

What's New in FlexPro 9

FlexPro offers the following new key features: the Unit Manager, the new Media object for video analysis, Multiprocessing and support for diagram, table, document and analysis templates. These and other new features in FlexPro 9 are described in more detail below.

New Unit Manager

The Unit Manager is based on the International System of Units (SI) and the International System of Quantities (ISQ) in accordance with ISO 80000. In FScript you can now perform calculations directly using quantities, which are composed of a value and unit. FScript can adjust different units to each other before calculation, convert units into other units, and recognize physically incorrect operations with quantities. This convenient feature not only covers arithmetic FScript operations, but also FlexPro's over 200 integrated FlexPro analysis functions and thus all of the analysis objects. The unit is now an integral part of the result of a formula or analysis object. The Unit Manager is expandable and supports the Gaussian system of units and the US unit system in addition to the SI unit system. You can therefore work on data accurately from different domains. From the moment you begin importing data, you can check the imported units, thus ensuring that you will be working only with recognized and correctly identified units within FlexPro. When displaying data and results in diagrams and tables, you choose the output unit separately from the unit in which the data is present.

New Presentation, Document and Analysis Templates

You can use presentation and document templates to expand the wizard to include custom objects for creating diagrams, tables, text and documents that you can then create as easily as you would using the built-in FlexPro objects. For tables and diagrams, FlexPro also supports dynamic templates in which the number of curves or table columns or cells is adapted to the particular number of selected data sets.

You can also use your custom document templates on the last screen of the diagram, table, text or analysis wizard to embed the newly created object into a document of your choice.

You can save complete object networks as an analysis template. When subsequently selecting such an analysis template in the analysis wizard, the objects at the lowest hierarchical level, i.e., objects that do not refer to other objects, are replaced by the selected objects.

Custom FScript Functions

You can now add to the number of available FScript functions yourself. Program your own analysis functions in FScript and save them in a template database. More information on how to do this is available in the Custom FScript Functions Tutorial. If you want to access external libraries (DLLs) to develop the function or to make existing algorithms available to FlexPro, you can implement the custom FScript function in VBA or another automation-compatible programming language. For more information, refer to the example A Custom FScript Function.

Use the Media Object for Video Analysis

State-of-the-art measurement applications capture video and audio signals along with physical quantities. With the new media object FlexPro offers you a powerful tool for evaluating these types of measurements. You can use the media object together with diagrams in a worksheet or document. The current video playback position can be synchronized with the X position of the cursor in

diagrams. When you move the cursor in a diagram, the corresponding image in the video is displayed. When you play back the video, the cursors in the diagram follow along. The media object saves the last position reached as a still image, which you can mark up with arrows and print out, for instance.

The media object can play all video and audio formats for which you have installed a codec for Windows Media Player.

Shared Template Databases

In addition to personal and global template databases, the FlexPro 9 Professional edition also supports shared template databases in which you can store presentation templates, analysis templates and units that you want to share with your colleagues.

Higher Performance on Multicore Systems

FlexPro Professional can run updates of objects on computers with multiple CPUs or cores simultaneously. This is done by distributing and simultaneously running substeps of the update process on individual CPUs or cores.

Improved License Manager

You can now specify any length of time to check out a network license. You can also return a checked out network license to the license server before the specified checkout period has expired.

New User Interface Features

Undo/redo edits without opening an object

Now you can undo and redo edits to an object directly in the Object List. Just right-click with your mouse on the name and select Undo or Redo from the context menu.

New FlexPro Project Database Features

Output of complex numbers in a+bi format

For complex numbers, you can now choose between the output formats a+bi and (a ; b). For new project databases, the format a+bi is set as the default, and for existing project databases from previous versions of FlexPro, the default is the original format (a ; b).

Improved project database searches

The function Search in Project Database has been expanded to include the Parameter name, Parameter value, Parameter unit, Quantity and Void Values search items. The default settings for the various search items have been optimized, improving the function's ease of use. You can now enter numeric search values as numeric values, time spans or calendar time values.

