iC Tool

User Manual

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1 Introduction

The tool dedicated to work with the devices driven by the nano EDGE ENGINE is the iC Tool. The iC Tool is a free computer program provided by the iSMA CONTROLLI.

As a significant part of an end-to-end solution, the iC Tool is a native programming tool for the nano EDGE ENGINE devices. The iC Tool covers all requirements to create and manage applications: it has a wire sheet for convenient visual programming, property sheets for details; it offers libraries management, real-time monitoring of system states and slots values, logs, and deployment.

1.1 Revision History

Rev.	Date	Description
1.0	28 Feb 2022	First edition

Table 1. Revision history

2 About

The iC Tool allows programming of applications and parameter setting in the nano EDGE ENGINE series devices. Using proper functions implemented in the iC Tool, the user can program his own application from scratch or edit an existing application working directly on a connected device.

The iC Tool is addressed to every user working with the device on the daily basis, i.e., distributors, integrators, engineers, and maintenance technicians.

3 Naming and Definitions

A proper understanding of the terms used hereafter will allow the iC Tool user to adopt the described issues in a more proficient way.

3.1 Basic Definitions

- iC Tool: the name of a computer program this documentation applies to;
- component: a single element of an application. The component is either a function block with a pre-defined task (algorithm), which requires specific parameters and logical connections with other components to work and exchange data properly, or a container (folder to segregate other components);
- library: a set of components with similar functionalities or working in the same area, e.g., components handling device's inputs and outputs. In the iC Tool, the libraries and their components are shown in a Device Libraries window;
- link: a logical connection between components: such connection allows two components to send data between each other. The graphical representation of a link in the Wire Sheet view is a line connecting components;
- Reference link: a special compound link designed to connect Data Points with network points. The Reference link is created between special Reference slots and transfers values along with the component's status; Alternatively, it may transfer values between Data Points and network points at the same time returning status from network points to Data Points, or it may return values from network points to Data Points;
- slot: an element of the component which defines the parameter along with its name, value, unit, and range. Slots are not visible in all views in order to avoid overwhelming the user with too much information. The views dedicated to work with the slots are: the Property Sheet and Wire Sheet;
- selection: a user's action of choosing any component or link by clicking it. The chosen object becomes highlighted graphically. In the Wire Sheet view, the component's selection is illustrated by surrounding a component with an orange frame, and a link's selection is illustrated by changing its color to orange. The selected element is an object to which the commands such as copying, deleting, or moving will relate;
- marking: a state relating to the component or link connected with the selected object. Marking means that a specific component or link is in correlation with a selected component/link. In the Wire Sheet view, a green color is used to mark a component or link, which allows the user to easily notice which components/links will be affected by the action taken on the selected object, e.g., after deleting a selected component/link the marked object will lose its correlation;
- Workspace Tree window: one of the basic windows provided by the iC Tool. The window shows the connected devices along with their components. Additionally, the devices may be assigned hierarchically to folders, and folders to projects;
- Device Libraries window: one of the basic windows provided by the iC Tool. It is a palette of iSMA libraries along with components assigned to them. The content of the Device Libraries is dynamically adjusted to the content installed in the device's SD card;
- Main Screen window: a main workspace of the iC Tool, where the views of editable components are displayed on tabs;
- Object Properties window: a window showing information regarding a selected element allowing to preview and change some of the selected element's parameters without closing the current view;

- Console: a window where the messages regarding the operation of the iC Tool program are displayed.

3.2 Component Views

A component shows its data on views assigned to it. The list below shows two basic views, which present data about the same component in different ways, making the work with components easier. Some components have also individual views (apart from the standard ones), which are not included in the list below (see the Special Views).

- Wire Sheet: a view showing programming relations between the components in a graphical way. The view shows logical relations between the linked components. This view makes building an application logic easier, because the connections between the components are easy to enter and analyze. It is the view most commonly used on the application programming stage;
- Property Sheet: a tabular form of showing parameters–component slots. The user can see not only the slot value, but also its units and range. The view allows to change the slot value if it has the change value rights. The Property Sheet is often used at the start-up stage, when the settings of many parameters (slots) in components need to be appointed.

4 Installation and Updates

4.1 iC Tool Installation

The iC Tool is delivered as a compressed folder, which needs to be extracted in a chosen location on a hard drive, unless the access to the extracted folder is restricted by the system (e.g., Program Files is not a recommended location). The iC Tool is a software created for modern Microsoft Windows system, such as **Windows 10**. The oldest supported version of the operating system is Windows 7.

The iC Tool software bundle is a zipped file, which has to be extracted on the user's computer. Extracting the zipped package reveals the folders and additional files described below. In order to run the iC Tool, open the iCTool.exe file.

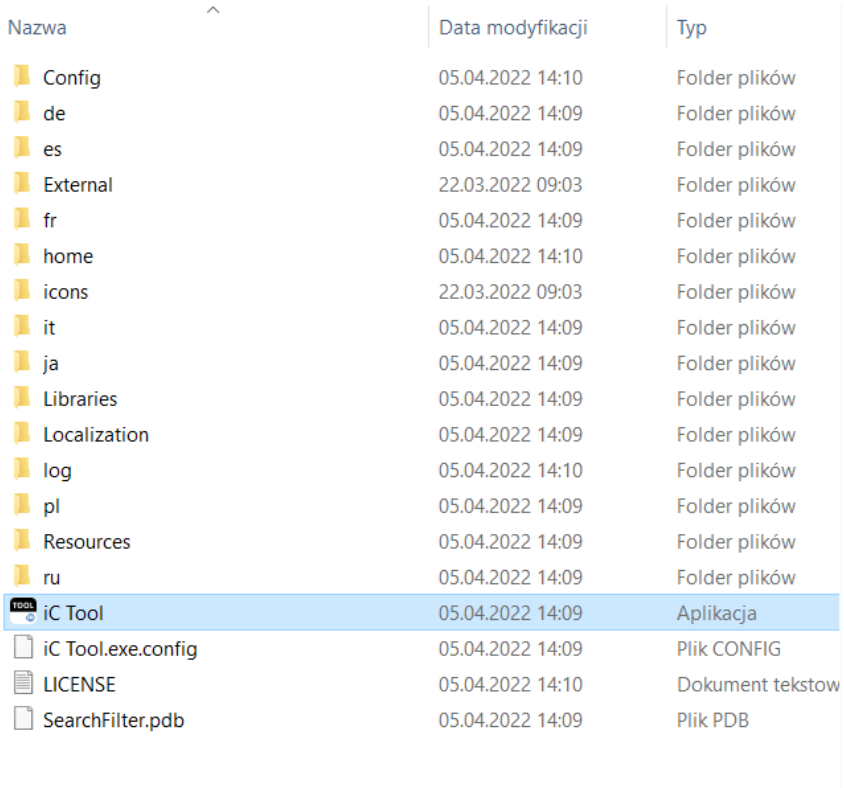

Figure 1. The iSMA Tool zipped folder

The extracted folders have the following functions:

- **Config:** a folder containing a record of user's individual settings regarding windows location and other iC Tool work settings, such as a language chosen for the iC Tool interface;
- **External**: a folder containing an API .dll file;
- **home:** a folder where all the data created by user are saved, i.e., device backups, applications, etc. It is also a folder where the OS and libraries, available the in iC Tool, are located;
- **icons:** a folder with graphical files such as the iC Tool interface icons;
- **Libraries:** a folder containing iC Tool auxiliary files;
- **Localization:** a folder with the text files providing the iC Tool language sources;
- **log:** a folder, where the logs of the iC Tool, which also appear in the Console window, are saved. When contacting iSMA CONTROLLI technical support, it is advised to copy the file with logs from this folder;

- **de, es, fr, it, ja, pl, Resources, ru:** folders with system libraries.

To properly install and work with the iC Tool, the computer must meet the following minimal requirements:

- processor (CPU): Intel Core i3-3xxx or equivalent;
- memory: 4 GB RAM;
- storage: 50 GB internal hard driver;
- Ethernet 100 Mbit or 1 Gbit NIC;
- MS Windows 7 (recommended MS Windows 10);
- .NET Framework 4.6.2 or higher.

WARNING!

When the iC Tool is being run for the first time, it asks to accept the EULA license. The license must be accepted to run the program. Failure to do so closes the iC Tool.

Worth to Notice

In order to make sure that the iC Tool is always up to date, it needs to be run periodically at least once a month, on a computer connected to the Internet for about an hour, depending on the data transfer rate. It enables the iC Tool to automatically download the latest data, such as libraries and updates.

The iC Tool is a portable software. It is transferable and it can be installed on a portable data storage device, such as a USB memory stick. It allows the iC Tool to be run directly from a portable data storage device on any PC, including offline ones.

5 Settings

5.1 Software Settings

The iC Tool allows to adjust individual settings for a better fit of the working environment to the user's needs. Such settings include, among others, the language interface, number of remembered or recently opened files of the Workspace Tree, and Console settings. The settings are available in the main menu File-> Settings.

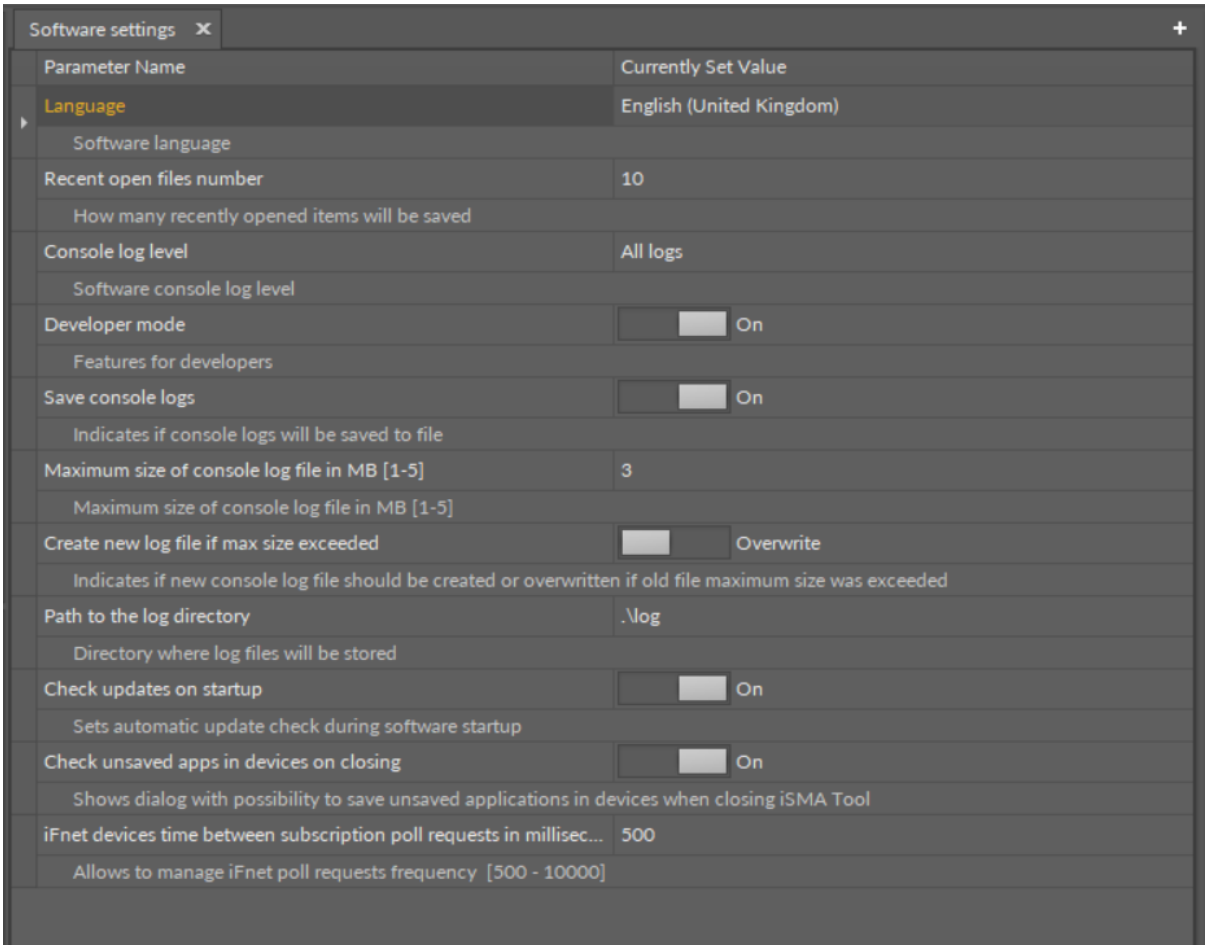

Figure 2. Software settings

The meaning of particular settings is explained under each setting line, see the figure above. Parameters to set in the Software settings include:

- language;
- number of recently opened files;
- Console log level;
- turning on/off developer mode;
- saving logs to a file;
- size of Console log file;
- action upon exceeding maximum log file size;
- path to the log directory;
- checking updates on startup;
- checking unsaved apps on closing;
- iFnet communication timeout;
- time of iFnet request waiting;
- time between subscription poll requests;

- frequency of iFnet requests.

5.1.1 Language Settings

A default language of the iC Tool is UK English.

The iC Tool allows to change the language in the Software settings view. The language change affects a graphic interface of the iC Tool. After the language is changed, the program needs to be restarted.

If the language is not on the supported languages list, please contact iSMA CONTROLLI Support Team to discuss the options (contact information is available in the About view, opened from the main menu Help -> About).

6 Navigation and Windows

6.1 iC Tool Windows

When the iC Tool is run for the first time, the iC Tool application is displayed. It consists of a few windows shown on the figure below.

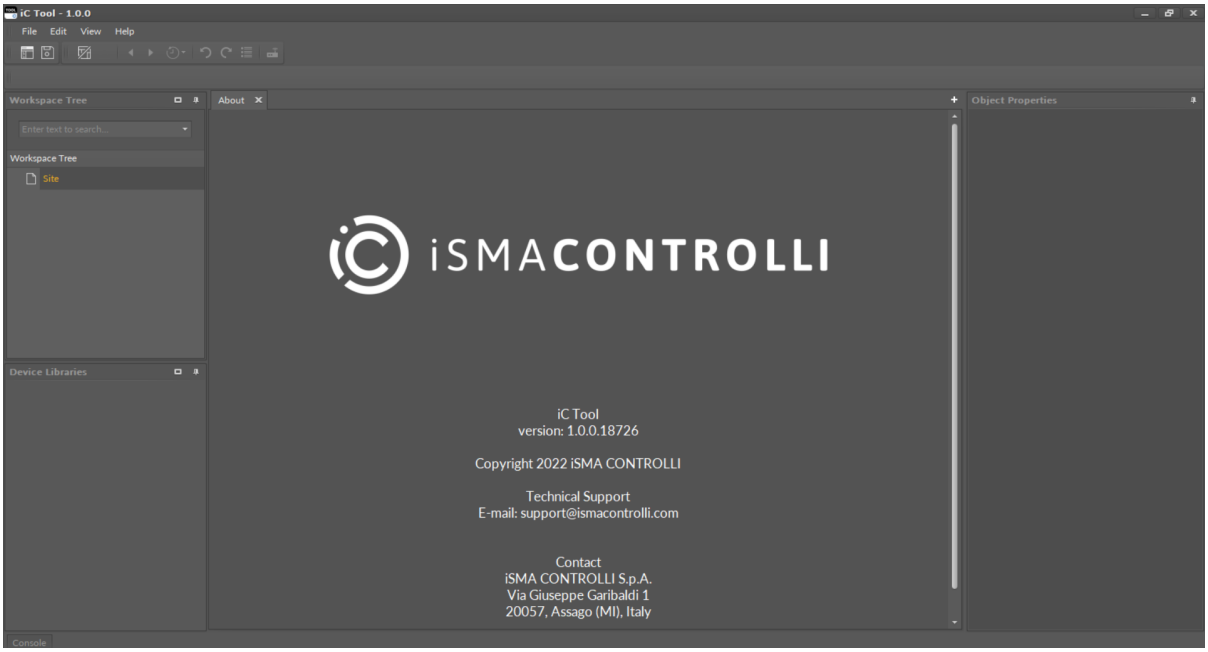

Figure 3. The iC Tool initial window

The above look applies only during an initial activation of the iC Tool. Next opening and updates of the program will remember the window settings changed by the user in accordance with his preferences.

In the default settings of the iC Tool, the upper left side of the screen is occupied by a Workspace Tree window. Below is a Device Libraries window showing current libraries of the connected device. Central part of the screen is occupied by a Main screen, a space where the application's views are shown on tabs, which is discussed further. After the iC Tool activation, the Main screen shows program information shown on the figure above. On the right of the Main screen there is an Object Properties window. The Console window is by default minimized. It is accessible as an expandable tab in the bottom left corner of the iC Tool .

Additionally, besides the mentioned windows, the iC Tool screen shows a menu and a toolbar, a window with editable component path, and a capacity identifier.

The window with an editable component path is by default set below the main menu and toolbar. It can be moved to the bottom, or to the left or right margin by changing the path text to the vertical one.

The suggested window position in the iC Tool can be modified freely by dragging, resizing, and fixing views relative to each other.

6.1.1 Start Screen

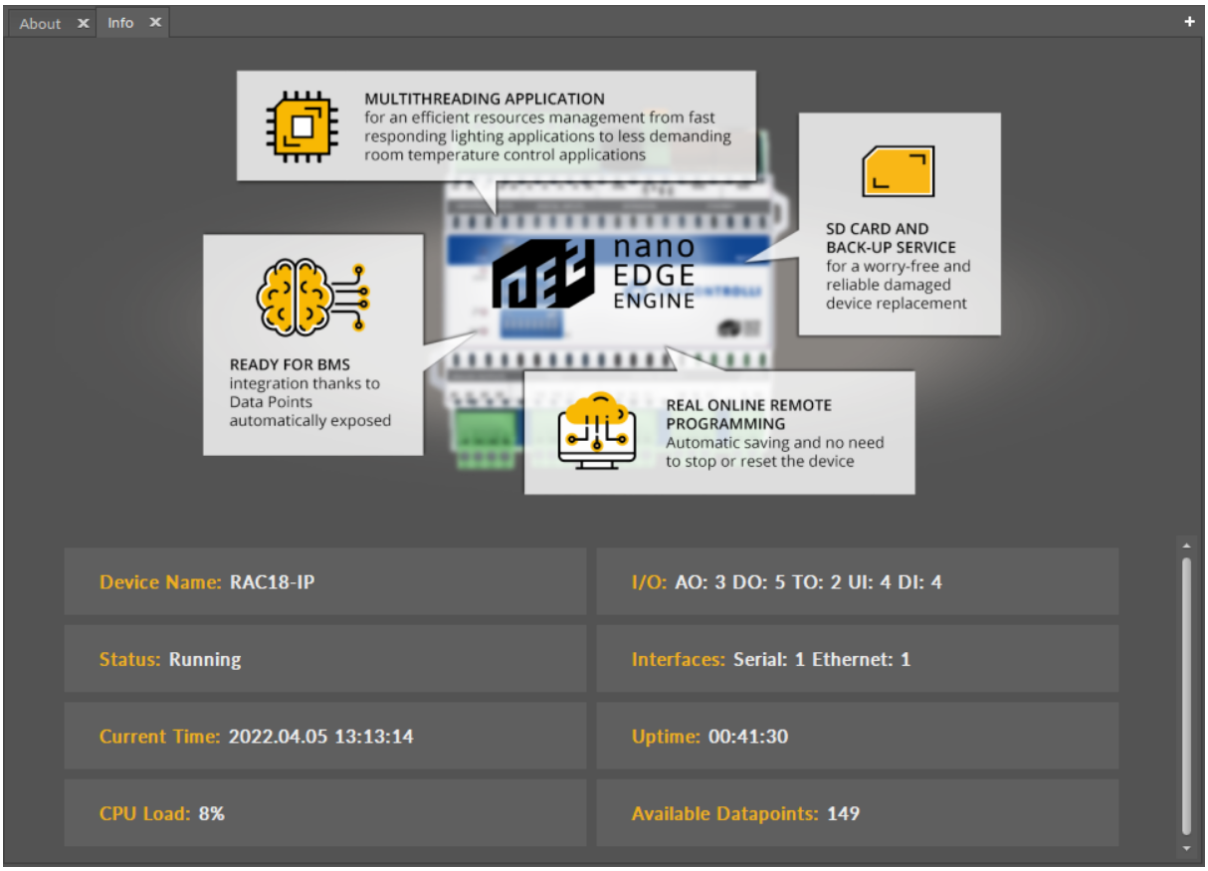

Figure 4. The iC Tool start screen

Once the iC Tool connects with a device, a start screen is displayed. It provides basic information about:

- device name;
- I/O;
- status;
- interfaces;
- current time;
- uptime;
- CPU load;
- available Data Points.

6.2 Windows Adjustment

The iC Tool allows a completely free setting of the views and windows. Free distribution allows specific windows to be visible non-stop or hide automatically. These settings apply to the windows such as the Workspace Tree, Device Libraries, or Object Properties. It is possible to move the window outside of the iC Tool software to the other connected screen–the only exception here is the Main screen window, which cannot be moved to the other connected screen.

To move any window into another part of the screen, it needs to be grabbed by the header and dragged into a new location. The figure below shows moving of the Device Libraries window. While moving the window, special controls appear to facilitate proper placing of the window in relation to the remaining windows in the view.

Figure 5. Windows adjustment controls

As a result of changing the windows position, it is possible to adjust them according to individual needs. On the figure below, the Workspace Tree window has been moved above the Main screen, and the Device Libraries window has changed its position from the left side to the right.

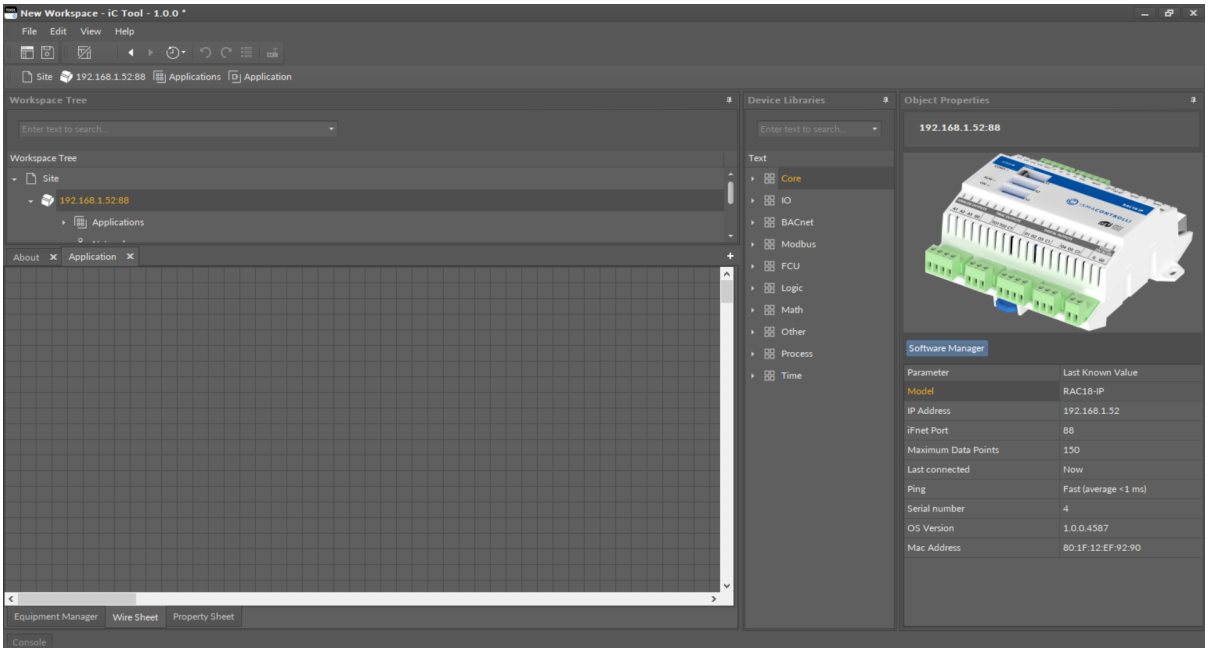

Figure 6. Rearranged windows

The iC Tool offers a quick extension of the Main screen to the whole area thanks to automatic minimizing of the remaining windows. To temporarily enlarge the Main screen, press the Hide panels icon (third one from the right) on the toolbar under the main menu, as it is depicted on the figures below showing the iC Tool before and after the enlargement of Main screen. In order to restore the full view of all windows, either press the icon again or press the next Restore previous panels set icon.

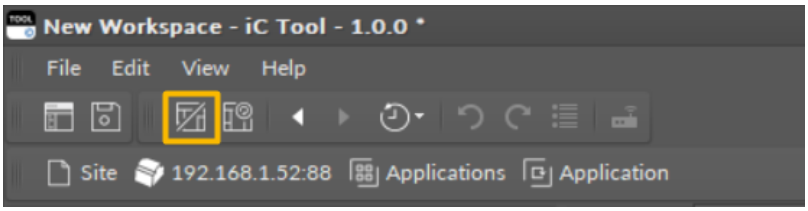

Figure 7. Hide panels button

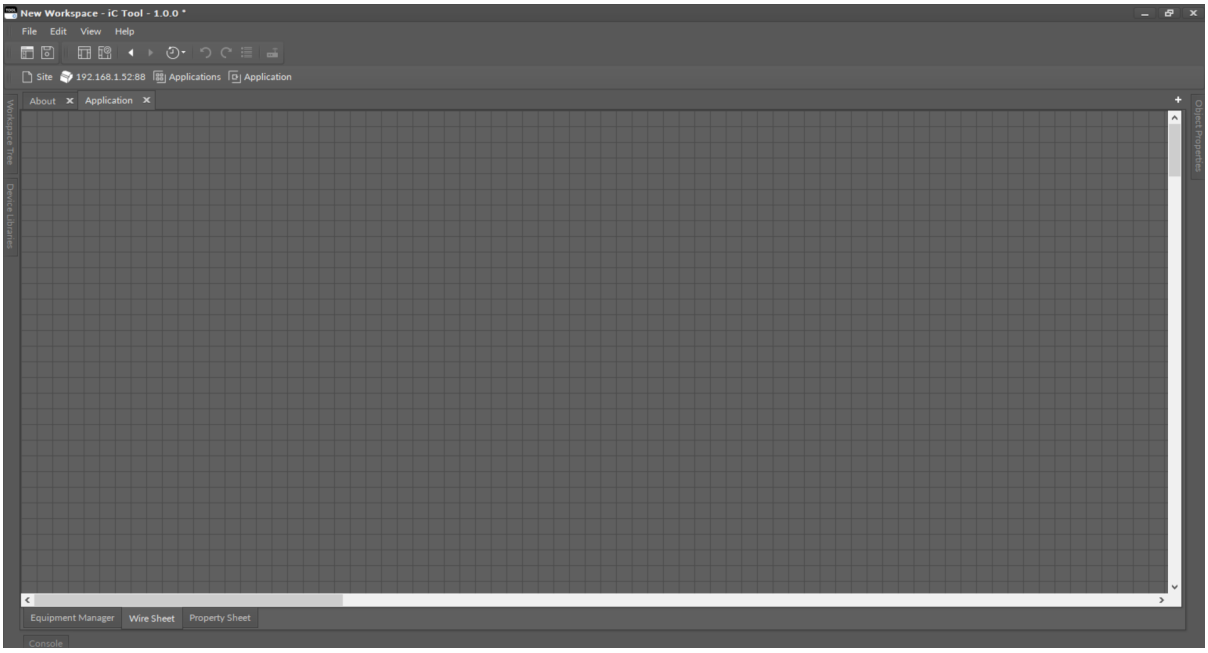

Figure 8. Temporarily enlarged main screen

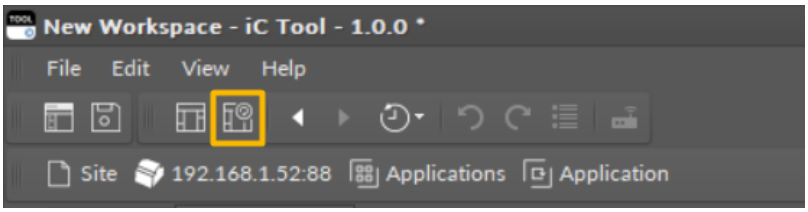

Figure 9. Restore previous panels set button

6.3 Workspace Tree

A Workspace Tree, also known as a project tree, is a window designed to work with devices. Thanks to a hierarchical structure of the tree, it is easy to switch between the devices and their components. It is also a place to add/remove the devices and to manage components.

The Workspace Tree is designed to navigate the projects and devices defined for them. For each project, it is possible to define any number of folders and any number of devices inside them. It is recommended that the structure of folders, subfolders, and devices corresponds to their physical placement and/or logical subordination of devices on an object. It makes finding a particular device among a vast quantity of devices fast and easy. The structure of folders, subfolders, and projects, mentioned above, allows to properly locate a specific device in the Workspace Tree. The hierarchical structure inside the device is loaded directly from the device and consists of components.

The Workspace Tree is saved in an .itw file in a specified location [home\Workspaces]. The user can save the Workspace Tree under a defined name in a specific location. The .itw (Workspace) file stores the whole structure of the Workspace Tree including devices names and their addresses. This allows to save many projects in one .itw file, or otherwise, each individual project in a separate .itw file.

A file with the .itw extension is an .xml file, and contains sensitive data, such as device IP addresses and their passwords if the user issued a command to remember them. Due to an obvious threat of exposing such data, the iC Tool codes sensitive data automatically, preventing their exposure to third parties.

6.3.1 Workspace Tree Structure

The Workspace Tree structure is defined for the nano EDGE ENGINE devices, and it is based on four containers (Applications, Networks, Services, and System). However, once the iC Tool is opened for the first time, it displays a predefined project (Site). A project is a space to include a device or devices to the Workspace Tree. The Workspace Tree can contain more than one project. Projects can be freely renamed.

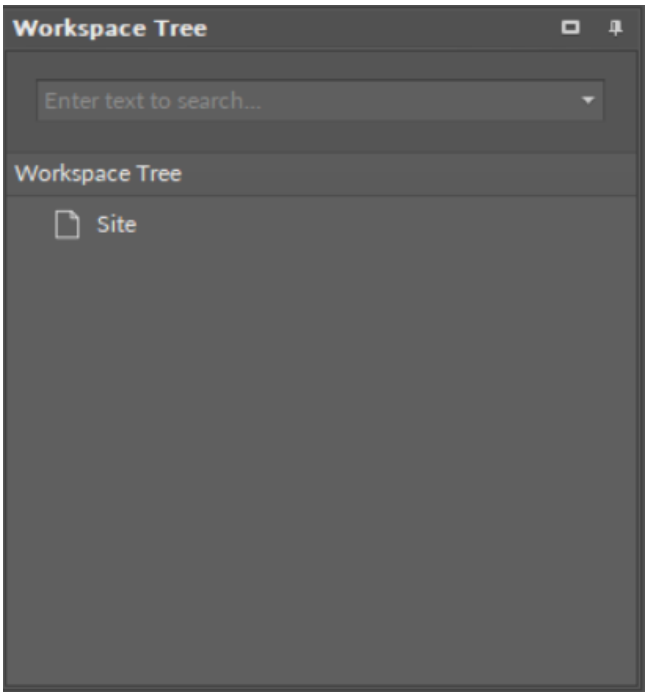

Figure 10. Initial project in the Workspace Tree

As mentioned, the device driven by the nano EDGE ENGINE has a specific Workspace Tree structure based on four containers–Applications, Networks, Services, and System:

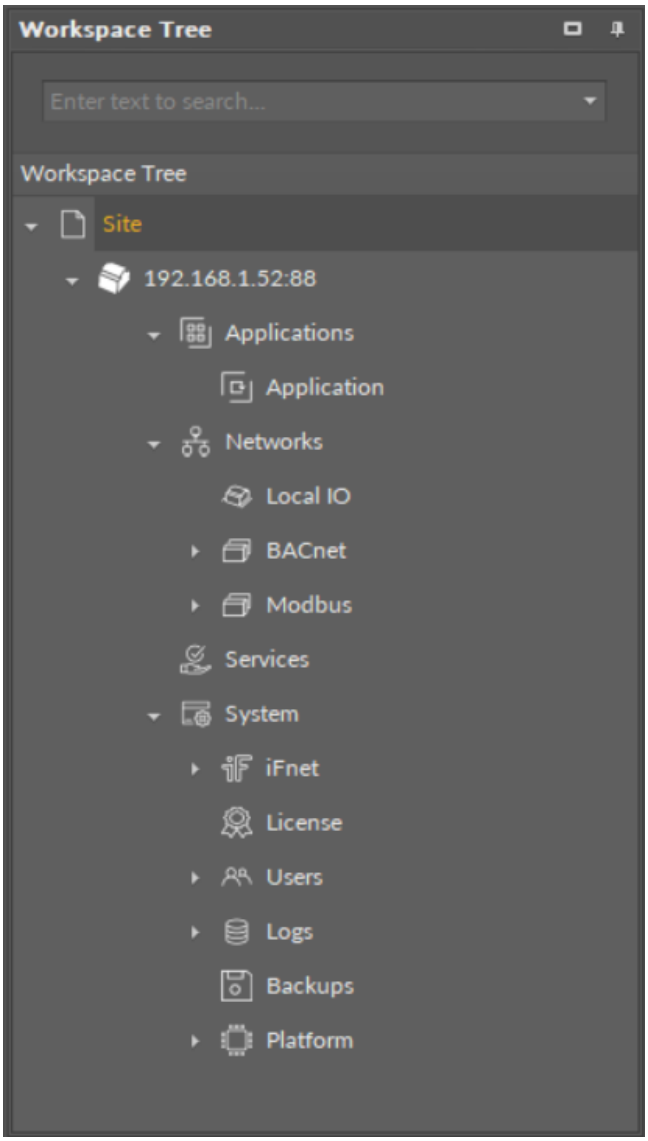

Figure 11. Workspace Tree structure in the nanoEdgeEngine device

6.3.2 Editing of the Workspace Tree Elements

For folders, subfolders, and the main element–project, opening the context menu provides the following options:

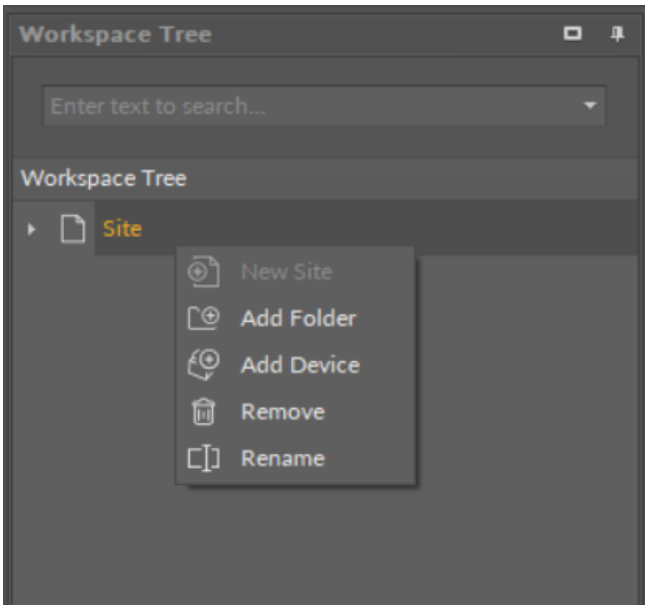

Figure 12. Workspace Tree editing options

- **New Project**: creating a new project independent of the others;
- **Add Folder**: adding a folder under the selected folder;
- **Add Device**: opening a device adding window for the selected folder;
- **Remove**: removing the selected element: device, folder, or project from the tree.

WARNING!

Removing a superior folder or project removes all subfolders and items that were structured under it, upon confirmation of operation. In the situation shown on the figure, removing the project will result in removing the device from the project, but the device contents will not be deleted.

The iC Tool software supports UTF8 symbols in most of the places in the project. It is therefore possible to use native letters to lay out the project in a convenient way:

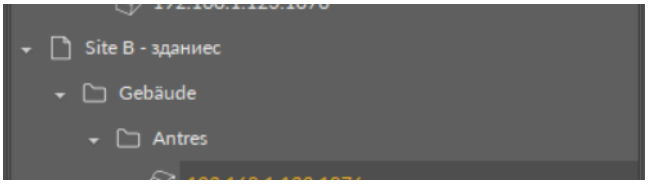

Figure 13. Use of native letters example

Any name can be given to a project, folder, or even device. For this purpose select and click an object, which then becomes editable, or select an object and press the F2 key.

Tip

Use an F2 key to rename an object.

The device components, which can be used to program the application, are shown on the Workspace Tree, under a device. If a selected element of the tree has other elements under it, i.e., inferior elements, issuing a command to a the superior component impacts all the subject elements as well, due to a hierarchical structure of the tree. This involves the Delete function–deleting the superior element deletes all the inferior elements.

It is possible to select many elements at once by using a Ctrl or a Shift key the same way as in the Windows Explorer (selecting elements with a Ctrl key pressed allows to select elements one by one, not in a consecutive manner; selecting elements with a Shift key pressed allows to select consecutive elements).

WARNING!

To save any modifications in the Workspace Tree hierarchy or to save its naming (not applicable to device tree), the Workspace Tree needs to be saved using a Save or a Save as option available in a File menu or corresponding button on the toolbar.

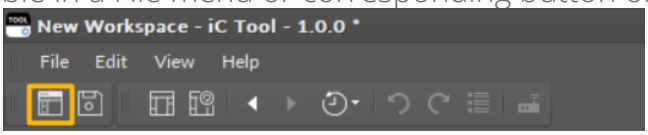

Figure 14. Save workspace button

6.3.3 Adding and Connecting Device

Adding Device

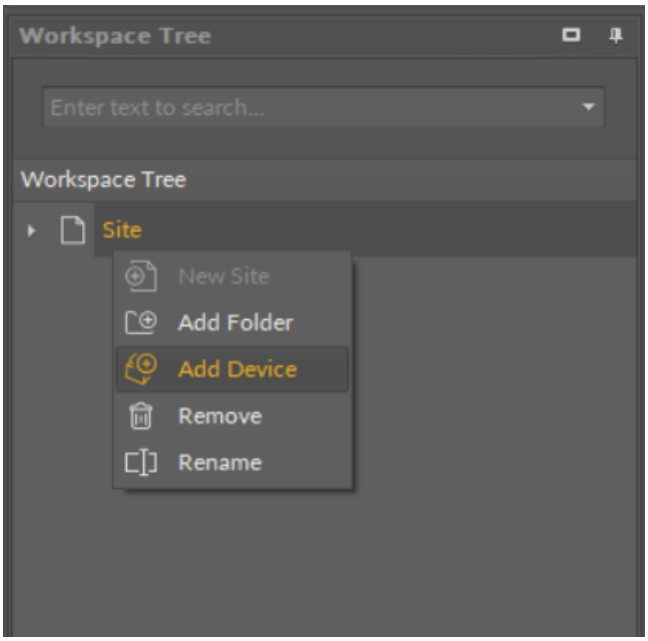

Figure 15. Adding the device

To connect the device, it needs to be added to the Workspace Tree: right-click anywhere in the Workspace Tree window, and add a new project from the context menu (in case the required project is already added, omit this step). Then, right-click on the project, and select the Add Device option from the context menu, which opens a dialog window allowing to configure basic connection data:

- Type: displays the type of the device to be connected;
- Host: allows to set a device's IP address;

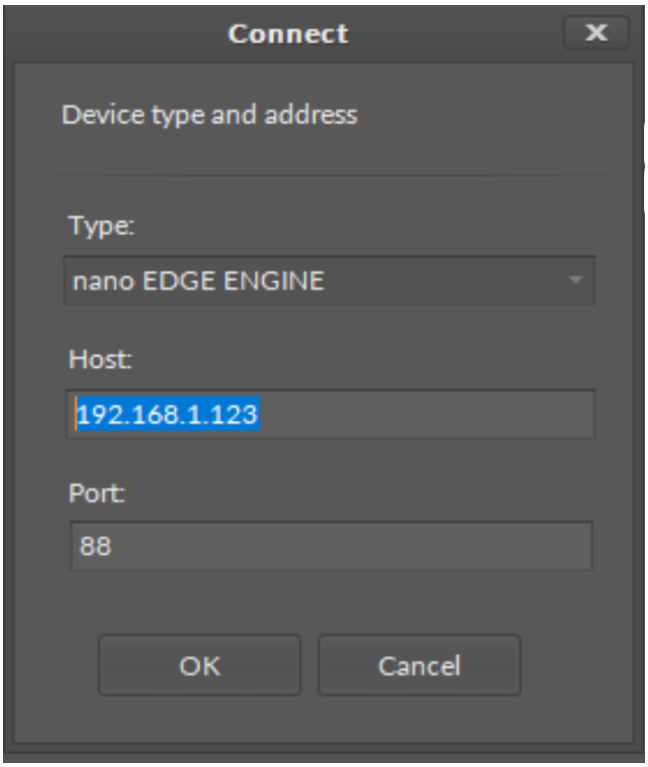

Figure 16. Connection dialog window

Worth to Notice:

Each device has a default IP address 192.168.1.123, which may be later changed in the Platform component.

- Port: shows a device's port number.

Worth to Notice:

Upon adding, each device shows its default port number: 88.

Connecting Device

After entering a proper IP address and pressing Enter or OK, a login window appears to enter the username and password.

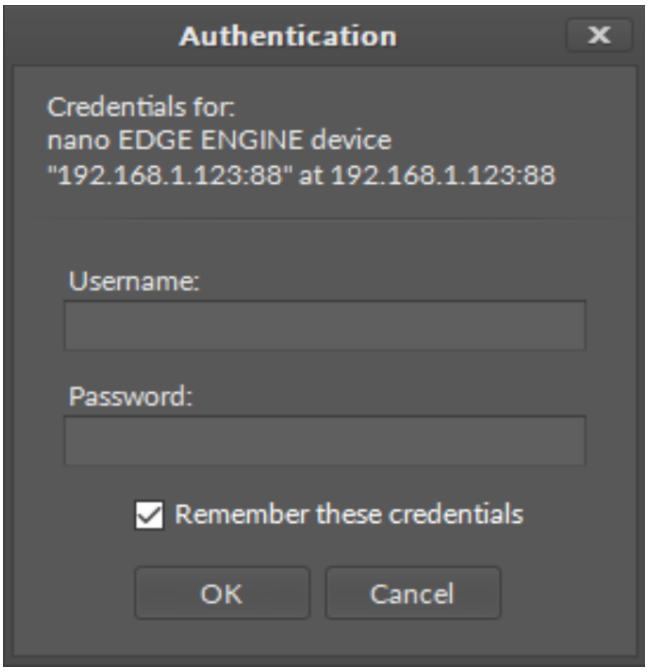

Figure 17. Authentication dialog window

WARNING!

Saving credentials is dangerous from a security standpoint. Please avoid storing production system passwords.

If the username and password, needed to connect with the device, are to be remembered, select the Remember these credentials option. The entered data are then saved in the .itw file, which stores the whole structure of the Workspace Tree in a way that prevents access to sensitive data by third parties.

After confirming the entered authorization data by pressing Enter or OK button, the iC Tool begins the process of connecting and reading the components tree for the device. After a correct connection with the device, its application tree loads automatically in the Workspace Tree. If the device is selected in the Workspace Tree view, the Object Properties Window shows its picture and the most important parameters, such as IP address, serial number, or operating system version number. These parameters are available in this window even after disconnecting the device, which allows offline checking of, e.g., device IP number or its operating system version.

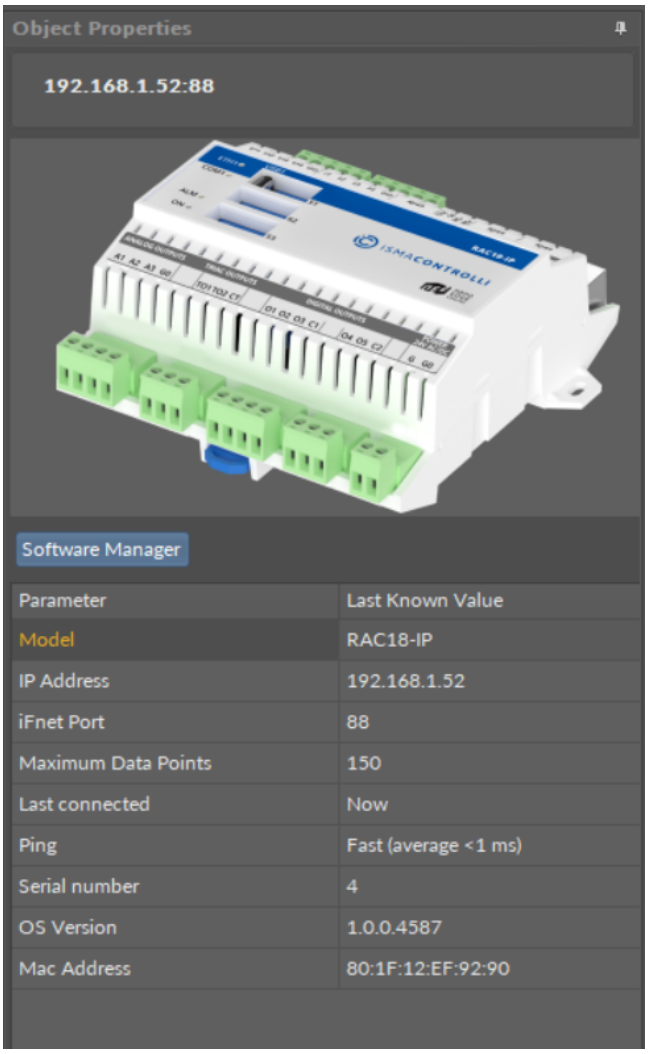

Figure 18. The Object Properties window

Connecting an Added Device

If the iC Tool is opened, and all the devices are already added to the project, in order to connect the device, right-click it, and select the Connect option from the context menu.

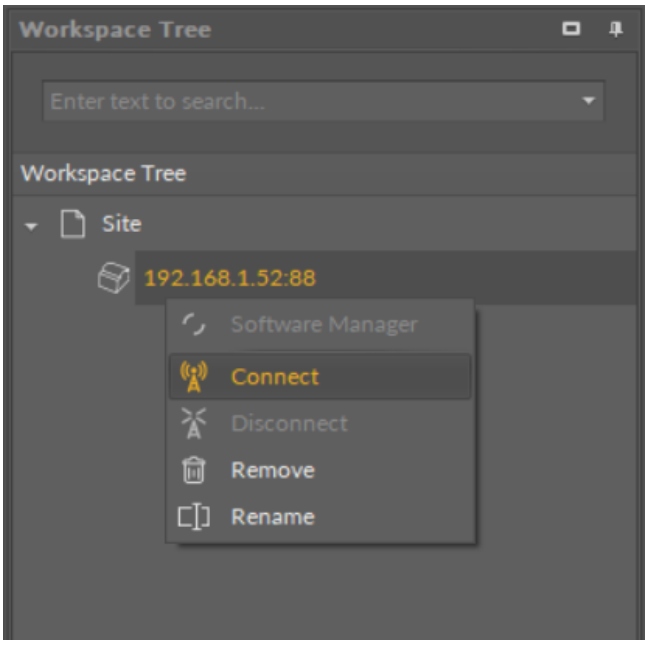

Figure 19. Connecting an added device

Then the Authorization window pops up, either with saved credentials, or ready to fill them in.

6.3.4 Disconnecting Device

To disconnect the device, select it on the Workspace Tree and choose a Disconnect option from the context menu, then accept.

Figure 20. Disconnect option in the context menu

After disconnecting the device its icon's view changes; it is impossible to expand its contents and the figure is grayed out (see the figure below). Double-clicking on the device again begins the reconnection process.

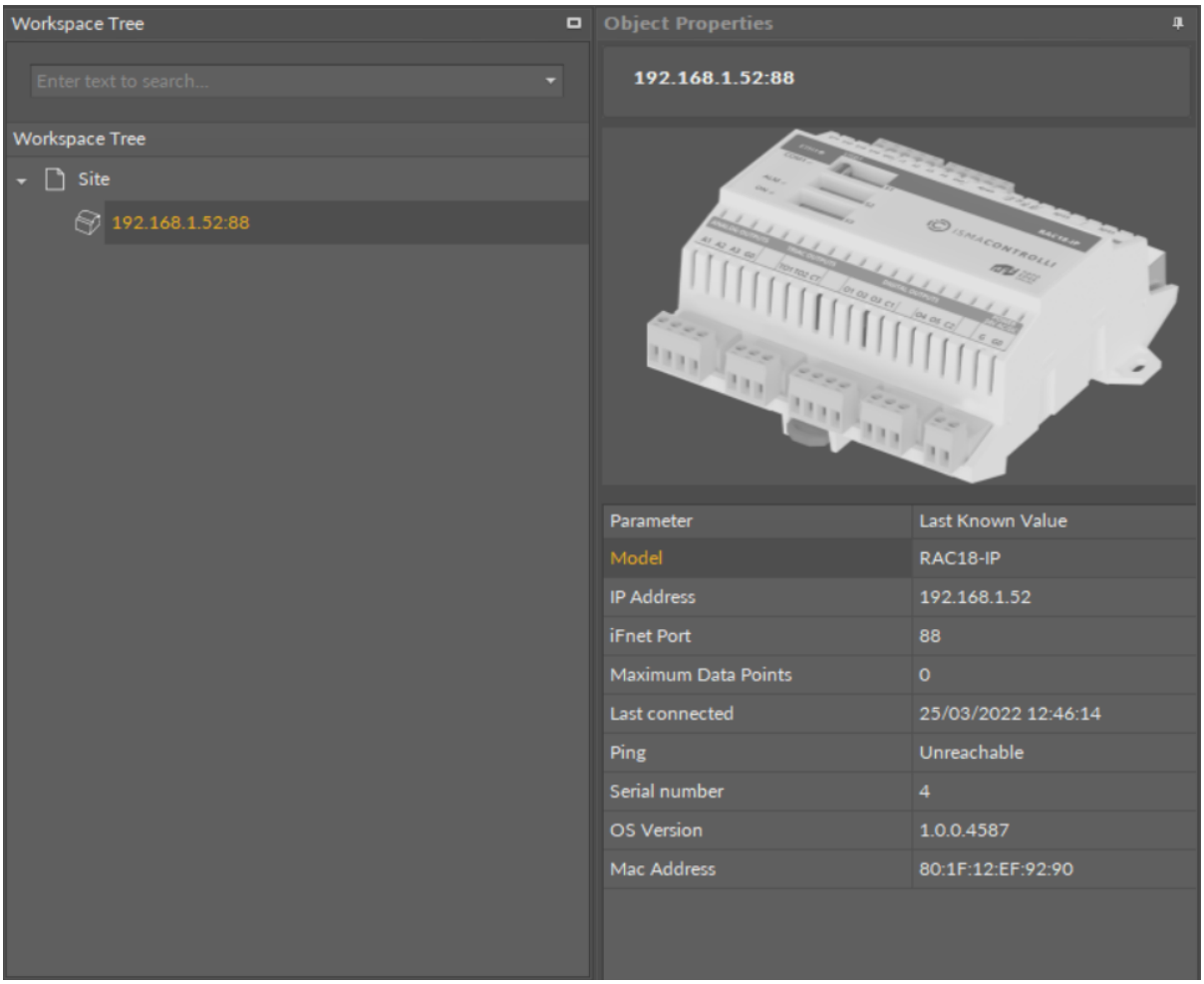

Figure 21. Disconnected device view

If the device gets disconnected by mistake, while working with it, the program will detect it automatically and inform the user showing a “Device disconnected” text in the upper part of the view and folding the device tree on Workspace Tree.

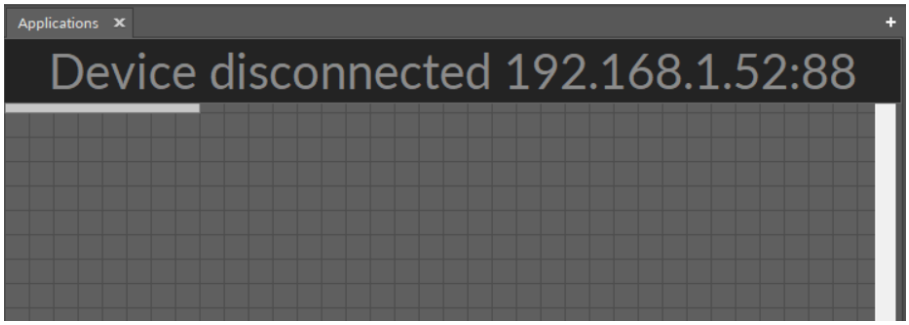

Figure 22. Disconnected device notification

6.3.5 Connected Device View

After connecting with the device, a subtree appears in the Workspace Tree listing all components available in device: four main containers (Application, Networks, Services, System) and their inferior components.

Every change made in components, such as editing a component's name, its superior component, or other parameters in the component, is saved in the device. This guarantees that, after reloading the data from the device, data (components) are

displayed in the same way and they are synchronized among other users working at the same time on the same device.

Operations, which can be performed on components such as copying, adding, or removing new components, defining connections between components, are described in the further part of this manual.

Immediately after connecting with the device, both the Main screen and Device Libraries window remain unchanged. It is the opening of any component from the device tree that results in showing a specific view in the Main screen and filling the Device Libraries window with the proper device libraries.

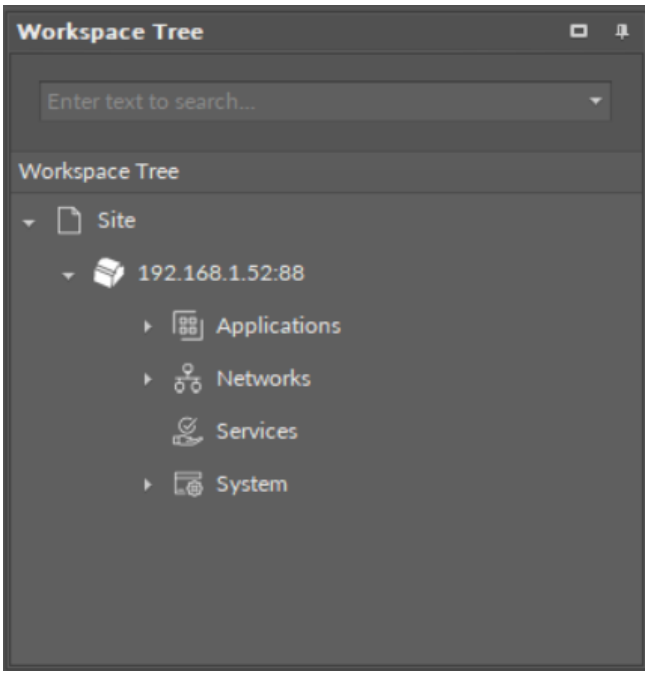

Figure 23. Connected device view in the Workspace Tree window

6.3.6 Adding and Removing Components in the Workspace Tree

Adding Component

In order to add a new component in the Workspace Tree window, it is necessary to find a specific component in the Device Libraries window, and drag it to a proper place in the Workspace Tree. Adding components is performed by a drag and drop method. For nano EDGE ENGINE devices, it is possible to place inferior components only in the proper container or service component–the iC tool automatically blocks it, for example, to place an Application component in the Networks container, or the LocalDevice component in the iFnet service component.

