

USER INTERFACE MANUAL

Digital Drive *PLUS*

DD-10+, DD-12+, DD-15+ and DD-18+



Velodyne®

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INTRODUCTION

One of the advanced features of your Digital Drive^{PLUS} subwoofer is the available options for optimizing the bass output, including Self-EQ, Auto-EQ^{PLUS} and Manual-EQ. You can use all the optimization methods, except Manual-EQ, without either of the user interfaces for Digital Drive^{PLUS} optimization. However, if you want to use Manual-EQ optimization you need to use one of the user interfaces. Also, if you want to view your subwoofer's frequency response and/or parameter settings, you need to use a user interface.



Refer to the Digital Drive^{PLUS} User's Manual for information about the Self-EQ, Auto-EQ^{PLUS} and Manual-EQ optimization methods and the parameters each optimizes, descriptions of the parameters that can be optimized manually, and a recommended order to adjust parameters during Manual-EQ optimization.

For your convenience, Velodyne provides the following two user interfaces for performing optimizations:

- **Velodyne's Digital Drive^{PLUS} Windows Setup Program:** (*Velodyne recommended interface*) Software that runs on a Windows computer. This program is sometimes referred to by the shorter name of **Windows interface**. The software is used to:
 - Control and display preset EQ and parametric filter settings
 - Initiate Self-EQ, Auto-EQ^{PLUS} and Manual-EQ optimizations
 - Display the subwoofer's frequency response curve
 - Display the parametric filter curves
 - Save and open Digital Drive^{PLUS} files with subwoofer's settings and for Manual-EQ only, the frequency response curve that results from these settings
 - Save settings to the subwoofer's memory

- **TV Screen Display and Remote Control Commands:** This combination is often referred to by the shorter name of **TV Screen interface** because settings and command choices are shown on your TV screen. The TV screen interface and remote control can be used together to:
 - Control and display preset EQ and parametric filter settings
 - Initiate Self-EQ, Auto-EQ^{PLUS} and Manual-EQ optimizations
 - Display the subwoofer's frequency response curve
 - Display the parametric filter curves
 - Save settings to the subwoofer's memory

MANUAL ORGANIZATION

You need to only use one interface for optimization or viewing of settings and frequency response curves. We recommend the Windows interface as it is usually much easier to connect your subwoofer to your computer than to your TV screen. Also, the Windows interface allows you to see the parametric filter curves and save settings to files on your computer. These features aren't available with the TV screen interface. Because you only need to use one interface, skip to the part of this manual that covers the interface you want to use:

- **Part One - Windows User Interface for Optimization (*Recommended Interface*)**

OR

- **Part Two - TV Screen User Interface for Optimization**

The final part of this manual covers how to update the driver, software, bootcode and firmware.

- **Part Three - Software & Driver Updates**

PART ONE -

Windows Interface for Optimization

(Recommended Interface)

In order to use the Windows interface to perform any setup or optimization of your Digital Drive^{PLUS} subwoofer, the following two programs need to be installed on your computer:

- USB Virtual COM Port Driver
- Velodyne's Digital Drive^{PLUS} Windows Setup Program

Both pieces of software can be fully uninstalled using normal Windows procedures as described later in this document, leaving your computer in its former state.

This part of this document covers:

- The purpose of the driver and program.
- The computer requirements for installing this driver and program.
- How to install and uninstall this driver and program.
- How to connect your subwoofer and the Windows Setup Program so that they communicate and share data.
- How to troubleshoot connection issues between your subwoofer and the Windows Setup Program.
- How to use the Windows Setup Program controls to modify and save subwoofer parameters.
- How to run Self-EQ and Auto-EQ^{PLUS} optimization using the Windows Setup Program.
- How to use the Windows Setup Program to perform Manual-EQ optimization.
- How to update the USB Virtual COM Port driver, the Velodyne Digital Drive^{PLUS} Windows Setup Program, the Velodyne Digital Drive^{PLUS} subwoofer bootcode and the Velodyne Digital Drive^{PLUS} subwoofer firmware.

CAUTION: Since the DD+ subwoofer is a USB device, there is more to connecting the subwoofer to your PC than simply installing the USB cable. You should always connect the subwoofer to the PC right after running the Velodyne Digital Drive^{PLUS} Windows Setup Program CD to allow Windows to recognize the subwoofer and complete driver configuration and installation.

Virtual COM Port Driver

The USB Virtual COM Port driver allows the Digital Drive^{PLUS} subwoofer to appear as though it was connected through a COM port even though it connects with a USB port. The Digital Drive^{PLUS} subwoofer communicates usually through a COM port, such as the two RS-232 connectors on the back of your subwoofer. Because most modern computers have USB ports instead of COM ports, you need to convert one of your computer's USB ports to a COM port. Instead of having to physically perform this conversion with hardware, you can use the USB Virtual COM Port driver to virtually perform the conversion.

Velodyne's Digital Drive^{PLUS} Windows Setup Software

Velodyne's Digital Drive^{PLUS} Windows Setup Software is the Windows computer interface for adjusting your subwoofer's parameters. This interface displays the same information and allows for the same parameter adjustments as the TV screen interface. However, with this interface you don't need to access the video input connections to your TV that are often hard to reach in an already installed home theater system.

Software Installation Requirements

The USB Virtual COM Port software and Velodyne's Digital Drive^{PLUS} Windows Setup software require the Windows operating systems and minimum hardware as shown in the table below.

Windows Setup Software and USB Driver Minimum Hardware and Operating System Requirements	
Supported Windows Operating Systems	32-bit and 64-bit Home and Professional versions of: XP SP2 Vista SP1 Windows 7
RAM (Memory)	1 GB RAM
Processor Speed	1 GHz single core
Available Hard Drive Space	5 MB
Display Resolution	800 x 600

Note: Velodyne's Digital Drive^{PLUS} Windows Setup software was not designed to operate in any Mac, Linux, or virtual machine operating systems. Often in virtual machine operating systems, such as VM Ware and Parallels for Mac, the operating system can't recognize devices connected to the computer's USB and COM ports. Hence, your computer can't communicate with the Digital Drive^{PLUS} subwoofer from within a virtual machine.

Installing the USB Virtual COM Driver and the Digital Drive^{PLUS} Windows Setup Program

The Velodyne Digital Drive^{PLUS} Windows Setup Program CD is designed to perform the installation of both the USB Virtual COM driver and the Digital Drive^{PLUS} Windows Setup Program with minimal user guidance. However, for the Digital Drive^{PLUS} Windows Setup Program you can choose your installation language and the location to install the software.

To install the driver and software:



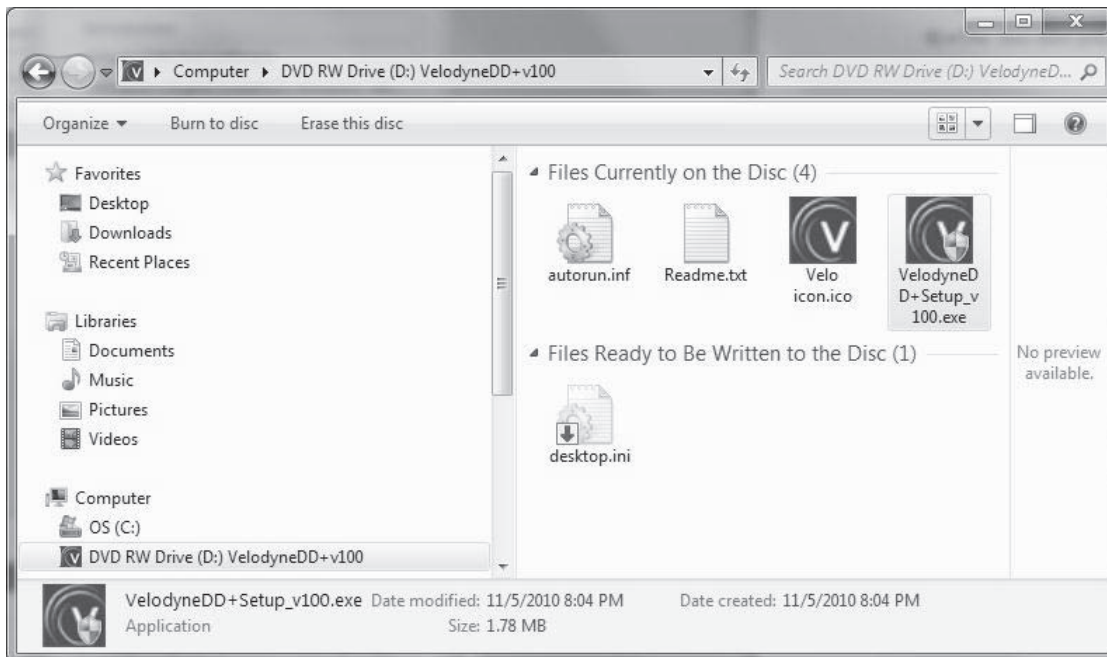
The images included in this procedure are from an installation done on a Windows 7 computer. Due to differences in the various Windows operating systems, your install experience may vary slightly from the one presented here.

- 1) Make sure your computer is on and that you can see your Windows desktop. The subwoofer should NOT be connected to the subwoofer yet.
- 2) Save your work and close running application programs, open browser windows and other open screens.
- 3) Insert the Velodyne Digital Drive^{PLUS} Windows Setup Program CD into your computer's compatible disc drive.
- 4) The disc auto plays and begins installing the USB Virtual COM Port driver. It may take up to 10 seconds for the auto play to begin depending on your computer.

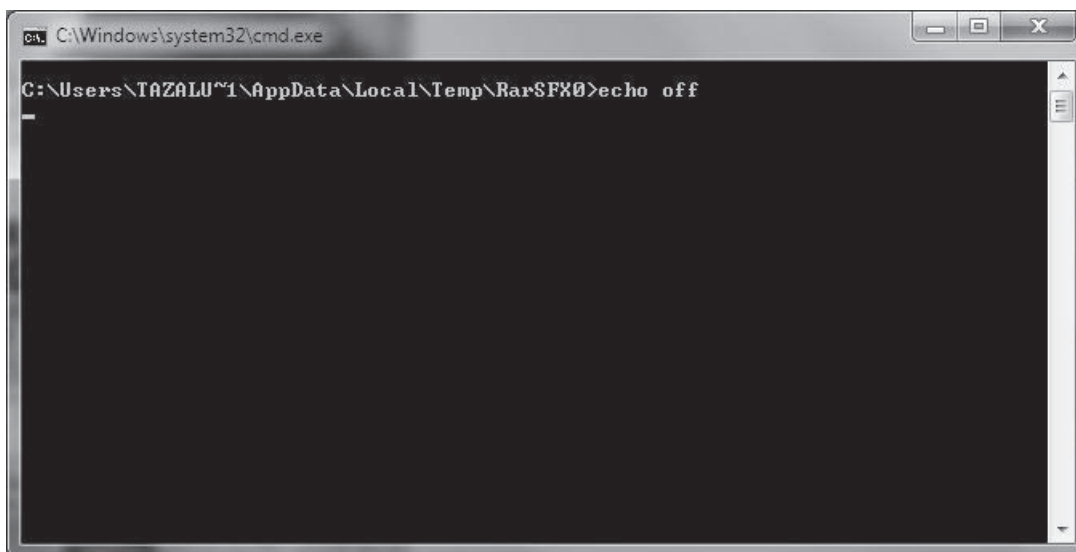
- 5) In Windows 7, if you see an **AutoPlay** dialog window as shown below, click **Run VelodyneDD+Setup_v###.exe** under the text that reads “Install or run program from your media.”



If the install program doesn't start automatically, you can start the installation by double-clicking on the **VelodyneDD+Setup_v###.exe** file in the CD directory in Windows Explorer as shown below. **###** represents the version number of the software, such as 100.

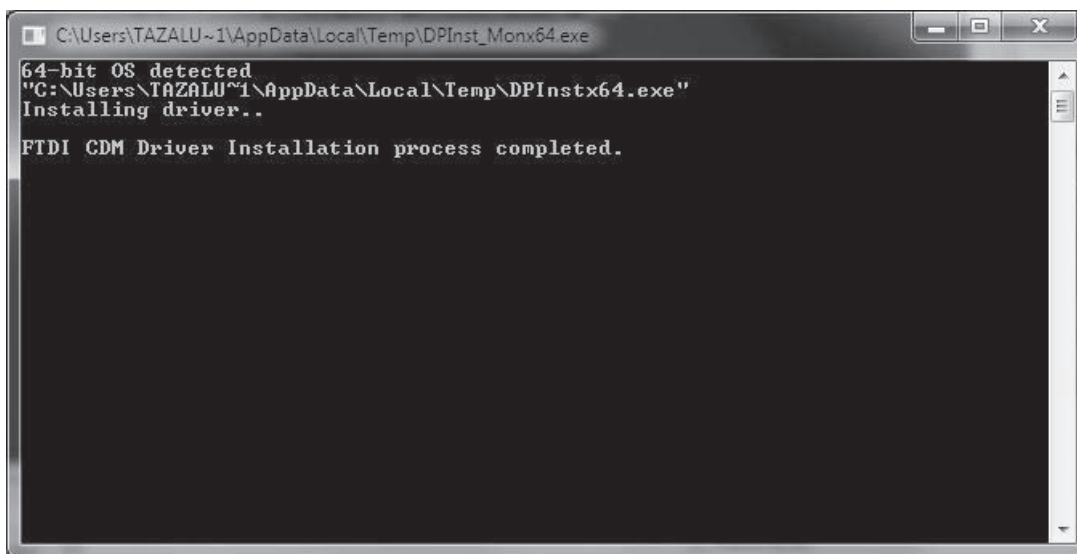


- 6) The driver install is performed in a black background command prompt window. It begins by displaying the **echo off** message as shown below.



```
C:\Windows\system32\cmd.exe
C:\Users\TAZALU~1\AppData\Local\Temp\Rar$FX0>echo off
-
```

- 7) The driver install can take anywhere from a few seconds to a few minutes, depending on the configuration of your computer. When the driver install finishes, the **FTDI CDM Drive Installation process completed** message appears and you are prompted to "Press any key to continue." The installation of the Digital Drive^{PLUS} Windows Setup Program Setup Wizard does not start until you press a key.

