MetroConnect Chassis

User Manual

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DISCLAIMER

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13th January 2012	B	Document updated for WCC support
14th August 2012	C	Updated for WCC1100 Support

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1 INTRODUCTION

The Metrodata MetroConnect is a modular chassis based product which offers increased card density and thereby more efficient use of data centre equipment rack space. The MetroConnect is a 19" Rack based chassis occupying 4U. MetroConnect offers 12 slots into which a wide range of IO Modules may be inserted. To ease maintenance, and provisioning of new services, all modules and power supplies are "hot swap" compliant.

The IO Modules for MetroConnect support both basic standalone operation with simple bit switch configuration and with the Management Module, fully managed operation including SNMP.

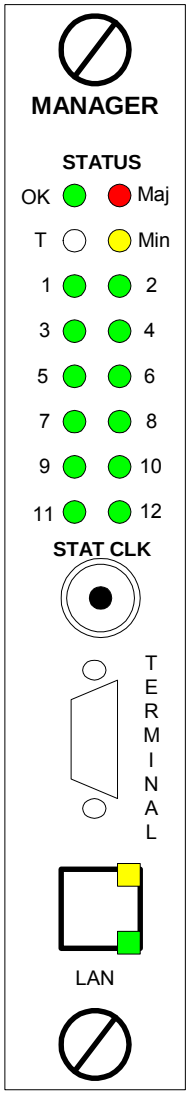
Management of the MetroConnect will be either via the console port, or via the management Ethernet port using SNMP or Telnet. SNMP version 1 will be supported, including MIB-2 and Traps. SNMP traps will be generated based on configurable alarms generated for any of the IO Modules. TFTP download of software and configuration will be supported. To further future proof the MetroConnect system, remote hardware upgrade of CPLD firmware is included. A password will be required for management access whether via the console or Telnet. Performance statistics will be available for all ports with statistics collected in 15 minute segments for a 24 hour period

The MetroConnect offers a pair of change over relays to indicate alarm conditions. The Major Alarm relay is energized for normal operation to ensure a fault is signaled in the event of a power failure.

The MetroConnect is a compact unit requiring 4U in a 19" rack. A single Power Supply supports a full rack of cards, however for increased reliability the AC PSU is load sharing when used in the optional 1+1 redundant configuration. For critical applications -48V DC PSU modules may be used.

2 MODULES

2.1 Management Module



The MetroConnect Management module adds a management function. The Manager is inserted in slot 0 of the chassis.

The manager may be accessed using either the local VT100 terminal port or remotely using Telnet or SNMP via the LAN port.

The Manager has numerous LED's to indicate system status.

OK - Manager Status, Green = Normal

T - Test Mode, Yellow = Test Running

Maj - Major Alarm, Red = Major Alarm

Min - Minor Alarm, Yellow = Minor Alarm

1-12 - IO Module Status

Green = Card Present, and OK

Red = Card Present and Alarmed

Off = Card not fitted.

The LAN port RJ-45 has two integrated LEDs as below

Green = Link Up

Yellow = Tx/Rx Activity

2.2 FC1x00 Module

The MetroConnect FC1x00 module provides an extension of an E1 G703 circuit over a fibre optic connection. Several models are available supporting different fibre specifications:

80-15-9xx FC1000 (Multi-Mode)

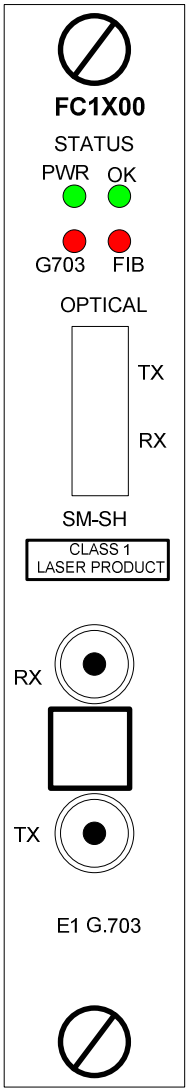
80-15-9xx FC1100 (Single Mode / Short Haul)

80-15-9xx FC1200 (Single Mode / Long Haul)

The FC1x00 can operate in either stand alone, or fully managed mode. In stand-alone mode the operating parameters are configured using bit switches. In managed mode the manager card will configure the module via the backplane.

The FC1x00 has four status LED's to indicate the operating status of the module.

The FC1x00 module is fully "hot swappable" and may be inserted / removed from the chassis without affecting other modules.



2.2.1 FC1x00 Bit switch Settings

The FC1x00 has an 8 position DIP switch on the PCB. This switch is used to configure the module for stand alone operation, and to select the default settings for the Managed Mode of operation.

The bit switches configure the unit as follows:

Bit Switch	ON	OFF
1	75Ohm BNC Port	120Ohm RJ45 Port
2	Normal Operation	Loopback Enable
3	Alarm Extension Disabled	Alarm Extension Enabled
4	Short Haul	Long Haul
5	X^3+1 Scrambler	Scrambler Disabled
6	Unused	
7	Unused	
8	Unused	

The default settings for the FC1x00, as shipped from the factory, is for all the switches to be in the ON position.

2.2.2 FC1x000 LEDs

The FC1x00 has four LEDs to indicate status. The LEDs have the following significance

2.2.2.1 PWR LED

The Green PWR LED indicates that the FC1x00 card is correctly inserted into a “powered up” rack chassis.

Green On Module Powered Up

Off Module not plugged in, Rack not powered up

2.2.2.2 OK LED

The bi-colour OK LED has different significance in managed and unmanaged mode.

Unmanaged Mode

Green ON	Module Powered Up
Off	Module not plugged in, Rack not powered up

Managed Mode

Green ON	Module Operating Correctly, No Alarms
Red ON	Module has at least one port in Alarmed state
Off	Module not plugged in, Rack Not powered up.

2.2.2.3 G703 LED

The bi-colour G703 LED indicates the status of the G703, E1 port on the FC1x00 as follows:

Green On	G703 port operating normally
Red On	G703 port in LOS or AIS condition
Off	Module not plugged in, Rack Not powered up.

2.2.2.4 FIB LED

The bi-colour FIB LED indicates the status of the fibre optic port on the FC1x00 as follows:

Green On	Fibre port operating normally
Red On	Fibre port in LOS condition
Off	Module not plugged in, Rack Not powered up.

2.3 FC3x000 Module

The MetroConnect FC3x00 module provides an extension of a selectable E3 or DS-3 G703 circuit over a fibre optic connection. Several models are available supporting different fibre specifications:

80-15-920 FC3000 (Multi-Mode)

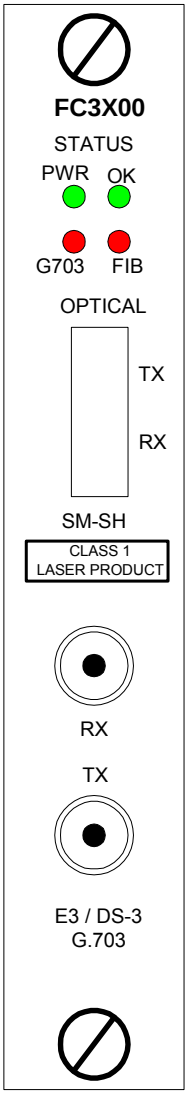
80-15-921 FC3100 (Single Mode / Short Haul)

80-15-922 FC3200 (Single Mode / Long Haul)

The FC3x00 can operate in either stand alone, or fully managed mode. In stand-alone mode the operating parameters are configured using bit switches. In managed mode the manager card will configure the module via the backplane.

The FC3x00 has four status LED's to indicate the operating status of the module.

The FC3x00 module is fully "hot swappable" and may be inserted / removed from the chassis without affecting other modules.



2.3.1 FC3x00 Bit switch Settings

The FC3x00 has an 8 position DIP switch on the PCB. This switch is used to configure the module for stand alone operation, and to select the default settings for the Managed Mode of operation.

The bit switches configure the unit as follows:

Bit Switch	ON	OFF
1	E3 Mode	DS-3 Mode
2	Normal Mode	Loopback Test Mode
3	Alarm Extension Disabled	Alarm Extension Enabled
4	E3 or DS-3 Cable <225’	DS-3 Cable >225’
5	X^3+1 Scrambler	Scrambler Disabled
6	Unused	
7	Unused	
8	Unused	

The default settings for the FC3x00, as shipped from the factory, is for all the switches to be in the ON position.

2.3.2 FC3x000 LEDs

The FC3x00 has four LEDs to indicate status. The LEDs have the following significance

2.3.2.1 PWR LED

The Green PWR LED indicates that the FC3x00 card is correctly inserted into a “powered up” rack chassis.

Green On Module Powered Up

Off Module not plugged in, Rack not powered up

2.3.2.2 OK LED

The bi-colour OK LED has different significance in managed and unmanaged mode.

Unmanaged Mode

Green ON	Module Powered Up
Off	Module not plugged in, Rack not powered up

Managed Mode

Green ON	Module Operating Correctly, No Alarms
Red ON	Module has at least one port in Alarmed state
Off	Module not plugged in, Rack Not powered up.

2.3.2.3 G703 LED

The bi-colour G703 LED indicates the status of the G703, E3 or DS-3 port on the FC3x00 as follows:

Green On	G703 port operating normally
Red On	G703 port in LOS or AIS condition
Off	Module not plugged in, Rack Not powered up.

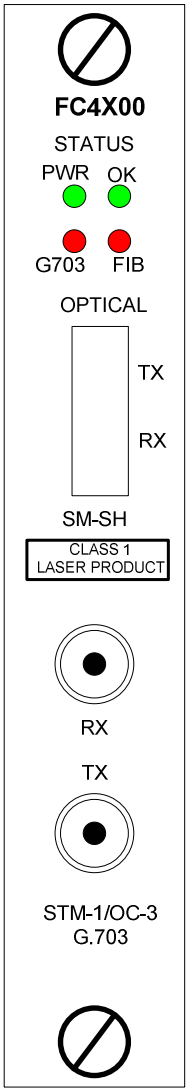
2.3.2.4 FIB LED

The bi-colour FIB LED indicates the status of the fibre optic. port on the FC3x00 as follows:

Green On	Fibre port operating normally
Red On	Fibre port in LOS condition
Off	Module not plugged in, Rack Not powered up.

2.4 FC4x000 Module

The MetroConnect FC4x00 module provides a conversion between optical and electrical STM-1/OC-3 interfaces. Several models are available supporting different fibre specifications:



80-15-915 FC4000 (Multi-Mode)

80-15-916 FC4100 (Single Mode / Short Haul)

80-15-917 FC4200 (Single Mode / Long Haul)

The FC4x00 can operate in either stand alone, or fully managed mode. In stand-alone mode the operating parameters are configured using bit switches. In managed mode the manager card will configure the module via the backplane.

The FC4x00 has four status LED's to indicate the operating status of the module.

The FC4x00 module is fully "hot swappable" and may be inserted / removed from the chassis without affecting other modules.

2.4.1 FC4x00 Bit switch Settings

The FC4x00 has an 8 position DIP switch on the PCB. This switch is used to configure the module for stand alone operation, and to select the default settings for the Managed Mode of operation.

The bit switches configure the unit as follows:

Bit Switch	ON	OFF
1	Normal Operation	Fibre Loopback
2	Normal Operation	G703 Loopback
3	Alarm Extension Disabled	Alarm Extension Enabled
4	Normal Operation	Trim Enabled
5	Trim0	
6	Trim1	
7	Trim2	
8	Trim3	

The default settings for the FC4x00, as shipped from the factory, is for all the switches to be in the ON position.

2.4.2 FC4x000 LEDs

The FC4x00 has four LEDs to indicate status. The LEDs have the following significance

2.4.2.1 PWR LED

The Green PWR LED indicates that the FC4x00 card is correctly inserted into a “powered up” rack chassis.

Green On	Module Powered Up
Off	Module not plugged in, Rack not powered up

2.4.2.2 OK LED

The bi-colour OK LED has different significance in managed and unmanaged mode.

Unmanaged Mode

Green ON	Module Powered Up
Off	Module not plugged in, Rack not powered up

Managed Mode

Green ON	Module Operating Correctly, No Alarms
Red ON	Module has at least one port in Alarmed state
Off	Module not plugged in, Rack Not powered up.

2.4.2.3 G703 LED

The bi-colour G703 LED indicates the status of the G703, port on the FC4x00 as follows:

Green On	G703 port operating normally
Red On	G703 port in LOS or AIS condition
Off	Module not plugged in, Rack Not powered up.

2.4.2.4 FIB LED

The bi-colour FIB LED indicates the status of the fibre optic. port on the FC4x00 as follows:

Green On	Fibre port operating normally
Red On	Fibre port in LOS condition
Off	Module not plugged in, Rack Not powered up.

2.5 WC1000 Module

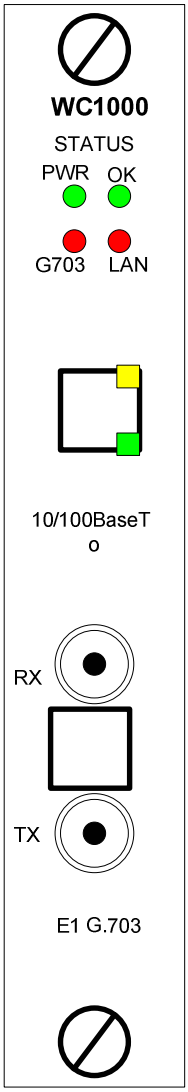
The MetroConnect WC1000 module provides an extension of a 10/100BaseT Ethernet connection over an E1 G.703 circuit.

80-15-541 WC1000 Lan to E1 converter

The WC1000 can operate in either stand alone, or fully managed mode. In stand-alone mode the operating parameters are configured using bit switches. In managed mode the manager card will configure the module via the backplane.

The WC1000 has four status LED's to indicate the operating status of the module.

The WC1000 module is fully "hot swappable" and may be inserted / removed from the chassis without affecting other modules.



2.5.1 WC1000 Bit switch Settings

The WC1000 has an 8 position DIP switch on the PCB. This switch is used to configure the module for stand alone operation, and to select the default settings for the Managed Mode of operation.

The bit switches configure the unit as follows:

Bit Switch	ON	OFF
1	Loop Timing	Internal Timing
2	E1 BNC Port	E1 RJ45 Port
3	Alarm Extension Disabled	Alarm Extension Enabled
4	Normal Mode	Loopback Enabled
5	Flow Control Disabled	Flow Control Enabled
6	10M	100M
7	Half Duplex	Full Duplex
8	Auto Negotiate	Manual

The default settings for theWC1000, as shipped from the factory, is for all the switches to be in the ON position.

2.5.2 WC1000 LEDs

The WC1000 has four LEDs to indicate status. The LEDs have the following significance

2.5.2.1 PWR LED

The Green PWR LED indicates that the WC1000 card is correctly inserted into a “powered up” rack chassis.

Green On Module Powered Up

Off Module not plugged in, Rack not powered up

2.5.2.2 OK LED

The bi-colour OK LED has different significance in managed and unmanaged mode.

Unmanaged Mode

Green ON	Module Powered Up
Off	Module not plugged in, Rack not powered up

Managed Mode

Green ON	Module Operating Correctly, No Alarms
Red ON	Module has at least one port in Alarmed state
Off	Module not plugged in, Rack Not powered up.

2.5.2.3 G703 LED

The bi-colour G703 LED indicates the status of the G703, E1 port on the WC1000 as follows:

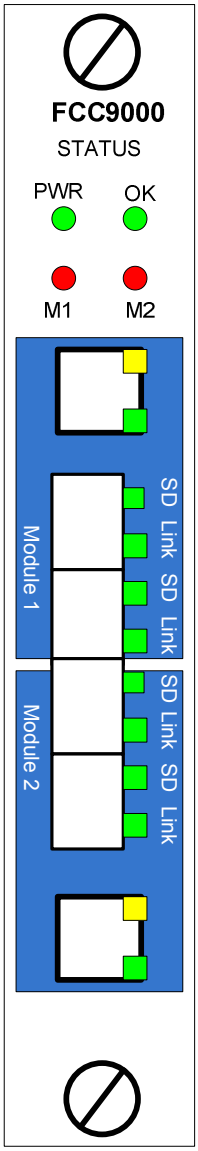
Green On	G703 port operating normally
Red On	G703 port in LOS or AIS condition
Off	Module not plugged in, Rack Not powered up.

2.5.2.4 LAN LED

The bi-colour LAN LED indicates the status of the LAN port on the WC1000 as follows:

Green On	LAN port operating normally
Red On	LAN port in Link Down condition
Off	Module not plugged in, Rack Not powered up.

2.6 FCC9000 Dual Media Converter



The MetroConnect FCC9000 module provides a media conversion function between copper (10/100/1000BaseT) and fibre (1000Base-X). The FCC9000 card offers two independent media converter modules.

The FCC9000 can operate in either stand alone, or fully managed mode. In stand-alone mode the operating parameters are configured using bit switches.

In managed mode the manager card will configure the module via the backplane and the card supports a much greater range of functionality.

The FCC9000 has four status LED's to indicate the operating status of the module.

The FCC9000 module is fully "hot swappable" and may be inserted / removed from the chassis without affecting other modules.

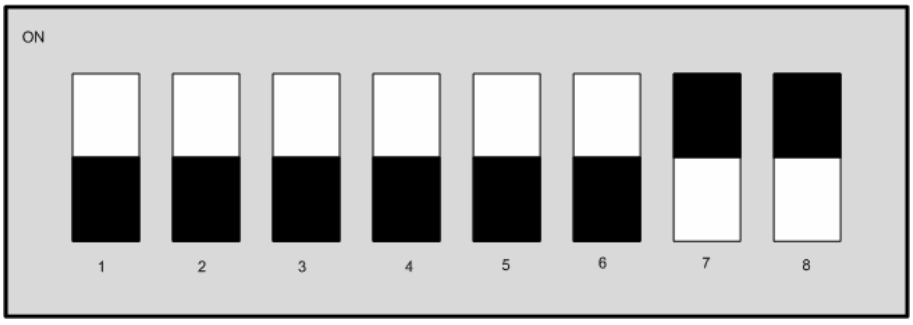
2.6.1 FCC9000 Bit switch Settings

The FCC9000 has an 8 position DIP switch on the PCB. This switch is used to configure the module for stand alone operation, and to select the default settings for the Managed Mode of operation.

The bit switches configure the unit as follows:

Bit Switch	ON	OFF
1	Managed Mode	Stand Alone Mode
2	Copper to Fibre	Fibre to Fibre
3	Alarm Extension Disabled	Alarm Extension Enabled
4	MTU 2048	MTU 10K
5	Copper Port Mode	
6		
7	100Base-FX SFP	1000Base-X SFP
8	LSF Enabled	LSF Disabled

The default settings for the FCC9000, as shipped from the factory, is for the switches to be set as shown, 1-6 ON, 7+8 OFF.



2.6.1.1 Bit Switch 1, Operating Mode

This switch controls the operating mode of the module.

ON Managed Mode (default)

OFF Unmanaged / Standalone Mode

When Managed mode is selected the FCC9000 is fully under the control of the MetroConnect Manager and offers a full suite of functions.

When unmanaged / standalone mode is selected the FCC9000 is contolled by the local cpu, and has a limited functionality with configuration controlled using the bit switches.

2.6.1.2 Bit Switch 2, Media Conversion Mode

This switch configures the operating mode of the media converter.

ON Copper to Fibre (default)

OFF Fibre to Fibre

2.6.1.3 Bit Switch 3, Alarm Relay Drive

This switch enables the module to drive the back plane alarm relay independent of the manager. This switch should only be set when the card is used in an unmanaged, or standalone mode.

ON Disable Alarm Driver (default)

OFF Enable the Alarm Driver

2.6.1.4 Bit Switch 4, Maximum Frame Size

This switch selects the maximum frame size supported.

ON 2048 bytes Maximum (default)

OFF 10K bytes

The default setting of 2048 bytes will support most network protocols such as QinQ, MPLS for example.

2.6.1.5 Bit Switch 5+6, Copper Port Mode

These switches select the speed and duplex for the copper port.

Sw5	Sw5	Configuration
ON	ON	Auto Negotiation, 10/100/1000BaseT (default)
ON	OFF	10M, Full Duplex
OFF	ON	100M, Full Duplex
OFF	OFF	1000M, Full Duplex

It is often required to force the operating mode of the copper port, rather than relying on auto negotiation, to give maximum interoperability with other vendor switch and router ports.

2.6.1.6 Bit Switch 7, SFP Mode

This switch defines the operating mode of the SFP.

ON	100Base-FX, 100M, Full Duplex
OFF	1000Base-X, Auto Negotiating (default)

2.6.1.7 Bit Switch 8, Link State Forwarding

This switch defines the LSF operating mode.

ON	LSF Enabled
OFF	LSF Disabled (default)

Link State Forwarding is a method of mirroring the port states such that a failure on one side is visible on the other. LSF should only be used in unmanaged configurations as it is undesirable where remote management is used.

2.6.2 FCC9000 LEDs

The FCC9000 has four LEDs to indicate status. The LEDs have the following significance

2.6.2.1 PWR LED

The Green PWR LED indicates that the FCC9000 card is correctly inserted into a "powered up" rack chassis.

Green On	Module Powered Up
Off	Module not plugged in, Rack not powered up

2.6.2.2 OK LED

The bi-colour OK LED has different significance in managed and unmanaged mode.

Unmanaged Mode

Green ON	Module Powered Up
Off	Module not plugged in, Rack not powered up

Managed Mode

Green ON	Module Operating Correctly, No Alarms
Red ON	Module has at least one port in Alarmed state
Off	Module not plugged in, Rack Not powered up.

2.6.2.3 M1 LED

The bi-colour M1 LED indicates the status of the Media Converter Module 1 as follows:

Green On	Module 1 operating normally
Red On	Module 1 port Alarmed
Off	Module not plugged in, Rack Not powered up.

2.6.2.4 M21 LED

The bi-colour M1 LED indicates the status of the Media Converter Module 2 as follows:

Green On	Module 1 operating normally
Red On	Module 1 port Alarmed
Off	Module not plugged in, Rack Not powered up..

2.7 WCC-Serial, Ethernet over Serial Module

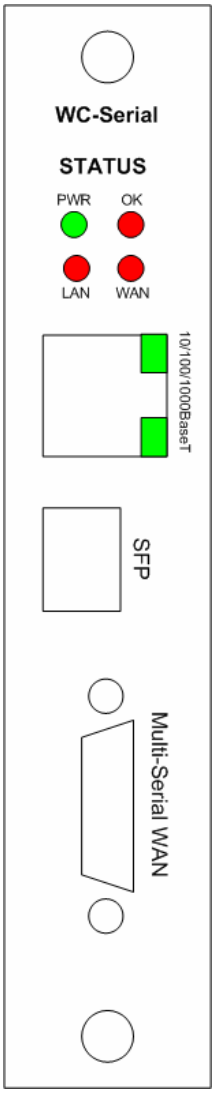
The MetroConnect WCC-Serial module enables the extension of LAN segments over a serial connection. The WCC-Serial presents a 'Cisco' compatible HD60 connector to support V.11, EIA-530, V.36, V.35 and RS-232 in both DTE or DCE modes

The WCC-Serial can operate in either stand alone, or fully managed mode. In stand-alone mode the operating parameters are configured using bit switches.

In managed mode the manager card will configure the module via the backplane and the card supports a much greater range of functionality.

The WCC-Serial has four status LED's to indicate the operating status of the module.

The WCC-Serial module is fully "hot swappable" and may be inserted / removed from the chassis without affecting other modules.



2.7.1 WCC-Serial Bit Switch Settings

The WCC-Serial has an 8 position DIP switch on the PCB. This switch is used to configure the module for stand alone operation, and to select the default settings in managed mode.

The bit switch settings are as below:

Bit Switch	ON	OFF
1	Managed Mode	Stand Alone Mode
2	Enable QOS	Enable Flow Control
3	Alarm Driver Disabled	Alarm Driver Enabled
4	MTU 1522	MTU 2048
5	Copper Port Mode	
6		
7	1000BaseX	100BaseFX
8	DSCP QOS	802.1p QOS

The default setting for the WCC-Serial is for all switches in the ON position.

2.7.1.1 Bit Switch 1, Operating Mode

This switch controls the operating mode of the WCC-Serial.

ON Managed Mode (Default)

OFF Unmanaged / Standalone Mode

When Managed Mode is selected, the WCC-Serial is fully under the control of the MetroConnect Manager and offers the full suite of configuration options

When Unmanaged / Standalone mode is selected, the WCC-Serial will operate in a limited range of configurations, controlled by the setting of the bit switches.

2.7.1.2 Bit Switch 2, QOS Enable

This switch enables the priority queuing mode.

ON Priority Based QOS processing Enabled

OFF IEEE802.3X pause frame based Flow Control Enabled

In order to ensure that high priority traffic gets passed in preference to lower priority traffic the QOS function should be enabled. The module supports 4 levels of priority queueing, with the priority scheme being defined by switch 8.

Flow control will ensure traffic is not lost due to buffer overflow, but will not prioritise traffic.

2.7.1.3 Bit Switch 3, Alarm Relay Driver

This switch enables the module to drive the backplane alarm relay independent of the manager. This switch should only be enabled in stand alone mode.

ON Relay Driver Disabled

OFF Relay Driver Enabled

2.7.1.4 Bit Switch 4, Maximum Frame Size

This bit switch controls the maximum frame size that may be used,

ON MTU = 1518 Bytes

OFF MTU = 2048 Bytes

For standard LAN frames, the maximum frame size should be set to 1518, however if VLAN or QinQ encapsulations are enabled the MTU should be raised to 2048.

2.7.1.5 Bit Switch 6/5, Copper Port Operating Mode

These two switches define the operating mode for the copper port

SW6	SW5	Operating Mode
ON	ON	Auto Negotiate, 10/100/1000BaseT
ON	OFF	10M, Full Duplex
OFF	ON	100M, Full Duplex
OFF	OFF	1000M, Full Duplex

In some cases it may be desirable to fix the operating parameters of the copper port, rather than having the port auto negotiate for speed and duplex.

2.7.1.6 Bit Switch 7, SFP Mode

This switch determines the speed of the fibre port

ON	SFP Mode, 1000Base-X, Auto Negotiate
OFF	SFP Mode, 100Base-FX, Full Duplex

The switch controls the mode of the fibre port and must be set to match the type of SFP fitted.

2.7.1.7 Bit Switch 8, Prioritisation Mode

When switch 2 is in the ON position, selecting QOS mode, then this switch selects the priority scheme to use

ON	IP DSCP
OFF	IEEE 802.1p

With QOS enables, all packets are examined and based on the incoming piority are placed in one of the four priority queues. Unmarked packets are assumed to be low priority.

2.7.2 LED Indications

The WCC-Serial has a bank of four LED indicators to display the status of the module. The LEDS operate as below:

PWR	GREEN	Module Inserted, and Powered Up
OK	GREEN	Normal Operation
	RED	Alarm Condition
LAN	GREEN	LAN / SFP Link Up
	RED	LAN or SFP Link Down
WAN	GREEN	WAN Link Up
	RED	WAN Link Down

Note, that in standalone mode, the LAN port will show Link Down unless both the LAN and SFP ports are operational and have link up. In managed mode, unused ports may be disabled.

2.7.3 Multi Serial Interface

The serial interface is presented on a high density, 60 way connector. The interface supports the following standards, EIA-530, X.21, V.35, V.36/RS-422 at speeds of upto 20Mbps.

The port uses the cable identifier to determine the type of the interface used, and uses CISCO compatible cables as shown below:

EIA-530 DTE	CAB-530-MT
X.21 DTE	CAB-X21-MT
X.21 DCE	CAB-X21-FC

V.35 DTE	CAB-V35-MT
V.35 DCE	CAB-V35-FC
V.36/RS-422 DTE	CAB-V36-MT
V.36/RS-422 DCE	CAB-V36-FC

2.8 WCC1100, Ethernet over E1 Module

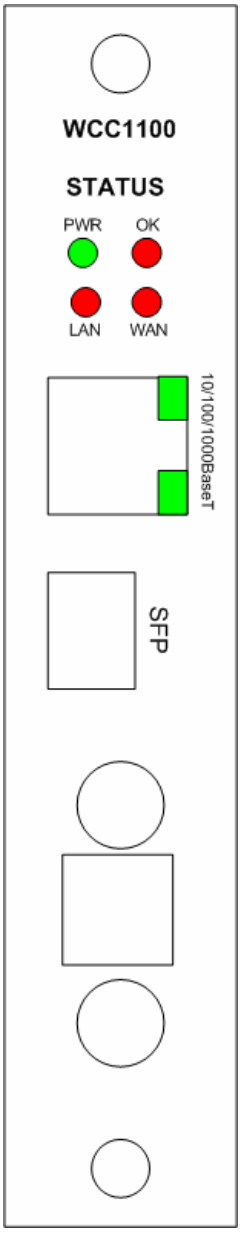
The MetroConnect WCC1100 module enables the extension of LAN segments over an E1 connection.

The WCC1100 can operate in either stand alone, or fully managed mode. In stand-alone mode the operating parameters are configured using bit switches.

In managed mode the manager card will configure the module via the backplane and the card supports a much greater range of functionality.

The WCC1100 has four status LED's to indicate the operating status of the module.

The WCC1100 module is fully "hot swappable" and may be inserted / removed from the chassis without affecting other modules.



2.8.1 WCC1100 Bit Switch Settings

The WCC1100 has an 8 position DIP switch on the PCB. This switch is used to configure the module for stand alone operation, and to select the default settings in managed mode.

The bit switch settings are as below:

Bit Switch	ON	OFF
1	Managed Mode	Stand Alone Mode
2	Enable QOS	Enable Flow Control
3	Alarm Driver Disabled	Alarm Driver Enabled
4	MTU 1522	MTU 2048
5	Copper Port Mode	
6		
7	1000BaseX	100BaseFX
8	DSCP QOS	802.1p QOS

The default setting for the WCC1100 is for all switches in the ON position.

2.8.1.1 Bit Switch 1, Operating Mode

This switch controls the operating mode of the WCC1100.

ON Managed Mode (Default)

OFF Unmanaged / Standalone Mode

When Managed Mode is selected, the WCC1100 is fully under the control of the MetroConnect Manager and offers the full suite of configuration options

When Unmanaged / Standalone mode is selected, the WCC1100 will operate in a limited range of configurations, controlled by the setting of the bit switches.

2.8.1.2 Bit Switch 2, QOS Enable

This switch enables the priority queuing mode.

ON Priority Based QOS processing Enabled

OFF IEEE802.3X pause frame based Flow Control Enabled

In order to ensure that high priority traffic gets passed in preference to lower priority traffic the QOS function should be enabled. The module supports 4 levels of priority queueing, with the priority scheme being defined by switch 8.

Flow control will ensure traffic is not lost due to buffer overflow, but will not prioritise traffic.

2.8.1.3 Bit Switch 3, Alarm Relay Driver

This switch enables the module to drive the backplane alarm relay independent of the manager. This switch should only be enabled in stand alone mode.

ON Relay Driver Disabled

OFF Relay Driver Enabled

2.8.1.4 Bit Switch 4, Maximum Frame Size

This bit switch controls the maximum frame size that may be used,

ON MTU = 1518 Bytes

OFF MTU = 2048 Bytes

For standard LAN frames, the maximum frame size should be set to 1518, however if VLAN or QinQ encapsulations are enabled the MTU should be raised to 2048.

2.8.1.5 Bit Switch 6/5, Copper Port Operating Mode

These two switches define the operating mode for the copper port

SW6	SW5	Operating Mode
ON	ON	Auto Negotiate, 10/100/1000BaseT
ON	OFF	10M, Full Duplex
OFF	ON	100M, Full Duplex
OFF	OFF	1000M, Full Duplex

In some cases it may be desirable to fix the operating parameters of the copper port, rather than having the port auto negotiate for speed and duplex.

2.8.1.6 Bit Switch 7, SFP Mode

This switch determines the speed of the fibre port

ON	SFP Mode, 1000Base-X, Auto Negotiate
OFF	SFP Mode, 100Base-FX, Full Duplex

The switch controls the mode of the fibre port and must be set to match the type of SFP fitted.

2.8.1.7 Bit Switch 8, Prioritisation Mode

When switch 2 is in the ON position, selecting QOS mode, then this switch selects the priority scheme to use

ON	IP DSCP
OFF	IEEE 802.1p

With QOS enables, all packets are examined and based on the incoming piority are placed in one of the four priority queues. Unmarked packets are assumed to be low priority.

2.8.2 LED Indications

The WCC1100 has a bank of four LED indicators to display the status of the module. The LEDS operate as below:

PWR	GREEN	Module Inserted, and Powered Up
OK	GREEN	Normal Operation
	RED	Alarm Condition
LAN	GREEN	LAN / SFP Link Up
	RED	LAN or SFP Link Down
WAN	GREEN	WAN Link Up
	RED	WAN Link Down

Note, that in standalone mode, the LAN port will show Link Down unless both the LAN and SFP ports are operational and have link up. In managed mode, unused ports may be disabled.

2.8.3 E1 Interface

The E1 interface is presented as either unbalance 75ohm on a pair of BNC co-ax connectors, or as a balanced, 120ohm on an RJ45 connector.

The presentation pinout of the RJ45 is controlled by a slide switch on the PCB. The default position is TE (Terminal Equipment) which will allow direct connection to a network port on an NTU. Changing the switch allows the card to present an NT interface.

3 QUICK START CONFIGURATION

The purpose of this document is to give users new to the MetroConnect, a simple overview on how to configure the various options for a basic level of operation. This document should be used in conjunction with the User Manual.

