JFW Industries, Inc.

50PMA-XXX
Sample Test Software for
Transceiver Test Systems

This document corresponds to firmware 3.3.15 (or higher)

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1.0 INTRODUCTION

The sample test program is designed to work with test systems running firmware 3.3.0 (or higher). This test system can be used to configure the Ethernet setting, configure the RS-232 setting, and control programmable attenuators. All transmitted commands are displayed in the *DATA SENT* window. All data received from the test system is displayed in the *DATA RECEIVED* window.

1.1 ETHERNET TEST BOX

JFW does have an Ethernet test box setup at fixed IP address 104.63.176.50 (TCP port 3001). You can connect to this test box with the sample test program and be able to send/receive remote commands.

1.2 FIRMWARE OVERVIEW

Command syntax and examples can be found in the 3.x.x Firmware Manual which is available for download in the test systems section of the JFW website. The 3.x.x firmware is written with a multi-threaded command process that allows multiple connections to the test system. Remote commands received from different connections are handled independently. Each connection can send remote commands to the test system without blocking any functionality of the test system to the other connections. Listed below are some 3.x.x firmware feature highlights:

- ➢ DHCP capable.
- ➢ Ethernet and RS-232 interfaces run simultaneously.
- ➢ Multi-Threaded command process (i.e. non-blocking architecture).
- ➢ Up to 12 simultaneous Ethernet connections to the test system.
- ➢ User configurable command line prompt.
- ➢ Remotely accessible help files with command syntax and examples.
- ➢ Command options such as Max dB (-M), Step Size (-S), Lock (-L), Block (-B), and Verbose (-V).
- ➢ The ability to escape out of erroneous Pause, Fade, and Handover commands.
- ➢ Date feature that allows for time tracking with timestamp command option.
- ➢ User comments can now be added to script files without interfering with script execution.

1.3 ATTENUATOR REMOTE COMMANDS

Attenuator Attributes...........................Set the lock/unlocked attributes of an attenuator
Set Attenuator ....Set the dB value for an attenuator
Set All Attenuators ....Set all attenuators to the same dB value
Read Attenuator ....Read the dB setting for an attenuator
Read All Attenuators ....Returns the current dB value of all attenuators
Read All Attenuators Extended ....Returns the current dB value of all attenuators in table format
Fade Attenuator ....Increment the dB setting of an attenuator w/ specified time interval
Variable Attenuator Handover.............Can handover up to 8 pairs of attenuators w/ a single command
Set Path ....Set the dB value of the attenuator on a defined input/output path
Read Path ....Read the dB setting of the attenuator on a defined input/output path
Set All Paths...Set all paths (i.e. attenuators) to the same dB value

1.4 SECURITY REMOTE COMMANDS

IDENT ....Can be used to set/clear a system password or login to a system if a password is set.
RESTRICT ....ADMIN level user can restrict use of certain remote command (i.e. Date, Prompt)

1.5 SYSTEM REMOTE COMMANDS

Identification ....Respond with system identification information
Help ....Returns list of all command available for the test system
Serial ....Set/respond with serial interface settings baud rate and flow control
Net ....Set/respond with network interface settings such as IP address, DHCP mode, etc.
Close ....Closes all active network connections except for connection that sent command
Date ....Set/respond with time and date for the system
Disconnect ....Disconnects the current network connection
Uptime ....Respond with the time that has passed since being turned on or rebooted
Name ....Set/respond with name of the current connection
Show Users ....Return a table listing all current connections to the test system
MOTD ....Set/respond with the message of the day
Message...................Sent a message up to 480 characters to another connection
Prompt.....................Set/respond with the current command prompt setting
Pause ....Suspend remote command execution for a connection for specified time duration
Escape......................Break from the current task
Store ....Stores the current settings for all attenuators
Recall ....Recalls the dB settings saved with Store command and sets all attenuators
Reboot ....Remotely reboot the test system
Startup.....................Setup a list of commands that are executed when the system first boots
Wipe ....Clears all saved data and resets the system to factory defaults

2.0 TEST PROGRAM

No installation program needs to be run in order to use the GUI sample test program. Just copy the executable file onto any location on your computer. When you exit the program, it does create some text files that are used to save basic settings for the next session.

2.1 MAIN MENU

The main menu is broken up into seven basic areas.

