

Software Guide for NS-RX231

<GADGET>

Contents

1 Summary	2
2 NS-RX231	3
2.1 Load the Project	3
2.2 Source Code	4
3 GR-SAKURA	5
3.1 Web Compiler	5
3.2 Load the Project	6
3.3 Install the USB Driver	7
3.4 Source Code	10
4 Build and Upload	11
5 Execution	13

1 Summary

Gadget Renesas projects GR series (SAKURA, PEACH, KURUMI ...) are designed to be combined with other modules and boards.

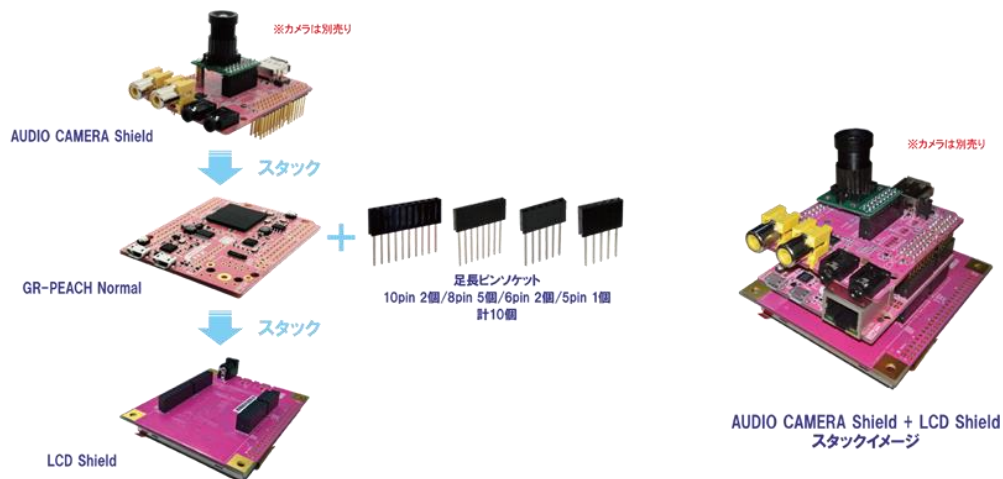


figure 1-1 GR-PEACH + Camera module + LCD module

The NS-RX231 and GR-SAKURA can be used in combination because they are designed to conform to the Arduino UNO standard on such as pin header spacing, screw hole size, and position.

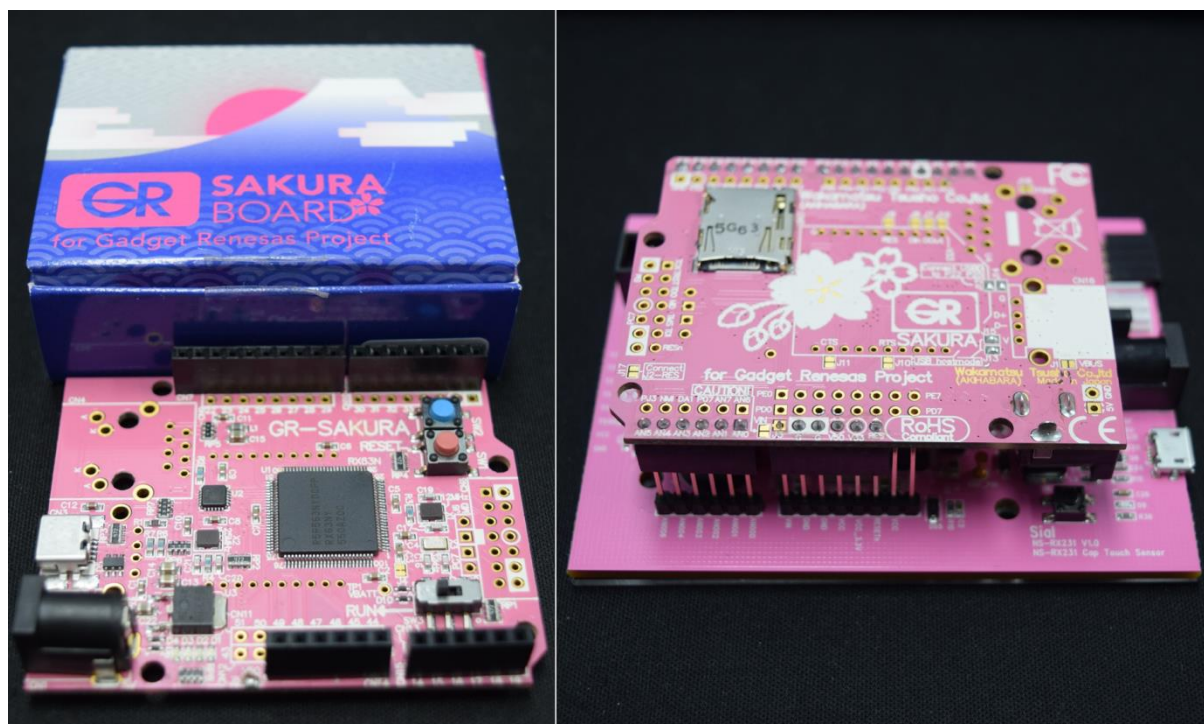


figure 1-2 GR-SAKURA board (left) and the Combination of NS-RX231 board (right)

