



GW3-TRBO®
GEnSAC
Software Version 2.16.4
Module Book

GW3-TRBO®

600-2.16.4-Z.1
4/5/2019

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Refer to the GW3-TRBO Manual Overview for your full license. All license information contained on pages 4-7 (Book 600-2.16.4-AA.1) are to be considered as contained herein.

Support

Customer satisfaction is our number one priority at Genesis. We are here to provide you with the best software possible, and we want to know when you have any questions, concerns or problems with GW3-TRBO so that we can make it a better product for everyone.

Refer to the *Troubleshooting & Support* section of the GW3-TRBO Manual Shell (Book 600-2.16.4-AA.1) for complete support and contact information.

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Goals

This manual describes the role and function of the GEnSAC module in the GW3-TRBO solution.

Who Should Read This Manual?



This manual is written for the intended audience of novice to mid-level MOTOTRBO radio system users and novice to mid-level PC users. Familiarity with the Motorola MCC 7500, MCC 5500 or Centracom Gold Elite console is strongly recommended.

How This Manual Is Organized

This manual is organized as follows:

- **Overview:** Provides an overview of the role and function of the GEnSAC module.
- **Hardware Setup:** Connecting input and output hardware to the PC.
- **Software Setup:** Configuring the GEnSAC module.
- **GEnSAC to Console Setup:** Wiring and programming your console for GEnSAC.
- **GEnSAC Troubleshooting:** GEnSAC FAQ.

This manual contains the following images, used to indicate that a segment of text requires special attention:

-  **Additional Information:** Additional information is used to indicate shortcuts or tips.
-  **Warning:** Warnings are used to indicate possible problem areas, such as a risk of data loss, or incorrect/unexpected functionality.

This chapter gives an overview of the GEnSAC (Genesis **E**nanced **S**tand **A**lone **C**EB) module.

This chapter contains the following sections:

- **What is GEnSAC?:** Defines the GEnSAC module and GUI (graphical user interface).
- **Glossary:** Defines several acronyms used throughout this manual.
- **Feature List:** List of GEnSAC features.
- **Specifications:** Hardware and system impact details.
- **Power and Heat:** Watt usage and BTU output information.
- **Warranty:** Details about software and hardware warranties.
- **Knowledge Requirements:** Outlines the basic knowledge required to effectively operate GEnSAC.

What is GEnSAC?

The GEnSAC module is a collaborative effort between Motorola field engineers and the Genesis Group. With GEnSAC, you can display IDs and emergency calls on their Gold Elite, MCC 7500 or MCC 5500 operator positions, without connection to the Embassy Switch or AEB.

The GEnSAC solution provides an alternate means of sending call packet data to consoles. A PC running GEnSAC receives the packet information through a GW3-TRBO input module connection. It then separates those packets according to talkgroup and forwards them via RS-232 serial cables to ACIM cards on the CEB (one talkgroup per card).

All together, the connection of all components looks like this:

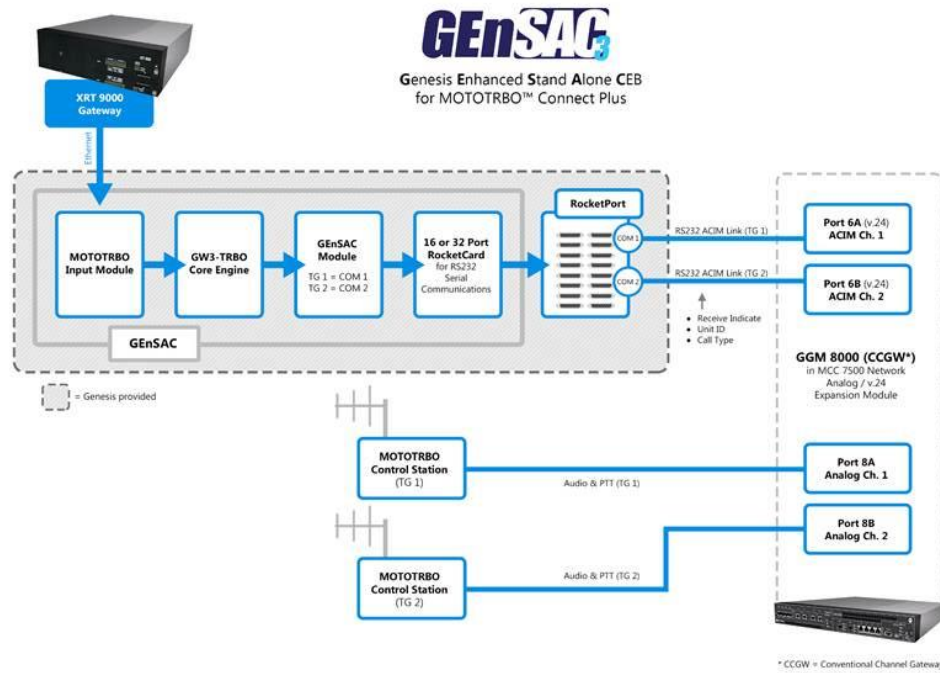


Figure 1.1 – GW3-TRBO with GEnSAC Solution (Connect Plus)

