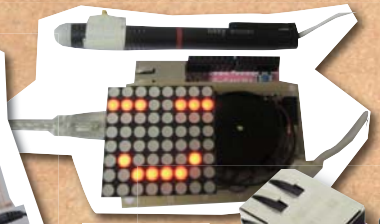
GR-SAKURA Starter Guide

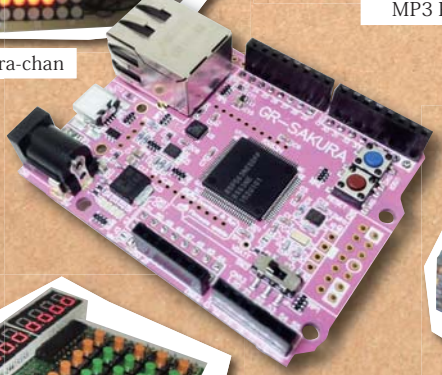
「GR-SAKURA de ADK」

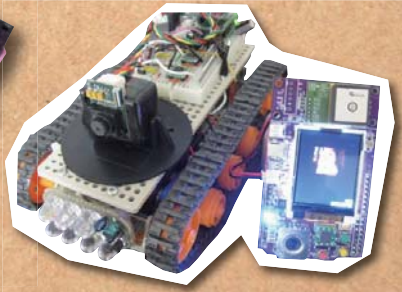


Sakura-chan

MP3 Player

Deka-L-Chika





GR WiFi Controller for Camera Tank

Mandelbrot Set Viewer

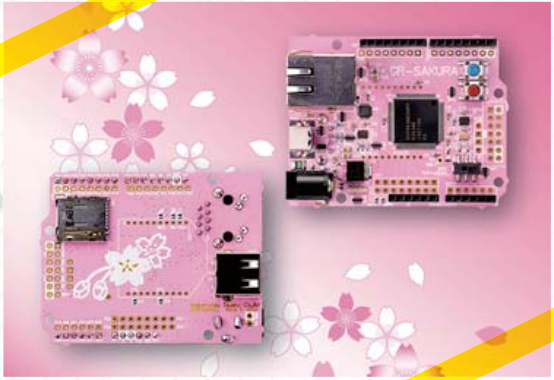
TK-80 Emulator

Name _____

All about GR (Gadget Renesas)

---Make fun electric toys! ---

If you've picked up this booklet, you probably like to make electronic projects. Or perhaps you are into gadgets. Are you a budding artist, hobbyist, or fan of all things cute? We welcome all who love to fidget with electronics, not matter where your interests lie! That's what Gadget Renesas is all about!



GR-SAKURA, produced by Gadget Renesas, is a compact board embedding a tiny but powerful microchip made by Renesas. Connect input and output devices to create your own original electronic gadget.

By input devices, we mean sensors that check out the surroundings, detecting things like light, sound, and distance.

Output devices, such as LEDs, speakers and motors, create action or sound.

GR-SAKURA, combined with your own design and program, orchestrates the output devices in response to input, creating a unique gadget.

Things for input …
Light, sound, tilt, switches, odor, temperature, humidity, distance, acceleration, radiation, GSP, etc.

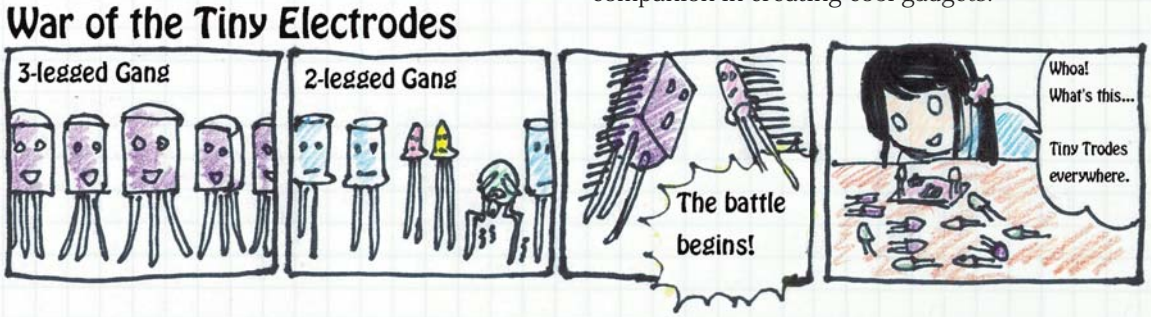
+

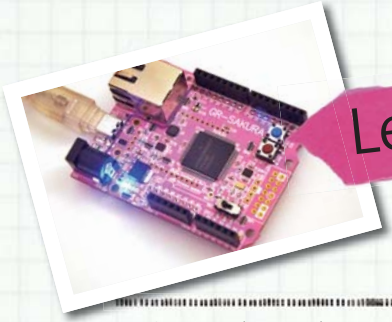
Things for output…
LED, LCD screen, speakers, oscillator, motor, memory card, network, etc.