3.1 Logging onto the MetroConnect Manager

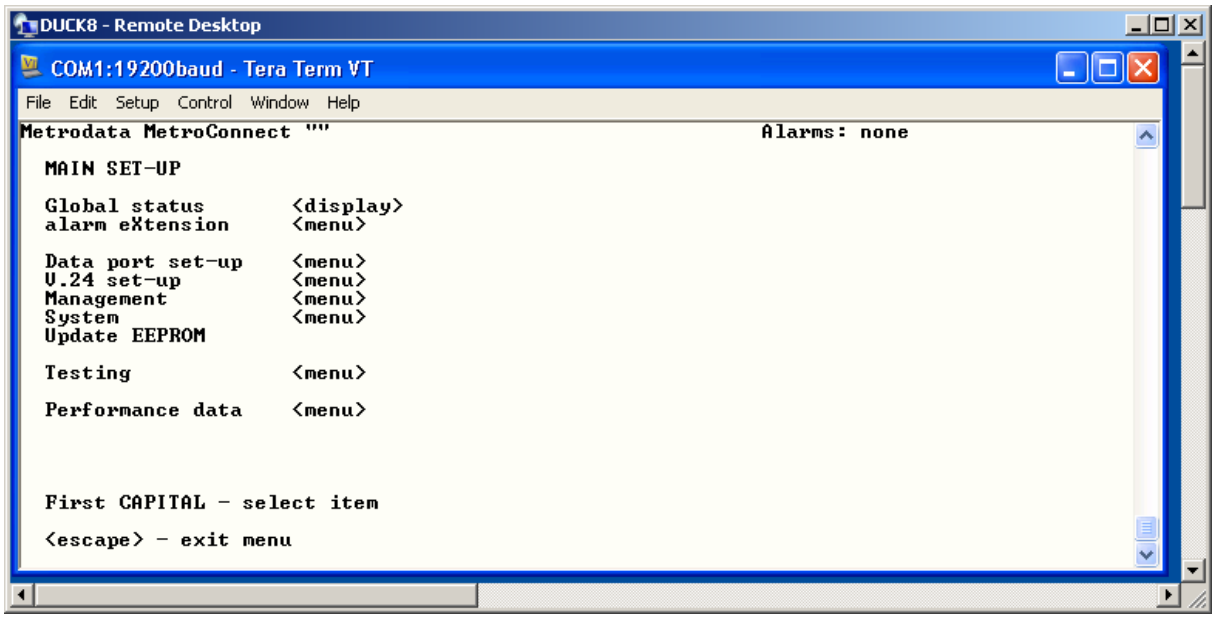
The initial access to the MetroConnect Manager must use a local terminal connected to the terminal port. The default terminal settings are:

19200baud, 8 bits, No Parity, 1 Stop bit.

The MetroConnect has a password protected, menu driven user interface. When a terminal session is connected to the MetroConnect, the welcome banner will be displayed as shown:

Metrodata MetroConnect: Local connection to “”
Password (‘view’ to view only) :

At the prompt, enter the password to gain access to the user interface. The default password is “metroconnect”. For security, the password is obscured with an asterisk (*) being displayed for each character typed. An incorrect password will lead to the welcome banner being redisplayed. A correct password will lead onto the main set up menu as shown below:



3.1.1 User Interface Navigation

The MetroConnect user interface is a simple, menu based interface. Each selectable item may be selected by typing the first capital of the option, e.g. for “Data port set-up” type <D>[1] or <d>. Sometimes, where multiple items have the same starting letter the selection capital will not be the first letter, e.g. “alarm eXtension” which is selected with <X> or <x>.

On the right side of the display is a list of what is below each item. This could be:

<menu>	This indicates a sub-menu will be entered
<display>	This indicates an information screen will be displayed. This may be status or statistics.

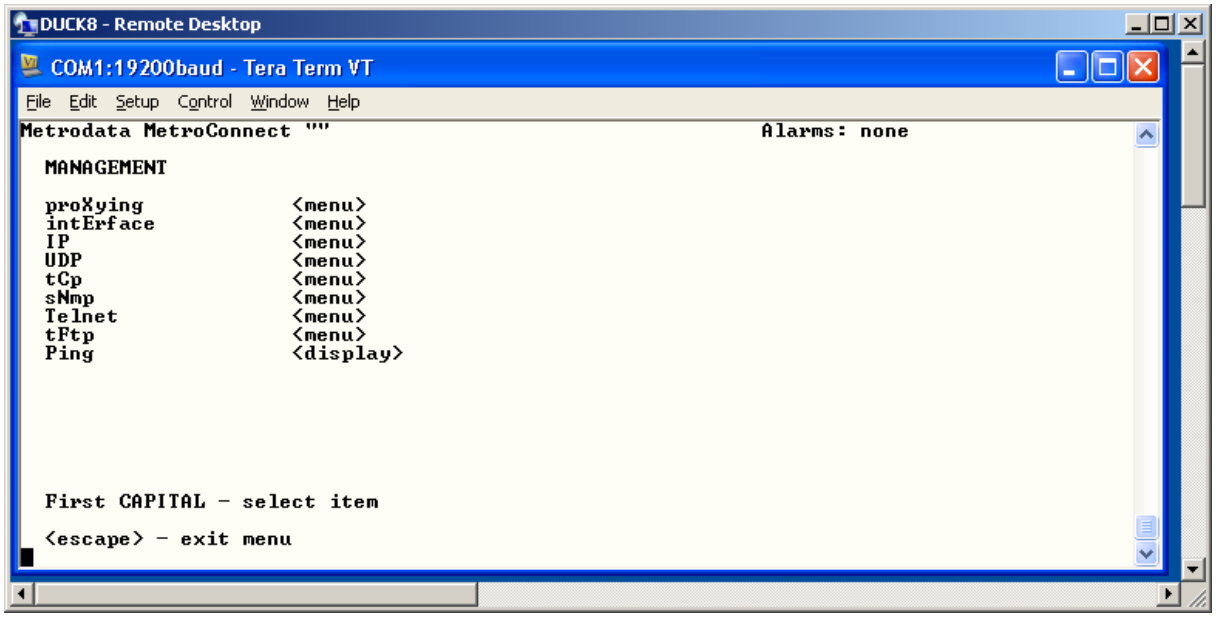
Additional keys may be used to navigate the menu system:

<ESC>	This will exit the current menu, or log out from the main set up menu.
<SPACE>	This will toggle through a list of selectable options
<ENTER>	This will select an item

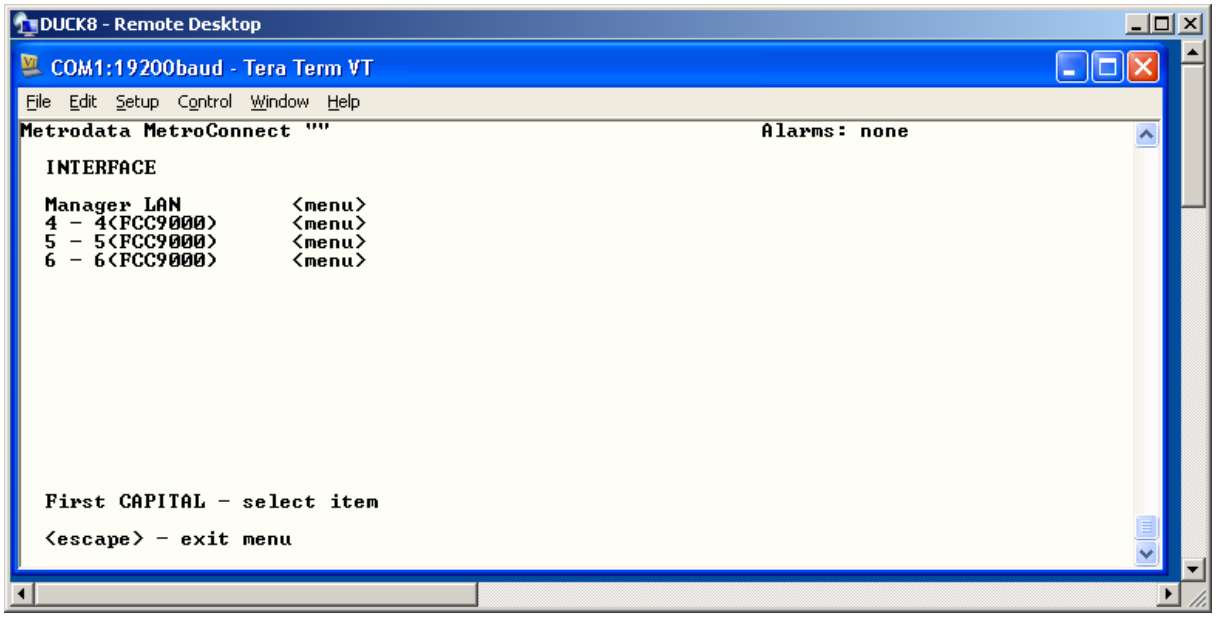
[1] Encapsulating an item within < > indicates a key press is required, for example <D> means type D.

3.1.2 Setting the Unit IP Address

From the Main Setup Menu, select the Management Menu.

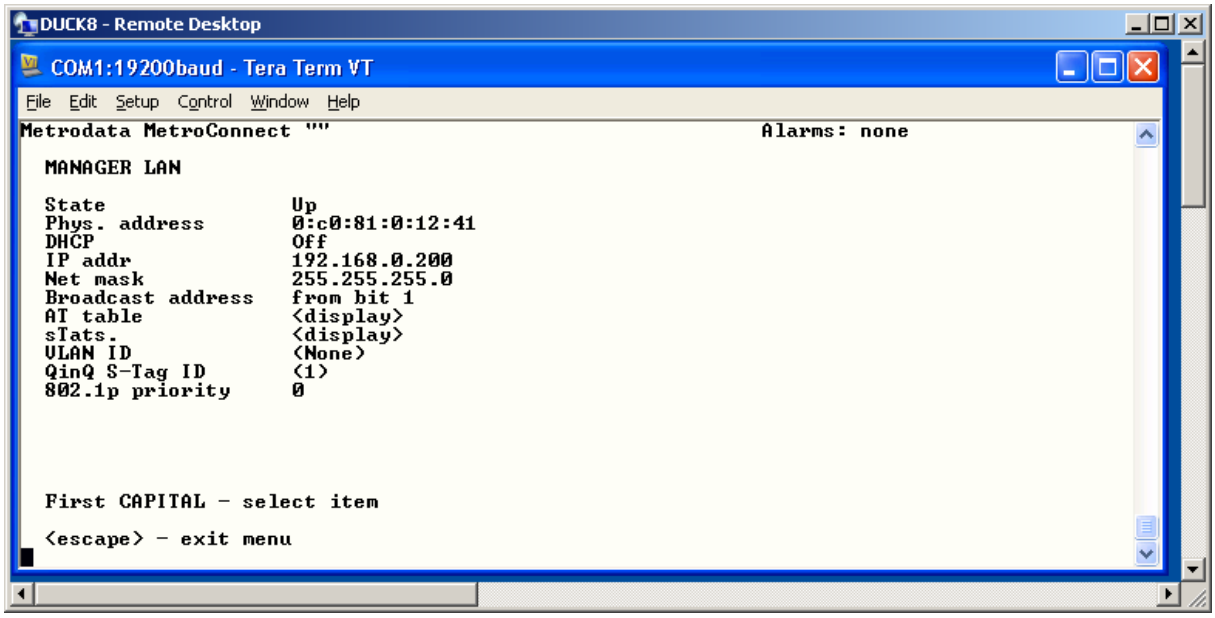


then select the interface menu:



The interface menu allows access to the Management Interface setup, and also to the configuration for the other cards fitted in the chassis.

To set the IP address, select Manager LAN:



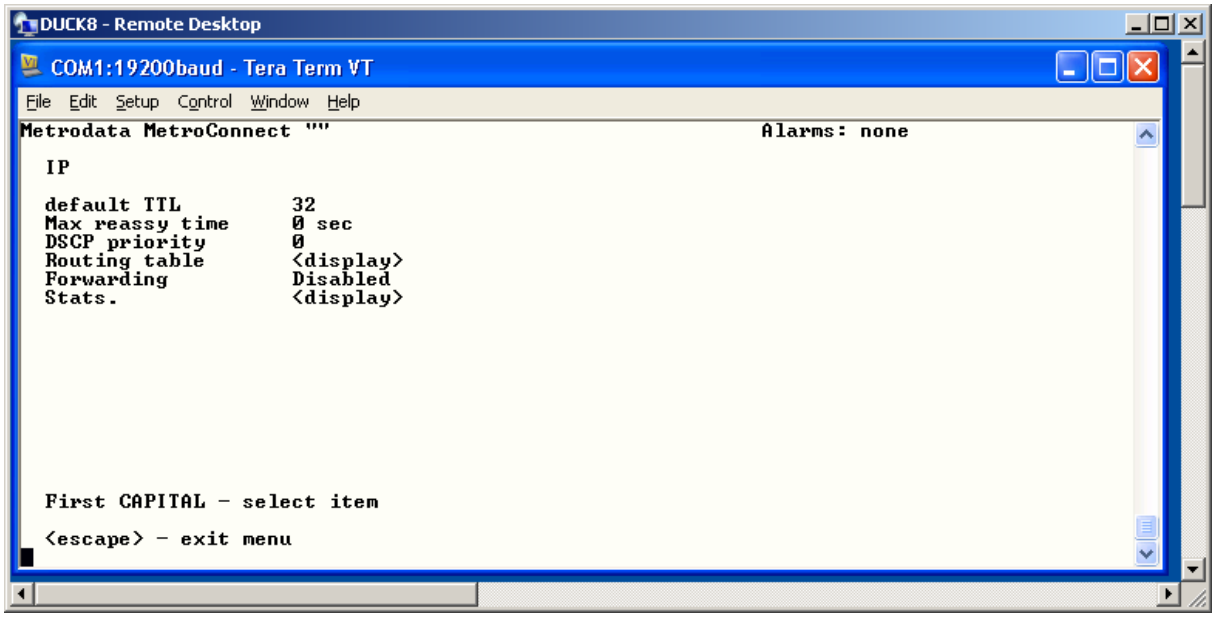
To change the IP settings for installation:

dHcp	For operation in a DHCP enabled network and automatic IP address allocation leave this parameter enabled.
IP Address	Assign the required IP address for correct installation into the network.
Net mask	Assign the required network mask for correct installation into the network.

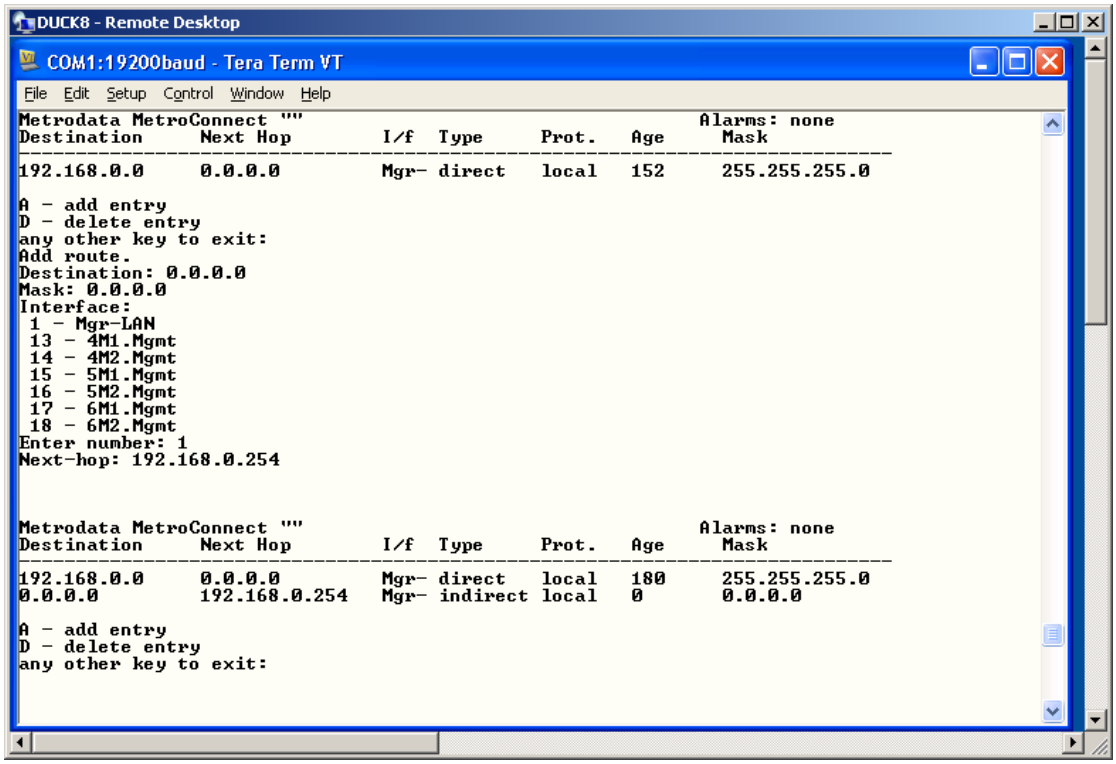
Where Management Traffic is VLAN tagged, the VLAN ID must also be configured.

3.1.3 Setting a default Route

From the Main Setup Menu, select the Management Menu, IP Menu:

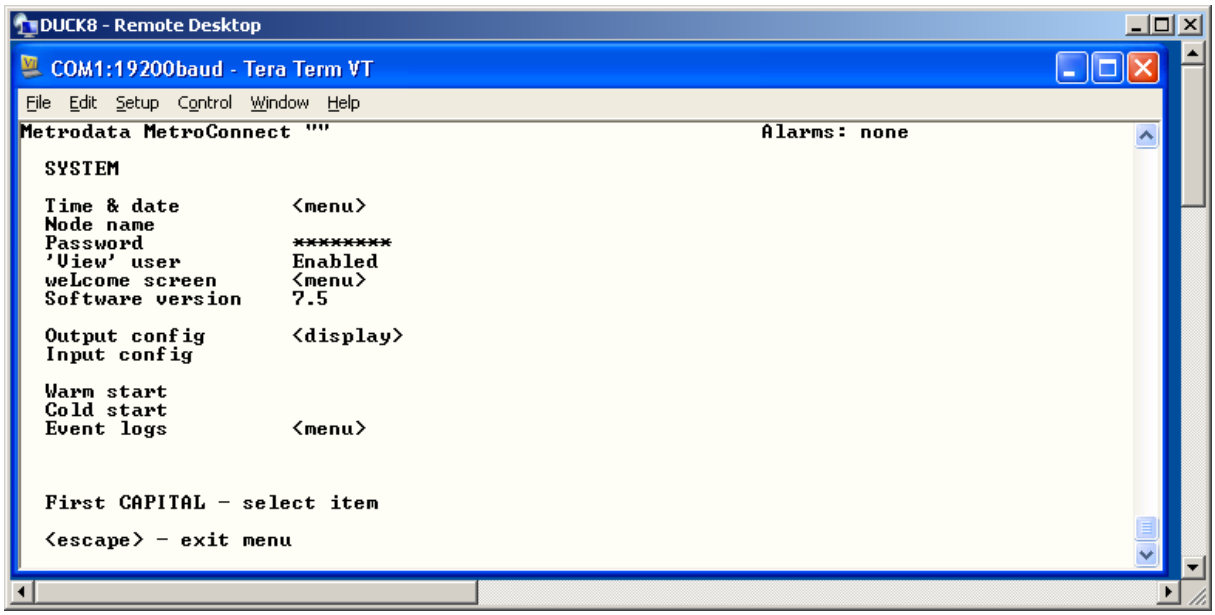


then select the Routing Table and add the default route using 0.0.0.0 as destination and mask and enter the required next hop router address. For management traffic the default route should be assigned to the Mgr-LAN interface.



3.2 System Configuration

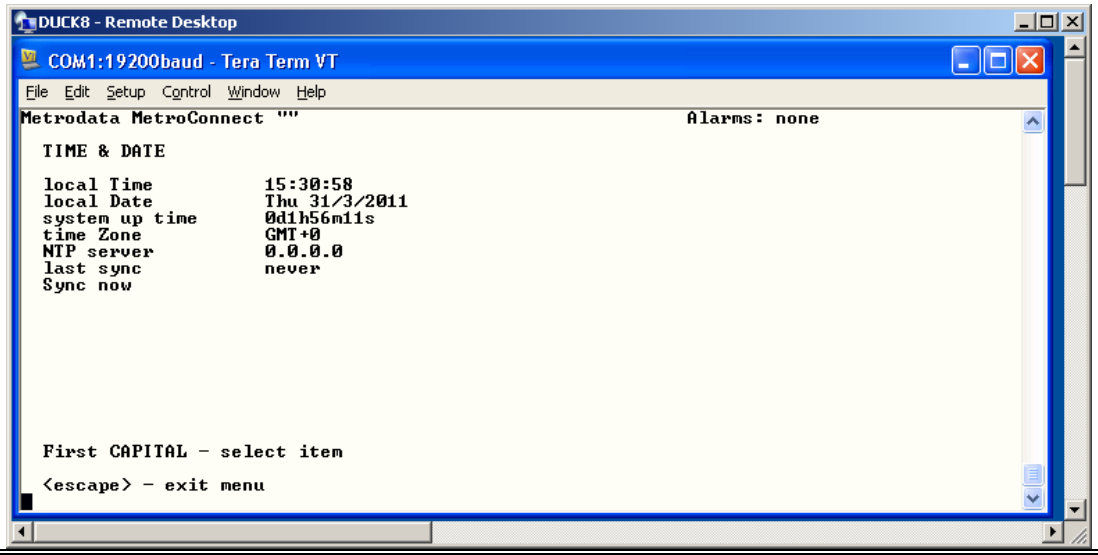
The system menu provides the basic administrative configuration items for the MetroConnect and should be configured first. The system menu is shown below:



3.2.1 Setting the Time and Date

The MetroConnect has a short term backup for the real time clock, however the RTC will nto be maintained after the power has been removed for more than a day. To ensure accurate timekeeping, the MetroConnect optionally supports the use of NTP. In applications where NTP is not available, the MetroConnect may be configured manually with the current time and data settings.

To configure the NTP parameters, select the “Time and date” menu from the “System” menu. The menu is as below:



If NTP is available, then the following parameters need to be set,

Time Zone +/-12	Since NTP uses GMT, time zone adjustment allows the correct time to be configured wherever the units are deployed globally.
NTP Server	Enter the IP address of the network NTP server.

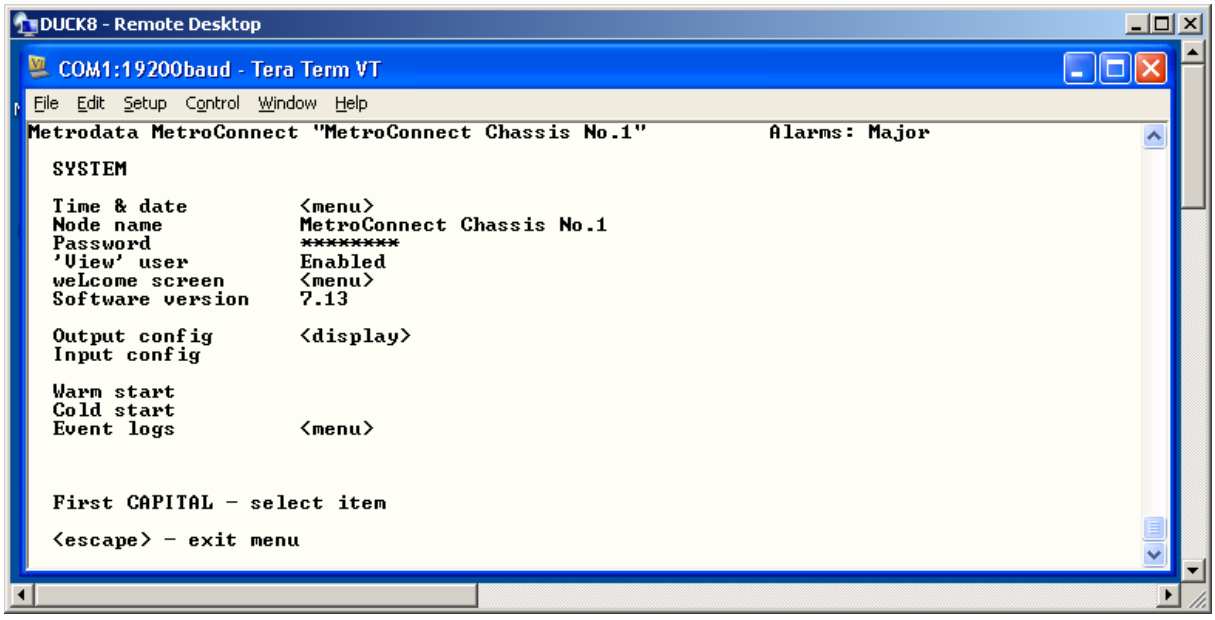
According to the NTP protocol, the MetroConnect will wait for a random period of between 1 and 5 minutes before requesting an NTP update.

If NTP is not available, then the user can manually enter the time and date which will be stored in the non volatile real time clock device.

Where NTP is not available, the system uptime is available.

3.2.2 Setting the Node Name

To enable identification of the MetroConnect it is useful to enter a meaningful name for the unit. The node name is entered as a string of up to 16 alpha numeric characters, including spaces.



The "*nodename*" is displayed at the top of each menu to assist identification of which particular device you are currently connected to.

3.2.3 Setting the Password

The password for the MetroConnect may be changed from the system menu. The default password is “metroconnect”, however for deployment a more secure password may be required.

To change the unit password, select “Password” from the system menu. The user interface will display the following:

Enter new password

Password >

Enter the new password, up to 16 alphanumeric characters. For security, each character is shown on the screen as an asterisk “*”. Once the new password is entered, the display changes to

Enter new password

Password > **********
Verify>

Re-enter the new password. If the password is correctly verified the unit will assume the new password for the next logon.

3.2.3.1 Password Recovery

If for any reason, the password for access to the MetroConnect is lost, the unit may be cold started by using bit switch 8 on the manager card which will return it to the default factory configuration. The default factory password is “metroconnect”.

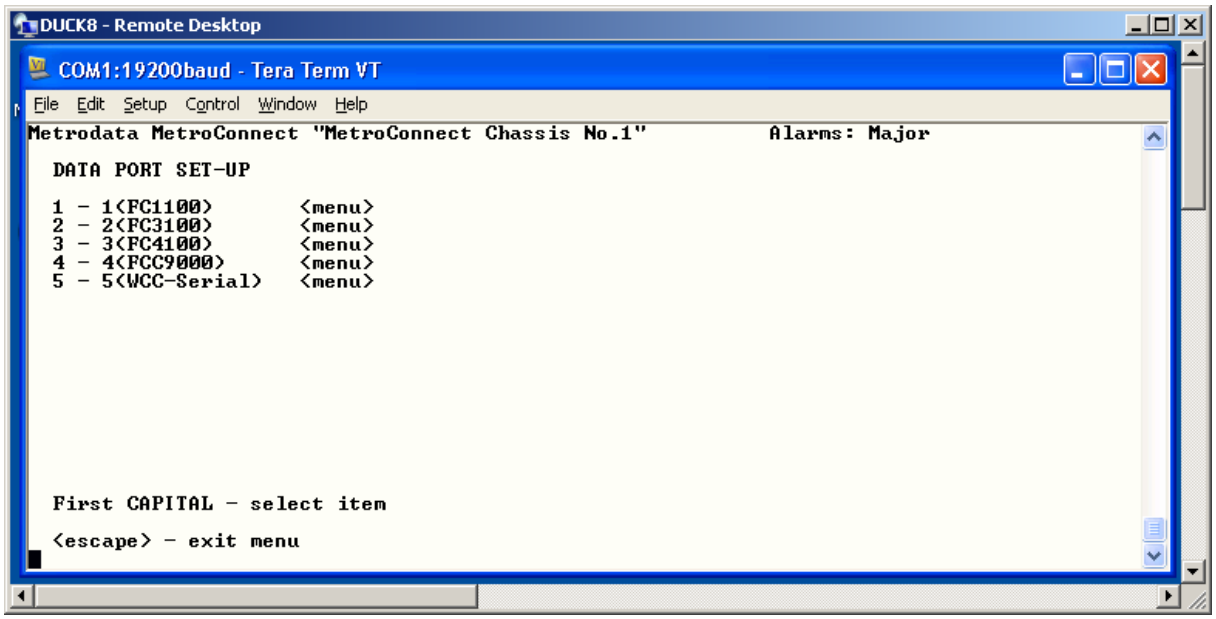
Note, that returning the unit to factory default will erase the configuration EEPROM and all configuration items including IP address.

Once the unit has been cold started, bit switch 8 must be returned to the normal operating position, otherwise the unit will cold start on each subsequent restart or power cycle.

3.3 Configuration of the IO Modules

This section deals with the configuration of each of the IO Modules. Up to 12 IO modules are supported in a MetroConnect chassis. A simple configuration will be shown for each type of port.

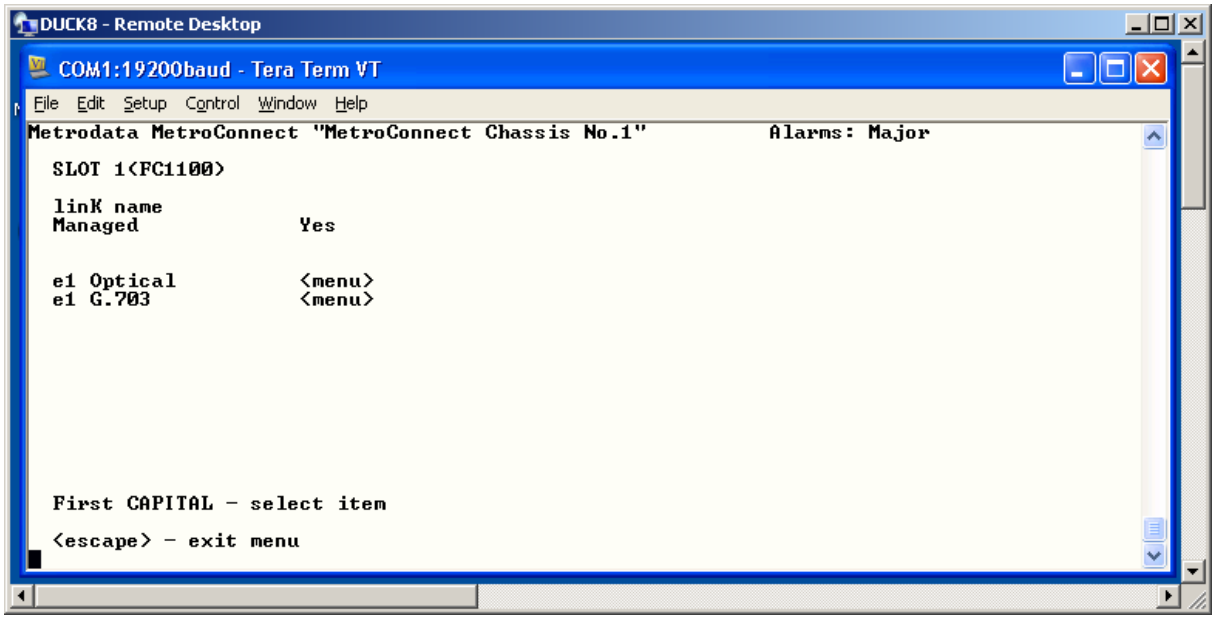
The port configuration is accessed from the main setup menu by selecting the data port menu. The data port menu gives the following options



Note, the slots are selected using “hex” notation, ie 1 to 9, then A=10, B=11, C=12

3.3.1 FC1x00

Selecting an FC1x00 IO module will lead to the following menu



The FC1x00 module may operate in stand alone mode, where the manager simply monitors the status of the FC1x00, or it may be operated in fully managed mode where the configuration is controlled from the user interface.

3.3.1.1 Link Name

In order to assist identification of the link being configured a label may be applied. The label my be upto 32 characters.

3.3.1.2 Managed

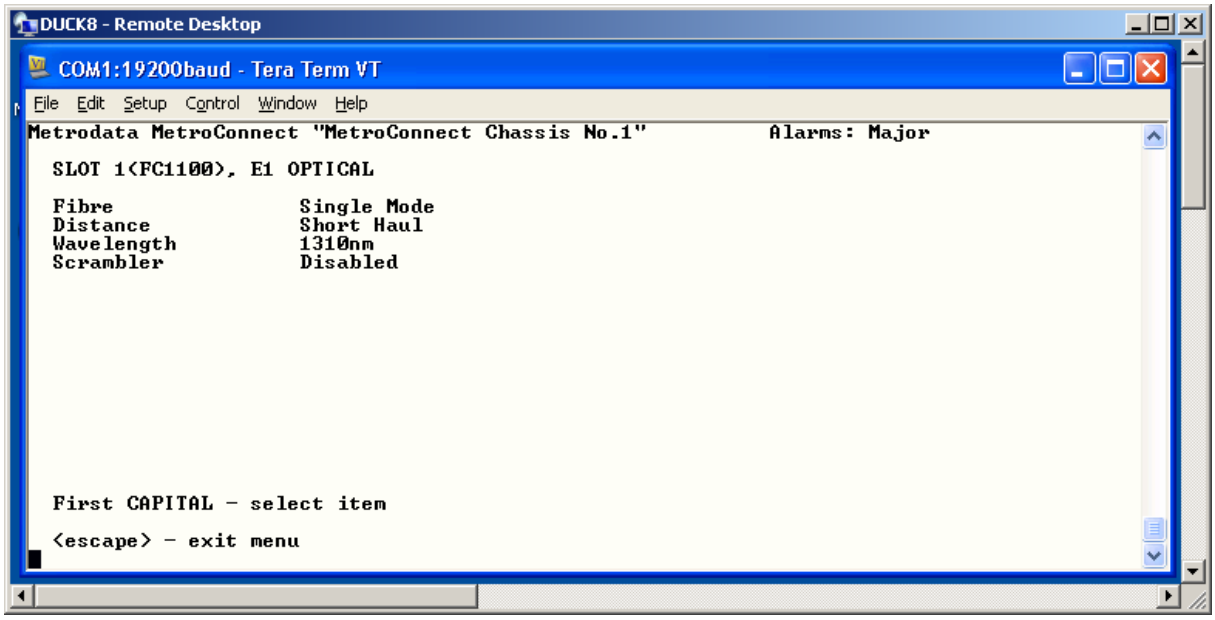
The Managed menu item is used to select the operating mode of the FC1x00.

