iSMACONTROLLI

iSMA-B-MAC36NL

User Manual

iSMA-B-LIB-GRAPH

powered by niagara4 framework

Table of Contents

1 Introduction

iSMA-B-LIB-GRAPH is a library containing a graphical pallet, allowing the integrator to use ready-made graphic components. The palette contains graphic objects, such as ventilation ducts, air dampers, coolers, heaters, air filters, sensors, humidifiers, fans, heat exchangers, free-standing HVAC devices, grids, devices, graphic representations of devices on a floor plan, hydraulic systems with valves, and pumps. The iSMA_Graphics.jar graphics palette is an ideal addition to the iSMA-B-MAC36NL controller set with HDMI port and iSMA-B-PD-10-TB touchpad.

1.1 Revision History

Rev.	Date	Description
1.0	28 Mar 2019	First version
1.1	24 Jun 2021	Graphic templates added to the library
1.2	25 May 2022	Rebranded

Table 1. Revision history

1.2 iSMA-B-MAC36NL Overview

iSMA-B-MAC36NL is a new generation Hybrid IoT Controller equipped with 36 I/O and powered by Niagara 4 framework. It supports many protocols including BACnet IP, BACnet MS/TP. Modbus TCP, Modbus RTU, LON IP, KNX IP, and many more. The iSMA-B-MAC36NL, beside great hardware features and outstanding software functionality, offers many additional packages, which build superb competitive advantage. One of the packages is described below.

1.3 Key Features

- Niagara 4.6 and later;
- Prepared bindings;
- Animated components;
- Components representing alarm conditions;
- Components representing switching on and off states;
- Components of 0-100% controlled values;
- Multistate components.

1.4 Software License

This product is licensed. The iSMA-B-MAC36NL driver is licensed for iSMA-B-LIB-GRAPH as standard. The license is formatted as an additional GC5.license file available on the Niagara central server.

Note: If there is no license, after adding a component to the PX worksheet, the following watermark appears on the component only in the web browser. The components in the Workbench looks as usual.

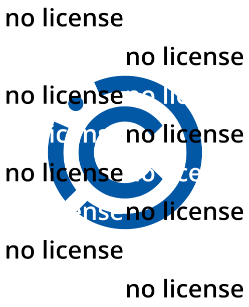

Figure 1. No license watermark

2 Equipment Templates

2.1 List of Templates

The iSMA-B-LIB-GRAPH includes graphic templates for various air handling equipment. The graphic templates can be used for visualizations of HVAC applications built in the iSMA-B-MAC36NL and iSMA-B-FCU controllers. The below tables contain a list of specific equipment templates included in the palette.

AHU	
CrossHE_WH	Cross-flow heat exchanger (CrossHE) and water heater (WH)
CrossHE_WH_WC	Cross-flow heat exchanger (CrossHE), water heater (WH), and water cooler
RotHE_WH	Rotating heat exchanger (RotHE) and water heater (WH)
RotHE_WH_WC	Rotating heat exchanger (RotHE), water heater (WH), and water cooler (WC)
Rec_WH	Recirculation (Rec) and water heater (WH)
Rec_WH_WC	Recirculation (Rec), water heater (WH), and water cooler (WC)

Table 2. AHU graphic templates included in the palette

VAV	
VAVx1	Supply VAV
VAVx2	Supply/exhaust VAV
VAVx2_WH	Supply/exhaust VAV with water heater
VAVx2_WC	Supply/exhaust VAV with water cooler
VAVx2_WH_WC	Supply/exhaust VAV with water heater and water cooler

Table 3. VAV graphic templates included in the palette

RTU (Roof Top Unit)	
RotHE_Rec_FH_FC	Rotating heat exchanger with recirculation and cooling-heating unit
RotHe_FH_FC	Rotating heat exchanger with cooling-heating unit

Table 4. RTU graphic templates included in the palette

FCU	
FCU	iSMA-B-FCU controller, optionally with an iSMA-B-LP panel
FCU_Humid	iSMA-B-FCU controller with iSMA-B-LP-H panel

FCU	
FCU_CO2	iSMA-B-FCU controller with iSMA-B-LP-C panel
FCU_CO2Humid	iSMA-B-FCU controller with iSMA-B-LP-HC panel

Table 5. FCU graphic templates included in the palette

2.2 How to Use Templates

2.2.1 AHU/VAV/RTU Templates

Each of AHU/VAV/RTU templates has points bound by default. Specific points can be identified in the points folder, which is located under each template (each template has different content in the points folder). Points included in folders are BooleanWritable, NumericWritable, and EnumWritable, all adjusted and linked according to the requirements of each template.

In order to use a specific template, follow the below steps:

Step 1: Go to the AHU/VAV/RTU folder in the iSMA_Graphics palette, and expand Template Graphics.

Step 2: Add a relevant points folder to the station, and name it as appropriate.

Step 3: Then, create a new view and edit it.

Step 4: Go to the Widget Tree, remove the default CanvasPane and ScrollPane, and in the place of root on the Widget Tree, place the template's Canvas Page.

Step 5: Save the view. The graphic is ready to use.

