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GE
Intelligent Platforms

Installation Guide

VMIACC-5595*
2Gb/s Reflective Memory Hub Assembly



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Overview

Introduction

The VMIACC-5595* is a managed hub, designed to operate with GE's VMIxxx-5565 Reflective Memory products. Without a hub device, the Reflective Memory nodes must be networked together in a daisy-chained loop. In the hub-less configuration if one node becomes inoperable, the entire loop becomes disabled. When the VMIACC-5595 hub is incorporated into the network, the network is converted from a loop to a star configuration. In the star configuration if one node becomes inoperative, that node is bypassed by the VMIACC-5595 and the remaining nodes on the network remain operational. When a network consists of a large number of nodes or if the nodes are widely dispersed over an area, the star configuration is easier to build and maintain.

The VMIACC-5595 automatically bypasses a port when it detects a loss of signal or the absence of a valid synchronization pattern, allowing the remaining nodes to continue to operate. Each port on the VMIACC-5595 regenerates the serial optical signal, eliminating problems with insertion losses and cable attenuation. Signal regeneration also reduces jitter.

The optical ports are implemented with Small Form-Factor Pluggable (SFP) transceivers (see Figure 1 on page 8). Only the required ports need to be populated. The SFP transceivers can be a mix of multimode (short distance) or single-mode (long distance) transceivers. This feature permits a cost savings in small networks, as well as system optimization. For larger networks, several VMIACC-5595 hubs can be cascaded, permitting a managed hub array with up to 256 nodes.

An RS232 port permits local monitoring and control of the Reflective Memory network using a standard PC serial port. The Ethernet port (10BaseT) can be used to monitor and control the hub from great distances through a Local Area Network (LAN) or with the use of a Web browser.

The VMIACC-5595 is available as a 19-inch 1U rack mountable enclosure or as a desktop enclosure. The universal power supply permits operation with nearly any international power standard. Figure 2 on page 9 is a functional block diagram of the VMIACC-5595 Hub Assembly.

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The VMIACC-5595 can operate without the use of the Ethernet port or the RS232 port. When first activated, the VMIACC-5595 operates using the factory default configuration with each optical port in the auto bypass mode and the bypass is based on detection of Loss of Signal (LOS).

Features

- Designed for use with GE's VMIxxx-5565 Reflective Memory products
- Provides up to 8 ports per hub assembly using Small Form-Factor Pluggable (SFP) transceivers
- Hub assemblies can be cascaded up to the maximum 256 node limit
- Automatically bypasses disabled or disconnected nodes in a fiber-optic network
- Automatic bypass controlled by the loss of signal or by the loss of sync pattern
- Each port regenerates the serial optical signal to eliminate link losses and to reduce jitter
- 10Base-T Ethernet TCP/IP port for remote access and control
- RS232 port for local access and control
- Available as either a 19-inch 1U rack mount or desktop enclosure
- Internal universal power supply
- Dark-on-Dark option turns off the board's transmitter controller if the receiver does not detect a signal or detects invalid data patterns (available for firmware versions 02.00 and later)

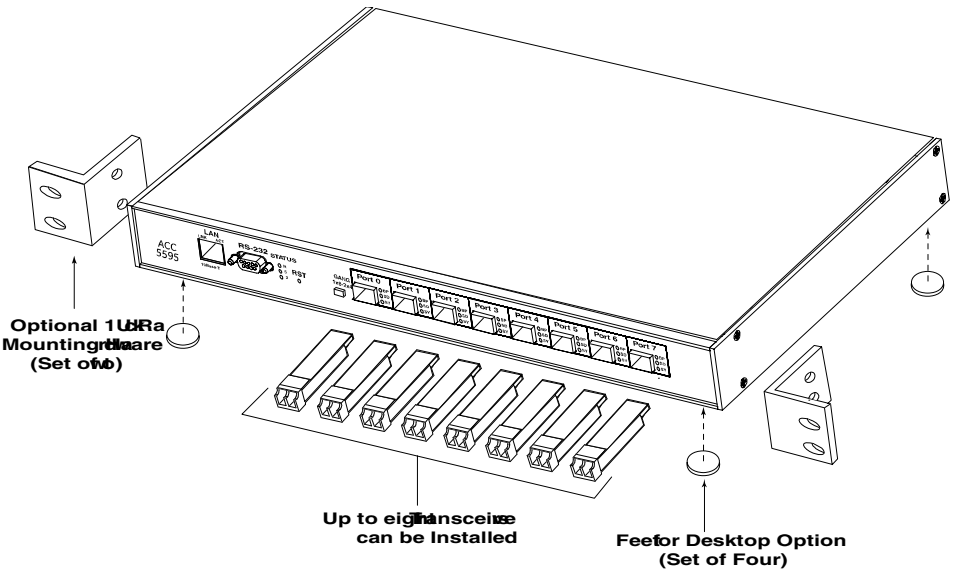


Figure 1 VMIACC-5595 Hub Assembly

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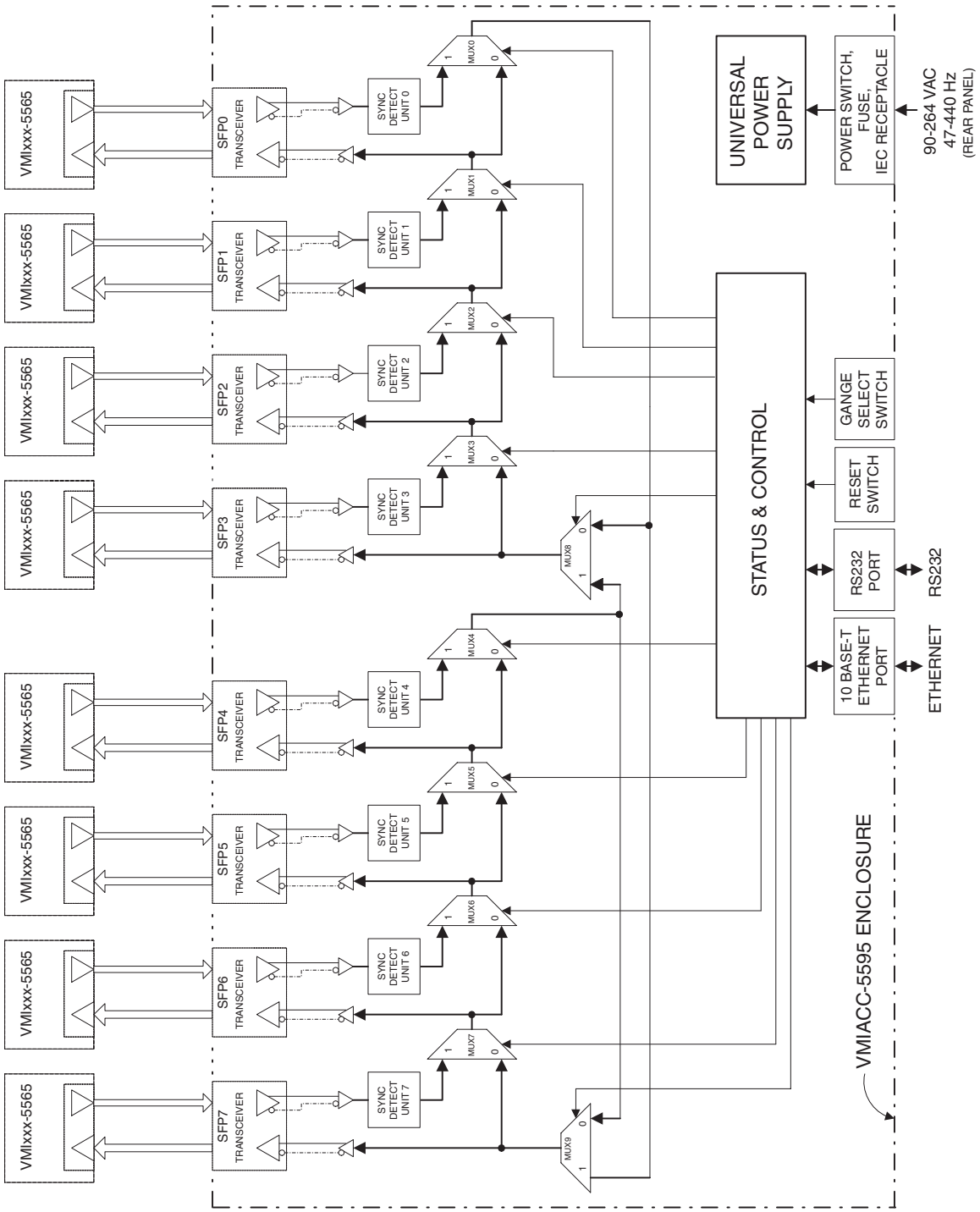


Figure 2 VMIACC-5595 Functional Block Diagram

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Reference Material List

Refer to Rabbit Semiconductor's *"Rabbit 2000 Microprocessor User's Manual" Document # 019-0069 011205* for a detailed explanation of the Rabbit 2000 Microprocessor, available from the following source:

Rabbit Semiconductor
2932 Spafford St.
Davis, CA 95616
(530) 757-8400
FAX: (530) 757-8402
www.rabbitsemiconductor.com

Refer to Rabbit Semiconductor's *"Rabbit Ethernet Module User's Manual"* for a detailed explanation of the Rabbit Ethernet Module available from the following source:

Rabbit Semiconductor
2932 Spafford St.
Davis, CA 95616
(530) 757-8400
FAX: (530) 757-8402
www.rabbitsemiconductor.com

Refer to the VMIxxx-5565 *"Reflective Memory Product Manuals"* for a detailed explanation of the Reflective Memory available from the following source:

GE
12090 South Memorial Pkwy.
Huntsville, AL 35803-3308, USA

1-800-433-2682
1-780-401-7700

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Safety Summary

The following general safety precautions must be observed during all phases of the operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of this product.

GE assumes no liability for the customer's failure to comply with these requirements.

Ground the System

To minimize shock hazard, the chassis and system cabinet must be connected to an electrical ground. A three-conductor AC power cable should be used. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet.

Do Not Operate in an Explosive Atmosphere

Do not operate the system in the presence of flammable gases or fumes. Operation of any electrical system in such an environment constitutes a definite safety hazard.

Keep Away from Live Circuits

Operating personnel must not remove product covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

Do Not Service or Adjust Alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

Do Not Substitute Parts or Modify System

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to GE for service and repair to ensure that safety features are maintained.

Dangerous Procedure Warnings

Warnings, such as the example below, precede only potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

STOP: Dangerous voltages, capable of causing death, are present in this system. Use extreme caution when handling, testing and adjusting.

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Safety Symbols Used in This Manual

STOP: informs the operator that a practice or procedure should not be performed. Actions could result in injury or death to personnel, or could result in damage to or destruction of part or all of the system.

WARNING: denotes a hazard. It calls attention to a procedure, a practice, a condition, which, if not correctly performed or adhered to, could result in injury or death to personnel.

CAUTION: denotes a hazard. It calls attention to an operating procedure, a practice, or a condition, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the system.

NOTE: denotes important information. It calls attention to a procedure, a practice, a condition or the like, which is essential to highlight.

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CHAPTER

1

Theory of Operation

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Basic Operation

The default factory configuration for the VMIACC-5595 is to automatically bypass ports due to the loss of a signal (light) at the receiver or the absence of a valid synchronization pattern, without any interface through the Ethernet port or RS232 port.

Three LEDs adjacent to each port give a visual indication of the port status. Status information and modes of operation are available using the Ethernet port and your standard Web Browser or using the RS232 port and any RS232 terminal interface.

Status information includes:

- Detection of installed transceivers
- Detection of signal (light)
- Detection of valid synchronization patterns (multiple or single)

The Hub Assembly allows for the bypassing of a port to be based on the absence of either single/multiple synchronization patterns or the loss of a signal (light). Also, each port can be manually forced active or bypassed regardless of the status indicators. Finally, each port transmitter can individually be disabled without shutting down the entire Hub.

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Both the serial port interface and the Ethernet interface can be used at the same time. Multiple Ethernet users are also possible. At times this feature is actually useful. It can be tedious to temporarily change your PC's Ethernet port to a range that matches the default factory settings, if restoring the defaults becomes necessary. On some machines, it could require a time consuming multi-reboot process. By using the serial port only to re-establish the IP settings, the process becomes easier.

The total signal propagation delay through the entire VMIACC-5595 hub is 25 nanoseconds — equivalent to the delay through approximately 18 feet of cable.

The switching time depends on the Detection Mode used: LOS, Single Sync mode or Multi-Sync mode.

For the Single Sync Detect Mode, the auto bypass switch delay will be approximately 0 to 15.5µsec. For the Multi-Sync mode, the auto bypass switch delay is approximately 4 times 15.5µsec or 62µsec provided four consecutive invalid sync periods occur. The auto bypass OFF switching delay for the LOS Detect Mode is approximately 100µsec. The auto bypass ON switching delay for the LOS Detect Mode is approximately 1.25msec. Also note that upon power-up of the hub, all ports will default to bypass ON.

NOTE: The switching time values are difficult to measure accurately, so they are estimated and based on component specifications.

The power up delay of the VMIACC-5595 is less than 2 seconds. This is measured from the time power is first applied to the time the Ethernet Link light is truly asserted. The last event to complete at power up is the boot of the Ethernet module's imbedded processor. The optical ports are operational in the default mode (auto bypass based on LOS) in approximately 1 second after power is applied. The bypass circuitry of this hub is not passive. Power must be applied to the unit before it will pass network data.

All the control settings, not just the communication settings, are stored in non-volatile memory. If power is lost or interrupted, the hub will return to the last good configuration, once the processor boot cycle is complete.

