



DEWESoft TalonRF Plugin User's Manual

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Chapter 1 System Overview

1.1 Overview

The TalonRF Plugin is a software plugin for DEWESoft data acquisition software. The TalonRF Plugin requires that your system has the TalonRF-PCI card drivers properly installed within it. Let's have a look at the critical components and technologies contained within the hardware and software.

What is the TalonRF hardware?

The TalonRF-PCI Digital Receiver is a multi-mode board that has a frequency range of S, Upper-L, Lower-L bands including GPS L1. The card can be configured to Single, Dual or a Tri-band configuration upon ordering. The IF data bandwidth is software programmable from 1 kHz up to 36 MHz. Am and Level AGC test points are available for antenna tracking on BNC outputs along with 70 MHz downconverter output.

The TalonRF Plugin allows the user to set up each individual card with an easy to use GUI interface. The user GUI allows users to program the RF Frequency band with IF Filter Bandwidth, along with the AGC and digital Demodulator. Graphical displays like spectral FFT and waveform displays give the user easy tool to optimize the Receiver performance

1.2 Scope of this document

This help file and manual is meant to serve as an adjunct to the current version of the DEWESoft user's manual. It is not a replacement for that document, which is quite voluminous, and highly detailed, especially in the area of analog inputs, CAN, GPS, and most standard operational aspects of DEWESoft systems in general. Please refer to that manual for all general operational aspects of DEWESoft.

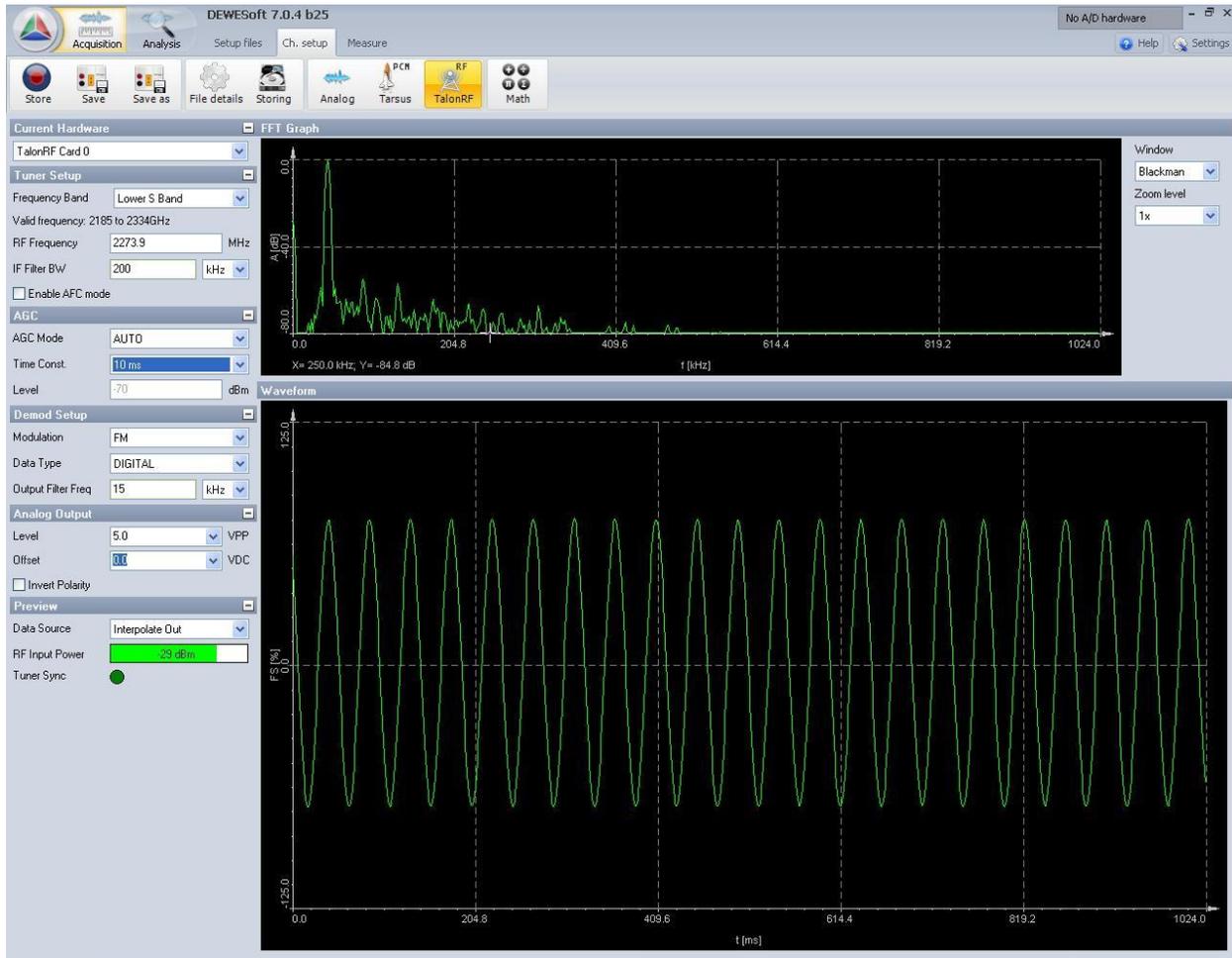
This document is intended to supplement that manual with information specific to the TalonRF-PCI hardware and the software plugin called TalonRF Plugin. Software plugins are specialized applications, usually created as a DLL, which can "plug in" to the master DEWESoft data acquisition software application, and exist within that application to add new features and capabilities. Plugins range from very simple applications that perform a single basic function, or complex plugin such as the TalonRF Plugin, with thousands of features and functions with extensive interaction with complex hardware.

Plugins are sold separately from DEWESoft, as they have an additional cost associated with them. Of course they also require hardware (their respective interface cards) to make them run.

Please use this document as a handy reference when using the TalonRF Plugin within your system.

1.3 What is the TalonRF Plugin?

The TalonRF Plugin provides the software interface to the TalonRF-PCI hardware. It allows you to easily access and use the digital receiver in a graphical, easy to use manner. In this document we will see how to set up and then use the TalonRF hardware installed within the system, via the software plugin.



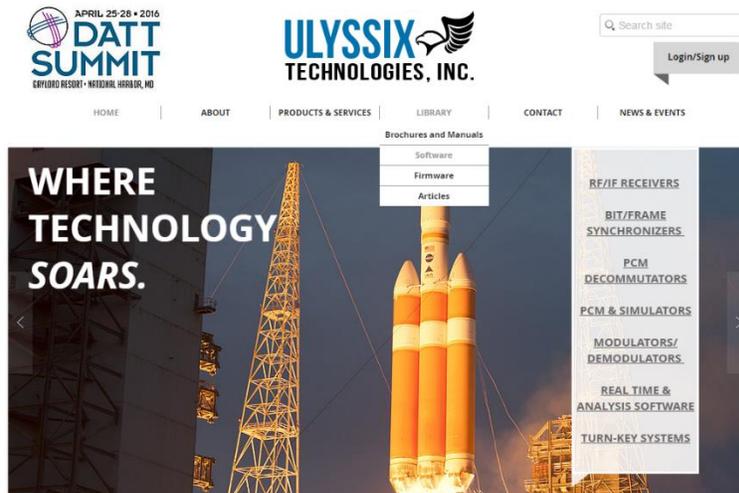
Chapter 2 Installation

2.1 Installing DEWESoft Software Suite

2.1.1 Installing DEWESoft X2

1. Determine if a previous version of DeweSoft X2 is installed on your computer. If DeweSoft X2 is currently installed, then skip to the DeweSoft X2 Upgrade section.
2. Acquire the DeweSoft X2 installer.
 - a. Using the website:

- i. The DeweSoft X2 installer can be downloaded from the Ulyssix website at <http://www.ulyssix.com/#!software/cv43>.



