

FalCon eXtra - Release Notes / News

Version 8

User Interface

- **New Features** analog to MS Office 2010:
- Main toolbar now in window title.
- **Backstage View** for a clear access to all functions, which have been spread under "File", "About" and "License". File types are shown with big icons during "Open" or "Last Used". Start via big round button with red X.
- Tab line for all open documents in the bottom of the main window (switch on/off via program settings).
- Dialog themes partially refreshed.
- Note: Under Windows 7 the corresponding Dll for opening help texts might be not installed. Follow the link in the shown message box to install the correct language and version dependent Microsoft Dll.

Common

- Setup files signed with certificate.
- **New:** New picture from clipboard.
- Open dialog: Even after several changes of the file type the last used directory of the selected type will be preset. The directory is only kept, if the user has changed/set it actively.
- Program Settings: Multiple program start can be checked.
- Change of registered file types (see Program Settings): restrictions under Windows 7 possible depending on the current user rights.
- Main toolbar: **New** button "R" for reset of several window layouts as well as reset of picture optimization parameters and file type registrations.

QuickView

- **New:** Insert logo: button for "white = transparent or opaque".
- Insert logo "Adaptive":
now for any angle and zoom as well any logo size valid;
changes of the values via spin-buttons: +- 1 pixel, 0.5 deg or 0.5 % or while pressing Ctrl key * factor 10.
- **New:** Sharpening of pictures:
Method = unsharp masking using high-boost filter.
Laplace filter kernel 3x3 (old algorithm) or 5x5 .
Calculation of the sharpening weight in different color modes:
+ RGB = individually in each color channel (corresponds to the old algorithm "Matrix" or "Frequency")

- + G = only in green channel
- + Y = in luminance Y-channel (corresponds to the old algorithm "Intensity")
- **New:** Create AVIs with not-equidistant time steps and store the time value of each frame in the file header. Export/load time values as time channel.
- The recommended version of the codec x264vfw was released before the start of Windows 7. In cases of individual configuration via the FFmpeg dialog incorrect parameters could be transferred or even the program could abort (only under Windows 7). Internal safeguarding of the calling interface helped to avoid and thus correct this behavior.
- **Configuration Files:**
AVI include parameters are now stored in file *.fai.
AVI include parameters and physical units are now stored (selectable) individually or globally.
*.fac, *.puu, *.fpo and *.icf, *.dar files are saved automatically during shutdown of the. Only the *.fai file is changed by explicit "Save Settings", thus company specific settings can be stored.
- **New:** Picture optimization - Sharpening: Gradient filter for automatic edge detection. Application e.g. as overlay picture during online positioning of cameras.
- During creation of AVIs a log file *.txt is written. In some applications no entries were logged: now applied. If no error happens during creating the AVI, the log file will be deleted automatically at the end of processing. Exception: ImagerControl.
- AVI Export/Import time vector: format ISO CHN is supported.
- AVI Time vector: After import from file the vector is now directly applied. Only monotonously increasing time vectors are allowed.
- Printing of pictures improved.
- AVI and Picture viewer: shift the zoomed area via pressed center mouse button (scroll wheel).
- AVI film stripe: adjustable separator frame width and color. Now also vertical layout available; show a separator frame.

Picture Transformation

- Open dialog with selection of image indices or time values.
- Show timing information in picture list by own column, e. g. apply the timing of an AVI or MCF, CIN.
- Logical names to be used in insert texts and movie names:

Testname	(\$TEST)
Input path	(\$INPATH)
Full input directory	(\$INDIRFULL)
Last input directory	(\$INDIR)
Output path	(\$OUTPATH)
Full output directory	(\$OUTDIRFULL)
Last output directory	(\$OUTDIR)
Movie name	(\$MOVIE)
X-Resolution	(\$XRES)
Y-Resolution	(\$YRES)
X-Position	(\$XPOS)

Y-Position	(\$YPOS)
Sampling Rate	(\$SRATE)
Duration	(\$DURATION)
Compression	(\$COMPRESSOR)

- Inserting drawing elements internally improved.
 Drawing element "Line" now with vales length and angle.
- Picture Transformation and ImagerControl: insert logical names via right-mouse-click (see Plot settings).

