GSC3000

Remote Facilities Management

Installation & Operations Manual

Gentner

Perfect Communication through Technology, Service, and Education.™
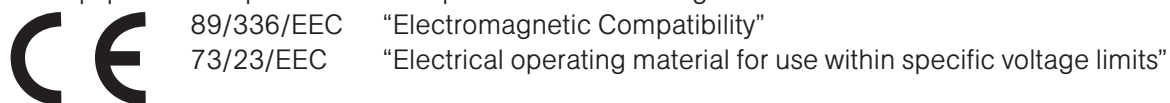
GSC3000 Installation and Operations Manual
Gentner Part No. 800-085-100 (Rev. 1.9)
October 1998

This equipment complies with the requirements of the EU guidelines:

$C\epsilon$ 89/336/EEC   "Electromagnetic Compatibility"
    73/23/EEC   "Electrical operating material for use within specific voltage limits"

Conformity of the equipment with the above guidelines is attested by the CE mark.

Table of Contents

1 Introduction

The GSC3000 is a remote control system designed to monitor and control equipment operating in remote locations. Intelligence, reliability, and versatility have made the GSC3000 one of the most popular remote facilities management systems today.

With release 1.9, many new capabilities and features have been added to the GSC3000. All changes are made in response to the requests of our customers. The Gentner commitment is to improve our products to better serve you.

This manual has been redesigned to be more readable and easier to use. We recommend that you familiarize yourself with this manual in order to take full advantage of all of the GSC3000's capabilities.

What's In This Manual

The manual is divided into the following sections:

"Overview" is a basic introduction to the GSC3000, including a brief discussion of the new features that are available in the new software and firmware versions with release 1.9.

"Quick Setup" is a section for advanced users or those who are already familiar with the GSC3000. This section is the quickest way to get your system up and running.

"Installation" provides detailed information on how to connect the GSC3000 hardware to your equipment. This section also includes software installation instructions.

"Configuration" discusses the GSC3000 Configuration program. This section describes how to set up the GSC3000 hardware and software to monitor and control your equipment.

"Monitoring" describes how your system will operate on a day-to-day basis. You will learn how to operate the GSC3000 Monitor program, handle alarms, and issue commands from your PC.

"Macros" is a section devoted completely to macro programming, the powerful tools that give the GSC3000 its intelligence.

"Troubleshooting" provides suggestions for addressing technical problems that may occur during installation or operation.

"Appendices" include additional information such as technical specifications, connector pinouts, as well as sections for the Voice Interface and Network Module.

Be sure to refer to our new glossary and alphabetical index for quick reference information.

For additional help on how to install, set up, or operate the GSC3000 system, please contact Gentner in any of the following ways:

Telephone:	1.800.283.5936 (USA)	**or** 1.801.974.3760	
Fax:	1.800.933.5107 (USA)	**or** 1.801.977.0087	
Internet:	www.gentner.com	**e-mail:** tech@gentner.com	

Gentner Communications Corporation
1825 Research Way, Salt Lake City, UT 84119

Unpacking

You should have received the following items with each GSC3000 I/O unit you have purchased.
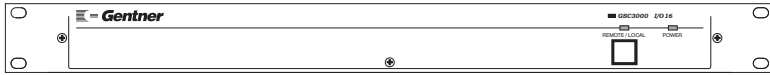
GSC3000 I/O Unit

10-inch G-Bus
Jumper
Part 830-085-104

G-Bus
Terminator
Part 830-085-100

AC Power Cord
Part 699-150-006

Solder-cup Mating
Connectors (x4)
**Parts 671-003-037
and 671-020-037**

DB9-to-DB9
Null-Modem Cable
Part 830-085-101

DB9-to-DB25
Modem Cable
Part 830-085-102
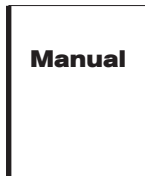
Manual

GSC3000 Installation
and Operations Manual
Part 800-085-100
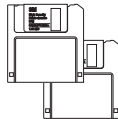
Software
Diskettes
Part 806-085-100

Gentner Communications is not responsible for product damage incurred during shipment. You must make claims directly with the carrier. Inspect your shipment carefully for obvious signs of damage. If the shipment appears to be damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

You should have received the following items with each Command Relay Unit you have purchased.

Gentner Communications is not responsible for product damage incurred during shipment. You must make claims directly with the carrier. Inspect your shipment carefully for obvious signs of damage. If the shipment appears to be damaged, retain the original boxes and packing material for inspection by the carrier.
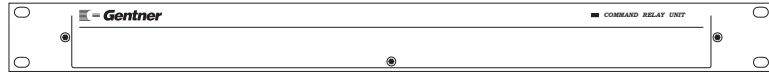
Command Relay Unit

3-Terminal Phoenix Push-On Blocks (x16)
Part 673-016-003

Accessory Cable
Part 830-085-103

You should have received the following items with each Wiring Interface unit you have purchased.
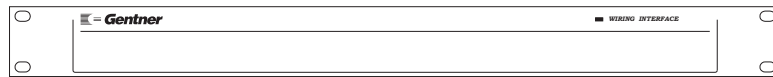
Wiring Interface

2-Terminal Phoenix Push-On Blocks (x16)
Part 673-016-002

Accessory Cable
Part 830-085-103

If you have not received any of the above items, contact Gentner immediately at either of the numbers listed on the bottom of the page.

Warranty Instructions

Please register your GSC3000 online by visiting Gentner Technical Support on the World Wide Web at **http://www.gentner.com**. When your product is properly registered, Gentner Communications will be able to serve you better should you require technical assistance. Warranty information will also be used to notify you of upgrades, new product information, etc.

2 Overview

About the GSC3000

The GSC3000 system enables you to monitor and control equipment from almost anywhere at any time. From a PC, you can connect to the GSC3000 using dial-up and dedicated telephone lines, radio (RF) links, or a direct serial port connection. By adding a Voice Interface unit, you can make observations and issue commands from any touch-tone telephone. You can even be notified of critical alarms by telephone or pager.

As an input/output device, each GSC3000 I/O unit inputs status and metering information, and outputs commands. Up to 16 units may be connected together to form a high-speed digital LAN (local area network) that operates as a single system. Commands can be issued for any I/O (input/output) unit on the LAN, and all status and metering information for the entire system can be observed through one connection.

The GSC3000 has mission-critical hardware. It is a stand-alone system which requires no external PC for normal operation. Powerful, internal microprocessors allow you to configure the GSC3000 to evaluate any situation and take corrective action when necessary. Automatic time-of-day functions minimize the amount of time you are required to spend on day-to-day operation.

About Version 1.9

The new software version 1.9 introduces the following new features and capabilities to the GSC3000. These features and others are discussed in detail in Chapter 5—Configuration and Chapter 6—Monitoring.

Two-Level Priority Alarms

A new alarm level is now available for non-critical situations. Non-critical alarms are logged for easy tracking, but no attempt is made to contact you. You can still configure critical alarms for emergencies, notifying you by phone, pager, or on your PC.

New Alarm Window Features

A new "snooze" button allows you to temporarily stop alarms from appearing in the alarm window. Alarm logging continues uninterrupted, but you are able to take action without being overwhelmed by successive alarms. You can also see when another user has cleared alarms.

Muted Alarm Indicator

Muted status or metering channels are now shown in the GSC3000 Monitor window; even alarms on muted channels are visible.

Upgrade Wizard

Version 1.9 automatically converts information from previous versions of the GSC3000 software during the installation process. This includes incompatible configuration settings and unit data files such as macros.

One-Shot Automatic Commands and Macros

The GSC3000 can be configured to take action when a status input changes state or when a metering limit is passed. The automatic responses can be commands or macros. In the past, commands or macros were issued once every second until the problem was corrected. Due to the more-efficient corrective powers of the new macros, in version 1.9 these actions are taken only once. These "one-shot" responses to status and metering changes enable the GSC3000 to correct problems without issuing unnecessary or redundant commands.

Network Communications

The new remote facilities management **Network Module** is now available for use with the GSC3000 software version 1.9. Network Module allows you to add TCP/IP capability to the GSC3000 software. You can connect to your GSC3000 hardware anywhere that your LAN (local area network) or WAN (wide area network) is accessible. Any authorized PC running the 1.9 software can access the GSC3000 hardware, provided it has the correct IP address or machine name. The PC that is connected to the GSC3000 hardware must be running the Network Module software for TCP/IP sharing to occur. A local connection (direct or 4-wire) is also required . **The Network Module is purchased separately**.

Security Information

The GSC3000 has several security features which are designed to ensure the integrity of your system hardware. The capability to issue remote commands to equipment must be taken very seriously. You should change the GSC3000's security defaults as soon as possible in order to protect your equipment.

I/O Unit Identification

Each GSC3000 I/O unit has unit-specific identification assigned by the associated Windows® software. I/O-unit ID is checked whenever communications are initiated, even before requesting a password.

User-Selected Password(s)

Any attempt at accessing a GSC3000 I/O unit through a COM port connection (direct, modem, TCP/IP, or Voice Interface) will generate a password request. The correct password must be entered before access is granted. The passwords are validated and maintained by the I/O unit. Without the correct password, it is impossible to access your GSC3000 system.

Each user is assigned a password. The access level permitted when the password is entered depends on the access level assigned during configuration. The three access levels are: "system", which allows the user to configure the system, issue commands, and make observations; "operator" which allows observation and commands, but not system configuration; and "observer" which allows system observation only.

TCP/IP Security (For Network Module Users Only)

It is impossible to access your GSC3000 system using TCP/IP without having access to your network (LAN or WAN) and the correct IP address or machine name for the connected PC. However, additional features are provided to ensure the highest possible security. By entering a list of "Allowed Client Addresses", the only TCP/IP remote users that will have access to your GSC3000 system are those who are designated on the list. A user-defined network ID number may also be assigned to your GSC3000 system, which must be included by the remote user to gain access. Finally, TCP/IP access is possible only if you configure your system for it.

Operational Requirements

PC Hardware Requirements

For best performance, your PC (minimum Pentium 133 recommended) should have 24 MB RAM, 50 MB of free hard-disk space, a free COM port, 16500 UART serial circuit, 19,200 bps or faster modem, and a mouse. Users planning to simultaneously view more than one site at a time may wish to consider a 17-inch or larger monitor. For audible alarms, a PC speaker or multimedia speakers are required.

The recommended 2-wire modem is the U.S. Robotics V.34 Sportster 33.6. The recommended 4-wire modem is the Multitech MT 2834L. These recommendations are subject to change without notice.

If you will be using the real-time automatic logging feature, a printer must be directly connected to the PC for printing of alarms and scheduled loggings.

If you have purchased the Network Module software:

To maintain a remote TCP/IP connection with your GSC3000 hardware, a PC must be directly connected to an I/O unit (either direct RS232 or 4-wire leased-line connection) and have continuous access to your LAN or WAN. The GSC3000 Network Module program must be running on the connected PC in order for a remote client to connect via TCP/IP.

Windows Requirements

To function correctly, the GSC3000 application requires Windows® 95/NT or a later version. For best visual performance, a color video mode of 800x600 resolution and a color depth of 256 colors is recommended.

G-Bus Network Requirements

The GSC3000 I/O units and Voice Interface unit may be linked together to form a RS485 LAN. The unit connections are made via a high speed digital bus called a "G-Bus" using RJ45 connectors. The sum total of all G-Bus cable running between locally connected I/O units should be 1,000 feet or less.

Power Requirements

The GSC3000 I/O unit will automatically accommodate an AC voltage-input range of 100 to 240 Vac, 50/60 Hz, 15 W. Power-line swings and brownouts have no effect on I/O unit operation.

Equipment Placement

The GSC3000 I/O unit and its accessories are designed for mounting in a 19-inch equipment rack.

Safety Information

The front panel of the GSC3000 I/O has one button which allows you to switch operational modes. The standard mode of operation is the remote mode, which is indicated by a solid green LED on the I/O unit's front panel. When the I/O unit is in remote mode, users who connect via modem, TCP/IP, direct connection, or Voice Interface may issue commands as well as view status and metering input information.

If you are performing maintenance on you communications equipment, you must press the REMOTE/LOCAL button to switch the unit into local mode. The LED indicator will change to a solid red color. Local mode prevents the I/O unit from issuing command outputs. All metering and status information will still be available to remote users.

Pressing the REMOTE/LOCAL button on one I/O unit will cause all other connected I/O units to be placed in local mode. G-bus networked I/O units will display a flashing red LED, which indicates that they are in local mode, but did not perform the switch. The I/O unit with the solid red LED performed the switch to local-mode. Press the button again on the same unit and all G-bus networked I/O units will return to remote mode.

> **!** **Possible injury or death may occur if a command channel is activated while you are performing maintenance on your communications equipment. It is critical that you switch the I/O unit from remote to local mode before working with connected equipment.**

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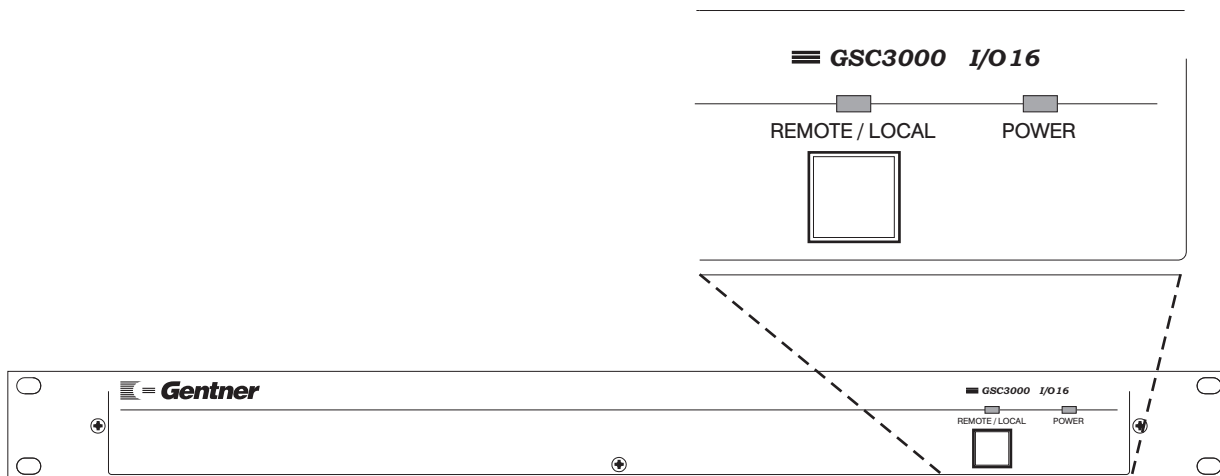
3 Quick Setup

This section has been included for advanced users or those who are already familiar with the GSC3000. Quick Setup contains a minimum of information to allow you to get your GSC3000 up and running as quickly as possible. For more complete instructions, refer to Chapter 4—Installation and Chapter 5—Configuration.

Hardware Connections

Connecting an I/O Unit to Your PC

· Connect the appropriate serial cable (provided) to the first available COM port on your PC. This will be either a DB9 or DB25 connector.

· Connect the other end of the serial cable to the COM 1 port on the back of the I/O unit. COM 1 is a DB9 male connector.

· For firmware upgrade, connect to COM 2 which is also a DB9 male connector.

· For information on configuring your modem, see page 38.

This section is for advanced users only. If you are not familiar with the GSC3000, skip this section and go directly to Chapter 4—Installation.

Connect here for
serial communication

I/O Unit

G – BUS 1   G – BUS 2   COM 1
                               COM 2

Connect here for
firmware upgrade
or dial-up modem

Gentner
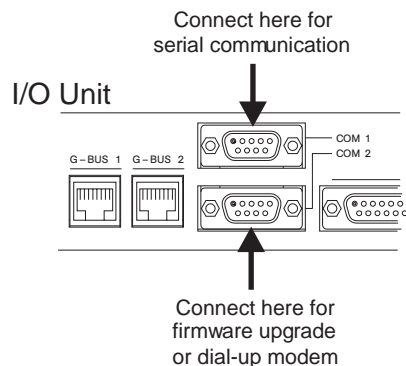
Connecting the Units of Your GSC3000 System

· Up to 16 I/O units and one Voice Interface unit may be connected using the G-bus LAN.

· Connect units using the provided 10-inch G-bus jumper. On the first unit, G-bus 1 connects to a G-bus terminator. G-bus 2 on each succeeding unit connects to G-bus 1 on the following unit in daisy-chain fashion. On the last unit, G-Bus 2 connects to a G-bus terminator.

G-bus terminator or
connect to G-bus 2
on prior unit

G-bus terminator or
connect to G-bus 1 on
a following unit
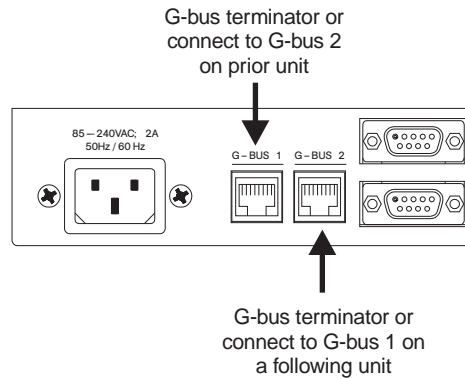
Software Setup

Before You Install

· Make sure your PC meets the necessary system requirements (minimum Pentium 133 with 24 MB RAM). See page 12 for more details.

· If you are using a previous version of the GSC3000 software, backup the data files. The Install Wizard will automatically convert macros and other data files from previous versions, but you should still create backup copies of the files in the Sitedata and Archives folders to prevent accidental loss of this information.

Install the GSC3000 Software

· Insert disk 1 into your 3.5" floppy drive.

· From the START menu on your Windows® 95 taskbar, choose RUN. In the resulting dialog box, type "A:\SETUP". The install wizard will guide you through the installation process.

Run the GSC3000 Port Wizard Program

· Run the Port Wizard by double-clicking on the program icon in the GSC program group. You may also launch the program from the Windows® START menu by choosing PROGRAMS > GSC3000 Applications > GSC3000 Port Wizard.

GSC3000 Port Wizard

· Press the button marked "Re-Detect Ports". The Port Wizard will check to see which of your PC's COM ports are connected to GSC3000 hardware. The PC COM port that is connected to your I/O unit should show "Direct Serial" as the selected option.

COMM Port 1
○ Direct Serial
○ Modem ____
○ Do not Access
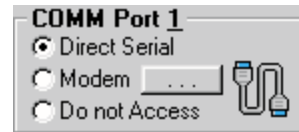
Run the GSC3000 Configuration Program

· Run the Configuration program by double-clicking on the program icon in the GSC program group. You may also launch the program from the Windows® START menu by choosing PROGRAMS > GSC3000 Applications > GSC3000 Configuration.

GSC3000 Configuration

· Press the button marked "Site Setup". Enter the site name and current network address (which should be zero unless you have changed it). From the "connect using:" pull-down menu, choose "COM 1, Direct" or another directly connected COM port. Add the site to your list by pressing "Add from below".

Site Information
Site Name **New Site 1**
Current Network Address (0-84)   **3**
Connect Using: **COM 1, Direct**

· Connect to your site by clicking on the site icon. A password will be requested. If you are upgrading from a previous version, your password has not been changed. The default password is "**GSC3000**".

Run the GSC3000 Monitor Program

· Run the Monitor program by double-clicking on the program icon in the GSC program group. You may also launch the program from the Windows® START menu by choosing PROGRAMS > GSC3000 Applications > GSC3000 Monitor.

GSC3000 Monitor

· You may also launch the Monitor program from the Configuration program by pressing the Monitor button.

Firmware Upgrade

· I/O units are shipped from the factory already loaded with the most current version of firmware. You do not need to upload firmware if the two front panel LED's (REMOTE/LOCAL and POWER) are solid green when the unit has power.

· If you are using an older version of firmware, or if the REMOTE/LOCAL LED is not solid green, you should upload new firmware. See page 30 for more instructions. The latest firmware can be downloaded from our web site at **www.gentner.com**.

Changing Network / Unit Numbers

· If you will be connecting more than one I/O unit in a G-bus LAN, each unit must be assigned an individual unit number. The first unit in your network must be number "0". If you are using a Voice Interface unit, it must be assigned as unit number "16".

· If you will be connecting to more than one GSC3000 site, each site must have its own network number. You must also assign each unit in the site the same network number.

· You must connect to each I/O unit separately to assign the unit number. Connect to the COM 2 port on the I/O unit. The G-bus must be disconnected from all units before you attempt to reassign the numbers.

· To assign unit addresses, run the Configuration program. From the "Site" pull-down menu, choose "Unit Initialization". Then click the site icon to connect. The Unit Initialization window will open. Change the unit number and/or network number. Make sure that the UPLOAD box is NOT checked. Click OK. Connect to the next box and repeat the procedure.
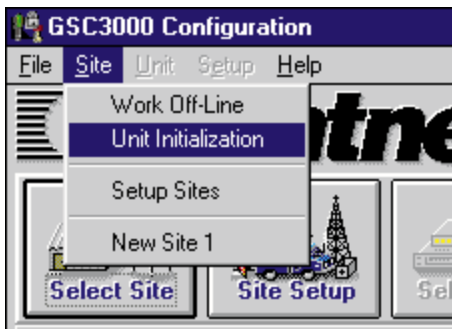
You may also change the network address (number) for all units simultaneously. Once you have assigned unit numbers, you do not need to connect to individual units to change the network address. See page 59 for details.
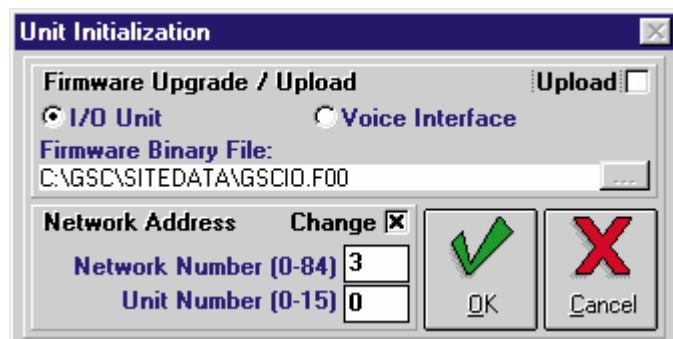
4 Installation

Before You Install

Hardware Requirements

Before you try installing the GSC3000 software, make sure your PC meets the necessary requirements. You should be using a Pentium 133 or faster, with 24 MB RAM, and approximately 50 MB of free hard-disk space. See page 12 for more details on the Operational Requirements.

Backup Previous Version Files

If you have been using a previous version of the GSC3000 software, you should backup the data files before proceeding with version 1.9 installation. The Install Wizard has upgrade utilities which will automatically convert macros and other data files from previous versions, but you should still create backup copies of these files. This precaution will prevent accidental loss of information should the software be unable to properly convert your files.

You can make backup copies using Windows® Explorer to copy and paste the files to another folder on your hard-drive such as the "My Documents" folder. You may also save copies to a floppy disk. The files you should copy are located in the GSC folder on the root directory of your hard-drive (ex. C:\GSC). Copy these folders and any files they contain: ARCHIVES, CUSTVIEW, and SITEDATA. You do not need to back up any of the previous version program files, only the data files.
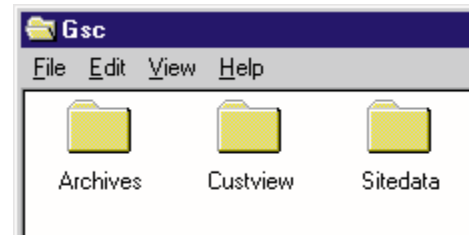
Installing the Software

The first step in setting up your GSC3000 system is the software installation. The GSC3000 software operates in Windows® 95 / NT or a later version.

To install the software, start Windows® and close all program applications so that only Windows Explorer is running. Insert the install disk 1 into your 3.5-inch disk drive (A: or B: depending on your hardware configuration).

Click on the START button on you taskbar and choose RUN. Type "A:\Setup.exe" (or "B:\Setup.exe").
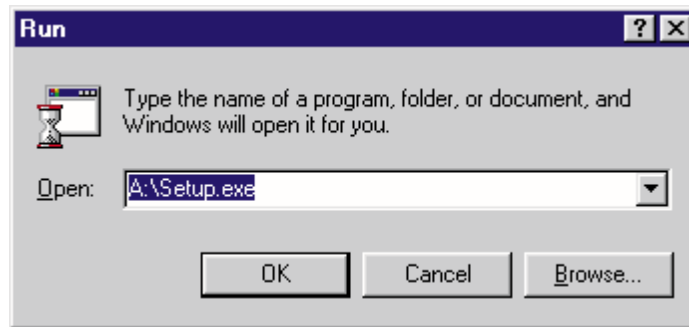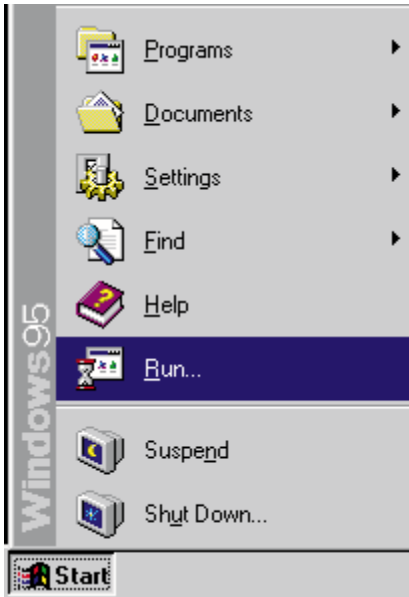
Setup will launch the InstallShield Wizard which will guide you through the installation process.
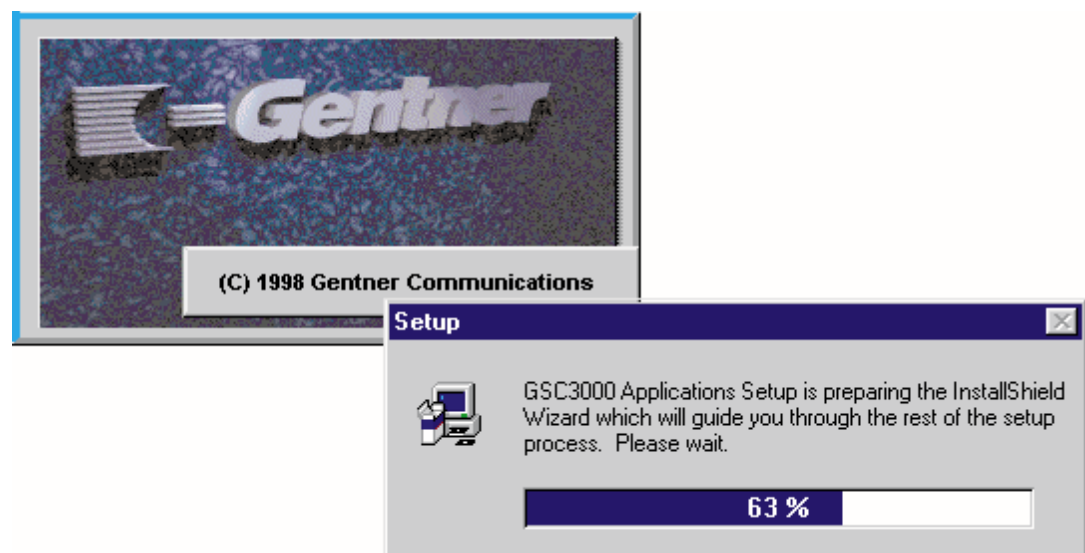
When you reach the welcome screen click NEXT to continue installation or CANCEL to abort the installation.

The following screen allows you choose where you want to install the GSC3000 software on your hard drive. We recommend that you use the default, but you may select a different directory if you like. If you have been using a previous version of GSC3000 software, be sure that the directory you choose is the same as the previous version's. Otherwise the Upgrade Wizard conversion utilities will not convert your old files for use with version 1.9. To change directories, click BROWSE.

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Choose NEXT and the Install Wizard will install the GSC3000 software files to the selected location. Exchange disks in the floppy drive when you are prompted to do so.
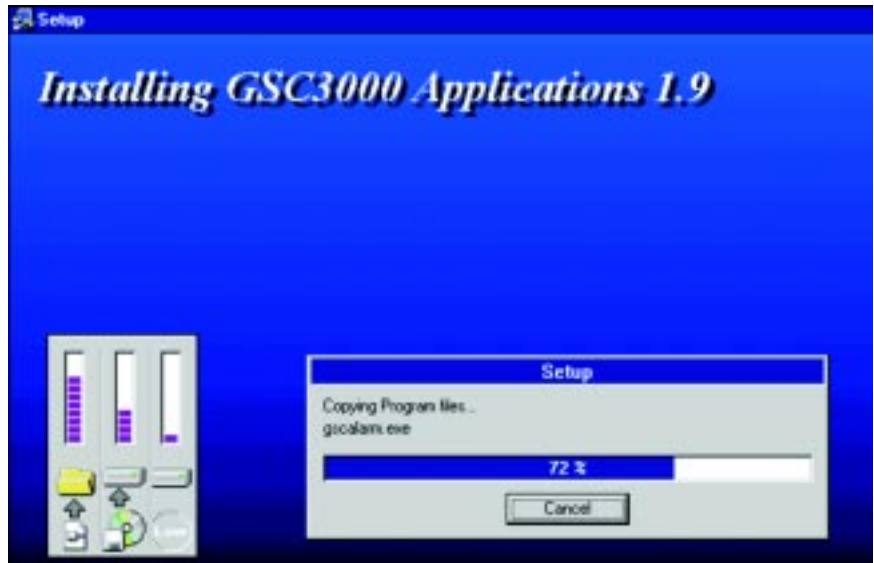
Install Wizard will create a program group called "GSC3000 Applications" in your startup menu.

Wait a few seconds and a box will appear on your screen indicating that installation is complete. Click OK and remove the floppy disk from your floppy drive.

Connecting to the I/O Unit

The first step in installing your GSC3000 systems is to establish communications between your PC and the I/O units. The GSC3000 software can communicate through up to nine serial ports simultaneously.

PC COM Ports

Before connecting to the I/O unit, you should determine which COM ports on your PC are available. Go to the START menu, select SETTINGS, and open the CONTROL PANEL.
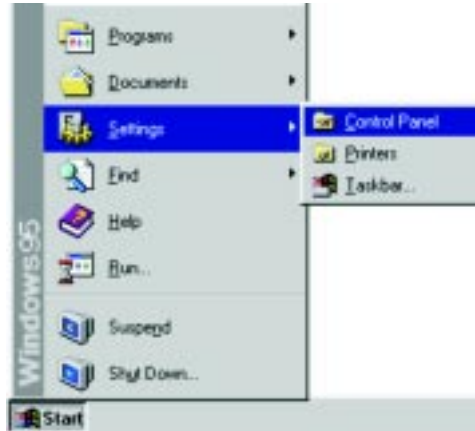
Double click on the SYSTEM icon and choose the DEVICE MANAGER tab. Double-click on PORTS and you will see a list of ports that Windows® 95 recognizes on your machine.

> **If one of your COM ports is devoted to a serial mouse (RS232 nine-pin), you can free up the COM port by switching to a PS/2 mouse.**

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Port Settings

Once you have selected the port(s) you will use to connect to your GSC3000 system, you should check the port settings. In the Device Manager window (see previous page), click once to select the desired port. Then click on the PROPERTIES button. This will open the Port Properties window (see below). Click on the PORT SETTINGS tab.
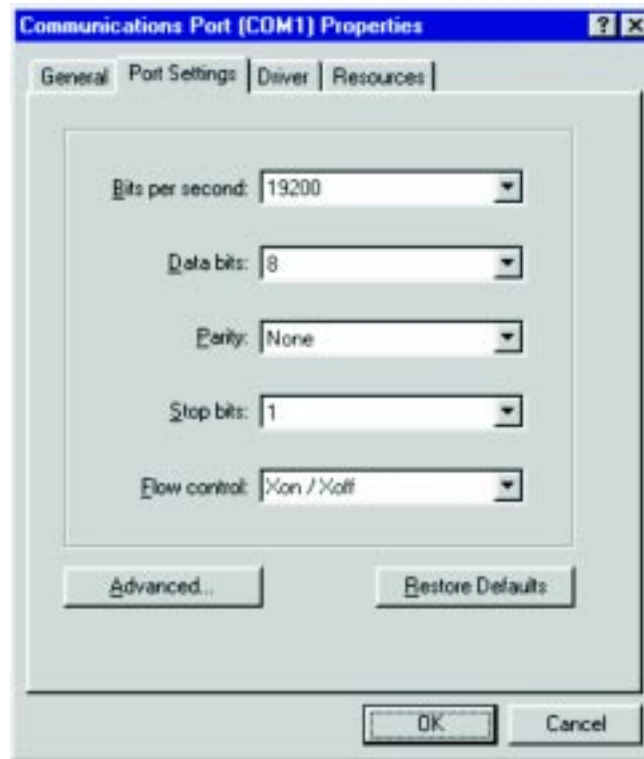
The **baud rate** should be set to a minimum of 19,200 bps. The setting may be higher than 19,200 without any problem because the GSC3000 Comm Server will automatically reduce the baud rate to its setting. However, if your COM port is set to a lower baud rate, you may have trouble communicating with your GSC3000 system.

Data bits should be set to "8".

Parity should be set to "None".

Stop bits should be set to "1".

The **flow control** may be set to either "Xon/Xoff" or "Hardware" without ill effects.

The same COM port settings apply if you are using a modem. For more information on modem configuration, see page 39.

I/O Unit COM ports

The first step in hardware installation is establishing communications with the GSC3000. Before making any other connections to an I/O unit, connect the I/O unit's COM 1 to any available COM port on your PC. COM 1 is a DB9 male connector. Your PC COM port will either be a DB9 male connector or a DB25 male connector. The cables provided are for connection to a DB9 COM port (more common). For your initial communication, a direct connection is recommended.

Serial Cables. Whether you are making a direct connection or connecting through a modem, use only the provided null-modem cable. These cables are wired to meet the specific requirements of your I/O unit. To extend the serial cable, connect the Gentner serial cable to your I/O unit and plug a straight-through extension into the Gentner cable. You will need a female-to-male extension to make the connections (the female to connect to the PC, and the male to connect to the Gentner cable). See Appendix B: Pinouts for more information.

If your COM port is a DB25 connector, you will need to have a DB25 female-to-DB9 male straight-through adaptor to connect to the provided cable. See Appendix B for pinouts.

The I/O unit shown in the diagram is an I/O 16. COM 1 and COM 2 are located in the same position on an I/O 8 unit. For most direct communications to the I/O unit, you will use the COM 1 connector. COM 2 is reserved primarily for uploading firmware and assigning individual unit numbers.

PC to I/O COM 1

85—240VAC; 2A
50Hz / 60 Hz

G–BUS 1   G–BUS 2

COM 1
COM 2

METERING   STATUS   COMMAND 1–8   COMMAND 9–16

Gentner
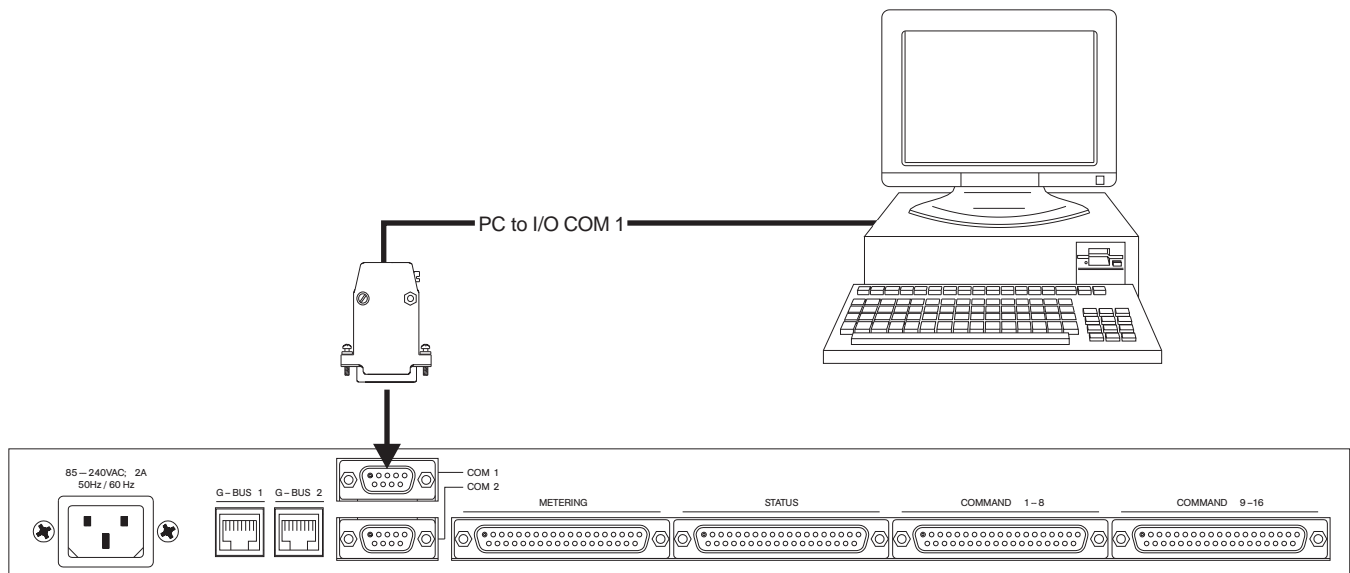
Gscports.exe

Run Port Wizard

You should now run the GSC3000 Port Wizard. The Port Wizard enables you to configure the COM ports on your PC for communication with GSC3000 system. If you run Port Wizard by double-clicking on the executable file (default path C:\GSC\GSCPORTS.EXE), it will automatically attempt to detect which of your PC COM ports are connected to an I/O unit or a modem. If you chose to run Port Wizard from the shortcut in the START menu (PROGRAMS > GSC3000 APPLICATIONS), you will need to click on the button marked "Re-Detect Ports" for detection to occur.

The I/O unit or modem must have power for Port Wizard to recognize the connections. If no connections are recognized, check your power and serial connections and click the button marked "Re-Detect Ports".

The GSC3000 can communicate through nine COM ports simultaneously. This allows you to connect to up to nine different GSC3000 sites via modem and/or direct connection. For speed and convenience, the Port Wizard defaults to detect only four COM ports. To detect up to 9 COM ports, click on the button marked "Handle COM Ports 1-9". Then click on "Re-Detect Ports". You can return to four-port detection by clicking the button marked "Handle COM Ports 1-4 Only". When you are finished detecting the ports, click "Exit".
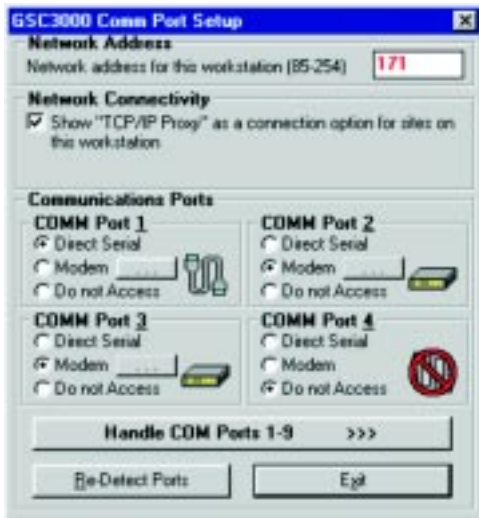
Port Wizard is also used for modem configuration which is discussed beginning on page 39.

Network Address is used by the I/O unit to recognize which PC it is communicating with. The number in the box is randomly assigned from 85-254. The network address for the workstation is important if more than one PC will be communicating with a GSC3000 system. Each workstation must be assigned a unique address.

The check mark in the Network Connectivity box allows you to use TCP/IP as a proxy COM port to communicate over a computer network. For more information, see page 59. **Network Module required.**

Site Setup

After you have detected the PC ports, you should run the GSC3000 Configuration program. During installation, you will use the Configuration program to establish the parameters for communications with your individual I/O units. This program will also be used later on to configure all of your I/O units (see Chapter 5—Configuration).

To run GSC3000 Configuration, double-click the Configuration icon in the GSC program group. You can also run it from the START menu in PROGRAMS > GSC3000 APPLICATIONS > GSC3000 Configuration.

GSC3000
Configuration

When the Configuration program first opens, the site window will contain only an icon entitled "Edit Default Unit". This is because no sites have been established. Once you have created a new site during site setup, a Site icon will appear in this window. The default unit is a practice unit that can be used to familiarize yourself with the unit configuration procedures. To remove the default unit from the site window, go to File and click on "Show Default Unit" to deselect it. To setup your site, click on the large button marked "Site Setup".

Site Setup
Button

GENTNER
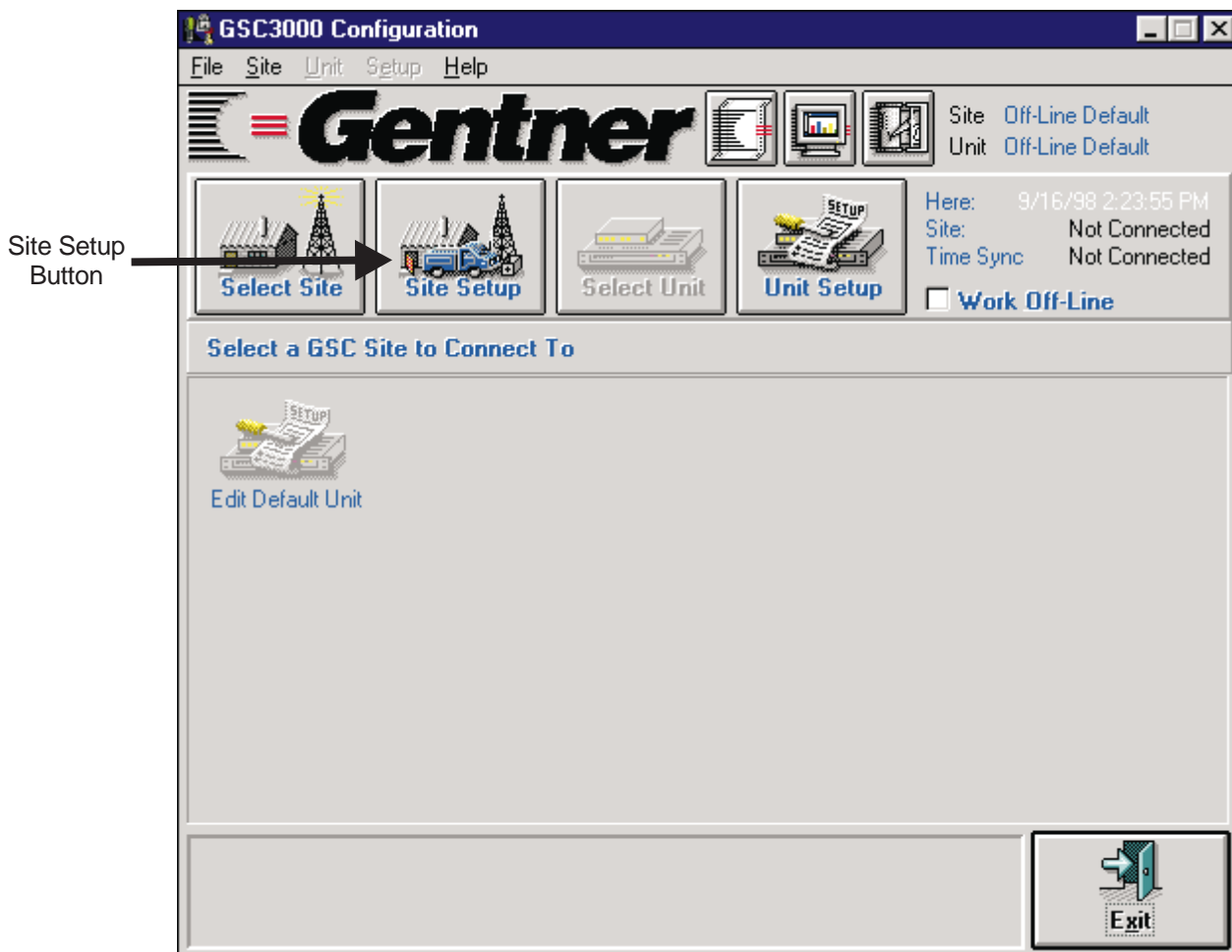
The Site Setup window is used to define the manner in which your PC will communicate with your GSC3000 site(s). At this point in the installation, you only need to set the parameters that apply to a direct serial connection with one I/O unit. These will be discussed in the order they are labeled below. All of the parameters of a complete site setup will be discussed in Chapter 5—Configuration.
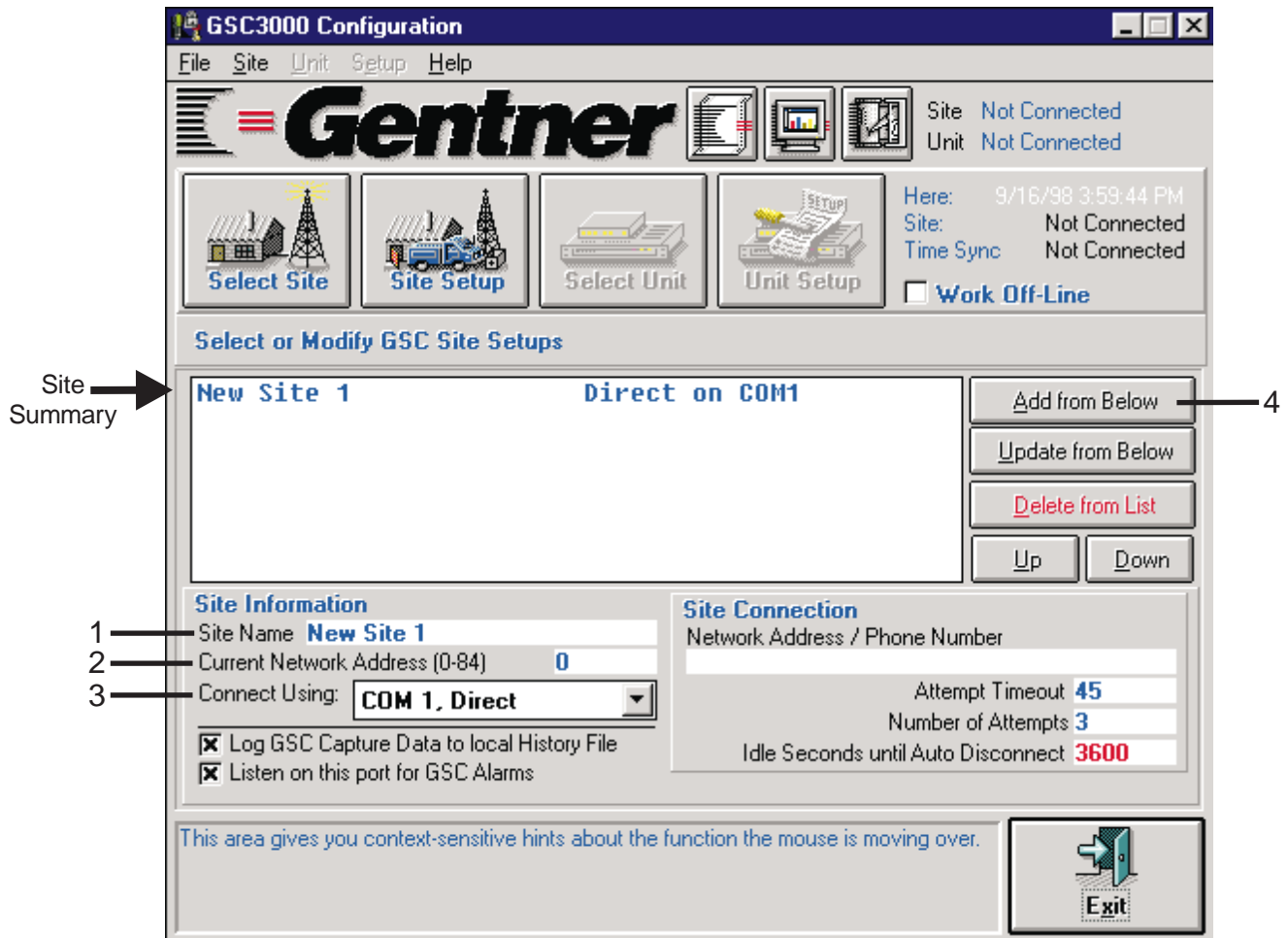
1. Site Name. Enter a descriptive name for this site. Because you are connecting to a unit on the bench to test communications, you may want to call it something like "temp site" and delete it later on.

2. Current Network Address. The network address should match the address set in your I/O units. The default should be left at "0" at this point. Later on you can change the network address to differentiate one site from another.

3. Connect Using. Choose the COM port you will be connecting through. The port setting will also be indicated (ex. COM 1, Direct; COM 2, Modem). "TCP/IP Proxy" is a choice which will be discussed in Chapter 5. For bench testing of communications, you should choose a direct connection.

4. Add From Below. When you have set parameters 1-3 above, click this button. The new site will appear in the Site Summary window.

Connecting

Once site setup is complete, click on the "Select Site" button. An icon for your new site should appear in the site window. Click on the new site icon and the Configuration program will try to connect to the site. If the attempt is successful, the Site Access window will open and request a user password. The default system password is "**GSC3000**". Information on changing the system password can be found on page 71.

Click Here to View Sites →

Select a GSC Site to Connect To

Click Here to Connect to Site →
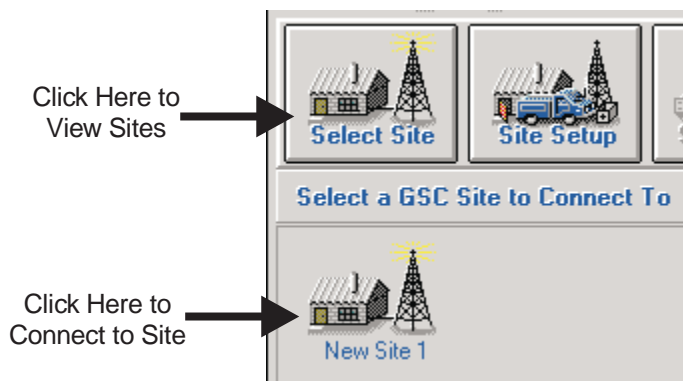
New Site 1

After the password is accepted, the Configuration software will query the new site for units. Allow the query to run a complete cycle (1 through 19), even if you have only one unit connected. An new unit icon should appear in the site window.

Select a Unit At a GSC Site to Connect To

Unit 0

Querying for Device 12/19

≡ = Gentner

GSC3000 Configuration ✕

⚠ GSC Site is not communicating.

[OK]
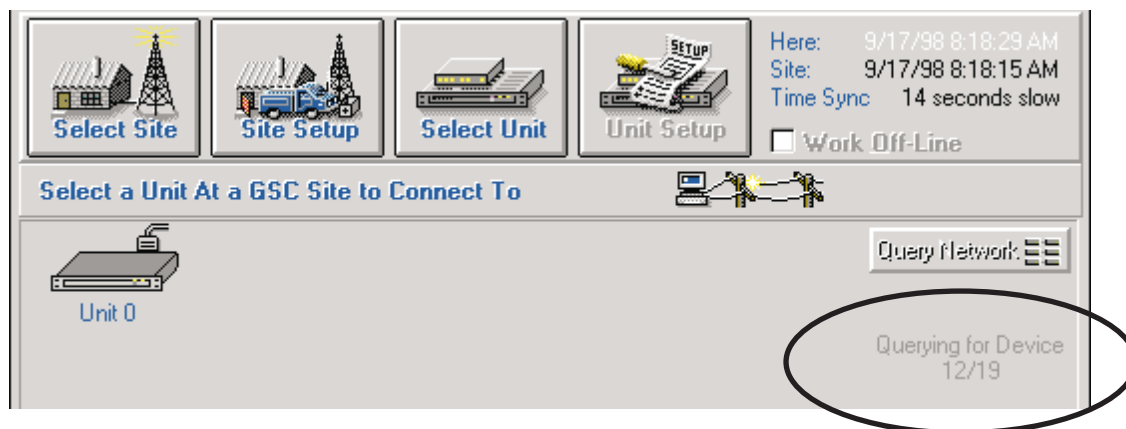
If Configuration is unable to connect to your site, you will receive an error message. Make sure that the I/O unit has power and that the serial cable is properly connected. If you are still unable to communicate with the connected I/O unit, you may need to upload new firmare. The status of the I/O unit's firmware is indicated by the REMOTE/LOCAL LED located on the front of the I/O unit. If the firmware is functioning properly, this LED should be solid green. If the LED is pulsating alternatively green and amber, there is a problem with the firmware and new firmware should be uploaded to the I/O unit. If the LED is solid amber, the I/O unit has had an operating system failure and new firmware must be uploaded. If the LED is solid red, the I/O unit is in local mode (see page 13) which does not affect the capability of the I/O unit to communicate with your PC. If you are still unable to connect after uploading new firmware, contact technical support as noted on the bottom of the page.

REMOTE / LOCAL
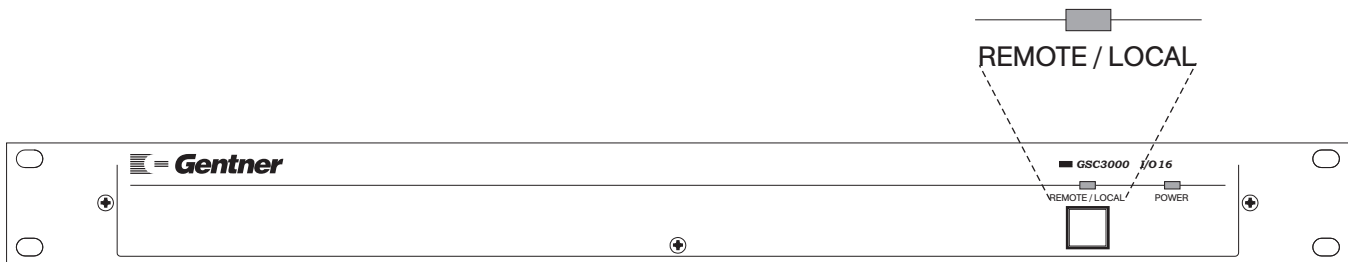
Uploading Firmware

! **Uploading firmware will reset the I/O unit. All communications to other connected I/O units will be interrupted during the upload process. We recommend that you disconnect the G-bus and connect to each I/O unit individually for firmware uploading.**

Before you try to upload firmware to an I/O unit, make sure the serial cable from your PC is connected to the COM 2 port on the back of the unit. Do not try to upload firmware to the COM 1 port. You will need to make a direct serial connection to each unit you want to update.

Connect here for firmware upgrade
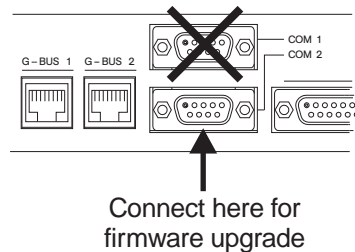
Firmware is uploaded from the Configuration program. From the "Site" pull-down menu, select the "Unit Initialization" option. Then click on the appropriate site icon to connect to the I/O unit for upload. A window labeled "Burn Firmware" will open and ask you for your user password. If you have not changed the password, the default is "**GSC3000**".
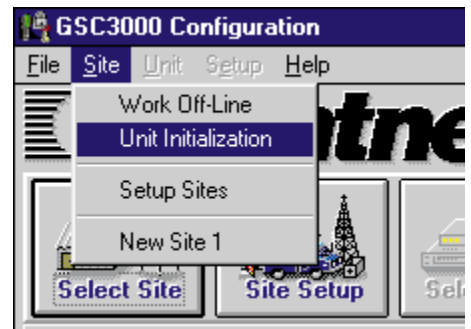
Once your password is entered, the Unit Initialization window will open. In the "Firmware Upgrade / Upload" section of the window, make sure the Upload box is checked. Make sure the radial button for "I/O unit" is selected. Enter the path for the firmware binary file you wish to upload to the I/O unit. A firmware file will always end with the extension ".F00". The default path is "C:\GSC\SITEDATA\GSCIO.F00". To find a firmware file saved in a different location, click on the browse button. The latest version of firmware should have been installed on your computer when you installed the version 1.9 software. If you are updating your firmware at a later time, you can download the newest version of firmware from our web site at **www.gentner.com**.

The Network Address information does not affect your firmware upload. This is a separate parameter of unit initialization that will be discussed on page 32.
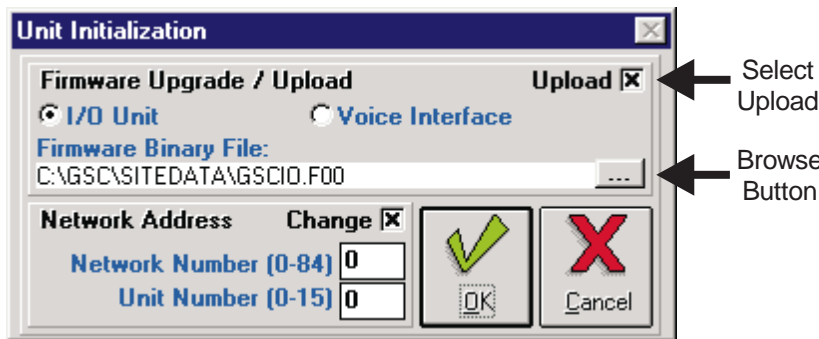
Click "OK" to start the upload. The REMOTE/LOCAL LED will go dark during the upload process. When finished, the LED should be solid green. If the upload fails, disconnect power to the I/O unit and wait for approximately 10 seconds. Then reconnect power and try again.
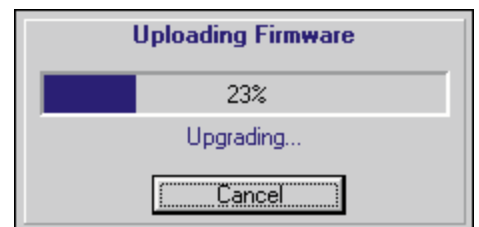
Setting Unit Numbers

If you are using a Voice Interface, the unit number defaults as "16" and it should be the last unit on your G-bus LAN; it is not necessary to change the unit number on a Voice Interface unless you plan to move it to another location on the network (see App. D: Voice Interface for more information).

If you will be connecting more than one I/O unit together in a G-bus LAN (see page 33), each I/O unit must be assigned a unit number or address in the LAN. The first unit must be unit "0" and additional I/O units are numbered 1 through 15. Keep track of each unit's number, because they must be connected in the correct order to create the G-bus LAN. If more than one unit is assigned the same unit number, you will be unable to communicate with your site. Disconnect any G-Bus connections before you attempt to change unit numbers.

