APPLICATION NOTES

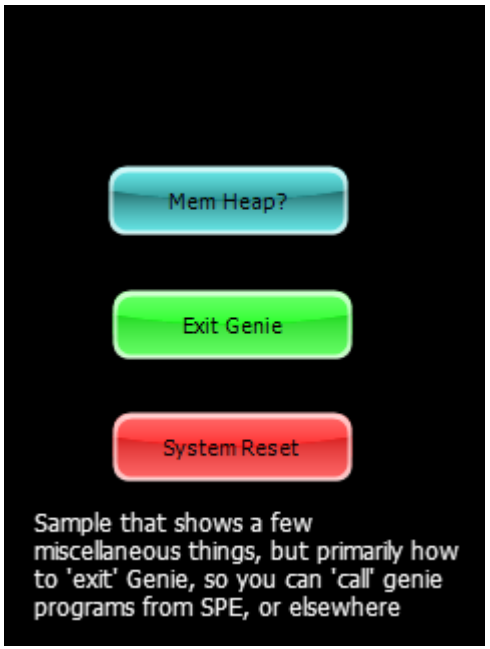
4D SYSTEMS
TURNING TECHNOLOGY INTO ART

ViSi-Genie Magic Exit Genie

DOCUMENT DATE: **21th MAY 2019**
DOCUMENT REVISION: **1.1**

Description

This application note shows how to use the **Magic Release** object. The Magic Release object is under the Genie Magic pane in Workshop 4 Pro. It contains a 4DGL code that is executed every time a touch release action occurs. Below is a screenshot image of the project for this document.



Note 1: The ViSi-Genie project for this application is found in Worskhop. Go to the File menu -> Samples -> ViSi Genie Magic (Picaso/Diablo16) -> **ExitGenie.4DGenie**.

Note 2: **Worskhop Pro** is needed for this application.

Before getting started, the following are required:

- Any of the following 4D Picaso and gen4 Picaso display modules:

  gen4-uLCD-24PT gen4-uLCD-28PT gen4-uLCD-32PT
  uLCD-24PTU uLCD-32PTU uVGA-III

  and other superseded modules which support the ViSi Genie environment

- The target module can also be a Diablo16 display

  gen4-uLCD-24D series gen4-uLCD-28D series gen4-uLCD-32D series
  gen4-uLCD-35D series gen4-uLCD-43D series gen4-uLCD-50D series
  gen4-uLCD-70D series
  uLCD-35DT uLCD-43D series uLCD-70DT

  Visit www.4dsystems.com.au/products to see the latest display module products that use the Diablo16 processor. The display module used in this application note is the uLCD-32PTU, which is a Picaso display. This application note is applicable to Diablo16 display modules as well.
- 4D Programming Cable / uUSB-PA5/uUSB-PA5-II
  for non-gen4 displays(uLCD-xxx)
- 4D Programming Cable & gen4-PA, / gen4-IB / 4D-UPA
  for gen4 displays (gen4-uLCD-xxx)
- micro-SD (µSD) memory card
- Workshop 4 IDE (installed according to the installation document)
- When downloading an application note, a list of recommended application notes is shown. It is assumed that the user has read or

has a working knowledge of the topics presented in these recommended application notes.

Content

Application Overview

Certain applications may need the execution of another program besides the Genie program during runtime. Hence, a means for "exiting" the Genie program and loading another program is needed. In this application, the **Magic Release** object is used to demonstrate how to exit the Genie program and load another program (a child program) from the uSD card during runtime. The SPE application is used as the child program.

Setup Procedure

For instructions on how to launch Workshop 4, how to open a ViSi-Genie project, and how to change the target display, kindly refer to the section "**Setup Procedure**" of the application note:

ViSi Genie Getting Started – First Project for Picaso Displays (for Picaso)
or
ViSi Genie Getting Started – First Project for Diablo16 Displays (for Diablo16).

