SLCD Screen Layout Utilities

GIMP Plug-Ins

Reach Technology, Inc.

06/13/2013

Reach Technology Inc.

www.reachtech.com

Sales: 510-770-1417 x112
sales@reachtech.com

Technical Support: 503-675-6464
techsupport@reachtech.com

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1 Overview

This document describes a set of GIMP plug-in scripts that are used to design the screen layout on a Reach Technology SLCD Display Module.

These scripts were written for GIMP version 2.8.0 with Python version 2.7.2. It is recommended that you use these versions of GIMP and Python since the scripts may use GIMP or Python features that are not available in earlier versions.

This document and the plug-in scripts assume that the reader has a copy of the Reach SLCDX Software Reference Manual or the SLCD5+ Reference Manual, depending on which Display Module is being used. For the remainder of this document, the applicable reference manual will be referred to as the Reach Reference Manual.

This document also assumes that the reader is familiar with using GIMP. There are GIMP tutorials online in many locations, but a good starting point is the GIMP web site itself: http://www.gimp.org/tutorials/

2 SLCD Screen Layout Design Flow

The general design flow is to first select a screen-sized canvas by choosing one of the standard sizes or by defining a custom size.

Then, items such as buttons, sliders, meters, hotspots or bitmaps are added to this canvas. Items are added by selecting the appropriate GIMP menu entry, which will pop up a window to collect item-specific information from the user. Each item is added on a new layer, which allows the user to easily move the items into position on the screen canvas. The user is able to use all of the standard GIMP tools to move and align the screen items as desired.

Once all items have been placed, one final GIMP menu entry creates a macro that will, when programmed into the SLCD Display Module along with all of the associated bitmaps, generate the same screen on the SLCD Display Module.

The individual item layers are named using the SLCD command that is used to create the item on the SLCD. The parameters used in the command are collected from the user when the item is added, and a placeholder called COORDS is used to mark where the final X and Y location coordinates are placed when the macro is created.

The bitmaps used in the items above should all be located in the same folder, and they should use the naming convention suggested in the Reach Reference Manual. In summary, bitmap file names should have the desired bitmap number prepended to the file name. This helps BMPload put the bitmaps in a known order within the Display Module, which references all bitmaps by number. A typical file name would be something like “01_button_up.bmp” and it would be referenced inside the Display Module as bitmap 1.

When the macro file is generated, the script also generates an include file suitable for use in a C programming environment. This file contains definitions of each item placed on the screen using the nickname assigned to the item. This allows you to easily reference the screen items in your application code.

3 Script Installation

The screen layout scripts are added to GIMP by unzipping the file ReachScreenLayoutUtils.ZIP, browsing into the Scripts folder in the ZIP file, and then copying all of the Python script files into the GIMP plug-ins folder. When GIMP is started, it will import the scripts into the standard GIMP menu structure. The Python script files are all of the files that have the ".py" extension.

On a Windows XP system, the GIMP plug-ins folder is typically located in your "Documents and Settings" folder, such as "C:\Documents and Settings\Fred\.gimp-2.8 \plug-ins".

On a Windows 7 system, the GIMP plug-ins folder is typically located in your "Users" folder, such as "C:\Users\Fred\.gimp-2.8 \plug-ins".

After running these scripts, an additional folder called ReachSLCD will be created in your GIMP folder. This folder is used by the scripts to store working information. This folder may be deleted, but after doing so you will need to reselect the bitmap files used for the screen items.

