**LAO – Lists As Objects**

**Lists Object structure:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Attribute Names | Type | Attribute names | Values | Attribute names | Values | Attribute names | Values |
| \_LAO\_oLists | Object | \_LAO\_tObjectVersion | v.1.xx |  |  |  |  |
|  |  | \_LAO\_iLastListRef | nnnnn |  |  |  |  |
|  |  | \_LAO\_tSource | “File” or “Method” |  |  |  |  |
|  |  | \_LAO\_tHostMethodLoad | Host method name |  |  |  |  |
|  |  | \_LAO\_tHostMethodSave | Host method name |  |  |  |  |
|  |  | \_LAO\_tDateTimeStamp | yyyymmdd-hh:mm:ss |  |  |  |  |
|  |  | \_LAO\_bIntegrityCheckOnLoad | True / False (dft) !!! |  |  |  |  |
|  |  | \_LAO\_bIntegrityCheckOnSave | True / False (dft) !!! |  |  |  |  |
|  |  | \_LAO\_bAttribDftCollapsed | True (dft) / False |  |  |  |  |
|  |  | \_LAO\_colLists | Collection of Objects | \_LAO\_iListRef | 1 -> nnnnn |  |  |
|  |  |  |  | \_LAO\_tListName |  |  |  |
|  |  |  |  | \_LAO\_bListIsActive | True/False |  |  |
|  |  |  |  | \_LAO\_tListType | “List” (\*\*\*) |  |  |
|  |  |  |  | \_LAO\_tListDescr |  |  |  |
|  |  |  |  | \_LAO\_colListAttrib | Collection of Objects | name  type (\*)  value | nnnnnn  “Text”  vvvvvvv |
|  |  |  |  | \_LAO\_oListMandAttrib | Object | Name  Type (\*\*) | nnnnnn  “Text” |
|  |  |  |  |  |  |  |  |
| \_LAO\_colListsRef\_1 (holds all list items info) | Collection of Objects | \_LAO\_tItemName |  |  |  |  |  |
|  |  | \_LAO\_iItemOrder |  |  |  |  |  |
|  |  | \_LAO\_bItemIsActive | True / False |  |  |  |  |
|  |  | \_LAO\_bItemIsSublist | True / False |  |  |  |  |
|  |  | \_LAO\_colItemAttributes | Collection of Objects | key |  |  |  |
|  |  |  |  | value |  |  |  |
|  |  |  |  | type (\*\*) |  |  |  |
|  |  |  |  | mand | True / False |  |  |
| ….. |  |  |  |  |  |  |  |
| ….. |  |  |  |  |  |  |  |
| \_LAO\_colListsRef\_nnnnn |  |  |  |  |  |  |  |

**List object structure:**

* The list of all available lists is in the collection of the attribute “\_LAO\_oLists.\_LAO\_colLists”.
* The list itself can have a collection of attributes available in the attribute \_LAO\_colListAttrib.
* When the list object attribute named “\_LAO\_oListItemsMandAttrib” is present, each attribute in that object becomes a mandatory attribute for every list item of that list.
* For each list in the collection “\_LAO\_colLists” a collection of list items exist with attribute names \_LAO\_colListsRef\_1 ….. \_LAO\_colListsRef\_nnnnn.
* Every list item in any “\_LAO\_colListsRef\_nn” collection can optionally have an object with attributes associated with it (mandatory or not).

**Where is the list information stored?**

Where the list object is stored depends on the contents of the attribute “\_LAO\_tSource” which can have one of 2 values: “File” or “Method”:

If the value is “File” (=default), the list object will be stored (and retrieved) as JSON text from the file “\_LAO\_Lists.json” located in the folder “\_LAO\_Lists” next to the 4D .4DD database file.

If the value is “Method”, the list will be saved by calling the host method which name is stored in the attribute “\_LAO\_tHostMethodSave”.

This method will receive in the first parameter of the text representation of the object. Subsequently, when the component will need to load the lists, it will call the method named in the attribute “\_LAO\_tHostMethodLoad”, and expects the same text representation of the list object in the first parameter.

Changing the attributes “\_LAO\_tSource”; “\_LAO\_tHostMethodSave” and “\_LAO\_tHostMethodLoad” can be done using the “Settings”-menu in the editor.

**List access:**

Upon calling ANY component function, the complete list structure will be stored in your local STORAGE object, provided that the information is not already there.

When saving the list object in the list editor, the STORAGE object will be update with the latest version of the list object (for the computer using the editor).

(\*) - values: “Text” (dft), “Number”, “Date”, “Boolean”,”Object”;”Collection”.

(\*\*) - values: “Text” (dft), “Number”, “Date”, “Boolean.