Create a New Project

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 the application note

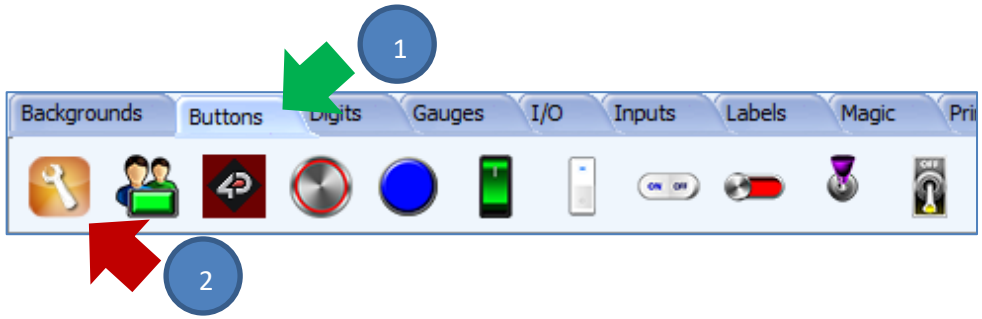
[ViSi Genie Getting Started – First Project for Picaso Displays](#) (for Picaso)
or
[ViSi Genie Getting Started – First Project for Diablo16 Displays](#) (for Diablo16)

Design the Project

A uLCD-32PTU (portrait orientation) will be used for this application note.

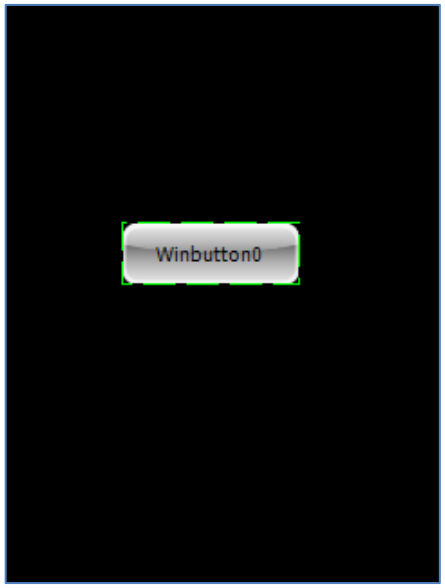
Add Three Winbutton Objects to Form0

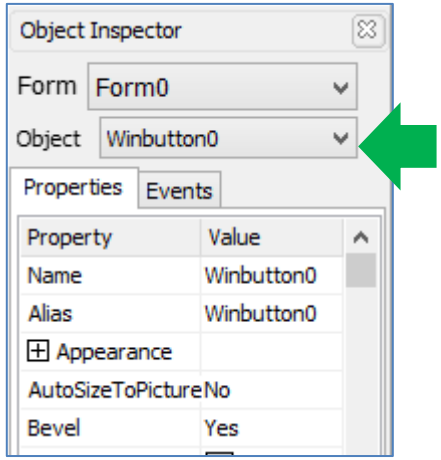
Select the Object Icon



Click on the WYSIWYG Screen

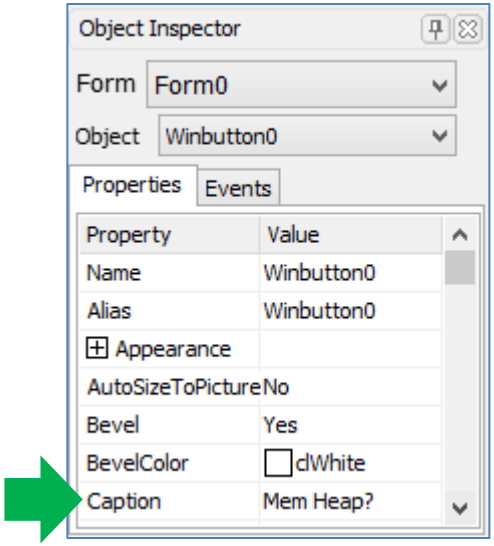
Upon clicking on the WYSIWYG screen, a winbutton object is created. This is **Winbutton0**.





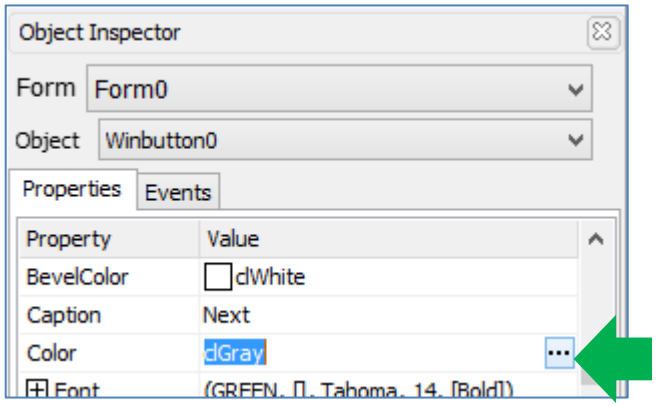
Many of the properties are self-explanatory. The user is encouraged to experiment with the property values.

