



GenWatch3®
GW_GenSPOut
Software Version 2.23.5
Module Book

GenWatch₃

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Refer to the *Troubleshooting & Support* section of the GenWatch3 Manual Shell (Book 600-2.23.5-AA.1) for complete support and contact information.

Document History

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2.13	Revisions Before Release	ATG
2.14	Revisions Before Release	JAW
2.15	Revisions Before Release	REB
2.16	Revisions Before Release	JPS

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Goals

This manual describes the role and function of the GW_GenSPOut module in the GenWatch3 solution.

Who Should Read This Manual?

This manual is written for the intended audience of mid-level trunked radio system users and mid-level PC users.

How This Manual Is Organized

This manual is organized as follows:

- **Overview:** Describes the GW_GenSPOut module and provides an overview of its features.
- **GW_GenSPOut Setup:** Describes the process of setting up the GW_GenSPOut module to suit your needs.

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 describes the GW_GenSPOut module and provides an overview of its features.

This chapter contains the following sections:

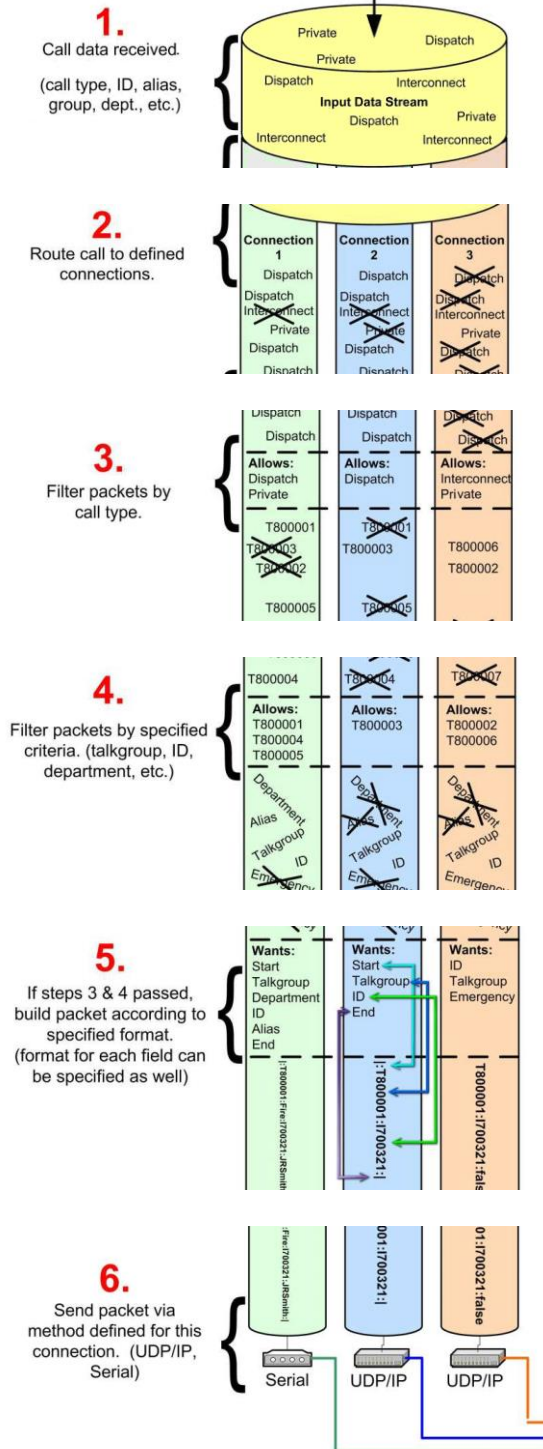
- **What is GW_GenSPOut?:** A brief description of the purpose behind GW_GenSPOut.
- **Features:** Describes the features provided by GW_GenSPOut.
- **Display Overview:** Describes the GW_GenSPOut graphical user interface (GUI) data entry and display areas.

What is GW_GenSPOut?

The “**Genesis Specified Packet Output**” is a formatting and filtering engine for GenWatch3. GW_GenSPOut allows GenWatch3 to function as a powerful and flexible middleware solution.

GW_GenSPOut starts with the packet stream flowing through GenWatch3. The packets are parsed and duplicated to feed all the outbound connections that you have set up. Then the filters take over and eliminate any unnecessary data. Finally, GW_GenSPOut reassembles the data you want to see in the order that you want to see it and passes it out to your device.

Let us break this down in detail



Features

The GW_GenSPOut feature set:

- Receives data from any GenWatch3 source.
- Filters data received.
 - Filter on any or all receivable fields.
 - Create complex (Boolean algebra) filters to specify *exactly* what information you want to see.
- Forms output from data received.
 - You select the fields to send out.
 - You set the format and order of the fields.
 - Specify prefix
 - Specify suffix
 - Trim
 - Pad
 - Replace
 - And more...
 - Add other fields
 - Static text that you specify
 - Time/date in many different formats
- Create timed output packets.
 - Can serve as heartbeat monitors or time sync packets.
- Send data out through one or more connection types.
 - TCP/IP Server
 - UDP Server
 - Serial Port
- Import/Export settings between GenSPOut installations.

With GW_GenSPOut you can take one stream of data and send it to many locations, or even split the data into partial streams based on filters. You can also use GW_GenSPOut to take several GenWatch3 inputs and combine them into one easy to process, formatted stream. The possibilities are nearly limitless!

