

I Introduction

The Programming Board is designed and created by Powersoft for the programming of DSPs mounted in the DigiMod and D-Cell504 series modules. A single device allows real time communication and preset storage with the on board DSP. Operation is made possible using Analog Devices® SigmaStudio™ software, starting from version 3.3.

I.1 Programming Board Versions

The Programming Board is available in two different versions:

I.1.1 Programming Board LITE.

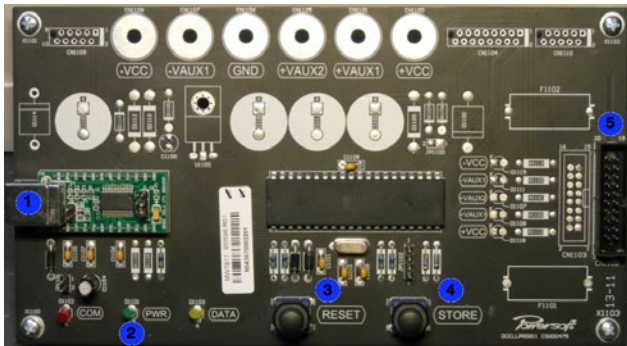


FIGURE 1: The Programming Board LITE. 1: USB data port, 2: Power On LED, 3: Reset Button, 4: Store button, 5: 20-pin connector for programming cable

Functions:

- ▶ real time monitoring and control of DSP-C presets via SigmaStudio 3.3
- ▶ one-preset-at-a-time storage in one of the free memory slots on the DSP-C

I.1.2 Programming Board PRO

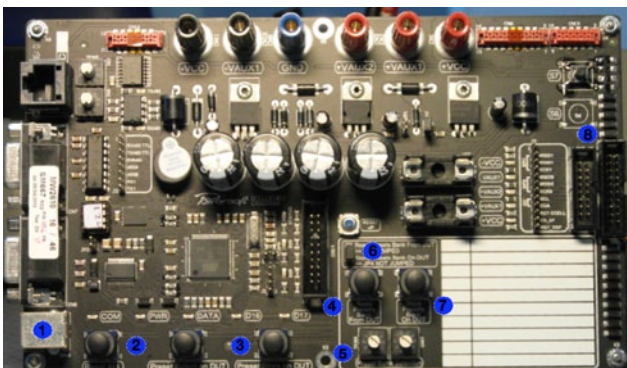


FIGURE 2: The Programming Board PRO. 1: USB data port, 2: Reset Button, 3: Store Button, 4: Read Button, 5: Bank selector, 6: JP4 jumper, 7: Store presets bank button, 8: 20-pin connector for programming cable

Functions:

- ▶ real time monitoring and control of DSP-C presets via SigmaStudio 3.3
- ▶ one-preset-at-a-time storage in one of the free memory slots on the DSP-C
- ▶ reading an entire 4-preset-bank from the DSP-C
- ▶ storing up to 50 different preset banks in the board's internal memory. Each preset bank can be read from a DSP-C.
- ▶ saving an entire 4-preset-bank in the DSP-C memory in one operation
- ▶ Remote DSP-C preset selection

I.2 Compatible Products

- ▶ DigiMod 1000/1500/2000HV IS
- ▶ DigiMod 500/1000/1500/2000HV/3000PFC with DSP
- ▶ D-Cell504 IS DSP
- ▶ D-Cell504 IS 4ch

I.3 System Requirements

- ▶ Operating System: Windows 2000 with SP4, Windows ME; Windows Server 2003, Windows XP / XP Professional or Home edition with SP2; Windows Vista; Windows 7 without SPI.
- ▶ .NET Framework 3.5
- ▶ CPU: AMDX86-64Series / IntelX86series. Both32-bitand 64-bit platforms are supported
- ▶ RAM : minimum 128MB (256MB recommended).
- ▶ Disk Space : 45MB of available hard disk space.
- ▶ Screen Resolution : 1024x768.
- ▶ Data port : USB 1.1/2.0 data port

I.4 About help and support

This guide provides an overview of programming with Powersoft Programming Board LITE and Powersoft Programming Board PRO. For more information regarding SigmaDSP and SigmaStudio 3.3 software, consult the following:

- ▶ **SigmaStudio Help file:** SigmaStudio has an extensive Help file included with the installation, explaining the operation of all of the software's features and signal processing blocks. You can access the Help file in the Help menu software (shortcut F1), or by opening the file located in the Help folder inside your SigmaStudio installation folder
- ▶ SigmaStudio 3.3 user guide released by Powersoft, this guide is available for download at:

http://www.powersoft-audio.com/en/component/docman/doc_download/419-sigmastudio-user-guide.html?Itemid=111

