

TouchGFX Customerization

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Revision history

Date	Revision	Changes
15th March 2016	1	Initial release.

First, download an evaluation copy of TouchGFX from the web site at http://touchgfx.com/. The only difference between an evaluation version with a paid license is the watermark appearing from time to time on the display.

At time of writing, the latest version is 4.5.0.

Demo in this guide uses version 4.4.1.

After download and extract to somewhere you find it convenient. In my case, I have extracted it to D:\projects\touchgfx-release-4.4.1-eval.

TouchGFX is a graphical framework much more sophisticated than those free/royalty free libraries in the market (in my opinion). The philosophy is that TouchGFX allows a developer to design from a stand point as a graphic designer. Simulation in Windows Visual Studio Express is possible for preview and deployment to real hardware afterwards.

From an embedded point of view, rendering is done via a frame buffer allocated in external SDRAM or internal SRAM. In our case of a 240x240 MIPI display, it is possible to use either external SDRAM on STM32F429I-disco board or, simply internal SRAM of STM32F429I MCU which has a 256KB SRAM (240*240*2 byte frame buffer = 115,200Byte for frame buffer).

Once you have extracted the code for TouchGFX, it is required to copy the driver code for SSD2805, SSD2541, nRF8001, and a new BoardConfiguration.cpp file.

Path to download these folders at : http://www.techtoys.com.hk/Displays/SSD2805EvalRelease3/Firmware/Touch GFX/driver.rar

Manually copy the 'ble' and 'thirdparty' folders to the path ..\framework\include\platform\driver.

In my case, the folders are located at D:\projects\touchgfx-release-4.4.1eval\touchgfx\framework\include\platform\driver.

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Documents			

Next manually copy the file BoardConfiguration.cpp to replace the original one at .. \touchgfx\board\ST\STM32F429I-DISCO\source. It is advised to backup the old one prior to replacing it.

🔒 source				_			
🕞 🕞 🖡 🔹 projects 🔹 touchgfx-release-4.4.1-eval 🔹 touchgfx 🔹 board 🔹 ST 🔹 STM32F429I-DISCO 🔹 source 🔹 🔹 🚺 Search source							
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Drophox	E CEIO	10/27/2015 8:27 AM	C++ Source File	4.KB			

This step is very important because this BoardConfiguration.cpp file contains the code to direct TouchGFX framework to use the new MIPI display instead of the onboard 320x240 LCD.

In the function touchgfx_init() you will find LCDController& hal referencing a new class defined in LCDControllerS6D04D2.hpp.

Boar	dConfiguration.cpp
382	<pre>//displayXferFB(rect.x, rect.y, rect.hidth, rect.height, (uint32 t)0xD0000000);</pre>
383	//displayXferFB(0, 0, DISP HOR RESOLUTION, DISP VER RESOLUTION, (uint32 t)0xD0000000);
384	}
385	private:
386	1;
387	#endif
388	-*/
389	<pre>void touchgfx init()</pre>
390 🗄	
391 🗄	#ifdef USE_SSD2805_#6D04D2
392	<pre>//MyHAL& halk (MyHAL&) touchgfx_generic_init<myhal>(noDMA, display, tc, 240, 240, 0, 0);</myhal></pre>
393	LCDController& hal = (LCDController&)touchgfx_generic_init <lcdcontroller>(noDMA, display, tc, 24</lcdcontroller>
394	hal.setFrameBufferStartAddress((uint16_t*)frameBuf0, 16, false, false);
395	// This platform can handle simultaneous DMA and TFT accesses to SDRAM, so disable lock to incre
396	hal.lockDMAToFrontPorch(false);
397	<pre>#elif defined (USE_SSD196X)</pre>
398 🗄	#ifdef USE_TY700TFT800480
399	LCDController& hal = (LCDController&)touchgfx_generic_init <lcdcontroller>(noDMA, display, tc, 80</lcdcontroller>
400	<pre>#elif defined USE_TY430TFT480272</pre>
401	LCDController& hal = (LCDController&)touchgfx_generic_init <lcdcontroller>(noDMA, display, tc, 48</lcdcontroller>
402	- #endif
403	hal.setFrameBufferStartAddress((uint16_t*)frameBuf0, 16, false, false);
404	hal.lockDMAToFrontPorch(false);
405	#else
406	HAL& hal = touchgfx_generic_init <stm32f4hal>(dma, display, tc, 240, 320, 0, 0);</stm32f4hal>
407	hal.setFrameBufferStartAddress((uint16_t*)frameBuf0);
408	#endif
400	

The final step is to copy the source code of swipe analog clock demo 240x240 to the path D:\projects\touchgfx-release-4.4.1-eval\app\demo.

