IDEA 3.6.017 Readme File

README for Foresight Imaging IDEA V3.6.017, April 30, 2024
This release is provided as an online download for Windows 10 & 11
64 bit operating systems.

IDEA v3.6.017 for 64 bit OS

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 in
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_AV Active X Demo, StreamCap and IDEADemo API Example Program are the three example
programs recommended for use to evaluate the full functionality of the frame grabbers and video
streamers. MultiCard can be used if you are using more than one capture card. They are included in:
Start || Foresight Imaging.

StreamCap is the DirectShow demonstration program that uses the IDEA WDM AVStream driver.
It is located in the C:\Program Files\Foresight\idea\Demo\Bin folder.

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

```
============================================================
********* Release Notes *********
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```

IDEA 3.6.017 is a full release package which supersedes 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 3.6.017 Changes:

All:

- Fixed an error in the 32 bit IDEA DLLs that caused a program crash on startup.

IDEA 3.6.016 Changes:

All:

- Updated board support list. AccuStream Express 170, AccuStream Express 75, AccuStream Express 50, AccuStream Express HD+, AccuStream Express HD 75+, AccuStream Express SD 50+, AccuStream 1000, AccuStream 1000 SDI
- Improved AutoSync performance.
- Fixed an AS1000 gate array DMA error that caused the DMA to timeout if the Vertical Back Porch was set high enough to extend the DMA transfer beyond vertical sync.
- Fixed an occasional PCIe link training width error AS1000 gate array seen on a few systems.
- Fixed an occasional PCIe enumeration miss seen on a system where there was a race for the gate array to be ready when device enumeration started.
- Changed a DVI/HDMI equalizer setting that fixed a problem seen on one DVI source.
- Added Windows 11 support.
- Dual trigger support across all demo applications.

API Changes to support Trigger2 on the AS1000

New structure SettingWithIndex passed to eHP_SetControlValue() for trigger settings so Trigger1 and Trigger2 can be passed as an index. 0 & 1 select Trigger1, 2 selects Trigger2.

typedef struct tagSettingWithIndex

{

  long lIndex;

  long lValue;

} SettingWithIndex;

The following settings require the new structure to change the values for Trigger2. Old code passed in a single DWORD as a parameter which will still set the values for Trigger1.

TriggerPolarity, TriggerFilterTime, RetriggerDelayTime, RetriggerDelay, TriggerState,

ForceTrigger and ForceTriggerAll.

Example from IdeaDemo

```
void CIdeaDemoDlg::SetTriggerPolarity(int nTrigger, int nTriggerPolarity)
{
        SettingWithIndex Setting = { 0 };
        Setting.lIndex = nTrigger;
        Setting.lValue = nTriggerPolarity;
        eHP_SetControlValue(m_BoardHandle, "TriggerPolarity", sizeof(Setting), &Setting);
}
```

The definition for eHP_EnableTriggerEvent() changes:

Old definition:

ERRTYPE APPTYPE eHP_EnableTriggerEvent(BoardHandle bh, HANDLE hEvent, BOOL bOneShot)

New definition:

ERRTYPE APPTYPE eHP_EnableTriggerEvent(BoardHandle bh, HANDLE hEvent, int nFlags)

The value for nFlags are the bitwise OR of:

```
#define TRIGGER_FLAGS_ONESHOT  1
#define TRIGGER_FLAGS_TRIGGER2 16
```

SNAP_CONTROL structure passed to eHD_SnapToBuffer():

Union added to replace bTrigger and detail how to select 2nd trigger on a snapshot.