(\*\*\*) - values: “List” (dft), “Sublist”, “Menu”, “Submenu”.

(!!!) - not yet implemented.

**List editor form:**

|  |  |
| --- | --- |
| Page 1 | Form objects |
|  | |  |  |  |  | | --- | --- | --- | --- | |  | Listbox 1 | Listbox 2 | Listbox 3 | | Name | \_LAO\_lbMainlist | \_LAO\_lbItemList | \_LAO\_lbItemAttributesStatic | | Collection | Form.\_LAO\_colLists | Form.\_LAO\_colListItems | Form.\_LAO\_colListItemAttribStatic | | Curr. Item | Form.\_LAO\_CurrentList | Form.\_LAO\_CurrentListItem |  | | Curr. Item Pos. | Form.\_LAO\_CurrentListPos | Form.\_LAO\_CurrentListItemPos |  | | Selected Items | Form.\_LAO\_CurrentListSel | Form.\_LAO\_CurrentListItemSel |  | |
| Page 2 | Form Objects |
|  | |  |  |  | | --- | --- | --- | |  | Listbox 4 | Listbox 5 | | Name | \_LAO\_lbListAttributes | \_LAO\_lbItemAttributes2 | | Collection | Form.\_LAO\_colListAttrib | Form.\_LAO\_colListMandAttrib | | Curr. Item | Form.CurrentListAttrib | Form.CurrentMandatoryAttrib | | Curr. Item Pos. | Form.CurrentListAttribPos | Form.CurrentMandatoryAttribPos | | Selected Items |  |  | |
| Page 3 | Form Objects |
|  | |  |  | | --- | --- | |  | Listbox 6 | | Name | \_LAO\_lbItemAttributes3 | | Collection | Form.\_LAO\_colListItemAttrib | | Curr. Item | Form.\_LAO\_CurrentItemAttrib | | Curr. Item Pos. | Form.\_LAO\_CurrentItemAttribPos | | Selected Items |  | |

**Component functions:**

**\_LAO\_EditorStart**

Starts the list editor. Only one instance of the editor can be active on any time (protected by a semaphore).

**\_LAO\_DDLWidget**

Starts the component’s internal drop-down widget. Relies on the presence of an object FORM attribute called “widgetDDLSelectParam”.

For a list of attributes within that form object see below.

Form. oDDLWidgetParam:= New object

Form. oDDLWidgetParam.list:="list name" // Mandatory

or

Form. oDDLWidgetParam.list:=new collection("Eeny";"Meeny";"Miny";"Moe") // Mandatory (for ddl’s not in the list object)

Form. oDDLWidgetParam.sourceAttrib:="tDDLValue" // Mandatory – the drop down object source

Form. oDDLWidgetParam.sourceType:="scalar|listbox" // Mandatory when “listbox” - default="scalar"

Form. oDDLWidgetParam.listboxColObj:="value" // Mandatory but only when "sourceType" is listbox - is the the list box column object name = this.value

Form. oDDLWidgetParam.sourceAttribValue:=Form.tDDLValue) // Optional - for feedback purposes / pre-selection of values in the drop down widget

Form. oDDLWidgetParam.sortByDescription"; True// Optional

Form. oDDLWidgetParam.ddlLocation:="Top" // Optional - "Bottom" (Default) or "Top" – puts the DDL over (top) or under (bottom) the source

Form. oDDLWidgetParam.ddlWidth:=200 // Optional

Form. oDDLWidgetParam.ddlRows:=20 // Optional

Form. oDDLWidgetParam.hdrShow:=True // Optional - default False except for full listbox

Form. oDDLWidgetParam.itemHdr:="Select an item" // Optional - header contents for item column when hdrShow = True

Form. oDDLWidgetParam.selectionButton:=False // Optional - use button click to confirm selection or tab key(dft) - always true for full list box multi selection

Form. oDDLWidgetParam.multiSelection:=False // Optional

Form. oDDLWidgetParam.multiSelectionCheckBox:=False // Optional - use checkboxes to make item selections (only for scalar)

Form. oDDLWidgetParam.itemSeparator:= "\_" // Optional - Default = ","

Form. oDDLWidgetParam.filterActive:=True // Optional - default false - when true filter object on top of DDL widget

Form. oDDLWidgetParam.autoComplete:=True // Optional - default false

Form. oDDLWidgetParam.autoSelectOne:=False // Optional - when filter is active and only has 1 option left, automatically select that option

Form. oDDLWidgetParam.returnInfo"; New object("info";"name")) // Optional default "name" - "\*";"nameOnly";"name";"nameAndOrder";"nameAndAttr"

OB SET($oDDLWidgetParam; "returnInfoRenamed"; New object("name"; "name"; "order"; "order"; "attr"; "attr"; "active"; "isActive")) // Optional

