

PLATFORMIO I

Boards, Platforms, Frameworks & Packages

board

Sipeed
Longan
Nano

platform

-GigaDevice
GD32V
-Nuclei
-Rath RISC-V

framework

-Arduino
-GigaDevice
GD32V SDK

packages

-framework-
arduino-gd32v
-framework-
gd32vf103-sdk
-tool-dfuutil
-tool-gd32vflash
-tool-openocd-gd32v
-toolchain-gd32v

INTRO

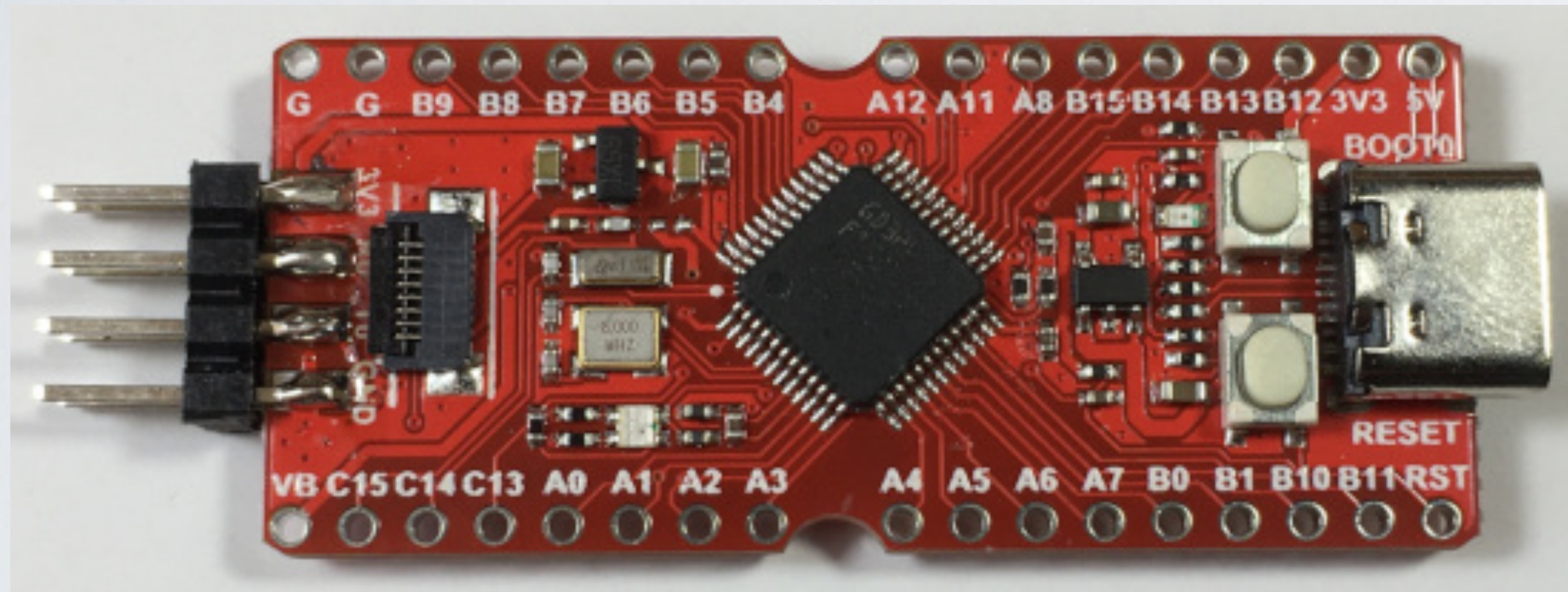
- In this video I will explain what boards, platforms, frameworks and packages are.
- This video is not a beginners guide or a tutorial how to use PlatformIO.

PRESENTATION

- This presentation can be found at:
https://www.mobilefish.com/download/platformio/platformio_part1.pdf
- All my PlatformIO videos and presentations can be found at:
<https://www.mobilefish.com/developer/platformio/platformio.html>

ABOUT THE DEVELOPMENT BOARD

- In this video I will be mentioning the Sipeed Longan Nano development board.



