

ELAD FDM-S1



USER MANUAL

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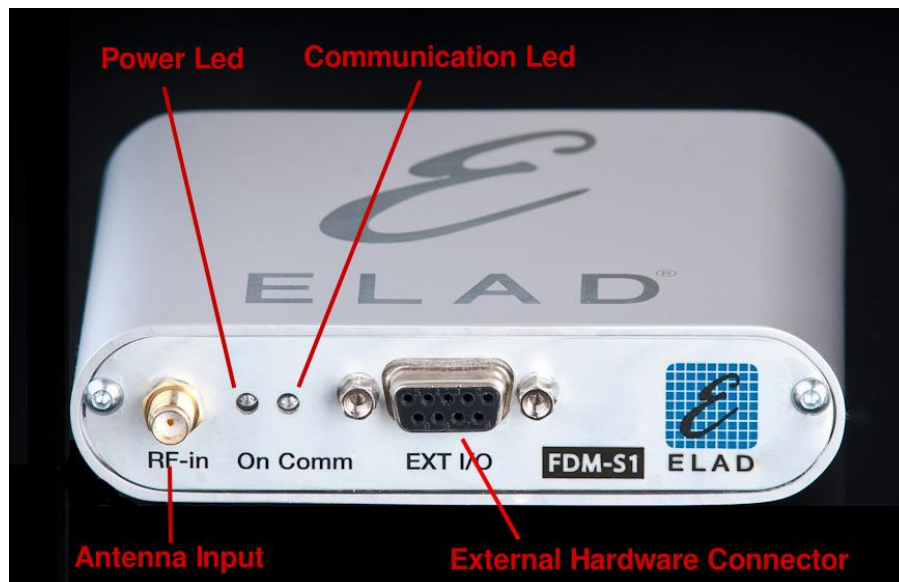
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1 FDM-S1 Overview

1.1 Description of the ELAD FDM-S1 receiver

The radio-receiver ELAD FDM-S1 is conceived as a SDR (Software Defined Radio). This approach means that the receiver is composed of an Hardware RF front-end and a PC with an ELAD software (ELAD FDM-SW1).

1.2 Front Panel Description



Power Led

Turns on when the receiver is connected to a USB port of the PC

Communication Led

Shows the communication between the receiver and the PC

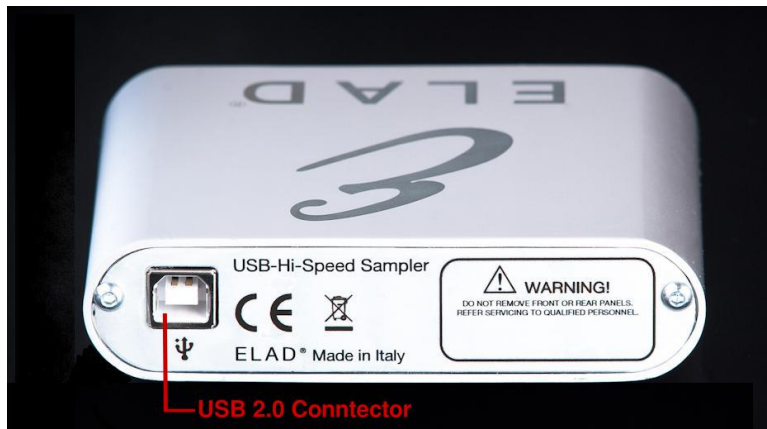
Antenna Input

SMA 50Ω input connector.

External Hardware Connector

DB9 connector for external hardware (eg pre-selector filters board)

1.3 Rear Panel Description



USB 2.0 Connector

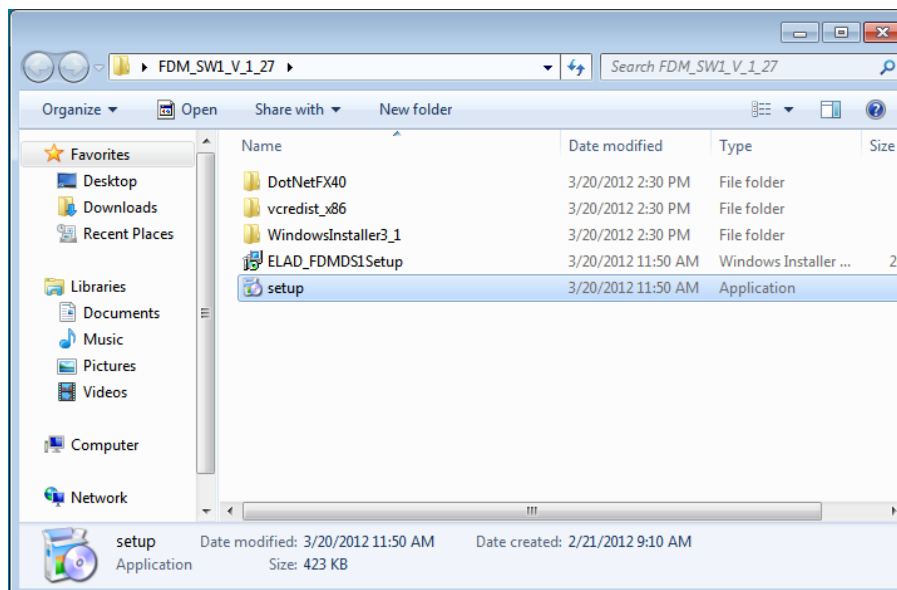
Connection with the PC. Please use the supplied cable.

2 Software & Driver Installation

2.1 Software installation in Windows 7 and Windows XP

2.1.1 First-time install in Windows 7

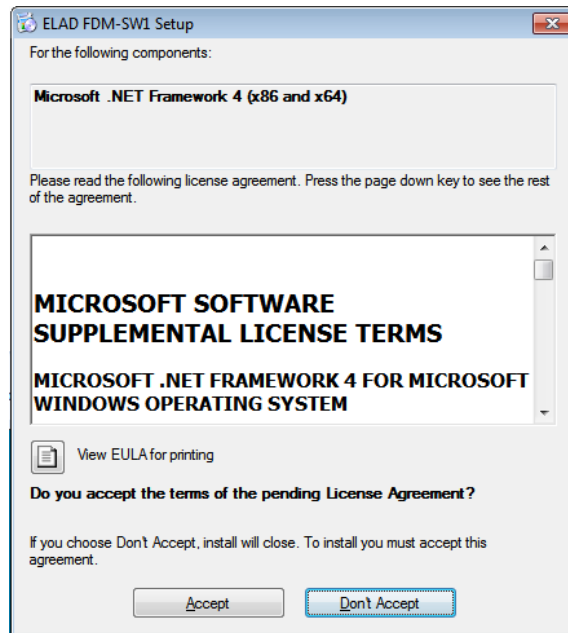
Double-click the file “setup.exe” in the CD .



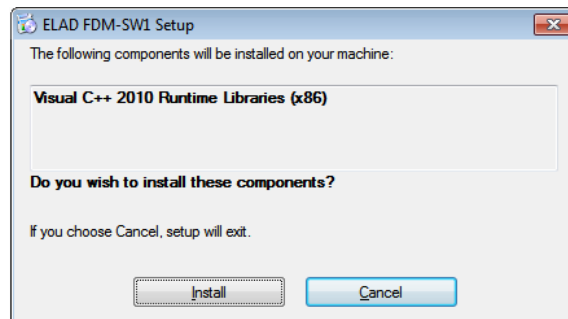
The windows installer first installs the prerequisites:

- Microsoft VC++ 2010 Runtime libraries
 - Microsoft .NET Framework 4.0
- and then the FDM-SW1 software.

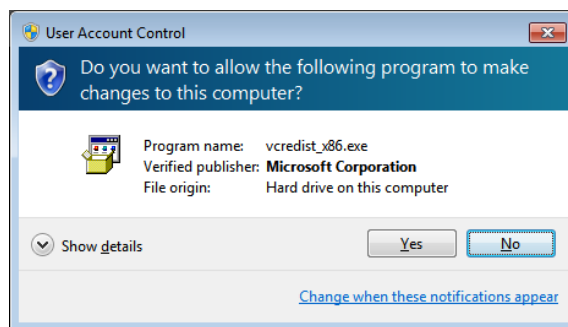
Click on “Accept”



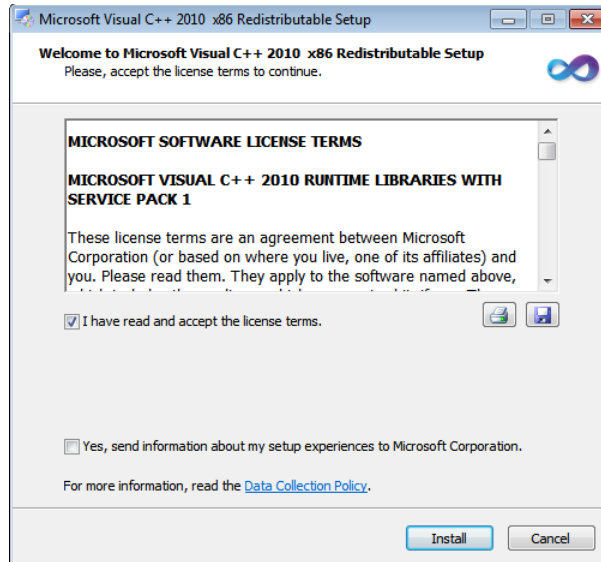
Click on “Install”



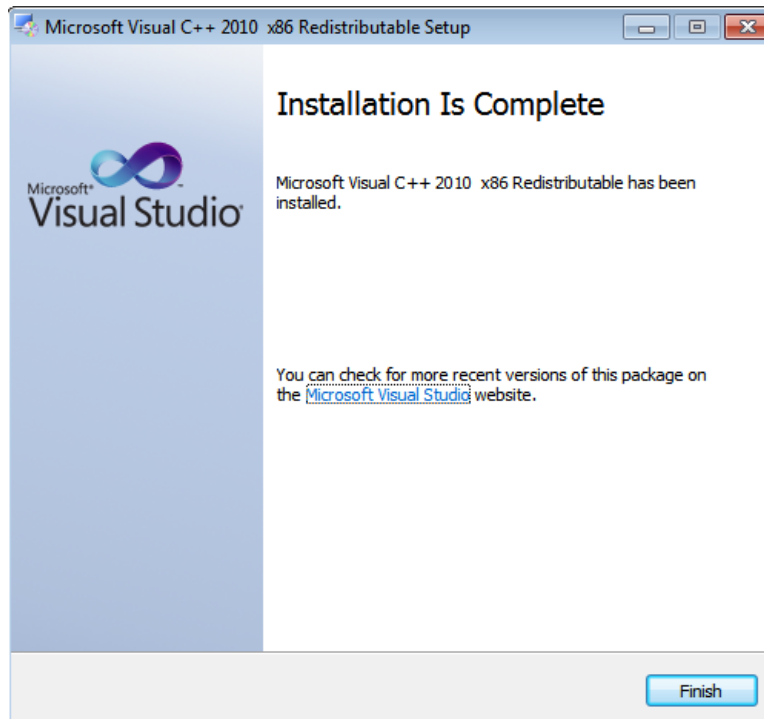
Click on “Yes”



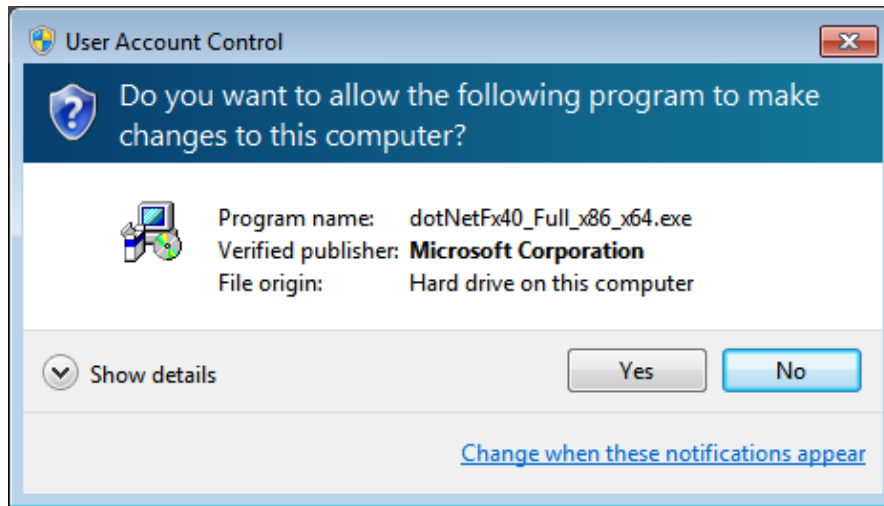
Click on Install



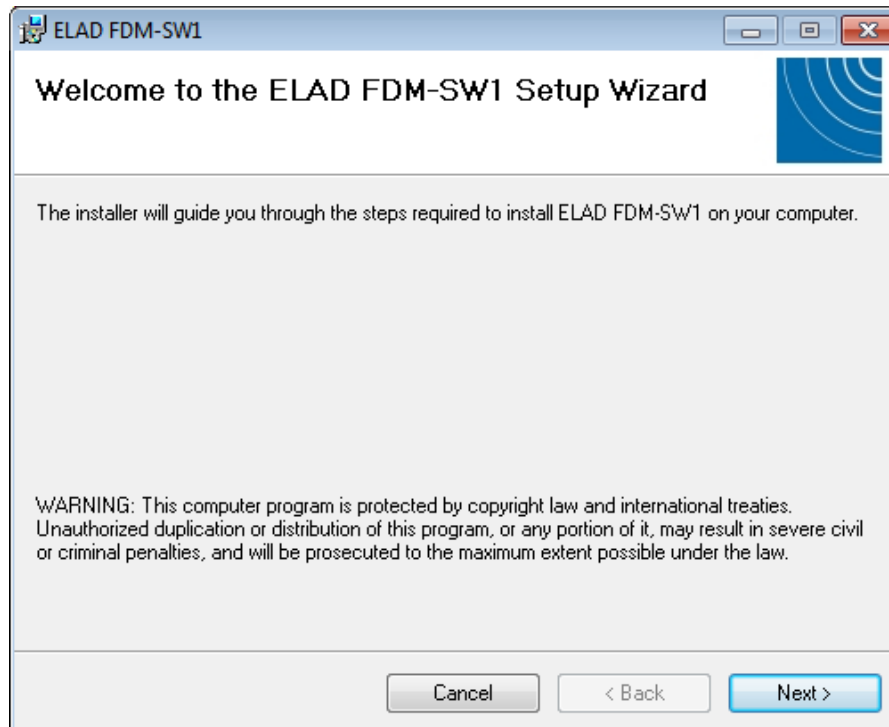
Microsoft Visual C++ 2010 x86 Redistributable installation is complete, click on "Finish"



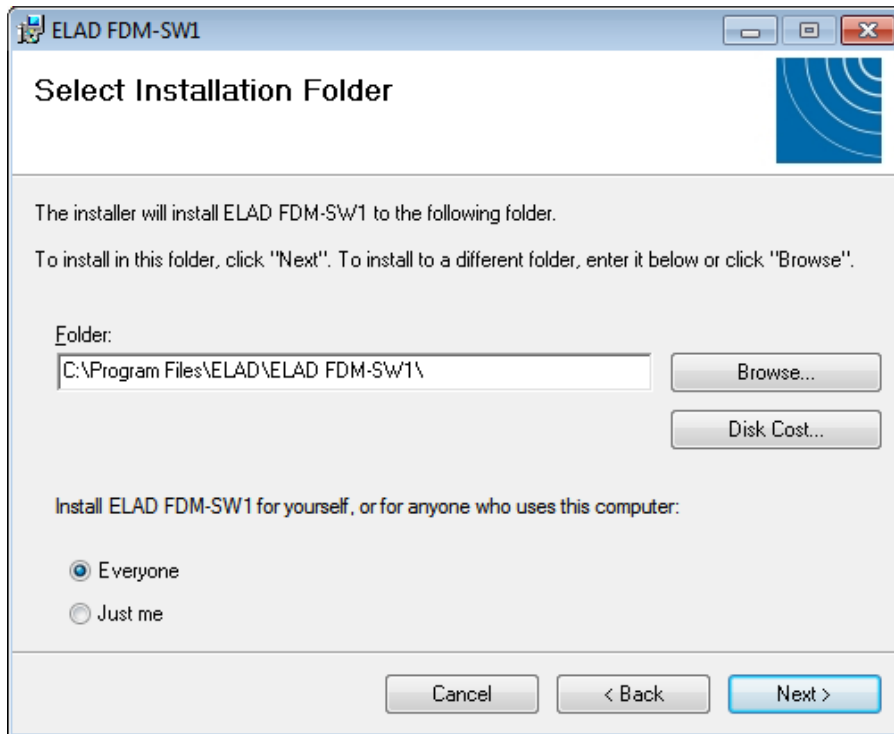
Click on "Yes" to start the installation of the .Net Framework 4.0



