

FalCon eXtra - Release Notes / News

Version 9

Common

- Site License: The license is read from the server dongle and remembered in the registry. The run time until the program needs a refresh of the license (via connection to network/server) is usually 30 days. The remaining run time is shown in the status bar. New: colored labeling within the warning interval: yellow < 14 days, red < 7 days.
- Outputs in dialog license administration improved.
- **Hint to** dialog license administration dialog:
If you can open FalCon eXtra only with restricted modules, e.g. during switch of a license dongle or toggle of the license search, it might happen that the subset of available file types is saved. If not all (typical) file types show up in the open dialog after the next start of the program, please follow this **tip**:
"Reset all settings of file types to factory defaults" via "R" in toolbar.
- Background image (falco tinnunculus) Version 9 in typical screen format 16:9
- New background color "bright green-blue "; previous color = "Grey Classic".
- **New:** dialog license administration:
Info about type (**HL** or **HASP**), location (local or server) and possible run time of the hardlock. Activate here licenses via keys, which can be requested by phone, e.g. after turn of the year.
Site licenses are read from a server hardlock and stored in the registry. The run time - without any further access to the server - is now 30 days as standard. if the computer is connected to the server this run time is automatically refreshed/extended in the background (needs some seconds). (see also button "Refresh Registry Licences")
- **Hint:** If you have no HL server hardlock switch off the license search "Server Hardlock" to enhance the performance.
- Hints to registry keys (for system admins):
 1. Under Windows 7 a problem occurs, because data are in the cache for up to 10 seconds until they are visible for other programs.
In order to avoid this behaviour the *DirectoryCacheLifeTime* should be set as follows:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanWorkstation\Parameters "REG-DWORD DirectoryCacheLifeTime 0"
 2. Switch off Virtual Store:
user-specific:
HKEY_CURRENT_USER\Software\Classes\VirtualStore "REG_MULTI_SZ ExcludedExtensionsAdd DAR ICF"
system-specific:
HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Luafv\Parameters "REG_MULTI_SZ ExcludedExtensionsAdd DAR ICF"

3. The DB-Client cannot send data to the server:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Lsa

"REG_DWORD32 lmcompatibilitylevel = 3 (oder 0)"

Note: value 5 blocks sending to the server.

4. TCP/IP reached the safety limit, which was defined for the number of concurrent TCP connectiontrials. Since Windows XP SP2 the maximum number of TCP/IP connections is limited to 10:

HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Tcpip\Parameters

"REG_DWORD TcpNumConnections 0x00ffffe (16777214)".

Note: the allowd values are in the range 0 - 0xffffe.

==> reboot the computer.

QuickView

- Save single picture including overlay drawings.
- Edit PNG picture and save: implemented.
- Substitution variables for text drawings: dependent on type of document =

JPG (Exif Data):

(\$TAGIMAGEDescription)	(\$STAGEQUIPMAKE)	(\$STAGEQUIPMODEL)
(\$TAGSOFTWAREUSED)	(\$TAGDATETIME)	
(\$TAGEXIFISO SPEED)	(\$TAGEXIFEXPOSURETIME)	
(\$TAGEXIFFNUMBER)	(\$TAGEXIFFOCALLENGTH)	
(\$TAGTESTNAME)	(\$TAGDBTESTNAME)	

ImagerControl:

(\$TEST)	(\$VIEW)	(\$MOVIEDIR)
(\$XRES)	(\$YRES)	(\$SRATE)
(\$DURATION)	(\$NOOFPIC)	(\$STARTAVI)
(\$TOAVI)	(\$IMAGERTYPE)	(\$IMAGERNO)
(\$EXPOSURE)	(\$SLAVE)	(\$LENSTYPE)
(\$LENSID)	(\$FOCALLENGTH)	(\$APERTURE)
(\$DESCRIPTION)	(\$COORDSYSTEM)	(\$PO SX)
(\$POSY)	(\$PO SZ)	(\$COMPRESSOR)
(\$TILT)	(\$AXIS)	(\$SWING)

MTR:

