



ViSi: Run Child Program

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Description

This Application note shows how to call and run child programs stored in the uSD card.

Before getting started, the following are required:

Hardware

- Any [4D Systems display module](#) powered by any of the following processors:
 - Pixxi28/44
 - Diablo16
 - Picaso
- [Programming Adaptor for target display module](#)
- uSD Card

Software

- [Workshop4](#)

This application note comes with one (1) ViSi project and a zip file containing the child program files to be copied to the uSD card:

- main.4DViSi
- uSD_Files.zip

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

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Application Overview

This application note demonstrates on how to run child programs residing outside the processor's internal flash banks. This practice is useful for large applications that could not fit in the processors internal flash memory. The child program in this application note will only execute its coded tasks without receiving arguments or returning anything to the main program. Once called the child program has two options to return to the mother program: one is to use the return function, the other is to do a system reset.

Setup Procedure

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

- [ViSi Getting Started – First Project for Picaso and Diablo16](#)
- [ViSi Getting Started – First Project for Pixxi Displays](#)

Create a New Project

For instructions on how to create a new **ViSi** project, please refer to the section “**Create a New Project**” of the application note

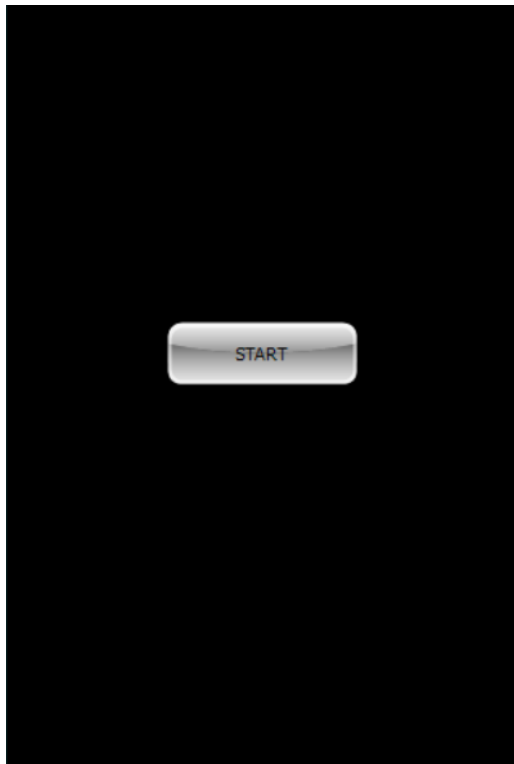
- [ViSi Getting Started – First Project for Picaso and Diablo16](#)
- [ViSi Getting Started – First Project for Pixxi Displays](#)

Mother Program

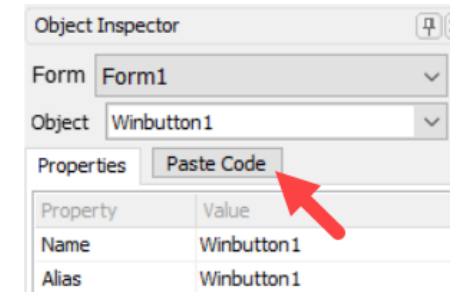
The mother program is the one residing in the processor's main Flashbank.

Design the Project

Add a button to Form0.



Paste the code onto the Code editor by clicking on widget and then pressing the **Paste Code** button in the object inspector.



```

35 // Winbutton1 1.0 generated 03/04/2020 8:11:39 am
36 img_ClearAttributes(hndl, iWinbutton1, I_TOUCH_DISABLE);
37 img_Show(hndl, iWinbutton1); // show button, only do th
38 img_SetWord(hndl, iWinbutton1, IMAGE_INDEX, state); // w
39 img_Show(hndl, iWinbutton1);

```

Mother Program Code

The program starts by mounting the media containing the child program. This is provided in the ViSi template by simply uncommenting these code snippets in the code editor.

```

13 putstr("Mounting...\n");
14 if (!(file_Mount()))
15     while(!(file_Mount()))
16         putstr("Drive not mounted...");
17         pause(200);
18         gfx_Cls();
19         pause(200);
20     wend
21 endif
22 hndl := file_LoadImageControl("Mother.dat", "Mother.gci", 1);

```

In the Main Loop, the program will constantly check for button action in this section.

```

30  repeat
31      touchStatus := touch_Get(TOUCH_STATUS);
32      widget := img_Touched(hndl,ALL);
33
34      switch (touchStatus)
35          case TOUCH_PRESSED:
36              if (widget == iWinbutton1)
37                  img_SetWord(hndl, iWinbutton1, IMAGE_INDEX, 1);
38                  img_Show(hndl,iWinbutton1) ;
39              endif
40              break;
41          case TOUCH_RELEASED:
42              if (widget == iWinbutton1)

```

If the button is toggled by touch, the child program with the **filename** “Child.4XE” residing in the external media will be called through the **file_Run(filename, arglistptr)** function. This function sends no arguments to the child program when argument list **arglistptr** is 0.

```

42      if (widget == iWinbutton1)
43          img_SetWord(hndl, iWinbutton1, IMAGE_INDEX, 0);
44          img_Show(hndl,iWinbutton1) ;
45          file_Run("Child.4XE", 0);
46          goto reinit;

```

When the child returns to the mother program, there will be a need to reinitialize the setup for the mother program hence the use of the function **goto** for jumping back at the start of the program labelled as **reinit**.

```

12  func main()
13      reinit:
14      if (!(file Mount()))

```

Build and Upload the Mother Program

The mother program is uploaded to the display module just like any normal ViSi project. For instructions on how to build and upload a **Designer/ViSi** project to the target display, please refer to the section “**Build and Upload the Project**” of the application note