- ii. Navigate to the “DeweSoft Software Suite” section and click the “New DeweSoft X2 Install” link. This will download the file “DS_FullInstall_X2.zip.”

DEWESoft Software Suite

User friendly software package with real time displays and playback analysis. DEWESoft allows for multiple asynchronous embedded formats, tagged parameters, frame format identifiers and much more.

All Ulyssix telemetry cards are now running in both DEWESoft X2 SP5 and DEWESoft 7.1.2:

** The New TarsusPCM driver must be installed prior to download the new DEWESoft upgrades

Download New Installs or Updates ver. Tarsus.dll 10.4.7, pcm_hw.dll 3.1.0.15, Chapter10 ver 5.12:

[New DEWESoft X2 Install](#) | [DEWESoft X2 Updates](#) |

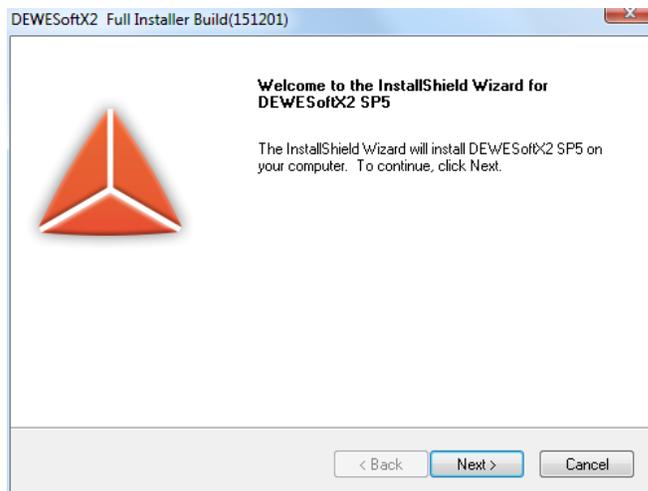
[New DEWESoft 7.1.1 Install](#) | [DEWESoft 7.1.2 Update](#) |

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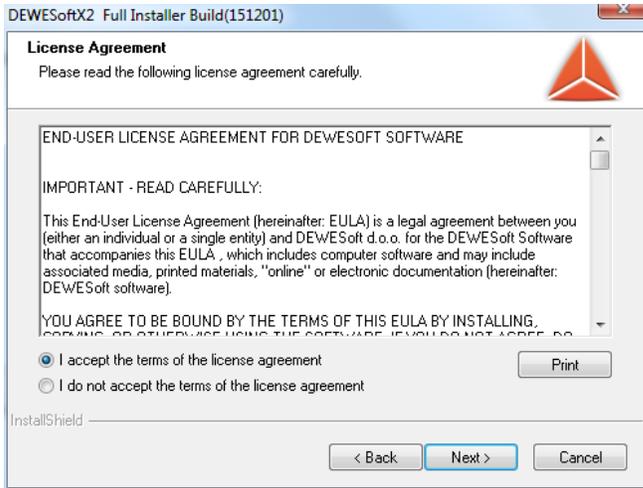
[Win7 64-bit Driver](#) | [Win7 32-bit Driver](#) | [WinXP Driver](#) |

[Software Install Instructions](#)

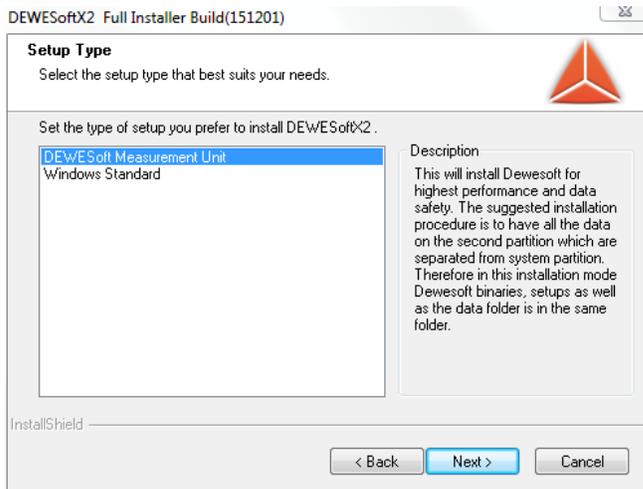
- iii. Unzip “DS_FullInstall_X2.zip” and run the file “DEWESoft_FULL_X2_SP5.exe.”
- b. Using the Ulyssix Software CD:
 - i. Insert the Software CD into the CDROM.
 - ii. Open the folder “DeweSoft X2”
 - iii. Inside the DS_FullInstall_X2, run the file “DEWESoft_FULL_X2_SP5.exe.”
3. On the DeweSoft X2 Full Installer Welcome screen, click “Next.”



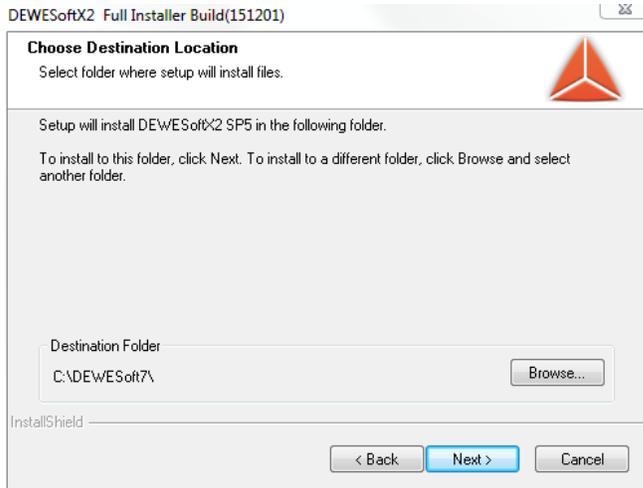
4. Click the radio button to accept the Licence Agreement and click “Next.”



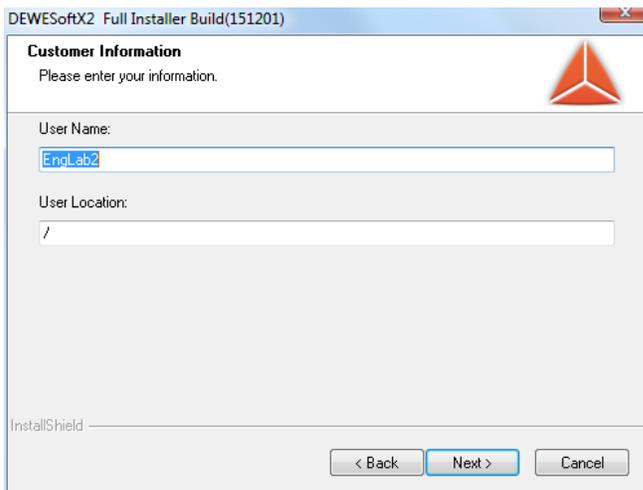
5. If your computer has Ulyssix hardware installed, then select “DeweSoft Measurement Unit” in the selection window. If the computer does not have Ulyssix hardware installed and will be used to as a View Client, then select “Windows Standard.” Click “Next” to continue.