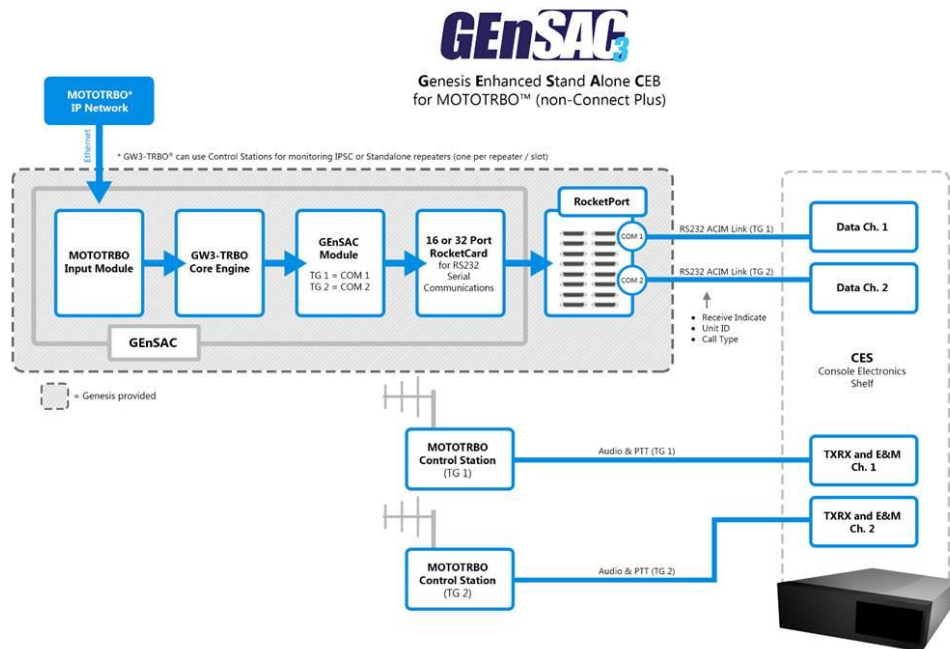


Figure 1.2 – GW3-TRBO with GEnSAC Solution (non-Connect Plus)

This will be explained in a later chapter in detail, but basically what happens is this: GEnSAC comes loaded on a PC with a 16- or 32-COM Port Rocket® Board from Control Corp. You will connect one cable for each talkgroup from the GEnSAC PC COM Ports to each ACIM card in the CEB (Central Electronics Bank).

Glossary

ACIM	ASTRO® Console Interface Module
AEB	Ambassador Electronics Bank
AUX I/O	Auxiliary Input Output
BIM	Base Interface Module
CEB	Central Electronics Bank
CES	Console Electronics Shelf (MCC 5500)
CSDM	Console System Database Manager (MCC 5500)
DAP	Digital Audio Processor (MCC 5500)
GEnSAC	Genesis Enhanced Stand Alone CEB



On Connect Plus and Capacity Max systems, the data from GEnSAC will be delayed by up to 2 seconds due to buffering by the data source and/or input module.

Feature List

GENSAC will provide the following features:

- Routing of group calls to ACIM cards.
- Routing of emergency PTTs to ACIM cards.
- Routing of multigroup calls to ACIM cards.
- Routing of emergency alarms to ACIM cards.

Specifications

See <http://genesisworld.com/TRBOspecs/>

Power and Heat

PC: At present, we use a current model Dell Dimension computer, and the numbers are from their website (subject to change based on current model).

- Wattage = 305W.
- Heat = 560 BTU fully loaded without monitor (which is the way we ship it).

RocketPort Card: The RocketPort Card will add:

- Wattage = zero since it is powered from the PC (5VCD bus~ 250mA, 12VCD bus~50mA).
- Heat = 5.87 BTU/hr.

Warranty

GENESIS: GENsAC software – 1 year after installation

DELL: PC – 5-year warranty including Next Business Day Parts and Labor.
On-Site Response.

COMTROL: RocketPort – The warranty information on this product was included with your GENsAC shipment. Be sure you fill out the warranty information and send it to Comtrol.

Hardware – 5 years from date of purchase.

Firmware and Software – 1 year from date of purchase.

