REMOTE MANAGER™ software

Manual version 1.1

Remote Manager User's Manual

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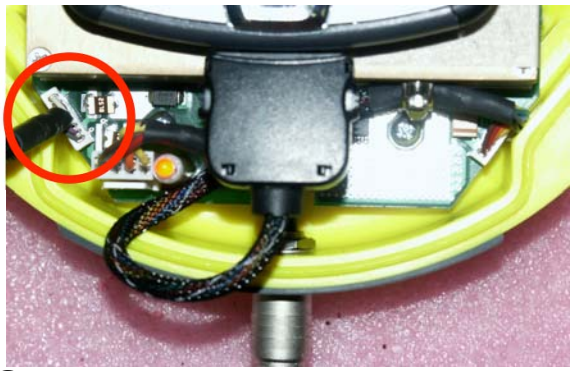
HARDWARE INSTALLATION

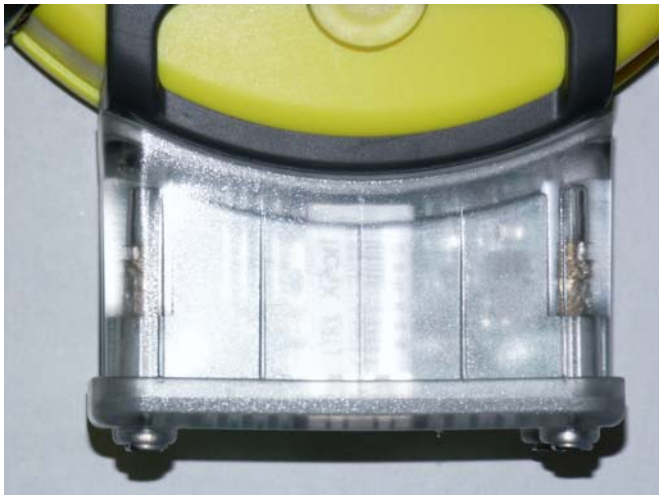
Your YellowJacket B/A/G/N will come from the factory with Remote Manager hardware already installed if you ordered it that way or if you ordered Remote Manager software with your YellowJacket B/A/G/N hardware. Refer to your Yellowjacket manual for basic disassembly of your unit. If your YellowJacket B/A/G/N is not already configured to take advantage of Remote Manager's Ethernet communications, follow these simple steps below:

Remove clips holding in port cover from bottom



Connect the dongle hardware cable only to this PORT

Now install the dongle to the bottom of the unit



BVS YellowJacket B/A/G/N Remote Manager Software User Manual

INTRODUCTION

The YellowJacket B/A/G/N Remote Manager (RM) runs on a Windows-based PC (XP/Vista) that is connected to a BVS YellowJacket B/A/G/N (BAGN) system remotely. This connection is made through TCP/IP.

Through this connection, a BAGN can be controlled. The BAGN can be set to any mode and settings available. Data can be monitored in real-time and stored in a relational database for later viewing and reporting.

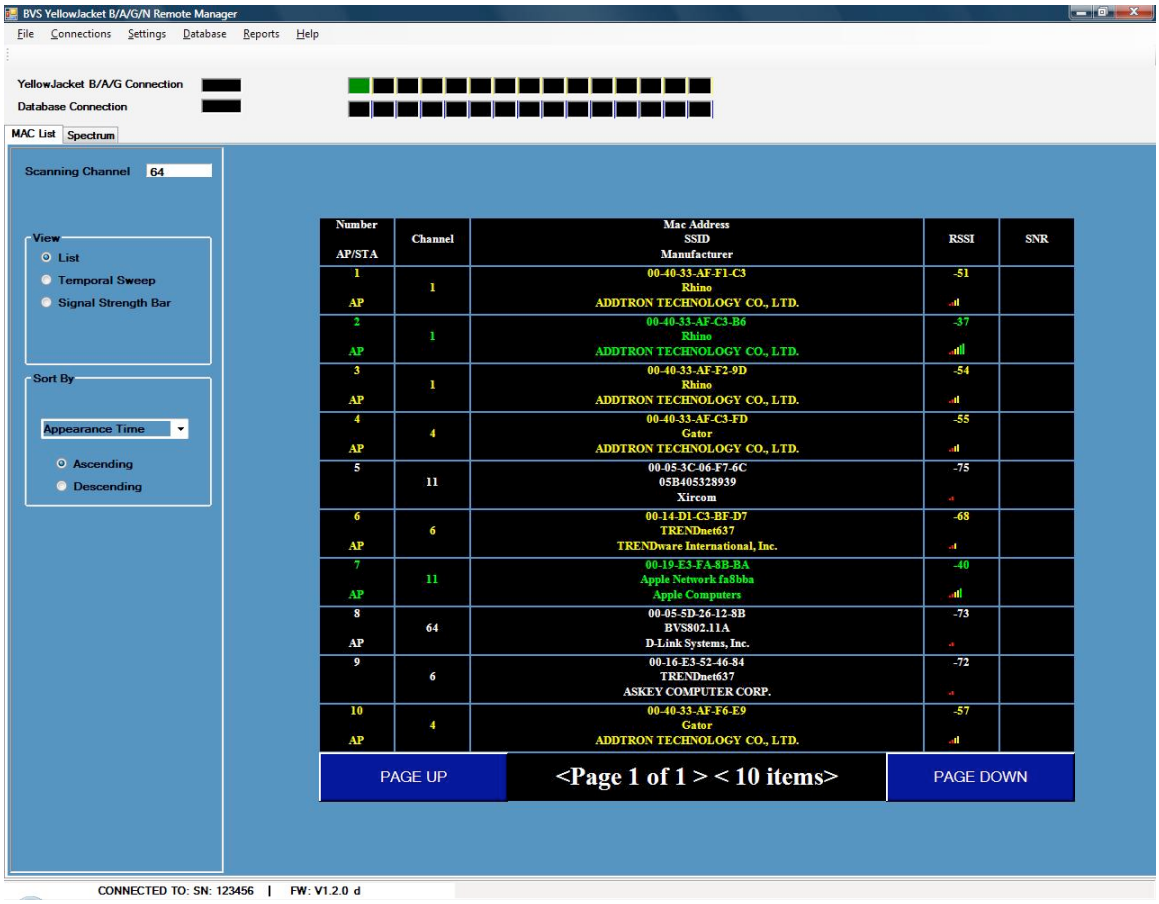


Figure 1 - YellowJacket B/A/G/N Remote Manager

INSTALLATION

Two applications are needed to use the complete functionality of the Remote Manager. One is the RM software and the other is SQL Server Express, a free application from Microsoft.

