APPLICATION NOTES

4D SYSTEMS
TURNING TECHNOLOGY INTO ART

ViSi Genie: Custom Digits

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Description

This application note provides instructions for designing a CustomDigits widget for a ViSi Genie application.

Before getting started, the following are required:

Hardware

- Any ViSi Genie compatible 4D Systems display module
- Programming Adaptor for target display module
- uSD Card
- USB Card Reader

Software

- Workshop4

This application note comes with two (2) ViSi-Genie projects:

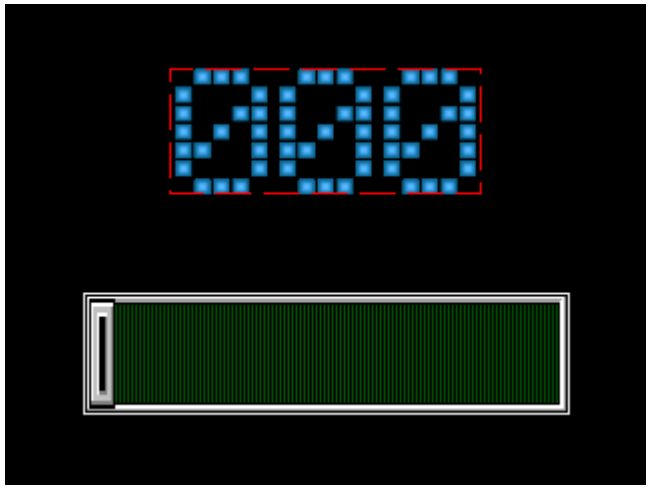
- CustomDigits+ve.4DGenie - negative Digits widget values disabled
- CustomDigits-ve.4DGenie - negative Digits widget values enabled

Note: Using a non-4D programming interface could damage the processor and void the warranty.

Content

Application Overview

Some user projects utilize Workshop4's LedDigits widget. This provides users a way to show an integer value with a simple seven-segment inspired widget. However, advanced users may want to use their own design for a Digits widget. CustomDigits allow users to use their own design as a replacement for the usual seven-segment design.



The projects developed in this application note demonstrate CustomDigits linked to the changes of a Slider widget. The user moves or touches the Slider, and the CustomDigits change their values to correspond with the Slider's change in value.

By default, input objects such as the Slider respond to touch. The user can configure an input widget to drive an output widget such as the CustomDigits.

Design Custom Digits

CustomDigits widget requires a single image as its source file. This image file is simply a set of ***equally sized images arranged horizontally***.

Digit widgets can either have negative values enabled or disabled.

The CustomDigits source file should contain all digits from 0 to 9 if negative values are disabled in the project.

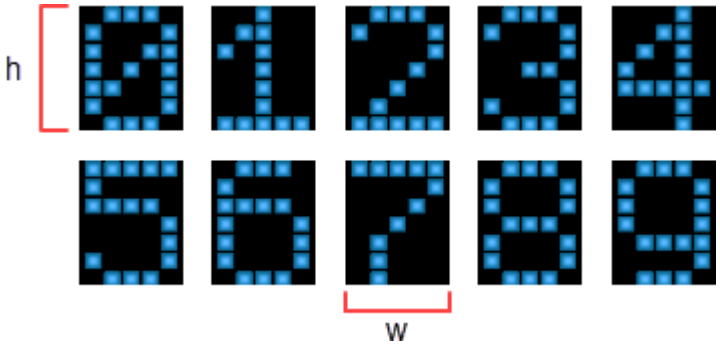
Otherwise, the CustomDigits source file needs additional two (2) characters: space and negative sign.

Notice that in the examples above, the source images are designed with a filled background. This is because CustomDigits converts images to bitmap which fills up the transparent portions with a solid colour. Therefore, it is best to simply design with a background colour that you want.

Preparing the Digits

As mentioned, CustomDigits widgets require a single image file which is a set of ***equally sized images arranged horizontally***.

To start designing CustomDigits, prepare separate images for each of the digits from 0-9. These images need to have the same dimensions.



Images representing a space and a negative sign are also required if negative Digits value is enabled on your project. This will be discussed in Enable or Disable Negative Values.