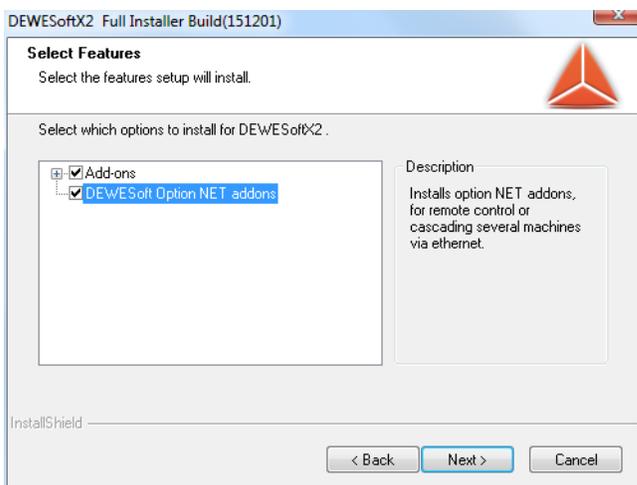
6. In the Choose Destination Location window, either use the default Destination Folder or click “Browse” to select a new Destination folder. If DeweSoft 7 is installed on your computer, then the location should be the same as your DeweSoft7 folder. Please make note of your install directory. It will be needed to perform the DeweSoft Upgrades. Click “Next” to proceed.



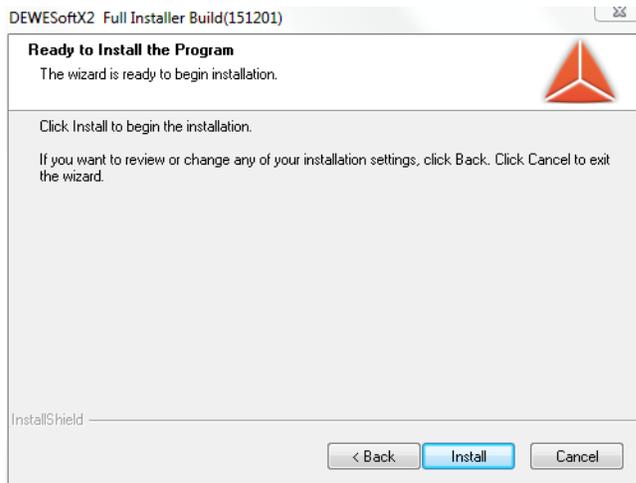
7. In the “Customer Information” window enter the User Name and User location if desired. Click “Next” to continue.



8. In the “Select Features” window, check the boxes for both Add-ons and the DeweSoft Option NET addons and then click “Next.”



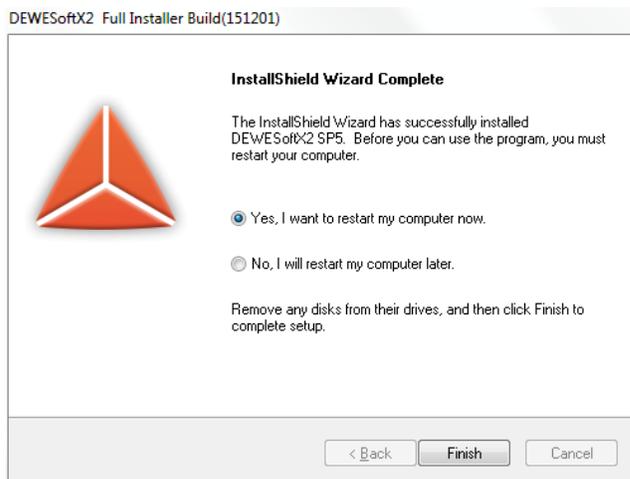
9. The installer is now ready to start the installation process. Click the “Install” button to start.



10. If a “Smartek GigE Vision Filter Driver” window pops up, click the “OK” button to continue the driver upgrade process.

11. If Windows Security asks “Would you like to install this device software?” for Smartek, click “Install.”

12. After a period of time, the installation will finish. Select the “Yes, I want to restart my computer now” radio button and click “Finish” to complete the installation and restart your computer.



13. When your computer is done restarting, launch DeweSoft X2. DeweSoft will need a license.

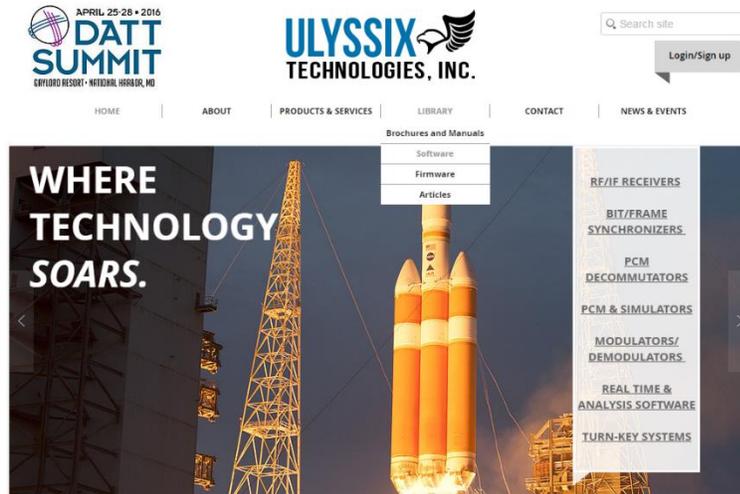
- a. If this computer has not had DeweSoft installed before, a new license is needed. Please contact Ulyssix for support
- b. If a DeweSoft exists on this computer, please go to “DeweSoft X2 Import License and Register Plug-Ins.”

2.1.2 DEWESoft X2 and Addons Upgrade

1. Acquire the DeweSoft X2 Upgrade files if you do not already have them.

a. Using the website:

- i. The DeweSoft X2 Upgrade can be downloaded from the Ulyssix website at <http://www.ulyssix.com/#!software/cv43>.



- ii. Navigate to the “DeweSoft Software Suite” section and click the “DeweSoft X2 Updates” link. This will download the file “DS_Upgrade_X2.zip.”

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[Win7 64-bit Driver](#) | [Win7 32-bit Driver](#) | [WinXP Driver](#) |

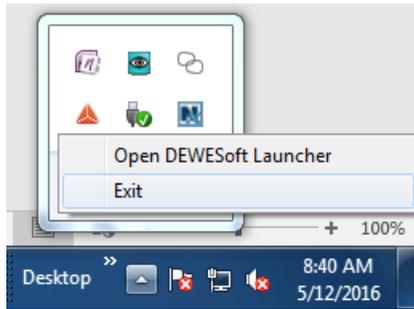
[Software Install Instructions](#)

- iii. Unzip “DS_Upgrade_X2.zip.” The file contains three folders and a ReadMe.txt file.

