Installation Guide for End Users

Hardware and Software

Document change log

Issue	Date	Relevant Information
1.0	2007-04-11	Document creation
2.0	2007-07-11	Support for DELTA-hd-key Linux installation added
3.0	2008-03-14	Integration of DELTA-sdi family
4.0	2008-06-17	Integration of DELTA-hd-e and DELTA-hd-e-key
4.1	2008-11-03	PCIe bus requirements added PCI DELTA-hd and DELTA-hd-key support removed
4.2	2008-12-16	Linux dynamic memory allocation method added
4.3	2009-01-05	Integration of DELTA-sdi-elp family FCC compliance statement added
4.4	2009-02-24	Automatic firmware upgrade on DELTA-hd-e and DELTA-hd-e-key
4.5	2009-04-06	ROHS declarations of conformity added
4.6	2009-04-29	Integration of DELTA-dvi-e
4.7	2009-05-06	Warm Firmware update of DELTA-hd-e and DELTA-dvi-e
4.8	2009-05-25	DELTA-dvi-e conformance statements added ROHS declarations of conformity removed (located in separate documents)
5.0	2009-10-07	Integration of DELTA-codec family
5.1	2010-01-07	A couple of enhancements and clarifications
5.2	2010-03-09	Dual-link DVI integration Cabling recommendations added
5.3	2010-06-24	DELTA-hd-e 40 integration Unified Windows installation procedure New Linux drivers loading procedure using udev
5.4	2010-08-19	DELTA-hd-e 40 FCC compliance added
5.5	2010-09-15	DELTA-3G support added
5.6	2011-03-09	DELTA-3G-e-key 22 support added Windows installation process clarification Linux installation process modification
5.7	2011-06-16	DELTA-hd-e 04 support added Windows installation process clarification Linux installation process clarification
5.8	2011-08-31	DELTA-hd-elp support added RoHS and DoC Notices updated
5.9	2012-03-05	DELTA-hd-elp-d 80 and DELTA-3G-elp-d 40 support added
5.10	2012-06-13	DELTA-hd20-asi01-e support added

5.11	2012-10-31	DELTA-hd-elp-d and DELTA-3G-elp-d support added
5.12	2012-12-10	DELTA-sd-elp-d 80, DELTA-hd-elp-d 62 and DELTA-3G-elp 40 support added
5.13	2013-04-19	DELTA-3G-elp 10,01,11,20,02 and DELTA-3g-elp 2c support added
5.13	2013-05-24	Mac OSX Lion and Mountain Lion support added
5.13	2013-06-17	DELTA-h4k support added
5.14	2013-09-02	DELTA-hd20-asi02-e support added
5.15	2014-02-06	DELTA-sdi, DELTA-hd-e 40 and 04 has been deprecated DELTA-3G-elp-key 11 support added
5.16	2014-05-19	DELTA-sfp-elp and DELTA-asi support added
5.17	2014-12-16	DELTA-hd-e 40,04 and DELTA-hd-elp 40,20,10 has been deprecated
5.18	2015-06-15	DELTA-3G-elp-d 4c and DELTA-3G-elp-d 8c added
5.19	2016-01-14	Windows 7 and Server 2008 R2 SHA-256 support
5.20	2016-01-20	Update Microsoft Security Advisory 3033929 Logo Change Update Linux driver installation
5.20	2016-04-06	Companion Card family overview added
5.21	2016-05-24	DELTA-ip family overview added EOL DELTA-3G-e 22 and DELTA-3G-e-key 22
6.00	2016-10-04	Windows 10 support TICO support added New VideoMasterHD_SP library
6.01	2016-12-06	3G family picture changed VideoMasterHD becomes VideoMaster
6.02	2017-02-14	DELTA-h4k2 support added
6.03	2017-02-16	Creation of a new chapter “DELTA-dv family”

Contents

1. ABOUT THIS GUIDE

This guide covers the DELTACAST cards hardware installation, and provides setup instructions of the VideoMaster SDK and runtime software, under Windows, Linux and Mac OS.

You can always access the latest Deltacast documentation on the Internet at http://www.deltacast.tv.

1.1. Document objectives

This publication describes specific procedures for preparing your equipment for the initial installation of Deltacast products from the following families :

- DELTA-3G
- DELTA-hd
- DELTA-key
- DELTA-dvi
- DELTA-codec
- DELTA-h4k(2)
- DELTA-flex
- DELTA-asi
- DELTA-ip

The document also deals with the installation of the **VideoMaster SDK** software.

1.2. Who should read this guide ?

To use this publication, you should be familiar with electronic circuitry and software installation practices and preferably have experience as an electronic or computer science technician.

1.3. Related documentation

Please refer to the **VideoMaster SDK** documentation – VideoMaster.chm or VideoMaster.pdf – for more information on the concepts used by **VideoMaster** and the functions implemented.

1.4. Document conventions

Notes

Notes use the following conventions:

	*<u>Note:</u> Means reader take note. Notes contain helpful suggestions or references to material not covered in the publication.*

Cautions

Cautions use the following conventions:

	*<u>Caution:</u> Means reader must be careful. In this situation, you might do something that could result in equipment damage or loss of data.*

Warnings

Warnings use the following conventions:

	*<u>Warning:</u> This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents.*

2. PRODUCT OVERVIEW

2.1. DELTA-sdi family

2.1.1. DELTA-3G cards

DELTA-3G is a very high-performance and low-cost 3G, HD and SD SDI ingest and playout solution for PCI Express (PCIe) bus computers.

This device meets all the specifications for SMPTE 424M, 292M and SMPTE 259M equipment with extensive features to help the real-time processing of 3G, HD and SD SDI streams on the host computer. The DELTA-3G is designed for easy integration with customer applications. A comprehensive software development kit (SDK) includes device drivers for standard platforms, a range of SDI processing services and an easy-to-use programming interface for controlling the card

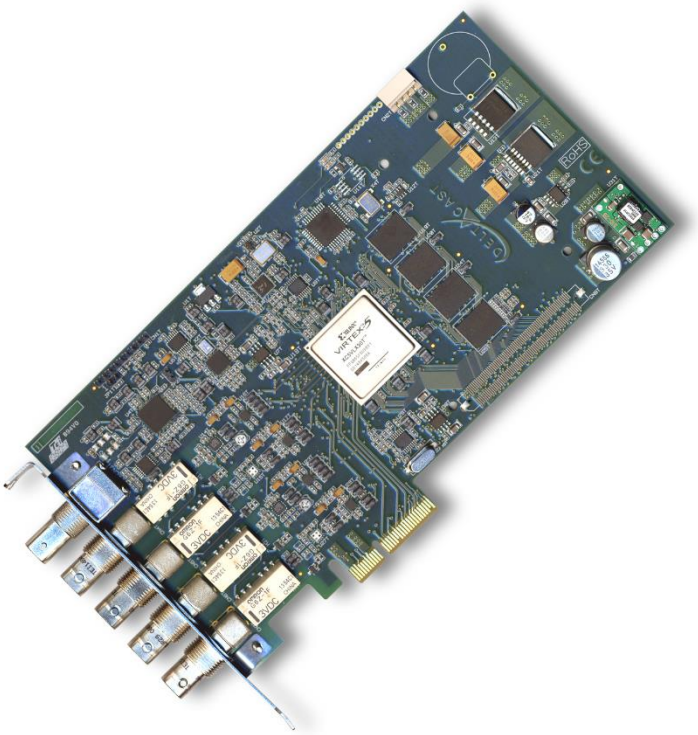
This family of products includes a large set of cards with many combinations of input and output connectors, ranging from a single channel up to 2 inputs and 2 outputs on the same card. 4 inputs card and 4 outputs card are also available.

The cards also host HDMI monitoring outputs.

2.1.2. DELTA-hd cards

DELTA-hd is a very high-performance and low-cost HD and SD SDI ingest and playout solution for PCI Express (PCIe) bus computers.

This device meets all the specifications for SMPTE 292M and SMPTE 259M equipment with extensive features to help the real-time processing of HD and SD SDI streams on the host computer. The DELTA-hd is designed for easy integration with customer applications. A comprehensive software development kit (SDK) includes device drivers for standard platforms, a range of SDI processing services and an easy-to-use programming interface for controlling the card.

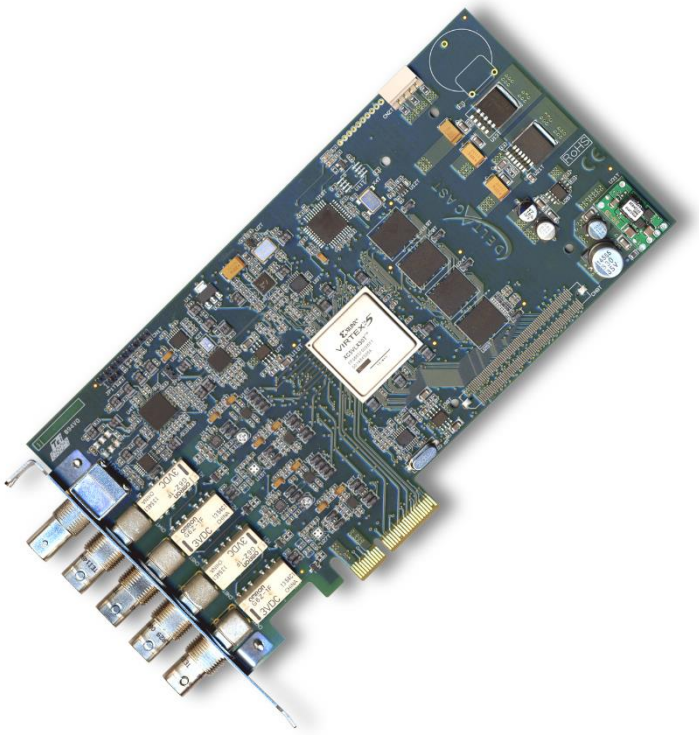


This family of products includes a large set of cards with many combinations of input and output connectors, ranging from a single channel up to 4 inputs and 4 outputs on the same card. 6 inputs with 2 outputs or 8 inputs card is also available.