NO	The FC1000 is configured using the pcb mounted bit switches and the manager simply monitors the status of the FC1000 Module.
YES	The FC1x00 is configured according to the user configuration.

In unmanaged mode, the following menu items are all for information only and cannot be changed, however if managed mode is enabled, some items may be configured.

3.3.1.3 E1 Optical Port Configuration

Selecting the E1 optical configuration gives the following options:



3.3.1.3.1 Fibre

This parameter, non configurable, displays the fibre type supported by the transceiver fitted to the FC1x00 module:

Options:

Multi-Mode	50/125 or 62.5/125 Multi Mode Fibers Supported
Single Mode	9/125 Single Mode Fibre Supported

3.3.1.3.2 Distance

This display item displays the drive capability of the fibre transceiver.

Options:

Short Haul	Multi-Mode	2km approx
Short Haul	Single Mode	25km approx
Long Haul	Single Mode	70km approx

3.3.1.3.3 Type

This display item details the type of transceiver fitted and also the transmit wavelength.

Options:

Duplex, 1300nm

Duplex, 1550nm

Bidir, Tx 1310nm

Bidir, Tx 1550

The bidirectional transceivers support transport over a single fibre by utilizing CWDM and transmitting and receiving on different wavelengths. For Single Fibre Operation, a matched pair of transceivers must be used.

3.3.1.3.4 Scrambler

This item is configurable in managed mode. In normal operation it should be enabled to ensure a balanced 1's density is maintained.

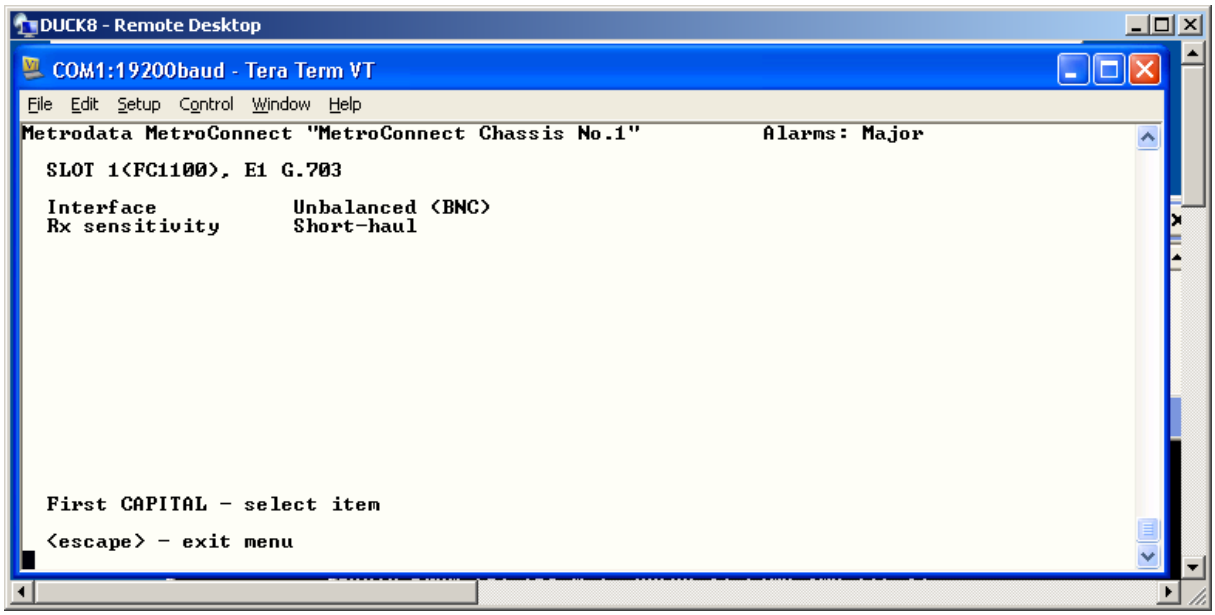
Options

Enabled X^3-1 Self synchronizing Scramber Enabled

Disabled Scrambler Disabled.

3.3.1.4 E1 G.703 Port Configuration

Selecting the E1 G703 option leads to the following configuration menu



3.3.1.4.1 Interface

The interface selection enables selection of the physical E1 port presentation.

Options:

Unbalanced (BNC)	75Ohm, Co-ax, BNC
Balanced (RJ45)	120Ohm, twisted pair, RJ45,

3.3.1.4.2 Rx Sensitivity

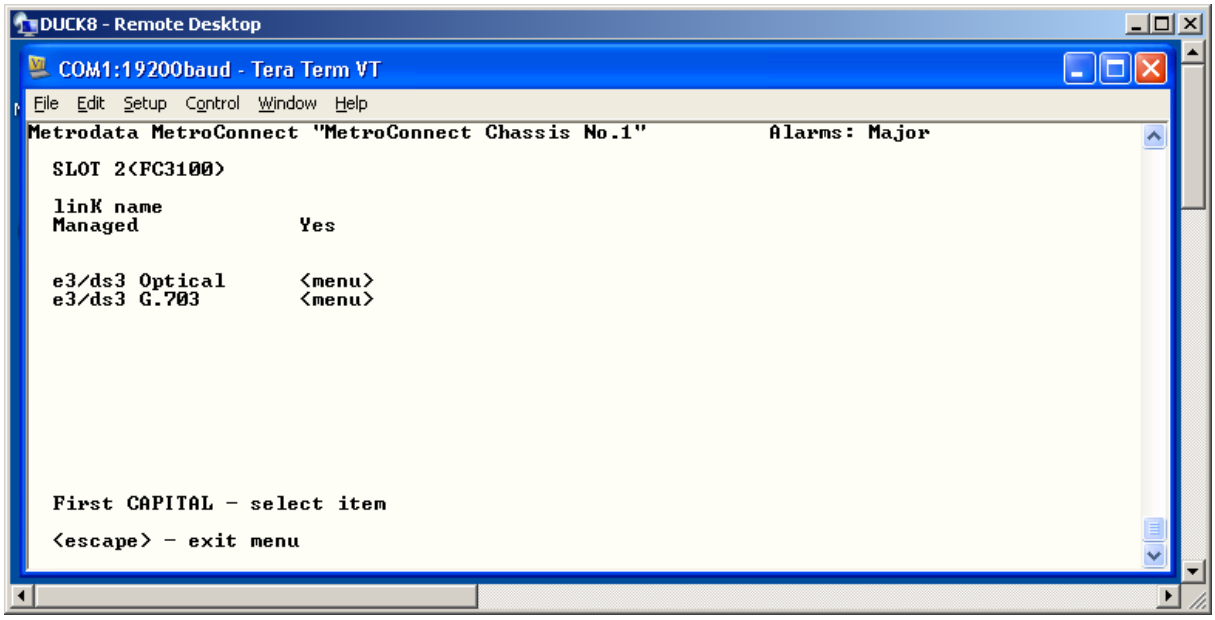
This option defines the sensitivity of the E1 receiver. By increasing the sensitivity more loss may be tolerated in the cable, and hence longer cable runs may be supported.

Options

Short-Haul	Sensitivity -12dB
Long-Haul	Sensitivity -43dB

3.3.2 FC3x00

Selecting an FC3x00 IO module will lead to the following menu



The FC3000 module may operate in stand alone mode, where the manager simply monitors the status of the FC3000, or it may be operated in fully managed mode where the configuration is controlled from the user interface.

3.3.2.1 Link Name

In order to assist identification of the link being configured a label may be applied. The label my be upto 32 characters.

3.3.2.2 Managed

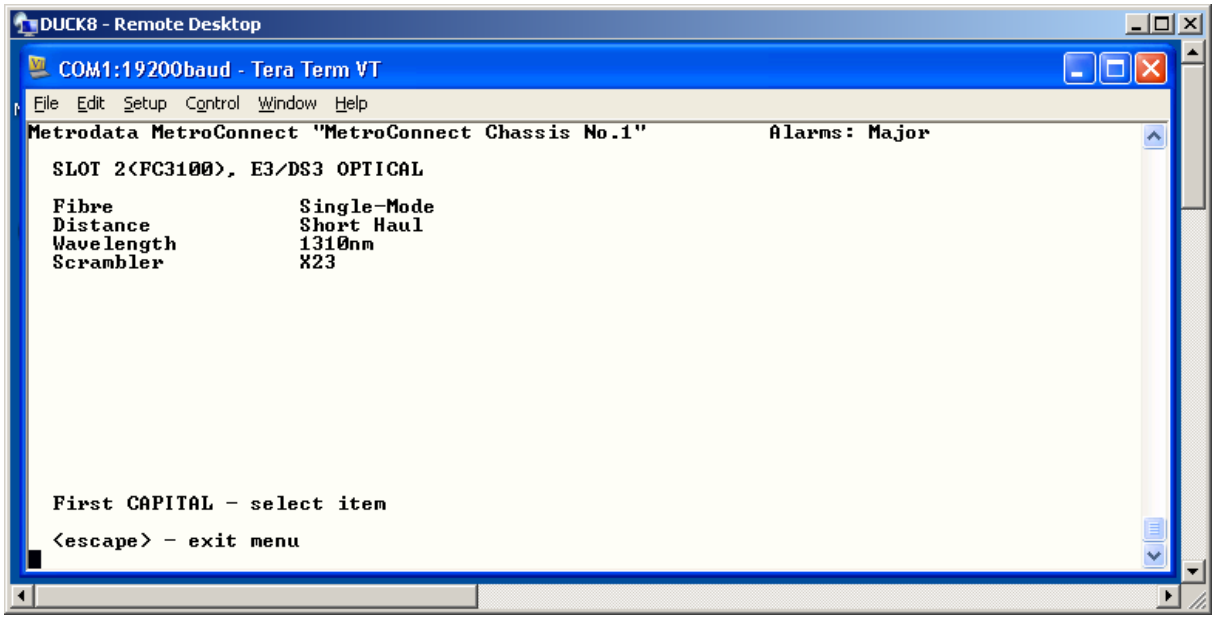
The Managed menu item is used to select the operating mode of the FC3x00.

NO	The FC3x00 is configured using the pcb mounted bit switches and the manager simply monitors the status of the FC3x00 Module.
YES	The FC3x00 is configured according to the user configuration.

In unmanaged mode, the following menu items are all for information only and cannot be changed, however if managed mode is enabled, some items may be configured.

3.3.2.3 E3/DS3 Optical Port Configuration

The NRZ menu enables configuration or monitoring of the Optical Interface.



3.3.2.3.1 Fibre

This parameter, non configurable, displays the fibre type supported by the transceiver fitted to the FC3x00 module:

Options:

Multi-Mode	50/125 or 62.5/125 Multi Mode Fibers Supported
Single Mode	9/125 Single Mode Fibre Supported

3.3.2.3.2 Distance

This display item displays the drive capability of the fibre transceiver.

Options:

Short Haul	Multi-Mode	2km approx
Short Haul	Single Mode	25km approx
Long Haul	Single Mode	70km approx

3.3.2.3.3 Type

This display item details the type of transceiver fitted and also the transmit wavelength.

Options:

Duplex, 1300nm

Duplex, 1550nm

Bidir, Tx 1310nm

Bidir, Tx 1550

The bidirectional transceivers support transport over a single fibre by utilizing CWDM and transmitting and receiving on different wavelengths. For Single Fibre Operation, a matched pair of transceivers must be used.

3.3.2.3.4 Scrambler

To maintain a DC balance on the fibre a balanced 1's density is required.

Options:

X23 X23 scrambler (default)

X3 X3 scrambler

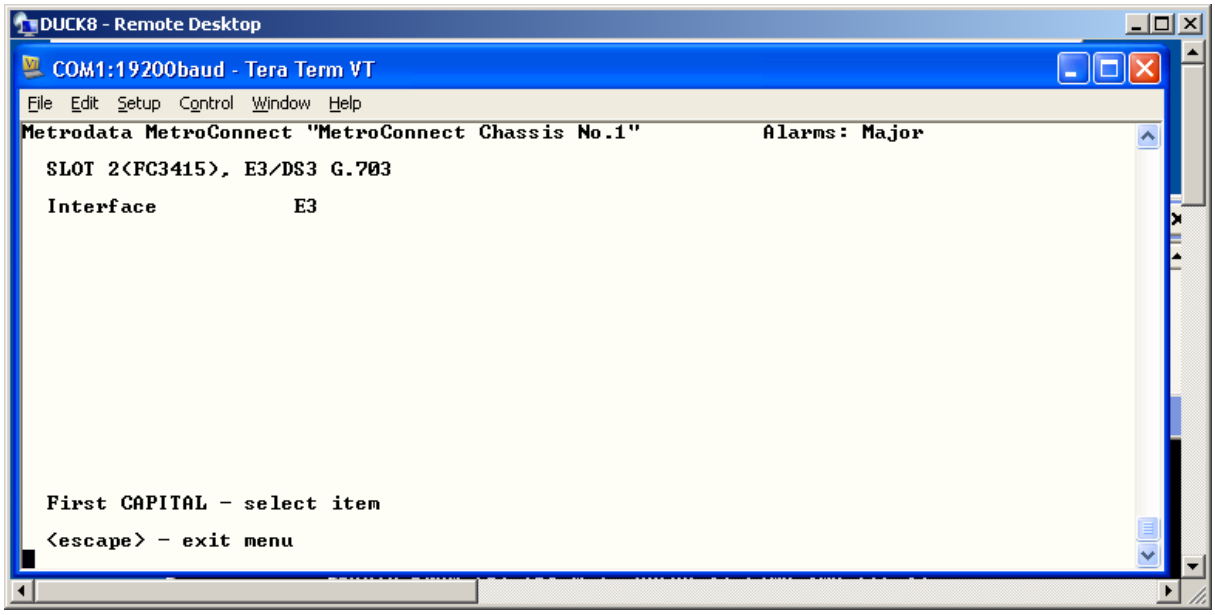
The X23 scrambler is a strong scrambler which utilizes 23 bits with dual feedback and should be used in most applications.

X3 is a much weaker scrambler, and is only for use with older version standalone FC3x00 units that only support X3.

3.3.2.4 E3/DS3 G703 Port Configuration Menu

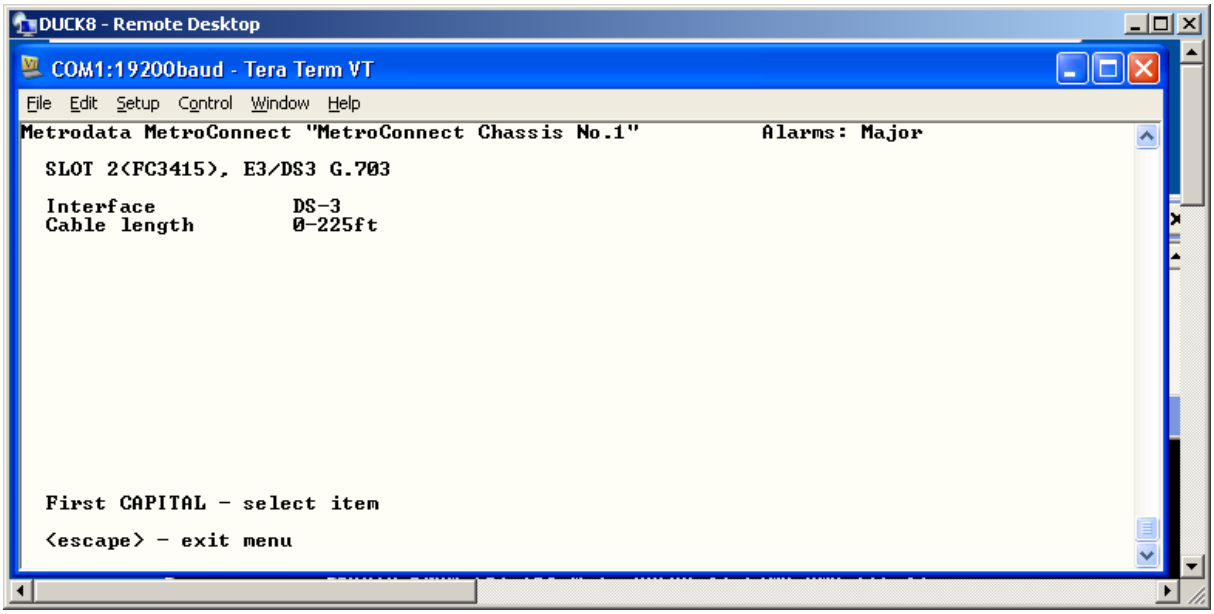
The G703 menu enables the configuration of the G703 interface. The menu is as shown below showing both the E3 and DS-3 options:

3.3.2.4.1 E3 Mode



In E3 mode, there are no additional configuration items. However the interface may be changed to select DS-3 mode.

3.3.2.4.2 DS-3 Mode



In DS-3 mode, the additional parameter – Cable Length, must be configured.

Options

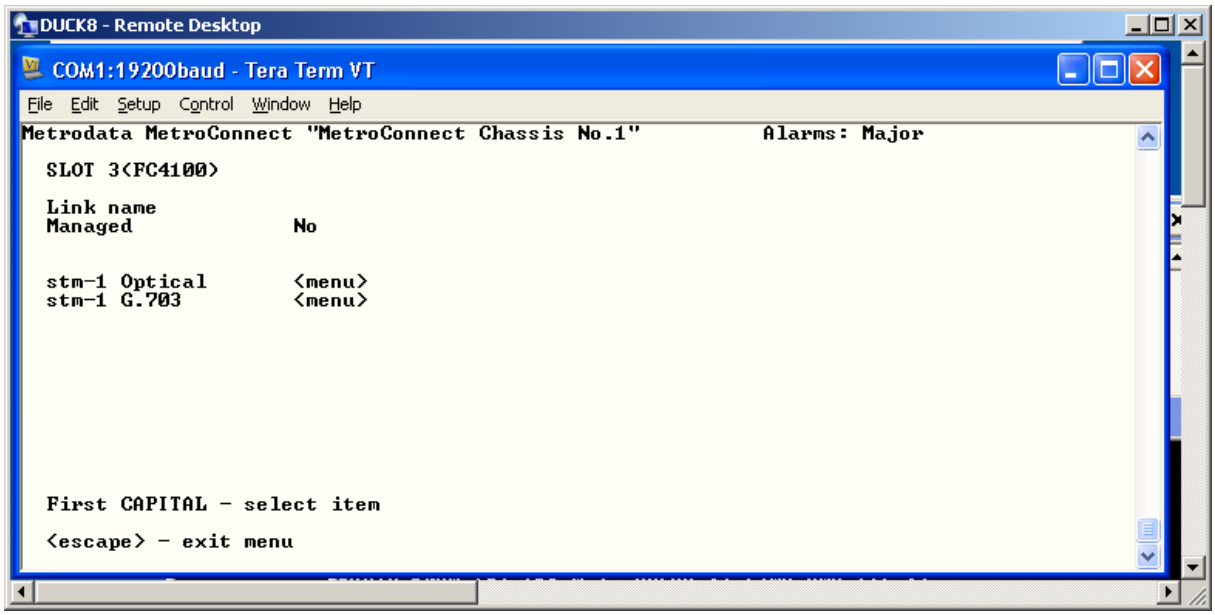
0 – 225ft

225 – 450ft

It is important to ensure the cable length parameter is selected correctly otherwise receiver overdrive may occur. Overdrive is also a possibility when very short cables, (less than 10m), and will often lead to errors. This issue is due to the DS-3 specification defining the pulse mask at the end of the cable run, rather than at source hence short cables will have larger signals. With short cable runs, 10dB attenuators may be added inline to get the circuit running error free.

3.3.3 FC4x00

Selecting an FC4x00 IO module will lead to the following menu



The FC4x00 module may operate in stand alone mode, where the manager simply monitors the status of the FC4x00, or it may be operated in fully managed mode where the configuration is controlled from the user interface.

3.3.3.1 Link Name

In order to assist identification of the link being configured a label may be applied. The label my be upto 32 characters.

3.3.3.2 Managed

The Managed menu item is used to select the operating mode of the FC4x00.

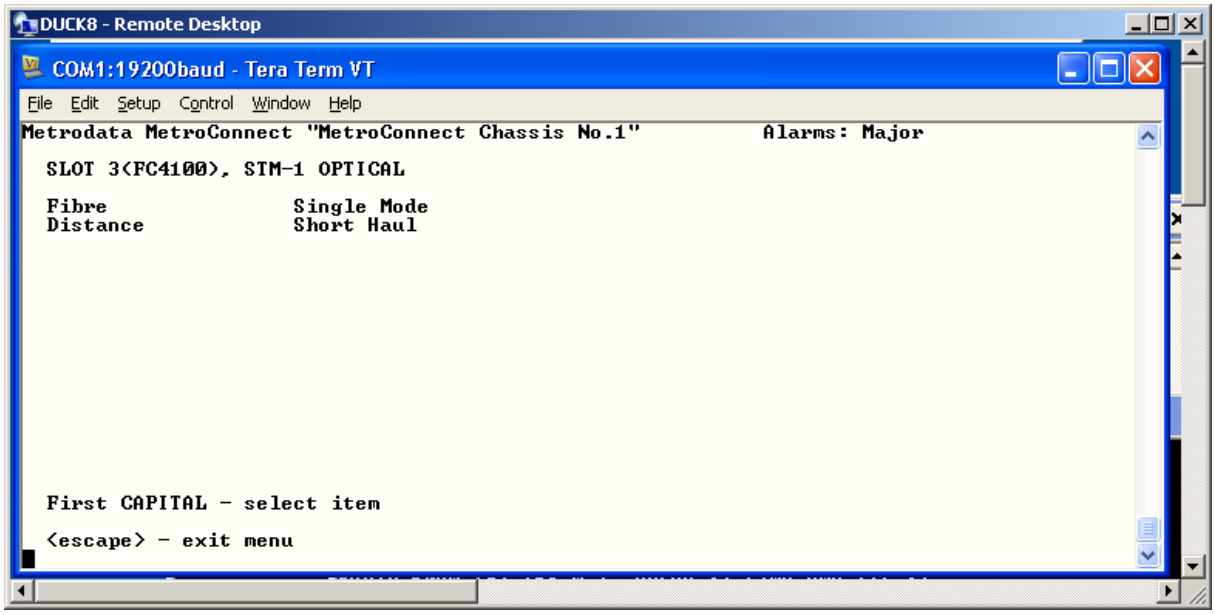
NO	The FC4x00 is configured using the pcb mounted bit switches and the manager simply monitors the status of the FC4x00 Module.
YES	The FC4x00 is configured according to the user configuration.

In unmanaged mode, the following menu items are all for information only and cannot be changed, however if managed mode is enabled, some items may be configured.

3.3.3.3 STM-1 Optical Port Configuration

The FC4x00 provides a transparent media conversion function and supports both SDH or SONET circuits.

The optical port configuration menu is as below:



3.3.3.3.1 Fibre

This parameter, non configurable, displays the fibre type supported by the transceiver fitted to the FC3x00 module:

Options:

Multi-Mode	50/125 or 62.5/125 Multi Mode Fibers Supported
Single Mode	9/125 Single Mode Fibre Supported

3.3.3.3.2 Distance

This display item displays the drive capability of the fibre transceiver.

Options:

Short Haul	Multi-Mode	2km approx
Short Haul	Single Mode	25km approx
Long Haul	Single Mode	70km approx

3.3.3.3.3 Type

This display item details the type of transceiver fitted and also the transmit wavelength.

Options:

Duplex, 1300nm

Duplex, 1550nm

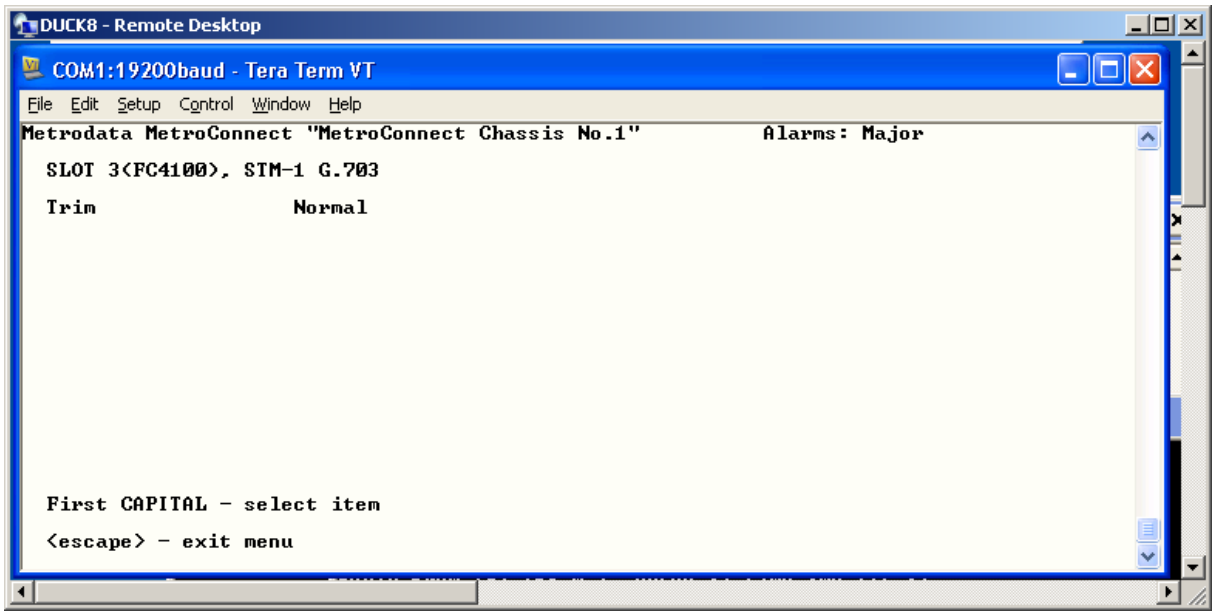
Bidir, Tx 1310nm

Bidir, Tx 1550

The bidirectional transceivers support transport over a single fibre by utilizing CWDM and transmitting and receiving on different wavelengths. For Single Fibre Operation, a matched pair of transceivers must be used.

3.3.3.4 STM-1 G703 Port Configuration

The FC4x00 supports the following configuration options for the G.703 port

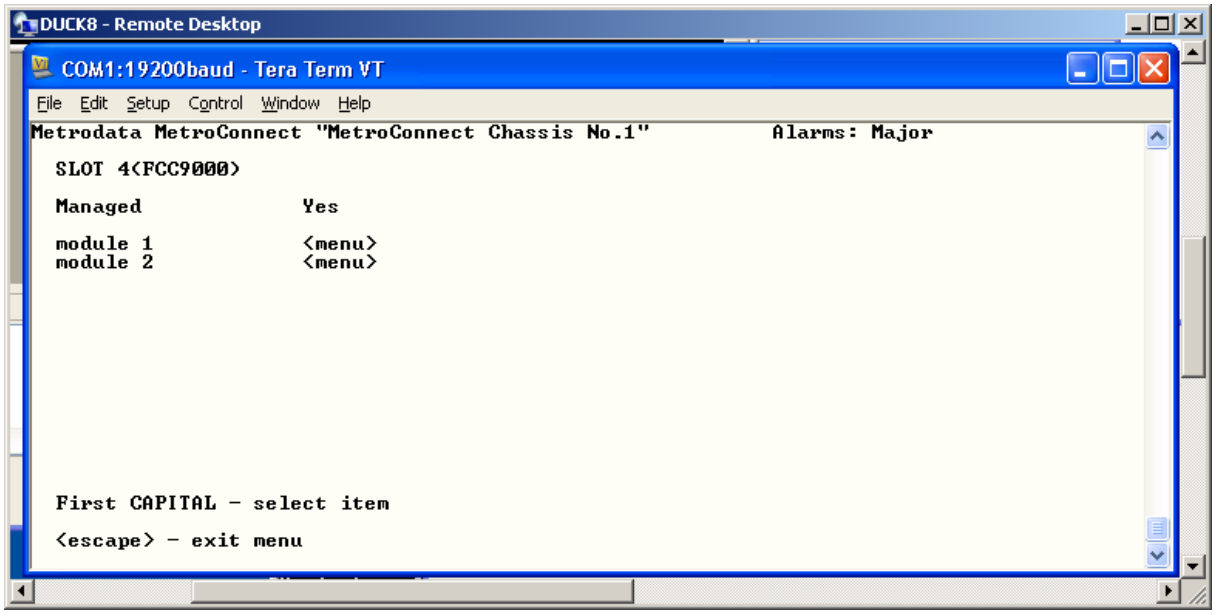


The TRIM level allows the pulse amplitude to be adjusted to allow for varying cable lengths if problems are encountered. If a circuit is experiencing a high number of BPV errors then the transmitter may need to be trimmed, but otherwise it should not be changed.

3.3.4 FCC9000

The FCC9000 is a dual media converter module for the MetroConnect Chassis. It is designed for use with the MetroConnect FCM9000 standalone, CPE device. The FCC9000 comprises two media converters, presenting one 10/100/1000BaseT RJ45 port and a pair of SFP ports capable of supporting either 1000Base-X or 100BaseFX SFP modules. The FCC9000 supports basic Copper to Fibre, Copper to Dual Fibre or Fibre to Fibre modes of operation. Dual Fibre mode uses link aggregation to provide a resilient link.

When the FCC9000 is installed in the MetroConnect chassis, the card is configured using the data port menu:



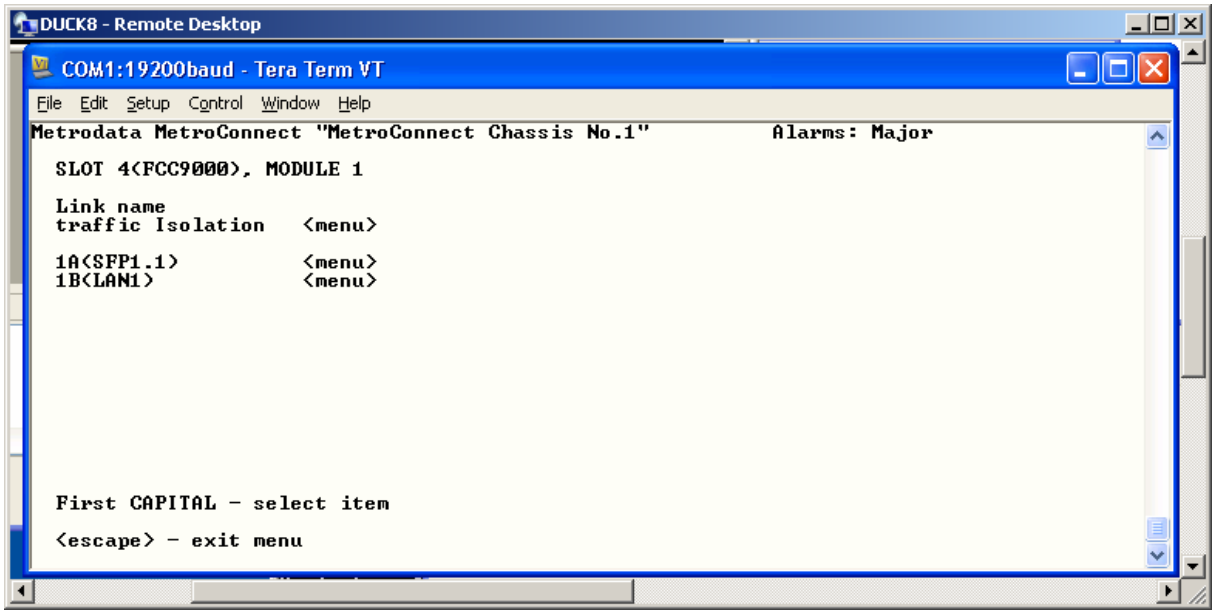
3.3.4.1 Managed Mode

The FCC9000 should always be operated in managed mode to enable functions such as OAM, Management and Performance Monitoring.

3.3.4.2 Module Configuration

The FCC9000 comprises two separate media converter modules, Module 1 and Module 2. The SFP ports on the front panel are labeled 1.1 and 1.2 for Module 1, and 2.1 and 2.2 for Module 2.

The modules are fully independent and are configured separately. Both modules offer the same configuration options and are configured using the Module menu as follows:



The module menu is identical for Module 2.

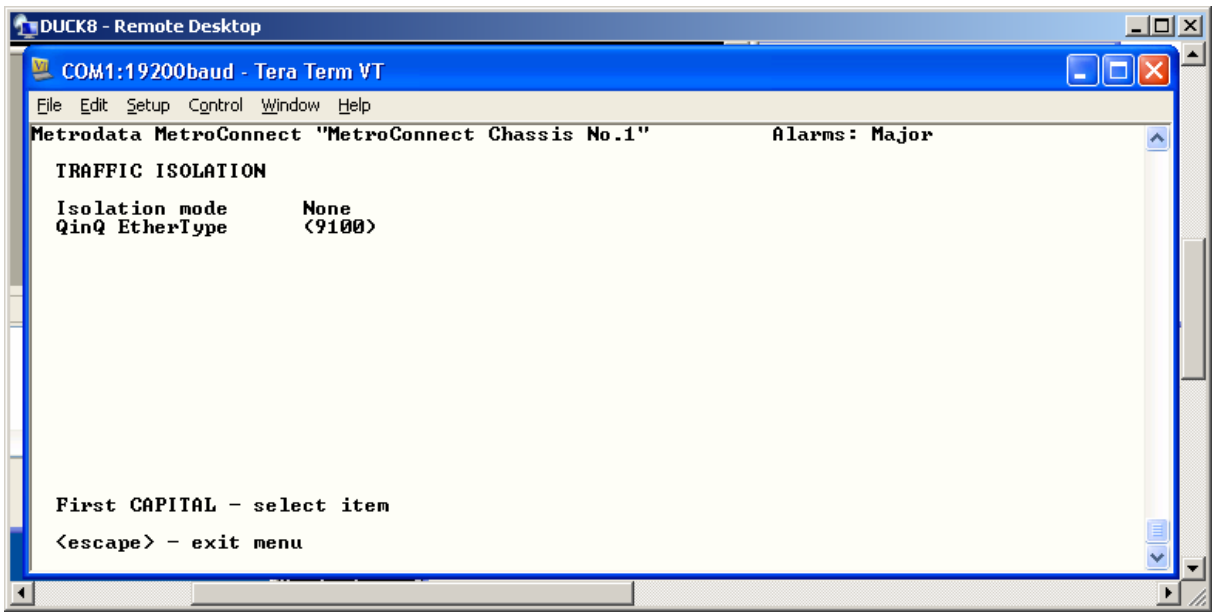
3.3.4.2.1 Link Name

In order to assist identification of the link being configured a label may be applied. The label may be upto 32 characters.