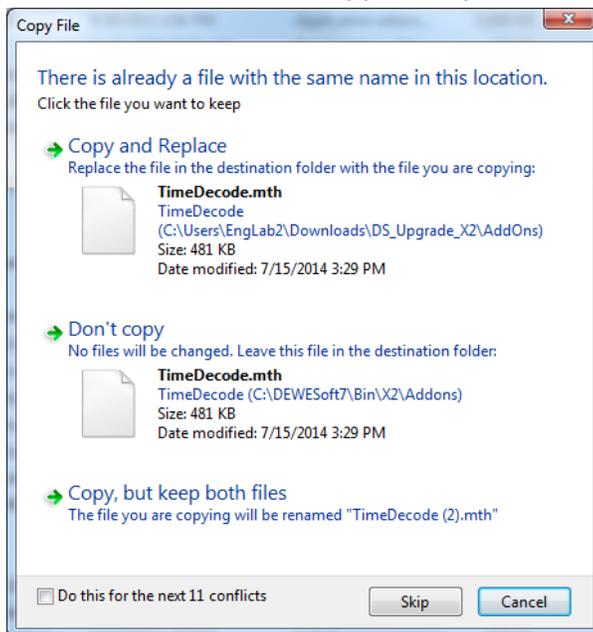
b. Using the Ulyssix Software CD:

- i. Insert the Software CD into the CDROM.
 - ii. Open the folder “DeweSoft X2”
 - iii. The needed files are located inside the DS_Upgrade_X2.
2. Copy the all of the contents of the “AddOns” folder from the DS_Upgrade_X2 folder to your DeweSoft X2 Addons folder directory. This must be done via Copy and Paste. Drag and Drop will not work.

- a. Before copying and pasting the files, the DeweSoft X2 Launcher must be turned off. If the DeweSoft X2 Launcher is left running, Windows will encounter a “Folder in Use” error and will not copy all of the files.
- b. To exit the DeweSoft X2 Launcher in Windows 7, look for the up arrow near the clock in the tool bar. Click the up arrow to display a pop up menu. In the pop up menu, look for the DeweSoft X2 orange triangle icon. Right click on the orange triangle and select “Exit.”



- c. This directory is typically either “C:\DEWESoft7\Bin\X2\Addons” or “D:\DEWESoft7\Bin\X2\Addons.”
- d. If Windows prompts you that the file already exists, check the box for “Do this for the next conflicts”, and then click “Copy and Replace.”

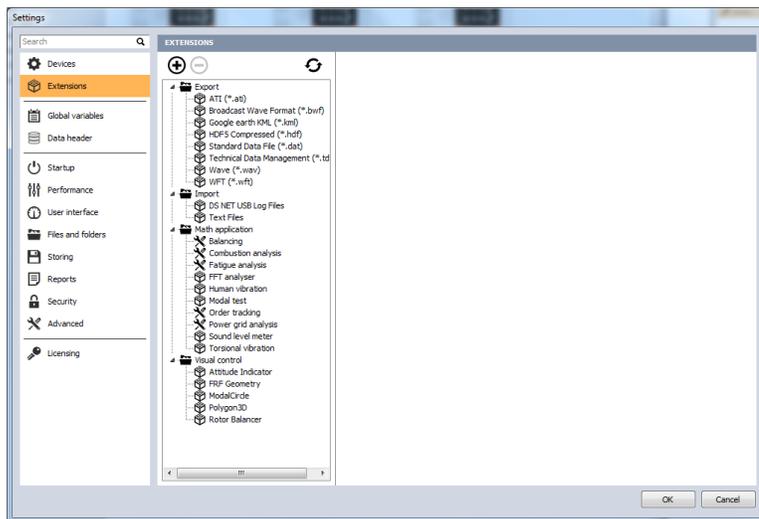


- e.
3. Copy the contents of the “Manual” folder from your DS_Upgrade_X2 folder to your DeweSoft X2 Manual folder directory. This must be done via Copy and Paste. Drag and Drop will not work.
 - a. This directory is typically either “C:\DEWESoft7\Bin\X2\Manual” or “D:\DEWESoft7\Bin\X2\Manual.”
 - b. As mentioned above, when the “Copy File” dialog box appears check the “Do this for the next conflicts” and then click “Copy and Replace.”

4. Copy the contents of the “DS_X2” folder from your DS_Upgrade_X2 to your DeweSoft X2 folder. This must be done via Copy and Paste. Drag and Drop will not work.
 - a. This folder is typically located in “C:\DEWESoft7\Bin\X2” or “D:\DEWESoft7\Bin\X2.”
 - b. As mentioned above, when the “Copy File” dialog box appears check the “Do this for the next conflicts” and then click “Copy and Replace.”

2.1.3 DeweSoft X2 Register Plug-Ins and Import License

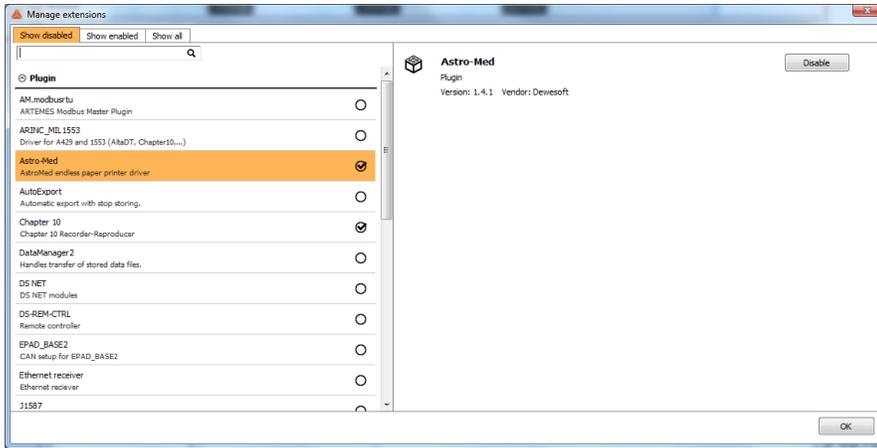
1. In the upper right hand of DeweSoft X2, click the “Settings” button and then select “Settings” from the menu. The Settings window will launch.
2. To Register Plug-ins, select “Extensions,” on the left side of the Settings window, to display the Extension properties.



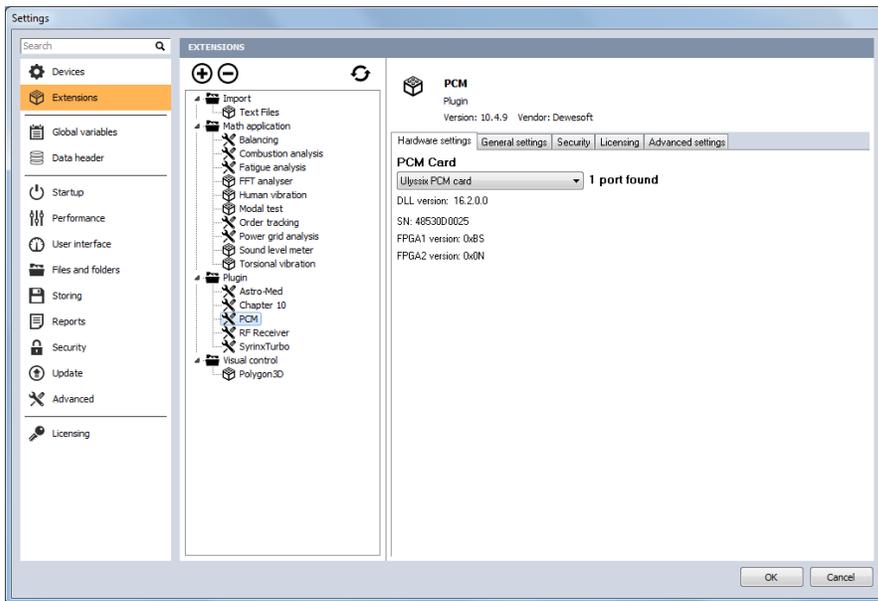
3. Click the plus sign at the top of the Extensions properties to launch the Manage Extensions window. In the Manage Extensions select the desired Plug-Ins by clicking on the circle to the right of the Plug-In. After you click the circle, a check mark will appear inside of the circle. Below is a list of typical Plug-Ins.

