

Renesas RA Family

GUIX "Hello World" for EK-RA8D1

Introduction

This application note describes the process of creating a simple two-screen GUI using Azure RTOS GUIX Studio for the EK-RA8D1 kit. This application demonstrates how easily a user can create and configure a new application using the Renesas Flexible Software Package (FSP).

The Renesas Flexible Software Package includes Azure RTOS ThreadX[®] real-time operating system, the Azure RTOS GUIX library and hardware drivers unified under a single robust software package. This powerful suite of tools provides a comprehensive integrated framework for rapid development of complex embedded applications.

The Hello World application was developed under e² studio using the Renesas Flexible Software Package.

Required Resources

Development tools and software

- e² studio IDE Version: 2023-10 (23.10.0)
- Renesas Flexible Software Package (FSP) v5.1.0
- Azure RTOS GUIX Studio V6.2.1.0

Hardware

- Renesas EK-RA8D1 kit (RA8D1 MCU Group)
 - ER-TFT043-3 with Capacitive Touch Panel 40 pins connection.
 - Recommended user should use RA6M3G kit's LCD.
- Renesas EK-RA8D1's "SW1" switches setting.
 - Switch #6 for GLCDC set "ON" and switch #7 for SDRAM set "ON".
- Renesas-app-lcd-conv_v1_b_mfg order from the link: <u>https://oshpark.com/shared_projects/pzfp0mCD</u>
 - User needs to click to "Actions" button to order LCD converter board.
 - Refer to section "3". Step 11 on Figure: 29 for pins connection.

Reference Manuals

- RA Flexible Software Package Documentation Release v5.1.0
- Azure RTOS GUIX and GUIX Studio v6.2.1.0
- Renesas RA8D1 Group User's Manual Rev.1.1.0
- EK-RA8D1-v1.0 Schematics

Provided Software Files

- A Source.zip folder that has a touch ft5x06 folder and 4*.c files inside.
- hal_entry.c, system_thread_entry.c, touch_thread_entry.c, windows_handler.c

Purpose

This document will guide you through the setup of an Azure RTOS GUIX touch screen interface Hello World application in e₂ studio. This document will show how to configure the drivers and library included with the FSP. These will allow you to set up the GLCD Controller, the touch screen driver, and semaphores to communicate with application tasks. It also shows the steps necessary to create a simple GUI interface using the Azure RTOS GUIX Studio editor. In addition, this app note will also cover project setup along with basic debugging operations. When it is running, the application will respond to touchscreen actions, presenting a basic graphical user interface (GUI).

Intended Audience

The intended audience is users who want to design GUI applications.

Note: If the user wants to skip fully design and running the fully functional project see Chapter or Section 6.



Contents

1.	Downloading and Installing Tools	2
1.1	Overview	2
1.2	Procedural Steps	2
2.	Creating Application Project and Enabled Backlight	4
2.1	Overview	4
2.2	Procedural Steps	4
3.	Adding and Configuring "Touch Function Driver"	15
4.	Creating Folders in the Hello_World GUIX_EK_RA8D1 Project for Azure RTOS GUIX Stud Project	io 25
5.	Using Azure RTOS GUIX Studio create GUI Windows	28
6.	Overview of Fully Functional Project	54
6.1	Overview	54
6.2	Procedural Steps	54
7.	Website and Support	55

1. Downloading and Installing Tools

1.1 Overview

In this section you will copy materials to your PC and install v2023-10.0 /FSP v5.1.0 and Azure RTOS GUIX studio v6.2.1.0.

1.2 Procedural Steps

 If you already have e² studio v2023-10 with FSP v5.1.0 or later installed, you can skip this step. Otherwise, you can download it from <u>https://www.renesas.com/us/en/software-tool/flexible-software-package-fsp</u>

Detailed installation instructions for the e² studio and the FSP are available on the Renesas website <u>https://www.renesas.com/fsp</u>. Review the release notes for e₂ studio to ensure that the e² studio version supports the selected FSP version. The starting version of the installer includes all features of the RA MCUs.

2. You can get Azure RTOS GUIX Studio v6.2.1.0 or greater from this link.

You should see the window in the next step on the web browser. Note: Microsoft Store must be installed and working on your PC to install Azure RTOS GUIX studio.



3. Click **Install** button and a new window pops up. Click **Open Microsoft Store**.



Figure 1. Get Azure RTOS GUIX Studio

4. Click Open Microsoft store to continue installing Azure RTOS GUIX studio.

Open Microsoft Store?
https://apps.microsoft.com wants to open this application.
Open Microsoft Store Cancel

Figure 2. Open Microsoft Store

5. Click "Open" to open "Azure RTOS GUIX Studio" App.

💼 Microsoft Sto	pre	×
G	Azure RTOS GUIX Studio	
	5.0 🚖 🕜 Privacy & terms 🕜 More details	
	YONE Open	



_	-	×	-	0	-	10	La	4	H)	Įğ	4	Θ	Ð	 •	x.	3	
	Draigo	+ 1/10					_					 			-		
ф	Projec	t vie	W		-												
🖻 No	o Project																
_	and sold states			500 C													
	Prope	rties	Vie	W	-												

Figure 3. Click Open to start "Azure RTOS GUIX Studio"

2. Creating Application Project and Enabled Backlight

2.1 Overview

In this section, you will create a project to which you will add pre-written source code and integrate it with a pre-created Azure RTOS GUIX studio project.

2.2 Procedural Steps

1. Create a new Renesas RA C/C++ project. Name it ra8d1_guix_hello_world.

	and Location	 	
Project nar	ne		
ra8d1_gui	_hello_world		
Use de	fault location		
Location:	C:\WorkSpace\EK_RA8D1\ra8d1_guix_hello_world		Browse
	Choose file system: default 🗸		
You can dov	nload more Renesas packs here		

Figure 4. Create New Project



2. Select and set board to EK-RA8D1.

📴 Renesas RA	C/C++ Project		— — X
Renesas RA (Device and To	C/C++ Project ols Selection		
Device Selection FSP Version: Board: Device: Core: Language:	n 5.1.0 ~ EK-RA8D1 ~ R7FA8D1BHECBD … CM85 ~ O C O C++	Board Descriptior Evaluation kit for Visit TBD to get k example projects	n RA8D1 MCU Group cit user's manual, quick start guide, errata, design package, , etc.
		Device Details TrustZone Pins Processor	Yes 224 Cortex-M85
Toolchains GNU ARM En LLVM Embedo 12.2.1.arm-12	nbedded ded Toolchain for Arm -mpacbti-34 ~	Debugger J-Link ARM	~
?	[< <u>B</u> ack	Next > Einish Cancel

Figure 5. Select and Set Board to EK-RA8D1



3. Select Flat (Non-TrustZone) and Executable with Azure RTOS ThreadX (v6.2.1+FSP.5.1.0).

enesas RA C/C++ Project			
roject Type Selection			
oject Type Selection			
 Flat (Non-TrustZone) Project Renesas RA device project without Trust All code, data and peripheral settings w Renesas RA device will remain in secure EDMAC RAM buffers will automatically TrustZone Secure Project Renesas RA device project for TrustZone All code, data and peripherals placed in secure Secure project settings such as TrustZon list of secure peripherals will be passed After initialization, a call to the non-secur TrustZone Non-secure Project Renesas RA device project for TrustZone Alter initialization, a call to the non-secur TrustZone Non-secure Project Renesas RA device project for TrustZone Alt code, data and peripherals placed in non-secure Must be associated with a secure project Non-secure startup handler will be calle 	tZone separation ill be configured in this project mode be placed in non-secure RAM e secure execution this project will be initialized as ne partitions, linker maps and a to a selected non-secure project are startup handler will be made e non-secure execution this project will be initialized as tt or smart bundle d after secure code initialization		
2	< <u>B</u> ack N	ext > Einish	Cancel
Renesas RA C/C++ Project Renesas RA C/C++ Project Build Artifact and RTOS Selection Build Artifact Selection Executable Project builds to an executable file Static Library Project builds to a static library file Executable Using an RA Static Library Project builds to an executable file	< <u>Back</u> RIOS Selection Azure RIOS ThreadX	ext >Einish : (v6.2.1+fsp.5.1.0)	Cancel

Figure 6. Select Azure RTOS ThreadX



4. Use FreeRTOS - Minimal template.

🔋 Renesas R	tA C/C++ Project		
enesas RA Project Temp	C/C++ Project		Ď
Project Temp	plate Selection		
0	Azure RTOS ThreadX - Blinky Azure RTOS ThreadX project that includes BSP and will blink LEDs if available. This project will initialize be initialized and a single thread to blink the LEDs will be started. [Renesas.RA.5.1.0.pack]	e the MCU using the BSP. Three	adX will also
•	Azure RTOS ThreadX - Minimal Empty ThreadX FSP project with no threads. This project will initialize the MCU using the BSP. [Renesas.RA.5.1.0.pack]		
Code Gener	ration Settings		
✓ Use Rene	esas Code Formatter		

Figure 7. Select Azure RTOS ThreadX Minimal Finish

5. Open the project configuration and go to the BSP tab. Change Heap size (bytes) to 0x2000.

💱 *[ra8d1_guix	:_hello_world] FSP Configuration $ imes$	- 0	Propert	$ies \times$	📑 🖬 🏹 🖾 🔗	8
Board Sup	port Package Configuration	Generate Project Content	EK-RA8	51		
Board Supp Pevice Select FSP version Board: Device: Core: RTOS:	ttion x 5.1.0 EK-RA8D1 CM85 Azure RTOS ThreadX	Generate Project Content Board Details Evaluation kit for RA8D1 MCU Group Visit TBD to get kit user's manual, quick start guide, errata, design package, example projects, etc.	EK-RA81 Settings	Property series V RABD1 Family > Security > OFS1 orgister settings > OFS1 SEL register settings > OFS1 register settings > Disck Protection Settings (BPS) > First Stage Bootloader (FSBL) > Clocks > Cache settings Dual Bank Mode Main Oscillator Wait Time * RA Common Main stack size (bytes)	Value 8 Disabled 8163 cycles 0x400	
				Heap size (bytes) MCU Vcc (mV) Parameter checking Assert Failures Error Log Clock Registers not Reset Values during Startup Main Oscillator Populated PFS Protect C Runtime Initialization Early BSP Initialization Early BSP Initialization Main Oscillator Clock Source Subclock Populated Subclock Drive (Drive capacitance availability varies by MCU)	0x2000 3300 Disabled Return FSP_ERR_ASSERTION No Error Log Disabled Populated Enabled Disabled Crystal or Resonator Populated Standard/Normal mode	
ummary BSP	Clocks Pins Interrupts Event Links	tacks Components		Subclock Stabilization Time (ms)	1000	

Figure 8. Change Heap Size



6. Click tab "Clocks" and set "Clocks" for the LCD.

locks Configura	tion				Gen	erate Project Cont
						Restore Defa
TAL 20MHz			Clock Src: PLL1P	CPUCLK Div /1	✓ → CPUCLK 480MHz	
	→ PLL Src: XTAL V			→ICLK Div /2	 → ICLK 240MHz 	
OCO 48MHz	✓ ✓ ✓ ✓ PLL Div /1 ✓ ✓ PLL1P Div /2	✓ → PLL1P 480MHz	\rightarrow	> PCLKA Div /4	✓ → PCLKA 120MHz	
DCO 32768Hz	PLL Mul x48.00 > → PLL1Q Div /2	✓ → PLL1Q 480MHz		> PCLKB Div /8	✓ → PCLKB 60MHz	
OCO 8MHz	✓ PLL 960MHz ✓ PLL1R Div /2	✓ → PLL1R 480MHz		> PCLKC Div /8	✓ → PCLKC 60MHz	
IBCLK 32768Hz	PLL2 Src: XTAL			> PCLKD Div /4	✓ → PCLKD 120MHz	
	PLL2 Div /1 PLL2P Div /6	✓ → PLL2P 200MHz		> PCLKE Div /2	✓ → PCLKE 240MHz	
	PLL2 Mul x60.00 > → PLL2Q Div /3	✓ → PLL2Q 400MHz		SDCLK Enabled	✓ → SDCLK 120MHz	
	PLL2 1.200GHz → PLL2R Div /3	✓ → PLL2R 400MHz		BCLK Div /4	✓ → BCLK 120MHz	
			_	EBCLK Div /2	✓ → EBCLK 60MHz	
				FCLK Div /8	✓ → FCLK 60MHz	
			CLKOUT Disabled	✓ → CLKOUT Div /1	✓ → CLKOUT 0Hz	
			SCICLK Disabled	✓ → SCICLK Div /8	✓ → SCICLK 0Hz	
			SPICLK Disabled	✓ → SPICLK Div /4	✓ → SPICLK 0Hz	
			CANFDCLK Disabled	✓ → CANFDCLK Div /8	✓ → CANFDCLK 0Hz	
	<u></u>		LCDCLK Src: PLL1Q	✓ → LCDCLK Div /5	 → LCDCLK 96MHz 	
			> I3CCLK Disabled	✓→I3CCLK Div /3	✓→I3CCLK 0Hz	
			UCK Disabled	 → UCK Div /5 	 → UCK 0Hz 	
			>> U60CK Disabled	✓ → U60CK Div /5	✓ → U60CK 0Hz	
			OCTASPICLK Disabled	✓ → OCTASPICLK Div /4	✓ → OCTASPICLK 0Hz	