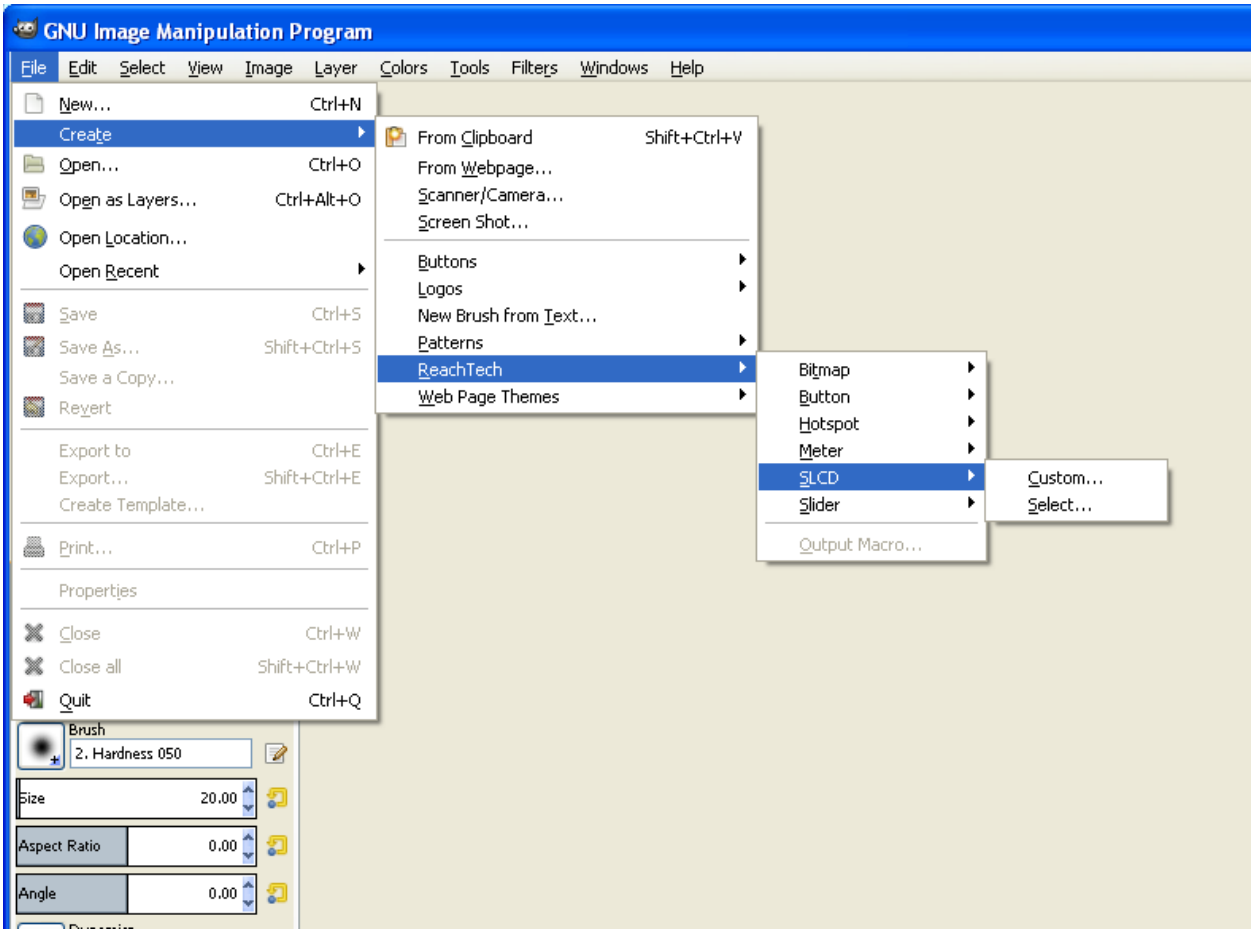
4 Example Bitmap Installation

Some example bitmaps are in the ZIP file ReachScreenLayoutUtils.ZIP, in the Bitmaps folder. The easiest installation is to copy the Bitmaps folder to your Windows desktop.

5 Add Screen-Sized Canvas

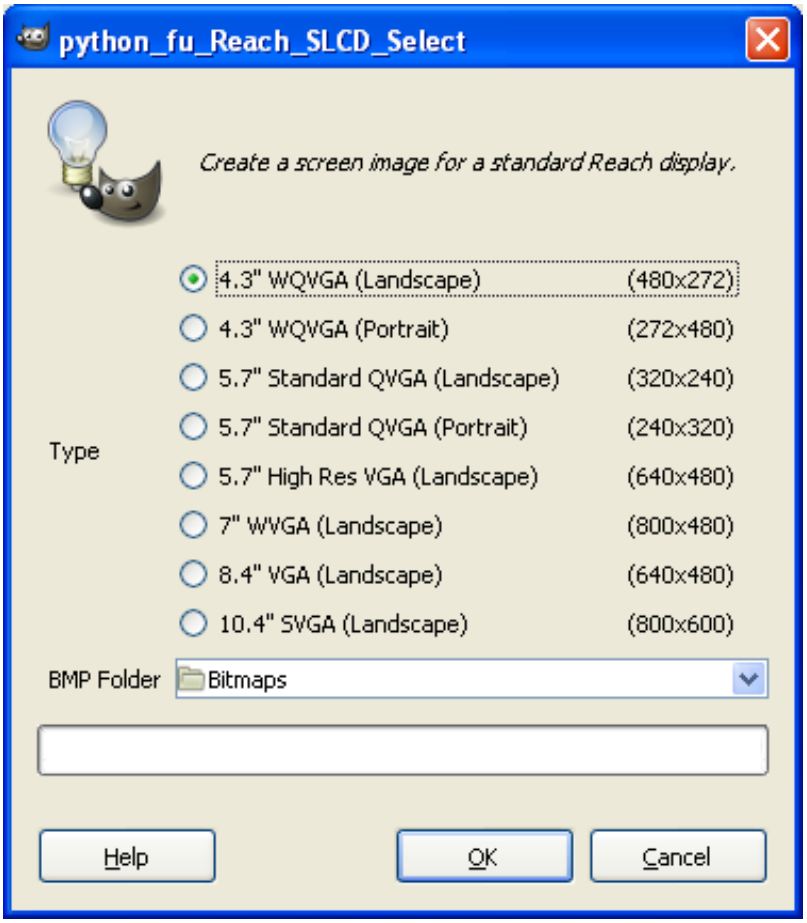
The initial screen-sized canvas is added by starting GIMP, then selecting Create→ReachTech→SLCD, then either Custom or Select.

In the menu tree below, notice the other submenus for Bitmap, Button, Hotspot, Meter and Slider. Once a screen canvas is selected, these other options allow you to add the named items to the canvas. The items in these submenus and the Output Macro item are greyed-out until a canvas is added.



