

RZ/A1LU group

R01AN4413EJ0101

GUI Sample Program

Rev.1.01

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Introduction

This document describes the way to connect TES Guiliani and the users application runs on RZ/A1LU Software Package.

Target Device

RZ/A1LU

Target Board

Stream it! RZ V2.3 (YSTREAM-IT-RZ-V2.3)

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1. Overview

This document describes the usage of GUI Sample Program included in the RZ/A1LU Software Package, and the way to modify this sample program. You can develop your GUI application by modifying this sample program using this document.

2. Developing GUI Sample program

The way to launch GUI Sample program and the outline of flow to develop GUI are described in this section.

2.1 The Way to Launch GUI Sample Program

By following the following sequence, you can launch GUI Sample Program.

1. Running the application program.

Run the application. For details, please refer to Quick Start Guide(R01QS0024).

2. Launching the GUI Sample program.

Input “gui[enter]” to the command console.

```
RZ/A1LU RZ/A Software Package Ver.3.01.0256  
Copyright (C) Renesas Electronics Europe.  
  
REE> gui
```

Figure 2-1 Command to launch the GUI Sample Program

2.2 The Behavior of GUI Sample Program

Figure 2-2 shows the image of the screen displayed on Stream it! board.

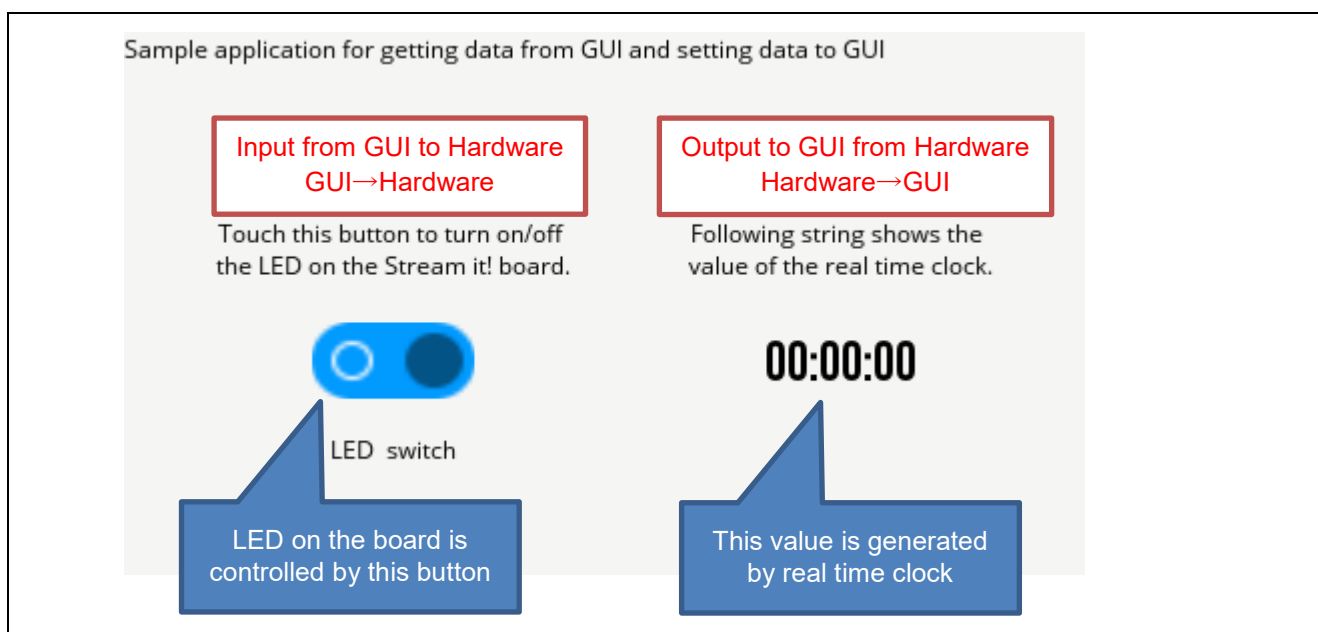


Figure 2-2 The image displayed on the board

2.3 Outline of Flow to Develop GUI (modify GUI Sample Program)

The flow to modify GUI Sample Program is shown in this section.

2.3.1 Invoking TES Guiliani Stream Editor

1. Execute "RZA1LU_Sample\src\tes\GSE\GSE.exe" on PC
GSE.exe is the WYSIWYG PC Editor.

2.3.2 Opening & Editing GUI Sample Project

1. Select "File" menu → "Open Project", and select following file:
— "RZA1LU_Sample\src\tes\GUI_Sample\GuilianiDemo\480x272\GuilianiDemo.gpr"
2. The way to edit the GUI and application is described in section
3. How to connection between GUI and hardware

2.3.3 Simulating edited GUI

You can simulate the GUI you edited on PC.