2 NS-RX231

2.1 Load the Project

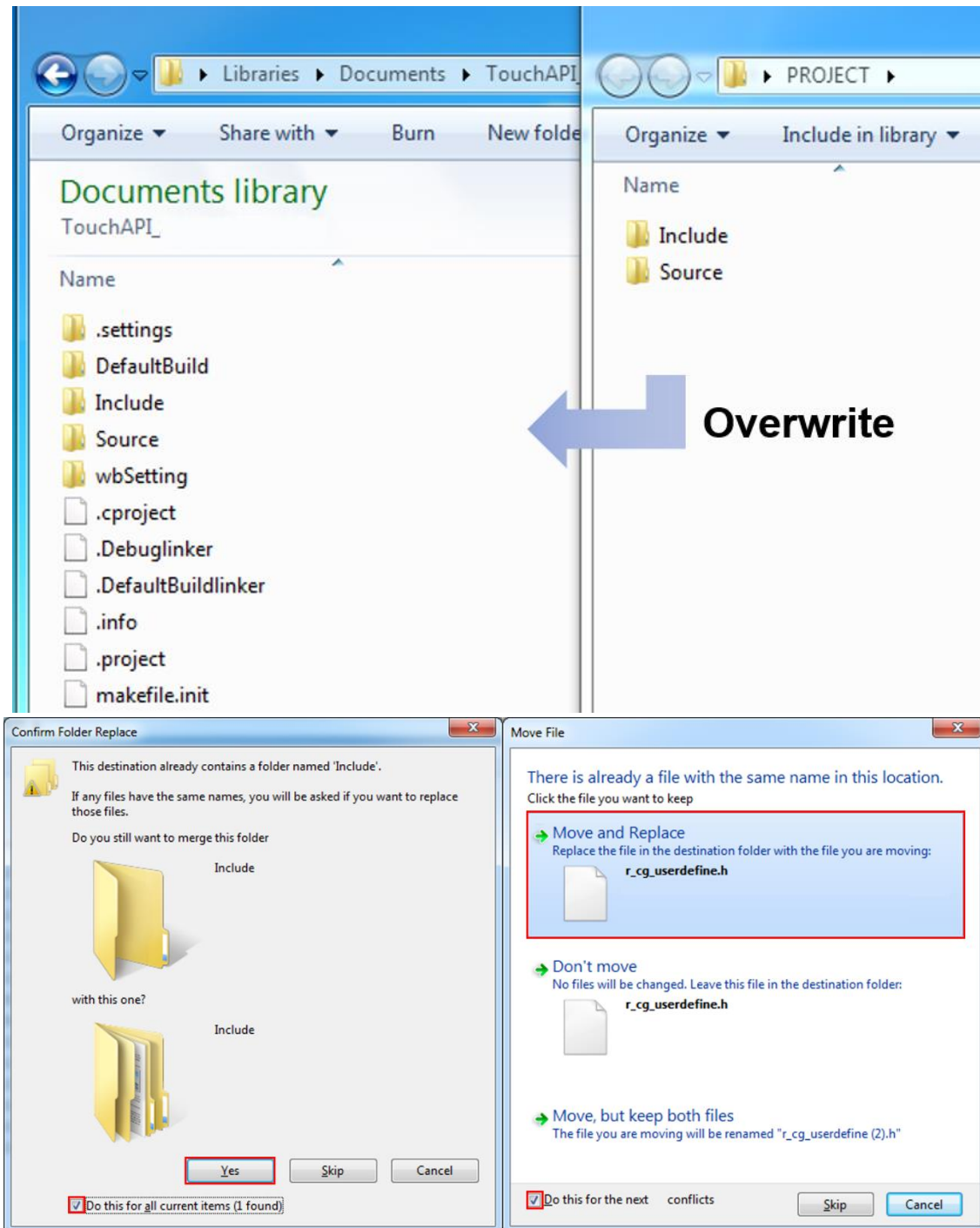


figure 2-1 Overwrite the source file

Overwrite the attached source file with the project created by the Workbench6 First step guide wizard and run it in e2studio.

2.2 Source Code

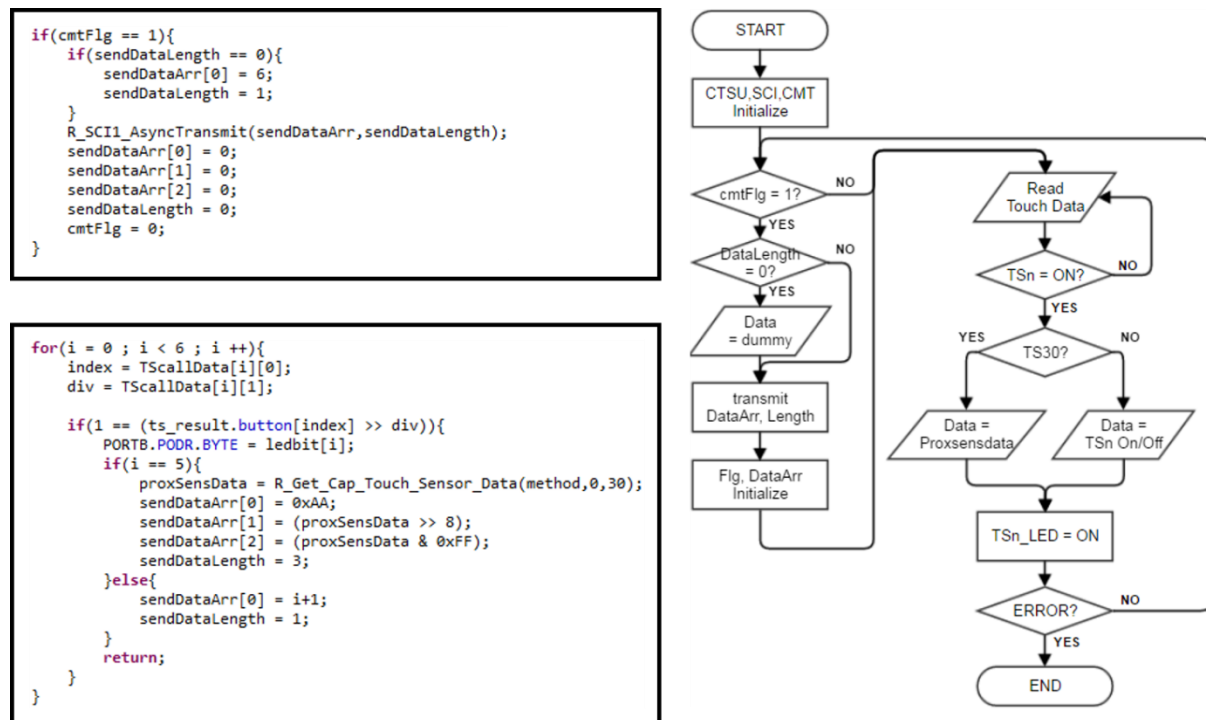


figure 2-2 Source code and flowchart

CMT (Compare Match Timer) is activated every 20ms after initialization, and cmtFlg is set to 1.