Figure 9. Setting All Clocks

7. Add a new thread and name it as System Thread with the settings below.

tacks Configuration	0	System 1	Thread	
ttacks Configuration Threads New Thread Remove gioport I/O Port (r_ioport) Azure RTOS ThreadX Port (rm_threadx.port) System Thread Objects New Object > Remove	Generate Project Content System Thread Stack New Stack > ≜ Extend Stack > Remove Add stacks to the selected thread by using the 'New Stack' toolbar button (above), or by pasting here from the clipboard.	System ¹ Settings	hread Property ✓ Common > General > Timer Timer Proformance Performance RA Interrupts ✓ Thread Symbol Name Stack size (bytes) Priority Auto start Time slicing interval (ticks)	Value Value system_thread System Thread 1024 5 Enabled 5 S

Figure 10. Add System Thread



8. Click "New Stack" and add Azure RTOS GUIX to System thread.

🌼 *[ra8d1_guix_hello_world] FSP Configuration 🛛 🕹			Propert	ies ×
Stacks Configuration		Generate Project Content	System	Thread
Threads 🔄 New Thread ቘ Remove 📄	System Thread Stacks	Extand Stade >	Settings	Property ✔ Common
✓ 🗬 HAL/Common	Remove	Artificial Intelligence		> General > Timer
g_ioport I/O Port (r_ioport) Aure RIOS ThreadX Port (rm threadx port)	Add stacks to the selected thre	Audio >		> Trace
System Thread	clipboard.	Bootloader > Connectivity >		Performance RA Interrupts
		Graphics >	Azure F	RTOS GUIX
		Input > Monitoring > Motor > Networking > Power > Security > Sensor > Storage > System >	 Captur D/AVE D/AVE Graphic 	e Engine Unit (r_ceu) 2D (r_drw) 2D Port Interface (r_drw) :s LCD (r_glcdc) Time slicing interval
Objects New Object > 🔊 Remove	4	Timers > Transfer > Search	-	

Figure 11. Add Azure RTOS GUIX



9. Settings properties for Azure RTOS GUIX



Figure 12. Setting and Checking Properties for Hardware



10. Settings property for **Graphics LCD** Note: Setting properties for the LCD.

acks Configuration		Generate I	Project Content	g_displa	y Graphics LCD (r_gicdc)	
			De	Settings	Property	Value
nreads 🐑 New Thread 🕷 Remove 📄	Azure RTOS GUIX Stacks	Mew Stack > 🚠 Extend Stack :	Remove	API Info	▼ common	D-fh (BCD)
AL/Common	-		1		Parameter Checking	Default (BSP)
G ioport I/O Port (r ioport)	Azure RTOS GUIX				Color Correction	Off
Azure BTOS ThreadX Port (rm thready port)					 Module g_display Graphics LCD (r_glcdc) 	
A System Thread					✓ General	
49 to proci cum	(i)				Name	g_display
Azure RIOS GUIX					> Interrupts	
					✓ Input	
	Azure RTOS GUIX Port (rm_	guix_port)			 Graphics Layer 1 	
					✓ General	
					Enabled	Yes
	١				Horizontal size	480
		A	I		Vertical size	272
	d ⁰ a diada 0 Carabi 100				Horizontal position	0
	g_display0 Graphics LCD	W D/AVE 2D Port Interface			Vertical position	0
	(r_gicac)	(i_arw)			Color format	RGB888 (32-bit)
					Line descending mode	Disabled
	U	<u>u</u>			> Background Color	5.540 FCU
	↓				> Framebuffer	
	Add MIPLOSI Output	# D/AVE 2D (r. drw)			> Line Report	
	(Optional)	- D/AVE 2D (I_UIW)			> Line Repeat	
	(op norm)				raung Graphics Laws 2	
		0			Graphics Layer 2	
hinste New Objects Do		W			✓ General	
bjects Verious					Enabled	No
					Horizontal size	480
					Vertical size	272
					Horizontal position	0
					Vertical position	0
					Color format	RGB888 (32-bit)
					Line descending mode	Disabled
					> Background Color	
					> Framebuffer	
					> Line Repeat	
					> Fading	
					✓ Output	
					✓ Timing	
					Horizontal total cycles	559
					Horizontal active video cycles	480
					Horizontal back porch cycles	5
					Horizontal same signal oxfor	2
					Horizontal sync signal colority	Low active
					Vertical total lines	216
					Vertical total lines	272
					Vertical active video lines	212
					Vertical back porch lines	8
					Vertical sync signal lines	1
					Vertical sync signal polarity	Low active
					Data Enable Signal Polarity	High active
					Sync edge	Rising edge
					> Format	
					> Background	
					> CLUT	
					> TCON	
					> Color Correction	
					> Dithering	
	Components					
nmary BSP Clocks Pins Interrupts Event Links Stacks	components					

Figure 13. Setting Properties for Graphic LCD



11. Click "New Stack" and add PWM Timer.

		Generate Project Content	System 1	ſhread
Inreads New Thread Remove Image: Comparison of the second s	System Thread Stacks Azure RTOS GUIX Azure RTOS GUIX Port (rm_guix_port	 Extend Stack > Remove Analog Artificial Intelligence Audio Bootloader Connectivity DSP Coraphics Input Monitoring Motor Networking Security Sensor Storage System Yaranfer Search 	 Settings Port Output Realtime C Three-Phase Timer, Gen Timer, Lltr, Utr 	 Property Common General Timer Trace Performance RA Interrupts Thread Symbol Name Stack size (bytes) Priority Auto start Time slicing interval (tick for GPT (r_poeg)) lock (r_rtc) se PWM (r_gpt_three_phase) real PWM (r_gpt) rPower (r_agt) a-Low-Power (r ulpt)

Figure 14. Add the Timer

12. Setting "**Timer**" module properties. Click "arrow" to set pin P404 for "DISP_BLEN".

tacks Configuration		Generate Project Content	g_timer_	PWM Timer, General PWM (r_gpt)	
		Generate Project Content	Settinas	Property	Value
hreads 🛛 💿 New Thread 💼 Remove 📄	g timer PWM Timer, General PWM	New Stack >		✓ Common	
. · · · · · · · · · · · · · · · · · · ·	(r_gpt) Stacks	Extend Stack > 🔊 Remove	API Into	Parameter Checking	Default (BSP)
HAL/Common				Pin Output Support	Enabled
g_ioport I/O Port (r_ioport)	a timer PWM Timer.			Write Protect Enable	Disabled
Azure RIOS ThreadX Port (rm_threadx_port)	General PWM (r_gpt)			 Module g_timer_PWM Timer, General PWM (r_gpt) 	
System Thread				✓ General	
Azure RTOS GUIX				Name	g_timer_PWM
g_timer_PWM Timer, General PWM (r_gpt)				Channel	3
				Mode	PWM
				Period	50000
				Period Unit	Nanoseconds
				✓ Output	
				> Custom Waveform	
				Duty Cycle Percent (only applicable in PWM mode)	50
				GTIOCA Output Enabled	False
				GTIOCA Stop Level	Pin Level Low
				GTIOCB Output Enabled	True
				GTIOCB Stop Level	Pin Level Low
				✓ Input	
				Count Up Source	
				> Count Down Source	
				Start Source	
ects New Object > Remove				Stop Source	
_ , _				> Clear Source	
				Capture A Source	
				Capture B Source	
				Noise Filter A Sampling Clock Select	No Filter
				Noise Filter B Sampling Clock Select	No Filter
				> Interrupts	
				> Extra Features	
		\Box		✓ Pins	
				GTIOC3A	None
				GTIOC3B	P404
many RSP Clocks Pins Interrupts Event Links Stacks	Components			<	8

Figure 15. Settings Timer Property and DISP_BLEN pin P404



13. Configuration pin **P404** for the **DISP_BLEN** signal of the LCD panel.

Note: If the GTIOC3B Pin showed as <unavailable> then user needs to perform step 13 first then step 12.

