ontrol

Ox Programming with Niagara 4

Rev A
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Powered by sedona FRAMEWORK™

CONTENTS

1 INTRODUCTION

This document describes graphics programming, primarily for Ontrol's ORION touch-screen display. Ontrol Graphics (Ox) framework allows designing custom user-interfaces with rich functionality on touch-screen devices.

Ox Page editing workflow is very similar to standard Niagara px page editing. The pages designed for display on the screen are called *Ox Pages*, and individual graphic elements on the pages are called *Ox Widgets*.

2 PREREQUISITES

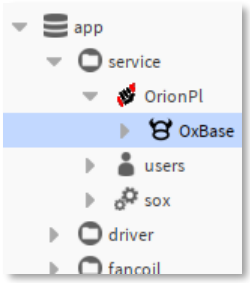
- N4 Workplace software (or equivalent), version 4.13 or higher
- Basic Niagara programming knowledge, preferably TCP certification.
- ontrolSedonanet feature in license (ONT-DR-SED)
- ontrolSedonanet modules
  (download latest versions at www.ontrol.com/sedonadownload)
    - ontrolSedonanet-rt
    - ontrolSedonanet-wb
    - ontrolSedonaOx-wb

Refer to document *AN043 Sedona Programming in Niagara 4* for programming environment setup within Niagara N4 Workbench and general programming info.

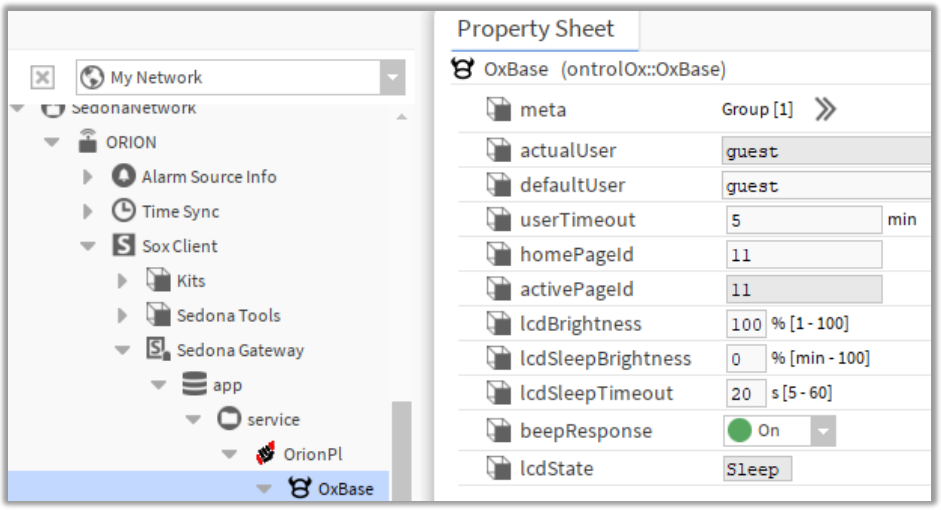
3 OxBase Component

The OxBase type component, available in the OntrolOx kit, is central to ORION graphics functionality on a device.

There must be one, and only one, OxBase component in the Sedona app and it must be located under the platform service.



The OxBase component has a number of properties that can be modified to change overall functionality of the display.



OxBase Properties

The first 3 properties are related to user management. These are only applicable if password protected pages are defined for different users. See security related settings.

Actual User Currently signed in user. Read Only.

Default User Default user on device power-up.

User Timeout A signed in user will be automatically logged out after this amount of time (in minutes) elapses with no user activity. Default user will be active again.

The next 2 properties are related to basic page management:

Home Page Id Component Id of the start-up page. This should **not** be set manually here. See setting the Home Page section.

Active Page Id Component Id of the currently displayed ox page. Normally for information only. Can be written from a supervisor to switch the display to a specific page at any time (e.g. for fire alarm annunciation)

There are 4 properties are related to display brightness and timeouts:

Lcd Brightness Brightness level, in percent, during normal use – 0...100%

Lcd Sleep Brightness Brightness level in sleep mode (after a period has elapsed with no user interaction)

Lcd Sleep Timeout The period, in seconds, that the display will wait for a user interaction before activating sleep mode.

Lcd State Current sleep state – active/sleep. Read Only, for information.

TIP These settings may affect temperature measurement adversely. Do not set a long timeout period, or a high sleep brightness level. Recommended values are:
- Sleep brightness: 0%
- Sleep timeout: 20 seconds

And a final property:

Beep Response Enable the buzzer on the device to beep on every screen touch.

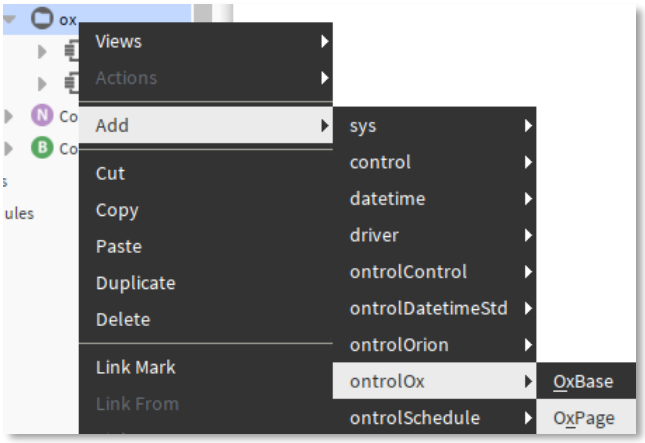
4 Ox Pages, Widgets and Editor

4.1 Adding a new Ox Page

The OxPage component is available in the OntrolOx kit and represents a full-page display on the screen. Add an OxPage component to the Sedona app for each page that you want to present to the user.

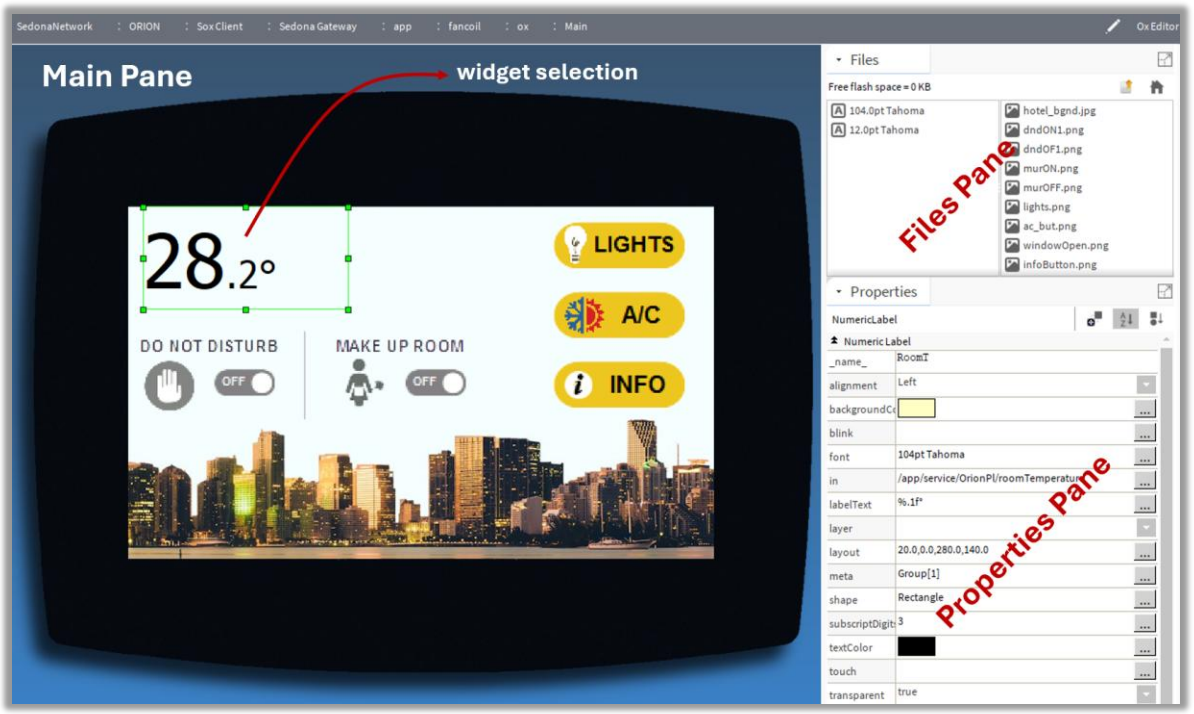
To add a new page, right-click on any folder and select:
Add > ontrolOx > OxPage.

