invensys
Eurotherm

iTools
Help manual

iTools configuration and monitoring software
Version 7 and later

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iTools Help manual

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1. INTRODUCTION

These help pages apply to iTools version 7.00.

Please note that not all facilities are available to each product supported by iTools. Where a feature is not available to a product (Graphical Wiring for example), then the toolbar icon, or menu item does not appear.

1.1. CONVENTIONS

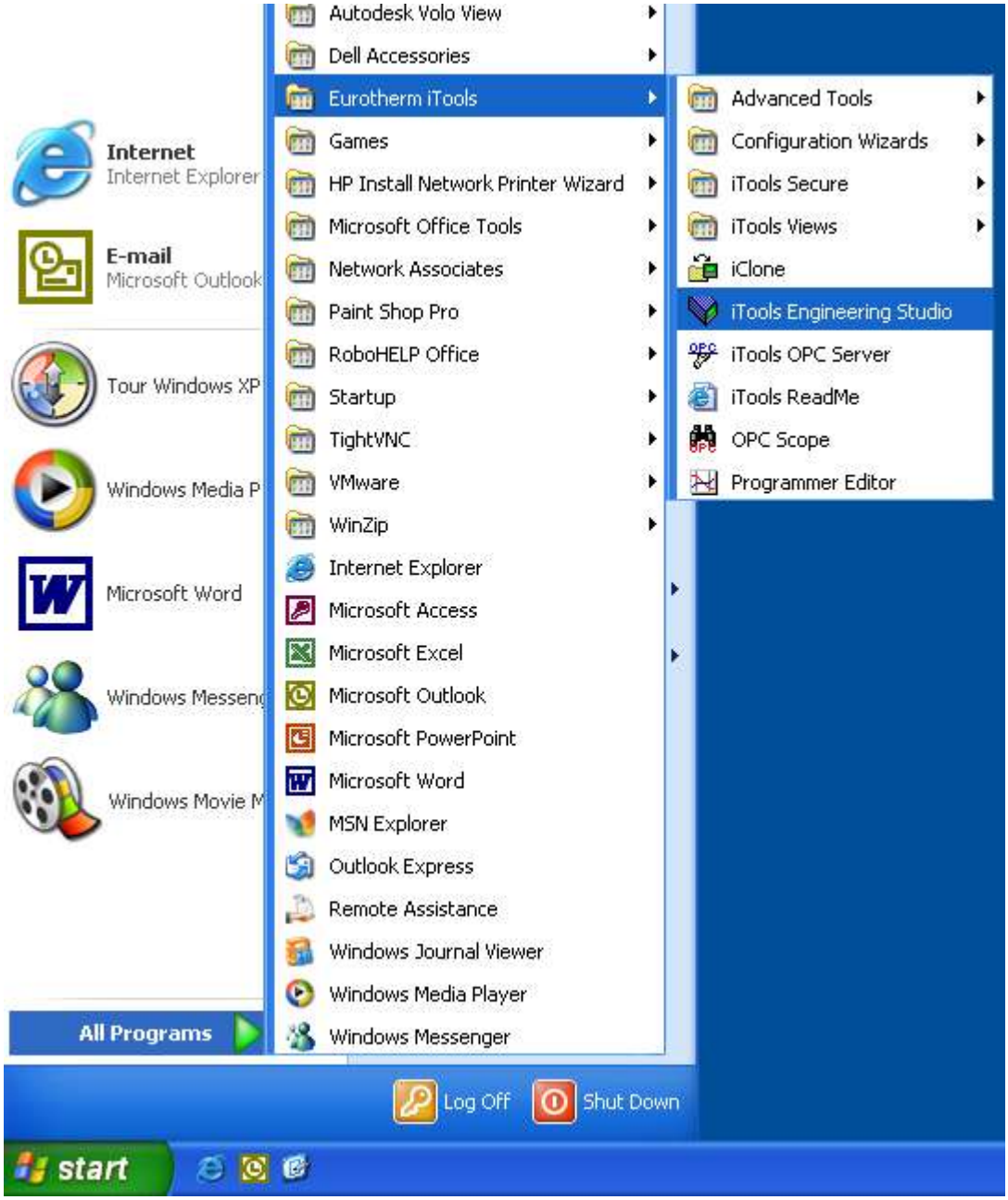
When instructions are given to use a keyboard key, the key name is displayed thus: <Insert>. The keys' names may vary from keyboard to keyboard, in particular <Insert> may appear as <Ins>, and <Delete> may appear as <Del>.

2. RUNNING ITOOLS

2.1. LAUNCHING THE APPLICATION

iTools may be launched in any of the following ways:

1. By starting the iTools application itself. The setup program creates a program group called 'Eurotherm iTools', containing an 'iTools' icon. Selecting this icon launches the application.



2. By opening an instrument clone file directly from the Windows Explorer or Shell. A Clone file may be recognised by its filename extension (.UIC) or by its icon.

or

3. By opening a view of a connected on-line device from the Eurotherm network explorer (supplied as a part of Eurotherm Suite). Each device attached to a Modbus port in the Eurotherm Network explorer presents an 'Open in iTools' command on its file and context menus.

See also Command-line options

2.2. LOADING DEVICES INTO ITOOLS

Note: For certain instruments, a 'Wizard' appears when a 'new' instrument is loaded. These wizards allow device configuration from a sequence of set-up pages. See 'Wizards' for more details.'

Devices can be loaded into iTools in the following ways:

1. By clicking on the Scan icon

in the toolbar, or
by selecting 'Enable background scan' in the Device menu, or
by using the shortcut <Ctrl> + <Alt> +<S>

2. By clicking on the 'Add' icon

in the toolbar, or
by selecting 'Add...' in the Device Menu, or
by using the shortcut <Alt> + <Insert>, or
by right clicking in the Panel views window at the bottom of the iTools window,
then selecting 'Add Devices...'
Use of the 'Add' feature displays a dialogue box showing all the devices known to the Modbus server.
See the Options menu description for more details (Options/Advanced/Show server).
3. By opening a view of a real or clone device in the Eurotherm network explorer.
The same copy of iTools can be used to open all device views.
4. By dragging a device icon out of the Eurotherm Network explorer and
dropping it into the iTools window.

2.2.1. Clone devices

Clone devices can be used to set up a configuration for a particular device type, and then download this configuration to a real device. It is also possible to read the configuration from a real instrument and transfer it into a clone device for editing.
On the screen, clones for devices which incorporate digital displays, can be distinguished from 'real' instruments by the colour of the digital display - yellow for real instruments and white for clone instruments.
Clones for devices without digital displays are 'filled' grey, whereas real devices are 'filled' green.
See 'Loading Clone Devices' for more details.

2.3. LOADING CLONE DEVICES

Clone files may be 'opened' in the following ways:

1. For new files, by clicking on the 'New File' icon in the toolbar

or,
by selecting 'New Clone File...' in the File menu, or,
by right clicking in the Panel views window at the bottom of the iTools window
then selecting 'New Clone File...'

2. For existing files, by clicking on the 'Open File' icon in the toolbar

or,
by selecting 'Open Clone File' in the File menu or,
by double clicking on a clone file from Windows explorer or shell or,
by dragging a file out of explorer and dropping it into the iTools window or,
by right clicking in the Panel views window at the bottom of the iTools window,
then selecting 'Open Clone File...'.

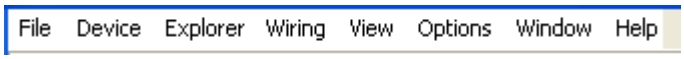
2.4. NAVIGATION

iTools functionality can be accessed by various means, as follows:

2.4.1. Menu Bar

The iTools Main menu contains a number of items, fully described elsewhere in this document. (See 'The menus'). The contents of the menu bar varies according to device type. The illustration below is a composite - not all device types will display all the menu items shown.

The content of the menu bar items themselves also depends on device type.



2.4.2. Main Toolbar

This toolbar features the functionality of the File and Device menus. See 'The Toolbars' for more information.

2.4.3. Views Toolbar

Located below the main toolbar, this features buttons relevant to the currently selected device type. The toolbar contents can therefore change according to device type. The displayed view options mimic the entries in the 'Views' menu. See 'The Toolbars' for more information.

As well as launching an instance of the selected view, these buttons also provide a convenient means of bringing a particular view to the front.

2.4.4. Right Mouse Button

Clicking on the right mouse button, causes a pop-up menu to appear. This menu is relevant to the location of the tip of the cursor at the time the button is clicked (i.e. it is context sensitive). These menus are therefore sometimes called 'context menus'.

2.5. USING THE APPLICATION

iTools uses a 'device workspace' architecture which allows the user to open views on multiple devices, but normally,only views associated with the currently selected device are visible.

Note: A device view can be made permanently visible by clicking on the panel-pin icon at the top right of the view. When 'pinned', the pin changes shape, and has a red background when a different device is selected as the current device.

Pinout icon = ; Pinned icon =

There are two device selection windows docked to the main iTools frame: Panel Views and Device Browser, as described below.

Double clicking on a device name or faceplate launches the default view for that device. This may be the 'Parameter explorer' or the 'Graphical wiring editor' according to device type.

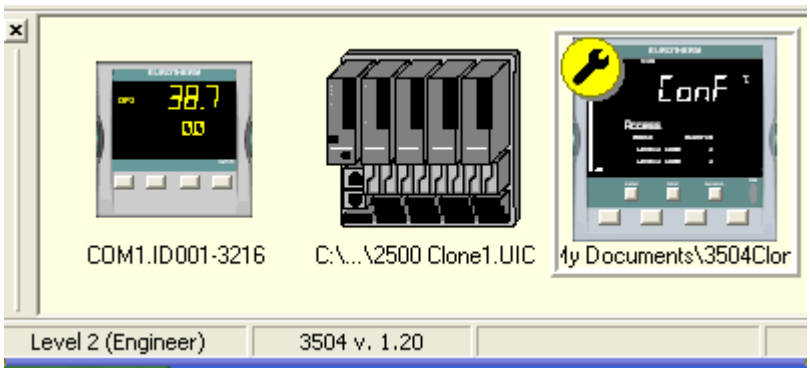
2.5.1. Panel Views

This view, which as a default, resides at the bottom of the frame, shows the 'faceplates' of the currently loaded devices. The panel views window can be shown or hidden by selecting/deselecting 'Panel Views' in the View menu. The panel views frame can be set either at the top or the bottom of the frame using the 'Panel Views Position' item of the Options menu.

The currently selected instrument is highlighted by means of a grey box surrounding the faceplate. Devices which are in configuration mode display a 'spanner' symbol; devices which have a communications failure for any reason display a white cross with a red background.

Configuration symbol

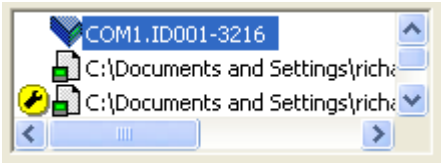
Comms Fail symbol



2.5.2. Device Browser

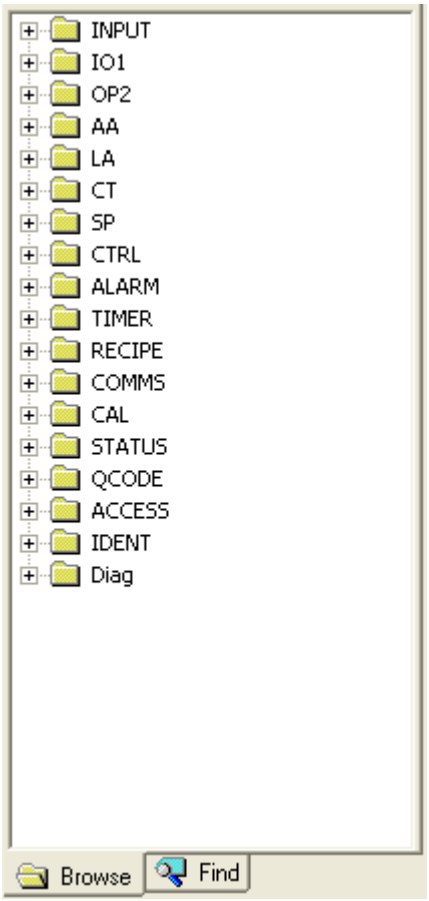
This view, near the top left of the frame, displays a list of currently loaded devices. The OPC parameters associated with the currently selected device are displayed in a separate pane directly below the device browser. Each item in the device browser gives communications information for real instruments, or the file location (if any) for clone devices. Configuration and comms failure symbols, as described above, appear to the left of the device symbol, if appropriate.

The currently selected device is highlighted.

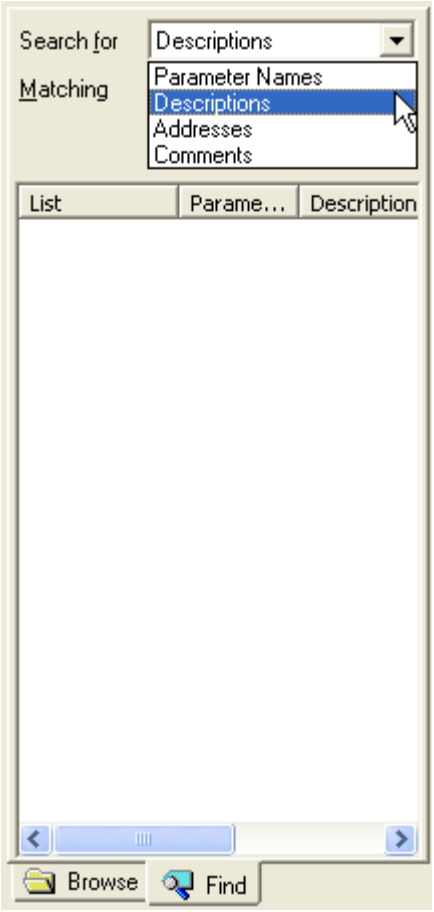


Device Browser

The Find tab at the bottom of the OPC parameter browser window allows the user to search for parameters by name, description,Address or Comment. The user types in the required item in a field directly below the 'Matching' window (hidden by the drop-down menu in the figure below).



OPC Parameter Browse tab



OPC Parameter Find Tab

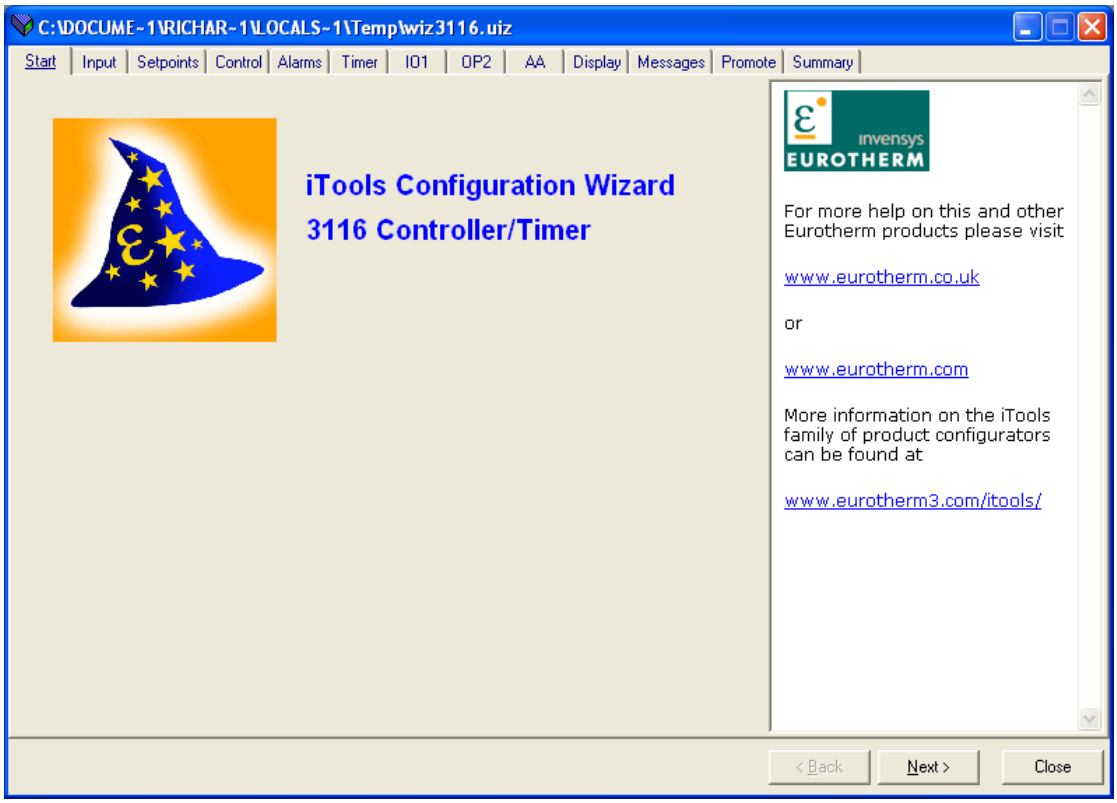
Double clicking on a parameter in the OPC Parameter find tab window launches a Parameter Explorer view for that parameter.

2.6. WIZARDS

When certain devices are loaded into iTools, either as clones or as real devices, a configuration wizard appears.

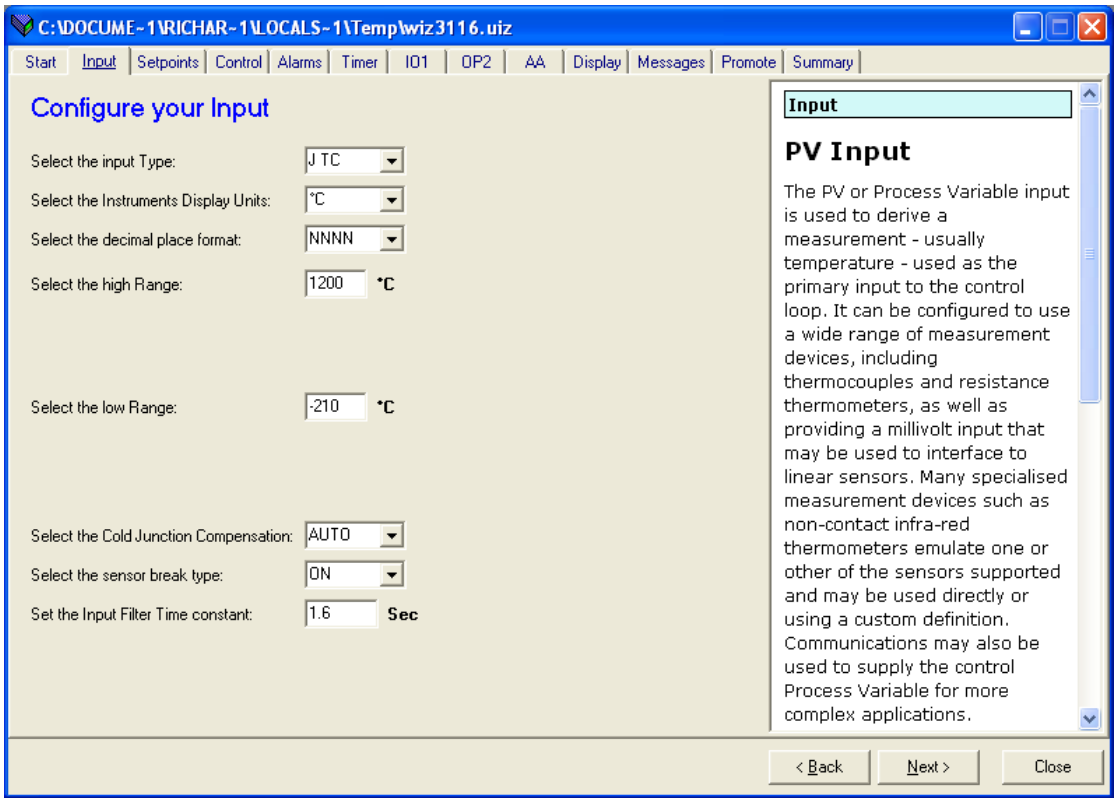
Note: It is possible to disable this function for Clone files, by 'unchecking' the 'Run Wizard for New Clone File' item in the Options menu.

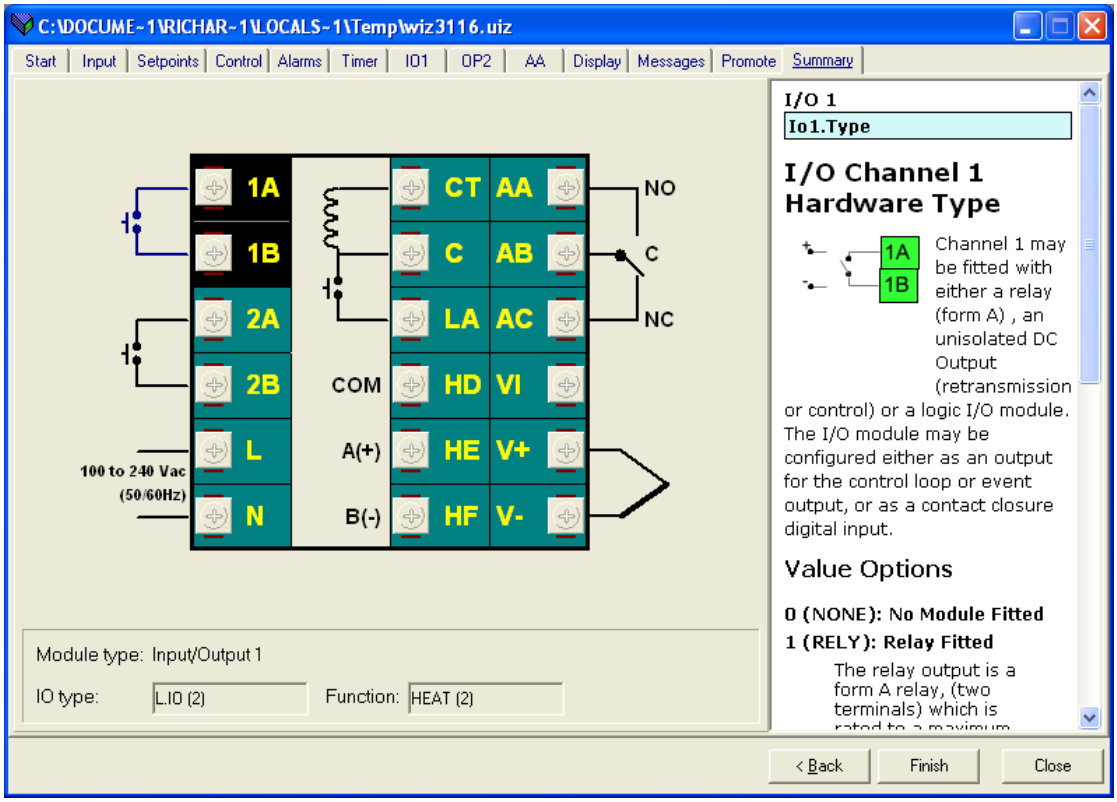
These wizards allow the user to set-up the device's parameters, using a number of configuration pages. Clicking on the 'Next' key, calls the start page:



2.6 WIZARDS (Cont.)

As can be seen, there are a number of tabs near the top of the screen, each one representing a specific area of instrument configuration. These can either be clicked-on directly, or they can be accessed, in sequence, by use of the 'Next >' key. Once started, the '< Back' key can be used to go back through the sequence one step at a time.
It is not the intention of these pages to describe how to configure an instrument; the 'Input' and 'Summary' pages for the above wizard are given below to show the style of presentation. As will be seen, the right hand portion of each window is given over to parameter help.





2.6 WIZARDS (Cont.)

Once all the required configuration items have been set up, clicking on the 'Finish' key allows the user to save the configuration to a clone file, and then to send this clone file to an instrument if required.

3. PARAMETER EXPLORER

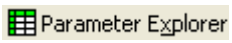
3.1. THE PARAMETER EXPLORER WINDOW

The parameter explorer window is, for most instruments*, the default iTools window. The window shows the parameters associated with the current iTools browse list.

*Note: For some instruments, the default window is the Graphical Wiring Editor

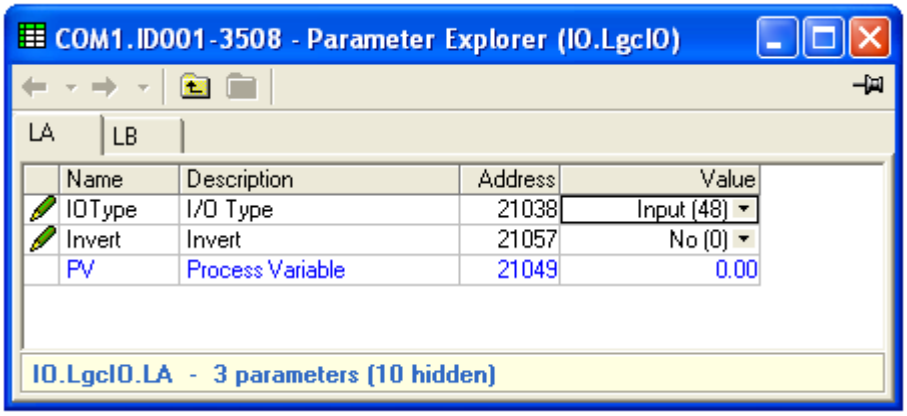
Providing that the first instance is not maximised, multiple window instances, showing different lists, may be created by double-clicking on the iTools browse tree. Only the active instance is updated.

The window (example shown below) is opened:

1. by double-clicking on the device faceplate (but see note above),
2. by clicking on the Parameter Explorer button in the Views Toolbar 

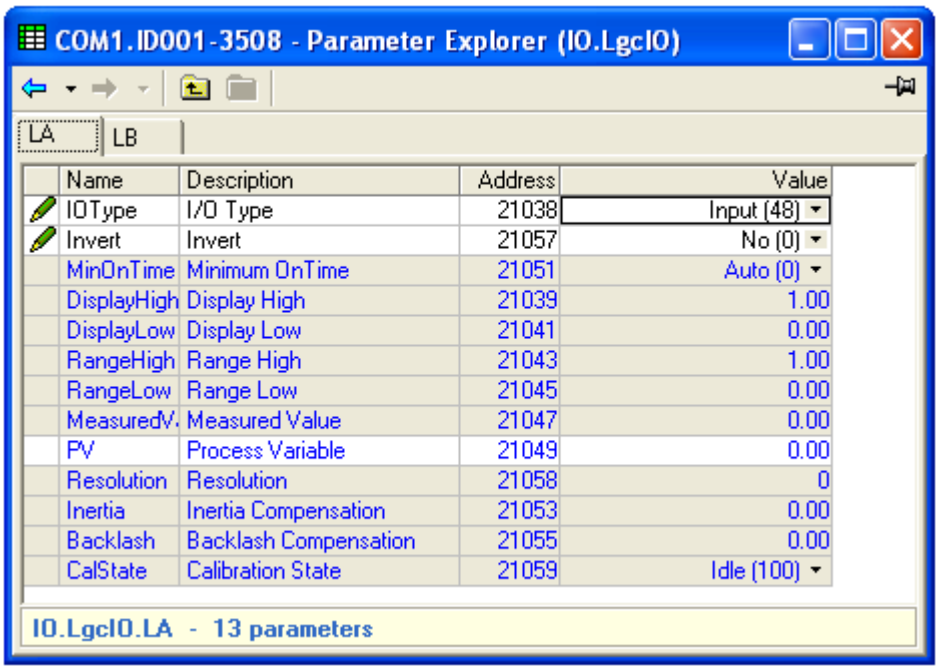
3. by clicking on a folder or subfolder in the parameter browse window
4. by using the shortcut <Alt> + <X>.

The window opens, showing the parameters associated with the selected folder in the parameter browse window. Where there are sub-folders, these appear as tabs (e.g. LA and LB in the figure below). The status bar at the bottom of the window shows the full path of the list, together with the number of parameters.



The figure above shows the three parameters which are considered relevant out of the 13 available. 'Hidden' parameters can be displayed by de-selecting 'Hide Parameters and Lists when Not Relevant' in the 'Parameter Availability settings...' item in the Options Menu.

3.1 THE PARAMETER EXPLORER WINDOW (Cont.)



Parameters in blue text are non-editable (Read Only).
Items in black text (with the 'pencil' symbol) are editable (Read/Write)
Parameters with a coloured background are hidden, when 'Hide Parameters and Lists when not relevant' in the 'Parameter Availability settings...' item in the Options Menu is selected (default = hidden)

3.1.1. Columns

The figures above show the default display, showing read/write status, name, description, address and value columns. For some instruments, a further column ('Wired From') also appears. The Explorer menu 'Columns' item allows the user to define which default and non-default columns are to be displayed.

3.1.2. Parameter Explorer tools

Note: Not all of these tools are available for use all of the time.

Back To: List name. See 'Historical Navigation' for more details

Forward to: List name. See 'Historical Navigation' for more details

Up one level. Displays the 'parent' of the currently displayed list. See 'Vertical Navigation' for more details.

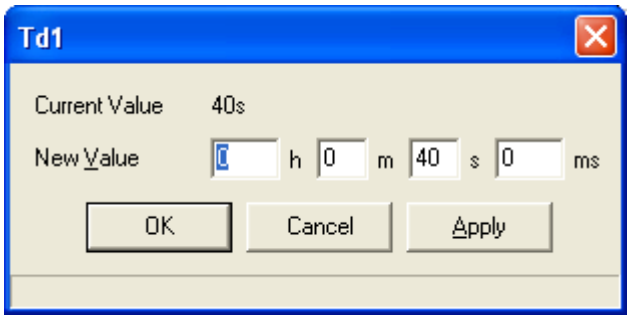
Down one level. Causes a sublist (if any) of the current display to appear. See 'Vertical Navigation' for more details.

Push pin... Clicking on this icon causes the current display to become permanent. I.E it is still viewable when another device is the current device. See 'Using the application' for more details.

3.1.3. Editing Parameter Values

Writable parameters have their values changed by clicking anywhere in the parameter's row, and either typing a value in, or making a selection from a pull-down menu. The existence of a pull-down (combo) menu is indicated by a black downward pointing arrow head. Clicking on this arrow head produces a list of items which may be selected.

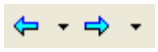
A number of 'Value cells' have an 'ellipsis' button ... associated with them. Clicking on this button causes a dialogue box to be launched which allows time values to be edited.



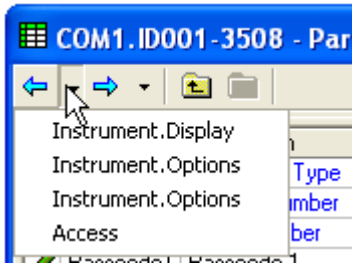
3.2. EXPLORER BROWSING AND NAVIGATION

By default, the browse list displayed in the window is continuously synchronized with the user's browsing activity in the iTools browse panel tree. This synchronization occurs even when the Parameter Explorer is obscured by other iTools editors. If multiple Parameter Explorers are open, only the active instance is controlled by the browse tree.

3.2.1. Historical navigation

 (Shortcuts <Ctrl> + <B>, and <Ctrl> + <F> respectively)

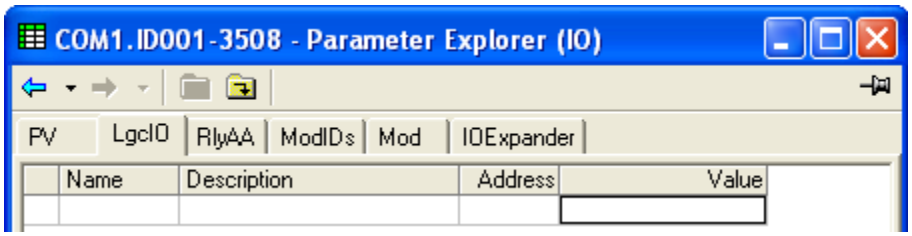
The parameter explorer maintains a history buffer of up to 10 lists that have previously been browsed in the current instance of the window. The 'Back to: List name' and 'Forward to: List name' buttons allow easy retracing or repeating of the sequence of list selections. Hovering the cursor over either key (if active) causes the name to be displayed, of the list which will appear if the key is clicked. Clicking on the black down arrow causes a drop down pick list to appear, which shows the last (up to 10) parameter lists visited in the relevant direction. The user can then select the required list to go to.



3.2.2. Vertical navigation

(Shortcuts <Ctrl> + <U>, and <Ctrl> + <D> respectively)

The up/down pushbuttons are used to browse the address spaces of devices that have nested lists. If the currently displayed list has sub-lists then the Down button browses one level deeper, and display these lists as a tabbed display, as depicted below.



The 'Up' tool button calls the parent of the currently displayed list.

Note: The parameter explorer does not browse to the very top level in the name hierarchy, because there are no parameters at this level. It is possible, however, to browse to other levels that do not have parameters, providing that they have sub-lists.

4. FLASH MEMORY

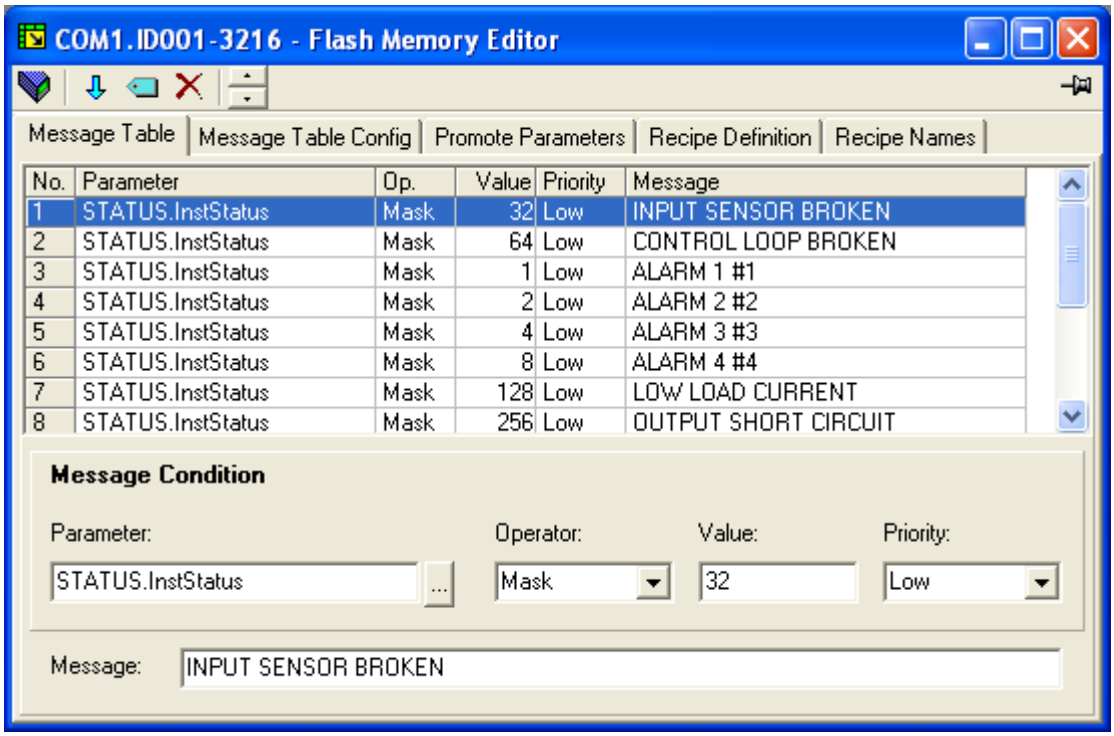
4.1. FLASH MEMORY EDITOR

Not all devices are fitted with flash memory.

The Flash Memory Editor is available to some devices to allow the editing of five tabbed lists that require an extra step in order to block-write the parameters' values to flash memory.

As can be seen from the figures below, the five lists are entitled: Message Table, Message Table Config, Promote Parameters, Recipe Definition and Recipe Names. Of these, Message Table, Message Table Config and Promote Parameters have a user interface which is dedicated to the lists. The other lists are displayed using the standard iTools grid, as used by the Parameter Explorer, for example, and are not discussed further here.

4.1.1. Message Table



The message table contains a list of up to 15 items, each of which defines the message that is to appear if the specified parameter's value satisfies a specified condition. The Flash Memory Editor tool bar or Flash menu items are used to insert, delete, reorder etc. the messages.

Once editing is complete, the new list is downloaded to the device by means of the 'Update device flash memory' tool button, the 'Update Device Flash' item in the 'Flash' menu, or by using the shortcut + . In all cases, a confirmation message appears before download is carried out. The user is prompted to download if an attempt is made to close the editor without downloading.

Message table items are displayed in a read-only grid: editing is performed using the control windows below the message table.

4.1.1 MESSAGE TABLE (Cont.)

PARAMETER

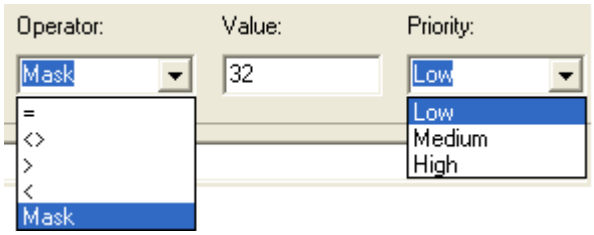
There are a number of ways to access parameters for editing:

1. Invoke a browse dialogue by clicking on the ellipsis button adjacent to the parameter entry field.
2. Invoke a browse dialogue by double-clicking on the grid row
3. Invoke a browse dialogue by attempting to type into the Parameter entry field.
4. Drag parameters onto any grid row from elsewhere in iTools
5. Invoke a browse dialogue using the 'Edit Parameter' tool button, Flash menu or Context menu item
6. Invoke a browse dialogue using the shortcut <Ctrl> + <E>

CONDITION

This allows the message display condition to be defined from a drop-down pick lists.

Note: the figure below is a composite image. The two pick lists cannot be displayed simultaneously.



Operator
= Message displayed if the parameter value is equal to the entered Value
< > Message displayed if the parameter value is not equal to the entered Value
> Message displayed if the parameter value is greater than the entered Value
< Message displayed if the parameter value is less than the entered Value
Mask Message displayed if all the bits in the parameter match all the bits in the entered value

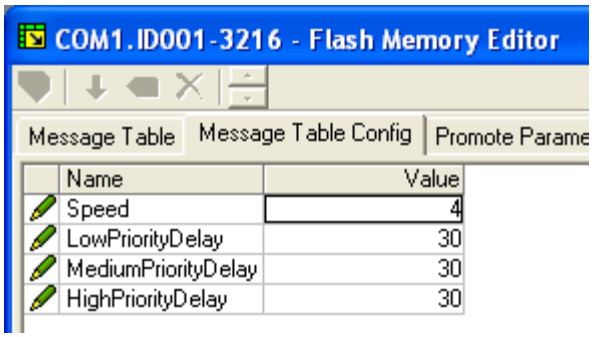
Value
Allows the user to enter a value against which the parameter value is to be compared.

Priority
Allows the user to set the message priority as 'Low', 'Medium' or 'High'. These priority levels define the gap between message displays.
These time delays are individually configurable in Message Table Config, below.

MESSAGE

This text-entry field allows the user to enter the message to be displayed when the Condition criterion is met.

4.1.2. Message Table Config



This window allows the user to set up time constants associated with message displays (see 'Message Table' above). All values are in units of 100msec., thus an entry of 30 equates to a gap of 3 seconds.

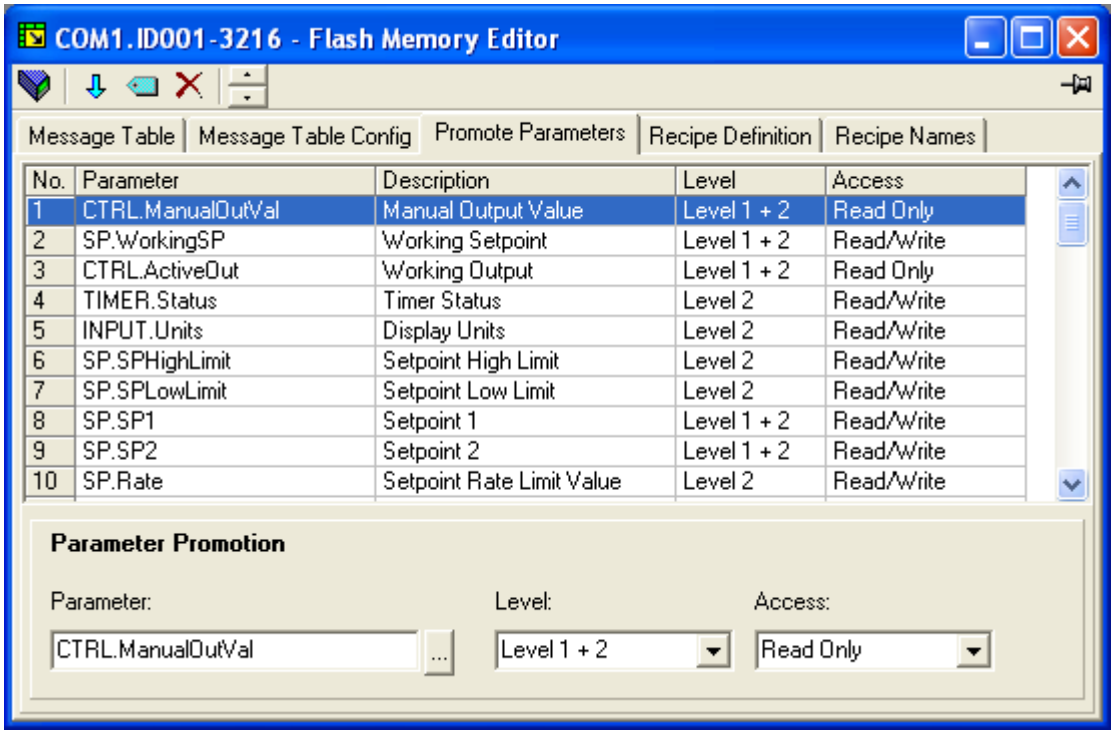
SPEED

The speed at which message characters move across the display. The default speed is 400 milliseconds between character 'jumps'.

PRIORITY DELAYS

These priority delays define the gap between the final character of a message's disappearance, and the subsequent reappearance of the first character of the same message. Several messages with the same priority level may be grouped together into one big message.

4.1.3. Promote Parameters



The parameter promotion table contains a list of up to 60 items. The purpose of the list is to arrange the listed parameters in a specific order for display by the device. Parameters can be added, deleted, moved etc. by means of the Flash Memory Editor toolbar, or by the 'Flash' menu.

4.1.3 MESSAGE TABLE CONFIG (Cont.)

Once editing is complete, the new list is downloaded to the device by means of the 'Update device flash memory' tool, the 'Update Device Flash' item in the 'Flash' menu, or by using the shortcut + . In any case, a confirmation message appears before download is carried out. The user is prompted to download if an attempt is made to close the editor without downloading.

The parameter promotion table items are displayed in a read-only grid: editing is performed using the control windows below the message table.

PARAMETER

There are a number of ways to access parameters for editing:

1. Invoke a browse dialogue by clicking on the ellipsis button adjacent to the parameter entry field.
2. Invoke a browse dialogue by double-clicking on the grid row
3. Invoke a browse dialogue by attempting to type into the Parameter entry field.
4. Drag parameters onto any grid row from elsewhere in iTools
5. Invoke a browse dialogue using the 'Edit Parameter' tool button, Flash menu or Context menu item
6. Invoke a browse dialogue using the shortcut <Ctrl< + <E>

LEVEL

Allows 'Level 2', or 'Level 1 + 2' to be selected from a drop-down pick list.
Levels 1 and 2 relate to Operator Access Levels as discussed in the relevant User Manual.

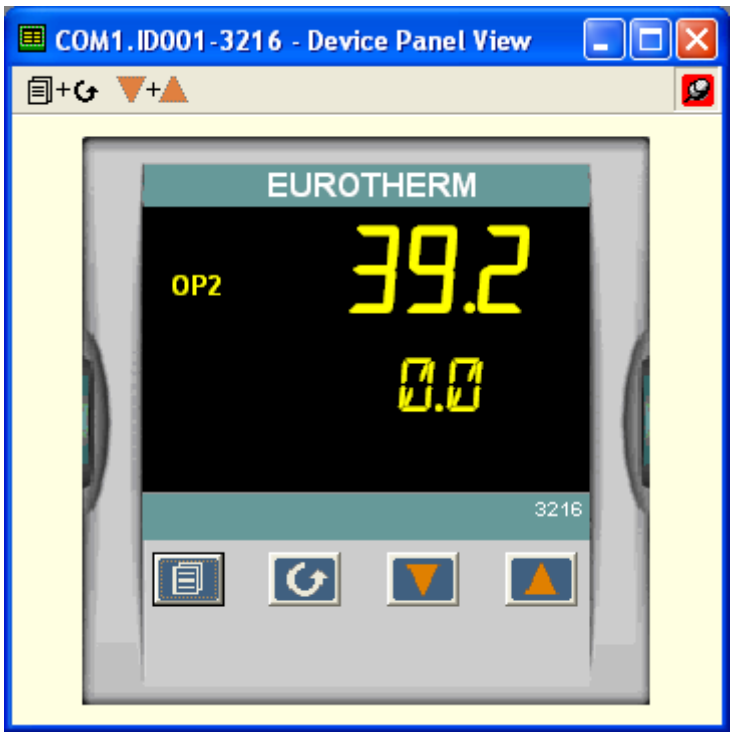
ACCESS

Allows the user to set the parameter access as Read Only or Read Write

5. DEVICE PANEL VIEW

Clicking on this Views Toolbar item causes a front panel faceplate of the selected device to appear in the main iTools frame. For many instruments types, any digital displays and/or push buttons etc. which 'appear' on the device itself, are mimicked on this Device Panel View, allowing the device to be 'operated' via iTools (instead of at the panel) if desired.

The Device Panel View can also be initiated by selecting 'Device Panel' in the 'View' menu, or by means of the shortcut <Alt> + <E>.



A device-specific toolbar appears above the faceplate, to allow, for example, combinations of keys to be operated simultaneously. Hovering the mouse cursor over these tool buttons causes a tool tip to appear, containing a description of the button function. The figures below show these tool tips for the example above. Other device types will have other tool button functions.

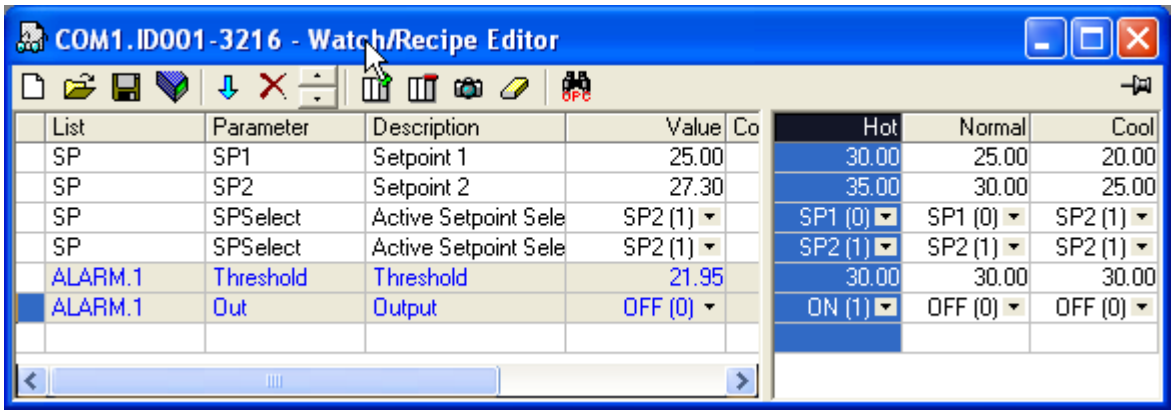
6. WATCH/RECIPE

6.1. WATCH RECIPE EDITOR

The watch/Recipe Window can be opened by clicking on the Watch/Recipe tool button (above), by selecting 'Watch/Recipe' in the Views menu, or via the shortcut <Alt> + <A>. The window is in two parts: the left part contains the watch list; the right-hand part contains a data set, initially empty and unnamed.

The window is used:

1. To monitor a so-called 'watch list' of parameter values. The watch list can contain parameters from many different lists within the same device.
2. To create 'data sets' of parameter values which can be selected and downloaded to the device, in the sequence defined by the recipe. The same parameter may be used more than once in a recipe.



6.1.1. Creating a Watch List

After opening the window, as described above, parameters can be added to it as described below. Parameters can be added only from the device to which the Watch/Recipe window relates (that is, parameters from more than one device cannot be placed in one Watch list). The values of the parameters update in real time, allowing the user to monitor, simultaneously, a number of parameters which might otherwise be unrelated.

ADDING PARAMETERS TO THE WATCH LIST

1. Parameters can be 'click-dragged' into the watch list grid from elsewhere in iTools (for example: the main browse tree, the Parameter Explorer window, the Graphical Wiring Editor (if applicable)). The parameter is placed either in the empty row at the bottom of the list, or 'on top' of an existing parameter, in which case it is inserted above this parameter in the list, the remaining parameters moving down one place.
2. Parameters can be dragged from one position in the list to another. In such a case, a copy of the parameter is produced: the source parameter remains in place. Parameters can be also be copied by using the 'Copy Parameter' item in the Recipe or right mouse-click menu, or by using the short cut <Ctrl> + <C>. Data set values are not included in the copy.
3. The 'Insert item...' tool button , the 'Insert Parameter' Recipe menu item or the shortcut <Insert> can be used to open a browse window from which a parameter can be selected. The selected parameter is inserted above the currently active parameter.
4. A parameter can be 'copied' from (for example) the Graphical Wiring Editor and subsequently 'pasted' into the watch list using the 'Paste Parameter' item in the Recipe menu, or the right mouse-click context menu (short cut = <Ctrl> + <V>).

6.1.1 CREATING A WATCH LIST (Cont.)

CREATING A DATA SET

All the parameters required for the recipe should be added to the watch list, described above.

Once this has been done, if the empty data set is selected (by clicking on the column header), the 'Snapshot' tool button can be used to fill the data set with the current values. Alternatively, the 'Snapshot Values' item in the Recipe or context (right click) menu or the shortcut + can be used to fill the data set.
Individual data values can now be edited by typing directly into the grid cells. Data values can be left blank or cleared, in which case, when the recipe is downloaded, no value will be written for those values. Data values can be cleared by deleting all the characters in the field, then, either moving to a new cell, or typing <Enter>.

The set is called 'Set 1' by default. The name can be edited by using the 'Rename Data Set...' item in the Recipe or right mouse-click menu, or by using the shortcut <Ctrl> + <R>.

New data sets can be added and edited in the same way, by using the 'Create a new empty....' tool button , or by selecting the 'New Data Set' item in the Recipe or right mouse-click menu, or by using the short-cut +

Once all the data sets required for the Recipe have been created, and saved, they can be downloaded to the device, one at a time, using the download tool , or equivalent Recipe/context menu item, or the shortcut <Ctrl> + <D>.

For descriptions of other tool buttons, see 'Watch/Recipe toolbar'. For descriptions of Recipe menu items, see 'Recipe Menu (Watch/Recipe)'.

7. GRAPHICAL WIRING EDITOR (GWE)

7.1. INTRODUCTION

This View menu button appears only for instruments which support graphical wiring.

The Graphical wiring editor is used to view and/or edit instrument block wiring (not physical signal cabling etc.). Comments may be added and monitor windows can be linked to inputs and outputs, to show instantaneous values. The remainder of this introduction takes the form of a glossary, describing the terminology used in the topic as a whole.

7.1.1. Function block type

The wiring editor groups parameters into one or more function blocks. A 'function block type' defines the parameters needed to make up a unit of instrument functionality. Control loops and mathematical calculations are examples of function block types. In most cases, a function block type is all the parameters in an iTools parameter list (and its sublists).

Function blocks have inputs and outputs. Any parameter may be used as an output, but there are restrictions on which parameters may be used as inputs.

The function block type definition does not refer to a specific set of parameters: it defines a pattern of parameters (which may appear in more than one parameter list).

EXAMPLE

A simple block type may be called 'Add', and may contain three parameters, 'In1', 'In2' and 'Out'. The purpose of the block is to add 'In1' to 'In2', and place the result in 'Out'. Thus, although the block type definition includes the name of the block and the names of the parameters, it does not know where the parameters reside within the device's address space.

Note: The Function block types available to the Graphical Wiring Editor vary from device to device.

7.1.2. Function block instance

A function block instance takes a function block type definition and maps it to a specific set of parameters.

In the case of the Add block in the example above, an instance (Add.1) would contain the OPC path to a parameter list which contains all the parameters in the Add block. For a Mini8 or 350x, the parameters would be called 'Add.1.In1', 'Add.1.In2' and Add.1.Out. If a further instance of the Add block were to be introduced, this would be called Add.2, and its parameters would be 'Add.2.In1', 'Add.2.In2' and Add.2.Out. Other instruments may use a different naming structure

Function block instances remember their input and output parameter values, so once a parameter value is set, it will retain that value until something changes it.

7.1.3. Wire

A wire transfers a value from one parameter to another. Transfers are executed by the device once per control cycle.

Wires are created from the output of a function block to the input of a function block. It is possible to create a wiring loop, in which case there will be a single iteration delay at some point in the loop. For a Mini8 controller or 350x, this point is shown on the diagram, and it is possible to move this position if required, and thus to choose where the delay will occur.

For EPower controllers, wiring between tasks must include a task break to avoid phasing problems (the tasks are synchronised with different power phases). These breaks are shown in blue.

7.1.4. Block execution order

For Mini8 controllers, model 350x and EPower, the order in which blocks are executed by the device depends on the way in which they are wired. If there are no loops, they will be ordered such that each block output has been set by the block execution before its value is transferred to another block. Block execution order appears in the bottom left corner of each block.

For EPower controllers, each 'Task' (Network Block) has its own execution order. These are shown in the bottom left-hand corner of each block. Task one execution orders appear with a red background (as for Mini8 Controllers and Model 350x). Execution orders for tasks two, three and four appear against green, black and blue backgrounds respectively.

The execution order for models 2400 and 2704 is fixed, and not shown on the diagram

7.2. COMPOUNDS

Compounds are used to simplify the top level wiring diagram, by allowing the placing of any number of function blocks within one 'box', the inputs and outputs of which operate in the same way as those of a normal function block. The maximum number of compounds which can be created depends on the type of instrument.

Each time a compound is created, a new tab appears at the top of the wiring diagram. If there are more compounds than can fit across the width of the diagram, scroll buttons appear to allow navigation to hidden tabs. Initially, the compounds and their tabs are labelled 'Compound 1' 'Compound 2' and so on, but they can be re-named by right clicking either on the compound in the top-level diagram, or anywhere within an open compound, selecting 'Rename' and typing in the required text string (16 characters max.).

Compounds cannot contain other compounds (i.e. they can be created only in the top level diagram).

Compounds can be opened by double clicking on them in the top level menu, by right clicking within the compound in the top level menu and selecting 'Open', or by clicking on the required tab. The tabs can be scrolled through (and the associated compound opened) using <Ctrl> + <Page Up> and/or <Ctrl> + <Page Down>.

7.2.1. Compound creation

Create compound toolbar icon

Flatten compound toolbar icon

1. Empty compounds can be created (only within the top level diagram) by clicking on the 'Create Compound' toolbar icon. If the maximum number of compounds already exists, or, if this is not the top level of the wiring diagram, this toolbar icon is greyed-out.
2. Compounds can also be created by highlighting one of more function blocks in the top level diagram, and then clicking on the 'Create Compound' toolbar icon. The highlighted items are moved into a new compound.
3. A Compound is 'uncreated' (flattened) by highlighting it in the top level diagram, then clicking on the 'Flatten compound' toolbar icon. All the items previously contained within the compound appear in the top level diagram.
4. Wiring from a top level item to a compound item is carried out by clicking on the source parameter, then clicking on the relevant compound (or its tab) and finally clicking on the destination parameter. Wiring from a compound item to a top level item or to an item in another compound is carried out in a similar way. The tag system of identification is used for all wiring in to and out of compounds.
5. Unused function blocks can be moved into compounds by dragging them from the tree view. Existing blocks can be dragged into a compound from the top level diagram or out of a compound to the top-level diagram. A block can be dragged from one compound to another by dragging the required item(s) onto the tab of the destination compound. Items can also be 'cut and pasted'.
6. Each default compound name (e.g. 'Compound 2') is used only once. For example, if Compounds 1 and 2 (only) have been created, and Compound 2 is then deleted (flattened), then the next compound to be created will be 'Compound 3'.

7.3. OPENING THE WIRING EDITOR

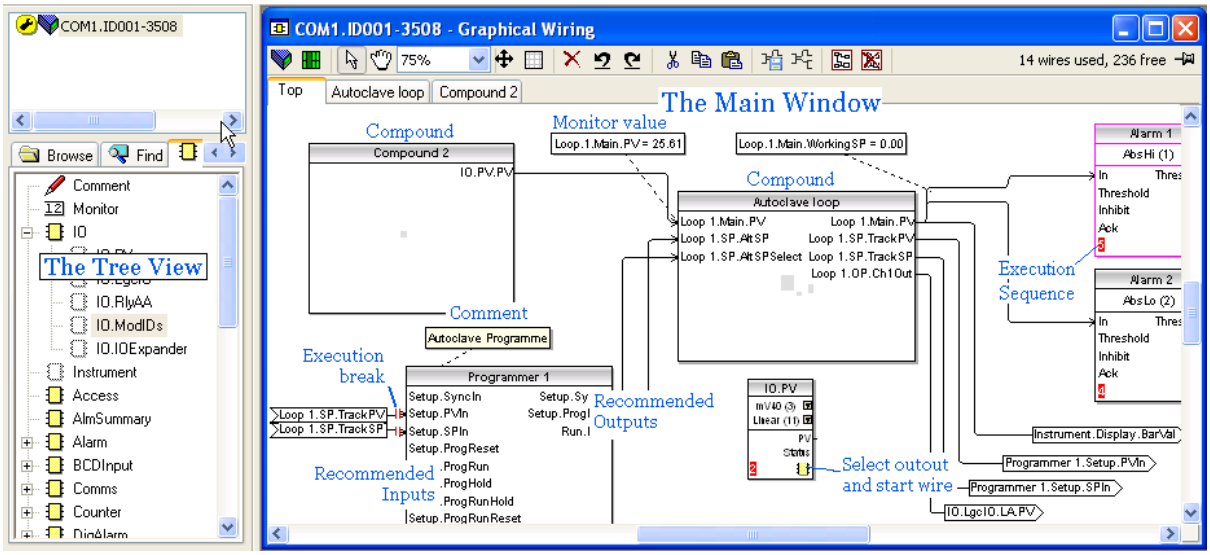
For those instruments that support the feature, the graphical wiring editor can be opened by:

1. Double clicking on the device faceplate in the Panel Views area.
2. Clicking on the Graphical Wiring Editor button (shown above) in the Views toolbar.
3. Selecting 'Graphical wiring' from within the 'Views' menu.
4. By right clicking on the device faceplate, and selecting 'Graphical Wiring' from the resulting context menu.

The Graphical wiring tool button can also be used to bring the existing wiring diagram to view if it is obscured by other windows.

7.4. GRAPHICAL WIRING EDITOR WINDOW

The Graphical Wiring Editor window is in two parts, called 'the tree view' and 'the main window'. Note that block and parameter names vary from device to device.



7.4.1. The Main Window

This consists of the main drawing area and the toolbar. The main drawing area contains the wiring diagram. See 'Creating an Application' for an example.

NAVIGATION

The visible part of the diagram can be moved within the window in the following ways:

1. By using the up, down, left and right keyboard keys.
2. By using the horizontal and vertical scroll bars
3. In select mode , by holding down the shift key, then click-dragging on the diagram.
4. In Pan mode , by click-dragging on the diagram.
5. By using the Pan tool .

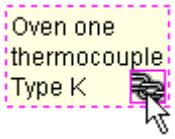
See 'Wiring editor toolbar' for details of these and other tools.

7.4.2. The Tree View

This window contains:
1. Comment
2. Monitor
3. IO
4. A list of function block types

COMMENT

To add a comment to the wiring diagram, click/drag the Comment item from the Tree View to the Main Window. A text entry box appears to allow the user to enter the comment text, followed by 'OK'. The text entry box closes, and the comment box appears in the wiring diagram at the point at which the mouse button was released.
To link the comment to an item, click on the chain symbol at bottom right-hand corner of the comment box, then again on the destination point. Once linked, the chain symbol disappears, and reappears only when the mouse pointer hovers over bottom right-hand corner of the comment box.



Note: For some devices, new items are drawn with 'dashed' outlines until the file has been downloaded to the device. For all devices, the Link Line is dashed both before and after downloading.

MONITOR

Monitor windows are added to the wiring diagram using the same method as described above for Comments (except that the monitor points do not have a text entry window). Monitor windows are linked to the input or output of a function. Once the link is established, the displayed value changes from its initial ???????? to the current value of the input or output point (e.g. PV = 1243.09).

IO

IO shows all the IO function block types and the instances in use in the wiring diagram.

FUNCTION BLOCK TYPES

Note: Where there is only one available instance of a function block type (Instrument for example) the tree cannot be expanded at this point.
1. If a function block is in use on the diagram it is 'faded' in the tree view
2. If a function block is in use on the diagram it is 'faded' in the tree view.
3. If all available instances of a block have been used, the block type also becomes faded.
4. Block names vary from device to device

To enable a block and make it available for wiring, click-drag either the type, or an instance of it, from the tree to the required position on the diagram. (If the type is dragged, the first available instance of that type will be used.)
Once the block appears on the diagram, a context menu becomes available in the tree window, allowing the user to open the iTools Function block view for all the parameters in that block. Function block view can be opened by double clicking on the block, either in the tree or in the diagram, or by clicking the right-hand mouse button over the block, and selecting Function Block View from the resulting menu.
If the active iTools window is not maximised, multiple function block views can be open at the same time.
If a block instance is clicked on in the tree view, the block is selected and the diagram moves to bring it to the centre of the view. Clicking on a block also updates the contents of the Function Block View to show the parameters in the newly selected block.

7.5. CREATING AN APPLICATION

When the wiring editor is opened on a connected instrument, the current wiring and diagram layout is read from the instrument.

For models 2604/2704, any changes made in the diagram are downloaded immediately to the instrument. For such devices, new items (e.g. blocks, wires) are drawn with solid outlines. The 'download' key writes the wiring layout to a file on the pc.

For series 3500 devices, EPower controllers and Mini8 controllers, changes made in the diagram have no effect on the block execution or wiring of the actual instrument until the download key is pressed, at which time, the wiring diagram is written to the instrument. For such devices, new blocks, wires etc. are drawn with green, dashed outlines, and deleted items are drawn 'ghosted' and dashed, (and can be 'undeleted'), until the download button is operated. If changes are made, and the editor is subsequently closed without those changes being saved, a delay will occur whilst the editor clears the changes.

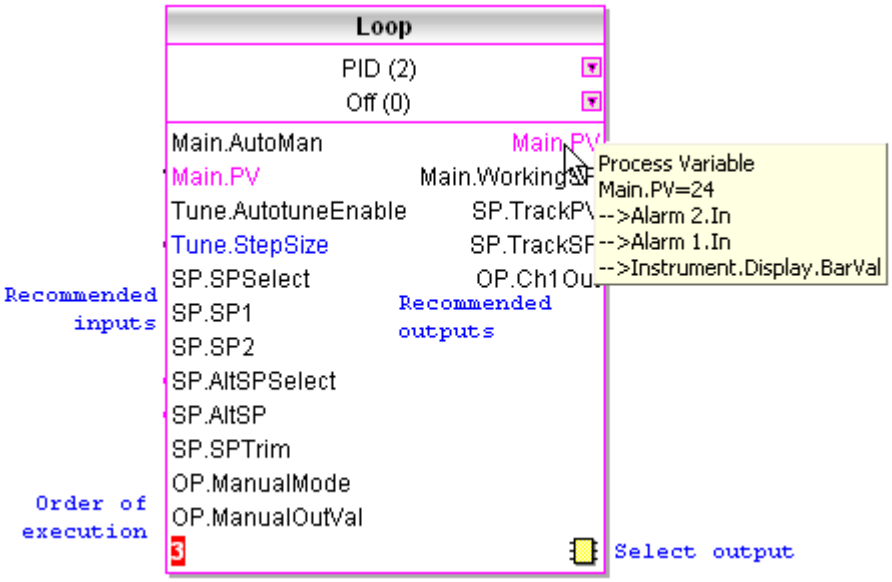
7.5.1. Using function blocks

INTRODUCTION

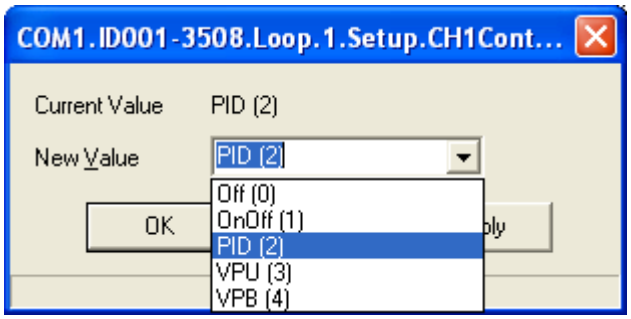
If a function block is not 'faded' in the tree, then it can be dragged into the diagram. Once in the diagram, it can be moved by click-dragging with the mouse, or the selected item can be moved using the keyboard left, right, up and down keys. Blocks can be deleted using the right mouse-click 'context' menu or by operating the <Delete> key.

A block labelled 'Loop' is depicted below, where 'Loop' is the name of the block instance.

Hovering the mouse cursor over the block, causes 'tooltips' to appear. In the figure below the tooltip for 'Main PV' is shown as an example.



If the Block Type information is editable, clicking on the adjacent down arrow, causes a pop-up window to appear, allowing the user to select or enter a new value:



The inputs and outputs which are commonly of most use appear within the body of the block. Further parameters can be selected by clicking on the 'Select Output' icon at the bottom right of the block.

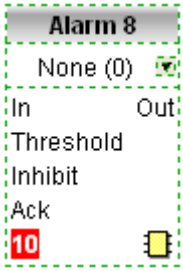
Generally, for blocks to be of use, parameters must be 'wired' to other parameters. To start a wire from a recommended output, click on the output parameter, then move the mouse cursor to the destination point, and click again on the required input.

7.5.2. Block Appearance (3500 series, EPower and Mini8 controllers)

DASHED OUTLINE

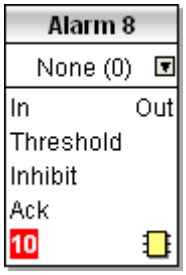
When first dragged into the diagram, the block is shown with a green, dashed outline. This shows that the block is enabled, but is not yet being executed by the instrument. The block remains in this state, until the wiring diagram is downloaded into the instrument. The block is then added to the instrument function block execution list and is drawn with a solid outline.

If a dashed outline block is deleted, it is removed from the diagram immediately.



SOLID OUTLINE

When the wiring diagram has been downloaded, any dashed items are re-drawn with solid lines. The block is in the instrument's function block execution list, and is being executed.



GHOSTED OUTLINE

Not applicable to all devices.

If a solid outline block is deleted, it remains on the wiring diagram in a dashed and ghosted form, to show that it is still being executed by the instrument. The ghosted image is removed from the diagram, and from the instrument function block execution list, after the diagram has been downloaded to the device.

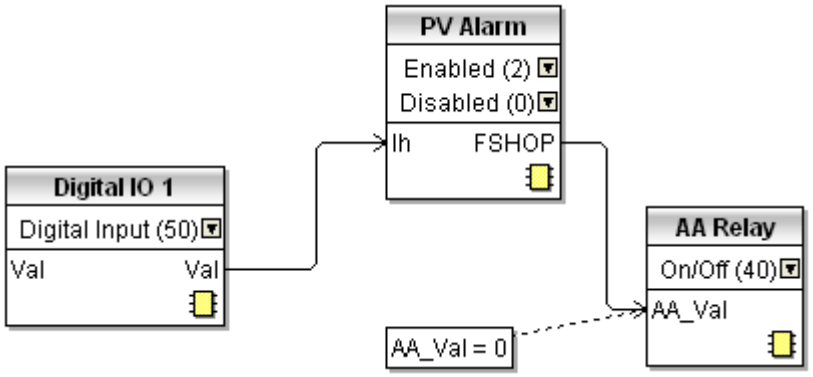
A ghosted outline block can be 'undeleted' using the right mouse-click 'context' menu.

7.5.3. Block Appearance (Models 2604, 2704)

New items are downloaded to the instrument immediately. There are no dashed or ghosted states as described above, for the Series 3500, EPower and Mini8 controllers.

If an item is deleted, it is immediately removed from the diagram. The 'Undo' tool button must be used to restore it. This button 'undoes' item-by-item back to the time the Wiring editor was last opened.

New blocks, wires, monitor windows appear as shown below.



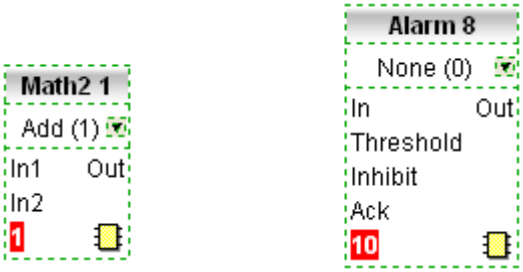
7.5.4. Wiring

Note: New blocks, wires etc. may be drawn green and dashed (as shown) or solid, according to device type.

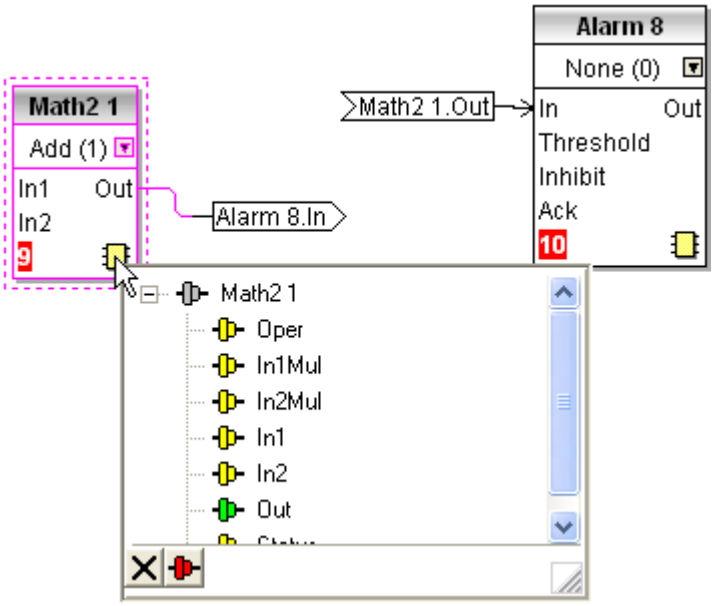
MAKING A WIRE BETWEEN TWO BLOCKS

In this example, a maths block output is to be wired to an alarm block input.

1. Locate the two blocks to be wired together, or add new blocks as required.

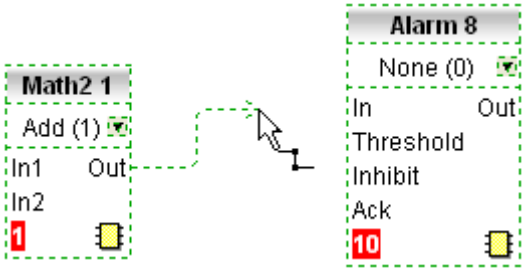


2.. Either click on the Maths block 'Out' parameter, or, as shown below, click on the wiring icon at bottom right to display the Connection dialogue. This shows all the connectable parameters for the block, with the recommended parameters in green. (If it is required to wire a parameter that is not currently available, the red 'plug' icon should be clicked on to add non-wirable (red) parameters to the dialogue box.)



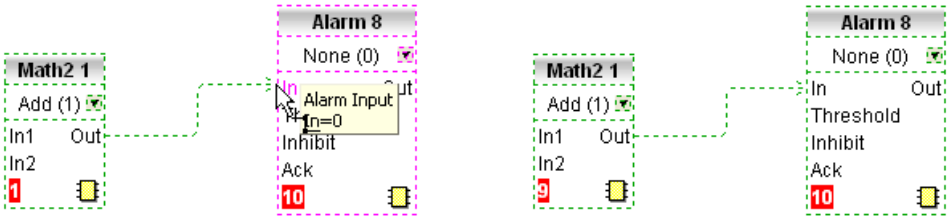
3. Click on the required parameter ('Out' for this example). This is equivalent to clicking on the 'Out' parameter in the block view.

The dialogue box disappears, and the mouse cursor becomes a wiring pointer.



7.5.4 MAKING A WIRE BETWEEN BLOCKS (Cont.)

4. Move this pointer to the parameter labelled 'Input' in the Alarm block, and left click to complete the wire.



WIRE COLOURS

Dashed wires (not all devices) have not been downloaded to the instrument, and are therefore not being executed.

Black: Normal, functioning wire.
Magenta: The mouse is hovering over a black wire or its source or destination block. This aids identification in densely packed wires.
Grey, dashed:
A wire marked for deletion at next download
Red: The wire is connected to an input which is not alterable, or to an output which is not available for wiring. Values on the wire will be rejected by the input, or be indeterminate.
Violet: The mouse is hovering over a red wire or its source or destination block. This aids identification in densely packed wires.

TOOLTIPS

If the mouse is hovered over a wire, a tooltip appears, showing the source and destination parameters, and if the diagram has been downloaded, the current value of the source parameter.

ROUTING WIRES

When a wire is first made, it is autorouted by iTools, which tries to find a clear path amongst the function blocks. A wire can be autorouted again, either by using the right mouse-click context menu, or by double clicking on the wire.

If a wire segment is clicked-on, it is redrawn with small boxes at the corners, and each segment between these boxes can be click-dragged to re-route it manually. iTools remembers that the wire has been re-routed, and should the block subsequently be moved, as much as possible of the current shape of the path is preserved.

THICK WIRES

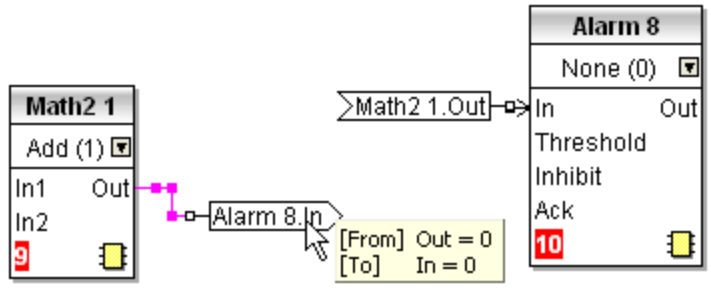
For EPower controllers only. If no task break is inserted when attempting to wire between blocks that are located in different tasks, all the affected wires are highlighted by being drawn with a much thicker wire than usual. Thick wires still execute, but the results are unpredictable as the unit cannot resolve the strategy.

7.5.4 MAKING A WIRE BETWEEN BLOCKS (Cont.)

USING TAGS

If blocks are some distance apart, or the wires are densely packed, it may be more useful to convert a wire to source and destination tags as shown below. This is done by right clicking on the wire, and enabling the 'Use Tags' menu selection. Once created, tags can be moved by click-dragging them to the desired position. The wire can subsequently be restored by disabling 'Use Tags'.

As shown in the example below, the tags are labelled with their destination block names. As with normal wires, current values can be viewed by using the tooltip which appears when the cursor hovers over the tag.

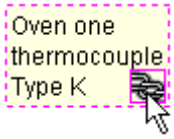


7.5.5. Addition of Comments

To add a comment to the wiring diagram, click/drag the Comment item from the Tree View to the Main Window. A text entry box appears allowing the user to enter the comment text, followed by 'OK'. The text entry box closes, and the comment box appears in the wiring diagram at the point at which the mouse button was released.

Note: The text appears in the note box as it appears in the text entry box. Carriage returns are used if the width of the comment box is to be limited.

To link the comment to a block, wire etc. click on the chain symbol and then on the destination item. Once linked, the chain symbol disappears, and reappears only when the mouse pointer hovers over the bottom right hand corner of the comment box.



If a wire is selected as the link destination, the comment box is linked to the centre of the wire.

Note: For relevant devices the comment box remains green and dashed until the file has been downloaded to the device. For all instruments, the Link Line remains dashed.

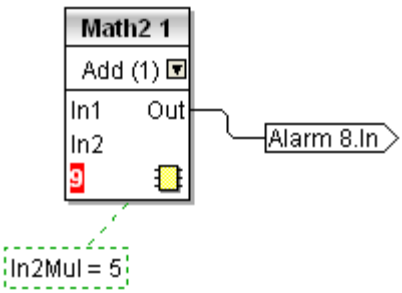
7.5.6. Addition of Monitor Points

Monitor windows are added to the wiring diagram using the same method as described above for Comments (except that the monitor points do not have a text entry window). Monitor windows are linked to the input or output of a function or a wire.

Once the link is established, the displayed value changes from its initial ???????? to the current value of the input or output point (e.g. PV = 1243.09). If the parameter name is not required, it can be removed by right-clicking in the monitor box, and disabling 'Show Names'. Show Names can subsequently be re-enabled if required.

It is possible to link a monitor window to any of the block's parameters, by clicking on the link symbol, then on the 'Chip' icon and selecting a parameter (In2Mul in the example below) from the list.

7.5.6 ADDITION OF MONITOR POINTS (Cont.)



7.5.7. Making selections

Selections are made by clicking on the relevant item. Selected wires are shown with small blocks at their corners; all other items are surrounded with a dashed line when selected. Selecting a block automatically also selects any wires associated with it.