Display Overview

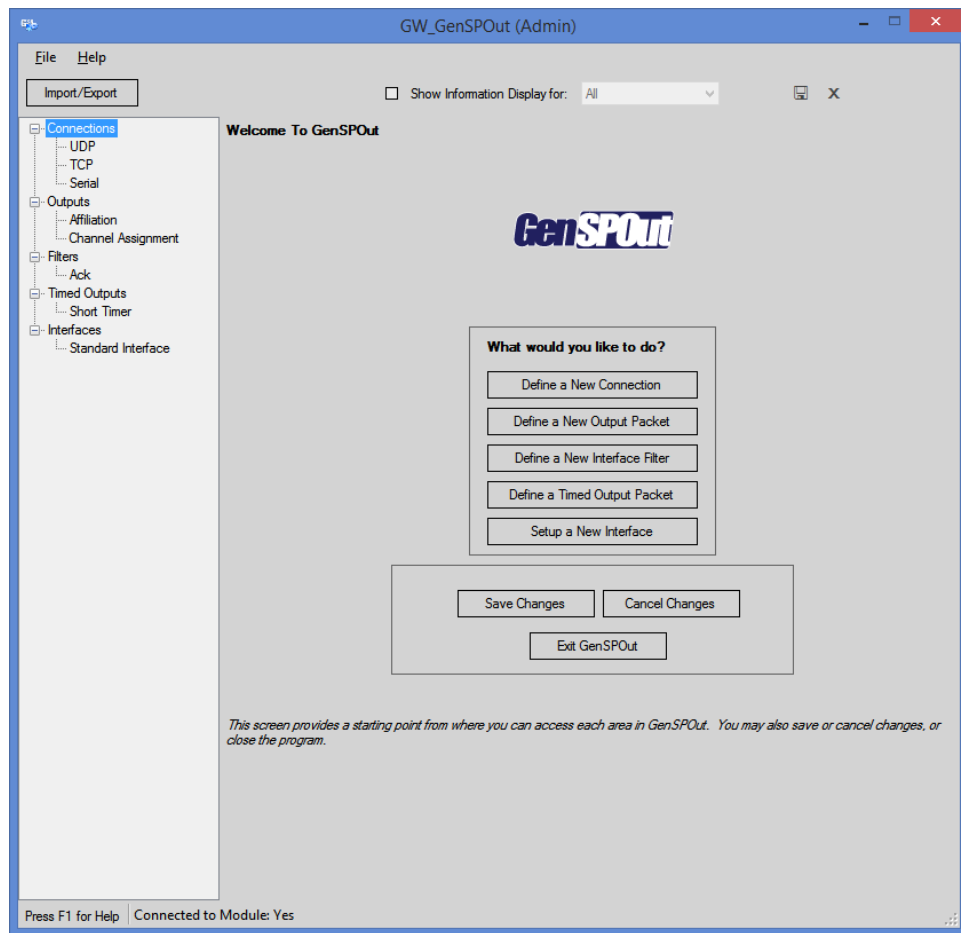


Figure 1.1 – GW_GenSPOut GUI

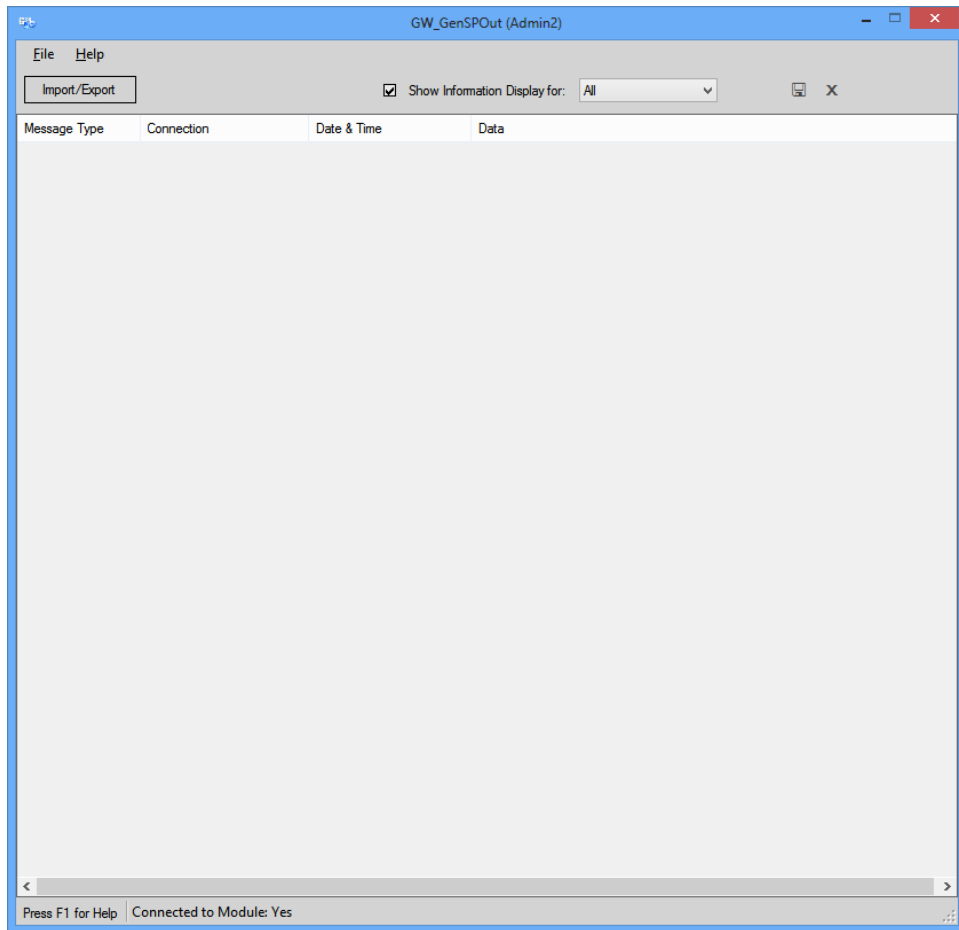


Figure 1.2 - Information Display

The *Information Display* allows you to see exactly what information is being sent out from one or all the outbound connections.



Data exceeding 259 characters in length will be truncated at 256 characters and end with '...' to indicate not all information is visible.

This chapter describes the process of setting up the GW_GenSPOut module to suit your needs.