You may think fiddling with electronics is too difficult. Well, it's not exactly easy, but you can make a simple demo using only your PC and the GR-SAKURA board. Connect switches and maybe a sensor for input and a speaker for output. Volia! You have a very cool gadget. Just make sure the components are connected in the right direction!
Plus, GR offers a variety of development environments, including simple programming using a smartphone, making it easy for just about anyone to create a program.

Have fun! Be creative!

GR-SAKURA can be used to create nearly anything. Try integrating the possibilities into a work of art for interactive communication with the outside world, or into a stuffed animal to create a warmth-emitting lucky charm! Electronics are no longer reserved for engineers with specialized knowledge. Use this to express your artistic tendencies. A bit of inspiration can open the door to a whole new world...let GR-SAKURA be your companion in creating cool gadgets!

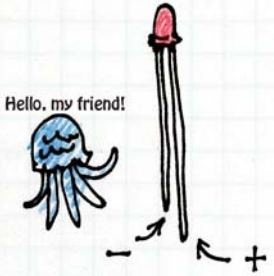




Let's plug in!

From connection to glowing success

Here's a quick introduction for testing the GR-SAKURA and setting up the Web compiler (your development environment). First, you need to register with "MyRenesas". To get started, all you need is the GR-SAKURA board, a USB mini cable and a PC with Internet access.



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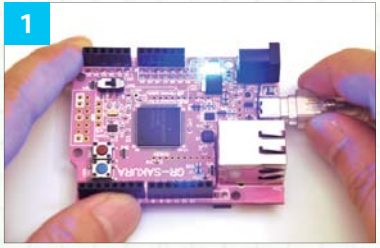


Connect GR-SAKURA to your PC with the USB mini cable. The board is powered by your PC. Make sure switch SW3 is set to "RUN". When the blue LEDs are flashing, the board is OK and ready for programming.

2

Next, press the red (reset) switch. The PC will then mount the GR-SAKURA board as a memory drive The example above shows Windows, but the good thing is, GR-SAKURA also works on Mac.

http://sakuraboard.net/index_en.html

3

The drive contains only one file. Double click the file to go to the SAKURA Board website. Please follow the instructions on this page.

http://update.renesas.com/gur/countrySelect.do

Renesas provides the Cloud Web Compiler to build your program. Either log in as a guest for trial use as shown Step 3, or register for regular use. Go to MyRenesas as shown above and click [New Registration].

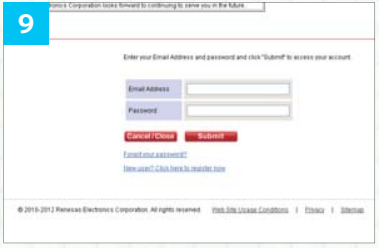
First, register your name and e-mail address. You will immediately receive an e-mail. Click on the [For new registrations] link in the e-mail and proceed to the next step.

This is the main registration view! Be patient... you have to fill in a lot of information. Complete all the required fields, then select the "I agree" box under Registration Agreement, and click Submit.

After completing your profile, you will be forwarded to the [Service registration] view. Just click [Next] and you are done with registration!

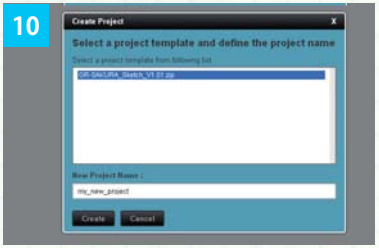
http://www.renesas.com/products/promotion/gr/index.jsp

Access the Renesas Web Compiler shown in Step 3, or use the above URL. After logging off the compiler, you will return to this page, which is the official Gadget Renesas website.



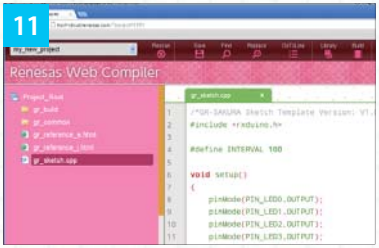
This is the login view of the Web Compiler. Each time you log into the Web Compiler you'll need to enter your MyRenesas e-mail address and password.