> ➢ In the top right are 3 text boxes that allow the user can change the # of attenuators, the maximum total attenuation, or the attenuation step size.
> ➢ The ETHERNET CONNECTION mini-box is where you enter the test system's IP Address and open a new network connection.
> ➢ The RS-232 CONNECTION mini-box is where you select your computer's COM port number and your computer's Baud rate.
> ➢ The TEST SYSTEM SETUP mini-box is where you set/read the test system's settings. It also has two "query" buttons that allow you to check the test system's network and RS-232 settings.
> ➢ The ATTENUATOR COMMANDS mini-box provides all of the functionality you need to set/read attenuator settings.
> ➢ Commands sent to the test system are shown in the DATA SENT text box. Messages received from the test system are shown in the DATA RECEIVED text box.
> ➢ The bottom right mini-box is additional functionality that is provided by the GUI test program.
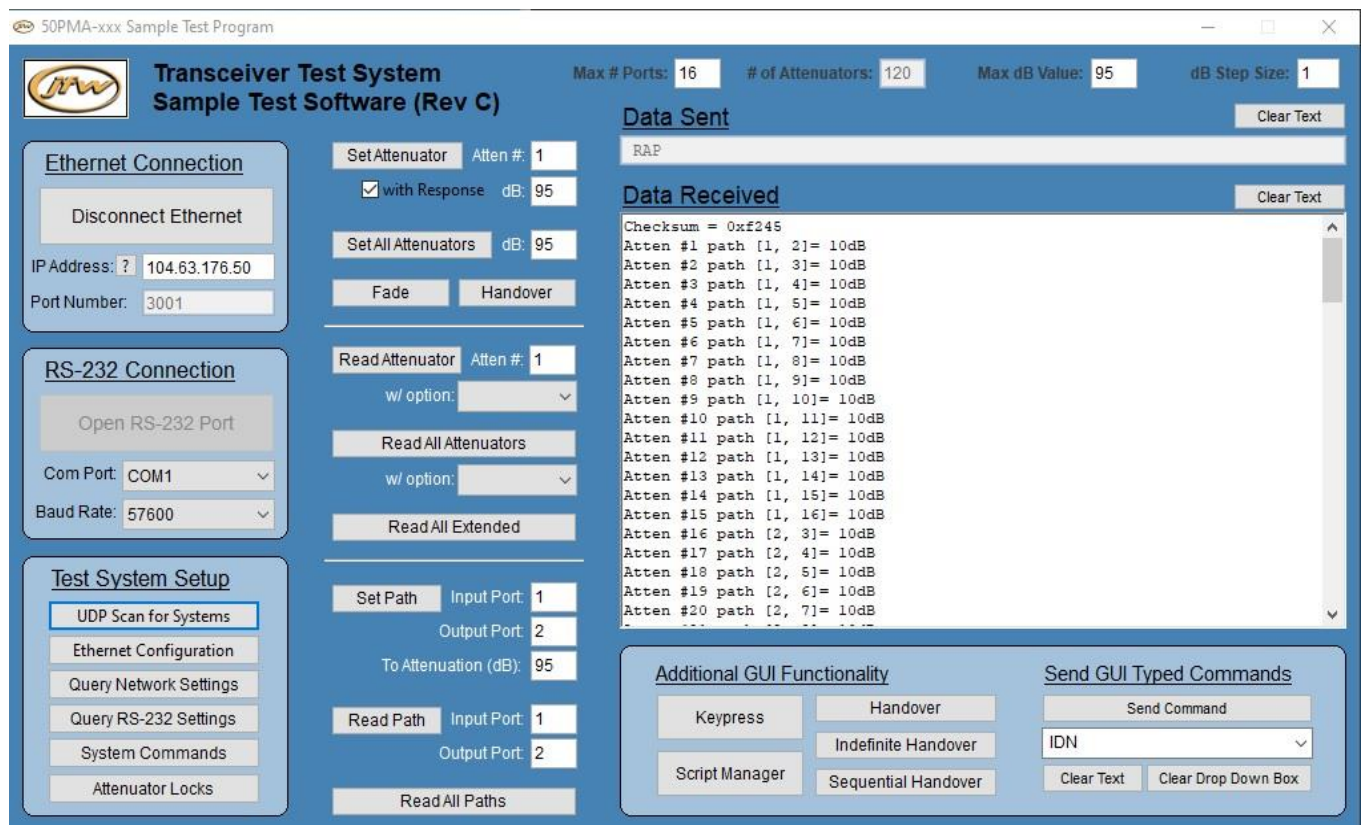
## 2.2 NETWORK CONFIGURATION

Update via RS-232 Connection

Make an RS-232 connection to the test system. A null modem type cable must be used to connect your COM port to the RS-232 port of the test system. Select your COM port number and Baud rate (57600 Baud factory default). Once the RS-232 port is open, click the ETHERNET CONFIGURATION button to open the configuration window. From the configuration window you can query the current settings, change to Fixed Address mode, change the maximum number of network connection, or set the IP Address/Gateway/Net mask. If you use a RS-232 connection you may update multiple network properties without losing your connection.

Update via Ethernet Connection

New test systems are shipped out in DHCP mode. If you connect the test system to your network it will automatically be assigned an IP address, gateway, and net mask from your DHCP server. To determine the current IP address use the UDP SCAN FOR SYSTEMS button located in the TEST SYSTEM SETUP mini-box. Using UDP protocol any JFW test system running firmware 3.0.0 (or higher) will respond with its current settings. Once you know the IP address you may make an Ethernet connection to the test system and use the ETHERNET CONFIGURATION window to configure settings. If you update network properties using a network connection, your network connection will close after each individual change.

