IDEA 3.4.4 Readme File

README for Foresight Imaging IDEA V3.4.416, Apr 1 2020
This release is provided as an online download or on a single CD for both Windows 7 and Windows 10 32 bit & 64 bit operating systems.

IDEA v3.4.4 for 32 Bit & 64 bit OS, CD part number: 042700-344

Uninstall previous versions of IDEA prior to installing version 3.4.416

Please note that product documentation is provided in electronic format only.
You will need the Adobe Acrobat Reader version 8.0 or higher to view the documentation.
Adobe Acrobat can be downloaded at either:
www.adobe.com or www.fi-llc.com

The IDEA software and hardware installation manuals are located on the CD and in the **C:\Program Files\Foresight\IDEA\Doc** directory (after installation) as SDK_Manual.pdf & Install_Manual.pdf.

A demonstration version of the Accusoft / Pegasus Imaging MJPEG codec is included for use with the example programs.
For information on licensing this software, please go to:
https://www.accusoft.com/products/picvideo-m-jpeg-codec/overview/

IDEA Active X Demo Using Visual Basic, StreamCap and IDEA API Example Program are the three example programs recommended for use to evaluate the full functionality of the frame grabbers and video streamers. They are included in:
Start || Programs || Foresight || Demos.

VideoTest is a test program to verify the system's ability to create a live direct draw surface for display.   For Windows 7 32 bit installations only:
Start || Programs || Foresight || Demos

StreamCap is the demonstration program recommended for use of the WDM driver.
It is located in the C:\Program Files\Foresight\idea\Demo\Bin folder.

Note: Video for Windows is for windows 32 bit only.

Recommended WDM capture software:
An excellent WDM recording software program, Debut Video Capture application is available from NCH Software. With the IDEA WDM driver and this software, streaming video to disk is accomplished in a matter of minutes. For information and downloading,
go to: http://www.nchsoftware.com/capture/index.html

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*********  Release Notes  ********
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IDEA 3.4.416 is a full release package which supersedes IDEA 3.4.414 and all previous IDEA versions.
-Note: the full IDEA revision information is available under Windows Control Panel, 'Programs and Features' or 'Add or Remove Programs'

IDEA 3.4.416 Changes:

AutoSYNC:

- Aspect Ratio Tool settings are saved across sessions.

- Input selection dialog is not shown if there is only 1 active input.

- Input selection dialog remembers last choice.

- Color mode selection dialog remembers last choice.

DirectShow::

- Made "don't show error dialogs" the default setting. Error dialogs can be turned back on in the Capture Filter properties dialog.

CHP Files::

- Added European HDTV formats to the VideoFormats\HDTV folder.

Installer:

- Default installation does not include SDK.   SDK feature must be selected at installation time. Silent install does not include SDK.

- Install_IDEA.exe install launcher has been updated to allow several installation options. There are .bat files to show how to use them.

  Command Line **Parameters**:

  Passing no parameter will launch setup.exe then Install_IDEA will exit to get out of the way.

  silent – calls setup.exe with /s /wait_clone, generates log files in the users temp folder c:\Users\User\AppData\Local\Temp.

  hide – makes launcher window invisible. can be combined with silent and uninstall.

  record – creates/overwrites setup.iss in the 64\Scripts folder (32\ if 32 bit o/s). Use this only if silent option is not working for you.

  uninstall - uninstalls currently installed instance of IDEA.

  To run Install_IDEA from inside an application use "start /wait Install_IDEA.exe silent".

IDEA 3.4.414 Changes:

DirectShow::

- Fixed a problem where the DirectShow driver did not release a board claim until the application using it was closed. Caused unexpected
  board in use messages.

AutoSYNC:

- With DVI/HDMI video sources, three separate monochrome channels are now created: CA1, CA2 & CA3.

(In 3.4.411 & 3.4.412, only CA1 monochrome was created corresponding to the RED channel).

Installer:

- Installer does a full uninstall if a previous IDEA version is found.

General:

- Fixed error in the 32 bit API DLL where addresses above 2G would cause a lock error to occur during eHD_LiveStreamInit() on a 64 bit system .

IDEA 3.4.412 Changes:

General::

- Fixed a problem that caused streaming to become and stay erratic when CPU load nears 100%.

IDEA 3.4.411 Changes:

WDM AVStream driver:

- Fixed a problem that on rare occasions caused a blue screen crash during streaming.
- Added more exception handling to allow driver to shut down streaming if a user application exits without stopping streaming properly.