3.3.4.2.2 Traffic Isolation Configuration

Traffic Isolation allows the traffic streams to be un-modifed, VLAN tagged or S-Tagged as they traverse the FCC9000.

The configuration menu is shown below:



3.3.4.2.2.1Isolation Mode

The isolation mode selects which, if any, tagging is to be applied.

Options

None	Packets pass through untagged
VLAN	Packets entering the Copper port are VLAN Tagged
QinQ	Packets entering the Copper port are S-Tag Tagged

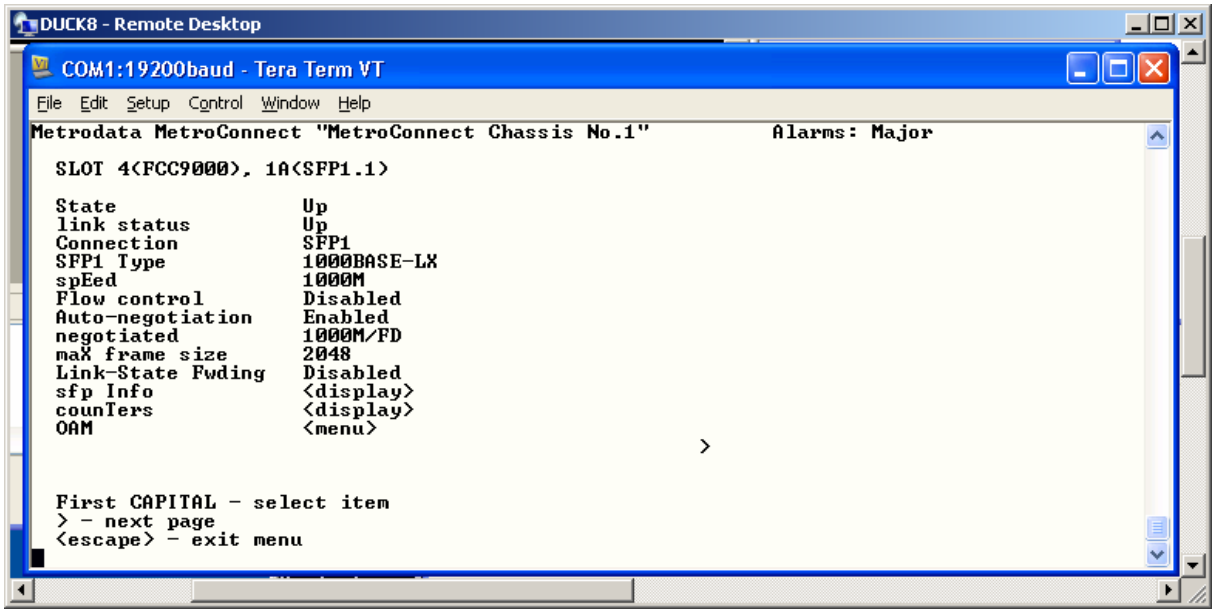
3.3.4.2.2.2QinQ Ethertype

To ensure interoperability with other vendor equipment the S-Tag ethertype is configurable and possible options are:

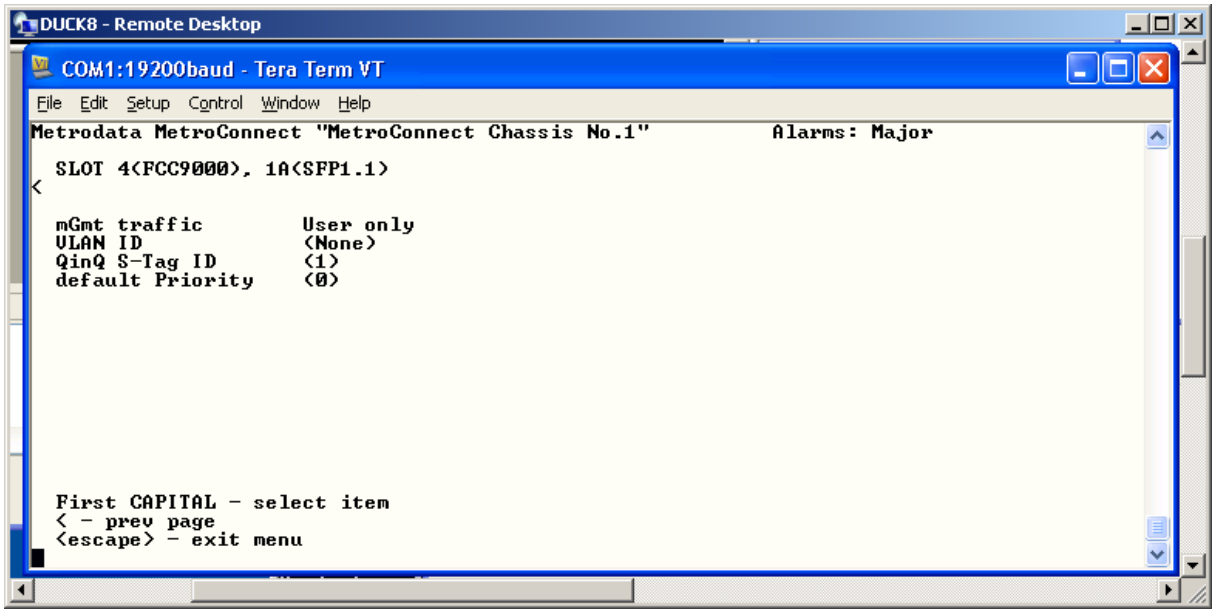
9100	QinQ
8100	VLAN 802.1q
9200	Brocade, Juniper
88A8	IEEE 802.1ad Provider Bridge, Extreme

3.3.4.2.3 Port A, SFP Configuration

This menu allows configuration of the SFP interface



the menu stretches over two pages, as indicated by the “>” at the bottom of the page. Selecting the second menu page shows:



3.3.4.2.3.1 State

This configuration item defines the administrative status for the SFP port.

Options:

Up	Port is enabled, Alarms are generated if required
Down	Port is disabled, no alarms generated

For normal operation, a port must be in the administrative Up state, however when ports are not connected they should be disabled to prevent them generating alarms.

3.3.4.2.3.2 Link Status

The Link Status item is a real time indication of the current state of the link.

Options:

Up	Link is UP, traffic may pass
Down	Link Down,

3.3.4.2.3.3Connection

This menu item selects the operating mode of Port A,

Options

SFP1	Traffic Passes over SFP1
SFP2	Traffic Passes over SFP2
Dual SFP	Traffic uses both SFP ports, Link Aggregation Active.

3.3.4.2.3.4SFP Type

The SFP type shows a decode of the SFP EEPROM according to the SFP-MSA agreement. This shows a decode of bytes 3 to 10 of the EEPROM

For Gigabit Operation the valid types are

1000Base-SX	Multi Mode, 850nm
1000Base-LX	Single Mode, 1300nm

For 100M operation the valid types are

OC-3 Multi Mode

OC-3 Single Mode

Where other types of SFP are used, other decodes may be displayed. If the decode is not valid, then UNKNOWN will be shown, and where the SFP is not fitted, NOT FITTED will be shown.

3.3.4.2.3.5Speed

The speed setting selects the operating speed of the SFP port.

Options

1000M	Use with 1000BaseX SFP
100M	Use with OC-3/100BaseFX SFP
Auto	The software will attempt to read the type info from the SFP and then configure the port accordingly.

3.3.4.2.3.6 Flow Control

This option controls the operation of pause frame flow control on the SFP port.

Options

Disabled	Flow Control disabled
Enabled	Flow Control Enabled

3.3.4.2.3.7 Auto Negotiation

This configures the port for auto negotiation.

Options

Enabled	Port will Auto Negotiate
Disabled	Port is fixed

Note, 1000BaseX should always have auto negotiation enabled.

3.3.4.2.3.8 Negotiated

This display item shows the results of the auto negotiation process.

Options

----	Auto Negotiation not completed
1000M/FD	1000M, Full Duplex
100M/FD	100M, Full Duplex
100M/HD	100M, Half Duplex

3.3.4.2.3.9Max Frame Size

Many network protocols form packets which exceed the standard 802.3 MAC frame size the FCC9000 supports a configurable maximum:

Options

1522 Standard MAC Frame

2048 Mini Jumbo Frames

10K Jumbo Frame Support

3.3.4.2.3.10 Link State Forwarding

Link State Forwarding propagates the physical link state, ie if Port B is down, then LSF will force port A down. In this way, devices connected via the media converter will see the link fault if it occurs downstream.

In a managed network, with remote management or OAM, LSF should be disabled otherwise a remote fault will disable the link used for management.

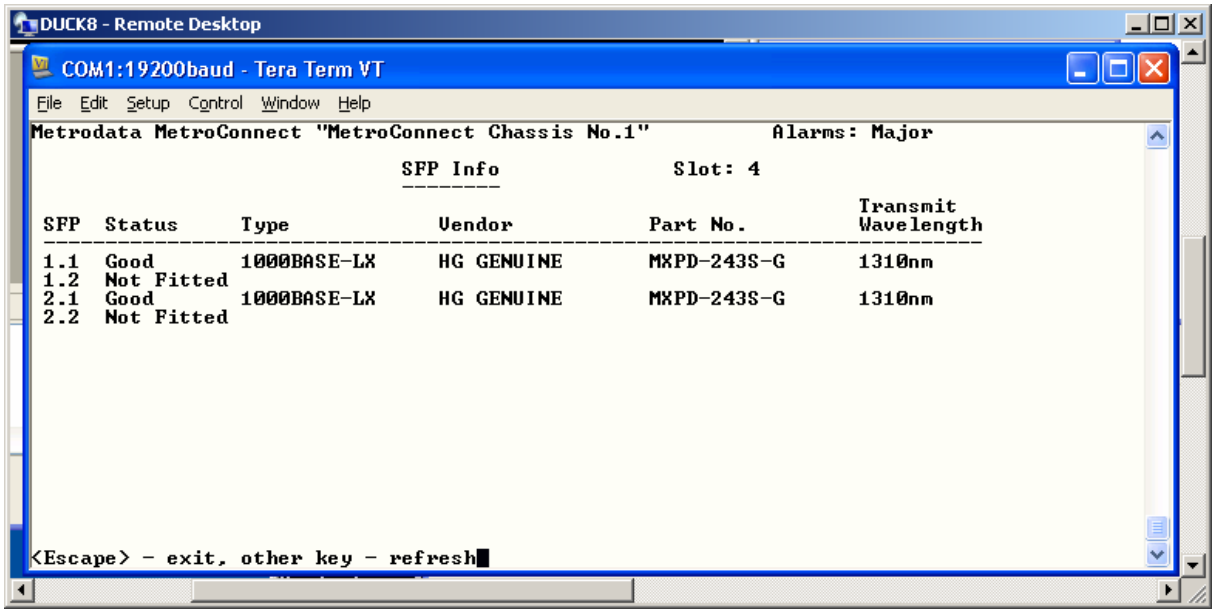
Options:

Disabled

Enabled

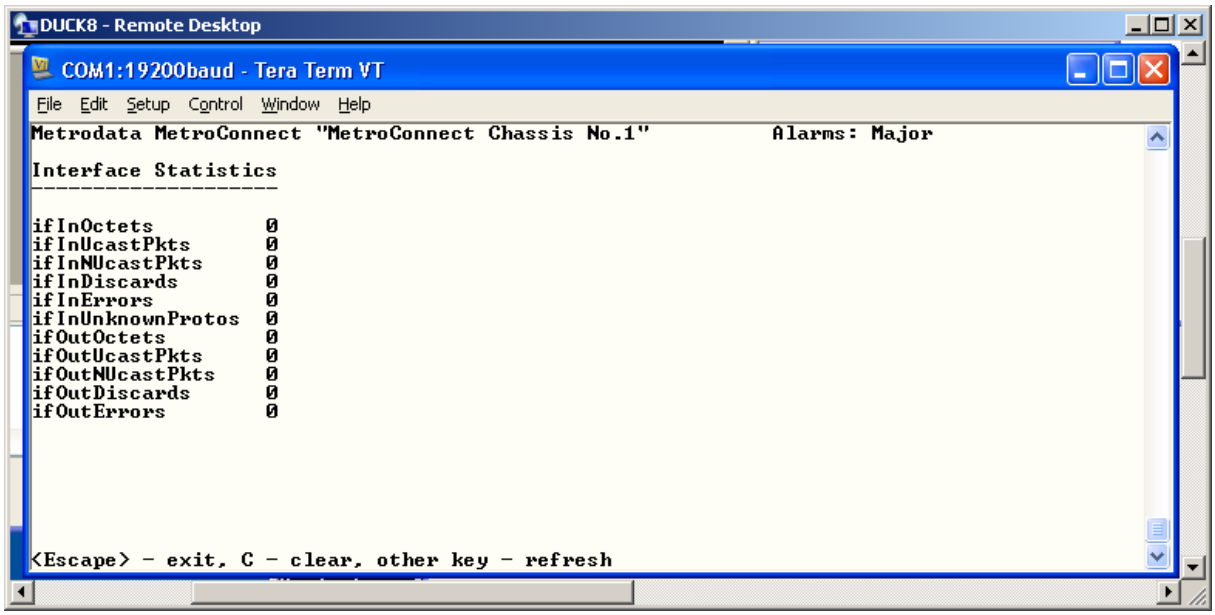
3.3.4.2.3.11 SFP Info

The SFP Type display shows the basic decode for the SFP module. The SFP info gives a more detailed description of the SFP based on the information read from the EEPROM.



3.3.4.2.3.12 Counters

The FCC9000 provides the basic SNMP MIB-2 counters for the interface as shown



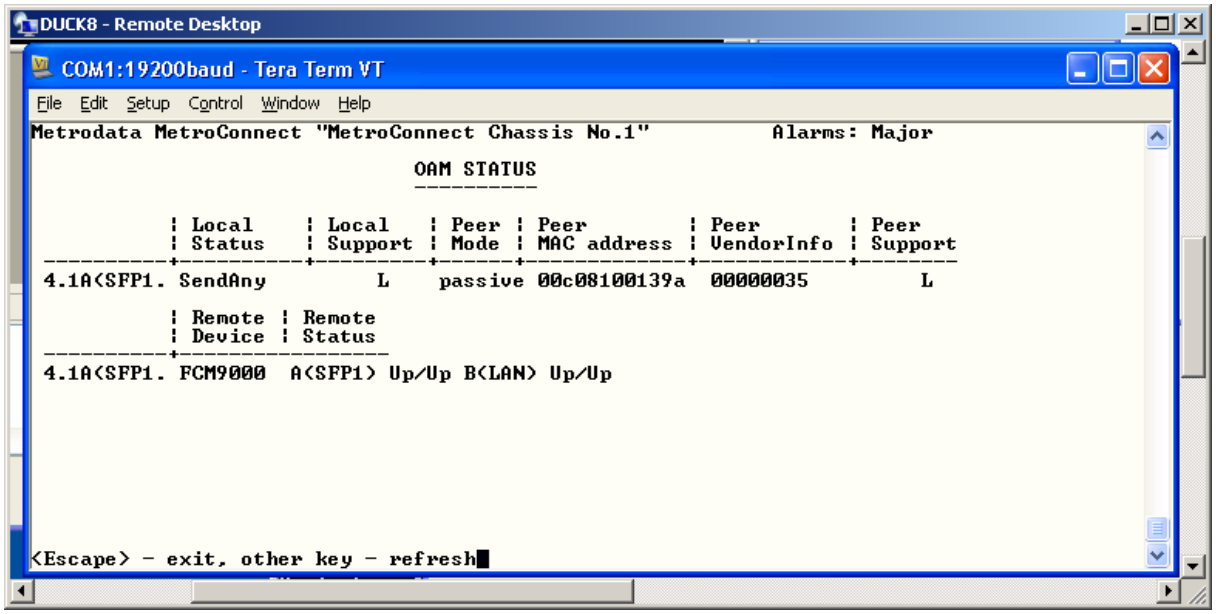
3.3.4.2.3.13 OAM

The FCC9000 offers monitoring using IEEE802.3ah Link OAM. OAM is configured on a per port basis and may be configured as follows:

Options

Disabled	
Active	FCC9000 Generates OAM PDU Requests
Passive	FCC9000 Waits for requests and then responds

When OAM is enabled, either active or passive, the current status may be displayed as below:



3.3.4.2.3.14 Mgmt Traffic

This config item determines the type of traffic flowing on the SFP port.

Options

User Only (default)

User + Management

Management only

User traffic is traffic that should pass between the ports of the media converter. This is the main mode for the FCC9000, and should be used with OAM and Proxy Management modes.

Management traffic is traffic that is to be intercepted and forwarded to the MetroConnect manager via the backplane.

3.3.4.2.3.15 VLAN ID

If the traffic isolation mode is set to VLAN, then this defines the 802.1q tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.4.2.3.16 QinQ S-TAG ID

If the traffic isolation mode is set to QinQ, then this defines theS-Tag that will be applied to the incoming packets.

The valid values range 1 to 4095

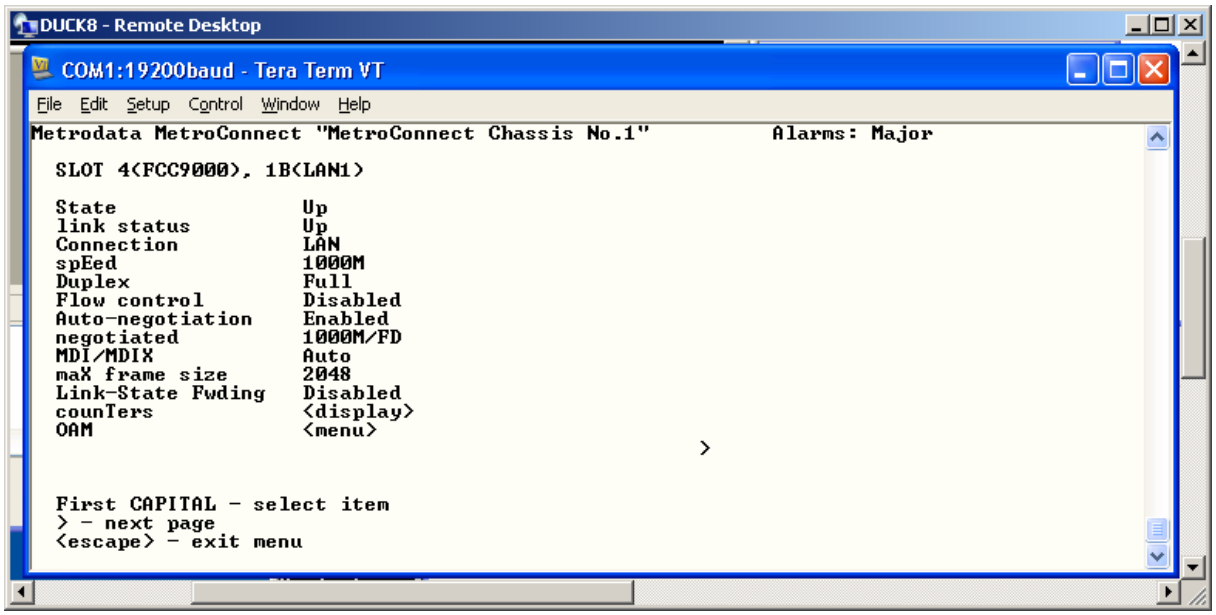
3.3.4.2.3.17 Default Priority

When a VLAN tag is added, this priority is assigned to the packet. Where S-Tags are added to already tagged packets, the priority is inherited, for untagged frames the default priority is assigned.

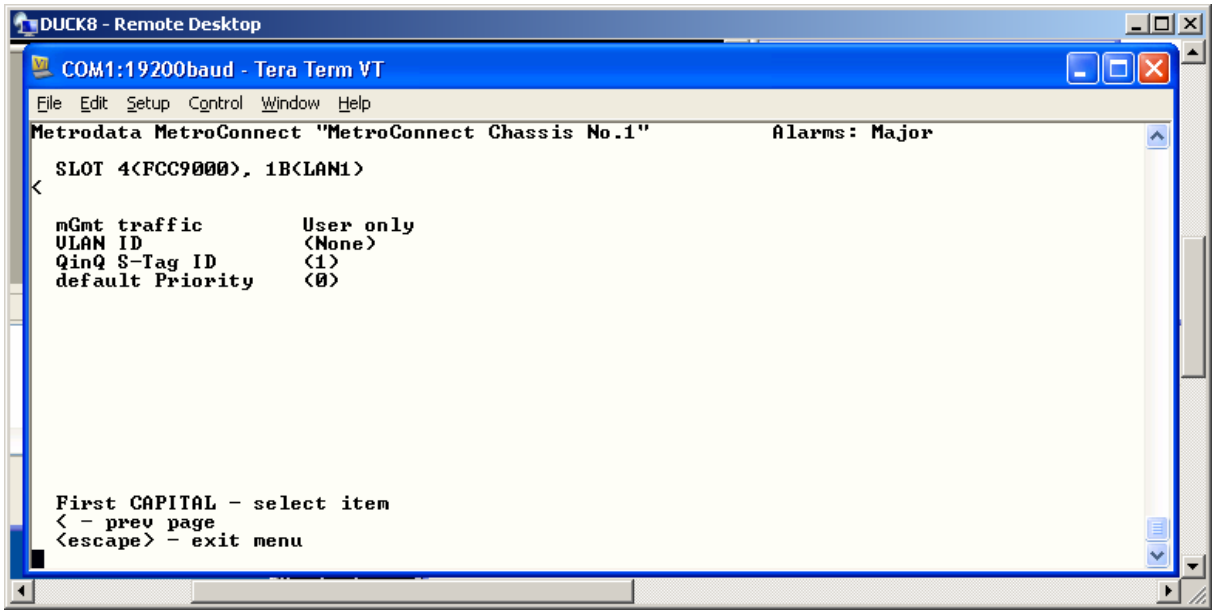
The valid values are 0 – 7

3.3.4.2.4 Port B, LAN Configuration

This menu allows configuration of the LAN interface



the menu stretches over two pages, as indicated by the “>” at the bottom of the page. Selecting the second menu page shows:



3.3.4.2.4.1 State

This configuration item defines the administrative status for the LAN port.

Options:

Up	Port is enabled, Alarms are generated if required
Down	Port is disabled, no alarms generated

For normal operation, a port must be in the administrative Up state, however when ports are not connected they should be disabled to prevent them generating alarms.

3.3.4.2.4.2 Link Status

The Link Status item is a real time indication of the current state of the link.

Options:

Up	Link is UP, traffic may pass
Down	Link Down,

3.3.4.2.4.3Connection

This menu item selects the operating mode of Port A,

Options

LAN	Traffic Passes over LAN
SFP2	Traffic Passes over SFP2

3.3.4.2.4.4Speed

When Auto Negotiation is disabled, this sets the operating speed of the port. When Auto Negotiation is enabled, this setting defines the maximum speed to be advertised.

Options

1000M

100M

10M

3.3.4.2.4.5Duplex

When Auto Negotiation is disabled, this sets the operating duplex mode of the port. When Auto Negotiation is enabled, this setting defines the maximum duplex to be advertised.

Options

Full

Half

3.3.4.2.4.6Flow Control

This option controls the operation of pause frame flow control on the LAN port.

Options

Disabled	Flow Control disabled
Enabled	Flow Control Enabled

3.3.4.2.4.7Auto Negotiation

This configures the port for auto negotiation.

Options

Enabled	Port will Auto Negotiate
Disabled	Port is fixed

3.3.4.2.4.8Negotiated

This display item shows the results of the auto negotiation process.

Options

----	Auto Negotiation not completed
1000M/FD	1000M, Full Duplex
100M/FD	100M, Full Duplex
100M/HD	100M, Half Duplex
10M/FD	10M, Full Duplex
10M/HD	10M, Half Duplex

3.3.4.2.4.8.1 MDI/MDIX

The RJ45 port may be configured to automatically sense the interface type and automatically configure itself for MDI or MDIX operation. This mode ensures a straight cable can always be used. Alternatively, the port mode may be fixed.

Options

Auto	Auto Detect the connection required
MDI	Present MDI for connection to Switch Port
MDIX	Present MDIX for connection to PC

3.3.4.2.4.9Max Frame Size

Many network protocols form packets which exceed the standard 802.3 MAC frame size the FCC9000 supports a configurable maximum:

Options

1522	Standard MAC Frame
2048	Mini Jumbo Frames
10K	Jumbo Frame Support

3.3.4.2.4.10 Link State Forwarding

Link State Forwarding propagates the physical link state, ie if Port A is down, then LSF will force port B down. In this way, devices connected via the media converter will see the link fault if it occurs downstream.

In a managed network, with remote management or OAM, LSF should be disabled otherwise a remote fault will disable the link used for management.

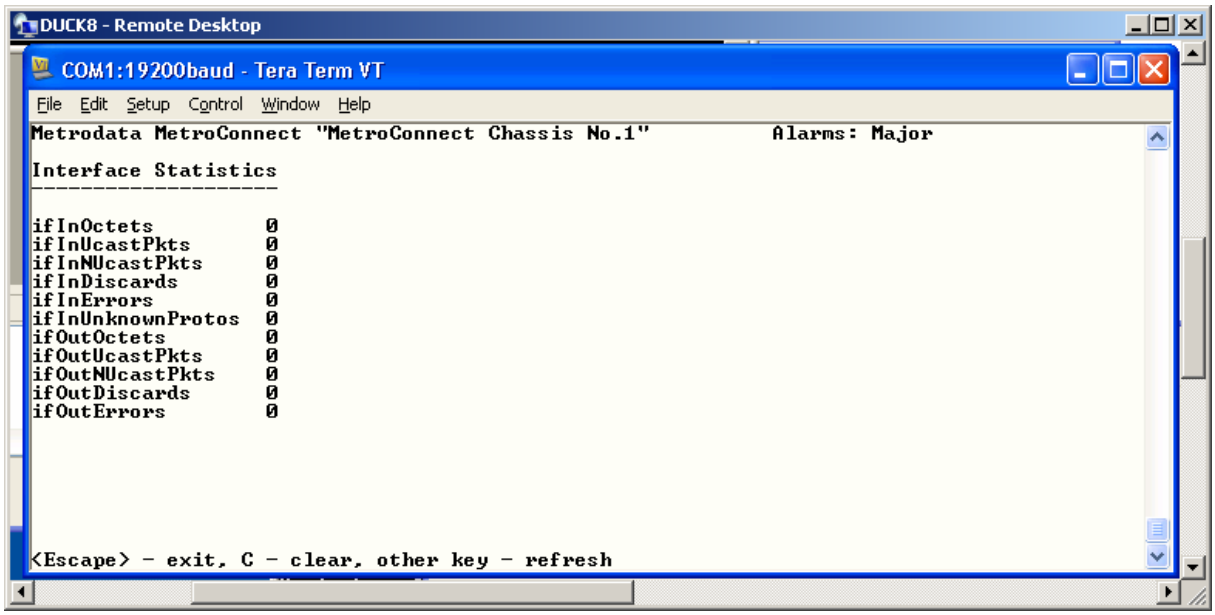
Options:

Disabled

Enabled

3.3.4.2.4.11 Counters

The FCC9000 provides the basic SNMP MIB-2 counters for the interface as shown



3.3.4.2.4.12 OAM

The FCC9000 offers monitoring using IEEE802.3ah Link OAM. OAM is configured on a per port basis and may be configured as follows:

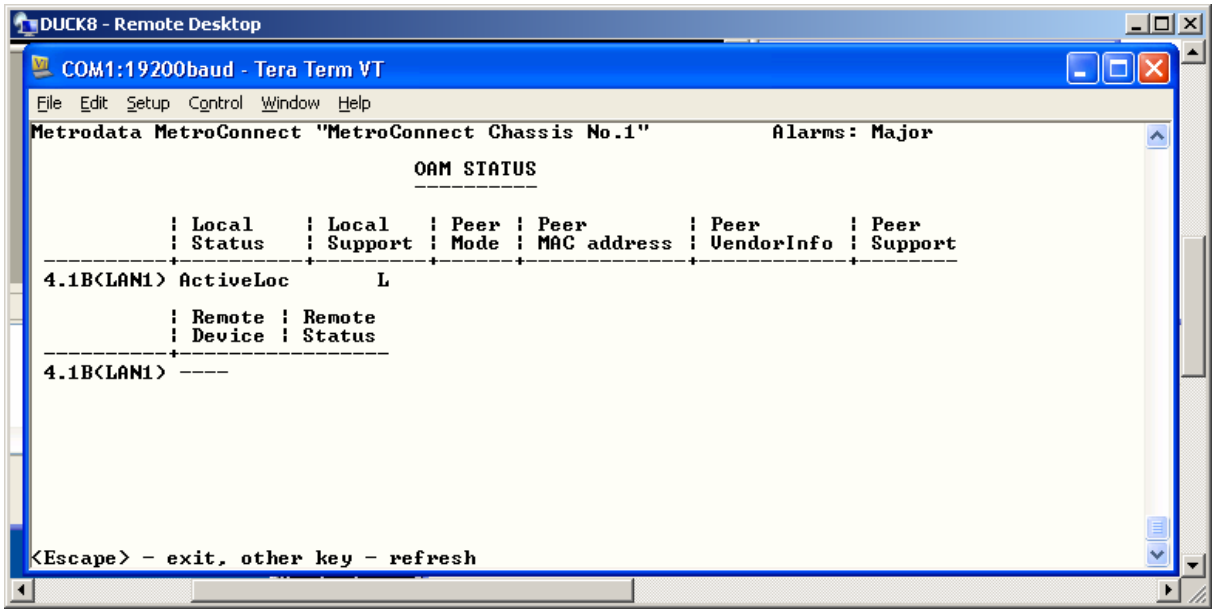
Options

Disabled

Active FCC9000 Generates OAM PDU Requests

Passive FCC9000 Waits for requests and then responds

When OAM is enabled, either active or passive, the current status may be displayed as below:



3.3.4.2.4.13 Mgmt Traffic

This configuration item determines the type of traffic flowing on the LAN port.

Options

User Only (default)

User + Management

Management only

User traffic is traffic that should pass between the ports of the media converter. This is the main mode for the FCC9000, and should be used with OAM and Proxy Management modes.

Management traffic is traffic that is to be intercepted and forwarded to the MetroConnect manager via the backplane.

3.3.4.2.4.14 VLAN ID

If the traffic isolation mode is set to VLAN, then this defines the 802.1q tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.4.2.4.15 QinQ S-TAG ID

If the traffic isolation mode is set to QinQ, then this defines theS-Tag that will be applied to the incoming packets.

The valid values range 1 to 4095

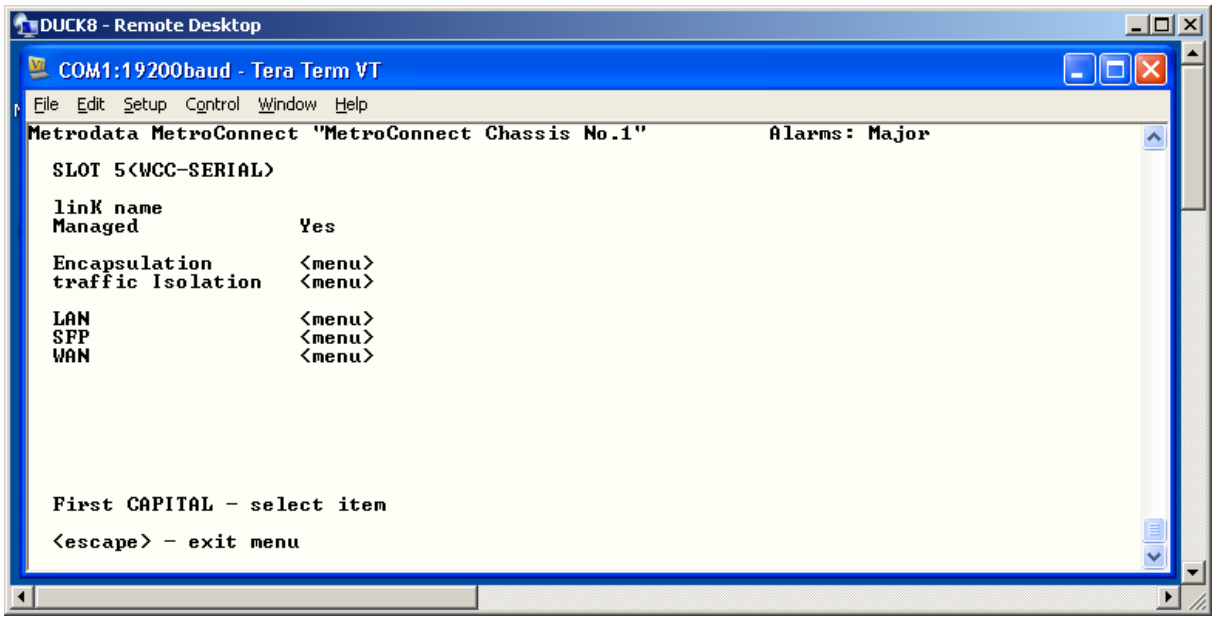
3.3.4.2.4.16 Default Priority

When a VLAN tag is added, this priority is assigned to the packet. Where S-Tags are added to already tagged packets, the priority is inherited, for untagged frames the default priority is assigned.