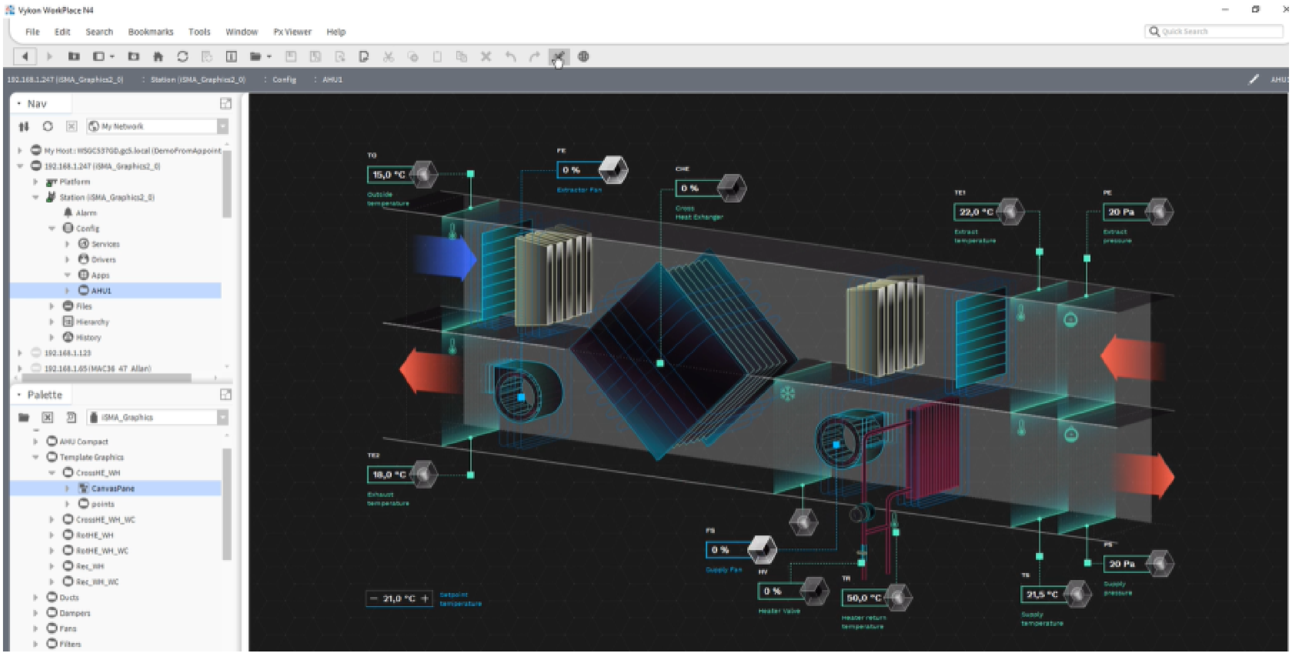

Figure 2. AHU graphic template

2.3 FCU Templates

Templates for iSMA-B-FCU devices are constructed separately for BACnet and Modbus protocols, working with each type of the iSMA-B-LP room panel (the FCU template without

Humid or CO2 extension can be used without any iSMA-B-LP panel). If any temperature sensor is connected to any of the S1-S4 special inputs, the graphic FCU template will recognize it and display temperature reading in an appropriate place. Also, the template automatically reads DIP switches states and adjusts to the set configuration.

2.3.1 Using FCU Templates with the BACnet Protocol

Step 1: First, go to the BACnet Devices in Drivers and open it in the AX Property Sheet view. Go to the Mstp Port and check the network number (Network Number slot).
Step 2: Go to the FCU folder in the iSMA_Graphics palette, expand Template Graphics, expand BACnet Devices, and drag and drop the iSMA-B-FCU device to the station. Double-click it, and set the network number, in the Network slot, compliant with the BACnet network number (checked in step 1). Set the device's MAC address and the Device ID. Set the Enabled slot to true. Confirm with OK.
Step 3: Right-click the added device, expand the Actions, and invoke the Ping action. If the communication is properly established, the device changes status to OK.
Step 4: Go to points extension and open it. The extension shows the connected points with their statues. Go back to the list of devices.
Step 5: Right-click the device, expand the Views, and open the iSMA-B-FCU view. The view shows the template graphic with values from connected points.

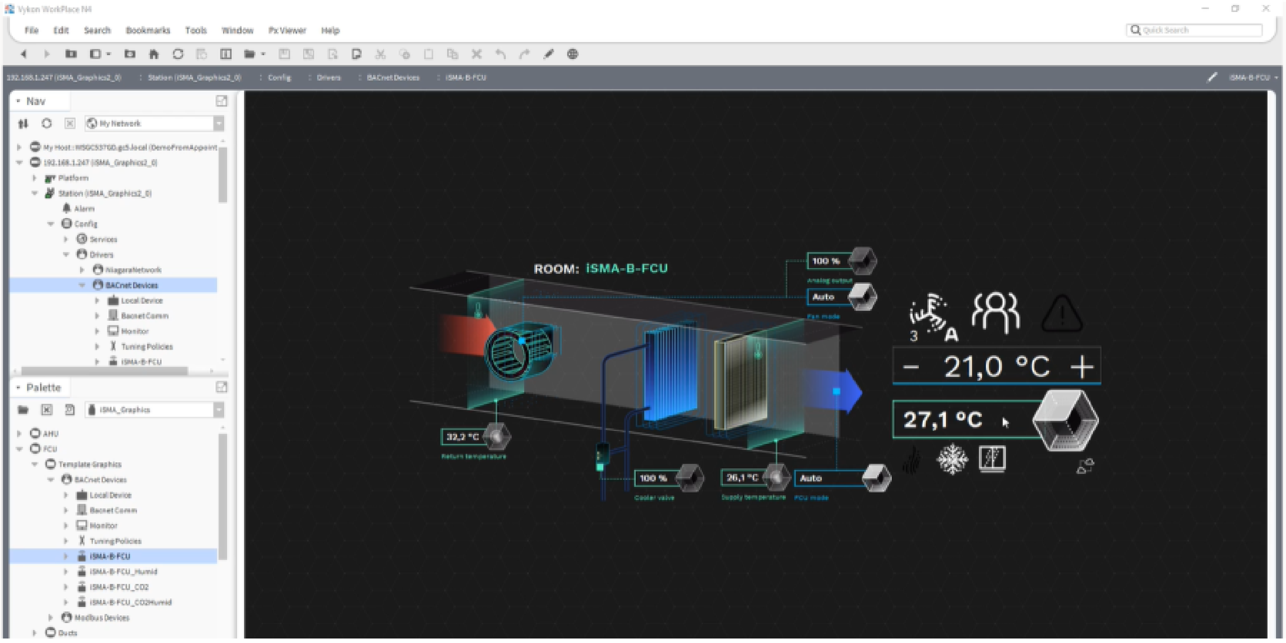

Figure 3. FCU template working in BACnet protocol

2.3.2 Using FCU Templates with the Modbus Protocol

Step 1: Go to the FCU folder in the iSMA_Graphics palette, expand Template Graphics, expand Modbus Devices, and drag and drop the iSMA-B-FCU device to the station (to the ModbusAsyncNetwork). Double-click it, and set the device Modbus address (the Device Address slot). Set the Enabled slot to true. Confirm with OK.
Step 2: Go to points extension and open it. The extension shows the connected points with their statues. Go back to the list of devices.

Step 3: Right-click the device, expand the Views, and open the iSMA-B-FCU view. The view shows the template graphic with values from connected points.