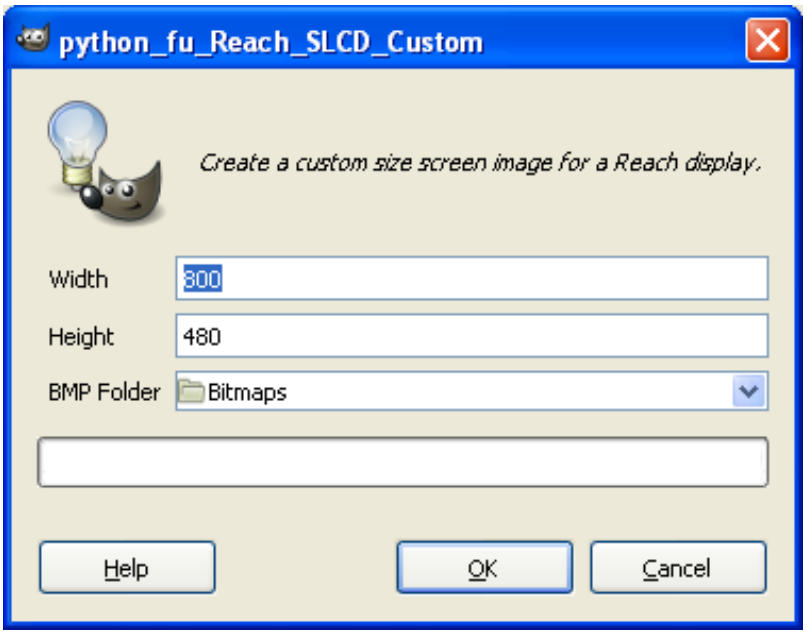
5.1 Select

The Select option lets you select from one of several pre-defined screen canvas sizes based on standard Reach SLCD products and orientation (where applicable), and then use a file browser option to select the folder that contains all of the bitmaps that will be used in this design.



5.2 Custom

The Custom option lets you specify the width and height of the screen canvas, and then use a file browser option to select the folder that contains all of the bitmaps that will be used in this design.

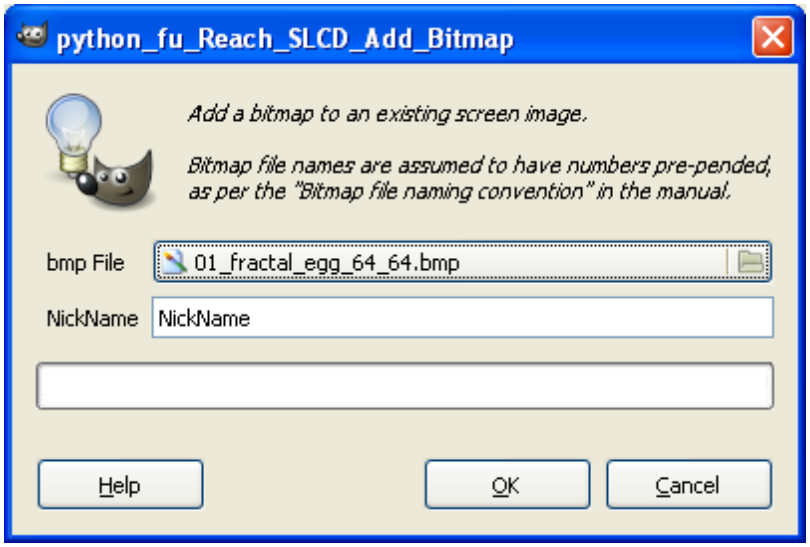


6 Add Bitmap

To add a bitmap to the screen, select Create→ReachTech→Bitmap, then select either Bitmap or Windowed Bitmap.

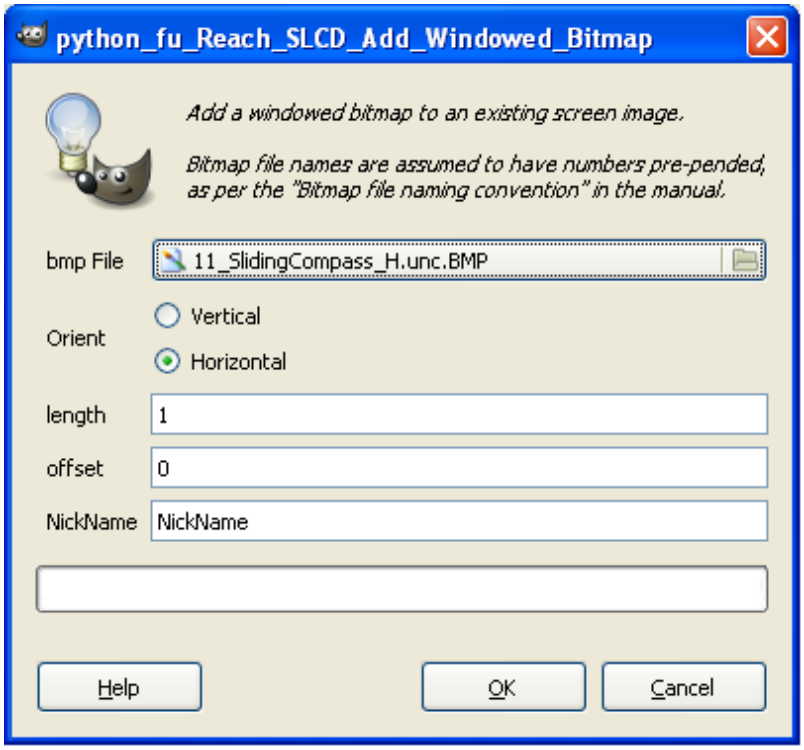
6.1 Bitmap

The Bitmap option allows you to select the bitmap file name (assumed to be in the folder selected when the screen canvas was added) and assign a nickname to the bitmap.



