ISO 9001:2015
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Installation and Operation Manual

RDMS™ Status Logger

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11 July, 2017

****** Revision 1.0.2 ******

Table of Contents

List of Figures

List of Tables

1 Status Logger Interface to the RDMS

1.1 RDMS Serial Interface Module (SIM)

The RDMS Serial Interface Module (SIM), shown in Figure 1, provides an interface between an available USB port on your PC to the 25 pin control port on the rear panel of the RDMS receiver. The RDMS SIM integrates a security device that activates a license to use the Status Logger application.

Figure 1: Serial Interface Module

1.2 1U Status Logger Interface

A 1U Interface unit is also available, as shown in Figure 2. This unit provides for up to four (4) RDMS connections simultaneously. The internal security device activates available licenses (one to four).

Figure 2: 1U RDMS Status Logger

2 Initial Set Up

2.1 Install the Application

1. Insert the installation disk.
2. Run **install.bat**.
3. Follow the installation instructions.

   Note: The software installs the RDMS Status Logger and drivers from FTDI.
4. Locate the RDMS Status Logger icon on the desktop, then double click.

2.2 Hardware Connection

After the application has been installed, connect the supplied USB cable from the PC to the SIM. Then connect the 25 pin cable from the SIM to the RDMS.

Figure 3: Serial Interface Module with Supplied 25 pin Cable

2.3 Identify RDMS Rack

1. On the Status Logger Launcher screen, select the Rack Manager menu, as shown in Figure 4, then the Rack Management option.

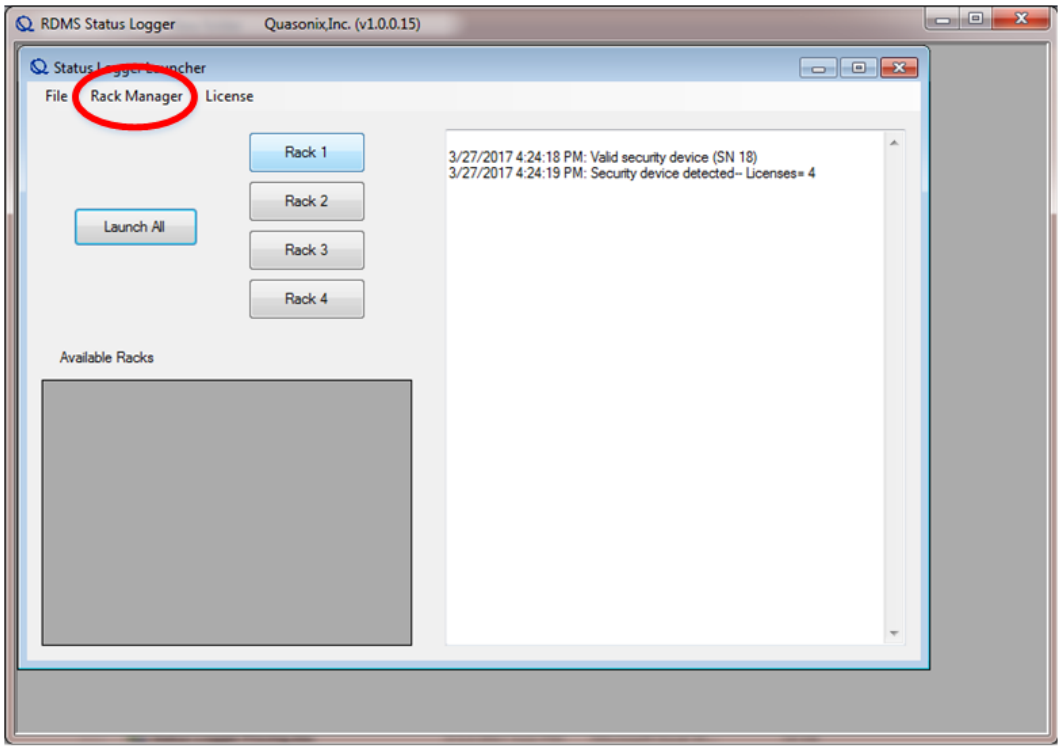

Figure 4: Status Logger Launcher, Rack Manager Menu

2. In the FormRackManager screen, select the Database menu, shown in Figure 5, then select the Import from Master option.

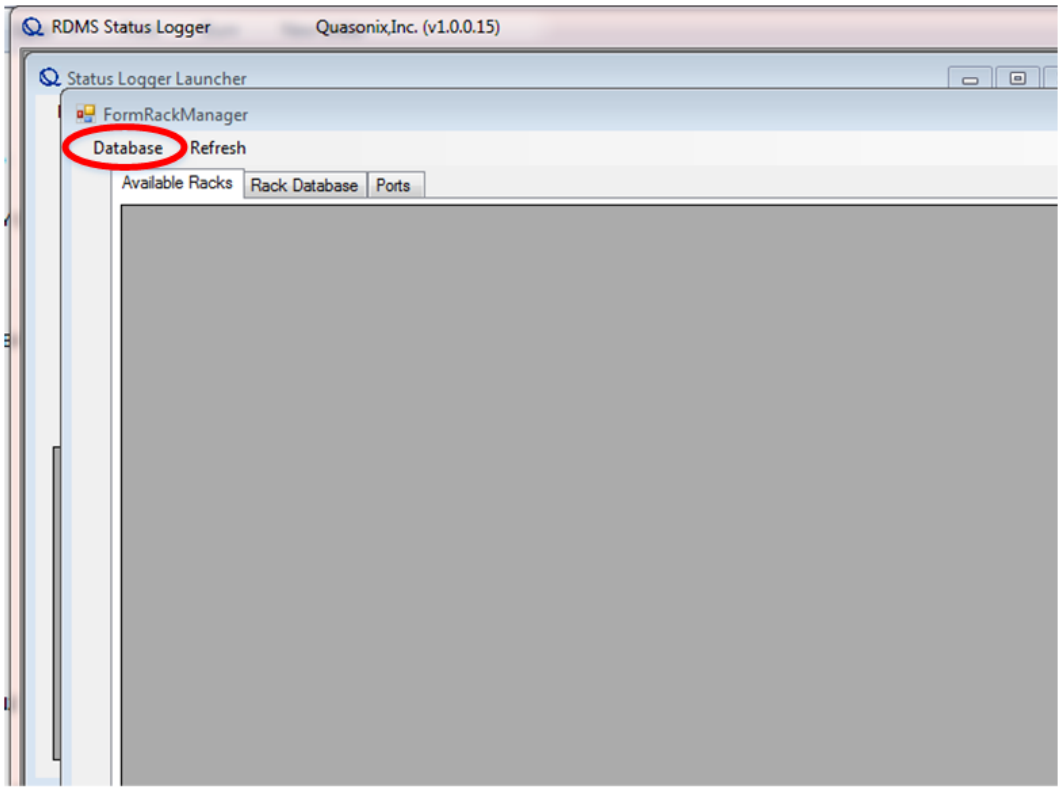

Figure 5: FormRackManager, Database Menu

3. Navigate to the installation CD.
4. Select the file **RackDatabaseMaster.xml**.
5. Type the serial number of the RDMS rack, then click on OK (Figure 6).