Select "File" menu → "Run Simulation", then simulation dialog will be appeared. Press "Run" on the dialog.

2.3.4 Exporting edited GUI

For running edited GUI on Stream it! V2 board, export GUI Sample Project.

1. Select "File" menu → "Save Project" to save the project.
2. Select "Resource" menu → "Export", then export dialog will be appeared.
3. Select following directory and press "OK".
— "RZA1LU_Sample\src\tes\GUI_Sample\Include\GUIConfig"

2.3.5 Downloading GUI Resources

Download the GUI Resources to the board. For detail, refer Quick Start Guide(R01QS0024).

2.3.6 Editing User Application

If user system requires some handshake between user sample application and GUI, such as passing data from H/W to GUI or from GUI to H/W, user needs to modify the user sample application. For more detail how to hand some data between GUI and user sample application, please refer to section 3.

2.3.7 Building and Running Application Program

Build and run the application project. For detail, refer Quick Start Guide(R01QS0024).

3. How to connection between GUI and hardware

In this section, the way for connection between GUI and hardware is described. In GUI Sample Program, some Guiliani APIs are used. For detail of these APIs and the other APIs, refer to following URL:

https://www.guiliani.de/mediawiki/downloads/Guiliani_doc_2.2/index.html

In this section the modification needed for GUI editor is described in the subsection “GUI Editor”. And the modification needed for your own application except GUI is described in the subsection “User Application”.

Please mind that each Guiliani API has to be called from “prvGuilianiTask” context.

3.1 Overview of GUI Sample

The switch object and text field object are used in this GUI Sample. Please refer following figure to learn overview of this GUI Sample. The black arrow indicates input from GUI. In the other hand, red arrow indicates output to GUI.

DataPool and Object ID are needed to exchange data between user application and Guiliani library.

After creating an image of system on GSE, the DataPool and Object ID should be exported and be included to system. Both of Guiliani Library and Sample Application hands some data according to DataPool and Object ID.

Regarding switch input, the DataPool provides a callback to user application when status of switch object changed. When status of switch object is changed on GUI, Guiliani Library will give a callback for Sample Application.

Regarding time value output, Sample Application set current time to Guiliani Library after reading RTC register value. Sample Application calls a set function of Guiliani Library with Object ID.

