



# **Application Note**

## **AN\_423**

### **FT\_App\_Imageviewer**

**Version 1.0**

**Issue Date: 2016-11-03**

This document describes the operation of the Imageviewer Demo Application running on an FT8xx device.

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## 1 Introduction

This application demonstrates an interactive image viewer using the Blend function, Bitmap flip & embedded Jpeg decoder available on FT8xx platforms.

The Imageviewer application demonstrates the use of the inbuilt jpeg decode function.

The application also demonstrates a reflection effect where the same image is flipped and displayed in the bottom with a transparent effect.

In this demo application, the images are of size 320x194.

**The image files are available in the project folder - FT\_App\_Imageviewer\Test**

### 1.1 Overview

The project will deliver understanding of the FT8xx Jpeg decoding feature, bitmap handling, blend function, and the creation of a reflection effect.

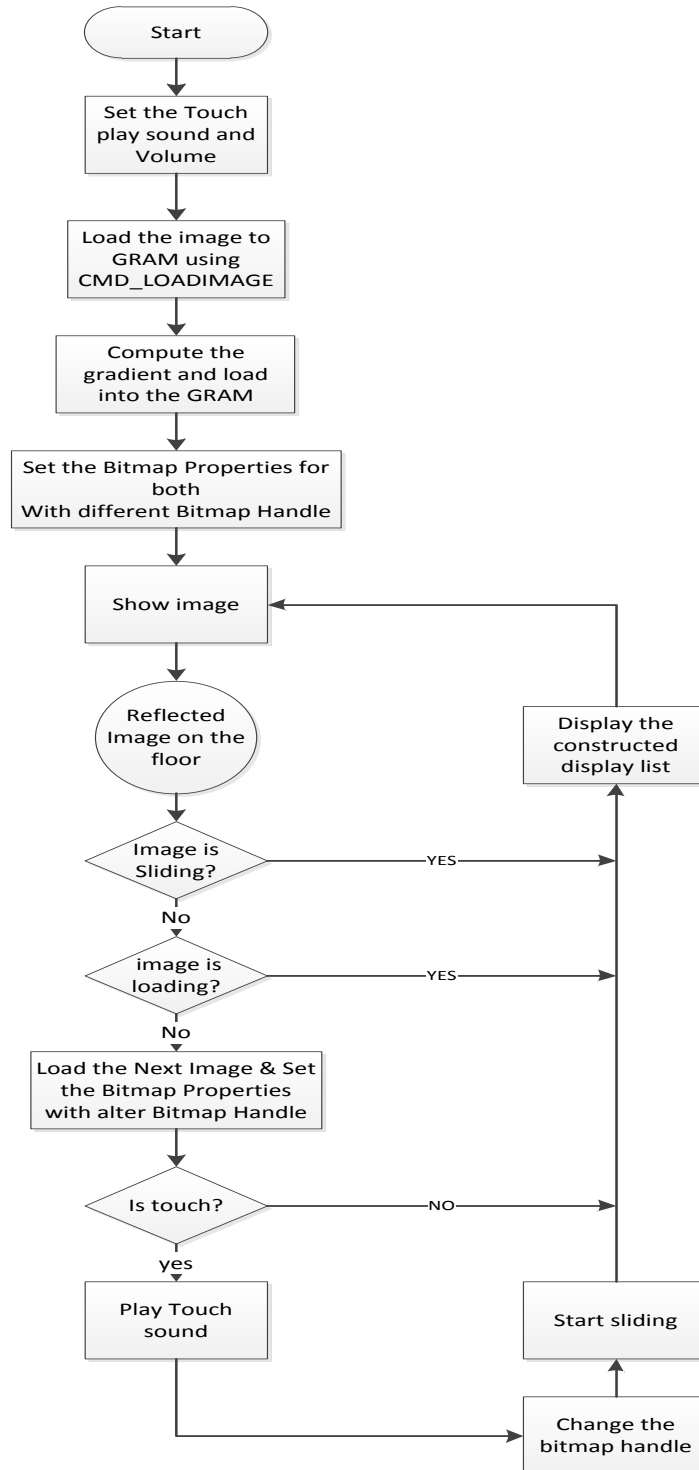
For information on the Project file, and Source code building refer to [AN\\_391 EVE Platform Guide](#)

### 1.2 Scope

This document will be used by software programmers to develop GUI applications by using any of the FT8xx series devices with any MCU via SPI.