After cmtFlg is detected in the main loop, data is sent via UART through conditional statement only when cmtFlg is 1. If there is no touch data, it passes the dummy data and displays the OFF state.

When touching, the data of five touch buttons (TS15, TS16, TS22, TS23, TS27) contains one byte data indicating ON and OFF in the array. TS30 has one byte of identification code By dividing 2 bytes of the reference value of own touch by 1 byte, a total of 3 bytes data is stored in the array.

Data transmission uses SCI1, and when NS-RX231 board and GR-SAKURA board are combined, data is sent by UART communication to TXD1, RXD1 pin.

3 GR-SAKURA

3.1 Web Compiler

<http://tool-cloud2.renesas.com/>

GR-SAKURA is one of the models supported by GadgetRenesas's web compiler, which you can code and easily upload from the Internet website.

It has the advantage of being easy to develop in an environment similar to Arduino using the Arduino library.

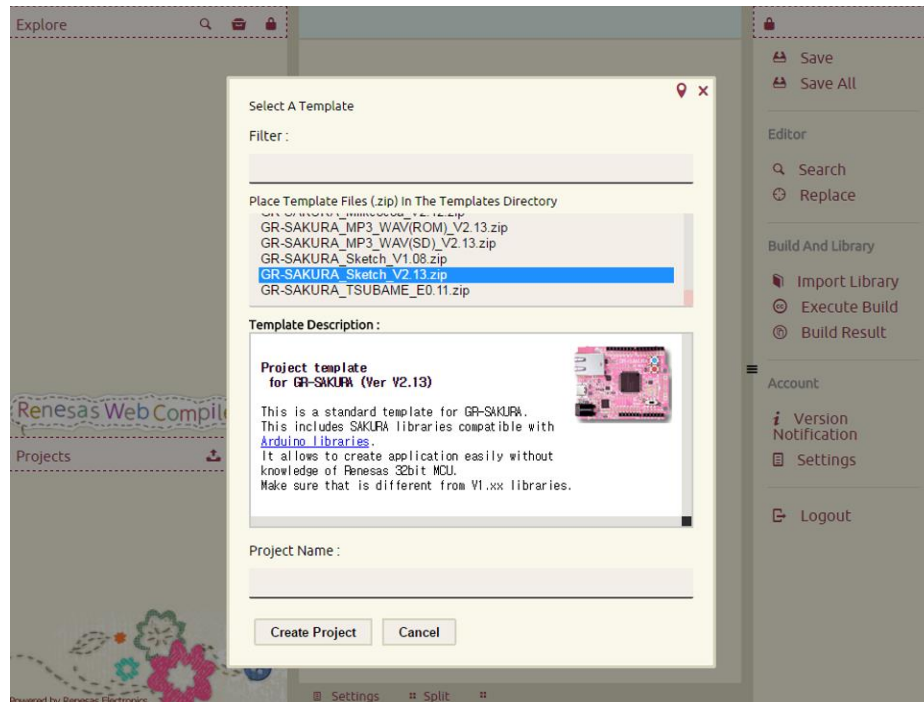


figure 3-1 Starting the web compiler

Templates help you to build and debug your project by choosing the one for your purpose.

Choose GR-SAKURA_Sketch_V2.13.zip

Version 2.13 instead of version 1.08 is recommended because the USB driver installation is convenient and the library support is better.