Then, double-click on the new OxPage component to open the Ox Editor view.



4.2 Ox Editor

Double-clicking on an OxPage component opens the Ox Editor view:



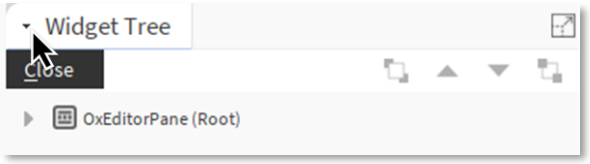
Graphics editing workflow is very similar to Niagara px page editing.

4.2.1 Ox Editor Screen Layout

It's a good idea to take a moment to organize the work area in Ox Editor to make editing pages more efficient.

Sidebar

Normally, you need only the *Files* and *Properties* panes on the right-side bar (see above image). If other panes are visible, you can close them by clicking on the small arrow next to the pane title.

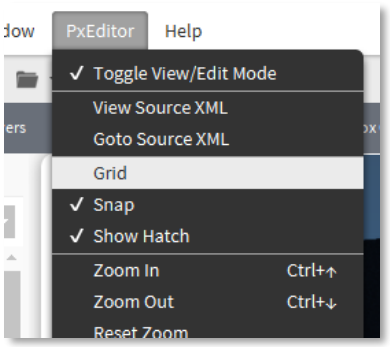


Zooming

Use the Zoom In and Zoom Out button in the toolbar to adjust the magnification.

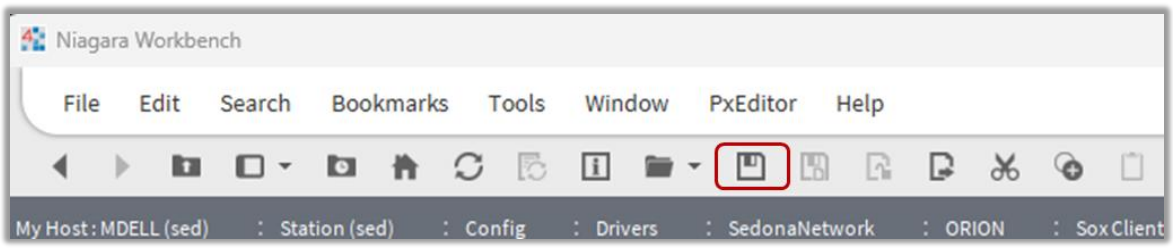
Grid

You can also turn off the grid by using the PxEditor menu to have a better view of how the display will look on the device.



4.2.2 Saving changes

Changes are not immediately pushed to the device. Click on the SAVE button on the toolbar to commit your changes.

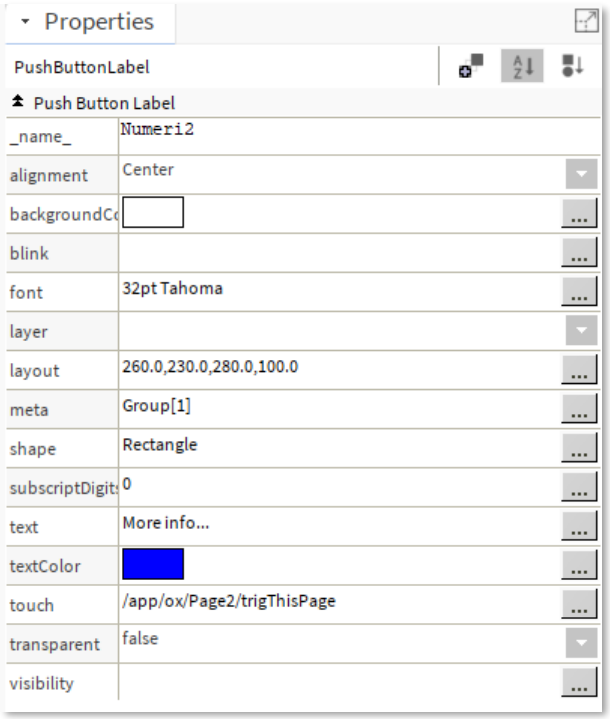


4.2.3 Properties Pane

The Properties pane (on the right-side bar) shows the properties of the selected widget and allows modifying them. Each type of widget will have a different set of properties.

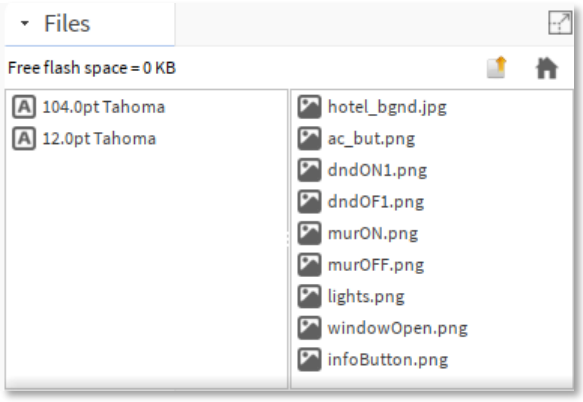
Click on a property, or the button with the three dots, to edit its value.

Different widgets and their various properties are explained in detail in the following sections.



4.2.4 Files Pane

The Files pane (on the right sidebar) lists the image and font files that are required for the ox page. To display correctly, these files need to be transferred to the device.



Transferring files to device

To transfer to the device, select any number of files and click on the UPLOAD button on the top right.

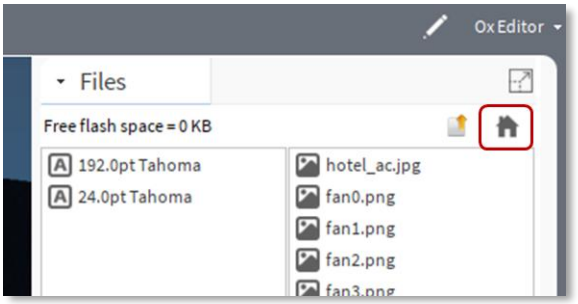
The free flash space is indicated on the top area.

NOTE: There is no way to delete files from the device. Transferred files that are no longer used will continue to take up space in internal memory. If you are running low on memory, a "clean-up" tool is available and explained in this document in a following section.

Setting the home page

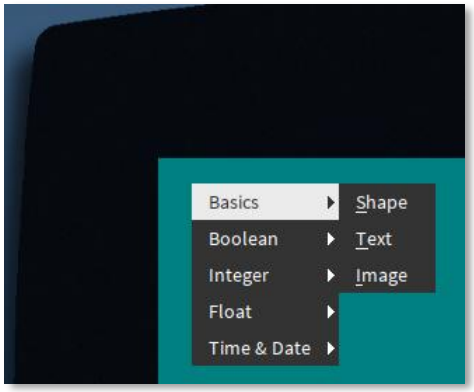
To set the present page as the start-up page, click on the HOME button on top-right corner of the Files pane.

This will automatically add a link from this OxPage component to the OxBase component's *Home Page* slot.



4.3 Adding Widgets

To add a new widget, right-click on an empty area of the design window and select from the list of available widgets.