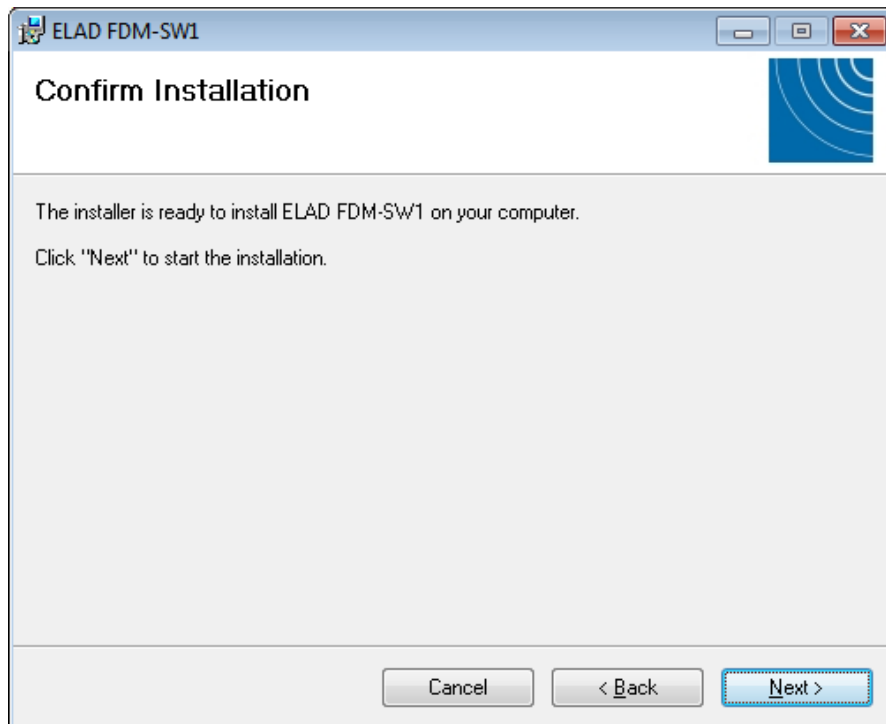
Click to "Next" to start the FDM-SW1 software installation



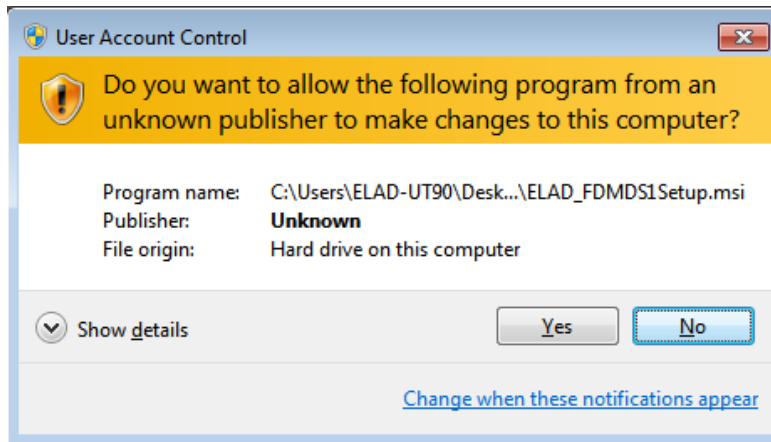
Chose the installation folder, then click on "Next"



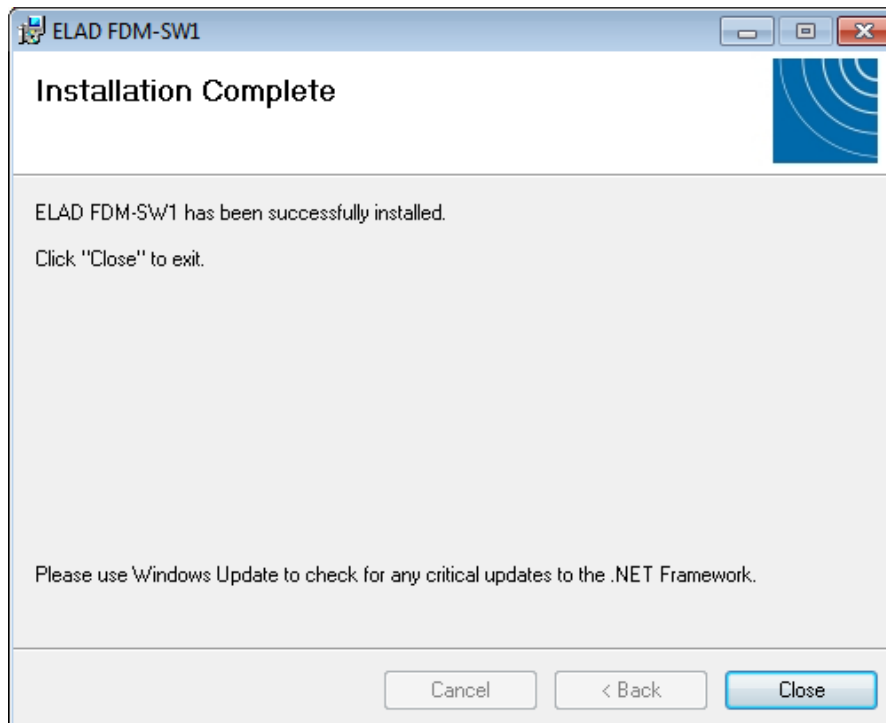
Click on “Next”



Click on “Yes”

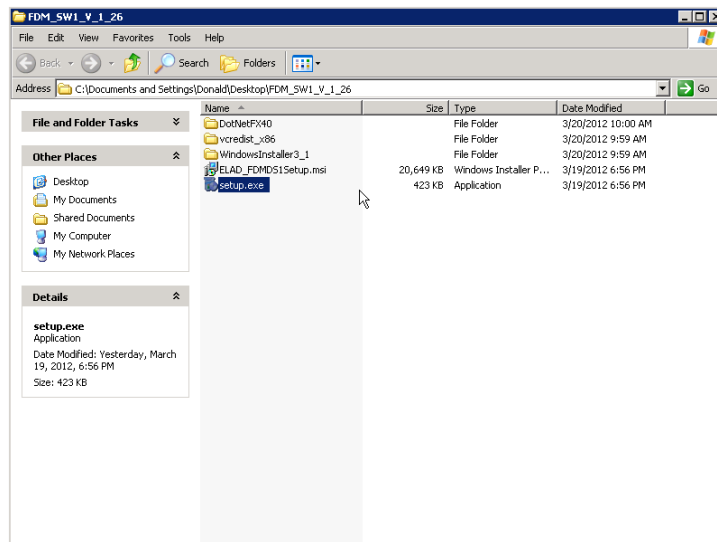


The FDM-SW1 software installation is completed, click on "Close"

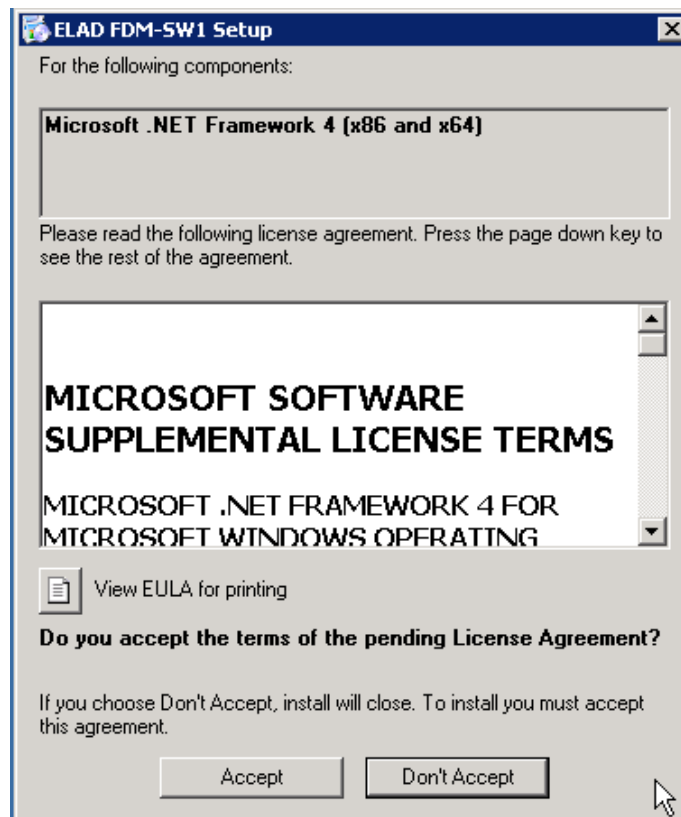


2.1.2 First-time install in Windows XP

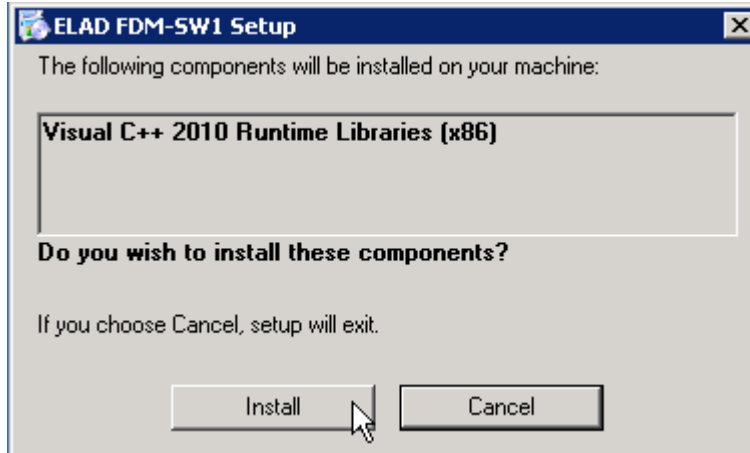
Double-click the file “setup.exe” in the installation folder.



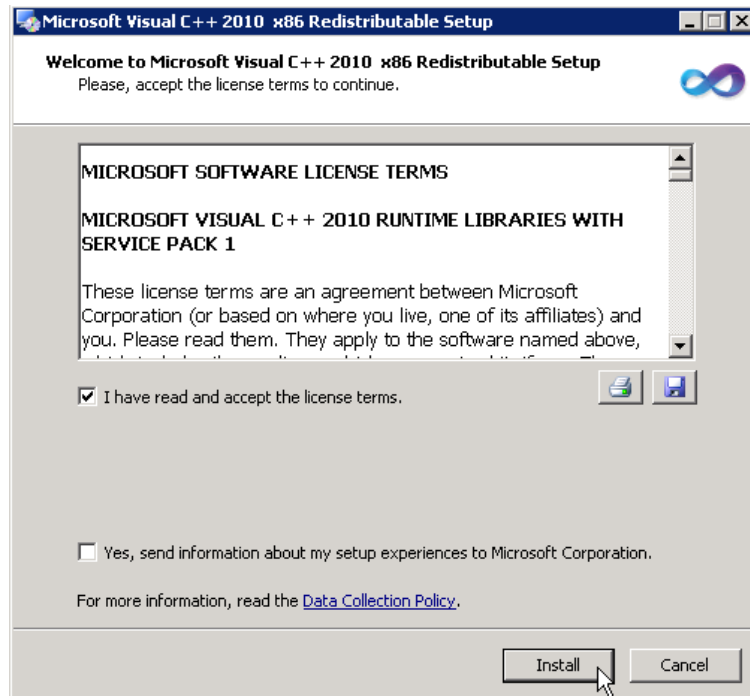
Click on “Accept”



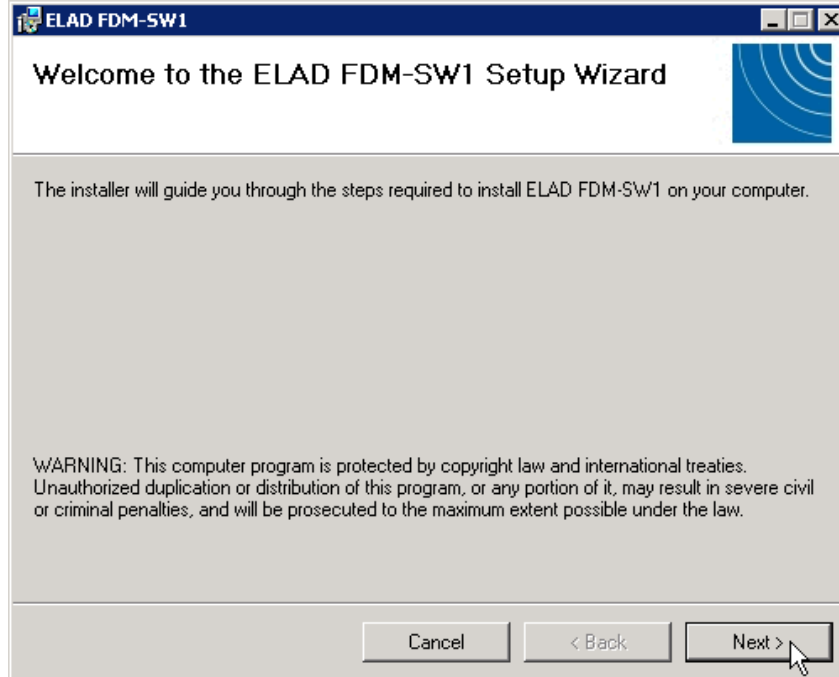
Click on “Install”



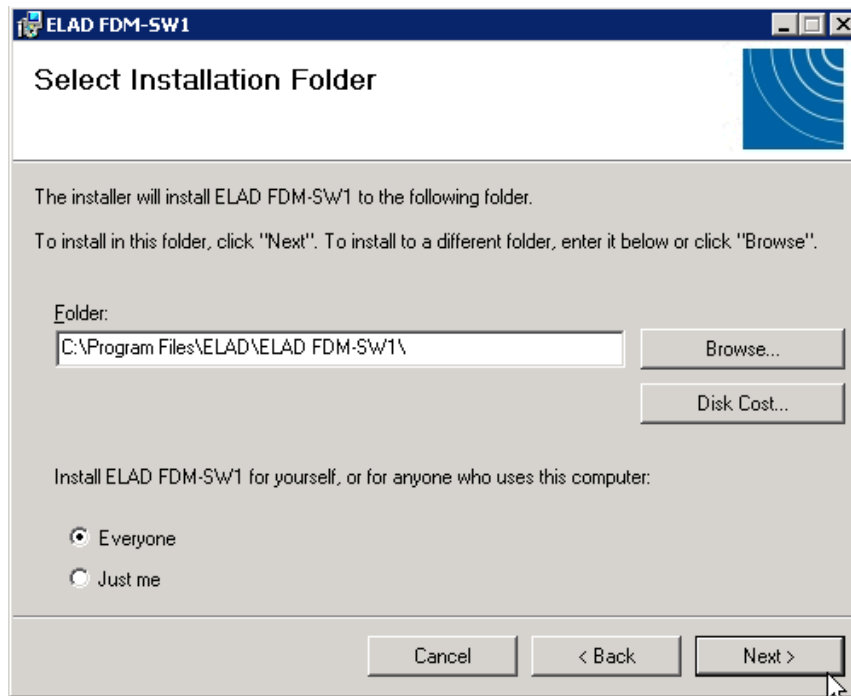
Click on “Install”



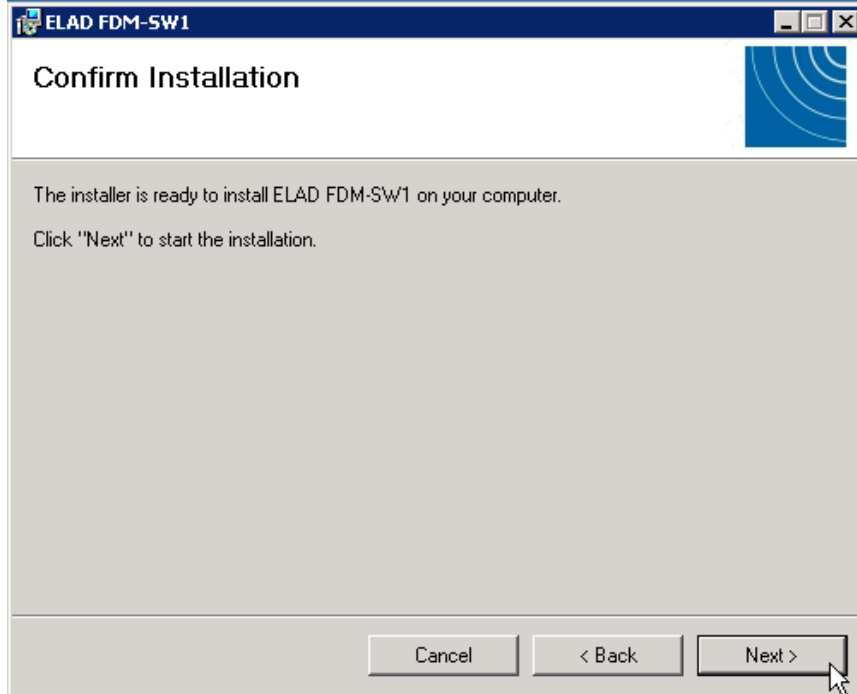
Click on Next to install the FDM-SW1 software



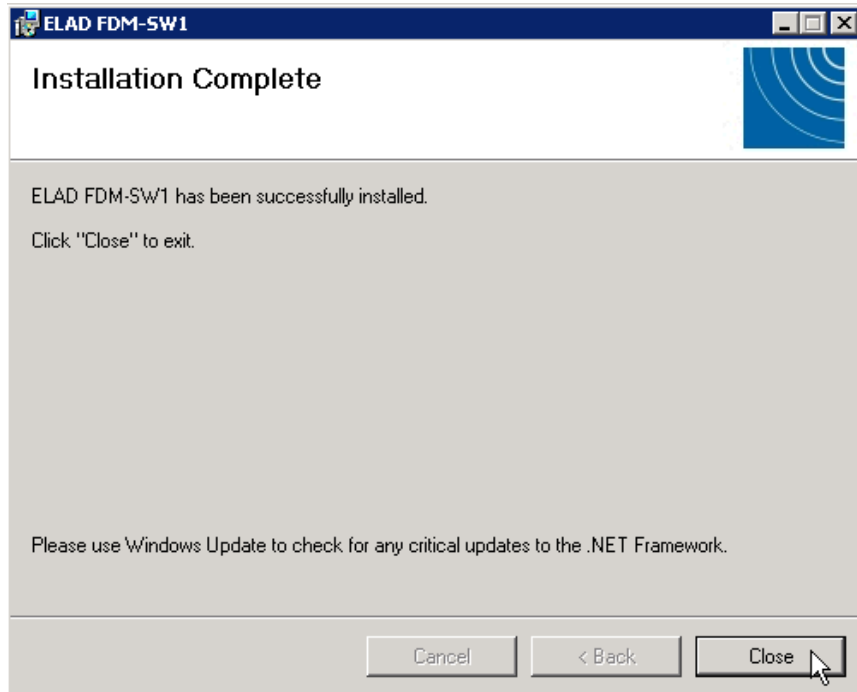
Select the installation folder, then click on "Next"



Click on "Next"



The FDM-SW1 Software installation is completed



2.1.3 Update an existing software version

If you need to update an existing software version, first uninstall the version already installed, then install the update.