3.2 Load the Project

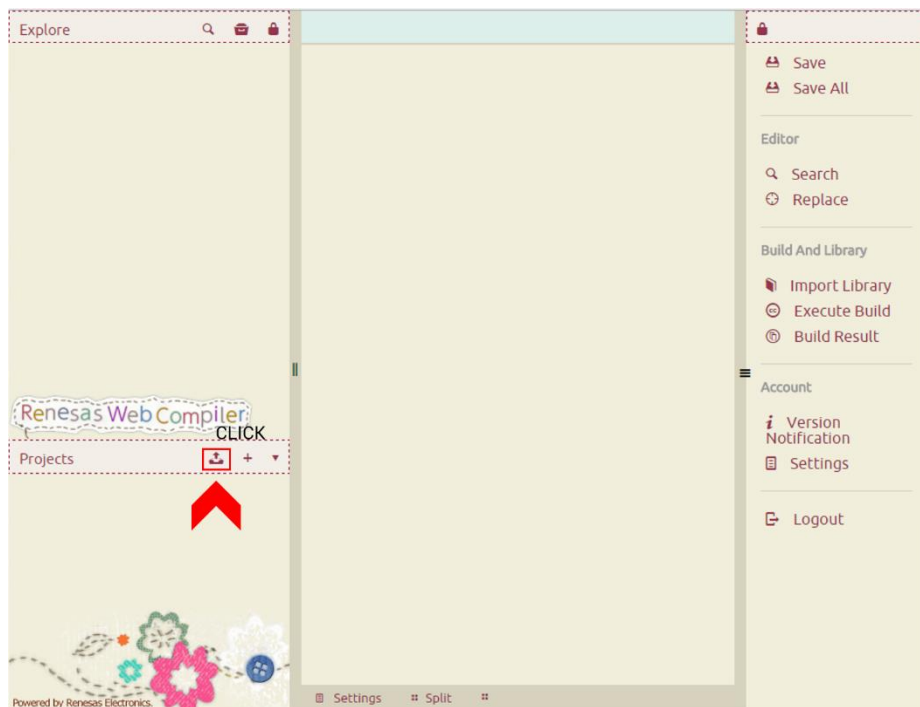


figure 3-2 Load project - 1

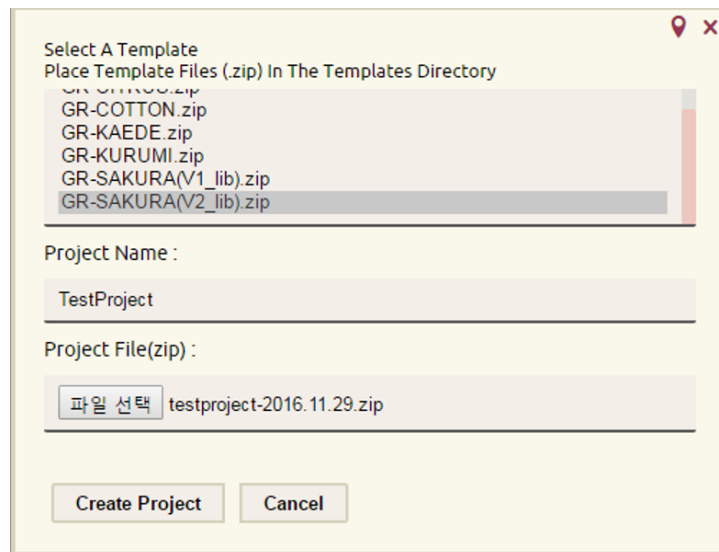


figure 3-3 Load project - 2

In selecting GR-SAKURA (V2_lib) .zip as a template, the Project Name below can be named as you like.

3.3 Install the USB Driver

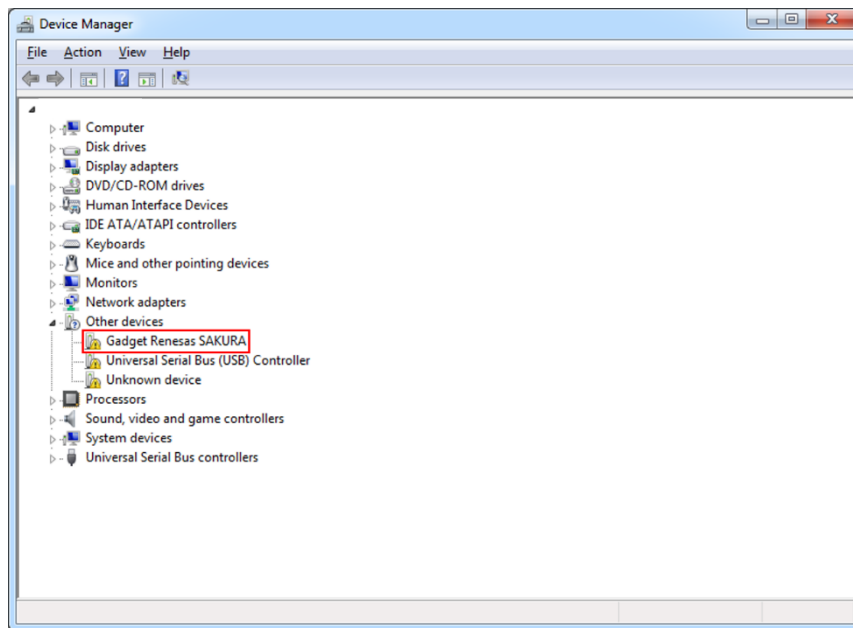


figure 3-4 Device Manager Window

If you cannot recognize GR-SAKURA as shown above when connecting to a computer, follow the procedure below to install the driver.

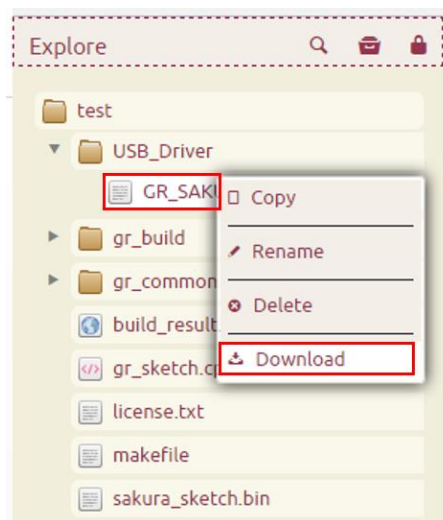


figure 3-5 Install the USB Driver - 1

After the web compiler creates the SAKURA project, download **GR_SAKURA_USBCDC.inf** and put it in the folder.

The reason for putting it in a folder is to make it easier to work on subsequent installations.

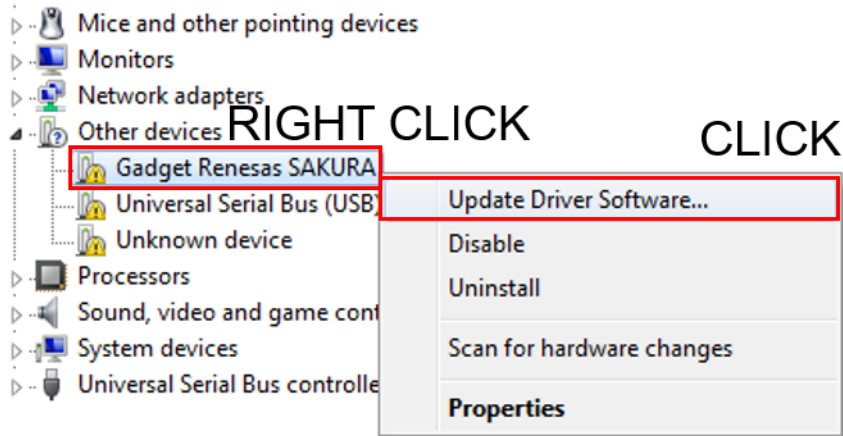


figure 3-6 Install the USB Driver- 2

Right click on the Gadget Renesas SAKURA item and proceed to the driver software update screen.