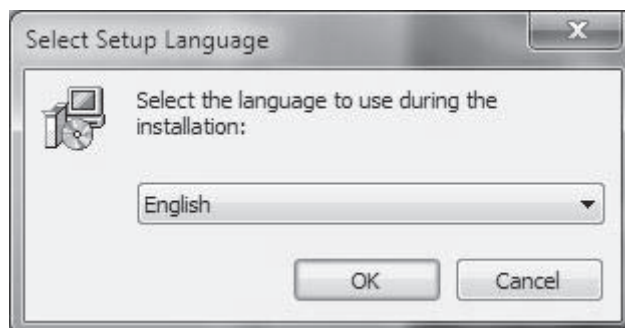


```
C:\Users\TAZALU~1\AppData\Local\Temp\DPIInst_Monx64.exe
64-bit OS detected
"C:\Users\TAZALU~1\AppData\Local\Temp\DPIInstx64.exe"
Installing driver..
FTDI CDM Driver Installation process completed.
```

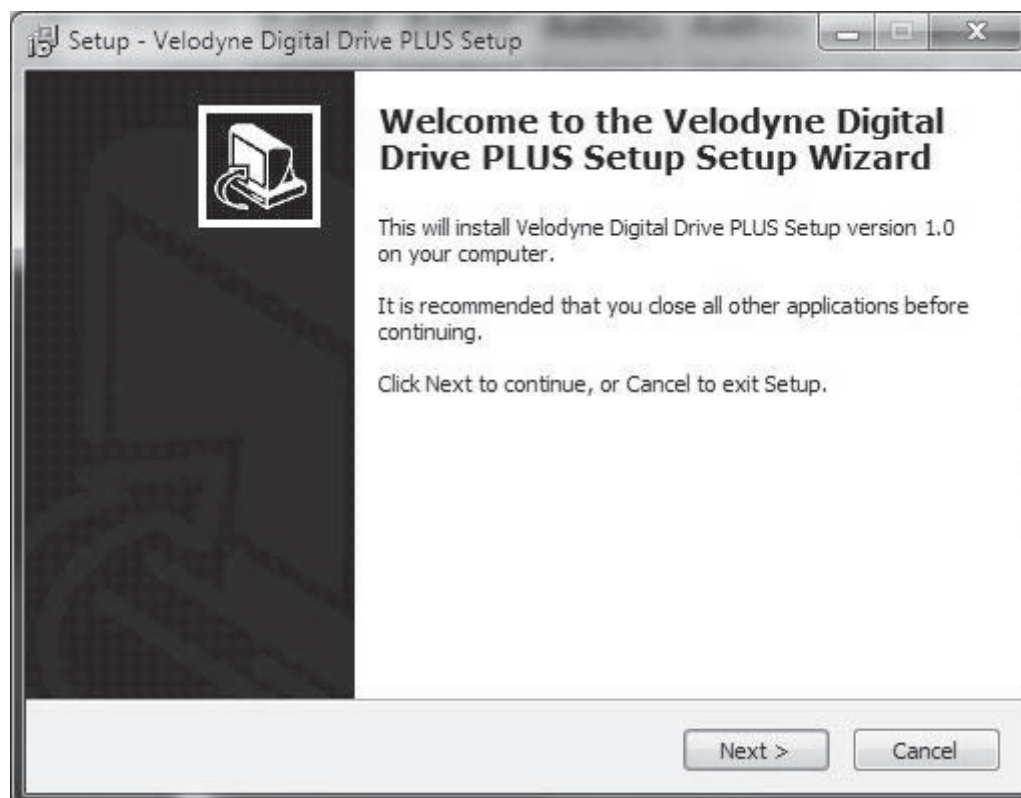


If after a few minutes, the message indicating the install is complete doesn't appear and you still see the window as shown in Step 7, the driver installation may need to be re-started. To re-start, first close the driver installation window. Next, eject the CD and go back to Step 4.

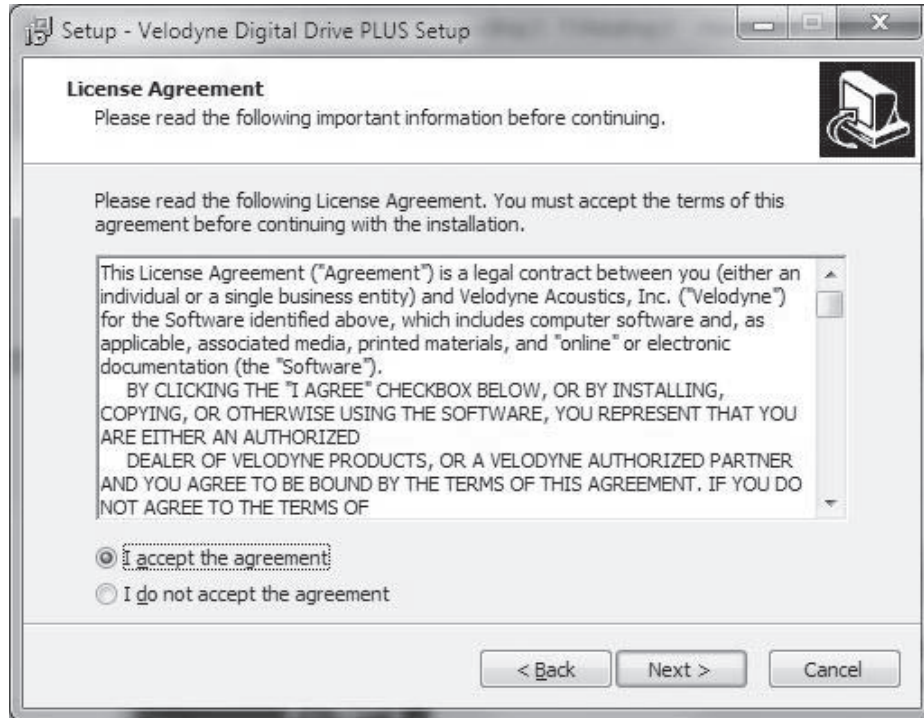
8) The **Select Setup Language** dialog window opens. Select an install language and then click **OK**.



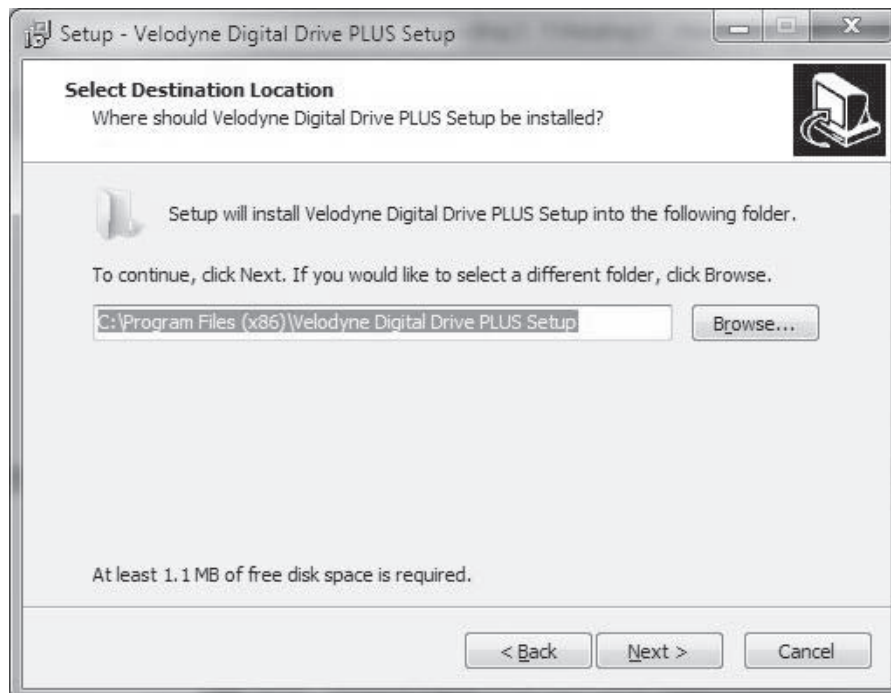
9) The Velodyne Digital Drive^{PLUS} Setup Program Wizard opens. Click **Next** to continue.



- 10) Read the EULA (End User License Agreement), then select the **I accept the agreement** option. You have to accept the EULA to continue with the software installation.
- 11) Click **Next**.

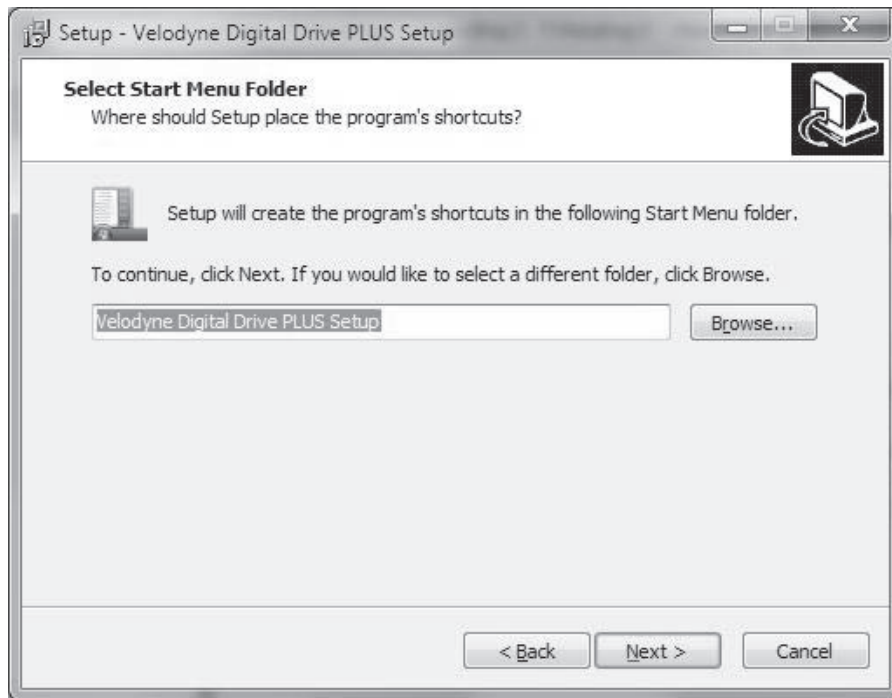


- 12) Browse to where you want to install the Digital Drive^{PLUS} Windows Setup Program. The default location is your Windows Program Files folder.
- 13) Click **Next**.



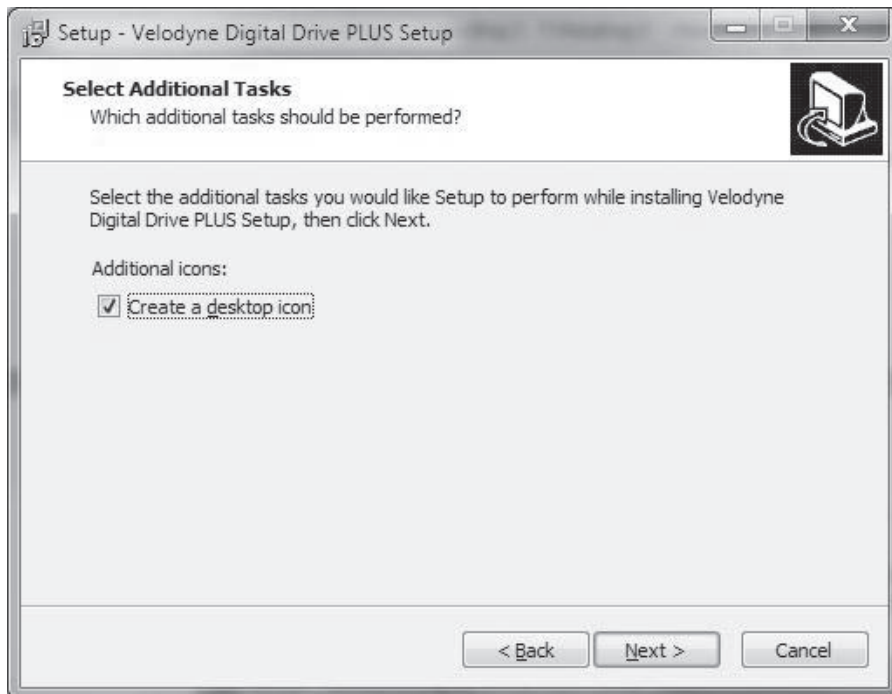
14) Browse to where you want the program to appear in your Start Menu. The default folder is **Velodyne Digital Drive^{PLUS} Setup**.

15) Click **Next**.

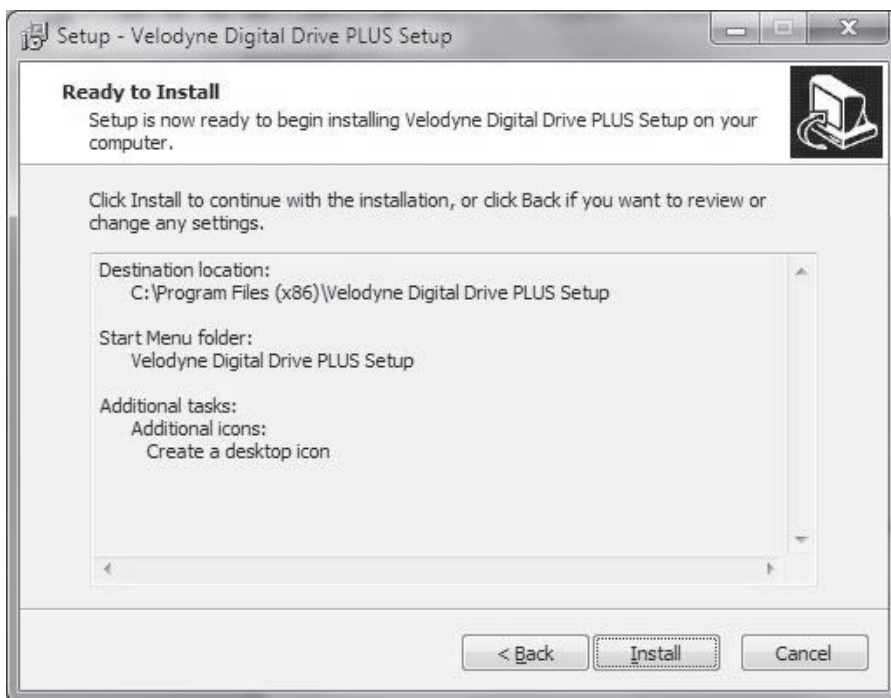


16) If you don't want the installation to create a desktop icon for the Digital Drive^{PLUS} Windows Setup Program, un-check the **Create a desktop icon** option. By default a desktop icon is created.

17) Click **Next**.