The Remote Manager software can be installed from the software CD. .NET Framework needs to be installed on the computer in order for RM to function correctly. This framework is already installed on all computers loaded with Windows Vista*. If the RM will not run, install the framework from the CD or from www.microsoft.com.

When using databases to generate reports, SQL Server 2005 must be installed on the computer. SQL Server Express 2005 is located on the CD and may also be found at www.microsoft.com. SQL Server is the database engine through which the RM creates/adds and reports on data from the BAGN.

SYSTEM REQUIREMENTS

Below is the minimum system requirements needed to run the full Remote Manager system.

Supported Operating Systems:	**Windows Vista; Windows XP Service Pack 2**
Processor Speed:	**2 GHz**
Memory:	**512 MB**
Hard Drive Space:	**1GB**

REGISTRATION CODE

The first time that Remote Manager is run, a dialog box will show up asking for the registration code. This code is located on the paperwork you received from the factory. Each unit has its own registration code that is unique to the serial number.

This registration code is tied to the serial number of the BAGN hardware. The code will be verified upon connection to the hardware.

The Remote Manager must be connected to the BAGN unit when running the application in order to verify the registration code.. The Remote Manager asks the hardware for its serial number. If it is not talking to the hardware, the registration code cannot be verified and the application disabled.

QUICK START

DEVICE CONNECTION

In order to receive data from the BAGN, you must first make a connection through the network. See "Opening a Connection" below for details on this process.

DATABASE CONNECTION

In order to begin saving data to a database and have the ability to generate reports, you must first create the database and then open it. Please see "Opening a Database" below for instructions on how to do this.

DEVICE INTERFACE

HARDWARE REQUIREMENTS

In order to connect to a BAGN unit, the hardware must be configured with the optional Ethernet adapter and installed per the instructions. The BAGN must also be powered by A/C when using this adapter.

OPENING A CONNECTION

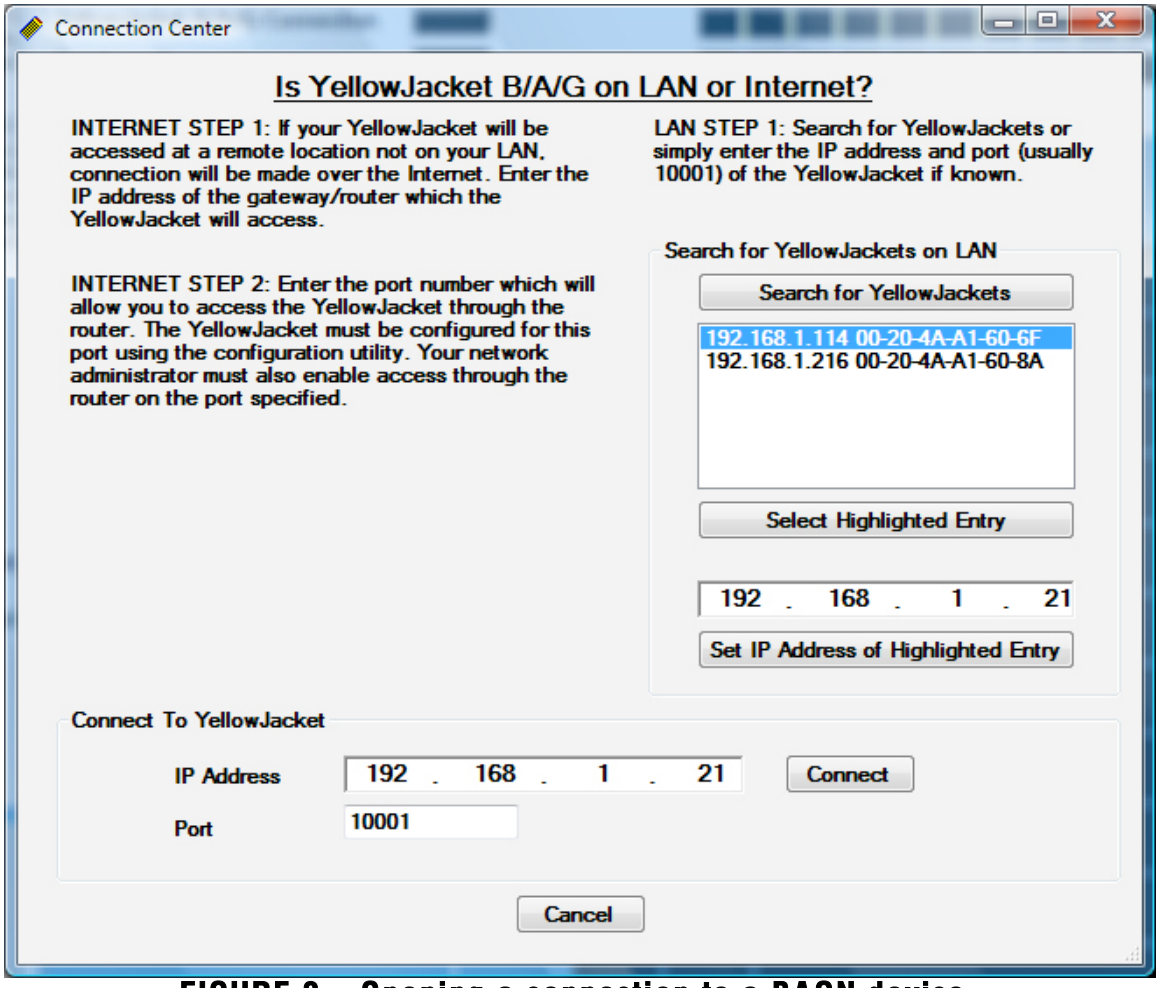


FIGURE 2 – Opening a connection to a BAGN device.

