OrangeApps

ObjectBrowser V1.1

KUKA KRC4

User documentation

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The contents of this document have been tested with the described software. Since deviations cannot be excluded, no guarantee for full compliance can be taken.

History of document versions

Version	Date	Author	Change Reason / Comment
1.0	20.03.2013	Christian Mayer	First position
1.1	04/20/2013	Christian Mayer	Runtime variables
1.2	05/13/2013	Christian Mayer	User-defined lists
1.3	05/28/2013	Christian Mayer	Scope of Variables

Content

1 Introduction

1.1 Target group

This documentation is intended for users with the following skills:

- Knowledge of robot programming
- Knowledge in the robot programming language KRL

1.2 Representation of information

These notes indicate that death or severe personal injury will be safe or very likely to occur if precautions are not taken.

These notes indicate that death or serious bodily injury could occur if precautions are not taken.

These notes indicate that minor personal injury can result if precautions are not taken.

These notes indicate that damage may occur if precautions are not taken.

This manual contains useful tips or special information for the current topic.

1.3 Terminology used

Notion	Description
SmartPad	Handheld unit
SmartHmi	User interface of the robot software
KRL	KUKA Robot Language

Table 1-1 terms used

2 Product Description

The ObjectBrowser software tool provides an interface for easy viewing and changing of all known on the control variables.

Key Features

- Intuitive use of the software by scrolling list
- Displayed as an integrated window in SmartHmi

Key Features

- Display and modification of KRL variable values in real time
- Breakdown of the list by:
  - Variable Name
  - Data Type
  - Modules
  - Currently selected module
  - Favorites
  - Runtime variables
  - Lists
  - Search function to quickly find variables
  - Favorites List
- Display and modification of run-time variables of the currently selected routine
- Import / export of user-definable variable lists
- Copying and pasting variable values of mutually compatible data types via the context menu
- Representation of the scope of variables (global or local)
- Language English and German

3 Installation

The installation is done via the *additional software* option. These can be found in the main menu under *start-up*.

3.1 System requirements for running

Minimum Hardware Requirements

- KUKA System Software 8.2

3.2 Install ObjectBrowser or upgrade to new version

Requirement

- User group Expert

For installation on the three systems, Real Robot, Office Lite and Office PC follow these steps:

Method

1. Extract the .Zip file
2. Copy the installation folder ***OrangeApps.ObjectBrowser*** containing the setup files to a USB stick or directly to a drive on the target system (for example, d: \).
3. If you are already in possession of a valid license file, copy it to the files in the installation folder. The license file is automatically detected and installed during setup. Alternatively, you can manually install the license file after installation.
4. When installing from a USB stick, connect this to the controlling PC or the SmartPad.
5. Choose ***commissioning → Additional software*** from the main menu.
6. Click the button ***New software***.
7. You'll get a list of available software for installation. If there's no entry ***OrangeApps.ObjectBrowser*** in the list, click ***Refresh***. If now the entry appears, go to step 10
8. If the entry does not appear, the drive from where to install must be configured first. To do this, choose ***Configuration***. In the new window you now have the option to select the path where to find the folder ***OrangeApps.ObjectBrowser.***
9. Select an empty cell in the ***installation paths for options*** and click ***path selection***. The available drives are displayed. Select the drive on which the folder ***OrangeApps.ObjectBrowser*** is located and save your selection with. The window closes. ***OrangeApps.ObjectBrowser*** should now appear as an entry in the list. If this is not the case, press ***refresh*** and/or repeat steps 7 to 8
10. Highlight the entry ***OrangeApps.ObjectBrowser*** and press ***Install***. Confirm the security prompt with ***Yes***.
11. Read the license agreement carefully. Explain your agreement to the license terms by clicking ***I Accept*** and continue the installation by clicking ***Continue***. If you do not agree with the license terms, please cancel the installation by clicking ***Cancel***.
12. The installation will be prepared now. To perform the final installation the control PC has to be restarted. This can immediately be executed by clicking ***Reboot Control PC now*** or later by clicking ***later***.
13. If you select ***later***, the window is closed. In order finalize the installation proceed with step 14. If you select ***Reboot Control PC now***, a restart of the control PC will be performed. Step 15 is then executed.
14. Perform a shutdown of the control PC by clicking ***shutdown*** in the main menu.

15. During reboot of the control PC ObjectBrowser will be installed on the computer.
16. Remove the USB stick from the PC.