You must connect directly to each unit in your G-bus LAN to assign the unit numbers. Use the COM 2 port on the back of the I/O unit.
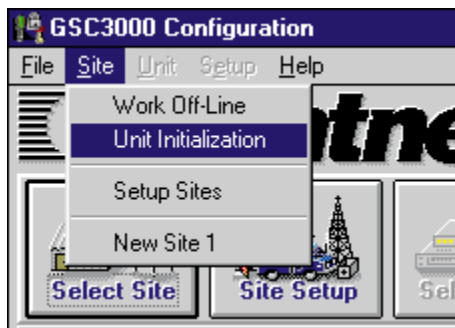
Like firmware uploads, units are renumbered through the Unit Initialization window. Select "Unit Initialization" from the "Site" pull-down menu. Click on the site icon to connect to the I/O unit. You will be asked for your user password. Once it is entered, the Unit Initialization window will open.
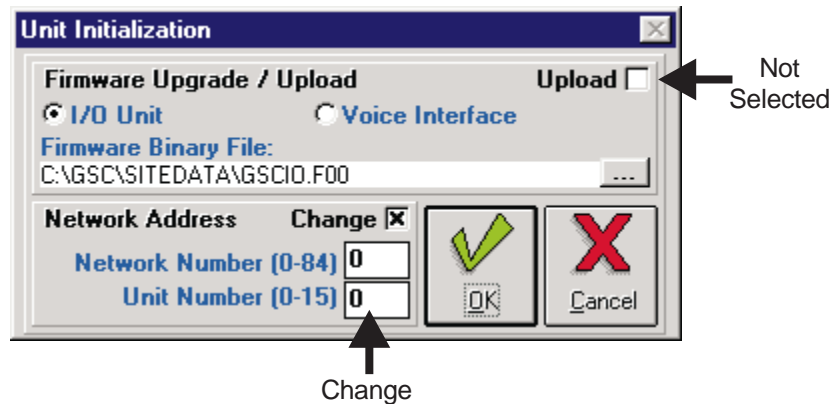
Make sure that the Upload box is NOT checked. You do not want to upload new firmware, only change the unit number. The Change box should be selected. Change the unit number and click OK.

If the change is successful, connect to the next I/O unit and repeat the procedure. If the change fails, check your serial connections and try again. Make sure you are connected to COM 2 on the I/O unit.

Network Number

If you will be connecting to more than one GSC3000 site, each site must have its own network number (0-84). You can assign the network number for the site at the same time you are setting the unit number for individual units. However, the network address for all units can be changed simultaneously once your site installation is complete (see page 58). All units in a site must have the same network number.

Connecting the Hardware

G-Bus Connections

Up to 16 I/O units and one Voice Interface unit may be linked together to form a local area network (LAN) called the G-bus network. The G-bus is a high speed digital bus that allows the units to exchange information. By connecting to one COM port on an I/O unit or Voice Interface, you will be able to view status and metering information and issue commands for all of the units on your G-bus network.

If you are installing your GSC3000 on an equipment rack, G-bus connections are made using the 10-inch RJ45 jumper that was provided with your shipment. For longer networking distances, use category five twisted pair cable (10BaseT). The total distance of your G-bus LAN should not exceed 1,000 feet.

Arrange the I/O units in order according to the unit numbers. If you have not already set the unit numbers, see page 32. On the first unit, the G-bus 1 connects to a G-bus terminator. G-bus 2 connects to G-bus 1 on the following unit. This pattern continues in daisy-chain fashion until all units are connected. On the last unit, G-bus 2 connects to a G-bus terminator.

The rest of this chapter is devoted to hardware and telephone connections. At this point in installation you may choose to skip to Chapter 5 and start making changes to the Configuration settings for your GSC3000 site. It is a good idea to familiarize yourself with the Configuration and Monitoring software before trying to run a complete system. However, many Configuration settings will need to be established or modified after you have completed your installation.
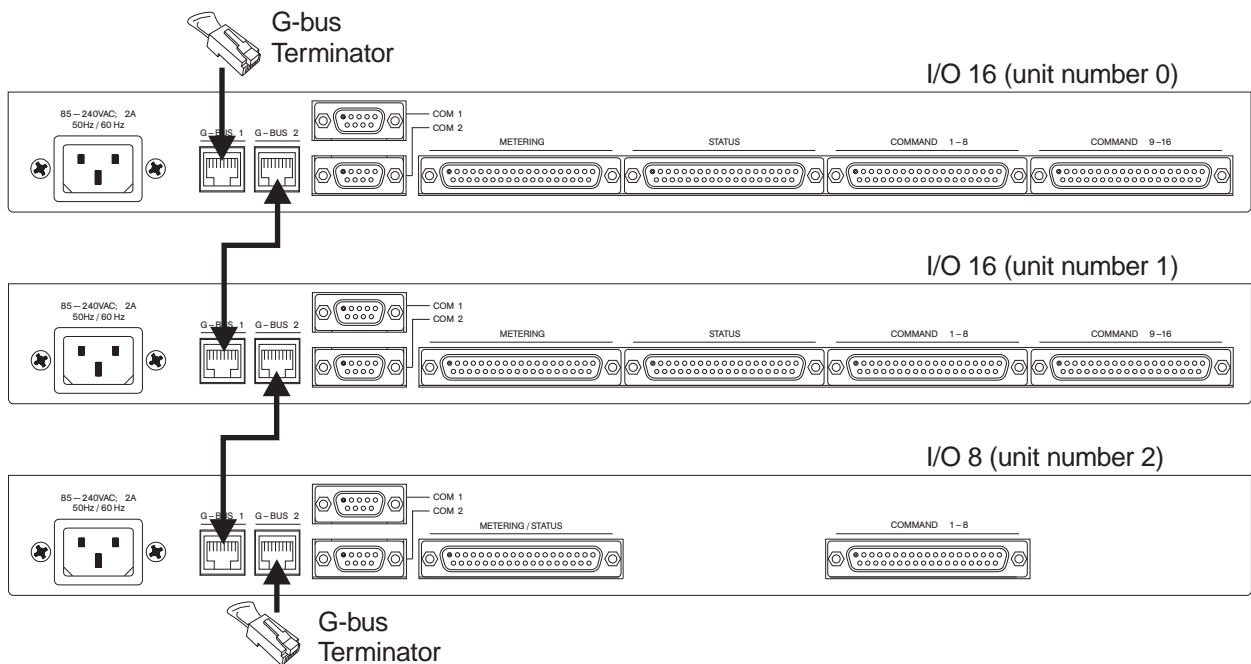
If you did not purchase a Wiring Interface or Command Relay Unit, skip to the section on modem connections, beginning on page 38.

Wiring Interface Hookup

The Wiring Interface is designed to simplify connection of your equipment to the GSC3000 I/O unit. It provides easy pin-for-pin wiring using Phoenix™ push-on blocks to allow connection to one of the DB37 connectors (Status or Metering) on the rear of panel of the I/O unit. You can troubleshoot with a volt meter on the Phoenix™ block connections. No soldering is required. Equipment should be connected to the Wiring Interface for Status or Metering inputs only.
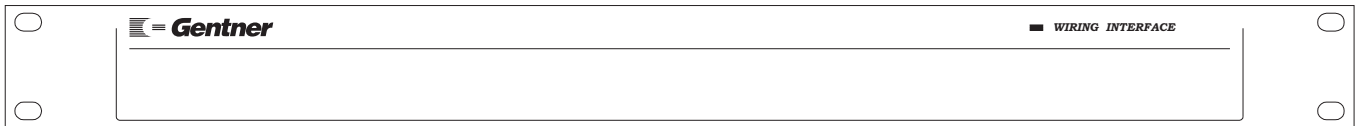
Wire your equipment to the provided two-terminal Phoenix™ push-on connectors. Insert the correct wire into the connector opening, and tighten down the top screw. If the equipment will be connected to a **status** channel, the input voltage must not exceed the range of **±30 V**. If the equipment will be connected to a **metering** channel, the input voltage must not exceed either the range of **0 to +10 V** or the range of **-5 to +5 V** (determined by the setup in Configuration—see page 78). If any ground for a status or metering input is a floating ground, it must be connected to an isolation amplifier (such as a Dataforth) before you connect it to the Wiring Interface.
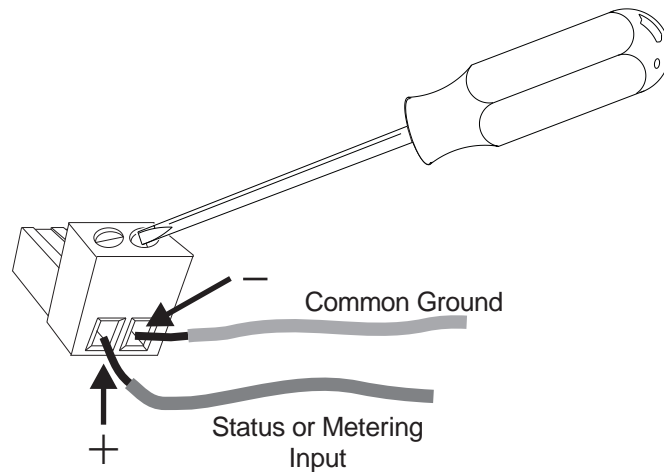
Carefully position your Phoenix™ connectors in relation to the screened legend on the back of the unit; overlapping from one channel to the other will cause the Wiring Interface to feed incorrect data to the site controller.

The two terminals on the Phoenix™ connector correspond with the contacts on the back-panel of the wiring interface: + (status or metering) and - (common ground). Insert the Phoenix™ connector into the back-panel connector on the Wiring Interface with the set screws on top.

The DB37 "Site Controller I/O" connector on the back panel of the Wiring Interface connects to one of the status or metering connectors on the back of the I/O unit. Use the provided DB37-to-DB37 cable.

One Wiring Interface unit will connect to up to 16 channels of status or metering. For an I/O 16, two Wiring Interfaces are required to make all status and metering connections. For an I/O 8, only one Wiring Interface is necessary.
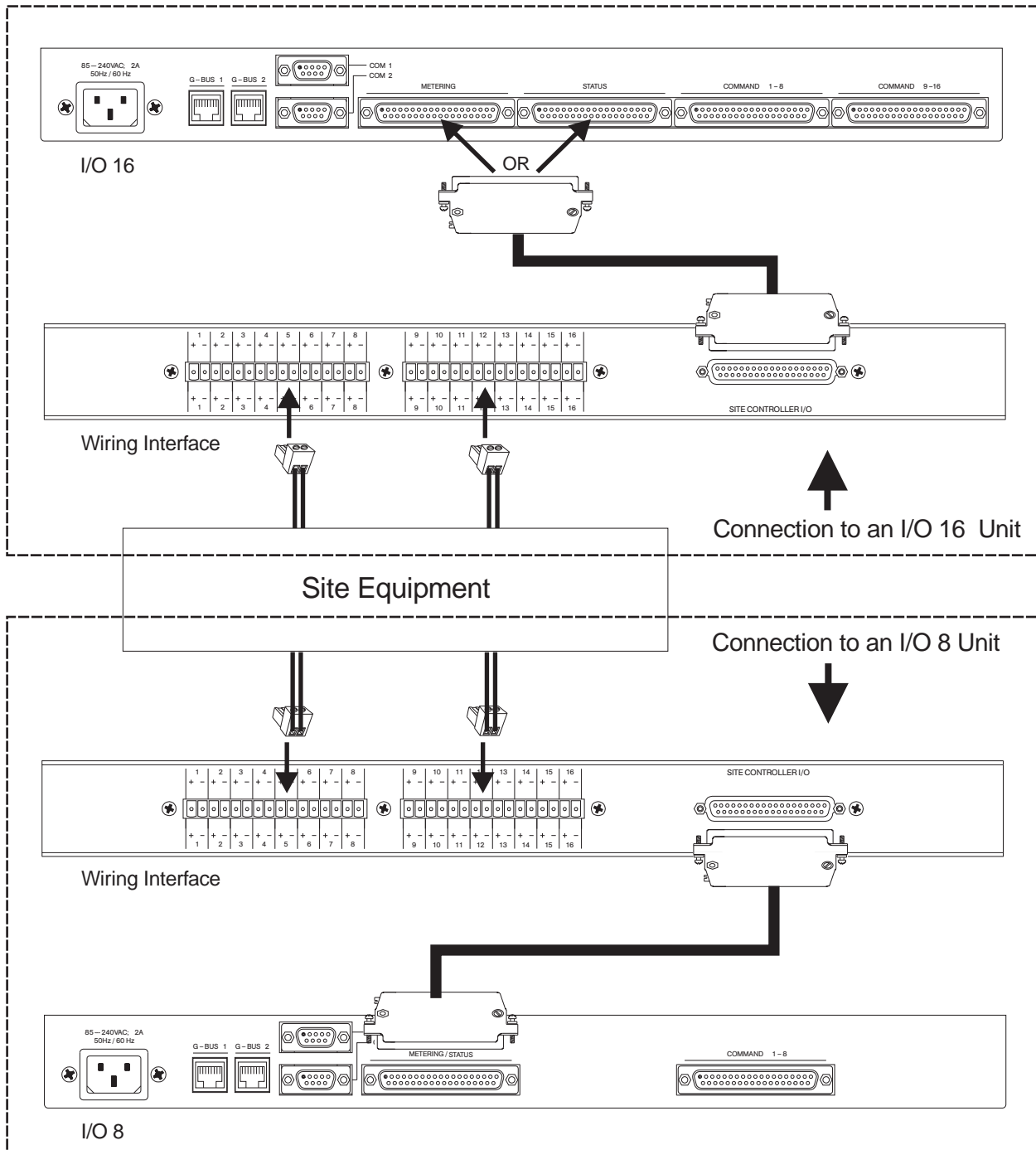
The command outputs on the back of the I/O unit can sink up to 250 mA unassisted. The Command Relay Unit is required if the current draw is more than 250 mA to provide protection and isolation for the I/O unit.

Command Relay Unit Hookup

The Command Relay Unit provides isolation between the I/O unit's solid-state open-collector outputs and your equipment which requires relay switching for operation. Each Command Relay Unit can connect to up to eight command output channels on your I/O unit. The three-terminal Phoenix™ push-on blocks simplify pin-for-pin wiring to one of the DB37 connectors (command only) on the back of your I/O unit; no soldering is required.
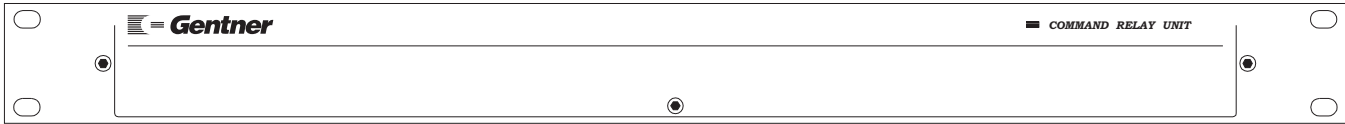
Wire your equipment to the provided three-terminal Phoenix™ push-on connectors. Insert the correct wire into the connector opening and tighten down the top screw. One three-terminal Phoenix™ push-on block is provided for each relay. Each command channel has two relays: A and B.
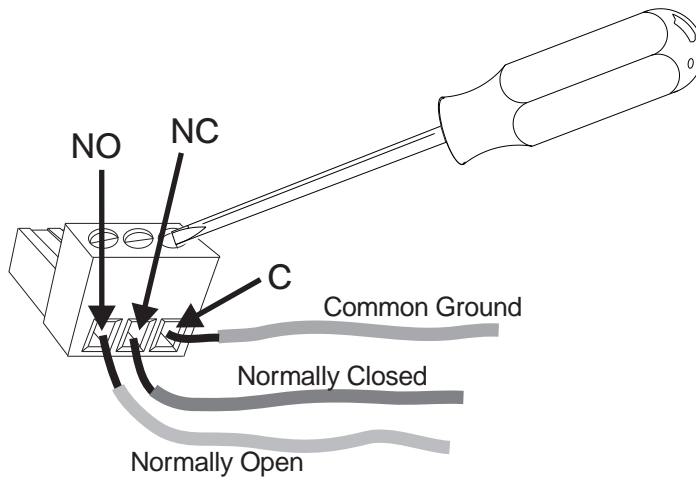
Carefully position your Phoenix™ connectors in relation to the screened legend on the back of the unit; overlapping from one channel to the other can cause improper command-channel operation.

The three terminals in the Phoenix™ connector correspond with the contacts on the back panel of the Command Relay Unit (standard Form C, from left to right): NO (normally open), NC (normally closed), and C (common). Insert the Phoenix™ connector into the back-panel connector on the Command Relay Unit with the set screws on top.

The DB37 "Site Controller" connector on the back panel of the Command Relay Unit connects to one of the DB37 "Command" connectors on the back of the I/O unit. Use the provided DB37-to-DB37 cable.

Two pins on the DB37 connector are used to power the Command Relay Unit. When the I/O unit is powered up, verify that both power LEDs on the back panel of the Command Relay Unit are green, indicating 5 Vdc power. Two relay LEDs are provided because the relay load is divided between two 5 V sources from within the I/O unit. If the power LEDs do not light (or only one LED lights), the unit is not being properly powered for operation. Check the DB37 connection. If tightening the back-panel connection does not cause both LEDs to light, a fuse may have blown.   The I/O unit's 5 Vdc outputs are protected by chemical (self-healing) fuses which will reset in about 30 seconds once an overload has been removed. Unplug the DB37 connector and wait for at least 30 seconds. After 30 seconds, plug the connector back in. Both LEDs should light. If the problem persists, contact technical support.

The power connection on the back of the Command Relay Unit is for use with the Gentner VRC2000 only. The GSC3000 I/O unit supplies power through the DB37 command-output connector. No external power is required for operation with a GSC3000 system.

Not Used With GSC3000

Power LEDs
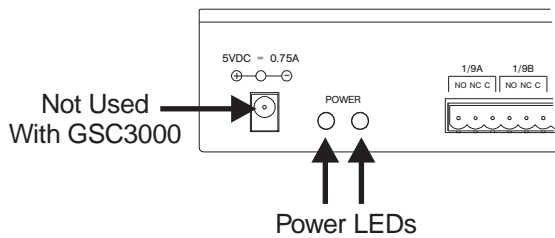
Each Command Relay Unit provides relay closures for up to eight command channels (1-8 or 9-16). For an I/O 16, two Command Relay Units are required to make all command channel connections. For an I/O 8, only one Command Relay Unit is necessary.

I/O 16

OR

Command Relay Unit

Site Equipment

Gentner
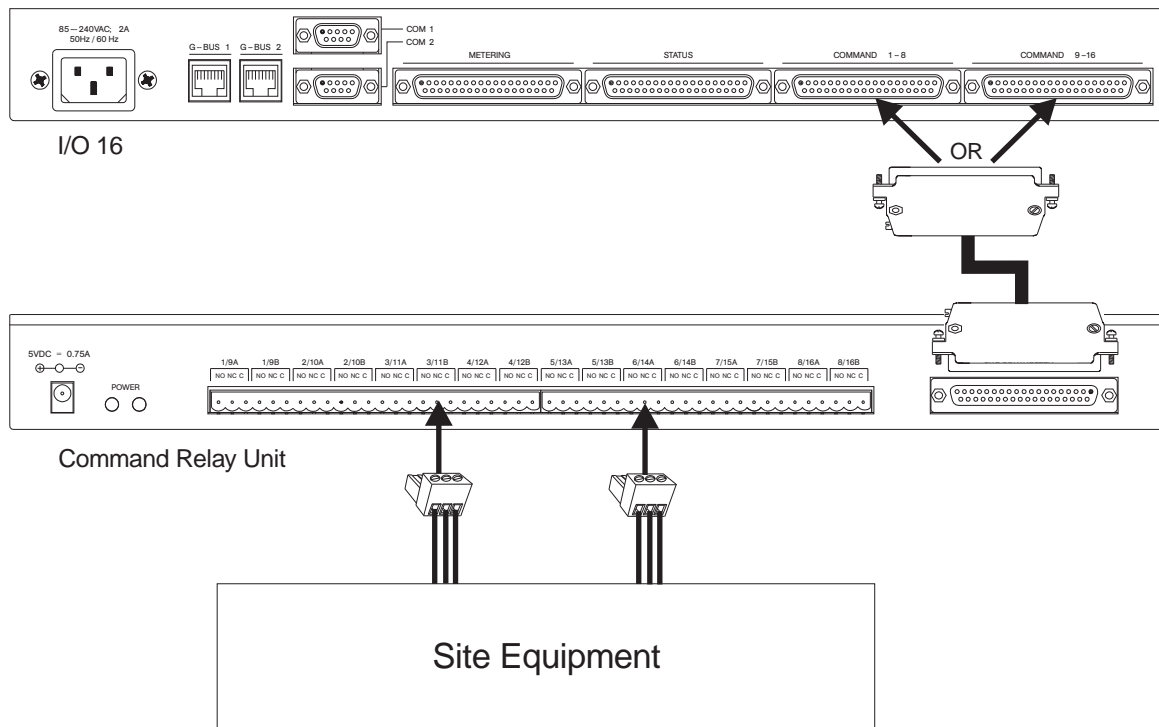
Two-Wire Modem Connections

In addition to the direct COM port connection, you can also communicate with your GSC3000 system using a two-wire modem (dial-up telephone connection or dedicated leased-line), or a four-wire modem (radio-frequency link). The addition of a Voice Interface unit allows you retrieve information or issue commands using any touch-tone telephone. The following pages describe how to install and configure your GSC3000 for use with a two-wire modem and telephone line.

Telephone Surge Protection

Whether you are connecting the telephone line to a modem or directly to a Voice Interface unit, you should always protect your equipment using a telephone surge protector. Damage to your GSC3000 system (including Voice Interface) caused by voltage surges is not covered under the terms of your warranty.

Two-Wire Modem Connection

You must use an external modem to connect to the GSC3000 system. At the PC end you may use an internal or external modem as desired. The recommended two-wire modem is the U.S. Robotics Sportster 33.6 (subject to change without notice).

If you are connecting the modem to an I/O unit, use the COM 2 port. Connect the TELCO jack on the modem directly to the RJ-11 wall jack.

I/O 16 Unit

Null-Modem Serial Cable

Wall Jack
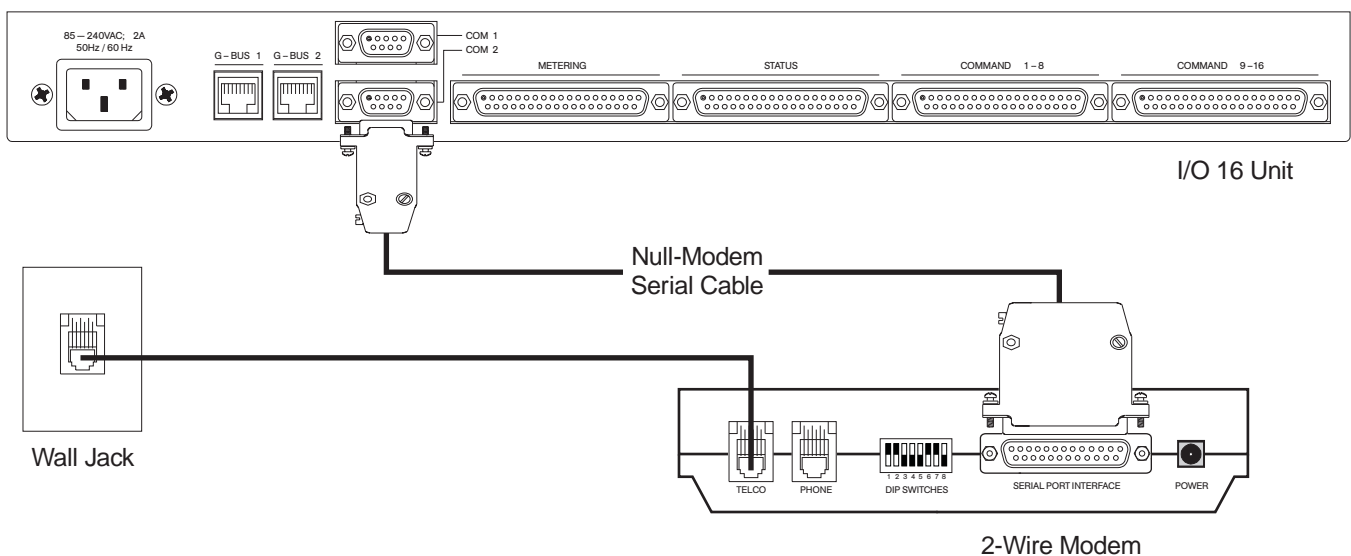
2-Wire Modem

You may also connect a two-wire modem to a Voice Interface unit. Route the telephone line through the Voice Interface unit before connecting to the TELCO phone jack on the modem. This will allow you to connect to your GSC3000 site using either the modem or the Voice Interface (DTMF—touch-tones). The serial cable connects to the COM 1 port on the Voice Interface.
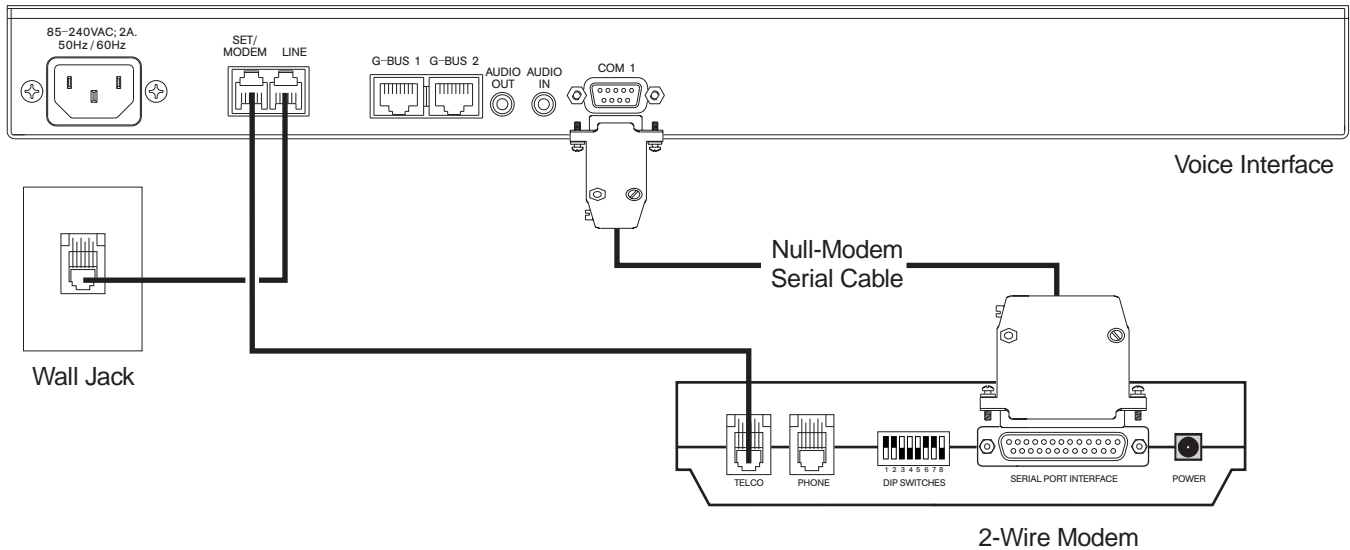
Be sure to used the provided null-modem serial cable. The COM ports on the I/O or Voice Interface units are DB9 male connectors. The serial connection on the U.S. Robotics modem is a DB25 female connector.

Follow the manufacturers instructions for installing the modem for your PC.

Two-Wire Modem Configuration

Make sure that the modem connected to your PC is connected to power and turned on. Modem Configuration for the GSC3000 software is performed through Port Wizard. In order to begin configuration, you will need to Re-Detect the PC COM ports. If you run the Port Wizard from the "File" pull-down menu in the Configuration program (or from the executable file), Port Wizard will automatically re-detect the COM ports. If you run it from the START menu or a shortcut, you will have to click on the "Re-Detect Ports" button after the Port Wizard opens. This shortcut feature allows you to open Port Wizard without waiting for re-detection of the ports.

Gentner

The Port Wizard should indicate whether each COM port has a direct or modem connection. If your modem is not detected, check the power and serial connections and click on "Re-Detect Ports".

Click Here To Change Configuration
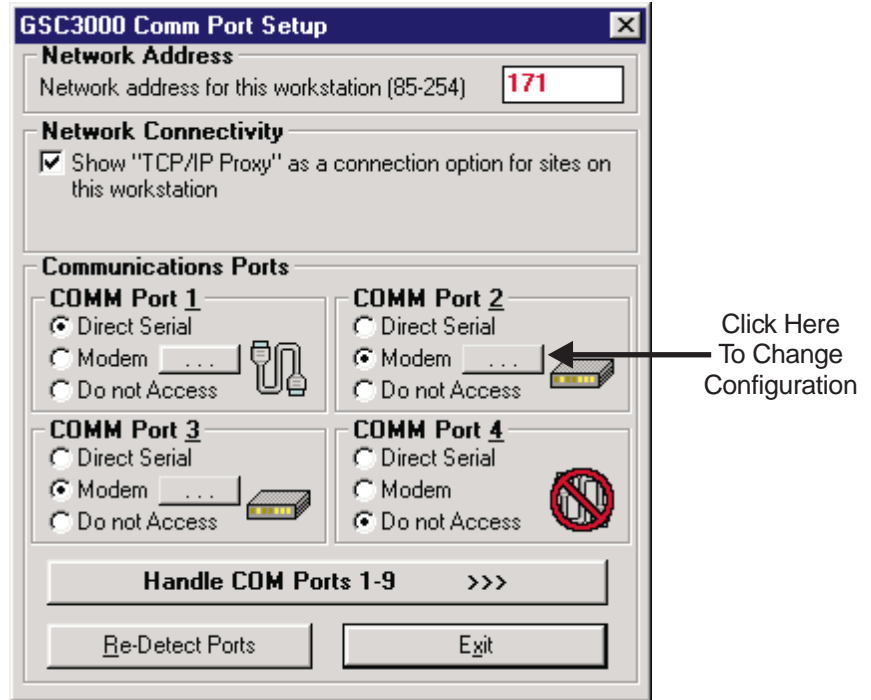
To change the modem settings, click on the "..." button next to the modem option. This will open the Modem Programming window.

Two-Wire Selected

Two-Wire Modem Programming
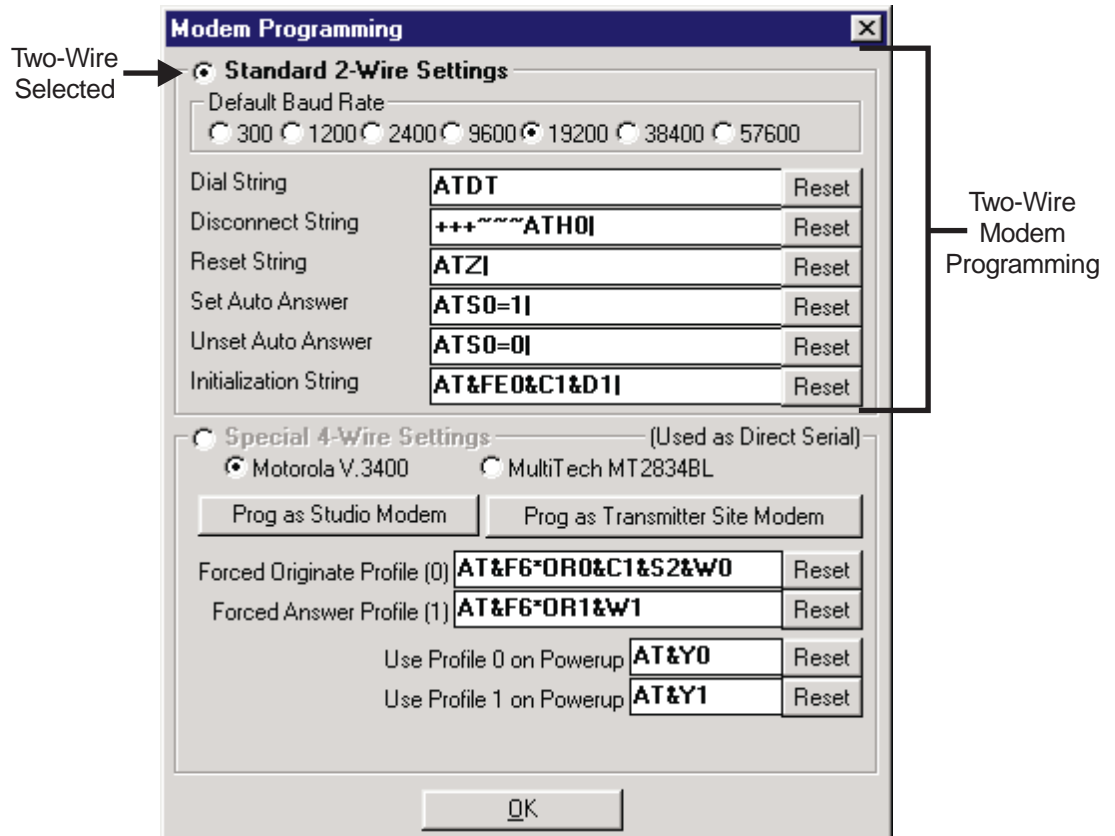
Make sure the "Standard 2-Wire Settings" option is selected. The default baud rate is 19,200 bps. Do not change the baud rate unless absolutely necessary. 19,200 is the ideal baud rate for communications between your PC and the GSC3000. If you use a lower baud rate, you may experience overflow and lose data during complex operations. If you use a higher baud rate, the connection may timeout frequently.

Do not use a cellular modem. Cellular connections are not reliable and will not support the required baud rate for a GSC3000 system.

Command Strings. The default command strings generated by the Port Wizard are for use with the U.S. Robotics Sportster 33.6. If you are using a different brand or model of modem, you may need to modify the "Set Auto Answer", "Unset Auto Answer", and "Initialization" strings to match the manufacturer's requirements. The table on the right defines each of the commands used in these strings.

DIP Switches. You must also configure the DIP switches for use with the GSC3000. The required DIP switch settings for the U.S. Robotics Sportster 33.6 are shown below. They are the same whether you are connecting your modem to a PC or a Voice Interface, but differ slightly if it will be connected to an I/O unit. If you are using a different modem, the DIP switches (or command equivalents) must be configured to enable your modem to operate in the same manner. The following table defines the operational parameters associated with each DIP switch on the U.S. Robotics Sportster 33.6.

COMMAND	DEFINITION
AT	Required Command Prefix
S0	Sets the number of rings in Auto Answer Mode. When set to 0, Auto Answer is OFF.
S0=1	Auto Answer after 1 ring.
S0=0	Auto Answer Diabled.
&F	Loads a generic template. &F is same as &F0.
E0	Sets local echo OFF.
&C1	Sets Carrier Detect (CD) signal to normal operations.
&D1	Sets DTR operations. 14.4: Reserved and 28.8: Reserved.

PC or Voice Interface unit

I/O Unit
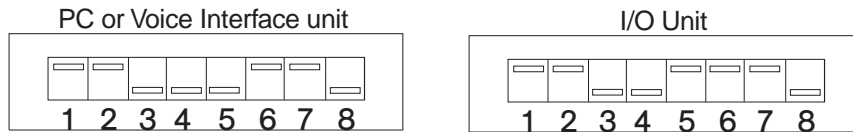
DIP SWITCH	POSITION	DEFINITION
1	UP	Data Terminal Ready (DTR) Override. Normal DTR operations computer must provide DTR signal for modem to accept commands; dropping DTR terminates a call
2	UP	Verbal/Numeric Result Codes
3	DOWN	Enables Result Code Display
4	DOWN	Suppresses Local Echo
5	DOWN UP	Disables auto answer Enables auto answer
6	UP	Modem sends CD (Carrier Detect) signal when it connects with another modem, drops CD on disconnect.
7	UP	Loads Y or Y1 configuration from user-defined nonvolatile memory (NVRAM)
8	DOWN	AT Command Set Recognition (enables Smart mode)

Configuration Settings. The other settings that affect modem operation are entered during Site Setup in the Configuration program. These parameters will be discussed in the order they are labeled in the diagram on page 42.

GENTNER
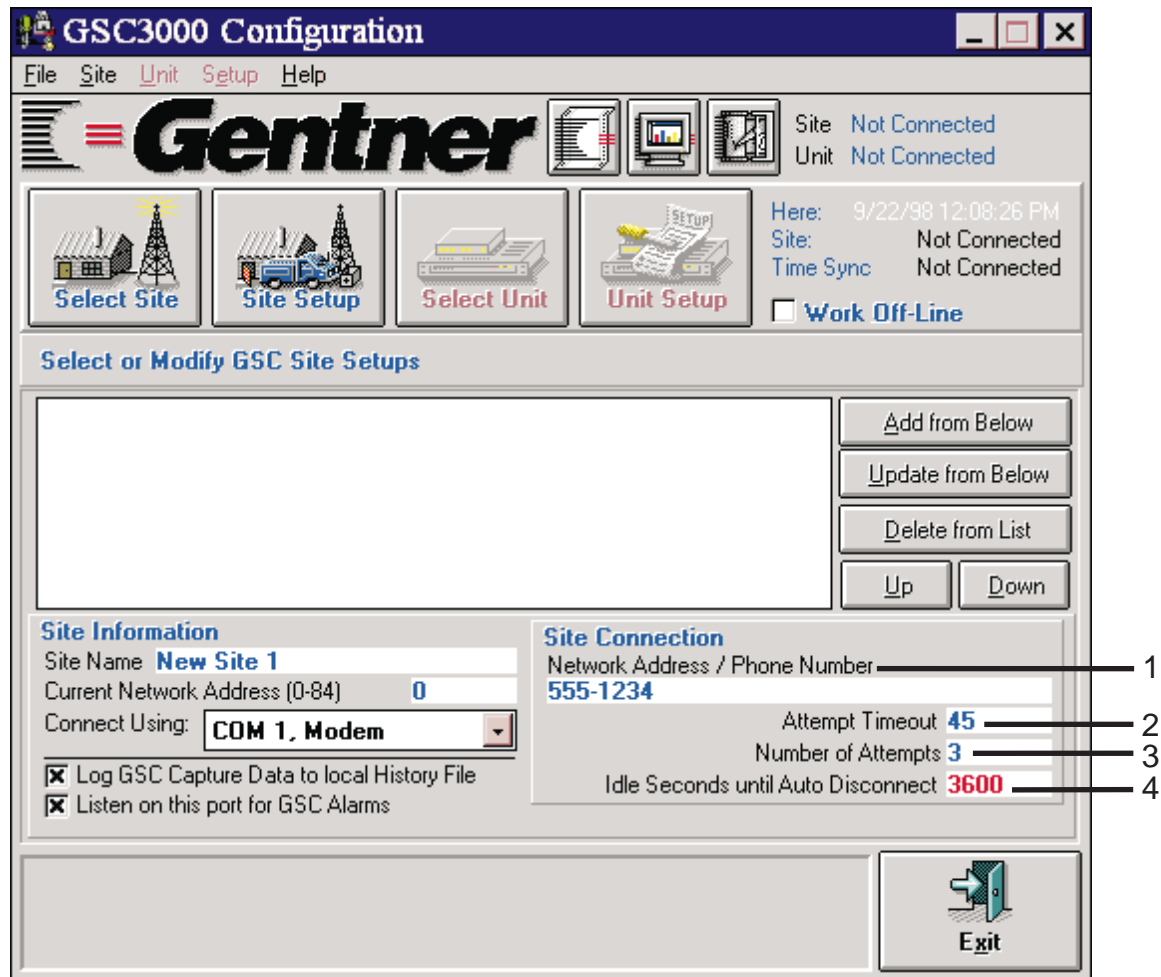
1. Phone Number.   Enter the number you want the PC modem to dial. Be sure to indicate area code, 9 for an outside line, etc. You may use "#" and "*" notation for extended dialing, as well as "," for two-second pauses between digits. The | and ~ symbols are not valid in the phone number. **Example: 9*503,555-1234#215**

2. Attempt Timeout.   This is the number of seconds for the GSC3000 software to wait after it dials before it assumes there is an error. Forty-five seconds is typically long enough to get a carrier, busy or error command from the dialing.

3. Number of Attempts.   The GSC3000 software will try this number of times to connect to a phone number before telling the user that the dialing failed.

4. Idle Seconds until Auto Disconnect.   This is the number of seconds that the GSC3000 software will wait until it timeouts and hangs up the telephone. The default is one hour (3600 seconds).

Troubleshooting. If your two-wire modem connection is unreliable at a 19,200 baud rate, you should try installing a RFI filter (Radio Frequency Interference). Close proximity to a transmitter or other RF sources may cause interference with the modem signal. The RFI filter should be installed next to the modem or Voice Interface (whichever is connected closest to the TELCO line).

Two-Wire Leased-Line Connection

If you will be connecting to a two-wire leased line (also called dedicated or private lines), you will need to buy a two-wire modem capable of leased-line operation. Use standard two-wire telephone cable to make the connections from the modem to the phone line. If you are connecting the modem to an I/O unit, use only the COM 1 port. Never use the COM 2 port for leased-line operation. Modem serial connections should be made using the provided null-modem serial cable.

> **!** **Do not connect a two-wire modem to a Voice Interface unit if you will be using it with a leased line.**

I/O 16 Unit

Null-Modem
Serial Cable

Phone Co
Leased-Line

2-Wire Leased-Line Modem
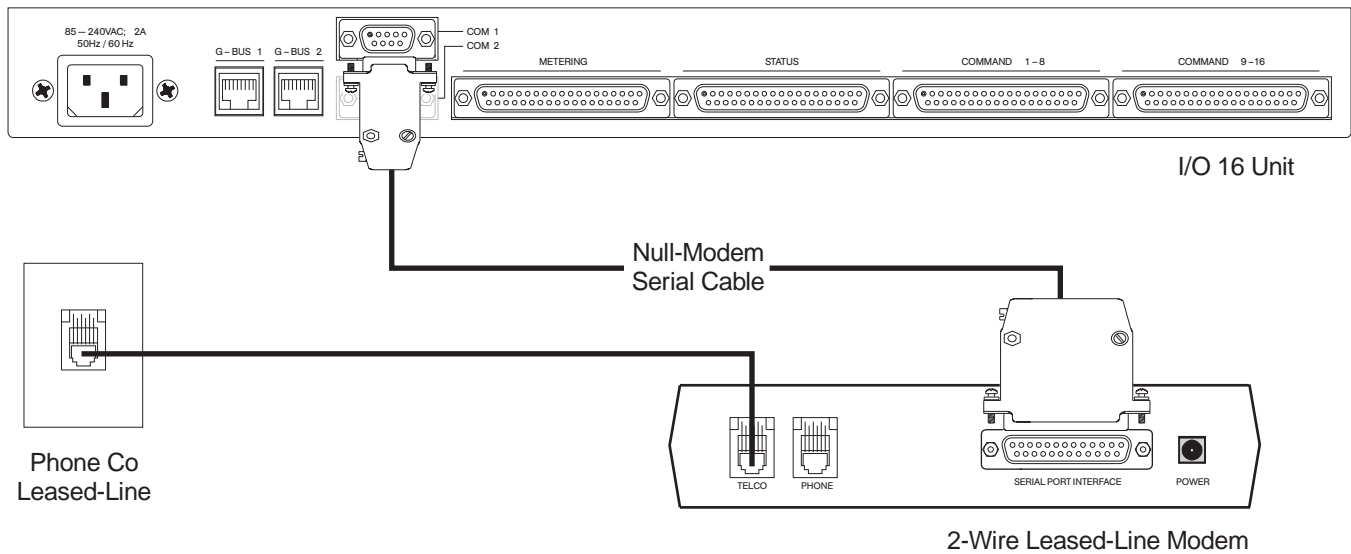
Modem Configuration. Make sure that the two-wire modem is connected to your PC and the power is turned on. Two-wire modem configuration is done through the Port Wizard program. Open the Port Wizard and re-detect the ports. The PC COM port connected to the two-wire modem will probably be detected as a modem. However, you must change this to "Direct Serial". A leased line functions in the same manner as a direct serial connection. Then click on the "..." button next to the modem option. This will open the Modem programming window (see next page).
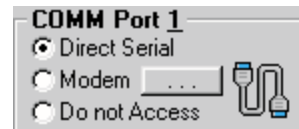
You will need to create an initialization string to suit your two-wire modem. Refer to the manufacturer's documentation for instructions on how to configure your modem for leased-line operation.

Modem Programming   ☒

○ Standard 2-Wire Settings
  Default Baud Rate
    ○ 300 ○ 1200 ○ 2400 ○ 9600 ⊙ 19200 ○ 38400 ○ 57600

Dial String	ATDT	Reset
Disconnect String	+++~~~ATH0|	Reset
Reset String	ATZ|	Reset
Set Auto Answer	ATS0=1|	Reset
Unset Auto Answer	ATS0=0|	Reset
Initialization String	AT&FE0&C1&D1|	Reset

Click here for →   ⊙ Special 4-Wire Settings   (Used as Direct Serial)
2-wire leased line   ○ Motorola V.3400   ⊙ MultiTech MT2834BL   ← Choose this modem
                                                                                     and modify init string
                      [Prog as Studio Modem]   [Prog as Transmitter Site Modem]

                      Initialization String AT$SB19200$BA0&W0   [Reset]

                               1 2 3 4 5 6 7 8 9 101112 13141516   Disregard DIP
BEFORE modem can be   ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚   ←   switch key
programmed, set DIPS:

                                    [OK]

Because a two-wire leased line functions as a direct connection, it is configured in the same manner as a generic four-wire modem. In the Modem Programming window, select the "Special 4-Wire Settings" option. Choose the MultiTech MT2834BL modem. For programming, connect each modem you will be using to your PC. If the modem will be connected to an I/O unit, click on the "Prog as Transmitter Site Modem" button. The initialization string (or DIP switch setting) should designate this modem as the RECEIVE modem. If the modem will be connected to your PC, click on the "Prog as Studio Modem" button. The initialization string should designate this modem as the ORIGINATE modem. Once your modem has been programmed successfully, turn off the power, then turn it back on. This will allow the new settings to take effect. For additional assistance, call Gentner technical support as noted on the bottom of the page.

Site Setup. When you are setting up your site for communications in the Configuration program, be sure that the COM port you select is shown as a direct connection.

Site Information
Site Name **New Site 1**
Current Network Address (0-84)   **3**
Connect Using: **COM 1, Direct**   ▾   ← Leased Line
                                                          is a direct
                                                          connection
☒ Log GSC Capture Data to local History File
☒ Listen on this port for GSC Alarms
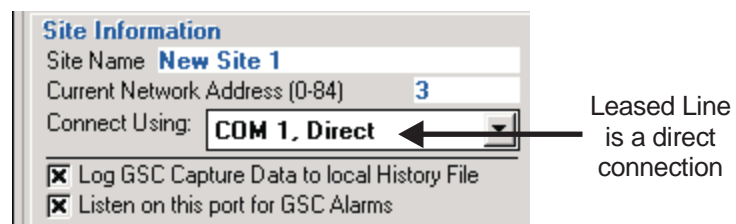
Four-Wire Modem Connections

Four-Wire Modem Configuration

You should program and configure your four-wire modem before you make the connections to your RF equipment.

Make sure that the four-wire modem is connected to your PC and the power is turned on. Four-wire modem configuration is done through the Port Wizard program. Open the Port Wizard and re-detect the ports. The PC COM port connected to the four-wire modem should be detected as a direct serial connection. To configure and program your modem, click on the "..." button next to the modem option. This will open the Modem programming window.

Select 4-Wire Settings →
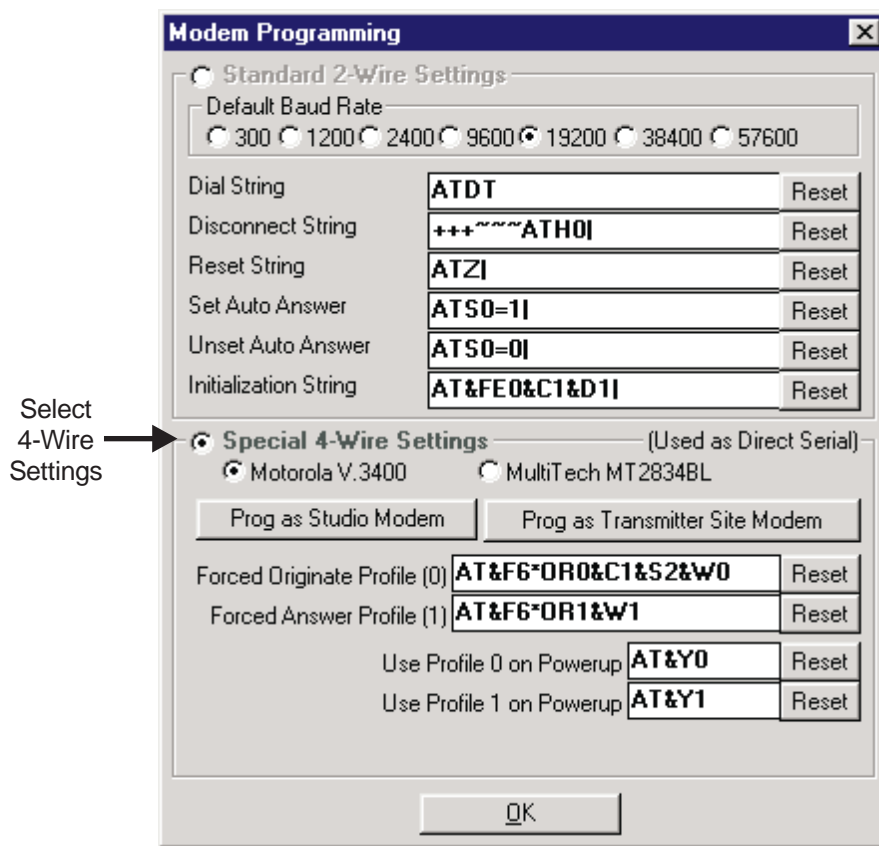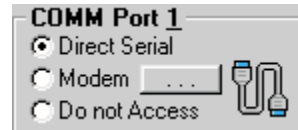
Make sure that the "Special 4-Wire Settings" option is selected. The Port Wizard is configured to generate the modem programs and command strings for either the Motorola V.3400 or MultiTech MT2834BL.

Motorola V.3400. You must connect each Motorola modem to your PC for programming. If the modem will be connected to an I/O unit, click on the "Prog as Transmitter Site Modem" button. If the modem will be connected to your PC, click on the "Prog as Studio Modem" button.

Once your modem has been programmed successfully, turn off the power, then turn it back on. This will allow the new settings to take effect.

Do not modify the command strings for the Motorola modem, if you are using a different brand of modem, Choose the MultiTech MT2834BL modem and modify the strings/DIP switches accordingly.

MultiTech MT2834BL. Most of the parameters on the MultiTech modem are determined by the setting of the DIP switches. These settings are different if you are programming or operating the modem. They are also slightly different if you are connecting the modem to your PC or your I/O unit.

Click here for MultiTech or any other non-Motorola

On MultiTech set DIP switches to match key
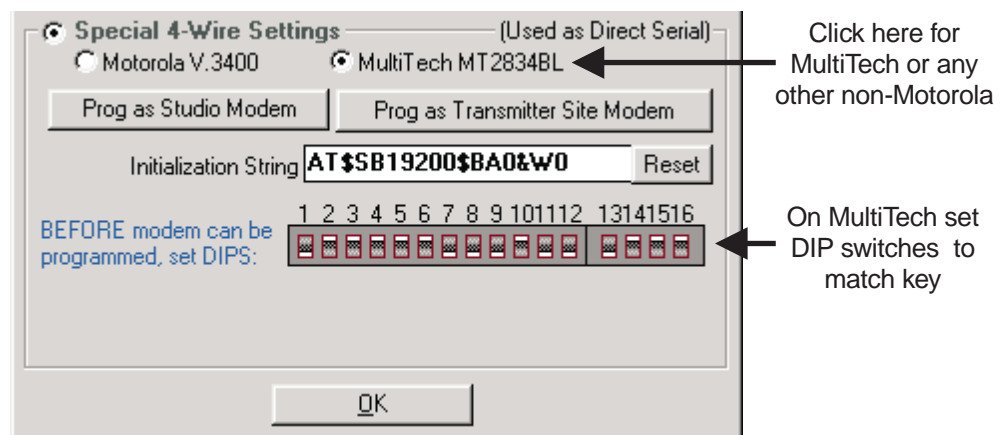
To program the modem, turn off the power and set the DIP switches on each MultiTech modem to match the key shown in Modem Programming window. Then connect each MultiTech modem to your PC. Turn on the power. If the modem is to be connected to an I/O unit, click on the "Prog as Transmitter Site Modem" button. Once the modem is programmed successfully, you will receive the following message.
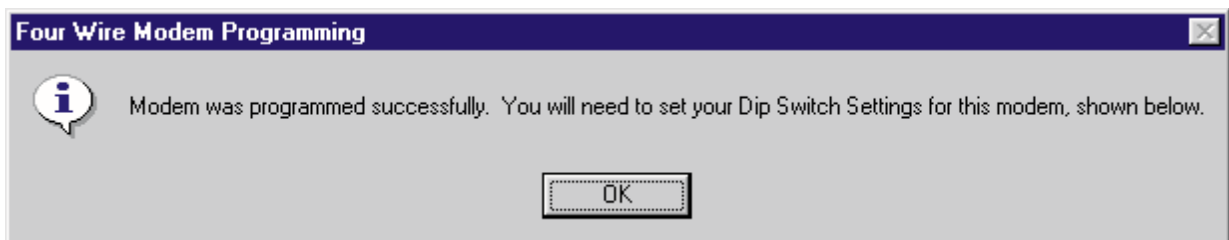
Click OK. Another DIP switch key will appear in the modem program-ming window. Turn off the power on the modem and change the DIP switch settings to match the key before you attempt to operate the modem. For a modem connected to an I/O unit, you will move DIP switches 10 and 16 to the DOWN position.

If you want to change the baud rate on your MultiTech modem to 9600, insert the command $MB9600 in the initializa-tion string. The initialization string would then read: AT$SB19200$MB9600$BA0&W0".

If you clicked here
this key will appear

Move 10
down

Move 16
down
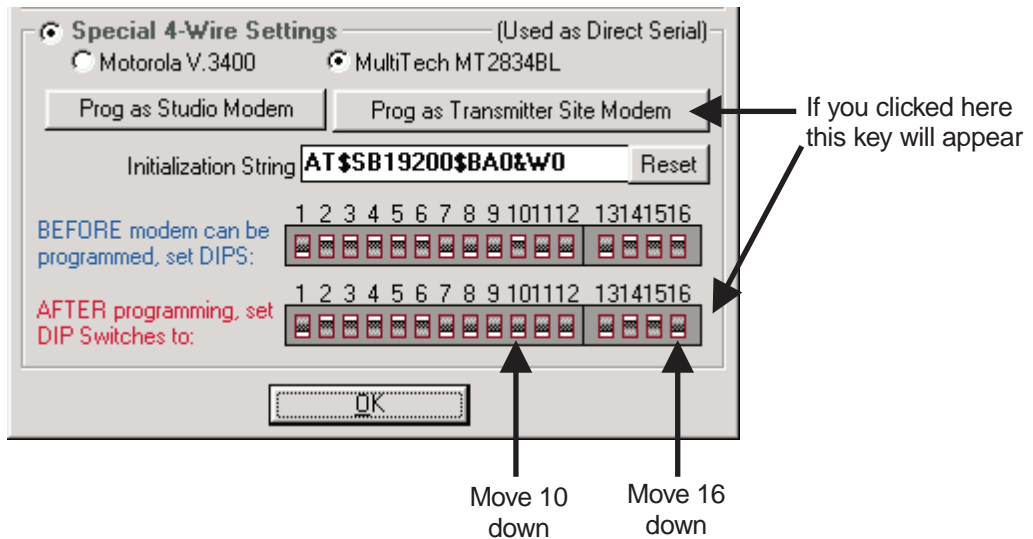
If your modem will be connected to a PC, click on the "Prog as Studio Modem" button. If the modem is programmed successfully, click OK. A slightly different DIP switch key will appear. Turn off the power and move DIP switches 5, 10, and 16 to the DOWN position.

If you clicked here
this key will appear

Move 5
down

Move 10
down

Move 16
down
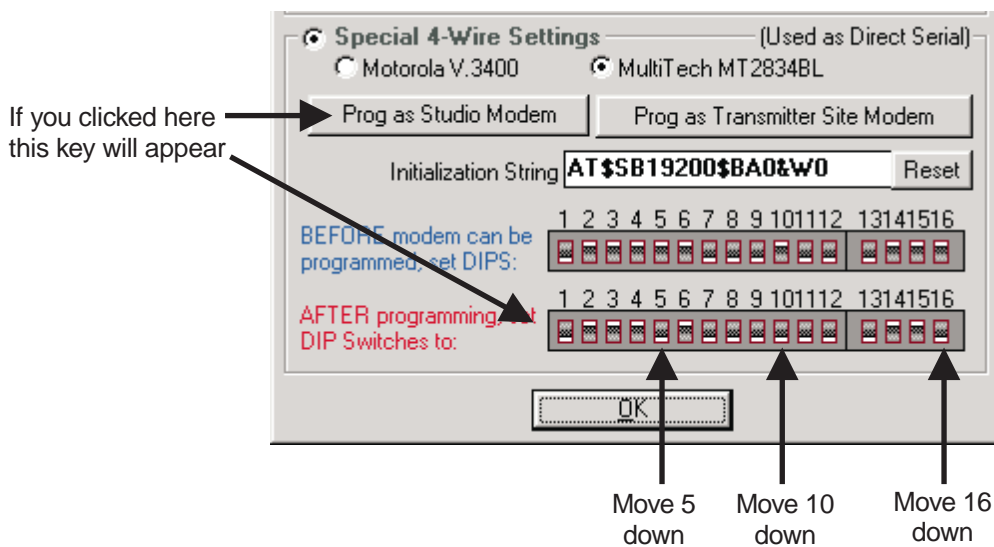
When power is turned back on, your modems will be ready to communi-cate.

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Other Modems. If you will be using another brand of four-wire modem, you may need to modify the initialization string and DIP switch settings to match the modem manufacturer's requirements. The two tables below show the command definitions and DIP switch definitions required for the MultiTech MT2834BL. Configure your modem to operate in a similar manner.

COMMAND	DEFINITION
AT	Required Command Prefix
$SBn	Sets the baud rate at the serial port. n=speed.
$Mbn	Sets the baud rate on-line or at the modem. n=speed.
$BA0	Sets speed conversion to On.
&W0	Causes modem to store its current parameters in non-volatile RAM, and modem will load these for future sessions instead of reading factory ROM defaults.

