

4D SAS

Conversion in 4D v13



**Conversion in 4D v13
Migration Guide
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Required hardware and software configuration

	Windows	MacOS
Processor	Intel © Core Duo	
System	Windows XP SP3 (*), Windows 7	10.6.8 et >
RAM memory	2 Go	
Resolution	1280 x 1024 pixels	

(*) *under XP, 4D v13 doesn't support the integrated WebKit rendering engine.*

Conversion to 4D v13 of previous version databases

The scenario for converting databases from **4D v12** to **4D v13** will be the same as that for changing from **4D v11** to **4D v12**.

When opening a **.4DB** structure or a **4D v11** or **4D v12** data file with a **4D v13** version, a confirmation dialog box offers to modify the file to convert it to **4D v13**.

When opening a structure or data file from **4D 2004** or earlier, the same conversion dialog box appears as for conversion from version **4D 2004** to **4D v13**.

Converting a **4D v11** or **4D v12** datafile will reindex text fields.

4D v11 and any previous versions cannot open a **4D v13** data or structure file.



4D v12 cannot open a **4D v13** structure file.

4D v12.1 HF4 and higher versions give you a choice when you attempt to open a **4D v13** data file (three choices are available: *Always refuse*, *Always accept*, *Ask the user for confirmation*. The chosen option is kept in the structure settings. The default option is *Always refuse*).

- If you open a **4D v13** datafile with **4D v12**, we suggest to immediately repair the datafile using MSC. If for any reason you cannot do that, you must reindex the datafile in **4D v12**.
- and must not forget to reindex it again manually when you later move to **4D v13**.

Scrollable areas are changed in ListBoxes.

Obsolescence over the course of versions...

Theme	Replaced by	Status
PICT	Modern formats	Removed in 4D v12
4D Open	Synchronization, WebServices, SQL Pass Thru	Removed in 4D v11 SQL
4D Draw	SVG	Removed in 4D v11 SQL (older versions still work under Windows)
Scrollable areas	Automatic conversion to list boxes	Removed in 4D v13
Platform interface	Use "System"	Removed in 4D v13
QuickDraw patterns	SVG	Removed in 4D v13
Contextual Web mode	Use non-contextual Web mode	Removed in 4D v13
4D Chart (plugin area)	SVG/WebArea/PHP	Coming soon
Mac Resources Warning: the following commands will soon be obsolete ... ARRAY TO STRING LIST Create resource file DELETE RESOURCE Get component resource ID SET PICTURE RESOURCE SET RESOURCE SET RESOURCE NAME SET RESOURCE PROPERTIES SET STRING RESOURCE SET TEXT RESOURCE ...	Use the "Resources" folder of the database	We will soon remove write access
Altura Mac2Win	Use native Windows code	Coming soon
Sub-tables	Use N <-> 1 relations	Coming soon
Non-Unicode mode	Use the Unicode mode	Coming later
Icons of the tool bar associated with a menu item 		This functionality will be removed in 4D v14

Compatibilities

Component with 4D v13

4D v13 can open **4D v12** or **4D v11** components without converting them or displaying confirmation dialog boxes. As a reminder: components are always opened in read-only mode.

It is not necessary to recompile components but conversion to **4D v13** is only possible for **.4DB** files and not for **.4DC** ones.

4D Chart becomes an external plug-in again

The command:

GRAPH TABLE is deprecated

works only if the plugin is available; otherwise, it does nothing.

The two commands:

**GRAPH
GRAPH SETTINGS**

works if the Plug-in is available or with SVG if they are used in a variable and not in a Plug-in area.

If the plugin is available in the plugins folder, compatibility with **4D v12** behavior is supported but no longer recommended.

Therefore, we have:

- in the Tools menu, two available commands (**Charts** and **4D Chart**)
- the associated popup list for the Tool button
- the **Graph destination** for **Quick Reports**.
- 4D Form automatic creation: The Graph button automatically inserted in list forms has been removed by default, but you can add it using the Form wizard.
- PropertyList for objects of the 'Plugin area' type: If 4D Chart is not present, the **Graph** and **4D Chart** items are not displayed.

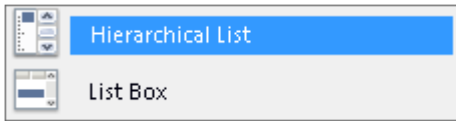
Deprecated (no longer used)**Patterns**

The patterns (for text background and border attributes, rectangles, round rectangles, matrix, ovals background and border attributes, lines background and border attributes) are no longer used.

The **Objects** menu contents were modified. The following commands were replaced or removed:

Commands removed from Objects Menu in 4D v12	Equivalent in 4D v13:
Fill	<i>Removed</i>
Border	<i>Removed</i>
Line Width	Property List: « Line Width » item
Color	Property List: « Color » item « Color » in contextual menu
Font	Property List: « Font » item
Style	Property List: « Text » item

Patterns are also used in the Label editor, **4D Chart** and **4D Graph**. No changes will be done. Patterns will stay.

Scrollable areas

Scrollables areas no more exists in **4D v13**.

Support of external CGIs

4D no longer supports execution of external CGIs, whether in automatic mode (by using an URL) or manually (by using the **SET CGI EXECUTABLE** command).

SET CGI EXECUTABLE

The command. **SET CGI EXECUTABLE** is deprecated. (for memory, the two commands **SET WEB TIMEOUT** and **SET WEB DISPLAY LIMITS** were deprecated in v12).

Html tags: 4DVAR and 4DHTMLVAR

4DVAR must be changed to: **4DTEXT**

4DVAR combined with a **Character(1)** in your string, you must change it in **4DHTML**.

4DHTMLVAR must be changed to: **4DHTML**

The Web server contextual mode

The commands **SET WEB DISPLAY LIMITS** and **SET WE TIMEOUT** are disabled.

AP Get File MD5 Digest

AP Get File MD5 Digest must be changed to **Generate digest**.

C_GRAPH

the syntax:

C_GRAPH (zeGraph) //or C_LONGINT)
GRAPH (zeArguments) //-

Is deprecated (and the plug-in must be installed for using this command).

You must replaced this command by:

C_PICTURE (zeGraph) //or C_LONGINT)
GRAPH (zeArguments) // -> use the SVG

Temporay breakpoints in the debugger

This function is removed and replaced by the item « Run to cursor » in the new context menu.

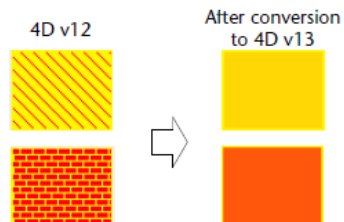
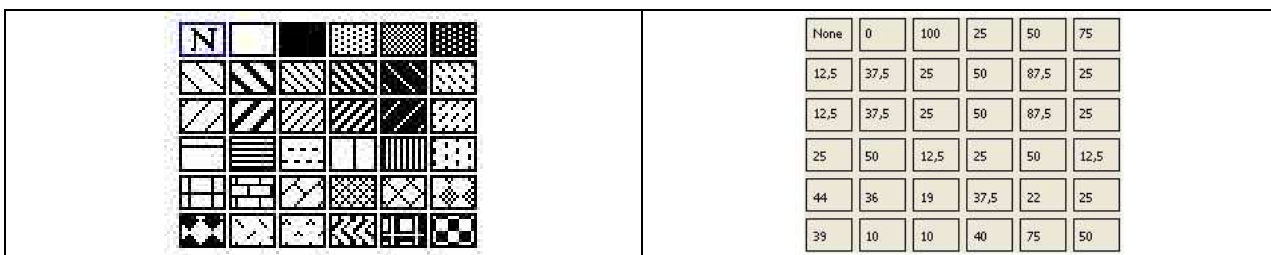
Conversion

Conversion of former patterns

The patterns (for text background and border attributes, rectangles, round rectangles, matrix, ovals background and border attributes, lines background and border attributes) are no longer used.