3.3 Uninstall ObjectBrowser

Requirement

- User group Expert

Method

17. Choose ***commissioning→ Additional software*** from the main menu.
18. Highlight the ***OrangeApps.ObjectBrowser*** and click ***Uninstall***. Answer the security prompt with ***Yes***. The uninstallation is prepared. After completion of the preparatory work, a message box appears. To perform the final installation the control PC has to be restarted. To perform the final installation the control PC has to be restarted. This can immediately be executed by clicking ***Reboot Control PC now*** or later by clicking ***later.***
19. If you select ***later***, the window is closed. In order finalize the uninstallation proceed with step 4. If you select ***Reboot Control PC now***, a restart of the control PC will be performed. Step 5 is then executed.
20. Perform a shutdown of the control PC by clicking ***shutdown*** in the main menu.
21. During reboot of the control PC ObjectBrowser will be uninstalled from the computer.

4 Licensing

ObjectBrowser is subject to licensing. Licensing is done by a license file or a USB dongle. Visit our website www.orangeapps.de for more information on licensing.

Reference

- A license for each robot, office computer or Office Lite is required.
- Trial licenses can be obtained once for each evaluation system.
- Trial licenses are free of charge and limited in time.
- Date manipulations of the system are detected, ObjectBrowser automatically disables the License

4.1 Generate license number

Trial licenses can be obtained directly at www.orangeapps.de. Runtime licenses are given after receipt of the license fee.

4.1.1 Robot License

To obtain a valid license, you will need the serial number of the robot. These can be found on the rating plate of the robot or in the control software in the Help menu → ***Info*** → ***Robot*** → ***Serial number.***

4.1.2 License office computer / OfficeLite

After installing and starting the software, a product ID is displayed. These ID you will need to obtain a valid license.

4.2 Installing a License

4.2.1 ObjectBrowser is not installed yet

Copy before the installation of ***ObjectBrowser*** the license file into the installation folder as below 3.2 described.

4.2.2 ObjectBrowser is already installed

Method 1

- Plug in a USB stick containing the license file to a USB port of the controller or SmartPad.
- Alternatively, copy the license file to the d: drive control
- At startup of the software the license will be copied automatically into the license folder and then enabled. Note: A run-time license in the license folder is not overwritten by a trial license
- Remove the USB stick

Method 2

- Copy the obtained license in the folder c:\KRC\TP\ObjectBrowser\Lic

5 User interface

5.1 Controls

The user interface of the ObjectBrowser contains the following elements:

22. Button bar
23. Scroll list view the main view
24. Close button
25. Scroll list with the variable view
26. Bar for fast scrolling
27. Toolbar Favorites