DIP SWITCH	POSITION	DEFINITION
1	DOWN	DTR (Data Terminal Ready) forced ON at all times
2	UP	SDLC (Synchronous Data Link Control) Mode ON
3	UP	Command Mode Response OFF
4	UP	AS/400 Mode OFF
5	UP DOWN	Answer Mode ON Originate Mode ON
6	UP	Slave Clocking OFF
7	DOWN	RTS (Request to Send signal) forced ON at all times
8	DOWN	Command Mode ON
9	DOWN	Remote Digital Loopback ON
10	UP DOWN	Dial-Up Operation Leased Line Operation
11	DOWN	Internal Clock Selected
12	DOWN	Asynchronous Mode ON
13/14	DOWN/UP	19,200 bps Operation (Overridden by $Mbn command)
15	UP	CD/DSR (Carrier Detect/ Data Set Ready) from Interface
16	UP DOWN	2-Wire Leased Line 4-Wire Leased Line

! **The RF audio channel that you will be using for your connection should be able to handle 19,200 bps in both directions or your connection may be unreliable. Although a lower baud rate may be acceptable for monitoring and other simple communications, 9,600 bps and lower may create a bottleneck that will cause complex operations to fail.**

Four-Wire Modem Connections

We recommend that you begin by testing your four-wire modem RF link on the bench. This will allow you to ensure that the modems are communicating and calibrate your RF equipment before you attempt remote operation.

The four-wire modem shown in the following installation (see page 50 for diagram) is the MultiTech MT2834BL, which is the recommended four-wire modem (subject to change without notice). A similar installation should work for most brands of four-wire modem. Several more examples may be found on our web site at **www.gentner.com**.

RS232 Interface. The serial interface port on the back of your modem is a DB25 female connector. Use the provided null-modem serial cable to connect the modem to your PC or I/O unit. A four-wire modem should always be connected to the COM 1 connector on the I/O unit, never to COM 2.

RF Link Connections. Plug the provided RJ-11 telephone cord into the LEASE jack on the back of the modem. Four wires of the RJ-11 cord will be used to connect the modem to your RF equipment: green, yellow, black, and red.

> **!** **Do not connect a four-wire modem to a Voice Interface unit.**
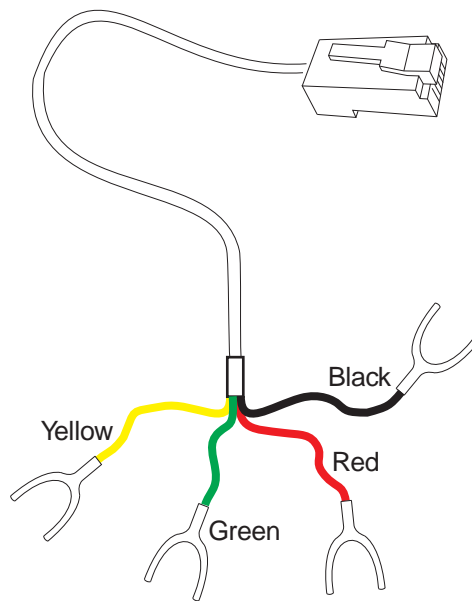
> **RJ-11 Pins 2 (yellow) and 3 (green) are nominally the transmit pair. Pins 4 (red) and 5 (black) are nominally the receive pair. However, for best results, follow the table below and diagram on the next page when connecting your modems.**

The installation diagram on the following page shows the modem connections to a subcarrier generator and demodulator. The green and yellow wires must be paired with the polarity reversed at opposite ends of the installation. The black and red wires must also be paired with the polarity reversed at opposite ends of the installation. See the table below and the installation diagram on the following page for more information.

Transmitter (I/O) End				**Studio (PC) End**		
Device	**Connection**	**Wire color**		**Wire color**	**Connection**	**Device**
Generator	Input 1	black		red	Output 1	Demodulator
	Input 2	red		black	Output 2	
Demodulator	Output 1	green		yellow	Input 1	Generator
	Output 2	yellow		green	Input 2	

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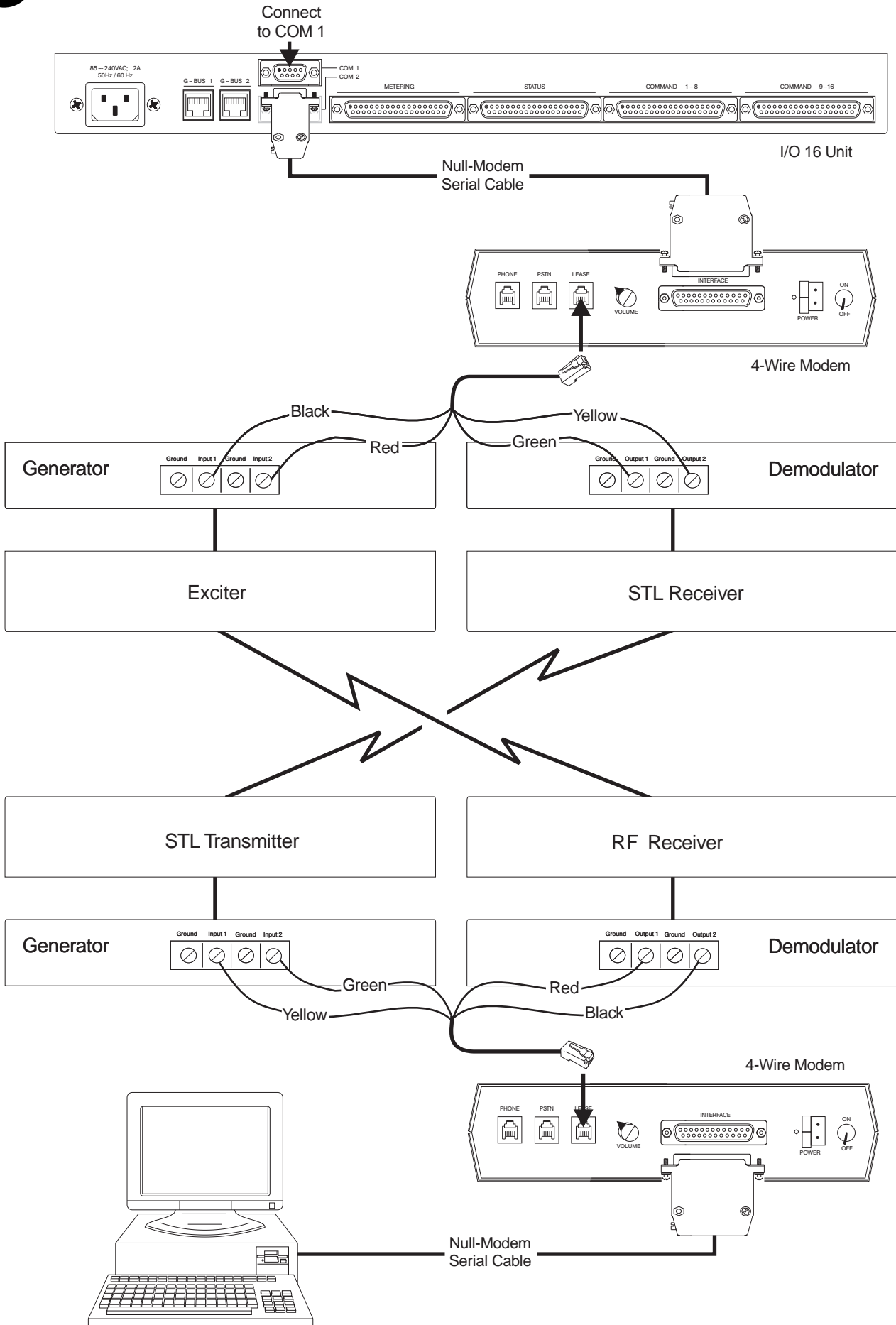
Power Connections

The GSC3000 I/O unit is designed to operate with a wide range of voltages. It will accept an AC voltage-input range of 100-240 Vac, 50/60 Hz, 15 W without manual switching. Power-line swings and brownouts have no effect on I/O unit operation.

Surge Protector
Although the I/O unit has built-in resistance to voltage changes, we recommend that you use a power surge protector or line conditioner on the incoming AC line. Lightning strikes and other high surges in voltage levels will damage your GSC3000 system and connected equipment if it is not properly protected.

Battery Backup
We recommend that you connect your GSC3000 to a battery backup system. An I/O unit connected to battery backup will be able to start a generator or take other steps to restore power to your remote site. The GSC3000 will also be able to notify you of the power outage by phone, pager or data, depending on the configuration of your system.
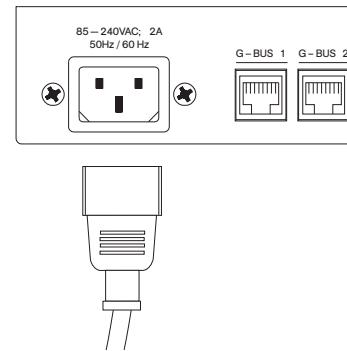
Other Gentner Products

Gentner Communications Corporation also manufactures other products that may be useful additions to your installation.

Silence Sensor (Fail Safe Unit)
This unit allows you to meet FCC regulations that require the ability to shut down your transmitter if normal methods of control fail. When program audio has been shut off for a predetermined delay, the Silence Sensor closes a relay to turn off your transmitter.
Part Number 910-076-201

Temperature Sensor Unit
This unit provides highly accurate air temperature monitoring to ensure a proper operating environment for your equipment. The Temperature Sensor can measure a range from -40 to +120° C or -40 to +250° F. One temperature probe is included; up to four may be connected. The Temperature Sensor connects to metering inputs on your I/O unit.
Part Number 910-091-001

AC Current Sensor
The AC Current Sensor measure current samples from AC power lines. Connects directly to I/O unit metering inputs. Use for monitoring the status of tower lights, incoming AC power, or generator output.
Part Number 910-093-001

52

Completed
Installation
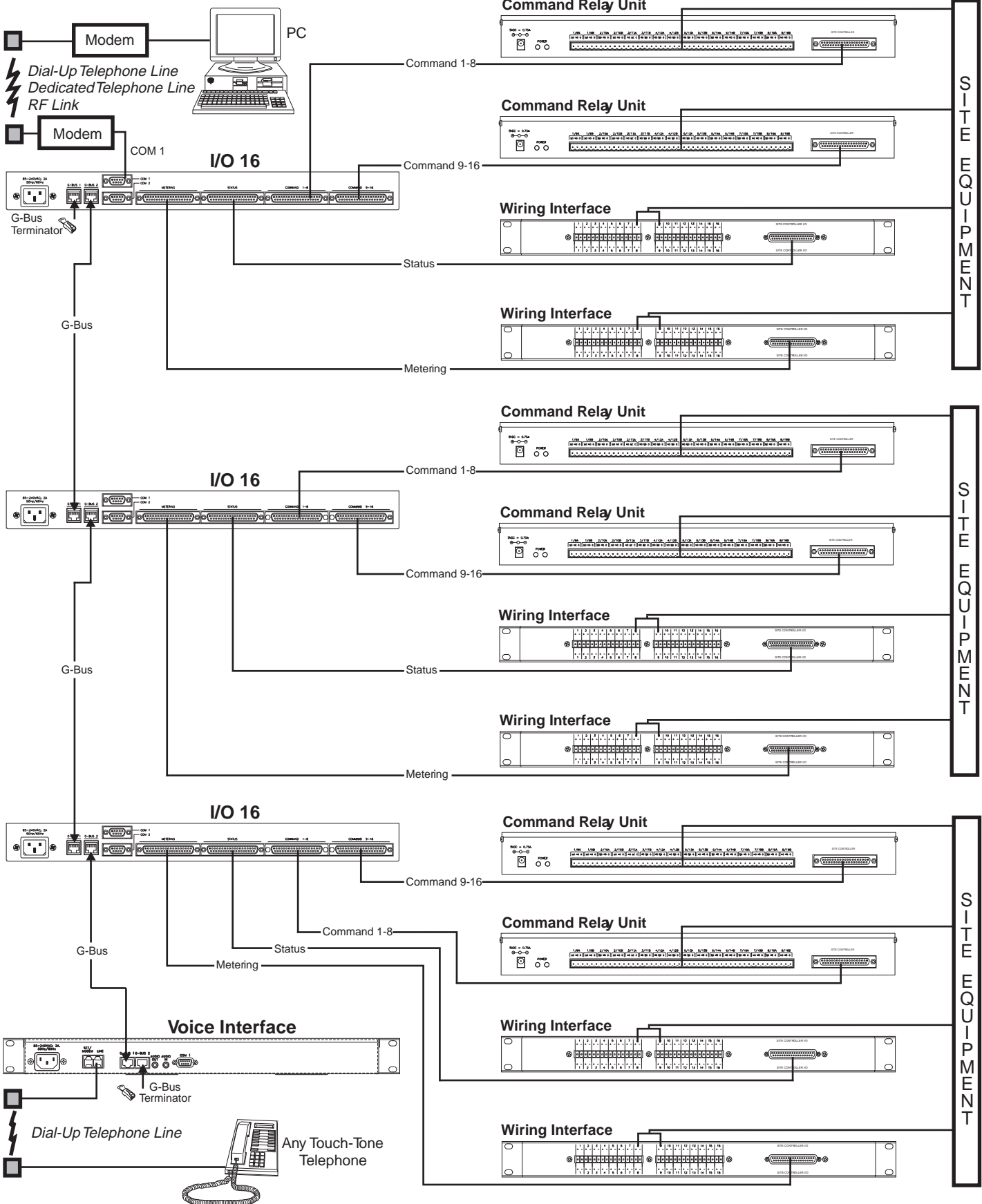
5 Configuration

The information in this section concerns the GSC3000 Configuration program, the Logger program, and the History program. We recommend that you read the entire chapter to familiarize yourself with all of the capabilities of the GSC3000 before you begin configuring your system.

Configuration is your primary tool for programming the GSC3000. Using this program, you will create commands and macros, assign status inputs, and establish metering limits. The Configuration program uploads and downloads the setup information for I/O units. Other features include site security, dialing information, and user-definable alarm options.

GCS3000 Logger is a real-time logging application. This program allows the readings from any site to be sent to a dedicated printer or saved to file.

The History program is used for viewing data captured by your I/O units. Using the History program you will be able to manipulate the data for analysis or to be printed out as hard copy.

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GSC3000 Configuration

To run GSC3000 Configuration, double-click the Configuration icon in the GSC program group. You can also run it from the START menu under PROGRAMS > GSC3000 APPLICATIONS > GSC3000 Configuration.

GSC3000
Configuration

Main Screen Functions

When Configuration first opens, you will see a main screen similar to the one shown below. All of the functions of the Configuration are accessed starting with this screen. These functions will be described in the order they are labeled in the figure below.

1. View Window. The mid-section of the Configuration main screen is the view window. When you click on any of the four large buttons (2-5), the view window will display the related functions. If you click on the Select Site button, you will get a view similar to the one shown below.

2. Select Site. When you click on this button, Configuration will display icons in the view window for each of your sites. Clicking on any of these icons will connect you to the corresponding GSC3000 site.
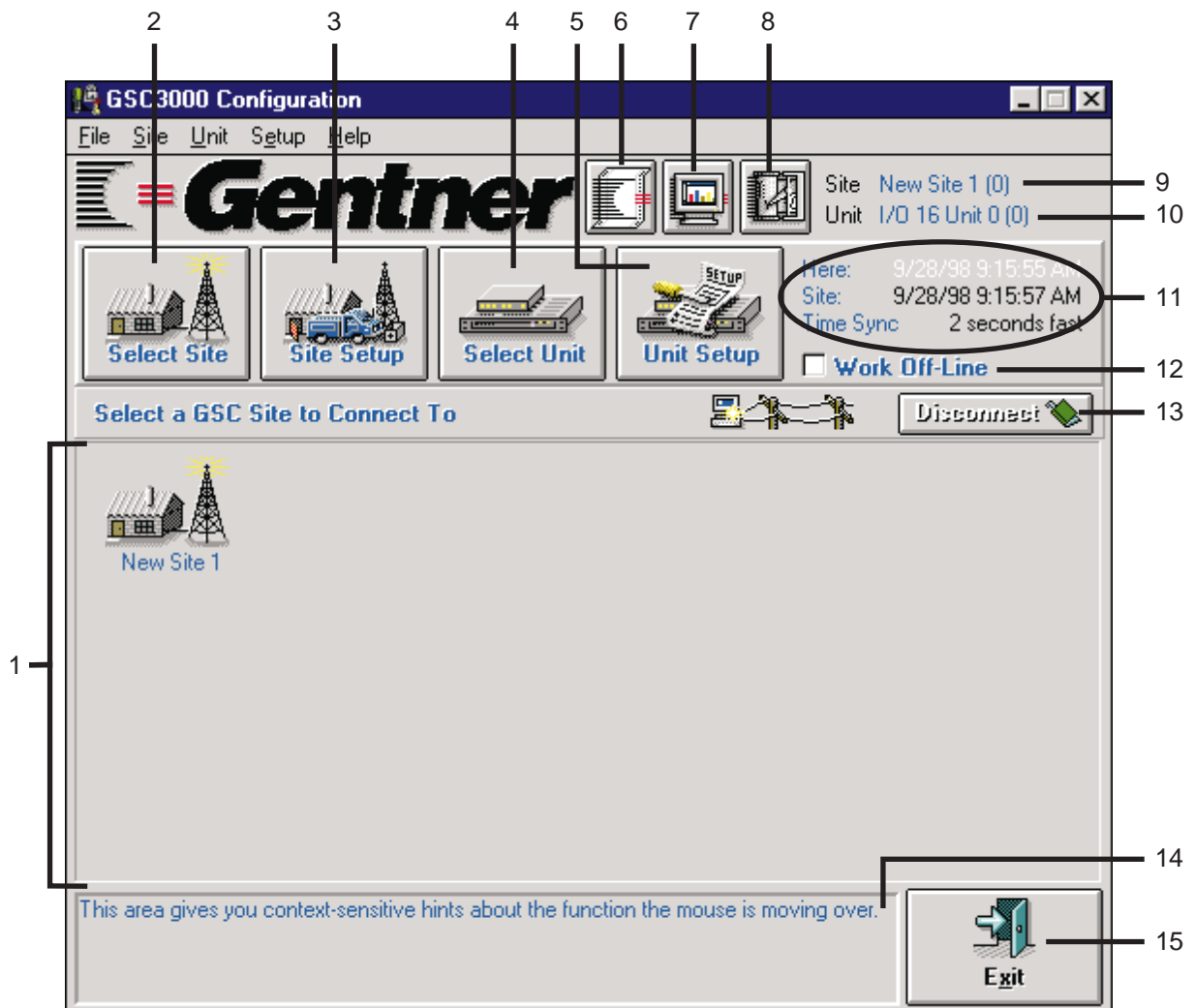
3. Site Setup. When you click on this button, the Site Setup functions will appear in the view window. Site Setup allows you to establish the communications parameters required for you to connect to your GSC3000 system(s).

4. Select Unit. When you click on this button, Configuration will display icons in the view window for each of the units in your site. You must connect to a site before you will be able to click on the Select Unit or Unit Setup buttons.

5. Unit Setup. When you click on this button, the Unit Setup functions will appear in the view window. Unit Setup allows you to configure features such as time-of-day events, command outputs, and status and metering inputs for individual units in your site. From this window, you can also upload and download setup information and create archive files on disk.

6. Logger Button. This button launches the GSC3000 Logger program. If the Logger program is already running, the button will move the Logger window to the front on your screen.

7. Monitor Button. This button launches the GSC3000 Monitor program. If Monitor is already running, the button will move the Monitor window to the front.

8. History Button. This button launches the GSC3000 History program. If History is already running, the button will move the History window to the front.

9. Site Status. When you are connected to a site, this line will indicate the name of the site and the network address for the site (in parentheses). The message will read "not connected" until a password has been accepted and access granted.

10. Unit Status. This line indicates the name of the unit (if any) and the unit number on the G-bus LAN. The message will read "not connected" until you have connected to a site and selected the unit you want to configure.

11. Time. This area shows the time of both the PC running the Configuration program and the GSC3000 site you are connected to. The "Time Sync" line indicates the time difference between the two. If the times are the same, the "Time Sync" line will read "synchronized. If you are not connected to a site, only the PC time is shown.

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12. Work Off-Line. Click on this box if you wish to make changes to units in your GSC3000 site without actually connecting. You will still be required to give a password, but you will be able to reconfigure units without affecting the current operations of your site. You must have connected previously to the site before it is possible to work off-line. If the setup information has never been downloaded from the I/O units, it is not possible to make any changes.

13. Disconnect. This button will disconnect you from the site you are currently connected to. The button is invisible unless you are connected to a site.

14. Help Area. Help messages are displayed in this area. Place your mouse arrow over the feature of the Configuration software you have a question about and a message will be displayed in the help area.

15. Exit. This button disconnects you from any connected site and closes the Configuration program.

Other Functions

Several other functions appear as buttons in many of the windows of the Configuration program. These functions will be discussed in the order they are labeled in the figure on the left.
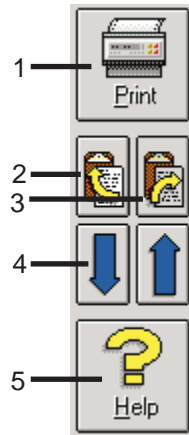
1. Print. This button will print the active window to the Windows® default printer.

2. Copy to Clipboard. This button allows you to copy the contents of the active window to the clipboard.

3. Paste from Clipboard. This button allows you to paste the contents of the clipboard into the active window.

4. Download / Upload. When you click on the down-arrow button, the Configuration program will download setup information from the connected I/O unit. This allows you to download without having to leave the active window. When you click on the up-arrow button, Configuration uploads information to the connected I/O unit without having to leave the active window. When these two buttons are used, the information uploaded and downloaded is for the active window only.

5. Help. This button will launch the Acrobat (.pdf) version of this manual. Help will open the section of the manual relevant to window you are in when the Help button is pressed.

Site Setup

Site Setup Functions

Although Site Setup has already been described in a limited manner in the Installation section, you should read this entire section. Many of the features of Site Setup have not been discussed previously. Site Setup features will be described in the order they are labeled in the diagram below.

Enter Site Setup by clicking on the large "Site Setup" button in the Configuration main screen. A view similar to the one shown below will appear in the View window.
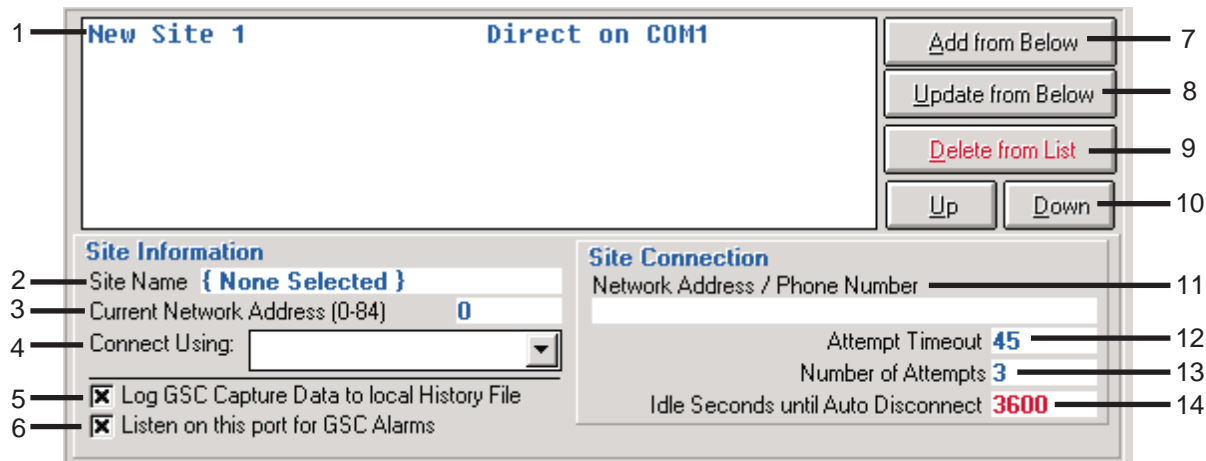
1. Site Summary. This area displays a one line summary for each site you have created. To modify a site setup, click once on the summary line and the setup information will be displayed below for modification. If no sites have been created, this area will be empty.

2. Site Name. If you have not selected an existing site for modification, this field will read "{None Selected}". You may begin creating a new site by typing in a descriptive name. This name will appear on the Site Icon in the View window after the new site has been added. You can enter any alphanumeric value up to 20 characters in length.

3. Current Network Address. If you are going to be connecting to only one GSC3000 site, you may leave the network address at "0". If you will be connecting to more than one GSC3000 site, each site must have its own network number. You can choose a network number from 0 to 84. If the network address assigned to the GSC3000 site does not match what you enter in this field, you will receive the following query when you attempt to connect.
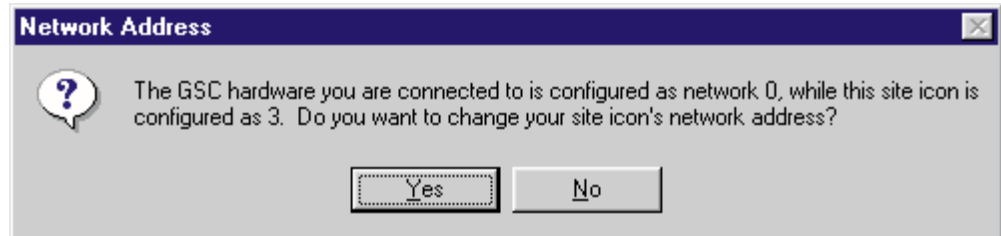
If you choose "Yes", the network number in Site Setup will be changed to match the number in the I/O units. If you choose "No", the network number in Site Setup will stay the same. You will need to change the network number saved in the I/O units at the site to match your desired value.

Changing Site Addresses. To change the network numbers at the site, you must first connect to the site using the old network address. Then from the "Unit" pull-down menu, choose "Change Site Addresses". A window will open in which you can enter a new network address. Click OK and the Configuration program will notify you if the change succeeded or failed. The network address will be changed for only the I/O units physically connected together in the G-bus LAN.

TECHNICAL SUPPORT: 1.800.283.5936 (USA) OR 1.801.974.3760
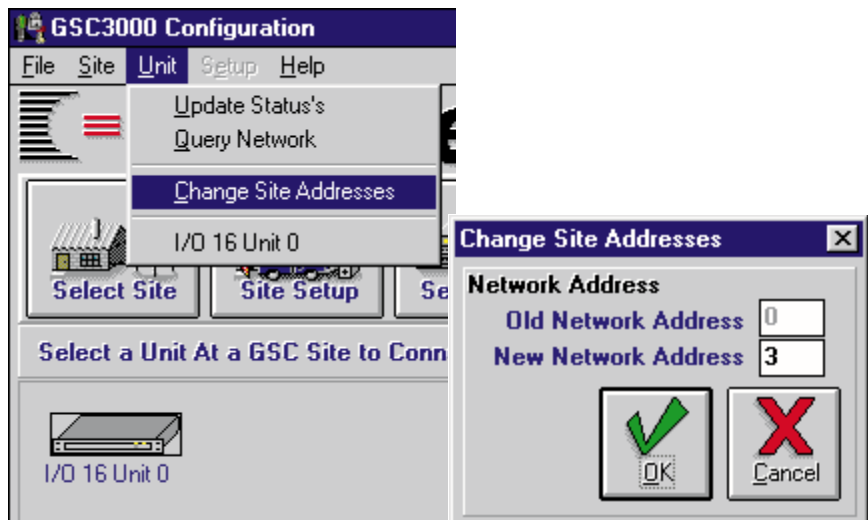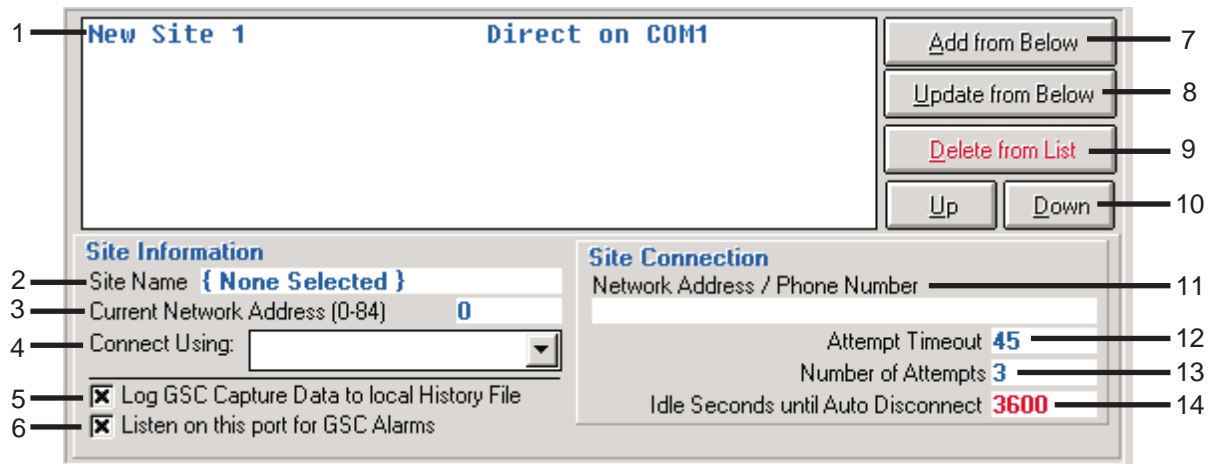
4. Connect Using. The pull-down menu will allow you to choose which available COM port you want to use when connecting to this site. Up to nine COM ports are possible, plus the TCP/IP proxy.

TCP/IP Proxy. This choice is valid only if you will be using the GSC3000 software version 1.9 with the Network Module software (**purchased separately**). This selection allows the GSC3000 software to use TCP/IP as a proxy COM port. Data packets are sent and received through your LAN or WAN instead of through a COM port. TCP/IP communications will not work unless the computer connected to your GSC3000 site is running the Network Module. The Network Module computer must also be directly connected to the site (direct serial, 4-wire modem, or 2-wire leased line).

If you do not want to have TCP/IP to appear as a connect option, you may disable this feature in the GSC3000 Port Wizard program. Launch the port wizard and un-check the box under Network Connectivity and "TCP/IP Proxy" will no longer appear as an option.
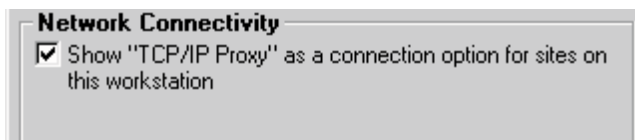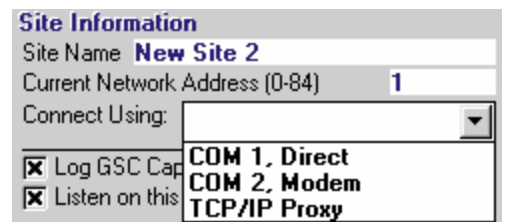
5. Log GSC Capture Data to Local History File. Click on this box if you want this PC to collect and save event formation from the site. Only one PC should log capture data per site.

6. Listen On this Port for GSC Alarms. If you want this PC to be notified of alarms when they are issued from the GSC3000 site, click on this box.

7. Add From Below. When you have completed all of the options in the Site Information and Site Connection sections of Site Setup, click on the "Add from Below" button to complete the new site and add it to the Site Summary area.

8. Update from Below. If you are modifying the information for an existing site, use the "Update from Below" button to apply the changes.

9. Delete from List. To delete a site, click on the Site Summary to select it, then click on "Delete from List" to erase all setup information.

10. Up / Down. These two button are used to move a site summary up and down in the list of your sites, allowing you to sort your sites in whatever order you choose.

11. Network Address / Phone Number. This field is used for the phone number if you are connecting via a dial-up modem, or for the network address if you are connecting using TCP/IP.

Phone Number. Enter the number you want the PC modem to dial. Be sure to indicate area code, 9 for an outside line, etc. You may use "#" and "*" notation for extended dialing, as well as "," for two-second pauses between digits. The | and ~ symbols are not valid in the phone number. **Example: 9*503,555-1234#215**

Network Address. If you are using TCP/IP, the network address must be either the IP address or machine name of the computer running the Network Module software. The IP address will be shown in the lower right-hand corner of the GSC3000 Comm Server window when it is maximized. The machine name is the equivalent of the IP address in alphanumeric format. This is the name by which the computer is identified on your LAN or WAN.
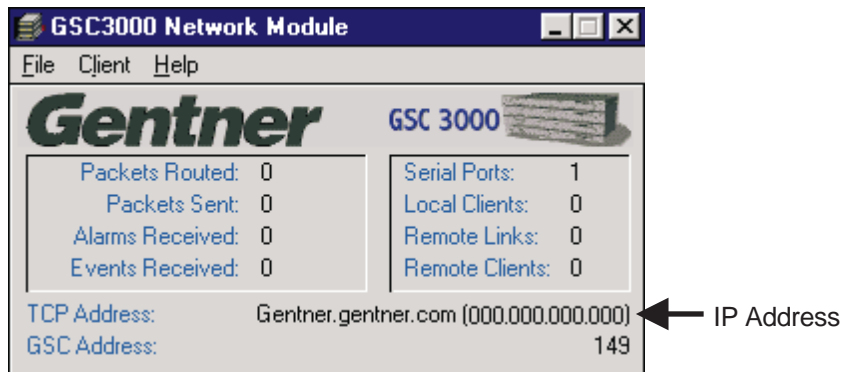
Enter IP Address
or Machine Name

<u>Network Availability.</u> One way to test if you are able to reach the machine name or IP address on your network is to go to a MS-DOS prompt and type: "Ping" then the machine name/IP address and press ENTER. Your computer will attempt to Ping that address. If the attempt is successful, the other computer will reply. If there is no response, DOS will respond "Bad IP address [your entry]".

12. Attempt Timeout. This is the number of the seconds for the GSC3000 software to wait after it tries to connect before it assumes there is an error. The Timeout applies whether your PC is dialing a number or trying to connect using TCP/IP. If you are dialing, forty-five seconds is typically long enough to get a carrier, busy or error command from the dialing.

13. Number of Attempts. The GSC3000 software will try this number of times to connect to a phone number or IP address before telling the user that the attempt has failed.

14. Idle Seconds Until Auto Disconnect. This is the number of idle seconds that the GSC3000 software will wait until it timeouts and hangs up the telephone or disconnects. The default is one hour (3600 seconds).

Alarm Options
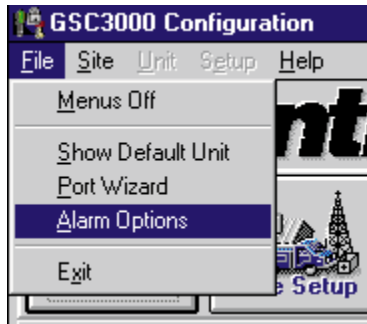
The Configuration program also allows you to configure how your PC will react when alarms are received by the GSC3000 software. To open the Alarm Options window, go to the "File" pull-down menu and choose "Alarm Options". The features of the Alarm Options window will be described in the order they are labeled below.
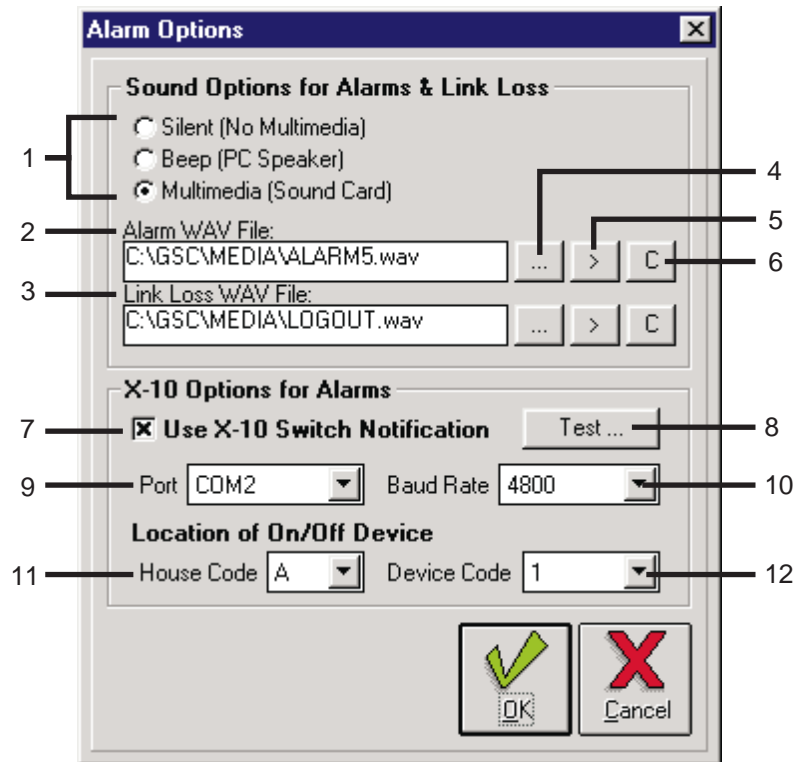
Sound Options for Alarm & Link Loss

1. Sound Options. When an alarm is received by the Comm Server or the communications link is lost, your PC can respond with three sound options: Silent, Beep, or Multimedia. If you do not want your PC to play a sound, choose "Silent". Choose "Beep" if you do not have a sound card or want the PC speaker issue a beep. The "Multimedia" option allows your PC to react by playing any WAV file.

2. Alarm WAV File. This is the sound file that will be played when an alarm is received by your PC. The "Multimedia" option must be selected in order for the file to be played.

3. Link Loss WAV File. This is the sound file that will be played when the communications link between your PC and the GSC3000 site is lost. The "Multimedia" option must be selected in order for the file to be played.

4. [...]. Click on the "..." button to browse your hard-drive for a different WAV file. The file path you select will appear in the field on the left.

5. [>]. Click on the ">" button to test play the WAV file you have selected.

6. [C]. The "C" button will clear the WAV file field.

X-10 Options for Alarms

The GSC3000 software is X-10 compatible. X-10 modules use the existing 110 Vac wiring in your house or building to communicate. By connecting an X-10 computer interface to a COM port on your PC, you can use the X-10 to turn ON/OFF low-voltage lights or other electrical devices. As a GSC3000 alarm option, X-10 could be used to turn on a warning light in an office or studio when alarms are issued. You will need to follow the manufacturer's directions for configuring your X-10 device for use with your PC.

7. Use X-10 Switch Notification. If you wish to be notified of alarms by activation of a switch using your X-10 module, click once on this box. A check mark will appear when X-10 is enabled. X-10 notification may be used simultaneously with any of the three sound options.

8. Test. This button allows you to test the X-10 switch to see if it is operating properly. You will receive an error message if the test action is unable to be completed.

9. Port. Use the pull-down menu to choose the COM port you will be using to connect to your X-10 module. The COM port you wish to use must be disabled in the GSC3000 Port Wizard or you will not be able to use it for interface with the X-10.

10. Baud Rate. Use the pull-down menu to select the baud rate for communication to the X-10. The baud rate is determined by the requirements of your X-10 module. Refer to the manufacturer's documentation for this information.

11. House Code. Use the pull-down menu to choose the house code of the X-10 module you want to activate. Valid House codes are A through P.

12. Device Code. Use the pull-down menu to choose the device code of the X-10 module you want to activate. 1 through 16 are valid Device Codes.

When you have finished configuring the Alarm Options, click OK to accept the new values or CANCEL to ignore the changes.

Unit Configuration

Each unit is configured on an individual basis. To begin unit configuration, you must first connect to the GSC3000 site. Click on the "Select Site" button in the Configuration program main screen. You will see an icon for each of the sites you have created. Click **once** on the Site icon to connect to the site. If connection is successful, the Site Access window will open and you will be queried for a user access code. The factory default access code is "**GSC3000**".

Once the password is accepted, the Configuration software will query the site for the units. One unit icon should appear in the View Window for each of the units networked in the G-bus LAN. If all of you units do not show up or you see a broken unit icon, click on the "Query Network" button to try to find the lost or miscommunicating units. The Unit icon with a serial connector indicates which unit you are connected through.

Click here to begin unit setup →
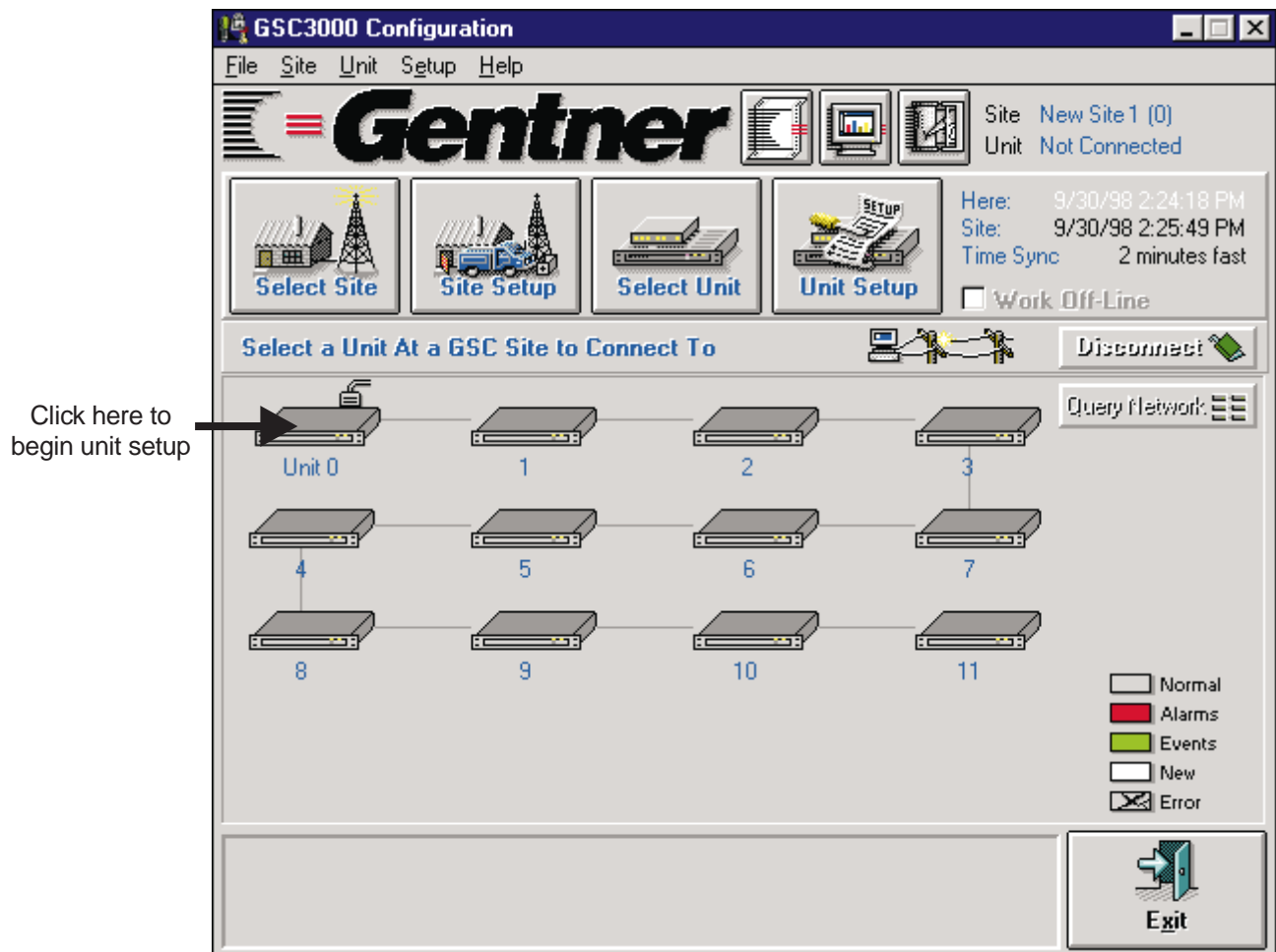
To configure a unit, click on the Unit icon. Buttons for each of the configuration parameters will appear in the View window. Each of the configuration parameters will be discussed in the following pages.
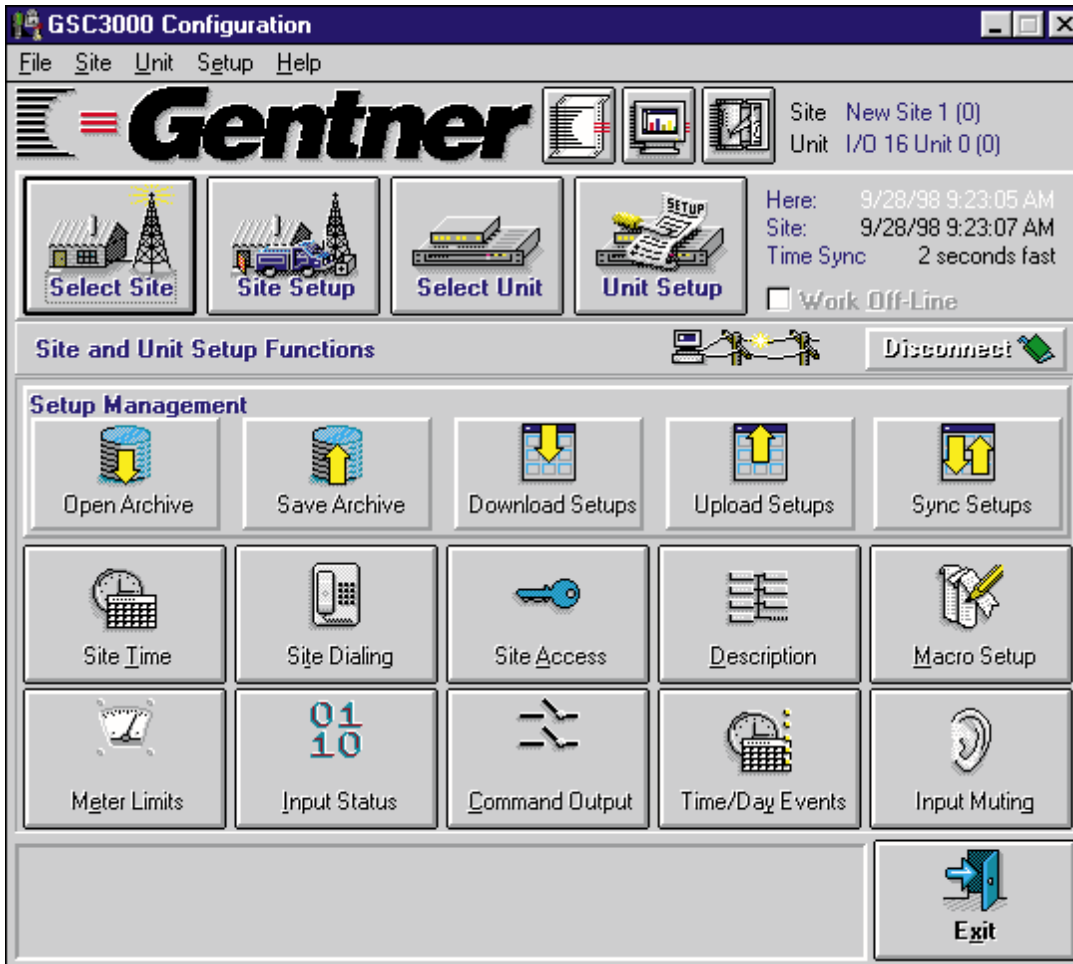
Site Functions

Site Time, Site Dialing, and Site Access are configured for the entire GSC3000 system. Not every unit needs to be configured for these parameters, only the units which administrate the functions for the rest of the site.

Site Time. This parameter is configured for unit 0 only. The time settings established for unit 0 are communicated to all other units on the G-bus LAN. To change the time, click on the "Site Time" button. The Site Date and Time window will open. The features of this window will be discussed in the order they are labeled in the figure below.
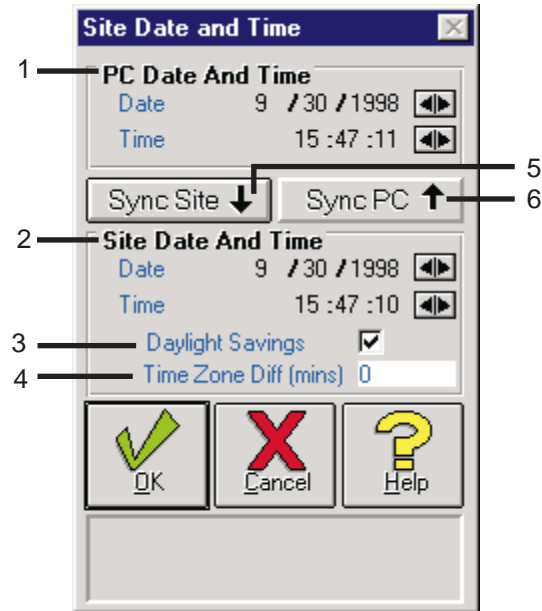
1. PC Date and Time. This area shows the date and time of your PC as it is set in Windows®. Use the < > buttons to move back or advance the date by one day, or to move back or advance the time by one minute. When you click OK, Windows® will be set to the new date and/or time.

2. Site Date and Time. This area shows the date and time of I/O unit 0 which administrates date and time for all units on your G-bus LAN. Use the < > buttons to move back or advance the date by one day, or to move back or advance the time by one minute. When you click OK, the new date and time will be set in I/O unit 0.

3. Daylight Savings. Click on this box if the GSC3000 site is in a time zone which uses Daylight Savings Time. If this box is checked, the time will automatically be advanced one hour at 2 a.m. on the first Sunday of April and move back one hour at 2 a.m. on the last Sunday of October.

4. Time Zone Diff (mins). If your PC and site are in two different time zones enter the number of minutes that separate the two time zones. For example, if the I/O unit is in California and the PC is in New York, the value entered would be -180 (California is three hours behind New York).

5. Sync Site. If you click on this button, the site date and time will be synchronized to match the date and time of the PC. Daylight Savings and Time Zone Diff will be automatically factored in.

6. Sync PC. If you click on this button, the PC date and time will be synchronized to match the date and time of the site. Daylight Savings and Time Zone Diff will be automatically factored in.

When you have complete all changes to the date and time, click OK to apply the changes or click on CANCEL to close the window without applying any changes.

Site Dialing. This parameter needs to be configured for only the I/O units which are connected to a modem. You may connect a modem to any I/O unit on the G-bus LAN, but unit 0 is recommended. To establish the numbers the I/O unit modem should dial, click on the "Site Dialing" button. The Site Dialing window will open. The features of this window will be discussed in the order they are labeled in the figure below.

If you are using a Voice Interface unit, you must configure the Site Dialing information for that unit as well. Any unit that is require to dial out (to modem, voice, or pager) must be configured for Site Dialing.
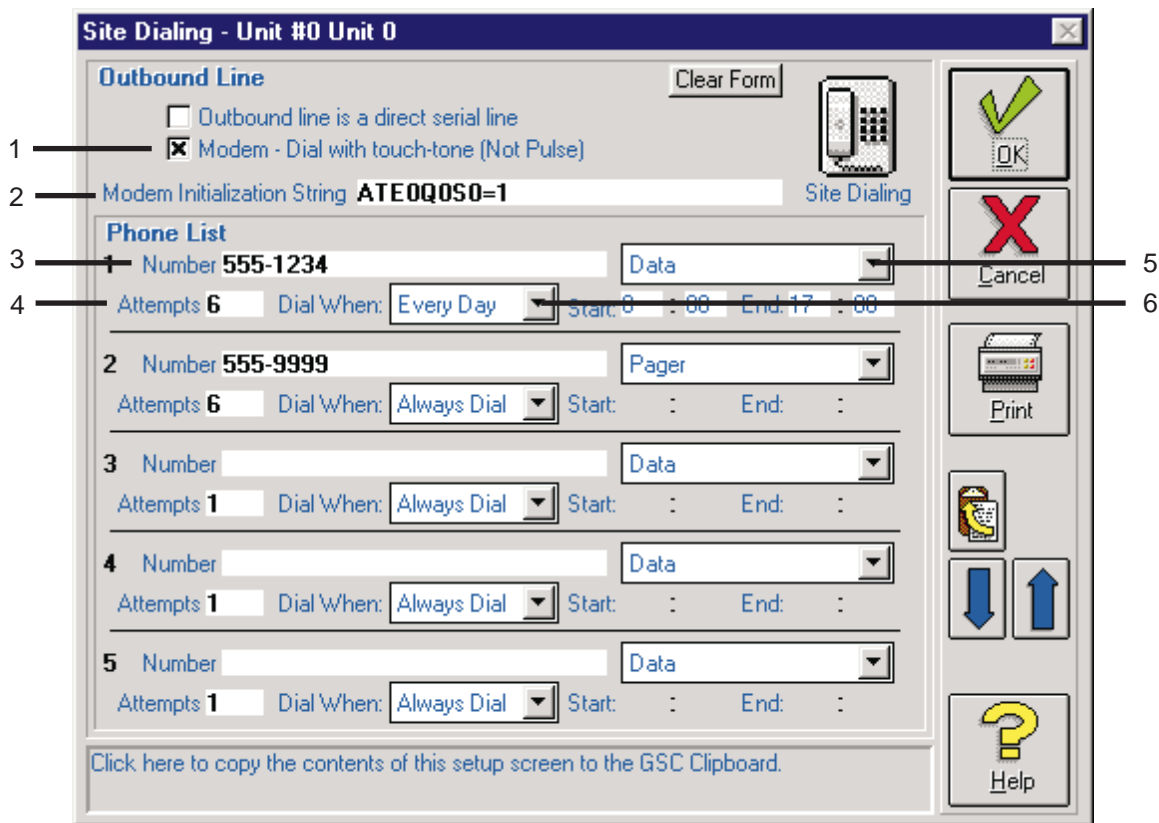
1. Outbound Line. First you should configure the outbound line. If the I/O unit is directly connected to the PC, the top box should be checked. There is no need to enter the Site Dialing window if the outbound line is a direct serial line, this is the assumed default.

COMMAND	DEFINITION
AT	Required Command Prefix
E0	Sets local echo OFF.
Q0	Returns online
S0	Sets the number of rings in Auto Answer Mode.
S0=0	Auto Answer OFF
S0=1	Auto Answer after 1 ring.
S7	Sets number of seconds modem waits for carrier or answers before sending No Carrier result code.
S7=30	Sets register S7 to 30 secs.

If the I/O unit is connected to a modem, you must click on the lower box. If there is not a check mark in the Modem box, your I/O unit will not send the initialization string to the modem or dial any of the phone numbers.

2. Modem Initialization String. Enter the appropriate initialization string. If you click on the "Clear Form" button at the top of the window, the default initialization string will appear in this field. This string will initialize the U.S. Robotics Sportster 33.6 for connection to an I/O unit. If you are connecting your modem to a Voice Interface unit, you must enter a different initialization string. The initialization strings for both unit types are shown below. Also included is a table that shows the command equivalents for each of the commands in the init strings. If you are using a different brand of modem, be sure that the initialization string that you enter uses equivalent commands which can be found in your manufacturer's documentation.

**I/O Unit Init String—ATE0Q0S0=1
Voice Interface Init String—ATE0Q0S0=0S7=30**

3. Phone Number. Enter the phone number(s) you wish the unit to dial when alarms are received. Phone numbers should be listed in order of priority. The I/O unit will attempt to connect to the phone number on line 1 first, then line 2 and so on. Up to five different contacts may be entered on the phone list. Be sure to indicate area code, 9 for an outside line, etc. You may use "#" and "*" notation for extended dialing, as well as "," for 2-second pauses between digits.
Example: 9*503,555-1234#215

4. Attempts. Enter the number of times you want the unit to attempt to connect to the phone number before moving down to the next line on the phone list. The unit will wait one minute between dial-out attempts to allow time for a contacted party to call in and clear the alarms.

5. Connection Type. Use the pull-down menu to choose what type of connection the unit will be making. If you are configuring an I/O unit, you may choose "Data" or "Pager". "Data" assumes the unit will be connecting to another modem on a PC and will begin communicating alarm information to the GSC3000 Comm Server. If you select "Pager", the unit will connect to the paging service and then hang up. If you are configuring a Voice Interface, you may also choose "Voice, Leave Msg" and "Voice, Enter Pass". See the Voice Interface manual insert (Appendix D) for more information.

6. Dial When. You should also set the time limits when each number on the phone list should be contacted. There are four contact options: Always Dial, Week Days, Weekends, and Every Day. If you select "Always Dial", the unit will attempt to contact that number 24 hours a day, 7 days a week, 365 days a year. If you choose any of the other options, you may also set up a range of times in which the unit will attempt to contact that number. Enter the times in 24 hour format (0:00 to 23:59). For example, if you chose "Every Day" and entered the times 5:00 to 22:00, the I/O unit would attempt to contact you every day of the week between 5:00 a.m. and 10:00 p.m.
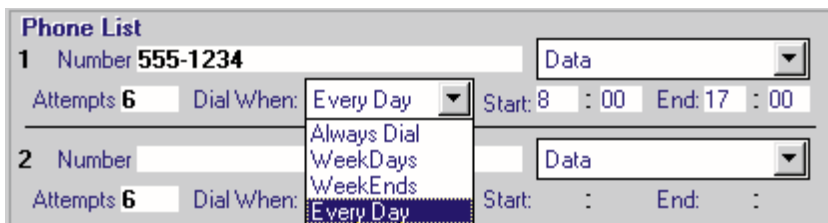
When you have finished configuring Site Dialing, click OK and the information will be uploaded to the connected I/O unit.

If you are using a Voice Interface unit, you must configure Site Access information for that unit as well. Any unit that an outside user will dial in to (voice or data) must be configured for Site Access.

