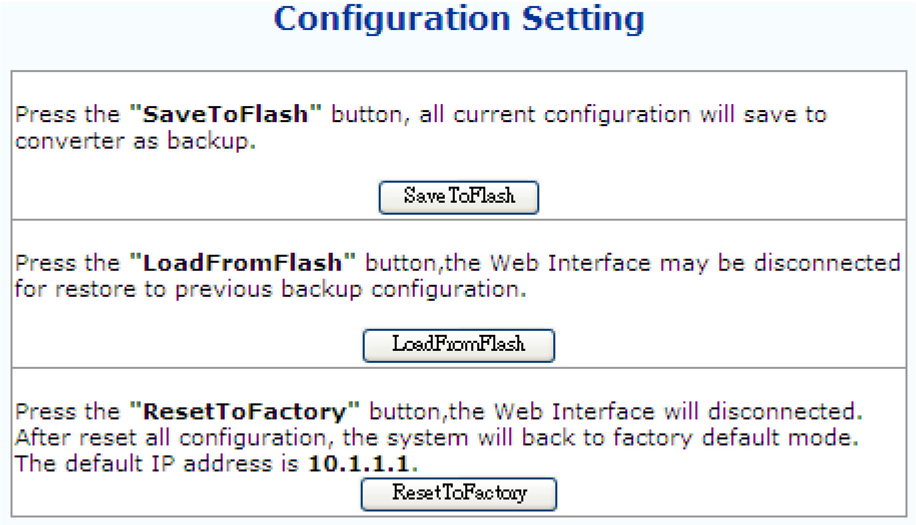


Message from webpage

Do you want to restart the Converter?

3.2.9.2 Save and Restore

After performing configuration of the converter, the settings must be saved. Click the “**Save To Flash**” button to save settings. If you wish to abandon all settings and return to the previous settings before doing configuration, click the “**Load From Flash**” button.



Configuration Setting

Press the "**SaveToFlash**" button, all current configuration will save to converter as backup.

Press the "**LoadFromFlash**" button,the Web Interface may be disconnected for restore to previous backup configuration.

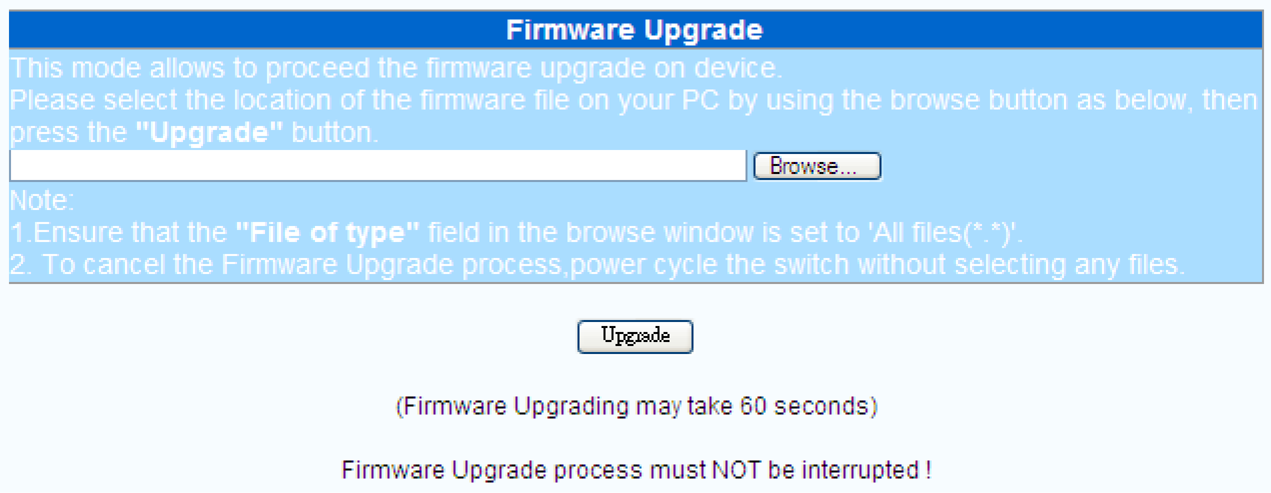
Press the "**ResetToFactory**" button,the Web Interface will disconnected. After reset all configuration, the system will back to factory default mode. The default IP address is **10.1.1.1**.

To restore all settings to factory default, click the “**Reset To Factory**” button. The IP address will also be reset, so you might lose management contact with the converter. So, be careful.

3.2.9.3 Firmware Upgrade

If bugs are discovered, if functions are added, or if factory default settings are changed, the firmware in the converter will require upgrading. The only method to do upgrade for this converter is through the local Web (HTTP) user interface. The firmware image is uploaded from the browser (Post), it is checked for integrity, the flash is erased and then the flash is written with the new image.

DO NOT LET ANY POWER INTERRUPTION OCCUR DURING THE UPGRADE PROCEDURE.



Firmware Upgrade

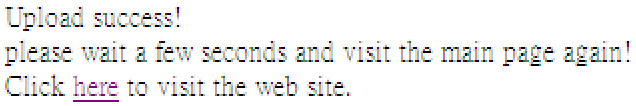
This mode allows to proceed the firmware upgrade on device.
Please select the location of the firmware file on your PC by using the browse button as below, then press the **"Upgrade"** button.