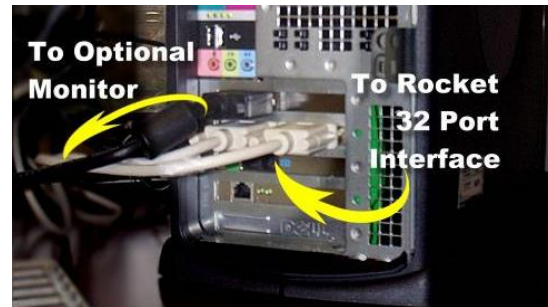
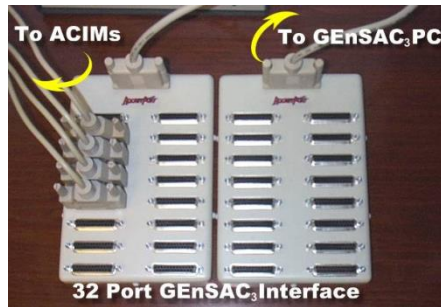
Knowledge Requirements

GENsAC and its manual will make a few assumptions about your knowledge level. For best success operating GENsAC, we recommend you have a good working knowledge of the following:

- Your version of Windows operating system
- MCC 7500, MCC 5500 or Gold Elite console setup and configuration
- Creating RS-232 cables

Welcome, and thank you for purchasing our GEnSAC (Genesis Enhanced Stand Alone CEB) solution. We are proud to have you as a customer, and are confident that you will soon be benefiting from your new system.

Upon receiving your GEnSAC hardware, you will want to set up and connect the various components before booting the machine. Below is the general setup of the system.



You may have purchased a 4-, 8-, 16- or 32-port GEnSAC. To keep things simple, we are supplying a RocketPort Card that is capable of up to 32 ports. If you have purchased a GEnSAC that is 16 or fewer ports, you will receive one port adapter “brick” (see below). If you order a GEnSAC capable of 32 ports, you will receive two port adapter ‘bricks’ (see below). Depending on which version of the GEnSAC port interface you purchased, you will have received one of the following:

32 Port GEnSAC	2 RocketPort Adapters (as shown above)
16 or fewer Port GEnSAC	1 RocketPort Adapter

To set up your GEnSAC hardware, follow these steps:

1. **Power-** Hook up power to the GEnSAC PC, your console and your monitor.
2. **Data Source** – Connect standard Ethernet network equipment and cables to the GEnSAC PC.
3. **RocketPort Cables** – Connect the RocketPort adapter cables to the back of the PC as shown in the picture. These cannot be extended as they are proprietary.
4. Connect your remaining COM Port cables to the RocketPort adapter and then to the ACIMs (Gold Elite) or DAP in the CES (MCC 5500).

This completes the hardware setup of GEnSAC.

The GEnSAC GUI (Figure 3.1) contains one or more rows of properties. Each row is a GEnSAC group-to-serial-port connection. The number of available connections is determined by the *Connections* property under the GEnSAC module in your GW3-TRBO license file.

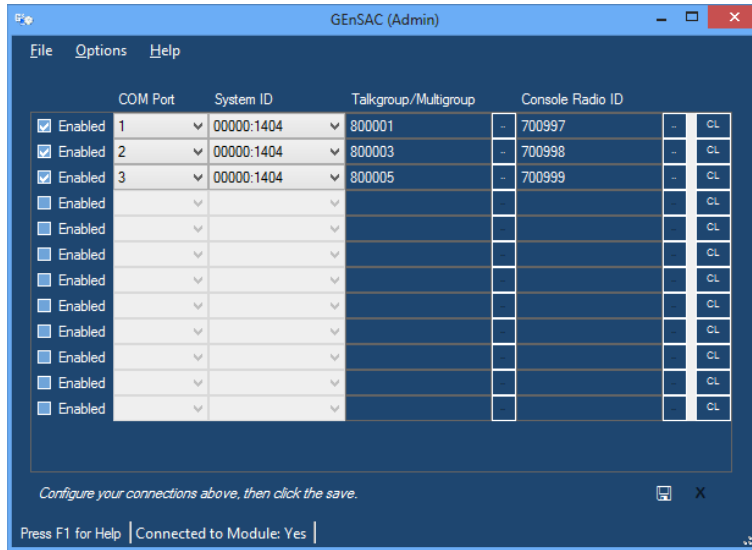


Figure 3.1 – GEnSAC GUI

Options

The GEnSAC module can output Radio IDs in one of two formats. By default, the output is the numeric radio ID. This can be changed to the ID plus 700,000 by selecting the **ID + 700,000** option.

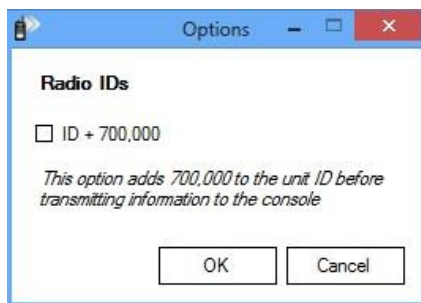


Figure 3.2 – GEnSAC Options Window

Connection Properties

Each GEnSAC connection contains the following options:

- **Enabled:** Check this box to enable (start) a GEnSAC connection. Enabled connections must have a valid COM Port, System ID, Talkgroup and Console Radio ID before they can be saved.
- **COM Port:** This is the Serial Port to which you want to send any Emergency or Call events that occur for this connection.
- **System ID:** This is the ID of the system you are connecting to.
- **Talkgroup:** This is the group you wish to filter activity on this connection by. For example: If you select 1, all Emergency Alarm and Call events that occur on talkgroup 1 from the selected System ID will be sent to the COM Port specified for the connection.
- **Console Radio ID:** This is the radio ID of the console that GEnSAC is connected to. All Status, Emergency Alarm, and Call events originated from this radio ID will be ignored and NOT sent on this connection.