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Front Panel Description

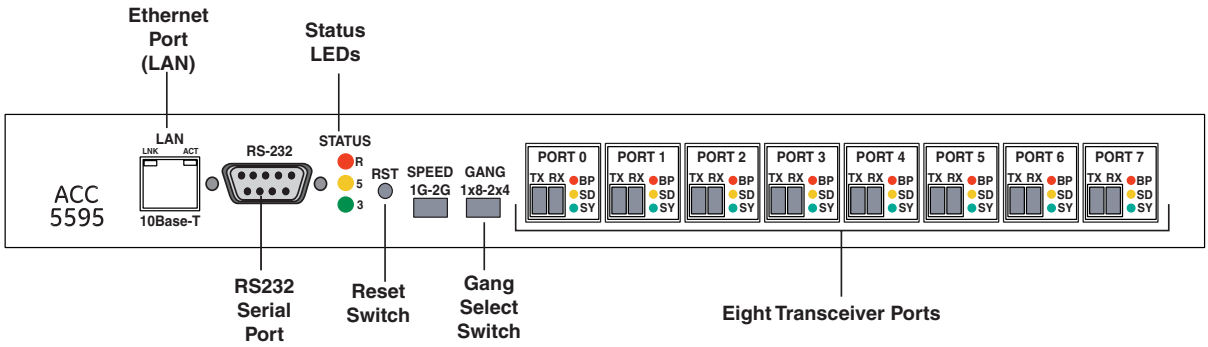


Figure 1-1 VMIACC-5595 Front Panel

LAN - This is the 10Base-T Ethernet port, using a standard RJ45 receptacle. The connector has two LEDs along its top edge. The LED labeled LNK is the link status and the LED label ACT is the link activity. The Ethernet interface is compliant with the Transmission Control Protocol/Internet Protocol (TCP/IP) specification. Each hub assembly has a unique Internet Protocol (IP) address that can be altered by the user (see Figure 1-2 on page 17 for the location of the switch) or reset to the default settings. The hub assembly can operate on either a Local Area Network (LAN) or Wide Area Network (WAN).

RS232 – RS232 is a PC compatible standard female DB9 serial port, supporting baud rates up to 19.2 kbps. The RS232 port is used for local monitoring and control of the hub. Depending on the application, it can also be used as the primary control port.

Auxiliary Manual Switch (S4)

Switch S4 is a bank of four dip switches located on the circuit board of the VMIACC-5595 (see Figure 1-2 and Figure 1-3 on page 17). The dip switch is used to restore the hub to the default settings.

NOTE: If the user forgets the login password or if the hub communication settings are changed in such a way that the user can no longer communicate with the unit, then S4 auxiliary manual dip switch is used to restore the hub to its default configuration values.

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For each of the four dip switches, only position number 1 is used, the other three are reserved. When the switch is in the “OFF” position, the corresponding direct I/O signal will read high (1). Likewise, when the switch is in the “ON” position, the corresponding direct I/O signal will read low (0). Table 1-1 below lists the dip switch number and description.

Table 1-1 Switch S4 Configuration

Dip Switch No.	Description	Action
1	Configuration Settings	Restore
2	Reserved	
3	Reserved	
4	Reserved	

To restore the factory default configuration, place switch S4 position 1 to the ON position and then cycle the power or press the reset button. Each time the unit leaves reset and senses that switch S4 position 1 is in the ON position, it will restore the unit settings to the factory default values.

The default values are:

- Password is “password”
- IP address is 10.0.0.1
- IP netmask is 255.255.255.0
- IP gateway is 0.0.0.0
- Serial port baud rate is 9600
- Transmitters are enabled
- All ports operate in the auto bypass mode
- All ports are bypass based on Lost of Signal (LOS) detection
- All ports are set to ‘Dark on Dark’ (off)

CAUTION: Do not leave switch S4 in the ON position indefinitely. Otherwise, every time the unit is reset or power cycled the unit will revert to the defaults settings and your desired configuration will be lost.

Jumper E4 is for factory use only. Leave the jumper shunt of E4 between pins 1 and 2. Both the serial and the Ethernet port will not operate if the E4 jumper is altered.

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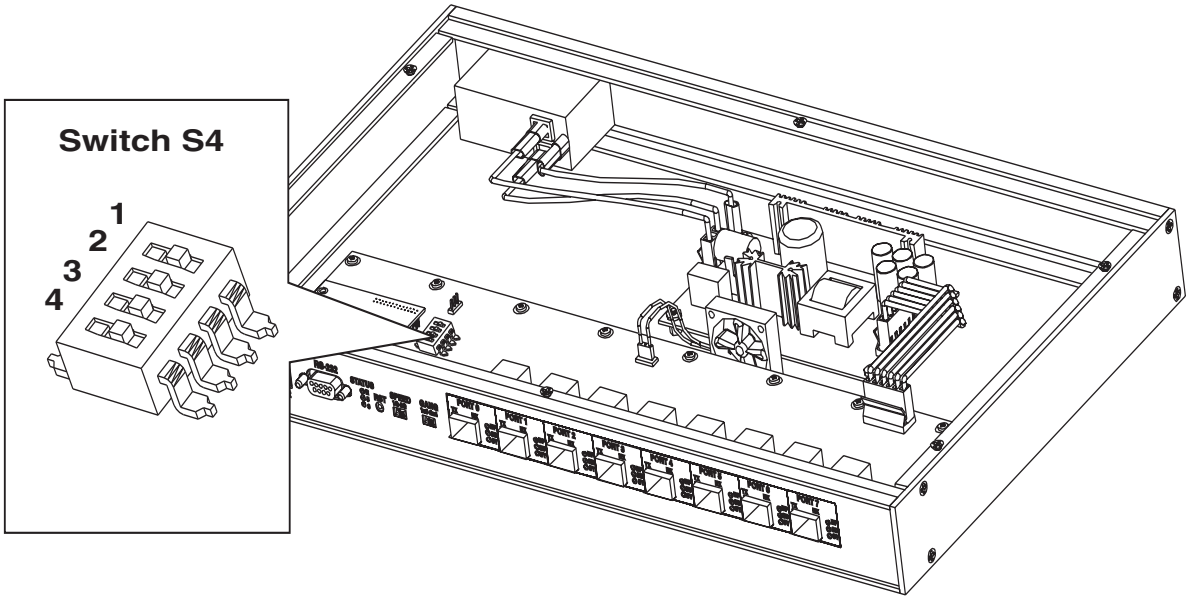
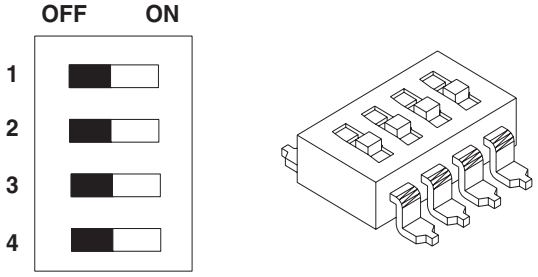


Figure 1-2 Location of User Configurable Jumper (E4) and Switch S4



Default State: All switch positions OFF.
Only position #1 is used to reset the Hub to the default settings.

Figure 1-3 Auxiliary Manual Switch

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Front Panel Status Indicators, Switches and Ports

Status LEDs – The Status LEDs provide a limited status of the hub. See Table 1-2 below for a description of the status LEDs:

Table 1-2 Status LED Descriptions

LED	Color	Description	Action
R	Red	Reset	This LED is ON when power up/reset or the manual reset is active
5	Yellow	5.0VDC	This LED is ON when 5.0VDC power is present
3	Green	3.3VDC	This LED is ON when 3.3VDC power is present

RST – RST is a manual push button reset switch, which will reset the entire VMIACC-5595 hub including the 10Base-T Ethernet module.

GANG 1x8-2x4 – The GANG switch configures the hub as either 1 group of 8 ports (labeled 1x8) or 2 groups of 4 ports (labeled 2x4). When operating in the 2x4 configuration, ports 0 through 3 form one group and ports 4 through 7 form the second group. The two groups of ports operate independent of each other. To select either setup move the switch either left or right. Moving the switch to the right sets the hub to 2x4, moving the switch to the left sets the hub for 1x8.

PORTs 0 through 7 – There are eight positions available for the optical Small Form-Factor Pluggable (SFP) transceivers. Each port can contain an actual transceiver, depending on the option ordered. Ports that do not have a transceiver installed will have a filler plug to avoid dust contamination and reduce EMI emissions, and will automatically be bypassed. The SFP transceivers accept the standard LC type fiber-optic connectors, either the simplex (single) or duplex (double) configuration. The LC receptacle labeled TX is the transmitter and the receptacle labeled RX is the receiver.

Port Status LEDs - The three LEDs to the right of each port indicate the current status of that port. See Table 1-3 below for a detail description of the Port Status LEDs.

Table 1-3 Port Status LEDs

LED	Color	Description	Action
BP	Red	Bypass LED	This LED is ON when the port is being bypassed.
SD	Yellow	Signal Detect	This LED is ON when the port receiver detects a valid optical signal.
SY	Green	Sync	This LED is ON when the port receiver detects valid network sync patterns.

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Rear Panel

The rear panel has a power entry module which includes a power ON/OFF switch, a 1A/250V fuse and a globally accepted IEC power receptacle. See Figure 1-4 below for the location of the ON/OFF switch and the fuse.

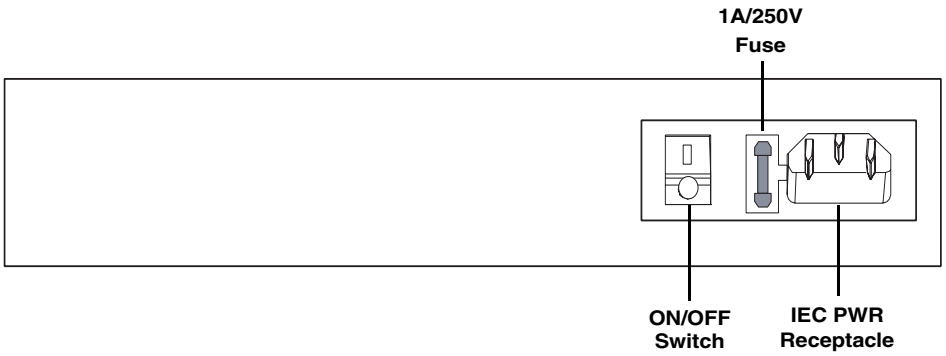


Figure 1-4 VMIACC-5595 Rear Panel

Fuse Type:

5 x 20mm, fast-acting, IEC 60127-2 standard glass 1A, 250V. Littelfuse part Number 217001 or equivalent.

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Cascading

To create a star network configuration greater than 8 nodes, two or more VMIACC-5595 hubs can be cascaded. Cascading of up to 256 nodes is the limit. This is due to each node having a unique node ID, ranging from 0 through 255. Any port on the VMIACC-5595 can be cabled to another VMIACC-5595 to form the cascade. However, it is best to establish some convention to keep track of the port destinations. When connecting more than two hubs together, GE recommends using simplex cables. Simplex cables will not sacrifice an additional port with each cascaded hub. Figure 1-5 on page 21 and Figure 1-6 on page 22 illustrate three cascaded VMIACC-5595 hubs. Figure 1-5 on page 21 shows simplex cables cascading the hubs, with 21 ports available for networking. Figure 1-6 on page 22 shows duplex cables cascading the hubs and has only 20 ports available for networking. Duplex cables are used in both examples, interconnecting the VMIACC-5595 with the VMIxxx-5565 Reflective Memory boards.

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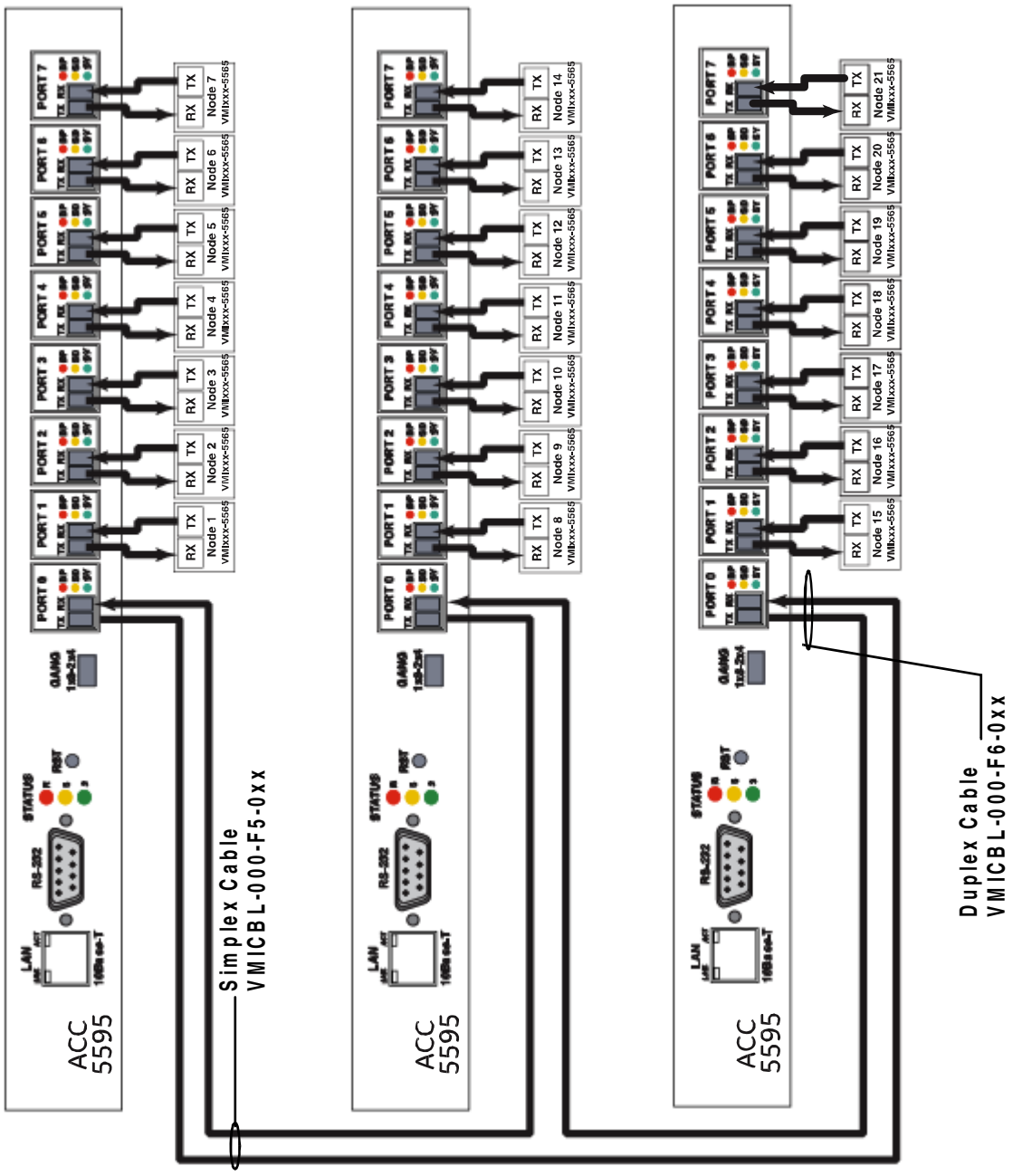


