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1 Release notes for AVT SmartView 1.14.1

Release version of executable:	**1.14.1**	
Release date of executable:	07.01.2013	
Minimum Driver/FireStack version:	2.5.0.0/2.5.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.9.0.2/2.9.0.0	(32bit)
	2.9.0.2/2.9.64.0	(64bit)

1.1 Changes from SmartView 1.14 to 1.14.1

1.1.1 Improved Guppy PRO support

- The new Guppy PRO models GPF033B/C, GPF046B/C and GPF095B/C now show the correct 14 bit data depth in 16 bit modes instead of 12 bit data depth.
- In rare cases, the first update of Guppy PRO models was not allowed. Corrected.
- For the GPF503 cameras, the increment and decrement buttons of the extended shutter did not work. Corrected.

1.2 Solved bugs and flaws

- Added a message box in case that the license file cannot be found.
- Extended logging
- Fixed some minor bugs

2 Release history

2.1 Release notes for AVT SmartView 1.14

Release version of executable:	**1.14**	
Release date of executable:	31.01.2012	
Minimum Driver/FireStack version:	2.5.0.0/2.5.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.9.0.2/2.9.0.0	(32bit)
	2.9.0.2/2.9.64.0	(64bit)

2.1.1 Changes from SmartView 1.13.1 to 1.14

2.1.1.1 Maximum ISO packet size

Check box "Maximum ISO packet size" added to Advanced Page 3 for controlling MAX_ISOSIZE feature. This feature allows a higher limit for the size of isochronous packets in Format_7 (5500 for S400 instead of 4096 bytes, and 11000 for S800 instead of 8192 bytes), thus possibly allowing higher frame rates. Keep in mind that if you are using this feature and you are setting the packet size to a value larger than 4096/8192, you are forcing the camera to violate the 1394 bandwidth requirements for isochronous transfers. Even if there is no other camera on the same bus, use a packet size that is suitable for your needs of asynchronous communication.

2.1.2 Solved bugs and flaws

- Menu entries during firmware update disabled
- Bug fix when debayering RAW 16 images: right most column was always black
- Several minor bug fixes

2.2 Release notes for AVT SmartView 1.13.1

Release version of executable:	**1.13.1**	
Release date of executable:	12.07.2011	
Minimum Driver/FireStack version:	2.5.0.0/2.5.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.8.0.1/2.8.0.0	(32bit)
	2.8.0.1/2.8.64.0	(64bit)

2.2.1 Changes from SmartView 1.13 to 1.13.1

2.2.1.1 Solution for problems with Stingray versions 2.1.5 to 3.0.1

- Stingray cameras with firmware versions between 2.1.5 and 3.0.1 experienced a camera stall when
  - AutoShutter and/or AutoGain
    - are in use
    - or have been used after camera start
  - And either
    - the camera is opened in SmartView
    - or the settings were loaded from an XML file.
    - or registers ADV_SW_FEATURE_CTRL or ADV_IO_INP_DEB_x are accessed

  This behavior results from a firmware flaw that is harmless as long as registers ADV_SW_FEATURE_CTRL (for "Disable LED functionality")or ADV_IO_INP_DEB_x (Input debouncing) are not accessed if auto-shutter or auto-gain is (or was) activated. The firmware flaw will be solved as soon as possible.
- As a consequence, the mentioned features Disable LED functionality and Input debouncing are not available in SmartView for the mentioned firmware versions of the Stingray. All other models and camera families are not concerned.
- If auto-shutter or auto-gain is activated (or was activated before), don't even read one of the mentioned registers with direct access; otherwise your Stingray will become unavailable.

2.3 Release notes for AVT SmartView 1.13

Release version of executable:	**1.13**	
Release date of executable:	23.05.2011	
Minimum Driver/FireStack version:	2.5.0.0/2.5.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.8.0.1/2.8.0.0	(32bit)
	2.8.0.1/2.8.64.0	(64bit)

2.3.1 Changes from SmartView 1.12 to 1.13

2.3.1.1 Defect pixel correction

- Added support for new DPC (e.g. PF1100B/C and PF1600B/C)
- Removed auto setting of shutter, gain and offset during DPC (e.g. SF504B/C)
- Automatically switch to RAW8/MONO8 and disable mirroring during DPC; restores original settings afterwards (e.g. SF504B/C)
- Automatically switch to RAW8/MONO8 during CMOS DPC; restores original settings afterwards (e.g. GPF503B/C)

2.3.1.2 Format tab

State of “Auto size” (auto max packet size) checkbox in format tab will be saved now.

2.3.2 Solved bugs and flaws

- Release of ISO channel after DPC fixed (e.g. GPF503B/C)
- Several minor bug fixes

2.4 Release notes for AVT SmartView 1.12

Release version of executable:	**1.12**	
Release date of executable:	07.12.2010	
Minimum Driver/FireStack version:	2.5.0.0/2.5.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.8.0.1/2.8.0.0	(32bit)
	2.8.0.1/2.8.64.0	(64bit)

2.4.1 Changes from SmartView 1.11 to 1.12

2.4.1.1 Added support for Guppy PRO camera family

The newly introduced Guppy PRO camera family is now supported.

2.4.1.2 Viewer

- New command line parameter "-la" for starting auto-flushing of the log file

2.4.1.3 Settings window

- GF503/GPF503:
  - After changing shutter mode, format page is displayed automatically
  - Changing shutter mode is only possible if camera is idle
- Added the GPF503B/C to the cameras that show the “CMOS” tab for the defect pixel correction
- Improved defect pixel correction

2.4.1.4 Firmware window

- New firmware window for new Guppy PRO camera family
- Support for new firmware XML file format (old format is still supported)

2.4.2 Solved bugs and flaws

- Bayer autopattern fixed for GF503C
- Several minor bug fixes

2.5 Release notes for AVT SmartView 1.11

Release version of executable:	**1.11**	
Release date of executable:	26.07.2010	
Minimum Driver/FireStack version:	2.5.0.0/2.5.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.8.0.1/2.8.0.0	(32bit)
	2.8.0.1/2.8.64.0	(64bit)

2.5.1 Changes from SmartView 1.10.2 to 1.11

2.5.1.1 Firmware upload

- Minor improvements for firmware upload via FireWire (available only for Guppy, Pike and Stingray cameras)

2.5.1.2 Topology view

- Changed the display of the camera name in the topology window to list the serial number instead of the vendor for AVT cameras. Example: Instead of "Pike F032C(AVT)", "Pike F032C(#26789123)" is listed.

2.5.1.3 Viewer window

- Behavior change: cameras now always start with the format and mode they are configured to.
- Pixel value tooltips are now also available for Raw12 and Raw16.
- Display of frame rate value (in fps) in the status bar is stopped immediately after Stop button is pressed.
- "Save" Menu/toolbar button:
  - First time usage: "save as" functionality is called.
  - During grabbing images, saving images is also possible.
- Channel balance is now also available for Mono12 and Raw12.

2.5.1.4 Settings window

- "Format" tab: Changed behavior of the "AutoSize" flag for the packet size. Now the state of the flag is maintained even if the maximum packet size is selected.
- "Ctrl1"/"Ctrl2" tab: Defined more tab stops in the feature sliders.
- "Adv3" tab:
  - Added a button for resetting the color correction coefficients.
  - Changes to color correction are now only possible when not in Raw modes
  - Added display of the number of digitization taps for the sensor.
  - For cameras capable of switching the number of digitization taps, there is a radio button and an "Apply" button for doing this.
- "Adv4" tab: The defect pixel detection algorithm now uses the current "timebase" feature value to allow a longer detection time for the defect pixel correction.