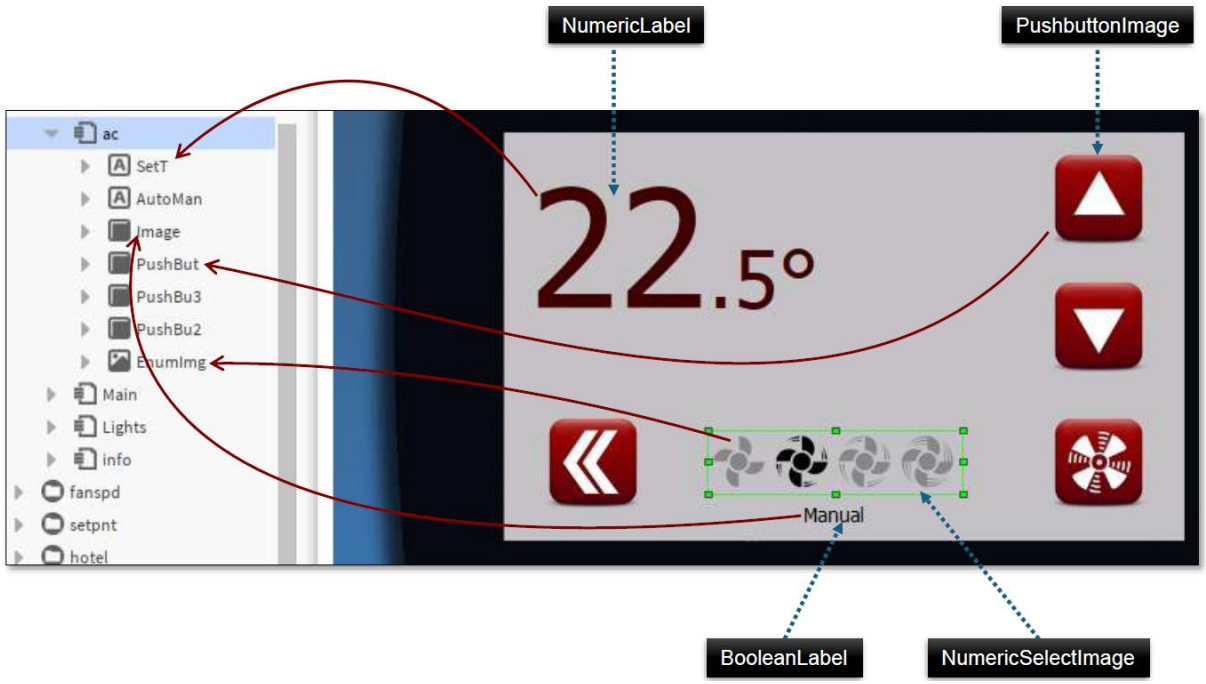


The Add Widget menu is categorized according to the type of live values they can be associated with.

Once added, widgets can be moved around, resized and configured using the properties pane.

Ox Widgets are actually Sedona components

Ox Widgets are actual Sedona components that get added as children of an oxPage. Every time you add a new widget, a Sedona component is automatically created. You can see these in the app's navigation tree, but there is normally need to manage these manually. The Ox Editor takes care of adding, deleting and editing them.



IMPORTANT WARNING

Never place logic components under an oxPage. Children components of an Ox Page do not execute unless that particular oxPage is active on the device display. At all other times, such child components remain idle.

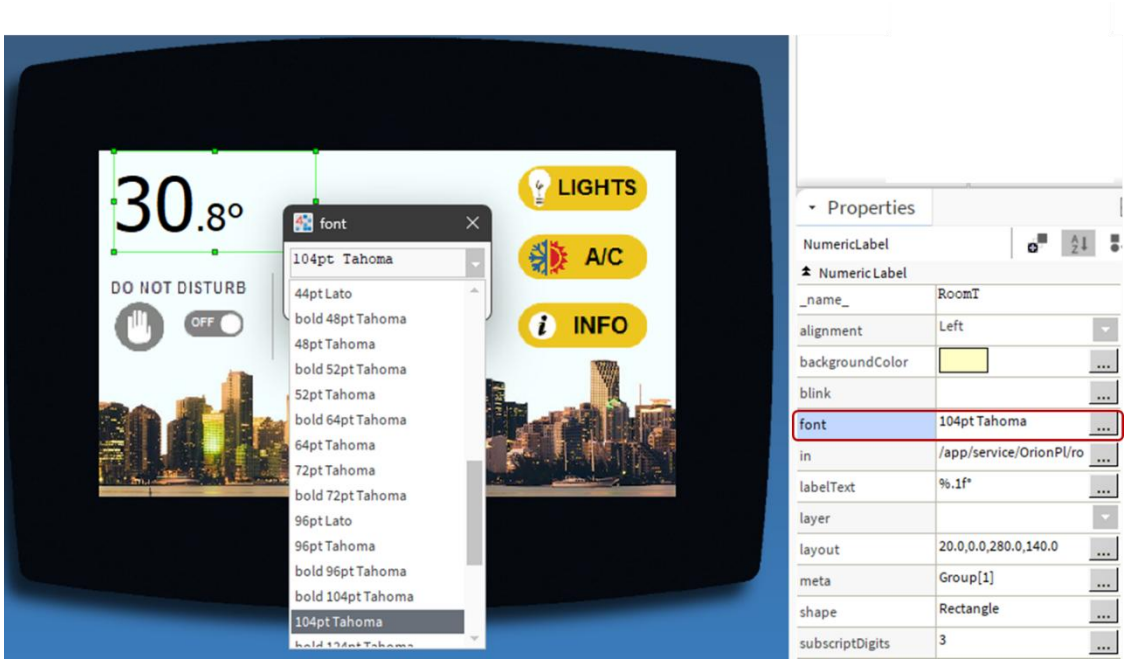
5 WIDGET PROPERTIES

Most widget properties are simple settings. But a few require additional explanation. This section covers:

- Font Selection
- Image File Selection
- Linkable Properties

5.1 FONT SELECTION

When selecting a font, a drop-down box allows selection from available fonts.



ORION uses special native font files, which are typically transferred to the device during page design. When you click on a widget's font property, you will be presented with a list of fonts available on your system.

The available fonts are stored in: {Sedona Home}\ontrol\fontBankXL
(typically C:\Niagara\sedona\ontrol\fontBankXL)

A set of standard fonts come with the Ontrol Sedona Package (see document *AN043 Sedona Programming in Niagara 4*). If you require additional fonts, contact Ontrol.

TIP If the selected font displays correctly in Workbench, but not on the device, it means the font file has not yet been uploaded to the device. Use the Files Pane to transfer the required font file (see Files Pane section).

WARNING To conserve device memory, the larger size font files may contain only numbers and some symbols, but no letters. When you attempt use these fonts to display text, letters will not display properly.

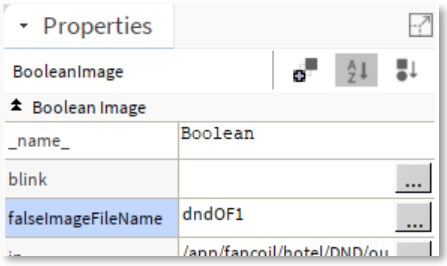
5.2 IMAGE FILE SELECTION

This section is a general guide for setting any image property.