VIA LAN

If you are connecting to a BAGN through an internal network (LAN), you simply need to know the IP address that has been assigned to the Ethernet adapter connected to the device. The port is typically 10001 and does not have be changed.

If you are unsure of the IP address but know the MAC address of the adapter (usually visible through the casing of the adapter), a search can be made for devices. Clicking on the search button will list (after 5 seconds or so) any MAC addresses the Remote Manager thinks may possibly be a BAGN.

Choosing the correct MAC address will place the IP address in the lower box.

Make sure that the IP address matches the subnet of your network or you will not be able to make a successful connection. If not, please use the "Set IP Address" option.

Click 'CONNECT' after populating the IP address box and the port. After a few seconds you will see the top band of LED's begin to blink in sequence if a connection has been made.

MAC List mode will be entered and the default channels will be scanned.

If is is necessary to change the IP address of the BAGN, (for instance, if the address is not on the right subnet) select the MAC address inquestion and choose "Set IP Address". After doing this, search for MAC addresses again to verify that the address has changed.

VIA INTERNET

If connecting to a BAGN which is outside your local network, you need to find out the IP address of the router which provides access to the hardware. Typically the router will have to be configured to forward requests on port 10001 to the IP address of the BAGN device. Please see the instructions for your router.

Entering the IP address of your router (make sure it is a static IP address and not dynamically addressed), use port 10001. If the router is configured correctly, you should be able to connect to the BAGN through this port.

After clicking 'CONNECT' and waiting a few seconds, you will see the top band of LED's begin to blink in sequence if a connection has been made.

MAC List mode will be entered and the default channels will be scanned.

If is is necessary to change the IP address of the BAGN, (for instance, if the address is not on the right subnet) select the MAC address inquestion and choose "Set IP Address". After doing this, search for MAC addresses again to verify that the address has changed.

CONNECTION STATUS

Choosing the 'Status' option from the Connection menu will provide basic information after having connected to the BAGN unit. Information such as serial number and firmware version of the BAGN will be provided.

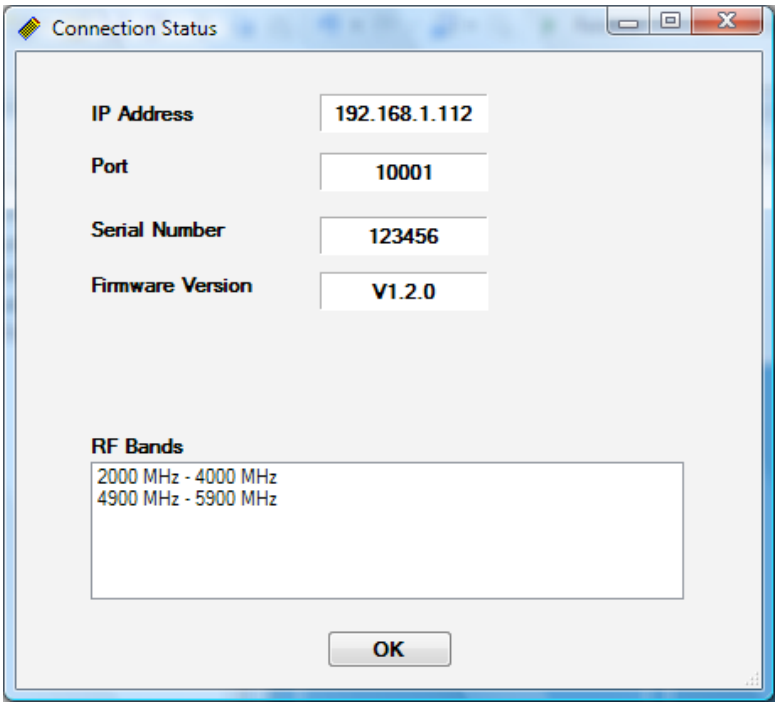


FIGURE 3 – Connection Status

MAC LIST MODE

MAC List mode will scan previously selected channels in the 802.11abg bands (2.4GHz and 5 GHz). Packets received from different wireless MAC addresses will begin to display on the screen.

LIST MODE

List mode shows all of the MAC addresses seen in the order they were received by default. The list can be sorted by RSSI, channel, etc. If there are more than 10 items in the list, using the 'PAGE UP' and 'PAGE DOWN' buttons will navigate through the list.