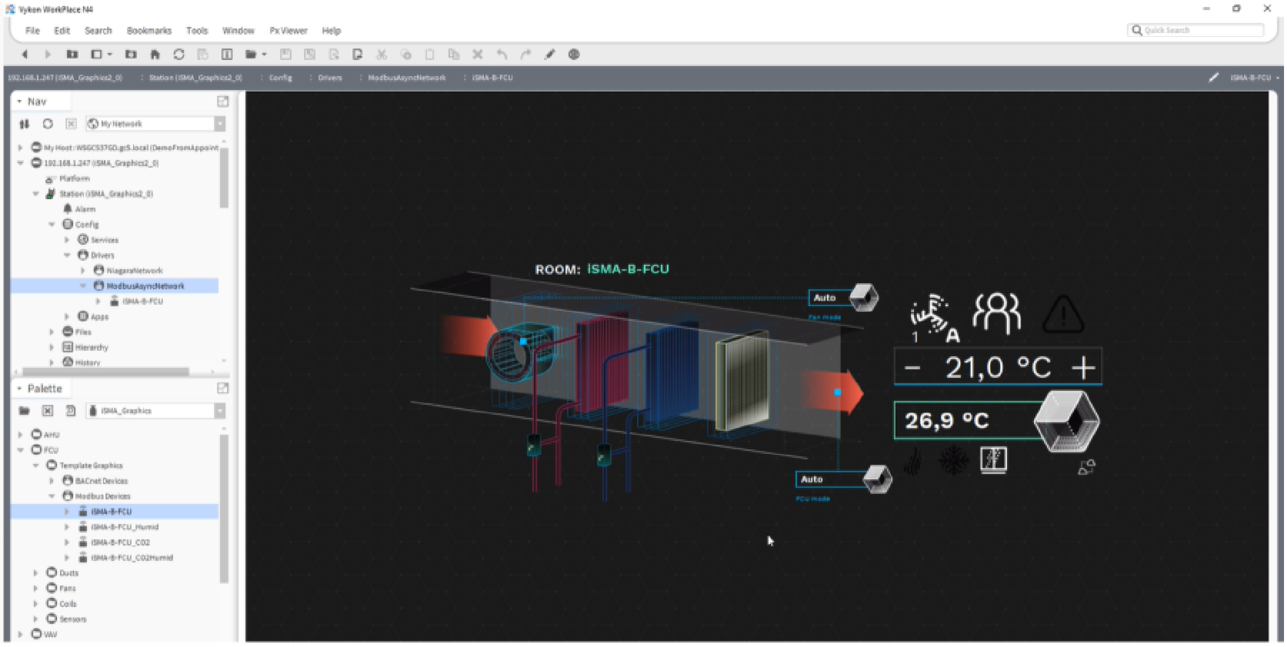

Figure 4. FCU template working in Modbus protocol

3 Equipment Components

The iSMA-B-LIB-GRAPH graphic templates can be expanded by additional components, which are contained in specific folders. Folders with equipment components are described in this section.
Please follow a few practical tips while working with graphic templates and additional components:

- most graphic objects have light shadows, therefore, the palette looks best with black backgrounds;
- the PX file, which graphic components are placed on, must have the Scale property set to the Ratio Fit for resolution different than default (for full-screen mode); for default resolution, the Scale property can be set as Ratio Fit or None.

The whole pallet is divided into folders structure, which is described according to the nomenclature and order are given in the following subsections.

3.1 Ducts

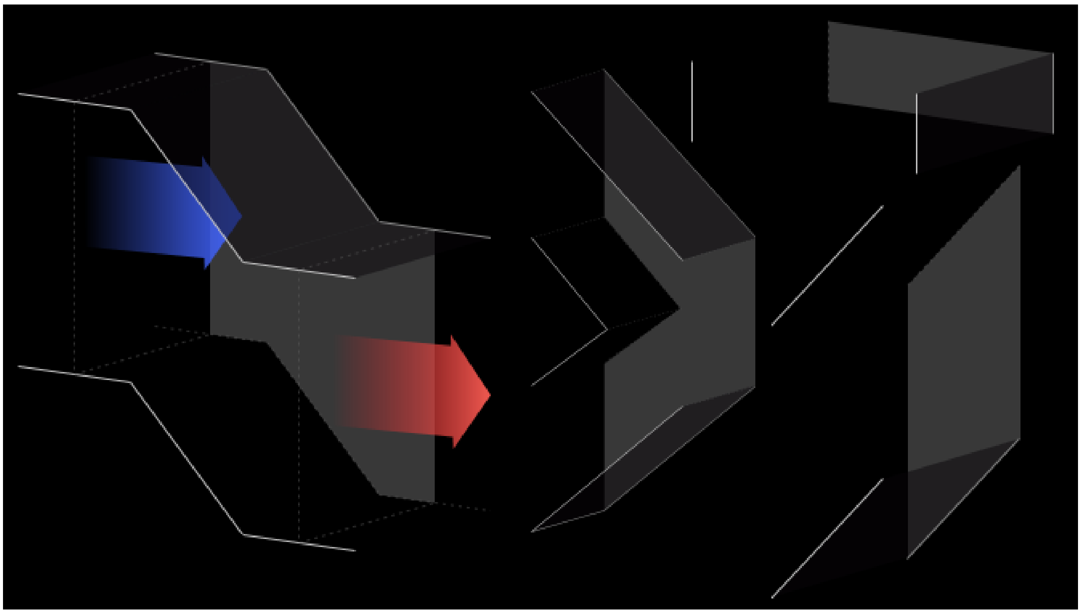

Figure 5. Sample graphic components from the Airflow folder

The Airflow folder contains static images representing ventilation ducts. Due to the features described above, graphic components in the folder with prefixes "duct_air", "duct_h", and "duct_v" must be distributed in the appropriate order in the PX file. Ventilation ducts on the right-hand side must be positioned higher (in display order - on a higher layer) than the ducts on the left-hand side.
The picture below shows the effects of incorrect (connection between duct 2 and duct 3) and correct (connection between duct 3 and duct 1) placement of objects in the PX file, where component numbers correspond to their order in the Widget Tree.