Input path (\$INPATH)	Full input directory (\$INDIRFULL)
Last input directory (\$INDIR)	Output path (\$OUTPATH)
Full output dir. (\$OUTDIRFULL)	Last output directory (\$OUTDIR)
Compression (\$COMPRESSOR)	Movie name (\$MOVIE)
Movie name part 1 (\$MOVIE_1)	Movie name part 2 (\$MOVIE_2)
X-Resolution (\$XRES)	Y-Resolution (\$YRES)
X-Position (\$XPOS)	Y-Position (\$YPOS)
Sampling Rate (\$SRATE)	Duration (\$DURATION)

- Default for all standard picture types (JPG, BMP, TIF, PNG ...) now without showing the optimization dialog.
- Default for all standard picture types (JPG, BMP, TIF, PNG ...) now without checked "Open as sequence ". (See also Reset of all optimization settings in the title toolbar)
- Movie with long path/name: Windows shortens the DOS path, but now:
 title in filmstrip overview original,
 New Analysis => with full path/name,
 Info dialog with button to show full name.
- Movies: The Microsoft viewer for AVIs limits the length of the allowed file path (: max. 128 characters), therefore the path+name are automatically abbreviated.
 For display in the window title and for optional storage of screenshots the original name is now used.
- The color of the FalCon desktop is now freely selectable:
 Sky Grey (version 9) - Classic-Grey (version 8) or any shade of color.
- Movie + Picture + Plot:
 Ctrl + minimize one window = minimize all windows of the same type.
 Ctrl + restore one window = restore all windows of the same type.
- Movie: handling at zoom factors > 500 improved.
- Movie + Picture: Ctrl or Shift pressed + mouse wheel = zoom at constant window size.
- Auto-Layout:
 now applicable in all movie, picture and plot windows.
 Menu Window/Arrange Windows:
 Auto-Layout Windows = "L"
 Auto-Layout Movies / Plots = "Shift + L"
 Auto-Layout Movies
 Auto-Layout Pictures
 Auto-Layout Plots
 (The selected windows will be set to foreground.)
- Help for creating movie screenshots:
 + Standard: "Save As" or MS shortcut F12 (type: avi, jpg or bmp)
 + Ctrl + F12 => automatic saving with the file name
 "AVI-name + @xxxms + .bmp/jpg".
 + Shift + F12 => automatic saving of all open movie windows.
 Define in the status bar "Define Capture" the file type (jpg or bmp) and the destination directory. If the destination directory is empty, the screenshots will be written into the directory of the movie document.
- **SyncPanel:** In case of some image frequencies, e.g. 6000 Hz, problems can occur due to rounding: step width = periodical infinite = 1.666666...
 New correctives:
 + output of step width with 3 fractional digits in ms, e.g. 1.667.
 Hint: set time format also to ms with 3 fractional digits.
 + improvement at negative time values.
 + using the slider only multiples of the (internal) not rounded step width are selected.

- MCF files can contain trigger time (as Datum) and exposure begin and end (as Datum) for each frame. These time parameters are now read and shown in the dialog "Info" or can be exported to Excel file.
- MJPEG MainConcept Video Codec V 3.2.4 supported.
- Picture-Transformation: acceleration during (multiple) AVI creation by load distribution to a thread; gain especially with GPU license.
- **New:** Picture file format PNG now supported.
- Picture Optimization dialog checkbox "Unchanged": now with three states (tri-state): original without drawings / original with drawings / optimized with drawings.
- Normalize picture contrast: editable threshold "Ignore values %" with histogram overview and Min/Max bars.
- During replay of externally created AVIs this error message could show up: "Parameter out of valid range for this command". We set now internally the decoded replay frequency to a valid/meaningful range.
- See also modified version V4.1 of the tool "ModifySampleRate.exe".
- AVI Insert Parameters: checkbox for font = adaptive depending on image size. See limits (= Min/Max) in Program Settings.
- Reset settings for Logo/Texts to factory defaults: "R" in toolbar.

QuickView Draw

- Grid and rectangle now with optional rotation angle.
- Smooth polygon and freehand drawings: line chains are subsampled into the picture raster and smoothed acc. to "filter width". (no closed curves are necessary)
- Common shift + zoom for all drawing elements (numerically or via pressed Ctrl key)
- Polygon and freehand with own zoom parameter.
- Click on a drawing element in the picture overlay (directly or into the circumlocutory rectangle) => the corresponding tab of the drawing element will be selected automatically.
- Picture copy (Ctrl C) includes now drawings.