2.1.3. DELTA-key cards

The **DELTA-key** is a family of very high-performance and low-cost 3G, HD and SD hardware linear keyers and SDI ingest and playout solutions for PCI Express (PCIe) bus computers.

These devices host extensive features to help the real-time processing of 3G, HD and SD SDI streams on the host computer. The DELTA-key is designed for easy integration with customer applications. A comprehensive software development kit (SDK) includes device drivers for standard platforms, a range of SDI processing services and an easy-to-use programming interface for controlling the card.



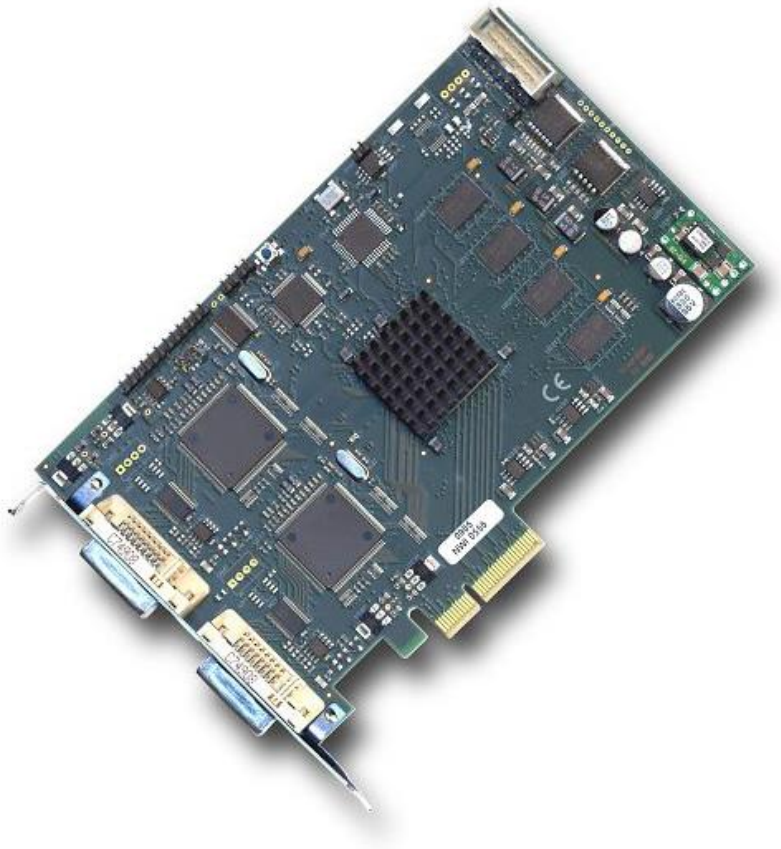
This family of products includes 4 cards : a HD single-input and single-output one, a 3G single-input and single-output one, a card hosting 2 3G inputs and 2 3G outputs, and a card hosting 2 HD inputs and 2 HD outputs.

2.2. DELTA-dv family

2.2.1. DELTA-dvi cards

The **DELTA-dvi** is a very high-performance and low-cost DVI-A and DVI-D ingest solution for PCIe bus computers.

This device meets all the specifications of the Digital Display Working Group (DDWG) industry consortium with extensive features to help the real-time processing of DVI streams on the host computer. The DELTA-dvi is designed for easy integration with customer applications. A comprehensive software development kit (SDK) includes device drivers for standard platforms, a range of DVI processing services and an easy-to-use programming interface for controlling the card.



This family of products includes two cards : a single-input one and dual-input one.

2.2.2. DELTA-h4k(2) cards

The **DELTA-h4k(2)** is a very high-performance and low-cost HDMI ingest solution for PCIe bus computers.

This device meets all the specifications of the Digital Display Working Group (DDWG) industry consortium with extensive features to help the real-time processing of HDMI streams on the host computer. The DELTA-h4k(2) is designed for easy integration with customer applications. A comprehensive software development kit (SDK) includes device drivers for standard platforms, a range of HDMI processing services and an easy-to-use programming interface for controlling the card.

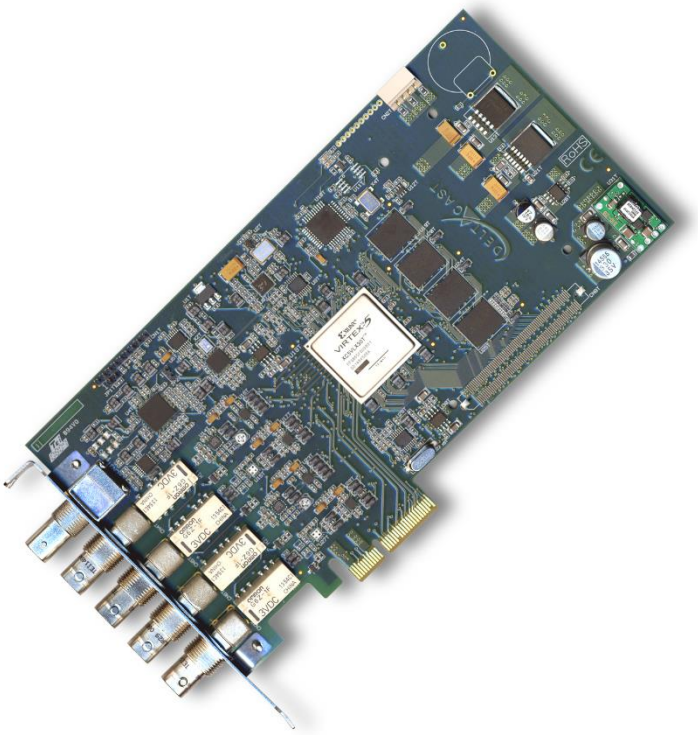
This family of products includes two cards :

1. The DELTA-h4k-elp 20, dual-input. Supports DVI-D, HDMI 1.3, HDMI 1.4b, HDMI 2.0 (only YUV 4:2:0 UHD and 4k 50/60Hz).
2. The DELTA-h4k2-elp 20, dual-input. Supports DVI-D, HDMI 1.3, HDMI 1.4b, HDMI 2.0.

2.3. DELTA-codec family

The **DELTA-codec** is a family of PCI Express cards including a mix of ASI and SDI ingest and playout channels.

This device meets all the specifications for SMPTE 292M and SMPTE 259M equipment, as well as for DVB ASI equipment. The DELTA-codec is designed for easy integration with customer applications. A comprehensive software development kit (SDK) includes device drivers for standard platforms, a range of ASI and SDI processing services and an easy-to-use programming interface for controlling the card.



This family of products includes two cards :

- The DELTA-hd10-asi12-e, including 1 SDI input, 1 ASI input and 2 ASI outputs
- The DELTA-hd11-asi11-e, including 1 SDI input, 1 SDI output, 1 ASI input and 1 ASI output
- The DELTA-hd10-asi10-e, including 1 SDI input and 1 ASI input
- The DELTA-hd20-asi01-e, including 2 SDI inputs and 1 ASI output
- The DELTA-hd20-asi02-e, including 2 SDI inputs and 2 ASI outputs

2.4. DELTA-flex family

DELTA-flex is a very high-performance and low-cost 3G, HD and SD SDI ingest and playout solution for PCI Express (PCIe) bus computers.

The cards of this family can be seen as DELTA-3G family card with SFP cages. The flex family has SFP cages allowing to use SFP module converter. The power of this family is to easily allow to switch interface from optical to Coaxial and to permit to use converter like SDI to HDMI and SDI to analogical.

This device meets all the specifications for SMPTE 424M, 292M and SMPTE 259M equipment with extensive features to help the real-time processing of 3G, HD and SD SDI streams on the host computer. The DELTA-sfp is designed for easy integration with customer applications. A comprehensive software development kit (SDK) includes device drivers for standard platforms, a range of SDI processing services and an easy-to-use programming interface for controlling the card.

These low profile cards are compatible with SFP video modules from Embrionix and other manufacturers, providing a variety of interfaces such as:

- SDI (6G/3G/HD/SD) coaxial interface (DIN 1.0/2.3 or HD-BNC)
- SDI (6G/3G/HD/SD) optical interface (single-mode, multi-mode, CWDM)
- HDMI / DVI (225MHz max TMDS)
- Analog PAL / NTSC (CVBS - composite).

The cards also host HDMI monitoring output.

This family of products includes 2 cards : a 2 SFP cages and a 1 SFP cage.

2.5. DELTA-asi family

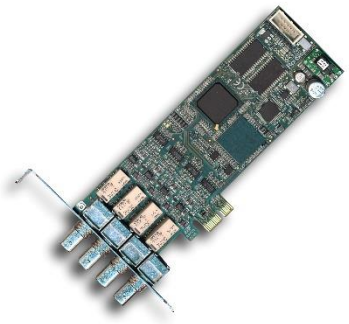
DELTA-asi is a family of very high-performance and low-cost MPEG-2 to PC gateways addressing PCI and PCI Express buses computers.

The cards meet all the specifications for DVB ASI equipment with all the typical features to help the real-time processing of MPEG-2 streams on the host computer.

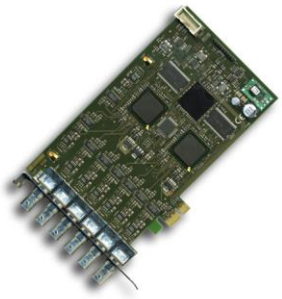
DELTA-asi is designed for easy integration with customer applications.

A comprehensive software development kit (SDK) includes device drivers for standard server platforms, a range of MPEG-2 stream processing services and an easy-to-use programming interface for controlling the reception, transmission and processing of full-speed MPEG-2 streams.

The **DELTA-asi** products family offers a large set of input and output configurations, ranging from one single channel, up to 8 connectors on the same card.



DELTA-asi-elp 22



DELTA-asi-e 60

All members of the large **DELTA-asi** family share the same drivers and SDK.

2.6. DELTA-ip

DELTA-ip is a very high-performance and low-cost 3G, HD and SD SMPTE2022-6 ingest and playout solution for PCI Express (PCIe) bus computers.

This device meets all the specifications of the SMPTE ST2022-6, ST2022-5 and ST2022-7 standards to help the real-time processing of 3G, HD and SD SDI streams (over IP) on the host computer.