6.2 Windowed Bitmap

The Windowed Bitmap option allows you to select the bitmap file name, the bitmap orientation, the window length and offset, and assign a nickname to the bitmap. The Reach Reference Manual details the meaning of these values.



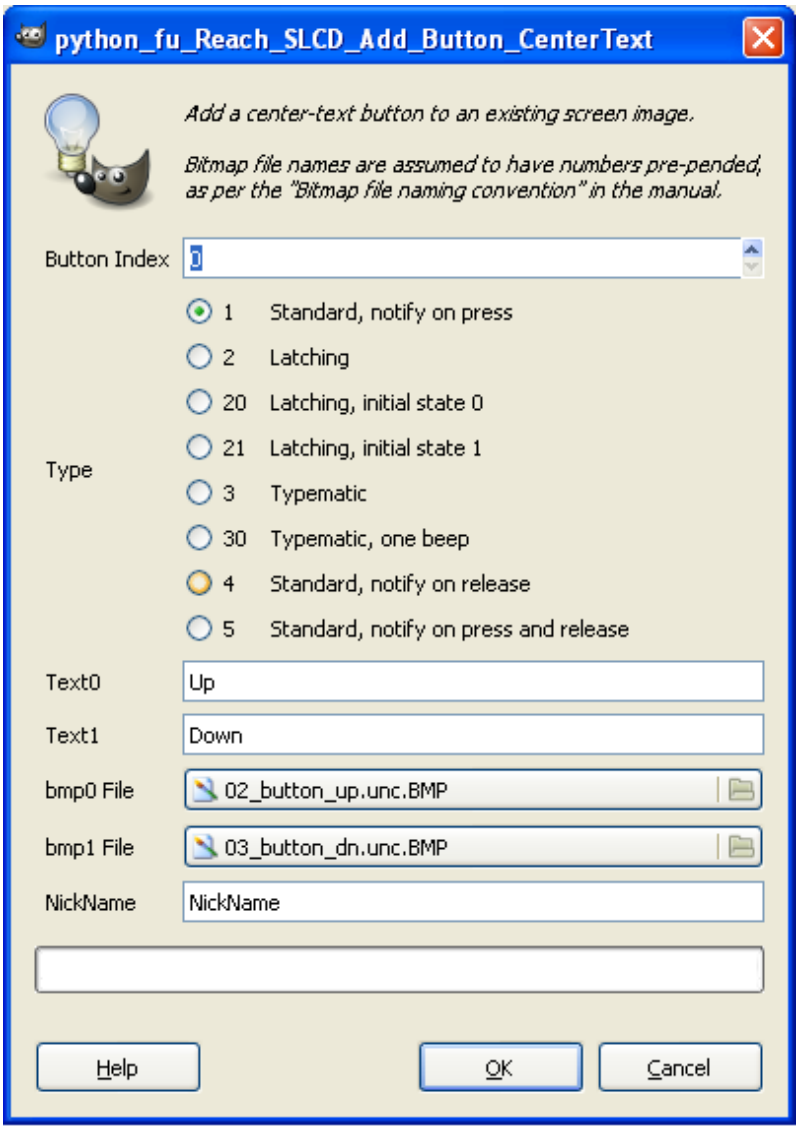
7 Add Button

To add a button to the screen, select Create→ReachTech→Button, then select Center Text, Latching, or Momentary.

Note that in all button options, you must ensure that the button index is unique, and be aware that GIMP will tend to present the last-used button index as a default.