AutoSYNC:

- Added circle matching tool to assist in the image tuning process of Fluoroscope video where AutoSYNC is not able to determine the pixel frequency.

ActiveX control:

- Corrected problems changing contrast and brightness through the API.
- Added a Dialog Action Event AOI_DIALOG_NOTIFY for Area Of Interest changes made through the AOI property page..

General:

- Fixed error in Auto Format Detection to prevent a YPbPr file from being used for an RGB signal.

IDEA 3.4.410 Changes:

Driver for Windows 10 Secure Boot:

For Windows 10 the setup.exe will install the driver from the "Driver - Win10 Secure Boot" folder on the installation media.

For Windows 7 the driver from either \64\Drivers or \32\Drivers will be installed.

API Additions: Contact Foresight for more information.

- eHD_AutoDetect()
- eHD_SetInfoEvent()
- eHD_ResetInfoEvent()

IDEA 3.4.409 Changes:

WDM AVStream driver:

- Fixed a problem that caused a blue screen crash during streaming.

IDEA 3.4.408 Changes:

WDM AVStream driver:

- Fixed a problem where in some applications the frame rate control code caused a blue screen crash.

StreamCap DirectShow Demo:

- Disabled Preview live video when showing properties dialog to prevent crash when format changes..

IDEA 3.4.408 Known Issues:

APIDemo.net:

- Uses old AVI 1.0 methods to write a video file. May produce distorted video on Windows 10. Will be fixed in a later release.

IDEA 3.4.407 Changes:

ActiveX control:

- Snap cancel fixed to prevent lockup on trigger event occurring after a snap is cancelled.

WDM AVStream driver:

- Added frame rate control to both the capture and preview pins.

StreamCap DirectShow Demo:

- Added frame rate control to both the capture and preview pins settings.

General:

- Added detection for HDMI and DVI Pixel Repetition Mode when pixel clock rate is multiplied because
pixel rate is too low for TMDS signaling.

IDEA 3.4.406 Changes:

AutoSYNC:

-With DVI video sources, three separate monochrome DVI channels are now created: CA1, CA2 & CA3. (Previously, only CA1 monochrome was created).

General:

-When switching from a Digital to Analog source, the analog capture would result in black or corrupted images, this is now resolved. (Applies to AccuStream Express 170 & AccuStream 170+ only)

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IDEA 3.4.405 Changes:

General:

DVI/HDMI Hot-plug detect "AlwaysOn" added as an option for HD+ and HD+C boards. This will prevent problems seen in some DVI/HDMI splitters where Hot plug detect reacts very slowly to input changes.

HD+C codec firmware corrected to include CPB (Coded Picture Buffer) delay setting.

Foresight 1920x1080.dat EDID file video timing corrected.

HD+C automatically inserts "No Video" message into stream on loss of sync.

Corrected some initialization timing problems seen on new systems especially running Win 10.

Added exception handling to DirectDraw and Direct2D buffer handling to prevent crash if surface memory address goes invalid while displaying live video.

WDM Capture Driver:

Added Streaming triggered start.

Resolved an issue where if the video source was disconnected and reconnected while capture image trigger was enabled and active live video display would not display upon video reconnection.

ActiveX control:

Improved handling for live video recovery after returning from Windows Screen Saver or Login screen.

IDEA 3.4.3 Changes:

General:

Windows 10 Support

HD+C will continue streaming a "No Video" message frame when the video signal is removed, if enabled to do so.

When the IDEA release contains new Gate Array programming files, as this one does, you will no longer have the option to skip updating. After the flash memory programming is completed the system must be powered off and back on again for the update to take effect. The power off/on is now required because many newer systems will either blue screen crash or disable the mapping of the board's register area if the PCIe interface gets disabled, which happens when the gate array loads from flash memory. The mapping will not get re-enabled until the next power on.

Minor improvements for the Accustream 170+ and AccuStream Express 170 on recovering from signal loss/re-connection on some DVI formats.

Board Gate Array Firmware changes:

Correct sync decoding where composite sync is generated by Exclusive OR of H & V syncs, on the Express family of boards. Addition of "No Video" handling in HD+C.

Driver:

Better handing of low memory conditions which can happen if Virtual Memory is disabled. In some cases, this condition caused a system crash in previous versions.

WDM Capture Driver:

Improvements to AVStream capture to be compatible with more DirectShow applications and WebRTC.

Sync status indicator made more reliable.