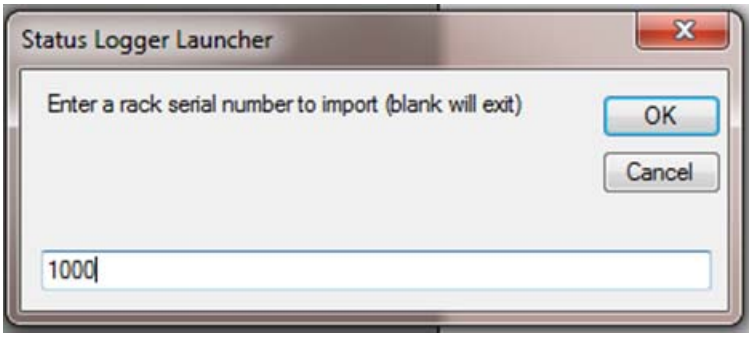

Figure 6: Status Logger Launcher, Rack Serial Number Entry Window

Serial number import is confirmed with a Serial Number Added window, as shown in Figure 7. Click on OK.

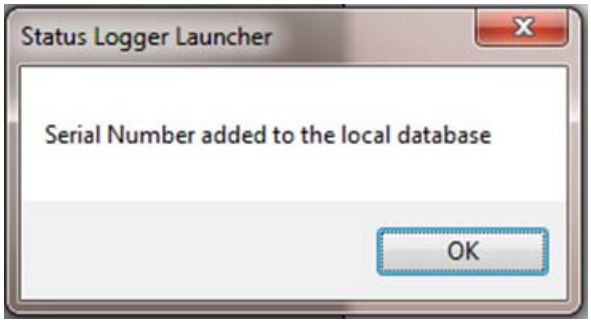

Figure 7: Status Logger Launcher, Serial Number Added Window

If there are additional racks, continue to add serial numbers. To exit, leave the serial number entry window blank, then click on OK. You will be prompted to save, as shown in Figure 8. Click on Yes.

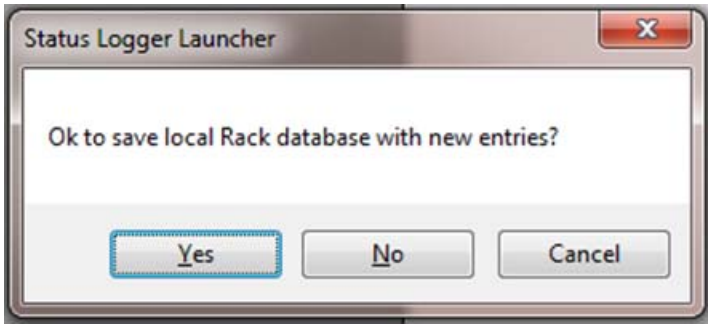

Figure 8: Status Logger Launcher, Save Database Entries Window

6. Exit the Rack Manager window (close or minimize).

   If a rack is connected, and no racks show in the Available Racks window, select Rack Manager -> Detect Receivers, as shown in Figure 9.

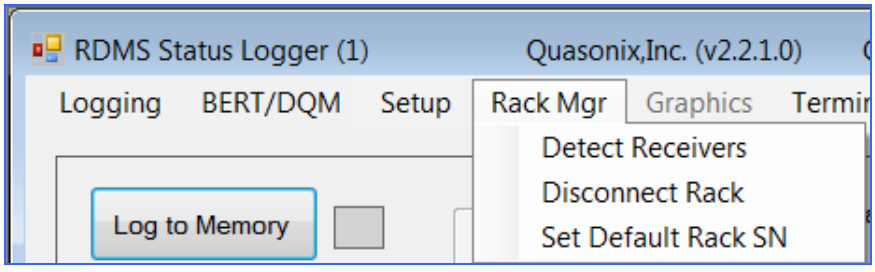

Figure 9: Rack Mgr Menu

Connected receivers display in the list, as shown in Figure 10.

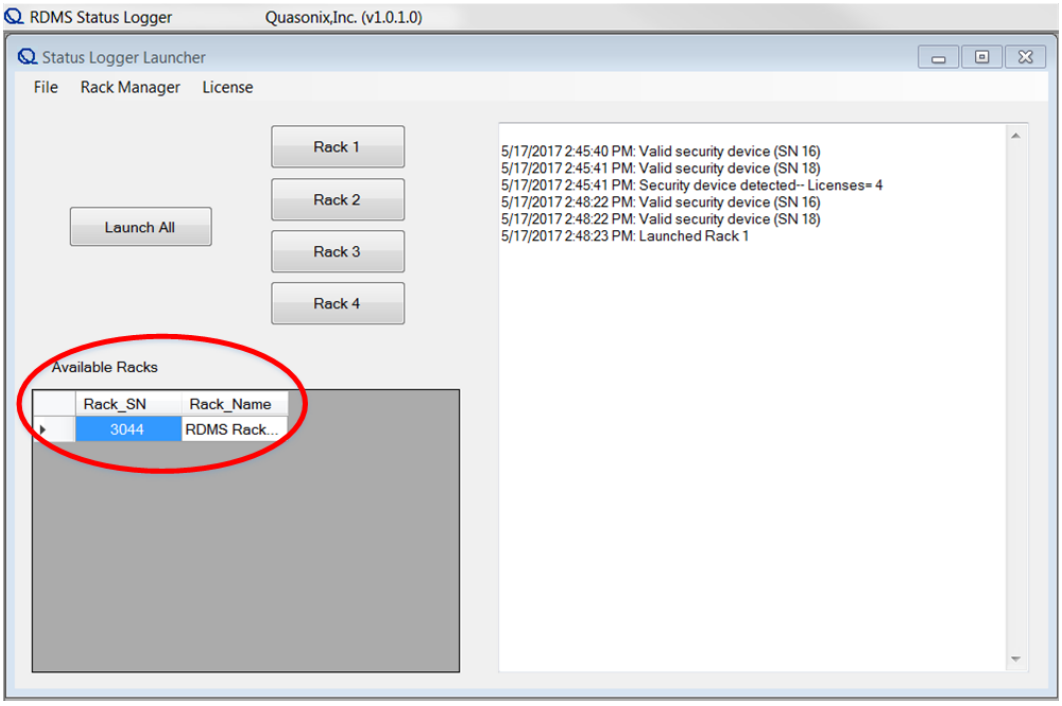

Figure 10: Status Logger Launcher, Available Racks List

3 Status Logger Operation

3.1 Launch the Status Logger

To launch the status logger, at least one license must be detected, such as the Serial Interface Module (SIM), or a 1U Status Logger Interface is connected. Up to four licenses are supported with multiple SIMs or a 1U Status Logger Interface. The License Drop Down Menu is shown in Figure 11.