Picture Transformation & FrameMerge

- Until now camera parameters for rectifying of pictures can be imported only via drag&drop from a CamFolder file.
New: The import of ISO COR files is also possible, if a CamFolder license is available at the workstation or on a server. The license will not be activated; it needs to be only disposable.
- **New layout:**
Configurable dialog for larger image window and zoom facility.
Note: min. screen height 1080 pixel!

- **New FrameMerge:** during mosaicking and overlaying acceleration by GPUSpeed is supported.
- Duplicate entries of pictures in the input tab.
- Delete pictures with selectable step width.

QuickView DB

- MME Export: convert AVI names according to customer specific LUT tables, e. g. lab test ref. number => customer test ref. number.

Picture Transformation

- Auto Section also in mode "Translation+Rotation+Zoom":
solution using assumptions:
1. rectangle with original aspect ratio
2. rectangle centered to center of the cutting polygon
=>
Similar to fitting panorama photos the invalid margin is marked by green color.
The effective inner rectangle is shown by dashed lines.
This overview is shown after clicking "Section" in the tab "Anti-Shake".

Picture Transformation / ImagerControl

- Enter texts with proportional font size:
New: After each change of the flag or of the font size a message window shows the effective values; optional also Cancel.
A possible limitation of the font size (to min/max) is shown in the message window or in the tooltip.
New: "Reset" with the options "From Configuration File" and "To Factory Defaults".
In IMC a change of flag "Proportional" or change of font size is applied to all selected cameras.

Plot

- Display of extrema in time curves:
minimum/maximum globally or locally in plot window,
text and symbol (square, circle, crosshair) at position of the extremum,
while zooming the position is dynamic in case of "... in plot window";
text e.g.: "min=(\$MINWIN) (\$ORDUNIT) @ (\$MINWINATT) (\$ABSUNIT)"
- Info dialog: show the ISO channel properties in separate tab dialog; available at file format CHN, ISO, TDMS.
- Min/Max display with selectable fractional digits:
automatic logical text = e.g. (\$MAX) => autom. number of fract. digits acc. to the range of values; min=1.
New: logical text with explicit number of fract. digits, e.g. (\$MAX4) for 4 fract. digits; the number is to be edited.
- Existing diagram f(t) with units mm and ms; add a curve f(t) with in m and s => now each new curve is automatically recalculated into the target units mm and ms. This is also valid for spatial curves etc.

- NI TDMS meas. data: open now also via "New Measurement Plot"; show/select the TDM groups (same at ISO MME: test objects).
- The first entry in the templates list is now always "< FalCon >" = FalCon default settings.
- Read channels from Excel worksheets *.xls:
 first 3 lines (optional) = name, label, unit,
 display/selection in preview dialog by max. 4 columns,
 open via "File / New => Measurement Plot".
- Plots of ASCII tables: The first lines of an ASCII table can contain - in fixed sequence - "Name / Label / Unit".
 These lines are shown in the import dialog and can be applied via "OK".

Example:

name1	name2	name3
label11	label12	label13
s	m	m/s
0.000	0.000	-0.146
0.100	3.471	0.695
0.200	3.964	3.327
0.300	4.188	3.699
0.400	4.255	3.965
...		

- **New:** Read measurement data in NI TDMS format:
 1. Installation of the National Instruments Dlls via separate setup necessary!
 2. See copyright note in "?" = "Info About FalCon eXtra".
 3. Display as Plot or import in MME Creator (= "Add ISO Channels").
 4. Standard ISO tags are supported as TDMS properties: read and save as list of comments.
 Please ask us if you need a detailed documentation!
- **New:** window with numerical table of values:
 dialog window with maximum height of program window;
 color highlighting by 2/5/10-steps and gray background at T0;
 including editing: numerical input or delete (with multiple selection, key DEL)
- Display of Min/Max as f(curve):
 - + during definition of an extreme value (Min/Max) it is assigned to a curve.
 - + see curve index in tab Plot Settings/Insert.
 - + numerical value (in case of using the logical placeholders \$MIN bzw. \$MAX), color and axis property (Left/Right) depend now always from the curve.
 - + during insert in tab Plot Settings/Insert several curves can be selected.

Plot 3D

- Auto Texts: supported in title (\$SOURCE), (\$TIME) und (\$TIMEUNIT)
- Using a selection list in the toolbar a single curve can be selected as visible. Reset via show "All Curves" visible.
- Numerical table: time channel now in first column.
New: show t + x,y,z-coordinates and standard deviations with grading by traffic light colors.
- Now also with function "Capture as AVI".