When the console is keyed up, the call will appear with its radio ID set as the ID of the talkgroup on which it is broadcasting. For example, a call from the console on talkgroup 10001 will appear as a group call from radio ID 10001 on talkgroup 10001. To avoid an “echo chamber” effect, GEnSAC will ignore all activity from radio IDs equal to the IDs of the talkgroups for which it is configured. It is important, therefore, to avoid using the same ID for both a radio and a talkgroup on your system.

Cancel

Click this button to abandon any changes made to the connection settings and reload previous settings from the database.

Save

Click this button to save the current connection settings to the GW3-TRBO database. GEnSAC will start all enabled connections and stop all connections that are not enabled.



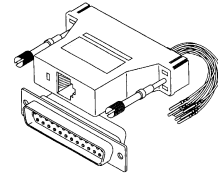
The number of connections available in the GEnSAC screen is limited by your license. See the GW3-TRBO Core Manual for more information on licensing.



If your licensed number of GEnSAC connections is changed to a number lower than your previous license, connections are removed from the bottom of the connections list shown in GEnSAC.


Cabling

This section may vary depending on the number of ports you purchased. Your objective is to get the data that is present on the RocketPort breakout box (brick) into the ACIM cards (Gold Elite) or DAP (MCC 5500). In the case of the 32-port Rocket DB25 breakout, your easiest method is likely to be purchasing a DB25 / RJ45 adapter. You will need one adapter for each talkgroup. On the DB25 side, it needs to be male-to-male with the RocketPort ports. The next step will be to create the RJ45 to RJ45 cables for your installation (from the adapter to the ACIM card). Use good RS-232 cable practices, being concerned with length limits. Lower peripheral speeds of up to 9600 baud serial interfaces, like those used on the ACIM, can usually operate over cables up to 50 feet long. Use of special high-quality cable may, in some cases, allow this limit to be extended to as much as 150 feet. The last step in the cabling process is to configure the adapter pin-outs, then plug everything together.



Gold Elite

The pin-out configuration may vary. For a DB9 and DB25 to RJ45 adapter, here is the configuration.

 Before beginning the work on the DB25-RJ45 adapter, compare the wire colors to the ones listed below. It has been found that different manufacturers use different color schemes.

The pin numbers are the accurate part of the chart below.

Color	RJ45 pin	DB9 pin	DB25 pin
Brown	1	NC	NC
Blue	2	NC	NC
Yellow	3	NC	NC
Green	4	2	3
Red	5	1	8
Black	6	3	2
Orange	7	4	20
Gray	8	5	7

NOTE: Jumper DB-9 pins 6, 7, 8 together

NOTE: Jumper DB-25 pins 4, 5, 6 together

The DB9 adapter is part number BKN6159A in CIE Maintenance Manual 68-81095E45.

The DB9 adapter should be female.

The DB25 adapter should be male.

After creating the adapter, use straight through RJ45 to RJ45 cable to connect from the adapter to the ACIM card top port. Do not exceed 150 feet under normal circumstances.

MCC 5500

There are four connection points that are made to the MCC 5500:

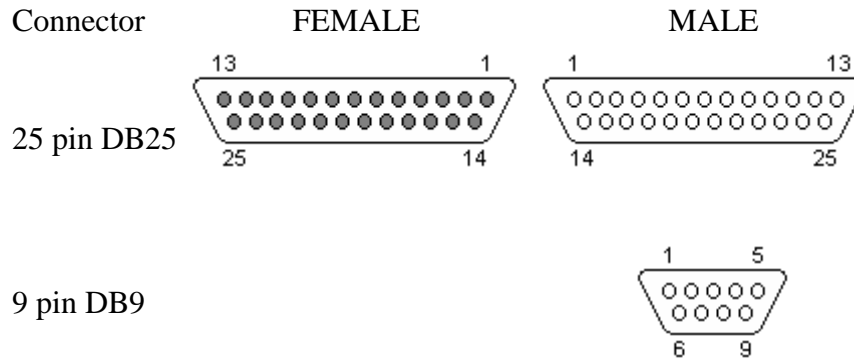
- **TX Audio**
 - This is a wired connection from the mic audio input and ground pins of the control station radio's accessory connector to J4 connector labeled TX/RX Audio on the back of the CES. Points of connection can be found in the MCC 5500 manual (6881005Y65-H), Table A-52.
- **RX Audio**
 - This is a wired connection from the receive audio output and ground pins of the control station radio's accessory connector to J4 connector labeled TX/RX Audio on the back of the CES. Points of connection can be found in the MCC 5500 manual (6881005Y65-H), Table A-52.
- **PTT Signaling**
 - This is a wired connection from the mic PTT and ground pins of the control station radio's accessory connector to J3 connector labeled E&M on the back of the CES. Points of connection can be found in the MCC 5500 manual (6881005Y65-H), Table A-56.
- **Data Input**

This is a serial connection from GEnSAC to the MCC 5500. This comes out of GEnSAC via a 'Rocket Port' multi-RS232 board where each RS232 port is equivalent to ID information for one talkgroup. This comes into the MCC 5500 via J15 connector labeled DATA on the back of the CES. Points of connection can be found in the MCC 5500 manual (6881005Y65-H), Table A-49.