Site Access. Like Site Dialing, this parameter needs to be configured for only the I/O units which are connected to a modem. User Access codes are stored in the I/O units which are connected to an outbound line, whether it is a direct connection or dial-up modem. To change access codes or establish new codes, click on the "Site Access" button. The User Access window will open. The features of this window will be discussed in the order they are labeled in the figure below.
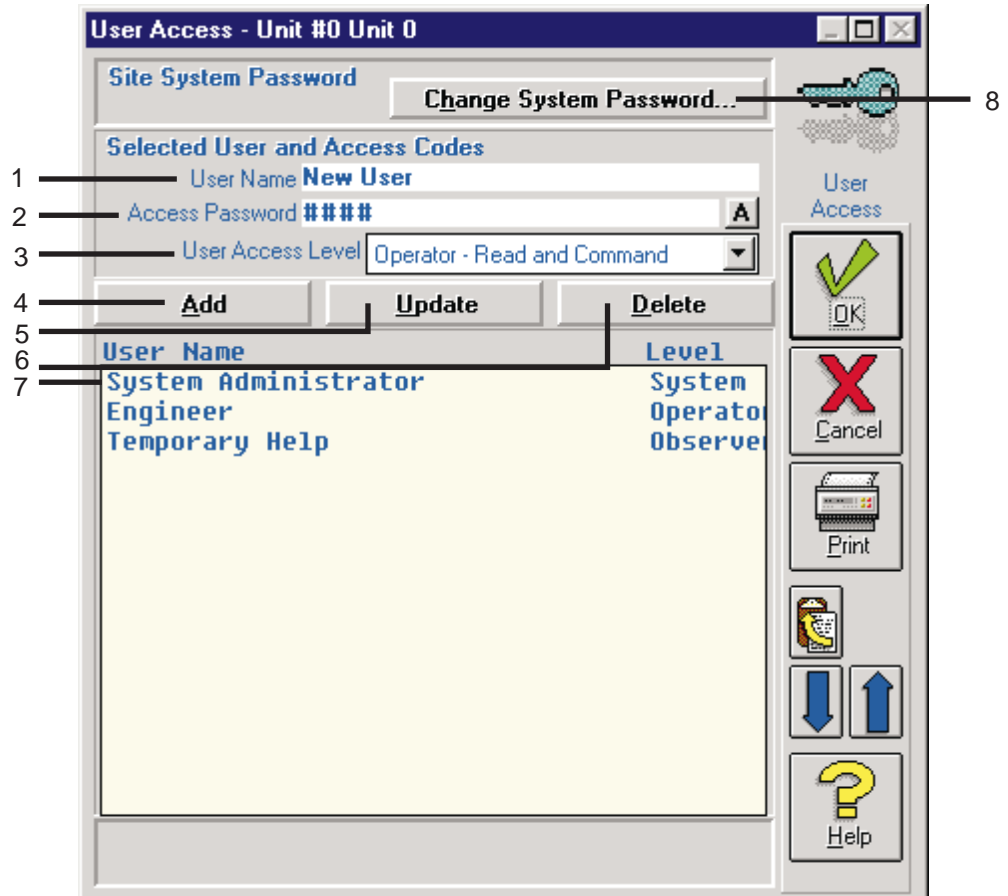
1. User Name. Enter the name of the user you want to add to your access list. This can be the name of a person or a description if more than one person will be using the same access code. The User Name can be up to 32 characters in length and may be letters or numbers.

If you are configuring site access for a Voice Interface unit, you may still use the alphanumeric format in the password. However, when making a voice call, you will need to enter the numeric equivalents (as they appear on the telephone keypad) for any letters in the password.

2. Access Password. Enter an alphanumeric user password. If you would like to view the password you have entered, click on the "A" button to the right of the entry field. If you want the password to be concealed by # signs, click on the button again. Passwords can be up to eight (8) characters in length. The access password is also called the "access code".

3. User Access Level. Use the pull-down menu to assign each user an access level: system, operator, or observer. System-level access is an administrative clearance; it allows the user to configure the site, issue commands and monitor the site. Operator-level does not permit configuration, but enables the user to issue commands and monitor the site. Observer-level permits read-only access; no commands or macros can be issued by an observer.
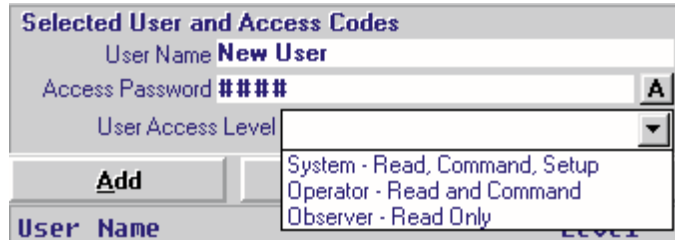
4. Add. If the user information you have entered is for a new user, click on the "Add" button.

5. Update. If you are changing information for an existing user, click on the "Update" button. You must first click on the User Summary line to view the user information.

6. Delete. If you want to delete an existing user, click on the "Delete" button. You must first click on the User Summary line to select the user you want to delete.

7. User Summary. Each time you add a user to the site, a User Summary line will appear in the User Access window. You may update or delete users by click on the User Summary line to select it. The user's complete information will appear in the top of the window.

8. Change System Password. The default Site System Password is "**GSC3000**" as shipped from the factory. You may change the Site System Password by clicking on this button. A query box will appear asking you to enter the old Site System Password. If entered correctly, you will be requested to enter a new password up to eight (8) characters in length. Click OK and you will be asked to verify the new password. The site system password gives you the same access as a system-level user password.

When you have completed entering all site access information. Click OK and the new information will be uploaded to the connected unit.

GENTNER
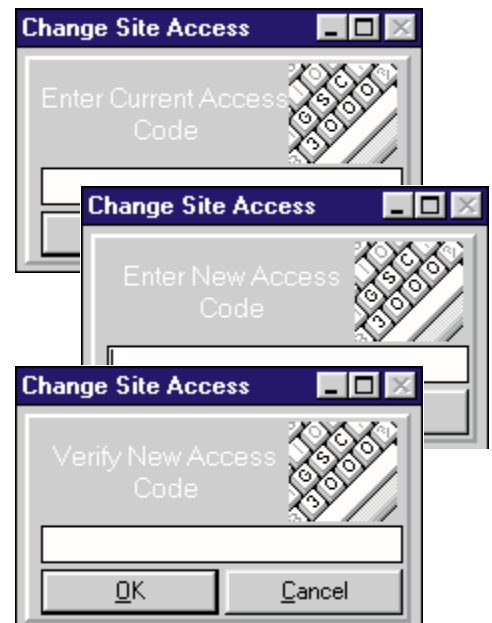
Unit Functions

The following seven functions need to be configured for every I/O unit in your GSC3000 system: Description, Command Output, Macro Setup, Time/Day Events, Meter Limits, Input Status, and Input Muting. These functions will be discussed in the order they are labeled in the figure below.
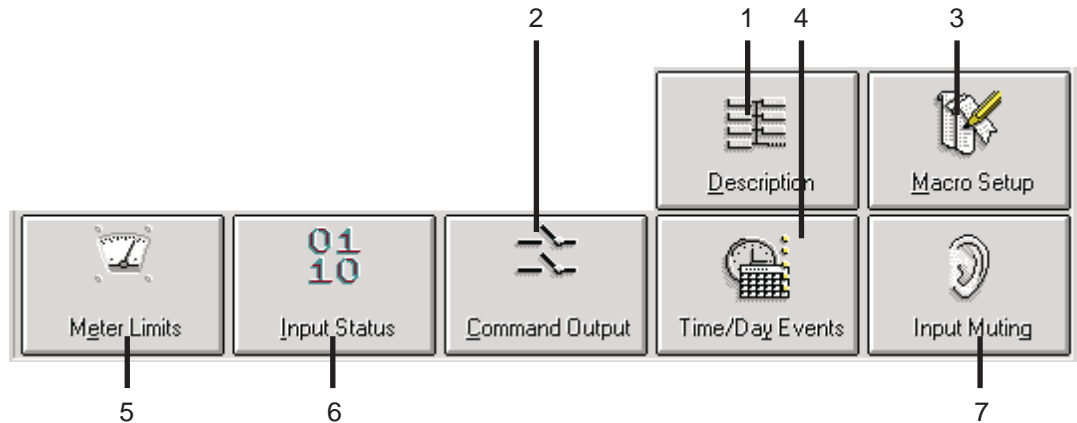
Description. This button opens the Unit Description window which allows you to name each unit. If the unit you are configuring is also the unit you are physically connected to (by modem or direct connect), you may also rename the site from this window. You may enter a descriptive name of up to 20 characters in each name field. Click OK to upload the new unit name.
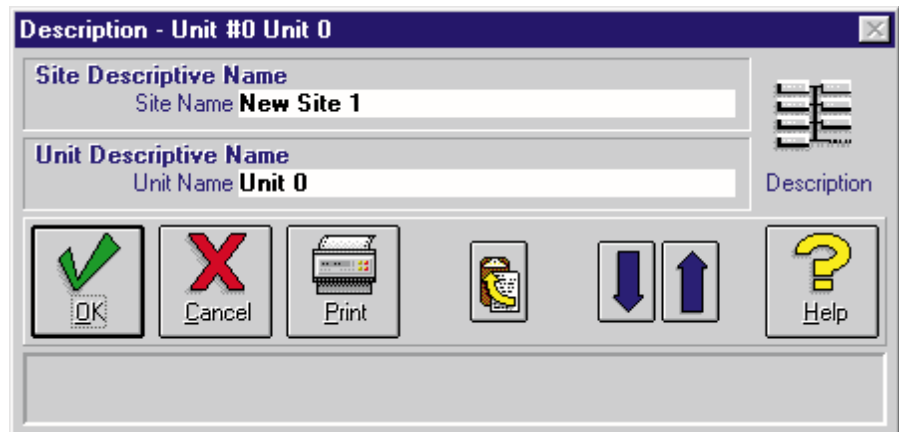
Command Output. This button opens the Command Output window which allows you to name and configure each of your command outputs. The parameters of the Command Output window will be discussed in the order they are labeled in the figure on the top of the next page.
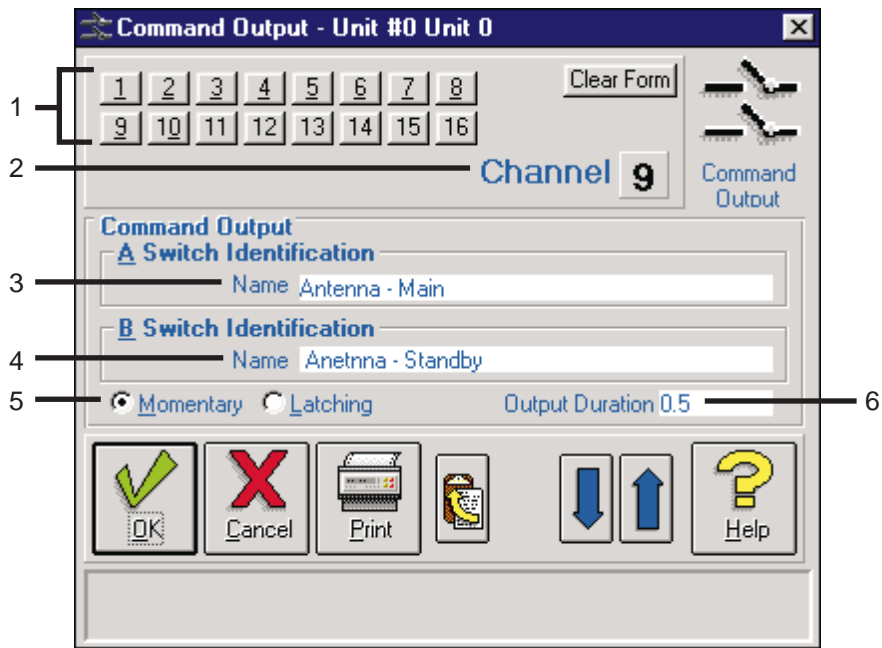
1. Channel Select. Click on any of these buttons to select the command output channel you wish to configure.

2. Channel Indicator. This box shows the current channel selected.

3. A-Switch Identification. Enter a descriptive name (up to 32 characters) for the command output A switch.

4. B-Switch Identification. Enter a descriptive name (up to 32 characters) for the command output B switch.

5. Output Mode. Choose the operating mode of the command-output, either momentary or latching.

6. Output Duration. Enter the length of contact following activation of the command output. This parameter applies to momentary switching only, NOT latching. The duration may range between 0.1 and 25.5 seconds.

When you have finished configuring all of the command outputs, click OK to upload the information to the connected unit.

Macro Setup. This button allows you to open the Macro Setup window. Macros are powerful tools which allow you program your I/O unit to perform a complex sequence of functions. Although macro programming is fairly easy, it has many features. Due to its length, Macro setup has been assigned its own section; see Chapter 7—Macros for more information.

Time-of-Day Events. This button opens the Time-of-Day Events window which allows you to configure your I/O unit to perform certain tasks at specific times of the day. A Time-of-Day Event can issue commands, launch macros, and take data-capture snap-shots of your I/O unit. The parameters of the Time-of-Day Events window will be discussed in the order they are labeled in the figure below.
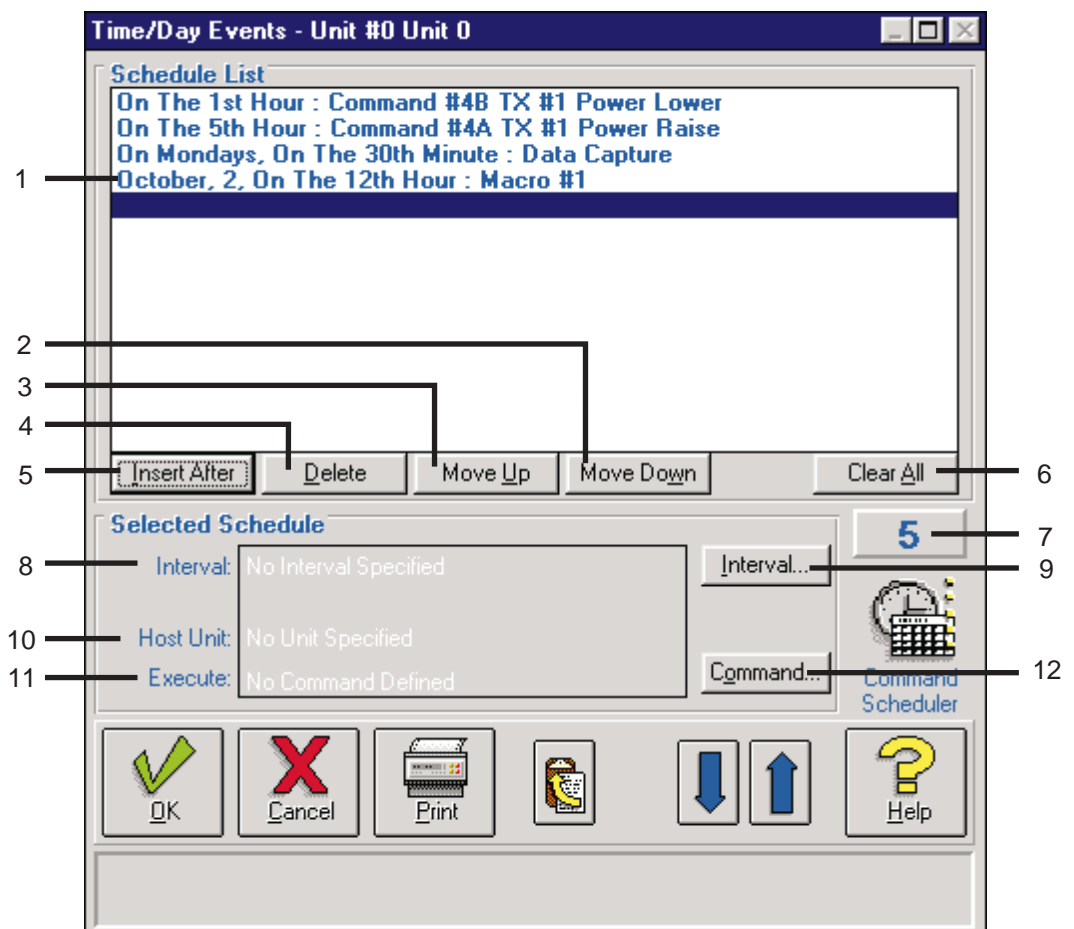
1. Schedule List. This area shows a list of the Time-of-Day Events that are scheduled to occur. You may edit individual events by clicking on the summary line.

2. Move Down Button. Click on this button to move an event summary line down one position in the Schedule List.

3. Move Up Button. Click on this button to move an event summary line up one position in the Schedule List.

4. Delete Button. Click on this button to delete a Time-of-Day Event from the Schedule List

5. Insert After Button. Click on this button to insert a blank Time-of-Day Event in the Schedule List. The new event will be inserted after the event summary line that is currently selected. You will need to click on this button each time you create a new Time-of-Day Event.

6. Clear All Button. Click on this button to clear all Time-of-Day Events from the Schedule List.

7. Schedule Position. This box indicates the position of the selected event summary on the Schedule List.

8. Interval. This line shows a complete description of the interval for the selected event.

9. Interval Button. Click on this button to change the interval for the selected Time-of-Day Event. A window will open that allows you to enter the date, day of the week, and/or time that you want the event to occur. If an interval parameter is left empty (a wildcard), it will repeat at every interval in that parameter.

Date. If you enter a month but leave the day parameter empty, the Time-of-Day Event will occur every day during that month. If you enter a day, but leave the month empty, the event will occur once a month on that day.

Day of the Week. Choose the day of the week you want the event to occur. If you want the event to occur every day, click on the "Every" option. Day of the week is overridden if you have entered a date (month/ day).

Time. Entering a number into the hour column will make the event occur at a particular hour each day. Entering zeros into the minute and second columns will mean that the command is repeated hourly. If you enter an hour and minute, but leave the second parameter empty, the event will repeat every second during that interval. If you enter only the seconds value, the event will repeat once every minute.

Each I/O unit stores its own data-capture criteria. You may recreate a data-capture Time-of-Day Event for each I/O unit or archive the setup for upload into multiple I/O units (for more information on archiving unit setups see page 84).
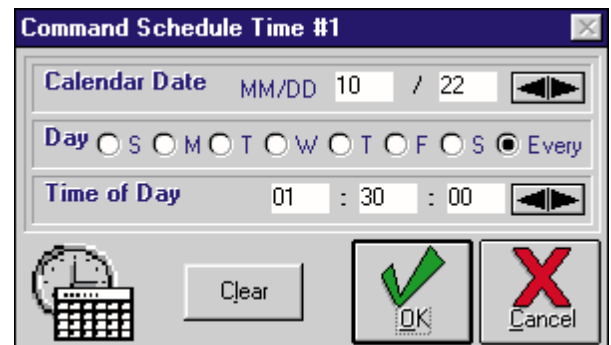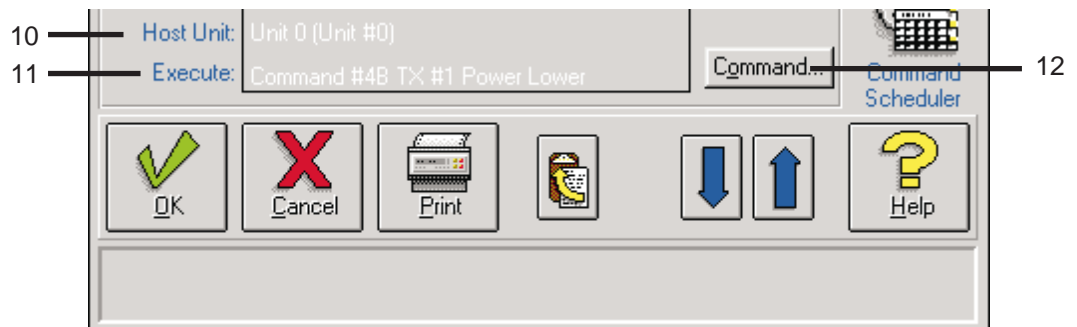
10. Host Unit. This line describes the host I/O unit where the action for the selected Time-of-Day Event will occur.

11. Execute. This describes the action to be taken by the selected Time-of-Day Event.

12. Command Button. Click on this button to choose the action taken when the Time-of-Day Event occurs. A window will open that shows the available command, macro, and data capture options that are available on each unit. The unit marked "(ME)" is the unit you are currently connected to. You may choose any command, macro, or the date capture option for any unit on the G-bus LAN. You must click on both the unit and the action to make a selection.
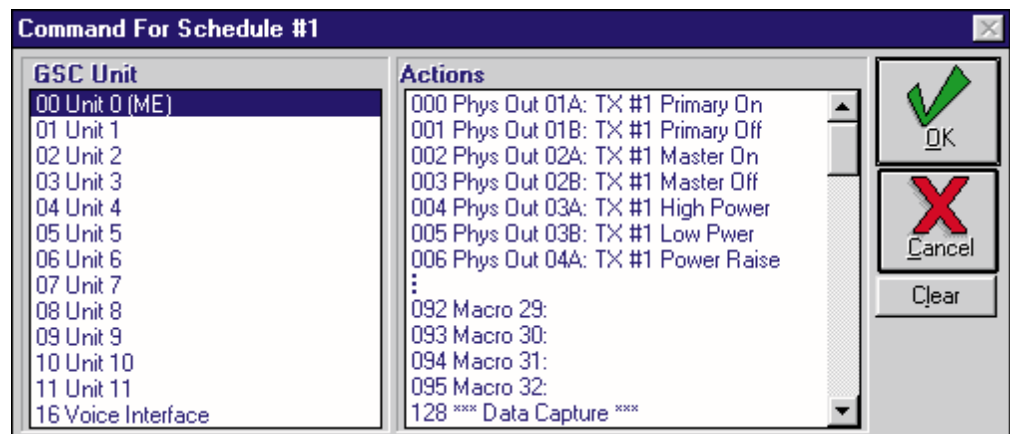
When you are finished setting up the Time-of-Day Events for this unit, click OK to upload the information to the connected unit. Up to 64 Time-of-Day Events may be configured and stored in each I/O unit.

Meter Limits. This button opens the Meter Setup window which allows you to configure each of the metering inputs on your I/O unit. The parameters of the Meter Setup window will be discussed in the order they are labeled in the figure below.

Meter Limits
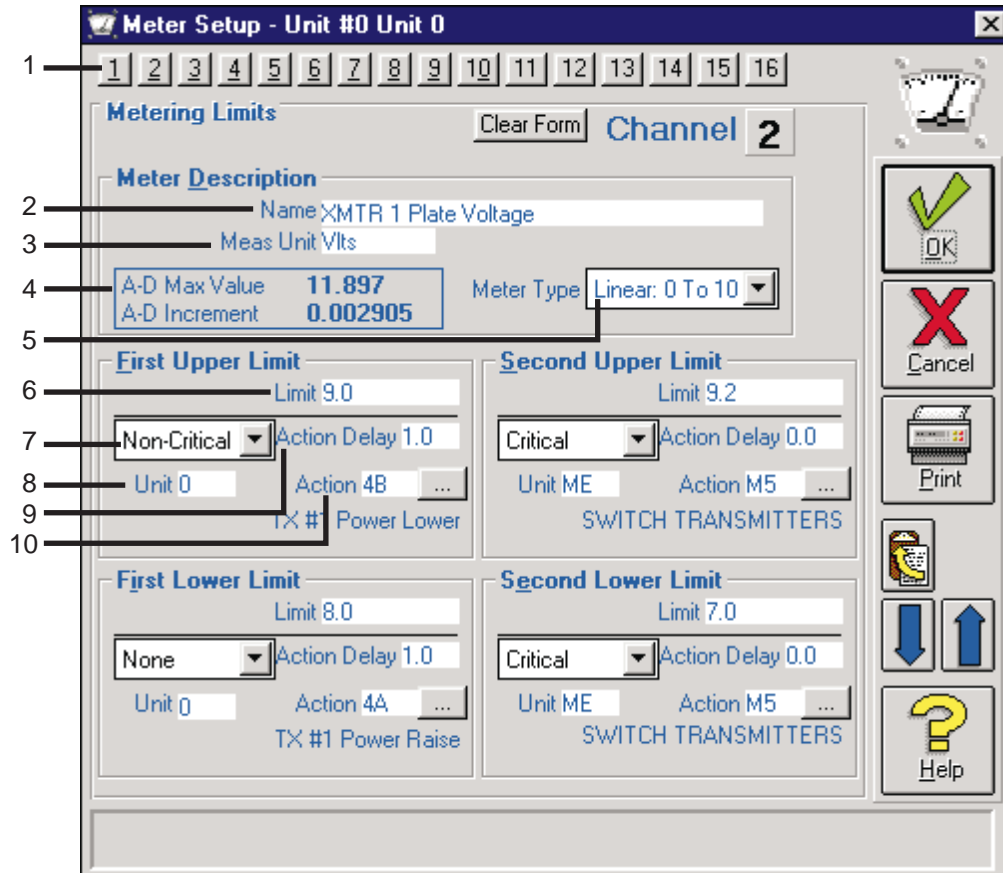
1. Channel Select. Click on these buttons to select the metering channel you want to configure.

2. Name. Input a descriptive name of up to 32 characters. This is the name that will appear on the current metering input when it is viewed in the Monitor application.

3. Measurement Unit. Enter a abbreviated description (up to four characters) of the type of measurement this metering input is using (vlts, amps, etc).

4. A-D Values. This read-only area shows the A-D Max Value and the A-D Increment as you have calibrated them in the Monitor program (see pages 106-108). If you are configuring your metering inputs for the first time, ignore this information until you have calibrated the readings.

If you use all capitalized characters, the label may appear clipped on the metering input in Monitor. We recommend using lower- or mixed-case letters to help prevent this problem.
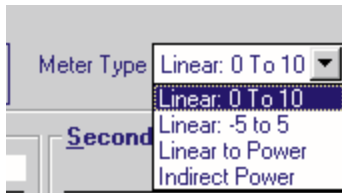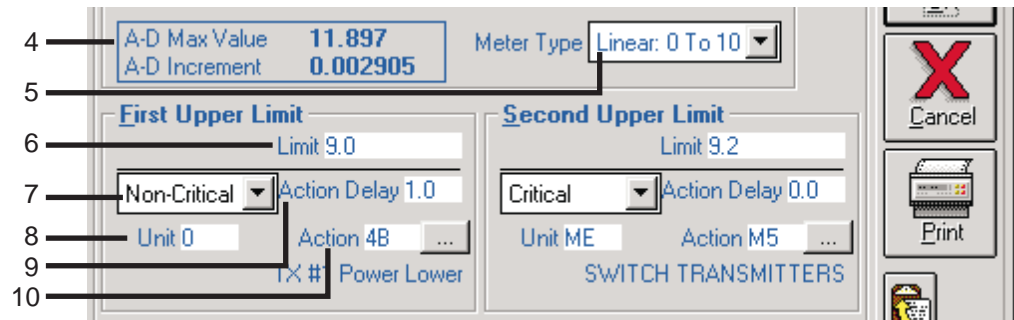
5. Meter Type. Use the pull-down menu to choose the type of meter used by this metering channel. "Linear 0 to 10" means the metering input sample ranges from 0 to 10 Vdc; "Linear -5 to 5" means the metering input sample ranges from -5 to 5 Vdc; "Linear to Power" and "Indirect Power" means the metering input samples range from 0 to 10 Vdc and are calculated values.

6. Upper/Lower Limits. Each metering input has four limits, two upper and two lower limits. The second upper limit must be greater than or equal to the first upper limit. The second lower limit must be less than or equal to the first lower limit. The value you that you enter for each limit is the real-world value that corresponds to the limits you have set on the connected input. For example, if you want to be notified by alarm when a meter passes 9.2 volts on your equipment, the second upper limit in your I/O unit should be set to 9.2.
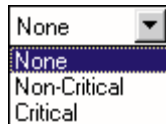
7. Alarm Condition. Use the pull-down menu to choose the type of alarm you want issued when a limit is passed. If you do not want to be alarmed, select "None". If you want the alarms to register, but do not want the I/O unit to attempt to notify you, choose "Non-Critical". If you want to be notified of an alarm, select "Critical" and the I/O unit will attempt to call out (or open the alarm window) when a limit is passed.

We recommend that you wait until you have calibrated your meter readings in the Monitor program before you assign alarms to meter limits. If your limits exceed the range assigned in the Monitor application, your I/O unit may register false alarms.

8. Unit. This is the number of the I/O unit that is to execute an action when a meter limit is passed. "ME" stands for the currently connected I/O unit.

9. Action Delay. Enter the amount of time (in tenths of a second) that the I/O unit should wait after a limit is passed before executing an action or issuing an alarm.

10. Action. This space shows the action the I/O unit will take when a limit is passed. Click on the "..." button to open the window which allows you choose which action should be taken. You may choose any command, macro, or the date capture option for any unit on the G-bus LAN.
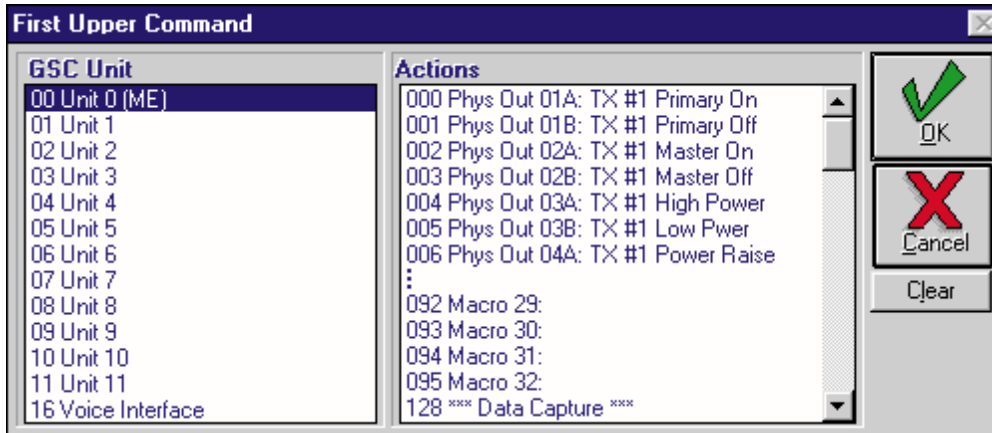
The action taken when a limit is passed is a "one-shot"; the command, macro, or data capture will occur only once each time the limit is passed. In past versions, actions were repeated until the metering value returned to proper limits. This is no longer the case. If you want an action to be repeated until a problem is corrected, you will have to write a repeating macro using "If", "Then", "While" and other commands. See Chapter 7—Macros for more information.

When you have finished configuring all meter limits, click OK and the information will be uploaded to the connected unit.
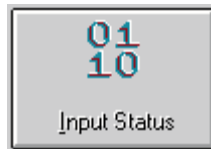
Input Status. This button opens a window which allows you to configure each of the status inputs on your I/O unit. The parameters of the Input Status window will be discussed in the order they are labeled in the figure below.
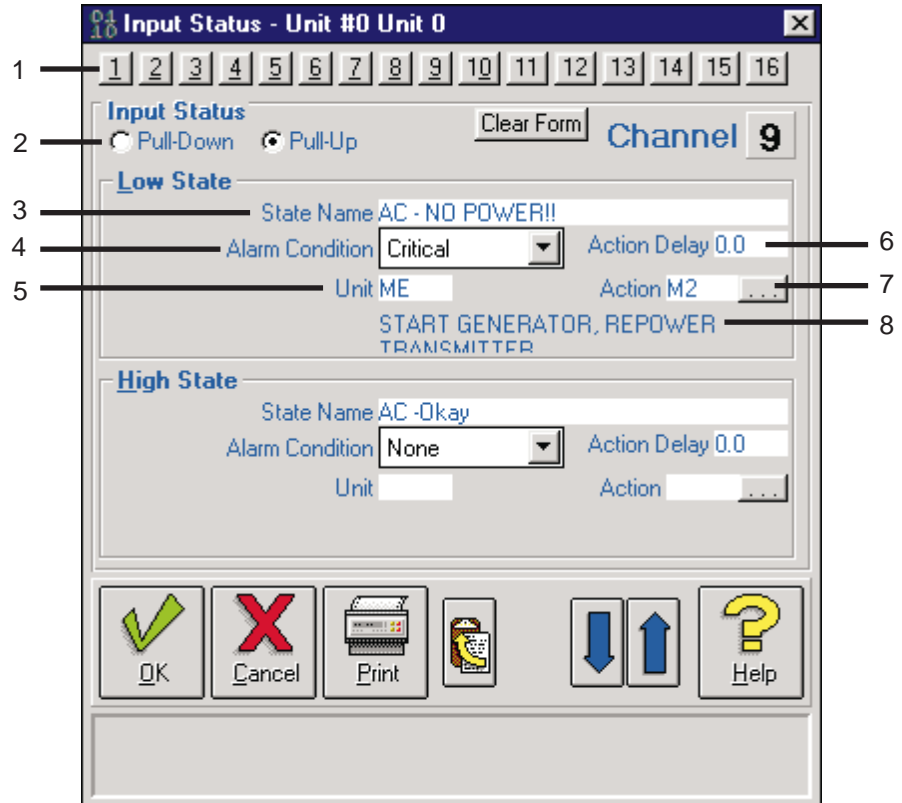
1. Channel Select. Click on any of these buttons to select the status channel you want to configure.

2. Input Status. This option sets the initial state (low or high) of each status channel. Click on "Pull-Down" to set the status channel to the low state. Click on "Pull-Up" to set the status channel to the high state. The high state is normally +5 V and the low state is 0 V or ground. If your equipment uses contact closures to indicate a change in state, you should set this parameter to "Pull-Up".

3. State Name. Each status input has two states: low and high. On this line, enter a description of each state (up to 32 characters). These are the names that will appear on the status inputs when they are viewed in the Monitor application. If you use all capitalized characters, the label may appear clipped in Monitor. We recommend using lower- or mixed-case letters to help prevent this problem.

If you are interfacing to a transistor logic status input, setting the input to "Pull-Down" provides a CMOS-compatible state change threshold (2.5 Vdc). Setting the input to "Pull-Up" provides a TTL-compatible state change threshold (1.5 Vdc).

4. Alaro Condition. Use the pull-down menu to choose the type of
alarm you want issued when a change in state occurs. If you do not
want to be alarmed, select "None". If you want the alarms to regis-
ter, but do not want the I/O unit to attempt to notify you, choose
"Non-Critical". If you want to be notified of an alarm, select "Critical"
and the I/O unit will attempt to call out (or open the alarm window)
when the input changes state.
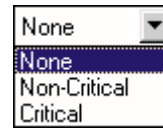
5. Unit. This is the number of the I/O unit that is to execute an
action when a change of state occurs. "ME" stands for the currently
connected I/O unit.

6. Action Delay. Enter the amount of time (in tenths of a second)
that the I/O unit should wait after a change of state before execut-
ing an action or issuing an alarm.

7. Action. This space shows the action the I/O unit will take when
the input changes state. Click on the "..." button to open the window
which allows you choose which action should be taken. You may
choose any command, macro, or the date capture option for any
unit on the G-bus LAN.
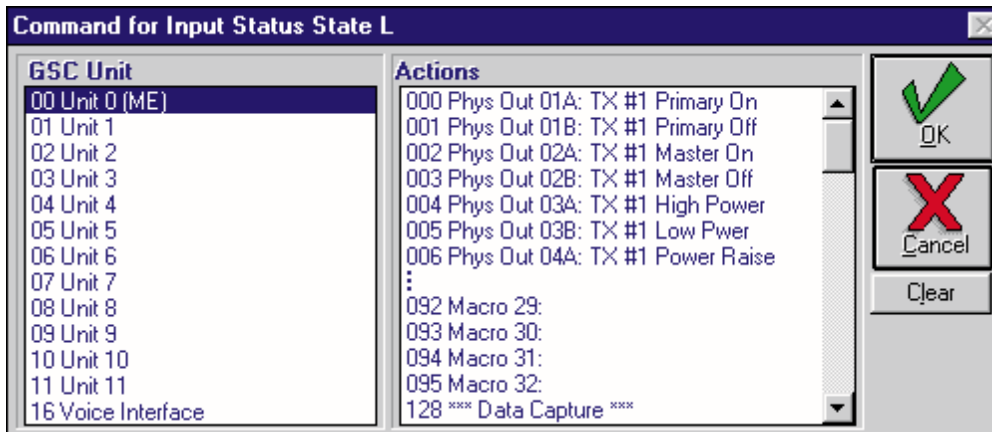
The action taken when a status input changes state is a "one-shot";
the command, macro, or data capture will occur only once each
time a change of state occurs. In past versions, actions were
repeated until the problem was corrected. This is no longer the
case. If you want an action to be repeated, you will have to write a
repeating macro using "If", "Then", "While" and other commands.
See Chapter 7—Macros for more information.

When you have finished configuring all status inputs, click OK and
the information will be uploaded to the connected unit.

Input Muting. This feature allows you to configure your GSC3000 to automatically mute specific input channels when certain events occur, such as a change of state on a status input or activation of a command output. You can mute either status inputs or metering inputs to prevent alarms from being issued or actions from being taken. This feature is useful because under one set of circumstances you may want an alarm issued, but in a different situation, you may not. Up to 64 muting events may be configured per I/O unit. The features of the Input Muting window will be discussed in the order they are labeled in the figure below.
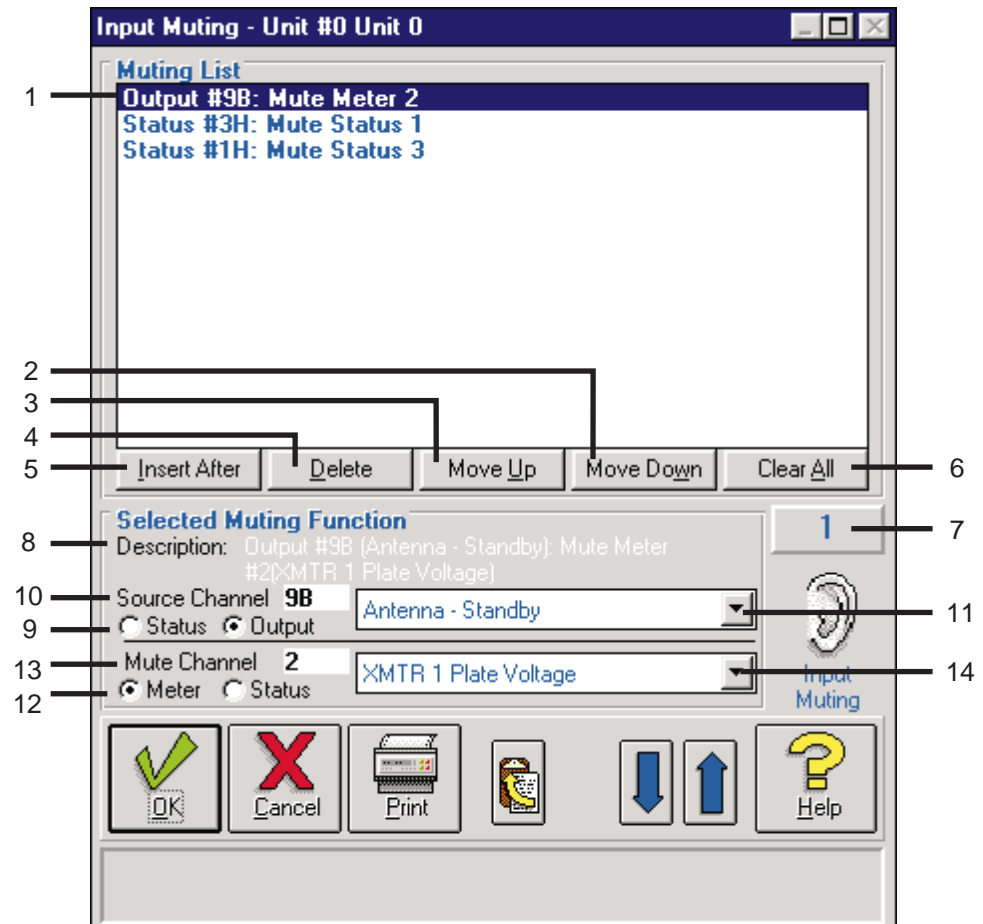
1. Muting List. This area shows a list of the source channels and the inputs that are to be muted. You may edit individual muting events by clicking on the summary line.

2. Insert After Button. Click on this button to insert a blank muting event in the muting list. The new muting event will be inserted after the summary line that is currently selected. You will need to click on this button each time you create a new muting event.

3. Move Down Button. Click on this button to move a muting event summary line down one position in the Muting List.

4. Move Up Button. Click on this button to move a muting event summary line up one position in the Muting List.

5. Delete Button. Click on this button to delete a muting event from the list

6. Clear All Button. Click on this button to clear all muting events from the list.

7. Muting List Position. This box indicates the position of the selected muting event summary on the list.

8. Description. This area provides a detailed description of the source channel and muting channel for the current muting event.

9. Source Channel Type. Choose the type of channel that will be the source of the muting event. This can be either a status input or a command output.

10. Source Channel. This area shows the number of the output channel or the number and state of a status channel. If you enter a command output, the muting event will occur when the output is activated. If you enter a status channel and state ("H"—high or "L"—low), the muting event will occur when the channel switches to that state. The muted channel will automatically unmute when the status channel changes state again.

11. Source Pull-Down Menu. Click on the pull-down menu to choose from your descriptions of the output or status channels. When you select a channel, the number of the channel will appear in the source channel box (see #10, above).
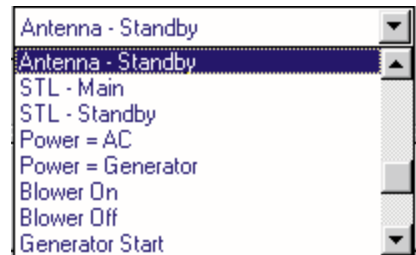
12. Mute Channel Type. Chose the type of channel that will be muted when the event occurs. You can choose to mute either a metering input or a status input.

13. Mute Channel. This area shows the number of the status or metering channel that will be muted when the event occurs. If you know the number, you may type it in this box.

14. Mute Pull-Down Menu. Click on the pull-down menu to choose from your descriptions of the metering or status channels. When you select a channel the number of the channel will appear in the mute channel box (see #13, above).
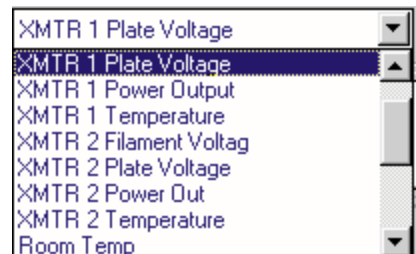
When you have finished creating or modifying muting events, click OK to upload the information to the connected I/O unit.

Setup Management

Configuration has five setup management buttons that allow you to save to disk, load from disk, download, upload, and synchronize the information you have configured for the connected I/O unit. These features are very useful time-savers because they allow you to adapt configuration information from one unit for use with another. For example, you have two I/O units which need to be configured very similarly with only a few minor differences. You can save the configuration information on the first unit, then load it when you are connected to the second one. Make the changes you want then upload the information to the second unit. You may create as many setup files as you like, but each setup file contains information for only one unit on your G-bus LAN. The five setup management functions will be discussed in the order they are labeled in the figure below.
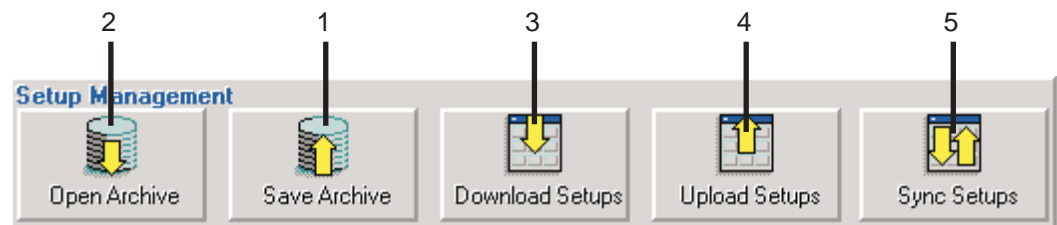
Save Archive. This function takes selected setup files, and puts that information into a file with a .SET extension that can easily be restored onto the same or another I/O unit. When you click on the "Save Archive" button, a window will open that allows you to choose the path and name the new .SET file.
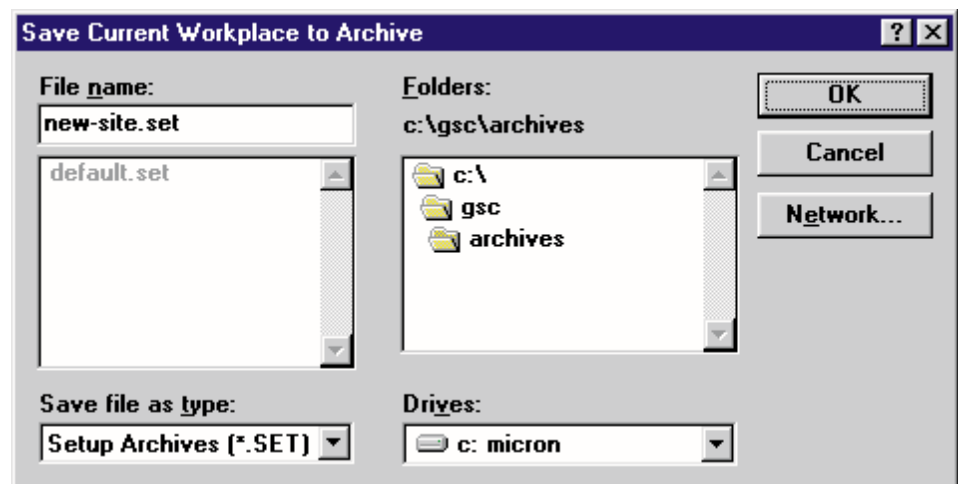
When you click OK in the save window, a second window will appear. This window allows you to choose which parameters you want saved to the new file. If you want to save configuration information for the entire unit, make sure that all ten boxes are checked. You may also change the path the new file will be saved to by clicking on the "..." button. Click OK to create the new file or CANCEL to exit without saving.
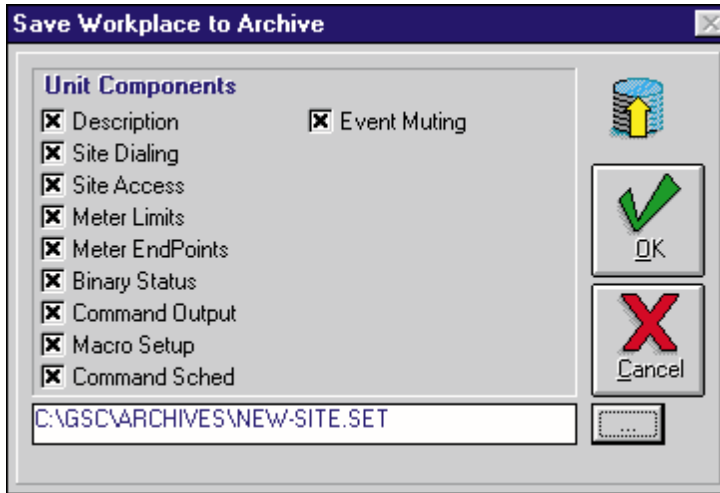
The Site Time parameter is not included in the Setup information. You may archive, upload, and download as many setup files as you like without affecting the integrity of your Site Time. Each time you configure a new site, you will have to reconfigure the Site Time parameter to meet the specific time requirements of that site.

Save Workplace to Archive

Unit Components
- ☒ Description   ☒ Event Muting
- ☒ Site Dialing
- ☒ Site Access
- ☒ Meter Limits
- ☒ Meter EndPoints
- ☒ Binary Status
- ☒ Command Output
- ☒ Macro Setup
- ☒ Command Sched

✔ OK

✗ Cancel

C:\GSC\ARCHIVES\NEW-SITE.SET

Open Archive. This function loads a .SET file to the workplace. If you want to load the same file information to an I/O unit, you must also use the "Upload Setups" function as well (see page 87). When you click on the "Open Archive" button, a window will open that allows you to select which file you would like to load to the workplace.

Open Archive

Load Archive to Current Workplace

File name:
new-site.set

- default.set
- **new-site.set**

Folders:
c:\gsc\archives

- 📁 c:\
- 📁 gsc
- 📁 archives

OK
Cancel
Network...

List files of type:
Setup Archives (*.SET) ▼

Drives:
💾 c: micron ▼

☰ Gentner
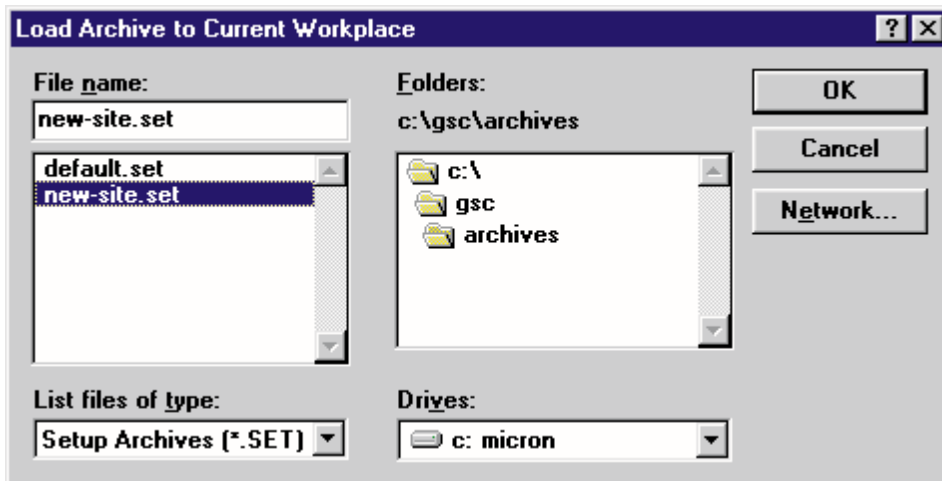
When you are using the Open Archive and Save Archive functions, one additional parameter is saved to the file which is not established in the Configuration program—Meter Endpoints. Meter Endpoints are established in the Monitor application and determine the range the metering inputs will consider when sampling equipment information.

When you click OK in the open window, a second window will appear. This window allows you to choose which parameters you want loaded to the workplace. If you want all of the information in the setup file, make sure that all ten boxes are checked. You can change the path in this window by clicking on the "..." button. Click OK to load the information or CANCEL to exit without loading.

Load workplace from Archive

Unit Components
- ☒ Description
- ☒ Event Muting
- ☒ Site Dialing
- ☒ Site Access
- ☒ Meter Limits
- ☒ Meter EndPoints
- ☒ Binary Status
- ☒ Command Output
- ☒ Macro Setup
- ☒ Command Sched

OK
Cancel

C:\GSC\ARCHIVES\NEW-SITE.SET

10/5/1998 11:22:28 AM
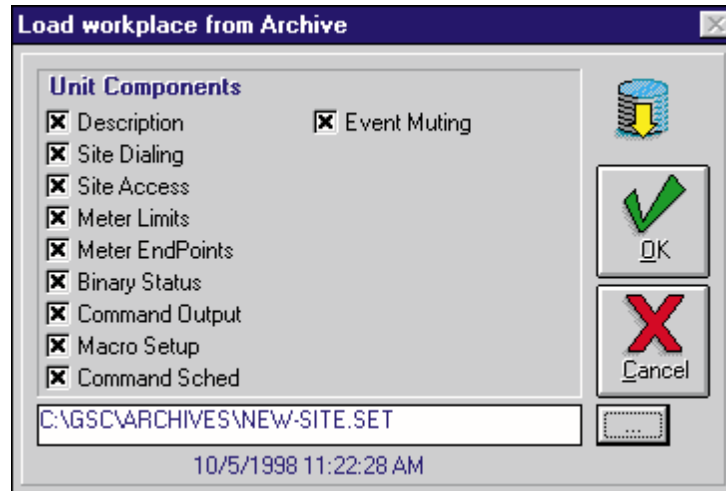
Download Setups. This function downloads configuration information from the I/O unit to the workplace. This is a way to retrieve the information saved in the I/O unit whenever you may require it. Once the information is downloaded you can save the information to an archive file, or make changes for upload back to the I/O unit. When you click on the "Download Setups" button, a window will open that allows you to choose which parameters you would like to download to the workplace. If you want all of the information in the I/O unit to be downloaded, make sure that all nine boxes are checked.

Download From Unit to Workplace

Unit Components
- ☒ Description
- ☒ Site Dialing
- ☒ Site Access
- ☒ Meter Limits
- ☒ Binary Status
- ☒ Command Output
- ☒ Macro Setup
- ☒ Command Sched
- ☒ Event Muting

OK
Cancel

Download Setups from Unit(s) to Workplace.

Downloading Block S05

60%

Downloading...

Cancel
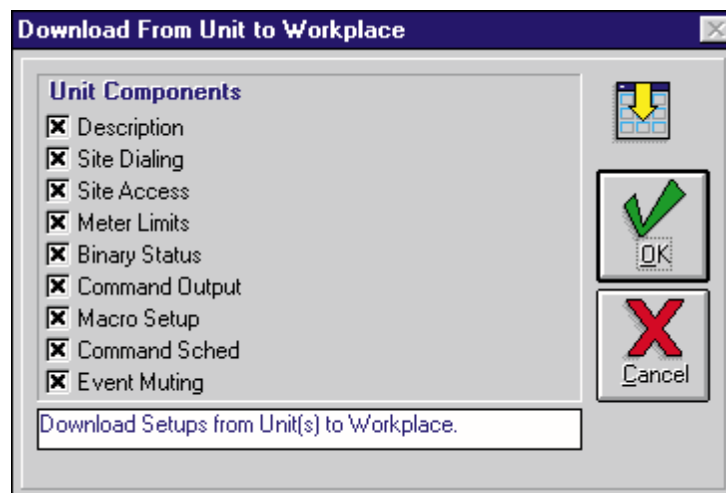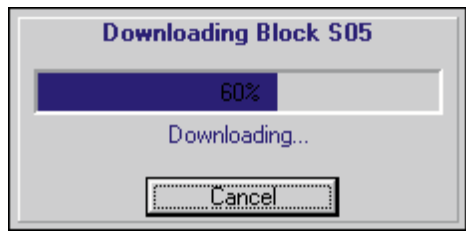
When the download is complete, a window will appear that informs you how many of the parameters were downloaded successfully.

GSC Setup

⚠ 9 Setups downloaded from GSC unit to work area.

OK
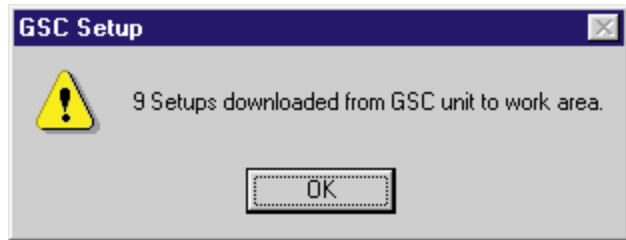
Upload Setups. This function uploads configuration information from the workplace to the I/O unit. When you open a previously saved .SET file, you can use the Upload Setups function to upload all of this information to the connected unit, even if no changes have been made. When you click on the "Upload Setups" button, a window will open that allows you to choose which parameters you would like to upload to the I/O unit. If you want all of the information to be uploaded, make sure that all nine boxes are checked. Make sure you are connected to the unit you want to upload the setup information to.

Upload Setups

Upload Workplace to Unit

Unit Components
☒ Description
☒ Site Dialing
☒ Site Access
☒ Meter Limits
☒ Binary Status
☒ Command Output
☒ Macro Setup
☒ Command Sched
☒ Event Muting

OK

Cancel

Upload Setups from Workplace to Unit(s).

Uploading Block S03

16%

Uploading...

Cancel
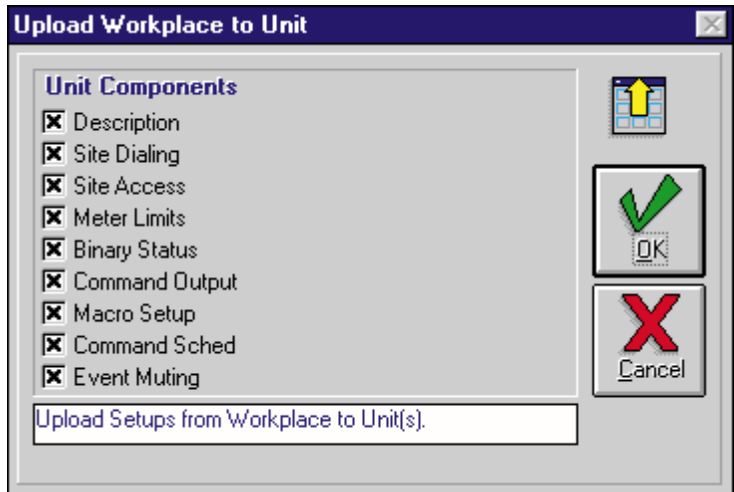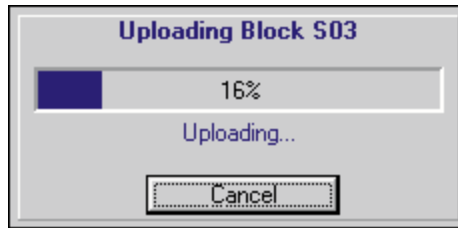
When the upload is complete, a window will appear that informs you how many of the parameters were uploaded successfully. If one or more parameters fail repeatedly to upload successfully, you may be communicating at too low of a baud rate. A low speed connection may fail to buffer the information adequately and result in an overflow error or lost data. Try increasing your baud rate to 19,200 bps or try uploading one parameter at a time instead of all nine at once.

GSC Setup   ✕

⚠   9 Setups uploaded from work area to GSC unit.

OK

Sync Setups
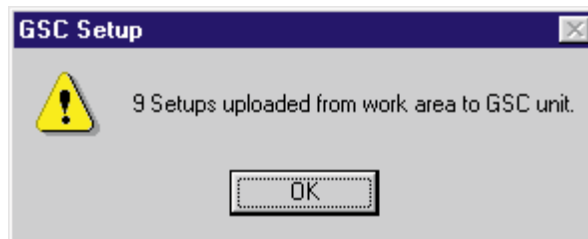
Synchronize. This function allows you to verify that all of the setup information was successfully uploaded to the connected I/O unit. If the files are the same, a window will open stating that the PC and I/O unit are synchronized. If the files are different, Synchronize will automatically upload the required files to complete the synchronization. Click on the "Synchronize" button to activate this feature.

Synchronize   ✕

⚠   Unit and PC are synchronized.

OK

Gentner
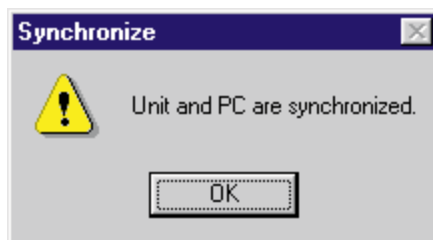
Real-Time Logging

The GSC3000 Logger program captures data in real time and sends the information directly to a dedicated printer and/or saves it to a file on your computer. Unlike captures performed by macros, commands, or time-of-days functions, this information is not stored in the I/O unit for retrieval using the GSC3000 History program. You must be running GSC3000 Logger to log data in real-time. In order to print this information in real-time, your PC must be connected to a printer. The information is not condensed in anyway and the full description of each input and metering channel will be printed out along with the logged data.