To select more than one item, < Ctrl> should be operated when the required items are clicked, or the mouse can be click-dragged to encompass all the required items, and then released.

7.5.8. Item Colours

RED ITEMS

Items which totally or partially obscure other items and items which are totally or partially obscured by other items. Wires that are connected to unalterable or non-available parameters. Execution breaks. Block execution order background for all blocks except for models 2400 and 2704 (not used) and Tasks 2, 3 and 4 for EPower controllers.

BLUE ITEMS

Non-available parameters in function blocks. Block execution order background for Task 4 (EPower controllers only). Task breaks (EPower controllers only).

GREEN ITEMS

Items added since the last down load are shown as green dotted lines. Block execution order background for Task 2 (EPower controllers only).

MAGENTA ITEMS

All selected items. Any item over which the cursor is hovering.

PURPLE ITEMS

Red wires when being hovered over by the mouse cursor.

BLACK ITEMS

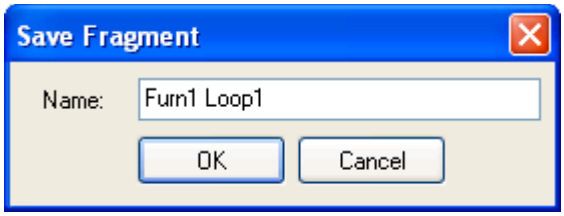
All items added to the diagram before last download. Redundant execution breaks. Monitor and comment text. Block execution order background for Task 3 (EPower controllers only).

7.5.9. Wiring Fragments

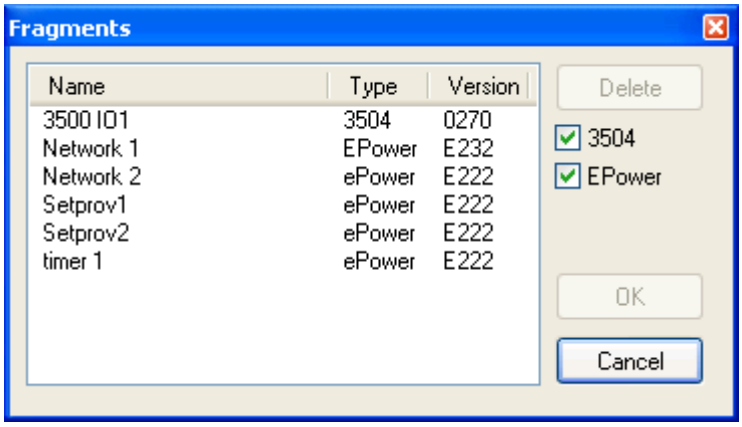
Copy a diagram fragment to a file toolbar icon.
Paste a diagram fragment to a file toolbar icon.

Elements of wiring diagrams cane be saved to and restored from file, using the toolbar icons depicted above. This is identical in operation with standard Copy and Paste operations, except that the fragment is named and saved to a file from which it can be pasted at a later date.

Highlighting one or more diagram elements and clicking on the 'Copy a diagram fragment...' icon opens a dialogue window allowing the user to name the fragment before saving it.



Clicking on 'Paste a diagram fragment...' opens a window showing all the saved fragments from compatible instrument types.



Fragment files are saved to a sub-folder within 'My iTools Wiring Fragments' located in 'My Documents'. Fragments can be renamed, deleted etc. from within the relevant sub-folder.

8. FUNCTION BLOCK VIEW

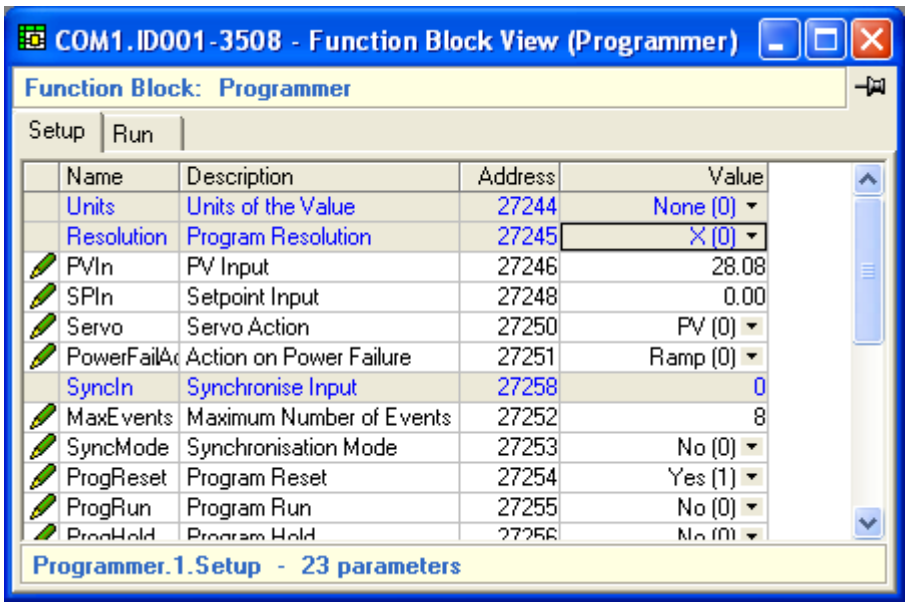
This view is available only with devices that support the Graphical Wiring Editor or Terminal Wiring view.

The function block view is a variant of the Parameter Explorer that can be created by double clicking on a block in the Graphical Wiring Editor, or by using the 'View parameters in selected I/O module' tool button in the Terminal Wiring view. Multiple copies of the window can be opened, provided that the top iTools window is not maximised.

Closing the Graphical Wiring Editor (or Terminal Wiring View) also closes all Function Block Views that were opened from within it.

The list or set of tabbed sublists displayed in the window may be updated by clicking on any of the blocks in the wiring diagram, or by selecting these used blocks via the Block's browse tree. The function block view has no explorer-type capabilities.

The function block view has the same context menu as the Parameter Explorer.

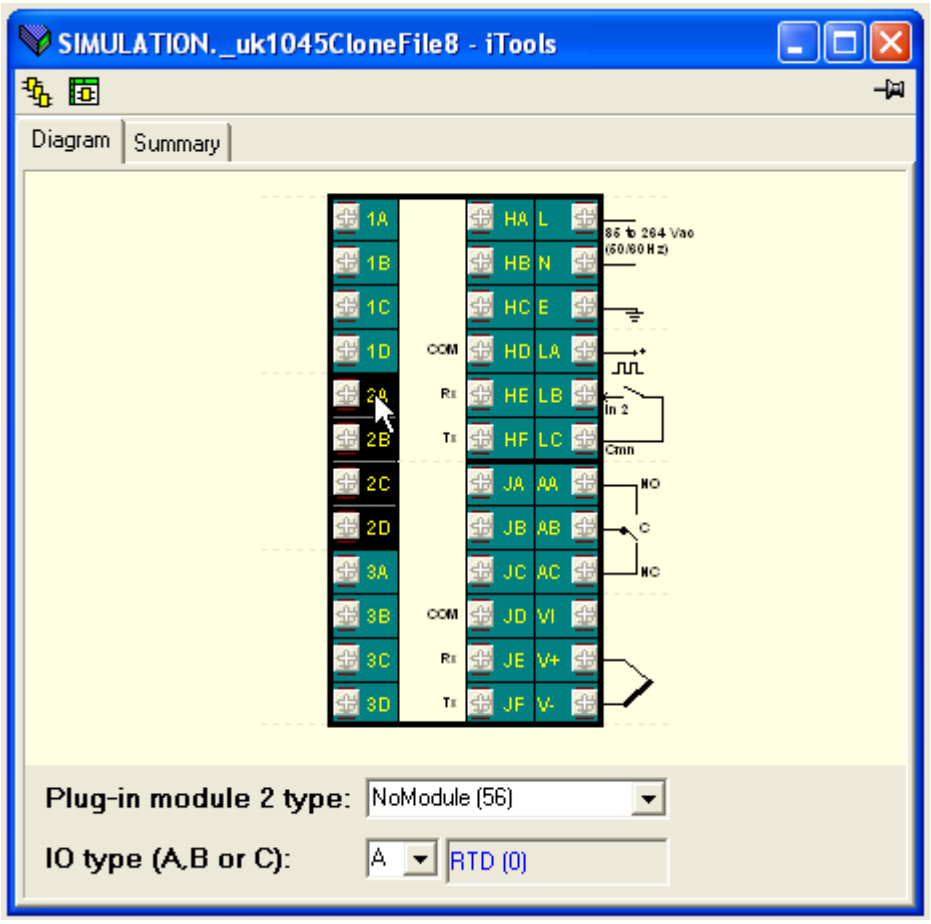


9. TERMINAL WIRING VIEW Terminal Wiring

For certain instruments, a 'Terminal Wiring' tool button (above) allows the user to view the rear terminal panel of the device, and to determine the hardware setup. The initial view shows the rear panel, with Module One highlighted. Clicking on other areas of the diagram highlights other modules (module two in the figure below). Details of the currently highlighted module are given below the terminal layout.

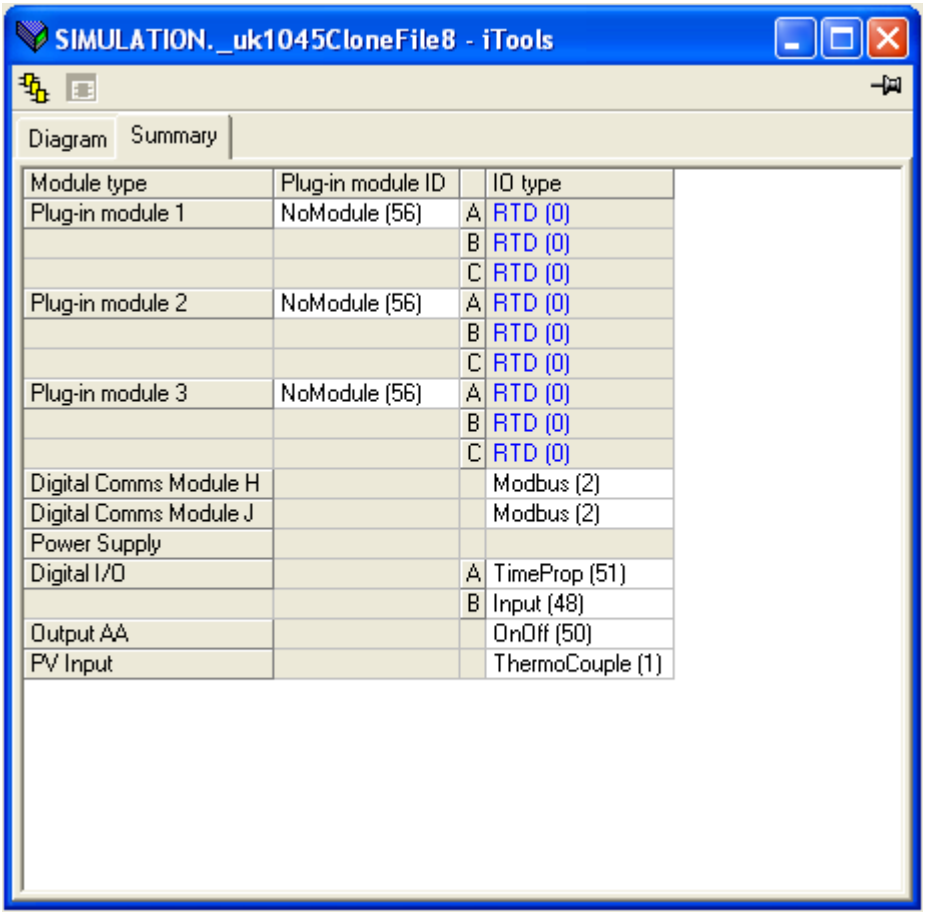
The two tool buttons allow the user to display a list of fitted modules (not all devices) or to view the parameters associated with the highlighted module . See 'Terminal Wiring toolbar' for more details.

See also 'Terminal Wiring context menu'.



Clicking on the Summary tab calls a further display, showing details of all the modules fitted.

9 TERMINAL WIRING VIEW (Cont.)



Module type	Plug-in module ID		IO type
Plug-in module 1	NoModule (56)	A	RTD (0)
		B	RTD (0)
		C	RTD (0)
Plug-in module 2	NoModule (56)	A	RTD (0)
		B	RTD (0)
		C	RTD (0)
Plug-in module 3	NoModule (56)	A	RTD (0)
		B	RTD (0)
		C	RTD (0)
Digital Comms Module H			Modbus (2)
Digital Comms Module J			Modbus (2)
Power Supply			
Digital I/O		A	TimeProp (51)
		B	Input (48)
Output AA			OnOff (50)
PV Input			ThermoCouple (1)

10. TOOLKIT BLOCKS VIEW

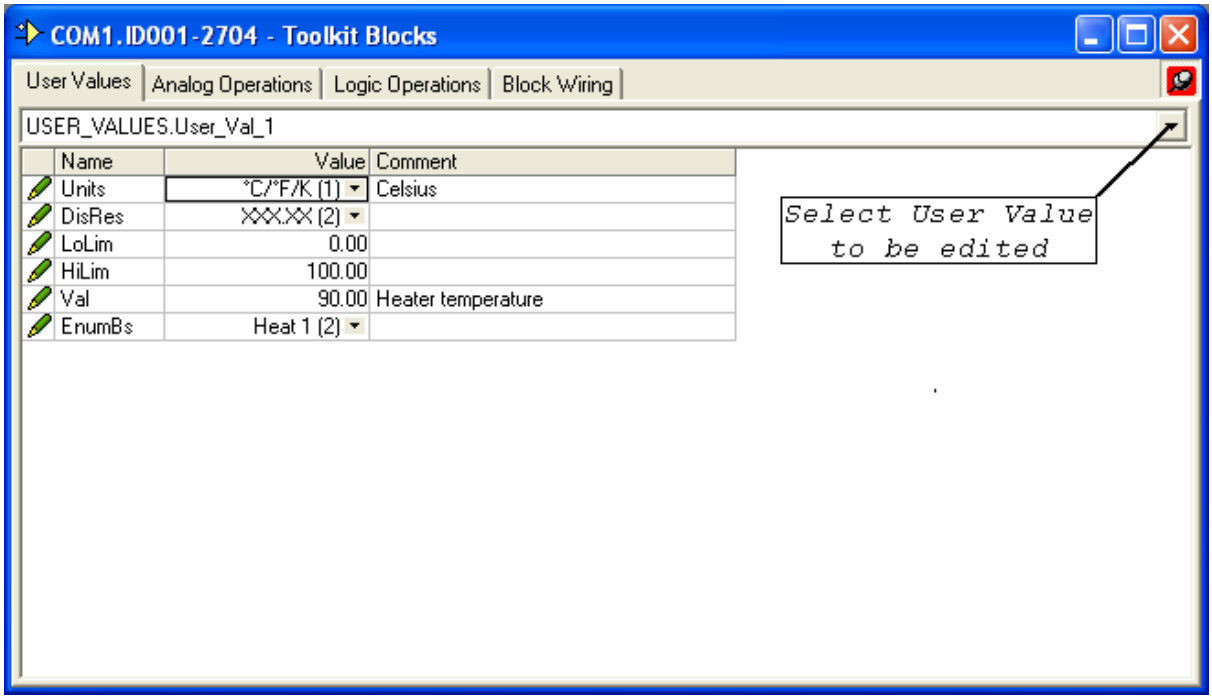
10.1. TOOLKIT BLOCKS

Opened by the Toolkit Blocks Views toolbar tool, by the Toolkit Blocks View menu item or via the context menu which appears when the selected device faceplate (in Panel Views) is right-clicked. Toolkit blocks simplifies production of applications by allowing wiring links to be made by 'dragging and dropping' parameters.

Note: The displays vary from device to device

The window has three or, as shown below, four tabs *viz*: User Values, Analog operations, Logic operations, Block Wiring. The Block Wiring tab can be enabled or disabled for view using the 'Toolkit Blocks Performance' item in the Options menu.

10.1.1. User Values



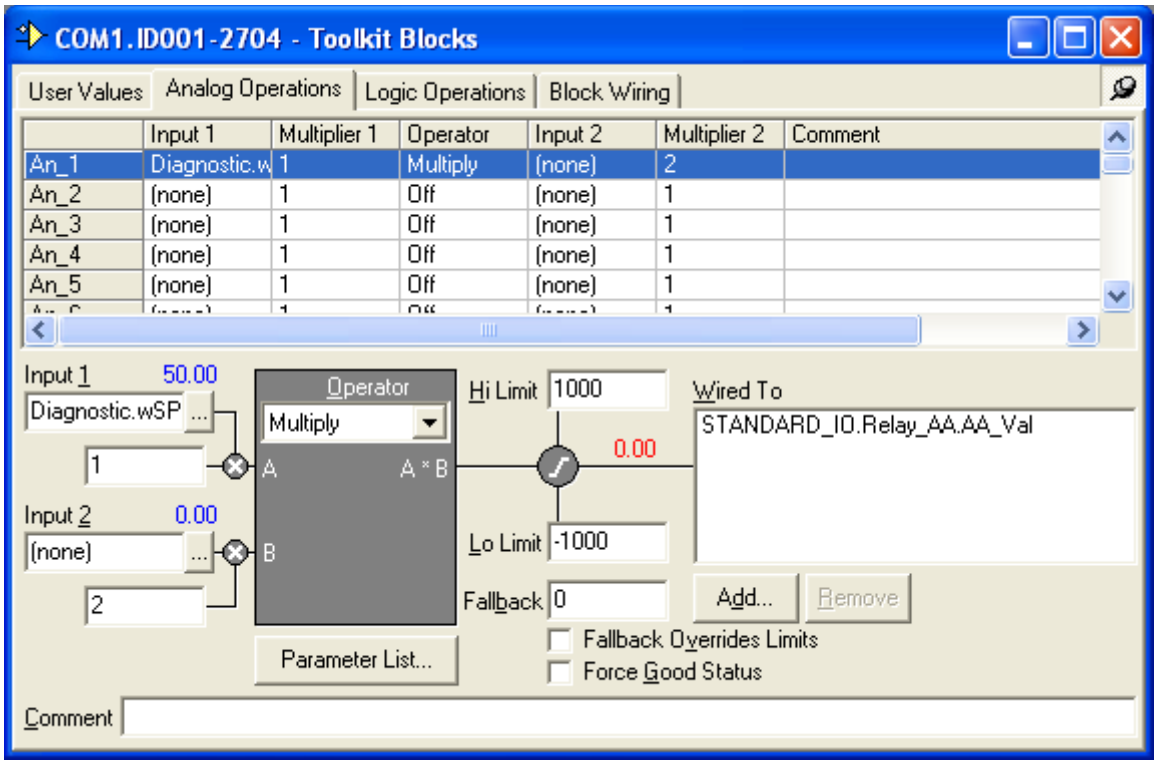
User values are intended for use as constants or comms inputs to calculations.

In the example above, the user value to be edited is selected by clicking on the down arrow and selecting the required User_Value. For other instruments, only the value can be edited and the page contains a list of all the supported UserVals.

Items are edited either by clicking on the value or comment area and typing in the required value, or selecting the required entry from a picklist displayed by clicking on the down arrow at the right-hand end of the relevant field.

10.1.2. Analogue operations

Note Also known as 'Analogue calculations'.



This page provides a convenient way to configure the device to perform a mathematical calculation on two inputs. These inputs may be analogue or digital values. The page allows:

1. The 'soft' wiring of two inputs to an analogue calculation block.
2. The ranging of such inputs by the application of a multiplication factor.
3. The performance of a mathematical calculation on the two inputs. See 'Maths operations' for details
4. The application of maximum and minimum limits on the result of the calculation.
5. The provision of a 'fallback' value to be used in case an error occurs.
6. An optional method of wiring the output value of the calculation to a further stage in the process.

INPUT 1 / INPUT 2

The page allows up to 32 calculations to be performed. Selection of inputs is made in the graphical part of the window, by:

1. Pressing the ellipsis button ... adjacent to the Input 1 or Input 2 field. This causes a browser window to open, allowing the user to select the required parameter.
2. Drag-dropping the parameter from the tree browser window to the relevant field.

Output wiring is optional, and is made by selecting a destination parameter from a pop-up browser window that opens when 'Add' is clicked-on.

Note: The calculations are called An_1 to An_32, or AOPR01 to AOPR32 according to device type.

PARAMETER LIST

Clicking on this button calls a display box showing the input and output parameters used in this calculation.

10.1.2 ANALOGUE OPERATIONS (Cont.)

HI LIMIT / LO LIMIT

Allows the user to specify a maximum output range.

FALLBACK

Allows the user to enter a value which the output will adopt if an error condition occurs in the calculation. This value must lie within the Hi and Lo limits, unless Fallback Overrides Limits is enabled (below).

FALLBACK OVERRIDES LIMITS

If 'Fallback Overrides Limits' is enabled, then if the relevant parameter goes invalid for any reason, the fallback value is adopted whether the fallback value be inside or outside the value's normal clipping limits. If 'Fallback Overrides Limits' is not enabled, the value will be 'clipped' as normal.

ADD / REMOVE

Allows the user to add (via a browse window) or delete wires from the calculation block output.

FORCE GOOD STATUS

This tickbox appears only for some device types. This is used to force the status of the output to 'Good', even in error conditions.

COMMENT

Allows a comment to be entered to be associated with this analogue operation.

MATHS OPERATORS

The following mathematical operators are available for each analogue operation.

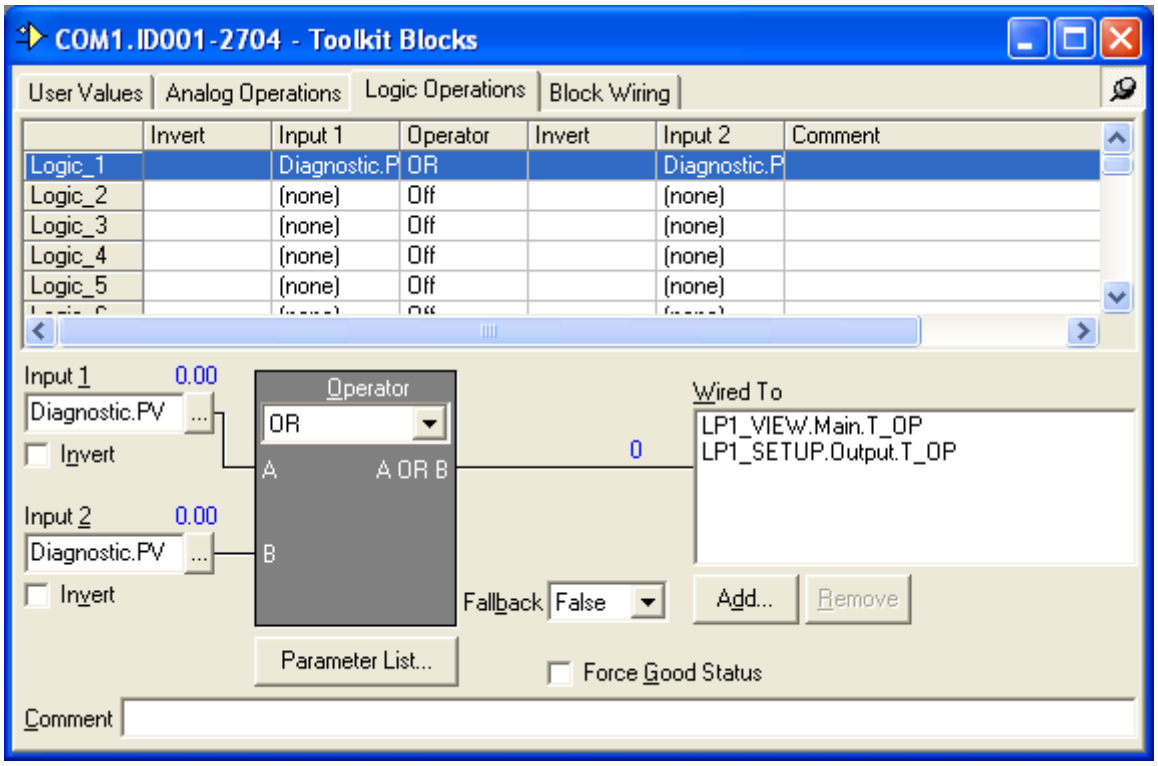
Alternative function names		Function description
None		No function
Add		Add A and B
Sub		Subtract B from A
Mul		Multiply A by B
Div		Divide A by B (see note 2)
Abs Dif	Absolute Dif	Unsigned difference between A and B
Max	Select Max	Output is the larger out of A and B
Min	Select Min	Output is the smaller out of A and B
Hotswp	Hot Swap	Output = B if A fails
S/Hold	Sample Hold	Samples A when B goes true, and holds that value
Expt	Power	Output is A^B
Sqrt	Square root	Output is square root of A
Log		Output is $\log_{10} A$
Ln		Output is $\log_e A$
Exp		Output is e^A
10^x		Output is 10^A
SelN	Select Logic N	Output = A if Logic N is true else, output = B

Notes:
1. A is input 1 (as modified by its multiplier); B is input 2 (as modified by its multiplier).
2. If B passes through 0, Status goes invalid and the output goes to high limit.

10.1.3. Logic Operations

Notes

1. Also known as 'Logic calculations' and as 'Digital Calculations'.
2. Logic wiring always outputs a 'Boolean' type result no matter what the input type(s)



This page provides a convenient way to configure the device to perform a logical function on two inputs. These inputs may be analogue or digital values. The page allows:

1. The 'soft' wiring of two inputs to an logic calculation block.
2. The individual inversion of such inputs.
3. The performance of a logical calculation on the two inputs. See 'Logic Operators' for more details.
4. The provision of a 'fallback' value to be used in case an error occurs.
5. An optional method of wiring the output value of the calculation to a further stage in the process.

INPUT 1 / INPUT 2

The page allows up to 32 calculations to be performed. Selection of inputs is made in the graphical part of the window, by:

1. Pressing the ellipsis button ... adjacent to the Input 1 or Input 2 field. This causes a browser window to open, allowing the user to select the required parameter.
2. Drag-dropping the parameter from the tree browser window to the relevant field.

Output wiring is optional, and is made by selecting a destination parameter from a pop-up browser window that opens when 'Add' is clicked-on.

Note: The calculations are called Logic_1 to Logic_32, or DOPR01 to DOPR32 according to device type.

10.1.3 LOGIC OPERATIONS (Cont.)

INVERT

Allows each input to be inverted as required. The box is not available for logic functions such as = or >, which require a numeric entry rather than a 'Boolean' entry.

PARAMETER LIST

Clicking on this button calls a Parameter Explorer view showing the input and output parameters used in this calculation.

FALLBACK

Allows the user to select a value (True or False) which the output will adopt if an error condition occurs in the calculation.

ADD / REMOVE

Allows the user to add (via a browse window) or delete wires from the calculation block output.

FORCE GOOD STATUS

This tickbox appears only for some device types. This is used to force the status of the output to 'Good', even in error conditions.

COMMENT

Allows a comment to be entered to be associated with this analogue operation.

LOGIC OPERATORS

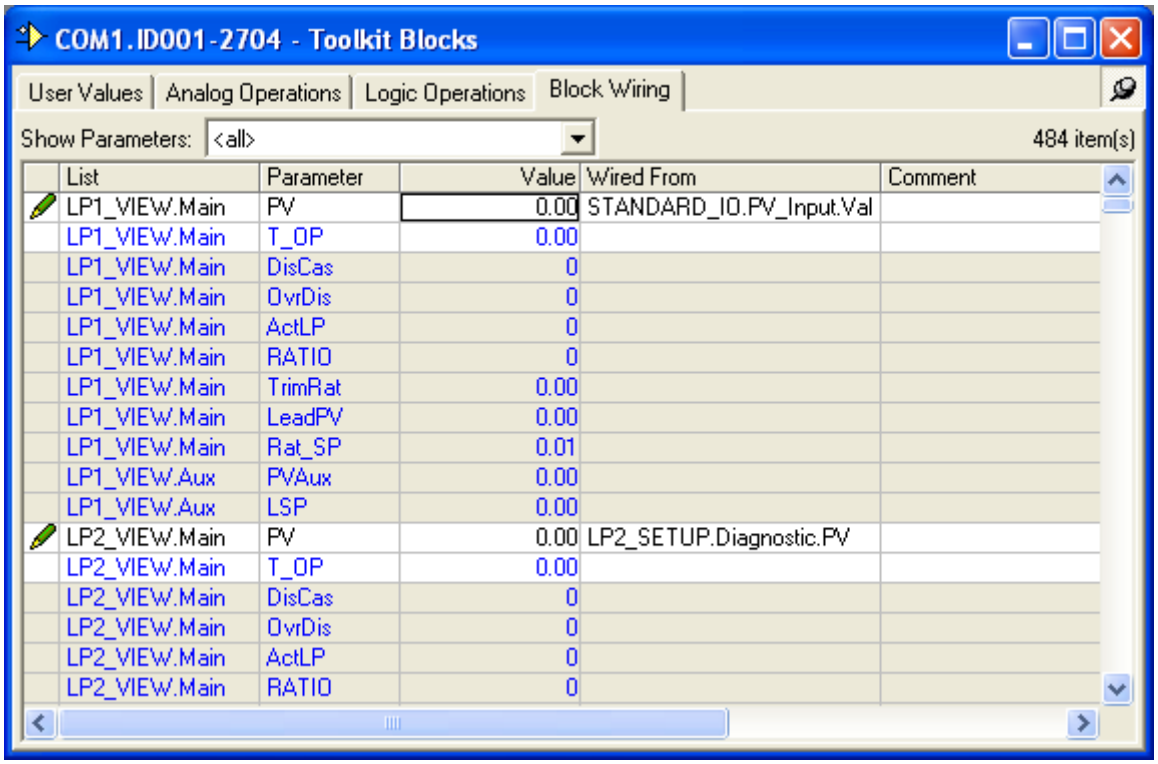
The following operators are available for each logic operation.

Alternative function names		Function description
None	Off	No function
AND		True if A and B true
OR		True if A and/or B true
XOR		True if A or B true. False if A = B
LATCH	Latch	Output follows A when B is true. When B false, Output = A when A goes true and latches true until B goes true.
=	Equal	True if A and B are equal
< >	Not equal	True if A and B are unequal
>	Greater than	True if A is greater than B
<	Less than	True if A is less than B
>=	Greater or equal	True if A is greater than or equal to B
<=	Less than or equal	True if A is less than or equal to B

10.1.4. Block wiring

Notes

1. Also known as 'Wireable Params'.
2. The Block Wiring tab can be enabled or disabled for view using the 'Toolkit Blocks Performance' item in the Options menu.



List	Parameter	Value	Wired From	Comment
LP1_VIEW.Main	PV	0.00	STANDARD_IO.PV_Input.Val	
LP1_VIEW.Main	T_OP	0.00		
LP1_VIEW.Main	DisCas	0		
LP1_VIEW.Main	OvrDis	0		
LP1_VIEW.Main	ActLP	0		
LP1_VIEW.Main	RATIO	0		
LP1_VIEW.Main	TrimRat	0.00		
LP1_VIEW.Main	LeadPV	0.00		
LP1_VIEW.Main	Rat_SP	0.01		
LP1_VIEW.Aux	PVAux	0.00		
LP1_VIEW.Aux	LSP	0.00		
LP2_VIEW.Main	PV	0.00	LP2_SETUP.Diagnostic.PV	
LP2_VIEW.Main	T_OP	0.00		
LP2_VIEW.Main	DisCas	0		
LP2_VIEW.Main	OvrDis	0		
LP2_VIEW.Main	ActLP	0		
LP2_VIEW.Main	RATIO	0		

Wiring between control blocks and other application specific blocks uses the wirable parameters listed under the Block Wiring tab.
Clicking in the 'Wired From' column calls a Browser window allowing the user to edit the current entry.
To remove a wire, right click in the relevant row, and select 'Delete Wire' from the pop-up context menu that appears.

After confirmation, the wire is removed.

Note: Wires can also be deleted using the Edit Wire... selection.

11. ITOOLS WITH THE MODEL 2400

11.1. PROGRAMMER EDITOR

11.1.1. Introduction (2400)

This sequence of help pages refers to the Model 2400 controller/programmer.

The Programmer Editor is used to edit setpoint programs for those devices which include a programmer. These pages are not intended to describe the device programmer itself, as this is explained in the user guide and / or engineering manual appropriate to the device.

Most operations require that the clone or instrument be in 'Configuration' mode. This mode can be entered either by clicking the right-hand button of the mouse over the required device panel view, then using the 'Set Access Level...' menu item, or by using the 'Access' tool button to toggle between 'Configuration' and 'Operator' (see 'Main toolbar').

ONLINE / OFFLINE EDITING

If the editor is opened for a connected device (i.e. not a clone device), then any changes made to the program are written to the device, immediately. Normal instrument rules apply, so the same changes can be made to the running instrument via iTools, as can be made at the instrument's operator interface.

Online editing can be relatively slow, so it may be preferred to make the changes to a clone file, or to a previously saved file, and then to download the edited version to the instrument.

If the editor is opened for a clone device, the program created must either be saved to file, or downloaded to an on-line device.

GRAPH PRINTING

The graph (also called the 'chart') cannot be printed directly. Right clicking within the chart area, then selecting 'Copy Chart' saves a copy of the chart to the clipboard, whence it may be imported into Word or Excel, and then printed as usual (e.g. <Ctrl> + <P>).

PROGRAM PRINTING

The program can be printed by selecting the required segments and copying to the clipboard (e.g by using <Ctrl> + <C>). The program can now be imported into, say, Excel by using the Paste command (e.g. <Ctrl> + <V>), and printed as usual (e.g. <Ctrl> + <P>). It may be convenient to delete unused columns, rows etc. prior to printing.

11.1.1 PROGRAMMER EDITOR INTRODUCTION (Cont.)

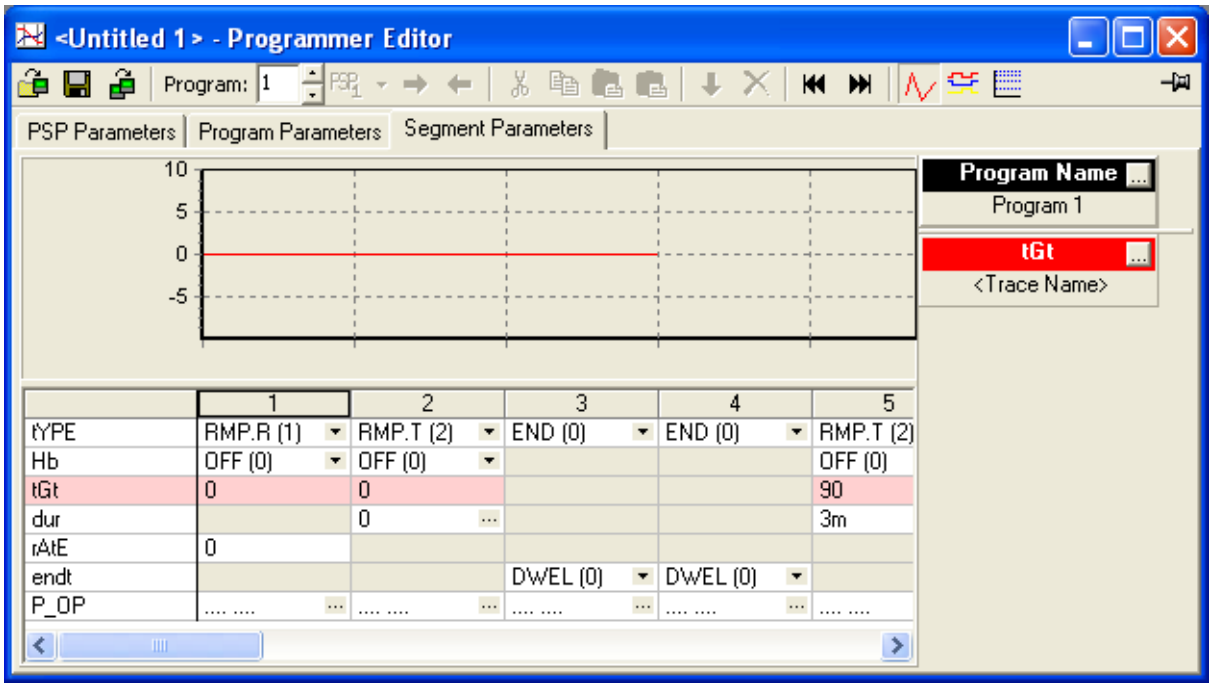
OPENING THE EDITOR

The Programmer Editor is opened for an actual device or for a clone by:

1. Clicking on the Programmer Editor tool button in the Views toolbar.

2. Selecting 'Programmer' in the 'Views' menu, or in the right mouse-click context menu.
3. Using the short cut <Alt> + <P>

The programmer window opens with the 'Segment Parameters' tab active. The figure below shows a new (untitled) clone. Real devices may have different segments defined, depending on the programming history of the device.



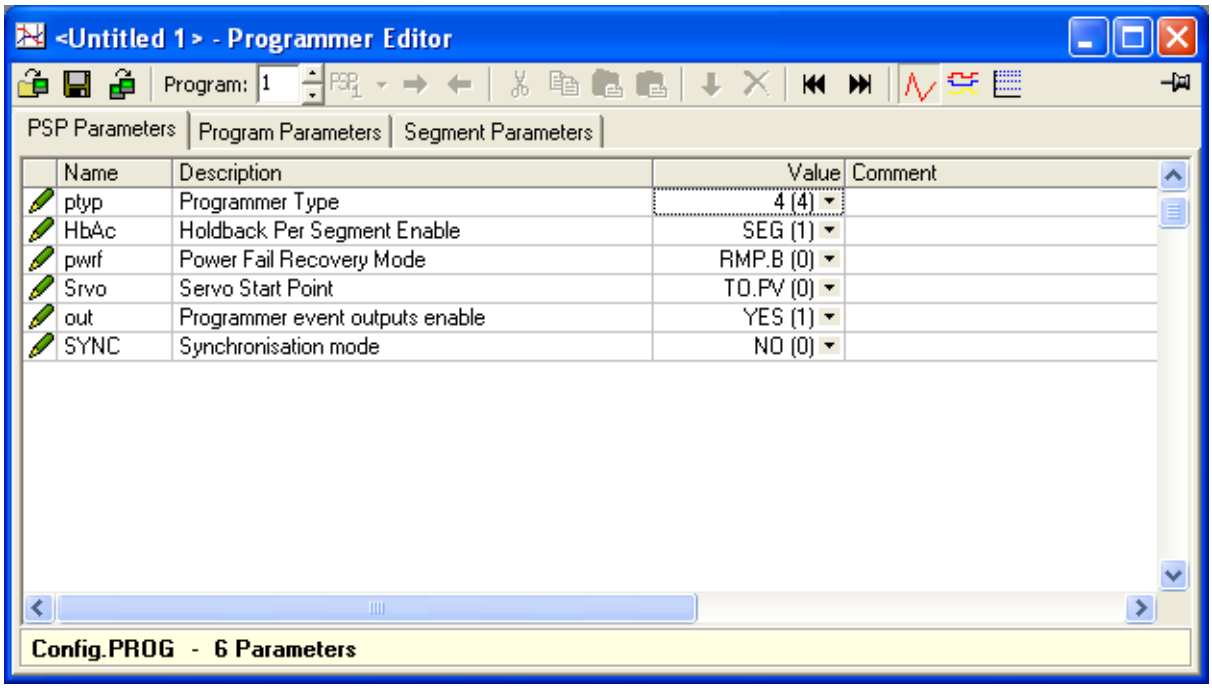
The parameter browse window contains the PSP Parameters, allowing these to be edited (if read/write), without losing the segment parameters view.

11.1.1 PROGRAMMER EDITOR INTRODUCTION (Cont.)

PSP PARAMETERS

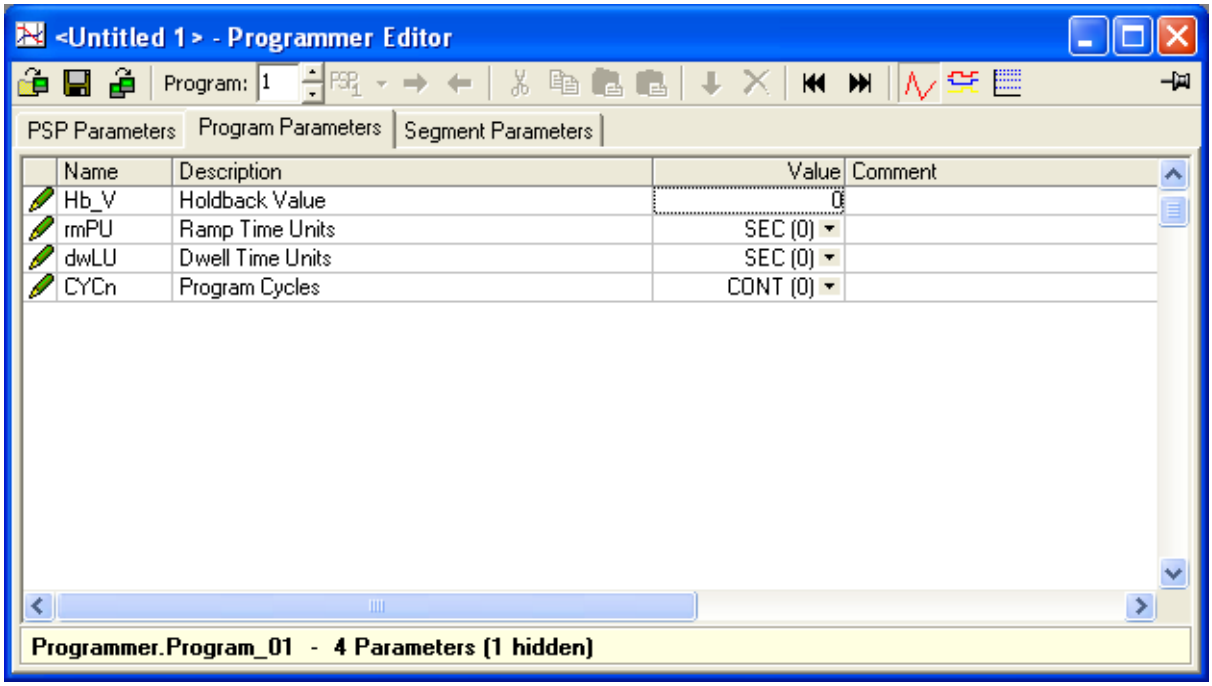
When Access Level = 'Configuration', Program Setpoint parameters can be displayed by clicking on the 'PSP Parameters' tab. This produces a grid list of parameters which may be edited if Read/Write. Read only parameters appear in blue (e.g. 'EventOut1' and 'Event Out2' in the figure below).

The 'PSP Parameters' tab does not appear for Access level = 'Operator'.



PROGRAM PARAMETERS

Program parameters can similarly be displayed by clicking on the 'Program Parameters' tab.



11.1.1 PROGRAMMER EDITOR INTRODUCTION (Cont.)

HIDDEN PARAMETERS

'Hidden' parameters can be displayed by de-selecting 'Hide Parameters and Lists when Not Relevant' in the 'Parameter Availability settings...' item in the Options Menu. When displayed, such parameters have a coloured background, as shown in 'The Explorer Window' description.

11.1.2. Program Editing (2400)

Note: The device (real or clone) must be in configuration mode before editing can be carried out. Configuration mode can be entered either by clicking the right-hand button of the mouse over the required device panel view, then using the 'Set Access Level...' menu item, or by using the 'Access' tool button to toggle between 'Configuration' and 'Operator' (see 'Main toolbar').

PROGRAM AND TRACE NAMES

The program name can be edited by double-clicking anywhere in the Program Name area, or single clicking on the ellipsis box (as shown) then entering a new name, of up to 16 characters, in the text entry box which appears. The program name applies only to the program in which it is entered.

The Target Setpoint (Trace) name is edited in a similar way.

SEGMENT PARAMETERS

See the separate topic 'Segment Parameters' for full details of the 'spreadsheet' view.

THE GRAPH

See separate topic 'The Graph' for details of the graphical display.

PROGRAMMER TOOLBAR

See 'Programmer Toolbar' for details.

PROGRAMMER MENU

See 'Programmer Menu' for details

11.1.3. Segment parameters (2400)

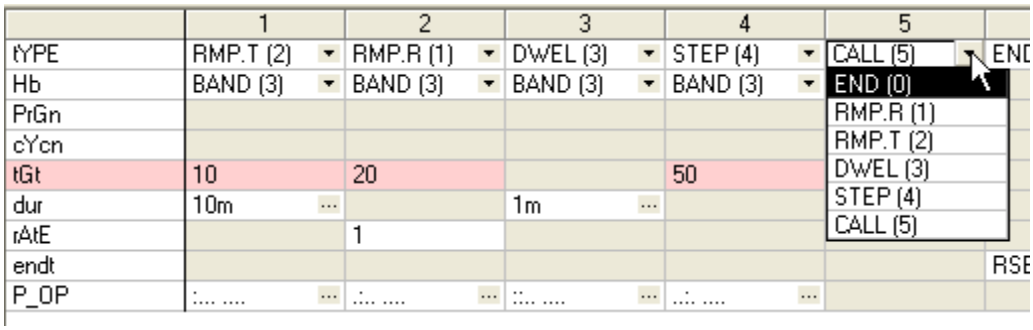
INSERTING AND DELETING SEGMENTS

Inserting Segments
A segment can be added by:

1. Clicking on the 'Insert' Programmer tool
2. Select 'Insert Segment' from the right-click (context) menu or the main Programmer menu or
3. Use the short cut <Insert>.
4. Pasting a segment from the clipboard using either the 'Paste Insert' or 'Paste Over' Tool, Programmer menu item or Context menu item. 'Paste Insert' causes a new segment to be inserted after the high-lighted segment. 'Paste Over' replaces the selected segment.

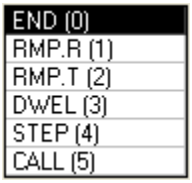
Deleting Segments
A segment is deleted by selecting it, then either clicking on the 'Delete' Programmer tool, by selecting 'Delete Segment' from the Programmer menu or the context menu, or by using the short cut <Ctrl> + <Delete>.

SEGMENT CONFIGURATION



Clicking on the arrow head, as shown above, produces a list of available parameter types. Once a type has been selected the display changes to include the relevant parameters for the selected segment type.

tYPE
Select a segment type from the picklist.



RMP.R = Rate type ramp segment
RMP.T = Time to Target type ramp segment
DWEL = Dwell segment
STEP = Step segment
CALL = Call sub-program type segment.

11.1.3 SEGMENT PARAMETER (2400) CONFIGURATION (Cont.)

Hb
In holdback mode, the program is 'frozen' if the measured process value (PV) does not track the setpoint (SP) within a user defined amount.

The parameter appears only if the 'Holdback Per Segment Enable' parameter (HbAc) is set to 'SEG' in the' PSP Parameters' tab. Allows the user to select Off, Low, High or Band as holdback mode per segment. The holdback value is set using the Hb_V parameter in the 'Program Parameters' tab

If HbAc is set to 'PROG', then holdback is selected for the current program using the 'Holdback Type Per Program' parameter (Hb) in the 'Program Parameters' tab.

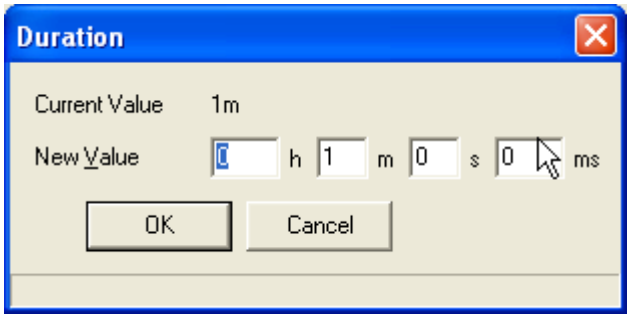
In either case:
OFF= Holdback disabled for this segment.
LO = Holdback mode is entered when the PV is lower than (SP - HoldbackVal)
HI = Holdback mode is entered when the PV is higher than (SP + HoldbackVal)
BAND = Holdback mode is entered when the PV is lower than (SP - HoldbackVal) or higher than (SP + HoldbackVal)

PrGn
Program number. This appears only if one or more 'call' type segments are included in the program, and allows the user to type-in the number of the program which is to be called.

cYcn
No. of cycles. This appears only if one or more 'call' type segments are included in the program. The parameter allows the user to type-in how many iterations of the called program are to be run, or to select CONT, for continuous running.

tGt
Target setpoint. This allows the user to enter a target value to which the segment is to ramp. For RMP.T segments, the ramp duration is entered using the 'Duration' parameter 'dur'. For RMP.R mode segments, the ramp duration depends on the rAtE, setting below.

Dur
For 'RMP.T' and 'DWEL' segment types only.



By clicking on the ellipsis button in the Duration cell, the Duration entry box (shown above) appears. This allows the user to set a time for the segment to complete its task.

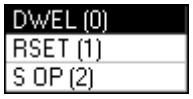
Time segments take this specified time to reach the new setpoint
For Dwell segments, the setpoint remains at the starting value.

For 'DWEL' type segments, the value set here, and the value of the 'Dwell Time Units' parameter (dwLU) in the Program Parameters tab must be compatible, or the segment may not be seen at the instrument display.

11.1.3 SEGMENT PARAMETER (2400) CONFIGURATION (Cont.)

rAtE
For RMP.R segments, this defines the rate at which the ramp is to be completed. The units (seconds, minutes or hours) are configured using the 'Ramp Time Units' parameter (rmPU) in the 'Program Parameters' tab.

endt



Allows the user to define the action of the program end segment as shown in the figure above.

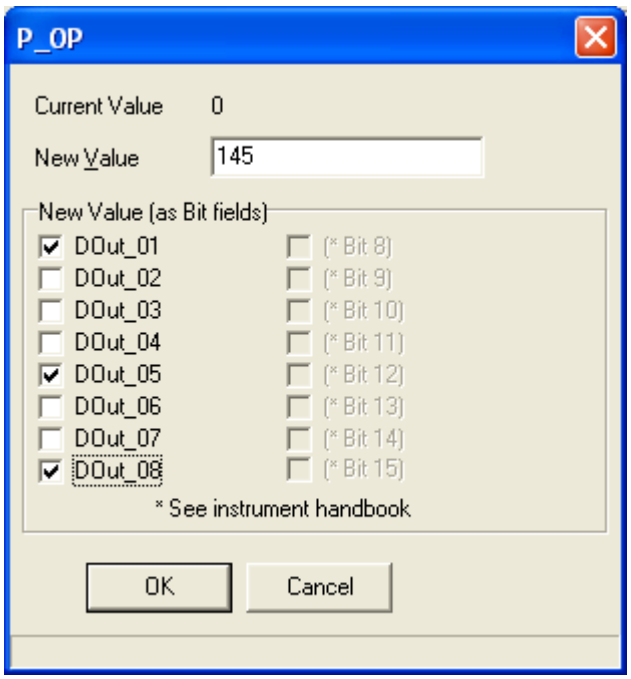
DWEL causes the output value to remain at the previous segment's end value.

RSET causes the program to reset.

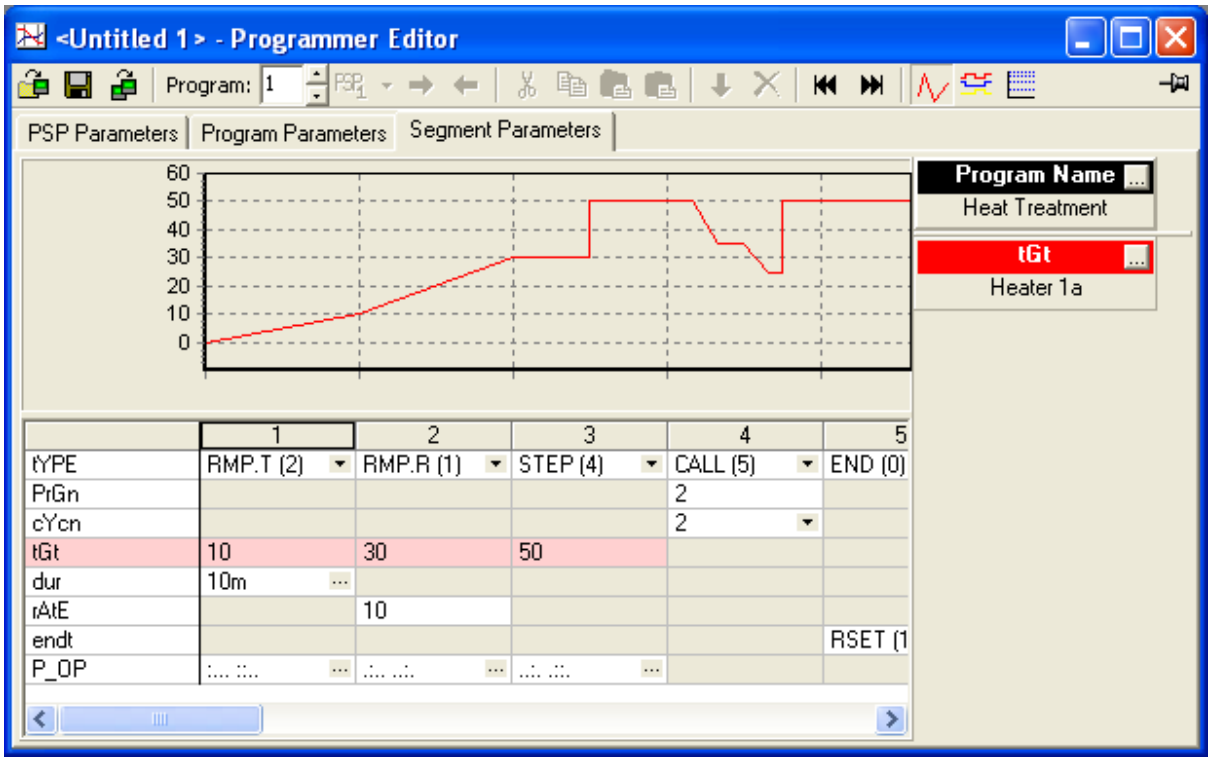
S OP causes the output to go to the value set in the 'Power Level in End Segment' parameter (EndP) to be found in the Operator/OP folder in the tree browser window.

P_OP

This Event output status display appears only if the 'Programmer event outputs enable' parameter ('out') is enabled in the PSP Parameters tab. The number of event outputs is eight. Active events for the segment are indicated by the upper row of dots.
Event outputs can be used to drive relay, triac or logic outputs, according to the modules fitted.
Clicking on the ellipsis button calls the Event output configuration page. This allows the user to define which event outputs are active during the segment.
The Bit fields display gives each Event output (D out) a binary value, such that, when checked, D out 1 = 1; D out 2 = 2; D out 3 = 4; D out4 = 8; D out5 = 16; D out6 = 32; D out7 = 64 and D out8 = 128.
In the example, D out1, D out5 and D out8 are checked, giving a cumulative value of 1 + 16 + 128 = 145.
The status of the outputs can be shown graphically, as described in 'The Graph', which also allows the output names to be defined.



11.1.4. The Graph (2400)



The graph displays the setpoint program segments.

As can be seen from the figure above, subprograms (segment 4) are depicted as occurring all in one segment width.

A Graph may be printed by pasting it into a standard spreadsheet, and printing it from there. See 'Graph printing' in the Introduction to the Programmer Editor.

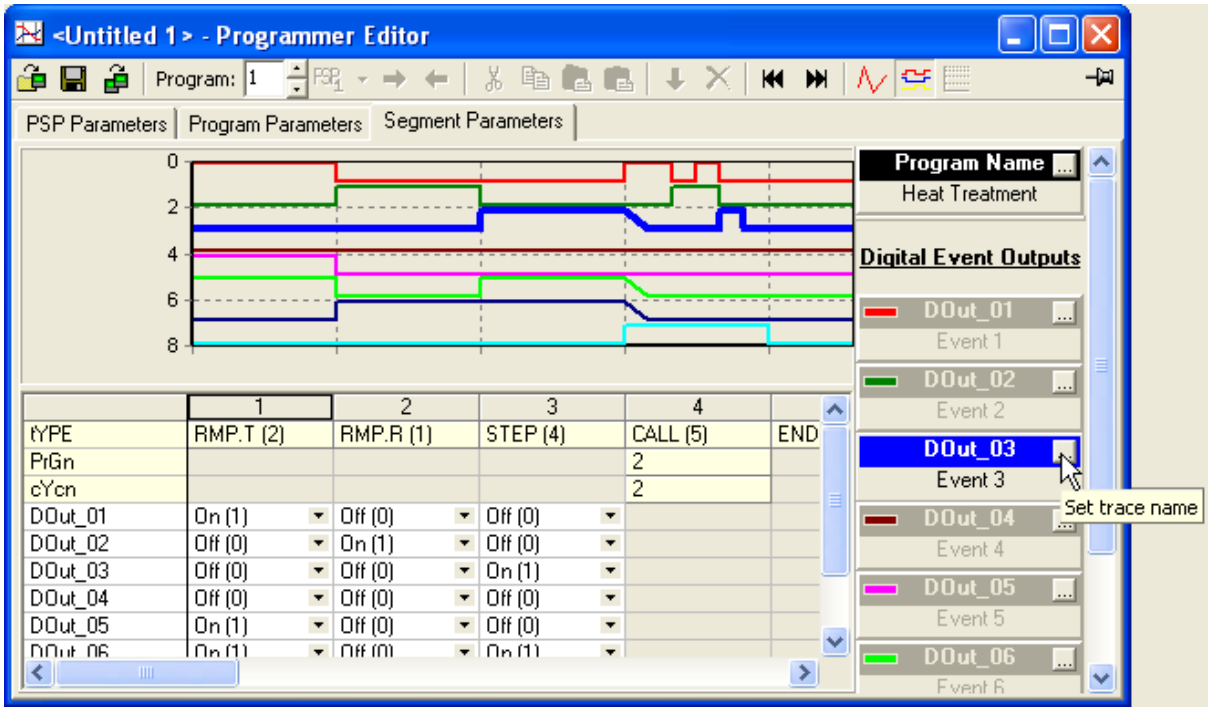
LOGARITHMIC SCALES

Scales can be chosen as either linear or logarithmic, by using the 'logarithmic' tool button (shortcut <Ctrl> + < M>) to switch between the two scale types.

11.1.4 THE GRAPH (MODEL 2400) (Cont.)

DIGITAL GRAPHS

The examples above show analogue graphs. If Event Outputs are enabled, their status can be displayed in graphical form:



Clicking on a Event output 'face plate' (DOut_03 above), Highlights that faceplate, and emphasises the associated trace on the graph.

Event output names can be entered, as described for program names in 'Program editing'.

12. ITOOLS WITH THE MODEL 2704

12.1. PROGRAMMER EDITOR

12.1.1. Introduction (2704)

This sequence of help pages refers to the Model 2704 controller/programmer.

The Programmer Editor is used to edit setpoint programs for those devices which include a programmer. These pages are not intended to describe the Device Programmer itself, as this is explained in the user guide and / or engineering manual appropriate to the device.

Most operations require that the clone or instrument be in 'Configuration' mode. This mode can be entered either by clicking the right-hand button of the mouse over the required device panel view, then using the 'Set Access Level...' menu item, or by using the 'Access' tool button to toggle between 'Configuration' and 'Operator' (see 'Main toolbar').

NUMBER OF PROGRAMS

Version 6 and later of the Model 2704 include an asynchronous program mode which allows up to three program setpoints (PSPs) to be driven by separate programmers, The programs can be included in program groups, and the operator can then select and run that group of programs. Alternatively, the user can select a program for each PSP, and start them individually, or as a group.

There are 60 programs available to the user. In synchronous mode, these are called Program 1 to Program 60. In asynchronous mode, each of the PSPs is allocated 20 programs. These are variously called Programs 1 to 20, for each PSP, or Programs 1 to 20 for PSP1, Programs 21 to 40 for PSP2 and Programs 41 to 60 for PSP3.

ONLINE / OFFLINE EDITING

If the editor is opened for a connected device (i.e. not a cone device), then any changes made to the program are written to the device, immediately. Normal instrument rules apply, so the same changes can be made to the running instrument via iTools, as can be made at the instrument's operator interface.

Online editing can be relatively slow, so it may be preferred to make the changes to a clone file, or to a previously saved file, and then to download the edited version to the instrument.

If the editor is opened for a clone device, the program created must either be saved to file, or downloaded to an on-line device.

GRAPH PRINTING

The graph (also called the 'chart') cannot be printed directly. Right clicking within the chart area, then selecting 'Copy Chart' saves a copy of the chart to the clipboard, whence it may be imported into Word or Excel, and then printed as usual (e.g. <Ctrl> + <P>).

PROGRAM PRINTING

The program can be printed by selecting the required segments and copying to the clipboard (e.g by using <Ctrl> + <C>). The program can now be imported into, say, Excel by using the Paste command (e.g. <Ctrl> + <V>), and printed as usual (e.g. <Ctrl> + <P>). It may be convenient to delete unused columns, rows etc. prior to printing.

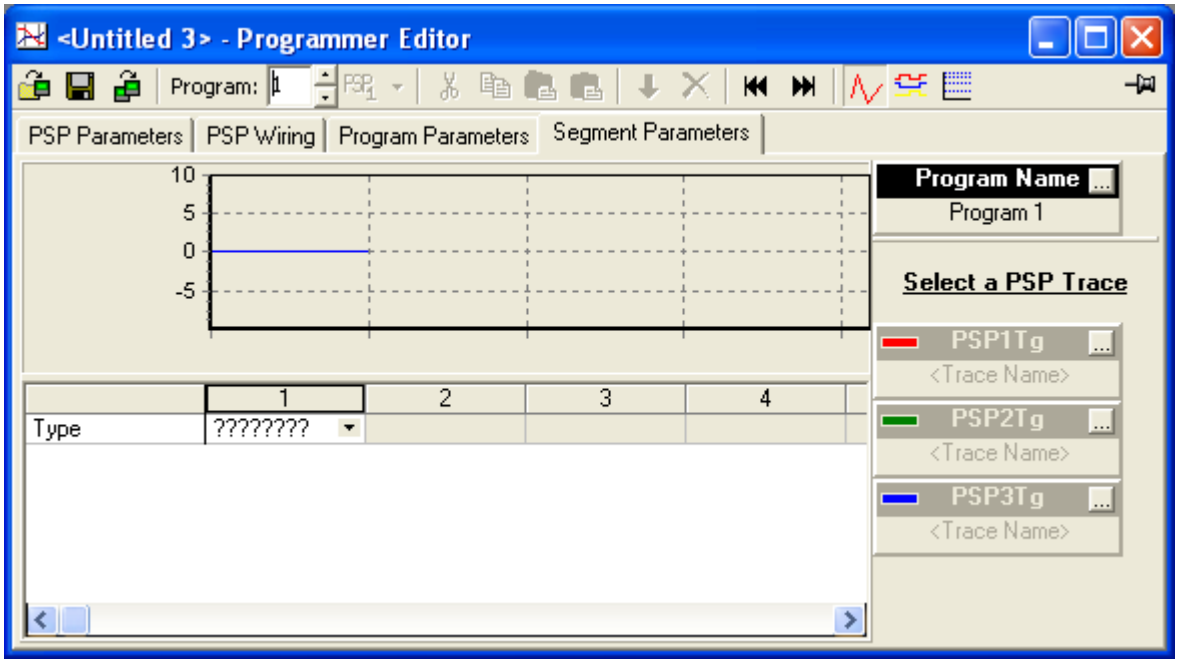
12.1.2. Opening the editor

The Program Editor is opened, for an actual device or for a clone by:

1. Clicking on the Programmer Editor tool button in the Views toolbar.

2. Selection of 'Programmer' in the 'Views' menu, or in the right mouse-click context menu.
3. Using the short cut <Alt> + <P>

The programmer window opens with the 'Segment Parameters' tab active. The figure below shows a new (untitled) clone in Configuration mode. By default, new programs have no segments defined for them. Real devices, or previously saved clones may have one or more segments defined, depending on programming history.



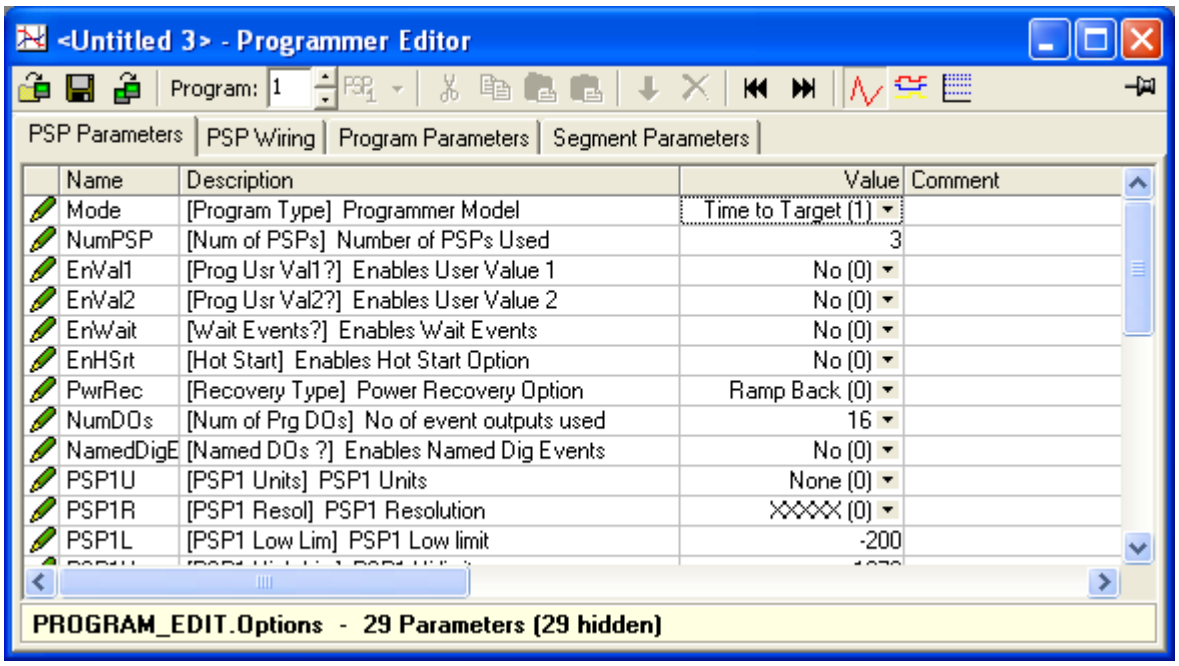
The parameter browse window contains the Program Setpoint (PSP) Parameters, allowing these to be edited (if read/write), without losing the segment parameters view.

12.1.2 OPENING THE EDITOR (Cont.)

PSP PARAMETERS

When Access Level = 'Configuration', Program Setpoint parameters can be displayed by clicking on the 'PSP Parameters' tab. This produces a grid list of parameters which may be edited if Read/Write. Read only parameters appear in blue.

The 'PSP Parameters' tab does not appear for Access level = 'Operator'.



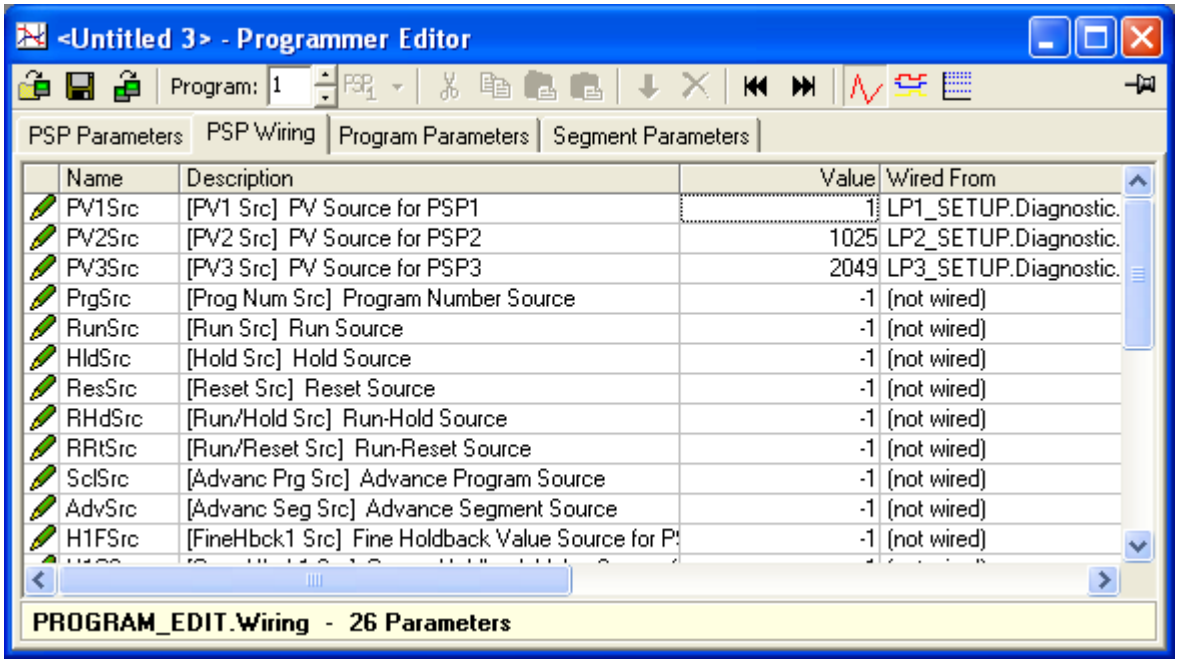
Hidden Parameters

'Hidden' parameters can be displayed by de-selecting 'Hide Parameters and Lists when Not Relevant' in the 'Parameter Availability settings...' item in the Options Menu. When displayed, such parameters have a coloured background, as shown in 'The Explorer Window' description.

12.1.2 OPENING THE EDITOR (Cont.)

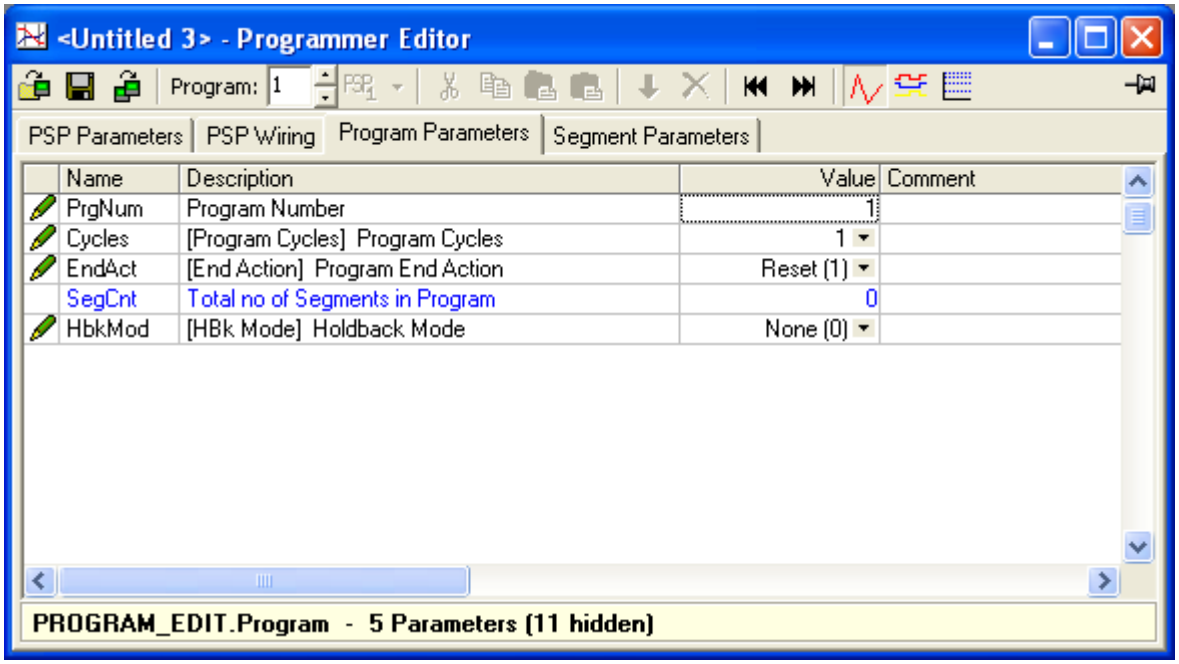
PSP WIRING

When Access Level = 'Configuration', Program Setpoint wiring can be displayed by clicking on the 'PSP Wiring' tab. This produces a grid list of parameters the wiring for which may be edited as required. The 'PSP Wiring' tab does not appear for Access level = 'Operator'.



PROGRAM PARAMETERS

Program parameters can similarly be displayed by clicking on the 'Program Parameters' tab. Read only parameters appear in blue.

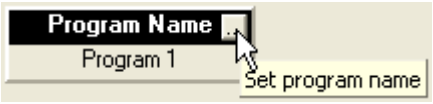


12.1.3. Program editing (2704)

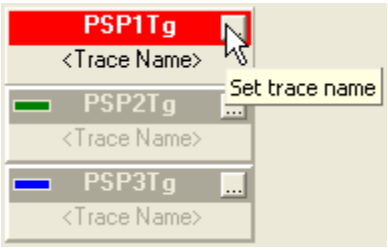
Note: The device (real or clone) must be in configuration mode before editing can be carried out. Configuration mode can be entered either by clicking the right-hand button of the mouse over the required device panel view, then using the 'Set Access Level...' menu item, or by using the 'Access' tool button to toggle between 'Configuration' and 'Operator' (see 'Main toolbar').

PROGRAM AND PSP NAMES

The program name can be edited by double-clicking anywhere in the Program Name area, or single clicking on the ellipsis box (as shown) then entering a new name, of up to 16 characters, in the text entry box which appears. The program name applies only to the program in which it is entered.



The Program Setpoint (PSP) names (Trace Names) are changed in a similar way. The PSP names entered here are common to all programs i.e. if a name is edited in one program, then the new name appears in all other programs. See also 'Asynchronous Programmer'.



Notes:

1. The number of PSPs is defined by 'NumPSP' in the 'PSP Parameters' tab.
2. The colours in the PSP faceplate header bars are reflected in the Segment list and on the graph, easing identification.
3. Clicking on a faceplate highlights the selected PSP trace in the graph. See 'The Graph' for more details.
4. In order to improve clarity, if the PSP values are widely different, then one or more of the traces will be drawn to a different scale (displayed scale is x10 or x100 actual value). The scaling factor appears in the faceplate. See 'The Graph' for more details.

SEGMENT PARAMETERS

See the separate topic 'Segment Parameters' for details of the 'spreadsheet' view.

THE GRAPH

See separate topic 'The Graph' for details of the graphical display.

PROGRAMMER TOOLBAR

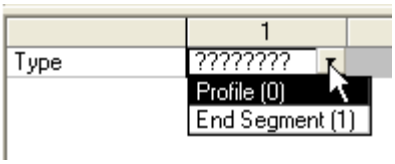
See 'Programmer toolbar' for details.

PROGRAMMER MENU

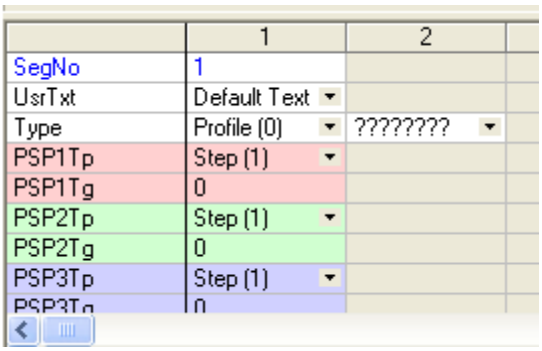
See 'Programmer Menu' for details

12.1.4. Adding, Inserting and deleting segments

FIRST SEGMENT



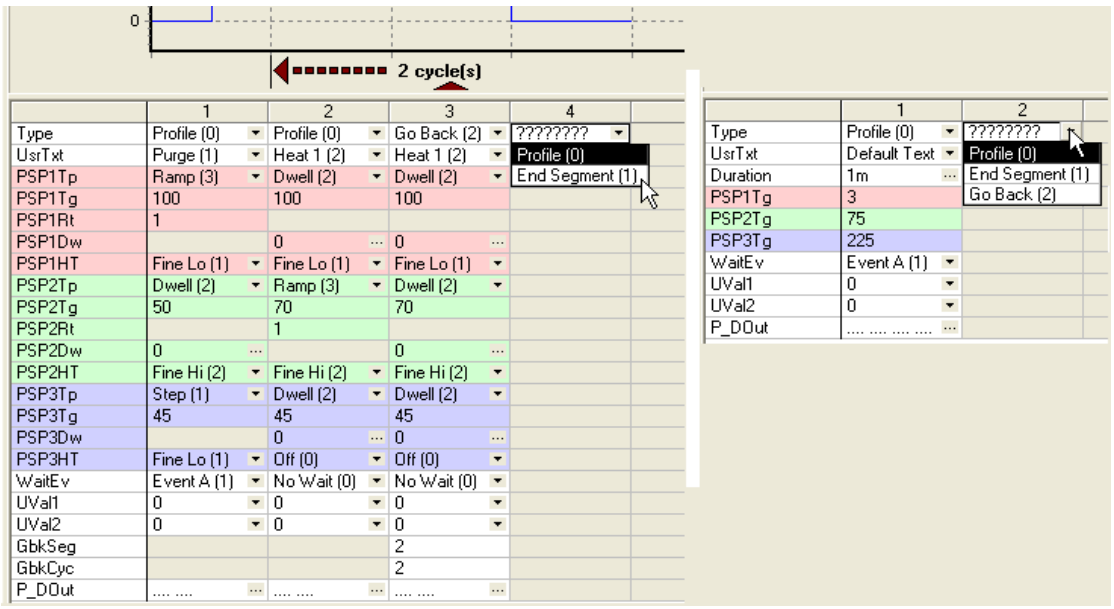
Clicking on the arrow head, produces a list of available segment types. All Segments but the first (illustrated above) also include 'Go Back' as a segment type. Once a type has been selected the display changes to include the relevant parameters for the selected segment type. The figure below shows a partial parameter list for a Ramp Rate type program.