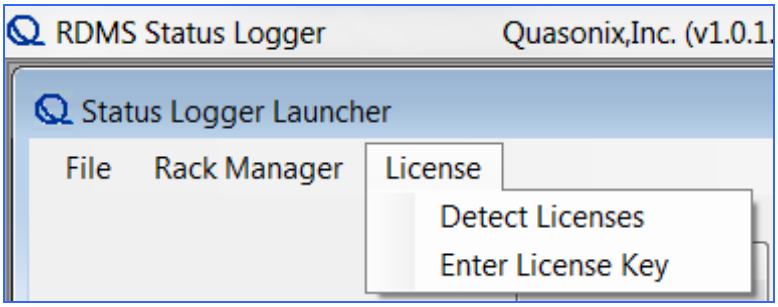

Figure 11: Status Logger Launcher, License Drop Down Menu

Click on the Rack 1 button, as shown in Figure 12, to launch an instance of the logger.

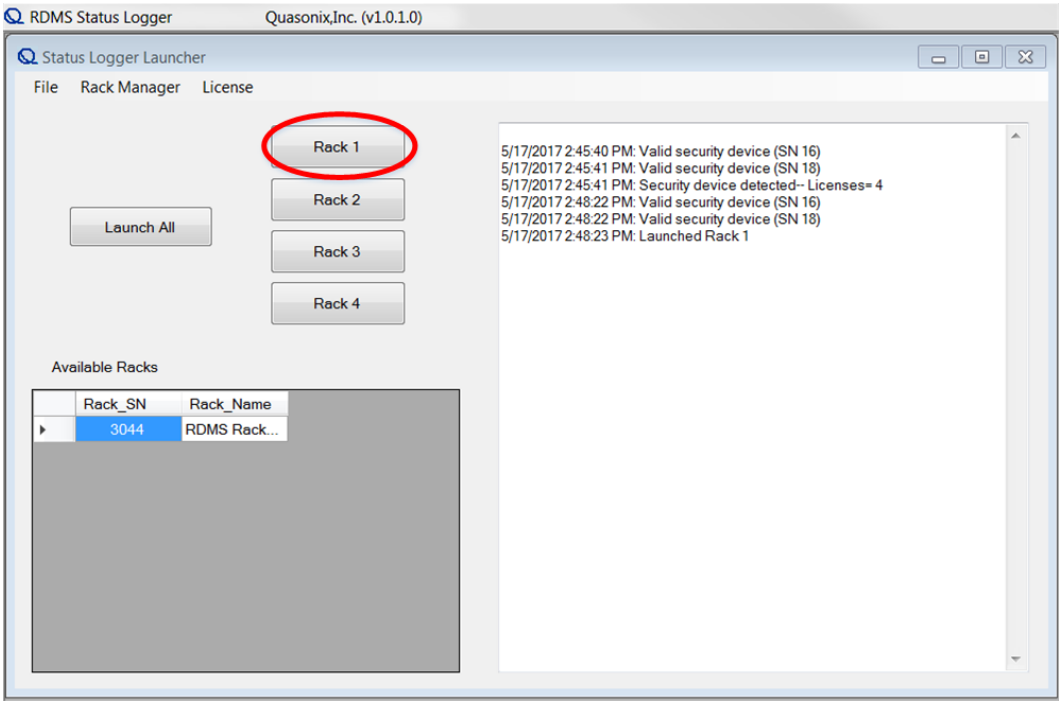

Figure 12: Status Logger Launcher, Launch Rack 1

After a few seconds, the Status Logger launches.

On the RDMS Status Logger main interface screen, select the new rack from the RDMS Rack drop down menu (circled in red), as shown in Figure 13. The three indicators (circled in green) light in green to confirm connection to the three channels in the RDMS.

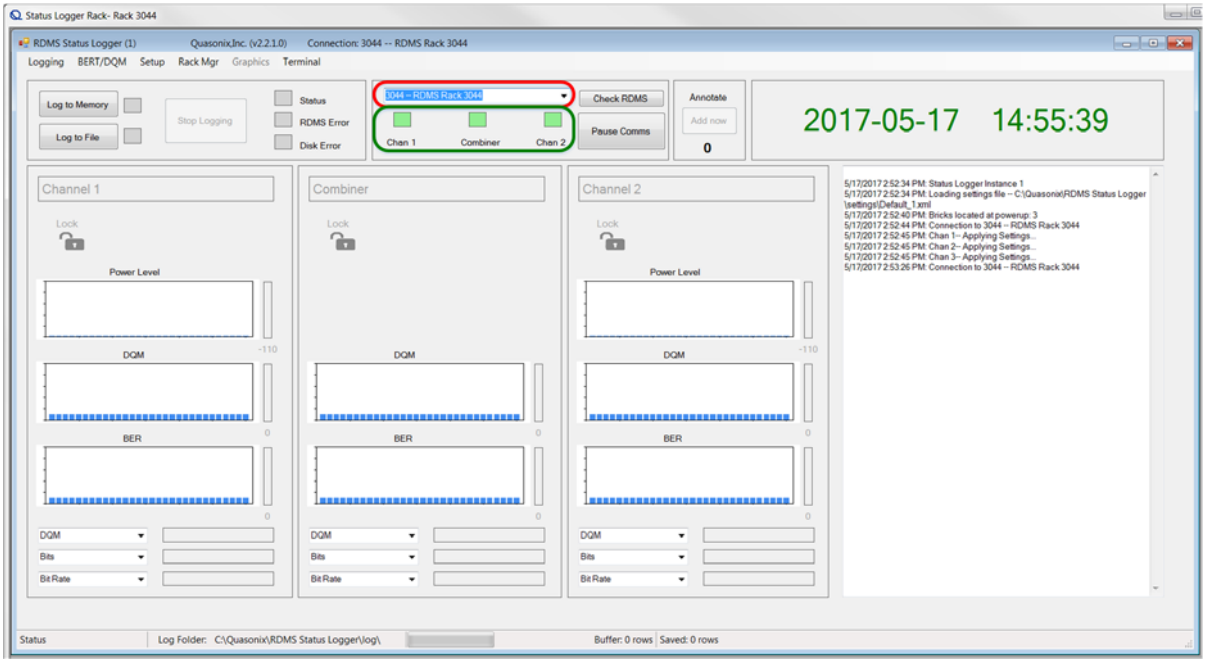

Figure 13: RDMS Status Logger Main Screen

Optionally, select the Rack Mgr menu at the top of the RDMS Status Logger main screen, then select the Set Default Rack SN option, as shown in Figure 14, to automatically connect to this (or another) rack automatically when launching.