```
 union
 {
  BOOL  bTrigger;    /* 0 = No trigger, 1 = Wait on external trigger */
  int   nTrigger;    /* 0 = No trigger, 1 = Primary trigger, 2 = Secondary trigger */
 };
```

The nMode parameter for eHD_LiveStreamMode() now takes the value
TRIGGER_FLAGS_TRIGGER2 ORd with the nMode value to indicate Trigger2.

ERRTYPE APPTYPE eHD_LiveStreamMode(ImageHandle ih, int nMode)

IDEA 3.5.301 Changes:

Installer:

- Fixed installation issues for 32-bit Windows O/S.

All:

- Fixed an AS1000 DMA error where 16-pixel blocks could be dropped under certain rare circumstances.

ActiveX control:

- Added support for AS1000 second trigger input.

IdeaDemo.net:

- Added support for AS1000 second trigger input.
- Added support for controlling multiple boards.
- Added snapshot save by right-click on snapshot image.

IDEA 3.5.300 Changes:

All:

- Logging changed to be enabled by default. Driver log moved from C:\ to C:\Users\Public\Documents\Foresight. Log files are created daily with old logs saved to C:\Users\Public\Documents\Foresight\OldLogs. Logs are kept for 30 days.
- Corrected a driver problem that could cause the on-board EEPROM containing board info to be erased.
- Added support for the second trigger input on the AS1000.
- "HotPlugAlwaysOn" is now defaulted to "On". Hot Plug Detect will only toggle when the contents of an EDID EEPROM are changed.

Autosync:

- Added control of the DVI and HDMI cable extender circuits on the AS1000 Rev C and above. They can be disabled or enabled from the CHP file. Default is enabled unless configured differently in DVI_Config.

DVI_Config:

- Added control of the DVI and HDMI cable extender circuits on the AS1000 Rev C and above. These controls set the system-wide defaults.

IdeaDemo:

- Added support for the second trigger input on the AS1000.

IDEA 3.5.239 Changes:

Hdpw32.dll, hdpw64.dll:

- Added support for the AS1000 second trigger input.

IdeaDemo:

- Added support for the second trigger input on the AS1000.

ActiveX control, Idea_AV Demo:

- Added support for AS1000 second trigger input.

All:

- Fixed a problem where when switching channels a DVI or HDMI source could detect the switch as a cable disconnect and turn its output off momentarily. Reduced the time when the differential signal terminators are disabled from 30ms to 5ms.

IDEA 3.5.236 Changes:

All:

- Fixed a problem where when switching channels a DVI or HDMI source could detect the switch as a cable disconnect and turn its output off momentarily. Reduced the time when the differential signal terminators are disabled from 30ms to 5ms.

IDEA 3.5.235 Changes:

All:

- Fixed a problem in the device driver where the on-board EEPROM could be erased if an application that used DirectShow accessed the device driver at the same time as an IDEA application was starting.

IDEA 3.5.233 Changes:

All:

- Fixed a DMA problem that gave incorrect pixel data near the end of a line if the width in pixels was not divisible by 16.

IDEA 3.5.232 Changes:

All:

- Fixed Y-only DMA problem where the last 6 pixels of each line was set to zero. Autosync uses this mode for the 4-panel view.
- Added a dialog to give the user the opportunity to shut down the system after a gate array flash update.
- Fixed problem in speed up optimizations of RSET_Set() that caused AutoSync pixel detect to make errors on some formats and incorrectly set Hue in YPbPr formats.

IDEA 3.5.231 Changes:

All:

- Added ability to disable the DVI and HDMI cable extenders on the HD+. Chp file entries in the [I-RGB] section, DVICableExtender = 0 or 1 and HDMICableExtender = 0 or 1.
- Fixed capture failure with AccuStream Express 170 capture introduced in 3.5.225.
- Fixed a problem where capturing a video format of a smaller size than specified by the CHP file could cause a system crash.
- S-Video did not show sync detected in some programs.
- Accustream 1000 frame rate control was not working correctly for interlaced signals.

DirectShow:

- Fixed problem in Accustream 1000 where some interlaced signals would fail to AutoDetect.
- Fixed framing problem with interlaced analog video signals..

IDEA 3.5.225 Changes:

All:

- Fixed brightness and contrast adjustment and improved update rate.
- Gate array update. Fixed a problem where DMA would hang if lines past vertical sync were requested as can happen in AutoSync when adjusting Vertical Back Porch.

DirectShow:

- Fixed capture and display DMA which stopped working after gate array change in .224.

IDEA 3.5.224 Changes:

All:

- Fixed an error where 24-bit captures resulted in distorted images when the width was not a multiple of 16 pixels.
- Fixed an error in sync detection for the AccuStream Express 170.
- Fixed an error in interlaced sync detection for the AccuStream Express 1000.
- Changed AccuStream Express 1000 primary trigger input from the ring to the tip so a standard BNC to 3.5mm tip & sleeve 2-conductor cable can be used in a single trigger application.

ActiveX control:

- Fixed Area of Interest capture.

IDEA 3.5.220 Changes:

All:

- Fixed an error in sync detection where if composite sync moved from one analog channel to another the change wasn't detected.

IDEA 3.5.219 Changes:

All:

- Fixed an AS1000 error where AutoSync created a format for monochrome analog composite sync signals that was too narrow.