OB SET(Form.widgetDDLSelectParam; "listBoxSelectionAttrib"; "LastName")Optional - for Full Listbox DDL only - = column value to be selected from

OB SET(Form.widgetDDLSelectParam; "listBoxColumnAttrib"; New Collection("LastName";"FirstName")) Optional - for Full Listbox DDL only - = collection of attributes of the main collection

// OB SET(Form.widgetDDLSelectParam; "listBoxColumnHdrs"; New Collection("Last Name";"First Name")) Optional - for Full Listbox DDL only - = collection of header titles for the main collection

// OB SET(Form.widgetDDLSelectParam; "listBoxColumnWidths"; New Collection(250;180)) Optional - for Full Listbox DDL only - = collection of column widths

// OB SET(Form.widgetDDLSelectParam; "listBoxSortOrder"; "") Optional - for Full Listbox DDL only - see https://developer.4d.com/docs/19/API/CollectionClass#orderby for format

// OB SET(Form.widgetDDLSelectParam; "listBoxWindowTitle"; "Select a Customer") Optional - for Full Listbox DDL only

**\_LAO\_ListTo4DCList** (ListName(text);Listpointer(pointer);SortByDescr(boolean))->Object

Returns the active list items of the given ListName in the 4D list provided in the Listpointer. By default, list items are sorted by the order attribute.

This can be overwritten by the optional SortByDescr parameter.

Returns an object with the following attributes: “ok” set to 1 if successful, 0 in case of error. Error message found in attribute “errMsg”

**\_LAO\_ListToArray** (ListName(text);Arraypointer(pointer);SortByDescr(boolean))->Object

Returns the active list items of the given ListName in the 4D list provided in the Arraypointer. By default, list items are sorted by the order attribute.

This can be overwritten by the optional SortByDescr parameter.

Returns an object with the following attributes: “ok” set to 1 if successful, 0 in case of error. Error message found in attribute “errMsg”

**\_LAO\_ListToCollection** (ListName(text);Collectionpointer(pointer);SortByDescr(boolean))->Object

Returns the **active** list items of the given ListName in the 4D list provided in the Collectionpointer.

By default, list items are sorted by the order attribute.

This can be overwritten by the optional SortByDescr parameter.

Returns an object with the following attributes: “ok” set to 1 if successful, 0 in case of error. Error message found in attribute “errMsg”

**\_LAO\_ListTo4DHList** (Param (object))->Object

Returns a hierarchical list of the active list items of the given listname in the 4D list provided in the Collectionpointer. By default, list items are sorted by the order attribute. This can be overwritten by the optional SortByDescr parameter.

Returns an object with the following attributes: “ok” set to 1 if successful, 0 in case of error. Error message found in attribute “errMsg”

Object parameter attributes:

“tListName”: text – the list to retrieve

“pReturnList”; pointer – the 4D list holding the retrieved items

“bSortByDescription”; boolean (dft false)

“bShowActiveOnly; boolean (dft false)

**\_LAO\_Init**({ForceUpdate(boolean))

Stores the latest version of the lists in your local storage. Is automatically called when using one of the functions.

To force update of the information in STORAGE, call \_LAO\_Init(True).

**\_LAO\_GetListAttributes**(ListName (text))

Returns an object containing all the list attributes.

Return value:

“ok” - set to 1 if successful, 0 in case of error.

“errMsg” - error message in case “ok” is 0.

“colListAttrib” - collection of all the list attributes.

**\_LAO\_GetListItemAttributes**(ListName (text);ItemRef(variant))

Returns an object containing all attributes for the given list item.

Parameters: - List name – text.

- Item ref – Item name or Item order.

Return value:

“ok” - set to 1 if successful, 0 in case of error.

“errMsg” - error message in case “ok” is 0.

“oItemAttrib” - object with all the list item attributes.

**\_LAO\_MenuAppendToMenuBar**(Menubar ref (pointer);ListName (text); {MenuLabel (text)})

Appends all the active menu items from the given list name (of type menu) to the given menu bar

Return value:

“ok” - set to 1 if successful, 0 in case of error.

“errMsg” - error message in case “ok” is 0.

**\_LAO\_MenuPopUp**(ListName (text))

Shows a popup menu at the cursor location with all the active list items and returns the menu parameter of the selected item

Return value: Menu parameter of the selected menu item or empty string.

**\_LAO\_MenuUserHas4DAccess**({UserName (text)})

Returns True or False depending the user is in the 4D User Group of the menu 4D Access Group parameter, based upon the selected menu item.

If no user is provided “Current User” is assumed.

Needs to be called from within the context of the On Menu Selected event.