Path to download this demo at:

http://www.techtoys.com.hk/Displays/SSD2805EvalRelease3/Firmware/Touch GFX/ClockDemo_240x240.rar

🔒 demo						_	
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Organize 👻 Include in library 👻 Share with 👻 i	Burn New folder						(?)
Favorites	Name ^	Date modified	Туре	Size			
Desktop Downloads Recent Places Google Drive Dropbox	ClockDemo_240x240 home_automation touchgfx_demo2014 touchgfx_demo2014_small	2/19/2016 8:38 PM 12/7/2015 11:33 AM 12/7/2015 11:33 AM 12/7/2015 11:33 AM 12/7/2015 11:33 AM	File folder File folder File folder File folder File folder		-		
Libraries Documents J Music	touchgir_demo2015_480x272_8MB touchgfr_demo2015_800x480	12/7/2015 11:33 AM 12/7/2015 11:33 AM 1/5/2016 2:07 PM	File folder File folder				

Finally, make sure you have access to Keil uVision5. You may download a trial MDK-Professional Trial License from http://www2.keil.com/mdk5/install/.

Go straight to installation and launch Keil uVision 5.



From Project→Open Project.



Browse to application.uvprojx at ...\app\demo\ClockDemo_240x240\target\ST\STM32F429I-DISCO\Keil

Vs Select Project File								
Orgen → app → demo → ClockDemo_240x240 → target → ST → STM32F429I-DISCO → Keil → ✓ ✓								
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Make sure BoardConfiguration.ccp includes support for 1.54" MIPI LCD with

Project view as follow. The source code for SSD2541 & SSD2805 can be seen under the Mipi folder. Make sure it is available from the project workspace.



Next highlight on the project title with a right mouse click. Go to 'Options for Target 'Internal flash'. Select C/C++ tab.

🐺 Options for Targ	et 'Internal fla	ish'						X
Device Target O	utput Listing	User C/C++	Asm	Linker I	Debug L	Itilities		
STMicroelectronics STM32F429ZI								
Xtal (MHz): 25.0					ieneration Compiler:	Use latest i	installed version	
Operating system:	None		•			,		
System Viewer File:	,			U:	se Cross-M	Iodule Optimiz	ation	
STM32F429x.SFR				L n	e MicroLl	в	🔲 Big Endian	
Use Custom File	e			Floati	ng Point H	lardware:	Use Single Prec	ision 💌
Read/Only Memo	ory Areas			Read/\	Write Mem	ory Areas		
default off-chip	Start	Size	Startup	default	off-chip	Start	Size	Nolnit
ROM1:			0		RAM1:			
ROM2:			0		RAM2:			
ROM3:			0		RAM3:			
on-chip					on-chip			
IROM1:	0x8000000	0x200000	•		IRAM1:	0x20000000	0x30000	
IROM2:			0		IRAM2:	0x10000000	0×10000	
OK Cancel Defaults Help								

From Preproccessor Symbols under Define. Add two directives: *USE_SSD2805_S6D04D2 RELEASE_3*

This is to "let Keil know" you are using a different LCD from the onboard 320x240 TFT onboard of STM32F429i-disco.

Preprocessor Symbols Define: x91_EVAL USE_STDPERIPH	_DRIVER HSE_VALUE=8000000 USE_SSE	2805_S6D04D2 RELEASE_3
Undefine:		
Anguage / Code Generation Execute-only Code Iptimization: Level 3 (-0.3) Optimize for Time Split Load and Store Multiple One ELF Section per Function Include Paths Misc	Strict ANSI C Enum Container always int Plain Char is Signed Read-Only Position Independent Read-Write Position Independent Varget\include;\\\platform\os;\\	Warnings: <ur> <unspecified></unspecified> Thumb Mode No Auto Includes C99 Mode </ur>
Controls Compiler control string	apcs=interwork -I\\\gui\include -I\\ erated\fonts\include -I\\\generated\im	.\\target\include -I\\ ages\include -I\\



From Project \rightarrow Rebuild all target files to build all.

Connect STM32F429i-disco to the PC. Highlight on the project title and select 'Options for target-...' to bring up this user interface. From Debug tab make sure ST-Link Debugger has been selected.

🐺 Options for Target 'Internal flash'	×
Device Target Output Listing User C/C++ Asm	Linker Debug Utilities
C Use Simulator Settings	Use: ST-Link Debugger Settings
Load Application at Startup Initialization File:	Load Application at Startup Run to main() Initialization File: Edit
Restore Debug Session Settings Image: Breakpoints Image: Toolbox Image: Breakpoints Image:	Restore Debug Session Settings Image: Breakpoints Image: Toolbox Image: Watch Windows Image: Memory Display Image: System Viewer
CPU DLL: Parameter: SARMCM3.DLL -MPU -REMAP	Driver DLL: Parameter: SARMCM3.DLL -MPU
Dialog DLL: Parameter: DCM.DLL -pCM4	Dialog DLL: Parameter: TCM.DLL pCM4
OK Car	Icel Defaults Help

Click OK to exit.

From Debug→Start/Stop Debug Session (Ctrl+F5) to start development.

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main.cpp	-{}-	Step Over			F10	***************************************
startup_stm32f429x.	(j)	Step Out		(Ctrl+F11	<touchgfx hal="" hal.hpp=""></touchgfx>
🗐 🛅 Gui		Run to Cursor Lin	e	(Ctrl+F10	<pre><toucngix boardconfiguration.npp="" nai=""></toucngix></pre>