For old databases, where patterns were used, they will be replaced by a merged color between the two colors used (fill color and line color).

Each pattern will have a coefficient of merging. The value is the percentage of the line color:



For Text

Patterns will be simply removed. From now on, Text color (located in Text tab) will act on text and Fill color on background. Fill Color will be renamed Background color.

We will keep the color palette. For custom colors, we will display the 16 most commonly used colors in all the database forms.

For compatibility:

- Text object with pattern 1 (none), Background color (old Fill color) will be set to Transparent if it's not already the case.

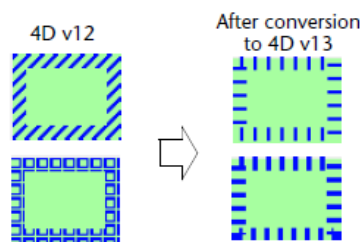
- Text object with pattern 2 (white), nothing will change.
- Text object with pattern 3 (black), colors for Fill color and text color will have to be inverted.
- Text object with other patterns, patterns will disappear and the rest will not change.

For Lines

Line patterns will disappear and will be replaced by different style of lines (Plain, Dotted, Raised, Sunken, Double).

For old databases, where patterns were used, they will be replaced by a dotted style available via Line style property.

For example:



Patterns are also used in the Label editor, **4D Chart** and **4D Graph**. No changes will be done. Patterns will stay.

Conversion of scrollable areas

In **4D v13**, the rendering of the scrollable areas will be done with the listbox engine. A scrollable area will be transformed automatiquement into listbox

▼ Objects	
Type	List Box
Object Name	Zone de défilement
Variable Name	
Data Source	Arrays

For this listbox, the **Scrollable Area** option of the “**Compatibility**” theme is checked in the **Property list**:

▼ Compatibility	
Scrollable Area	<input checked="" type="checkbox"/>

When this option is checked, the listbox functions in a particular way so as to maintain the original interface:

if the array of the listbox has the “invisible” property, the listbox object is also entirely invisible ;

Assigning a value to the array selects the corresponding row in the list box (for example:

MyArray:=1 selects the first row) ;

Clicking in a row modifies the current value of the array ;

When a drop is performed, the command **DRAG AND DROP PROPERTIES** returns a pointer to the array (and not to the listbox).

Conversion of SVG graph

Warning:

A graph constructed using the SVG rendering engine (built using the GRAPH command and a picture variable in 4D v11 or 4D v12) does not have the same rendering in 4D v13. It may be necessary to rectify the picture format or to enlarge the picture size.

Conversion of ListBox Header (and default values for the Footer)

Headers and footers in ListBox created in v13 or in ListBox converted (from v12 and below):

Options in case of creation of ListBox in v13:

Headers	
Display headers	<input checked="" type="checkbox"/>
Invisible by Default	<input type="checkbox"/>
Height	1 Line
Footers	
Display footers	<input checked="" type="checkbox"/>
Invisible by Default	<input checked="" type="checkbox"/>
Height	1 Line

Options in case of converted databases:

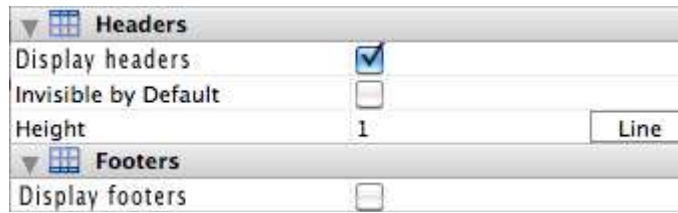
For headers

- “Display headers” will be checked
- and “Invisible by Default” will be checked if “Display headers” (in v12) was not checked
- Height will be set to “1 line”.
- Under Windows Vista and Windows7, the height will be set to 24 pixels ;
- Under Windows XP, the height will be set to 20 pixels ;
- Under MacOS the height will be set to 20 pixels.

Note : Under Windows 7 and Windows Vista, **4D v13** keeps the headers set by the system, which are set to 24 pixels. Headers having lower heights that are used in your converted databases will be automatically resized. In this case, it will be necessary to touch up your listboxes.

For footers

- “Display footers” will be displayed and will be not checked ;
- “Invisible by default” and “Height” will be not displayed (“Invisible by default” will be set to “not checked” and Height will be set to “1 line”)



If this option "Display footers" is not set, footers will NEVER be visible (even if you use the command **OBJECT SET VISIBLE(*;"@";True)**).

Be careful: will be deprecated...

ARRAY TO STRING LIST
Create resource file
DELETE RESOURCE
Get component resource ID
SET PICTURE RESOURCE
SET RESOURCE
SET RESOURCE NAME
SET RESOURCE PROPERTIES
SET STRING RESOURCE
SET TEXT RESOURCE
 ...

Modifications and behavioral changes

Method

Method: code, comment, stamp, attributes

Now you can control methods and method properties available on client and server, compiled or interpreted.

Used in a host base, the commands will apply only to the host methods. Component methods are not listed, even when they are shared.

Used in a component, every command used with a * parameter will apply to the host database.

Methods and form objects that are in the trash are not listed.

The method content may be changed only when the database is in interpreted mode.

Modification of syntax for Time constants under Mac OS

Time constants are now stored, as under Windows, with "?": **?00:00:00?**

? instead of †

Modification of syntax for Character Reference Symbols under Mac OS

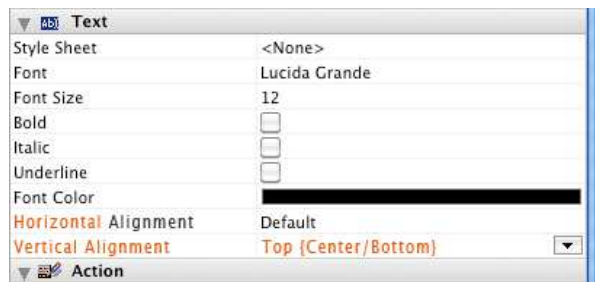
To refer to a single character in a string, the syntax of the Character Reference Symbols are now the same under Mac OS and under Windows: String[[1]]
 [[and]] instead of ≤ and ≥

ListBoxes

Scrolling

For scrolling, a scroll unit corresponds to a line of data (in **4D v12** the unit was a pixel).

Vertical alignment



Available for hierarchical or non-hierarchical listboxes.