CHP changes:

Addition of VideoWidth and VideoHeight parameters to define the width and height of the full video signal when ImageWidth and ImageHeight are used to define an area of interest. This is needed for the HD+C board to continue delivering a video stream when there is no video signal connected.

AutoSYNC:

Added Image Rotation control for all signals and Clamp position adjustment for analog signals.

IdeaAVI DLL:

Retains compatibility with previous versions but adds the capability to instantiate an IdeaAviFile object to allow multiple boards to have their own instance of the AVI file writer.

Create a new instance using:

CIdeaAviFile* CreateInstance(CWnd* pParent)

IdeaAviMP DLL is deprecated but included for legacy compatibility

MultiBoard Demo:
Changed to Use IdeaAVI DLL instead of IdeaAVIMP DLL.

API Changes:

Structure and parameter changes. See hpd_lib.h in the Idea\include folder.

Structure members added to the LIVESTREAM_INFO structure.
API detects new structure from increased structure size, dwSize must be set properly.

DWORD dwTriggerStartFrameDelay   Frames after start trigger where capture starts

DWORD dwTriggerStopFrameDelay   Frames after stop trigger where capture stops

HD+C now responds to changes in H.264 Profile and Level where "Auto" was the only setting available on previous versions.

Profile can be "HIGH", "MAIN" or "BASELINE"

Level can be from 1 to 4.2. Depends on resolution rate. See a description online of H.264 levels.

To enable HD+C to continue streaming a "No Video" message frame when the video signal is removed:

```
DWORD dwValue = 1;  // 0 to disable
eHP_SetControlValue(BoardHandle, "InsertMessageFramesOnLossOfVideo",
sizeof(DWORD), &dwValue);
```

To force HD+C to show the "No Video" message frame:

```
DWORD dwValue = 1; // 0 to return to normal
eHP_SetControlValue(BoardHandle, "ShowMessageFrame",
sizeof(DWORD), &dwValue);
```

To get information about the currently connected video signal:

```
SIGNAL_INFO SignalInfo;
memset(&SignalInfo, 0, sizeof(SignalInfo));
SignalInfo.dwInfoSize = sizeof(SignalInfo);
SignalInfo.dwMode = 1;
eHP_GetControlValue(g_BoardHandle, "CurrentSignalInfo",
sizeof(SIGNAL_INFO), &SignalInfo);
```

To get information about the signals connected to all the video inputs:

```
SYNC_INFO SyncInfo;
memset(&SyncInfo, 0, sizeof(SYNC_INFO));
SyncInfo.dwInfoSize = sizeof(SYNC_INFO);
eHP_GetControlValue(g_BoardHandle, "SyncInfo", sizeof(SYNC_INFO), &SyncInfo);
```

ActiveX control:

Live video display restarts after desktop switch or resolution change.

IdeaDemo:

Live video display restarts after desktop switch or resolution change.

IDEA 3.4.2 Changes:

Driver changes:

        Corrected error in DMA buffer unlock where a zero pointer caused a blue screen crash.

IDEA 3.2.1 Changes:

CHP changes:

        Rotate command added to the I-RGB section. Values = None, Left, Right

API changes:

        Structure and parameter changes. See hpd_lib.h in the Idea\include folder.

        Structure members added to the COMPRESSION_INFO structure.

                API detects new structure from increased structure size, dwSize must be set properly.

                        szH264GopStructure, values = IBBP, IBP, IPPP

                        bH264OpenGoop, values = FALSE, TRUE.

                        bH264DisableTimebaseCorrector, values = FALSE, TRUE.

                        dwH264CodedPictureBufferDelay, values = 50 – 500 (milliseconds)

                dwOutputFrameRate now functioning.

                Minimum compression DMA buffer size reduced from 4096 to 1024 bytes.

        HPR_FLAGS_ROTATE_LEFT & HPR_FLAGS_ROTATE_RIGHT added to HPR_FLAGS member of RSET

        HDXFR_PIXEL_BGR888_24, HDXFR_PIXEL_BGR888_32 & HDXFR_PIXEL_BGR555_16 pixel types added to all transfer calls.

ActiveX control:

        Common Configuration for All Users checkbox added to configuration dialog. Previously configurations were saved only on a per user basis. This allows one configuration regardless of user login.

        Target Frame Rate control added to Configuration Streaming tab. Allows precise output frame rate control.

        Parameters added to H.264 Configuration:

                Timebase corrector disable. Enabled is recommended. Disable control provided in case an encoding timebase problem is suspected.

                GOP type, Open or Closed – Closed is default.