Change the Caption of Winbutton0

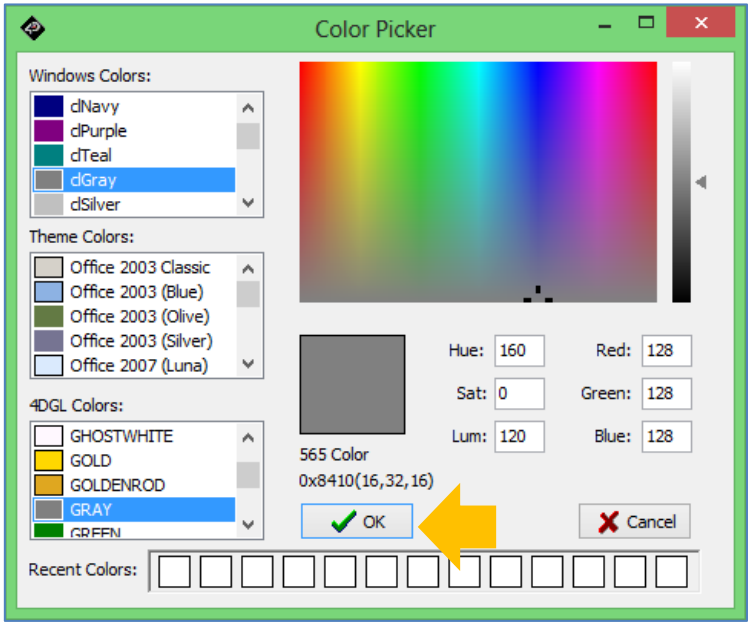


Change the Color of Winbutton0

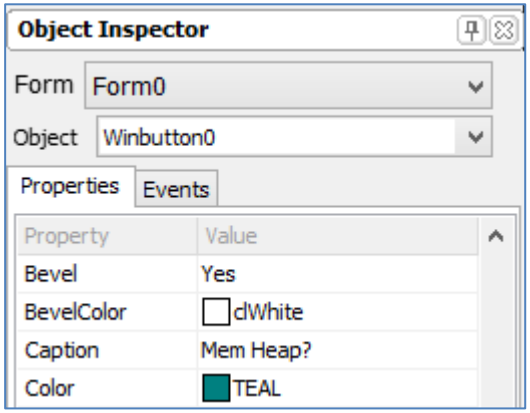
Click on the ellipsis symbol indicated below.



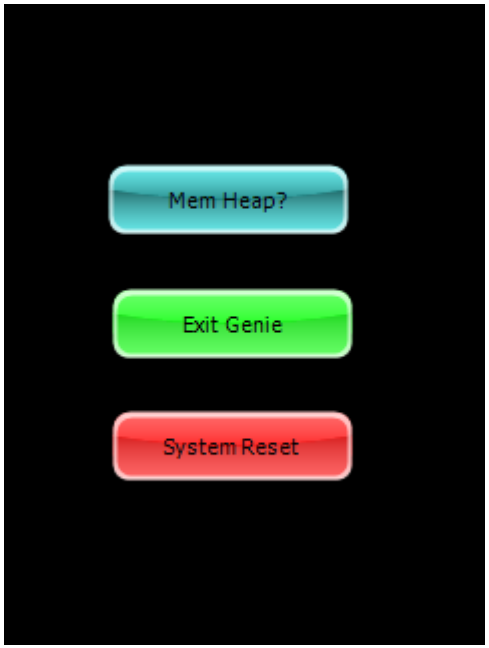
The Color Picker window appears. Choose the desired color and click OK.



Below is the final appearance of **Winbutton0** after modification of some of its default property values.

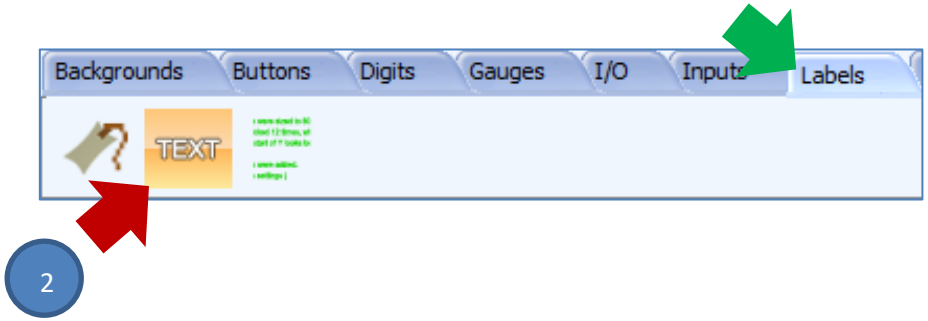


Follow the same procedure to create the two other buttons. When, done the WYSIWYG screen should look like as shown below.