Display the purpose of the objects in the Hierarchy View

For linked objects, you can display the exact purpose in the Hierarchy View by pointing to the particular object with your mouse.

New Import, Export and Communication Options

Digitization changes when exporting to audio format (.wav)

Exporting data in audio format (.wav) now covers, if specified, the measurement range end values in the data set when digitizing the data. Values outside this range are then clipped. If none of the

measurement range end values were specified, the data is digitized symmetrically to 0, i.e. without an offset.

Export an entire folder of data

With several data formats it is now also possible to export an entire project database folder of data. Instead of selecting all of the objects in the folder, you only have to select the folder before using the Export command.

Import data in ISO/TS 13499 MME format

The ISO/TS 13499 MME format is widely used in the automotive industry as a multimedia format for crash tests. FlexPro can import data, images and videos from ISO/TS 13499 MME data sets.

New Presentation Object Features

General

New fields for accessing object parameters and their units

The Field Wizard, which is used to insert a field into an axis label, for instance, now features additional fields in the header information category for accessing object parameters and their units.

Diagram

Display a signal series/data matrix as concatenated

The new display format Concatenated series/columns of a signal series/data matrix concatenates the individual series of a data matrix or signal series and displays them as a single curve.

Add new curves to a diagram showing X/Y data

If a diagram already contains curves showing X/Y data, the same X data set used for the existing curve is assigned to a new curve when the curve is added.

Table

Output complex numbers with real and imaginary parts

Complex numbers are now output in tables with the real and imaginary parts. Previous versions of FlexPro only output the absolute value.

New Cursor Features

Animated cursors

You can animate any cursor, which means you can let it run automatically over a curve. You can achieve a scrolling effect by displaying the curve as spread out.

New Adjust Image Section option

On the toolbar or in the Cursors menu as well as on the Cursors tab of the Properties dialog box, you can find a new option called Adjust Image Section, which you can use to manage whether the image section of a diagram is to be enlarged or moved automatically when the cursor leaves the current image section, or whether the image section is to be adjusted so that the cursor appears in a fixed location.

Improved cursor settings options

In a workbook or document you can now adjust all settings related to controlling the cursors individually for the individual diagrams. You can thus use different settings for the individual diagrams. When cursors are activated, these settings can now also be viewed and edited in the Properties window. When you open the Properties dialog box of a document or workbook, the Cursors and Markers tabs for the currently active diagram appear.

Improved synchronization of zoom actions

Synchronization of zoom actions has been improved. Depending on the setting, synchronization occurs via the data index or X value; you can optionally activate synchronization of zoom actions in the Y direction as well.

Marker navigation

Not only can you use the cursor to navigate to minima and maxima, but you can also use it to navigate to the next/previous marker.

New Delete All Markers command

The new command on the toolbar and Cursors menu deletes all markers on the curve under the active cursor.

New Analysis Procedures and Analysis Object Features

Enhanced signal correction

The Signal Correction analysis object now also features a Replace void values mode, which is used to replace all void values with a specified value.

New Signal Sampling analysis object

The new Signal Sampling analysis object offers different methods for increasing or reducing the number of values of data sets or resamples them for new X values.

New 2D Approximation analysis object

You can use the new 2D Approximation analysis object to approximate 2D data to any linear model function $Y(X, Z)$.

Approximation analysis object with custom model function

The Approximation analysis object now provides you with the option to define your own element functions in FScript whose linear combination then forms the model function to be approximated.

Enhanced event isolation

The Event Isolation analysis object supports two additional events known as Interpolate values and Set values void, which you can use to interpolate or remove outliers, for instance.

Enhanced surface interpolation

The Surface Interpolation analysis object now features "Natural Neighbor" interpolation in a mode that prevents convex surfaces from being extrapolated.

New Analysis Option Features

Enhanced Statistics Option

New Crest Factor quantity

The Statistical Quantity analysis object has been expanded to include the Crest factor quantity.

ASAM ODS Data Import Option

Fast import of ATF/ATFX files

All ATF/ATFX file data can now be imported using the Import command on the FlexPro File menu.