IDEA 3.5.218 Changes:

All:

- Fixed an AS1000 frame dropping problem.
- Fixed an AS1000 error with frame rate measurement.
- Improved AS1000 FPGA timing margins.
- Added back ASHD+ S-Video detection accidentally disabled in a previous release.
- Fixed an AS1000 error where StreamCap would fail on VGA type input signals during the AutoDetect operation.

IDEA 3.5.217 Changes:

All:

- Fixed an error where if a smaller digital format was input when a larger format was selected the frame rate dropped to less than 1 FPS and only the first line of video was captured.
- Fixed an error where if display or capture was running and the input signal was removed from the Accustream 1000 the system would sometimes lock up or blue screen.

IDEA 3.5.214 Changes:

All:

- Fixed error in eHP_GetControlValue("SignalInfo") that caused AutoSync to not show Input Selection dialog if one of the inputs was monochrome.
- Added optimization to RSET_Set() to skip checking for sync on completion when only simple image adjustments are done. Speeds up AutoSync adjustments.
- Fixed an error where some VGA formats were incorrectly being detected as interlaced.

AutoSync:

- The "Center Image" button caused system crash.

IDEA 3.5.211 Changes:

All

- Added adjustment of HDMI pixel frequency measurement when the pixel repetition value is not 0. Was not working correctly on 480i and 576i formats.
- Added IDEA_INFO_CONNECTION message to the IDEA_INFO event to indicate sync status changes on all but the selected input. Event now returns SYNC_INFO in the pInfoObject of IDEA_INFO_EVENT.
- Fixed error in eHP_GetControlValue("SignalInfo") that caused AutoSync to not detect sync on some digital signals.
- Added DVIHotPlug and HDMIHotPlug to eHP_SetControlValue() and eHP_GetControlValue() to allow a user to set and get the state of these signals.

IDEA 3.5.210 Changes:

All

- Made timing improvements in sync loss detection.
- Fix to AccuStream 1000 gate array to eliminate 16 byte aligned start address requirement.
- Fix for AccuStream 1000 DMA where lines wider than 1920 could make address errors.
- Calls to eHD_GetControlValue() for CurrentSignalInfo and SyncInfo now return copies of internal structures rather than reading hardware registers. Registers are now read in a background IDEA thread to allow IDEA to control when the reads occur. This prevents operational conflicts caused by asynchronous hardware accesses.
- Fixed an I2C register read problem caused by long PCIe read latency. This has been seen in some systems especially if a board is in a slot connected through a bridge
- Corrected AccuStream 1000 SDI interface, interlaced was only capturing one field.

AutoSYNC:

- AccuStream 1000 AutoSync YPbPr video framing improvements.

ActiveX control:

- Fixed JPEG file save, had red and blue swapped.

IDEA 3.5.102 Changes:

All:

- Rotate was not working for 32-bit pixel types.

API:

- Fixed a problem where bHP_CSyncDetect() execution time increased dramatically from 3.4.416.
- Fix for Block Sync Formats (No horizontal sync during vertical sync) where image moved up and down by 1 line. If Block Sync setting in AutoSync Miscellaneous tab doesn't work, try Extended Block Sync. This change only takes effect when Vertical Sync Type is not set to normal.
- Added logging.

ActiveX control:

- Frame rate control using frame decimation did not set the AVI file frame rate correctly.

Driver:

- Fixed an error where on very rare occasions the driver would return a hardware registers pointer of zero which would cause the calling application to crash.

DirectShow:

- Sync was not detected with AutoDetect turned off and a VGA type format file selected.

AutoSYNC:

- Fixed error where input selection dialog would not display when more than one input signal was connected.

StreamCap DirectShow Demo:

- Status bar capture time was incrementing while waiting for trigger. Now holds at zero until trigger event.

IdeaDemo API Demo:

- Snapshot saves were being written to the application folder not the pictures folder.
- Live display scaling was not sized properly
- Snapshot taken when Live Display was stopped was sometimes be black.

IDEA 3.5.101 Changes:

All:

- All programs had a slight AVI frame rate error when the rate was not a whole number. Fixed by increasing the precision of the rate.

API:

- Added logging.

- Fixed a problem where bHP_CSyncDetect() would sometimes not report the correct sync state..

Driver:

- Fixed an error where on very rare occasions the driver would return a hardware registers pointer of zero which would cause the calling application to crash.

Demos:

- Improved C# demo.

IDEA 3.5.100 Changes:

API:

- Fixed a problem where bHP_CSyncDetect() execution time increased dramatically from 3.4.416.

- Fix for Block Sync Formats (No horizontal sync during vertical sync) where image moved up and down by 1 line. If Block Sync setting in AutoSync Miscellaneous tab doesn't work, try Extended Block Sync. This change only takes effect when Vertical Sync Type is not set to normal.

- Added support for streaming to Nvidia GpuDirect.

- Added IdeaGpuDemo to demonstrate using IDEA with Nvidia GpuDirect.

IDEA 3.5.033 Changes:

All:

- Added support for the new AS1000 and AS2000 boards.

- Temperature logging command added to SetControlValue()