The valid values are 0 – 7

3.3.5 WCC-Serial

The WCC-Serial Module may be configured by selecting the Module Slot number at the Data Port Set-Up Menu. The main WCC-Serial Configuration screen is shown below:



3.3.5.1 Link Name

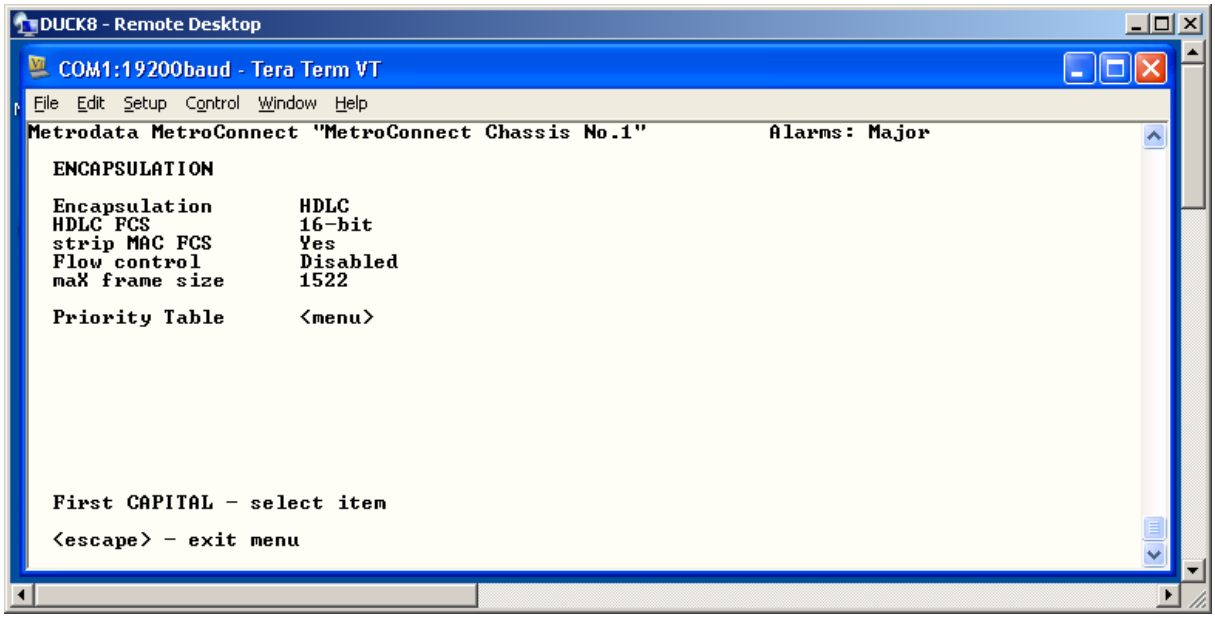
In order to assist identification of the link being configured a label may be applied. The label may be upto 32 characters.

3.3.5.2 Managed Mode

The WCC-Serial should always be operated in managed mode to enable functions such as OAM, Management and Performance Monitoring.

3.3.5.3 Encapsulation

To transmit packets over the serial interface, they must first be encapsulated within a protocol suitable for bit synchronous transmission. The Encapsulation menu is shown below:



3.3.5.3.1 Encapsulation

The WCC-Serial uses HDLC encapsulation, with a minimum of a single flag (0x7E) between frames. HDLC is a bit synchronous protocol which uses flag delimiting and bit stuffing to prevent false flag detection.

3.3.5.3.2 HDLC FCS

The transmitted HDLC frames are protected against errors through the addition of a 16 bit Frame Check Sequence (FCS). When a frame is received, any bit errors will cause the FCS check to fail, and the packet to be discarded.

3.3.5.3.3 Strip MAC FCS

Ethernet Frames are protected using a 32 bit FCS. The WCC-Serial offers the option of reducing the required bandwidth by stripping these four bytes whilst the packet is transmitted over the serial link, and recalculating the FCS at the far end.

The frame will be protected by the HDLC FCS whilst on the serial link, so it is not possible for bit errors to be ignored.

3.3.5.3.4 Flow Control

The WCC-Serial offers the user the option of using IEEE 802.3X pause based flow control to prevent packet loss due to buffer overflow, however enabling flow control disables the priority queueing support.

In general, priority queuing will give much better results than flow control.

3.3.5.3.5 Max Frame Size

The maximum frame size that may be transported by the WCC-Serial module. The options are

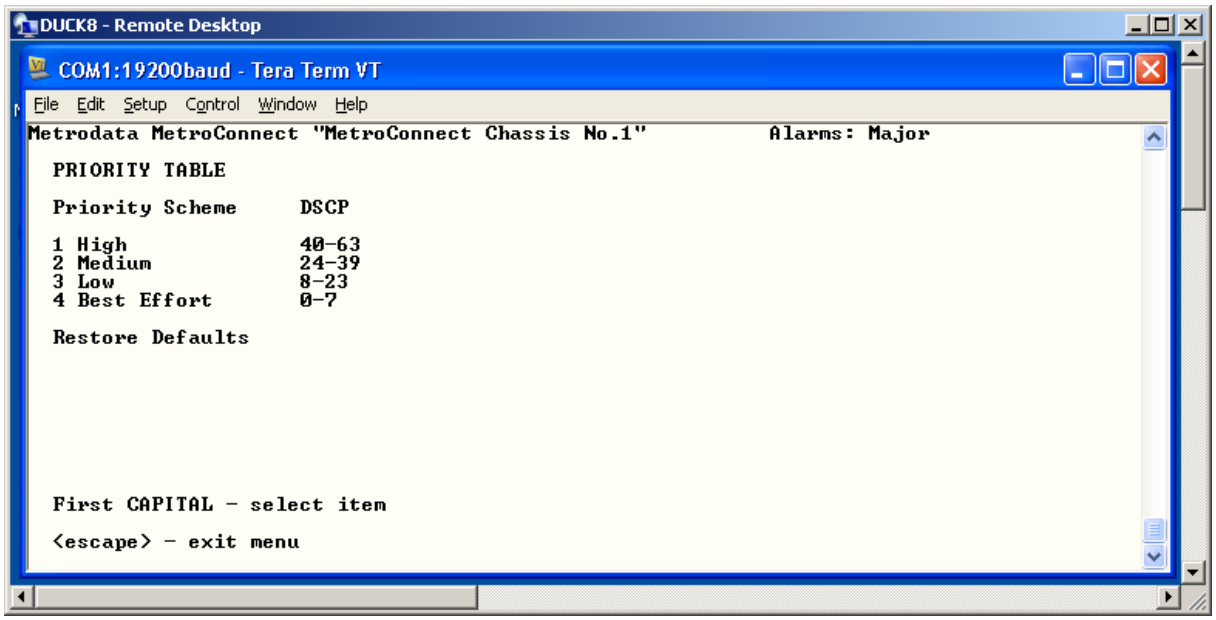
1518/1522	Standard MAC / IEEE 802.1q VLAN
2048	QinQ, Provider Bridge, MPLS etc
10k	Jumbo Frames

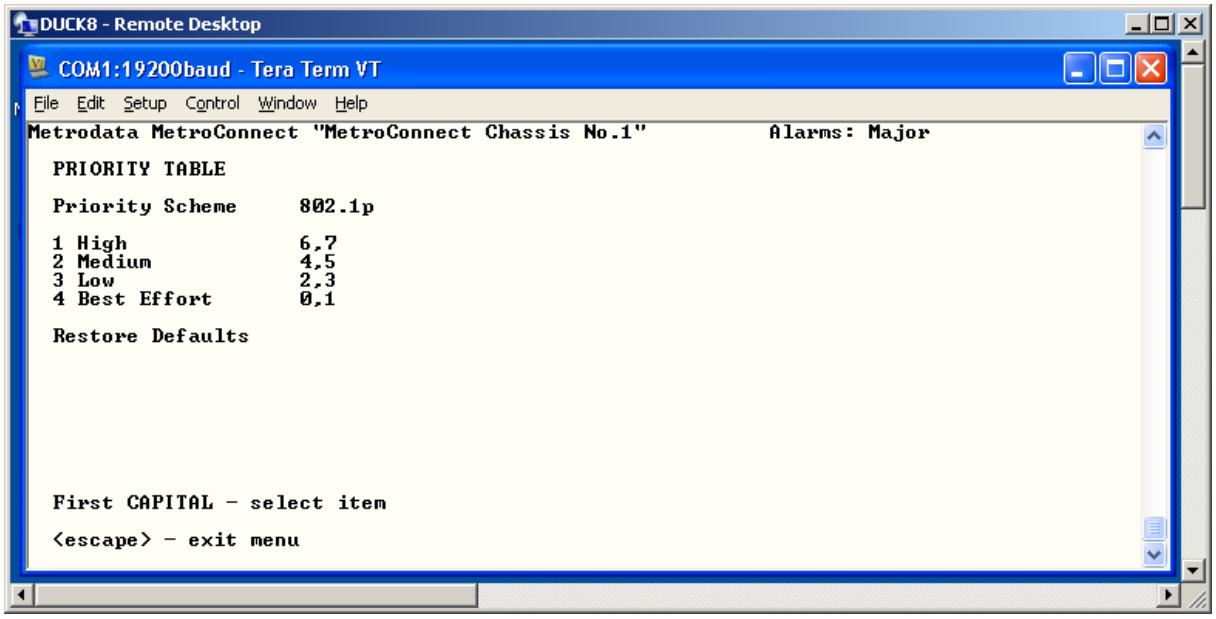
Due to the low speed of the serial link, (<20M) it is not advisable to use jumbo frames due to latency issues.

3.3.5.3.6 Priority Table

The WCC-Serial supports 4 levels of priority queuing. The two options, DSCP has 32 levels, whilst IEEE 802.1p has 8. The priority table allows the user to map the various levels to the WCC-Serial priority levels.

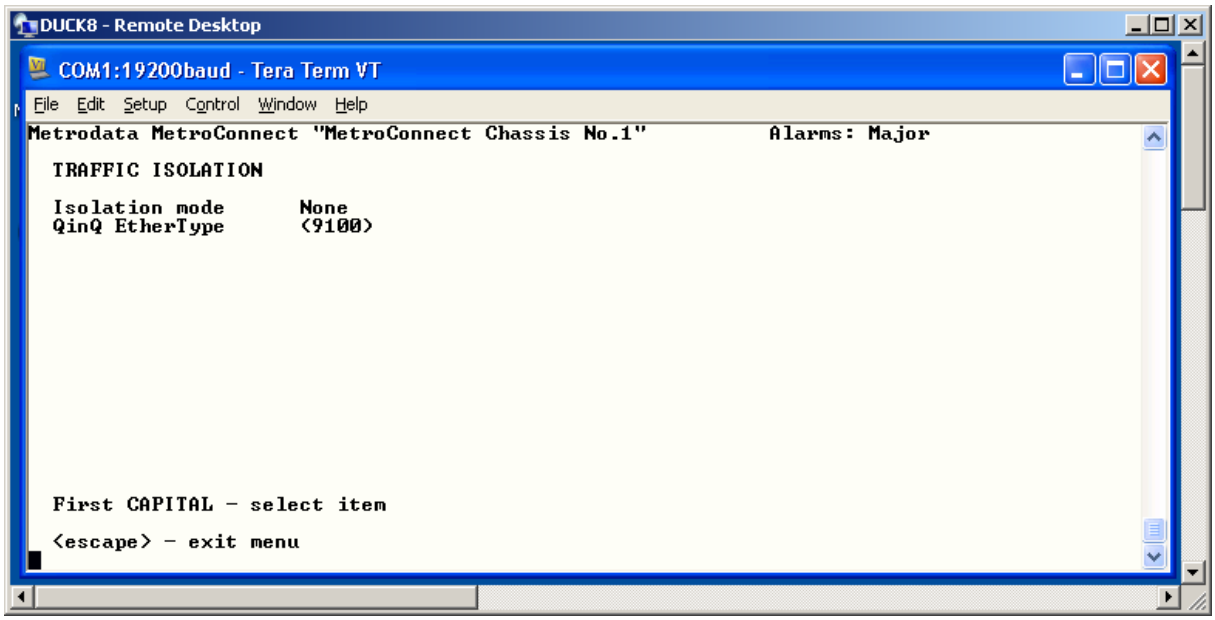
The displays below show the default settings for the priority tables





3.3.5.4 Traffic Isolation

The traffic isolation menu configures the VLAN processing mode of the module. The configuration menu is shown below:



3.3.5.4.1 Isolation Mode

The isolation mode selects which, if any, tagging is to be applied.

Options

None	Packets pass through untagged
VLAN	Packets entering the Copper port are VLAN Tagged
QinQ	Packets entering the Copper port are S-Tag Tagged

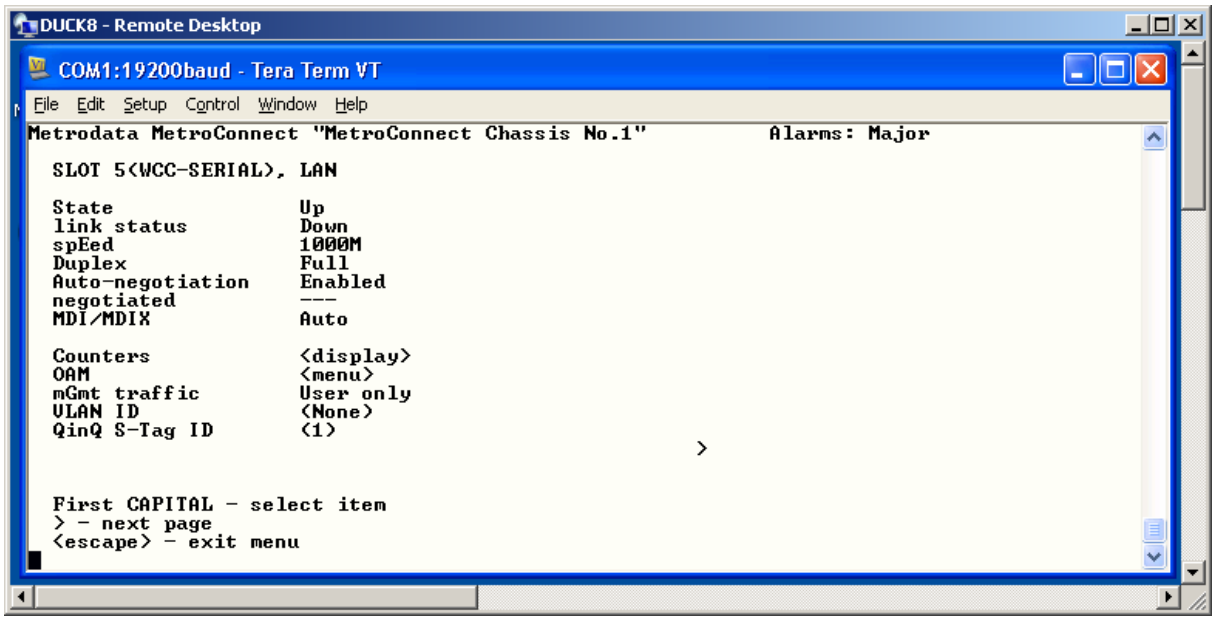
3.3.5.4.2 QinQ EtherType

To ensure interoperability with other vendor equipment the S-Tag ethertype is configurable and possible options are:

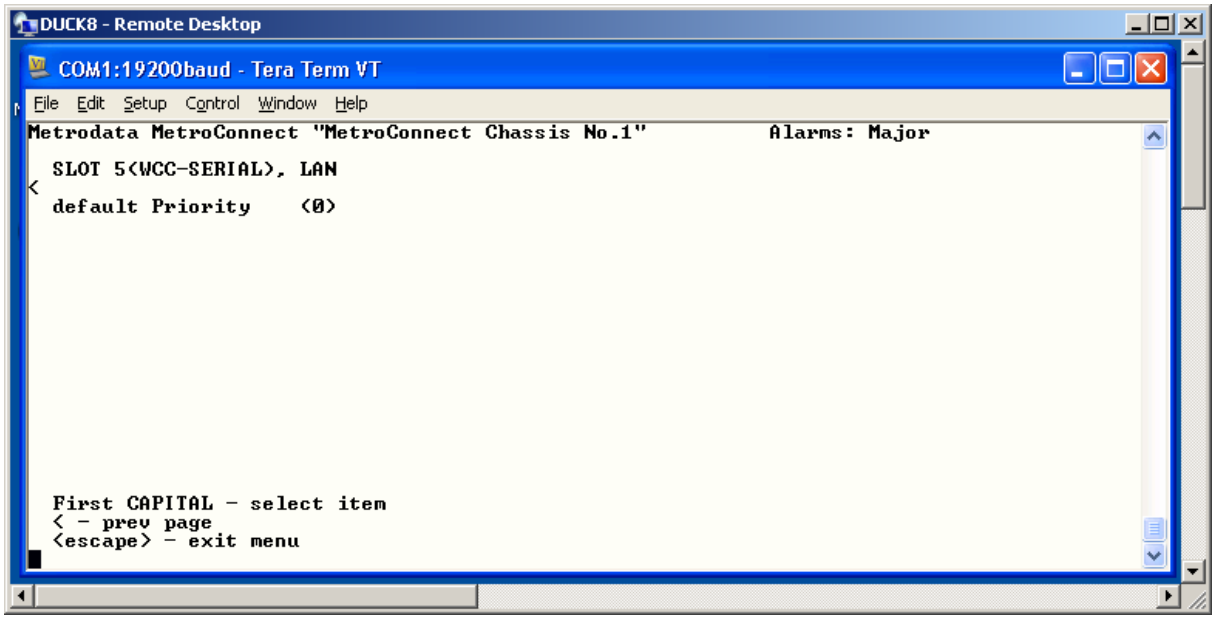
9100	QinQ
8100	VLAN 802.1q
9200	Brocade, Juniper
88A8	IEEE 802.1ad Provider Bridge, Extreme

3.3.5.5 LAN Port Configuration

This menu allows configuration of the LAN interface



the menu stretches over two pages, as indicated by the “>” at the bottom of the page. Selecting the second menu page shows:



3.3.5.5.1 State

This configuration item defines the administrative status for the LAN port.

Options:

Up	Port is enabled, Alarms are generated if required
Down	Port is disabled, no alarms generated

For normal operation, a port must be in the administrative Up state, however when ports are not connected they should be disabled to prevent them generating alarms.

3.3.5.5.2 Link Status

The Link Status item is a real time indication of the current state of the link.

Options:

Up	Link is UP, traffic may pass
Down	Link Down,

3.3.5.5.3 Speed

When Auto Negotiation is disabled, this sets the operating speed of the port. When Auto Negotiation is enabled, this setting defines the maximum speed to be advertised.

Options

1000M

100M

10M

3.3.5.5.4 Duplex

When Auto Negotiation is disabled, this sets the operating duplex mode of the port. When Auto Negotiation is enabled, this setting defines the maximum duplex to be advertised.

Options

Full

Half

3.3.5.5.5 Auto Negotiation

This configures the port for auto negotiation.

Options

Enabled	Port will Auto Negotiate
Disabled	Port is fixed

3.3.5.5.6 Negotiated

This display item shows the results of the auto negotiation process.

Options

----	Auto Negotiation not completed
1000M/FD	1000M, Full Duplex
100M/FD	100M, Full Duplex
100M/HD	100M, Half Duplex
10M/FD	10M, Full Duplex
10M/HD	10M, Half Duplex

3.3.5.5.7 MDI/MDIX

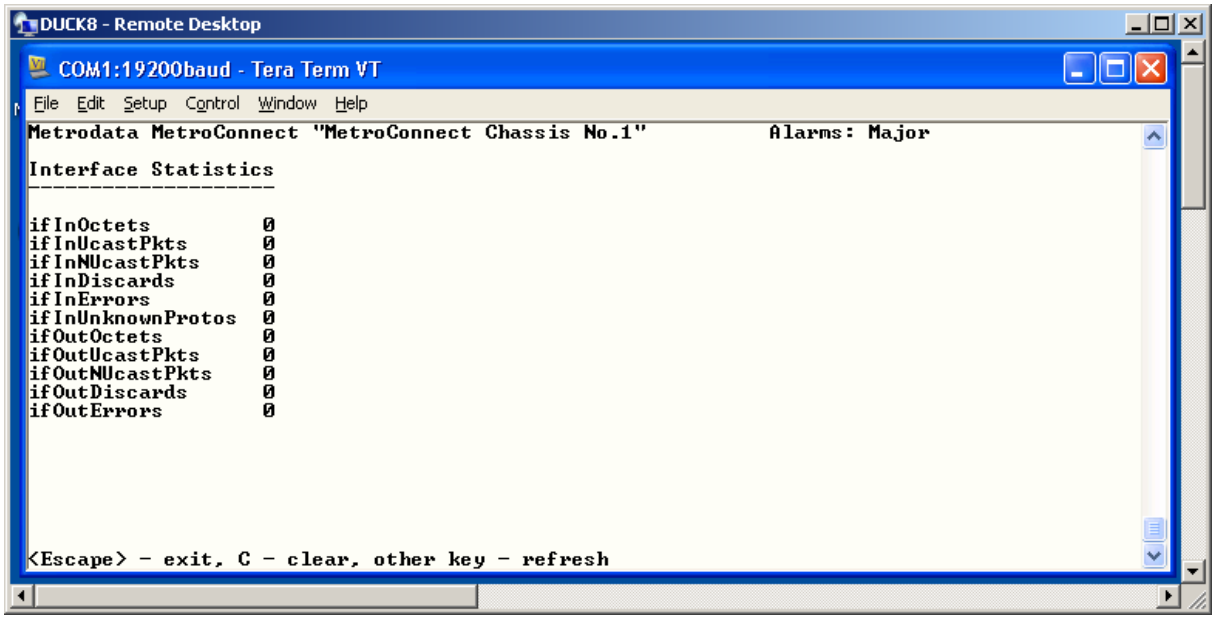
The RJ45 port may be configured to automatically sense the interface type and automatically configure itself for MDI or MDIX operation. This mode ensures a straight cable can always be used. Alternatively, the port mode may be fixed.

Options

Auto	Auto Detect the connection required
MDI	Present MDI for connection to Switch Port
MDIX	Present MDIX for connection to PC

3.3.5.5.8 Counters

The WCC-Serial provides the basic SNMP MIB-2 counters for the interface as shown



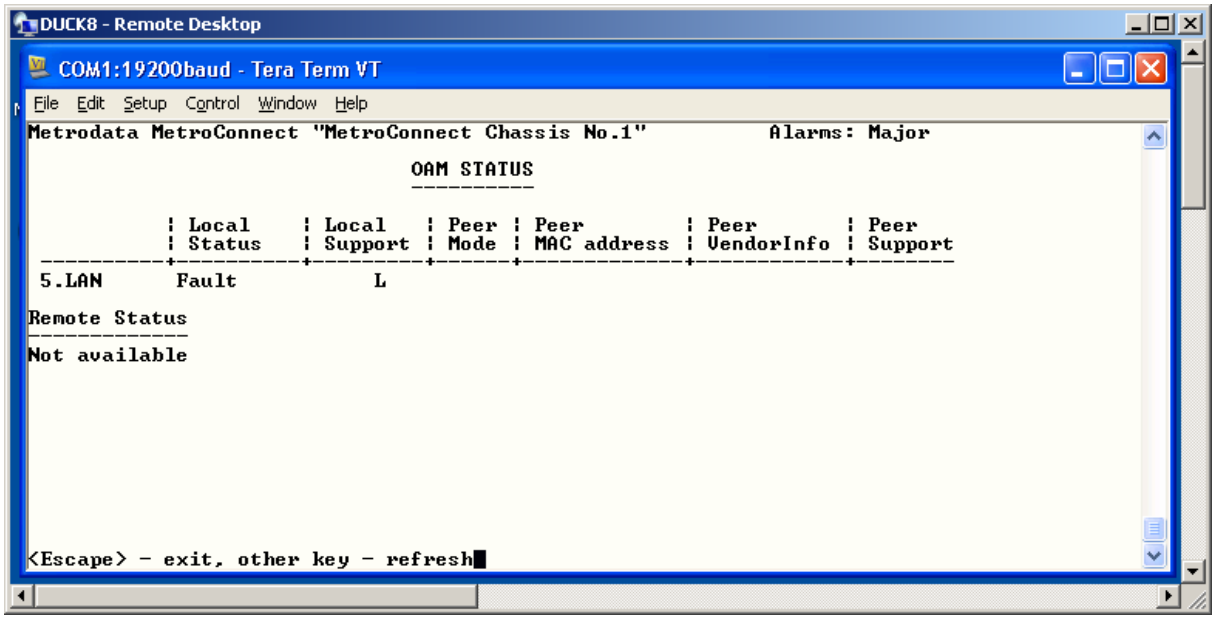
3.3.5.5.9 OAM

The WCC-Serial offers monitoring using IEEE802.3ah Link OAM. OAM is configured on a per port basis and may be configured as follows:

Options

Disabled	
Active	WCC-Serial Generates OAM PDU Requests
Passive	WCC-Serial Waits for requests and then responds

When OAM is enabled, either active or passive, the current status may be displayed as below:



3.3.5.5.10 Mgmt Traffic

This configuration item determines the type of traffic flowing on the LAN port.

Options

User Only (default)

User + Management

Management only

User traffic is traffic that should pass between the ports of the module. This is the main mode for the WCC-Serial, and should be used with OAM and Proxy Management modes.

Management traffic is traffic that is to be intercepted and forwarded to the MetroConnect manager via the backplane.

3.3.5.5.11 VLAN ID

If the traffic isolation mode is set to VLAN, then this defines the 802.1q tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.5.5.12 QinQ S-TAG ID

If the traffic isolation mode is set to QinQ, then this defines theS-Tag that will be applied to the incoming packets.

The valid values range 1 to 4095

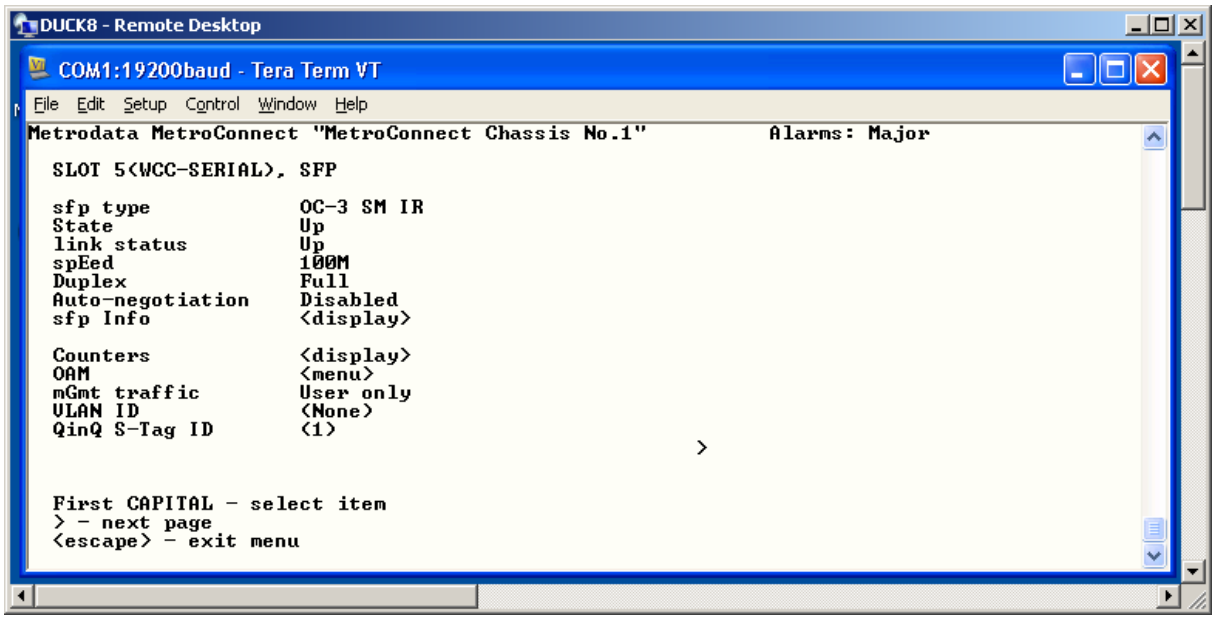
3.3.5.5.13 Default Priority

When a VLAN tag is added, this priority is assigned to the packet. Where S-Tags are added to already tagged packets, the priority is inherited, for untagged frames the default priority is assigned.

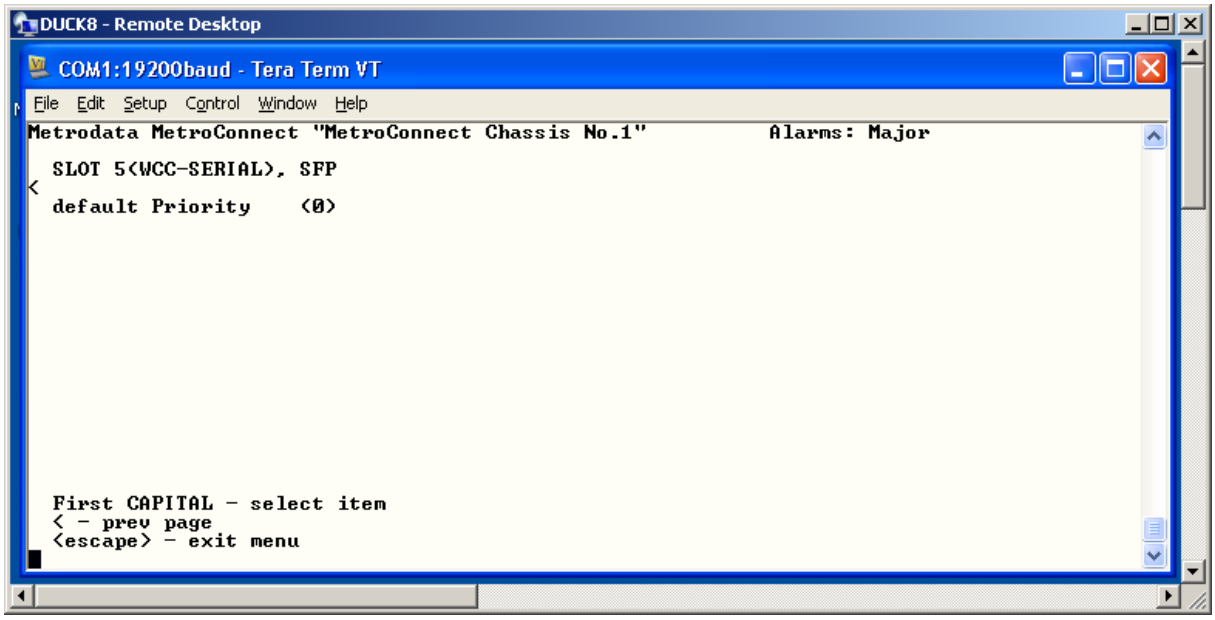
The valid values are 0 – 7

3.3.5.6 SFP Configuration

This menu allows configuration of the SFP interface



the menu stretches over two pages, as indicated by the “>” at the bottom of the page. Selecting the second menu page shows:



3.3.5.6.1 State

This configuration item defines the administrative status for the SFP port.

Options:

Up	Port is enabled, Alarms are generated if required
Down	Port is disabled, no alarms generated

For normal operation, a port must be in the administrative Up state, however when ports are not connected they should be disabled to prevent them generating alarms.

3.3.5.6.2 Link Status

The Link Status item is a real time indication of the current state of the link.

Options:

Up	Link is UP, traffic may pass
Down	Link Down,

3.3.5.6.3 SFP Type

The SFP type shows a decode of the SFP EEPROM according to the SFP-MSA agreement. This shows a decode of bytes 3 to 10 of the EEPROM

For Gigabit Operation the valid types are

1000Base-SX	Multi Mode, 850nm
1000Base-LX	Single Mode, 1300nm

For 100M operation the valid types are

OC-3 Multi Mode

OC-3 Single Mode

Where other types of SFP are used, other decodes may be displayed. If the decode is not valid, then UNKNOWN will be shown, and where the SFP is not fitted, NOT FITTED will be shown.

3.3.5.6.4 Speed

The speed setting selects the operating speed of the SFP port.

Options

1000M	Use with 1000BaseX SFP
100M	Use with OC-3/100BaseFX SFP
Auto	The software will attempt to read the type info from the SFP and then configure the port accordingly.

3.3.5.6.5 Duplex

The duplex setting sets the Duplex mode of the SFP port. This is only valid for 100baseFX mode.

Full	Full Duplex
Half	Half Duplex

3.3.5.6.6 Auto Negotiation

This configures the port for auto negotiation.

Options

Enabled	Port will Auto Negotiate
Disabled	Port is fixed

Note, 1000BaseX should always have auto negotiation enabled.

3.3.5.6.7 Negotiated

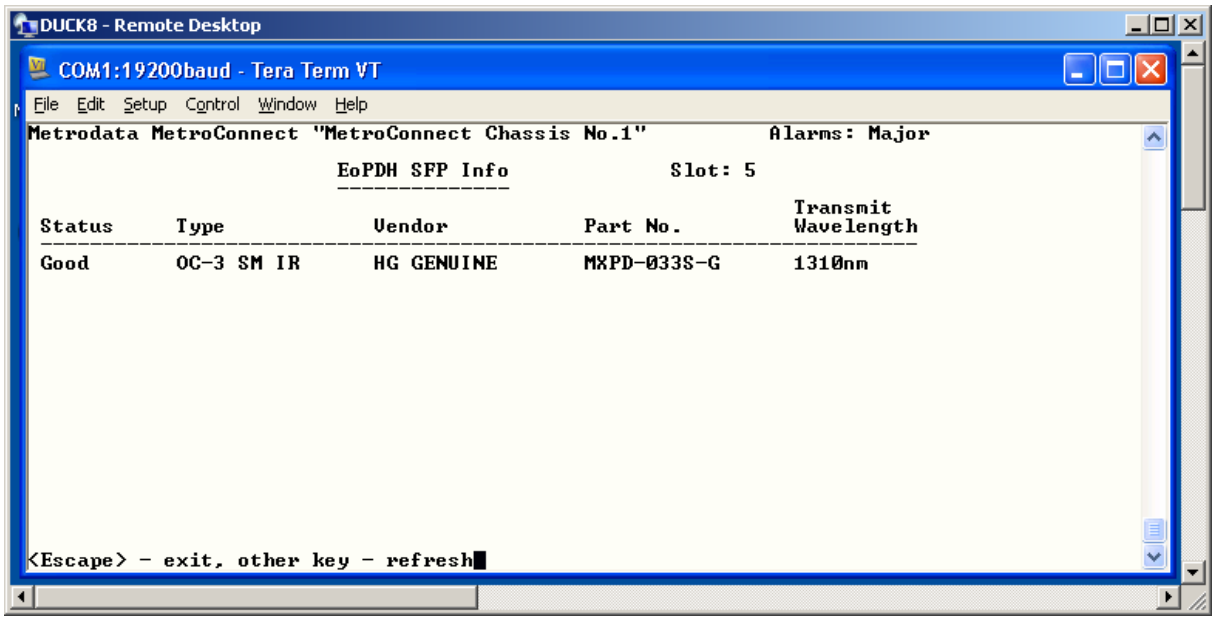
This display item shows the results of the auto negotiation process.