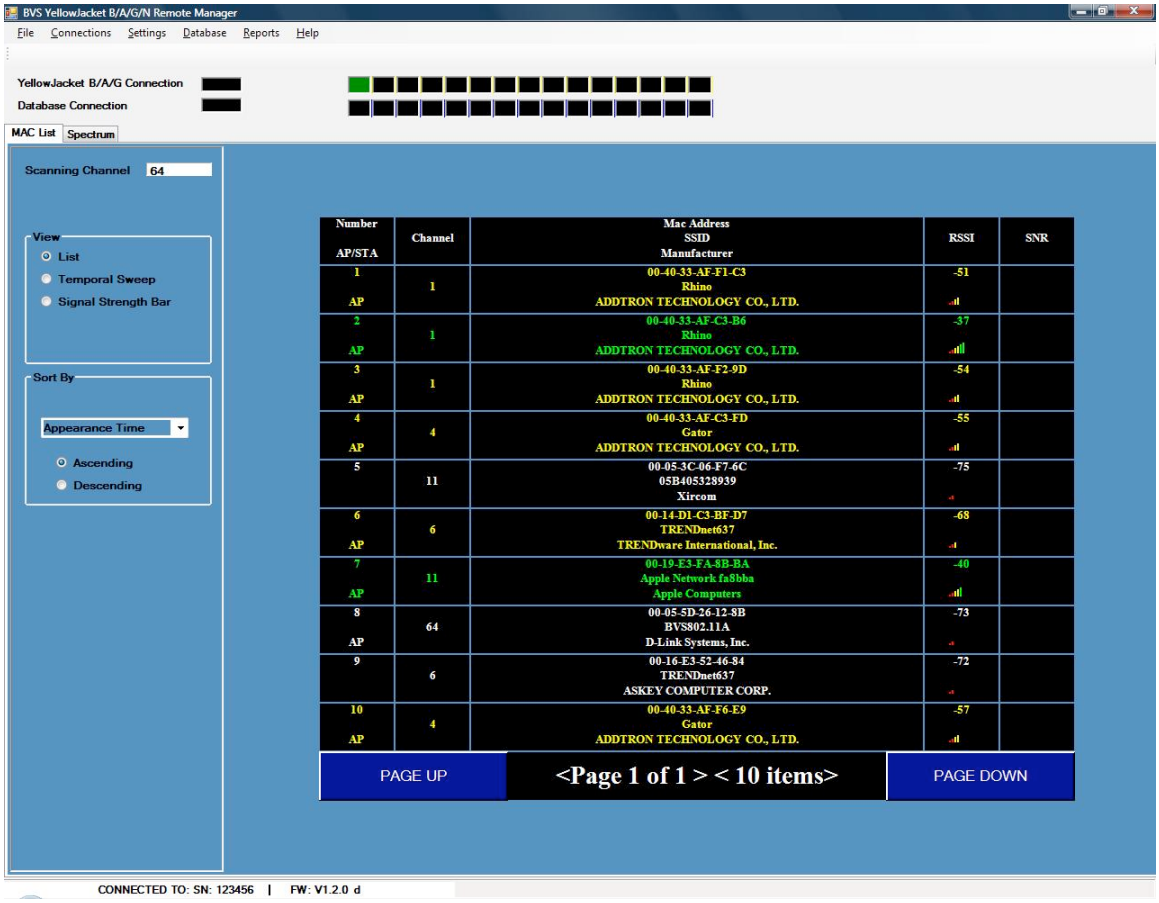


FIGURE 4 – MAC List Mode

There are three selectable displays in this mode that are chosen from the radio buttons on the left-hand side of the screen. These are the list display, the temporal sweep display, and the signal strength bar display.

LIST DISPLAY FIELDS

- CHANNEL – Channel that MAC address is transceiving on.
- MAC Address – 12 character identifier of hardware.
- SSID – Service Set ID.

- **Manufacturer – Manufacturer of equipment.**
- **RSSI – Received signal strength indicator in dBm.**
- **S/N – Signal/Noise ratio**

TEMPORAL SWEEP DISPLAY

Temporal sweep mode will show the RSSI values of devices over time. A white line will timestamp every minute or so and appear on the graph. Each device will have it's own color up to 10 devices.

FIGURE 5 – Temporal Sweep Display

SIGNAL STRENGTH BARS

The signal strength bars display will show the MAC addresses seen as a bar graph with the latest RSSI values. Some of the identifying information will be displayed inside of the bar.

FIGURE 6 – Signal Strength Bars

NOTE: Each channel will typically be scanned for 2 seconds. Therefore, if for example you have all 14 802.11bg channels selected, it will take approximately 30 seconds to complete a scan.

CHOOSING CHANNELS

Select the 'Channel' option from the Settings menu. A popup dialog will appear and various channels may be selected by checking them. Use the buttons to select or deselect ranges of channels. After you are satisfied, exit the dialog. The new channel list will be scanned.

FIGURE 7 – Choosing Channels

SPECTRUM MODE

By selecting the Spectrum tab, the BAGN being controlled will switch from demodulation or packet mode to spectrum analyzer mode.