Windows 7

- Go to: Control Panel->Programs->Programs and Features. Select the ELAD FDM-SW1 and click on "Uninstall".
- Double click on file ELAD_FDM_SW1_V_x.xx.msi included in the update.

Windows XP

- Go to: Control Panel->Add or Remove Programs. Select the ELAD FDM-SW1 and click on "Remove".
- Double click on file ELAD_FDM_SW1_V_x.xx.msi included in the update.

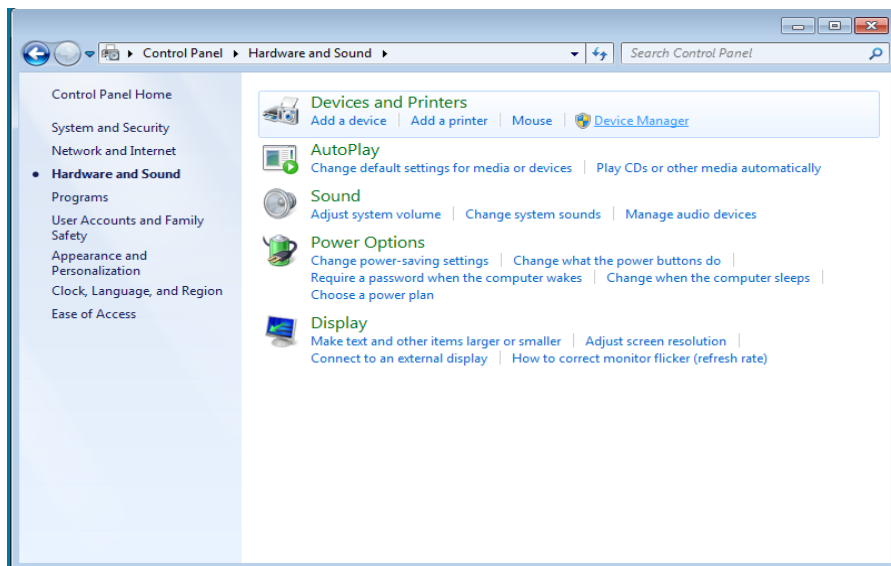
2.2 FDM-S1 USB driver

2.2.1 FDM-S1 USB driver installation in Windows 7

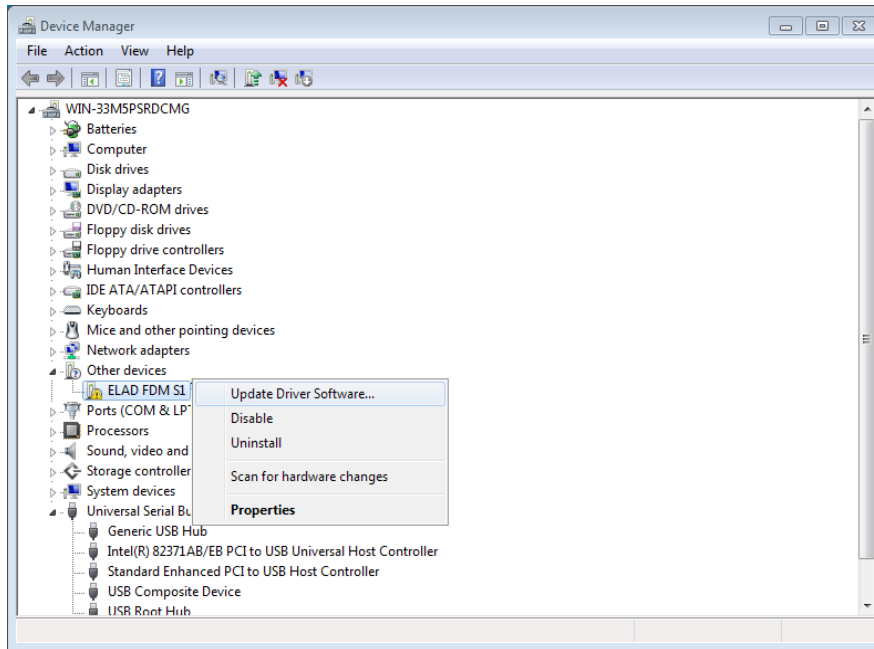
2.2.1.1 *First driver installation*

To install ELAD FDM-S1 driver, connect FDM-S1 sampler to a USB 2.0 socket on PC to power on the device. When Windows 7 detects the new hardware, follow the steps listed below to install driver correctly:

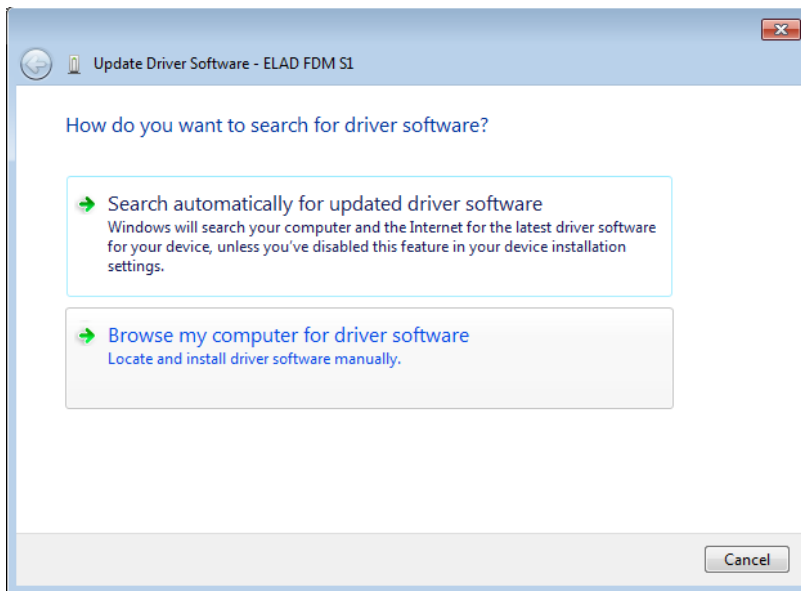
Open **Control Panel** from **Start** menu, select “System” and “Device Manager”. Expand “Other Devices” node: the system reads FDM-S1 firmware version named as FDM S1 USB FW 1.0.



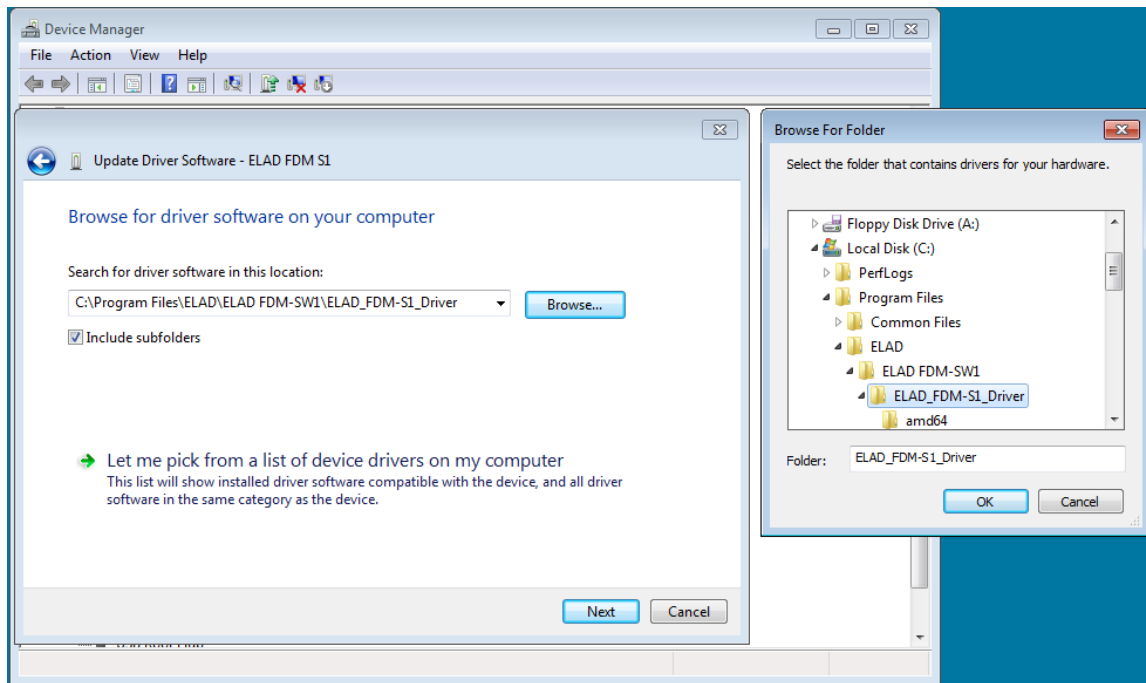
Select FDM S1 USB FW 1.0, right click on it and execute “Update driver software”.



When Windows 7 starts the installation procedure, select the last option “Browse my computer for driver software” (the second option).

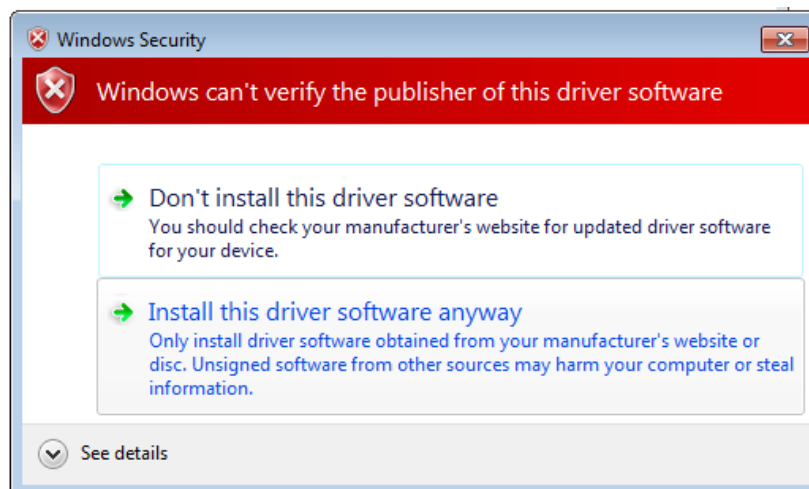


In the next dialog-box, insert the driver folder location using “Browse” button and check the option “Include subfolders”. In this way manual driver search is enabled.

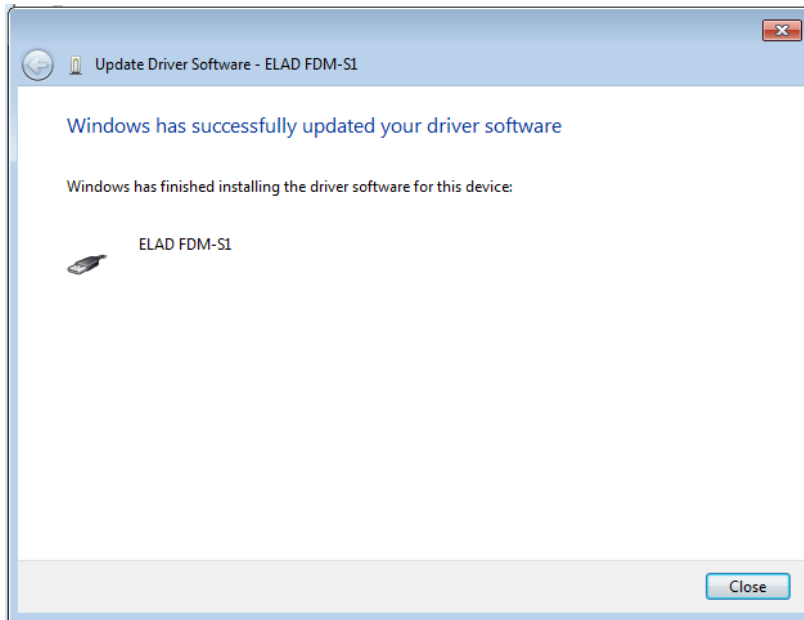


For 32 bit system select the folder: **C:\Program Files\ELAD\ELAD FDM-SW1\ELAD_FDM-S1_Driver**.
 For 64 bit system select the folder: **C:\Program Files (x86)\ELAD\ELAD FDM-SW1\ELAD_FDM-S1_Driver**.
 Then click "Next".

Ignore the warning and select "Install this driver software anyway" at next dialog-box (the second option).



Let the hardware installation automatically completes and, at the procedure ending, click on "Close"; then disconnect and connect FDM-S1 device on the same USB socket.

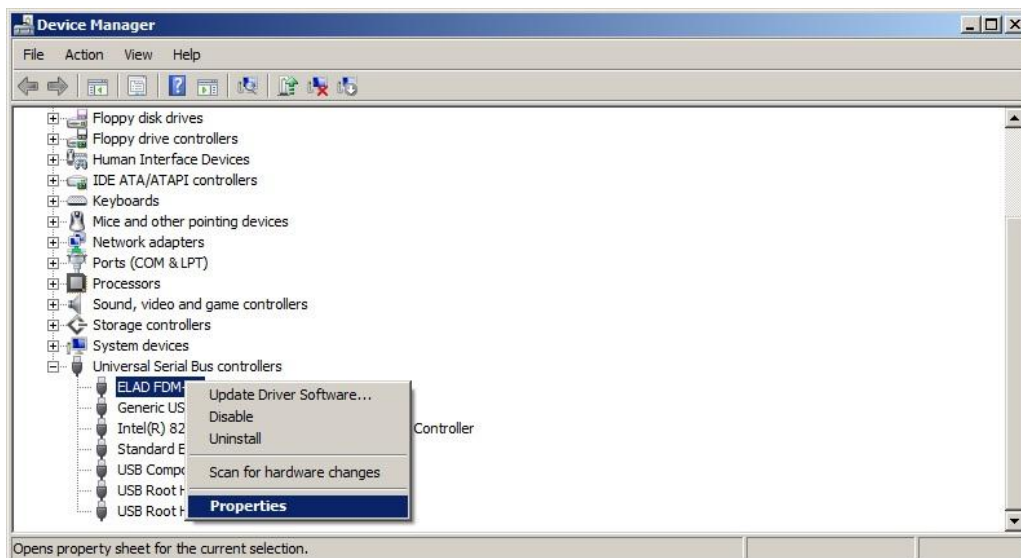


Now ELAD FDM-S1 driver is installed on your PC.

2.2.1.2 Driver installation verify

To verify FDM-S1 driver current version, connect the device to USB socket (where the device driver is already installed) and open **Control Panel** from **Start** menu. Click on "System" and select "Device Manager".

Expanding "Universal Serial Bus controllers" node, FDM-S1 device driver is installed as "ELAD FDM-S1": right click on "ELAD FDM-S1" and select "Properties".



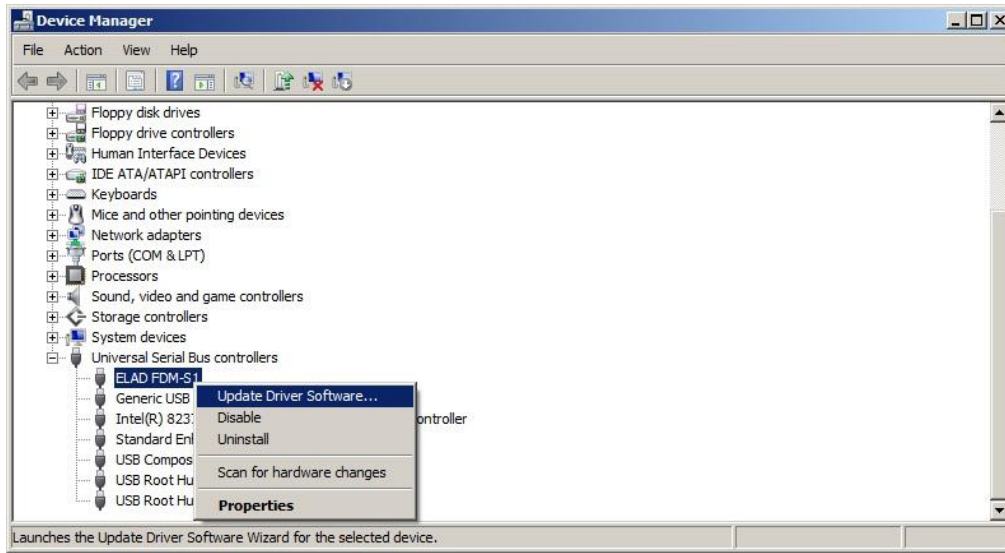
When dialog box opens, select “Driver” label: you must read provider name, current driver release date and current driver version. The figure shows an old FDM-S1 driver version.