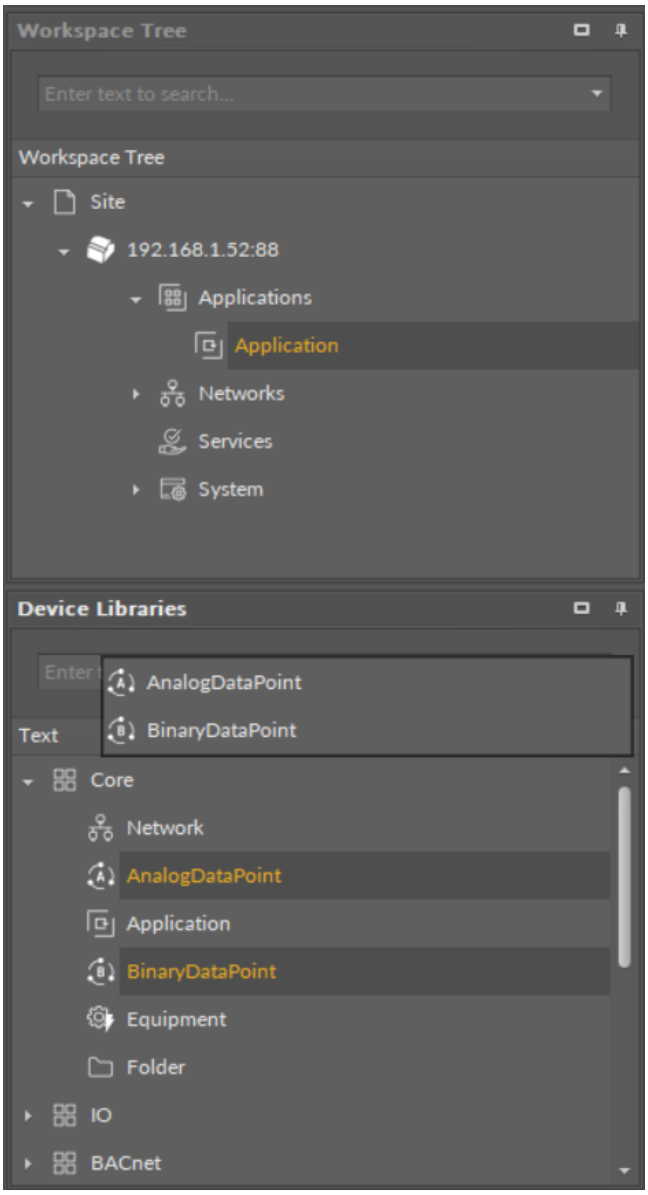

Figure 24. Dragging new components

After dropping a single component in the specific place in the Workspace Tree, a dialog window appears, allowing to name a newly created component. After confirmation of the name, the component is added to the device, and the tree is refreshed.

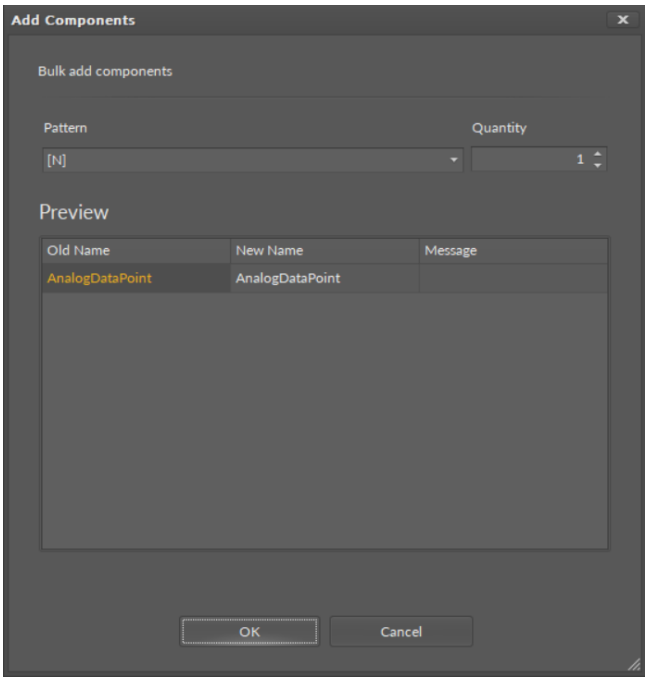

Figure 25. Naming component dialog window

Many components can be dragged at once. After dropping them on the Workspace Tree, their names will be automatically defined as the component's default name, without the user's participation.

A second method of adding a component is copying and pasting or duplicating components already existing in the Workspace Tree. In order to do it, select a component in the Workspace Tree window, Property Sheet, or Wire Sheet view, and copy it using a keyboard shortcut Ctrl+C or the context menu using a Copy option. Afterwards, it is essential to choose the component in the Workspace Tree, under which the copied component is pasted with a Ctrl+V operation or the context using a Paste option.

The details of copying/pasting operation as well as duplication are described in the Single Device Functions section.

Special Adding of Data Points

The Workspace Tree window, the Wire Sheet and Property Sheet views offer a special way of adding Data Points and folders (the Folder and Equipment components) to the Application, simply from the context menu. In order to add components this way, right-click in an empty space of the Wire Sheet grid or Property Sheet and choose the Add option from the context menu. In the Workspace Tree, special adding of Data Points and folders is available in the context menu of the Application component. This way of adding Data Points and folders to the Application allows to add a multiple Data Points or folders.

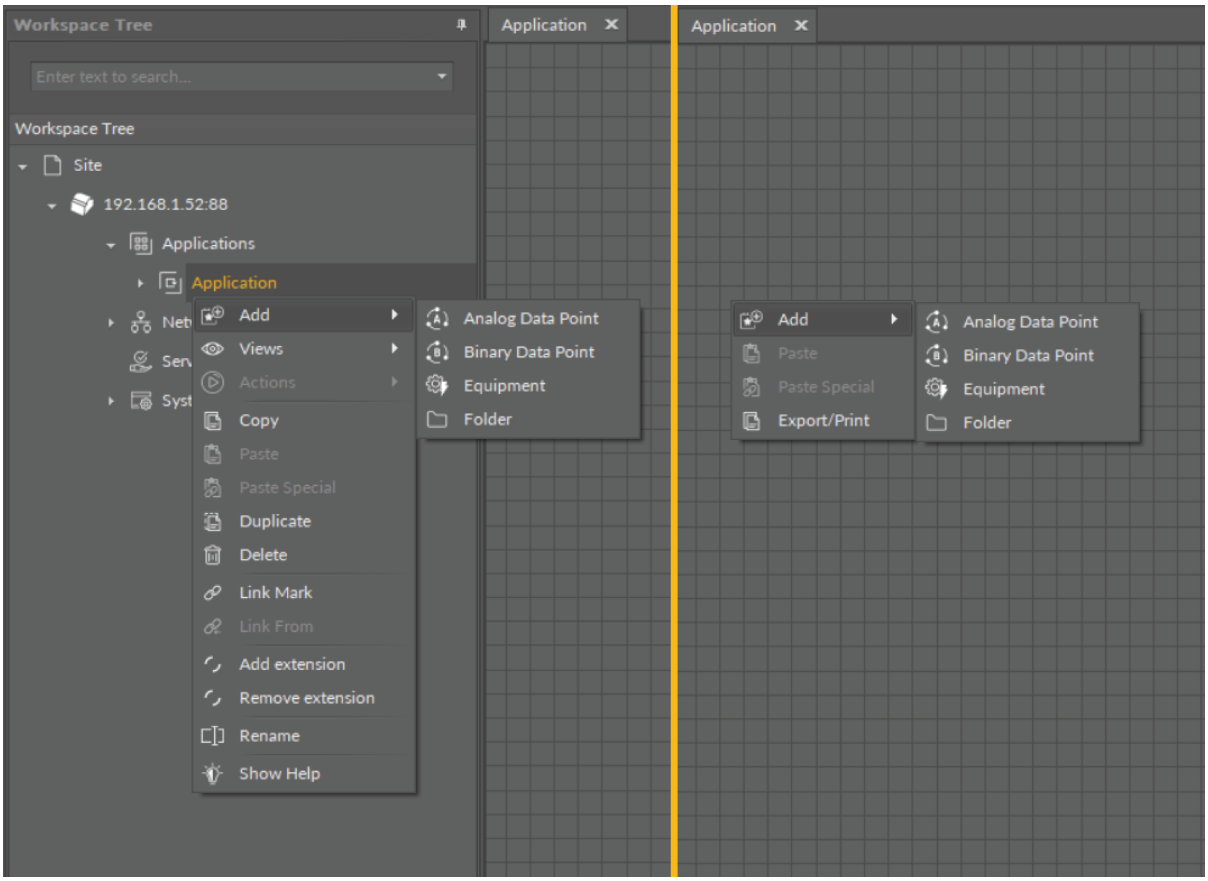

Figure 26. Special adding of Data Points and folders from the context menu

Removing Component

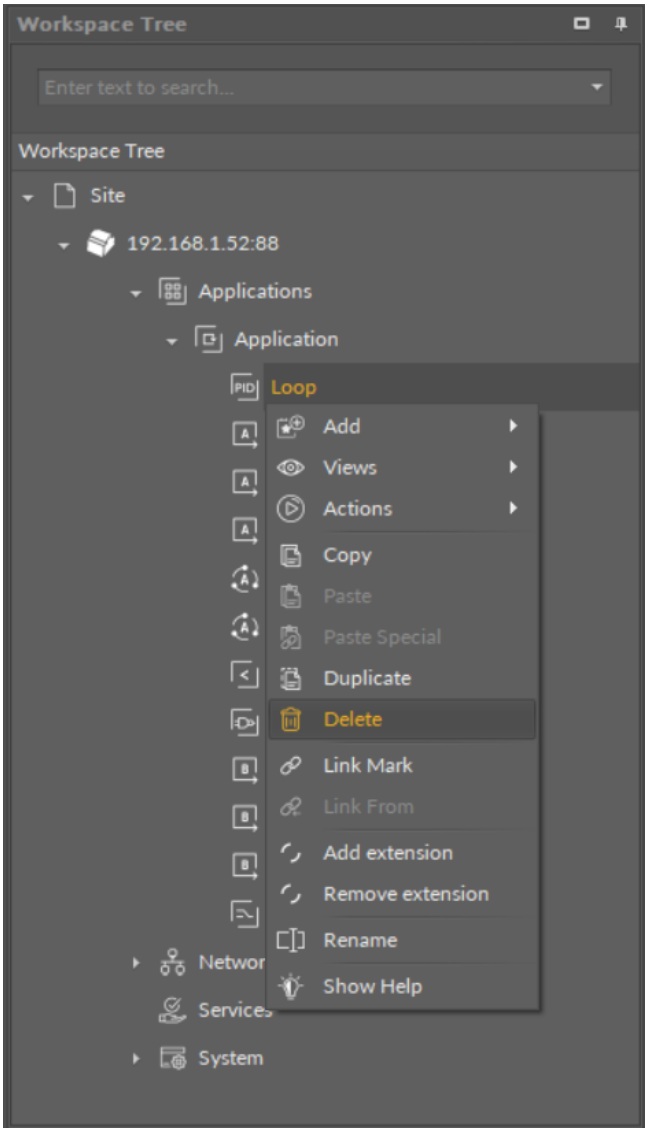

Figure 27. Removing component

A component may be removed from the Workspace Tree window level only by selecting it and choosing a Delete option from the context menu. Removal by pressing Delete key on the keyboard is blocked for this window.

6.4 Device Libraries

The Device Libraries is a window listing all libraries available after connecting the iC Tool to a device driven by the nano EDGE ENGINE. This window always shows the libraries available in the device connected at the moment. It means that, if there are many devices used in a project, the window contents will be automatically adjusted at the moment of switching from one device to another.

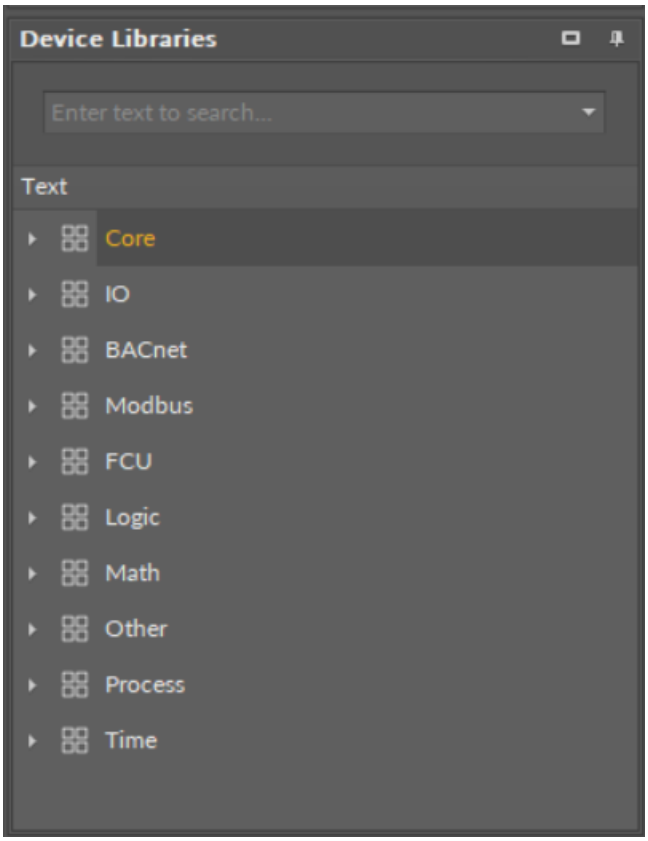

Figure 28. The Device Libraries window

The libraries are presented as the main elements of a tree structure in the Device Libraries window, and can be expanded to see their components. Each component is presented with its icon and name. The icons visible before the component name define it clearly and help to quickly identify the type of component. An icon associated with a particular component is also shown in other views, including the Wire Sheet, Property Sheet, and the path of an editable component.

It is possible to select and move more than one component simultaneously in the Device Libraries by using a Ctrl or Shift key.

Using any library from the Device Libraries window, means adding a not configured component with default parameters. In order to add a component similar to already existing one with pre-configured parameters to the project, it is necessary to use copying or duplicating function on the existing component.

The components dragged directly from the Device Libraries to the Wire Sheet view (this view is explained in detail in the Wire Sheet section) are placed in the location they were dropped. If the components were dropped on a view other than the Wire Sheet view, their physical location (shown on the Wire Sheet view) will be in the upper left corner–point (0,0).

While dragging many components to any view, the iC Tool will arrange them in a cascading manner, so they will not overlap.

The components in the Device Libraries window cannot be edited and their location cannot be changed.

6.4.1 Searching the Device Libraries

In order to easily find a specific component among a vast number of components available for a particular device, it is possible to use a filter available at the top of the window. For this purpose, it is necessary to enter the name or part of the name of the required component into the filter field, and the matching components list will be shown dynamically in the Device Libraries window. The example below shows a list of components matched with a word 'analog'.

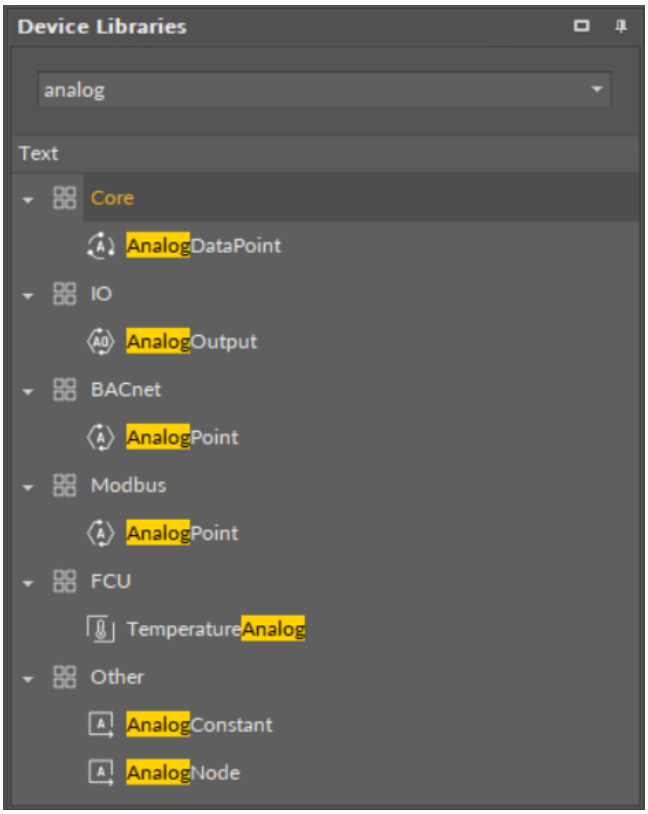

Figure 29. Search results in the Device Libraries window

6.5 Main Screen

The main workspace (Main Screen), where the application is created, is the middle, biggest window of the iC Tool. Here, the functional views are available in tabs: the Wire Sheet and the Property Sheet.

Navigating between many views in the Main Screen is performed by selecting a proper tab placed at the bottom of the window.

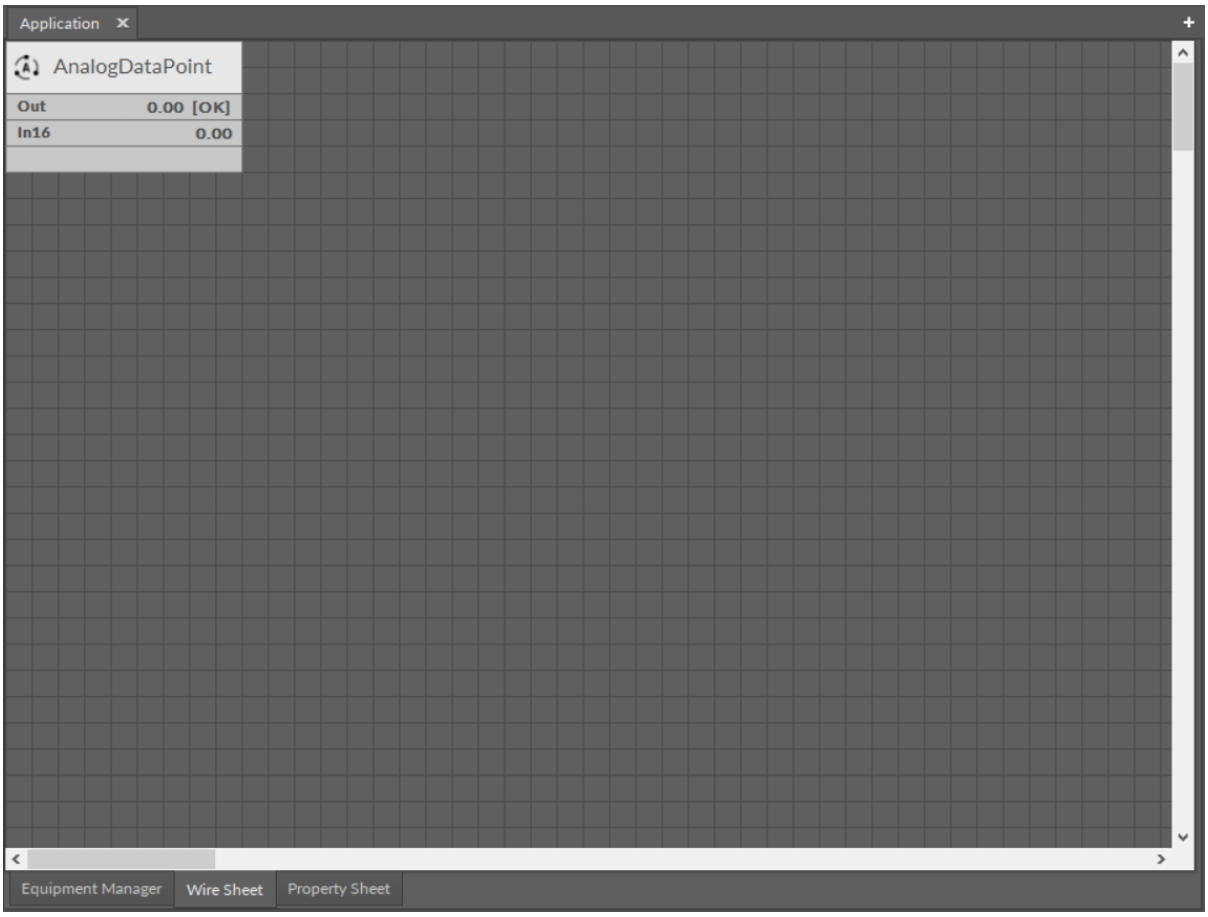

Figure 30. The Main Screen window

To show the component data in the Main screen it is necessary to:

- Double-click a component of interest, which opens in the Main Screen; the default view for nE^2 components is the Property Sheet; however, once the user opens and saves another view for the component, it is remembered, and next time the component is opened in the Main Screen last-remembered view.
- Open the context menu of a component, hover over the Views option, and choose a required view from the menu. For most components, there are two views available: the Wire Sheet and the Property Sheet.

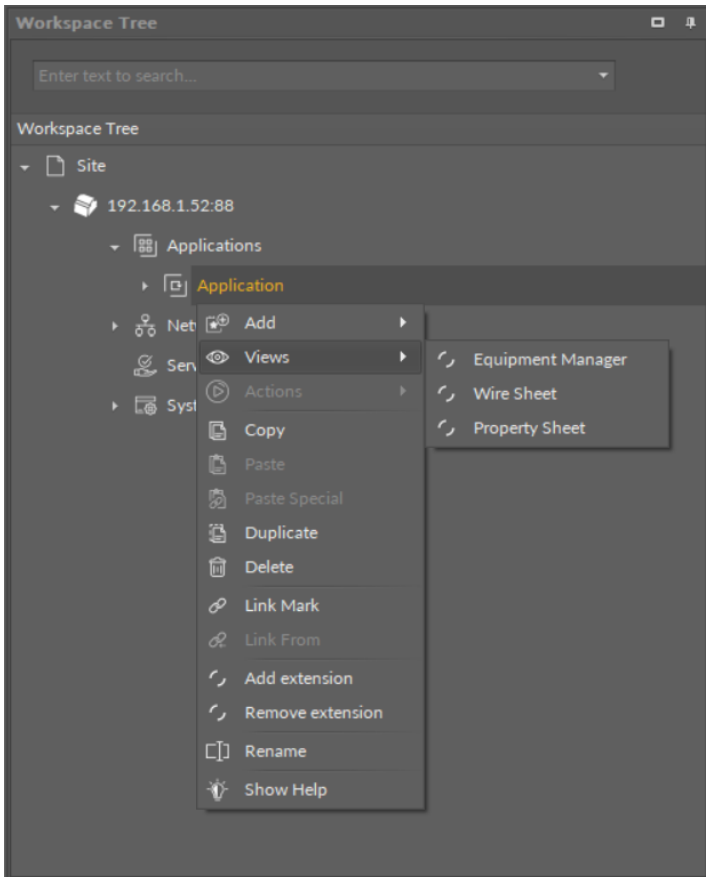

Figure 31. The context menu views options

6.5.1 Switching Between Tabs

Once the view is opened in the Main screen, switching between views is possible by selecting a proper tab in the bottom part of the window. The change of view is automatically remembered as a view dedicated for a particular component type.

In case one component is opened, choosing another component to edit (using methods described above) replaces all views with data saved earlier for the newly opened component. The default view is the one, which was used recently, or is set by default for the type of component opened.

In order to avoid replacing the data in the tabs, there is a concept of a workspace environment–a new tab, allowing to work on a few components independently, without switching the data in the tabs. To open another, independent tab, use key combination–Ctrl+T, or press an icon +, available in the right corner of the tabs bar in the upper part of the Main Screen window.

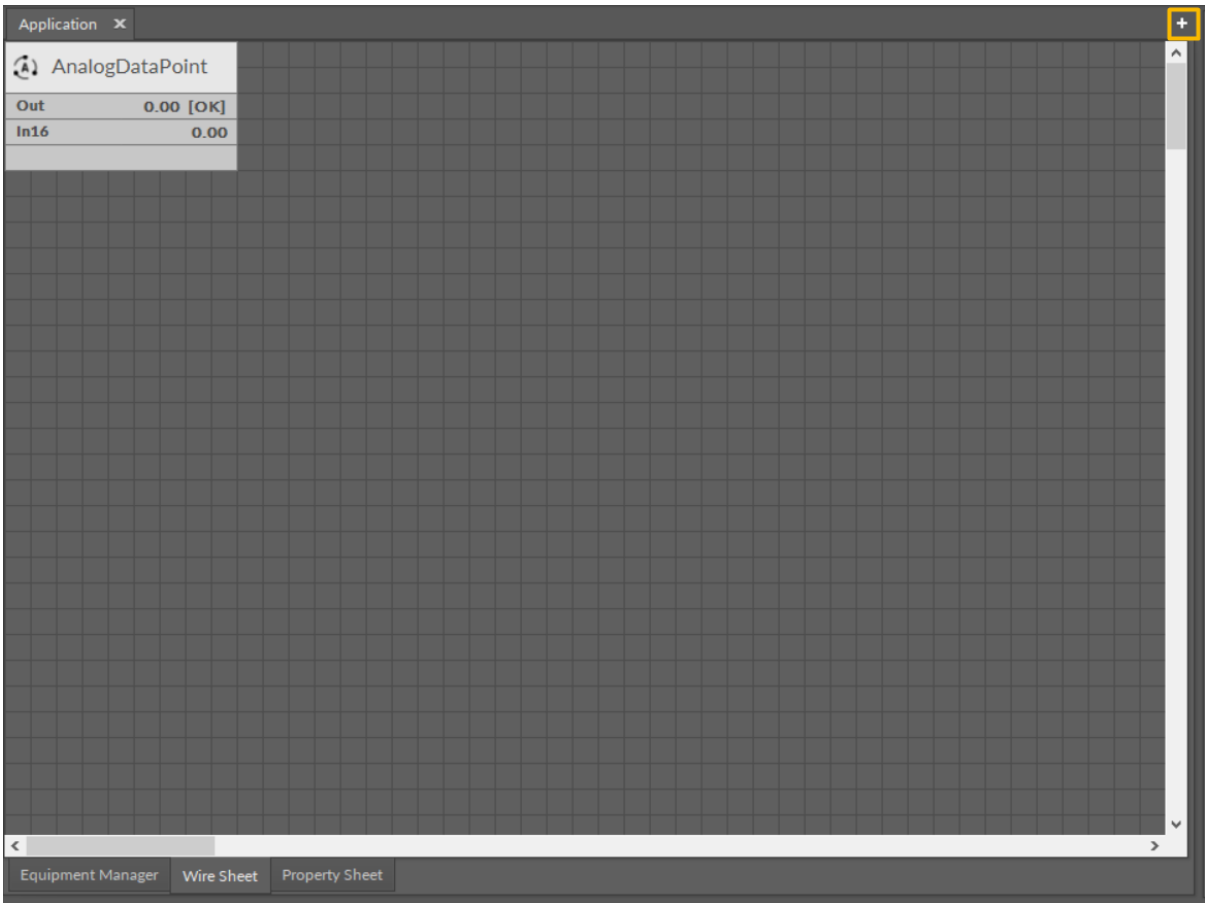

Figure 32. Opening an independent tab

6.6 Object Properties

The Object Properties window shows specific information about a selected element: a device, component, or link. It allows a quick preview and editing of a selected element's data without the need for switching, or closing, the current view in the iC Tool. The object can be selected in any view and the Object Properties window will show its detailed information.

The view and contents of the Object Properties window may differ depending on the selected element. The look of Object Properties window is described in this section, depending on the type of the object selected.

The Object Properties window, as any other window in the iC Tool, may be freely moved around the screen and mounted in other windows, which allows to adjust the window to the user's preferences. It is also possible to place the Object Properties window on another connected screen if the user is working on multiple computer monitors.

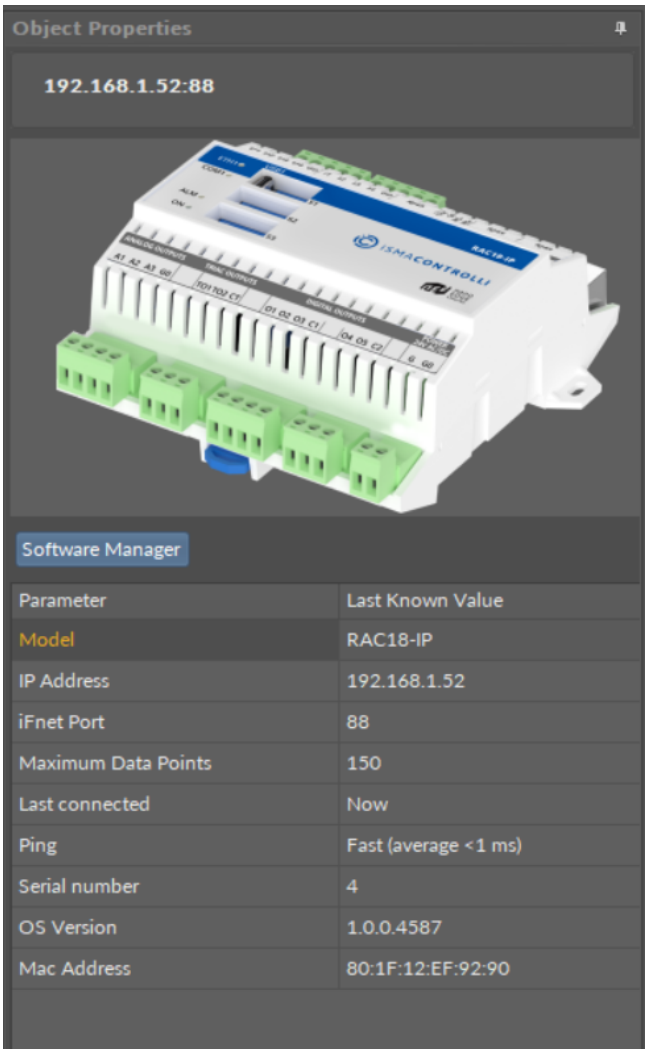

Figure 33. The Object Properties window

6.6.1 Device in Object Properties

After selecting a nano EDGE ENGINE device in the Workspace Tree window, the Object Properties window presents useful data about a device:

- picture of a device;
- model of a device;
- IP address of a device;
- iFnet port number;
- Data Points available within the license limit;
- last connected;
- ping;
- serial number of a device;
- OS version;
- MAC address.

Information contained in the Object Properties window is available even after disconnecting the device (in offline mode). No information about the device, presented in the Object Properties window, is editable.

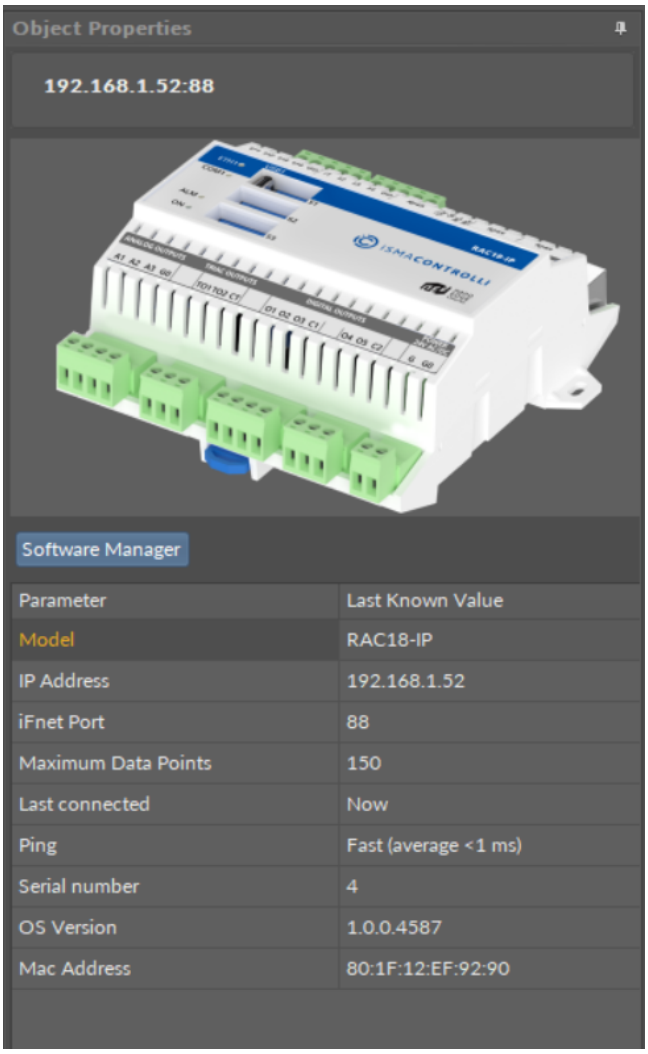

Figure 34. Selected device in the Object Properties window

6.6.2 Component in Object Properties

After selecting a component, the Object Properties window shows four sections:

- section with a slot list (the Main tab);
- section with a list of outgoing or incoming links to the selected component (the Links tab);
- section with a list of configuration data of the selected component (the Info tab)–only available in the Developer mode;
- section with Action buttons (blue buttons above tabs).

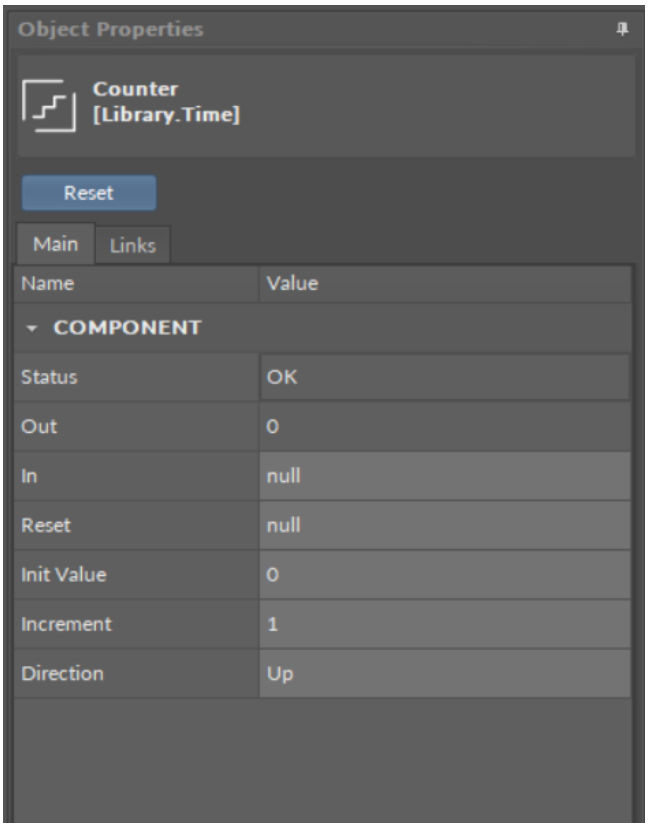

Figure 35. The component's view in the Object Properties window

In the upper bar of the window, it shows the name and type of element, which data is displayed.

- Main tab: allows reading and editing of the selected component's slots. If the user changes the value of a slot in the Object Properties window, new value is immediately saved in the controller. The Object Properties window works in the auto save mode.

> **Worth to Notice:**
>
> This section is also available to components in libraries (selected in the Device Libraries window), and allows to check the slots offered by a particular component even before using it in an application.

- Links tab: informs about all incoming and outgoing links with a full location path of target components and the names of target slots. For each link, it is possible to choose the following options from the context menu:
  - Go to link: transfers to the Wire Sheet view of a superior of a target component;
  - Go to component: transfers to the Property Sheet view of a target component;
  - Delete link: removes a chosen link.

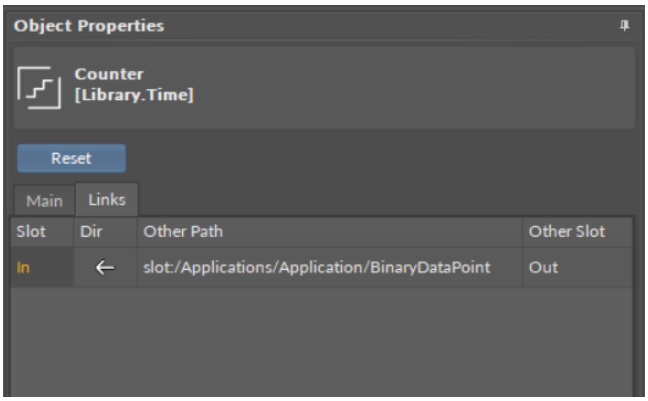

Figure 36. The Links tab view in the Object Properties window

- Info tab: (available only in the Developer Mode) shows the identification and configuration data of the selected component;

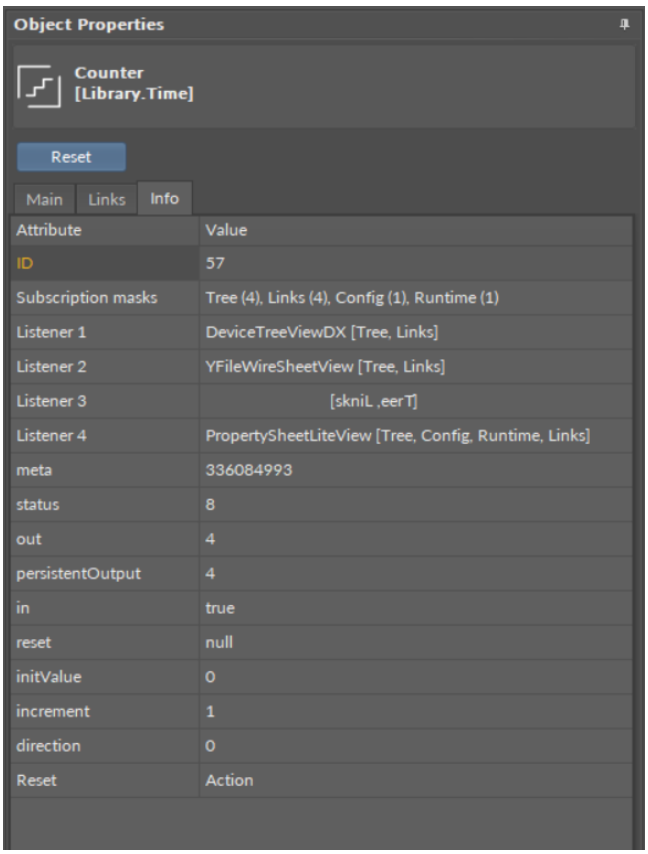

Figure 37. The Info tab view in the Object Properties window

- Actions Section: buttons available in the bar above tabs, allowing a simple execution of actions on selected component. These are the same actions which are listed in the component's context menu under the Actions option.

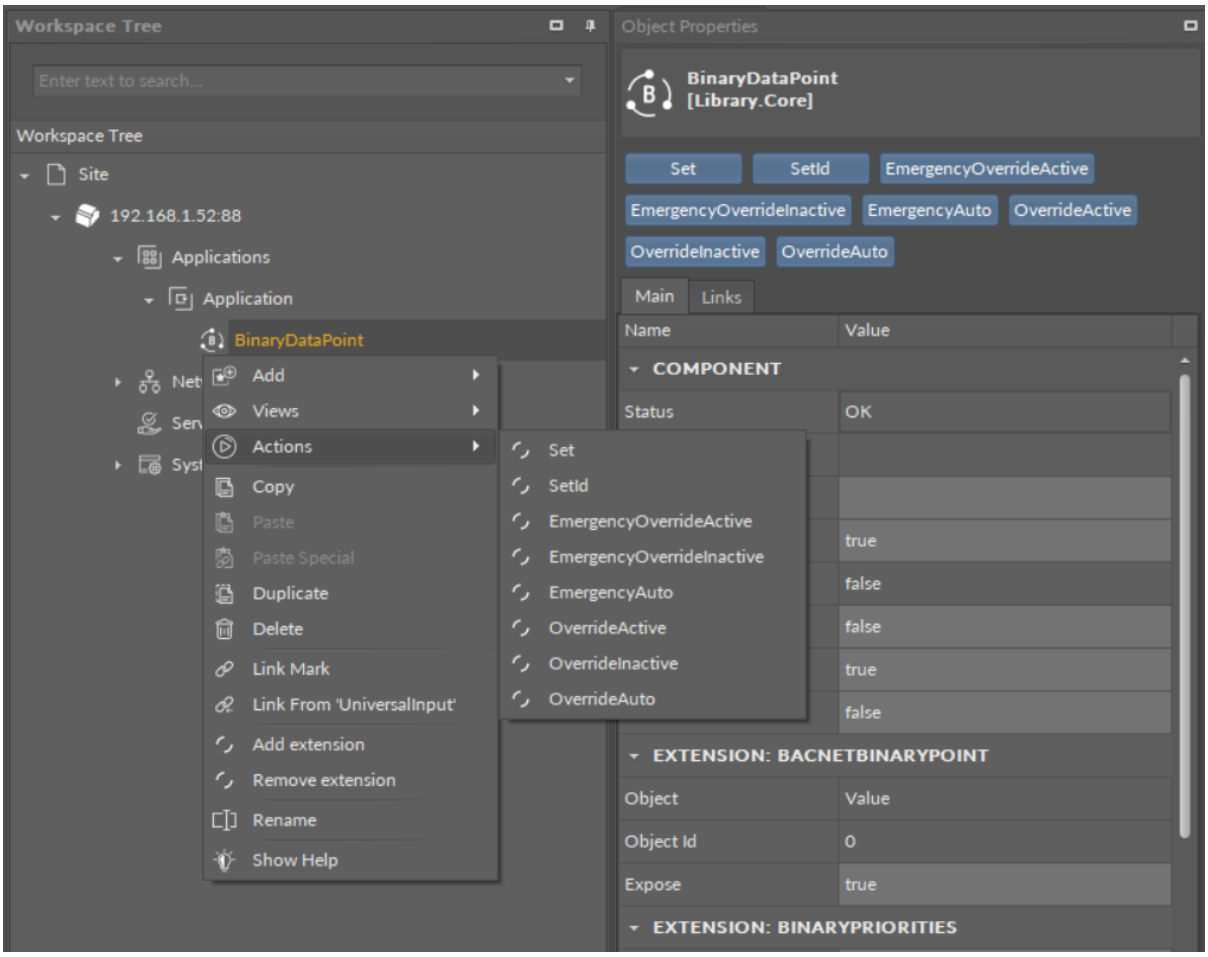

Figure 38. The Actions section in the Object Properties window

Many Components in Object Properties

The iC Tool offers the possibility to simultaneously display common properties of many selected components.

Each time the user selects more than one component, the Object Properties window changes its header to show the number of simultaneously selected components.

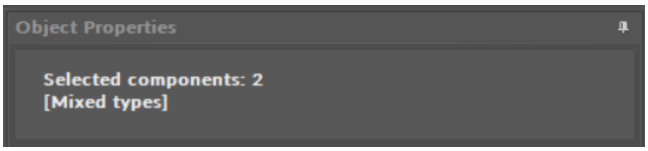

Figure 39. The Object Properties header for two selected components

Common Slots

While working with many components simultaneously, the Object Properties window changes its work mode to show only the slots common for all selected components. The value of the slot shown in this mixed view is only displayed if all selected components have exactly the same value for this slot; otherwise, the value field is empty.

Regardless of whether the shown slot displays a value or not, if it is an editable slot, entering a new value overwrites it in all selected components. If this process is not successful, the Console will show an appropriate information.

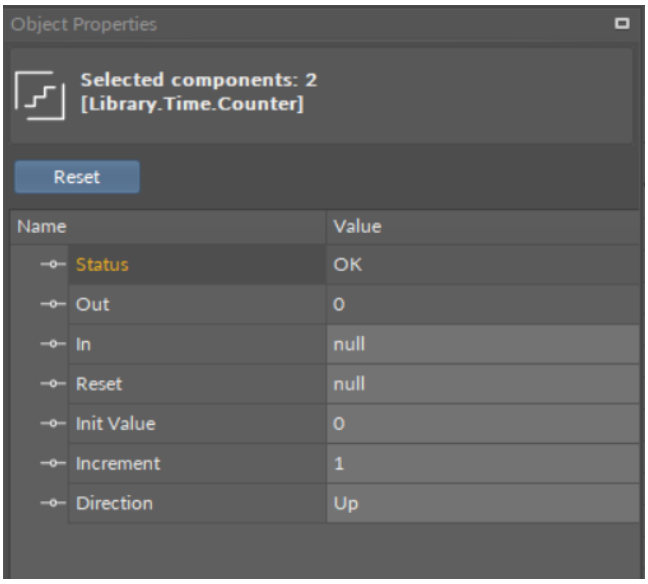

Figure 40. Common slots of same type components

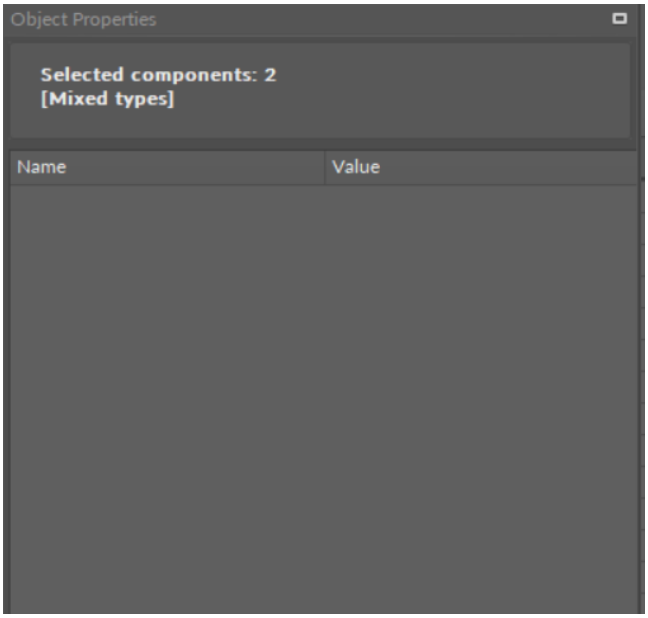

Figure 41. Common slots of different type components

Using this multiselect function for an editable slot enables entering a new value (e.g., In B), which will be sent to all components at once. Setting the same values for various components simultaneously allows setting common setpoints or configurations for many components at once, enabling to activate network variables, etc.

Common Actions

The case of common actions is similar to setting a new value for common slots. Assuming the selected components share the same actions, then the buttons of these actions appear in the Object Properties window. Pressing the action button will execute the action in all selected components.

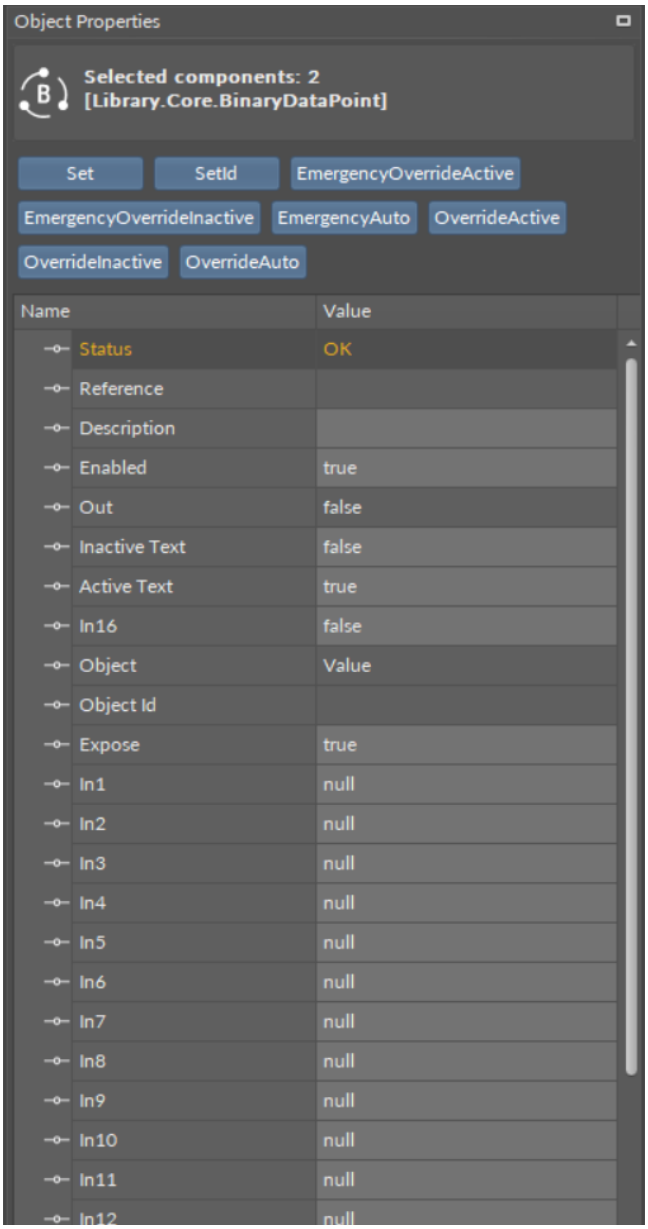

Figure 42. Common actions of same type components

6.6.3 Links Tab in Object Properties

A Links Tab view is a view showing a list of all links incoming and outgoing of the selected component in the Object Properties view. The link's full location path is displayed in the Links tab, including the name of the target slot.

This view is a dynamic one, and it is updated constantly by downloading data directly from the device.

The figure below shows the component selected in the Wire Sheet view. The Object Properties window has instantly shown all its links in the Links tab.

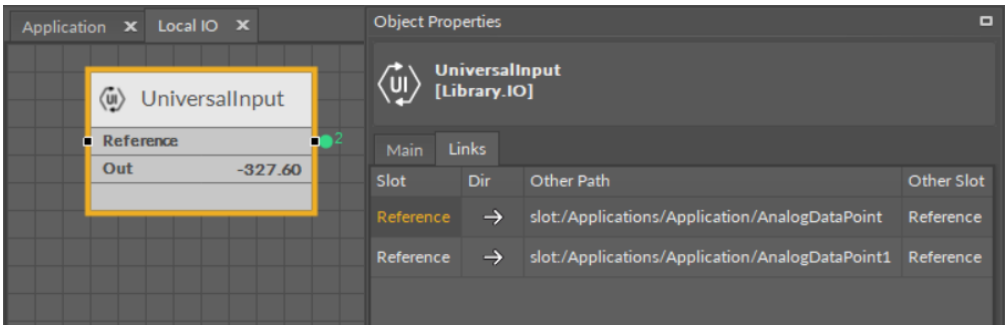

Figure 43. The Links Tab

Each link in the Link tab has the context menu available with the following options:

- Go to link: go to the Wire Sheet tab of the parent of the target component;
- Go to component: go to the Property Sheet tab of the target component;
- Delete link: remove a chosen link.

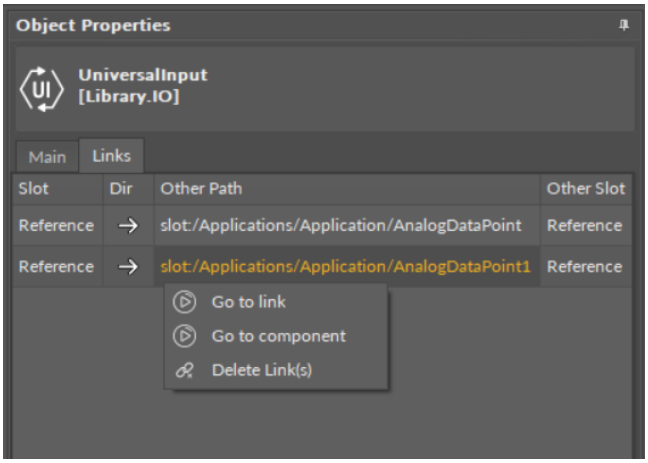

Figure 44. The context menu in the Links Tab

6.6.4 Object Properties in Developer Mode

The Object Properties window may provide advanced data such as a component ID, version of a component's library, and other technical data useful to an advanced user. These data are available in the Info tab, which appears in the Object Properties window after switching on the Developer Mode in the iC Tool settings. To switch on the Developer Mode, go to the main menu File > Settings; the Developer Mode is switched on by toggling in the Settings window.