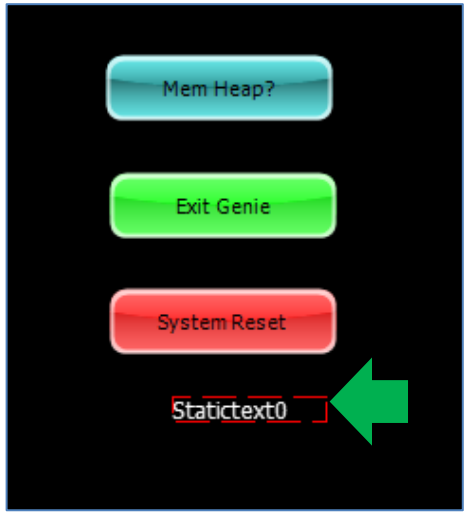
Add a Static Text Object to Form0

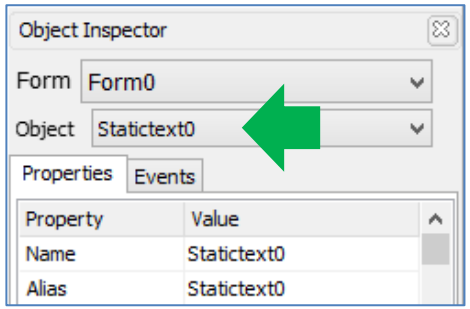
Select the Object Icon



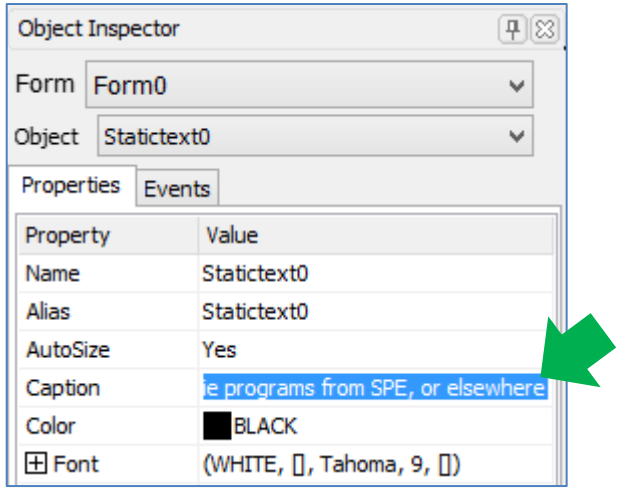
Click on the WYSIWYG Screen

Click on the WYSIWYG screen to place the static text object. This is **Statictext0**.

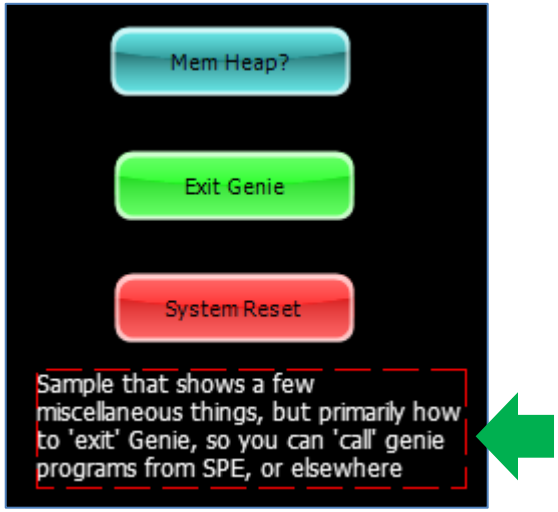




Change the Caption for Statictext0



Statictext0 is updated accordingly.



Add a Magic Release Object to Form0

See the application note ViSi-Genie How to Add Magic Objects for the procedures for adding a Magic Release object and opening the code for it.

Understanding the 4DGL Code for MagicRelease

Working Model

To facilitate this discussion, the model below is used.

1. Genie constantly waits for touch actions.
2. Genie stores the index of the object on which a touch action occurred into the variable "**ImageTouched**".
3. Genie determines the type of the touch action. There are three types of touch actions:
    a. TOUCH_PRESSED
    b. TOUCH_RELEASED
    c. TOUCH_MOVING

    The names of the constants define themselves. If the touch action is a "TOUCH_RELEASED", Genie calls on the routine inside the object **MagicRelease**.
4. At this point, Genie normally goes back to step 1, unless **MagicRelease** says otherwise.