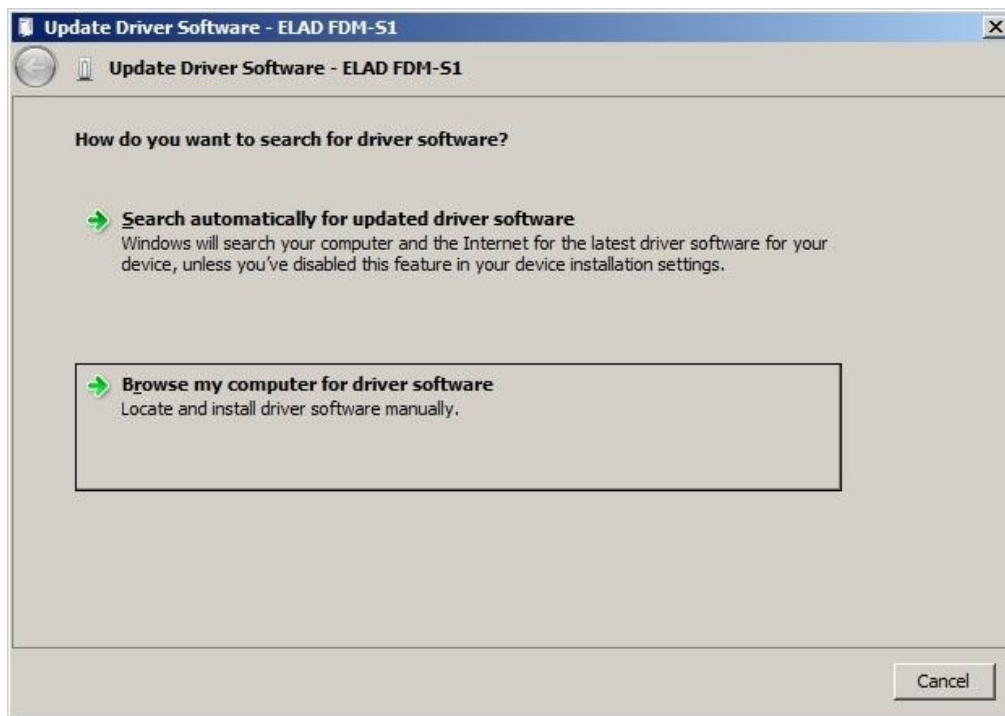
2.2.1.3 Manual driver update

To update FDM-S1 driver, connect the device to USB socket (where the device driver is already installed) and open **Control Panel** from **Start** menu. Click on “System” and select “Device Manager”.

Under “Universal Serial Bus controllers” list, the driver for FDM-S1 is installed as “ELAD FDM-S1”. Select “ELAD FDM-S1”, right click on it and execute “Update driver”.



When Windows 7 starts the installation procedure, select the last option “Browse my computer for driver software”.



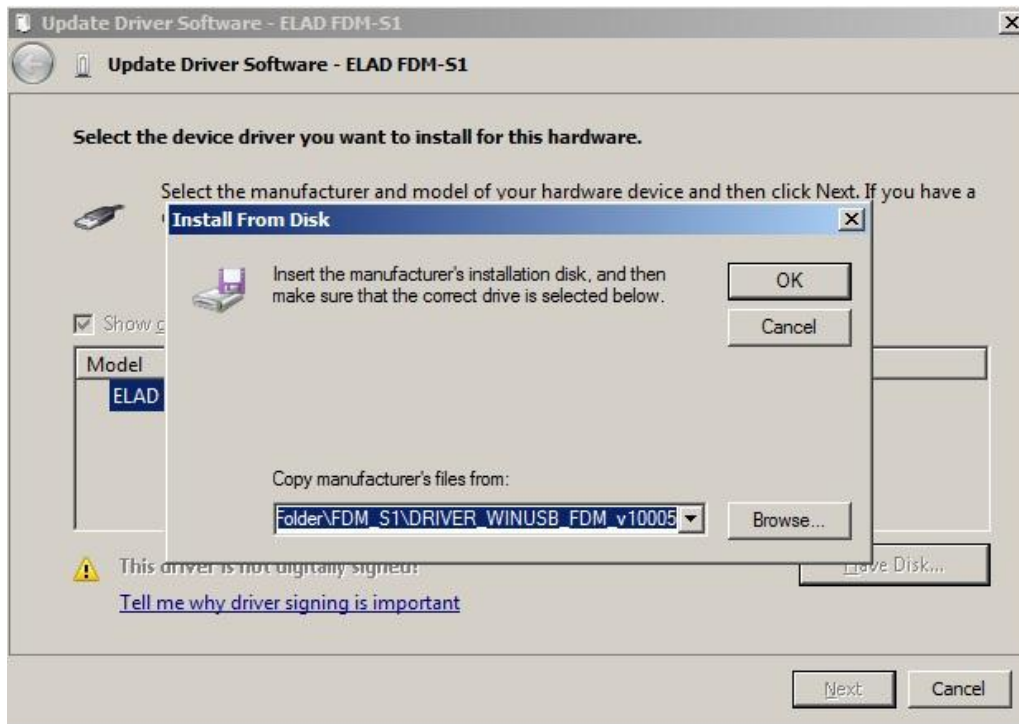
In the next dialog-box, disable the option “Include subfolders” and choose “Let me pick from a list of device drivers on my computer”. Don’t click “Next”.



Verify that “Show compatible hardware” option is checked and ELAD FDM-S1 is selected: then click on “Have a Disk”. In this way the manual driver update is enabled. Don’t click “Next”.

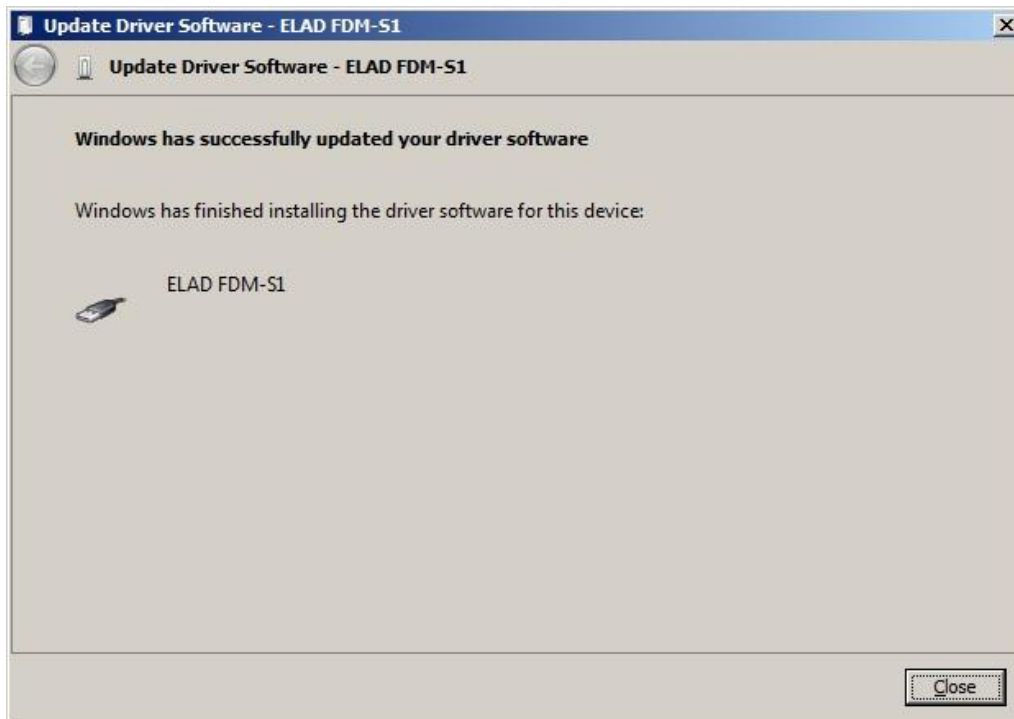


Click on “Browse” and search for FDM-S1 driver update folder location; then open winusb_fmgsampler.inf file, as depicted on figure. Click “OK” and then “Next”.



Now driver update starts: select “Install this driver software anyway” and ignore the warning at next dialog-box.

Let the hardware installation automatically completes and, at the procedure ending, click on “Close”; then disconnect and connect FDM-S1 device on the same USB socket.



To verify that a correct update is done, enter “Device Manager” in Control Panel; under “Universal Serial Bus controllers” label select ELAD FDM-S1 driver (see sub-chapter “2.2.1.2 Driver installation verify”): right click on it and choose “Properties”: select “Driver” label to visualize the last driver version (an example is depicted in figure below).



2.2.2 FDM-S1 USB driver installation in Windows XP

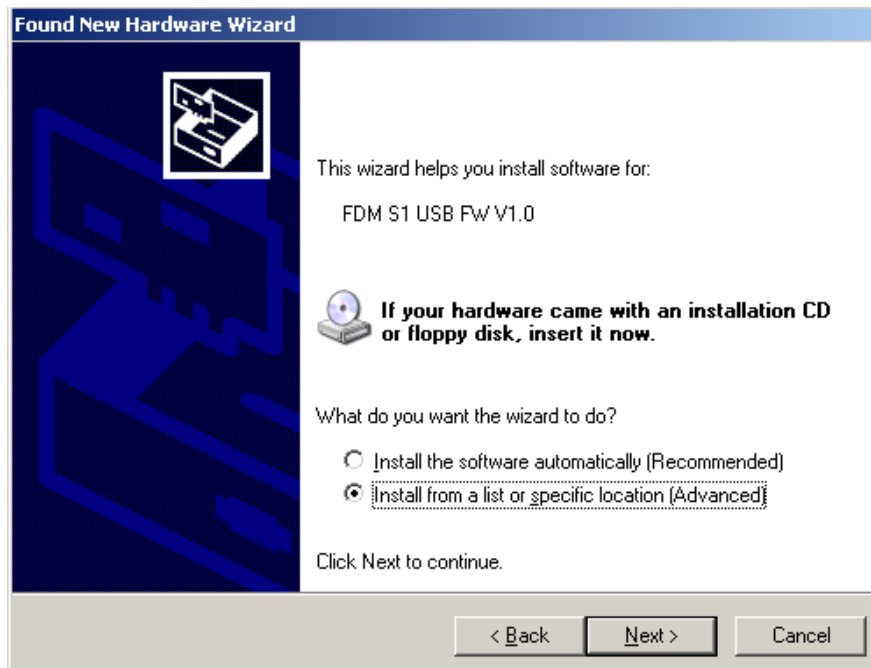
2.2.2.1 First driver installation

To install ELAD FDM-S1 driver, connect FDM-S1 sampler to a USB 2.0 socket on PC to power on the device. Windows XP detects the new hardware and starts the hardware installation wizard. Then, next steps to install FDM-S1 driver are listed below:

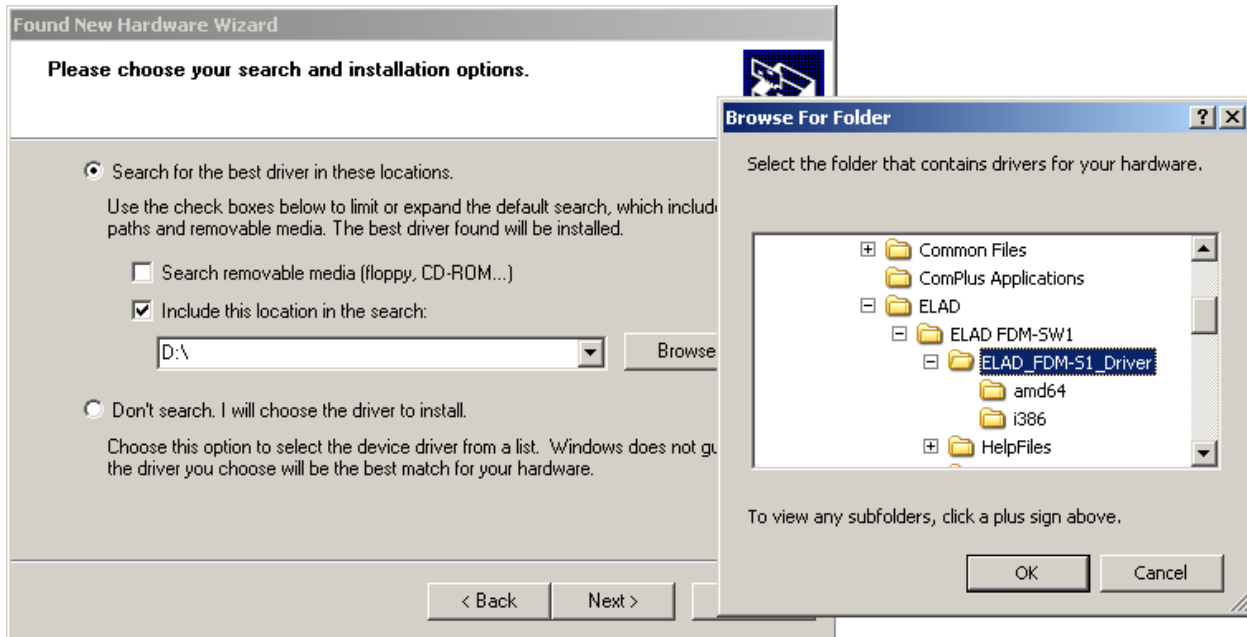
At the first dialog box, select the last option “No, not this time” and “Next”.



Select "Install from a list or specific location (Advanced)" and "Next".



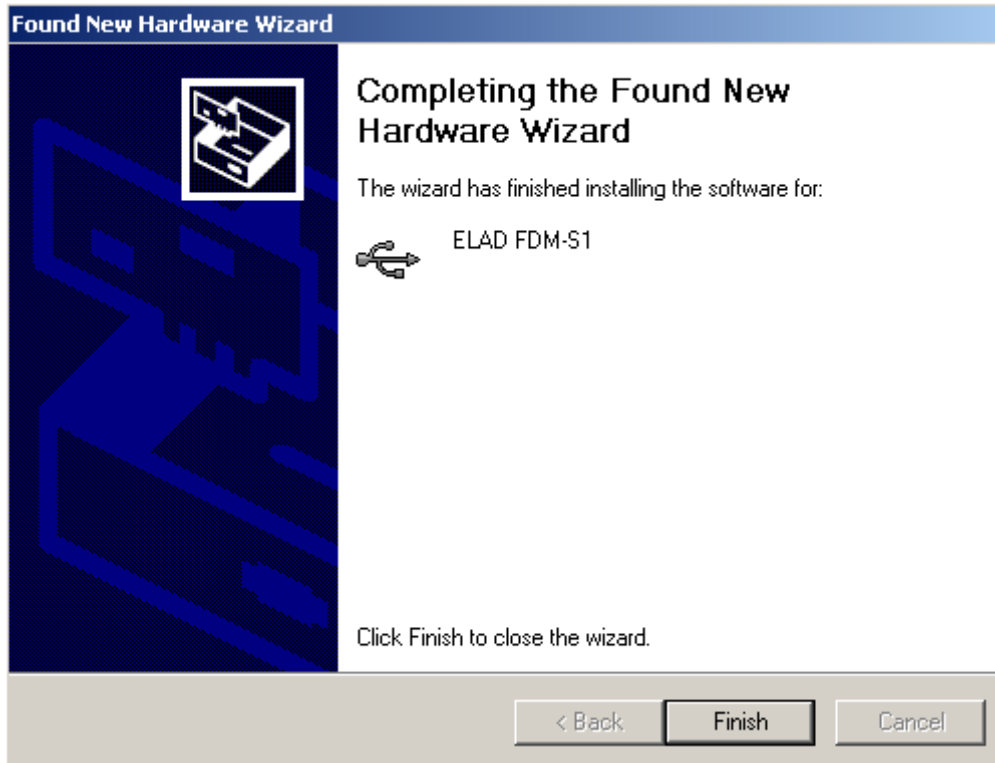
In the next dialog-box, check the options "Search for the best driver in these location" and "Include this location in the search" to enable manual driver search. Clicking on "Browse", select the path where the driver folder is located: **Local Drive (C:) \Programs\ELAD\ELAD FDM-SW1\ELAD_FDM-S1_Driver**. Then click "Next".



The installation begins automatically: select “Continue Anyway” and ignore the warning at next dialog-box.



Let the hardware installation automatically completes and click on “Finish”; then disconnect and connect FDM-S1 device on the same USB socket.

