1. Introduction

The *DsSdk* is an SDK consisting out of set of DirectShow filters for capturing and rendering transport-streams and (3G/HD/SD)-SDI signal with supported DekTec hardware adapters.

A setup program is available for easy installation or upgrading of the *DsSDK* software. The installation package also includes installation support for the **Dta** and **Dtu** device drivers, which are required to run the *DsSDK*.

1.1. DekTec PCI Cards Supported by DsSDK

The *DsSDK* supports the following DekTec PCI cards and USB-2 adapters:

Type	***Description***	***Input Format***
PCI		
DTA-107	DVB-S L-band modulator	DVB-S\S2
DTA-112	ATSC/DVB-T/QAM VHF/UHF modulator	MOD and ASI
DTA-115	Multi-standard VHF/UHF modulator, ASI in+out	MOD and ASI
DTA-124	Quad ASI/SDI Input Adapter	ASI and SDI
DTA-145	ASI/SDI Input+Output, Low-Profile	ASI and SDI
DTA-160	Gigabit Ethernet TS-over-IP + 3 ASI Ports	ASI, SDI and TSoIP
PCI Express		
DTA-2107	Multi-standard L-band modulator	MOD
DTA-2111	Multi-standard VHF/UHF modulator	MOD
DTA-2136	Dual QAM-A/B/C receiver	QAM-A/B/C
DTA-2137	Dual DVB-S/DVB-S2 receiver	DVB-S/S2
DTA-2138	DVB C2/T2 receiver	DVB-C/C2 and DVB-T/T2
DTA-2139	Twelve-channel QAM Receiver	QAM-A/B/C
DTA-2144	Quad ASI/SDI Input+Output Adapter	ASI and SDI
DTA-2145	ASI/SDI Input+Output, Low-Profile	ASI and SDI
DTA-2152	HD-SDI Input + Output Adapter	(HD-)SDI
DTA-2154	Quad HD-SDI Input + Output Adapter	ASI and (HD)-SDI
DTA-2160	Gigabit Ethernet TS-over-IP + 3 ASI Ports	ASI, SDI and TSoIP
DTA-2162	Dual GigE ports	TSoIP
DTA-2174	Quad 3G-SDI Input + Output Adapter	ASI and (HD)-SDI

USB-2		
DTU-225	FantASI ASI/SDI Input	ASI and SDI
DTU-234	VSB/QAM-B receiver	ATSC and QAM-B
DTU-235	DVB-T measurement receiver	DVB-T
DTU-236	QAM measurement receiver + ASI input	ATSC and QAM-A/B/C
DTU-245	FantASI ASI/SDI Input+Output	ASI and SDI
USB-3		
DTU-351	HD-SDI Input Adapter	(HD-)SDI

1.2. Files

The `DirectShowSDK.zip` archive contains the following files:

`DirectShow SDK SetUp.exe`	Setup program that installs the ***DsSDK*** and the **Dta** and **Dtu** device drivers
`DirectShow SDK Installation.pdf`	This document

The setup program includes the following modules:

`DtCaptureAudio32.ax` `DtCaptureAudio64.ax`	`V2.0.38`	32- and 64-bit audio capture filter for use with (SD/HD/3G)-SDI inputs
`DtCaptureTs32.ax` `DtCaptureTs64.ax`	`V2.0.38`	32- and 64-bit capture filter for use with transport-stream inputs
`DtCaptureVideo32.ax` `DtCaptureVideo64.ax`	`V2.0.38`	32- and 64-bit video capture filter for use with (SD/HD/3G)-SDI inputs
`DtRendererAudio32.ax` `DtRendererAudio64.ax`	`V2.0.38`	32- and 64-bit audio renderer filter for use with (SD/HD/3G)-SDI outputs
`DtRendererTs32.ax` `DtRendererTs64.ax`	`V2.0.38`	32- and 64-bit renderer filter for use with transport-stream outputs
`DtRendererVideo32.ax` `DtRendererVideo64.ax`	`V2.0.38`	32- and 64-bit video renderer filter for use with (SD/HD/3G)-SDI outputs
`SDK\Lib, SDK\Include`	`V2.0.38`	C++ library and include files for DirectShow filters
`Dta`	`V4.14.6`	Device driver system file for PCI/PCIe cards
`Dtu`	`V4.8.2`	Device driver information file for USB-2/USB-3 devices

2. Installing the Software

The *DsSDK* setup program is self-contained. Installing the monitor software and the device driver is as simple as running the setup executable (`DsSDK SetUp.exe`) and pressing "Next" a few times.

2.1. System requirements

Before installing the application first check if the used PC meets the system requirements for *DsSDK* as found in the table below.

OS	Windows XP/2k3/Vista/7/8/8.1	
Processor	Core Duo@2.0GHz*, Core 2 Duo@1.7GHz*	NOTE: Core 2 Duo is required for use with DTU-2xx/3xx devices
Memory	1024MB	
Graphics	PCI Express graphics card, with full DirectX 9 support	

* Or equivalent AMD processor

2.2. Operation of the Setup Program

The setup program copies the *DsSDK* executable to the `DsSDK` sub-directory in `C:\Program Files\DekTec\`. A shortcut to "DsSDK" is created in the Start Menu and optionally on the Desktop.