10



Logging in will bring you to the [Create New Project] view. Select any template and enter a temporary project name. We have entered “my_new_project” as our project name.

11



This takes you to the [Development] view. Double click the gr_sketch.cpp file on the left of the screen, and you’ll see a sample program in the editor window on the right. This program makes the LEDs blink on GR-SAKURA!

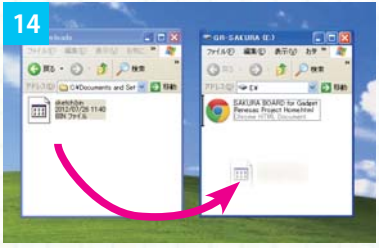
12

You can make your own program by modifying this sample program. Here, all you need to do is press [Build]. The "'my_new_project' has been compiled with no error" message should appear.

13

If the build is successful, a sketch.bin file will be created. Right click on the file name and select [Download]. This will download the sketch.bin file to your PC.

14



Next, copy the downloaded sketch.bin file to the GR-SAKURA Drive on your PC. This is the way you download a program to GR-SAKURA.

15

GR-SAKURA is dismounted automatically from the PC and executes the program, making the 4 LEDs blink sequentially. You have just completed the software development process on GR-SAKURA.

Take good care of GR-SAKURA!

GR-SAKURA is a very delicate device. There are a few things you need to do to avoid damaging the board.

Use a 5V power suppy adapter when necessary

GR-SAKURA is designed for use with a 5V power supply unlike the Arduino, which uses a 9V power supply. Before you plug in an Arduino shield on GR-SAKURA, check the operating voltages of both boards. Make sure the components on each board receive the proper voltage.

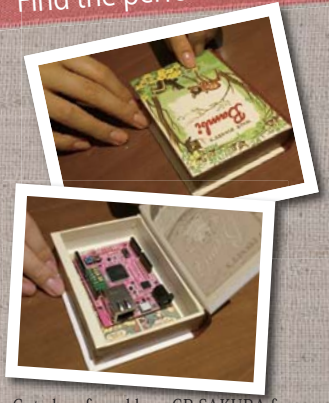
GR-SAKURA actually runs on 3.3V

The power supplied from the 5V power supply or the USB connector is converted to 3.3V and fed to the on-board MCU. Input signals for the board should be clamped to 3.3V. Always check the operating voltage of the Arduino shield. Incompatible voltage may damage both boards.

Be careful of short circuits and static electricity

Do not turn on the board when it is placed on metal or other conductive material, as this will cause circuit shortage and damage to the board. It's a good idea to use an insulated container of some kind. Be careful when using a plastic box, which easily accumulates static electricity. Wrapping the board in aluminum foil is one way to prevent damage. Don't forget to remove the foil before using!

Find the perfect case!



Cute box found by a GR-SAKURA fan
Book Box Mini (by Greeting Life)

Buying parts...

One of the fun things about making electronic gadgets is shopping around for components. Check hobbyist magazines and community Websites for what to use. To avoid buying the wrong parts, make sure you list up your required components and their specifications.

For beginners!!

3 Fundamental Shopping Rules

- Draw the circuit diagam
- List up parts, check specs
- Check availability and your wallet!

About Akihabara...

Akihabara, also known as Akihabara Electric Town, is a district of Tokyo packed with shops selling electronics and computers. It is also a haven for anime and otaku goods. You'll find Japanese and overseas visitors alike, buying all sorts of electronic appliances. Akihabara is a gold mine for electronic parts.

Akihabara Town Guide
http://www.akiba.or.jp/english/index.html

Akihabara in a nutshell
http://en.wikipedia.org/wiki/Akihabara

Get lost and have fun!

Most stores in Akihabara are highrise buildings, each floor crammed with more electronics than you can imagine. Expect to get lost! Stores are staffed with experts ready to answer even the most detailed questions. Don't be afraid to ask for directions or help, as many of the staff speak two languages...English, Chinese, Korean, etc. The area is worth a visit even if you buy just one little resistor!

Interview with GR-SAKURA maker

On our search for parts to use with GR-SAKURA, we interviewed Mr. Kogure of Wakamatsu Tsusho, manufacturer of the GR-SAKURA board.

What's the best way to shop for parts?

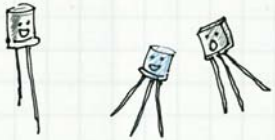
Make sure you confirm part numbers and specifications on the Web ahead of time. Save time by checking on availability as well.

Good point. In-store stock and online availability may differ, so it's best to be prepared.

When it comes to switches, there are so many varieties and each one has a different touch. If you're a novice, you really should visit a shop and get a feel for what you want.