OBJECT SET VERTICAL ALIGNMENT ({*;ObjectName}|Variable;**Vertical alignment**)

Parameter	Type		Description
*	*	->	variable or object
ObjectName	Text	->	Object Name
VariableName	Text	->	Variable name
Vertical alignment	LongInt	->	Vertical alignment of the cells: 1: <u>Align default</u> 2: <u>Align top</u> 3: <u>Align center</u> 4: <u>Align bottom</u>

example:

```
OBJECT SET VERTICAL ALIGNMENT(*;"MyColumn1";Align top)
OBJECT SET VERTICAL ALIGNMENT(*;"MyColumn2";Align bottom)
```

OBJECT Get vertical alignment ({*;ObjectName}|Variable) -> Vertical alignment

Parameter	Type		Description
*	*	->	variable or object
ObjectName	Text	->	Object Name
VariableName	Text	->	Variable name
Vertical alignment	LongInt	<-	Alignment: 1: Align default 2: Align top 3: Align center 4: Align bottom

These commands are available only for Listboxes and objects included inside Listboxes: Columns, headers and footers.

New Headers commands

LISTBOX SET HEADERS HEIGHT ({*};ObjectName}|Variable; HeaderHeight {; Unit})

LISTBOX Get headers height ({*};ObjectName}|variable{;Unit})-> Height

N.B. As long as the headers all have the same height, the variable (or object) can be either the listbox itself or any header.

Examples:

LISTBOX SET HEADERS HEIGHT(*;"MyListbox";20;[Listbox pixels](#))

LISTBOX SET HEADERS HEIGHT(*;"MyHeader1";2;[Listbox rows](#))

\$NbPixels:=**LISTBOX Get headers height**(*;"MyListbox"; [Listbox pixels](#))

\$NbLines:=**LISTBOX Get headers height**(*;"MyHeader1"; [Listbox rows](#))

New Footers commands

▶ Group C			
▶ Group D			
▼ Charlie			
▶ Delta			
▶ Group A			
▶ Group B			
▶ Group C			
▶ Group D			
	6 456 842	854 231	4,5

LISTBOX SET FOOTER CALCULATION ({*};ObjectName}|Variable; Calculation)

LISTBOX Get footer calculation ({*};ObjectName }|var) -> Calculation

LISTBOX SET FOOTERS HEIGHT ({*};ObjectName}|Variable; FootersHeight {; Unit})

LISTBOX Get footers height ({*};ObjectName}|variable{;Unit})-> Height

N.B. As long as the headers all have the same height, the variable (or object) can be either the

ListBox, either the foot

New event

On Footer Click (for **LISTBOX GET CELL POSITION** command)

On getting focus and On before data entry

For a list box cell to be enterable, both of the following conditions must now be met:

The cell's column must have been set as **Enterable** (otherwise, the cells of the column can never be enterable).

In the On Before Data Entry event, **\$0** does not return -1.

Now when the cursor arrives in the cell, the On Before Data Entry event is generated in the column method. If, in the context of this event, **\$0** is set to -1, the cell is considered as not enterable. If the event was generated after **Tab** or **Shift+Tab** was pressed, the focus goes to either the next cell or the previous one respectively. If **\$0** is not -1 (by default \$0 is 0), the cell is enterable and switches to editing mode.

Example with a list box containing two arrays, one date and one text. The date array is not enterable but the text array is enterable if the date has not already past.

Header1	Header2
Variable Name: tDate	Variable Name: tText

Method of the **tText** array:

Case of

```

: (Form event = On Before Data Entry)
LISTBOX GET CELL POSITION (*;"lb";$col;$row)
If (tDate{$row} < Current date)
  $0:= -1 // cell is NOT enterable
Else
  // otherwise, cell is enterable
End if
End case

```

Get edited text command

With 4D v13, the On Before Data Entry event is returned before On Getting Focus, which is different from previous versions of 4D. This difference may require some adjustments for enterable text cells: if before the text entered was available in the On Before Data Entry event and could be read using the **Get edited text** command, in 4D v13, this command returns an empty string in this context. You must put code for processing data entry in the On Getting Focus event.

Default values

You can now assign a list of default values to ListBox column. To do this, click on the **Edit** button next to **Default values** in the **Property list** for the column.

Statistics functions

Average, Max, Min, Std deviation, Sum, Sum squares, Variance now work with arrays and with listbox footers.

Hierarchical list

A new command **GET LIST ITEM PARAMETER ARRAYS** allows you to get all the parameters attached to a list item at once.

Spell checker

“Unspell” dictionaries use

4D v13 now supports OpenSource « Unspell » dictionaries:

<http://hunspell.sourceforge.net/>

<http://wiki.services.openoffice.org/wiki/Dictionaries>

To be able to use a Hunspell dictionary, for example “fr-moderne”, in your 4D application, you must install 2 files:

- *fr-moderne.aff*
- *fr-moderne.dic*

at one of the following locations:

- in the 4D application: *<4D>/Resources/Spellcheck/Hunspell/*
- in the 4D database: *<Database Files>/Resources/Hunspell*

Both locations are compatible: the database folder is parsed first, then it is completed by the one in the 4D application, which means that you can encapsulate specialized dictionaries with your 4D databases.

If two dictionaries with the same name are present in both locations, it is the one in the database that is taken into account.

Modification of the Spell check files locations:

Beginning with version 13 of 4D, dictionaries are no longer saved in the 4D Extensions subfolder of 4D applications.

The new locations are:

- in the 4D application: `<4D>/Resources/Spellcheck/Hunspell/`
- in the 4D database: `<Database_Files>/Resources/Hunspell`

Users can also add existing dictionaries or create new ones. The process for creating these dictionaries is the same as that for Cordial user dictionaries (found in previous versions of 4D). User dictionaries are stored in UTF-8 format.

Statistics functions

Average, Max, Min, Std deviation, Sum, Sum squares, Variance now work with arrays (even 2D arrays). Arrays must be real, integer or long integer. These functions will also work in listbox footers.

Windows

SET WINDOW RECT enhancement

New "*" parameter for the command **SET WINDOW RECT** to keep the window in the background. More precisely, "not to set the window to the front systematically". Currently, this command sets the window to the frontmost which in some cases may be annoying.

SET WINDOW RECT (left ; top ; right ; bottom {; window};*)

- If the parameter is NOT passed, then the window WILL become the frontmost window (this will maintain compatibility with previous versions).
- If the parameter IS passed, then the window is only moved and/or resized (x and y) but it keeps its previous "z" position.

Only one "On resize" event

The **SET WINDOW RECT** command triggers a **On resize** cycle directly from the code of the command when the window is part of the current process.

Since this caused problems for re-entry, the cycle is now triggered after execution of the current cycle.

So, if several **SET WINDOW RECT** commands are called in the same form during the same cycle, there is now only one **On resize** event instead of there being one for each **SET WINDOW RECT** as in previous versions of 4D.

Queries

SET QUERY DESTINATION

SET QUERY DESTINATION (destinationType {; destinationObject {; **destinationPtr**)

Parameter	Type		Description
destinationType	Longint	->	0: <u>Into current selection</u> 1: <u>Into set</u> 2: <u>Into named selection</u> 3: <u>Into variable</u>
destinationObject	String	->	Name of the set, or Name of the named selection, or empty string if variable
destinationPtr	Pointer	->	a pointer to a variable, when the destination type is a variable

A new parameter is added: **destinationPtr**. this allows a new syntax:

SET QUERY DESTINATION (Into variable;"";->MaVar)

the old syntax, with 1 or 2 parameters, is always authorized:

SET QUERY DESTINATION (Into current selection)

SET QUERY DESTINATION (Into named selection;"MyNamedSelection")

SET QUERY DESTINATION (Into set;"MySet")

SET QUERY DESTINATION (Into variable;MyVar)

4D Pack commands implemented in 4D

Generate digest

Generate digest (param,algoType) -> Text

Parameter	Type		Description
param	Blob Text	->	Blob or text object for which the MD5 key is needed
algoType	LongInt	->	algorithm used to return the key 0 for MD5 digest, 1 for SHA1 digest <u>MD5 Digest</u> <u>SHA1 Digest</u>
Function result	Pointer	<-	MD5 our SHA1 key value

Deprecated: **AP Get File MD5 Digest** (filePath;Digest;Resfork) -> Error

HTTP server

WEB SEND HTTP REDIRECT sends error message with SOAP requests

In **4D v13**, the **WEB SEND HTTP REDIRECT** command (name changing) also works with SOAP requests and sends a "Service has changed location..." error message. (In **4D v12**, this command did nothing in the case of a Web Service).