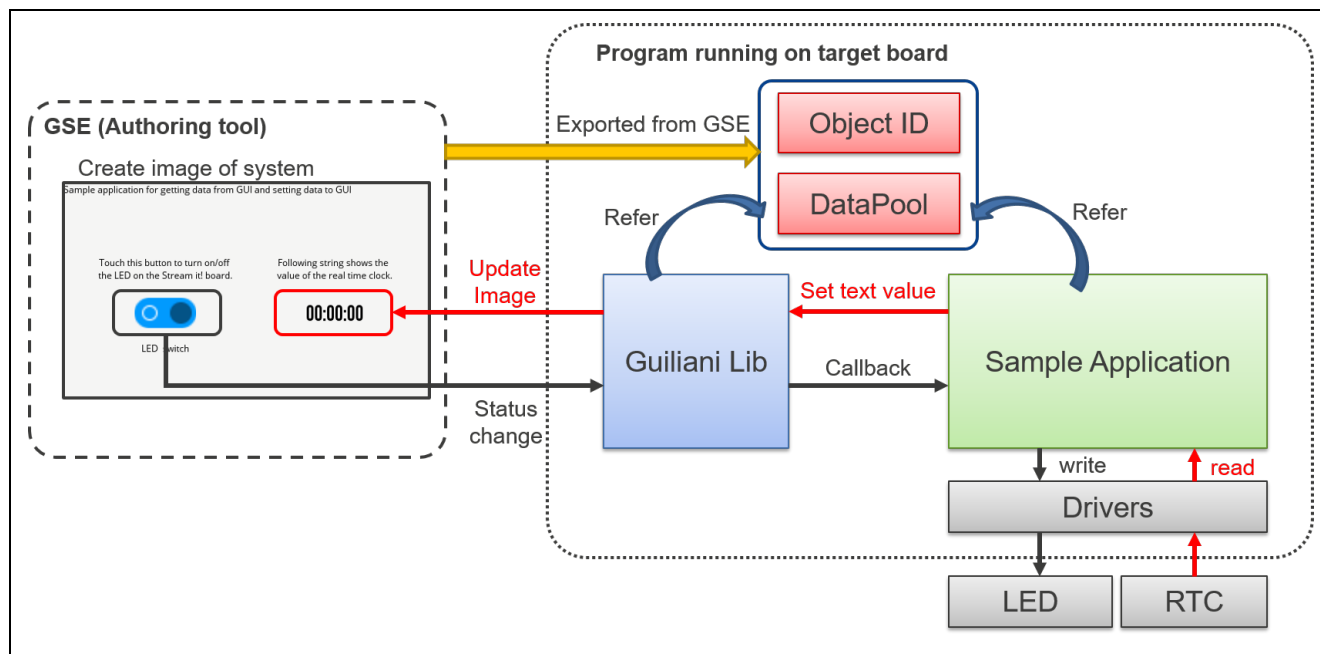


Figure 3-1 Overview of GUI Sample

3.2 How to implement Switch Function

By connecting an object for input and DataPool, when the value of the object is modified, the callback function registered by sample application will be called.

Following sequence shows the way LED button on GUI Sample Program is developed.

3.2.1 GUI Editor

1. Add object for input.
In this sample, CheckBox is added.
2. Name unique object ID.
In this sample, CheckBox is named “AID_CHECKBOX_1”.

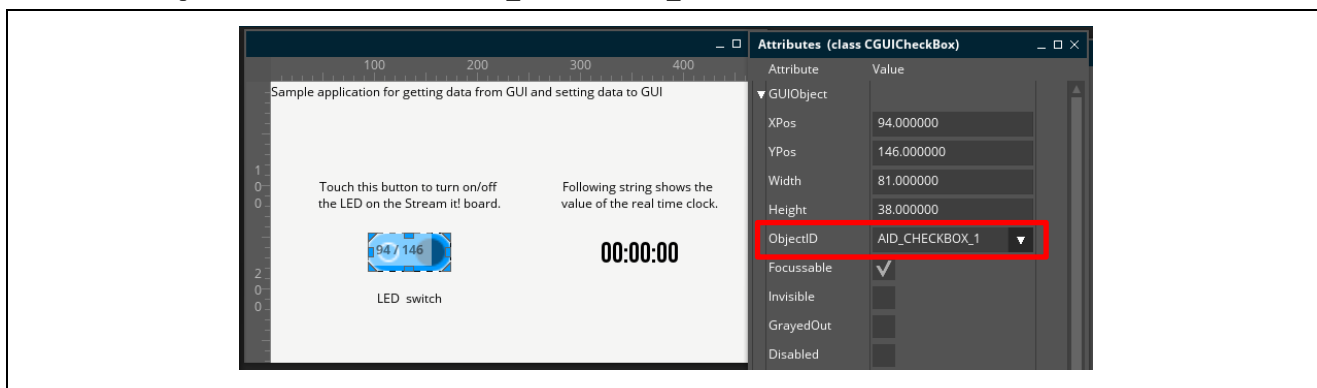


Figure 3-2 Setting ObjectID of CheckBox

3. Add DataPool by selecting “Resources” menu → “Manage” → “DataPool”. “Manage Datapool” dialog will appear.
 - a. Press “Add new Entry”.
 - b. Name unique name of DataPool. In this sample, DataPool is named “DATAPOOL_LED”.
 - c. Press “▼” icon and select the object ID you named in the sequence 2. In this sample, AID_CHECKBOX_1 is chosen.
 - d. Press “Add as Observer”.
 - e. Press “Close”.

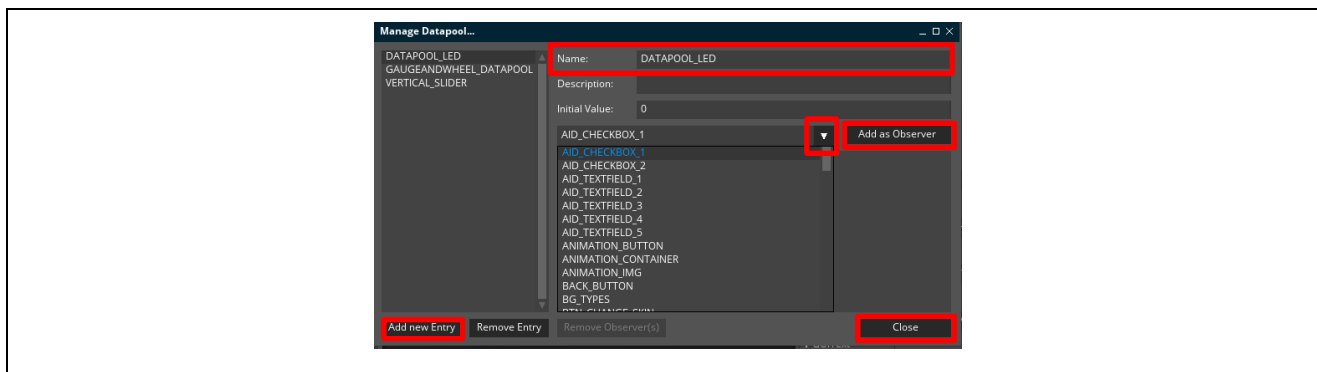


Figure 3-3 Setting DataPool parameters

Note that “GAUGEANDWHEEL_DATAPOOL” and “VERTICAL_SLIDAR” are defined as DataPool for original TES Guiliani demonstration. this GUI Sample never use these DataPool definitions.