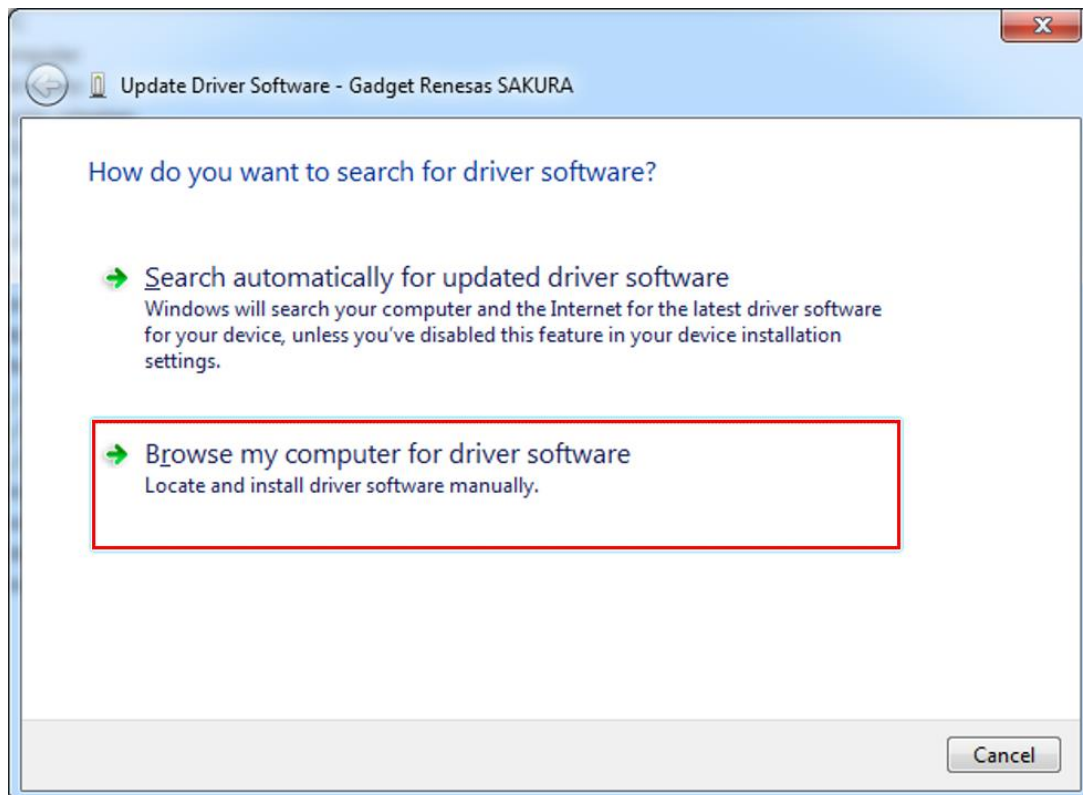


figure 3-7 Install the USB Driver - 3

Select Browse my computer for driver software to continue.

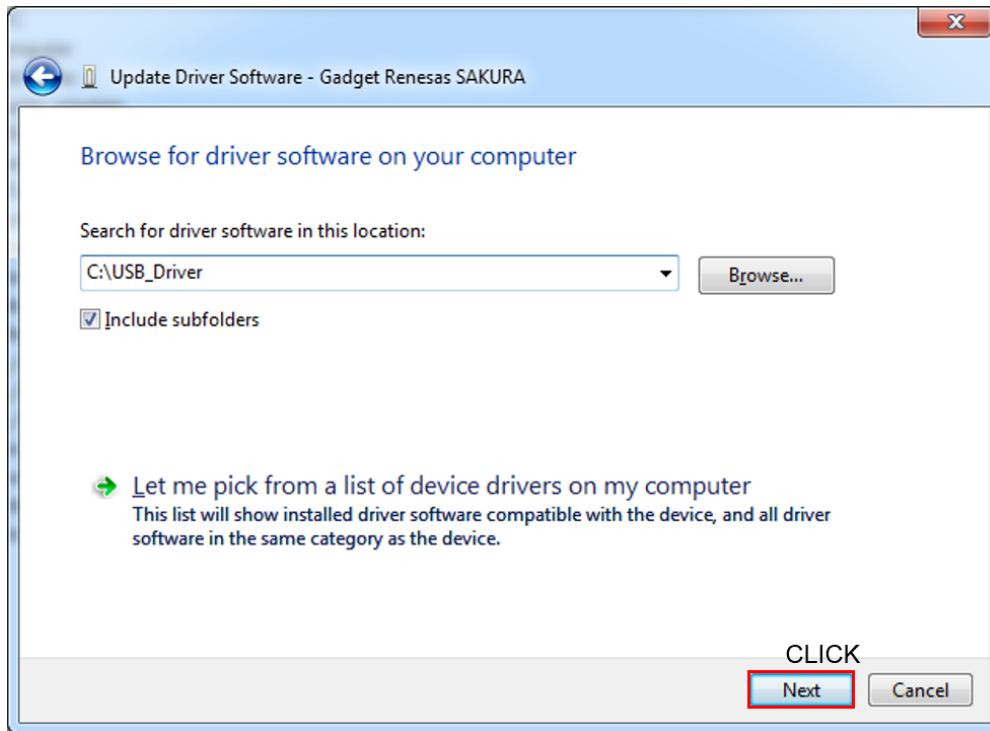


figure 3-8 Install the USB Driver - 4

Create a folder called USB_Driver on the local disk C and saved the file. After setting the path of the downloaded file, click Next to continue.