- It is done for demonstration purpose and this is not a sponsored video.
- For the Sipeed Longan Nano development board there are only toolchains for Windows and Linux. There is no support for MacOS.

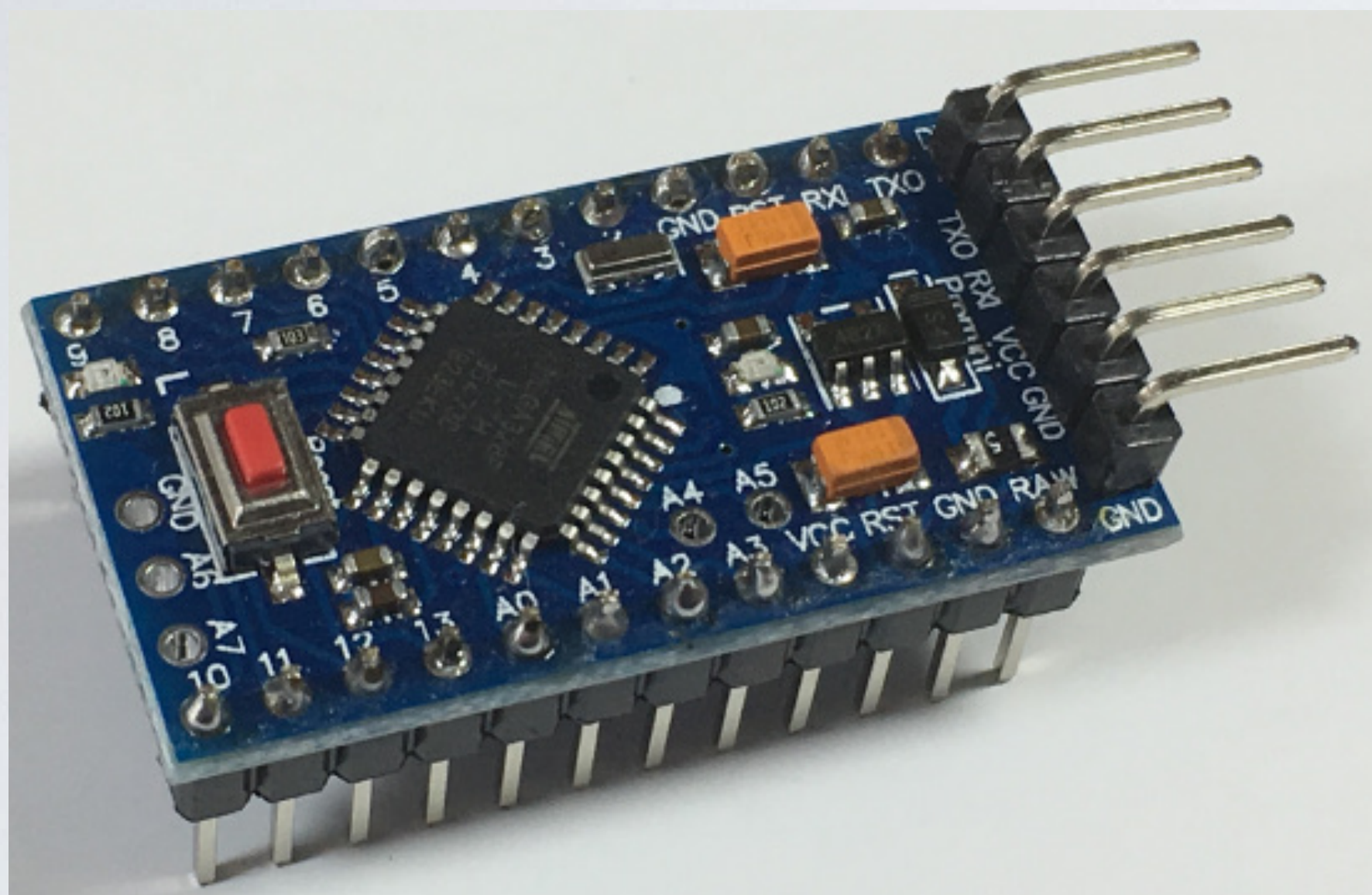
TOOLCHAIN

- A toolchain is a set of tools that compiles source code into executables that can run on a device, and includes a compiler, a linker, run-time libraries, debugger or more.
- To install a toolchain on PlatformIO you must first select the board, then the platform and last the framework.