2.5.2 Solved bugs and flaws

- Format 7 mapping dialog: The combo box contents for binning or sub-sampling factors are now visible if the list is folded out.
- Several minor bug fixes

2.6 Release notes for AVT SmartView 1.10.2

Release version of executable:	**1.10.2**	
Release date of executable:	10.09.2009	
Minimum Driver/FireStack version:	2.5.0.0/2.5.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.7.0.1/2.7.0.3	(32bit)
	2.7.0.1/2.7.64.1	(64bit)

2.6.1 Changes from SmartView 1.10 to 1.10.2

- Minor improvements for firmware upload via FireWire (available only for Guppy, Pike and Stingray cameras)

2.6.2 Solved bugs and flaws

- Corrected the input range detection for the PWM pulse width
- Dual-tap offset adjustment / Channel offset adjustment
    - Corrected the channel offset adjustment algorithm
    - Added refresh of values after loading a user set
    - Renamed the offset button to "Offset adjustment"
    - Minor GUI improvements
- Minor corrections for Defect pixel detection pages
- Resolved a crash in the sequence dialog after using the menu item “Clear grid”

2.7 Release notes for AVT SmartView 1.10

Release version of executable:	**1.10**	
Release date of executable:	26.06.2009	
Minimum Driver/FireStack version:	2.6.0.0/2.6.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.7.0.1/2.7.0.1	(32bit)
	2.7.0.1/2.7.64.1	(64bit)

2.7.1 Changes from SmartView 1.9 to 1.10

2.7.1.1 Camera support

2.7.1.1.1 Support for features of the Guppy F503 cameras

- Global reset release shutter
- Defect pixel correction

2.7.1.1.2 Support for new features of the Pike cameras

- Channel offset

2.7.1.1.3 Support for new features of the Stingray cameras

- Defect pixel correction
- Software trigger
- Additional output mode WaitingForTrigger
- Adjustable debouncing for inputs
- Disable LED status lamps
- Low noise binning like in the Pike family

2.7.1.2 Feature support

2.7.1.2.1 Topology view

Modified behavior of "Initialize" command in the Topology view: Now the viewer window is closed and re-opened if it was open before.

2.7.1.2.2 Settings dialog

2.7.1.2.2.1 Added support for the IIDC Software_Trigger feature

On tab “Trig/IO”, you now may select a different trigger source in the combo-box for the trigger mode. The existing modes using the external trigger now have a trailing “-ext”, and the software trigger modes have a trailing “-SW”. If one of the “-SW” modes is selected and integration is enabled, the button “Trigger” in the group “SW Trigger” becomes active. In edge mode (Trigger_Mode_0) and programmable mode (Trigger_Mode_15), you may trigger the image by pressing the button. In level mode (Trigger_Mode_1), the integration is started if the button is pressed and the button converts to a button “Stop trigger”, which stops the integration.

2.7.1.2.2.2 Added support for the WaitingForTrigger feature

On tab “Trig/IO”, the Output pins now have an additional mode “WaitingForTrigger”, which allows to generate a signal if the camera is ready to grab a new image (depending on the trigger mode). See the technical manual for more details.

2.7.1.2.2.3 Added support for the Input debouncing feature

On tab “Trig/IO”, the Input pins now have an additional parameter configurable in column “Debounce”. In this column, you may control the timeout for input debouncing in units of 500µs. The minimum for this value is 3 (=1.5ms), the maximum is 32767.

2.7.1.2.2.4 Added support for controlling the status LEDs

On tab “Adv 3”, you can now find the check box “Disable LED functionality” which switches the LEDs off except for indicating errors.

2.7.1.2.2.5 Added support for the Defect pixel correction feature

For the Guppy F503 cameras, this feature may be controlled on tab “CMOS”, for the Stingray family on tab “Adv 4”.

- Enable the feature with the check box “Defect pixel correction on”.
- Detect the number of defect pixels (with a closed lens) by using the “Detect” button. For this operation, you may select the sensitivity of the algorithm used by adjusting the “Threshold” value with a slider or an edit field with spin controls.
- Edit the current defect pixel list by using the button “View/Edit”. The list of pixels is shown in an extra dialog. Please consider that the co-ordinates used in this dialog start with 1 and end with the number of pixels. (The co-ordinates displayed in the viewer tooltip are zero-based, up to size-1.)
- Save the current defect pixel list to the camera flash memory.
- Load the current defect pixel list from the camera flash memory if you have used the Detect feature and would like to restore the camera settings.
- The number of defect pixels is displayed as well as the mean value for the detection.

2.7.1.2.2.6 Added support for the Global reset release feature

On tab “CMOS”, you can select between the Global reset release shutter and the Electronic rolling shutter.

2.7.1.2.2.7 Color correction matrix

On Tab “Adv 3”: The coefficient strings in front of the edit fields were changed to be consistent with the manuals.

2.7.1.2.3 SIS dialog

The display of the cycle counter values in the SIS dialog has been changed. Now, the value is split into seconds, cycles and an offset, according to the IIDC specification.

2.7.1.2.4 Channel adjustment dialog

The AFE channel adjustment dialog, which is only available for Pike cameras with two channels, has been extended with controls for adjusting the channel offset balance. The dialog is now split into two parts, the upper one still allowing to adjust the gain balance and the lower one allowing to adjust the offset balance.

For the offset balance adjustment, you may use the "One-push offset adjustment" button or you may correct the value manually. The offset balance adjustment should be done before the gain balance adjustment. Please perform the offset balance adjustment with a closed lens.
For the gain balance adjustment, the button "Do one-push adjustment" has been replaced by a check box "Gain auto adjustment", but the functionality is unchanged. (Since the formerly-called "one-push" functionality does not reach the optimum in one step, you have to grab multiple images anyway, which is normally the case for auto-features.)

2.7.1.2.5 Direct access dialog

Added entries for Channel gain balance and Channel offset balance, Defect pixel correction, Software trigger, Software feature control (LED control) and Input debouncing.

2.7.1.2.6 XML settings

Added support for Low noise binning, Defect pixel correction, Global reset release shutter, Software feature control (LEDs) and Input debouncing.

2.7.2 Solved bugs and flaws

- Corrected the firmware upload mechanism and added CRC checks. **For firmware updates, please only use this version (or newer versions) from now on**!
- Corrected the display of the node number in the viewer caption
- Deferred transport: Fast capture is now only possible when in Format 7
- Re-allowed serial I/O elements to be used with Marlin cameras
- Corrected the bit depth for Stingray cameras from 12 to 14 bit

2.8 Release notes for AVT SmartView 1.9

Release version of executable:	**1.9**	
Release date of executable:	30.10.2008	
Minimum Driver/FireStack version:	1.2.0.1/1.2.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.7.0.0/2.7.0.0	(32bit)
	2.7.0.0/2.7.64.0	(64bit)

2.8.1 Changes from SmartView 1.8.3 to 1.9

2.8.1.1 New features and changes

2.8.1.1.1 Improved LUT editor

- An extended LUT editor allows previewing LUT changes under the following preconditions:
  - The image format is Mono12, Mono16, Raw12 or Raw16
  - LUT feature is set to “off”
  - An image without active LUT has already been captured
  - “Deep images” are used (Menu item “File->Use deep images”)
- A histogram is added if the preview mode is active
- Changed the edit mode from region-based to grip-point-based

2.8.1.1.2 Added support for “Low Noise Binning” feature

- On Tab “Format” of the settings dialog, there is now a checkbox below the “Framerate” list box for Pike cameras.
- The checkbox becomes available only if twofold horizontal binning is used.

2.8.1.1.3 Miscellaneous

- Added a dialog for entering the gain reference, if the camera supports it (only available for some Pike cameras). Available by pressing Alt+Ctrl+G
- Thinned out the list of feature names in the direct access combo box to the features supported by the current camera.

2.8.2 Solved bugs and flaws

- Allowed Input modes “SeqStep” and SeqReset” also for Stingray cameras
- Also stored color correction of Stingray cameras in XML settings file
- Lowered the minimum ExtendedShutter value to 1.