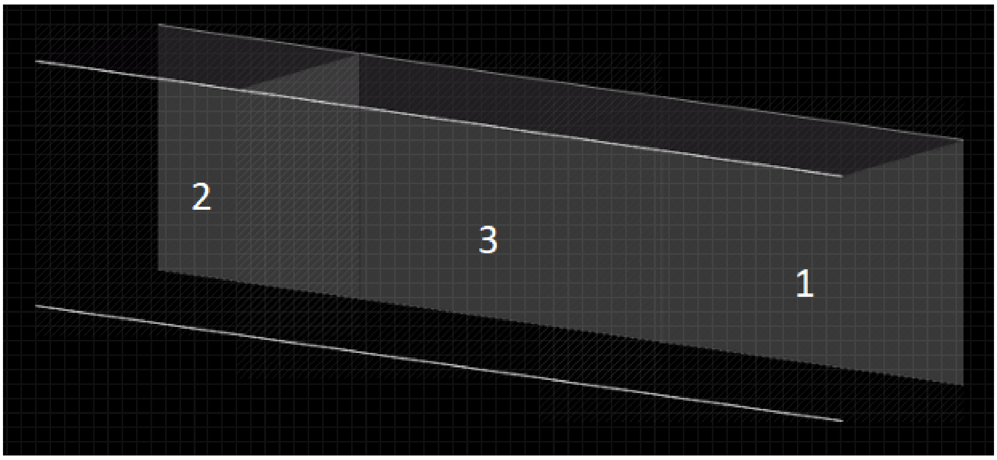

Figure 6. Effects of Airflow folder components placement

For ducts "duct_v", at the bottom of the PX file there should be an object that is first in order in the Widget Tree.

3.2 Dampers

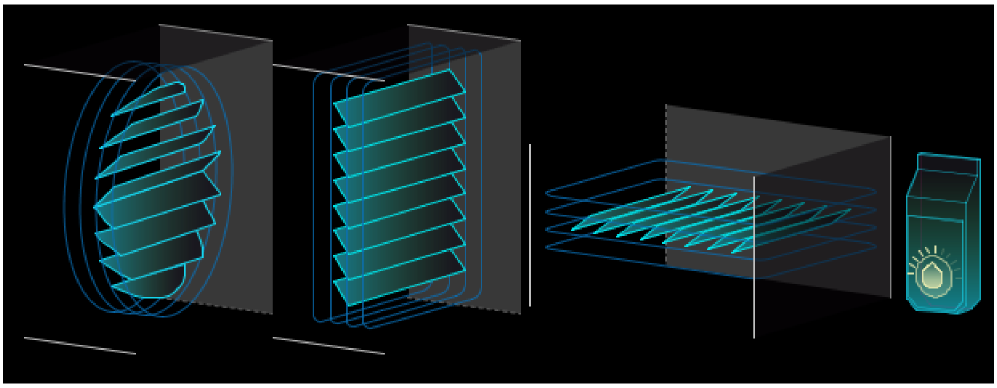

Figure 7. Sample graphic components from the Dampers folder

The Dampers folder contains dynamic images representing air dampers. Due to the features described in section 3, graphic components from the folder with the prefixes "damper_round" and "damper_square" must be placed in the appropriate order in the PX file. This principle is the same as for the static images described in section 3.

3.2.1 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which affects the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.2.2 On/Off Components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false for horizontal, true for vertical) and operation (true for horizontal, false for vertical) of the device. The second value affects the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.2.3 0-100% Components

Components with the "0-100" suffix are dedicated to binding numeric type variables containing analog control value in the range of 0-100%. Graphics have been added to these objects to represent the percentage of opening or closing a device. The component has two control values (Value Binding). The first one affects switching between the graphics responsible for the level of opening (or closing) depending on the entered value from 0 to 100. The second value affects the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Dragging a numeric component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "0-100" suffix automatically binds the dragged component to the control value described as switching between the graphics responsible for the opening (or closing) level.

For horizontal graphic components, the 0 value represents a closing and 100 an opening, while for vertical components, the 0 value represents an opening and 100 a closing.

3.3 Cooling

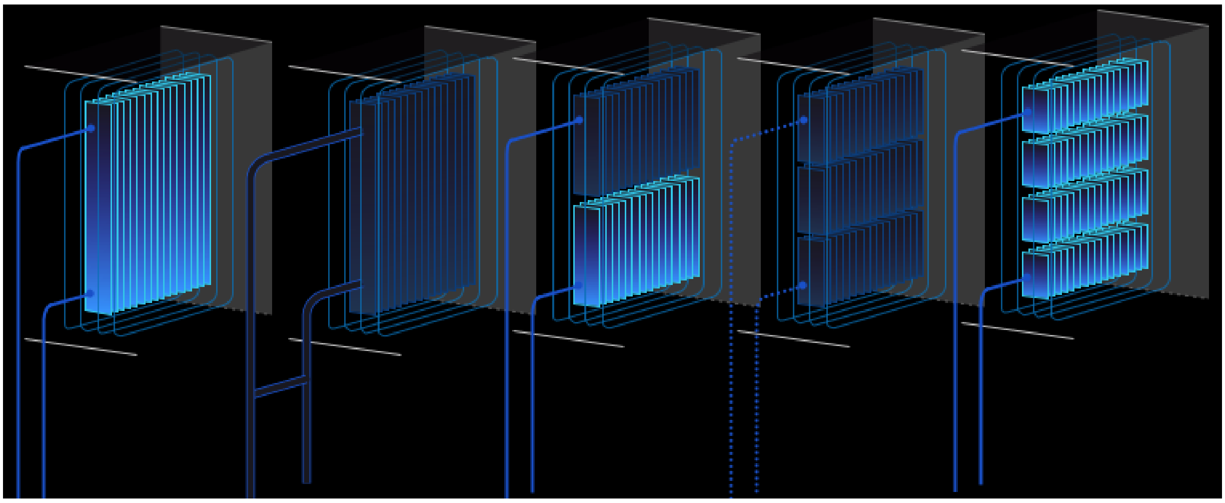

Figure 8. Sample graphic components from the Cooling folder

The Cooling folder contains dynamic images representing air coolers. Due to the features described in section 3, the graphic components in the folder must be arranged in the correct order in the PX file. This principle is the same as for the static images described in section 3.