## 2 Application Flow

### 2.1 Flowchart



**Figure 2.1-1 Flowchart**

### 3 Description

A few parameters are needed to be initialized before constructing the display list.

#### 3.1 Initialization

Before entering into the application, one image is loaded to GRAM with handle

```
/* In the function*/
Loadimage2ram(r);      // r is the bitmap handle
```

Set the Bitmap properties For the Image

```
/* In the Function*/
Ft_App_WrCoCmd_Buffer(phost, BITMAP_HANDLE(r));
Ft_App_WrCoCmd_Buffer(phost, BITMAP_SOURCE((r ? 131072L : 100)));
Ft_App_WrCoCmd_Buffer(phost, BITMAP_LAYOUT(RGB565, 320L * 2, 194));
Ft_App_WrCoCmd_Buffer(phost, BITMAP_SIZE(NEAREST, BORDER, BORDER, 320, 194));
```

**Note:** In this application, all images are fixed Size 320x194

#### 3.2 Functionality

This application demonstrates the usage of the inbuilt jpeg decode function. The application constantly monitors the user touch on the screen and respectively changes the image after the touch. The application maintains two bitmaps in the graphics RAM (a ping pong style of implementation), one for the present image being displayed, and another for the future image to be displayed. The application also demonstrates a reflection effect where the same image is flipped and displayed at the bottom with a transparent effect.



**Figure 3.2-1 Image viewer**

### 3.2.1 Scrolling Effect Handling

A flipped bitmap handle is set to the next image to be scrolled on to the display. The next image is decompressed and loaded to GRAM at location 300.

```
/* In the function*/
if(px == temp_x && loaded==0)
{
Ft_App_WrCoCmd_Buffer(phost,BITMAP_HANDLE(r^1));
Ft_App_WrCoCmd_Buffer(phost,BITMAP_SOURCE(((r^1) ? 400000L : 300)));
Ft_App_WrCoCmd_Buffer(phost,BITMAP_LAYOUT(RGB565,imgWidth*2,imgHeight));
Ft_App_WrCoCmd_Buffer(phost,BITMAP_LAYOUT_H((imgWidth*2)>>10,imgHeight>>9));
Ft_App_WrCoCmd_Buffer(phost,BITMAP_SIZE(NEAREST,BORDER,BORDER,imgWidth,imgHeight));
Ft_App_WrCoCmd_Buffer(phost,BITMAP_SIZE_H(imgWidth>>9,imgHeight>>9));
Loadimage2ram(r ^ 1);
loaded = 1;
}
```

### 3.2.2 Image Reflection

The image is reflected on the floor, by flipping the image by using TRANSLATE and SCALE commands. A blended effect by is created using the blend function.

#### Reflection

```
/*In the Function*/
Ft_Gpu_CoCmd_LoadIdentity(phost);
Ft_Gpu_CoCmd_Translate(phost,(temp_x)*65536L, 65536L*96.5);
Ft_Gpu_CoCmd_Scale(phost,1*65536, 65536*-1);
Ft_Gpu_CoCmd_Translate(phost,-(temp_x)*65536L, 65536L*-96.5);
Ft_Gpu_CoCmd_SetMatrix(phost);
```

#### Blend Function

```
Ft_App_WrCoCmd_Buffer(phost,VERTEX2I(x, (10+aspect_ratio),r, 0));
Ft_App_WrCoCmd_Buffer(phost,SAVE_CONTEXT());
Ft_App_WrCoCmd_Buffer(phost,COLOR_MASK(0,0,0,1));
Ft_App_WrCoCmd_Buffer(phost,BLEND_FUNC(ONE, ZERO));
Ft_App_WrCoCmd_Buffer(phost,VERTEX2I(0, 212, 2, 0));
Ft_App_WrCoCmd_Buffer(phost,COLOR_MASK(1,1,1,1));
Ft_App_WrCoCmd_Buffer(phost,BLEND_FUNC(DST_ALPHA, ONE_MINUS_DST_ALPHA));
```

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## Appendix A– References

### Document References

[FT800 Embedded Video Engine Datasheet](#)

[FT81x Datasheet](#)

[FT81x Programmers Guide](#)

[Example project download](#)

### Acronyms and Abbreviations

Terms	Description
Arduino Pro	The open source platform variety based on ATMEL's ATMEGA chipset
EVE	Embedded Video Engine
SPI	Serial Peripheral Interface
UI	User Interface
USB	Universal Serial Bus



## Appendix B – List of Tables & Figures

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## Appendix C– Revision History

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1.0	Initial release	2016-11-03