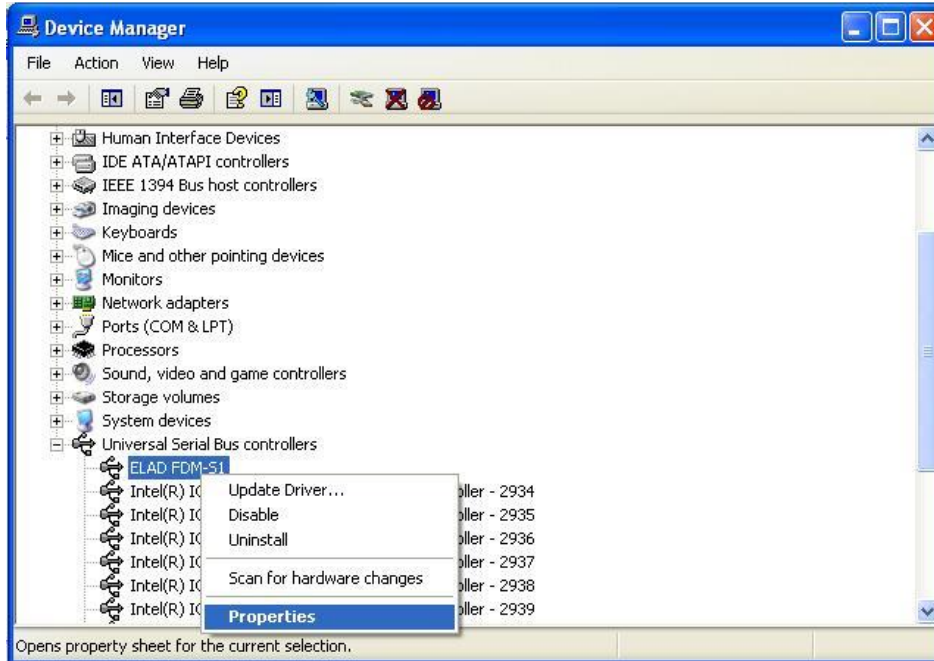


Now ELAD FDM-S1 driver is installed on your PC.

2.2.2.2 *Driver installation verify*

To verify FDM-S1 driver current version, connect the device to USB socket (where the device driver is already installed) and open **Control Panel** from **Start** menu. Click on "System" and select "Device Manager" under "Hardware" label.

Expanding "Universal Serial Bus controllers" node, FDM-S1 device driver is installed as "ELAD FDM-S1": right click on "ELAD FDM-S1" and select "Properties".



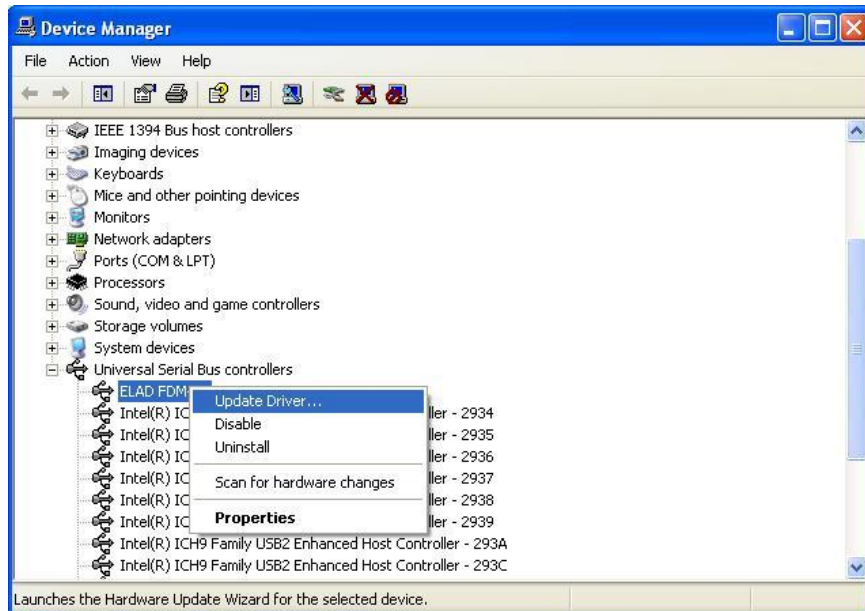
When dialog box opens, select “Driver” label: you must read provider name, current driver release date and current driver version. The old ELAD FDM-S1 driver version is shown in figure below as example.



2.2.2.3 Manual driver update

To update FDM-S1 driver, connect the device to USB socket (where the device driver is already installed) and open **Control Panel** from **Start** menu. Click on “System” and select “Device Manager” under “Hardware” label.

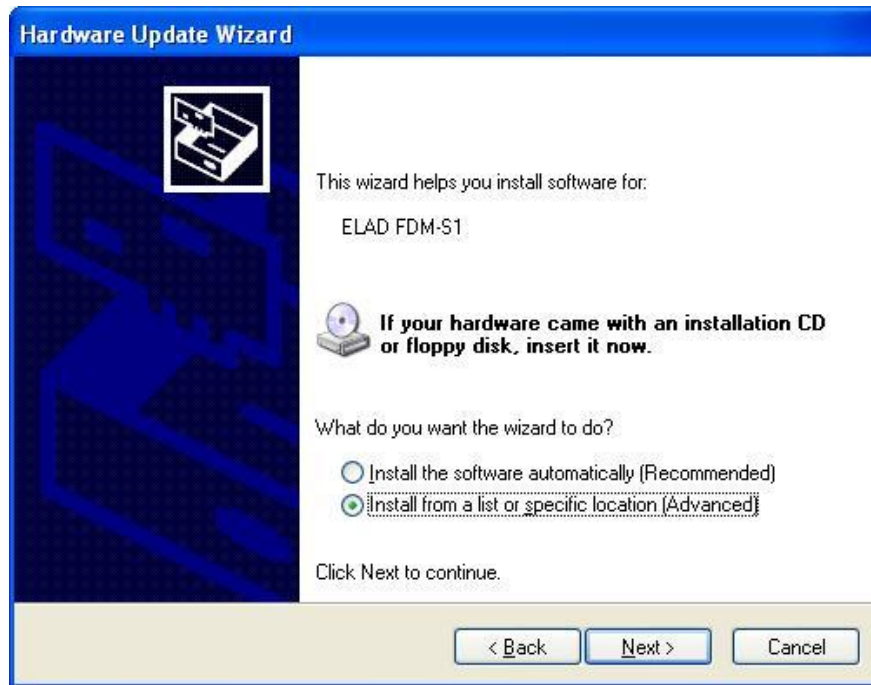
Select “ELAD FDM-S1” from “Universal Serial Bus controllers” list, right click on it and execute “Update driver”



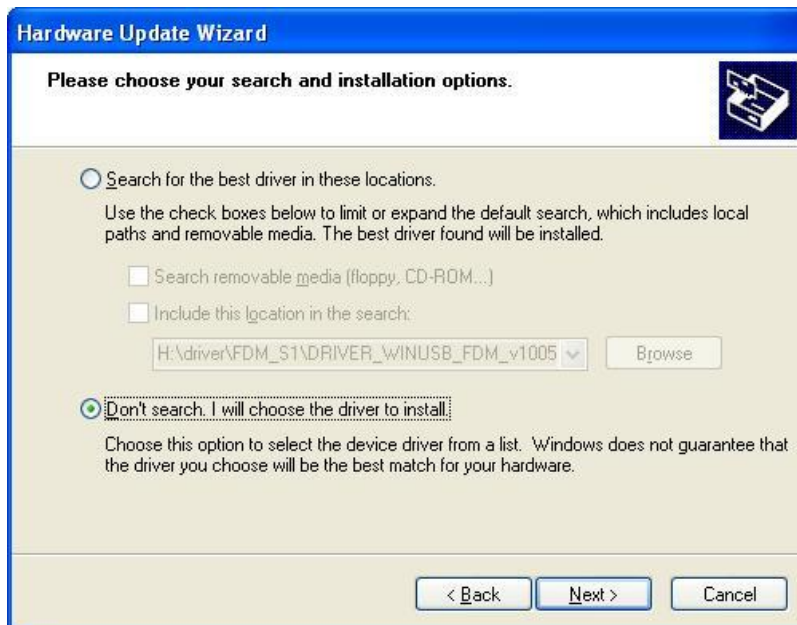
Now Windows XP launches the hardware update wizard: select the last option “No, not this time” and “Next”.



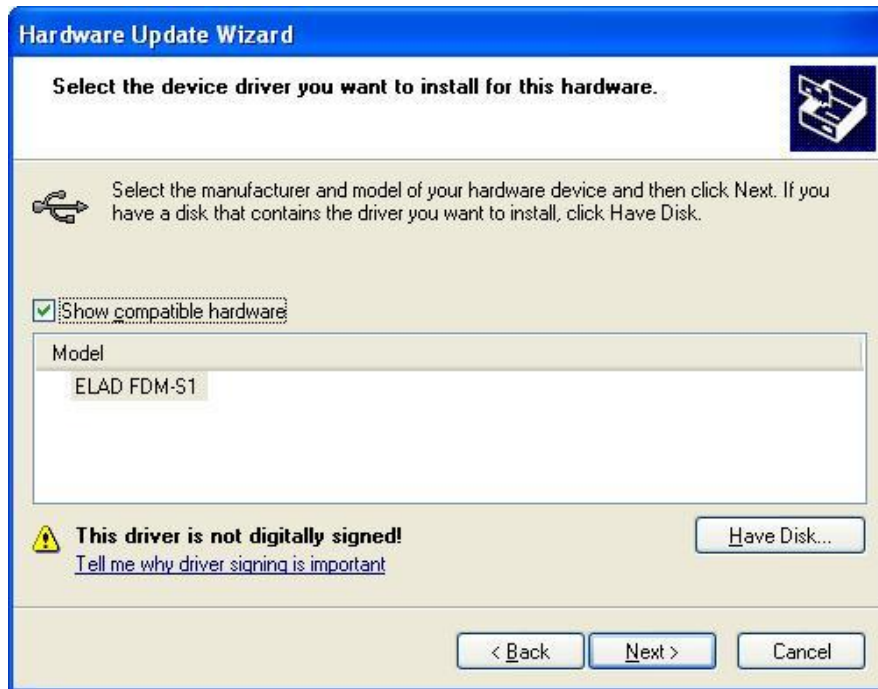
At next step select “Install from a list or specific location (Advanced)” and “Next”.



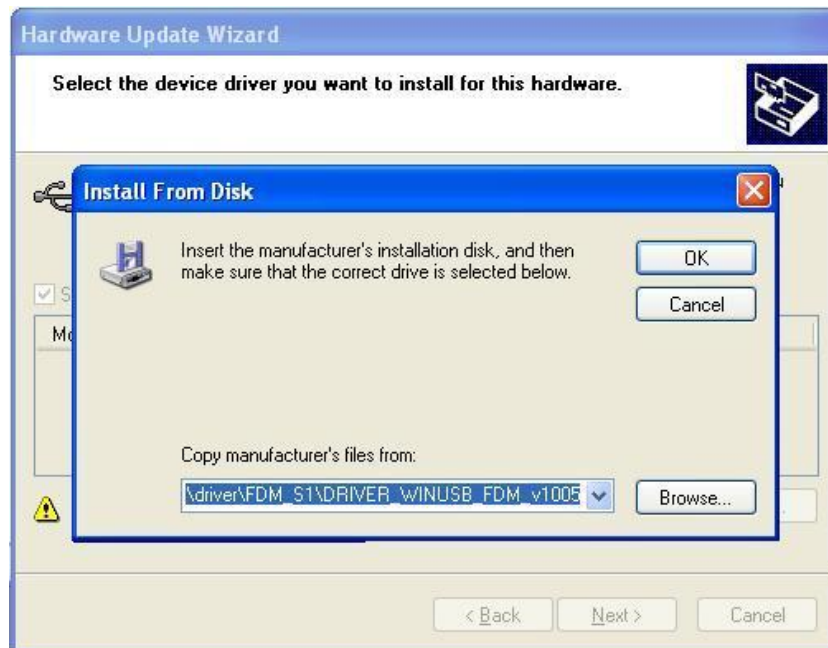
Then, disable all check-boxes that the system automatically sets and choose the last option for manual driver update, as depicted in figure. Select “Next”.



Verify that “Show compatible hardware” option is checked and ELAD FDM-S1 is selected: then click on “Have a Disk”. Don’t click “Next”.

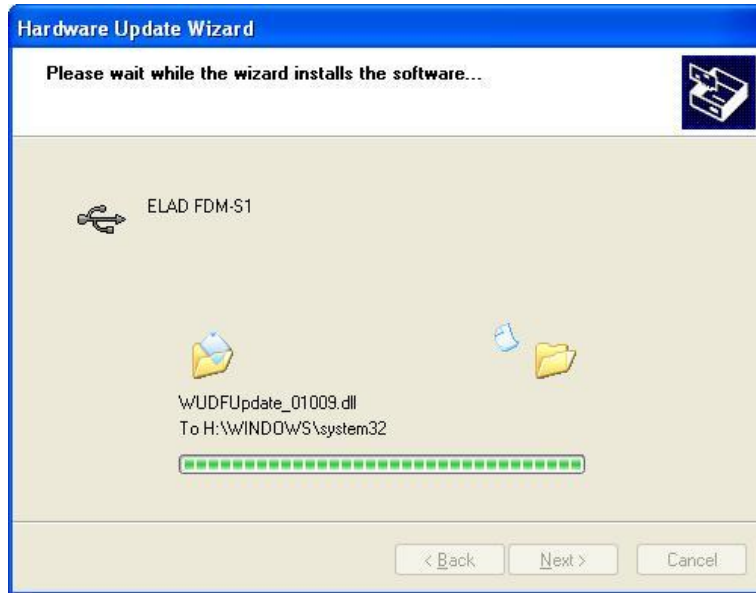


Click on “Browse” and search for the FDM-S1 driver update folder location; then open `winusb_fdmsampler.inf` file, as depicted in figure. Click “OK” and then “Next”.



Now driver update starts: at next dialog box select “Continue Anyway” and ignore the warning.

Let the hardware update automatically completes and, at the procedure ending, click on “Finish”; then disconnect e connect FDM-S1 device on the same USB socket.



To verify that a correct update is done, enter “Device Manager” from **Control Panel**; under “Universal Serial Bus controllers” list, select ELAD FDM-S1 driver (see chapter “2.2.2.2 Driver installation verify”) right click on it and choose “Properties”. Select “Driver” label to visualize the last driver version (an example is depicted in figure below).



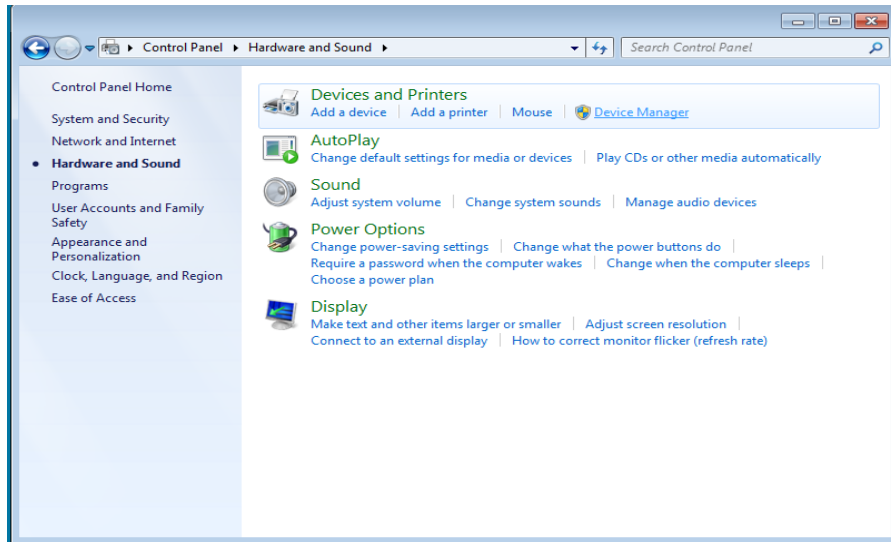
2.3 WoodBoxRadio Tmate USB driver installation

2.3.1 WoodBoxRadio Tmate USB driver installation in Windows 7

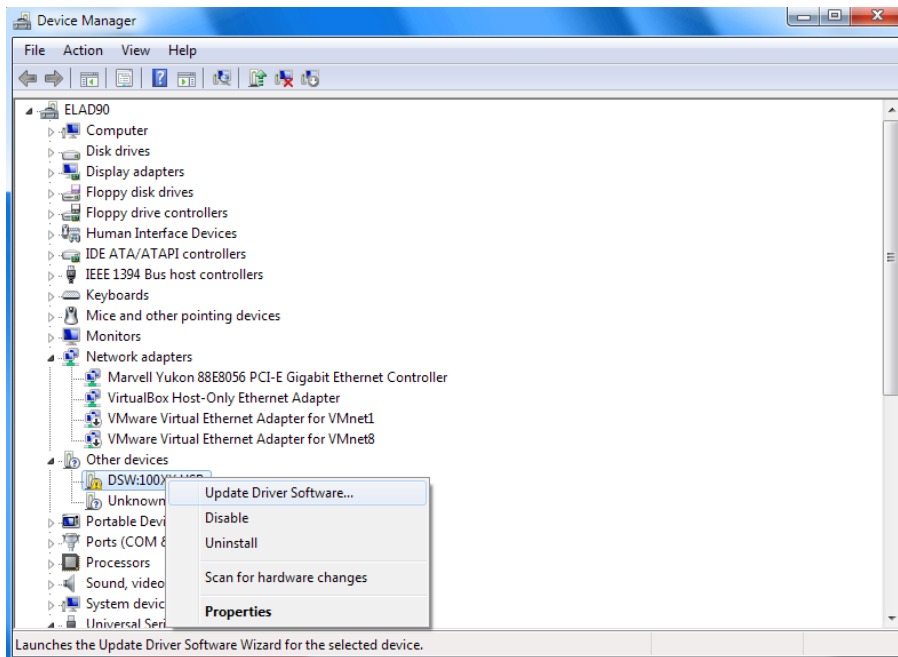
2.3.1.1 *First driver installation*

To install Tmate driver, connect device to a USB 2.0 socket on PC and let Windows 7 detects the new hardware.