BOARDS

- **A board is a printed circuit board with a microcontroller built onto it. It usually has I/O circuits, a clock generator, RAM, flash memory and any necessary supported Integrated Circuits.**
- Usually each board provides support for one platform.
- The Sipeed Longan Nano supports 3 platforms.

BOARDS



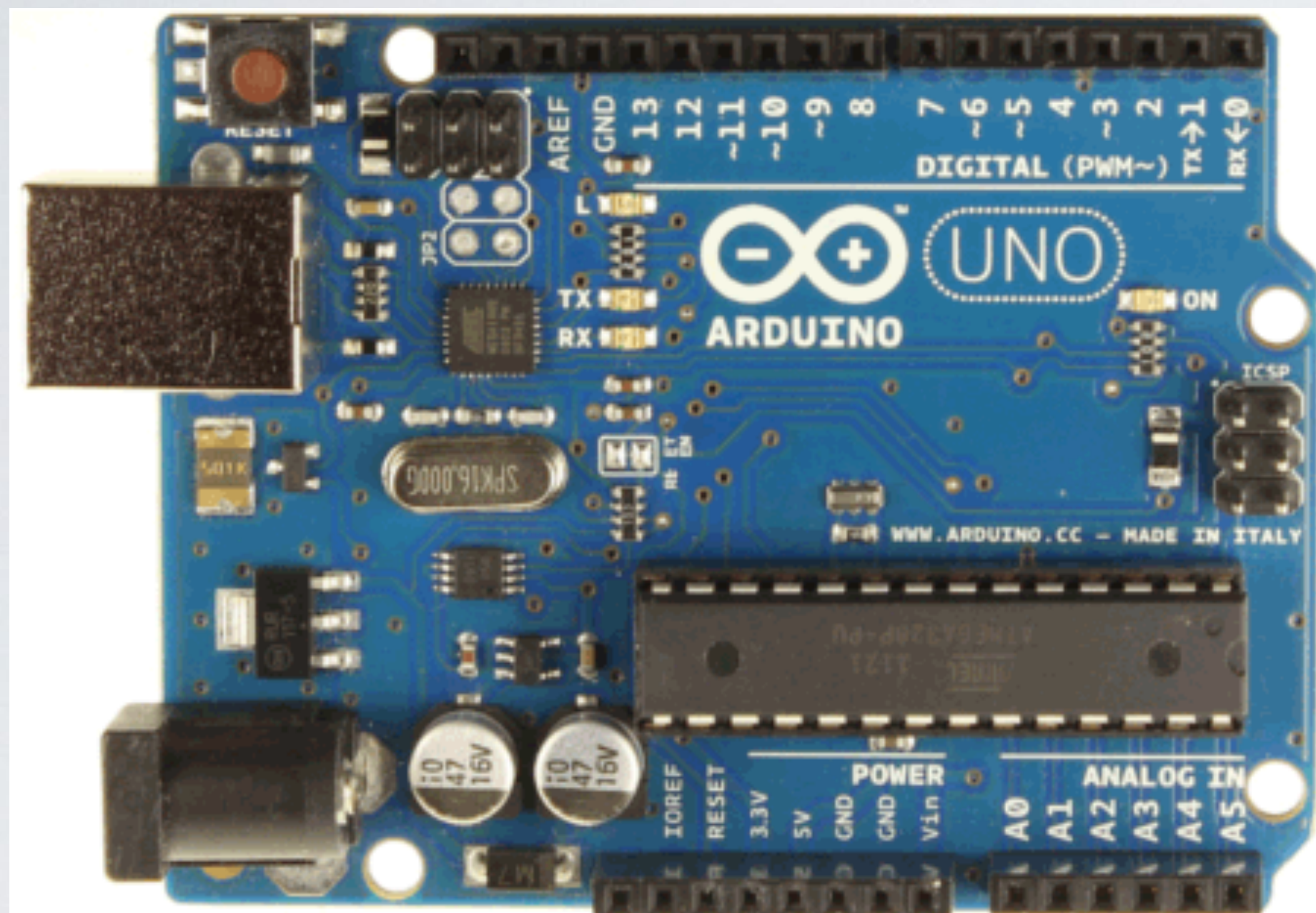
Board: Arduino Pro or
Pro Mini ATmega328
(3.3V, 8 MHz)