Modification of 4D Tag: 4DINCLUDE

In the previous versions, the path was relative to the current document being analyzed, i.e. the "parent" document. In the current version, the path is relative to what was previously set in the current document being analyzed by the new **4DBASE** tag. If **4DBASE** was not invoked in the current document being analyzed, the meaning of the path is the same as in the previous 4D versions.

Support for different content types

The default content types supported by 4D and 4D Server are now stored in a file named **MimeTypes.xml** located in the **Contents\ Native Components\ HTTPServer.Bundle\ Contents\ Resource** folder.

You can edit this file.

Keep-Alive Connections

An improvement has been made in the new implementation: The keep-alive connections can be used with dynamic pages as well.

On web connection, the body is no longer in \$2

In 4D v12, in the database method On web connection, the body was copied into \$2. In **4D v13**, \$2 only contains the "status line" and the "header". The "body" is no longer there. To obtain the body, you can use the command **WEB GET HTTP BODY**.

4DCGI type URLs are now processed the same way as unknown URLs.

This may pose a problem for databases converted from 4D 2003 **and in which the "Remove / on unknown URLs" compatibility option is checked**. In this context, historically, 4DCGI type URLs were not concerned and kept their « / » characters. However, now in **4D v13**, 4DCGI type URLs are processed in the same way as unknown URLs, *therefore the « / » character is removed from them as well*.

From now on, standard functioning is with « / » characters for unknown URLs and for 4DCGI type URLs.

This means there is no problem for databases where the compatibility option is not checked nor for

databases created beginning with 4D v11: unknown URLs and 4DCGI type URLs are both processed the same way, i.e. with « / » characters.

Deprecated: 4DVAR and 4D VAR HTML

4DVAR must be changed to: **4DTEXT**

4DVAR combined with a **Character(1)** in your string, you must change it in **4DHTML**.

4DHTML VAR must be changed to: **4DHTML**

New behavior: 4DINCLUDE

4DINCLUDE can be prefixed by another folder (with **4DBASE** tag).

New: 4DBASE

Syntax: <!--#**4DBASE** folderPath-->

New: 4DELSEIF

You can use **4DELSEIF**.

Menu shortcuts

Modification of Menu dialog: same as property list

SET MENU ITEM SHORTCUT now accepts the syntax with string "[F1]"... "[ESC]"...

Get menu item key: now authorizes a syntax like this: « [A] », « [F1] »

Get menu item modifiers: **shift**, **option/alt**, or **command/ctrl** keys (by default, the modifiers **command/ctrl** is sent with keys **F1** to **F12**).

Debugger

A new context menu is available with some options:

- Go to definition
- Search references
- Run to cursor (replaces “**temporary breakpoints**”, which were removed with **4D v13**)
- Set next statement
- Toggle breakpoint
- Edit breakpoint

Graph

Improvement of the **SVG** rendering engine and adding of specific IDs attributed automatically to the elements found in the SVG graph (columns, lines, areas, shadows, bullets, pie chart labels, legends, values of x, values of y, values of z, background...).

Warning:

A graph constructed using the **SVG** rendering engine (built using the **GRAPH** command and a picture variable in **4D v11** or **4D v12**) does not have the same rendering in **4D v13**. It may be necessary to rectify the picture format or to enlarge the picture size.

Management of Direct2D

Direct2D is a vector graphic rendering API developed by Microsoft for rendering both simple graphic shapes (ellipses, rectangles, polygons, etc.) and more complex ones (paths with Bezier curves), as well as pictures and also text using the complementary **DWrite** API (in a 2D space). DWrite also has extended word processing functionalities.

Direct2D is only available on PC (**Windows**) and only starting with **Vista**.

Direct2D takes advantage of the hardware acceleration of graphic cards.

As far as text is concerned, note that **Direct2D/DWrite** are only compatible with **TrueType** vector fonts (for rendering bitmap fonts, **Direct2D** changes transparently to **GDI/GDIPlus**).

Also note that rendering text with **Direct2D** is not exactly the same as rendering text with **GDIPlus** or **GDI**, particularly at the level of smoothing or the alignment of glyphs with respect to pixels.

The **SET DATABASE PARAMETER** and **Get database parameter** commands allow the management of Direct2D graphics rendering engine.

SET DATABASE PARAMETER (Direct2D Status;value)

value can now take 6 values.

SET: If constant 69, 2nd parameter Get: Result if constant 74	Type	value	Comments
<u>Direct2D Disabled</u>	LongInt	0	Direct2D is disabled
<u>Direct2D Hardware</u>	LongInt	1	Direct2D hardware (software if hardware not available) graphic context is used by default in all applications (on Vista, switch to GDI/GDIPLUS impl if hardware is not available because Direct2D software impl is too slow on Vista)
<u>Direct2D Hardware SVG and Editors</u>	LongInt	2	Direct2D hardware (software if hardware not available) graphic context is used by SVG, structure and code editor components (otherwise, or on Vista if hardware is not available, use

			GDI/GDIPLUS impl)
<u>Direct2D Software</u>	LongInt	3	On Windows 7, Direct2D software graphic context is used by default in all applications (on Vista, switch to GDI/GDIPLUS impl because Direct2D software impl is too slow on Vista)
<u>Direct2D Software SVG and Editors</u>	LongInt	4	On Windows 7, Direct2D software graphic context is used by SVG, structure and code editor components (otherwise, or on Vista use GDI/GDIPLUS impl)
<u>Direct2D Mixed</u>	LongInt	5	On Windows 7, Direct2D software graphic context is used by default in the application but 4D uses Direct2D hardware graphic context for SVG and for structure and code editor components (on Vista, switch by default to GDI/GDIPLUS impl because D2D software impl is too slow on Vista)

Get Database Parameter

Get database parameter (74) -> **Result**

Constants	Type	Value
<u>Direct2D Get active status</u>	LongInt	1, 2, 3, 4 ou 5 (voir les valeurs du sélecteur 69)

BuildApp

The build application generates 2 log files into the log directory (near the structure file):

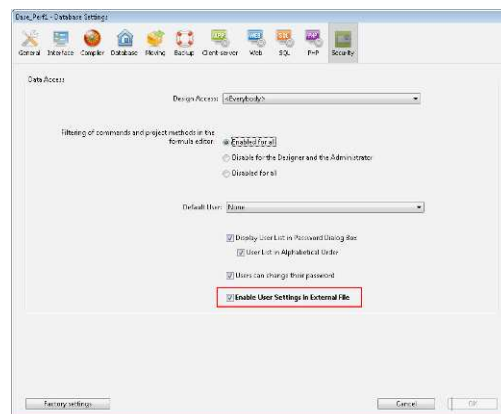
- buildApp.log.xml
- buildApp.log.html

These two files contain the warnings and error messages generated during the build application.