ADDING SEGMENTS

To add a new segment, the arrow head to the right of the ???????? Type field can be clicked (as shown below), and once a type has been selected, the new segment parameters appear, their values based on the previous segment. The ???????? field does not appear if the final segment is of type 'End Segment'.

The two views below show typical parameter lists for the two 'Modes' of operation *viz*: 'Ramp Rate' and 'Time to Target'. Mode selection is defined by 'Mode' in the 'PSP Parameters' tab. Other parameters appear only if the relevant options have been enabled, also via the 'PSP Parameters' tab. The parameters themselves are described in a separate topic: 'Segment parameters'.



12.1.4 ADDING, INSERTING AND DELETING SEGMENTS (Cont.)

INSERTING SEGMENTS

To insert a segment, highlight the segment immediately to the right of where the new segment is to appear, then:

1. Click on the 'Insert' tool button in the Programmer toolbar,
2. Select 'Insert Segment' from the main Programmer menu or the right-click (context) menu,
3. Use the shortcut <Insert>.

A new segment, identical with the one highlighted, appears to the left of the highlighted segment.

An alternative is to highlight one or more segments, copy them to the clipboard and then paste them into the required position . Again, the inserted segments appear to the left of the highlighted segment. This cut and paste technique can be used to copy portions of one program into another, either within one instrument or clone, or from one to another.

Copying is done by highlighting the required segments, then:

1. Clicking on the 'Copy' tool button in the Programmer toolbar,
2. Selecting 'Copy' from the main Programmer menu or the right-click (context) menu,
3. Using the shortcut <Ctrl> + <C>.

Pasting is done by highlighting the segment to the right of the insertion point, then:

1. Clicking on the 'Paste Insert' tool button in the Programmer toolbar,
2. Selecting 'Paste Insert' from the main Programmer menu or the right-click (context) menu,
3. Using the shortcut <Ctrl> + <V>.

It is also possible to replace one or more segments with the same number of replacement segments. This is done by copying and pasting as described above, but using the 'Paste Over' tool button or menu item, rather than 'Paste Insert'. Shortcut = + + . The number of segments highlighted to be pasted over must be the same as the number of segments on the clipboard.

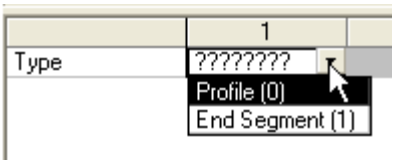
DELETING SEGMENTS

Segments can be deleted in the following ways;

1. By selecting one or more segments, then clicking on the Delete tool button .
2. By selecting one or more segments, then selecting 'Delete Segment' from the right-click (context) menu or the main 'Programmer' menu.
3. By selecting one or more segments, then using the shortcut <Ctrl> + <Delete>.
4. By changing segment type to 'End'. This deletes all segments to the right of the new End segment.

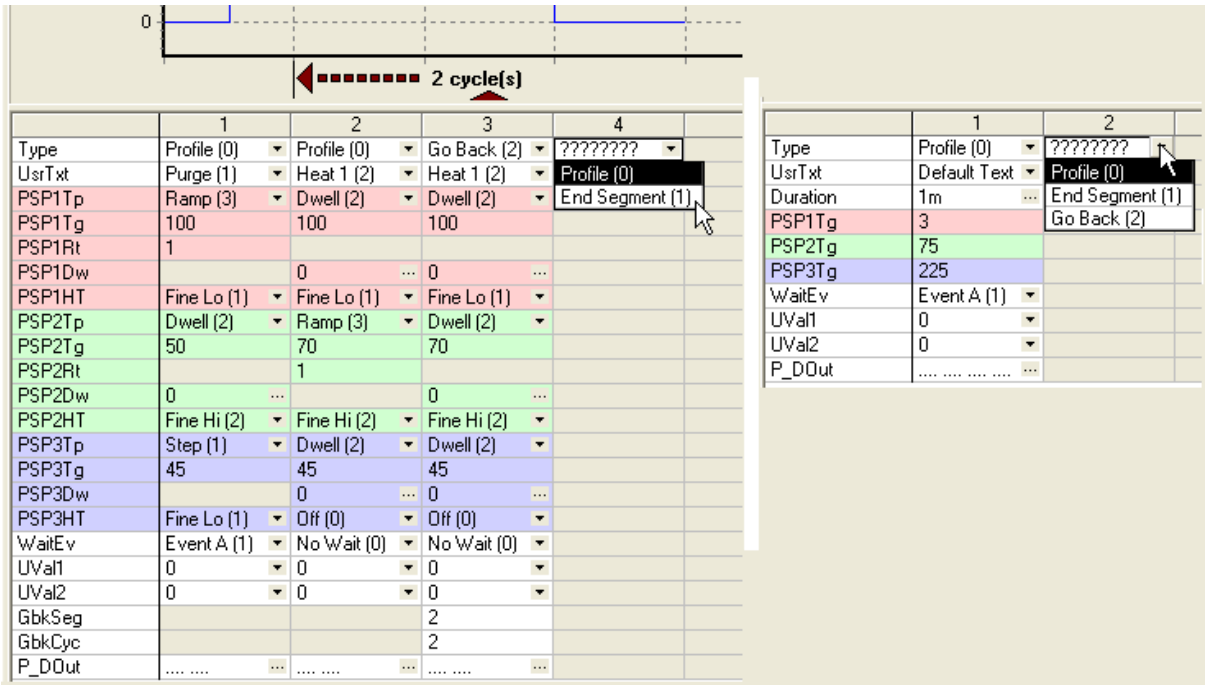
12.1.5. Segment parameters (2704)

SEGMENT TYPE



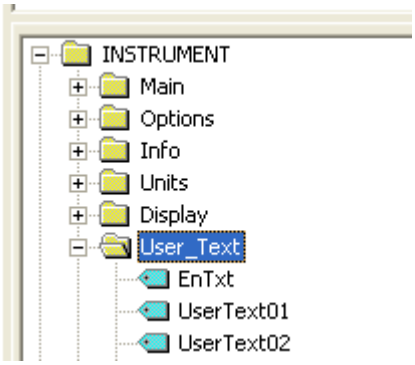
Clicking on the arrow head, produces a list of available segment types. All Segments but the first (illustrated above) also include 'Go Back' as a segment type. Once a type has been selected the display changes to include the relevant parameters for the selected segment type.

The two views below show typical segment parameter lists for the two 'Modes' of operation *viz*: 'Ramp Rate' and 'Time to Target'. Mode selection is defined by 'Mode' in the 'PSP Parameters' tab.



UsrTxt
User Text.

Clicking on the arrow head to the right of 'Default Text', displays a picklist of text strings, one of which may be selected for this segment. These text strings are edited in the INSTRUMENT/ User_Text subfolder.



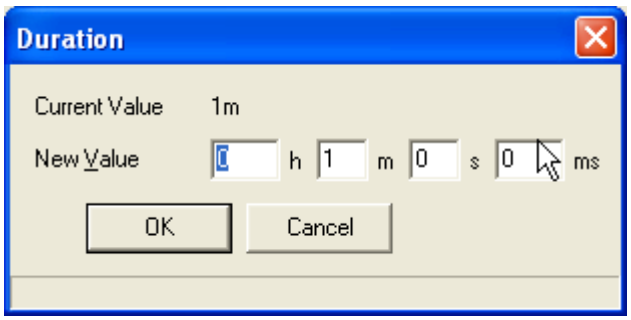
12.1.5 SEGMENT PARAMETERS (2704) (Cont.)

Type
Select a segment type from the picklist, as shown above.

End segment action is set in 'EndAct' in the 'Program Parameters' tab to be either 'Reset' or 'Dwell'.

For Go back details, see GbkSeg, below.

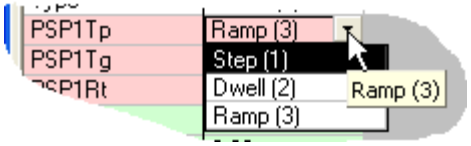
Duration
For Time to Target Mode programs only.



By clicking on the ellipsis button next to 'Duration', the Duration entry box (shown above) appears. This allows the user to set a time for the segment to complete its task.

PSPnTp
Segment type ('n' = 1, 2 or 3).

For Ramp Rate mode only.



Select a Ramp Type of Step, Dwell or Ramp. Subsequent PSP parameters vary according to the Type selected.

PSPnTg
Segment target ('n' = 1, 2 or 3).

This allows the user to type in a target value to which the segment is to ramp. For mode = Time to target, the ramp duration is entered using the 'Duration' parameter described above. For Ramp Rate mode programs, the ramp duration is set in PSPnRt (below).

PSPnRt
Ramp Rate ('n' = 1, 2 or 3).

For Mode = 'Ramp Rate' and PSPnTp = 'Ramp' only.

The speed at which the ramp is to take place is entered here. The units are set as per second, per minute or per hour in 'RateU' to be found in the Program Parameters tab list.

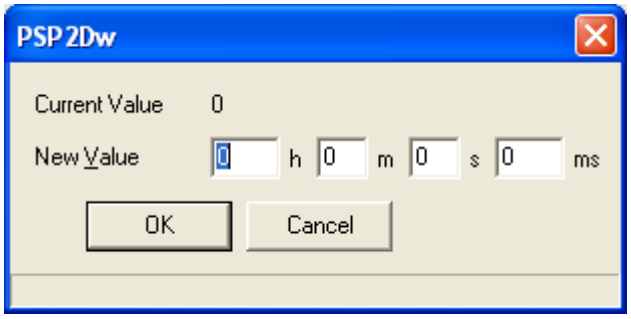
Example: With 'RateU' set to 'per minute', an entry of '2' would mean the ramp takes place in 30 seconds. An entry of '3' would mean the ramp would complete in 20 seconds, and so on.

12.1.5 SEGMENT PARAMETERS (2704) (Cont.)

PSPnDw

Dwell Duration ('n' = 1, 2 or 3).

For Mode = 'Ramp Rate' and PSPnTp = 'Dwell' only.



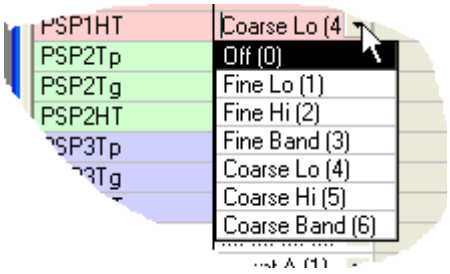
Clicking on the ellipsis button next to the dwell value field causes the Dwell Time entry box (shown above) to appear. This allows the user to set a time for the segment to complete its task.

This value may affect the timing of other PSPs.

PSPnHT
Holdback Type ('n' = 1, 2 or 3).

In holdback mode, the program is 'frozen' if the measured process value (PV) does not track the setpoint (SP) within the user-defined amount. The actual values associated with the list items are editable in the 'Program Parameters' tab list (H1FVal, H2FVal, H3FVal and H1CVal, H2CVal, H3CVal, where 1, 2 and 3 represent the relevant PSP number).

If holdback is enabled (HbkMod in the 'Program Parameters' Tab list), and 'Per Segment' selected, then the user can select the required holdback time for this segment from a drop-down list containing the following: Off, Fine Lo, Fine Hi, Fine Band, Coarse Lo, Coarse Hi and Coarse band.



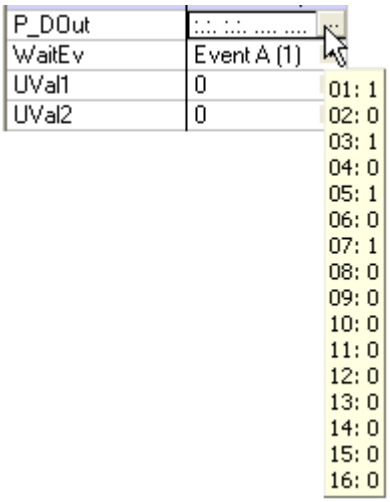
If holdback 'Per Program' is selected (HbkMod in the 'Program Parameters' tab list), then the user can select the required holdback time for all segments in the program from drop-down lists called PSP1HT, PSP2HT and PSP3HT, also in the 'Program Parameters' tab list. The drop-down lists contain the same items as listed above.

12.1.5 SEGMENT PARAMETERS (2704) (Cont.)

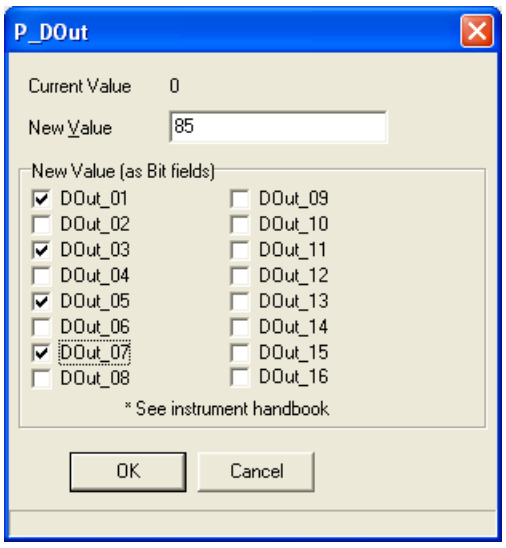
P_DOut

Event outputs are used to drive Relay, Triac or Logic outputs, according to the modules fitted.
The Event Output Status Word (P_DOut) is displayed graphically as two horizontal lines each of up to 16 dots where the dots representing Event output 1 are leftmost. The number of dots in the lower line matches the number of Event outputs entered in the 'NumDos' parameter in the 'PSP Parameters' tab. (Normally, only the maximum number of Event outputs needed is typed-in, in order to minimise display complexity at the 2704 user interface.)
The dots in the upper line show which Event Outputs are to be active, whilst the associated segment is active. The figure below shows that this segment is to have Event Outputs 1, 3, 5 and 7 active.

Hovering the cursor over the ellipsis button displays the status in logical format as shown below, where 1 = active and 0 = inactive.



Clicking on the ellipsis button allows the user to edit the status of each Event Output. The value of the status word is the sum of all the bits set. In this example, with Bits 1, 3, 5 and 7 set, the value of the status word is 1 +4 + 16 +64 = 85.



Event No.	Value when set	Event No.	Value when set
DOut_01	1	DOut_09	256
DOut_02	2	DOut_10	512
DOut_03	4	DOut_11	1024
DOut_04	8	DOut_12	2048
DOut_05	16	DOut_13	4096
DOut_06	32	DOut_14	8192
DOut_07	64	DOut_15	16384
DOut_08	128	DOut_16	32788

12.1.5 SEGMENT PARAMETERS (2704) (Cont.)

WaitEv

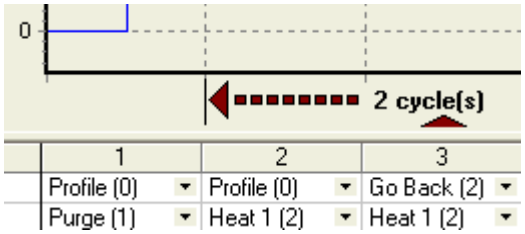
On completion, the segment waits for as long as the selected Wait Event is active.

UVal1/UVal2

Allows the selection of a User Value to be made. User values are associated with the Pattern Generator and are described in the Installation and Operation handbook.

GbkSeg

For 'Go Back' segments only, this allows the user to define the segment to which the program is to go back. Once defined, a graphical interpretation is displayed just below the graph, showing which segment is to be returned-to and how many times the segment(s) included in the go back section are to be run (see GBkCyc, below).

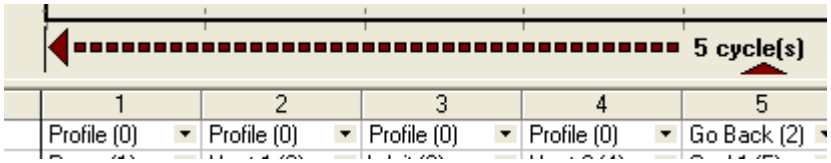


GbkCyc

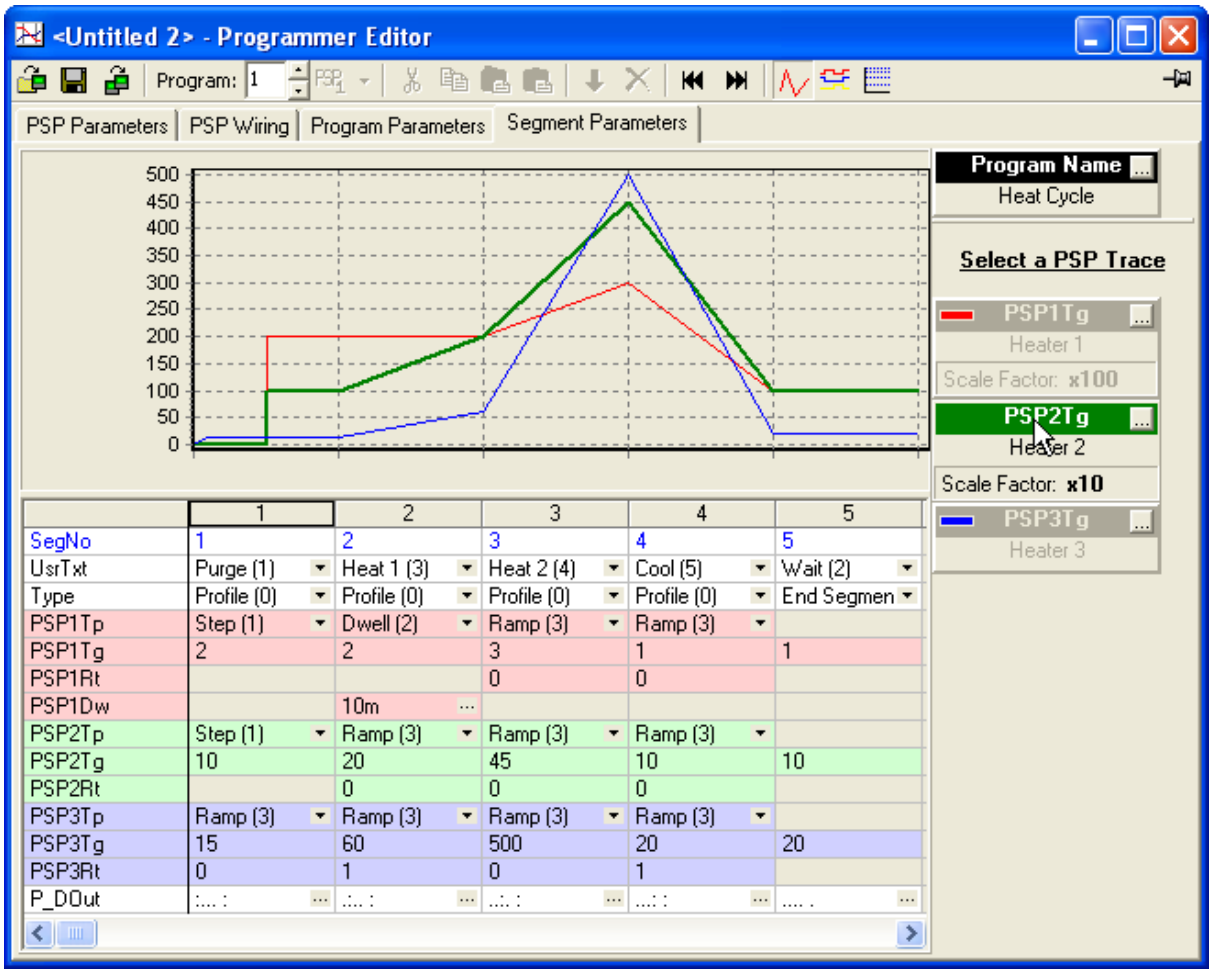
For 'Go Back' segments only, this allows the user to define how many times the segment(s) included in the go back section are to be run (see also GBkSeg, above).

In the example above, segments 2 and 3 run once, and are then repeated twice before segment 4 runs.

In the example below, segments 1 to 5 run once, and are then repeated 5 times (i.e. they are run 6 times in all) before segment 6 executes.



12.1.6. The Graph (2704)



The graph displays the setpoint program segments. As can be seen from the figure above, the traces and parameters reflect the colours of the PSP faceplates.

Clicking on a faceplate (PSP2 in the example above) causes both the faceplate and the associated trace to be highlighted.

As can be seen from PSP1 and PSP 2 in the example above, if traces have widely different values, then the traces with lower values are 'magnified' so that they can be seen more clearly. In the example above, PSP1 trace is magnified by 100 and PSP2 trace is magnified by 10. Obviously, the values in the graph y-axis must be divided by the same factors to give correct values.

A Graph may be printed by pasting it into a standard spreadsheet, and printing it from there. See 'Graph printing' in the Introduction to the Programmer Editor.

LOGARITHMIC SCALES

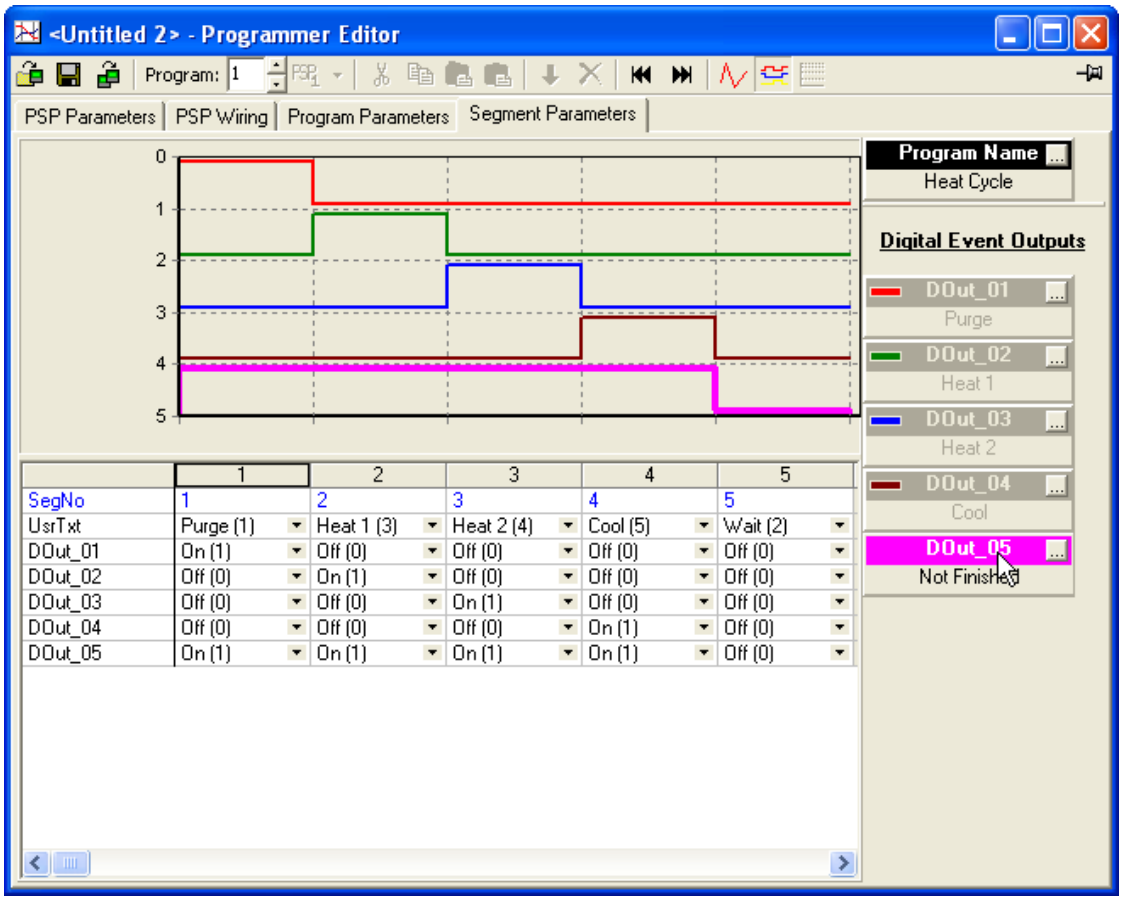
Scales can be chosen as either linear or logarithmic, by using the 'logarithmic' tool (shortcut <Ctrl> + <M>) to switch between the two scale types.

12.1.6 THE GRAPH (2704) (Cont.)

DIGITAL GRAPHS

The examples above show analogue graphs. If Event Outputs are enabled, a digital view of the program can be displayed, by clicking on the 'Digital' tool button , or by using the shortcut <Ctrl> + <D>. The example below shows a display for five Event outputs. See 'P_DOut' in 'Segment Parameters' for more details.

To return to the analogue display, the 'Analog' tool button should be clicked on.



12.1.7. Asynchronous Programmer

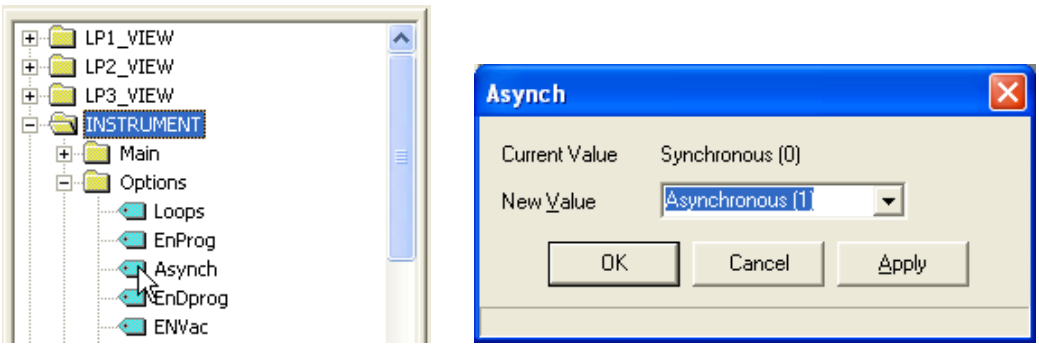
Version 6 and later of the Model 2704 include an asynchronous program mode which allows up to three program setpoints (PSPs) to be driven by separate programmers, The programs can be included in program groups, and the operator can then select and run that group of programs. Alternatively, the user can select a program for each PSP, and start them individually, or as a group.

Notes:

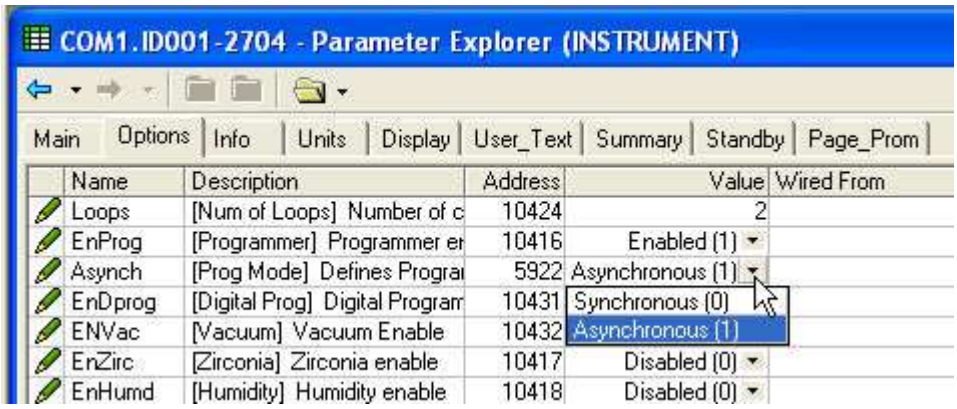
1. Enabling asynchronous mode causes all existing programs to be deleted, so if the existing programs are to be retained, they should be saved.
2. After changing mode, it may be necessary to close, then re-open the programmer before the changes take full effect.

ENTRY TO ASYNCHRONOUS MODE

Once the instrument or clone is active, the Instrument/Options/Asynch can be double clicked in the parameter browse window, and 'Asynchronous' selected in the resulting picklist.

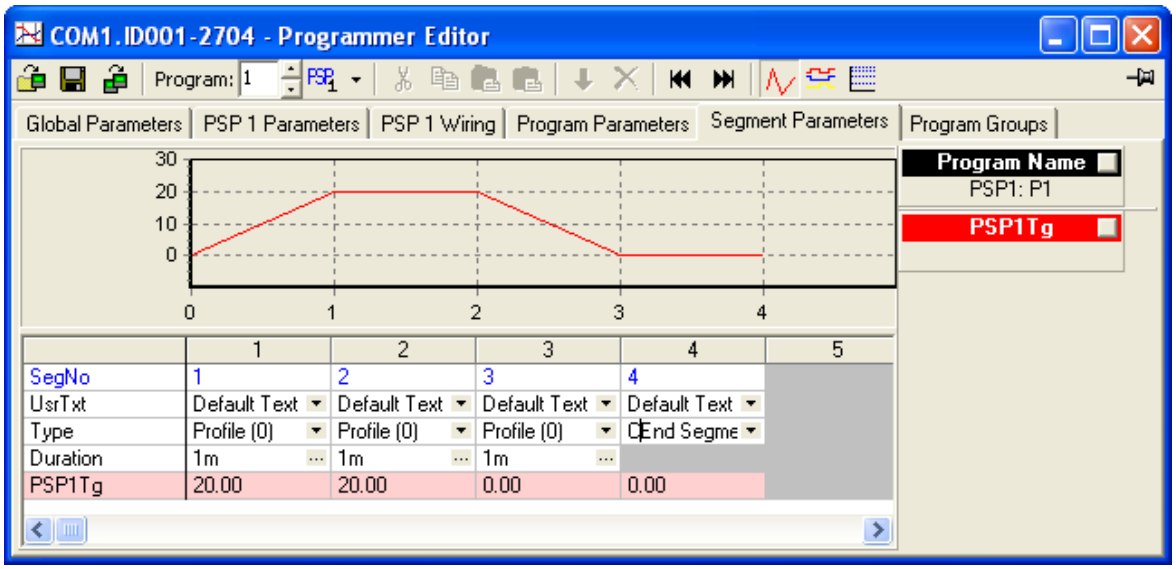


Alternatively, the value can be changed from the Options tab of the Instrument function block view, called by double clicking on Instrument in the Tree view:

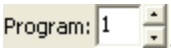


A similar process is carried out to return to Synchronous mode should this be required.

12.1.8. Using the editor in asynchronous mode



Asynchronous mode editing is similar to Synchronous mode editing, described in 'Progam editing'. The basic procedure is as follows:

1. Select the 'Global Parameters' tab and set the program mode (Mode) to 'Ramp Rate' or 'Time-to-Target' as required. Set the number of PSPs (NumPSP) to 1, 2 or 3, as required.
2. Select the 'Segment Parameters' tab. If necessary, select PSP1 using the 'Select asynchronous PSP' tool .
3. Select the required program number using the 'Program Number tool  .
4. Create the required PSP program, as described in 'Program editing'.
5. Repeat for all required PSPs and Programs.
6. Select the 'Program Groups' tab and assign the PSPs to the required Program groups.

DIFFERENCES BETWEEN SYNCHRONOUS AND ASYNCHRONOUS

The following sections describe the differences between the two modes.

Parameter List changes

1. The 'PROGRAM_RUN' list is removed.
2. The three PSP option parameters are shown in 'PSP1-PROFILE', 'PSP2_PROFILE' and 'PSP3_PROFILE'.
3. Programmer options appear in 'PSP1-PROFILE', 'PSP2_PROFILE' and 'PSP3_PROFILE', not in 'PROGRAM_EDIT'.
4. Groups of programs are created and controlled via 'PROGRAM_EDIT/Groups' and 'PROGRAM_EDIT/Group names'

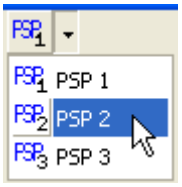
Number of Programs

There are 60 programs available to the user. In synchronous mode, these are called Program 1 to Program 60. In asynchronous mode, each of the PSPs is allocated 20 programs. These are variously called Programs 1 to 20, for each PSP, or Programs 1 to 20 for PSP1, Programs 21 to 40 for PSP2 and Programs 41 to 60 for PSP3.

12.1.8 USING ASYNCHRONOUS MODE (Cont.)

Operator interface

1. An extra tool button is enabled on the toolbar, allowing the user to select PSP1, 2 or 3 for programming.



2. Only one PSP is shown, because each asynchronous program can have only one PSP.
3. The 'PSP Parameters' and' PSP wiring' tab names include the currently selected PSP number. The faceplace is always PSP1.
4. A new tab 'Global Parameters' appears. This tab contains the parameters that are associated with all PSPs.
5. A new tab 'Program Groups' appears which allows the user to allocate the PSPs to program groups. Thus when a program group is run, the PSPs which have been allocated to that group are run. In the example below, if program group 3 were chosen, then PSP1 Program 1, PSP2 Program 5 (25) and PSP3 Program 5 (45) *would be* run.

Asynchronous Program Groups

	PSP1	PSP2	PSP3
Group 1	PSP1: P1 (1)	PSP2: P1 (21)	PSP3: P1 (41)
Group 2	PSP1: P2 (2)	PSP2: P3 (23)	PSP3: P4 (44)
Group 3	PSP1: P1 (1)	PSP2: P5 (25)	PSP3: P5 (45)
Group 4	PSP1: P10 (10)	PSP2: P7 (27)	PSP3: P10 (50)
Group 5	Not Used (0)	Not Used (20)	Not Used (40)
Group 6	Not Used (0)	Not Used (20)	Not Used (40)
Group 7	Not Used (0)	Not Used (20)	Not Used (40)
Group 8	Not Used (0)	Not Used (20)	Not Used (40)
Group 9	Not Used (0)	Not Used (20)	Not Used (40)
Group 10	Not Used (0)	Not Used (20)	Not Used (40)
Group 11	Not Used (0)	Not Used (20)	Not Used (40)
Group 12	Not Used (0)	Not Used (20)	Not Used (40)
Group 13	Not Used (0)	Not Used (20)	Not Used (40)
Group 14	Not Used (0)	Not Used (20)	Not Used (40)
Group 15	Not Used (0)	Not Used (20)	Not Used (40)

PSP / Program / Group relationship

The twenty programs associated with each PSP are independent of each other, and of all the programs associated with other PSPs, except in the relationship defined in the Program Groups database. For example, PSP1 Program 1, PSP2 program 1 and PSP3 program 1 are entirely independent, unless they are placed in the same Program group.

Saving / Loading asynchronous programs

Each program is saved and loaded individually. It is not possible to save or load groups of parameters in one step.

Groups are saved in the instrument clone file. The editor cannot save groups separately.

12.2. USER PAGE EDITOR

12.2.1. 2704 User Page Editor

INTRODUCTION

The User Page Editor provides templates to allow the user to create screens to appear at the 2704 display, by assigning parameters to locations on the screen. 'Live' mode simulates the appearance of the actual display.

There are eight user-definable pages available, and each page can be configured to show parameter values in one of seven styles. Pages are edited in the User Screen Tab. The User List tab displays up to ten 'Promote Parameters'.

The User Page Editor is opened by:

1. Clicking on the 'User Pages Editor' tool button

in the 'Views' toolbar.
2. Selecting 'User Pages' from the Views menu
3. Using the shortcut <Alt> + <U>
4. Right clicking over the relevant instrument faceplate, and selecting 'User Pages' from the resulting context menu.

The editor opens in whatever style Page 1 is set to. For new clones or instruments, the default style is Parameter List.

ADDING PARAMETERS

No matter which style of display is chosen (apart from blank), and providing the conditions below are met, parameters can be dragged from anywhere in iTools into any parameter position. If a parameter already exists in the dragged-to location, it is overwritten.

Note: The dragged-to screen location becomes the 'selected parameter'.

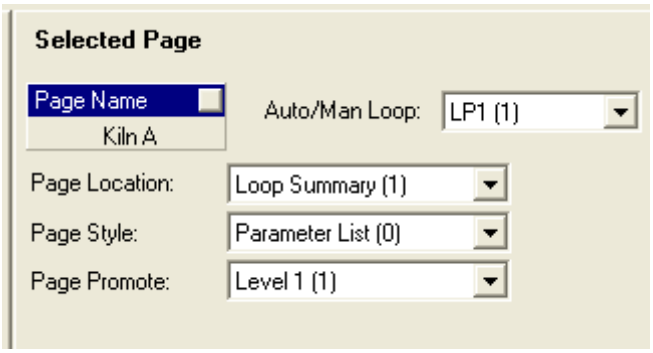
Alternatively, the Edit wiring tool button , the 'Pages' menu item in the iTools main menu, the context menu (right click) or the shortcut <Ctrl> + <E> can be used.

Conditions

1. The device must be in configuration mode, otherwise 'Edit' mode is not available.
2. The User screen must be in Edit mode, not in Live mode. Live and edit are toggled between using the 'Show live data'/'Return to editor' tool button in the toolbar, by selecting 'Show live data'/'Return to editor' from the 'Pages' menu, or by using the shortcut <Ctrl> + <L>.

12.2.1 2704 USER PAGE EDITOR (Cont.)

SELECTED PAGE



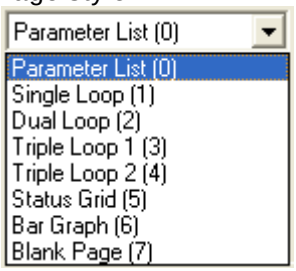
A panel to the right of the device 'faceplate' allows Page details to be configured.

Page Name
Clicking in this area calls the user text dialogue box, allowing the user to select one of 100 text strings for the page name. These text strings are entered in the Instrument/User_Text folder in the parameter browse list.

Auto/man Loop:
Allows the user to select None, LP1, Lp2 or Lp3. Defines which page the Auto/Man(ual) key is to be associated with.

Page Location:
Select 'None', 'Loop Summary' or 'Main Page' for the User Page location at the 2704 user interface.
None = Page is hidden
Main Page = Page name appears in the main configuration menu, immediately below 'User Pages'.
Loop Summary = Page found by one or more operations of the 'Loop' front panel control button.

Page Style:



Allows the user to select a style for the selected user page. See Parameter List style, Single Loop style, Dual Loop style, Triple Loop style 1, Triple Loop style 2, Status Grid style, Bar Graph style, for further details.

The Blank Page style is used to 'hide' other displays until needed.

Note: The Parameter List style differs from other styles in that it shows the 'Promotion Parameter' list in the main display area (i.e. the user screen).
Each of the other styles (except 'Blank') includes a display area, near the bottom of the screen, in which one of the promotion parameters is displayed. The default is the first parameter in the promotion Parameter List, but scroll buttons allow any one of the 10 parameters to be chosen. The full list can be viewed by clicking on the 'User List' tab.

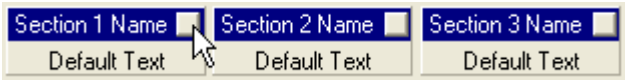
12.2.1 2704 USER PAGE EDITOR (Cont.)

Page Promote:
Allows the user to select the access level(s) at which the page may be viewed.

Graph Style:
This appears only for User pages incorporating bargraphs etc.

Allows 'Absolute' or 'Error' to be selected for graphical elements.
Absolute starts at the bottom and grows upwards.
Error starts at zero, but Error type graphs are scaled by GraphLo and GraphHi (in the 'Selected Parameter' area), thus allowing the zero point to be offset to allow positive and negative excursions to be shown. The Graph end points can also be set up in the 'LPn_SETUP/Display' folder, parameters GraLo and GraHi.

Section name
These controls appear only if the page style is dual or triple loop. Double clicking anywhere in the control or single clicking in the ellipsis box allows the user to select a text string from the User_Text subfolder, to act as a section name.



SELECTED PARAMETER

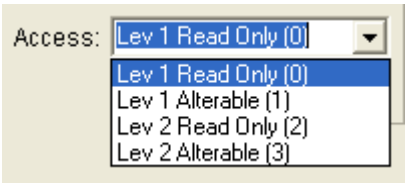
This panel area displays details of the currently selected (clicked-on) parameter.

User Text
Clicking in this area calls the user text picklist, allowing the user to select one of 100 text strings for the parameter name. These text strings are entered in the Instrument/User_Text subfolder in the Parameter Browse List.

The user text dialogue box can also be called by clicking on the 'Edit user text for selected parameter' tool , or by using the short cut <Ctrl> + <T>. This allows an individual entry to be selected or edited, to become the new parameter name.

Graph Lo / Graph Hi
These controls appear only for 'Bargraph' display style and allow endpoints for the relevant parameter's graphical display to be entered.

Access



This field appears only in the User List Tab View, or for 'promote parameters' and allows the user to select a required access level for each parameter. Access levels and their passwords are set in the ACCESS folder.

12.2.2. Promote Parameters

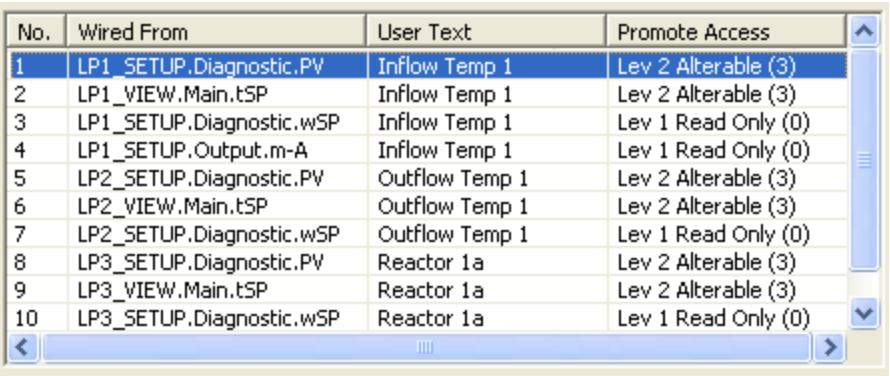
The (up to 10) parameters displayed when the 'User List' tab is clicked-on are called Promote parameters. In each style (except 'Parameter List' and 'Blank Page') there is an area near the bottom of the User Screen display in which one of these Promote Parameters is displayed.

As shown in the figure below (for edit mode), the User list parameter number (2) and the parameter mnemonic (AL_2) appear, along with a pair of scroll buttons. These scroll buttons are used to select the required promote parameter for display. Alternatively, a replacement parameter can be displayed by dragging it into the display area. Such an action automatically updates the User List.

The 'Live' mode display is similar, but the User List parameter number disappears, and the parameter name and value are displayed instead of just the mnemonic. Again, the scroll buttons are used to select the required promote parameter for display.

12.2.3. User List Tab

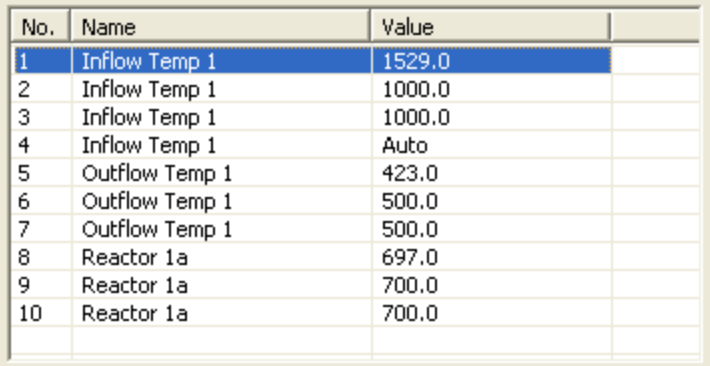
Note: the figure below is a composite view of the User List (Edit mode) - it is not possible to view the full width of this window in iTools.



No.	Wired From	User Text	Promote Access
1	LP1_SETUP.Diagnostic.PV	Inflow Temp 1	Lev 2 Alterable (3)
2	LP1_VIEW.Main.tSP	Inflow Temp 1	Lev 2 Alterable (3)
3	LP1_SETUP.Diagnostic.wSP	Inflow Temp 1	Lev 1 Read Only (0)
4	LP1_SETUP.Output.m-A	Inflow Temp 1	Lev 1 Read Only (0)
5	LP2_SETUP.Diagnostic.PV	Outflow Temp 1	Lev 2 Alterable (3)
6	LP2_VIEW.Main.tSP	Outflow Temp 1	Lev 2 Alterable (3)
7	LP2_SETUP.Diagnostic.wSP	Outflow Temp 1	Lev 1 Read Only (0)
8	LP3_SETUP.Diagnostic.PV	Reactor 1a	Lev 2 Alterable (3)
9	LP3_VIEW.Main.tSP	Reactor 1a	Lev 2 Alterable (3)
10	LP3_SETUP.Diagnostic.wSP	Reactor 1a	Lev 1 Read Only (0)

The User List Tab allows all the promote parameters for the associated User Page to be displayed simultaneously.

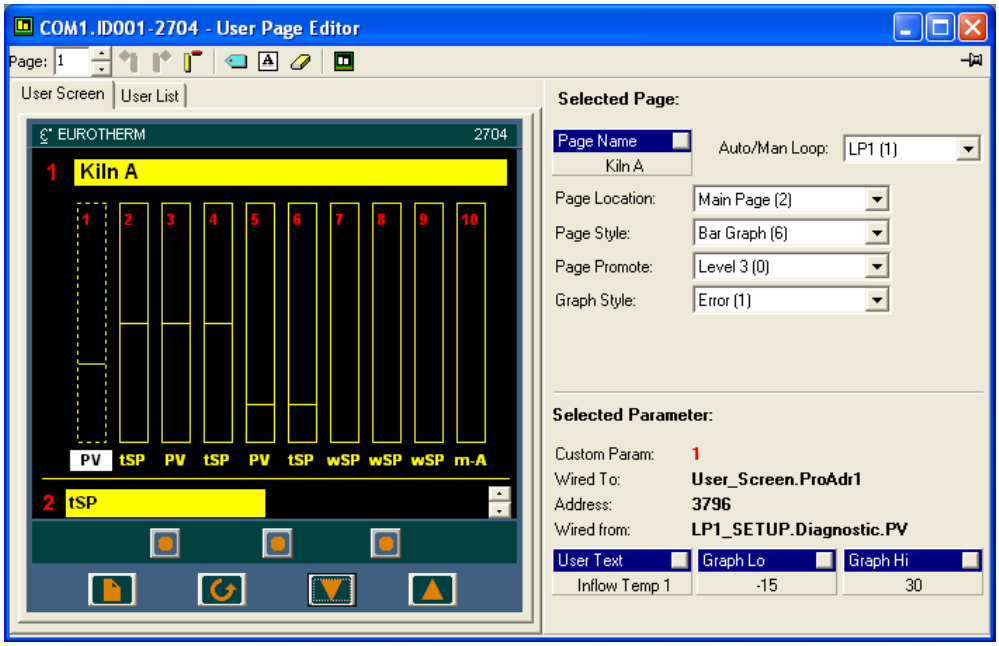
In Edit mode, User Text and Access level can be edited using the 'Selected Parameter' panel. In Live Data mode, the list appears as shown below, giving the parameters' User Text names and associated live values.



No.	Name	Value
1	Inflow Temp 1	1529.0
2	Inflow Temp 1	1000.0
3	Inflow Temp 1	1000.0
4	Inflow Temp 1	Auto
5	Outflow Temp 1	423.0
6	Outflow Temp 1	500.0
7	Outflow Temp 1	500.0
8	Reactor 1a	697.0
9	Reactor 1a	700.0
10	Reactor 1a	700.0

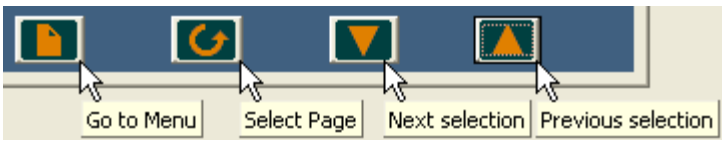
12.2.4. Styles

BARGRAPH



This provides a view of a Bar Graph style, used to display analogue values. Parameters can be dragged to the relevant positions on the page, or they can be inserted using the Edit wiring tool button or 'Pages' menu item or by using the shortcut <Ctrl> + <E> or the Context (right-click) menu.
A maximum of 10 bars can be shown. Bars can be added (up to a maximum of 10) or deleted, using the toolbar tool buttons, or the relevant selections from the Pages menu or Context menu.
The figure above shows the style, in edit mode. The live data screen is described below.
As can be seen above, the display screen is divided into a number of areas. Each of these areas is covered by a separate topic:

1. The user screen itself which shows a Model 2704 faceplate. Parameters can be dragged into the display from any other area of iTools.
   The Control buttons (below) can be used to navigate through the pages and the page items. The 'Go to Menu' button calls the main menu, from which any one of the eight User Pages can be selected for view, either by double clicking on the menu item, or by clicking on the 'Select Page' control button.

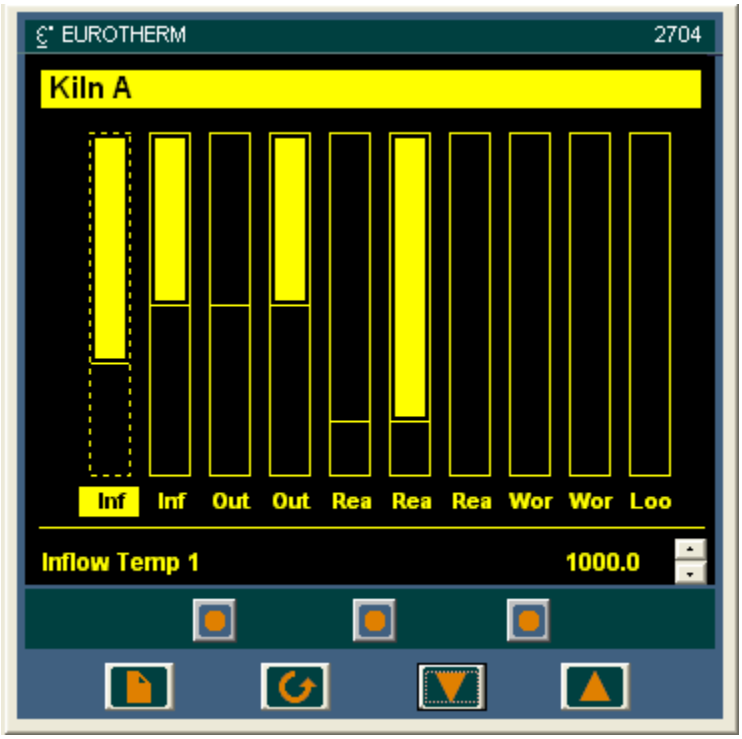


2. Selected Page area. This allows the currently selected page to be configured. See Selected Page for more details.
3. Selected Parameter area. This gives details of the currently selected parameter. See Selected Parameter for more details.
4. User pages toolbar

. See 'Pages Toolbar' for further details.
5. User List Tab. See 'User List Tab' for further details.
6. Promote parameter. See 'Promote Parameters' for details

12.2.4 STYLES (BARGRAPH) (Cont.)

LIVE DATA SCREEN



As can be seen, the live data screen is similar to the Edit screen, but this time the bargraphs are active.

Default Parameter names are displayed or, if any parameter has been re-named, then the new name appears here.

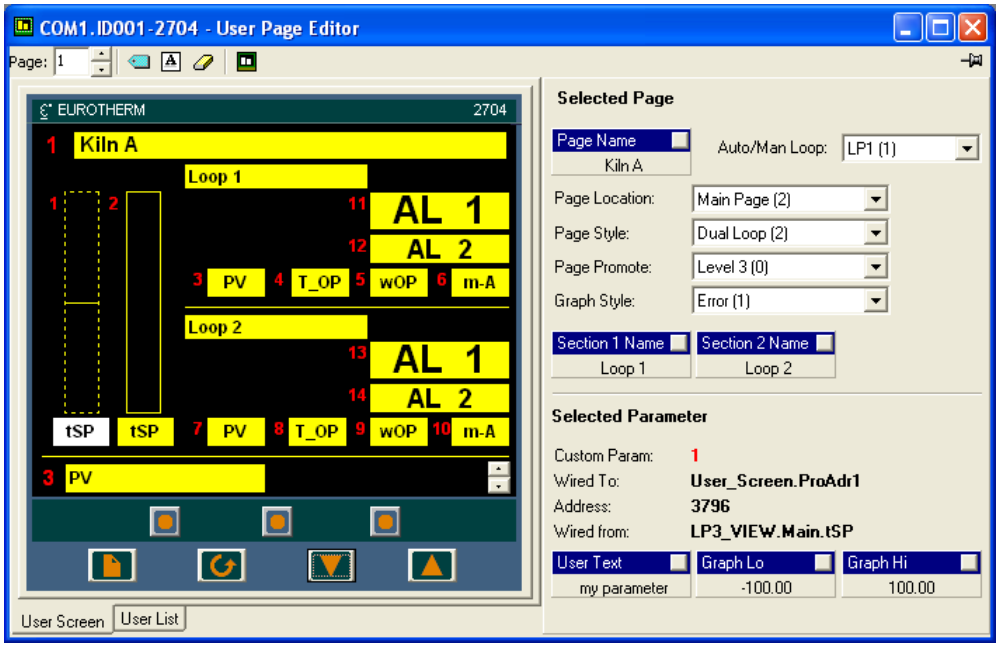
See 'Selected Parameter' for details of how to re-name the parameter.

Promotion Parameters
The User List tab contains up to 10 parameters, which may be the same as or different from the parameters at the display. These parameters are called Promotion parameters, and appear in the Parameter List User page.

One of these parameters is displayed at the bottom of the device screen, as shown above. The up/d0wn arrows allow the user to scroll through the promotion parameters, one at a time, as required.

12.2.4 STYLES (Cont.)

DUAL LOOP STYLE

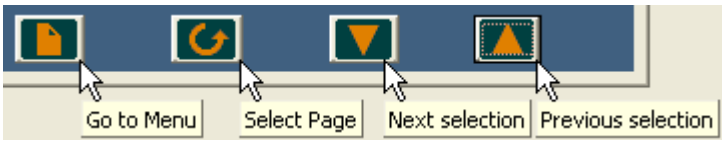


This provides a view of a dual loop program. Parameters can be dragged to the relevant positions on the page, or they can be inserted using the Edit wiring tool button or 'Pages' menu item or by using the short-cut <Ctrl> + <E>.

The figure above shows Dual Loop style, in edit mode. The live data screen is described below.

As can be seen above, the display screen is divided into a number of areas. Each of these areas is covered by a separate topic:

1. The user screen itself which shows a Model 2704 faceplate. Parameters can be dragged into the display from any other area of iTools.
   The Control buttons (below) can be used to navigate through the pages and the page items. The 'Go to Menu' button calls the main menu, from which any one of the eight User Pages can be selected for view, either by double clicking on the menu item, or by clicking on the 'Select Page' control button.

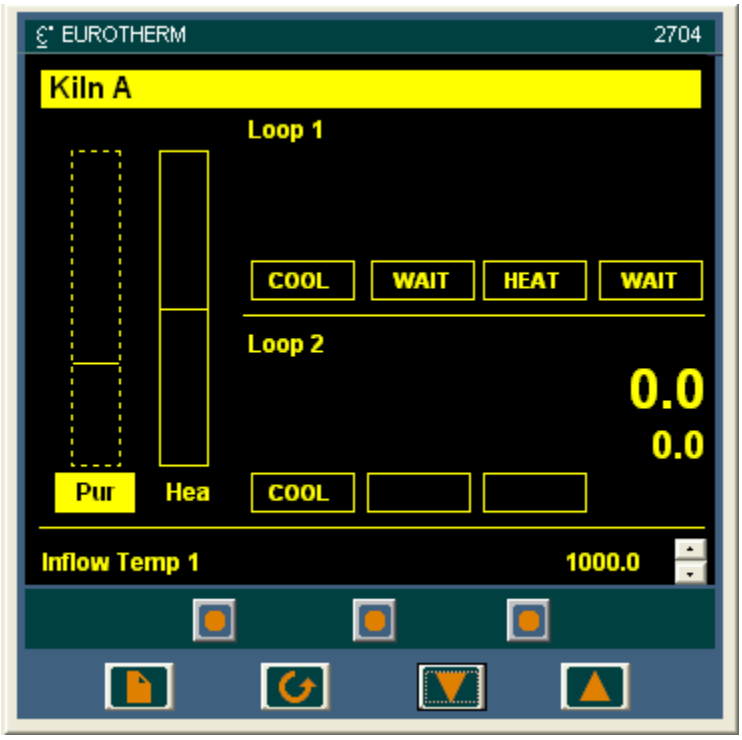


2. Selected Page area. This allows the currently selected page to be configured. See Selected Page for more details.
3. Selected Parameter area. This gives details of the currently selected parameter. See Selected Parameter for more details.
4. User pages toolbar

. See 'pages Toolbar' for further details.
5. User List Tab. See 'User List Tab' for further details.
6. Promote Parameter. See 'Promote Parameters' for details.

12.2.4 STYLES (Cont.)

LIVE DATA SCREEN



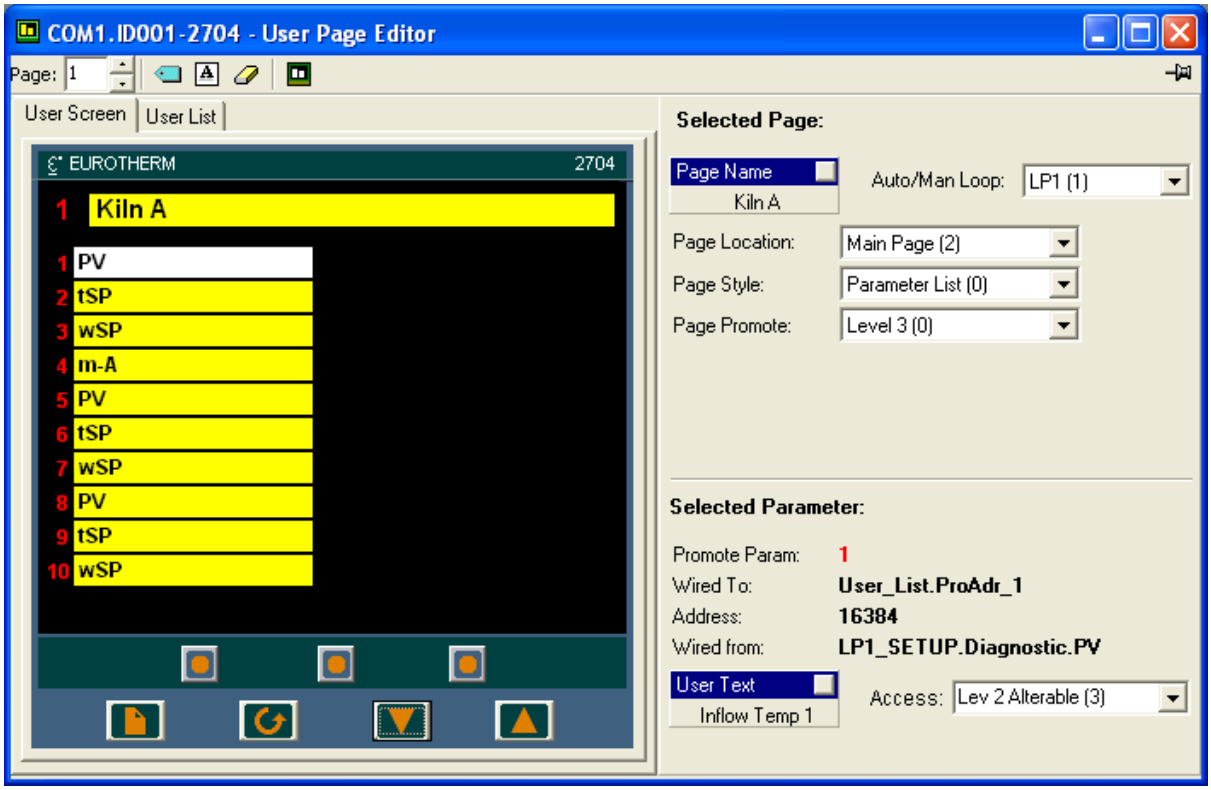
As can be seen, the live data screen is similar to the Edit screen, but this time with instantaneous values displayed for each parameter.

Default Parameter names are displayed or, if any parameter has been re-named, then the new name appears here.

See 'Selected Parameter' for details of how to re-name the parameter.

12.2.4 STYLES (Cont.)

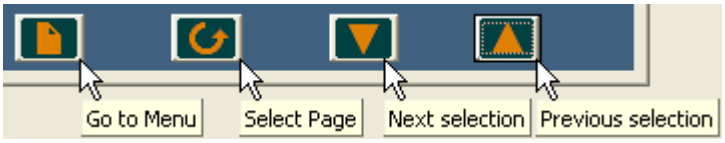
PARAMETER LIST STYLE



The figure above shows a parameter list style page, in edit mode. The live data screen is discussed below.

As can be seen above, the display screen is divided into a number of areas. Each of these areas is covered by a separate topic:

1. The user screen itself which shows a Model 2704 faceplate with space for up to 10 'promote parameters'. Parameters can be dragged into the display from any other area of iTools. This list and the User list are identical for this display style.
   The Control buttons (below) can be used to navigate through the pages and the page items. The 'Go to Menu' button calls the main menu, from which any one of the eight User Pages can be selected for view, either by double clicking on the menu item, or by clicking on the 'Select Page' control button.



2. Selected Page area. This allows the currently selected page to be configured. See Selected Page for more details.
3. Selected Parameter area. This gives details of the currently selected parameter. See Selected Parameter for more details.
4. User pages toolbar

. See 'Pages Toolbar' for further details.
5. User List Tab. See 'User List Tab' for further details.

12.2.4 STYLES (Cont.)

LIVE DATA SCREEN

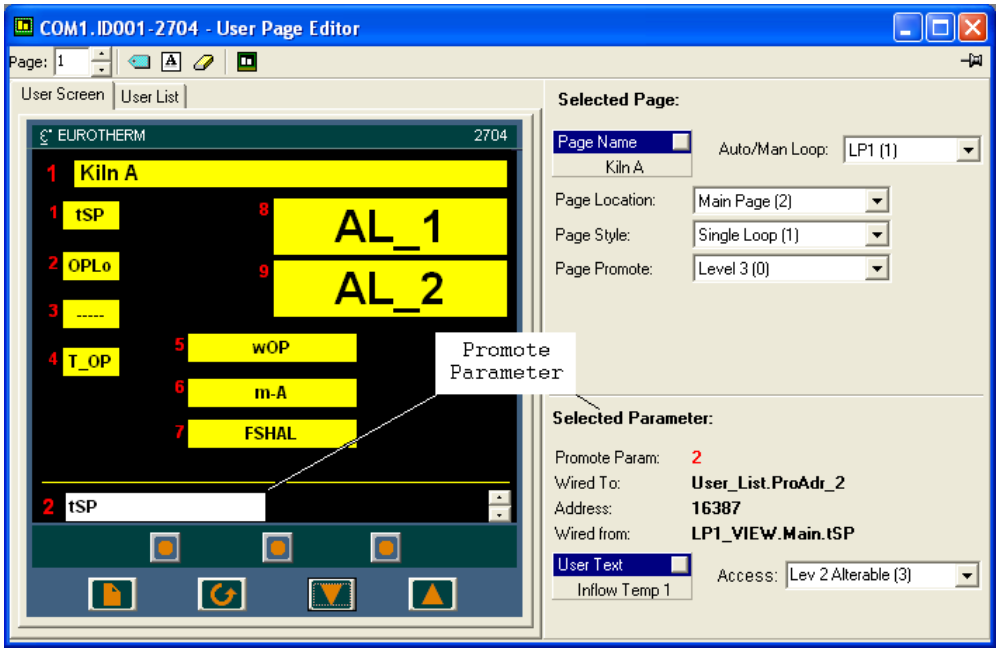
As can be seen, the live data screen shows the same parameter list, but this time with live values displayed for each parameter.

Parameter names are displayed with their full default text, or, if any parameter has been re-named, as in parameter 7 (Purge), above, then the new name appears here.

See 'Selected Parameter' for details of how to re-name the parameter.

12.2.4 STYLES (Cont.)

SINGLE LOOP STYLE

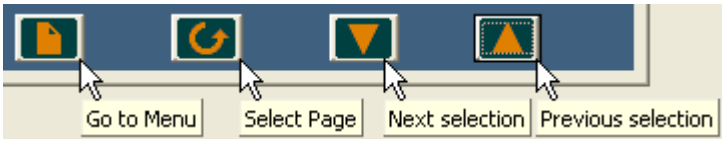


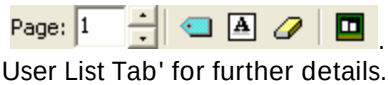
This provides a view of a single loop program. Parameters can be dragged to the relevant positions on the page, or they can be inserted using the Edit wiring tool button or 'Pages' menu item or by using the short-cut <Ctrl> + <E>.

The figure above shows Single Loop style, in edit mode. The live data screen is described below.

As can be seen above, the display screen is divided into a number of areas. Each of these areas is covered by a separate topic:

1. The user screen itself which shows a Model 2704 faceplate. Parameters can be dragged into the display from any other area of iTools.
   The Control buttons (below) can be used to navigate through the pages and the page items. The 'Go to Menu' button calls the main menu, from which any one of the eight User Pages can be selected for view, either by double clicking on the menu item, or by clicking on the 'Select Page' control button.

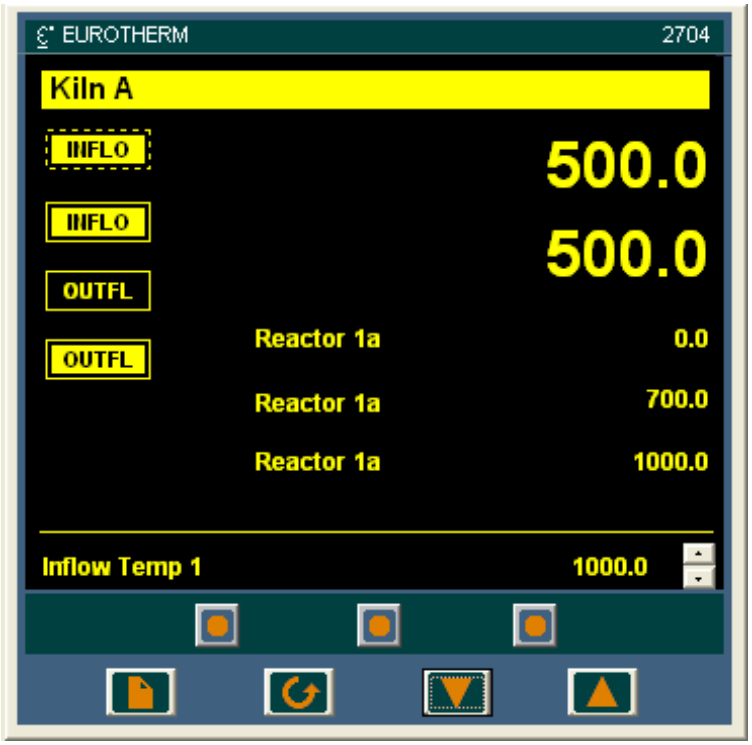


2. Selected Page area. This allows the currently selected page to be configured. See Selected Page for more details.
3. Selected Parameter area. This gives details of the currently selected parameter. See Selected Parameter for more details.
4. User pages toolbar 

. See 'Pages Toolbar' for further details.
5. User List Tab. See 'User List Tab' for further details.
6. Promote parameter. See 'Promote Parameters' for details

12.2.4 STYLES (Cont.)

LIVE DATA SCREEN



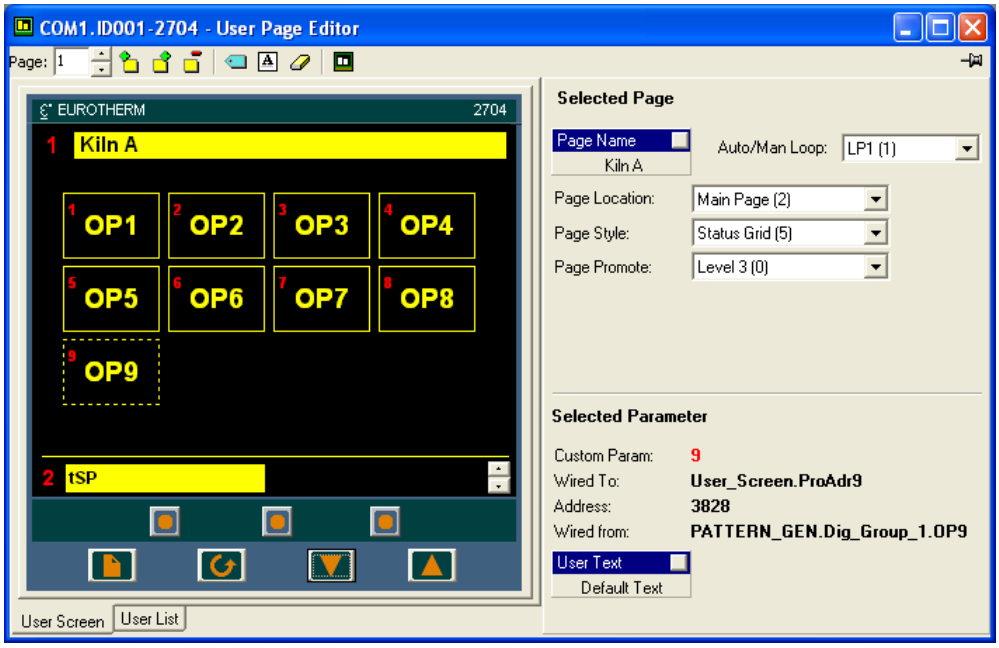
As can be seen, the live data screen is similar to the Edit screen, but this time with live values displayed for each parameter.

Default Parameter names are displayed or, if any parameter has been re-named, then the new name appears here.

See 'Selected Parameter' for details of how to re-name the parameter.

12.2.4 STYLES (Cont.)

STATUS GRID



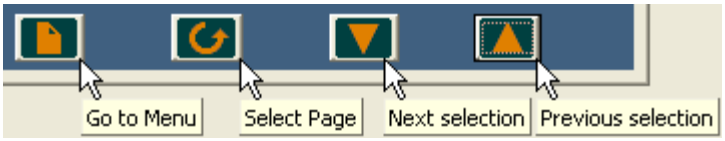
This provides a view of a status grid style, used to display the on/off status of digital values. Parameters can be dragged to the relevant positions on the page, or they can be inserted using the Edit wiring tool button or 'Pages' menu item or by using the shortcut <Ctrl> + <E>.

A maximum of 12 items can be shown. Parameters can be added (up to a maximum of 12) or deleted, using the toolbar tools, or the relevant selections from the Pages menu or by dragging.

The figure above shows the style, in edit mode. The live data screen is described below.

As can be seen above, the display screen is divided into a number of areas. Each of these areas is covered by a separate topic:

1. The user screen itself which shows a Model 2704 faceplate with space for up to 12 parameters'. Parameters can be dragged into the display from any other area of iTools.
   The Control buttons (below) can be used to navigate through the pages and the page items. The 'Go to Menu' button calls the main menu, from which any one of the eight User Pages can be selected for view, either by double clicking on the menu item, or by clicking on the 'Select Page' control button.

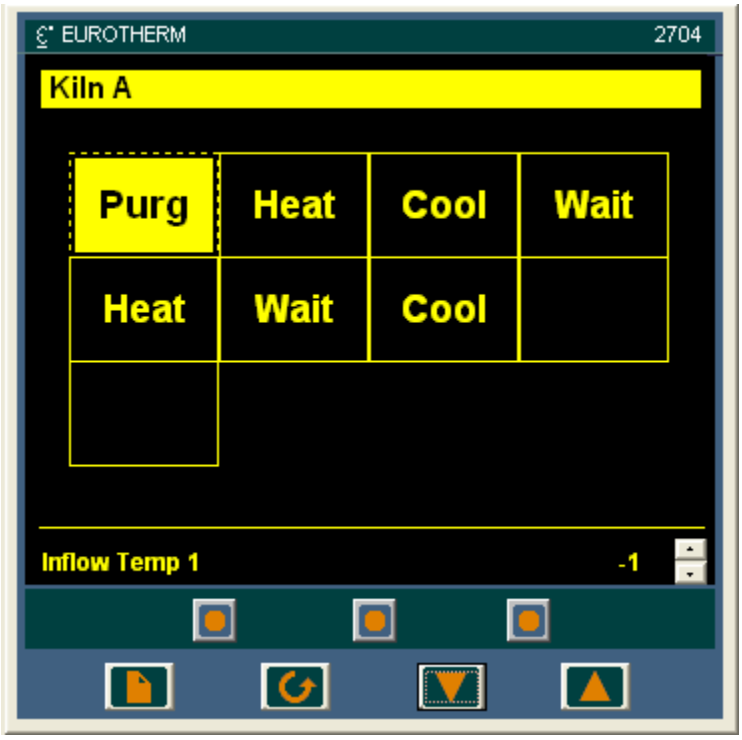


2. Selected Page area. This allows the currently selected page to be configured. See Selected Page for more details.
3. Selected Parameter area. This gives details of the currently selected parameter. See Selected Parameter for more details.
4. User pages toolbar

. See 'Pages Toolbar' for further details.
5. User List Tab. See 'User List Tab' for further details.
6. Promote parameter. See 'Promote Parameters' for details

12.2.4 STYLES (Cont.)

LIVE DATA SCREEN



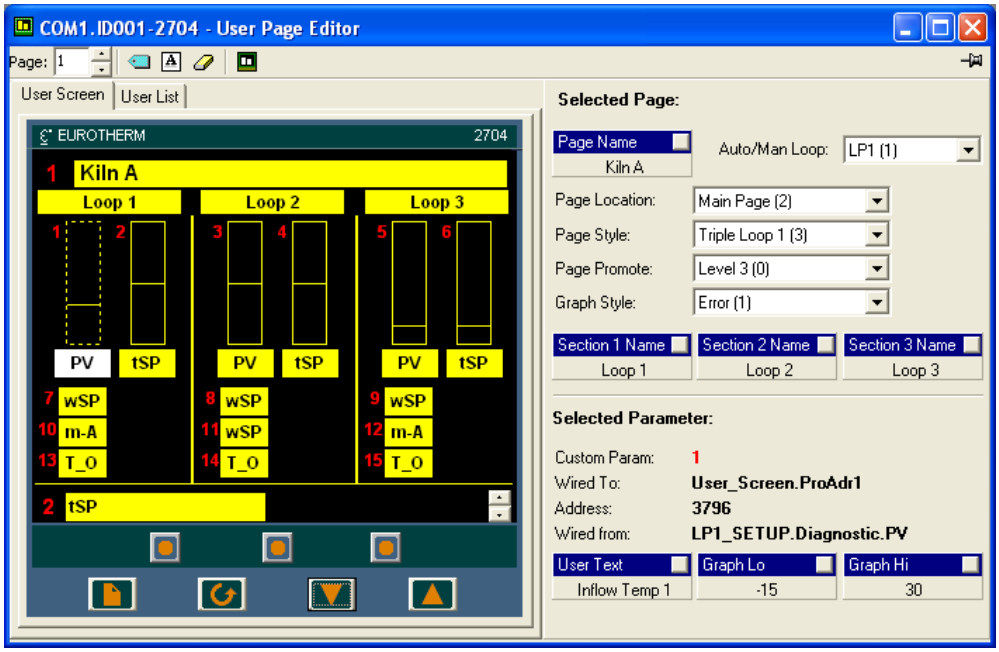
As can be seen, the live data screen is similar to the Edit screen, but 'On' (non-zero) parameters are high-lighted yellow, and 'Off' (zero) parameters remain in black.

Text strings appear only for parameters that have been re-named, otherwise, the areas are blank.

See 'Selected Parameter' for details of how to re-name the parameter.

12.2.4 STYLES (Cont.)

TRIPLE LOOP STYLE 1

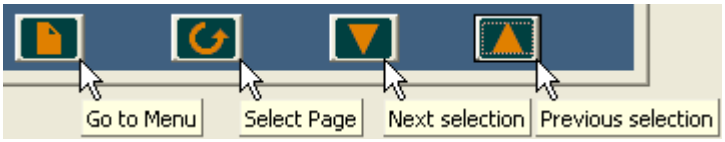


This provides a view of a triple loop style 1 program. Parameters can be dragged to the relevant positions on the page, or they can be inserted using the Edit wiring tool button or 'Pages' menu item or by using the shortcut <Ctrl> + <E>.

The figure above shows the style, in edit mode. The live data screen is described below.

As can be seen above, the display screen is divided into a number of areas. Each of these areas is covered by a separate topic:

1. The user screen itself which shows a Model 2704 faceplate. Parameters can be dragged into the display from any other area of iTools.
   The Control buttons (below) can be used to navigate through the pages and the page items. The 'Go to Menu' button calls the main menu, from which any one of the eight User Pages can be selected for view, either by double clicking on the menu item, or by clicking on the 'Select Page' control button.