MMECreator

- Handling of missing objects improved:
+ number of objects > number of entries in Information File,
+ all entries MISSING.
Hint after reading the MME file; invalid entries are removed.
- Handling of CHN channel names: show in dialog; compare with entries in channel file;
(colored) warning if neither name nor code is contained; see also Check button in
toolbar. Button for automatic renaming if all CHN channel names.
- Add Photos: now only standard picture types, default type = JPG.
- Add DIAdem channels with ISO entries:
Until now the standard DIAdem entries:
101 Description of data set => Title
103 Person responsible => Lab. contact name
104 Date => Test date
have been the master over the corresponding ISO entries 102 ...
New: the standard DIAdem entries remain to be master, BUT only, if they are valid set.
Exception: the ISO date is taken, if it is valid; additionally 105 is applied as timestamp.
Note: the syntax of date and time format is not checked, these parameters are applied as
texts.
- If movie information entries are missing, the optional parameters" + ... " of the COR file
are used for the MII file.
- New analysis from the MMEViewer: in case of a deleted film the rest of films and
corresponding parameters is handled correctly.
- "Descriptors" for additional comments with prefix "+" or "." can now be edited.
- The following comments are now supported in ISO MME files:

Comments	= standard
+My Parameter	= leading plus "+"
.Your Parameter	= leading point "."

In case of movies and photos the descriptor need to be extended by the index;
e. g. for movie #2: +My Parameter 2
These enhanced comments are supported during reading and writing. In the FalCon
MMEViewer they are shown in tabs "Plus". Here additional comments (with the
standard key 'Comments') can be added.
Note: The ordering cannot be changed during writing or viewing.
- Replace Test number in file names of multi-media data.
- Replace view names in movie files: definition via Excel file with multiple worksheets:
headings of 3 columns = OLDVIEW / NEWVIEW / NEWDESCRIPTION.
- Add documents:
new types = doc, docx, txt, pdf; previous: doc, txt, wri.
- Write and read several "Comments":
1. During reading several comment lines within a file or within a data structure are
saved internally as pairs of "Descriptor+Comment". (default "Descriptor =
"Comments").
2. Display on additional tabs "Plus". or within a own dialog for Movie Correction

Parameters.

3. Add (several, max 15) comments via editing in "Plus" tab.
4. During writing the pairs are written in consecutive lines, i.e. a previous different sorting of the single lines cannot be re-established.
5. Implemented in:
TestInformation und TestObjects*, ChannelInfo und ChannelDescription, Movies*, Photos* (*: mit indexed comment "Comments #")

ImagerControl

- **New:** Available cameras:
 - + Add cameras, which are not yet in the test.
 - + Remove cameras from the test, which are not found.
- Substitution variables for AVIs - with different output resolutions:

Testname (\$TEST)	View (\$VIEW)
X-Resolution (\$XRES)	Y-Resolution (\$YRES)
Sampling Rate (\$SRATE)	Duration (\$DURATION)
X-Position (\$XPOS)	Y-Position (\$YPOS)
Imager Type (\$IMAGERTYPE)	Imager Number (\$IMAGERNO)
Exposure (\$EXPOSURE)	Slave (\$SLAVE)
Lens Type (\$LENSTYPE)	Lens ID (\$LENSID)
Focal Length (\$FOCALLENGTH)	Aperture (\$APERTURE)
Description (\$DESCRIPTION)	Coord.System (\$COORDSYSTEM)
Pos X (\$POSX)	Pos Y (\$POSY) Pos Z (\$POSZ)
Neigung/Tilt (\$TILT)	Richtung/Axis (\$AXIS)
Kantung/Swing (\$SWING)	Compression (\$COMPRESSOR)
Name of Lab (\$NAMEOFLAB)	Contact Name Lab (\$CONTACTNAMELAB)
Title (\$TITLE)	Date of Test (\$DATEOFTTEST)
Contact Phone Lab (\$CONTACTPHONELAB)	
Name of Customer (\$NAMEOFCUSTOMER)	
Lab Test Ref No (\$LABTESTREFNO)	
Customer Test Ref No (\$CUSTESTREFNO)	
Default = (\$MOVIEDIR)\(\$TEST)_(\$VIEW)_(\$XRES)x(\$YRES).avi	
- **New:** IDT CrashCam CCmini 1520 and 3510
- Accelerated search at PCO CSx (with new Firmware)
- Online Positioning:
 - Input of camera calibration data now consistently in tab "Lens".
 - New license "MovXact Option CamPos" for calculation of the camera position (EOR) without the module Mov3D.
- **New:** NAC MEMRECAM Q5
- **New:** IDT CrashCam CCmini-1510
- **New:** Photron FASTCAM Mini AX200, AX100, AX50
- Snapshot at HG100K:
 - The recording of a single image starts now immediately after the chosen pre-history time. Setting pre-history to 0 ms, the snapshot is done as fast as possible.
- **New:** IDT CrashCam series; with backup mode on SSD; 12 Bit raw images.