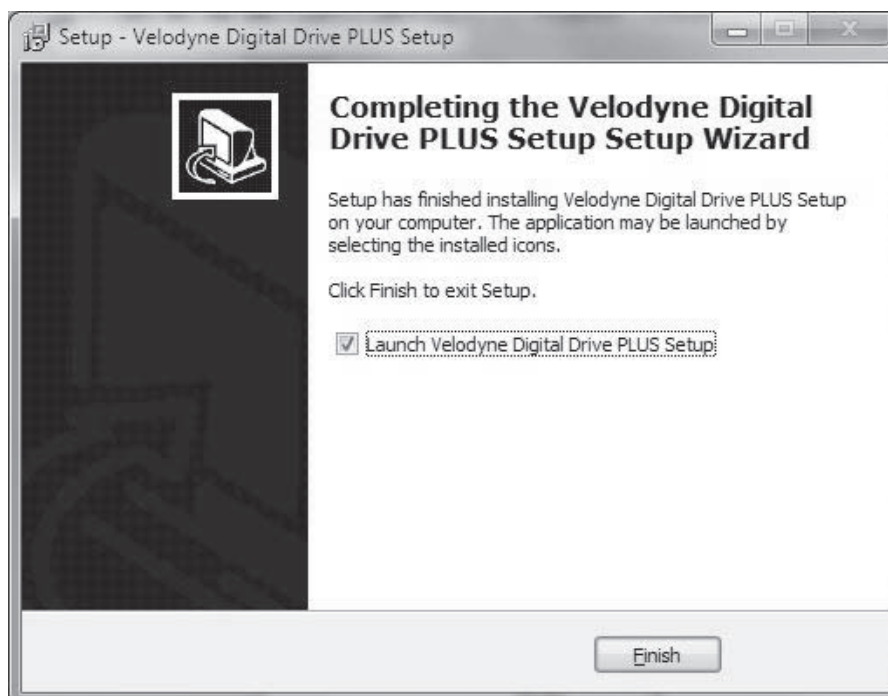


18) Click **Install**.



19) If you want to run the Digital Drive^{PLUS} Windows Setup Program now, select the **Launch Velodyne Digital Drive^{PLUS} Setup** option.

20) Click **Finish**.



21) You should now connect your Digital Drive^{PLUS} subwoofer to the computer with the supplied USB cable, making the subwoofer is powered on. This allows Windows to finish the driver installation.

22) You can now begin using the software to set the equalization parameters for your subwoofer.



After the installation of the Virtual COM Port software, your computer thinks the USB cable from your computer to the Digital Drive^{PLUS} is really a serial cable connected to a COM port.

You can see the COM port number assigned to the USB port by using the Windows Control Panel's System > Hardware > Device Manager. The virtual port appears as an additional COM port with the label "USB Serial Port."

DIGITAL DRIVE^{PLUS} WINDOWS SETUP PROGRAM USER INTERFACE

This section describes the controls and features available in the two user interface screens in the Windows Setup Program:

- Frequency Response and Parameters screen
- Preset screen

Frequency Response and Parameters Screen

When you run the Digital Drive^{PLUS} Windows Setup Program it opens to the Frequency Response and Parameters screen. This screen is the screen you'll use most often when optimizing the bass response.

The main functional areas of the screen are indicated in the following image. The features available in each of these areas are described after the image.

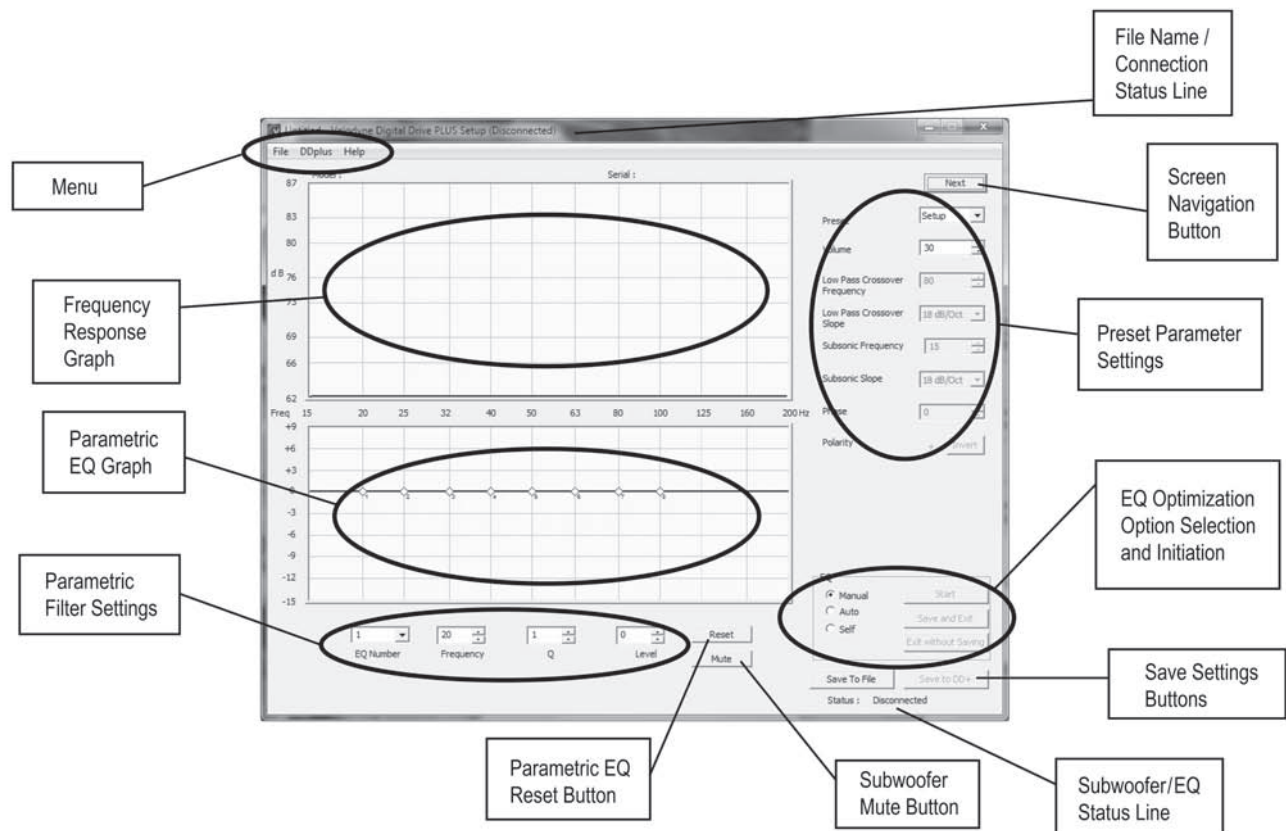

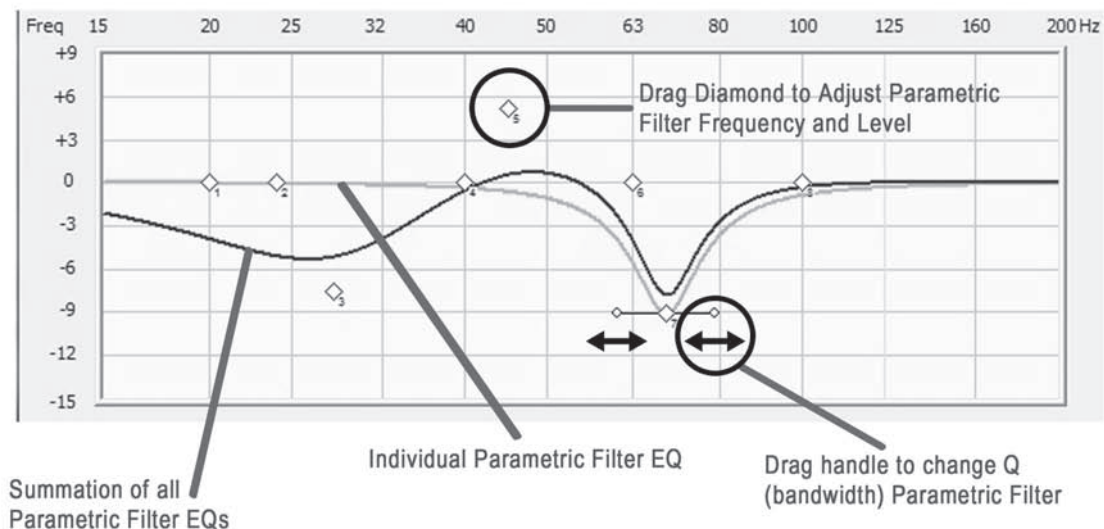


Figure 1: The Frequency Response and Parameters Screen

Graphs

- **Frequency Response Graph:** Displays the measured frequency response. Both the horizontal and vertical scales are fixed.
- **Parametric EQ Graph:** Displays the graphical representation of the 8 adjustable parametric EQ filters based on the **Parametric Filter Settings**.
 - Each diamond represents one of the eight parametric filters. The small number by each  indicates the EQ number of the parametric filter that diamond represents.
 - The filters are numbered 1 to 8 from left to right.
 - The green line is the curve for a single parametric filter.
 - The blue line is the summation of all parametric filter EQs.
 - After one complete sweep tone, the frequency response updates.
 - You can use the mouse to grab and drag the filter to a new frequency and level. Moving the diamond up and down changes the level of boost or cut. Moving it side-to-side changes the frequency of the selected EQ filter.
 - Once a parametric filter's EQ graph has a peak or dip, you see a horizontal line with small diamond handles appear through the latest filter at the maximum or minimum level. Moving one of the diamonds at the end of this line towards the filter center diamond raises the filter Q, narrowing the bandwidth. Moving it away from the filter center diamond widens the bandwidth lowering the Q.
 - If you change a filter's settings using this graph, the changes are shown in the **Parametric Filter Settings** area.



Optimization Parameters

- **Parametric Filter Settings:** Displays and allows you to adjust each of the parametric filter's settings. You adjust the settings using either single-increment mouse clicks or direct entry of a value. If you adjust a filter's settings using these input fields, the changes are reflected in the **Parametric EQ Graph**.
- **Preset Parameter Settings:** Displays and allows you to adjust the values of a selected preset with single-increment mouse clicks or direct entry of a value.

EQ Optimization Option Selection and Initiation

The options and buttons in this area allow you to select and start an optimization option for the connected subwoofer.

- **Manual:** Manual-EQ optimization.
- **Auto:** Auto-EQ^{PLUS} optimization.
- **Self:** Self-EQ optimization.
- **Start:** Begin the selected optimization.

Save Setting Options

- **Save to File:** Save the current settings in the program to an EQ optimization profile file on your computer. Same as the **File > Save As** menu selection.
- **Save to DD+:** Loads the current settings or loaded EQ optimization profile in the Digital Drive^{PLUS} Windows Setup Program into the Digital Drive^{PLUS} subwoofer, memory but the subwoofer doesn't reboot. You can save settings to the subwoofer even when the subwoofer is not synced as long it is communicating with the Digital Drive^{PLUS} Windows Setup Program.
- **Reset:** Reset all of the parametric filters to their factory default settings, which produces a flat line (level=0 dB, ISO frequencies, Q=4.3) as the **Parametric EQ Graph**. ISO (International Organization for Standardization) frequencies are standard frequencies used in the audio industry for EQ.
- **Save and Exit:** (Used in EQ process only) Saves EQ results to the subwoofer's memory and then reboots the subwoofer.
- **Exit without Saving** (Used in EQ process only): Exit EQ mode without saving settings to a file or to the subwoofer. Reboots the subwoofer.

Subwoofer Controls

- **Mute:** Mute the subwoofer to see the low end frequency response of the satellites of the audio system to which the Digital Drive^{PLUS} subwoofer is matched to.

Status Information

- **Filename/Connection (title bar):** Shows the name of the settings file after it has been saved to the computer as well as connection status of the subwoofer.
- **Subwoofer/EQ (lower right):** Displays the subwoofer connection as well as various status updates within the EQ optimization processes.

Menu

- **File Menu:**
 - **Open:** Open a subwoofer setup profile file.
 - **Save:** Save a subwoofer setup profile file as a DDP file.
 - **Save As:** Save a subwoofer setup profile file with an additional name, or to a different place.
 - **Exit:** Close the program without saving settings to a file or to the subwoofer.
- **DD+ Menu:**
 - **Reconnect:** Try to re-connect to the subwoofer.
 - **Save to DD+:** Save the current settings to the connected subwoofer
 - **Restore Defaults:** Restore the Digital Drive^{PLUS} subwoofer to its factory default settings.
- **Help Menu:**
 - **About:** Display the software Digital Drive^{PLUS} Windows Setup Program version. You can use this to determine if you have the latest version of the software that is available on the Velodyne website.

Screen Navigation

- **Next:** Allows you to open the Preset screen

Preset Screen

The Preset screen allows you to view and modify the volume, low pass crossover frequency and slope, subsonic filter frequency and slope, phase, and polarity of the presets including the Setup, or global, preset. The Preset screen also allows you to modify the contour frequency and level, and servo gain for each preset. This screen also allows you to set the Night mode percentage and the auto-on setting.