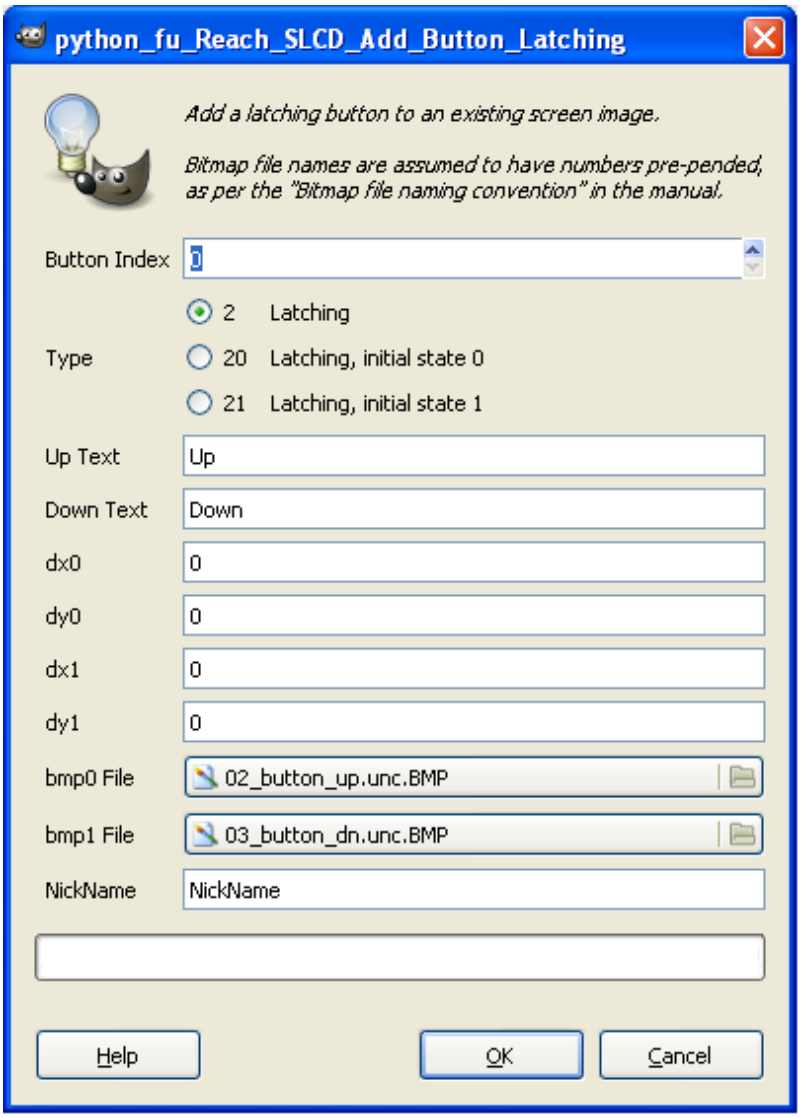
7.1 Center Text

The Center Text option allows you to select the button index, the button type, the text for the different states (as per type), the bitmap file names, and a nickname.



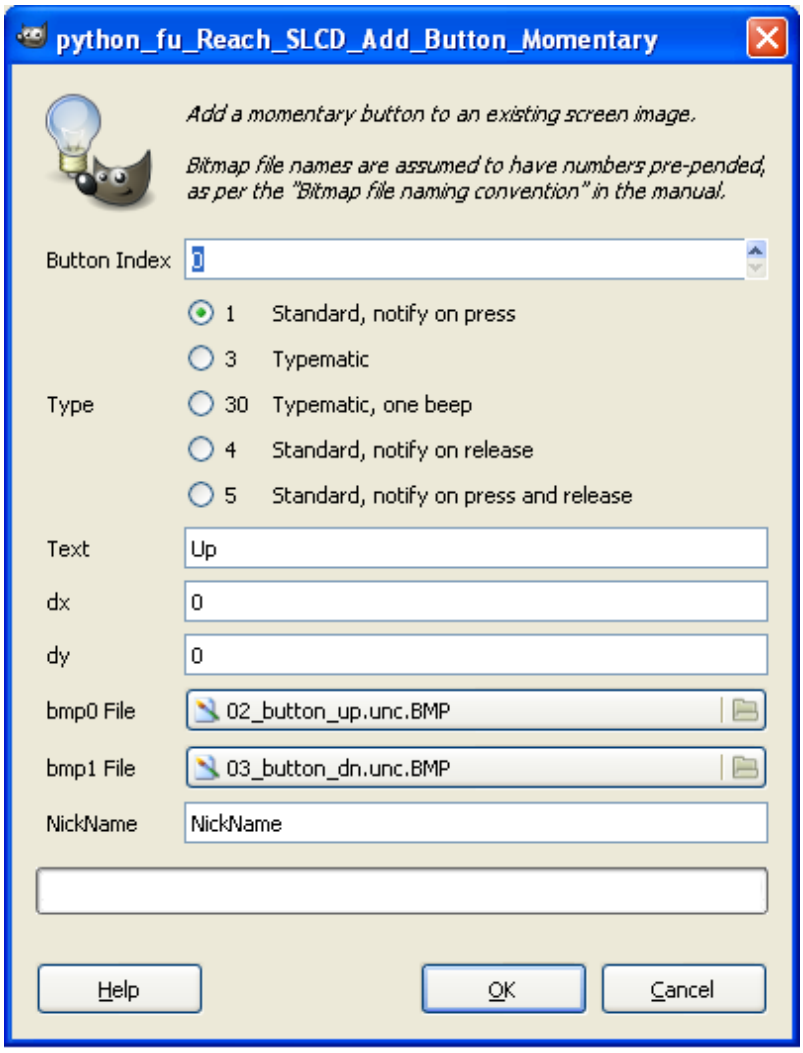
7.2 Latching

The Latching option allows you to select the button index, the button type, the text for the different states (as per type), the X and Y text offsets, the bitmap file names, and a nickname.



7.3 Momentary

The Momentary option allows you to select the button index, the button type, the text for the button, the X and Y text offsets, the bitmap file names, and a nickname.