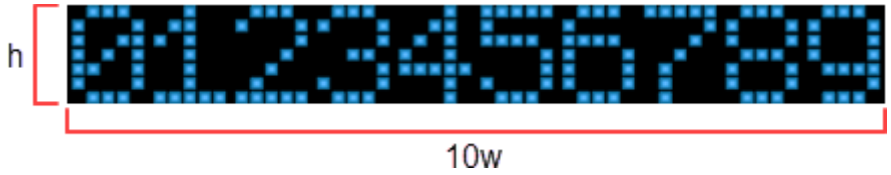
Both of these images need to be of the same width (w) and height (h) as the rest of the images (Digits 0-9).

Note: The size of a CustomDigits widget will match the size of the source image. Therefore, it is necessary to use the target digit size (in pixels) as the dimensions of these Digits/Characters when designing.

Creating the Source Image

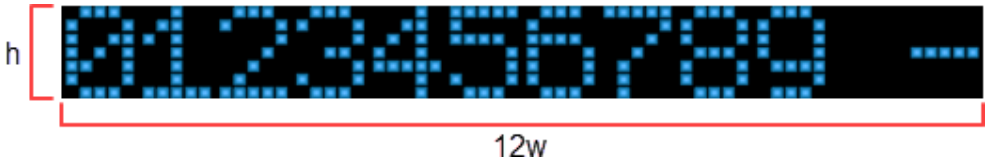
After designing images for all the digits and characters, these images needs to be combined into a single image file. Each image file should be arranged horizontally to form a single source file.

If negative digits values are disabled, the source file only needs the digits 0-9. The images need to be arranged from 0 to 9 and from left to right as shown below.



The height of the output image would be equal to the height while its width will be ten (10) times the width of a single digit.

If negative digits values are enabled, the source file will also need the space and negative sign characters. These needs to be appended on the right of the digits 0-9 as shown below.



The height of the output image would be equal to the height while its width will be twelve (12) times the width of a single digit.

Setup Procedure

For instructions on how to launch Workshop4, how to open a **ViSi Genie** project, and how to change the target display, kindly refer to the section "**Setup Procedure**" of any of the following application notes:

- ViSi Genie Getting Started - First Project for Picaso Displays
- ViSi-Genie Getting Started - First Project for Diablo16 Display Modules

Create a New Project

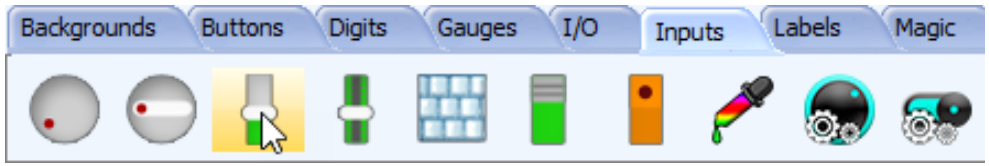
For instructions on how to create a new **ViSi Genie** project, please refer to the section "**Create a New Project**" of any of the following application notes:

- ViSi Genie Getting Started - First Project for Picaso Displays
- ViSi-Genie Getting Started - First Project for Diablo16 Display Modules

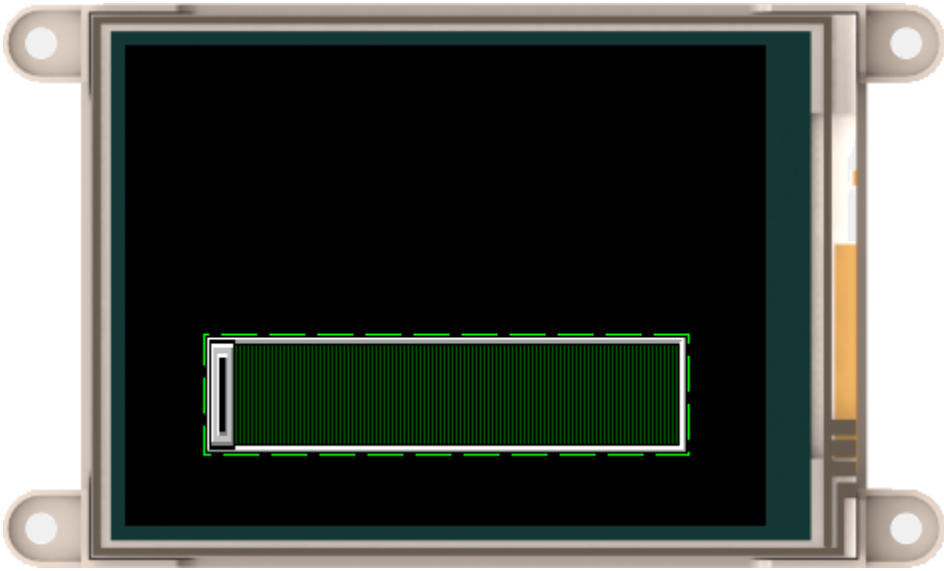
Design the Project

Adding Slider

The **Slider** widget will be linked to the CustomDigits widget using ViSi Genie's event system. To add a Slider widget, go to the **Inputs** pane and select the icon as shown below.