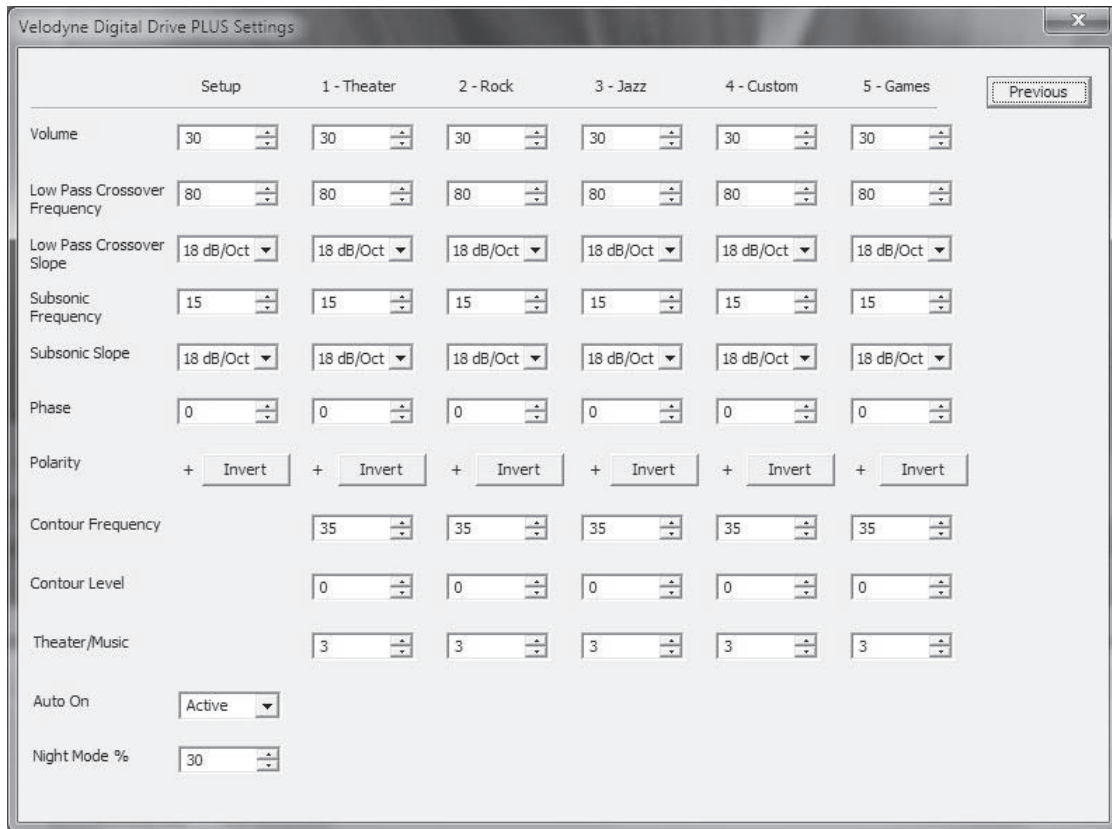



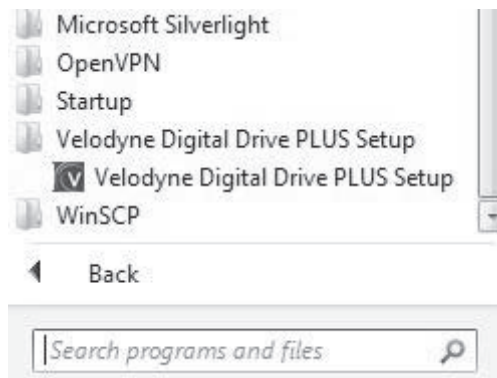
Figure 2: The Preset Screen

• **Screen Navigation:**

- **Previous:** Allows you to return to the **Frequency Response and Parameters** screen.

Establishing Communication between the Digital Drive^{PLUS} Subwoofer and the Digital Drive^{PLUS} Windows Setup Program

- 1) Start the Velodyne Digital Drive^{PLUS} Windows Setup Program using either the desktop shortcut icon  or selecting it from the Windows Program menu.



- 2) Connect your subwoofer's front panel USB port to your computer using the supplied USB cable. Refer to the Digital Drive^{PLUS} User's Manual for directions on how to remove the subwoofer's front grille to access the USB port.
- 3) The program establishes communication with the subwoofer and indicates this by displaying **Connected or Connected, Not Synced** in the program's title bar and in the lower left corner of the window in the **Subwoofer/EQ Status Line**.
- 4) Once communication is established, the subwoofer model and serial number appear at the top of the **Frequency Response Graph** area.
- 5) Once you see the Connection message, you can use the program to control the subwoofer.
- 6) See the Troubleshooting section of this part of the manual if you don't see the Connection message.



Refer to the Digital Drive^{PLUS} User's Manual for more information about the different optimization methods and setup options.

MAKING & SAVING PRESET CHANGES

The simplest customization of parameters you can do is to make and save changes to the presets.

You can modify the preset parameters either in the **Preset Parameter Settings** area on the **Frequency Response and Parameters** screen or on the **Preset** screen. The **Preset** screen has the advantage that you can see settings for all the presets at one time and also modify the night mode and power on settings. The **Frequency Response and Parameters** screen has the advantage that you don't have to open the **Preset** screen.



See the Digital Drive^{PLUS} User's Manual for a detailed explanation of the preset parameter settings that you can modify.

To modify the presets using the **Preset** screen:

- 1) On the **Frequency Response and Parameters** screen, click **Next** (upper right hand corner).
 - Some values are changed with pull-down menus, like the slopes, whereas others increment with up/down buttons.
 - The parameter input fields can also be selected with the mouse and the value typed into them.
- 2) Click **Previous** to return to the **Frequency Response and Parameters** screen.
- 3) Click **Save to DD+** to save the preset setting changes to the subwoofer's memory.
- 4) Click **Save to File** to save the preset changes to a file on your computer. Velodyne recommends this practice as a way to "back up your work" and to be able to retrieve subwoofer settings without having the subwoofer connected to your computer. You can also save the settings using the **File > Save** menu option. Previously saved profile files can be retrieved using the **File > Open** menu option.

To modify the presets using the **Frequency Response and Parameters** screen:

- 1) In the **Preset Parameter Settings** area use the **Preset** pull down menu to select which preset to modify.
- 2) Use the pull down menus to change the preset parameter settings.
- 3) Click **Save to DD+** to save the preset setting changes to the subwoofer's memory.
- 4) Click **Save to File** to save the preset changes to a file on your computer.

RUNNING SELF-EQ OPTIMIZATION– YOUR FIRST EQ

The easiest EQ optimization to perform is the Self-EQ. With Self-EQ the subwoofer generates its own sweep tone.

To perform Self-EQ optimization:

- 1) Remove the microphone, mic cable and stand from the accessory kit. Carefully snap the microphone into the stand and attach the larger end of the cable to it. See the Digital Drive^{PLUS} User's Manual for more information.
- 2) Place the microphone at the main listening position.
- 3) Attach the small end of the mic cable to the jack on the left side of the subwoofer front control panel.
- 4) Make sure the subwoofer is on and your audio system is off.

- 5) On the **Frequency Response and Parameters** screen, select the **Self** option in the **EQ Optimization Option Selection and Initiation** area.
- 6) Click **Start**.
- 7) The subwoofer produces its own sweep tone and its frequency response.
- 8) You can watch the subwoofer smooth its frequency response by adjusting the parametric EQ filter levels on the **Frequency Response and Parameters** screen. Self-EQ doesn't change the Setup preset parameters (volume, crossover, etc.) Self-EQ uses a 160 Hz crossover.
- 9) When Self-EQ finishes, the front subwoofer display shows End for 10 seconds, then the subwoofer reboots by turning itself off and back on. The display shows the preset number and then volume level. During this process the new filter settings are saved into the subwoofer's memory.
- 10) Click **Save to File** to save the Setup preset's EQ filter settings to a DDP file on your computer.



The frequency response curve is only saved with Manual-EQ, not Self-EQ or Auto-EQ^{PLUS}.

RUNNING AUTO-EQ^{PLUS} OPTIMIZATION – STEPPING UP IN POWER

The next level up in the Digital Drive^{PLUS} EQ optimization methods is Auto-EQ^{PLUS} optimization. To perform Auto-EQ^{PLUS} optimization:

- 1) Set up the microphone as in the Self-EQ instructions above.
- 2) Make sure the subwoofer and your audio system are both on.
- 3) Place the Digital Drive^{PLUS} Sweep Tone CD into your disc player and press play.
- 4) Once the sweep tone starts to play, adjust the receiver or processor output level to about the level of a normal-loudness conversation.
- 5) On the **Frequency Response and Parameters** screen, select the **Auto** option in the **EQ Optimization Option Selection and Initiation** area.
- 6) Click **Start**.
- 7) The subwoofer not only adjusts the Setup preset EQ filter parameters as you watch, but it also adjusts the volume, crossover, slope, and phase while these input fields are grayed out during the Auto-EQ^{PLUS} optimization process.
- 8) You can also watch the status of the subwoofer in the process down in the lower right in the subwoofer/EQ status line.
- 9) When Auto-EQ^{PLUS} optimization finishes, the front display shows End for 10 seconds, the subwoofer reboots by turning itself off and back on. The display shows the preset number and then volume level. During this process the new filter settings are saved into the subwoofer's memory. When the subwoofer is rebooting, the Digital Drive^{PLUS} Windows Setup Program shows the subwoofer is **Disconnected**.
- 10) While the subwoofer is rebooting, shut off the Sweep Tone CD and remove it from the player.
- 11) When the subwoofer has finished rebooting, either the program and subwoofer reconnect automatically or you can click **DDPLUS > Reconnect** in the menu.
- 12) Click **Save to File** to save the Setup preset's EQ filter settings to a DDP file on your computer. You will need it to perform the following Manual-EQ optimization instruction.



The frequency response curve is only saved with Manual-EQ, not Self-EQ or Auto-EQ^{PLUS}.

RUNNING MANUAL EQ OPTIMIZATION – ADJUST IT TO YOUR LIKING

In some particularly problematic rooms, it may be necessary to employ even further adjustment than the Auto-EQ^{PLUS}. Manual EQ gives enough flexibility to get the subwoofer response very flat:

- 1) Set up the microphone, subwoofer and Sweep Tone CD as in the Auto-EQ^{PLUS} optimization instructions.
- 2) Set the system playback volume level as in the Auto-EQ^{PLUS} optimization instructions.
- 3) On the **Frequency Response and Parameters** screen, select the **Manual** option in the **EQ Optimization Option Selection and Initiation** area, then click **Start**.
- 4) Watch the subwoofer/EQ status line until it says **Connected, Not Synced** and then **Syncing**.

- 5) When the subwoofer/EQ status line says **Synced**, start adjusting the subwoofer parameters. Do not attempt to adjust any settings until the **Subwoofer/EQ** status line says **Synced**. **Synced** means the subwoofer has synchronized its frequency measurement with the frequency of the sweep tone being played through your audio system. An indication of not being synced is that you raise or lower a filter slider and the response curve moves at another filter frequency.
- 6) Click **Mute**. You can now see the low frequency character of the satellites so that you can make a judgment about this crossover frequency and slope to properly blend the Digital Drive^{PLUS} subwoofer to them.
- 7) Click **Mute** again to restore the subwoofer to playing.
- 8) Go to the **File > Open** menu option and open the file that you saved at the end of the Auto-EQ^{PLUS} optimization process. All the settings shown in the Windows interface are reverted to those arrived at by the Auto-EQ^{PLUS} optimization.
- 9) Click **Save to DD+**. Now the Digital Drive^{PLUS} subwoofer has been reset to its state at the end of the Auto-EQ^{PLUS} optimization. You can save settings to the subwoofer even when the subwoofer is not synced as long as it is communicating with the Digital Drive^{PLUS} Windows Setup Program.
- 10) Adjust the preset parameters as described in the Making & Saving Changes section.
- 11) Adjust the parametric filter EQ parameters as described in the Graphs section above.
- 12) Click **Save to DD+** to save the parametric filter settings to the subwoofer's memory.
- 13) Click **Save to File** to save the parametric filter settings and the frequency response curve to a file on your computer.



The frequency response curve is only saved with Manual-EQ, not Self-EQ or Auto-EQ^{PLUS}.

TROUBLESHOOTING GUIDE

This section includes information about how to fix issues you may have with the software and driver required to operate and optimize your Digital Drive^{PLUS}. If you can't resolve your software issue using this section, please contact Velodyne customer service at (408) 465-2851 or service@velodyne.com.

Issue: Can't connect to subwoofer.

Solution:

- Make sure subwoofer is on.
- Make sure USB cable is connected to both computer and subwoofer.
- Try plugging the USB cable into a different USB port on your computer.
- You may need to re-install the USB Virtual COM port driver. Re-insert the Velodyne Digital Drive^{PLUS} Windows Setup Program CD into your computer. You can cancel out of the install at the language selection prompt.

Issue: Windows still asks for USB drivers after running the program disc.

Solution:

On your program CD is an archive file named "FTDI USB Driver XXXXXX". The file XXXXXX is a numeric date. Copy this executable file to your computer and extract the files. Direct the Windows hardware wizard to this extracted folder.

Issue: You hear an audible hum while your laptop is connected to the subwoofer through the USB port.

Solution:


The hum is caused by the laptop power supply. The power supply doesn't have a ground loop isolator, which means you can get cross-talk noise/hum when any USB device, including the Digital Drive^{PLUS} subwoofer, is connected to the power supply. To eliminate the hum:

- **(Recommended)** Disconnect the power supply and run the laptop on battery power when using the Windows Setup Program; or
- Plug the laptop into a 3-prong to 2-prong adapter and then into the power outlet.