GOP structure, IBBP, IBP and IPPP – IBBP is default

Coded Picture Buffer Delay, 50ms – 500ms – 100ms default

DirectDrawCopy added to Live Video type to allow DirectDraw emulation on Windows 7 and above with systems that don't support hardware DirectDraw support.

All parameters saved to the registry on a using PCI slot number rather than board serial number.

Record Audio to WAV file.

New Properties:

long   H264OutputFrameRate

long   StreamingFrameRate (AVI and memory)

boolean H264TimebaseCorrectorEnable

boolean H264OpenGop

long   H264CodedPictureBufferDelay

BSTR   H264GopStructure

New Methods:

long   GetTriggerState()

boolean StreamToMemoryAtRate(long FrameCount, long Flags, long, StartEvent, long PauseEvent, long CancelEvent, long* MemoryHandle, long FrameRateX100)

boolean StreamToAviAtRate(long FrameCount, long Flags, long, StartEvent, long PauseEvent, long CancelEvent, long* MemoryHandle, long FrameRateX100)

boolean StreamToDicomAtRate(long FrameCount, long Flags, long, StartEvent, long PauseEvent, long CancelEvent, long* MemoryHandle, long FrameRateX100)

Autosync changes:
Temperature measurement added to About dialog box.
MultiBoard Demo:
Added ability to record separate AVI file or MPG file per board, up to 4.
WDM driver:
Added frame rate control to output pins.

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INSTALLATION:

- To install IDEA 3.4.416 on a system:

Un-install any previous versions of IDEA in Windows Control Panel, Add/Remove Programs.

Run the **Install_IDEA**.exe file in the root directory.

Follow the prompts to complete the installation.

NOTE: Upon installation, if the following error message occurs:

"Windows cannot verify the digital signature for the driver required for this device"

Install this Windows update to allow SHA256 certificates on Windows 7.
https://technet.microsoft.com/en-us/library/security/3033929

UPGRADING Applications to IDEA 3.4.416
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* IDEA 3.4.416 is compatible with IDEA 3.4 so it is possible to update a system without recompiling your IDEA 3.4 application. It is recommended to uninstall IDEA 3.4 and install 3.4.416 since many components, including board firmware files, may have been changed.

* If your application is based on an earlier version of IDEA it must be recompiled and re-linked using the new IDEA 3.4.416 libraries, header files, & OCX wherever applicable.
* Updating only the IDEA DLL's and drivers from a pre-3.4 release without rebuilding the application may result in unstable operation.

Supported:
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* Windows 10 All Editions, Windows 7 All Editions.

* Foresight Imaging frame grabbers and video streamers:
  AccuStream 170+, AccuStream 75+, AccuStream 50+
  AccuStream 205a, AccuStream 75a, AccuStream 50a
  AccuStream Express 170, AccuStream Express 75, AccuStream Express 50
  AccuStream Express HD+, AccuStream Express HD 75+, AccuStream Express SD 50+
  AccuStream Express HD+C, AccuStream Express HD 75+C, AccuStream Express SD 50+C
* DVI-D Single link signals only, (DVI-D Dual link is not supported)

CONTENTS:
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This CD-ROM or file download contains:
* IDEA 3.4.4 SDK and Demo files in the setup directory
* AutoSYNC video configuration & measurement tool
* The IDEA installation and SDK manuals in PDF format
* Pegasus compression software for streaming to disk demo (AVI file creation)
* A Video Test program for verification of VGA display modes.
* VidCap32 application program as an example for running the Video for Windows driver (32 bit only).
* StreamCap application program an example to stream large video files.
* The unpacked IDEA library contains the IDEA software, Demos, Documents, and Windows Drivers.

Updates to Documentation
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The included documentation is for the V3.4.4 software release. Additions to functionality are documented above in the **Important Changes** section.

MINIMUM SYSTEM REQUIREMENTS:
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* Intel Core processor or better
* Windows 7 or Windows 10
* Memory: minimum 512 MB
* Appropriate video source
* High quality input video cabling
* 32 bit PCI bus, PCI-64/66 PCI bus, or PCIe x4 bus
* Administrator rights are required to install the IDEA SDK & software.

*** Note: For RGB signals, please ensure that the cable lengths are identical for all connections.
     A bundled RGB and sync cable is recommended.

Other Notes:
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1) The DirectX SDK (available from Microsoft) must be installed to recompile and build the VideoTest application.