- a. Astro-Med
- b. Chapter 10
- c. PCM
- d. RF Receiver
- e. Syrinx Turbo

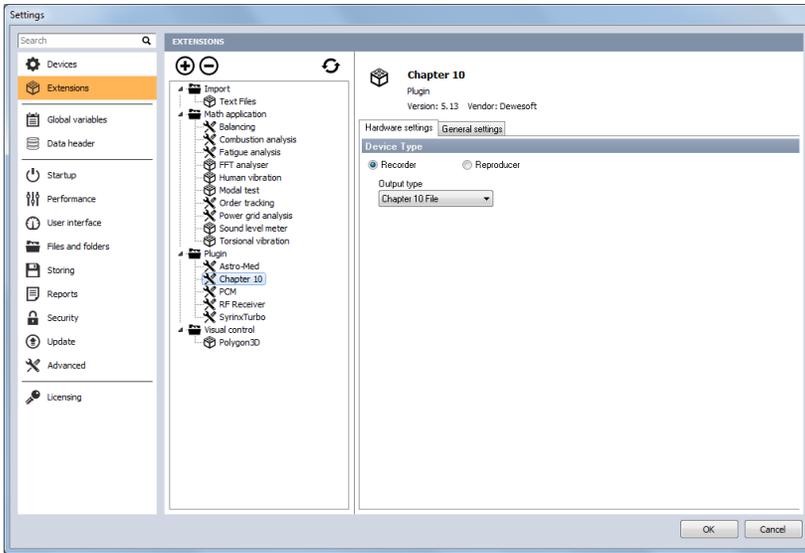
4. Also select any additional Plug-Ins that you desire and click “OK” in the bottom right hand corner of the window.



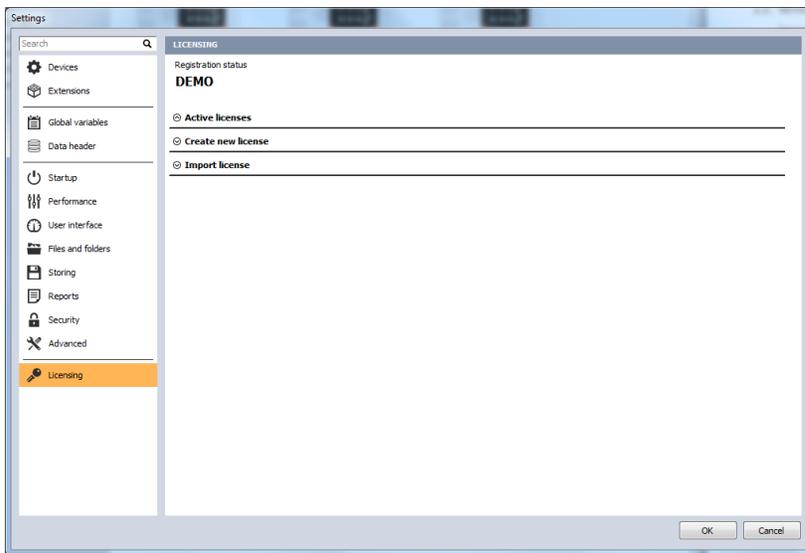
5. In the Settings window, select “Extensions” on the upper left had corner. In the list of Extensions, select PCM from the Plug-in folder. In the combo box under “PCM Card” select “Ulyssix PCM Card.” Under the combo box information about the DLL Vesion, Ulyssix Card Serial Number, and FPGA Versions numbers will appear.



6. If a window saying “Only one clock provider must be assigned,” please complete the following steps:
 - a. Click “OK” on the pop up window.
 - b. Select Chapter 10 from the Plug-Ins list.
 - c. In the Chapter 10 Settings window, select the radio button next Recorder. DeweSoft can only have a single time source and the Ulyssix PCM card and the Ch10 Reproducer are both considered time sources.



7. To Import a License, select “Licensing,” on the left side of the Settings window, to display the License Properties in the right side of the Settings window.



8. Click the down arrow next to “Import License” to expand the Import License details. Click “Import offline license...” to begin the license import process. This will launch a file dialog box. In the file dialog box, navigate to the location of DeweSoft license file. The file extension of the DeweSoft license file is “.lic” The DeweSoft license file is typically located one of the following directories:

- a. C:\DEWESoft7\System\V7_1
- b. D:\DEWESoft7\System\V7_1

9. DeweSoft X2 Installation is complete. Please proceed to the “Upgrade DeweSoft X2 and Addons” section to get the latest upgrades and Plug-Ins.

2.2

Hardware Installation

The TalonRF-PCI hardware can be easily installed into any PC chassis with an available full length PCI slot. Please be aware, to work properly, all software applications must be installed before installing any hardware. To install a TalonRF-PCI card, carefully follow the instructions below:



WARNING: SERIOUS DAMAGE WILL RESULT IF YOU DO NOT TURN THE SYSTEMS POWER OFF BEFORE INSTALLING A TARSUSHS-PCI CARD.

1. Make certain all software applications have been properly installed before installing any hardware.
2. Turn off power to the computer.
3. Remove the cover of the computer to expose the available PCI slot.
4. Remove the blank bracket on the back of the computer that's covering the opening to the available PCI slot. Retain the screw which will later be used to secure the TalonRF-PCI card.
5. Install the TalonRF-PCI card into the prepared PCI slot and secure it with the screw from the bracket.
6. Return the cover to the computer.
7. Turn computer On.

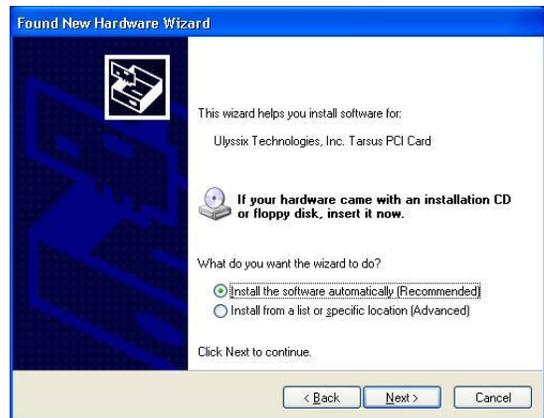
2.2.1 Plug and Play – Window’s Hardware Configuration

The TalonRF-PCI card is a plug and play device, so after installing a card to a system and starting up for the first time, Window’s will automatically detect the hardware and begin installing all necessary drivers, update the system and allocate all resources. To explain the process, review the steps below:

1. At the opening window of the Found New Hardware Wizard, select **Yes, this time only** and click **Next**.



2. The next step will ask, “what do you want the wizard to do” – select **Install the software automatically**. Click **Next**.
3. After the wizard has finished installing the software for the Tarsus PCI Card, click **Finish**.