- ▶ General information about SigmaDSP processors can be found in the SigmaDSP FAQ page of the Analog Devices website:

<http://www.analog.com/en/technical-documentation/frequently-and-rarely-asked-questions/resources/embedded-processing-dsp/sigmadsp/listing.html>

- ▶ Any help and support request for the use of SigmaStudio

with Powersoft products can be addressed to: support@powersoft.it

- Further SigmaDSP or SigmaStudio support inquiries can be directed to EngineerZone forum

<http://ez.analog.com/community/dsp/sigmadsp>

2 Installing software and hardware

2.1 Where And How To Download The Software

SigmaStudio is freely distributed by Analog Devices and is downloadable from the Analog Devices website provided you supply the software key included with the purchase of one of the Analog Devices evaluation kits.

Powersoft has a license agreement with Analog Devices for redistributing the software exclusively to Powersoft customers without the need to purchase an Analog Devices evaluation board. That is the reason why you will not find a direct public link on the Powersoft website to download the software.

In order to obtain the link to download your copy of SigmaStudio, please contact Powersoft at the following email address:

support@powersoft.it

2.2 Installing SigmaStudio 3.3

After download, save and unzip the SigmaStudio archive. After unzipping, the folder 'SigmaStudio_3.3' will contain two more zip files:

- Sigma Studio 3.3 X64 Release solo computer che montano Microprocessori AMD X86-64.
- Sigma Studio 3.3 X86 Release solo computer che montano Microprocessori Intel X86.

After unzipping the file corresponding to your system, a folder named 'Sigma Studio v3.3 xxx Release' will be created. Open the folder and follow these steps:

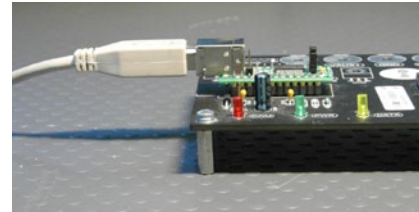
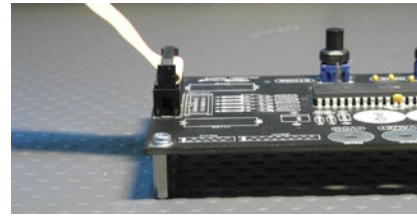
1. launch the installer by double clicking the 'Sigma Studio.msi' file
2. follow the on screen instructions
3. click "End" to complete the installation.
4. the device driver installation wizard will be launched: follow the instructions that appear.
5. click "End" to complete the installation.

For further support, see the SigmaStudio user guide released by Powersoft (see Section 1.4 on page 1)

2.3 Installing the hardware

After that you have installed SigmaStudio 3.3, restarted your computer, but before launching the software, connect the Programming Board to the computer and to the amplifier.

1. Take one USB cable type B male / type A male (not provided by Powersoft). Connect the side type B male to the Programming Board and the type A male to the computer's USB data port.

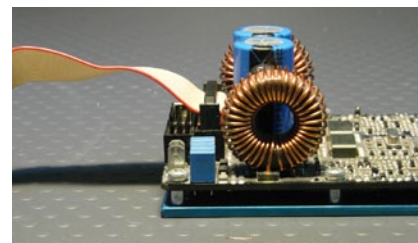


2. Take the flat programming cable and connect the side with the 20 poles connector to the programming board and the other side to either:

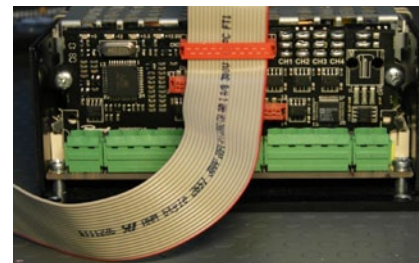
- the 20 poles connector on the interface in case you have an IS type amp module (DigiMod 1000/1500/2000HV IS o D-Cell504 2ch/4ch IS).



- the 20 poles connector on the amp module for the D-Cell504



- If you have an amp module without an interface (DigiMod 500/1000/1500/2000HV/3000PFC), connect the micromatch to the CN2' connector on the DSP board.