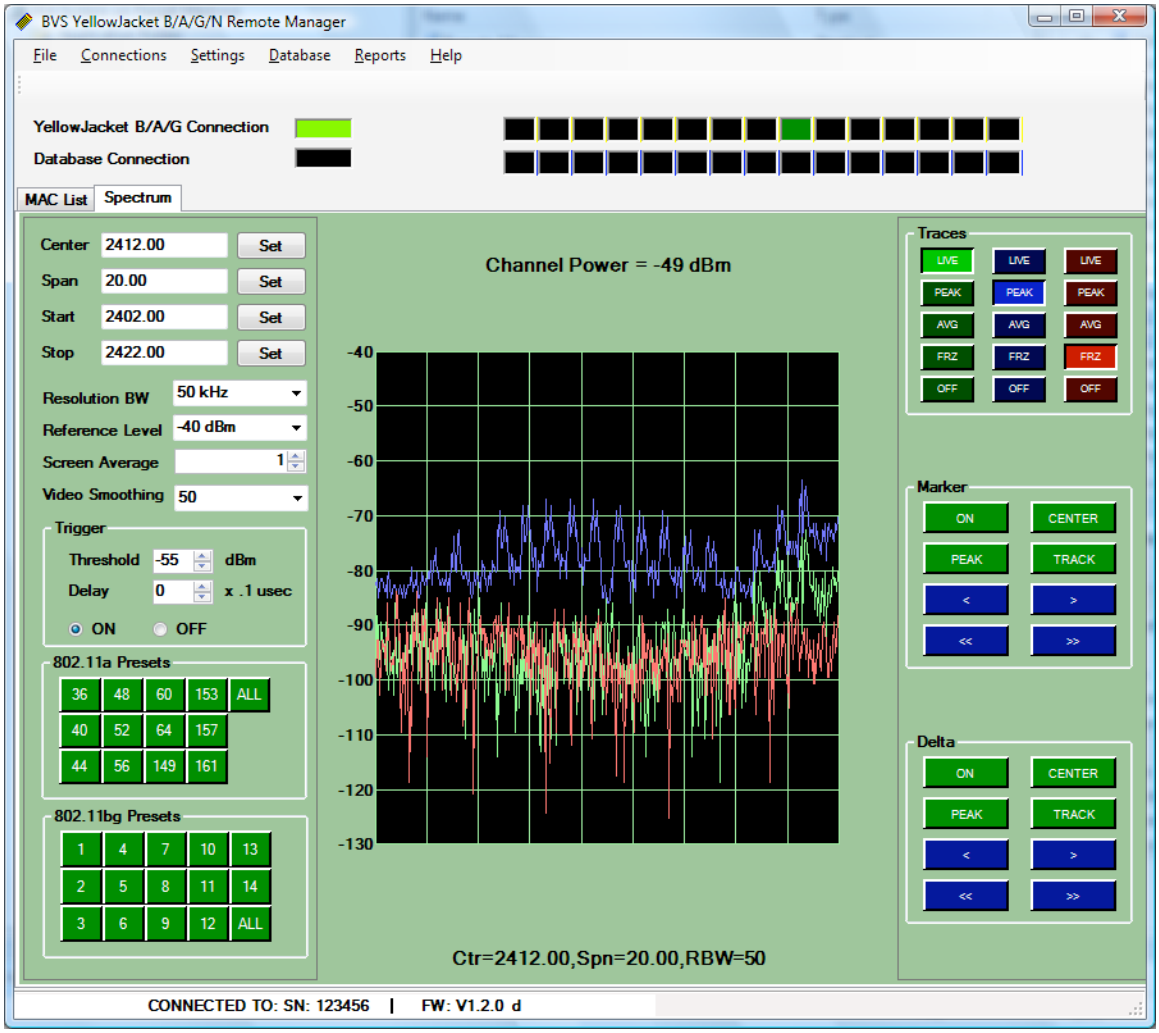


FIGURE 8 – Spectrum Mode

Here the center frequency may be set. The span, start and stop frequencies can also be selected.

REFERENCE LEVEL

This menu option allows the user to set the current reference level of the receiver. The valid choices are between -20 and -70 dBm, in 10 dBm increments.

The Reference Level should be adjusted to obtain the greatest dynamic range. The Reference Level should be set so that the strongest signal on the display is about 10 dB down from the top of the measurement display. If a signal is drawn

off the top of the measurement display or the message “clipped” is displayed, lower the Reference Level. The highest Reference Level is –20dBm. The lowest Reference Level is –70dBm.

RESOLUTION BANDWIDTH

The BAGN measures the energy present in different frequency bins, each bin’s width equal to the resolution bandwidth. The resolution bandwidth is set by setting the level for the resolution bandwidth desired.

Why use a small Resolution Bandwidth? A small Resolution Bandwidth is appropriate to measure frequency components and signal characteristics. Smaller Resolution Bandwidths increases the Sweep Time (number of traces displayed per second) for a given frequency Span.

Why use a large Resolution Bandwidth? A large Resolution Bandwidth is appropriate to measure large Spans of frequencies quickly. A Resolution Bandwidth larger than the signal’s bandwidth can measure channel power. The BAGN may be set to a large Resolution Bandwidth and a large Span to quickly sweep and identify frequencies of interest. The Span and Center can then be decreased to measure frequency components and the signal's characteristics.

SCREEN AVERAGE

The average of the last N sweeps will be displayed if the trace is put into AVG mode.

VIDEO SMOOTHING

Video Smoothing uses adjacent bin averaging to reduce the amount of fluctuation in the measured trace due to noise. This is different from Screen Averaging, which averages the same frequency bin from different traces.

Use the arrows to increase or decrease the bandwidth which are averaged for the smoothing. When properly set, Video Smoothing can reduce the variation of the trace due to noise without distorting the trace. It is especially useful for smoothing signals that are not continuous or repetitive.

The user must use good judgment when applying Video Smoothing. It is possible to smooth the trace too much so that the trace no longer represents the spectrum of the signal.

TRIGGERING

Trigger Mode enables the BAGN to quickly capture the spectrum from sources that are not continuously transmitting. The trigger threshold represents the amount of CHANNEL POWER that when exceeded will trigger the BAGN to

measure the spectrum. The trigger delay sets a delay between the trigger threshold being exceeded and the measurement of the spectrum.

The trigger threshold is set by the user in dBm, and its range is from the current Reference Level to 20dB below the current Reference Level.

NOTE: Span MUST be set to 20 Mhz.

Trigger Mode is very useful to capture the spectrum from any source that is not continually transmitting on the same frequency. This includes 802.11 a,b,g devices and Frequency Hoppers.

A more detailed discussion of the triggering function is discussed in the manual that came with your BAGN hardware.

CHANNEL PRESETS

Channel presets can be selected by pressing one of a variety of buttons on the panel on the left side of the screen. Each preset will set the center frequency and span. For example, pressing channel 1 will set the center frequency to 2412 MHz and the span to 22 MHz.