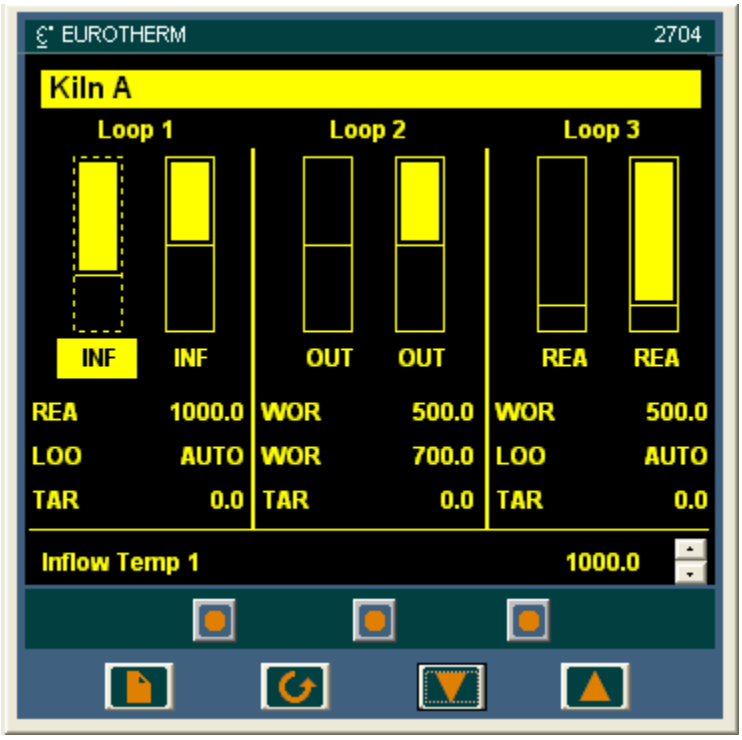


2. Selected Page area. This allows the currently selected page to be configured. See Selected Page for more details.
3. Selected Parameter area. This gives details of the currently selected parameter. See Selected Parameter for more details.
4. User pages toolbar

. See 'Pages Toolbar' for further details.
5. User List Tab. See 'User List Tab' for further details.
6. Promote parameter. See 'Promote Parameters' for details

12.2.4 STYLES (Cont.)

LIVE DATA SCREEN



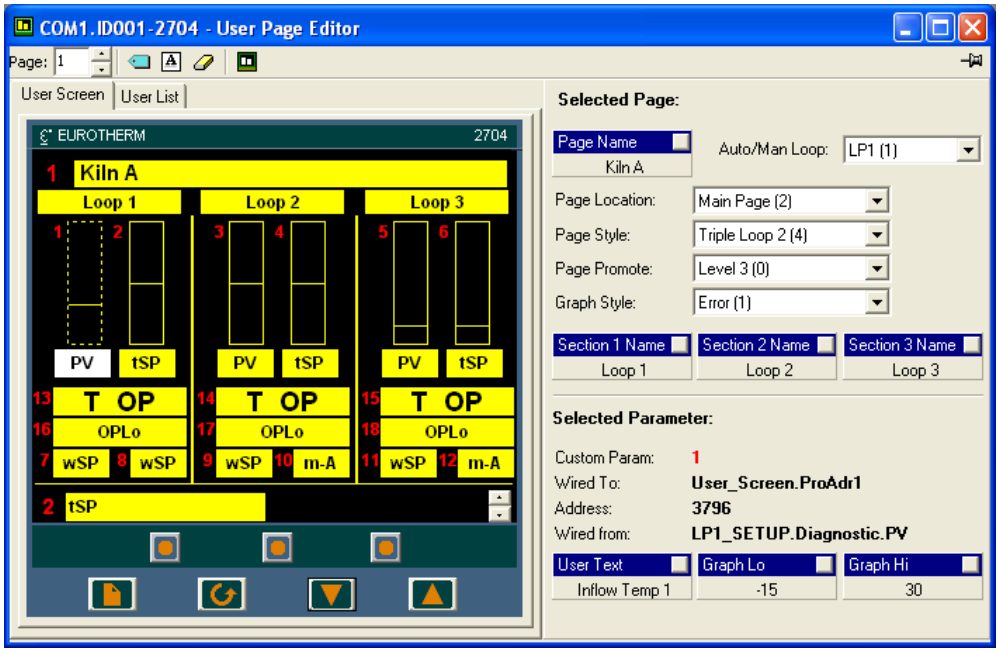
As can be seen, the live data screen is similar to the Edit screen, but this time with instantaneous values displayed for each parameter.

Default Parameter names are displayed or, if any parameter has been re-named, then the new name appears here.

See 'Selected Parameter' for details of how to re-name the parameter.

12.2.4 STYLES (Cont.)

TRIPLE LOOP STYLE 2

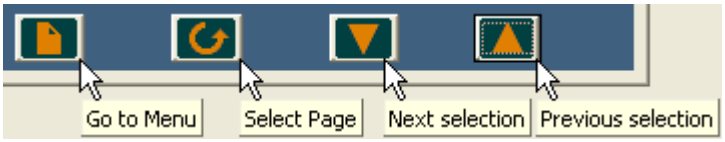


This provides a view of a triple loop style 2 program. Parameters can be dragged to the relevant positions on the page, or they can be inserted using the Edit wiring tool button or 'Pages' menu item or by using the shortcut <Ctrl> + <E>.

The figure above shows the style, in edit mode. The live data screen is described below.

As can be seen above, the display screen is divided into a number of areas. Each of these areas is covered by a separate topic:

1. The user screen itself which shows a Model 2704 faceplate. Parameters can be dragged into the display from any other area of iTools.
   The Control buttons (below) can be used to navigate through the pages and the page items. The 'Go to Menu' button calls the main menu, from which any one of the eight User Pages can be selected for view, either by double clicking on the menu item, or by clicking on the 'Select Page' control button.

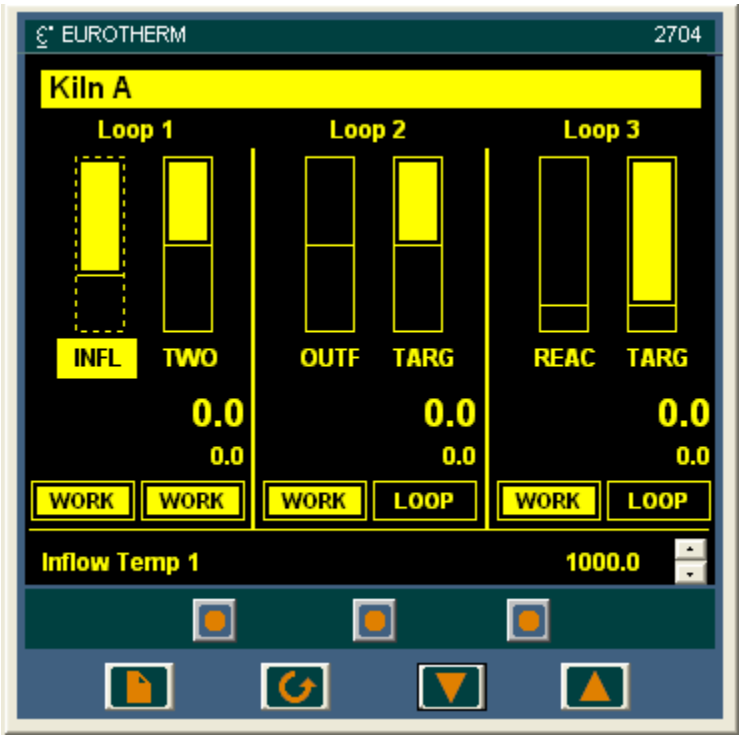


2. Selected Page area. This allows the currently selected page to be configured. See Selected Page for more details.
3. Selected Parameter area. This gives details of the currently selected parameter. See Selected Parameter for more details.
4. User pages toolbar

. See 'Pages Toolbar' for further details.
5. User List Tab. See 'User List Tab' for further details.
6. Promote parameter. See 'Promote Parameters' for details.

12.2.4 STYLES (Cont.)

LIVE DATA SCREEN



As can be seen, the live data screen is similar to the Edit screen, but this time with instantaneous values displayed for each parameter.

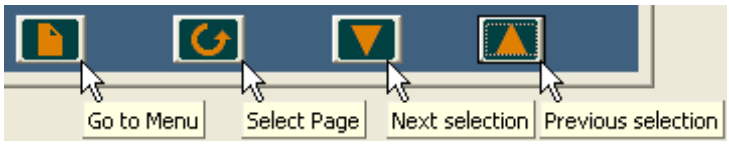
Default Parameter names are displayed or, if any parameter has been re-named, then the new name appears here.

See 'Selected Parameter' for details of how to re-name the parameter.

Promotion Parameters
The User List tab contains up to 10 parameters, which may be the same as or different from the parameters at the display. These parameters are called Promotion parameters.

One of these parameters is displayed at the bottom of the device screen, as shown above. The up/d0wn arrows allow the user to scroll through the promotion parameters, one at a time, as required.

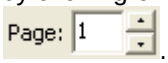
12.2.5. Go to Menu Control Button



When the User Pages Editor is the active editor, The Go to Menu control button calls the top level User Pages menu, depicted below.

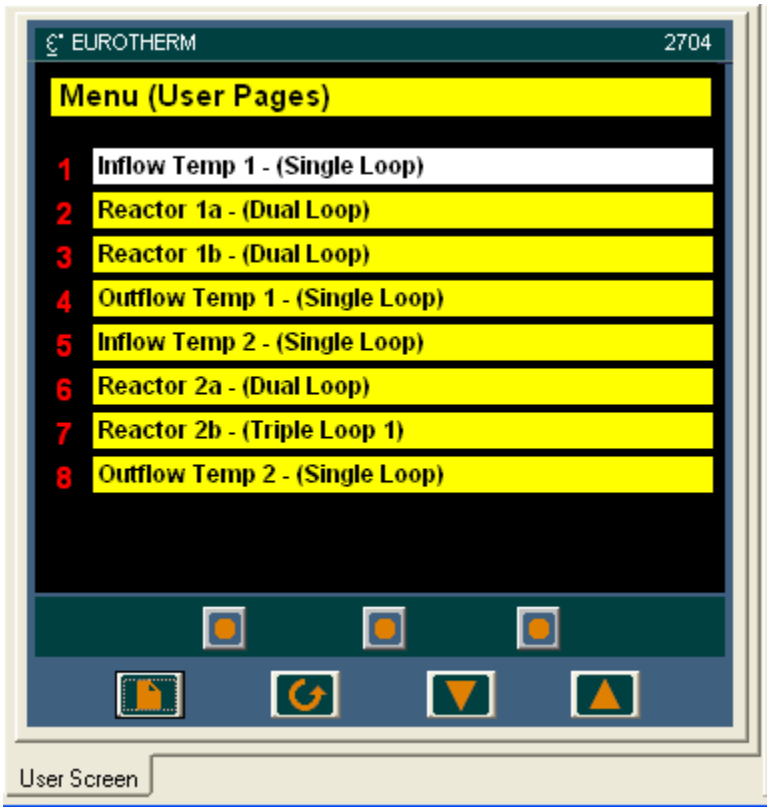
Any of the eight pages can be selected:

1. by double clicking on the relevant page item
2. by clicking on the item once, to highlight it, and then clicking on the 'Select Page' control button.
3. by clicking on the item once, to highlight it, and then clicking on the 'Select Page' tool button



.

Note: Once a menu item has been selected, other items can be selected by use of the up/down (Next Selection/ Previous selection) control buttons.



13. ITOOLS WITH THE MODEL 3500 SERIES

13.1. DEVICE RECIPE EDITOR

13.1.1. Introduction

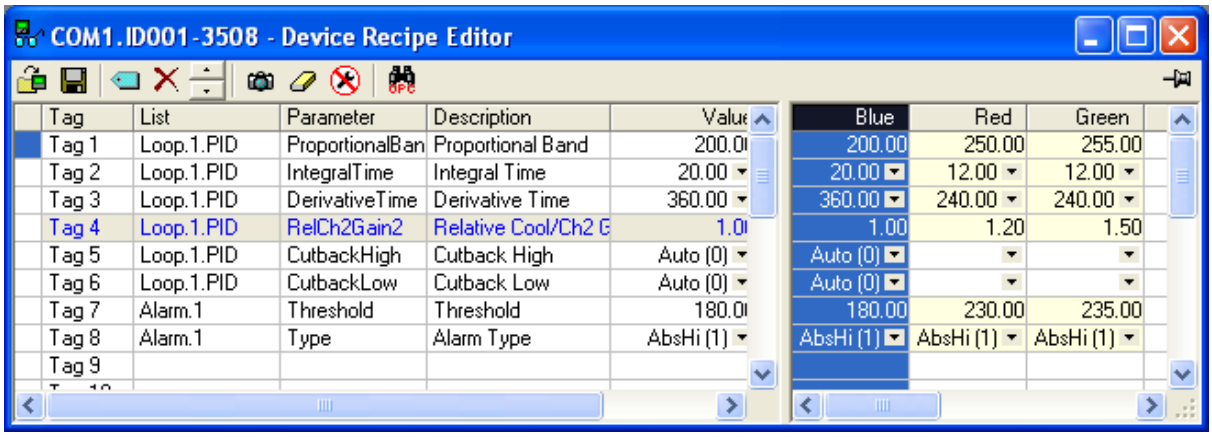
The Device Recipe Editor can be opened by clicking on the Device Recipe View tool button or by selecting 'Device Recipe' in the Views menu. The window is in two parts: the left part contains the recipe parameter list; the right-hand part contains 'Data sets' and is initially empty.

The window is used:
To monitor a so-called 'watch list' of parameter values. The watch list can contain parameters from many different lists within the same device and the values of these parameters are continuously updated from the device.
To create 'data sets' of parameter values which can be selected and downloaded to the device in the sequence defined by the recipe. The same parameter may be used more than once in a recipe.

The difference between the Device Recipe and the Watch/Recipe editors is that with the Device Recipe, the parameters and data sets are stored as parameters on the device, whereas the Watch/Recipe window is a file-based system. Unlike the Watch/Recipe window, the downloading of data values to their corresponding parameters can be performed from the device front panel without the need for iTools to be running.

The 3500 can store up to 24 parameters and up to eight data sets.

Note: It is not necessary that parameters occupy contiguous grid rows (i.e. gaps may be left between parameters). It is also possible to have empty data set cells.



13.1.2. Recipe creation

After opening the window, as described above, parameters can be added to it as described below. Parameters can be added only from the device to which the Device Recipe window relates (that is, parameters from more than one device cannot be placed in one watch list). The values of the parameters update in real time, allowing the user to monitor, simultaneously, a number of parameters which might otherwise be unrelated.

The order in which items appear in the list may be changed using the 'Move selected item' (up/down) tool button in the Device Recipe tool bar. Because there is a fixed relationship between the item locations in the window grid, and the corresponding parameters in the device, the move operation may seem quite slow.

Note: The left-most column indicates (by being 'colour-filled') which parameter is currently 'selected'. In the figure above, it is Loop.1.PID.

ADDING PARAMETERS TO THE WATCH LIST

1. Parameters can be 'click-dragged' into the watch list grid from elsewhere in iTools (for example: the main browse tree, the parameter explorer window, the graphical wiring editor). The parameter is placed either into an empty row, or 'on top' of an existing parameter, in which case it replaces this parameter in the list.
2. Parameters can be dragged from one position in the list to another. In such a case, a copy of the parameter is produced: the source parameter remaining in place. Parameters can be also be copied by using the 'Copy Parameter' item in the Recipe menu or the context (right click) menu, or by using the short cut <Ctrl> + <C>. Data set values are not included in the copy.
3. The 'Browse for recipe parameter' tool button , the 'Browse Parameters...' Recipe (or right mouse-click) menu item or the shortcut + can be used to open a browse window from which a parameter can be selected. The selected parameter is inserted into the selected grid row, overwriting an existing parameter at that position.
4. The Browse window can also be opened by double clicking on a row in the grid. The parameter selected is loaded into the selected row, replacing any previously existing parameter in that row.
5. A parameter can be 'copied' from (for example) the Graphical Wiring Editor and subsequently 'pasted' into the watch list using the 'Paste Parameter' item in the Recipe menu, or the right mouse-click context menu (shortcut = <Ctrl> + <V>).

Note: Each row in the grid can be given a 'meaningful' title,by directly editing the appropriate cell in the 'Tag' column.

CREATING A DATA SET

All the parameters required for the recipe should be added to the watch list, described above.

Initially, all the data sets are empty. Values for each parameter can be directly entered into the data sets, or a whole data set can be selected (by clicking on the column header), and the 'Snapshot' tool used to fill the data set with the current values. Alternatively, the 'Snapshot Values' item in the Recipe or right mouse-click menu or the shortcut + can be used to fill the data set.
Individual data values can now be edited by typing directly into the grid cells. Data values can be left blank or cleared by deleting all the characters in the field, then, either moving to a new cell, or typing <Enter>.

The sets are called 'Set n' by default, where n can take the values 1 to the maximum number of sets for the device. The names can be edited by using the 'Rename data Set...' item in the Recipe or right mouse-click (context) menu, or by using the shortcut <Ctrl> + <R>.

13.2. PROGRAMMER EDITOR

13.2.1. Introduction (3500)

This sequence of help pages refers to the Model 3504/3508 controller/programmer.

The Programmer Editor is used to edit setpoint programs for those devices which include one or more programmers. These pages are not intended to describe the device programmer itself, as this is explained in the user guide and / or engineering manual appropriate to the device.

Some operations require that the clone or instrument be in 'Configuration' mode. This mode can be entered either by clicking the right-hand button of the mouse over the required device panel view, then using the 'Set Access Level...' menu item, or by using the 'Access' tool button to toggle between 'Configuration' and 'Operator' (see 'Main toolbar').

SINGLE/DUAL PROGRAMMERS

The model 3500 may be supplied as a zero, one or two programmer unit, as defined at time of order. The two-programmer unit can operate in one of three modes, selected using the 'ProgMode' parameter in Instrument Options configuration. These modes are called 'SyncAll', 'SyncStart' and 'Single Channel'. The program editor is closed down, after suitable warnings, when a mode change is requested.

SyncAll
This means that all segments for the two 'channels' are synchronised during program execution. This means that only time-based segment types are available.

SyncStart
This means that the two programmers start running the two segment 'channels' together, but thereafter run independently of one another. Wait segments in Channel 1 can be configured to specify a channel 2 segment with which to synchronise. Whichever channel reaches the synchronisation point first stops and waits for the other channel to 'catch up'. When both channels have reached the synchronisation point, both programs continue at their next segments
simultaneously.

Single Channel
The same as a single programmer unit.

ONLINE / OFFLINE EDITING

If the editor is opened for a connected device (i.e. not a clone device), then any changes made to the program are written to the device, immediately. Normal instrument rules apply, so the same changes can be made to the running instrument via iTools, as can be made at the instrument's operator interface.

Online editing can be relatively slow, so it may be preferred to make the changes to a clone file, or to a previously saved file, and then to download the edited version to the instrument.

If the editor is opened for a clone device, the program created must either be saved to file, or downloaded to an on-line device.

GRAPH PRINTING

The graph (also called the 'chart') cannot be printed directly. Right clicking within the chart area, then selecting 'Copy Chart' saves a copy of the chart to the clipboard, whence it may be imported into Word or Excel, and then printed as usual (e.g. <Ctrl> + <P>).

13.2.1 3500 PROGRAMMER EDITOR INTRODUCTION (Cont.)

PROGRAM PRINTING

The program can be printed by selecting the required segments and copying to the clipboard (e.g by using <Ctrl> + <C>). The program can now be imported into, say, Excel by using the Paste command (e.g. <Ctrl> + <V>), and printed as usual (e.g. <Ctrl> + <P>). It may be convenient to delete unused columns, rows etc. prior to printing.

13.2.2. Opening the editor

The Programmer Editor is opened for an actual device or for a clone by:

1. Clicking on the Programmer Editor tool button in the Views toolbar.

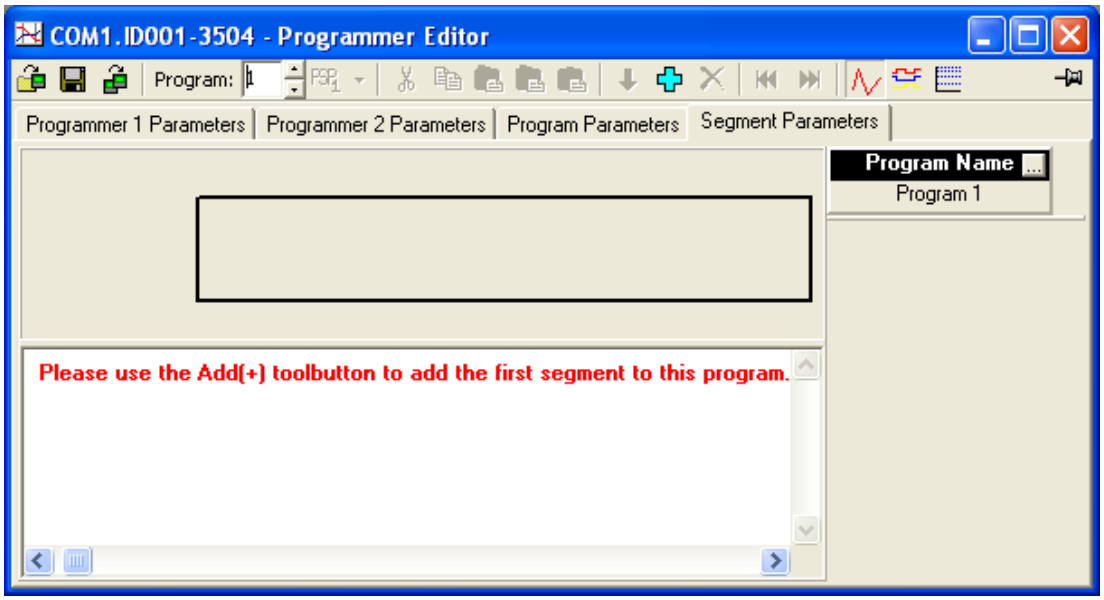
2. Selecting 'Programmer' in the 'Views' menu, or in the right mouse-click context menu.
3. Using the short cut <Alt> + <P>

The programmer window opens with the 'Segment Parameters' tab active. By default, new programs have no segments defined for them. Real devices may have one or more segments defined, depending on the programming history of the device.

The figure below shows the opening display for a two-programmer configuration. The single-programmer display is similar, except that the 'Programmer 2 Parameters' tab does not appear.

Note: The 'Add (+)' tool button referred to in the figure below means the 'Add' tool button in the Programmer Editor toolbar, not the similar tool button

in the main toolbar.



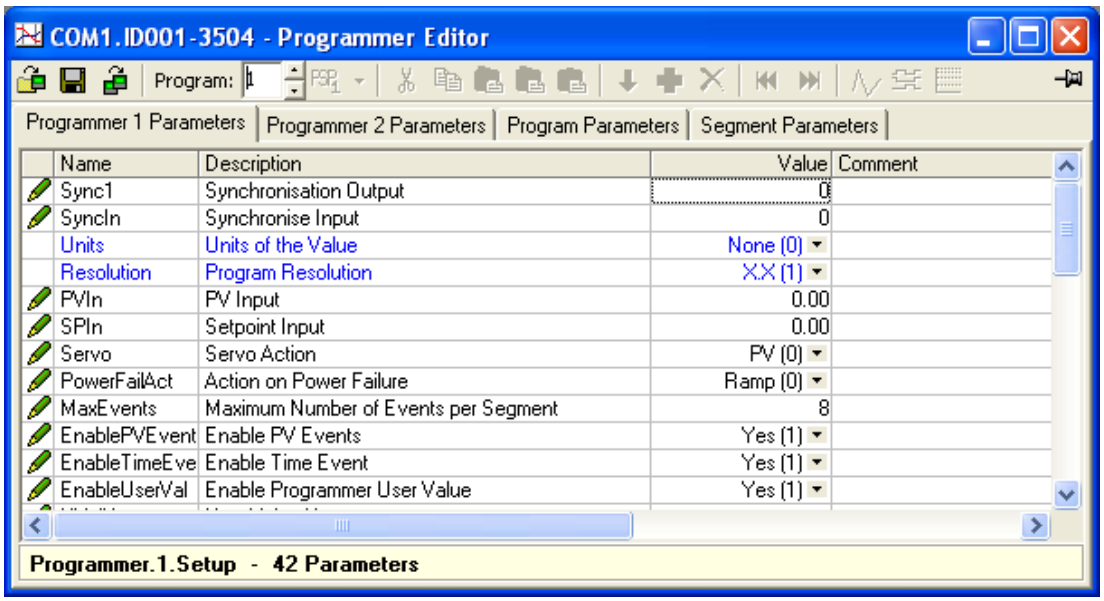
The parameter browse window contains the Program Setpoint (PSP) Parameters, allowing these to be edited (if read/write), without losing the segment parameters view.

13.2.2 OPENING THE EDITOR (Cont.)

PROGRAMMER PARAMETERS

When Access Level = 'Configuration', Programmer parameters can be displayed by clicking on the 'Programmer 1 Parameters' or 'Programmer 2 Parameters' (two-programmer instruments only) tab. This produces a grid list of parameters which may be edited if Read/Write. Read only parameters appear in blue (e.g. 'Units' and 'Resolution' in the figure below).

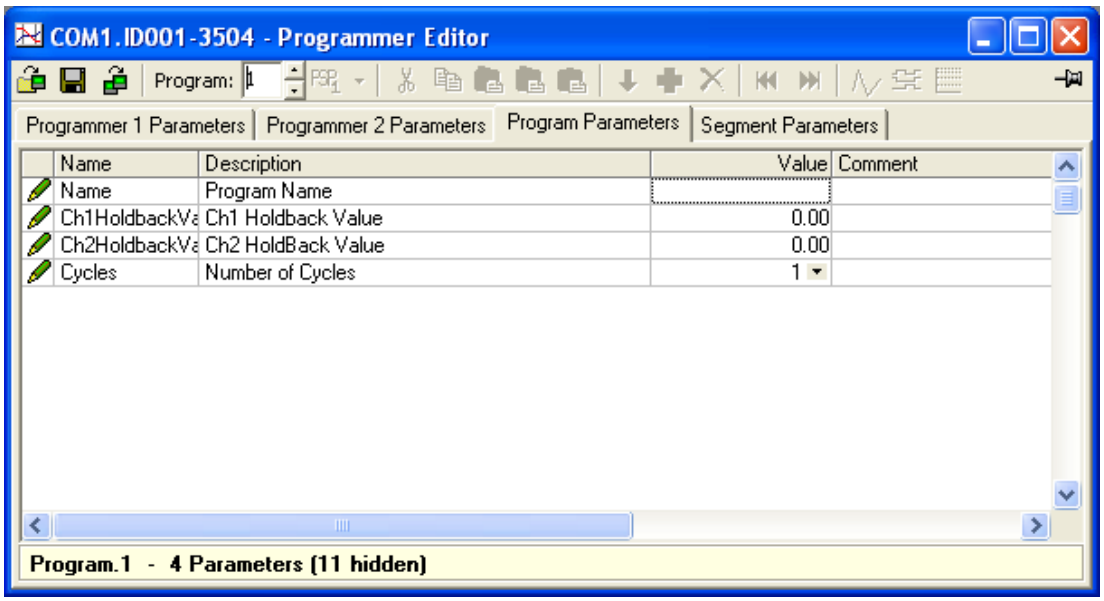
'Programmer 1(2) Parameters' tabs do not appear for Access level = 'Operator'.



Hidden Parameters
'Hidden' parameters can be displayed by de-selecting 'Hide Parameters and Lists when Not Relevant' in the 'Parameter Availability settings...' item in the Options Menu. When displayed, such parameters have a coloured background, as shown in 'The Explorer Window' description.

PROGRAM PARAMETERS

Program parameters can similarly be displayed by clicking on the 'Program Parameters' tab.

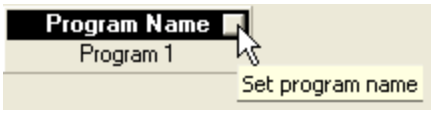


13.2.3. Program editing (3500)

Note: The Programmer 1 Parameters and Programmer 2 Parameters tabs appear only in configuration mode. Configuration mode can be entered either by clicking the right-hand button of the mouse over the required device panel view, then using the 'Set Access Level...' menu item, or by using the 'Access' tool button to toggle between 'Configuration' and 'Operator' (see 'Main toolbar').

PROGRAM AND TRACE NAMES

The program and trace names can be edited by double-clicking in the Name area, or single clicking on the ellipsis box (as shown for 'Program Name') then entering a new name, of up to 16 characters, in the text entry box which appears. The new names apply only to the program in which they are edited.



SEGMENT PARAMETERS

See the separate topic 'Segment Parameters' for full details of the 'spreadsheet' view.

THE GRAPH

See separate topic 'The Graph' for details of the graphical display.

PROGRAMMER TOOLBAR

See 'Programmer Toolbar' for details.

PROGRAMMER€ MENU

See 'Programmer Menu' for details

13.2.4. Adding, inserting and deleting segments

The following description relates to all modes except 'SyncStart'. See 'SyncStart segments' for details.

Note: The total number of segments available depends on the number of programs fitted. For 1 program, the maximum number of segments is 20; otherwise the maximum number of segments available is 5 00. The Segment diagnostics display is useful in establishing the number of segments used, and the number still available.

ADDING SEGMENTS

The first segment is added by:

1. Clicking on the 'Add at end' Programmer tool button
2. Selecting 'Add Segment' from the right-click (context) menu or the main 'Programmer' menu.
3. Using the short cut <Ctrl> + <Insert>

Subsequent segments are incorporated either by 'Adding' as above, or by inserting segments into a specific location, as described below.

Unless the final segment is an 'End' segment, the 'Add Segment' procedure places a copy of the current final segment at the end of the program to become the new final segment.

If the final segment is an 'End' segment, then the Add Segment procedure inserts a copy of the previous penultimate segment immediately before the End segment.

INSERTING SEGMENTS

To insert a segment, highlight the segment to the right of where the new segment is to appear, then:

1. Click on the 'Insert' Programmer tool button
2. Select 'Insert Segment' from the right-click (context) menu or the main 'Programmer' menu or
3. Use the short cut <Insert>.

A new segment, identical to the one highlighted, appears to the left of the highlighted segment.

An alternative is to highlight one or more segments, copy them to the clipboard (<Ctrl> + <C>), and then paste them into the required position (<Ctrl> + <V>). Again, the inserted segments appear to the left of the highlighted segment. This cut and paste technique can be used to copy portions of one program into another, either within one instrument or clone, or from one to another.

DELETING SEGMENTS

Segments can be deleted in the following ways;

1. By selecting one or more segments, then clicking on the Delete tool button .
2. By selecting one or more segments, then selecting 'Delete Segment' from the right-click (context) menu or the main 'Programmer' menu.
3. By selecting one or more segments, then using the shortcut <Ctrl> + <Delete>.
4. By changing segment type to 'End'. This deletes all segments to the right of the new End segment.

13.2.5. SyncStart segments

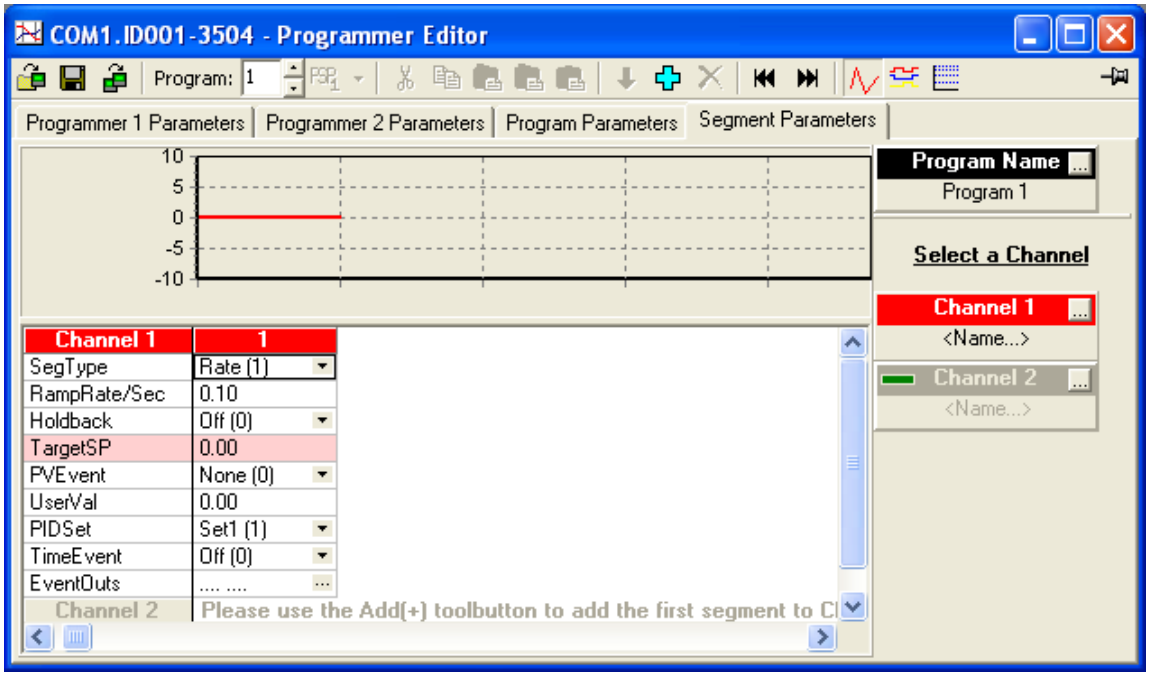
SyncStart mode segments differ from other segments in that they are added/inserted/deleted for each trace separately. Channels can be re-synchronised at any point by using a channel 1 'wait' segment with the 'Wait for' parameter set to 'Ch2Sync', and the relevant Channel 2 segment selected as the synchronisation point.

ADDING SEGMENTS

The first segment is added by:

1. Clicking on the 'Add at end' Programmer tool button
2. Selecting 'Add Segment' from the right-click (context) menu or the main 'Programmer' menu.
3. Using the short cut <Ctrl> + <Insert>

The first segment is added to Channel 1. Channel 1 and Channel 2 'faceplates' appear, with Channel 1 'active'.



Subsequent segments are incorporated into Channel 1, either by 'Adding' as above, or by inserting segments into a specific location, as described below. To add segments to Channel 2, click on the Channel 2 faceplate, or click in the Channel 2 area to highlight Channel 2, then proceed as for Channel 1.

Unless the final segment is an 'End' segment, the 'Add Segment' procedure places a copy of the current final segment at the end of the program to become the new final segment.

If the final segment is an 'End' segment, then the Add Segment procedure inserts a copy of the previous penultimate segment immediately before the End segment.

13.2.5 SYNCHSTART SEGMENTS (Cont.)

INSERTING SEGMENTS

To insert a segment, highlight the segment to the right of where the new segment is to appear, then:

1. Click on the 'Insert' Programmer tool button
2. Select 'Insert Segment' from the right-click (context) menu or the main 'Programmer' menu or
3. Use the short cut <Insert>.

A new segment, identical to the one highlighted, appears to the left of the highlighted segment.

An alternative is to highlight one or more segments, copy them to the clipboard (<Ctrl> + <C>), and then paste them into the required position (<Ctrl> + <V>). Again, the inserted segments appear to the left of the highlighted segment. This cut and paste technique can be used to copy portions of one program into another, either within one instrument or clone, or from one to another.

DELETING SEGMENTS

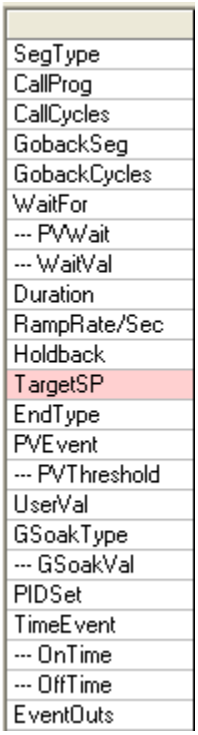
Segments can be deleted in the following ways;

1. By selecting one or more segments, then clicking on the Delete tool button .
2. By selecting one or more segments, then selecting 'Delete Segment' from the right-click (context) menu or the main 'Programmer' menu.
3. By selecting one or more segments, then using the shortcut <Ctrl> + <Delete>.
4. By changing segment type to 'End'. This deletes all segments to the right of the new End segment.

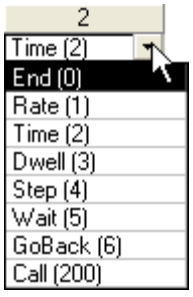
13.2.6. Segment parameters (3500)

Notes:

1. The order in which segment parameters appear depends on the operating mode.
2. Some items appear only if the relevant parameter has been enabled in the Programmer 1(2) parameters tab.



SegType



Clicking on the drop-down arrow displays a menu listing the available segment types. Once a type has been selected the display changes to include the relevant parameters for the selected segment type.

Notes

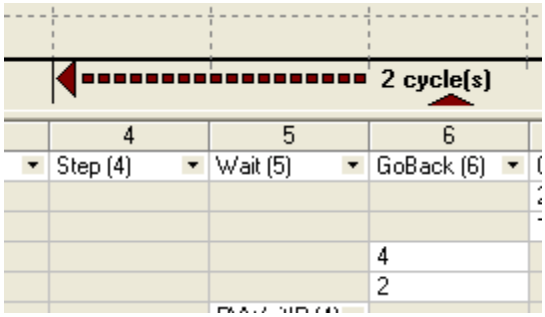
1. Goback is not available from segment 1 or from any segment immediately after an existing GoBack segment.
2. In SyncAll mode, only End, Time, Wait, and GoBack segments are available.

CallProg
This appears only if one or more 'call' type segments are included in the program, and defines the program number to be called.

13.2.6 SEGMENT PARAMETERS (Cont.)

CallCycles
This appears only if one or more 'call' type segments are included in the program, and defines how many iterations of the called program are to be run.

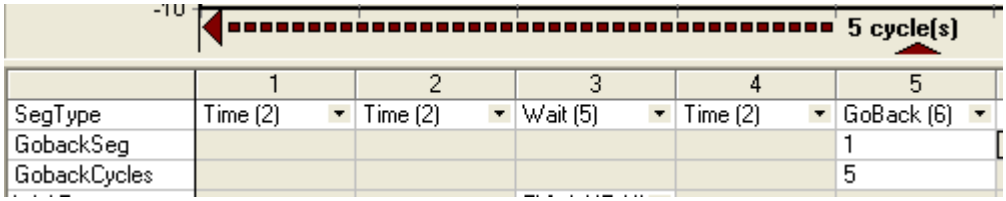
GobackSeg
For 'Go Back' segments only, this allows the user to define the segment to which the program is to go back. Once defined, a graphical interpretation is displayed just below the graph, showing which segment is to be returned-to and how many times the segment(s) included in the go back section are to be run (see 'GobackCycles', below).



GobackCycles
For 'Go Back' segments only, this allows the user to define how many times the segment(s) included in the go back section are to be run (see also GoBackSeg, above).

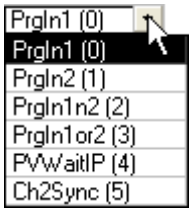
In the example above, segments 4 and 5 run once, and are then repeated twice before segment 7 runs.

In the example below, segments 1 to 4 run once, and are then repeated 5 times (i.e. they are run 6 times in all) before segment 6 executes.



13.2.6 SEGMENT PARAMETERS (Cont.)

WaitFor
This allows the user to hold program execution until a certain event takes place: In all cases, the program waits until the event is 'True'.



PrgIn1 and PrgIn2
These are digital inputs to the program. The program waits until the selected input goes true.

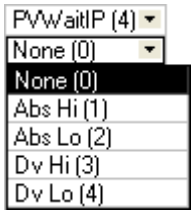
PrgIn1n2
The program waits until PrgIn1 and PrgIn2 are both true simultaneously.

PrgInor2
The program waits until either or both inputs are true.

PVWaitIP
The program waits until the Process value meets the criteria defined in 'PVWait' and 'WaitVal' (described below).

Ch2Sync
Valid only for two-programmer instruments working in SyncStart mode The program waits until Channel 2 has completed the segment specified in 'SyncToCh2Seg', described below.

PVWait and WaitVal



These parameters appear only for Wait segments which have the 'WaitFor' parameter set to 'PVWaitIP'. For units working in 'SyncAll' mode, separate parameters appear for each channel.

PVWait allows a threshold to be defined such that the program waits until the Process Variable value moves above or below the threshold (WaitVal) before continuing with the next segment.

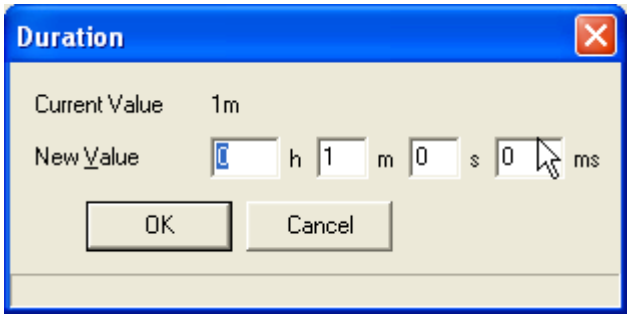
Examples:
For a PSP = 100, and a WaitVal = 15, the program waits until the process value reaches the following values before continuing:
AbsH1: PV >= 15
AbsLo: PV<= 15
DvHi: PV<= 115 (PSP + WaitVal)
DvLo: PV>= 85 (PSP - WaitVal)

13.2.6 SEGMENT PARAMETERS (Cont.)

SyncToCh2Seg
Valid only for two-programmer instruments working in SyncStart mode, which have a Wait segment configured as 'WaitFor Ch2Sync'.

The program waits until Channel 2 has completed the segment number entered here before starting both channels simultaneously (i.e. it re-synchronises the channels).

Duration
For 'Time' and 'Dwell' segment types only.



By clicking on the ellipsis button in the Duration cell, the Duration entry box (shown above) appears. This allows the user to set a time for the segment to complete its task.

Time segments take this specified time to reach the new setpoint
For Dwell segments, the setpoint remains at the starting value.

RampRate/Sec
For Ramp segments, this defines the rate at which the ramp is to be completed. The units (seconds, minutes or hours) are configured in 'Ramp Units' in the 'Program Parameters' tab.

Holdback
For 'Rate', 'Time' and 'Step' segments, this allows the user to select Off, Low, High or Band as holdback mode per segment. In holdback mode, the program is 'frozen' if the measured process value (PV) does not track the setpoint (SP) within a user defined amount.

Off = Holdback disabled for this segment.
Low = Holdback mode is entered when the PV is lower than (SP - HoldbackVal)
High = Holdback mode is entered when the PV is higher than (SP + HoldbackVal)
Band = Holdback mode is entered when the PV is lower than (SP - HoldbackVal) or higher than (SP + HoldbackVal)

For Dwell segments, Holdback is replaced by GSoakType, described below.

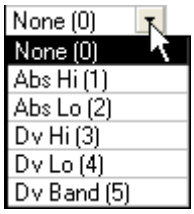
TargetSP
This allows the user to enter a target value to which the segment is to ramp. For Time segments, the ramp duration is entered using the 'Duration' parameter described above. For Ramp segments, the ramp duration depends on Ramp Rate (above).

13.2.6 SEGMENT PARAMETERS (Cont.)

End Type

The action to occur at the end of the program can be selected as Reset, Dwell or SafeOP.
Reset resets the program. Dwell causes the output value to remain at the previous segment's end value. SafeOP means that the program outputs the value of the 'SafeOutVal' parameter in Loop/1/OP or Loop/2/OP as appropriate.

PVEvent
Appears only if 'EnablePVEvent' has ben enabled in the relevant Programmer 1(2) tab.



This is an alarm,which is triggered when the Process value reaches a certain value (PV Threshold). Once triggered, the relevant PV Event Output becomes active.

Examples:
For a PSP = 100, and PVThreshold = 15, the alarm is triggered when the process value reaches the following values:
AbsH1: PV >= 15
AbsLo: PV<= 15
DvHi: PV<= 115 (PSP + WaitVal)
DvLo: PV>= 85 (PSP - WaitVal)
DvBand: 85 <= PV<=115 (alarm is active if the PV lies outside the band PSP +/- PV Threshold)

UserVal
For 'Rate', 'Time' and 'Step' segments, this causes the value of 'UserVal' to be output to UValOP for the duration of the segment.

Notes:
1. UserVal appears only if 'EnableUserVal' is set to 'yes' in the relevant Programmer 1(2) Parameters tab.
2. The 'UValName' parameter in the relevant Programmer 1(2) Parameters tab can be used to enter a text string of up to eight characters to replace 'UserVal'.

GSoakType and GSoakVal
For 'Dwell' segments only, this is the same as 'Holdback' (described above), except that the user can define a holdback value (GSoakVal) for the segment.

Note: These parameters appear only if 'EnableGSoak' has been enabled in the relevant Programmer 1(2) Parameters tab.

13.2.6 SEGMENT PARAMETERS (Cont.)

PID set
Allows a PID set to be selected for each 'Rate', 'Time', 'Dwell' or 'Step' type segment. P, I and D parameters are defined in the Loop setup page.

Note: This parameter appears only if 'EnablePIDSched ' has been enabled in the relevant Programmer 1(2) Parameters tab.

TimeEvent
For 'Rate' and 'Dwell' segments, EventOut1 can be set to become active at a specified time (OnTime) after segment start, and to become non-active at a second specified time (OffTime) after segment start.

Notes:
1. This parameter appears only if 'EnableTimeEvent' has been enabled in the relevant Programmer 1(2) Parameters tab.
2. EventOut 1 (see below) cannot be edited if 'EnableTimeEvent' is enabled.

13.2.6 SEGMENT PARAMETERS (Cont.)

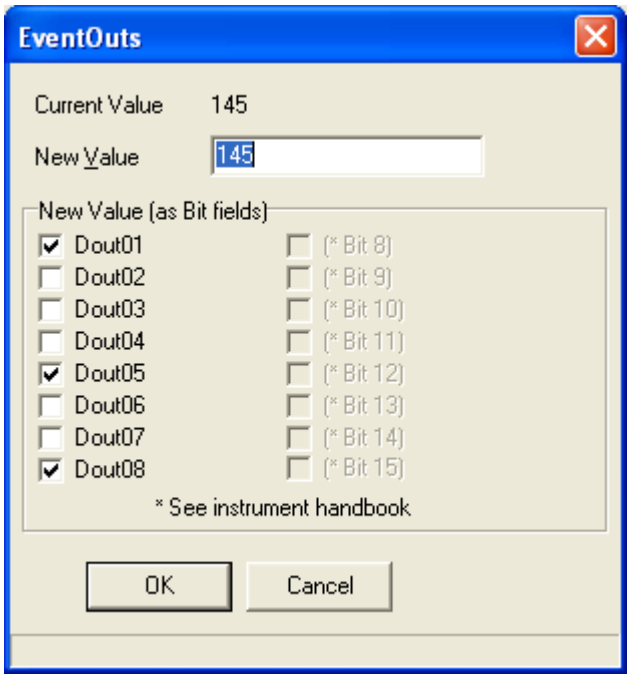
EventOuts

Event outputs can be used to drive relay, triac or logic outputs, according to the modules fitted. The number of event outputs enabled is set in the Programmer/N/Setup/MaxEvents parameter, where N is the number of the relevant programmer. If MaxEvents is set to zero, then all event outputs are disabled.

Clicking on the ellipsis button calls the EventOuts dialogue box. This allows the user to define which event outputs are active during the segment. In the example above, outputs 1, 5 and 8 are active during the segment. The status of the outputs can be shown graphically, as described in 'The Graph'.

The Bit fields display gives each Event output (D out) a binary value, such that, when checked, D out 1 = 1; D out 2 = 2; D out 3 = 4; D out4 = 8; D out5 = 16; D out6 = 32; D out7 = 64 and D out8 = 128.

In the example below, D out1, D out5 and D out8 are checked, giving a cumulative value of 1 + 16 + 128 = 145.



Notes:

1. Event Output 1 cannot be edited if 'EnableTimeEvent' (see 'TimeEvent' above) is enabled for the segment.
2. The number of event outputs (maximum eight per channel) can be set using the 'MaxEvents' parameter in the relevant Programmer 1(2) Parameters tab.

13.2.7. The Graph (3500)

The graph displays the setpoint program segments either as an analogue trace, or if Event outputs are enabled, these can be shown in digital form. Analogue graphs (default) are selected by clicking on the 'Analogue' button . Digital graphs are selected by clicking on the 'Digital' button .

Notes

1. Subprograms (Call segments) are depicted as occurring all in one segment width.
2. A Graph may be printed by pasting it into a standard spreadsheet, and printing it from there. See 'Graph printing' in the Introduction to the Programmer Editor.
3. Clicking on a 'face plate' highlights that faceplate, and emphasises the associated trace on the graph.

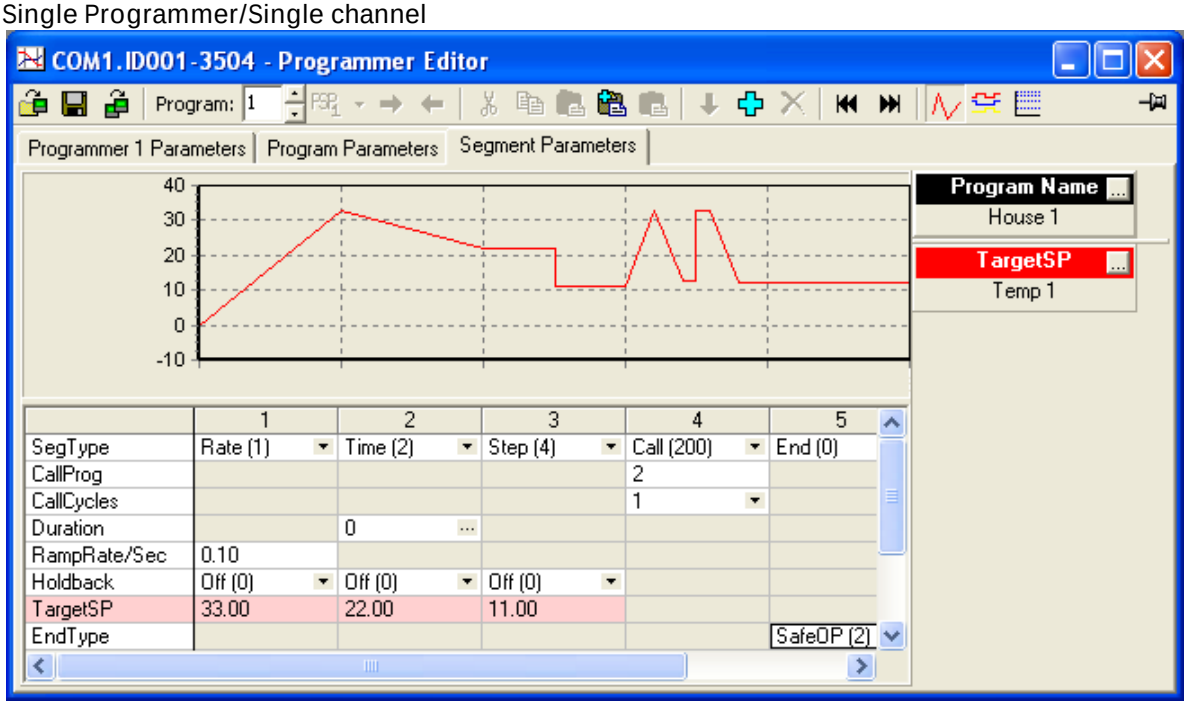
LOGARITHMIC SCALES

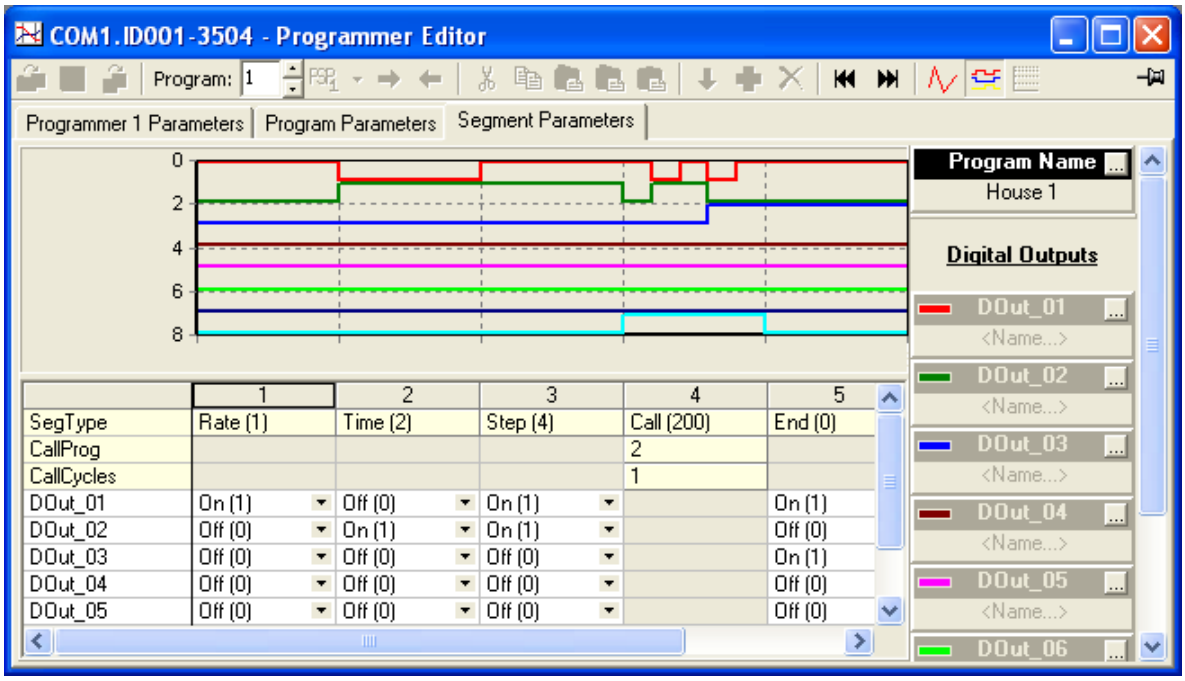
For analogue graphs, scales can be chosen as either linear or logarithmic, by using the 'logarithmic' tool button (shortcut <Ctrl> + < M>) to switch between the two scale types.

13.2.7 THE 3500 GRAPHS (Cont.)

GRAPHS

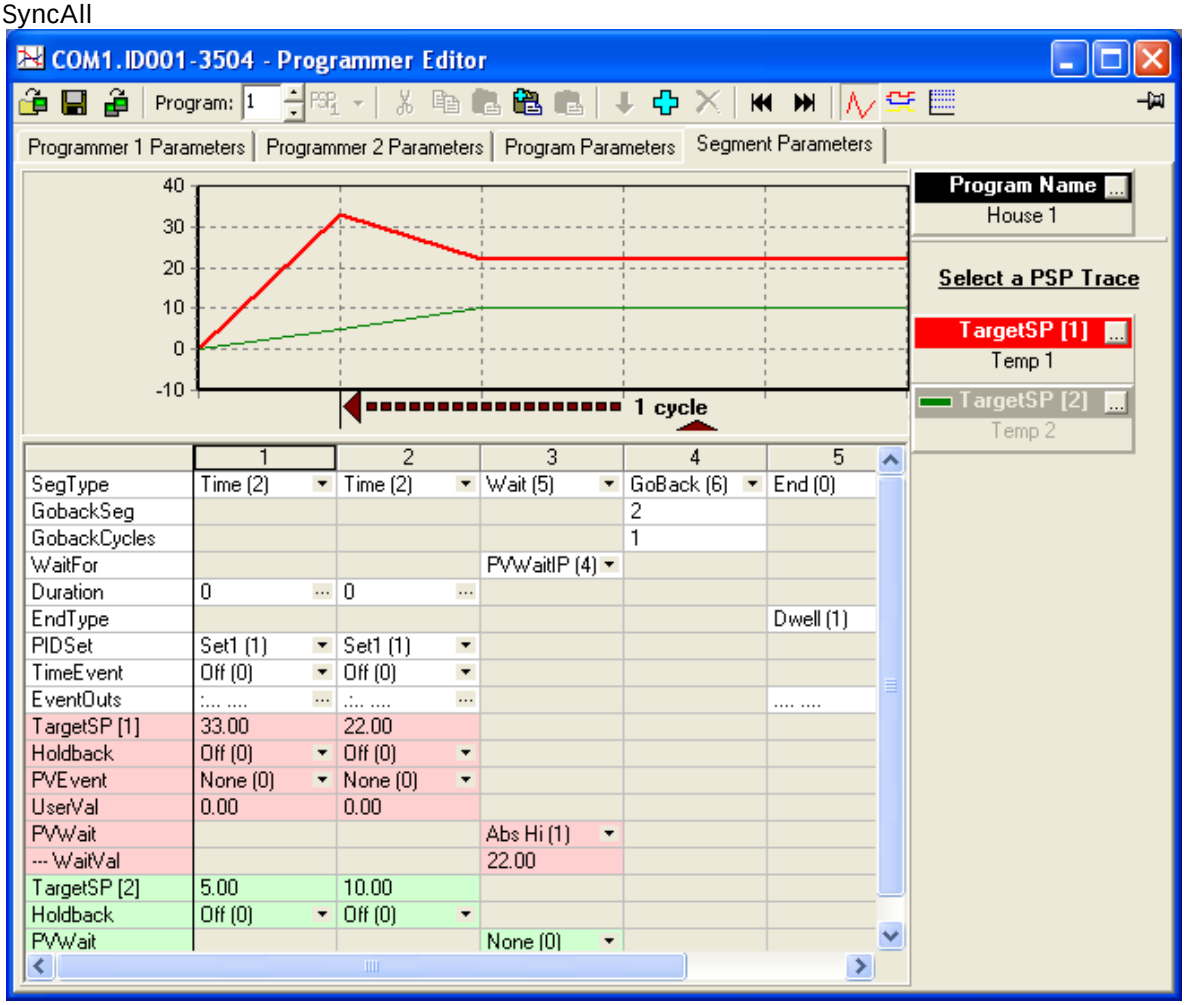
The following illustrations show typical graph displays for the various operating modes.
Single Programmer/Single channel

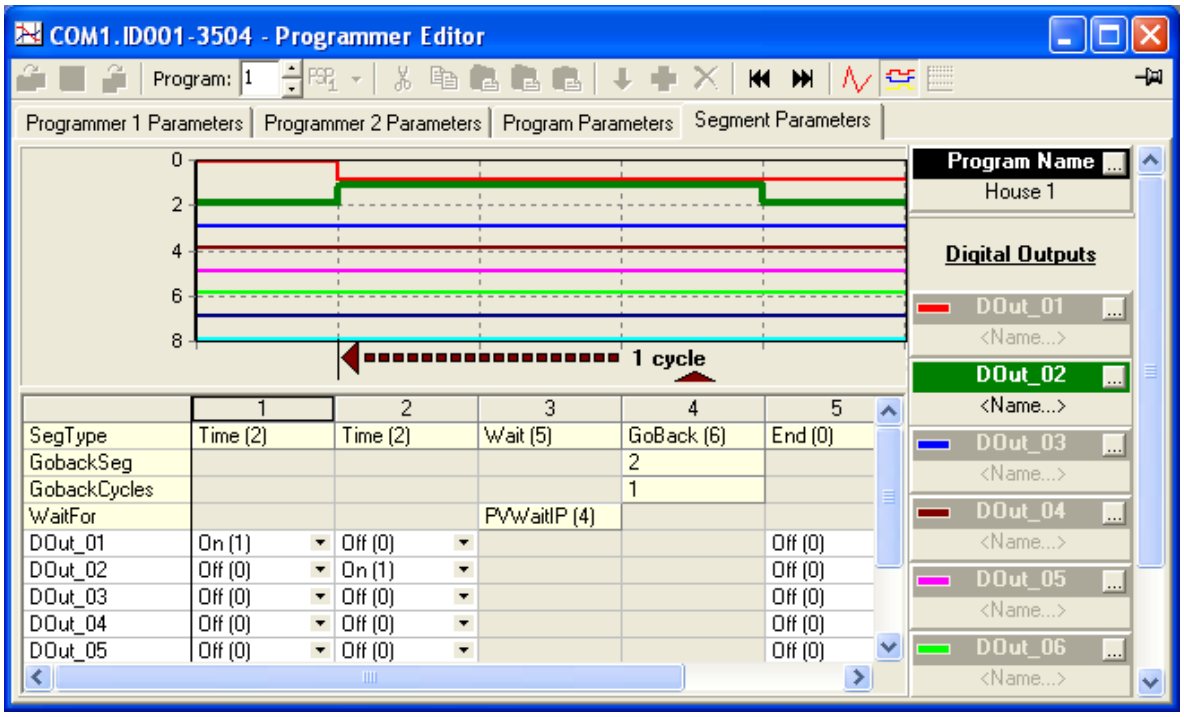




13.2.7 THE 3500 GRAPHS (Cont.)

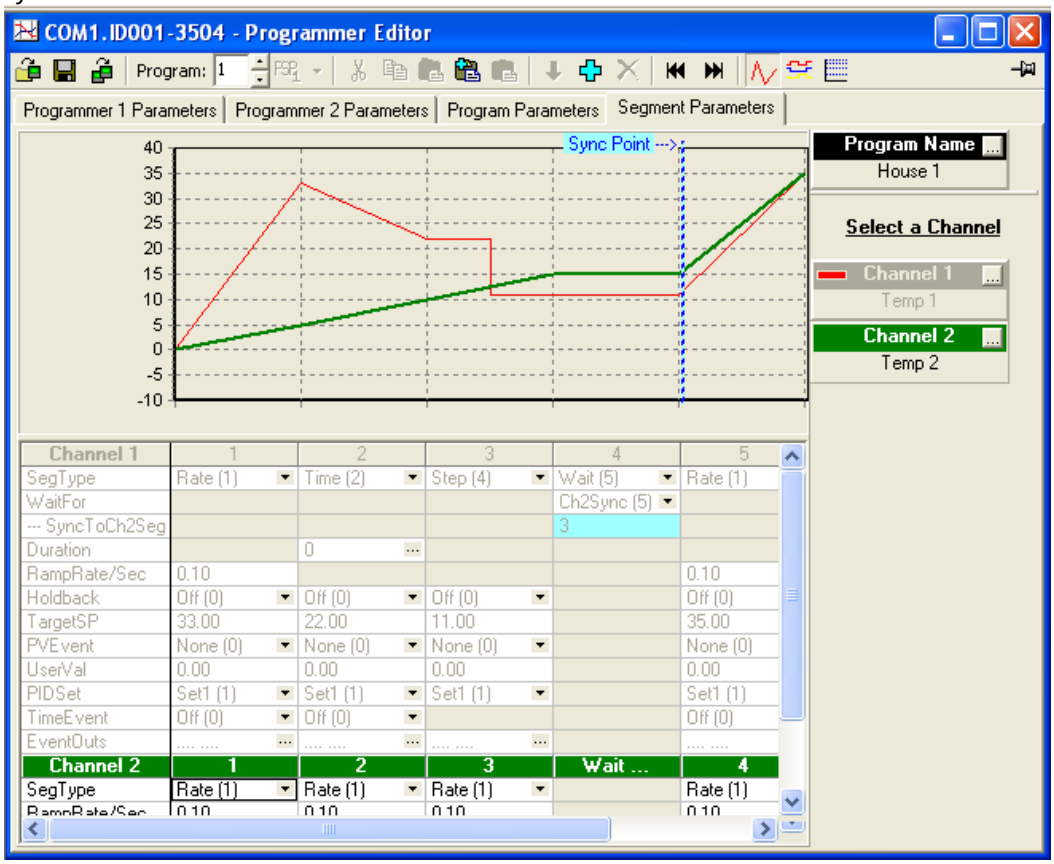
SyncAll

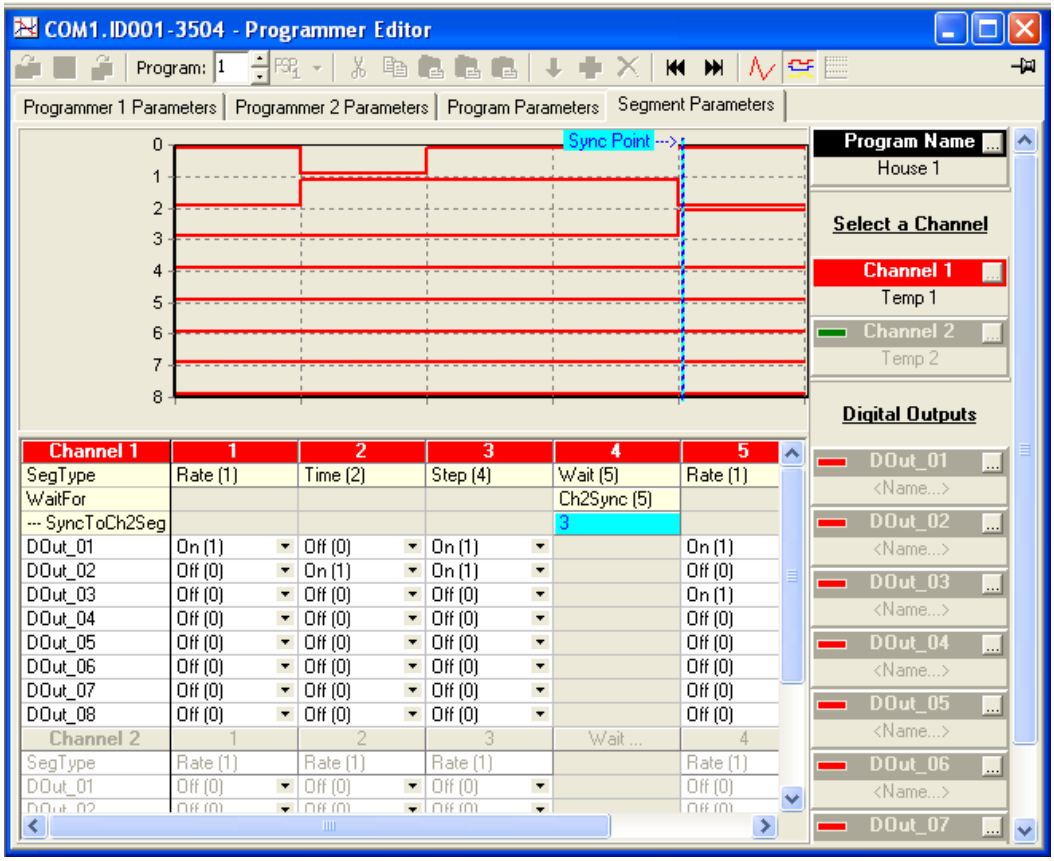




13.2.THE 3500 GRAPHS (Cont.)

SyncStart





13.3. 3500 USER PAGE EDITOR

13.3.1. Introduction

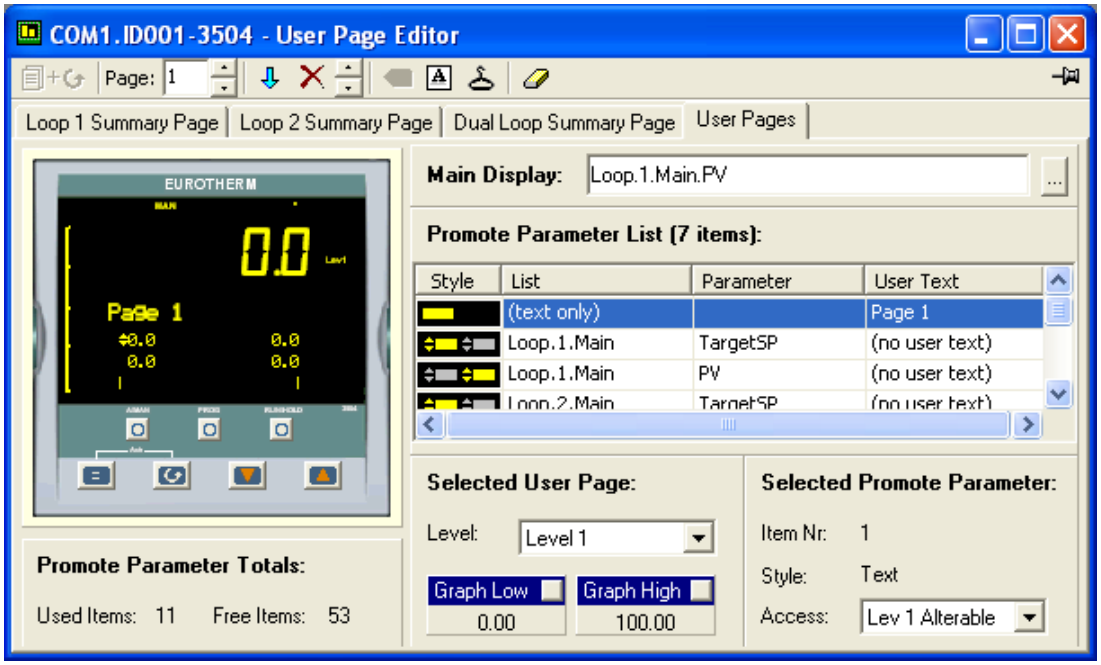
This device provides user-configurable pages, known equally as User pages and Custom pages.

The User Page Editor is used to set up these pages to show a scrollable sequence of parameter values in a variety of display styles. There are 64 display items which can be freely assigned within the eight pages.

The User Page Editor is opened by:

1. Clicking on the 'User Pages' tool

in the Views toolbar
2. Selecting 'User Pages' from either the Views Menu or the Device context menu
3. Using the short cut <Alt> + <U> in the iTools main window.



If the device is a connected device (i.e. it is not a clone), the window opens with the current configuration displayed. If the device is a clone, the configuration grid is empty (for new clones) or contains the saved configuration (for saved clones).

The window consists of the following areas:

1. Toolbar. See 'User Page Editor toolbar (3500)' for details.
2. Loop summary page tabs. See separate topic: 'Summary page tabs'.
3. 'User Pages' tab used to return the user page to the display after accessing any of the loop summary tabs.
4. Faceplate of the instrument ('live' if connected)
5. 'Promote Parameter Totals', showing the number of items used in all pages and the number of free items available.
6. A 'Promote Parameter List' showing the display items for the current page.
7. A 'Selected User Page' area showing page specific items, and a pair of entry boxes for setting graph limits for all relevant bargraphs on this page.
8. A 'Selected Promote Parameter' area showing details of the currently selected item.

MAIN DISPLAY

This allows the user to select the parameter to appear as the main display item. As there is a maximum of five characters, not all parameters are suitable for display here.

13.3.1 INTRODUCTION (Cont.)

PROMOTE PARAMETER LIST

One of the promote parameters (selected using the scroll key) appears on the bottom line of the instrument's display.

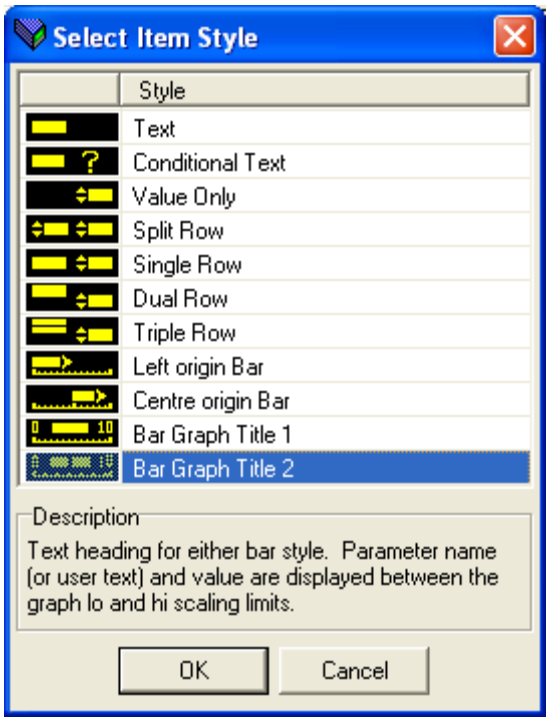
Style	List	Parameter	User Text
	(text only)		Page 1
	Loop.1.Main	PV	
	Loop.1.Main	AutoMan	
	Loop.1.Main	PV	PV

Items can be added to the grid by:

1. Click-dragging from the main iTools parameter browse tree. (Select Item Style window opens.)
2. Inserting an item using the 'Insert item ahead of selected item' tool button .
3. Selecting 'Insert item...' from either the 'Pages' menu or the right click (context) menu.
4. Using the shortcut <Insert>. (Select Item Style window opens.)

Style

Double-clicking on this column, or anywhere in an empty row, calls the 'Select Item Style' dialogue box, which allows a style to be selected for the selected row. If there is not yet a parameter associated with this row, the user is given the opportunity to assign one.



A description of each style is given in the 'Description' box below the style list.

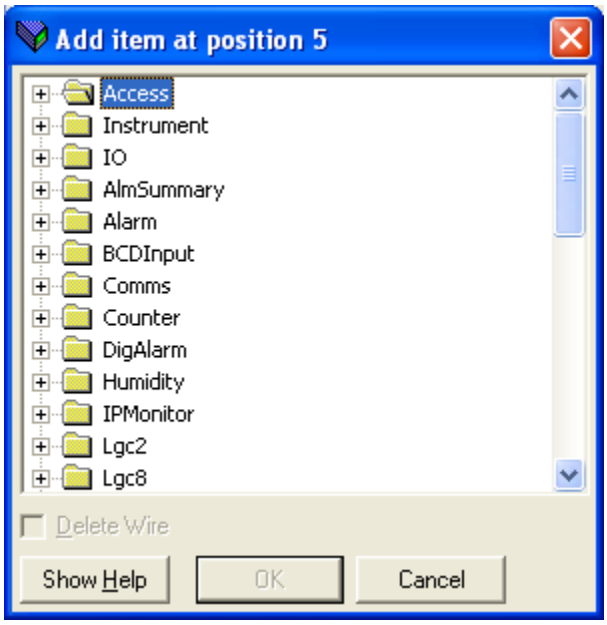
Notes:

1. 'Text' style has no parameter associated with it.
2. 'Value only' style has no user text capability.
3. 'Dual Row' and 'Triple Row' styles occupy more than one line on the device display, and should not be used for the 1st item in the page, as this item does not scroll.

13.3.1 INTRODUCTION (Cont.)

PROMOTE PARAMETER LIST (Cont.)

If there is not yet a parameter associated with the row, the following parameter browse dialogue box appears, allowing the user to select a parameter to be assigned to the style.



List
This column contains the name of the folder which contains the selected parameter. Double-clicking in the relevant cell calls a parameter browse dialogue box, similar to the 'Add item..' browser above, allowing the user to select a new parameter.

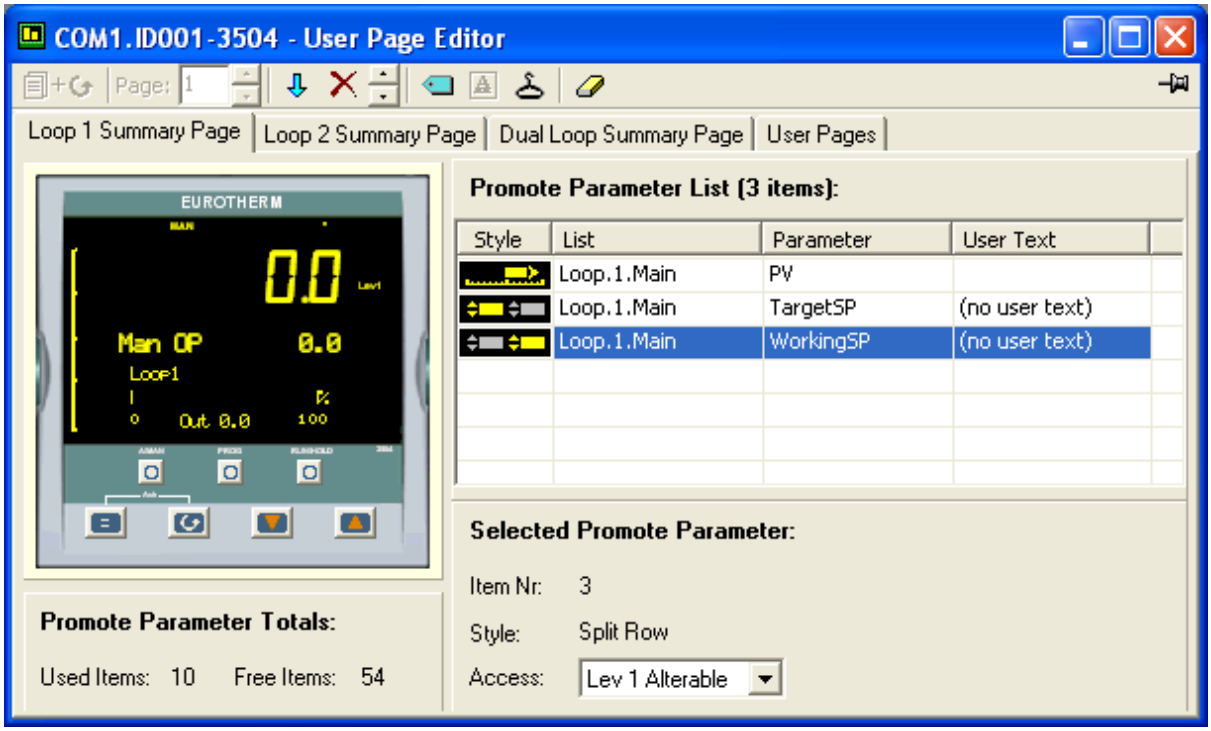
Parameter
This column contains the name of the selected parameter. Clicking in the relevant cell calls a parameter browse dialogue box, similar to the 'Add item..' browser above, allowing the user to select a new parameter.