To run GSC3000 Logger, double-click the Logger icon in the GSC program group. You can also run it from the START menu under PROGRAMS > GSC3000 APPLICATIONS > GSC3000 Logger. There is a button in the Configuration or Monitor applications that will run Logger as well.

Connect to Site

When the Logging program is launched, the Logging main screen will open. Your existing sites will appear in the View area. Connect to the site you want to log by clicking on the site icon. A query box will open requesting a password.

GSC3000

If you are already connected to the site you want to log in the Configuration or Monitor program, you can click on the Logging button and you will be connected automatically.

Click Here
to Connect →

Gentner
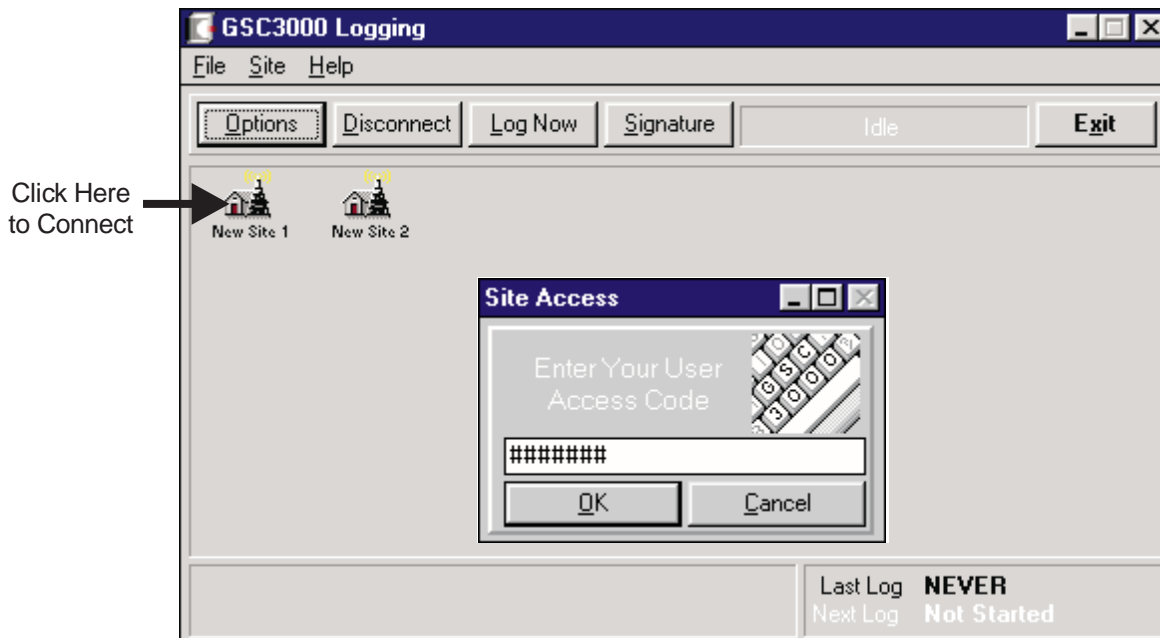
Logging Options

Enter your user password and the Logging options will appear in the View area. These options will be discussed in the order they are labeled in the figure below.
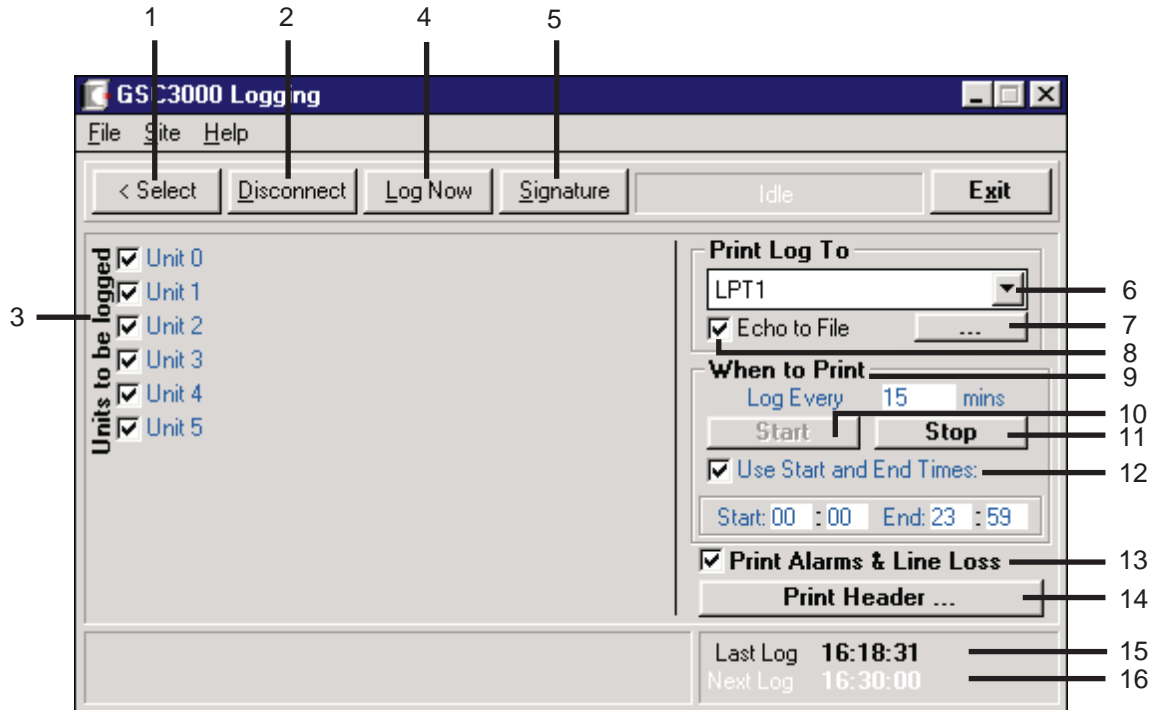
1. Select. This button is used to toggle from the main screen that shows the available sites and the options screen that allows you determine how the logging should take place. On the main screen this button will say "Options", on the options screen this button will say "Select".

2. Disconnect. This button disconnects you from the current site. You may then connect to another site or exit the program.

3. Units to Be Logged. Choose which units in your GSC3000 system should be logged. All information for each selected unit will be printed and/or saved to file.

4. Log Now. This button allows you to manually log unit data. Each time you click on this button, a log will occur and all data from all selected units will be sent to the printer and/or file.

5. Signature. This button generates a header and a signature line for the operator to sign. A header and signature line are always generated at the beginning of your log as well.

```
New Site 1 LOGGING REPORT          DATE: Oct 5, 1998          PC TIME: 17:10:35
================================================================================
                                 New Site 1


OPERATOR SIGNATURE:  _____
```

6. Print Log to. This shows where you want the log to be sent to. You may choose a printer port or print to file. Output to file is in text (.txt) format. If you are sending the log to a printer, it must be a local printer connected to the PC. Logger does not support network printing.

Serial Printers must be connected to a port that is configured as "Do Not Access" in the GSC3000 Port Wizard.

7. Browse Button. The "..." button allows you to determine where you would like the log file to be saved on your computer.

Select Logging File

File name:
printlog.txt

printlog.txt

Folders:
c:\gsc\sitedata

c:\
gsc
sitedata
007a70c3
007b43c3

OK

Cancel

Network...

List files of type:
Logging File (*.TXT)

Drives:
c: micron
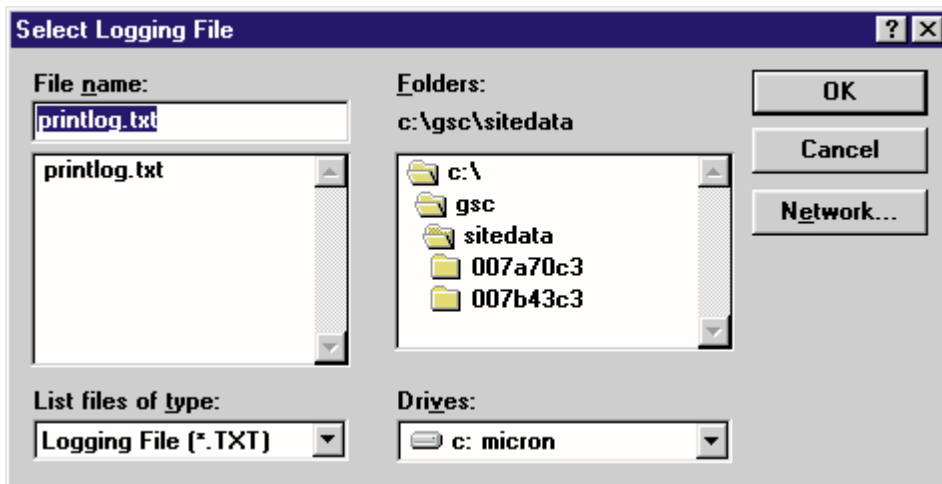
8. Echo to File. This option allows you to print your log and save the same information to a file on your computer. A check mark will appear in the box when this feature is enabled. You may choose the location of the file by clicking on the "..." button. The Echo to File feature is not functional if you choose to print to "File" instead of a printer port.

9. When to print. This feature lets you specify when and how often you want Logger to perform logs and print the data. In the box marked "Log Every____Minutes", enter the time interval you want Logger to wait between logs. The time interval must be between 1 and 1,440 minutes.
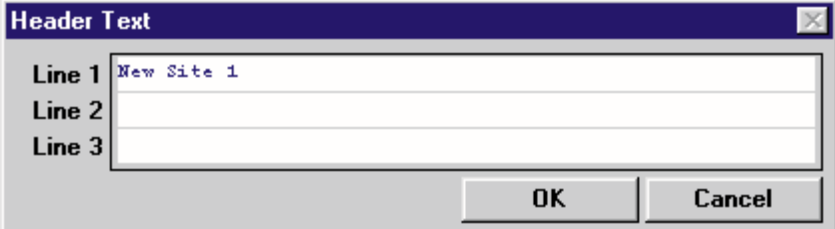
10. Start button. This button allows you to begin real-time logging. Data will be automatically logged as frequently as you have specified until you stop it. The "Start" button is disabled if you have entered start and end times (see below).

11. Stop button. Click on this button to manually stop logging data. This button is used in conjunction with the manual "Start" button.

12. Use Start and End Times. Click on this box if you want to enter a specific period of time you want Logger to log data. If this box is not marked, the unit will continuously log all units until the manual "Stop" button is clicked or the site is disconnected. Enter the start and end times in the boxes provided. Times must be entered in 24 hour format. Logger will log data at the set interval between the two times you enter. The Logger program must be running in order for the logs to occur.

13. Print Alarms & Line Loss. When enabled, this feature will cause Logger to print alarms and the line loss information in the log as well as the regular log data.

14. Print Header. This button opens the Header Text window which allows you to enter personalized information on the header. This information will be added to the log each time you begin logging or click on the "Signature" button.

Header Text	☒
Line 1	New Site 1
Line 2	
Line 3	
	OK Cancel

15. Last Log. This line shows the time of the last log since logging began.

16. Next Log. This line shows when the next log event is scheduled to occur. Last Log and Next Log are good troubleshooting tools if the system is not printing correctly.

History

The GSC3000 History program is used primarily for viewing capture data. Unlike the GSC3000 Logger program, History does not log any new data in real-time, but is used for viewing and filing data that has been previously captured by an I/O unit. Before you will be able to view any data in History, you must first configure your I/O unit to perform captures and store the data. Captures can occur when a status input changes state, when a meter limit is passed, or when a time-of-day event or macro requires it. Captures performed in these ways are stored in the I/O unit until you connect to the site.

As soon as you connect to a site, the captured data is downloaded to your PC automatically and saved as an event file (.EVT). A new .EVT file will be created for each I/O unit that downloads captured data. The icons for these I/O units will appear green in your Monitor or Configuration window. You may view the downloaded data by launching the History application. To run GSC3000 History, double-click the History icon in the GSC program group or run it from the START menu under PROGRAMS > GSC3000 APPLICATIONS > GSC3000 History. There is a button in the Configuration or Monitor applications that will run History as well.

When History opens, click on the Site and Unit icons to choose the I/O unit you want to view. If no data has been captured or downloaded from an I/O unit, the icon will appear grayed out and you will not be able to select that unit; no .EVT file has ever been created. If capture data was successfully downloaded from a unit, the .EVT file that corresponds to that unit will open automatically and the downloaded data will appear in the data view window.

Each I/O unit can store up to 128 captures. When the unit's storage capacity reaches 75% full, the unit will issue an alarm stating "Buffer Full".
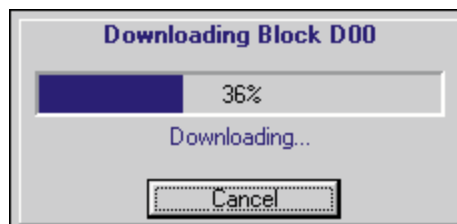
Only one PC should be setup to collect capture data from one site. Otherwise, the information will be downloaded to whoever connects to the site first. See page 59 for instructions on how to disable this feature.

Choose the Site →

Choose the Unit →

← Unit With No Capture Data

Understanding the Data

The lower half of the History main screen displays the contents of the .EVT file. Each capture event that was downloaded from the I/O unit is summarized in three lines beginning with the date and time of the capture. This part of the main screen also has other features that are designed to help you to understand the data. These features will be discussed in the order they are labeled in the figure below.

1. View Window. This window displays the actual capture data. Each new capture begins with the date and time. The other data is input status, command information, and meter readings.

2. Start. This area shows the date and time of the first capture event displayed in the view window.

3. End. This area shows the date and time of the last capture event displayed in the view window.

4. BegMark. This area shows the date and time of the capture event you have marked as the beginning mark in the file (for more information, see page 97—File Mark Functions).

5. EndMark. This area shows the date and time of the capture event you have marked as the ending mark in the file.

6. Key. The information shown above the view window is a key designed to help you understand the capture data.

7. Date/Time. The date and time are the first part of the data summary line. Each capture event will begin with the date and time.

8. Status Inputs. The "Inputs" key summarizes the data in a Hex format. 0-9 and A-F correspond to the actual status inputs 1-16 on the back of your I/O unit. In the first capture example shown, 0=H actually means status input 1 is high; F=L means that status input 16 is low.

9. Command Outputs. The "Out" key also summarizes the data in a Hex format. 0-9 and A-F correspond to the command outputs 1-16 on the back of the I/O unit. In the first capture example shown, 0=A means that command output 1A is active at the time of the capture.; F=A means that command output 16A is active.

10. Metering Inputs. The sixteen numbers in the key correspond to the metering inputs on the back of your I/O unit. Use this key to understand the metering readings show in the data summary line. In the first capture example shown, metering input 1 has a value of 6.141; metering input 16 has a value of 120.000.

11. Revision Date. The date shown here is not part of the key. This date shows the last time changes were made to the configuration of the I/O unit. This is important because the status, command, and metering channels may perform different functions if you have reconfigured your unit.

If an I/O unit has been significantly revised (metering inputs, status inputs, or command outputs were changed) between captures, two "setup revision" buttons will appear in the main toolbar. Use these to switch between the captures under the old configuration and the new.

GSC3000 History

File Site Unit History Help

Purge
Merge
Export

Mark Begin   F7
Mark End   F8
Clear Marks   F9
Show Details F12

Date/Time
              1
              9
10/06/98 10:
       6.141
       0.000   0.000   120.000
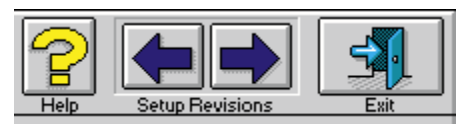
History Details

Another feature of the History program is the "View Details" function which shows the complete details of the capture entry, including the descriptions you have entered for each input and output.

Select the desired capture entry by clicking on the data summary line. Then, using the "History" pull-down menu, choose "Show Details". A window will open that displays the complete details of the capture event.

```
─Inputs─────────────────────────    ─Outputs────────────────────────────
0) H - TX #1 On                     0) A - TX #1 Primary On
1) H - TX #1 High Power             1) A - TX #1 Master On
2) L - TX #2  Off                   2) A - TX #1 High Power
3) L - TX #2 Low Power              3) B - TX #1 Power Lower
4) H - Antenna Main                 4) A - TX #2 Primary On
5) H - STL - Main                   5) A - TX #2 Master On
6) H - Power = AC Mains             6) A - TX #2 High Power
7) L - Generator Off                7) A - TX #2 Power Raise
8) H - AC -Okay                     8) A - Antenna - Main
9) L -                              9) A - STL - Main
A) L - Smoke Alarm OK               A) A - Power = AC
B) L - Security Okay                B) B - Blower Off
C) L -                              C) B - Generator Stop
D) L -                              D) A - AC Mains Breaker On
E) L - EAS OK                       E) A - TX #1 Mains Power On
F) L - Mod Monitor OK               F) A - TX #2 Mains Power On
─Meter Readings──────────────────────────────────────────────────────────
1)      6.141 Amps XMTR 1 Plate Current        10/06/98 10:17:00
2)      9.668 Vlts XMTR 1 Plate Voltage
3)     33.599 KW   XMTR 1 Power Output
4)      0.000 Deg  XMTR 1 Temperature
5)      0.000 Vlts XMTR 2 Filament
6)      0.000 KV   XMTR 2 Plate Voltage
7)      0.000 KW   XMTR 2 Power Out
8)      0.000 F    XMTR 2 Temperature
9)      0.000 F    Room Temp
10)     0.000 W    Reflected Power
11)   120.000 V    AC Phase 1
12)   120.000 V    AC Phase 2
13)    80.000 V    AC Phase 3
14)   120.000 V    Gen Phase 1
15)   137.142 V    Gen Phase 2                    Close
16)   120.000 V    Gen Phase 3
```

File Mark Functions

The "Mark" functions allow you to specify a beginning point and an ending point in the current file that you are viewing. By "marking" a section of the file, you can purge, merge, or export just that section instead of the entire file. The file "Mark" functions are discussed in the order they are labeled in the figure below.
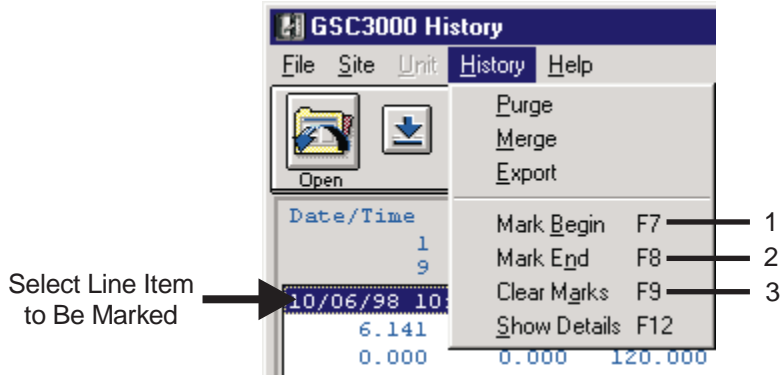
1. Mark Begin. To set the beginning mark in a file, you must first select the capture event that you want as the beginning of your marked section (click on the data summary line). Then using the "History" pull-down menu, choose "Mark Begin". The date and time of the marked capture event should appear in the "BegMark" area at the bottom of the main screen.

2. Mark End. To set the ending mark in a file, select the capture event that you want as the end of your marked section (click on the data summary line). Then using the "History" pull-down menu, choose "Mark End". The date and time of the marked capture event should appear in the "EndMark" area at the bottom of the main screen.

3. Clear Marks. To clear your marks, go to the "History pull-down menu and choose "Clear Marks". No date and time should be shown in the "BegMark" and "EndMark" areas at the bottom of the main screen.

Main Toolbar Functions

The other functions of GSC3000 History are activated by buttons on the main toolbar. These buttons will be discussed in the order they are labeled in the figure below.
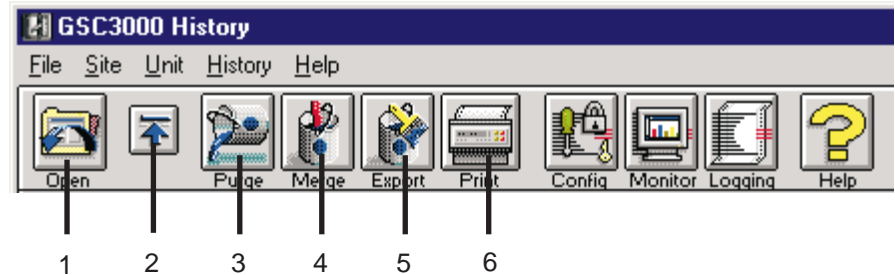
1. Open. This button allows you to open files in the view area. History can open several different types of files.
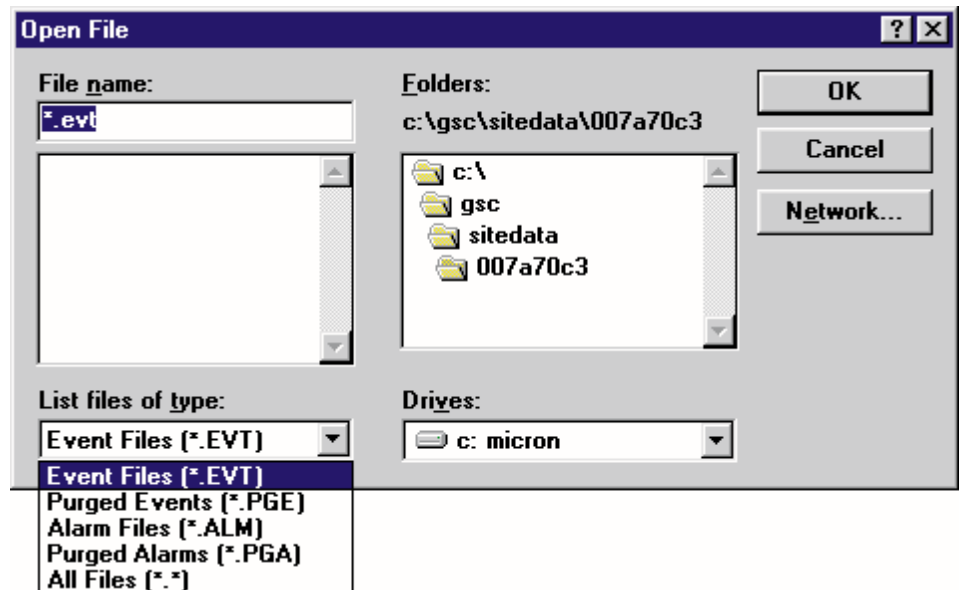
Event files (.EVT) are the files created when capture data is downloaded from the I/O unit to your PC. These files will open automatically when you click on the History site and unit icons.

Purged Events (.PGE). These are the files you create when you purge a capture event file and choose to save the information to another file (for more information, see page 99—Purge).

Alarm files (.ALM) are created by the Alarm Handler which notifies you whenever an alarm is issued. An alarm file is created for each unit that issues alarms. You may view the complete alarm history for a unit at any time by opening it in the History application (see page 100—Viewing Alarm Data).

Purged Alarms (.PGA). These are the files you create when you purge an Alarm file and choose to save the data to another file.

2. Resize Data View. Click on this button to change the size of the data view window.

3. Purge. Depending on the frequency of your data captures, the .EVT file for a given unit may eventually become too large to be useful. The Purge function allows you to delete all or part of the data in the file. You can perform a straight purge which deletes all of the information perma-nently, or you may purge to file which saves the purged data to a .PGE file. If you want to purge only part of the data, first mark the section of the file you want to purge, then choose to "Purge From: Mark Begin" and "Purge To: Mark End". You may choose any valid combination of options in the "Purge From:" and "Purge To:" sections. If you want to purge to file, make sure there is a check mark in the "Purge to File" box. To change the file path and name, click on the "Purge File Path" button.
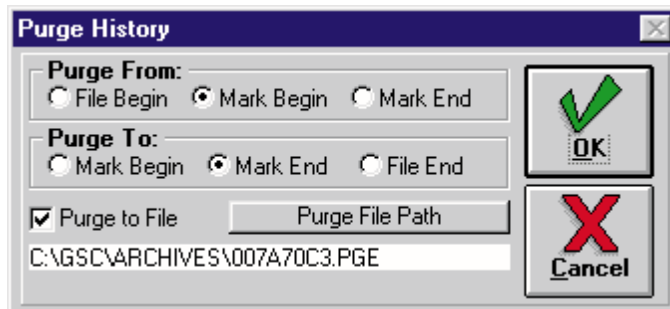
4. Merge. This function allows you to merge all or part of one History file into another file. You may merge the current open file into a closed file, or you may merge the data from another file into the open file. This is determined under "Merge Direction" by clicking on either "Into Merge File" or "Into Open File". A section of data may be merged by using the file mark functions as described above. To choose which file you want to merge, click on the "Select Merge File" button. If you want to delete the merged information from its original file, click on "Delete Source" to enable the option. When you merge files, the contents are automatical-ly sorted by date and time.

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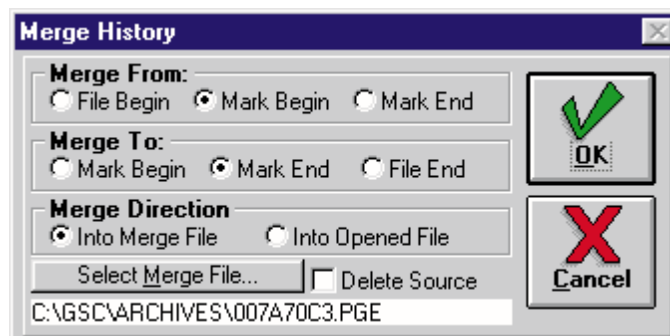
5. Export. This function exports the contents of your .EVT or .ALM file as a text file (.TXT). The information is organized in blocked text format ("comma separated" isn't available in this version). You may choose the path and file name by clicking on the "Select Export File" button. Export the entire file or only a selected portion by using the file mark functions. Once you have created the export file, you can open the information in Microsoft Excel™ or another spreadsheet for additional formatting.
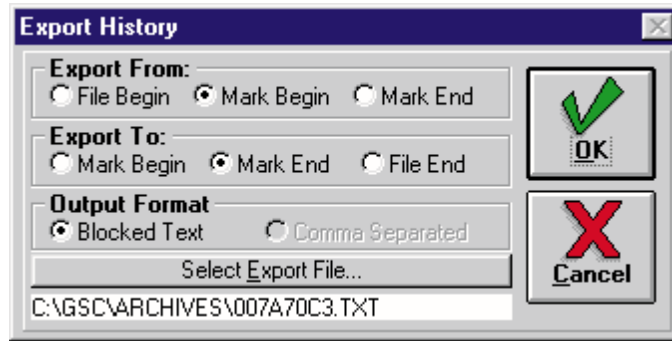
6. Print. Click on this button to print the open History file.

Viewing Alarm Data

History can also be used to view alarms. Whenever alarms are issued, the Alarm Handler saves the information to an alarm file (.ALM). Successive alarms are appended to the same file. This allows you to view the entire history of alarms issued by each unit. To view alarms in the History program, click on the "File" pull-down menu and select "Alarm Type as Default". You may now click on the Site and Unit icons to view the history of alarms issued by that unit. If no alarms have ever been issued by that unit, the Unit icon will appear grayed out and you will not be able to select that unit; no .ALM file has been created. Purge, merge and export functions are handed in the same manner for alarm files as capture data files.

Choose the Site

Choose the Unit

Unit With No Alarm Data

TECHNICAL SUPPORT: 1.800.283.5936 (USA) OR 1.801.974.3760
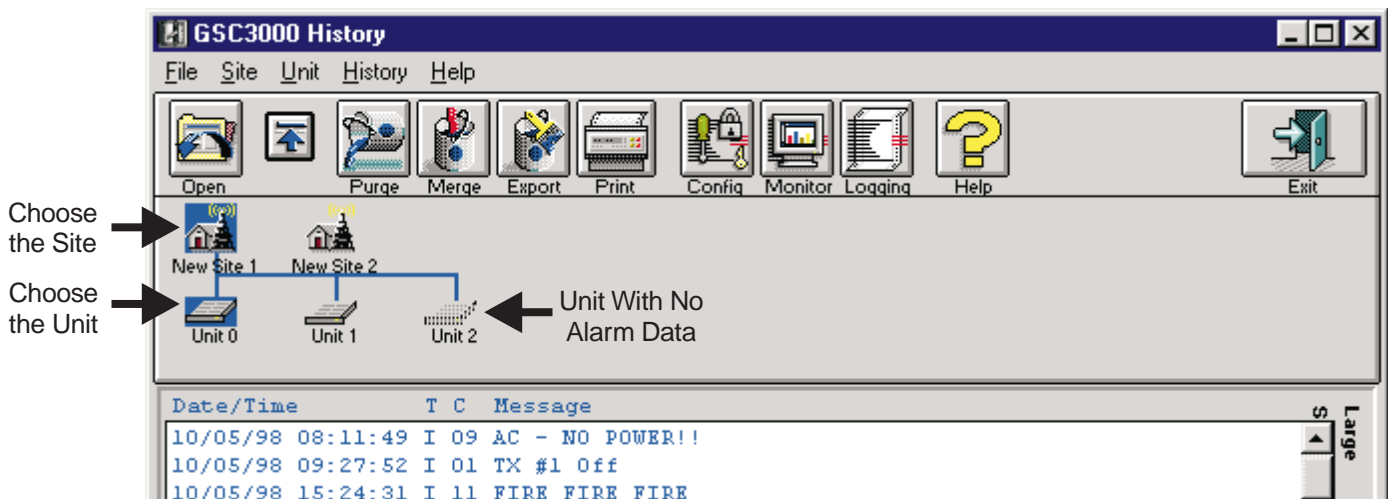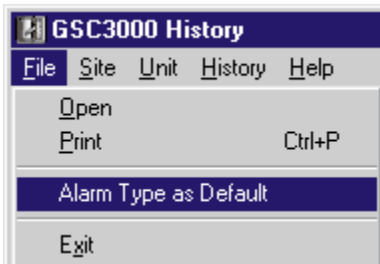
6 Monitoring

This chapter discusses how you will monitor your GSC3000 site on a day-to-day basis. Your primary tools are the GSC3000 Monitor application and the Alarm Handler.

The Monitor program allows you to view status and metering information in real-time and manually issue commands and macros to take corrective action. Monitor can be configured with custom screens that show only certain inputs and commands. For simultaneous viewing of multiple sites, you may create custom views that combine metering and status information for different sites in the same window.

The Alarm Handler will attempt to notify you whenever an alarm is issued. Other functions of the Alarm handler include clearing alarms and the new Snooze function.

GSC3000 Monitor

To run GSC3000 Monitor, double-click the Monitor icon in the GSC program group. You can also run it from the START menu under PROGRAMS > GSC3000 APPLICATIONS > GSC3000 Monitor, or by clicking on the Monitor button in one of the other programs.

GSC3000 Monitor

Main Screen Functions

The Monitoring main screen has several functions that allow you to switch between existing view windows and create new custom views. They are labeled in the figure below.

1. Site Icon. Click on a Site icon to connect to a site. A query box will open that requests your user password. When the password is accepted, icons for each of the units in your site will appear below the Site icons.

2. Unit Icon. Click on a Unit icon to open the unit's View window which will appear in the area below the site and unit icons. When you open a view window by clicking on the Unit icon, all of the unit's status inputs, metering inputs, command outputs, and macros, will appear in the View window. Each View window contains information for only one I/O unit.

3. New. This button creates a blank Custom View window. You may add any combination of status and metering inputs, and commands or macros to create your own custom view.

4. Open. This button opens a Custom View window that you have created and saved as a .CSV file. When you first open Monitor you can go straight to a Custom View window by clicking on the "Open" button. There is no need to click on the Site or Unit icons, you will be queried for the user password after you select the .CSV file you want to use and connected automatically. If your Custom View window gathers data from more than one site, you will be asked to enter a user password for each site you need to connect to.
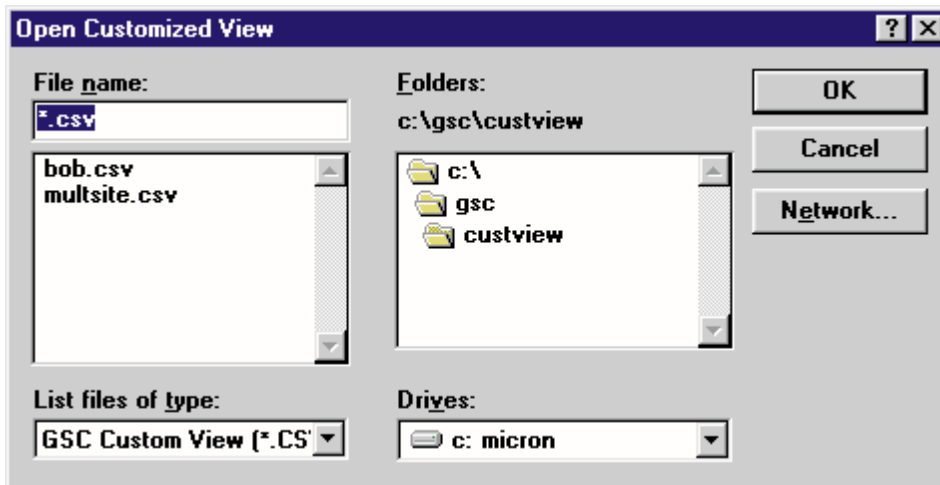
5. Save. This button saves your Custom View window with a .CSV extension.
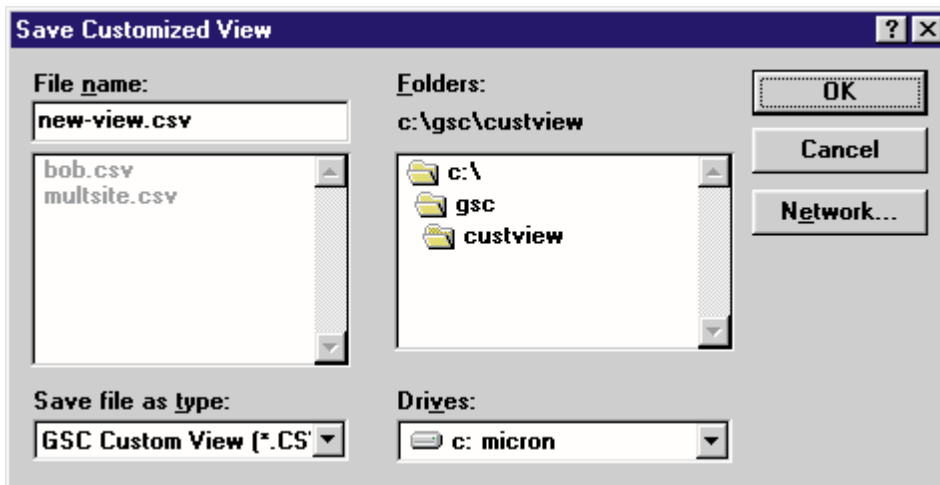
6. Resize View Area. Click on this button to change the size of the View area.

7. Query Button. This button causes the GSC3000 software to query your site to find out how many units are on your G-bus LAN and obtain the unit description. You many need to click on this button if not all of your I/O units show up in the Monitor main screen.

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View Window

The View window displays the High/Low state of your status inputs, the current reading on your metering channels, and allows you to manually issue commands and macros. The features of this window will be discussed in the order they are labeled below.
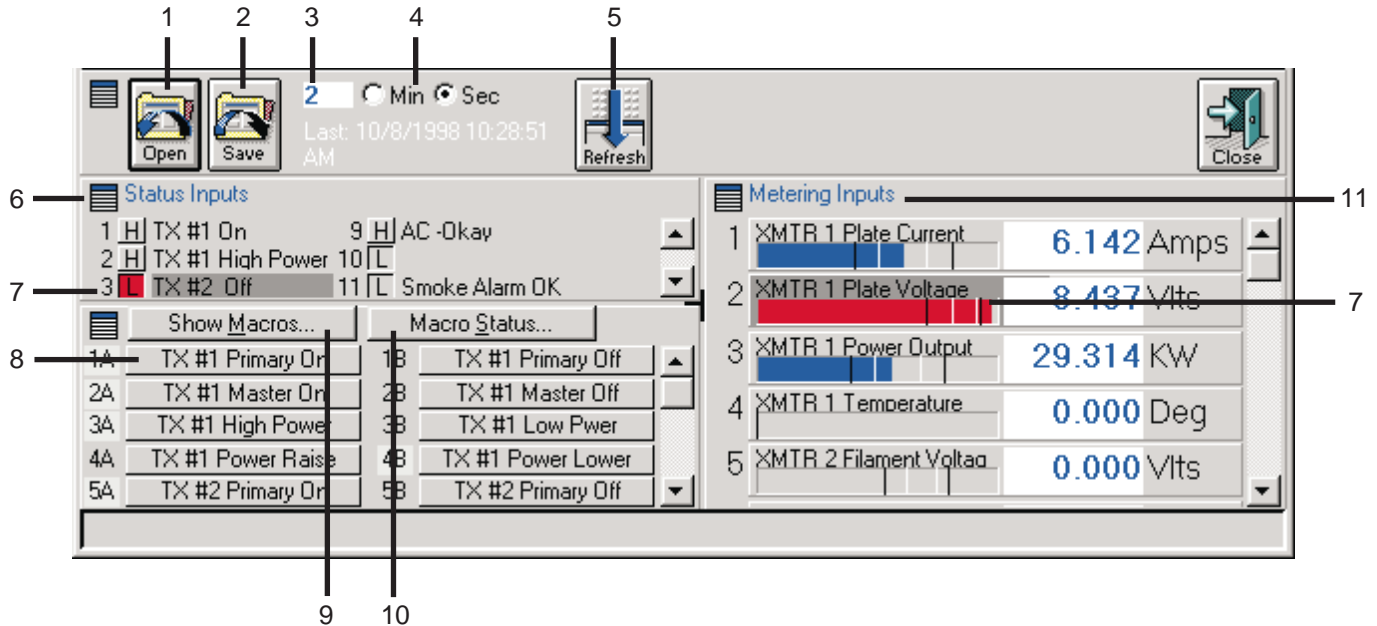
Disconnecting a Site.
Clicking the "Close" button on a View window does not disconnect you from the site, it only closes the window. To disconnect from the site, right-click on the site icon.

A View window can be minimized to a bar in the bottom of the view area. Double-click on the bar to reopen the window.

1. Open. This button is the same as the "Open" button on the previous page. It allows you to open a Custom View window.

2. Save. This button is the same as the "Save" button on the previous page. It allows you to save a Custom View window.

3. Sample Frequency. Enter how often you want the Monitor program to refresh the View window (re-sample the inputs and outputs). You may enter a value from 2 to 60. Each I/O unit on each site you are monitoring must be allowed at least three seconds between refresh samples or Monitor will never finish refreshing (at 19,200 bps). For example, if you are monitoring two sites with three units each, set the sample frequency to 18 seconds. If you are connecting at a lower baud rate, you will need to increase the sample frequency accordingly.

4. Time Unit. Choose whether you want Monitor to refresh the View window every_____minutes or seconds.

5. Refresh Button. Click on this button to manually refresh.

6. Status Inputs. This area shows all of the status inputs for the current I/O unit. If the window is a Custom View window, it shows the status inputs you have selected for this view. H and L stand for High and Low and reflect the current state of the input.

7. Input Indicators. Each input has two indicators: alarm and mute. On status inputs, the H/L box will appear red if the current state has caused an alarm to be issued. On metering inputs, the meter bar will appear red if an alarm has been issued in response to a limit being passed. When the problem is corrected the meter bar will return to blue. Whenever a input (status or metering) is muted, the description of the input will be enclosed by a dark gray box.

8. Command Outputs. This area contains a button that corresponds to each of the command outputs for the current I/O unit. If the window is a Custom View window, it shows the command buttons you have selected for this view. You can issue commands by clicking on the corresponding button. The command output numbers enclosed in a white box show the output that has been most recently activated.

Users with Observer-only access cannot issue commands or macros.

Control + Click Operation. To prevent accidental activation of a command channel or macro, GSC3000 Monitor comes with a safeguard feature. When activated, this feature requires you to press and hold down the CTRL button on your keyboard while clicking on the mouse button to activate a command or macro button. To activate this feature, go to the "Window" pull-down menu and choose "Use Ctrl + Click for Commands". A check mark will appear next to the option when enabled.
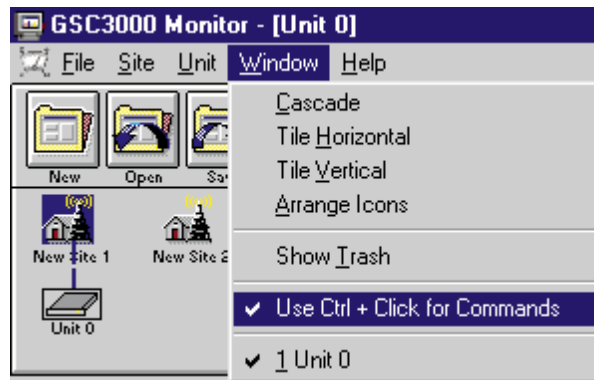
9. Show Macros. Click on this button to switch to a view of the macros available on the current I/O unit. You can click on this button again to "Show Commands". If the window is a Custom View window, only macros you have selected for this view will be shown. Like command buttons, you may run any macro by clicking on the macro button. If Ctrl + Click operation is enabled, you will have to hold down the CTRL button while you click on the macro button.

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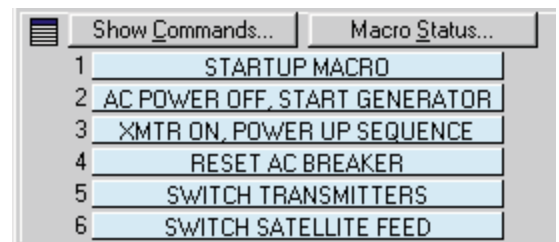
10. Macro Status. This button will open the Macro Status window which shows you which macros are currently running. If you want to disable a macro to prevent it from running, click on the "End Task" button. To exit without affecting the operation of running macros, choose "Cancel".
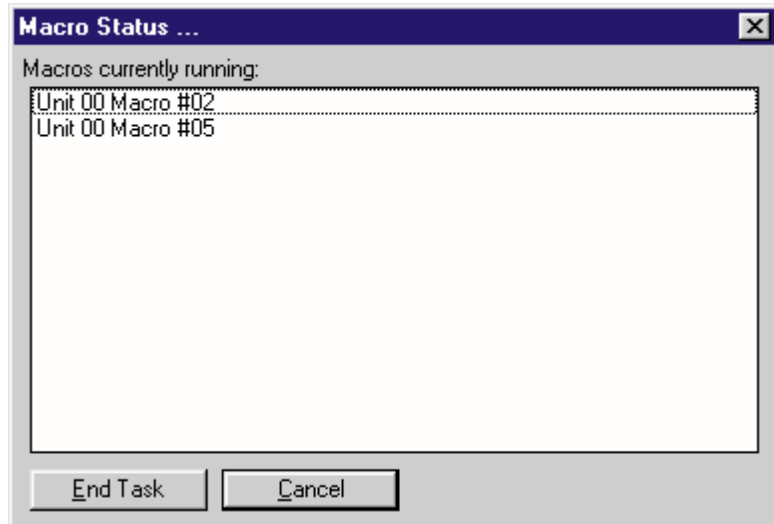
11. Metering Inputs. This area shows all of the metering inputs for the current I/O unit. If the window is a Custom View window, it shows the metering inputs you have selected for this view. The meter bar is a representation of the actual numeric value of the input which appears to the right of the bar. The white lines crossing the bar represent the first upper and lower limits. The black lines represent the second upper and lower limits. The type of units (amps, volts, etc) is shown to the right of the value of the input.

Calibrating Metering Inputs

The I/O unit samples metering inputs over a 10 Vdc range, either 0 to 10 Vdc or -5 to 5 Vdc, depending on how you configured the input. When Monitor is first run, the numeric value that will appear in the View window is the actual voltage sampled by the I/O unit in that 10 Vdc range. You will need to calibrate Monitor to display the real-world information you need to effectively monitor your equipment.

Double-Click Here
to Enter New Value
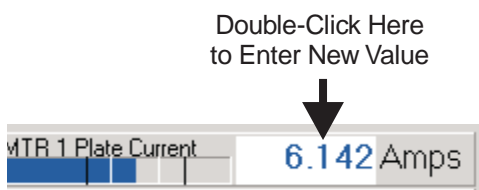
To change the reading, double-click on the number in the value box next to the meter bar. Check your equipment for the actual reading, then enter that number in the value box. Here is an example: the value on metering input 1 reads 6.0000 when you first launch the metering application; the metering sample on the I/O unit is 6 Vdc. You have an FM transmitter connected to that metering input and you want to monitor the power output, your current reading is 30,000 watts. In Monitor you enter "30,000". Press ENTER and Monitor is now calibrated to scale the meter reading to reflect the power output of your transmitter.

Adjusting Metering View

After calibrating Monitor to show the desired equipment values, you may want to adjust the view of the meter bar. You may also want to adjust the upper and lower limits. These parameters may be changed by double-clicking on the meter bar to open the Meter View window. The features of this window will be discussed in the order they are labeled in the figure below.

Double-Click Here
to Adjust Metering View

Click & Slide Buttons
to Change Values
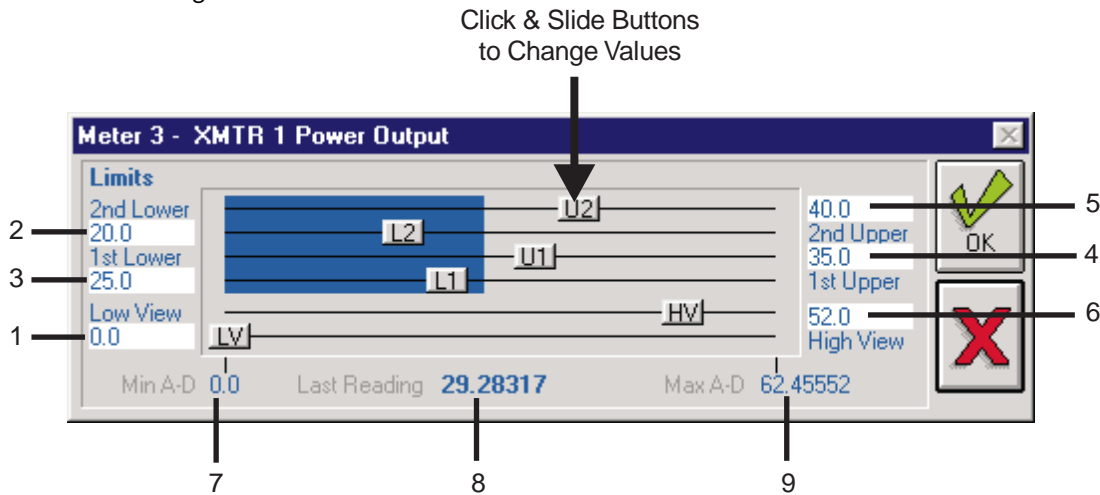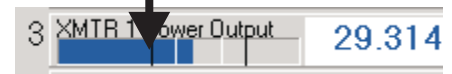
1. Low View. This is the lowest value that will be shown on the bar meter in the metering display. It must be less than the second lower limit if you want that limit to be displayed in Monitor. You may enter a numeric value or click and slide the corresponding button to set an approximate value.

2. Second Lower Limit. The is the lowest limit you can set. It must be less than or equal to the first lower limit. When the metering value drops below this limit or the first lower limit, you may configure your I/O unit to issue an alarm and/or take other action, see page 78 for more information. You may enter a numeric value or click and slide the corresponding button.

3. First Lower Limit. This limit must be higher than the second lower limit, but lower than both of the upper limits. You may enter a numeric value or click and slide to set an approximate value.

4. First Upper Limit. This limit must be higher than both lower limits, but lower than the second upper limit. When the metering value rises above this limit or the second upper limit, you may configure the I/O unit to issue an alarm and/or take other action (see page 78). You may enter a numeric value or click and slide the corresponding button.

5. Second Upper Limit. This limit must be higher than all other limits. You may enter a numeric value or click and slide to set an approximate value.

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Click & Slide Buttons
to Change Values
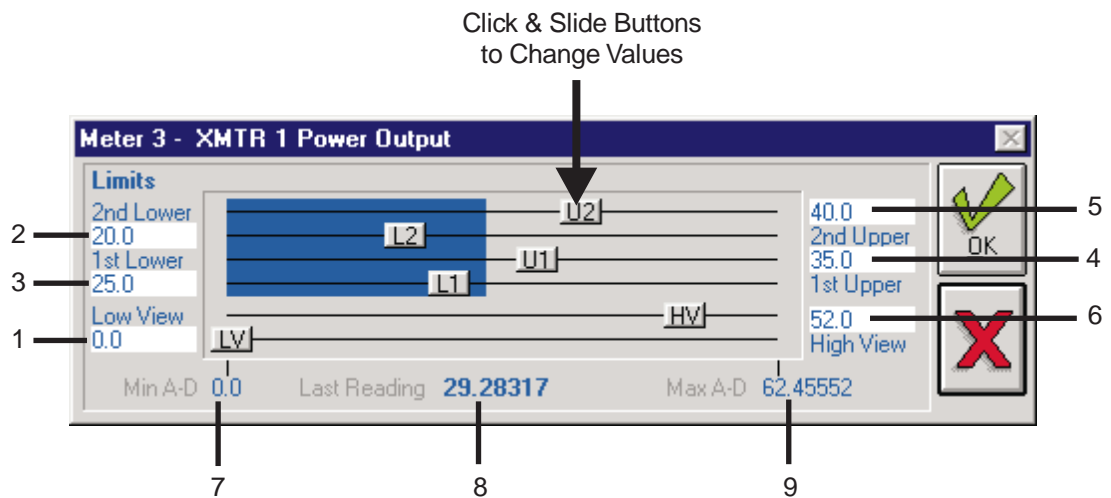
6. High View. This is the highest value that will be shown on the bar meter in the metering display. It must be greater than the second upper limit if you want that limit to be displayed in Monitor. You may enter a numeric value or click and slide the corresponding button to set an approximate value.

7. Min A-D (For reference purposes only). This is the minimum analog-to-digital value that will be displayed in Monitor based on the value you entered when you calibrated the metering input.

8. Last Reading. This is the exact value of the metering input when you double-clicked on the meter bar. The blue bar shown above is a graphic representation of the last reading taken. This number is a useful reference when setting your high/low views and metering limits.

9. Max A-D (For reference purposes only). This is the maximum analog-to-digital value that will be displayed in Monitor based on the value you entered when you calibrated the metering input. The A-D values are based on the 10 Vdc range of the metering input. The digital equivalent consists of 4096 bins. For example, if the original reading was 6 Vdc, the digital equivalent is 2458 bins. When you calibrated the input you entered 30,000. To find the A-D increment you will divide 2458 by 30,000 which gives you an A-D increment of .08193. To find the Max A-D value, divide the original value (6) by the max analog value of 10 which is equal to the new value (30,000) divided by X (the max A-D value). Solve for X and the Max A-D value is 50,000.

$$\frac{6}{10} = \frac{30000}{\times} \qquad \times = 50000$$

When you are finished adjusting the limits, click OK to accept the changes or CANCEL to exit without changing.

Creating Custom Views

Custom View windows are simple to create. They are useful tools that allow you to view only specific metering, status, and command channels, as well as certain macros. You may combine information from more than one unit and even more than one site.

To create a Custom View window, you must first be connected to the I/O units that contain the information you want to add to the Custom View. You may open as many windows as you like. Then click on the "New" button; an empty window will open.

Then add the channels you want by clicking and dragging the information from the unit windows over to the new window. For **status inputs**: click anywhere on the line and while holding down the mouse button, drag it to the new window. For **metering inputs**: click on the description and drag to the new window. For **commands and macros**: do not click on the button, this will activate the command or macro; to add to a Custom View, click on the *number* of the command or macro (to the left of the button) and drag it to the new window.

Monitor does not automatically show unit or site identification when more than one is combined in a custom view. You must indicate in the description line of the macro or status, metering, or command channel which unit or site it corresponds to (set in Chapter 5—Configuration).

Click and Drag

Click & Drag
to Resize Views
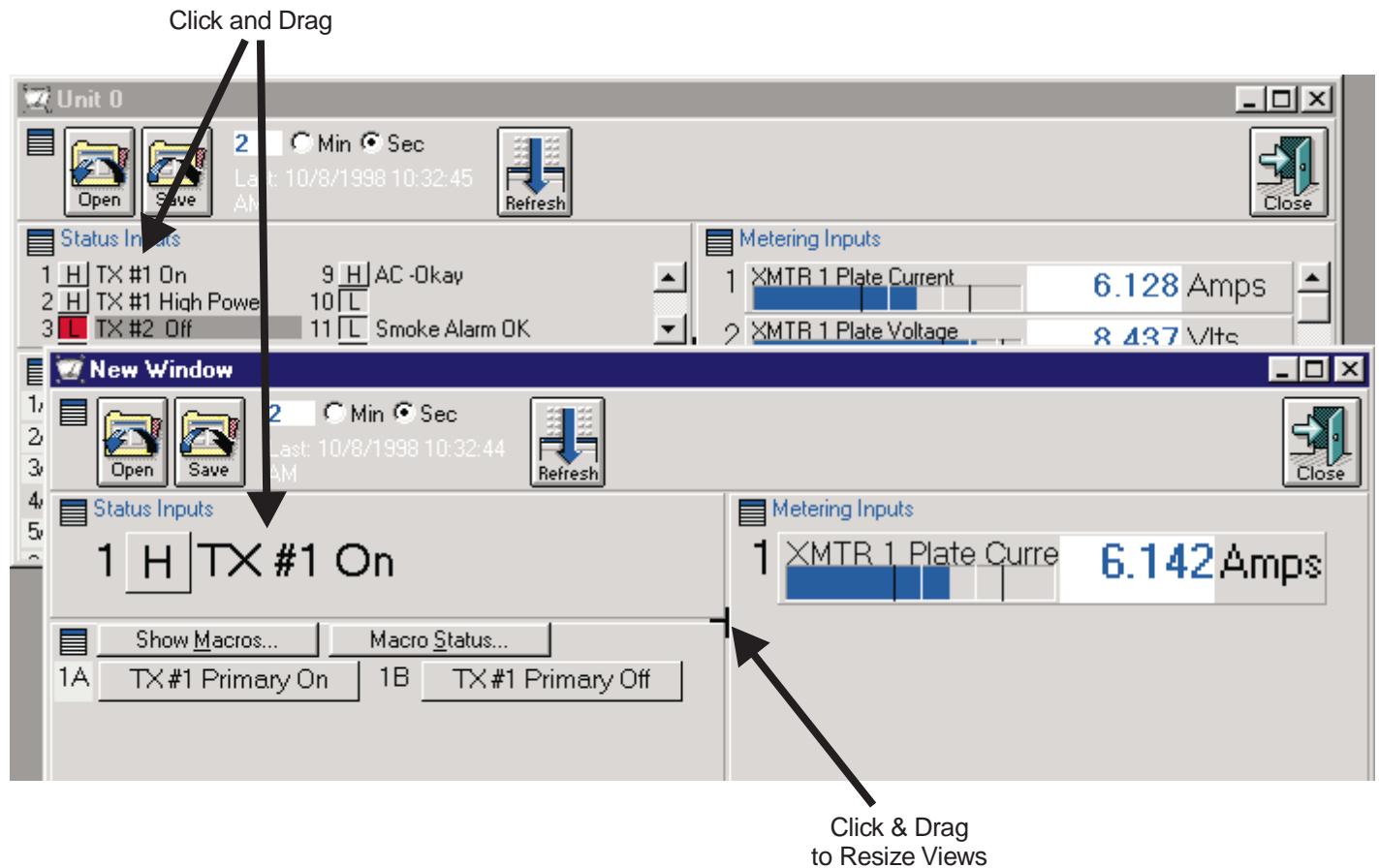
You must have multiple COM port connections and/or TCP/IP access to view multiple sites simultaneously.

Monitoring Multiple Sites

You may monitor multiple sites simultaneously. Connect to each site by clicking on the Site icon and entering the corresponding password. Then click on the desired Unit icons to open the View windows.

You may also combine elements of more than one site in a Custom View window by connecting to the sites and pulling elements from the desired View windows into the new Custom View window. Make sure to differentiate the sites/units in the descriptions you enter during Configuration.

Differentiate Sites in Channel Descriptions

When you open the Custom View window, Monitor will automatically query you for the passwords for each site in the Custom View window.

Communications Link-Loss Recovery

Monitor will automatically try to recover a lost communications link. When the GSC3000 site does not respond, a window will appear notifying you of the problem. Monitor will wait for 30 seconds before it reattempts communication. Click on the "Try Now" button to attempt to reestablish communications without waiting.
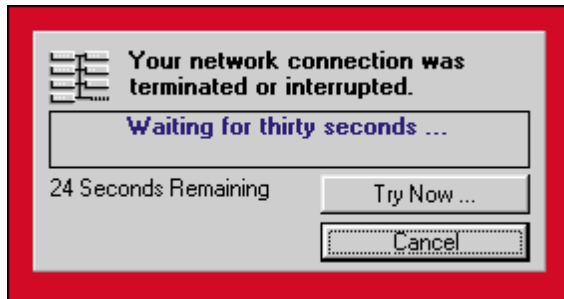
Monitor will attempt to reconnect three times—waiting 30 seconds between each attempt—before informing you that communications could not be recovered.
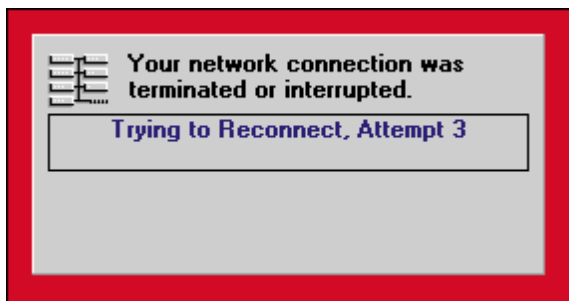
If link-loss recovery fails to reconnect you to the site, you may try reconnecting by clicking on the Site icon. If alarms are issued and the I/O unit cannot contact you via a data connection, it will continue down the Dialing list (see page 67) until it successfully notifies a user of the alarm.

Alarm Handling

Alarms are issued by an I/O unit at your GSC3000 site. Many different events can cause an alarm: change of state on a status input, when a metering limit is passed, or even as a message sent to you by a macro. When alarms are received at your PC, they are handled by the GSC3000 Alarm Handler. You must be running the GSC3000 Comm Server in order to receive alarms on your PC; Alarm Handler is launched by the Comm Server.

