10.19.11

RibEye™ Simulator
Version 1.0
September 27, 2010

Introduction:
The RibEye Simulator is a PC-based program that simulates the Ethernet communication protocol of the RibEye measurement system. The Simulator was intended as a tool for software developers, but it can also be used for training purposes. The Simulator does not allow you to use all the functionality of the RibEye software. Certain buttons on the screen and features of the software do not work in the Simulator as they would in a real RibEye.

For more information on the RibEye communication protocol, download the latest version from http://www.boxborosystems.com/servicepage.html

The Simulator program supports all current RibEye models. The program can run on windows XP, Vista, and Windows 7. The program is written in National Instruments Labwindows CVI 2009, and the installer will install the Labwindows run-time engine on the target PC.

Installation:
Download and unzip the installation program ("RibEye Simulator") from the MANUALS page on the Boxboro Systems website at http://www.boxborosystems.com/servicepage.html.

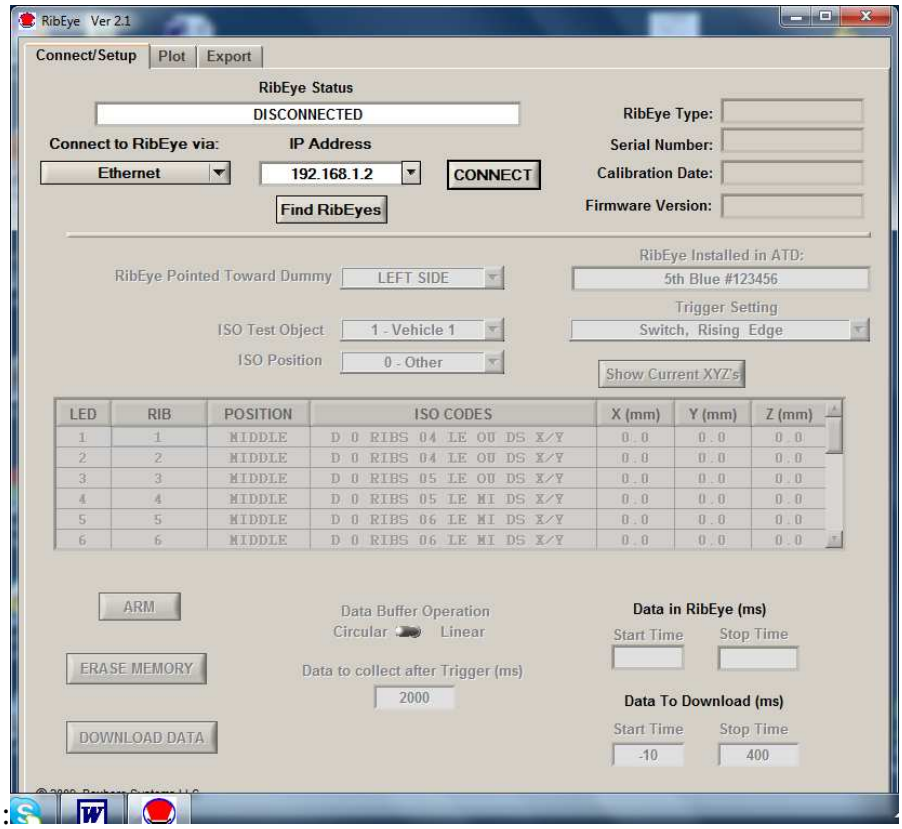
Run setup.exe and follow the instructions on the screen.

Operation:
Make sure that you have loaded the RibEye software on your PC. If not, you can download and unzip the current version ("RibEye Installer") from the MANUALS page at http://www.boxborosystems.com/servicepage.html.

Start the RibEye program (currently, RibEye_2.1.exe).