Platform: Atmel AVR

Name ^	Platform ▾	Frameworks	MCU ▾	Debug ▾	Frequency ▾	RAM ▾	Flash ▾
arduino pro	▾	▾		▾			
Arduino Pro or Pro Mini ATmega168 (3.3V, 8 MHz)	Atmel AVR	Arduino	ATMEGA168	On-board	8 MHz	1 kB	14 kB
Arduino Pro or Pro Mini ATmega168 (5V, 16 MHz)	Atmel AVR	Arduino	ATMEGA168	On-board	16 MHz	1 kB	14 kB
Arduino Pro or Pro Mini ATmega328 (3.3V, 8 MHz)	Atmel AVR	Arduino	ATMEGA328P	On-board	8 MHz	2 kB	30 kB
Arduino Pro or Pro Mini ATmega328 (5V, 16 MHz)	Atmel AVR	Arduino	ATMEGA328P	On-board	16 MHz	2 kB	30 kB

<https://platformio.org/boards>

BOARDS



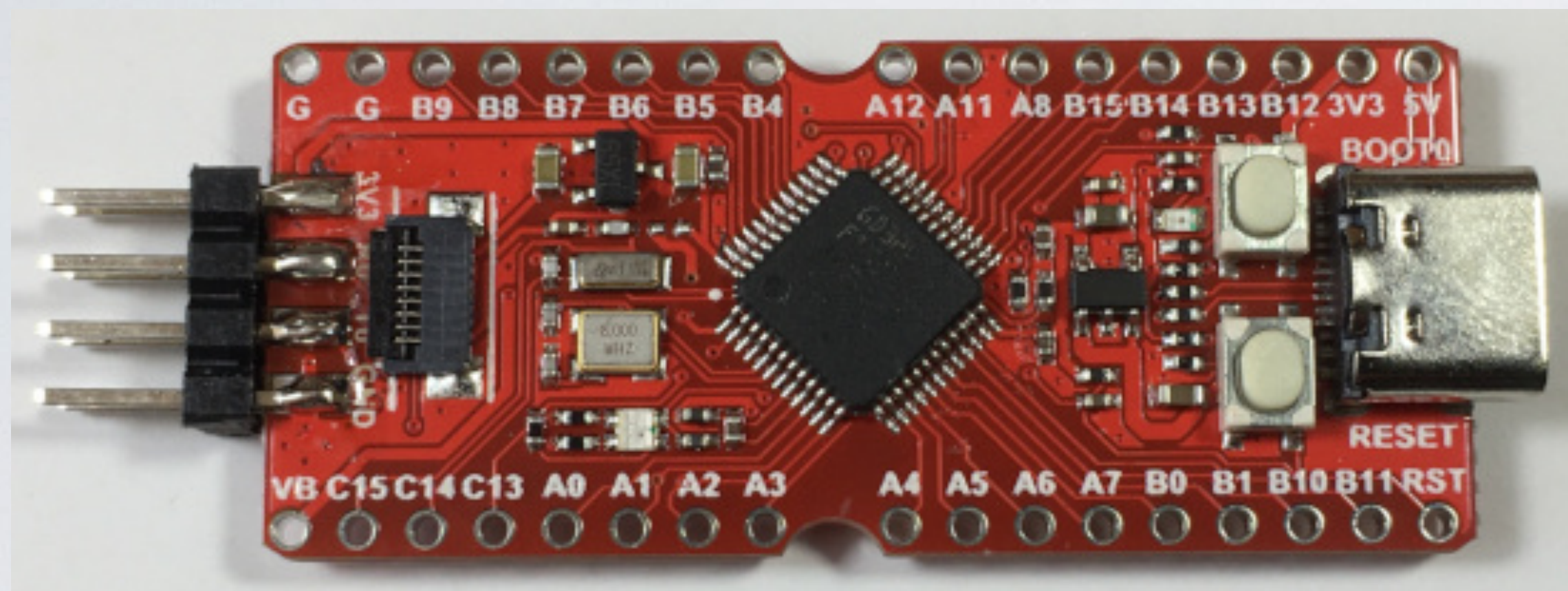
Board: Arduino Uno

Platform: Atmel AVR

Name ^	Platform ▾	Frameworks	MCU ▾	Debug ▾	Frequency ▾	RAM ▾	Flash ▾
arduino uno	▾	▾		▾			
Arduino Uno 📄	Atmel AVR	Arduino, Simba	ATMEGA328P	On-board ⓘ	16 MHz	2 kB	31.5 kB

<https://platformio.org/boards>

BOARDS



Board: Sipeed Longan Nano

Platform: GigaDevice GD32V
Nuclei
Rath RISC-V

Name ^	Platform ⇅	Frameworks	MCU ⇅	Debug ⇅	Frequency ⇅	RAM ⇅	Flash ⇅
<input type="text" value="sipeed"/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>			
Sipeed Longan Nano 	GigaDevice GD32V	GigaDevice GD32V SDK, Arduino	GD32VF103CBT6	External ⓘ	108 MHz	32 kB	128 kB
Sipeed Longan Nano 	Nuclei	Nuclei SDK	GD32VF103CBT6	External ⓘ	108 MHz	32 kB	128 kB
Sipeed Longan Nano 	Rath RISC-V	GigaDevice GD32V SDK, Rath HAL SDK	GD32VF103CBT6	External ⓘ	108 MHz	32 kB	128 kB

BOARDS