Options

----	Auto Negotiation not completed
1000M/FD	1000M, Full Duplex
100M/FD	100M, Full Duplex
100M/HD	100M, Half Duplex

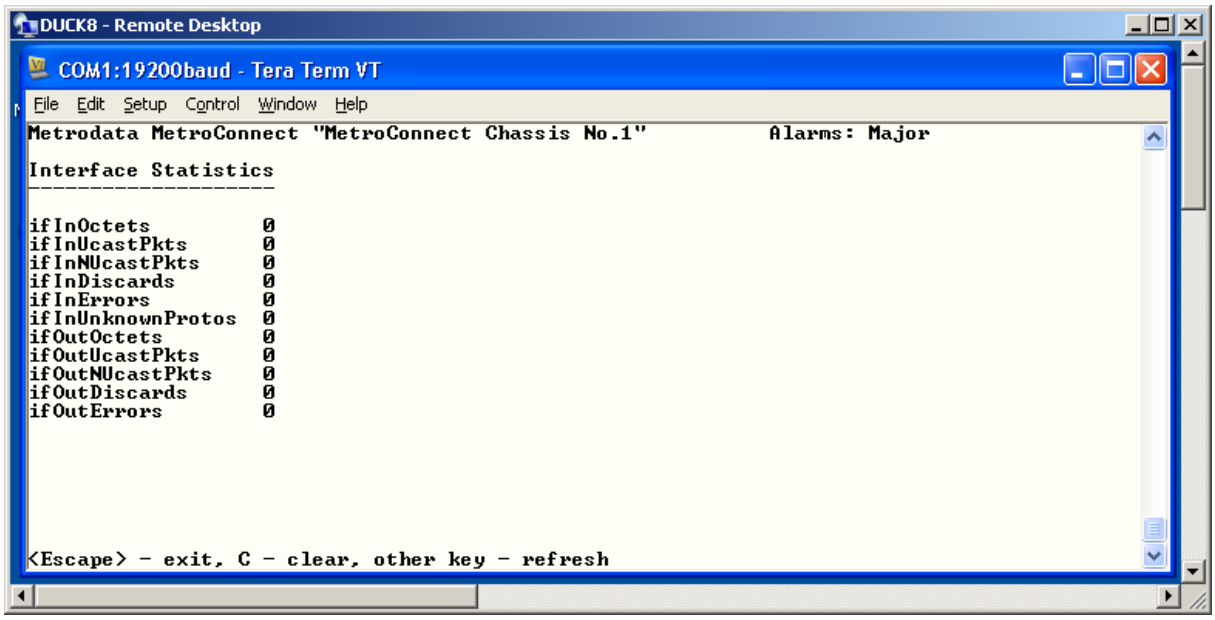
3.3.5.6.8 SFP Info

The SFP Type display shows the basic decode for the SFP module. The SFP info gives a more detailed description of the SFP based on the information read from the EEPROM.



3.3.5.6.9 Counters

The WCC-Serial provides the basic SNMP MIB-2 counters for the interface as shown



3.3.5.6.10 OAM

The WCC-Serial offers monitoring using IEEE802.3ah Link OAM. OAM is configured on a per port basis and may be configured as follows:

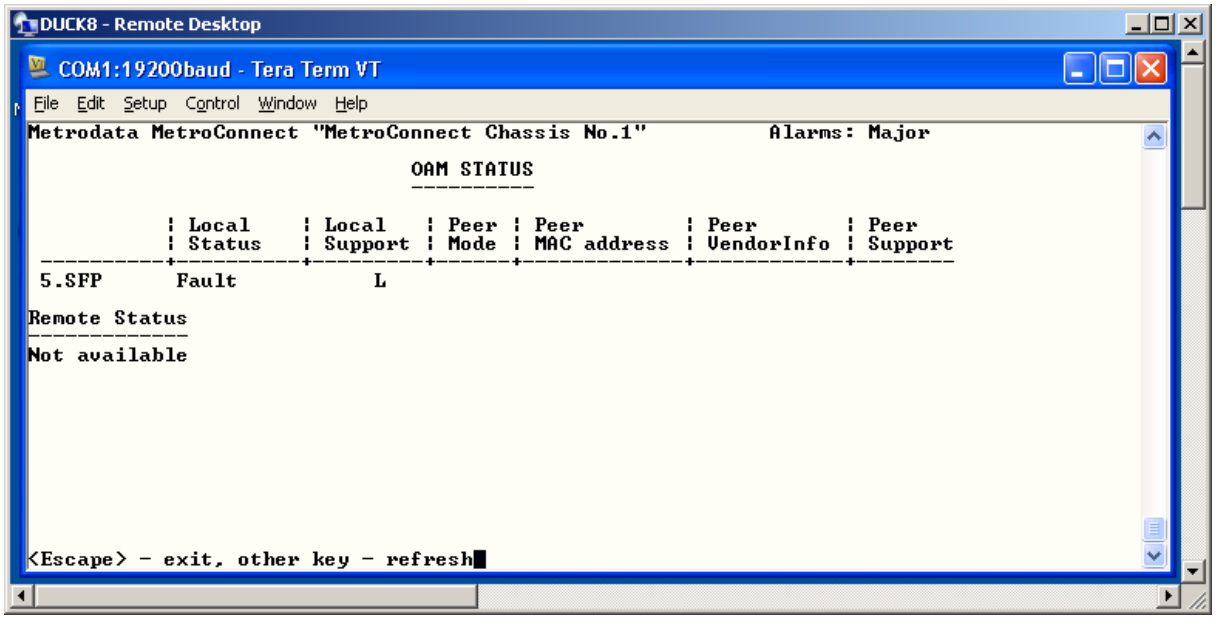
Options

Disabled

Active WCC-Serial Generates OAM PDU Requests

Passive WCC-Serial Waits for requests and then responds

When OAM is enabled, either active or passive, the current status may be displayed as below:



3.3.5.6.11 Mgmt Traffic

This config item determines the type of traffic flowing on the SFP port.

Options

User Only (default)

User + Management

Management only

User traffic is traffic that should pass between the ports of the module. This is the main mode for the WCC-Serial, and should be used with OAM and Proxy Management modes.

Management traffic is traffic that is to be intercepted and forwarded to the MetroConnect manager via the backplane.

3.3.5.6.12 VLAN ID

If the traffic isolation mode is set to VLAN, then this defines the 802.1q tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.5.6.13 QinQ S-TAG ID

If the traffic isolation mode is set to QinQ, then this defines theS-Tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.5.6.14 Default Priority

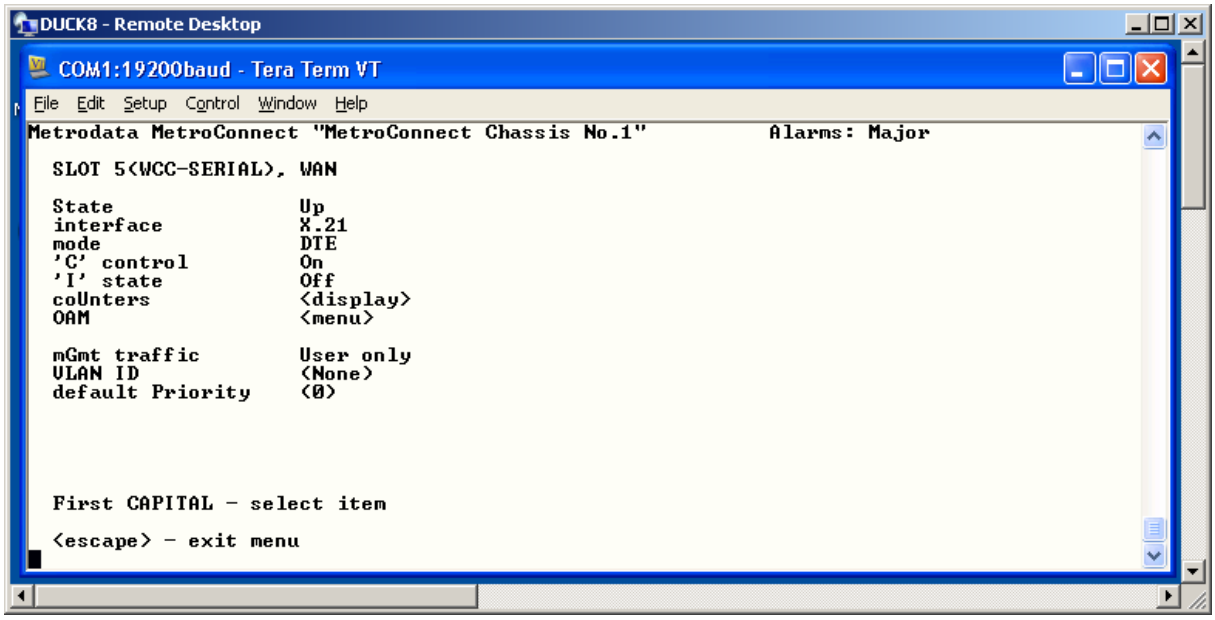
When a VLAN tag is added, this priority is assigned to the packet. Where S-Tags are added to already tagged packets, the priority is inherited, for untagged frames the default priority is assigned.

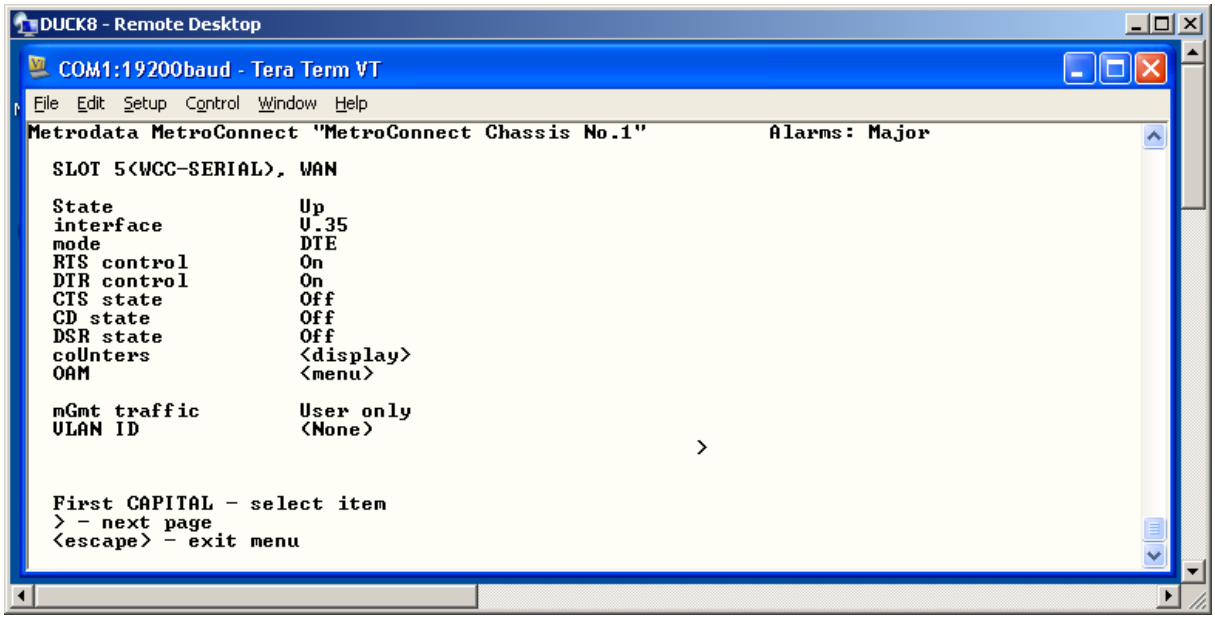
The valid values are 0 – 7

3.3.5.7 WAN Configuration

The WAN configuration menu alters depending upon which cable type is connected to the port. The cables contain an identifier and the multi serial interface will adapt itself to provide the required interface, DTE or DCE; and electrical specification, X.21, V.36, EIA-530, V.35, RS-232.

Below are the WAN configuration menus for the X.21 and V.35 DTE modes.





3.3.5.7.1 State

This menu item configures the ADMIN state of the WAN port. For normal operation the port must be in the UP state. Unused ports should be placed in the down state to prevent alarms being generated.

3.3.5.7.2 Interface

This read only display item shows the electrical specification of the attached cable. The supported options are

Not Fitted	No Cable Attached, or incorrect cable used
X.21	CAB-X21-MT or CAB-X21-FC Fitted
V.35	CAB-V35-MT or CAB-V35-FC Fitted
V.36	CAB-V36-MT or CAB-V36-FC Fitted
EIA-530	CAB-530-MT Fitted

3.3.5.7.3 Mode

The WCC-Serial interface can operate as either DTE (for connection to a NTU / Modem) or DCE (for back to back testing)

3.3.5.7.4 Modem Controls

Serial interfaces support control lines to signal the state of the line and to provide handshaking to ensure error free transmission.

On the module, there are output controls and input controls. The output controls, eg RTS (V35) or C (X.21) may be controlled by changing the control setting. The options are as below:

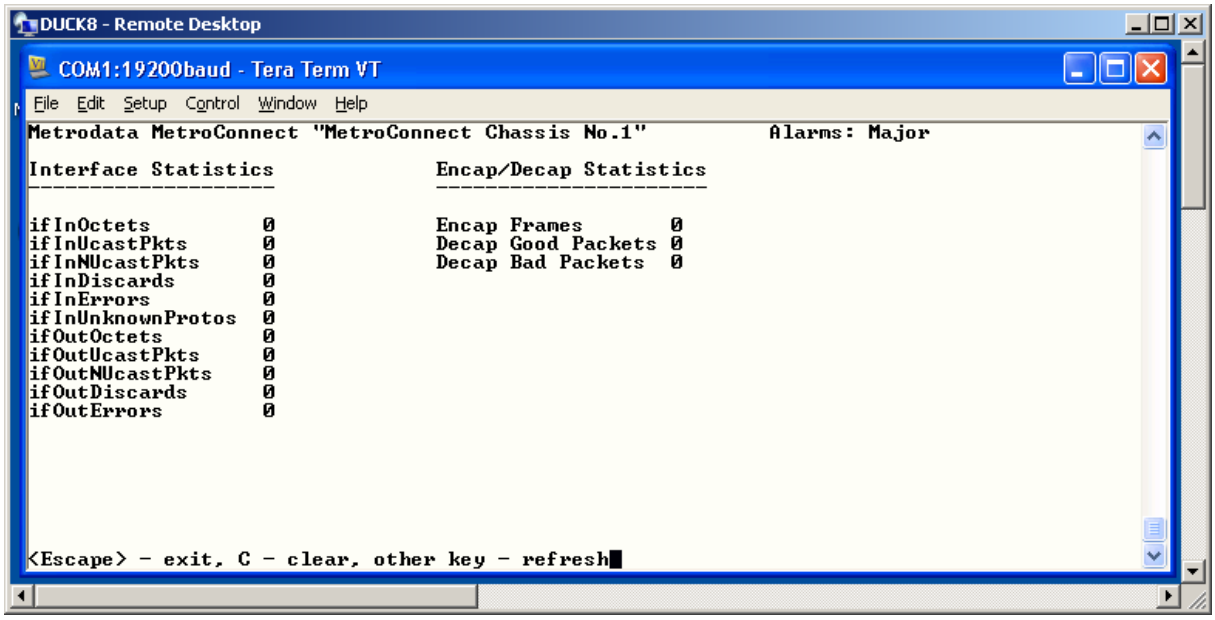
ON	Control is always ON
OFF	Control is always OFF

The module reports the state of the input control

ON	Control is received ON
OFF	Control is received OFF

3.3.5.7.5 Counters

The WAN interface provides the MIB-2 counters and also provides statistics for the packets transmitted over the serial interface:



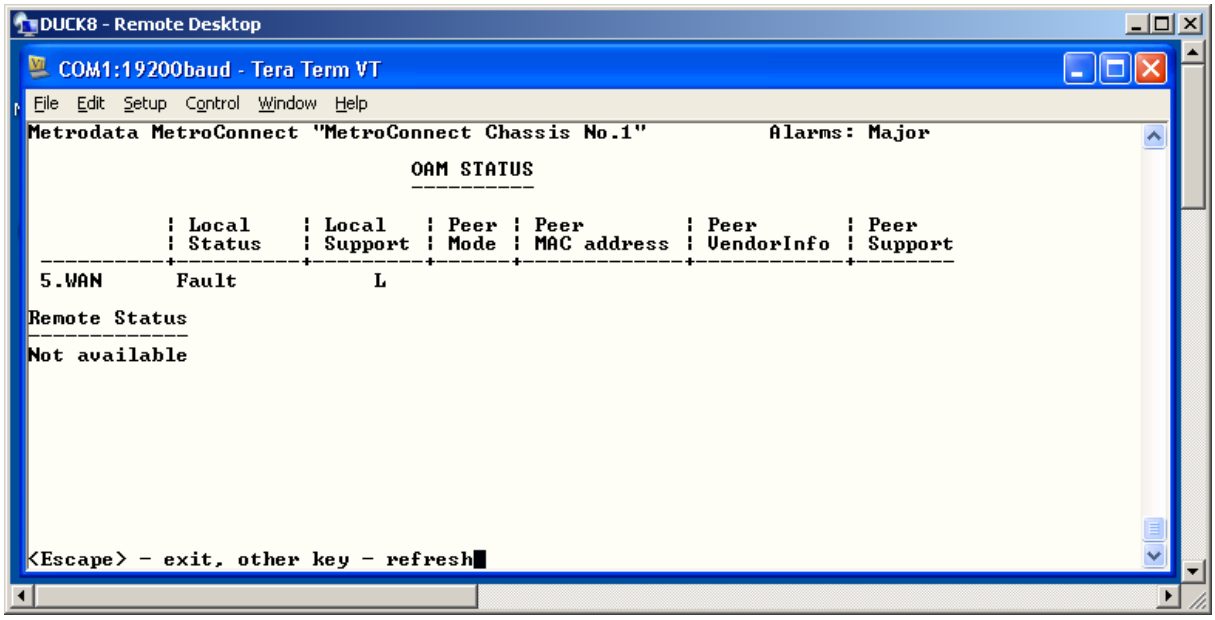
3.3.5.7.6 OAM

The WCC-Serial offers monitoring using IEEE802.3ah Link OAM. OAM is configured on a per port basis and may be configured as follows:

Options

Disabled	
Active	WCC-Serial Generates OAM PDU Requests
Passive	WCC-Serial Waits for requests and then responds

When OAM is enabled, either active or passive, the current status may be displayed as below:



3.3.5.7.7 Mgmt Traffic

This config item determines the type of traffic flowing on the SFP port.

Options

User Only (default)

User + Management

Management only

User traffic is traffic that should pass between the ports of the module. This is the main mode for the WCC-Serial, and should be used with OAM and Proxy Management modes.

Management traffic is traffic that is to be intercepted and forwarded to the MetroConnect manager via the backplane.

3.3.5.7.8 VLAN ID

If the traffic isolation mode is set to VLAN, then this defines the 802.1q tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.5.7.9 QinQ S-TAG ID

If the traffic isolation mode is set to QinQ, then this defines theS-Tag that will be applied to the incoming packets.

The valid values range 1 to 4095

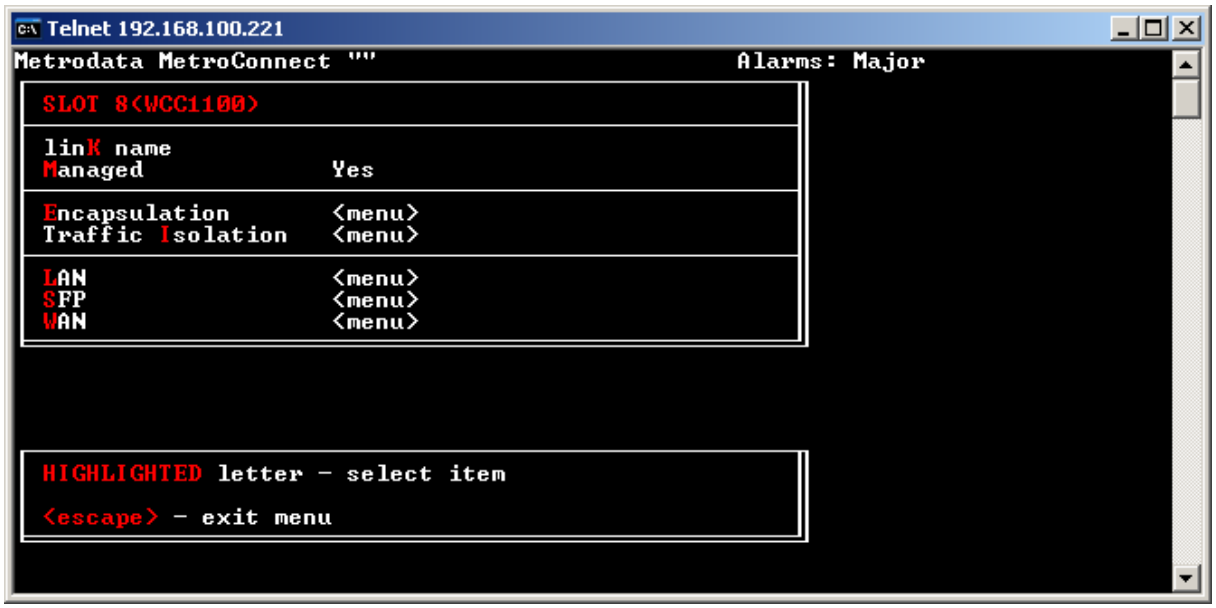
3.3.5.7.10 Default Priority

When a VLAN tag is added, this priority is assigned to the packet. Where S-Tags are added to already tagged packets, the priority is inherited, for untagged frames the default priority is assigned.

The valid values are 0 – 7

3.3.6 WCC1100

The WCC1100 Module may be configured by selecting the Module Slot number at the Data Port Set-Up Menu. The main WCC1100 Configuration screen is shown below:



3.3.6.1 Link Name

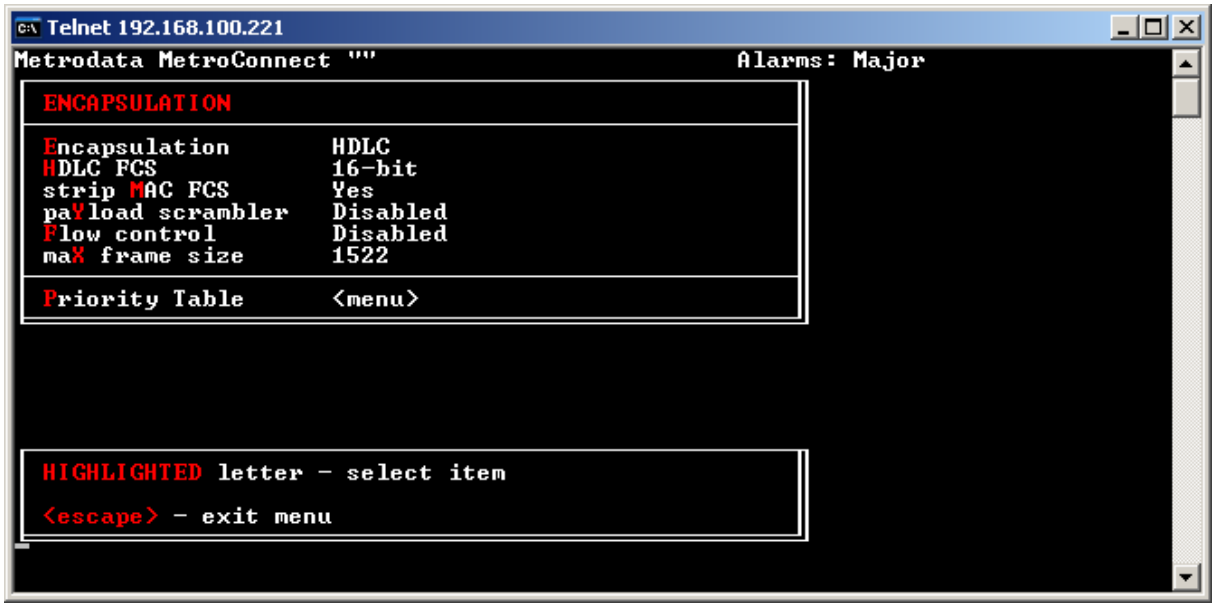
In order to assist identification of the link being configured a label may be applied. The label may be upto 32 characters.

3.3.6.2 Managed Mode

The WCC1100 should always be operated in managed mode to enable functions such as OAM, Management and Performance Monitoring.

3.3.6.3 Encapsulation

To transmit packets over the serial interface, they must first be encapsulated within a protocol suitable for bit synchronous transmission. The Encapsulation menu is shown below:



3.3.6.3.1 Encapsulation

The WCC1100 uses HDLC encapsulation, with a minimum of a single flag (0x7E) between frames. HDLC is a bit synchronous protocol which uses flag delimiting and bit stuffing to prevent false flag detection.

3.3.6.3.2 HDLC FCS

The transmitted HDLC frames are protected against errors through the addition of a 16 bit Frame Check Sequence (FCS). When a frame is received, any bit errors will cause the FCS check to fail, and the packet to be discarded.

3.3.6.3.3 Strip MAC FCS

Ethernet Frames are protected using a 32 bit FCS. The WCC1100 offers the option of reducing the required bandwidth by stripping these four bytes whilst the packet is transmitted over the serial link, and recalculating the FCS at the far end.

The frame will be protected by the HDLC FCS whilst on the serial link, so it is not possible for bit errors to be ignored.

3.3.6.3.4 Payload Scrambler

To ensure ones density, a scrambler may be enabled to remove long strings of 1's or 0's. Both ends of the link must be set to the same mode.

3.3.6.3.5 Flow Control

The WCC1100 offers the user the option of using IEEE 802.3X pause based flow control to prevent packet loss due to buffer overflow, however enabling flow control disables the priority queueing support.

In general, priority queuing will give much better results than flow control.

3.3.6.3.6 Max Frame Size

The maximum frame size that may be transported by the WCC1100 module. The options are

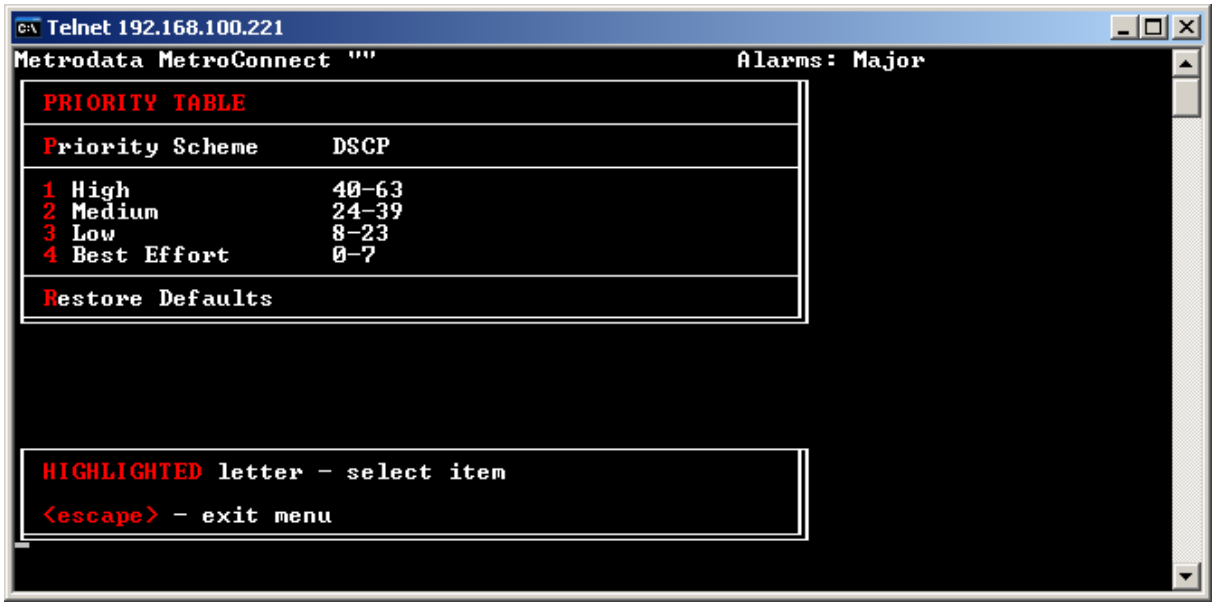
1518/1522	Standard MAC / IEEE 802.1q VLAN
2048	QinQ, Provider Bridge, MPLS etc
10k	Jumbo Frames

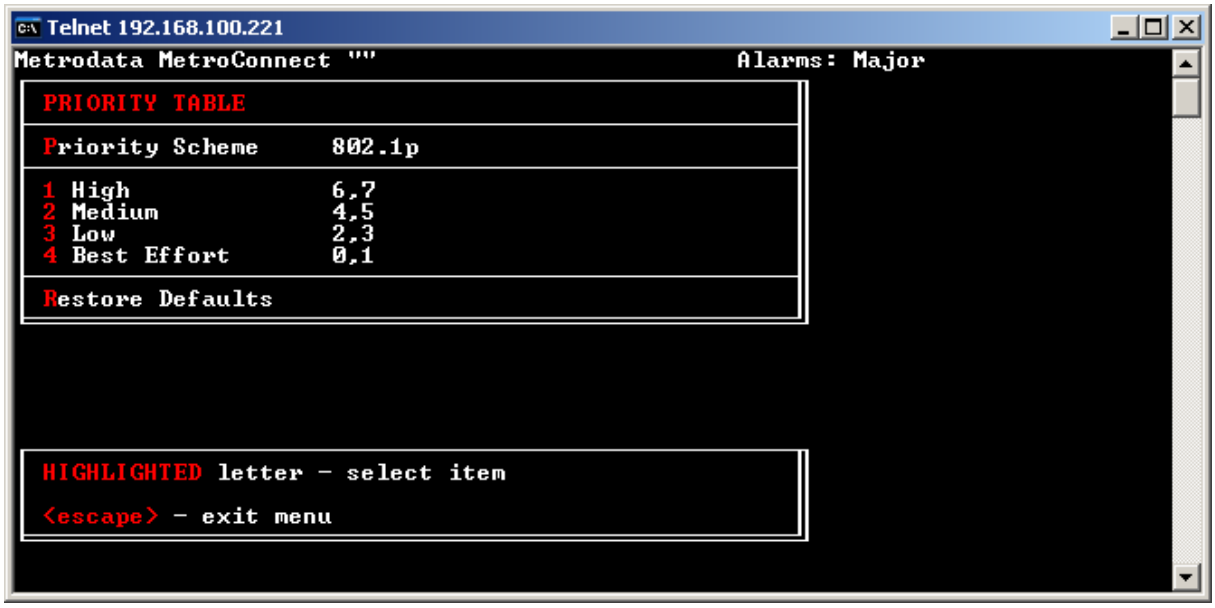
Due to the low speed of the serial link, (<20M) it is not advisable to use jumbo frames due to latency issues.

3.3.6.3.7 Priority Table

The WCC1100 supports 4 levels of priority queuing. The two options, DSCP has 32 levels, whilst IEEE 802.1p has 8. The priority table allows the user to map the various levels to the WCC1100 priority levels.

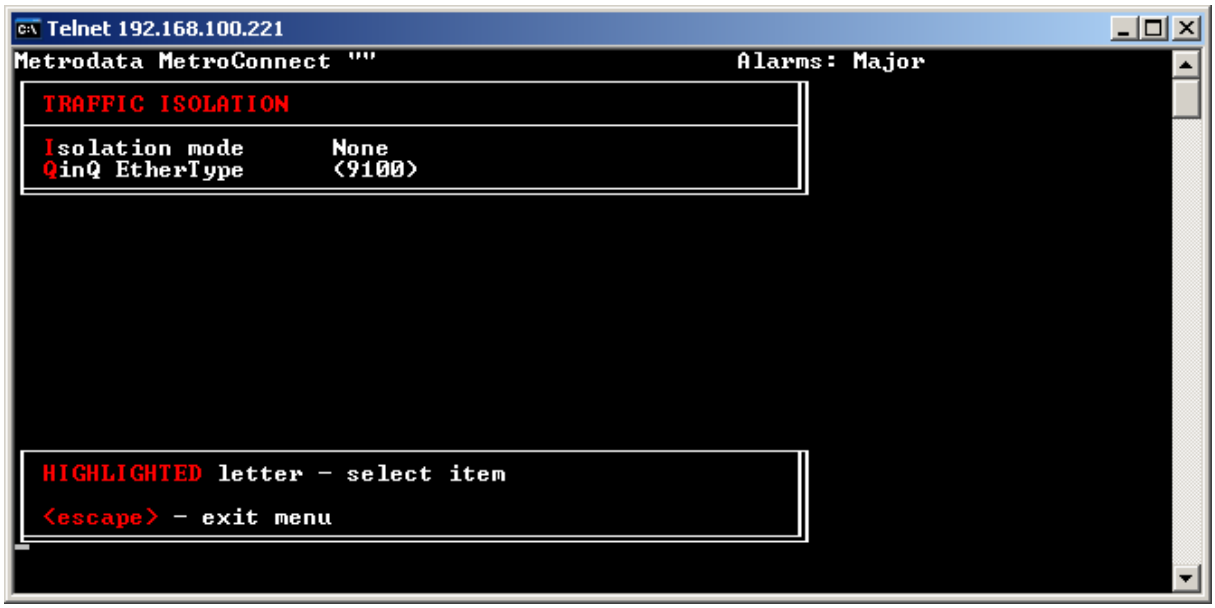
The displays below show the default settings for the priority tables





3.3.6.4 Traffic Isolation

The traffic isolation menu configures the VLAN processing mode of the module. The configuration menu is shown below:



3.3.6.4.1 Isolation Mode

The isolation mode selects which, if any, tagging is to be applied.