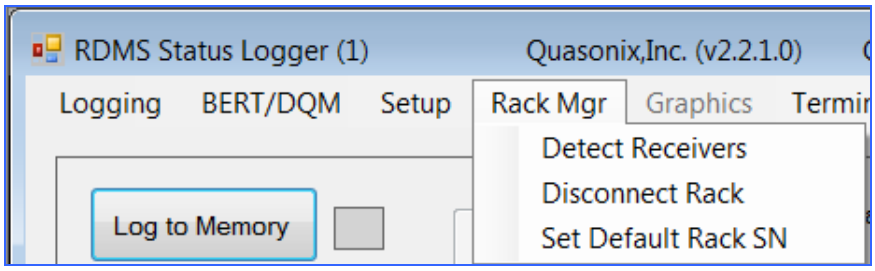

Figure 14: Rack Mgr Menu

An input control window, shown in Figure 15, asks for the serial number of the rack to automatically detect upon launch. If the rack is not available, not connected, or is connected in another instance, no automatic connection is made.

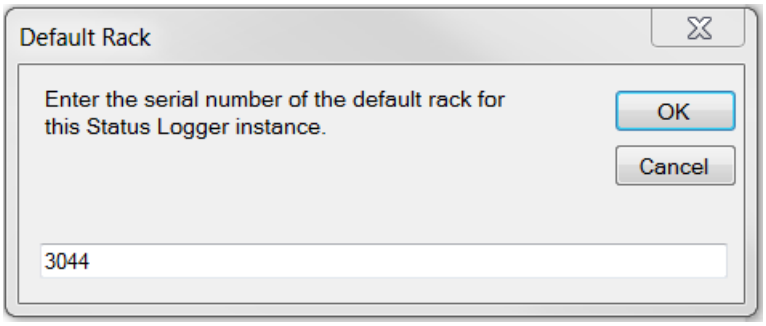

Figure 15: RDMS Status Logger Main Screen

3.2 Status Logger Setup

It is not necessary to modify the setup to begin logging. However, for BER testing or to set the PCM framing parameters, setup information is required. To view the status logger setup, select the Setup menu, then the Logger Setup option, as shown in Figure 16. The Status Logger Setup window displays, as shown in Figure 17.

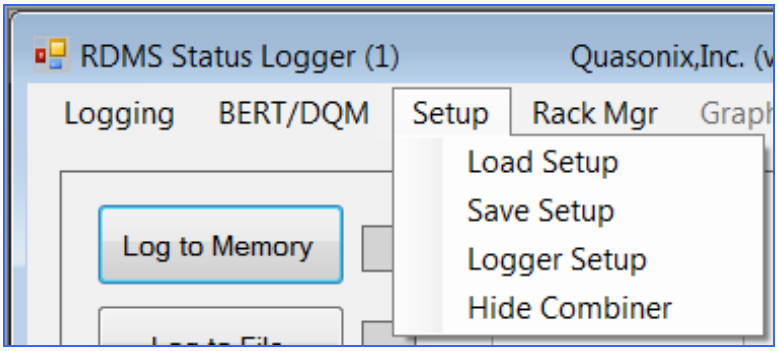

Figure 16: Setup Drop Down Menu

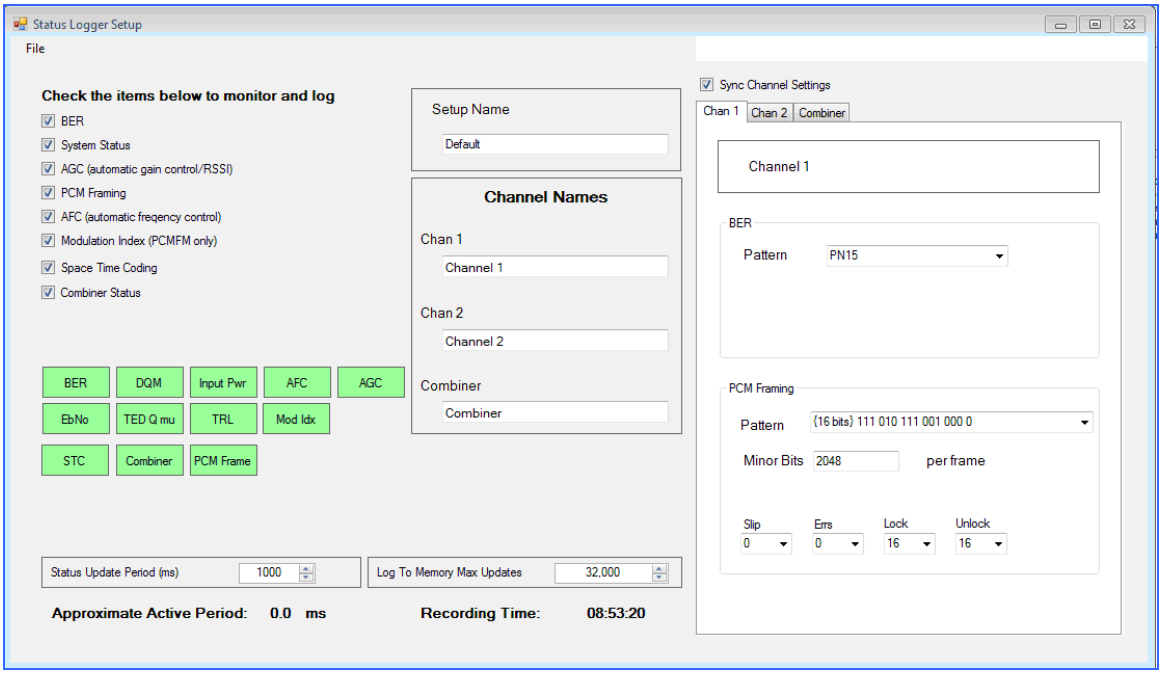

Figure 17: Status Logger Setup Screen

The list of logged metrics, shown in Figure 18, is best left with all values checked/selected (default). Generally, there is not a significant performance penalty if status parameters that you don't intend to use are selected. Further, the Status Logger detects the mode of the receiver, so items such as Modulation Index (PCMFM only) and Space Time Coding Status (STC only) are only logged if the appropriate mode is enabled. For some cases, such as high rate status sampling, it is advantageous to deselect unnecessary items.

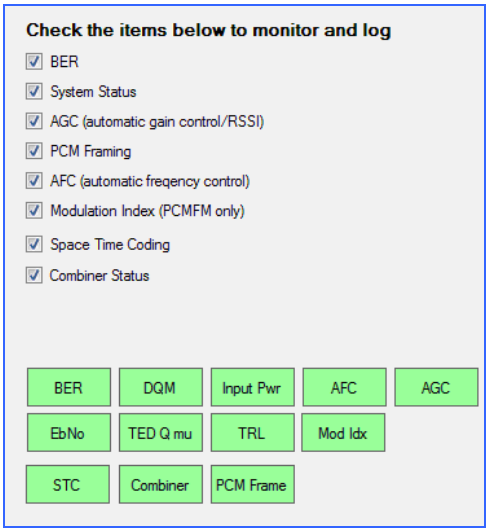

Figure 18: Status Logger Setup, Logged Metrics List

To customize the setup, the setup can be named and saved, as shown in Figure 19. The channels can be named something other than the default, if desired. This may be especially helpful in non-combined modes of operation (Channel 1 and Channel 2 are independent), frequency diversity (different frequencies on Channel 1 and Channel 2), or simply to identify the channel that is RHCP or LHCP.