This chapter contains the following sections:

- **Default Page:** Describes the Default Page.
- **Connection Page:** Describes the Connection Page.
- **Output Page:** Describes the Output Page.
- **Filter Page:** Describes the Filter Page.
- **Timed Output Page:** Describes the Timed Output Page.
- **Interface Page:** Describes the Interface Page.
- **Importing and Exporting:** Describes the import and export feature.

The Default Page

Shown in Figure 1.1, this page provides an access point for adding components to GW_GenSPOut, saving or canceling changes, and closing the GUI. You can always bring up the default page by clicking on one of the component names (i.e. **Connections**) in the navigation tree.

You can alternatively add new GW_GenSPOut components by right-clicking on an item in the navigation tree.

The Connection Page

Figure 2.1 – Connection Page

Figure 2.1 shows the Connection Page. Adding a new connection or selecting an existing one in the navigation tree will show this page.

You may enter a name by which you can refer to this connection in the future. As you change the name, you will see the change reflected in the navigation tree.



A connection is a data path. It represents a destination (data stream) for data packets that will be sent from GW_GenSPOut to another device.

Connection Protocols

There are three possible types for connections:

- TCP Server
- UDP Server
- Serial

TCP Server

A TCP Server connection binds to a port on the local GW_GenSPOut machine and listens for clients to connect to it. Once a client has connected, GW_GenSPOut will begin sending packets to that client. Data sent from GW_GenSPOut over a TCP connection will be formatted using ASCII character encoding. Characters unsupported in ASCII will be replaced with a question mark (?).

Required Fields

Local Port: This value identifies the port on the GW_GenSPOut machine that will be used for communication. This is the port number that must be specified for any client looking to communicate with GW_GenSPOut.

Optional Fields

Remote Host: The remote machine that can connect to this server. This value can be either an IP address (xxx.xxx.xxx.xxx) or a machine name.



If this value is specified, only clients originating from this computer name or IP address will be allowed to successfully connect. Leaving this value blank will allow any client to connect.

Remote Port: The remote port that can connect to this server.



If this value and a **Remote Host** value are specified, then only the remote host connecting from this port will be allowed to connect to the TCP server. If the **Remote Host** is not specified, a client from any host can connect, but only if it is bound to this port. Setting this value to zero will not restrict incoming connections to a specific remote port.

UDP Server

A UDP Server broadcasts packets over a network using the UDP protocol. This protocol does NOT guarantee arrival of packets at the receiving end. Data sent from GW_GenSPOut over a UDP connection will be formatted using ASCII character encoding. Characters unsupported in ASCII will be replaced with a question mark (?).

Required Fields

Remote Host: The IP address to which this server will send UDP packets. This value can be either an IP address (xxx.xxx.xxx.xxx) or a machine name. To send packets to the entire network, enter 255.255.255.255 as the IP address. Alternatively, you can specify group broadcasts via 192.168.255.255, etc. To send UDP packets to a specified host only, enter a specific IP address here.

Local Port: The port on the local GW_GenSPOut machine from which this UDP Server will send data packets.

Remote Port: The port to which the UDP Server will attempt to send packets. This is the port on which UDP clients should listen for datagrams.

Serial

A serial connection uses the RS232 protocol to communicate to a remote device over a wired cable. Data sent from GW_GenSPOut over a serial connection is encoded as UTF-8.

Required Fields

COM Port: The serial port number on the local GW_GenSPOut computer that the wired cable data should be sent on.

Baud Rate: The speed at which data should be communicated over the serial connection. The default, and most common value, is 9600.



Baud rates lower than 2400 may result in serial errors displayed and data loss in GW_GenSPOut when sending large amounts of data.

Data Bits: The number of data bits per byte transferred over a serial connection. The default, and most common value, is 8.

Parity: This represents the parity-checking protocol. The default, and most common, value is “None.”

Stop Bits: Used to synchronize serial data transmission. The default, and most common, value is 1.

Flow Control: The handshaking protocol for serial port transmission of data. The default, and most common, value is “Hardware.”

Optional Fields

N/A

Once you have finished entering all data for a connection, it is always a good idea to click **Save** in the control bar.