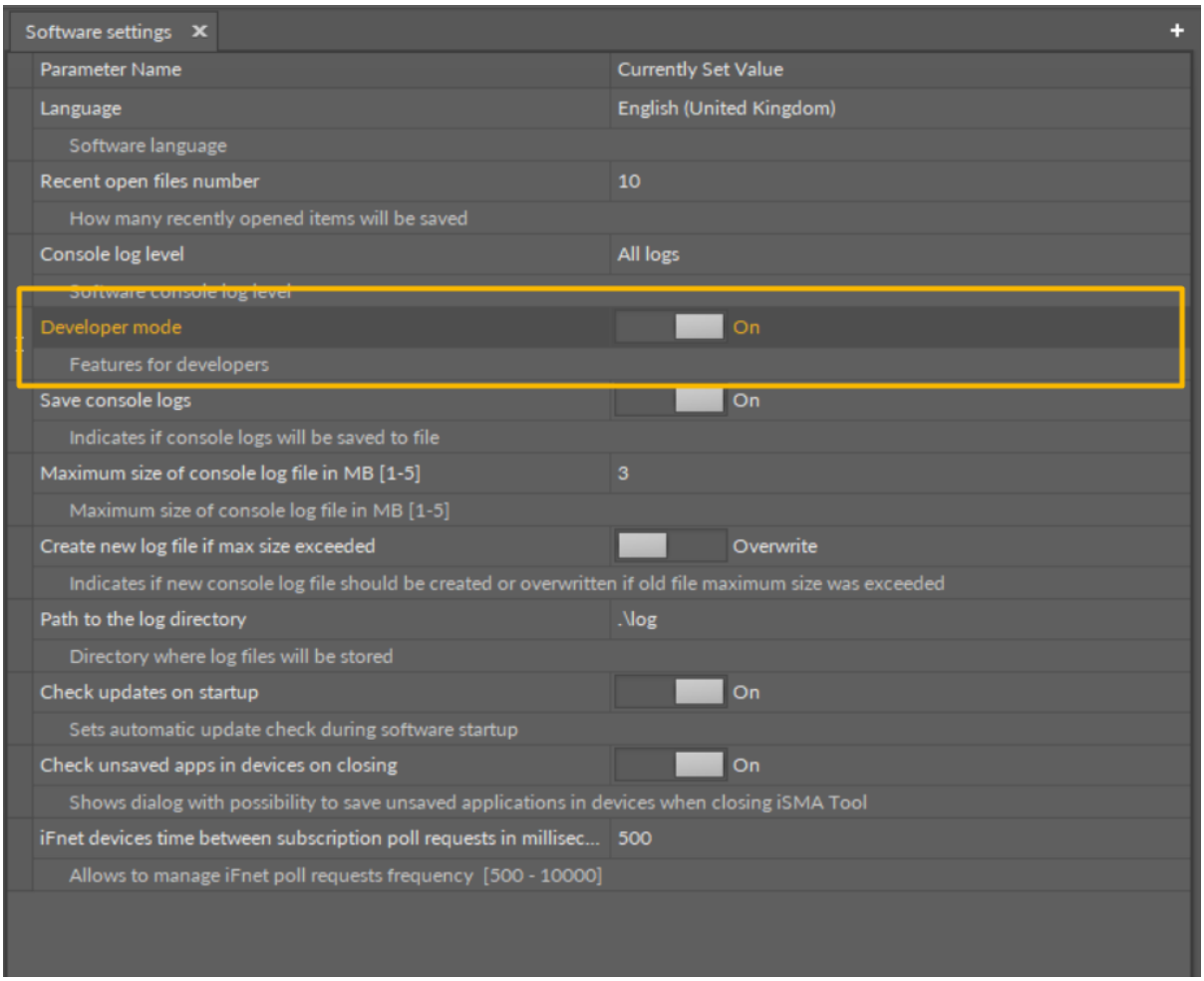

Figure 45. Turning on the Developer Mode

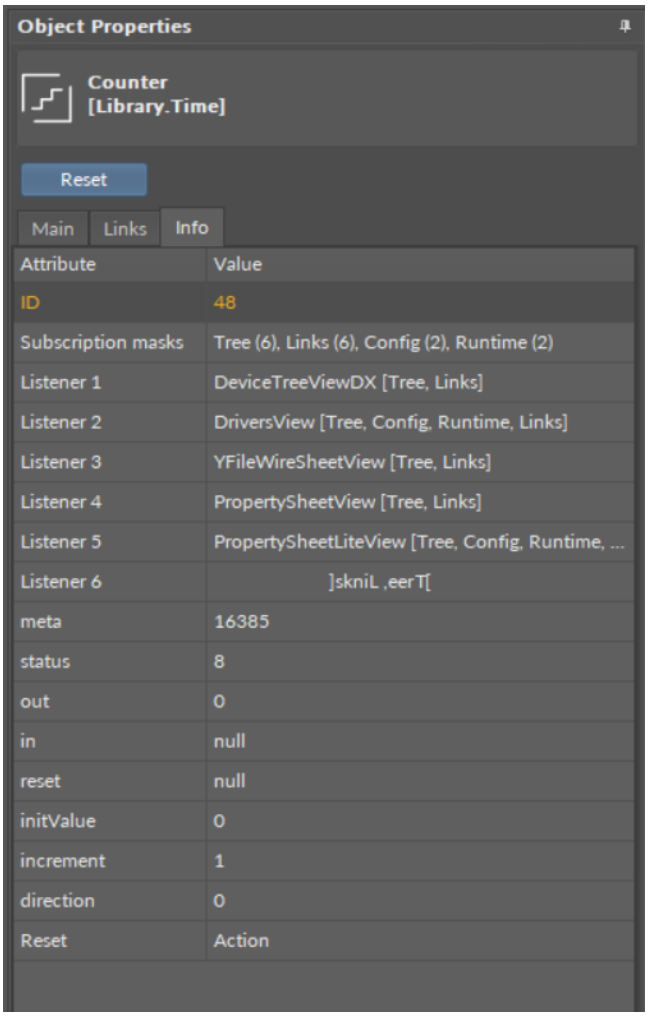

Figure 46. The Info tab in the Object Properties window

6.7 Console and Logs

The Console is a window where the iC Tool informs the user about the application status and its operations. By default, the Console window is minimized. It is accessible as an expandable tab in the bottom left corner of the iC Tool.

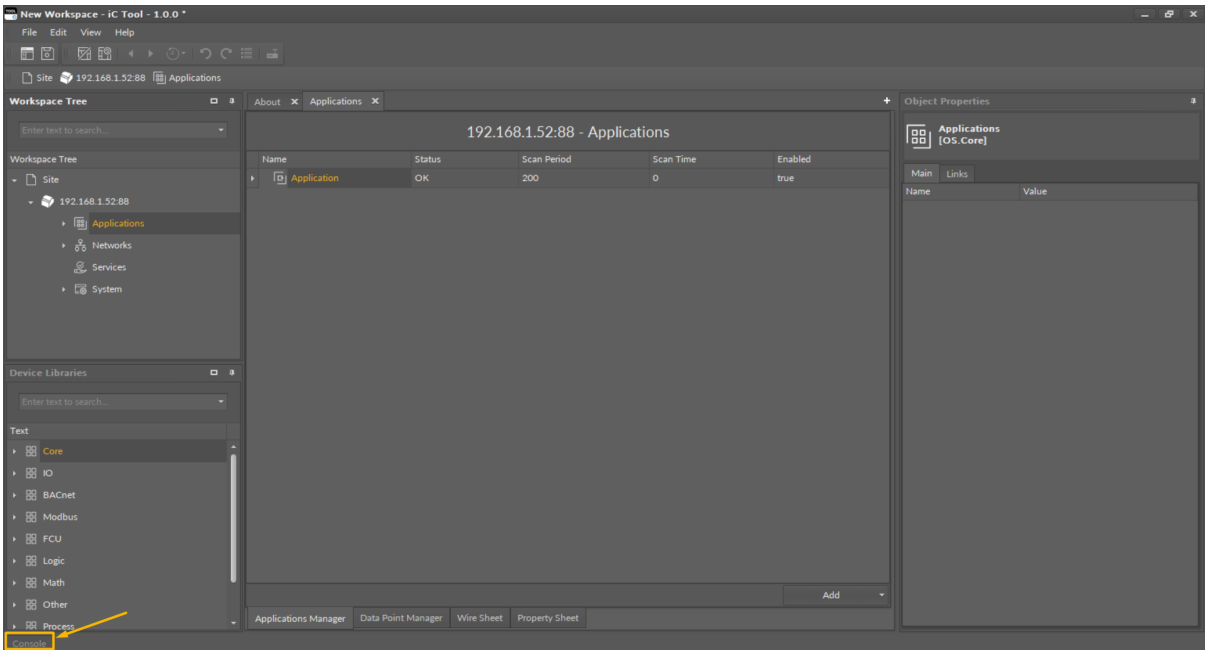

Figure 47. Accessing console in the bottom left corner of the view

While performing user's tasks or processes such as object removal or establishing connection with a controller, the Console window shows the logs of what is being performed at the moment.

The basic concept in the iC Tool is that the Console shows all detailed messages, while only some of them are additionally displayed as a pop-up window.

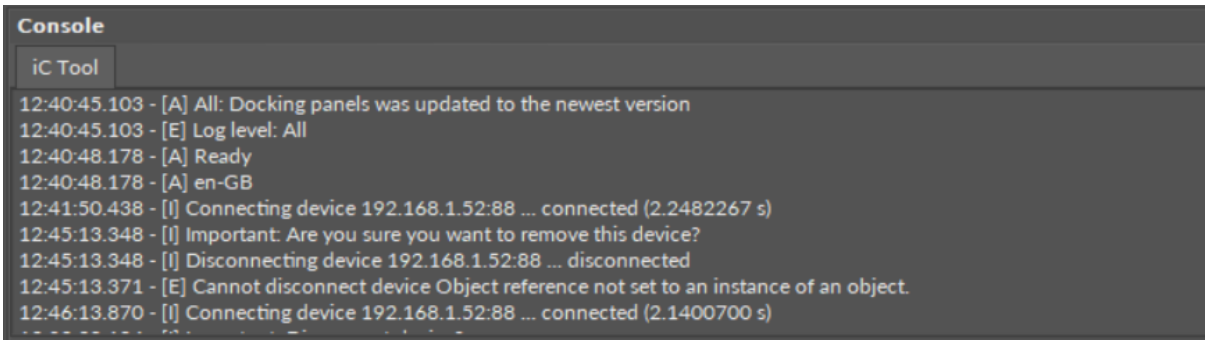

Figure 48. The Console view

The Console window contents are automatically saved in the log file to store the information for a longer period of time. It is therefore possible to open the log file for a later analysis using any text editor. The log files are by default saved in the log folder. Both the name of the folder for saving logs and its location may be changed by defining a path in the Settings (see the description further in this section).

The iC Tool allows to define the size of a single log file, as well as the course of conduct after exceeding the maximum log file size. The file size may be from 1 MB to 5 MB (by default it is 3 MB), and there are two possible courses of conduct after exceeding the maximum log file size:

- creating a new log file and keeping previous files;
- complete wiping of the actual log file and start recording again.

The above settings can be modified in the Software settings in the main menu File -> Settings.

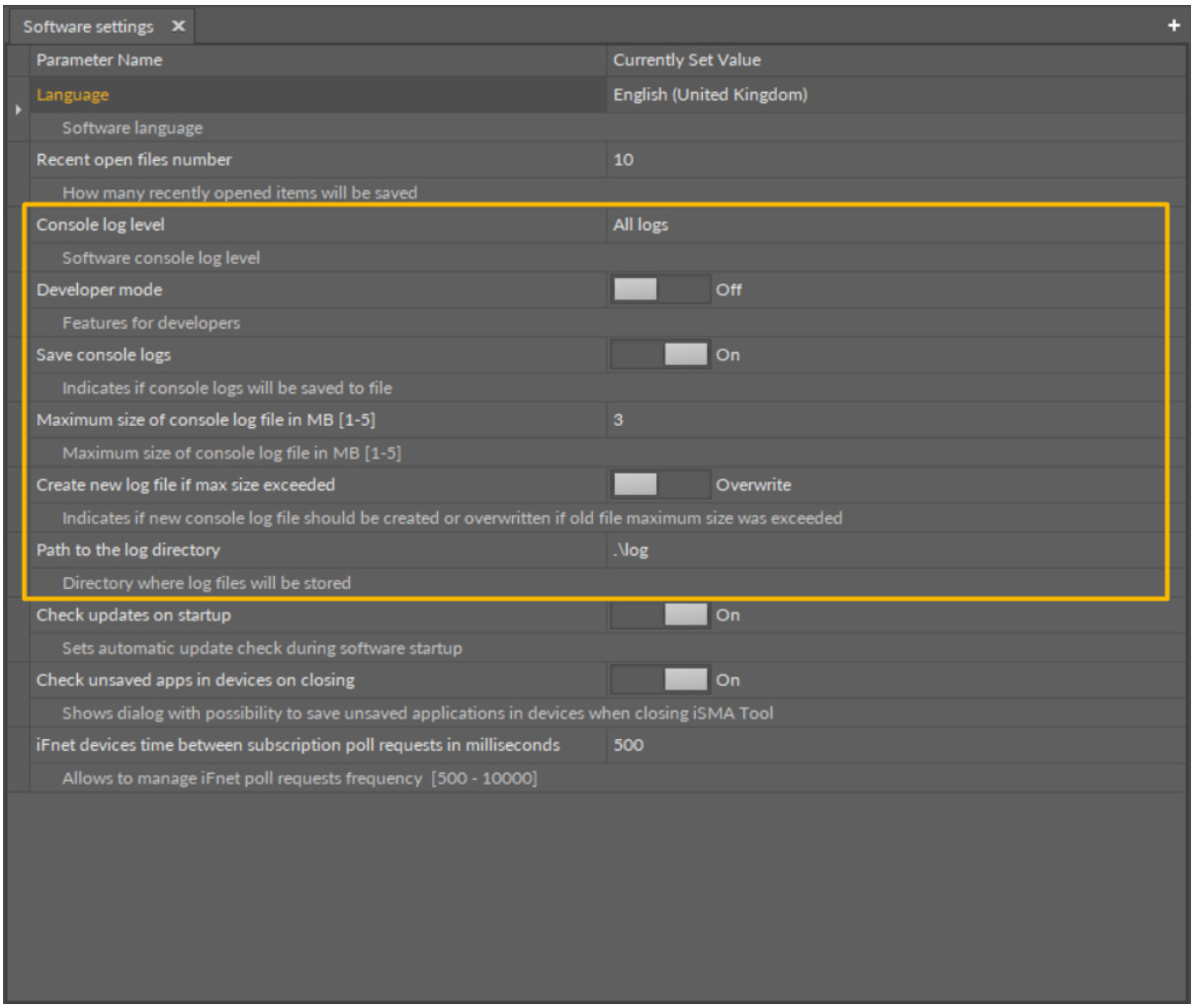

Figure 49. The available Console and logs settings

All settings applicable to logs and the Console window are the following:

- Console log level: a filter defining a kind of logs to be displayed in the Console window (the listed options provide the same result as given by the letter filter, D, A, I, and E, available at the bottom of the Console window);
- Developer mode: allows hiding/showing of the D filter–Debug button in the Console window;
- Save console logs: turns on/off recording of the log to a file saved on a hard drive;
- Maximum size of console logs file: defines the maximum size of the log file;
- Create new log file if max size exceeded: a switch defining how the system acts after exceeding the maximum log file size;
- Path to the log directory: allows defining of the log file saving location.

6.7.1 iC Tool Log Viewer

The iC Tool allows to view its log file saved on the hard drive. To see the iC Tool logs, go to the main menu, click the View option, and then the Log Viewer option.

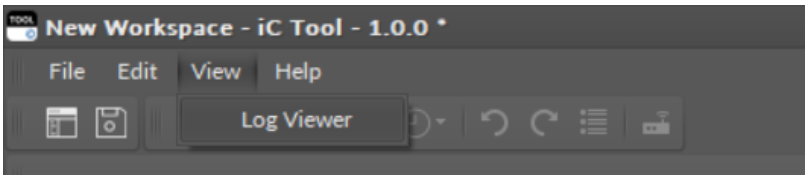

Figure 50. Accessing the Log Viewer

The Log Viewer opens in the Main screen. Once the listed log file is double-clicked, it is opened in a default .txt program.

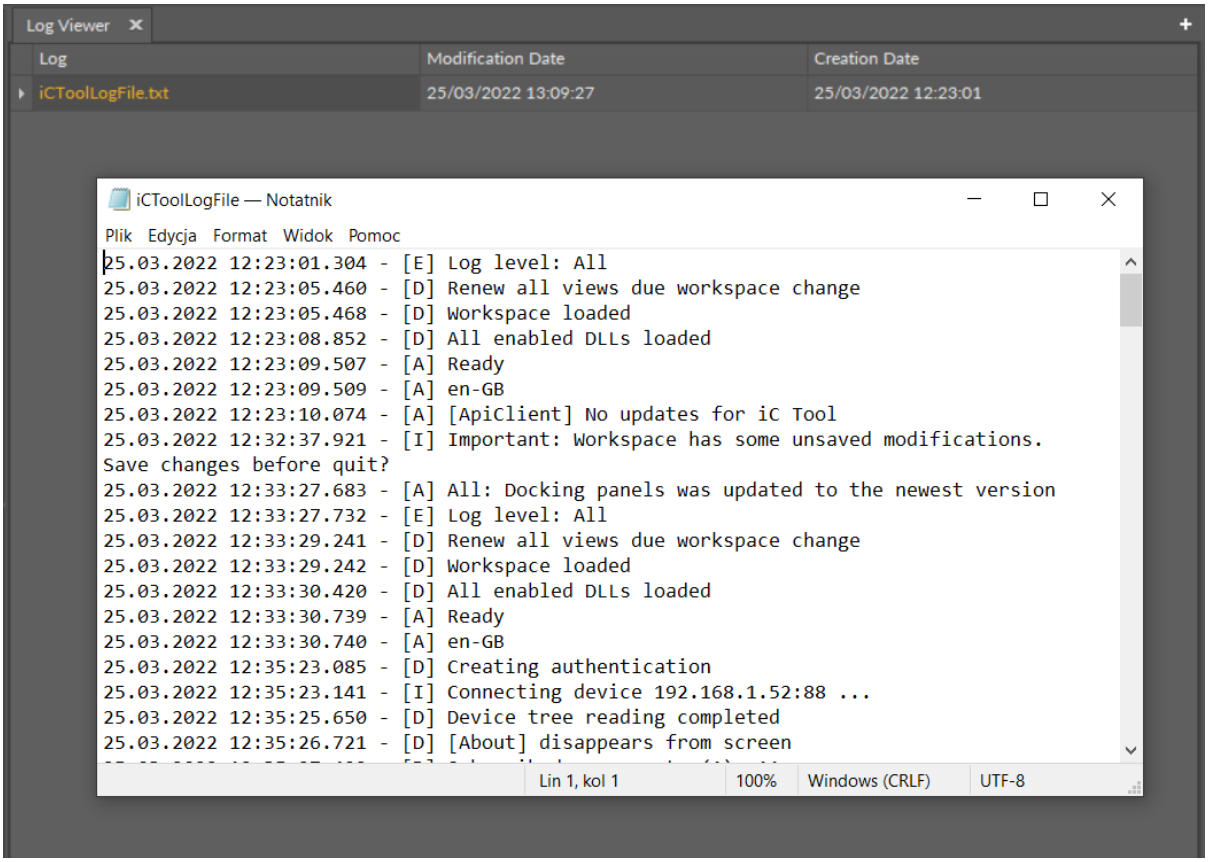

Figure 51. The iSMA Tool logs file

7 Single Device Functions

The iC Tool offers many functions for handling of components such as copying, duplication, removing, linking, performing actions, etc.

The functionalities described in this section are global, they apply in the following views: the Wire Sheet, Property Sheet, and Workspace Tree window. Individual operation of global functions, separately for each standard view, is described in section Standard Views.

7.1 Context Menu

A basic way of initiating global functions is using a context menu opened on the components of interest.

The context menu is displayed after selecting a component or link and right-clicking it.

The context menu content depends on the type of object, which has been selected. The menu's content will be different for one component or link, different after selecting many components or many links, and different when components and links are selected together at the same time.

If using one of the options in the menu is impossible for what the user has selected, this option will be inactive.

The options available in the context menu for a component are the following:

- Add: allows to add a component (Analog Data Point, Binary Data Point, Equipment, or Folder) in the Applications container (option inactive in other containers);
- Views: allows to display component's data in one of the defined standard views (Wire Sheet, Property Sheet), or in other views if they are available for a particular component;
- Actions: shows a list of actions that may be evoked for the given component (such as Override or Set actions);
- Copy: (shortcut Ctrl + C) remembering and copying of selected component along with all its properties, settings, and links information;
- Paste: (shortcut Ctrl + V) pasting of previously remembered component into a specific place and possible recreation of internal links;
- Paste Special: same as the Paste option, plus recreating of incoming external links, if possible;
- Duplicate: (shortcut Ctrl + D) duplication of selected components in the same location;
- Delete: (shortcut Del) removal of selected components;
- Link Mark: defining the component from which a link will be led;
- Link From: defining the component to which a link will be led;
- Add extension: allows to add an available extension to a component (extensions are available for Analog and Binary Data Points);
- Remove extension: removes an extension from an Analog or Binary Data Point;
- Rename: changing a component's name;
- Show help: opens a help online web page for a selected component.

The figure below shows the context menu, which appears after right-clicking a single component. Options Paste and Paste Special are inactive because a Copy option has not been used. Similarly, Link From option is inactive because the source component for a link has not been defined by a Link Mark option.

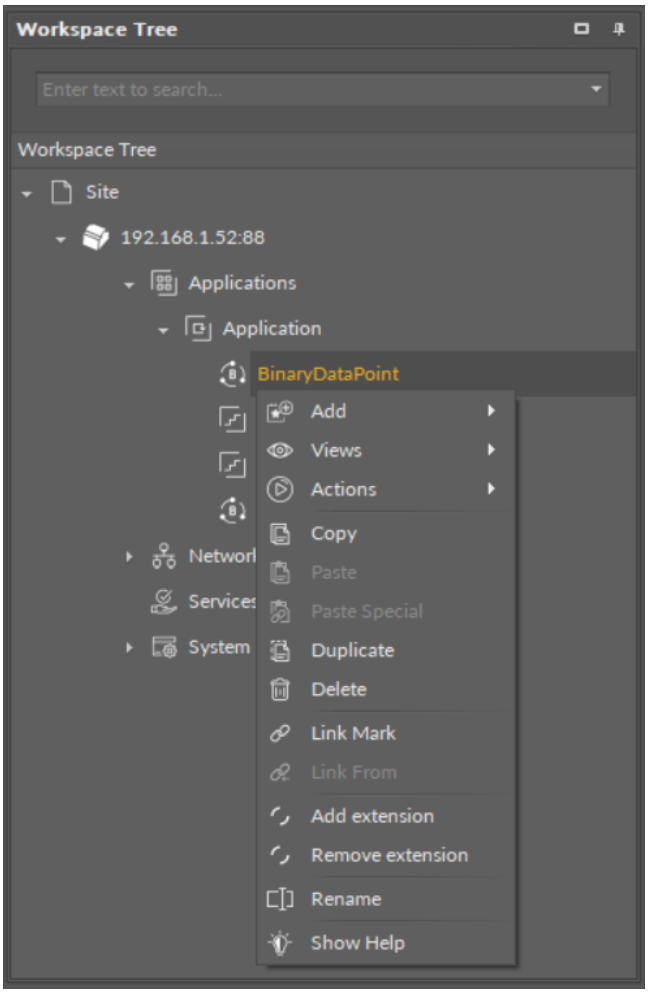

Figure 52. The context menu of a single component

For links, the context menu appears after right-clicking a link. Apart from removing it, no other operation can be performed on a link.

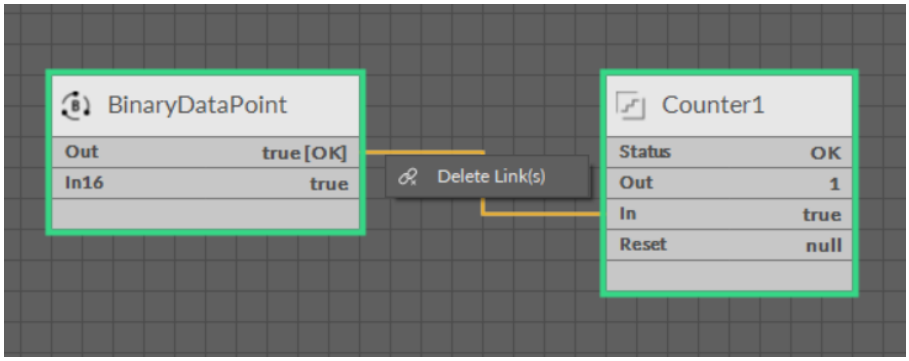

Figure 53. The context menu of a link

After selecting many components or mixed objects (component with link) most of the options are inactive because the iC Tool cannot perform operations on many objects simultaneously. Options available in this case will be Copy, Duplicate, and Delete, which will be performed on all selected objects.

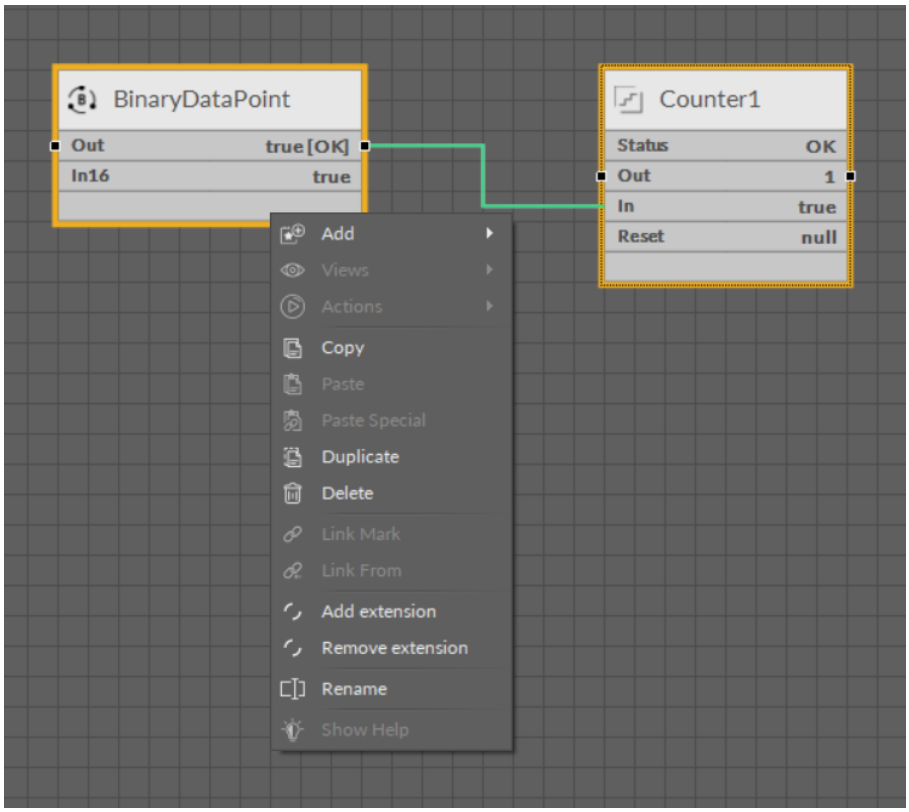

Figure 54. The context menu of multiple components

7.2 Component

A component is the smallest logical and functional unit that requires entering specific data to perform properly.

The component may be, for example, an arithmetic function of adding two numbers, therefore, it requires information about the numbers to be added. These data may be provided, for example, by other components able to read physical universal inputs of a controller, and transfer numeric data to be added.

In various iC Tool views the component is presented differently, showing various information, as depicted on the figures below. In the Wire Sheet view the component is shown as a rectangle with a limited amount of data dislayed, and in the Property Sheet view it is a table which lists all component's slots. Some of the slots in the table may be edited directly. More about the Property Sheet view and the Wire Sheet view may be found in the section Standard Views.

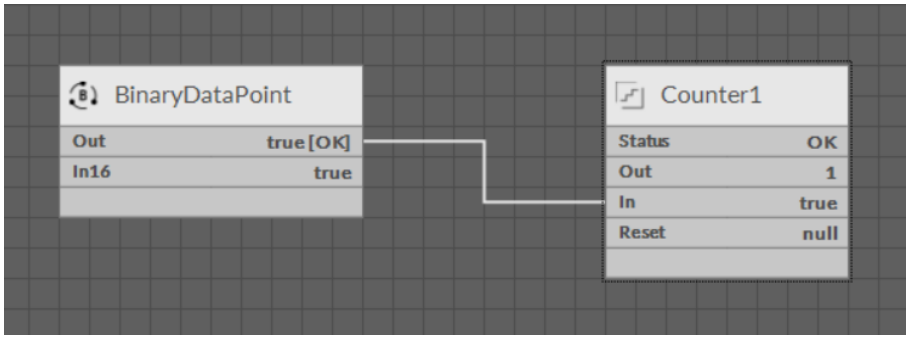

Figure 55. Components view in the Wire Sheet

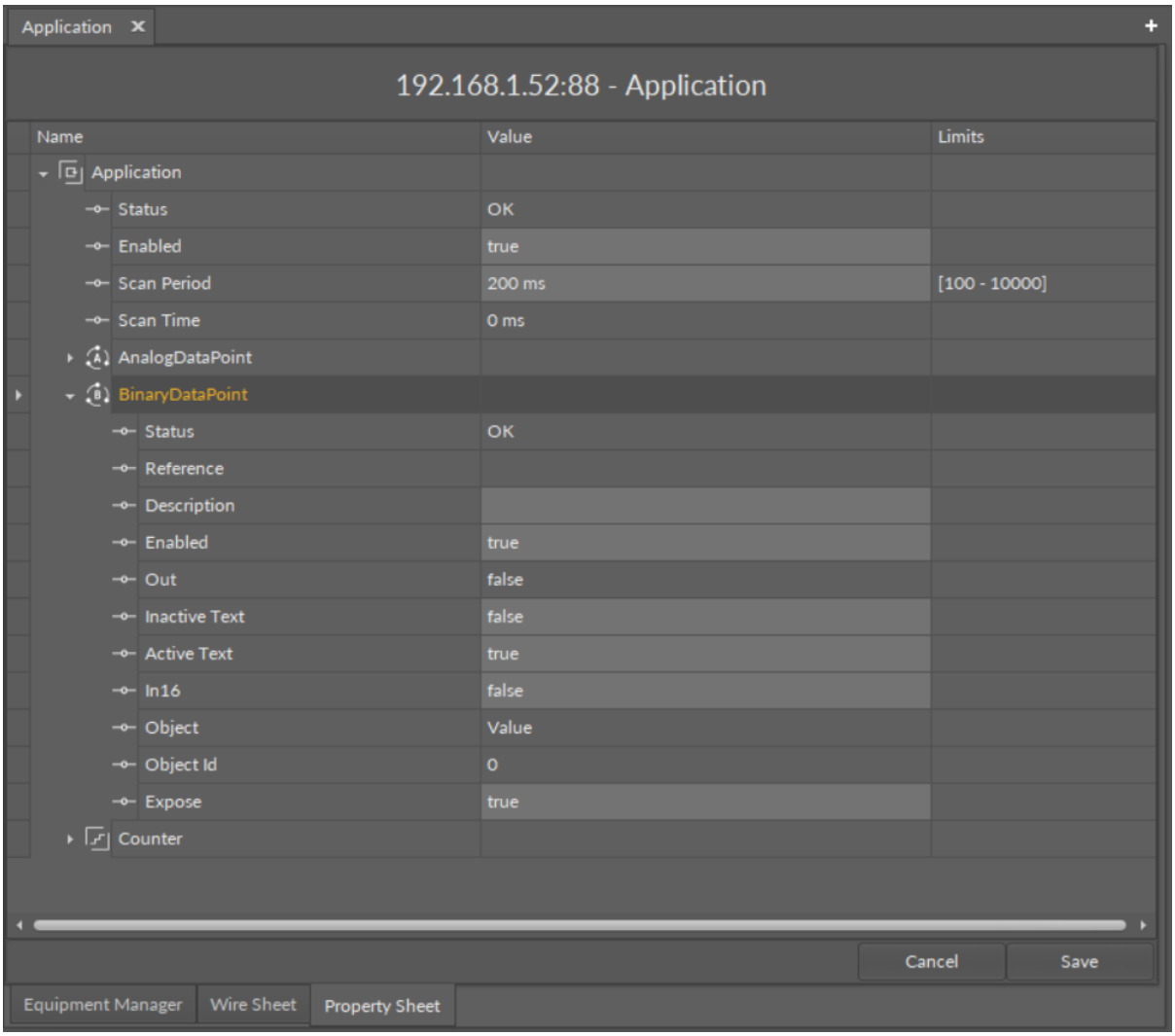

Figure 56. Component's view in the Property Sheet

The component is the main element of application created in a device. Therefore the iC Tool guarantees a standardized way of issuing commands to components. Regardless of whether the component is shown in the Wire Sheet view, Property Sheet view, or Workspace Tree window, operations are performed on it in the same way.

7.2.1 Components' Hierarchy

Components may be organized into a hierarchy tree. The component, which has other components below, it is called a superior, and the elements below it–inferior. Hierarchy allows to organize components logically, making some components dependent on others.

In the iC Tool, hierarchy is presented in the Workspace Tree window and on the Property Sheet view as a tree, showing superior elements together with their inferior components placed underneath.

Importantly, the components' hierarchy on the Wire Sheet view is limited to one generation. After opening a superior component, the Wire Sheet view shows a schematic with all the inferior components distributed in the view. The figure below shows an opened superior component, LocalIO, with its inferior components, in the Property Sheet view and in the Wire Sheet view.

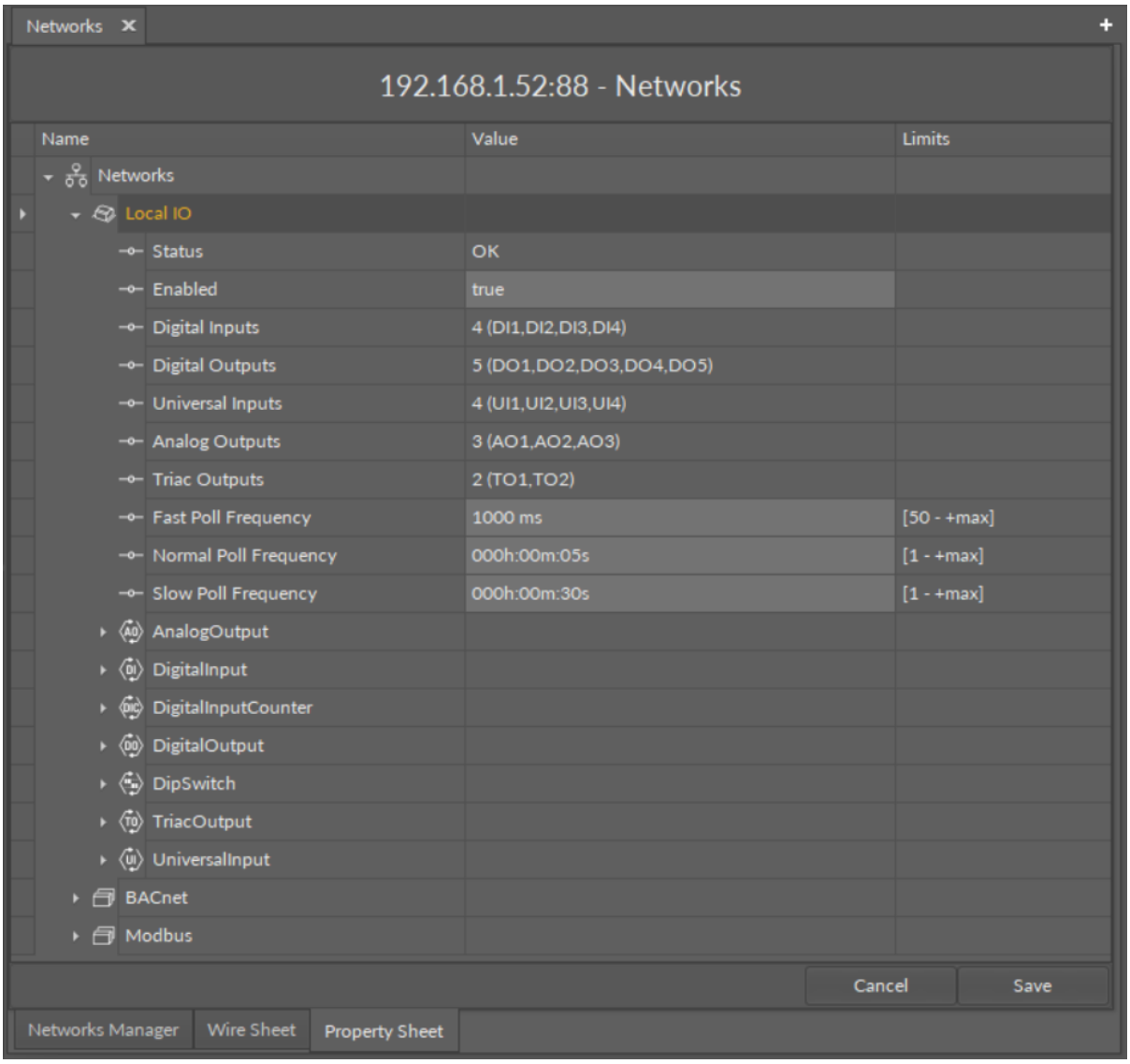

Figure 57. Components' hierarchy in the Property Sheet

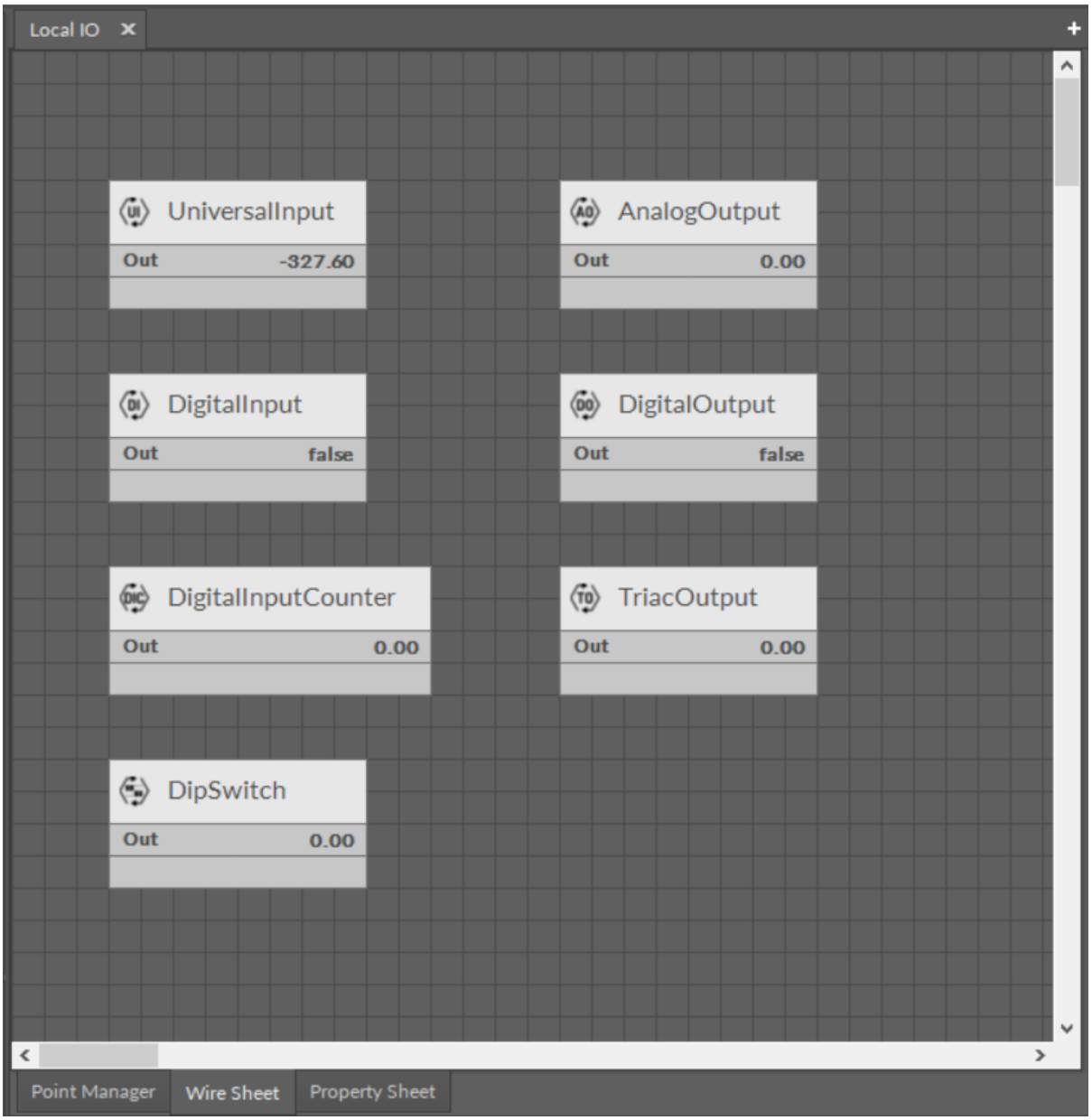

Figure 58. Component's hierarchy in the Wire Sheet

7.2.2 Adding New Component

New components can be added in three windows: the Workspace Tree, Wire Sheet, and Property Sheet. New component is created by:

- duplicating the existing component (using Copy or Duplicate function);
- dragging a new component directly from the Device Libraries window.

The name of the new component is given automatically; however, it can be changed manually by the user. It is possible to bulk add components of the same type by indicating a number of components to add along with a naming pattern in the dialog box (see more in Renaming Components). If several components of different types are added at the same time, the iC Tool will generate unique names to all the components added automatically.

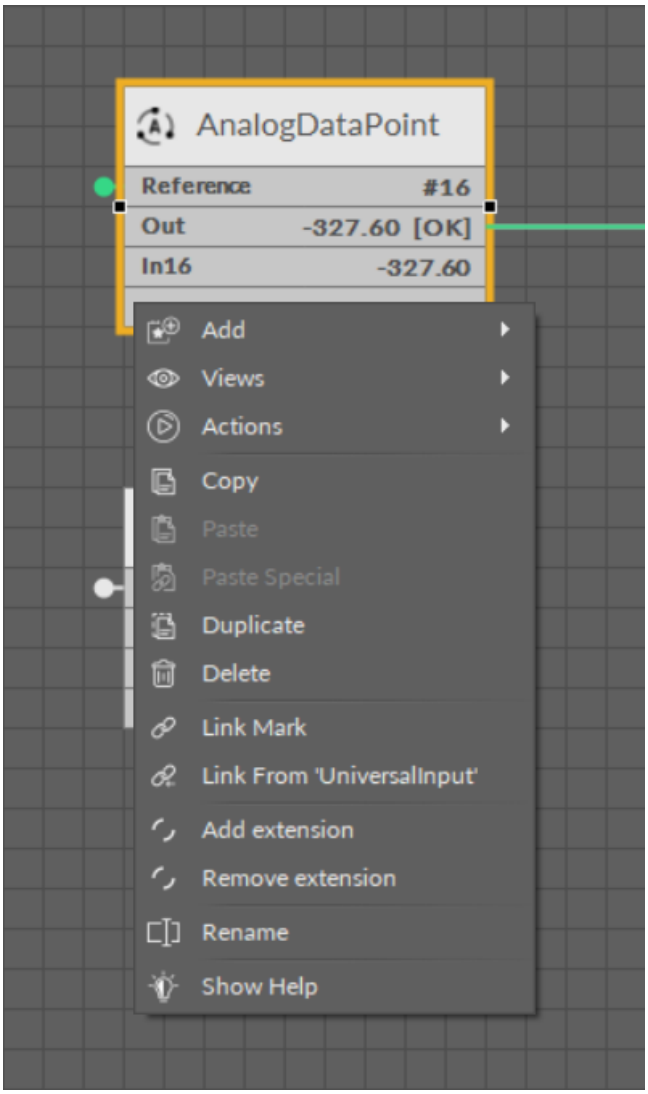

Figure 59. Adding new components - copying/duplicating

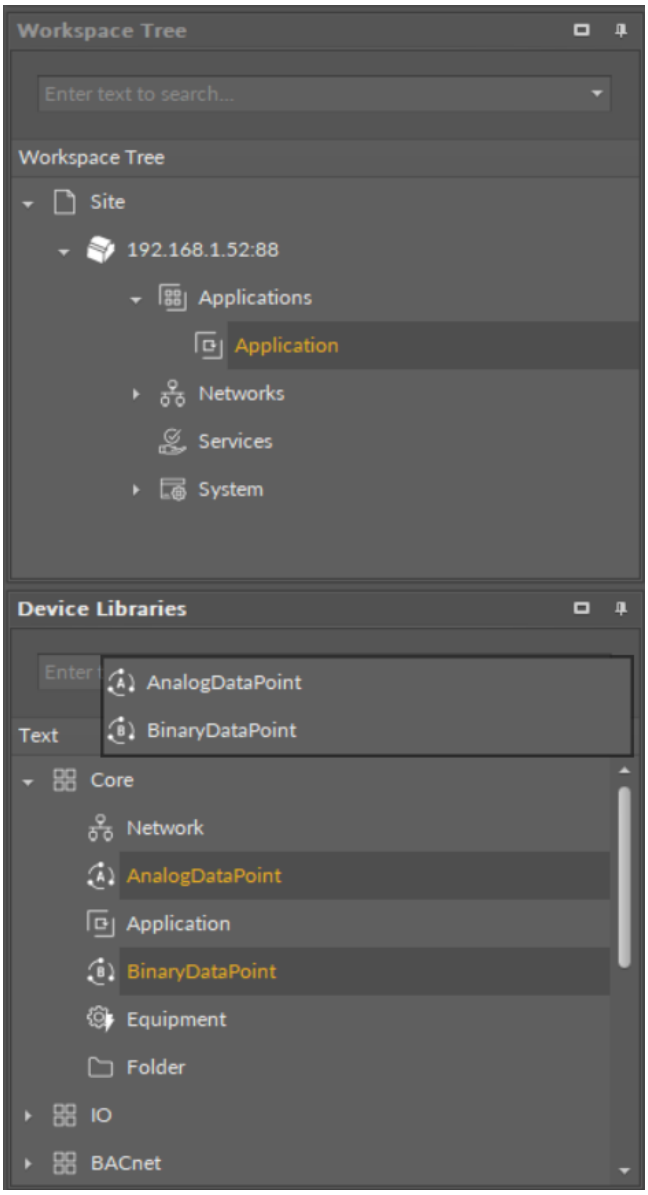

Figure 60. Adding new components - dragging

Special Adding of Data Points and Folders

The Workspace Tree window, the Wire Sheet and Property Sheet views offer a special way of adding Data Points and folders (the Folder and Equipment components) to the Application, simply from the context menu. In order to add components this way, right-click in an empty space of the Wire Sheet grid or Property Sheet and choose the Add option from the context menu. In the Workspace Tree special adding of Data Points and folders is available in the context menu of the Application component.

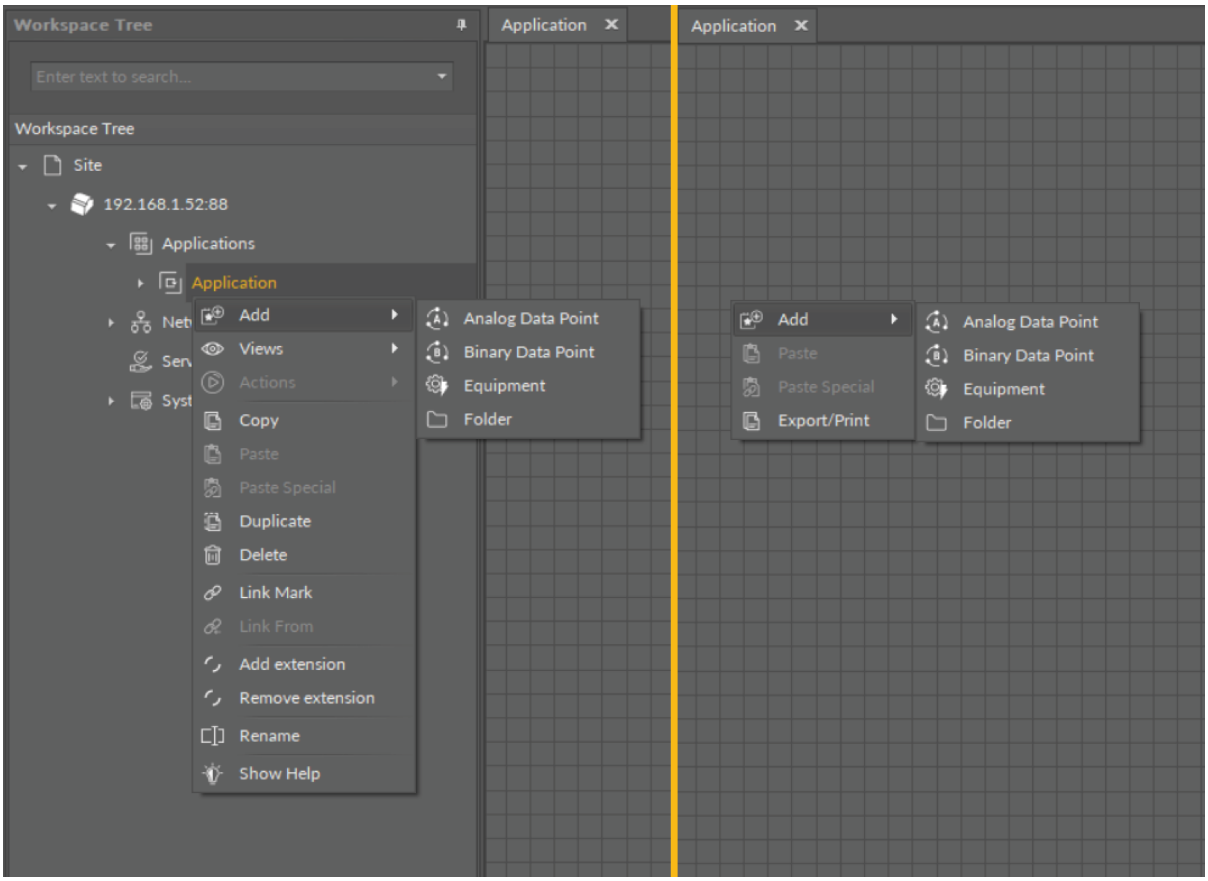

Figure 61. Adding Data Points/folders from the context menu

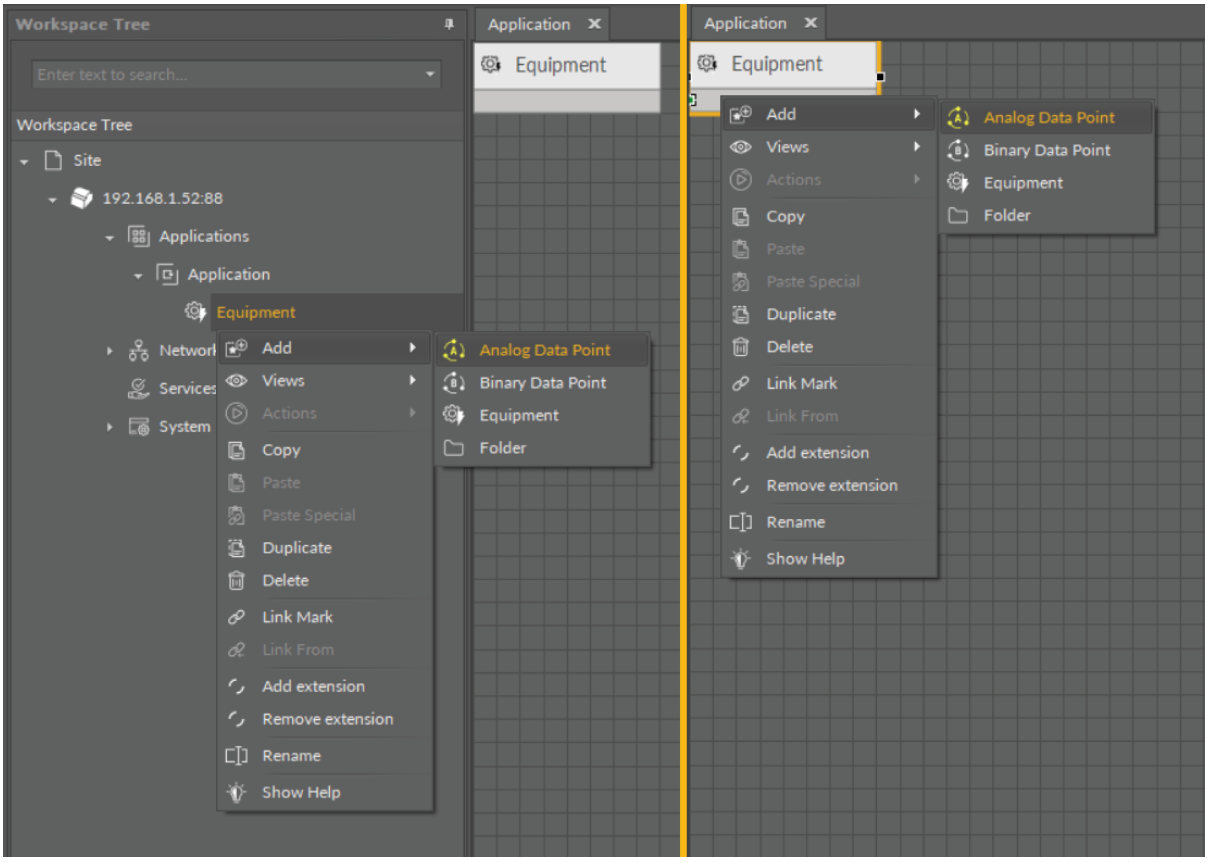

Figure 62. Adding Data Points to folders from the context menu

7.2.3 Copying, Pasting, and Duplication

Copying

Copying in the iC Tool uses a standard Windows clipboard and may take place within the limits of one device. Copying always includes all the inferior components of the selected component.

Copying in the iC Tool requires to identify components to be copied by selecting them. When a Copy option or Ctrl+C combination is used, the elements are saved to the Windows clipboard. This allows the Paste option to be used in any moment in the future until the next element is copied, even after the components, which were copied, were deleted because the iC Tool automatically recreates the copied structure by recreating the needed components remembered in the clipboard.

Copying includes all the links created between the copied components. This means that while pasting the links between these components will be recreated. The situation is different for external links (links to components placed under a different parent/superior component). A basic Paste function does not support the recreation of external links, this needs the Paste Special function described in the following point.

Worth to Notice:

The iC Tool allows copying only of components; copying and pasting of links alone is impossible. Information about all component's links is stored in the component itself. It means that if a component is copied and pasted, and there is a possibility to recreate its links from a logical point of view, the iC Tool will do it automatically, adding new links between components.

Pasting

Copied components may be pasted into a chosen place in the Wire Sheet or Property Sheet views or in the Workspace Tree window, by indicating the pasting place and pressing Ctrl+V, or using the Paste option from the context menu.

Pasting copied components creates new components along with their inferior components and slot settings effective at the moment of copying. The pasted slot values are sourced from the copied component.

Pasting function can be used many times because pasting does not erase the clipboard. The clipboard is wiped after device disconnection.

When pasting a single component, the system will ask for a new component's name (with a highlighted name suggestion and support for bulk naming patterns, see Renaming Components) and number of copies to paste, and for a multi-component operation the iC Tool will use a mechanism ensuring that the names will be unique.