The best way is to utilize a DB25 / RJ45 adapter to allow ease of adjusting the pin-outs. Here is the configuration:

RJ45 pin	DB25 pin
1	7
2	2
3	NC
4	8
5	3

Where is Pin #1? This diagram may help:



MCC 7500

There are four connection points that are made to the MCC 7500:

- **TX Audio**
 - This is a wired connection from the mic audio input and ground pins of the control station radio's accessory connector to the appropriate RJ45 connector on CCGW. Points of connection can be found in the Motorola CCGW Manual.
- **RX Audio**
 - This is a wired connection from the receive audio output and ground pins of the control station radio's accessory connector to the appropriate RJ45 connector on CCGW. Points of connection can be found in the Motorola CCGW Manual.
- **PTT Signaling**
 - This is a wired connection from the mic PTT and ground pins of the control station radio's accessory connector to the appropriate RJ45 connector on CCGW. Points of connection can be found in the Motorola CCGW Manual.
- **Data Input**

This is a serial connection from GEnSAC to the MCC 7500. This comes out of GEnSAC via a 'Rocket Port' multi-RS232 board where each RS232 port is equivalent to ID information for one talkgroup. This comes into the MCC 7500 via the appropriate RJ45 connector on CCGW. Points of connection can be found in the Motorola CCGW Manual.

GEnSAC Gold Elite Workaround Connector

We have learned from field experience that the Gold Elite console will stop processing audio if the ACIM senses the lack of input. In a non-GEnSAC world, this would be if the DIU (which feeds its data to the ACIM) goes bad, the audio processing stops for that channel or talkgroup. What this means to GEnSAC users

is that if you need to turn off the GEnSAC machine for any reason, or if the unit fails, you could have a minor disaster on your hands. There is a workaround.

We suggest that you build a small “loopback” cable and tie wrap it to the main cable that goes from the RocketPort to the ACIM port. Tie this loopback to the ACIM end so that in an emergency, it can be quickly plugged into the ACIM in place of the GEnSAC cable. You will need to make one loopback for each talkgroup that is connected from GEnSAC to the ACIM.

We are not aware if this same issue exists in the MCC5500. Logically, it might be due to the “data” in port on the MCC5500 being the same specification as the ACIM port on the Gold Elite. To be safe, you should also create loop backs if you have an MCC5500 console.

How to build your emergency connector

1. Build a very short cable with an RJ45 on one end and nothing on the other end.
2. Connect the wires from Pin 4 & Pin 6 together (nothing else). Ensure you use a secure connection (soldering would be best).
3. Put heat shrink tubing over that.
4. Tie wrap that shorting plug to the end of the GEnSAC cable that plugs into the ACIM and mark it “Emergency Workaround Plug.”

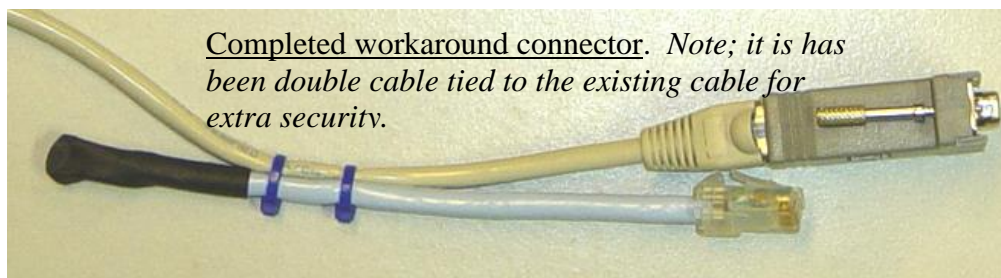
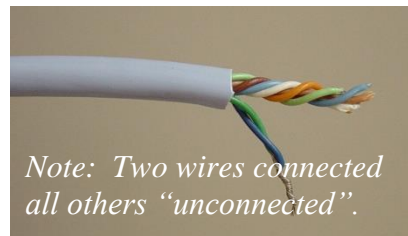
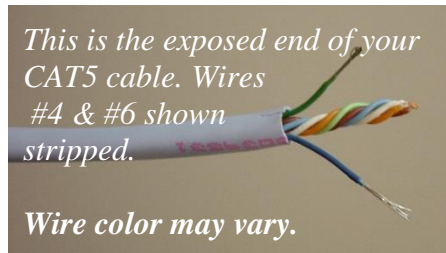