2.9 Release notes for AVT SmartView 1.8.3

Release version of executable:	**1.8.3**	
Release date of executable:	29.7.2008	
Minimum Driver/FireStack version:	1.2.0.1/1.2.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.6.0.3/2.6.0.1	(32bit)
	2.6.0.3/2.6.64.1	(64bit)

2.9.1 Changes from SmartView 1.8.1 to 1.8.3

2.9.1.1 Solved bugs and flaws

- Corrected the display of the firmware version numbers for Guppy cameras
- Corrected the handling of Mono16 images in fixed formats if the full available image depth is used ("Use deep images"): the pixel values in the tool-tips and in the histogram are correct. Additionally, 16 bit images are saved correctly in raw file format.
- Corrected Mono16 and Raw16 handling for Guppy cameras with higher bit depth.
- Corrected the selection mask displayed when selecting a file for firmware update. This was necessary for cameras with a GOF interface to help find the appropriate firmware file.
- Changed the behavior of automatic ISO channel selection: Now, the lowest possible ISO channel is always tried first (not the one in the edit box, which sometimes led to an error)
- Improved error handling during asynchronous communication with the camera
- Sequence dialog:
    - Added PWM (for pulse width modulation) to the output modes
    - Corrected the values generated by the selectable output modes

2.10 Release notes for AVT SmartView 1.8.1

Release version of executable:	1.8.1	
Release date of executable:	6.5.2008	
Minimum Driver/FireStack version:	1.2.0.1/1.2.0.0	(32bit)
	2.6.0.3/2.6.64.1	(64bit)
Recommended Driver/FireStack version:	2.6.0.2/2.6.0.1	(32bit)
	2.6.0.3/2.6.64.1	(64bit)

2.10.1 Changes from SmartView 1.8 to 1.8.1

2.10.1.1 64bit version provided

With this release of the AVT SmartView the first time also a 64bit version is available. Each 64bit version is part of a certain AVT FirePackage64 and can be used with the 64bit versions of Windows Vista and XP.

2.10.2 Solved bugs and flaws

- Stingray cameras:
  - corrected the display of the Format 7 modes available for format mapping
  - corrected the display of the boot loader version
- Corrected the initial position of scroll bars when zooming into and out of images
- Solved a crash in the format mapping dialog for some Stingray cameras

2.11 Release notes for AVT SmartView 1.8

Release version of executable:	**1.8**
Release date of executable:	7.3.2008
Minimum Driver/FireStack version:	1.2.0.1/1.2.0.0
Recommended Driver/FireStack version:	2.6.0.2/2.6.0.1

2.11.1 Changes from SmartView 1.7.2 to 1.8

2.11.1.1 Added full feature support for Stingray camera family

All features of the Stingray camera family available in SmartView are now supported.

2.11.1.2 Advanced zooming

For images that are too large to display on the screen, you now have the possibility to zoom out of the image in steps of 10% of the image (90% ... 10%). Additionally, there is now a new menu entry and a tool bar button for a zoom factor of 1.
Important remark concerning zooming: Not all graphics cards properly support zooming into an image. Sometimes parts of an image are not refreshed. If you experience this, select a different zoom factor.

2.11.2 Solved bugs and flaws

- Navigation by tab key is now possible in the camera settings dialog
- When using 1394B cameras in legacy mode, too many FPS values were displayed
- When restoring a saved camera setting via settings file, sometimes the wrong color mode was selected. If you encounter this problem, re-save your desired settings with this version of SmartView (not backward compatible)
- The scrollbar length in the viewer window is now scaled appropriately
- In case of negative row values for the SIS, the SIS values in the display window were not updated
- Other minor GUI improvements

2.12 Release notes for AVT SmartView 1.7.2

Release version of executable:	**1.7.2**
Release date of executable:	22.11.2007
Minimum Driver/FireStack version:	1.2.0.1/1.2.0.0
Recommended Driver/FireStack version:	2.5.0.7/2.5.0.0

2.12.1 Changes from SmartView 1.7.1 to 1.7.2

2.12.1.1 Solved bugs and flaws

- corrected a bug that occurred when retrieving camera settings from external file
- Corrected display of pixel values for image formats with more than 8 bits
- Fixed a problem with setting the format of the Marlin 131

2.13 Release notes for AVT SmartView 1.7.1

Release version of executable:	**1.7.1**
Release date of executable:	12.11.2007
Minimum Driver/FireStack version:	1.2.0.1/1.2.0.0
Recommended Driver/FireStack version:	2.5.0.6/2.5.0.0

2.13.1 Changes from SmartView 1.7 to 1.7.1

2.13.1.1 Added support for Stingray Camera Family

The newly introduced Stingray Camera Family is now supported.

2.13.2 Solved bugs and flaws

- Version information reported by recent camera firmware is now interpreted correctly. This also fixes an issue regarding the SmartView firmware update functionality.

2.14 Release notes for AVT SmartView 1.7

Release version of executable:	**1.7**
Release date of executable:	22.08.2007
Minimum Driver/FireStack version:	1.2.0.1/1.2.0.0
Recommended Driver/FireStack version:	2.5.0.5/2.5.0.0

2.14.1 Changes from SmartView 1.6.2 to 1.7

2.14.1.1 Added support for the Pike Format 7 mode mapping

In Pike cameras, you now have the possibility to **customize** your **Format 7** layout with respect to **binning or sub-sampling**. Mode 0 may not be altered, but for mode 1 to 7, you may select which binning/ sub-sampling configuration (whichever is available) up to a factor of 8 should be used. Note: binning is only available with monochrome cameras.

You may configure these modes in an extra dialog that is available from the topology view; there is a menu entry "Camera->Format 7 mapping" and a context menu item "Format 7 mapping" for Pike cameras, opening a dialog where you may select one of the four options for every mode from 1 to 7:

- Disabled: causes this mode to disappear from the Format 7 mode list
- Default: the factory setting is used
  (e.g. binning 2H, 2V, 2HV: mode 1,2,3; subsampling 2H, 2V, 2HV: mode 4,5,6)
- Binning: select the binning factor from the combo boxes below
- Subsampling: select the subsampling factor from the combo boxes below

For an overview of the available modes, open an info dialog by using the button "Camera mode info".

Using the "Apply" button applies all the changes you made and resets the camera (which is necessary for the mapping to become valid).

When saving settings to an XML file, a hash value is calculated and stored for each format 7 mode, so that it is not possible to read illegal settings for a re-mapped mode. This has of course no impact on old settings files. In this case, illegal settings could be re-read.

2.14.1.2 Added support for the Packed 12-Bit Modes

The Pike cameras now have additional color modes in Format 7, **RAW12** and **MONO12** (color IDs 136 and 132). These color modes may be selected on tab "Format" of the settings pages and displayed just like the other color modes, but there is only one debayering algorithm, a simple 2x2 debayering.

2.14.1.3 Added support for the Sequence Mode

The Pike cameras now have a **Sequence Mode**, in which a sequence of parameter settings may be defined, which will then be executed as a kind of program in the camera. The parameters that may be used for this are fixed, and may be seen in the Sequence Dialog, which is available from the "Extras" menu with menu item "Sequence dialog...".

You may change camera parameters while this dialog is open, and when using the button "Get current settings", the currently valid camera settings are fetched and put:

1. into the row that you have currently placed your cursor into or
2. after the last row if no element of a row is selected

All the parameters that are part of sequence steps are listed in the header row of the table. Changing them does not change the settings inside the camera; only when you use the "Apply" button, the whole list of settings is sent to the camera and the sequence mode is enabled and may be started. If a sequence is enabled, a "SEQ" is displayed in the status bar of the viewer window.

> Note:
> Steps altering parameters concerning the transfer via 1394 should not be tried out with SmartView. In SmartView, just try out steps that don't alter the image format or bandwidth.

Un-checking the "Enabled" box disables your current sequence, and it has to be applied again to become valid. Likewise, parameter changes done during a sequence is enabled do not become valid until the "Apply" button is pressed again.

Setting the Stepping Mode determines the behavior of the sequence mode with external control additionally to triggering. For this, the input pins on tab "Trig/IO" have two new states, "SeqStep" and "SeqReset". Read the manual for more detailed information.