- PlatformIO supports over 1000 boards and these boards can be found when using the PlatformIO Project Wizard.

Project Wizard ✕


This wizard allows you to **create new** PlatformIO project or **update existing**. In the last case, you need to uncheck "Use default location" and specify path to existing project.

Name:

Board:

Framework:

Location: Use default location ?



Project Wizard ✕

This wizard allows you to **create new** PlatformIO project or **update existing**. In the last case, you need to uncheck "Use default location" and specify path to existing project.

Name:

Board:

Framework:

Location:

Arduino Pro or Pro Mini ATmega328 (3.3V, 8 MHz)

Arduino Pro or Pro Mini ATmega328 (5V, 16 MHz)

Arduino Robot Control

BOARDS

Project Wizard ×

This wizard allows you to **create new** PlatformIO project or **update existing**. In the last case, you need to uncheck "Use default location" and specify path to existing project.

Name:

Board:

Framework:

- GigaDevice GD32V ← **Platform**
- Sipeed Longan Nano** ← **Board**
- Sipeed Longan Nano Lite

Location:

- Nuclei ← **Platform**
- Sipeed Longan Nano (GigaDevice) ← **Board**
- Rath RISC-V ← **Platform**
- Sipeed Longan Nano** ← **Board**

As mentioned earlier the Sipeed Longan Nano supports three platforms:

- GigaDevice GD32V
- Nuclei
- Rath RISC-V

When entering "sipeed longan nano" the pull down menu shows 3 options all with the same board name.