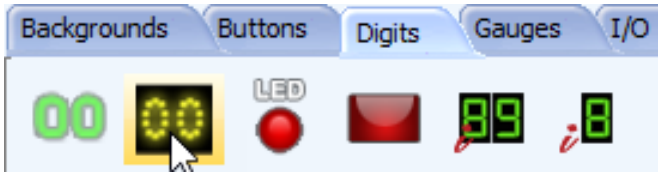
Click the screen and drag the widget to place it to desired location.



By default, the slider ranges from 0 to 100.

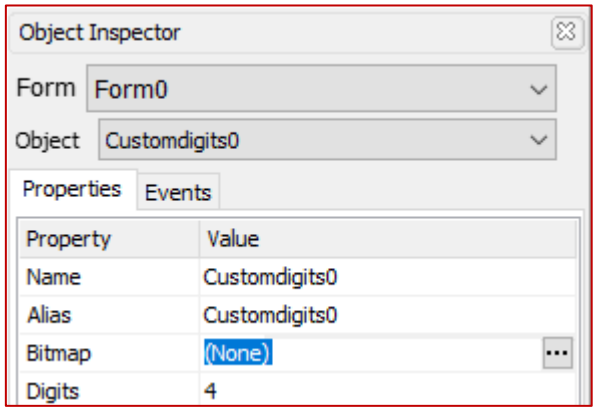
Adding Custom Digits

The **CustomDigits** widget updates its value when the value of Slider0 has changed. To add a CustomDigits widget, go to the **Digits** pane and select the icon as shown below.

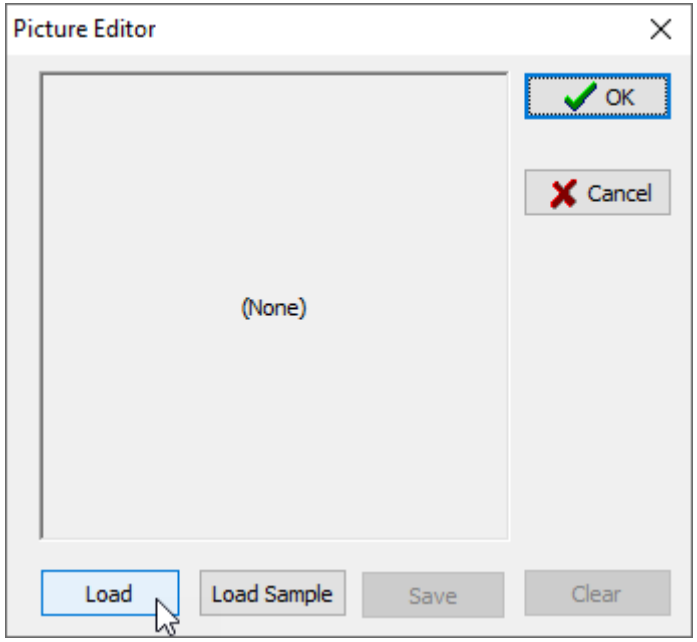


Click on the WYSIWYG screen to place the object.