2) The Accusoft / Pegasus Compression CODECS are available at
https://www.accusoft.com/products/picvideo-m-jpeg-codec/overview/

3) For AVI file playback, the latest version of Windows Media Player is available at:
https://www.microsoft.com/en-us/search/result.aspx?q=windows+media+player,
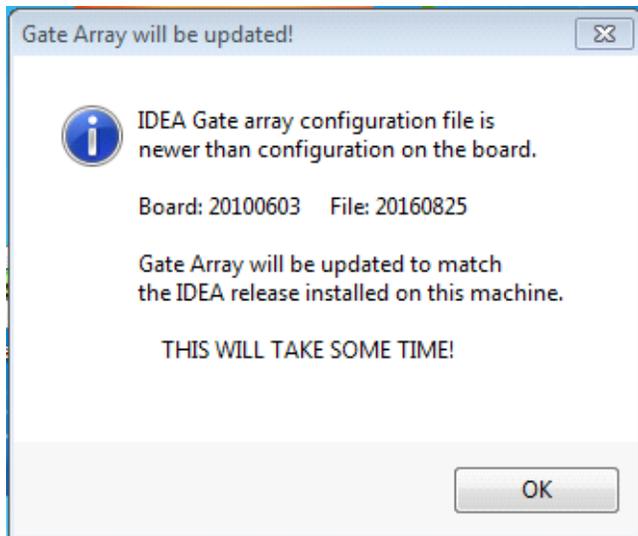Virtual Dub: http://www.virtualdub.org, VLC: http://www.videolan.org

Gate Array Messages:
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-The gate array firmware on the AccuStream Express, AccuStream HD+ & AccuStream HD+C series of boards comes programmed from the factory.
-This gate array firmware can be updated in the field on new IDEA software updates.

-Upon invoking an IDEA application, an "**IDEA Gate array configuration**" message may appear, similar to:

Gate Array will be updated!

IDEA Gate array configuration file is
newer than configuration on the board.

Board: 20100603   File: 20160825

Gate Array will be updated to match
the IDEA release installed on this machine.

THIS WILL TAKE SOME TIME!

OK

This is not an error message, but an indication the programmed firmware on the AccuStream board is not the same version as the files in IDEA software.

The revision is in a date format of **YYYYMMDD.**

-If the BOARD revision is *older* than the FILE version it indicates:
a. A new version of IDEA was recently installed on an older system, or,
b. An older AccuStream board was installed in a newer system.

The recommended action is to update the board to the newest Gate Array firmware file by selecting: OK, and following the prompts.
-**DO NOT** shut down or abort the update while in progress.
-Once the update is complete. Power down the system completely, and reboot the system.

-If the BOARD revision is *newer* than the FILE version it indicates:
a. A new AccuStream board was recently installed on an older system, or,
b. An older AccuStream board was installed in a newer system.

The recommended action is to update the IDEA software to the newest revision.
Or, if not practical / feasible to update IDEA software revision, to eliminate the mismatch Gate array message, replace the existing older gate array firmware files, with the latest IDEA files.
-Updating the files will eliminate the dialog message, and preserve the latest board firmware.

-Only the specific board files need to be replaced.
-The files are located at the default location of:
C:\Program Files\Foresight\IDEA\Iseries directory.
The specific files are:
AccuStream Express board series: AccuStreamExpress.JBC
AccuStream HD+ board series: AccuStreamExpressHD.JBC
AccuStream HD+C board series: AccuStreamExpressHDC.JBC

It is not recommended to downgrade the newer board revision unless IDEA software or file updates are not allowed.
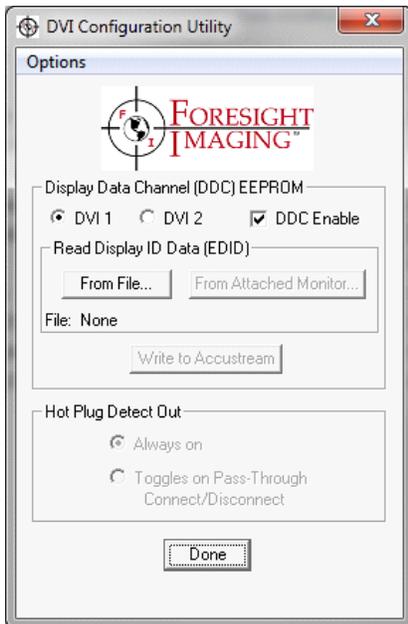
Please contact Foresight support BD-SUPPORT@fi-llc.com, 978-458-4624 x244 for additional information.