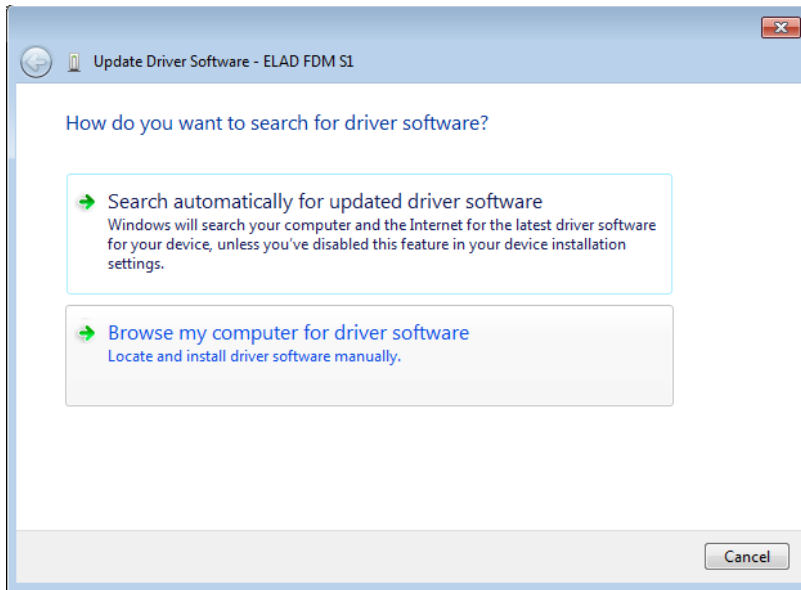
Open **Control Panel** from **Start** menu, select “System” and “Device Manager”.



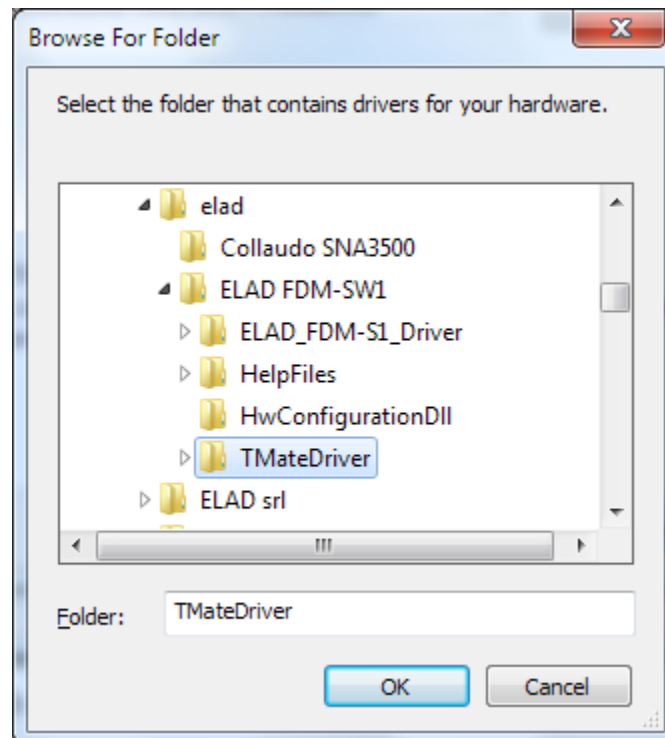
Expand “Other Devices” node: the system reads Tmate firmware version named as “DSW:100XX USB”. Select “DSW:100XX USB”, right click on it and execute “Update Driver Software...”.



When Windows 7 starts the installation procedure, select the last option “Browse my computer for driver software” (the second option).

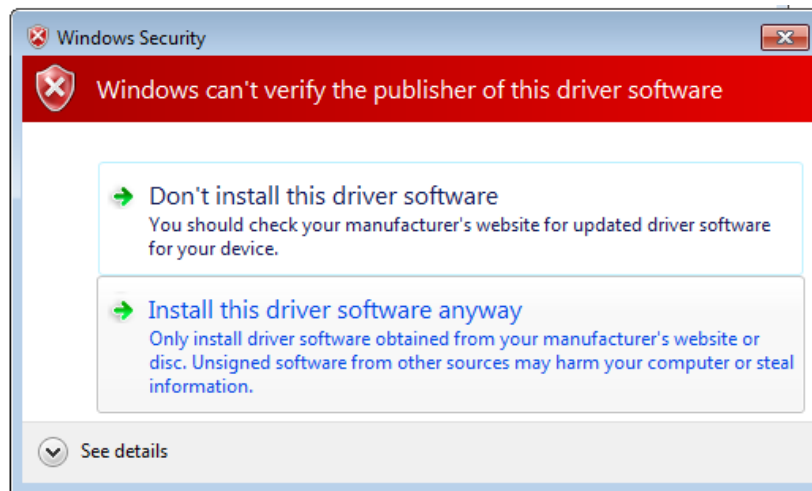


Insert the driver folder location using “Browse” button and check the option “Include subfolders”. In this way manual driver search is enabled.

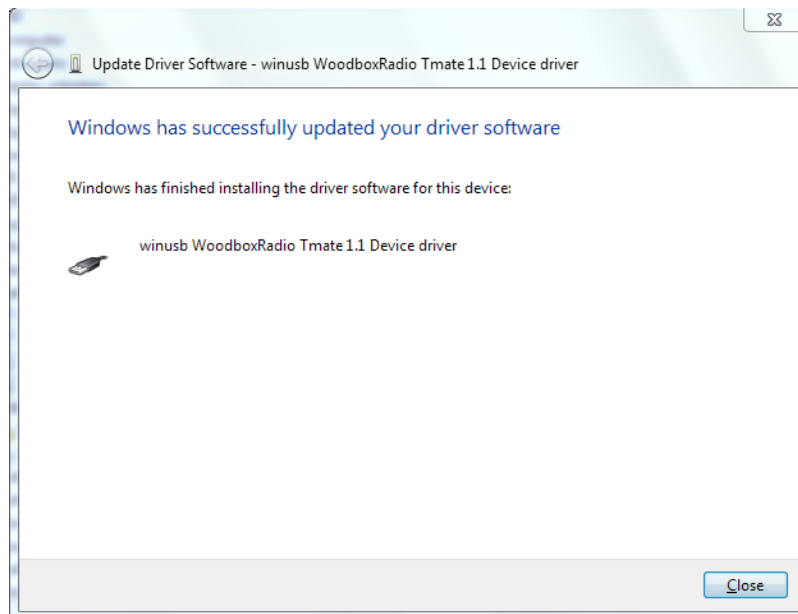


For 32 bit system select the folder: **C:\Program Files\ELAD\ELAD FDM-SW1\TMateDriver**.
 For 64 bit system select the folder: **C:\Program Files (x86)\ELAD\ELAD FDM-SW1\ TMateDriver**.
 Click on “Next”.

At next dialog box, ignore the warning and select “Install this driver software anyway” (the second option).



Let the hardware installation automatically completes and click on “Close”. Then disconnect and connect Tmate device on the same USB socket.

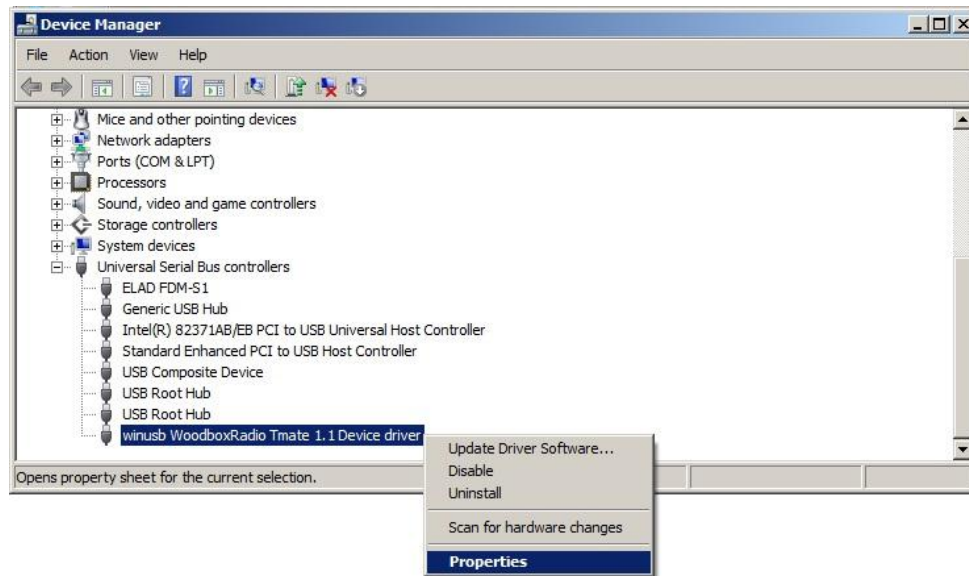


Now WoodboxRadio Tmate driver is installed on your PC.

2.3.1.2 *Driver installation verify*

To verify Tmate driver current version, connect the device to USB socket (where the device driver is already installed) and open **Control Panel** from **Start** menu. Click on “System” and select “Device Manager”.

Expanding “Universal Serial Bus controllers” node, Tmate device driver is installed as “winusb Woodboxradio Tmate 1.1 Device driver”: select it and right click on it, then choose “Properties”.



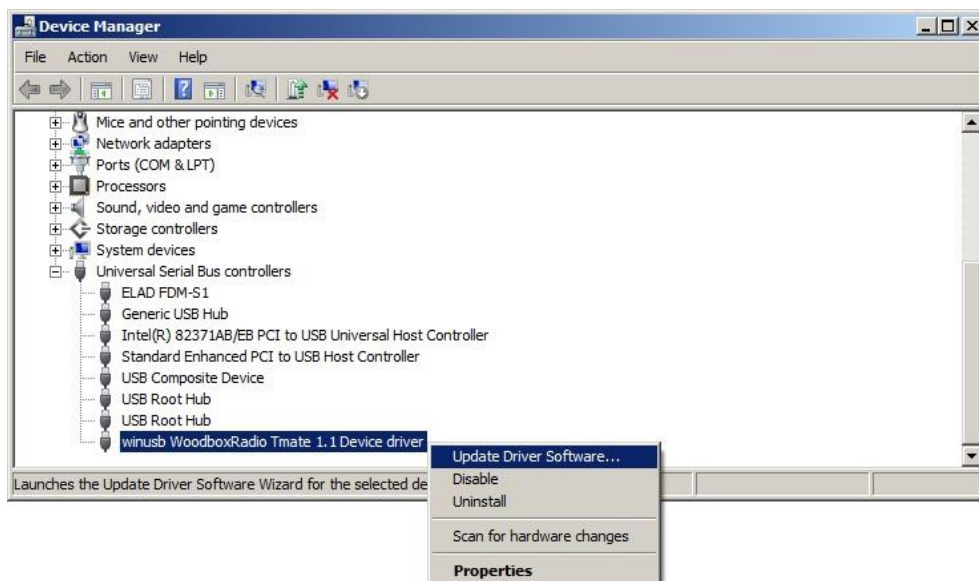
The figure represents an old driver version for Tmate.



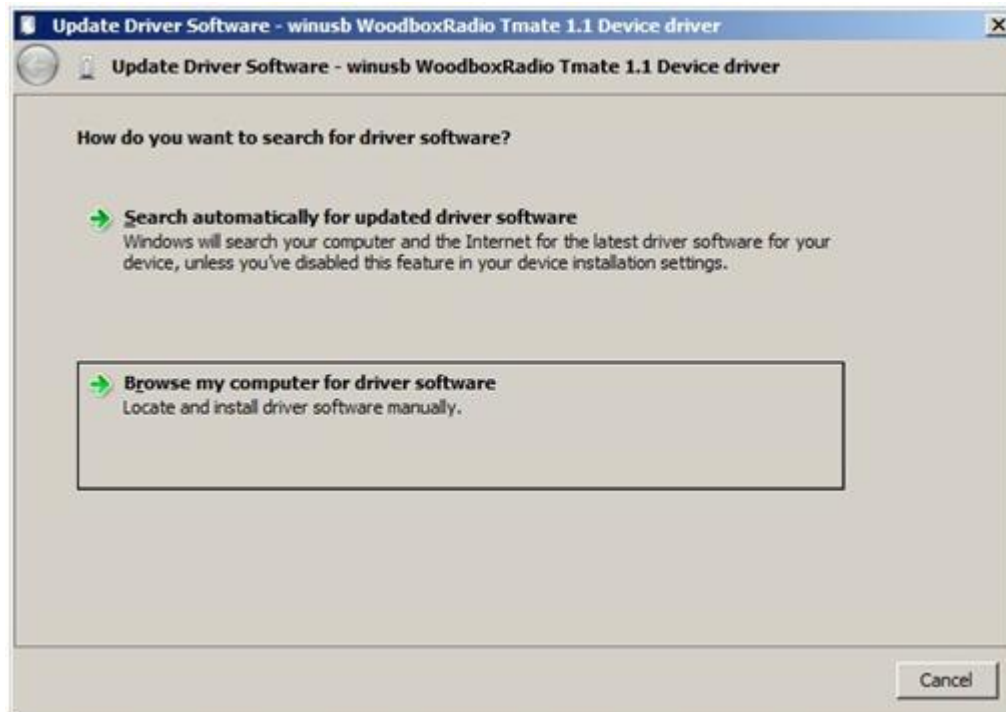
2.3.1.3 Manual driver update

To update Tmate driver, connect the device to USB socket (where the device driver is already installed) and open **Control Panel** from **Start** menu. Click on “System” and select “Device Manager”.

Under “Universal Serial Bus controllers” list, the driver for Tmate is installed as “winusb Woodboxradio Tmate 1.1 Device driver”. Select it and right click on it; then execute “Update driver”.



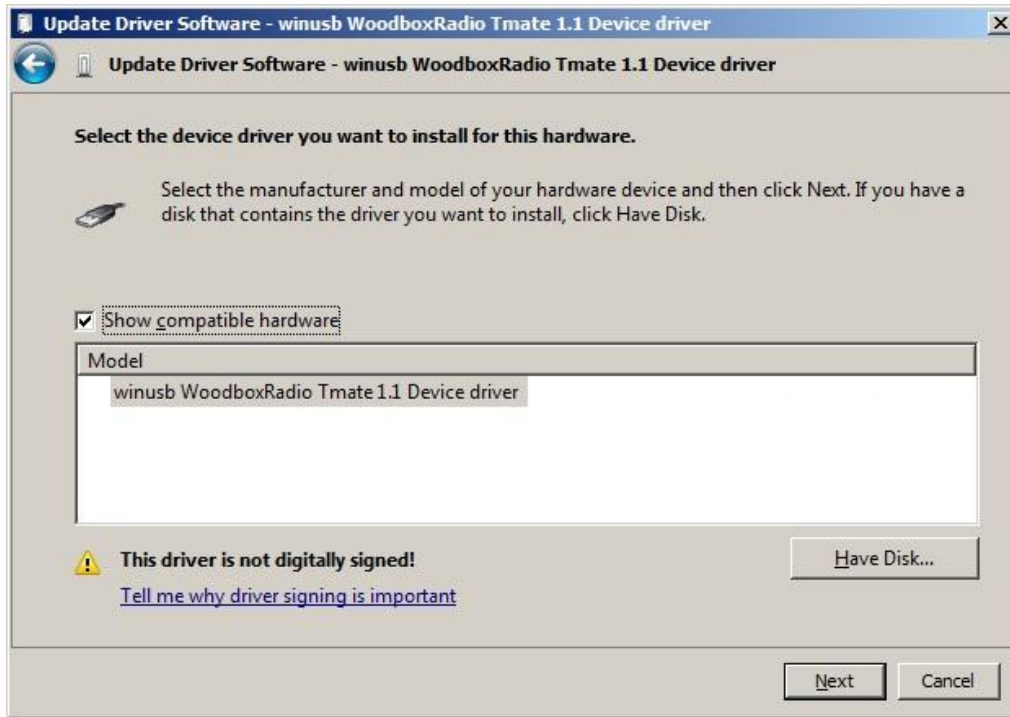
When Windows 7 starts the installation procedure, select the last option “Browse my computer for driver software”.