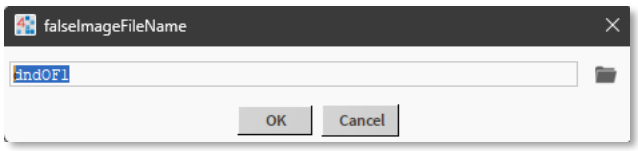
Setting an Image Property

The workflow for setting an image property is as follows:

1. Select a widget and click on the image property you want to set (or click on the button with the three dots).

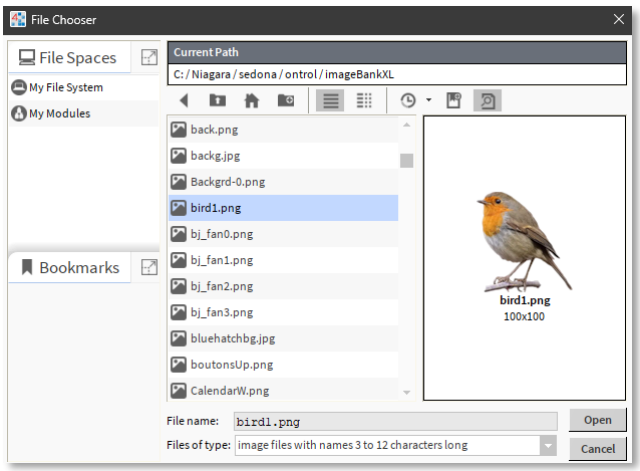


2. A dialog box will be displayed with the previously set file name. Click on the OPEN button on the right of the text box.



3. A File Chooser dialog box will open. Select the desired file and click the **Open** button.
   See next page for image file constraints.

4. Click **OK** to change the property.



5. Back in the main editor pane, right-click on the widget and select “To Preferred Size” to automatically set the widget size to selected image dimensions.

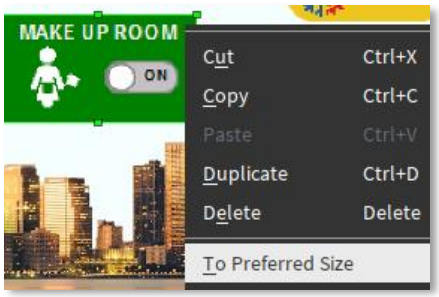


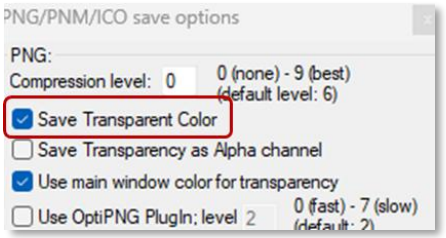
Image File Considerations

When setting widget properties for images, the following points must be observed.

Location	Image files must reside in: {Sedona Home}\ontrol\imageBankXL (e.g. C:\Niagara\sedona\ontrol\imageBankXL) Copy your image file to this location before using it in Ox Editor.
File Names	File names must be 3 to 12 characters long. Rename if necessary.
File types	Compatible image types are jpg, jpeg, png, gif. Animated gif images are not supported. Progressive Jpeg type is not supported.
Conversion	Images are converted before they are transferred to the device. - Background images are always converted to jpg format. - Other images are converted to a native format.

TIP If the selected image displays correctly in Workbench, but not on the device, it means it has not yet been uploaded to the device. Use the Files Pane to transfer the required image file (see Files Pane section).

TIP When images containing transparency information is converted to native format, they will result in larger files. Many image editing programs will let you choose whether you want to include transparency when saving an image. If you know you don't need transparency, make sure you save your image without transparency info to save memory. (Example on right from *IrfanView* software).



5.3 LINKABLE PROPERTIES

While most properties are set to fixed values at design time, some properties allow widgets to change behaviour dynamically in response to changing values. Examples of some such properties are:

- Visibility: the widget can be made to disappear on a change-of-value
- Blink: the widget can be made to blink on a change-of-value
- In: this is often the main property used for display, e.g. room temperature value on a numeric label widget.
- Touch: this is an outgoing slot that switches to true while the widget is touched. It is used to add user-interactions to widgets. See section Adding Touch Functionality.

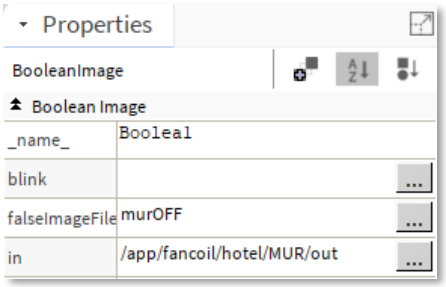
There are also other linkable properties, covered in the next section.

Setting a linkable property

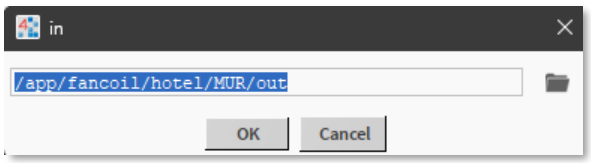
The workflow to set (link) such properties is as follows:

1. Select widget on main editor pane

2. In the Properties pane, click on the property to link (or click on the button with the three dots).

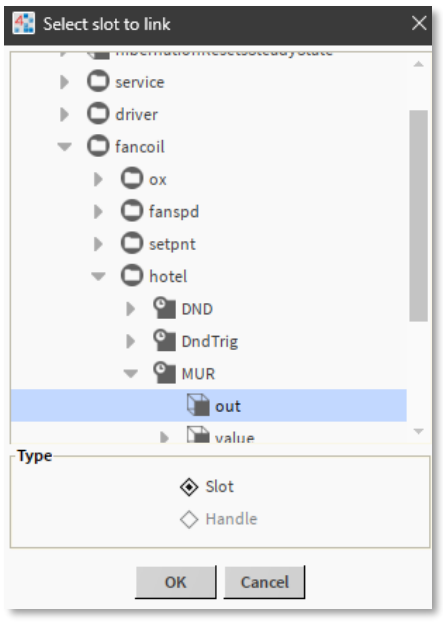


3. A dialog box will be displayed showing the existing link ord.
   Click on the OPEN button on the right of the text box.



4. A Slot Chooser dialog box will open. Navigate to the desired component/slot and click the **OK** button. Only compatible slots are shown.

5. Click **OK** to set the property.
   The link will be done when the page is saved.

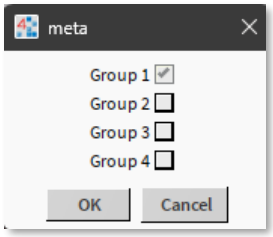
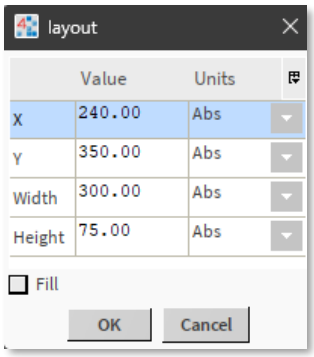


5.4 Widget Common Properties

This section describes common properties shared across multiple widget types. The next section will explain each widget type separately.

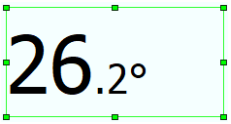
5.4.1 Properties common to all Ox Widgets

Below listed properties exist in every widget.

name	The name of the widget component, assigned automatically when widget is first created. The name doesn't affect the widget's appearance, so there is normally no need to edit this.
Meta	Used to define security levels for password-protected pages 
Layout	Position and size setting in pixels. Widgets are generally positioned and resized by mouse actions. Editing this property manually can provide precise positioning/sizing. Fill is not supported. Only Absolute (Abs) option is supported. 
Blink	Linkable property (type boolean) that causes the widget to be blinking when true
Visibility	Linkable property (type boolean) that controls visibility of the widget: true: widget is drawn (default) false: widget is invisible
Touch	Linkable property (type boolean) used to add touch functionality to any widget. See section …

5.4.2 Properties common to text widgets

Below listed properties exist in all widgets used to display text or numeric values.

Alignment	Text alignment within the bounds of the text box: left / centre / right. (Fill option is not supported)
Font	See fonts section
Subscript Digits	The number of characters from the right to display at half size. An example, with the value set to 3: 
Text Colour	The colour of the text to be displayed
Background Colour	The fill colour for the widget background Only effective when property *Transparent* is false
Shape	Determines shape of widget (rectangle or ellipse) Only effective when property *Transparent* is false
Transparent	Whether a solid colour will be painted for the widget background. If true, only the text will be displayed against the page background.