User Text
Double-clicking in this column calls a text entry box, allowing the user to enter new text, or to edit existing text. Parameters which do not support user text display '(no user text)' in this column, and access is denied.

13.3.2. Loop Summary pages

Loop summary pages are preconfigured pages within the model 3500. The User Page Editor allows the user to create a list of additional 'Promote' parameters which are appended to the preconfigured list. The scroll key is used to scroll through this list, until the required parameter appears at the bottom of the display screen.

The illustration below shows the Loop 1 summary page for a two-programmer instrument. A single programmer unit's page is similar, but contains neither the 'Loop 2 Summary Page' nor the 'Dual Loop Summary Page' tab.



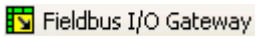
See the topic '3500 User Page Editor' for details of Promote parameters.

See the topic 'User Page Editor toolbar (3500)' for details of the tool buttons.

14. ITOOLS WITH EPOWER CONTROLLERS

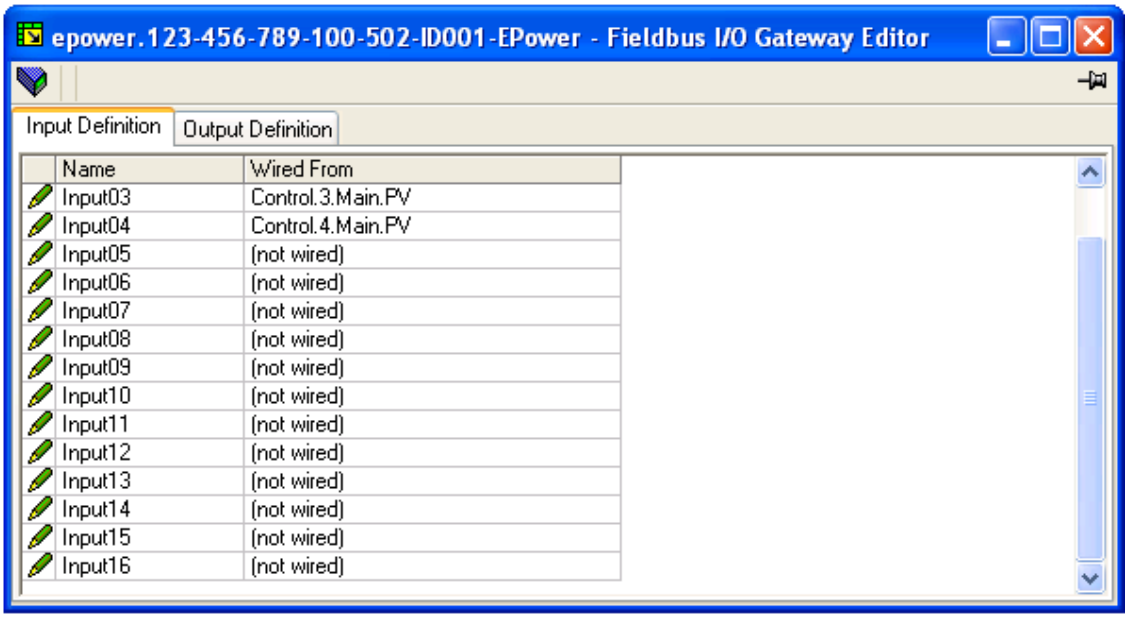
14.1. EPOWER CONTROLLERS

The unique iTools items associated with EPower controllers are as follows:
Fieldbus I/O Gateway,
Tasks,
User pages.

14.2. FIELDBUS I/O GATEWAY EDITOR 

A Profibus master may be required to work with slaves from different manufacturers and with different functions. Also, there are many parameters which are not required by the network master. Fieldbus I/O Gateway (opened by clicking on the toolbar icon shown above) allows the user to define which input and output parameters are to be available over the Profibus link. The master may then map the selected device parameters into, for example, PLC input/output registers, or, in the case of a supervisory SCADA package, to a pc.

Values from each slave (the 'input data') are read by the master, which then runs a control program such as a ladder logic program. The program generates a set of values (the 'output data') and loads them into a predefined set of registers for transmission to the slave devices. This process is called an 'I/O data exchange' and is repeated continuously to give a cyclical data exchange.



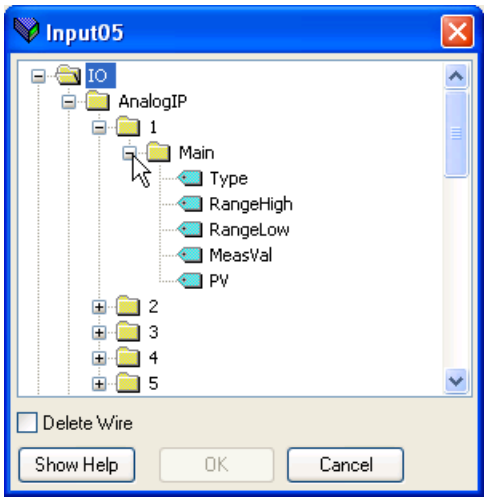
As shown above, there are two tabs called 'Input Definition' and 'Output Definition'. Inputs are values sent from the EPower controller to the Profibus master. Outputs are values received from the Master and used by the controller (e.g. setpoints written by the Master). Values from Profibus overwrite changes made at the Controller's Operator Interface.

The procedure for selecting variables is identical for input and output definition tabs.

1. Double-click the next available position* in the relevant table and select the variable to assign to it. (A pop-up, shown below for input 5) provides a browser from which a list of parameters can be opened.
2. Double click the required parameter to assign it to the input definition.

* Gaps may be left in the tables if desired.

14.2 FIELDBUS GATEWAY EDITOR (cont.)



When all the required parameters have been added, notes of how many 'wired entries' are included in the input and output areas should be made, as this information is required when setting up the Profibus Master.

Notes:

1. The Profibus standard allows a maximum of 117 total input and output parameters, but most Profibus masters are unable to support this number. For EPower, a maximum of 32 input and 16 output parameters may be set using the Gateway I/O Register.
2. No checks are made that output variables are writable. If a Read-only parameter is included, it will be ignored without any warning message.
3. The read and write parameter tables both access the same memory location (0C06), which then points to the read or write table, according to whether this is a read or write instruction. The values read or written depend on the parameters in the read and write tables. This means that if a value is written to a particular address, and this address is then read from, the value that is read will be different from the value written, unless the same parameter is in the same location in both read and write tables.

Once the changes have been made to the Input and Output definition lists, they must be downloaded to the controller unit. This is done (for both tables simultaneously) by clicking on the 'Update device Flash Memory' button just above the Input Definition tab. The controller performs a restart after this operation.

14.3. TASKS

The EPower Controller User guide (HA179769) should be referred-to for more details of controller operation.

The EPower controller is designed to drive single or multiphase ac supply power to loads such as furnaces. iTools for this application has to cater for the situation that in a multi-phase system, the phases, by definition, are out of phase with one another. For this reason the concept of 'tasks' is introduced, where a task may be considered to be associated with a phase. The task would normally consist of input and output blocks, a network block, a Firing OP block etc. Each task (i.e. all items associated with a Network block) has its own block execution order, distinguishable from others by background colour.

14.3 TASKS (Cont.)

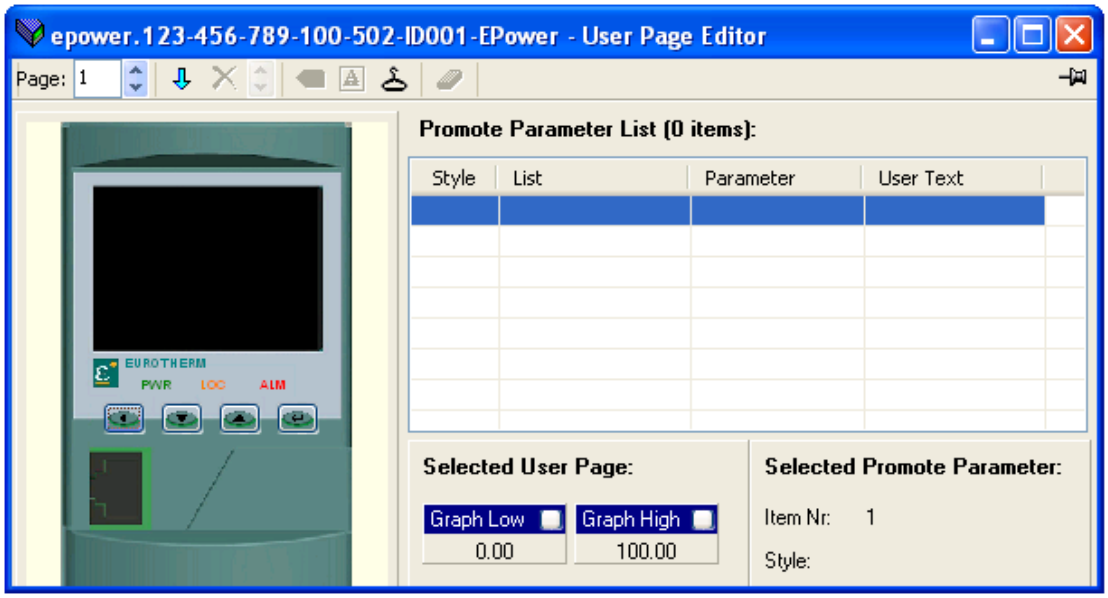
It is convenient but not necessary to arrange tasks to be within separate Compounds.
Any software wiring between tasks must include a task break to ensure that phasing problems do not occur. Wiring between tasks, that does not include a task break, is drawn with thick wires. Such wires will execute, but the results are unpredictable as the unit is unable to resolve the strategy.

BLOCK EXECUTION ORDER BACKGROUND COLOURS

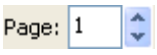
The background colours for block execution order are as follows:
Task 1 = Red
Task 2 = Green
Task 3 = Black
Task 4 = Blue

14.4. USER PAGES (EPOWER CONTROLLERS) User Pages

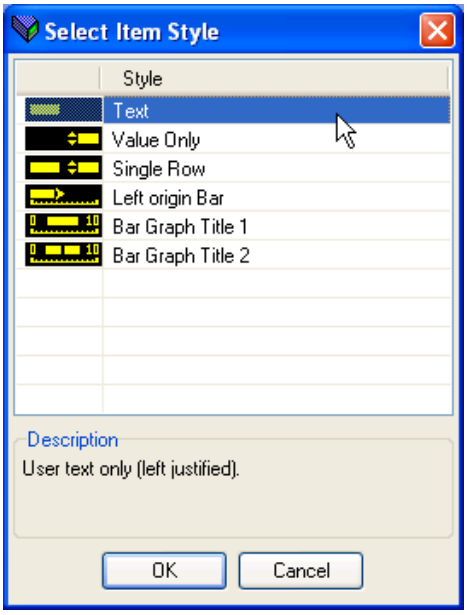
Up to four User Pages, each with four lines, can be created and downloaded to the unit. These allow the operator interface to display particular sets of values, in various formats. The figure below shows the initial display when the 'User Pages' toolbar icon (shown above) is clicked on.



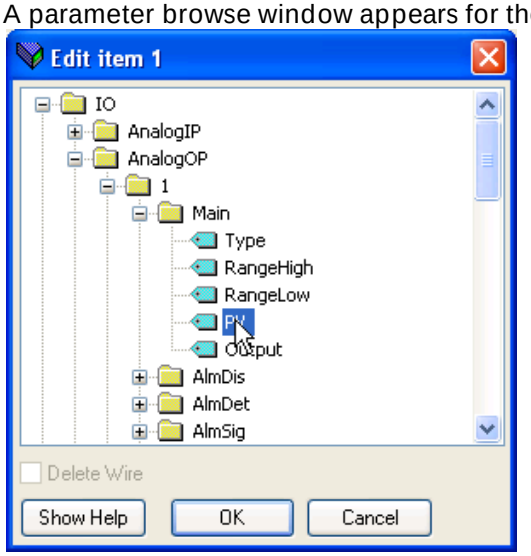
14.4.1. User Page Creation

1. Click on the Page up/down arrow 

to select the required Page number for configuration.
2. Double-click one of the cells in the 'Promote Parameter List' to display the Select Item Style window



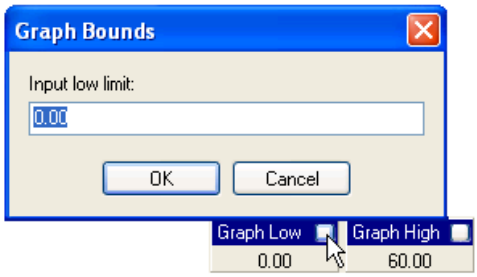
3. Click on the required style, then on 'OK'.
A parameter browse window appears for the selected row, allowing a parameter to be selected.



4. Click 'OK' to insert the parameter into the list.

14.4.1 USER PAGE CREATION (Cont.)

5. If required, click on the white square on the relevant 'Graph Low' and/or 'Graph High' title bar and set the low and high values which are to appear with an associated bargraph.



14.4.2. Styles

TEXT

If 'Text' is selected, a text entry window appears allowing the user to enter the text which is to appear on the selected line of the display. The display can accommodate 10 characters - any further characters are hidden. This style is shown as line one of the figure above.

VALUE ONLY

Displays the value of the selected parameter, right justified. No user text may be entered for this style. This style is shown as line two of the figure above.

SINGLE ROW

Displays the parameter mnemonic (left justified) and the parameter value (right justified). User text may be entered but overwrites the parameter mnemonic. This style is used for line three of the above figure.

LEFT ORIGIN BAR

Displays the parameter value as a left-hand zero bargraph. This style is shown in line four of the figure above (and in line two of the figure below.

BAR GRAPH TITLE 1

Supplies low limit (left justified), parameter mnemonic (centred) and high limit (right justified) displays. Normally used in conjunction with a Left Origin bar on the line below (as shown in lines one and two below) or on the line above. User text may be entered. As the number of characters increases, user text first over-writes the mnemonic, then the range values.

BAR GRAPH TITLE 2

Similar to' Bar Graph Title 1' above, but includes a numeric value for the parameter as well as its mnemonic and range values. Normally used in conjunction with a Left Origin bar on the line below or on the line above (as shown in lines two and three below) . User text may be entered. As the number of characters increases, user text first overwrites the mnemonic, then the range values. If the number of characters entered exceeds 10, then all the user text is hidden, leaving just the parameter value.

15. THE MENUS

15.1. CONTEXT MENUS

15.1.1. Block Wiring context menu

This menu appears if the mouse right button is clicked whilst the mouse pointer is hovering over a parameter row in the Toolkit Blocks 'Block Wiring' tab window. Applies only to those instruments that support 'Toolkit Blocks'.

PARAMETER PROPERTIES... AND PARAMETER HELP...

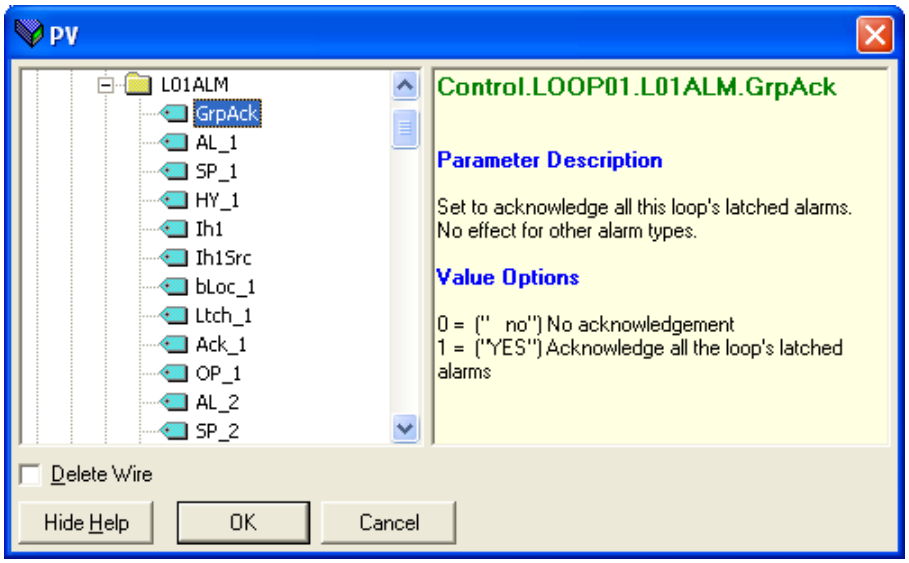
See Explorer menu for details. Parameter help is available only for some instruments.

EDIT WIRE...

Clicking on this entry calls the browser window for the clicked-on parameter. This allows the user to select a source or destination block to wire to.

For instruments with parameter help, a 'Show Help' button is appears, and if this is clicked-on, help details for the selected parameter appear (as shown below). The 'Show Help' button becomes the 'Hide Help' button.

Existing wires can be deleted (after confirmation) by clicking on the 'Delete Wire' box, then on 'OK'.



15.1.1 BLOCK WIRING CONTEXT MENU (Cont.)

PASTE WIRE

Allows the user to paste a wire, previously copied to the clipboard, into the clicked-on location.

DELETE WIRE

Allows the user to delete a wire, after confirmation.

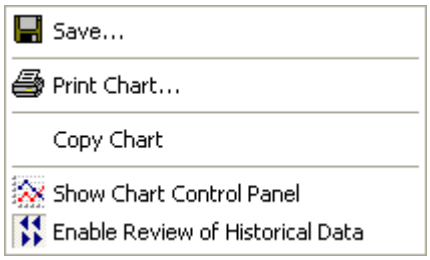
REFRESH

Refreshes the display.

COLUMNS...

Not active in the 'Block Wiring' tab. In the 'User Values' tab area, this allows the user to enable/disable certain columns for display.

15.1.2. Chart context menu (OPC Scope)



This menu appears when the mouse right-hand key is clicked, whilst the mouse cursor is hovering over the OPC Scope chart.

SAVE...

Opens a file dialogue window allowing the user to define a destination path for saving the chart.

PRINT CHART...

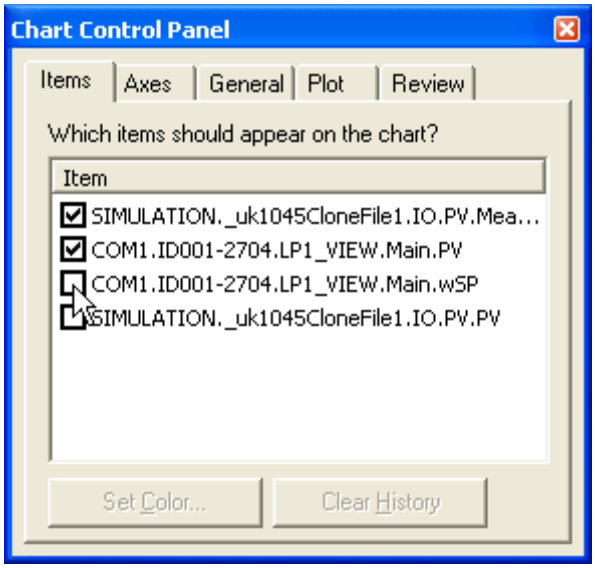
Initiates the chart printing process. Colour or monochrome, and grid or no grid, are selected from the 'Plot' tab of the Chart Control panel.

COPY CHART

Allows the user to copy the chart to the clipboard, for use in other applications.

SHOW CHART CONTROL PANEL

Calls the Chart Control Panel, allowing the user to set up chart parameters such as parameter content, colours, scales and so on.

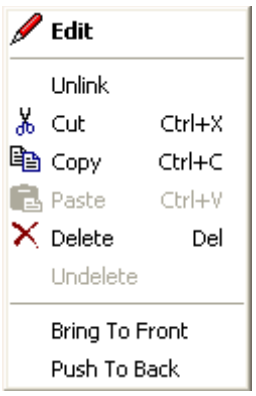


ENABLE REVIEW OF HISTORICAL DATA

Selecting this item causes OPC scope chart to enter Review Mode.

15.1.3. Comment context menu

This menu appears if the right mouse button is clicked whilst the mouse pointer is hovering over a comment box.



EDIT

Selecting this item causes the comment edit dialogue box to open, allowing the user to edit the current text.

UNLINK

This discards any existing link between the comment box and a function block or wire. Creating a new link also discards any existing link.

CUT, COPY, PASTE

The normal cut, copy and paste functions, applied to Comment boxes.

DELETE

Models 3500, EPower controllers, Mini-8 controllers
If the comment has previously been downloaded, it is shown 'ghosted' until next time the wiring diagram is downloaded, when it disappears from view. Until such time, it can be 'undeleted' using the 'Undelete' menu item, below. If the comment is 'new' (that is, it has not yet been included in a download), then the deletion takes effect immediately.

Models 2604, 2704
Deleted items are immediately removed from the wiring diagram. Such items can be restored using the Undo tool button (shortcut +).

UNDELETE

Models 3500, Epower controllers, Mini-8 controllers
Comments that have been downloaded at least once, then deleted are shown 'ghosted' to indicate that the instrument still has the comment stored in its memory. If the 'Undelete' item is selected before the next download, then the comment is restored to its former non-deleted status.

Models 2604/2704
This 'Undelete' menu item is not available. Deleted items can be restored using the Undo tool button (shortcut +).

BRING TO FRONT

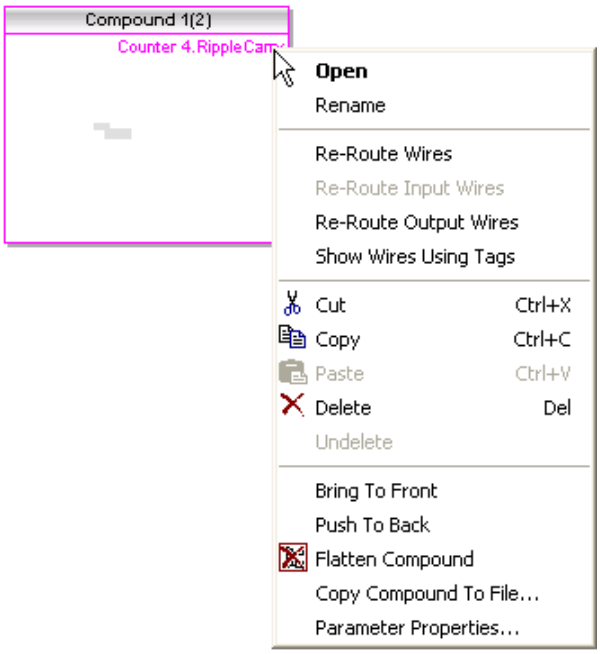
Selecting this item brings the selected comment to the front of the diagram. The same effect can be achieved by moving the comment.

PUSH TO BACK

Selecting this item sends the selected comment to the back.

15.1.4. Compound Context Menu

This context menu is displayed when the mouse is right clicked whilst the cursor is hovering over a compound in the top level wiring diagram.



OPEN

Opens the compound

RENAME

Allows the compound to be renamed.

RE-ROUTE WIRES

This causes iTools to discard, and do a re-route for the current routing for all the wires connected to the compound.

RE-ROUTE INPUT WIRES

This causes iTools to discard, and do a re-route for the current routing for all input wires connected to the compound.

RE-ROUTE OUTPUT WIRES

This causes iTools to discard, and do a re-route for the current routing for all output wires connected to the compound.

SHOW WIRES USING TAGS

This menu item can be enabled on a block-by-block basis. When enabled, wires are replaced by source and destination tags.

CUT, COPY, PASTE

Carries out the normal cut, copy and paste functions on the Compound. Error messages appear if there are insufficient blocks of the correct types available.

If Compound 1 (for example) is cut and pasted onto the same diagram, then the default name is Compound 1(2).

15.1.4 COMPOUND CONTEXT MENU (Cont.)

DELETE

Models 3500, EPower controller, Mini8 controller
If the item has previously been downloaded, it is shown 'ghosted' until next time the wiring diagram is downloaded, when it disappears from view. Until such time, it can be 'undeleted' using the 'Undelete' menu item, below. If the item is 'new' (that is, it has not yet been included in a download), then the deletion takes effect immediately.

Models 2604, 2704
Deleted items are immediately removed from the wiring diagram. Such items can be restored using the Undo tool button (shortcut +).

UNDELETE

Models 3500, EPower controller, Mini8 controller
Items that have been downloaded at least once, then deleted are shown 'ghosted' to indicate that the instrument is still 'executing' the item. If the 'Undelete' item is selected before the next download, then the item is restored to its former non-deleted status.

Models 2604/2704
This 'Undelete' menu item is not available. Deleted items can be restored using the Undo tool button (shortcut <Ctrl + <Z>)

FLATTEN COMPOUND

Selecting this item (active in the top level only) causes the compound 'box' to be removed from the top level diagram and its contents to be positioned on the top level diagram. These components are 'selected', so that they can easily be moved to a convenient place on the diagram.

The associated compound tab is removed from the window. Default compound names can be used only once. For example, if Compound 1, Compound 2 and Compound 3 exist and then Compound 2 and Compound 3 are deleted, the next compound to be created will have the default name Compound 4.

COPY COMPOUND TO FILE...

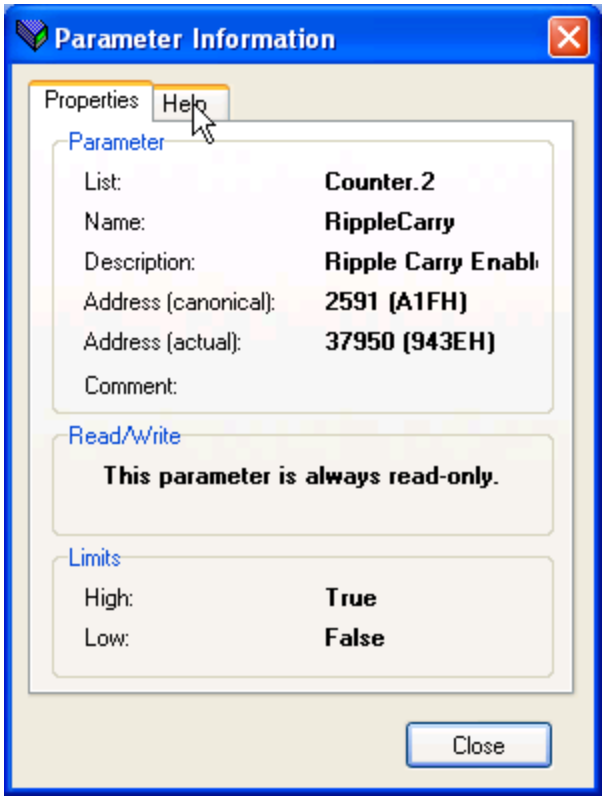
This saves a copy of the selected compound to a file name entered by the user. This file is located in 'My iTools Wiring Fragments' located in 'My Documents'.

Paste Fragment is used to place a copy of the saved compound on to a top level wiring diagram. Paste Fragment is initiated either by clicking on the Paste Fragment icon , or by selecting 'Paste Fragment' from the Diagram Context menu (opened by right clicking within an empty area of the diagram).

15.1.4 COMPOUND CONTEXT MENU (Cont.)

PARAMETER PROPERTIES...

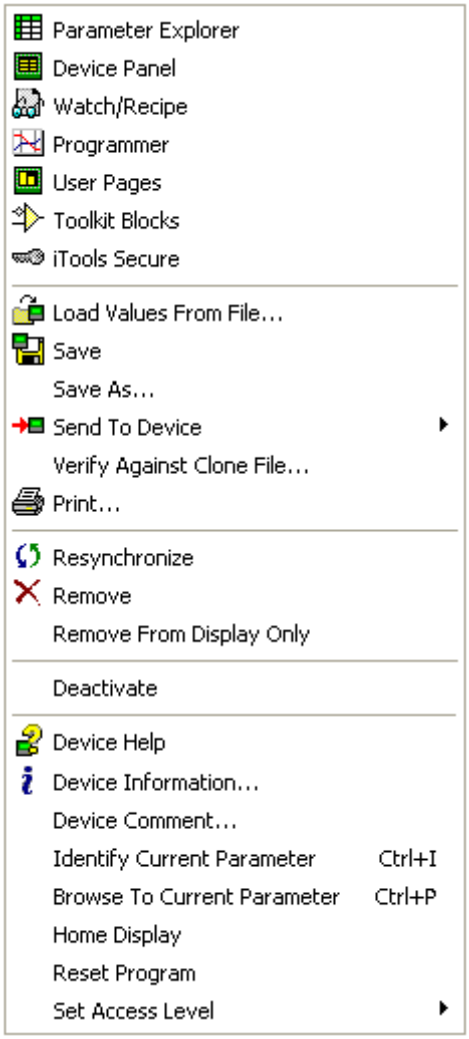
Compounds which are wired into and/or out of, show the names of the parameters which have wires associated with them. Right clicking whilst hovering over such a parameter name (as in the diagram above) activates the Parameter Properties... menu item, which is otherwise greyed.
Selecting this item calls the relevant Parameter properties display. If Parameter Help is available (depends on instrument type) then a 'Help' tab is located at the top of the Properties window allowing the user to display the description for this parameter.



15.1.5. Device context menu

This context menu appears if the mouse right button is clicked whilst the mouse pointer is hovering over a device either in the device browser window, or in the panel views area.

Note: This menu varies according to device type.



VIEW SELECTION

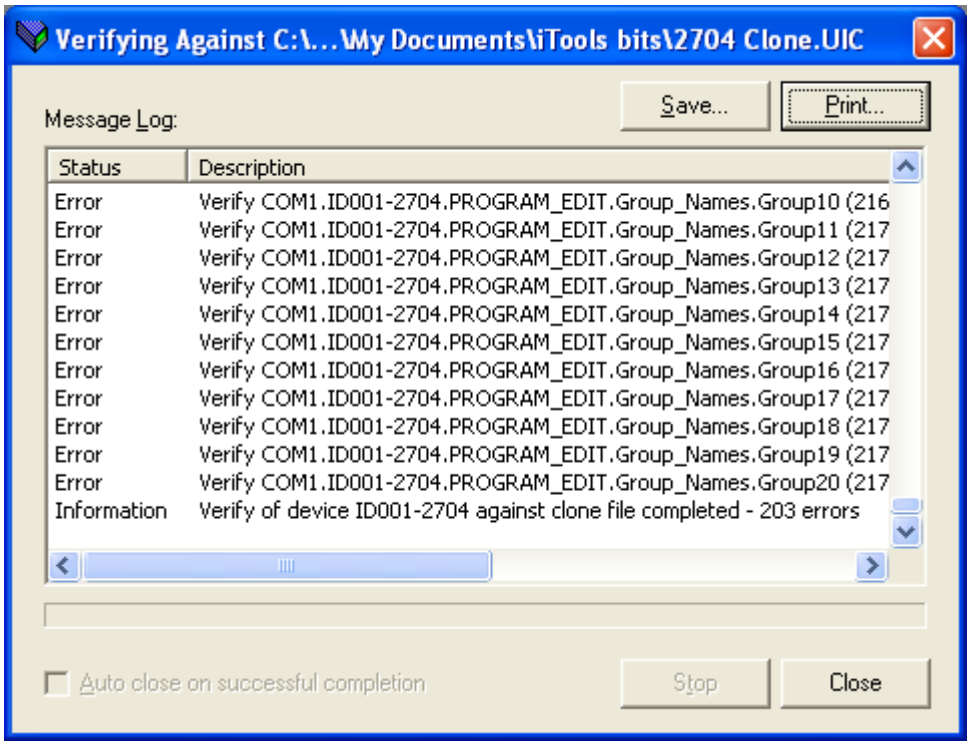
The top section of this menu contains Viewing mode selections. The available viewing modes are described in the Views menu topic and the Views Toolbar topic.

FILE MENU SELECTIONS

Load values from File...
This selection opens a file dialogue box to allow the user to select a previously stored file for loading into the selected instrument. If the file is incompatible with the selected device, the load will fail.
Save
Saves the current file to its previous location. If the file is new, then the Save As... dialogue box opens.
Save As... / Save to File...
Opens a file dialogue box to allow the user to select a destination folder for the file.
Send to Device
Allows the user to select a connected instrument to which the file is to be downloaded.

15.1.5 DEVICE CONTEXT MENU (Cont.)

Verify against Clone File



Looks for differences between the clone file and the device file. A message log appears (above), identifying any differences.

Note: This can take some minutes.

The log can be Saved, or Printed by clicking on the relevant button.

Should the error 'Verifying clone of device xxx not supported while parameter attribute monitoring is enabled' appear (where xxx represents the device type), then 'Global Enable Active Mirror Device' must be disabled in the Options/Advanced/Show Server Edit menu.

Print
Opens the Report configuration window. See 'Report Configuration' for more details.

15.1.5 DEVICE CONTEXT MENU (Cont.)

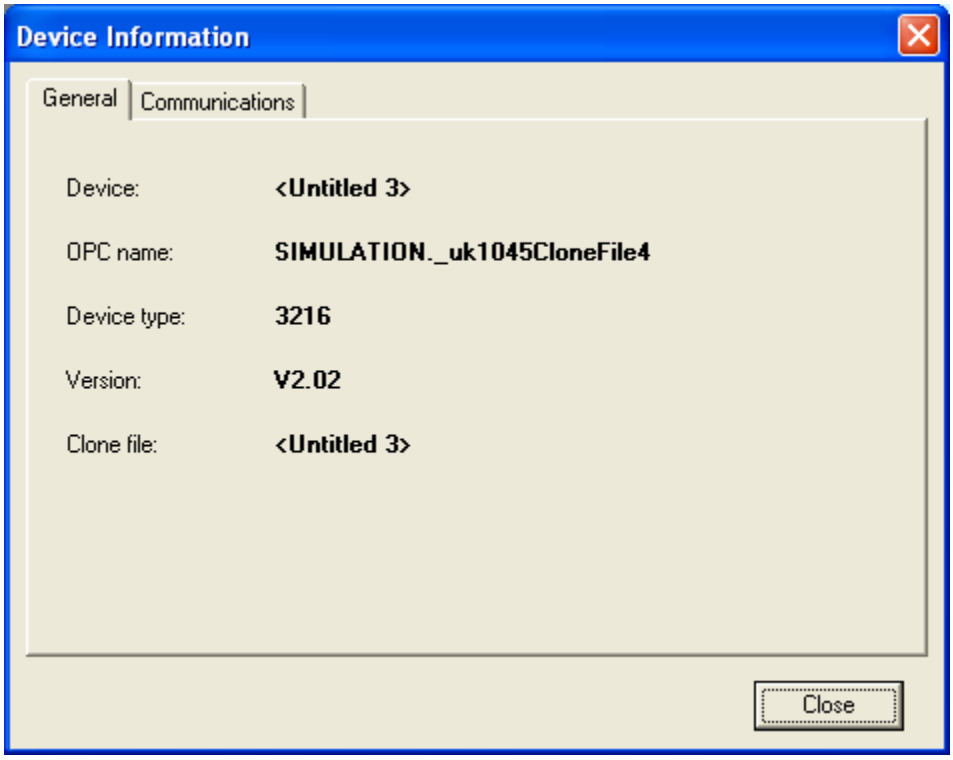
DEVICE MENU ITEMS

Resynchronise
Used to re-synchronise iTools with the instrument. Used when changes have been made at the instrument via its operator interface. See 'Synchronisation' for more details.
Remove
Removes the selected device from iTools.
Remove from display only
For connected instruments, removes the selected item from the panel views area and from the Device browser. Can be re-instated by using the Add facility for example.
Deactivate / Activate
For supported instruments, this toggles the selected instrument's operator interface display, in the Panel Views area, on and off.
Device Comment...
Allows a device comment to be added.
Identify Current Parameter
For relevant device types only, this displays a dialogue box identifying the parameter currently shown at the instrument display. Short cut <Ctrl> + <I>. The entry is 'greyed' for other device types.
Browse To Current Parameter
For relevant device types only, this opens the iTools browse tree to the parameter currently shown at the instrument display. Short cut <Ctrl> + <P>. The entry is 'greyed' for other device types.
Home Display
For relevant device types only, this returns the instrument to its default home display page. The entry is 'greyed' for other device types.
Reset program
For relevant device types only, this resets any setpoint program running in the device. The entry is 'greyed' for other device types.
Set Access Level
Allows the user to select 'Operator' level (short cut <Ctrl> + <Alt. + <O>) or Configuration access level (short cut <Ctrl> + <N>).

15.1.5 DEVICE CONTEXT MENU (Cont.)

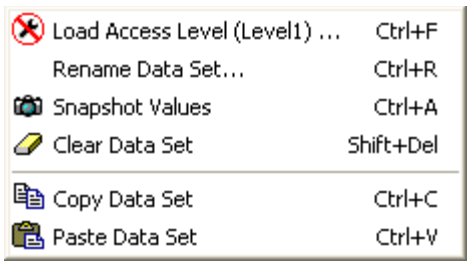
HELP MENU ITEMS

Device Help
This menu item appears only for those instruments which have their own parameter help pages. Selecting the menu item opens the instrument's help system. The menu item does not appear for instruments without Parameter Help.
Device information...
This menu item calls the 'Device info' display. The communications tab shows the Communications protocol, the Device address and the (for live devices only) Baud rate.



15.1.6. Device Recipe Data Sets context menu

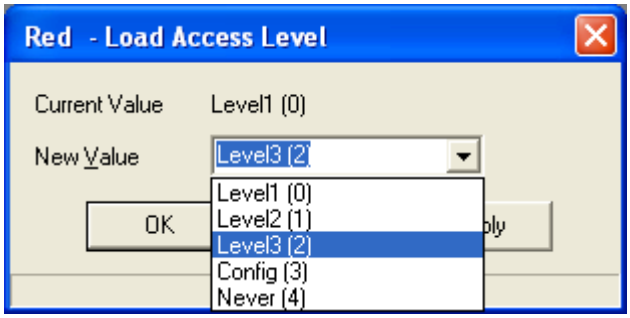
This menu appears if the right hand mouse button is operated whilst the mouse pointer is hovering over a Device Recipe data set (not supported by all instruments).



LOAD ACCESS LEVEL

Enabled only if a data set is 'selected'.

Selection of this Recipe menu item calls the access level configuration page, which allows the required access level to be set for the selected data set. The number of access levels varies from one device to another. Short cut <Ctrl> + <F>.



= configuration access only.
= access never.
= other access levels.

RENAME DATA SET...

Enabled only if a data set is selected, this allows the user to enter a title for the selected data set. Short cut <Ctrl> + <R>.

SNAPSHOT VALUES

Enabled only if a data set is selected, this fills the selected data set with the current values of the parameters listed in the data list. Short cut <Ctrl> + <A>.

COPY DATA SET

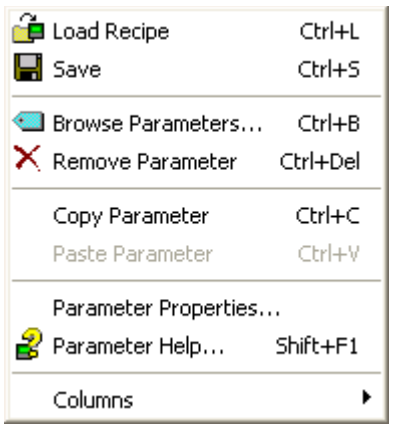
Enabled only if a data set is selected, this allows the user to copy the selected data set to the clipboard. Short cut <Ctrl> + <C>.

PASTE DATA SET

Enabled only if a data set is selected, and there is a data set located on the clipboard, this allows the user to paste a previously copied data set from the clip board to the selected data set. Short cut <Ctrl> + <V>.

15.1.7. Device Recipe parameter context menu

This menu appears if the right hand mouse button is operated whilst the mouse pointer is hovering over the Device Recipe parameter area (not supported by all instruments).



LOAD RECIPE

Loads the recipe list and data sets from a file, clearing all existing values from the device. Short cut <Ctrl> + <L>

SAVE

Saves the current parameter sets to a file. Short cut <Ctrl> + <S>

BROWSE PARAMETERS...

If a parameter is selected, then this opens a browse list at that parameter. If an empty row is selected, the browse window opens at the parameter last accessed using this browser tool. Short cut <Ctrl> + <B>

REMOVE PARAMETER

Enabled only if a parameter is 'selected', this removes the currently selected parameter. Short cut <Ctrl> + <Delete>

COPY PARAMETER

Enabled only if a parameter is 'selected', this allows the user to copy the selected parameter to the clip-board. Short cut <Ctrl> + <C>.

PASTE PARAMETER

Enabled only if a suitable parameter is located on the clipboard, this allows the user to paste a parameter from the clip board to the watch list. Short cut <Ctrl> + <V>.

PARAMETER PROPERTIES... AND PARAMETER HELP

Enabled only if a parameter is 'selected'.

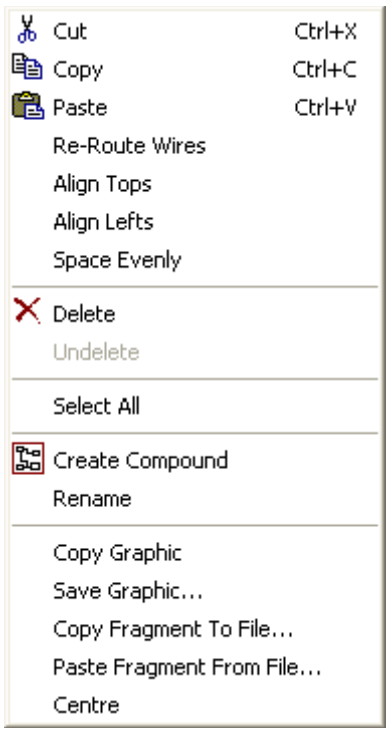
See Explorer menu for details.

COLUMNS

Allows the user to enable/disable the Description and comment columns for display in the watch list win-dow.

15.1.8. Diagram context menu

This menu appears if the right hand mouse button is operated whilst the mouse pointer is hovering over the wiring diagram background.



CUT, COPY, PASTE

The standard cut copy and paste items for wiring diagram components.

RE-ROUTE WIRES

For selected wires, the current routing is discarded and a new path found. If no wires are selected, all wires are discarded and new paths found for all wires.

ALIGN TOPS

Aligns the tops of all selected (non-wire) items.

ALIGN LEFTS

Aligns the left edges of all selected (non-wire) items.

SPACE EVENLY

This allows the user to space the selected items such that their top left corners are evenly spaced, both horizontally and vertically. The items to be spaced should be control-clicked in the order in which they are to be spaced, before the Space Evenly is selected by right clicking in the selected area, then left clicking 'Space Evenly'.

SELECT ALL

Selects all items in the wiring diagram. Short cut = <Ctrl> + <A>.

CREATE COMPOUND

Selecting this item causes a new compound to be created. A new tab (Compound N) appears at the top of the wiring area. If the maximum number of compounds for the instrument type already exist, then this item is greyed out. See 'Compounds' for more details.

15.1.8 DIAGRAM CONTEXT MENU (Cont.)

DELETE

Note: this function is active only if more than one item is selected in the wiring layout diagram. If only one item is selected, the Function Block context menu appears instead.

Models 3500, EPower controllers, Mini-8 controllers
If deleted items have previously been downloaded, they are shown 'ghosted' until next time the wiring diagram is downloaded, when they disappear from view. Until such time, they can be 'undeleted' using the 'Undelete' menu item, below. If deleted items are 'new' (that is, they have not yet been included in a download), then the deletion takes effect immediately.

Models 2604, 2704
Deleted items are immediately removed from the wiring diagram. Such items can be restored using the Undo tool button (shortcut +).

UNDELETE

Note: this function is active only if more than one item is selected for undeleting. If only one item is selected, the Function Block context menu appears instead.

Models 3500, EPower controllers, Mini-8 controllers
Items that have been downloaded at least once, then deleted are shown 'ghosted' to indicate that the instrument still has the items in its memory. If the 'Undelete' item is selected before the next download, then the items are restored to their former non-deleted status.

Models 2604/2704
This 'Undelete' menu item is not available. Deleted items can be restored using the Undo tool button (shortcut +).

COPY GRAPHIC

If one or more items are selected, they are copied to the clipboard as a metafile. If no items are selected, the whole diagram is copied. Metafiles can be imported into documents etc. if required. The grid is copied, if enabled.

Note: The quality of metafile rendering varies from package to package, but generally the printed result is better than the on-screen appearance would suggest.

SAVE GRAPHIC...

As above, but the diagram is saved to a file instead of to the clipboard.

COPY FRAGMENT TO FILE...

Copies the highlighted items to a filename defined by the user, located somewhere in 'My iTools Wiring Fragments' to be found in 'My Documents'.

PASTE FRAGMENT FROM FILE...

This opens a browse window showing all the fragments previously saved (copied) from this or another compatible instrument.

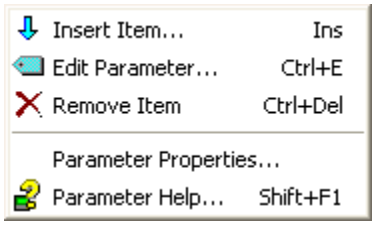
CENTRE

This item becomes active when multiple components are selected (by click-dragging a rectangle round them) and the mouse is right-clicked within the selection area. Selecting 'Centre' causes the selected items to move to the centre of the wiring diagram.

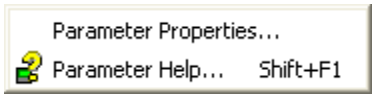
15.1.9. Flash Memory Context menu

There are two versions of the Flash Memory Editor context menu. The version which appears when the mouse is right clicked, depends on which tab is currently active.

For the 'Message Table' and 'Promote Parameters' tabs, the full version appears:



For the remaining tabs ('Message Table Configuration, 'Recipe Definition and Recipe names'), the simpler version appears (see Explorer menu for details):



INSERT ITEM...

Inserts an item immediately above the currently selected item. An item can be added to the end of the list by inserting it with the final empty row selected. Shortcut = <Insert>

EDIT PARAMETER...

Open a browse dialogue to edit the parameter associated with the selected item. Shortcut = <Ctrl> + <E>

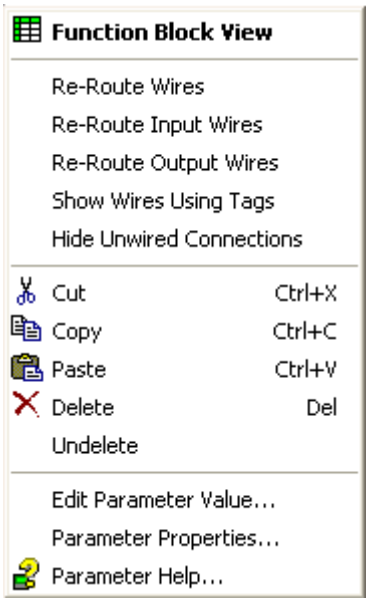
REMOVE ITEM

Removes the selected item from the list. Shortcut = <Ctrl> + <Del>.

PARAMETER PROPERTIES... AND PARAMETER HELP

See Explorer menu for details.

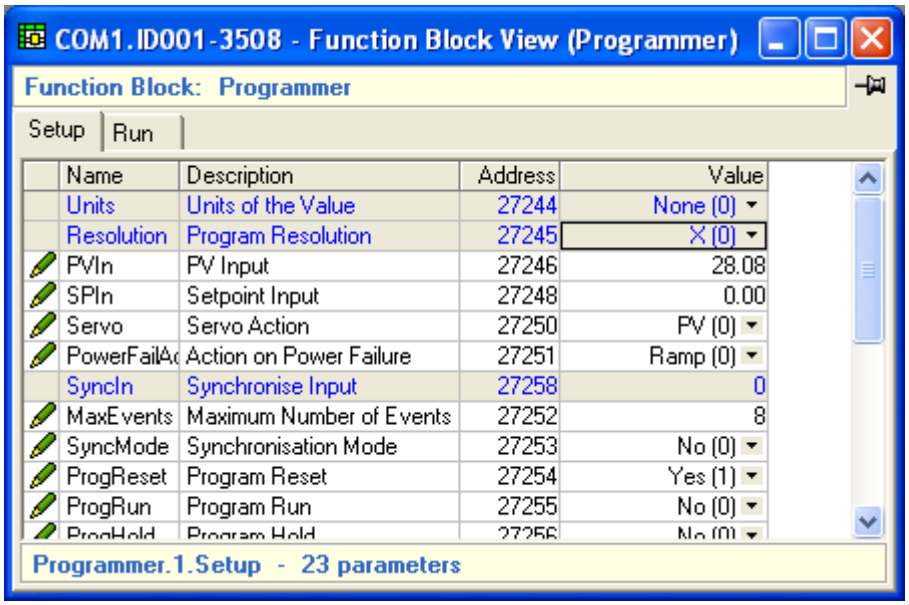
15.1.10. Function Block context menu



This 'Context' menu appears if the right mouse button is clicked whilst the mouse pointer is hovering over a block.

FUNCTION BLOCK VIEW

Selecting this item calls an iTools parameter list showing all the parameters in the block. If the list contains sub-lists, these are shown as tabs, as in the example below.



RE-ROUTE WIRES

This causes iTools to discard, and do a re-route for the current routing for all the wires connected to the selected block.

RE-ROUTE INPUT WIRES

This causes iTools to discard, and do a re-route for the current routing for all input wires connected to the selected block.

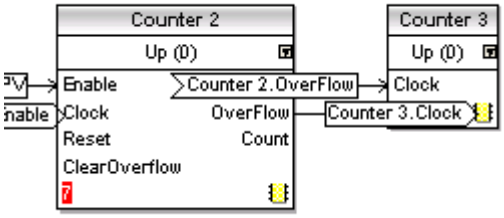
15.1.10 FUNCTION BLOCK CONTEXT MENU (Cont.)

RE-ROUTE OUTPUT WIRES

This causes iTools to discard, and do a re-route for the current routing for all output wires connected to the selected block.

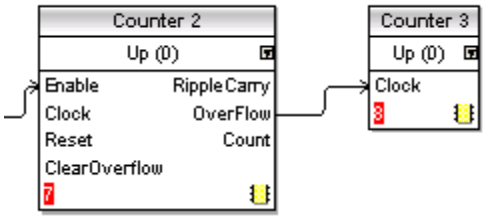
SHOW WIRES USING TAGS

This menu item can be enabled on a block-by-block basis. When enabled, wires are replaced by source and destination tags.



HIDE UNWIRED CONNECTIONS

This menu item can be enabled on a block-by-block basis. When enabled, all parameters not so far used are hidden. The figure shows two identical blocks one with parameters shown - the other with unwired parameters hidden.



CUT

This operation copies the selected item(s) to the pasteboard and either removes them from the diagram or marks them for removal ('ghosts' them) according to instrument type (see 'Delete' and 'Undelete', below).

COPY

If the context menu is opened by right clicking when the mouse pointer is over a parameter, and 'Copy' selected, then a reference to the parameter will be copied for subsequent 'pasting' into a watch window or OPC scope.
If the context menu is opened by right-clicking when the mouse pointer is over a block (but not directly over a parameter) the block is copied to the pasteboard ready for pasting elsewhere in the diagram.

PASTE

Copies the contents of the pasteboard to the selected location

DELETE

Models 3500, EPower controller, Mini8 controller
If the item has previously been downloaded, it is shown 'ghosted' until next time the wiring diagram is downloaded, when it disappears from view. Until such time, it can be 'undeleted' using the 'Undelete' menu item, below. If the item is 'new' (that is, it has not yet been included in a download), then the deletion takes effect immediately.

Models 2604, 2704
Deleted items are immediately removed from the wiring diagram. Such items can be restored using the Undo tool button (shortcut +).

15.1.10 FUNCTION BLOCK CONTEXT MENU (Cont.)

UNDELETE

Models 3500, EPower controller, Mini8 controller
Items that have been downloaded at least once, then deleted are shown 'ghosted' to indicate that the instrument is still 'executing' the item. If the 'Undelete' item is selected before the next download, then the item is restored to its former non-deleted status.

Models 2604/2704
This 'Undelete' menu item is not available. Deleted items can be restored using the Undo tool button (shortcut <Ctrl> + <Z>).

BRING TO FRONT

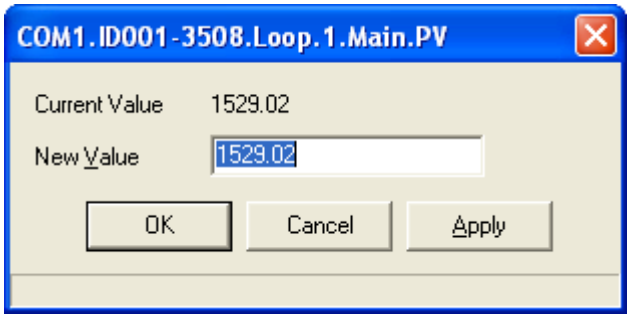
Selecting this item brings the selected block to the front. The same effect can be achieved by moving the block, using the mouse or direction keys.

PUSH TO BACK

Selecting this item pushes the selected block to the back. Normally used when the current item is obscuring another (and is therefore drawn in red).

EDIT PARAMETER VALUE...

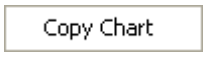
This menu item is enabled when the right mouse button is clicked whilst the mouse pointer is hovering over a parameter. Left clicking on this menu item calls a parameter edit box, allowing the user to change the value (providing that the parameter is not Read Only).



PARAMETER PROPERTIES... / HELP...

See Explorer menu for details.

15.1.11. Graph context menu



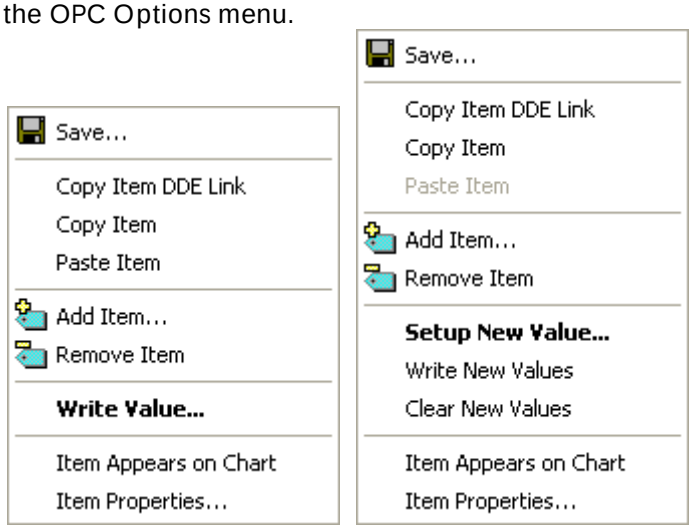
This menu is obtained by right-clicking over the chart area of the screen for instruments which support Programmer editor. See 'Chart context menu' for OPC Scope functions.

COPY CHART

Selecting this item causes a copy of the chart to be saved to the clipboard ready for 'Pasting' into word processing or spreadsheet programs. Amongst other things, this allows the chart to be printed.

15.1.12. List context menu (OPC Scope)

There are two List context menus, the default menu (contains 'Write Value...') and the Group Item Value Writes version (contains 'Setup New Value...' etc.) which appears if 'Group Item Value Writes' is enabled in the OPC Options menu.



SAVE...

Opens a file dialogue box allowing the user to define a destination path for saving the file.

COPY ITEM DDE LINK

Allows the user to define the selected item as a link parameter. When added to a spreadsheet, the parameter value is updated in real time. See 'DDE Interface' for more details.

COPY ITEM

Copies the selected item to the clipboard.

PASTE ITEM

Pastes item from the clipboard into the selected list or chart etc, within OPC scope, or anywhere else.

ADD ITEM...

Adds the selected item to the list or chart, after a confirmation message.

REMOVE ITEM

Removes the selected item from the list or chart.

WRITE VALUE...

For Read/Write parameters, this allows the user to edit the value of the selected parameter.

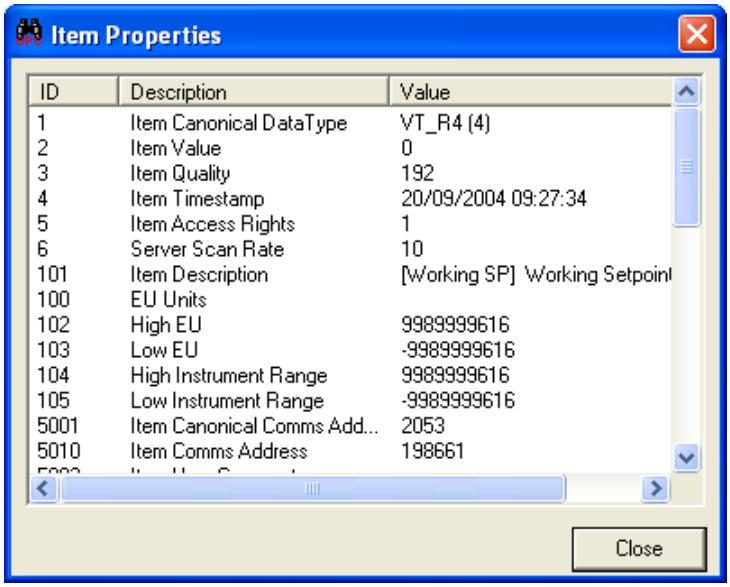
15.1.12 LIST CONTEXT MENU (OPC SCOPE) (Cont.)

ITEM APPEARS ON CHART

For parameters newly entered to the list, selecting this menu item, causes the parameter to be added to the chart. Subsequently, the parameter can be removed from and restored to the chart as required.

ITEM PROPERTIES...

Calls the item properties page to the display.

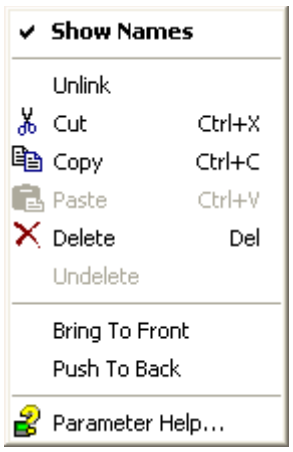


SETUP NEW VALUE...

If 'Group Item Value Writes' is enabled in the Options menu, then new values can be entered for one or more of the parameters in the OPC list. The entered values can then be downloaded together, by using the Write New Values item. Should it be necessary, the new values can be deleted by selecting 'Clear New Values'.

15.1.13. Monitor context menu

This menu appears if the right mouse button is clicked whilst the mouse pointer is hovering over a monitor box.



SHOW NAMES

This selection allows the user to add/delete parameter names to/from the monitor window. Names are particularly useful when monitoring wires.

Example 1: Monitor value for parameter ('ShowNames' selected): SP.TrackPV = 1529.02

Example 2: Monitor value for parameter ('Show Names' not selected): 1529.02

Example 3: Monitor for wire ('Show Names' selected):
[From] SP.TrackPV = 1529.02 [To] Setup.PVIn = 1529.02

Example 4: Monitor for wire ('Show Names' not selected): [From] 1529.02 [To] 1529.02

UNLINK

This discards any existing link between the monitor box and a function block or wire. Creating a new link also discards any existing link.

CUT, COPY, PASTE

Carries out the normal cut, copy and paste functions for Monitor windows.

DELETE

Models 3500, EPower controllers, Mini-8 controllers
If the item has previously been downloaded, it is shown 'ghosted' until next time the wiring diagram is downloaded, when it disappears from view. Until such time, it can be 'undeleted' using the 'Undelete' menu item, below. If the comment is 'new' (that is, it has not yet been included in a download), then the deletion takes effect immediately.

Models 2604, 2704
Deleted items are immediately removed from the wiring diagram. Such items can be restored using the Undo tool button (shortcut <Ctrl> + <Z>).

15.1.13 MONITOR CONTEXT MENU (Cont.)

UNDELETE

Models 3500, EPower controlers, Mini-8 controllers
Items that have been downloaded at least once, then deleted are shown 'ghosted' to indicate that the instrument still has the monitor point stored in its memory. If the 'Undelete' item is selected before the next download, then the comment is restored to its former non-deleted status.

Models 2604/2704
This 'Undelete' menu item is not available. Deleted items can be restored using the Undo tool button (shortcut <Ctrl> + <z>).

BRING TO FRONT

Selecting this item brings the selected monitor box to the front of the diagram. The same effect can be achieved by moving the monitor box.

PUSH TO BACK

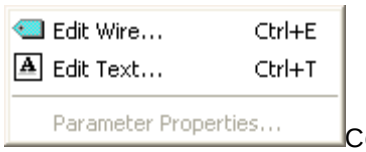
Selecting this item sends the selected comment to the back.

PARAMETER HELP

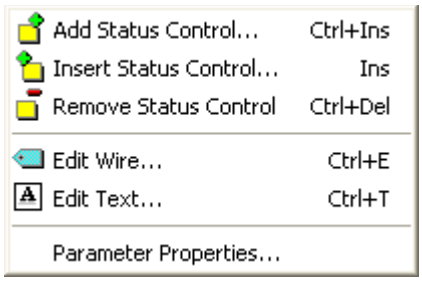
For instruments which support Parameter Help, this produces a description of the parameter which is being monitored. A 'Properties' tab is located near the top of the display, and this allows the user to view the properties of the parameter.

15.1.14. User Page Editor Context menu (2704)

This context menu is called by clicking on the right mouse button whilst the mouse pointer is hovering over a parameter in the page display. the menu content changes according to the page style currently selected. The menu content mimics the functions of the 'Pages' menu and the Pages Toolbar.



Context menu for all styles except Status Grid, Bargraph and Blank.



Context menu for Status grid style

Context menu for Bargraph style.

EDIT WIRE...

Selection of this item causes a browse dialogue box to appear allowing the user to select a parameter to add to the page at the highlighted position. Any existing parameter is overwritten, after confirmation. Short cut<Ctrl> + <E>. Disabled in Live Data mode.

EDIT TEXT...

Edit user text for selected parameter. When enabled, this opens the User Text dialogue box. The user can either select an existing item of user text from the 100 available, or an item can be edited. As soon as the selection is made, it is assigned to the selected parameter. Short cut<Ctrl> + <T>. Disabled in Live Data mode.

If an existing item of user text is edited here, then the new text will apply to all instances of this User Text item throughout the device.

PARAMETER PROPERTIES

See Explorer menu for details.

UNWIRE PAGE

Removes ALL parameters from the page, not just the highlighted one. Short cut<Ctrl> + <U>. Disabled in Live Data mode.

15.1.14 USER PAGE CONTEXT MENU (2704) (Cont.)

SHOW LIVE DATA

Switches display to live mode. Menu item text changes to 'Return to Editor'. Short cut<Ctrl> + <L>.

RETURN TO EDITOR

Switches back to edit mode from Live Data mode. Menu item text changes to 'Show Live Data'. Short cut<Ctrl> + <L>.

INSERT STATUS CONTROL...

For 'Status Grid' style only, this allows the user to insert a new status block to the left of the selected block. Short cut <Insert>. The maximum number of blocks is 12, and this control is disabled if all 12 blocks are used. Disabled in Live Data mode.

ADD STATUS CONTROL...

For 'Status Grid' style only, this allows the user to insert a new block to the right of the selected block. Short cut <Ctrl> + <Insert>. The maximum number of blocks is 12, and this control is disabled if all 12 blocks are used. Disabled in Live Data mode.

REMOVE STATUS CONTROL

For 'Bargraph' style only, this allows the user to delete the selected status block. Short cut <Ctrl> + <Delete>. Disabled in Live Data mode.

INSERT BAR...

For 'Bargraph' style only, this allows the user to insert a new bar to the left of the selected bar. Short cut <Insert>.

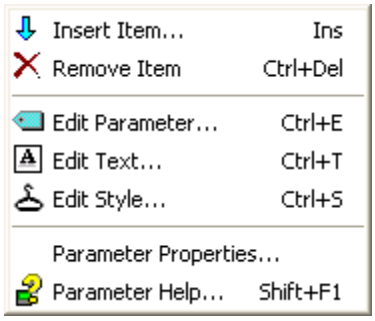
ADD BAR...

For 'Bargraph' style only, this allows the user to insert a new bar to the right of the selected bar. Short cut <Ctrl> + <Insert>. Disabled in Live Data mode.

REMOVE BAR

For 'Bargraph' style only, this allows the user to delete the selected bar. Short cut <Ctrl> + <Delete>. Disabled in Live Data mode.

15.1.15. Pages context menu (3500 and EPower controllers)



INSERT ITEM...

Opens a browse window to allow the user to select a parameter for insertion into the table. The insertion point is above the currently selected item. Short cut <Insert>.

REMOVE ITEM

Removes selected item from the configuration list. Short cut = <Ctrl> + <Delete>.

EDIT PARAMETER...

If this is clicked-on, a browser dialogue box appears allowing the user to replace the current parameter with another. Short cut<Ctrl> + <E>.

EDIT TEXT...

Allows the user to edit the existing user text, or to create a new text string. Short cut<Ctrl> + <T>. For parameters which do not support user text, '(no user text)' appears in the 'User Text' column.

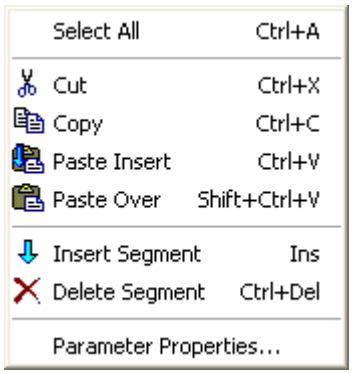
EDIT STYLE...

Clicking on this tool calls the style selection dialogue box, allowing the user to edit the current selection for the selected parameter. Short cut <Ctrl> + <S>.

PARAMETER PROPERTIES / PARAMETER HELP...

See Explorer menu for details.

15.1.16. Segment context menu (2400)



This menu appears when the right-hand mouse button is operated whilst the mouse pointer is hovering within the segment progamming area of the screen.

SELECT ALL

Selects all segments. Shortcut = <Ctrl> + <A>.

CUT

Removes the selected segment(s) from the program and places them on the clipboard. Shortcut = <Ctrl> + <X>.

COPY

Copies the selected segment(s) to the clipboard, leaving the originals in place. Shortcut = <Ctrl> + <C>.

PASTE INSERT

This takes any segments located on the clipboard and inserts them into the program. The insertion point is to the left of the highlighted segment. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Ctrl> + <V>.

PASTE OVER

This tool replaces the highlighted segment(s) with the contents of the clipboard. All other segments remain unchanged. Shortcut = <Shift> + <Ctrl> + <V>.

INSERT SEGMENT

This inserts a copy of the highlighted segment into the program, at the highlighted position. All subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Insert>.

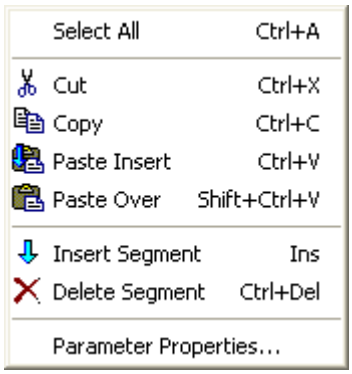
DELETE SEGMENT

Removes the highlighted segment. Subsequent segments are moved left and renumbered appropriately. Shortcut = <Ctrl> + <Delete>.

PARAMETER PROPERTIES...

See Explorer menu for details.

15.1.17. Segment context menu (2704)



This menu appears when the right-hand mouse button is operated whilst the mouse pointer is hovering within the segment programming area of the screen.

SELECT ALL

Selects all segments. Shortcut = <Ctrl> + <A>.

CUT

Removes the selected segment(s) from the program and places them on the clipboard. Shortcut = <Ctrl> + <X>.

COPY

Copies the selected segment(s) to the clipboard, leaving the originals in place. Shortcut = <Ctrl> + <C>.

PASTE INSERT

This takes any segments located on the clipboard and inserts them into the program. The insertion point is to the left of the highlighted segment. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Ctrl> + <V>.

PASTE OVER

This tool replaces the highlighted segment(s) with the contents of the clipboard. All other segments remain unchanged. Shortcut = <Shift> + <Ctrl> + <V>.

INSERT SEGMENT

This inserts a copy of the highlighted segment into the program, at the highlighted position. All subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Insert>.

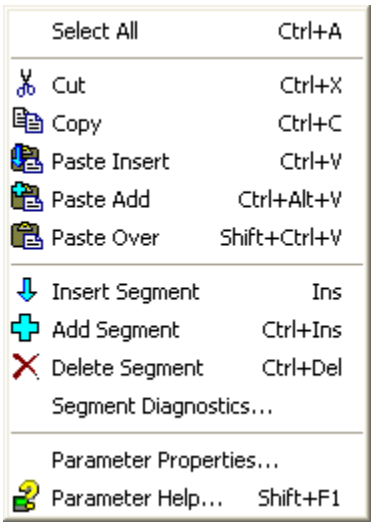
DELETE SEGMENT

Removes the highlighted segment. Subsequent segments are moved left and renumbered appropriately. Shortcut = <Ctrl> + <Delete>.

PARAMETER PROPERTIES...

See Explorer menu for details.

15.1.18. Segment context menu (3500)



This menu appears when the right-hand mouse button is operated whilst the mouse pointer is hovering within the segment programming area of the screen.

SELECT ALL

Selects all segments. Shortcut = <Ctrl> + <A>.

CUT

Removes the selected segment(s) from the program and places them on the clipboard. Shortcut = <Ctrl> + <X>.

COPY

Copies the selected segment(s) to the clipboard, leaving the originals in place. Shortcut = <Ctrl> + <C>.

PASTE INSERT

This takes any segments located on the clipboard and inserts them into the program. The insertion point is to the left of the highlighted segment. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Ctrl> + <V>.

PASTE ADD

This takes any segments located on the clipboard and appends them to the program. Selection is enabled only if there are no segments highlighted, otherwise the entry is 'greyed'. Shortcut = <Ctrl> + <Alt> + <V>.

PASTE OVER

This tool replaces the highlighted segment(s) with the contents of the clipboard. All other segments remain unchanged. Shortcut = <Shift> + <Ctrl> + <V>.

INSERT SEGMENT

This inserts a copy of the highlighted segment into the program, at the highlighted position. All subsequent segments are moved rightwards and renumbered appropriately. Selection is enabled only if there are one or more segments highlighted, otherwise the entry is 'greyed'. Shortcut = <Insert>.

ADD SEGMENT

Appends a segment to the end of the program. The segment is identical to the previous segment. Selection is enabled only if there are no segments highlighted, otherwise the entry is 'greyed'. Shortcut = <Ctrl> + <Insert>.

15.1.18 SEGMENT CONTEXT MENU (3500) (Cont.)

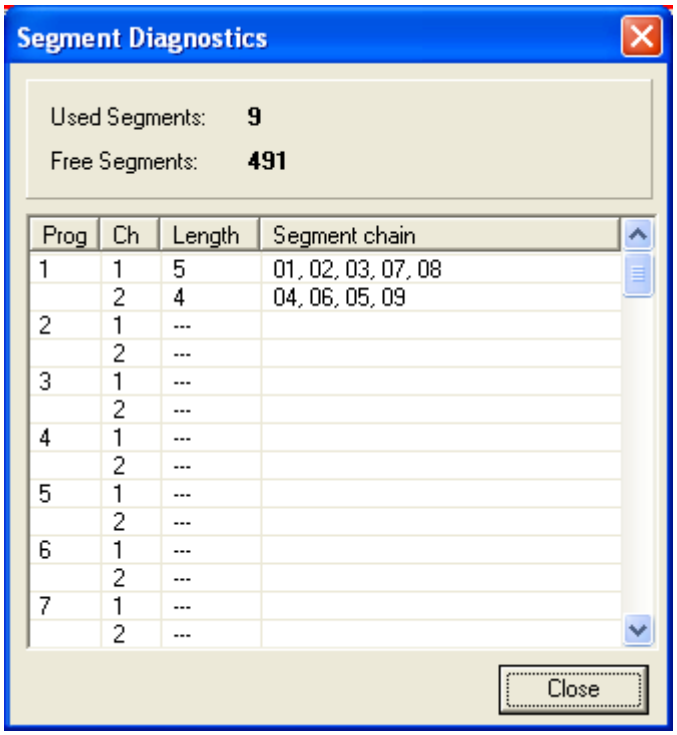
DELETE SEGMENT

Removes the highlighted segment. Subsequent segments are moved left and renumbered appropriately. Selection is enabled only if one or more segments are highlighted, otherwise the entry is 'greyed'. Shortcut = <Ctrl> + <Delete>.

SEGMENT DIAGNOSTICS

A program consists of a list of linked segments, these segments being obtained from a common segment pool. Knowledge of this internal structure is normally required only for diagnostic purposes.

The 'Used Segments' and 'Free Segments' totals are useful in understanding why any error messages, stating that there are insufficient segments available to perform an operation, have been generated.

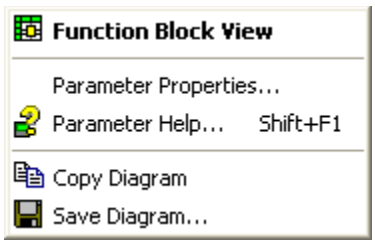


PARAMETER PROPERTIES... / PARAMETER HELP...

See Explorer menu for details.

15.1.19. Terminal Wiring context menu

This menu appears when the mouse is right clicked whilst the cursor is hovering over a Terminal Wiring View diagram.



FUNCTION BLOCK VIEW

For appropriate modules only, selecting 'Function Block View ' calls the Function Block parameter list for that module.

Where terminations are not associated with modules (supply voltage input, for example) the menu selection is greyed.

PARAMETER PROPERTIES... AND PARAMETER HELP

See Explorer menu for details.

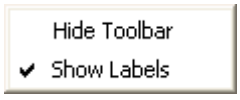
COPY DIAGRAM

Allows the user to copy the diagram to the clipboard, for subsequent pasting into word processing or spreadsheet applications.

SAVE DIAGRAM...

When selected this calls a 'Save Diagram' dialogue box to allow the user to define a name and destination folder for the (.emf) file containing the diagram. Such diagrams can then be imported into word processing or spreadsheet applications.

15.1.20. Toolbar context menu

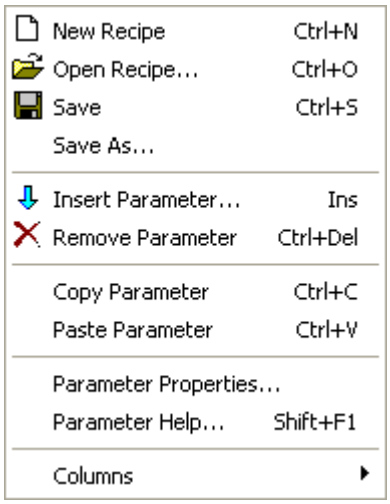


Allows the user to enable/disable the display of tool labels in the Main and Views Toolbars. The tool bars themselves can also be hidden, individually by selecting 'Hide Toolbar'. In such a case, the Views menu 'Tools' item must be used to re-display the hidden toolbar(s).

Typical toolbars without labels appear as follows.

Hovering the mouse pointer over any tool shows a tool tip describing that tool's function.

15.1.21. Watch Recipe context menu



NEW RECIPE

This creates a new watch list by clearing out parameters and data sets from the window. If any of the existing data is unsaved, confirmation is requested before the operation starts. Short cut <Ctrl> + <N>.

OPEN RECIPE...

This opens a file containing a previously created watch list and any data sets that were defined for it. If any existing data is unsaved, confirmation is requested before the operation starts. Short cut <Ctrl> + <O>.

SAVE

Saves the current watch list and any data sets. If the file has not previously been saved, 'Save' acts as 'Save As...', described below. Short cut <Ctrl> + <S>.

SAVE AS...

Saves the current watch list and any data sets to a file name entered by the user.

INSERT PARAMETER

This opens a browse list to allow the user to choose a parameter for insertion into the watch list. The insertion point is above the currently selected parameter. Short cut <Insert>.

REMOVE PARAMETER

This causes the selected parameter to be deleted from the watch list. Short cut <Ctrl> + <Del>.

COPY PARAMETER

This allows the user to copy the selected parameter to the clipboard. Short cut <Ctrl> + <C>.

PASTE PARAMETER

This allows the user to paste a parameter from the clip board to the watch list. Short cut <Ctrl> + <V>.

PARAMETER PROPERTIES... AND PARAMETER HELP

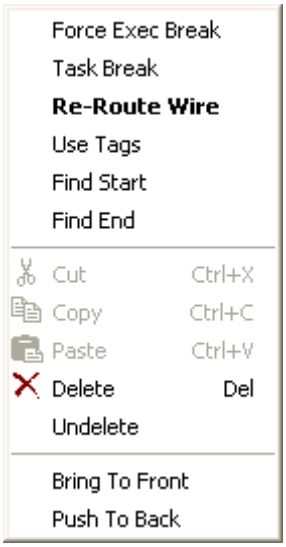
See Explorer menu for details.

15.1.21 WATCH RECIPE CONTEXT MENU (Cont.)

COLUMNS

Allows the user to enable/disable the Description and comment columns for display in the watch list window.

15.1.22. Wire Context menu



This 'Context' menu appears if the right mouse button is clicked whilst the mouse pointer is hovering over a wire.

FORCE EXEC BREAK

For Mini8 Controllers, EPower controllers and Models 350x.

If wires form a loop, a break point has to be established, where the value written to a block input comes from a source that was executed during the previous execute cycle, thus introducing a delay. This option allows the user to specify which wire is to have this break imposed upon it. The item allows the break to be enabled or disabled as required.