QuickView Plot

- **New:** Export of channel data into Excel Workbook *.xls.
- **New:** Auto-Notes "Minimum & Maximum" (only at time graphs).
- **New:** Symbols or time values as labels with selectable step size.
- Edited graphs show the appendix "(e)" in the legends.
- T-Diagrams with one ordinate axis: show zero line
- T-Diagrams with two ordinate axes: show common zero line for left and right axis. (see new icon in toolbar)
- T-Diagrams: mean and standard deviation of the ordinate values; see Info.
- Number of horizontal grid lines/meshes same at left and right ordinate axis (independent on selected curve) => lines now always left and right (!) on ticks of the axis. This new scaling modes works only in case of full range (not zoomed).
- No more automatic indication of the status "edited" = "(e)" as extension of the legend, if only the unit of the curve has changed, e.g. [ms] instead of [s].QuickView

QuickView Plot 3D

- Three-dimensional viewer of trajectories.
- Thanks to Marco Santi for his bachelor thesis at Hochschule München and Alessandro Falappa (www.codeproject.com) for basic OpenGL code!
- Handling, attributes and parameters analogue to 2D-Plot.
 Toolbar with buttons: view x-z and show standard deviations.
- Display of measured values including standard deviations (if available).
- Supported data sources:
 display in the analysis module Mov3D,
 Extra ASCII *.txt and ISO MME *.chn
 Note: In ISO files 3 channels with the channel codes (position 13-15) DSX, DSY and DSZ need to be available. Avoid a mixture of curves with different units.
- Diagram type: 3D Graph, 3D Graph(t), Point Cluster, Point Cluster(t)
- Hints:
 Arrow keys up/down, left/right = rotation of the view by 45 deg
 Ctrl key pressed + "+" or "-" = increase/decrease enhancement of standard dev.
 Mouse button 1 pressed = rotation of the view
 Mouse button 2 pressed = translation of the view

Mouse wheel scrolled = zoom of the view
(relative to center of cube)

Hint: In case that you have selected a nearly perpendicular view, i. e. if one axis corresponds almost to the orientation of the view, you can zoom at the position of the cursor via additionally pressed Ctrl key.

- Data sheet with user interface and import formats (available as PDF).
- Value cursor (press Ctrl key and move the mouse along the curve).
Requirement: Select a nearly perpendicular view, i. e. one axis has to correspond (almost) to the orientation of the view.
- Value cursor: shortcut to adapt the size = "C" + "+"/"-".
- Scaling: all axes equal or each axis individual (automatically or manually).

QuickView Draw (New)

- Insert of drawing elements:
In the dialog "Picture Optimization" drawings can be inserted into pictures, sequences (e.g. "Modify AVI") as well in the modules Picture Transformation, ImagerControl and FrameMerge.
- List of drawing elements:
Line, Cross, Rectangle, Circle, Polygon Freehand, Picture, Symbol, Text.
- Shortcuts:
Line, Rectangle, Picture: Shift = start point/left, top corner, Ctrl = end point(right, bottom corner)
Cross: Ctrl = Size
Circle: Shift / Ctrl = radius y/x, Shift + Ctrl = radius symmetrical
Polygon, Freehand: Return=Ok, Esc=Cancel + popup menu
- Save as bitmap *.bmp (preset color of transparency) or as binary drawing list (overlay) *.ovl

ImagerControl

- **New:** Tablet Control: mobile setup of cameras via remote desktop.
- **New:** AOS S- and Q-Series cameras are supported.
- **New supported imager types:** NAC-Q1M, NAC-Q1V, PCO-DIMX-HD55 and PCO-DIMAX-HD55PLUS.
- **New:** AOS-Sx, AOS-Qx und MotionXtra Os4-S1x.
- For IDT N4xx and Y4xx a resolution of 1024x1024 is supported, if the imager is able to record in this resolution. For older imagers, which only support 1016x1016, new imager types are realized.
- For PCO-DIAMX-xx new lowest sampling rates of 2, 5 and 10Hz. Attention: You need a new firmware for the imagers! When using external sync, the sync has to be 1 Hz.
- **New:** Online camera position to adjust reproducible camera setups:
Mode "Overlay Image" +

Mode "Interactive" (setup markers and find within search area)

Mode "Automatic" (CODE) (read Code markers as control points, calculate camera position automatically and show error/traffic lights).