TRACES

There are three available traces for display. By default, trace 1 is set to the live feed. Each trace can be set to the following:

- **LIVE – Current real-time data will be displayed.**
- **PEAK – The highest value recorded at each frequency will be displayed.**
- **AVG – Video Smoothing and Screen Average results will display.**
- **FREEZE – The last sweep will be displayed and frozen.**
- **OFF – Trace will be turned off.**

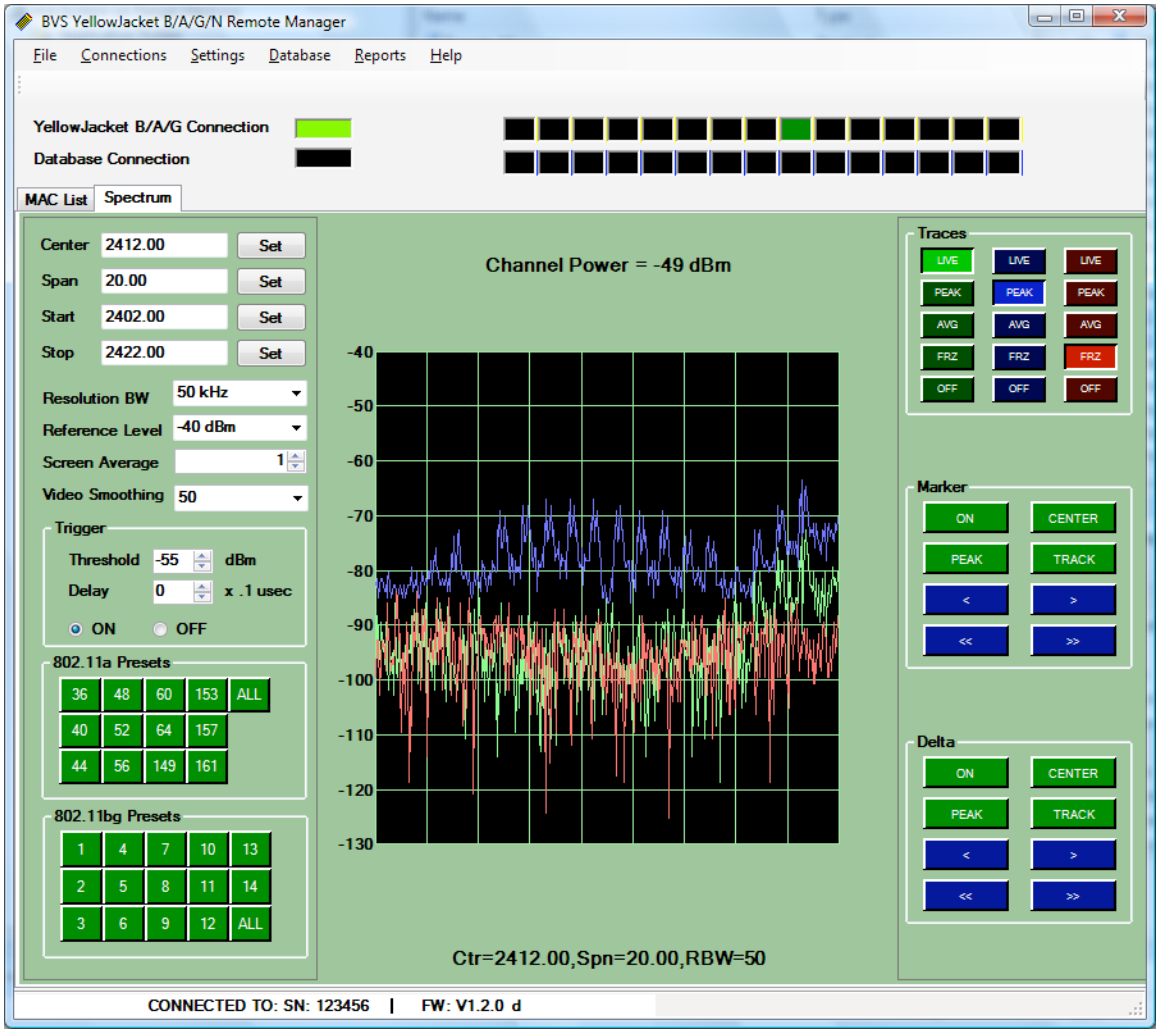


FIGURE 9 – Multiple Traces

MARKER/DELTA

The marker menu option allows the user to place a marker at a certain frequency. The frequency and power values are shown at the marker position. It also allows a delta marker. This delta marker shows the difference in frequency and power from the marker.

To turn on the marker value and/or the delta marker value, simply tap the ‘ON’ button for either value. Use the arrows to move the marker or delta value left or right across the screen. Use the double-arrows to move faster. To center the marker on the screen, press the ‘CENTER’ button. To place the marker on the highest power value, press the ‘PEAK’ button. To track the peak value, press the 'TRACK' button.