3. connect the mains:

- if you have a D-Cell504 IS, take a mains cable with an IEC C14 type female connector and plug it into the power outlet of the amp module
- if you have D-Cell504 IS_pora DigiMod 1000/1500/2000HV IS, take a mains cable with a PowerCon female connector

I Pay special attention in plugging the micromatch connector CN2 in the DSP-C: the connector on the flat cable has a two-way socket. Pin number 1 (always marked in red) is at the right hand side end of the connector.

and plug it into the power outlet of the amp module

- ▶ If you have D-Cell504 or a DigiMod 3000PFC/2000HV take a mains cable with faston connectors and plug it into the power outlet of the amp module
- ▶ if you have DigiMod 500/1000/1500, take one main cable with a 2-pin phoenix connector and plug it into the power outlet of the amp module

4. turn the module on²

When the amp module is powered, the Programming Board will be powered as well.

2.4 Installing the drivers

Follow the instructions below to correctly install the drivers released by Analog Device

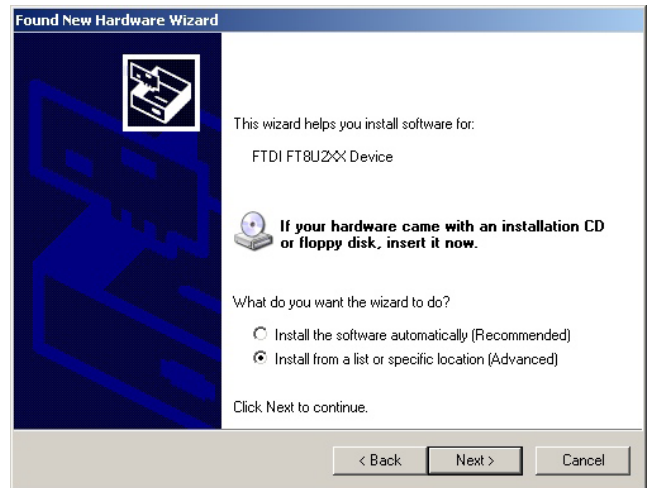
2.4.1 Windows XP



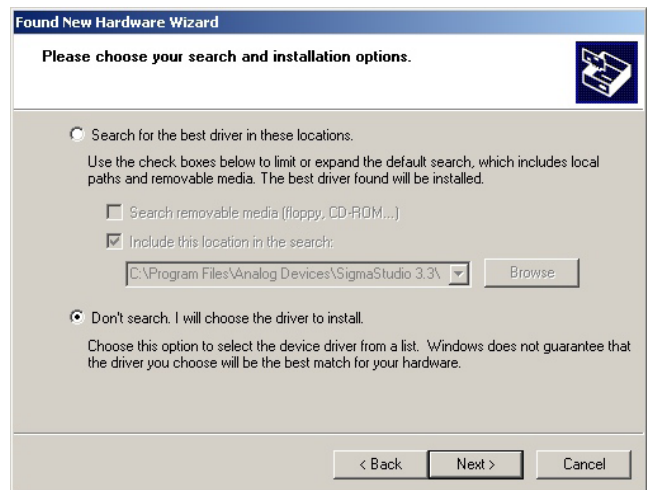
1. As soon as you switch on the amplifier, the system detects the programming board as an external USB device.



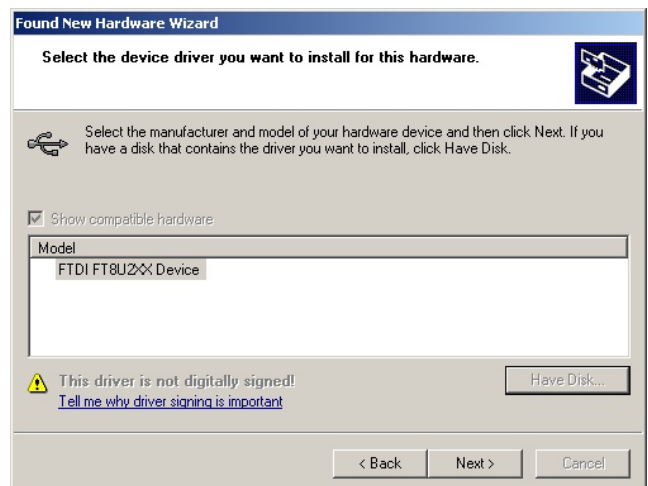
2. The "Found new Hardware Wizard" appears. Select the option "No, not this time", to avoid the installation of generic drivers instead of the ones needed for the programming board. Press "Next" to continue.