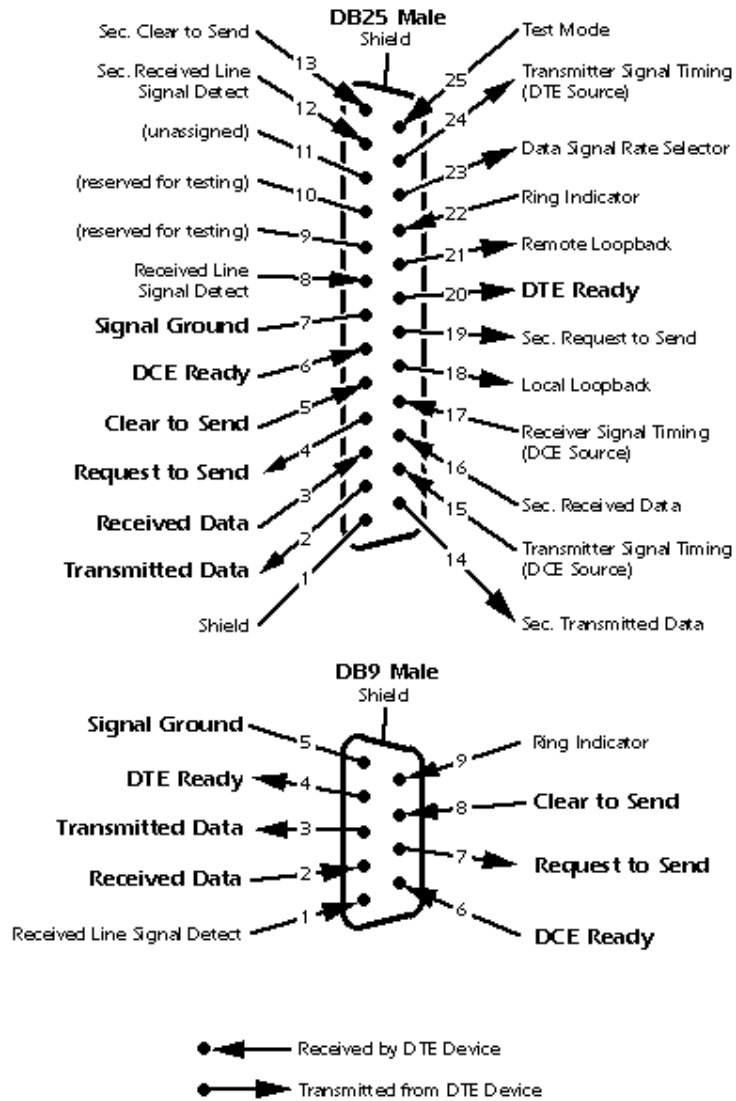
Figure 4.1 – Emergency connector

The RS-232 standard

DB-25	DCE	DB-9			
1			AA	x	Protective Ground
2	TXD	3	BA	I	Transmitted Data
3	RXD	2	BB	O	Received Data
4	RTS	7	CA	I	Request To Send
5	CTS	8	CB	O	Clear To Send
6	DSR	6	CC	O	Data Set Ready
7	GND	5	AB	x	Signal Ground
8	CD	1	CF	O	Received Line Signal Detector
9			--	x	Reserved for data set testing
10			--	x	Reserved for data set testing
11				x	Unassigned
12	SCF			O	Secndry Rcvd Line Signl Detctr
13	SCB			O	Secondary Clear to Send
14	SBA			I	Secondary Transmitted Data
15	DB			O	Transmissn Signl Elemnt Timng
16	SBB			O	Secondary Received Data
17	DD			O	Receiver Signal Element Timing
18				x	Unassigned
19	SCA			I	Secondary Request to Send
20	DTR	4	CD	I	Data Terminal Ready
21	CG			O	Signal Quality Detector
22		9	CE	O	Ring Indicator
23	CH/CI			I/O	Data Signal Rate Selector
24	DA			I	Transmit Signal Element Timing
25				x	Unassigned

STANDARD RS-232 PINOUT

Looking Into the DTE Device Connector



Hardware Setup

Centracom Gold Elite

The Console, at its heart, is a Motorola Centracom Gold Elite CEB with some programming and external wiring modifications. The basic parts list inside the card cage starts with 2 System Timers. Add one COIM for each operator position desired. Add one BIM, one AUX I/O, and one ACIM card for each talk group to be used by the console. Other cards for other applications may be added as needed (BIM for tone controlled conventional station, etc.). The BIMs should be configured for 4-wire audio at 600 ohms. The AUX I/O must be configured for local keying. P2, P3, and P4 should be routed to punch blocks as in a standard installation.

Programming



The information provided here about Gold Elite and MCC 5500 programming is for simple reference only. Please refer to your Motorola documentation for full details regarding the Gold Elite and MCC 5500 console programming.

Gold Elite

Special consideration must be paid to the way the console is programmed with the CDM. When the BIMs are added, they must be configured as ASTRO® Conventional signaling BIMs. This allows the AUX I/O card and the ACIM to be added accordingly. Also, in the ADM, aliases must be set up in the ASTRO® conventional book instead of trunking. In essence, the Genesis PC translates what would normally be SystemWatch data into ASTRO® conventional data, allowing it to pass through the ACIM, AUX I/O, and BIM in a standard Motorola format, minimizing modifications to the CEB. The serial ports are matched to talkgroups in the Genesis PC to allow data to be sent to the correct BIM. Data and audio take two different paths and have two different sources in this application. Using the BIMs in the ASTRO® conventional mode limits the console keying to local, as tone is not supported in the ASTRO® conventional setup.