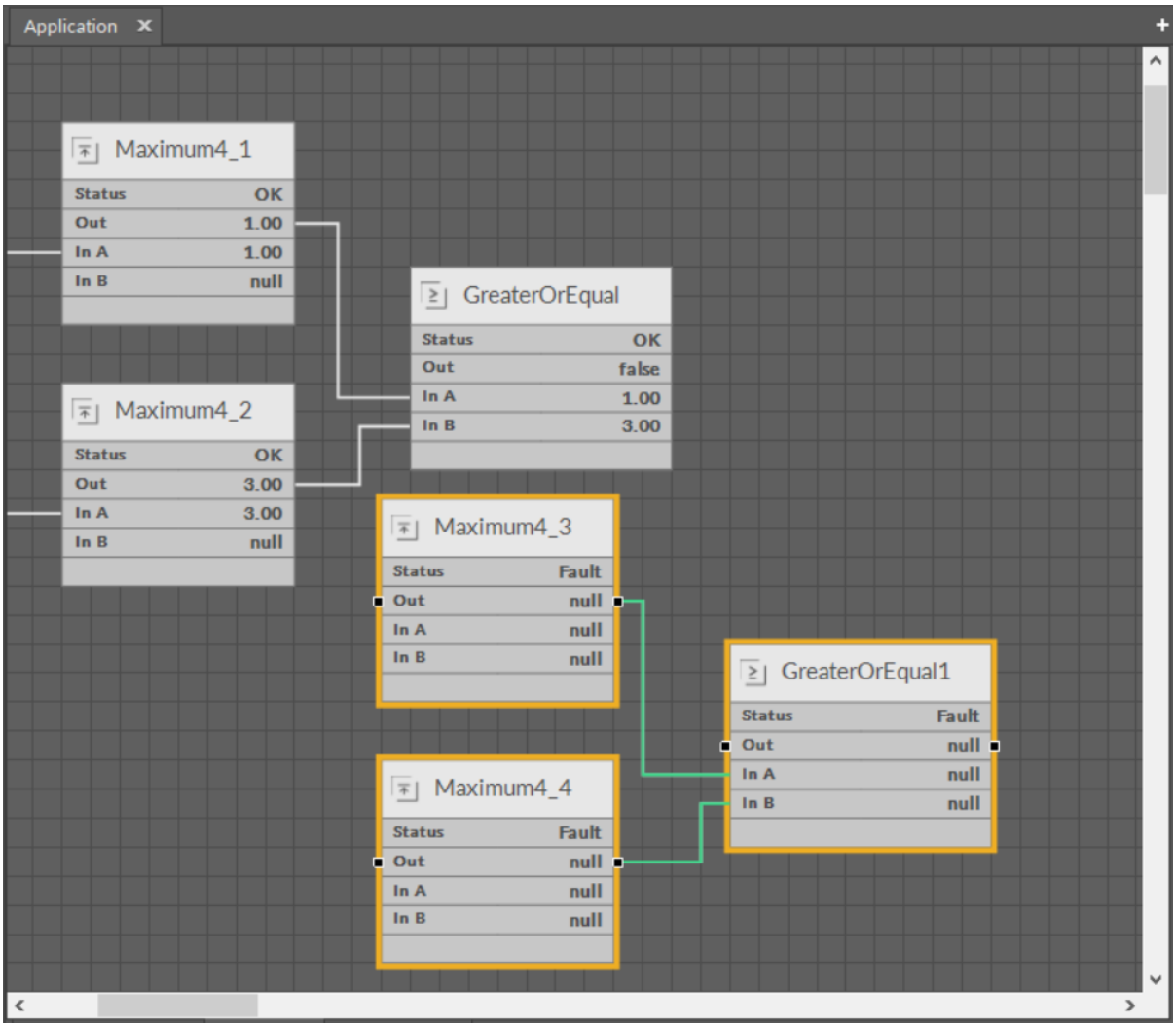

Figure 63. Copied and pasted components

Special Pasting

An expanded version of the Paste function is called Paste Special (available in the context menu); its aim is to recreate external links for copied components.

External links will be recreated only if all the below requirements are met:

- using the Paste Special, not the Paste command from the context menu;
- components copied to the clipboard have external input links;
- an external component, which an external input link is recreated for, still exists.

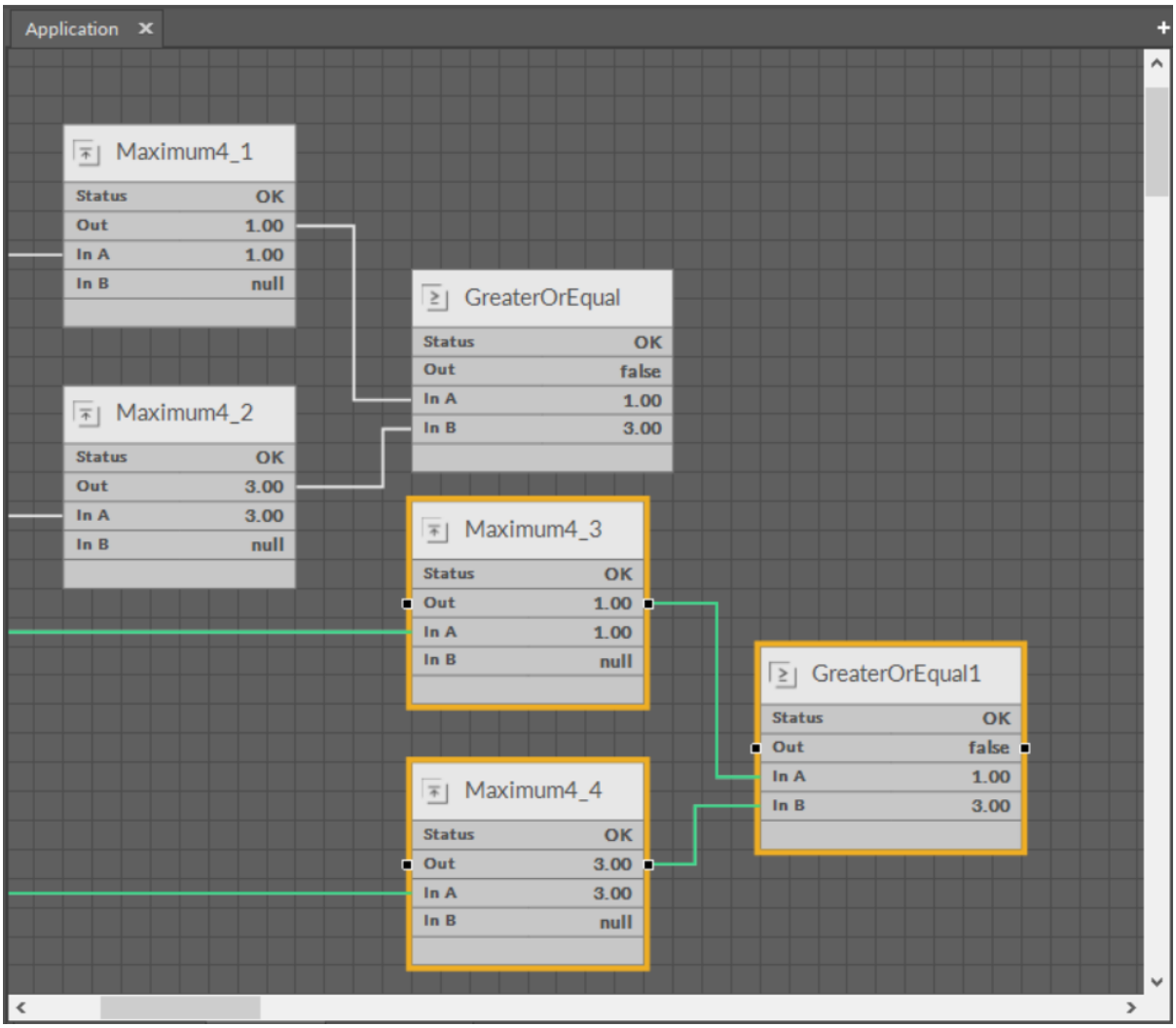

Figure 64. Special pasted component

Duplication

A Duplication method is used for a quick replication of a selected component along with its values. The slot values for the duplicated component are rewritten from the source component.

Additionally, the duplication does not disturb what was copied by using Copy and Paste functions, i.e., it does not overwrite what is contained in the clipboard.

Duplication can be performed by key combination Ctrl+D or from the context menu function.

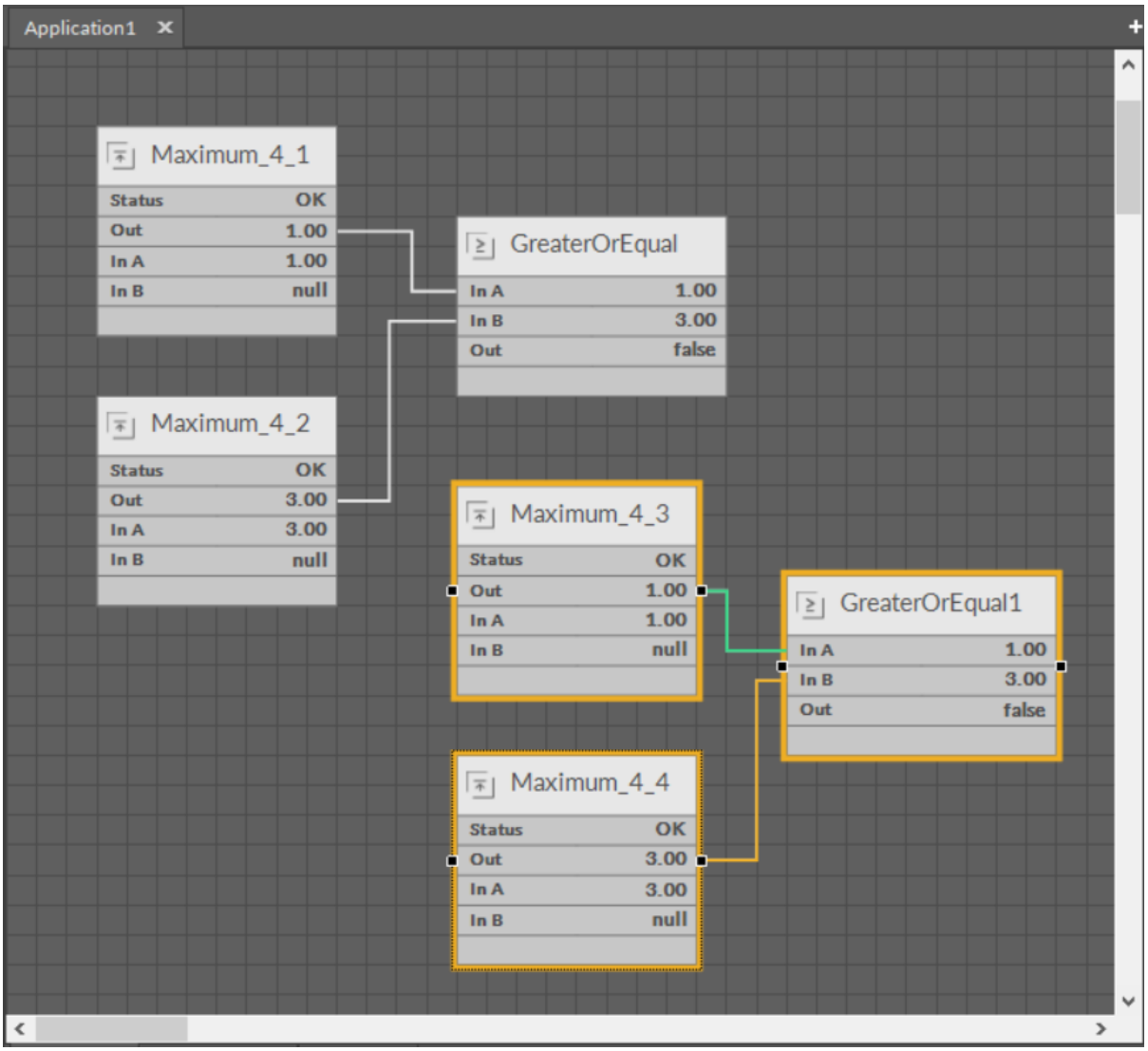

Figure 65. Duplicated component

7.2.4 Linking Components

A link is a way of exchanging data between components. It connects components between which the data are transferred. The link identifies, which parameter is taken into account on both sides of the connection. This allows to show the data flow direction, i.e., where a specific parameter is read and where it is saved.

The Wire Sheet view shows the link as a line connecting two components. The Workspace Tree window and the Property Sheet view do not show information about existing links at all.

Views designed to check links for a specific component are the Wire Sheet view and the Links tab in the Object Properties window.

Linking in the iC Tool may be performed in two ways:

- Reference linking (described in details below), and
- Standard linking method, which involves simple creating links between the input and output slots; a standard link will transfer a value between the connected slots. Standard linking may be applied between all four containers of the nano EDGE ENGINE device structure.

The Reference linking method is unique for the nano EDGE ENGINE devices. Is it designed to link Data Points with network points, and it offers much more advantage than the standard linking method.

The **Reference link** is a special compound link designed to connect Data Points with network points. The Reference link is created between special Reference slots and transfers values along with the component's status. Alternatively, it may transfer values between Data Points and network points at the same time returning status from network points to Data Points, or it may return values from network points to Data Points. As network points are situated in the Networks container and Data Points are situated in the Applications container, Reference links are created using the Link Mark and Link From options from the context menu, and they are created between the tabs (or, for example, between the Application tab and the network points expanded in the Workspace Tree window). Either way the Reference link between tabs is displayed in the Wire Sheet as a bubble connected to the component's Reference slot.

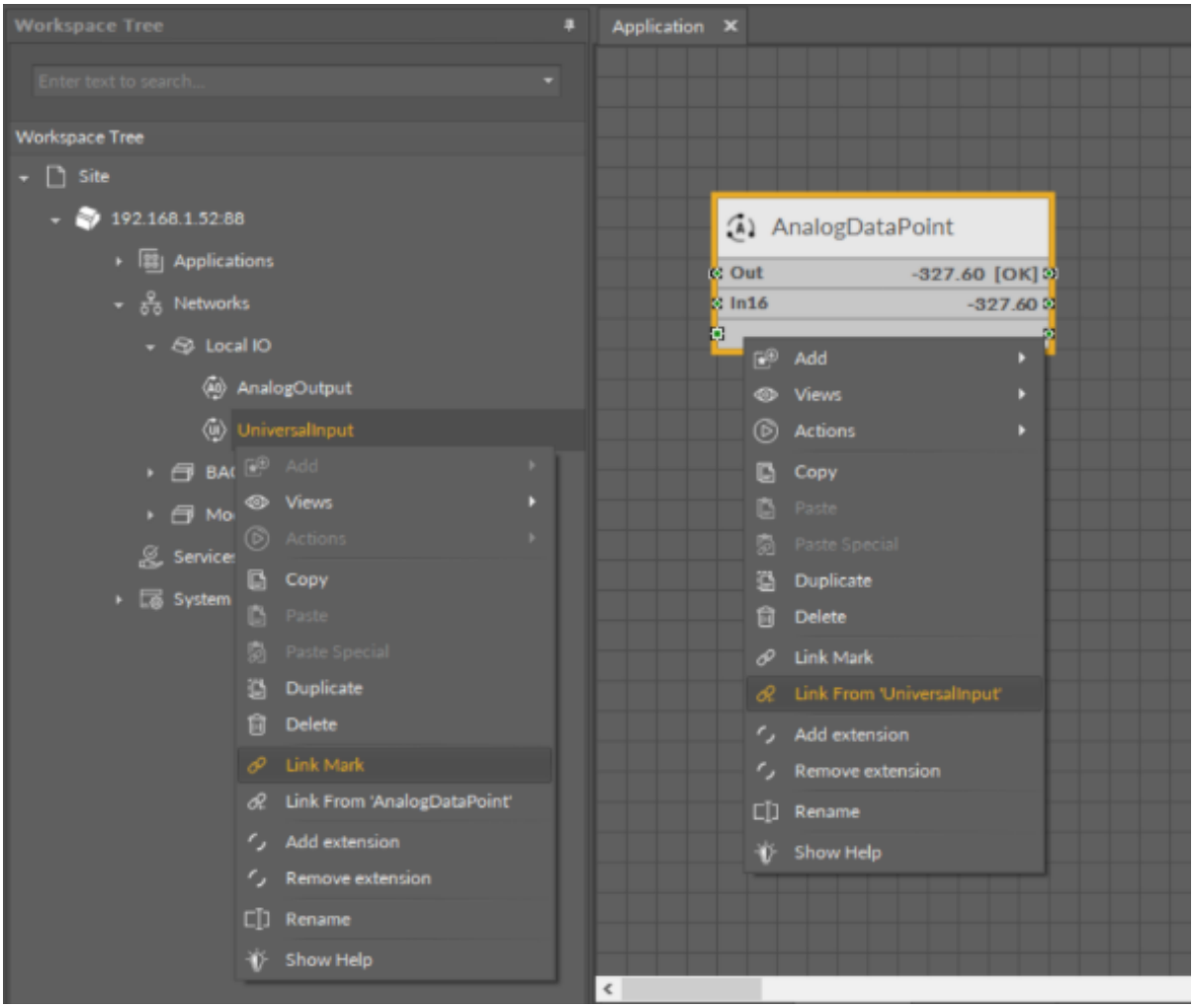

Figure 66. Link Mark-Link From options

The basic and exceptional feature of the Reference links is the fact that they are made to **transfer the value along with the component's status**. This feature gives a major advantage and translates to substantially enhanced functionality of linking. The fact of transferring the Status along with component's value is exceptionally important for the functionality of Data Points. Data Points are central elements in the nano EDGE ENGINE applications, and they represent values in applications on the Wire Sheet. Therefore,

displaying network point's status makes the Data Point much more informative, and allows to display this important information directly in the Wire Sheet.

Data Point and the Input-type Network Point Links

If the Data Point is linked with the input-type network point, the Reference link transfers the network point's value and status to the Data Point (if the Data Point has a priorities array extension added, there is also the option to set the Input Priority slot in the network point, which defines the input priority in the Data Point receiving the value from the network point). In this variant, the Reference link is unidirectional, and provides the information about the change of value and the network point's status.

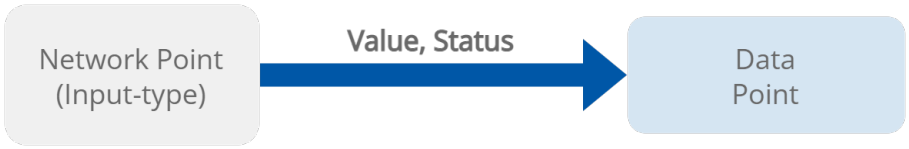

Figure 67. Data Point and the input-type network point links

If the Data Point is linked with the output-type network point (or network points), it offers even more advantages.

Data Point and the Output-type Network Point Links

- First of all, in such case the Reference link behaves **bidirectionally**. It transfers the value from the Data Point to the network point, and **in turn it informs whether the value has been correctly received by the network point by sending back the network point's status**. This hugely advantageous feature allows to instantly identify that at least one of the linked network points has gone into the fault status.

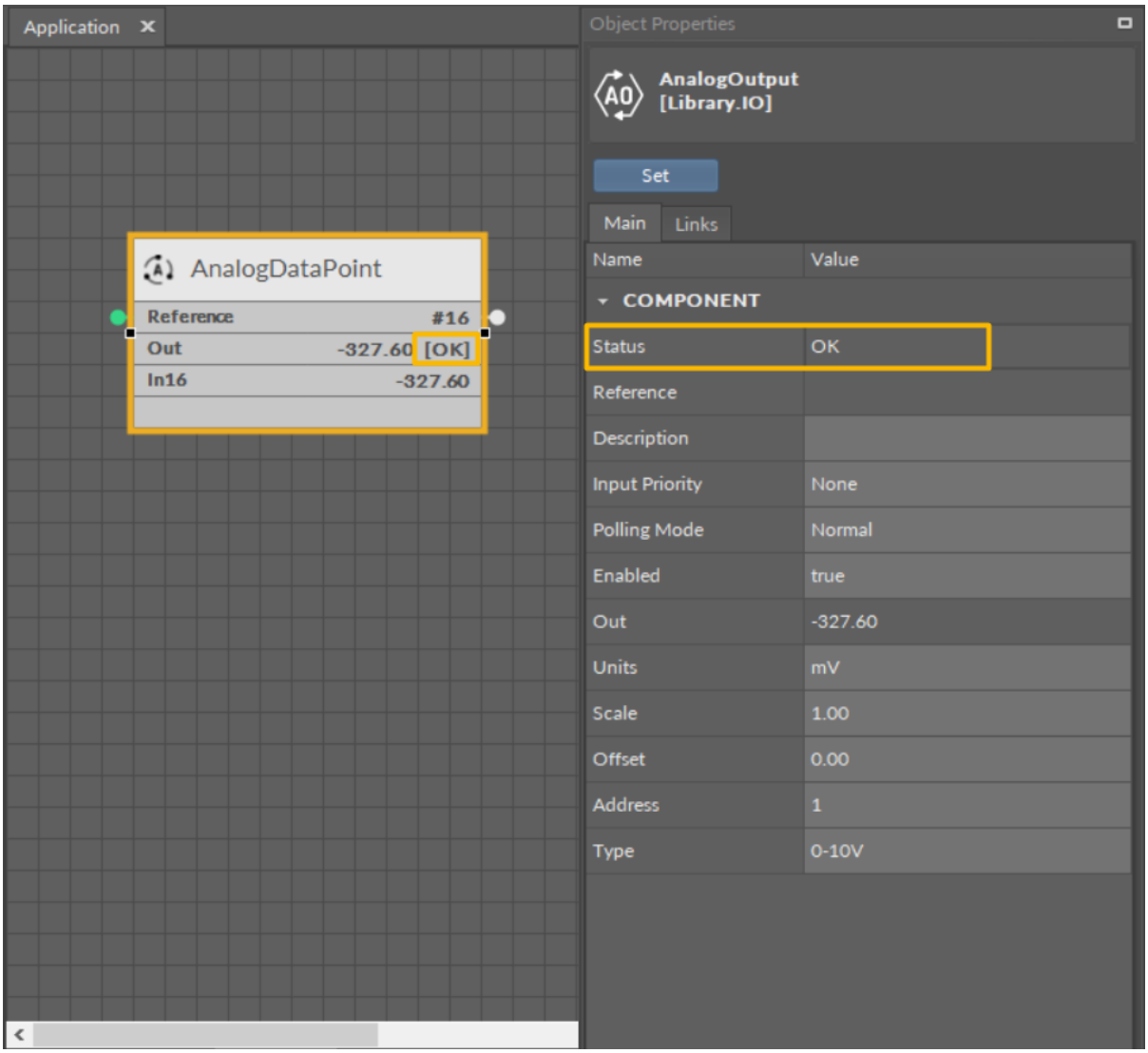

Figure 68. Output-type network point (status OK) referenced to the Data Point

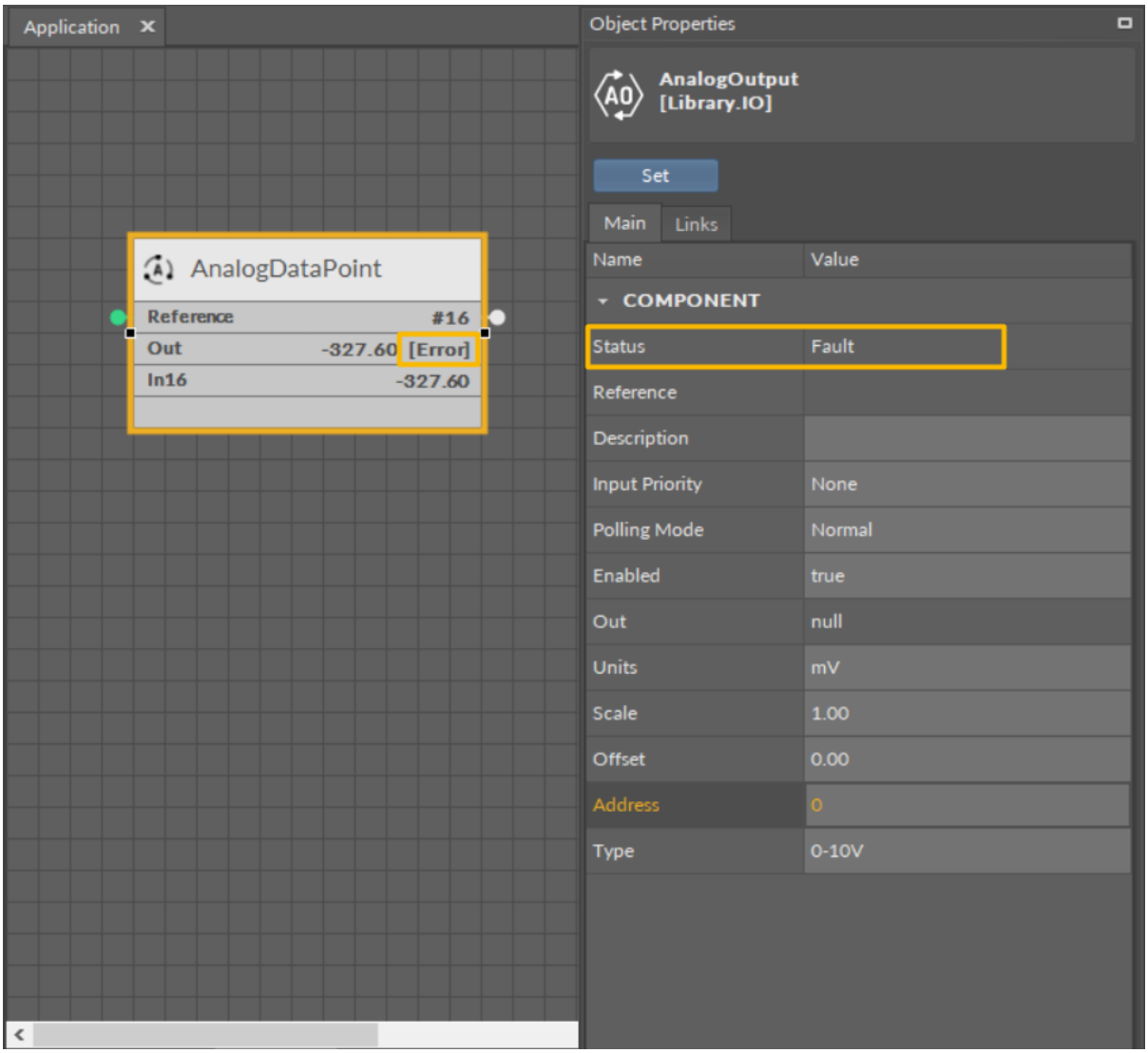

Figure 69. Output-type network point in the Fault status returning an Error status to the referenced Data Point

- Another innovative feature of the Reference linking is that the Reference link is able not only to return status from the network point but also to **return its value**. The network point's slot, Input Priority, is designed to identify the Data Point's priority, which the network point will transfer its value back to. For example, if the network point's Input Priority slot is set to In16, it will transfer its value back to the Data Point's 16th priority slot. In turn, if this value is the highest priority for the Data Point, it can distribute it to all network points linked with the Reference link. **This way, if there are more output-type network points linked with the Data Point, and one of them changes its value and sends it back to the Data Point, thanks to the bidirectional Reference link, the Data Point can synchronize values in all linked network points.**

Note: The difference between the two possible options for linking Data Points with output-type network points is derived from the network point's **Input Priority slot**. In the first scenario, the network point does not have the Input Priority set to any value, therefore, it cannot return a value back to the Data Point. In the second option, the network point has the Input Priority slot set and it reacts to the change of value–if the network point's value is changed, it is automatically sent back to the Data Point by the Reference link, and is updated on the defined input priority.

Priorities Array Extension

Setting the network point's Input Priority slot is effective providing that the Data Point has the priorities array extension added. The Data Point is available in its basic version with one input slot (In16), however, it can be expanded by another 15 writable input slots with the priorities array extension (available at the right-click on the Data Point). If the Data Point has 16 writable slots, setting the Input Priority slot in the network point defines the Data Point's input receiving the value from the output-type network point over the Reference link. If the Data Point remains in its basic version, setting the Input Priority slot in the network point has no actual effect, and the value is sent to the 16th input priority in the Data Point.

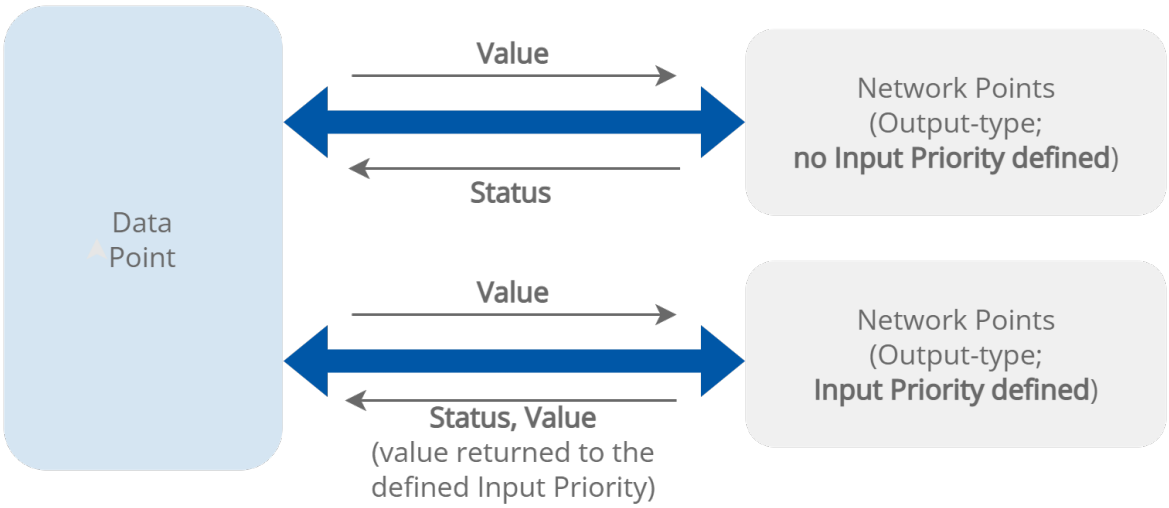

Figure 70. The Reference links between the Data Point and output-type network points

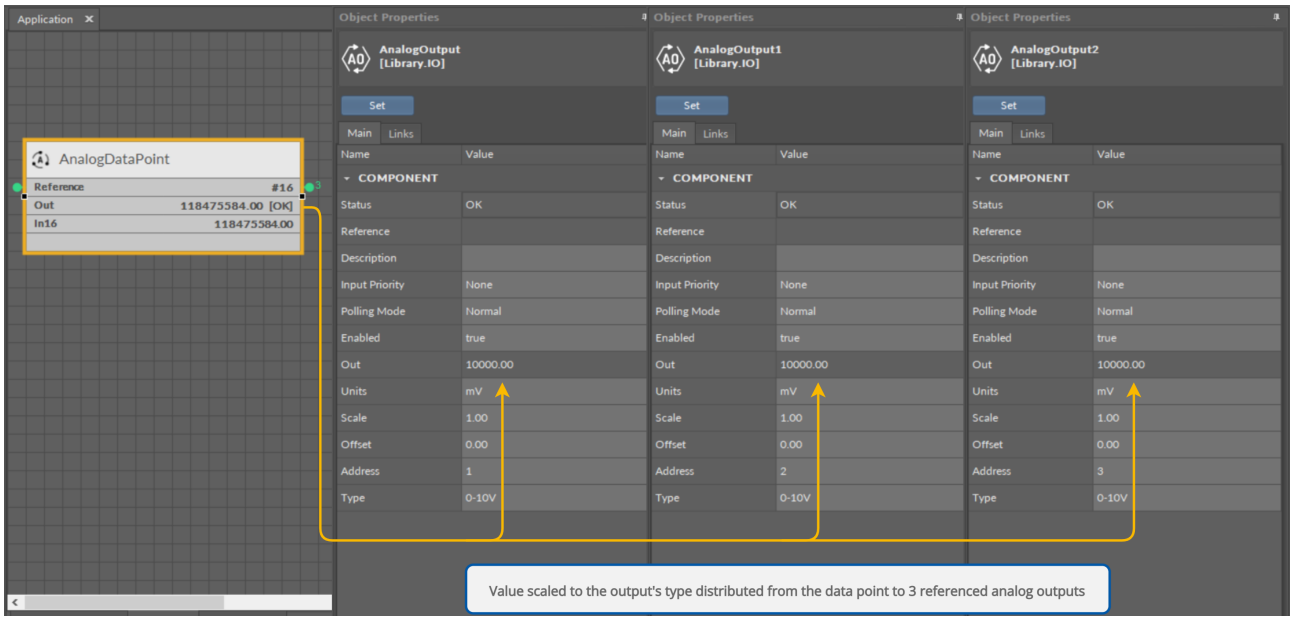

Figure 71. Values distributed from the Data Point to the referenced output-type network points

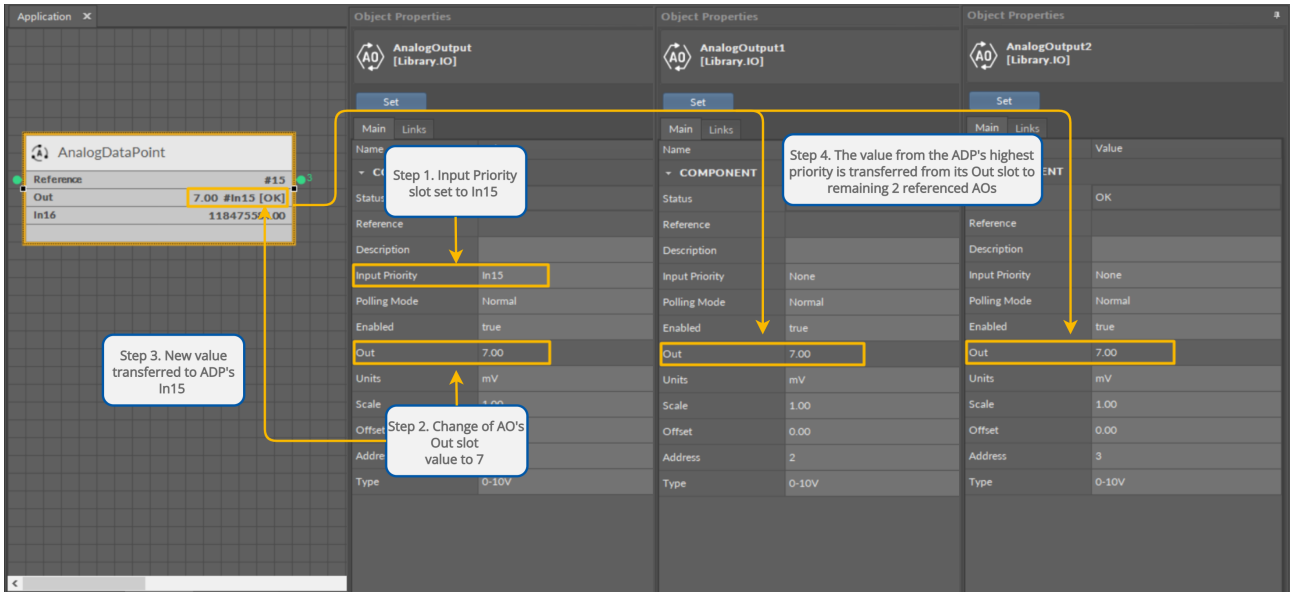

Figure 72. Value sent back to the specified input priority in the Data Point and distributed to remaining referenced output-type network points

Creating Links

The iC Tool allows to link only the fitting slots, making creation of a faulty link impossible– once the source slot is selected, only the fitting target slots are highlighted.

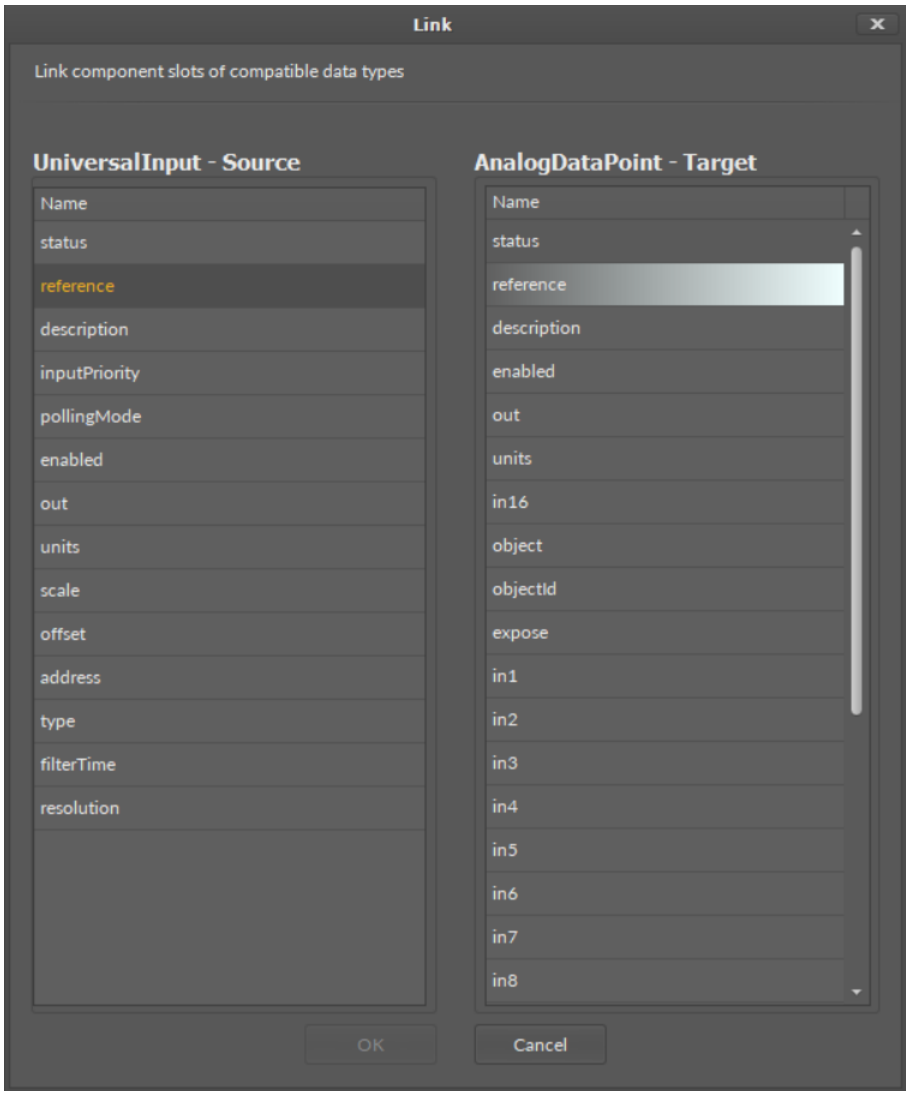

Figure 73. The Reference linking dialog window

Links in the iC Tool are created in two ways:

- Using the **Link Mark** and **Link From** options from the context menu: the Link Mark option selects the source component, and the Link From option selects the target component. The context menu with the Link Mark and Link From options may be opened in the Workspace Tree, Wire Sheet, and Property Sheet.
- **Graphically**: drawing a line from the source component to the target component. The link may be created graphically in the Wire Sheet. In order to create link graphically, click on the source slot, and drag the line to the target slot. The iC Tool automatically highlights the fitting target slots. As the Wire Sheet displays limited number of slots in the component, drawing a line to the empty row opens a dialog window with the list of all slots to select the target slot.

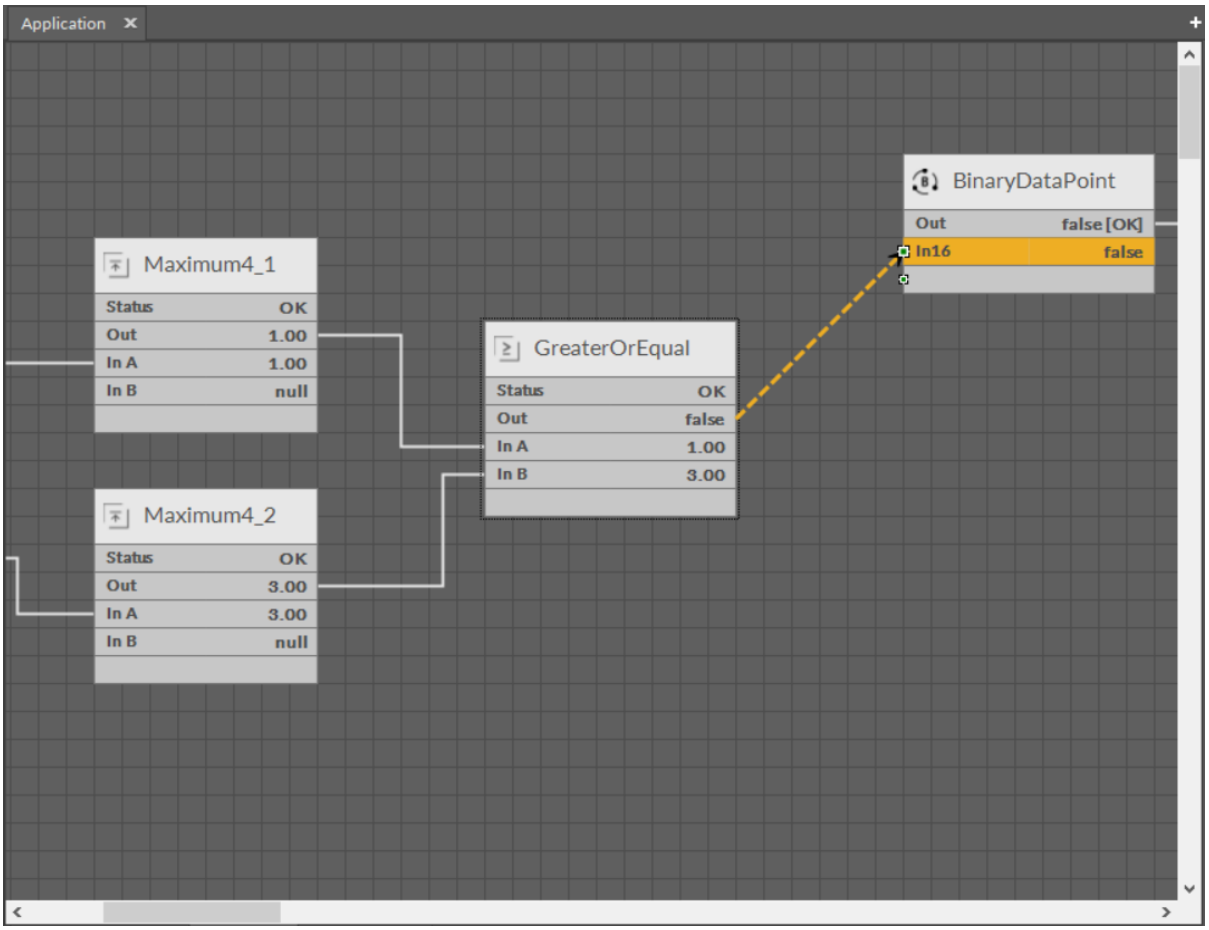

Figure 74. Creating links graphically

7.2.5 Removing Components and Links

Removing Components

Deleting components allows removal of the selected components along with all their inferior components. Deleted components are instantly removed from the application in the device, which provides full synchronization in views and windows: the Property Sheet, Wire Sheet, and Workspace Tree.

Removal is possible after selecting one or more components and pressing a Delete key on the keyboard, with the exception of removing components from the Workspace Tree.

Components' removal from the Workspace Tree with the Delete key has been blocked to prevent removing the main tree elements, such as the main containers or the whole application by mistake. Removing components in the Workspace Tree is possible using the context menu but the removal requires confirming it in a pop-up window.

The above limitations do not include the Property Sheet and Wire Sheet views, where using the Delete key removes selected components instantly.

Removing Links

Removing links is performed automatically after removing the component, which a specific link leads to. It regards both input and output links.There is no need to remove

links if a component is removed. However, there are situations when only the link needs to be deleted, without removing the component.

In order to remove the link only, it needs to be selected in the Wire Sheet view and then deleted by the Delete key on the keyboard or from the context menu by choosing a Delete link(s) option.

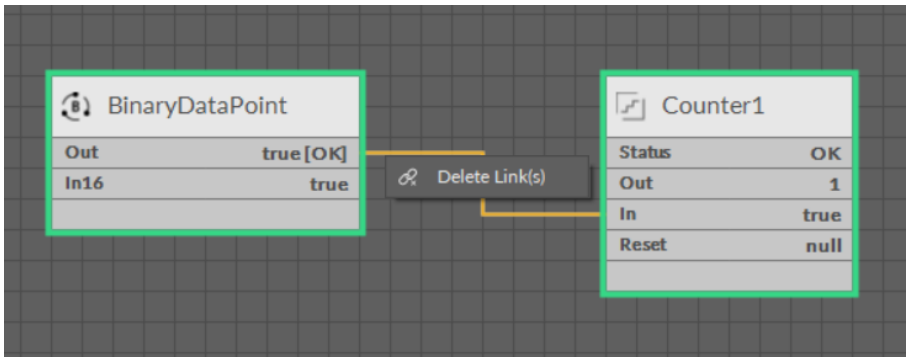

Figure 75. The context menu of a link

7.3 Actions

Actions are the most commonly used functions performed on a specific component, such as setting a new value or resetting a counter.

Available actions depend on the component type. It is possible to access them as follows:

- Pressing the Actions option on the context menu of a component;

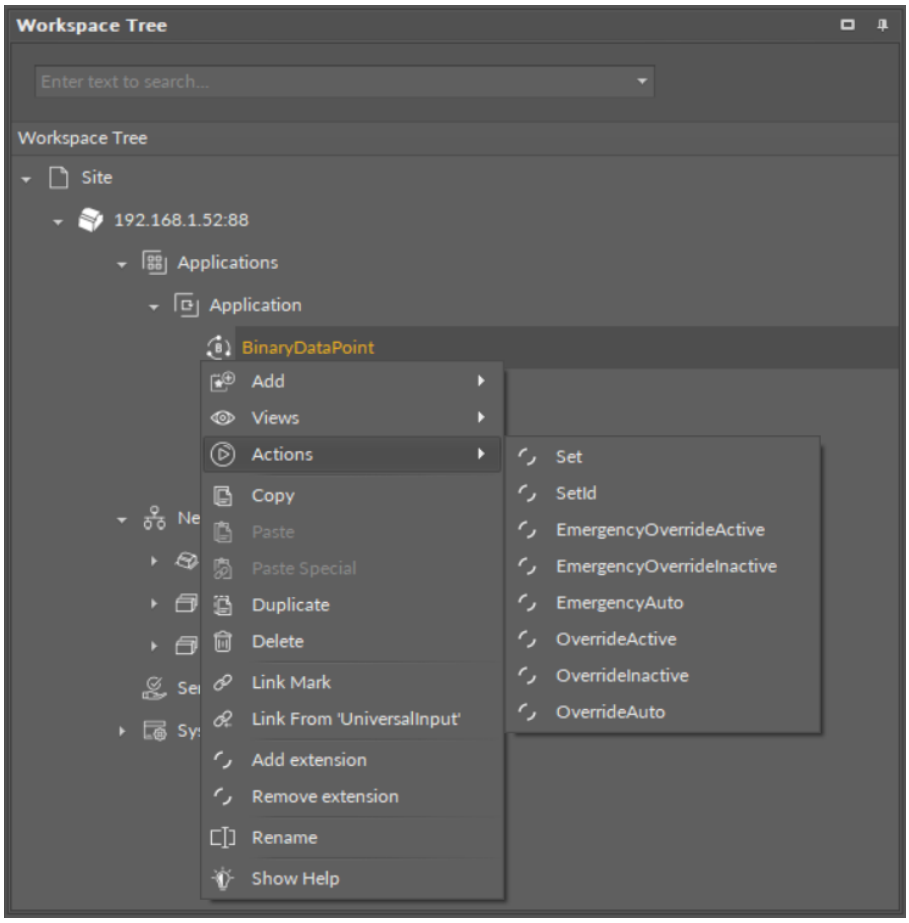

Figure 76. Accessing actions from the context menu

- Pressing the actions button available in the Object Properties window after selecting the required component.

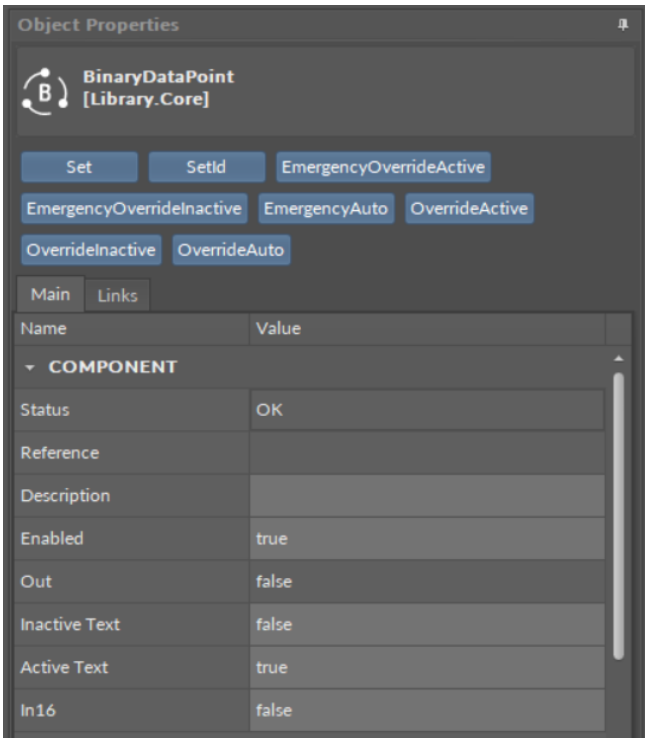

Figure 77. Accessing actions in the Object Properties window

If the action requires entering parameters in the component, for example, setting values, the iC Tool will ask for values on a separate pop-up window.

7.4 Renaming Components

A Rename option selected on the component's context menu allows changing its name. The Rename pattern defines how the new name for components will be generated. It can include some constant literals with special placeholders embedded.

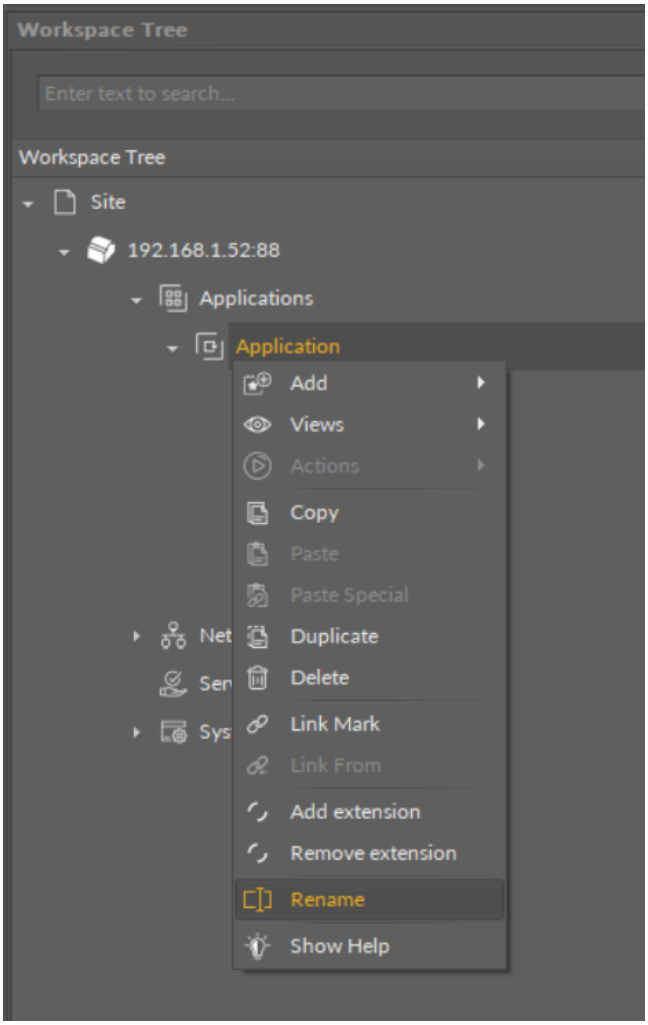

Figure 78. Renaming components

8 Standard Views

The iC Tool defines a few standard views available after choosing the component. For devices driven by the nano EDGE ENGINE, they are: the Wire Sheet and Property Sheet. These views are displayed in the iC Tool's Main Screen on separate tabs. Apart from the standard views mentioned above, available for any component, there can also be other, dedicated views for particular components (see Special Views).

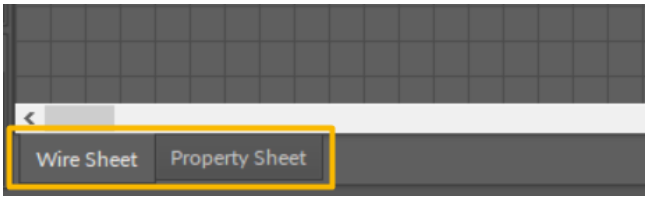

Figure 79. The component's standard views

Standard views for components have different roles and functions, however, they share common actions, which facilitate working with components.

8.1 View History

While working on application, the user switches between views to present objects being worked on in a most convenient way. Double clicking on a component in the Workspace Tree opens a corresponding default view. As a convenience matter, the iC Tool offers a view navigation history to allow the user to return to previously opened tabs.

The view navigation history is available on a toolbar under the main menu. There are three navigation history buttons in the toolbar: Tab backward, Tab forward, and Tab history.

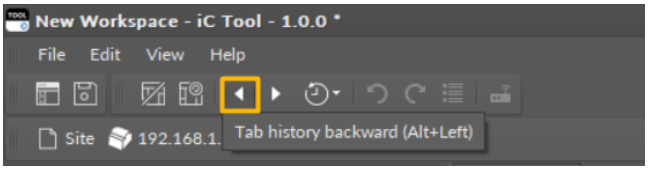

Figure 80. Tab backward

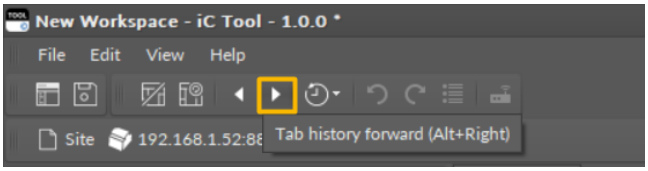

Figure 81. Tab forward

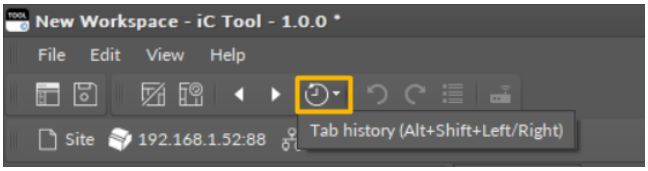

Figure 82. Tab history

These actions can also be invoked using keyboard shortcuts: Alt+Left, Alt+Right, or Alt+Shift+Left/Right key combinations.

The view history is presented depending on how it was invoked. Clicking a toolbar button presents a dropdown list:

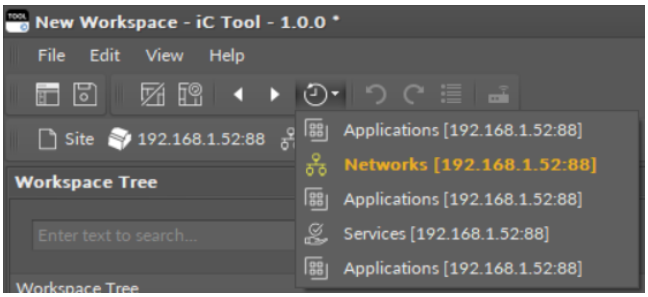

Figure 83. Tabs history

Pressing an Alt+Shift+Left/Right keyboard shortcut presents a flyout panel:

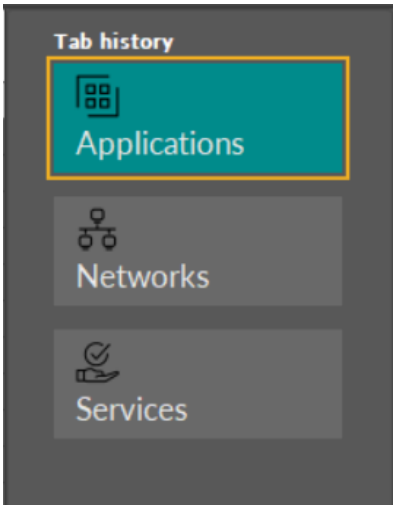

Figure 84. Tabs history flyout panel

8.2 Undo/Redo Actions

In case of an unintended action (for example, a component deleted by mistake, link added by mistake, randomly moved components), the iC Tool offers undo/redo actions.