2.14.1.4 Added support for the Secure Image Signature

With the Pike cameras, you are now capable of stamping extra data into your images to reflect the camera settings used for them and to get more security about delivery of images. The Secure Image Signature of the Marlin (cycle time, trigger count and frame count) was enhanced for the Pike, so now there is more info to extract from an image if this feature is enabled (done on tab "Adv 2" or on the dialog displaying the current SIS info). This info dialog may be invoked with menu entry "Extras->Secure Image Stamp Info...".

On tab "Adv 2", you may also set a custom value that is also part of the Secure Image Signature.

2.14.1.5 Added support for Reduced Smearing

Since CCD sensors produce smearing under certain circumstances, the Pike provides a mode to reduce this smearing, which may be enabled on tab “Adv 3”. This mode should only be used it you perceive smearing in your images, it does not prevent smearing in all circumstances!

2.14.1.6 Further changes

- UniTransform 1.3 used internally
- Added more tooltip texts, e.g. for the color correction
- For the color correction on tab “Adv 3”, a row sum is displayed.
- “Format” tab: The minimum value of transfer frame buffers was lowered from 4 to 3 frames

2.15 Release notes for AVT SmartView 1.6.2

Release version of executable: **1.6.2**
Release date of executable: 22.06.2007
Minimum Driver/FireStack version: 1.2.0.1/1.2.0.0
Recommended Driver/FireStack version: 2.5.0.2/2.5.0.0

2.15.1 Changes from SmartView 1.6.1 to 1.6.2

- Uses UniTransform 1.2 internally
- Added XML settings support for Advanced White Balance (interlaced Guppy cameras)

2.15.2 Solved bugs and flaws

- The software-modification of Hue and Saturation for “raw” images on the tab “Ctrl3” works again.
- A bug in the conversion of the binned interlaced mode 0 in the Guppy cameras led to a wrong intensity level. Fixed.
- Sometimes loading or saving of XML files failed until restart of program. Fixed.

2.16 Release notes for AVT SmartView 1.6.1

Release version of executable: **1.6.1**
Release date of executable: 30.03.2007
Minimum Driver/FireStack version: 1.2.0.1/1.2.0.0
Recommended Driver/FireStack version: 2.5.0.2/2.5.0.0

2.16.1 Changes from SmartView 1.6 to 1.6.1

- The color quality of the debayering results for interlaced Guppy cameras was improved

2.16.2 Solved bugs and flaws

- In the topology window, the “Open” and “Close” toolbar buttons had no effect and were removed
- Changed Universal time to local time in the logging file
- When saving files (or changing options for saving files), some settings – like the BAYER pattern start pixel and the debayering method – were re-read from the registry.
- On tab “Ctrl 3” for interlaced Guppy cameras, the “auto” checkbox now disables and re-enables all four control groups (and not only two).
- Removed a crash which could occur when quickly and continually changing the AOI position

2.17 Release notes for AVT SmartView 1.6

Release version of executable: **1.6**
Release date of executable: 13.2.2007
Minimum Driver/FireStack version: 1.2.0.1/1.2.0.0
Recommended Driver/FireStack version: 2.5.0.0/2.5.0.0

2.17.1 Changes from SmartView 1.5.1 to 1.6

2.17.1.1 Added support for the Guppy GF-036

The image sensor of the Guppy GF-036C has a different **BAYER pattern** than Sony or Kodak sensors, and correct debayering is implemented starting with this viewer release.
The **HDR mode** of the Micron MV022 sensor allows for two knee points. They are controllable in an easy mode, which means that the draining voltage may be set for both knee points (measured from the minimum voltage) and the time is assigned automatically by the sensor. On tab "CMOS", you may enter voltage levels from 0 to 31, a value of 0 meaning 0.5625 Volt (each step meaning an increase of 0.0625 Volt). If you select two knee points, the second value must be less than or equal to the first value.
The Micron MV022 sensor also allows for **vertical image flipping**, which is available on tab "Adv 1" beneath the checkbox for the usual (=horizontal) Mirror image feature.

2.17.1.2 Added support for interlacing Guppy cameras

For the GF-038B/C and GF-044B/C Guppy cameras, a couple of additions were necessary to cope with the output of the sensor (which sends interlaced image parts).
Since the pixel size is not the same in both directions, all output in the viewer window will be slightly distorted. If you'd like to see a corrected image, make sure that menu items "View->Resize view on format change" and "View->Always scale image to window" are selected and select "View->Set display size to->Ratio-corrected image size" (otherwise use CTRL+Shift+A). This corrects the currently displayed image only horizontally and may of course lead to doubled or left-out columns, but circles should still be circles.
On the "VFormat" tab, there are several changes:

- A check box "De-Interlace", which becomes active if raw image data with no debayering is selected (and of course for monochrome cameras)
- The BAYER pattern can't be changed.
- There is one debayering method for Format 7 mode 0 and one debayering method for Format 7 mode 1. There is no debayering for Format 7 mode 2, since all four colors are binned into each pixel and therefore can't be separated.

On tab "Ctrl3", there are a few more GUI controls for additional color control. You may control the white balance of the camera by adjusting the single color channels of the sensor in mode 1 and the binned color channels in mode 0, as well as the Auto-function of this feature.

2.17.1.3 Added support for the board level Guppy "GF-080 BL"

The Guppy GF-080 has an interesting new feature: four I/O ports with pulse width modulation. For the output channels, you may set period and pulse width on tab "Trig/IO" for each output channel individually. You may enter values from 1 to 65535 micro seconds for the period and 1 to the period for the pulse width. On the input rows, these two fields are not available and are marked "n.a." (not applicable).
These settings are also stored in the optional XML settings file you may use.

2.17.1.4 More available memory for frame buffers

The amount of main memory for frame buffers may now be adjusted within the range of available physical memory (On settings tab "VFormat"), if you use driver version 2.5 or newer (if you use driver version 2.3 to 2.4.x, you are restricted to 1024 Buffers).
Since allocating/de-allocating memory is done during the start/stop of integration, the start/stop may be delayed if a huge number of buffers is used. Also keep in mind that using the largest part of your available physical memory for SmartView may lead to more memory swapping in other applications (including Windows), which might slow down the image capturing process anyway, so try to be conservative with your buffer settings.
Every time you change a parameter that influences the size of the frame buffers, the upper limit is recalculated and adjusted, so that you won't be able to assign too many frame buffers.

2.17.1.5 Improved XML-settings support

- Auto-Shutter state is now correctly restored
- The TestImage state is now restored
- HDR feature state for Guppy 036 may be now saved and restored
- HDR feature state for the Pikes may be now saved and restored
- Complete I/O states for BoardLevel-Guppy cameras may be now saved and restored
- Partial settings files possible: only one of the sections "Camera", "StdFeatures" and "AdvFeatures" is now necessary.

2.17.1.6 Topology window

If there are more cameras/cards than fit into the contents box of the topology view window, a vertical scroll bar appears.

2.17.1.7 Direct access dialog

You may now adjust the height of the direct access dialog, which is also stored between sessions.

2.17.1.8 Vista-related adaptations

For a correct display of SmartView in Windows Vista, some dialogs had to be re-designed.
Furthermore, after the sleep mode or the suspend mode of Vista, SmartView was frozen, also slowing down the system. This is now prevented by closing SmartView in case of activating suspend mode or sleep mode.

2.17.2 Solved bugs and flaws

- The menu entries for “Start Free-Run automatically on camera open”, “Start one-shot on camera open” and “Set shutter, gain and white balance automatically” did not react logically in some circumstances. Fixed.
- The displayed pixel values in scaled image viewing mode were wrong if zooming was enabled. Corrected.
- Added a parameter correction phase during the start of integration with format 7 based image modes. If there is an error in the configuration of the transfer, some parameters are adjusted.
- Corrected the clean starting of SmartView in case of a bad FireWire connection: now, the complete initialization is done in S100 speed, and the availability of S200, S400 or S800 is checked and selected at the end of this phase.
- Auto-Shutter state is now correctly restored when loading settings from XML file.
- More feature texts were synchronized with the availability of a feature, e.g. if you look at the tab “Ctrl 1”, not only the input elements, but also the texts “White balance” and “UV” and VR are disabled for monochrome cameras.
- More timeout for saving a user set (was too short for some Pikes, which were not responding directly after the saving)
- User messages in case of errors when saving or loading a user setting were improved
- Adapted the display size of some dialogs to systems with different display settings
- The reported number of current frames per second was averaged more smoothly over time.

