Local Variables (Active Pictures)

Picture local variables

Local variables are variables that are valid within a picture instance. It means that the same picture opened on several consoles (the D2000 HI processes) at the same time, and uses its copies of local variables. Local variables are visible only within the picture script, they are not available on the system level. They can be connected to graphic objects and Windows controls.
There are five categories of picture local variables:

- Basic local variables – they have no special features and can be connected to objects and manipulate the object value.
- Input-output local variables – they allow to give parameters to the picture opened from other picture in both directions.
- Reference local variables - they are used for the identification of graphic objects and Windows controls. Such variables are used as unambiguous identifiers of these objects within the picture script.
- Indexed - they are used to handle the currently displayed row of structured variables connected to graphic objects to view.
- External - similar to Basic local variables, but the parameters can be set from a parent picture

Configuration of local variables

Clicking the button [icon] from the Main toolbar opens the dialog box allowing you to configure local variables.

		Variable name	Category	Value type	Structure	Value	Filter type	Status text	Text palette
0		_bo	LOCAL	BOOL	---		No start value		---
0		_boSt	LOCAL	BOOL	---	FALSE	Passive	Bool	---
0		_ext	EXTERNAL	INT	---	1	Passive		(0) - None
0		_i	LOCAL	INT	---	33	Active		(0) - None
0		_idx	INDEX	INT	SV._System_NetStatus	---	No Filter		(0) - None
0		_idx2	INDEX	INT		---	No Filter	Integer	(0) - None
0		_inout	INOUT	TEXT	---	---	---		---
1		_Ro	REFID	INT	---	1	---	---	---
0		_Text	LOCAL	INT	---		Passive		(0) - None

The definition of one local variable consists of the following attributes:

First column	The column is used to select a given local variable in the list. Double-click on the column corresponding to clicking the button **OK** in the dialog window. After inserting graphic objects from clipboard into picture, the column shows symbols for added local variables or name or definition conflicts.
Second column	Shows how many times it is used in graphic objects of the picture (not in the picture scripts); does not apply to the INOUT category.
Variable name	Local variable name. The name can be used either for connection to the picture graphic object or in the picture script. The name must begin with the character '_' (underline).

Category	Category of the local variable. According to the selected category, local variables in the list are shown in corresponding colors: • **LOCAL** - basic local variable • **INOUT** - input-output local variable used for passing parameters between pictures • **REFID** - reference local variable used for object identification in picture script • **INDEX** - indexed local variable that specifies a row of structured variable
Value types	Local variable value type. Possible types: • **BOOL** - binary, logical variable • **INT** - integer variable • **REAL** - real variable • **TIME** - variable of Absolute time type • **TEXT** - text variable • **STRUCT** - structured variable
Structure	The attribute is valid only for the value type **STRUCT** and defines the object of Structure definition type, which determines the type of structured local variable. The attribute is also valid for index local variable that handles a filter (detailed description in index local variables below).
Value	• it defines, for reference variable, its value for use in the picture script. • it is a start value for local and external variables

Filter type	• filter type of index local variable (detailed description in index local variables below).
	• parameters for local and external variables:
	   ○ No start value - without a start value
	   ○ Passive - a passive start value - it is only set when opening the picture
	   ○ Active - an active start value - when clicking above visible, not forbidden graphic object which uses the local variable for displaying, the value of the intern identifier of the object in the D2000 presented by **MyValue** expression is set automatically. This value can be used in display palettes using **MyValue** expression in status script of a palette row.

Status text	Object of Status text type that will be used for displaying the value of the local variable when it is connected to a graphic object.
Text palette	Mask definition from transformation palette for value types INT, REAL, and TIME from LOCAL and INOUT categories.

Note: Items without meaning are unavailable and are marked with ---

Use of local variables

Basic variables	They are used for connection to graphic objects / Windows controls. Connection is being performed in the palette Connect object - the tab Connect, Palettes, Control... Using such a connected local variable allows reading or modifying the object contents and changing the variable value.
Input-output variables	They are used for parameter passing among pictures. Among pictures they are paired by name - when a picture is being opened from the mother picture, the contents of the mother picture variables is copied into input-output variables with the same names in the opened picture. Before closing the new picture, new contents of the input-output variables is copied to the corresponding mother picture variables.

Reference variables	They are used to name (identification) objects. There are three cases, you need to identify an object:	
	• when you need to call an object function • when you define an object event handler • when you detect the event source in generic event handler	- e.g. %HI_SetText(_N1, "Text") - e.g. ENTRY N1_OnClick - e.g. ENTRY OnClick(IN INT _RefID) IF _RefID = _N1 THEN
Indexed variables	They are used to handle the currently displayed row of structured variable connected to graphic object to view. Handling the value of indexed variable from the picture script you can change current connected structure row. The change of value in the picture ensures the change of value of variable but not the connected row of structure. Index variables can handle so-called *filter*. Filter allows optimization of the communication between the D2000 Server and D2000 HI processes by the distribution of the values of the row defined by the indexed variable and not the values of whole structured variable. In this case, the indexed variable must be bound with a structured variable using the attribute **Structure**. Filter type is defined in the attribute **Filter type**: • **No filter -** filtering is disabled - there are distributed value changes of all rows. • **Passive -** filtering is enabled. Initial value of the indexed variable is not defined - it must be initialized in the picture script. While no value of the indexed variable is defined no change of filtered structured variable is not distributed. • **Active -** filtering is enabled. Initial value of the indexed variable is automatically set according the picture instance. After opening the picture, the distributed value of the filtered structure row is according the picture instance number. When the filtering is enabled, value distribution can be also handled by the functions *%HI_OpenRow, %HI_CloseRow, %HI_ChangeRow*.	
External variables	Parameters of values of external variables can be set from a parent picture, which displays this picture in visual display unit as a subpicture. When setting parameters from a parenting picture, it is possible to bind on such external variables other variable. Then, the external variable represents the value of this bound variable. Anz change of the bound variable will reflect into value change of the external variable. The binding applies in both directions, so the change of the external variable will cause change in the bound variable. The external variables are typically used when the picture is used as a component. It is possible to connect the external variables to graphic objects in the same way as the basic variables.	

Note:
The list of local variables is sorted first by category (the column Category) and then by name (the column **Variable name**). Dialog box of local variables keeps the last sorting when it is reopened.
When a conflict occurs (see the chapter Inserting graphic objects from clipboard into picture), the list is sorted only by name.
Clicking on the header of some columns classifies the list downwards, next clicking classifies it upwards.
When the local variable is edited from the Connect object palette, tab **Script**, the appropriate row in the dialog window of local variables is highlighted by color (gray color).