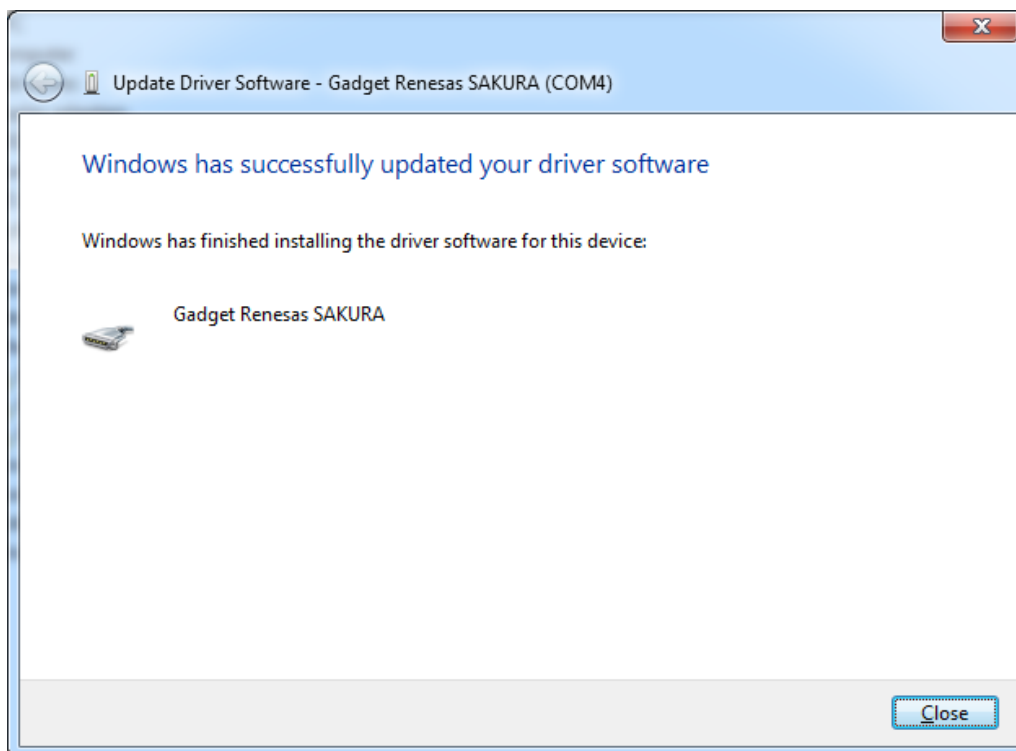


figure 3-9 Install the USB Driver – 5

USB Driver Installation is finished.

3.4 Source Code

```

void setup() {
  Serial.begin(9600);
  blth.begin(9600);

  pinMode(PIN_LED0,OUTPUT);
  digitalWrite(PIN_LED0,1);
}

void loop() {
  if(blth.available()){
    data = blth.read();

    if(proxSensFlg != true && data == 170){
      proxSensFlg = true;
    }

    if(proxSensFlg == true){
      switch(proxSensCnt){
        case 1:
          proxSensData = (data<<8);
        case 2:
          proxSensData += data;
          proxSensCnt = -1;
          proxSensFlg = false;
          break;
      }
      proxSensCnt++;
    }

    if(proxSensData != 0 || (0 < data && data < 7)){
      if(data > 0 && data < 6){
        onoff[data-1] = 1;
      }

      Serial.println("      TS      ");
      Serial.println(" 15  16  22  23  27  ");
      Serial.println("      ");
      for(int i = 0 ; i < 5 ; i ++){
        Serial.print(onoff[i] == 1 ? " ON |" : " OFF|");
        onoff[i] = 0;
      }
      Serial.println();

      Serial.println("-----");
      Serial.print(" Prox. Sensor |");
      if(proxSensData != 0){
        Serial.print(" " + String(proxSensData,DEC));
        Serial.println(" |");
      }else{
        Serial.println(" OFF |");
      }
      Serial.println("-----");
      proxSensData = 0;
    }
  }
}

```

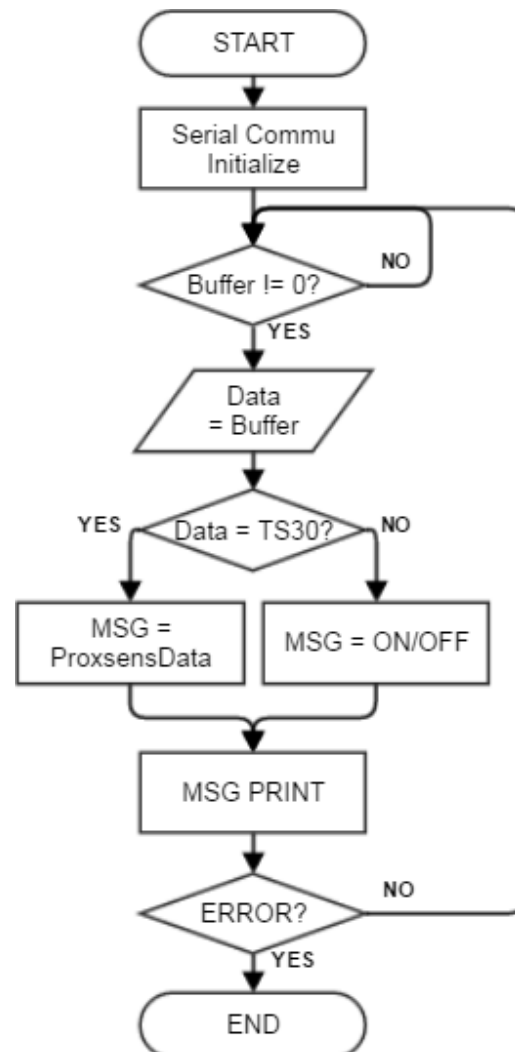


figure 3-10 Source code and flowchart

Data is transferred through the TXD1 and RXD1 pins. If the data is a constant value, it is judged to be data of TS30, the next data is stored whose result is OR computed..