3.2.2 User Application

1. Register the callback function.

Please mind that callback function is registered during running Guiliani.

To register the callback function, use `CGUIDataPool::Register()` function.

Figure 3-4 shows the sample program to register the callback function to DataPool.

In this package, Figure 3-4 is described in “GUI_Sample()” function in:

"RZA1LU_Sample\src\tes\GUI_Sample\Source\MyGUI_SR.cpp"

```
/* register callback function */
CGUIDataPool::Register(DATAPPOOL_LED, &pvLedButtonCallback);
```

The ID of DataPool. callback function to register

Registering callback function

Figure 3-4 Registering callback function

2. Get the current switch value.

To get the value of DataPool, use `CGUIDataPool::Get()` function.

Figure 3-5 shows the sample program to get the data from GUI.

In this package, Figure 3-5 is described in: "RZA1LU_Sample\src\tes\GUI_Sample\Source\MyGUI_SR.cpp"

```
void CMyGUI::pvLedButtonCallback(CDataPoolEntry& data)
{
    CGUIValue value;
    uint16_t led = LED0;
    int_t led_handle = (-1);

    /* get the value of datapool for LED checkbox */
    CGUIDataPool::Get(DATAPPOOL_LED, value);

    /* open LED driver */
    led_handle = open( DEVICE_IDENTIFIER "led", O_RDWR);

    /* check the value of datapool for LED checkbox */
    if (value.ToInt() == 0)
    {
        /* LED OFF */
        control(led_handle, CTL_SET_LED_OFF, &led);
    }
    else
    {
        /* LED ON */
        control(led_handle, CTL_SET_LED_ON, &led);
    }
    close(led_handle);
}
```

The value of DataPool and object is copied to the variable "value".

The ID of DataPool.

Checking the value of DataPool and object. value "0" means "off", and value "1" means "on".

Figure 3-5 Sample of callback function

3.3 How to implement Real Time Clock Function

Following sequence shows the way real time clock on GUI Sample Program is developed.

Note that the way to update the text and to update numeric value is different.

3.3.1 GUI Editor

1. Add object for output.
In this sample, TextField is added.
2. Name unique object ID.
In this sample, TextField is named "AID_TEXTFIELD_2".

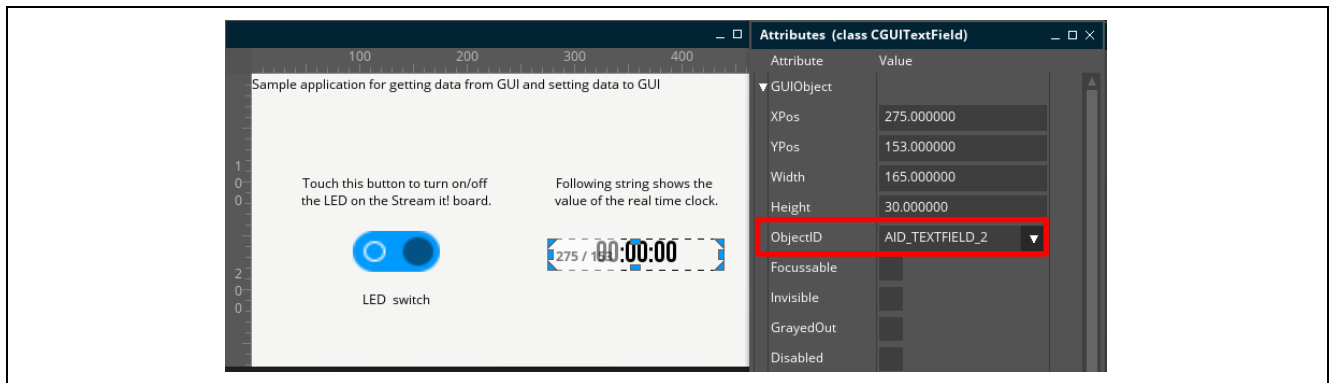


Figure 3-6 Setting ObjectID of CheckBox

3.3.2 User Application

1. Add callback for polling Real Time Clock.

"RZA1LU_Sample\src\tes\GUI_Sample\Source\MyGUI_SR.cpp"

```
// add callback for polling RTC
GETTIMER.AddAnimationCallback(100, this);
```

ms order add DoAnimate member of this
class as callback.