Note:
1.Ensure that the **"File of type"** field in the browse window is set to 'All files(*.*)'.
2. To cancel the Firmware Upgrade process,power cycle the switch without selecting any files.

(Firmware Upgrading may take 60 seconds)

Firmware Upgrade process must NOT be interrupted !

Click the “Browse” button and locate the image upgrade file through the “Choose File to Upload” dialogue box, then click “Open”. Next, click the “Upgrade” button.

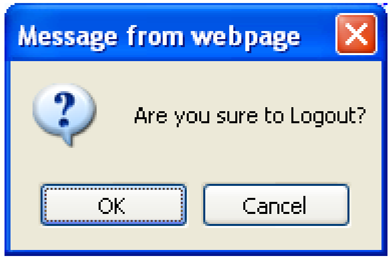


Upload success!
please wait a few seconds and visit the main page again!
Click here to visit the web site.

The “Upload success!” indicates the image was transferred OK. **Do not do anything for the next 60 seconds!!!!**. After 60 seconds, you may click the link to re-login to the web interface.

3.2.10 Logout

Logging out will ensure that the management session with **FRM220-1000MS** is terminated. This is especially important if you are using a public computer to manage the device. Once logged out, a password must be entered to access **FRM220-1000MS** again.



Message from webpage

Are you sure to Logout?

Click the “OK” button to completely log out. Click the “Cancel” button to return to configuration of **FRM220-1000MS**.

3.3 Troubleshooting

3.3.1 Factory Default.

Apply power to **FRM220-1000MS** and allow 25-30 seconds to fully boot. Using a pencil or ball-point pen, press the 'DEFAULT' recessed push-button switch (located on the face plate) and hold for 6 seconds or more then release. **DO NOT POWER OFF**; Allow the unit to again fully reboot (about 25 seconds). The factory default TCP/IP settings are:

IP=10.1.1.1
netmask=255.255.255.0
GW=10.1.1.254

The username and password are both reset to 'admin'.

Additionally, any VLAN, 1Q or Q in Q will be disabled. All ports will be enabled, UTP ports set for auto-negotiation and no bandwidth limiting on any port.

3.3.2 LED Observations

3.3.2.1 Power On

At initial power on, PWR LED will be lit.

Error conditions :

If all LEDs immediately light and never turn off, or if no LED ever lights, then the card is possibly defective. Be sure to double check power source and try either another **FRM220-1000MS** in the same chassis or try the card in a different chassis.

3.3.2.2 UTP Link Test.

Following a complete power and boot up (about 25 seconds) the converter will be active and LAN port will display LAN LNK state when connected to a live Ethernet circuit. The LAN SPD LED will be green when connected to Fast Ethernet (100M) and yellow when connected to Gigabit Ethernet (1000M). When connected to 10Base-T the LAN SPD LED will be off.

3.3.2.3 Fiber Link Test

Following a complete power and boot up (about 25 seconds) the converter will be active. For **FRM220-1000MS**, place a known good SFP module into Fiber Port cage. Use a simplex patch cable (single fiber strand, LC to LC), route the SFP Tx back to the Rx optical connection. The FX LNK LED should light. For **FRM220-1000M**, use a simplex patch cable (single fiber strand, SC to SC, ST to ST or FC to FC), route the Tx back to the Rx optical connection. The FX LNK LED should light.

Caution: When performing a physical loop back on any fiber port, DO NOT connect the LAN port to a live Ethernet network. Doing so could create a broadcast storm.

3.3.3 Operation Checks

3.3.3.1 Converter Check

A very easy way to ensure a pair of **FRM220-1000MS** is passing traffic, is to place them between two PCs. Connect PC1 to LAN of one converter and PC2 to LAN of the other converter. When the two PCs can ping each other, it indicates **FRM220-1000MS** pair is operational.

3.3.3.2 Console Check

Connect a dumb terminal (or PC running terminal emulation) to the CONSOLE port of the **CH01M** one-slot chassis. Set the terminal configuration for 38.4K, 8bit, no parity, 1 stop and now flow control. When **FRM220-1000MS** is running normally, there should be a terminal display with either the main page or a password login prompt. If no terminal display, it indicates some internal problem with the unit.

3.3.3.3Ping Test

With **FRM220-1000MS** reset to factory default, connect a PC and configure the PC to the 10.1.1.0 network (10.1.1.100 recommended). Use a PC to ping **FRM220-1000MS** at its factory default IP address of 10.1.1.1. With a direct connection to PC, there should be no time outs and ping latency should be less than 1 millisecond. If you switch to another FRM220-1000MS, be sure to clear the PC ARP table. Every **FRM220-1000MS** has the same default IP address, but every unit has a different MAC address. To clear the PC's MAC table, open a command window and execute the command 'arp –d'. In addition, if you disconnect the PC from any LAN connection and then re-connect, the ARP table should also be cleared.

3.3.3.4 Web Access Test

With **FRM220-1000MS** reset to factory default, connect a PC and configure the PC to the 10.1.1.0 network (10.1.1.100 recommended). Use a PC to connect to **FRM220-1000MS** at its factory default IP address of 10.1.1.1 using a web browser (Internet Explorer, Firefox, Chrome, etc.). The local web page login page should display. Use 'admin/admin' to login; the local main page should be displayed in the browser.

If the ping test can pass and the login page can be displayed but login fails, we recommend that cookies be deleted. You may either delete all cookies for your browser or only the individual cookie created for the IP address of **FRM220-1000MS**.

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