3.3.1 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.3.2 On/Off Components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false value) and operation (true value) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.3.3 0-100% Components

Components with the "0-100" suffix are dedicated to binding numeric type variables containing analog control value in the range of 0-100%. Graphics have been added to these objects to represent the percentage adjustment of the device. The component has two control values (Value Binding). The first one affects switching between the graphics responsible for the level of adjustment depending on the entered value from 0 to 100. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Dragging a numeric component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "0-100" suffix automatically binds the dragged component to the control value described as switching between the graphics responsible for the adjustment level.

3.4 Heating

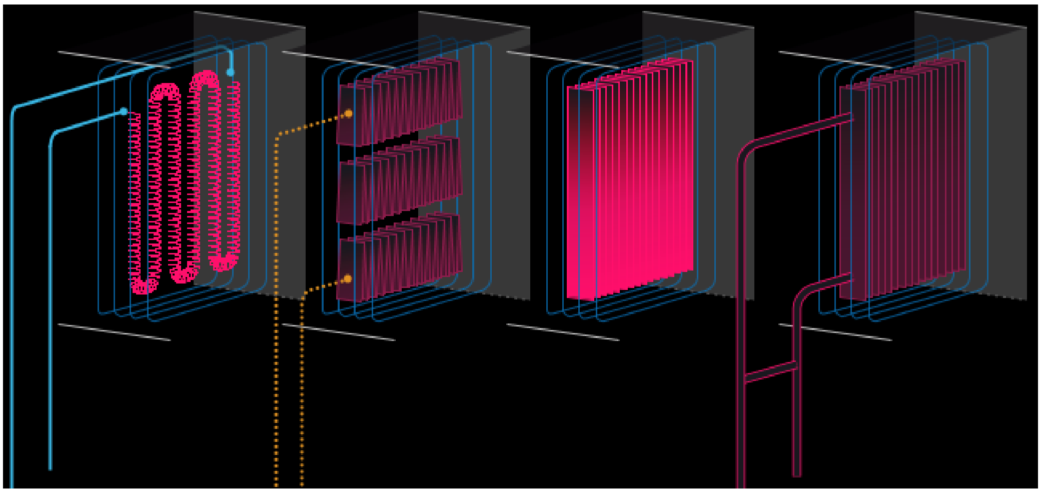

Figure 9. Sample graphic components from the Heating folder

The Heating folder contains dynamic images representing air heaters. Due to the features described in section 3, the graphic components in the folder must be arranged in the correct order in the PX file. This principle is the same as for the static images described in section 3.

3.4.1 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.4.2 On/Off Components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false) and operation (true) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.5 Filters

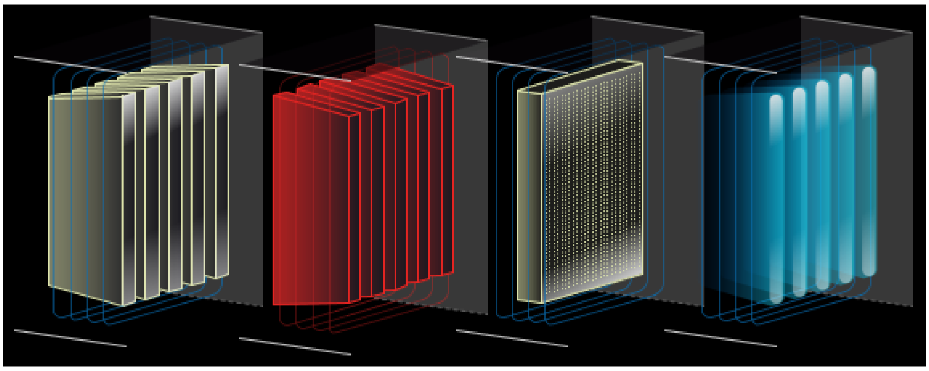

Figure 10. Sample graphic components from the Filters folder

The Filters folder contains dynamic images representing air filters. Due to the features described in section 3, the graphic components in the folder must be arranged in the correct order in the PX file. This principle is the same as for the static images described in section 3.

3.5.1 Normal/Alarm Components

Components with the "normal-alarm" suffix are dedicated to bind Boolean variables indicating normal state or alarm/failure. Graphics representing normal and alarm statuses of the device have been added to these objects. The component has one control value (Value Binding), which causes switching between the graphics of the normal state (false) and the alarm (true) device.

3.5.2 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.5.3 On/Off Components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false) and operation (true) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.6 Sensors

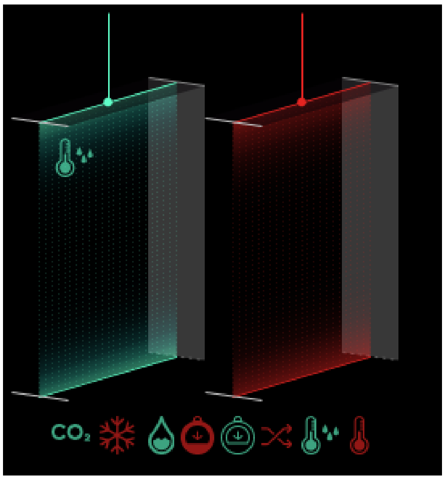

Figure 11. Sample graphic components from the Sensors folder

The Sensors folder contains dynamic and static images representing sensors. Due to the features described in section 3, the graphic components in the folder must be arranged in the correct order in the PX file. This principle is the same as for the static images described in section 3.

3.6.1 Static Components

Static components do not have the suffixes described below. If added to a PX file, they are immediately connected to the graphic file.

3.6.2 Normal/Alarm Components

Components with the "normal-alarm" suffix are dedicated to bind Boolean variables indicating normal state or alarm/failure. Graphics representing normal and alarm statuses of the device have been added to these objects. The component has one control value (Value Binding), which causes switching between the graphics of the normal state (false) and the alarm (true) device.