Figure 3-7 Sample of adding callback.

2. Update the current time as text by using SetLabel() function in the callback.

Figure 3-8 shows the sample program to update screen.

In the package, text is updated in “CMyGUI::DoAnimate” function in:

"RZA1LU_Sample\src\tes\GUI_Sample\Source\MyGUI_SR.cpp"

```
DATE last_date;

void CMyGUI::DoAnimate(const eC_Value &vTimes)
{
    /* polling real time clock */
    {
        char date_str[32];
        DATE date;
        /* open real time clock */
        int_t rtc_handle = open(DEVICE_IDENTIFIER "rtc", O_RDWR);
        if (control(rtc_handle, CTL_GET_DATE, &date) == 0)
        {
            if( date.Field.Second != last_date.Field.Second )
            {
                /* create text for time */
                sprintf(date_str,"%02d:%02d:%02d", (int_t) date.Field.Hour, (int_t) date.Field.Minute,
(int_t) date.Field.Second);
                /* get the object for AID_TEXTFIELD_2 */
                CGUITextField* pkTextField =
static_cast<CGUITextField*>(GETGUI.GetObjectByID(AID_TEXTFIELD_2));
                /* set the new label for AID_TEXTFIELD_2 */
                pkTextField->SetLabel(date_str);
            }
            last_date = date;
        }
        close(rtc_handle);
    }
}
```

Set current time value.
Guiliani will update
screen image.

Figure 3-8 Sample of updating screen.

4. Tips for developing GUI application

This section shows the way to develop GUI that is not used in the sample program. Here, some crucial functions are picked up.

For more detail, please refer to the Guiliani SDK of TES solutions.

guiliani.de : <https://www.guiliani.de/mediawiki/index.php?title=Downloads:EvalKits>

Guiliani 2.2 SDK including GSE and GuilianiDemo for Renesas RZ/A (StreamIt) with eGML (FreeRTOS10 for e² studio 6.2)

Guiliani 2.2 SDK including GSE and GuilianiDemo for Renesas RZ/A (StreamIt) with eGML (FreeRTOS10 for EWARM 8.30.1)

4.1 Adding new screen image (new dialog)

You can add new screen image into your system. The new screen image is managed as dialog in case of GSE. To add new dialog, which means new screen, does not require any modifying the user sample application.

4.1.1 GUI Editor

1. Press “+” icon left-bottom of Dialoglist window. “Create new dialog” window will appear.
2. Name the unique name of the new dialog.
3. Specify the width and the height of the dialog.
4. Press “OK”.