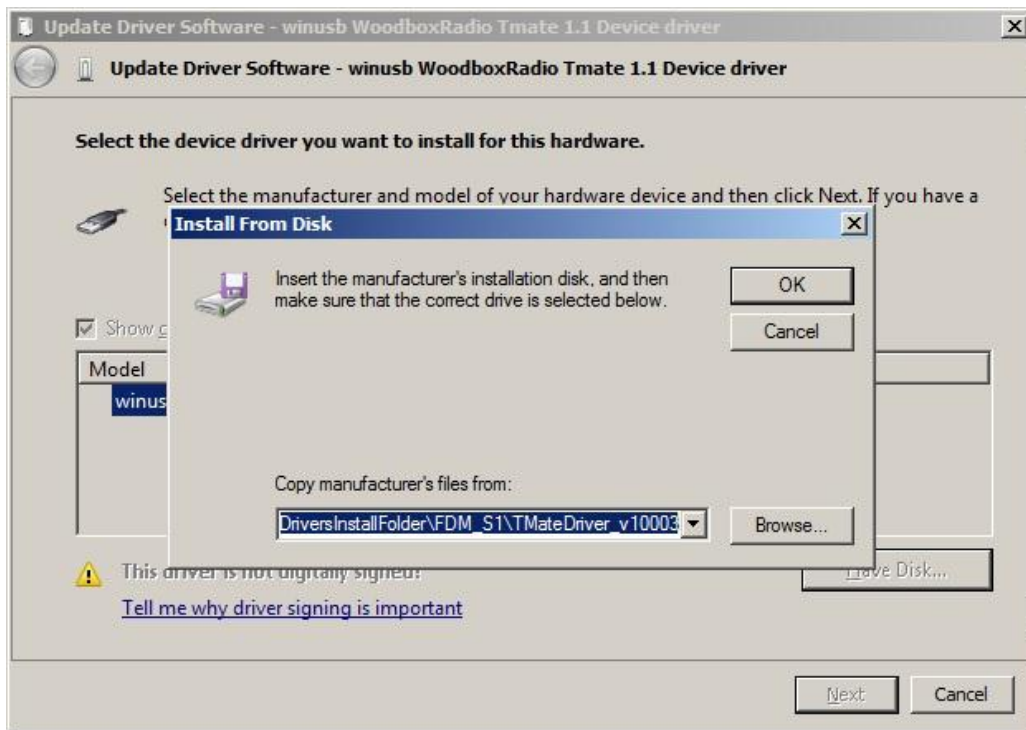
In the next dialog-box, disable the option “Include subfolders” and choose “Let me pick from a list of device drivers on my computer”. Don't click “Next”.



Verify that the option “Show compatible hardware” is checked and Tmate is selected: click on “Have a Disk”. In this way the manual driver update is enabled. Don’t click “Next”.

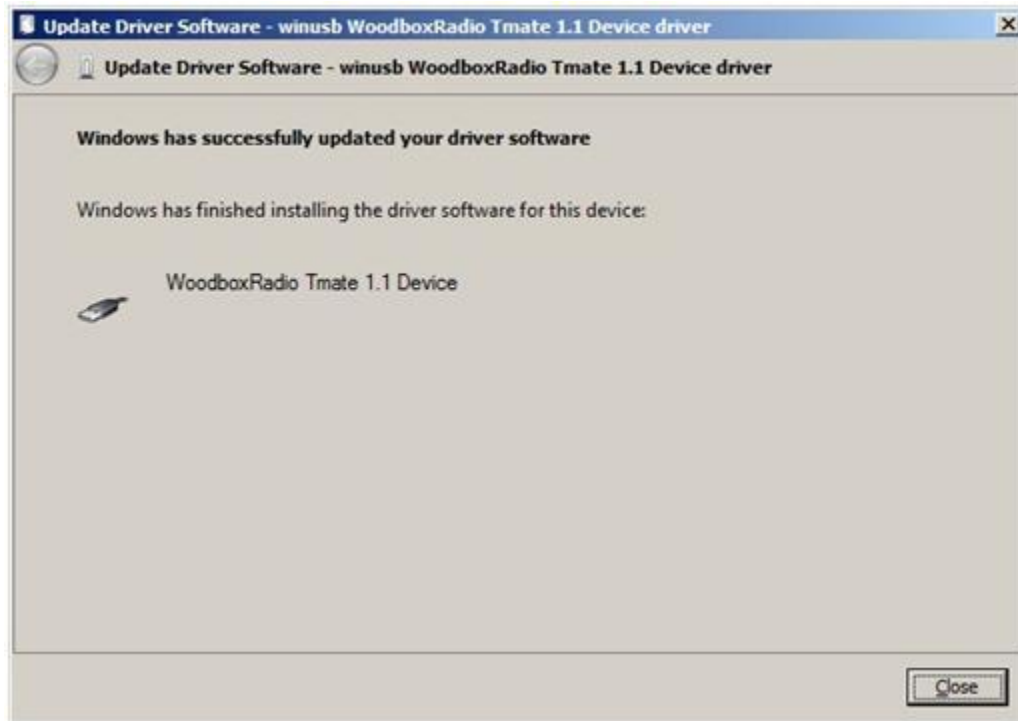


Click on “Browse” and search for Tmate driver update folder location; then open winusbtmate.inf file, as depicted on figure. Click “OK” and then “Next”.



Now driver update starts: select “Install this driver software anyway” and ignore the warning at next dialog-box.

Let the hardware installation automatically completes and, at the procedure ending, click on “Close”; then disconnect and connect Tmate device on the same USB socket.



To verify that a right update is done, enter “Device Manager” from **Control Panel** and expand “Universal Serial Bus controllers” node: select “WoodboxRadio Tmate 1.1 Device” driver (see sub-chapter “2.3.1.2 Driver installation verify”), right click on it and choose “Properties”. Select “Driver” label to visualize the last driver version (an example is depicted ion figure below).



2.3.2 WoodBoxRadio Tmate USB driver installation in Windows XP

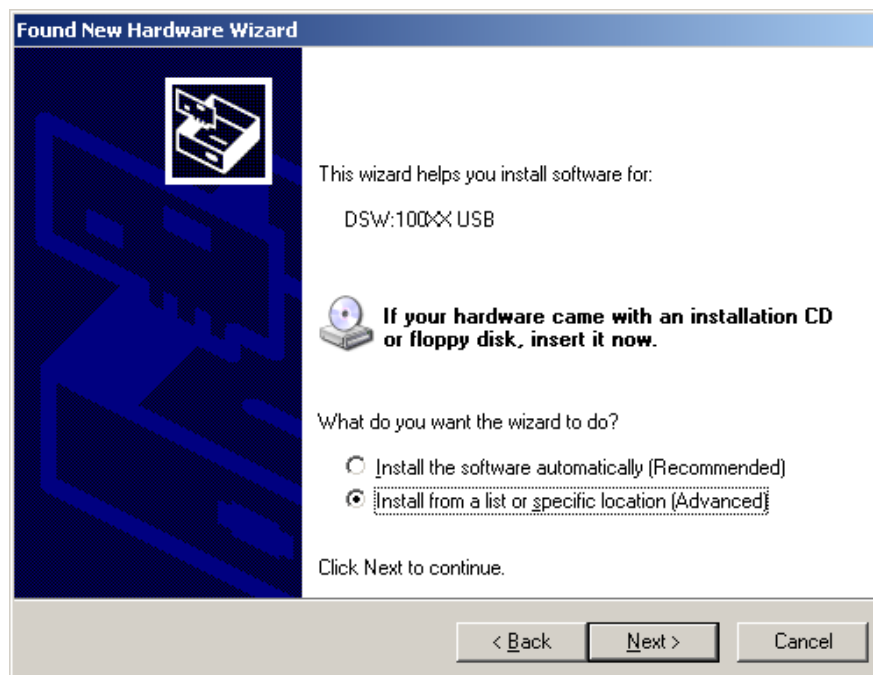
2.3.2.1 *First driver installation*

To install Woodbox T-Mate driver, connect WoodboxRadio Tmate to a USB 2.0 socket on PC. Windows XP detects the new hardware and starts the hardware installation wizard automatically. Then follow the steps listed below to install correctly the driver:

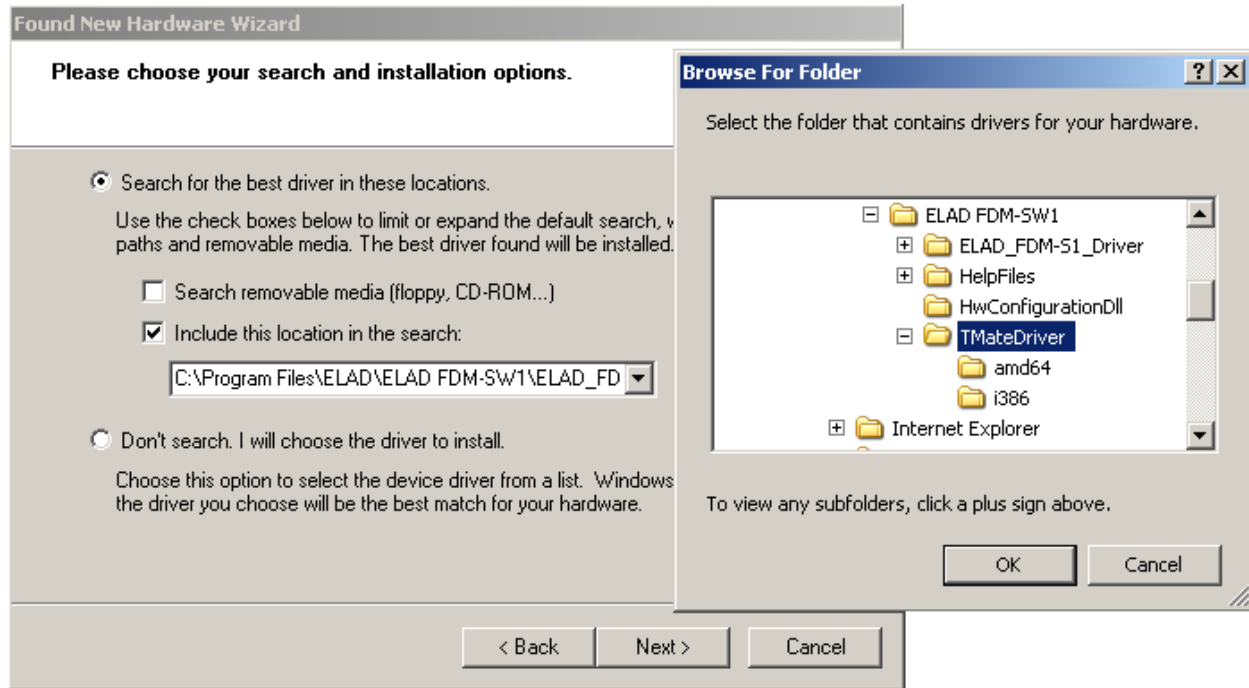
At the first dialog-box, select the third option "No, no this time", the click on "Next".



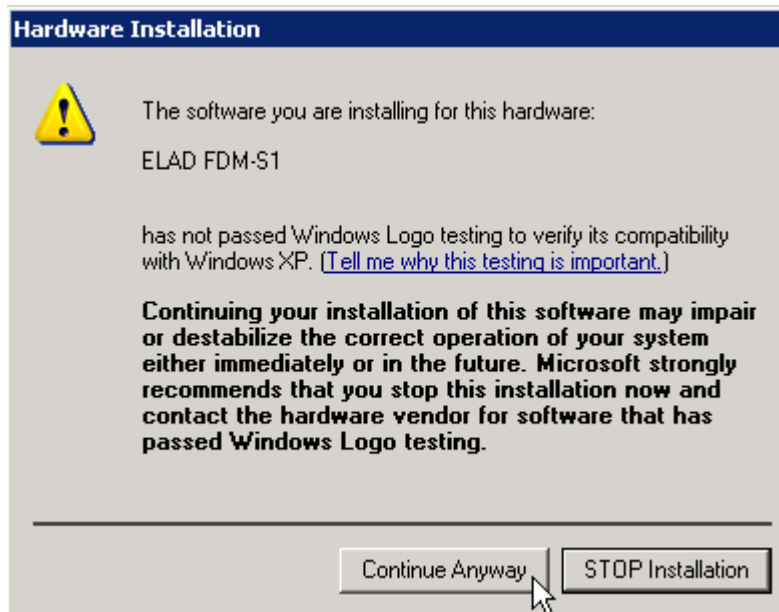
Select the option “Install from a list or specific location (Advanced)” and click on “Next”.



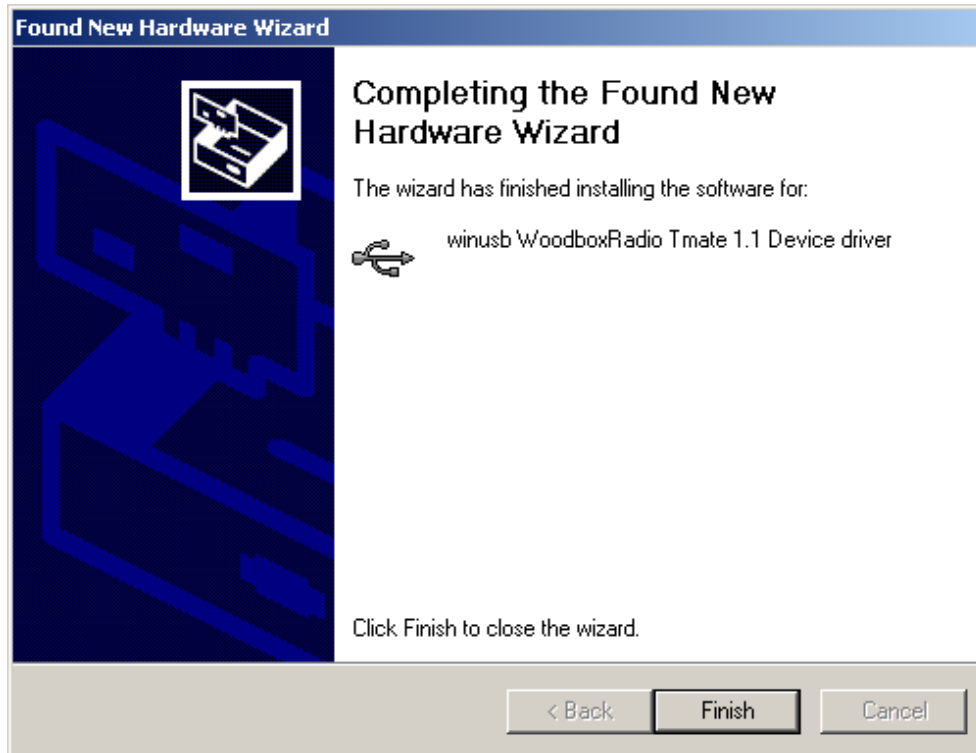
Select “Search for the best driver in these location” and “Include this location in the search”, click on “Browse” and select the folder: **Local Drive (C:) \Programs\ELAD\ELAD FDM-SW1\TMateDriver**. Then click on “Next”.



At the next dialog box ignore the warning and click on “Continue Anyway”.



Let the hardware installation automatically completes and click on “Finish”; then disconnect e connect Tmate device on the same USB socket.



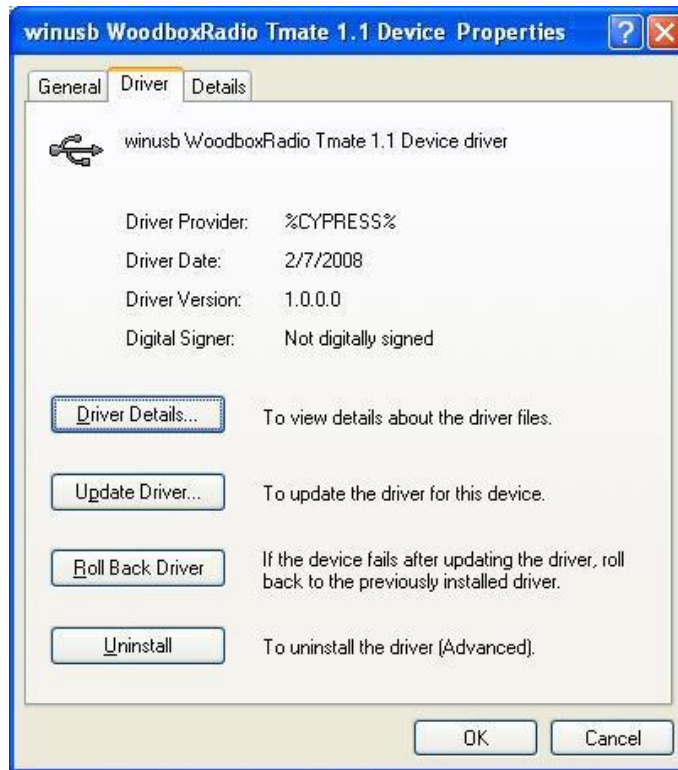
Now WoodboxRadio Tmate driver is installed on your PC.

2.3.2.2 *Driver installation verify*

To verify Tmate driver current version, connect the device to USB socket (where the device driver is already installed) and open **Control Panel** from **Start** menu. Click on "System" and select "Device Manager" under "Hardware" label.

Expanding "Universal Serial Bus controllers" node, Tmate device driver is installed as "winusb Woodboxradio Tmate 1.1 Device": select it and right click on it, then select "Properties".