5.5 LAYERING

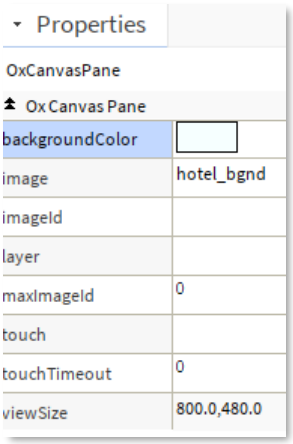
There is no layering !

You should never place overlapping widgets on an oxPage. There is no logical way to guarantee in which order the widgets are painted. Even if your page view looks right, it might well change after the next save or after an update.

AVOID OVERLAPPING WIDGETS

5.6 Ox Page Background Properties

To edit the page background, click on any empty area. The Properties pane will show the list of properties with the title “Ox Canvas Pane.”



Background Color Click on this line to set the background colour. The background colour is painted only if no background image is selected.

Image Click on this line to select an image to use as the page background. The background image must be exactly the same size as the display resolution (for the ORION, 800 x 480 pixels).

Image Id This is a linkable property and can be used to change the page background dynamically. It can only be linked to an int value. See below for more explanation.

Max ImageId This must be set if ImageId property is linked. See below for more explanation.

Touch Timeout If there is no user interaction (touch) for this amount of time, in seconds, the display will automatically switch back to the home page. If set to zero, timeout will be disabled.

View Size Display size in pixels. Read Only, for information only.

Configuring a dynamically changing background

The background of an Ox Page is normally static (fixed), either a solid colour or an image covering the display. But it is possible to have the background change in response to a changing value.

1. Create a series of image files with the same name, but ending with a number. The filename of the first image must end with “0”.
   For example: weather0.jpg, weather1.jpg, weather2.jpg...
2. Make sure all images are exactly the same size as the display screen resolution (for the ORION, 800 x 480 pixels).
3. For the *Image* property, select the first image in the sequence (ending with ‘0’)
4. *Max Image Id* property must be set to the number of the last image in the sequence.
5. *Image Id* property must be linked to an integer value.
   A value of 0 will cause the first image to be displayed (file name ending with '0’).
   A value of 1 will display the next image (file name ending with '1’) ...

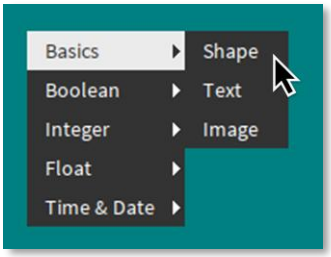
6 Widget Types

This section covers individual widget types and functionality. Only type-specific properties are explained here. For common properties, refer to previous section.

6.1 Basics → Shape

(Sedona type ontrolOx::Geometry)

The **Shape** widget is used to draw simple, static shapes such as rectangle, circle, ellipse or line. There are no type-specific properties for this widget.



TIP To draw a line,
- Add a shape widget
- Set *Shape* property to 'Rectangle'
- Set height or width (in *Layout* property) to 1 pixel.

6.2 Basics → Text

(Sedona type ontrolOx::PushButtonLabel)

The **Text** widget is used to display simple, static text. In addition to common properties, it has one additional property as below:

Text	Text to be displayed. Maximum length is 15 characters

6.3 Basics → Image

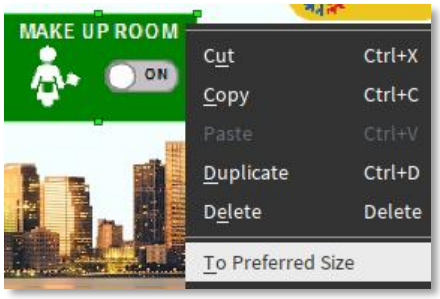
(Sedona type ontrolOx::PushButtonImage)

The **Image** widget is used to display a fixed image. In addition to common properties, it has one additional property as below:

Image File Name	The image file to be displayed within the bounds of the widget. See images section for details

TIP

After setting the image file, you can right-click on the widget and select 'To Preferred Size' to automatically set the Layout property's width and height to match image dimensions.



6.4 BOOLEAN → LABEL

(Sedona type ontrolOx::BooleanLabel)

The **Boolean Label** widget is a text box that displays one of two texts depending on the value of a linked boolean slot. In addition to common properties, it has the below additional properties.

In	Linkable property (type boolean) that determines the displayed text, text colour and background colour
True Text **False Text**	Texts to be displayed depending on value of linked in slot. Maximum length is 10 characters each
True Text Color **False Text Color**	Colours used for the text font depending on value of linked in slot
True Background Color **False Background Color**	Colours used for the widget background depending on value of linked in slot. Only effective when property *Transparent* is false.

6.5 BOOLEAN → IMAGE

(Sedona type ontrolOx::BooleanImage)

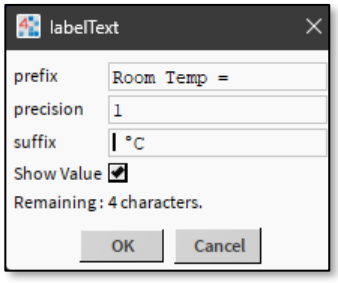
The **Boolean Image** widget displays one of two images depending on the value of a linked boolean slot. In addition to common properties, it has the below additional properties.

In	Linkable property (type boolean) that determines the displayed image
True Image File Name **FalseImage File Name**	Images to be displayed within the bounds of this widget depending on value of linked in slot. See images section for details.

6.6 FLOAT → VALUE DISPLAY

(Sedona type ontrolOx::NumericLabel)

The **Float Value Display** widget is used to dynamically display a float value (e.g. room temperature). In addition to common properties, it has the below additional properties.

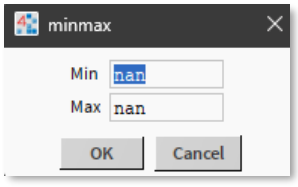
In	Float property that determines the displayed numeric value
Label Text	This property allows setting the number of digits to display after the decimal point (precision). It is also possible to add a prefix and/or suffix to the displayed value. Example: with the settings on the right, the text displayed may be: "Room Temp = 22.4 °C" 
Value Tab Position	This property is useful If you are configuring table-like displays. If set to a non-zero value, - The prefix will be displayed first (left-aligned) - a colon (':') character will be painted at the position you specify - the linked live value will be displayed after the semicolon This enables multiline label-value pairs to be displayed, with both labels and values aligned.

6.7 FLOAT → VALUE DISPLAY & SET

(Sedona type ontrolOx::NumericLabelSet)

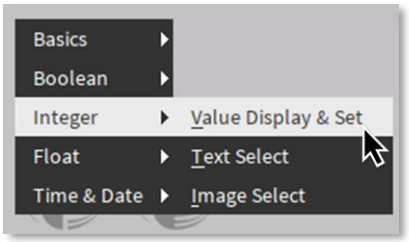
The **Float Value Display & Set** widget is similar to the above ***Float Value Display*** widget. It will dynamically display a linked numeric value (e.g. temperature setpoint). But in addition, on a user touch, it will present a numeric keypad allowing the user to enter a new value.

The differences from the ***Float Value Display*** widget are detailed below:

In	Float property that determines displayed numeric value. When the user sets a new value using the keyboard, the value is written back to this linked property.
InInt	Int property that determines displayed numeric value. Use this to display/set int type properties instead of the above 'in' property. Never use both.
MinMax	Limits user adjustments to a defined range. Values outside this range are rejected. Leave at "nan" to disable limiting function. 

6.8 Integer → Value Display & Set

This is the same widget as the above ***Float Value Display & Set*** widget. It is present on the Add menu separately for convenience.