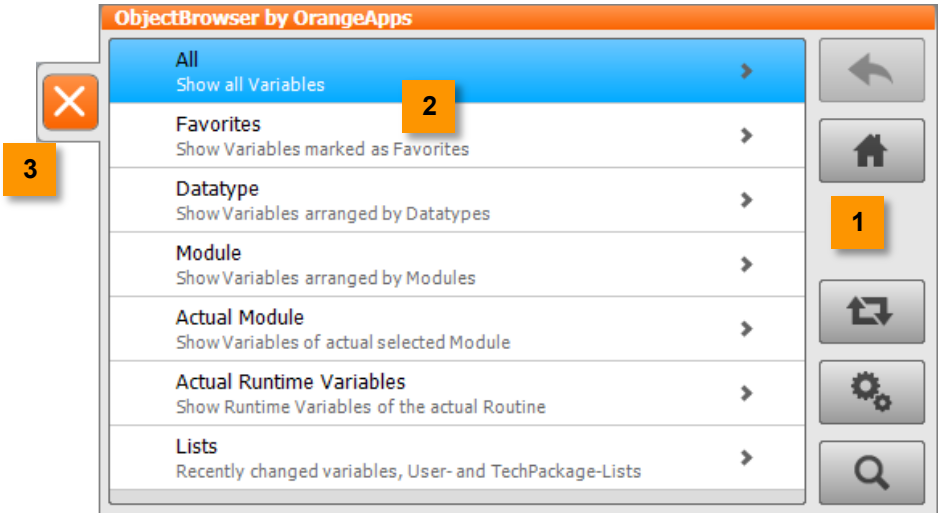


Figure 5-1: Scroll list with main view

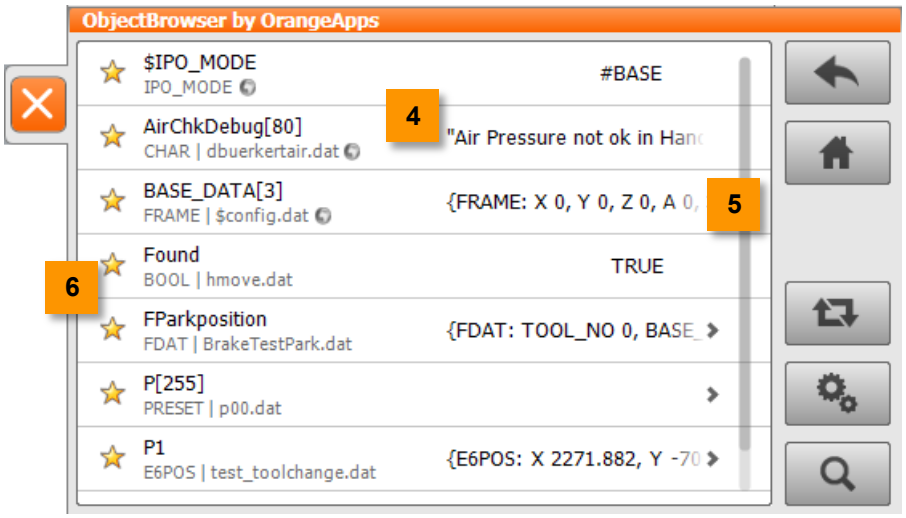


Figure 5-2: Scrolling list with variable view

5.2 Symbols

Icon	Description
	Variable does not appear in the favorites list
	Variable appears in the favorites list
	List entry can be further resolved
	Variable globally available

5.3 Buttons

Back

Button	Description
	Enabled, change to higher-level list possible
	Disabled, main view reached

Home

Button	Description
	Changes the scrolling list to main view

Update

Button	Description
	Cyclic display of variable values turned off
	Cyclic display of variable values turned on

Configuration

Button	Description
	Shows the configuration page

Search

Button	Description
	Displays a text field to enter a text for a filter function of the currently displayed

6 Using the ObjectBrowser

6.1 Open the ObjectBrowser

Method

28. The ObjectBrowser is started from the main menu under ***Anzeige → ObjectBrowser***

6.2 Close the ObjectBrowser

Method

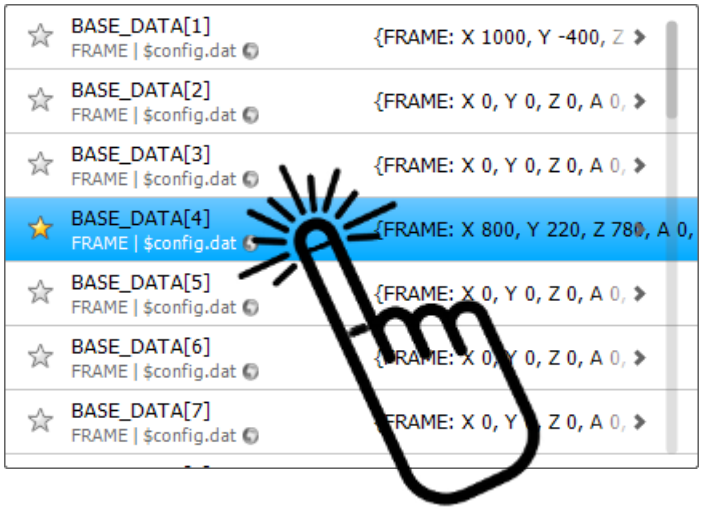
29. The ObjectBrowser is closed by clicking on the Close button 

6.3 Basic principles of operation

Interacting with the illustrated lists is done by tapping on list items and swipe across the screen.