Wakamatsu Tsusho, Inc.

A legendary parts shop located in the heart of Akihabara. In addition to millions of parts, they also offer various workshops.



I know what you mean. It's terrible to find out you bought the wrong pitch, and the switch won't fit on the bread board.

You'll make loads of little mistakes in the beginning--buying the wrong parts, soldering in the wrong direction, damaging the board with static... Ask the GR Users Group in RenesasRulz or join a hobbyist community. It's always easier and more fun to work together.

Thanks for all the great advice!

Use the power of the Internet!

You can get any part you need on the Internet. Try to order all your parts at the same shop to save on delivery charges. The thing is, not all shops will have everything you need and prices will differ from place to place. Do your homework...shop around to make sure you get the best deal!

Example 1

Make a piano with a speaker and a few switches

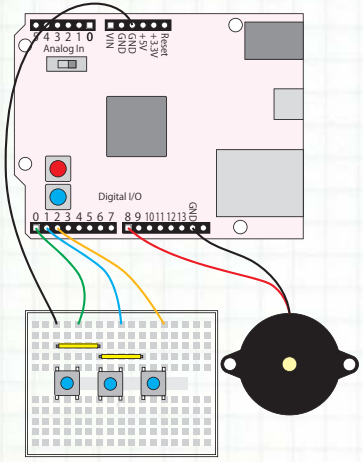
Make sure you complete the installation described on page 4 before you start this project.

Now that you have made a few LEDs blink, let's create some sound! You can make a simple piano by connecting a speaker and a few switches. First gather all the components listed below, then get started!

Components you need

- ☐ Bread board x 1
- ☐ Jumper wire x a few
- ☐ Piezo speaker x 1
- ☐ Tact switch x 3

Wiring



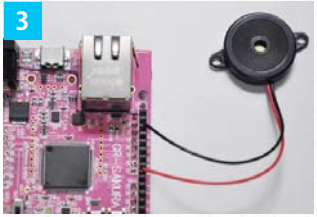
1

Line up 3 tact switches on the bread board.

2

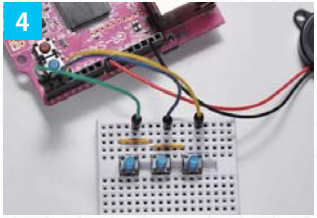
Connect the switches with 2 jumper wires as shown here.

3



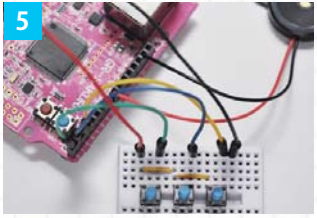
Connect a piezo speaker to GR-SAKURA headers.

4



Connect the switches to GR-SAKURA headers.

5

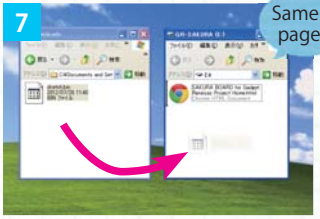


Connect the GR-SAKURA and bread board GNDs with a wire.

6

Copy and paste the program shown on Page 14 to the Web Compiler.

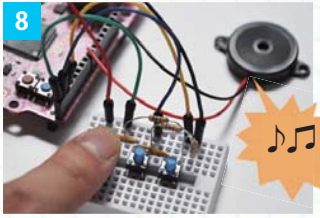
7



Same as page 4

Build and download the program to GR-SAKURA.

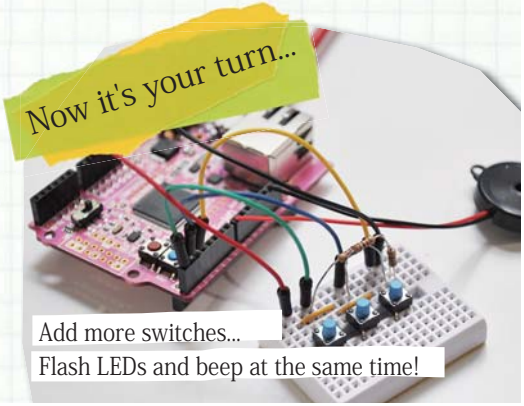
8



Done!
Push the switches to hear Do-Re-Me!

Why is GR-SAKURA pink?

There is a good reason for GR-SAKURA's fancy pink color and handicraft style. The GR-SAKURA project was initiated to help not just gadget hobbyists, but artists and other creative people integrate electronics into their crafts. The project team contacted a university electronic crafts club for ideas appealing to the younger generation, finally deciding on pink as an inspirational, creativity-enhancing color! The team also made software development easy enough for just about anybody to challenge.