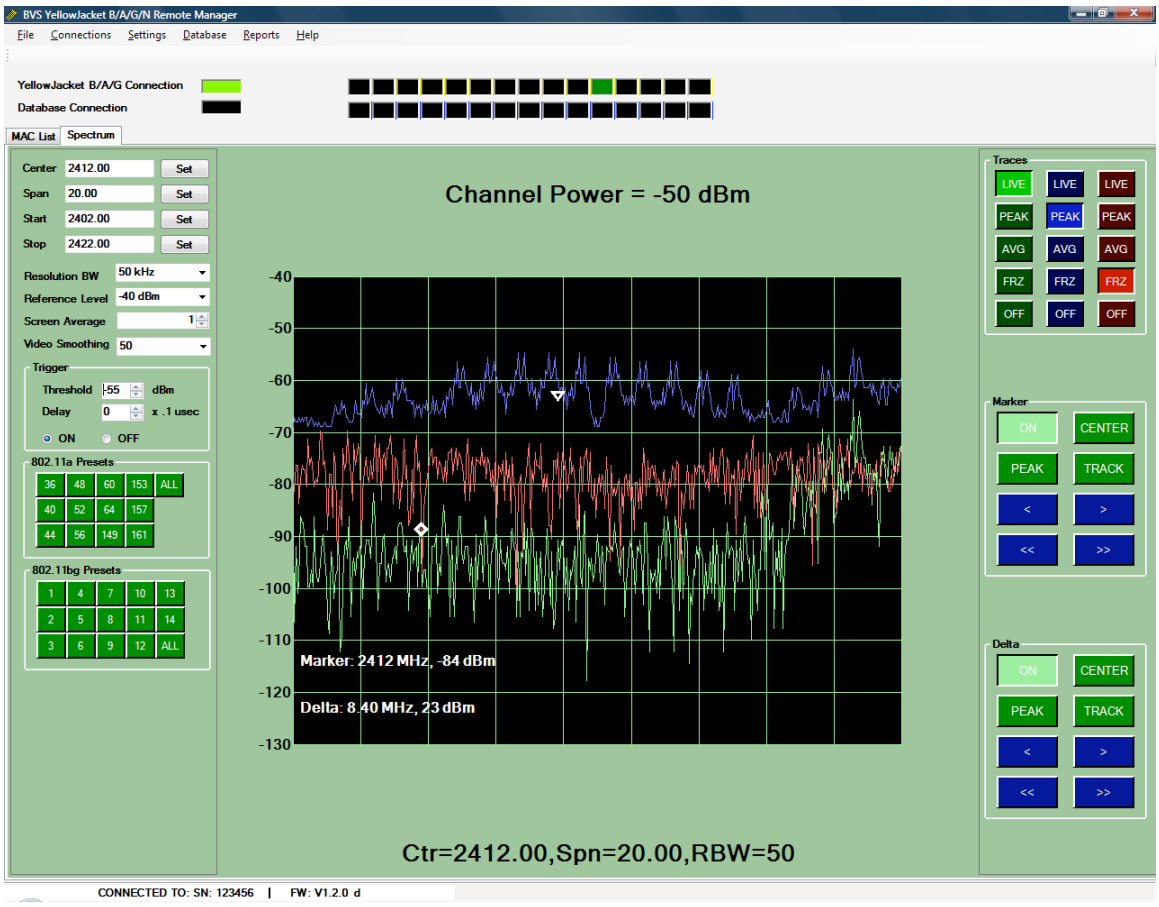


FIGURE 10 – Marker/Delta Function

DATABASES

The data being viewed can be stored for later retrieval in a database. This data is then stored into relational tables that can be formatted into reports on the information. The following options can be found in the 'Database' menu.

CREATION

Choose a filename for your database. Database files can be up to 4GB in size. As the database approaches this size, it will be necessary to create another database.

All appropriate tables will be created here. A popup box will tell you if the database has been successfully created. If you receive an 'Access Denied' error, the current user does not have permission through either Windows or SQL Server to create the database. If this happens, you must check on these permissions.

OPENING

After a database has been created, it can be opened to collect data or to generate reports on existing data. Choose from the list of databases found to be registered with SQL Server.

If the database has been successfully created, the second set of LED's on the top panel will begin to blink in sequence.

CLOSING

When switching databases or deciding to stop collecting data, simply choose this option to close the database.

REPORTS

After sufficient data has been collected, a variety of reports can be generated to view the history of the information in MAC list mode or spectrum mode. The options for these reports are in the 'Report' menu and can only be accessed after a database has been opened.