If you are directly connected to the GSC3000 site by direct serial, four-wire modem, or two-wire leased line, you will be notified immediately of an alarm by the Alarm Handler. Comm Server must be running on your computer in order for your PC to answer the GSC3000 site; otherwise, the site will consider the communication failed and continue on to the next contact on the dialing list (see page 67).

If you want the GSC3000 to dial a phone number to connect to your modem, you must set your modem to auto answer. The phone number the site is dialing must be an additional line used for modem connection only. Your modem must be set to auto answer; it will not be able to differentiate between incoming voice calls and incoming modem calls. The computer must be on and running the Comm Server or this will be a failed communication.

GSC3000 Comm Server is minimized when it is first run. If you connect to a site while using the Configuration or Monitor programs , Comm Server runs automatically. For more information on the GSC3000 Comm Server, see Chapter 8—Troubleshooting, pages 144-147.
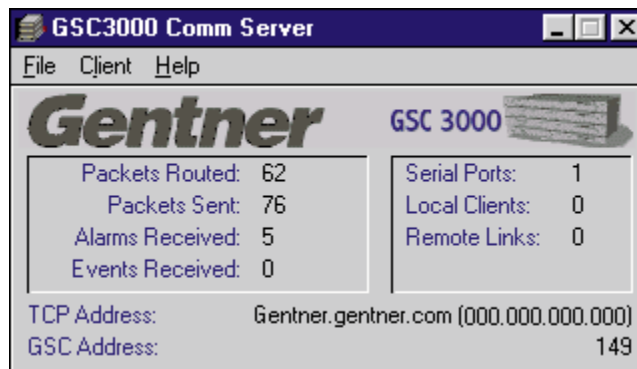
Alarm Handler

As soon as an alarm is received, the Alarm Handler will pop up on your screen. You will also be notified according to the configuration you selected in the Alarm Options window (see page 62) by a sound or X-10 switch notification. The Alarm Handler will wait for 30 seconds for you to clear or snooze the alarms before attempting to contact the next user on the dialing list. The features of the Alarm Handler will be discussed in detail in the order they appear below.
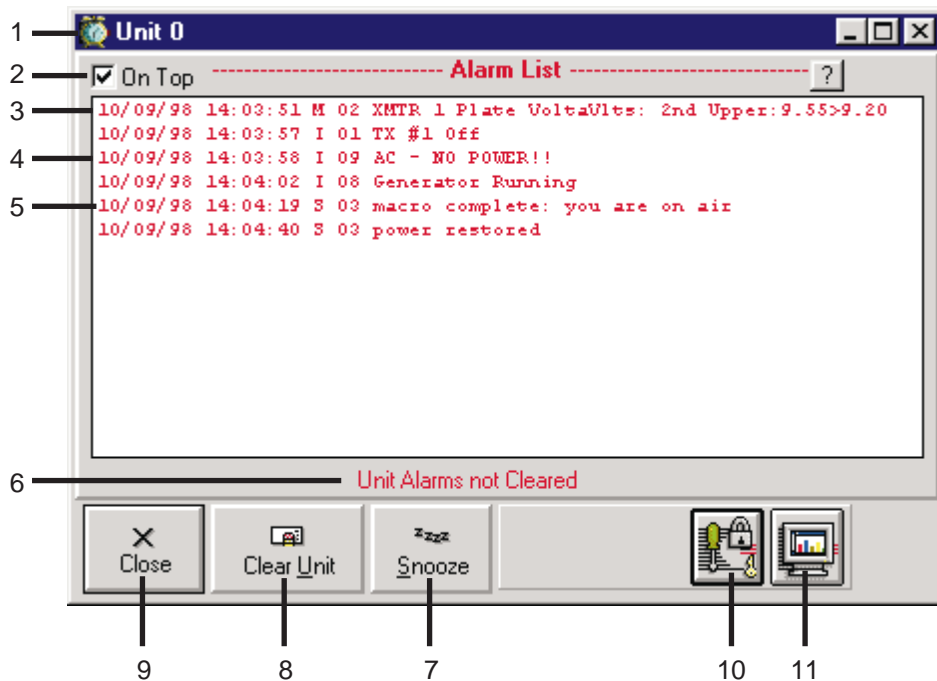
1. Unit ID. Your description of the unit that issues the alarm will appear on the top of the Alarm Handler window.

2. On Top. This feature places the Alarm Handler on top of all other applications. When enabled, the Alarm Handler window will always be visible even if you are working in another program. A check mark will appear in the "On Top" box when this feature is enabled.

3. Alarm from Metering Input. The alarm description contains information that is designed to help you to identify the source of the alarm. All alarms show the date and time the alarm was issued. If a metering limit has been passed, the letter "m" will appear to the right of the time, followed by the number of the metering channel. Also included is your description of the channel, which limit was passed, and the last reading when the limit was passed. In the example shown, the second upper limit was 9.2 and the last reading was higher than that limit at 9.55.

```
1 ── 🎰 Unit 0                                                    _ □ ✕
2 ── ☑ On Top  ------------------------ Alarm List ------------------------  ?
3 ── 10/09/98 14:03:51 M 02 XMTR 1 Plate VoltaVlts: 2nd Upper:9.55>9.20
     10/09/98 14:03:57 I 01 TX #1 Off
4 ── 10/09/98 14:03:58 I 09 AC - NO POWER!!
     10/09/98 14:04:02 I 08 Generator Running
5 ── 10/09/98 14:04:19 S 03 macro complete: you are on air
     10/09/98 14:04:40 S 03 power restored



6 ──                        Unit Alarms not Cleared

     ╔═══════╗ ╔═══════╗ ╔═══════╗ ╔═══════════╗ ╔═══╗ ╔═══╗
     ║   ✕   ║ ║  📷   ║ ║  ᶻᶻᶻ  ║ ║           ║ ║🌡🔒║ ║📊 ║
     ║ Close ║ ║Clear Unit║ ║Snooze ║ ║           ║ ║   ║ ║   ║

         9         8         7                      10    11
```
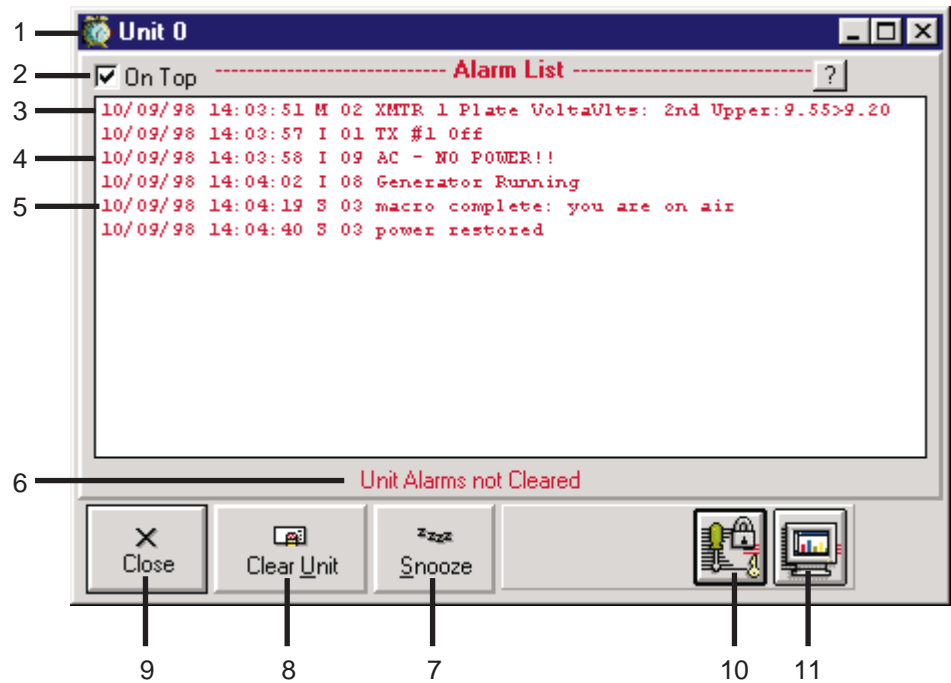
Non-critical alarms are logged but do not cause the Alarm Handler to open. However, if a critical alarm causes the Alarm Handler to open, the non-critical alarms will also appear on the alarm list.

4. Alarm from Status Input. Alarms that were issued when a status input changes status are marked with the letter "I", followed by the number of the status input. The description shown corresponds to the alarmed state of the input.

5. Alarm from Macro. You may also write macros that will send an alarm to the Alarm Handler. By inserting the line—ALARM "<message>"—in your macro, the text contained in the quotes will appear as an alarm. Alarms that were issued by a macro are marked with the letter "s" and the number "03".

6. Alarm Message. This message shows whether or not the alarms have been cleared by another user. If no one has cleared the alarms, the message will read "Unit Alarms not Cleared". If another user has cleared the alarms, the message will read "Unit Cleared by Another User". Anyone who has configured their PC to listen for alarms can clear the unit.

7. Snooze. This button enables you to temporarily "snooze" the alarm handler. You may encounter a situation where you receive repeated alarms so rapidly that you are unable to launch Monitor or effectively address the situation. If you encounter this situation, click on the "snooze" button to temporarily halt alarm reception. "Snooze" does not prevent your PC from logging alarms, it merely prevents them from appearing in the Alarm Handler window. Once you have "snoozed" the Alarm Handler, you can click on the "Close" button to exit the Alarm Handler. After approximately two minutes, the Alarm Handler will reopen and resume receiving alarms. It will also display any alarms received while the "snooze" feature was active.

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8. Clear Unit. This button signals to the GSC3000 site that you have received the alarms, and clears and closes the Alarm Handler. The "Clear Unit" button will not prevent repeated alarms from registering, only clear the ones already received.

9. Close. Click on this button to exit the Alarm Handler. Closing the Alarm Handler does not clear the unit or prevent new alarms from being received. It merely removes the window from view.

10. Configuration Button. Click on this button to launch the GSC3000 Configuration program.

11. Monitor Button. Click on this button to launch the GSC3000 Monitor program.

Other Alarm Indicators

If alarms are received while you are using the Configuration or Monitor programs, the icon for the unit issuing the alarm will appear bright red. An alarm button will also appear in the program's main screen. The alarm button in either application can be used to reopen the Alarm Handler if you have "snoozed" or closed it without clearing the alarms. Click on the "Alarm" button and a list of the alarmed units will appear. Click on the unit you want to view and the Alarm Handler will reappear.

Red Indicates Alarmed Units

Click to Reopen Alarm Window

Select Alarmed Unit

Click to Reopen
Alarm Window

Select
Alarmed
Unit

Red Indicates
Alarmed Units
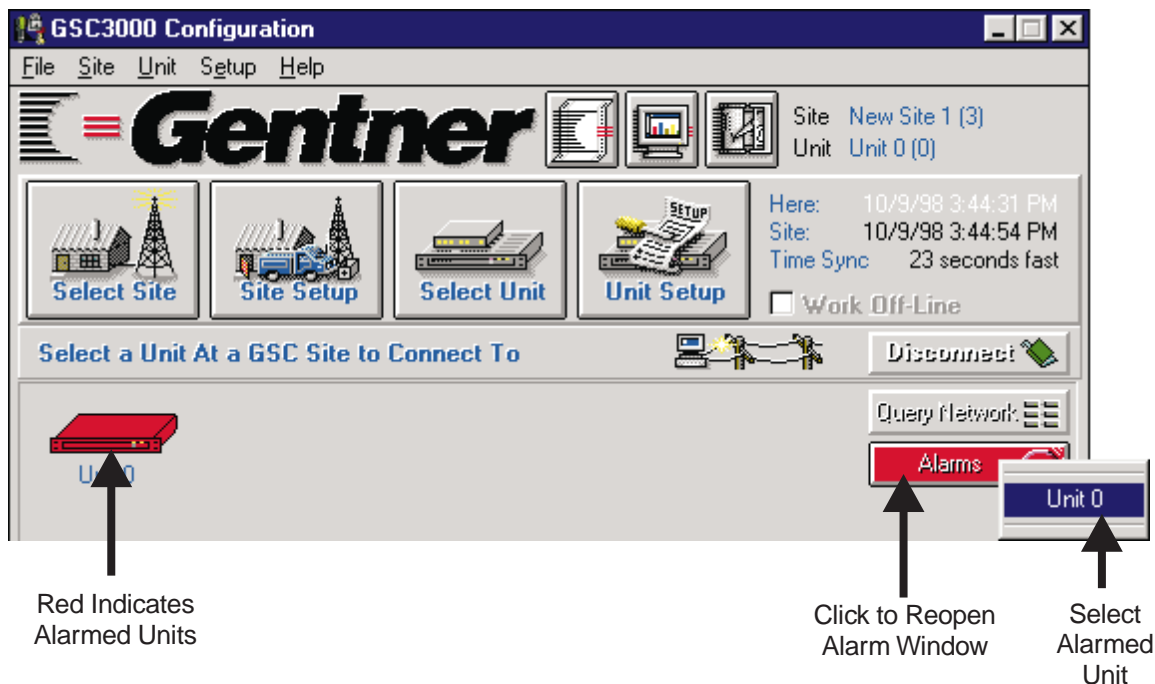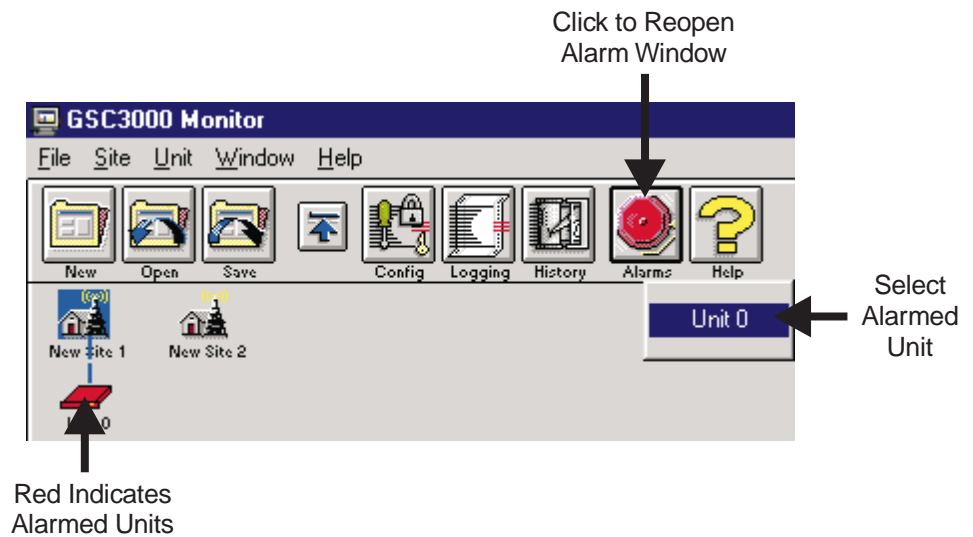
When alarms are cleared the Unit icon will return to its normal gray and the "Alarm" button will disappear.

For information on how to view past cleared alarms, see the section on the GSC3000 History application (pages 93-100, esp. pg. 100).

7Macros

Macros are a powerful tool for maximizing the capabilites of your GSC3000 system. When your I/O unit runs a macro, it issues a string of software commands that can be as complex and precise as you want to make them. For example, an entire power change sequence can be executed by running one macro, complete with time delays, power readings, etc. The GSC3000 can automatically initiate macros under certain conditions such as out-of-tolerance conditions (the actions that result from status changes or passing the upper and lower metering limits) or time-of-day events. You may also run macros manually by clicking on a macro button in the Monitor View window (see page 105).

Macros can even issue commands or run macros found on other I/O units in the same site. Each "command" or "macro" line is provided with a site and unit address. This address tells the macro which unit on the LAN should issue the required command or macro and the information is conveyed via the G-bus. A macro on one site cannot refer to a command or macro on another site.

Each I/O unit has 10K of compressed memory for storing macro information. This represents such a large number of macros that you are unlikely to ever run into this limit.

If you have macros written for previous versions of the GSC3000 software, the conversion utilities incorporated into the InstallShield for version 1.9 should convert them automatically. However, you may want to rewrite these macros to incorporate some of the new features. You should always backup your data files before installing a new version of software.

Macro Setup

To begin macro programming, you must first run the GSC3000 Configuration program. You can run Configuration by double-clicking on the Configuration icon in the GSC program group. You can also run it from the START menu under PROGRAMS > GSC3000 APPLICATIONS > GSC3000 Configuration

Connect to a site by clicking on the site icon. After you have entered the password, a map of the I/O units on your G-bus LAN will appear. Connect to a unit by clicking on the unit icon, then click on the "Macro Setup" button. This will open the Macro Setup window which you will use to write, compile, and upload the macros to the I/O unit. The features of this window will be discussed in the order they are labeled in the figure below.
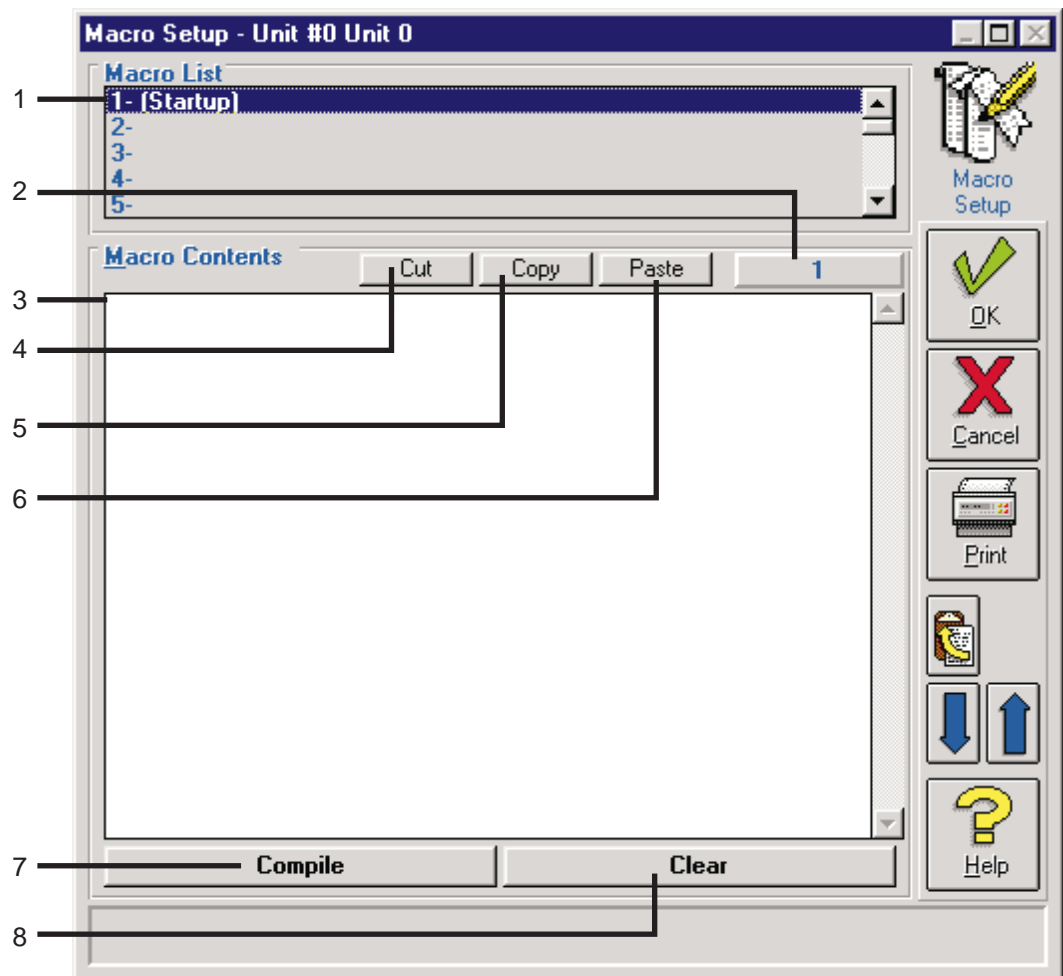
1. Macro List. This list shows all of the macros that are stored in this unit. Macros are named when you program them. Macro #1 is reserved as the re-boot or power-up macro. If your GSC3000 I/O unit loses power, then comes back on, as part of the re-booting process it will run Macro #1.

2. Macro Number. This box displays the number of the currently selected macro.

3. Programming Window. The programming window is where you enter the contents (source code) of the macro.

4. Cut. Use this button to cut information from the programming window for pasting to another macro.

5. Copy. Use this button to copy information from the programming window.

6. Paste. Use this button to paste cut or copied information into the current macro programming window.

7. Compile. When you have finished writing your macro, click on this button to compile the macro. The source code will be converted to an instruction set (object code) that the I/O unit's micro-processor can understand. During the compiling process, syntax and formation of the macro are checked. If you have entered the source code incorrectly in a line or have used a word the compiler doesn't recognize, it will notify you of the error in that particular line and will give you hints on how the line could be corrected.

8. Clear. Click on this button to erase the contents of the macro programming window. If you clear an existing macro, it will be deleted from the I/O unit when you click OK to exit.

When you are finished creating new macros, click on the OK button to upload the macros to the connected unit.

Macro Programming

You don't need to be a programmer to write macros! Although they may seem intimidating at first, they are actually quite simple. The important thing is that macros must be written in language the GSC system will understand.

To write a macro, you will use SOURCE CODE, which is a specific set of characters and words. Source Code is a simple way of telling the I/O unit what you want it to check and what you want it to do next.

The Source Code for writing macros is shown in the table on the facing page.

Notes: "EXP" and "NUM" as used in the table below are not valid source code. They denote the use of a number. In programming macros, you will enter the appropriate LAN or I/O unit ID number, or status / command channel or macro number instead of "EXP" or "NUM." "CR" refers to a carriage return or ENTER; a colon (:) can also be used to separate instructions within a macro line. Where parentheses "( )" are shown, the parentheses must be included in the source code. Where brackets "[ ]" are shown, the brackets are there to set off the item only—such as [CR]—the brackets are not included in the source code. Commas "," shown must be included.

Basic Macro Structure

A macro consists of the macro name, a sequence of instructions, and an instruction to end the macro. Macros can be any length, and with the exception of Macro and Alarm names, lines within the macro may be any desired length (text will roll to the next line automatically; the macro will not recognize the end of the line until it sees a CR or a : message (Enter or colon). The total compressed memory used for macro programming cannot exceed 10K per I/O unit. However, this represents such a large number of macros, you are unlikely to run into this limit.

You must identify each macro by name in the first line of the macro itself. Use the word Macro just prior to the name and enclose the name in double-quote (" ") marks (Macro "name"). Alarms issued within a macro (frequently used as an alert that the macro was completed) also use double-quote marks and are identified by typing: Alarm"statement".

Remarks may be inserted anywhere in the macro by using single quote (' ') marks around the remark. (These are handy as a reminder of why a certain instruction is made, or what it affects.)

SOURCE CODE	DESCRIPTION
+	Add
/	Divide
=	Equal
>	Greater than
<	Less than
*	Multiply
<>	Not equal to
-	Subtract
0 - 65535	Numbers used for values
1[A or B] - 16[A or B]	Identifies a command channel, A or B contact
Alarm"text string" [CR]	Alarm text reading (any text you want); max length 32 char.
Capture [EXP, EXP] [CR]	Captures information for a particular LAN, particular I/O unit
Command [EXP, EXP, NUM A or B]	Executes A or B contact of a particular command channel (LAN then I/O unit is defined)
Delay [EXP][CR]	Inserts a delay before executing next line in macro; increments are tenths (.1 of a second; maximum delay 65535 (6553.5 seconds)
G(1)—G(8)	Global variables (same value for all macros)
HIGH(or ON, or 1)	High state of status channel (any can be used) (High = On = 1)
IF [condition] THEN [instruction]	Used to execute commands IF certain conditions are met
L1meter(EXP) = EXP [CR]	Changes first lower metering limit for a particular channel
L2meter(EXP) = EXP [CR]	Changes second lower metering limit for a particular channel
LOW [or OFF, or 0]	Low state of status channel (any can be used) (Low = Off = 0)
Macro"text string" [CR]	Name of Macro (use any text you want); max length 32 char.
Macro[EXP, EXP, NUM]	Executes a specific macro (must be identified by LAN and I/O)
ME	First "ME" in a macro or command string refers to the LAN; second "ME" refers to the I/O unit running the command or macro in a LAN
Mend [CR]	Ends macro
Meter(EXP)	Identifies a metering channel
MeterAD(EXP) = EXP [CR]	Reassigns A to D value of a particular metering channel
MeterCC(EXP) = EXP [CR]	Changes calibration constant of a particular metering channel
Meteroff(EXP) [CR]	Turns off a metering channel
Meteron(EXP) [CR]	Turns on a metering channel
Mutemeter(EXP) [CR]	Mutes a metering channel
Mutestatus(EXP) [CR]	Mutes a status channel
Status(EXP)	Identifies a status channel
`Text string' [CR]	text in single quotes can be placed anywhere as remarks
U1meter(EXP) = EXP [CR]	Changes first upper metering limit for a particular channel
U2meter(EXP) = EXP [CR]	Changes second upper metering limit for a particular channel
Unmutemeter(EXP) [CR]	Unmutes a metering channel
Unmutestatus(EXP) [CR]	Unmutes a status channel
User defined variables (see examples)	32 per macro; these are NOT global; string length < 64 characters
WHILE	Executes commands as long as certain conditions are met

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When issuing commands or triggering other macros within a macro, you must identify the LAN and I/O unit to be affected by the instruction prior to stating the specific command output or macro to be triggered. They are identified first by LAN, then by I/O. In the examples below, you will see the word "me" within instruction lines. "Me" simply refers to this LAN or this I/O unit (the one issuing the macro). The network address of the LAN and I/O unit can also be used. The LAN will always be "me" or the network number for the current site. A macro cannot trigger commands or macros in another site.

The most common macro is a sequence of command outputs for stepping through an event such as a power change. Here are two examples of this type of macro. The first example executes three commands within the first I/O unit of the LAN being addressed. Note that the LAN and I/O unit being addressed by a macro line are identified prior to identifying the command channel.

Lines within macro	Description
Macro "High Power"[CR]	Names the macro. "CR" moves to the next line
Command me, me, 1A[CR]	Executes Command output 1A, this LAN, this I/O unit
Command me, me, 2A[CR]	Executes Command output 2A, this LAN, this I/O unit
Command me, me, 3A[CR]	Executes Command output 3A, this LAN, this I/O unit
Mend[CR]	Ends macro

The following macro also executes three command outputs within the LAN, but in two different I/O units and with a ten second delay between two of the steps.

Lines within macro	Description
Macro "High Power"[CR]	Names the macro. "CR" moves to the next line
Command me, me, 1A[CR]	Command output 1A, this LAN, this I/O unit
Command me, me, 2A[CR]	Command output 2A, this LAN, this I/O unit
Delay 100[CR]	Wait 10 seconds (100 units of .1 second)
Command me, 2, 4A[CR]	Command output 4A, this LAN, second I/O unit
Mend[CR]	Ends macro

Issuing Commands

The above examples showed a sequence of individual commands contained within a macro. To issue a command in a macro, begin a new line with the word "Command". This is followed by the location of the command output that will be triggered. You will first identify the LAN (group of I/O units). This should be the word "me" or the network number to identify the LAN. The next number identifies the I/O unit that will be affected by the instruction. If you are executing a command from the current unit, use the word "me" to identify the I/O unit. If you have multiple I/O units and wish to execute a command from another unit, enter the unit number for that I/O unit.

The final instruction in the line is the actual command output (1-16, A or B contact) to be activated by the macro command. The following example issues a macro in "this" LAN, "this" I/O unit, command contact 10A.

Macro Line Example	Description
Command me, me, 10A[CR]	"Command" tells the macro it will issue a command
	The first "me" refers to the LAN
	The second "me" refers to the first I/O unit in the LAN (use the network assignment for another I/O unit)
	10A refers to the actual command output to be executed
	[CR] is the same as (Enter)

Nested Macros

A macro can also trigger another macro. As with Commands, macros are identified by LAN and I/O unit. Start the line with the word "Macro", followed by the LAN identifier and I/O identifier, then the macro number to be triggered.

Macro Line Example	Description
Macro me, me, 5[CR]	"Macro" tells the macro it will be triggering another macro
	The first "me" refers to the LAN
	The second "me" refers to the first I/O unit in the LAN
	The "5" means macro number 5 in that I/O will be triggered
	[CR] is the same as (Enter)

It is important to note that macros within macros do not act as subroutines. They will run concurrently with the main macro. If you need to execute a full macro sequence prior to running another macro, see the subprocedure example on pages 134 and 135.

An example of a nested macro would be a macro re-defining upper and lower metering limits, placed at the end of a power change macro.

Captures

Captures are useful in obtaining "snapshots" of an I/O unit, including metering channel readings, status channel states, and the last action of the command channels. When you program a macro involving significant changes in I/O unit settings, it is a good idea to set up multiple captures during the macro. Each capture will be flagged with the date and time for later viewing using the GSC3000 History program (see page 93). Each I/O unit will store up to 128 captures in its memory without downloading.

To capture a "snapshot" of the I/O unit, begin a new line in the macro with the word "Capture" followed by the LAN and I/O unit ID numbers, then end the line with a "CR" or colon (:).

Macro Line Example	Description
Capture me, me[CR]	Will capture all information for this I/O unit in this LAN at this point in the macro

Delay Times

Each average-length line in a macro takes approximately one second to run.

It may be necessary to insert a pause between steps of a macro (for example, to give a motor time to come fully up to speed). Delay times are entered numerically with the instruction Delay EXP (where EXP equals the desired delay time), and are available in .1 second (one tenth of a second) increments. Entering a 1 will give you a .1 second delay; 500 will give you 50 seconds, and so on. The maximum value available for delay time is 65535 (just over 109 minutes).

Macro Line Example	Description
Delay 600[CR]	Insert a 60 second delay prior to executing the next line in the macro

Remarks

You can place remarks anywhere within the macro . Remarks must be enclosed by single quote (' ') marks.

Macro Line Example	Description
'Limits changed for lower power'[CR]	Any text in single quote marks is a remark

Alarms

An alarm message can be generated within a macro by using the word "Alarm" followed by the desired text within double quote (" ") marks. These alarm messages will pop up in the Alarm Handler whenever the macro line is run. They are treated as a critical alarm; normal dial-out procedures will apply.

Macro Line Example	Description
Alarm "Power Change Complete" [CR]	The statement in double-quotes will appear in the Alarm Handler when the macro line is run. 32 characters maximum.

If Then Statements

This feature allows the macro to perform conditional functions, such as initiating a command output if a metering or status channel gives a certain reading. IF THEN statements can be placed anywhere within a macro (be sure to use both "if" and "then" in the same macro line). The IF THEN statement is ended with the line "ENDIF[CR]". Two examples of IF THEN statements are shown below.

Macro Line Example	Description
If Status(3)=Low then[CR]	"If" begins the IF statement.
Command me, me, 4A[CR]	The lines that follow will run only if status input 3 is low.
Delay 50[CR]	
Command me, me, 16A[CR]	
Endif[CR]	Endif ends the IF statement (the macro can continue).

Macro Line Example	Description
If Meter(12) > 60 then[CR]	"If" begins the IF statement.
Macro me, me, 5[CR]	Meter input 12 must be higher than 60 or macro 5 will not run.
Endif[CR]	Endif ends the IF statement.

While Statements

WHILE statements are similar to IF THEN statements in that instructions are only executed under certain conditions. This kind of statement could be used repeat a command as long as a specific condition exist. These statements begin with the word "while" followed by a specific condition and instructions to be executed while that condition exists.

Macro Line Example	Description
While Meter(5) < 50[CR]	"While" begins the statement.
Command me, me, 12A[CR]	As long as meter input 5 is less than 50, command 12A in this LAN, this I/O will be triggered. As soon as meter input 5 reads 50 or more, command 12A will stop being run.
Wend[CR]	Wend ends the While statement. (The macro can continue).

This WHILE statement sets up a variable loop which executes a specific command as long as the variable x has a value of less than 10. The value of "x" increments by one after initiating the command, then executes the sequence again until "x" = 10.

Macro Line Example	Description
x=1[CR]	This line sets the individual variable "x" to 1.
While(x)<10[CR]	As long as "x" is less than 10, the next lines will be repeated.
Command me, me, 10A[CR]	Issues command 10A on this LAN, this I/O unit.
x=x+1[CR]	This line adds 1 to "x" each time the line is run, until x=10.
Wend[CR]	Wend ends the While statement. (The macro can continue).

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Up to eight macros can run concurrently. More than eight macros running at one time may trigger an alarm, requiring you to enter the Macro Status window and shut down one or more macros.

If by accident a macro goes into an infinite loop, the macro can be shut down by going into the Macro Status window of the GSC3000 Monitor program. Connect to the site, then to the unit and click on the macro status button; this will show you which macros are running and will allow you to shut down the macros that are causing the problem.

Macro Status ...   ☒

Macros currently running:

Unit 00 Macro #02
Unit 00 Macro #05

[End Task]   [Cancel]
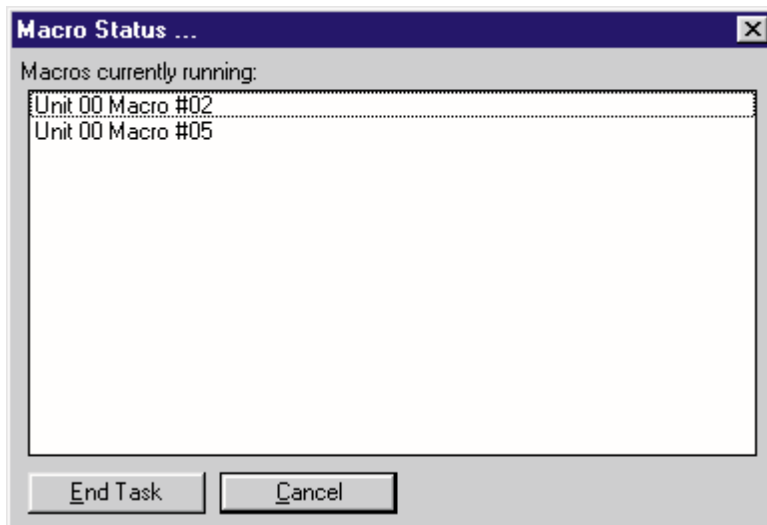
Variables

There are two types of variables available in macro programming: global and individual. Global variables have the same value no matter where they are used. Eight global variables are available; they are denoted by **G(1) - G(8)**. Be careful when changing global variable values within a macro, as any other use of that variable will also be affected by the value change.

Macro Line Example	Description
G(1)=134	This global variable will have a value of 134.
G(1)=Meter(5)*Meter(4)	This global variable is assigned the value of meter input 5 times metering input 4.

Individual variables do not use the "G" designation and apply to that macro only. You may use up to 32 different variables within a macro, with a maximum string length of 64 characters.

Macro Line Example	Description
X=1	Anywhere you use X in the macro, it will have a value of 1.
Y=Meter(10)	This variable assigns Y the value of metering input 10.

Variables can be useful in programming WHILE or IF THEN statements to establish a test count, set up a loop to trigger a command output X number of times, or establish other parameters for the duration of the statement.

Changing Metering Parameters

Macros may be used to mute or unmute metering and status channels, disable or enable metering channels, reassign A-D values on metering channels, change calibration constants, or change upper and lower metering limits. This ability is especially useful for long-term functions such as power changes (where a failure to change metering limits would result in a large number of alarms), or temporary actions such cycling a motor off and on (where you may or may not want to see alarms as a result of the action).

To mute a metering or status channel, begin the macro line with the word "Mutemeter" or "Mutestatus" followed by the number of the metering or status channel in parentheses. To unmute, the macro line should read "Unmutemeter" or "Unmutestatus" followed by the metering or status channel in parentheses.

Macro Line Example	Description
Mutemeter(5)[CR]	Mutes metering input 5
Unmutemeter(5)[CR]	Unmutes metering input 5
Mutestatus(3)[CR]	Mutes status input 3
Unmutestatus(3)[CR]	Unmutes status input 3

The A to D value of a metering channel sets the calibration constant. The metering A-D values can be set anywhere in a range of 0 to 4096. (The calibration constant may also be set by typing in voltage increments; see below.) When changing the A-D values of a metering channel, identify the action to be taken by typing "MeterAD" followed by the channel number in parentheses, then "=", then the new desired value.

Macro Line Example	Description
MeterAD(5)=390[CR]	Changes the A-D value of Meter 5 to 390
MeterAD(1)=MeterAD(9)[CR]	Sets the A-D value of Meter 1 to the A-D value of meter 9

You may also set the calibration constant by specifying the voltage, use the term "MeterCC" followed by the channel number in parentheses, then "=", then the desired value. Increments of .002441 will specify the exact voltage over the 10 volt range of the metering channel (10 volts divided by the A-D range of 4096 increments equals .002441). Setting the value to .002441 defaults the Calibration Constant and allows the operator to see the actual analog voltage present at the input.

Macro Line Example	Description
MeterCC(3)=.002441[CR]	Sets the calibration constant of meter input 3 to .002441

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To change upper and lower metering limits for a specific channel, you will identify the limit to be changed, then the metering channel in parentheses, followed by the = sign and the new desired value.

Macro Line Example	Description
Macro"Metering 6 Limits, Low Power"	Names the macro
U2meter(6)=390 [CR]	Sets upper limit 2 of meter input 6 to 390
U1meter(6)=370 [CR]	Sets upper limit 1 of meter input 6 to 370
L1meter(6)=340 [CR]	Sets lower limit 1 of meter input 6 to 340
L2meter(6)=330 [CR]	Sets lower limit 2 of meter input 6 to 330
Mend[CR]	Ends macro

To disable a metering channel, type "Meteroff", then enter the metering channel number in parentheses.

Macro Line Example	Description
Meteroff(12)[CR]	Turns off meter input 12

To enable a metering channel (turn it back on), type "Meteron", then enter the metering channel number in parentheses.

Macro Line Example	Description
Meteron(12)[CR]	Turns on meter input 12

Macro Examples

The following pages contain several examples of typical macros. If you need further assistance in learning how to program macros, check Gentner's web site at **www.gentner.com** and go to technical support, or call us at the numbers listed at the bottom of the page.

```
Macro Setup - Unit #0 Unit 0

Macro List
2-POWER SWITCH
3-WHILE DELAY
4-START TRANSMITTER AFTER POWER OUTAGE
5-OR IN AN IF STATEMENT
6-AND IN AN IF STATEMENT

Macro Setup

Macro Contents    Cut    Copy    Paste    1

Macro "Power Switch"
Mutemeter(2)
Command me, me, 1a
Command me, me, 2a
Command me, me, 3a
L2meter(2)=7
L1meter(2)=7.4
U1meter(2)=7.6
U2meter(2)=8
L2meter(3)=45
L1meter(3)=47
U1meter(3)=53
U2meter(3)=55
Unmutemeter(2)
Mend

Compile    Clear

OK
Cancel
Print
Help
```

Power Change Example

This example shows a power change and a limit change. First, the macro mutes meter channel two to prevent any alarms that might be triggered before the new limits are established. The macro issues three commands: 1a, 2a, and 3a to initiate the power change. Then the macro sets new limits for meter channel two. Lower limit two is set to 7. Lower limit one is set to 7.4. Upper limit one is set to 7.6. Upper limit two is set to 8. The macro also sets new upper and lower limits for meter channel three but does not mute the channel. After all adjustments are completed, the macro unmutes meters channel two and ends.
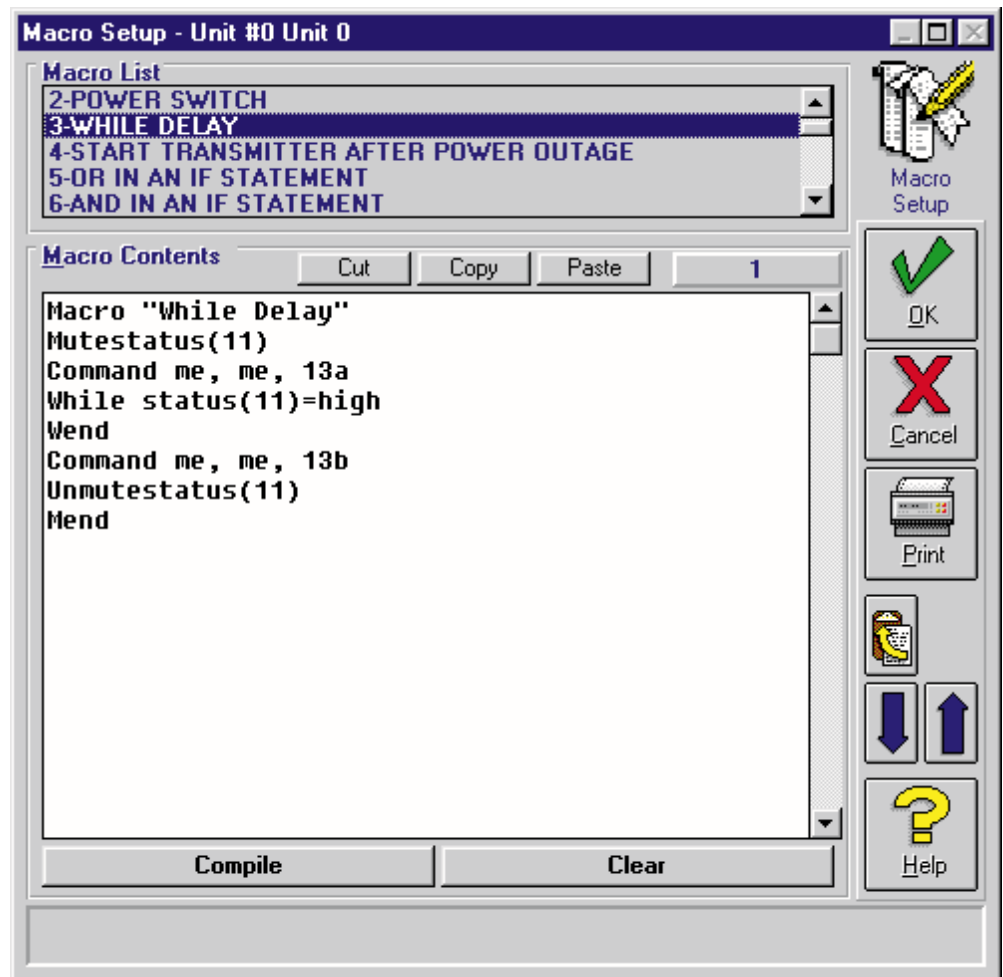
While Delay Example

This example shows how a While statement can set up a variable loop which "pauses" a macro until a defined set of conditions are met. First, the macro mutes status channel 11, then issues command 13a. The While statement checks the reading of status channel 11. As long as status channel 11 is "high", the macro will continue to loop and check the status. When the channel is no longer "high" the While statement ends and the macro issues command 13b. Lastly, the macro unmutes status channel 11 and ends.

```
Macro Setup - Unit #0 Unit 0                          _ □ ☒

┌─Macro List──────────────────────────────────┐ ┌──────────┐
│ 2-POWER SWITCH                            ▲  │ │  Macro   │
│ 3-WHILE DELAY                                │ │  Setup   │
│ 4-START TRANSMITTER AFTER POWER OUTAGE       │ └──────────┘
│ 5-OR IN AN IF STATEMENT                      │
│ 6-AND IN AN IF STATEMENT                  ▼  │
└─────────────────────────────────────────────┘

┌─Macro Contents─┐  [ Cut ] [ Copy ] [ Paste ]  [    1    ]   ✔
│                                                             OK
│ Macro "Start transmitter after power outage"   ▲
│ Macro me, me, 2                                             ✗
│ Delay 100:'Delay 10 seconds'                             Cancel
│ Macro me, me, 3
│ Delay 100:'Delay 10 seconds'                             Print
│ Macro me, me, 4
│ Mend
│
│
│
│
│                                                ▼          Help
│ [      Compile      ]    [      Clear      ]
└────────────────────────────────────────────────┘
```

Start Transmitter Example

This is an example of a macro that starts other macros after a short time delay. The first line starts macro two. There is a 10-second delay, then macro three is started. After another delay of ten seconds, macro four begins. Each line of code takes approximately one second to run.

! **This macro shows a time delay only. Each macro will start immediately after the specified amount of delay time whether or not the previous macro has finished. This type of macro should be used with caution because too many macros running simultaneously (more than eight) will cause an alarm. If your application requires that each macro be completed before continuing to the next, see the sub-procedure example on pages 134-135.**

Macro Setup - Unit #0 Unit 0

Macro List
```
2-POWER SWITCH
3-WHILE DELAY
4-START TRANSMITTER AFTER POWER OUTAGE
5-OR IN AN IF STATEMENT
6-AND IN AN IF STATEMENT
```

Macro Setup

Macro Contents   Cut   Copy   Paste   1

```
Macro "OR in an IF Statement"
x=0
IF Status(2)=High then
Command me, me, 16b
Command me, me, 12a
x=1
Endif
IF x=0 then
IF Status(5)=High then
Command me, me, 16b
Command me, me, 12a
Endif
Endif
Mend
```

OK

Cancel

Print

Help

Compile   Clear

"Or" in an IF Statement

This macro shows how a macro can examine a situation then choose the appropriate course of action. The first line sets an individual variable ($x = 0$). This line is very important because it enables the macro to recognize whether or not it has already taken action. The first IF statement checks status channel 2. If the reading on this channel is "high", then the macro issues two commands: 16b and 12a, and changes the individual variable to $x = 1$. If the reading on channel two is not "high", the IF statement ends without issuing the commands or changing the variable.

The second IF statement checks the individual variable. If $x = 1$, then the macro recognizes that commands have already been issued and skips the end of the IF statement and ends the macro. If x still equals 0, the macro recognizes that no action has been taken and continues on to the next line. Here another IF statement begins which checks status channel five. If the reading on this channel is "high", the macro issues two commands: 16b and 12a, then ends the macro.

> **!** **The individual variable is crucial to this example. Without the variable, it is possible that the macro could attempt to issue the same commands twice.**

Macro Setup - Unit #0 Unit 0

Macro List
2-POWER SWITCH
3-WHILE DELAY
4-START TRANSMITTER AFTER POWER OUTAGE
5-OR IN AN IF STATEMENT
6-AND IN AN IF STATEMENT

Macro
Setup

Macro Contents   Cut   Copy   Paste   1

```
Macro "AND in an IF Statement"
IF Status(5)=LOW Then
IF Status(6)=LOW Then
Command me, me, 10a
Command me, me, 11a
Endif
Endif
Mend
```

OK

Cancel

Print

Help

Compile   Clear

"And" in an IF Statement

This example shows how a macro can examine two factors in a situation
and then take action if both factors show that it is required. First, the
macro checks status channel five. If the reading on this channel is not
"low", the macro skips to the end of the IF statement and ends the
macro. If the reading on this channel is "low", then the macro checks
status channel six. If the reading on status six is also "low", the macro
then knows to issues commands 10a and 11a. If it is not "low", then no
action is taken and the macro ends. In order for any command to be
issued in this example, both variables must be "low". If neither variable
is "low", no command will be issued.

```
Macro Setup - Unit #0 Unit 0

Macro List
5-SUB PROCEDURE EXAMPLE
6-SUB PROCEDURE 1
7-SUB PROCEDURE 2
8-
9-

Macro Contents     Cut    Copy    Paste    1

Macro "Sub Procedure Example"
G(1)=0
Macro me, me, 6
While G(1)=0
Wend
Macro me, me, 7
While G(1)=1
Wend
Mend

Compile          Clear
```

Macro Setup — OK — Cancel — Print — Help
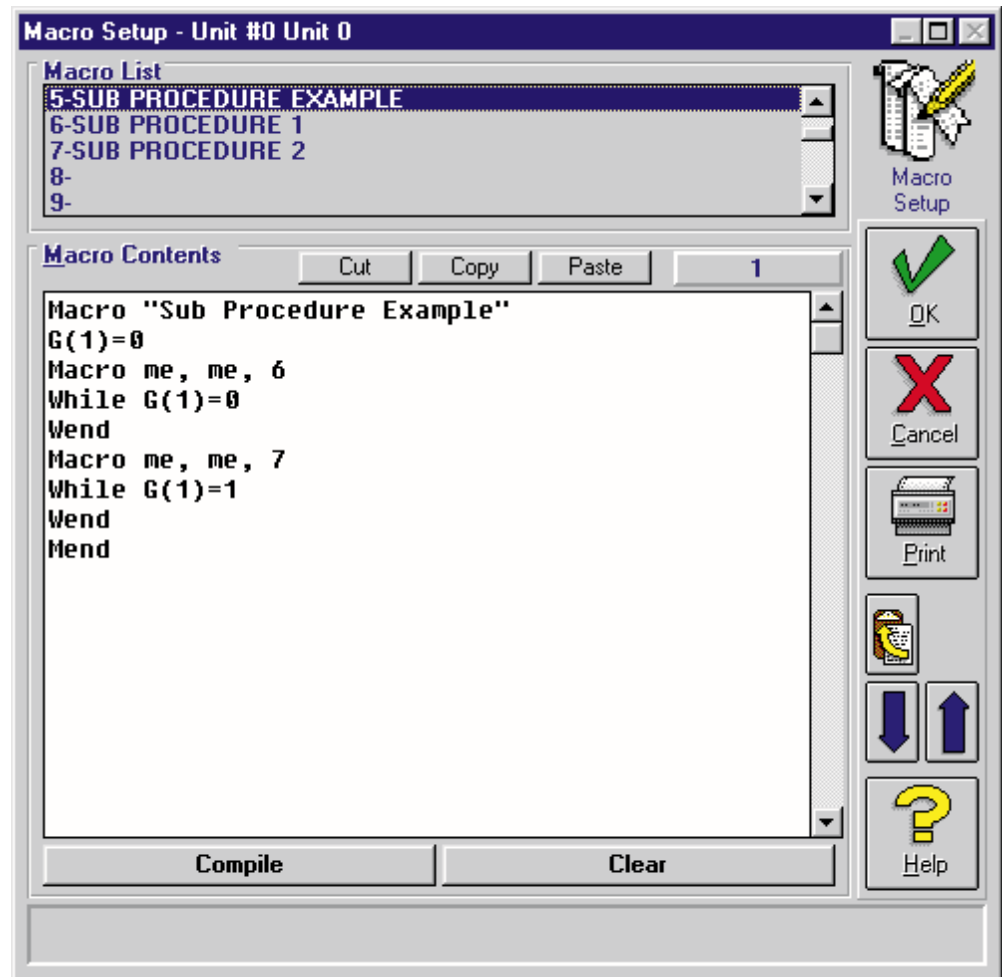
Sub Procedure Example

This examples shows how global variables may be used in nested macros to ensure that each macro is finished before another one begins. The first line sets global variable one to a value of zero: "G(1) = 0". This line is very important, because it will be used to set up a variable loop that prevents subsequent macros from starting before the current one has finished running. The second line launches macro six. Macro six issues three commands: 10a, 11a, and 12a. After issuing these commands, macro six changes the global variable: "G(1) = 1", and ends.

> ⚠ **Global variables should be reset each time they are used. Because global variables are stored in memory independent of individual macros, failure to reset a global variable may prevent macros from launching as desired.**

Meanwhile, macro five has been "paused" in a variable loop established by a While statement. As long as G(1) = 0, the macro continues to loop and check the status of the global variable. When macro six changes the global variable to one, macro five ends the While statement and launches macro seven. Macro seven issues three commands: 13a, 14a, and 15a; changes the global variable: "G(1) = 2", and ends.

Macro five (above) has been "paused" by another While statement. When macro seven changes the global variable to two, macro five finishes the While statement and ends.

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Macro Setup - Unit #0 Unit 0

Macro List

5-SUB PROCEDURE EXAMPLE
6-SUB PROCEDURE 1
7-SUB PROCEDURE 2
8-
9-

Macro Setup

Macro Contents   Cut   Copy   Paste   1

```
Macro "Sub Procedure 1"
Command me, me, 10a
Command me, me, 11a
Command me, me, 12a
G(1)=1
Mend
```

OK

Cancel

Print

Macro Setup - Unit #0 Unit 0

Macro List

5-SUB PROCEDURE EXAMPLE
6-SUB PROCEDURE 1
7-SUB PROCEDURE 2
8-
9-

Macro Setup

Macro Contents   Cut   Copy   Paste   1

```
Macro "Sub Procedure 2"
Command me, me, 13a
Command me, me, 14a
Command me, me, 15a
G(1)=2
Mend
```

OK

Cancel

Print

Help

Compile   Clear

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8Troubleshooting

Common Problems and Solutions

Many common errors can be easily handled without having to contact technical support. This section presents several common problems with suggestions on how to remedy them. If, however, the nature of your error is not represented here, please contact us at the number listed below.

Installation Problems

Problem 1
I can't change the unit number.

Solution
To change the unit number on an I/O unit, you must be connected to the COM 2 port on the back panel. Make sure you are not connected to the COM 1 port. You should also connect using the null-modem serial cable that was provided with your shipment or you may not be able to change the unit number.

Problem 2
I can't upload firmware.

Solution
You must be connected to the COM 2 port on the I/O unit to upload firmware. Make sure you are not connected to the COM 1 port. You should also connect using the null-modem serial cable that was provided with your shipment. Also, firmware cannot be uploaded via modem. If you were attempting to do so, reconnect using a direct serial connection then try again.

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Problem 3

The front panel LEDs are not both green.

Solution

LEDs blink green-amber-black repeatedly. A watch-dog chip needs to be replaced (U24 in I/O unit, Voice Interface unit needs to be sent in to the factory).

Power LED only is lit. The unit programs successfully, but the Remote/Local LED is dark. This signifies a hardware failure and the unit should be sent in for factory repairs.

LEDs go solid amber. This indicates corrupt firmware. Use the JP9 jumper to clear the firmware (see page 148) and reload firmware. If the LEDs remain solid amber, you may have a hardware failure that requires you to send the unit in for repairs.

Remote/Local LED is red and no commands are being issued. The I/O unit is in local mode. This mode prevents command outputs from being activated for your safety. Press the Remote/Local button to return the I/O unit to remote mode.

Problem 4

The I/O unit loses its programming every time the power is cycled off and on.

Solution

Check JP9 to see if the jumper is engaged. The jumper should be connected to one pin only (see page 148).

Communications Problems

Problem 1

My mouse locks up when I click on the site or open the port.

Solution

The COM port is either the same as, or shares an interrupt with the mouse. Try switching COM ports, or if you are using an add-in serial board, change the interrupt, and try again.

Problem 2

GSC3000 Comm Server cannot open the port you requested.

Solution

Either the COM port is physically unavailable (not installed or experiencing a conflict), or another application is currently using the COM port. Use the GSC3000 Port Wizard application to verify that the COM port is available and configured for use.

Problem 3

GSC3000 Comm Server could not find or access an available modem.

Solution

This occurs if your selected site is set to auto-modem select, and all modems are in use with other sites. This may also occur if no modems are ready or connected. Make sure the modem's power is turned on. Use the GSC3000 Port Wizard to check that it is configured correctly for your modem. See pages 38-50 for information on modem configuration.

Problem 4

Could not connect to the GSC3000 site by modem.

Solution

The GSC3000 software is unable to establish communication by modem. Check your dial string, phone number and site settings. Radio-frequency interference (RFI) may also be preventing clear communication. Listen for modems attempting to negotiate a connection. If they are not, check the modem at the site to make sure auto-answer is on. (There should be a status light indicating such). You should also try installing a RFI filter next to the modem or Voice Interface unit (whichever is closest to the telephone line)

If you are using a two-wire dial-up modem, make sure that it is connected to the COM 2 port on the back of the I/O unit. The COM 1 port is for direct connections only.

Problem 5

GSC3000 site rejected password.

Solution

The password has probably been changed. If you connecting for the first time, use the default system password ("GSC3000"). However, once the system password has been changed by the site administrator, the default is no longer valid. All passwords are stored in the I/O unit, you will not be able to connect unless you know the system password or have been assigned a user password. If the system password has been changed and forgotten, then the password will need to be reset to its default value by reloading firmware to the I/O unit.

Problem 6

Error message "You do not have system access to the site."

Solution

The error occurs when a user with "observer" or "operator" access only tries to connect to a site in the Configuration program. You must have "system" level access to connect to a site in the Configuration program.

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Problem 7

The modem does not appear to be working.

Solution

Make sure that the modem has power and is turned on. Check the DIP switch settings. Use other communications software—such as HyperTerminal™—to see if it is working properly. Enter the dial, initialization, reset and auto-answer strings as set up in GSC3000 Port Wizard. You should get a dial tone with the dial string, and OK on the other strings. If necessary, consult your modem manual to research appropriate initialization strings, etc., and make necessary changes. Make sure you are using the correct null-modem cable to connect to your modem. The cable between your PC and modem should be a full implementation (nine-pin connection) cable supporting carrier detect, RTS/CTS and send/receive.

Problem 8

When I run Comm Server, my computer freezes up.

Solution

This problem usually occurs when you are setup to listen for alarms from a remote site using TCP/IP proxy and you have entered a machine name instead of the IP address. If your local area network is not a DNS network, but rather a workstation (peer-to-peer) network, the Comm Server will cause your computer to freeze up when the remote workstation is not logged onto the network. Change the machine name to the IP address and your computer will recognize that the IP address is not available instead of continuously searching for a missing machine name. You will also have trouble connecting in Monitor or Configuration if the computer is not logged on to the network.

Problem 9

I'm directly connected to the site and I'm still having trouble communicating.

Solution

Check which COM port you are connected to on the back of the I/O unit. For a direct serial connection, you must be connected to the COM 1 port. The COM 2 port is for connection to a two-wire dial-up modem only (as well as firmware upload and changing unit numbers). If you are using a four-wire modem or two-wire leased line, use the COM 1 port; this is the same as a direct connection.

Site Setup Problems

Problem 1
I can't connect to the site with the GSC3000 Software.

Solution
This is either a communication problem, an issue with site hardware setup or a modem problem. Check your serial connections between the PC and I/O unit.

If you are using a modem and the modem is simply not answering, check the connection between the on-site modem and the I/O unit. Check the external status light on the modem to make sure auto-answer is on. Try direct connecting to make sure that the PC and I/O unit are able to communicate. Check the Port Wizard to make sure that the COM ports are configured correctly.

If you hear two sets of tones (both modems are attempting to connect), check to make sure that both modems are set to the same baud rate (19,200 recommended). The modems should also be the same speed modem, if one modem is 33.6 and the other is 56K, the faster modem may not be auto-bauding down fast enough. RF interference may also be inhibiting communications. Try installing an RF filter next to the modem.