6.9 Integer → Text Select Widget

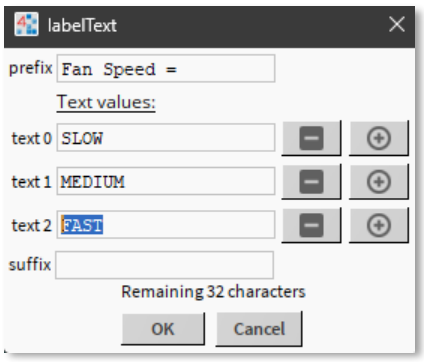
(Sedona type ontrolOx::NumericSelectLabel)

The **Text Select** widget displays one of a range of fixed texts, depending on the value of the linked **in** slot.

Some examples:
- Slow; Medium; Fast
- Hand; Off; Auto
- MON; TUE, WED; THU; FRI; SAT; SUN

Selection is zero based.
A value of 0 will cause the first text to be displayed.
A value of 1 will display the next text…

In	Linkable property (type integer) that selects which text to display
Label Text	Define a series of texts to display depending on the value of linked integer slot. The number of text values can be changed with the plus/minus buttons on each row (dialog window may need resizing).



6.10 Integer → Image Select Widget

(Sedona type ontrolOx::NumericSelectImage)

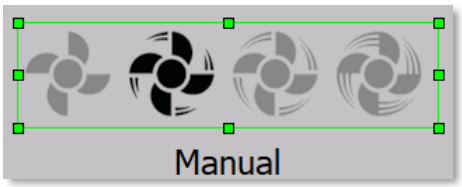
The **Image Select** widget displays one of a range of images, depending on the value of the linked **in** slot.

The sequence of images should be named similarly, the first image ending with a “0”, the second image ending with a 1. See an example below.

Selection is zero based.
A value of 0 will cause the first image in sequence to be displayed.
A value of 1 will display the second image…

In	Linkable property (type integer) that selects which image to display
Image Zero	Select the first image in a sequence. Its name must end with a “0”
Max Index	The index number of the last image in sequence

Example: Display fan speed by a changing graphic



Fan speed is available as an integer value:
0=off, 1=slow, 2=medium, 3=fast

Prepare four images with appropriate names:
fan0.png, fan1.png, fan2.png, fan3.png

Set properties as follows:
ImageZero = “fan0”
maxIndex = 3

6.11 Time & Date → Time

(Sedona type ontrolOx:TimeLabelSet)

The **Time** widget displays time-of-day and can allow the user to set the time. Widget-specific properties are described below:

In	Linkable property (type integer). This property normally doesn't need to be linked. - When not linked, the widget will automatically retrieve the time-of-day from the Date Time Service in the app. - When linked, the value will be interpreted as minutes-after-midnight and displayed in time format (e.g. hh:mm)
Allow Edit	Is user editing of time allowed? If true, the user can touch the widget and set the time via on-screen keyboard
AM PM Format	If true, the time will be displayed with AM / PM format.
Text	A prefix text to be displayed before the time value. Maximum 23 characters

6.12 Time & Date → Date

(Sedona type ontrolOx::DateLabelSet)

The **Date** widget displays a date and can allow the user to set the date. Widget-specific properties are described below:

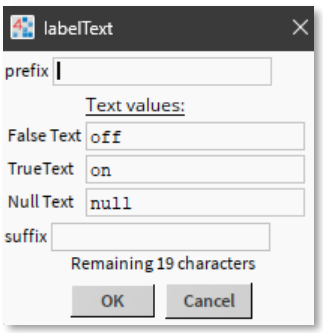
Allow Edit	Is user editing of date allowed? If true, the user can touch the widget and set the date via on-screen keyboard
Day Month Leading Zero	If true, the day and month fields will be padded with a zero (e.g. "01/01/2026" instead of "1/1/2026"
Day Month Order	Select order of date & month fields (e.g. "02/28/2026" instead of "28/02/2026"
Display Year	To display the year field or not
Separator Character	Slash / Dot / Dash / Space
Year Digits	Display year with 2 or 4 digits

6.13 Time & Date → Schedule

(Sedona type ontrolOx::ScheduleLabelSet)

The **Schedule** widget displays the output of a linked boolean schedule component and allows the user to modify the schedule. Functionality is only compatible with Boolean Schedule components added from the OntrolSchedule kit.

Widget-specific properties are described below:

In	Linkable property (type boolean). This property must be linked to the **out** slot of a boolean schedule component from the OntrolSchedule kit
Allow Edit	Is user editing of time allowed? If true, the user can touch the widget and set the time via on-screen keyboard
True Text Color **False Text Color**	Colour used for the text font depending on current output of linked schedule
True Background Color **False Background Color**	Colour used for the widget background depending on current output of linked schedule. Only effective when property *Transparent* is false.
True Image File Name **False Image File Name**	Image to display within the bounds of the widget depending on the current output of linked schedule.
Label Text	Allows defining text values for the linked schedule's output. Additionally, a prefix and/or a suffix text can be defined. 

7 PASSWORD PROTECTED PAGES

It is possible to restrict access to select Ox Pages by password protection. The security scheme makes use of the standard Sedona User Service permissions. This allows any Sedona component to be a member of one or more security groups (of a total of 4 groups).

7.1 SECURITY GROUPS OF OX WIDGETS

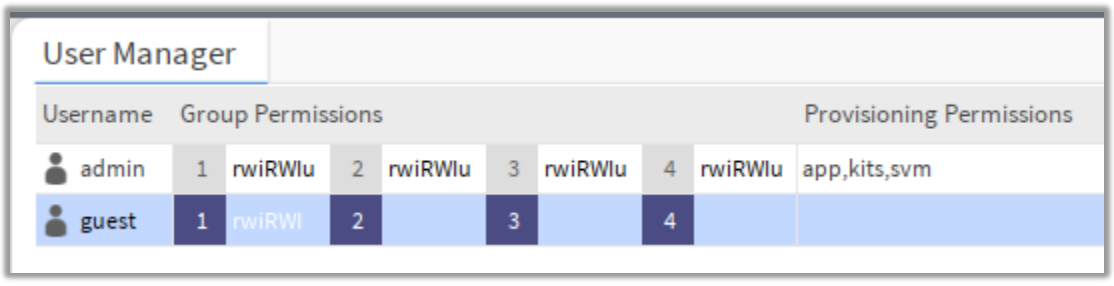
A widget's **meta** property allows changing the security groups that the widget is member of. Newly added widgets are by default a member of only Group 1.

To limit access to a particular page, modify the **meta** property of the button linking to that page (not the ox page itself).

Modify the **meta** property of the button widget to assign it to a group other than Group 1 (remove Group 1 check mark).

7.2 SET UP USERS

Double-clicking the User Service component brings up a Sedona User Manager view. Here, you can add, remove or modify users.



The admin and guest users are installed by default. Do not remove or modify these. Note that the guest user has read/write/invoke privileges only for Group 1. When first added, ox widgets are a member of Group 1 by default. Therefore, the guest user would not be able to use any widget which is not a member of Group 1.