Output Page

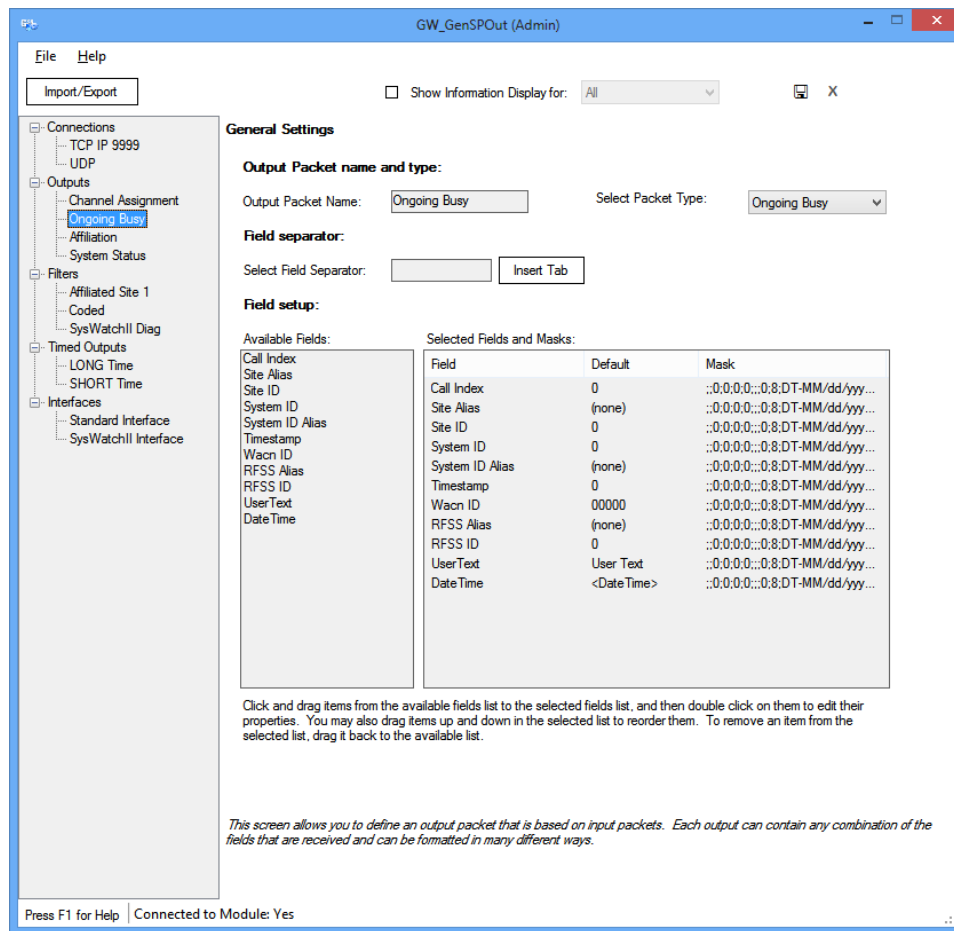


Figure 2.2 – Output Page

Figure 2.2 shows the Output Page. Adding a new output or selecting an existing one in the navigation tree will bring up this page.

You may enter a name by which you can refer to this output in the future. As you change the name, you will see the change reflected in the navigation tree.

What is an Output?

An output is a packet of data that will be sent out on one or more connections each time a certain packet type of information is received by GW_GenSPOut. There are many trunked radio system packet types, the most common of which are:

- **Affiliation:** Indicates a radio is active on a group
- **Association:** Indicates a radio is active on a conventional channel
- **Busy:** Indicates that a busy condition has occurred
- **Call Update:** Received when a call has been updated
- **Channel Assignment:** Indicates an RF channel has been activated on the system
- **Current Control Channel:** Notifies radios of the current frequency on which data is being transmitted
- **Deaffiliation:** Indicates a radio is no longer active on a group
- **Deregistration:** Indicates a radio is no longer active on a site
- **Disassociation:** Indicates a radio is no longer active on a conventional channel
- **Emergency Alarm:** Received when the emergency button is pushed on a radio
- **Emergency Alarm Ack:** Received when an emergency alarm is acknowledged by another device
- **End of Busy:** Issued when a busy is ended
- **End of Call:** Issued when a call is ended
- **GPS Location:** Indicates that the radio's GPS device is updating or restating its GPS location information (requires Location module)
- **Location:** Indicates that the IMW is reporting a radio's GPS location information (requires Connect module)
- **Message:** Indicates a radio user has sent a message update
- **Message Ack:** Received when a device acknowledges a message
- **Ongoing Busy:** Received regularly while a busy condition persists
- **Ongoing Channel Assignment:** Received regularly while a channel assignment is still active
- **Presence:** Indicates that the IMW is reporting a radio's presence information (requires Connect module)
- **Registration:** Indicates a radio is active on a site
- **Ring:** Indicates that a private call request has been made
- **Ring Ack:** Indicates acknowledgment of a private call request
- **Ring Update:** Indicates that a private call request is in progress
- **Status:** Indicates a radio user has sent a status update
- **Status Ack:** Received when a device acknowledges a status update
- **System Status:** Reports current system status

Each of these packet types has its own set of fields that are available for output when they are received. Selecting a packet type from the packet type list will populate the **Available Fields** list with these fields.

Adding Fields to an Output

Add fields to an output by clicking on a field in the **Available Fields** list and dragging it into the **Selected Fields and Masks** list. Upon doing this, you will see the field show up as selected with a default value and mask. The **Available Fields** list also supports multiselect. To select more than one field at a time, click on the first field you wish to add, then **Shift + click** or **Ctrl + click** additional fields. You can then drag all the selected items from the **Available Fields** list into the **Selected Fields and Masks** list.

To rearrange the order of fields you have selected, click and drag them up and down in the **Selected Fields and Masks** list.

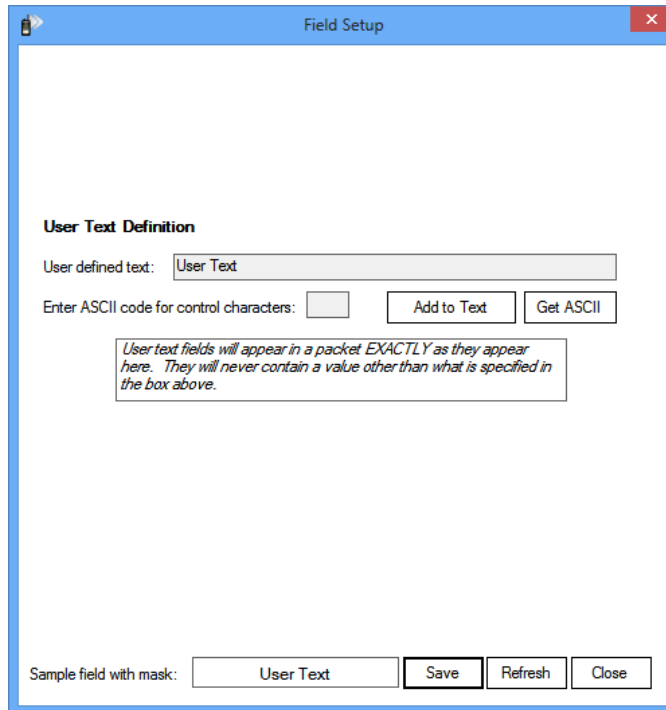
To remove a field from the **Selected Fields and Masks** list, click on it and drag it out of the **Selected Fields and Masks** list.



Certain fields will always be set to the default value depending on the information provided by your system. Use the GW_Activity GUI's packet details view to ensure a field contains the value you wish to include in your output packet.