Problem 2
The I/O unit does not call when it has alarms.

Solution
Make sure that the dial-out table for the controlling I/O unit dialing is setup properly. Make sure that the phone numbers have any necessary extra digits, such as "1" for long distance, the area code, or "9" if the modem is dialing out through a PBX. If the I/O unit is dialing a pager, add commas to provide the appropriate number of one second pauses for connection to the paging service. You may also need to add commas if you are using a Voice Interface unit.

You must be running the GSC3000 Comm Server to register alarms by data transfer. Make sure that you are communicating at a high enough baud rate. 19,200 bps is the recommended setting. If you are listening for alarms using TCP/IP proxy make sure that you have entered the correct TCP/IP address. Make sure this workstation is setup to listen for alarms in Site Setup (Configuration program).

Data Capture Problems

Problem 1

How do I view/access captured data?

Solution

GSC3000 History is the only GSC3000 software application that can open and view event history as well as alarm history on a per-I/O unit basis. You can also manipulate (merge, purge, export and print) history from this application. See pages 93-100 for more information.

Problem 2

All of my history disappeared before xx-xx-xxxx (a date)!

Solution

Your history was revised (due to changes in setup) or purged. If you have changed the configuration of your I/O unit significantly since the last data captures, you will need to use the revision buttons to switch between revisions. If desired, revisions can be merged together (if the changes are insignificant) If the history was purged, it may have been purged to a file in which you can merge that file back into the current history file.

Problem 3

I have set up data capture, but I get no results!

Solution

Make sure that the site is setup to collect capture data (page 59). Also make sure that only one workstation is setup to collect capture data; if more than one PC collects captures, the data will be downloaded to whoever connects to the site first. When you connect to the site in Configuration or Monitor, the I/O unit(s) that have performed captures should be green. If the captures are being executed by a macro, make sure that the macro is being executed. A good way to do this is to add an "alarm" line to the macro that informs you whenever the macro has been run.

Comm Server Problems

Problem 1
The GSC3000 Comm Server was not found when you attempt to connect to your site.

Solution
Either your client program(s) (Configuration, Monitor, etc) are installed in a different location than GSCCOMM.EXE or GSCCOMM.EXE is corrupted, damaged or deleted. Locate the file, and run the Comm Server manually. The client applications will remember where it is for subsequent launches.

Problem 2
GSC3000 Comm Server cannot open the port you requested.

Solution
Either the COM port is physically unavailable (not installed or experiencing a conflict), or another application is currently using the COM port. Use the GSC3000 Port Wizard application to verify that the COM port is available and configured for use.

Configuration Problem

Problem
I get missing or corrupted file errors when I start GSC3000 Configuration.

Solution
Files may be corrupted by installation of other programs, dirty shutdowns, and/or similar situations. Move your C:\GSC\ARCHIVES*.SET files to a safe location on your hard-drive. Uninstall the software using the UninstallShield utility. Delete the GSC directory. Then reinstall the GSC3000 software. Then move the *.SET files back to the ARCHIVES directory.

GSC3000 Comm Server

When first run, the GSC3000 Comm Server will be minimized and appear only as a button on your Windows® Taskbar.

GSC3000 Comm Server

Main Screen Features

The GSC3000 Comm Server has several tools that you can use when troubleshooting your GSC3000 system. It is a good idea to familiarize yourself with these tools in case you are required to use them when you contact Gentner technical support. The features of the Comm Server will be discussed in the order they are labeled in the figure below.
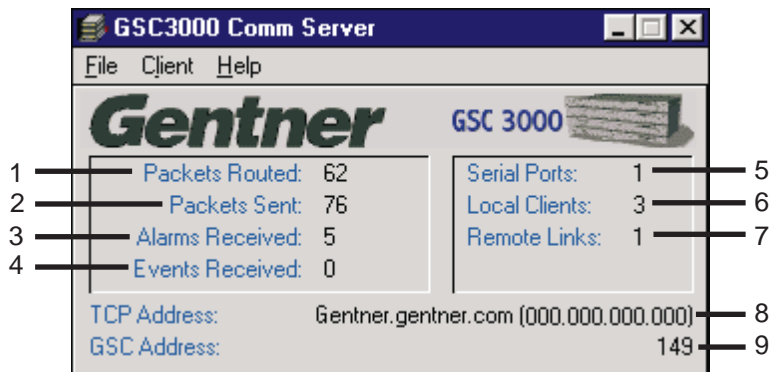
1. Packets Routed. This is the number of protocol packets that have been routed through the Comm Server. This may be from the PC to the I/O unit or vice versa, or it may be packets sent by TCP/IP.

2. Packets Sent. This is the number of protocol packets that have been sent to the Comm Server. This number is frequently higher because the Comm Server is the destination of some packets.

3. Alarms Received. This shows the number of alarms that have been received.

4. Events Received. This parameter is reserved for future release.

5. Serial Ports. This shows the number of serial port connections that have been configured for the Comm Server to use. You may connect using up to nine COM ports simultaneously.

6. Local Clients. This is the number of local clients that are using the Comm Server. Local clients are other GSC3000 programs such as Configuration, Monitor, and History. If two instances of Monitor are running, connected to two different sites, they would be shown as two local clients.

7. Remote Links. This is the number of remote sites the Comm Server is connected through using TCP/IP. You may connect to up to 32 remote sites using TCP/IP proxy.

8. IP Address. This is the IP address of the current workstation. This is the same IP address used by Windows® to identify your PC on a network.

9. GSC Address. This is the random address that the GSC3000 assigns to your PC when you first run Port Wizard. This address allows the GSC3000 site to recognize which PC it is communicating with.

Other Features
The Comm Server also has two other useful tools: the Client Connections Manager and the Communications Log.

Client Connections Manager
This Client Connections Manager allows you to view the details of the local clients that are using the Comm Server. To open the Client Connections Manager, click on the "Client" pull-down menu and choose "Local Clients". The features of the Client Connections Manager will be discussed in the order they are labeled below.
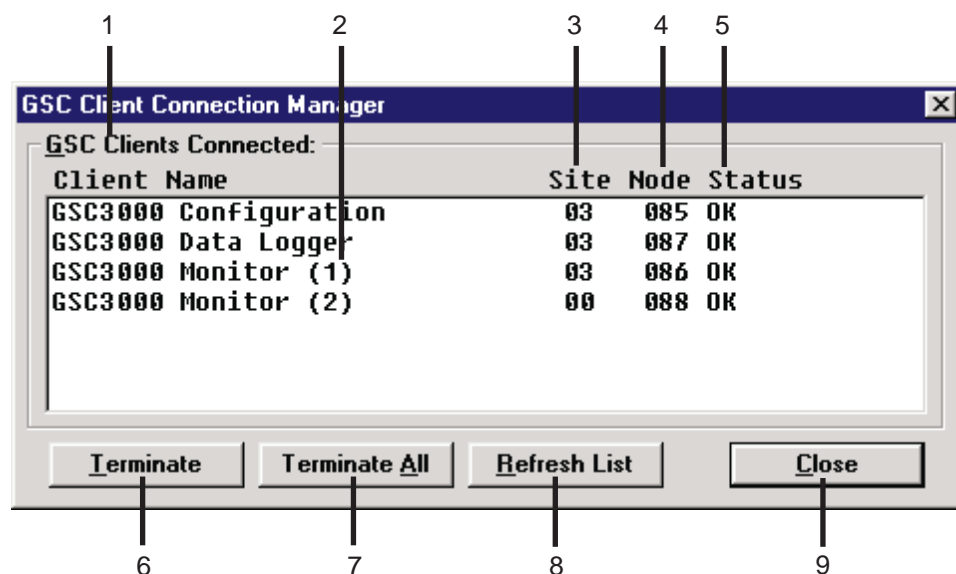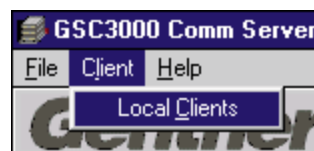
1. GSC Clients Connected. All of the GSC3000 programs that are connected to a site will appear under GSC Clients Connected. If you are running more than one instance of a program (Configuration for example) and are connected to two different sites simultaneously, that program will be listed twice under Clients Connected.

1   2   3   4   5

```
GSC Client Connection Manager                                    [×]
GSC Clients Connected:
Client Name                        Site Node Status
┌──────────────────────────────────────────────────────────────┐
│ GSC3000 Configuration              03   085 OK                 │
│ GSC3000 Data Logger                03   087 OK                 │
│ GSC3000 Monitor (1)                03   086 OK                 │
│ GSC3000 Monitor (2)                00   088 OK                 │
│                                                                │
│                                                                │
└──────────────────────────────────────────────────────────────┘

   [ Terminate ]   [ Terminate All ]   [ Refresh List ]     [ Close ]
```

6   7   8   9
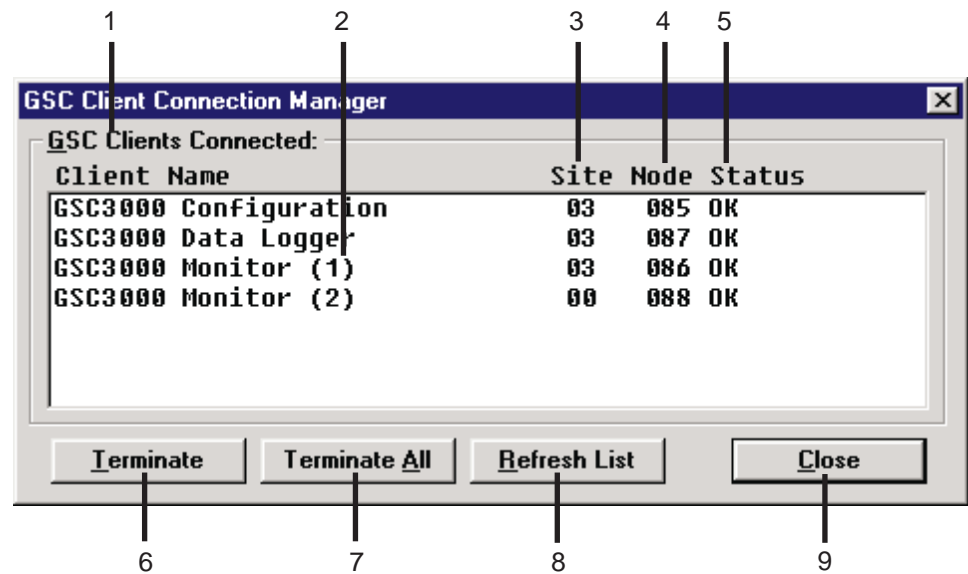
2. Connection Order. If you are connected to more than one site in Monitor, it will show up as multiple clients, listed in the order you connected.

3. Site. The number shown for "Site" is the network number that you assigned to the site. Each site (group of units connected by the G-bus LAN) must have a unique network number (see page 58). The "Site" number allows you to identify which client is connected to which site.

4. Node. This is the number of the communications node that the Comm Server is using to route packets to and from the local clients.

5. Status. This line allows you to see connectivity status of each client program. If your one of the clients stops responding, the status line will indicate which clients are okay and which ones need to be terminated to resume your operations.

6. Terminate. Click on a client line to select it, the click on the "Terminate" button to close an application that is not responding.

7. Terminate All. Click on this button to terminate all of the clients currently connected through the Comm Server.

8. Refresh. Click on this button to refresh the view of the connected local clients.

9. Close. When you are finished click on "Close" to exit the Client Connections Manager.

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Communications Log

The Communications Log records any errors reported by the Comm Server in a temporary log file. Technical support may require you to open this window to provide more information about a communications error you are experiencing. To open this window, click on the "file" pull-down menu and choose "View COMM Log". Click "Clear" to delete the contents of the log, or "Close" to exit the window.

GSC3000 Comm Server

File   Client   Help

View COMM Log

Upgrade to Network Module

Exit

Communications Log

```
[10/13/1998 09:43:05]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:10]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:16]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:22]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:27]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:33]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:38]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:44]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:49]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:43:55]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:44:01]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:44:06]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:44:12]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:44:17]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:44:23]-COM1 Lost DSR, Link Loss.
[10/13/1998 09:44:28]-COM1 Lost DSR, Link Loss.
```

Close   Clear

Clearing I/O Unit Memory

You may decide that the easiest solution to a problem is to simply wipe the I/O unit's memory and start over. You can clear either standard memory only, or standard memory **and** firmware.

Clearing I/O-Unit Standard Memory

To clear the I/O unit's standard memory, remove the I/O unit's lid. Find the JP9 jumper as shown below.

JP9 Jumper

Back of I/O Unit
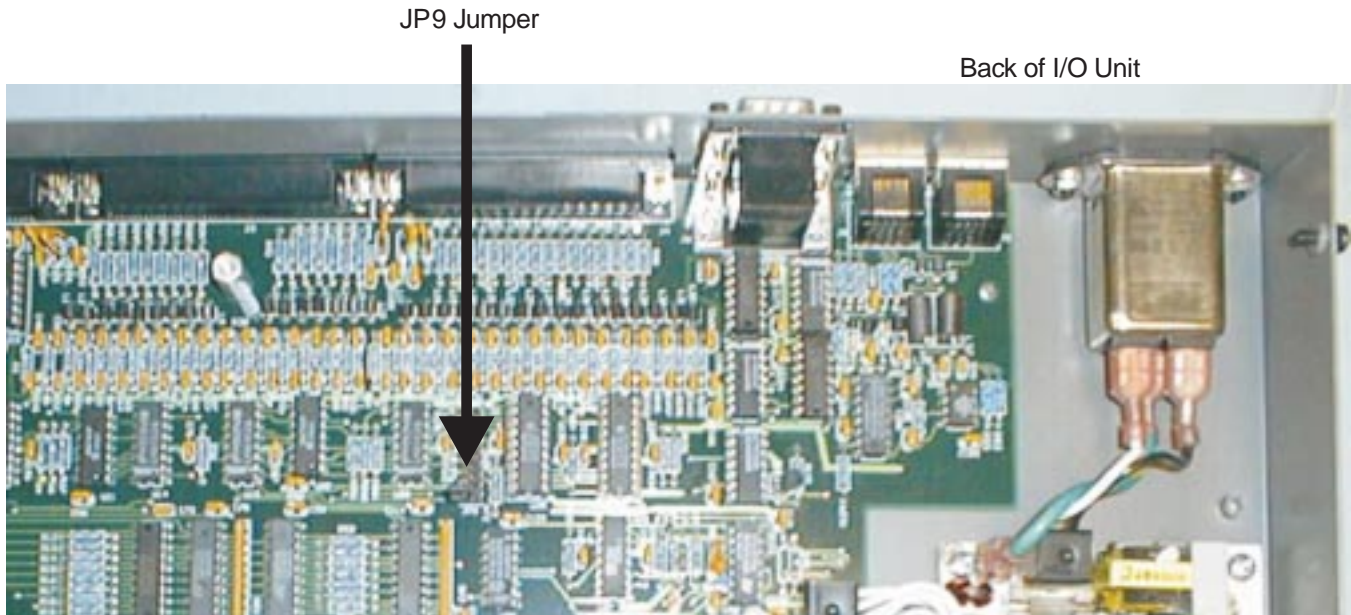
With the I/O unit powered up, engage jumper JP9. This is done by pushing the jumper onto both pins to complete the circuit. This will wipe the I/O unit's standard memory. When you are finished disengage the jumper by removing it and reconnecting it to one pin. When you are finished, you may resume configuring your I/O unit.

JP1-JP8

Jumper
Disengaged

JP9

Engage the
Jumper

Jumper
Engaged

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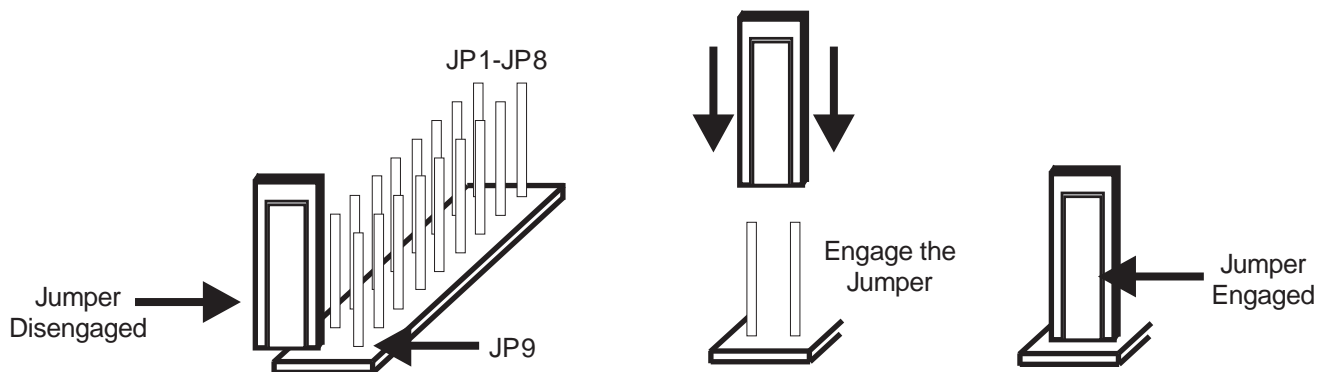
Clearing Standard Memory and Firmware

To clear the I/O unit's standard memory and firmware, power down the I/O unit and remove the lid. Find the JP9 jumper.

Before powering up, engage the JP9 jumper. This is done by pushing the jumper onto both pins to complete the circuit. Then power up the I/O unit. This will wipe the I/O unit's standard memory and firmware. The REMOTE/LOCAL LED will turn off indicating that the firmware has been erased. Power down the I/O unit and disengage the jumper by removing it and reconnecting it to one pin. When powered up again, you will need to reload firmware (see page 30) before you resume configuring your I/O unit.

You must cycle the power as described above or the firmware will not be erased, only standard memory.

If your I/O unit still retains the programming after following the above steps, remove all of the G-bus connections and try again. You can also try leaving the JP9 jumper engaged while reloading firmware.

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Appendix A: Specifications

I/O Unit Specifications

Switches
Front-panel "remote/local," for suspending the generation of command outputs.

System Type
Embedded microprocessor-based design, with battery backed real-time clock.

Memory Type
CMOS Static RAM / Flash EPROM (battery backed)

Dimensions (W/H/D)
19"/48.3cm x 10"/25.4cm x 13/4"/4.45cm

Weight
7 lbs./3.18kg (dry)   12.95 lbs./5.88kg (shipping)

Connectors
COM 1:   DB9; serial communication at 19.2kbps

COM 2:   DB9; serial communication at 19.2kbps

Command 1−8:   DB37; open collector, 30Vdc, 250mA maximum, clamped, momentary or latching, latching duration programmable 0.1−25.5 seconds

*Command 9–16:   DB37; open collector, 30Vdc, 250mA maximum, clamped, momentary or latching, latching duration programmable 0.1–25.5 seconds

**Metering: DB37; input impedance greater than 100kOhms, unbalanced during measurement; >10mOhms, unbalanced, quiescent (nonsampling); 0–10Vdc and -5 to 5Vdc nominal; 2.44mVdc resolution (12-bit resolution over 10V range); input limits not to exceed -16Vdc or 16Vdc; sampling rate four times per second per channel; RFI immunity at 70dB at 1MHz, 140dB at 100MHz, 170dB at 500MHz

**Status: DB37; 16 binary (low/high) channels; input impedance > 24kOhms; input voltage range -30 to 30Vdc continuous; toggle threshold low-to-high with pull-down at 2.5Vdc (CMOS compatible), high-to-low with pull-up at 1.5Vdc (TTL compatible); RFI immunity 70dB at 1MHz, 140dB at 100MHz, 170dB at 500MHz

G-Bus 1:   RS485; 115.2kbps; 110ohm impedance, category-five twisted-pair cable; 1,000-foot limit for all units networked combined

G-Bus 2:   RS485; 115.2kbps; 110ohm impedance, category-five twisted-pair cable; 1,000-foot limit for all units networked combined

Power Requirements
85 to 264 VAC, 47 to 440Hz, at 15W

Accessory Power
5Vdc, fused at 100mA (pin 17, J4: metering)
12Vdc, fused at 100mA (pin 18, J4: metering)
-12Vdc, fused at 100mA (pin 19, J4: metering)
5Vdc, fused at 100mA (pin 17, J3: status)
5Vdc, fused at 100mA (pin 18, J3: status)
5Vdc, fused at 500mA (pin 17, J2: command 1–8)
5Vdc, fused at 500mA (pin 18, J2: command 1–8)
5Vdc, fused at 500mA (pin 17, J1: command 9–16)*
5Vdc, fused at 500mA (pin 18, J1: command 9–16)*

Operating Temperature
0 to 70° C

Storage Temperature
-30 to 70° C

Supplied Cables
AC power cord
G-Bus (RS485) jumper
G-Bus terminator
DB9-to-DB25 modem cable
DB9-to-DB25 null-modem cable

*Not available on I/O 8 units.

**I/O 16 units have 16 channels each of metering, status, and command consisting of one status port (16 channels), one metering port (16 channels), and two command ports (8 channels each). An I/O 8 unit has one metering/status port (8 channels of metering and 8 of status combined in one port) and one command port (8 channels).

All specifications are subject to change without notice.

Wiring Interface Specifications

Dimensions (W/H/D)
19"/48.3cm x 1.75"/4.5cm x 1"/2.5cm

Weight
1.2 lbs/0.55kg (dry)   2 lbs/9kg (shipping)

Connectors
Phoenix™ Block: Push-on terminal block with slotted set-screw
                       connectors

Site Controller I/O: DB37 female

Relay: +, - contacts provided at terminal block for
                       polarized status/metering inputs

All specifications are subject to change without notice.

Command Relay
Unit Specifications

Physical Dimensions
19"/48.3cmW x 1.75"/4.5cmH x 11.25"/28.6cmD

Weight
6 lbs/2.72kg (dry)   8 lbs/3.6kg (shipping)

Connectors

Phoenix™ Block:	Push-on terminal block with slotted set-screw connectors
Site Controller:	DB37 female
Relay:	NO, NC, C contacts provided at terminal block for each relay (total of 16 relays); each relay rated at 5A, 125Vac or 3A, 48Vdc

Power Requirements
5Vdc, 750mA, supplied by GSC3000 I/O unit

Power Supply not included (optional—for use with VRC2000 only)

FCC Part 15
Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference 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/her own expense.

Changes or modifications not expressly approved by Gentner Communications Corporation could void the user's authority to operate the equipment.

Warranty

Warranty

Gentner Communications Corporation (Manufacturer) warrants that this product is free of defects in both materials and workmanship. Should any part of this equipment be defective, the Manufacturer agrees, at its option, to:

A. Repair or replace any defective part free of charge (except transportation charges) for a period of one year from the date of the original purchase, provided the owner returns the equipment to the Manufacturer at the address set forth below. No charge will be made for parts or labor during this period;

B. Furnish replacement for any defective parts in the equipment for a period of one year from the date of original purchase. Replacement parts shall be furnished without charge, except labor and transportation.

This Warranty excludes assembled products not manufactured by the Manufacturer whether or not they are incorporated in a Manufacturer product or sold under a Manufacturer part or model number.

THIS WARRANTY IS VOID IF:

A. The equipment has been damaged by negligence, accident, act of God, or mishandling, or has not been operated in accordance with the procedures described in the operating and technical instructions; or,

B. The equipment has been altered or repaired by other than the Manufacturer or an authorized service representative of the Manufacturer; or,

C. Adaptations or accessories other than those manufactured or provided by the Manufacturer have been made or attached to the equipment which, in the determination of the Manufacturer, shall have affected the performance, safety or reliability of the equipment; or,

D. The equipments original serial number has been modified or removed.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE, APPLIES TO THE EQUIPMENT, nor is any person or company authorized to assume any warranty for the Manufacturer or any other liability in connection with the sale of the Manufacturer's products.

Manufacturer does not assume any responsibility for consequential damages, expenses, or loss of revenue or property, inconvenience, or interruption in operation experienced by the customer due to a malfunction in the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period.

In case of unsatisfactory operation, the purchaser shall promptly notify the Manufacturer at the address set forth below in writing, giving full particulars as to the defects or unsatisfactory operation. Upon receipt of such notice, the Manufacturer will give instructions respecting the shipment of the equipment, or such other matters as it elects to honor this warranty as above provided. This warranty does not cover damage to the equipment during shipping and the Manufacturer assumes no responsibility for such damage. All shipping costs shall be paid by the customer.

This warranty extends only to the original purchaser and is not assignable or transferable.

Gentner Communications Corporation, 1825 Research Way, Salt Lake City, Utah 84119

Appendix B: Pinouts

Connector Pinouts

Command 1–8 Pinout (Both I/O8 and I/O16)

Pin	Description	Pin	Description
1	Command 1A	11	Command 6A
2	Command 1B	12	Command 6B
3	Command 2A	13	Command 7A
4	Command 2B	14	Command 7B
5	Command 3A	15	Command 8A
6	Command 3B	16	Command 8B
7	Command 4A	17-19	Reserved—Accessory Cnx
8	Command 4B	20-35	Command Return
9	Command 5A	36-37	Reserved—Accessory Cnx
10	Command 5B		

Gentner

Command 9–16 Pinout (I/O16)

Pin	Description	Pin	Description
1	Command 9A	11	Command 14A
2	Command 9B	12	Command 14B
3	Command 10A	13	Command 15A
4	Command 10B	14	Command 15B
5	Command 11A	15	Command 16A
6	Command 11B	16	Command 16B
7	Command 12A	17-19	Reserved—Accessory Cnx
8	Command 12B	20-35	Command return
9	Command 13A	36-37	Reserved—Accessory Cnx
10	Command 13B		

Metering/Status Pinout (I/O8)

Pin	Description	Pin	Description
1	Metering 1	11	Status input 3
2	Metering 2	12	Status input 4
3	Metering 3	13	Status input 5
4	Metering 4	14	Status input 6
5	Metering 5	15	Status input 7
6	Metering 6	16	Status input 8
7	Metering 7	17-19	Reserved—Accessory Cnx
8	Metering 8	20-27	Metering return
9	Status input 1	28-35	Status return
10	Status input 2	36-37	Reserved—Accessory Cnx

Metering Pinout (I/O16)

Pin	Description	Pin	Description
1	Metering 1	11	Metering 11
2	Metering 2	12	Metering 12
3	Metering 3	13	Metering 13
4	Metering 4	14	Metering 14
5	Metering 5	15	Metering 15
6	Metering 6	16	Metering 16
7	Metering 7	17-19	Reserved—Accessory Cnx
8	Metering 8	20-35	Metering return
9	Metering 9	36-37	Reserved—Accessory Cnx
10	Metering 10		

Status Pinout (I/O16)

Pin	Description	Pin	Description
1	Status 1	11	Status 11
2	Status 2	12	Status 12
3	Status 3	13	Status 13
4	Status 4	14	Status 14
5	Status 5	15	Status 15
6	Status 6	16	Status 16
7	Status 7	17-19	Reserved—Accessory Cnx
8	Status 8	20-35	Status return
9	Status 9	36-37	Reserved—Accessory Cnx
10	Status 10		

Cable Pinouts

G-Bus Terminator
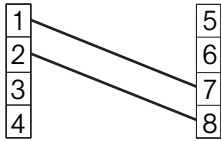
RJ45 Jumper
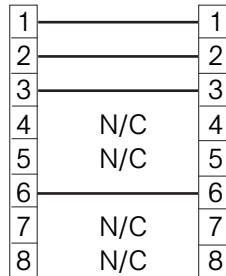
DB9F to DB9F
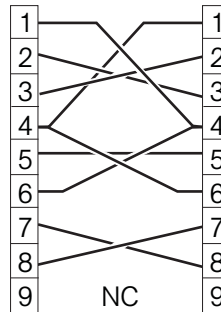
DB9F to DB25M
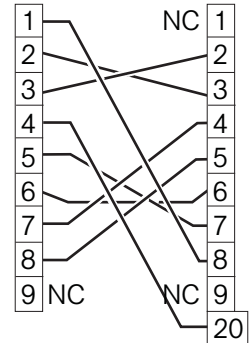
Jumper Settings

Jumper Settings

Jumper	Default (I/O 16)	Default (I/O 8)
JP1	Disengaged	Engaged
JP2	Disengaged	Engaged
JP3	Disengaged	Engaged
JP4	Disengaged	Engaged
JP5	Disengaged	Engaged
JP6	Disengaged	Engaged
JP7	Disengaged	Engaged
JP8	Disengaged	Engaged
*JP9	Disengaged	Disengaged
*Engaging JP9 will clear I/O unit standard memory, or standard memory and firmware (see page 148).		

Appendix C: Schematics

The schematics on the following pages are for an I/O 16 unit. If you have purchased an I/O 8 unit, the schematics show components that are not found in your unit. Please disregard the components that do not apply.

The bill of materials that follows the schematics pages is accurate as of this printing. The information contained herein is subject to change without notice.

If you want full-size schematics or a more current bill of materials, please contact Gentner technical support as noted on the bottom of the page.
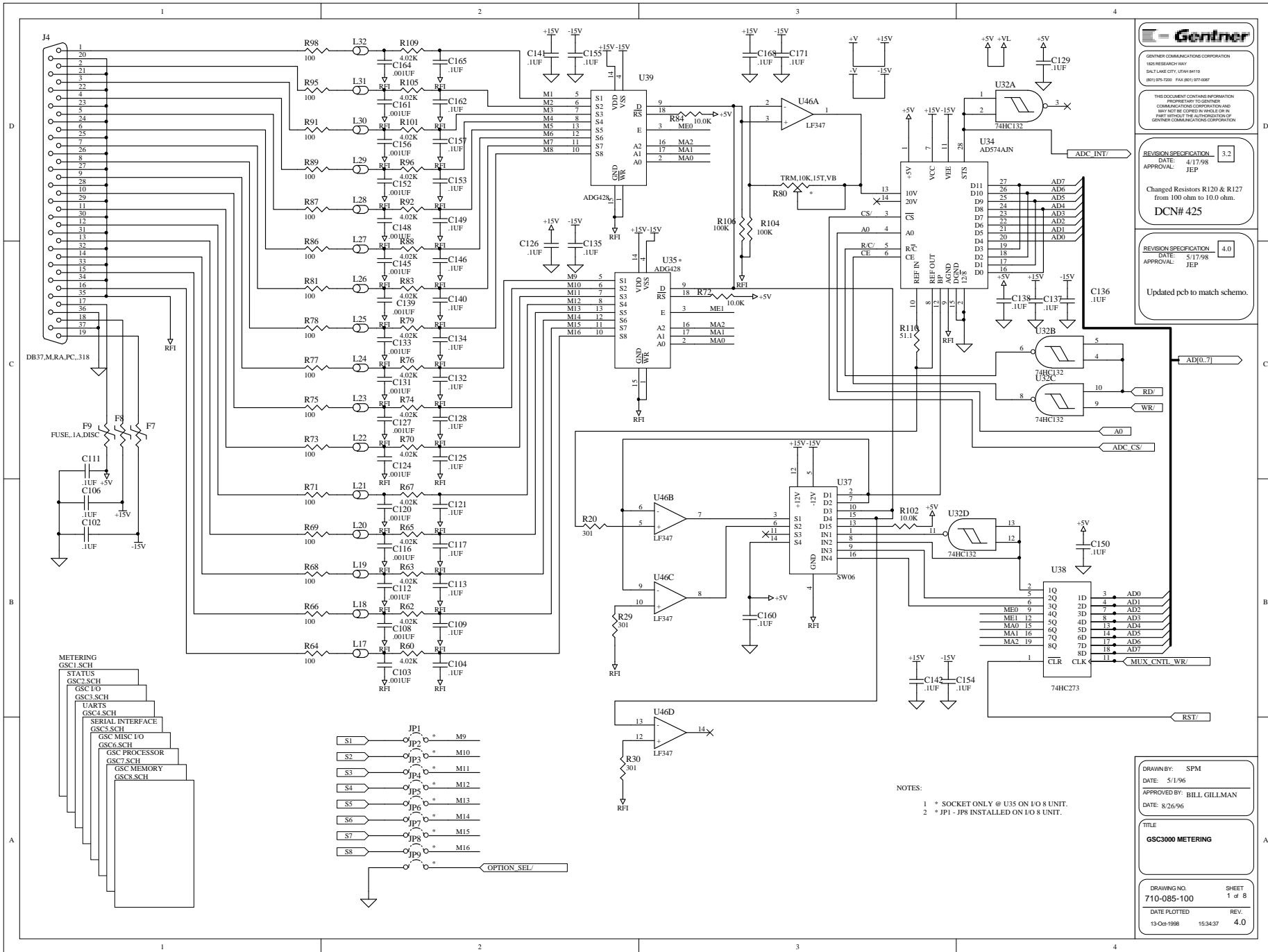
GENTNER COMMUNICATIONS CORPORATION
1825 RESEARCH WAY
SALT LAKE CITY, UTAH 84119
(801) 975-7200   FAX (801) 977-0087

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REVISION SPECIFICATION	3.2
DATE: 4/17/98	
APPROVAL: JEP	

Changed Resistors R120 & R127 from 100 ohm to 10.0 ohm.

DCN# 425

REVISION SPECIFICATION	4.0
DATE: 5/17/98	
APPROVAL: JEP	

Updated pcb to match schemo.

METERING
GSC1.SCH
STATUS
GSC2.SCH
GSC I/O
GSC3.SCH
UARTS
GSC4.SCH
SERIAL INTERFACE
GSC5.SCH
GSC MISC I/O
GSC6.SCH
GSC PROCESSOR
GSC7.SCH
GSC MEMORY
GSC8.SCH

NOTES:
1 * SOCKET ONLY @ U35 ON I/O 8 UNIT.
2 * JP1 - JP8 INSTALLED ON I/O 8 UNIT.

DRAWN BY:	SPM
DATE:	5/1/96
APPROVED BY:	BILL GILLMAN
DATE:	8/26/96

TITLE
GSC3000 METERING

DRAWING NO.	SHEET
710-085-100	1 of 8
DATE PLOTTED	REV.
13-Oct-1998 15:34:37	4.0
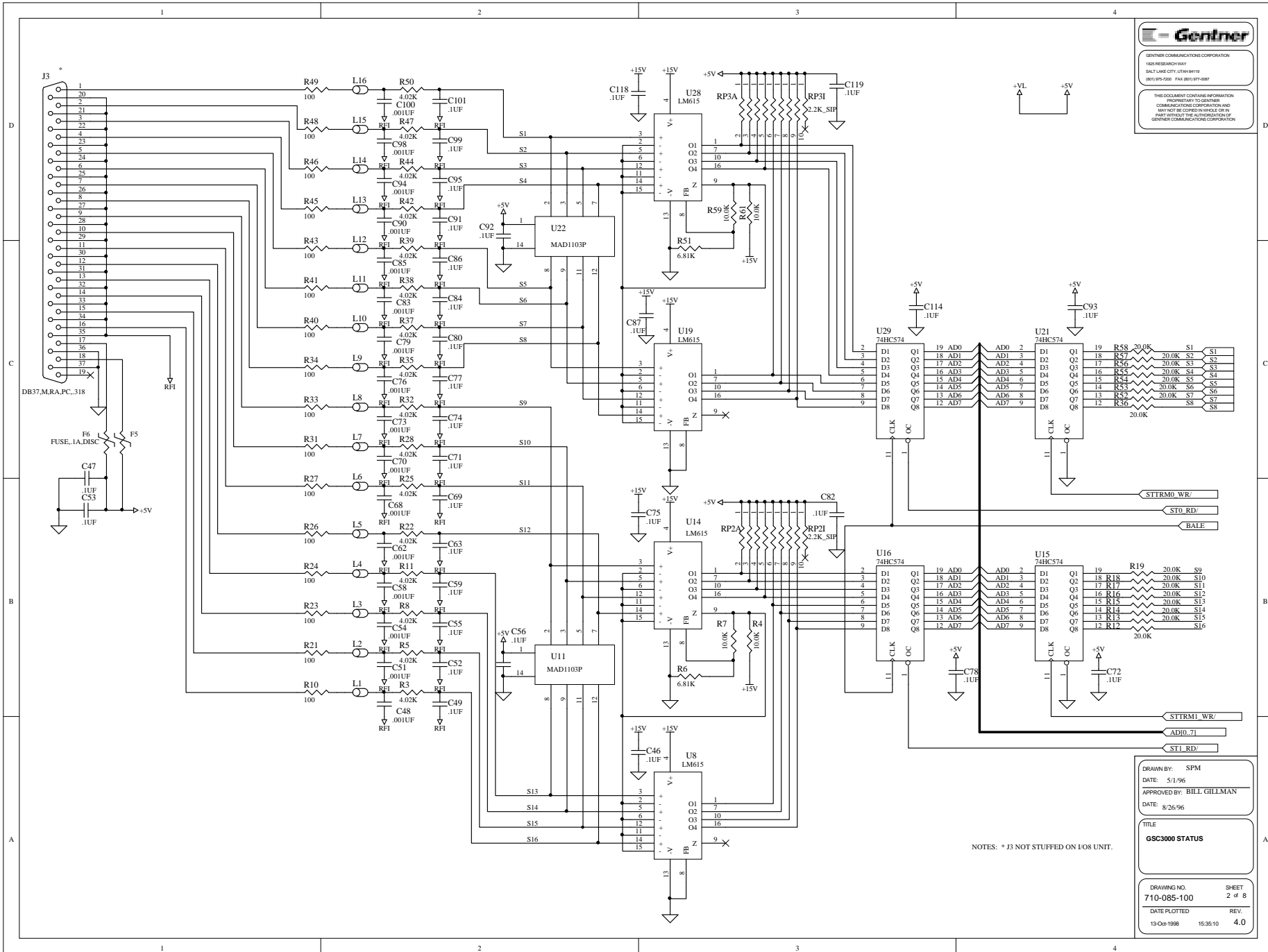
NOTES: * J3 NOT STUFFED ON I/O8 UNIT.

DRAWN BY: SPM
DATE: 5/1/96
APPROVED BY: BILL GILLMAN
DATE: 8/26/96

TITLE
GSC3000 STATUS

DRAWING NO.   710-085-100   SHEET   2 of 8
DATE PLOTTED   REV.
13-Oct-1998   15:35:10   4.0

APPENDIX C: SCHEMATICS · I/O UNIT

COMMAND 1-8

COMMAND 9-16

AD[0..7]

+5V   C3 .1UF   C10 .1UF   C14 .1UF   C20 .1UF

+5V   C26 .1UF   C31 .1UF   C36 .1UF   C43 .1UF

+VL   +5V

U10 — IN0 OUT0, IN1 OUT1, IN2 OUT2, IN3 OUT3, CLR, STRB, OE, GND, VK, VDD — UCN5800A
U7 — UCN5800A
U6 — UCN5800A
U5 — UCN5800A

U4 * — UCN5800A
U3 * — UCN5800A
U2 * — UCN5800A
U1 * — UCN5800A

AD0, AD1, AD2, AD3
AD4, AD5, AD6, AD7

C44 .001UF C42 .001UF C41 .001UF C40 .001UF RFI
C39 .001UF C38 .001UF C37 .001UF C35 .001UF RFI
C34 .001UF C33 .001UF C32 .001UF C30 .001UF RFI
C29 .001UF C28 .001UF C27 .001UF C25 .001UF RFI

C22 .001UF C21 .001UF C19 .001UF C18 .001UF RFI
C17 .001UF C16 .001UF C15 .001UF C13 .001UF RFI
C12 .001UF C11 .001UF C9 .001UF   C8 .001UF   RFI
C7 .001UF   C6 .001UF   C5 .001UF   C4 .001UF   RFI

CMDA1, CMDB1, CMDA2, CMDB2, CMDA3, CMDB3, CMDA4, CMDB4, CMDA5, CMDB5, CMDA6, CMDB6, CMDA7, CMDB7, CMDA8, CMDB8

CMDA9, CMDB9, CMDA10, CMDB10, CMDA11, CMDB11, CMDA12, CMDB12, CMDA13, CMDB13, CMDA14, CMDB14, CMDA15, CMDB15, CMDA16, CMDB16

J2 *
J1 *
DB37,M,RA,PC,.318

F4 F3 FUSE,0.5A,DISC
F2 F1 FUSE,0.5A,DISC

CR2 DIODE,1N4751
CR1 DIODE,1N4751

C24 .1UF   C23 .1UF
C1 .1UF   C2 .1UF
+5V

RST
CMD_OE/
CMD0_WR/
CMD1_WR/
CMD2_WR/
CMD3_WR/

CLAMP VOLTAGE SUPPLIED BY EXTERNAL RELAY BOARDS

NOTES:
*J1 NOT STUFFED ON I/O 8 UNIT.
*SOCKETS @ U1 - U4 EMPTY ON I/O 8 UNIT.

DRAWN BY: SPM
DATE: 5/1/96
APPROVED BY: BILL GILLMAN
DATE: 8/26/96
TITLE
GSC3000 I/O UNIT COMMAND OUTPUTS
DRAWING NO. 710-085-100   SHEET 3 of 8
DATE PLOTTED   REV.
13-Oct-1998   15:35:41   4.0

DCD_U1 — U50A 3 1 — DS14C89
RXD_U1 — U50B 6 4 — DS14C89
TXD_U1 — U43A 2 3 — DS14C88
DTR_U1 — U43C 9 10 8 — DS14C88
DSR_U1 — U50C 8 10 — DS14C89
RTS_U1 — U43B 4 5 6 — DS14C88
CTS_U1 — U50D 11 13 — DS14C89
R1_U1 — U45A 3 1 — DS14C89

"COM 2 /DTE"

J6A
← DCD 1
← DSR 6
← RXD 2
→ RTS 7
→ TXD 3
← CTS 8
→ DTR 4
← R1 9
5
DB9M,DUAL
RFI

U43D 12 13 11 — DS14C88
+15V C172 .1UF C182 .1UF C163 .1UF C174 .1UF −15V

DCD_U2 — U44A 3 1 — DS14C89
RXD_U2 — U44B 6 4 — DS14C89
TXD_U2 — U51A 2 3 — DS14C88
DTR_U2 — U51B 4 5 6 — DS14C88
DSR_U2 — U44C 8 10 — DS14C89
RTS_U2 — U51C 9 10 8 — DS14C88
CTS_U2 — U44D 11 13 — DS14C89
R1_U2 — U45B 6 4 — DS14C89

"COM 1 /DTE"

J6B
← DCD 1A
← DSR 6A
← RXD 2A
→ RTS 7A
→ TXD 3A
← CTS 8A
→ DTR 4A
← R1 9A
5A
DB9M,DUAL
RFI

U51D 12 13 11 — DS14C88

U45D 13 11 — DS14C89

+VL   +5V
+V   +15V
−V   −15V

U50E DS14C89 C173 .1UF U44E C166 .1UF U45E C167 .1UF
DS14C89

RXD_U0
GBUS_RCV_EN/
TXD_U0

U53 MAX485 1 2 3 4 7 6
R82 10.0 L37 6HOLE L39 FERRITE
C143 100PF
R85 10.0 L38 6HOLE L40 FERRITE
C190 100PF
RFI

J9 1 2 3 4 5 6 7 8
G-BUS 1
RJ45
RFI

+5V R125 2.55K
C185 .1UF
U52A CEXT 14 REXT/CEXT 15 A 1 B 2 CLR 3 Q 13 Q̄ 4
74HC123
+5V

C186 .1UF
+5V C183 .1UF
U52B CEXT 6 REXT/CEXT 7 A 9 B 10 CLR 11 Q 5 Q̄ 12
74HC123
+5V R124 2.55K
C189 .1UF

+15V R122 20.0K
U45C 8 10 — DS14C89
L34 COIL,12UH L33 R120 10.0
C187 .1UF C184 .001UF
RFI RFI

J8 1 2 3 4 5 6 7 8
G-BUS 2
RJ45

R115 10.0K Q4 2N3904
L35 COIL,12UH L36 R127 10.0
C188 .001UF +5V R121 1.00K R119 150
R117 1.00K
RFI RFI

GBUS_BSY
SPD_IN
SPD_OUT

DRAWN BY: SPM
DATE: 5/1/96
APPROVED BY: BILL GILLMAN
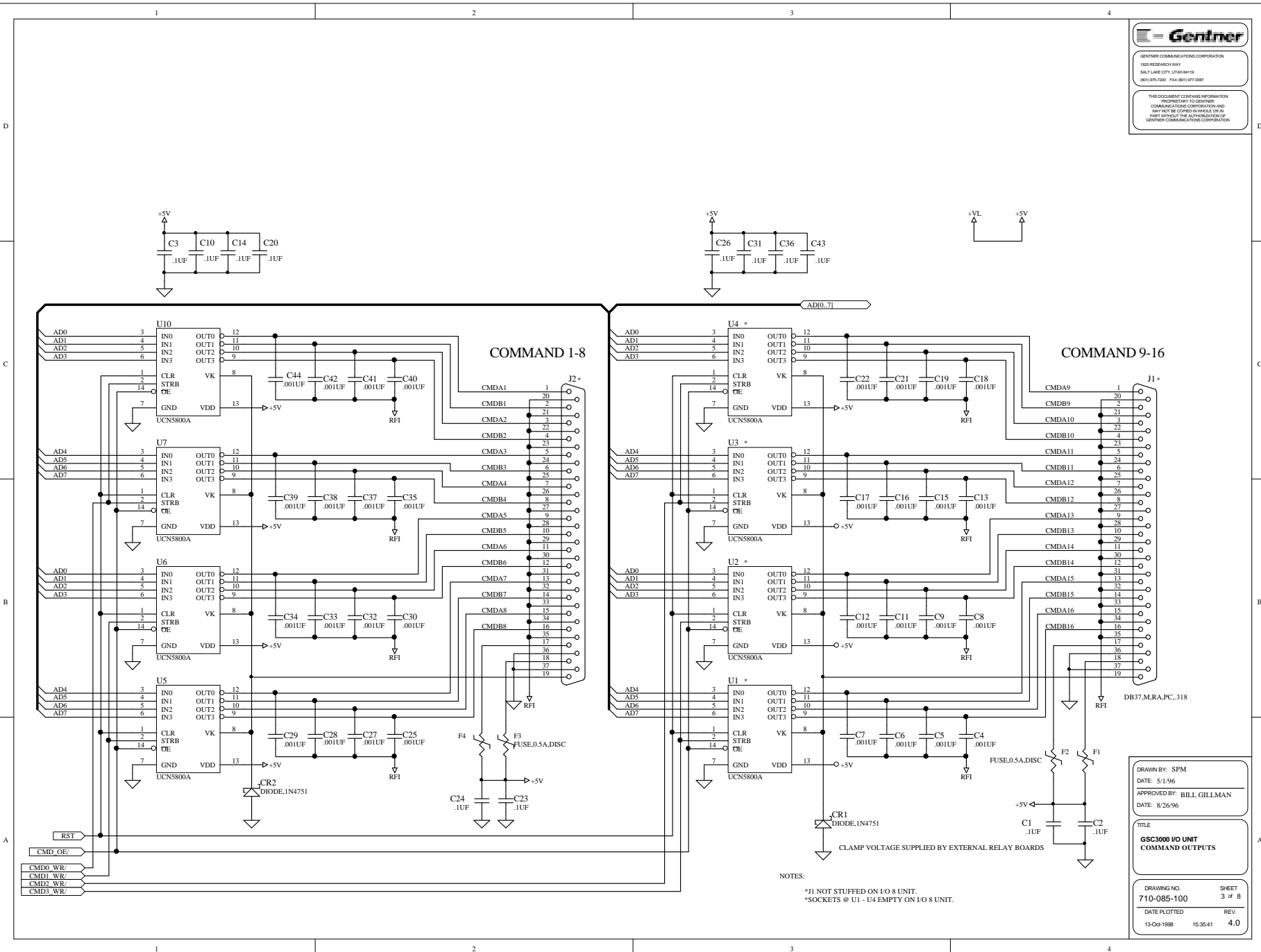DATE: 8/26/96
TITLE
GSC3000 SERIAL
INTERFACE
DRAWING NO. 710-085-100   SHEET 5 of 8
DATE PLOTTED 13-Oct-1998 15:36:35   REV. 4.0

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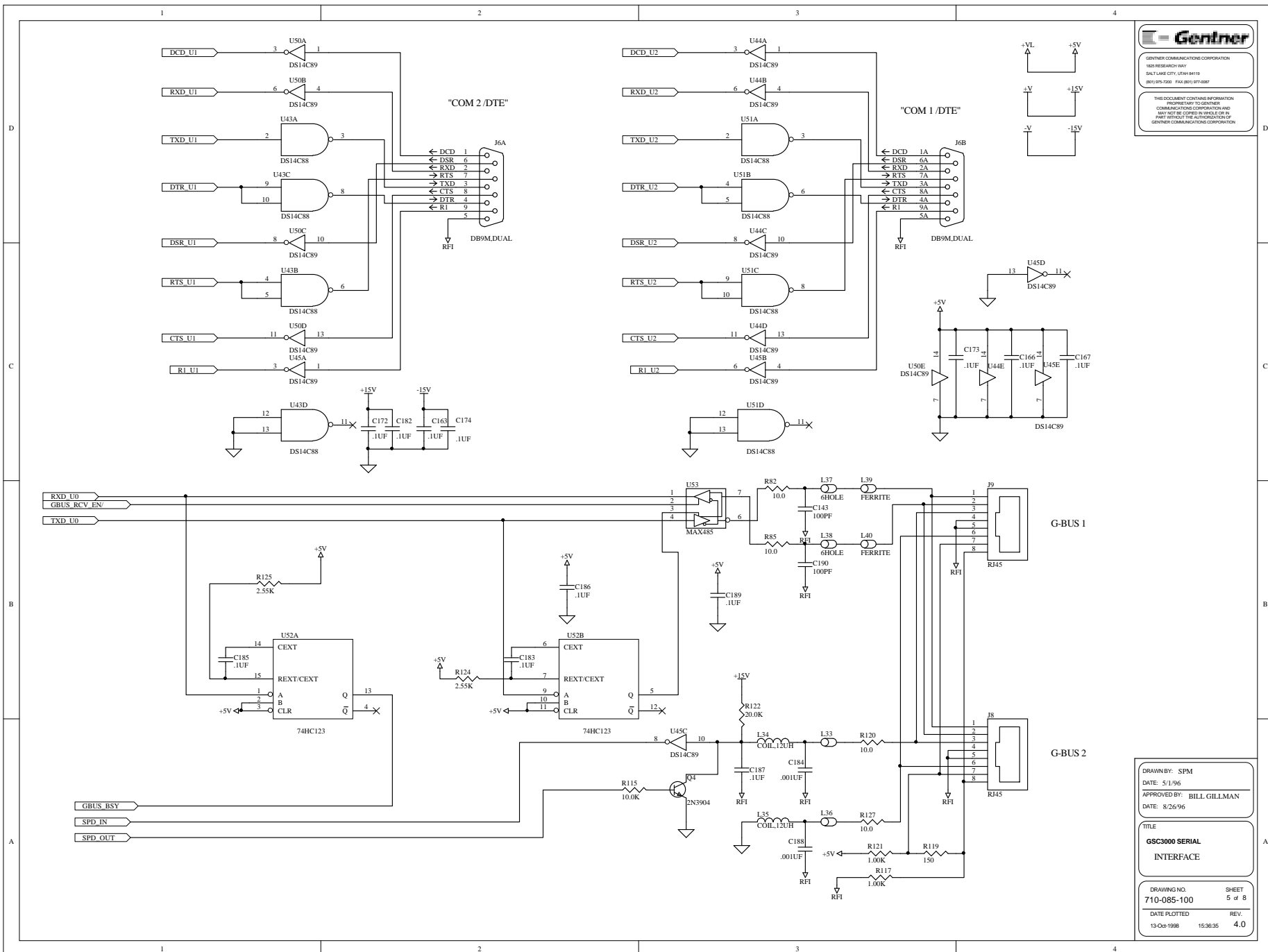SALT LAKE CITY, UTAH 84119
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+VL   +5V

+5V
C130
.1UF
RP4A
10K_SIP   RP4I
10K_SIP

+5V
C123
.1UF

U31
74HC574
INT_U0   2 D1   Q1 19 AD0
RXRDY_U0   3 D2   Q2 18 AD1
TXRDY_U0   4 D3   Q3 17 AD2
INT_U1   5 D4   Q4 16 AD3
RXRDY_U1   6 D5   Q5 15 AD4
TXRDY_U1   7 D6   Q6 14 AD5
SPARE_I1   8 D7   Q7 13 AD6
SPARE_I2   9 D8   Q8 12 AD7
              CLK OC
              11   1

BALE
IO0_RD/

IO0_WR/
RST/

+5V
C151
.1UF
RP5A
10K_SIP   RP5I
10K_SIP

+5V
C144
.1UF

U36
74HC574
INT_U2   2 D1   Q1 19 AD0
RXRDY_U2   3 D2   Q2 18 AD1
TXRDY_U2   4 D3   Q3 17 AD2
GBUS_BSY   5 D4   Q4 16 AD3
SPD_IN   6 D5   Q5 15 AD4
              7 D6   Q6 14 AD5
OPTION_SEL/   8 D7   Q7 13 AD6
SPARE_I4   9 D8   Q8 12 AD7
              CLK OC
              11   1

IO1_RD/

AD[0..7]

+5V
C158
.1UF

+5V
C179
.1UF

U41
74HC273
AD0   3 1D   1Q   2   EXT_WD_STB/
AD1   4 2D   2Q   5   GBUS_RCV_EN/
AD2   7 3D   3Q   6   SPD_OUT
AD3   8 4D   4Q   9
AD4 13 5D   5Q 12 PWR_LED_RED/
AD5 14 6D   6Q 15 CMD_SPD_GRN/
AD6 17 7D   7Q 16 CMD_SPD_RED/
AD7 18 8D   8Q 19 CMD_SPD_CLR/
     11 CLK   CER 1

U49A
74HC132
1
2   3   CMD_OE/

R113
10.0K   Q3
         2N3906

+5V
C159
.1UF
R100
150

R112
10.0K   Q2
         2N3906
R97
150

R111
10.0K   Q1
         2N3906
R94
150

R90
10.0K
R93
150

J5
1
2
3
4
5
6
MAS,M,6,PC,.1

U49C
74HC132
8
9   10

U49D
74HC132
11
12   13

U49B
74HC132
4
5   6

TP,BLACK
TP5 TP4 TP7 TP6

+15V
+5V
-15V

J7
1
2
3
4
5
6
MAS,M,6,PC,.156

C175   C176   C177
.1UF   .1UF   .1UF

C7

GENTNER

EXT_ROM
RST

U9A
74HC132

RTC_INT/
ADC_INT/
INT_U0
INT_U1/
INT_U2
SPARE INT

RP1A
10K_SIP
RP1I
10K_SIP

C45 .1UF
C64 .1UF
C50 .1UF
C60 .1UF
C66 .1UF
C65 .1UF
C96 .1UF
C105 .1UF
C115 .1UF
C97 .1UF
C67 .1UF
C169 .1UF
C57 22PF
C61 22PF

U12
DS87C520-QCL
VCC
BA
RESET
INT0 INT1 INT2 INT3 INT4 INT5
T2 T2EX RXD1 TXD1 RXD0 TXD0 T0 T1
AD0 AD1 AD2 AD3 AD4 AD5 AD6 AD7
A8 A9 A10 A11 A12 A13 A14 A15
RD WR PSEN ALE
GND GND GND X1 X2

Y1 XTAL,24.0M

U23
74HC573
D0 D1 D2 D3 D4 D5 D6 D7
Q0 Q1 Q2 Q3 Q4 Q5 Q6 Q7
LE OC
A0 A1 A2 A3 A4 A5 A6 A7

AD[0..7]
A[0..7]
A[8..15]
ALE

U9B 74HC132
U9D 74HC132
U9C 74HC132
R1 51.1   BALE
R2 1.00K   TP1 PCLOCK TEST PAD

U42 DS1232
PBR TD TOL
/RST RST ST
RST/
EXT_WD_STB/
R128 2.21K

U26 22V10
I1/CLK I2 I3 I4 I5 I6 I7 I8 I9 I10 I11 I12
A0 A1 A2 A3 A4 A5 A6 A7
I/O1 I/O2 I/O3 I/O4 I/O5 I/O6 I/O7 I/O8 I/O9 I/O10
RTC_CS/
UART0_CS/
UART1_CS/
UART2_CS/
ADC_CS/
MUX_CNTL_WR/
ST0_RD/
ST1_RD/
STTRM0_WR/
STTRM1_WR/

U30 22V10
I1/CLK I2 I3 I4 I5 I6 I7 I8 I9 I10 I11 I12
A0 A1 A2 A3 A4 A5 A6 A7
I/O1 I/O2 I/O3 I/O4 I/O5 I/O6 I/O7 I/O8 I/O9 I/O10
CMD0_WR/
CMD1_WR/
CMD2_WR/
CMD3_WR/
IO0_RD/
IO1_RD/
IO0_WR/
IO1_WR/
SPARE_DECODE1
SPARE_DECODE2

U13 22V10
I1/CLK I2 I3 I4 I5 I6 I7 I8 I9 I10 I11 I12
RD/ WR/ PSEN/ IO_DECODE/ FLSH_PGM BANK_S0 BANK_S1 BANK_S2 BANK_S3 FLSH_VFY
I/O1 I/O2 I/O3 I/O4 I/O5 I/O6 I/O7 I/O8 I/O9 I/O10
FLASH_WE/
FLASH_OE/
FLASH_CE/
NVRAM_WE/
NVRAM_OE/
NVRAM_CE/
FLASH_A15
FLASH_A16
FLASH_A17
FLASH_A18
R9 10.0K