All of the functionality of the ETHERNET CONFIGURATION window is derived from the NET remote command. See the Firmware Manual for details/examples of the NET command. Using a terminal program you could set up the network settings typing each NET command out by hand or sending a script.
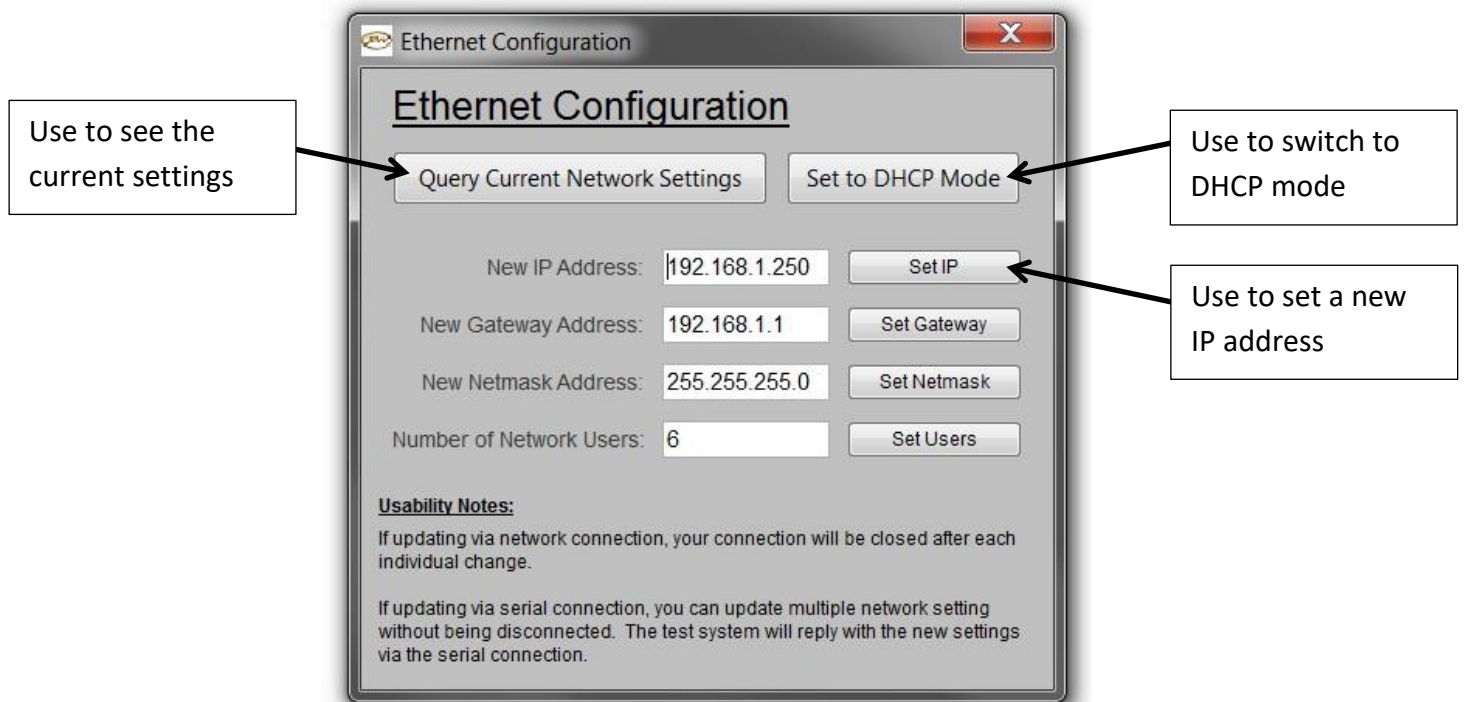
2.3 RS-232 CONFIGURATION

The RS-232 CONFIGURATION mini-box is located on the SYSTEMS COMMANDS window. You can update the baud rate or hardware flow control setting. The RS-232 settings can be set while you are connected to the test via a RS-232 connection or a network connection.

All of the functionality of the RS-232 CONFIGURATION mini-box is derived from the SERIAL remote command. See the Firmware Manual for details/examples of the SERIAL command. Using a terminal program you could set up the RS-232 settings typing each SERIAL command out by hand or sending a script.

Use to change test system's baud rate

Use to turn ON/OFF test system's hardware flow
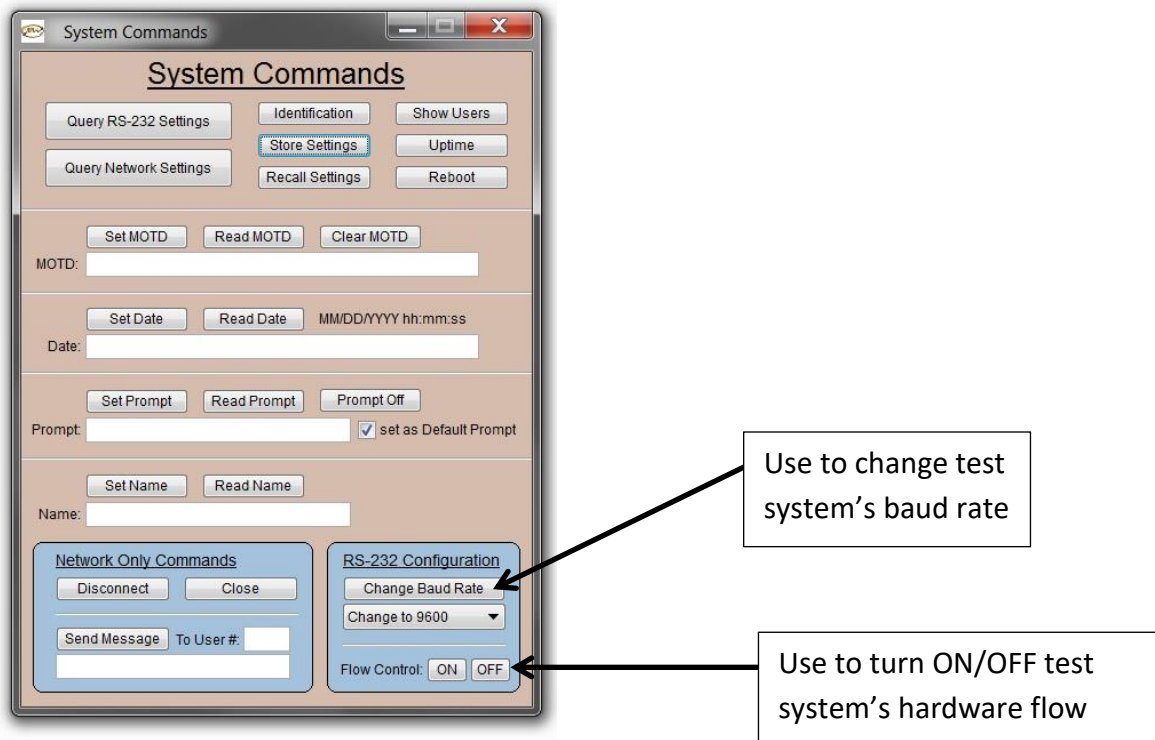
2.4 ATTENUATOR LOCKS WINDOW