MCC 5500

The primary settings that have been found to affect the operation of GEnSAC are in regard to the “Caller ID Type” that is to be displayed. To program the MCC 5500, in the MCC 5500 **CSDM** do the following:

1. Configuration
2. Radio Channel
3. Configuration
4. Pick a Radio Channel to Configure (such as TalkGroup 7)
5. Click on Edit at the bottom of the window
6. **IMPORTANT**—Be sure that the Caller ID format is set to ASTRO® 25 or Mixed Mode

7. Press NEXT
8. Choose ASTRO® Settings
9. Select- PTT ID
10. Select- Ignore Mobile to Mobile
11. Select all necessary buttons to back out to the CSDM desktop
12. Select File
13. Select Load

XRT Setup for Connect Plus Systems

In the MOTOTRBO XRT Configuration Tool, first create an XRT user. You must assign the user a number of talkpaths equal to the number of talkgroups to be monitored.

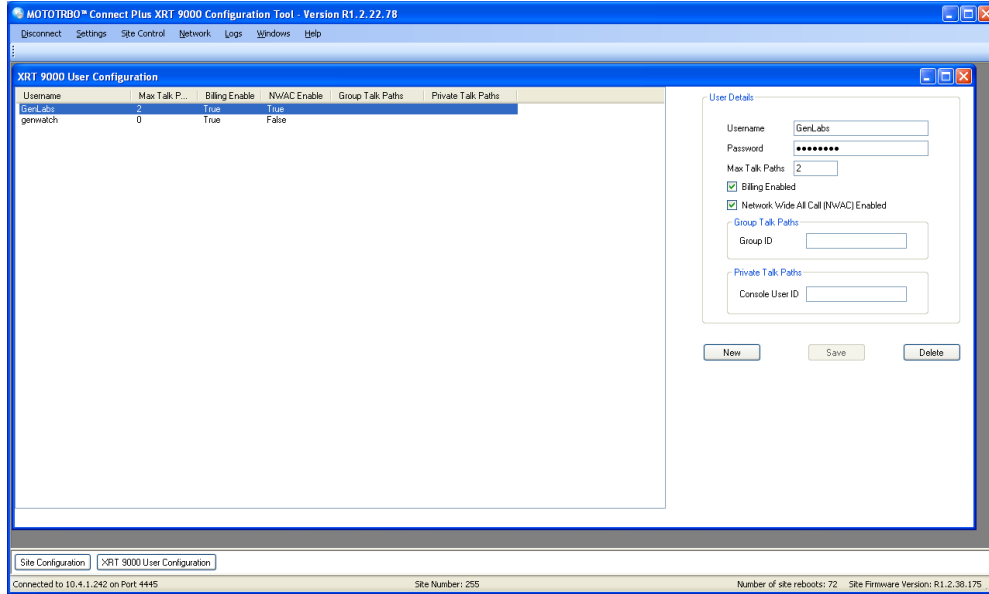


Figure 4.2 – XRT Configuration Tool – XRT User Configuration

Next, in the general configuration screen, assign a set of pool IDs to be used by the talkpaths.

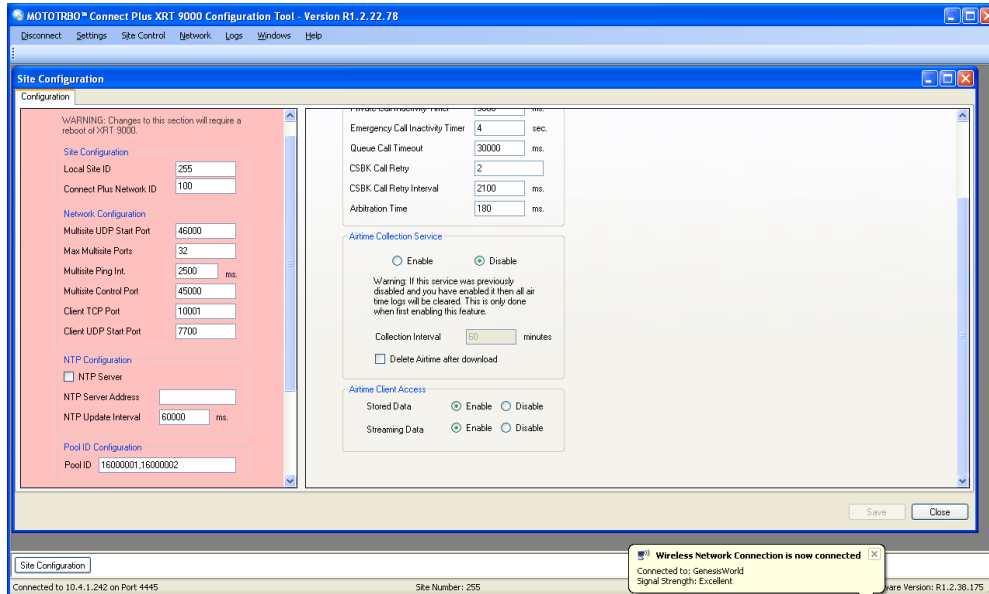


Figure 4.3 – XRT Configuration Tool – Site Configuration window

In the Users screen, create a user for each pool ID, as shown.