elect Pin Configuration		I	📙 Export to CSV file 🔝 Confi	igure Pin Driver V	Varnings
RA8D1 EK	~	Manage configurations			
Generate data: g_bsp_p	in_cfg				
Pin Selection	E ⊕ ⊖ ↓ª₂	Pin Configuration		Cycle Pi	n Group
Type filter text		Name	Value	Lock L	ink
> TRG:ADC(Digital)	^	Pin Group Selection	Mixed		
> TRG:CAC		Operation Mode	GHOCA or GHOCB	_	
> Timers:AGT		✓ Input/Output			
✓ ✓ Timers:GPT		GTIOC3A	None		
GPTO		GHOC3B	¥ P404		4
GPT1					
GPT2					
SPT3					
GPT4		<			>
GPT5		-			-
GPT6		Module name: GPT3			
GPT7	~				
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration	Iterrupts Event Link	s Stacks Components		Generate Project	t Content
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration	P Configuration ×	s Stacks Components	🔓 Export to CSV file 👔 Confi	Generate Project gure Pin Driver V	Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK Generate data: g_bsp_p	iterrupts Event Link	s Stacks Components	🖫 Export to CSV file 👔 Confi	Generate Project gure Pin Driver V	Content
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration Gelect Pin Configuration RA8D1 EK Generate data: g_bsp_p Pin Selection	P Configuration × in_cfg III III IIIIIIIIIIIIIIIIIIIIIIIIIIIII	S Stacks Components Manage configurations Pin Configuration	🕌 Export to CSV file 💽 Confi	Generate Project igure Pin Driver V	Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK Image: Generate data: g_bsp_p Pin Selection Type filter text	iterrupts Event Link P Configuration × in_cfg III III IIIIIIIIIIIIIIIIIIIIIIIIIIIII	s Stacks Components Manage configurations Pin Configuration Name	🔓 Export to CSV file 👔 Confi Value	Generate Project gure Pin Driver V Cycle Pi Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK Image: Generate data: g_bsp_p Pin Selection Type filter text	iterrupts Event Link P Configuration × in_cfg III III IIIIIIIIIIIIIIIIIIIIIIIIIIIII	Stacks Components Manage configurations Pin Configuration Name Symbolic Name	Let to CSV file E Confi Value DISP_BLEN	Generate Project gure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK Image: Generate data: g_bsp_p Pin Selection Type filter text Image: Place Image: Place	iterrupts Event Link P Configuration × in_cfg III III IIIIIIIIIIIIIIIIIIIIIIIIIIIII	s Stacks Components Manage configurations Pin Configuration Name Symbolic Name Comment	Legent to CSV file E Confi Value DISP_BLEN	Generate Project igure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK Image: Generate data: g_bsp_p Pin Selection Type filter text Image: P400 Image: P400	P Configuration × in_cfg III IIII IIIIIIIIIIIIIIIIIIIIIIIIIIII	s Stacks Components Manage configurations Pin Configuration Name Symbolic Name Comment Mode	Legent to CSV file Confi Value DISP_BLEN Peripheral mode	Generate Project igure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK ✓ Generate data: g_bsp_p Pin Selection Type filter text ✓ P4 P400 ✓ P401 P402	iterrupts Event Link P Configuration × in_cfg III III IIIIIIIIIIIIIIIIIIIIIIIIIIII	s Stacks Components Manage configurations Pin Configuration Name Symbolic Name Comment Mode Pull up/down	Value DISP_BLEN Peripheral mode None	Generate Project igure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK Image: Selection Type filter text Image: Selection Imag	P Configuration × in_cfg IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	s Stacks Components Manage configurations Pin Configuration Name Symbolic Name Comment Mode Pull up/down IRQ	Value DISP_BLEN Peripheral mode None None	Generate Project gure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration ielect Pin Configuration RA8D1 EK Image: Generate data: g_bsp_p Pin Selection Type filter text Image: P400 Image: P401 Image: P403 Image: P404	iterrupts Event Link P Configuration × in_cfg IE IE IE III	s Stacks Components Manage configurations Pin Configuration Name Symbolic Name Comment Mode Pull up/down IRQ Output Type	Value DISP_BLEN Peripheral mode None None CMOS	Generate Project gure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK Image: Generate data: g_bsp_p Pin Selection Type filter text Image: P400 Image: P402 Image: P403 Image: P404 Image: P405	iterrupts Event Link P Configuration × in_cfg III III IIIIIIIIIIIIIIIIIIIIIIIIIIIII	s Stacks Components Manage configurations Pin Configuration Name Symbolic Name Comment Mode Pull up/down IRQ Output Type Drive Capacity	Export to CSV file Confi Value DISP_BLEN Peripheral mode None None CMOS L	Generate Project gure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration Gelect Pin Configuration RA8D1 EK Generate data: g_bsp_p Pin Selection Type filter text Y P4 P400 P401 P403 P404 P405 P406	iterrupts Event Link P Configuration × in_cfg	s Stacks Components Manage configurations Manage configurations Pin Configuration Name Symbolic Name Comment Mode Pull up/down IRQ Output Type Drive Capacity ✓ Input/Output	Value DISP_BLEN Peripheral mode None CMOS L	Generate Project gure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK ✓ Generate data: g_bsp_p Pin Selection	iterrupts Event Link	s Stacks Components Manage configurations Manage configurations Pin Configuration Name Symbolic Name Comment Mode Pull up/down IRQ Output Type Drive Capacity ✓ Input/Output P404	Value DISP_BLEN Peripheral mode None CMOS L Value	Generate Project igure Pin Driver V Cycle Pin Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK ✓ Generate data: g_bsp_p Pin Selection	iterrupts Event Link	s Stacks Components Manage configurations Manage configurations Pin Configuration Name Symbolic Name Comment Mode Pull up/down IRQ Output Type Drive Capacity ✓ Input/Output P404	Image: Second state of the second	Generate Project igure Pin Driver V Cycle Pi Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK ✓ Generate data: g_bsp_p Pin Selection	iterrupts Event Link	s Stacks Components Manage configurations Manage configuration Name Symbolic Name Comment Mode Pull up/down IRQ Output Type Drive Capacity ✓ Input/Output P404	Image: Second state of the second	Generate Project gure Pin Driver V Cycle Pi Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK ✓ Generate data: g_bsp_p Pin Selection Type filter text ✓ P4 ✓ P400 ✓ P401 ✓ P402 ✓ P403 ✓ P404 ✓ P405 ✓ P406 ✓ P407 ✓ P409	iterrupts Event Link	s Stacks Components Manage configurations Manage configuration Name Symbolic Name Comment Mode Pull up/down IRQ Output Type Drive Capacity ✓ Input/Output P404	Value DISP_BLEN Peripheral mode None CMOS L VOS L	Generate Project gure Pin Driver V Cycle Pi Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK ✓ Generate data: g_bsp_p Pin Selection Type filter text ✓ P4 ✓ P400 ✓ P402 ✓ P403 ✓ P404 ✓ P405 ✓ P406 ✓ P409 ✓ P409 ✓ P409	iterrupts Event Link P Configuration × in_cfg III III IIIIIIIIIIIIIIIIIIIIIIIIIIIII	s Stacks Components Manage configurations Manage configuration Name Symbolic Name Comment Mode Pull up/down IRQ Output Type Drive Capacity Input/Output P404 Module name: P404	Image: Second state of the second	Generate Project gure Pin Driver V Cycle Pi Link	t Content Varnings
mmary BSP Clocks Pins Ir *[ra8d1_guix_hello_world] FS in Configuration elect Pin Configuration RA8D1 EK ✓ Generate data: g_bsp_p Pin Selection Type filter text ✓ P4 ✓ P4 ✓ P400 ✓ P401 ✓ P403 ✓ P405 ✓ P406 ✓ P409 ✓ P410 ✓ P411 ✓ P412	iterrupts Event Link P Configuration × in_cfg IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	s Stacks Components Manage configurations Manage configurations Name Symbolic Name Comment Mode Pull up/down IRQ Output Type Drive Capacity ✓ Module name: P404 Port Capabilities: CEU: VIO_	Image: Second state of the second	Generate Project gure Pin Driver V Cycle Pi Link	t Content Varnings

Figure 16. Settings for Pin P404 DISP_BLEN



14. LCD_BLEN pin from the LCD panel will connect to DISP_BLEN pin P404 of the board RA8D1 Figure 17.



Figure 17. LCD_BLEN will connect to DISP_BLEN pin P404

15. Refer to "system_thread_entry.c" file in "**Source.zip**" for more information. This function below controls the PWM output.



Figure 18. gpt_timer_PWM



3. Adding and Configuring "Touch Function Driver"

1. Click "New Thread" and name "Touch Thread" with setting below.

tacks Configuration Threads New Thread Remove	Generate Project Content Thread Stacks Add stacks to the selected thread by using the 'New Stack' toolbar button (above), or by pasting here from the clipboard.	Touch Th Settings	Property Common Seneral Timer Trace	Value
Impact of the second	h Thread Stacks ♠ Extend Stack > Add stacks to the selected thread by using the 'New Stack' toolbar button (above), or by pasting here from the clipboard.	Settings	Property Common S General Timer Trace	Value
Intreads New Thread Remove Toucl 	h Thread Stacks		Common General Timer Trace	
 ✓ A HAL/Common <i>G</i>_joport I/O Port (r_ioport) <i>G</i>_Azure RTOS ThreadX Port (rm_threadx_port) <i>G</i>_System Thread <i>G</i>_Azure RTOS GUIX 	Add stacks to the selected thread by using the 'New Stack' toolbar button (above), or by pasting here from the clipboard.		> General > Timer > Trace	
g_ioport I/O Port (r_ioport) Azure RTOS ThreadX Port (rm_threadx_port) System Thread Azure RTOS GUIX	Add stacks to the selected thread by using the 'New Stack' toolbar button (above), or by pasting here from the clipboard.		> Timer > Trace	
Gloport (r_oport) Azure RTOS GUIX	Add stacks to the selected thread by using the 'New Stack' toolbar button (above), or by pasting here from the clipboard.		> Trace	
Azure RIOS IhreadX Port (rm_threadx_port) System Thread Azure RTOS GUIX	New Stack toolbar button (above), or by pasting here from the clipboard.			
System Ihread Azure RTOS GUIX	pasting here norn the clipboard.		> Performance	
TAZUTE RTOS GUIX	pasung nere nom die cipboard.		✓ RA	
			Hardware Thread Stack Monitoring	Disabled
g timer PWM Timer, General PWM (r_gpt)			> Interrupts	
Touch Thread			✓ Thread	
			Symbol	touch_threa
			Name	Touch Threa
			Stack size (bytes)	4096
2			Priority	3
Objects 🐑 New Object > 🐮 Remove			Auto start	Enabled
			Time slicing interval (ticks)	5

Figure 19. Add and Set TOUCH THREAD Properties

2. Click "New Stack" and add "External IRQ" module.



Figure 20. Add External IRQ



3. Name "g_touch_irq" g_touch_irq and setting External IRQ property.

tacks Configuration		Generate Project Content	g_touch_irq External IRQ (r_icu)			
Inreads New Thread Remove Image: State of the state	g_touch_irq External IRQ (r_icu) Stacks	New Stack > Extend Stack > Remove	Settings API Info	Property Common Parameter Checking Module g. touch_irq External IRQ (r_icu) Name Channel Trigger Digital Filtering Digital Filtering Sample Clock (Only valid Callback Pin Interrupt Priority Pins IRQ3	Value Default (BSP) g_touch_irq 3 Falling Enabled PCLK / 64 touch_irq_cb Priority 5 P510	

Figure 21. Setting External IRQ Properties

4. Configuration pin **P510** for **DISP_INT** signal pin.

*[ra8d1_guix_hello_world] FSP Configur	ation ×	Cananta	
Select Pin Configuration	[] Export to CSV	file ፤ Configure Pin D	river Warnings
RA8D1 EK	 Manage configurations 		
Generate data: g_bsp_pin_cfg			
Pin Selection $\models \oplus \models \downarrow_z^a$	Pin Configuration	20	ycle Pin Group
Type filter text	Name Pin Group Selection Operation Mode V Input/Output IRQ3	Value Mixed Custom	Lock
IRQ4 IRQ5 IRQ6 IRQ7 ~	< Module name: IRQ3		>

Figure 22. Configuration Pin P510 "IRQ3"



5. Click "New Stack" and add "I2C Master".





6. Name "g_i2c_touch" and setting property.



Figure 24. Name and Settings Property



7. Click "New Object" and add Semaphore.



Figure 25. Add New Semaphore

8. Name "Touch Semaphore" and setting Property.

🔯 *[ra8d1_guix_hello_world] FSP Configuration $ imes$			Propert	ies ×	
Stacks Configuration		Generate Project Content	g_new_s	emaphore0 Sema	phore
Threads New Thread Remove Image: Comparison of the second	g_i2c_touch I2C Master (r_iic_master) Stacks	New Stack >	Settings	Property Name Symbol Initial count	Value Touch Semaphore g_touch_semaphore 0
 System meau Azure RTOS GUIX g_timer_PVM Timer, General PWM (r_gpt) Touch Thread g_touch_irq External IRQ (r_icu) g_i2c_touch I2C Master (r_iic_master) 	Add DTC Driver for Transmission [Optiona	Add DTC Driver for Reception [Optional]			
Objects New Object > Remove g_touch_semaphore Semaphore					
Summary BSP Clocks Pins Interrupts Event Links Stac	< Ks Components	>		<	

Figure 26. Add and Name Touch Semaphore



9. Click "New Object" and add another Semaphore

		Generale Project Content
Threads New Thread Remove Image: Comparison of the system # HAL/Common # g_ioport I/O Port (r_ioport) # Azure RTOS ThreadX Port (rm_threadx_port) # System Thread # Azure RTOS GUIX # g_timer_PWM Timer, General PWM (r_gpt) # Touch Thread # g_touch_irq External IRQ (r_icu) # g_i2c_touch I2C Master (r_iic_master) 	g_i2c_touch I2C Master (r_iic_master) Stacks g_i2c_touch I2C Master g_i2c_touch I2C Master Add DTC Driver for Transmission [Optional	New Stack > Extend Stack > Remove r (r_iic_master) Add DTC Driver for Reception [Optional]
Objects New Object > Remove g_touch_semaphore Semaphore Event Flags Mutex Queue Semaphore Semaphore		, ,

Figure 27. Add Another New Semaphore

10. Name "I2C Semaphore" and setting Property.

stacks Configuration Gene			Generate Project Content	g_new_semaphore0 Semaphore		
Threads → All HAL/Co ⊕ g_io ⊕ Azur → System ⊕ g_tin ⊕ g_to ⊕ g_to ⊕ g_io ⊕ g_io	New Thread Remove Common port I/O Port (r_ioport) e RTOS ThreadX Port (rm_threadx_port) Thread e RTOS GUIX ner_PWM Timer, General PWM (r_gpt) hread uch_irq External IRQ (r_icu) c_touch I2C Master (r_iic_master)	g_i2c_touch I2C Master (r_iic_master) Stacks g_i2c_touch I2C Master g_i2c_touch I2C Master Add DTC Driver for Transmission [Optiona	Image: Stack > Extend Stack >	Settings	Property Name Symbol Initial count	Value I2C Semaphore g_i2c_semaphore 0
Dbjects g_touch_se g_i2c_sema	New Object > Remove emaphore Semaphore aphore Semaphore	<	>			

Figure 28. Add and Name I2C Semaphore

11. Wiring RA6M3G's LCD pins connector "NC1" to the pins header "J57" of EK-RA8D1 as shown below.

RA6M3 LCD Board needs to modify Pins Conr			nector ON RA8D1 Board			
Pins# on LCD	I CD Bin Nama			Pins # on	PASD1 Din Nama	
board	LCD PIII Name			RA8D1 board	RAODT FIII Naille	
Connector		Connector	Connect to	Connector J57		