Editing Selected Fields

Once you have selected your fields, you can edit their properties by double-clicking on them in the **Selected Fields and Masks** list. If the field you double-clicked is a **User Text** field, you will see the following window:



The image shows a window titled "Field Setup" with a blue border and a red close button in the top right corner. Inside the window, there is a section titled "User Text Definition". Below this title, there is a text input field labeled "User defined text:" containing the text "User Text". Below this field, there is a label "Enter ASCII code for control characters:" followed by a small text input field, a button labeled "Add to Text", and a button labeled "Get ASCII". Below these elements, there is a text box containing the text: "User text fields will appear in a packet EXACTLY as they appear here. They will never contain a value other than what is specified in the box above." At the bottom of the window, there is a label "Sample field with mask:" followed by a text input field containing "User Text", and three buttons: "Save", "Refresh", and "Close".

Figure 2.3 – User Text Definition Window

Here you can enter static text that will be sent out as the value for this field every time the packet type for this output is received.

If you wish to add ASCII control characters to the text, enter the numeric value for them in the **ASCII control character** field and click **Add to Text**.

An example of the output can be seen at the bottom of the window.

If you double-click on a DateTime or Timestamp field, then you will see the following window:

Date and/or time field:

Select date or time format for this field:

☐ Send In UTC Time

A user defined Date/Time field will contain a time or date indicating the time when GenSPOut sent the packet on the connection.

General Settings

Default value: Case:

Prefix and Suffix

Prefix: Suffix:

Trim Settings

Trim characters from the beginning of the field.

Trim characters from the end of the field.

☐ Set maximum length Maximum length is from the

Pad Settings

Pad side of field with until field is characters long.

Replacements

Replace occurrences of: with this text:

+
 -

Sample field with mask:

Figure 2.4 – Date and Time Field Window

Here you can select the format in which you would like the date or time to appear. You can also select to send the time in UTC if desired as well as the generic fields described below. An example of the output can be seen at the bottom of the window.



The following formats have fixed UTC settings:

- **LocalTime** – Always uses local time (non-UTC).
- **FileTime & FileTimeUTC** – 100-nanoseconds since Jan 1, 1601

If you double-click on any other field, then you will see the following window:

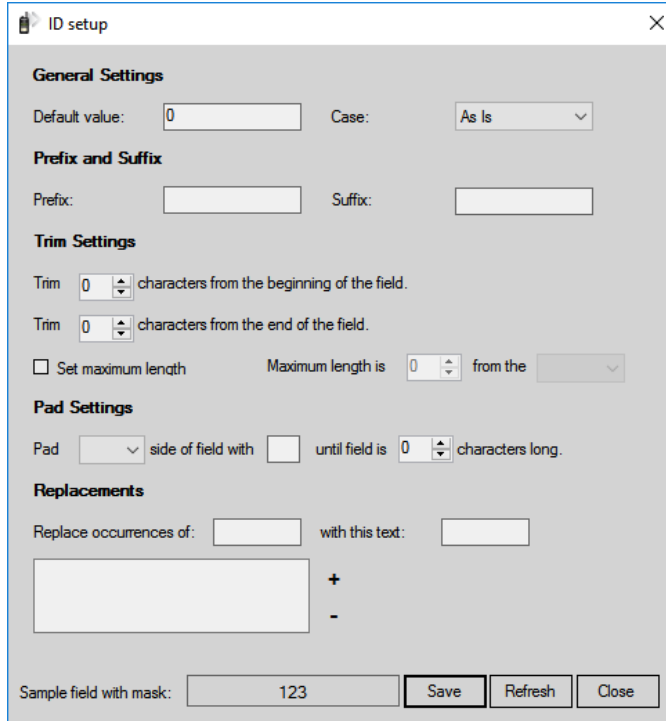
The image shows a dialog box titled "ID setup" with a close button (X) in the top right corner. The dialog is divided into several sections: "General Settings" with "Default value:" (0) and "Case:" (As Is); "Prefix and Suffix" with "Prefix:" and "Suffix:" text boxes; "Trim Settings" with two "Trim" spinners (both at 0) and a checkbox for "Set maximum length"; "Pad Settings" with a "Pad" spinner (0) and a checkbox for "Set maximum length"; and "Replacements" with "Replace occurrences of:" and "with this text:" text boxes. At the bottom, there is a "Sample field with mask:" text box containing "123" and three buttons: "Save", "Refresh", and "Close".

Figure 2.5 – Setup Window

Here you can format how the value will appear. You have the following options:

Default Value

The value entered here will be passed on if no value is received for this field.

Case

Here you can select whether you would like text received in this field to be passed on in upper case, lower case, or as it is received.

Prefix

The value entered here will be added to the beginning of the value received before it is passed on.

Suffix

The value entered here will be added to the end of the field before it is passed on.

Trim

The number of characters to be removed from either the beginning or end of the value received.

Set Maximum Length

By selecting this option, you can limit the size of the value in this field. Choose a maximum length and which side of the value you want to start counting from.



A given value of 123456789 with a maximum length of 5 from the right would equal 56789, and from the left would equal 12345.

Pad

By entering values here, you can pad a character (typically '0') to the left or right side of the value until the field is a certain number of characters long.



For example, by selecting Left, entering a 0, and selecting 5, a value of 123 would become 00123.

Replacements

This allows you to replace certain characters found in the received value with different characters. Enter the value you want replaced, what you want it replaced with, and click **Add to List**. To remove a replacement, select it in the list and click **Remove from List**. A typical use of this feature would be to replace all occurrences of "0" with "False", and all occurrences of "1" with "True."

As before, you can always see an example output using the mask you have created at the bottom of the window.

When you are done, click **Save**.



This will not save the output, only the field. To save the output you must click the **Save** button in the control bar.