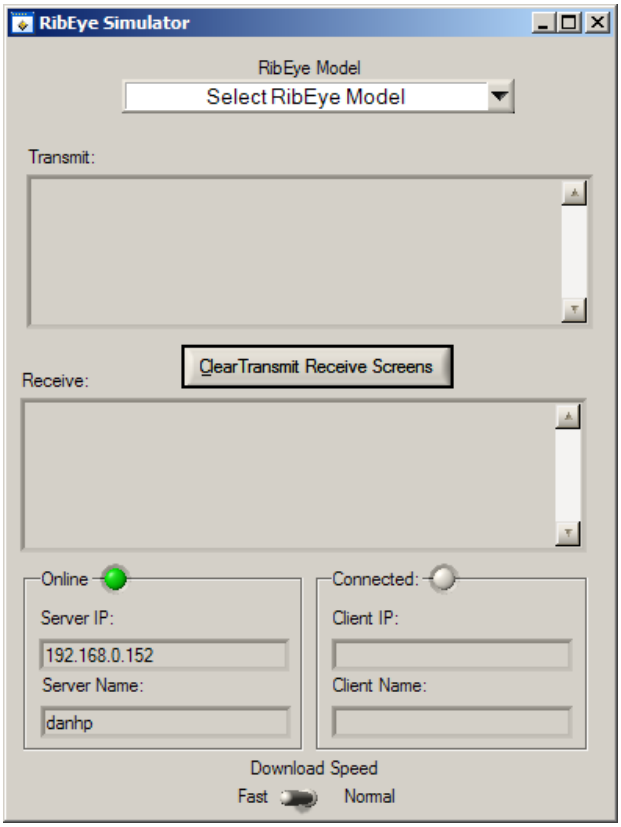
You will see the screen shown at the top of the next page.

Please note that the "Find RibEye" button will not work with the Simulator.



Above: First Screen of the RibEye Software Program

Next, start the Simulator program, which is called Resim.exe. You will see the screen shown at the top of the next page.



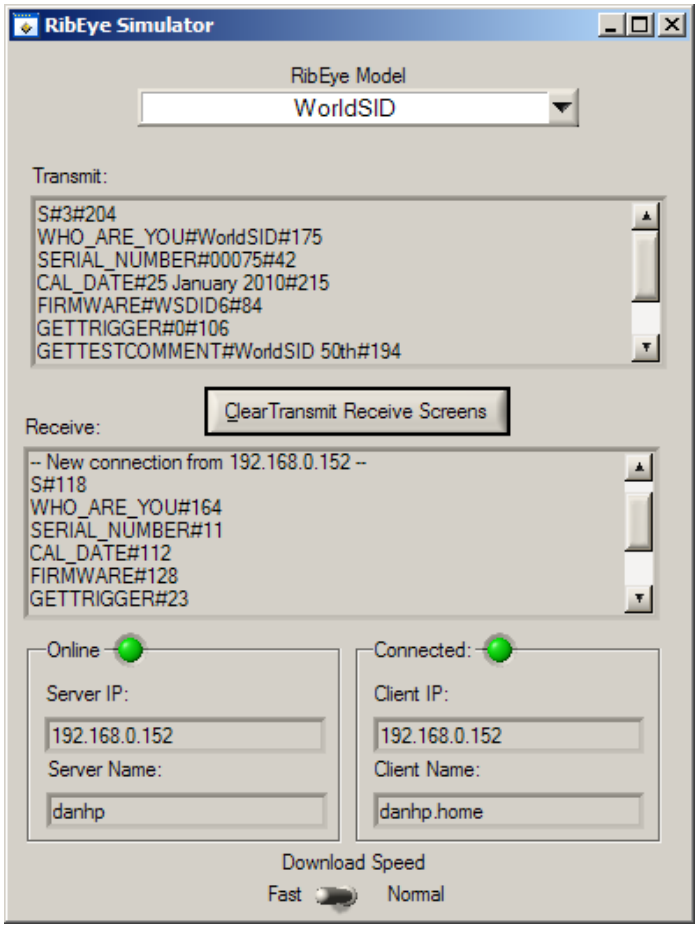
Above: Simulator Program Screen

The Simulator program will automatically set up a TCP server, and will show the IP address of the PC. To start the Simulator, select a RibEye model from the drop-down box at the top of the Simulator screen.

Make sure that the IP address on the RibEye software screen matches the Server IP address on the left side of the Simulator screen. If they do not match, you will get the error message: "Cannot open COM port."

Next, press "CONNECT" on the RibEye software screen.

When your application program connects to the Simulator, the "Connected" light on the right side of the Simulator screen will turn green, and the IP address of your computer will be shown as the client. Note that you can run your application on the same PC as the server, as shown in the screen below. You can also run your program from another computer on the same LAN.



Above: Simulator Screen When Connected

Commands that you send will be shown in the Receive box. RibEye responses are shown in the Transmit box.