- **New:** Redlake IDT MotionXtra NR3-S1, NR3-S3 supported.
- **New:** NAC HX3 supported.
- **New:** Crash light control (LED models of company IES):
 Search/Add like a camera; lights can be assigned to one/several cameras and can be controlled jointly; check status, switch on/off, low/normal light and exposure time.
- Download bar individually for each camera.
- PCO: accelerated live image.
- PCO: Check Sync mode (external timing) and show by Ready status.
- Extended logical names to be used in insert texts and movie names:

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)
Tilt	(\$TILT)
Axis	(\$AXIS)
Swing	(\$SWING)
Compression	(\$COMPRESSOR)
Name of Lab	(\$NAMEOFLAB)
Contact Name Lab	(\$CONTACTNAMELAB)
Contact Phone Lab	(\$CONTACTPHONELAB)
Name of Customer	(\$NAMEOFCUSTOMER)
Lab test ref No	(\$LABTESTREFNO)
Customer test ref No	(\$CUSTESTREFNO)
Title	(\$TITLE)
Date of Test	(\$DATEOFTTEST)

Default

for AVI reductions: (\$MOVIEDIR)\(\$TEST)_(\$VIEW)_(\$XRES)x(\$YRES).avi

- Online Positioning: AVI frame with selectable frame no or raw data image as overlay image.
- Create AVIs: button "Resolutions" to select several codecs or to export as additional list of single image files (TIF, JPG).
- Warning in case of few disk space. Show free space in status bar (red, if less than 10 GB free).
- Show overlay picture in TabletControl.
- Distortion of AVI display within ImagerControl fixed for AVI resolutions larger screen resolution.
- During AVI creation on slaves color matrix is now applied.
- Online Positioning:
Own marker independent dialog for overlay picture. Default transparency = 50%; optional edge display (Gradient).

FrameMerge

- **New:** Auto Matching: Match picture automatically by means of 2D control points = matching.
3 modes:
(see details under "Info" button)
Film 1 = Master, Film 2 = Slave;
Matching markers with identical names are setup in both films at image #0.
 - A) Static Matching = 'Static' checked
The movements are preserved in both films.
 - B) Dynamic Matching = 'Static' not checked
The movements of film 1 are preserved. Film 2 will show the same reference movements as film 1 after matching.
 - C) Dynamic Matching = 'Static' not checked + 'Anti-Shake' checked
The movements of film 1 and 2 will be removed.
- Insert logos and texts.

MME Creator

- Version 1.6 is supported during read and write.
- Float values, like mass, temperature, speed or focal length, are now written without following zeros as fractional digits: 1.2 instead of 1.20000, 4 instead of 4.00000.
- Valid from version 1.5: no more warning at lines with more than 80 characters.
- Click of mouse button 2 selects the tree element, thus the corresponding popup menu opens.
- Deleting entries: photos (sub-groups), stat. values, AVIs, measurement channels. Query window, if the related files should be deleted too.
- Add measurement data: automatic conversion to SI units (if necessary).
- Photos: after editing of PRE/POST the tree view is updated.
- Rename all photos automatically: "Test_Testobject-ID_Pre/Post_ID"

- Preview of measurement channels: Layout like plot view with axes and grid.
- Import of camera calibration data into ISO MME Viewer:
 1. via drag&drop from CamFolder
 2. via import (Open dialog) from cor-file
- Rename all photos: logical names are supported (: enter via mouse button 2).
- Channels: number of novalues is shown as info.
- ISO MME 1.5: The line length of 80 characters can be exceeded (after agreement); therefore we skip now the warning message "=> 80 CHAR=".