2.18 Release notes for AVT SmartView 1.5.1

Release version of executable: **1.5.1**
Release date of executable: 11.08.2006
Minimum Driver/FireStack version: 1.2.0.1/1.2.0.0
Recommended Driver/FireStack version: 2.3.0.14/2.3.0.1

2.18.1 Changes from SmartView 1.5 to 1.5.1

- Allow to change the order of the BAYER pattern during integration
- Slightly changed the display of the stated image errors. If "Extras->Drop faulty frames" is disabled, the number of erroneous frames is now displayed in-between parentheses.

2.18.2 Solved bugs and flaws

- When reloading settings from an XML setting file for color Marlins and Oscars, there was a fatal bug. Solved.
- On camera settings tab "Format", the check box for automatic packet size was not always reset when changing mode or speed. Solved.
- Corrected the ranges for the adjustment of the Pikes´ channel balance.

2.19 Release notes for AVT SmartView 1.5

Release version of executable: **1.5**
Release date of executable: 27.06.2006
Part of: AVT FirePackage 2.5
Minimum Driver/FireStack version: 1.2.0.1/1.2.0.0
Recommended Driver/FireStack version: 2.3.0.11/2.3.0.1

2.19.1 Changes from SmartView 1.4 to 1.5

2.19.1.1 Update via FireWire for Guppy and Pike

You now have the possibility to update your Guppy or Pike firmware without having to connect a different cable to your camera than the FireWire cable.
If Guppy and Pike cameras are selected in the topology view of SmartView, an option "Update firmware" is available via normal menu or popup menu -- but only if no viewer window for this camera has been opened, so be sure to close it in order to update your firmware.
The Firmware update dialog allows for two major actions: updating the camera with an accessible firmware file provided to you by AVT's support on one hand, and on the other hand recalling the last firmware.

- **Upload**: First click the ellipsis button (...) to select a firmware file for your camera. You are only allowed to select files with a short version of the camera name in the file name (like "PF032C"), so that you can't select a wrong file by accident. Having selected the file, it is scanned for correct contents, rejecting the file if its contents are not suited for the current camera. If the file contains a valid firmware set, the "Upload" button becomes active. After clicking it, the firmware found in the file is uploaded to the camera, while a progress dialog is displayed. After this, a short success message is displayed, and then the camera is reset to start the new firmware.
- **Recall recent firmware**: If you wish to revert to a previously used firmware set (which has a different version number than the one currently used), you may do this by clicking "Recall recent firmware". The passive firmware set is then selected as the new startup set, and the camera is reset to start the other firmware. If by chance you have programmed the same firmware multiple times, you still have the possibility of programming the original firmware which you may get through AVT's technical support.

2.19.1.2 Changes for the Pike

2.19.1.2.1 Modifying the color correction of your camera

With the Pike, a popular feature is now provided: The color correction, which has been firmware-defined up to now, can now be user-defined.
Just to remind you: the color correction is realized as an additional step in the process from the sensor data to color output, and it was used to harmonize colors for the human eye. With other AVT (color) cameras so far, you had the opportunity to use it or to switch it off. Now, you may manipulate the color-correction coefficients yourself. This may be done on camera settings tab "Ctrl 3". There, you see a three by three matrix containing values from -1000 to +2000.
Some notes:

- For an identity matrix (leaving the colors as they are in the RAW modes), values of 1000 should be set for the diagonal elements, and 0 for all others.
- The sums of all rows should be equal to each other; otherwise you will get tinted images.
- Each row should sum up to 1000; otherwise, images will become less or more colorful.

For more information, please contact our technical support.

2.19.1.2.2 Modifying the channel balance of the Pikes' image sensors

To achieve more speed, the Kodak sensors of the Pikes are read out horizontally via two separate channels, so two ADCs are involved which may have to be configured differently. A standard adjustment between the channels is done at production time, but under certain circumstances, an intensity step might still be visible from left to right. To be able to make the step disappear, there is an extra dialog available from the viewer window. Either use menu item Extras->Adjust channels or press Alt+Ctrl+A. For using this dialog, the camera must be in format 7 and in RAW (color cameras) or MONO (monochrome cameras) modes. If you are using RAW modes, make sure not to use the viewer debayering because the pure sensor data is needed.
Using a pattern that has the full range of intensity values along a vertical line in the middle of the image, start image capturing and either select the channel adjustment value manually (by slider or by value) or press the "Do one-push adjustment" button, possibly multiple times.
The final value will only be active as long as the camera is powered and may be stored (among others) in user sets. (The original value may always be retrieved when loading factory set 0).

2.19.1.2.3 Saving shading data permanently

With the Pike, you are now able to store your generated shading data in flash memory inside the camera, allowing you to calibrate your imaging setup once under controlled conditions and then just load the stored shading data with one command after camera startup without having to transfer data from the PC to the camera.
For this, you are now able to switch the external source/destination from "file" (like it was possible before) to "flash", allowing you to store to flash, load from flash and to clear the flash instead of downloading and saving shading data to a file or uploading from a file.

2.19.1.3 Viewer window

2.19.1.3.1 Zoom keys (Alt+“+”,Alt+”-“)

In the viewer window, zooming in/out is now invoked by the keys Alt+”+” resp. Alt+”-“, and selecting maximum/minimum zoom is done by “Ctrl”+”Alt”+”+” resp. “Ctrl”+”Alt”+”-” (instead of “+”, “-“, Ctrl+”+” and Ctrl+”-“). To be able to enter negative numbers, e.g. for the color correction coefficients, different keys than “+” and “-“ had to be used.

2.19.1.3.2 Debayering Hue/Saturation

The “extra features during debayering” on “Ctrl 3” tab are now available for every color camera, not only for the Guppy (but still only in RAW8 modes with the last three offered debayering methods - “2x2 YUV422”, “2x2 LCAA” and “2x2 LCAA+V”).
Additionally, these three algorithms “2x2 YUV422”, “2x2 LCAA” and “2x2 LCAA+V” have been sped up if hue or saturation are used.

2.19.2 Solved bugs and flaws

- Corrected the frame rate displayed on the “Format” tab of the camera settings dialog. Now this value should be the same as the maximum transfer rate that can be achieved. Previously, it didn’t consider the jitter of half a cycle around the start of the transfer.
- The debayering pattern was always saved in-between sessions, but was not correctly initialized at startup. Fixed.
- For cameras with more output pins than input pins, the output mode “follow input” is not available any more for output pins missing a corresponding input pin (e.g. this mode is available for output pin 1 of the Guppy, which corresponds to input pin 1, but not for output pins 2 and 3)
- For the Pike, user sets / memory channel data is much bigger than before, so the time it takes to save them to flash memory is much longer. The timeout was much too small. Fixed.
- For the Marlin 131, the timeout for saving blemish/defect pixel data was also much too small, which led to strange camera behavior afterwards. Fixed.
- Removed the 16 bit debayering method “2x2, inv”, which was meant to be used with 16 bit raw data in big endian byte order – which AVT cameras don’t provide.

2.19.3 Added files

There are two added LUT files:

- LUT_Pike_Gamma_040_150.csv
- LUT_Pike_Contrast.csv

which provide gamma tables and contrast-manipulating tables for upload to the Pike cameras.
The first file contains a series of LUTs for the gamma function with a gamma of 0.4 to 1.5, using steps of 0.05, the second file contains LUTs lowering or enhancing the contrast in the range of 0.25 to 4.0. All of the LUTs start in row 2 because the first row is a header row. Since the first column is filled with the LUT entry index, the look-up table with a gamma value of 0.4 is positioned in the second column (Col B), so for a gamma of 0.9, you must select Col L.