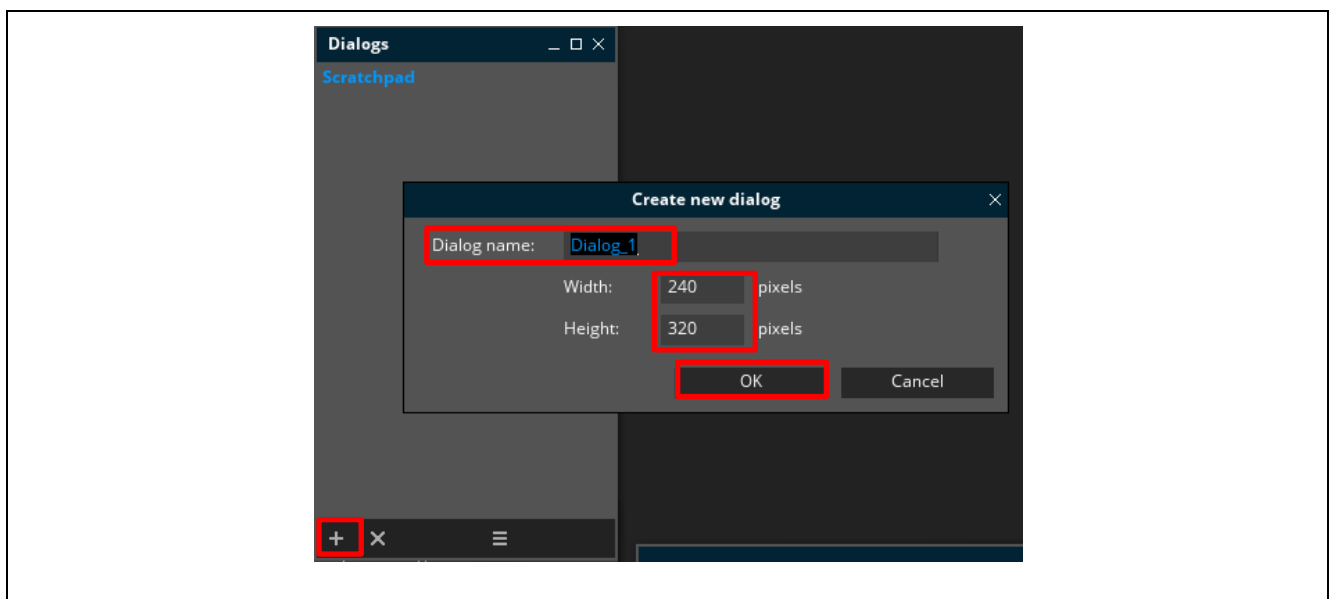


Figure 4-1 Adding new dialog

4.2 Adding new screen image transition

After creating new dialog, you can add the screen image transition function. Also, this function does not require any modifying the user sample application.

4.2.1 GUI Editor

1. Add object such as switch, button, and so on, for moving the dialog. (Here, describe by switch object of GUI Sample)
2. Modify the “Command Class ID” parameter to CMD_DIALOG_TRANSITION.
3. Press “▼” icon on the right of the “DestDialogFileName”. Select the dialog ID to transit.
4. Press “▼” icon on the right of the “Source Object ID”. Select the dialog ID on which the object exists.

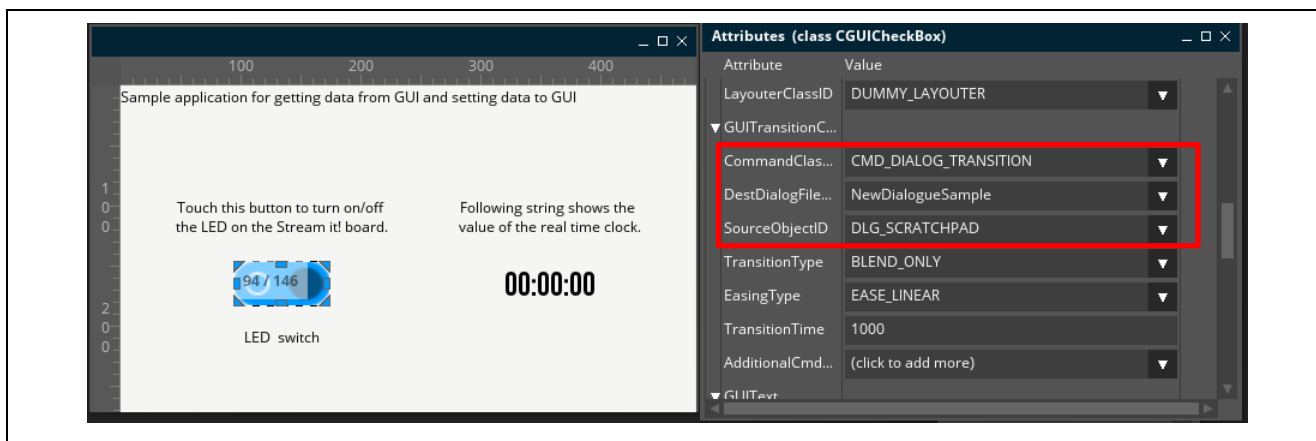


Figure 4-2 Modifying the attribute to transit dialog.

4.3 Sharing the value between objects

You can share the value between some objects by using DataPool. For example, in case of user system require that a lamp object on GUI co-work with switch object.

4.3.1 GUI Editor

DataPool can be added by selecting “Resources” menu → “Manage” → “DataPool”. “Manage Datapool” dialog will appear.

- Press “Add new Entry”.
- Name unique name of DataPool. In this sample, DataPool is named “DATAPOOL_LED”.
- Press “▼” icon and select the object ID you want to share the value. In this sample, AID_CHECKBOX_1 is chosen.
- Press “Add as Observer”.
- Repeat the sequence c. and d for remaining objects to add as an observer.
- Press “Close”.