MovXact

- **Marker Templates *.mrd** completely redesigned:
 Add now several sets of markers within one document and show by a tree view (see CamFolder). During import into an analysis e. g. via drag&drop, a specific marker set can be selected.
- Marker ISO-Codes: If the marker name is identical to an ISO basecode (= 12 characters) and if the internal ISO code is still empty/default, the marker name will be used as ISO basecode automatically during export.
- Diagrams: select several markers for saving into container file.
- Interactive Measuring: "Check after each image" (query dialog) can be switched off.
- Interactive Measuring: Additionally to the cursor types "crosshair, vertical/horizontal ruler" now rulers parallel to the (rotated) axes of the coordinate system (X,Y,Z) are available.
- FalCon Report: replace and append possible; Ctrl +F = append to last report.
- Marker Trajectories (Edit): Fill manually gaps.
- Picture List document: (Raw-) Pictures in container files, e.g. *.mcf, are now fully supported.
- Store default marker type and size for a new analysis into the registry.
- Adjustment of Temporal Filter:
 In MovXact, the 4-Pole Butterworth time filter is implemented in accordance with ISO 6487 = SAE J211/. Enter in the dialog the filter frequency (= 3dB cutoff-frequency f-N) in Hz. The corresponding channel frequency class (CFC) is derived via multiplication by 0.6: e.g. 100 Hz => CFC 60.
 During a comparison with calculations in DIAdem we recognized that the frequency was internally interpreted as f-H, e.g. 100 Hz => CFC 100. Thus the filtering effect was so far too low. Bug fixed!
- **New method** for differentiation:
 In MovXact the temporal differentiation of a signal is carried out as follows:
 1. Filtering acc. to ISO 6487 = SAE J211/1 (optional/recommended)
 2. Equidistant sampling acc. to the film frequency (linear filling of gaps)
 3. v-curves: differentiation acc. to **SAE J1727 FEB2010 5.1.2 * = new**
 3. a-curves: duplicate differentiation (**new** = without second filtering)
 4. Re-sampling into original time raster (with gaps)
 * = Symmetrical quotients using +-2 neighbor values (= '5-point method')

- Export of ISO channel names:
Appendix "Filter Class" default = "V".
In case of filtering with valid CFC = "A" - "D".
In case of filtering with other frequencies = "S" (special filter).
- **New:** Export of diagram curves into Microsoft Excel Workbook *.xls.
- Main window of analysis: delete objects, e. g. single or several markers, by Delete key.
- Marker defaults list during setup: save selection as default into registry.
- Auto. setup of markers with @ prefix: in some cases double marker names could appear. Source now fixed. Tree view now unambiguous.
- Defaults tab: additional button with "marker icon" = open marker defaults *.mrd. If a global path is predefined in Program Settings/Administration, this path will be preset. If only one MRD file exists in this directory, the open dialog is skipped.
Hint: click on button + press "Ctrl": open the marker defaults document in own window; use here import of marker sets via drag&drop.
- View tab: additional button with "movie icon": open video/AVI of the current view in own movie window.
- Interactive Measurements: show single positions of markers and now additionally (= option) full trajectory.
- The MovXact settings can be reset to factory defaults.
- Diagrams/Save Curves: simple switch to SI units via check box.
- MovXact Settings/Algorithms/Setup: preselect overlay color of newly setup markers and preselect parameter capture range for new analyses.
- Virtual 2D markers: If more than 1 reference marker is assigned to the virtual object, at least 2 valid/tracked reference values need to be available for a valid virtual value.
- Stencil and Contour(t): meas. value "Perimeter/Length " extended for not closed or crossing graphs.
- Interactive Measuring: Multiple display of contours and stencils. Click on the symbol "Contours(t)" or "Stencils" in the left tree structure and select the objects to be displayed in the overlay via the button "Selection".
- Stencils are "shifted" according to their measured reference points.
So far the geometric transformation was calculated from the raw measurements of the image points.
New: the transformation now covers also depth values (parallaxes), camera calibration and possible camera position.
- ISO code display in marker defaults and definitions:
default ISO base code (12) = 00---000000.
If the code is "empty" (= default), additionally the code used during later export is shown:
a) marker name == 12-digit ISO base code => apply marker name
b) marker name <= 3 characters, e.g. "ABC" => x02ABC000000 with x=test obj. code
c) marker name > 3 characters => x0Mxxx000000 with x=test obj. code, xxx = index