With standard key combinations of Ctrl+Z and Ctrl+Y, the iC Tool allows to undo/redo actions step-by-step.

Pressing either key combination brings an undo/redo history flyout panel to help identify what will be undone/redone next. The panel stays in place while the user keeps holding the Ctrl button down so it is visible what is available to be undone/redone next if multiple changes are needed.

Figure 85. Undo/Redo action flyout panel

It is also possible to invoke undo/redo actions or open the flyout panel clicking corresponding buttons on the toolbar:

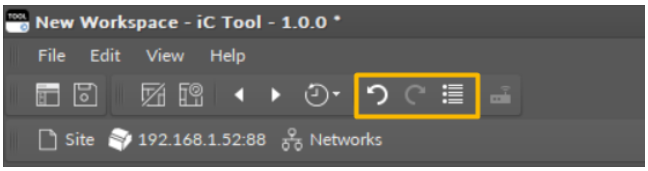

Figure 86. Undo/redo buttons

WARNING!

As many operations on components involve immediate changes to the device over the wire, and the device itself could be modified by another user of iC Tool software remotely, it is possible that some actions will fail to complete. To minimize risks of loses to the application the user is creating, the undo/redo history is cleared in case of unrecoverable communication issues.

8.3 Reconnecting Devices

When working with multiple devices, it is often a case that multiple tabs are opened but devices (that the tabs refer to) are disconnected. It is possible to reconnect them all at once by clicking a single button on the toolbar.

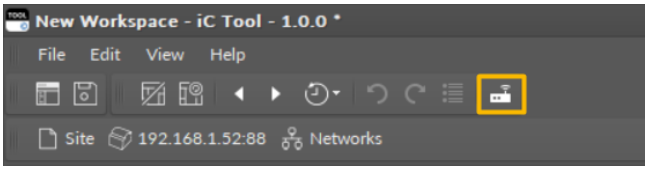

Figure 87. The Reconnect button

Once the action is invoked, all devices with at least one tab open are reconnected. To avoid swamping network communication, actual connection commands are sent once the user switches to a corresponding tab.

8.4 Wire Sheet

The Wire Sheet is a graphic view which shows all the inferior components (along with links) for the selected superior component (double-clicked in the Workspace Tree). Each component in the Wire Sheet view is shown as a rectangle with its name and icon placed in a header, and slot names and values in rows underneath. The link is displayed as a line connecting two component slots, between which values are transferred. The figure below shows the Wire Sheet view with corresponding list of components in the Workspace Tree for the Application service.

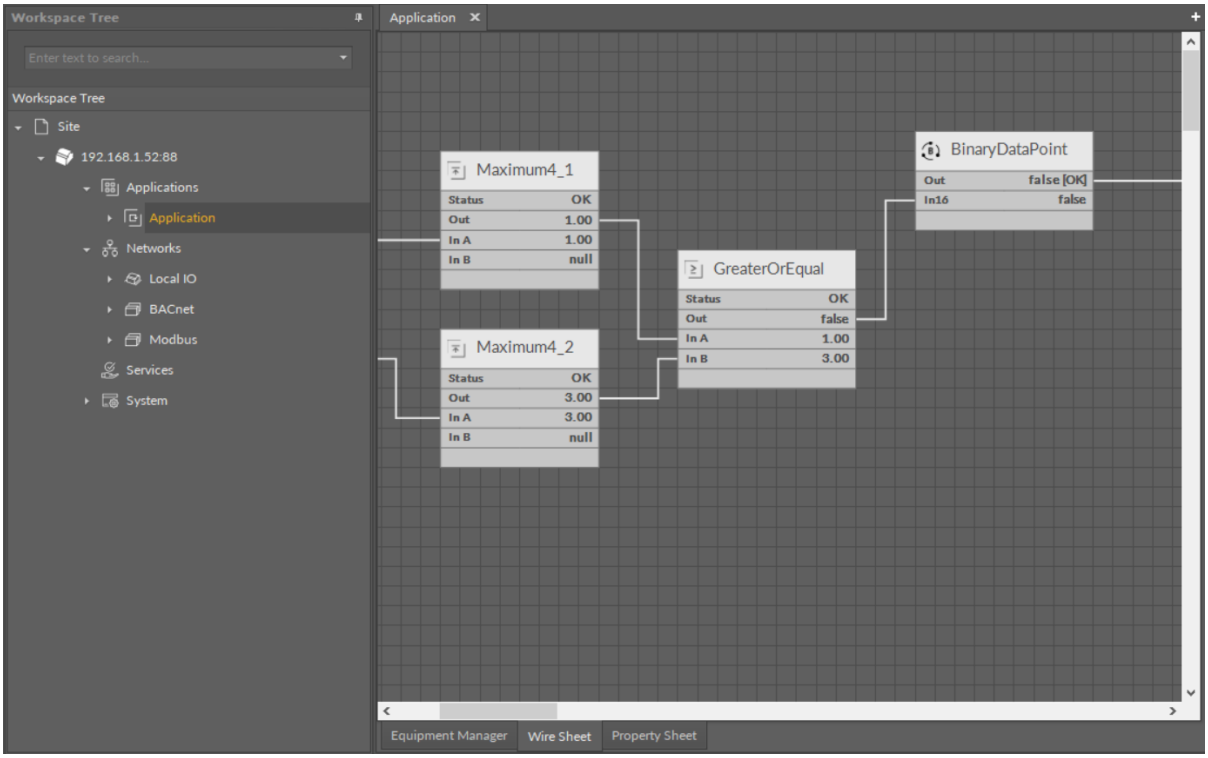

Figure 88. The Wire Sheet view along with the Workspace Tree

In the Wire Sheet view the user can define the location of components by dragging them by the header. To make moving components easier the Wire Sheet displays a grid allowing precise placement of the component. The grid makes organizing of components and their alignment easier.

8.4.1 Components and Links Characteristics

Every component in the Wire Sheet view has a following look and behavior:

- Components have headers with icons and components' names.
- Under the component's header, every row represents a single slot with a name, value, and unit.
- Slots hidden by default are not displayed.
- Component may be extended left and right between 5 and 31 grid sections. This allows the component to be adjusted optimally, so all the slots names and their values can be fully visible.
- Component can be moved on the Wire Sheet into any place by clicking and holding a component's header or a middle part of any slot. Releasing the component defines its new location, after which links between this and other components are redrawn.
- Moving of component can be cancelled by pressing an Esc button on the keyboard (before releasing it in the new location).
- Component can also be moved by pressing an Alt key and clicking any part of component. This allows to grab and drag the component also behind the place, where link assigning begins.
- Selected (clicked) component is marked with an orange frame, and is treated by the iC Tool as an object chosen by the user, contrary to the component surrounded by a green frame, which is treated by the iC Tool as a reference (auxiliary) object, not selected.
- A context menu available at right-click provides functions, which can be performed on a component regardless of the view it is displayed in.

Every link in the Wire Sheet view has a following look and behavior:

- Links between components reflect the connections between specific slots of connected components.
- Link guarantees sending the value of source component slot to a target component slot.
- Only one input link can be defined for an input (left) slot.
- Many output links may come out of one output (right) slot.
- Links connecting components from different Wire Sheets are graphically represented as short segments coming in/out of slots ended with a full circle.
- A context menu available under right-click allows to remove a selected link.
- The user has no influence on a link route, i.e. the way it will be drawn, since the process is done automatically.

8.4.2 Navigation

Navigation on the Wire Sheet view is carried out by zooming in/out and moving the object in the view.

Zooming the view in or out requires turning a mouse wheel upward or downward. Zooming is centered where the mouse pointer is. In order to zoom in or out a particular Wire Sheet fragment, the mouse pointer needs to be moved into this area, so it does not escape the field of view.

In order to scroll the Wire Sheet view, move the sliders at the bottom and right side of the window or press the Ctrl button and click and move up or down.

After opening the Wire Sheet view, the iC Tool automatically adjusts the zoom allowing all components to be visible.

8.4.3 Selecting and Marking of Components and Links

The Wire Sheet view has been designed to make it easy for the user to analyze the logic of the program by proper marking of the inferior components and links in relation to a selected component or link. Both components and links are selected by clicking them, and pressing the Ctrl key while clicking allows to select more than one component.

Components

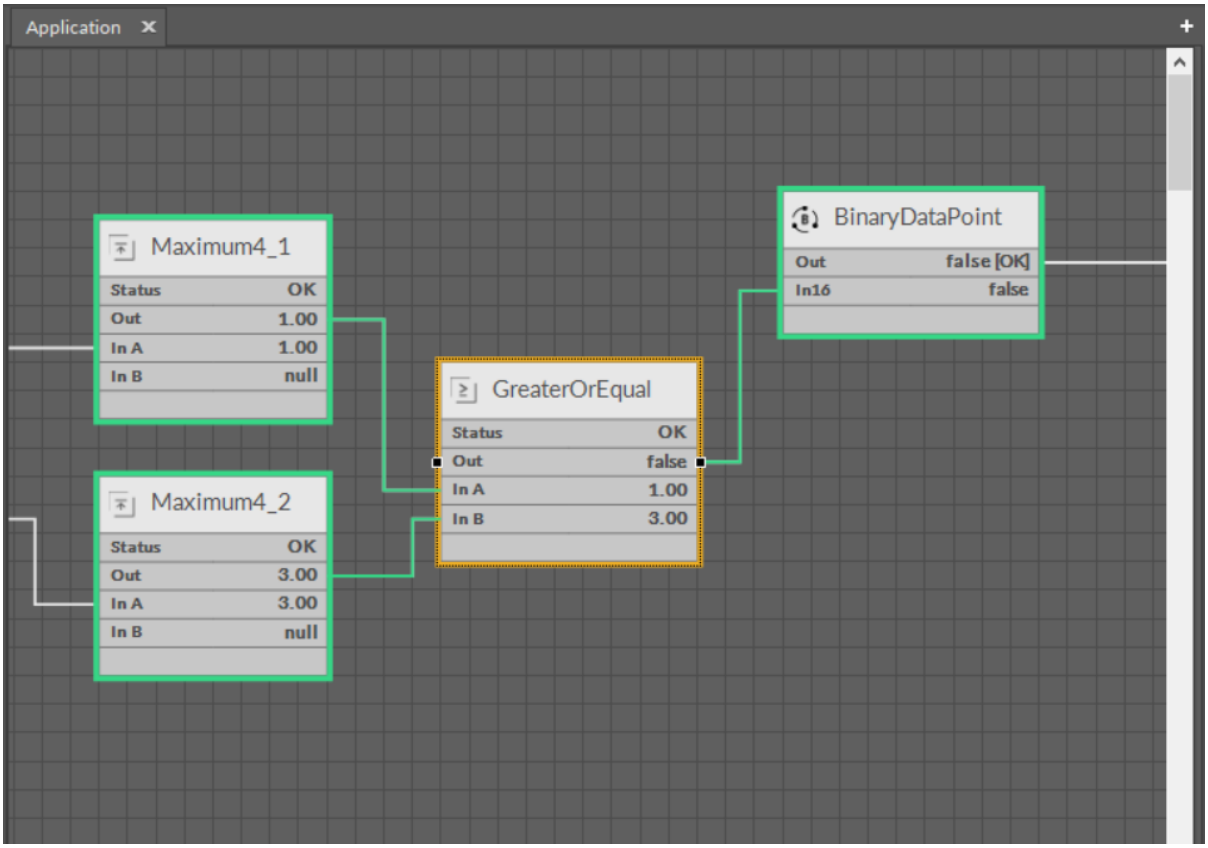

Figure 89. Selecting (orange) and marking (green) of components

In the figure above, a GreaterOrEqual component has been selected and is marked with an orange frame. If it will be removed or moved, or duplicated, it has an impact on the links connected to it and their components. The whole path of connected objects has been highlighted in green. A coloring mechanism shown above may be very useful to analyze complex programs with many connections, links, and components.

Links

Similar color highlighting takes place if a link is selected (marked in orange). In such case the iC Tool will automatically mark with a green color all components connected with this link. It allows the user to be aware, which components is the link connected to, and which will be affected in case it is, for example, deleted.

The link gets marked if a connected component gets selected.

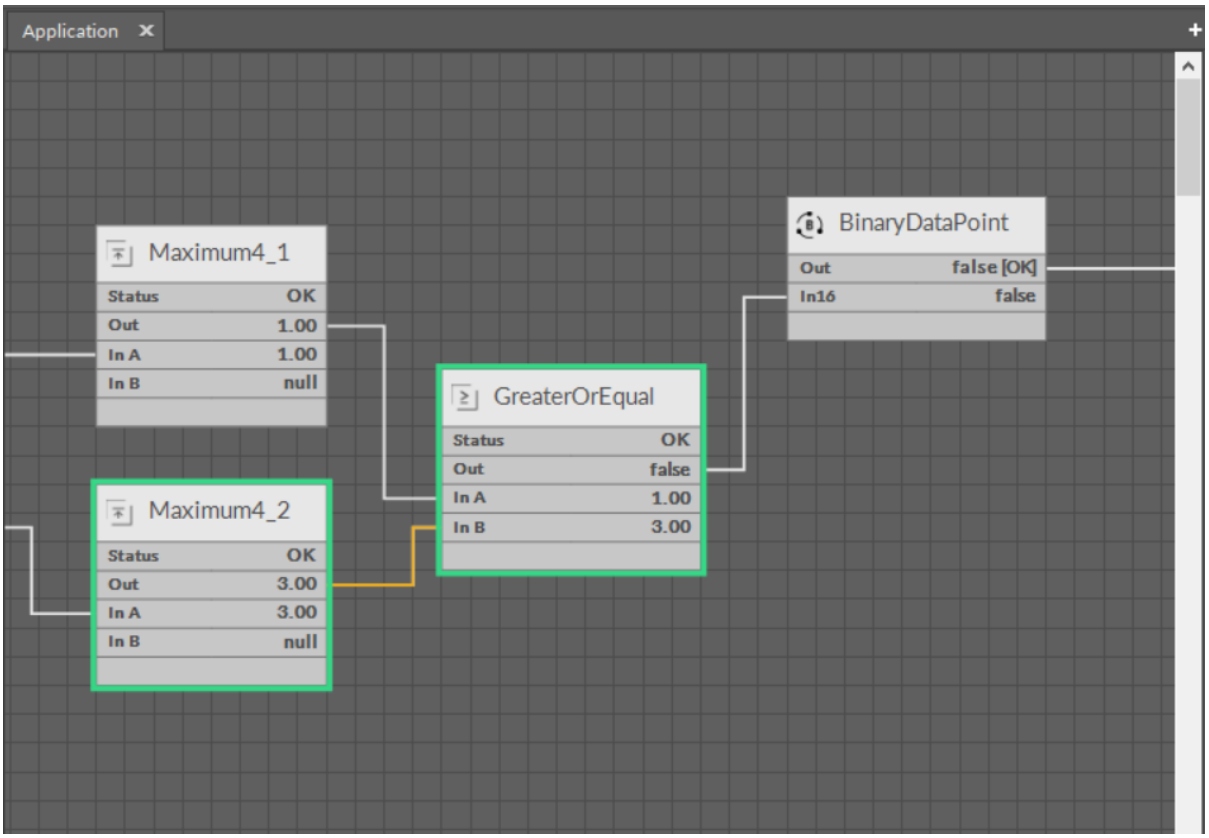

Figure 90. Selected link

Window and Crossing Selection

In the Wire Sheet view there is also another method of selecting components and links. The method involves defining a rectangular area, which marks objects to be selected. It can either be a window selection or a crossing selection.

Both types require marking a square area in the Wire Sheet view by clicking in an empty area and dragging a rectangle over the objects to be selected. Release the rectangle, when all the selected objects are included.

Window Selection

In case of a window selection, a rectangle dragged **from the left to the right** is blue. Only objects fully covered by the rectangle are selected (orange color); here, these are the Maximum and GreaterOrEqual components and their links. The remaining element has not been selected because it was not fully covered by the blue rectangle. The element dependent on the selected component and selected links is marked in green.

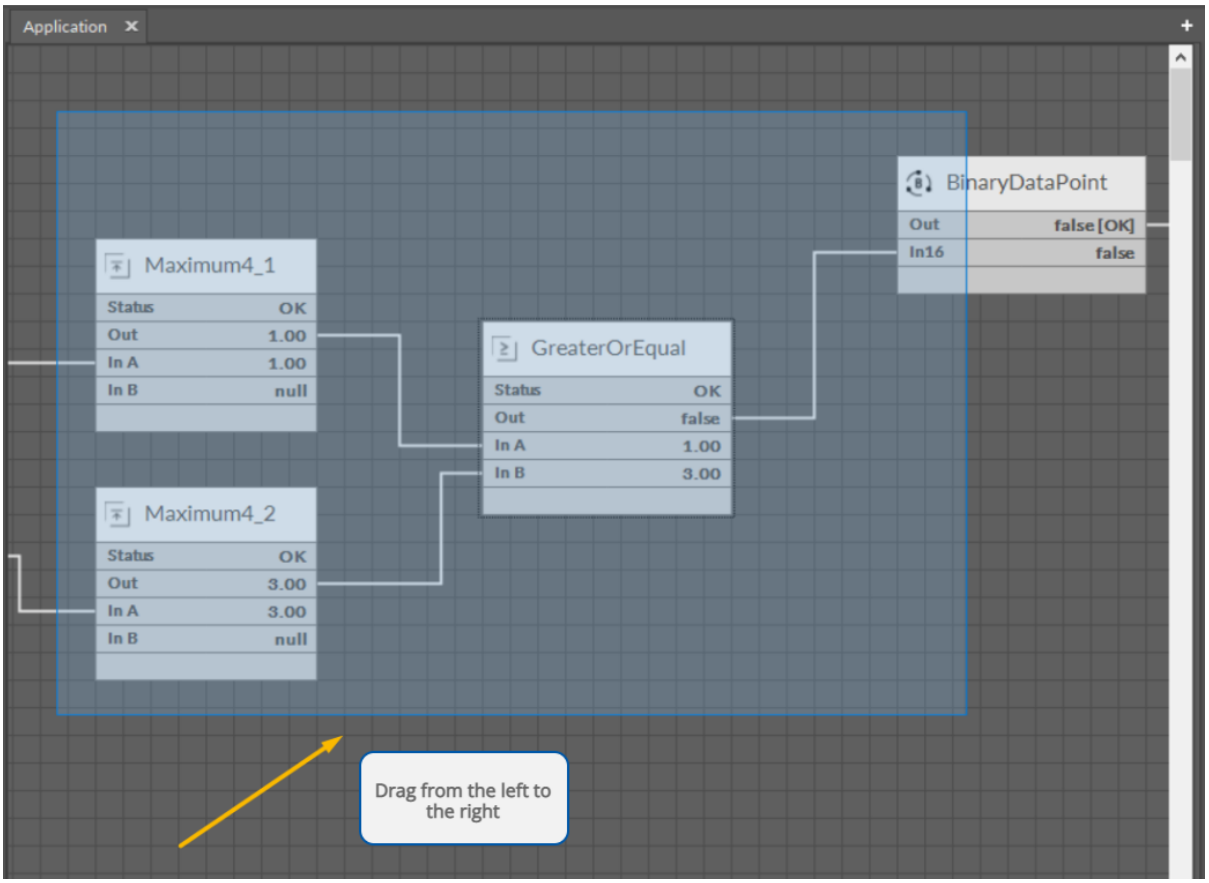

Figure 91. Window selection

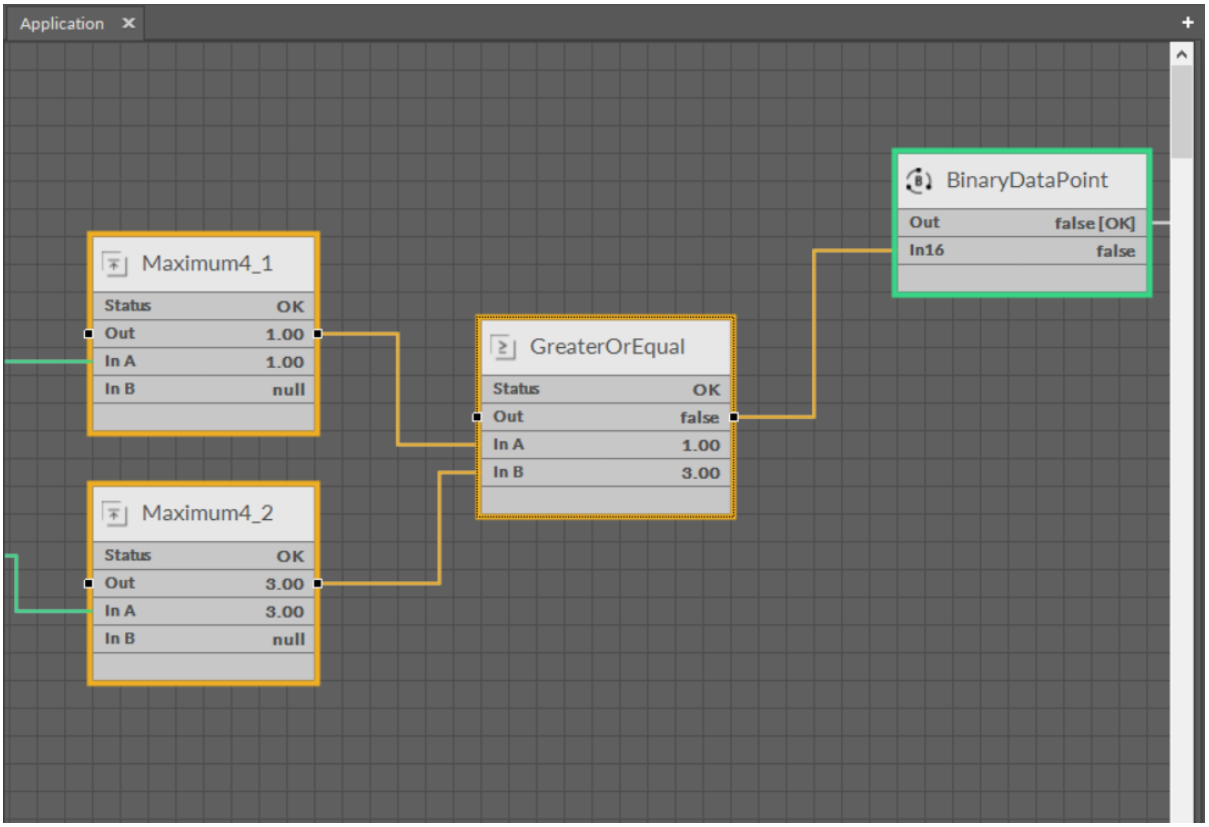

Figure 92. Window selection

Crossing Selection

In case of a crossing selection the rectangle is dragged the opposite way, **from the right to the left**, and it is red. All the objects, even partially included in the rectangle, are selected (orange color); here, these are the Maxiumum, GreaterOrEqual, and Binary Data Point component along with their links.

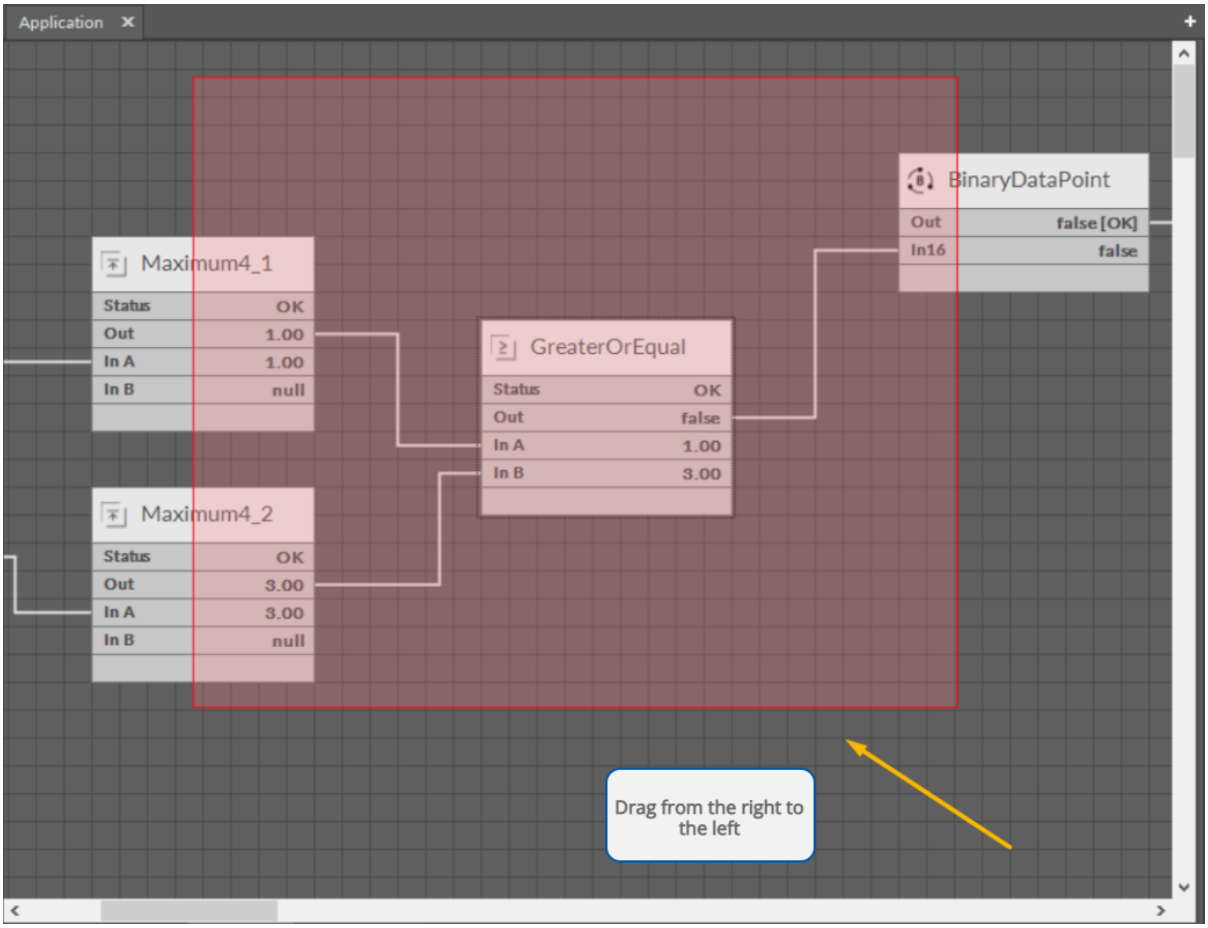

Figure 93. Crossing selection

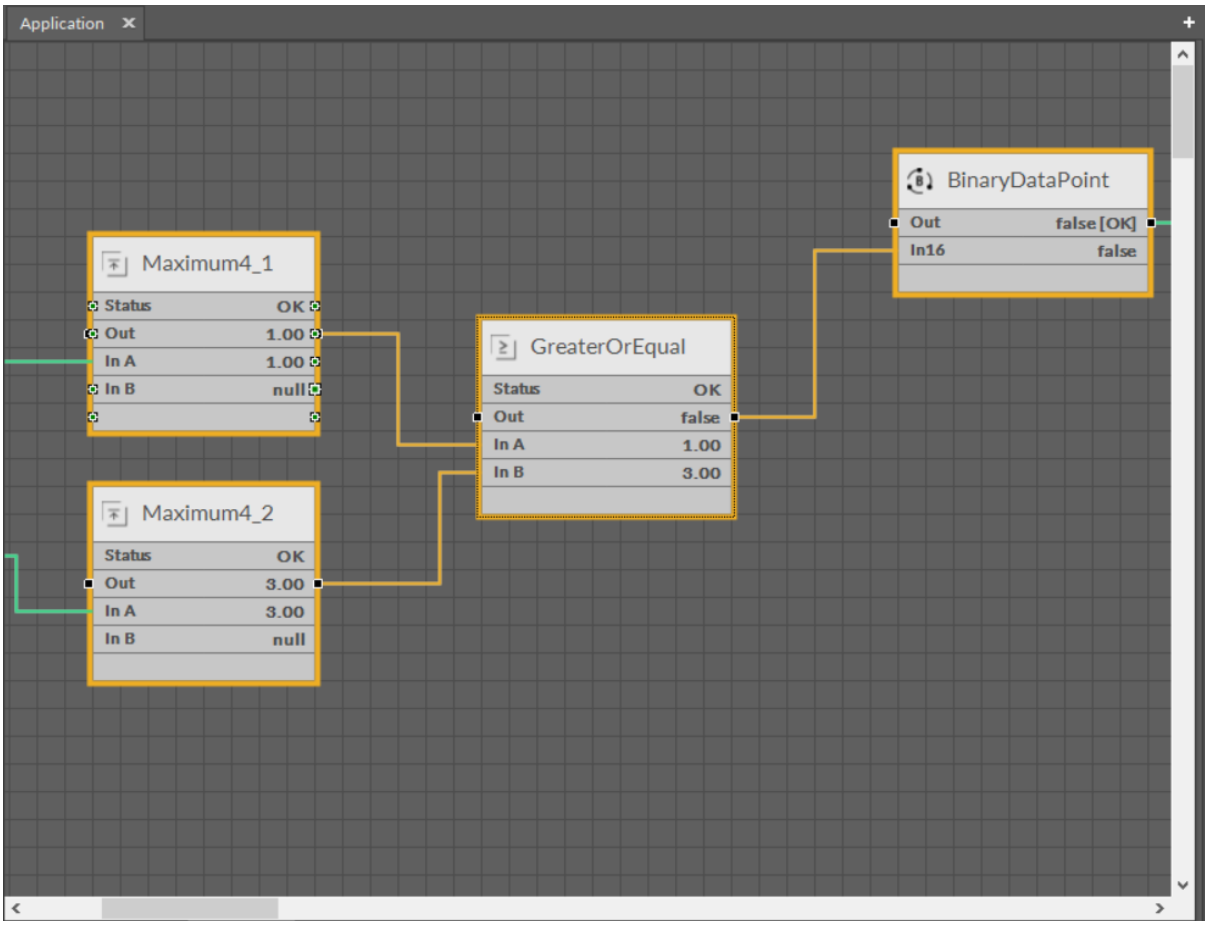

Figure 94. Crossing selection

The crossing selection method enables easy removal of all input links of the component without a need to individually select each link. For this purpose drag a narrow rectangle across the component's links that are to be selected (see the figures below). All selected links (orange color) can be deleted with a Delete key or a context menu.

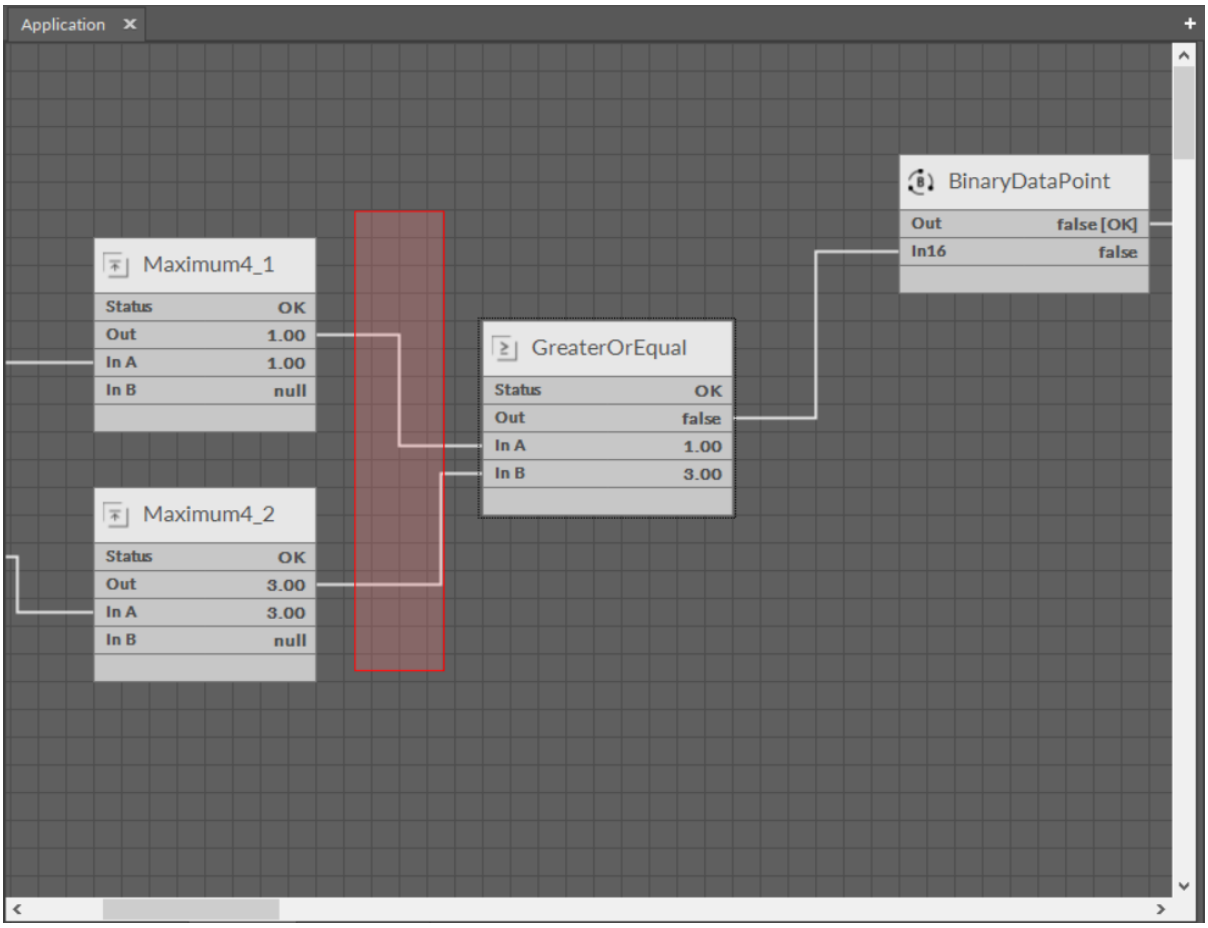

Figure 95. Crossing selection of links

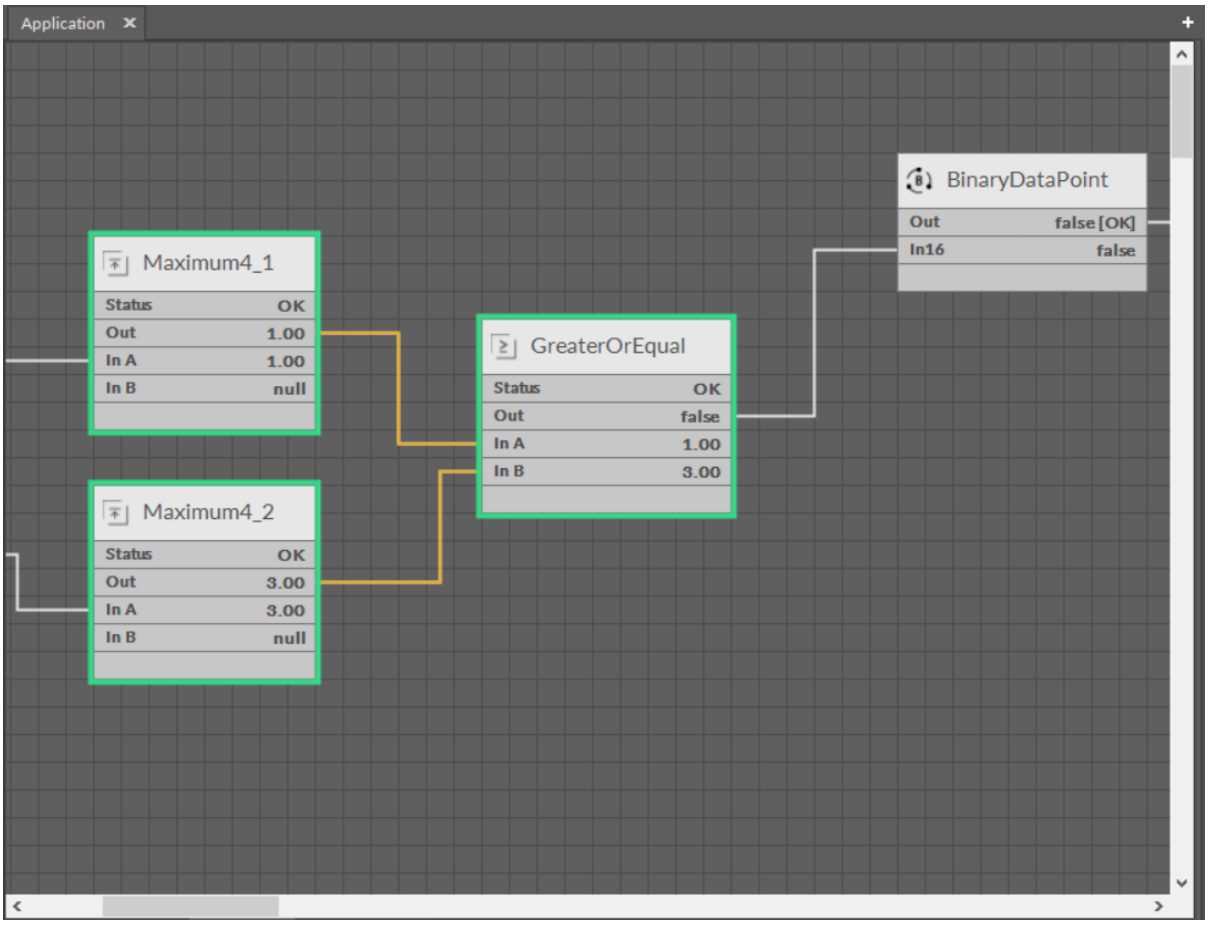

Figure 96. Crossing selection of links

8.4.4 Adding and Removing Components in the Wire Sheet

Adding Components

There are three methods of adding a new component to the Wire Sheet view:

- dragging it from the Device Libraries window;
- copying it in the Device Libraries window and pasting it in the Wire Sheet tab;
- duplicating a component already added to the Wire Sheet (it is an option in the context menu).

If the component is dragged or pasted to the Wire Sheet, it is released where the mouse points. However, if the component has not been added directly to the Wire Sheet but, for example, placed in the Workspace Tree window, its position in the Wire Sheet will be the same as original component (including cascade offset) in case of pasting or duplicating. In case the component has been dragged from the Device Libraries window to the Workspace Tree, its position in the Wire Sheet is (0, 0), it will appear in the upper left corner.

In all cases added components are slightly relocated relative to original components, so they do not overlap. The iC Tool uses a cascade mechanism here.

Special Adding of Data Points and Folders

The Workspace Tree window, the Wire Sheet and Property Sheet views offer a special way of adding Data Points and folders (the Folder and Equipment components) to the

Application, simply from the context menu. In order to add components this way, right-click in an empty space of the Wire Sheet grid or Property Sheet and choose the Add option from the context menu. In the Workspace Tree special adding of Data Points and folders is available in the context menu of the Application component.

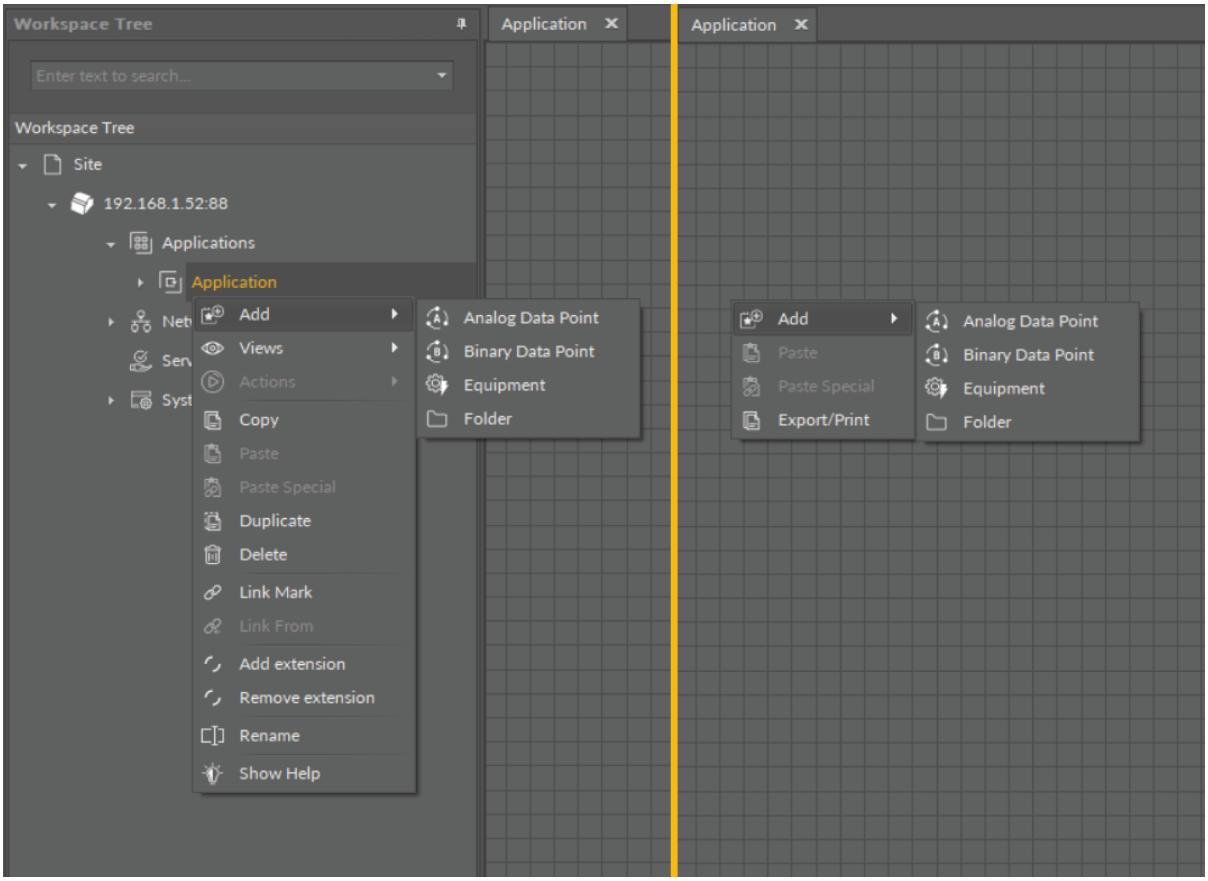

Figure 97. Adding Data Points/folders from the context menu

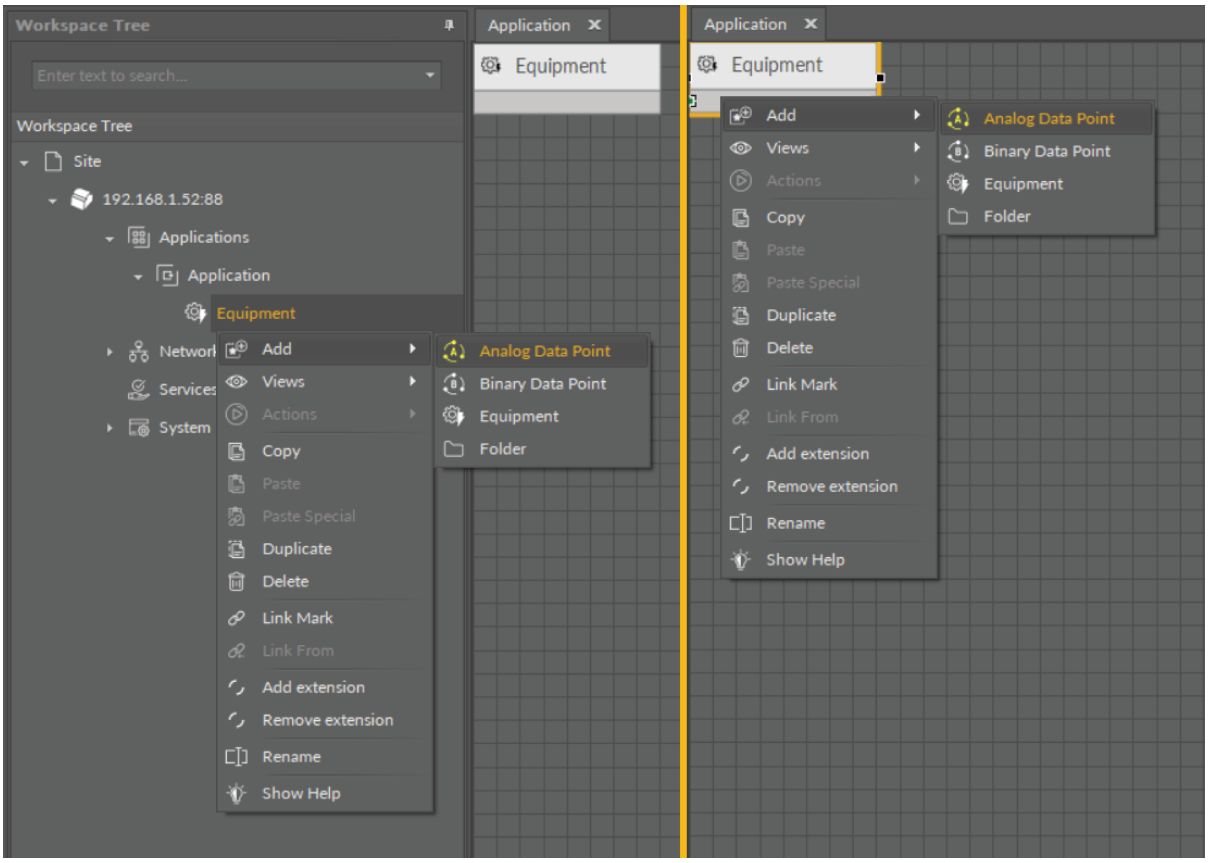

Figure 98. Adding Data Points to folders from the context menu

Removing Components

A component in the Wire Sheet view can be removed after selecting it and pressing the Delete key or choosing the Delete option from the context menu. After removing the component, the iC Tool will automatically remove all links connected to the removed component. If necessary, the remaining links will be automatically redrawn to use the space remaining after the removed component.

8.4.5 Adding and Removing Links

Adding Links

A link is a way of exchanging data between components. It connects components between which the data are transferred. The link identifies, which parameter is taken into account on both sides of the connection. This allows to show the data flow direction, i.e., where a specific parameter is read and where it is saved.

The Wire Sheet view shows the link as a line connecting two components. The Workspace Tree window and the Property Sheet view do not show information about existing links at all.

Views designed to check links for a specific component are the Wire Sheet view and the Links tab in the Object Properties window.

Reference Links

Linking within applications, built with the nano EDGE ENGINE, may be performed twofold: using a standard linking method or using a special Reference link designed specifically to connect Data Point class components (in the Applications container) with network point class components (in the Networks container):

- The Reference link is a special compound link designed to connect Data Points with network points. The Reference link is created between special Reference slots and **transfers values along with the component's status**. Alternatively, it may transfer values between Data Points and network points at the same time returning status from network points to Data Points, or it may return values from network points to Data Points.
- The standard linking method involves simple creating links between the input and output slots; a standard link transfers a value between the connected slots. Standard linking may be applied between all four containers of the nano EDGE ENGINE device structure.

The **Reference link is unique for the nano EDGE ENGINE solution**, and it is a recommended method to be used in application building as **it offers an advantage of transferring the status information between components.**

> **Worth to Notice:**
>
> By default, not all slots of a particular component are always visible in the Wire Sheet view. The hidden slots are not displayed in the component default view. A hidden slot becomes visible once it is an end slot to a link. The link to hidden slot may be created using the linking dialog window.

Links in the iC Tool are created in two ways:

- Using the **Link Mark** and **Link From** options from the context menu: the Link Mark option selects the source component, and the Link From option selects the target component. The context menu with the Link Mark and Link From options may be opened in the Workspace Tree, Wire Sheet, and Property Sheet.
- **Graphically**: drawing a line from the source component to the target component. The link may be created graphically in the Wire Sheet. In order to create link graphically, click on the source slot, and drag the line to the target slot. The iC Tool automatically highlights the fitting target slots. As the Wire Sheet displays limited number of slots in the component, drawing a line to the empty row opens a dialog window with the list of all slots to select the target slot.

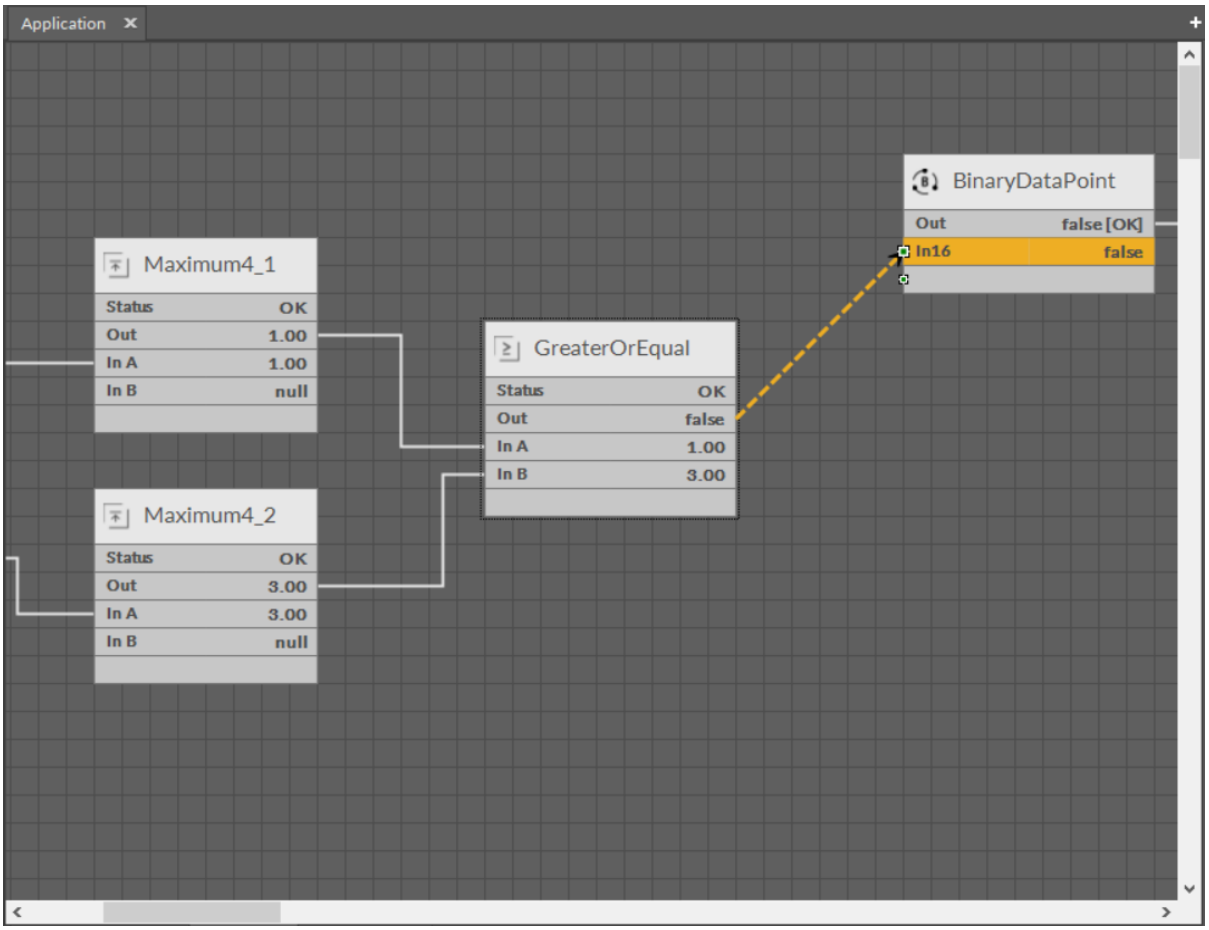

Figure 99. Creating links graphically

A dialog window shows the selected output slot (in the left column) and input slots available to select (in the right column). The available input slots are highlighted in the right column. Selecting the input slot has to be confirmed by pressing Ok.

Creating a link, regardless of a method used, is directly saved to the controller.

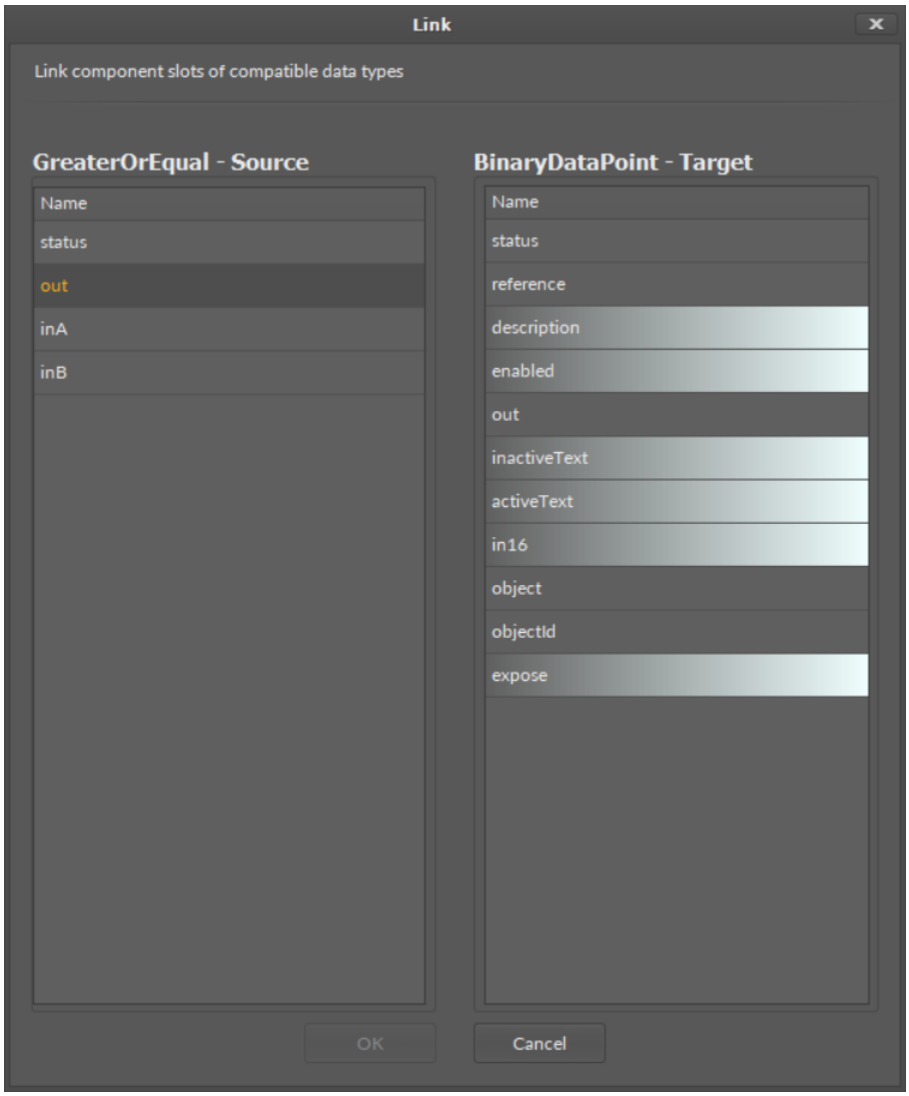

Figure 100. A linking dialog window

Removing Links

A link in the Wire Sheet view can be removed after selecting it and pressing Delete key or choosing a Delete link(s) option from the context menu. If necessary, the remaining links will be automatically redrawn to use the space remaining after the removed one.