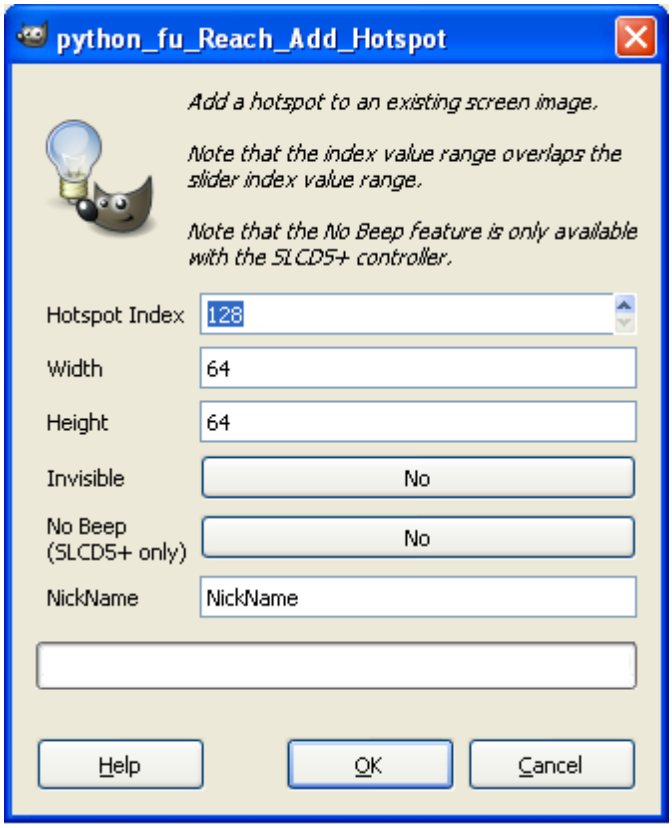
8 Add Hotspot

To add a hotspot to the screen, select Create→ReachTech→Hotspot, then select Hotspot, Typematic Hotspot, or XY Hotspot.

Note that in all hotspot options, you must ensure that the hotspot index is unique, and be aware that GIMP will tend to present the last-used hotspot index as a default. Also note that the hotspot index range overlaps the slider index range, so you need to track them both to ensure no collisions.

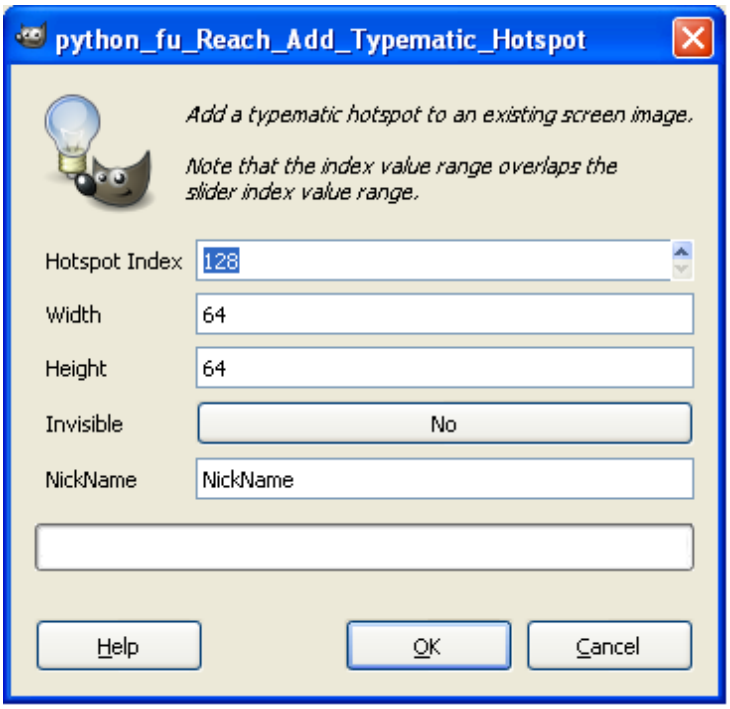
8.1 Hotspot

The Hotspot option allows you to select the hotspot index, set the hotspot width and height, select the Invisible and/or No Beep (if applicable) parameters, and set a nickname.



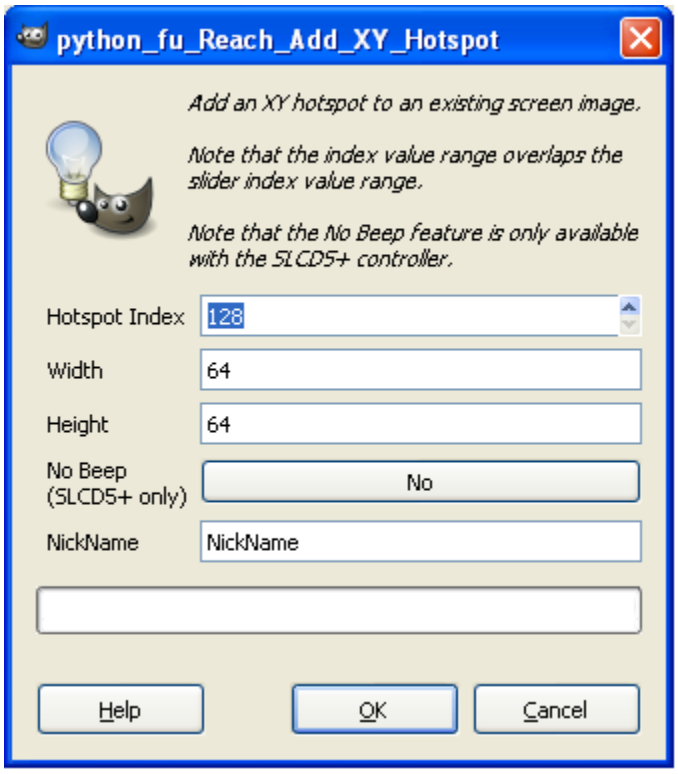
8.2 Typematic Hotspot

The Typematic Hotspot option allows you to select the hotspot index, set the hotspot width and height, select the Invisible parameter, and set a nickname.