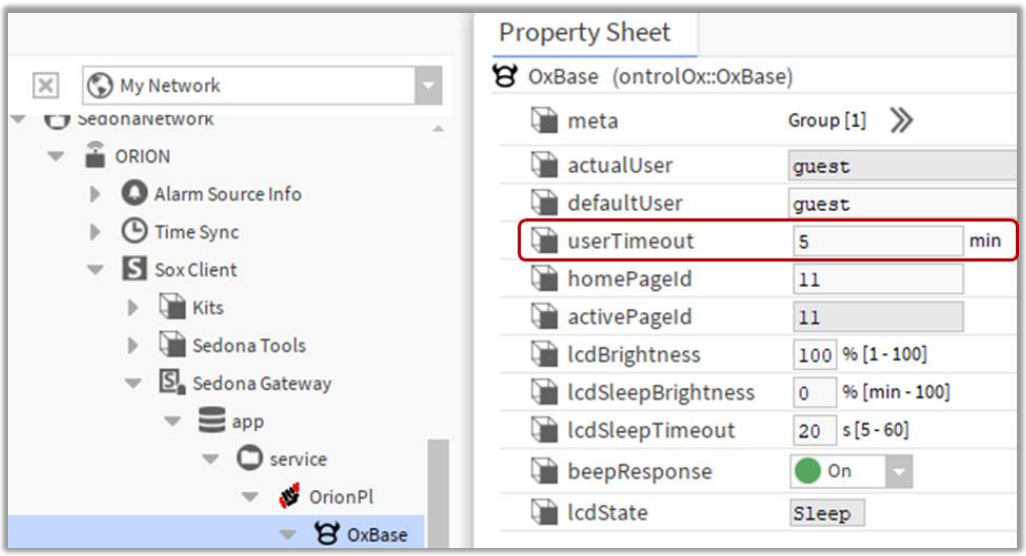
Add new users to allow password protected access to such widgets. Make sure you observe the following important points.

- The password for each user needs to be unique. Do not use the same password for more than one user.
- The passwords need to be numeric. Do not use letters. Only digits are allowed.
  (The user will be presented with an on-screen numeric keyboard to enter their password)

7.2.1 Usage

When set-up correctly, the password protection scheme works as follows:

- The device starts up with the guest user active.
- When a button is touched with security protection, the user is presented with a numeric keyboard to enable them to enter their password.
- If a correct password is entered, the associated user becomes active. The display returns to the previous page.
- Now, when the user presses the same button, the link will work (if the new active user security settings have the right privileges).
- Any active user (other than guest) will be automatically signed off after a set time. This time can be set in OxBase component properties. Active user is also displayed there for information.



8 Adding Touch Functionality

8.1 The Touch Property

Touch functionality of widgets is configured via the **touch** property, which is present in every widget type. This is a boolean readonly property that has a very simple function. It is normally false, but switches to true for as long as the widget is being touched. As such, it doesn't do anything on its own, but is typically linked to other components to trigger various functions.

8.2 Page Navigation

OxPage components have special slots to enable navigation between pages:

- Trig This Page
- Trig Back
- Trig Home

These linkable properties provide an easy way to configure navigation within the device. Remember that the linking can be done directly in the Ox Editor view:

Hyper-linking to another page

Simply link the **touch** slot of a widget to the **trigThisPage** slot of an Ox Page.

Configuring a Back button

Simply link the **touch** slot of a widget to the **trigBack** slot of its own Ox page. Touching this widget area will take the user to the previous page.

Configuring a Home button

Simply link the **touch** slot of a widget to the **trigHome** slot of its own Ox page. Touching this widget area will take the user to the home page.

8.3 ONTROLTRIGGER KIT

The OntrolTrigger kit provides a number of logic components to enable touch functions for changing values and controlling devices.

- The names of these components are all in the form “Trig…” (e.g. TrigToggle).
- They all have one or more boolean properties that are linked from an ox widget’s **touch** property. Names of such properties are also in the form “trig…” (e.g. trigUp)
- They have a readonly **out** property that changes value when a trig… input value changes from false to true (except for TrigAction… components)

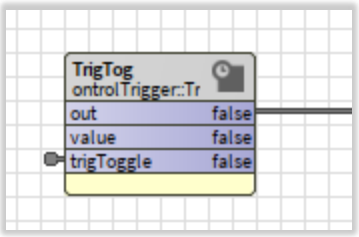
A brief summary of Trig… components:

TrigToggle	Toggle a boolean output value on each trigger of a single input. For example, switch a light ON/OFF every time a button area is touched.
TrigBoolSet	Drive a boolean output with separate true/false triggers. For example, switch a device ON from one touch button, OFF from another.
TrigRegisterBool	This component has trig inputs for turning the output on, off or toggling it, similar to the above two components. But additionally, the boolean value is saved in a non-volatile register.
TrigNumericUpDown	Increment/decrement a numeric output value on touch events from separate trigger inputs. For example, adjust a light level up/down using two touch buttons.
TrigRegisterUpDown	Similar to the above, but the numeric value is saved to a non-volatile register on every change. For example, adjust a room temperature setpoint up/down using two touch buttons.
TrigTemperatureUpDown	Similar to the above but with additional functionality to handle temperature unit changes.
TrigNumericSelect12	The numeric output takes one of a series of preset values depending on which input is triggered (up to 12). For example, create different touch buttons to set light level to 25%, 50%, 75%, 100%.
TrigAction…	These components do not have an **out** property. They are used when an action on another component needs to be triggered by a touch function. For example, create a touch button to reset runtime.

IMPORTANT WARNING

Never place logic components (including trig… components explained here) under an oxPage. Children components of an Ox Page do not execute unless that particular oxPage is active on the device display. At all other times, such child components remain idle.

8.3.1 TrigToggle



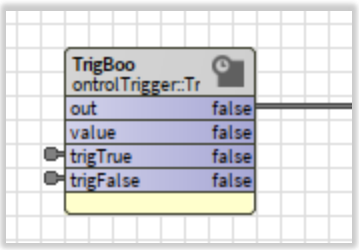
The output of this simple component will toggle every time the input changes from false to true. This allows control of a boolean output from a single touch button.

Out Boolean output property

Value Do-not-use.

TrigToggle Boolean input to be linked from a widget's touch property. Every touch will cause the out value to toggle true/false.

8.3.2 TrigBoolSet



This component has two individual trigger inputs for setting the value to true or false. This allows control of a boolean output using separate touch buttons for ON/OFF.

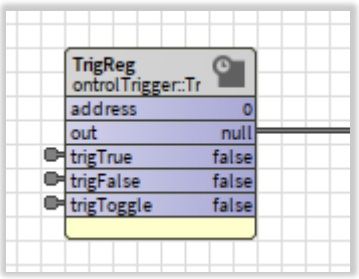
Out Boolean output property

Value Do-not-use.

TrigTrue Boolean input to be linked from a widget's touch property. Touch will switch the out value to True.

TrigFalse Boolean input to be linked from a widget's touch property. Touch will switch the out value to False.

8.3.3 Trig Register Bool



This component combines the functions of the above two components. The output can be forced on or off, or be toggled from individual touch buttons.

Additionally, the out value is maintained in a non-volatile register. Therefore, the out value will be preserved across power-interruptions.

Address Register address (1-32). When setting, if the register is already used in another component, the value will not be accepted and will revert back to zero.

Out Boolean output property

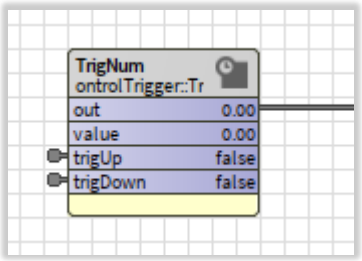
TrigTrue Boolean input to be linked from a widget's touch property. Touch will switch the out value to True.

TrigFalse Boolean input to be linked from a widget's touch property. Touch will switch the out value to False.

TrigToggle Boolean input to be linked from a widget's touch property. Every touch will cause the out value to toggle true/false.

8.3.4 TrigNumericUpDown

The output of this component is numeric (type float). Two trigger inputs function as up/down triggers, causing the output value to be incremented/decremented. This allows changing a value incrementally from two touch buttons on the display.



Out Numeric output property (type float)

Value Do-not-use.

TrigUp Boolean input to be linked from a widget's touch property. Every touch will cause the out value to be incremented by the delta value.

TrigDown Boolean input to be linked from a widget's touch property. Every touch will cause the out value to be decremented by the delta value.