Links Between Wire Sheet Tabs

Each Wire Sheet tab displays components belonging to a common superior component. More complex applications require to create a logical connection between components belonging to different superiors, therefore, displayed in different Wire Sheet tabs. The simplest example of such logical connection would be linking network points with Data Points: network points are nested in the LocalIO component, which is placed in the Networks container; Data Points, on the other hand, are located in the Application component in the Applications container; therefore, linking them requires creating links between two separate views.

Links between components belonging to different superiors are displayed as full circles coming out of linked slots. It means that the further part of such link is continued in another Wire Sheet tab.

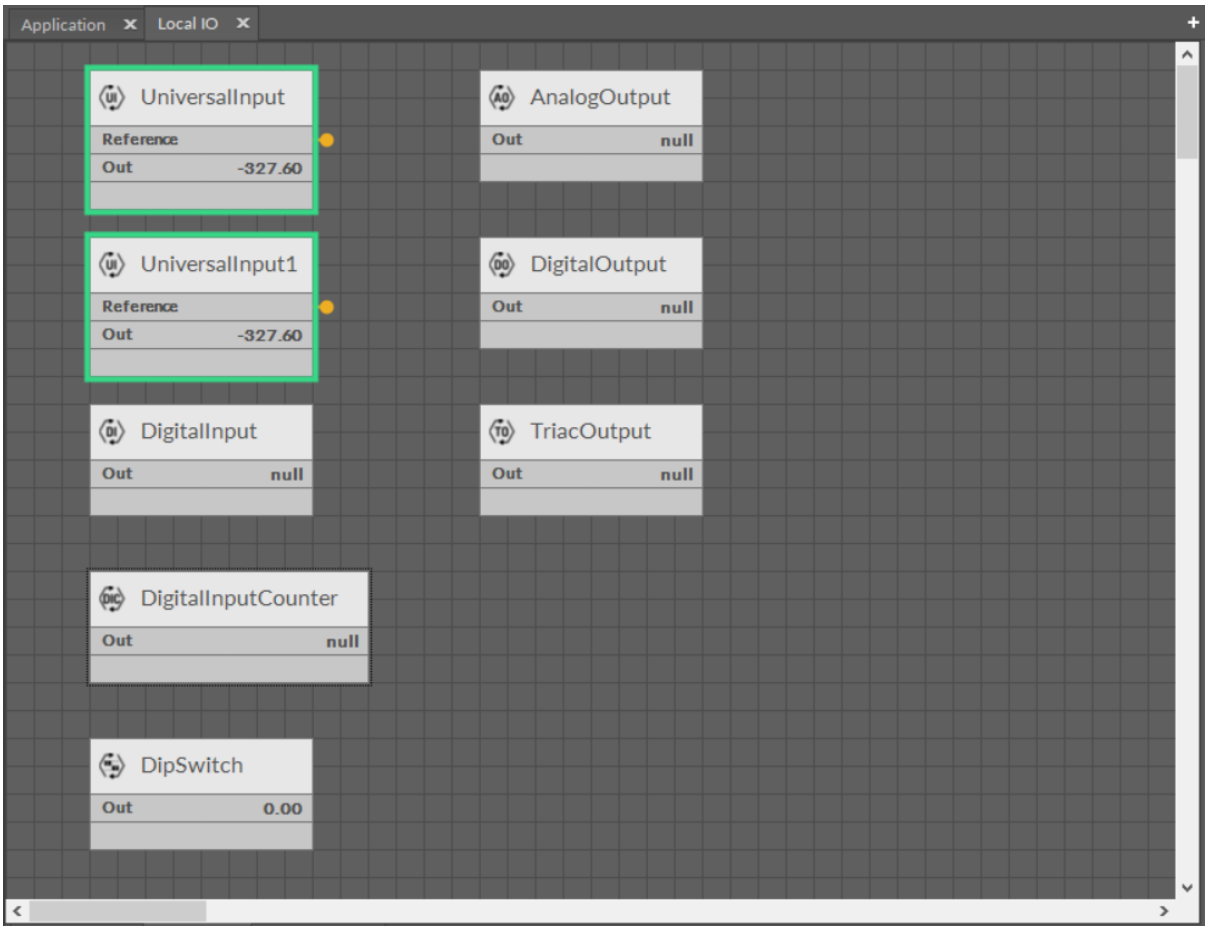

Figure 101. Two UniversalInputs linked with Analog Data Points

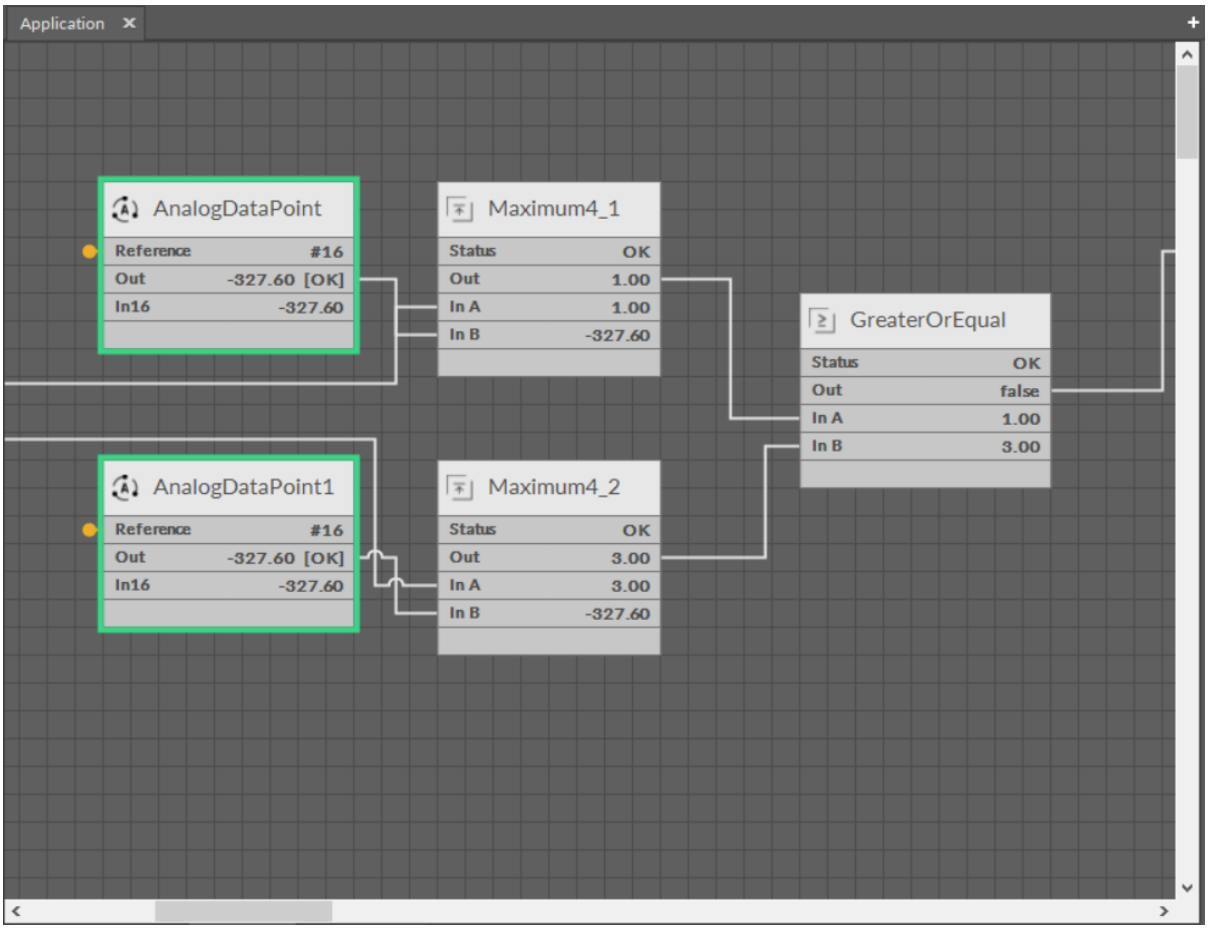

Figure 102. Two UniversalInputs linked with Analog Data Points

Additionally, in case there is more than one link coming out from one output slot, a number of links is displayed next to the link circle. Detailed information about the links' directions, slots, and components can be obtained in the Object Properties window after clicking the links circle.

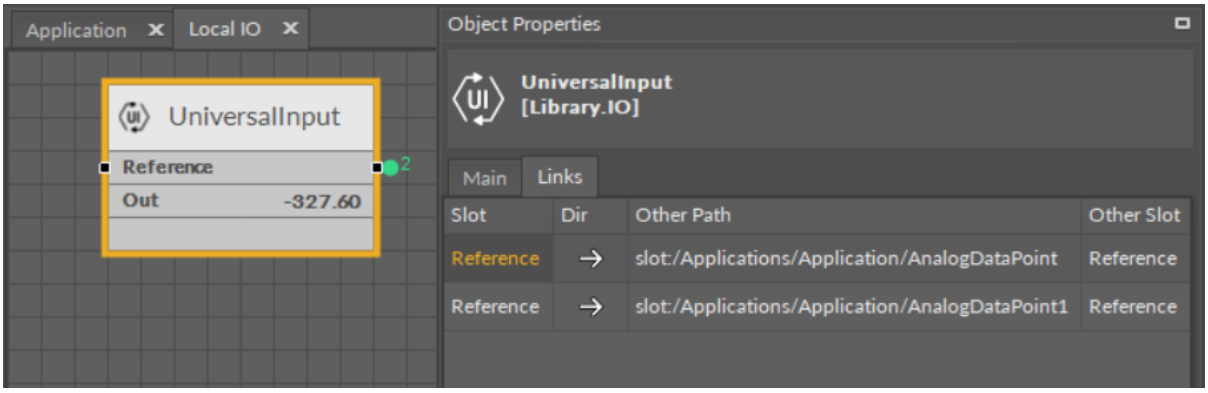

Figure 103. Two external links coming out of the Reference slot

8.5 Property Sheet

A Property Sheet is a tabular view listing all of the selected component's slots, its inferior components, and their slots. The Property Sheet provides information about slots' names, their current values, units, and ranges .

The Property Sheet view allows to select only one component at a time to perform basic functions such as copying, duplicating, and removing.

Each component in the Property Sheet view is displayed in an expandable tree structure. Slots, which values can be edited, are highlighted with a lighter background.

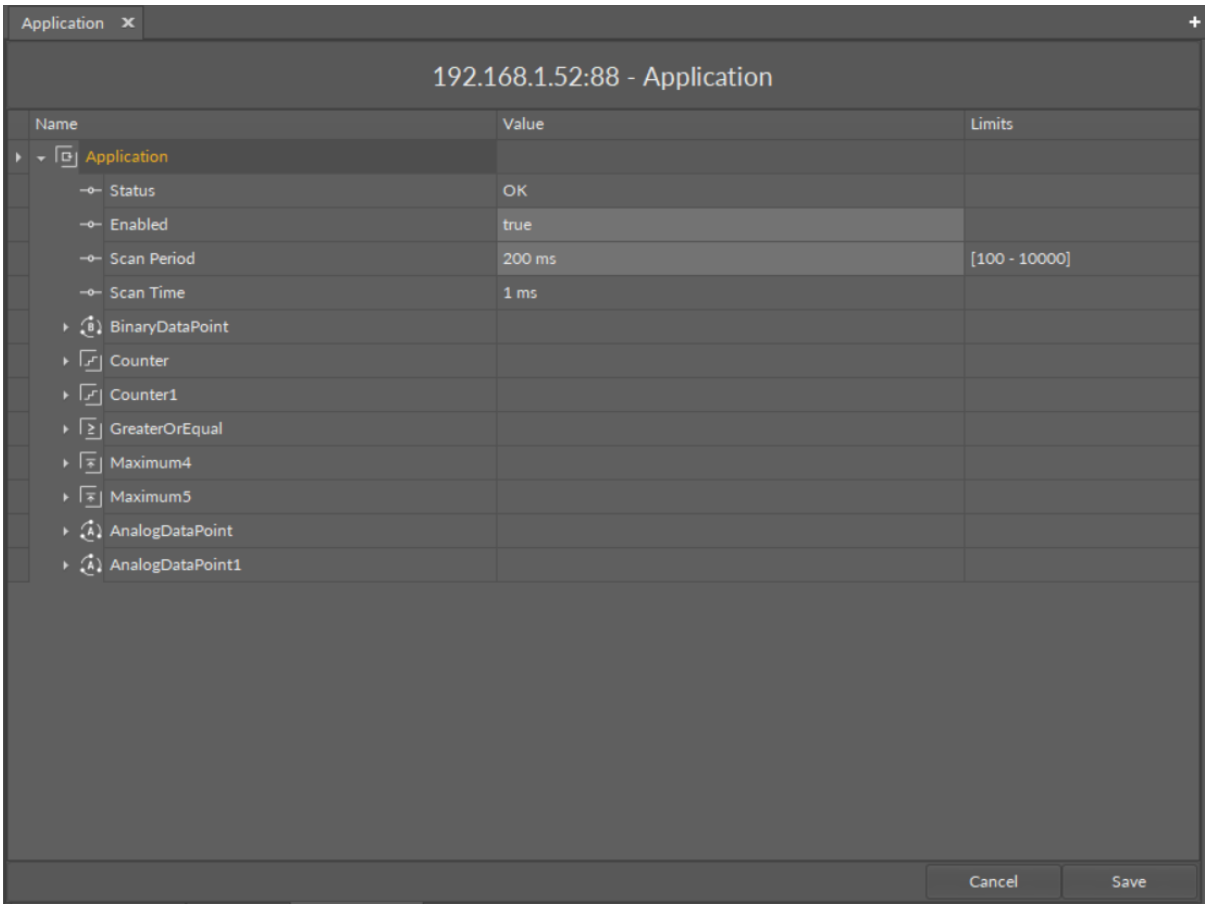

Figure 104. The Property Sheet view

The Property Sheet view shows three columns:

- Name of component;
- Value;
- Limits.

Worth to Notice

The Info column shows units and/or the range of values available for component. If the range of values is unlimited, it is marked [-min - +max].

8.5.1 Adding and Removing Components in the Property Sheet

Adding Components

In order to add a new component to the Property Sheet view, drag it from the Device Libraries window straight to the Property Sheet tab. As the Property Sheet tab can only be opened for a selected component (displaying a plain Property Sheet tab is not possible), the dragged component will always be added as an inferior of the selected component. If the dragged component is dropped in an unoccupied field in the Property Sheet view, it will be added to the main component of this view.

Special Adding of Data Points and Folders

The Workspace Tree window, the Wire Sheet and Property Sheet views offer a special way of adding Data Points and folders (the Folder and Equipment components) to the Application, simply from the context menu. In order to add components this way, right-click in an empty space of the Wire Sheet grid or Property Sheet and choose the Add option from the context menu. In the Workspace Tree special adding of Data Points and folders is available in the context menu of the Application component.

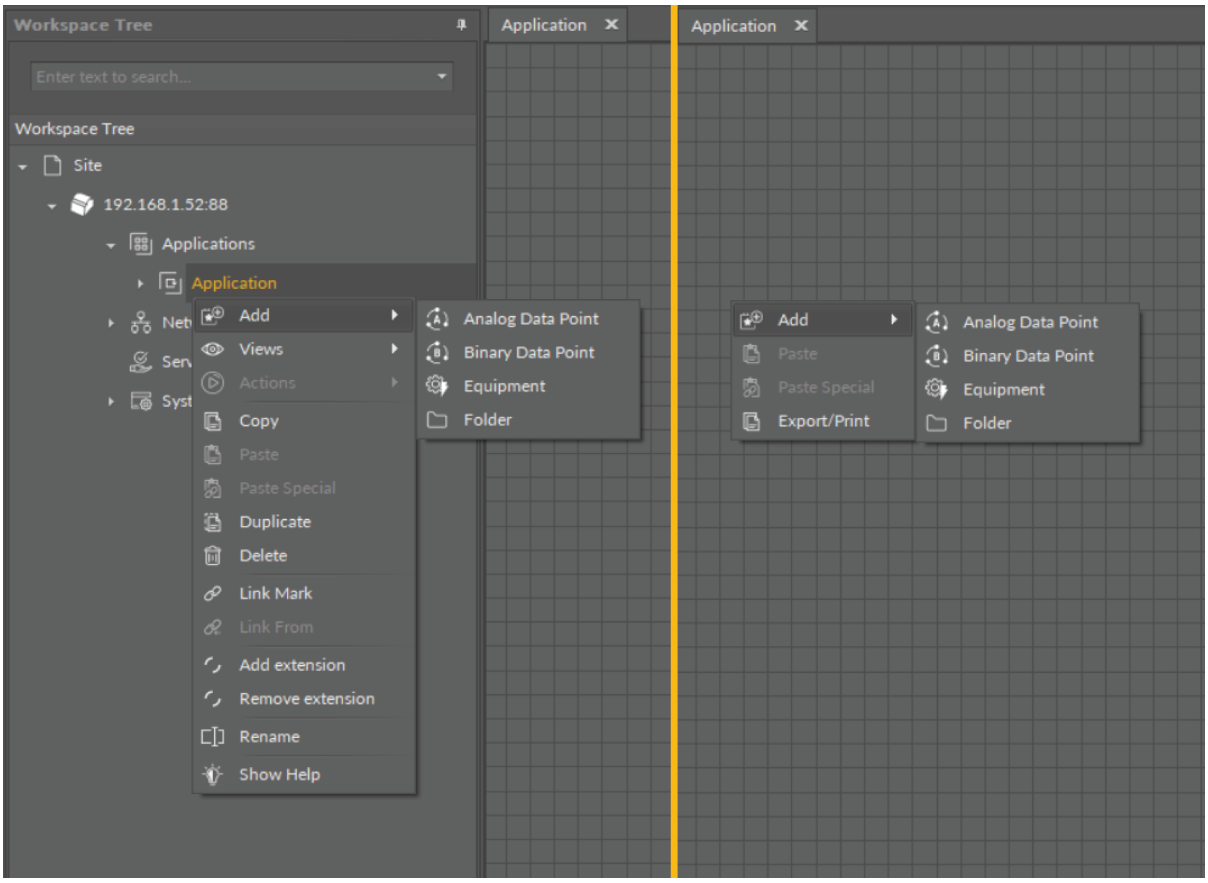

Figure 105. Adding Data Points/folders from the context menu

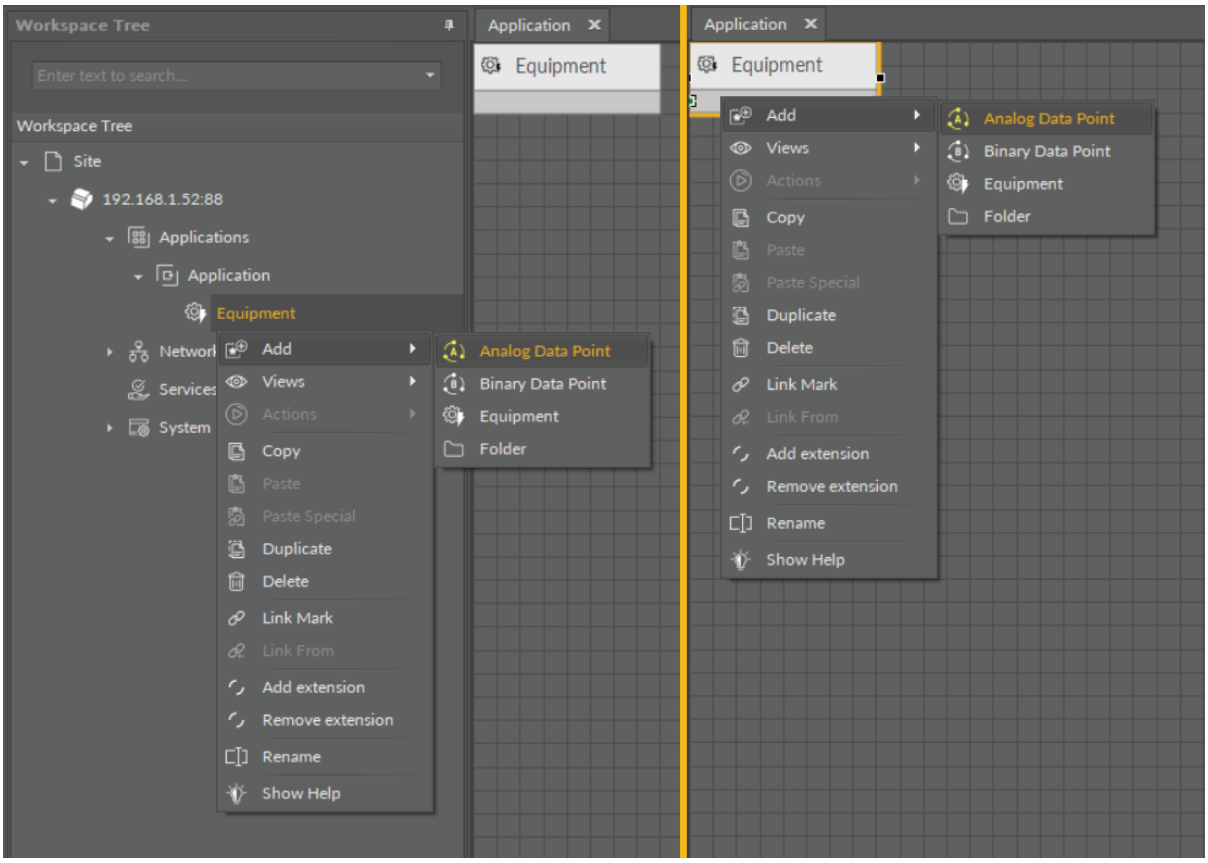

Figure 106. Adding Data Points to folders from the context menu

Removing Components

A component selected in the Property Sheet tab can be deleted with a Delete key or a Delete option in the context menu.

8.5.2 Creating Links

The only way of creating a link in the Property Sheet view is using the context menu with the Link Mark and Link From options.

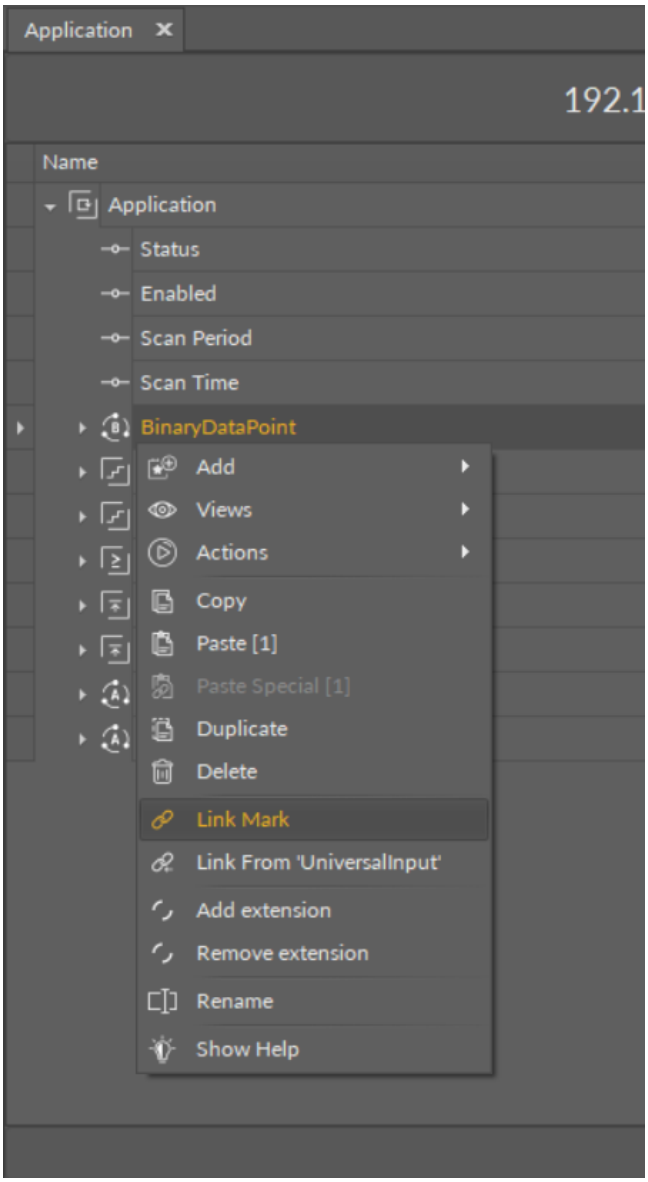

Figure 107. The Link Mark option

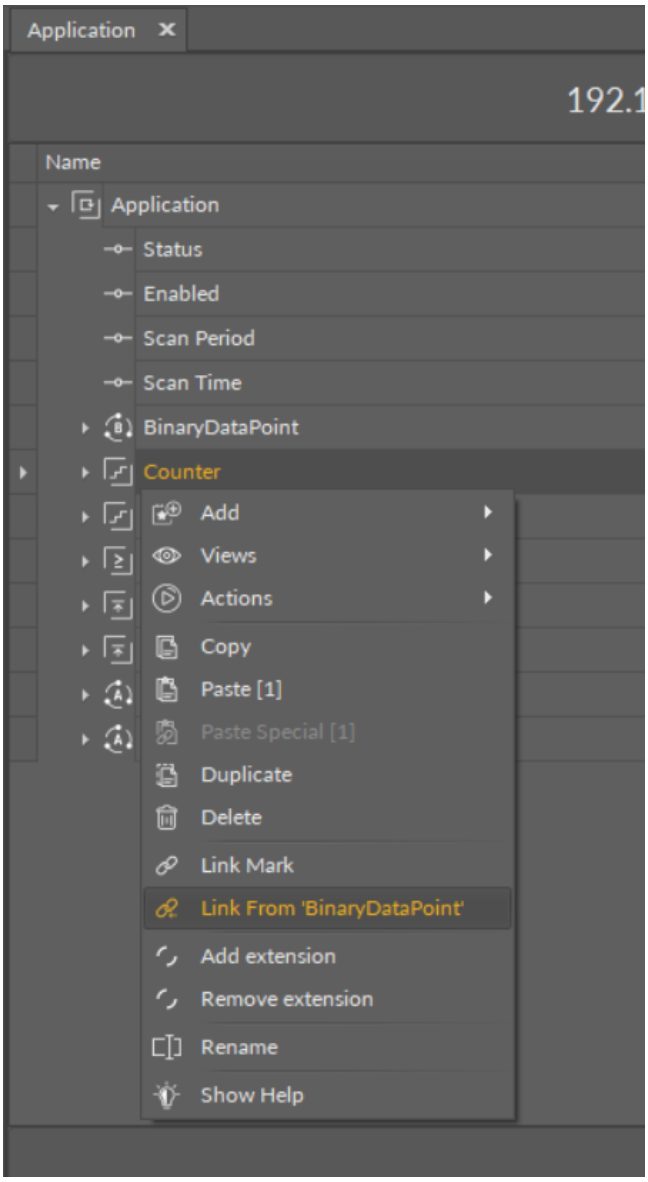

Figure 108. The Link From option

There is no possibility of removing a link in the Property Sheet view. To remove a link use the Wire Sheet or Object Properties view.

9 Special Views

The iC Tool for nano EDGE ENGINE devices offers special views that are tailored for the nano EDGE ENGINE functionalities.

9.1 Applications Manager

The Applications Manager is a special view that allows to manage the Application components added to the Applications container.

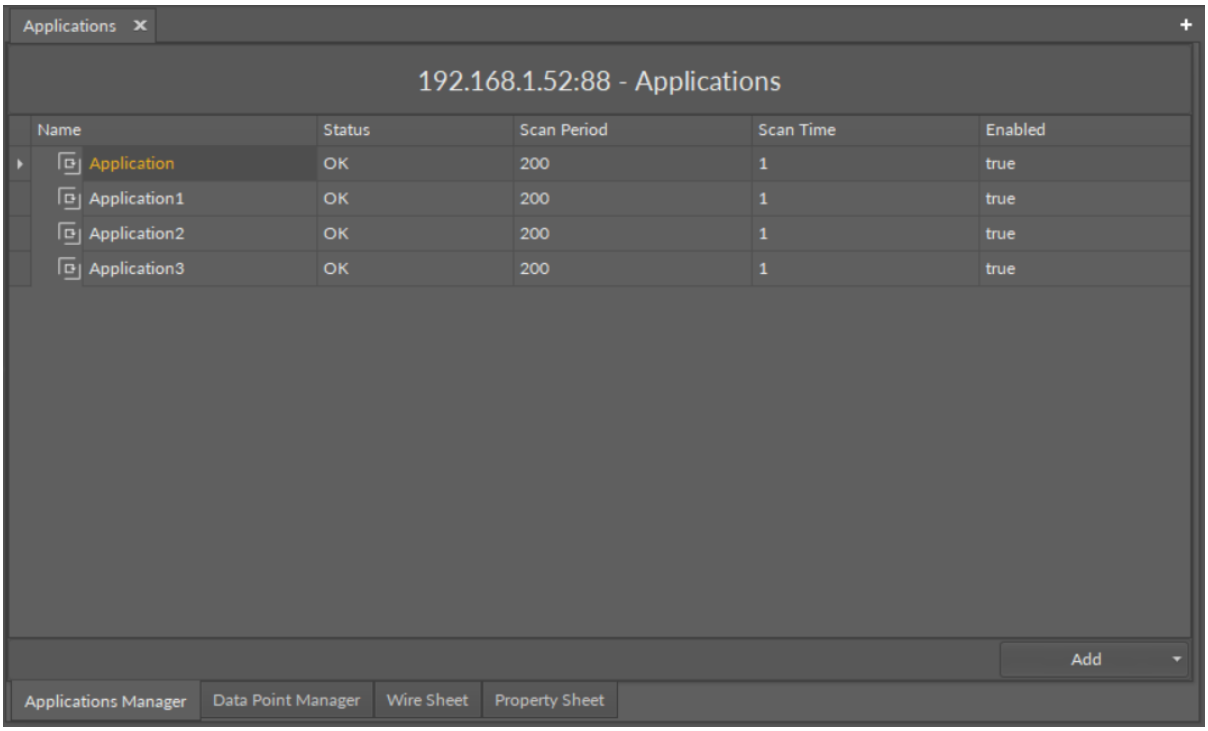

Figure 109. The Applications Manager

The Applications Manager lists all the Application components used on the device. The view shows the following fields:

- Name of the application;
- Status;
- Scan period;
- Scan time;
- Enabled or disabled status.

In the Applications Manager, it is possible to add, remove, copy, or duplicate Application components.

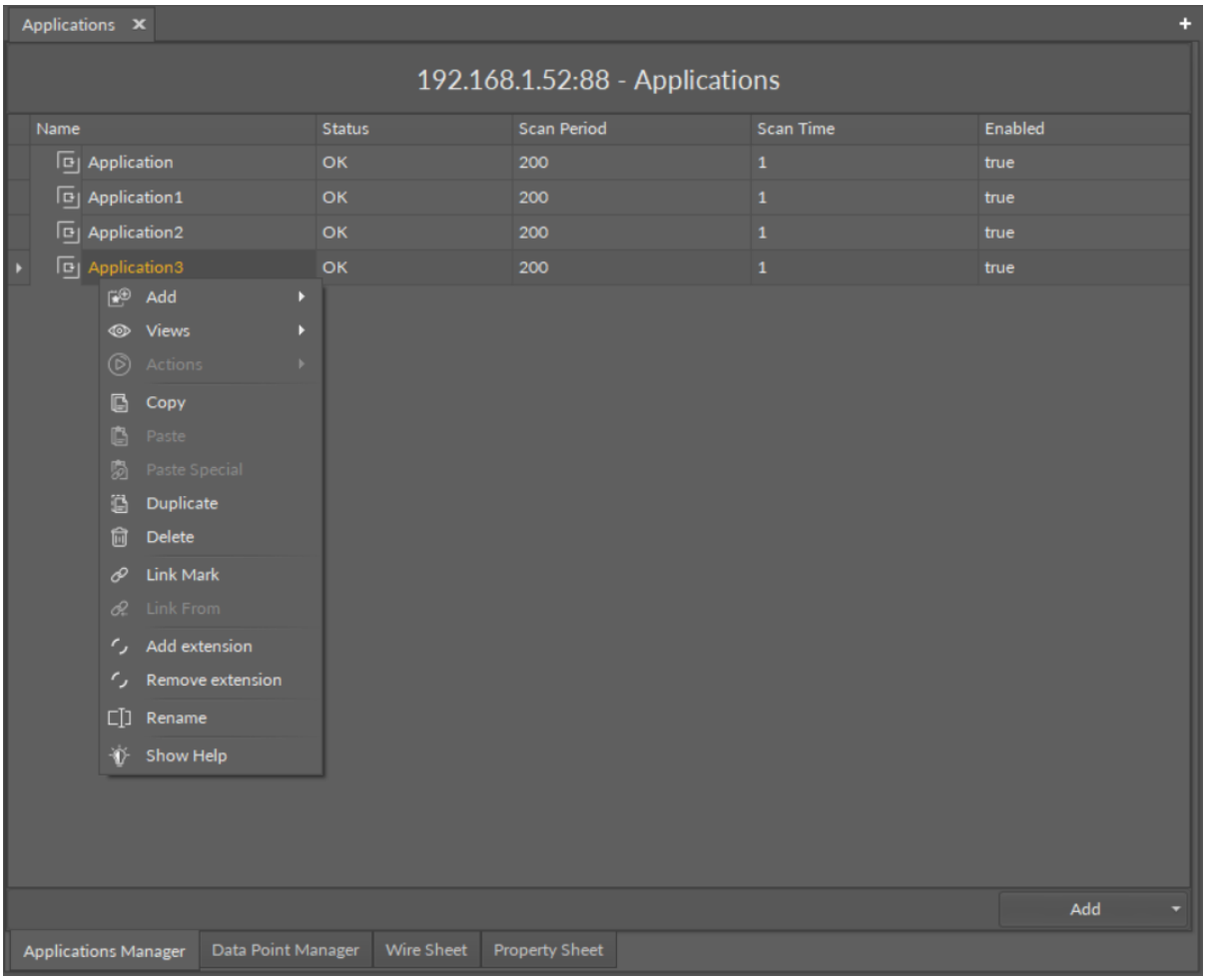

Figure 110. Options in the Applications Manager

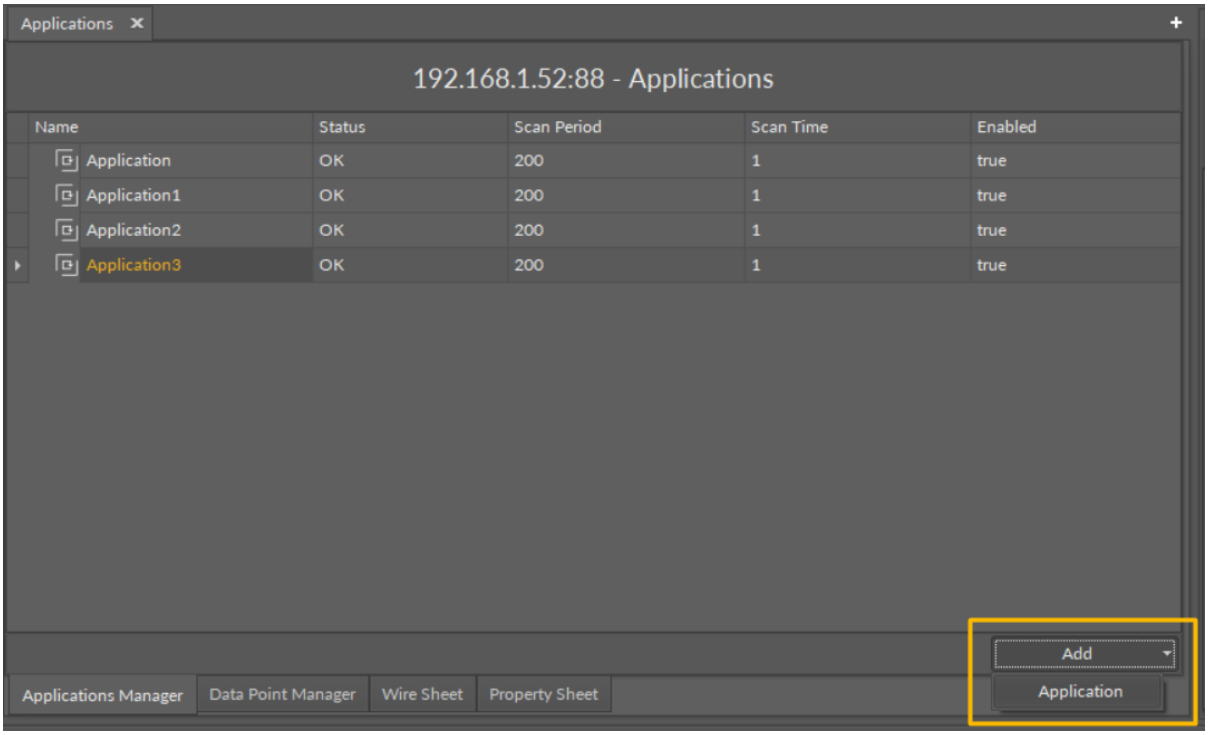

Figure 111. Options in the Applications Manager

9.1.1 Opening the Applications Manager

The Applications Manager view is accessible in the context menu of the Applications container.

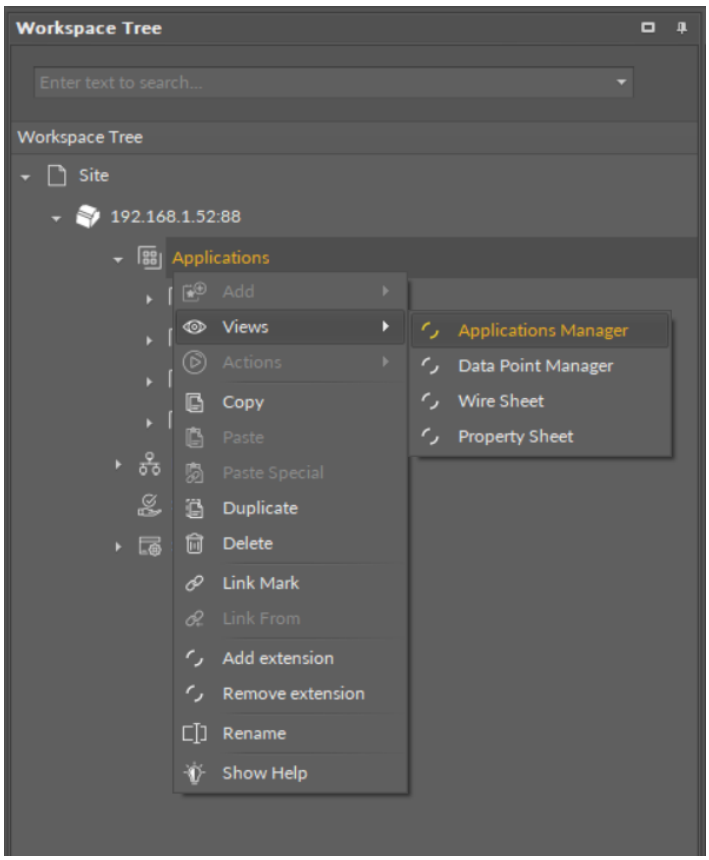

Figure 112. Accessing the Applications Manager from the Applications container context menu

The Applications Manager view is also automatically opened if the Applications container is double-clicked in the Workspace Tree window.

9.2 Data Point Manager

The Data Point Manager is a special view that allows to manage the Data Points available within the nano EDGE ENGINE license.

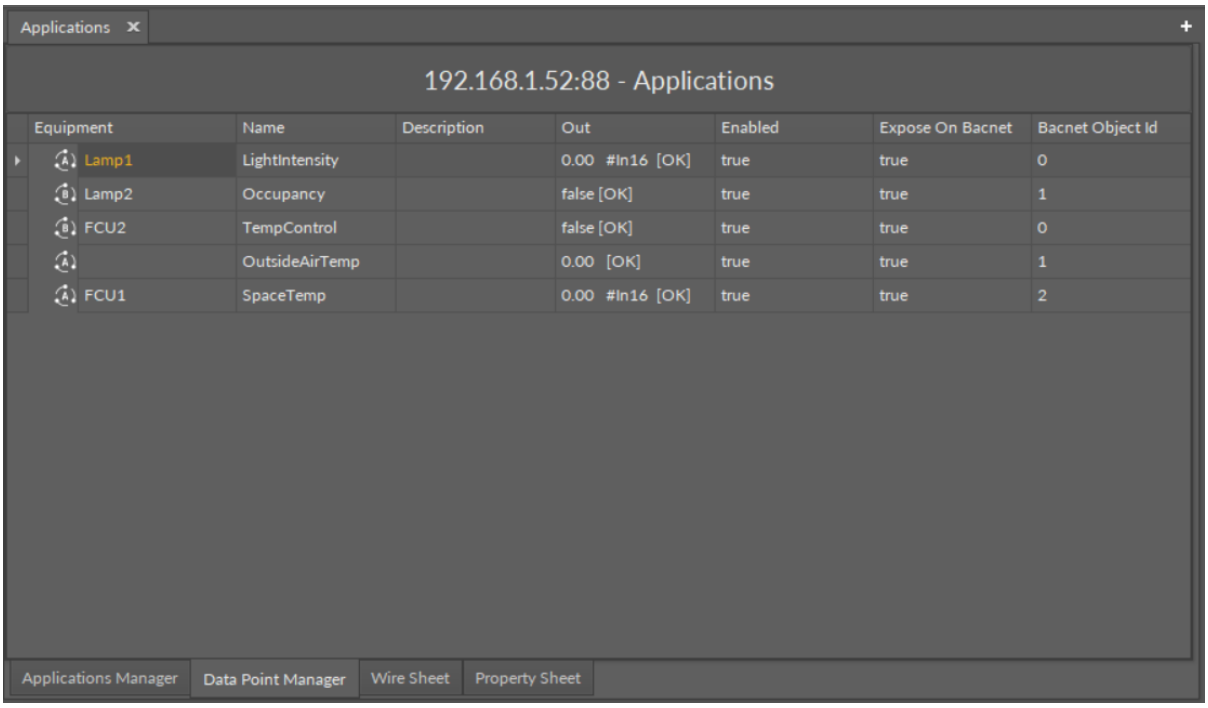

Figure 113. The Data Point Manager

The Data Point Manager lists all the Data Points used in applications saved on the device. The view shows the following fields:

- Equipment, which the Data Point belongs to;
- name of the Data Point;
- description;
- value on the Out slot;
- enabled or disabled status;
- exposition on BACnet status;
- BACnet object Id.

The Data Point Manager view is not editable; however, once a specific Data Point is clicked in the Manager view, it is displayed in the Object Properties window, where it can be freely edited. Also, the view allows for multiediting of compatible Data Points–if compatible Data Points are selected in the Data Point Manager, their common slots are available for multiedition in the Object Properties window.

9.2.1 Opening the Data Point Manager

The Data Point Manager view is accessible from two locations:

- in the context menu of the Applications container;
- in the context menu of the RAC18-IP (LocalDevice) component.

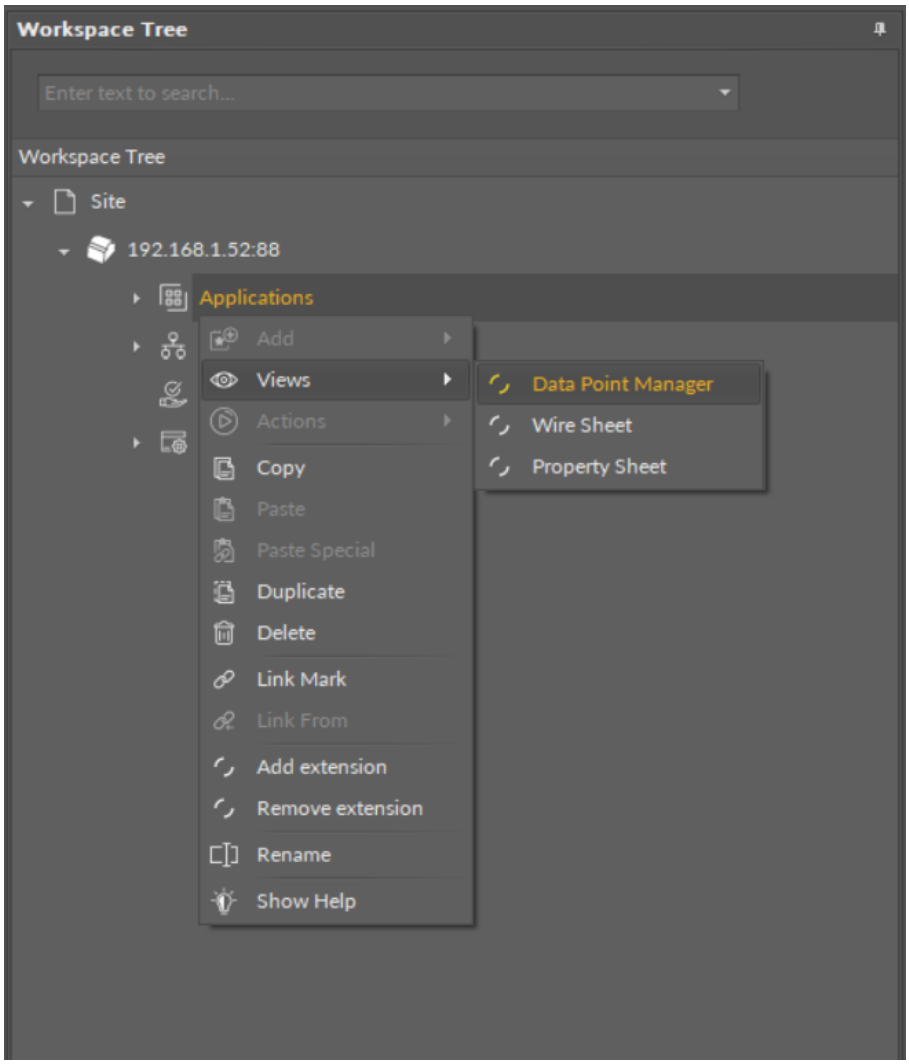

Figure 114. Accessing the Data Point Manager from the Applications container context menu

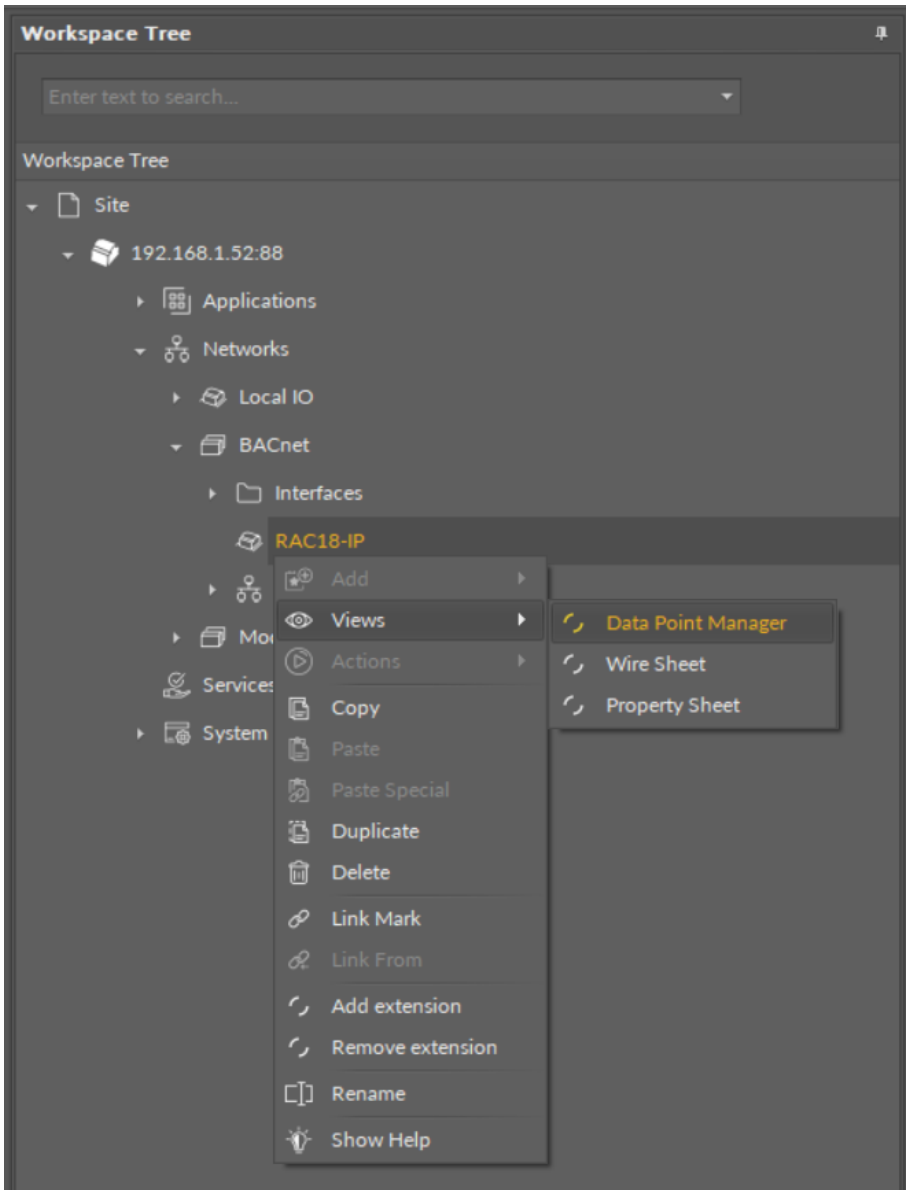

Figure 115. Accessing the Data Point Manager from the context menu of RAC18-IP (LocalDevice) component in the Networks container

The Data Point Manager view is also automatically opened if either the Applications container or the RAC18-IP (LocalDevice) component is double-clicked in the Workspace Tree window.

Licensing

The license for the new generation of iSMA CONTROLLI controllers driven by the nano EDGE ENGINE is constructed against the number of Data Points: each device based on the nano EDGE ENGINE is granted a specified number of license points (Data Points in this case), which can be used within applications. Therefore, the licensing system is only of quantitative, not functional, character–only the real number of Data Points in applications is taken into account, regardless of how many communication protocols are used to expose them, or how many network points are controlled. With the nano EDGE ENGINE-generation devices it is possible to create as big an application (or applications) as the number of licensed Data Points. No elements in the Networks, Services, or System containers are subject to license limitations, other than Data Points in the Applications container.

Note: In order to check the number of license points, please refer to the License in the device.

9.3 Equipment Manager

The Equipment Manager is a special view that allows to manage the Equipment components, Data Points, and Folder components added to a specific Application component.

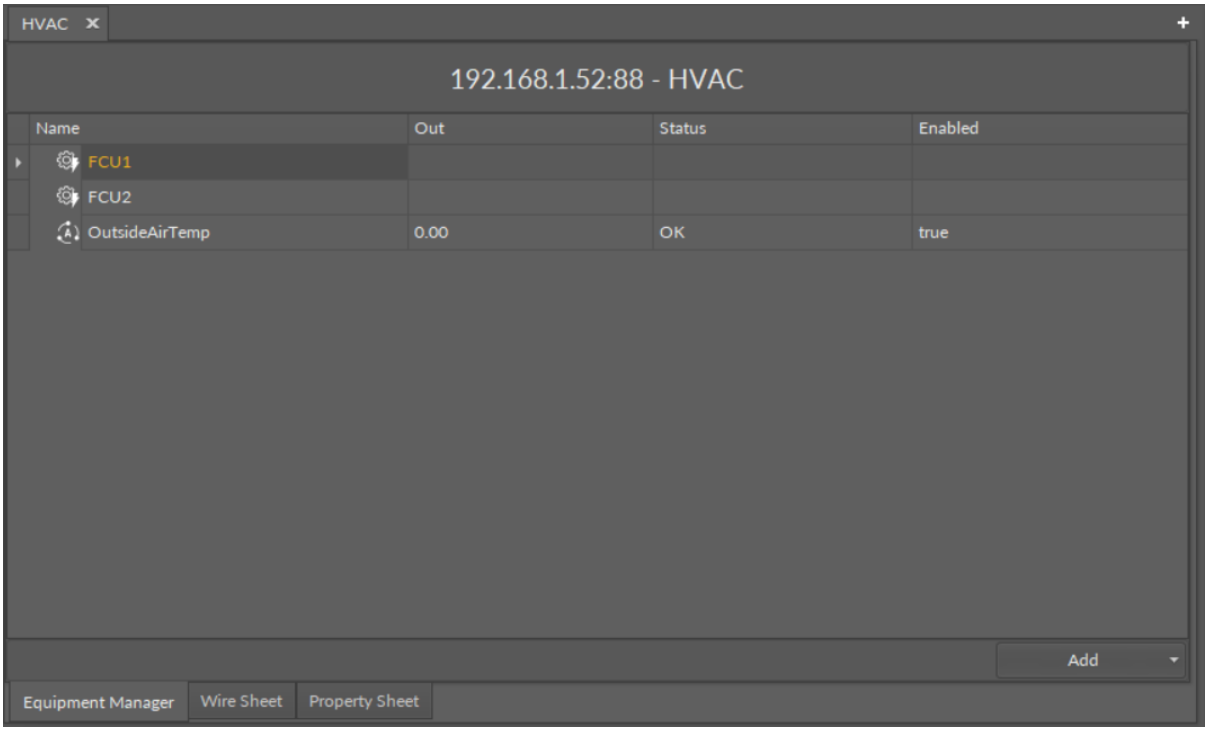

Figure 116. The Equipment Manager

The Equipment Manager lists all Equipment components and Data Points used in the specific Application component. The view shows the following fields:

- name of the Data Point;
- value on the Out slot;
- Data Point's status;
- enabled or disabled status.

The Equipment Manager view is not editable; however, it allows to add, remove, duplicate, and rename Equipment components, Data Points (withing the Equipment components and directly in the Application component), and Folder components, which help organize components in the application.

Once a specific Data Point is clicked in the Equipment Manager view, it is displayed in the Object Properties window, where it can be freely edited. Also, the view allows for multiediting of compatible Data Points–if compatible Data Points are selected in the Application Manager, their common slots are available for multiedition in the Object Properties window.