8.3 XY Hotspot

The XY Hotspot option allows you to select the hotspot index, set the hotspot width and height, select the No Beep (if applicable) parameter, and set a nickname.

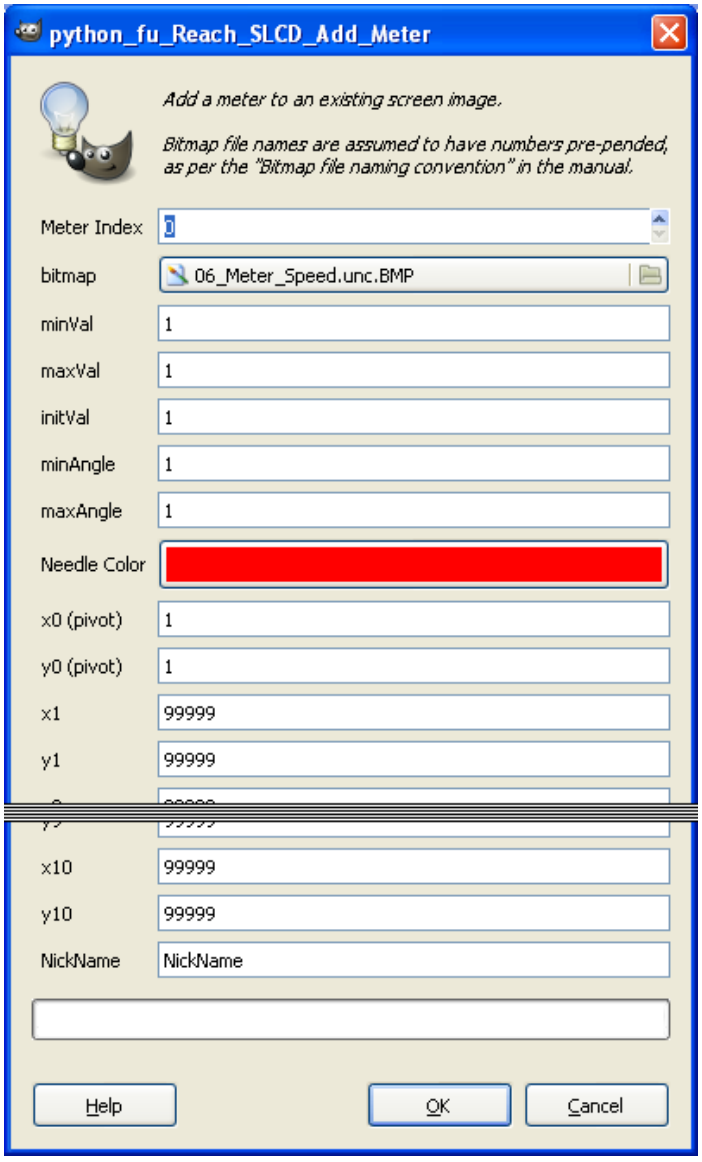


9 Add Meter

To add a meter to the screen, select Create→ReachTech→Hotspot, then select Meter.

Note that in all meter options, you must ensure that the meter index is unique, and be aware that GIMP will tend to present the last-used meter index as a default.

The Meter option allows you to select the meter index, select the bitmap file name, set the minimum, maximum and initial range values, the minimum and maximum needle angle values, the needle color, the needle pivot point, up to 10 X/Y pairs to define the needle, and set a nickname. Needle X/Y pairs with a value of 99999 indicate the end of the needle point pair list.