2.2.2 Adding Cards to an Existing System

Additional TalonRF-PCI cards can be installed into any available full length PCI slot in a computer at any time by following the installation instructions described in section 2.2, but before adding any additional cards, it’s important to verify the host computer’s power supply has adequate surplus power for the total number of cards being installed. To calculate the total amount of power required by the PCI cards, add the individual card’s power requirements together (power requirements are found on the product data sheets). Please contact the factory if further assistance is needed.

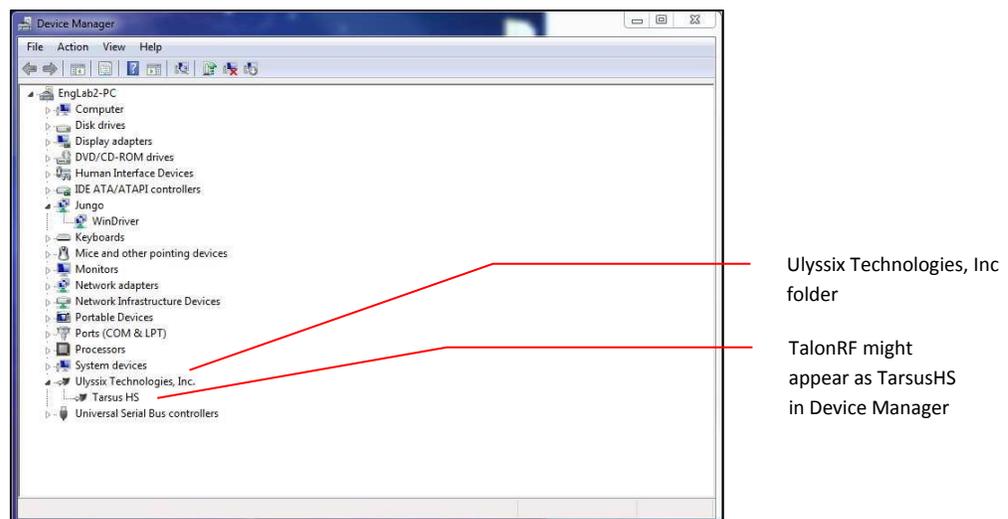
When additional cards are installed in a system, the PCI bus may assign new Demod ID numbers for existing or new cards depending on the slot used and the configuration of the PCI bus on the computer. If this happens, the configuration files will be corrupted and will not program the hardware properly.

2.3 Hardware Installation Troubleshooting and Problems

2.3.1 Hardware Detection

A common problem when installing hardware-based software is the proper installation of the device drivers. If a hardware detection problem occurs, the first step is to determine if the DEWESoft software recognizes the hardware. To determine this, complete the following steps below:

1. Verify whether or not Windows has identified the newly installed hardware. To do this, open the **Control Panel/System** window on the computer. Select the **Hardware** tab and click the **Device Manager** button. Open the **Ulyssix Technologies, Inc** folder in the hardware list. The display should look similar to the picture below (except without callouts):

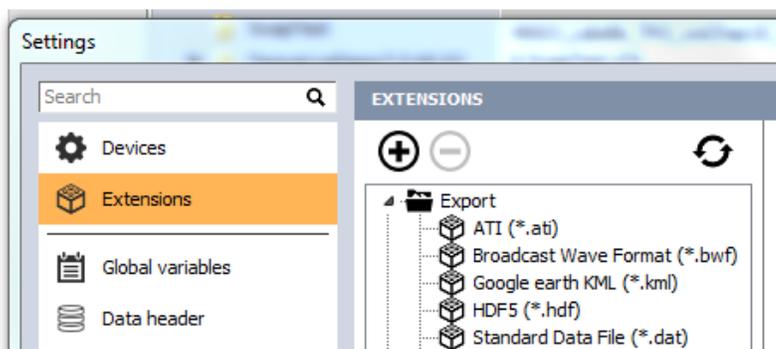


2. If the device manager doesn't show the TarsusHS or TalonRF hardware, the next step is to look for any devices that say "Unknown PCI Bridge Device" or unknown PCI device type.
3. If so, delete the unknown devices and restart the PC. Upon restart, Windows will find the device and try to attach a device driver to it. If a TalonRF-PCI card is installed, Windows should identify it by a device and vendor ID and install the proper drivers.
4. If the software continues to have problems detecting the hardware, please contact Ulyssix for additional support.

2.4 DEWESoft TalonRF Plug-In Set-up

DEWESoft is ready to setup after the software and hardware have been properly installed and the system has been shut down and restarted. The Plug-In were registered in Section 2.1. Now the Talon RF Plug-In needs to be turned on.

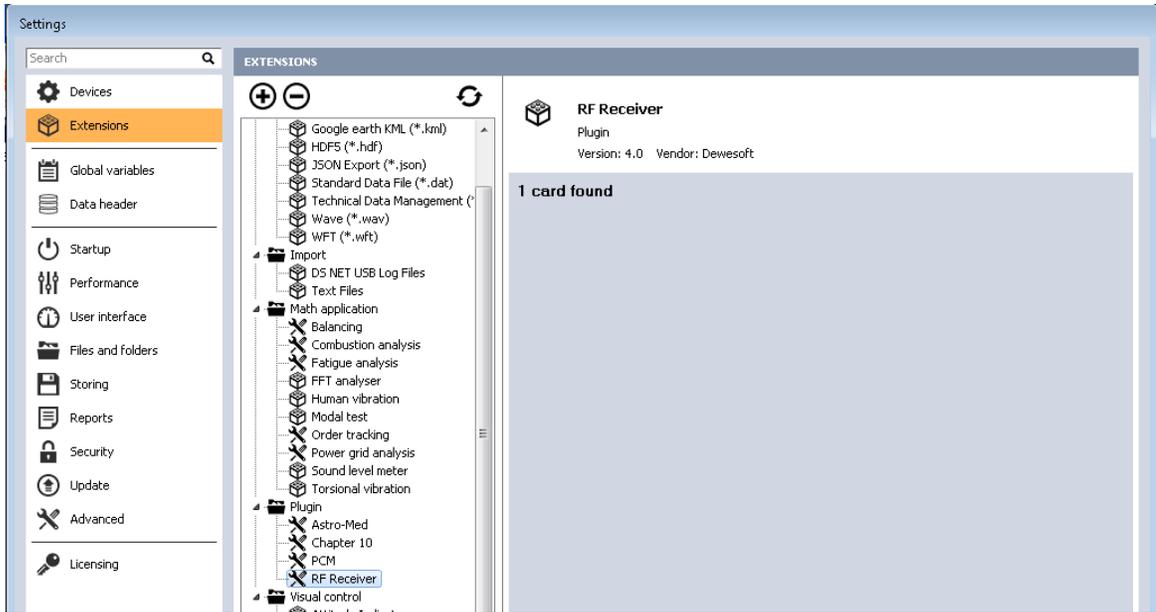
1. Go to the **Settings** menu in the top right hand corner of the screen and select **Settings**. The Settings window will appear.
2. In the Settings window, select **Extensions** from the menu on the left side. The Extension settings will appear in the pane to the right.