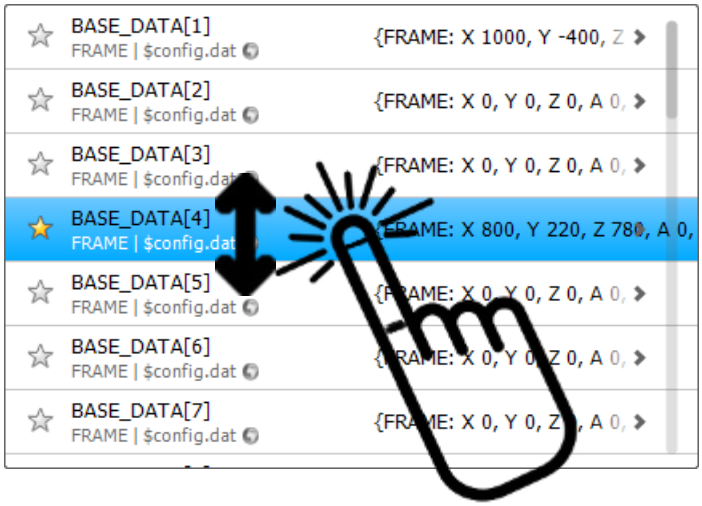
Opening a list item

Tap a list item



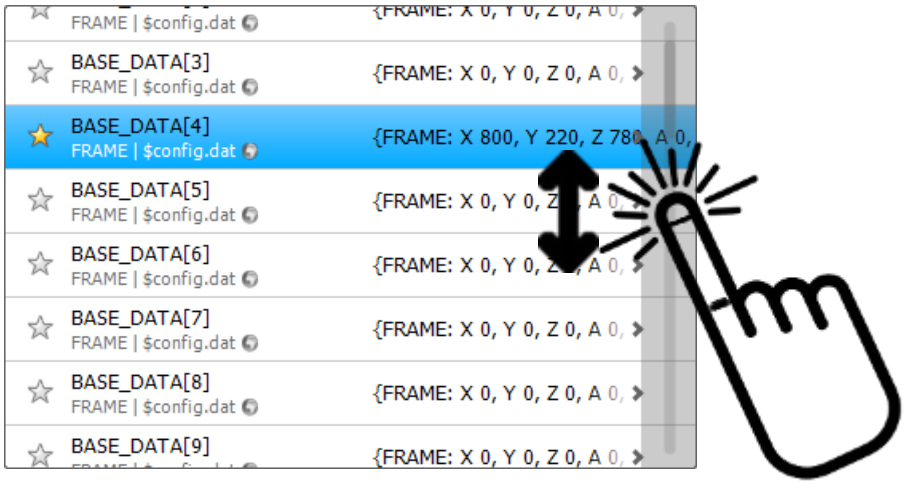
Scroll down the list

Tap the scrolling list and move the finger or the input device up and down to scroll.



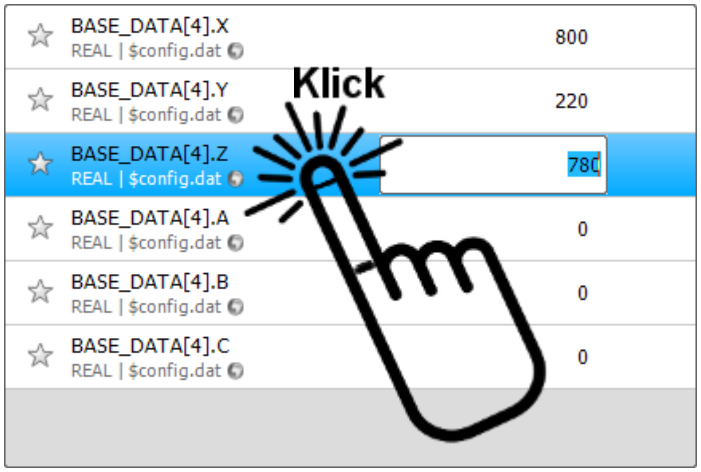
Fast Scroll in the list

Touch the scroll bar and move your finger or the input device up and down to scroll quickly.



Select a list entry to dissolve or to change the variable value

Click on a list entry. Depending on the type of variable the appropriate input box appears.

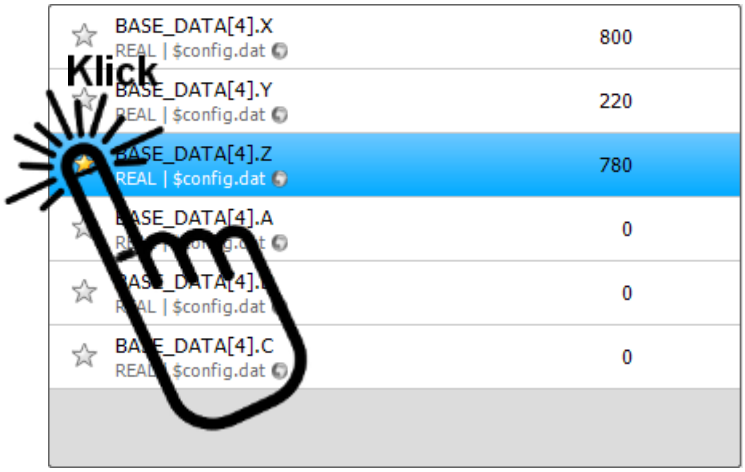


The on-screen keyboard opens when you click in the input field.

To close the input field without changing the value, click on either the listing or press the ESC key on the keyboard.