DVI EDID Programming:
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In DVI mode, the AccuStream boards act as a destination device, similar to a standard DVI LCD / Monitor. As such, the AccuStream communicates with the DVI or HDMI source using EDID (Extended Display Identification Data). The default native AccuStream EDID resolution parameters can be changed with an included IDEA EDID utility.
-To invoke the EDID program, go to:
  C:\Program Files\Foresight\IDEA\Utilities
-Run the **DVI_Config.exe** program.
-Select the interface, DVI 1 or DVI 2 (HDMI input).
-Select "FROM FILE",
-Choose the desired default native resolution from the selections.

Video Streaming:
============
* Video stream rates are dependent on several factors beyond the AccuStream board.
* The AccuStream boards can run in PCI 32 & 64 bit slots.
* The AccuStream Express boards can run in PCIe x4, x8 and x16 slots.
* For fastest stream rates and data transfers, PCIe is recommended.
* System processor, memory & disk speed all contribute to transfer rate speeds.
* Below are transfer rates to memory on "typical" PCI 32 & PCI 64 bit machines that perform at

125 MB/second transfers,
   and 250 MB/second transfers respectively, as well as performance on "typical" PCIe x4
systems (500-700MB/s).
   Your performance may vary on slower machines.

RESOLUTION	STREAM to MEMORY (32 bit PCI Bus)	STREAM to MEMORY (64 bit PCI bus)	STREAM to MEMORY (PCIe x4 bus)
1600x1200x60	15 fps	20 fps	60 fps
1280x1024x60	30 fps	60 fps	60 fps
1024x768x60	30 fps	60 fps	60 fps
1920x1080x30	15 fps	30 fps	30 fps
1920x1080x60	15 fps	30 fps	60 fps

 * For fastest video streaming, use computers with a PCIe x4 bus or higher,
   1GB of more memory and a SATA Raid striped disk or SSD sub-system is recommended for best
    performance when streaming to disk.   Or for best performance, use the real-time hardware
compression
of the AccuStream Express HD+C boards for high quality streaming video at bit rates from 2-30 Mbps,
taking
up very little disk space and bus bandwidth.

Part numbers:
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IDEA disk, P/N 042700-344

AccuStream 205a   032000-100
AccuStream 75a   032000-175
AccuStream 50a   032000-150

AccuStream 170+   033000-100
AccuStream 75+   033000-175
AccuStream 50+   033000-150

AccuStream Express 170   034000-100
AccuStream Express 75   034000-175
AccuStream Express 50   034000-150

AccuStream Express HD+   035000-100
AccuStream Express HD 75+   035000-175
AccuStream Express SD 50+   035000-150

AccuStream Express HD+C   036000-100
AccuStream Express HD 75+C   036000-175
AccuStream Express SD 50+C   036000-150

All boards are ROHS compliant

Typical **maximum** video capture formats:
See our product selection chart at: http://www.fi-llc.com/boards/ProductsSelectionChart.php

AccuStream 205a   - Analog only,
                           - VGA 1600x1200x75 (202.5 MHz)

All 170 series (incl HD+) - Analog & DVI,
                           - VGA 1600x1200x60, 1900x1200x60, (162 MHz),
                           - HDTV 1080p60 (148.5 MHz)

All 75 series   - Analog & DVI ,
                           - VGA 1024x768x70 (75 MHz),
                           - HDTV 1080i30, interlaced (74.25 MHz), 720p60 (74.25 Mhz)

All 50 series   - Analog & DVI,
                           - HDTV 480p60 (27 MHz)
                           - VGA 800x600x70 (45.5MHz)
                           - RS170 (12 MHz),
                           - PAL (14 MHz)

Power & Operating Temperatures
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*AccuStream Power consumption:
 AccuStream 170+/75+/50+   = 8 watts
 AccuStream 205a/75a/50a   = 6.5 watts
 AccuStream Express 170/75/50   = 15 watts to 20 watts
 AccuStream Express HD+/HD 75+/SD 50+ = 15 watts to 20 watts
 AccuStream Express HD+C/HD 75+C/SD 50+C = 15 watts to 20 watts

* Operating temperatures:
  10 to 50 degrees C

* Humidity:
  10% to 90% non-condensing

* Storage Temperature:
  0 to 70 degrees C
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For additional information or assistance, contact Foresight Imaging Technical
Support at:

Email: BD-Support@fi-llc.com

Phone: + 978 458-4624 x244

Fax: + 978 458-5488

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