The order of operations for formatting fields is as follows:

1. Trim Left
2. Trim Right
3. Max Length
4. Replacements
5. Pad Left
6. Pad Right
7. Prefix
8. Suffix
9. Case

Filter Page

GW_GenSPOut (Admin)

File Help

Import/Export

Show Information Display for: All

Filter Setup

Filter details:

Filter Name: Affiliated Site 1 Filter Type: Standard

Add to filter:

Field	Condition	Value
Ack		

Add Remove

Current filter:

Operator	Field	Condition	Value
WHERE	Affiliated Site	Equals	1

Edit filter:

Operator	Field	Condition	Value
			0

This screen allows you to define a filter that can later be applied to an interface. It will allow the interface to send only packets that pass the criteria you specify. An example would be sending out only packets relating to talkgroup T800123.

Press F1 for Help Connected to Module: Yes

Figure 2.6 – Standard Filter Page

Figure 2.6 shows the Filter Page. Adding a new filter or selecting an old one in the navigation tree will bring up this page.

You may enter a name by which you can refer to this filter in the future. As you change the name, you will see the change reflected in the navigation tree.

What is a Filter?

A filter restricts what packets of information will be passed on by GW_GenSPOut on any given **Interface** (this may apply to more than one **Output**).

Adding Filter Items

Any field that can be received by GW_GenSPOut will be available to be selected as a field to filter by (even though it may not be receivable, given the outputs selected for an interface). Select one of these fields, select a condition (Equals, Less than, Greater than, etc.), enter a value, and click **Add**.



Note that there is a limit of 10 filter items per filter. Once the maximum number of filter items has been added, the controls in the *Add to Filter* section will become disabled until an existing filter item is removed.

Editing Filter Items

Click a filter item in the filter list to edit it in the area at the bottom of the page. Change the operator field to determine how filter items should relate to each other (And, Or, And not, Or not). The first filter item in the list must always be “Where” or “Where not.” Use the parentheses to correctly define the order of operations for the filter. Algebraic rules apply.

You can also click **Remove** to remove the selected filter item from the filter.

SystemWatchII Filter

The SystemWatchII filter allows you to control which packets are sent out through a GenSPOut interface. This filter can only be applied to SystemWatchII interfaces.

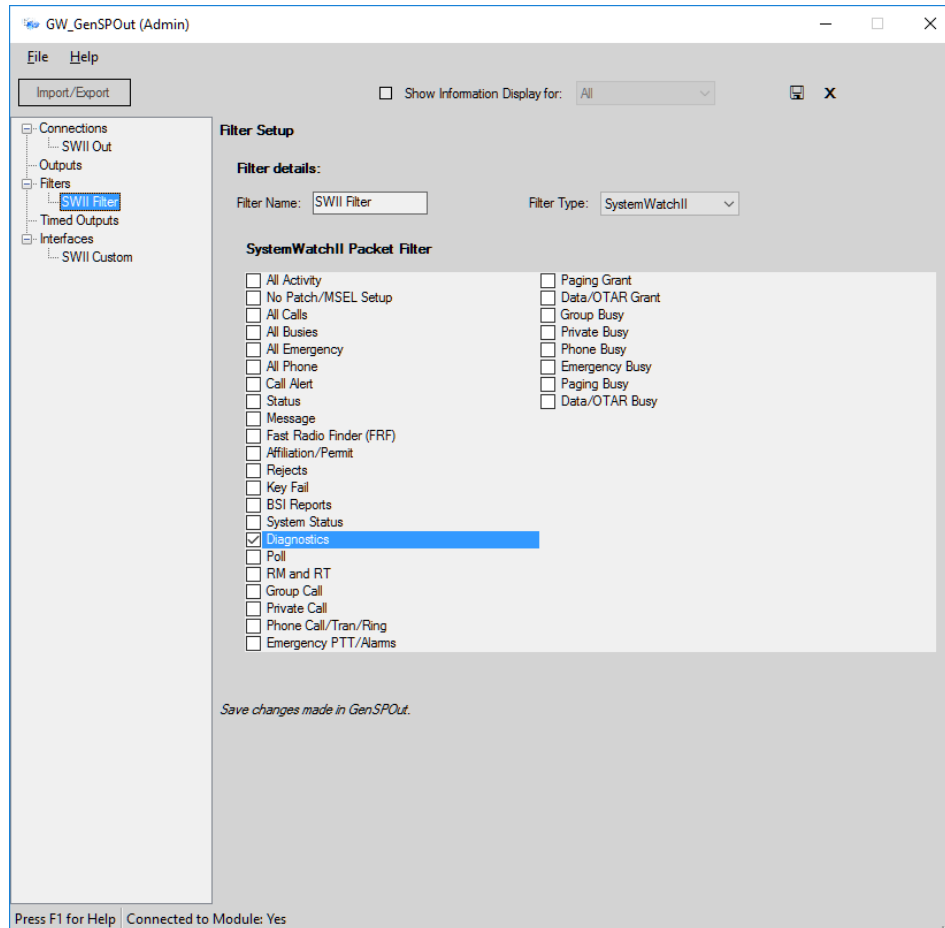


Figure 2.7 – SystemWatchII Filter Page

ATIA Filter

The ATIA filter allows you to control which packets are sent out through a GenSPOut interface. This filter can only be applied to ATIA interfaces.

The ATIA Opcodes are grouped under their corresponding ATIA Command Type. These ATIA Command Types (prepended with the word Flexible) are defined on pages 2-5 and 2-6 in the following Motorola document:

Flexible Air Traffic Information
Access (ATIA) TID Manual
Interface Release 1.151.0
6802800U72-AV Released March 2019.

The ATIA Opcodes are described under their corresponding ATIA Command section within the same Motorola document.