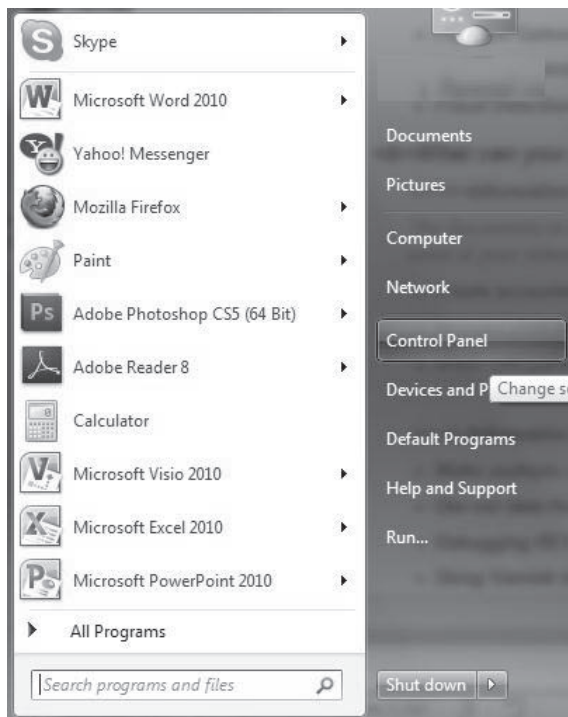
UNINSTALLING VELODYNE'S DIGITAL DRIVE^{PLUS} WINDOWS SETUP SOFTWARE

To uninstall the Velodyne Digital Drive^{PLUS} Windows Setup Software, follow these steps:

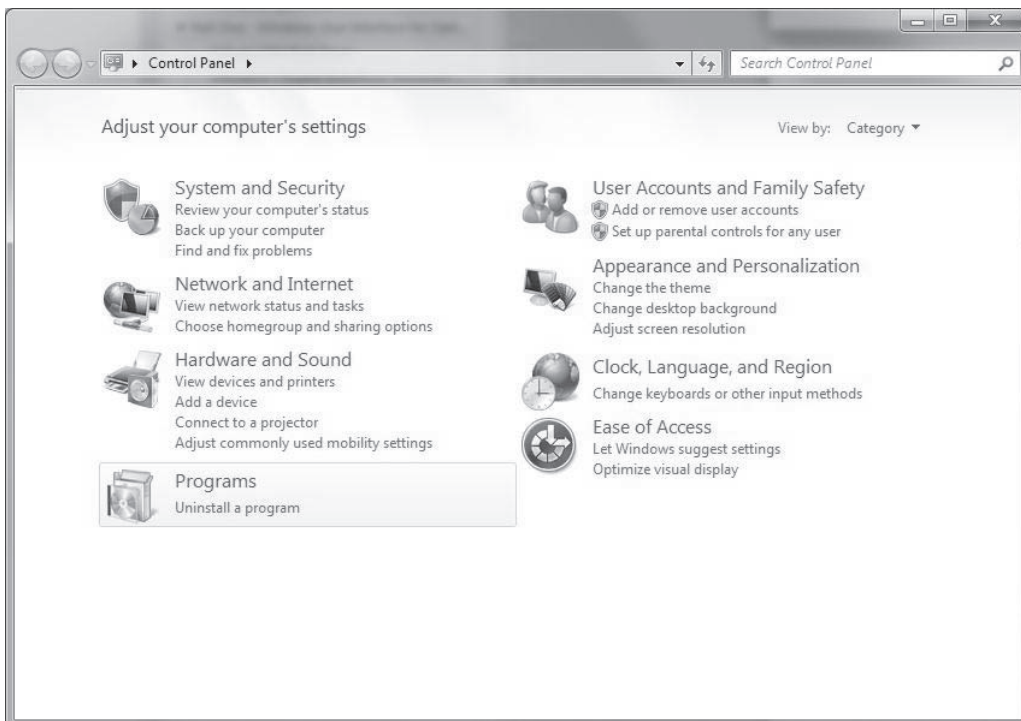
1) With no programs running and all windows closed, go to the Uninstall Program feature of the Windows Control Panel. Each version of the Windows operating system has a slightly different way to access the Control Panel and the Uninstall Program feature. Refer to the Help system for your version of Windows to determine how to access the Control Panel's Uninstall Program feature.

a. In Windows 7, go to the Windows **Start Menu** by right-clicking the  image usually found in the lower left corner in the Windows toolbar. Your Windows toolbar may also be at the top or either side of your computer screen depending on how you've set up your computer.

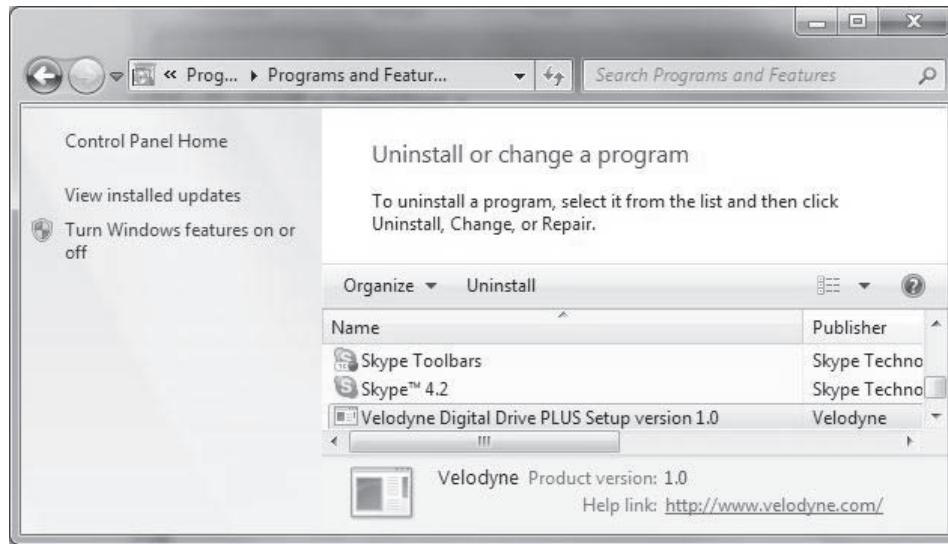
b. Select **Control Panel** from the popup menu.



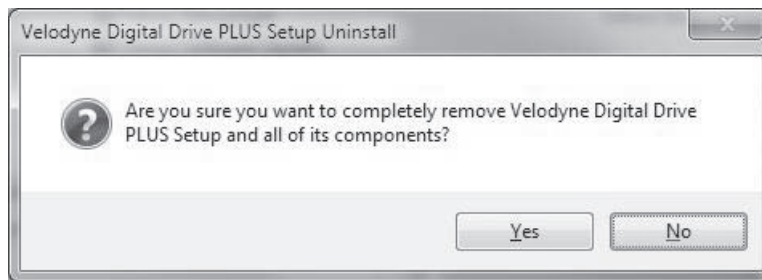
c. Click **Uninstall a program** under Programs.



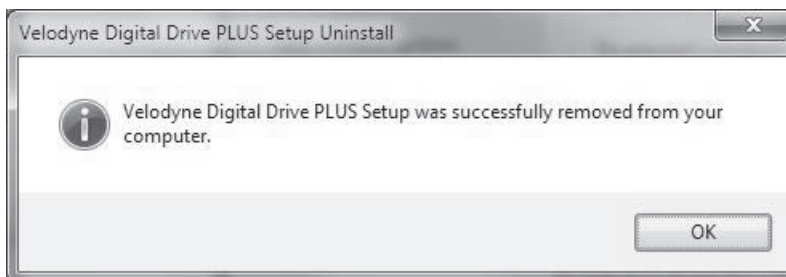
- 2) Scroll down to the “Velodyne Digital Drive^{PLUS} Setup version X.XX” line and double-click it.



- 3) In the Velodyne Digital Drive^{PLUS} Setup Uninstall dialog window, click **Yes**.



- 4) When the Windows uninstall wizard has finished, the Velodyne Digital Drive^{PLUS} Windows Setup Program has been completely removed from your computer.



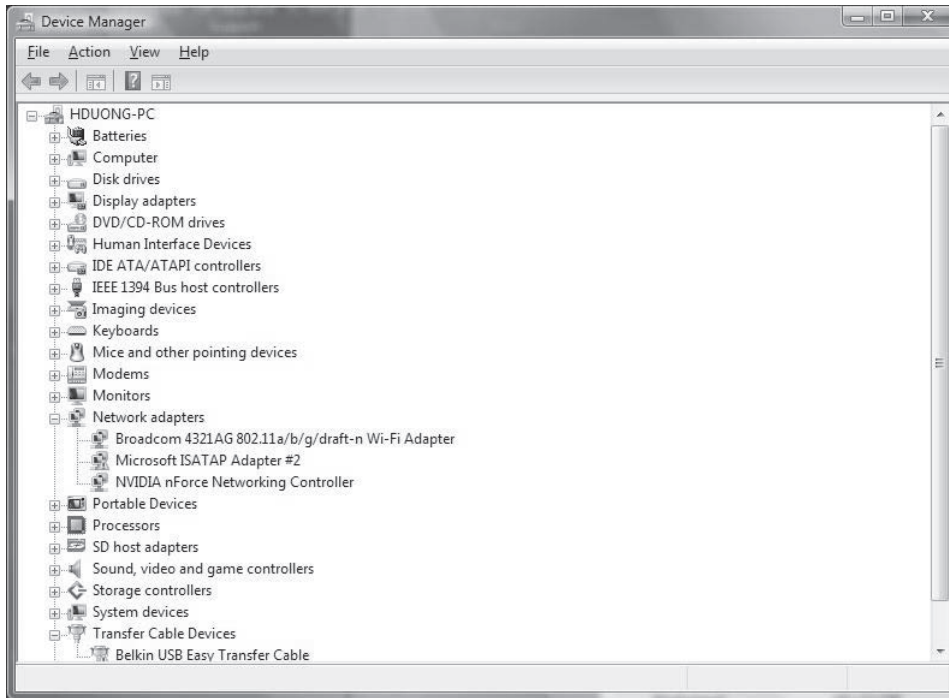
UNINSTALLING THE VIRTUAL COM PORT SOFTWARE

You can leave the Virtual COM Port driver on your computer after you finish setting up your Digital Drive^{PLUS} subwoofer. If you leave the Virtual COM Port driver on your computer, you can more easily use the Windows Setup Software later to make changes to the Digital Drive^{PLUS} subwoofer parameters. You can leave it on even if you decide to uninstall the Digital Drive^{PLUS} Windows Setup Program as it will give your computer the ability to work with more USB devices that require a virtual COM driver.

However, if you need the hard drive space for other programs or files, you can uninstall the Virtual COM Port Software. If you uninstall the Virtual COM Port software and want to modify Digital Drive^{PLUS} subwoofer parameters, you need to re-install the Virtual COM Port software. Because port drivers go into the Windows Device Manager, not the Windows Program folder, the USB Virtual COM Port driver is uninstalled in a different way than the Velodyne Digital Drive^{PLUS} Windows Setup Program.

To uninstall the USB Virtual COM Port driver:

- 1) Go to the System Device Manager feature of the Windows Control Panel. Each version of the Windows operating system has a slightly different way to access the Control Panel and the System Device Manager feature. Refer to the Help system for your version of Windows to determine how to access the Control Panel's System Device Manager feature.
- 2) Click **COM Ports** in the Device Manager.



- 3) Right-click on **USB Serial Port**. You must remove the COM Port driver before the Universal Serial Bus Controller driver or you won't be able to find the COM Port driver.
- 4) Select **Uninstall**.
- 5) Go to the Universal Serial Bus Controllers listing and right-click on **USB Serial Converter**.
- 6) Click **Uninstall**.
- 7) To finish uninstalling the USB Virtual COM Port driver on Windows XP, you must remove the driver INF and PNF files manually.
 - a. In the control panel go to **Folder Options > View** and select the **Show hidden files in folders** and **display the contents of system folders** options.
 - b. Search the Windows/INF folder file for **FTDIBUS.INF** with the **Word or phrase in the file** option selected. This returns a file named with the format of oem###.inf. Delete this oem###.inf file.
 - c. Search for the oem###.pnf file with the same number and delete it.
 - d. Search the Windows file for **FTDIPORT.INF** with the **Word or phrase in the file** option selected. This returns a file named with the format of oem###.inf. Delete this oem###.inf file.
 - e. Search for the oem###.pnf file with the same number and delete it.
- 8) You have successfully removed the USB Virtual COM Port driver.

PART TWO -

TV Screen User Interface for Optimization

In order to use the TV Screen interface to perform any setup or optimization of your Digital Drive^{PLUS} subwoofer, you need to connect the video input on your TV to the video output of the subwoofer.

This part of this document covers:

- How to make the video connection between your TV and subwoofer.
- How to use the remote control to modify and save subwoofer parameters.
- How to run Self-EQ and Auto-EQ^{PLUS} optimization using the remote control.
- How to use the remote control to perform Manual-EQ optimization.

Instruction Conventions

- Words in all uppercase bold letters in the setup instructions (e.g., **SELECT**, **MENU**, etc.) identify the specific remote button to be pressed or selected, or the field (e.g., **NEXT**, **SEL**, etc.) on the screen you should select or should be paying attention to.
- Words in title case and bold are the names of the interface screens, such as **Introductory** screen.

Make Video Connection between TV and Subwoofer

To make the video connection from the subwoofer to the TV:

1. Connect either:

The subwoofer's Video Output (yellow RCA connector) to the TV's composite video input (yellow connector).

OR

The subwoofer's S-VIDEO output to the TV's S-Video input.

2. Use the TV's remote to set the video input where you connected the video output as the active TV image. The **Introductory** screen appears on your TV screen as shown in Figure 1.

See the *Controls & Connections* section of the *Digital Drive^{PLUS} User's Manual* for locations of these connectors on the subwoofer's back panel.

SCREENS

Following is an overview of the screens you use to optimize the subwoofer audio output.

Introductory Screen

When you first connect the video output of the subwoofer to your TV and turn on the power to both the TV and subwoofer, the **Introductory** screen appears as shown Figure 1. If you use the remote to change settings, such as the selected preset or volume, the changes are automatically reflected on this screen. This screen indicates that the subwoofer is in its Active mode. However, this screen can also be used to indicate the subwoofer is in Runtime Inactive modes; screenshots are shown later in this section. See the *Digital Drive^{PLUS} User's Manual* for description of the subwoofer modes.

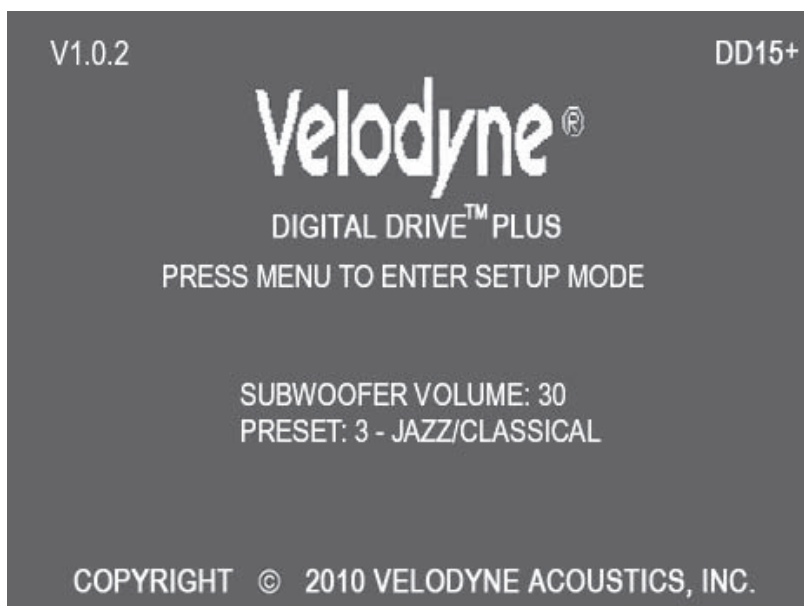


Figure 1: Introductory Screen

On the remote, if you press MUTE to mute the subwoofer or NIGHT to go to night mode, these settings are also displayed on the **Introductory** screen as shown in Figure 2.