TASK BREAK

For EPower controllers only, this inserts a task break for wiring between tasks. This helps to avoid phasing problems by inserting a time delay.

RE-ROUTE WIRE

The current wire route is discarded and a new route traced.

USE TAGS

This allows the user to replace one or more wires with source and destination tags. See 'Using Tags' in 'Creating an application'.

FIND START / FIND END

Selecting 'Find Start' causes the visible part of the diagram to move to the source block of the highlighted wire. Selecting 'Find End' causes the visible part of the diagram to move to the destination block of the highlighted wire.

CUT, COPY, PASTE

Not used in this context.

15.1.22 WIRE CONTEXT MENU (Cont.)

DELETE

Models 3500, EPower controllers, Mini8 controllers
If the item has previously been downloaded, it is shown 'ghosted' until next time the wiring diagram is downloaded, when it disappears from view. Until such time, it can be 'undeleted' using the 'Undelete' menu item, below. If the comment is 'new' (that is, it has not yet been included in a download), then the deletion takes effect immediately.

Models 2604, 2704
Deleted items are immediately removed from the wiring diagram. Such items can be restored using the Undo tool button (shortcut <Ctrl> + <z>).

UNDELETE

Models 3500, Epower controllers, Mini-8 controllers
Items that have been downloaded at least once, then deleted are shown 'ghosted' to indicate that the instrument is still 'executing' the comment. If the 'Undelete' item is selected before the next download, then the comment is restored to its former non-deleted status.

Models 2604/2704
This 'Undelete' menu item is not available. Deleted items can be restored using the Undo tool button (shortcut <Ctrl> + <z>).

BRING TO FRONT

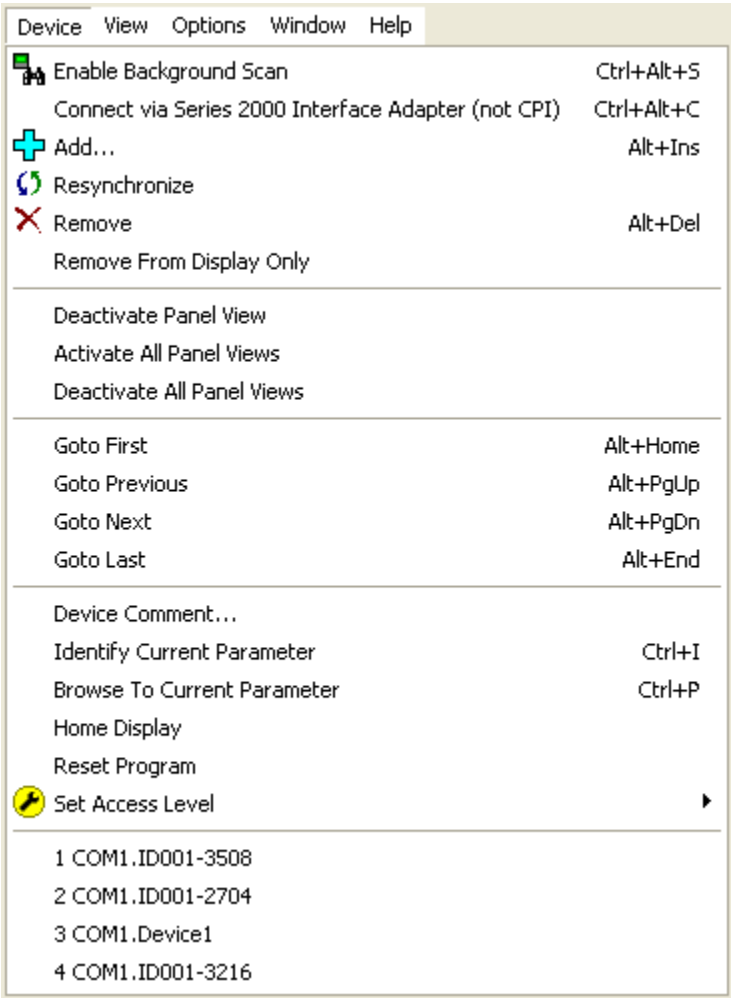
This brings the selected item to the front of the diagram. The same effect can be achieved by moving the item.

PUSH TO BACK

This pushes the selected item to the back.

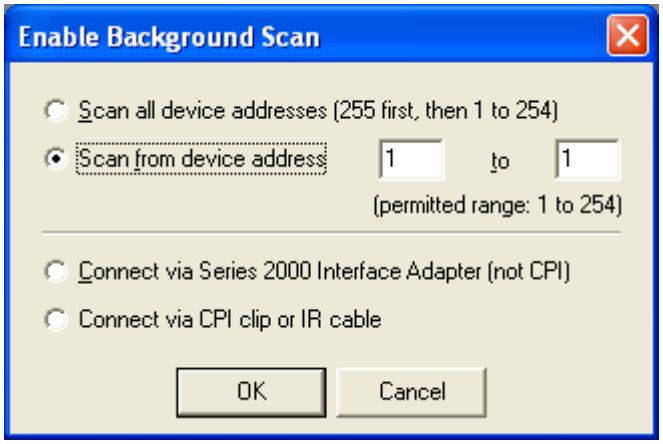
15.2. MENU BAR MENUS

15.2.1. Device menu



ENABLE BACKGROUND SCAN

This causes iTools to search for connected instruments with addresses within the range specified by the user. Newly detected instruments spend some time synchronising. See 'Synchronisation' for more details. Short cut <Ctrl> + <Alt> + <S>.



15.2.1 DEVICE MENU (Cont.)

CONNECT VIA SERIES 2000 INTERFACE ADAPTER (NOT CPI)

This allows the use of iTools with a Series 2000 Configuration Station to configure and commission Series 2000 instruments. Short cut <Ctrl> + <Alt> + <C>. For more details, see the Technical Information Sheet TIS 241, to be found under 'Technical Information bulletins' on the iTools CD.

ADD...

Select additional devices from list. Clicking on this tool causes a selection list to appear containing all the devices known to the Modbus server. Items are added to/deleted from the list via the Options/Advanced/Show server menu item.
Short cut <Alt> + <Insert>.

RESYNCHRONISE

Used to re-synchronise iTools with the instrument. Used when changes have been made at the instrument via its operator interface. See 'Synchronisation' for more details.

REMOVE

Removes the selected device from iTools. Short cut <Alt> + <Delete>.
Remove From Display Only
For connected instruments, removes the selected item from the panel views area and from the Device browser. Can be re-instated by using the Add facility for example.

DEACTIVATE / ACTIVATE PANEL VIEW

For supported instruments, this toggles the selected instrument's operator interface display, in the Panel Views area, on and off.

ACTIVATE ALL PANEL VIEWS

This activates all devices' operator interface displays in the Panel Views area.
Deactivate All Panel Views
This deactivates all devices' operator interface displays in the Panel Views area.

GOTO FIRST

Makes the first device in the list the active device. Short cut <Alt> + <Home>. Has no effect if the current device is the first device.

GOTO PREVIOUS

Makes the previous device in the list the active device. Short cut <Alt> + <Page Up>. Has no effect if the current device is the first device.

GOTO NEXT

Makes the next device in the list the active device. Short cut <Alt> + <Page Down>. Has no effect if the current device is the last device.

GOTO LAST

Makes the final device in the list the active device. Short cut <Alt> + <End>. Has no effect if the current device is the last device.

DEVICE COMMENT...

Allows a device comment to be added.
Identify Current Parameter
For relevant device types only, this displays a dialogue box identifying the parameter currently shown at the instrument display. The entry is 'greyed' for other device types. Shortcut <Ctrl> + <I>.

15.2.1 DEVICE MENU (Cont.)

BROWSE TO CURRENT PARAMETER

For relevant device types only, this opens the iTools browse tree to the parameter currently shown at the instrument display. The entry is 'greyed' for other device types. Shortcut <Ctrl> + <P>.

HOME DISPLAY

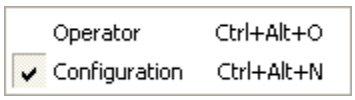
For relevant device types only, this returns the instrument to its default home display page. The entry is 'greyed' for other device types.

RESET PROGRAM

For relevant device types only, this resets any setpoint program running in the device. The entry is 'greyed' for other device types.

SET ACCESS LEVEL

Allows the user to select 'Operator' level (short cut <Ctrl> + <Alt. + <O>) or Configuration access level (short cut <Ctrl> + <N>) via a pop-up menu.

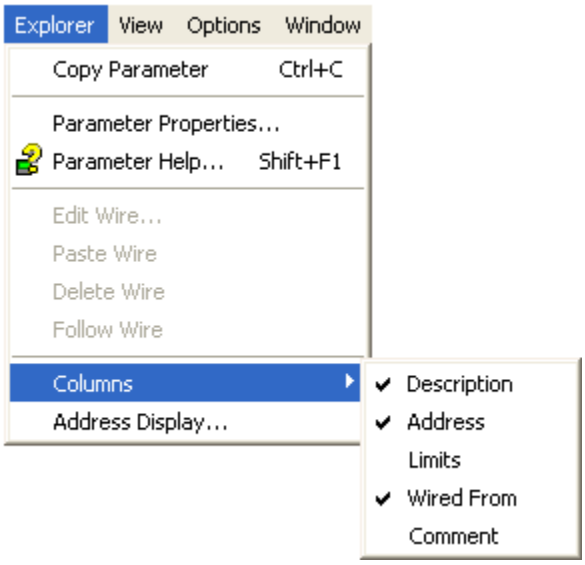


MOST RECENTLY USED DEVICES

A list of recent devices. Clicking on one of these devices adds it to iTools.

The list may be cleared, using the 'Clear Most Recently Used Lists' item on the Options Menu

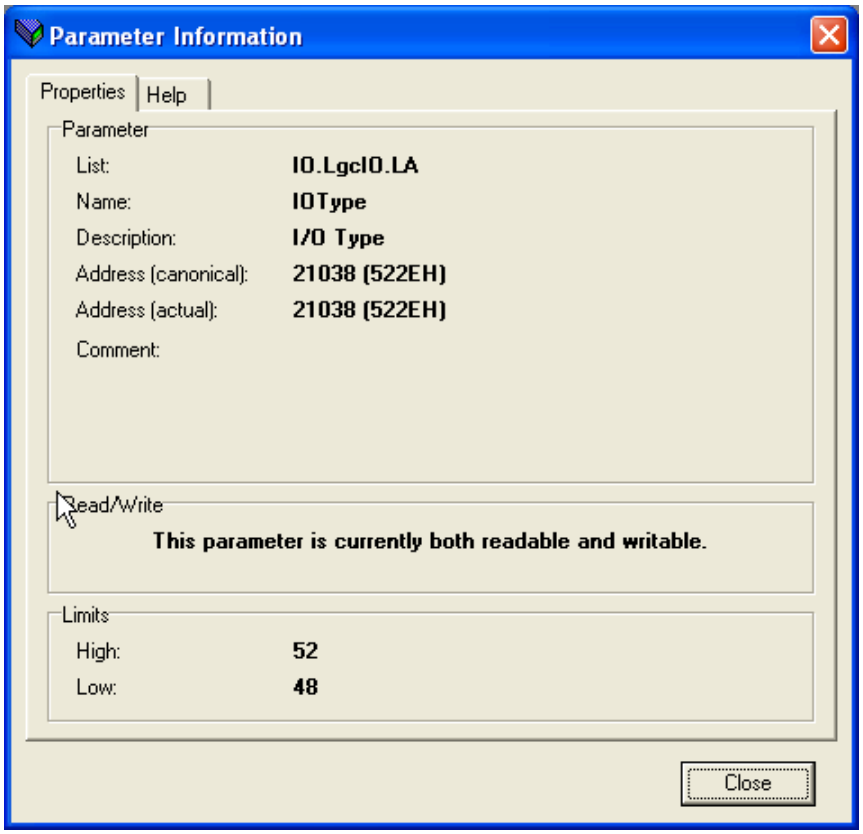
15.2.2. Explorer menu



COPY PARAMETER

This Explorer menu item copies the selected parameter to the clipboard.
Shortcut = <Ctrl> + <C>

PARAMETER PROPERTIES...



This calls a display showing details of the selected parameter.

The help tab produces a display describing all the possible 'values' which can be associated with the parameter type selected.

15.2.2 EXPLORER MENU (Cont.)

PARAMETER HELP

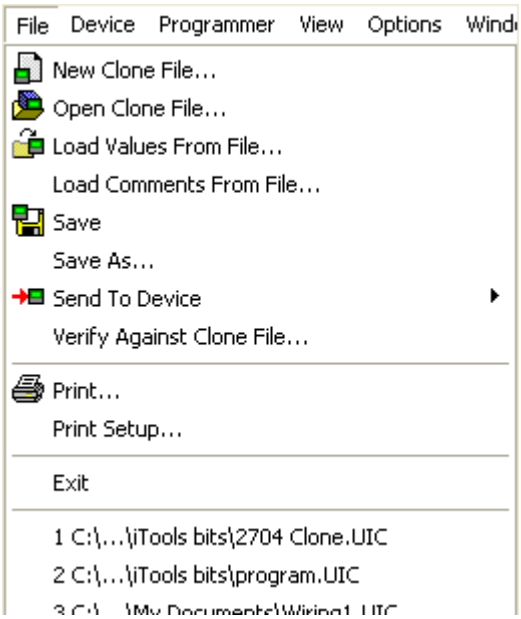
This produces the same display as appears when the 'Help' tab is clicked from within the Parameter Properties Information display, above. The help can also be opened via the shortcut <Shift> + <F1>.

COLUMNS

This allows various columns to be enabled and disabled for display. Some columns are device dependent, and therefore do not always appear in the menu.

15.2.3. File menu

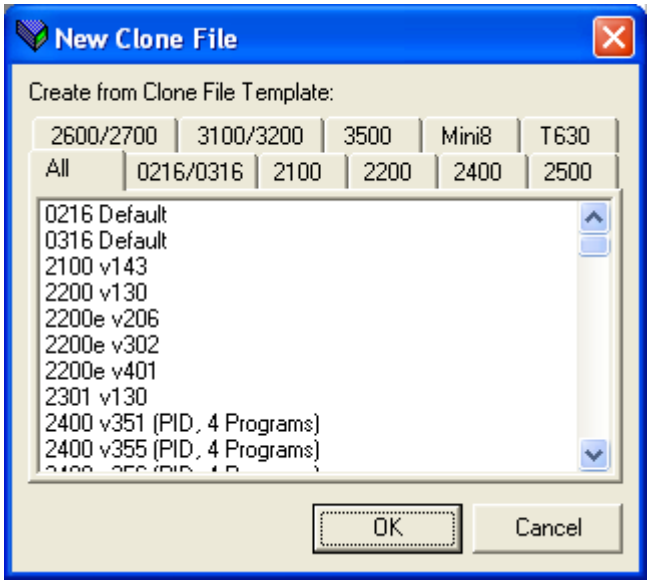
Note: The file menu content varies according to device type. A particular device may contain items not shown in the figure below, or may not contain items which are shown below. The same applies to the menu item descriptions.



15.2.3 FILE MENU (Cont.)

NEW CLONE FILE...

Calls the 'New Clone File' selection box to the display, to allow the user to select a device type for opening. The selection can be made from the 'All' tab, or the device type tabs may be used to filter the choices.



OPEN CLONE FILE...

Calls a file dialogue box , allowing the user to open an existing saved file.

LOAD VALUES FROM FILE...

Calls a file dialogue box , allowing the user to open an existing saved file. An attempt is made by iTools to load this file into the selected device. If the file is incompatible with the selected device, the load will fail. The tool is disabled ('greyed') if no device is currently selected.

LOAD COMMENTS FROM FILE...

Live instruments have insufficient space to contain the comments which can be entered, for example, in Parameter explorer. It is possible, however, to store comments in an associated clone file. If this is done, and the 'Load comments from file...' facility used, the parameter lists of the instrument will display the comments from the clone file.

Selecting this item opens a browse window, allowing the user to select the appropriate clone file.

SAVE

If this is a pre-existing file, then 'Save' saves the file to its original location. If this is a new file, 'Save' calls a file dialogue box allowing the user to save the file to a chosen destination.

SAVE AS...

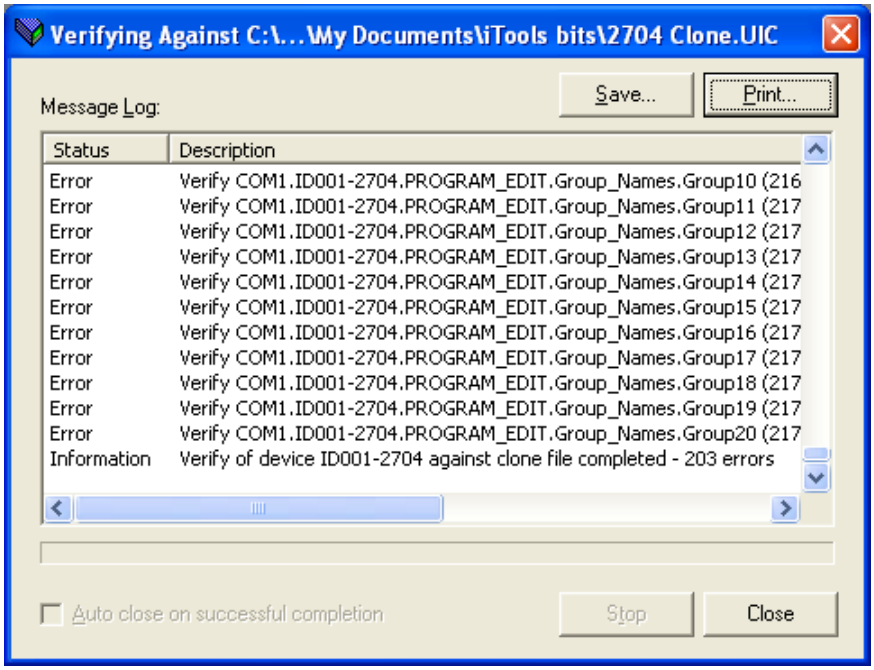
Calls a file dialogue box allowing the user to save the file to a chosen destination.

SAVE TO FILE...

Calls a file dialogue box allowing the user to save the file to a chosen destination.

15.2.3 FILE MENU (Cont.)

VERIFY AGAINST CLONE FILE...



Looks for differences between the clone file and the device file. A message log appears (above), identifying any differences.

Note: This can take some minutes.

The log can be Saved, or Printed by clicking on the relevant button.

Should the error 'Verifying clone of device xxx not supported while parameter attribute monitoring is enabled' appear (where xxx represents the device type), then 'Global Enable Active Mirror Device' must be disabled in the Options/Advanced/Show Server Edit menu.

SEND TO DEVICE

Allows the user to select a connected instrument to which the file is to be downloaded.

PRINT

Opens the report wizard. This allows the user to create. a 'report' showing the current configuration of a set of user selected parameters. See 'Report Configuration' for more details.

PRINT SETUP...

Opens the normal printer set-up page, allowing the user to select the required printer, paper size, orientation and so on.

EXIT

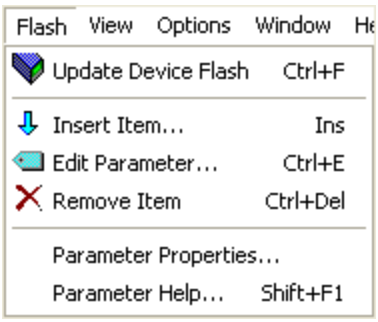
Causes iTools to quit (after confirmation).

MOST RECENTLY USED FILES

Lists the latest files to be opened. Clicking on any one of the listed files opens that file.

The list may be cleared, using the 'Clear Most Recently Used Lists' item on the Options Menu

15.2.4. Flash menu



The Flash menu contains the following items, the functions of some of which are copied by the tools in the Flash memory editor tool bar.

UPDATE DEVICE FLASH

This tool is used to cause the updated flash contents to be downloaded to the device. A confirmation message must be 'OKed' before the download is allowed to commence. If the editor is closed while changes are still unsaved the user is prompted to write the changes to the device flash memory, or to discard them. Shortcut = <Ctrl> + <F>

INSERT ITEM...

Inserts an item immediately above the currently selected item. An item can be added to the end of the list by inserting it with the final empty row selected. Shortcut = <Insert>

EDIT PARAMETER

Open a browse dialogue to edit the parameter associated with the selected item. Shortcut = <Ctrl> + <E>

REMOVE ITEM

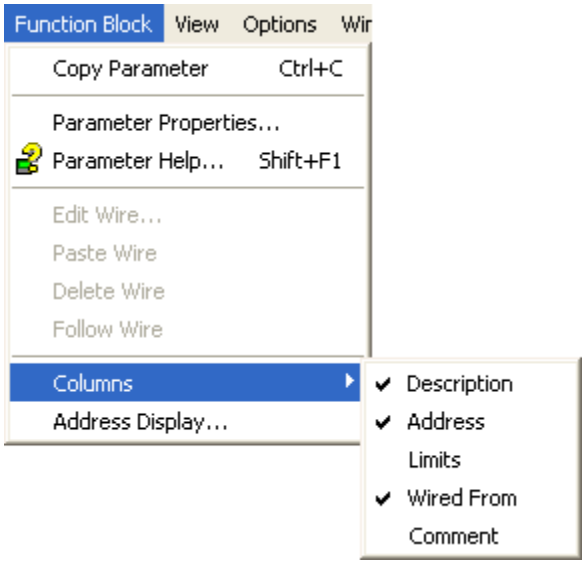
Removes the selected item from the list. Shortcut = <Ctrl> + <Del>.

PARAMETER PROPERTIES... AND PARAMETER HELP

See Explorer menu for details.

15.2.5. Function Block menu

This item appears in the main menu bar, whenever a function block view is open.



15.2.5 FUNCTION BLOCK MENU (Cont.)

COPY PARAMETER

Copies selected parameter to the clipboard, ready to be pasted into (for example) a watch list. Short cut = <Ctrl>+ <C>.

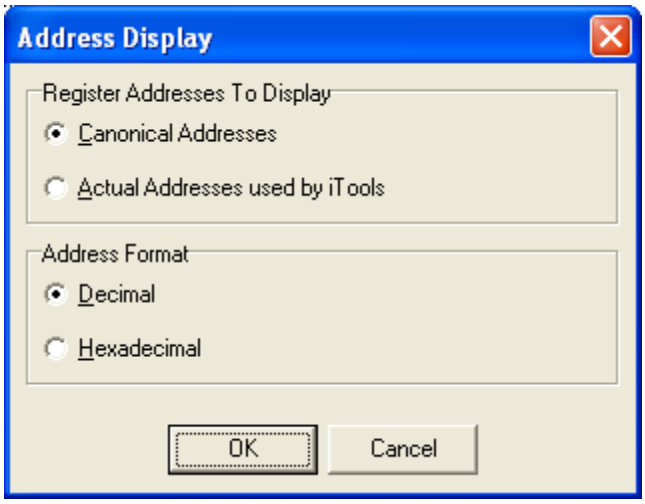
PARAMETER PROPERTIES / PARAMETER HELP...

See Explorer menu for details.

COLUMNS

This allows various columns to be enabled and disabled for display. Some columns are device dependent, and therefore do not always appear in the menu.

ADDRESS DISPLAY...



REGISTER ADDRESS TO DISPLAY

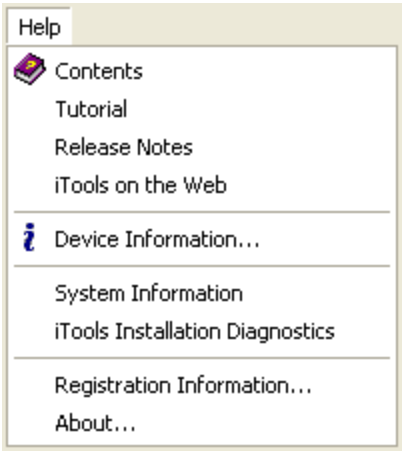
Canonical is used here in the sense of "authoritative, standard, accepted". These are generally the addresses published in the communications handbooks, for users of 3rd-party communications drivers.

They are often not the addresses used by iTools because the same parameter also exists at a second address, where it may be read with higher precision - as an IEEE 32-bit float or integer, rather than a scaled integer. Some 3rd-party communications drivers do not support this advanced functionality, thereby making it harder (or impossible) to configure when using these addresses.

ADDRESS FORMAT

Allows the user to select Decimal or Hexadecimal for the address column display.

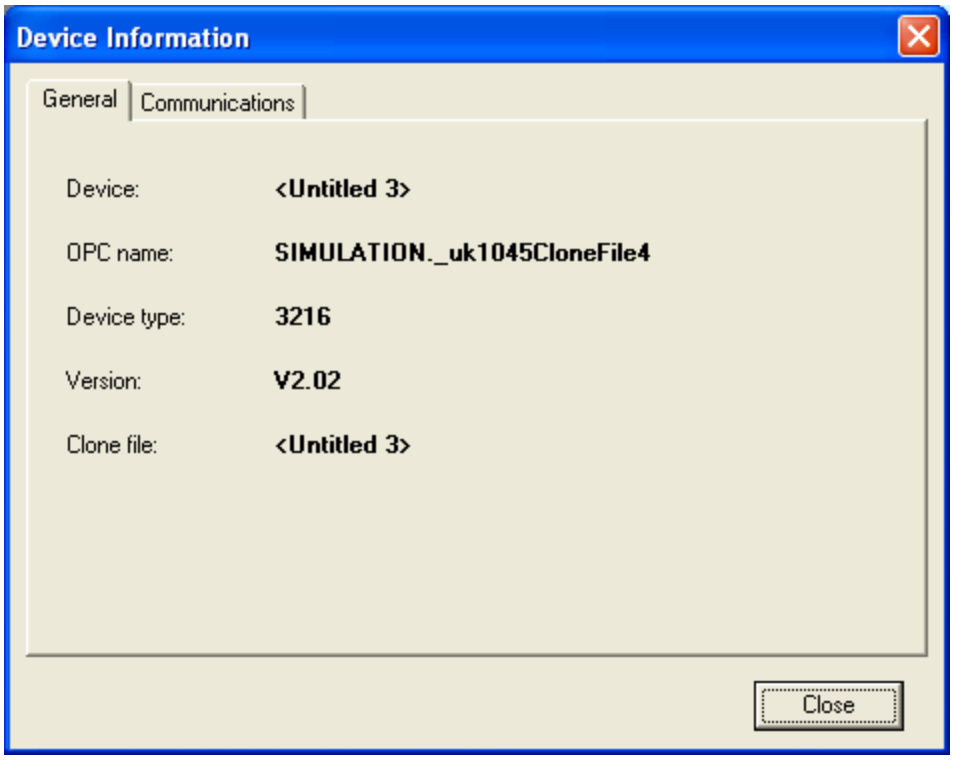
15.2.6. Help menu



This menu gives access to the various help and information systems available to the user. The menu items vary from one instrument type to another.

DEVICE INFORMATION

This calls the 'Device information' display giving information about the selected device. The communications tab shows the Communications protocol, the Device address and the (for live devices only) Baud rate.



SYSTEM INFORMATION

Selecting this item produces a display giving details of the pc on which this version of iTools is running.

ITOOLS INSTALLATION DIAGNOSTICS

Produces a display showing details of the various iTools components.

15.2.6 HELP MENU (Cont.)

REGISTRATION INFORMATION...

Allows entry of a new product key code, for the adding of new features etc.

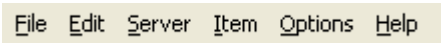
ABOUT...

Selecting this item calls the iTools 'About' screen:

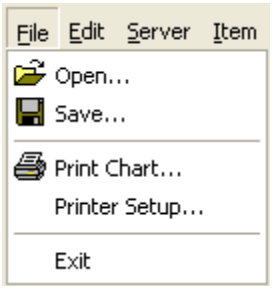
The above figure shows the About screen after the 'Features' key has been clicked-on.

Note: The figure above is for illustrative purposes only, and therefore does not contain the current software version number. See 'Introduction' for the software version to which these help pages apply.

15.2.7. OPC Scope menu



FILE MENU



OPEN...

Copies the function of the 'Load settings from file' tool. Opens a file dialogue box to allow the user to load a previously saved .uix file

SAVE...

Opens a file dialogue box to allow the user to define a destination path for the current (.uix) file. The function is also available from the 'save settings to file' tool, and via the Chart context menu.

PRINT CHART...

Initiates the chart printing process. Colour or monochrome, and grid or no grid, are selected from the 'Plot' tab of the Chart Control panel.

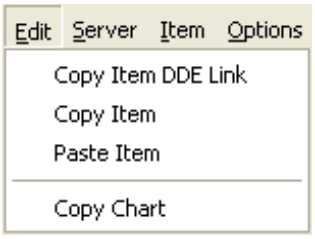
PRINTER SETUP...

The standard printer set up page allowing paper size and orientation etc. to be defined.

EXIT

Quits the OPC Scope session.

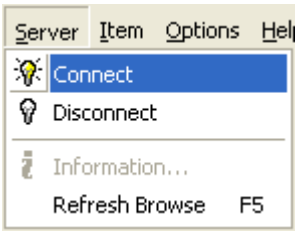
EDIT MENU



Copy Item DDE Link
Copies the item for DDE linking with spreadsheet etc. applications. Allows the user to define the selected item as a link parameter. When added to a spreadsheet or other DDE client, the parameter value is updated in real time. See 'DDE Interface' for more details.
Copy Item
Copies the item to the clipboard.
Paste Item
Pastes the clipboard contents into the selected location
Copy Chart
Copies the chart to the clipboard

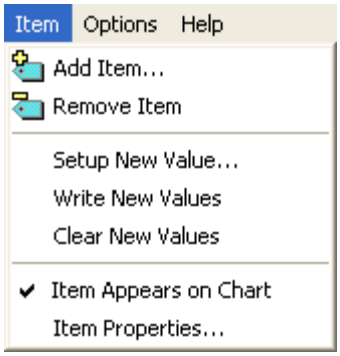
15.2.7 OPC SCOPE MENUS (Cont.)

SERVER MENU



Connect
If no server connection is currently in use, this connects to the specified server.
If a server is already connected, this re-connects to it, losing the current configuration.
Disconnect
This causes a disconnection from a connected server. If there is no current server the icon is disabled (greyed).
Information...
Displays server information
Refresh Browse
Closes all open subfolders in Browse tree. Shortcut <F5>.

ITEM MENU

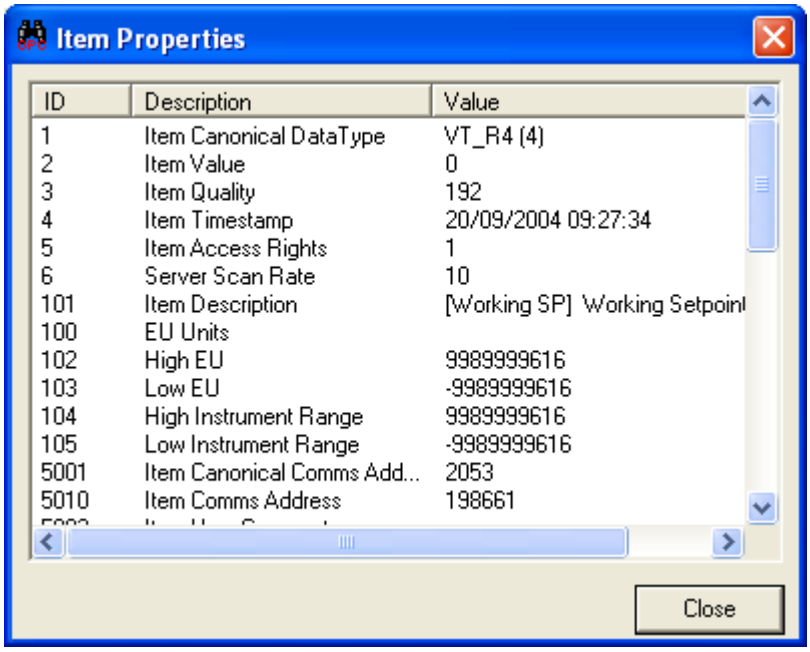


Add Item...
If a parameter is highlighted, this opens a dialogue box which allows the user to add this parameter to the list. See OPC Scope Introduction. If the display is in chart mode, the new parameter will automatically be added to the chart. Otherwise, the parameter can be added to the chart by:
1. Selecting the 'Item appears on chart' selection.
2. Clicking on the tick box in the Chart control panel.
3. Using the 'Add item' selection in the right click (context) menu.

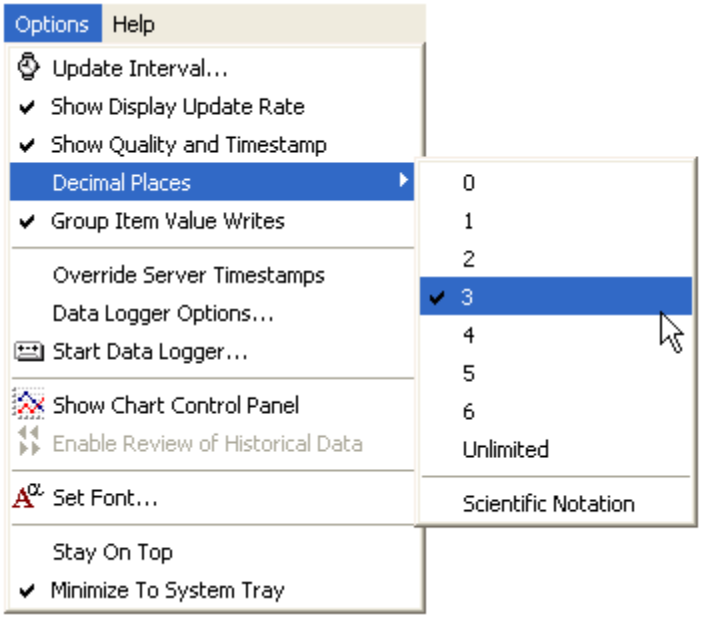
Remove Item...
Removes the selected item from the list.
Setup New Value...
Allows the user to enter a value for the selected parameter. The Parameter must be read/write, and the user's access level must be sufficient to allow the updating of this parameter.
Write New Values...
Allows the user to write the new value to the selected parameter. The Parameter must be read/write, and the user's access level must be sufficient to allow the updating of this parameter.
Clear New values...
Deletes the newly set up value(s).
Item appears on chart
This menu item allows the user to add or remove the selected parameter from the OPC chart display. May also be done from the Chart Control panel 'Items' tab and via the List context menu.

15.2.7 OPC SCOPE MENUS (Cont.)

Item Properties...
Calls the item properties page to the display.

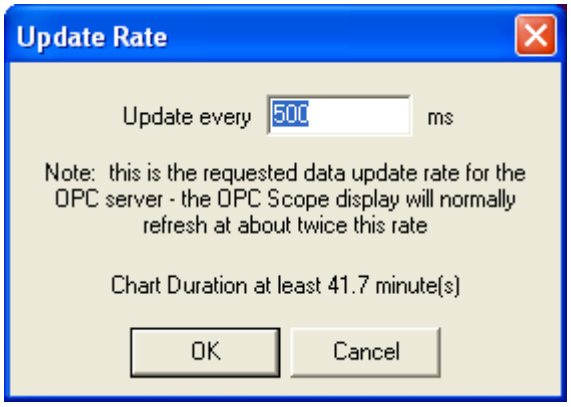


OPTIONS MENU



15.2.7 OPC SCOPE MENUS (Cont.)

Update Interval...
This defines the update rate for the OPC server. The chart is updated, typically, at twice this rate. This setting defines the total history length. The displayed width of the chart is set up in the Chart Control Panel 'Axes' tab.



Show Display update Rate
If enabled, this shows the OPC Scope display update rate in the status bar at the bottom of the OPC Scope window, replacing the server's data update rate.

Group Item Value Writes
This enables/disables the ability to enter new values for one or more OPC list parameters, and then write them simultaneously. See the separate topic 'Group Item Value Writes'.

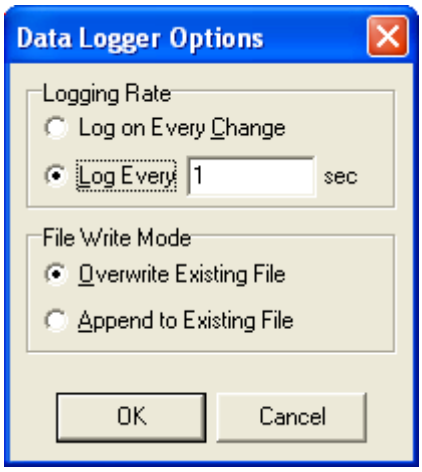
Show Quality and TimeStamp
Adds columns for parameter status and Time and Date to the display.

Decimal Places
Allows the user to choose the number of decimal places to be displayed for the parameter value, or 'Scientific notation' to be chosen instead.

Override Server Timestamps
This is enabled if it is necessary to ensure that time stamps are regular and in the local time. When enabled, data values are time stamped by OPC Scope, overriding time stamps provided by OPC server. This may be useful when using OPC servers which do not update their own time stamps properly.

15.2.7 OPC SCOPE MENUS (Cont.)

Data Logger Options...



This allows the user to select Logging rate and File write mode. See 'Data Logging' for more details.

Start Data Logger...
Allows the user to initiate data logging. A file dialogue box opens, allowing the user to define a path for the data logging CSV file. When logging, the text changes to 'Stop Data Logger', allowing the user to terminate the logging session.

Show Chart Control Panel
Calls the Chart Control Panel, to allow the chart items to be defined and configured.

Enable Review of Historical Data
This control toggles the chart between 'live' and 'review' modes. See 'Review Mode' for more details.

Set Font...
Allows the user to select type face, size, style, colour etc. for the parameter lists.

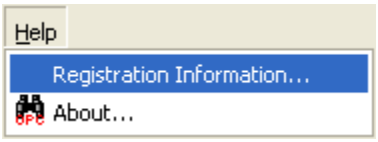
Stay On Top
If this is enabled, the OPC Scope window always remains on view, no matter what other applications may be accessed.

Minimize to System Tray

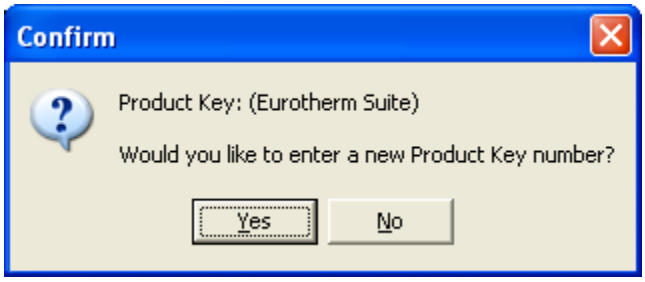
Normally, the minimize command minimizes the OPC scope window to the task bar. It may be found more convenient to minimize it to the 'System tray' (i.e. the area in the bottom right-hand corner of the screen, normally containing the time display).

15.2.7 OPC SCOPE MENUS (Cont.)

HELP MENU

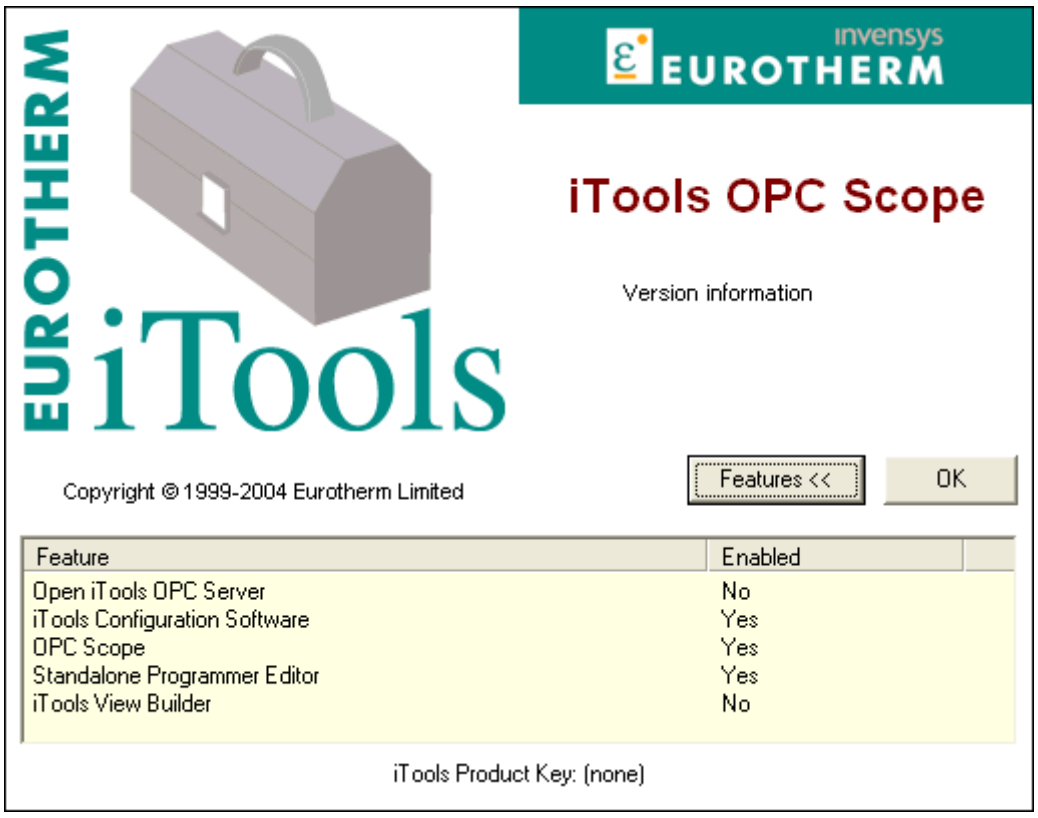


Registration Information...

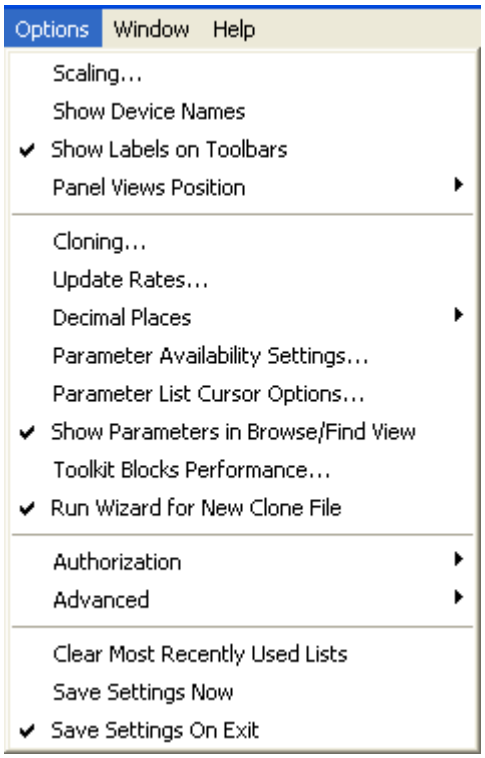


Allows the user to enable new features by entry of a key code.

About...
Displays the iTools OPC Scope about screen. In the figure below, the 'Features <<' key has been clicked-on.

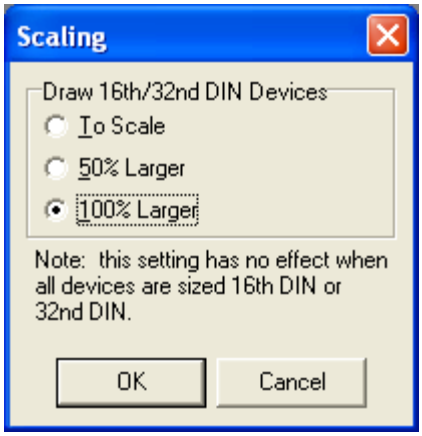


15.2.8. Options menu



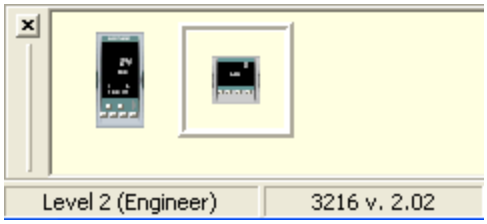
15.2.8 OPTIONS MENU (Cont.)

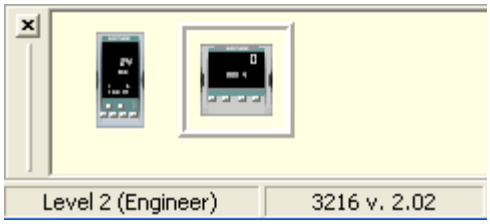
SCALING...

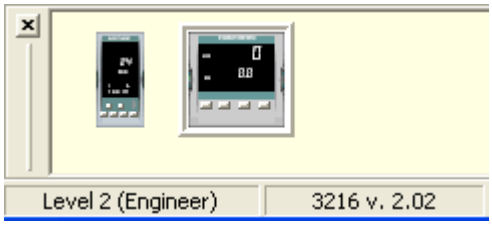


Allows the user to increase the faceplate size for small-frame devices. Applies to faceplates in the Panel Views area of the iTools window. The illustrations below show 'To Scale', '50% Larger' and '100% Larger' respectively.

Note: If all panel devices are 1/16th or 1/32 DIN, then they are all drawn '100% larger' no matter what the Scaling setting.







SHOW DEVICE NAMES

When enabled, shows the name of the device/clone in the panel views area. It may be necessary to increase the height of the panel views area to see the device names.

SHOW LABELS ON TOOLBARS

Allows the user to show or to hide toolbar names. See 'Toolbar context menu' for details.

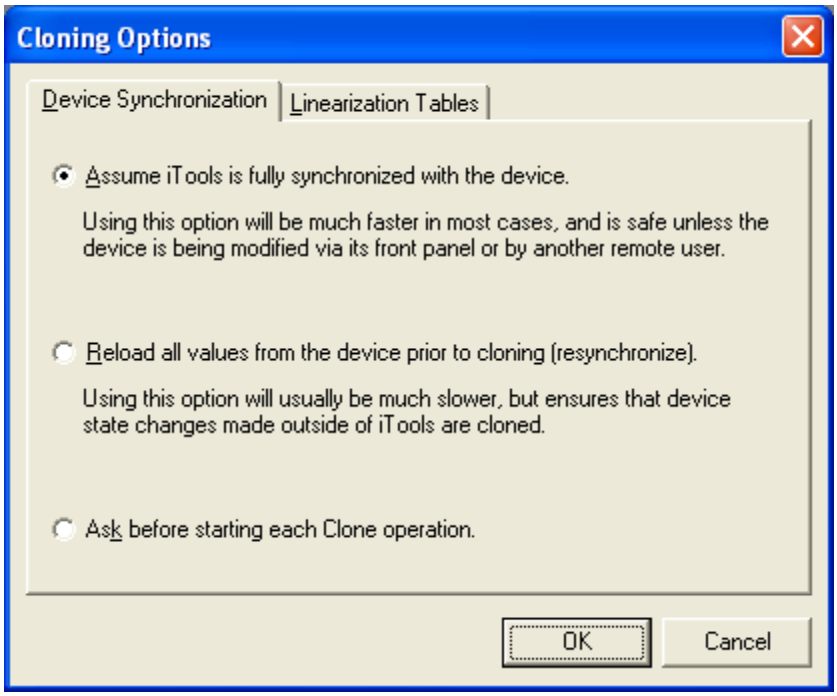
15.2.8 OPTIONS MENU (Cont.)

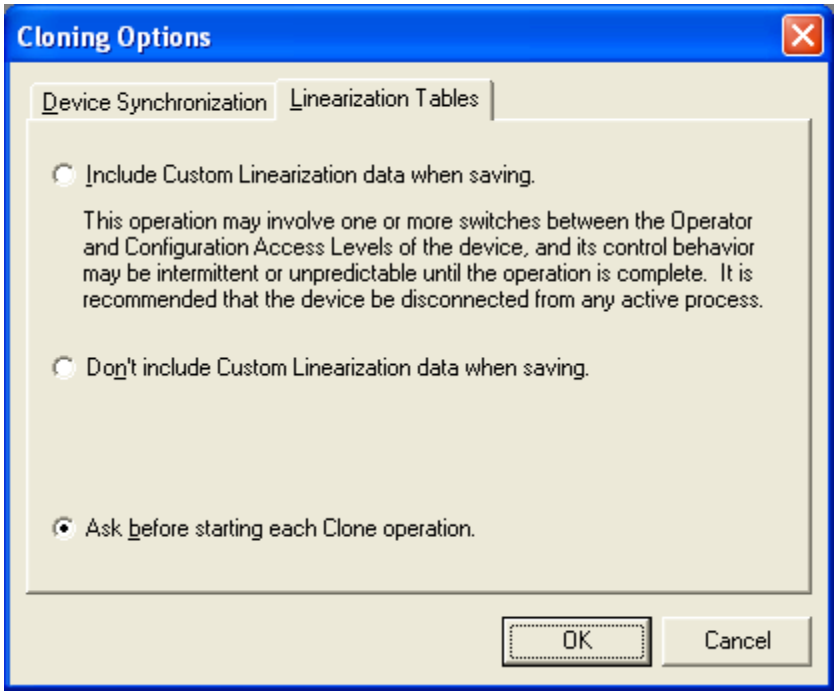
PANEL VIEWS POSITION

Allows the user to select top or bottom of screen for the Panel Views area. The Panel views area can be shown or hidden according to the status of the 'Panel Views' selection in the View Menu.

CLONING...

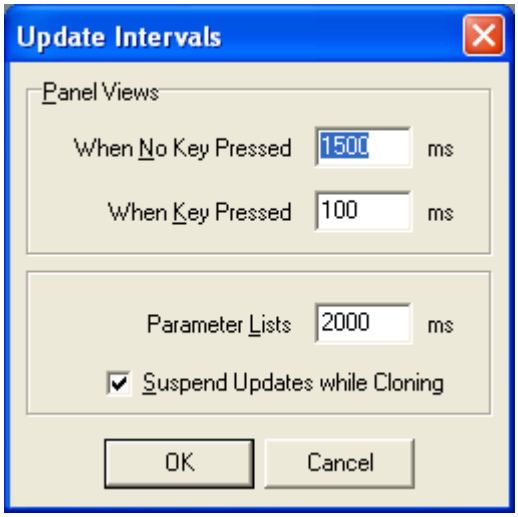
This selection has two tabs *viz* 'Device Synchronization' and 'Linearization tables'. Each selectable item within these tabs contains a description of its function.





15.2.8 OPTIONS MENU (Cont.)

UPDATE RATES...



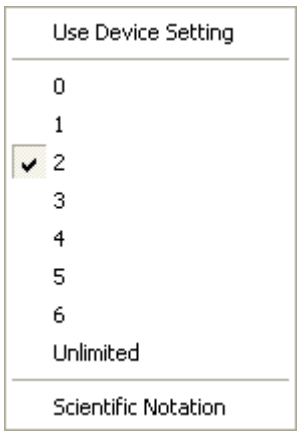
Panel Views
When No Key Pressed
For use with devices whose front panel controls can be operated via iTools. Defines the update rate whilst no panel key is being operated.
When Key Pressed
For use with devices whose front panel controls can be operated via iTools. Defines the update rate whilst the panel keys are being operated. Typically, this will be considerably faster than the No Key Pressed state, so that the display can keep up with the key operations.

Parameter Lists
Allows a new update rate to be entered for parameter list refresh.

Note: Setting update rates too fast will have an effect on the serial communications performance. This is particularly important if there are numerous devices in the same communications network.

Suspend Updates while Cloning
Allows the user to enable or disable updates during the cloning process.

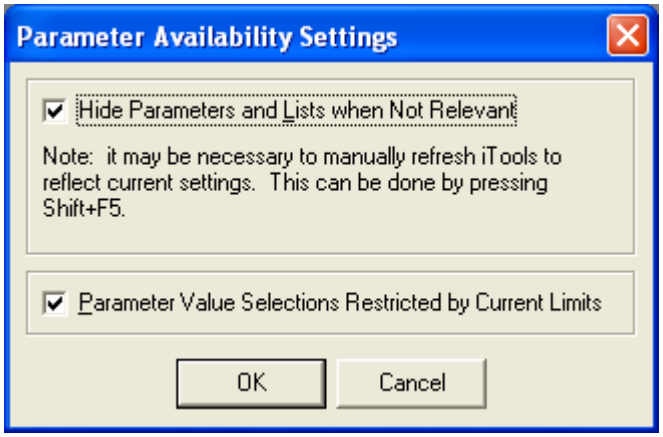
DECIMAL PLACES



Allows the user to select the number of decimal places, or to select 'Scientific' Notation (e.g. 1.23 E+002) for parameter numeric values.

15.2.8 OPTIONS MENU (Cont.)

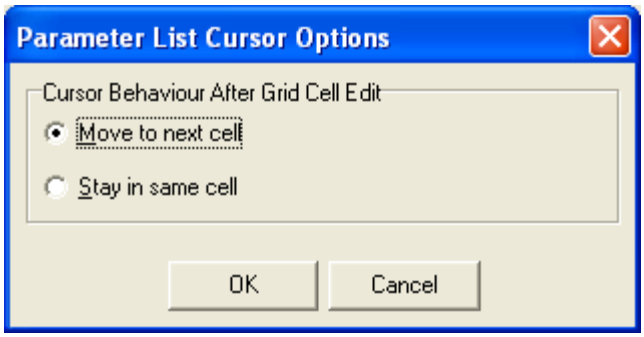
PARAMETER AVAILABILITY SETTINGS...



Hide Parameters and Lists when Not Relevant
If enabled, this reduces the length of parameter lists. The number of hidden parameters is displayed at the bottom of the parameter list window.

Parameter Value Selections Restricted by Current Limits
With this enabled, the set of enumerations shown when using a drop-down (combo) menu is restricted according to the current high and low limits for the parameter.

PARAMETER LIST CURSOR OPTIONS...



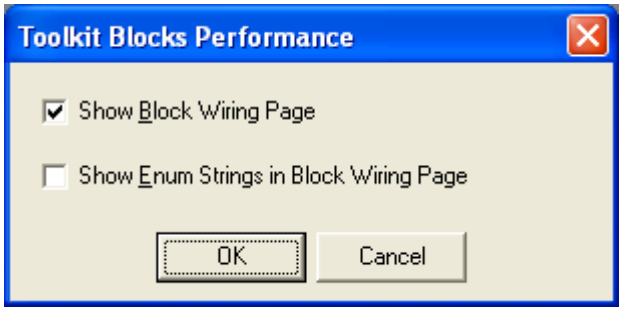
This allows the user to choose whether, after the value in a parameter list cell has been edited, the cursor remains in the just edited cell, or moves to the next cell in the list.

SHOW PARAMETERS IN BROWSE/FIND VIEW

If this setting is disabled, then tree view parameter lists etc. contain only folders and sub-folders. All parameters are hidden.

15.2.8 OPTIONS MENU (Cont.)

TOOLKIT BLOCKS PERFORMANCE...



Show Block Wiring Page
For those devices that support Toolkit Blocks this allows the user to enable or disable the Block Wiring Tab for display. If the selection is made with the Toolkit blocks view open, it is necessary to close, then re-open the window before the change takes effect. Disabling the Block Wiring Tab can speed-up the operation of the Toolkit Blocks editor.

Show Enum Strings in Block Wiring Page
For those devices that support Toolkit Blocks, this allows the enumeration strings (combo or pull-down pick-lists) to be enabled or disabled for view in parameter tables. If the selection is changed with the Toolkit blocks view open, it is necessary to close, then re-open the window before the change takes effect. The figures below show a part of a parameter list with Enumerations strings enabled, and disabled, respectively.

	List	Parameter	Value	Wired
	VACUUM.Low_Vacuum	LVal	0.00	
	VACUUM.Low_Vacuum	LsVal	Good (0)	
	VACUUM.Back_Vacuum	BVal	0.00	
	VACUUM.Back_Vacuum	BsVal	Good (0)	
	VACUUM.Pump_Control	Pump_Running	Yes (1)	
	VACUUM.Leak_Detect	LTstVal	No (0)	

Show Enum strings... enabled

	List	Parameter	Value	Wired
	VACUUM.Low_Vacuum	LVal	0.00	
	VACUUM.Low_Vacuum	LsVal	0	
	VACUUM.Back_Vacuum	BVal	0.00	
	VACUUM.Back_Vacuum	BsVal	0	
	VACUUM.Pump_Control	Pump_Running	1	
	VACUUM.Leak_Detect	LTstVal	0	

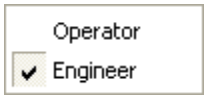
Show Enum Strings... disabled

RUN WIZARD FOR NEW CLONE FILE

When enabled, iTools automatically launches the Configuration Wizard window when a new clone file is opened for a device that supports wizards. See 'Wizards' ('Running iTools') for more details.

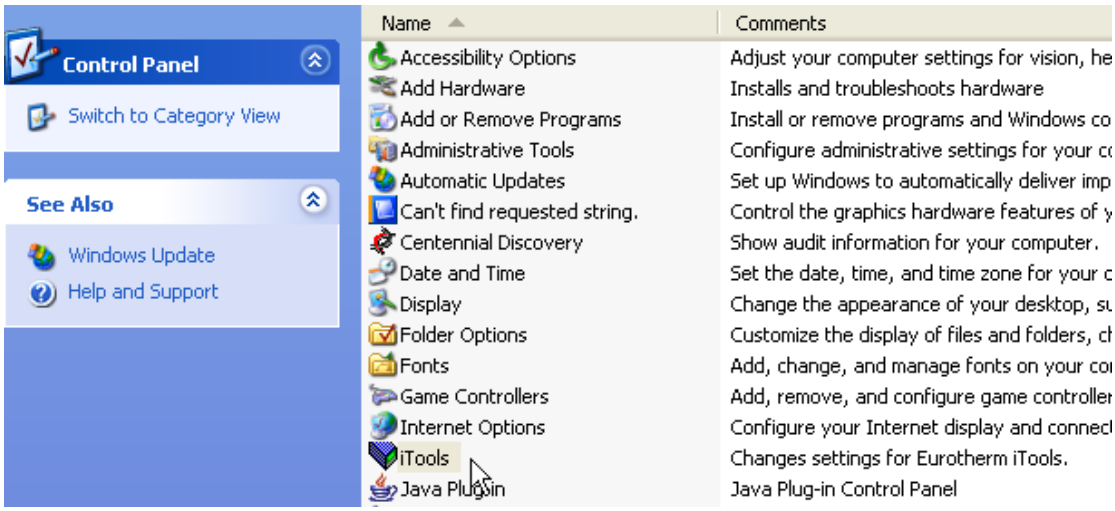
15.2.8 OPTIONS MENU (Cont.)

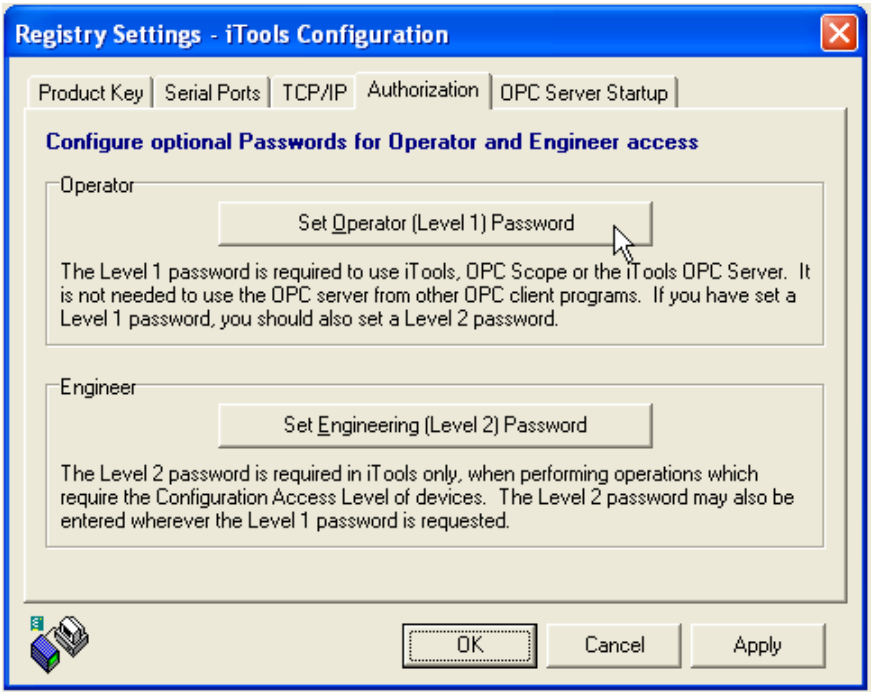
AUTHORIZATION



Allows the user to select 'Operator' or 'Engineer' as Authorization level. The user may be asked for a password to confirm the operation. Operator and Engineer passwords may be set up using the iTools applet in the Windows Control Panel.

Note: It is recommended that Windows XP users switch to 'Classic View' - as shown below - if necessary. This is done by clicking on 'Switch to Classic View':





15.2.8 OPTIONS MENU (Cont.)

ADVANCED

Show Server
Causes the current OPC server to appear. Any devices saved in this server will appear in the 'Add device' pick lists.

Hide Server
Removes the server window from the task bar.

Send Command to Server...

CLEAR MOST RECENTLY USED LISTS

This clears the lists of recently used items from the File and Device menus.

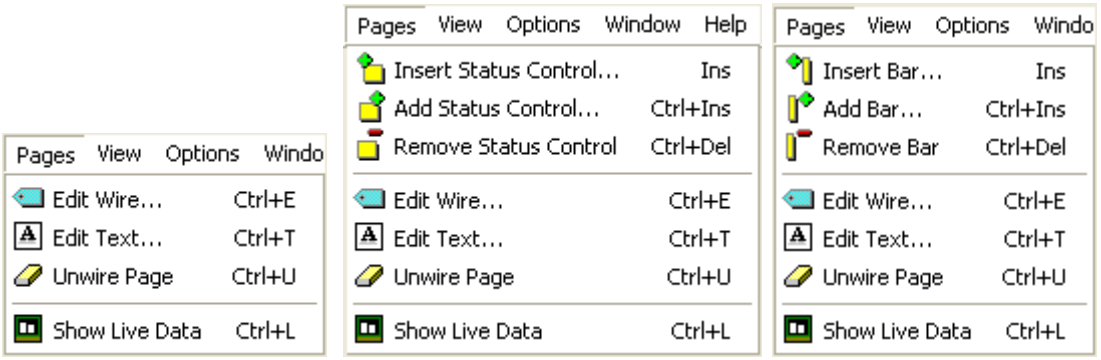
SAVE SETTINGS NOW

Causes the current iTools settings to be saved immediately.

SAVE SETTINGS ON EXIT

Causes the current iTools settings to be saved when the user quits.

15.2.9. Pages menu (2704)



Standard menu | with Status Grid items | with Bargraph items

This menu appears as a part of the main iTools menu bar whenever User Page Editor is the active editor for the selected device. The functions are also available via the User Page Editor toolbar and by the context (right-click) menu. The contents of the menu change according to the display style selected, as shown above.

EDIT WIRE...

Selection of this item causes a browse dialogue box to appear allowing the user to select a parameter to add to the page at the highlighted position. Any existing parameter is overwritten, after confirmation. Short cut<Ctrl> + <E>. Disabled in Live Data mode.

EDIT TEXT...

Edit user text for selected parameter, if applicable. When enabled, this opens the User Text dialogue box. The user can either select an existing item of user text from the 100 available, or an item can be edited. As soon as the selection is made, it is assigned to the selected parameter. Short cut: <Ctrl> + <T>. Disabled in Live Data mode. If an existing item of user text is edited here, then the new text will apply to all instances of this User Text item throughout the device.

UNWIRE PAGE

Removes ALL parameters from the page, not just the highlighted one. Short cut<Ctrl> + <U>. Disabled in Live Data mode.

SHOW LIVE DATA

Switches display to live mode. Menu item text changes to 'Return to Editor'. Short cut <Ctrl> + <L>.

RETURN TO EDITOR

Switches back to edit mode from Live Data mode. Menu item text changes to 'Show Live Data'. Short cut <Ctrl> + <L>.

INSERT STATUS CONTROL...

For 'Status Grid' style only, this allows the user to insert a new status block to the left of the selected block. Short cut <Insert>. The maximum number of blocks is 12, and this control is disabled if all 12 blocks are used. Disabled in Live Data mode.

ADD STATUS CONTROL...

For 'Status Grid' style only, this allows the user to insert a new block to the right of the selected block. Short cut <Ctrl> + <Insert>. The maximum number of blocks is 12, and this control is disabled if all 12 blocks are used. Disabled in Live Data mode.

REMOVE STATUS CONTROL

For 'Bargraph' style only, this allows the user to delete the selected status block. Short cut <Ctrl> + <Delete>. Disabled in Live Data mode.

15.2.9 PAGES MENU (Cont.)

INSERT BAR...

For 'Bargraph' style only, this allows the user to insert a new bar to the left of the selected bar. Short cut <Insert>. Disabled in Live Data mode.

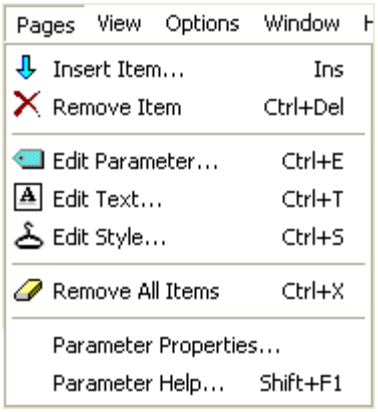
ADD BAR...

For 'Bargraph' style only, this allows the user to insert a new bar to the right of the selected bar. Short cut <Ctrl> + <Insert>. Disabled in Live Data mode.

REMOVE BAR

For 'Bargraph' style only, this allows the user to delete the selected bar. Short cut <Ctrl> + <Delete>. Disabled in Live Data mode.

15.2.10. Pages menu (3500 & EPower controllers)



INSERT ITEM...

Opens a browser dialogue box to allow the user to select a parameter for insertion into the table. The insertion point is above the currently selected item. Short cut <Insert>.

REMOVE ITEM

Removes selected item from the configuration list. Short cut = <Ctrl> + <Delete>.

EDIT PARAMETER...

If this is clicked-on, a browser dialogue box appears allowing the user to replace the current parameter with another. Short cut<Ctrl> + <E>.

EDIT TEXT...

Allows the user to edit the existing user text, or to create a new text string. Short cut<Ctrl> + <T>. For parameters which do not support user text, '(no user text)' appears in the 'User Text' column.

EDIT STYLE...

Clicking on this tool calls the style selection dialogue box, allowing the user to edit the current selection for the selected parameter. Short cut <Ctrl> + <S>.

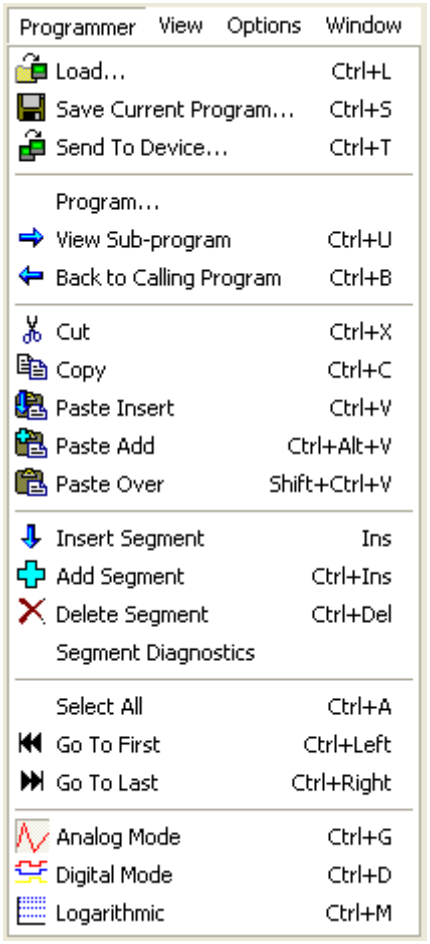
REMOVE ALL ITEMS

Removes ALL parameters from the page, not just the highlighted one. Short cut<Ctrl> + <X>.

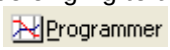
PARAMETER PROPERTIES / PARAMETER HELP...

See Explorer menu for details.

15.2.11. Programmer menu



Note: Not all of the above menu items appear for all devices.

The Programmer menu appears within the main iTools menu bar only if the active editor is a Programmer Editor belonging to the selected device. Program mode is entered by clicking on the Programmer editor button 

in the Views toolbar, or via the 'Views' menu.

Most Programmer menu items have functions similar to those of the tool buttons in the Programmer toolbar which appears above the graph in the Programmer window.

LOAD

Selecting this item calls a standard Windows File Open dialogue box which allows the user to select a previously saved program. Shortcut = <Ctrl> + <L>.

SAVE CURRENT PROGRAM

Clicking on this tool calls a standard Windows File Save dialogue box which allows the user to define a destination when saving a program. Shortcut = <Ctrl> + <S>.

SEND TO DEVICE

Calls a list of currently connected devices to allow the user to download the program to a selected device. Shortcut = <Ctrl> + <T>

15.2.11 PROGRAMMER MENU (Cont.)

PROGRAM...

Allows the user to choose the required program number, via a pop-up dialogue box. The program number range depends on the device type.

VIEW SUB-PROGRAM

For devices that support 'Call' type segments, this menu item calls the subprogram associated with the high-lighted segment, to the display. Shortcut = <Ctrl> + <U>.

BACK TO CALLING PROGRAM

For devices that support 'Call' type segments, this menu item returns the calling program associated with the highlighted segment, to the display. Shortcut = <Ctrl> + <B>.

CUT

Used to copy the selected item to the clipboard, deleting the source. Shortcut = <Ctrl> + <X>.

COPY

Copies the selected item to the clipboard, without deleting the selected item. Shortcut = <Ctrl> + <C>.

PASTE INSERT

This takes any segments located on the clipboard and inserts them into the program. The insertion point is to the left of the highlighted segment. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Ctrl> + <V>.

PASTE ADD

Not all device types.

This takes any segments located on the clipboard and appends them to the program. Enabled only if there are no segments selected. Shortcut = <Ctrl> + <Alt> + <V>.

PASTE OVER

This tool replaces the highlighted segment with the contents of the clipboard. All other segments remain unchanged. Enabled only if there is a segment selected. Shortcut = <Shift> + <Ctrl> + <V>.

INSERT SEGMENT

This inserts a copy of the highlighted segment into the program, at the highlighted position. The high-lighted segment and all subsequent segments are moved rightwards and renumbered appropriately. En-abled only if there is a segment selected. Shortcut = <Insert>.

ADD SEGMENT

Not all device types.

Appends a copy of the final segment to the end of the program. Enabled only if there are no segments se-lected. Shortcut = <Ctrl> + <Insert>.

DELETE SEGMENT

Removes the highlighted segment(s). Subsequent segments are moved left and renumbered appropriately. Enabled only if there is one or more segment selected.
Shortcut = <Ctrl> + <Delete>.

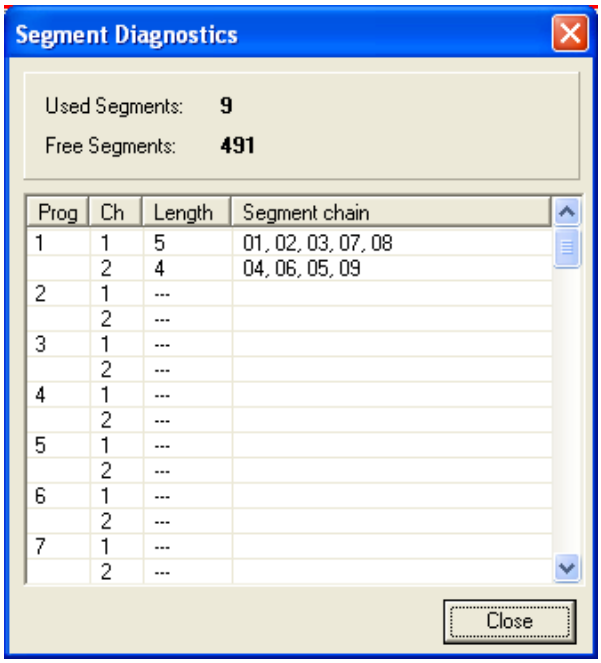
15.2.11 PROGRAMMER MENU (Cont.)

SEGMENT DIAGNOSTICS

Not supported by all devices.

A program consists of a list of linked segments, these segments being obtained from a common segment pool. Knowledge of this internal structure is normally required only for diagnostic purposes.

The 'Used Segments' and 'Free Segments' totals are useful in understanding why any error messages, stating that there are insufficient segments available to perform an operation, have been generated.



SELECT ALL

Selects all segments. Shortcut = <Ctrl> + <A>.

GO TO FIRST

Makes the beginning of the program visible if the segment display has been scrolled to later in the program. Shortcut = <Ctrl> + <Left arrow>.

GO TO LAST

Makes the end of the program visible if it has been scrolled off the end of the display. Shortcut = <Ctrl> + <Right arrow>.

ANALOG MODE

This is the default mode for displaying and editing the selected program's segment data. The graphical display shows a separate trace for each PSP Target Setpoint. Shortcut = <Ctrl> + <G>.

DIGITAL MODE

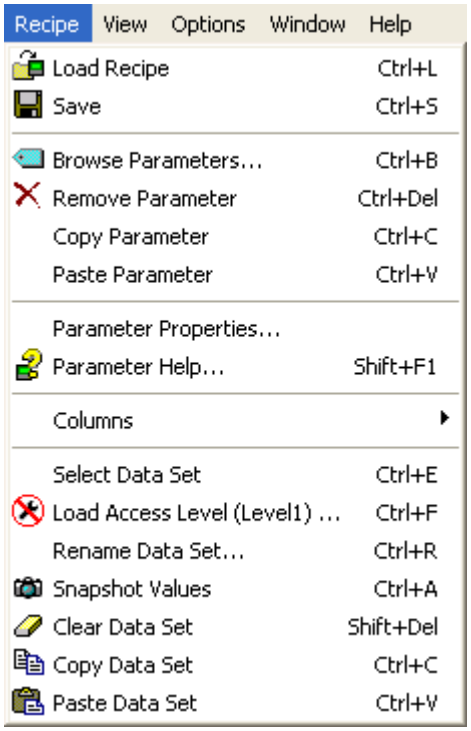
A view of the selected program displaying separate graphical traces for each enabled Event Output bit. Shortcut = <Ctrl> + <D>.

LOGARITHMIC

Toggles between linear and logarithmic graph scales. Shortcut = <Ctrl> + <M>.

15.2.12. Recipe menu (Device Recipe)

This menu appears in the main iTools menu only when the Device Recipe Editor is the active editor. The recipe menu items are also available by right clicking in the editor to obtain the context menu. The content of the context menu depends on whether it is clicked while the cursor is in the parameter list or the data sets part of the window.



LOAD RECIPE

Loads the recipe list and data sets from a file (extension .uir), clearing all existing values from the device. Shortcut <Ctrl> + <L>.

SAVE

Saves the current parameter sets to a file with the extension .uir. Shortcut <Ctrl> + <S>.

BROWSE PARAMETERS...

If a parameter is selected, then this opens a browse list at that parameter. If an empty row is selected, the browse window opens at the parameter last accessed using this browser tool. Shortcut <Ctrl> + <B>.

REMOVE PARAMETER

Enabled only if a parameter is 'selected', this removes the currently selected parameter. Shortcut <Ctrl> + <Delete>.

COPY PARAMETER

Enabled only if a parameter is 'selected', this allows the sure to copy the selected parameter to the clip-board. Shortcut <Ctrl> + <C>.

PASTE PARAMETER

Enabled only if a suitable parameter is located on the clipboard, this allows the user to paste a parameter from the clipboard to the watch list. Short cut <Ctrl> + <V>.

15.2.12 RECIPE MENU (DEVICE RECIPE)(Cont.)

PARAMETER PROPERTIES... AND PARAMETER HELP

Enabled only if a parameter is 'selected'.

See Explorer menu for details.

COLUMNS

Allows the user to enable/disable the Description and Comment columns for display in the watch list window.

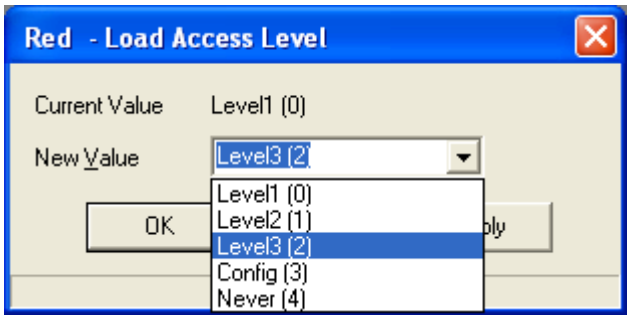
SELECT DATA SET

Short cut <Ctrl> + <E>.

LOAD ACCESS LEVEL

Enabled only when one of the data sets is selected.

Selection of this Recipe menu item allows the required access level to be configured for the selected data set via a dialogue box. Shortcut <Ctrl> + <F>.



= configuration access only.

= access never.

= other access levels.

RENAME DATA SET...

Enabled only when one of the data sets is selected, this allows the user to enter a title for the selected data set. Shortcut <Ctrl> + <R>.

SNAPSHOT VALUES

Enabled only when one of the data sets is selected, this fills the selected data set with the current values of the parameters listed in the data list. Shortcut <Ctrl> + <A>.