Externalizing User settings

With **4D v13**, you can generate an external file containing custom settings.

To be able to externalize user settings, you need to check the Enable **User Settings in External File** option, in **Security** page of the Database settings



When you check this option, database settings are separated into two dialog boxes: **Structure Settings** and **User Settings**.

The user settings file is automatically created and placed here.

[DatabaseFolder]/Preferences/settings.4Dsettings

It's an xml file, so you can modify it by programming.

You can also use an alias for this file and/or for the **Preferences** folder.

MSC - Structure check: no duplicated object names on a form

During the **Verification of the structure**, all objects of every form will be scanned in order to find out if there is any duplicated object names inside the same form. So if some duplicated names are actually found, this will be considered as a potential issue and the user will be warned.

The warning(s) will be shown as lines added in the log file that will look like the sentence below:

<< The name of the Button20 object of the [Customers]Input form (page 1) is not unique. >>

During the **Repairing of the structure**, if some objects have "non-unique" names, they will be renamed. This will be considered as a potential issue for users programming code and they will be warned as well.

The warning(s) will be shown as lines added in the log file that will look like the sentence below:

<< The Button20 object of the [Customers]Input form (page 1) has been renamed Button21.>>

New behaviors: miscellaneous

The scroll step of the mouse respects the system value

In **4D v13**, the scroll step of the mouse now scrupulously respects the value chosen in the system.

Macro

New macros tag: **<method_path>**

Your own constants now can be stored in a XLIFF file.

These constants were previously stored in 4DK# type resources. For more information, see the "**4D v13** upgrade" document.

A 4D Remote v13 launches only one process on the client

A **4D Remote v13** launches only one process on the client: a local process in cooperative mode.

In Client/server, a 4D remote launched 2 processes in v12 (one preemptive and one cooperative).

OPEN DATA FILE and CREATE DATA FILE: in Client/Server

Now you can use the commands **OPEN DATA FILE** and **CREATE DATA FILE** in Client/Server.

Behavior is identical to that of **4D**. The only difference is that restarting the database triggers a warning on any client machines that are connected requesting that they quit.

Automatic updating of a v13 server and a Windows client only works with 4D Client v12.3 or higher

Because the location of the “Resources” folder on Windows has changed, the **4D v12** version that is compatible for updating the new **v13** client must be version **4D 12.3** or higher.

COPY DOCUMENT

The existing command **COPY DOCUMENT** can now copy folders and not just files.

New path for Active 4D Folder on Mac OS

Get 4D Folder (**Active 4D Folder**) -> path

The 4D environment uses the active 4D folder to store the following information:

Preferences files used by the 4D environment applications ;

- Shortcuts.xml file (custom keyboard shortcuts) ;
- Macros v2 folder (macro commands of Method editor) ;
- Favorites v11 folder (pathnames for local and remote databases that have been opened).

The Active 4D folder was created by default at the following location:

- On Windows Vista: {Disk}:\Users\Current user\AppData\Roaming\4D
- On Windows XP: {Disk}:\Documents and Settings\Current user\Application Data\4D
- On Mac OS: {Disk}:Users:Current user:**Library:Preferences:4D**

In **4D v12**, on Mac OS, if the *DatabaseOutsidePackage* key was present in the **info.plist** file in a build application, the 4D folder was created at an other location (see:

<http://www.4d.com/solutions/deploy/appstore.html>)

GET HTTP HEADER	WEB GET HTTP HEADER
GET HTTP BODY	WEB GET HTTP BODY
START WEB SERVER	WEB START SERVER
STOP WEB SERVER	WEB STOP SERVER
-	WEB GET SESSION EXPIRATION (new command)
-	WEB Get Current Session ID (new command)
SET HTML ROOT	WEB SET ROOT FOLDER
GET WEB FORM VARIABLES	WEB GET VARIABLES
Secured web connection	WEB Is secured connection
SET CGI EXECUTABLE	SET CGI EXECUTABLE (deprecated in v13)
SET WEB TIMEOUT (deprecated in v12)	-
SET WEB DISPLAY LIMITS (deprecated in v12)	-
SET HOME PAGE	WEB SET HOME PAGE
-	WEB SET OPTION (new command)
-	WEB GET OPTION (new command)
Validate digest web password	WEB Validate digest
WEB CACHE STATISTICS	WEB GET STATISTICS

Digest

AP Get File MD5 Digest -> Generate digest

4D environment

OPEN 4D PREFERENCES -> OPEN SETTINGS WINDOW

Tools

PROCESS HTML TAGS -> PROCESS 4D TAGS

Web Services (Server)

Command names in 4D v12	Command names in 4D v13
Get SOAP info	SOAP Get info
Is SOAP request	SOAP request
SEND SOAP FAULT	SOAP SEND FAULT
SOAP DECLARATION	SOAP DECLARATION

Web Services (Client)

Command names in 4D v12	Command names in 4D v13
AUTHENTICATE WEB SERVICE	WEB SERVICE AUTHENTICATE
CALL WEB SERVICES	WEB SERVICE CALL
Get web service error info	WEB SERVICE Get error info
GET WEB SERVICE RESULT	WEB SERVICE GET RESULT
SET WEB SERVICE OPTION	WEB SERVICE SET OPTION
SET WEB SERVICE PARAMETER	WEB SERVICE SET PARAMETER

Renamed constants

Constant names in 4D v12	New names in 4D v13
Display listbox hor scrollbar	<u>Listbox display hor scrollbar</u>
Display listbox ver scrollbar	<u>Listbox display ver scrollbar</u>
Display listbox header	<u>Listbox display header</u>
Add to listbox selection	<u>Listbox add to selection</u>
Position listbox hor scrollbar	<u>Listbox hor scrollbar position</u>
Position listbox ver scrollbar	<u>Listbox ver scrollbar position</u>
Replace listbox selection	<u>Listbox replace selection</u>
Remove from listbox selection	<u>Listbox remove from selection</u>

Constant names in 4D v12	New names in 4D v13
Web Process with context	<u>_o Web process with Context</u>
Web Process on 4D Client	<u>Web process on 4D Remote</u>
Is a directory	<u>Is a folder</u>
Web Service http Error code	<u>Web Service http Status code</u>

New parameter or new option

ListBox

LISTBOX SET/GET TABLE SOURCE

LISTBOX SET TABLE SOURCE ({ * ; } object ; tableNum | name { ; highlighted set name })

LISTBOX GET TABLE SOURCE ({ * ; } object ; tableNum { selection { ; highlighted set name } })

LISTBOX SET/Get rows height

LISTBOX SET ROWS HEIGHT ({ * ; } object ; height { ; Unit })

LISTBOX Get rows height ({ * ; } object { ; Unit }) -> Function result

If the optional parameter is not sent, the height will be set in pixels (compatibility with v12).