The **DELTA-ip** is designed for easy integration with customer applications.

A comprehensive software development kit (SDK) includes device drivers for standard platforms, a range of SDI/IP processing services and an easy-to-use programming interface for controlling the card.

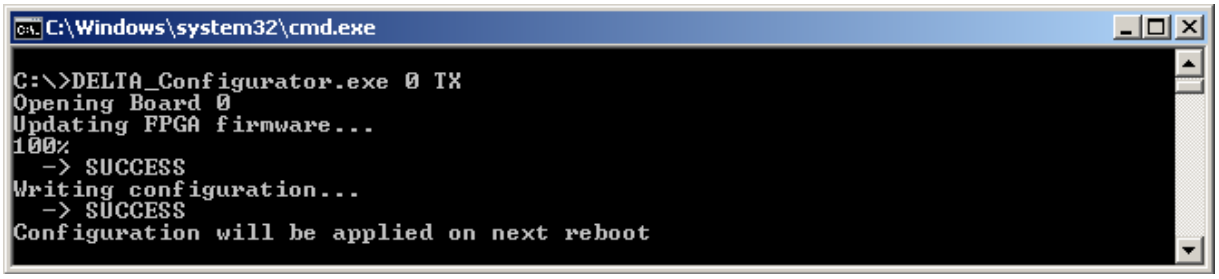
This family of products include two types of card:

- a dual Ethernet port card for receiving up to 3 streams
- a dual Ethernet port card for transmitting up to 3 streams

The second Ethernet port is reserved for redundant stream (Seamless Protection Switching –SMPTE ST2022-7).

2.6.1. DELTA-ip Configuration

The DELTA-ip can be configured in reception or in transmission (3 streams) thanks to a firmware update. A command line software called "DELTA_Configurator" is delivered with the SDK to perform this update. A call to "DELTA_Configurator" with the current board index and the new direction "RX" or "TX" is requested to change the DELTA configuration. A restart is needed to compete the operation.



2.7. TICO cards

TICO (TIny COdec) developed by **intoPIX** is a compression codec technology designs to transport 4K/UHD signal stream onto one single 3G-SDI link or an IP network.

This codec has a compression ratio of up to 4:1 and permits to handle 4K/UHD 60 Hz stream normally transported on 4 physicals links on a single 3G physical link. This codec is visually lossless. Over 10 Gbps Ethernet, It allows up to 3 simultaneous 4K/UHD streams.

TICO will help support existing networks with low pipeline bandwidth.

The **TICO** functionality is only available on **TICO** cards.

2.8. Companion Cards family

The **Companion Cards** family is an extension cards family whom purpose is to extend Deltacast cards functionalities.

This family currently includes a single card : A-LTC.

2.8.1. A-LTC Companion Card

A-LTC card can fit either on top of its low-profile host card, sharing the same bracket, or next to it and occupy an empty PCIe slot.

The **A-LTC** extended functionality is :

- LTC capture (single-ended LTC analog source)

3. INSTALLATION

The hardware and software installation sections of this chapter assume you are installing one or several DELTACAST devices and accompanying software on a new computer or a computer that has not been used before with such a card.

If you wish to upgrade the driver with a new version downloaded from the DELTACAST web site, please consult the appropriate topics in this guide.

	*<u>Caution:</u> Please read carefully the detailed instructions that follow before attempting to install any software or hardware component of this product. Inappropriate operation may result in a broken or malfunctioning system.*

3.1. Pre-installation procedure

Before starting the VideoMaster SDK installation, please visit the DELTACAST web site and check for latest software updates. Ensure to always install runtime binaries (drivers and dll) corresponding to the SDK version you developed for.

Before carrying on with the hardware installation, please shut down the PC and unplug the power supply cable from your PC case.

	*<u>Caution:</u> Static electricity from your body can damage sensitive electronic components on the DELTACAST devices. Please avoid touching the chips and other components and try to handle the card by its edges. Also drain static electricity from your body by touching a bare metal surface on your computer chassis before you install or remove any parts of your system. If you have grounding wrist strap, use it while handling DELTACAST devices.*

3.2. PCIe bus considerations

Not all PCIe bus controllers offer the same performances. Depending on the platform they are plugged in, DELTACAST devices could not be able to support full-speed transfers on all their channels, because of a bandwidth limitation on the motherboard itself.

When selecting the host motherboard, always get that point into account.

Moreover, DELTA-3G, DELTA-hd, DELTA-key, DELTA-dvi, DELTA-h4k, DELTA-sfp and DELTA-codec are 4-laned PCI Express devices. They are intended to PCI Express x4 slots (they can be plugged in PCIe x1 slots, but with restricted performances).

DELTA-ip, DELTA-h4k2, DELTA-3G-elp(-tico)-d 4c/8c and DELTA-3G-elp-key-d 2K/4K cards are 8-laned PCI Express devices. They are intended to PCI Express x8 slots but can be plugged in PCIe x4 slots with restricted performances.

When plugging in such a card in a x16 PCIe slot, always insure that this slot may downgrade itself to x4.

3.3. Important note

Most Deltacast devices are based on FPGA, which are programmable hardware components.

DELTA-3G, DELTA-hd, DELTA-key, DELTA-dvi, DELTA-h4k(2), DELTA-sfp, DELTA-codec and DELTA-ip cards store their FPGA firmware in an onboard memory module, updated if necessary during driver loading.

The main consequence of this model concerns DELTA-3G, DELTA-hd, DELTA-key, DELTA-dvi, DELTA-h4k(2), DELTA-sfp, DELTA-codec and DELTA-ip driver installation, upgrade, and loading. This operation may take some time and absolutely needs the computer to be restarted to complete.

Please carefully consult the driver upgrading procedure chapters of this document for further explanations about FPGA firmware upgrade procedure.

3.4. Hardware installation

3.4.1. What you need for installation

Once the PC case is opened, identify an appropriate PCI Express slot. If any doubt exists, please refer to the documentation of your motherboard.

Among the available PCIe slots, it is preferable to choose the highly ventilated ones and to select a smart repartition of cards for better heat dissipation.

	*Caution: An incorrectly ventilated card may behave improperly, or might even be damaged during operation.*

Select the most appropriate slot for each of the DELTACAST devices you wish to install, and remove the metal plate located on the PC case in regard to those slots. Don't loose the screws, as you will need them to fasten the cards later on.

3.4.2. Installing in the computer

To install the cards, repeat the following steps for each device:

- Carefully align the card with its selected PCIe slot.
- Slide the card towards the slot until it touches. Make sure that the bracket of the card slips into the opening left by the metal plate you have just removed.
- Once the card touches its slot and is correctly aligned, press it into the connector until it is firmly in place.
- Secure the card by fastening its bracket to the PC case using the screw you removed one moment ago.

Once all your devices are installed, close your PC case, plug in the power supply cable and turn it on to proceed with software installation.

3.4.3. Cabling recommendations

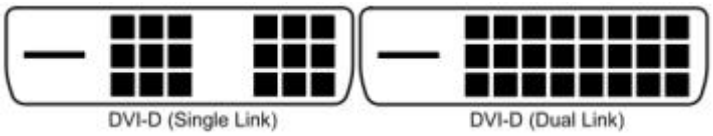
It is recommended to use quality cables to avoid signal perturbations and unexpected behaviour.

For SDI reception and streaming :

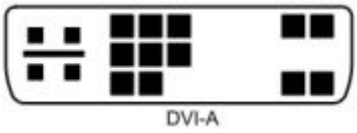
Coaxial RG6 or RG59 (75 Ohms) cables are required and low loss cables are recommended for 3G (ex. BELDEN 1694A, 1505A or 1855A).

For DVI reception :

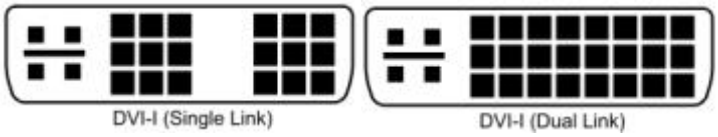
- DVI-D cables are used for digital reception (dual-link cable are required for dual-link reception).



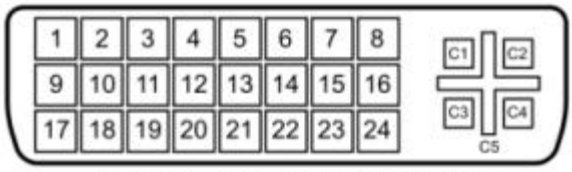
- DVI-A cables are used for analog reception.



- DVI-I cables can be use for digital or analog reception (some graphic card driver force analog reception with DVI-I cable).



- VGA cables with DVI adapter are used for analog reception. **It's important to know that in some VGA cables,the pin 9 is not connected (this pin is used to supply the E-EDID PROM). So, E-EDID reading and loading will not be available with such cables.**
- HDMI cables with DVI adapter are used for HDMI reception.
- Analog component cables with DVI adapter are use for Analog Component reception (C1 = Analog red, C2 = Analog green, C3 = Analog blue).



A female DVI-I socket from the front

For IP reception and streaming (SFP+ 10Gbit Ethernet transceiver):

10GbE SDP+ transciever must be compatible with the "SFI" electric interface and work at 10.3125Gbps (SFF Committee SFF-8431 : Specifications for Enhanced 8.5 and 10 Gigabit Small Form Factor Pluggable Module “SFP+”).

- SFP+ 10GbE optical transciever modules (10GBASE-SR, -LR or –ER)
- SFP+ Direct Attach copper Cables (10GSFP+Cu passive or active copper cable assembly). Warning: 10GSFP+Cu can only be used on systems with common grounds. Connecting systems with different ground potential with SFP+ direct attach cable results in a short and may cause damage.
- SFP+ Direct Attach optical cable.

3.5. Windows software installation

3.5.1. What you need for installation

To set up the machine wherein you will operate the DELTACAST cards, you must :

- First have successfully completed the hardware installation described above
- Install (or upgrade) the drivers, as detailed below
- Install the VideoMaster runtime libraries, as detailed below

Always ensure yourself to install VideoMaster runtime binaries (drivers and dll) corresponding to the SDK version your application has been compiled for. In case of any doubt on the version to install, please contact the application supplier.