2.20 Release notes for AVT SmartView 1.4

Release version of executable: **1.4**
Release date of executable: 17.02.2006

2.20.1 Changes from SmartView 1.3. to 1.4.

2.20.1.1 Behavior

- There is new default behavior when the viewer window is opened: Using the first image normally taken by the automatic one-shot, values for shutter and gain are computed (if they would result in an image too light or too dark) and an auto white balance is performed, and an additional image is taken, resulting in an image which should look roughly OK. (If settings are loaded or free-run is enabled at start, this is of course not done). This behavior may be modified by start parameters or by menu entries (disable Camera->Options->"Set shutter, gain and white balance automatically".
- The default behavior of making a one-shot may now also be changed via menu entry (disable Camera->Options->"Start one-shot on camera open")

2.20.1.2 Camera settings window

- On the "Ctrl 3" tab, the sliders for hue and saturation during debayering have more stops in-between.
- On the "Adv 2" tab, the new **image stamp** may be controlled. An image stamp including the cycle counter, the frame counter and the trigger counter may be positioned at the beginning of the row that you specify. The row number may either be a positive value up to the number of rows in a given image format, counted from the start of the image, or a negative number, which counts the rows from the last end of the image, so -1 means the last row. As before with the frame counter, now the trigger counter and the frame counter are only polled if the display check box is activated.
- Also on "Adv 2" tab, several camera registers may be saved in a **user set** inside the camera which may be restored by just one click/register toggle – also across sessions.
- On "Trig/IO" tab, the column "Polarity" for the input/output pins is now called "Invert" to clarify the use of this bit. A polarity of "low" before is now read as Invert:no, meaning the same.
- On the "Format" tab, the number of used frame buffers as well as the used debayering is stored in-between sessions.

2.20.1.3 Viewer window

- The display of frame numbers in the status bar has changed slightly: If there is more than one number, not all frames arriving on the card could be processed and displayed. The first number now shows the number of frames arriving at the card, the second number shows the number of frames lost on driver level (e.g. due to receive FIFO overflows), and the third shows the number of frames lost due to poor processing capability. The frame rates shown still show the frame rate at the card and, if there is a second frame rate, this one shows the processing frame rate.
- There are new menu entries for configuring the start behavior, available via Camera->Options:
    - Start one-shot on camera open
    - Set shutter, gain and white balance automatically
- There is a new menu entry for controlling the camera communication. Now, you can specify that you don't want any asynchronous block transfers by disabling Extras->"Allow async block transfers"
- There is also a new menu entry controlling the output of the Firewire driver: By disabling Extras->"Drop faulty frames", also all frames marked with an error are passed to processing and will be displayed. Use this switch if you use 1394b on a very slow computer (usually a laptop with a PCMCIA card) and you want all the frames arriving at the driver to be displayed.

2.20.1.4 Start options

Additionally to the appropriate menu entry, use start option "–a" for preventing the viewer from trying to adjust shutter, gain and white balance automatically after the initial one-shot. This flag is only valid if the –o flag is not specified.

2.20.2 Solved bugs and flaws

- If there was a bus reset on a 1394 bus where a camera was currently integrating, the DMA channels were not freed before re-enumeration, so that the viewer was quickly running out of 1394 resources. Solved.
- The Marlins did not have any support for serial I/O any more. Now they have it again.
- In the Marlins, the MONO16 mode was reported to have 14-bit depth (the pixel info also showed values according to 14 bit). Solved.
- In the "Format" tab of the settings dialog, the ISO channel number was not written into the appropriate register. Solved.
- After loading settings and after a soft reset, the display size did not fit the current zoom factor. Solved.
- If the specified XML settings file could not be found during an auto-load action, the message box popping up could not be closed by clicking OK, but only by closing the message box window.
- After loading settings, the "Auto" payload switch was still in the state as before, independent from the loaded payload settings. Now, if the payload is at the maximum, the auto switch is disabled, and if it is equal to the maximum, it is enabled.
- Some minor GUI changes for more user-friendliness.

2.21 Release notes for AVT SmartView 1.3

Release version of executable: **1.3**
Release date of executable: 14.12.2005

2.21.1 Changes from SmartView 1.2.4. to 1.3.

2.21.1.1 Behavior

- **Full support for Guppy cameras GF-033B/C, GF-046B/C and GF-080B/C.**
- Initial reading of the camera configuration is now restricted to S100, so that every camera may be found, even those that are only available over a slow/unreliable cable.
- For the initial read operations of the settings, the current camera capabilities are taken into consideration, resulting in less read operations and less read errors during startup.
- More checking for errors during read and write operations on the 1394 bus.
- As far as window positions are stored between sessions, they are checked for plausibility more thoroughly (and corrected) before applying them.
- Zoom keys (+ and -) have this function only when the viewer window is focussed. If the settings dialog has the focus, these keys are directed to dialog controls.

2.21.1.2 Camera settings window

- There is a new "Ctrl 3" tab, where you can adjust **hue and saturation during debayering** using methods "2x2 YUV422"(the older Marlin/Dolphin algorithm), "2x2 LCAA" (local color anti-aliasing, the method in newer firmware versions) and "2x2 LCAA+V" (local color anti-aliasing including vertical color smoothing, the newest algorithm for Pike cameras). This costs a lot of CPU power, of course, if values different from 0 (hue) or 100 (saturation) are selected, so be careful. Details for the algorithms:
    - All three algorithms convert the transported RAW8 image to the YUV space, where low-pass filtering of the color information (U and V values) takes place, and a conversion to the BGR space (the Windows RGB) afterwards.
    - Color low-pass filtering: "2x2 YUV422" only uses two horizontally neighboring pixels, "2x2 LCAA" uses four horizontally neighboring pixels and "2x2 LCAA+V" uses a window of four horizontal and two vertical pixels.
    - If hue is 0 (no hue rotation) and saturation 100 (=100%), a more efficient back transformation is performed, otherwise the hue rotation and the saturation enhancement are done in the YUV space before the transformation back into the RGB space.
- On the "Format" tab, you may adjust the number of frame buffers used by the FireStack. The number of buffers used for processing is 2 less than this number, so that the FireStack always has enough frame buffers to keep up DMA transfer. Nevertheless, if the processing buffer is full, the next arriving frame is dropped. The default value for the number of buffers is 16, with a minimum of four.

2.21.1.3 Viewer window

- The maximum size of the viewer window is now restricted to the screen size.
- The asynchronous transfer speed may be set manually ("Extras" menu)
- If logging is enabled, you may enable immediate flushing of the log file, so that every log message is written directly to the log file. This may of course slow down the viewer speed, so handle with care...
- There is a new menu entry View->"Reset position of settings dialog", to be used in case that the settings dialog doesn't reappear.
- The display of the image rate in the status bar is slightly modified: If reception and processing rate are the same, only one value is displayed. (The value does not show the absolute value from integration start, but shows a temporally low-pass filtered value of the current frame rate, so that abrupt changes don't occur.)

2.21.1.4 Topology viewer

- After selecting a camera, a context menu is available, which allows you to soft-reset a camera (if the unlikely case of a complete loss of control over a camera should occur).

2.21.1.5 Start options

Use start option –b for preventing all selected cards from becoming bus-master.

2.21.2 Solved bugs and flaws

- If there was a bus reset on a 1394 bus where a camera was currently integrating, the DMA channels were not freed before re-enumeration, so that the viewer was quickly running out of 1394 resources. Solved.
- Some minor GUI changes for more user-friendliness

2.21.3 Added files

There are two added LUT files:

- LUT_Guppy_Gamma_040_150.csv
- LUT_Guppy_Contrast.csv

which provide gamma tables and contrast-manipulating tables for upload to the Guppy cameras. The first file contains a series of LUTs for the gamma function with a gamma of 0.4 to 1.5, using steps of 0.05, the second file contains LUTs lowering or enhancing the contrast in the range of 0.25 to 4.0. All of the LUTs start in row 2 because the first row is a header row. Since the first column is filled with the LUT entry index, the look-up table with a gamma value of 0.4 is positioned in the second column (Col B), so for a gamma of 0.9, you must select Col L.