LISTBOX footer

LISTBOX GET ARRAYS ({ * ; } object ; arrColNames ; arrHeaderNames ; arrColVars ; arrHeaderVars ; arrColsVisible ; arrStyles { ; arrFooterNames ; arrFooterVars })

LISTBOX INSERT COLUMN ({* ;} object ; colPosition ; colName ; colVariable ; headerName ; headerVar {; footerName ; footerVar })

LISTBOX INSERT COLUMN FORMULA ({* ;} object ; colPosition ; colName ; Formula ; dataType ; headerName ; headerVar {; footerName ; footerVar })

LISTBOX Get information ({* ;} object ; Listbox display footer) -> 0=hidden, 1= displayed

LISTBOX Get information ({* ;} object ; Listbox footer height) -> height of footers in pixels

Blob

COMPRESS BLOB and **BLOB PROPERTIES** accept two new compression methods:

GZIP Best compression mode (-1) et GZIP Fast compression mode (-2).

FORM GOTO PAGE and FORM Get current page

New parameter (*)

Useful when these commands are called in the context of a subform page. These commands work on the subform.

SET WINDOW RECT

New parameter "*":

SET WINDOW RECT (left ; top ; right ; bottom {; window};*)

Added a new parameter (*) to keep the window in the background and not to set the window to the front systematically.

SET QUERY DESTINATION

SET QUERY DESTINATION (destinationType {; destinationObject {; destinationPtr })

A new parameter is added: **destinationPtr**. this allows a new syntax:

SET QUERY DESTINATION (Into variable;"";->MaVar)

OPEN SETTINGS WINDOW

OPEN SETTINGS WINDOW (selector {; access} {;settingType})

Parameter	Type	Description
Selector	String	-> Key designating a theme or a page of parameters in the Preferences or Settings dialog box "/" for all pages "User" or all pages "Structure" depending of the third parameter <i>SettingType</i>

Access	Boolean	->	True: lock the other pages of the dialog box False or omitted: leave the other pages of the dialog box active
Setting type	Longint	->	0: Structure Settings 1: User Settings by default, if not specified: Structure Settings

The user settings must have been allowed before by checking the option “**Enable User Settings in External File**” on Page **Security** of the **Database Settings**.

Gzip mode compression

These commands now supports gzip compression:

- **COMPRESS BLOB**
- **EXPAND BLOB**
- **BLOB PROPERTIES**
- **WEB SET OPTION**

The content is sent gzipped for:

- Static pages
- **WEB SEND FILE** (old **SEND HTML FILE**)
- **WEB SEND TEXT** (old **SEND HTML TEXT**)
- **WEB SEND BLOB** (old **SEND HTML BLOB**)

The header is automatically updated before sending to the client.

The **WEB SEND RAW DATA** does not compress the sent data. It's up to the developer to do it manually, if needed.

```
COMPRESS BLOB ($blob; GZIP Best compression mode)
WEB SET HTTP HEADER ("content-encoding: gzip")
WEB SEND RAW DATA ($blob;*)
```

```
BLOB PROPERTIES ($blob;Compressed {;expandedSize {;currentSize}}
```

5 options for **Compressed**:

- [Is not compressed](#) (0)
- [Compact compression mode](#) (1)
- [Fast compression mode](#) (2)
- [GZIP Best compression mode](#) (-1)
- [GZIP Fast compression mode](#) (-2)

Compact data file: two more options available

Compact data file(StructureFile;FilePath;{BackupFolderPath;Options;CallbackMethod})-> Function result

Two more options are now available:

- **Update Records**: 65536
- **Compact Address Table**: 131072

Example:

```
$BkpFolder:=Compact data file (vStructureFilePath; vDataFilePath;vBackupFolderPath; Update Records + Compact Address Table)
```

SELECTION TO ARRAY, ARRAY TO SELECTION and SELECTION RANGE TO ARRAY

A new parameter with the two commands **SELECTION TO ARRAY** and **ARRAY TO SELECTION** allows an execution step by step for these commands (like **QUERY** and **ORDER BY**).

This new parameter is the parameter **"*"**: it is the waiting for command flag.

If you pass a **"*"** parameter as the last parameter, the pairs (array;field) are stored and the operation is not executed.

It would be executed on the next call of the same command without the **"*"**.

It should be possible to write it in this way:

```
SELECTION TO ARRAY (aField1 | aTable ; array1;*)
SELECTION TO ARRAY (aField2 ; array2;*)
(...)
SELECTION TO ARRAY (aFieldN ; arrayN) // no "*" to execute the command
```

Or

```
SELECTION TO ARRAY
ALL RECORDS ([Table_1])
For ($i;1;Get last field number (1))
  $p:= Get pointer ("a"+String($i))
  SELECTION TO ARRAY (Field (1;$i)->,$p->,* )
End for
SELECTION TO ARRAY
```

SELECTION RANGE TO ARRAY can now be called with just the *Start* and *End* parameters.

```
SELECTION TO ARRAY (aField1 | aTable ; array1;*)
SELECTION TO ARRAY (aField2 ; array2;*)
(...)
SELECTION RANGE TO ARRAY (1 ;50)
```

Document list

DOCUMENT LIST (FolderPath;FileArray{; **options** }

Parameter	Type		Description
FolderPath	Text	->	Full path to a folder or a document
FileArray	Text Array	->	Name of the files
Options	Longint	->	Options of the folder parsing: <u>Recursive Parsing</u> (1) <u>Absolute Path</u> (2) <u>Posix Path</u> (4) <u>Ignore invisible</u> (8) These constants can be combined.

- In **Recursive mode**, document path in subfolders starts with “.” or “\” accordingly to the platform.
- In **Posix notation**, for absolute paths (options 2 + 4) paths always start with “/”.
- In **Posix notation**, for relative paths (option 4), paths don’t start with “/”.

Create folder

CREATE FOLDER (pathname{;*))

You can now create a folders hierarchy with the new parameter “*”.

New constants for existing commands

LISTBOX SET ROWS HEIGHT/LISTBOX Get Rows Height

LISTBOX SET ROWS HEIGHT ({ * ; } object ; height { **unit**)

LISTBOX Get Rows Height ({ * ; } object ; { **unit**)

Constants	Type	Values
<u>Listbox pixels</u>	LongInt	0
<u>Lisbox rows</u>	LongInt	1

Form event

Constants	Type	Value
+ ...		
<u>On Page Change</u>	LongInt	56
<u>On Footer Click</u>	LongInt	57
<u>On Delete Action</u>	LongInt	58

Compact data file

Constants	Type	option
+ ...		
<u>Update records</u>	LongInt	65536
<u>Compact address table</u>	LongInt	131072

SET DATABASE PARAMETER

Constant	Type	Value
<u>Direct2D Status</u>	LongInt	69
<u>Diagnostic Log Recording</u>	LongInt	79
<u>Log Command list</u>	LongInt	80

SET: If constant 69, next parameter Get: Result if constant 74	Type	value
<u>Direct2D Disabled</u>	LongInt	0
<u>Direct2D Hardware</u>	LongInt	1
<u>Direct2D Hardware SVG and Editors</u>	LongInt	2
<u>Direct2D Software</u>	LongInt	3
<u>Direct2D Software SVG and Editors</u>	LongInt	4
<u>Direct2D Mixed</u>	LongInt	5

Get Database Parameter

Get database parameter (74) -> **Result**

Get database parameter (Direct2D Get active status) -> **Result**

Constants	Type	Value
<u>Direct2D Get active status</u>	LongInt	1, 2, 3, 4 or 5 (see selector 69)

Document list

Document list (FolderPath;FileArray{; **options** }

Constants	Type	options
<u>Recursive parsing</u>	LongInt	1
<u>Absolute path</u>	LongInt	2
<u>Posix path</u>	LongInt	4
<u>Ignore invisible</u>	LongInt	8

Select document

Select document (directory ; fileTypes ; title ; options {; **selected**}) -> Function result

Constants	Type	selected
+ ...		
<u>File name entry</u>	LongInt	32

System folder

Constante	Type	Valeur
+ ...		
Documents folder	Entier Long	17

LOG EVENT

LOG EVENT ({**outputType** ;} message { ;importance})

Constants	Type	outputType
+ ...		
Into 4D Diagnostic log	Longint	5

Indicates to 4D to record the message in the 4D diagnostic file (enabled using the **SET DATABASE PARAMETER** command).