CLEAR DATA SET

Enabled only when one of the data sets is selected, this removes all values from the selected data set. Shortcut <Shift> + <Delete>.

COPY DATA SET

Enabled only when one of the data sets is selected, this allows the user to copy the selected data set to the clipboard. Shortcut <Ctrl> + <C>.

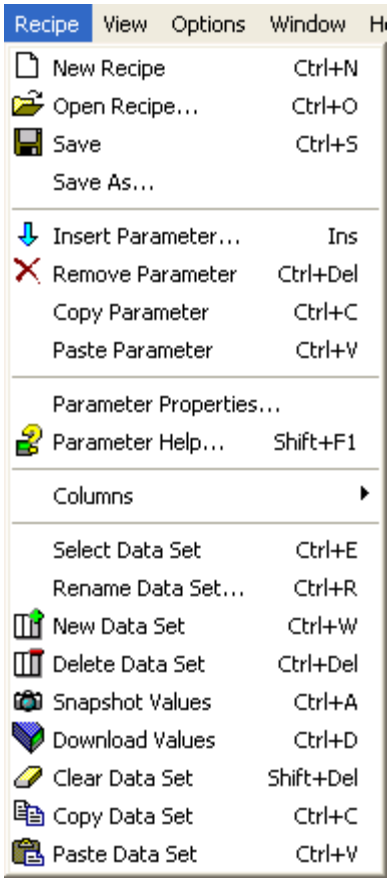
15.2.12 RECIPE MENU (DEVICE RECIPE)(Cont.)

PASTE DATA SET

Enabled only when one of the data sets is selected and there is a data set on the clipboard. This allows the user to paste a previously copied data set from the clipboard to the selected data set. Shortcut <Ctrl> + <V>.

15.2.13. Recipe menu (Watch/Recipe)

This Recipe menu appears in the main iTools menu only when the Watch/Recipe Editor is the active Editor. The recipe menu items are also available by right clicking in the editor to obtain the context menu. The content of the context menu depends on whether it is clicked while the cursor is in the parameter list or the data sets part of the window.



NEW RECIPE

This creates a new watch list by clearing out parameters and data sets from the window. If any of the existing data is unsaved, confirmation is requested before the operation starts. Short cut <Ctrl> + <N>.

OPEN RECIPE...

This opens a file containing a previously created watch list and any data sets that were defined for it. If any existing data is unsaved, confirmation is requested before the operation starts. Shortcut <Ctrl> + <O>. Recipe files have the extension .uir

SAVE

Saves the current watch list and any data sets. If the file has not previously been saved, 'Save' acts as 'Save As...', described below. Shortcut <Ctrl> + <S>. Recipe files have the extension .uir

SAVE AS...

Saves the current watch list and any data sets to a file name entered by the user.

INSERT PARAMETER

This opens a browse list to allow the user to choose a parameter for insertion into the watch list. The insertion point is above the currently selected parameter. Shortcut <Insert>.

15.2.13 RECIPE MENU (Watch/Recipe)(Cont.)

REMOVE PARAMETER

This causes the selected parameter to be deleted from the watch list. Shortcut <Ctrl> + <Del>.

COPY PARAMETER

This allows the user to copy the selected parameter to the clipboard. Shortcut <Ctrl> + <C>.

PASTE PARAMETER

This allows the user to paste a parameter from the clipboard to the watch list. Shortcut <Ctrl> + <V>.

PARAMETER PROPERTIES... AND PARAMETER HELP

See Explorer menu for details.

COLUMNS

Allows the user to enable/disable the Description and comment columns for display in the watch list window.

SELECT DATA SET

Shortcut <Ctrl> + <E>.

RENAME DATA SET...

Allows the user to enter a title for the selected data set. Shortcut <Ctrl> + <R>.

NEW DATA SET

Add an empty data set column. Shortcut <Ctrl> + <W>.

DELETE DATA SET

Deletes the selected data set. Shortcut <Ctrl> + <Del>.

SNAPSHOT VALUES

Loads current data into the selected data set. If no data set is selected, a new data set is created with the current data loaded. Shortcut <Ctrl> + <A>.

DOWNLOAD VALUES

Download the selected data set to the device after confirmation. Short cut <Ctrl> + <D>.

CLEAR DATA SET

Removes all values from the selected data set. Short cut <Shift> + <Del>.

COPY DATA SET

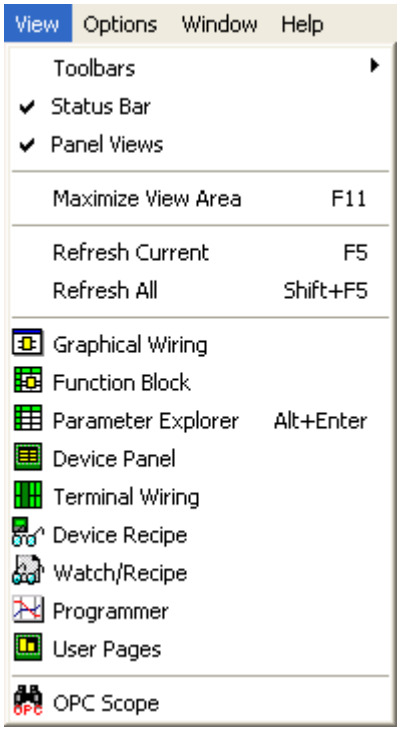
This allows the user to copy the selected data set to the clipboard. Short cut <Ctrl> + <C>.

PASTE DATA SET

This allows the user to paste a previously copied data set from the clipboard to the selected data set. Short cut <Ctrl> + <V>.

15.2.14. View menu

Note: The view menu content varies according to device type. A particular device may contain items not shown in the figure below, or may not contain items which are shown below. The same applies to the menu item descriptions.



TOOLBARS

Allows the user to display or hide the Main Toolbar and/or the Views Toolbar. By default, the toolbars include text descriptions of the tools' functions. These text strings can be hidden, by right clicking anywhere in the Main or 'Views' toolbar, and deselecting 'Show Labels' from the context menu which appears. See 'Toolbar Context menu' for more details.

STATUS BAR

This allows the user to display or hide the status bar at the bottom of the iTools window. The status bar contains various information windows, including access level, device type and software version, and a description of whichever window, tool, menu item etc. the mouse cursor is currently hovering over. In the above example, the mouse cursor is hovering over a parameter (ClearMemory) in a parameter explorer window. The status bar also displays scan information during the scanning-for-devices process.

PANEL VIEWS

This is the area of the window which contains the device faceplates. By default, Panel Views is enabled,and located near the bottom of the main iTools frame, just above the status bar.

The panel views area can be displayed or hidden using the 'Panel Views' menu item. When enabled, it can be positioned either near the top of the window, or near the bottom of the window, using the Options menu 'Panel Views Position' item.

MAXIMIZE VIEW AREA

When enabled, tool bars and Panel views are removed, to increase the working area to the maximum possible extent. Shortcut = F11.

15.2.14 VIEW MENU (Cont.)

REFRESH CURRENT

Refreshes the current display. Short cut <F5>

REFRESH ALL

Refreshes all displays. Short cut <Shift> + <F5>

GRAPHICAL WIRING

For those instruments which support the feature, opens the Graphical Wiring Editor window.

FUNCTION BLOCK VIEW

This menu item appears when one or more views have been launched from the Graphical Wiring Editor (GWE) (e.g. by double clicking on a block in the GWE window). This can be useful in bringing the function block list to the front, when the GWE (or other window) is maximised.

PARAMETER EXPLORER

Opens the Parameter Explorer window.

FLASH MEMORY

For those instruments which support the feature, this opens the Flash Memory Editor window

DEVICE PANEL

Selecting this item causes the Device Panel view of the device to appear in the main iTools frame.

DEVICE RECIPE

For devices which support the feature, this opens the Device Recipe Editor.

WATCH/RECIPE

For devices which support the feature, this opens the Watch/RecipEditor.

TOOLKIT BLOCKS

For those instruments which support the feature, this opens the Toolkit Blocks Editor.

PROGRAMMER

For those instruments which support the feature, this opens the relevant Programmer Editor.

USER PAGES

For those instruments which support the feature, this opens the relevant programmer window.

OPC SCOPE

Opens the OPC Scope application.

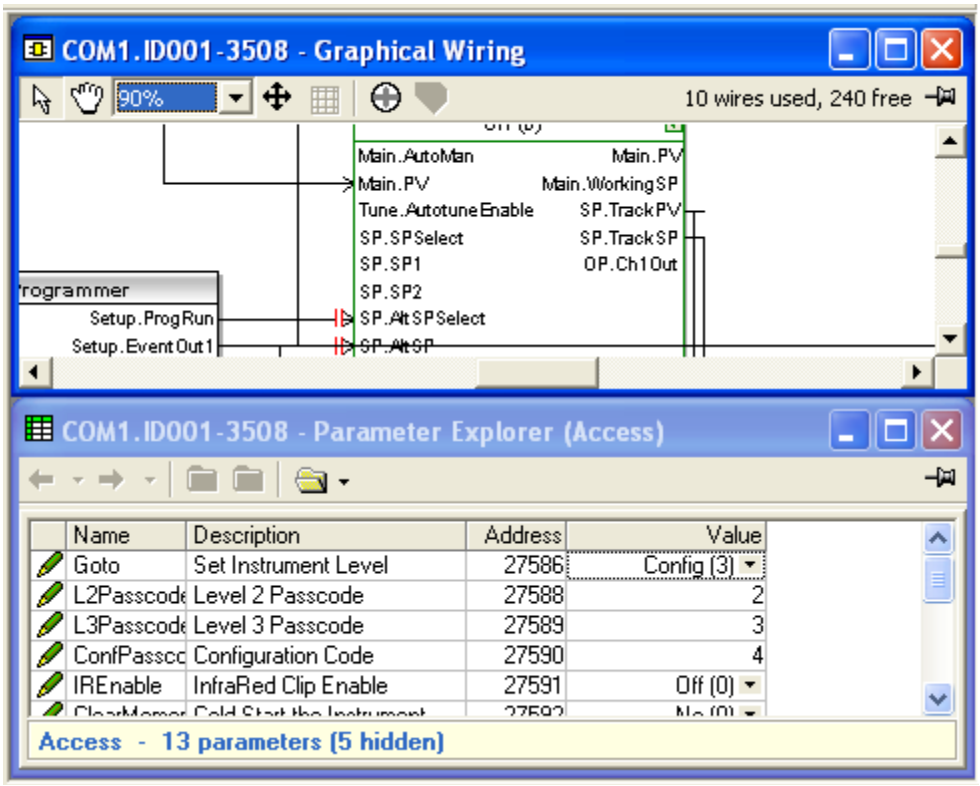
ITOOLS SECURE

For use by the manufacturer and/or agents to add software features. Not intended for customer use.

15.2.15. Window menu

TILE HORIZONTALLY

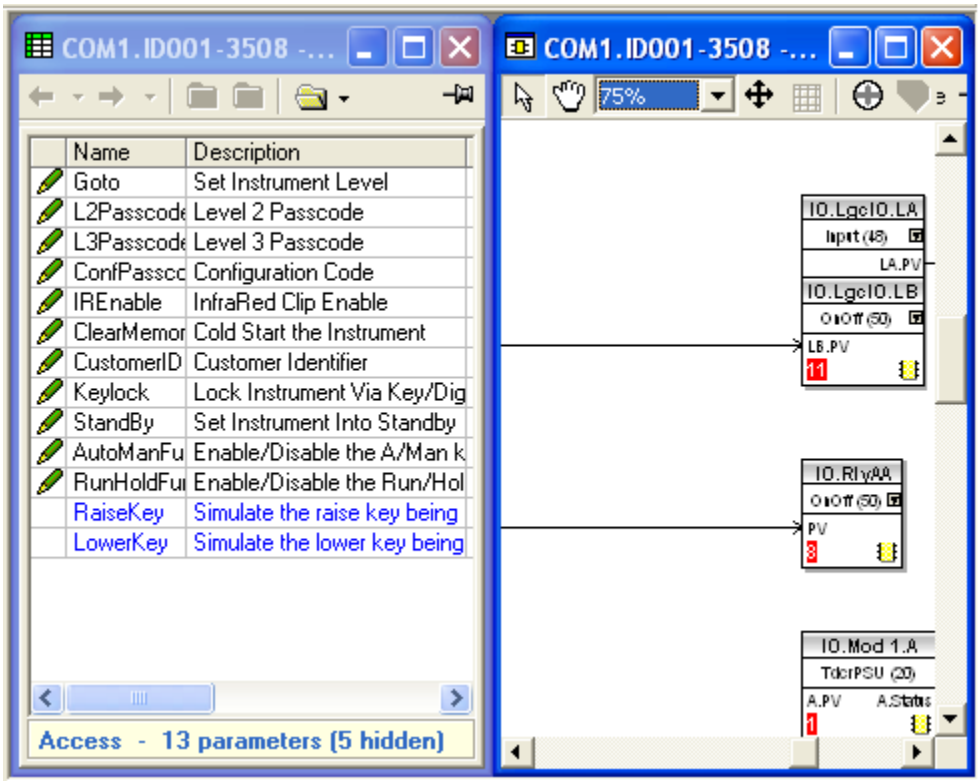
Arranges open windows in rows.



15.2.15 WINDOW MENU (Cont.)

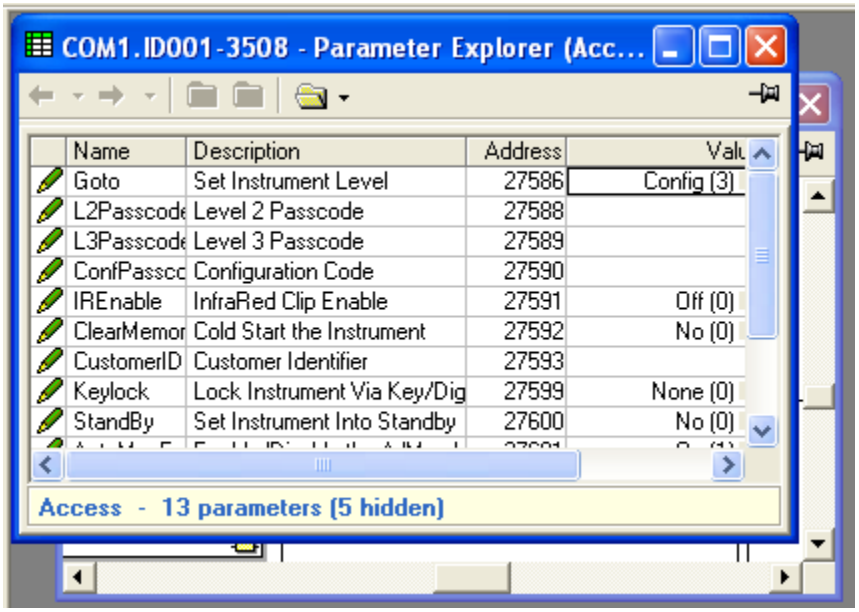
TILE VERTICALLY

Arranges open windows in column format



CASCADE

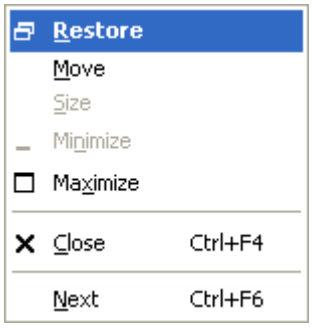
Arranges open windows one on top of the other.



15.2.15 WINDOW MENU (Cont.)

MINIMIZE ALL

Minimizes all open windows to icons at the bottom of the iTools window.
Left clicking on a minimized window icon calls the standard Windows application menu.



Restore
Restores the selected window to its previous non-minimised state.

Move
Allows the user to position the minimized icon anywher in the window, using the mouse.

Size
Not applicable to minimized windows.

Minimize
Not applicable to minimized windows.

Maximize
Maximises the window. Set to 'Cascade' to view other menus.

Close
Closes the selected window Short cut <Ctrl> + <F4>

Next
Moves to the next window.

RESTORE ALL

Restores all open widows previously minimized, to their previous state.

ARRANGE ICONS

Arranges minimized icons in rows, starting at the bottom left corner of the window.

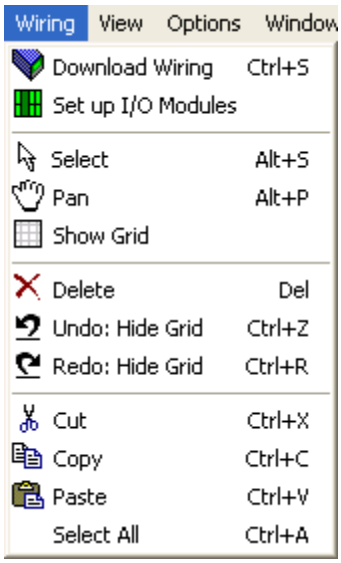
CLOSE

Closes the selected window Short cut <Ctrl> + <F4>

CLOSE ALL

Closes all windows for the current device.

15.2.16. Wiring menu

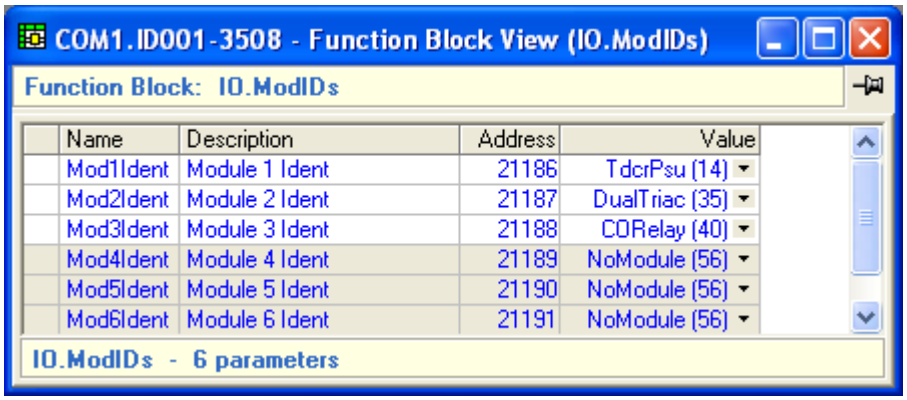


SAVE WIRING/DOWNLOAD WIRING/SAVE DIAGRAM LAYOUT

Downloads wiring to the instrument. This tool is used to initiate transfer of the wiring and (if the device supports it) the wiring layout to the device. Shortcut <Ctrl> + <S>

SET UP I/O MODULES

This opens a function block view for the I/O modules. The module types are non-editable for real instruments, but can be edited for clone devices. This view is also available using the 'View summary list of I/O modules' tool button in the Terminal Wiring view.



SELECT

Sets mouse into Select mode (i.e. its normal operating mode). The mouse can be used to click-drag the diagram within the viewing window if the shift key is held down whilst dragging. Short cut <Alt> + <S>.

PAN

Sets mouse into Pan mode, where the mouse can be used to click-drag the diagram within the viewing window. Shortcut <Alt> + <P>

SHOW GRID

This toggles the background grid on and off. Items snap to this grid whether or not it is displayed.

15.2.16 WIRING MENU (Cont.)

DELETE

Models 3500, EPower controllers, Mini8 controllers
If the item has previously been downloaded, it is shown 'ghosted' until next time the wiring diagram is downloaded, when it disappears from view. Until such time, it can be 'undeleted' using the 'Undelete' menu item, below. If the comment is 'new' (that is, it has not yet been included in a download), then the deletion takes effect immediately.

Models 2604, 2704
Deleted items are immediately removed from the wiring diagram. Such items can be restored using the Undo tool button (shortcut <Ctrl> + <z>).

UNDO / REDO

These menu items undo or redo the specified step. Shortcuts <Ctrl> + <Z> and <Ctrl> + <R> respectively.

CUT, COPY, PASTE

Carry out cut, copy and paste operations for wiring elements.

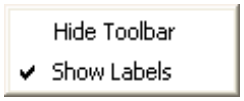
SELECT ALL

When selected, every item in the wiring diagram is selected. Shortcut <Ctrl> + <A>.

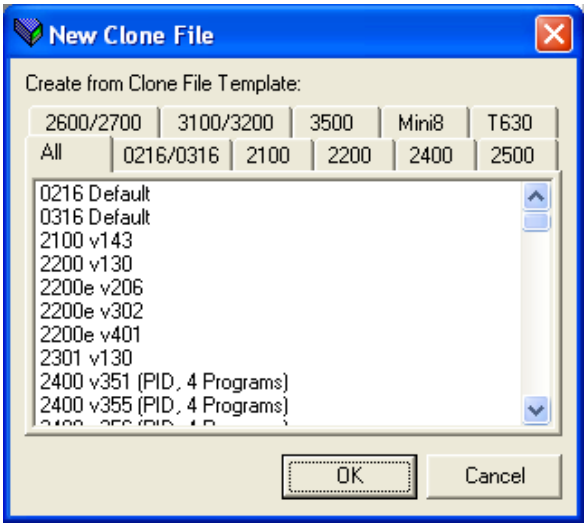
16. THE TOOLBARS

16.1. MAIN TOOLBAR

This combines the functions of the File menu and the Device menu. The toolbar shown below includes text descriptions of the tools' functions. These text strings can be hidden, by right clicking anywhere in the Main or 'Views' toolbar, and deselecting 'Show Labels from the context menu which appears. See 'Toolbar Context menu' for more details.



Create new clone file. Calls the 'New Clone File' selection box to the display, to allow the user to select a device type for opening. The selection can be made from the 'All' tab, or the device type tabs may be used to filter the choices.



Open clone file for editing. Calls a file dialogue box, allowing the user to open an existing saved file.

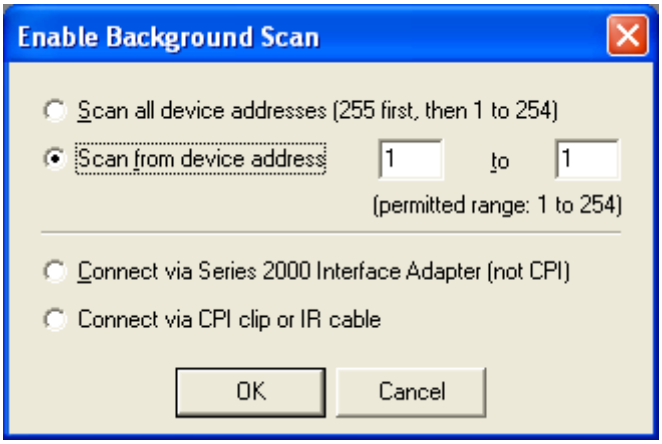
Load device parameters from file. Calls a file dialogue box, allowing the user to open an existing saved file. An attempt is made by iTools to load this file into the selected device. If the file is incompatible with the selected device, the load will fail. The tool is disabled ('greyed') if no device is currently selected.

Save device parameters to file. Calls a file dialogue box allowing the user to save a clone file to a chosen destination.

Generate Report on selected device. This allows the user to print a 'report' showing the current configuration of a set of user selected parameters. See 'Report Configuration' for more details.

16.1 MAIN TOOLBAR (Cont.)

Background scan for new devices. This causes iTools to search for connected instruments with addresses within the range specified by the user. See also, 'Synchronisation'.



''Connect via Series 2000 Interface Adapter (not CPI)' allows the use of iTools with a Series 2000 Configuration Station to configure and commission Series 2000 instruments. Short cut <Ctrl> + <Alt> + <C>. For more details, see the Technical Information Sheet TIS 241, to be found under 'Technical Information bulletins' on the iTools CD.

Select additional devices from list. Clicking on this tool causes a selection list to appear. This list contains all the devices known to the Modbus server. Items are added to/deleted from the list via the Options/Advanced/Show server menu item

Remove highlighted device from display. Clicking on this tool causes the selected device to be removed from iTools, after confirmation.

Toggle access configuration level. This button switches the selected instrument between Configuration and Operator levels of access.

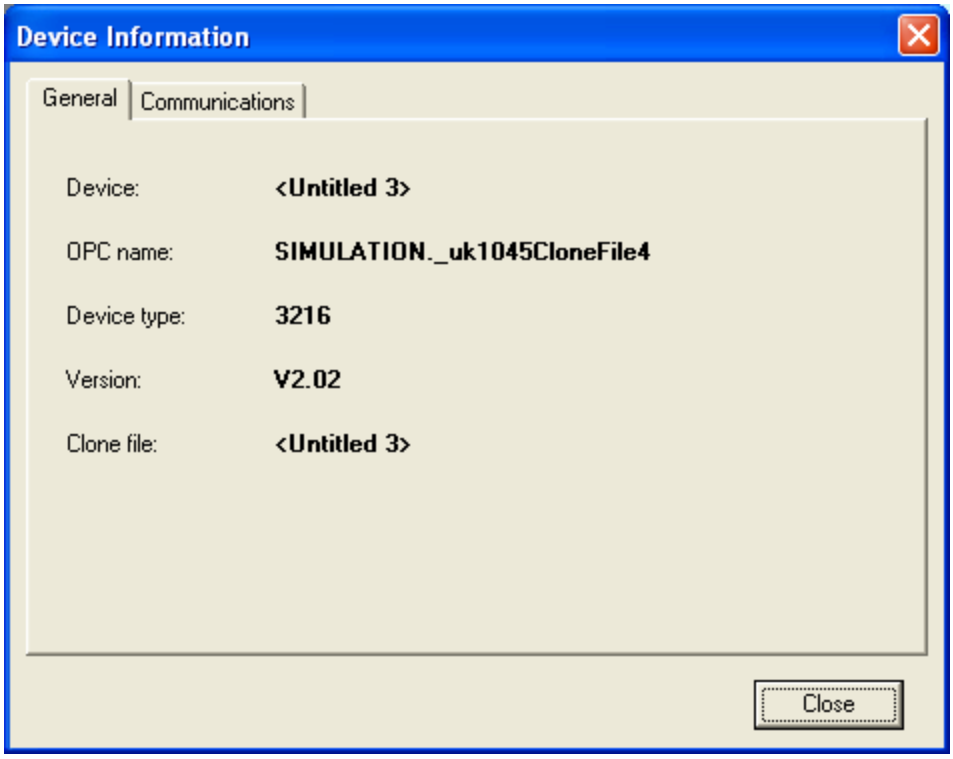
Click down arrow to list available wizards. For devices that support wizards, this allows the relevant wizard to be opened, to allow configuration editing.

Click down arrow to list available views. This tool displays all the Views toolbar items.

For devices with their own help system only, this allows the user to enter that help system, or to select 'Device Information' (see below).

16.1 MAIN TOOLBAR (Cont.)

This button calls the 'Device info' display. This button replaces the Help button, above, for instruments which do not have their own help pages. The communications tab shows the Communications protocol, the Device address and the (for live devices only) Baud rate.



16.2. VIEWS TOOLBAR

The Views toolbar mimics the functions of the Views menu. The toolbar shown below includes text descriptions of the tools' functions. These text strings can be hidden, by right clicking anywhere in the Main or 'Views' toolbar, and deselecting 'Show Labels from the context menu which appears. See 'Toolbar Context menu' for more details.

Note: The figure below is a composite, in an attempt to show as many View Tools as possible. Where a view is not supported by a device, the tool does not appear in the tool bar.

Graphical Wiring — This tool calls the graphical wiring window for those devices which support the Graphical Wiring Editor (GWE) feature.

Function Block — This appears when one or more Function block views have been launched from the Graphical Wiring Editor (GWE) (e.g. by double clicking on a block in the GWE window) or from the Terminal Wiring View. This can be useful in bringing the function block list to the front, when the GWE (or other window) is maximised.

Parameter Explorer — This tool opens the parameter explorer, allowing the user to edit, copy, move a selected parameter. See parameter Explorer for more details.

Fieldbus I/O Gateway — For EPower controllers only, this allows Profibus input and output parameters to be defined. See 'Fieldbus I/O Gateway' for further details.

Flash Memory — This opens the Flash tool editor window, for those devices which support Flash memory editing. See 'Flash memory editor' for more details.

Device Panel — This tool causes a front-panel view of the device to appear in the main window. For many instruments,the displays, push-buttons etc. are active in this view, allowing operation from iTools instead of via the front panel itself. See 'Device Panel' for more details.

Terminal Wiring — This tool opens a rear panel view of the device, showing the terminal layout. This view allows the user to see which modules are fitted where, and also allows the user to open a Function block view of the currently selected module, showing the relevant parameters. For more details, see 'Terminal Wiring View'.

Device Recipe — Opens the Device recipe editor for applicable devices. See 'Device Recipe Window' for details.

Watch/Recipe — Opens the watch Recipe editor for applicable devices. See 'Watch Recipe View' for details.

Programmer — For devices that include a programmer, this opens the Programmer editor. See the relevant Programmer editor topic for more details.

User Pages — Opens the User pages editor for devices that support user pages. See the relevant User pages editor topic for more details.

Toolkit Blocks — For relevant device types, this opens the Toolkit Blocks editor. See 'Toolkit Blocks' for more details.

OPC Scope — Opens the OPC scope application. See 'OPC Scope' for more details.

iTools Secure — For use by the manufacturer and/or agents to add software features. Not for customer use.

16.3. DEVICE RECIPE TOOLBAR

Note: This toolbar is context-sensitive, so some tool buttons will not always be available (i.e. they will be 'greyed').

Load recipe data from file (<Ctrl> + <L>). Loads the recipe list and data sets from a file, clearing all existing values from the device.

Save the current recipe list (<Ctrl> + <S>). Saves the current parameter sets to a file.

Browse for recipe parameter (<Ctrl> + <B>). If a parameter is selected, then this opens a browse list at that parameter. If an empty row is selected, the browse window opens at the parameter last accessed using this browser tool.

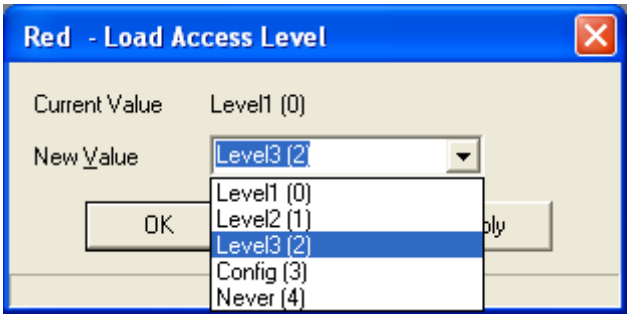
Remove recipe parameter (<Ctrl> + <Delete>). Removes the currently selected parameter. Enabled only if a parameter is 'selected'

Move selected item. Moves the currently selected parameter and its data set values to a new position in the list.

Capture current values into a data set (<Ctrl> + <A>). Fills the selected data set with the current values of the parameters listed in the data list. Enabled only if a parameter is 'selected'

Clear the selected data set (<Shift> + <Delete>). Removes all values from the selected data set. Enabled only if a data set is selected.

Set the access level in which the selected data set can be loaded (<Ctrl> + <F>). Enabled only if a data set is selected.
= configuration access only; = access never; = other access levels.
Clicking on the icon calls a dialogue box which allows the required access level to be set for the selected data set. The number of access levels varies from one device to another.



Open an OPC Scope window. This launches OPC Scope to view the parameters in the list.Enabled only if a data set is selected.

Push Pin to give window global scope. See Using the Application for details.

16.4. FLASH TOOLBAR

The tool buttons in the toolbar at the top of the Flash Memory Editor pages have the following functions:

Update device flash memory. Causes the updated flash contents to be downloaded to the device. A confirmation message must be 'OKed' before the download is allowed to commence. If the editor is closed while changes are still unsaved the user is prompted to write the changes to the device flash memory, or to discard them. Shortcut = <Ctrl> + <F>

Insert item. Inserts an item immediately above the currently selected item. An item can be added to the end of the list by inserting it with the final empty row selected. Shortcut = <Insert>

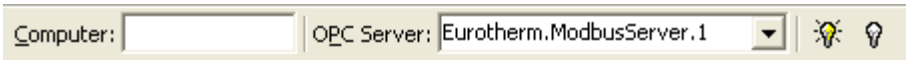
Edit parameter. Open a browse dialogue to edit the parameter associated with the selected item. Shortcut = <Ctrl> + <E>

Remove item. Removes the selected item from the list. Shortcut = <Ctrl> + <Del>

Move selected item buttons. Clicking on these buttons moves the selected item up or down the list, as applicable.

Push Pin to give window global scope. See Using the Application for details.

16.5. OPC SCOPE SERVER TOOLBAR



16.5.1. Computer:

If a computer name or IP address is entered in this field, OPC Scope will attempt to connect with the identified OPC server on that computer.

16.5.2. OPC Server:

When OPC_Scope is opened, it automatically starts the Eurotherm Modbus Server known as EuroMBus. OPC_Scope will also start running the configuration obtaining the last time it was shut down.

This field allows the user to choose an alternative OPC Server if such is available.

16.5.3. Connect /Reconnect to Server

If no server connection is currently in use, this connects to the specified server.
If a server is already connected, this re-connects to it, losing the current configuration.

16.5.4. Disconnect from server

This causes a disconnection from a connected server. If there is no current server the icon is disabled (greyed).

16.6. OPC SCOPE TOOLBAR

Load settings from file. Opens a file dialogue box to allow the user to load a previously saved .uix file

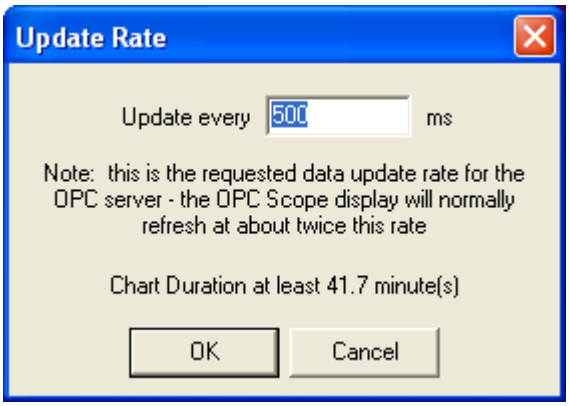
Save settings to file. Opens a file dialogue box to allow the user to define a destination path for the current (.uix) file.

Add new item to list. If clicked-on whilst a parameter is highlighted, opens a dialogue box which allows the user to add this parameter to the list. If the display is in chart mode, the new parameter will automatically be added to the chart. Otherwise, the parameter can be added to the chart by:

1. Using the 'Item appears on chart' selection in the 'Item' menu
2. Clicking on the tick box in the Chart control panel
3. Using the 'Add item' selection in the right click (context) menu.

Remove selected item. Removes the selected item from the list. Copies the function of 'Remove Item' in the 'Item' menu and in the context menu.

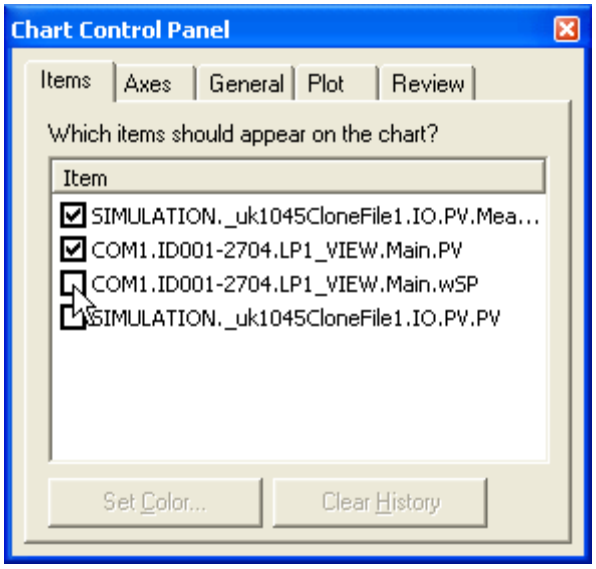
Set update interval for all items. This defines the update rate for the OPC server. The chart is updated, typically, at twice this rate. This setting defines the total history length. The displayed width of the chart is set up in the Chart Control Panel 'Axes' tab. The Update Rate page is also accessible from the Options menu.



Start/Stop data logger.

16.6 OPC SCOPE TOOLBAR (Cont.)

Show Chart properties. Calls the Chart Control Panel. Also accessible via the Options menu and the right click (context) menu.

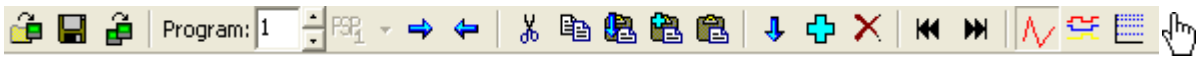


Toggle chart review mode. Switches between 'live' chart and 'review' mode.

Select display font. Allows the user to select type face, size, style, colour etc. for the parameter lists.

Show information dialogue.

16.7. PROGRAMMER TOOLBAR

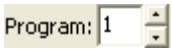


The Programmer toolbar appears above the graph. The contents of the bar varies according to device type.

Load Program. Clicking on this tool button opens a standard Windows File Open dialogue box to allow the user to select a previously saved program. Shortcut = <Ctrl> + <L>.

Save current program to file. Clicking on this tool tool button opens a standard Windows File Save dialogue box to allow the user to define a destination when saving a program. Shortcut = <Ctrl> + <S>.

Transfer this program within this session or download to another device. Calls a list of currently connected devices to allow the user to download the program to a selected device.



Program number. Allows the user to choose the required program number.

Select Asynchronous PSP. This tool is disabled (greyed) for synchronous programming, or for devices that do not support asynchronous programming. If asynchronous programming is enabled in Instrument/Options/Asynch, the tool allows the user to select a particular Setpoint for view/edit. See 'Asynchronous programmer' for more details.

View subprogram. Appears only for devices that support 'Call' type segments. Enabled for segments of type = 'Call' and if clicked on, the called program is displayed. Short cut = <Ctrl> + <U>.

Back to calling program. Appears only for devices that support 'Call' type segments. Enabled in subprograms, to allow the user to return to the calling program. Short cut = <Ctrl> + <B>.

Cut. This tool button is used to copy the selected item to the clipboard, deleting the source. Shortcut = <Ctrl> + <X>.

Copy. This tool button is used to copy the selected item to the clipboard, without deleting the selected item. Shortcut = <Ctrl> + <C>.

Paste insert. Operation of this tool button causes any segments located on the clipboard to be inserted into the program. The insertion point is to the left of the highlighted segment. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Ctrl> + <V>.

Paste add at end (Not all devices). This tool button takes any segments located on the clipboard and adds them to the end of the program. Shortcut = <Ctrl> + <Alt> + <V>. This tool button is disabled if one or more segments is highlighted.

Paste over. Operation of this tool button causes the highlighted segment(s) to be replaced with the contents of the clipboard. All other segments remain unchanged. The number of segments being copied must equal the number of segments highlighted. Shortcut = <Shift> + <Ctrl> + <V>.

16.7 PROGRAMMER TOOLBAR (Cont.)

Insert. This inserts a copy of the highlighted segment into the program, at the highlighted position. All subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Insert>. This tool button is enabled only if one or more segments is highlighted.

Add at End (not all devices). Copies the final segment, and appends it to the end of the program. If the program is empty, a 'Rate' segment is created as segment 1. This tool button is disabled if one or more segments is highlighted.

Delete. Removes the highlighted segment(s). Subsequent segments are moved left and renumbered appropriately.
Shortcut = <Ctrl> + <Delete>. This tool button is enabled only if one or more segments is highlighted.

Go To First. Makes the beginning of the program visible if the segment display has been scrolled to later in the program. Shortcut = <Ctrl> + <Left arrow>.

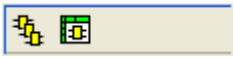
Go To Last. Makes the end of the program visible if it has been scrolled off the end of the display. Shortcut = <Ctrl> + <Right arrow>.

Analog. This is the default mode for displaying and editing the selected program's segment data. The graphical display shows a separate trace for each PSP Target Setpoint. Shortcut = <Ctrl> + <G>.

Digital. A view of the selected program displaying separate graphical traces for each enabled Event Output bit. Shortcut = <Ctrl> + <D>.

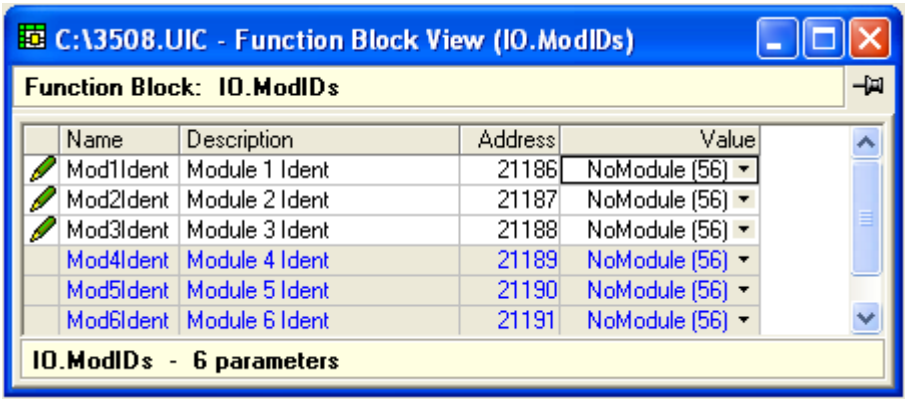
Logarithmic. Toggles between linear and logarithmic graph scales. Shortcut = <Ctrl> + <M>.

16.8. TERMINAL WIRING TOOLBAR

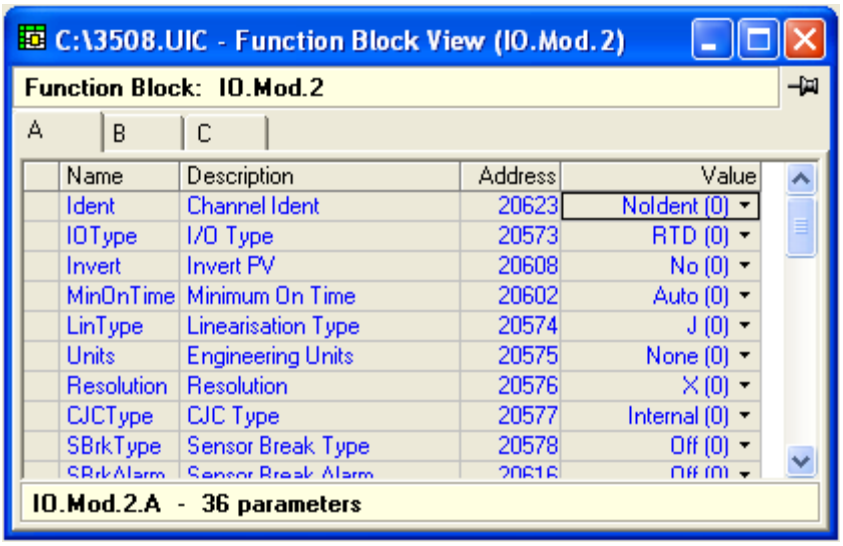


The tool buttons in the toolbar at the top of the Terminal Wiring Diagram View have the following functions.

View summary list of I/O modules. Clicking on this tool button, calls a summary page giving details of the |I/O modules fitted to the device. This tool button is not available for all devices.



View parameters in selected I/O module. Clicking on this tool button calls the Function Block view page, showing the parameters associated with the highlighted I/O Module. Not available from the Terminal Wiring Summary page.



See the Options/Parameter Availability Settings... item for details of how to display hidden items (if any).

Note: The Function Block Views toolbar tool is displayed when Function block view is displayed. This tool allows the Function block view to be brought to the front, when the Terminal Wiring function is maximized. Similarly, clicking on the Terminal Wiring View tool returns the Terminal Wiring View to the top.

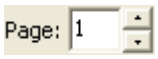
16.9. USER PAGE EDITOR TOOLBAR (2704)

Standard toolbar

with status grid tools

with bargraph tools

This toolbar appears at the top of the User Page editor display. Most of the tool buttons are disabled in 'Live' mode. Status grid tools appear only for status grid style; Bargraph tools appear only for Bargraph style.



Select Page. Allows the user to select the required page for editing.

Insert status control in front of selected status control. For 'Status Grid' style only, this allows the user to insert a new status block to the left of the selected block. Short cut <Insert>. The maximum number of blocks is 12, and this control is disabled if all 12 blocks are used. Disabled in Live Data mode.

Add status control after selected status control. For 'Status Grid' style only, this allows the user to insert a new block to the right of the selected block. Short cut <Ctrl> + <Insert>. The maximum number of blocks is 12, and this control is disabled if all 12 blocks are used. Disabled in Live Data mode.

Remove selected status control. For 'Bargraph' style only, this allows the user to delete the selected status block. Short cut <Ctrl> + <Delete>. Disabled in Live Data mode.

Insert bar in front of selected bar. For 'Bargraph' style only, this allows the user to insert a new bar to the left of the selected bar. Short cut <Insert>. Disabled in Live Data mode.

Add bar after selected bar. For 'Bargraph' style only, this allows the user to insert a new bar to the right of the selected bar. Short cut <Ctrl> + <Insert>. Disabled in Live Data mode.

Remove selected bar. For 'Bargraph' style only, this allows the user to delete the selected bar. Short cut <Ctrl> + <Delete>. Disabled in Live Data mode.

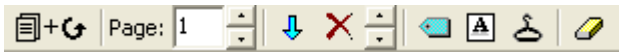
Edit wiring for selected parameter. If this is clicked-on, a browse list appears allowing the user to select a parameter to add to the page at the highlighted position. Any existing parameter is overwritten, after confirmation. Short cut<Ctrl> + <E>.

Edit user text for selected parameter. When enabled, this opens the User Text list. The user can either select an existing item of user text from the 100 available, or an item can be edited. As soon as the selection is made, it is assigned to the selected parameter. Short cut<Ctrl> + <T>.
If an existing item of user text is edited here, then the new text will apply to all instances of this User Text item throughout the device.

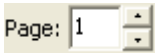
Unwire all parameters for this page. Removes ALL parameters from the page, not just the highlighted one. Short cut<Ctrl> + <X>.

Show live data/Return to editor. Toggles display between edit mode and live mode. Short cut<Ctrl> + <L>.

16.10. USER PAGE EDITOR TOOLBAR (3500 & EPOWER CONTROLLERS)



Acknowledge Device. Allows the user to 'Press' the Page and Scroll buttons simultaneously. Greyed out unless the operation of the keys is required. Does not appear for EPower controllers.



Select Page. Allows the user to select the required page for editing.

Insert item ahead of selected item. Opens a browser dialogue box to allow the user to select a parameter for insertion into the table. The insertion point is above the currently selected item. Short cut <Insert>.

Remove selected item. Removes selected item from the configuration list. Short cut = <Ctrl> + <Delete>.

Move selected item. Moves the selected item up or down the list.

Edit parameter for selected item. If this is clicked-on, a browser dialogue box appears allowing the user to replace the current parameter with another. Short cut<Ctrl> + <E>.

Edit user text for selected item. Allows the user to edit the existing user text, or to create a new text string. Short cut<Ctrl> + <T>. For parameters which do not support user text, '(no user text)' appears in the 'User Text' column.

Edit style for selected item. Clicking on this tool button calls the style selection page, allowing the user to edit the current selection for the selected parameter. Short cut <Ctrl> + <S>.

Remove all items from this page. Removes ALL parameters from the page, not just the highlighted one. Short cut<Ctrl> + <X>.

16.11. WATCH/RECIPE TOOLBAR

Note: The tools are context sensitive. Those tools which are not applicable to the current situation are 'greyed'.

Create a new Watch/Recipe list (<Ctrl> + <N>). This creates a new list by clearing out all parameters and data sets from the window. If the current list or data set has not been saved, confirmation is requested.

Open an existing Watch/Recipe file (<Ctrl> + <O>). If the current list or data set has not been saved, confirmation is requested. A file dialogue box then opens allowing the user to select a file to be opened.

Save the current recipe list (<Ctrl> + <S>). Allows the current watch list/data sets to be saved to a specified location.

Download the selected data set to the device (<Ctrl> + <D>). Causes the currently selected data set to be downloaded to the device, after confirmation.

Insert item in front of selected item. Adds a parameter to the list above the currently selected item.

Remove recipe parameter (<Ctrl> + <Delete>). Removes the currently selected parameter from the watch list.

Move selected item. These buttons are used to move the selected item up or down the list.

Create a new empty data set (<Ctrl> + <W>). Adds a new data set column.

Delete the selected data set (<Ctrl> + <O>). Removes the selected data set from the window.

Capture current values into a data set (<Ctrl> + <A>). Fill the selected data set with the instantaneous values in the watch list.

Clear the selected data set (<Shift> + <Del>). Clears all values from the selected data set.

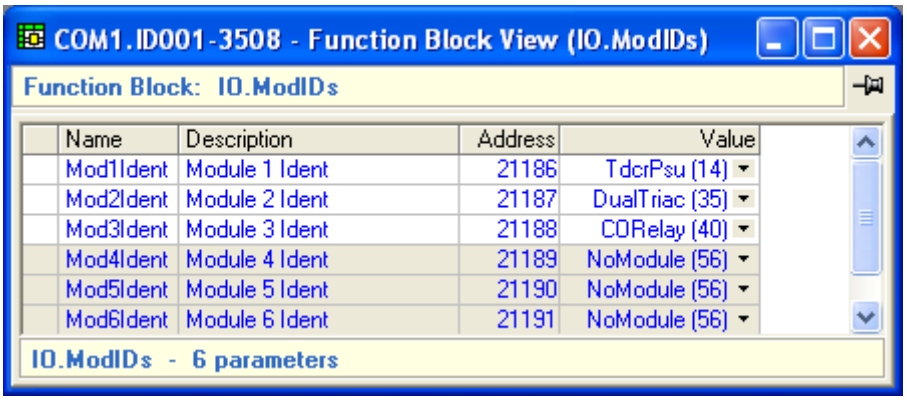
Open an OPC Scope window. Launches OPC Scope, to view the parameters in the watch list.

Push Pin to give window global scope. See Using the Application for details.

16.12. WIRING EDITOR TOOLBAR

Download Wiring to Instrument. This tool button is used to initiate transfer of the wiring and (if the device supports it) the wiring layout to the device. For series 2600/2700 devices, the wiring is transferred as it is drawn, and the Download Wiring to Instrument tool is used to save the wiring layout only.

Set up I/O modules. Clicking on this button opens the parameter list which defines the I/O module setup. The list is non-editable for real devices, but may be edited for clone devices.



Mouse Select. The mouse operates in its normal mode. Shift click-dragging allows the mouse to act in Pan mode.

Mouse Pan. The mouse can be used to click-drag the diagram.

Zoom Percent. Allows the user to choose a magnification for the wiring diagram.

Pan Tool. When this icon is clicked and held, a miniature version of the diagram appears and movement of the mouse cursor moves the view window over the diagram, allowing the user to select the required part of the diagram for display.

Show/Hide grid.

Delete. For models 2604, 2704, deletes the selected components immediately. Can be restored using the undo tool button (below), or the relevant context menu or Wiring menu item. For other models, components which have not yet been downloaded to the instrument are removed immediately. Components which have been downloaded are 'ghosted' until next download, after which they are removed from the diagram. 'Ghosted' items can be restored using the undo facilities described above.

Undo/Redo tool buttons. Shortcuts <Ctrl> + <Z> and <Ctrl> + <R> respectively. The tool tip shows the last edit to be undone or redone.

16.12 WIRING EDITOR TOOLBAR (Cont.)

Cut, Copy, Paste. Carry out the normal cut, copy and paste functions on wiring diagram items.

Copy a diagram fragment to a file. Copies the selected item to a file in 'My iTools Wiring Fragments' in 'My documents'

Paste a diagram fragment from a file. Opens a browser window containing diagram fragments and compounds from compatible instruments, for pasting to the current diagram.

Create compound. Creates a new compound. Greyed out if the maximum number of compounds for this type of instrument have already been created, or if the user is not in the top level diagram.

Flatten compound. Removes the compound and its tab, leaving the components previously in the compound on the top level diagram. These components are automatically selected ready for dragging to an appropriate place on the diagram.

17. OPC SCOPE

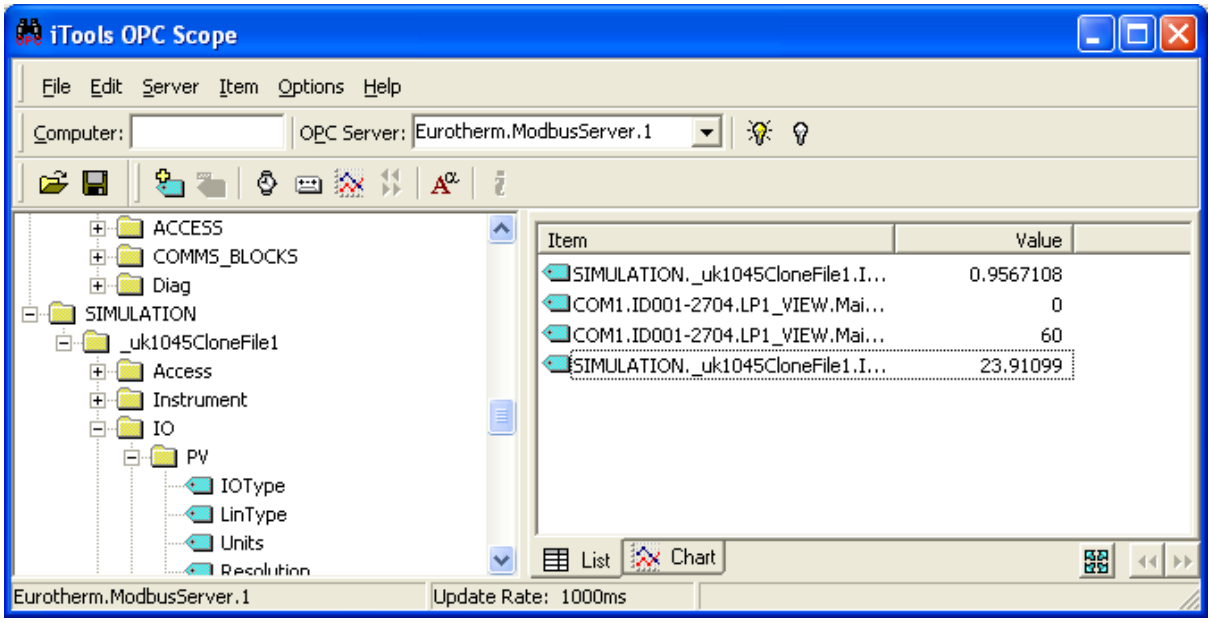
17.1. OPC SCOPE INTRODUCTION

'OPC Scope' is a separate utility that allows trending, data logging, Dynamic Data Exchange (DDE). It is an OPC explorer program that can connect to any OPC server that is in the Windows registry.

Note: OPC is an acronym for 'Object linking and embedding (OLE) for Process Control'

Opened by using the iTools 'OPC Scope' Views tool button, or the OPC Scope View menu item.

The figure below shows the start screen. Note that parameters from more than one device can be included in OPC Scope trending, data logging and data transfer operations.



As can be seen, the main part of the screen is divided into two areas, one containing parameter trees for all the devices (real or clone) currently open in iTools, the other containing a list of parameters for logging, trending or DDE.

17.1.1. Writing New Values

It is possible to write new values for groups of read/write parameters, using 'Group Item Value Writes' in the Options menu and then download them simultaneously.

17.1.2. Adding Parameters to the list

A parameter can be added to the list in the following ways:

1. Double-clicking on the parameter tab or name in the browse tree .
2. Click-dragging a parameter from the browse tree into the list
3. Clicking on the parameter tab or name, then clicking on the 'Add new item to list' tool or 'Item' menu item.
4. Using the 'Edit' menu 'Paste item...' selection to append a parameter previously copied to the clip-board.

In both cases 3 and 4, above, a confirmation window appears before the item is added. This confirmation window includes the ability to define an 'Access Path' which, if used, is intended to give the server a hint as to the optimal way to access the data item. How access paths are used is server-specific. It is always safe to omit the access path altogether.

Note: If the chart is on display, the new parameter is automatically added to the chart. If the list is on display, the new parameter will not appear in the chart, until enabled. This can be done by using the Chart Control Panel, displayed by clicking on the 'Show Chart Properties' tool , or by selecting 'Item Appears on Chart' in either the 'Item' or the right-click context menu.

17.1.3. Removing Parameters from the list

Parameters can be removed from the list by:

1. Clicking on the parameter, then on the 'Remove selected item' tool.
2. Clicking on the parameter, then selecting 'Remove Item' in the 'Item' menu.
3. Right clicking on the parameter, then selecting 'Remove Item' from the context menu which appears.

17.1.4. List Tab

The List view is the default OPC Scope view, allowing parameters to be added or removed as described above.

17.1.5. Chart Tab

Clicking on the Chart tab, causes the display to switch to Chart mode. The chart display is empty, until parameters have been configured to appear in it. See 'Chart Display' for more details.

17.1.6. Maximize Chart

When in chart mode, maximising the chart causes the tree browser window, tool bars etc. to be hidden, with the chart occupying the whole height and width of the OPC Scope window. A second operation, returns the display to 'normal'.

17.1.7. History Page Control

These two buttons are enabled only when the chart is in 'Review' mode. They are used to shift the chart time axis by one page-width at a time.

17.1.8. OPC Menu items

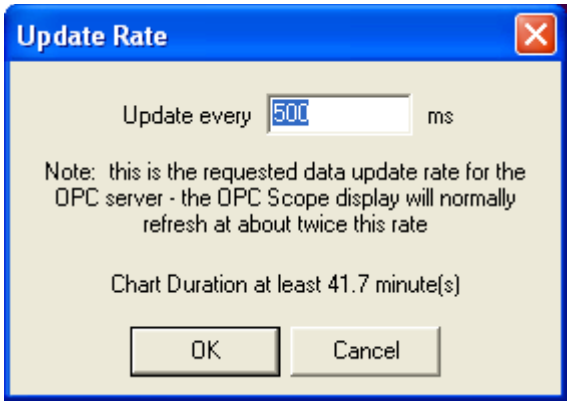
See 'The menus' for details of the main OPC Menu bar, and of the OPC context menus.

17.1.9. OPC Tools

See 'The Toolbars' for details of the various tools associated with OPC Scope.

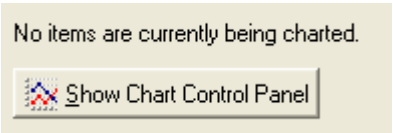
17.2. CHART DISPLAY

OPC Scope allows parameters from several devices to be traced, in real-time, on a simulated chart. The update rate can be selected by typing the required value into the Update rate entry box, which appears when the 'Set update rate for all items' tool is clicked-on.

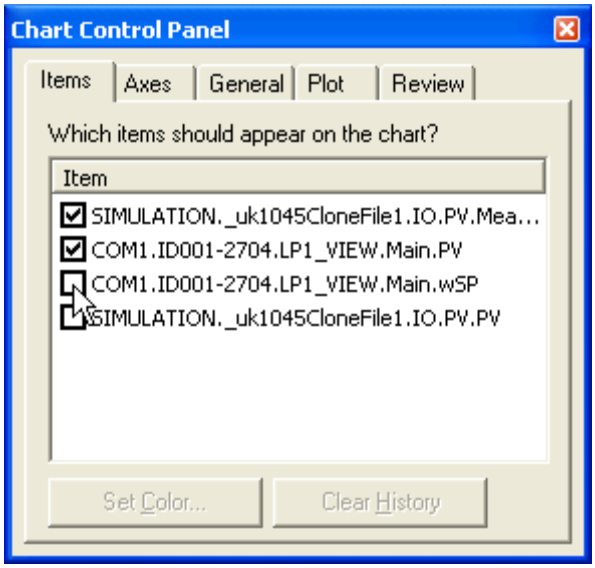


17.2.1. Display parameters

When the chart tab is first clicked-on, the chart display is empty, except for the Show Chart Control Panel tool, as shown below.



Clicking on this tool, calls the chart control panel, displaying its default tab 'Items'.



Initially all the tick boxes are empty. As soon as the first item is selected, a chart appears, with the selected parameter being traced on it. As each subsequent item is enabled, it is added to the chart.

17.2.1 DISPLAY PARAMETERS (Cont.)

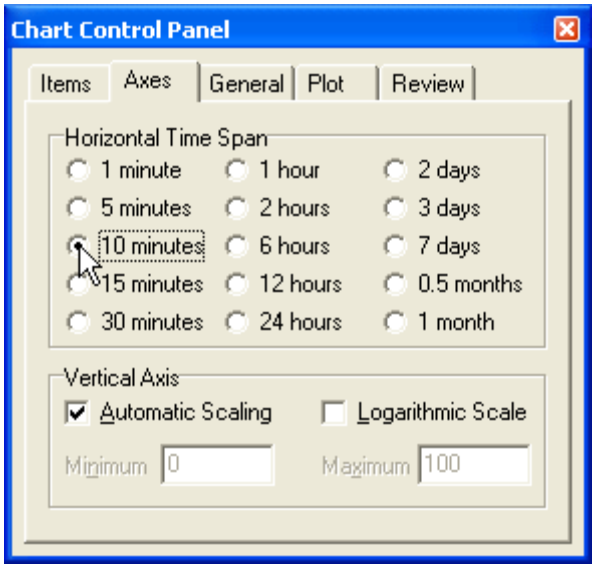
It is also possible to add parameters directly to the chart, by

1. Double-clicking on the parameter tab or name in the browse tree .
2. Click-dragging a parameter from the browse tree into the chart.
3. Clicking on the parameter tab or name, then clicking on the 'Add new item to list' tool or 'Item' menu item.
4. Using the 'Edit' menu 'Paste item...' selection to add a parameter previously copied to the clipboard.

In both cases 3 and 4, above, a confirmation window appears before the item is added.

17.2.2. Chart Configuration

AXES



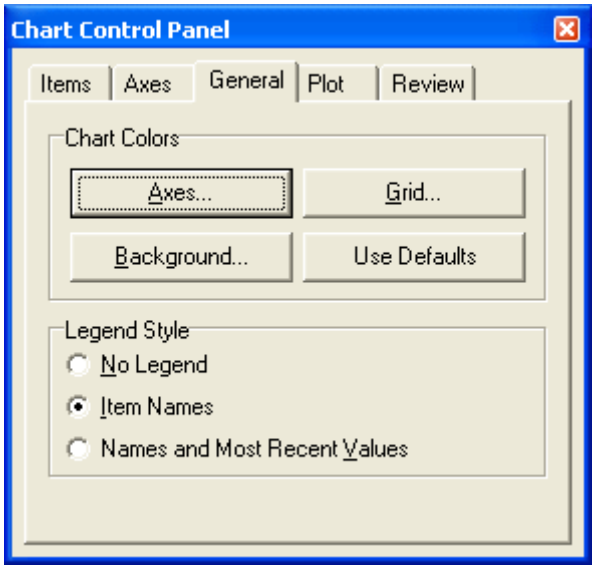
The horizontal (time) axis can be selected by clicking on the required item. This defines the total width of the chart in minutes, hours, days, months etc. as appropriate. The update rate is selected using the 'Set update rate for all items' tool .

The vertical scaling can be selected as automatic (default), in which case it is set to suit the selected input signals' ranges, or not. If not 'Automatic', the user enters the required Minimum and Maximum scale values. Any trace whose value lies outside this scale range is not drawn on the graph.

The user is also offered the option of using linear or logarithmic as the vertical scale.

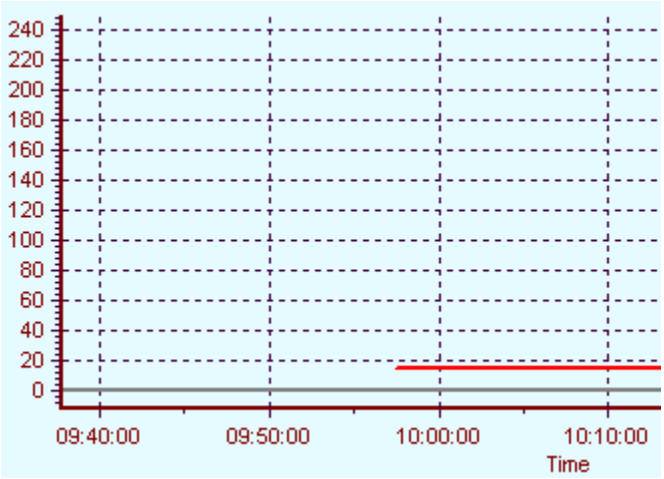
17.2.2 CHART CONFIGURATION (Cont.)

CHART COLOURS



Colours for the Axes, Grid and Chart (background) can be selected or defined by the user, from the 'Chart Colors' area of the 'General' tab (see below for an example). 'Use Defaults' returns the setting to factory values.

Trend colours may be edited via the 'Items' tab of the Chart Control Panel.



17.2.2 CHART CONFIGURATION (Cont.)

LEGEND STYLE

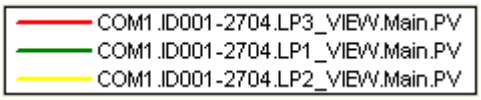
Legend refers to the box, listing the displayed parameters, which appears above the chart. It should be noted that the width of the box, and therefore, the number of parameters which appear per line, depends on the width of the OPC Scope window.

No legend

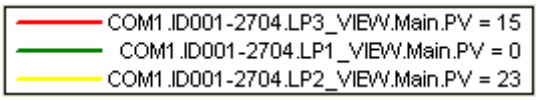
The legend box is not displayed.

Item Names

The legend block displays the names of the parameters and their trace colours.

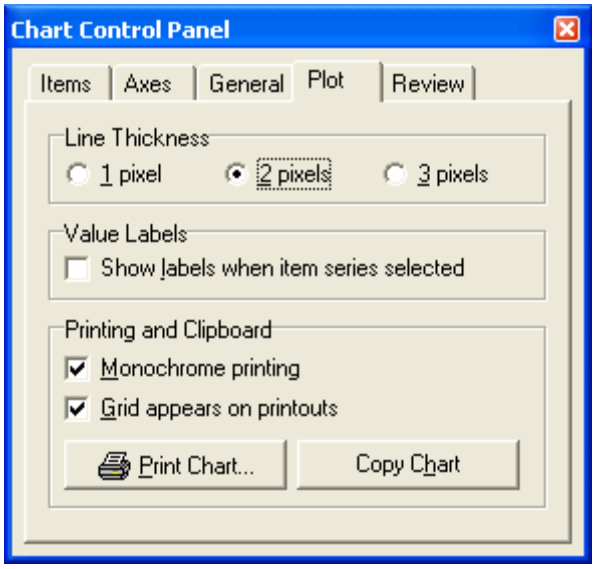


Names and Most Recent Values



The legend block displays the names of the parameters, their trace colours and the latest values.

LINE THICKNESS



The line thickness of the traces can be selected as one, two or three pixels in the Plot tab configuration area.

VALUE LABELS

If value labels is enabled, then clicking on a parameter trace in the legend box produces set of value boxes above the trace. Quite often, these boxes overlap to the extent that they appear as a thick black bar, with the current value at the right-hand end.

The easiest way to see the values, is to enter review mode, and then enlarge the area of interest, by click-dragging the mouse down and to the right. The enclosed size of the drag box is magnified to occupy the whole chart area.

17.2.2 CHART CONFIGURATION (Cont.)

PRINTING AND CLIPBOARD

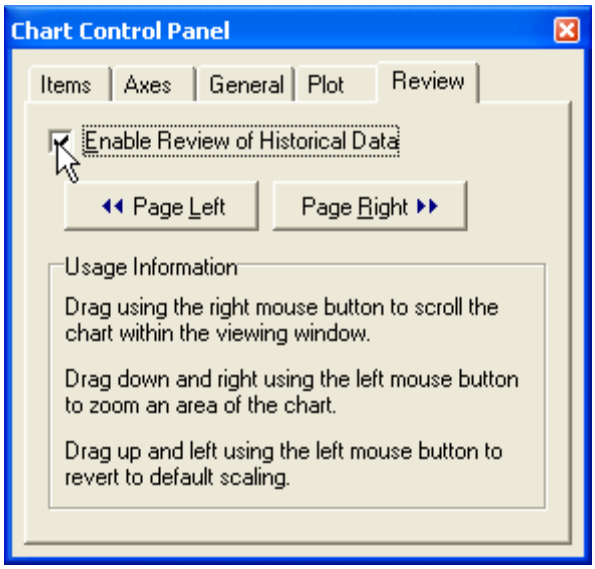
Monochrome printing
This allows the user to cause the chart to print in black and white. In some cases this is the only way of seeing some traces.
Deselecting Monochrome printing causes the traces to be printed in colour (or in shades of grey on a black and white printer).
When printing, the background colour of the chart is always white.

Grid Appears on Printouts
Allows the user to select whether or not grid lines are to appear on the printed chart.

Print Chart
Clicking on 'Print Chart' initiates the print process. This can also be initiated by selecting 'Print Chart' from the OPC 'File' menu, or from the chart right-click (context) menu.

Copy Chart
Clicking on 'Copy Chart' causes the chart to be copied to the clipboard, ready for pasting into other applications. This can also be initiated by selecting 'Copy Chart' from the OPC 'Edit' menu, or from the chart right-click (context) menu.

17.2.3. Review tab



This allows the user to Enable Review Mode. The Page Left and Page Right buttons allow the user to shift the displayed history page by one page-width left (older data) or right (newer data).

The 'Usage Information' panel gives useful information about zooming and navigation whilst in Review Mode.

REVIEW MODE

When in review mode, the chart stops being updated, and the user can scroll through the data on the chart and zoom in on a particular section, if required.

Note: Although the chart display is not updated, in review mode, chart data is still collected and retained, and added to the chart when the user quits review mode.

PAGE LEFT / PAGE RIGHT

These two keys allow the user to move the displayed data one page to the left, or one page to the right. In either case, no action is taken if the displayed area of chart is already at the end point. These Chart control keys copy the functions of the History Page Control keys, described in OPC Scope Introduction, above.

RIGHT MOUSE BUTTON FUNCTIONS

Click-dragging the right mouse button within the chart area allows the user to move the chart, both left-right and up-down.

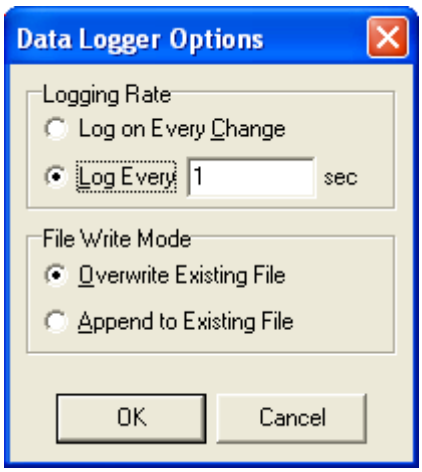
LEFT MOUSE BUTTON FUNCTION

Click dragging the left mouse button over an area of the chart, from top left to bottom right, causes that area to be expanded, both horizontally and vertically, to fill the chart area.
Click dragging the left mouse button from bottom right to top left, causes the chart area to return to 1:1 magnification.

17.3. DATA LOGGING (OPC SCOPE)

This allows the user to produce comma separated variable (CSV) file for importing into spreadsheets.

17.3.1. Data logging configuration



Opened by clicking on the 'Data Logger Options...' item in the OPC Scope Options menu, this allows the user to select Logging rate and File write mode.

LOGGING RATE

Allows the user to select 'Log every change' or 'Log every N seconds', where N is a user enterable value.

Note: Many parameters, such as Process value and Output power, may change frequently. In such cases it may be preferable to limit the file size by selecting a constant logging rate.

FILE WRITE MODE

Allows the user to select overwrite or append as the file write mode. If 'Overwrite Existing File' is selected, then the user is prompted for a new destination path when logging is initiated.

17.3.2. Log initiation

Logging can be started by:

1. Clicking on the 'Start data logger' tool . The tool changes to the 'Stop data logger' tool (below).
2. Selecting 'Start Data Logger' from the Options Menu. The menu entry changes to 'Stop Data Logger' (below).

In either case the user is prompted for a new destination path when logging is initiated.

17.3.3. Log termination

Logging is stopped by

1. clicking on the 'Stop data logger' tool . The tool changes to the 'Start data logger' tool (above).
2. Selecting 'Stop Data Logger' from the Options Menu. The menu entry changes to 'Start Data Logger' (above).

17.3.4. Spreadsheet display

The CSV file is imported into a spreadsheet, by clicking on File/Open in the spreadsheet. Select .csv as a file type if necessary.

The file is imported into the spreadsheet with the time and date in column A, parameter names in row 1; the other cells containing the values of the parameters at the specified time.

	A	B	C	D	E	F
1	Date/Time	COM1.ID0	COM1.ID0	COM1.ID0	COM1.ID0	COM1.
2	20/09/2004 14:15	60	0	0	0	
3	20/09/2004 14:15	60	0	0	0	

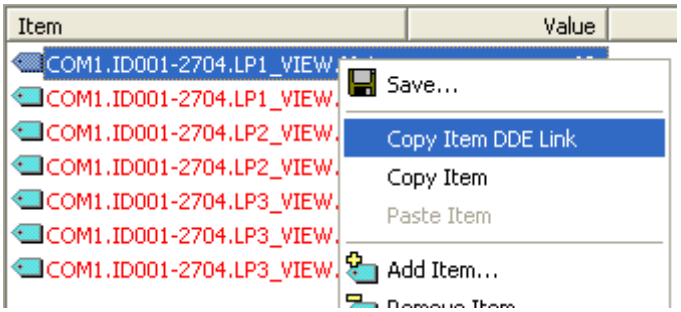
Note: If necessary, the time/date can be reformatted by right clicking on column A header, and selecting Format cell... The time and date display format can then be configured in 'Custom'. Custom allows dd/mm/yy or mm/dd/yy to be selected, amongst other things.

17.4. DDE INTERFACE (OPC SCOPE)

This allows the user to add parameters to a spreadsheet, where their values are updated in real time.
The procedure is as follows, and is illustrated below:

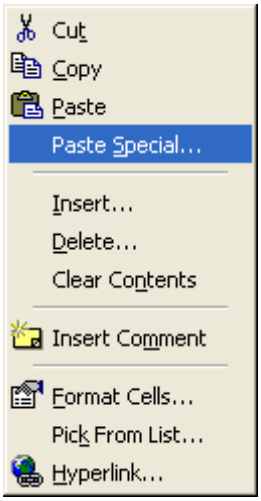
1. Select the parameter to added to the spreadsheet, from the OPC Scope list view.
2. Select 'Copy item DDE Link' from the 'Edit' Menu or from the list context (right click) menu.
3. Open the spreadsheet.
4. Right Click in the required spreadsheet cell.
5. Select 'Paste Special...
6. Select 'Paste Link'
7. Click on 'OK'.
8. Select 'Paste Link' as Unicode Text., then click on OK.

The parameter value appears in the selected cell, and the parameter path name appears in the equation block, preceded by
'=OPCScope|Server name'.



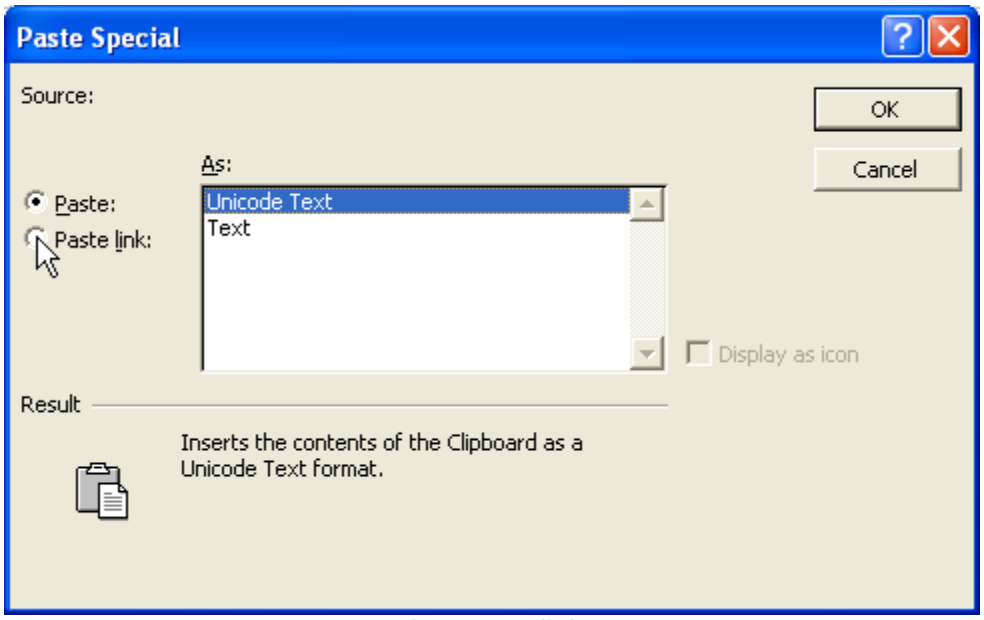
Copy item

Note: text colour in the above illustration was selected using 'Select Display Font' tool



Select Spreadsheet 'Paste Special'

17.4 DDE INTERFACE (Cont.)



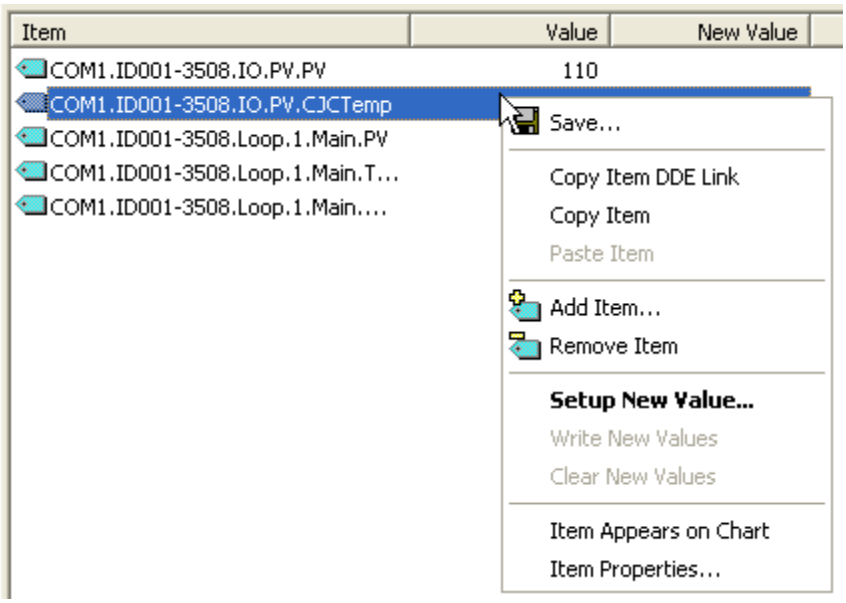
Select 'Paste link'

=OPCscope|Eurotherm_ModbusServer_1!COM1_ID001_2704_LP3_VIEW_Main_wSP

17.5. GROUP ITEM VALUE WRITES

Clicking on Options/Group Item Value Writes, adds a further column 'New value' to the OPC scope parameter list.