To open this window click the LOCKS button located in the TEST SYSTEM SETUP mini-box. Commands sent/received can be viewed in the main window's Data Sent and Data Received text boxes.   The attenuator locks window provides the following functionality:

> ➢ Lock attenuator(s) to the current connection
> ➢ Unlock attenuators for use by all connections
> ➢ Steal a locked attenuator from another connection
> ➢ Remove an attenuator lock that was set by another connection
> ➢ Lock out a manual user (if the test system has a keypad/display)
> ➢ Lock block(s) to the current connection
> ➢ Unlock blocks for use by all connections
> ➢ Steal a locked block from another connection
> ➢ Remove a block lock that was set by another connection

All of the functionality of this window is derived from the ATTEN remote command. See the Firmware Manual for details/examples of the ATTEN command. Using a terminal program you could set up the attenuator locks typing each ATTEN command out by hand or sending a script. The syntax of each command as it is sent to the test system can be seen in the "DATA SENT" text box of the main window.
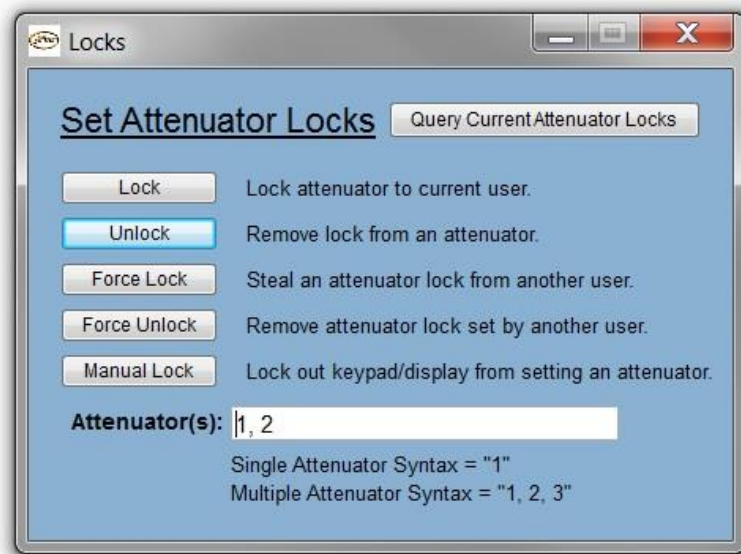
2.5 SYSTEM COMMANDS WINDOW

To open this window click the SYSTEM COMMANDS button located in the TEST SYSTEM SETUP mini-box. All of the functionality of this window is derived from the remote commands that can be found in the System Commands section of the Firmware Manual. Commands sent/received can be viewed in the main window's Data Sent and Data Received text boxes.

Query RS-232 ...... Respond with test systems current RS-232 port settings (i.e. Baud rate, Flow Control)
Query Network.... Respond with test systems current Network settings (i.e. IP Address, Net mask, Gateway, etc.)
Identification....... Respond with system identification information
Store.................... Stores the current settings for all attenuators
Recall.................. Recalls the dB settings saved with Store command and set all attenuators
Show Users.......... Return a table listing all current connections to the test system
Uptime .... Respond with the time that has passed since being turned on or rebooted
Reboot................. Remotely reboot the test system
MOTD .... Set/respond with the message of the day
Date..................... Set/respond with time and date for the system
Prompt .... Set/respond with the current command prompt setting
Name................... Set/respond with name of the current connection
Disconnect........... Disconnects the current network connection
Close.................... Closes all active network connections except for connection that sent command
Message .... Sent a message up to 480 characters to another connection
Change Baud .... Set the baud rate of the test system
Flow Control........ Set the hardware flow control of the test system
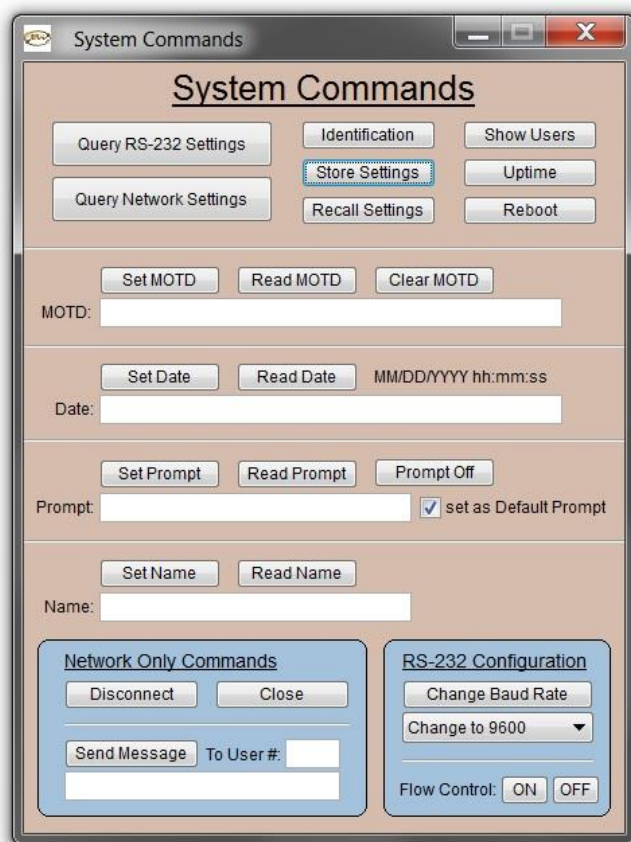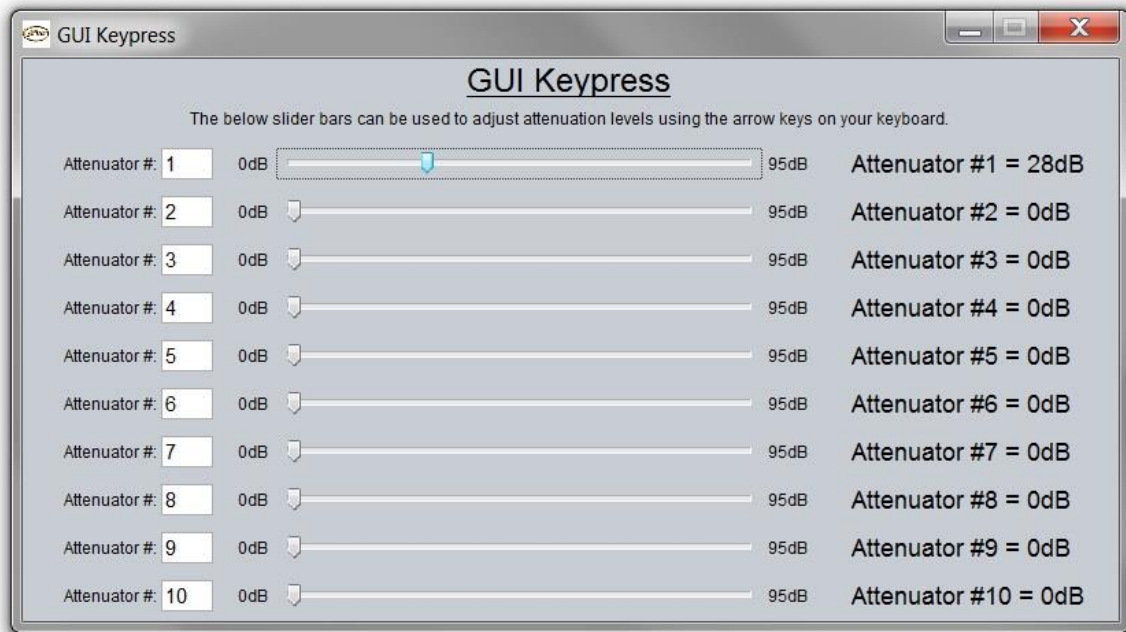
2.6 KEYPRESS WINDOW