- IDT Os-Serie: 12 Bit raw images.
- **New:** PCO S4 incl. further resolutions.
- **New:** NAC HX7.
- IDT cameras: since eXtra Version 8.15.0005 two new parameters "Datagram size" and "Network performance" are integrated, which can accelerate the downloads of the raw data considerable:

In eXtra the following values are selectable for "Datagram size":

1500 (standard), 2920, 4360, 5800, 7240, 8680 (maximum)

The parameter "Jumbo packet" of the network adapter needs to be set appropriately (1504 ... 9014)

Attention: for IDT cameras, which need a calibration file, only the "Datagram size" 1500 is allowed to be used and the parameter "Jumbo packet" of the network adapter needs to be set to 1504 or to be deactivated, otherwise the calibration file cannot be read from the flash memory of the camera.

IDT calibration file: xstrm_serial-number.dat (xstrm_02_1009_0349.dat)

In eXtra any values in the range 100 – 65500 are selectable for "Network performance":

100 (fast) improves the performance from 2 % to ca. 14 %;

4000 improves the performance from 2 % to ca. 9 %.

- Optimize "Normalize Contrast" (3x8 Bit pictures): implemented.
- Tablet Control: changing exposure time in live mode at NAC cameras.
- ImagerControl configuration files *.icf, *.dar: different program versions are now supported.
- File management: logical placeholders are now possible for parameter "Destination". After editing a name and clicking the button "..." the directory will be opened, if available.
- Rotate the live image by 180 deg: implemented.
- For a check of the camera orientation a still image can be overlayed to the live image. The check box "Show" in the 'Tablet Control' has now three states: on, off and alternating on-off. Thus differences during image swap can be easily recognized by blinking or jumps.
- Anti-Shake Auto-Section: If markers are setup and successfully tracked in all images within the tab Anti-Shake all correction values can be calculated. Using the button "Auto-Section" a window section is evaluated automatically in order to cover all individual margins by a common mask; thus the resulting sequence does not show jitters as well at the image borders. The format of the output sequence is automatically adapted. Note: only in mode "Translation".
- Parallel processing of setting parameters of several cameras, especially during set to Ready od to Live. Currently for NAC HX and Qcam. See selection in Program Settings/ ImagerControl/Defaults.

MovXact

- Dialog Export: Save and Apply settings as defaults.