Example 2

Make a fuzzy creature with felt and LEDs

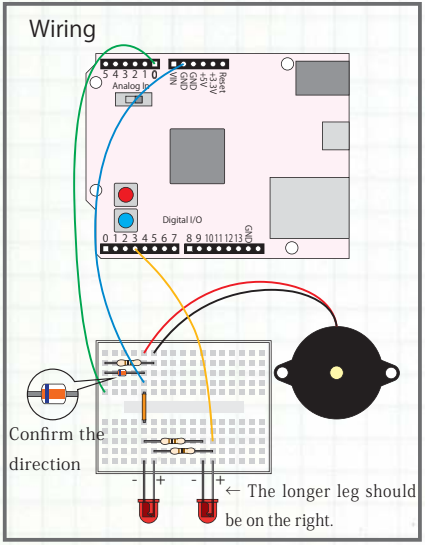
Make sure you complete the installation described on page 4 before you start this project.

Here, we combined the piezo speaker from the simple piano for input, creating a cute creature that responds to sound. We're not quite sure what he is, but the name Fuzzball fits perfectly!

Components you need

- ☐ Bread board x 1
- ☐ Jumper wire x a few
- ☐ Piezo speaker x 1
- ☐ Zener diode 2.5V x 1
- ☐ Resister 100 Ω x 3
- ☐ LED (Red) x 2

Wiring



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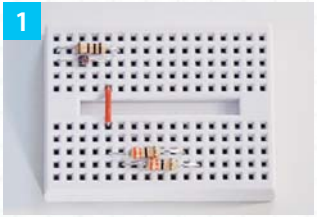


Place Zener diode, resisters, and jumper on the board, as above.

2

Put the bread board on top of GR-SAKURA.

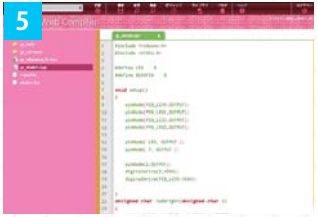
3

Form a fuzzy body with felt and implant a speaker in the skin.

4

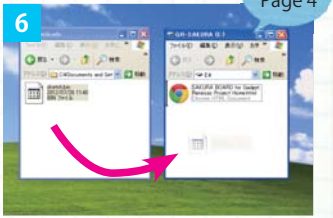
Insert 2 LEDs for the eyes and make sure they stay by bending their leads.

5



Copy and paste the program shown on Page 14 to the Web Compiler.

6



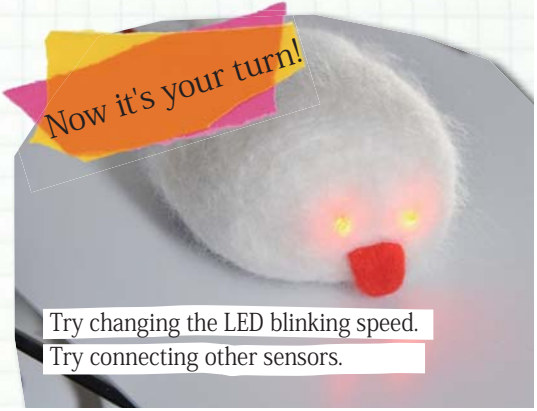
Build and download the program to GR-SAKURA.

7

Cover the boards with the felt skin and connect the wires.

8

Done! Give Fuzzball a nice pet on his back. His eyes should blink...happily!



Ask us anything!
Show off your work!

You'll probably have lots of questions as you start using GR-SAKURA. Don't hesitate to send inquiries to RenesasRulz (see URL below). Other GR-SAKURA users will respond with useful answers and suggestions. It may take a bit of courage at first, but just remember--everyone was a beginner at sometime…and most users are happy to help! Once you become a veteran, you can advise beginners as well!

Don't forget to show off your gadget when you are finished. It's fun to hear comments from other GR-SAKURA fans!

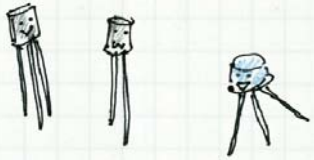
http://www.renesasrulz.com/community/demoboards/gr

Codes and detailed explanations for examples...

Access the following URL for more information and codes used in the examples introduced in this guidebook.

http://www.renesasrulz.com/docs/DOC-2321

Special Thanks



This guidebook was created in collaboration by the GR Project Team and GR Producers, our beta-site users. We would like to express our sincere thanks for all your help.

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