After the RibEye software connects to the Simulator, the grayed-out and empty boxes on the RibEye software screen will be supplied with data. You may download the data using the "DOWNLOAD DATA" button on the RibEye software screen, choosing one of the formats listed on the download screen. After you download the data, the RibEye software will generate plots which you can view by clicking on the "Plot" tab. You may also export the data in one of the available formats.

IMPORTANT NOTE: If you wish to run the Simulator again with a different RibEye model, you should click on the DISCONNECT button on the RibEye software, change the model type on the Simulator software, and then click on the CONNECT button on the RibEye software to reconnect.
Table 1 shows the data the Simulator will generate for the RibEye commands for all of the models.

For the CURRENT_POSITIONS command, the Simulator will generate data for the LED positions as follows:

LED Number. Axis (where the axis is 1 for X, 2 for Y and 3 for Z)

For example, for LED #1, X data will be 1.1, Y data will be 1.2, and Z data will be 1.3

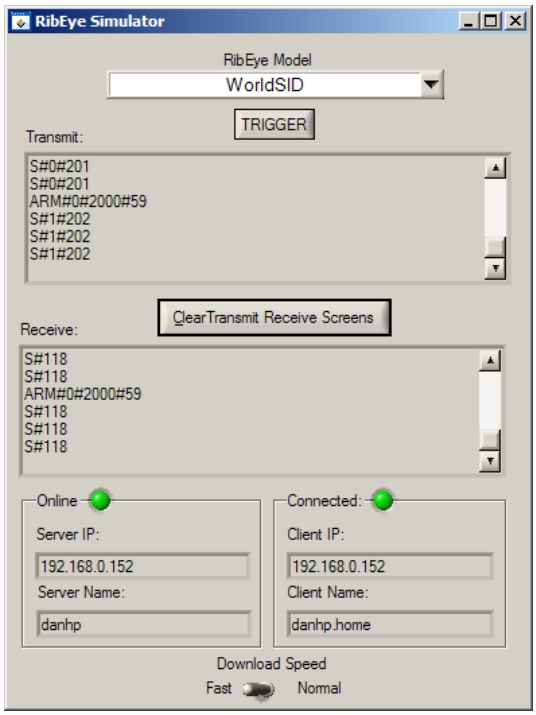
On startup, the program will simulate a RibEye powered up with test data in flash memory, with the data begin time of –500ms (-200ms for WorldSID) and a data end time of 1500 ms.

Data	WorldSID	50th	50th 3-axis	5th	SIDIIs	Polar	Ballistic	50th ADJ
Serial Number	00075							
Calibration Date	25 January 2010							
Calibration Location	Boxboro Systems, Boxboro MA							
Model	WorldSID	50th Male	50th 3D	5th Female	SIDIIs	POLAR	Ballistic	50th ADJ
Firmware	WSDID6	50S0005	50_3D_01	5S0004	S2S_003	P0000	BS000	50S0005
# of LEDS	18	12	6	12	6	6	3	12
# of Axes	3	2	3	2	3	2	3	2
Sample Rate	10000	10000	1000	10000	10000	10000	20000	10000
# of Sectors to Erase	32	32	26	32	26	18	30	32
Test Comment	WorldSID 50th	HIII 50TH	HIII 50TH 3-AXIS	HIII 5TH FEMALE	SIDIIs	POLAR	3-rib Ballistic Test Stand	HIII 50TH
Data points per line in DUMPBINA	60	27	21	27	21	14	12	27
Data points per line in DUMPBIN	54	24	18	24	18	12	9	24

Table 1. Data reported by Simulator for each RibEye Model

If you erase the memory using the Erase command, and ARM and Trigger the RibEye, you can have up to 30 seconds of data (25 seconds for WorldSID), simulating the DRAM storage in the RibEye.