Figure 1-5 Example of Three VMIACC-5595s Cascaded with up to 21 Nodes using Simplex Cables

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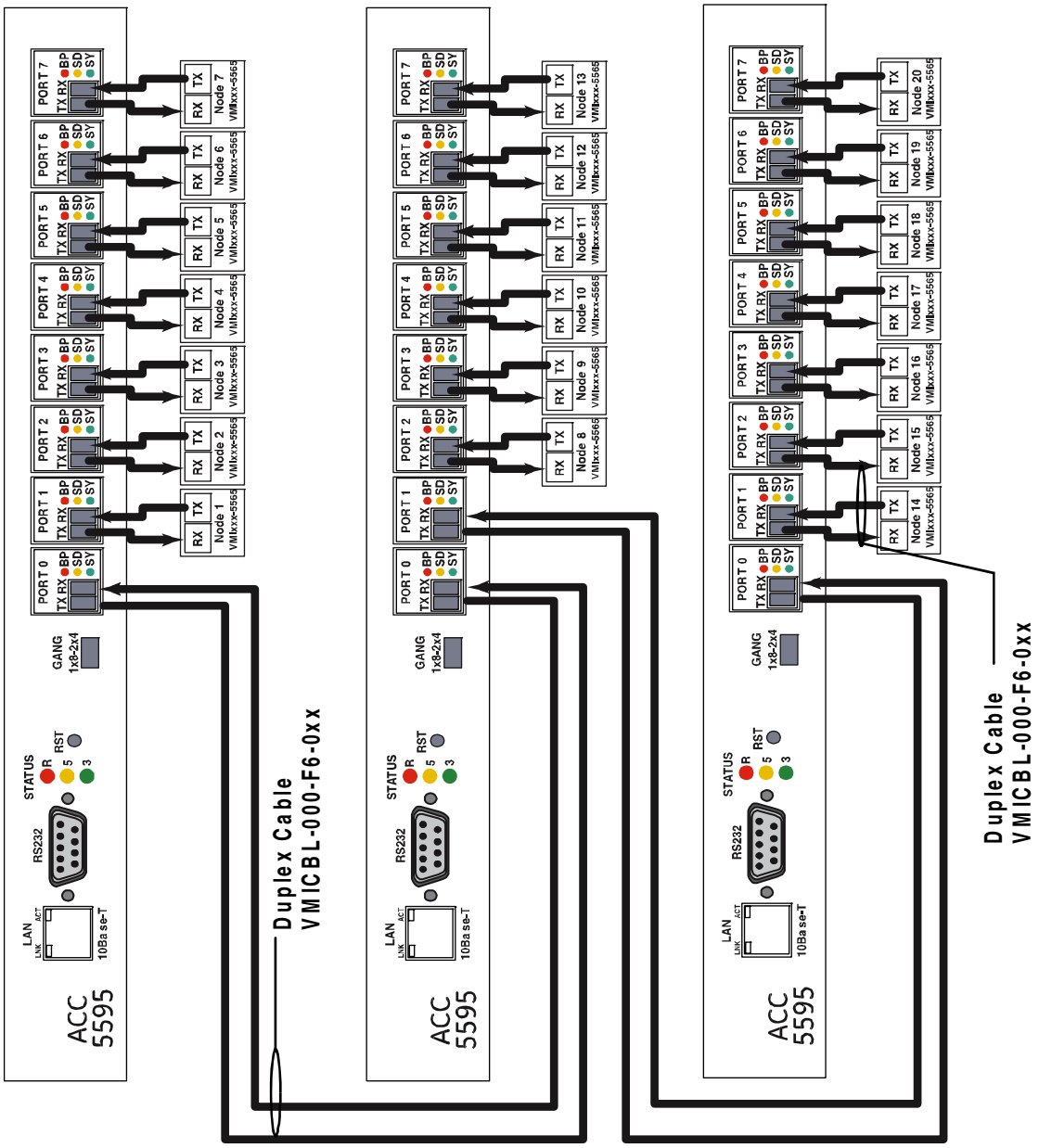


Figure 1-6 Example of Three VMIACC-5595s Cascaded with up to 20 Nodes using Duplex Cables

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Fiber-Optic Cable and Connector Description

The VMIACC-5595 is available with a multimode or single-mode fiber-optic interface. Figure 1-7 below is an illustration of the 'LC' type multimode or single-mode fiber-optic connector.

Cable Specification:

- Simplex, multimode, graded index glass fiber
- Core diameter = 62.5 ±3µm
- Cladding diameter = 125 ±2µm
- Jacket outer diameter = 3.0mm ±.1mm
- Attenuation: 4.0 dB/km (max) at 850nm, 1.75dB/km (max) at 1300nm
- Bandwidth: 160 to 300 MHz-Km (min) at 850nm, 300 to 700 MHz-km (min) at 1300nm
- UL type OFNR, CSA type OFN FT4

Connector Specification:

- Compatible with NTT LC standard and JIS C 5973 complaint
- Ceramic ferrule
- Insertion loss: 0.35 dB (max) multimode
- Fiber clad diameter: 125µm
- Jacket diameter: 3.0mm
- Temperature range: -20 °C to +85 °C

Cable Length Specification:

- Multimode maximum cable length is 300 meters using 50µm core multi-mode fiber-optic cables.
- Single-mode maximum cable length is 10 kilometers using 9µm core single-mode fiber-optic cables.

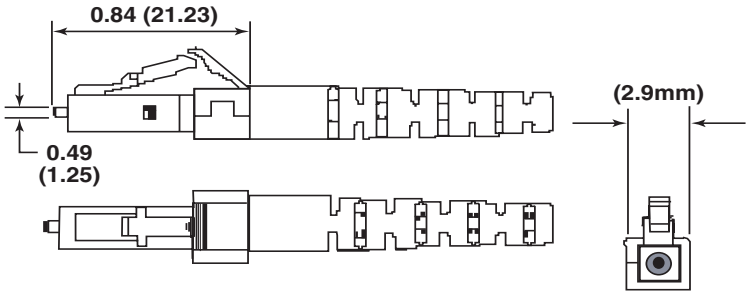


Figure 1-7 'LC' Type Multimode Fiber-Optic Cable Connector

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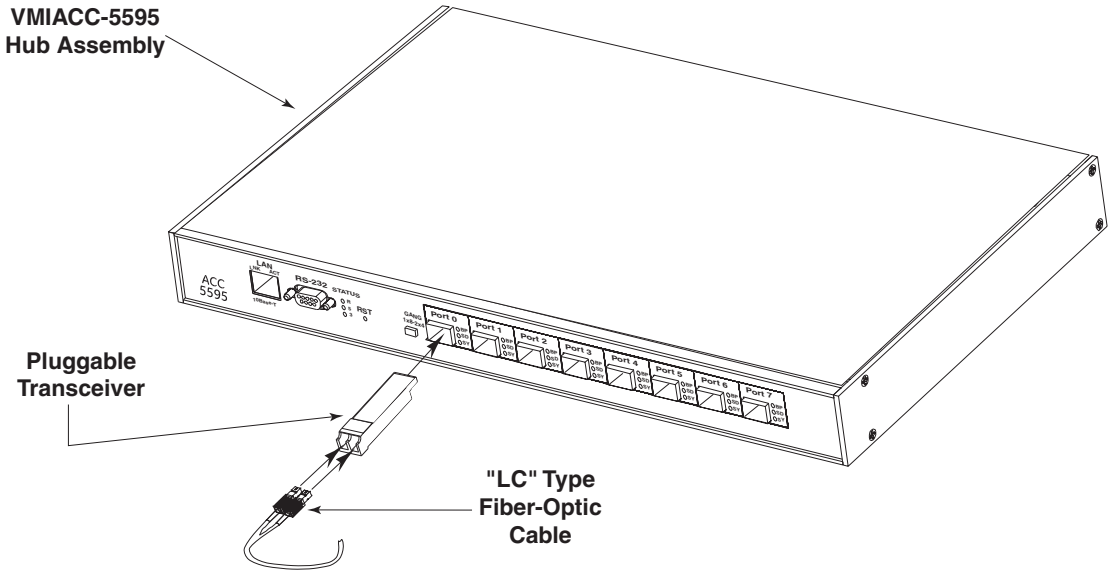


Figure 1-8 Fiber-Optic Cable with Pluggable Transceiver

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Using the RS232 Serial Port

The RS232 serial port can be used to monitor and control the VMIACC-5595. When used as the primary control port, the VMIACC-5595 can be cabled to a standard PC with an available serial port. See Figure 1-9 below for an example of setting up the VMIACC-5595 with a PC using the RS232 serial port, cable and the Control Utility (*RS232 Serial Port Control Utility* on page 29).

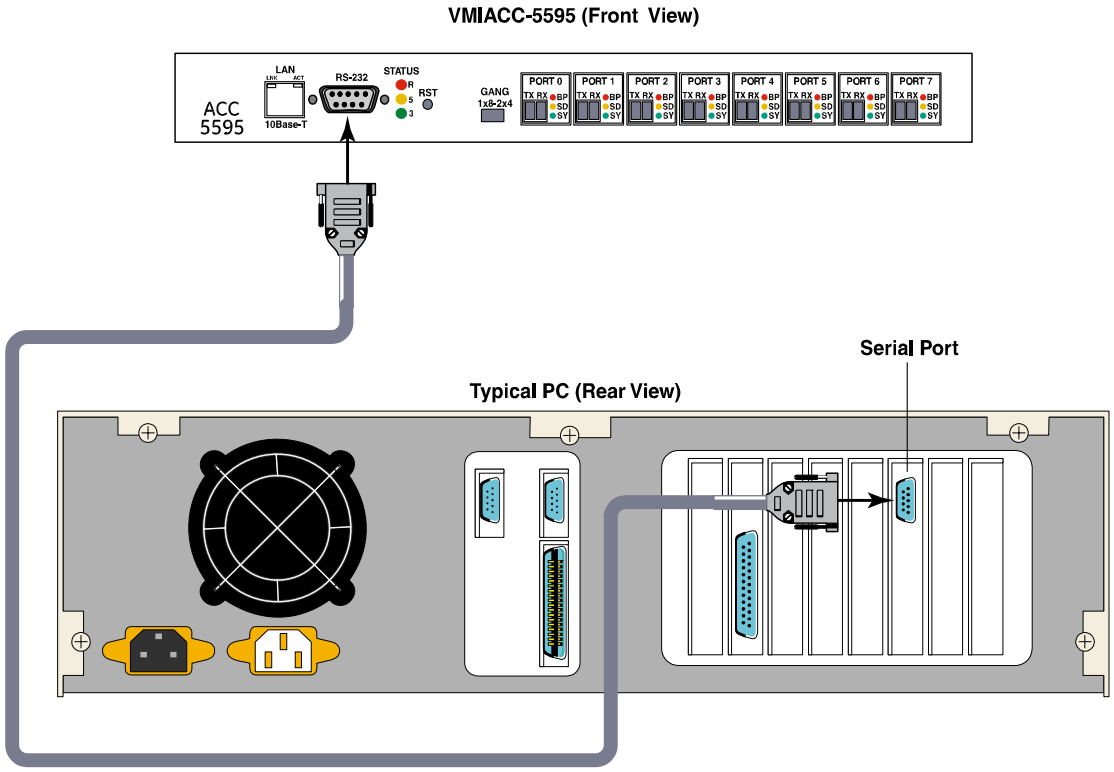


Figure 1-9 VMIACC-5595 RS232 Serial Port Setup

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RS232 Serial Port

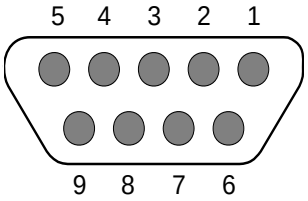


Figure 1-10 RS232 Connector Pin Assignment

Table 1-4 RS232 serial port pin out

Pin No.	Standard Name	Standard Description	VMIACC-5595 Function	Direction
1	CD	Carrier Detect	No Connection	--
2	RD	Receive Data	Receive Data	Output to PC
3	TD	Transmit Data	Transmit Data	Input from PC
4	DTR	Data Terminal Ready	Reset Ethernet Module (Low)	Input from PC
5	SG	Signal Ground	Signal Ground	--
6	DSR	Data Set Ready	Status	Output to PC
7	RTS	Request To Send	Tied to CTS only	Input from PC
8	CTS	Clear To Send	Tied to RTS only	Output to PC
9	RI	Ring Indicator	No Connection	--

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Using the Ethernet Port (LAN)

The Ethernet port can be used to monitor and control the VMIACC-5595 using either a WAN or LAN and your standard Web Browser. This method allows for a greater distances then that of the conventional serial port. See Figure 1-11 below for an example of the VMIACC-5595 Ethernet port setup for monitoring and control. See *Ethernet Port Graphical User Interface (GUI)* on page 36.