Options

None	Packets pass through untagged
VLAN	Packets entering the Copper port are VLAN Tagged
QinQ	Packets entering the Copper port are S-Tag Tagged

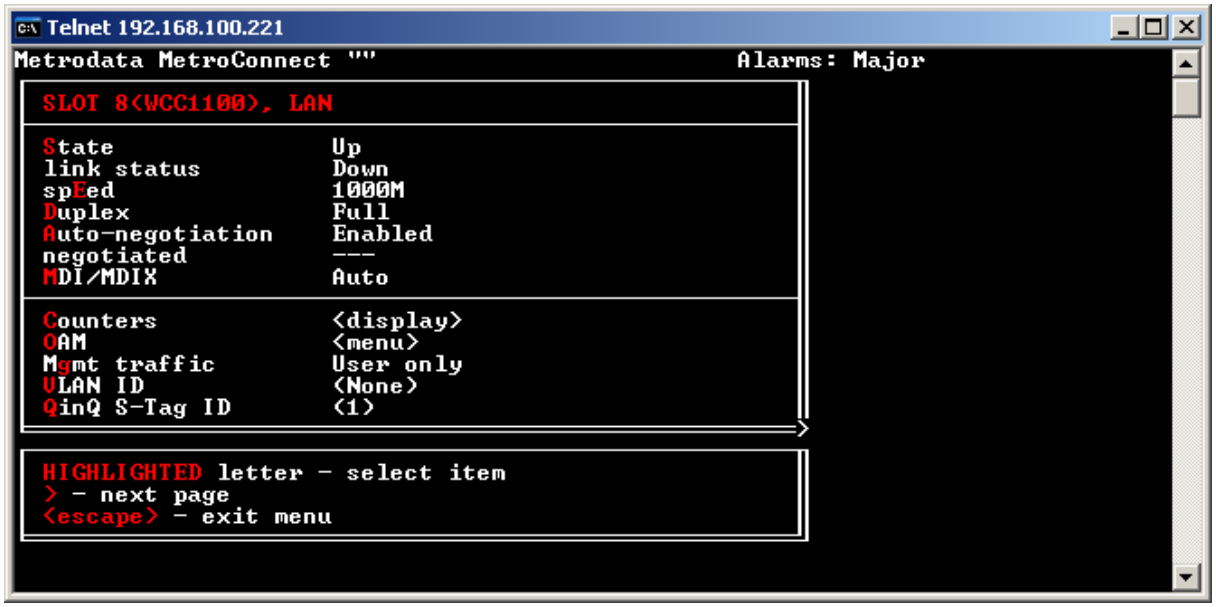
3.3.6.4.2 QinQ EtherType

To ensure interoperability with other vendor equipment the S-Tag ethertype is configurable and possible options are:

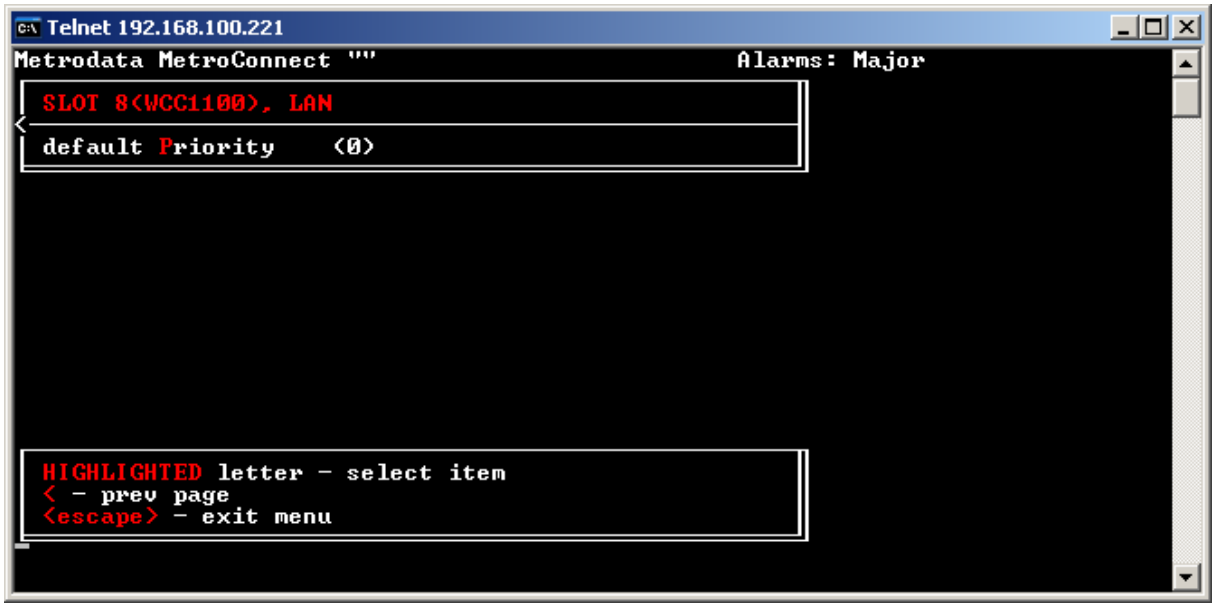
9100	QinQ
8100	VLAN 802.1q
9200	Brocade, Juniper
88A8	IEEE 802.1ad Provider Bridge, Extreme

3.3.6.5 LAN Port Configuration

This menu allows configuration of the LAN interface



the menu stretches over two pages, as indicated by the “>” at the bottom of the page. Selecting the second menu page shows:



3.3.6.5.1 State

This configuration item defines the administrative status for the LAN port.

Options:

Up	Port is enabled, Alarms are generated if required
Down	Port is disabled, no alarms generated

For normal operation, a port must be in the administrative Up state, however when ports are not connected they should be disabled to prevent them generating alarms.

3.3.6.5.2 Link Status

The Link Status item is a real time indication of the current state of the link.

Options:

Up	Link is UP, traffic may pass
Down	Link Down,

3.3.6.5.3 Speed

When Auto Negotiation is disabled, this sets the operating speed of the port. When Auto Negotiation is enabled, this setting defines the maximum speed to be advertised.

Options

1000M

100M

10M

3.3.6.5.4 Duplex

When Auto Negotiation is disabled, this sets the operating duplex mode of the port. When Auto Negotiation is enabled, this setting defines the maximum duplex to be advertised.

Options

Full

Half

3.3.6.5.5 Auto Negotiation

This configures the port for auto negotiation.

Options

Enabled	Port will Auto Negotiate
Disabled	Port is fixed

3.3.6.5.6 Negotiated

This display item shows the results of the auto negotiation process.

Options

----	Auto Negotiation not completed
1000M/FD	1000M, Full Duplex
100M/FD	100M, Full Duplex
100M/HD	100M, Half Duplex
10M/FD	10M, Full Duplex
10M/HD	10M, Half Duplex

3.3.6.5.7 MDI/MDIX

The RJ45 port may be configured to automatically sense the interface type and automatically configure itself for MDI or MDIX operation. This mode ensures a straight cable can always be used. Alternatively, the port mode may be fixed.

Options

Auto	Auto Detect the connection required
MDI	Present MDI for connection to Switch Port
MDIX	Present MDIX for connection to PC

3.3.6.5.8 Counters

The WCC1100 provides the basic SNMP MIB-2 counters for the interface as shown

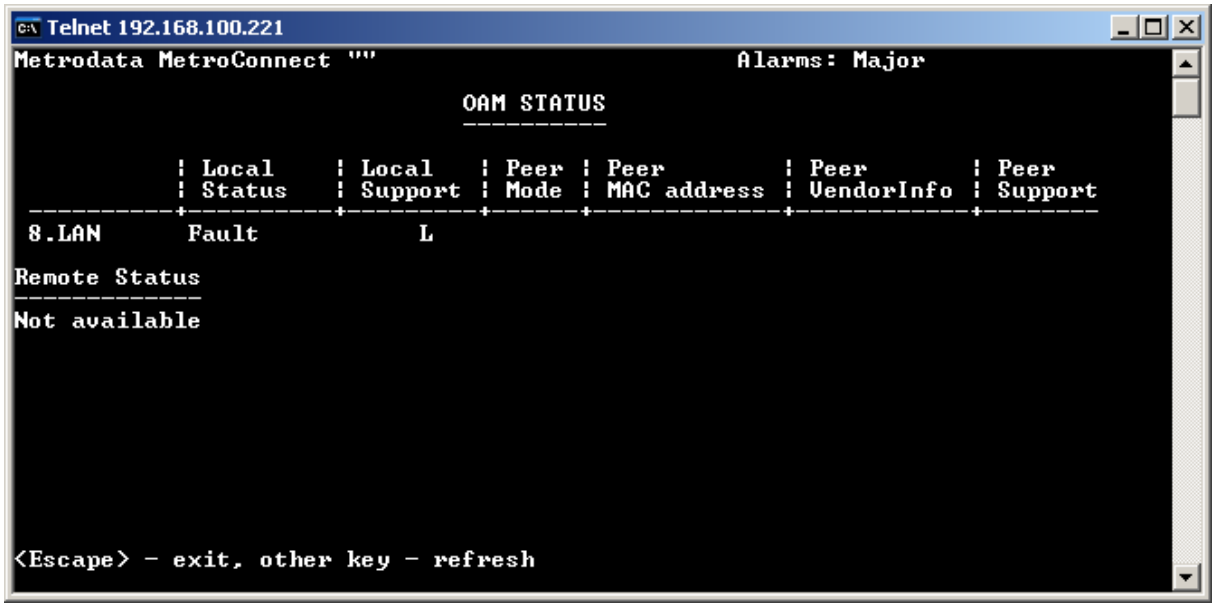
3.3.6.5.9 OAM

The WCC1100 offers monitoring using IEEE802.3ah Link OAM. OAM is configured on a per port basis and may be configured as follows:

Options

Disabled	
Active	WCC1100 Generates OAM PDU Requests
Passive	WCC1100 Waits for requests and then responds

When OAM is enabled, either active or passive, the current status may be displayed as below:



3.3.6.5.10 Mgmt Traffic

This configuration item determines the type of traffic flowing on the LAN port.

Options

User Only (default)

User + Management

Management only

User traffic is traffic that should pass between the ports of the module. This is the main mode for the WCC1100, and should be used with OAM and Proxy Management modes.

Management traffic is traffic that is to be intercepted and forwarded to the MetroConnect manager via the backplane.

3.3.6.5.11 VLAN ID

If the traffic isolation mode is set to VLAN, then this defines the 802.1q tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.6.5.12 QinQ S-TAG ID

If the traffic isolation mode is set to QinQ, then this defines theS-Tag that will be applied to the incoming packets.

The valid values range 1 to 4095

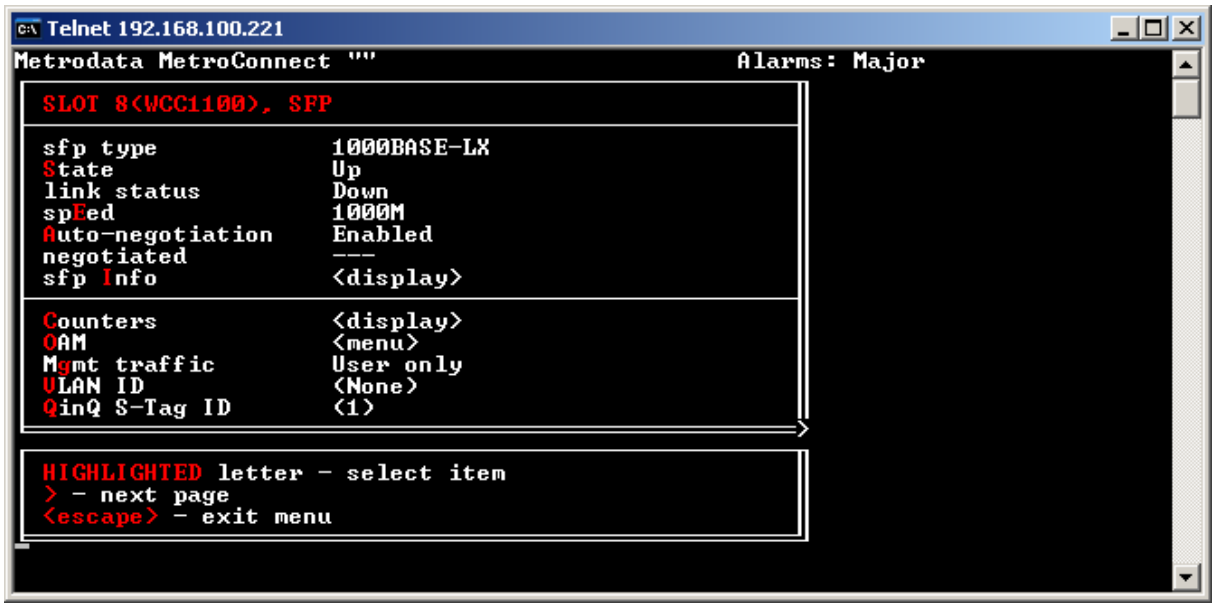
3.3.6.5.13 Default Priority

When a VLAN tag is added, this priority is assigned to the packet. Where S-Tags are added to already tagged packets, the priority is inherited, for untagged frames the default priority is assigned.

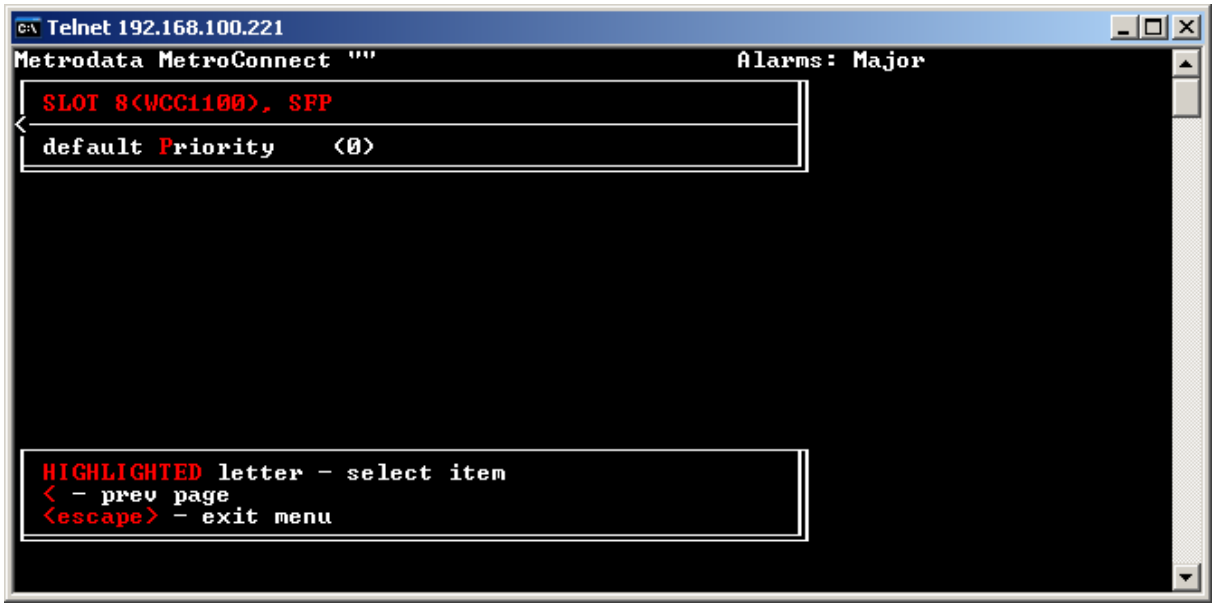
The valid values are 0 – 7

3.3.6.6 SFP Configuration

This menu allows configuration of the SFP interface



the menu stretches over two pages, as indicated by the “>” at the bottom of the page. Selecting the second menu page shows:



3.3.6.6.1 State

This configuration item defines the administrative status for the SFP port.

Options:

Up Port is enabled, Alarms are generated if required

Down Port is disabled, no alarms generated

For normal operation, a port must be in the administrative Up state, however when ports are not connected they should be disabled to prevent them generating alarms.

3.3.6.6.2 Link Status

The Link Status item is a real time indication of the current state of the link.

Options:

Up Link is UP, traffic may pass

Down Link Down,

3.3.6.6.3 SFP Type

The SFP type shows a decode of the SFP EEPROM according to the SFP-MSA agreement. This shows a decode of bytes 3 to 10 of the EEPROM

For Gigabit Operation the valid types are

1000Base-SX Multi Mode, 850nm

1000Base-LX Single Mode, 1300nm

For 100M operation the valid types are

OC-3 Multi Mode

OC-3 Single Mode

Where other types of SFP are used, other decodes may be displayed. If the decode is not valid, then UNKNOWN will be shown, and where the SFP is not fitted, NOT FITTED will be shown.

3.3.6.6.4 Speed

The speed setting selects the operating speed of the SFP port.

Options

1000M	Use with 1000BaseX SFP
100M	Use with OC-3/100BaseFX SFP
Auto	The software will attempt to read the type info from the SFP and then configure the port accordingly.

3.3.6.6.5 Duplex

The duplex setting sets the Duplex mode of the SFP port. This is only valid for 100baseFX mode.

Full	Full Duplex
Half	Half Duplex

3.3.6.6.6 Auto Negotiation

This configures the port for auto negotiation.

Options

Enabled	Port will Auto Negotiate
Disabled	Port is fixed

Note, 1000BaseX should always have auto negotiation enabled.

3.3.6.6.7 Negotiated

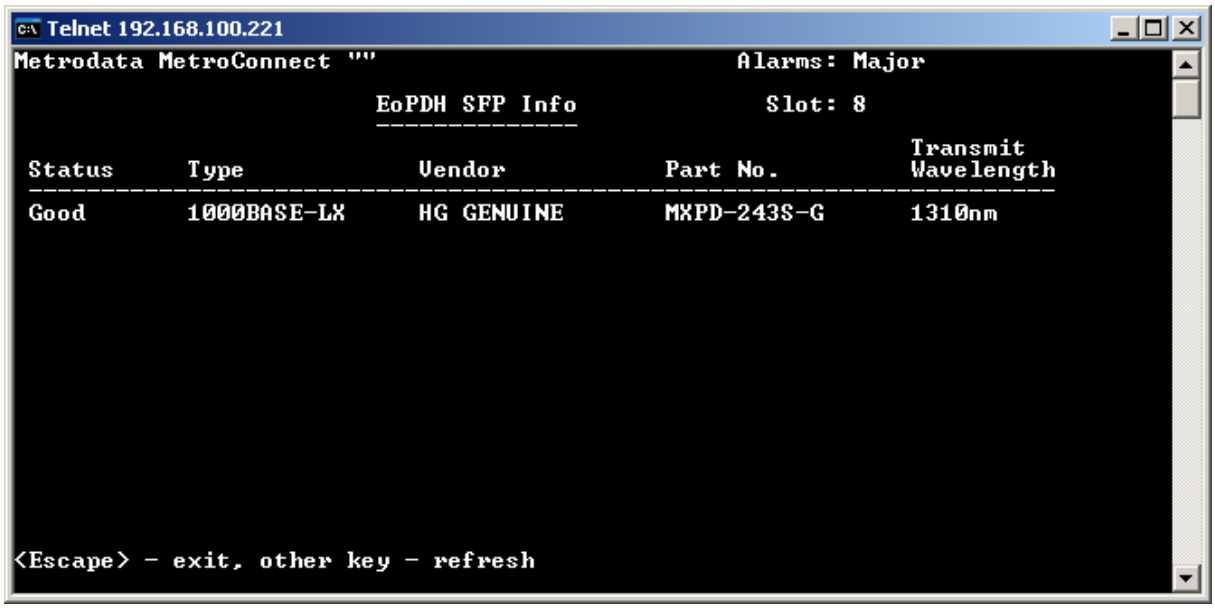
This display item shows the results of the auto negotiation process.

Options

----	Auto Negotiation not completed
1000M/FD	1000M, Full Duplex
100M/FD	100M, Full Duplex
100M/HD	100M, Half Duplex

3.3.6.6.8 SFP Info

The SFP Type display shows the basic decode for the SFP module. The SFP info gives a more detailed description of the SFP based on the information read from the EEPROM.



3.3.6.6.9 Counters

The WCC1100 provides the basic SNMP MIB-2 counters for the interface as shown

3.3.6.6.10 OAM

The WCC1100 offers monitoring using IEEE802.3ah Link OAM. OAM is configured on a per port basis and may be configured as follows:

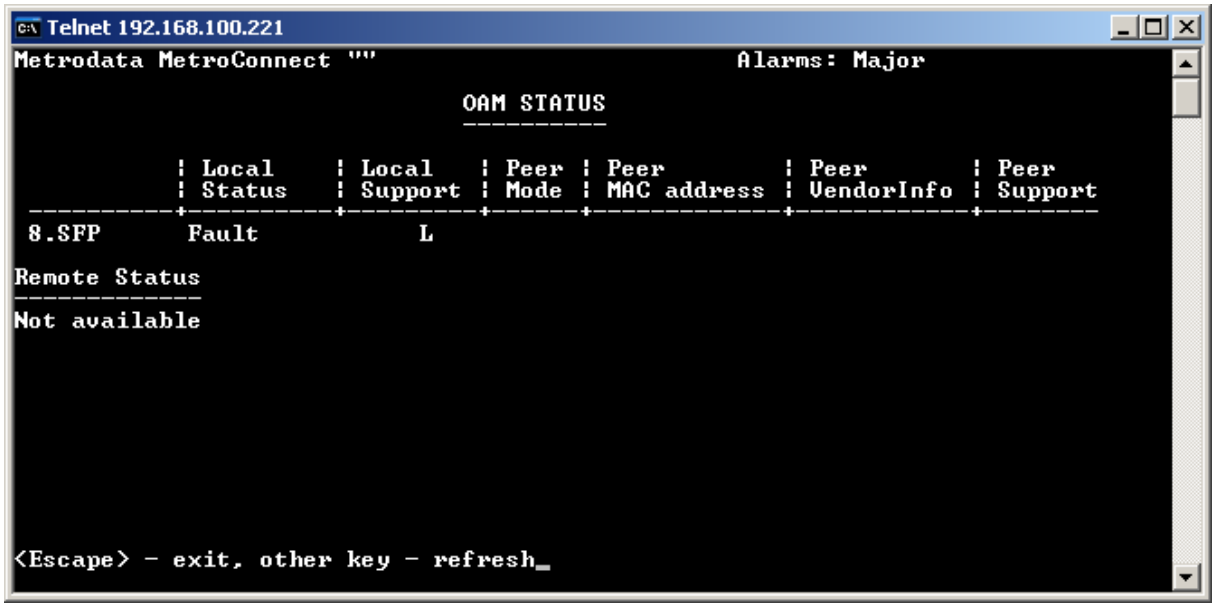
Options

Disabled

Active WCC1100 Generates OAM PDU Requests

Passive WCC1100 Waits for requests and then responds

When OAM is enabled, either active or passive, the current status may be displayed as below:



3.3.6.6.11 Mgmt Traffic

This config item determines the type of traffic flowing on the SFP port.

Options

User Only (default)

User + Management

Management only

User traffic is traffic that should pass between the ports of the module. This is the main mode for the WCC1100, and should be used with OAM and Proxy Management modes.

Management traffic is traffic that is to be intercepted and forwarded to the MetroConnect manager via the backplane.

3.3.6.6.12 VLAN ID

If the traffic isolation mode is set to VLAN, then this defines the 802.1q tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.6.6.13 QinQ S-TAG ID

If the traffic isolation mode is set to QinQ, then this defines theS-Tag that will be applied to the incoming packets.

The valid values range 1 to 4095

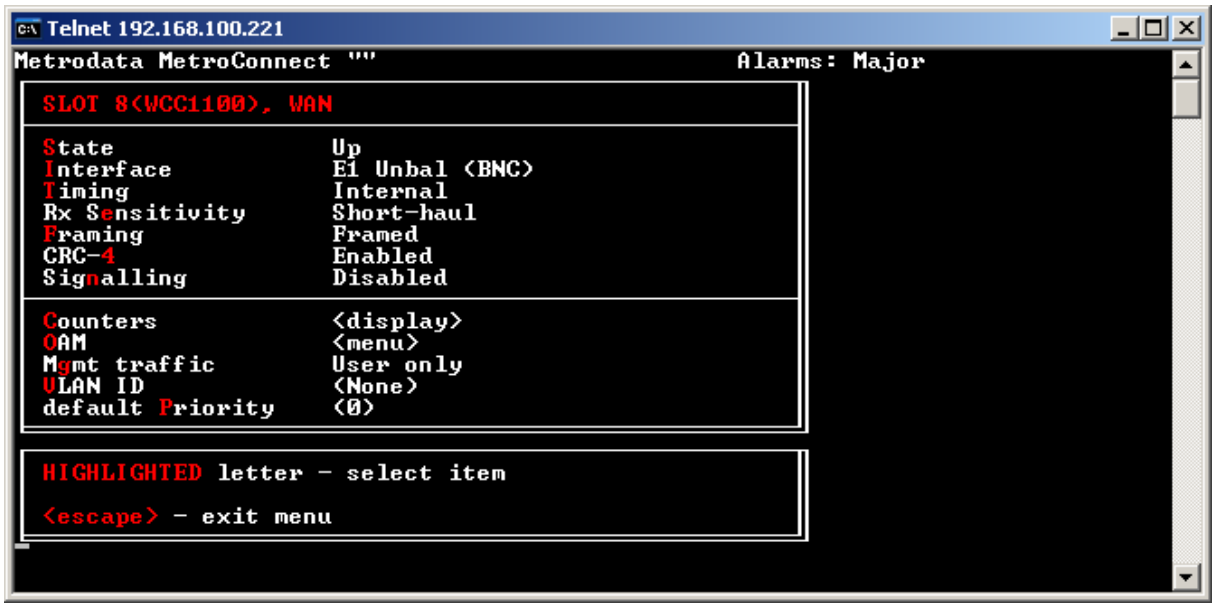
3.3.6.6.14 Default Priority

When a VLAN tag is added, this priority is assigned to the packet. Where S-Tags are added to already tagged packets, the priority is inherited, for untagged frames the default priority is assigned.

The valid values are 0 – 7

3.3.6.7 WAN Configuration

The WAN configuration menu configures the E1 interface.



3.3.6.7.1 State

This menu item configures the ADMIN state of the WAN port. For normal operation the port must be in the UP state. Unused ports should be placed in the down state to prevent alarms being generated.

3.3.6.7.2 Interface

This read only display item shows the electrical specification of the interface. The supported options are

E1 Unbal (BNC)	75ohm BNC
E1 Bal (RJ45)	120Ohm RJ45

3.3.6.7.3 Timing

The WCM1100 supports either internal or loop timing:

Internal	Transmit Timing sourced from local oscillator
Loop	Transmit Timing sourced from Receive Timing

3.3.6.7.4 RX-Sensitivity

The E1 interface can support long or short haul operation.

3.3.6.7.5 Framing

The WCC1100 E1 interface can be operated in several modes,

Framed	G.704
Unframed	G.703
Nx64	G.704 with individual timeslots enabled

3.3.6.7.6 CRC-4

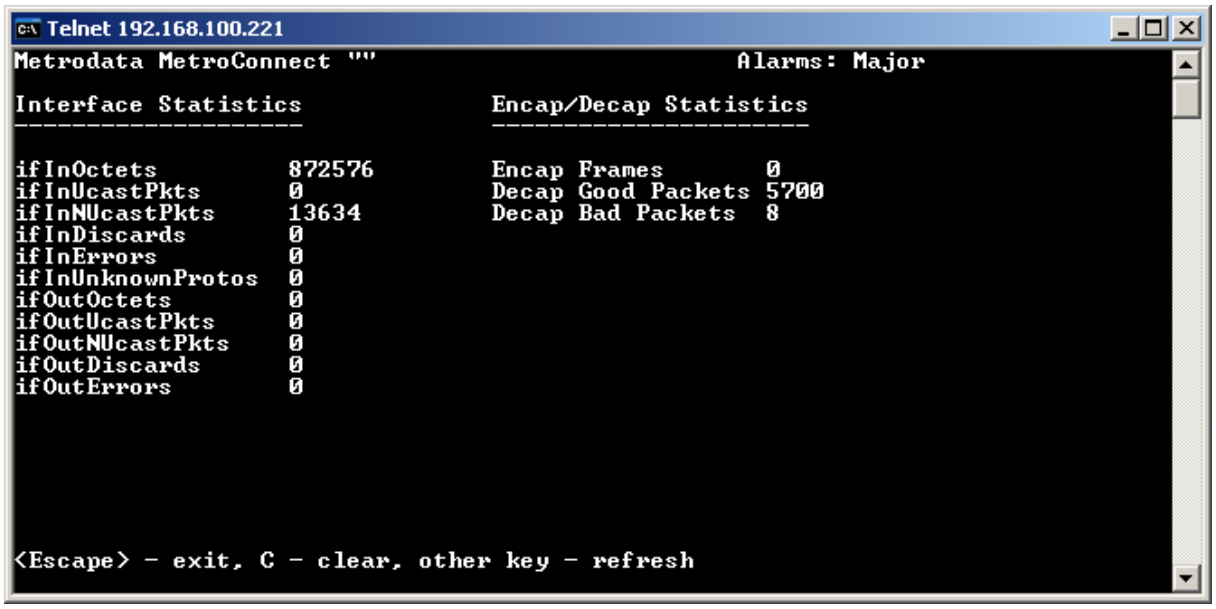
When in framed or Nx64 mode, the CRC-4 option enables a crc check across a multi frame of 16 frames.

3.3.6.7.7 Signalling

When in framed or Nx64 modes, enabling signaling excludes timeslot 16 from carrying payload data.

3.3.6.7.8 Counters

The WAN interface provides the MIB-2 counters and also provides statistics for the packets transmitted over the E1 interface:



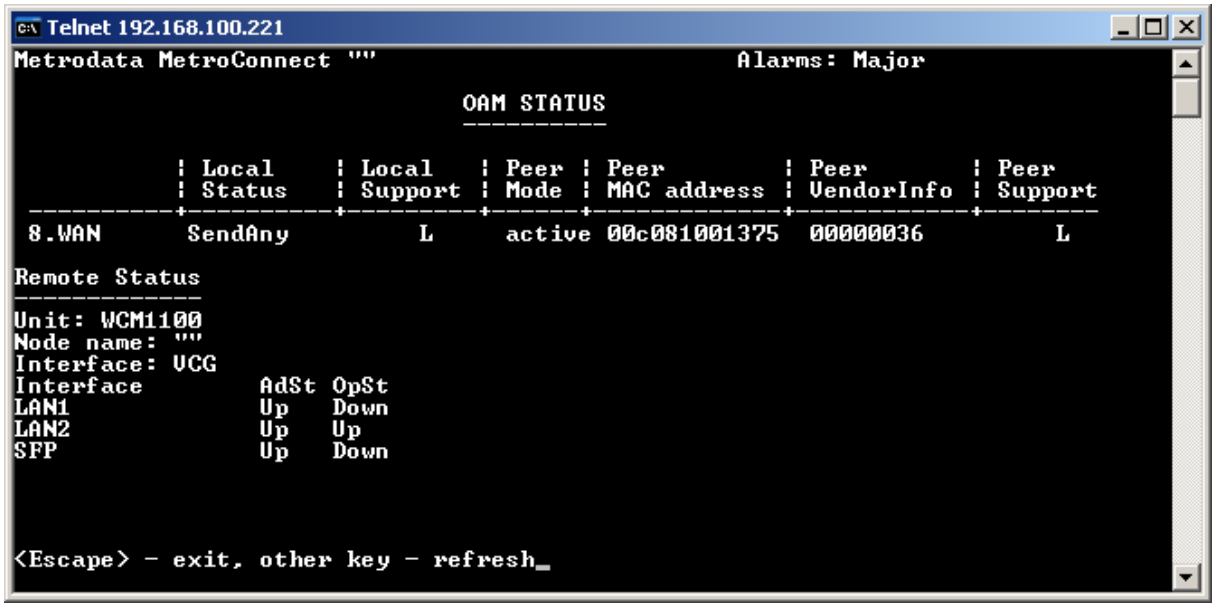
3.3.6.7.9 OAM

The WCC1100 offers monitoring using IEEE802.3ah Link OAM. OAM is configured on a per port basis and may be configured as follows:

Options

Disabled	
Active	WCC1100 Generates OAM PDU Requests
Passive	WCC1100 Waits for requests and then responds

When OAM is enabled, either active or passive, the current status may be displayed as below:



3.3.6.7.10 Mgmt Traffic

This config item determines the type of traffic flowing on the WAN port.

Options

User Only (default)

User + Management

Management only

User traffic is traffic that should pass between the ports of the module. This is the main mode for the WCC1100, and should be used with OAM and Proxy Management modes.

Management traffic is traffic that is to be intercepted and forwarded to the MetroConnect manager via the backplane.

3.3.6.7.11 VLAN ID

If the traffic isolation mode is set to VLAN, then this defines the 802.1q tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.6.7.12 QinQ S-TAG ID

If the traffic isolation mode is set to QinQ, then this defines theS-Tag that will be applied to the incoming packets.