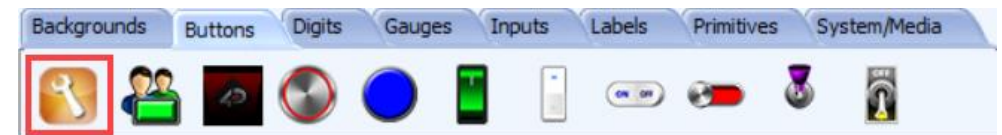
- [ViSi Getting Started – First Project for Picaso and Diablo16](#)
- [ViSi Getting Started – First Project for Pixxi Displays](#)

Child Program

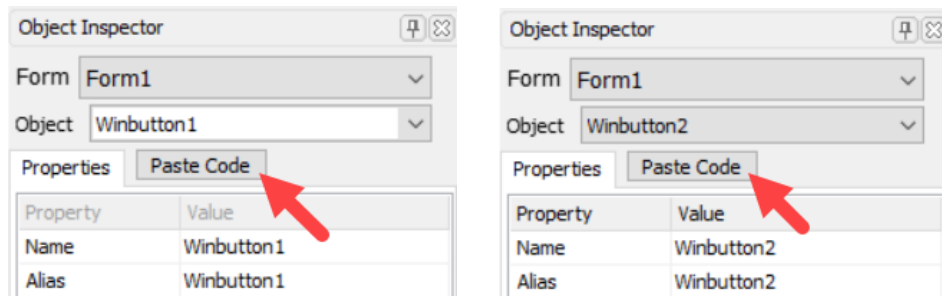
The child program is the one that will reside in the uSD card. This program will be executed by the mother program.

Design the Child Project

Add two buttons to Form0.



Paste the code onto the Code editor by clicking on widget and then pressing the **Paste Code** button in the object inspector.



```

36 // Winbutton1 1.0 generated 03/04/2020 8:35:51 am
37 img_ClearAttributes(hndl, iWinbutton1, I_TOUCH_DISABLE);
38 img_Show(hndl, iWinbutton1); // show button, only do thi
39 img_SetWord(hndl, iWinbutton1, IMAGE_INDEX, state); // wh
40 img_Show(hndl, iWinbutton1) ;
41
42 // Winbutton2 1.0 generated 03/04/2020 8:35:51 am
43 img_ClearAttributes(hndl, iWinbutton2, I_TOUCH_DISABLE);
44 img_Show(hndl, iWinbutton2); // show button, only do thi
45 img_SetWord(hndl, iWinbutton2, IMAGE_INDEX, state); // wh
46 img_Show(hndl, iWinbutton2) ;

```

Child Program Code

Since the media is already mounted by the mother program, there is no need to mount it again. The screen is initially cleared through **gfx_Cls()** as anything displayed by the mother program will be retained on screen.

```

11 func main()
12
13     gfx_Cls();
14

```

The program starts by initializing the graphics support files for the child program and updating the screen with the child program's widgets.

```

15 hndl := file_LoadImageControl("Child.dat", "Child.gci", 1);
16 // Winbutton1
17 img_ClearAttributes(hndl, iWinbutton1, I_TOUCH_DISABLE); // set
18 img_Show(hndl, iWinbutton1); // show button, only do this once
19 // Winbutton2
20 img_ClearAttributes(hndl, iWinbutton2, I_TOUCH_DISABLE); // set
21 img_Show(hndl, iWinbutton2); // show button, only do this once

```

In the Main Loop, the program will constantly check for button action in this section.

```

25 repeat
26     touchStatus := touch_Get(TOUCH_STATUS);
27     widget := img_Touched(hndl, ALL);
28
29     switch (touchStatus)
30     case TOUCH_PRESSED:
31         if (widget == iWinbutton1)
32             img_SetWord(hndl, iWinbutton1, IMAGE_INDEX, 1);
33             img_Show(hndl, iWinbutton1) ;
34         else if (widget == iWinbutton2)
35             img_SetWord(hndl, iWinbutton2, IMAGE_INDEX, 1);

```

If the Return button is pressed, this will jump to the end of the program using **goto** then return to the mother program through the **return** function.

```

40 if (widget == iWinbutton1)
41     img_SetWord(hndl, iWinbutton1, IMAGE_INDEX, 0);
42     img_Show(hndl, iWinbutton1) ;
43     goto exit;

```

```

55 exit:
56     gfx_Cls();
57     return 0;
58
59 endfunc

```

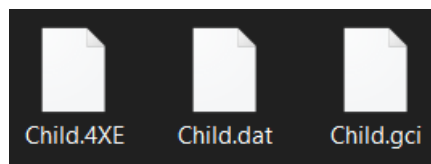
If the Restart button is pressed, this will activate the function **SystemReset()** to reset the processor. The display module will then restart to the mother program.

```
44         else if (widget == iWinbutton2)
45             img_SetWord(hndl, iWinbutton2, IMAGE_INDEX, 0);
46             img_Show(hndl,iWinbutton2) ;
47             SystemReset();
48         endif
```

Build and Copy the Child Program Files

The child program is built by pressing the **Compile** button in the Home Tab without uploading it to the display module. This will compile the program and generate the compiled program code with the **“.4XE”** file extension and the supporting graphics files with **“.GCI”** and **“.DAT”** file extension in the project’s directory.

The compiled program code and supporting graphics files can then be copied manually to the media, in this case the uSD card.



Run the Program

Insert the uSD Card into the display module after copying the files for the child program. With the mother program residing in the processor’s main Flashbank, this will always run first. The child program will only run if the button is pressed.

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