To open this window click the KEYPRESS button located in the ADDITIONAL GUI FUNCTIONALITY mini-box. All of the functionality of this window is derived from the GUI test program. It sends a set attenuator commands (i.e `SA x y<CR>`) to the test system when the slider bar location is changed.

Quick Set Attenuator
You can move the slider bar for each attenuator to quick set an attenuator individually. You can slide the slider bar with your mouse or click on the slider bar and use the arrow keys to step forward/backward. The active slider bar is denoted by a box drawn around the entire slider bar.

2.7 HANDOVER WINDOW

To open this window click the HANDOVER button located in the ADDITIONAL GUI FUNCTIONALITY mini-box. All of the functionality of this window is derived from the GUI test program. It streams set attenuator commands (i.e `SA x y<CR>`) triggered by a timer to achieve the stepping functionality.

Handover Testing
This window can be used to perform handover testing. Set the interval time and click the check boxes to activate each attenuator. Click the START button at the top of the window. Each slider bar will begin moving and sending remote commands to the test system. The current attenuation setting of each attenuator is listed and updated as the attenuation changes. When the attenuation level reaches the "Stop at dB" value, the slider bar will stop moving.

Manual Handover Testing
Use the plus/minus buttons to manually keypress through a handover test. Click the checkboxes to active which attenuators you wish to manually step.

Quick Set Attenuator
You can move the slider bar for each attenuator to quick set an attenuator individually. You can slide the slider bar with your mouse or click on the slider bar and use the arrow keys to step forward/backward.
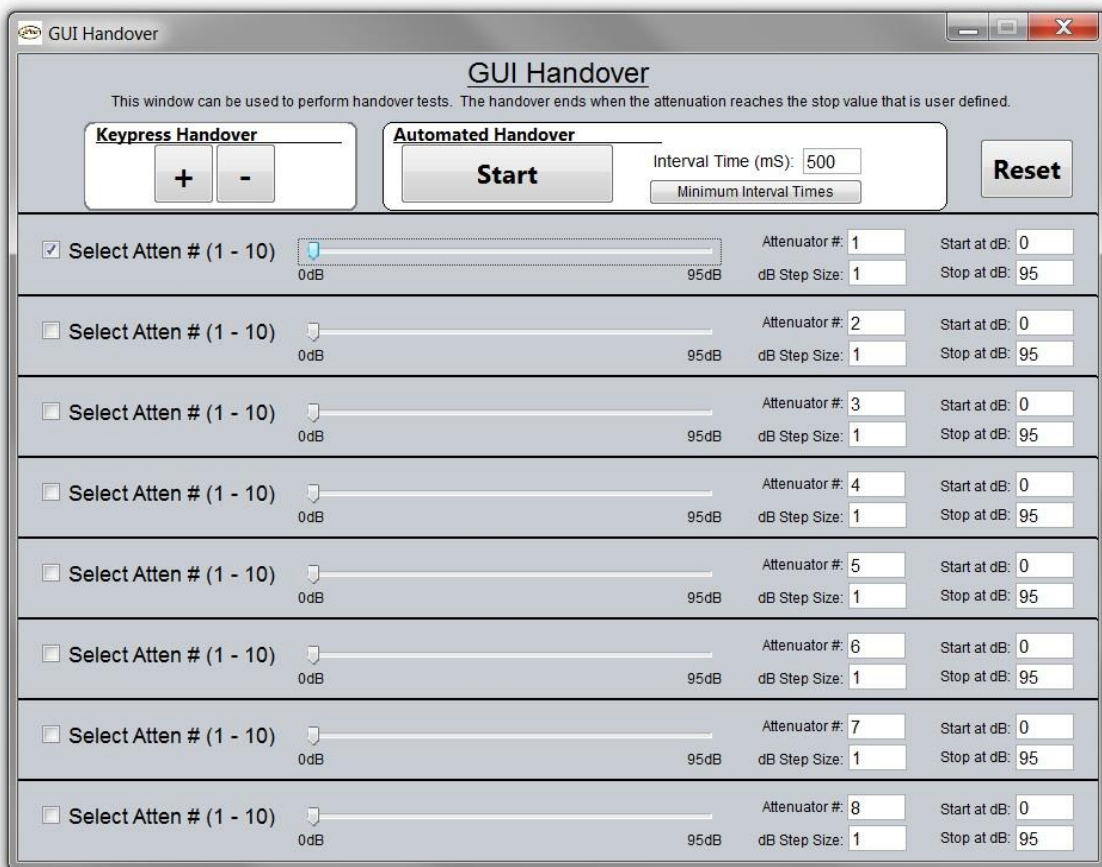
2.8 INDEFINITE HANDOVER WINDOW