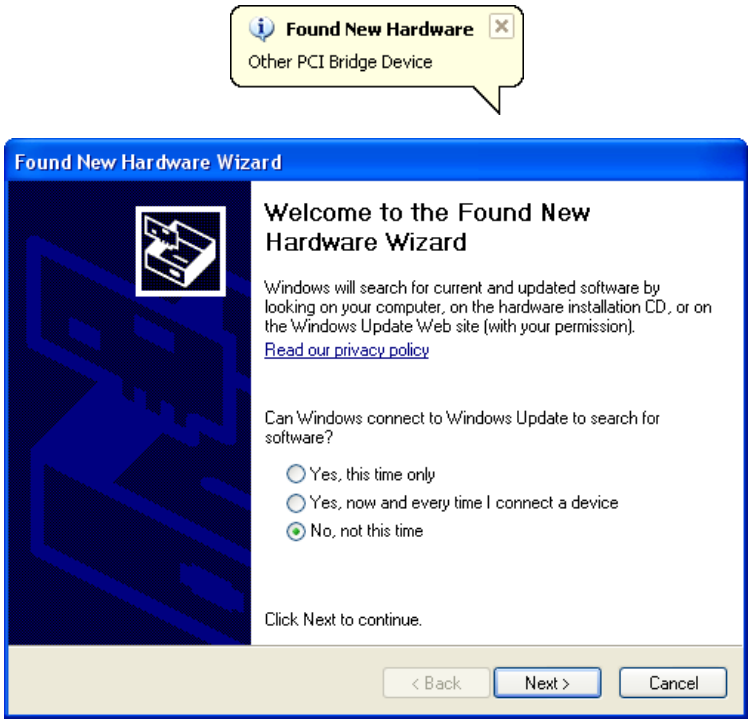
	*<u>Note:</u> You must ensure that, once logged in, you have sufficient privileges to complete both a driver installation and a standard application setup process.*

3.5.2. Installing the drivers

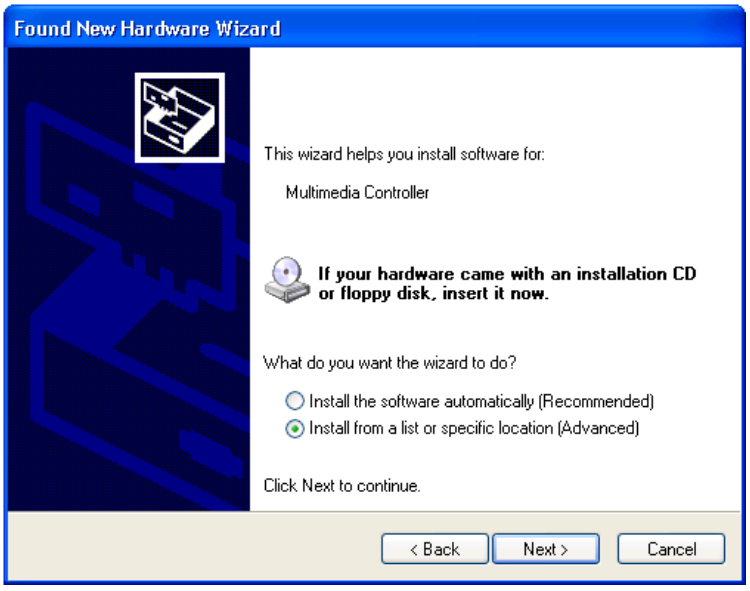
The first time the PC is started after having plugged in the new DELTACAST devices, the Plug and Play Manager of Windows will detect the presence of these new hardware pieces and prompt you for a driver installation. If a problem occurred during Windows startup or if you accidentally aborted the driver installation procedure, it is still possible to find the uninstalled cards within the Device Manager tool of the Windows Management Console and to re-start manually a driver installation of those cards. Please consult the Windows documentation for further information about device management.

The Plug and Play Manager detects a new hardware and prompts you with the following balloon and dialog box.

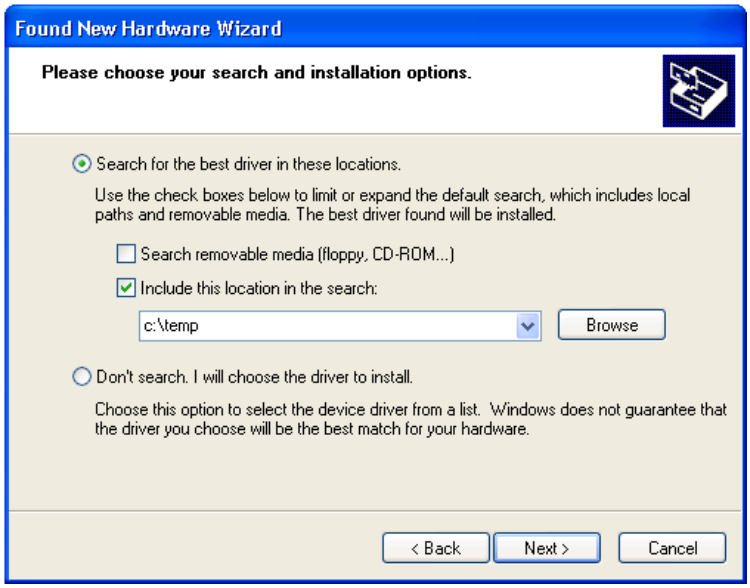
Select *No, not this time* to avoid Windows Update query, then click *Next* to proceed with the driver installation.



Then, select Install from a list or specific location (Advanced) and click Next.

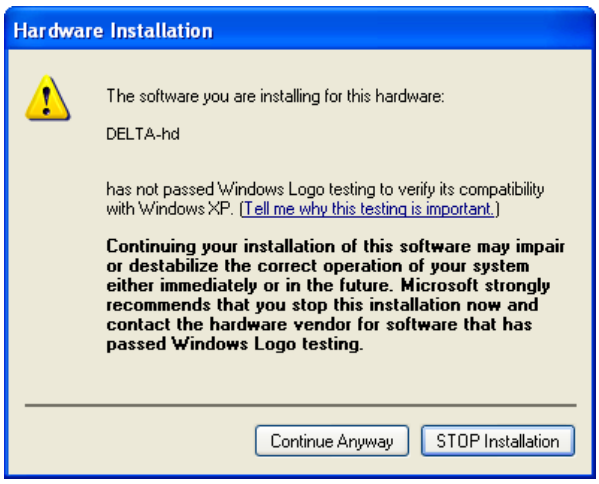


Let the *Search for the best driver in these locations* option selected, check the *Include this location in the search* and specify the folder wherein you unzipped the VideoMaster installation package. Then, click *Next*.



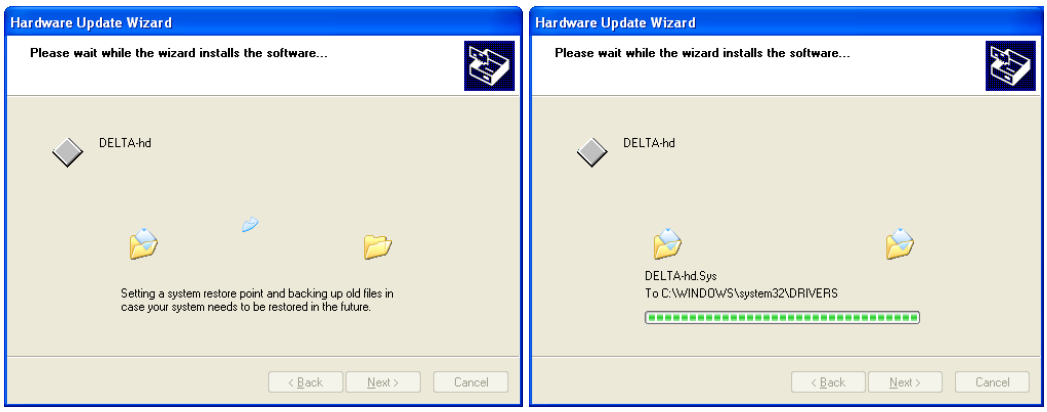
After having performed a couple of verification, Windows will start installing the DELTACAST drivers.

If Windows prompts you with the following screen, click *Continue Anyway*.



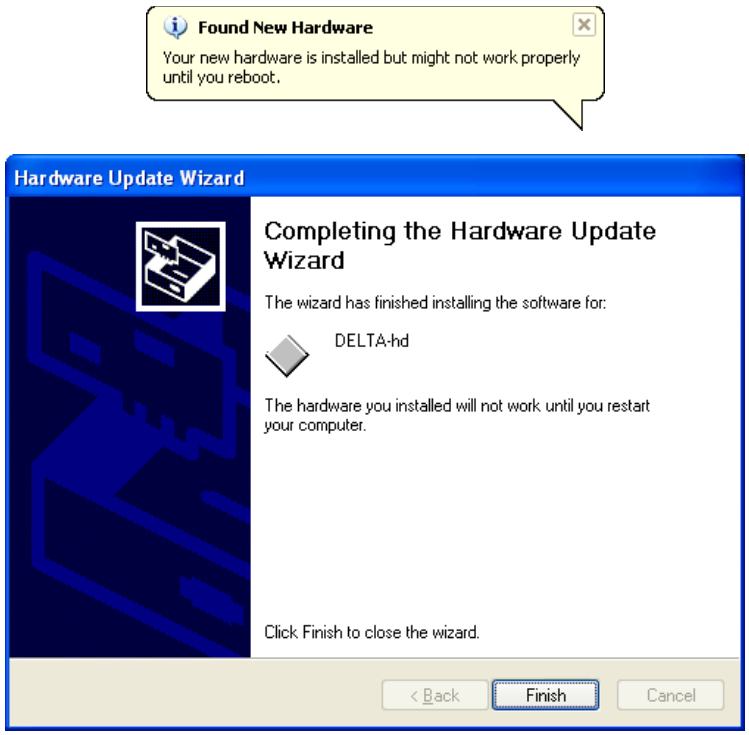
If Windows cannot find suitable drivers from its default locations, go back to step 3 and tick the *Install from a list or specific location* item, you will then be prompted for a path and must browse until the place where you stored the driver installation files.