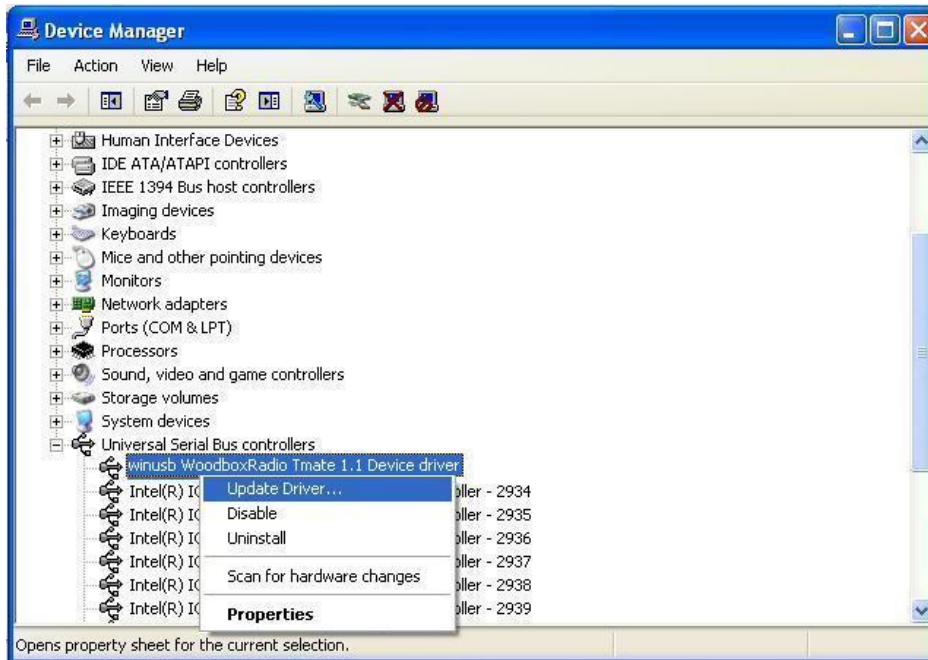
The figure represents an old driver version for Tmate.



2.3.2.3 Manual driver update

To update Tmate driver, connect the device to USB socket (where the device driver is already installed) and open **Control Panel** from **Start** menu. Click on "System" and select "Device Manager" under "Hardware" label.

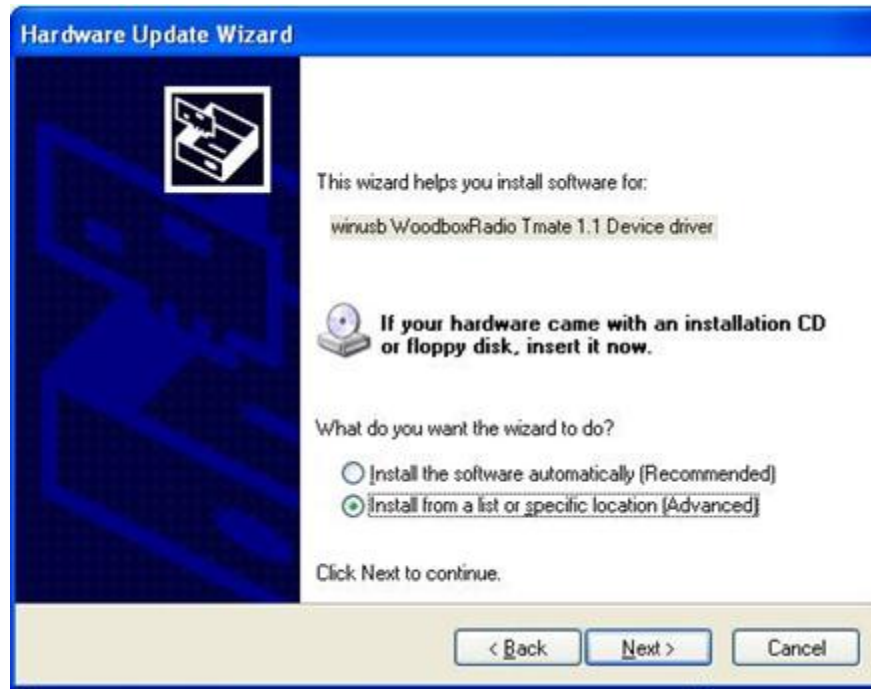
Select "winusb Woodboxradio Tmate 1.1 Device" from "Universal Serial Bus controllers" list, right click on it and execute "Update driver" .



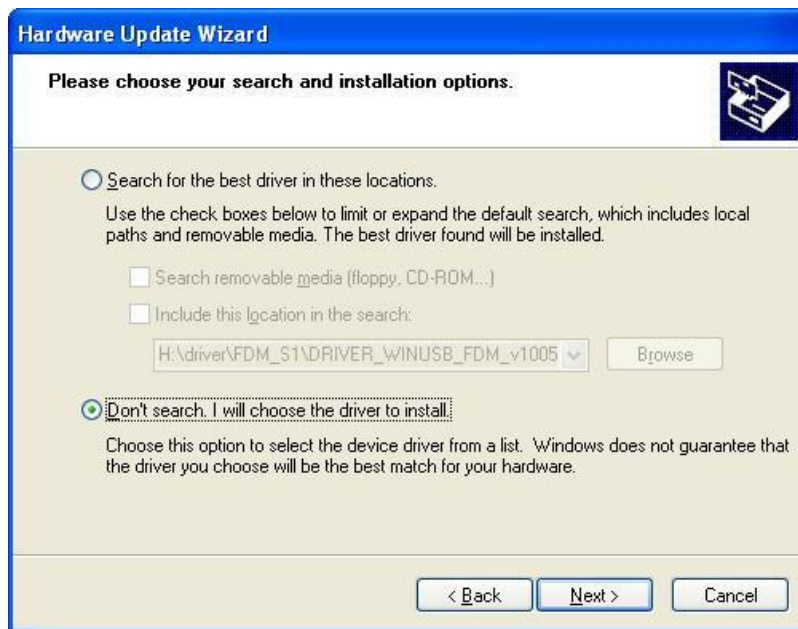
Now Windows XP launches the hardware update wizard: select the last option “No, not this time” and “Next”.



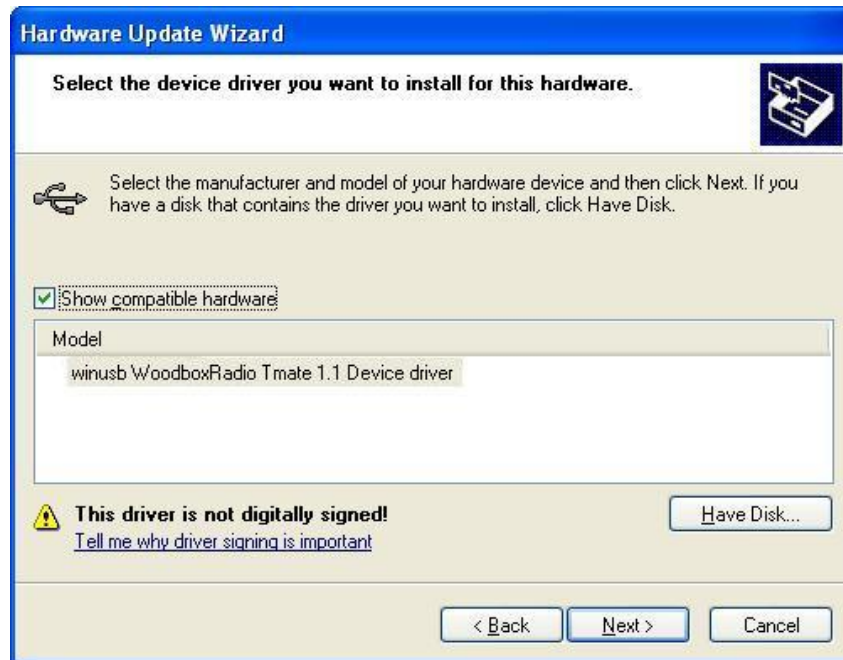
At next step select “Install from a list or specific location (Advanced)” and “Next”.



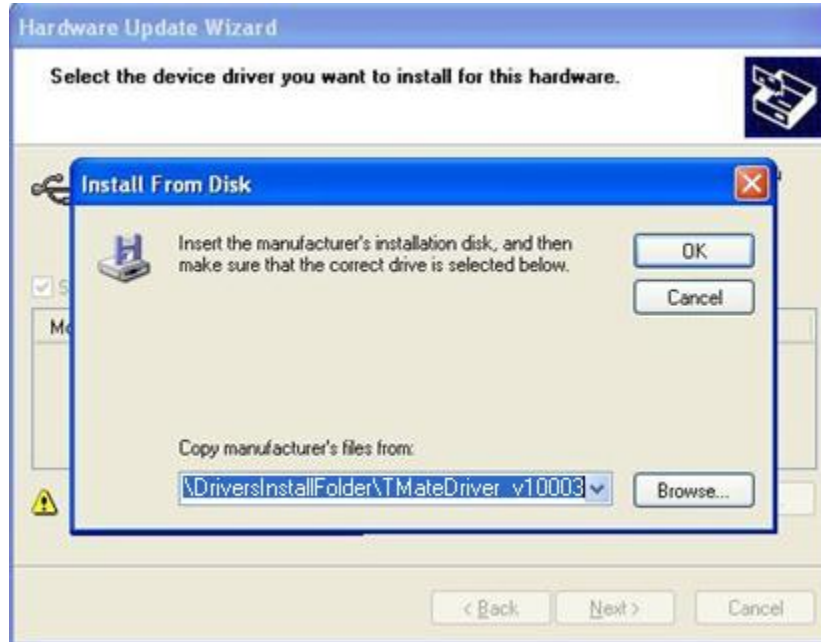
Then, disable all check-boxes that the system automatically sets and choose the last option for manual driver update, as depicted in figure. Select “Next”.



Verify that “Show compatible hardware” is checked and Tmate driver is selected: then click on “Have a Disk”. In this way manual update is enabled. Don’t click “Next”.

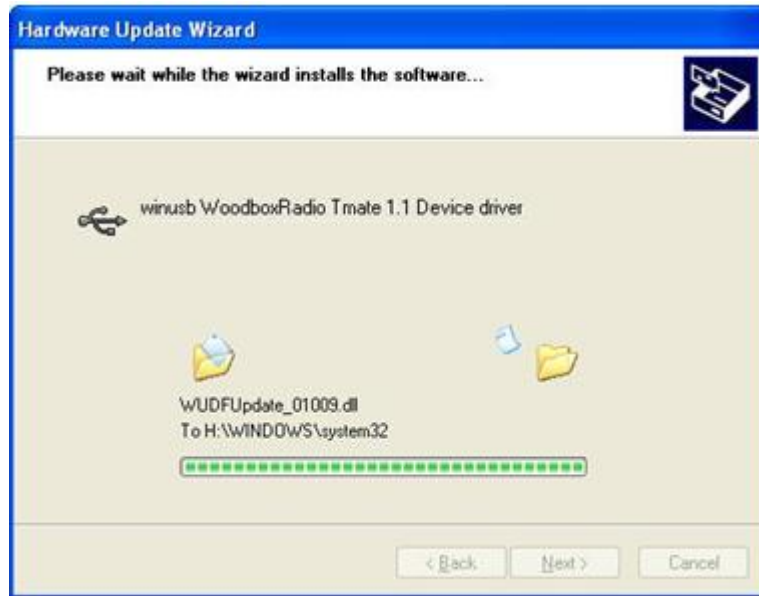


Click on “Browse” and search for the Tmate driver update folder location; then open winusbTmate.inf file. Click “OK” and then “Next”.



Now driver update starts: at next dialog box select “Continue Anyway” and ignore the warning.

Let the hardware update automatically completes and, at the procedure ending, click on “Finish”; then disconnect e connect Tmate device on the same USB socket.

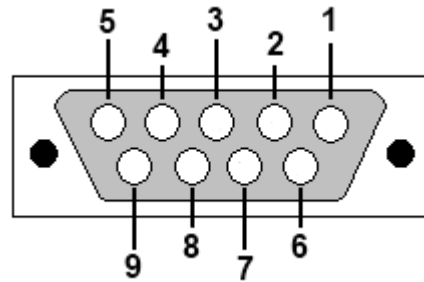


To verify that a correct update is done, enter "Device Manager" from **Control Panel** and expand "Universal Serial Bus controllers" node. Select "WoodboxRadio Tmate 1.1 Device" driver (see chapter "2.3.2.2 Driver installation verify") right click on it and choose "Properties". Select "Driver" label to visualize the last driver version.



Annex A

FDM-S1 External Hardware Connector



- Pin 1: SFE Latch 595
- Pin 2: I2C SCL
- Pin 3: SFE CLOCK 595
- Pin 4: I2C SDA
- Pin 5: Ground
- Pin 6: MUTE
- Pin 7: Reserved
- Pin 8: SFE Data 595
- Pin 9: Vcc (4.5V)

To mute the FDM-S1, connect the Pin 6 to ground.

ELAD FDM-S1 TECHNICAL SPECIFICATIONS		
		Rev. 5 10/2012
GENERAL	Frequency coverage:	20 kHz ÷ 30 MHz (up to 200 MHz in undersampling)
	Antenna connectors:	SMA (50 Ω) – SMA/BNC adapter included
	Temperature range:	0 ÷ 40 °C
	PC Interface	High-Speed USB 2.0 (480 Mbit/s)
	Power supply:	USB powered
	Power consumption:	Less than 2.2 W
	External I/O connector:	Female DB9 (mute control, I ² C and SPI interface)
	Dimensions:	108 (W) x 27 (H) x 88 (D) mm
Weight:	180 g	
RECEIVER	Configuration:	Direct sampling
	A/D Conversion	61.44 MSPS @ 14 bit/sample
	Sensitivity:	Typical -114 dBm (CW, BW 500 Hz, 10 dB (S+N)/N) -114,5 dBm (CW, BW 500 Hz, 10 dB S/N)
	3 rd Order Intercept Point:	> +25 dBm @ 14 MHz, Spacing 2 kHz, Input level -97 dBm, Low Pass Off, Attenuator Off
	Blocking gain	> 100 dB @ 14 MHz, Spacing 2 kHz, CW, BW 500 Hz
	compression:	Typical: 108 dB @ 14 MHz, Spacing 2 kHz, CW, BW 500 Hz, Noise Reduction On
	Noise floor (MDS):	< -124 dBm @ 14 MHz, CW, BW 500 Hz Typical: -130 dBm @ 14 MHz, CW, BW 500 Hz, Noise Reduction On
	Attenuator:	0, 20 dB
RF Preselection filter:	OFF (wide band), Low Pass (0 ÷ 30 MHz)	
SW TECHNICAL SPECIFICATIONS		
GENERAL	SW Name:	ELAD FDM SW1
	Mode:	CW, CW SH+, CW SH-, USB, LSB, DSB, AM, SYNC AM, FM, WB FM (Stereo + RDS decoder), RTTY, DRM
	Memory:	User frequency database support (XML files based), EIBI database support (CSV import), DX Cluster spot visualization (Internet connection required)
	Digital USB Streaming Sampling Rate:	192, 384, 768, 1536 and 3072 kHz I/Q channels, 32 bit/sample
	Digital Filters:	Double IF notch filters, continuous variable band filter (Selectivity > 100 dB)
	Adaptive Filters	Powerful Noise-Reducer and Auto-Notcher
	Tuning:	Manual entry keys, triple tuning bar (patent pending), WoodBox Tmate & Tmate2 compatible, CAT, Omni-Rig, touch-screen (under development)
	Display:	Spectrum, Waterfall
	Recorder:	Recording and playback of IF and audio data stream (automatic multiple files split feature)
	Minimum PC requirements:	Intel Atom N270, 1GB RAM (*) Operating System: Windows XP, Windows Vista, W7, W8 (Apple virtual machine compatible – tested on VMware Fusion environment) (*) Execute the application <i>FDM-SW1CompatibilityTest</i> to verify if your system meets the requirements to run Elad FDM-SW1 software. Join <i>elad_sdr_en</i> (English) or <i>elad_sdr</i> (Italian) on Yahoo!® Groups to download the application.
GENERAL	SW Name:	ExtIO_ELAD_FDMS1 DLLs
	Third Party Compatibility:	Studio1, Winrad, WrPLUS, HSDR, digiRadio
All stated specifications and other product information provided in this document are subject to change without notice or obligation.		

Declaration of Conformity

The product marked as

FDM-S1

manufactured by

Manufacturer: ELAD S.r.l.

Address: Via Col De Rust, 11 - Sarone
33070 CANEVA (PN)

is produced in conformity to the requirements contained in the following EC directives:

- R&TTE Directive 1999/5/CE
- EMC Directive 2004/108/CE
- Low Voltage Directive 2006/95/CE

The product conforms to the following Product Specifications:

Emissions & Immunity:

ETSI EN 300 330-1
ETSI EN 301 489-1
ETSI EN 301 498-15
ETSI EN 301 783-2
EN 55022: 2006 + A1: 2007
EN 55024: 1998 + A1: 2001 + A2: 2003

Safety:

EN 60950-1: 2006 + A11: 2009

And further amendments.

This declaration is under responsibility of the manufacturer:

ELAD S.r.l.
Via Col De Rust, 11 - Sarone
33070 CANEVA (PN)

Issued by:

Name: Franco Milan
Function: President of ELAD

Caneva
Place

March, 20th 2012
Date


Signature