RA6M3 LCD Board needs to modify			Pins Connector ON RA8D1 Board		
Pins# on LCD	I CD Pin Namo			Pins # on	PA8D1 Pin Namo
board				RA8D1 board	RAOD I FIII Naille
CN1 needs to		NC1			
		1			
2		2			
2		2	_	11	
3		3	7	11	
4		4	7	16	
5	SUL	5	7	4	
6	RGB_B1	6	7	15	
1	RGB_B4	1	→ -	20	
8	RGB_B3	8	→	17	LCDC_DATA03
9	RGB_B5	9	→	19	LCDC_DATA05
10	RGB_B2	10	→	18	LCDC_DATA02
11	RGB_B7	11	→	21	LCDC_DATA07
12	RGB_B6	12	→	22	LCDC_DATA06
13	RGB_G2	13	→	26	LCDC_DATA10
14	RGB_G0	14	→	24	LCDC_DATA08
15	RGB_G4	15	→	28	LCDC_DATA12
16	RGB_G3	16	→	25	LCDC_DATA11
17	RGB_G5	17	→	27	LCDC_DATA13
18	RGB_G1	18	→	23	LCDC_DATA09
19	RGB_G7	19	→	29	LCDC_DATA15
20	RGB_G6	20	→	30	LCDC_DATA14
21	IIC_SDA	21	→	2	IIC_SDA
22	RGB_R1	22	→	31	LCDC_DATA17
23	RGB_R4	23	→	36	LCDC_DATA20
24	RGB_R3	24	→	33	LCDC_DATA19
25	RGB_R5	25	→	35	LCDC_DATA21
26	RGB_R2	26	→	34	LCDC_DATA18
27	RGB_R7	27	→	37	LCDC_DATA23
28	RGB_R6	28	→	38	LCDC_DATA22
29	TCON0 = HSYNC	29	→	9	LCDC_TCON0
30	GND	30	→	39, 40	GND
31	OPEN	31			
32	TCON4 = VSYNC	32	→	12	LCDC TCON1
33	RGB R0	33	→	32	LCDC DATA16
34	OPEN	34			—
35	IIC RST	35	→	6	DISP RST
36	 =+V3.3	36	→	5, 7	_ =+V3.3
37	RGB CLK	37	- →	10	CLK
38		38	→	3	DISP INT
39		39	→	1	
40	=+V5.0	40	→	8	=+V5.0

Important note for touch function: User needs to add 10K Ohm resistor to R1 on connection board (40 pins board connect between LCD and J57 pins connector)





Figure 29. Schematic and Board Connection between LCD to J57 Connector on EK-RA8D1 Board

12. LCD Module pins connection



Figure 30. Set g_i2c_semaphore Semaphore Properties

The pins marked in a black square above are used for the touch panel controller on the LCD board:

- DISP_INT interrupt (P510) is used to trigger touch events.
- I2C channel 1 (P512, P511) is used to read and write data to the touch controller.
- Touch driver folder $touch_ft5x06$ for touch function is inside the provided Source folder.
- PA01 is used to reset the LCD's touch controller.



13. Note: Refer to the touch_thread_entry.c file in Source.zip for more information. The following code initializes the touch controller and process touch events.



Figure 31. Initializes the Touch Controller and Process Touch Events



14. From Stacks Configuration, click "Generate Project Content" to generate project content.

[ra8d1_guix_hello_world] F	SP Configuration × 🖻 hal_entry.c 🛛 🗎 tx_cm	isis.h	
Stacks Configuratio	n		Generate Project Content
Threads	🗟 New Thread 🗟 Remove 🗦	g_i2c_master0 I2C Master (r_iic_master) Stacks 🕙 New Stack	S ≗ Extend Stack > € Remove
 HAL/Common g_ioport I/O Port (System Thread Azure RTOS GUIX g_timer_PWM Time Touch Thread g_touch_irq Externa g_i2c_touch I2C M. 	ir_ioport) er, General PWM (r_gpt) al IRQ (r_icu) aster (r_iic_master)	g_i2c_touch I2C Master (r_iic_master)	
Objects	🕙 New Object > 🔞 Remove		
 g_touch_semaphore Sem g_i2c_semaphore Semaphore Se	naphore Jhore		
Summary BSP Clocks Pins I	nterrupts Event Links Stacks Components		



- 15. Unzip and open the provided folder Source.zip. Copy the four *.c files and one folder touch ft5x06 and paste into the folder src of your project "ra8d1_guix_hello_world".
 - Touch_ft5x06 folder
 - hal_entry.c
 - system_thread_entry.c
 - touch_thread_entry.c
 - windows_handler.c



Figure 33. Copied Folder and Files



4. Creating Folders in the Hello_World GUIX_EK_RA8D1 Project for Azure RTOS GUIX Studio Project

1. Under folder src create a new folder and name it guix_gen. Follow the image below, then click Finish.

ቕ Project Explo	orer ×		🏶 [ra8d1_q	guix_hello_world] F	SP Conf	figuratio	n × 🖻 hal
י ⊯ ra8d1_gu	uix_hello_world [Debug]		Stacks	Configuratio	n		
> 🔊 Includ	les						
> 🐸 ra der	n		Threads	🔁 N	lew Thre	ead 🔊 R	lemove 🗆
✓ [™] src			🗸 📲 НА	L/Common			
> 💽	New		>	Project			-
> 🖻 s	Go Into			File			
> 🖻 t	Open in New Window			Eolder	plate		(r. apt)
> 🗁 Det	Show In	Alt+	Shift+W >	Class			(-gpt)
> 🖻 ia_c	🗈 Сору		Ctrl+C	Header File			
🔅 con	Paste		Ctrl+V	Source File			7)
🖹 ra_c	 Delete Source 		Delete	Source Folder			
🗷 ra8c	Move		ŕ	C/C++ Project	t		_
> 🗷 Dev	Rename		F2	🖻 Example			
,	Import			🖻 Other	C	Ctrl+N	Remove
1	🖆 Export			h_semaphore Sem	naphore		
	Build Project		Ctrl+B	emaphore Semap	hore		
1	8 Refresh		F5				
New Fold	lor						\times
Folder	acı						
Folder	AC1						
Folder Create a nev	w folder resource.						
Folder Create a nev	w folder resource.						
Folder Create a nev Enter or selec	w folder resource. ct the parent folder:						
Folder Create a nev Enter or selec ra8d1_guix_l	w folder resource. ct the parent folder: hello_world/src						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ⇔ ⇔	w folder resource. ct the parent folder: hello_world/src						
Folder Create a nev Enter or selec ra8d1_guix_ ☆ ☆ ☆ ▼ ≝ ra8d1_	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug]						
Folder Create a nev Enter or selec ra8d1_guix_l Mathe ⇔ Y S ra8d1_ Back sett	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ⇔ ✓ ≝ ra8d1_ ▷ .sett ▷ Deb	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ☆ ☆ ♥ 營 ra8d1_ ֎ .sett @ Deb > @ ra	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ⇔ ↔ ✓ ≝ ra8d1_ ▷ sett ▷ Deb > ▷ ra_c	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ⇔ c × ≅ ra8d1_ ⊗ Deb > ⊗ ra > ⊗ ra_c ⊗ ra_c ⊗ c	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug cfg gen						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ☆ ☆ v 營 ra8d1_ œ .sett œ Deb > œ ra > @ ra_c œ scrig @ cre	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug cfg gen pt						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ⇔ ⇒ ✓ ≝ ra8d1_ ▷ beb > ▷ ra > ▷ ra_g ▷ srci ▷ src	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug cfg gen pt						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ☆ ☆ ✓ 營 ra8d1_ ▷ beb > ▷ ra > ▷ ra_c ▷ scrip ▷ src Folder name:	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug cfg gen pt						
Folder Create a nev Enter or select ra8d1_guix_l ☆ ☆ ☆ ra8d1_ ☆ .sett ŵ Deb > ŵ ra > ŵ ra_c ŵ ra_g ŵ src Folder name:	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug cfg gen pt : guix_gen						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ⇔ ⇔ ra8d1_ ☆ sett ⇒ Deb > ▷ ra > ▷ ra_c ▷ ra_c ▷ ra_c ▷ src Folder name: Advanced	w folder resource. ct the parent folder: hello_world/src guix_hello_world [Debug] tings bug cfg gen pt ; guix_gen >>						
Folder Create a new Enter or select ra8d1_guix_l ☆ ⇔ ⇔ ra8d1_ ☆ c ⇔ ra8d1_ c ⇒ c ra8d1_ c ⇒ c ra c ⇒ c s c ra c ⇒ scrip c > src Folder name:	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug cfg gen pt : guix_gen >>						
Folder Create a nev Enter or select ra8d1_guix_l ☆ ☆ ☆ ra8d1_ ☆ .sett ŵ beb > @ ra > @ ra > @ ra_c @ ra_g @ scrip @ src Folder name: Advanced	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug cfg gen pt ; guix_gen >>						
Folder Create a nev Enter or selec ra8d1_guix_l ☆ ⇔ ☞ ra8d1_ ☆ ⇒ sett ☆ beb ☆ ra_0 ☆ src Folder <u>n</u> ame: <u>A</u> dvanced	w folder resource. ct the parent folder: hello_world/src guix_hello_world [Debug] tings bug cfg gen pt guix_gen >>						
Folder Create a new Enter or select ra8d1_guix_l Create a new ra8d1_guix_l Create Create ra8d1_guix_l Create Create Scrip Create Scrip Create Scrip Create Scrip Create Scrip Create	w folder resource. ct the parent folder: hello_world/src _guix_hello_world [Debug] tings bug cfg gen pt >>			Einish		Cano	

Figure 34. Create and Name "guix_gen" Folder

2. Under folder src create a new folder and name it guix_studio. Then follow the image below and click **Finish**.



Figure 35. Create New Folder and Name "guix_studio"



3. Under folder guix_studio that was created earlier, create a new folder and name GNU. Follow the image below, then click **Finish**.

> 😕 ra		Thursda	A New Thread A Demove
> 😂 ra_gen		Threads	😢 New Thread 🐮 Remove 🕞
Y 🕮 src		# a iono	art I/O Port (r. joport)
> 🗁 guix_gen		✓ System Th	hread
Is nai_entry.c	and antry c	₽ Azure	RTOS GUIX
> le touch three	ad entry.c	⊕ g_time	er_PWM Timer, General PWM (r_gpt)
> 🗁 Debug		👻 🏶 Touch Thr	read
🖻 guix_studio		∉ g_touc	:h_irq External IRQ (r_icu)
> 🗁 ra_cfg	New	>	🖻 Project
> 🗁 script	Go Into		🖞 File
😨 configurati	Show In	Alt+Shift+W >	File from Template
ra_crg.txt I ra8d1 quiv	Сору	Ctrl+C	Folder
> ⑦ Developer	Paste	Ctrl+V	Source Folder re
•	Delete	Delete	C/C++ Project
	Move		🖻 Example
	Rename	F2	Ctrl+N
Create a new folder	resource.		
Create a new folder	arent folder:		
Create a new folder <u>Enter or select the pa</u> <u>ra8d1_guix_hello_wa</u>	resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the particular rascing the select the select the particular rascing the select the select the select the select the particular rascing the select the	resource. arent folder: orld/guix_studio		
Create a new folder Enter or select the pa ra8d1_guix_hello_wa ☆ ↔ ▷ .settings ▷ Debug	resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the pa ra8d1_guix_hello_w ☆ ⇔ .settings ▷ Debug ▷ guix studio	r resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the pa ra8d1_guix_hello_wa ☆ ↔ ▷ settings ▷ Debug ▷ guix_studic > ▷ ra	r resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the para ra8d1_guix_hello_wa ☆ ⇔ .settings ▷ Debug ▷ guix_studic > ▷ ra > ▷ ra_cfg	resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the pa ra8d1_guix_hello_wa	r resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the para ra8d1_guix_hello_wa ☆ ⇔ .settings ▷ Debug ▷ guix_studic > ▷ ra > ▷ ra_cfg ▷ ra_gen ▷ script	r resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the para $ra8d1_guix_hello_ward \textcircled{m} \Leftrightarrow \Leftrightarrow \textcircled{m} \Leftrightarrow \Rightarrow \textcircled{m} \Rightarrow $	r resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the para ra8d1_guix_hello_wa $ra8d1_guix_hello_wa ra8d1_guix_hello_wa ra8d1_guix_hello_wara8d1_guix_hello_wa ra8d1_guix_hello_wara8d1_guix_hello_wa ra8d1_guix_hello_wa$	r resource. arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the para ra8d1_guix_hello_wall	arent folder: orld/guix_studio		
Folder Create a new folder Enter or select the para ra8d1_guix_hello_wa	resource.		
Folder Create a new folder Enter or select the para ra8d1_guix_hello_way	resource.		
Folder Create a new folder Enter or select the para ra&d1_guix_hello_wa	resource.		