To open this window click the INDEFINITE HANDOVER button located in the ADDITIONAL GUI FUNCTIONALITY mini-box. All of the functionality of this window is derived from the GUI test program. It streams set attenuator commands (i.e `SA x y<CR>`) triggered by a timer to achieve the stepping functionality.

Functionality
This window functions just like the HANDOVER window except that it does no stop stepping when it reaches the user specified stop dB value. When it reaches the stop dB value, it begins stepping in the opposite direction. It does not stop oscillating between the start/stop attenuation values until the user pauses or resets the operation.

Manual Handover Testing
Use the NEXT button to manually keypress through a handover test. Click the checkboxes to active which attenuators you wish to manually step.

Quick Set Attenuator
You can move the slider bar for each attenuator to quick set an attenuator individually. You can slide the slider bar with your mouse or click on the slider bar and use the arrow keys to step forward/backward.
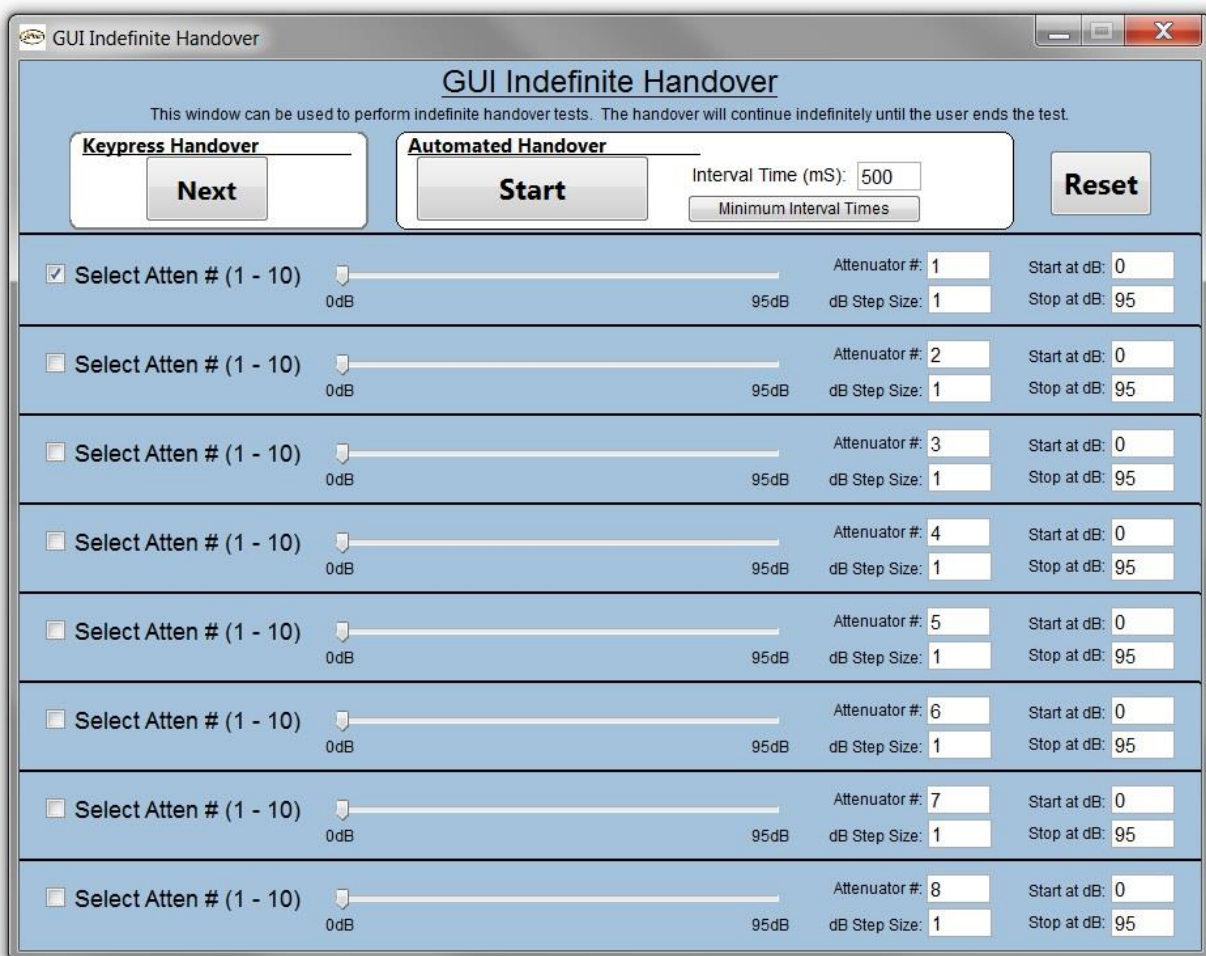
2.9 SEQUENTIAL HANDOVER WINDOW

To open this window click the SEQUENTIAL HANDOVER button located in the ADDITIONAL GUI FUNCTIONALITY mini-box. After changing settings, you must click the RESET button for the window to operate properly. The RESET button resets the slider bars to their proper starting position.