Check the Object on which a TOUCH_RELEASED has Occurred

To know the index of the object on which a TOUCH_RELEASED action has occurred, we have to compare the value of the variable **ImageTouched** against the indices of the objects on the form. Hence, we write:

```
13    if (ImageTouched == iWinbutton0)
14        gfx_MoveTo(0,0) ;
15        print(mem_Heap()) ;
16    else if (ImageTouched == iWinbutton1)
17        return ;
18    else if (ImageTouched == iWinbutton2)
19        SystemReset() ;
20    endif
```

Note how the index of an object is associated with its name.

Name of object	Index of object
Winbutton0	**i**Winbutton0
Winbutton1	**i**Winbutton1
Winbutton2	**i**Winbutton2

Print the Available Memory

If a **TOUCH_RELEASED** action has occurred on **Winbutton0**, the cursor is moved to the origin and the byte size of the largest chunk of memory available in the heap is printed.

```
13    if (ImageTouched == iWinbutton0)
14        gfx_MoveTo(0,0) ;
15        print(mem_Heap()) ;
```

For more information on the two 4DGL functions above, refer to the Picaso or Diablo16 Internal Functions Reference Manual. **Right-click** on the 4DGL function name text and choose "**Context Sensitive help**" to open the reference manuals.

Exit Genie

If a **TOUCH_RELEASED** action has occurred on **Winbutton1**, the Genie program is "closed" and nothing happens after.

```
16    else if (ImageTouched == iWinbutton1)
17        return ;
```

Reset the Display

If a **TOUCH_RELEASED** action has occurred on **Winbutton2**, the program restarts.

```
18    else if (ImageTouched == iWinbutton2)
19        SystemReset() ;
```

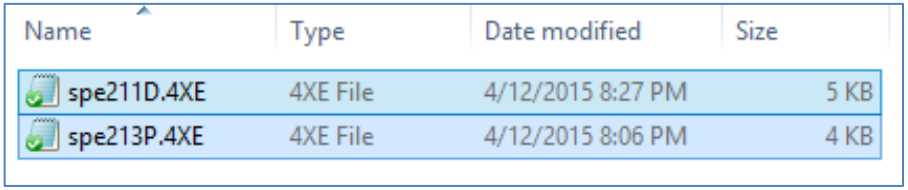
SystemReset() resets and restarts the program. It is the equivalent of a 'cold boot' (i.e. a total hardware reset). There is a two-second delay before the program restarts. This is due to the EVE boot procedure time.

Use MagicRelease to Load a Child Program

There are 4DGL functions for loading a program from the uSD card. The program to be loaded is called the child program. The program that does the loading is the parent program. Before a child program can be loaded, its 4XE file must first be on the uSD card.

Copy the 4XE File to the uSD Card

Attached to this application note is the folder "**uSD card file**". The folder contains two files:



These are 4XE files of the SPE application.

Spe211D.4XE is the 4XE file for the SPE application (SPE2 revision 1.1) compiled for a uLCD-35DT, which is a Diablo16 display.

Spe213P.4XE is the 4XE file for the SPE application (SPE2 revision 1.3) compiled for a uLCD-32PTU, which is a Picaso display.

The filenames will be hardcoded in **MagicRelease**. Choose which filename to include in the code and which file to copy to the uSD card according to your target display module. To learn how to generate the 4XE file for the SPE application, refer to the section "**Generate the 4XE File for the SPE Application**".

Function for Loading a Child Program

Shown below is a modified version of **MagicRelease**.

```
13  if (ImageTouched == iWinbutton0)
14      gfx_MoveTo(0,0) ;
15      print(mem_Heap()) ;
16  else if (ImageTouched == iWinbutton1)
17      gfx_Cls();
18      // send a message to the host
19      file_Exec("spe213P.4XE", 0) ;     // for
20      //file_Exec("spe211D.4XE", 0) ;  // for
21  else if (ImageTouched == iWinbutton2)
22      SystemReset() ;
23  endif
```