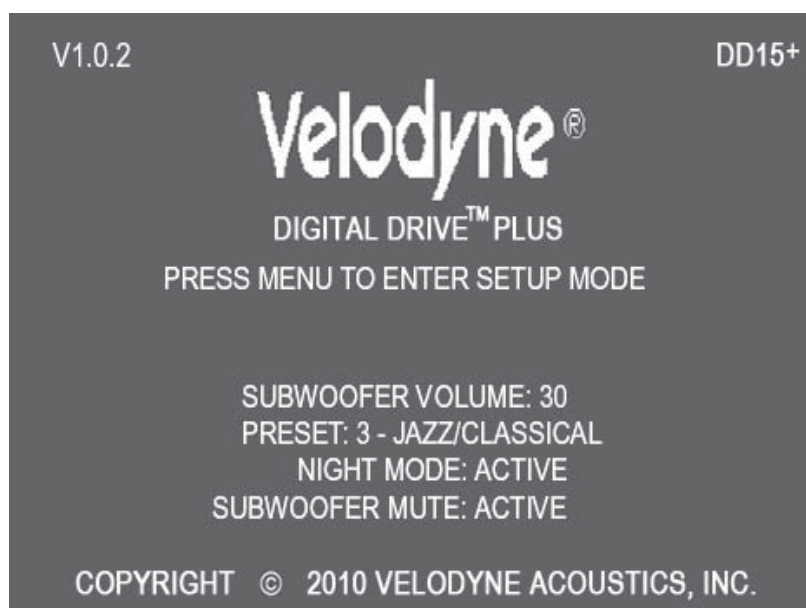


Figure 2: Introductory Screen with Night Mode and Subwoofer Mute

The **Introductory** screen also shows the current power status – if **12V Trigger** has been activated, if it has gone into Standby, or if it is running in **–Slave Mode–**; screenshots are shown later in this section.

SYSTEM RESPONSE SCREEN

From the **Introductory** screen you can get to the **System Response** screen which is used to display the frequency response graph for the subwoofer's output. See Figure 3. See the Remote Control Button Sequence Commands table on page 25 for the button sequence.

The **System Response** screen has the following information and features on it:

- A system response graph that shows the subwoofer's low frequency output from 15 to 200 Hz.
- A moving screen pixel marks on the frequency response curve the current frequency of the sweep tone that is playing.
- 8 parametric filters each of which can be used at its current frequency or adjusted to a frequency and Q you desire between 15 and 200 Hz when in Manual-EQ mode.



The filter level range is -13dB to +6dB although the screen is only marked from -12dB to +6dB.

Status Messages

Status messages appear in the upper left hand corner of the TV screen. In Figure 3, the status message is **LOW SIGNAL**. The following status messages appear in this position on the TV screen:

- **MIC?:** The subwoofer is receiving no signal from the microphone. Microphone is not connected, or either the microphone or the cable is damaged.
- **SYNCING:** The subwoofer is trying to synchronize its frequency measurement with the frequency of the sweep tone being played through your audio system.
- **SYNCED:** The subwoofer has synchronized its frequency measurement with the frequency of the sweep tone being played through your audio system.
- **LOW SIGNAL:** The receiver output level is too low to perform optimization. Turn up the receiver volume. After 6 sweeps with this condition, the subwoofer will reboot.
- **HIGH SIGNAL:** The receiver output level is too high to perform optimization. Turn down the receiver volume.
- **VOL..:** Auto-EQ^{PLUS} is adjusting subwoofer volume.
- **CRS..:** Auto-EQ^{PLUS} is adjusting subwoofer crossover frequency.
- **SLP..:** Auto-EQ^{PLUS} is adjusting subwoofer crossover filter slope.
- **PHS..:** Auto-EQ^{PLUS} is adjusting subwoofer phase. Auto-EQ^{PLUS} doesn't adjust the polarity of the signal, but rather goes right to adjusting the phase.

Screen Navigation

You can go to the **System Settings** screen using the **NEXT** option in the upper right hand corner of the screen.

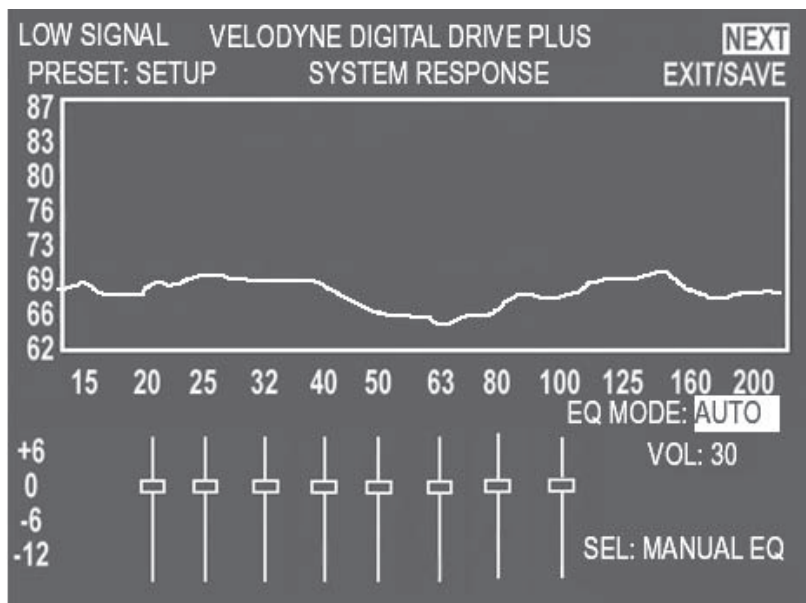


Figure 3: System Response Screen

SYSTEM SETTINGS SCREEN

From the **System Response** screen you can get to the **System Settings** screen by selecting **NEXT**.

The **System Setting** screen has the following information and features on it:

- Display and modify the crossover filter, subsonic filter, phase, polarity, theater/music, volume, and other settings for each preset.
- The **Setup** preset is in the first column and is used to globally set the crossovers, slopes, phase, polarity, and volume for all presets.

Screen Navigation

You can go back to the **System Response** screen using the **PREV** option in the upper left hand corner of the screen.

VELODYNE DIGITAL DRIVE PLUS		SYSTEM SETTINGS						PREV	
			-----PRESETS-----						EXIT/SAVE
	UNLOCKED -->	SETUP	1	2	3	4	5	6	
	LOW PASS XOVER FREQ	80	80	80	80	80	80	80	
	LOW PASS XOVER SLOPE	24	24	24	24	24	24	24	
	SUBSONIC FREQ	15	15	15	15	15	15	15	
	SUBSONIC SLOPE	24	24	24	24	24	24	24	
	PHASE	00	00	00	00	00	00	00	
	POLARITY	+	+	+	+	+	+	+	
	VOLUME (1-99)	30	34	33	30	30	33	30	
	CONTOUR FREQ	NA	37	52	35	35	60	35	
	CONTOUR LEVEL	NA	3.0	2.0	0.0	0.0	2.5	0.0	
	THEATER/MUSIC (1-8)	NA	03	08	06	08	08	08	
	DEFAULT PRESET: 03								
	AUTO ON/OFF MODE: ACTIVE USE ◀▶▲▼ KEYS FOR NAV								
	NIGHT MODE VOLUME %: 30 TEST: GRAPH SET +/-: ADJUST								

Figure 4: System Settings Screen

Screen Controls

You use the remote control to adjust the settings of the Digital Drive^{PLUS} subwoofer. You perform all the setup functions using the buttons on the Velodyne-supplied remote control and see the results on your TV screen. These controls are described later.

Tips for Using the TV Screen Controls

When using the on TV screen controls:

- Remember to point the remote control at the subwoofer, not the TV.
- Use the ▲, ▼, ▶ and ◀ directional arrow buttons that surround the **SELECT** button to navigate the fields of the setup screens.
- Settings are typically changed using the **SELECT** button, followed by the ▲ and ▼ buttons.
- Alternatively, the **SET +/-** buttons can be used to change settings.
- A screen field highlighted in reverse video indicates your current location on the screen.
- Holding down one of the ▲, ▼, ▶ and ◀ button causes the remote to repeat and you can then rapidly move through fields to arrive at the desired one.
- You should be able to perform most of the setup process by using the ▲, ▼, ▶ and ◀ directional arrow buttons and the **SELECT** button.

REMOTE CONTROL BUTTON COMMANDS

Following are commands and their remote control button sequences. Unless otherwise noted, these sequences work only on the **Introductory** screen.

Remote Control Button Sequence Commands for TV-based Interface		
Command	Button Sequence	Description
Go to System Response screen	1 – 2 – 3 – 4 – 5	On the Introductory screen
Self-EQ	3 – 2 – 1	Initiate Self-EQ optimization. Be sure to connect the microphone before engaging. After 28 sweeps, the unit saves and resets.
Cancel Self-EQ and Auto-EQ ^{PLUS}	RESET	Stop and cancel a Self-EQ or Auto-EQ ^{PLUS} optimization process.
Restore defaults	8 – 9 – 0	Restore defaults and reset the subwoofer.
Restore last saved volume	RESET	If volume is changed, restores last saved volume.
Display serial number	▲ - ▲ - ▲ - ▲ - SELECT	Shows the serial number of the unit at the top of the screen.
Switch PAL/SECAM video	▼ - ▼ - ▼ - ▼ - RESET	The unit restarts in PAL/SECAM video mode. Use 8 -9- 0 (Restore defaults) to return to NTSC mode.

Go to the System Response Screen

To get to the **System Response** screen:

1. With the **Introductory** screen showing on the TV, press **1-2-3-4-5** on the Digital Drive^{PLUS} remote. As you press these buttons, the numbers display on the **Introductory** screen as shown in Figure 5.



Figure 5: Introductory Screen

2. After pressing 5, you see the **System Response** screen as shown in Figure 6.

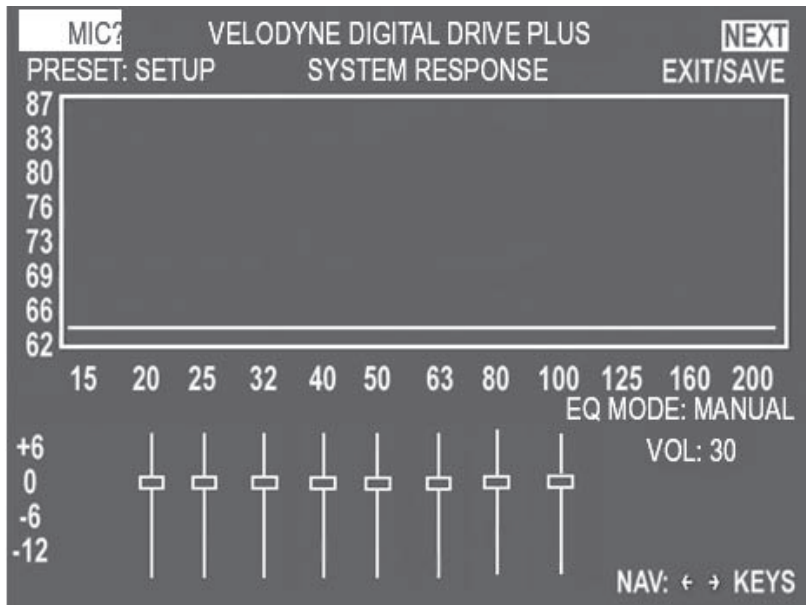


Figure 6: System Response Screen

Go to the System Settings Screen

To get to the **System Settings** screen:

1. On the **System Response** screen, navigate the cursor to the **NEXT** field.
2. Press **SELECT** on remote.
3. The **System Settings** screen appears as shown in Figure 7.

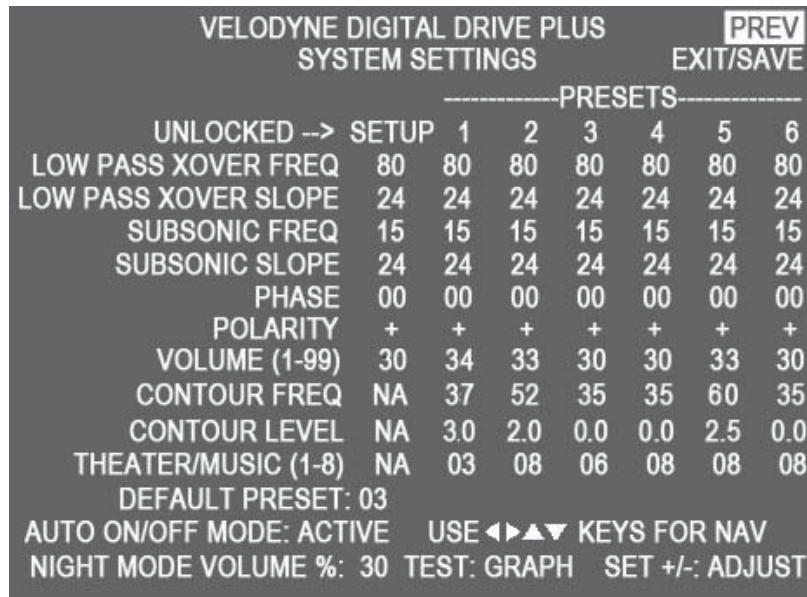


Figure 7: System Settings Screen

Lock the Setup Preset

Before modifying any of the individual preset settings, lock the Setup preset. You can also lock the Setup preset to make sure it doesn't get changed after setting up your Digital Drive^{PLUS} subwoofer. To lock the Setup preset:

1. On the **System Settings** screen position the cursor over UNLOCKED.
2. Press **SELECT** on the remote.
3. **LOCKED** appears on the screen as shown in Figure 8.

VELODYNE DIGITAL DRIVE PLUS SYSTEM SETTINGS		PRESETS						PREV EXIT/SAVE
	LOCKED --> SETUP	1	2	3	4	5	6	
LOW PASS XOVER FREQ	100	100	100	100	100	100	100	
LOW PASS XOVER SLOPE	24	24	24	24	24	24	24	
SUBSONIC FREQ	15	15	15	15	15	15	15	
SUBSONIC SLOPE	24	24	24	24	24	24	24	
PHASE	00	00	00	00	00	00	00	
POLARITY	+	+	+	+	+	+	+	
VOLUME (1-99)	30	35	30	33	30	30	30	
CONTOUR FREQ	NA	35	35	55	33	50	60	
CONTOUR LEVEL	NA	5.0	0.0	3.0	0.0	0.0	0.0	
THEATER/MUSIC (1-8)	NA	03	08	06	08	08	08	
DEFAULT PRESET: 03								
AUTO ON/OFF MODE: ACTIVE USE ◀▶▲▼ KEYS FOR NAV								
NIGHT MODE VOLUME %: 30 TEST: GRAPH SET +/-: ADJUST								

Figure 8: System Settings Screen Lock Setup Preset

Restore Defaults

To restore the factory defaults for all the EQ settings:

- On the **Introductory** screen, press **8-9-0** on the remote. The numbers won't appear on the screen as you press them. If you are successful, the screen flickers and then restores the **Introductory** screen; the **DEFAULTS RESTORED** message appears at the top of the screen as shown Figure 9.