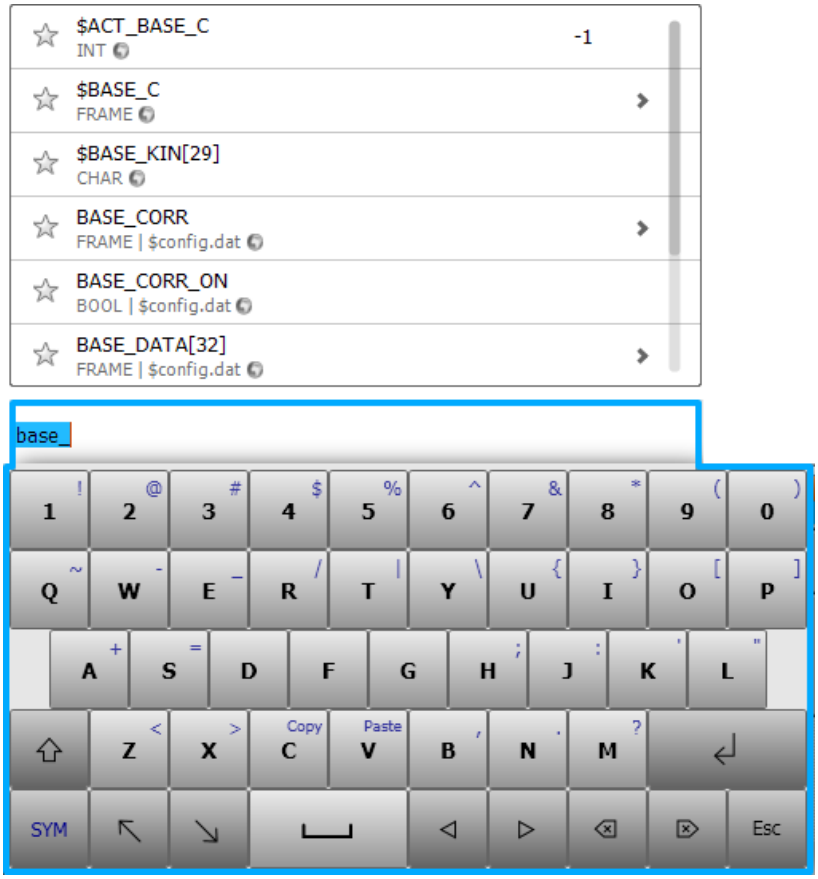
Mark favorites

Click the Favorites icon to mark variables as favorite



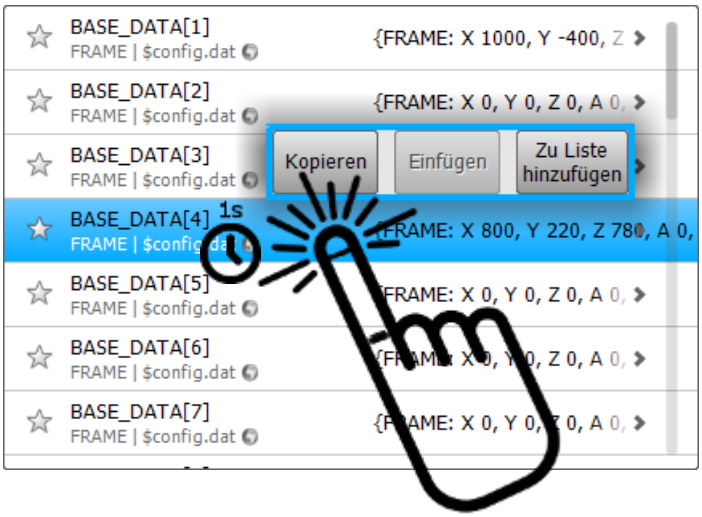
Search variables

Based on the input of the search text simultaneously the displayed list is filtered.



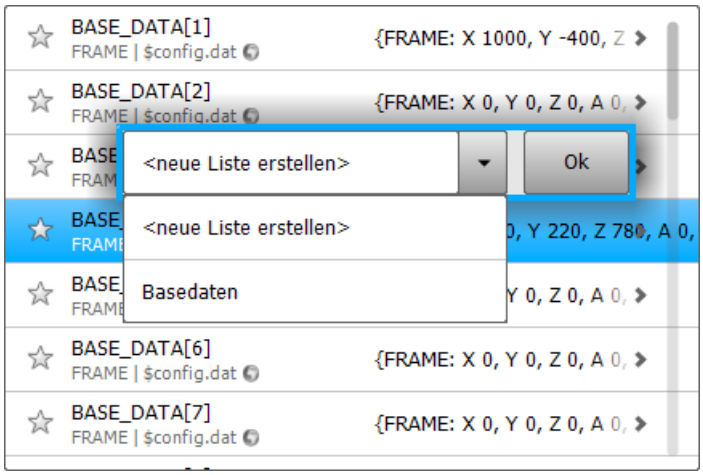
Copy entries

Elements of the list can be copied. Click 1sec on an entry to open the associated context menu.