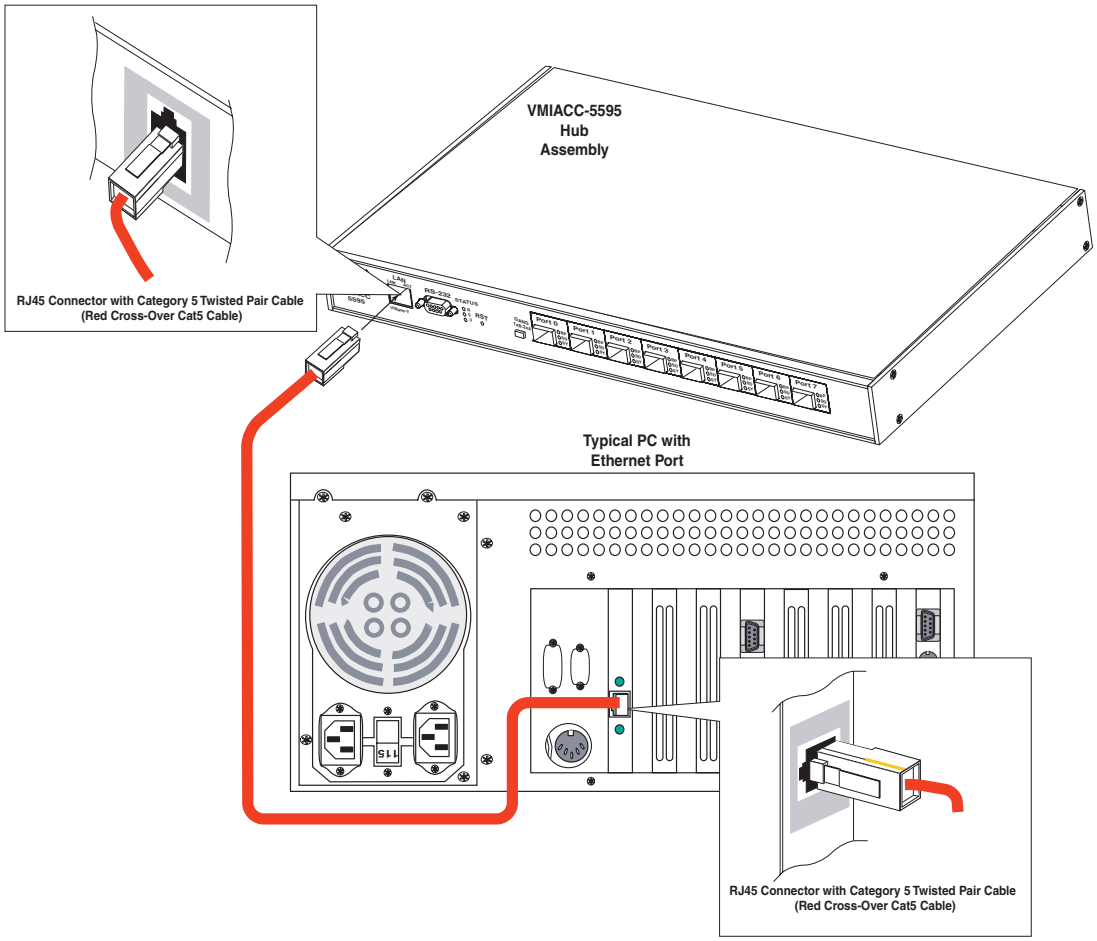


Figure 1-11 VMIACC-5595 Typical Ethernet Setup

NOTE: When using the VMIACC-5595's Ethernet Port, GE recommends using the Category 5 Twisted-Pair Cross-Over cable also, referred to as a Null Cable. This will eliminate the need for an Ethernet Hub, and allow for a direct connection between the VMIACC-5595 Hub Assemble and the PC.

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Ethernet Port

The Ethernet port is configured for standard 10/100 BaseT Ethernet cables, with the most popular type of Ethernet cables in use being CAT5 cables.

CAT5 is the 5th generation of twisted pair Ethernet cabling. CAT5 cable contains four pairs of copper wire. It supports Fast (100 Mbps) Ethernet and comparable alternatives such as ATM. As with all other types of twisted pair EIA/TIA cabling, CAT5 cable runs are limited to a maximum recommended run rate of 100m (328 feet). Although CAT5 cable usually contains four pairs of copper wire, Fast Ethernet communications only utilize two pairs.

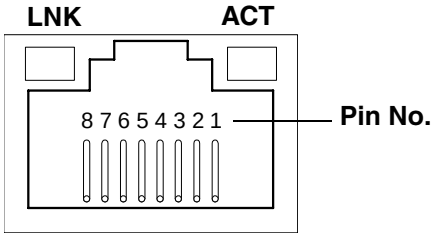


Figure 1-12 Ethernet Port and Pin Locations

Table 1-5 Ethernet Port RJ45 Connector Pinout

Pin No.	Description
1	TX+ Transmit Plus
2	TX- Transmit Minus
3	RX+ Receive Plus
4	N.C. No Connect
5	N.C. No Connect
6	RX- Receive Minus
7	N.C. No Connect
8	N.C. No Connect

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Operational Software Description

The VMIACC-5595 comes pre-loaded with both a Control Utility and a Graphical User Interface (GUI) that allows you to monitor and control the hub assembly, using either the RS232 or Ethernet port. The following screen shots are an illustration of the software and its capabilities. The status and control data provided through the RS232 port is equivalent to that provided through the Ethernet port. However, due to the limitation in standard terminal protocol, the data can not always be displayed in exactly the same manner.

RS232 Serial Port Control Utility

You can use the RS232 serial port to control and monitor the hub. The Control Utility shows status, enables and disables the transmitters, sets port mode, sets the bypass mode and changes the communications settings (i.e., IP Address, NetMask and Baud Rate).

1. First ensure that the VMIACC-5595 is OFF. To get started, from your task bar, click *Start* and go to *Programs* then to *Accessories*.
2. From Accessories, go to Hyperterminal and click on *Hyperterminal*.

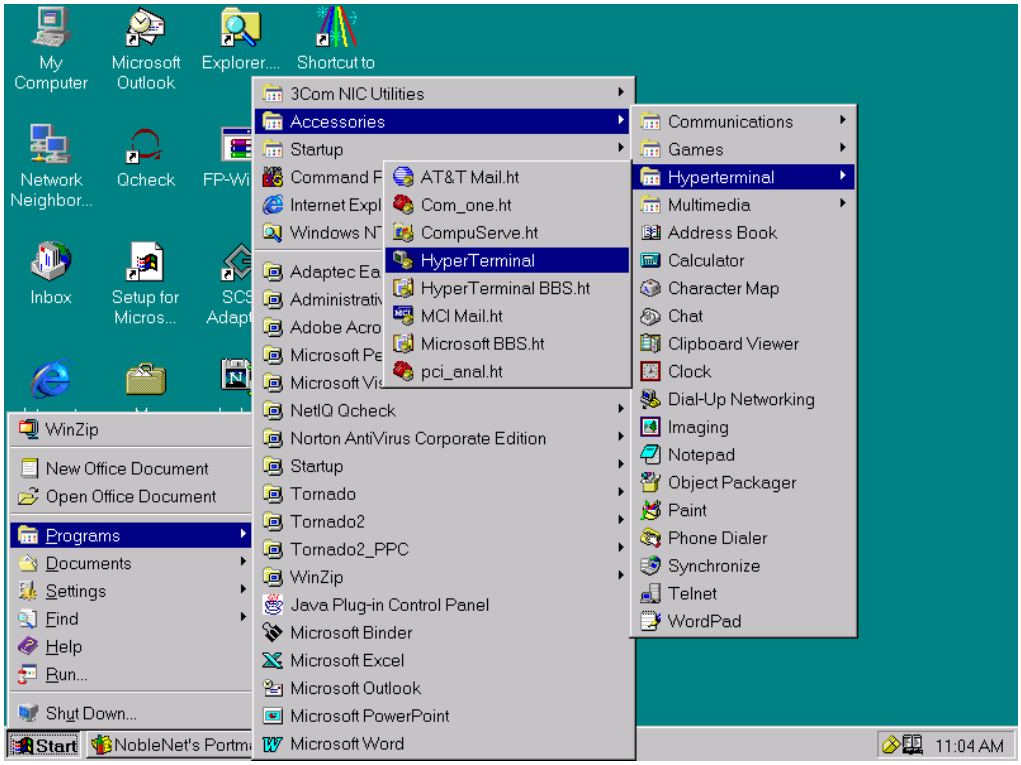


Figure 1-13 Desktop Window

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3. The following window will appear. From the Connection window type in the name (5595). You can also choose an icon for the connection. Click OK.

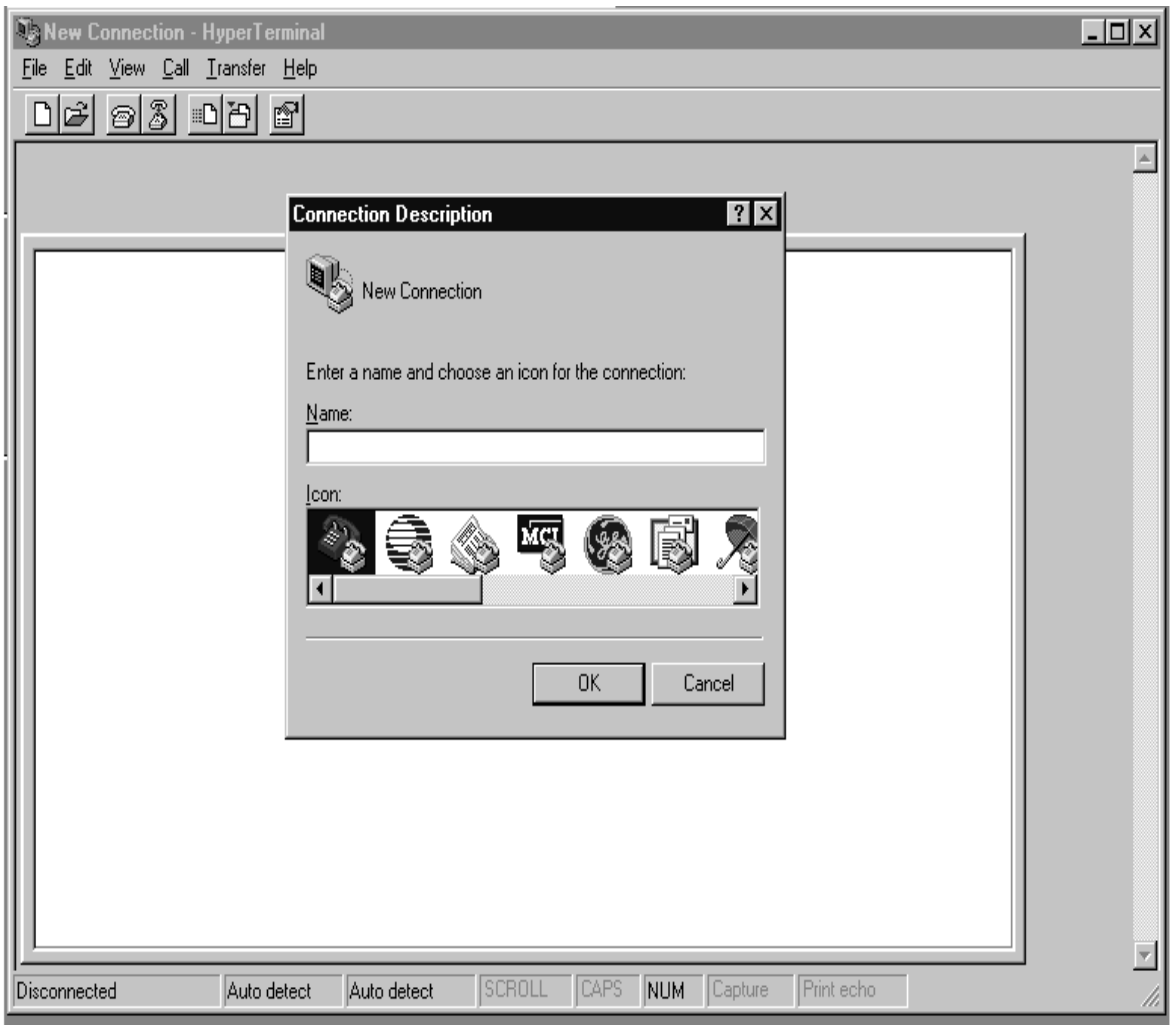


Figure 1-14 Hyperterminal New Connection Window

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4. Select the COM port you will be using, either COM 1 or COM 2. After selecting the COM port click OK.