- Diagram Export "DIAdem in time interval": a time vector, which is cut to the output time interval, will be inserted as the first channel in a container file.
 Attention: do not mix channels with different output time intervals!
- Interactive Measuring: multiple display of markers. Click on the symbol "markers" in the left tree and select the objects to be drawn in the overlay by the button "selection".
- Angle:
 The combo box of angle types showed until now the option "BC - AB" = angle difference between crossing lines AB and BC with B = inflection point.
 Depending on the orientation and position of the two lines the internal or external angle of the triangle was calculated.
 New options: angle ABC internal or ABC external with unambiguous mapping..
- Ctrl+S => save analysis (with sound of the gong).
- In most dialogs the entry of the image number is used for indexing within the image sequence.
New: Additional output of the time value in the unit ms; currently in the dialogs Tracking, Interactive Measuring and Airbag Measuring.
- Save Analysis Image into file:
 previous file name „analysis name“+“(“-view name“)+“_#image number“;
 new file name „analysis name“+“(“-view name**“)+*“+“@time value**“
 with *, if not default name "View 1" or if several views are in analysis;
 ** unit fix ms, max. 3 fractional digits.
 New: default file type = JPEG. Example: Pendulum-Left@4ms.jpg
- Default Methods improved user handling and dialog Settings/Methods eased:
 direct save into registry possible; apply changes in all already setup markers.
- Set colors for all markers of a view at same value:
 new copy button in dialog Marker Basic Settings.
- **Hint:** After start of a new analysis via popup menu in a movie window the analysis name is preset by the movie name.
New: click with mouse button 2 => popup menu with proposals to select the test name from the movie name; separator = "_" or "-".
- New button in analysis main window for opening the analysis directory by the Windows Explorer.
- New mode for showing trajectory values in the image overlay: "Name and Coordinates" additionally to "Name or Coordinates".
 Fast access in analysis image via "Menu View / Measurement Values".
- Fast entering of name of view ("View #"): click by right mouse button opens a selection window/menu. Up to now in "New Analysis", now additionally in "Info about Analysis" and "New View".
- Sort markers alphabetically – new: M3010 > M302.
- Track markers: without Overlay display = acceleration in case of plenty(!) of markers.
- Change zoom factor for zoom window: New shortcut = "Shift + +/-"
- Set virtual points with the help of 3D coordinates: the 3D point is projected to the 2D image plane according the current 2D calibration settings.

- Overlay grid with adjustable size for abscissa and ordinate (Auto or edit).
- Dialog-display of scale value in mm/pixel:
 1. display in Preview was calculated without camera calibration: corrected.
 2. display in dialog 'Calibration/Scale Planes' now always acc. to current dialog parameters; thus checkable before 'Apply'. If the scale is invalid, the field remains empty.
- **New App:**
Define stencil for 'Side Head Protection Coverage'; acc. to IIHS Crash Protocol (Version III), May 2014.
Hints/requirements:
import markers and calibration settings via template; this app defines the stencil acc. to the instructions.
Ask us for a special documentation!
- Camera parameter ASCII export: extension of the ASCII log file by further parameters for simultaneous calibration of a camera pair.
(see Save As "eXtra ASCII *.txt").
 Name / #: 31_Kamera_5013
 new: Hardware-ID
 Serial No / ID: 45
 Manufacturer: NAC Image Tech.
 Type: Hi-Dcam
 Comment:
 Image size: 1280 x 512 Pixel
 Pixel size: 12 x 12 um
 old: = always same for all digital cameras
 X/Y Proportion: 1 : 1
 new: indicating a stereo pair
 Camera pair: 3DMirror-R
 new: indicating the stereo partner for relative EOR
 EOR Master ID: 44
- A comparison test of a bachelor study showed that the measurement accuracy of algorithm MXT-2 (version 2-8-4) has dropped in relation to version 2-8-3:
mean error to 'target value in case of synthetic video:
(36 images, marker diameter 30 pixel)
 MXT-1: 0.05 pixel
 MXT-2-8-3: 0.01 pixel
 MXT-2-8-4: 0.1 pixel (with max. > 0.2 pixel)

MXT 2-8-4 is used since ca. 11/2010 – Version 7.03!

New: selection of the MXT algorithm

MXT-1,

MXT-2 (= 'old' Version 2-8-3),

MXT-2 B 'Big' (= previous Version 2-8-4, especially for big markers)

Hint:

The basis MXT version 1 proves to be extremely robust during marker tracking and it is insensible to variations of the illumination. (Default sensitivity = 100%.)

The MXT version 2 shows slightly higher accuracy and reproducibility than version 1, especially at very small markers (< 12 pixel).

Note:

Background structures with high contrast can cause in certain circumstances misdetections, therefore the default sensitivity is reduced to 50%.

The MXT version 2B 'Big' allows markers with a diameter beyond 60 pixels, however at lower accuracy. (Therefore MXT-1 is recommendable in these cases!)