"Reset & Repeat"
When it reaches the final dB setting of the final attenuator, it will restart the entire sequence from the beginning.

"Reverse from Last"
When it reaches the last dB setting of the last attenuator, it steps back through the entire sequence in reverse order starting with the last attenuator listed (i.e. bottom slider bar).

"Reverse from First"
When it reaches the last dB setting of the last attenuator, it steps back through the entire sequence in reverse order starting with the first attenuator listed (i.e. top slider bar).

"Stop"
When it reaches the last dB setting of the last attenuator, it stops.

"Dual Handover w/ Pause"
This option requires a minimum of 3 attenuators. It activates two slider bars at a time (i.e. two attenuators). It performs a 2 attenuator handover. The first pair of attenuators will be to top two slider bars. The last pair of attenuator will be the bottom slider bar and the top slider bar. The entire sequence will repeat after the specified pause duration.
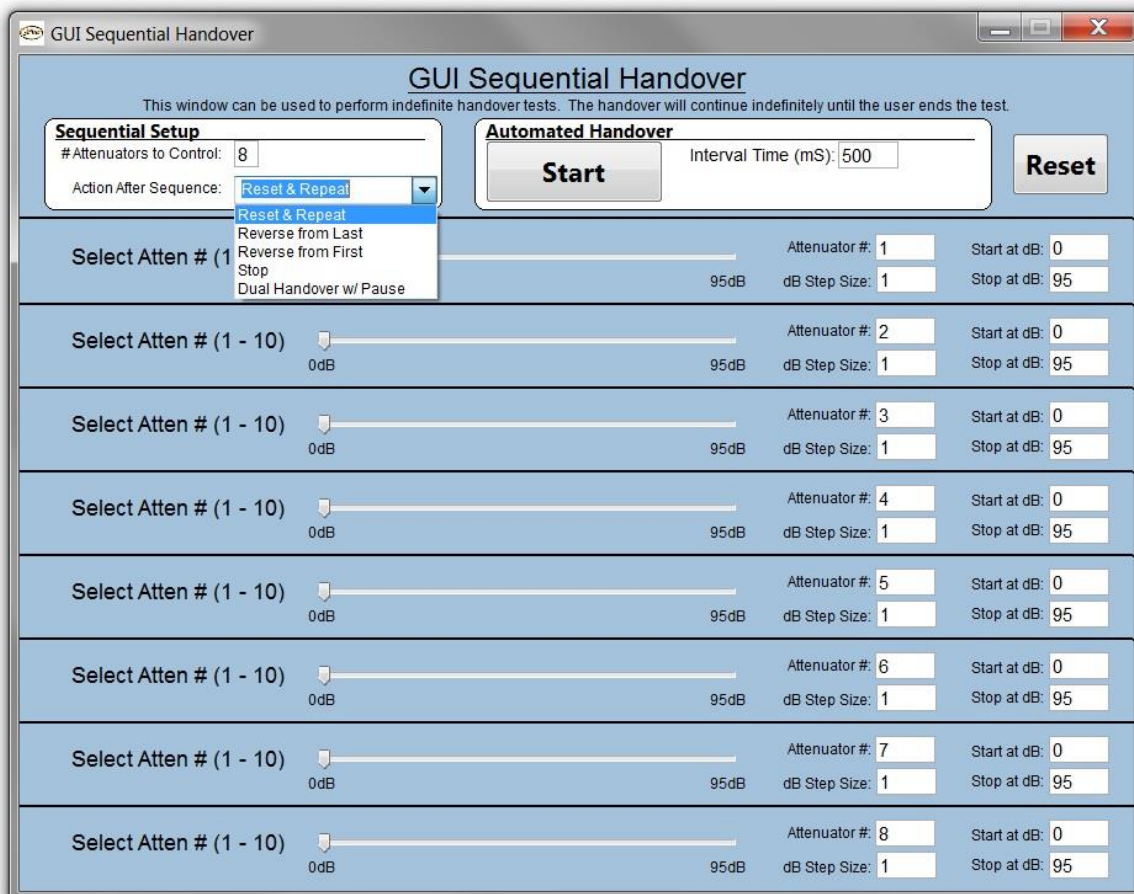
2.10 SCRIPT MANAGEMENT WINDOW

The Script Management screen allows you to send long complicated scripts to the test system from the test program. You can write your own script in a text editor or directly into the "Script to Send" text box. Traditionally, if you were sending a script through a Telnet service like PuTTY, it sends the entire script all at once. If the script is very long, this could overflow the receive buffer of the test system which would cause the test system to crash, reboot or lockup. Since many of these kinds of long scripts are repetitive, the Script Management window allows a user to send a smaller script repetitively and control the time duration between the scripts.

Saving and Loading Scripts
The Script Management window allows you to save your custom scripts as .jfw (.txt) files. The file will contain all of the information in Script Manager including the Description, Number of times to Send, Pause Duration between Scripts, the Initializing Script, and the Main Script.