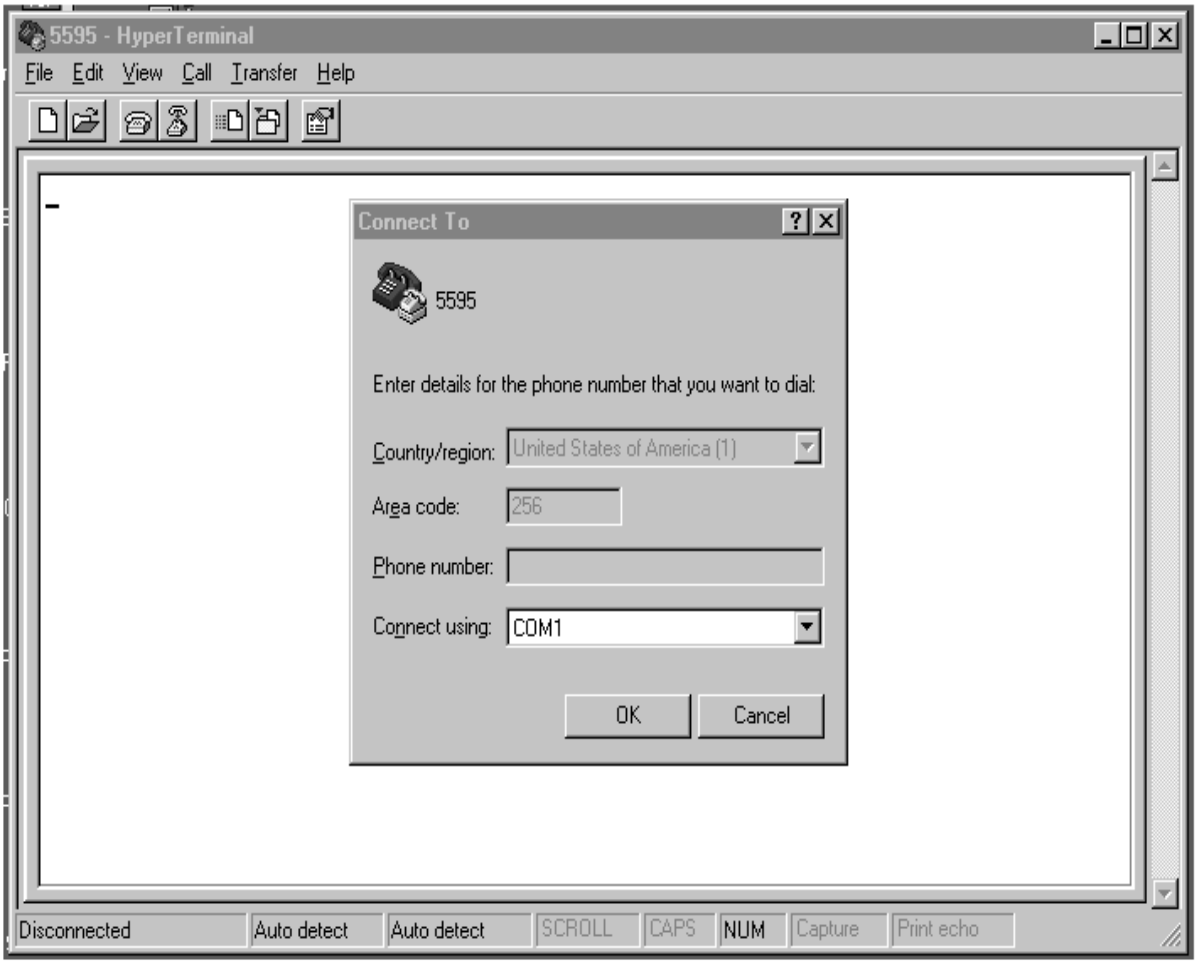


Figure 1-15 COM Port Window

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5. The COM port properties window will appear. Select the Baud rate (Bits per second). The default Baud rate for the VMIACC-5595 is 9600. Click OK.

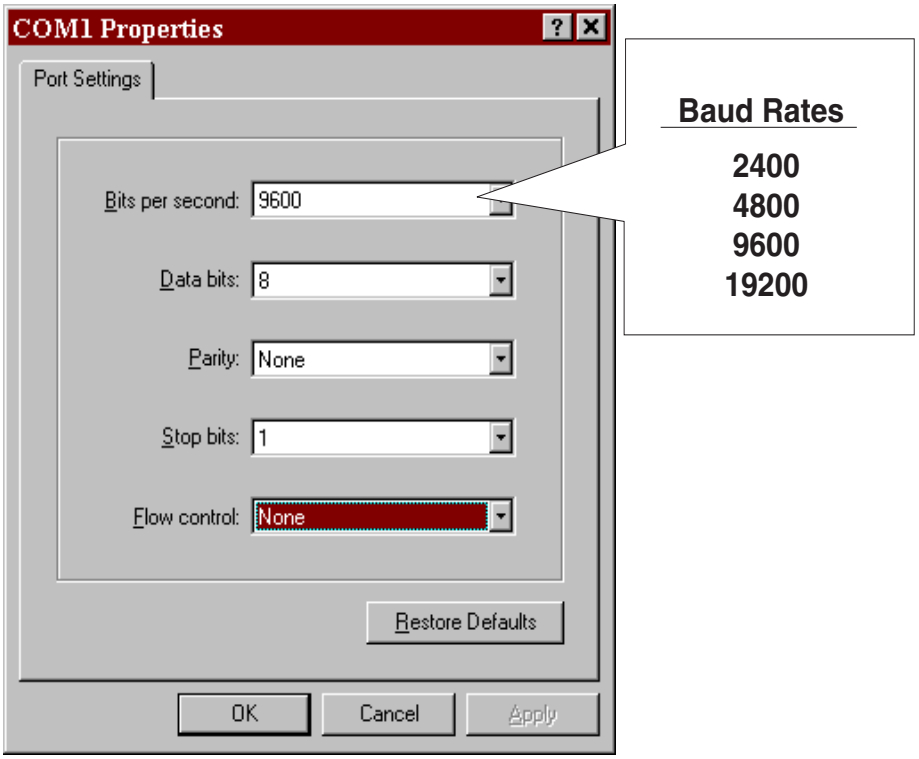


Figure 1-16 COM1 Property Window

Bits per second: 2400, 4800, 9600 or 19200

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None

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6. Turn on the VMIACC-5595, and then the following window appears.

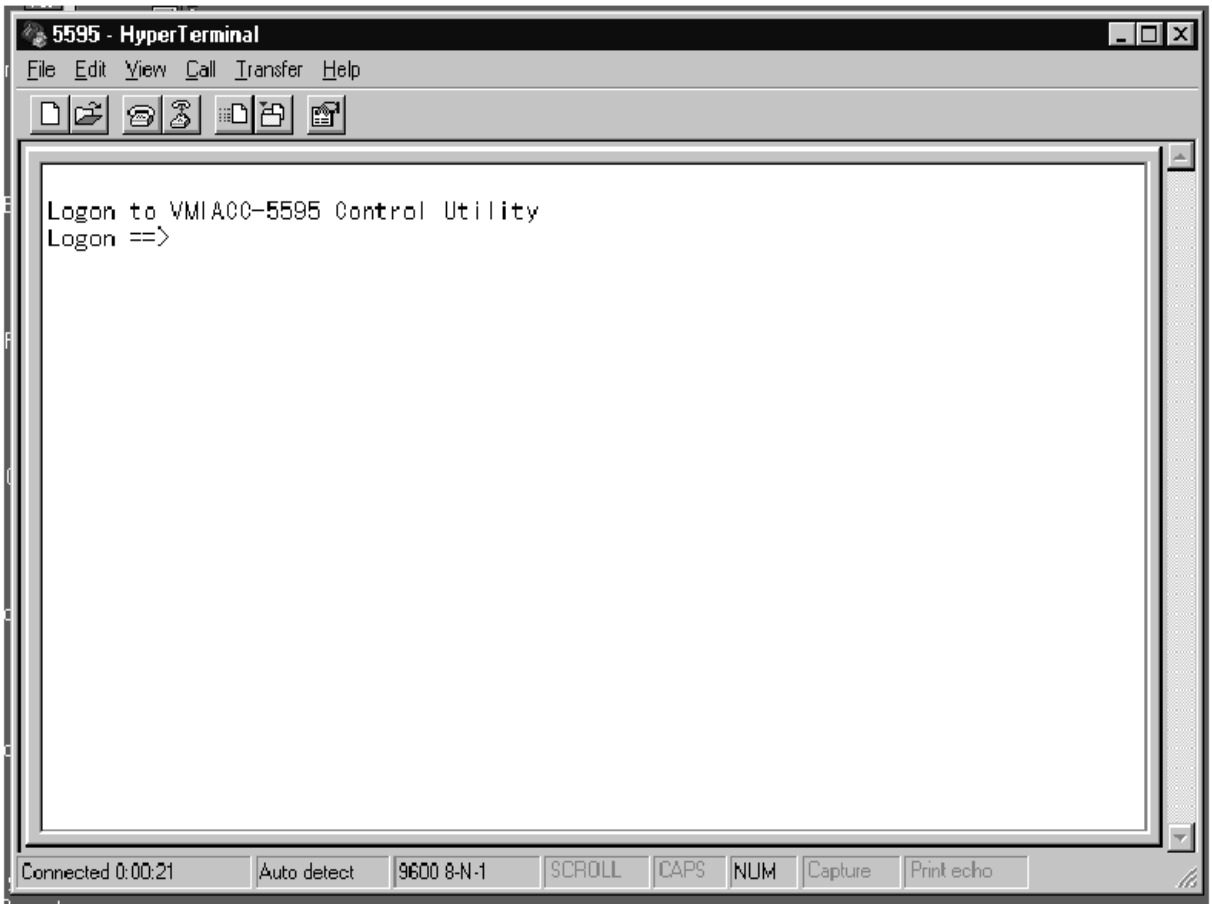


Figure 1-17 Control Utility Logon Window

7. Enter the Logon (user name) and password. The Logon is *"admin"* and the factory default password is *"password"* without the quotes.

To change the setup, enter the number for that setting.

8. Type a zero (0) to show the current status of the VMIACC-5595. See Figure 1-18 on page 34.

NOTE: Login name for the serial interface is "Admin". The factory default password is "Password" and is shared by both serial interface and the GUI. The User can change the password.

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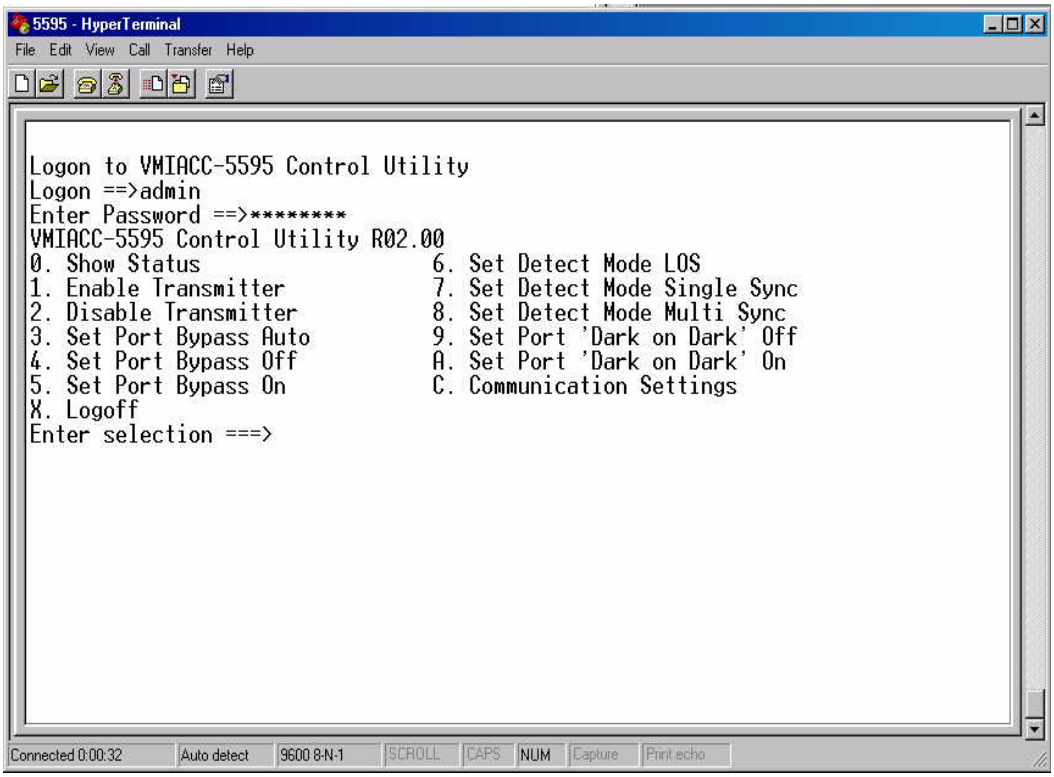


Figure 1-18 Control Utility Status Window

9. To select any of the options from this window, type in the corresponding number.

Due to hardware limitations, the settings of the Detect Mode (LOS, Single-Sync or Multi-Sync) is done in pairs of ports. The pairs are ports 0 and 1, ports 2 and 3, ports 4 and 5 with ports 6 and 7 together. Changing the Detect Mode for one port of a pair will also change the Detect Mode for the other port in the pair.