The **Dta** and **Dtu** device-driver files are copied to `C:\Program Files\DekTec\Drivers`. Thereafter, setup instructs the Windows 2000/XP/2003/Vista/Win7 Plug'n Play manager to install the device driver.

Notes

- You can omit installation of the **Dta** and/or **Dtu** device driver by deselecting the check box "Install the Dta device driver" and "Install the Dta device driver" respectively.
- A Windows 2000/XP/2003/Vista/Win7 device driver can only be installed by a user account with the privilege to *load and unload device drivers*, e.g. administrator.

The software can be installed *after* the device has been inserted into / connected to the system (§2.3), or *before* the hardware is inserted / connected (Pre-Installation, §2.4). Both approaches are equally valid.

2.3. Hardware Installed Prior To Software Installation

This scenario assumes that:

- The **Dta** and **Dtu** device driver software has not been installed before on the PC, and
- A DekTec PCI card has been inserted into the PC or a USB adapter has been connected to the PC.

Sometimes after booting the PC, the **Found New Hardware Wizard** will show up. As no device-driver software has been installed yet, you should **CANCEL** the wizard.

You can now run `DsSDK SetUp.exe` to automatically install the monitor software and the device driver. After the installation completes, the software can be used immediately. No reboot is required.

2.4. Pre-Installation: Software Installed without Hardware Present

This scenario assumes that:

- No previous version of the **Dta** or **Dtu** device driver software has been installed on the PC, and
- No DekTec PCI card is present in the PC, and no DekTec USB device is connected to the PC.

You can pre-install the software by running `DirectShow SDK SetUp.exe`.

Then, shut-down the computer and insert the DekTec PCI card in a free PCI slot, or connect the USB device to the PC. After powering up the computer again, the device driver should install itself just after booting. On Windows XP, the **Welcome to the Found New Hardware Wizard** will show up. Choose **Install the software automatically (Recommended)**. Press **Next** and **Finish**, and the driver installs.

The monitor software is now ready for use.

2.5. Upgrading

The setup program can also be used to upgrade the *DsSDK* Monitor software and the **Dta** / **Dtu** device driver to a new version in one go. Again, no reboot should be required.

3. Troubleshooting

3.1. Checking Device Status in the Device Manager

The Windows-2000/XP/2003 device manager can be used to check whether the Dta or Dtu driver runs properly. To check the device status of a DTA-1XX or DTU-2XX adapter:

1. Open the Windows-2000/XP/2003 device manager: right-click **My Computer**, select **Manage**, and go to **Device Manager** under **System Tools**.
2. Locate the DekTec adapter in the device category **Professional audio/video interfaces**.
3. Right-click **DTA-1XX** or **DTU-2XX**, select **Properties**, and check the **Device status** pane.

The status should be: This device is working properly. If not, don't try the Windows-2000/XP/2003 Troubleshooter (it does not know anything about DekTec devices), but inspect the event log (§3.2) and the install log (§3.3). If the computer does not boot, please review §3.4.

3.2. Checking the Event Log

The System Event Log can be consulted to check whether the **Dta** and/or Dtu device driver has been loaded and started properly. To open the System Event Log:

1. Right-click **My Computer**, select **Manage**, and open **Event Viewer** under **System Tools**.
2. Select the **System** log.
3. Dta driver messages have `Dta` in the **Source** column;
   Dtu driver messages have `Dtu` in the **Source** column.

If the driver loads successfully, the following event message is logged:

The Dta driver (Rev 4.14.6.205) has loaded successfully.

Or The Dtu driver (Rev 4.8.2.65) has loaded successfully.

The device-driver version listed in this message should match the `Dta`/`Dtu`-version number listed in the file overview in §1.2.

For each DekTec PCI card inserted in the system, a start-up message listing PCI-Card Type, Firmware Version and Slot Number is logged, e.g.:

The DTA-145 (Firmware Version 3) in PCI Slot 3 has started successfully.

Obviously, if the Dta driver detects an error while trying to start the PCI-Card, the message above will not occur. Instead, an error message is logged, which may be helpful to find the source of the problem.

For each USB device connected to the system, a start-up message similar to the PCI-card start-up message will be logged.

3.3. Checking the Device-Driver Install Log

The device-driver install log is a text file (`DtDrivInstall.log`) written into `C:\Program Files\DekTec\Drivers` (or a redirected path). In case of installation troubles, please contact DekTec at support@dektec.com, attaching the install log.

3.4. PC Does Not Boot

In some exceptional cases, inserting a DekTec PCI card into a PC may stop that PC from booting. The PC may already be suspended in the BIOS start-up sequence. Assuming that the PC does boot when the DekTec PCI card is not inserted, this may be caused (1) by a broken PCI card, or (2) by a bad contact on the PCI bus.

3.4.1. Broken PCI Card

Whether or not the PCI card is broken can be checked just after powering up the PC, by observing the LED on the PCI bracket of the card[1]. If the LED stays blank (does not flash), the PCI card is probably broken and should be returned to DekTec for repair.