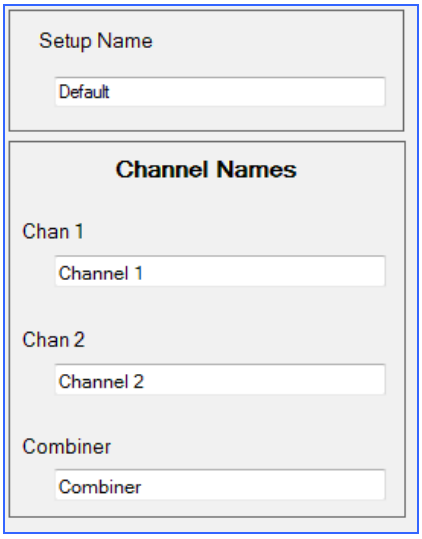

Figure 19: Status Logger Setup, Setup Name and Channel Names Windows

Most importantly, the BER characteristics, and the PCM framing characteristics, can be set, as shown in Figure 20. Note that BER measurements can only be made if the source being received is PN encoded with one of the IRIG sequences. Further, PCM lock is only detected if the source has been PCM encoded. If Sync Channel Settings check box is checked, all three channels are configured with the same settings.

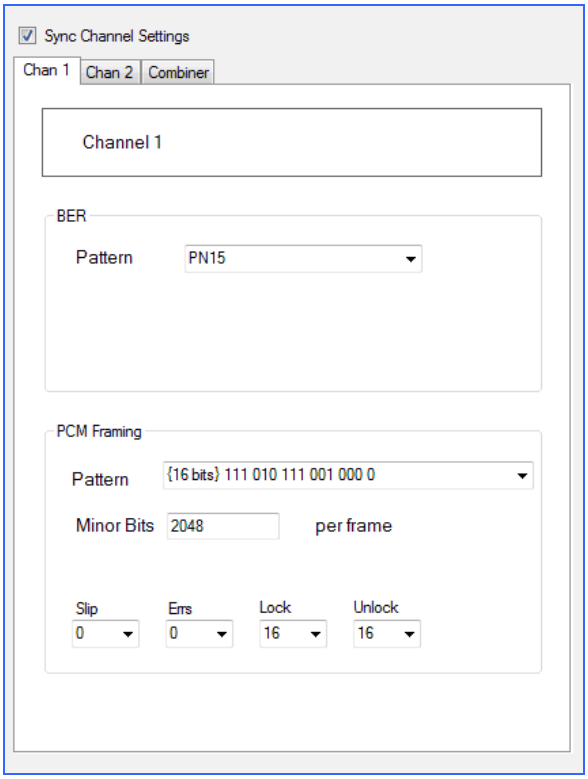

Figure 20: Status Logger Setup, Channel Tabs with BER and PCM Framing Parameters

The Status Update Period can be changed if more frequent or less frequent status updates are required, as shown in Figure 21. Good performance has been achieved as low as 500 ms, but may be limited by PC performance. The communication approach is poll-response, so selecting a period that is too fast for the PC to complete will not cause buffer overruns, but the status points may not be evenly spaced in time. Quasonix recommends setting the Status Update period such that the Approximate Active Period is 50% or less. This gives Windows™ time to service other processes.

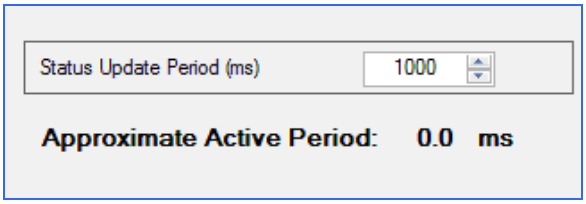

Figure 21: Status Logger Setup, Status Update Period Selection

There is also a setting to limit the number of status updates in “Log to Memory” mode. This is done to prevent excessive RAM use on the PC. The estimated recording time is given in {hours:minutes:seconds}. For spans greater than 24 hours, the result will be {days.hours:minutes:seconds}.

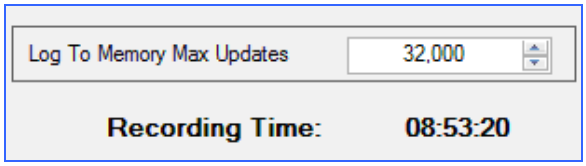

Figure 22: Status Logger Setup, Log to Memory Max Updates Selection

To save this setup, select the File menu on the Status Logger Setup screen, then the Save Setup option.

Previously saved settings can also be retrieved using File -> Load Setup. Note that saving to file **Default.xml** causes settings to be retrieved when the application is restarted in the future.

3.3 Log Status

The Status Logger provides two operating modes "Log to Memory" or "Log to File." These log exactly the same information, except that "Log to File" saves data to permanent storage every couple of minutes, to protect against power failure or software issues. The indicator light displays green after logging has started.

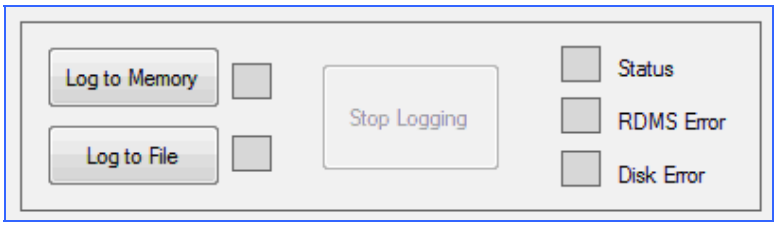

Figure 23: Log Status

A status update is logged each time the Status indicator blinks. RDMS connection errors or Disk operation errors are reported by the labeled indicators, as shown in Figure 24.

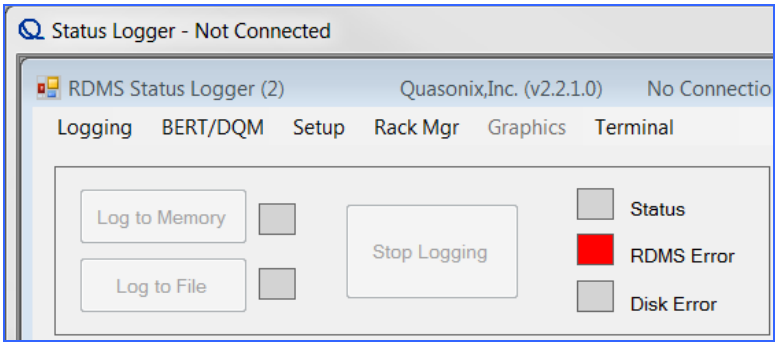

Figure 24: Log Status with RDMS Error

To stop logging, click on Stop Logging. If you were logging to file, the files automatically close. For "Log to Memory," you will be asked if you want to save. Keep in mind that if you answer "No", the data will be lost!