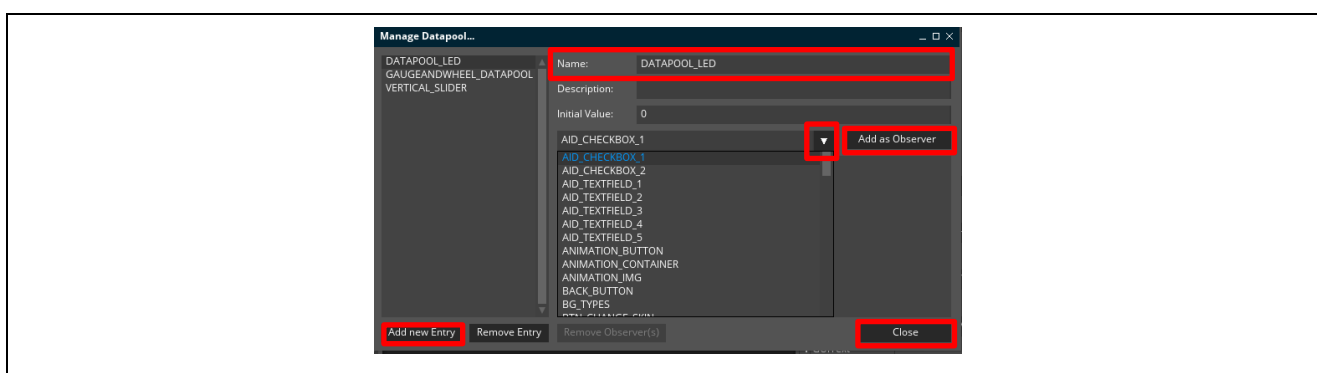


Figure 4-3 Setting DataPool parameters

4.3.2 User Application

The shared value by the DataPool can be updated by using CGUIDataPool::Set() function.

```
/* set the value of datapool for LED checkbox */
CGUIDataPool::Set(DATAPOOL_LED, ((eC_Int)50);
```

The ID of DataPool.

Figure 4-4 Setting DataPool value

4.4 Changing images and Adding new images

4.4.1 GUI Editor

You can change the image of the object by modifying the attribute that is set to “IMG_***”. By Clicking “IMG_***”, “Images” dialog will appear. You can choose the image using this dialog.

You can also add your own image by clicking “Insert new image” button.

Images bundled in the package are stored in the following directory.

- RZA1LU_Sample\src\tes\GSE\Resources

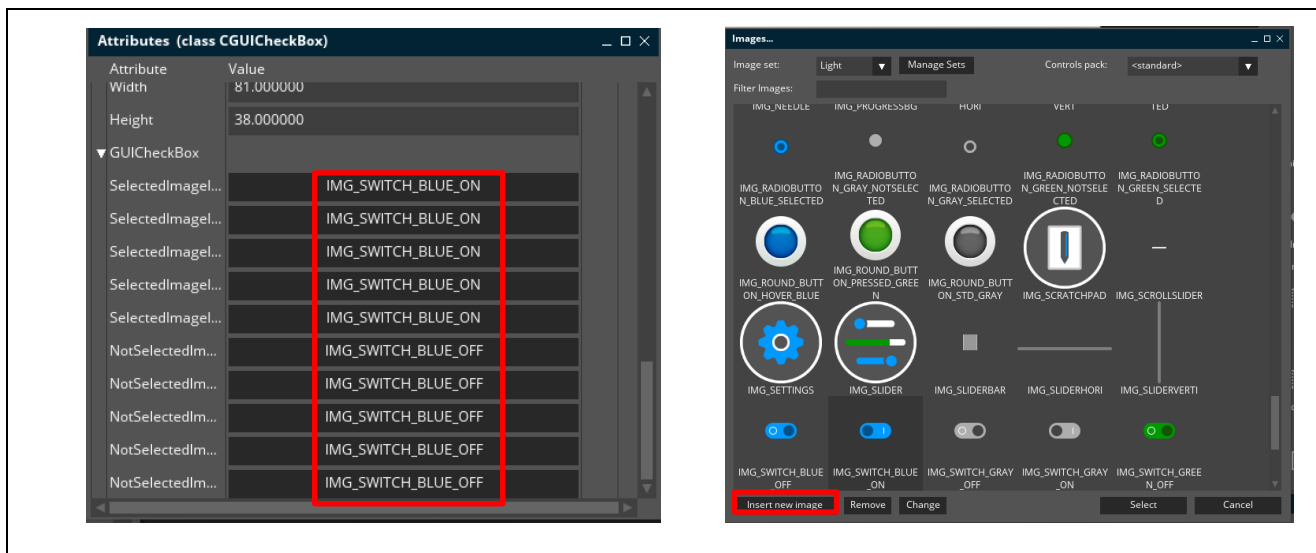


Figure 4-5 “Images” dialog

4.5 How to stop GUI log output

In this package, debug library of Guiliani is used. This library outputs the GUI logs.

In the case GCC toolchain is used, by switching debug configuration to “Release”, GUI log output will be stopped.