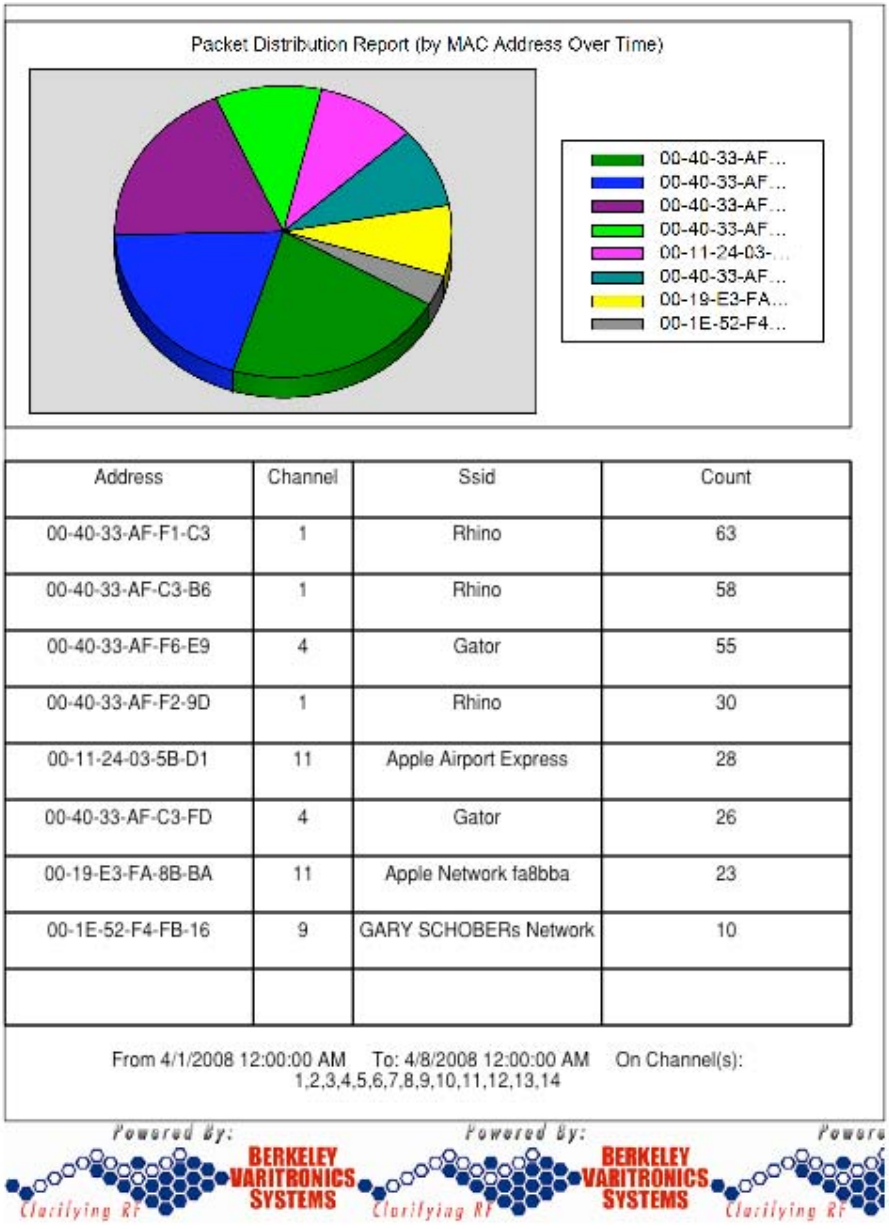
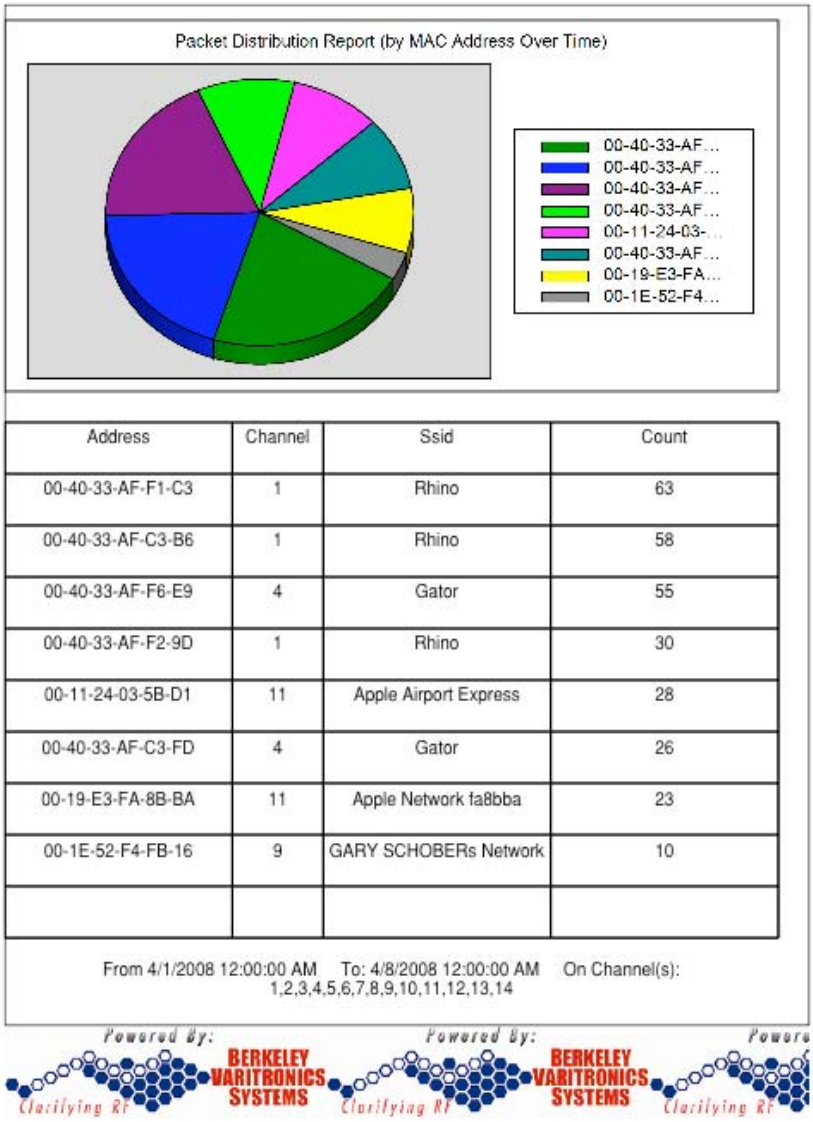


FIGURE 11– Sample Report



Address	Channel	Ssid	Count
00-40-33-AF-F1-C3	1	Rhino	63
00-40-33-AF-C3-B6	1	Rhino	58
00-40-33-AF-F6-E9	4	Gator	55
00-40-33-AF-F2-9D	1	Rhino	30
00-11-24-03-5B-D1	11	Apple Airport Express	28
00-40-33-AF-C3-FD	4	Gator	26
00-19-E3-FA-8B-BA	11	Apple Network fa8bba	23
00-1E-52-F4-FB-16	9	GARY SCHOBERs Network	10

From 4/1/2008 12:00:00 AM To: 4/8/2008 12:00:00 AM On Channel(s): 1,2,3,4,5,6,7,8,9,10,11,12,13,14

FIGURE 12– Sample Report

ENTRY FIELDS

FROM/TO DATES

Here the range of data can be selected. Choose times in which you would like to see the data. Make sure to select a data range when data has been collected.

CHANNEL SELECTION

Channels can be selected similar to when choosing channels in real-time mode. Press the button to popup the channel selection dialog. The resulting list of channels will appear ion the text box. DO NOT manually enter the channel list in the text box.

RSSI THRESHOLD

Here you can select to view only data above a certain RSSI level and eliminate data below this level.

MAC LIST

PACKET DISTRIBUTION

This report will show a pie chart and list of packets seen for each MAC address over the time period selected and above the RSSI threshold.

Only packets in the channel list selected will be seen.

RSSI OVER TIME

This report will show RSSI over time for each MAC address. Here significant dropoffs can be spotted.

SPECTRUM

CHANNEL POWER OVER TIME

In this report, the channel power reported over the time period will be graphed.

OUTPUT

SAVE TO PDF

Any report can be saved to Adobe Reader format (PDF). Simply click on the disk icon in the report.

SAVE TO EXCEL

Any report can be saved to MS* Excel format (XLS) as well. Click on the disk icon in the report.

PRINT

Each report can be printed. Click on the page preview to make sure that the report properly fits on the page and to determine if the report needs to be switched between landscape and portrait.