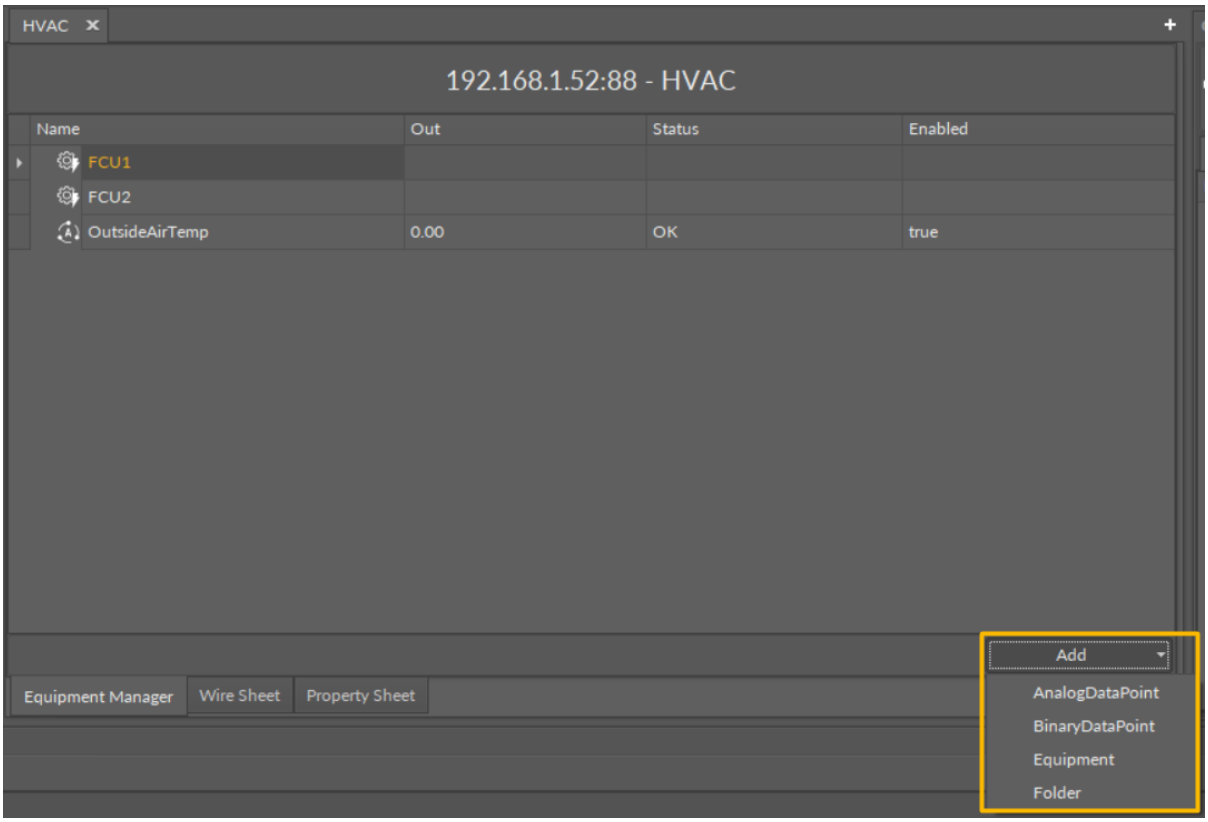

Figure 117. Options in the Equipment Manager

9.3.1 Opening the Equipment Manager

The Equipment Manager view is accessible in the context menu of the Application component.

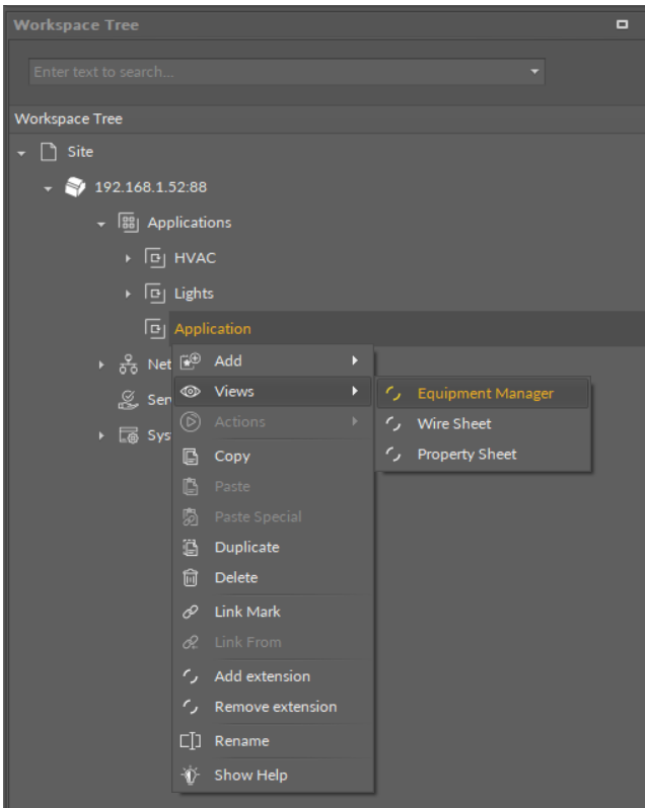

Figure 118. Accessing the Application Manager from the Applications container context menu

The Equipment Manager view is also automatically opened if either the Application component is double-clicked in the Workspace Tree window.

9.4 Network Manager

9.4.1 BACnet

The Network Manager view is available for the BACnet component. It lists all BACnet networks configured on the device's ports. The Network Manager view shows the statuses, ports (which the network is configured on), and enabled or disabled states of the the network. Once the network, listed in the Network Manager, is double-clicked, the respective Network component is opened.

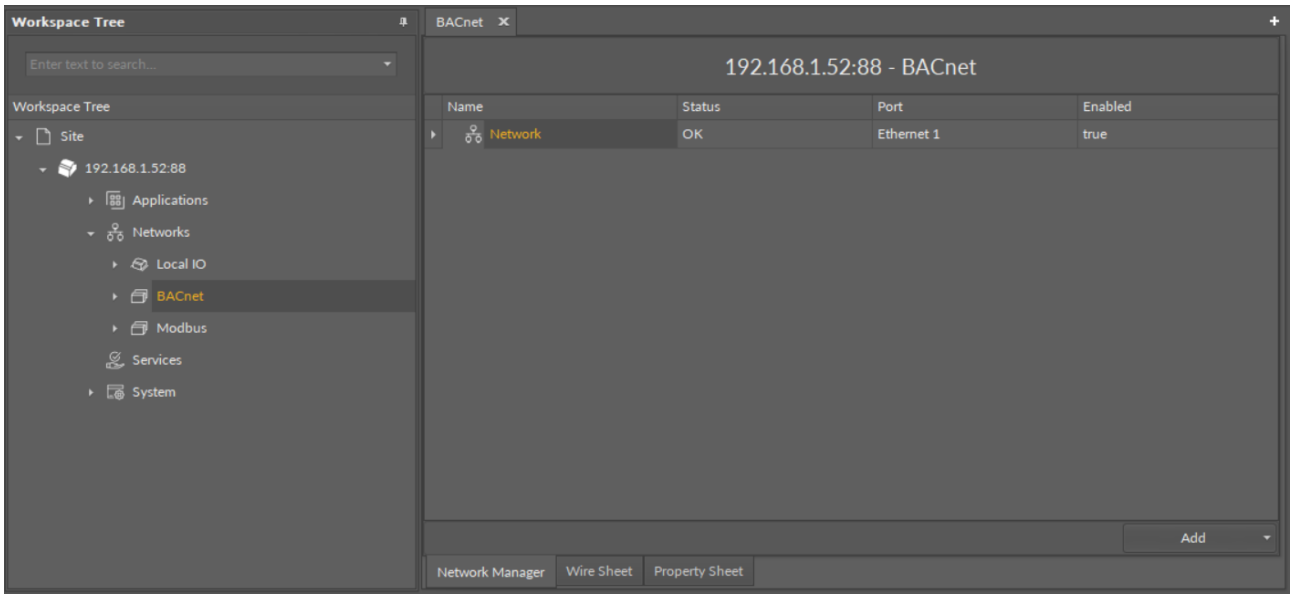

Figure 119. The Network Manager for BACnet

9.4.2 Opening Network Manager

The Network Manager view is accessible from the context menu of the BACnet component. It is also automatically opened if the BACnet component is double-clicked in the Workspace Tree window.

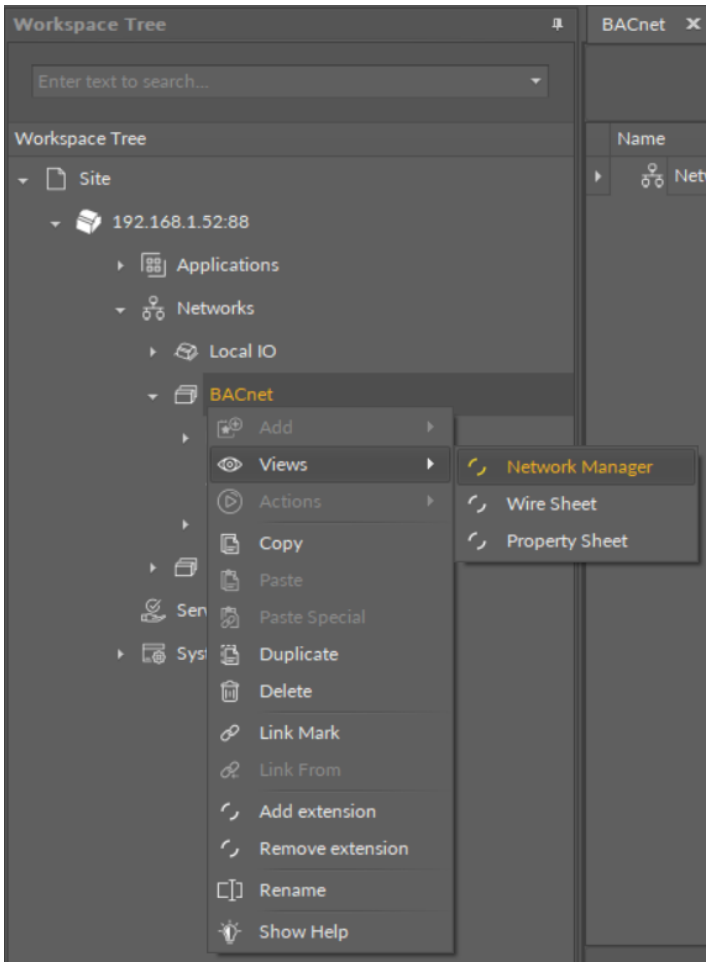

Figure 120. Opening the Network Manager

9.4.3 Adding BACnet Networks

The networks may be added to the Network Manager twofold: dragging and dropping the Network component to the BACnet component from the Core library (in the Device Libraries window), or using a special Add function in the Network Manager view available in the bottom right corner.

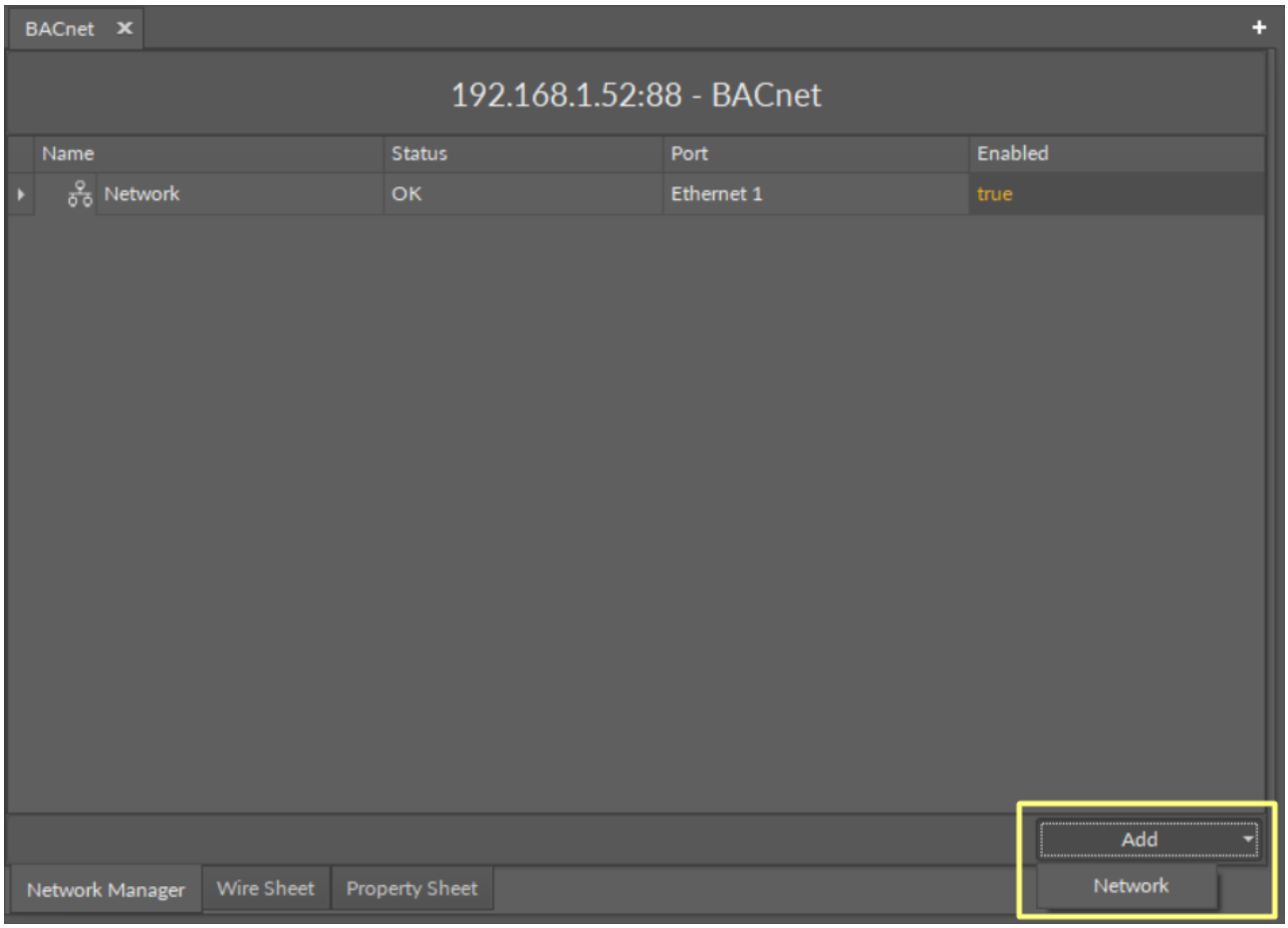

Figure 121. The Add button

Using this Add button opens the dialog window, which allows to adjust the quantity of networks to be added.

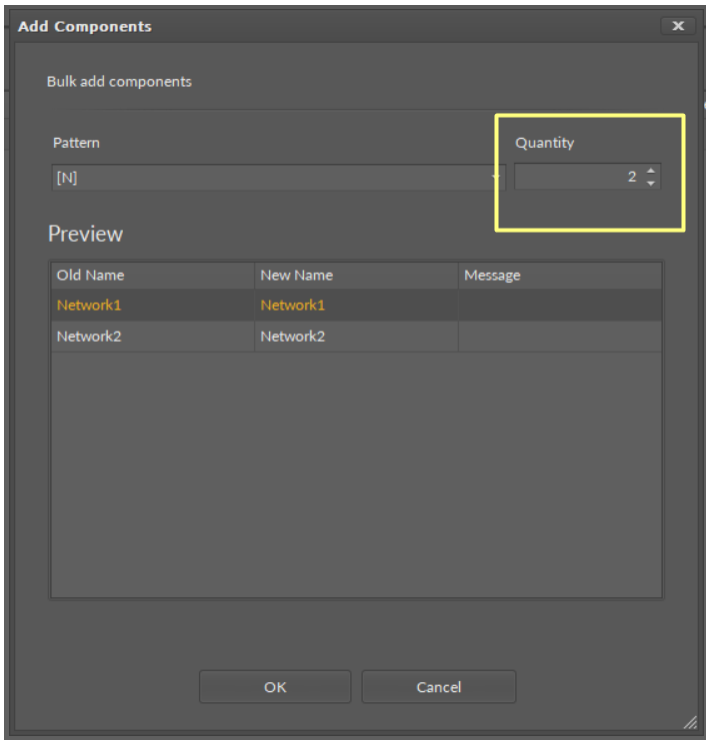

Figure 122. The dialog window

9.4.4 Multiediting of Common Slots

The Network Manager view allows multiediting of common slots in components of the same type, for example, to enable all one-type components at once. Multiediting is available in the Object Properties window, upon selecting one-type components in the Network Manager with Ctrl or Shift keys.

9.4.5 Modbus

The Network Manager view is available for the Modbus component. It lists all Modbus networks configured on the device's ports. The Network Manager view shows the statuses, ports (which the network is configured on), and enabled or disabled states of the the network. Once the network, listed in the Network Manager, is double-clicked, the respective Network component is opened.

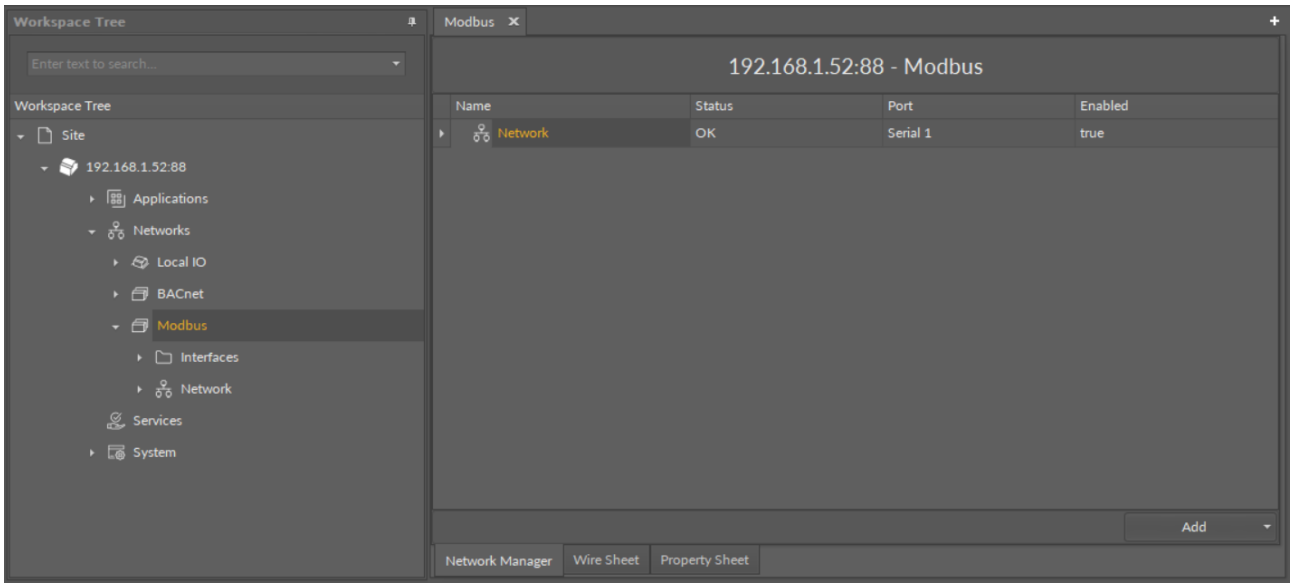

Figure 123. The Network Manager view

9.4.6 Opening Network Manager

The Network Manager view is accessible from the context menu of the Modbus component. It is also automatically opened if the Modbus component is double-clicked in the Workspace Tree window.

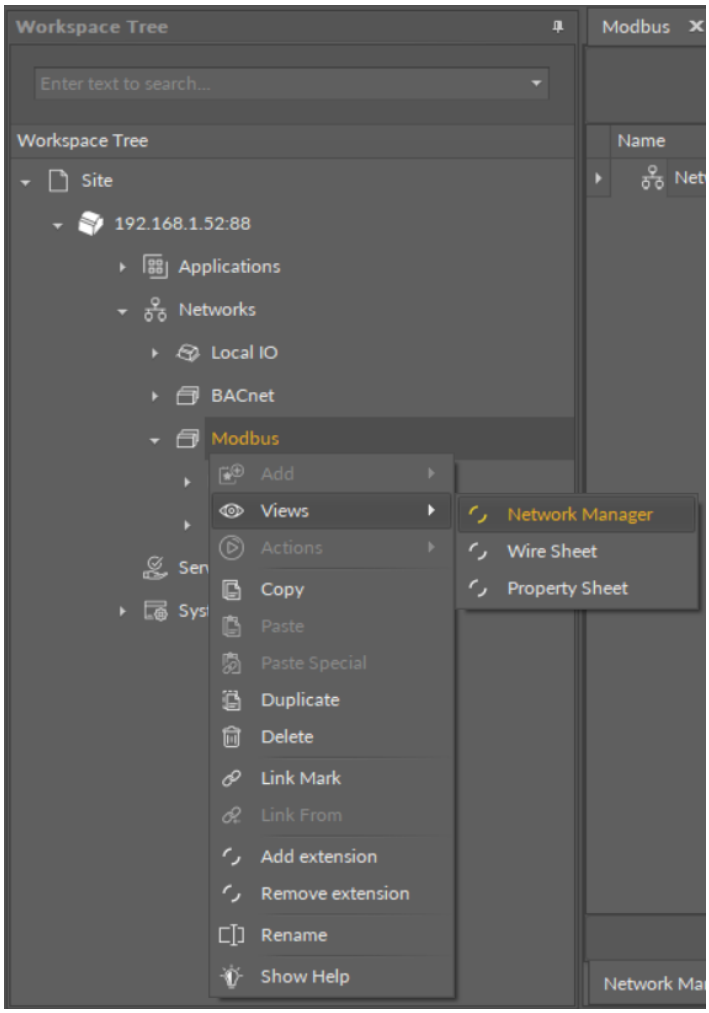

Figure 124. Opening the Network Manager

9.4.7 Adding Modbus Networks

The networks may be added to the Network Manager twofold: dragging and dropping the Network component to the Modbus component from the Core library (in the Device Libraries window), or using a special Add function in the Network Manager view available in the bottom right corner.

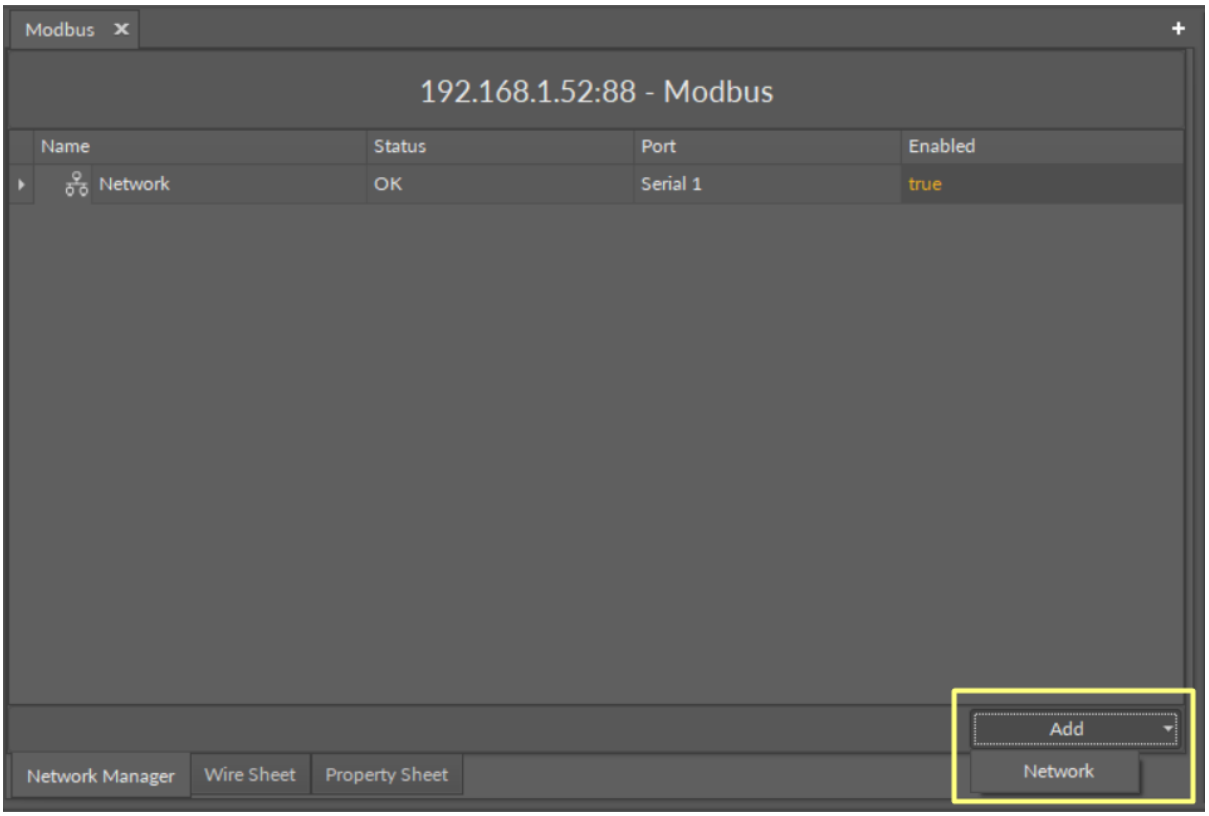

Figure 125. Adding the Modbus network

Using this Add button opens the dialog window, which allows to adjust the quantity of networks to be added.

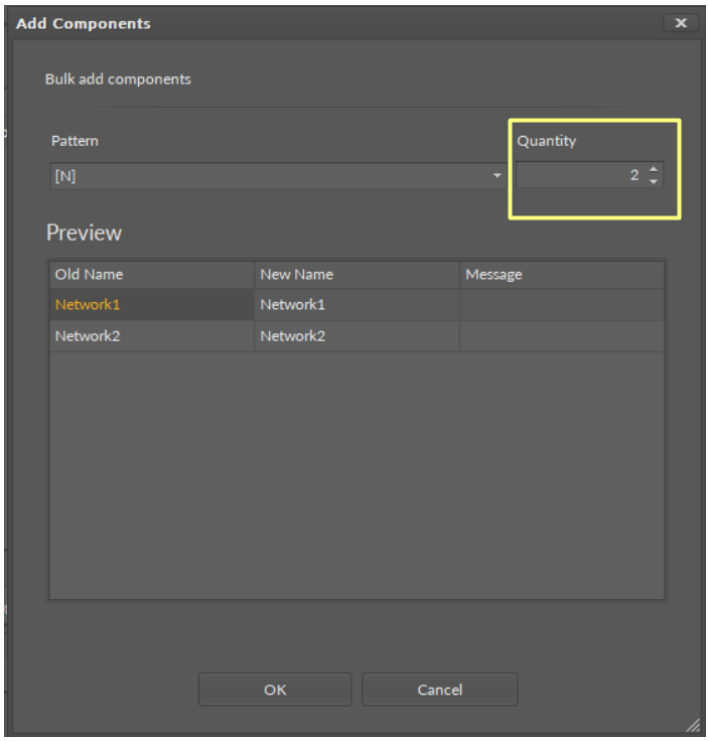

Figure 126. The dialog window

9.4.8 Multiediting of Common Slots

The Network Manager view allows multiediting of common slots in components of the same type, for example, to enable all one-type components at once. Multiediting is available in the Object Properties window, upon selecting one-type components in the Network Manager with Ctrl or Shift keys.

9.5 Device Manager

9.5.1 BACnet

The Device Manager view is available for the BACnet Network component. It lists all devices added to the configured BACnet network. The Device Manager view shows the statuses, BACnet device names and IDs, and enabled or disabled states of the devices in the network. Once the device listed in the Device Manager is double clicked, the respective Device component is opened.

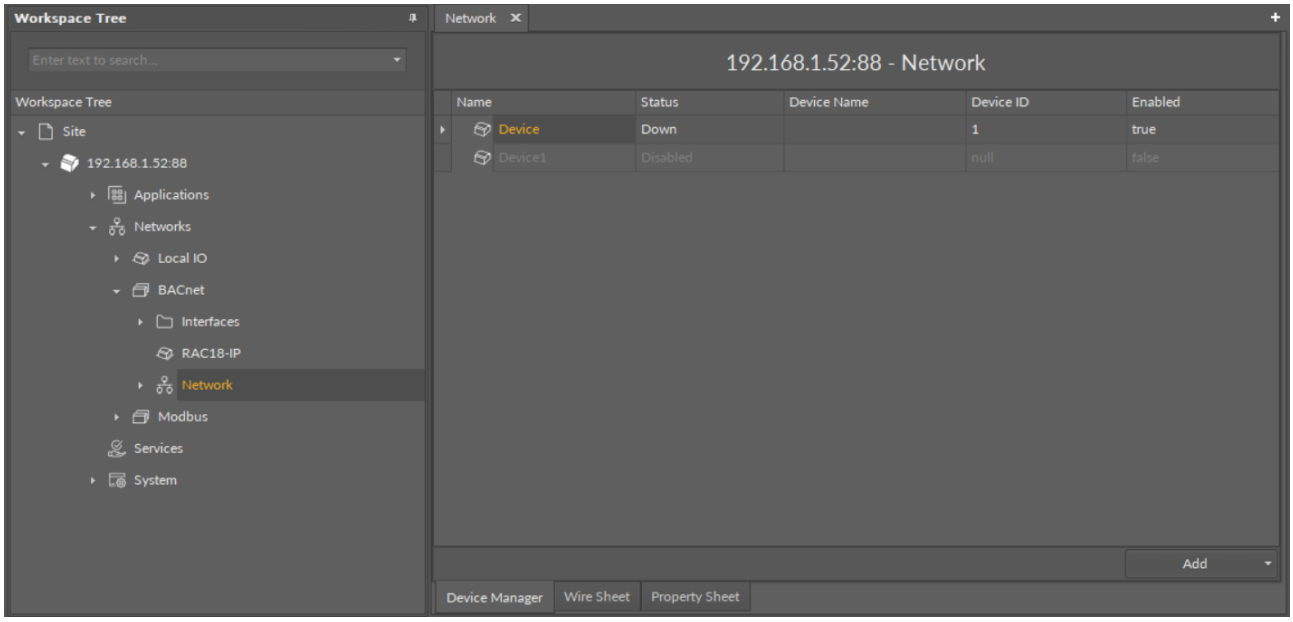

Figure 127. The Device Manager

9.5.2 Opening Device Manager

The Device Manager view is accessible from the context menu of the Network component. It is also automatically opened if the Network component is double-clicked in the Workspace Tree window.

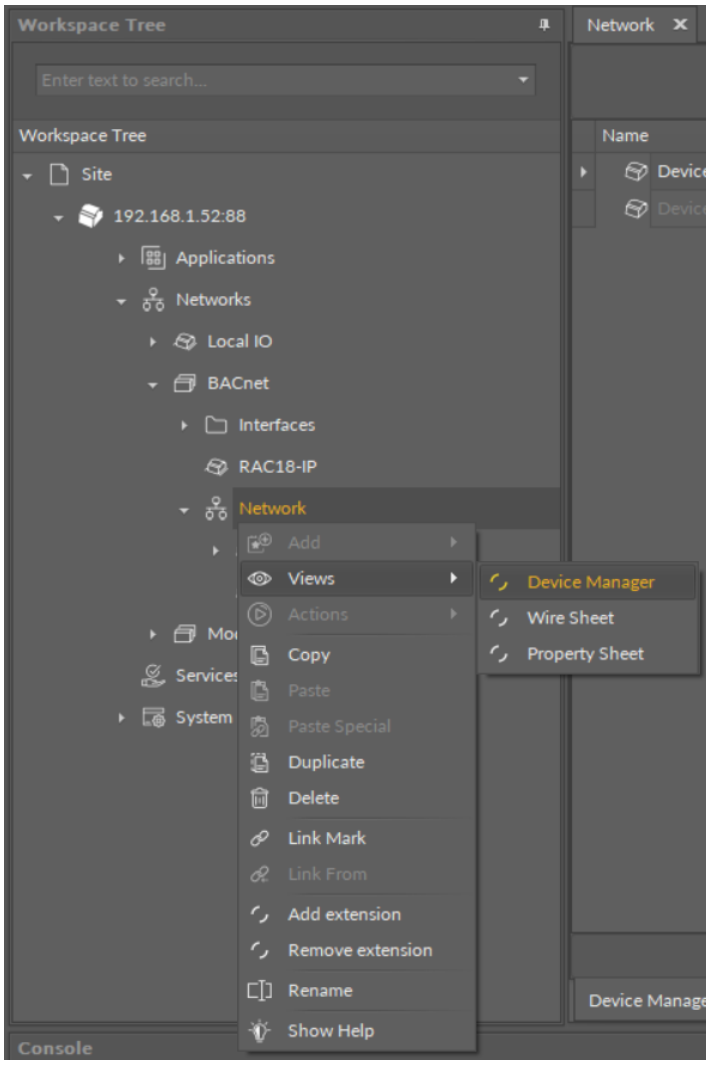

Figure 128. Opening the Device Manager

9.5.3 Adding BACnet Devices

The devices may be added to the BACnet network twofold: dragging and dropping the Device component to the Network component from the BACnet library (in the Device Libraries window), or using a special Add function in the Device Manager view available in the bottom right corner.

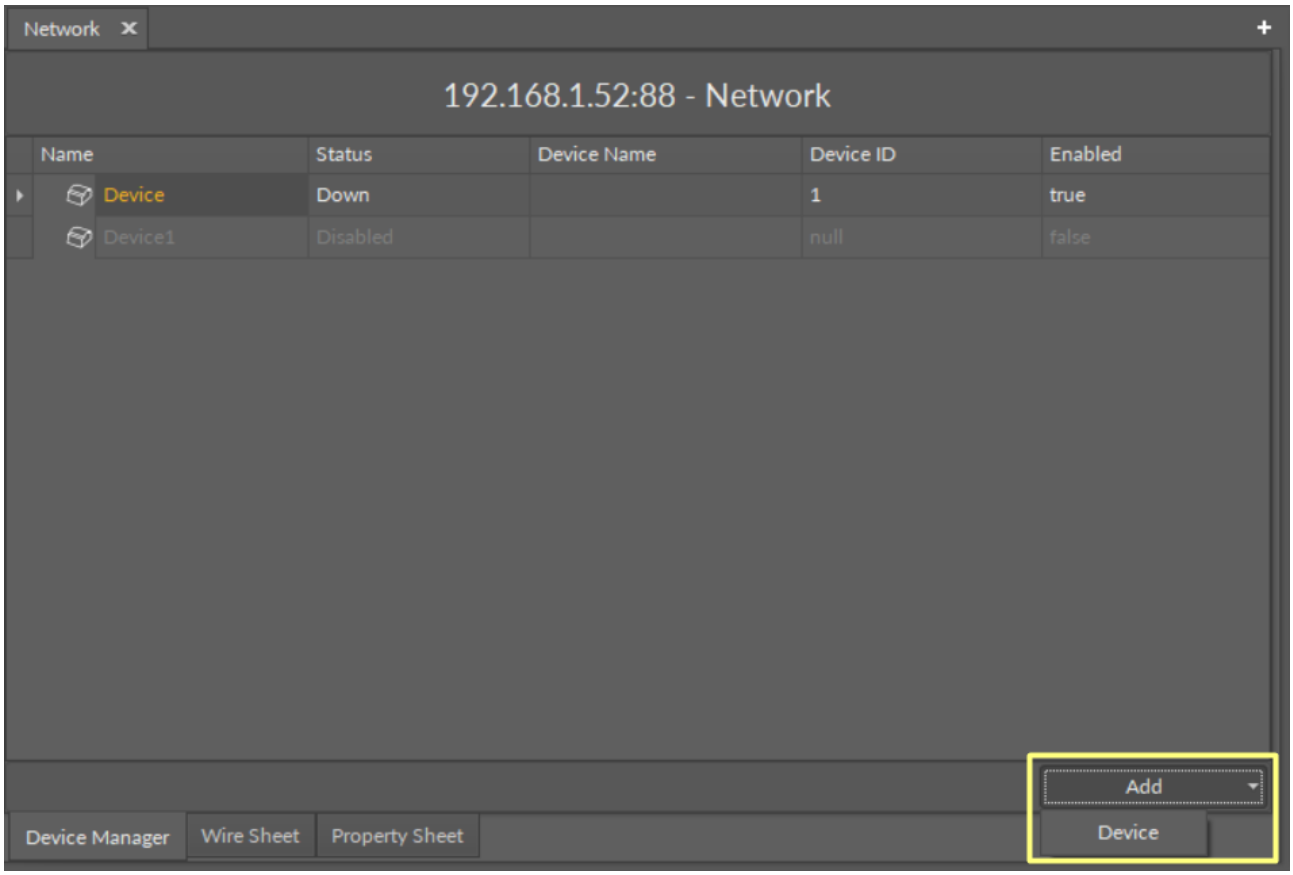

Figure 129. The Add button in the Device Manager

Using this Add button opens the dialog window, which allows to adjust the quantity of devices to be added.

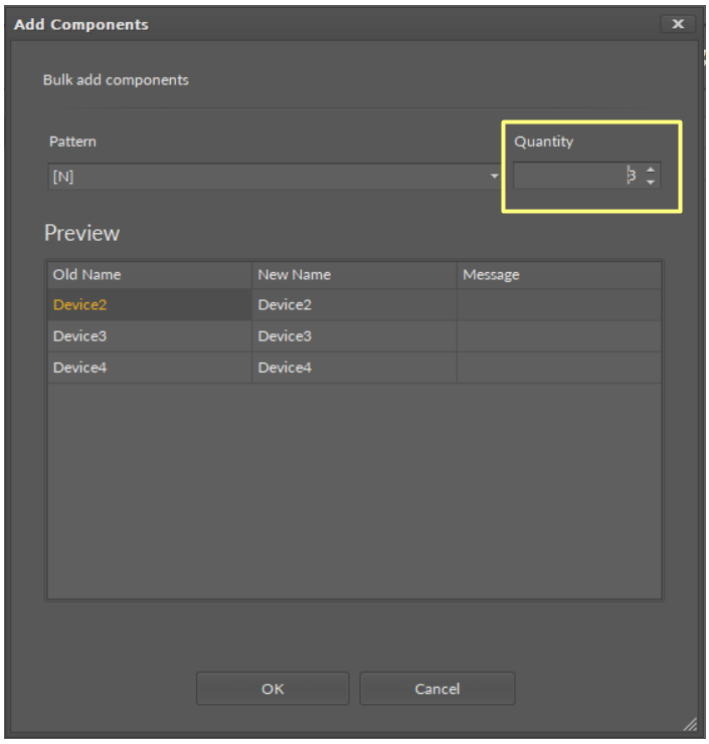

Figure 130. The dialog window

9.5.4 Multiediting of Common Slots

The Device Manager view allows multiediting of common slots in components of the same type, for example, to enable all one-type components at once. Multiediting is available in the Object Properties window, upon selecting one-type components in the Device Manager with Ctrl or Shift keys.

9.5.5 Modbus

The Device Manager view is available for the Modbus Network component. It lists all devices added to the configured Modbus network. The Device Manager view shows the statuses, device addresses, and enabled or disabled states of the devices in the network. Once the device, listed in the Device Manager, is double clicked, the respective Device component is opened.

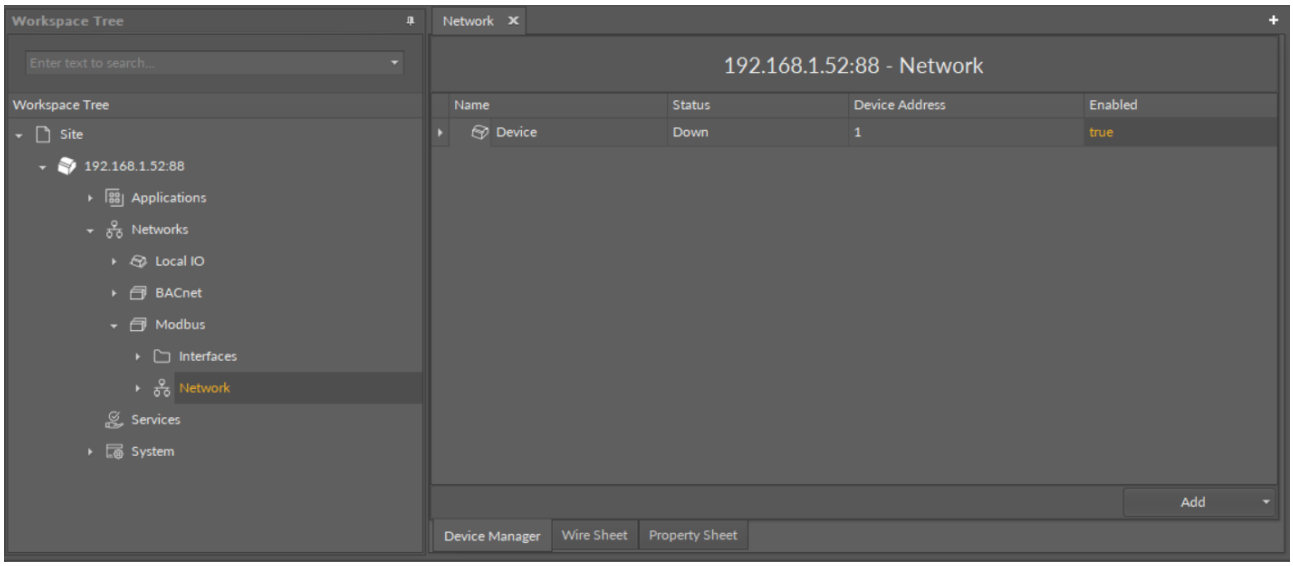

Figure 131. The Device Manager view

9.5.6 Opening Device Manager

The Device Manager view is accessible from the context menu of the Network component. It is also automatically opened if the Network component is double-clicked in the Workspace Tree window.

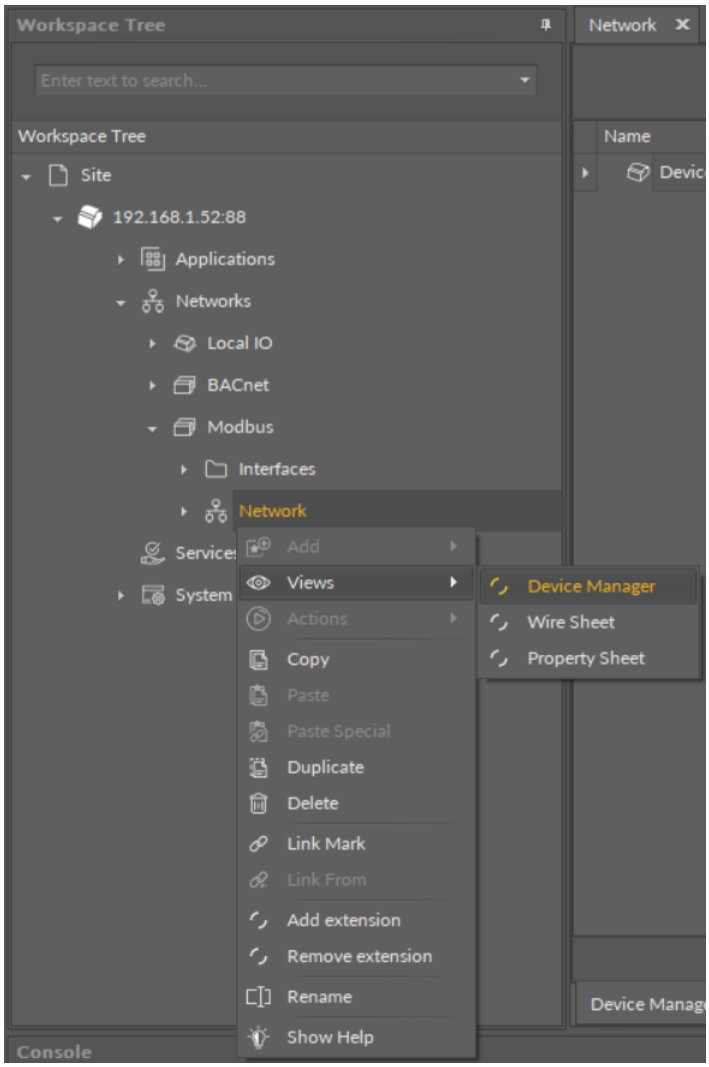

Figure 132. Opening the Device Manager

9.5.7 Adding Modbus Devices

The devices may be added to the Modbus network twofold: dragging and dropping the Device component to the Network component from the Modbus library (in the Device Libraries window), or using a special Add function in the Device Manager view available in the bottom right corner.

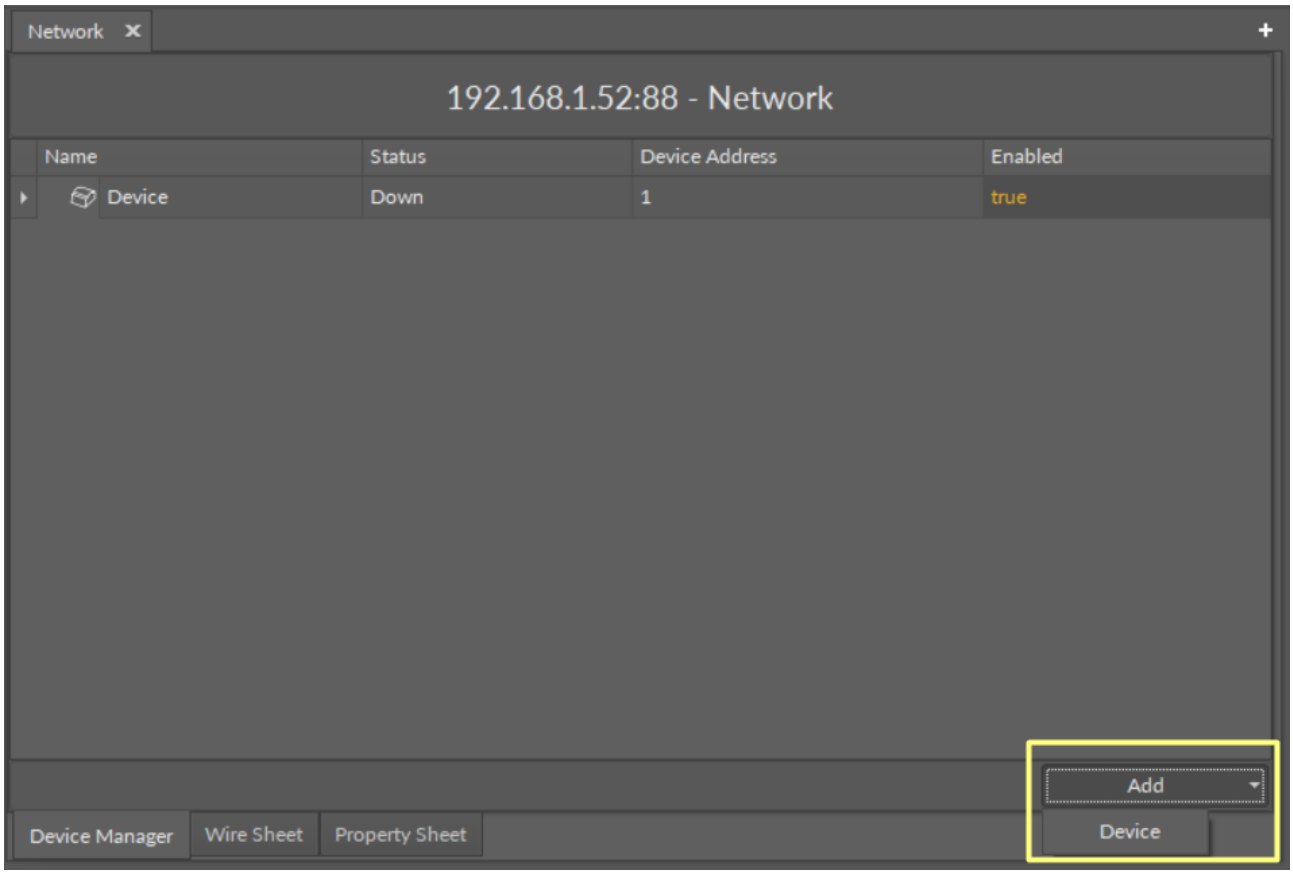

Figure 133. Adding Modbus devices

Using this Add button opens the dialog window, which allows to adjust the quantity of devices to be added.

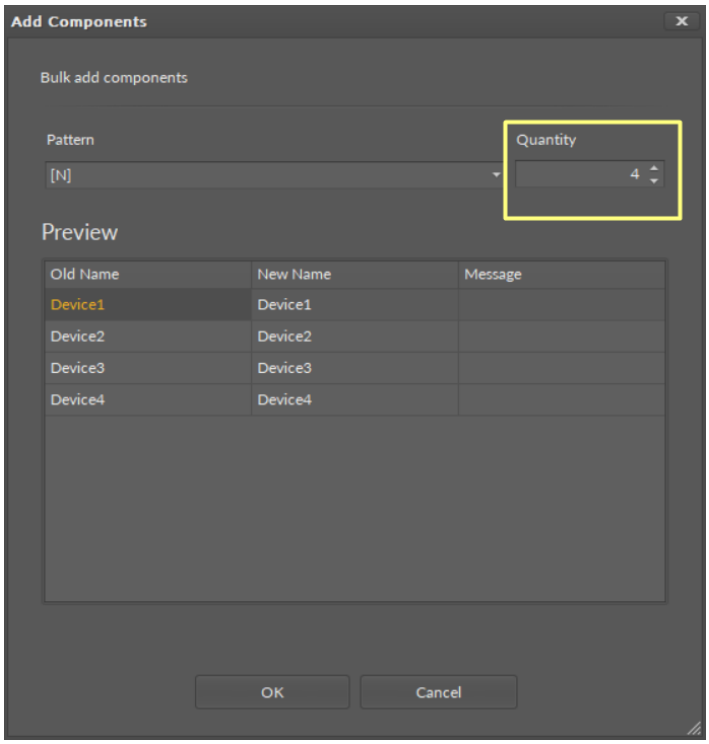

Figure 134. The dialog window

9.5.8 Multiediting of Common Slots

The Device Manager view allows multiediting of common slots in components of the same type, for example, to enable all one-type components at once. Multiediting is available in the Object Properties window, upon selecting one-type components in the Device Manager with Ctrl or Shift keys.

9.6 Point Manager

9.6.1 LocalIO

The LocalIO Point Manager view is available for the LocalIO component. It lists all I/O points added to the LocalIO component, and shows their:

- Out slot value;
- unit (for numeric values);
- status;
- number;
- enabled or disabled state.

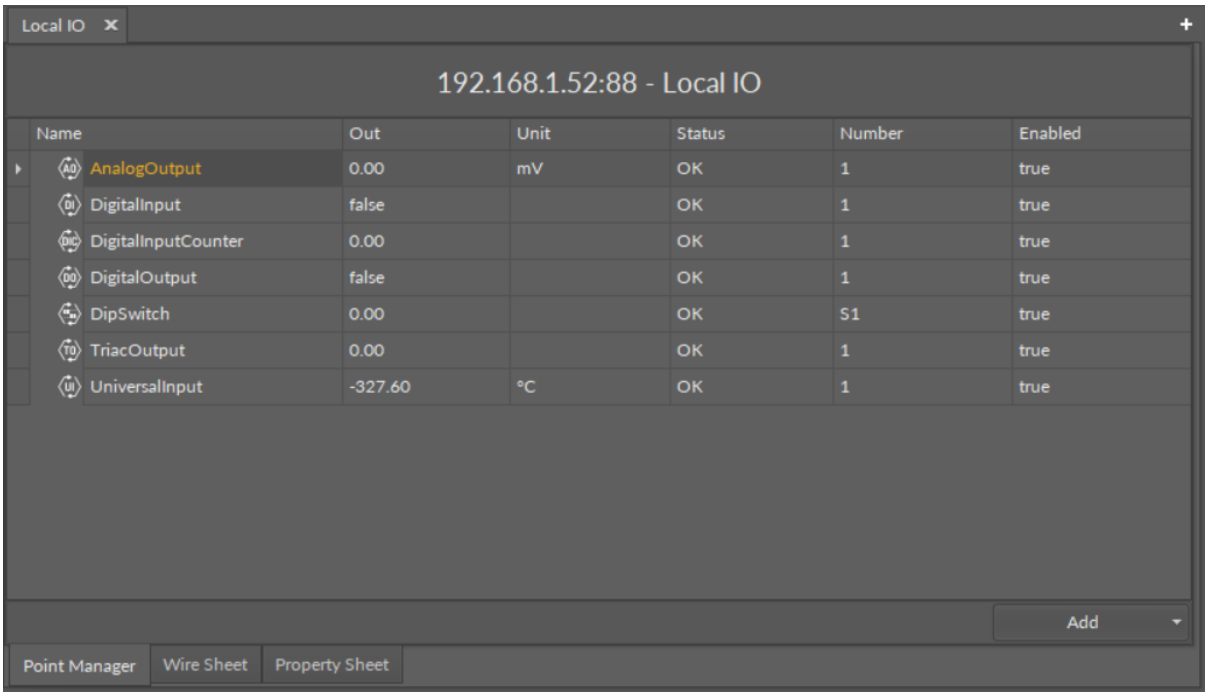

Figure 135. The Point Manager view

9.6.2 Opening Point Manager

The Point Manager view is accessible from the context menu of the LocalIO component. It is also automatically opened if the LocalIO component is double-clicked in the Workspace Tree window.

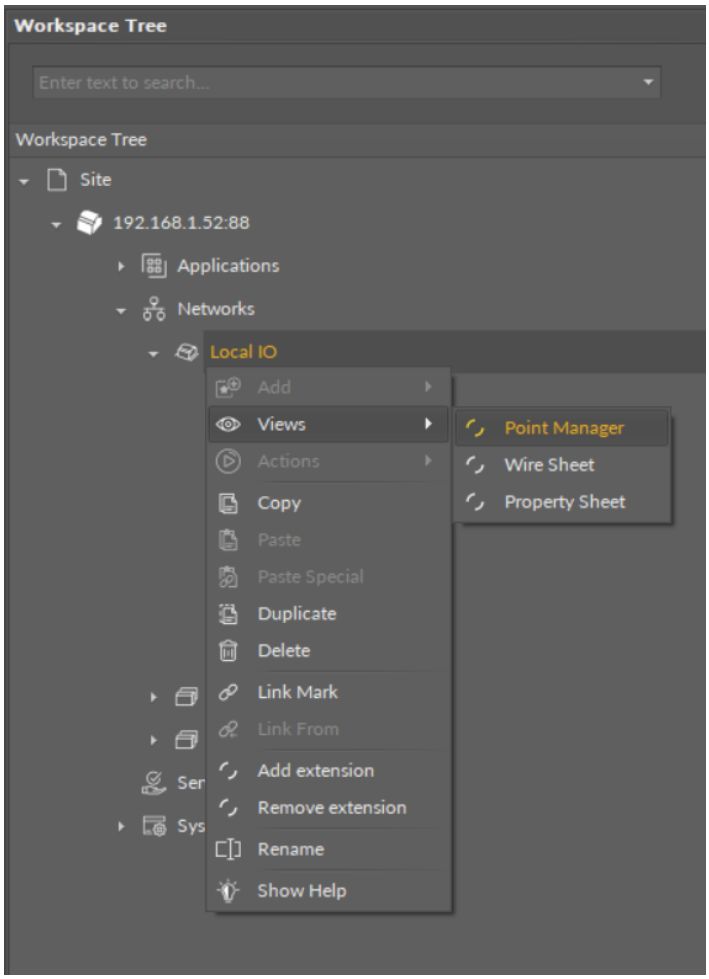

Figure 136. Opening the Point Manager view

9.6.3 Adding I/O Points

The I/O points may be added twofold: dragging and dropping the I/O points to the LocalIO component from the IO library (in the Device Libraries window), or using a special Add function in the LocalIO Point Manager view available in the bottom right corner. The Add function allows to add any of the I/O points available in the IO library.