Windows will now proceed to the installation of your DELTACAST device.

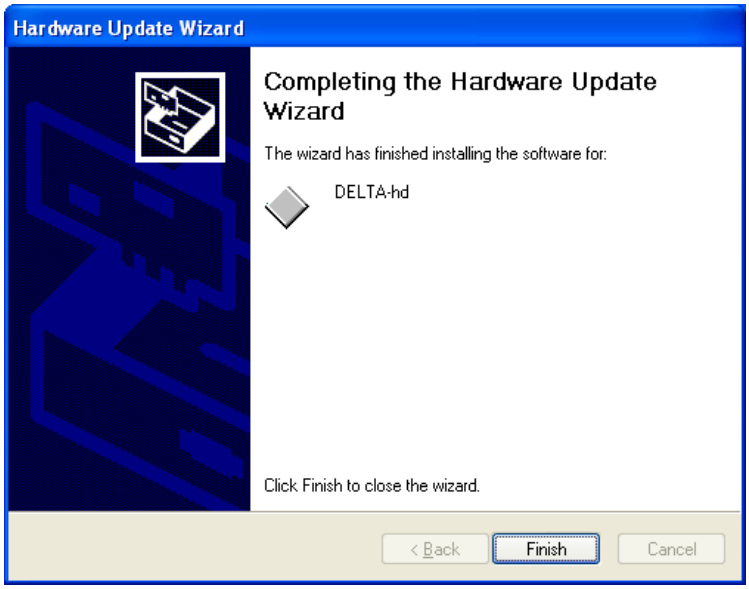


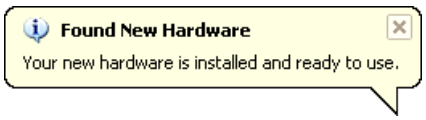
⚠	Caution: *This operation could take quite a long time (up to 2 minutes) if onboard firmware is being upgraded. Do not interrupt the installation process !*

At the end of the driver installation process, you may be asked to restart Windows. When onboard firmware has been upgraded during driver installation, this reboot step is mandatory to complete the firmware upgrade, as explained in chapter 3.5.5. Your DELTACAST device will not be functional unless you reboot.

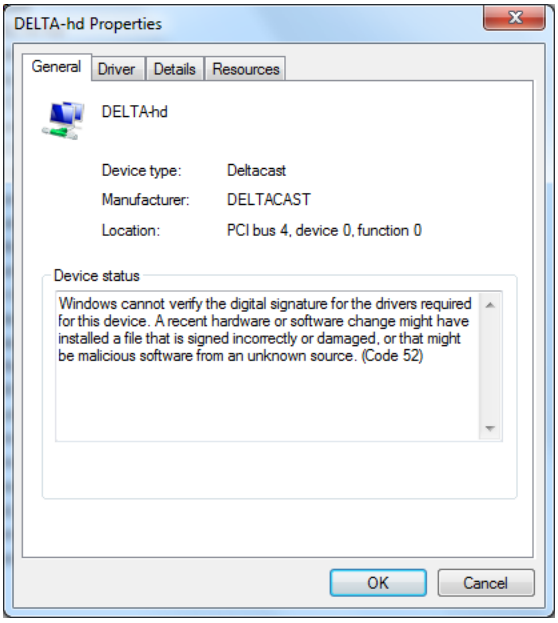


Alternatively, this final dialog box and balloon will be displayed is no Windows restart is required. In this case, simply click *Finish*.





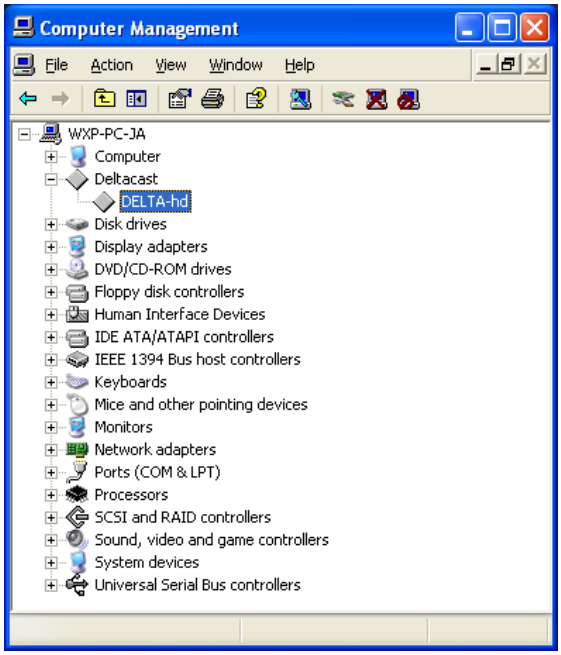
If you are running Windows 7 or Server 2008, the following dialog box may appear mentioning error code 52. It's due to a Microsoft SHA-1 deprecation policy. Indeed, Microsoft will no longer allow new SHA-1 code signing certificates to be used for signing files on Windows 7 and above starting Jan. 1, 2016. Windows 7 and Server 2008 R2 will require a hotfix for SHA-256 support. Please visit https://technet.microsoft.com/en-us/library/security/3033929 for more information.



If you are running Windows 10, due to some changes made by Microsoft into their security signature system, the VideoMaster drivers might not be correctly recognized.

You are invited to contact the Deltacast support service for any problem regarding signatures.

After a successful installation, the card typically appears in the *Other devices* category (depending on the driver version, it can alternatively be installed in the *Other devices* or *Sound, video and game controllers* category). This has no impact on actual functionalities. Also note that driver in *other devices* category are illustrated by a 'question mark' icon, this is normal and does not mean that the installation failed.



3.5.3. Installing the VideoMaster libraries

The VideoMaster libraries are a set of DLL files implementing all the SDK functionalities and acting as the interface between your application, and the underlying drivers and hardware. They are mandatory to operate any Deltacast card.

The VideoMaster libraries are compiled either for 32-bit or for 64-bit Windows operating system, depending on the redistribution package you selected. They must be manually copied to your target system.

Depending on your needs, VideoMaster libraries should be either copied to the Windows System32 directory, or directly into the application directory.

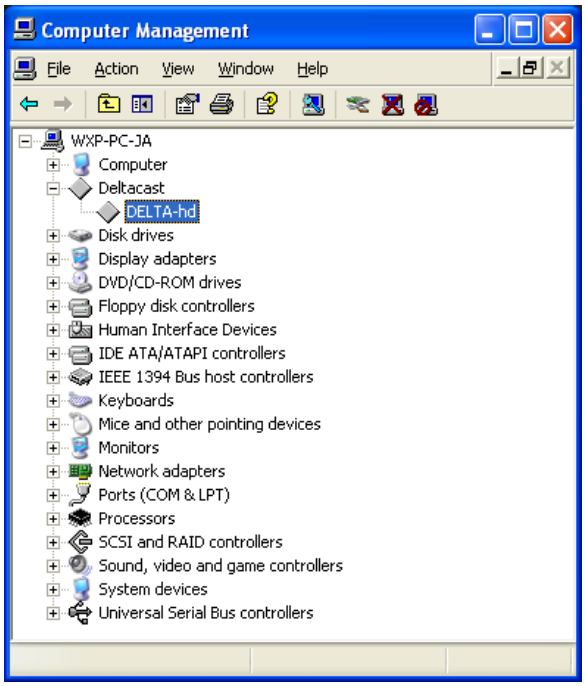
Note that if you are using the VideoMaster Directshow filters and/or the VideoMaster Demonstration application, then the runtime libraries must be installed in Windows System32 directory.

Upgrading the drivers

You can always download the latest version of the VideoMaster software at www.deltacast.tv.

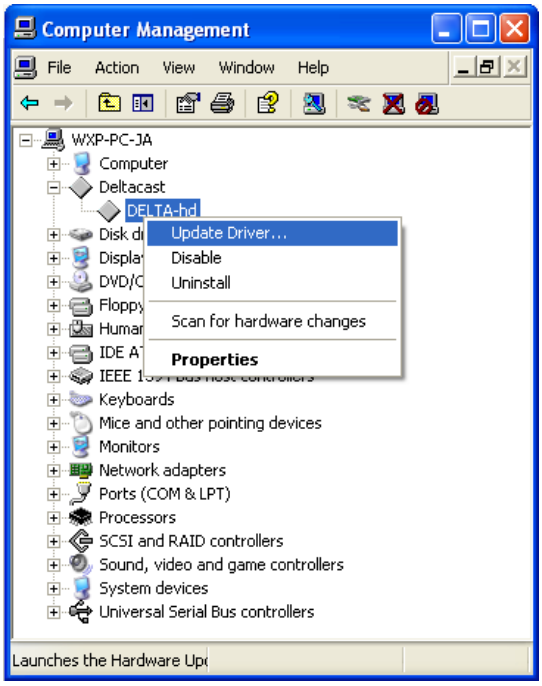
Nonetheless, it is always recommended to use runtime binaries corresponding to the SDK version the application is been compiled for. In case of any doubt, please contact the application supplier.

To upgrade the driver with a new version, go to the Windows Device Manager (right-click on My Computer, select Properties, then go to the Hardware tab and click Device Manager). Locate your DELTACAST device entry among the devices tree.



Depending on the driver version, the card might appear either in the *Sound, video and game controllers* category, *Other devices* category or in the *Deltacast* category. This has no impact on actual functionalities.