Creating lists

Each element can be added to a new or existing list. Click 1sec on an entry to open the associated context menu. After selecting the ***Add to List*** button the selected object can be assigned to an existing or a new list.



6.4 Display of the variables

Regardless of the type of a variable they will be presented in a clear structured list.

If the variable is an array or the data type of a variable is a structure, by clicking on the list entry branching into the array or structure elements will be executed. Branching can be executed as long as each item is resolved to a simple data type.

Simple data types: BOOL, INT, REAL, CHAR, SIGNAL, ENUM

The arrow symbol indicates whether a list entry can be resolved.

This is shown:

30. Variable Name
31. Data Type
32. The declaration location of the variable
33. Value of the variable
34. Arrow icon (appears when the variable can be resolved)
35. Favorites icon to display the variable in the favorites list
36. Globe identifies if a variable is globally available

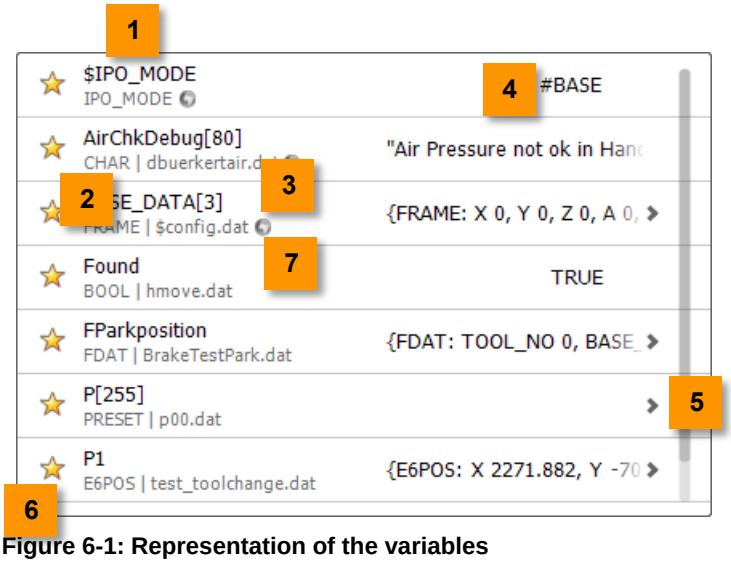


Figure 6-1: Representation of the variables

The selected entry is shown in blue.

6.5 Update the displayed variable values

An update of the values is always performed only for the currently visible tags. This is done only once,

37. Once a list has been rebuilt
38. After scrolling a list

Using the **Refresh** Button, a cyclic update of the values of the visible variables are a switched on and off. If this option is active, there is a constant update of the variable values.

> Concerns the cyclic update variables that are declared in the program window currently displayed program, using the functions change, commands, movement and block selection is not possible.

6.6 Grouping of variables

The launch window is displays the so called “top-level list”. The items display the different grouping types. By clicking the items in the list branching into the child list will be executed.

Representation

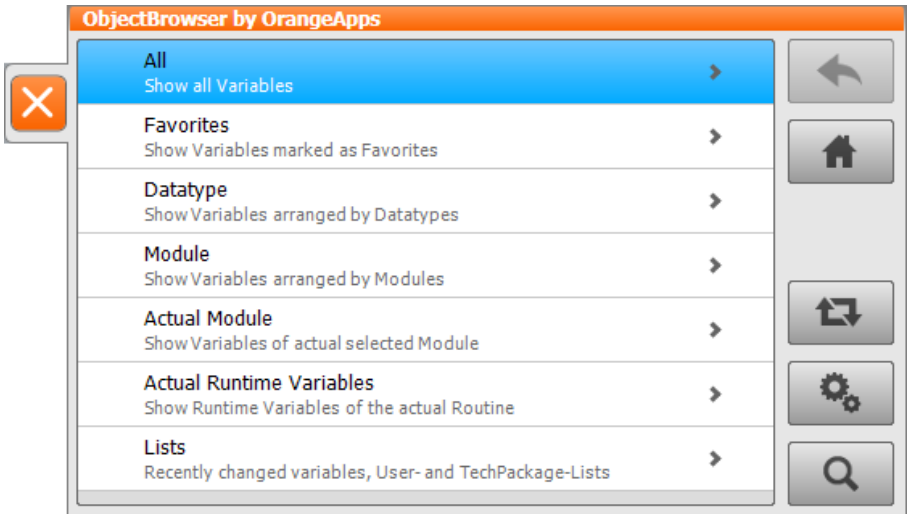


Figure 6-2: Selectable groups

Groups

Grouping	Description
All	shows a list with all defined variables. The display of system variables can be turned on and off in the configuration menu
Favorites	Displays a list of all defined favorites
Datatype	shows variables sorted by data type
Module	shows variables sorted by module
Actual module	shows all variable of the currently selected module