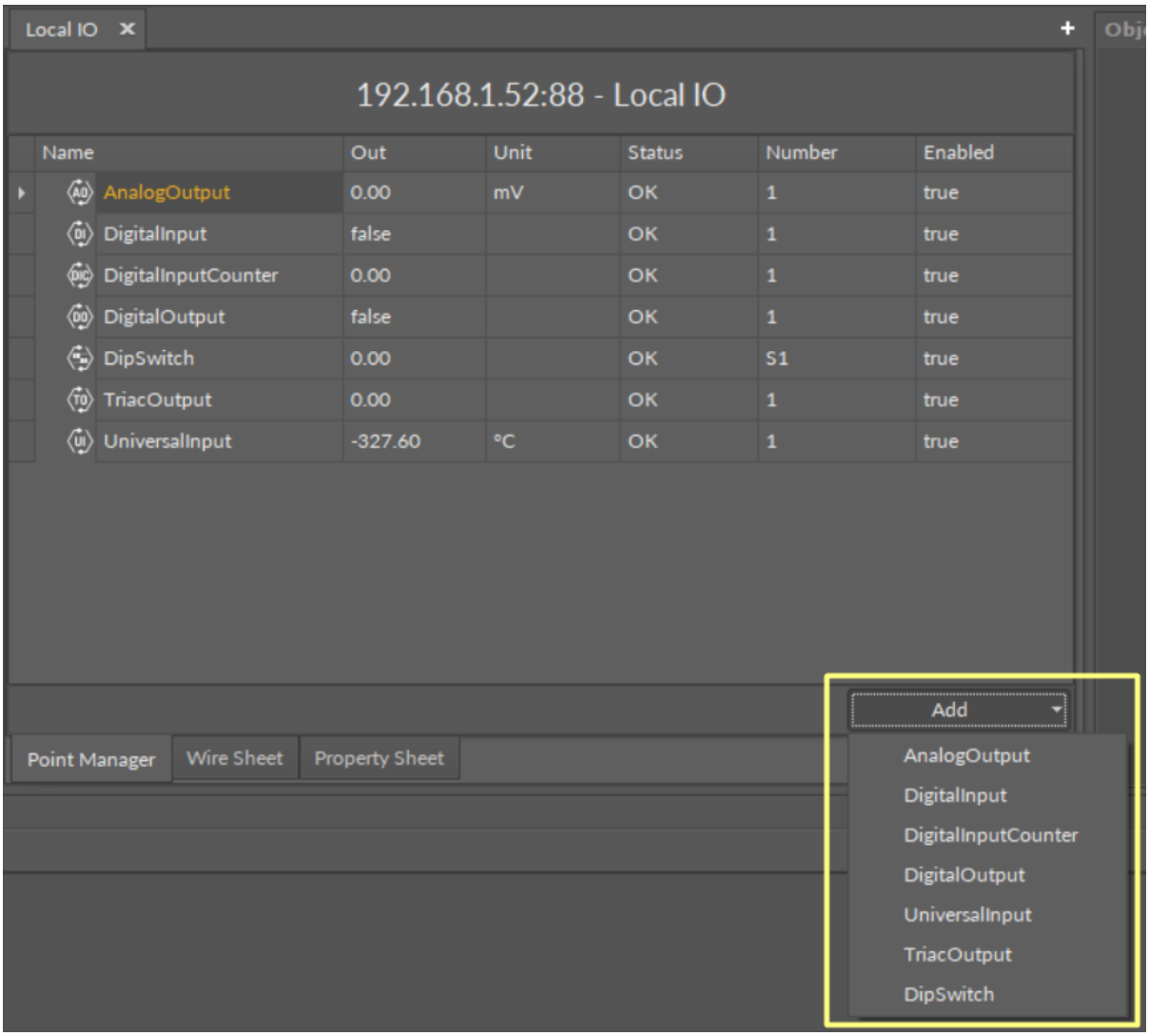

Figure 137. The Add button in the Point Manager

Using this Add button opens the dialog window, which allows to adjust the quantity of I/O points to be added.

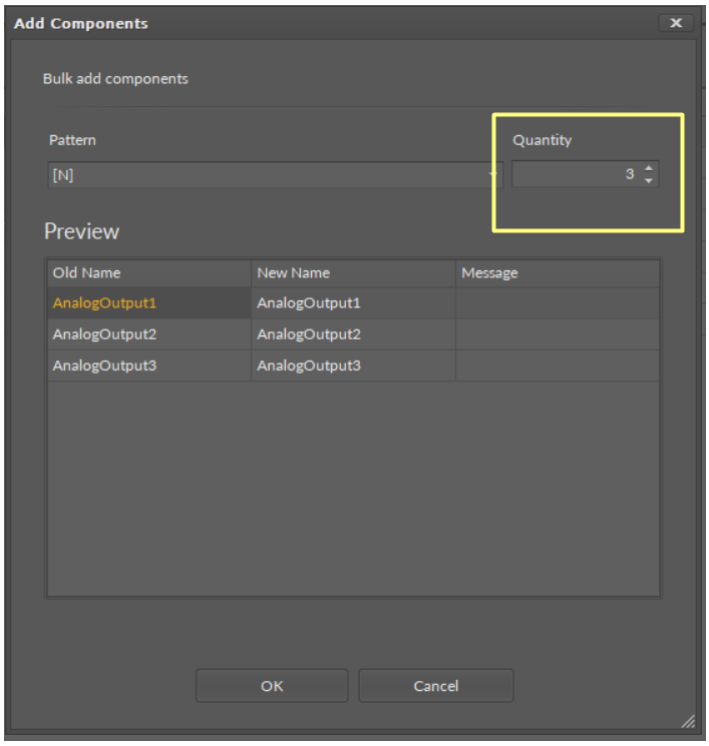

Figure 138. Adjusting quantity of added IO points

9.6.4 Multiediting of Common Slots

The Point Manager view allows multiediting of common slots in components of the same type, for example, to enable all one-type components at once. Multiediting is available in the Object Properties window, upon selecting one-type components in the Point Manager with Ctrl or Shift keys.

9.6.5 BACnet

The Point Manager view is available for each device added to the BACnet network. It lists all BACnet Points added to the Device component, and shows their Out slot value, status, object name and ID, polling mode, and enabled or disabled state.

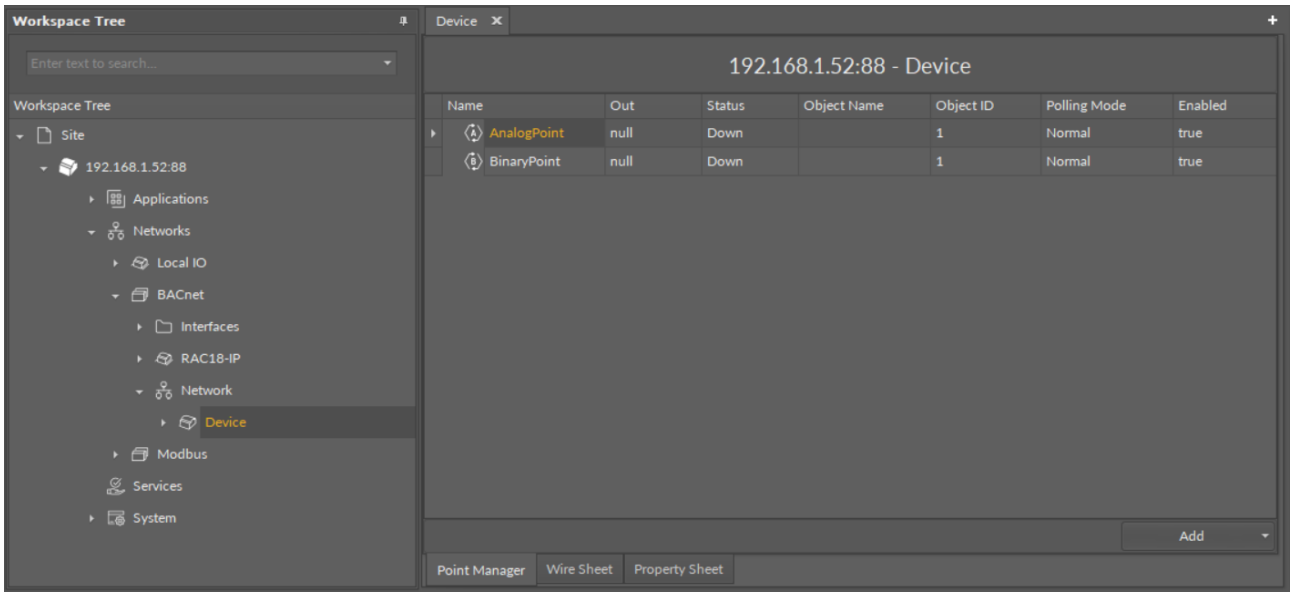

Figure 139. The Point Manager

9.6.6 Opening the Point Manager

The Point Manager view is accessible from the context menu of the Device component. It is also automatically opened if the Device component is double-clicked in the Workspace Tree window.

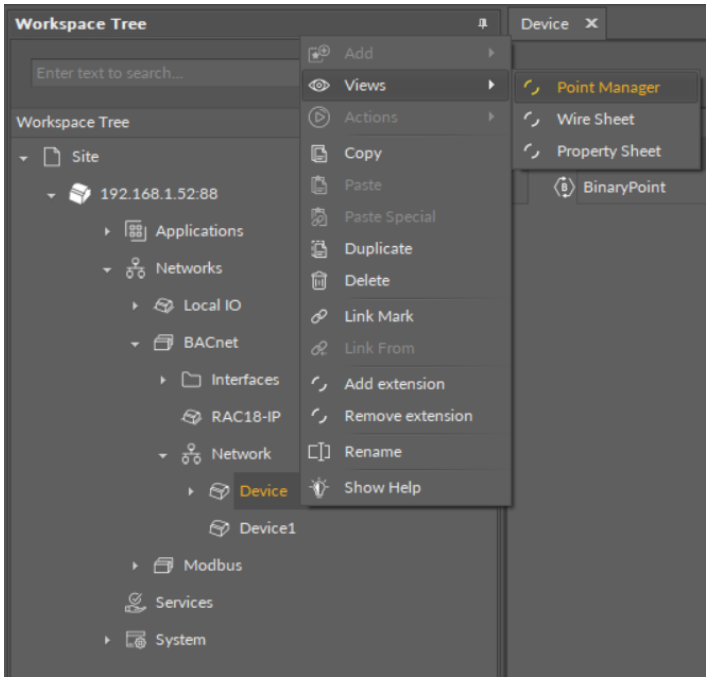

Figure 140. Opening the Point Manager

9.6.7 Adding BACnet Points

The BACnet points may be added to the device twofold: dragging and dropping the BACnet points to the Device component from the BACnet library (in the Device Libraries window), or using a special Add function in the Point Manager view available in the bottom right corner. The Add function allows to add any of the BACnet points available in the BACnet library.

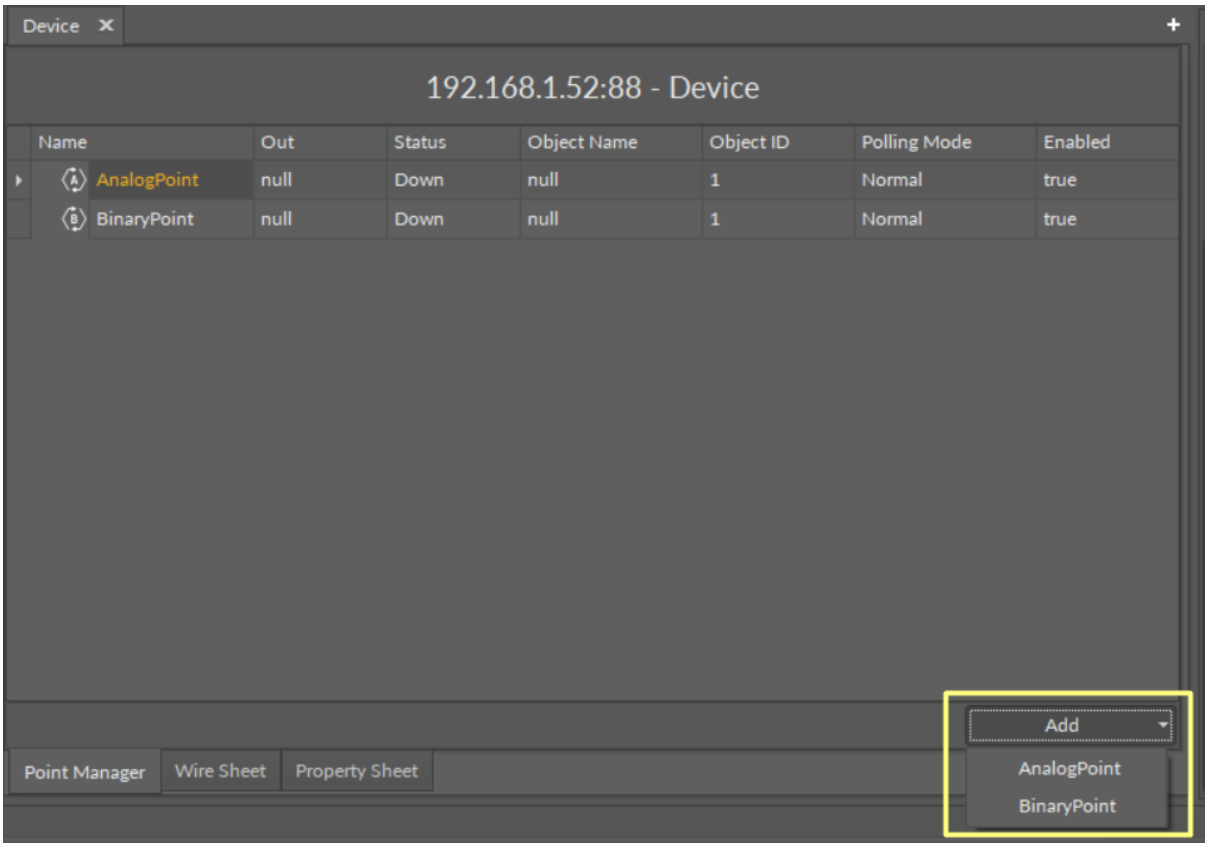

Figure 141. The Add button

Using this Add button opens the dialog window, which allows to adjust the quantity of BACnet Points to be added.

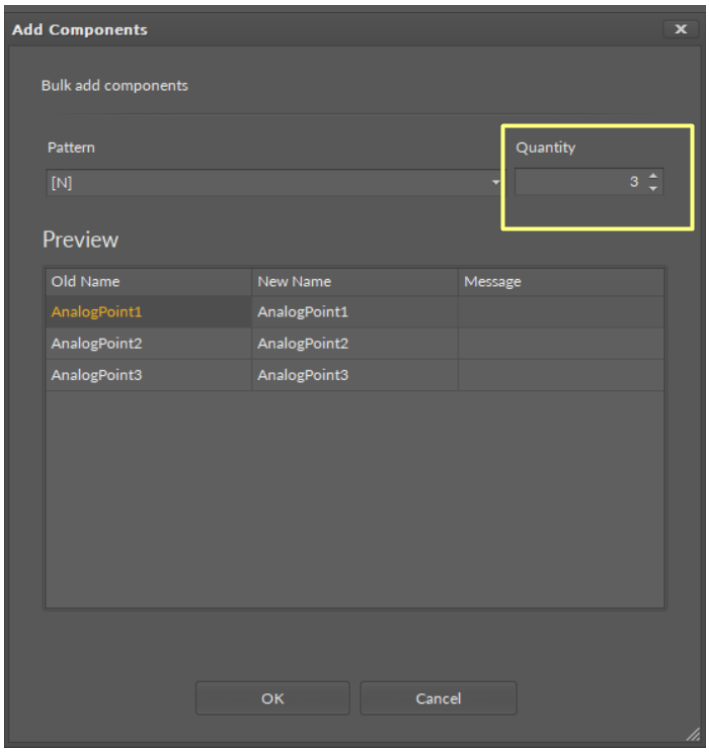

Figure 142. The dialog window

9.6.8 Multiediting of Common Slots

The Point Manager view allows multiediting of common slots in components of the same type, for example, to enable all one-type components at once. Multiediting is available in the Object Properties window, upon selecting one-type components in the Point Manager with Ctrl or Shift keys.

9.6.9 Modbus

The Point Manager view is available for each device added to the Modbus network. It lists all Modbus Points added to the Device component, and shows their Out slot value, status, address, polling mode, and enabled or disabled state.

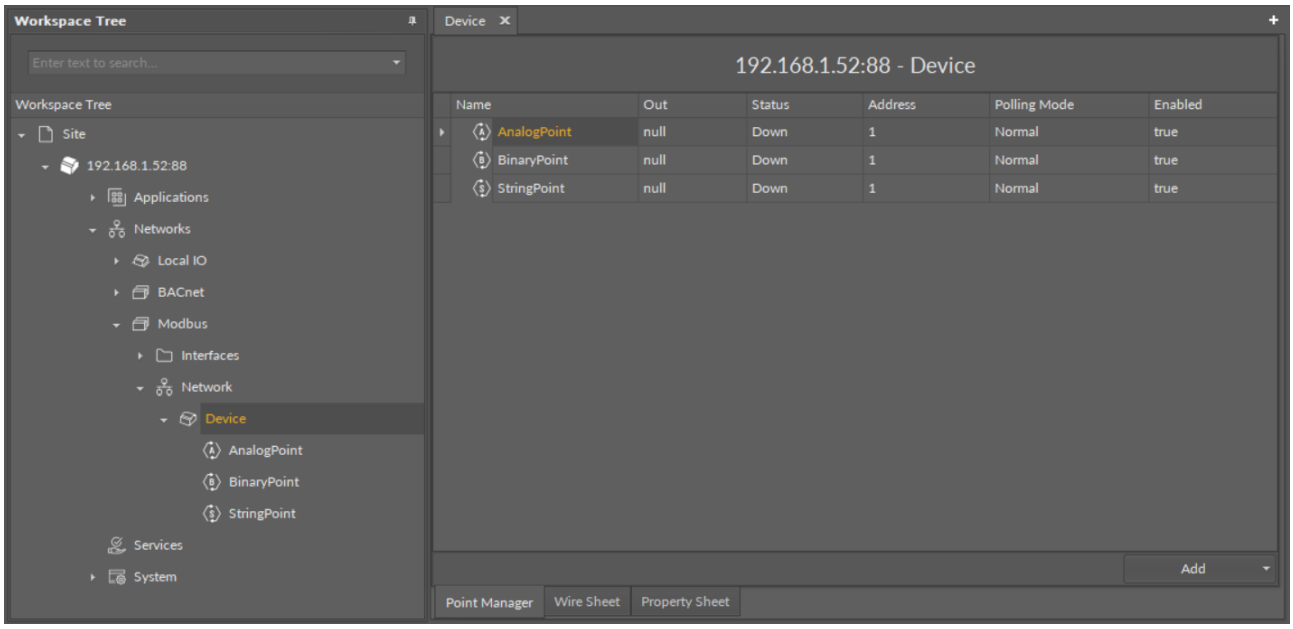

Figure 143. The Point Manager

9.6.10 Opening Point Manager

The Point Manager view is accessible from the context menu of the Device component. It is also automatically opened if the Device component is double-clicked in the Workspace Tree window.

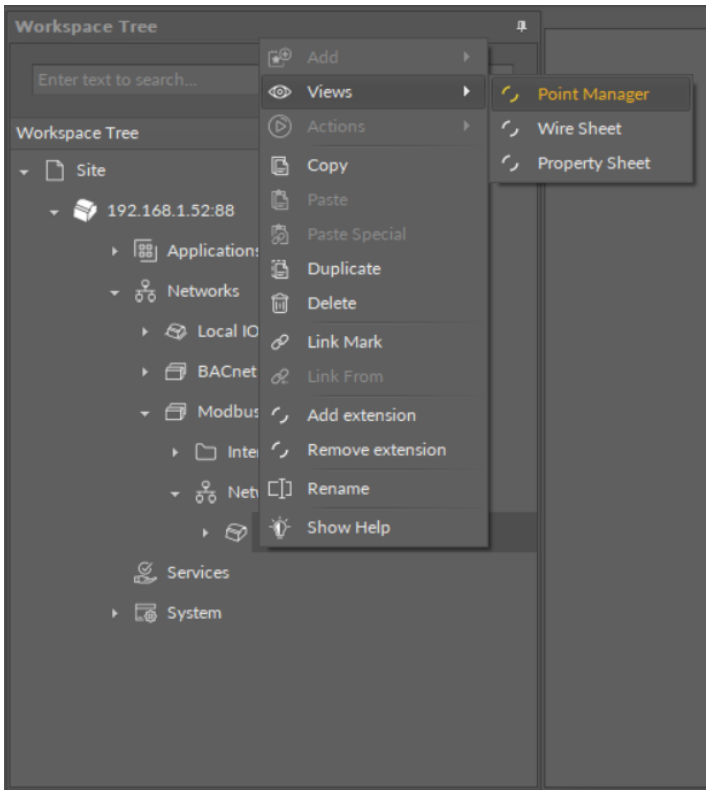

Figure 144. Opening the Point Manager

9.6.11 Adding Modbus Points

The Modbus points may be added to the device twofold: dragging and dropping the Modbus points to the Device component from the Modbus library (in the Device Libraries window), or using a special Add function in the Point Manager view available in the bottom right corner. The Add function allows to add any of the Modbus points available in the Modbus library.

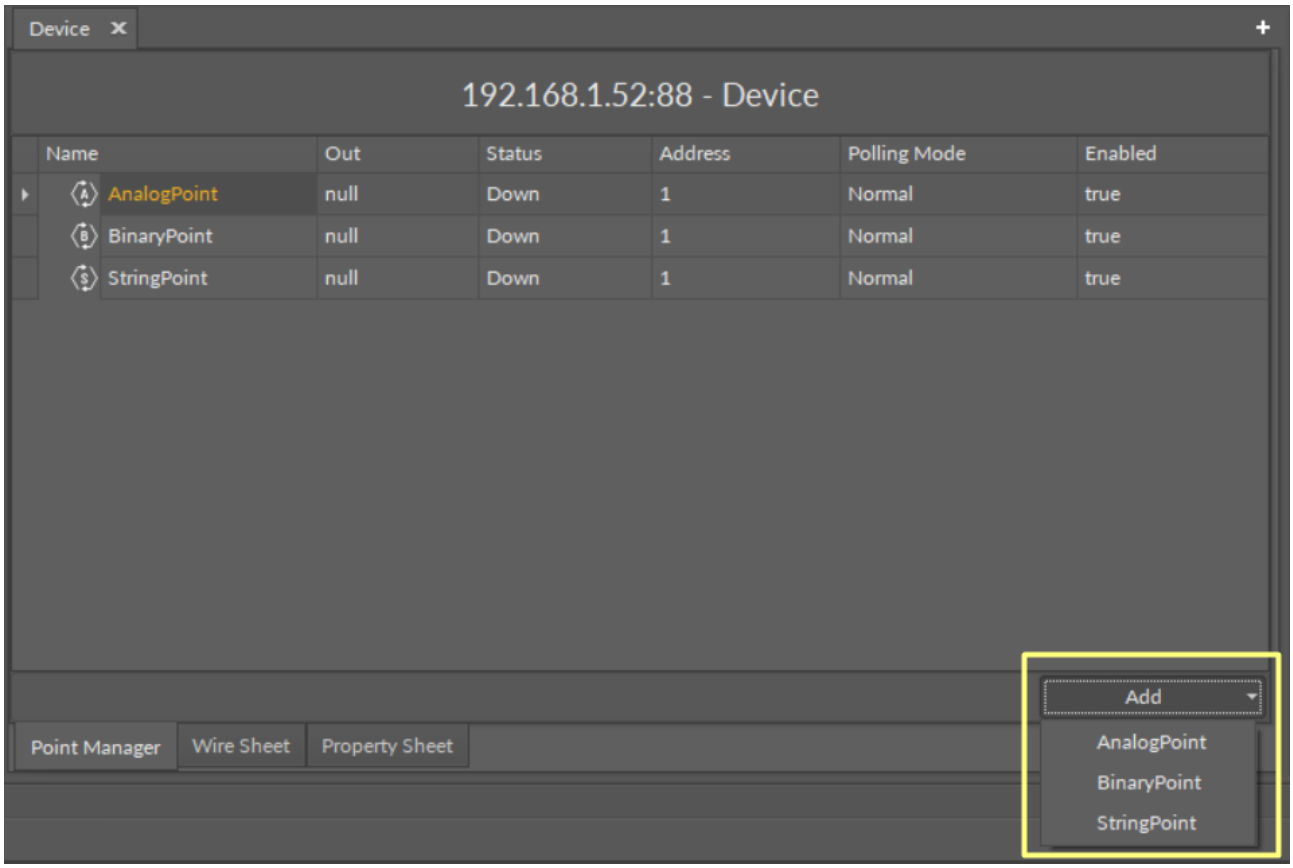

Figure 145. The Add button

Using this Add button opens the dialog window, which allows to adjust the quantity of Modbus Points to be added.

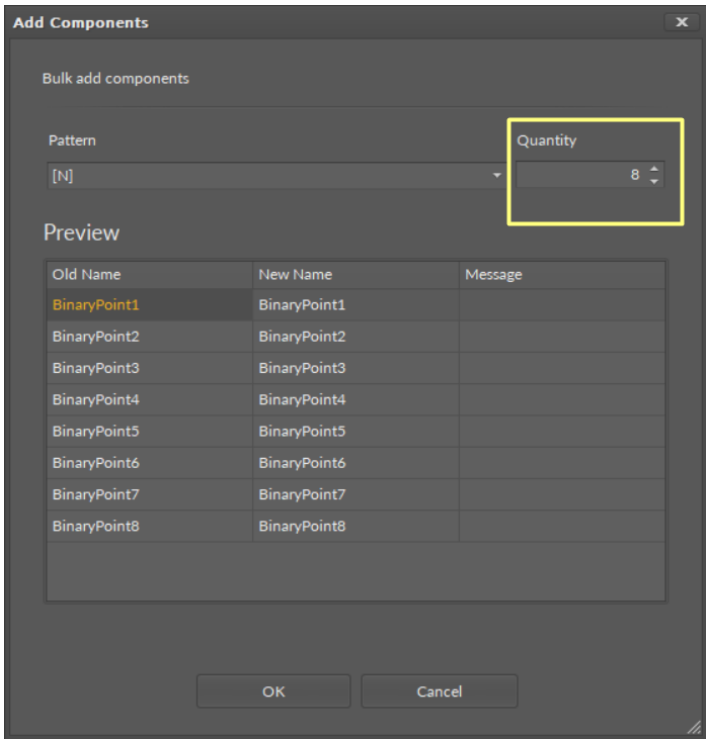

Figure 146. The dialog window

9.6.12 Multiediting of Common Slots

The Point Manager view allows multiediting of common slots in components of the same type, for example, to enable all one-type components at once. Multiediting is available in the Object Properties window, upon selecting one-type components in the Point Manager with Ctrl or Shift keys.

9.7 Software Manager

The Software Manager is a tool allowing the management of the device operating system and its libraries. The Software Manager allows installing, uninstalling, and changing versions of the OS and libraries.

The Software Manager lists all elements (OS, libraries) that are available locally in the iC Tool to be installed on the device. The list of elements, visible in the Software Manager table, corresponds with a physical content of the nano EDGE ENGINE folder in the main iC Tool's location: \home\nanoEdgeEngine. Proper placing of the user's own libraries in this location allows to add them to the Software Manager.

Figure 147. The Software Manager view

WARNING!

Every time the OS or libraries are edited in the device, it requires a restart of the device.

9.7.1 Opening the Software Manager

Once the iC Tool connects to the device, the Software Manager view is available from the Objects Properties window (blue button) or from the context menu of the device.

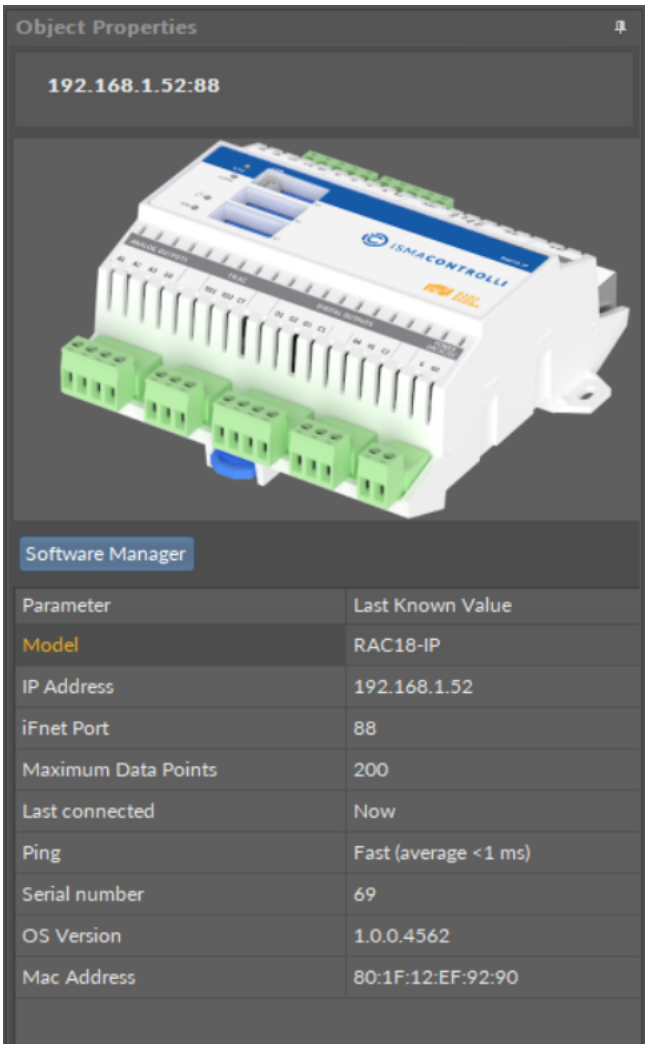

Figure 148. The Software Manager button

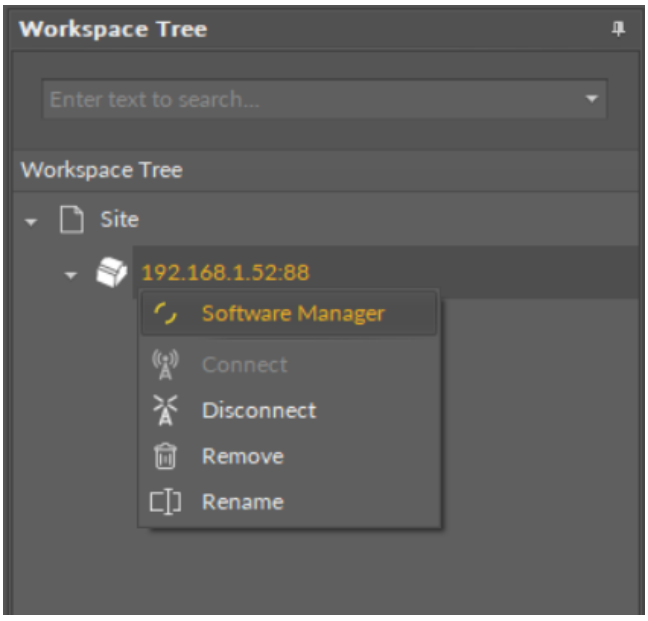

Figure 149. The Software Manager in the device's context menu

9.7.2 Using the Software Manager

The Software Manager view lists the OS and libraries available locally in the iC Tool. The view highlights each row (OS or libraries) according to its status:

- green: the element is up to date, and requires no action;
- orange: the element is out of date, and can be updated;
- blue: the action is about to be taken on the element.

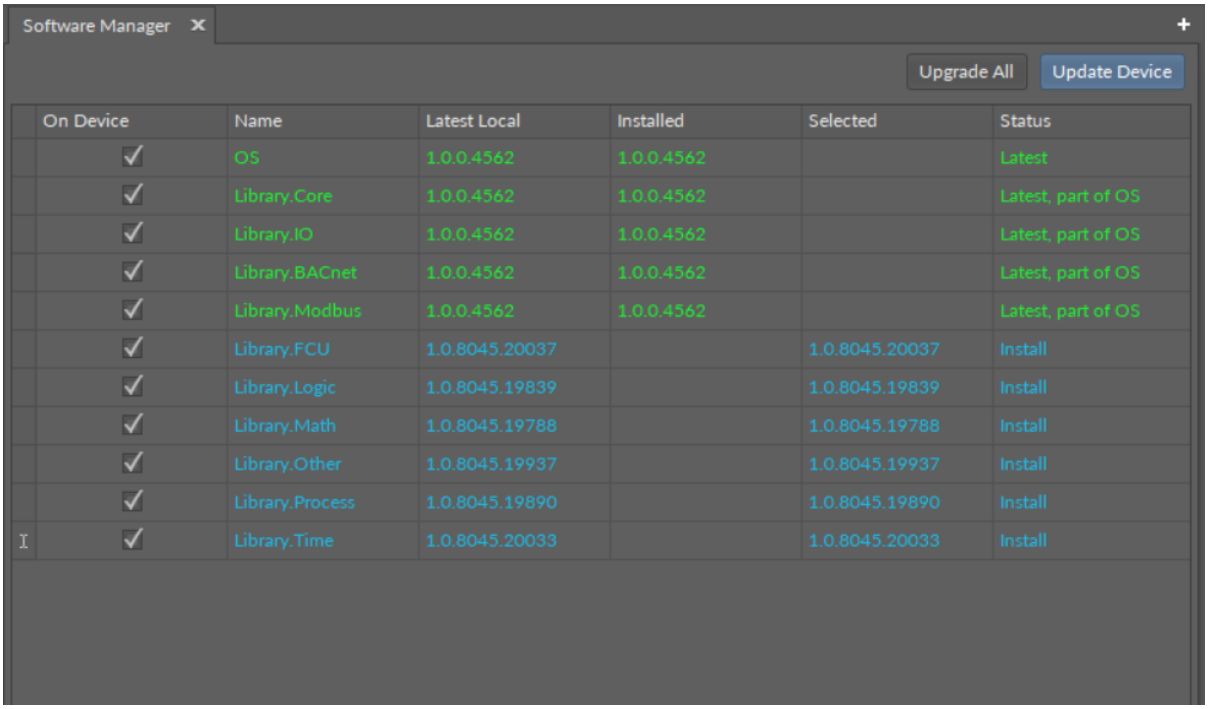

Figure 150. Updating

The Software Manager table contains the following columns:

- On Device: indicates, whether a given element is already installed on the device.
- Name: shows the name of the element.
- Latest Local: shows the latest version available locally to be installed on the device.
- Installed: shows the version of the element installed on the device.
- Selected: opens a dropdown list with all versions available locally for a selected element.
- Status: indicates, which action is to be performed on the element, once a specific version has been selected in the Action column.
    - Available information: Latest, Out of Date, Upgrade, Downgrade, Install, Uninstall, none (the selected version is the same as the one installed on the device).

In order to upgrade or downgrade the selected element, choose the desired version of the element in the Selected column, and press the Update Device option (highlighted in blue in the right upper corner of the Software Manager). This option executes all actions indicated in the Status column.

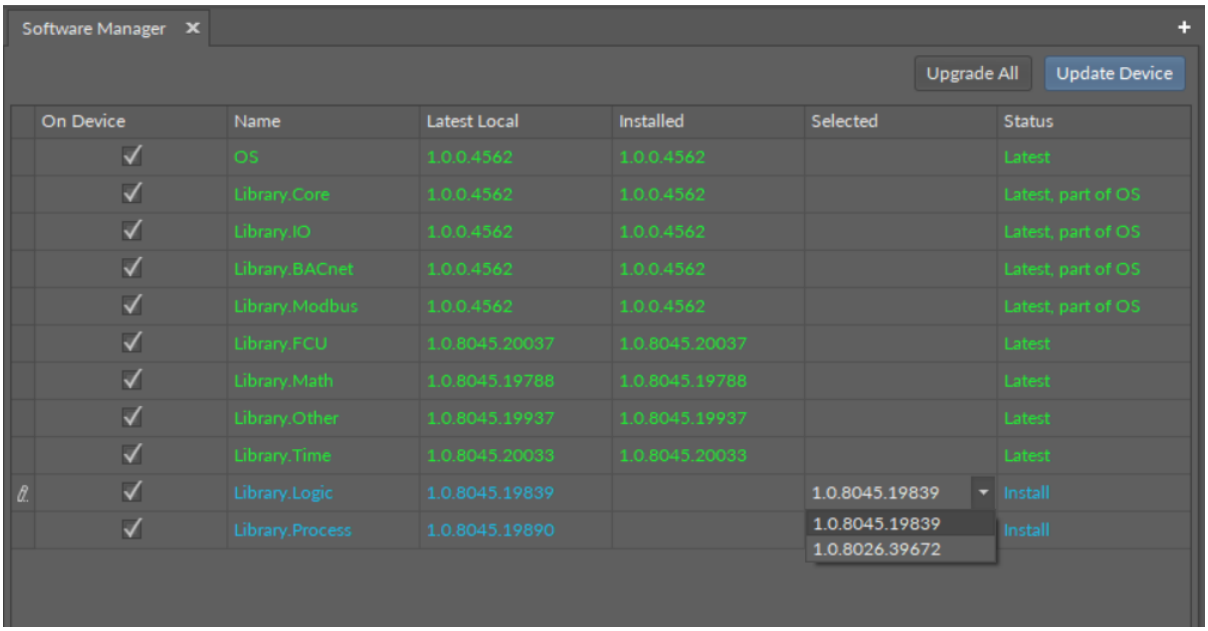

Figure 151. Selecting a library's version

Unless the user intends to manually select the versions to be installed, there is also the option to automatically select all newest versions for all out of date elements using the Upgrade All button.

> Worth to Notice:
>
> Depending if the the version indicated in the Selected column is higher or lower than the version already installed on the device, the Status column shows either the Upgrade or Downgrade option.

Regardless of the fact, whether the user intends to add or remove the library, available in the Software Manager, each operation requires performing three steps:

- check the box in the On Device column to install the library, or uncheck it to uninstall the library;
- provided the library is to be installed on the device, check its preferred version in the Selected column–by default, the newest version available locally is indicated to be installed;
- once selection of all libraries to be installed or uninstalled on the device is complete, hit the Update Device command.

> **WARNING!**
>
> The OS cannot be removed from the device; it is pre-installed on the device's SD card, and the only operations, which can be performed on this element, are upgrading or downgrading it.

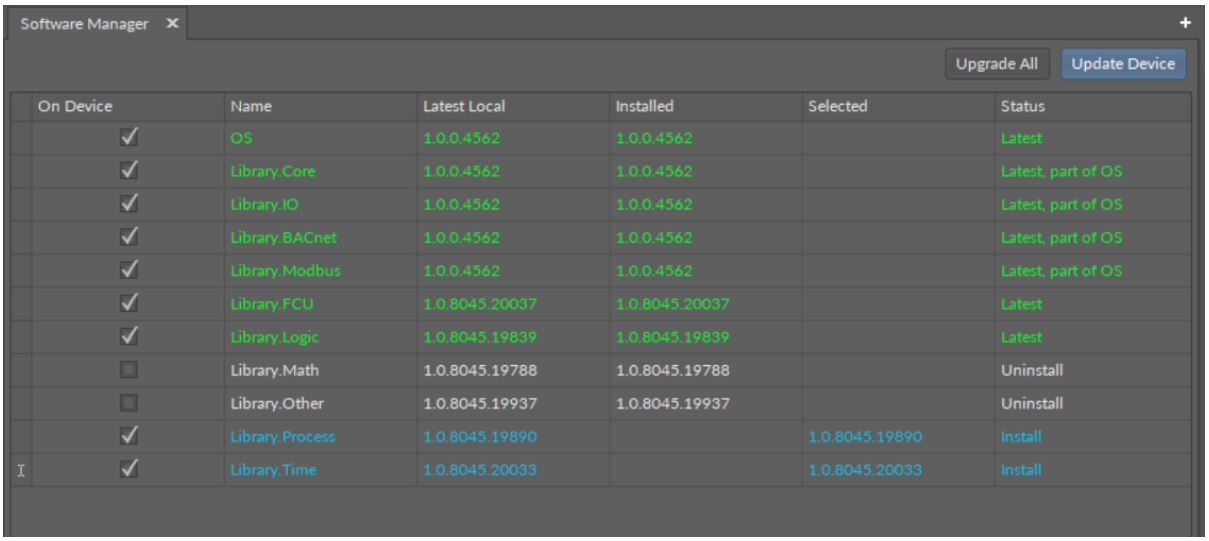

Figure 152. Adding or removing libraries

9.8 Log Viewer

Applicable to OS version 1.0.0.4592

The nano Edge Engine Log Viewer provides logs for diagnosing and analyzing the work of the device driven by the nano Edge Engine.

Logs are categorized by their source of occurrence:

- OS.Firmware;
- OS.SDK;
- Library.BACnet;
- Library.Core;
- Library.IO;
- Library.Modbus;
- OS.Core;
- OS.iFnet;
- OS.Storage.

The logs levels are defined in the Logs component. The Log Viewer is the default view of the Logs component.

9.8.1 Opening the Log Viewer

The Log Viewer is accessible by double-clicking the Logs component in the System container in the Workspace Tree window. Alternatively, it can be opened from the context menu of the Logs component, in the Views option.

Upon opening the Log Viewer shows the logs from the current log file, and updates it while running.

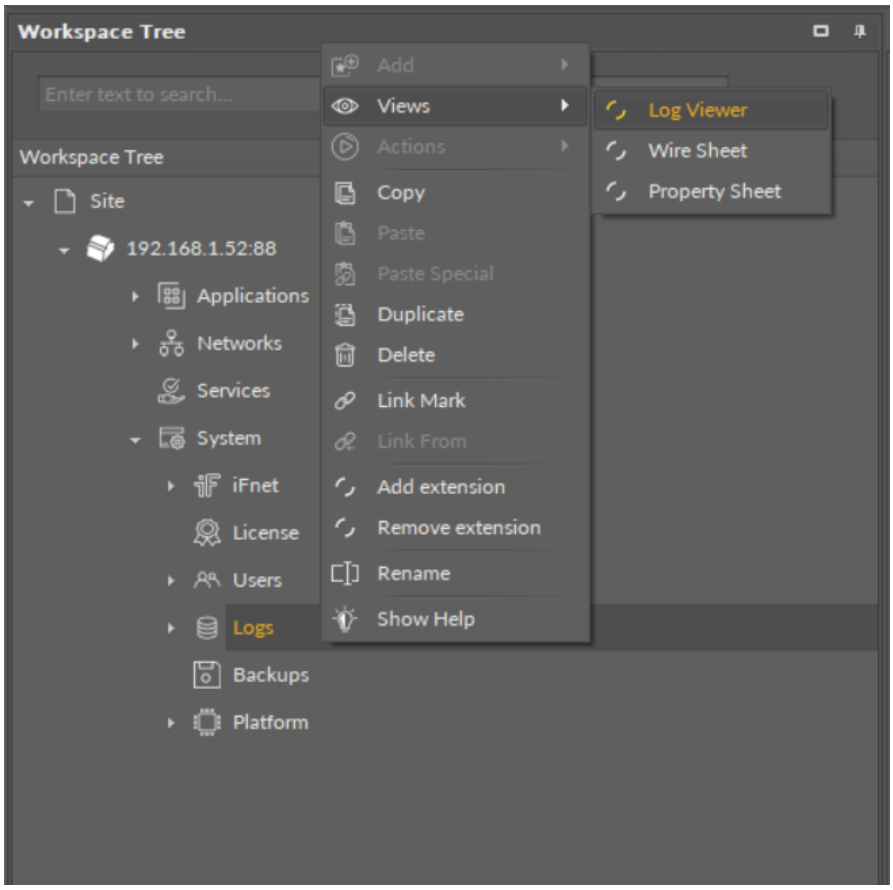

Figure 153. Accessing Log Viewer

9.8.2 Using the Log Viewer

Filtering

Once the Log Viewer is opened, it displays logs according to the configuration of the Logs component. The logs are categorized, and can be filtered by dates. The filtering option is available in the bottom left corner of the window.

Filtering can be time consuming, depending on the selected filtering option, however, it does not have any impact on the work of the iC Tool.

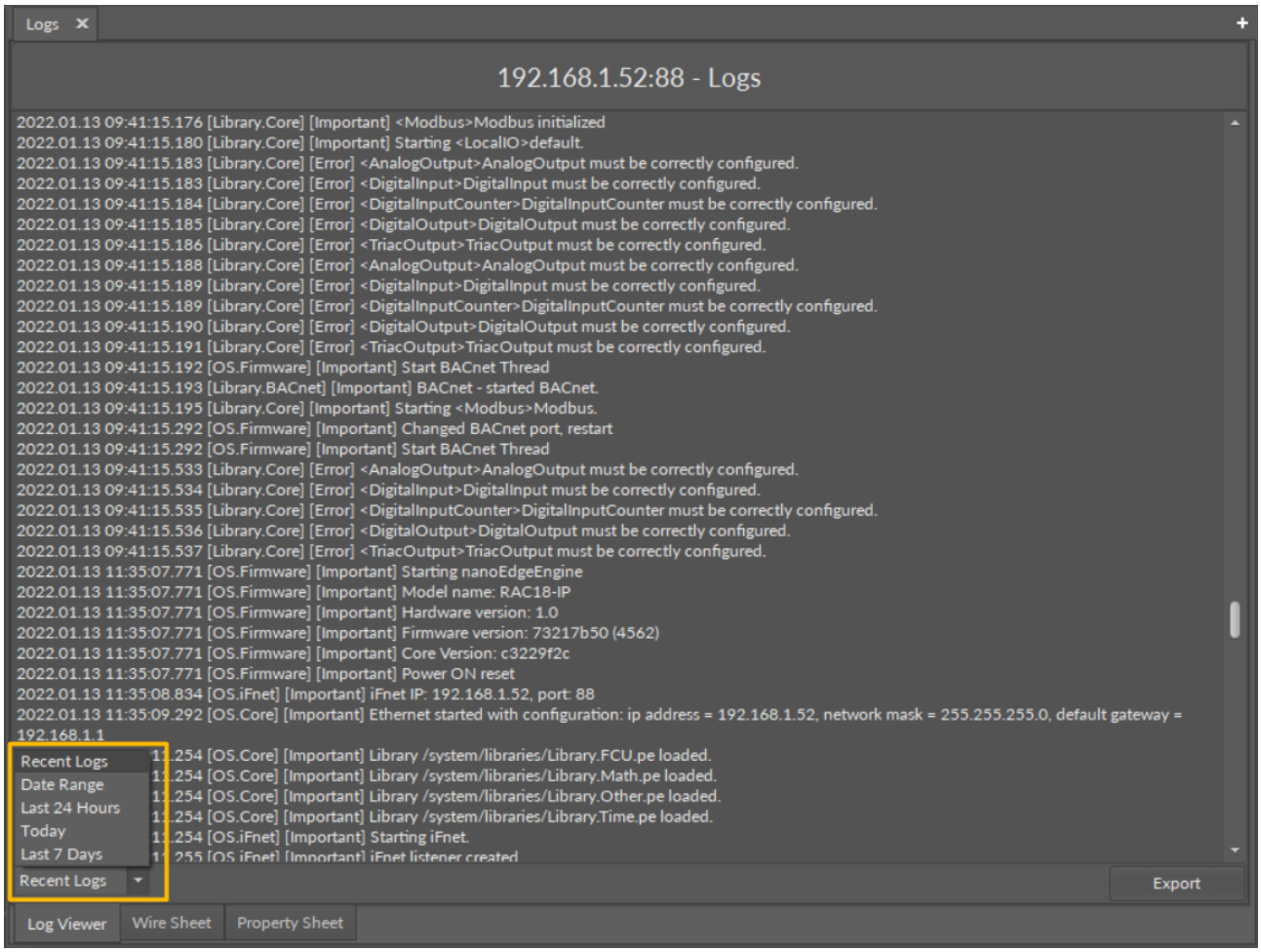

Figure 154. Filtering

Exporting

The contents of the Log Viewer can be exported to a chosen location on the hard drive. The Export options is available in the bottom right corner of the window. The logs file is exported as a .txt file, which name includes the date and hour of the export.

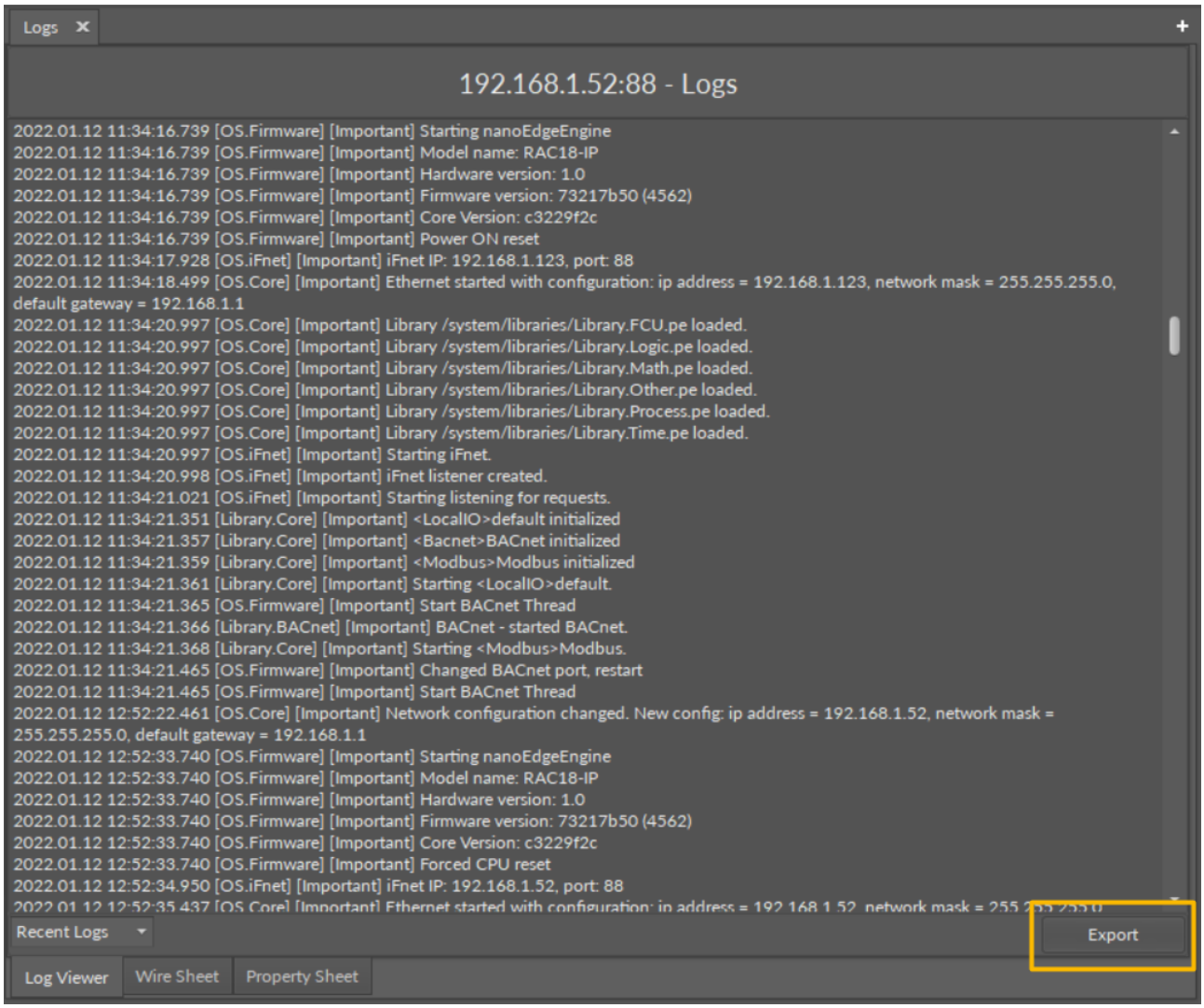

Figure 155. Exporting

10 Keyboard Shortcuts

Shortcut	Description
Ctrl + N	New workspace (creates new workspace on Workspace Tree)
Ctrl + O	Opens a dialog window to choose a *.itw file saved earlier (Workspace)
Ctrl + S	Save changes in Workspace Tree window tree to a defined workspace in *.itw file. Does not apply to saving data in controller.
Ctrl + Q	Exiting iC Tool with confirmation of the intent to leave
Ctrl + C	Copying of the selected components
Ctrl + V	Pasting of the components copied with (Ctrl + C) option
Ctrl + D	Duplication of selected components. The option does not overwrite what was remembered during (Ctrl + C) copying
Delete	Removal of selected elements (component and/or links)
Ctrl or Shift	The keys allow to select components and links selectively. Ctrl adds the chosen element, and Shift defines a set of added elements
Ctrl + N	Create new Workspace Tree window for new projects
F	Rescale all components on the Wire Sheet view to see the all on the screen
Ctrl + mouse wheel	Zoom the Wire Sheet in/out
Ctrl + A	Select all objects on active view
F11	Hide/show all other windows to make main screen as large as possible
F12	Restore previous windows position and size before used F11 option
Ctrl + Tab	Change focus to next window within opened windows in iC Tool
Ctrl + Shift + Tab	Change focus to previous window within opened windows in iC Tool
Tab	Navigate to the next object in current tree or list
Shift +Tab	Navigate to the previous object in current tree or list
PageUp/ PageDown	Jump to the first/last object in current tree or list

Ctrl + F	Use filter on active view
F2	Rename selected object
F10	Change focus to the main menu with a possibility to navigate between menu items
Ctrl + P	Print/export current view (option not available on all views)
Ctrl + Left/Right	Expand/collapse the tree
Esc	Cancel current settings
Enter	Accept current settings
Alt + F4	Exits iC Tool with prompt pop-up
Ctrl + Z	Undo previous action on components
Ctrl + Y	Redo previously undone action on components
Alt + Left/Right	Navigate view history
Alt + Shift + Left/Right	Show view history flyout panel

Table 2. Useful keyboard shortcuts