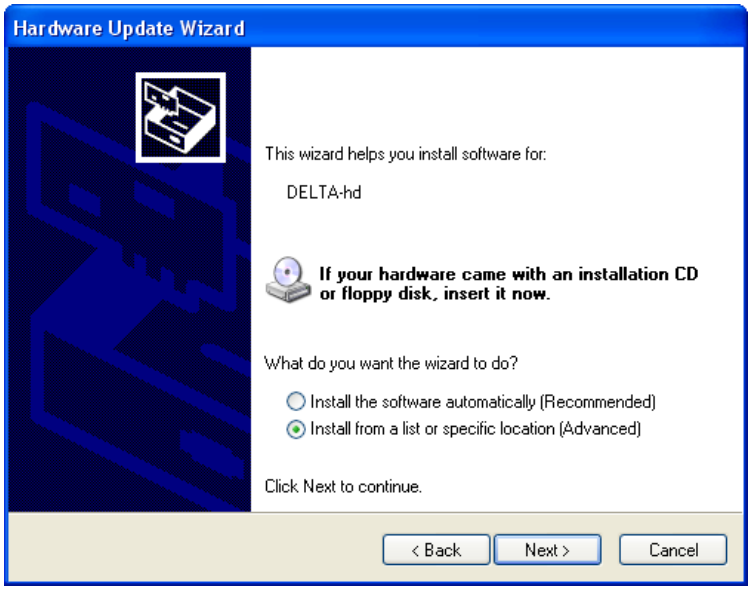
Right-click it and select *Update Driver...*



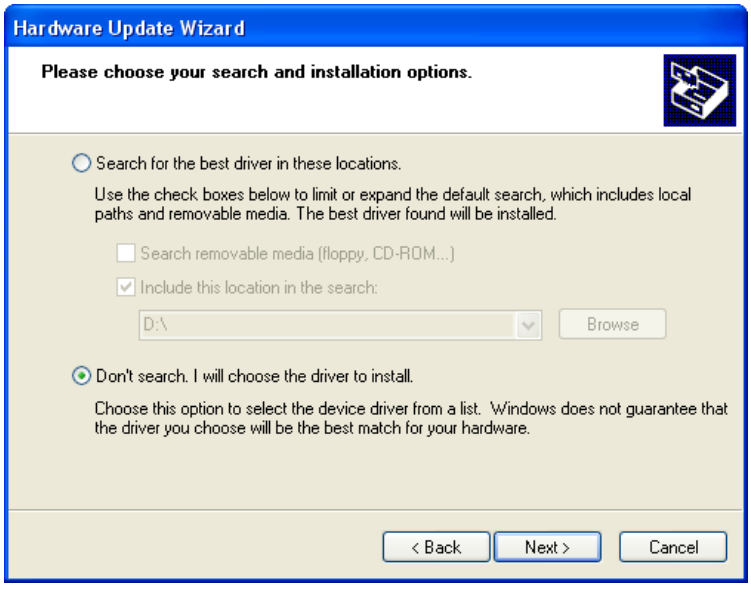
This will open the Upgrade Device Driver Wizard.

In the first dialog box, select No, not this time to avoid Windows Update query, then click Next.

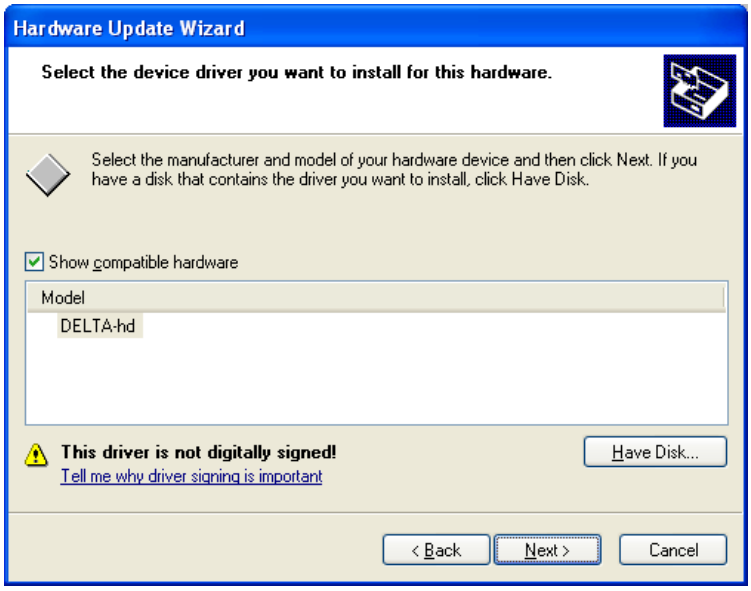
Then you must select the Install from a list or specific location(Advanced) option and click Next.



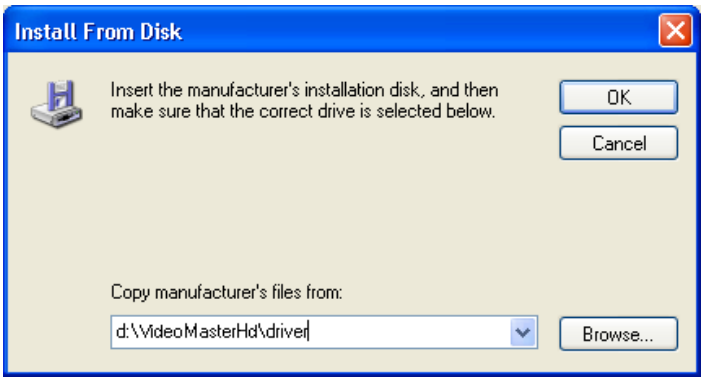
In the following dialog box, select Don't search. I will choose the driver to install, and click Next.



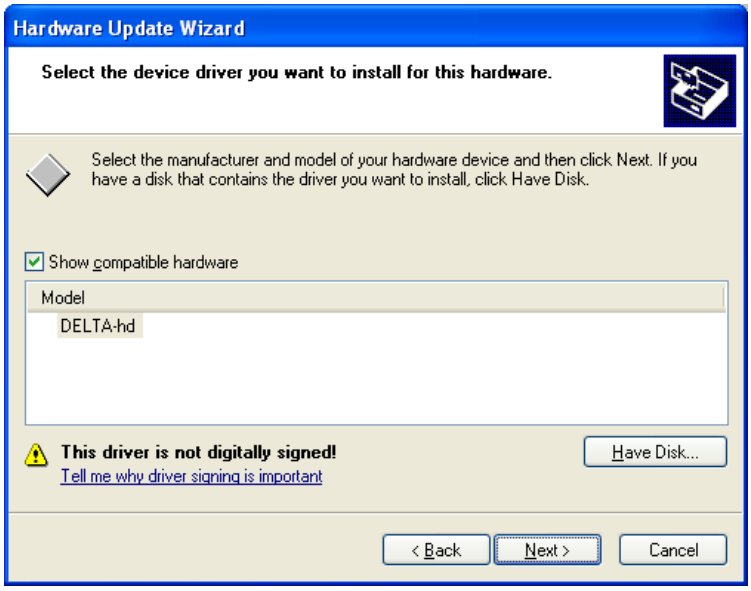
You will then reach the driver selection dialog box as shown below. Click the *Have Disk* button.



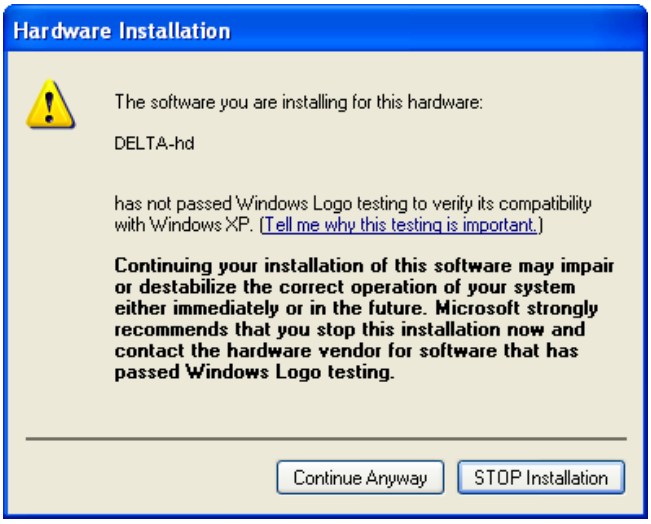
Once the system prompts you with the installation disk selection screen, browse to the folder wherein you stored the driver update package and click *OK* so you will reach back the driver selection dialog box.



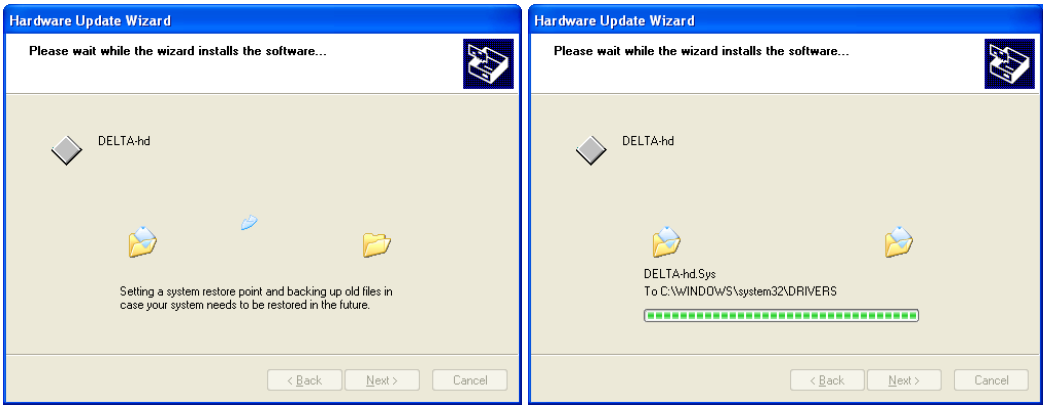
In the following screen, click *Next*.



If Windows prompts you with the following screen, click *Continue Anyway*.

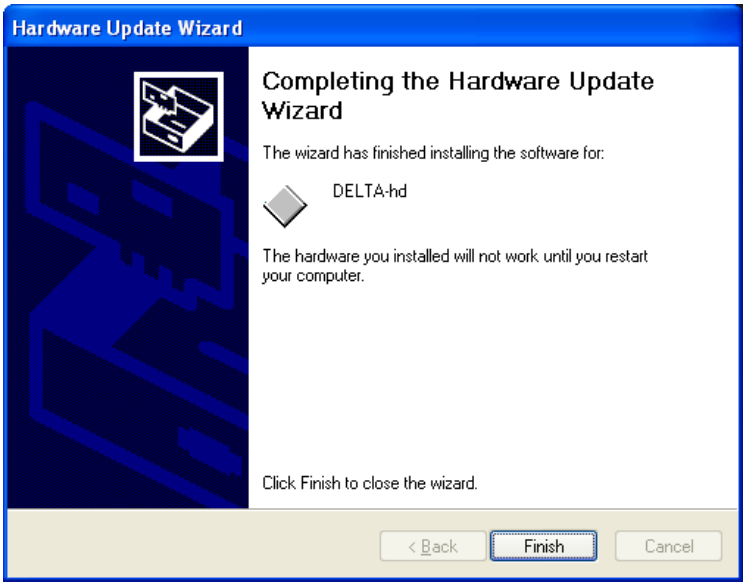


You will then be asked to wait while the installation is progressing.