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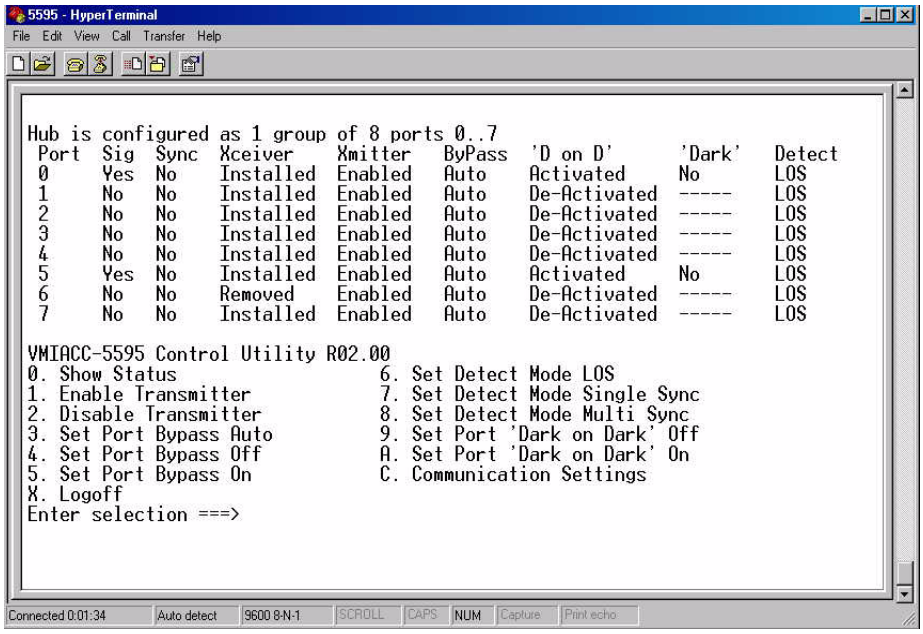


Figure 1-19 Control Utility Port Settings

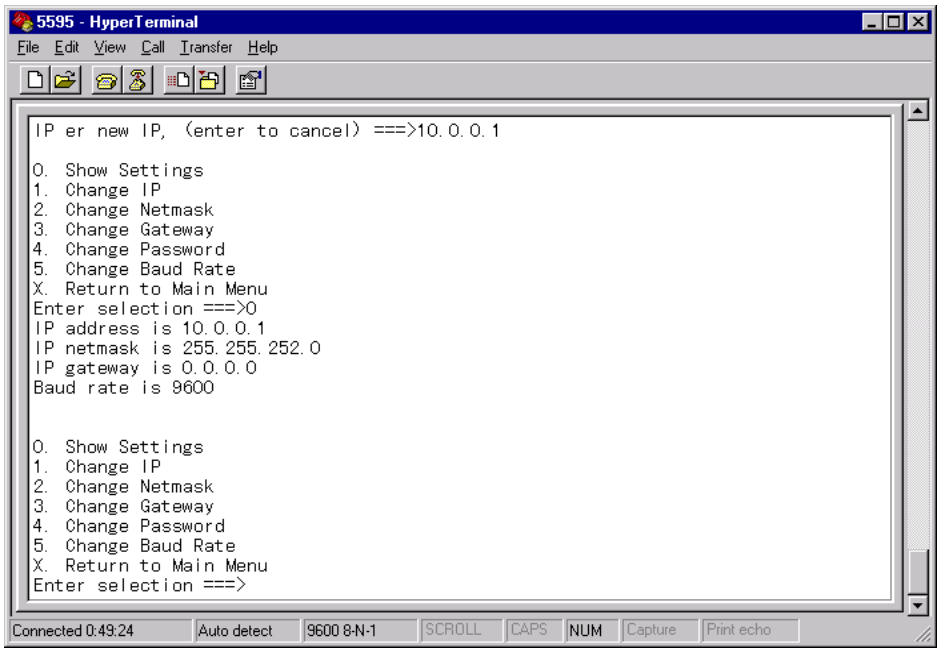


Figure 1-20 Example: Communications Settings

CAUTION: Changes to the communication settings occur immediately.

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Ethernet Port Graphical User Interface (GUI)

The GUI interface is used with an internet browser such as Microsoft's Internet Explorer.

1. This is the Logon screen seen when entering the GUI. Click the Logon button.

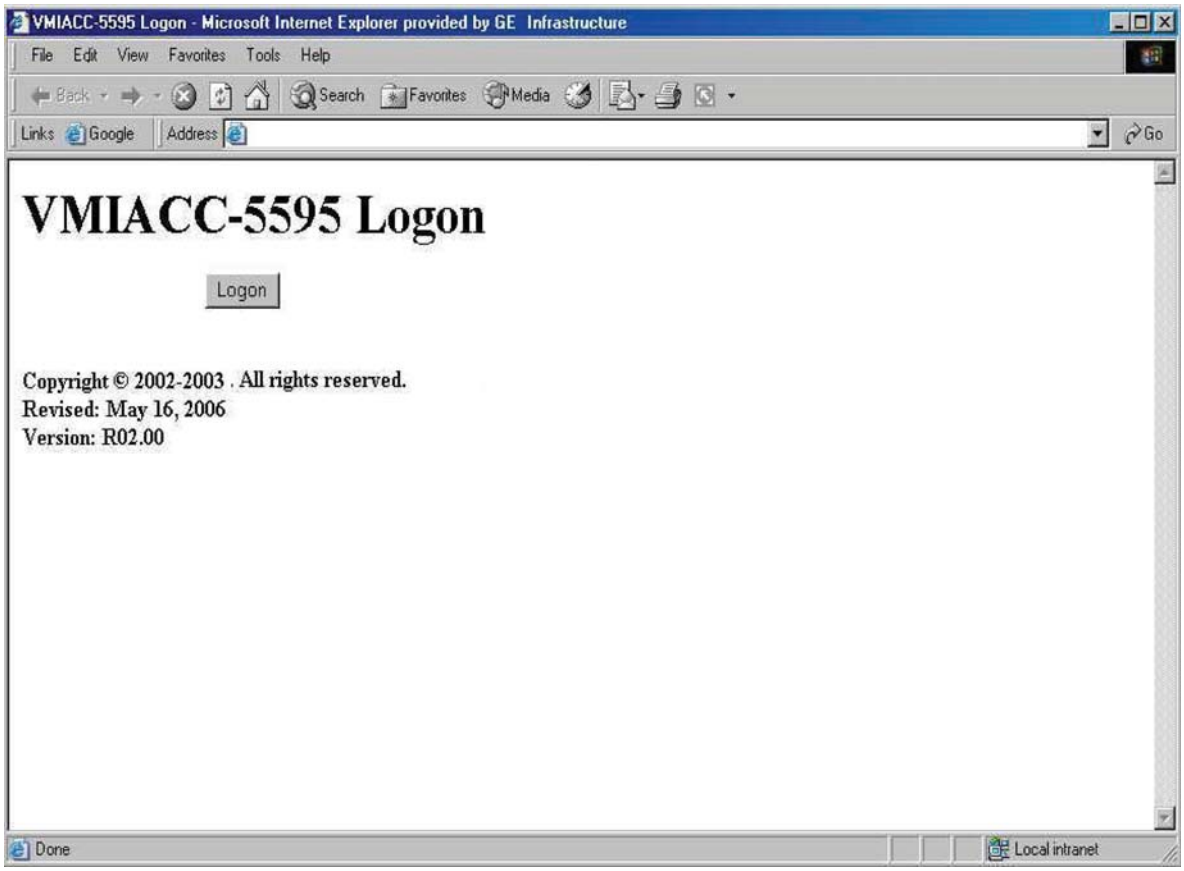


Figure 1-21 VMIACC-5595 Ethernet Port GUI Logon Screen

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2. The following screen will appear. Enter your user name and password. The user name for the login is *"admin"* and the factory default password is *"password"* without the quotes. After the initial login you can change the password.

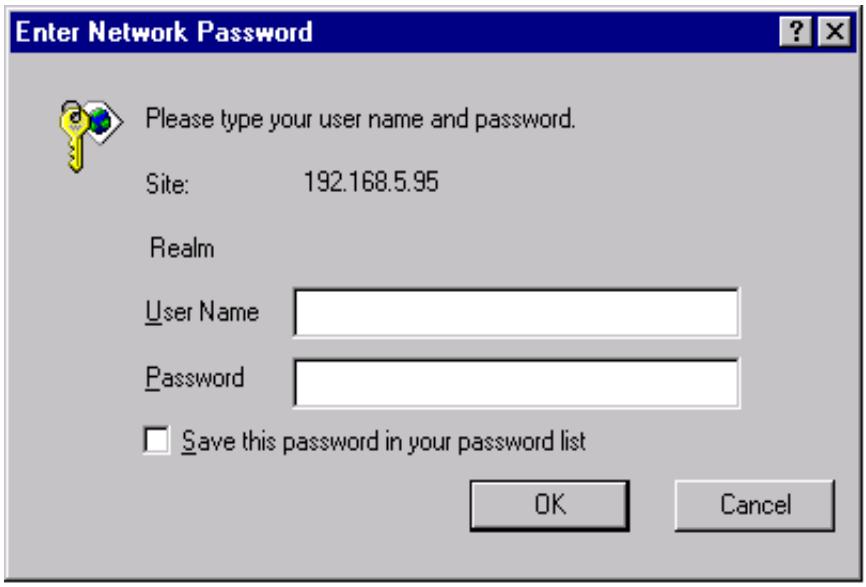


Figure 1-22 User Name and Password Screen

NOTE: The user name is always "Admin". The password can be changed. See Figure 1-33 *Change Password Screen* on page 48.

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3. The following screen is the main screen for the GUI software (Figure 1-23). From here you can control the hub. You can enable and disable any of the transmitters installed, set the detect mode and select the bypass mode condition. Click on the Communications Button and Figure 1-32 on page 47 appears.

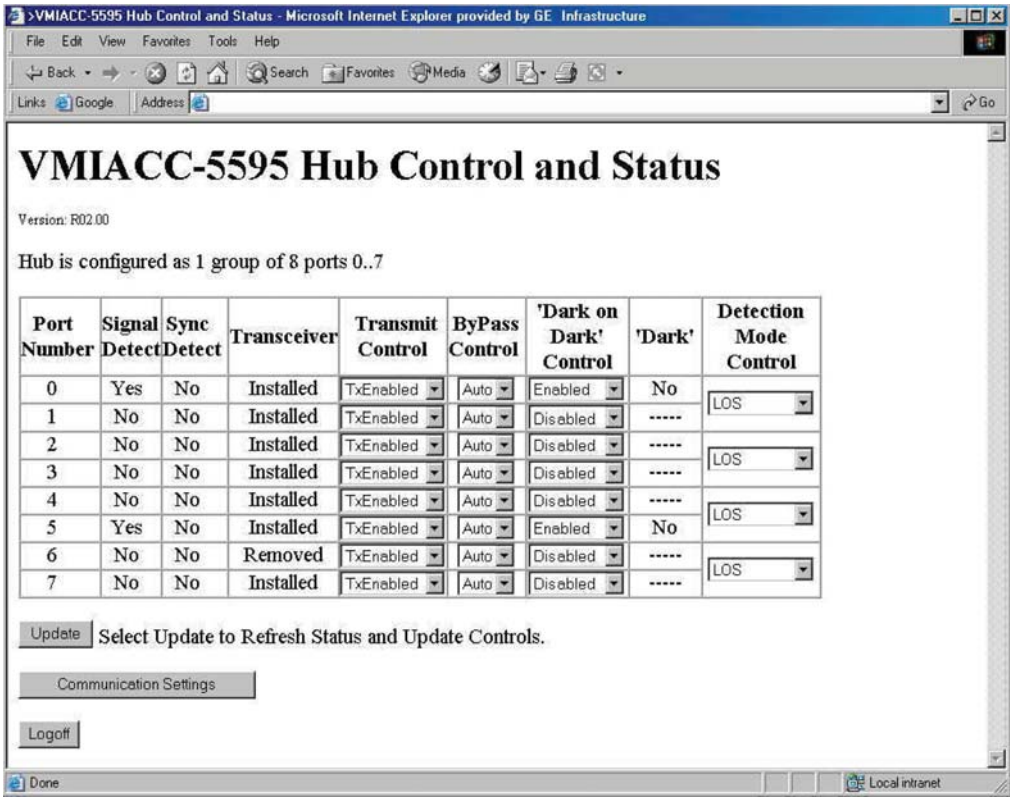


Figure 1-23 VMIACC-5595 Main Screen

WARNING: Changing the values in the Transmit Control, Bypass Control and Detect Mode columns alone will not implement the changes. Click on the Update button to submit the changes and refresh the status. The Status Screen presented by the Ethernet GUI does not update automatically. You must click on the “Update” button to see current status.

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Detect Mode Options

Loss of Signal (LOS)

Each Small Form factor Pluggable transceiver module has a LOS signal that goes high (1) when a SFP transceiver module fails to detect sufficient light within the normal spectral operating range. For Reflective Memory, the convention has been to treat this signal as a Signal Detect (not) rather than a Loss of Signal so each SFP's LOS is inverted and presented in the Signal Detect column of the Ethernet Control and Status screen. The Yellow LED adjacent to each port labeled SD also corresponds to the signal detect.

Single and Multi Sync

Each port receiver contains circuitry that detects the occurrence of a network synchronization pattern K28.5 within each period of approximately 15.5µsec. The K28.5 sync pattern occurs between all network packets and occurs repeatedly while the network is idle. In addition, this circuitry checks the incoming data stream for a valid running disparity (proper number of zeros (0) and ones (1) in each pattern), which is necessary for reliable operation. A combination of both valid sync and valid running disparity are required to constitute a "true" condition.

If the Detect Mode control is set to the Single-Sync setting, then the associated port's Sync Detect bit will either be set or reset every 15.5µsec depending on the state of this "true" condition.

If the Detect Mode control is set to the multi sync setting, then the state of the Port Sync Detect bit will only change on the occurrence of four consecutive "valid" or "invalid" periods. Until four consecutive "valid" or "invalid" periods do occur, the state of the Port Sync Detect signal will remain as before.

When Auto mode is selected in the Bypass Control options, and Single-Sync or Multi-Sync settings are selected, the port will be bypassed if the corresponding invalid condition occurs.

Due to hardware limitations, the settings of the Detect Mode (LOS, Single-Sync or Multi-Sync) is done in pairs of ports. The pairs are ports 0 and 1, ports 2 and 3, ports 4 and 5 with ports 6 and 7 together. Changing the Detect Mode for one port of a pair will also change the Detect Mode for the other port in the pair.