A new value is set up for writing by clicking on the parameter, then right-clicking on the mouse and selecting 'Setup New Value' from the pop-up 'context' menu.



Once the new value has been typed into the entry box, it appears in the 'New Value' column.

Once all the required parameters have had their new values entered, they can all be written together by clicking on 'Write New Values' in the context menu.

If necessary the new values can be cleared by selecting 'Clear New Values' from the context menu.

18. PORT SETUP

18.1. ITOOLS CONTROL PANEL

The iTools control panel applet allows access to system-level configuration items. These include Serial and TCP communications, and the ability to enter a product code to enable additional iTools features that have been purchased.

When setting up communications, it is normally necessary to have access to IT personnel in order to obtain some of the required information (e.g. IP addresses).

The control panel can accessed in three ways:
1. It appears at the end of the installation process.
2. It can be accessed using the host pc Start menu
3. It can be opened from within iTools itself.

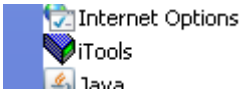
18.1.1. Access from the Start menu

1. Operate the keyboard Start key , or click on 'Start' at the bottom left of the screen.

2. Click on 'Control Panel'.

3. If the control panel opens in 'Category View, click on 'Switch to Classic View'

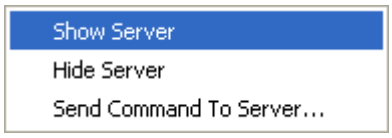
4. Find the iTools logo



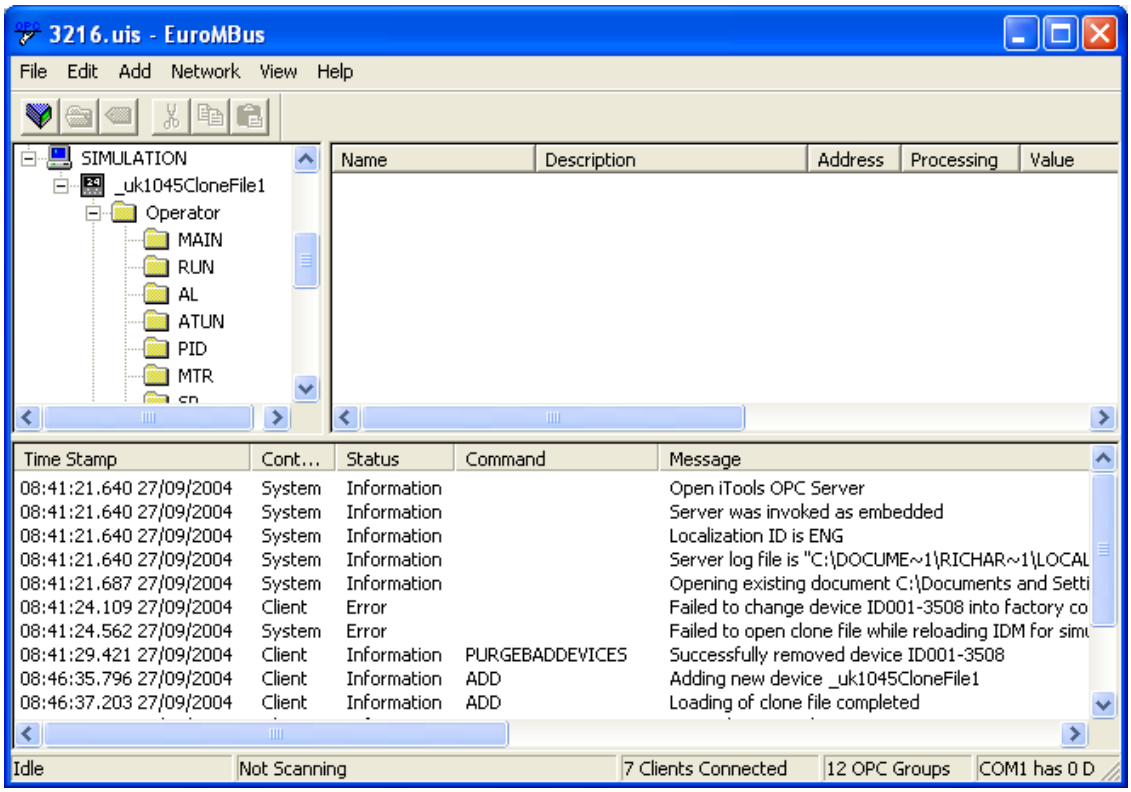
and double click it to launch the Registry Settings window.

18.1.2. Access from within iTools

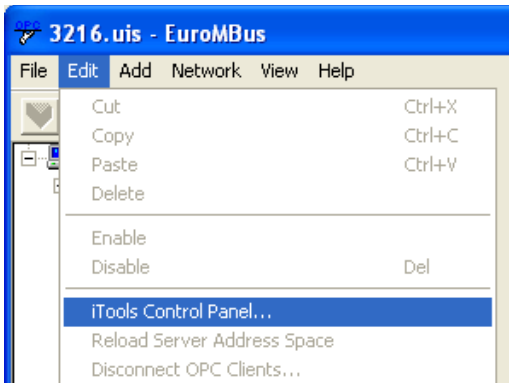
Select 'Advanced/Show Server' in the Options menu.



This opens the Server. The server window may appear on the screen, or may appear only as a new item in the task bar, according to the Windows operating system in use. Click on the Server item in the task bar if necessary to open the Server window.



In the Edit menu, select 'iTools Control Panel'.

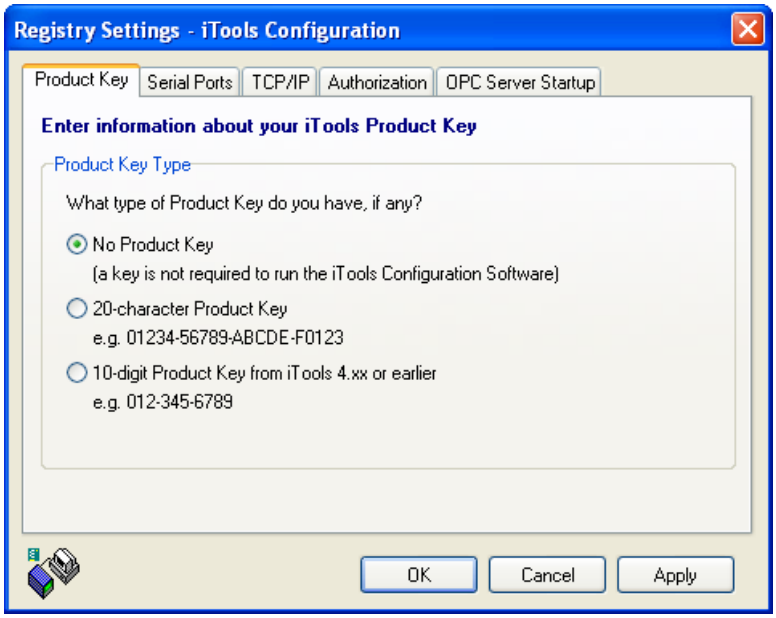


This opens the 'Registry Settings' window:

18.1.3. Registry Settings window

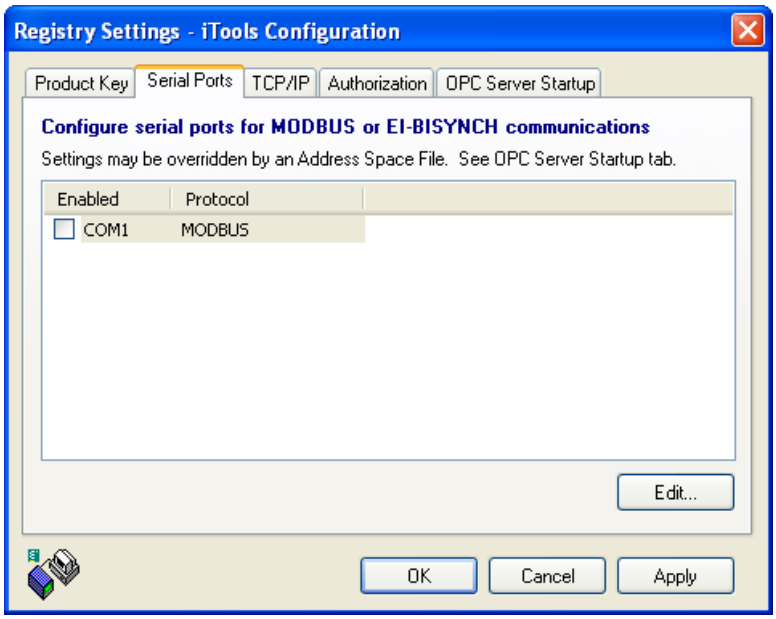
The registry window opens. In order to edit the contents of more than one tab, the 'Apply' key should be clicked on before the next tab is accessed. Clicking on 'OK' in any of the tabs, closes the window

PRODUCT KEY TAB



This allows users with Product keys to enter the key number to allows access to iTools features.

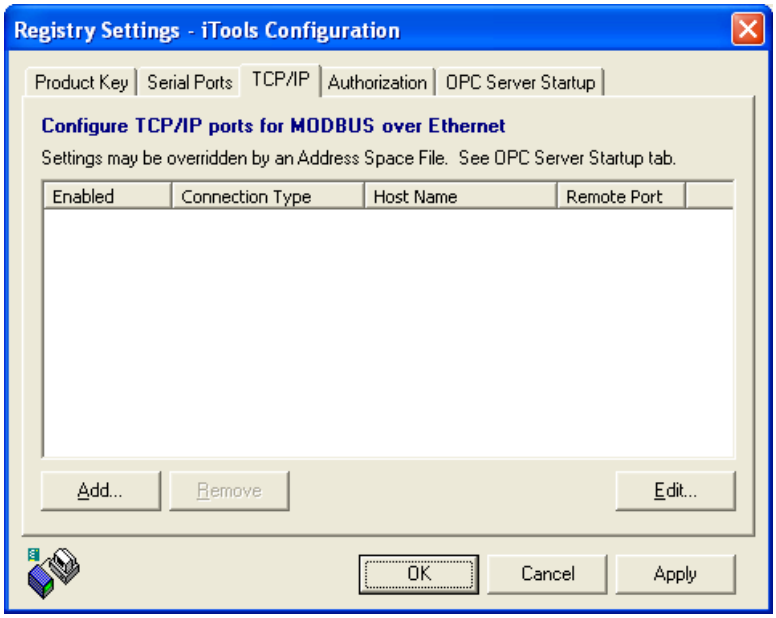
SERIAL PORTS TAB



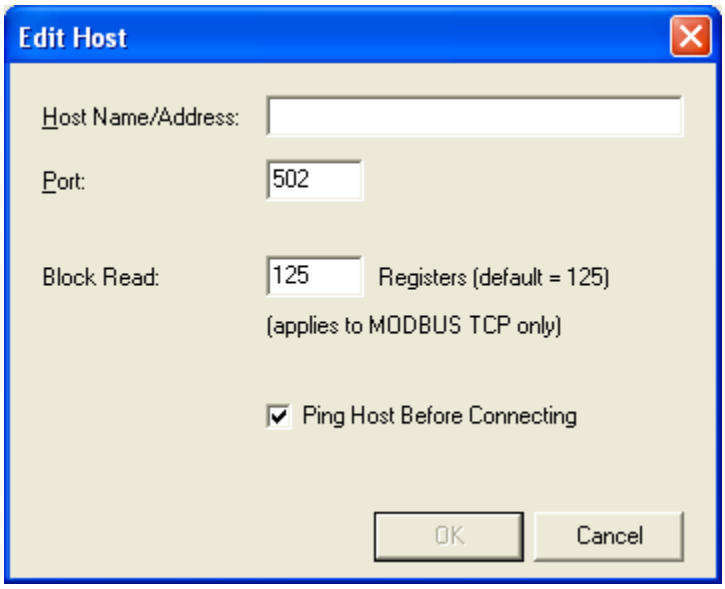
Click on the relevant port to enable it for use by iTools. Port characteristics can be edited if required (Edit... key), but this facility should be used only by advanced users.

18.1.3 REGISTRY SETTINGS WINDOW (Cont.)

TCP/IP TAB

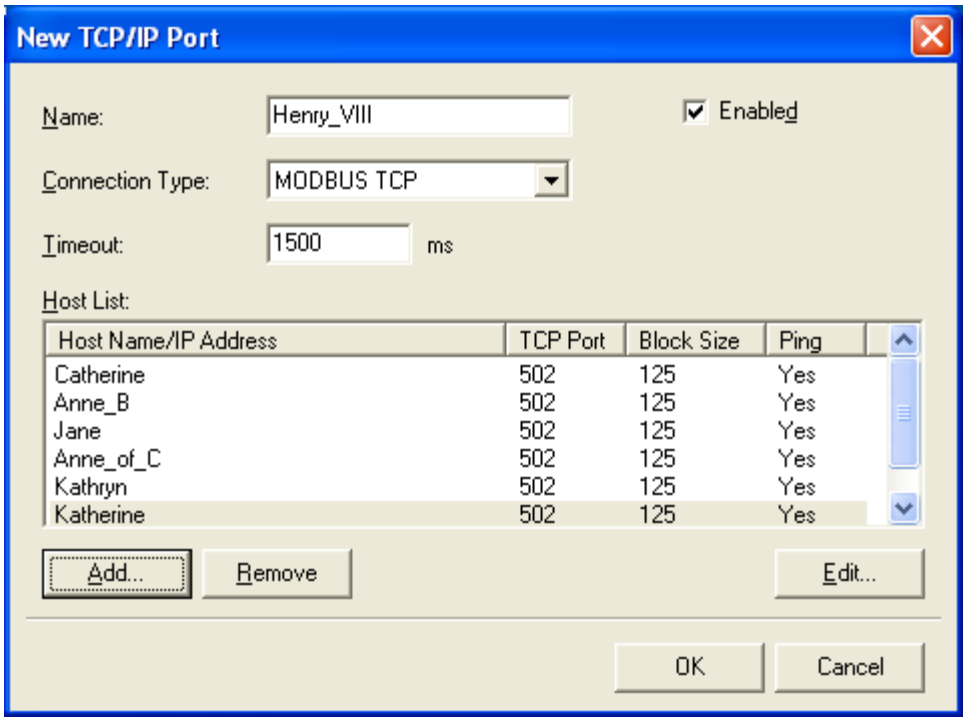


Clicking on 'Add' calls the 'New TCP/IP Port' configuration window. This window is initially empty. New ports can be added to the list by clicking on the 'Add' key, and typing in a name for the Port in the 'Edit Host' window which appears.

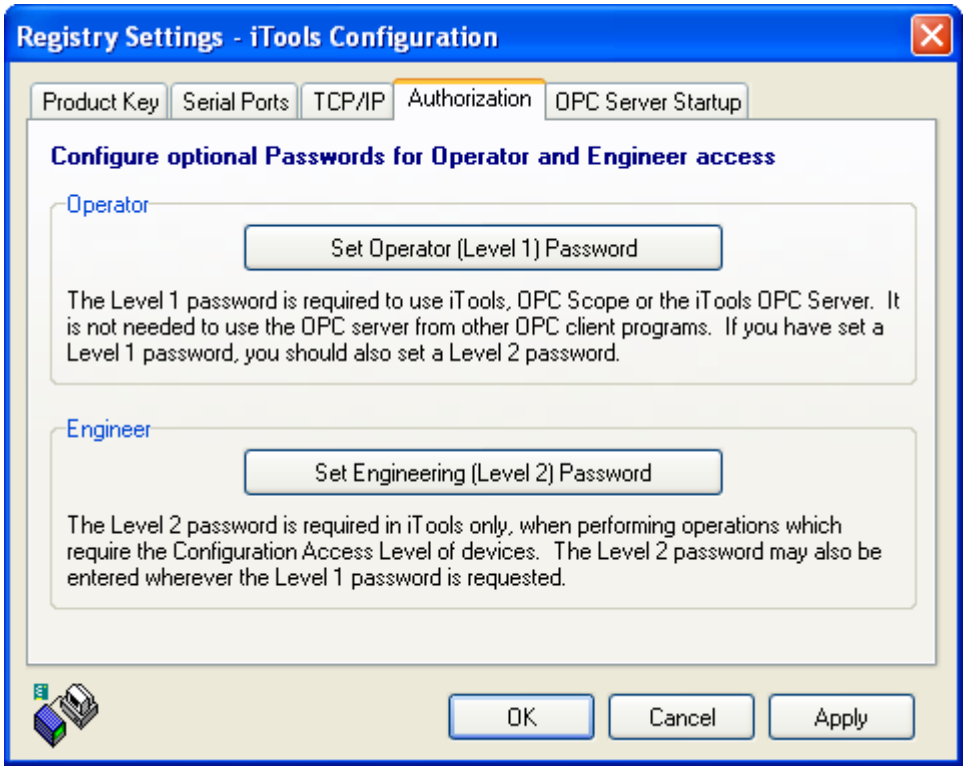


Once a name has been entered for the Port (Henry_VIII), the with the relevant port selected, clicking on the Add key allows the user to enter the names or IP addresses of one or more hosts to be associated with the new Port.

18.1.3 REGISTRY SETTINGS WINDOW (Cont.)



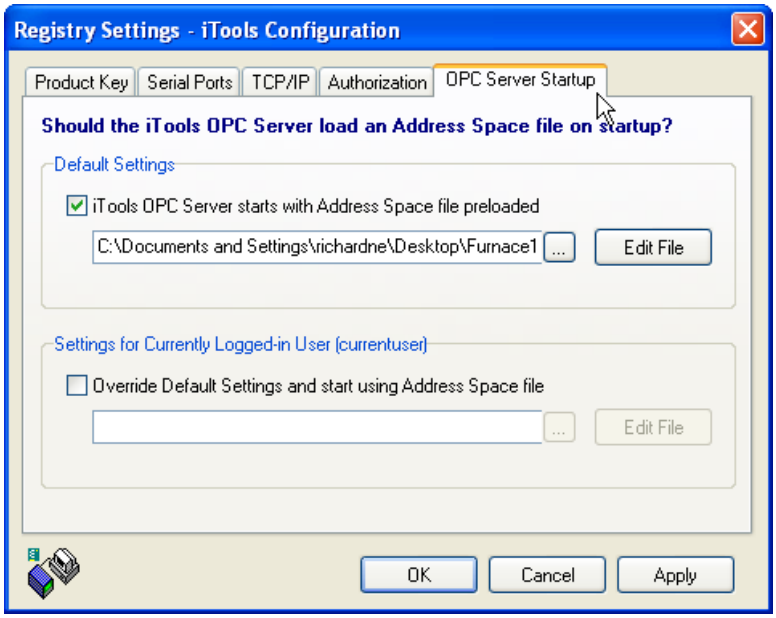
AUTHORIZATION TAB



This allows passwords to be entered, but the fields can be left blank if so desired.

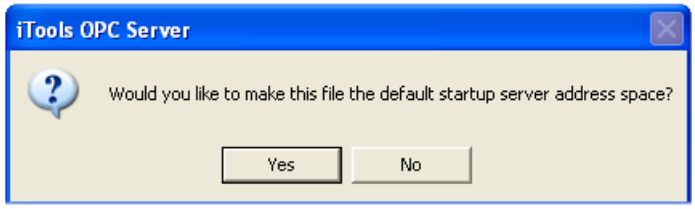
18.1.3 REGISTRY SETTINGS WINDOW (Cont.)

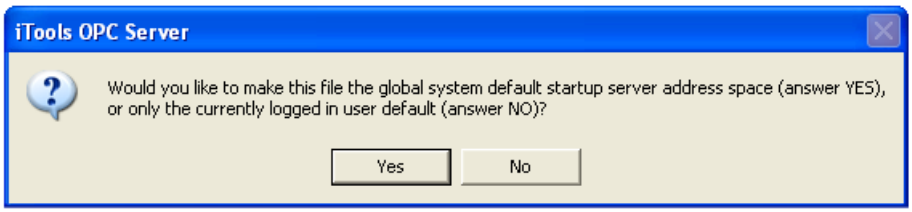
OPC SERVER STARTUP TAB



If the server configuration has previously been saved, then a saved file path name appears in the Default settings field. The ellipsis key can be clicked on to allow an alternative default to be selected.
If required, the default setting can be overridden, for the current user, by clicking on the 'Override Default Settings.....' area and browsing to the required filename.

When saving the server configuration to a new name (Server File menu Save As...) , the user is asked whether this new name is to become the default, and if so,whether it is to be the default for all users or only for the currently logged in user.





19. COMMAND LINE OPTIONS

19.1. AVAILABLE COMMAND LINE OPTIONS

Notes

1. Command line options are not case-sensitive.
2. See also 'Stand Alone Program Editor' 'Command Line Options'

19.1.1. /Addall

Causes faceplates for all devices known to the iTools server to be displayed on startup. Devices identified later (e.g. by the server scanning the network) will not be added. See also '/Scan'.

19.1.2. /NoPurge

Devices which have been known to the OPC Server, but which are no longer present, are normally purged when iTools starts up. Using the /NoPurge option prevents this from happening.

19.1.3. /NoSplash

This prevents the iTools 'Splash screen' from being displayed at startup.

19.1.4. /NoWarn

This option suppresses the warning messages which otherwise appear, when an attempt is made to load a device of unknown type and/or version.

19.1.5. /RegServer

Updates the Windows Registry with all settings required by iTools. This is performed automatically by the iTools setup program.

19.1.6. /Scan

Enables a background scan for new devices. As additional devices are detected by the iTools Server during execution, corresponding faceplate views are displayed in the iTools main window. This functionality can be enabled/disabled from the iTools Device menu, or via the toolbar. See also '/AddAll'.

19.1.7. /Server:name or /Server

Specifies the location of the computer running the iTools server application. Using this option causes iTools (client) to try connecting with the remote server machine using DCOM instead of using the server on the local computer.
If servername is notspecified on the command line, a dialogue box prompts for the name of the remote server.

Notes

1. The iTools Server must be installed and registered on the local (client) computer, even when connecting with a remote server using DCOM
2. This option is provided for user convenience and is not supported by the manufacturer.

19.1.8. /UnregServer

Removes all settings added by iTools from the Windows Registry.

20. ITOOLS ARCHITECTURE

20.1. ITOOLS SHELL

The iTools shell (iTools.exe) is the application through which the user interacts most of the time. The shell is responsible for ensuring that the iTools OPC Server is loaded and ready to run, and for 'containing' and organising the various device views which are available.

20.2. ACTIVEX CONTROLS

An ActiveX Control is a reusable software component which encapsulates a well-defined functionality, and which must be contained within an application in order to operate.

Note: An ActiveX Control is also known as an 'OLE Control' or as an 'OCX'.

The ActiveX Controls supplied are called 'Series2000Panel' and 'OPCItemGrid'. In some applications they appear as part of a library called 'Eurotherm iTools Controls'. They are accessible using the ProgIDs 'iToolsX.Series2000Panel' and 'iToolsX.OPCItemGrid' respectively.

20.2.1. Series2000Panel

This control shows a faceplate of a Series 2000 instrument, and allows the user to interact with a real or simulated device via a replica of the instrument's own keypad and the display of 'Live' data.

The key properties of this component are:

PROGID

Identifies the iTools OPC server to connect to. This item should be set to 'Eurotherm.ModbusServer.1'.

DEVICE NAME

Identifies the device to communicate with. This is the same name as appears against the device in iTools, and has a format of the type: COM1.ID001-2402-V356, where 'COM1' is the pc port, '001' is the Modbus address of the device '2402' is the device type and V356 is the device software version.

Note: The version part of the name is sometimes omitted.

PANEL ENABLED

This should be set to logic value: 'True'.

20.2.2. OPCItemGrid

This control shows the contents of any device parameter list, with 'live' updates and the ability to modify parameter values via a dialogue box.
The key properties of this component are:

PROGID

Identifies the iTools OPC server to connect to. This item should be set to 'Eurotherm.ModbusServer.1'.

BROWSEROOT

This is the OPC path name for the displayed parameter list e.g. COM1.ID001-2402-V356.Operator.Main

UPDATERATE

The interval (in msec) to be used for the updating of item values.

READONLY

Enables/disable the user's ability to modify item values.

20.3. OPC SERVER

The OPC Server (EuroMBus.exe) is responsible for the obtaining of values from devices, and for the writing of values to devices. Neither the iTools shell, nor the ActiveX Controls communicate directly with the devices, they communicate with EuroMBus which communicates with the devices.

In most cases, the iTools OPC server delivers data to its clients (e.g. iTools shell) using the published OPC interfaces. This means that the same OPC server may be used to provide data to third-party applications, particularly SCADA programs.

Note:
OPC = OLE for Process Control
OLE = Object Linking and Embedding

20.3.1. Instrument Descriptor Modules

The iTools OPC server starts one Instrument Descriptor Module (IDM) for every device or clone file to which it is connected. The IDM is responsible for supplying the OPC server with the parameter map for the appropriate device.

21. STAND-ALONE PROGRAM EDITOR

21.1. PROGRAM EDITING WITHIN ITOOLS

If an instrument or clone (simulation) needs to be in configuration mode whilst the program is being configured, then this configuration must be done via iTools.
The program editor adds the 'Programmer' menu to the iTools main menu, and contains the entries found in the 'Edit' and 'Plot' menus described below.

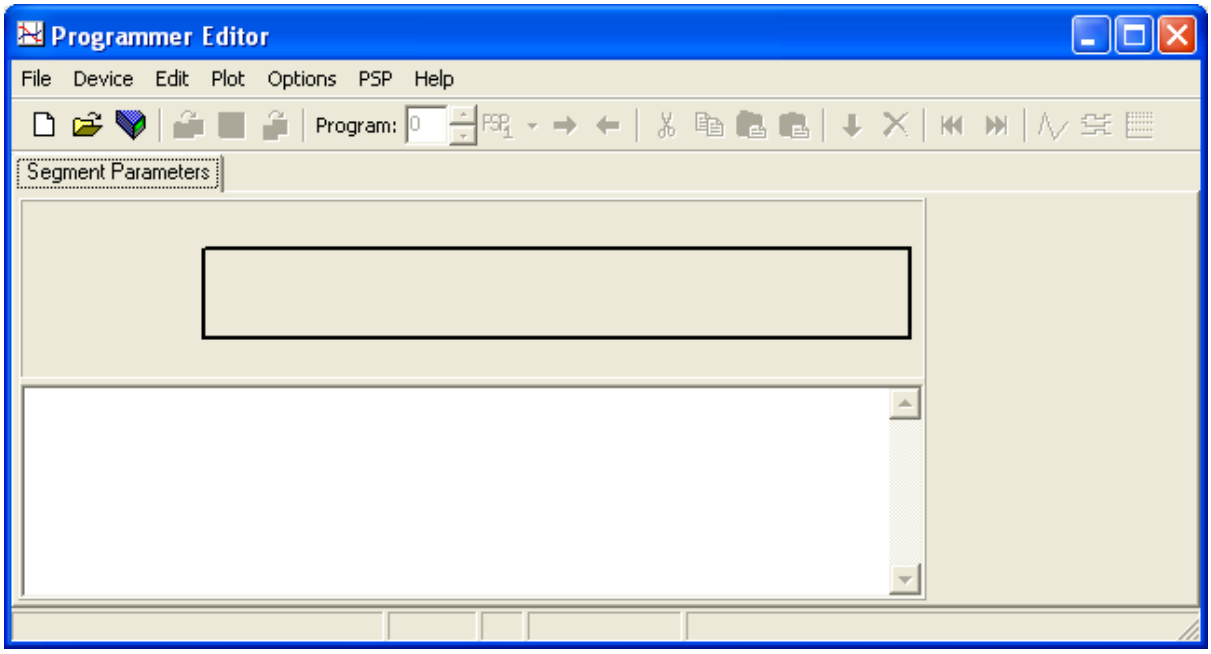
Toolbar buttons are displayed within the Programmer Editor window - they are not merged into the iTools main toolbar.

21.2. PROGRAM EDITING OUTSIDE ITOOLS

Note: The stand alone Programmer Editor is not intended as a configuration tool. It is for use only at Operator Access level. For Configuration Access level operations,the editor must be opened from within iTools by clicking on the 'Program Editor' tool button.

21.2.1. Opening the Programmer Editor

The programmer Editor is opened by double-clicking on 'S2KPE.exe in the iTools Folder (usually C:\Program Files\Eurotherm\iTools), or by clicking on 'iTools Programmer Editor' in the Start\(All) Programs\Eurotherm menu. The opening display is shown below.

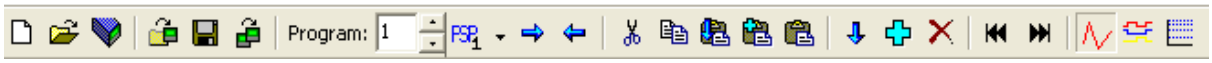


Once a clone has been opened or instrument connected, the display changes, according to model type.

For details of segment programming, display modes etc. refer to the 'Programmer editor' topic in 'iTools with the Model 2400', 'iTools with the model 2704' or 'iTools with the 3500 series' according to device type.

21.3. PROGRAMMER EDITOR TOOLBAR

The Programmer toolbar appears above the graph. The contents of the bar varies according to device type.



New. Opens a dialogue box to allow the user to select a device type for programming. Once a device has been selected, and 'Ok' clicked-on, the relevant Programmer Editor window opens. Shortcut <Ctrl> + <N>.

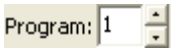
Open. Opens a standard Windows 'File Open' dialogue box, allowing the user to select an existing program (.uip) file for editing. Shortcut <Ctrl> + <O>.

Connect to Device. Clicking on this tool button opens the 'Connect to Device' dialogue box, allowing the user to select the required instrument from a list of devices known to iTools. See 'Device Menu' for further details. Shortcut = <Alt> + <Insert>.

Load Program. Clicking on this tool button opens a standard Windows File Open dialogue box to allow the user to select a previously saved program. Shortcut = <Ctrl> + <L>.

Save current program to file. Clicking on this tool tool button opens a standard Windows File Save dialogue box to allow the user to define a destination when saving a program. Shortcut = <Ctrl> + <S>.

Send to device. Calls a list of currently connected devices, that are known to the server, to allow the user to download the program to a selected device.



Program number. Allows the user to choose the required program number.

Select Asynchronous PSP. This tool is always disabled (greyed) for the Model 3500.

View subprogram. Appears only for devices that support 'Call' type segments. Enabled for segments of type = 'Call' and if clicked on, the called program is displayed. Short cut = <Ctrl> + <U>.

Back to calling program. Appears only for devices that support 'Call' type segments. Enabled in subprograms, to allow the user to return to the calling program. Short cut = <Ctrl> + <B>.

Cut. This tool button is used to copy the selected item to the clipboard, deleting the source. Shortcut = <Ctrl> + <X>.

Copy. This tool button is used to copy the selected item to the clipboard, without deleting the selected item. Shortcut = <Ctrl> + <C>.

Paste insert. Operation of this tool button causes any segments located on the clipboard to be inserted into the program. The insertion point is to the left of the highlighted segment. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Ctrl> + <V>.

21.3 PROGRAMMER EDITOR TOOLBAR (Cont.)

Paste add at end (Not all devices). This tool button takes any segments located on the clipboard and adds them to the end of the program. Shortcut = <Ctrl> + <Alt> + <V>. This tool button is disabled if one or more segments is highlighted.

Paste over. Operation of this tool button causes the highlighted segment(s) to be replaced with the contents of the clipboard. All other segments remain unchanged. The number of segments being copied must equal the number of segments highlighted. Shortcut = <Shift> + <Ctrl> + <V>.

Insert. This inserts a copy of the highlighted segment into the program, at the highlighted position. All subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Insert>. This tool button is enabled only if one or more segments is highlighted.

Add (not all devices). Copies the final segment, and appends it to the end of the program. If the program is empty, a 'Rate' segment is created as segment 1. This tool button is disabled if one or more segments is highlighted.

Delete. Removes the highlighted segment(s). Subsequent segments are moved left and renumbered appropriately.
Shortcut = <Ctrl> + <Delete>. This tool button is enabled only if one or more segments is highlighted.

Go To First. Makes the beginning of the program visible if the segment display has been scrolled to later in the program. Shortcut = <Ctrl> + <Left arrow>.

Go To Last. Makes the end of the program visible if it has been scrolled off the end of the display. Shortcut = <Ctrl> + <Right arrow>.

Analog. This is the default mode for displaying and editing the selected program's segment data. The graphical display shows a separate trace for each PSP Target Setpoint. Shortcut = <Ctrl> + <G>.

Digital. A view of the selected program displaying separate graphical traces for each enabled Event Output bit. Shortcut = <Ctrl> + <D>.

Logarithmic. Toggles between linear and logarithmic graph scales. Shortcut = <Ctrl> + <M>.

21.4. COMMAND LINE OPTIONS

21.4.1. /StayOnTop

Prevents the Editor from being obscured by other windows.

21.4.2. /ReadOnly

A program can be opened and sent to a connected instrument, but cannot be edited.

21.4.3. /TabbedOpen

Instead of using the Windows File Open dialogue, the File/New tabbed dialogue is used to open programs. Normally used only with /ReadOnly invoked. See 'Configuring the Runtime Environment' for further details.

21.4.4. /Device:<device name>

This option is used to connect to a device on start-up. The path to the device is set up in the OPC server.
Example: /Device:COM2.ID002-2604-V500

21.4.5. /ProgNum:<number>

Switch to this program number in the connected instrument/simulation.

21.4.6. /Quiet:<filename>

If set, the process dialogue is not shown when loading a file, but a file with this name is created if the program fails to load. The presence of <filename> can be used by the calling program to find out if the program download failed.

21.4.7. /LoadFile:<filename>

Load this file into the connected device. This command line option can be used only when the /Device: and /ProgNum: options have also been used.

21.4.8. Program Download Example

To download a program saved in d:\progdir\myprog.uip to the device COM2.ID002-2504-V500 program 6, the following command should be entered:

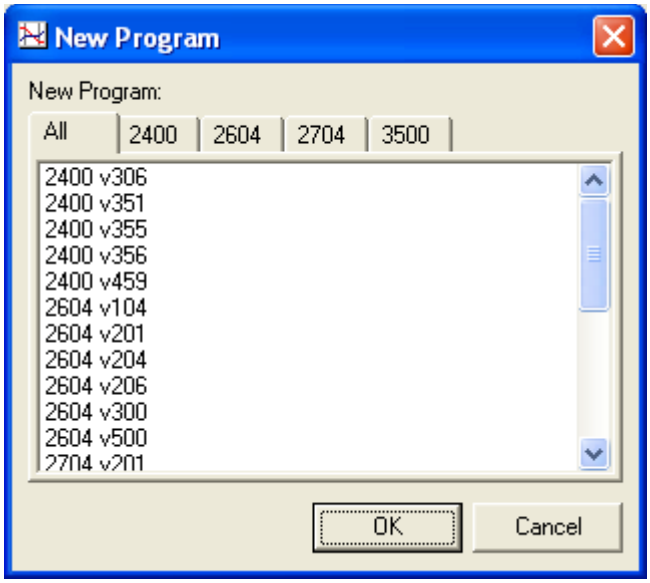
S2KPE /DEVICE:COM2.ID002-2604-v500 /prognum:6 /liadfile:d:\progdir\myprog.uip

If the process dialogue is to be hidden, add the /Quiet option to the S2KPE command.

21.5. CONFIGURING THE RUNTIME ENVIRONMENT

21.5.1. Configuring the Runtime Environment

A utility is provided which can be used to configure the File/New... dialogue box, shown below.



A file called 'progtempl.ini' located in the directory into which iTools is installed configures the new program dialogue box.

Note: Write access is required in order to edit this file and thus, to configure the dialogue box.

The file format is as shown below. Each 'section' is the name of a tab, and contains a 'Directory' value and a number of 'FileSpec' values.

The contents of the file installed by iTools is as follows:

```
[All]
Directory=ProgTmpl
FileSpec1=*.uip
[2400]
Directory=ProgTmpl
FileSpec1=24*.uip
[2604]
Directory=ProgTmpl
FileSpec1=26*.uip
[2704]
Directory=ProgTmpl
FileSpec1=27*.uip
[3500]
Directory=ProgTmpl
FileSpec1=35*.uip
```

21.5.1 CONFIGURING THE RUN-TIME ENVIRONMENT (Cont.)

The directory names can be relative to the iTools install directory, as shown above, or they can be full path names - the configuration program always turns them into full paths.

To make each Filespec name unique, each one has a numeral appended to it, starting with 1. The value of the Filespec name is a file pattern, and all files in the given directory, which match this pattern, appear under the relevant tab.

Once a program has been selected from the dialogue box, the Programmer Editor carries out the following sequence:

1. The program is opened and the instrument type and version information is extracted from it. The file is a standard program file which must contain, as a minimum, the instrument IDM ProgID. The program may also contain program segments.
2. The Programmer Editor then searches for a clone template (.uit) file, having the same name in the same directory. This .uit file is used to initialise the simulation into which the program template will be loaded. The instrument type and version of this template file must match that of the program.
3. It then looks for a clone template file named after the instrument type and version, in the same directory. For example: 2604 v204.uit.
4. If either or both of these .uit files cannot be found, the Programmer Editor constructs a name using the instrument type and version, and loads the relevant template as suppled with iTools.
5. The simulation is then loaded using the clone template file, and the program is loaded into that simulation.

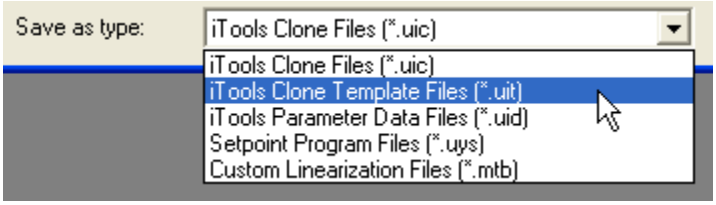
21.5.2. Customising New Program Creation

The New Program dialogue box can be customised using the 'Programmer Editor Configuration' utility supplied with iTools in the 'Advanced Tools' folder.

Before starting, it is recommended that existing template programs, and either the matching clone template files or the single template for that set of programs be saved.

SAVING CLONE TEMPLATE FILES

The iTools 'Save As...' File menu item is used to save a clone template, by selecting 'iTools Clone Template Files (*.uit)' as the file type.



The clone file may be given the same name as the program file, already saved, or the instrument type and version can be used as a file name. For example '2604_v206.uit'.

Note: When using the version number, do not include decimal points. For example use 'V206', not 'V2.0.6'.

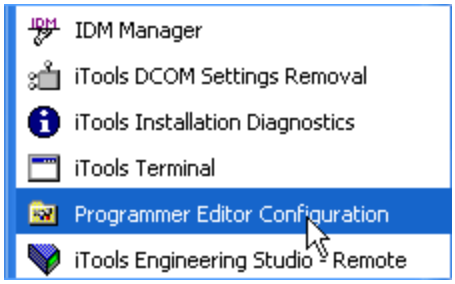
Instrument versions
When iTools is on line to an instrument, it will show the version of that instrument. If a clone file is saved, and then loaded into iTools, it may show a different version number because several versions are supported by the same IDM, and the version number in simulation is the version of the IDM.

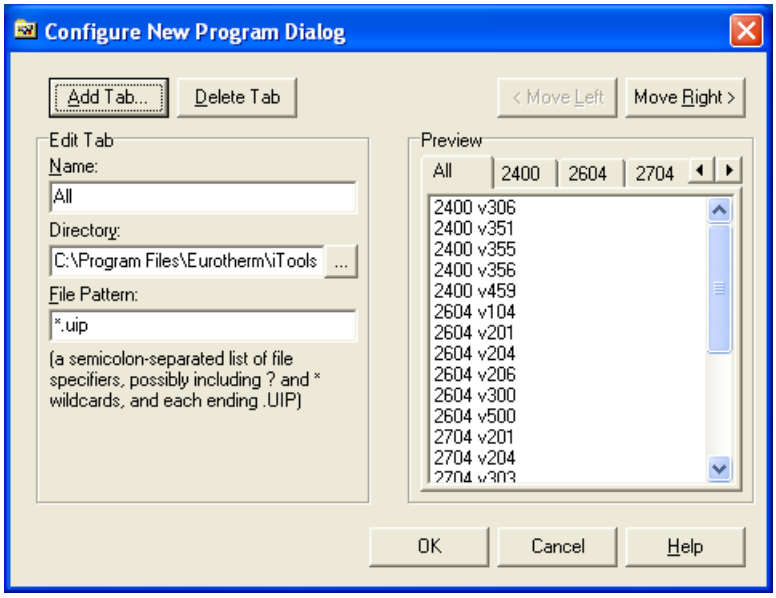
The only way to ensure that the correct name is being used for the .uit files is to save the clone file and load it into iTools. The correct version will appear at the bottom of the screen, and this is the version number needed to create the correct clone template file. I.E. the file needs to be re-saved with this version number.

21.5.2 CUSTOMISING NEW PROGRAM CREATION (Cont.)

CUSTOMISATION PROCEDURE

Clicking on 'Programmer Editor Configuration' in iTools 'Advanced Tools', opens the 'Configure New Program Dialog' box.





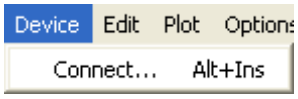
Add Tab
Allows the user to add a tab, by clicking on the 'Add Tab' button, and typing-in a name for the new tab. Clicking on 'OK' causes the tab to appear in the 'Preview' window.
Delete Tab
Allows the user to remove a tab by clicking on the 'Delete Tab' button and confirming the deletion.
Edit Tab
NAME
This field displays the name of the currently active tab. The user can edit this name if so desired.
DIRECTORY
This field allows the user to select the relevant Progtempl directory, either by typing the path name, or by browsing.
FILE PATTERN
File pattern defines which instruments and versions appear in the tab.
One of two wildcard characters may be used: the question mark and the asterisk. The question mark matches a single character. The asterisk matches any number of characters.
Examples
An entry of *.uip causes all files with the .uip extension to be included in the tab.
An entry of 26*.uip, causes all .uip files starting with 26 to be included in the tab.
An entry of 2?04v5*.uip causes 2604v500 and 2704v500 to appear in the tab.

21.5.2 CUSTOMISING NEW PROGRAM CREATION (Cont.)

Move Left/Move Right
These two buttons allow the order in which the tabs are arranged to be changed, by moving the current tab to the left or right relative to the other tabs.

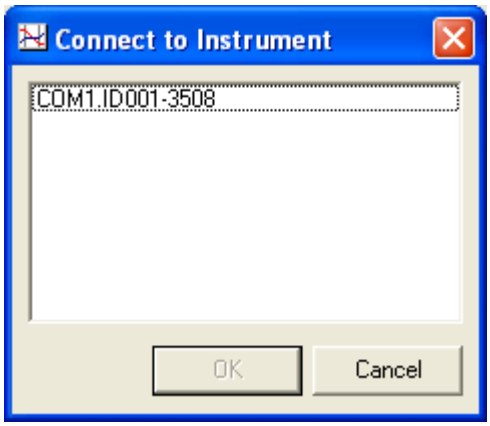
21.6. MENUS

21.6.1. Device menu

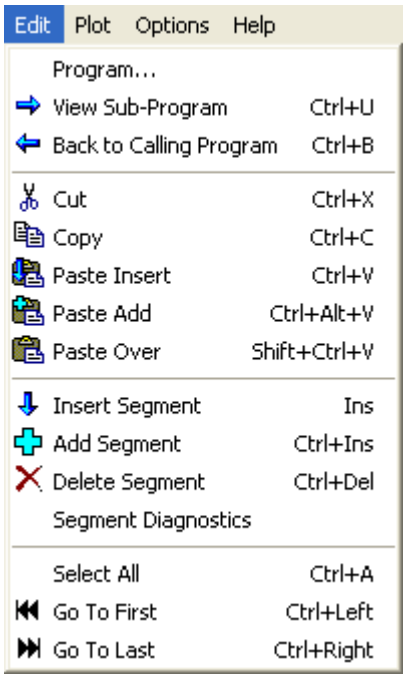


The device menu allows the user to connect the Programmer Editor to an instrument, so that programs within that instrument can be edited. Shortcut <Alt> + <Ins>.

The dialogue box lists all the connected instruments that are known to the server, allowing the user to select the required device. In the example below, only one instrument is connected.



21.6.2. Edit Menu



PROGRAM...

Allows the user to choose the required program number, via a pop-up dialogue box. The program number range depends on the device type. If the current program has unsaved changes, the user is prompted to save or discard it.

VIEW SUB-PROGRAM

Not supported by all instruments. Enabled only if the selected segment is of type 'Call', this allows the user to switch quickly to the called program. This can also be achieved by double-clicking on the 'Call' segment's header, by using the shortcut <Ctrl> + <U> or by using the 'View Sub-program' tool button .

BACK TO CALLING PROGRAM

Not supported by all instruments.
Enabled only if the current program has been reached using 'View Subprogram' as described above, this allows the user to return quickly to the calling program. This can also be achieved by using the shortcut <Ctrl> + <B> or by using the 'Back to calling program' tool button .

CUT

Used to copy the selected item to the clipboard, deleting the source. Shortcut = <Ctrl> + <X>.

COPY

Copies the selected item to the clipboard, without deleting the selected item. Shortcut = <Ctrl> + <C>.

PASTE INSERT

This takes any segments located on the clipboard and inserts them into the program. The insertion point is to the left of the highlighted segment. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Ctrl> + <V>.

21.6.2 PROGRAM EDITOR EDIT MENU (Cont.)

PASTE ADD

Not all device types.
This takes any segments located on the clipboard and appends them to the program. Enabled only if there are no segments selected. Shortcut = <Ctrl> + <Alt> + <V>.

PASTE OVER

This tool replaces the highlighted segment with the contents of the clipboard. All other segments remain unchanged. Enabled only if there is a segment selected. Shortcut = <Shift> + <Ctrl> + <V>.

INSERT SEGMENT

This inserts a copy of the highlighted segment into the program, at the highlighted position. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Enabled only if there is a segment selected. Shortcut = <Insert>.

ADD SEGMENT

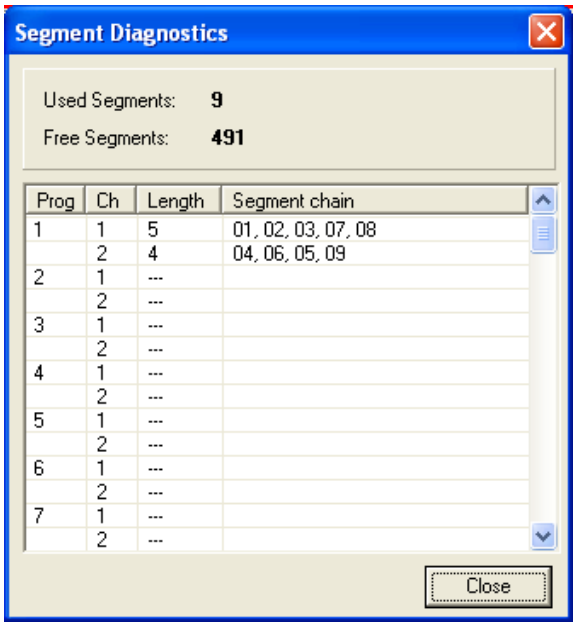
Not all device types.
Appends a copy of the final segment to the end of the program. Enabled only if there are no segments selected. Shortcut = <Ctrl> + <Insert>.

DELETE SEGMENT

Removes the highlighted segment(s). Subsequent segments are moved left and renumbered appropriately. Enabled only if there is one or more segment selected.
Shortcut = <Ctrl> + <Delete>.

SEGMENT DIAGNOSTICS

Not supported by all devices.
A program consists of a list of linked segments, these segments being obtained from a common segment pool. Knowledge of this internal structure is normally required only for diagnostic purposes.
The 'Used Segments' and 'Free Segments' totals are useful in understanding why any error messages, stating that there are insufficient segments available to perform an operation, have been generated.



SELECT ALL

Selects all segments. Shortcut = <Ctrl> + <A>.

21.6.2 PROGRAM EDITOR EDIT MENU (Cont.)

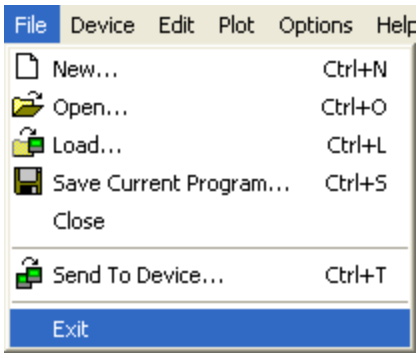
GO TO FIRST

Makes the beginning of the program visible if the segment display has been scrolled to later in the program. Shortcut = <Ctrl> + <Left arrow>.

GO TO LAST

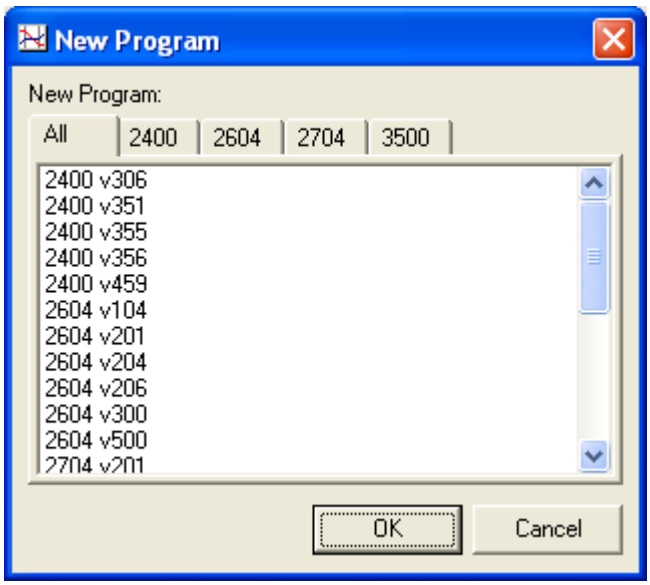
Makes the end of the program visible if it has been scrolled off the end of the display. Shortcut = <Ctrl> + <Right arrow>.

21.6.3. File menu



NEW...

Opens the dialogue box,shown below, to allow the user to select a device type for programming. Once a device has been selected, and 'Ok' clicked-on, the relevant Programmer Editor window opens. Shortcut <Ctrl> + <N>.



OPEN...

Opens a standard Windows 'File Open' dialogue box, allowing the user to select an existing program (.uip) file for editing. Shortcut <Ctrl> + <O>.

LOAD...

Loads a program file into the current program. Used to load a program into an instrument currently being viewed in the Editor, or to load several programs into one off-line edit session. Shortcut <Ctrl> + <L>.

SAVE CURRENT PROGRAM...

Opens a standard Windows 'File Save' dialogue box, allowing the user to choose a destination path for the current program. If the program has previously been saved to file, then the file name previously used appears as the default for the Save operation. Shortcut <Ctrl> + <S>.

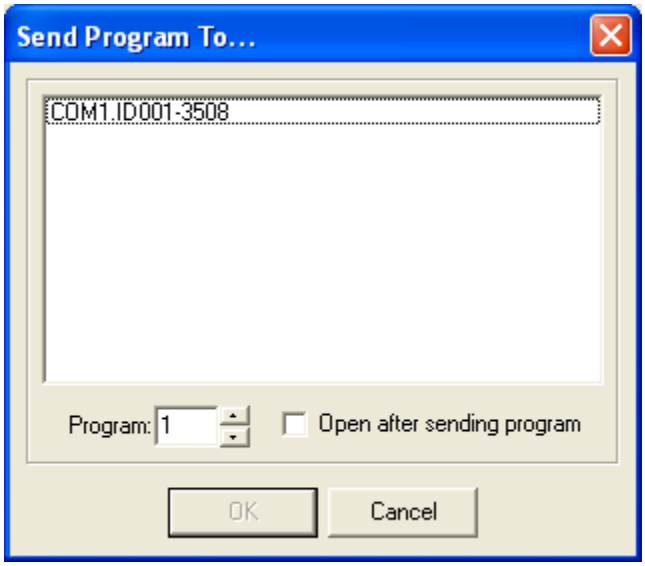
CLOSE

This selection closes the current program. If the program has been edited AND it is not in a 'real' device, the user is prompted to save the program before it closes.

21.6.3 FILE MENU (Cont.)

SEND TO DEVICE...

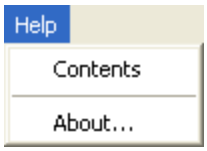
This allows the user to send the program to a connected instrument. Opens a dialogue box which allows the destination device to be selected and a program number to be defined. It also allows the user to specify whether or not the program is automatically to open once the send operation is complete. Shortcut <Ctrl> + <T>.



EXIT

This quits the Programmer editor, after any unsaved data has been saved, if required.

21.6.4. Help Menu



CONTENTS

Opens the iTools Help documentation contents list.

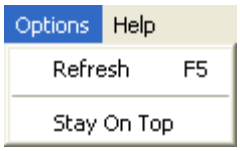
ABOUT...

Produces the iTools About screen.

Notes

1. The figure below shows the About screen after the 'Features' key has been clicked-on.
2. The figure is for illustrative purposes only, and therefore does not contain the current software version number. See 'Introduction' for the software version to which these help pages apply.

21.6.5. Options Menu



REFRESH

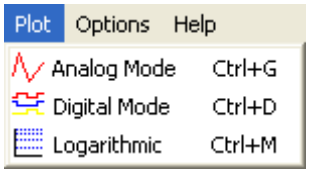
Refreshes the display. Shortcut <F5>.

STAY ON TOP

When selected, the programmer editor always stays 'on top' of any other windows on the desktop.

21.6.6. Plot Menu

This menu allows the user to select the display mode. The display modes are fully described in the 'Programmer Editor' topic within 'iTools with the Model 2400', iTools with the Model 2704' or 'iTools with the Model 3500 Series' Help items, according to Device type.



ANALOG MODE

This displays an analogue trace of the setpoint program. If digital outputs are enabled, the digital setpoints are shown as dots in the digital output row. Shortcut <Ctrl> + <G>.

The digital outputs for a segment can be edited by clicking on the 'hysteresis' button to the right of the digital output status display for the segment.

DIGITAL MODE

If digital outputs are not enabled, this selection is greyed out.

This mode shows the status of the digital outputs for each segment. Analogue setpoints are not shown. Shortcut <Ctrl> + <D>.

LOGARITHMIC

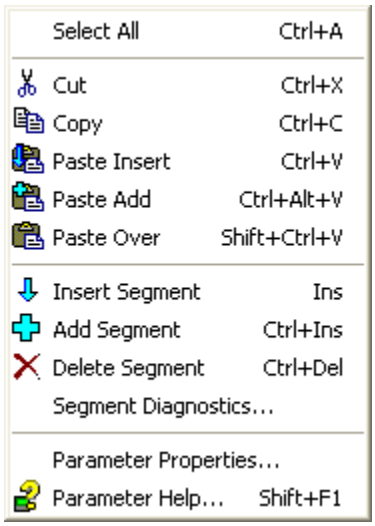
Allows the segment display to be viewed with a logarithmic vertical axis.

21.6.7. Context menus

SEGMENT CONTEXT MENU

This menu appears when the mouse right-hand button is clicked whilst the cursor is hovering within the segment programming area. The items which appear in this menu are Device-type dependent. This help topic contains descriptions of all items which can appear for any instrument.

The menu items are not all active all of the time. For example if a segment has not been copied or cut to the clipboard, or if the context menu is opened with no segment selected, many of the insert, add etc. entries are 'greyed'.



Select All
Always active, this command selects all the segments in the program. Shortcut <Ctrl> + <A>.
Cut
Active only when one or more segments are selected. Used to copy the selected segment(s) to the clipboard, deleting the source segment(s). Shortcut = <Ctrl> + <X>.
Copy
Active only when one or more segments are selected.
Copies the selected item to the clipboard, without deleting the selected item. Shortcut = <Ctrl> + <C>.
Paste insert
Active only if one or more segments are located on the clipboard.
This takes any segments located on the clipboard and inserts them into the program. The insertion point is to the left of the highlighted segment. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Shortcut = <Ctrl> + <V>.
Paste Add
Not all device types.
Active only if one or more segments are located on the clipboard, and there are no segments selected.
This takes any segments located on the clipboard and appends them to the program (i.e. adds them to the end). Shortcut = <Ctrl> + <Alt> + <V>.
Paste over
Active only if one or more segments are located on the clipboard.
This tool replaces the highlighted segment with the contents of the clipboard. All other segments remain unchanged. Enabled only if there is a segment selected. Shortcut = <Shift> + <Ctrl> + <V>.

21.6.7 CONTEXT MENUS (Cont.)

Insert Segment

This inserts a copy of the highlighted segment into the program, at the highlighted position. The highlighted segment and all subsequent segments are moved rightwards and renumbered appropriately. Enabled only if there is a segment selected. Shortcut = <Insert>.

Add Segment

Not all device types. Active only if there are no segments currently selected.

Appends a copy of the final segment to the end of the program. Shortcut = <Ctrl> + <Insert>.

Delete segment

Removes the highlighted segment(s). Subsequent segments are moved left and renumbered appropriately. Enabled only if there is one or more segment selected.

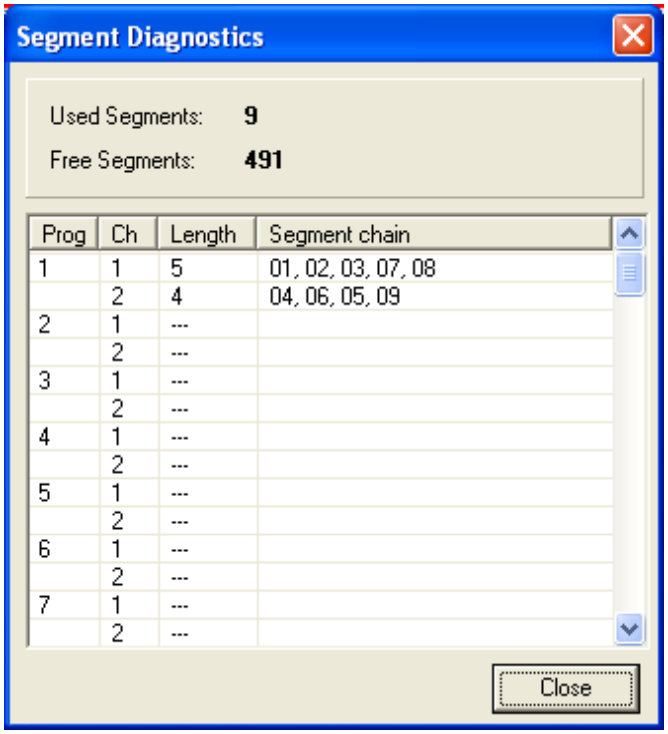
Shortcut = <Ctrl> + <Delete>.

Segment Diagnostics

Not supported by all devices.

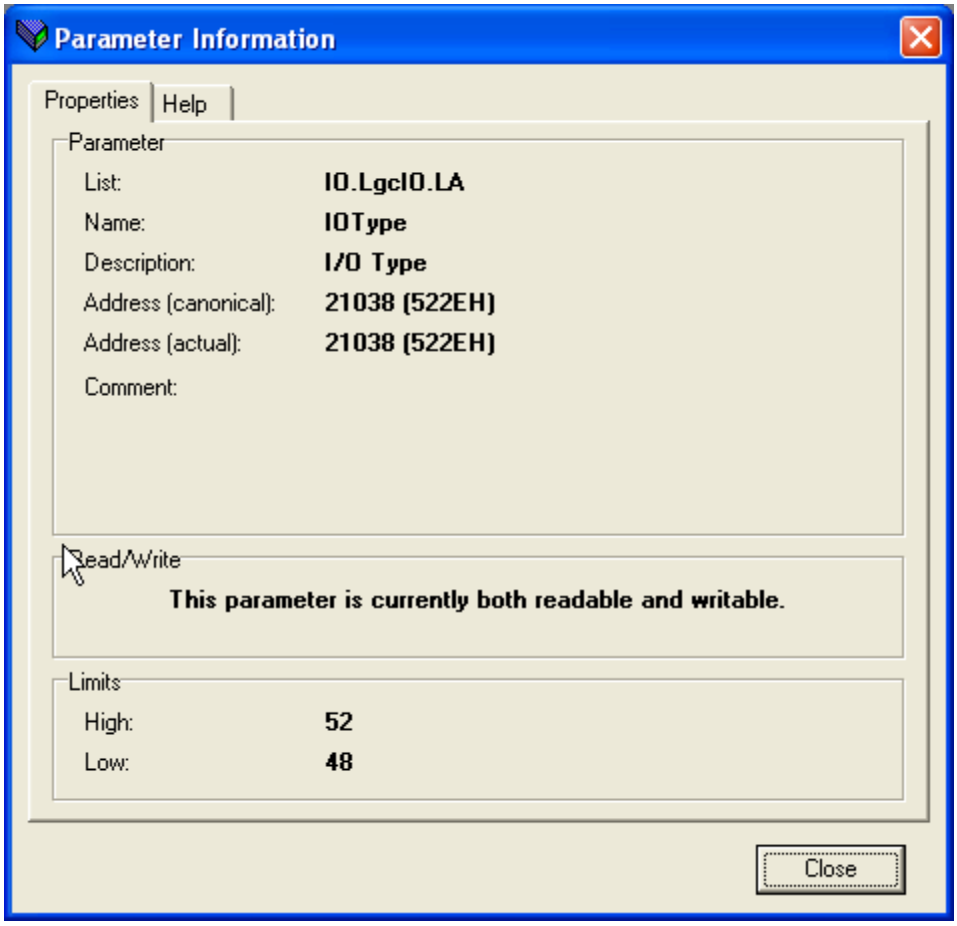
A program consists of a list of linked segments, these segments being obtained from a common segment pool. Knowledge of this internal structure is normally required only for diagnostic purposes.

The 'Used Segments' and 'Free Segments' totals are useful in understanding why any error messages, stating that there are insufficient segments available to perform an operation, have been generated.



21.6.7 PROGRAM EDITOR SEGMENT CONTEXT MENU (Cont.)

PARAMETER PROPERTIES...

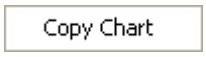


This calls a display showing details of the selected parameter.

The help tab produces a display describing all the possible 'values' which can be associated with the parameter type selected.

Parameter Help...
This produces the same display as appears when the 'Help' tab is clicked from within the Parameter Properties Information display, above. The help can also be opened via the shortcut <Shift> + <F1>.

Chart context menu
This menu is obtained by right-clicking over the chart area of the Programmer Editor screen.



Copy Chart
Selecting this item causes a copy of the chart to be saved to the clipboard ready for 'Pasting' into word processing or spreadsheet programs. Amongst other things, this allows the chart to be printed.

22. REPORT CONFIGURATION

The set up of a report for printing is carried out using four pages, as depicted below. When 'Finish' is clicked, the report is generated, and appears on the screen so that it can be edited before printing. Printing is initiated by clicking on a 'Print' button which appears at the top of the page.

The following control items appear on all the Report Configuration pages

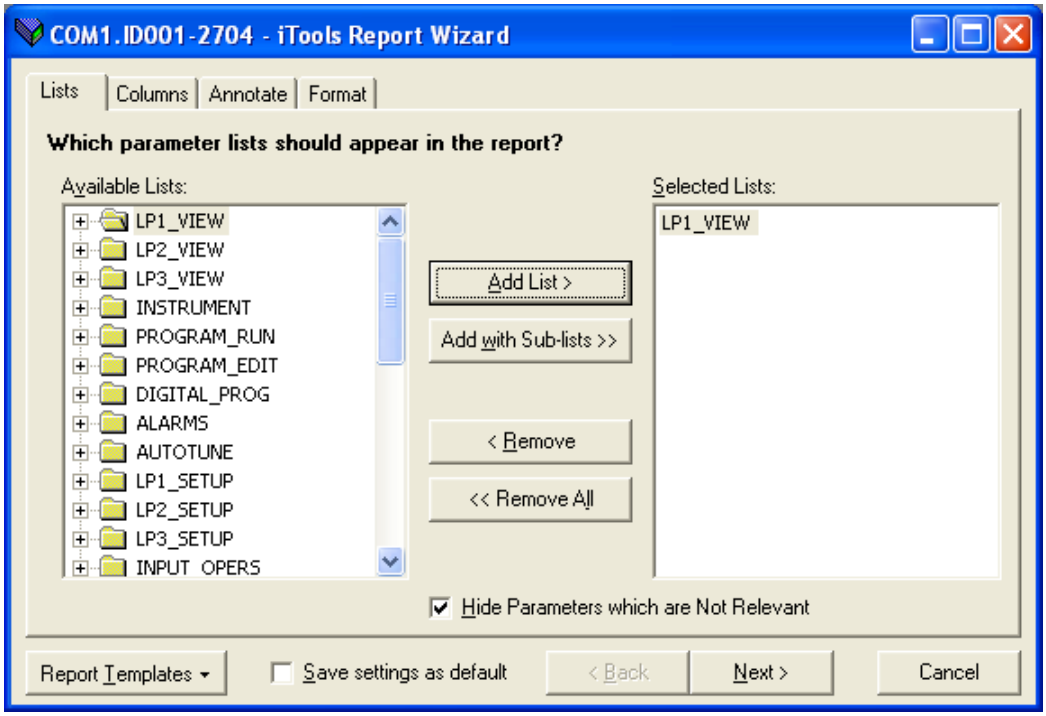
REPORT TEMPLATES

This button allows the user to save the report configuration as a template that can subsequently be re-loaded.

SAVE SETTINGS AS DEFAULT

This allows settings, such as which columns are to be enabled, to be saved as a default setting.

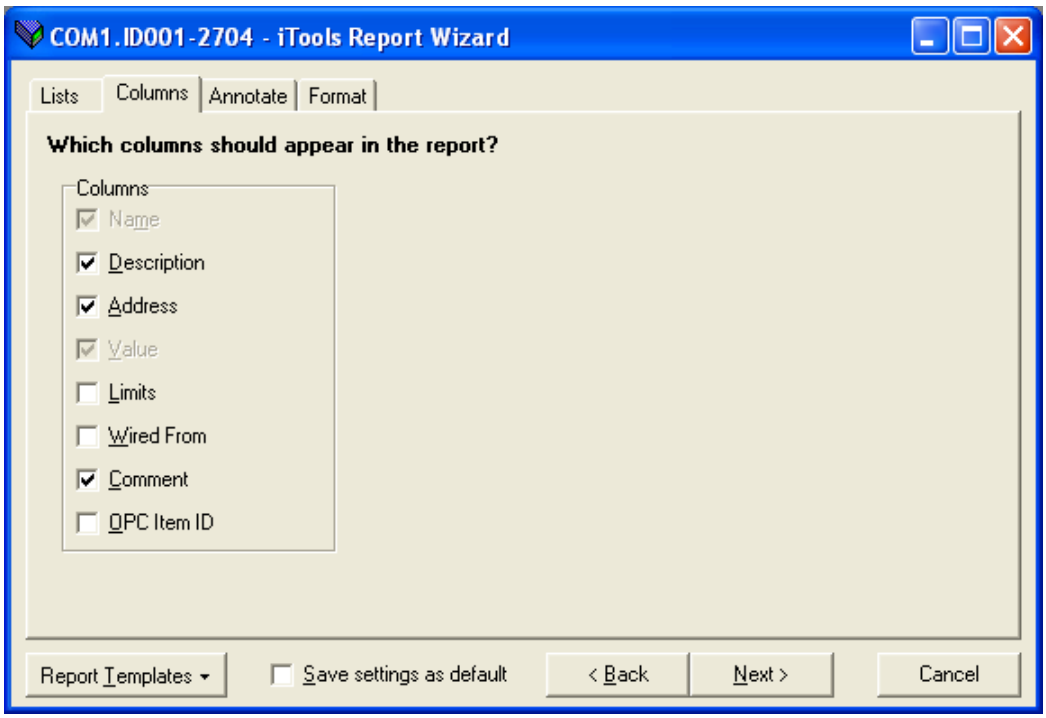
22.1. LISTS TAB



This tab allows the user to add or remove lists and/ or sublists of parameters. This is carried out by clicking on the required folder and then using the Add... and Remove../ buttons located in the central area of the window.

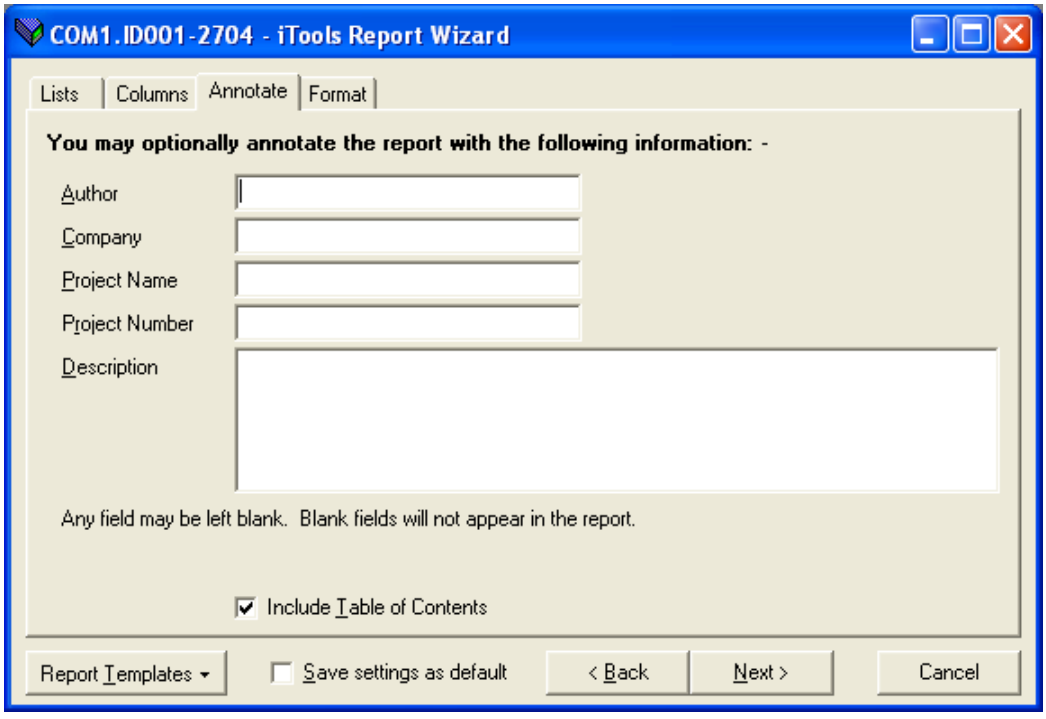
As in the parameter explorer view, the user can choose to hide or to display 'Non-relevant' parameters, by using the 'Hide parameters which are Not Relevant' check box.

22.2. COLUMNS TAB



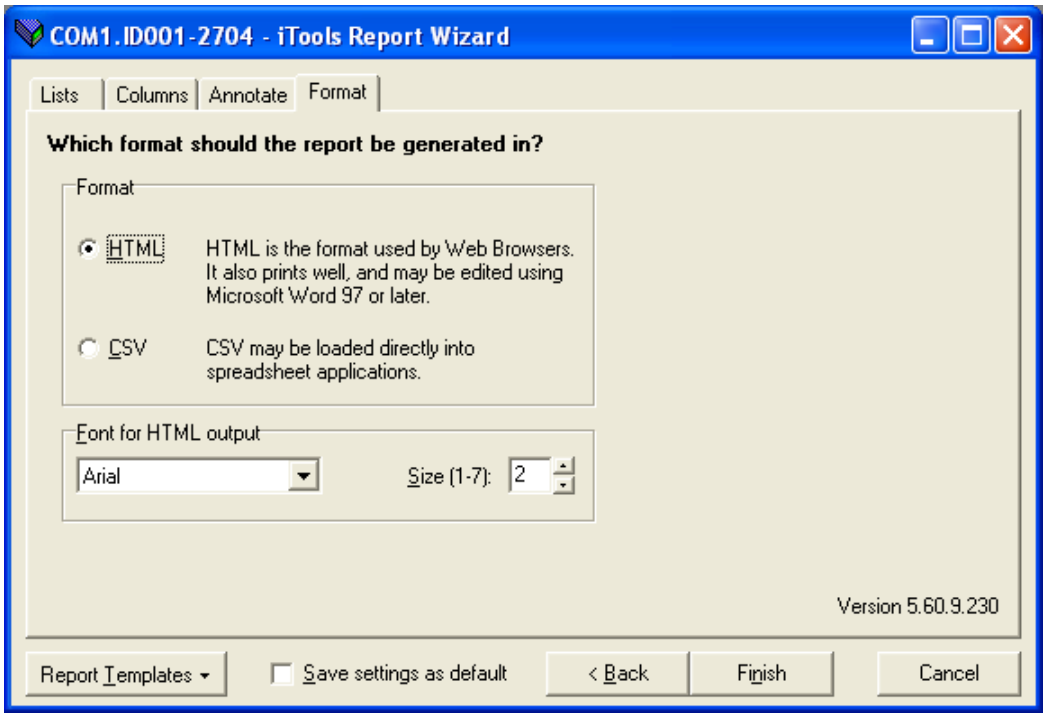
This tab allows the user to select certain columns for the parameter list. 'Name' and 'Value' cannot be disabled for printing.

22.3. ANNOTATE TAB



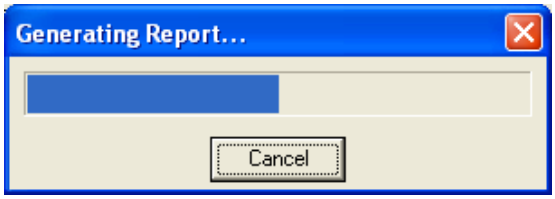
This tab allows the user to enter details which, if entered, appear at the head of the report, along with the time and date etc. automatically entered by iTools. The instrument identification (in this example COM1.ID001-2704) appears at the top of the report, and as a 'header' on each page.

22.4. FORMAT TAB



This page is used to format the output of the report.

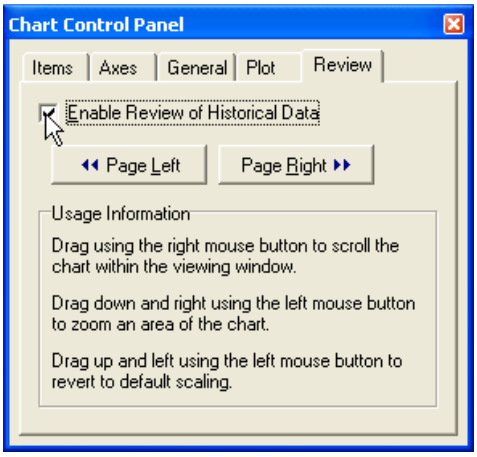
Clicking on the 'Finish' key causes the report to be generated, ready to be verified and edited (if necessary) before printing is initiated.



23. REVIEW MODE ENTRY

Review mode is entered by any of the following methods:

1. Click on the 'Toggle chart review mode' tool
2. Select 'Enable Review of Historical Data' in the OPC Scope Options menu
3. Select 'Enable Review of Historical Data' in the Chart context (right click) menu
4. Select 'Enable Review of Historical Data' in the Review tab of the Chart Control Panel



24. SYNCHRONISATION

After an instrument has been detected by the Scan process, iTools spends some tens of seconds reading instrument configuration data into its internal database so that the features relevant to the instrument type may be made available to the user. A similar process takes place if Resynchronise is selected from the Device context menu, or from the Device menu.

During this time, the User is unable to access some functions (e.g. Graphical Wiring Editor) associated with the synchronising instrument.

Whilst synchronising, the 'Synchronising' (curved arrows) icon appears in the 'connected instruments' area in the top left corner of the iTools window, below the toolbar.
Once synchronisation is complete, this is replaced by the normal 'connected instrument' icon.

Synchronisation (or Re-synchronisation) in progress.

Synchronisation (or Re-synchronisation) complete.

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