Actual runtime variables	Displays the run-time variables of the routine in which the program pointer is located (routine must be visible)
Lists	Displays variables of different lists

Table 6-1: Selectable groups in the main list

6.7 Changing the values of variables

Requirement

- User group Expert or approval of the user group operator by an expert in the configuration menu

Features

- The displayed input field depends on the data type
- The entries shown in the entry box depend on the data type of the variable
- The displayed on-screen keyboard depends on the data type of the variable

Open the entry to edit

Tap a list item to open the item for editing.

Use the entered value

By tapping **Return** the input box is closed and the entered value is set.

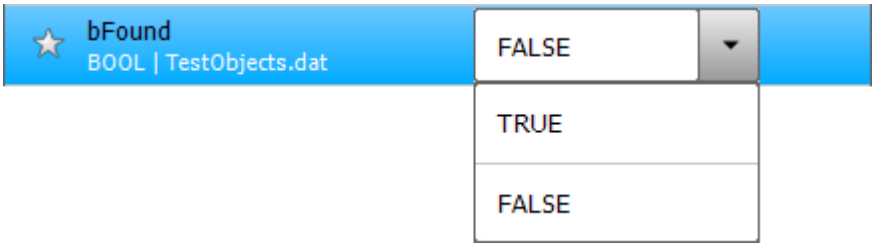
Discard the value entered

With the **ESC** key or tap on the list item, the box is closed without setting the value.

Error Messages

If it is not possible to set the value the error message "**Value could not be set**" will be displayed. Possible causes are read-only variables or incompatible data types (see Chapter Messages).

Displaying fields

Data Type	Display
INT, REAL	
BOOL	
CHAR	

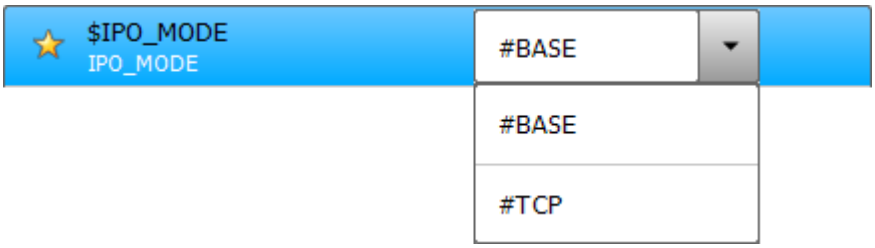
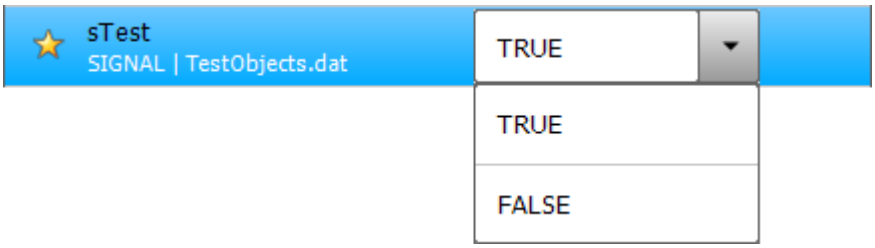
ENUM	 Note: Only the available items are displayed
SIGNAL	

Table 6-2: Input fields for changing variables

6.8 Copy and paste the values of variables

Requirement

- User group Expert or approval of the user group operator by an expert in the configuration menu

Features

- Variables with either simple data types or complex structures can be copied
- Copy and paste via the context menu

Open the context menu for copying

Tap about 1sec on the to be copied list entry.

Copy value

With the **Copy** button in the context menu the variable content is copied.

Add value

Tap about 1sec on the target variable. With the key **Paste** in the context menu the content of the copied variable is pasted into the destination variable.

Close context menu

The context menu closes automatically when idle for a few seconds. Alternatively, you can close it by tapping on a list entry.

Error Messages

If unable to insert the value the error message " **Value could not be set** " appears. Possible causes are read-only variables or incompatible data types (see Chapter Messages).

6.9 View and edit runtime variables

Requirement to modify the run-time variables

- User group Expert or approval of the user group operator by an expert in the configuration menu

Due to the internal behavior of the robot system following features in the representation and modification of run-time variables occur.