Figure 36. Create New Folder and Name "GNU"



4. After the sub-folder GNU is created, the folder structure should look like the image below.

EK_RA8D1 - ra8d1_guix_hello_world/configuration.xm	nl - e² studio				
<u>Eile Edit Source Refactor Navigate Search Project</u>	Renesas <u>V</u> iews <u>R</u>	un Renesas Al <u>W</u> indow <u>H</u> elp			
🗐 🕲 🕶 🔦 🕶 🖓 🖓 📴 🖬 🔍 🔯 🕶 💁 🕶					
Project Explorer X	🔅 [ra8d1_guix_h	ello_world] FSP Configuration $ imes$			
 ra8d1_guix_hello_world [Debug] Includes 	Stacks Conf	iguration			
> 🗁 ra > 🚰 ra_gen	Threads	🛃 New Thread ቘ Remove 📄			
 Src guix_gen touch_ft5x06 hal_entry.c system_thread_entry.c touch_thread_entry.c touch_thread_entry.c windows_handler.c Debug guix_studio GNU GNU script 	Inreads New Inread Remove Image: Remove Image: Remove Remove Image: Remove Image: Remove Image: Remove Image: Remove				
💱 configuration.xml	Objects	된 New Object > 🔬 Remove			
 ra_cfg.txt ra8d1_guix_hello_world Debug_Flat.launch Developer Assistance 	● g_touch_se ● g_i2c_sema	maphore Semaphore phore Semaphore			

Figure 37. Project with New Folder

5. Using Azure RTOS GUIX Studio create GUI Windows

1. Open Azure RTOS GUIX Studio v6.2.1.0 or greater.



Figure 38. GUIX Studio Icon

- 2. Create a New Project and name it Hello World.
 - A. Select **Project**. From the drop-down list, select **New Project**.
 - B. Project Name: Hello_World.
 - C. Project Path: Browse to the location of the folder you created in the ra8d1_guix_hello_world>
 - D. guix_studio\GNU as shown in the image below.
 - E. Hit **OK** button and then the **Save** button to confirm your selections.



G Azure RTOS GUIX Studio 6.2.1	.0 - Hello_World		-	\times
Project Edit Insert Configure	Help			
New Project	Ctrl+N	≝ № ⊑ ⊑ ⊖ ⊕ ■ ► ở 0		
Open Project Save Project Save Project As Close Project Import Project	Ctrl+O Ctrl+S Shift+Ctrl+S	Create New Project Project Name Hello_World Cilled Case is the full and the fu		
Recent Projects	>	Flojett Paul C. (WorkSpace acd_gur_letel_workigur_score(site) Browse Indicates required field		
Generate All Output Files Generate Resource Files Generate Specification Files		Cancel		
	Alt+F4	File Edit Source Refactor Navigate Search Project Renesas Views Run Window Help Image: Se		
		 > Includes > Includes		

Figure 39. GUIX Studio Creates Hello World Project

3. A new **Configure Project** window will pop up and user needs to set all the options as shown in **Figure 40**. included Advanced Settings. Finally, click **Save**.

Source Files\\src\gub Header Files\\src\gub Resource Files\\src\gub \\src\gub arget CPU Renesas RA oolchain GNU	_gen _gen _genAdvanced Settings	browse browse browse	Renesas Graphics A	dvanced Settir 🗙
Header Files\\src\gub Resource Files\\src\gub \\src\gub arget CPU Renesas RA oolchain GNU	Lgen	browse browse	Enable 2D Drawing Engine	
Resource Files\\src\gub arget CPU Renesas RA oolchain GNU	_gen	browse	✓ Enable 2D Drawing Engine	
arget CPU Renesas RA	Advanced Settings	Landon and and a second		
oolchain GNU	T AND YOU DE PET	1	Runtime Image Decoder	
oolchain GNU	Hardineed Seconda		JPEG: Software JPEG Deco	der ~
	👻 🗌 big endian]	PNG: Coffware PNC Decod	for V
dditional Headers		Insert Before	portware PNG Decod	
lumber of Displays	GUIX Library Version	6 2 2 0 2		
	,	Major Minor Patch	Cancel	Save
Display Configuration				
Display Number 1 🌲	Name display			
v resolution 480 r	ivals v resolution 272 n	ivale		
x resolution	vers y resolution are pr	Mel3		
O 1 bpp	grayscale [1:5:5:5 format		
2 bpp	invert polarity	4:4:4:4 format		
0 8 bpp	reverse byte order	3:3:2 format		
0 16 bpp	packed format			
24 bpp 22	allocate canvas memory	Rotation: None V		
O 32 opp				
umber of Dalette Mode Anti-	Vased Text Colors: 8			

Figure 40. Configuration New Project "Hello World" with Advanced Settings



4. Star New Project "Hello World" should look similar Figure 41.

G Azure RTOS GUI	K Studio 6.2.1.0 - Hello_World	ł						- 🗆 X
Project Edit Insert	Configure Help							
		ġ H∎ 😫	i G G	Ξ Q €		► - 4 [°]	0	
🔒 Project View	w	-			<u>.</u>			🛃 Theme: "theme_1"
B Hello_World								- Colors +
in the default fold	lor							T Fonts +
default_fold								
								♦ Strings +
Properties	View	-						
Widget Type	window							
Widget Name	window							
Widget Id								
User Data								
Left	0							
Тор	0							
Width	480							
Height	272							
Border	Thin Border							
Transparent								
Draw Selected								
Enabled		\checkmark						
Accepts Focus		\checkmark						
Runtime Allocate								
Normal fill	WINDOW_FILL	~						
Selected fill	WINDOW_FILL	~						
Disabled fill	DISABLED_FILL	\sim						
Template								
Visible At Startup								
Draw Function								
Event Function								
Wallpaper	None	~						
Tile Wallpaper								

Figure 41. After Settings New Project "Hello World"



5. Setting Properties View of Window1.

+ E		Ô	
- Project Vi	ew		
	ldor		
	лиен xw1		
E Properties	s View		-
Widget Type	window		
Widget Name	Window1		
Widget Id	ID_WINDOW1		
User Data			
Left	0		
Тор	0		
Width	480		
Height	272		
Border	No Border		
Transparent			
Draw Selected			
Enabled			\checkmark
Accepts Focus			\checkmark
Runtime Allocate			
Normal fill	WINDOW_FILL		×.
Selected fill	WINDOW_FILL		.~.
Disabled fill	WINDOW_FILL		~
Template			
Visible At Startup			
Draw Function			
Event Function	window1_screen	_event	
Wallpaper	None		~
Tile Wallpaper			

Figure 42. Property View of Window1



6. To add String ID, click on **Strings**. Follow the images below.

Theme: "theme_1"	
Colors	+
Fonts	+
9 Pixelmaps	4
Strings	



7. From the **Strings** dropdown, click **+ Add New String**.

🛃 Theme: "theme_	¢		
- Colors	Colors		
T Fonts		+	
Pixelmaps		+	
Strings		=	
String ID	English	41	
[+] Add New String	J		

Figure 44. Add New String

8. New String Table Editor window will pop up. Click the Add String button.

						×
Add String Delete	String Import	Export		Q	Sorting By: String ID	\sim
StringId 🔻	English 🔻	<u> </u>	4	Widgets that	use this string:	
STRING_1						
			* Indicates required field			
String ID: * STRING_1				Number of re	ferences:	0
String Text:				String width (pixels):	0
				Font:	SYSTEM	\sim
				Notes:		
Cancel				L		Save
						- Surc

Figure 45. String Table Editor



9. Edit String ID and String Text.

✤ String Table Ed	litor							×
Add String	Delete String	Import	Export		Q	Sorting By:	String ID	~
StringId 💌	Eng	llish ▼		•	Widgets that u	ise this string:		
CHECKBOX	_TEXT Pr	ess Me!						
				 Indicates required field 				
String ID: * CHE	ECKBOX_TEXT				Number of refe	erences:		0
String Text:	ess Me!				String width (p	ixels):		10
L					Font:	SYSTEM		\sim
					Notes:			
Cancel								Save

Figure 46. Edit String ID and String Text

10. Continue to click **Adding String**, then edit **String ID** and **String Text** until the table appears like **Figure 47** Then click the **Save** button.

String Table Editor		8
Add String Delete String Import	Export	Sorting By: None
StringId 🔻	English 🔻	Widgets that use this string:
CHECKBOX_TEXT	Press Me!	Window1.buttonenabler
INSTRUCT_CHECKBOX	Press to activate (blue), "Press me" for more.	
BUTTON_DISABLED	Stay in window1	Press Me!
WINDOW1	Window1	
HELLO_WORLD	Hello World -> Press anywhere to go to window 1	
WINDOW2	Window2	
BUTTON_ENABLED	GoTo Window 2	
INSTRUCT_BUTTON	Press "Goto window2" to show the next screen.	
String ID: * CHECKBOX_TEXT	* Indicates required fiel	d Number of references:
String Text: Press Me!		String width (pixels):
		Font: SYSTEM
		Notes:
Cancel		Save

Figure 47. All Strings



11. Right-click on **Window1** to insert a **Text Button** and follow Figure 48.

G Azure RTOS GUIX S	itudio 6.2.1.0 -	Hello_World							
Project Edit Insert Co	onfigure Help								
: 🖬 🖬	ж	li î	-	-	I	<u>Io</u>	를	₩Ĵ#	₽
H Project View			-						
Hello World									
display									
default folder									
Window1									
	Cut								
	Сору								
	Paste								
	Delete								
🔣 Properties									
Widget Type	Insert >	Folder							
Widget Name	Window1	Window	>				-		
Widget Id	ID_WINDOV	Button	>	Button			_		
User Data		Text	>	Text But	ton				
Left	0	Indicator	>	Multi Lii	ne Text B	utton			
Тор	0	Menu	>	Checkb	ох				
Width	480			Radio B	utton				
Height	272			Icon Bu	tton				
Border	No Border		~	Pixelma	p Buttor	า			
Transparent				lcon					
Draw Selected									
Enabled			\checkmark						
Accepts Focus			\checkmark						
Runtime Allocate									
Normal fill	WINDOW_FI	LL	~						
Selected fill	WINDOW_FI	LL	\sim						
Disabled fill	WINDOW_FI	LL	~						
Template									
Visible At Startup									
Draw Function									
Event Function	window1_scr	een_event							
Wallpaper	None		×.						
Tile Wallpaper									