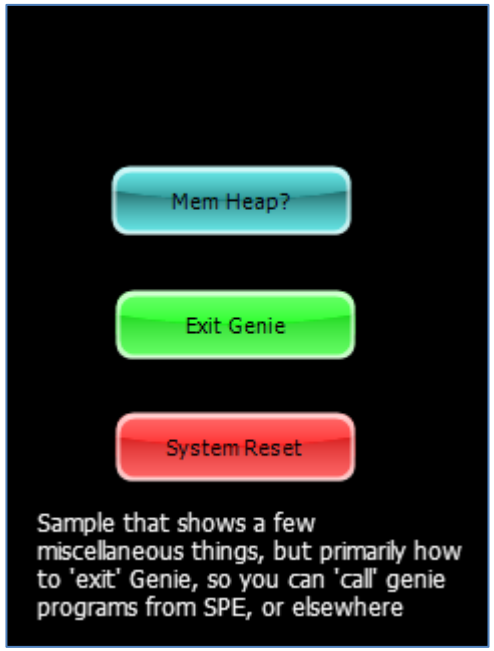
Choose according to your display. Here the target is a Picaso display module.

```
19      file_Exec("spe213P.4XE", 0) ;     // for
```

Note: When creating a filename for 4XE files, follow the 8.3 filename format.

Expected Output: Picaso Display

After pressing and releasing **Winbutton1**, the SPE application should now be loaded. Note that there will be a delay.

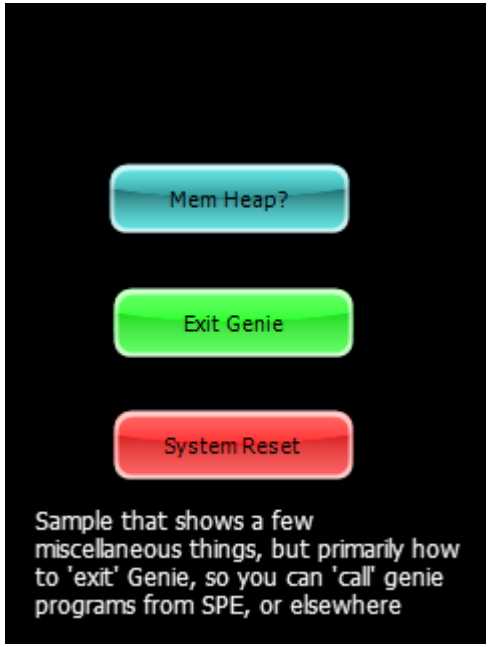


1. Press and release the Exit Genie button.

2. The SPE application now loads.

Expected Output: Diablo16 Display

After pressing and releasing **Winbutton1**, the SPE application should now be loaded. Note that there will be a delay.



1. Press and release the Exit Genie button.

2. The SPE application now loads.

Generate the 4XE File for the SPE Application

Step 1. Load the SPE application to the display.

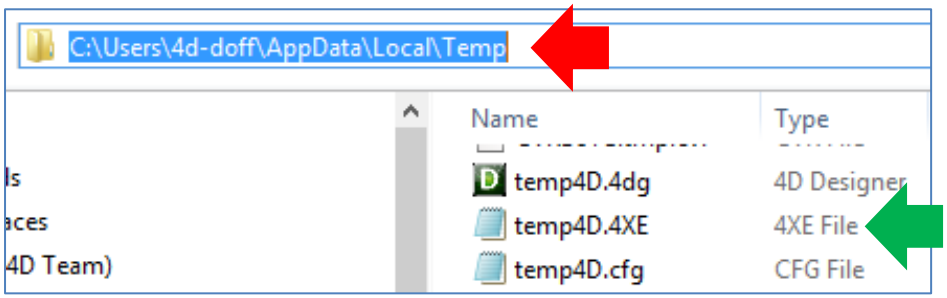
See the application notes for this.

Serial Picaso Getting Started - The SPE Application

Serial Diablo16 Getting Started - The SPE Application

Step 2. Locate the 4XE file for the SPE application.

The SPE application will be loaded to the flash memory of the display. However, we are interested with the 4XE file. Workshop places a copy of the 4XE file inside a temporary Windows folder. To illustrate,



The file "**temp4D.4XE**" is the 4XE file of the latest application loaded to the display. Rename the file if needed and copy it to the uSD card. Change the filename in the **MagicRelease** code as well.

Build and Upload the Project

For instructions on how to build and upload a ViSi-Genie project to the target display, please refer to the section "**Build and Upload the Project**" of the application note

ViSi Genie Getting Started – First Project for Picaso Displays (for Picaso)
or
ViSi Genie Getting Started – First Project for Diablo16 Displays (for Diablo16).

The uLCD-32PTU and/or the uLCD-35DT display modules are commonly used as examples, but the procedure is the same for other displays.

Proprietary Information

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