```
        eHP_SetControlValue(0, "LogTemperature", sizeof(LogTemperature), &
LogTemperature);

        typedef struct
        {
          char *pszLogFile;              // If null messages are written to default
IdeaTemperatureLog.txt
            BOOL bLogTemperature;
            int  nTemperatureLogSeconds;  // If 0 log interval is 60 seconds.
        } LOG_TEMPERATURE;
```

DirectShow:

- Added temperature display and logging in the Capture Filter Properties Dialog.

Demos:

- Added a C# demo called IdeaDemo.Net. The demo includes interface examples for IDEA API, IDEA ActiveX and DirectShow operation.

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INSTALLATION:

- To install IDEA 3.5 on a system:

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

  Run the **Install_IDEA**.exe or one of the batch files file in the root directory.

  Follow the prompts to complete the installation.

UPGRADING Applications to IDEA 3.6
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* If your application is based on an IDEA version earlier than IDEA 3.4 it must be recompiled and re-linked using the new IDEA 3.6 libraries, header files, & OCX wherever applicable.
* Updating only the IDEA DLL's and drivers from a pre-3.4 release without rebuilding the application will result in unstable operation.

Supported:
=========
* Windows 10 & 11 All 64-bit Editions.

* Foresight Imaging frame grabbers and video streamers:
  AccuStream Express 170, AccuStream Express 75, AccuStream Express 50
  AccuStream Express HD+, AccuStream Express HD 75+, AccuStream Express SD 50+
  AccuStream 1000, AccuStream 2000

* 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 3.6 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)
* 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 V3.6 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 10 or 11, 64 bit
* Memory: minimum 512 MB
* Appropriate video source
* High quality input video cabling
* 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.
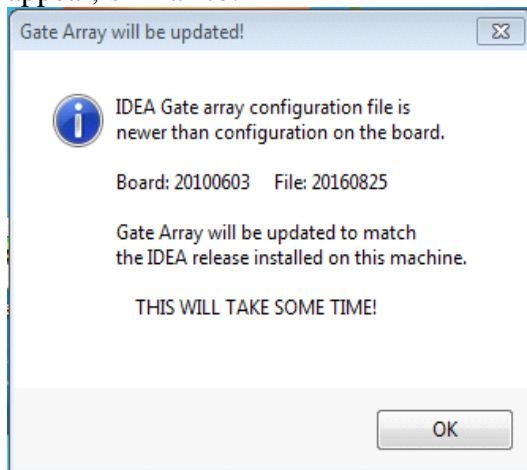

Other Notes:
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1) The Accusoft / Pegasus Compression CODECS are available at
https://www.accusoft.com/products/picvideo-m-jpeg-codec/overview/

2) 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, HD+ & 1000/2000 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:

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 1000 board series   AS1000.rpd
AccuStream 2000 board series   AS2000.rpd

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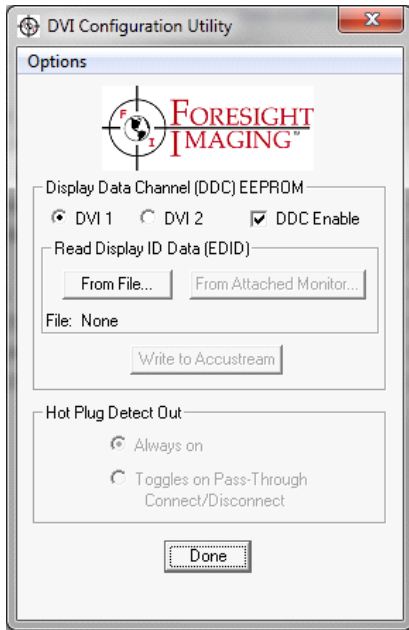
Please contact Foresight support BD-SUPPORT@fi-llc.com, 978-458-4624 x244 for additional information.

DVI EDID Programming:
============
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:
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* Video stream rates are dependent on several factors beyond the AccuStream board.
* The AccuStream Express boards can run in PCIe x4, x8 and x16 slots.
* System processor, memory & disk speed all contribute to transfer rate speeds.
* Below are transfer rates to memory on "typical" PCIe 1.0 x4 systems (500-700MB/s).
  and PCIe 2.0 x4 systems (1000-1300MB/s).
  Your performance may vary on slower machines.

RESOLUTION	STREAM to MEMORY (PCIe x4 bus)
1600x1200x60	60 fps
1280x1024x60	60 fps
1024x768x60	60 fps
1920x1080x30	30 fps
1920x1080x60	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.

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

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 1000   037000-100
AccuStream 1000 LF   037000-175
AccuStream 1000 SDI 037000-200

AccuStream 2000   038000-100
AccuStream 2000 LF   038000-175
AccuStream 2000 SDI 038000-200

All boards are ROHS compliant

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

All 75 and LF 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)

All Others   - Analog & DVI,
                           - VGA 1600x1200x60, 1900x1200x60, (162 MHz),
                           - HDTV 1080p60 (148.5 MHz)

Power & Operating Temperatures
============
*AccuStream Power consumption:
  AccuStream Express 170/75/50   = 15 watts to 20 watts
  AccuStream Express HD+/HD 75+/SD 50+ = 15 watts to 20 watts
  AccuStream 1000 = 8 watts
  AccuStream 2000 = 10 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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