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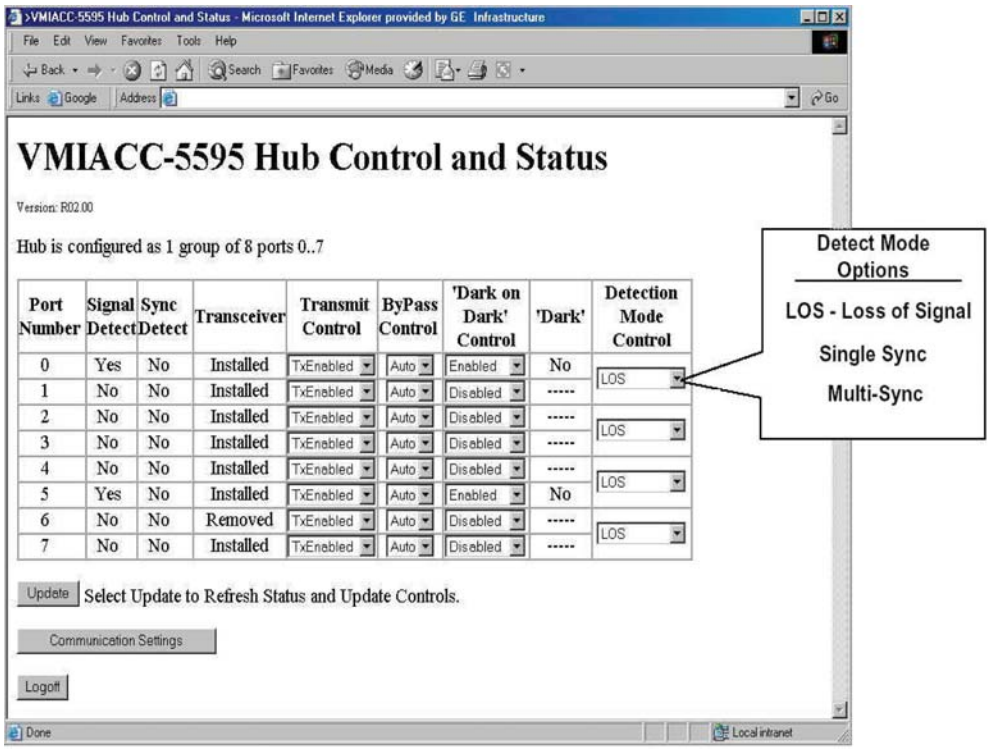


Figure 1-24 Detect Mode Options Menu

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Dark-on-Dark Enable

When this bit is set high (1), the port's transmitter will be automatically turned OFF if the port's receiver does not detect a signal. The dark-on-dark feature is useful in hub-to-hub configurations. This feature redirects an open path into smaller closed loops. This ensures that no open loops will occur due to LOS.

The following procedure is used to enable the ports after 'Dark'-ness:

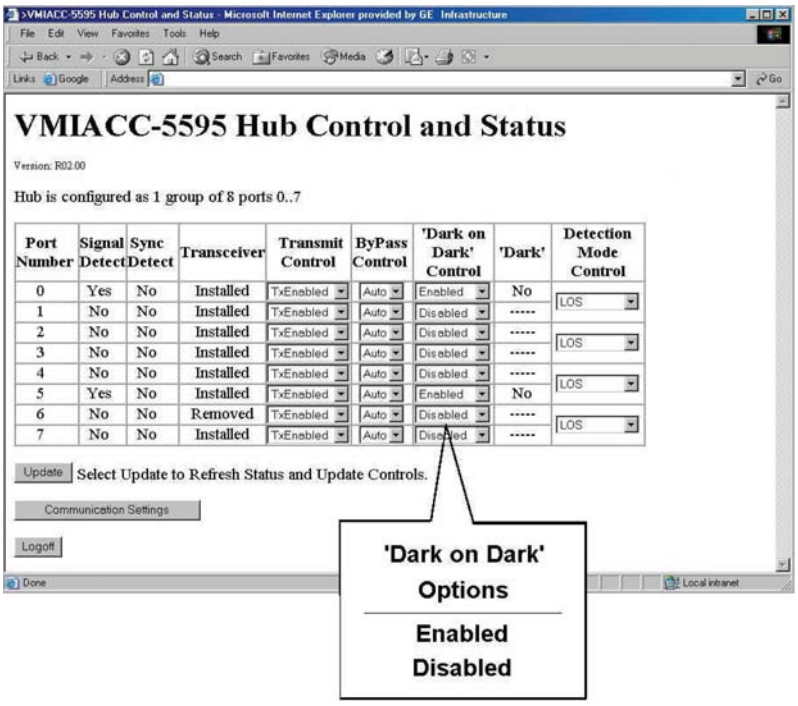


Figure 1-25 'Dark on Dark' Options Menu

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Resetting the 'Dark' Ports

1. 'Dark on Dark' is enabled and loop is intact (see Figure 1-26 for an illustration).

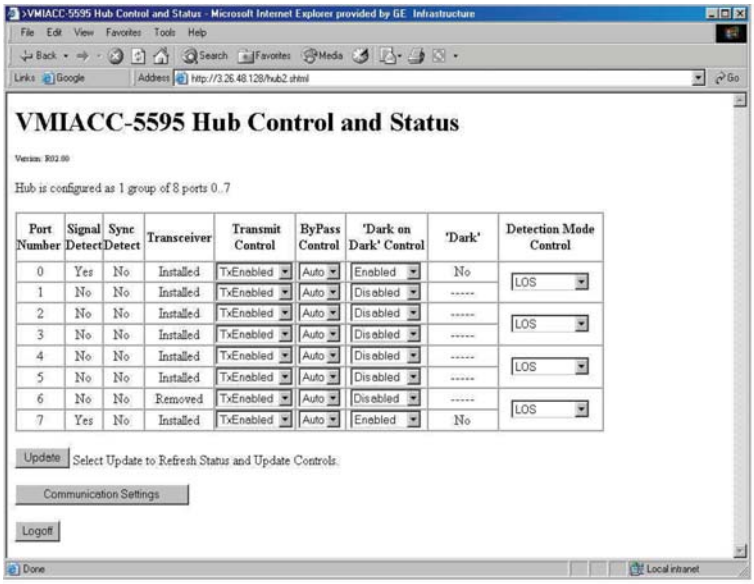


Figure 1-26 'Dark on Dark' Enable Screen

2. The ports have gone 'Dark' due to LOS.

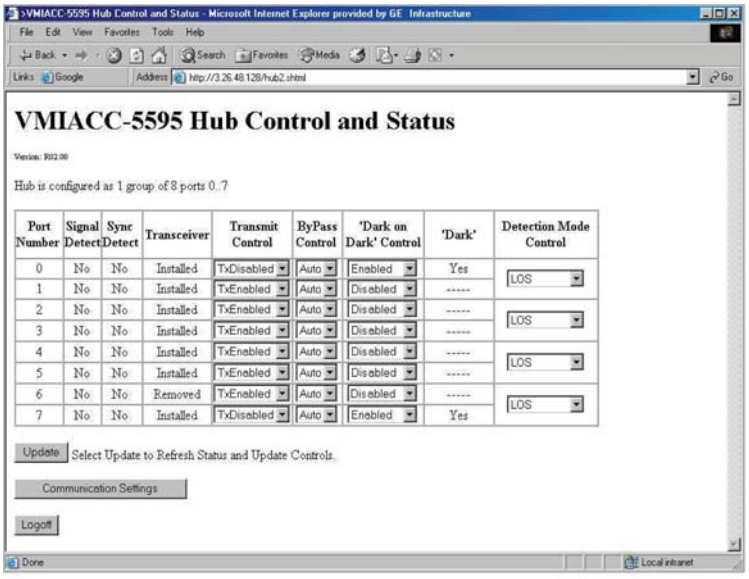


Figure 1-27 'Dark on Dark' Disable Screen

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3. Disable 'Dark on Dark' at either port of the broken link, after the connection is restored. The Transmitter is now Enabled at that port, the other port will reset after this is complete.

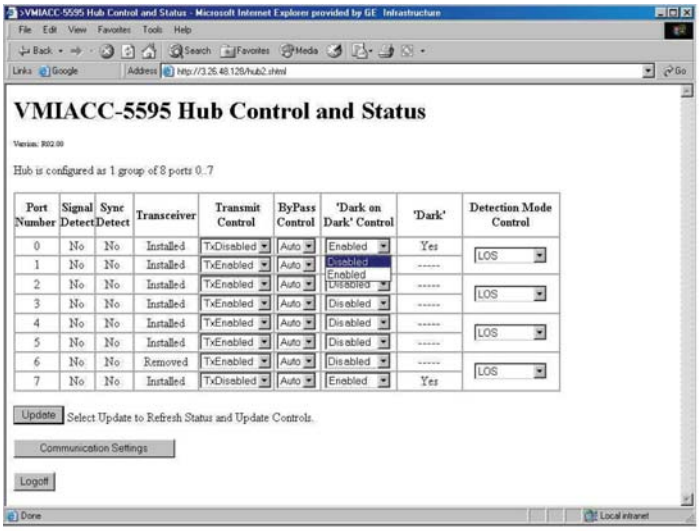


Figure 1-28 Restore Broken Link

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4. Enable 'Dark on Dark' on the port that was just disabled to return the loop to the original configuration.

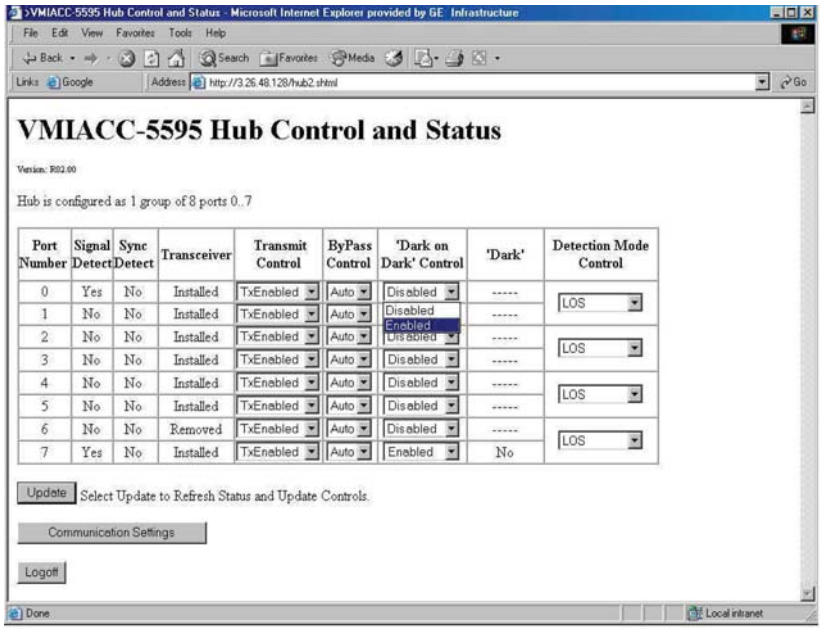


Figure 1-29 Enable 'Dark on Dark'

NOTE: To restore the ports using the serial interface, use the same procedure as outlined in the previous steps.

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Bypass Control Options

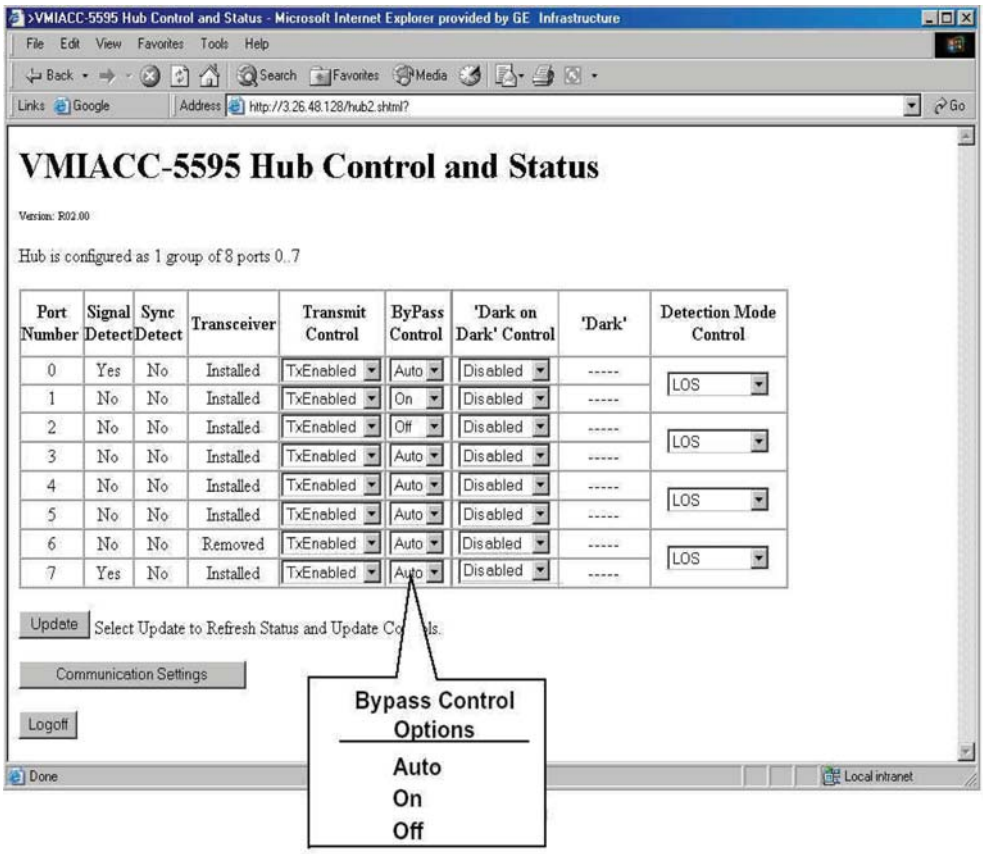


Figure 1-30 Bypass Control Options Menu

The three options of the pull-down menu for the ByPass Control column are (1) Auto, (2) On, and (3) Off. The Auto stands for automatic bypass. While in automatic bypass mode, the port is automatically active or bypassed, depending on the state of the detect source specified in the Detect Mode column. The “On” selection stands for manual ON during which the port bypassed remains ON regardless of the state of the Detect Mode. The “Off” selection stands for manual OFF during which the port bypassed remains OFF regardless of the state of the Detect Mode. Naturally, if the port is not bypassed, it must be in the active mode. Therefore, like the TxDisable control, it is possible to disrupt the network by forcing a disconnected port to the manual bypass Off state.