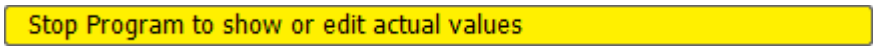
Characteristics:

- Always displayed are those runtime variables of the routine in which the program pointer is located **AND** which is currently displayed in the program window
- →Runtime variables of non-visible routines are not displayed
- Variable values are updated in the list and can be processed as soon as the program interpreter the obtains the state "STOP" (e.g., by pressing the stop button on the SmartPad or through a "stop" command in the program)
- If the program pointer reaches the end of the program, runtime variables get invalid and their value no longer appears in the list

Hint

- Runtime variables are valid only within the routine in which they are declared

As long as runtime variables neither can be updated nor be processed, the following message is displayed in the list:



6.10 Create lists and add items

Requirement

- User group Expert or approval of the user group operator by an expert in the configuration menu

Features

- Variables containing simple data types or complex structures can be added into lists
- Lists are created via the context menu or a text editor

Open the context menu for creating or inserting elements in lists

Tap about 1sec on the list entry to be inserted into a list.

Insert element into a list

39. Mark the element and open the context menu
40. Tap on **add to list** in the context menu.
41. Select the desired list from drop-down box or choose **Create new list**
42. Select **OK** key

Remove item from a list

43. Open the List
44. Mark the element and open the context menu

45. Tap **Remove from list** in the context menu.

Remove complete list

46. Open the entry **lists** in the main menu
47. Mark list and open the context menu
48. Tap **Remove List** in the context menu.

Note:

All lists are in the directory C:\KRC\USER as an XML file. When you click on the entry **lists** in the main screen all existing lists in this directory are loaded. Lists can thus be easily created and edited using a text editor.

6.11 Configuration Menu

The configuration menu allows customization of the display.

Exit the menu by pressing OK, the current state is accepted and the main page is displayed.

Requirement

- User group Expert

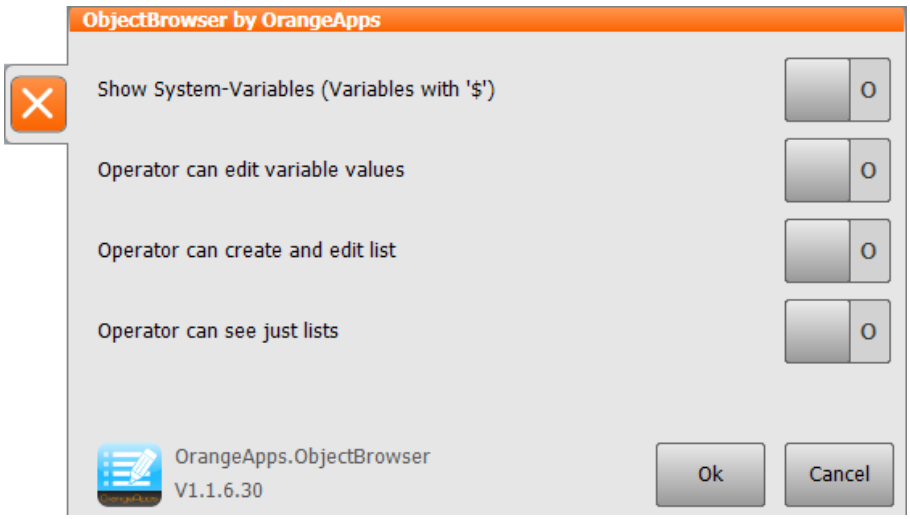


Figure 6-3: Configuration Menu

Available Options

Option	Description
Show System Variables	Toggle display of system variables
Operator can edit variable values	If this option is enabled, the user group "operator" can change variable values
User can create and edit lists	If this option is enabled, the user group "operator" can create and modify lists
Operator can see judt lists	If this option is activated, the main window is the user group "operator" only the entry "list" to choose from

7 Messages

The following messages can be displayed in the message window

Notification	Description	Error type	Error number
No license for robot {serial number} available	The license file to operate the software in a production environment for these robot serial number is missing	Status	101
License for robot {serial number} is invalid or expired	The license to operate the software in a production environment for these robot serial number is expired or invalid	Status	102
x days left until license runs out	x (= number) days remaining until the ObjectBrowser cannot be used any more	Info	103
You need at least expert rights in order to change values	Changing the values of variables is only possible for the user group expert or higher or for group operator when activated by the user group expert	Info	4
Value could not be set	Changing the variable's value could not be carried out. Possible causes: ▪ Variable is read-only ▪ Entered value is of the wrong data type ▪ An attempt was made to copy variables with incompatible data types	Info	1

Table 7-1 Messages

8 Appendix

8.1 List of Figures

8.2 List of Tables