Figure 48. Insert Text Button



12. Set Properties View of "text_button".

roject Edit Insert Configure Help Project View Hello_World Generation Properties View	
Project View Project View Hello_World display default_folder Window1 Window1 Window1 Project View Window1 Window2 Window1	
F. Project View Hello_World Hello_World Gisplay Gisplay Windowthanger Windowchanger idget Type text_button idget Name idget Id ID_WINDOWCHANGER ser Data eft 22 op 32 idith 204 eight 50 order ansparent raw Selected nabled ccepts Focus untime Allocate ormal fill BTN_LOWER elected fill isabled fill BTN_LOWER araw Function vent Function ushed raw Function ushed idito Repeat into Repeat into Repeat	
Hello_World I display I diget Name I diget Name I diget I d I display	
Image: Properties View Windowchanger Windowchanger Idget Type text_button idget Name Windowchanger idget Id ID_WINDOWCHANGER idget Id ID_WINDOWCHANGER idget Id 22 idget Id 22 idget Id 204 eight 50 order No Border ansparent View raw Selected No Border ansparent Ser Data raw Selected BTN_LOWER ordal fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER went Function Intervert Function vent Function Intervert Function ushed	-
Gefauit_folder Windowchanger Windowchanger ridget Type text_button ridget Name windowchanger ridget Id ID_WINDOWCHANGER ser Data ID_WINDOWCHANGER ser Data 22 op 32 ridth 204 eight 50 order No Border ansparent VintoWER raw Selected VintoWER bindth BTN_LOWER ceepts Focus BTN_UPPER sabled fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER order Identifier isabled fill BTN_LOWER raw Function Identifier orgele Identifier adio Identifier	-
Image: Window Image: Window <td< td=""><td>-</td></td<>	-
Properties View Properties View ridget Type text_button ridget Name windowchanger ridget Id ID_WINDOWCHANGER ser Data 22 op 32 ridth 204 eight 50 order No Border ansparent Vert Function raw Selected BTN_LOWER ormal fill BTN_LOWER elected fill BTN_LOWER asabled fill BTN_LOWER ormal fill BTN_LOWER elected fill BTN_LOWER ormal fill BTN_LOWER elected fill BTN_LOWER orgel Addio utine Allocate Comman fill BTN_LOWER Comman fill BTN_LOWER Comman fill BTN_LOWER Comman fill BTN_LOWER Comman fill Itsabled Structure itsabled Structure itsabled Structure itsabled <th< td=""><td>-</td></th<>	-
Properties View ridget Type text_button ridget Name windowchanger ridget Id ID_WINDOWCHANGER ser Data 22 ser Data 22 op 32 ridth 204 eight 50 order No Border ansparent vintime Allocate ormal fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER isabled fill BTN_LOWER raw Function Image Allocate orgele Jourder adio Jourder	
Indiget Pype Initial Server Serv	
Independence Independence fidget Id ID_WINDOWCHANGER ser Data 22 op 32 idth 204 eight 50 porder No Border ansparent Mo Border raw Selected No Border ansparent Ser Data raw Selected Ser Data order BTN_LOWER ormal fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER ushed Ser Data yent Function Ser Data ushed Ser Data orgele Ser Data adio Ser Data uto Repeat None	×
Insperior Isser Notion attemption ser Data Isser Data eff 22 idth 204 eight 50 order No Border ansparent Isser Data raw Selected Isser Data nabled Isser Data ccepts Focus Isser Data untime Allocate BTN_LOWER ormal fill BTN_LOWER elected fill BTN_LOWER isabled fill BTN_LOWER ormal fill BTN_LOWER isabled fill BTN_LOWER orggle Isabled isabled fill BTN_LOWER isabled Isable isabled Isable isabled Isable isabled Isable isabled Isable isable Isable	×
eft 22 pp 32 idth 204 eight 50 order 80 order 80 ansparent 50 raw Selected 70 habled 70 ccepts Focus 70 untime Allocate 70 ormal fill 8TN_LOWER 70 elected fill 8TN_UPPER 70 elected fill 8TN_LOWER 70 pagle 70 vent Function 70 vent	×
pp 32 idth 204 eight 50 order No Border ansparent No Border raw Selected Imabled ccepts Focus Imabled untime Allocate BTN_LOWER ormal fill BTN_UPPER elected fill BTN_LOWER isabled fill BTN_LOWER ushed Image: Comparent of the second of	~
idth 204 204 50 No Border 201 ansparent 50 ansparent 70 raw Selected 70 nabled 70 ccepts Focus 70 untime Allocate 70 ormal fill 8TN_LOWER 70 elected fill 8TN_UPPER 70 elected fill 8TN_LOWER 70 10 sabled 70 10 sabled 70 10 10 10 10 10 10 10 10 10 10 10 10 10	~
idit 204 eight 50 order No Border ansparent In Border raw Selected Inabled ccepts Focus Intime Allocate ormal fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER ushed Intime Allocate orggle Intime Allocate indicate Intime Allocate	~
brider No Border No Border No Border No Border Ansparent Selected Anabled Selected S	~
Into Dorder ansparent raw Selected habled ccepts Focus untime Allocate bornal fill BTN_LOWER elected fill BTN_LOWER elected fill BTN_LOWER vent Function Image: Comparent of the second o	
raw Selected habled ccepts Focus untime Allocate ormal fill BTN_LOWER elected fill BTN_UPPER isabled fill BTN_LOWER CCEPT STATES	
habled ccepts Focus untime Allocate fill BTN_LOWER elected fill BTN_UPPER isabled fill BTN_LOWER action vent Function ushed oggle adio uto Repeat tring ID None	
cccepts Focus untime Allocate ormal fill BTN_LOWER elected fill BTN_UPPER isabled fill BTN_LOWER raw Function Image: Comparison of the second of th	
adio Untime ID Untime Allocate Dermal fill BTN_LOWER BTN_UPPER BTN_LOWER BTN_D BTN	
anime rated and a second and a	
elected fill BTN_UPPER isabled fill BTN_LOWER aw Function vent Function ushed uggle adio uto Repeat tring ID None	
isabled fill BTN_LOWER isabled fill BTN_LOWER isabled fill BTN_LOWER isabled fill BTN_LOWER isabled is	×
raw Function vent Function ushed uggle adio uto Repeat tring ID None	~
vent Function ushed ushed oggle adio uto Repeat tring ID None	
ushed ggle adio uto Repeat rring ID None	_
inggle adio uto Repeat tring ID None	
adio uto Repeat ring ID None	H
uto Repeat tring ID None	
ring ID None	H
	~
ext	
ont PROMPT	~
ext Align Center	~
ormal Text Color BTN TEXT	_
elected Text Color BTN TEXT	\sim
isabled Text Color BTN_TEXT	×
ivate Text Copy	×
	×

Figure 49. Properties View of text_button



13. Right-click windowchanger to insert a Prompt and follow Figure 50.

G Azure RTOS GUIX S	itudio 6	.2.1.0) - He	ello_\	Norlo	d.gxp	C											
Project Edit Insert C	onfigu	re H	elp															
	Û			Ī		콜	∎{]∎	Ē	₫	-		[□]	Q	Ð,	∎∢	►	-Â	?
🕂 Project View			Circles I				-											
🕒 Hello_World																		
🖻 🖵 display																		
🖃 😑 default_folder	r																	
🗎 📄 Window1																		
windov	wchang	er	Cu	ıt														
Properties View			Сс	ру			-											
Widget Type	text_	b	Pa	ste		- Г												
Widget Name	win	dc	De	elete														
Widget Id	ID_	W	Inc	ort		2	E	older			18							
User Data			1112	sert		·		<i>l</i> inda										
Left	22						VI D	nnao 	vv									
Тор	32						В	utton		>		_			_	_	_	_
Width	204	ļ					Te	ext		>		Pro	ompt	t				
Height	50						Ir	ndicat	tor	>		Nu	imeri	ic Pro	mpt			
Border	No	Borde	er				Ν	lenu		>		Pix	elma	ap Pro	ompt			
Transparent								Г				Nu	imeri	ic Pix	elmap	o Pro	mpt	
Draw Selected											_	Sir	ngle I	ine l	nput			
Enabled							\checkmark					M	ulti Li	ne Vi	ew			
Accepts Focus							\checkmark					M	ulti Li	ne In	put			
Runtime Allocate												Ric	ch Tex	xt Vie	w			

Figure 50. Insert Prompt



14. Set Properties View of prompt.



Figure 51. Properties View of Prompt



15. Insert new Button. Right-click on windowchangertext and follow Figure 50.

G Azure RTOS GUIX Stud	lio 6.2.1.0 - H	lello_W	orld.	gxp												
Project Edit Insert Con	figure Help															
🕂 🖿 🖬 🗶 📴	0 🖻 🖻		<u>I</u> 0	콜	∎}∎	₽	₫		4		Q	Ð,	∎∢		-Â	?
Roject View			Ser. Ser.			-										
🗎 Hello_World																
😑 🖵 display																
😑 😑 default_folder																
🗎 📑 Window1																
🖻 📼 windowcł	nanger	_														
T. windo	wchangertex	ţ				.										
Properties View		C	Cut			-										
Widget Type	prompt	C	Сору													
Widget Name	windowchand	P	Paste													
Widget Id	ID_WINDOW	, C	Delete	e		H										
User Data		h	nsert		>		Fold	ler								
Left	44						Win	dow		>						
Тор	42						Butt	on		>	ł	Butto	n			
Width	160						Text			>	1	Text B	utton			
Height	30						Indi	cator		>	I	Multi	Line 1	Text E	Buttor	·
Border	No Border						Men	nu		>	(Check	box			
Transparent	ansparent								Radio Button							
Draw Selected							1	con F	Ruttor	1						
Enabled	\checkmark					1			utto							
Accepts Focus												ixein	ар Б	utto		
Runtime Allocate												con				

Figure 52. Insert Button



16. Set the Properties view of button.

roject Edit Insert Configure Help
Project View Project View display default_folder Window1 windowchanger window1changer window1changer vidget Type button vidget Type button vidget Id ID_WINDOW_1_CHANGER eft 22 opp 32 vidth 204 eight 50
 Project View display default_folder Window1 windowchanger window1changer window1changer Properties View Vidget Type button Vidget Id ID_WINDOW_1_CHANGER eft 22 pp 32 Vidth eight 50 order No Border
display default_folder Window1 windowchanger window1changer Vidget Type button Vidget Name Vidget Id ID_WINDOW_1_CHANGER ser Data eft 22 Vidth 22 Vidth 24 25 Vidth 26 27 28 29 20
 Window1 windowchanger window1changertext window1changer Properties View Vidget Type button Vidget Name window1changer ID_WINDOW_1_CHANGER ser Data ID_WINDOW_1_CHANGER ser Data 22 A add A add
Image: Second
Properties View /idget Type /idget Name /idget Id /idget Id /idget Name /idget Id /idget Name /idget Id /idget Id </td
Properties View Indget Type Vidget Type Vidget Name Vidget Name Vidget Id ID_WINDOW_1_CHANGER ser Data eft 22 opp 32 Vidth eight 50 order
Properties View - /idget Type button /idget Name window1changer /idget Id ID_WINDOW_1_CHANGER ser Data - eft 22 opp 32 /idth 204 eight 50 order No Border
Vidget TypebuttonVidget Namewindow1changerVidget IdID_WINDOW_1_CHANGERser Data22eft22opp32Vidth204eight50orderNo Border
Vidget Namewindow1changerVidget IdID_WINDOW_1_CHANGERser Data22eft22opp32Vidth204eight50orderNo Border
Vidget IdID_WINDOW_1_CHANGERser Data22eft22op32Vidth204eight50orderNo Border
ser Data 22 eft 22 opp 32 /idth 204 eight 50 order No Border ~
eft 22 op 32 /idth 204 eight 50 order No Border ~
op 32 /idth 204 eight 50 order No Border
/idth 204 eight 50 order No Border ~
eight 50 order No Border ~
order No Border 🗸
ansparent 🗸
raw Selected
nabled
ccepts Focus
untime Allocate
ormal fill BTN_LOWER ~
elected fill BTN_UPPER ~
isabled fill DISABLED_FILL ~
raw Function
vent Function
ushed
oggle
adio
uto Repeat

Figure 53. Properties View of Button



17. Insert **Prompt**. Right click on **Window1** and follow **Figure 54**. Insert two times to get two prompts. **Prompt** and **Prompt1** will show up once you finish.

		ĥ		⊒		In	토	B.
					•		-	
			-					
default folde	r							
Window1								
	Cut							
T N	Сору							
L(Paste							
	Delete							
	lnsert →	Folder	1					
	liow	Window	>					
	window	Button	>					
Widget Name	Window1	Text	>	Pron	npt			
Widget Id		Indicator	>	Num	neric Pron	npt		
User Data		Menu	>	Pixel	map Proi	npt		
l eft	0			Num	eric Pixel	map Pror	npt	
Тор	0			Sina	le Line In	out		
•	480			Mult	i Line Vie	N		
Width	100							
Width Height	272			Mult	i Line Inp	ut		
Width Height Border	272 No Border			Mult Rich	i Line Inp Text View	ut /		
Width Height Border E IGI Az Project	272 No Border	Studio 6.2.1. Configure <u>F</u>	0 - Hel	Mult Rich	i Line Inp Text View d	ut ,		
Width Height Border IGI Az Project	272 No Border zure RTOS GUIX t <u>E</u> dit Insert (Studio 6.2.1. Configure <u>F</u> X	0 - Hel lelp	Mult Rich	i Line Inp Text View	 ut ,		
Width Height Border Terrorer IGI Az Project I H P	272 No Border	Studio 6.2.1. Configure <u>F</u> X	0 - Hel lelp	Mult Rich	i Line Inp Text View	Le contra de la co		
Width Height Border IGI Az Project I Hell	272 No Border zure RTOS GUIX t Edit Insert 9 Froject View o_World	Studio 6.2.1. <u>C</u> onfigure <u>F</u> X	0 - Hel	Mult Rich	i Line Inp Text View	 ut ,		
Width Height Border Toject Broject Broject Hell	272 No Border zure RTOS GUIX t Edit Insert 9 Project View o_World display	Studio 6.2.1. Configure <u>F</u>	0 - Hel lelp	Mult Rich	i Line Inp Text View	Le contraction de la contracti		
Width Height Border T Project E Hell	272 No Border zure RTOS GUIX t <u>E</u> dit Insert 9 Project View o_World display e default folde	Studio 6.2.1. Configure <u>F</u> X	0 - Hel lelp	Mult Rich	i Line Inp Text View	 ut ,		
Width Height Border T	272 No Border Zure RTOS GUIX t Edit Insert 9 Project View o_World display default_folde	Studio 6.2.1. Configure <u>F</u> X	0 - Hel lelp	Mult Rich	i Line Inp Text View	ut		
Width Height Border T IGI Az Project I Hell B I Hell	272 No Border	Studio 6.2.1. Configure <u>H</u> X	0 - Hel	Mult Rich	i Line Inp Text View	 ut ,		
Width Height Border T	272 No Border Zure RTOS GUIX t Edit Insert 9 Project View o_World display default_folde display default_folde	Studio 6.2.1. Configure <u>F</u>	0 - Hel lelp	Mult Rich	i Line Inp Text View	 ut ,		
Width Height Border T Project	272 No Border Zure RTOS GUIX t Edit Insert 9 Project View o_World display default_folde Window1 Window1 Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_folde Default_f	Studio 6.2.1. Configure <u>H</u> X 7	0 - Hel	Mult Rich	i Line Inp Text View	 ut ,		
Width Height Border T	272 No Border Zure RTOS GUIX t Edit Insert 9 Foject View o_World display default_folder Window1 Form Form Form Communication	Studio 6.2.1. Configure <u>F</u> X	0 - Hel	Mult Rich	i Line Inp Text View	 ut ,		