The valid values range 1 to 4095

3.3.6.7.13 Default Priority

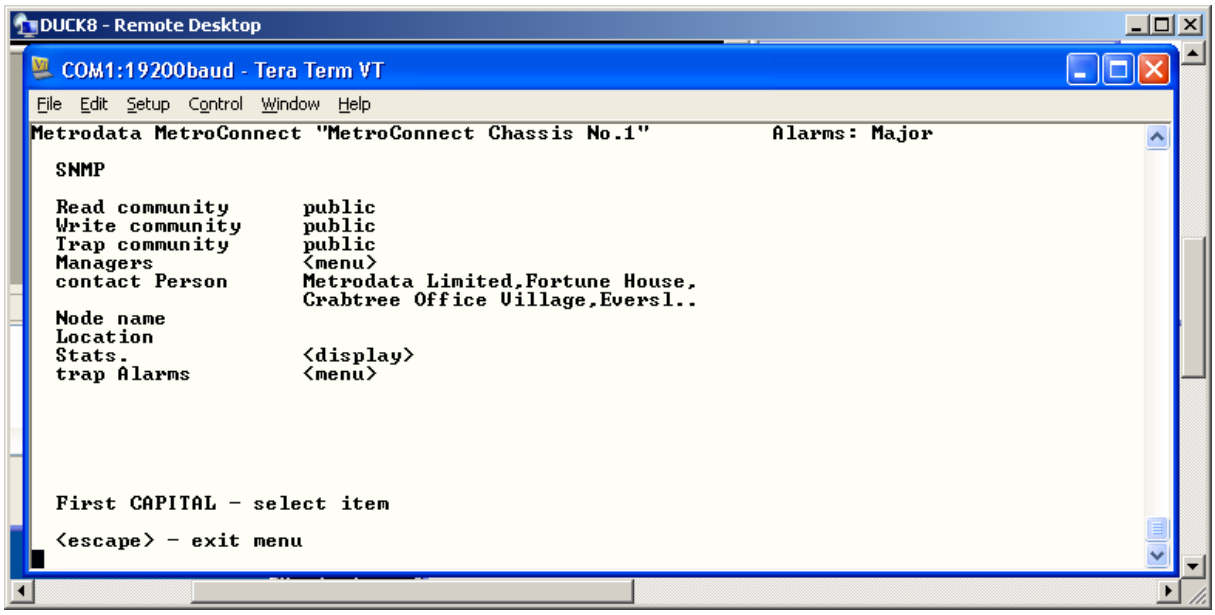
When a VLAN tag is added, this priority is assigned to the packet. Where S-Tags are added to already tagged packets, the priority is inherited, for untagged frames the default priority is assigned.

The valid values are 0 – 7

3.4 SNMP Configuration

The MetroConnect needs to be configured with the details of the SNMP Network Management Station before the unit will generate traps, or respond to SNMP polls.

The SNMP parameters are configured using the SNMP menu found under the Management menu



3.4.1 Read/Write/Trap Community

To provide a level of security, communities are used to control access to the unit via SNMP. Separate communities may be configured for Read/Write or Trap access.

3.4.2 Contact Person

The contact person is the SNMP MIB-2 system SysContact parameter, the default setting is:

Metrodata Limited, Fortune House, Eversley Way, Egham, Surrey, TW20 8RY

The parameter may be up to 255 characters and should be configured to reflect the actual installation requirements.

3.4.3 Node Name

The node name is the SNMP MIB-2 system SysName parameter. By default this entry is blank. The parameter may be up to 255 characters and should be configured to reflect the actual installation requirements.

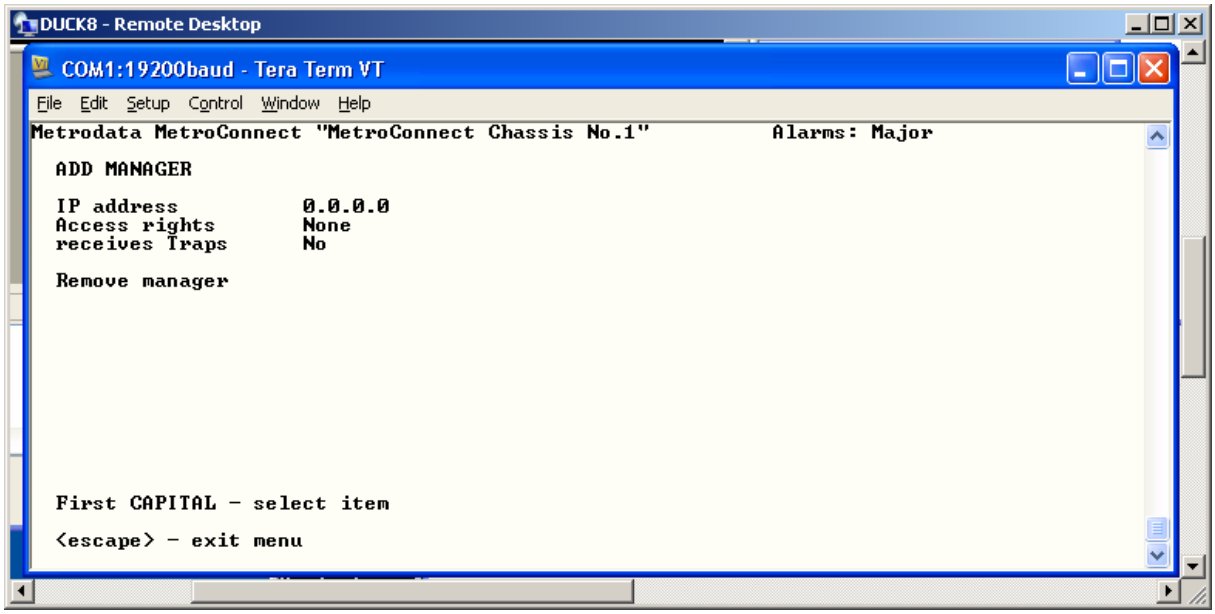
3.4.4 Location

The location is the SNMP MIB-2 system SysLocation parameter. By default this entry is blank. The parameter may be up to 255 characters and should be configured to reflect the actual installation requirements.

3.4.5 Managers

To enable access to the MetroConnect using SNMP, specific manager addresses must be configured. Once a Manager is assigned, the MetroConnect will respond to polls and generate traps for that manager. The MetroConnect supports up to 10 configured Network Management Stations.

The Add Manager Menu is as below:



The IP address is the IP address of the assigned Network Management Station.

The Access Rights supported are:

None	No Access
Read Only	Only SNMP GET access is allowed
Read-Write	SNMP GET/SET access allowed

The Receive Traps parameter determines whether, under alarm conditions, Traps should be sent to this Network Manager.

3.4.6 Trap Alarms

The MetroConnect enables the user to disable traps on a per interface basis. This may be used to limit the traps generated to specific events to ensure problems are clearly visible.

The Trap Alarms menu gives the option of selecting either

Trap - Generate a Trap on an Alarm Entry/Exit Event on this port

No Trap - Do not generate traps for this port.

4 SNMP MANAGEMENT

The MetroConnect supports SNMP V1 for both read and write access. Additionally the MetroConnect will generate unsolicited traps. The MetroConnect must be configured with the IP address of an NMS before it will generate traps or respond to SNMP Polls..

The MetroConnect requires the following MIBs

RFC-1213	MIB-2
METROHDR.MIB	Metrodata Enterprise Definitions
METROMSC.MIB	Metrodata Enterprise Miscellaneous Definitions
METROTRP2.MIB	Metrodata Enterprise Trap Definitions

4.1 MIB-2, sysObjectID

The MetroRack uses the following OID

Enterprises.503.1.53

Where

503	=	Metrodata Enterprise MIB (METROHDR)
1	=	MetroSysObjectID
53	=	MetroConnect

4.2 Traps

Traps are unsolicited messages issued when a given condition arises in the product that has to be signalled to the management system without waiting for the device to be polled.

The MetroConnect generates standard traps as per RFC-1215 as well as enterprise specific traps as defined in METROTR2.MIB.

Traps on the MetroConnect are all generated using the TRAP-V1 PDU. The METROTR2 MIB utilises the TRAP-TYPE macro as defined in RFC-1215. The MetroConnect will issue traps on the occurrence of physical faults on the interfaces.

METROTR2 is a generic trap database, and as such the interface generating the trap is included in the definition.

4.2.1 Trap Enterprise Field

The MetroConnect will issue traps with the ENTERPRISE field set to

Enterprises.503.3 Enterprises.metro.metroTraps

4.2.2 Trap Interface Field

The MetroRack allocates the following interface ifIndex values

ifIndex = 1 Internal Management LAN port

ifIndex = 75 Slot 1, Port 1

IfIndex = 76 Slot 1, Port 2

IfIndex = 139 Slot 2, Port 1

IfIndex = 140 Slot 2, Port 2

IfIndex = 203 Slot 3, Port 1

IfIndex = 204 Slot 3, Port 2

IfIndex = 267 Slot 4, Port 1

IfIndex = 268 Slot 4, Port 2

IfIndex = 331 Slot 5, Port 1

IfIndex = 332 Slot 5, Port 2

IfIndex = 395 Slot 6, Port 1

IfIndex = 396 Slot 6, Port 2

IfIndex = 459 Slot 7, Port 1

IfIndex = 460 Slot 7, Port 2

IfIndex = 523 Slot 8, Port 1

IfIndex = 524 Slot 8, Port 2

IfIndex = 587 Slot 9, Port 1

IfIndex = 588 Slot 9, Port 2

IfIndex = 651 Slot 10, Port 1

IfIndex = 652 Slot 10, Port 2

IfIndex = 715 Slot 11, Port 1

IfIndex = 716 Slot 11, Port 2

IfIndex = 779 Slot 12, Port 1

IfIndex = 780 Slot 12, Port 2

4.2.2.1 FC1000 Port Numbers

The FC1000 has two ports for SNMP indexed as follows

Port 1 Fibre Interface

Port 2 G.703 Interface (E1)

4.2.2.2 FC3000 Port Numbers

The FC3000 has two ports for SNMP indexed as follows

Port 1 Fibre Interface

Port 2 G.703 Interface (E3/DS-3)

4.2.2.3 FC4000 Port Numbers

The FC4000 has two ports for SNMP indexed as follows

Port 1 Fibre Interface

Port 2 G.703 Interface (STM-1/OC-3)

4.2.2.4 WC1000 Port Numbers

The WC1000 has two ports for SNMP indexed as follows

Port 1 LAN Interface

Port 2 G.703 Interface (E1)

4.2.3 Trap Types

The MetroConnect supports the following generic trap types

Trap Type 1 Warm Start

Trap Type 2 Link Down

Trap Type 3 Link Up

Trap Type 6 Enterprise Specific Trap

Other trap types are not supported, or generated by the MetroConnect.

4.2.3.1 Generic Trap 1, Warm Start

When the unit powers up and initialises, it will issue a single warm start trap to indicate that the MetroConnect has warm started.

Note, cold start is not issued, since the cold start returns the MetroConnect to the factory default condition with no SNMP managers configured.

4.2.3.2 Generic Trap 2, Link Down

When any of the external ports are in an alarmed state, a Link Down Trap will be issued on entry into the alarmed condition.

For a G.703 port, a Link Down Trap is issued on detection of either Loss of Signal, or AIS conditions.

For a Fibre port, a Link Down Trap is issued on detection of Loss of Signal.

For LAN ports, a Link Down Trap is issued when the port is in the “link down” state. The link down may be due to a cable disconnection or a mismatch between link partners.

The generic Link Down Trap contains the IfIndex value to indicate which port has entered the Link Down state.

4.2.3.3 Generic Trap 3, Link Up

When any of the external ports are not in an alarmed state, a Link Up Trap will be issued on exit from the alarmed condition.

For a G.703 port, a Link Up Trap is issued when the Loss of Signal, or AIS condition is no longer present.

For a Fibre Port, a Link Up trap is issued when the Loss of Signal condition is no longer present.

For LAN ports, a Link Up Trap is issued when the port is in the “link up” state. The link up indicates completion of the auto negotiation, or compatible link partners.

The generic link up trap contains the IfIndex value to indicate which port has returned to the link up state.

4.2.3.4 Generic Trap 6, Enterprise Specific Trap

4.2.3.4.1 Enterprise Specific Trap 1

When a port enters the alarmed state, i.e. Link Down, the MetroConnect will issue this trap to give more detailed information than the simple link down trap.

Trap 1 MetroOtherMajorStart

The MetroOtherMajorStart trap also includes the IfIndex value to indicate which port has entered the Major Alarm state.

4.2.3.4.2 Enterprise Specific Trap 3

When a port exits the alarmed state, i.e. Link Up, the MetroConnect will issue this trap to give more detailed information than the simple link up trap.

Trap 3 metroOtherMajorEnd

The MetroOtherMajorEnd trap also includes the IfIndex value to indicate which port has exited the Major Alarm state.

4.2.3.4.3 Enterprise Specific Trap 13

When the MetroConnect powers up, or warm starts, it will issue this trap to augment the generic “warm start” trap..

Trap 13 metroPowerUp

5 METROCONNECT FIRMWARE UPGRADE

The MetroConnect firmware may be upgraded in the field using a TFTP download facility. Both the system application software and module CPLD hardware may be upgraded.

The upgrade procedures are given below:

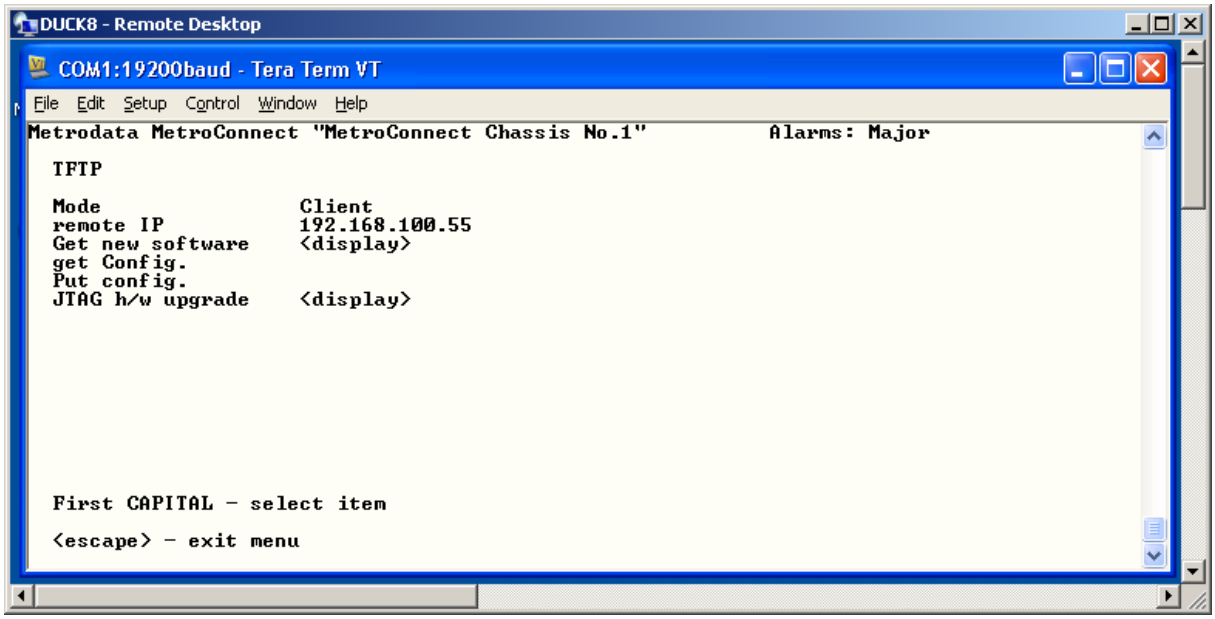
5.1 Application Software Upgrade

The MetroConnect Manager stores the application image in Flash memory. This may be upgraded using TFTP.

There are two modes of operation for TFTP, Client or Server. Client mode requires that a TFTP server is running and accessible. Server mode allows for operation from a normal desktop, and also is able to bypass firewalls, NAT etc.

The TFTP main menu is shown below for both client and server modes:

5.1.1 Client Mode



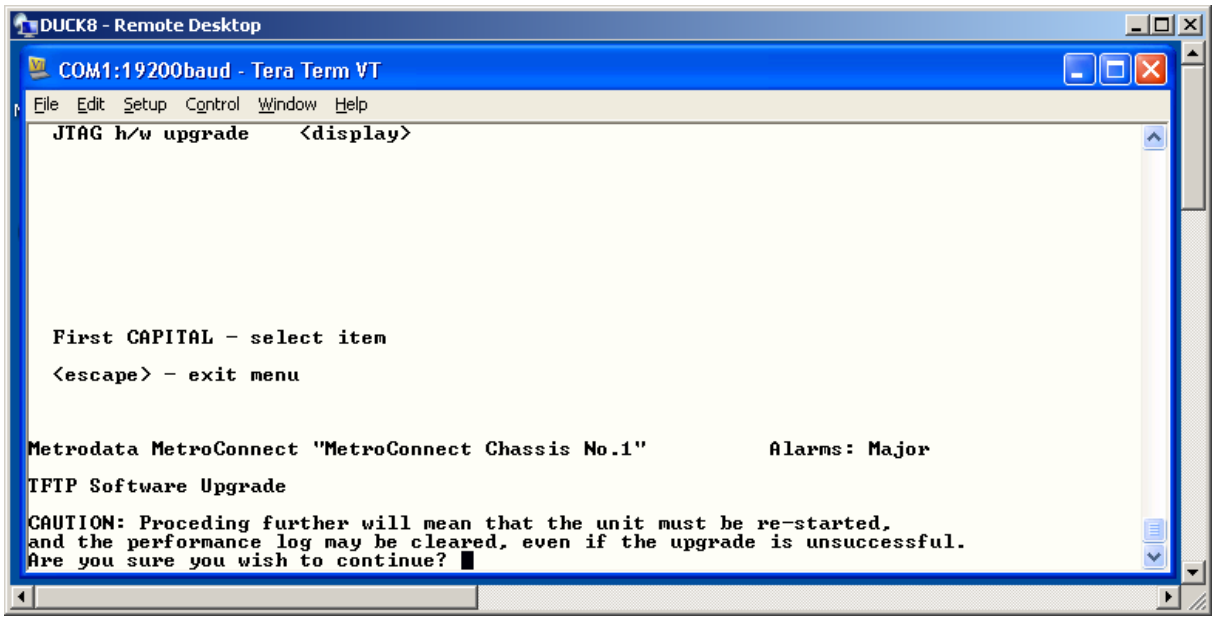
5.1.1.1 Remote IP

The IP address of the remote TFTP server must be entered. If this is on an other IP network, the IP routing tables must also be configured correctly.

5.1.1.2 Get New Software

Selecting the Get New Software command starts the TFTP process, and this will ultimately result in a system restart, whether the transfer was successful or not.

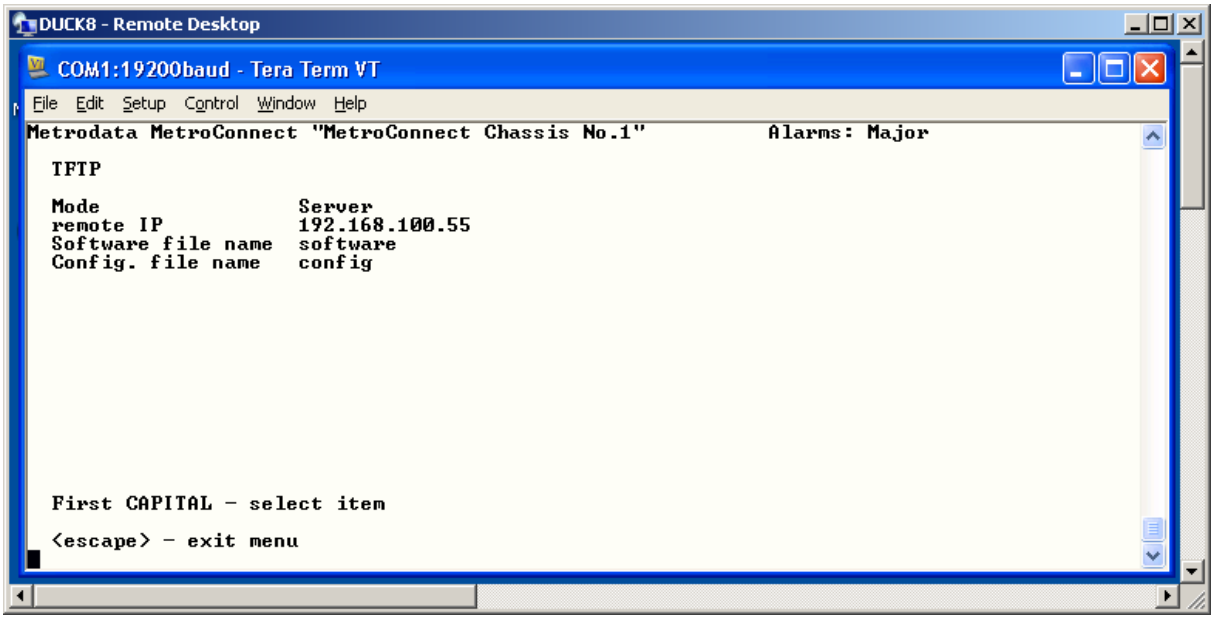
The first thing is that the system issues a warning about the system restart, if you want to proceed, confirm:



You will then be asked for the filename of the application code to download. Once the file has downloaded, the details of the new software will be displayed, and again you will be prompted to confirm you wish to continue and program the flash.

Once programmed, the system will reboot and restart.

5.1.2 Server Mode



In server mode, the IP address of the host that will initiate the transfer must be set, again if this is on another network the IP routing tables must be configured.

The Software File name is configured and then if a remote TFTP connection tries to put a file with this name onto the system it will be downloaded, and programmed into flash.

5.2 Module CPLD Firmware Upgrade

The MetroConnect modules contains one or more Xilinx CPLD device(s) which can be upgraded via the backplane using JTAG. The procedure describes how to download and program the CPLD firmware on an FCC9000 module in a system, however the process is the same for all module types.

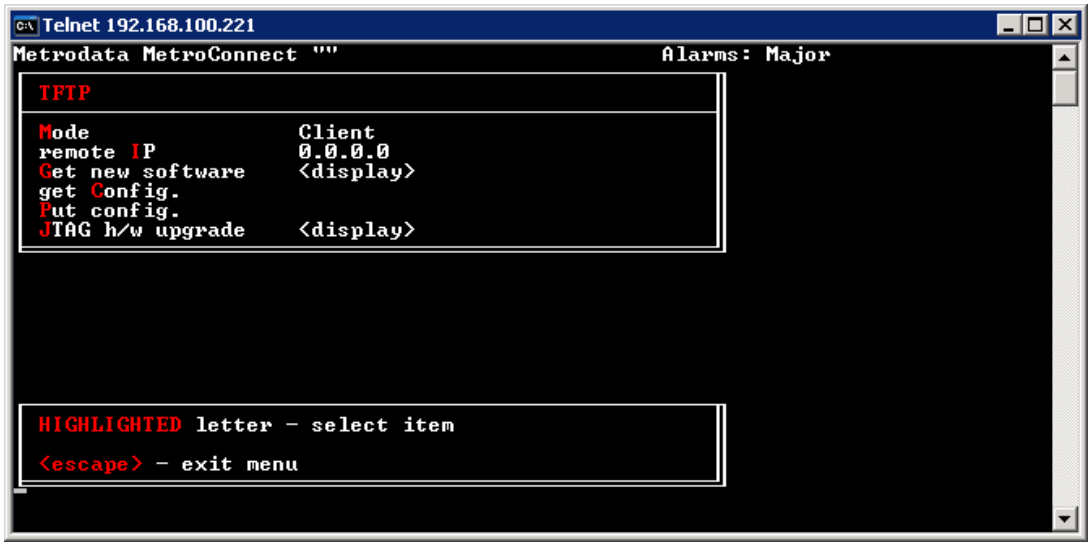
Please note that the firmware update procedure will result in a system restart and therefore will affect customer traffic.

To upgrade, follow this procedure:

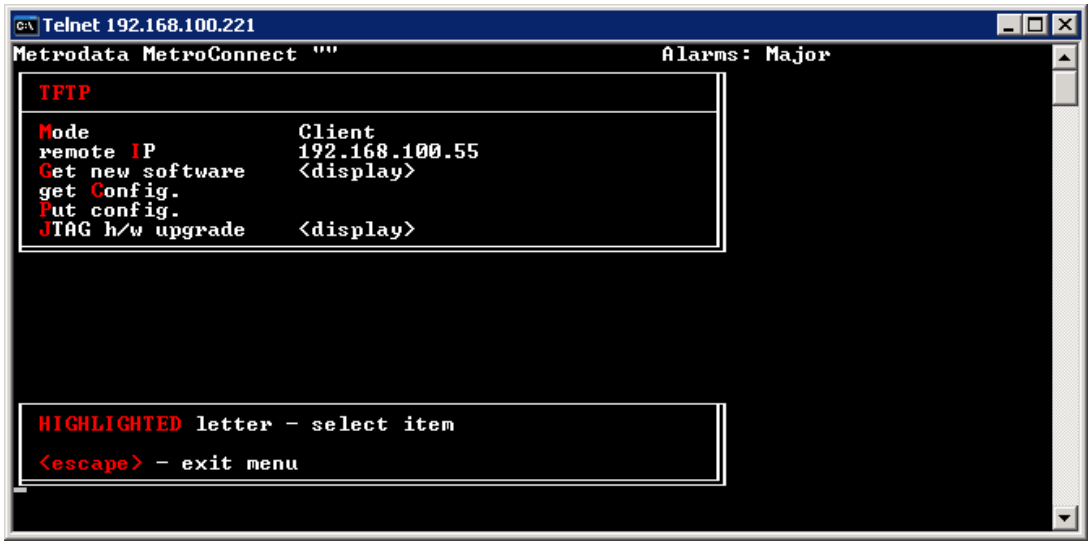
a) Enable a TFTP server, and ensure it is configured for a directory containing the firmware

b) Log into the MetroConnect Manager

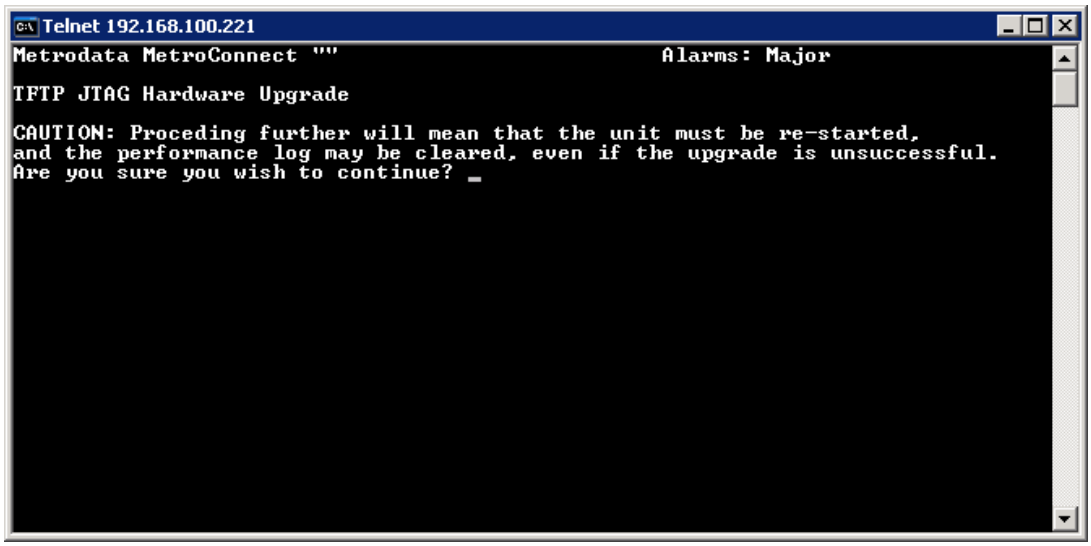
c) Select Management/TFTP menu



d) Configure the TFTP server IP Address

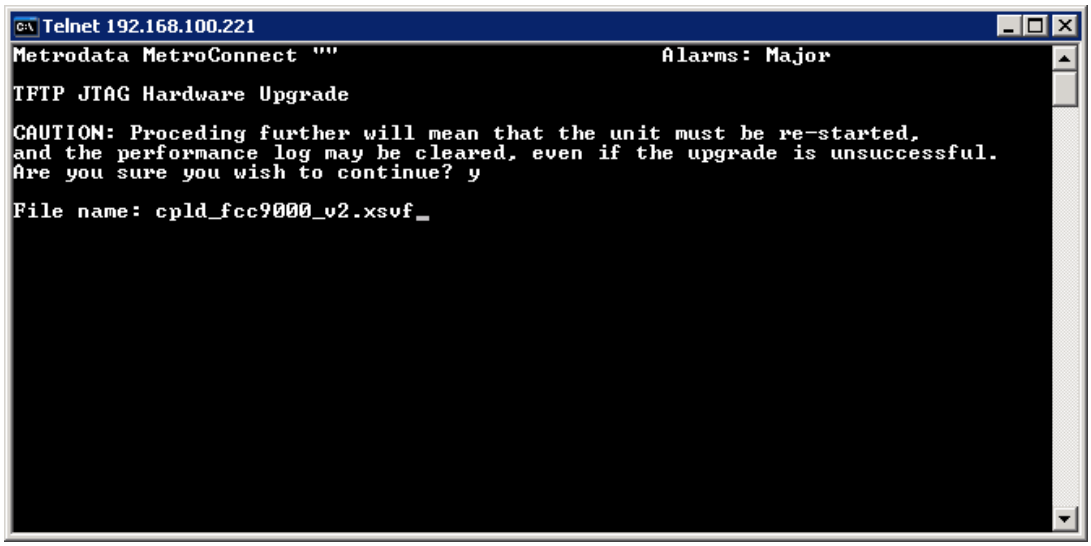


e) Select JTAG hardware upgrade option

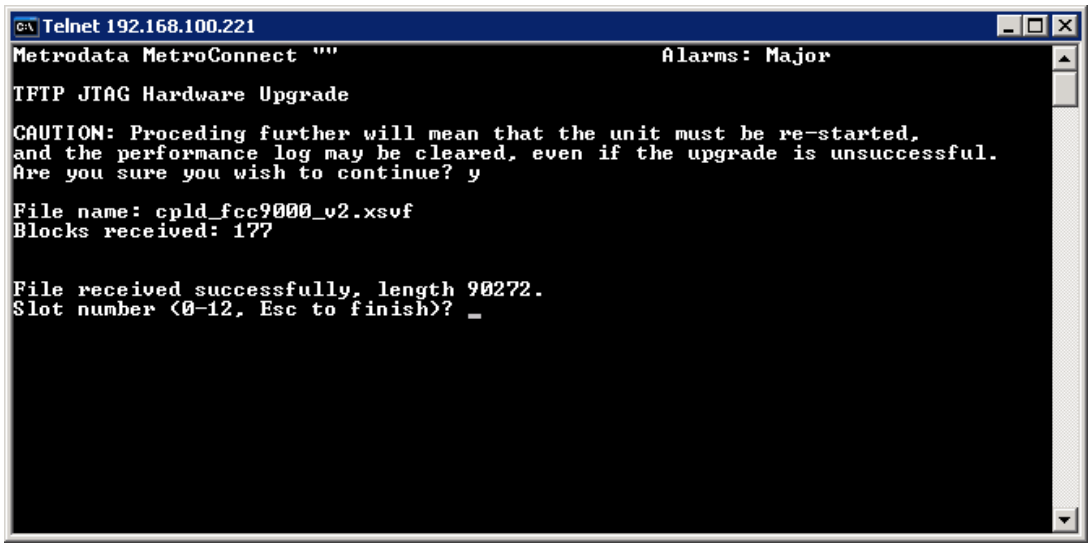


At the prompt, confirm with “Y”

f) Download the firmware file

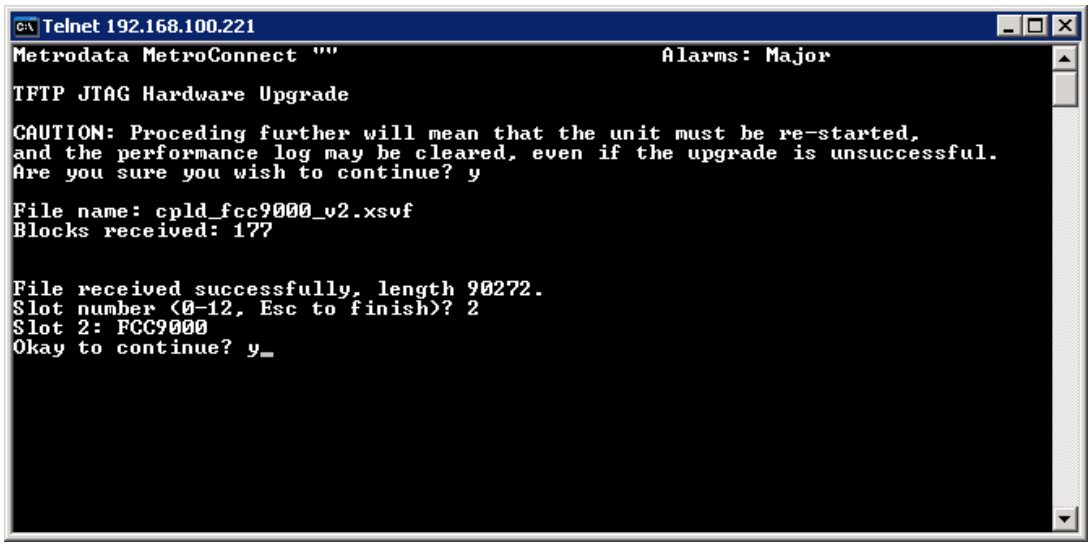


g) Program all modules with the updated firmware file



Once the firmware file has downloaded, the system will prompt for the slot number of the module to program. When the slot number is entered, the menu will show the type of card fitted in this slot, if it says FCC9000, then confirm Y, otherwise decline N

h) Select and program each available slot in turn



Once all modules have been updated, at the slot number prompt, type <ESC> and then confirm Y to exit. The MetroConnect will now reboot and restart.