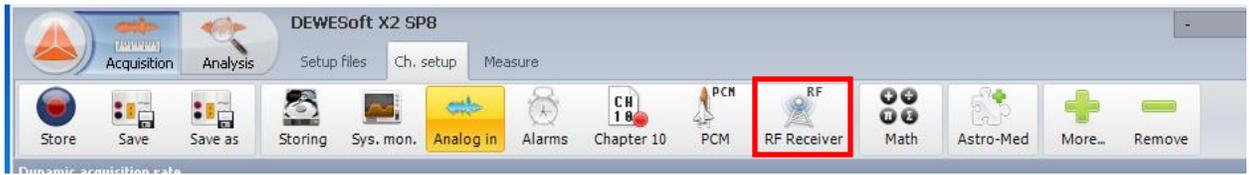
3. In the upper left hand corner of the Extension window, click the **Plus icon** to bring up the Manage Extensions window.
4. In the Manage Extension window, scroll down until you locate the RF Receiver. Click on the circle to the right to enable the TalonRF Plug-In. The circle will now have a check mark in it. Click the OK button to close the Manage Extensions window.



5. In the Extensions pane of the Settings window, locate the Plugins and then RF Receiver. Click on the RF Receiver to examine the settings for the TalonRF. The Plug-In will show how many TalonRF cards are in the system.

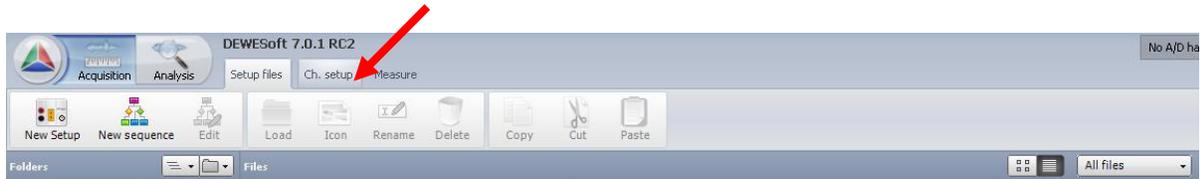


6. Click the OK button to close the Settings window.
7. The TalonRF Plug-In icon is now in the tool bar (red box in the image below).



2.5 Locating the TalonRF Plugin

First you need to access the Channel page and then there are two options for getting to the TalonRF channel setup screens. When DEWESoft first opens the SetupFiles tab is opened where all prestored setups should be located. By double clicking on the New Setup button or a previously created setup DEWESoft will automatically take you to the Channel Setup tab. If not, hit F2 or just click on the Ch. Setup tab at the top of the screen.



The setup screen will be shown. By default it will show you the ANALOG tab, which consists of any analog inputs that your system may have.

Note the tabbed interface which shows whatever interfaces are installed in your system. In the case of the screen below, they are Analog, Tarsus, TalonRF, and Math:



Depending on Your Hardware Settings your system may be different. For example, it could look like this:

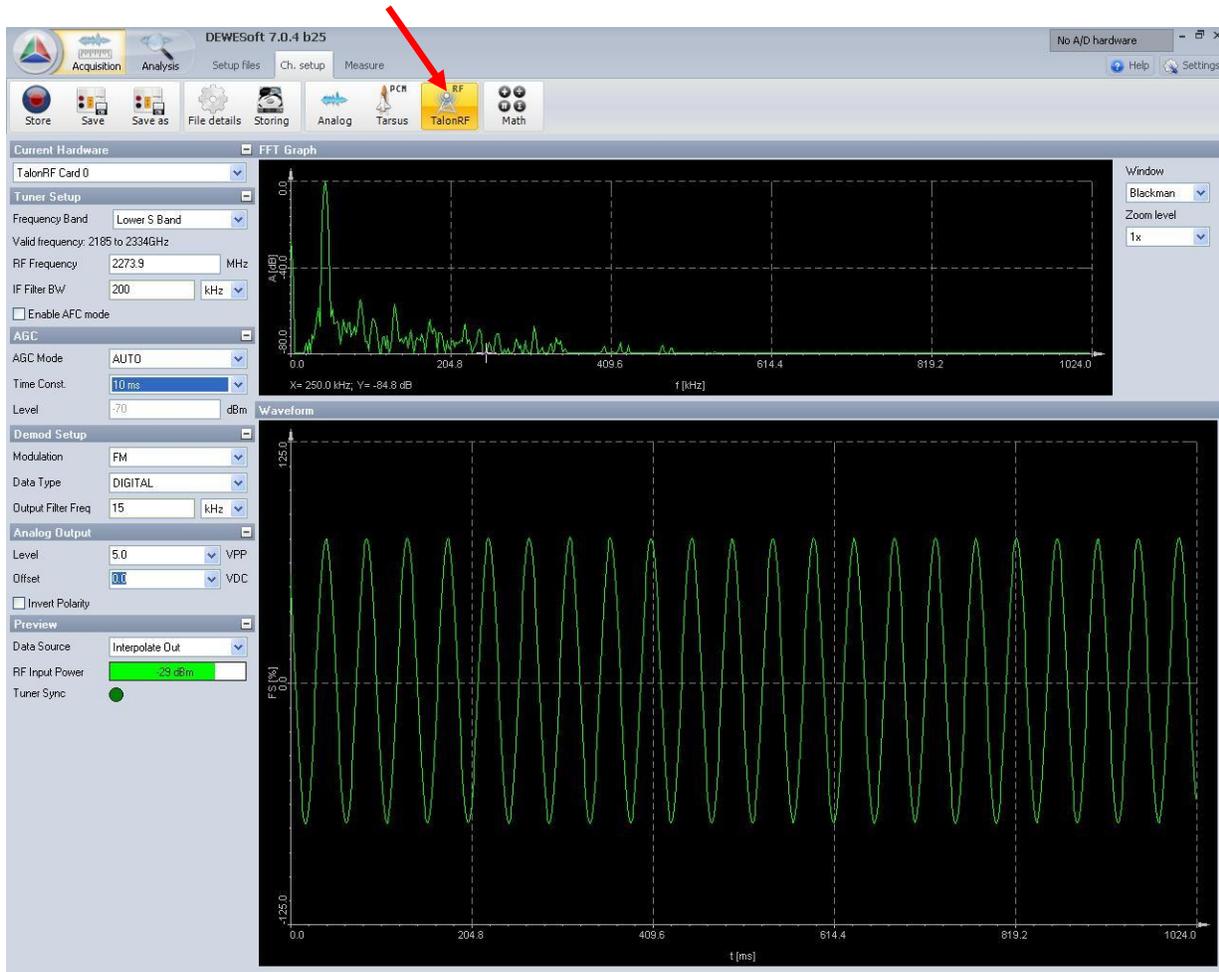


Note all of the additional tabs on this screen: Analog, Video, Alarms, Tarsus Plugins, Torsional Vibration - there are even more possibilities. The point is that these tabs will reflect exactly those hardware and software options which your system has installed.

Chapter 3 Configuring the Hardware

3.1 Configuring the Receiver

Go to the Ch. setup screen either by clicking the Ch. setup tab in the top tool bar or by pressing F2 on your keyboard. The setup screen will be shown and then click the TalonRF tab.



On this screen you set up the entire receiver card including selecting the RF Band, IF Filer, AGC Mode, Demodulation and more. The FFT spectral display is shown prominently on as a reference along with selectable waveform display to analysis your signal at different points in the hardware.