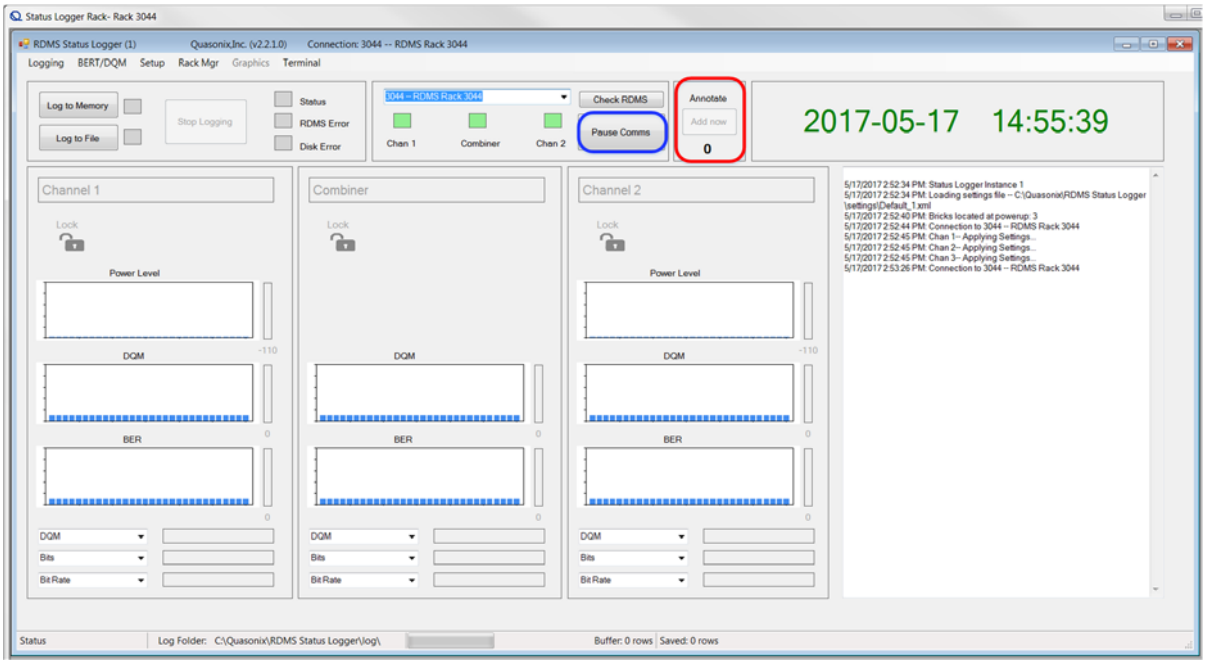

Figure 25: RDMS Status Logger Main Screen

The status logger uses the same serial bus to the receiver channel that the rack controller (front panel and browser control) uses. While Quasonix has made every effort to avoid collisions, issues may be encountered from time to time while changing a setting from the front panel or browser, such as turning on the equalizer. The only way to ensure that collisions won't happen is to Pause Comms (circled in blue in Figure 25) before making changes. The window changes to red and Pause Comms changes to Resume when paused (Figure 26).

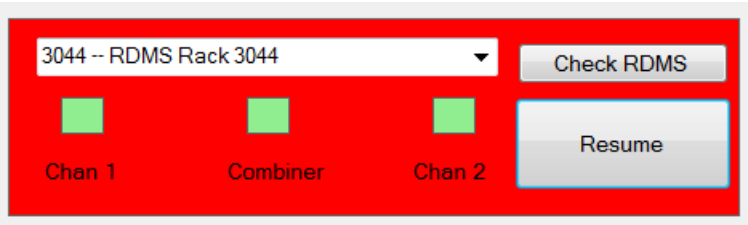

Figure 26: Rack and Channel Indicators, Window Red When Paused

Resume after the settings are done. No status updates are logged while paused, but since points are time stamped, this won't impact data analysis.

The Annotate button (circled in red) is provided to allow the user to mark a "footnote" in the log file. Often while observing a mission, it is necessary to make note of significant events. This can be done using a timestamp from the IRIG source. This "footnote" replaces the timestamp, by writing the number in the Annotate window to the log file. Be sure to make notes for the footnote indicators.

3.4 Screen Graphics and Real-time Feedback

The graphics and status windows on the main screen provide real time feedback, as shown in Figure 27. The bar to the right of each graphic (circled in green) shows the most current status, and is similar to the graphic on the RDMS front panel. The graphic shows history for the last 30 status readings.

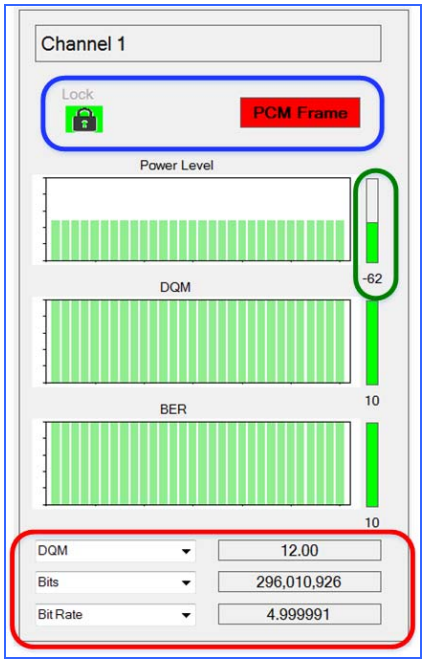

Figure 27: Channel Status Windows

DQM and BER displays are devised to show Data Quality metric and BER in the same units. A value of 10 indicates a BER of 10e-10.

The Lock and PCM Frame indicators (circled in blue in Figure 27) are real-time indicators of Bit Sync lock and PCM frame detection (setup required for PCM frame detection). The DQM, Bits, and Bit Rate parameters (circled in red) are user selectable status measurements to display measured data. The selections in this display do not affect what is being logged.

In the DQM, Bits, and Bit Rate drop down menus, two of the selections are Average BER and Average DQM. These measurements are locally calculated in the application using delta values from the status update process.

To reset these values, select the BERT/DQM drop down menu, as shown in Figure 28, then either Restart BERT average or Restart DQM average. These operations have no impact on the status information being logged.

The internal BERT in the receiver can also be restarted by selecting the Restart RDMS BERTs option from the drop down menu.

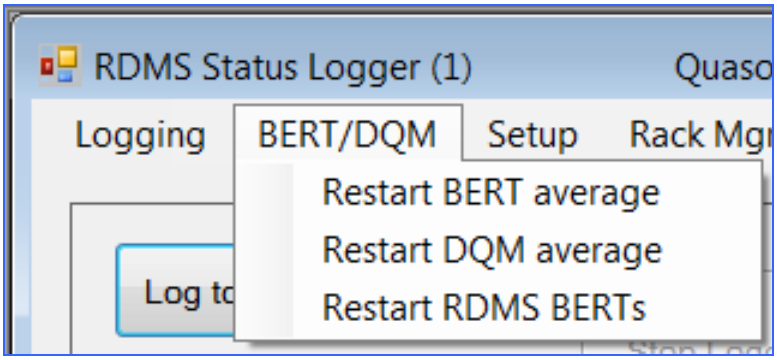

Figure 28: BERT/DQM Drop Down Menu

The status files are saved to a folder on the selected drive (default is C:\Quasonix\RDMS Status).