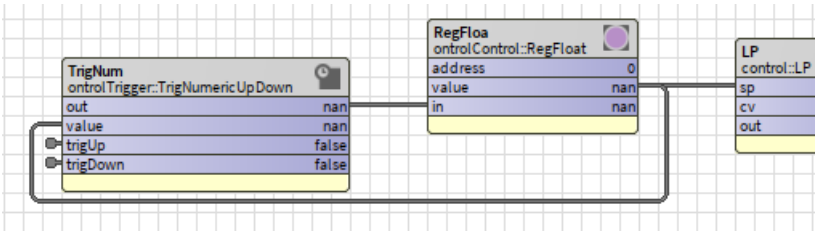
Delta The increment/decrement step value

Min The output value will not be decremented below this value.

Max The output value will not be incremented above this value.

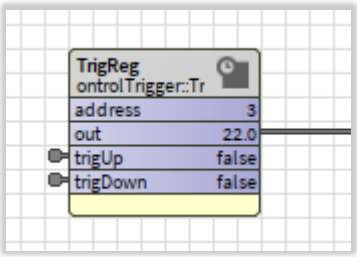
Rollover If set to true,
- after max output value is reached, output will rollover to min value with the next trigUp button touch
- after min output value is reached, output will rollover to max value with the next trigDown button touch.

In older Sedona applications, you can see logic as shown below. In this configuration, the TrigNumericUpDown component is coupled with a RegFloat component to save the adjusted value in a non-volatile register. This usage is no longer necessary thanks to new components, detailed in following sections.



8.3.5 TrigRegisterUpDown

This component is similar to the above NumericUpDown component, but the numeric value is saved to a non-volatile register on every change.



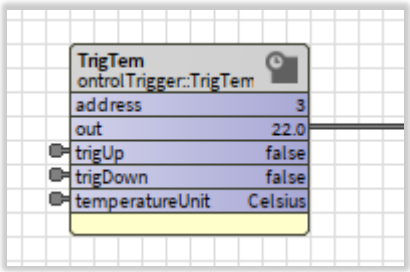
This ensures that user adjusted values (such as setpoints) are preserved across power interruptions.

There is one additional property for register number selection:

Address	Register address (1-32). When setting, if the register is already used in another component, the value will not be accepted and will revert back to zero.

8.3.6 TrigTemperatureUpDown

This component is similar to the above TrigRegisterUpDown, but has additional functionality for temperature unit changes.



The platform service has a property called **temperatureUnit**. This can be changed from a supervisory system, or from the display if a widget is configured for this purpose.

When starting, this component automatically adds a link from the platform component. Then, every time the unit is changed,

- The current value is converted to the new unit. If the related **Delta** value is greater than or equal to 1, the conversion is rounded to the nearest integer. If less than 1, it is rounded to the nearest 0.5 fraction.
- Active delta, min and max values also change for the new unit. For example, a setpoint may be incremented in steps of 0.5 degrees in Celsius, but in steps of 1 in Fahrenheit.

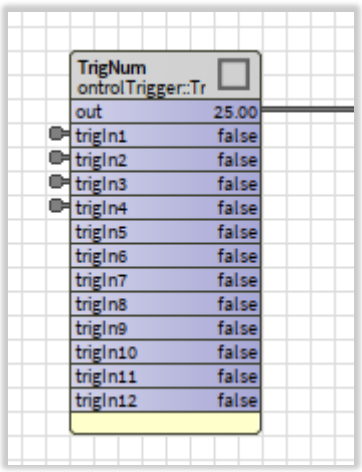
Additional properties in this component are:

Temperature Unit	Celsius/Fahrenheit selection. Automatically linked to related platform service property. Do not change here
Delta **Min** **Max**	Do not edit these properties, they are for information only in this component. Use the below properties instead.
Celsius Delta **Celsius Min** **Celsius Max**	The configuration values active when unit is selected as Celsius.
Fahrenheit Delta **Fahrenheit Min** **Fahrenheit Max**	The configuration values active when unit is selected as Fahrenheit.

8.3.7 TrigNumericSelect12

This component has 12 trigger inputs and 12 corresponding float value properties. When any input is activated by a touch button, the output is set to the related preset value.

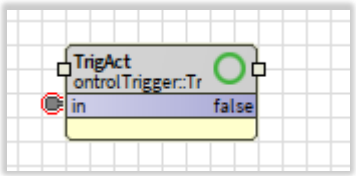
This can be used, for example, to create a series of touch buttons to set a light level to 0%, 25%, 50%, 75%, 100%. Another example could be to have individual buttons to set a fan speed to OFF, SLOW, MEDIUM, FAST.



Out	Numeric output property (type float)
TrigIn1…TrigIn12	Boolean inputs to be linked from a widget's touch property. On touch, the output will be set to the related preset value
Value1…Value12	Preset values for each trigger input

8.3.8 TrigActionVoid

This component is used to trigger an action on a separate component (an action with no value, for example reset runtime action)



This component has no out property, because it is not possible to add links to action type slots. Instead, there are two properties for setting the component id and slot id of the other component.

To find these ids for any component/slot, double-click on the App component. Note that component ids may change when copy/pasting logic between devices, so special care is necessary when using these components.

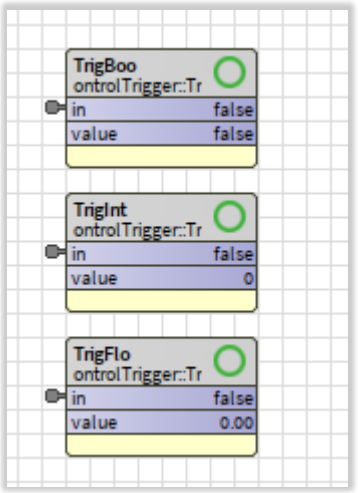
in	Boolean input to be linked from a widget's touch property. On touch, the configured action slot on the remote component will be triggered
Component Id	The component Id of the component on which an action is to be triggered
Slot Id	The Slot Id of the action slot on the other component

8.3.9 TrigActionBool / TrigActionInt / TrigActionFloat

These components are similar to the above trigActionVoid component, but are applicable for action slots that require a value.

These components also allow setting a property on a remote component without any linking (see the trigger property below).

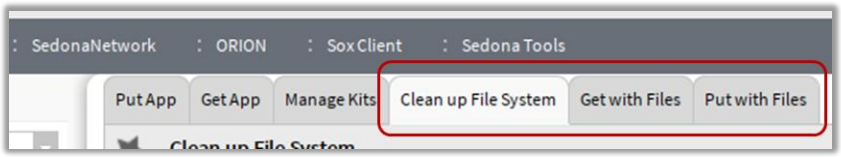
In addition to the Component Id and Slot Id properties as explained above, there are two additional properties on these components.



Value	The value to be used when triggering the action on the remote component. This will not be saved in power interruptions, so use a link into this slot instead of setting it to a fixed value on the Property Sheet
Trigger	Whether to allow this component to work on property slots as well or only action slots. The selections are: - Actions Only - Actions & Properties

9 PROVISIONING TOOLS

The document *AN043 Sedona Programming in Niagara 4* details use of Sedona tools, such as Kit Manager, Get App and Put App. When working with Ontrol's ORION devices some additional tools are available:



9.1 CLEAN UP FILE SYSTEM

As you work on your oxPage designs, you will have transferred several images and fonts to the device, some of which are probably not being used. (You tried something, changed your mind, tried another image...)

Since the oxEditor doesn't delete any existing files from the device, these unused files will be taking up memory. This tool recovers memory by deleting such unused files.

It will first delete all image and font files in the device, and re-transfer only the required files.

9.2 GET WITH FILES

This tool is similar to the Get App tool, but it makes a backup of the image files in addition to the Sedona app. Therefore, always use this tool rather than the Get App tool for making ORION backups, otherwise your backup will be missing the necessary image files.

9.3 PUT WITH FILES

This tools is similar to the Put App tool, but it restores image and font files to the device in addition to the Sedona app.