- Edit/Export and Diagram/Save: Mode for gaps = NoValues / Skip / (and new!) Interpolate (depending on the file type!). Note: During interpolation the calibrated values are linearly interpolated to bridge the gaps. See warning icon.
- Edit/Export: Selection of data elements (= check boxes and file type) will be saved internally. After re-open of the dialog or after import of an old analysis they are therefore kept.
- X-Diagrams: graphs can be (component wise) temporally filtered.
- Excel Export: factors now acc. to selected units, abscissa unit ok, worksheet name = marker name.
- Setup Markers: change "Quality min" (default value 25%) only in special cases. Default = editing disabled.
- Export analysis: calibrated measurement values => MS Excel Workbook *.xls and ISO MME Channels *.chn.
- Export: calibrated 3D measurements => ASCII Table in layout of APT control points. Only the 3D coordinates @ T0 are written. Note: mark only the check box at "Calibrated Data". Rename the file extension *.txt to *.apt.
- Time display format in analysis image [s] or [ms] with fractional digits adjustable = same parameters as in AVI window title!
- T-Diagrams: Now "Distances" are selectable explicitly in the tree structure: distance = resultant between 2 markers. For directed distances or distance angles select as before "Marker to Reference Marker".
- Show & Save Diagram: multi-marker select box for display in one window or saving to one container file.
- Overlay in Interactive Measuring and Edit Markers: in case of display setting "Name / Coord." the coordinates are now shown in the image overlay with names of axes and units one below the other (instead of side by side), e.g.
x: 12.3 mm
y: 5.1 mm
- Track Markers: a listbox offers several options for prediction: Automatic acc. to motion type / Steadiness control via still markers / Steadiness control via reference marker / Jump start via reference marker. (see button for short help) The previous button with the film symbol is now obsolete. The previous button "Group" is now an option (for filling gaps via group method) in the list of tracking modes.

Mov3D

- **Virtual 3D** markers: redesign.
The markers (= control points) will no more listed in a single view, but in a new tab "Virt (3D)" (between "Defaults" and "first view"). These markers are handled globally, parallel to the stereo views.
The tab is only visible, if a virtual marker is defined. Add the corresponding reference markers. The name of the 3D object is used just as comment.
During access within the tree views of the dialogs these virtual markers are sorted at the beginning.

(Hint: Avoid to setup virtual 2D markers and change to 3D calibration mode afterwards.)

- Virtual 3D markers: press button for selection of reference markers + Ctrl key => copy current list of reference markers into other VIRT markers.
- In the AICON DII Fai 1.4.0 standard deviations of a 3D transformation can be applied to the standard deviations of the single measurements.

Attention:

These will be slightly bigger as the previously calculated ones. Thus we will get an improvement in estimating overall errors, but also a degradation with respect to the shown accuracy.

New: In case of normal markers this error propagation can be selected optionally (see MovXact settings). In order to show a standard dev. for virtual VIRT markers the error propagation implemented as fixed.

MovXact & Mov3D

- **New Document:** ISO 8721 Inspection (*report not yet released*).

CamFolder

- Tree structure now including sub-group "image format". Thus different image sizes of the same camera can be combined.
- During copy of a calibration set into another (smaller) image format the calibration parameters (also the R0 parameter) are kept. Thus a data set of a camera with full format can be used also for sections. Note: this is only valid, if the image section is centered: check with your cameras!
- Image formats and their calibration data can be copied, rotated and inserted via the popup menu! The parameters are automatically adjusted to the new orientation. Application: mounting of the camera at 180 or 90 degree. Button showing license status. Fetch server license actively. Feedback about license status.
- New AICON-DII for simultaneous calibration of a camera pair with fixed stereo basis; evaluate relative camera position.
- Multi-export into format *.cor.
- Marker diameter as default in MovXact Settings.
- Select/Read APT files easier/faster.
- **Hint:** The path for the master CamFolder file can be preset in File/Program Settings tab Options/Administration.
- Measure Points: new check box "Auto-Update Diameter Interval". Default = (before measuring of first point) checked. After measuring the first single point the diameter interval is automatically adapted/updated and the check released. During setup of the following markers the preset interval remains constant, if the user does not adapt min/max interactively during setup of a single marker. Thus the manual measuring of several single points after each other is facilitated, because the diameter interval does not change.

MovBag

- **New:** measurement value "Perimeter".