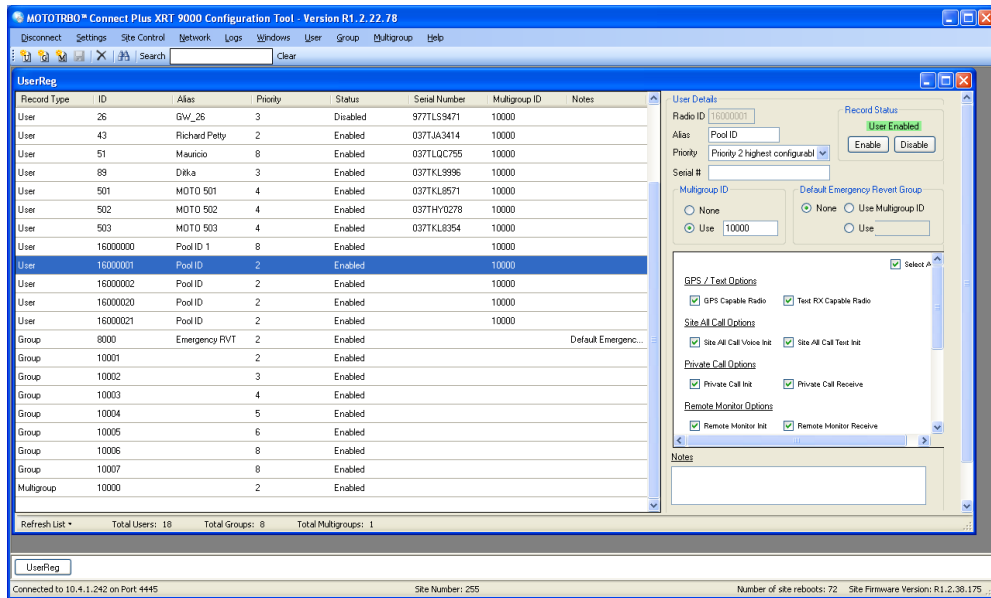


Figure 4.4 – XRT Configuration Tool – Users window

PC

The Genesis PC is set up per the instructions that are included with it. Be sure to turn off ALL power saving functions ensuring that the PC remains ready at all times. As noted earlier, specific talkgroups are routed to individual serial ports in the RocketPort that is installed in the PC. These must be configured on an individual basis. The PC acts as a filter, sending information recovered from the XRT 9000 that is relevant to the selected talkgroup to the designated COM Port as DIU formatted data. That data is then sent, via a cable, to the ACIM (Gold Elite) or CES (MCC 5500).



This section of the manual is designed to help you answer some of the most frequently asked questions. It will also help to resolve some of the common errors.

Q: The red light in the tray never turns green, even after I double checked my settings.

A: The red light in the tray indicates that the connection is not receiving data. Below is a list of items that you should check.

- The Ethernet cable is plugged into your PC and into the network.
- The Connect Plus connection settings are correct in the Connect module.
- The XRT 9000 is turned on and connected to the network.
- There is network connectivity between the PC and XRT 9000. You can check this by performing a “ping” command from the Command Prompt on your PC.
- Attempt to restart the Connect Plus connection in the Connect module.

Q: I get an SQL error when I try to start GENsAC, and it never starts.

A: Make sure that MSSQL server is running. You should see an icon in the windows tray that looks like this one . If you see this icon  instead, then double click it and press the start button on the dialog that appears.

Q: I added a group to the GENsAC module setup but I don't ever see that group's activity.

A: Make sure you checked the Enabled checkbox for that group.

Q: What happens if the GENsAC computer ceases to operate for any reason?

A: The biggest thing that you need to be aware of is related to a design issue in the ACIM card. There is a “heartbeat” that goes from the ACIM to GENsAC and then back to the ACIM. If GENsAC stops operating for some reason, that heartbeat is lost. Then, the ACIM card stops the flow of audio through the console. Of course, this is not good. Since hardware is fallible, this is a possible problem if the GENsAC PC stops running. The current workaround is the following: Build a short RJ45 cable with the RJ45 connector only on one end. On the end with no connector, jumper pins 4&6 together. Seal the wires with heat shrink or something else to protect the cable end. Now, tie-wrap that short “emergency” cable to your normal GENsAC cable so it is always ready for you. If the GENsAC fails for any reason, simply unplug the normal GENsAC to ACIM cable and plug in the “emergency” cable. Now you have the luxury of time to bring the GENsAC PC back online. Please refer to the GENsAC Gold Elite Workaround Connector section in Chapter 4 of this book.