3.6.3 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.7 Humidifier

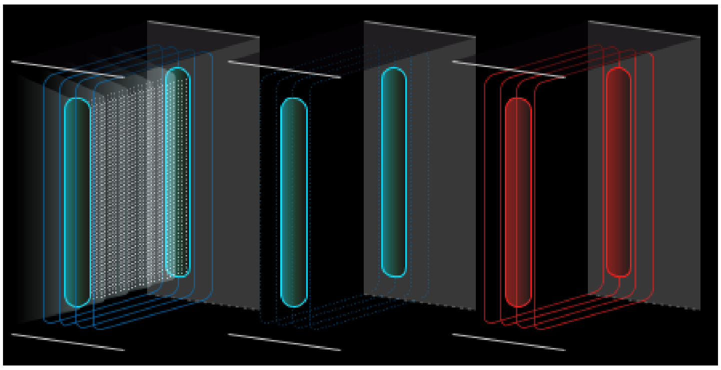

Figure 12. Sample graphic components from the Humidifier folder

The Humidifier folder contains dynamic images representing air humidifier. Due to the features described in section 3, the graphic components in the folder must be arranged in the correct order in the PX file. This principle is the same as for the static images described in section 3.

3.7.1 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.7.2 On/Off Components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false) and operation (true) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.8 Fans

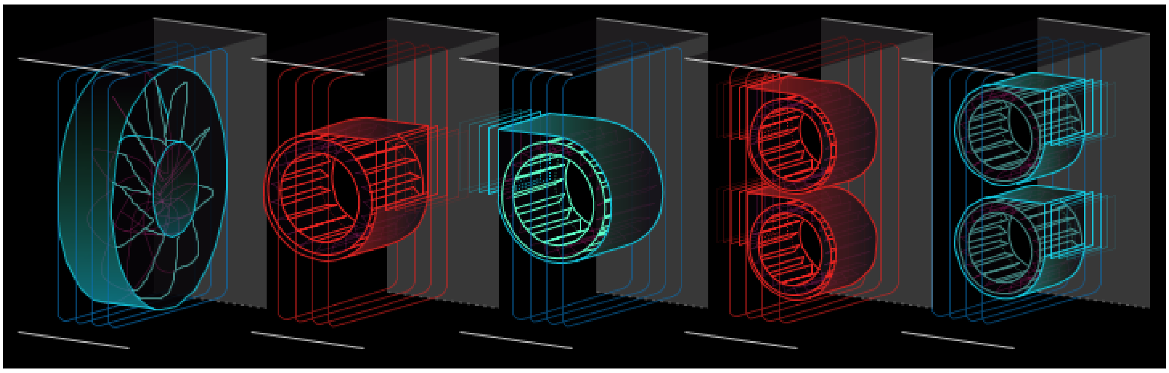

Figure 13. Sample graphic components from the Fans folder

The Fans folder contains dynamic images representing duct fans. Due to the features described in section 3, the graphic components in the folder must be arranged in the correct order in the PX file. This principle is the same as for the static images described in section 3.

3.8.1 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden. Components with the "alarm-anim" suffix work in the same way as "alarm", the difference is that this component does not have a background in the form of a ventilation duct and must be placed above the layer with a fan and ventilation duct.

3.8.2 On/Off Components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphic (false) and operation (true) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Components with the "off-on-anim" suffix work in the same way as "off-on", the difference is that "off-on" is not animated, while "off-on-anim" is animated in the on state, and the animated component, comparing the static component, does not have a background in the form of a ventilation duct and must be placed above the layer with a ventilation duct.

Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off graphics and switch-on animation.

3.9 Heat Exchange

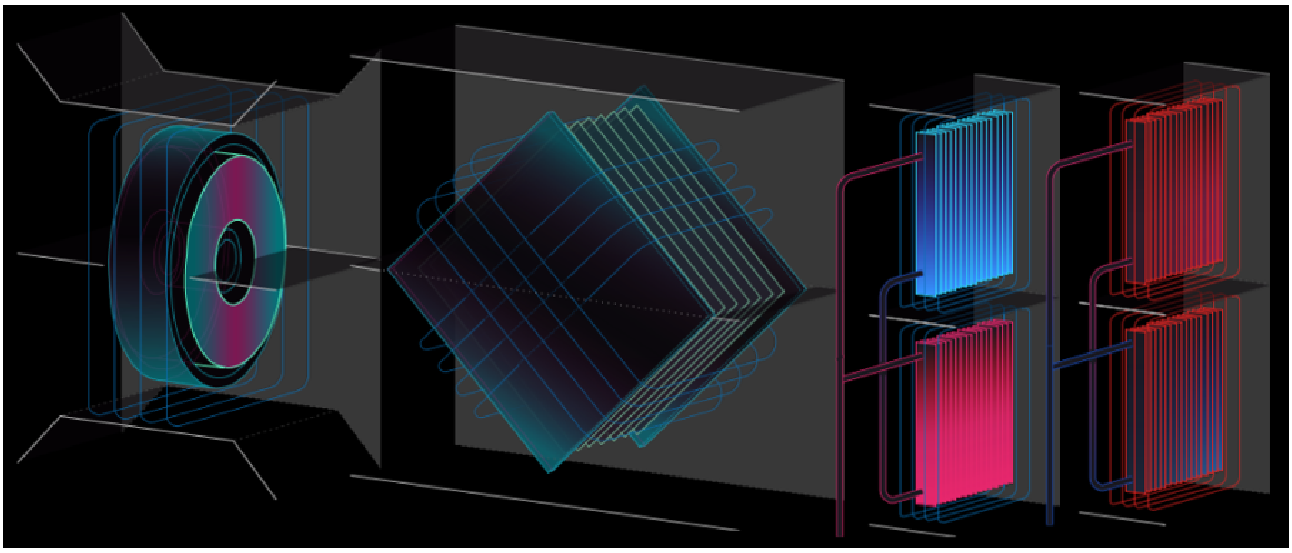

Figure 14. Sample graphic components from the Heat Exhange folder

The Heat Exchange folder contains dynamic images representing the heat exchangers of air handling units. Due to the features described in section 3, the graphic components in the folder must be arranged in the correct order in the PX file. This principle is the same as for the static images described in section 3.

3.9.1 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden. Components with the "alarm-anim" suffix work in the same way as "alarm", the difference is that this component does not have a background in the form of a ventilation duct and must be placed above the layer with a fan and ventilation duct.

3.9.2 On/Off Components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false) and operation (true) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Components with the "off-on-anim" suffix work way as "off-on", the difference is that "off-on" is not animated, while "off-on-anim" is animated in the on state, and the animated component, comparing to the static component, does not have a background in the form of a ventilation duct and must be placed above the layer with a ventilation duct.

Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.10 Standalone HVAC

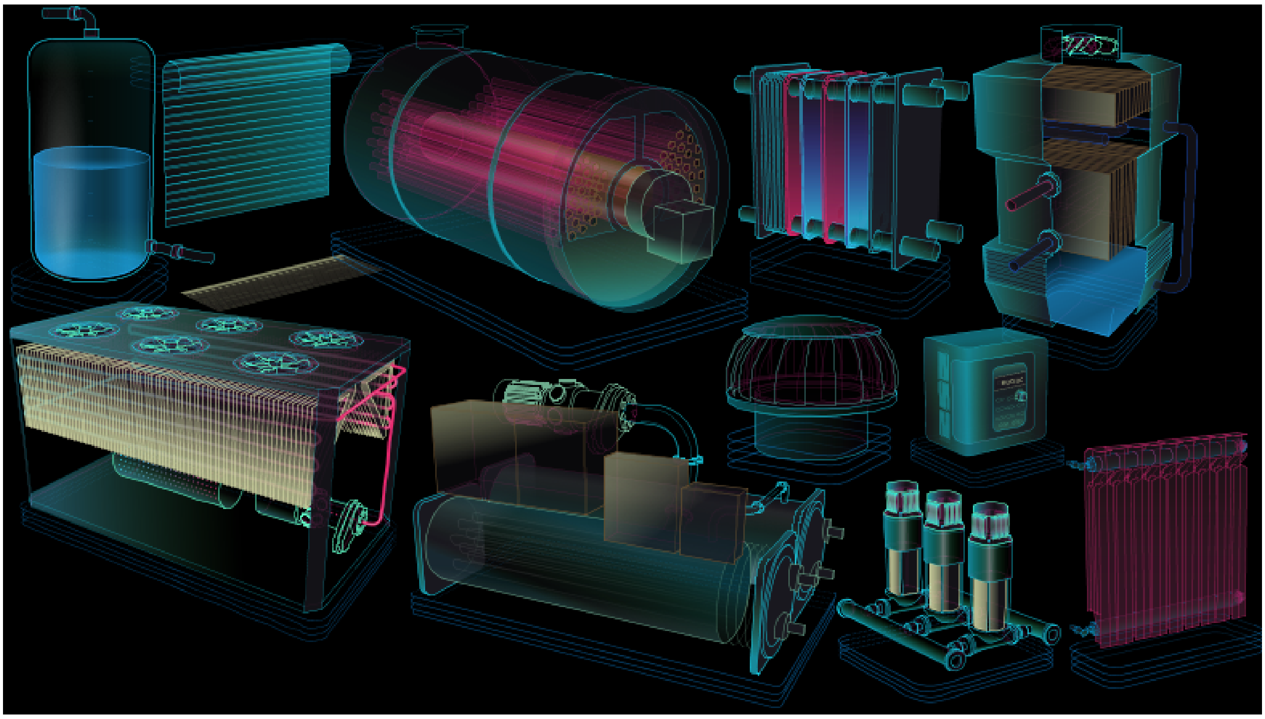

Figure 15. Sample graphic components from the Standalone HVAC folder

The HVAC Standalone folder contains dynamic images representing stand-alone devices. They include air handling units, blinds/rollers, boilers, chillers, compressors, control units, roof fans, heat exchangers, pumps, radiators, tanks, cooling towers.

3.10.1 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.10.2 On/Off Components

Components with the "off-on" suffix in the name are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false) and operation (true) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).
Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.10.3 0-100% Components

Components with the "0-100" suffix are dedicated to binding numeric type variables containing analog control value in the range of 0-100%. Graphics have been added to these objects to represent the percentage drive of the device. The component has two control values (Value Binding). The first one affects switching between the graphics responsible for the level of adjustment depending on the entered value from 0 to 100. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Dragging a numeric component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the suffix "0-100" automatically binds the dragged component to the control value described as switching between the graphics responsible for the adjustment level.

In case of tanks, the control value is the level of filling of the tank.

In case of blinds/roller blinds, the control value is the opening level (0 is a complete closure). The components "h-spin_0-100" and "v-spin_0-100" from 0 to 50% open the blinds, and from 51 to 100% raise them. The "outdoor_0-100" component causes lift over the whole range from 0 to 100%.

Grids

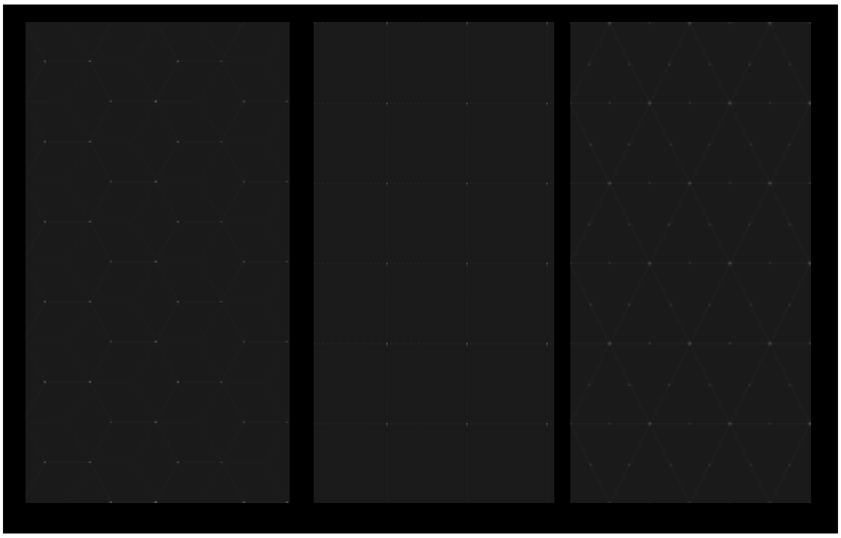

Figure 16. Sample graphic components from the Grids folder

The Grids folder contains static images representing grids. By adding these graphics to the PX file, triangular, square, and hexagonal grids can be constructed.

3.11 Floor Plan

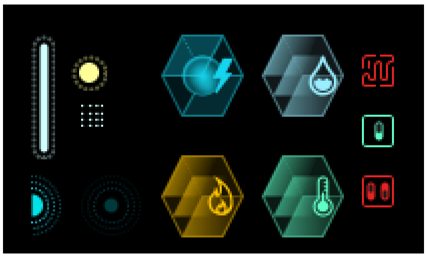

Figure 17. Sample graphic components from the Floor plan folder

The Floor Plan folder contains dynamic images representing lighting, sensors, counters, and connectors placed on the floor plan.