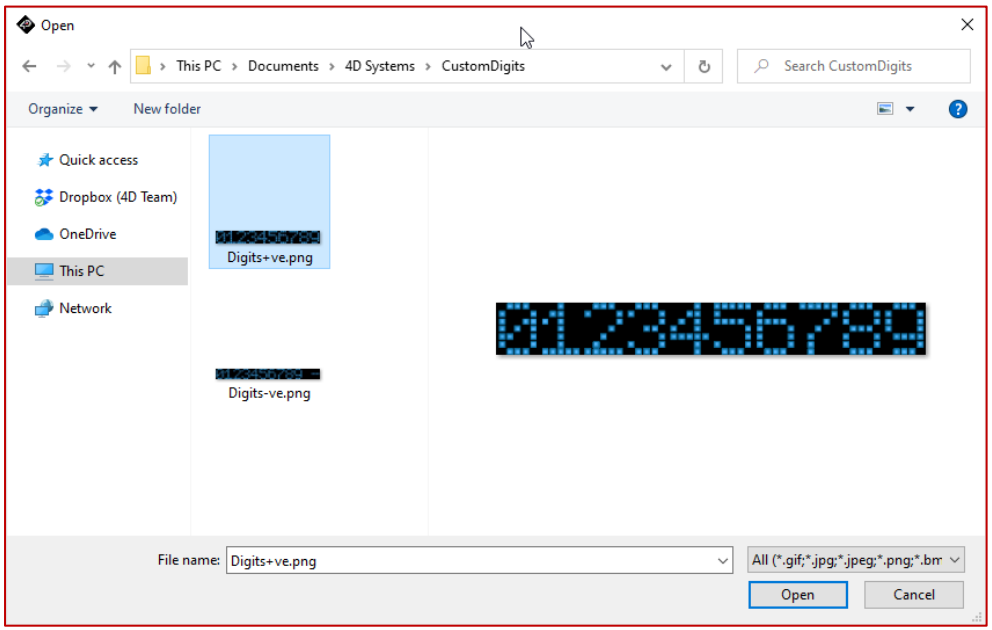
Go to the **Object Inspector** and set the Bitmap image source



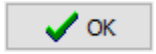
Click on ··· or double click the property to open Bitmap selection window.



Click on **Load**



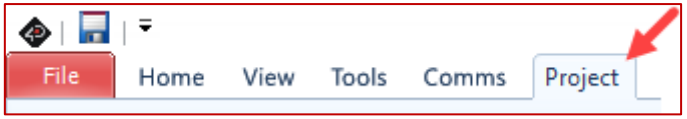
A standard file selection window will open. Select your custom designed source image for CustomDigits.

Click  to set the image source to the selected file.

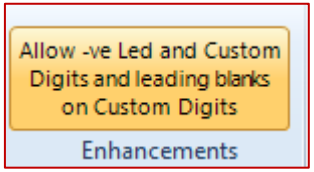
Enable or Disable Negative Values

Depending on what source image you designed based on the discussion on Design Custom Digits, you might need to enable or disable negative values.

This can be done by navigating to the **Project** menu



Click on the button under Enhancements

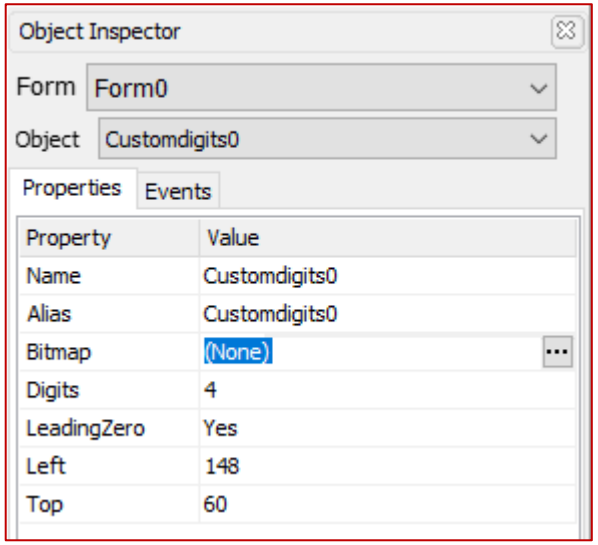


To turn negative values on and off.

On Custom Digits, enabling the negative values also enables leading blanks.