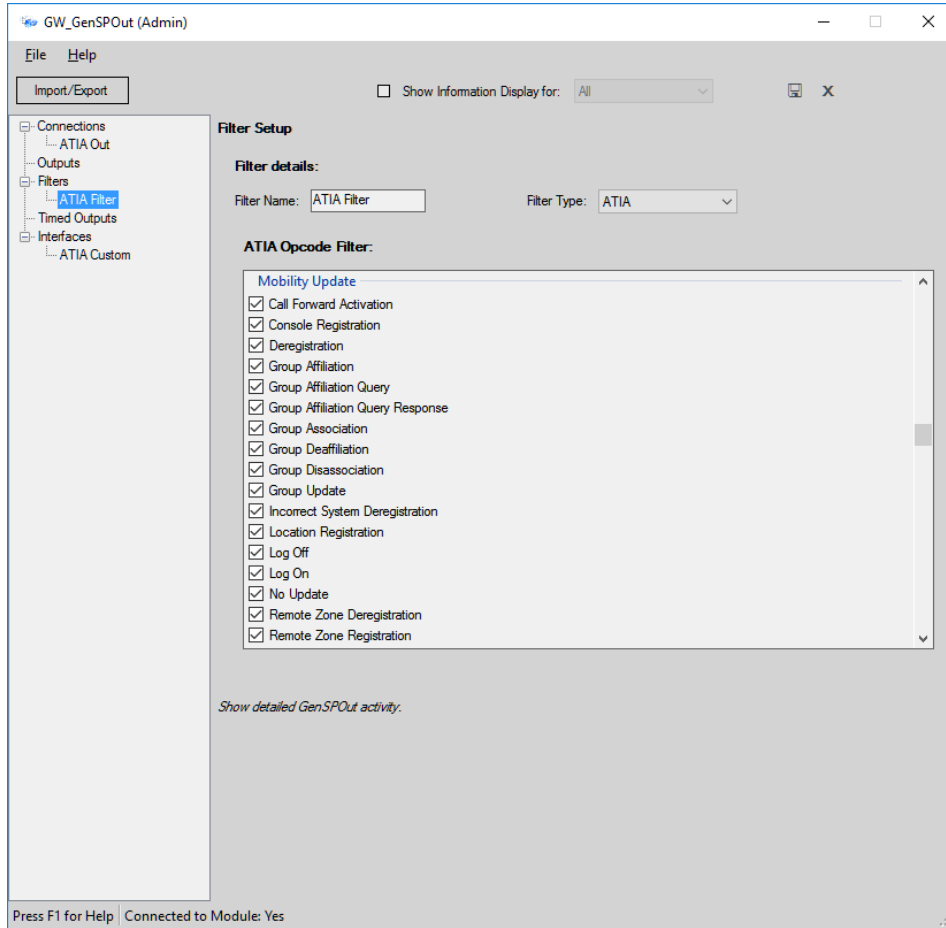


Figure 2.8 – ATIA Filter Page

ATIA Packets are sent via the ATIA custom output interface. See the *Interface Page* section of this document for more information.

Timed Output Page

Figure 2.9 – Timed Output Page

Figure 2.9 shows the Timed Output Page. Adding a new timed output or selecting an existing one in the navigation tree will bring up this page.

You may enter a name by which you can refer to this timed output in the future. As you change the name, you will see the change reflected in the navigation tree.

What is a Timed Output?

A timed output is a defined string of text that is sent out at specified intervals by GW_GenSPOut that may or may not contain the current date and/or time in a specified format. This feature is typically used as a heartbeat monitor to assure a client that the GW_GenSPOut module is still connected.

To add control characters to the text, enter the numeric value of the code in the ASCII field and click **Add to Text**.

If invalid characters are entered into the textbox, GW_GenSPOut will remove the invalid characters as you type. In this case, you will see the following message:

This textbox contained invalid characters. These characters were removed.

To add a date and/or time to the text, select a date/time format from the list and click **Add to Text**.

To change the frequency at which this packet will be sent, change the value in the *Frequency* section to the number of milliseconds by which you wish the packets to be separated.