- Dialog "Export": button "Units" for check/edit prior to export.
- New Analysis - Template: select to store the full path of a template file or only the file type in the registry.
- Interactive Measuring: new display modes:
 1. Difference (Pre) = difference of displacement to previous measurement value (standard = to previous image).
 2. Velocity (Pre) = $\Delta s / \Delta t$ relative zum previous measurement value.
- Interactive Measuring: new measuring mode for distances "from cursor=ruler to cursor=ruler" (save 2 helping markers optionally).
- Smooth stencils and contours(t):
line chains are subsampled into the picture raster and smoothed acc. to "filter width".
(no closed curves are necessary)
- Export stencils and contours(t) into format *.ovl (= overlay drawing):
All stencils are exported at setup image or one contour at a specific image is exported.
- Setup Markers: the zoom window follows now during shift of the search area via arrow keys.
- Edit Trajectories: fill gaps using manual prediction, button "Yellow Hand " in the upper dialog:
Mode A = manual measuring via cursor
Mode B = manual prediction and automatic centering ==> press Ctrl key!
- Export: ISO code for angles shows now the rotation axis X,Y or Z
2D: axis acc. to the given names of the coordinate system;
3D: axis acc. to the selected angle plane.
- 2D Diagrams: save/show 2 curves for abscissa nad ordinate via pressed Ctrl key:
the channels are now saved or shown in alphabetic order (: the window with the x-channel will be on top).
- Diagrams with editable time interval:
the cut of the interval will be performed after a possible time filtering!
After each switch-off of the time intervall check box the limits are set to min/max of the picture sequence.
- Diagrams Time Filter:
dialog elements now after the dialog group "Reference"; now with on/off-checkbox.
- New Analysis:
fast entering of name of view ("View #"):
click by right mouse button opens a selection window:
 - a) name from video name; separator "_" or (if not available separator "-")
 - b) some base names

- **MovXact Settings:** export of ISO channel names now selectable:
 - a) appendix "Filter Class": default = "V", in case of filtering with valid CFC = "A" - "D", in case of filtering with other frequencies = "S" (special filter).
 - b) appendix always "V" = video.
- Sort markers manually in the analysis main window via pressed left mouse button.
- Logical names for legends via context menu.
- **Manual measurements of markers:**
Until now only a crosshair cursor was offered as a tool for marker detection.
New: In case of all "round" markers, i.e. no PIX markers, a green circle ring is shown as auxiliary tool.
+ ring is shown with 'double' diameter, thus there is no integer jumping especially in the zoom window.
+ adapt the diameter interactively via Ctrl+arrow keys.
+ a possibly changed diameter is stored in the measurement value.
+ Note: In case of DOT markers a circle ring with half marker diameter is shown = diameter of the inner DOT kernel.

Mov3D

- **Export in ASCII tables:** press Ctrl while clicking on "Export" => select "Standard = Sorted by Names" or "Table - Sorted by Time Values".
- **3D Transformation:**
Selection of new points as source was not clear.
In case of invalid dynamic transformation values the transformation was skipped instead of using invalid 3D values: bug fixed.
- **New:** show valid interval of values with gaps = "G !"
- **New:** overview of dynamic transformation values as diagrams.
- **New:** deactivate views for calibration and export:
dialog Calibration: button "Active" = deactivate current view => calibration is no more active; coordinates are regarded to be uncalibrated, i.e. they are shown/exported in x', y' of the image axes, with the unit pixel. In diagrams image numbers instead of time values are used.
See title of the view tab in the analysis main window: added suffix "(--)".
Note: press Ctrl and click button "Active" for multiple selection and overview.
Note: inactive views are not used for export; see especially file format eXtra ASCII *.txt and ISO *.mme.
- **Interactive Measuring:** the control point coordinates and distances are now shown; this allows a simple comparison of new measurements with given control point data.
- **3D Coordinate System:**
New: Select as source: new points 3D = via intersection in space newly measured 3D points or control points = premeasured 3D points from the Defaults tab.
Note: Use only control points in the same coordinate system as the camera position or the target 3D transformation. Only static camera position is allowed.
- **3D Coordinate System:**
New: Select as source=new points 3D: now also virtual points are selectable.