Figure 9: Introductory Screen Defaults Restored

Save Settings

If you exit any EQ optimization without saving the settings, when the subwoofer power cycles, your settings return to what they were previously. To save optimization settings:

1. Press the **EXIT** button on the remote, or position the cursor over the **SAVE/EXIT** field on either the **System Settings** screen or the **System Response** screen.
2. The **SAVE SETTINGS?** prompt appears with **YES** selected as shown in Figure 10.
3. Press **SELECT**.

	PREV	SAVE SETTINGS?						CANCEL
		YES	NO					
		-----PRESETS-----						
	LOCKED -->	SETUP	1	2	3	4	5	6
LOW PASS XOVER FREQ		100	100	90	100	100	100	100
LOW PASS XOVER SLOPE		24	24	24	24	24	24	24
SUBSONIC FREQ		15	15	15	15	15	15	15
SUBSONIC SLOPE		24	24	24	24	24	24	24
PHASE		00	00	00	00	00	00	00
POLARITY		+	+	+	+	+	+	+
VOLUME (1-99)		30	35	30	33	30	30	30
CONTOUR FREQ		NA	35	35	55	33	50	60
CONTOUR LEVEL		NA	5.0	0.0	3.0	0.0	0.0	0.0
THEATER/MUSIC (1-8)		NA	03	08	06	08	08	08
DEFAULT PRESET: 03								
AUTO ON/OFF MODE: ACTIVE USE <=> <▲> <▼> KEYS FOR NAV								
NIGHT MODE VOLUME %: 30 TEST: GRAPH SET +/-: ADJUST								

Figure 10: System Settings Screen Save Settings

- Selecting **YES** and then pressing **SELECT** on the remote button, saves your settings and reboots the subwoofer, returning you to the **Introductory** screen.
 - Selecting **NO** and then pressing **SELECT** on the remote button, returns you to the **Introductory** screen without saving; the previous settings saved in memory are used.
 - Selecting **CANCEL** and then pressing **SELECT** on the remote button, keeps you on the current screen.
4. While the subwoofer is saving its settings, you will see the video flicker and you may hear a slight pop from the subwoofer. The subwoofer then displays the default preset and the volume. This is normal behavior.

Select a Preset

To select which preset you want to Manual-EQ, be sure to have the microphone connected to the subwoofer and the Sweep Tone CD in your disc player and playing:

1. Position the cursor in a preset column (you cannot select the heading) on the **System Settings** screen.
 2. Press **TEST**.
- OR
1. Highlight the **PRESET** field on the **System Response** screen.
 2. Use the **SET +/-** buttons on the remote to select a preset.
- OR
1. Press a preset button on the remote on either the **System Settings** or the **System Response** screen.

Make & Save Preset Changes

The simplest customization of parameters you can do is to make and save changes to the presets.

You can modify the preset parameters on the **System Settings** screen.



See the *Digital Drive^{PLUS} User's Manual* for a detailed explanation of the preset parameter settings that you can modify.

- 1) Go to the **System Settings** screen.
- 2) Use the remote keys to make changes to the presets as shown in Figure 11.
- 3) Press **TEST** to review the curve with these settings active. Be sure to have the mic connected and the Sweep Tone CD playing first.

VELODYNE DIGITAL DRIVE PLUS		PRESETS						PREV
SYSTEM SETTINGS								EXIT/SAVE
	UNLOCKED --> SETUP	1	2	3	4	5	6	
LOW PASS XOVER FREQ	100	100	100	90	100	100	100	
LOW PASS XOVER SLOPE	24	24	24	24	24	24	24	
SUBSONIC FREQ	15	15	15	15	15	15	15	
SUBSONIC SLOPE	24	24	24	24	24	24	24	
PHASE	00	00	00	00	00	00	00	
POLARITY	+	+	+	+	+	+	+	
VOLUME (1-99)	30	35	30	33	30	30	30	
CONTOUR FREQ	NA	35	35	55	33	50	60	
CONTOUR LEVEL	NA	5.0	0.0	3.0	0.0	0.0	0.0	
THEATER/MUSIC (1-8)	NA	03	08	06	08	08	08	
DEFAULT PRESET: 03								
AUTO ON/OFF MODE: ACTIVE				USE ◀▶▲▼ KEYS FOR NAV				
NIGHT MODE VOLUME %: 30				TEST: GRAPH SET +/-: ADJUST				

Figure 11: System Settings Screen Change Preset Low Pass Crossover Frequency

Change Default Preset

The Default preset is invoked when the subwoofer powers on. The factory setting is preset 3 for the Default preset. To change the default preset:

1. Use the ▲, ▼, ▶ and ◀ remote keys to select the current value for the **DEFAULT PRESET** as shown in Figure 12.

VELODYNE DIGITAL DRIVE PLUS		PRESETS						PREV
SYSTEM SETTINGS								EXIT/SAVE
	LOCKED --> SETUP	1	2	3	4	5	6	
LOW PASS XOVER FREQ	100	100	90	100	100	100	100	
LOW PASS XOVER SLOPE	24	24	24	24	24	24	24	
SUBSONIC FREQ	15	15	15	15	15	15	15	
SUBSONIC SLOPE	24	24	24	24	24	24	24	
PHASE	00	00	00	00	00	00	00	
POLARITY	+	+	+	+	+	+	+	
VOLUME (1-99)	30	35	30	33	30	30	30	
CONTOUR FREQ	NA	35	35	55	33	50	60	
CONTOUR LEVEL	NA	5.0	0.0	3.0	0.0	0.0	0.0	
THEATER/MUSIC (1-8)	NA	03	08	06	08	08	08	
DEFAULT PRESET: 03								
AUTO ON/OFF MODE: ACTIVE				USE ◀▶▲▼ KEYS FOR NAV				
NIGHT MODE VOLUME %: 30				TEST: GRAPH SET +/-: ADJUST				

Figure 12: System Settings Screen Change Default Preset

2. Push **SELECT** to be able to change the default preset.
3. Use the ▲ or ▼ remote keys to select the preset that you want as the default. Press **SELECT**.
4. Use the ▲, ▼, ► and ◀ remote keys to navigate to the **SAVE/EXIT** field and save per the Save Settings instruction above.

Set Parametric Equalizer Filter Parameters

You can use the parametric equalizer parameters to achieve better room equalization. To use the parametric EQ feature:

1. Go to the **System Response** screen.
2. Position the cursor over the EQ slider box.
3. Press **SELECT**. The values for that particular EQ appear on the right hand side of the screen as shown in Figure 13.



Note: If all you want to change is the level of each EQ, then you do not need to push **SELECT**. Simply push the ▲ or ▼ remote keys when you are on the slider that you wish to change. The other EQ filter parameters will not show on the right.

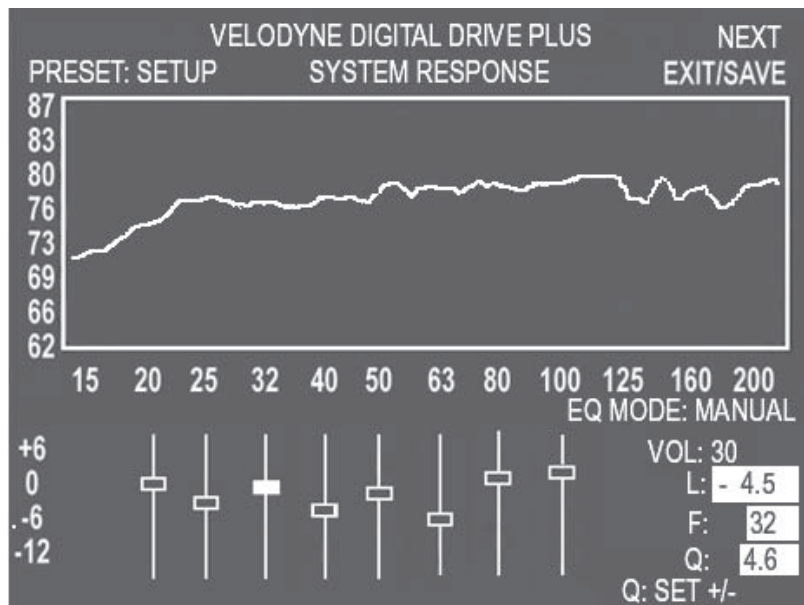


Figure 13: System Response Screen Modified 32 Hz EQ

4. To manipulate a parametric EQ, use:
 - ► and ◀ to move the frequency up and down
 - **SET +** and **SET -** to change the Q value.
 - ▲ and ▼ to adjust the level of the EQ as before.

A selected EQ that has been moved with its level changed and Q adjusted is shown in Figure 14:

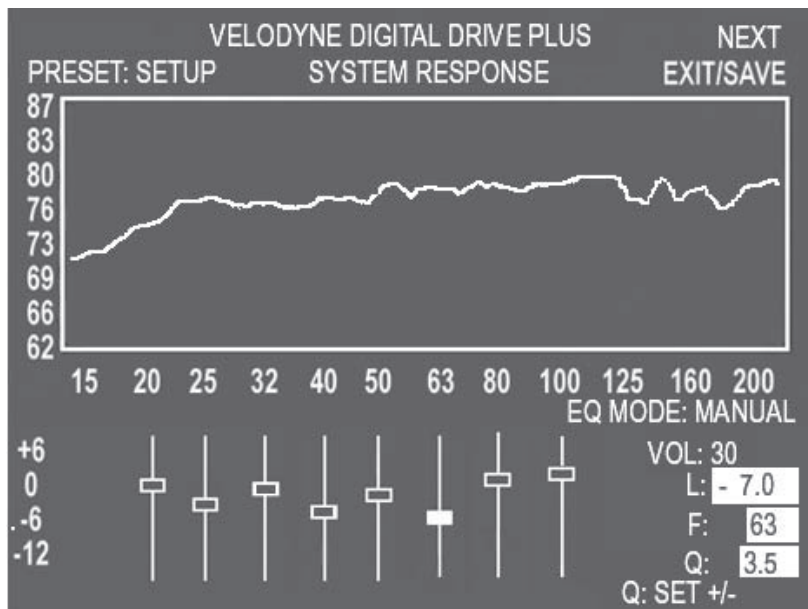


Figure 14: System Response Screen Modified 63 Hz EQ

5. To unselect the EQ, press **SELECT** again.
6. Use **▶** and **◀** to position the cursor on another EQ, if desired, and repeat Step 3, until the room is equalized.

Note: Don't put more than one EQ at one frequency. EQs can be close, but not stacked. If you find you need to stack the EQs at one frequency in order to get enough output, you are probably working with a room mode. In this case, it is best to move the location of the subwoofer or listening position instead.

Running Self-EQ Optimization – Your First EQ

The easiest EQ optimization to perform is the Self-EQ. With Self-EQ the subwoofer generates its own sweep tone. To perform Self-EQ optimization:

- 1) Remove the microphone, mic cable and stand from the accessory kit. Carefully snap the microphone into the stand and attach the larger end of the cable to it. See the *Digital Drive^{PLUS} User's Manual* for more information.
- 2) Place the microphone at the main listening position.
- 3) Attach the small end of the mic cable to the jack on the left side of the subwoofer front control panel.
- 4) Connect your subwoofer to your TV video input as described above in the *Make Video Connection between TV and Subwoofer* section.
- 5) Make sure the subwoofer is on and your audio system is not playing any signal.
- 6) Press **3 – 2 – 1** on the remote to start Self-EQ; the **System Response** screen will display as well. The subwoofer's front display status message shows **SE**.



Once the Self-EQ process starts, you can press **RESET** on the remote to stop Self-EQ. If you exit back to the **Introductory** screen, you can't see the Self-EQ frequency response curve again.

- 7) On the **System Response** screen, **SELF** option shows in the **EQ MODE** area.

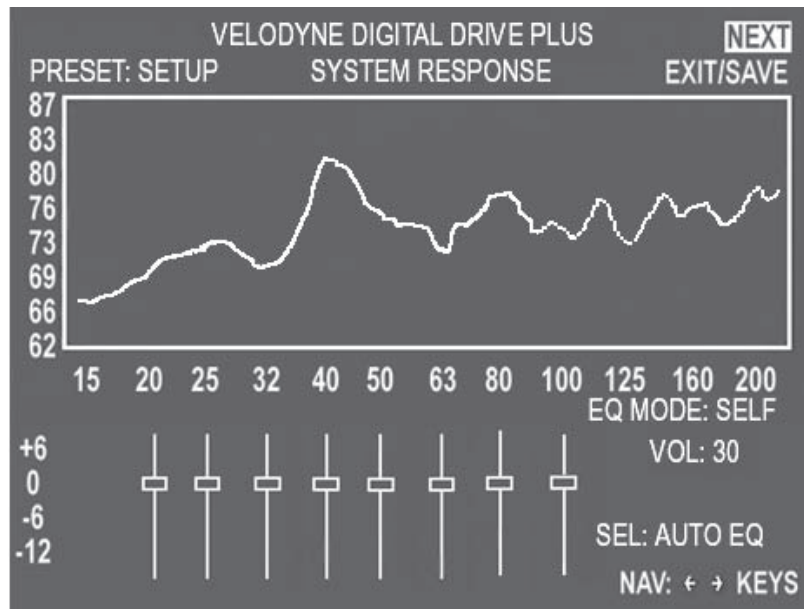


Figure 15: System Response Screen with Self-EQ Selected

- 8) You can watch the subwoofer smooth its frequency response by adjusting the parametric EQ filters on the **System Response** screen. Self-EQ doesn't change the Setup preset parameters (volume, crossover, etc.) and uses the crossover set to 160 Hz.
- 9) When Self-EQ finishes, the sweep tones stop, the front status message shows **End** for 10 seconds, the subwoofer reboots by turning itself off and back on. The subwoofer display shows the preset number and then volume level. During this process the new filter settings are saved into the subwoofer's memory.