3.4.2. Bad Contact on PCI Bus

From practical experience it is known that the PCI Bus is quite sensitive to dust or grease on the PCI-connector fingers of a PCI card. A single bad contact may lead to system instabilities, including:

- Boot failure;
- Invisibility of a PCI card during installation;
- System crash at the moment that the Dta device driver starts.

If one of these symptoms occurs, DekTec recommends extracting the DekTec PCI card, checking/cleaning the connector fingers and re-inserting the card, if possible in a different PC or in a different PCI slot, and avoiding mechanical strain on the PCI connector. If the problem persists, please contact DekTec at support@dektec.com

[1] Most DekTec PCI and PCIe cards have a LED on the PCI bracket. Cards without LED cannot be checked easily.

4. DTC-335 DsSDK Revision History

Revision	Date	Changes
v2.0.38	2015.11.04	All filters: • Fixes crash with DTA-2174 when using Dta driver version V4.14.0 or newer
v2.0.37	2015.02.17	Video Capture Filter: • Fixes issue with auto detection of 525i59.94 signals • Fixes missing version page Audio Capture Filter: • Fixes glitches in the audio when a with fractional input signal is applied
v2.0.36	2014.05.26	All filters: • Made sure last used settings are persistently stored in registry • Build against Feb2014 SDK release Video Capture Filter: • Add HANC output pin • Detection more reactive • Fixed compatibility issue with VLC • Add support for DTA-2174 Audio Capture Filter: • Add support to extract specific stereo pairs when filter is configured in two channels output Video renderer filter: • Add support for DTA-2174
v2.0.35	2014.05.08	All filters: • Roll-back (HKEY_LOCAL_MACHINE to HKEY_CURRENT_USER). Because applications which are running without admin rights could not use registry Video capture filter: • Support for display aspect ratio • Better handling of video formats and output pins connection/reconnection • Fix properties page dirty behavior Audio capture filter: • Fix properties page dirty behavior • Few small bug fixes TS renderer filter: • Add roll-off for DVB-S2 • Moved transmission code to separate thread, for improved stability TS capture filter: • Updated IDtCaptureRfCfg interface with support for RF statistics more modulation standards
v2.0.34	2014.02.10	Video capture filter • VANC output pin media is always v210 (10-bits) regardless video output media • Update signal detection to handle DTA-2154 Video renderer filter:

		• Check fractional IO configuration to handle DTA-2154. • TS capture filter : Fix for MER, SNR and BER statistics always returning with a value of 0.0dB
v2.0.33	2013.12.10	TS capture filter: • Fix failure to configure the 160/2160/2162 IP port as input; result was that filter failed to load for these cards
v2.0.32	2013.11.15	TS capture filter: • Fix failure to tune a DTA-2137
v2.0.31	2013.10.31	Video capture filter: • Increased timeout for black-frame insertion
v2.0.30	2013.10.28	Audio capture filter: • Update thread priority to THREAD_PRIORITY_HIGHEST • Now supports 32-bits output for 1 to 16 channels TS renderer filter: • Fix hang on stop • Fix use with DTAPI_TXSTUFF_MODE_ON Video capture filter: • Update thread priority to THREAD_PRIORITY_HIGHEST • Fix port attachment if already in use • New feature : Auto detect button (Property page & interface) Video renderer filter: • New output process (Start/Stop sending on CompleteConnect/BreakConnect). • Repeat the last picture in pause mode. • Better handling of A/V discontinuities and audio communication. • Fix port attachment if already in use. • Disable 3G-SDI modes (Minor fix). • Fix DTA-2152 start behaviour (DTAPI 5.2.2.26)
v2.0.28	2013.02.26	Audio capture filter: • Fix SD-SDI 24 bits audio decoding Video capture filter: • Fix underflows on high CPU frequency
v2.0.27	2013.02.04	All filters: • Added "32" as suffix to the name of the 32-bit versions of filter and "64" suffix for the 64-bit versions • Fixed fault 8 bits to 10 bits conversion routines
v2.0.26	2013.	All filters: • Add __declspec (uuid(...)) declaration for interfaces • Fix audio behaviour when no video frame is available • Now support old SDI equipment using 8-bit (0x000 0x3fc 0x3fc) • Now support v210 input format TS renderer filter: • Minor fixes around DVB-S/S2 property settings TS capture filter: • Fix default values load (cases where regsvr32 is not used) Video capture filter: • Fix VIDEOINFOHEADER2 interlaced formats Video renderer filter:

		• Fix audio embedding process in interlaced formats
v2.0.25	2012.10.05	All filters: • Change registry location, move from HKEY_CURRENT_USER to HKEY_LOCAL_MACHINE Video capture filter: • Fix SetFormat behaviour on the output pin Video renderer filter: • Auto-restart, output process, on A/V underflows
v2.0.24	2012.10.02	Audio capture filter: • Fix output buffer size according channels number
v2.0.23	2012.09.28	Audio Capture Filter: • Add missing 14-channels mode