U24 74HC30
A8 A9 A10 A11 A12 A13 A14 A15

+VL   +5V

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+VL   +5V
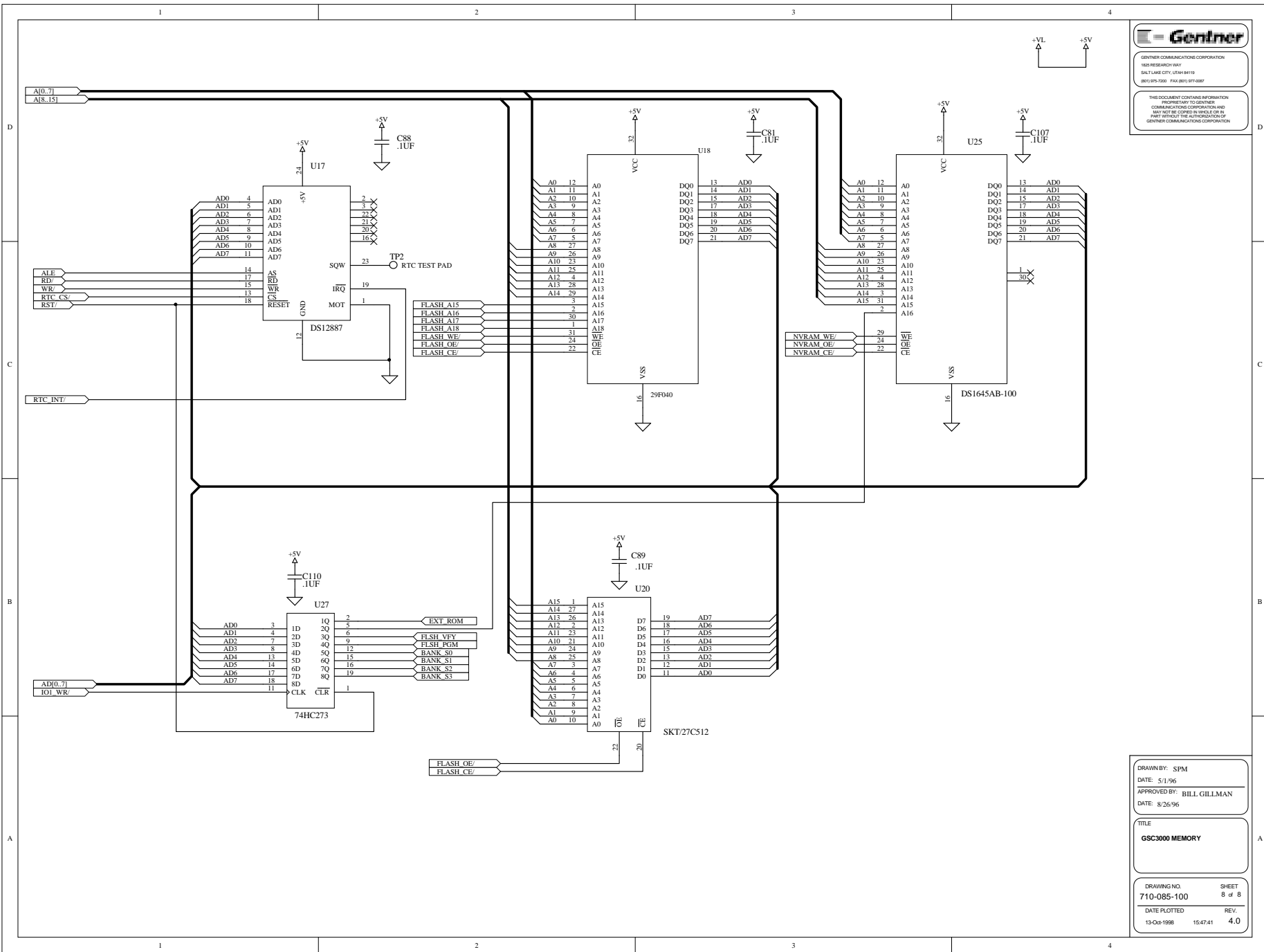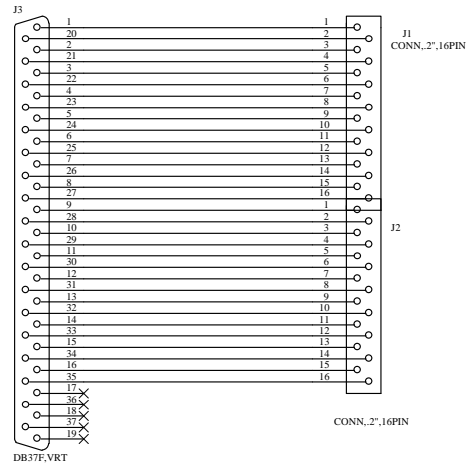
A[0..7]
A[8..15]

+5V   C88 .1UF

U17 DS12887
AD0 4 AD0
AD1 5 AD1
AD2 6 AD2
AD3 7 AD3
AD4 8 AD4
AD5 9 AD5
AD6 10 AD6
AD7 11 AD7
ALE 14 AS
RD/ 17 RD
WR/ 15 WR
RTC_CS/ 13 CS
RST/ 18 RESET
SQW 23 TP2 RTC TEST PAD
IRQ 19
MOT 1
24 +5V
12 GND
RTC_INT/

+5V   C81 .1UF

U18 29F040
A0 12 A0
A1 11 A1
A2 10 A2
A3 9 A3
A4 8 A4
A5 7 A5
A6 6 A6
A7 5 A7
A8 27 A8
A9 26 A9
A10 23 A10
A11 25 A11
A12 4 A12
A13 28 A13
A14 29 A14
FLASH_A15 3 A15
FLASH_A16 2 A16
FLASH_A17 30 A17
FLASH_A18 1 A18
FLASH_WE/ 31 WE
FLASH_OE/ 24 OE
FLASH_CE/ 22 CE
32 VCC
16 VSS
DQ0 13 AD0
DQ1 14 AD1
DQ2 15 AD2
DQ3 17 AD3
DQ4 18 AD4
DQ5 19 AD5
DQ6 20 AD6
DQ7 21 AD7

+5V   C107 .1UF

U25 DS1645AB-100
A0 12 A0
A1 11 A1
A2 10 A2
A3 9 A3
A4 8 A4
A5 7 A5
A6 6 A6
A7 5 A7
A8 27 A8
A9 26 A9
A10 23 A10
A11 25 A11
A12 4 A12
A13 28 A13
A14 29 A14
A15 31 A15
A16 2 A16
NVRAM_WE/ 29 WE
NVRAM_OE/ 24 OE
NVRAM_CE/ 22 CE
32 VCC
16 VSS
DQ0 13 AD0
DQ1 14 AD1
DQ2 15 AD2
DQ3 17 AD3
DQ4 18 AD4
DQ5 19 AD5
DQ6 20 AD6
DQ7 21 AD7
1
30

+5V   C110 .1UF

U27 74HC273
AD0 3 1D   1Q 2 EXT_ROM
AD1 4 2D   2Q 5 FLSH_VFY
AD2 7 3D   3Q 6 FLSH_PGM
AD3 8 4D   4Q 9 BANK_S0
AD4 13 5D   5Q 12 BANK_S1
AD5 14 6D   6Q 15 BANK_S2
AD6 17 7D   7Q 16 BANK_S3
AD7 18 8D   8Q 19
11 CLK   CLR 1

AD[0..7]
IO1_WR/

+5V   C89 .1UF

U20 SKT/27C512
A15 1 A15
A14 27 A14
A13 26 A13
A12 2 A12
A11 23 A11
A10 21 A10
A9 24 A9
A8 25 A8
A7 3 A7
A6 4 A6
A5 5 A5
A4 6 A4
A3 7 A3
A2 8 A2
A1 9 A1
A0 10 A0
OE 22
CE 20
D7 19 AD7
D6 18 AD6
D5 17 AD5
D4 16 AD4
D3 15 AD3
D2 13 AD2
D1 12 AD1
D0 11 AD0

FLASH_OE/
FLASH_CE/

DRAWN BY: SPM
DATE: 5/1/96
APPROVED BY: BILL GILLMAN
DATE: 8/26/96

TITLE
GSC3000 MEMORY

DRAWING NO.   710-085-100   SHEET 8 of 8
DATE PLOTTED   13-Oct-1998   15:47:41   REV. 4.0

C9

REVISION SPECIFICATION   A1
DATE: 8/11/96
APPROVAL: BILL GILLMAN

RELEASED FOR PRODUCTION-
UNDER DOCUMENT CONTROL
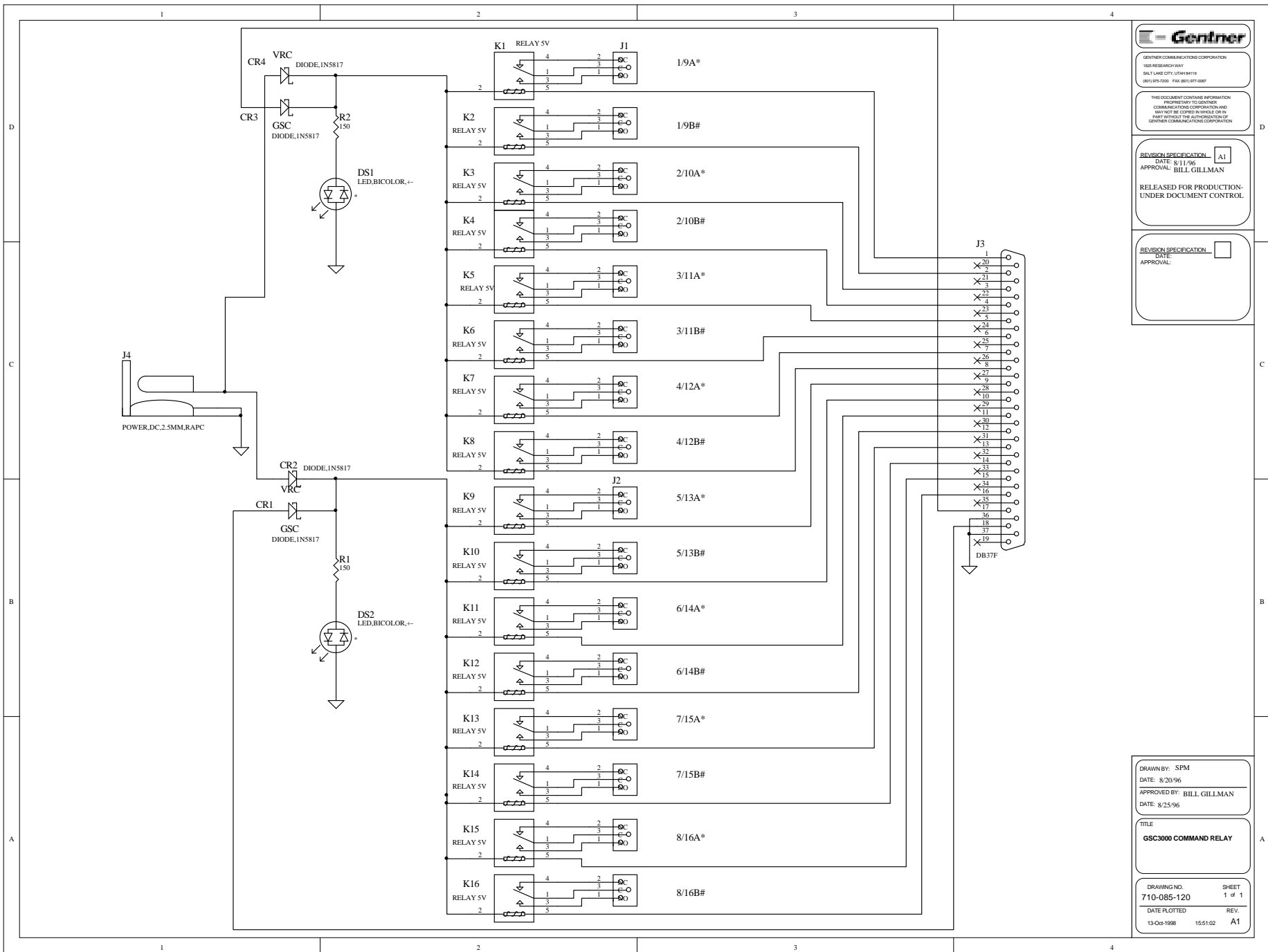
REVISION SPECIFICATION
DATE:
APPROVAL:

J3
DB37F,VRT

J1
CONN,.2",16PIN

J2

CONN,.2",16PIN

DRAWN BY: SPM
DATE: 8/20/96
APPROVED BY: BILL GILLMAN
DATE: 8/26/96

TITLE

GSC3000 WIRING INTERFACE
UNIT

DRAWING NO.   SHEET
710-085-110   1 of 1
DATE PLOTTED   REV.
13-Oct-1998   15:50:29   A1

CR4

VRC
DIODE,1N5817

CR3

GSC
DIODE,1N5817

R2
150

DS1
LED,BICOLOR,+-

J4

POWER,DC,2.5MM,RAPC

CR2   DIODE,1N5817

VRC

CR1

GSC
DIODE,1N5817

R1
150

DS2
LED,BICOLOR,+-

K1   RELAY 5V   J1   1/9A*
K2   RELAY 5V   1/9B#
K3   RELAY 5V   2/10A*
K4   RELAY 5V   2/10B#
K5   RELAY 5V   3/11A*
K6   RELAY 5V   3/11B#
K7   RELAY 5V   4/12A*
K8   RELAY 5V   4/12B#
K9   RELAY 5V   J2   5/13A*
K10 RELAY 5V   5/13B#
K11 RELAY 5V   6/14A*
K12 RELAY 5V   6/14B#
K13 RELAY 5V   7/15A*
K14 RELAY 5V   7/15B#
K15 RELAY 5V   8/16A*
K16 RELAY 5V   8/16B#

J3

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23
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DB37F

Gentner

GENTNER COMMUNICATIONS CORPORATION
1825 RESEARCH WAY
SALT LAKE CITY, UTAH 84119
(801) 975-7200 FAX (801) 977-0087

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REVISION SPECIFICATION
DATE:
APPROVAL:

DRAWN BY: SPM
DATE: 8/20/96
APPROVED BY: BILL GILLMAN
DATE: 8/25/96

TITLE
GSC3000 COMMAND RELAY

DRAWING NO.   SHEET
710-085-120   1 of 1
DATE PLOTTED   REV.
13-Oct-1998   15:51:02   A1

Bill of Materials

GSC3000 I/O 16 (910-085-100)

Item	Item Description
400-241-606	BOX, STANDARD KORRVU SHIPPING, 24X16X6
400-241-617	INSERT, TS612 MAINFRAME DIVIDER, CORR
400-300-009	INSERT, KORRVU SINGLE/DOUBLE RACK UNITS
400-300-011	INSERT, USE W/400-300-009 ACC. DIVIDER
432-000-019	LABEL, BLANK 3X3 1/4"w/pealaway, PKG I.D
850-085-100	UNIT ASSY, GSC3000 I/O 16 **(see below)**
860-085-100	ACC KIT, GSC3000 **(see page C15)**

UNIT ASSY, GSC3000 I/O 16 (850-085-100)

Item	Item Description
401-000-070	BAG, 14" 4MIL CLR PLASTIC TUBING
432-000-015	LABEL, COMPLIANCE FCC PART 15
432-000-018	LABEL, BLANK 1.75 X 2.5, PRODUCT I.D
432-110-004	LABEL, CAUT ELECT SHOCK ADH BK
460-110-001	PWR SUPPLY, SWITCHING UNIV +&-15 40W 5V
681-010-506	SCREW, #6-32 X 3/8 PPH BLK W/INTTH WASH
681-010-604	SCREW, 6-32 X 1/4" PPH
682-010-060	NUT, 6-32 X 1/4
683-046-403	SPACER, KIT M/F 4-40 X 3/16 W/HARDWARE
681-210-606	SCREW, 6-32 X 3/8" PPH BLK
684-050-060	WASHER, #6 INTERN TOOTH
685-410-604	SCREW, 6-32 X 1/4" BUTTON HEX
699-360-001	MOD, PWR ENTRY RECEPT W/EMI FILT 3 AMPS
740-009-003	COVER, DH
740-085-100	CHASSIS, GSC3000 I/O 16
740-085-102	PANEL, FRONT GSC3000 I/O 16
820-085-100	PCB ASSY, MAIN I/O 16, GSC3000 **(see pages C13-C14)**
820-085-101	PCB ASSY, DISPLAY, GSC3000 **(see page C15)**
830-069-002	MASC6P/MASC6P 22AWG 5"
830-085-108	CABLE ASSY, MASC6P/MASC6P W/DIODES 8"
830-110-012	CABLE ASSY, CRIMP LUG/FASTON F -4" GRND
830-110-013	CABLE ASSY, FASTON F/MASC 3P -3"

= Gentner

PCB ASSY, MAIN I/O 16, GSC3000 (820-085-100)

Item	Item Description	Item Location(s)
430-000-004	LABEL, BLANK ROLL 1 X 1-1/4	
500-004-751	DIODE, IN4751A ZENER 30V	CR1, CR2
504-001-103	DIODE, MAD1103P ARRAY DIP	U11, U22
510-010-100	RES, 10.0 OHM 1/4 W 1%	R82, R85, R120, R127
510-010-511	RES, 51.1 OHM 1/4 W 1%	R1, R110, R116
510-011-100	RES, 100 OHM 1/4 W 1%	R10, R21, R23, R24, R26, R27, R31, R33, R34, R40, R41, R43, R45, R46, R48, R49, R64, R66, R68, R69, R71, R73, R75, R77, R78, R81, R86, R87, R89, R91, R95, R98
510-011-150	RES, 150 OHM 1/4 W 1%	R93, R94, R97, R100, R119
510-011-301	RES, 301 OHM 1/4 W 1%	R20, R29, R30
510-012-100	RES, 1.00 KOHM 1/4 W 1%	R2, R114, R117, R121
510-012-221	RES, 2.21 KOHM 1/4 W 1%	R128
510-012-255	RES, 2.55 KOHM 1/4 W 1%	R124, R125
510-012-402	RES, 4.02 KOHM 1/4 W 1%	R3, R5, R8, R11, R22, R25, R28, R32, R35 R37, R38, R39, R42, R44, R47, R50, R60 R62, R63, R65, R67, R70, R74, R76, R79, R83, R88, R92, R96, R101, R105, R109
510-012-681	RES, 6.81 KOHM 1/4 W 1%	R6, R51
510-013-100	RES, 10.0 KOHM 1/4 W 1%	R4, R7, R9, R59, R61, R72 R84, R90, R102, R111, R112, R113, R115
510-013-200	RES, 20.0 KOHM 1/4 W 1%	R12, R13, R14, R15, R16, R17, R18, R19, R36, R52, R53, R54, R55, R56, R57, R58, R122
510-014-100	RES, 100 KOHM 1/4 W 1%	R104, R106
510-015-100	RES, 1.00 MOHM 1/4 W 1%	R118
518-008-104	RES, SIP 10 KOHM 6 PIN 5 RES BUSSED	RP6
518-010-103	RES, SIP 10 KOHM 10 PIN	RP1, RP4, RP5
518-010-222	RES, SIP 2.2 KOHM 10 PIN	RP2, RP3
523-515-103	RES, POT 10 KOHM 15 TURN VERT	R80
533-200-030	IC, DIG 74HC30N 8-INPUT NAND	U24
533-200-123	IC, DIG 74HC123A DUAL RETRIG MONOST MULT	U52
533-200-132	IC, DIG 74HC132 QUAD SCHMITT NAND GT	U9, U32, U48, U49
533-200-573	IC, DIG 74HC573 OCTAL TRISTATE TYPE	U23
533-200-574	IC, DIG 74HC574 OCT EDGE TRIG FLIP FLOP	U15, U16, U21, U29, U31, U36
533-202-273	IC, DIG 74HC273N OCTAL D FLIP FLOP W/CLR	U27, U38, U41
533-214-488	IC, DIG DS14C88N QUAD CMOS LINE DRIVER	U43, U51
533-214-489	IC, DIG DS14C89AN QUAD CMOS RCVR	U44, U45, U50
534-016-450	IC, DIG DS1245Y/AB 70-100 NS 1024K	U25
534-101-550S	IC, DIG TL16C550AFN CMOS UART W/FIFO SMT	U33, U40, U47
534-146-887	IC, DIG DS12887 REAL TIME CLOCK	U17
535-000-428	IC, ANA ADG428BN 8 CHAN MUX	U35, U39
535-000-574	IC, MIX AD574A 12-BIT A/D CONVERTER	U34
535-300-006	IC, ANA SW06GP QUAD ANA SWITCH	U37
537-127-140S	IC, DIG 29F040 4M BIT FLASH PROM 120NS	U18
540-001-232	IC, DIG DS1232 WATCHDG TIMER	U42
540-002-485	IC, DIG MAX485CPA RS485 TRANS	U53
540-005-800	IC, DIG UCN5800A OC LATCH/DRIVER	U1, U2, U3, U4, U5, U6, U7, U10
540-300-347	IC, ANA LF-347N QUAD BI-FET OP AMP	U46
540-300-615	IC, ANA LM615IN QUAD COMPARATOR W/REF	U8, U14, U19, U28
553-012-001	COIL, 12 UH AXIAL MT	L34, L35
558-043-511	FERRITE BEAD, 6 HOLE	L37, L38
558-064-101	FERRITE BEAD, 1 HOLE	L39, L40

PCB ASSY, MAIN I/O 16, GSC3000 (820-085-100)

Item	Item Description	Item Location(s)
558-073-101	FERRITE BEAD, WIRE MT	L1, L2, L3, L4, L5, L6, L7, L8, L9, L10 L11, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L32, L33, L36
561-103-904	TRANS, 2N3904	Q4
561-103-906	TRANS, 2N3906 PNP	Q1, Q2, Q3
570-450-014	SOCKET, IC 14 PIN .300 SPC MACH GLD	U1, U2, U3, U4, U5, U6, U7, U10
570-450-018	SOCKET, IC 18 PIN .300 SPC MACH GLD	U35, U39
570-450-028	SOCKET, IC 28 PIN .600 SPC MACH GLD	U20
570-451-032	SOCKET, IC 32 PIN .600 SPC MACH GLD	U25
570-452-024	SOCKET, IC 24 PIN .300 SPC MACH GOLD	U13, U26, U30
571-500-032	SOCKET, IC 32 PIN PLCC	U18
571-500-044	SOCKET, IC 44 PIN PLCC	U12, U33, U40, U47
583-180-240	CRYSTAL, 24.00 MHZ 18PF U49C	Y1
583-180-369	CRYSTAL, 3.6864 MHZ 20PF HC-49 C	Y2
603-050-024	CAP, 100 PF 50V MONO-CER NPO RAD .1	C143, C190
603-050-112	CAP, 0.1UF 50V MONO-CER NPO RAD .1	C1, C2, C3, C10, C14, C20, C23, C24, C26 C31, C36, C43, C45, C46, C47, C49, C50, C52, C53, C55, C56, C59, C60, C63, C64, C65, C66, C67, C69, C71, C72, C74, C75, C77, C78, C80, C81, C82, C84, C86, C87, C88, C89, C91, C92, C93, C95, C96, C97, C99, C101, C102, C104, C105, C106, C107, C109, C110, C111, C113, C114, C115, C117, C118, C119, C121, C122, C123, C125, C126, C128, C129, C130, C132, C134, C135, C136, C137, C138, C140, C141, C142, C144, C146, C147, C149, C150, C151, C153, C154, C155, C157, C158, C159, C160, C162, C163, C165, C166, C167, C168, C169, C170, C171, C172, C173, C174, C175, C176, C177, C178, C179, C182, C183, C185, C186, C187, C189
612-100-010	CAP, 22 PF 100V CERAMIC NPO RAD .1	C57, C61, C180, C181
612-100-064	CAP, 1000 PF CERAMIC NPO RAD .1	C4, C5, C6, C7, C8, C9, C11, C12, C13, C15, C16, C17, C18, C19, C21, C22, C25, C27, C28, C29, C30, C32, C33, C34, C35, C37, C38, C39, C40, C41, C42, C44, C48, C51, C54, C58, C62, C68, C70, C73, C76, C79, C83, C85, C90, C94, C98, C100, C103, C108, C112, C116, C120, C124, C127, C131, C133, C139, C145, C148, C152, C156, C161, C164, C184, C188
640-200-010	FUSE, 0.5 AMP RESETTABLE PCB MT	F1, F2, F3, F4
640-200-051	FUSE, 0.1 AMP RESETTABLE PCB MT	F5, F6, F7, F8, F9
671-211-037	CONN, DB37 M R/A .318 FOOTPRINT	J1, J2, J3, J4
671-211-109	CONN, DB9M DUAL R/A PCB	J6
673-002-006	CONN, HEADER POST 6P MASC .10C SPFL	J5
673-012-006	CONN, HEADER POST 6P MASC .15C SPFL	J7
676-100-008	CONN, TELE RJ45 8P R/A PCB w/SHIELD	J8, J9
678-101-000	PIN, BLACK TEST	TP7
678-224-018	PIN, STRIP DUAL 2X9=18PIN .24 TALL	JP1 TO JP9
678-250-002	JUMPER, BLOCK F 2P W/HANDLE	JP9 OFFSET PLACEMENT.
720-085-100	PCB, GSC3000	
807-085-100	FIRMWARE, U13, GSC3000	
807-085-101	FIRMWARE, U26, GSC3000	
807-085-102	FIRMWARE, U30, GSC3000	
807-085-104	FIRMWARE, U12, GSC3000 I/O 16	

PCB ASSY, DISPLAY, GSC3000 (820-085-101)

Item	Item Description
430-000-004	LABEL, BLANK ROLL 1 X 1-1/4
507-012-001	LED, RED/GRN RECTANGULAR 2X5 MM
622-010-001	SWITCH, MOMENT LO PRO W/O LED
622-011-001	LENS, KEY CAP .5 SQ LIGHT GRY
673-002-006	CONN, HEADER POST 6P MASC .10C SPFL
720-085-101	PCB, DISPLAY, GSC3000

ACC KIT, GSC3000 (860-085-100)

Item	Item Description
401-000-050	BAG, 6" 4MIL CLR PLASTIC TUBING
401-000-060	BAG, 12" 4MIL CLR PLASTIC TUBING
671-000-037	HOOD, DB37
671-020-037	CONN, DB37 F CABLE MT
681-400-002	SCREW, 10-32 X 5/8" BLK POH, DECORATIVE
684-400-001	WASHER, RACK CUP DECORATIVE
699-150-006	PWR CORD, MOLDED 8' BLK 3 COND
800-085-100	MANUAL, GSC3000 I/O
806-085-100	SOFTWARE, GSC3000 I/O 8 & I/O 16
830-085-100	CABLE ASSY, RJ45 TERM. GRAY COLOR
830-085-101	CABLE ASSY, DB9F/DB9F 4FT
830-085-102	CABLE ASSY, DB9F/DB25M MODEM 3.0FT.
830-085-104	CABLE ASSY, RJ45M/RJ45M 10"

PCB ASSY, COMMAND RELAY (820-085-120)

Item	Item Description	Item Location(s)
500-005-817	DIODE, 1N5817 SCHOTTKY BARRIER 20V	CR1, CR2, CR3, CR4
510-011-150	RES, 150 OHM 1/4 W 1%	R1, R2
556-503-050	RELAY, DPDT 5V MINIATURE PC MT	K1, K2, K3, K4, K5, K6, K7, K8, K9, K10 K11, K12, K13, K14, K15, K16
720-085-120	PCB, COMMAND RELAY	
432-500-010	LABEL, BLANK 1 X.5 WHT.	
507-010-021	LED, BI-COLOR T-1 .75	DS1, DS2
662-802-005	JACK, POWER 2.55MM R/A	J18
671-216-037	CONN, DB37 F R/A .318 FOOTPRINT	J17
673-016-224	CONN, HEADER EURO24P R/A .200 SP PC MT	J1, J2

Appendix D: Voice Interface

If you have purchased a Voice Interface Unit, you should have received the **Voice Interface Manual Insert** as part of your shipment. Please insert this addition to your manual here.

If you did not receive the manual insert, please contact **Gentner Technical Support:**

Telephone: 1.800.283.5936 (USA)   **or** 1.801.974.3760
Fax: 1.800.933.5107 (USA)   **or** 1.801.977.0087
Internet: www.gentner.com   **e-mail:** tech@gentner.com

Gentner Communications Corporation
1825 Research Way, Salt Lake City, UT 84119

Gentner

Appendix E: Network Module

The Network Module is an upgrade to your GSC3000 software that is purchased separately. If you are not interested in the Network Module upgrade you may disregard the information found in Appendix E. If you want to purchase the Network Module, the following pages contain instructions on how to perform the upgrade and then how to configure your GSC3000 software to use the added features.

The Network Module allows a computer to share information from a GSC3000 site with other computers on the same LAN/WAN (any other computer connected to the same network).   In order to share information, the Network Module must be running on a computer that is directly connected to the GSC3000 hardware (direct serial, 4-wire modem, or 2-wire leased-line connection). The Network Module acts as a TCP/IP bridge which enables access to the GSC3000 hardware from anywhere that your LAN/WAN is accessible.

It is not required to purchase the Network Module for all users. Any authorized PC using GSC3000 software version 1.9 will have the capability to communicate with your site via TCP/IP. You will only have to purchase the Network Module upgrade if you want your computer to share information with other users.

Network Module also incorporates several security features. It is impossible for anyone to access your GSC3000 site without having access to your LAN/WAN and the correct IP address or machine name for the connected PC. You may also create a list of allowed client IP addresses which allows only certain users to communicate through the Network Module. Anyone who is not designated on the list will be unable to gain access. In addition, all regular user and system passwords will required by the GSC3000 itself.

How to Upgrade to
Network Module

GSC3000
Comm Server

To upgrade to the Network Module, you must first be running GSC3000 software version 1.9. If you have not installed this software, see page 20 for installation instructions. The upgrade is performed through the GSC3000 Comm Server. You can run the Comm Server by double-clicking on the Comm Server icon in the GSC program group, or you can run it from the START menu under PROGRAMS > GSC3000 APPLI-CATIONS > GSC3000 Comm Server.

GSC3000 Comm Server
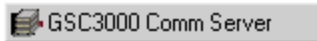
When Comm Server is first run, it will be minimized and appear as a button on the Windows® 95 taskbar. Click on this button to maximize Comm Server. To upgrade, click on the "File" pull-down menu and choose "Upgrade to Network Module".

GSC3000 Comm Server	_ □ X
File Client Help	
View COMM Log	GSC 3000
Upgrade to Network Module	Serial Ports: 1
Exit	Local Clients: 0
Alarms Received: 0	Remote Links: 0
Events Received: 0	
TCP Address: Gentner.gentner.com (000.000.000.000)	
GSC Address: 149	
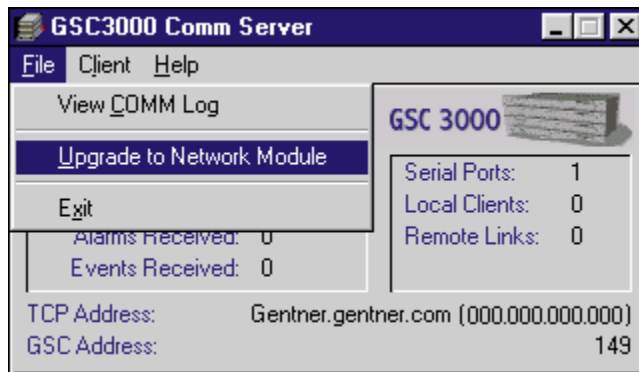
A new window will open that requires you to enter an activation code. Call Gentner Communications Corporation at **1.800.945.7730** or **1.801.975.7200** and purchase the Network Module upgrade. You will also be required to provide the IP address for the PC that will be running the Network Module. This "Host IP Address" appears in the Upgrade window as well as on the lower right-hand corner of the Comm Server main window. Gentner will provide you with an activation code.

Upgrade to Network Module   X

**Obtain an activation code from Gentner. This will
allow you to use Network Module functionality.**

You will need to supply your Host IP Address.

Host IP Address:	000.000.000.000
Activation Code:	

OK   Cancel

Gentner
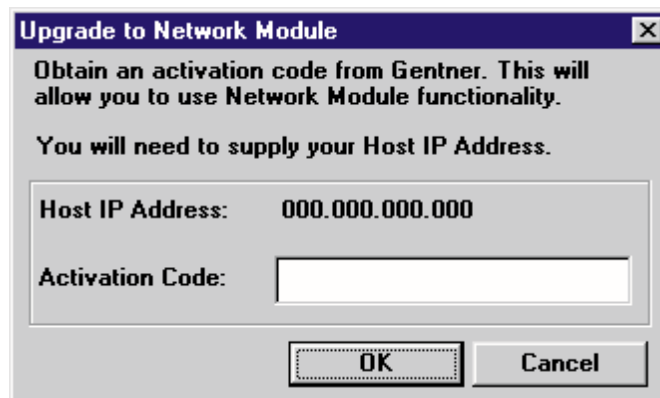
When this code is entered successfully, the capabilities of the Network Module are unlocked automatically. The activation code will work with only the PC you have purchased it for; it will not work on a machine with any other IP address. After you have entered the activation code, click OK to upgrade, or CANCEL to exit without upgrading. The title bar of the Comm Server should now be labeled "Network Module".
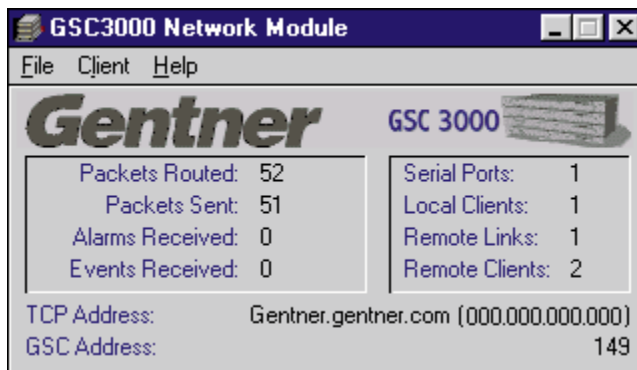
Network Module Security

The GSC3000 site will always request a user password when connection is attempted; it doesn't matter if the user is connecting through direct serial, modem, phone (with a Voice Interface unit), or TCP/IP. No access is permitted without a correct user password.

The Network Module also has the capability to filter the IP addresses that it will permit to communicate with your GSC3000 site through your LAN/WAN. First, the remote PC must have the IP address of the host computer that is running the Network Module (see Remote Site Setup, page E7). In addition, the Network Module includes a feature which allows you to create a list of the IP addresses you want to be able to access your GSC3000 site.

The list of "Allowed IP Addresses" is accessed through the GSC3000 Port Wizard. You can run this program by double-clicking on the Port Wizard icon in the GSC program group, or you can run it from the START menu under PROGRAMS > GSC3000 APPLICATIONS > GSC3000 Port Wizard.

GSC3000 Port Wizard

If you have successfully upgraded to Network Module, a button labeled "Network Module: Allowed Client Addresses" will be visible near the top of the Port Wizard main window. Click on this button.

Click Here to List Allowed IP Addresses
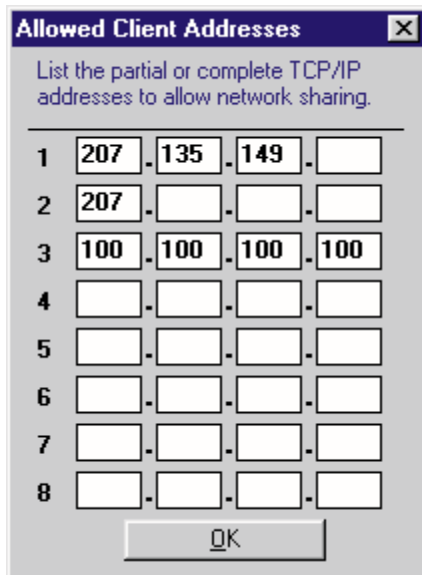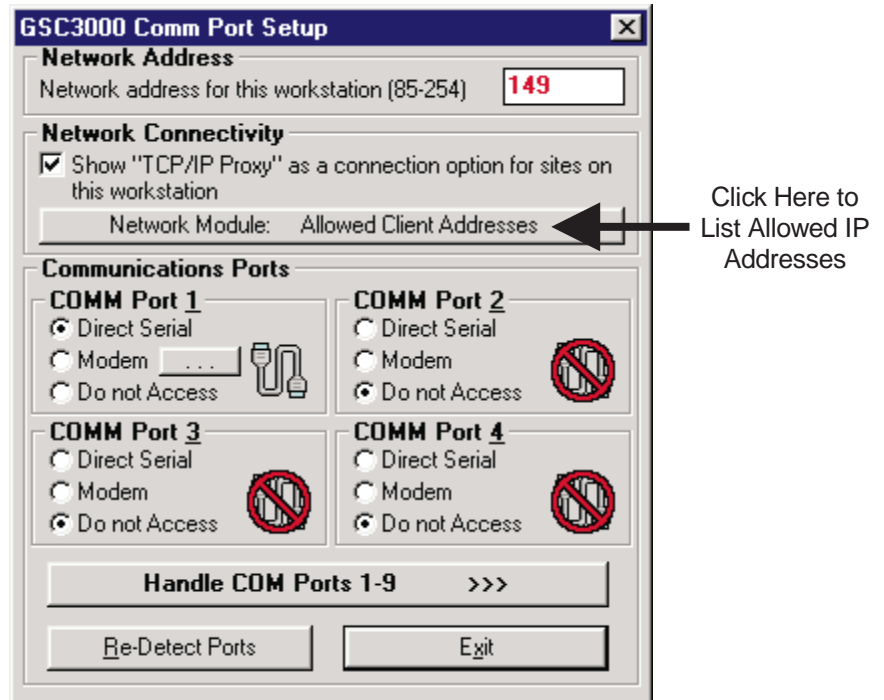
A window will open that allows you to create your list of allowed IP addresses. You may create a complete or partial IP mask by entering the numbers in any of the following ways.

If you enter only a partial IP address anyone on that sub-network will be permitted to communicate with your GSC3000 site. For example. If you entered only "207" in the first field of the IP address. Anyone with an IP address beginning with the numbers "207" would be allowed. If you entered "207.135.149" in the first three fields, anyone with an IP address containing those numbers in the first three fields would be allowed.

If you enter a complete IP address, only that exact address is permitted to communicate with your GSC3000 site.

If you leave the list blank, anyone who has access to your LAN/WAN will be able to attempt communication with your GSC3000 site. No IP filtering will occur.

Site Setup

Shared Site Setup

A shared site is configured in much the same manner as a regular directly connected site. Site Setup is managed in the GSC3000 Configuration program. To run GSC3000 Configuration, double-click on the Configuration icon in the GSC program group. You may also run it from the START menu in PROGRAMS > GSC3000 APPLICATIONS > GSC3000 Configuration.

In the Configuration main screen, click on the "Site Setup" button. In the Site Setup window, click on your direct connect site, or create a new site. Your must enter the following information to setup your shared site.
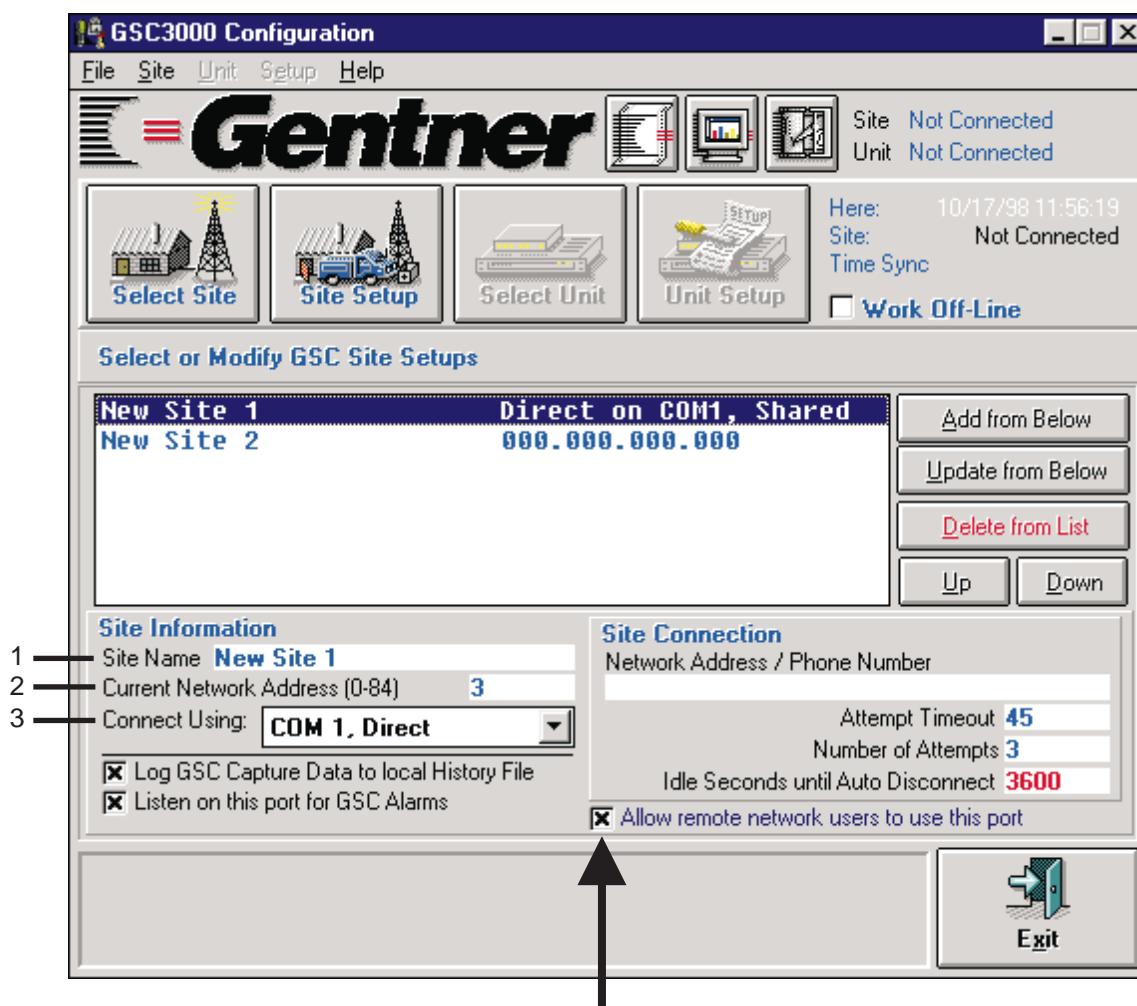
Click Here to Enable Sharing

GENTNER

1. Site Name. Enter any descriptive name up to 20 characters in length.

2. Current Network Address. Enter the address that you have assigned as the network number of the GSC3000 site ("network" refers to the G-bus LAN that connects the units together to form the GSC3000 site). Each GSC3000 site that you will be accessing must have a unique network number. For information on how to change the network number, see page 58. You must also provide remote users with this network number or they will not be able to communicate with your site. The default network address is "0".

3. Connect Using. You must be connected to the GSC3000 by direct serial, four-wire modem, or two-wire leased-line. The "Connect Using:" line must read "COM *, Direct" (* being the number of the PC COM port you are connecting through) or you will not be able to share information. You cannot share information using a dial-up modem.

Finally you must select the option "Allow remote network users to use this port". A check mark will appear in the small box, when this feature is selected. If you do not choose this option, remote users will not be able to communicate with your site using TCP/IP over a LAN/WAN. This option is not visible unless you have upgraded to Network Module.

When you are finished, click on the "Update from Below" button to update an existing site, or "Add from Below" if you have created a new site.

In the Configuration main window, a shared site's icon is differentiated by the "sharing" hand that appears on the icon. The Site Summary will also indicate the sites "shared" status by listing the site as "Direct on COM *, Shared".

Shared Site   Regular Site
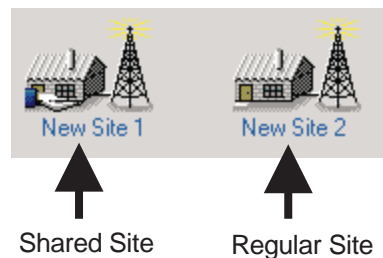
Remote Site Setup

Any computer that is running the GSC3000 software version 1.9 has the capability to connect to a shared site (running Network Module). To be able to connect to the shared site, you must first create a new site in the Site Setup window of the Configuration program. You must enter the following information.
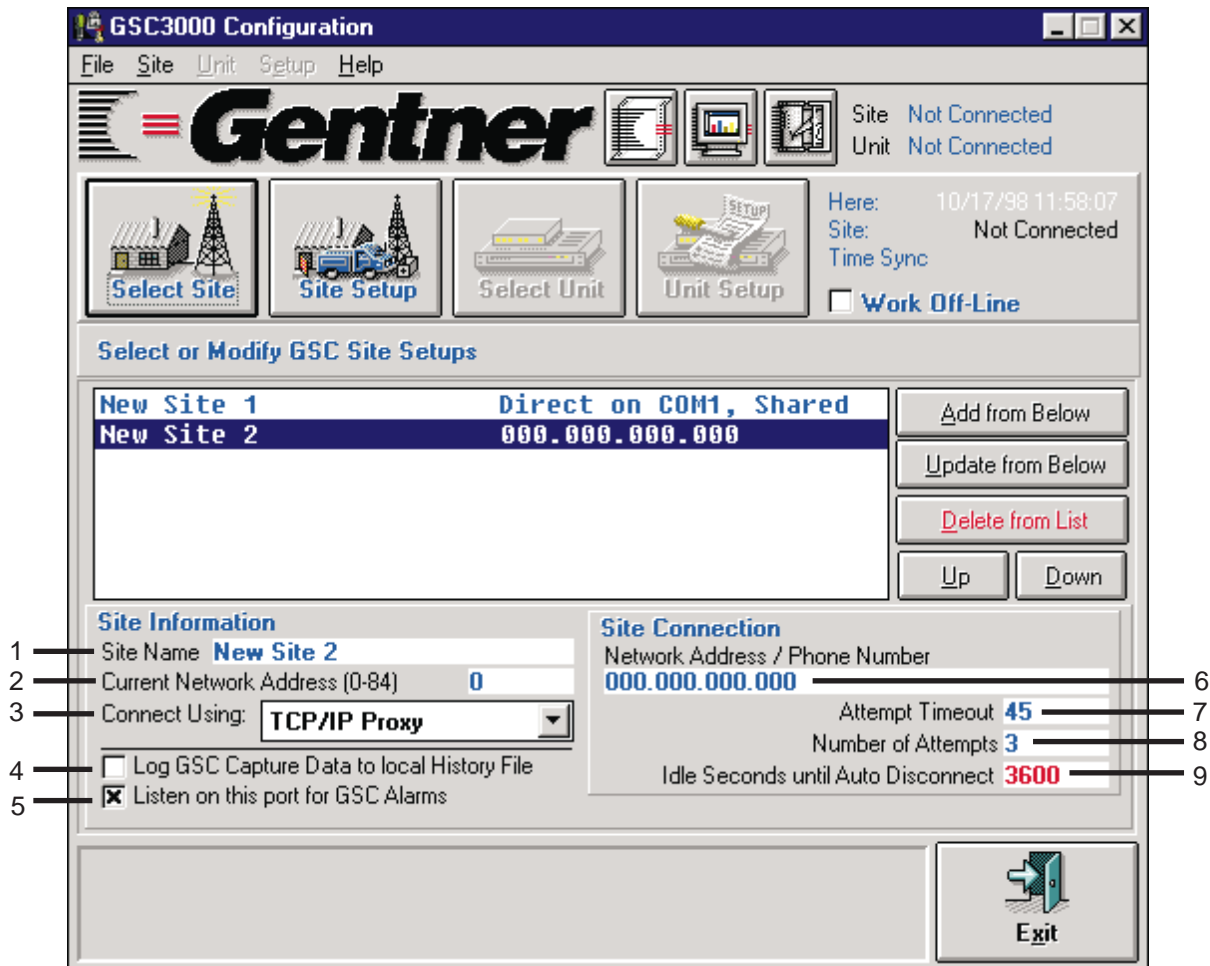
1. Site Name. Type in a descriptive name of up to 20 characters in length.

2. Current Network Address. You must enter the network number of the shared site. If you do not enter the correct network number, you will not be able to connect to the shared site using TCP/IP. If you are connecting to more than one site, each site must have a different network number.

3. Connect Using. From the pull-down menu choose the "TCP/IP Proxy" option. If this option is not shown you will need to enable it in the GSC3000 Port Wizard. At the top of the Port Wizard main window, click on the option labeled "Show 'TCP/IP Proxy' as a connectivity option for sites on this workstation". A check mark will appear in the small box when this option is enabled. "TCP/IP Proxy" allows you to send and receive data packets over your network instead of through a COM port connection.

4. Log GSC Capture Data to Local History File. Click on this box if you want this PC to collect and save event formation from the site. Only one PC should log capture data per site, otherwise capture data will be downloaded to whoever connects to the site first.

5. Listen On this Port for GSC Alarms. If you want this PC to be notified of alarms when they are issued from the GSC3000 site, click on this box.

6. Network Address / Phone Number. To connect using TCP/IP this field must contain either the IP address or machine name of the computer running the Network Module software. You must have the correct IP address or machine name or you will not be able to connect to the shared site. The machine name is the equivalent of the IP address in alphanumeric format. This is the name by which the computer is identified on your LAN or WAN.

One way to test if you are able to reach the machine name or IP address on your network is to go to a MS-DOS prompt and type: "Ping" then the machine name/IP address and press ENTER. Your computer will attempt to Ping that address. If the attempt is successful, the other computer will reply. If there is no response, DOS will respond "Bad IP address [your entry]".

7. Attempt Timeout. This is the number of the seconds for the GSC3000 software to wait after it tries to connect before it assumes there is an error.

8. Number of Attempts. The GSC3000 software will try this number of times to connect to the IP address before telling the user that the attempt has failed.

9. Idle Seconds Until Auto Disconnect. This is the number of idle seconds that the GSC3000 software will wait until it timeouts and disconnects from the shared site. The default is one hour (3600 seconds).

When you are finished, click on the "Add from Below" button to create the new site. Connect to the site by clicking on the Site icon.
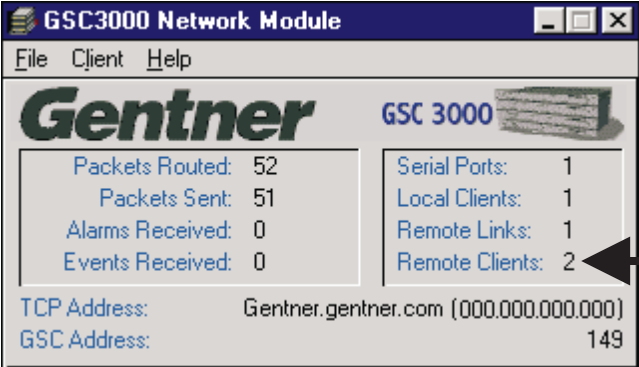
We recommend that you use the IP address rather than the machine name. If your local area network is not a DNS network, but rather a workstation (peer-to-peer) network, the Comm Server will cause your computer to freeze up when the host PC is not logged onto the network. Change the machine name to the IP address and your computer will recognize that the IP address is not available instead of searching for a missing machine name.

Site Sharing

Once you have completed updating Site Setup, your Network Module shared site will now be able to share information with other remote sites.

The host PC must be turned ON and be running the GSC3000 Comm Server (Network Module) or remote sites will not be able to access the shared GSC3000 site.

Any time you want to allow remote users to access your GSC3000 site, the host PC must be running the Comm Server (also known as "Network Module" after you have upgraded). No other software needs to be running for remote users to connect to the site. The number of remote clients that are connected to your GSC3000 site is visible when the Network Module (Comm Server) is maximized.

Number of Remote Users Connected to GSC3000 Site

Glossary

Alarm Handler.   The Alarm Handler is a component of the GSC3000 software. Whenever an alarm is received by the Comm Server, the Alarm Handler will open on your screen to inform you of the details of the alarm.

Capture.   A capture is a snap-shot of the current readings of an I/O unit. Information collected by a capture event includes: the current state of the status inputs, command output activity, and meter input readings. Captures are stored in the I/O unit until a user connects to the I/O unit, whereupon they are downloaded to the connected PC as a .EVT (event) file for viewing using the History program.

Command Relay Unit.   The Command Relay Unit is a device which provides isolation between the I/O unit's solid-state open collector outputs and equipment which requires relay switching for operation.

Comm Server.   The Comm Server is the component of the GSC3000 software that provides the communications link between your GSC3000 site and the connected PC. Other programs such as Configuration and Monitor will launch Comm Server automatically when you attempt to connect to a GSC3000 site. Comm Server must be running in order for a PC to receive notification of alarms.

Configuration.   Configuration is a component of the GSC3000 software. It is the primary tool in setting up the GSC3000 hardware and software. This application is used to setup all I/O unit functions such as status inputs, meter limits, command outputs, time-of-day events and macros. Configuration is also used to set up site security, site time, and dial-out information.

Dedicated Telephone Line. Also known as a leased-line, a dedicated line is a telephone line that is leased from the telephone company for reserved use. No dialing is required to connect via a dedicated telephone line. When connected to a GSC3000 system using a two-wire modem, a dedicated line operates in the same manner as a direct serial connection.

DIP Switch. Dual in-line package of miniature rocker switches. Many modems use DIP switches for configuration purposes.

DTMF. Dual-tone multi-frequency (touch-tones by AT&T) for dialing on the phone system.

Firmware. Software that is stored in EPROM (Erasable Programmable Read Only Memory). Firmware can uploaded from the Configuration program to I/O units to update the I/O units programming.

G-bus. A high speed digital bus that allows GSC3000 units to exchange information. G-bus connections are made using a RJ45 jumper.

G-bus LAN. The G-bus local area network (LAN) refers to the group of I/O units that are connected together using G-bus connectors. The G-bus LAN is an RS485 LAN which communicates via category five twisted pair cable (10BaseT).

History. History is the component of GSC3000 software used for viewing capture data. History allows you to manipulate captured data to create custom files which include only the desired information.

I/O Unit. The I/O (input/output) unit is the main component of a GSC3000 system. An I/O 16 unit has 16 channels each of metering, status, and command. An I/O 8 unit has 8 channels each of metering, status and command. The I/O unit is a stand-alone device; no separate PC is required for day-to-day operation.

IP Address. The IP (Internet Protocol) address is the 12-digit address used to identify a PC on a network. The IP address is required for TCP/IP sharing of GSC3000 data over a network (see Network Module).

Latching. A control signal that remains in a fixed state until you release it. This is opposed to a momentary control which is a pulsed signal.

LAN. Local area network. Usually refers to a network confined to a limited geographic area, owned by the user. When used alone, LAN refers to a private network of computers (as opposed to G-bus LAN, a network of GSC3000 units).

Leased-Line. See Dedicated Telephone Line.

LED. Light Emitting Diode. A semiconductor diode used in an electronic display that emits a light when subjected to an applied voltage.

Logging. Logging is performed by the GSC3000 Logger application. Logging occurs in real-time. GSC3000 data such as meter readings, current state of status inputs, and command output activation is sent to a printer port or saved to file, providing a real-time record of the activity of your GSC3000 system.

Macro. A macro is a string of software commands to your GSC3000 system that allows it to perform complex functions. Macros allow your GSC3000 to evaluate a situation and take intelligent corrective action.

Monitor. Monitor is the component of the GSC3000 software used for viewing the activity of your GSC3000 site. States of status inputs and meter readings are presented in real-time. Monitor also allows you to issue commands and run macros at the touch of a button.

Network Address (number). The network address refers to the unique number that each GSC3000 is assigned during configuration. This number allows your software to differentiate between more than one site when you are simultaneously connected.

Network Module. Network Module is an upgrade to the GSC3000 software which allows you to share GSC3000 site data over a LAN or WAN. Users on the same network can communicate with a GSC3000 system using TCP/IP. Network Module must be running on a PC that is directly connected to the GSC3000 system for TCP/IP sharing to occur.

Null-Modem Cable. An RS232 cable that reverses pin two and three. Use the provided null-modem cable when connecting your I/O unit to a PC or a modem.

Phoenix™ Push-on Block. A connector block that simplifies pin-for-pin wiring between an I/O unit and a Command Relay Unit or Wiring Interface unit. No soldering required, uses set screws to lock down connections.

Port Wizard. This component of the GSC3000 software is used to configure the PC's COM ports for use with the GSC3000 system. Port Wizard is also used for modem programming and TCP/IP configuration.

PBX. Post Branch Exchange. See Telephone Line.

POTS. Plain Old Telephone Service. See Telephone Line.

Remote Control System. Any system that is used to monitor and control equipment from a distance. The GSC3000 is a remote control system.

Remote Facilities Management. A more expansive term for remote control. It refers to a type of remote control that is completely self-sufficient and self-monitoring, capable of controlling complete facilities instead of only limited equipment.

RF Link. Radio-Frequency communications link. An RF link refers to any modulated frequency communication between a GSC3000 system and a PC. This includes any subcarrier generator/demodulator link using STL transmitters and receivers, microwave communications, spread-spectrum transceivers, etc.

RJ45 Connector. An 8-pin modular jack. Used to connect a GSC3000 unit to the G-Bus LAN.

RS232. A standard serial connector used for connecting data processing units and control systems. The COM 1 and COM 2 ports on the back of the I/O unit are RS232 connectors.

RS485 LAN. High speed digital bus, used to interface multiple I/O units in a GSC3000 system. See also G-bus LAN.

Serial Cable. The cable which connects your PC to an I/O unit or modem. Also used to connect an I/O unit to a modem. See Null-Modem Cable.

Snooze. The Alarm Handler function that allows you to temporarily halt alarm reception.

Source Code. The programming language used to create macros. Source code is compiled into object code that the I/O unit's microprocessor can understand.

TCP/IP. Transmission Control Protocol/Internet Protocol. A communications protocol used for internetwork routing and message delivery, most commonly used in Ethernet systems. TCP/IP is used by the GSC3000 Comm Server to share GSC3000 site data with remote network users (Network Module required).

Telephone Line. In this manual, a telephone line is defined as the line delivered by the telephone company to an individual subscriber. Sometimes known as a POTS (Plain Old Telephone System) line, this is an analog line as required by fax machines or modems. The GSC3000 requires analog telephone lines for use with a dial-up modem or Voice Interface unit.

You may use the GSC3000 in conjunction with a PBX (typical business telephone system). A PBX brings in a bank of telephone lines from the telephone company and provides a variety of functions along with multi-line access.

Voice Interface. A device which allows a user to call up the GSC3000 system using any touch-tone telephone. The user communicates with the unit using DTMF tones by pressing buttons on the telephone keypad. The Voice Interface will also call out when alarms are issued by an I/O unit. Uses computer-generated voice to communicate metering values and status point information using "text to speech" technology.

WAN. Wide area network. A network which uses common carrier-provided lines instead of private lines. See also LAN.

Wiring Interface. The Wiring Interface is designed to simplify connection of equipment to the I/O unit. It provides easy pin-for-pin wiring using Phoenix™ push-on blocks. For connection to I/O unit status and metering inputs only.

X-10. Modules that use the 110 Vac wiring in a house or building to communicate. The GSC3000 can use X-10 switching to notify you of an alarm.

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