3.5 Status Logger Files

The status files are saved to a folder on the selected drive (default is C:\Quasonix\RDMS Status Logger\log). Note the folder with the Rack Serial Number and date stamp. The folder contains the log files shown in Table 1.

Table 1: Status Logger Files

File Name	File Description
Channel_1.csv	main .csv for status for Channel 1
Channel_1_header.csv	header for the main— headers can be included (select in the application)
Channel_1_info.csv	brick information for Channel 1
Channel_1_state(pre).txt	all receiver settings at the start of logging
Channel_1_state(post).txt	all receiver settings after logging (can be used detect differences from pre-logging)
Channel_2.csv	main .csv for status for Channel 2
Channel_2_header.csv	header for the main— headers can be included (select in the application)
Channel_2_info.csv	brick information for Channel 2
Channel_2_state(pre).txt	all receiver settings at the start of logging
Channel_2_state(post).txt	all receiver settings after logging (can be used detect differences from pre-logging)
Channel_3.csv	main .csv for status for Channel 3 (Combiner)
Channel_3_header.csv	header for the main— headers can be included (select in the application)
Channel_3_info.csv	brick information for Channel 3

File Name	File Description
Channel_3_state(pre).txt	all receiver settings at the start of logging
Channel_3_state(post).txt	all receiver settings after logging (can be used detect differences from pre-logging)

3.5.1 Terminal Mode

The Status Logger provides a means to communicate directly with the receiver channels over the serial communications bus. On the menu bar select Terminal -> User Terminal. The Terminal screen displays, as shown in Figure 29. Commands or queries can be sent directly to the receiver brick, bypassing the RDMS front panel controls. This gives access to a large number of commands and queries that are not available through the browser or front panel. **This functionality is considered an advanced user capability, so it is not recommended that random commands be sent without training or assistance.**

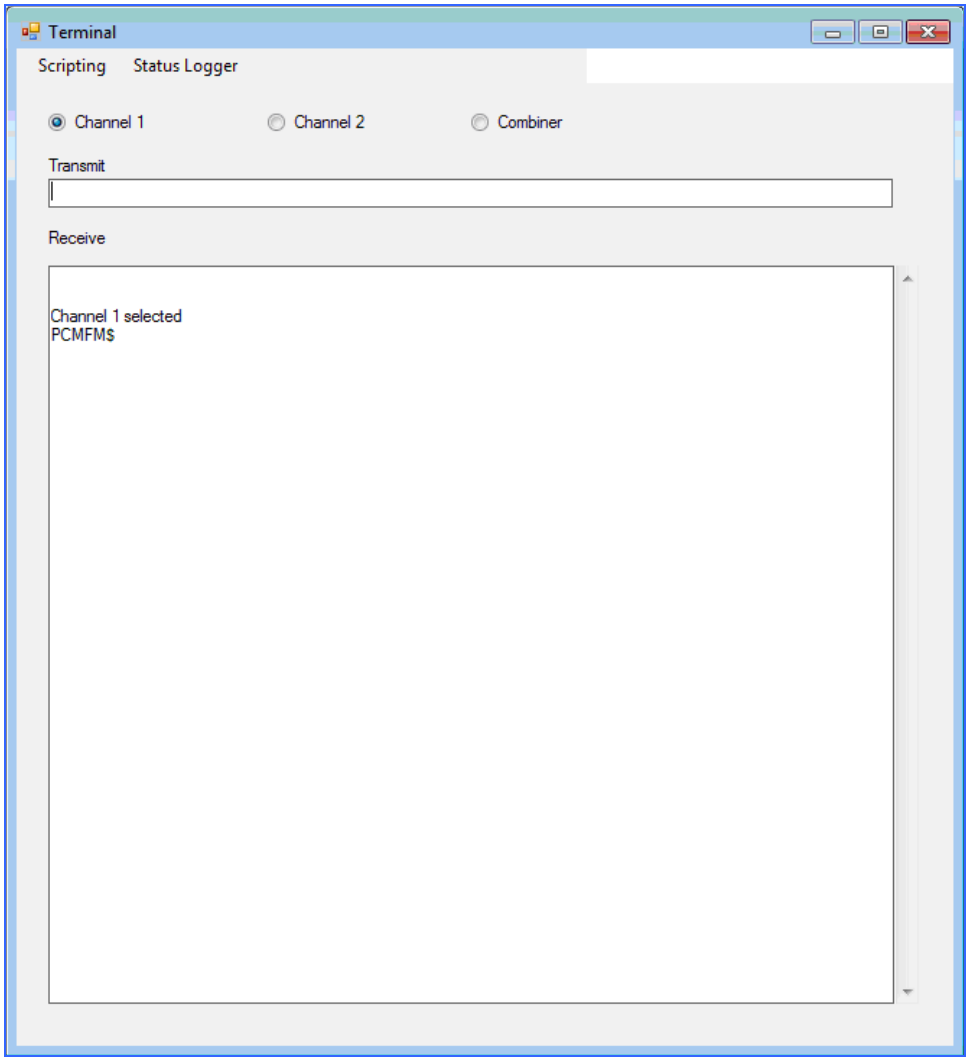

Figure 29: Terminal Screen

1. To send a command to the brick using Terminal, select the channel using the button adjacent to Channel 1, Channel 2, or Combiner.
2. Type the command in the Transmit text box.
3. Press the Enter key on the keyboard.

   For example, the result from “fr”, which queries the brick carrier frequency, is shown in Figure 30.

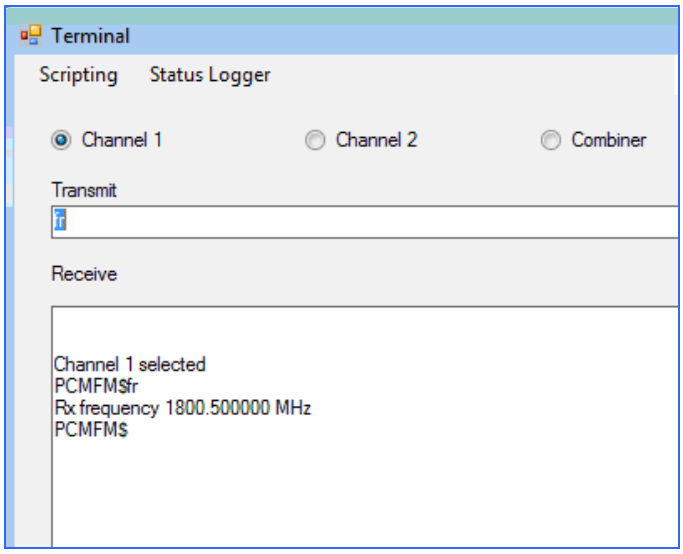

Figure 30: Terminal Screen, Text Command with Response

Terminal also supports scripting. Click Scripting -> Show Scripting.