If the data is not TS30, a message indicating On / Off will be created and displayed.

4 Build and Upload

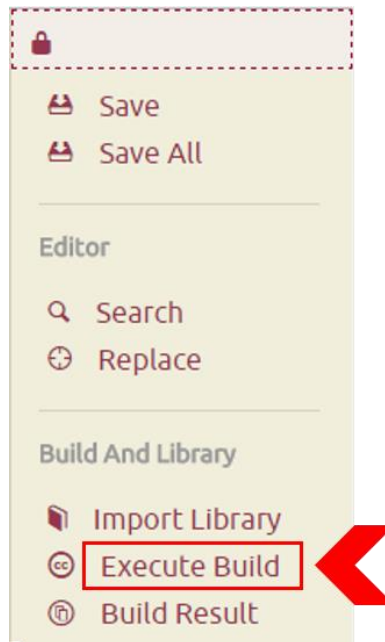


figure 4-1 Build the Project

Select Execute Build from the menu bar on the right to build the project.

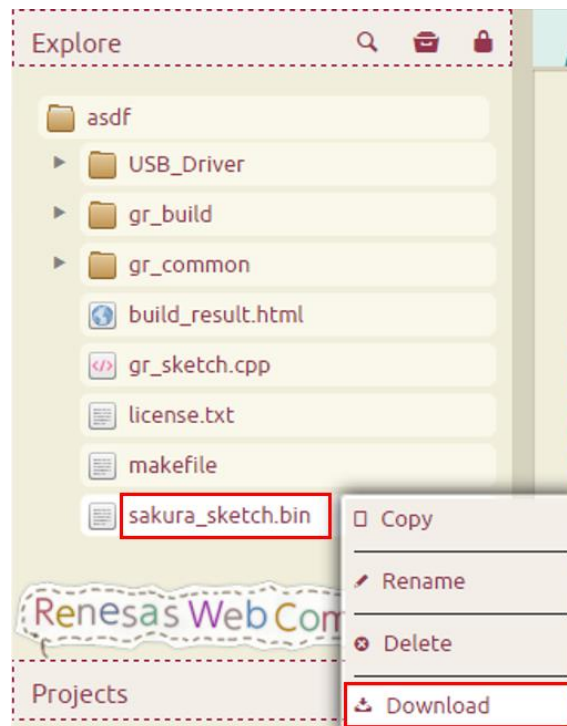


figure 4-2 Download the sakura_sketch.bin file

When the build is completed, the sakura_sketch.bin file is created and uploaded to the GR-SAKURA board to run the project.

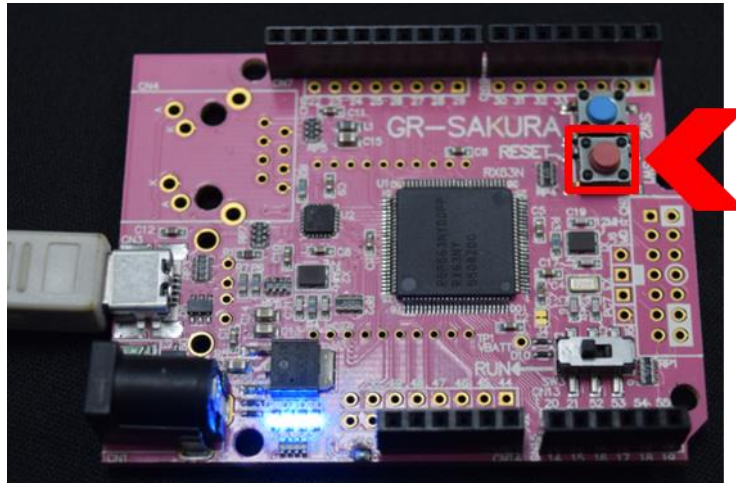


figure 4-3 Connecting GR-SAKURA and PC

Connect the GR-SAKURA to the PC using the USB Mini-B cable.

If the storage does not come up even after connecting, press the RESET switch to proceed.