Two new database methods

On System Event

This database method will be called each time the application moves to foreground / background,

The database method receives one parameter of Longint type, passed by **4D (\$1)**.

To test which event is concerned, use the predefined constants placed in the events database theme described below:

Constants	Type	Value	Comment
On application background move	Longint	1	When 4D moves to background
On application foreground move	Longint	2	When 4D moves to foreground

You must declare this parameter as follows:

```
// On System Event database method

C_LONGINT ($1)
//Code for method
Case of
  :($1=On application background move)
// do something
  :($1=On application foreground move)
// do something
  {...}
End case
```

On Web Session Suspend

4D will dispose of the oldest existing contexts each time it will need to free memory to create a new one. At this time, a database method is called, allowing the user to store the variables and the selection for future use.

New form events

On Page Change (56)

A new form event is available in **4D v13**: **On Page Change** .

This event occurs when page is changed and when the new page finished loading (e.g after initialization of a subform, a web area and so on. It can also be generated on 1st page, only after a **GOTO PAGE** (and not after a **On Load** event)

You can optimize your code: let us suppose the result of a research displayed on page 2 of the form. This new event allows to execute the research only if this page 2 is loaded. If the user remains on page 1, it is useless to execute it.

On Footer Click (57)

Available only for ListBox and ListBox column, and generate for both left and right clicks. **Object Get pointer** returns a pointer to the variable of the footer that is clicked.

On Delete Action (58)

Available for Hierarchical Lists and List Boxes and generated each time a user attempts to delete an item by pressing **Delete** or **Backspace** or selecting the **Delete** command in the **Edit** Menu.

```
if (Form event=On Delete Action)  
  LISTBOX DELETE ROWS ( { * ; } object ; vPosition ; number of lines )  
End if
```

New events for hierarchical ListBoxes

On Expand (43) and **On Collapse** (44) are now available with hierarchical list boxes.

New commands

Method and Forms

METHOD GET COMMENTS
METHOD SET COMMENTS
METHOD SET CODE
METHOD GET CODE
METHOD SET ATTRIBUTE
METHOD Get attribute
METHOD GET MODIFICATION DATE
METHOD SET ACCESS MODE
Current method path
METHOD Get path
METHOD GET PATHS
METHOD GET PATHS FORM
METHOD OPEN PATH
METHOD GET NAMES
METHOD RESOLVE PATH
METHOD GET FOLDERS

FORM GET NAMES

Objects

OBJECT SET VERTICAL ALIGNEMENT
OBJECT Get vertical alignement
OBJECT SET SHORTCUT
OBJECT GET SHORTCUT
OBJECT SET HELP TIP
OBJECT Get help tip
OBJECT SET RESIZING OPTIONS
OBJECT GET RESIZING OPTIONS
OBJECT SET DRAG AND DROP OPTIONS
OBJECT GET DRAG AND DROP OPTIONS
OBJECT SET FOCUS RECTANGLE INVISIBLE
OBJECT Get focus rectangle invisible
OBJECT SET AUTO SPELLCHECK
OBJECT Get auto spellcheck
OBJECT SET KEYBOARD LAYOUT
OBJECT Get keyboard layout

Listbox

LISTBOX SET FOOTER CALCULATION
LISTBOX Get footer calculation

LISTBOX SET HEADERS HEIGHT
LISTBOX Get headers height

LISTBOX SET FOOTERS HEIGHT
LISTBOX Get footers height

LISTBOX SET LOCKED COLUMNS
LISTBOX Get locked columns

LISTBOX SET STATIC COLUMNS
LISTBOX Get static columns

LISTBOX Get column formula
LISTBOX SET COLUMN FORMULA

LISTBOX GET GRID
LISTBOX GET GRID COLORS

ListBox & object command

OBJECT SET VERTICAL ALIGNMENT
OBJECT Get vertical alignment

These OBJECTS commands will be available only for Listboxes and objects included inside listboxes: Columns, headers and footers.

Hierarchical lists

GET LIST ITEM PARAMETER ARRAYS

Dictionary

SPELL ADD TO USER DICTIONARY
SPELL CHECK TEXT
SPELL GET DICTIONARY LIST
SPELL Get current dictionary

Web

WEB Get current session id
WEB SET OPTION
WEB GET OPTION
WEB GET SESSION EXPIRATION
WEB CLOSE SESSION
WEB Get body part count
WEB GET BODY PART

HTTP Client

HTTP AUTHENTICATE
HTTP Get
HTTP GET OPTION

HTTP Request
HTTP SET OPTION

Digest

Generate digest

Subform

OBJECT SET SUBFORM
OBJECT GET SUBFORM
OBJECT GET SUBFORM CONTAINER SIZE

Text and array

TEXT TO ARRAY
GET TEXT KEYWORDS

Queries

GET QUERY DESTINATION
Get query limit

4D Progress

Progress New
Progress QUIT
Progress Stopped
Progress SET BUTTON ENABLED
Progress Get Button Enabled
Progress SET BUTTON TITLE
Progress Get Button Title
Progress SET ICON
Progress Get Icon
Progress SET MESSAGE
Progress Get Message
Progress SET ON ERROR METHOD
Progress Get On Error Method
Progress SET ON STOP METHOD
Progress Get On Stop Method
Progress SET PROGRESS
Progress Get Progress
Progress SET TITLE
Progress Get Title
Progress SET FONT SIZES
Progress SET FONTS
Progress SET WINDOW VISIBLE

Printing

Get print preview
Is in printing preview

Picture tools

Equal pictures
Get picture file name
SET PICTURE FILE NAME
FORM SCREENSHOT (new in 4D 12.2)
GET PICTURE KEYWORDS

External data

SET EXTERNAL DATA PATH
Get external data path
RELOAD EXTERNAL DATA

New constants for new commands

LISTBOX SET HEADERS HEIGHT / LISTBOX Get Headers Height
LISTBOX SET FOOTERS HEIGHT / LISTBOX Get footers height

Constants	Type	unit
<u>Listbox pixels</u>	LongInt	0
<u>Listbox lines</u>	LongInt	1

LISTBOX SET FOOTER CALCULATION / LISTBOX Get footer calculation

Constants	Type	unit	Comment
<u>Listbox footer custom</u>	LongInt	1	No calculation performed by 4D. The footer is calculated by programming.
<u>Listbox footer min</u>	LongInt	2	Used with number, date, time or boolean type column
<u>Listbox footer max</u>	LongInt	3	Used with number, date, time or boolean type column
<u>Listbox footer sum</u>	LongInt	4	Used with number, time or boolean type column
<u>Listbox footer count</u>	LongInt	5	Used with number, text, date, time, boolean or picture type column
<u>Listbox footer average</u>	LongInt	6	Used with number or time type column
<u>Listbox footer std deviation</u>	LongInt	7	Only for array type ListBoxes - Used with number or time type column
<u>Listbox footer variance</u>	LongInt	8	Only for array type ListBoxes - Used with number or time type column
<u>Listbox footer sum squares</u>	LongInt	9	Only for array type ListBoxes - Used with number or time type column