2.22 Release notes for AVT SmartView 1.2.4

Release version of executable: 1.2.4
Release date of executable: 31.08.2005

2.22.1 Changes since SmartView 1.1.0.

(In cyan: changes since SmartView 1.2.0)
(In blue: changes since SmartView 1.2.2)

2.22.2 Start options

2.22.2.1 Start only one camera in a viewer window

If you specify a command line option like "-g17171717", only one viewer window is opened for the camera with the given ID (that you can see on the label on the camera). If the name of a valid camera settings file is specified in HKEY_CURRENT_USER\Software\AVT\SmartView\Options\SettingsFileName which contains settings for the camera in question, the settings are automatically loaded at program start and automatically saved at program end, unless you also specify the option "z". So, to just start a viewer window for a specific camera without auto-loading and –saving, use option string "-zg17171717".

2.22.2.2 Start viewer without initial one-shot

Specifying command line option "-o" disables the initial one-shot. This comes in handy if the camera you want to look at is still in external trigger mode and thus hangs during opening.

2.22.3 Viewer window

2.22.3.1 Behavior

- **Recording options**: The menu entry "File->Set stream file name..." has been renamed to "File->Recording options...". The functionality has been moved to the dialog that's popping up if you select the menu entry. Also on this dialog, you may set the number of digits used to construct the file name (you should set the file name AFTER you changed this value), and you may specify that you want only every nth image to be recorded.
- **Keyboard support**: The "record" function is now available via "Ctrl+R"
- **Zoom**: Set zoom factor to 1 using Alt+"-" keys and to maximum using Alt+"+" keys
- **Zoom and "auto resize view"**: If "View->Auto resize view" is selected, and you zoom in or out, the display window is resized if the resulting window size fits into the screen size.
- **Camera settings**: There is now an additional possibility to save and load camera settings to a file not by GUID like before, but by the camera type (model name + firmware number), so that one camera setting is valid for all cameras of the same type. For this, disable the menu entry "Camera>Settings>Search for camera by GUID"

2.22.3.2 Image view

- Status bar: The meaning of the image counters in the status bar has changed a bit. The pane on the left shows the current status or the image resolution, if selected. The next pane shown in the middle still displays the number of frames that have arrived on the FireWire bus from isochronous start, followed by the number of processed images instead of the number of "dropped frames" in previous versions (no matter who dropped them).
  The first value is always displayed, but the second only appears if frames could not be processed. The pane left of the display size shows an approximation of the frame rate on the FireWire bus, followed by the rate of processed images if not all images could be processed.
- Histogram window: There is now a minimum size of 256x128 for this window

2.22.3.3 Camera settings dialog

- "LUT/Shading" tab
  - If a LUT has been uploaded into the camera, this LUT may be displayed in a separate window with a button on this tab.
- "Adv 2" tab
  - Local color anti-aliasing: If a camera supports this feature, it can be switched on with a checkbox on this tab.
- Moved the Tool tip check box to an entry in the help menu of the main viewer window.

2.22.3.4 Window titles

To keep the captions of the additional windows a bit shorter, the card number and the node number added in version 1.1 are now abbreviated to something like "C0,N1".
Furthermore, if you specify a registry key "HKEY_CURRENT_USER\Software\AVT\SmartView\CameraView\DisplaySN with a value of 1, the serial number of the camera is displayed additionally to the node number in the window captions. This is the same info as on the "Adv 1" tab, so this is no additional information, but a shortcut to available information.

2.22.3.5 Behavior

- Due to a change in the event signalling by the FireStack, the receiving of image frames had to be changed. This might slow down image processing a bit.
- Improved bus level logging.
- Reduced the priority of processing thread to "normal". This way, you have a better chance to control the camera on slow systems, but the number of lost frames due to image display may increase. Only for continuous saving of images aka streaming, the priority is increased to "above normal"
- Improved stability around image grabbing.

2.22.4 Solved bugs and flaws

- After loading camera settings, the contents of the shutter register was sometimes not correctly restored. This is now solved.
- After loading camera settings, the status of the mirror image flag was not correctly shown. This is now the case.
- After switching from Format_7 to non-Format_7 modes on settings "Format" tab, all the format 7 related fields are cleared.
- In version 1.1, a file called "AVT_SmartView.log" was always created. Now, this file is only created if an appropriate start option is supplied. The log file is created in the same folder as the viewer executable, and it is only flushed every 8000 characters, so you have to close the viewer to see the complete log file. The log levels are: (listed in decreasing severity and including all the log levels above them)
    - "-f": fatal
    - "-e": error
    - "-w": warning
    - "-i": info
- There was a bug in restoring camera settings from a file for some newer firmware numbers which led to different camera settings than specified in the settings file which is now solved.
- Corrected behavior around "auto-resize view" option of the viewer: Now changing the format or mode leads to a zoomed display if zoom was enabled.
- Switching between RAW16 and RAW8 could lead to suppressed image display. Solved.
- Solved a bug which led to the selection of a too high frame rate when opening a camera view.
- A few minor GUI bug fixes.

2.22.5 Added files

There are three more files which contain a lot of look-up tables each, "LUT_Oscar_Contrast.csv", "LUT_Dolphin_Contrast.csv" and "LUT_Marlin_Contrast.csv". These are LUTs for increasing or decreasing the contrast for an image. Each of them has 16 tables with contrast values ranging from factor 0.25 to factor 4. A factor of 4 means that the gradient in the middle of the LUT is steeper by a factor of 4.

2.23 Release notes for AVT SmartView 1.1.0

Release version of executable: 1.1.0
Release date of executable: 21.02.2005

2.23.1 Changes since SmartView 1.0.0

2.23.1.1 Cameras

2.23.1.1.1 Full Oscar support

The whole Oscar family with all of the new features is supported by this SmartView version. RAW16 color mode images in Format_7 may now be saved as raw 16-bit files, the pixel values may be observed in full resolution and the histogram also may show the full image depth. Depending on the High SNR mode, the images may have a depth of up to real 16 bit (12-bit depth is normal in RAW16 mode).

2.23.1.1.2 MF131 support updated

Along with the release of SmartView 1.1, the Marlin MF131 B and C have received a firmware update. To be able to use the DSNU and blemish pixel functionality of this better firmware, this viewer is needed. MF131 cameras with an older firmware cannot be controlled by this viewer version.

2.23.1.2 Deep-image support

It is now possible to use images with more than 8-bit depth if the current camera mode allows it (MONO16 and RAW16 color modes). You can enable/disable this support by selecting the “File>Use deep images” menu item. The state of this switch is saved when the window is closed.
During deep-image support, the enhancements are:

- Extended histogram. Toggling the switch also toggles the display instantaneously
- Adjusted tooltip pixel values
- Saving 16-bit images is also possible. The file extension you enter in the “Save as...” dialog will only be valid for the 8-bit output. For the 16-bit output, the extension will be “raw”.
- Saving a series of 16-bit images.

The file format is exactly as it is comes from the camera, i.e. with the higher byte first, and the assembled pixel value is MSB-aligned, so that the lower bits are zero.
Example: a sequence “7F F0 FE 50” of a 12-bit image should be interpreted as “07FF 0FE5”, (equals “2047 4069”).
Warning: If you work with deep images, more computation is necessary and the viewer might become slower, leading to dropped frames!

2.23.1.3 Viewer window

2.23.1.3.1 Behavior

- **Keyboard support**: The cursor keys and the PgUp/PgDown keys have changed their meaning from moving the image to moving the scroll bars to be compatible with other programs. So now, pressing the right arrow key moves the scrollbar one position to the right and thus the image one position to the left, for example.
- **Additional keyboard support**: The SHIFTed cursor keys now move the image position half a screen width or height. If in scroll mode, the "Home" key (aka "Pos 1") centers the image to the cursor position (as far as possible).
- **Record function**: This function is now also available during free-run.