3. Select the option "Install from a list or specific location (Advanced)". Click "Next" to continue.

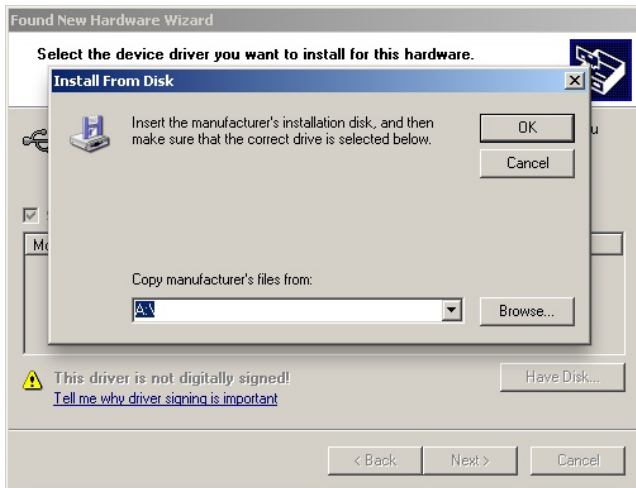


4. Select "Don't search. I will choose the driver to install". Click Next to continue.

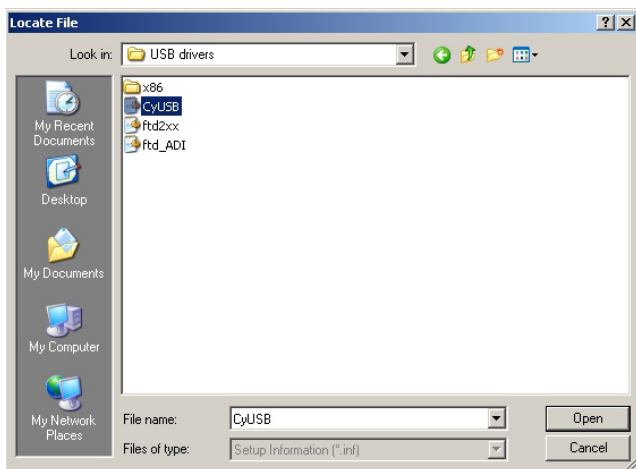


5. Click "Have a Disk" to tell the system where to find the drivers.

² with an on/off switch in the D-Cell504 2ch/4ch, or instantly when you plugging the power supply connector in the D-Cell504 IS_p, DigiMod 500/1000/1500/2000HV/3000PFC, DigiMod 1000/1500/2000HV IS.



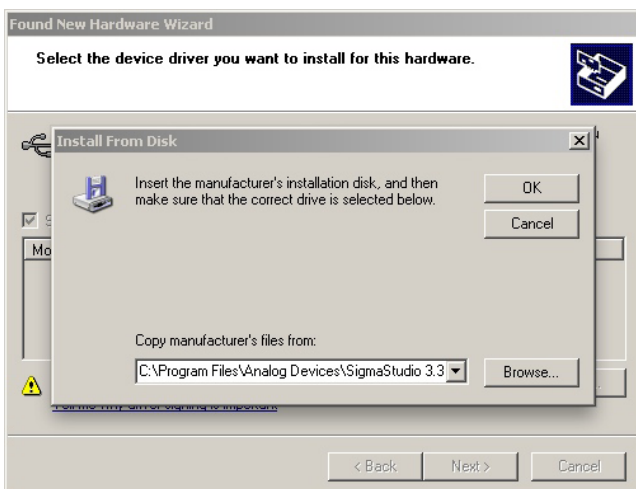
6. Click the "Browse" button.



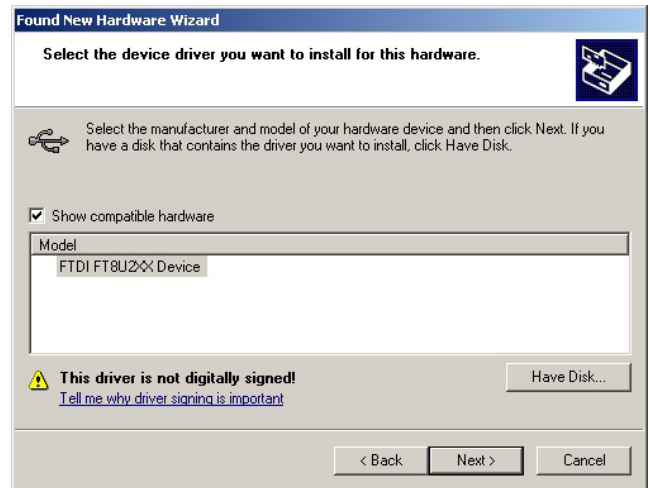
7. Browse your system and find the folder called "USB drivers" inside the SigmaStudio installation folder. Usually, the default path is:

C:\Program files\Analog Devices\Sigma Studio 3.3\USB Drivers

8. Select the file "CyUSB" and click "Open".



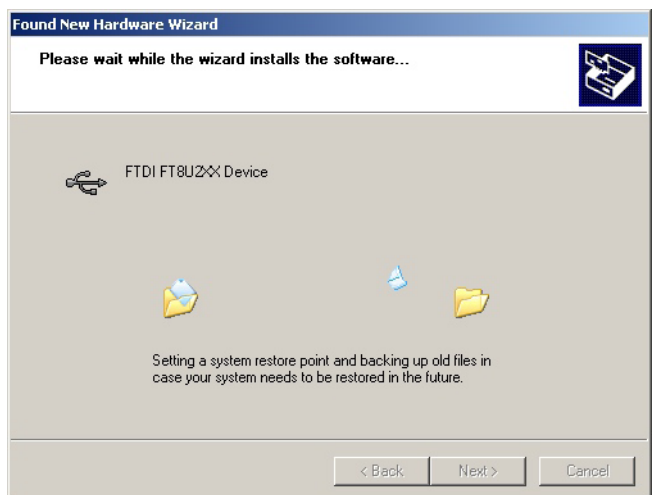
9. Click "Ok" to confirm the correct drivers location.



10. Click "Next" to continue.



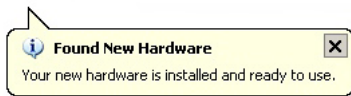
11. If the above window appears, click "Continue Anyway".



12. Please wait for the drivers being installed.

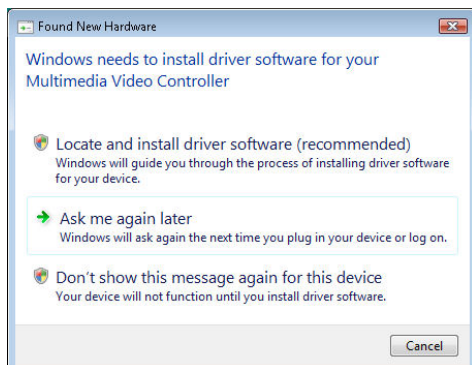


13. Click "Finish" to end the installation.



14. Your PC should now confirm the correct installation.

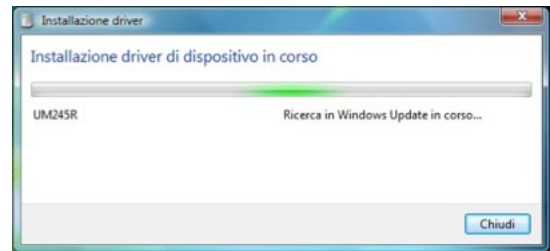
2.4.2 Windows Vista



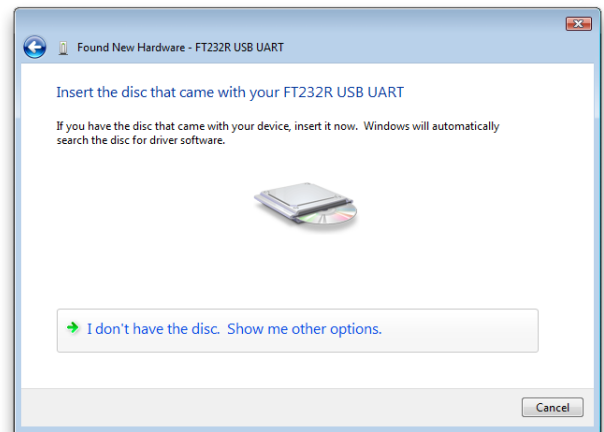
1. As soon as you switch on the amplifier, the system detects the programming board as an external USB device and the "Found new Hardware Wizard" utility appears. Select the option "Ask me again later".