Database method On System Events

Constants	Type	Value	Comment
<u>On application background move</u>	Longint	1	When 4D moves to background
<u>On application foreground move</u>	Longint	2	When 4D moves to foreground

OPEN SETTINGS WINDOW

Constants	Type	value
<u>Structure Settings</u>	LongInt	0
<u>User Settings</u>	LongInt	1

Generate digest

Constants	Type	value
<u>MD5 Digest</u>	LongInt	0
<u>SHA1 Digest</u>	LongInt	1

OBJECT SET VERTICAL ALIGNMENT / OBJECT Get vertical alignment

Constants	Type	value
<u>Align default</u>	LongInt	1
<u>Align top</u>	LongInt	2
<u>Align center</u>	LongInt	3
<u>Align bottom</u>	LongInt	4

OBJECT SET/GET RESIZING OPTIONS

Constants for <i>Horizontal</i> parameter	Type	value
<u>Resize horizontal none</u>	LongInt	0
<u>Resize horizontal grow</u>	LongInt	1
<u>Resize horizontal move</u>	LongInt	2
<u>Resize vertical none</u>	LongInt	0
<u>Resize vertical grow</u>	LongInt	1
<u>Resize vertical move</u>	LongInt	2

Constants for <i>Vertical</i> parameter	Type	value
<u>Resize vertical none</u>	LongInt	0
<u>Resize vertical grow</u>	LongInt	1
<u>Resize vertical move</u>	LongInt	2

OBJECT SET/GET DRAG AND DROP OPTIONS

Constants	Type	value
<u>Draggable False</u>	LongInt	0
<u>Draggable True</u>	LongInt	1
<u>Draggable auto False</u>	LongInt	0
<u>Draggable auto True</u>	LongInt	1
<u>Droppable False</u>	LongInt	0
<u>Droppable True</u>	LongInt	1
<u>Droppable auto False</u>	LongInt	0
<u>Droppable auto True</u>	LongInt	1

OBJECT SET/GET SHORTCUT

Constants	Type	value
<u>Shortcut with F1</u>	string	"[F1]"
<u>Shortcut with F2</u>	string	"[F2]"

<u>Shortcut with F3</u>	string	"[F3]"
<u>Shortcut with F4</u>	string	"[F4]"
<u>Shortcut with F5</u>	string	"[F5]"
<u>Shortcut with F6</u>	string	"[F6]"
<u>Shortcut with F7</u>	string	"[F7]"
<u>Shortcut with F8</u>	string	"[F8]"
<u>Shortcut with F9</u>	string	"[F9]"
<u>Shortcut with F10</u>	string	"[F10]"
<u>Shortcut with F11</u>	string	"[F11]"
<u>Shortcut with F12</u>	string	"[F12]"
<u>Shortcut with F13</u>	string	"[F13]"
<u>Shortcut with F14</u>	string	"[F14]"
<u>Shortcut with F15</u>	string	"[F15]"
<u>Shortcut with Carriage Return</u>	string	"[return]"
<u>Shortcut with Enter</u>	string	"[enter]"
<u>Shortcut with Backspace</u>	string	"[backspace]"
<u>Shortcut with Tabulation</u>	string	"[tab]"
<u>Shortcut with Escape</u>	string	"[esc]"
<u>Shortcut with Delete</u>	string	"[del]"
<u>Shortcut with Home</u>	string	"[home]"
<u>Shortcut with End</u>	string	"[end]"
<u>Shortcut with Help</u>	string	"[help]"
<u>Shortcut with Page Up</u>	string	"[page up]"
<u>Shortcut with Page Down</u>	string	"[page down]"
<u>Shortcut with Left Arrow</u>	string	"[left arrow]"
<u>Shortcut with Right Arrow</u>	string	"[right arrow]"
<u>Shortcut with Up Arrow</u>	string	"[up arrow]"
<u>Shortcut with Down Arrow</u>	string	"[down arrow]"

METHOD Get path / METHOD RESOLVE PATH

Constants	Type	unit
<u>Path Project method</u>	LongInt	1
<u>Path Database method</u>	LongInt	2
<u>Path Project form</u>	LongInt	4
<u>Path Trigger</u>	LongInt	8
<u>Path Table form</u>	LongInt	16

METHOD GET PATHS

Constants	Type	unit
<u>Path Project method</u>	LongInt	1
<u>Path Database method</u>	LongInt	2
<u>Path Project form</u>	LongInt	4
<u>Path Trigger</u>	LongInt	8
<u>Path Table form</u>	LongInt	16
<u>Path All objects</u>	Longint	31

METHOD SET ATTRIBUTE / METHOD Get attribute

Constants	Type	unit
<u>Attribute Invisible</u>	LongInt	1
<u>Attribute Published Web</u>	LongInt	2
<u>Attribute Published SOAP</u>	LongInt	3

<u>Attribute Published WSDL</u>	LongInt	4
<u>Attribute Shared</u>	LongInt	5
<u>Attribute Published SQL</u>	LongInt	7
<u>Attribute Executed on server</u>	LongInt	8

METHOD SET ACCESS MODE

Constants	Type	unit
<u>On object locked abort</u>	LongInt	0
<u>On object locked retry</u>	LongInt	1
<u>On object locked confirm</u>	LongInt	2

HTTP SET OPTION / HTTP GET OPTION

Constants	Type	value
<u>HTTP Timeout</u>	LongInt	1
<u>HTTP Follow redirect</u>	LongInt	2
<u>HTTP Max redirect</u>	LongInt	3
<u>HTTP Display auth dialog</u>	LongInt	4
<u>HTTP Reset auth settings</u>	LongInt	5
<u>HTTP Compression</u>	LongInt	6

HTTP AUTHENTICATE

Constants	Type	value
<u>HTTP Basic</u>	LongInt	1
<u>HTTP Digest</u>	LongInt	2

HTTP Request

Constant	Type	Value
<u>HTTP GET Method</u>	String	GET
<u>HTTP POST Method</u>	String	POST
<u>HTTP HEAD Method</u>	String	HEAD
<u>HTTP TRACE Method</u>	String	TRACE
<u>HTTP DELETE Method</u>	String	DELETE
<u>HTTP PUT Method</u>	String	PUT
<u>HTTP OPTIONS Method</u>	String	OPTIONS

WEB SET/GET OPTION

Constants	Type	Value
<u>Web IP Address to listen</u>	Longint	16
<u>Web Character set</u>	Longint	17
<u>Web Max Concurrent Processes</u>	Longint	18
<u>Web Maximum requests size</u>	Longint	27
<u>Web Log Recording</u>	Longint	29
<u>Web HTTPS Port ID</u>	Longint	39

<u>Web HTTP Compression Level</u>	Longint	50
<u>Web HTTP Compression Threshold</u>	Longint	51
<u>Web Keep session</u>	Longint	70
<u>Web Max sessions</u>	Longint	71
<u>Web Inactive session timeout</u>	Longint	72
<u>Web Session cookie name</u>	Longint	73
<u>Web Inactive process timeout</u>	Longint	78