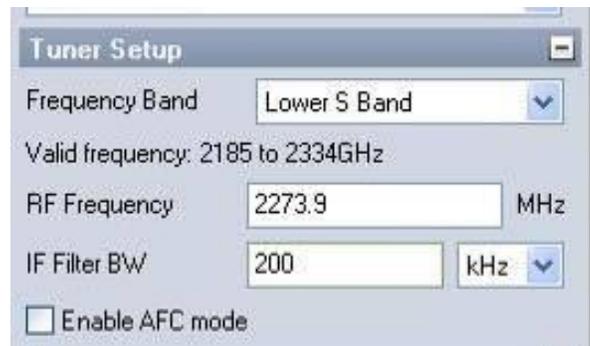
If there are multiple cards inside a single system they will run and are setup independent of each other. Each card can be selected by the drop down menu shown below:



3.1.1 Tuner Input Setup

1. Frequency Band:

Users can select between the RF Frequency Band coming into the card. This is dependent on the hardware configuration purchased.



2. RF Frequency:

Select the RF Carrier Frequency for the incoming stream in MHz.

3. IF Filter BW:

Enter the IF Filter Bandwidth for the data on the RF carrier. The TalonRF-PCI can handle rates from 1 kHz to 36 Mbps programmable to 4 digital resolutions.

4. Enable AFC mode:

The Auto Frequency Control mode will allow the TalonRF to automatically track the change in the RF Carrier Frequency

3.1.2 AGC Setup



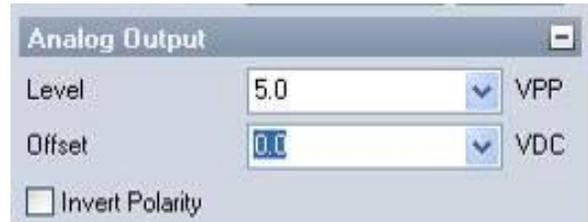
1. AGC Mode:
Select between Off, Auto, Freeze and Manual for the Auto Gain Control.
2. Time Const:
Select the update time constant for when the Auto Gain control updates.
3. Level:
Available when the AGC Mode is set to Manual. This gives the user the ability to directly set the Gain level.

3.1.3 Demod Setup



1. Modulation:
Select the RF Modulation technique used: FM, BPSK, PM, QPSK, AUQPSK and SOQPSK. Selection may vary depending on the card model purchased.
2. Data Type:
This selection controls which Demod filter technique is being used: Off, Analog, or Digital.
3. Output Filter Freq:
Enter the Output Filter Frequency for the data on the RF Carrier. The TalonRF-PCI allows for Data Rates up to 30 Mbps or 30 MHz.

3.1.4 Analog Output Setup



1. Level:
Select the voltage level for the RCVR output BNC.
2. Offset:
Select the Voltage offset for the output voltage.
3. Invert Polarity:
Enable this to invert the polarity on the out signal.

3.1.5 Preview



4. Data Source:
Select the data source for the Waveform display between different points in the hardware.
5. RF Input Power:
This meter tells the user what the RF power level (dBm) is coming into the card.
6. Tuner Sync:
Lock detect indicator that Phase Lock Loop (PLL) is locked.

3.1.6 Graphical Displays

FFT Diagram

This display shows the incoming PCM stream in a FFT (magnitude versus frequency, i.e., FFT/spectral) graph, where the magnitude is shown in decibels (dB), and the frequency is shown in Hertz (Hz, kHz, or MHz)



You can hover the mouse over the waveform and the display will calculate the magnitude in dB (vertical Y axis) and frequency (horizontal X axis) and show them numerically at the bottom of the graph.

You may select the window type for the FFT display and the zoom level from the drop down menu.

Rectangular does not influence the FFT decomposition at all, while the other selections are industry standard algorithms used for biasing the lobes of the FFT analysis in order to improve the calculations based on different signal types. It is beyond the scope of this manual to describe the different FFT windowing types and their purposes. The DEWESoft manual does include such an overview in the appendix section for your reference.

3.2 TalonRF BNC Pigtail

<u>BNC Label</u>	<u>Description</u>
RCVR	Receiver output from the demodulator
AGC Level	Linear representation of the AGC Level from 0 to -4 Volts.
10 MHz	10 MHz external reference input
AM OUT	Amplitude modulated AGC level signal
Q OUT	For quadrature based modulation schemes

Chapter 4 Saving and Loading Setups

Dewesoft makes it easy to save and load any hardware configuration. The setups can be stored to the local hard drive to be used by the unit or transferred to other measurement units.

In Dewesoft, a "Setup" contains all of the settings which are active at the moment you save it, except for the few global parameters which are restored automatically when the software is started. Global parameters are those which are set using the Hardware Settings and General Settings dialog boxes, which are selected under the Settings menu.

4.1 Starting a New Setup

There are times when you will want to clear away the current setup and start completely fresh. Simply select the New setup menu item to accomplish this.

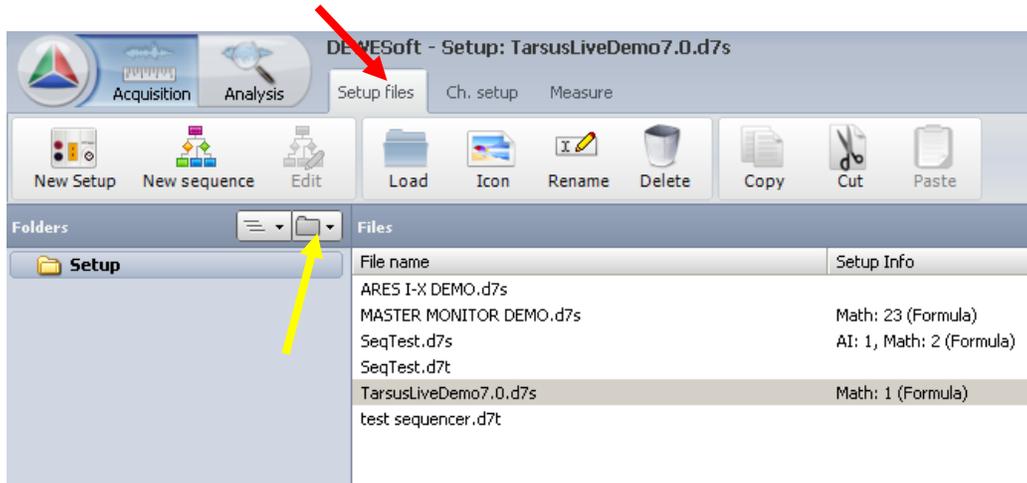


New setup: select this menu item and a new blank setup will be created. All existing setup parameters will be lost, so be sure that you have saved any changes before executing a new setup file.

A setup contains all aspects of your configuration which are available using the SETUP screen and the DISPLAY screens of DEWESoft.

4.2 Loading Previous Setups

Once you have saved a setup, you can reload it at any time. Setups are stored to the hard disk in your system, so they remain on the system until you delete them or change the hard drive. To load a new setup click the Setup Files tab in the horizontal toolbar.



The default project folder will be displayed with any setup files located inside. To browse the hard drive for setups saved in a different location use the folder button (yellow arrow) to navigate to the folder. Double click on the setup file or click the load button to open the file.

4.3 Saving Setup Configuration

At any time on the Ch. Setup tab the current configuration can be saved. This will also save the displays under the measure tab to the same setup file. Simply press the Save or Save as buttons in the main toolbar