Counting Procedures Option

Mean value count

The Count analysis object now also supports the mean value count procedure.

Order Tracking Option

Non-integral number of impulses

The Order Tracking analysis object now accepts the number of impulses per revolution to be specified with fractional digits if the speed is provided as an impulse signal.

Digital Filters Option

CFC filter in accordance with the SAE J211 standard.

FlexPro now also supports the SAE J11 standard for calculating the filter coefficients of the CFC filter.

New Data Object Features

New attributes for saving the description of the physical quantity

In the data object Header Information, you can now specify the description of the physical quantity for the individual data components.

New FPScript Programming Language Features

Constants without a decimal point are interpreted as floating point values

If a decimal point is missing in an FPScript code constant, arithmetic operations might be carried out with integers instead of floating point values. To prevent accidental rounding errors that might occur as a result, FPScript now interprets these types of figures as floating point values. Integers can be entered by adding an 'n' at the end, e.g. 123n. The modified behavior of FPScript can be disabled on the FPScript tab of a project database Properties dialog box to ensure backward compatibility.

The For loop can now be carried out in reverse and with the increment not equal to 1

The For loop has been expanded to include the Step keyword, which gives you the option to specify an increment. Negative increments in this case will cause the loop to run in reverse.

The Division remainder operator of % was renamed to Mod.

The FPScript Division Remainder Operator has been renamed from % to Mod in order to avoid confusion with the unit %. FPScript formulas from older versions of FlexPro will be corrected automatically.

The Value Index Operator supports space curves and signal series with two-dimensional X components

The FPScript Value Index Operator can now also index data via the X component of a space curve and via the Z component of a signal series with a two-dimensional X component.

Compiling and executing FPScript code within the context of particular environmental variables

The new With Environment...Do...End statement sets one or more FPScript environmental variables to a particular value and compiles a series of statements within the context of these set environmental variables or runs these within this context. Use this statement to write FPScript code that is independent of the external settings.

New FPScript Operators

Property	Description
Right Bit Shift (>>)	Shifts the bits in an integer to the right by the specified number of positions.
Left Bit Shift (<<)	Shifts the bits in an integer to the left by the specified number of positions.

New FPScript Properties

Property	Description
FilePath	Read access to the name and the path of the media file of a media object.
QuantityY	Read access to the description of the physical quantity of a data object's Y component. Read/write access to the description of the physical quantity of the current formula's Y component.
QuantityX	Read access to the description of the physical quantity of a data object's X component. Read/write access to the description of the physical quantity of the current formula's X component.
QuantityZ	Read access to the description of the physical quantity of a data object's Z component. Read/write access to the description of the physical quantity of the current formula's Z component.

New FPScript functions

Function	Description
AdjustUnit	Adjusts the unit(s) of a data set to those of a different data set.
ChangeUnit	Converts or sets the unit(s) of a data set.
ChangeUnitSymbol	Replaces one or more unit symbols of a data set.
Clip2D	Cuts the surfaces at the edges or along a closed curve.
Approximation2D	Approximates a linear model $Y(X, Z)$ with two independent variables to given 2D data according to the method of the least square error.
Execute	Interprets a string as FPScript code and executes it.
Format	Formats a value and returns the result as a string.
Intersections	Determines the exact intersections of two data sets or level crossings of a data set.
Isoline	Determines one or more contour lines from a data matrix or signal series.
MeanValueCount	Counts a signal and determines the mean value count.
SamplingRate	Determines the sampling rate of a data set or of its X-component with linearly increasing or decreasing values.
SIUnits	Passes the presentation of the unit of a data set in SI units.
Unit	Passes the unit of a data set as a quantity with the value 1.
UnitSymbol	Passes the symbol of the data set unit.
UnitType	Determines the type of unit for a data set.

Enhancements to Existing FScript functions

The FScript function Round now features a second mode for rounding with an ISO 80000 standard rounding interval.

The FScript function Approximation now also supports use of custom element functions.

The FScript function ConfidenceInterval can now also process signal series and data matrices. Instead of interval limits, the interval width can now also be returned for display as error indicators in a curve, for instance.