- **3D Coordinate System:**
To define the plane marker C unambiguously select the name of the plane, e.g. "x - z", and now also its quadrant within the plane. Select for this purpose the sign on the axes, e.g. "+x / -x" and "+z / -z". Note: marker A = center of the quadrant, marker B defines the direction of one axis.
- **Camera Calibration:** combo boxes 'manufacturer' and 'type' swapped among one another.
- **Point Table:** some details improved; set column elements, e.g. marker type or coordinate system, using multiple selection.
- **Calibration / Check:**
So far: Comparison of 3D control points (used for camera position) and newly calculated points.
New: In case of 3D transformation switched on the comparison between 3D trafo points and indepenewly calculated points is evaluated.
In case of dynamic camera position or dynamic 3D trafo the reference image no. can be selected.
- **Calculation of errors after camera calibration and at button 'Check' in dialog calibration:**
We show now error values with the help of absolute deviations, i.e. differences between target and measured values. These differences are now interpreted as direct observations of the measurement accuracy:
Mean Error = Mean of single errors = MR = $\text{Sum}(dR) / n$
with:
n = number of points
and
 $dX = X_{\text{target}} - X_{\text{measured}}$
 $dR = \sqrt{dX^2 + dY^2 + dZ^2}$

(Units of errors in eXtra ASCII-Protocol now always in mm.)

Only directly after the calculation of the camera calibration the residual mismatches of the bundle adjustment (σ_0) are shown additionally.
- **3D Coordinate System via 3-2-1-rule extended:**
Previously: orientation of an axis defined implicitly by origin and an explicit marker.
New: orientation of an axis defined by two explicit markers; this feature offers the possibility of an optional shift of the origin.
- **3D Transformation:** dialog for selection of control points supports selection of different coordinate systems.
- **Dialog Calibration:** button Check now with listing of the mean error of each component X,Y,Z as well of the resultant.
- **New:** Easy overview about accuracy of re-measured control points:
new button "Check" in calibration dialog; direct output in editor window.
- **New:** AICON Dll version 1.4.2 with accelerated performance in case that the Sentinel HASP service (for license check) is not installed/started.

- Show std. deviations of 3D trajectories as diagrams: modes x-y-z, x, y, z (only valid without postprocessing like time filter)
- Search of CODE markers in very large images insufficient: improved by internal parameters. (Avoid edge enhancement in case of very large markers!)
- 3D Viewer: display of point clusters with many points considerably accelerated.
- Import of AICON Ior and Eor files:
Camera Parameter: "Ctrl + Import",
Camera Positions: "Ctrl + Calculate".
(Note: fixed ASCII layout acc. to AICON specification.)
- For VIRT markers 3 instead 4 reference markers are now allowed.
Note: more markers improve the reliability!
- Camera Positions "Preview": overview about flag "Static/Not Static".
- Read control points from APT file:
Each line can be extended optionally by a text flag (without blanks), which enables during marker setup an easy assignment to a view or to a group: "@View".
X Y Z Name Type #No Coor.sys. @View
See selection under button "Defaults" in dialog "Setup Markers".
Please ask us if you need a detailed documentation!
- Read Marker-Names from APT/TXT file:
Here also each line can be extended by a text flag "@View".
Name ISO-Name Type @View

Mov6D

- Show coordinate symbol: a) with reference to image or b) to reference system.
- Acceleration at multiple display/save.

CamFolder & Camera Calibration

- Mirror calibration parameter set vertically = apply for onboard cameras with imaging via parallel mirrors and subsequent software mirror of the video.
- Display of grid and raster: until now the mesh size was fixed 50 pixel; new: number of meshes independent of image size and centered to image center.
- Camera calibration of 3D pairs redesigned:
calibration = simultaneous calibration incl. relative position.
Own name (parameter) for 3D pair.
In CamFolder only exactly one image format, one lens and one focussing can be assigned.
Calibration dialog with 2 camera buttons for easy switch between cameras.
Own tab for position(s).
CamFolder: own entries for positions: L: absolute position = (0,0,0), R: relative position
- During ASCII export of the camera calibration parameters no more listing of the (absolute) positions with respect to the test panel is appended, because this information is not significant.
- CamFolder menu Edit: Show Overview => ASCII file with overview like in camera-format-lens-calibration tree incl. date.

- Display of the SAE/ISO rings adapted:
all rings are now visible even in case of landscape formats.

MovBag

- App "Airbag Elongation" extended by automatic mode.
(We are pleased to send you a documentation on request.)
- **New App:** "Airbag Elongation".
Requirements: import of a template analysis with default markers for steering wheel points and preset scale and coordinate system.
Ask us for a special documentation!
- Contour options / Methods: Ctrl + Change Search Area = reset to default setting with 20 pixel distance to image margins.
- **New:** Greenscreen method: masking of background using a specific hue value = "chroma key".
- New measurement value to be selected: "Max. size in abscissa or ordinate".