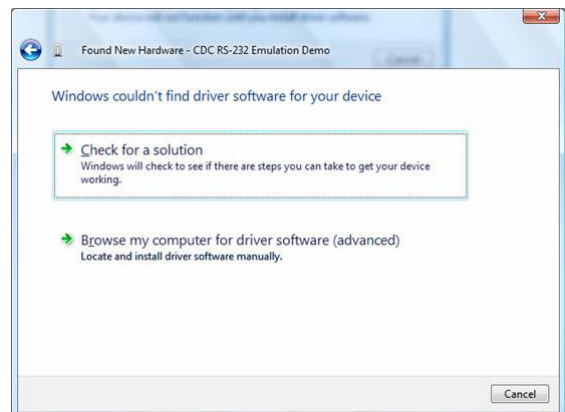
2. PC starts automatic installation of the drivers. Click the balloon appearing on the bottom right of your screen ("Installing device driver software") to see the status of the installation.



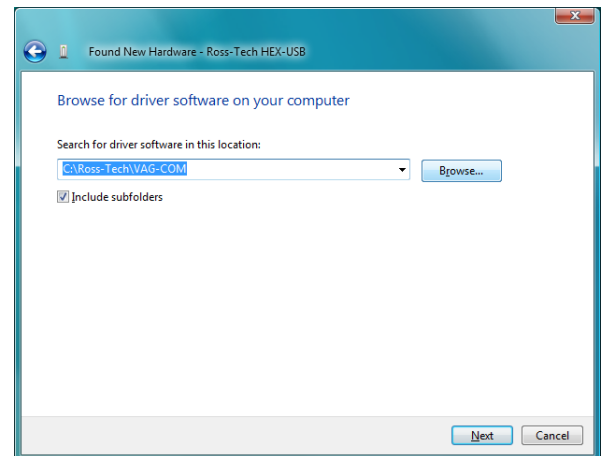
3. Click "Close" to stop the automatic installation of generic drivers.



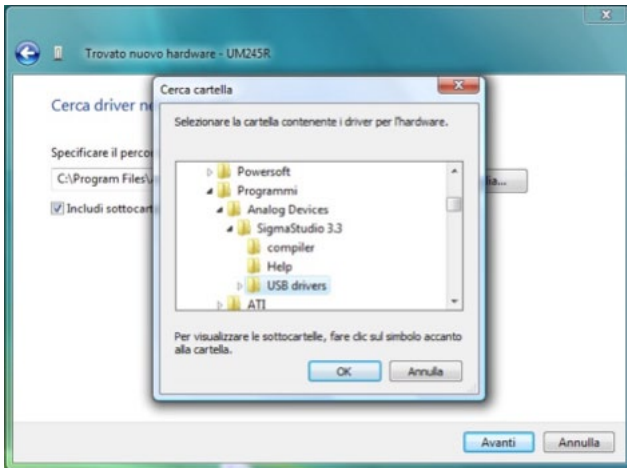
4. Click "I don't have the disk. Show me other options".



5. Choose the second option, "Browse my computer for driver software (advanced)".



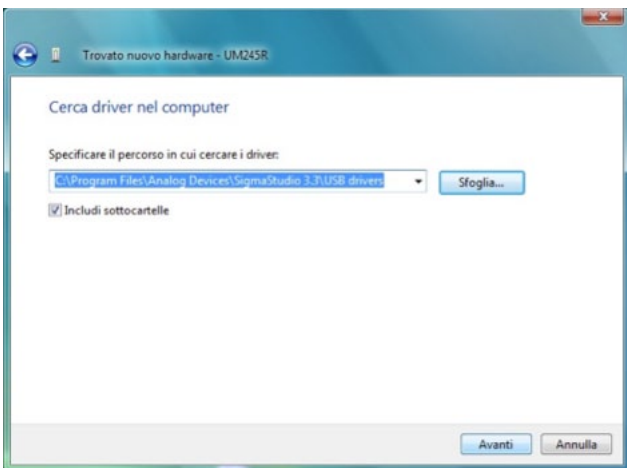
6. Click "Browse" to locate the drivers folder.



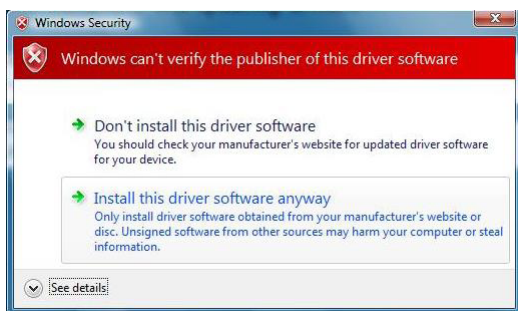
7. Browse your system and find the folder called "USB drivers" inside the SigmaStudio installation folder. Usually the default path is:

C:\Program files\Analog Devices\Sigma Studio 3.3\USB Drivers.