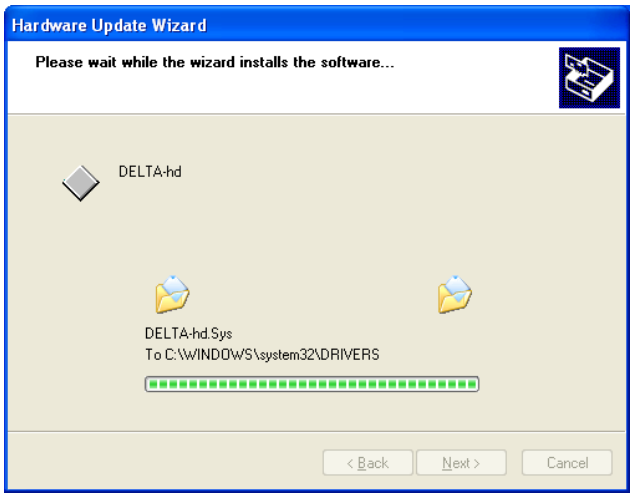
⚠	Caution: *This operation could take quite a long time (up to 2 minutes) if onboard firmware is being upgraded. Do not interrupt the installation process !*

At the end of the driver upgrade process, you may be asked to restart Windows. When onboard firmware has been upgraded during driver update, this reboot step is mandatory to complete the firmware upgrade, as explained in the following chapter. Your DELTACAST device will not be functional unless you reboot.

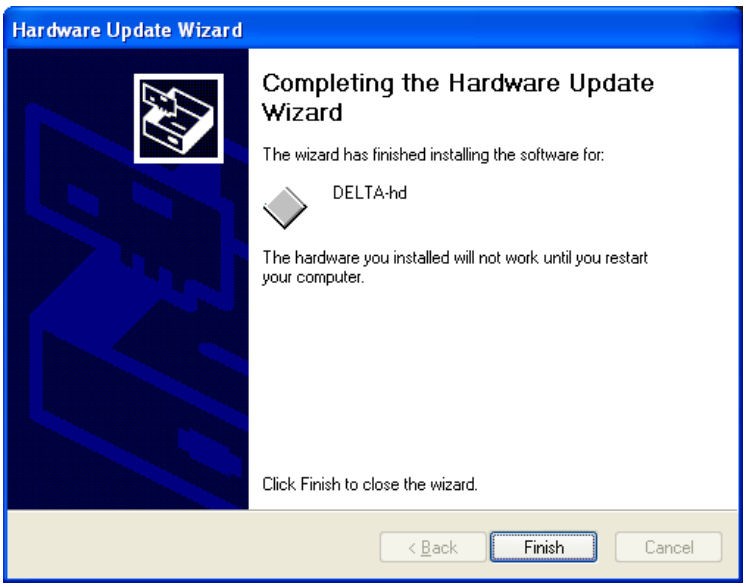


3.5.4. FPGA firmware upgrade

During the driver installation/update, the driver may automatically upgrade the FPGA. This operation takes some time, about one minute on the step illustrated by the following capture:



Complete the FPGA upgrade by **restarting the computer** when the following dialog box appears:



3.6. Mac OS installation

3.6.1. What you need for installation

To set up the machine wherein you will operate the DELTACAST cards, you must :

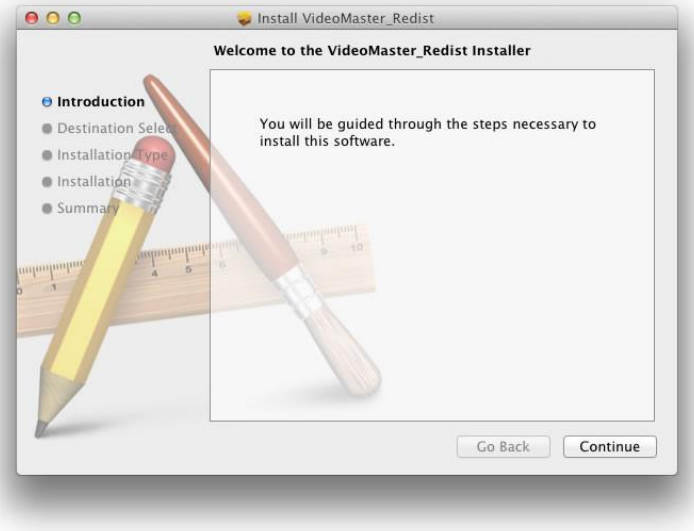
- First have successfully completed the hardware installation described above
- Install the VideoMaster redist package, as detailed below

3.6.2. Installing the VideoMaster redist package

To install VideoMaster under Mac OS, run the VideoMaster redist executable package.

	*Note: the VideoMaster redist installation requires a restart of the computer. You need to log as root during the installation.*

This will open the VideoMaster redist installer.

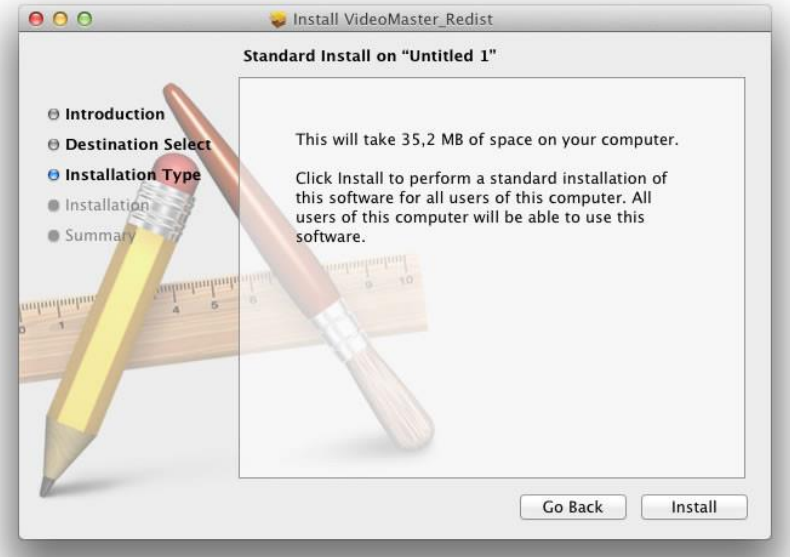


Then select *continue* to display the second panel.

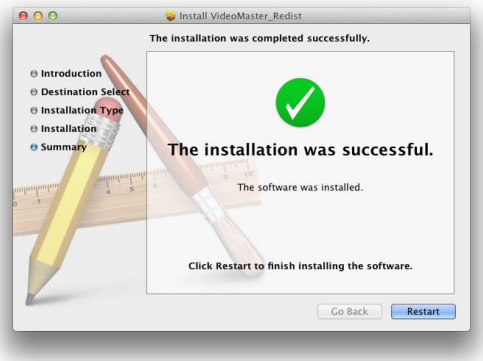
Please note that you cannot choose where to install the package, it is fully automatic. In some Mac OS configurations, another panel appears and forces you to choose an installation for *all users of this computer*. Select the item and click on continue.

Then, click *install* to perform the installation.

A new window appears to let you enter your *name* and *password* to begin the installation. Complete the fields and click *Install Software*.



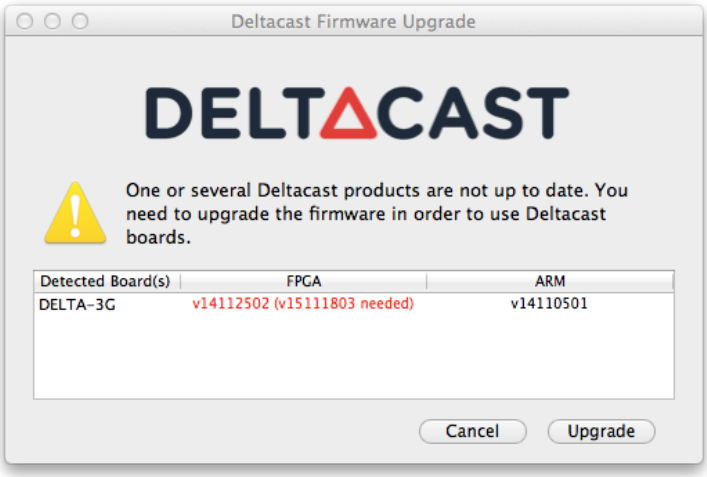
The installer advises you that a restart of the computer is required after the installation. Click *Continue Installation*.