Interface Page

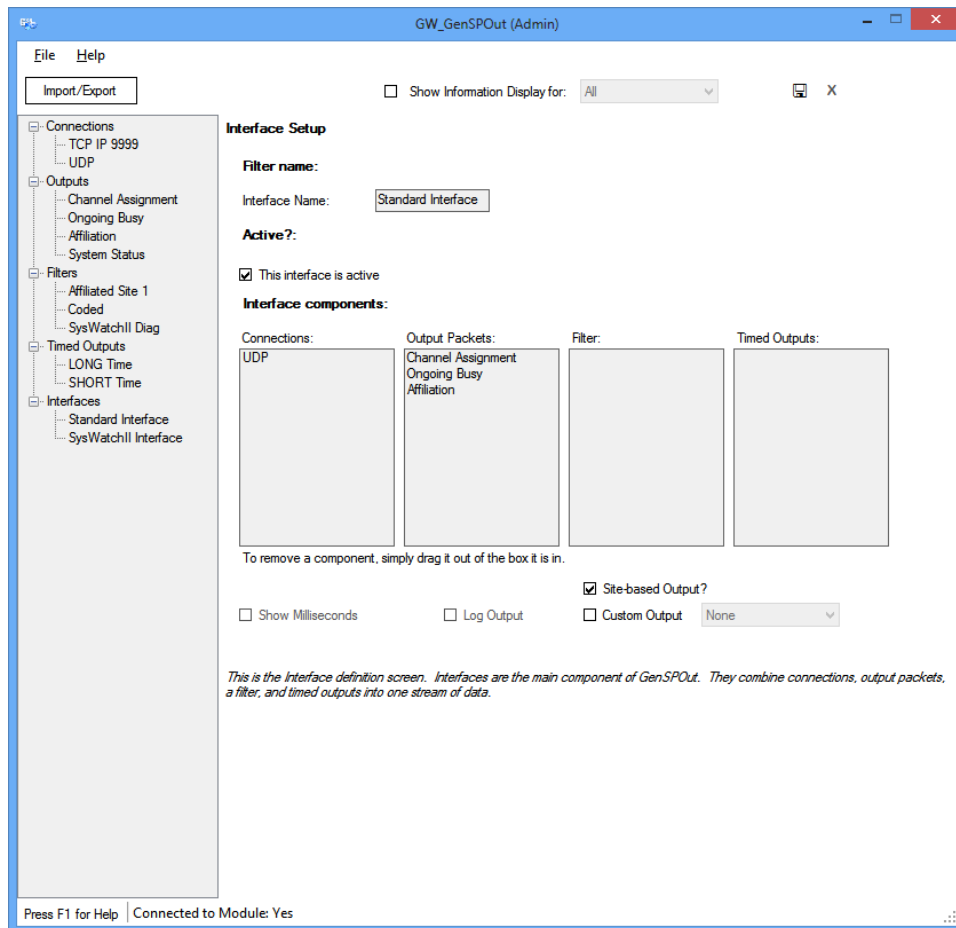


Figure 2.10 – Interface Page

Figure 2.10 shows the Interface Page. Adding a new interface or selecting an existing one in the navigation tree will bring up this page.

You may enter a name by which you can refer to this interface in the future. As you change the name, you will see the change reflected in the navigation tree.

What is an Interface?

An interface is the main component of GW_GenSPOut. It ties each of the other components together into one stream of data.

Building an Interface

To build the interface:

1. Drag one or more connections from the tree into the **Connections** box. Packets received on this interface will be sent to all connections in this box.
2. Drag one or more outputs from the tree into the **Outputs** box. This interface will process any incoming packets that correspond to any of the outputs in this box.
3. Drag a filter from the tree into the **Filter** box. You may only select ONE filter here, and it will apply to the entire interface (all outputs).
4. Drag one or more timed outputs from the tree into the **Timed Outputs** box. Any timed outputs in this box will be sent out on all outputs assigned to this interface.

To make an interface active and operational, check the **This interface is active** box. Unchecking this is an easy way to temporarily deactivate an interface without losing its settings.



To remove an item from one of the boxes, click and drag it out of the box. When dragging items from the tree, click-and-drag them; do not click then click-and-drag them.

Site-based Output?: This option sends a site-specific data packet for each site involved in an output. This option applies only to multisite data.

Custom Output: This option allows you to choose a custom output. This selection causes the output to emulate the selected custom output type. In this version SystemWatchII and ATIA are available.

SystemWatchII Custom Output

SystemWatchII emulates the SystemWatchII system activity output.

ATIA Custom Output

ATIA sends out a delimited field name and field value list. See the *ATIA Custom Output Description* section below for details.

Make sure to click **Save** in the control bar after finishing your settings so that all your changes will be saved to the database.

This completes the setup of a GW_GenSPOut interface. Repeat this process for each set of outputs. Data should start streaming out of the connections you

established (frequency will vary depending on filter) if the module is started and GenWatch3 is connected to a source of data.

ATIA Custom Output Description

The ATIA Custom output sends packets in the following format:

FieldName1{Unit Separator}FieldName2{Unit separator}...FieldNameN{Group Separator}FieldValue1{Unit Separator}FieldValue2{Unit separator}...FieldValueN{Carriage Return+New Line} where:

- {Unit Separator} = ASCII character 0x1F
- {Group Separator} = ASCII character 0x1D
- {Carriage Return + New Line} = ASCII characters 0x0D 0x0A

Each ATIA Opcode provides a distinct list of FieldNames and FieldValues. FieldNames and FieldValues include fields defined in the ATIA protocol and fields added to the packet during GenWatch3 processing.

Note: Although they are described in the Motorola document, the following ATIA Command Types are not available in the GenSPOut Custom ATIA interface:

- ControllingZoneUpdate
- ConventionalControllingZoneUpdate

Importing and Exporting

It is possible to import and export settings to and from installations of GenWatch3.

Exporting

To export settings that you have configured in GW_GenSPOut, click on the **Import/Export** button at the top-left of the window.

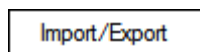


Figure 2.11 – Import/Export button

This will bring up the *GenSPOut Import & Export* window:

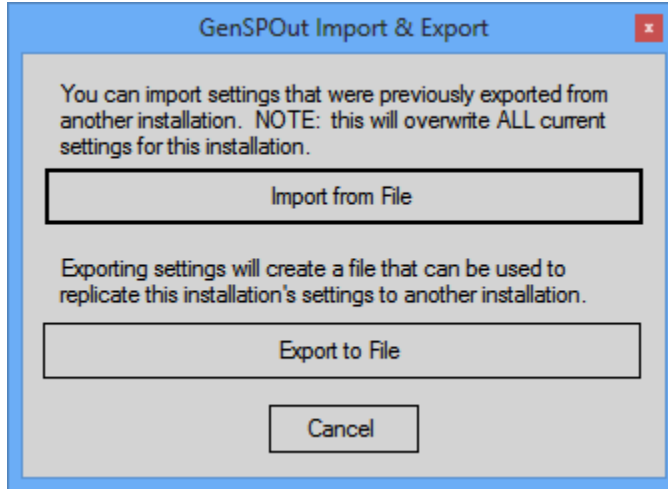


Figure 2.12 – GenSPOut Import & Export window

Click on the **Export to File** button. This will prompt you for a location and name for the export file. When you have specified the name and location, the export will immediately proceed and prompt you when it is done. The resulting file can then be imported into another GW_GenSPOut installation.

Importing

To import settings that were previously exported to a file, click on the **Import/Export** button at the top left of the GUI (Figure 2.11). This will bring up the same *GenSPOut Import & Export* dialog shown above. Next, click on the **Import from File** button.

You will be prompted for the file that you want to import. Browse to the file that you previously exported and select it. The import will proceed immediately after you select a file. You will be notified when the import is complete, and you will notice that your settings are updated.



The import process will **OVERWRITE** any settings you currently have configured in GenSPOut. It is recommended that you perform an export prior to adding any additional settings to an installation.



SystemWatchII filters from version 2.3 or earlier are not valid in the current version and will be removed after an import has completed.