2.23.1.3.2 Image view

- The **histogram** now displays two additional x-axis values: the maximum value and the medium value for orientation. Furthermore, the vertical wobbling of the histogram during continuous shot has been decreased a bit. An additional black vertical line in the lower regions of the histogram shows the position of the maximum of the histogram.

2.23.1.4 Camera settings dialog

- "Format" tab
  - High SNR mode control: select a value from the combo box to enable the AVT High SNR mode. Since the image is transported after the complete computation of the added image, the currently achieved frame rates are approximately (the frame rates without High SNR mode enabled) divided by (the selected value plus 1).
  - Debayering methods (RAW8):
    - A mode with UV-low-pass-filtered color output which produces the same color output as the Marlins and Dolphins in YUV422 mode (except for the color correction) is now included, called "2x2 YUV422". In this mode, two consecutive U or V values are averaged before creating the 4:2:2 byte stream.
    - A mode including low-pass-filtering 4 U and V values horizontally (instead of 2 bytes, as in the mode above) is also added, called "2x2 Int4UV"
    - A monochrome mode derived from the standard debayering is also added. (Only the Y signal is displayed) Name "2x2 mono"
    - The RAW16 mode has still got only one valid 2x2 debayering.
  - The starting debayering pixel can be selected in a separate combo box
  - The channel for isochronous transfer can be selected by an added combo box. An additional check box controls the automatic acquiry of a different channel number if the selected number fails. In this case, the acquired channel number is displayed in the combo box.

- “Trigger/IO” and “CMOS” tab
  - During HDR mode, level mode trigger is not possible any more and vice versa (due to a camera restriction)
  - The multi-shot counter also controls the number of shots in trigger mode 15
- "CMOS" tab
  - Blemish/DSNU correction: Behavior adapted to current camera functionality. Use the current camera firmware; cameras with older firmware cannot not be controlled properly

2.23.1.5 Direct Access dialog

2.23.1.5.1 Register name support

There is an additional combo box containing the name of a register to read or write to. This combo box is selected according to the numerical value in the “address” edit field, or a register name can be selected directly, and the address field is filled accordingly.

2.23.1.5.2 Most recent write operations stored

When closing the viewer, the ten most recently used write accesses will be stored and redisplayed in the history panel of the dialog. This allows you to carry on with your work of the previous session more easily or allows you easier access to registers that are often used.

2.23.1.6 Window titles

The caption of all windows now also contains the card number additionally to the node number, so that identical camera types with the same node number on different card may be distinguished

2.23.2 Solved bugs and flaws

- Corrected Mono16 and Raw16 support
- All used registry entries may now be found in HKey_Current_User/Software/AVT/SmartView
- After reading camera settings, the contents of the combo box containing trigger polarities is set to the correct value.
- In the direct access dialog and the camera settings dialog, the cursor keys work again.
- Wrong colors in the histogram of RAW8 images were corrected.

2.24 Release notes for AVT SmartView 1.0.0 for Intek.

2.24.1 Release Info

Release version of executable: 1.0.0
Release date of executable: 10.01.2005

2.24.2 Changes since IIDCView 0.5.0.

2.24.2.1 Viewer window

2.24.2.1.1 Behavior

- **Error handling**:
  - If there's an error when starting exposure, a message box is displayed.
  - If reading or writing the camera settings produces an error, a message box is displayed.
- **Stronger checking for quick settings read/write functionality**; reading is only possible if the camera is not running, a file name is given and this file exists; writing is only possible if the camera is not running and a file name is given.
- The **display state of the display settings dialog** is saved when closing the viewer window, and restored during start-up, so that it only comes up if it was displayed the last time you closed the viewer window.

2.24.2.1.2 Image view

- In **zoom mode**, images are displayed beginning at **pixel boundaries**. This might be irritating when zooming in or out because the pixel below the mouse position seems to move (it doesn't; the mouse stays centered on the same pixel, but the position of the pixel on the screen changes)
- A **histogram** of the current image can be displayed (menu View->additional information). Keyboard shortcut: CTRL+SHIFT+H
- **Full scroll bar functionality**: they are also usable for image positioning

2.24.2.1.3 Camera settings dialog

2.24.2.1.3.1 Changed functionality and usage

- "Control" tab
  - One-push white balance changes are also reflected in the sliders
- "Control 2" tab
  - Autofunction AOI: Width and Height combo boxes only show values accepted by the camera
- "Adv 2" tab
  - Fixed: Software reset changes the settings to the default settings without autoload (i.e. the largest fixed mode with the first color mode
- "CMOS" tab
  - Blemish/DSNU correction: Behavior adapted to current functionality. "Show correction data image" disables the "Blemish correction on" and "DSNU correction on" buttons.
  - HDR mode: Additional "easy mode" control. See below
- "LUT / Shading" tab
  - Added LUT support for Oscar cameras

2.24.2.1.3.2 HDR mode control

- In expert mode, the additional integration times after the reset levels are fully adjustable (they are not as restricted as in previous versions). **Warning**: You can also enter values that will not lead to any additional gain or result in a strange characteristic curve. Additionally, the minimum and maximum values for the additional gain are displayed above the slider and the current additional gain is displayed in the edit box beside the slider of the easy mode.
- In easy mode, the slider controls the desired additional gain (adjusted by the highest active reset level) which can be achieved for this shutter time and number of reset levels. It also adjusts all lower reset levels and the shutter value automatically so that the characteristic curve is as smooth as possible. You can see the resulting values in the value fields in the expert mode edit boxes.
- You can easily switch between the modes. When switching to easy mode, the value of the highest activated additional integration time is used as the basis for recalculating the values of all of the additional integration times, using the summed-up integration time. When switching back to expert mode, all the values are kept as before.
- "Display graph" gives a presentation of the characteristic curve resulting from the sensor reset settings as it will be if the HDR mode is enabled.

- Recommendations
  - Auto-shutter must be off!
  - Remember that in the original image, there should be many pixels with grey level 255 (see histogram)
  - Keep the histogram window open
  - Display the characteristics graph
  - Hint: also think of adjusting the "brightness" register value;
  - Keyboard usage for the slider is also possible: select the slider by mouse click, afterwards you can use SHIFT+LEFT and SHIFT+RIGHT for positioning the slider.
  - Proposed procedure:
    - Disable HDR mode, select "easy mode" control on "CMOS" tab
    - Display the histogram window
    - Set the extended shutter value on tab "Adv 1" and the brightness register value on tab "Ctrl 1"so that the dark image parts look good and the histogram also looks good.
    - On the "CMOS" tab, select the number of reset levels, select the lowest additional gain that's possible, enable hdr mode and start the camera.
    - Play with the slider until the histogram and the image look nice in the upper grey level regions
    - If needed, switch to expert mode and play some more with the values in between the shutter value and the highest reset level to smooth the histogram.

2.24.2.2 Note for camera settings support

In order to be able to save and load camera settings to and from an xml configuration file, the MSXML parser must be installed on your system.

2.24.2.3 Additional files

- Msxml3ger.msi: Installation file for the MSXML parser, version 3 service pack 4, German. For information or other languages see the Microsoft home page
- GdiPlus.dll: This DLL is only needed on Windows 2000 systems, not on Windows XP. For information or other languages, see the Microsoft pages
- CSV tables containing gamma look-up tables to upload to several AVT cameras. All of them contain LUTs for the gamma function for a gamma of 0.4 to 1.5, using steps of 0.05. All of them start in row 2 because the first row is a header row. The first look-up table with a gamma value of 0.4 is positioned in the second column (Col B), so for a gamma of 0.9, you must select Col L. Since the three camera families have different bit depths, there are three files:
  - LUT_Dolphin_Gamma_040_150.csv
  - LUT_Marlin_Gamma_040_150.csv
  - LUT_Oscar_Gamma_040_150.csv