3.11.1 Normal/Alarm Components

Components with the "normal-alarm" suffix are dedicated to bind Boolean variables indicating normal state or alarm/failure. Graphics representing normal and alarm status of the device have been added to these objects. The component has one control value (Value Binding), which causes switching between the graphics of the normal state (false) and the alarm (true) device.

3.11.2 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.11.3 On/Off components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false) and operation (true) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).
Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.12 Piping

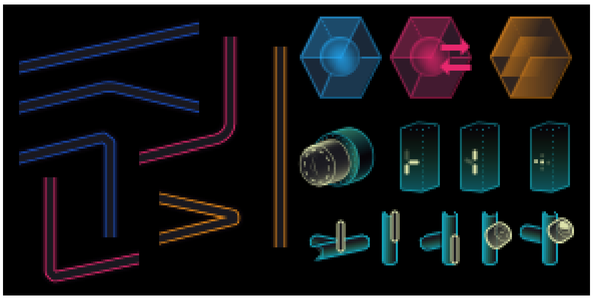

Figure 18. Sample graphic components from the Piping folder

The Piping folder contains dynamic and static images representing the pump, flow meters, meters, pipes, and valves (manual, electrical, and pneumatic).

3.12.1 Static Components

Static components are placed in subfolders "pipes_cold", "pipes_hot", and "pipes_mix". If added to a PX file, they are immediately connected to the graphic file.

3.12.2 Normal/Alarm Components

Components with the "normal-alarm" suffix are dedicated to bind Boolean variables indicating normal state or alarm/failure. Graphics representing normal and alarm status of the device have been added to these objects. The component has one control value (Value Binding), which causes switching between the graphics of the normal state (false) and the alarm (true) device.

3.12.3 Alarm Components

Components with the "alarm" suffix are dedicated to bind Boolean variables signaling an alarm or failure. Graphics representing the alarm status of the device have been added to these objects. The component has one control value (Value Binding), which impacts the Visibility property. The true value in the Boolean type component causes the graphics to be shown, while false causes the graphics to be hidden.

3.12.4 On/Off Components

Components with the "off-on" suffix are dedicated to binding Boolean variables signaling operation or switching on. Graphics representing the status of switch-off and switch-on of a given device have been added to these objects. The component has two control values (Value Binding). The first one affects switching between switching off graphics (false for horizontal, true for vertical) and operation (true for horizontal, false for vertical) of the device. The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden (same variable as for the alarm component above).

Components with the "off-on-anim" suffix work in the same way as "off-on", the only difference is that "off-on" is not animated, while "off-on-anim" is animated in the on state.

Dragging a Boolean component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget window, and then selecting "From Palette" from the palette of the object with the "off-on" suffix automatically pinpoints the dragged component to the control value described as switching between switch-off and switch-on graphics.

3.12.5 Multicondition

Components with "0-2" or "0-4" suffixes are dedicated to binding numeric type variables containing an integer. Graphics have been added to these objects to represent the appropriate device condition depending on the input. The component has two control values (Value Binding). The first one affects the switching between the graphics responsible for the condition depending on the entered value (0, 1, 2, 3, 4). Entering a value outside the range of the device displays the same status as entering 0. The (0-4) value of the variable presents the flow direction of the medium in the graphics, not the valve opening level (components dedicated for coil installations). The (0-2) value of the variable presents similar as above in the graphics (components dedicated for pipe installations). The second value impacts the Visibility property, where false causes the graphics to be shown, while true causes the graphics to be hidden.

Dragging a numeric component from the Nav tree to a PX file, selecting "From Palette" in the Make Widget, and then selecting "From Palette" from the palette an object with the "0-2" or "0-4" suffix automatically binds the dragged component to the control value described as switching between graphics responsible for the device condition.

4 Miscellaneous Components

The iSMA-B-LIB-GRAPH palette includes set of miscellaneous components, which are ready to use in visualizations. The components are categorized in the following groups:

- background grids;
- icons;
- widgets;
- symbols;
- pane.

4.1 Background Grids

4.1.1 Icons

The Icons folder includes components representing status icons (cubes) and whole sets for controlling statues, which can be done from components' Facets.

4.1.2 Widgets

The Widgets folder contains tools designed for specific activities:

- Action buttons: buttons with icons programmed to invoking actions;
- Menu buttons: buttons with symbols programmed to navigate menu;
- Data modules: modules designed to show or set values from/to sensors or devices, and to show their statuses;
- Data editing modules: modules for appointing setpoints;
- Panels: complete panels for showing or setting values, for example, FCU panel, floor panel, or current time panel.

All widgets are differentiated as passive (for showing values) and active (for showing and setting values or invoking actions).

4.1.3 Symbols

The Symbols folder contains components designed as icons symbols freely adjustable by the user. Symbols are prepared in black, blue, green, and white colors; some are programmed to be used for controlling statues with EnumWritable status components in the Facets folder.

4.1.4 Pane

The Pane folder contains the CanvasPane component designed exclusively for the iSMA panel, including TabbedPane and exemplary tabs.

5 FAQ and Troubleshooting

Where to download the iSMA CONTROLLI graphic palette for Niagara?

iSMA CONTROLLI provides a graphic palette, called 'iSMA_Graphics'. It can be downloaded from: ismacontrolli.com.

Why does the PX file created in the iSMA-B-MAC36NL controller from components included in the 'iSMA_Graphics' palette cause errors ('HTTP ERROR 500', 'Unknown type IsmaPicture', or 'Unknown type IsmaBoundLabel') while displaying a view?

In order to use the 'iSMA_Graphics' palette, the module has to be uploaded to the controller with the Software Manager in the platform.

Why do graphic components from the 'iSMA_Graphics' palette display the 'Not licensed' watermark?

The 'iSMA_Graphics' license is available only for the iSMA-B-MAC36NL controller, and it is its basic compound.

Why do 'iSMA_Graphics' components display watermarks on the Supervisor or JACE-8000 controller?

The 'iSMA_Graphics' palette is licensed only for iSMA-B-MAC36NL controllers; on the unlicensed devices, components are watermarked.