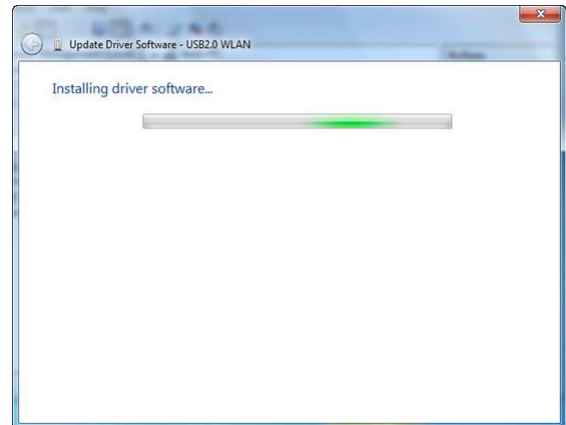
Select the CyUSB and click "Open".



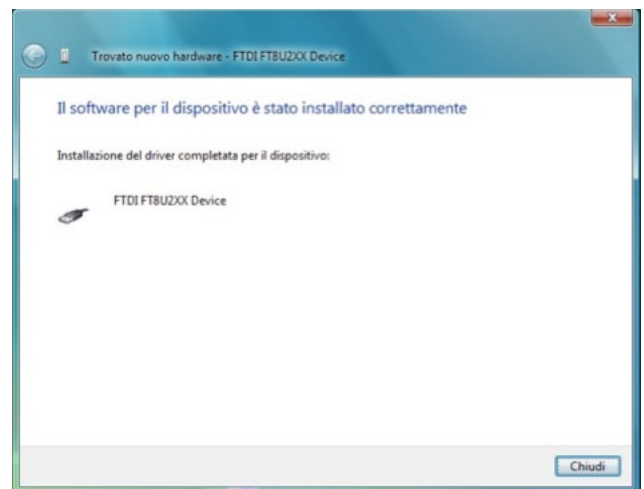
8. Click "Next" to continue the installation.



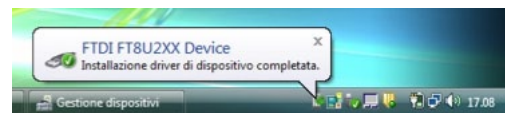
9. Click "Continue anyway"



10. Please wait for the drivers being installed



11. Click "Close" to complete the installation.

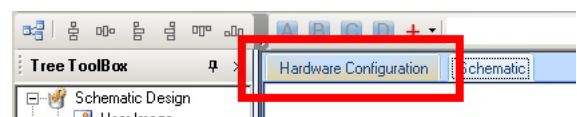


12. Your PC should now confirm the correct installation.

2.5 Verifying correct installation of the programming board

To verify that the programming board is correctly installed and that it can communicate with SigmaStudio, do the following:

1. connect and switch the amp module
2. launch SigmaStudio 3.3
3. open one of the templates provided by Powersoft that matches the amp module model that you have³
4. click the Hardware configuration tab located on the top side of the workspace



5. check the color of the label in the block "EvalboardI70x/I40x"
If the color of the label is orange, then there is proper communication between the programming board and SigmaStudio.

³ See Section 5 in the SigmaStudio user guide for more details.



If the color of the label is red, there is no communication between the programming board and SigmaStudio. In this case please verify that both the USB cable and the DSP programming cable are properly connected, then proceed with a manual update of the drivers as explained in the SigmaStudio user guide⁴.

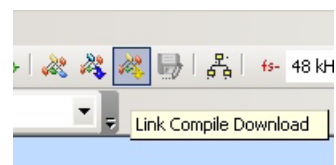


3 How to use the Programming Board LITE

3.1 Checking Presets In Real Time

The following steps allow checking in real-time if the template that you have opened and tweaked satisfies your requirements by sending the template in the DSP without having to store it. When the preset is sent to the DSP, the values of the parameters in the algorithms used can be modified live. The sound coming from the amp module changes in real time as a result of variations in the signal processing parameters.