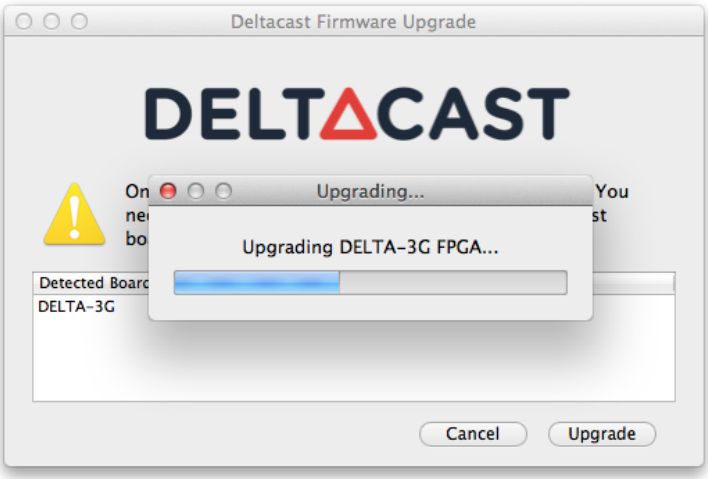
To complete the installation, a new panel appears and asks you to restart the computer. After the restart of the computer, a FPGA upgrade may be required, please follow the instructions described in 3.6.3

3.6.3. FPGA firmware upgrade

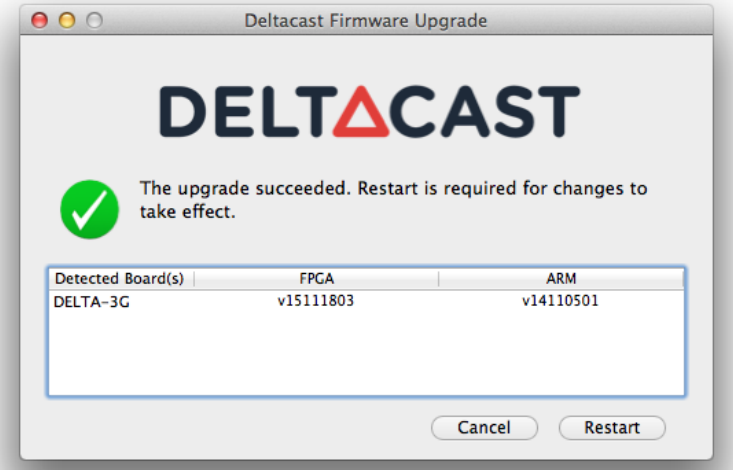
After the installation of a new card or upgrade of its drivers, a FPGA upgrade may be required. If it is, the firmware upgrade application will automatically open at Mac OS startup to allow you to upgrade the firmware.



Then, click upgrade to proceed.



Once the upgrade succeeded, you have to restart the computer.


Deltacast Firmware Upgrade
DELTACAST
The upgrade succeeded. Restart is required for changes to take effect.
Detected Board(s)
FPGA
ARM
DELTA-3G
v15111803
v14110501
Cancel
Restart

4. TROUBLESHOOTING

This chapter contains a series of known issues and solutions.

If you have encountered problems installing or operating one DELTACAST hardware and/or the VideoMaster SDK, browse through this list and locate the most appropriate case. If you cannot find the suitable solution in this list, please browse the DELTACAST web site, which contains an up-to-date troubleshooting section and a FAQ.

⊙ **I cannot insert my DELTACAST card in a PCIe slot**

☞ If you are installing your card in a new PC, PCIe slots may present some mechanical resistance as the card slides into the slot. Press the card strongly but carefully into the slot.

⊙ **My computer will not boot since I installed one DELTACAST device**

☞ The first issue could be that your card is not correctly positioned into its slot. In this case, turn off all power supplies and ensure that the card properly fits into the slot.

☞ Another possible issue is that a cable (IDE cable) or PC component (RAM module) has been accidentally moved and not correctly repositioned during the installation.

☞ The boot failure might be due to a system incompatibility. The DELTACAST devices have been tested on a wide range of up-to-date PC. Make sure your BIOS version is the latest available.

⊙ **After having placed a DELTACAST device in my PC and re-started it, Windows did not prompted me to install a driver**

☞ The first issue could be that your card is not correctly positioned into its slot. In this case, turn off all power supplies and make sure that the card is properly fitted into the slot.

☞ If the card is correctly positioned into its slot, please ensure that it has been at least detected by the Plug and Play of Windows. To achieve this, right-click the *My Computer* icon, select *Properties*, go to the *Hardware* tab and click *Device Manager*. There should be a *Other PCI bridge* entry in the device tree. Right-click this item and select *Install*.

☞ Another possible cause is that you did not log on properly on to Windows. Installing a driver requires Administrator privileges. Please log on using an appropriate account.

⊙ **DELTACAST driver installation failed due to a hardware conflict**

☞ There could be a conflict with another device (such as a network controller). Try re-installing the driver after having removed all other non-essential devices and, once installed, re-install the removed cards.

- **My computer crashes after days and days of perfect running**

☞ Some components on the DELTACAST devices require adequate ventilation. Please ensure that your PC is correctly ventilated.

☞ If your DELTACAST devices are well ventilated, please browse the DELTACAST web site and check for any driver or VideoMaster updates.

- **My Windows application complains about missing DLL**

☞ The VideoMaster SDK installer does not install redistribution libraries. They are necessary to execute application addressing DELTACAST cards, and depend on the underlying operating system. Please refer to the *Installing the VideoMaster libraries* chapter.

- **Under Windows, my application complains about un-sufficient resources during stream start-up**

☞ By default, DELTACAST drivers allocate memory at run time accordingly to application needs. This memory of a particular type is a restricted resource. Depending on other devices memory requirement and/or on memory fragmentation level, the drivers could fail to allocate such memory at runtime. To workaround this problem, some memory pools may be pre-allocated during system start-up. Please refer to the VideoMaster SDK documentation for further help on how to implement memory pre-allocation.

☞ Windows Vista, Windows 2008 Server and Windows 7 implement the SuperFetch functionality to allow faster start-up of commonly used applications. This functionality sometimes causes early memory fragmentation and rapidly prevents DELTACAST drivers from allocating their memory buffers. To solve that problem, disable the SuperFetch service start-up at boot time.

ANNEX A: CONFORMANCE

FCC Notice

Per FCC Part 2 Section 2. 1077(a)

Manufacturer's name :	DELTACAST
Manufacturer's address :	Rue Gilles Magnée 92/6 4430 Ans BELGIUM
Manufacturer's phone :	+32-4-239 7884

Hereby declares the products :

Trade name : DELTACAST

Model numbers :

DELTA-3G-elp 40
DELTA-3G-elp 01
DELTA-3G-elp 10
DELTA-3G-elp 11
DELTA-3G-elp 20
DELTA-3G-elp 11
DELTA-3G-elp 2c
DELTA-3G-elp-key 11

DELTA-3G-elp-key-d 4K
DELTA-3G-elp-key-d 2K

DELTA-3G-elp-d 40
DELTA-3G-elp-d 20
DELTA-3G-elp-d 10
DELTA-3G-elp-d 21
DELTA-3G-elp-d 22
DELTA-3G-elp-d 12
DELTA-3G-elp-d 11
DELTA-3G-elp-d 01
DELTA-3G-elp-d 02
DELTA-3G-elp-d 04
DELTA-3G-elp-d 4c
DELTA-3G-elp-d 8c

DELTA-3G-elp-tico-d 4c

DELTA-hd-elp-d 80
DELTA-hd-elp-d 44
DELTA-hd-elp-d 62

DELTA-hd-e-key 22
DELTA-hd-e-key 11

DELTA-hd-e 22
DELTA-hd-e 21
DELTA-hd-e 12
DELTA-hd-e 11
DELTA-hd-e 20
DELTA-hd-e 02
DELTA-hd-e 10
DELTA-hd-e 01

DELTA-dvi-e 20
DELTA-dvi-e 10
DELTA-h4k-elp 20
DELTA-h4k2-elp 20

DELTA-sfp-elp 1
DELTA-sfp-elp 2

DELTA-ip-ST2022-6 10
DELTA-ip-ST2022-6 01

DELTA-ip-ST2022-6-tico

DELTA-hd10-asi12-e
DELTA-hd11-asi11-e
DELTA-hd20-asi01-e
DELTA-hd10-asi10-e
DELTA-hd20-asi02-e

DELTA-asi-elp 40
DELTA-asi-elp 20
DELTA-asi-elp 10
DELTA-asi-elp 21
DELTA-asi-elp 22
DELTA-asi-elp 12
DELTA-asi-elp 11
DELTA-asi-elp 01
DELTA-asi-elp 02
DELTA-asi-elp 04
DELTA-asi-e 80
DELTA-asi-e 60
DELTA-asi-e 62
DELTA-asi-e 44
DELTA-asi-e 08
A-LTC-1

Conform to the following specifications : **FCC CFR47 Part 15 Subpart B**.

Supplementary Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Notes: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF Interference Warning: This is a Class A product. In a domestic environment this product may cause radio frequency (RF) interference, in which case the user may be required to take adequate measures.

Modifications: Any modifications made to this device that are not approved by DELTACAST may void the authority granted to the user by the FCC to operate this equipment.

ICES-003 Class A Notice - Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

DoC Notices

EU Declaration of Conformity

The following products are in conformity with the relevant Union harmonisation legislation: EU Electromagnetic Compatibility Directive (2014/30/EU), RoHS Directive (2011/65/UE) and are CE-marked accordingly.

Products (Part Numbers)	DELTA-ip-ST2022-6 xx, DELTA-ip-ST2022-6-tico DELTA-3G-elp xx, DELTA-3G-elp 2c, DELTA-3G-elp-d xx, DELTA-3G-elp-key 11 DELTA-3G40-hd40-elp-d, DELTA-3G-elp-d 4c, DELTA-3G-elp-d 8c, DELTA-3G-elp-tico-d 4c DELTA-3G-elp-key-d 4K, DELTA-3G-elp-key-d 2K DELTA-h4k-elp 20, DELTA-h4k2-elp 20, DELTA-sfp-elp x, DELTA-dvi-e xx, DELTA-hd-e xx, DELTA-hd-e-key xx, DELTA-hdxx-asixx-e DELTA-hd-elp-d xx, DELTA-sd-elp-d 80 DELTA-asi xx, DELTA-asi-elp xx A-LTC-1-cd, A-LTC-1, A-LTC-1-lb *where xx is a 2-digit number where x is a 1-digit number
Tested by request of	**DELTACAST.TV** Rue Gilles Magnée 92/6 B-4430 ANS (Belgium)
Manufactured at	**DELTACAST.TV** Rue Gilles Magnée 92/6 B-4430 ANS (Belgium)
Classification	Professional audio, video, audio-visual and entertainment lighting control apparatus
Trade mark	DELTACAST
Type of the equipment	Digital video to PCI-express gateway

For the evaluation of EU 2014/30/EU EMC directive, the harmonized standard listed below were applied:

Emission	Immunity
EN 55103-1:2009	EN 55103-2:2009
EN 55022:2006	EN 61000-4-4:2004
	EN 61000-4-2:1995 + A1:1998 + A2:2001
	EN 61000-4-3:2006 + A1 :2008

Ans, 13th February 2017

O. Roba, General Manager

DELTACAST

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www.deltacast.tv