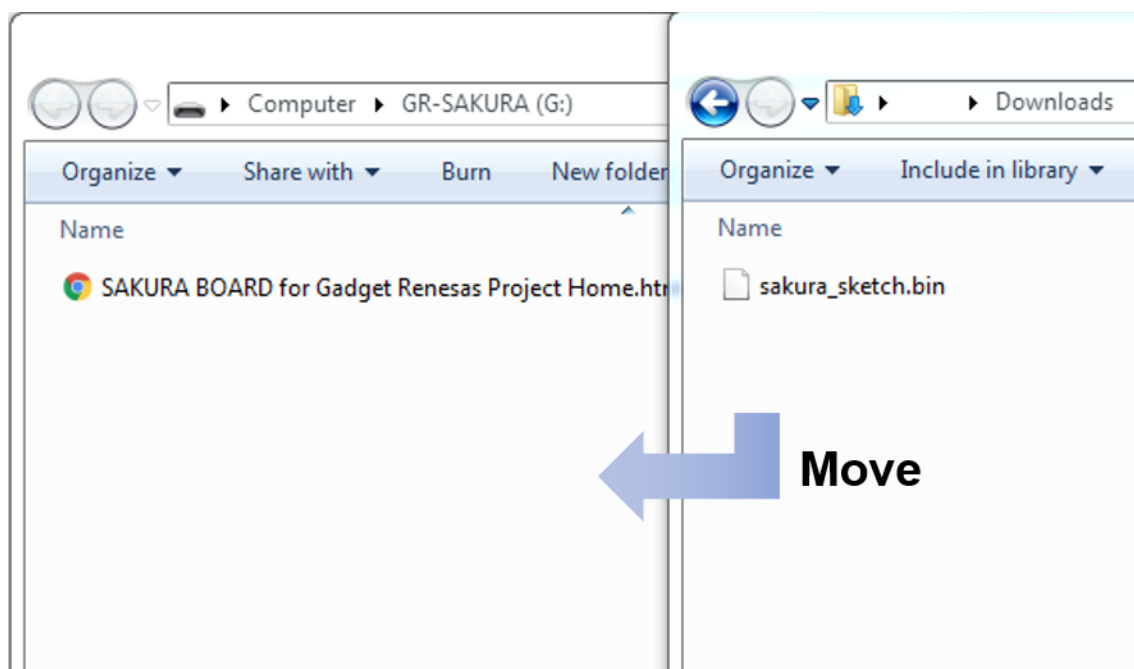


figure 4-4 Upload the GR-SAKURA project

Upload the sakura_sketch.bin file downloaded from Web Compiler to GR-SAKURA.

The GR-SAKURA LED blinks while the upload is in progress, so you can visually confirm it.

5 Execution

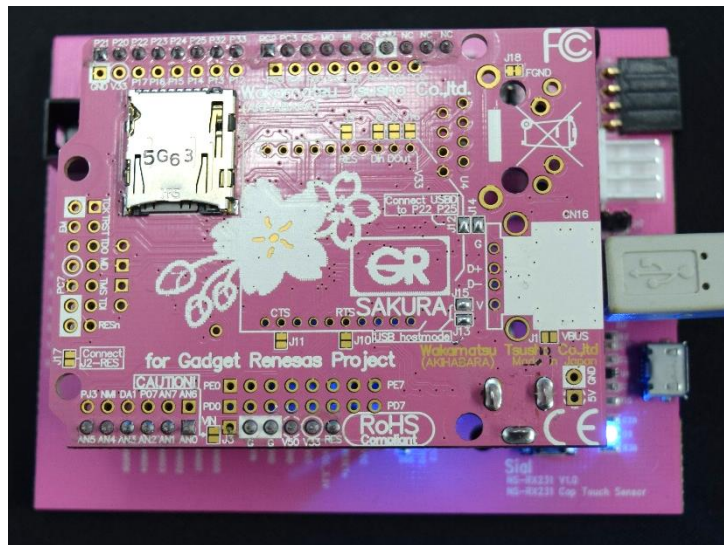


figure 5-1 Combination and USB connection picture of NS-RX231 and GR-SAKURA

After connecting the GR-SAKURA and NS-RX231 board, connect the USB cable to the mini-B port of SAKURA and connected it to the computer.

The terminal program uses Tera Term and below is the download link.

<https://osdn.net/projects/ttssh2/releases/>

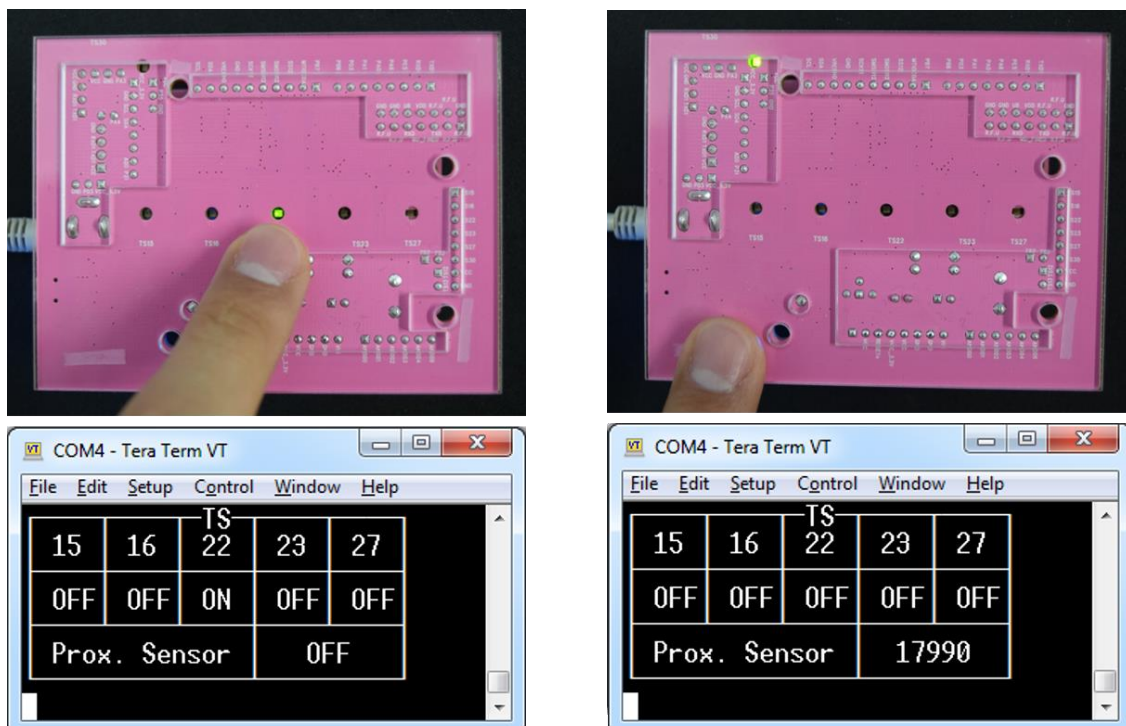


figure 5-2 Reaction the Terminal