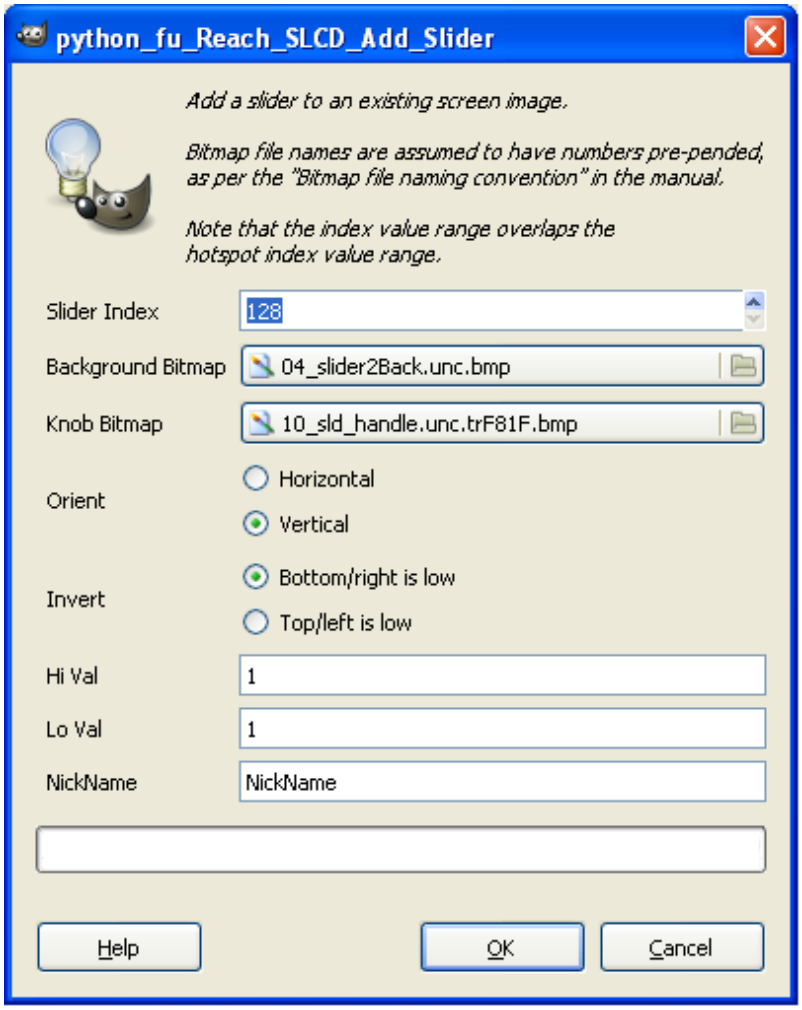
10 Add Slider

To add a slider to the screen, select Create→ReachTech→Slider, then select Slider.

Note that in all slider options, you must ensure that the slider index is unique, and be aware that GIMP will tend to present the last-used slider index as a default. Also note that the slider index range overlaps the hotspot index range, so you need to track them both to ensure no collisions.

An additional note about slider index values: the index range is 128 – 255 (the same as for hotspots) but only eight sliders are allowed. The script will limit the range allowed but it will not limit the total number of sliders defined. That is your duty.

The Slider option allows you to select the slider index, select the background and knob bitmap file names, select the slider orientation and inversion parameters, set the slider high and low range values, and set a nickname.

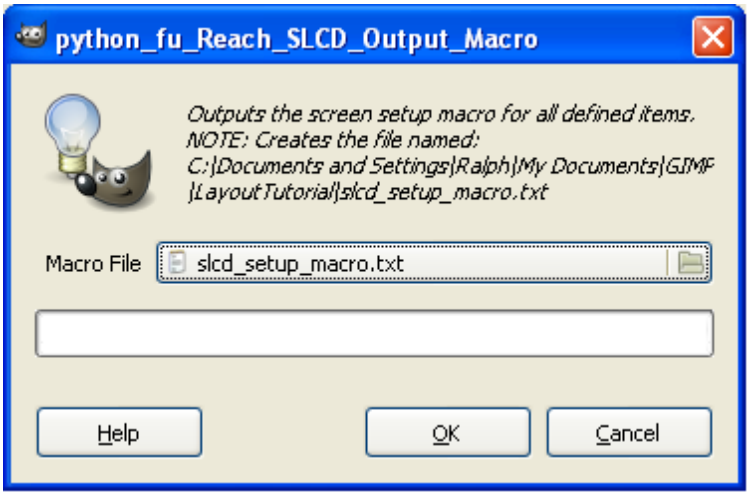


11 Output Macro

To output the SLCD screen setup macro, select Create→ReachTech→Output Macro.

The Output Macro option allows you to use either the default file name of “slcd_setup_macro.txt” or to select another existing macro file. The macro file is assumed to be located in the same folder as all of the bitmaps used in this screen. You would then use BMPload to load the setup macro and the bitmaps to the SLCD.

The Output Macro option will also output a C-style include file containing literals for all nicknames defined. This allows your application to reference the screen items by nickname.



12 Downloading Bitmaps and Setup Macro

Once you have designed the screen layout and output the setup macro, you use the Reach utility BMPload to download the files into the SLCD. There are video tutorials for BMPload and for using an SLCD Development Kit online at:

http://www.reachtech.com/tutorials/

In short, you start BMPload, click the checkbox for “Sort BMP Files when added/loaded”, then click on the Add BMP button, browse to the folder with your bitmap files, select the files, click Open. They you select the setup macro by clicking the Add Macro File button, select the macro file specified in the Output Macro step above, then click Open. Now click on the Store into SLCD button to download the bitmaps and macro to the SLCD.

Once the files have downloaded to the SLCD, use a terminal emulator such as Teraterm or Hyperterm to run the setup macro with the commands:

```
z
m 1
```

This will clear the screen and then run macro 1, which will draw your screen on the SLCD.

You would normally have other macros in the macro file. Since the GIMP scripts will overwrite the output macro file each time, it is recommended that you copy the setup macro into your own macro file when you change the screen layout and generate a new setup macro. You would use BMPload to load your macro file and bitmaps, just as described above.