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Transmit Control Options

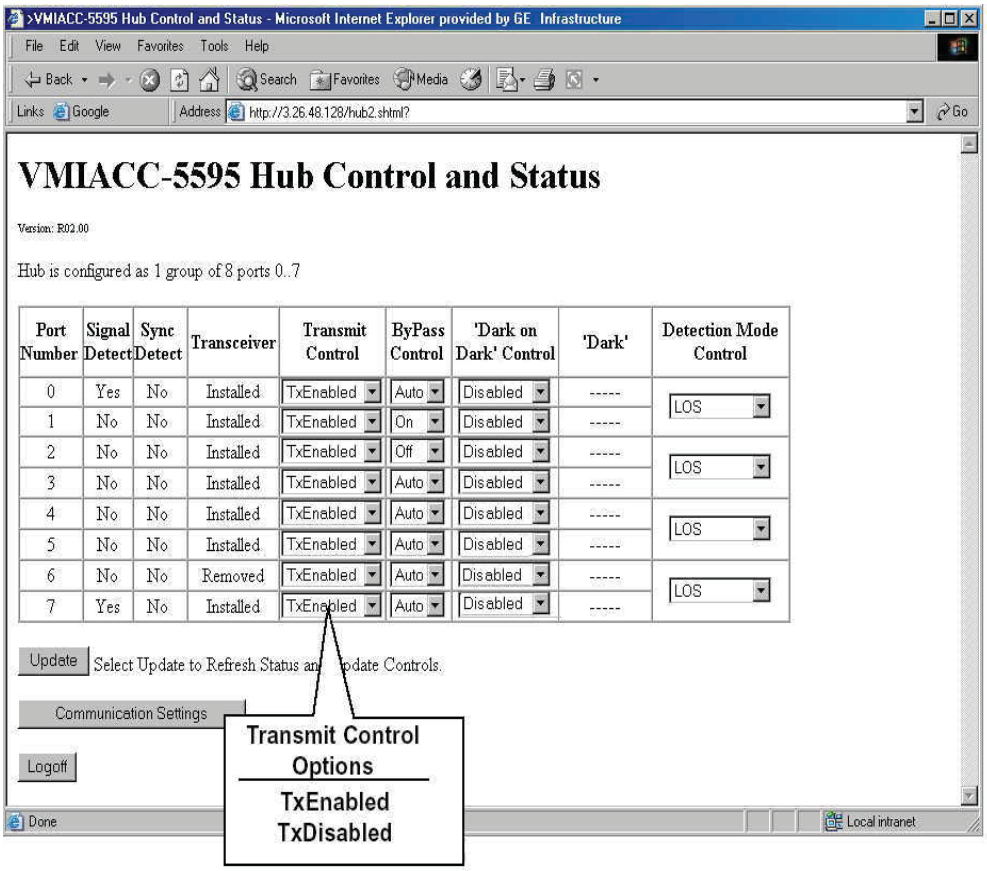


Figure 1-31 Transmit Control Options Menu

The pull-down menu options for the Transmit Control column are TxEnable and TxDisable. Their purpose is somewhat obvious but it should be noted that this control only affects the transmitter of the port. It does not affect the receiver or alter the bypass state. It is possible to disrupt the entire network by disabling the transmitter to an active node. The receiver of the port will still see light and syncs so the port will not auto bypass and yet the data packets cannot fully traverse the network. 'Dark on Dark' overrides any manual control of the transmitter.

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Communication Settings

From this screen you can set the IP Address, NetMask and Baud Rate. When shipped, the VMIACC-5595 has an IP Address of 10.0.0.1, a NetMask of 255.255.255.0 and a Baud Rate of 9600. These are the default settings. After making your changes, click the Submit button to save the changes.

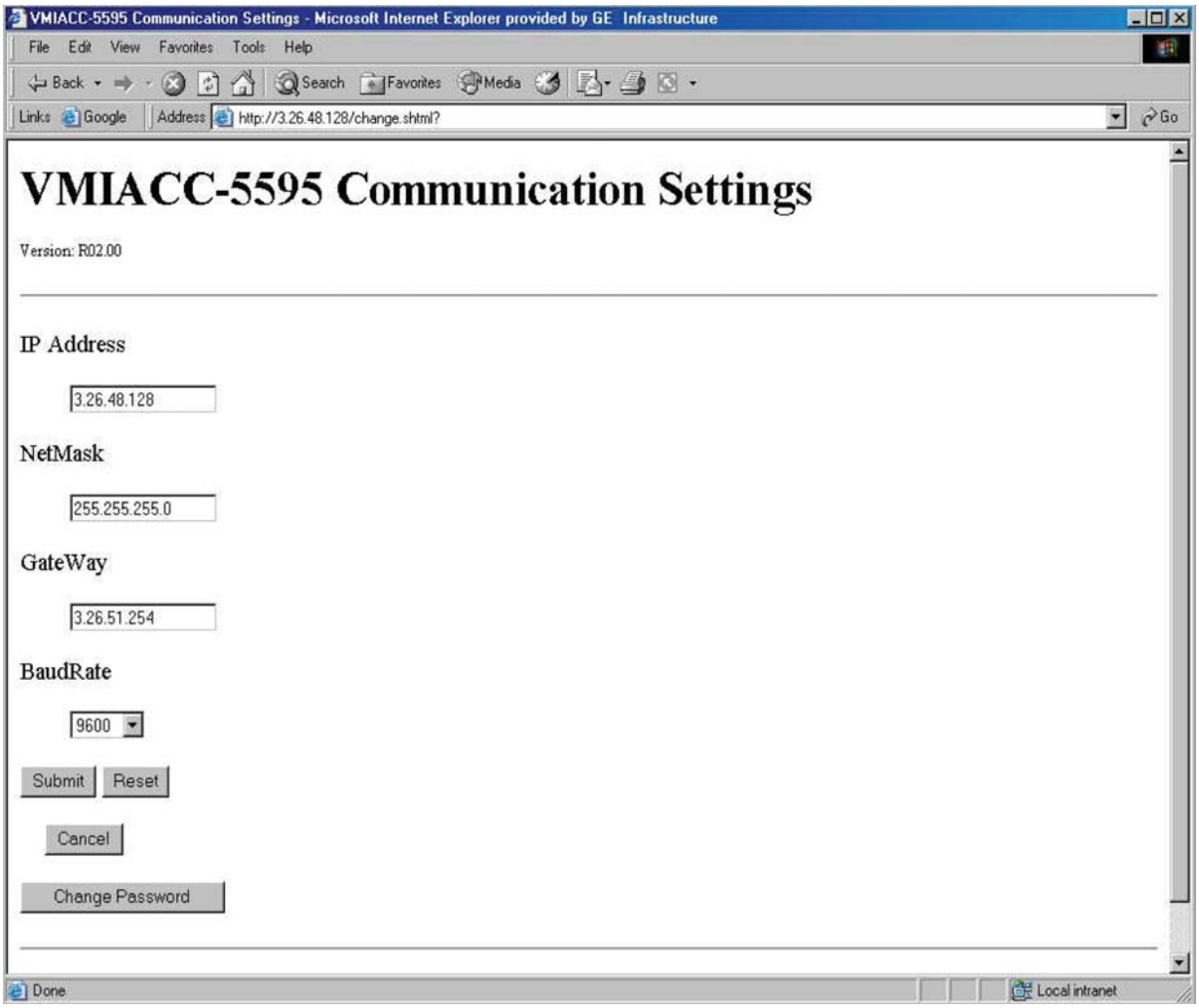


Figure 1-32 VMIACC-5595 Communication Screen

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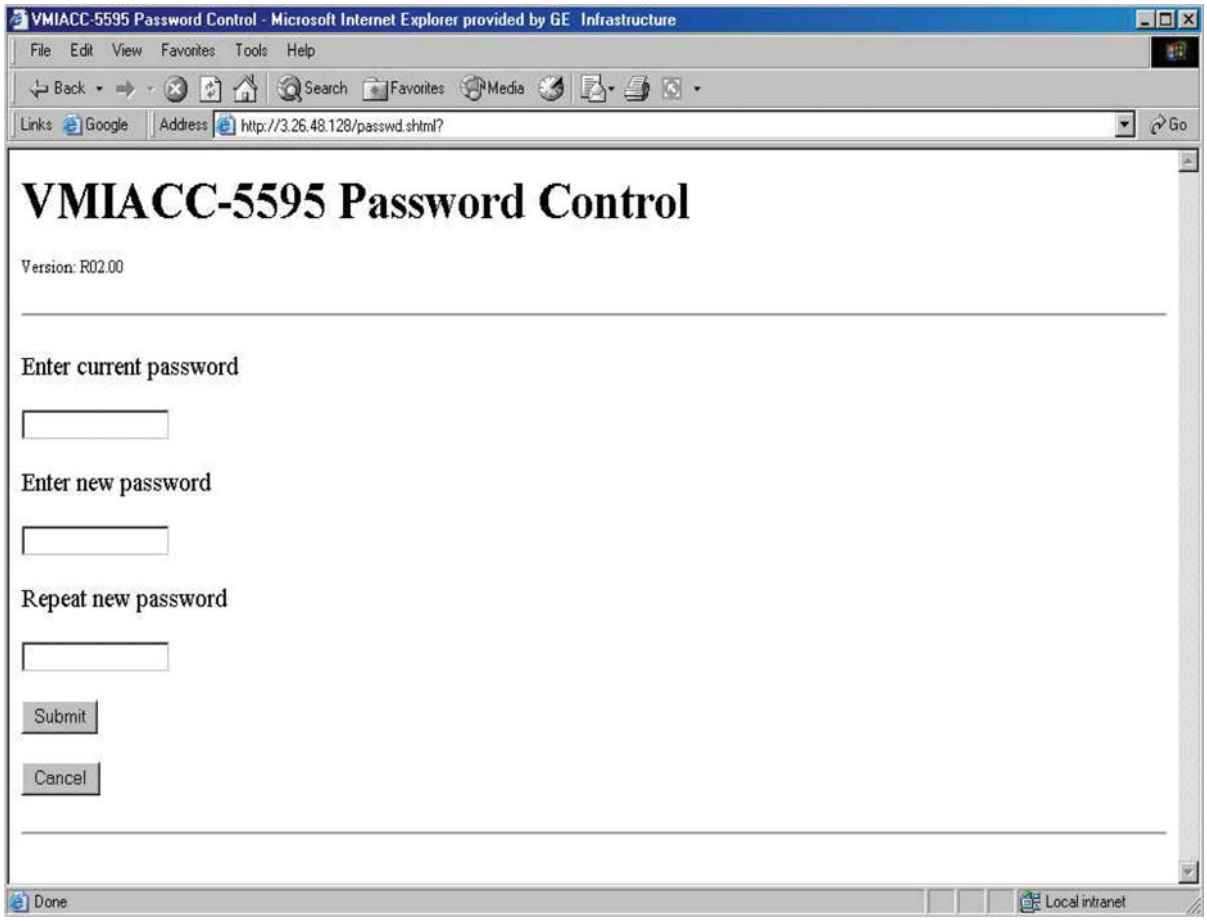


Figure 1-33 Change Password Screen

Click on the Change Password button in the Communication Settings screen to display the Change Password screen. If the current password and new password are entered correctly, the user name and password screen as shown in Figure 1-33 will appear. Otherwise, the GUI will prompt you that the change is invalid and will not occur.

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Maintenance

If a GE product malfunctions, please verify the following:

1. Software resident on the product
2. System configuration
3. Electrical connections
4. Jumper or configuration options
5. Boards are fully inserted into their proper connector location
6. Connector pins are clean and free from contamination
7. No components or adjacent boards were disturbed when inserting or removing the board from the chassis
8. Quality of cables and I/O connections

If products must be returned, contact GE for a Return Material Authorization (RMA) Number. **This RMA Number must be obtained prior to any return**. The RMA is available at Customer Care.

GE Customer Care is available at:
(or 1-800-433-2682), 1-780-401-7700.
Or visit our website at www.ge-ip.com

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Maintenance Prints

User level repairs are not recommended. The drawings and diagrams in this manual are for reference purposes only.

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Compliance Information

This chapter provides the applicable information regarding regulatory compliance for the VMIACC-5595.

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CE

GE VMIACC-5595 has been evaluated to and has met the requirements for compliance to the following standards:

- EN55024
- EN55022, Class B
- EN61000-4-2
- EN61000-4-3
- EN61000-4-4
- EN61000-4-5
- EN61000-4-6
- EN61000-4-11
- EN61000-3-2
- EN61000-3-3

International Compliance

It has also met the following international levels.

European Union

- EN55024 (1998 w A1:01 & A2: 03)
- CISPR22, EN55022 (Class B)
- CISPR11, EN55011(Class B, Group 1)

United States

- FCC Part 15, Subpart B, Section 109, Class B
- CISPR 22 (1997), Class B
- ANSI C63.4 (2003) method

Australia/New Zealand

- AS/NZS CISPR 22 (2002) Class B using:
- EN55022 (1998) Class B

Japan

- VCCI (April 2005) Class B using:
- CISPR 22 (1997) Class B
- ANSI C63.4 (2003) method

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Canada

- ICES-003 Class B using:
- CISPR 22 (1997) Class B
- ANSI C63.4 (2003) Method

FCC Part 15

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Class B

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTICE: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian Regulations

The VMIACC-5595 Class B digital apparatus complies with Canadian ICES-003.

NOTE: Any equipment tested and found compliant with FCC Part 15 for unintentional radiators or EN55022 (previously CISPR 22) satisfies ICES-003.

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