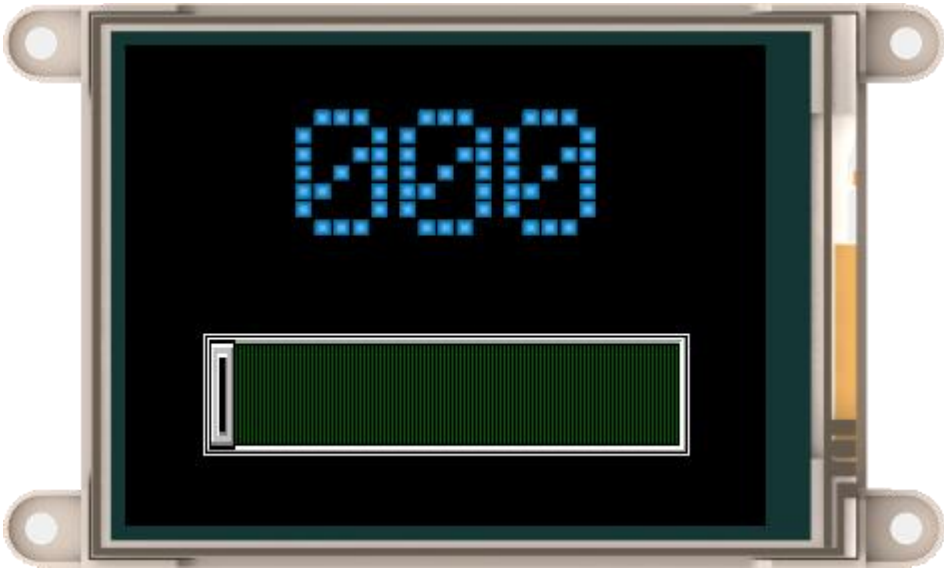
Configuring the CustomDigits

Other properties of the CustomDigits can be adjusted as required.



Since the slider is left at default range of 0 to 100, the CustomDigits only needs three (3) digits. Set the number of digits to 3.

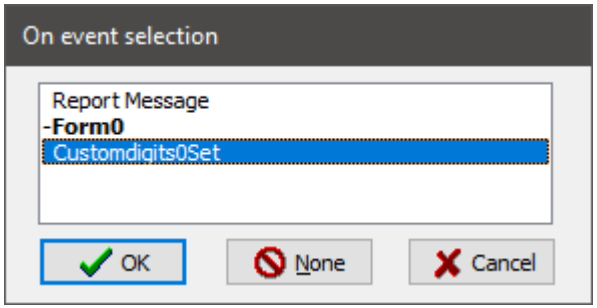
Adjust the position of the CustomDigits if desired.



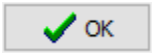
Configuring the Slider Events

An input object such as the slider can be configured to update the value of another widget based on its updated value.

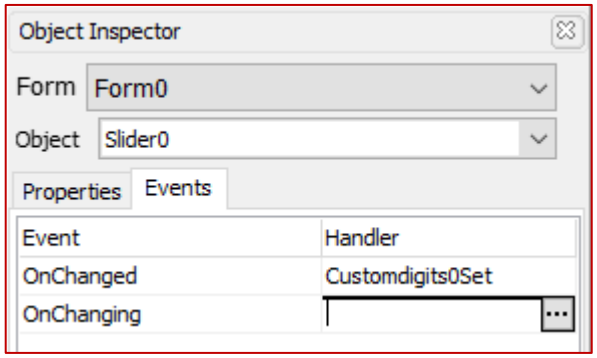
To do this, click on the Events tab in the object inspector and click on the ... symbol in the **OnChanged** line.



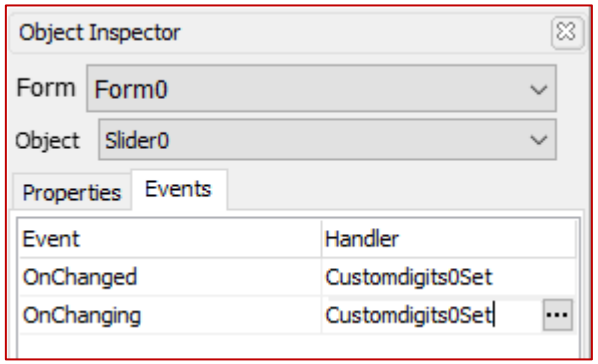
The **On event selection** window appears. Select **Customdigits0Set** and click



The Events tab is now updated.



Repeat the procedure for **OnChanging** Event



Now every time the slider is moving or has moved, the CustomDigits is also update.

Run the Program

For instructions on how to save a **ViSi Genie** project, how to connect the target display to the PC, how to select the program destination, and how to compile and download a program, please refer to the section "**Run the Program**" of any of the following application notes:

- ViSi Genie Getting Started - First Project for Picaso Displays
- ViSi-Genie Getting Started - First Project for Diablo16 Display Modules

Proprietary Information

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