Figure 55. Insert Prompts



18. Set the Properties View of Prompt.

G Azure RTOS GUI	(Studio 6.2.1.	0 - Hello <u>.</u>	_World	
<u>P</u> roject <u>E</u> dit <u>I</u> nsert	<u>C</u> onfigure <u>H</u>	elp		
+ 🗁 🖬	ж ж	B	Ô	
H Project Vie	w			-
🖻 Halla Warld				
	lor			
	iei ,1			
	uctions			
	ant 1			
□ pron	owchanger			
	vindowchange	rtext		
	⊃window1ch	anger		
		gei		
EProperties	View			-
Widget Type	prompt			
Widget Name	instructio	ns		
Widget Id	ID_INST	RUCTIONS	5	
User Data				
Left	19			
Тор	120			
Width	445			
Height	90			
Border	No Borde	er		\sim
Transparent				
Draw Selected				
Enabled				
Accepts Focus				
Runtime Allocate				
Normal fill	WIDGET	FILL		~
Selected fill	SELECT	ED_FILL		~
Disabled fill	WIDGET	FILL		\sim
Draw Function				
Event Function				
String ID	INSTRUC	CT_CHEC	KBOX	\sim
Text	Press to a	activate (b	lue), "Pres	s me" for
Font	PROMP	Γ		~
Text Align	Center			~
Normal Text Color	TEXT			~
Selected Text Color	SELECT	ED_TEXT	Г	\sim
Disabled Text Color	TEXT			~
Private Text Copy				

Figure 56. Properties View of Prompt



19. Set the Properties View of Prompt1.



Figure 57. Properties View for Prompt1



20. Insert **button Checkbox**. Right click on **Window1** and follow Figure 58.

	configure ricip	-	-	_1	_	-	-		
	X I	3 10					<u></u>		
🕂 Project Viev	N		-						
🖻 Hello_World									
🖶 🖵 display									
🖶 🗀 default_fold	er								
🖻 🗖 Window	1								
T ins	Cut								
T wir	Сору								
🖻 📼 wir	Paste								
—T	Delete								
	Insert >	Folder							
Properties	√iew	Window	>						
Widget Type	window	Button	>	Button	l				
Widget Name	Window1	Text	>	Text Bu	itton				
Widget Id	ID_WINDOW	Indicator	>	Multi L	ine Text Bu	utton			
User Data		Menu	>	Check	хох				
Left	0			Radio	Button				
Тор	0			Icon Button					
Width	480			Pixelmap Button					
Height	272			lcon					

Figure 58. Insert Button Checkbox



21. Setting Properties View of Button Checkbox.

G Azure RTOS GUIX	Studio 6.2.1.0 - He	llo_World	
<u>P</u> roject <u>E</u> dit <u>I</u> nsert <u>(</u>	<u>C</u> onfigure <u>H</u> elp		
8 🖬 🖬	였 년	Û	
+ Project View	1		-
B Hello World			^
display			
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	r		
- 🗹 buttor	nenabler		
T. instruc	ctions		
T windo	w1_text		\checkmark
📰 Properties V	/iew		
Widget Type	checkbox		^
Widget Name	buttonenabler		
Widget Id	ID_BUTTONEN	ABLER	
User Data			
Left	311		
Тор	34		
Width	160		
Height	50		
Border	No Border		~
Transparent			
Draw Selected			
Enabled			
Accepts Focus			\checkmark
Runtime Allocate			
Normal fill	BTN_LOWER		~
Selected fill	BTN_UPPER		~
Disabled fill	BTN_LOWER		~
Draw Function			
Event Function			
Pushed			
Toggle			\checkmark
Radio			
Auto Repeat			
String ID	CHECKBOX_T	EXT	×*.
lext	Press Me!		
Font	BUTTON		×*:
lext Align	Left		×.
Normal Text Color	BIN_TEXT		· · · ·
Disabled Text Color	BIN_IEXI		×**
Disabled lext Color	BIN_TEXT		×*1
Private Text Copy			
Chocked Pixelmap	CHECKBOX_0		×.
Unchocked Dischlad	CHECKBOX_0	IN	~
Sinchecked Disabled	None		2 ~ 2

Figure 59.	Setting Button	Checkbox	Properties
------------	----------------	----------	------------



22. After you have finished creating **Window1**, it should be like the image below.

Project Edit Insert Con	figure <u>H</u> elp																	X
0 6 8																		
	光 孑	Û		-	I	<u>Io</u>	÷	∎{}∎	HCH	Q	G.	G		Q	Ð	■4	•	-A'
H Project View			-									📮 The	me: "th	eme	1"			
🗎 Hello World																		
display												Col	ors					
default folder												T For	nts					
											1		elmans			i shanan sha		ou ou ou ou o
- Juttonena	abler												amapo					
. instruction	ns											🧄 Stri	ngs					
™ window1	text											String I	D	Eng	lish			
i windowch	nanger											BUTTON_	DISABLED	Stay i	n window1			
🗎 📼 windo	wchangertext											BUTTON E	NABLED	GoTo	Window 2			
wir	ndow1changer											CHECKBO	X TEXT	Press	Me!			
Properties View	N	este streament of	-									HELLOW	ORID	Hello	World -> Pre	ss anvwhe	re to ao to	window 1
Widget Type	window											INSTRUCT	BUTTON	Press	"Goto winde	ow2" to she	w the next	screen
Widget Name	Window1											INSTRUCT) Proce	to activate /	blue) "Pre-	se mo" for	moro
Widget Id	ID WINDOW1											INSTRUCT	_CHECKBU	// Press	to activate (Diue), Pre	ss me Tor	more.
User Data			_									WINDOW1		Windo	ow1			
Left	0											WINDOW2		Winde	ow2			
Тор	0				Stay in v	window1			Press Me	9!		STRING_1		buttor	1			
Width	480											STRING_2		prom	ot			
Height	272											STRING_3		check	box			
Border	No Border		×.		Press t	o activat	e (blue), '	Press m	e" for mor	e.		+ Add N	lew String					
Transparent																		
Draw Selected								_										
Enabled			\checkmark				Windo	w1										
Accepts Focus			\checkmark	-							+							
Runtime Allocate																		
Normal fill	WINDOW_FILL		~															
Selected fill	WINDOW_FILL		\sim															
Disabled fill	WINDOW_FILL		×.															
Template																		
Visible At Startup																		
Draw Function		4																
Event Function	window1_screen_ev	rent																
wanpaper	NONE		~															
пе нафара												<						3

Figure 60. Window1 Created

23. Insert Window2. Right click on default_folder and Insert > window > window follow Figure 61.



Figure 61. Insert Window2



24. Setting Properties View of Window2.

G Azure RTOS GUIX	Studio 6.2.1.0 - H	ello_World	
<u>P</u> roject <u>E</u> dit <u>I</u> nsert	<u>C</u> onfigure <u>H</u> elp		
	X B	Û	
Project View	/		
uerauit_roide			
	nenabler		
▼ butto	ctions		
T windo	wil text		
	wchanger		
	ndowchangertext		
	window1changer		
- Window?	s s s s s s s s s s s s s s s s s s s		
			~
E Properties V	/iew		-
Widget Type	window		
Widget Name	Window2		
Widget Id	ID_WINDOW2		
User Data			
Left	0		
Тор	0		
Width	480		
Height	272		
Border	No Border		×.
Transparent			
Draw Selected			
Enabled			\checkmark
Accepts Focus			\checkmark
Runtime Allocate			
Normal fill	WINDOW_FILI	_	~
Selected fill	WINDOW_FILI	_	×.
Disabled fill	WINDOW_FILI	_	~
Template			
Visible At Startup			
Draw Function			
Event Function	window2_scree	en_event	
Wallpaper	None		×.
Tile Wallpaper			

Figure 62. Setting Properties of Window2



25. Insert **Prompt** for Window2. Right click from **Window2**. **Insert > Text > Prompt** follow Figure 63.

		- P	Ê		믜		In		∎í
								-	
H Project v	lew			-					
🖹 🖳 display				^					
🖻 🕒 default_f	older								
🖻 🗄 Wind	ow1								
- ✓ bi	uttonenabler								
T. In	structions								
T W	indow1_text								
	Indowcnanger	havet							
	windowchangen	lexi							
	window renal	ngei		- 11					
	Cut	L		×					
III Propertie	S \ Copy			-					
Widget Type	Paste								
Widget Name	Delete	-							
Widget Id	Delete	_							
User Data	Insert	>	Folder						
Left	0		Window	>					
Тор	0		Button	>					_
Width	480		Text	>	Pro	ompt			
Height	272		Indicator	>	Nu	meric Pro	mpt		
Border	No Border	r	Menu	>	Pix	elmap Pro	ompt		
Transparent					Nu	meric Pixe	elmap Pro	mpt	
Draw Selected					Sin	gle Line l	nput		
Enabled				\checkmark	Mu	ılti Line Vi	ew		
Accepts Focus				\checkmark	Mu	ılti Line In	put		
Puntimo Allocato					Ric	h Taxt Via			

Figure 63. Insert Prompt for Window2



26. Setting Properties View of Prompt.

+ -	X 틸	Ô	
🕂 Project View	N		-
default_fold	er 1 onenabler		^
□ instru □ I instru □ I winde □ I winde □ I w □ I w □ I w □ I w □ I w □	ictions ow1_text owchanger indowchangertext window1changer 2		
	ow2_text		~
E Properties	View		-
Widget Type	prompt		
Widget Name	window2_text		
Widget Id	ID_WINDOW2_TEX	K T	
User Data			
Left	196		
Тор	244		
Width	80		
Height	24		
Border	No Border		~
Transparent			\checkmark
Draw Selected			
Enabled			
Accepts Focus			
Runtime Allocate			
Normal fill	WIDGET_FILL		~
Selected fill	SELECTED_FILL		~
Disabled fill	WIDGET_FILL		~
Draw Function			
Event Function			
String ID	WINDOW2		~
Text	Window2		
Font	PROMPT		\sim
Text Align	Center		~
Normal Text Color	TEXT		~
Selected Text Color	SELECTED_TEXT		~
Dischlad Text Color			~

Figure 64. Setting Properties of window2_text



27. Insert **text_button** for window2. Right click from **Window2** > **Insert** > **Button** > **Text_Button** follow Figure 65.