Running Auto-EQ^{PLUS} Optimization – Stepping Up in Power

The next level up in the Digital Drive^{PLUS} EQ optimization methods is Auto-EQ^{PLUS} optimization. To perform Auto-EQ^{PLUS} optimization:

- 1) Set up the microphone as in the Self-EQ instructions above.
- 2) Connect your subwoofer to your TV video input as described above in the *Make Video Connection between TV and Subwoofer* section.
- 3) Make sure the subwoofer and your audio system are both on.
- 4) Place the Digital Drive^{PLUS} Sweep Tone CD into your disc player and press play.
- 5) Once the sweep tone starts to play, adjust the receiver or processor output level to about the level of a normal-loudness conversation at the mic.
- 6) Press and hold **EQ** on the remote until Auto-EQ^{PLUS} starts; you will see on the **System Response** screen the **AUTO** option in the **EQ MODE** area. See Figure 16.



The Auto-EQ^{PLUS} proceeds until one of the following occurs:

- Auto-EQ^{PLUS} finishes successfully, saving the settings.
 - You decide to quit, and press **RESET** on the remote. You exit back to the **Introductory** screen, you don't see the Auto-EQ^{PLUS} frequency response curve any more.
 - You move the cursor off the **AUTO** field (in which case the field automatically reverts to Manual-EQ).
 - The frequency response level is too high (peaks over 87 dB) or too low (average level below 70 dB).
 - The Sweep Tone CD stops playing.
- 7) The Digital Drive^{PLUS} subwoofer not only adjusts the Setup preset EQ filter levels as you watch, but it also adjusts the subwoofer level, crossover, slope, and phase during the Auto-EQ^{PLUS} optimization process.
 - 8) You can also watch the status messages during the process in the upper left hand corner of the TV screen.

- 9) When Auto-EQ^{PLUS} optimization finishes, the front display status message shows **End** for 10 seconds, the subwoofer reboots by turning itself off and back on. The display shows the preset number and then volume level. During this process the new filter settings are saved into the subwoofer's memory.
- 10) While the subwoofer is rebooting, shut off the Sweep Tone CD and remove it from the player.

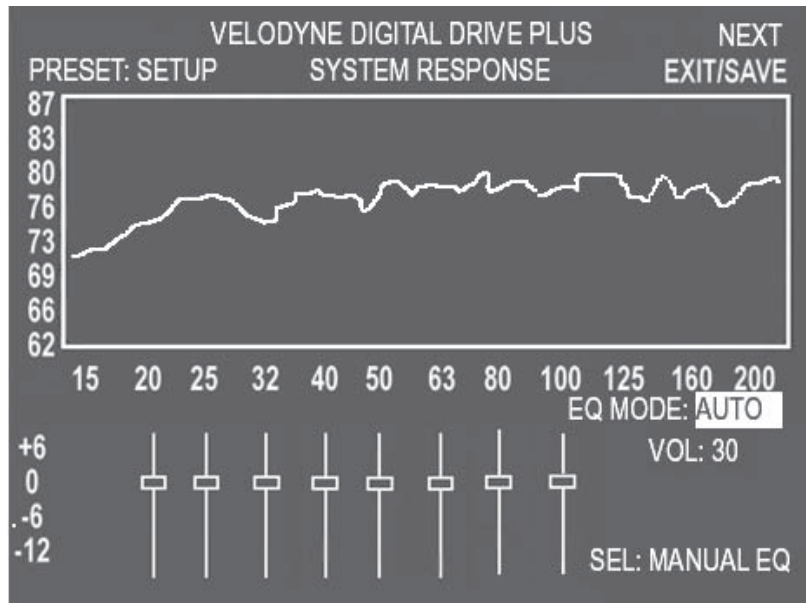


Figure 16: System Response Screen Auto EQ^{PLUS} Mode

Running Manual EQ Optimization— Adjust it to Your Liking

In some particularly problematic rooms, it may be necessary to employ even further adjustment than the Auto-EQ^{PLUS}. Manual EQ gives enough flexibility to get the subwoofer response very flat:

- 1) Set up the microphone, subwoofer and Sweep Tone CD as in the Auto-EQ^{PLUS} optimization instructions.
- 2) Connect your subwoofer to your TV video input as described above in the *Make Video Connection between TV and Subwoofer* section.
- 3) Set the system playback volume level as in the Auto-EQ^{PLUS} optimization instructions.
- 4) Push 1 – 2 – 3 – 4 – 5 on the remote. If you are already on the **System Response** screen, select the **MANUAL** option in the **EQ MODE** area.
- 5) Watch the status messages for **SYNCING**.
- 6) When the status message says **SYNCED**, start adjusting the subwoofer parameters. Do not attempt to adjust any settings until the status message says **SYNCED**. **SYNCED** means the subwoofer has synchronized its frequency measurement with the frequency of the sweep tone being played through your audio system. An indication of not being synced is that you raise or lower filter slider and the response curve moves at another frequency. Also, the marker in the sweep tone (a small pop) occurs anywhere but at the top of the graph.
- 7) Click **Mute**. You can now see the low frequency character of the satellites so that you can make a judgment about their roll-off frequency and slope to properly blend to them with the Digital Drive^{PLUS} subwoofer.
- 8) Click **Mute** again to restore the subwoofer to playing.



In Manual-EQ, if you press **RESET** on the remote, you are prompted if you want to save and exit, exit without saving, or to cancel the exit action.

- 9) Adjust the preset parameters.
- 10) Adjust the parametric filter EQ parameters.
- 11) Save your changes as described in the Save Settings section.

Perform Listening Test

As a final thought on matching your Digital Drive^{PLUS} subwoofer to your room, don't forget the objective listening test. That is, make sure the unit sounds good to you! Often, you may want to add a bit more bass than what would normally be considered flat even after you remove the major peaks and valleys to achieve a flat frequency response. This is quite normal because human hearing rolls off rapidly below 100Hz, causing the bass not to sound as loud. In order for the bass to sound flat to you, especially at lower levels, you may need to increase the subwoofer volume in relation to the satellite speakers. An increase of about 2 dB to 8 dB is normal.

To raise the subwoofer volume in relation to the satellites:

- Raise the level for the subwoofer in the speaker level setup of your surround receiver or processor.

OR

- Raise the volume of your Digital Drive^{PLUS} subwoofer after you have finished your room equalization and other settings.

INTRODUCTORY SCREEN RUNTIME INACTIVE MODES

This section describes the appearance of the Introductory screen with various runtime messages that are shown when the subwoofer is inactive. In all cases, reactivating the subwoofer will take only a couple of seconds as the subwoofer starts up.

Standby Mode

Figure 17 shows the message displayed when the Standby feature is engaged. The subwoofer enters Standby mode if this mode is set to **ACTIVE** in the **System Settings** screen, saved, and has not had any input signal for 10 to 15 minutes.

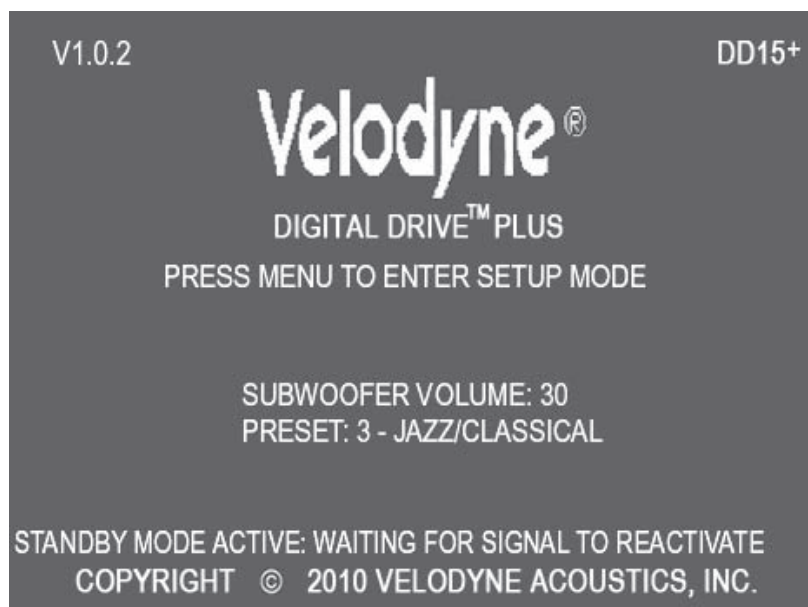




Figure 17: Introductory Screen Standby Mode Active

Power Off Mode

Figure 18 shows the message displayed when the  on the remote is pressed, powering down the subwoofer. When in this mode, press  to reactivate the unit.

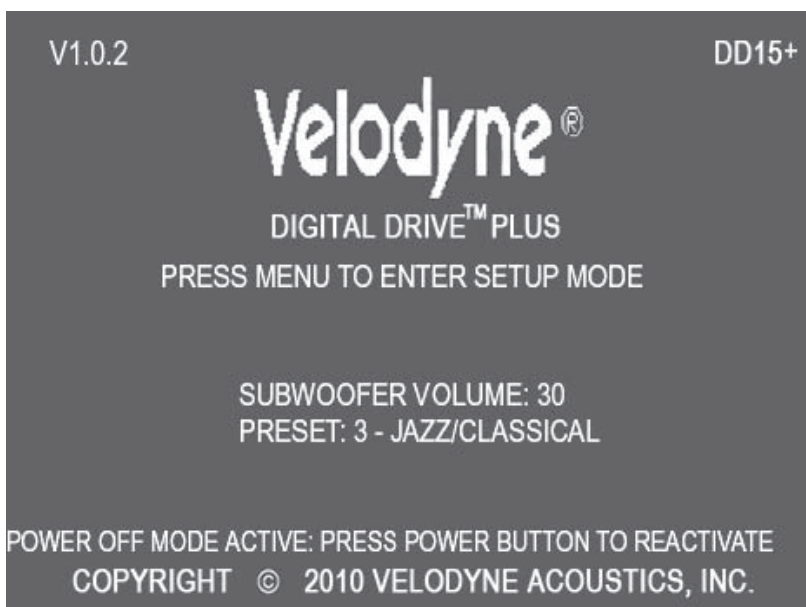


Figure 18: Introductory Screen Power Off Mode Active

Waiting for 12 Volt Trigger Mode

Figure 19 shows the message displayed when the unit is waiting for a 12 Volt trigger to activate after the **AUTO ON/OFF MODE** is set to **12V TRIGGER** operation on the **System Settings** screen and saved.

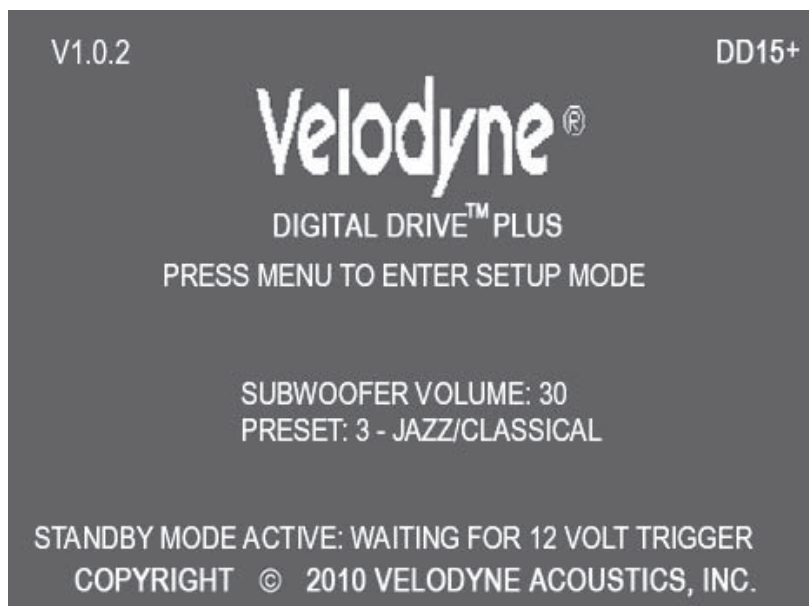


Figure 19: Introductory Screen Waiting for 12 Volt Input

Defeat Subwoofer's Low Pass Crossover Filter

In rare cases you may want to permanently defeat the subwoofer's low pass crossover. For example, if you have not performed Auto-EQ^{PLUS}, the subwoofer's input from the receiver is limited by the receiver's internal crossover to the bass frequencies, or you simply would rather not use the subwoofer's crossover filter. To defeat the low pass crossover:

1. Navigate to the **System Settings** screen.
2. Move the cursor down to **LOW PASS XOVER FREQ** and push **SELECT**.
3. Press **RESET**.
4. The screen shown in Figure 20 appears.
5. Exit and save per the *Save Settings* instruction above.

VELODYNE DIGITAL DRIVE PLUS								PREV
SYSTEM SETTINGS								EXIT/SAVE
-----PRESETS-----								
UNLOCKED -->	SETUP	1	2	3	4	5	6	
LOW PASS XOVER FREQ	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
LOW PASS XOVER SLOPE	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
SUBSONIC FREQ	15	15	15	15	15	15	15	
SUBSONIC SLOPE	24	24	24	24	24	24	24	
PHASE	00	00	00	00	00	00	00	
POLARITY	+	+	+	+	+	+	+	
VOLUME (1-99)	30	35	30	33	30	30	30	
CONTOUR FREQ	NA	35	35	55	33	50	60	
CONTOUR LEVEL	NA	5.0	0.0	3.0	0.0	0.0	0.0	
THEATER/MUSIC (1-8)	NA	03	08	06	08	08	08	
DEFAULT PRESET: 03								
AUTO ON/OFF MODE: ACTIVE USE ◀▶▲▼ KEYS FOR NAV								
NIGHT MODE VOLUME %: 30 TEST: GRAPH SET +/-: ADJUST								

Figure 20: System Settings Screen Defeating Subwoofer's Low Pass Crossover Filter

PART THREE -

Software & Driver Updates

Software updates and installation instructions for the USB Virtual COM Port driver, the Velodyne Digital Drive^{PLUS} Windows Setup Program, and the Velodyne Digital Drive^{PLUS} subwoofer firmware can all be found at www.velodyne.com.

The Velodyne Digital Drive^{PLUS} subwoofer firmware updates are applicable regardless of whether any of the user interfaces are used or not.

All firmware update instructions are included with the updates on the Velodyne website. When updating, be sure to read ALL readme.txt files and other instruction at the Velodyne website to make sure that you update the software correctly.

The Digital Drive^{PLUS} subwoofer firmware is updated through an RS-232 EXTENSION cable. A null modem or crossover cable will not work. Be sure that you have an extension cable before you attempt to update these. The USB Virtual COM Port driver and the Velodyne Digital Drive^{PLUS} Windows Setup Software only update through the controlling Windows computer, so no attachment is necessary to the subwoofer for their updates and no changes are made to the subwoofer by these updates.

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63-164 Rev B May 2014