In the case IAR toolchain is used, by following sequence, GUI log output will be stopped:

1. Open “options” of the project.
2. Select “Linker” in the “Category” box.
3. Select “Library” tab.
4. Modify the folder of the library “Release_StreamIt_eGML” from “Debug_StreamIt_eGML” of “Additional libraries:(one per line)” as following:

```
$PROJ_DIR$\src\tes\Libraries\FreeRTOS\rza\Release_StreamIt_eGML\libGaC.a
$PROJ_DIR$\src\tes\Libraries\FreeRTOS\rza\Release_StreamIt_eGML\libGuiliani.a
$PROJ_DIR$\src\tes\Libraries\FreeRTOS\rza\libfreetype_rza_iar.a
```

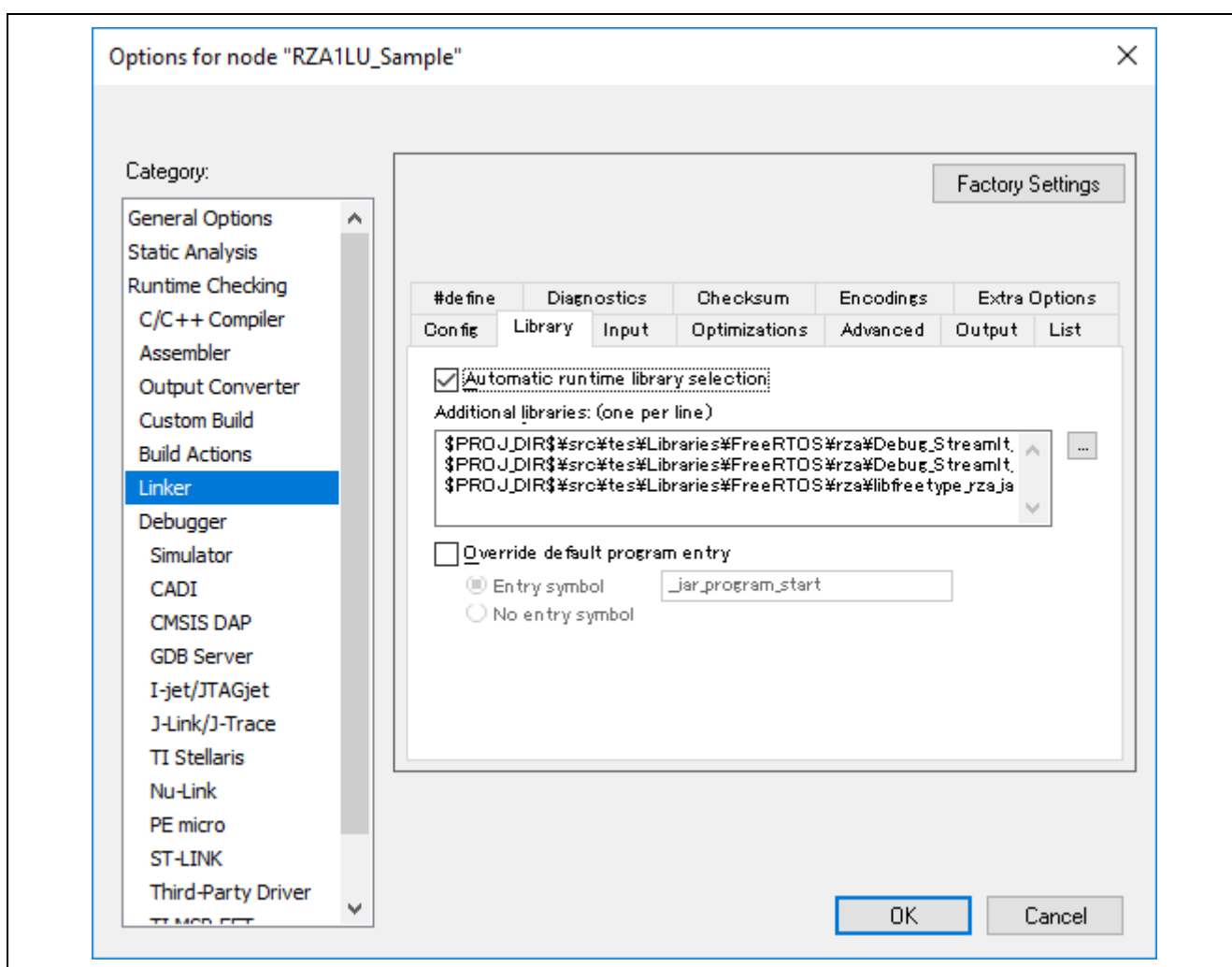


Figure 4-6 “Library” settings (IAR toolchain)

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Revision History

Rev.	Date	Description	
		Page	Summary
1.01	Oct 31, 2018	1	Added "Target Board".
		6, 12	Modified the description.
		13	Modified the typo.
		13	Modified the figure of "Images" dialog box.
1.00	Jun 29, 2018	all	First version issued

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The state of the product is undefined at the moment 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 moment when power is supplied.
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