Azure RTOS GUIX Studio 6.2.1.0 - Hello_World										
Project Edit Insert Co	nfigure Help									
+ 🛏 🖬	ж	9	Û				<u>Io</u>	뤁		
🕂 Project View		-								
				^						
🖶 📑 Window1										
🚽 🗹 buttoner	nabler									
- Instructio	ons									
T window1	l_text									
🖻 🗉 windowd	changer									
🖻 🖳 🖬 winde	owchangertex									
w	indow1chang									
🖻 📑 Windov 2	Cut									
winc	Conv			\sim						
	Deste									
Widget Name	idget Type Delete									
Widget Id	Insert 2	> Fo	older							
		2 W	/indow	>	+					
	0	В	utton	\rightarrow	Button					
Top	0	Te	ext	>	Text Bu	itton				
Width	In	dicator	>	Multi L	ine Text	Button				
Height	272	lenu	>	Check	хос					
Border	No Border		~	Radio	Button					
Transparent	NO DOIGCI				Icon B	utton				
Draw Selected					Pixelm	ap Butto	n			
Enabled					lcon					

Figure 65. Insert text_button for Window2



28. Setting Properties View of text button.

Project Edit Insert Configure	Help		
Project Lait Insert Configure	Help		
Project View		e.	
Project View	-9 	•	
			-
🖶 🖭 windowchang	jertext		^
window1c	hanger		
Window2			
window2 text			
window2changer			
Properties View			-
Nidget Type text_but	ton		
Widget Name window	/2changer		
Nidget Id ID_WIN	IDOW_2_CHA	NGER	
Jser Data			
_eft 31			
Гор 28			
Vidth 420			
Height 212			
Border No Bord	der		~
Fransparent			
Draw Selected			
Enabled			\checkmark
Accepts Focus			\checkmark
Runtime Allocate			
Normal fill SELEC	TED_FILL		~
Selected fill SELEC	TED_FILL		~
Disabled fill BTN_L	OWER		~
Draw Function			
Event Function			
Pushed			
loggle			
Radio			
Auto Repeat			
String ID HELLO)_WORLD		×.
	ond -> Press a	inywhere to g	30 10
Fort Align	PI		· · ·
Vormal Text Color			· · ·
Selected Text Color			· · · ·
Disabled Text Color			
Drivate Text Conv			~
пиате техт Сору			

Figure 66. Setting Properties of text_button



29. After Insert and configuration. Window2 looks like Figure 67.

G Azure RTOS GUIX S	Studio 6.2.1.0 - Hello_	World													_		×
<u>Project</u> <u>Edit</u> Insert <u>C</u>	onfigure <u>H</u> elp																
0 5 8	※ ⑮	ô 🕒	-		<u>Io</u>	콭	# 0 #		∎₫	ц.	4	[□]	Q	æ	•	•	-Â
🔒 Project View		-									🖳 Tr	neme: '	'them	e_1"			
🖃 🗉 win	dowchangertext	^									C	olors	Steche Cherry		Chesnes nes nes n		
L	window1changer													NACIONAL CARGO	Checkeloneck		
🗎 📑 Window2											T F	onts					
T window	w2_text										P P	xelmap	os				
windov	w2changer	~									View	Dims	Name	e			
	iow										S	/stem					
	text button											16 x 16	CHECK	BOX OFF			1KB
Widget Name	window2changer										-	10 × 10	ONEON	Box_on			ind
Widget Id	ID_WINDOW_2 CH	ANGER										16 x 16	CHECK	BOX_ON			1KB
User Data											0	16 x 16	RADIO	OFF			1KB
Left	31										-		-	-			
Тор	28										•	16 x 16	RADIO_	_ON			1KB
Width	420										🗀 Ci	ustom					
Height	212					_					dh Si	ringe	an an an an an a	nenenenenen	createdreated	shshshered	regregerednes
Border	No Border	~									97 O	innys	-				
Transparent											String	ID	Er	nglish			
Draw Selected											BUTTON	LDISABLE	D Sta	y in window1			
Enabled		\checkmark		Hello W	'orld -> Pr	ess anyw	here to g	o to winde	ow 1		BUTTON	LENABLE	D Go	To Window 2			
Accepts Focus											CHECK	BOX_TEXT	Pre	ss Me!			
Runtime Allocate											HELLO	WORLD	Hel	lo World -> Pi	ess anywh	ere to go to	window 1
Normal fill	SELECTED_FILL	~									INSTRU	СТ_ВИТТО	N Pre	ss "Goto wind	dow2" to sh	ow the nex	t screen.
Selected fill	SELECTED_FILL	~				Windo	w2				INSTRU		(BO) Pre	ss to activate	(blue), "Pre	ess me" for	more
Disabled III	BIN_LOWER	~	7									V1	Wir	ndow1	(/)		
Event Eunction											WINDON	10	Wir	dow?			
Duchod											CTDING	v2	VVII	iuuwz			
Toggle											STRING	_1	Duu	on			
Radio											STRING	_2	pro	mpt			
Auto Repeat											STRING	_3	che	ckbox			
String ID	HELLO WORLD	~									+ Ad	d New Strin	g				
Text	Hello World -> Press	anywhere to go to															
Font	PROMPT	~															
Text Align	Center	~															
Normal Text Color	SELECTED_TEXT	~															
Selected Text Color	BTN_TEXT	~															
Disabled Text Color	BTN_TEXT	~															
Private Text Copy																	
											<						>

Figure 67. Window2



30. Click on drop-down list **PixeImaps**, double-click on **CHECKBOX_OF**" and a new window will pop up. Uncheck **Compress Output** then click **Save**. Do the same for **CHECKBOX_ON**.

		Pix	elmaps			-
		View	Dims	Na	ame	Size
		<mark>=</mark> Sy	/stem			
			16 x 16	СН	ECKBOX_OFF	1KB
			16 x 16	СН	ECKBOX_ON	1KB
		0	16 x 16	RA	DIO_OFF	1KB
		•	16 x 16	RA	DIO_ON	1KB
		<u>-</u> Cı	ustom			
			ings			_
		String	g ID		English	•1
		BUTTO	N_DISABLE	ED	Stay in window1	
Stay in window1	Press Me!	CHECH	KBOX_TEX	Г	Press Me!	
		INSTRU	JCTION_CH	ECKI	Press to activate	(blue), "Pr
		WINDO	W1		Window1	
Source Image Path Image Path					bro	owse
Specify Output File						
Output Format						
Raw Format	Use	display defaul	t			
Compress Output						
Include Alpha Channel						
Dither						
() "Compress Output" option will be	e reset if the compressed dat	ta size is bigg	er than the	origin	al.	

Figure 68. Set Up Pixelmap



31. Now you can click on the **Project** drop down list, **Save Project**, and **Generate All Output Files**. You completed the process of creating and exporting GUIX Hello World into the project.

nfigure Help Ctrl+N Ctrl+O Ctrl+S Shift+Ctrl+S	tie ≌ []	<u> </u>	► * @		'heme: ' Colors	"theme_1"	
Ctrl+N Ctrl+O Ctrl+S Shift+Ctrl+S	-	⊑ ⊑ I Q Q ■(▶ ボ ③	🖳 T 🕞 C	'heme: ' Colors	"theme_1"	
Ctrl+O Ctrl+S Shift+Ctrl+S	-			<u>Г</u> Т С	'heme: ' Colors	"theme_1"	
Ctrl+S Shift+Ctrl+S				. C	Colors		
Shift+Ctrl+S				<u> </u>	00013		
5							
>				T	onts		
>				🖂 P	Pixelma	ps	
C (1)				View	Dims	Name	
Files				🖕 S	system		
iles					16 x 16	CHECKBOX DEE	11/1
on Files					10 X 10		
Alt+F4					16 x 16	CHECKBOX_ON	1KB
www.				0	16 x 16	RADIO_OFF	1KP
Window1							
ID WINDOW1				•	16 X 16	RADIO_ON	168
		Stay in window1	Press Me!	📄 📄 C	ustom		
0				<b p="" s<="">	strings	is his his his his his his his his his h	estestestestesteste
0				Strin	a ID	English	
480		Press to activate (blue	a) "Press me" for more	CHECK		T Press Mel	
272			i, i ressince for more.	INSTRI	ICT CHEC	KBO) Press to activate (blue) "Press me	e" for more
No Border	~			BUTTO		ED Stav in window1	, for more.
		Wir	ndow1	WINDO	W/1	Window1	
		7					ao to window 1
				MINDO		Mindeur?	go to window 1
				RUTTO		iD CoTo Window 2	
WINDOW_FILL	~			BUTTO	ICT BUTTO	D GOTO WINDOW 2	novt coros -
WINDOW_FILL	~			INSTRU	CI_BOLLC	Press Golo Window2" to show the	next screen.
WINDOW_FILL	\sim	Hello World -> Press an	ywhere to go to window 1	1:±; A	aa New Strir	ıg	
windowed another and the							
window1_screen_event		Win	dow2				
	Files Alt+F4	Files iles nn Files Alt+F4 window Window1 ID_WINDOW1 0	Files iles nn Files Alt+F4 window Window1 ID_WINDOW1 0	Files iles nn Files Alt+F4 window Window1 ID_WINDOW1 ID_WINDOW1 0 0 480 272 No Border Vindow1 WiNDOW_FILL WINDOW_FILL WINDOW_FILL WINDOW_FILL Window1_screen_event Window2	Files iles n Files Alt+F4 window Window1 ID_WINDOW1 ID_WINDOW1 <	Files iles n Files Alt+F4 window Window1 ID_WINDOW1 0 0 0 0 480 272 No Border Window1 Window1 Window1 Window1 Window1 Window1 Window1 Window1 Window2 Window1_screen_event Window1 Window2	Files Image: Support of the suppor

Figure 69. Save and Generate Project

32. Make sure the project is active and click to build the project. It may take a long time to finish building an Azure RTOS/GUIX project on your PC. Project **ra8d1_guix_hello_world** should be built with no errors or warnings.



Figure 70. Built the Code



33. Using the Micro USB cable, connect to J10 on EK-RA8D1 board and the other end to your PC. Download and run the "**ra8d1_guix_hello_world**" project.



Figure 71. Window1 Display

6. Overview of Fully Functional Project

6.1 Overview

In this section, you will import and run the complete "**ra8d1_guix_hello_world**" project. You can enable or disable the check box function. The text on the button, which is "Stay in window1" or "Go to Window 2", will be updated. Once you press the button, the screen will change from window1 to window2. Follow the text message on the screen, you can change from window2 back to window1. Referred to Figure 71.

6.2 Procedural Steps

 You can try the provided project "ra8d1_guix_hello_world" for the full function application. Use the Rename & Import Existing C/C++ Project into Workspace feature of the Import menu to do so since you already had a project with the same in the workspace.

0	Temp1 - e² studio		📴 Import	👩 Import — 🗆 🗙
File	Edit Source Refactor Navigate Se New Open File Open Projects from File System Recent Files	earch Project Rer Alt+Shift+N > >	Select Rename and Import and Existing C/C++ Project into the workspace Select an import wizard:	Rename & Import Project Select a directory to search for existing Eclipse projects.
	Close Editor Close All Editors	Ctrl+W Ctrl+Shift+W	type filter text	Use default location
	Save Save As Save All Revert	Ctrl+S Ctrl+Shift+S	Archive File CMSIS Pack Existing Projects into Workspace File System	Location: C\Temp\Temp1\ra8d1_guix_hello_world Browse ✓ Create Directory for Project Choose file system: default ✓
69	Move Rename Refresh Convert Line Delimiters To	F2 F5 >	Projects from Folder or Archive Project from Folder or Archive Project from Folder or Archive Project for CV(++ Project into Workspace Project for CA78K0R/CA78K0 Project for CC-RX, CC-RL and CC-RH	Select root directory: Image: Select archive file: C:\ra8d_ep\ra8d1_guix_hello_world.zip Browse Projects: P
27	Print Import Export	Ctrl+P	Cample Projects on Kenesas Website C/C++ C/C++ Cinstall Domph	ra8d1_guix_hello_world (e2studio/)
	Properties Switch Workspace Restart Exit	Alt+Enter >	? < Back Next >	Options Keep build configuration output folders
				Kack Next > Finish Cancel

Figure 72. Import Existing Project



7. Website and Support

Visit the following URLs to learn about key elements of the RA family, download components and related documentation, and get support:

RA Product Information RA Product Support Forum RA Flexible Software Package Renesas Support renesas.com/ra renesas.com/ra/forum renesas.com/FSP renesas.com/support



Revision History

		Description	
Rev.	Date	Page	Summary
1.00	Dec.13.23		Initial release



General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power reaches the level at which resetting is specified.

3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. Handling of unused pins

Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

5. Clock signals

After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

6. Voltage application waveform at input pin

Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

7. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

Notice

- Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
- Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
- 3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
- 4. You shall be responsible for determining what licenses are required from any third parties, and obtaining such licenses for the lawful import, export, manufacture, sales, utilization, distribution or other disposal of any products incorporating Renesas Electronics products, if required.
- 5. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
- 6. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.

"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.

"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.

- 7. No semiconductor product is absolutely secure. Notwithstanding any security measures or features that may be implemented in Renesas Electronics hardware or software products, Renesas Electronics shall have absolutely no liability arising out of any vulnerability or security breach, including but not limited to any unauthorized access to or use of a Renesas Electronics product or a system that uses a Renesas Electronics product. RENESAS ELECTRONICS DOES NOT WARRANT OR GUARANTEE THAT RENESAS ELECTRONICS PRODUCTS, OR ANY SYSTEMS CREATED USING RENESAS ELECTRONICS PRODUCTS WILL BE INVULNERABLE OR FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION ("Vulnerability Issues"). RENESAS ELECTRONICS DISCLAIMS ANY AND ALL RESPONSIBILITY OR LIABILITY ARISING FROM OR RELATED TO ANY VULNERABILITY ISSUES. FURTHERMORE, TO THE EXTENT PERMITTED BY APPLICABLE LAW, RENESAS ELECTRONICS DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT AND ANY RELATED OR ACCOMPANYING SOFTWARE OR HARDWARE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.
- 8. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
- 9. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
- 10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
- 11. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
- 12. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
- This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
 Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.
- (Note1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.
- (Note2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

(Rev.5.0-1 October 2020)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu, Koto-ku, Tokyo 135-0061, Japan www.renesas.com

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

Contact information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit: <u>www.renesas.com/contact/</u>.