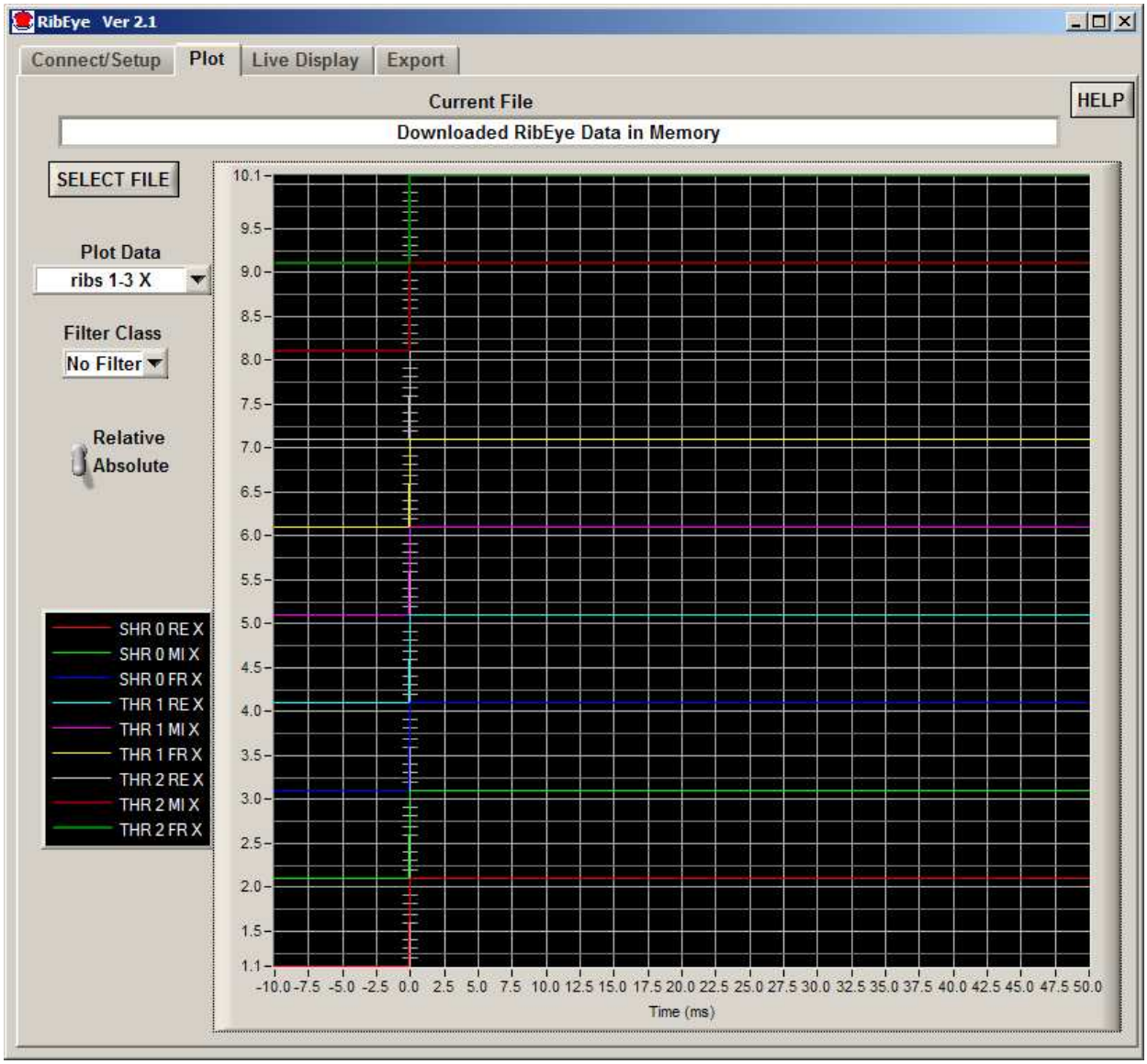
When you send an ARM command to the RibEye Simulator a Trigger button will appear on the screen. This button simulates a hardware trigger. Note that you can also generate a software trigger using the T# protocol command. The trigger button is shown on the screen below:



You will see a Download Speed toggle switch on the bottom of the screen. In the FAST position, the Simulator downloads data much faster than an actual RibEye can, because the PC Ethernet communications are much faster than the RibEye. In the NORMAL position, the Simulator slows down communications to be more like the typical RibEye speeds.

When downloading data from the RibEye using the DUMPBIN or DUMPBINA commands, pre-trigger data will be the same as in the CURRENT_POSITIONS commands, where for each channel the data will be LED#.Axis where Axis =1, 2, 3 for X, Y, Z. At time 0, 1 will be added to each data point. For example, LED#5 X data will be 5.1 prior to Time 0, and 6.1 at Time 0 and later. See the plot below for a sample.

The DUMPBINA command appends the ambient light data for each sensor to the data stream. The ambient light data, in counts, will always be 1000 for sensor 1, 2000 for sensor2, 3000 for sensor 3 etc. Note that the WorldSID has 6 sensors.



Sample Data from RibEye Simulator – WorldSID Ribs 1-3 X data