1. Select the memory slot where you want to allocate the preset template you want to check. This is done:
 - ▶ from the interface with the button "Preset Select" for IS modules (DigiMod 1000/1500/2000HV IS and D-Cell504 IS)
 - or
 - ▶ in all modules without an interface, by grounding pin number 17 on the CNI connector for the D-cell504 or pin 5 on the CNI connector for the DigiMods (this can be done, for example, by short circuiting it with pin number 1 in the same connector)
2. Click Link/Compile/Download in SigmaStudio 3.3



3. The bar becomes green each time the link is active. The "Data" LED on the Programming Board will briefly blink to confirm that the link is active



From this moment on, the DSP-software link is active. Each project template parameter that changes will be sent to the DSP. If speakers are connected to the module, these changes become audible in real time.

Each time a wire is removed or an algorithm is added to the processing path, the link is interrupted. The green bar becomes blue to signal this.

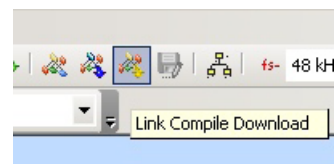


In order to re-establish an active link between the software and the DSP, repeat steps 1-3 above.

3.2 Storing Presets

To store the template as a preset in the DSP follow these steps:

1. Select the slot where you want to store the preset:
 - ▶ from the interface with the button "Preset Select" for IS modules (DigiMod 1000/1500/2000HV IS and D-Cell504 IS)
 - or
 - ▶ in all modules without an interface, by grounding pin number 17 on the CNI connector for the D-cell504 or pin 5 on the CNI connector for the DigiMods (this can be done, for example, by short circuiting it with pin number 1 in the same connector)
2. Click Link/Compile/Download in SigmaStudio 3.3



3. The bar becomes green each time the link is active.



4. Push the "Store" button on the Programming Board to store the template as a preset. In the IS module, the storing LED will blink.
5. The template is stored in the DSP as a preset.

⁴ See Section 2.8 in the SigmaStudio user guide for more details.

3.3 Reset

This operation allows to reset the Programm Board in case of any errors during the Link/Compile/Download from SigmaStudio 3.3 or during preset storage operations. Errors are reported when the red "COM" LED lights up. Push the "Reset" button to proceed.

4 How To Use The Programming Board PRO

4.1 Using As A Programming Board LITE

The Programming Board PRO, like the LITE version, allows to store and check only one preset at a time. In order to store only one preset, follow the same instructions listed for Programming Board LITE. In the Programming Board PRO, the "Store" button is replaced by the "Preset Store on DUT" button.

4.2 Storing Presets Banks Into Programming Board PRO

The Programming Board PRO allows simultaneous downloading of four presets from a previously programmed DSP board. These "banks" of four presets can also be stored in the board's internal memory in a single step.

1. Select the presets bank on the programming board where you want the presets to be stored. This is done using the two rotary encoders:

- ▶ rotary encoder on the left hand side determines the tens, the one on the right hand side indicates the units:

for example, if you want to store four presets in bank number 12, the encoder to the left will be set on "1" and the one on the right will be set to "2"

2. make sure jumper JP4 is not present
3. push the "Read presets bank from DUT" button: the operation will be confirmed by a single sound from the board's internal buzzer.

During the storage operation the yellow "Data" LED blinks. When the operation is successful, the yellow "Data" LED turns off and the green "DI6" LED will turn on. The operation completion will be confirmed by three audio sounds from the board's internal buzzer. If the operation is unsuccessful, the green "DI6" LED starts blinking, followed by one long sound from the board's internal buzzer. In this case, repeat the operation from step 1.

When the storage procedure is completed, replace the jumper in JP4 to avoid any errors.

4.3 Storing Presets Bank In The Amp Module

When one or more presets banks are stored in a Programming Board PR internal memory, these can be used to program an amp module.

1. In the Programming Board PRO, select the presets bank containing the presets that you want to store in the amp module
2. make sure jumper JP4 is present
3. Push the button "Store presets bank from DUT": the operation will be confirmed by one audio sound coming from the board's internal buzzer

During the storage operation the yellow "Data" LED blinks. When the operation is successful, the yellow "Data" LED turns off and the green "DI6" LED will turn on. The operation completion will be confirmed by three audio sounds from the board's internal buzzer. If the operation is unsuccessful, the green "DI6" LED starts blinking, followed by one long sound from the board's internal buzzer. In this case, repeat the operation from step 1.

4.4 Reset

This operation allows to reset the Programm Board in case of errors during the Link/Compile/Download from SigmaStudio 3.3 or during storage procedures. Errors are signalled when the red "COM" LED turns-on. Push the "Reset" button to proceed.