The window expands to show the scripting interface, as shown in Figure 31.

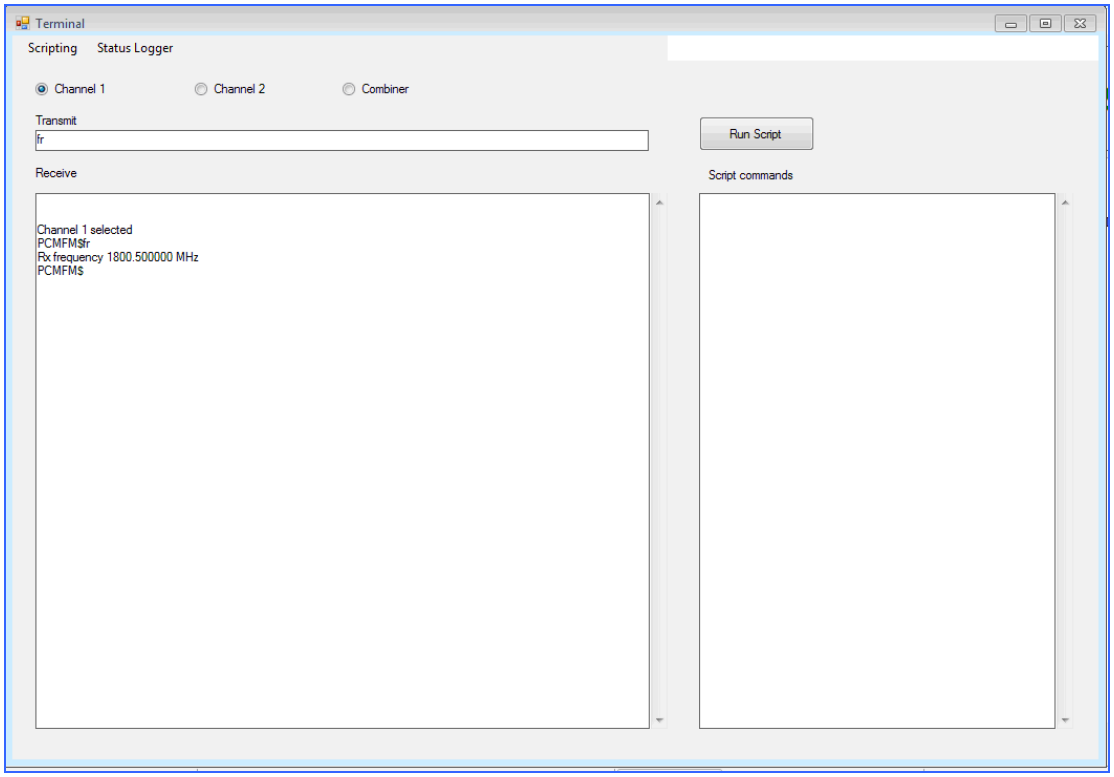

Figure 31: Terminal Screen with Script Command Window

Script commands can be typed into the Script Commands window, or loaded from a text file, using Scripting -> Load Script. The scripting interface applies multiple commands in sequence. It also provides for directives to allow comments and change channels. Directives are preceded by "#".

To run the script, click on Run Script. The example below queries the frequency and bit rate from all three channels.

```
# COMMENT ****************************************
# COMMENT Query frequency and bit rate for all channels
# channel 1
fr
br
# channel 2
fr
br
# channel 3
fr
br
```

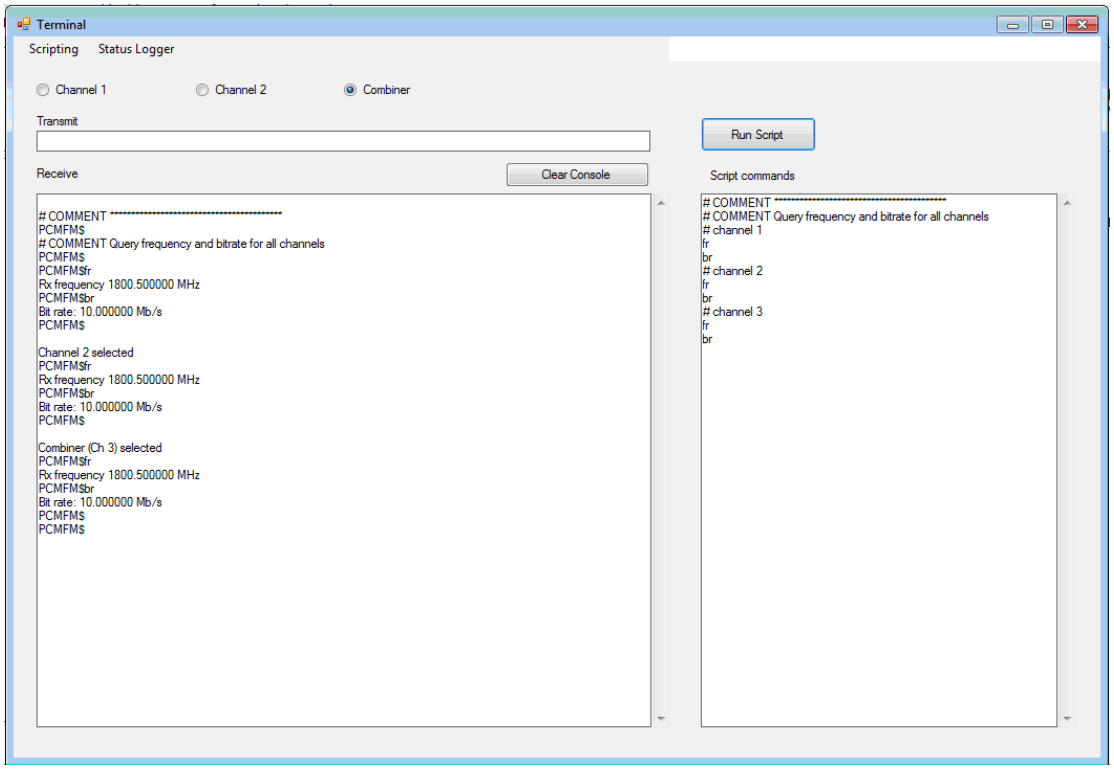

Figure 32: Terminal Screen with Script Command Window

The terminal is designed to send commands to the brick in the dead time of a status update cycle, so as not to interfere with the status logging process. The command waits until the active portion of a status cycle is complete, pauses the cycle, sends the command, waits for the response, and then resumes the cycle. For most commands, this won't have any effect on the status update process. If temporary control of the brick comm port is necessary , select Status Logger -> Pause Logging. Remember to resume logging after terminal activity is complete.