Recording Scripts
Recording a script is helpful if you cannot remember the exact command format for a particular command and also eliminates typing errors from entering them manually. By selecting the "Record Script" checkbox, all commands sent from the rest of the test program will NOT be sent to the test system but will instead be recorded in the "Script to Send" text box.
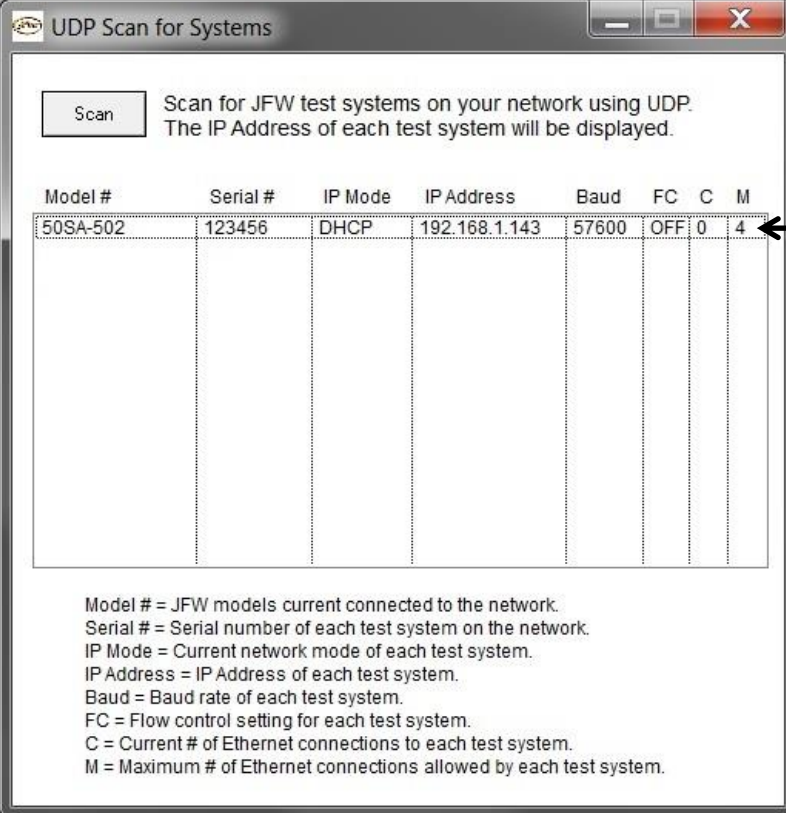
Calculate Script Duration
This feature calculates the entire length of the script in the "Script to Send" text box in milliseconds. This accounts for 3 milliseconds of processing time for each command. Commands that execute over time such as Pause, Fade, and Variable Handover are also included in the calculation.
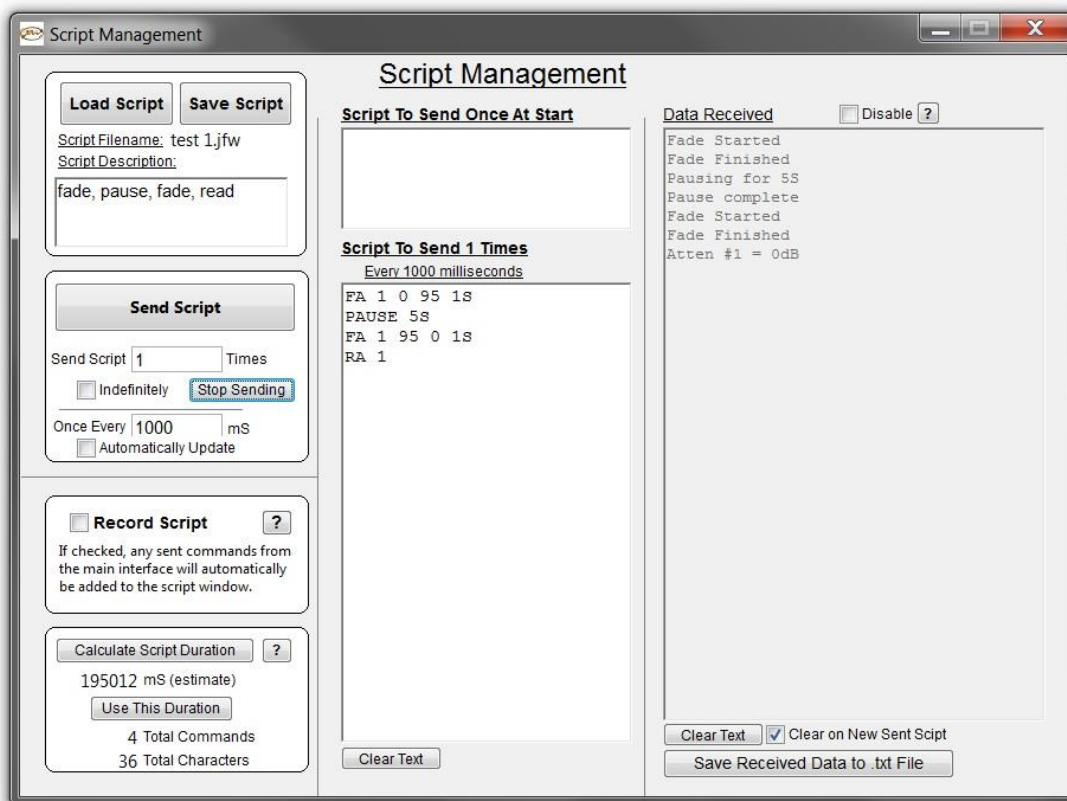
2.11 UDP SCAN FOR SYSTEMS

To open this window click the UDP SCAN FOR SYSTEMS button located in the TEST SYSTEM SETUP mini-box. This window is helpful when you first receive a test system and the test system does not have a front panel display showing the current IP address or baud rate. Just click the SCAN button and any JFW test system on your network running firmware 3.0.0 (or higher) will respond with its model number, serial number, and port configuration settings. The request and responses are sent via UDP protocol. If you have multiple test systems with the same model number, then use the serial number as their unique identifier.

Each line shows the current settings for a test system on your network.