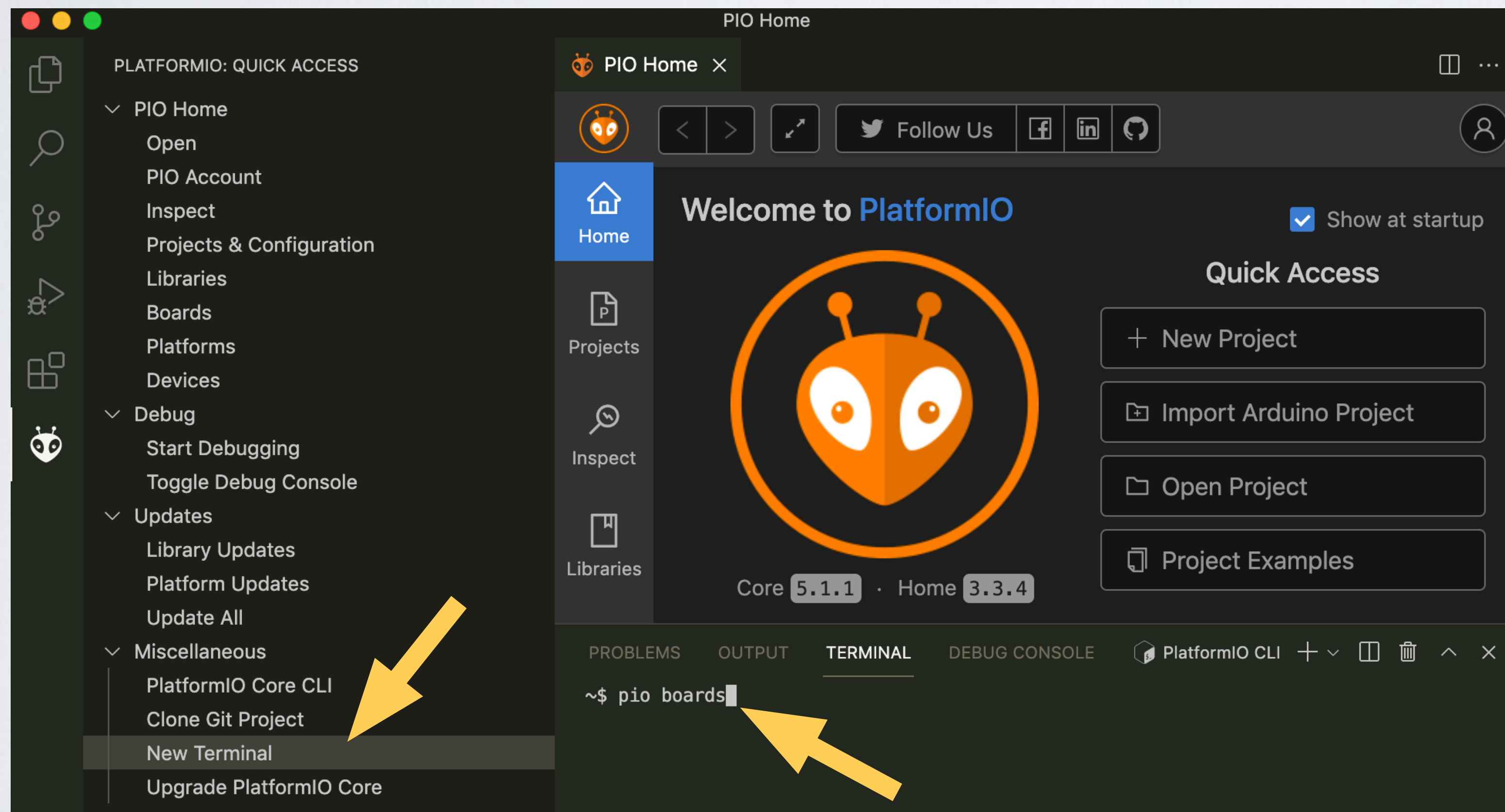
You must select the board for its intended platform.

BOARDS

- Using the PlatformIO Core Command Line Interface (CLI):

Type: `pio boards`

CLI guide: <https://docs.platformio.org/en/latest/core/userguide/index.html>



BOARDS

PROBLEMS	OUTPUT	TERMINAL	DEBUG CONSOLE			
micro		ATMEGA32U4	16MHz	28KB	2.50KB	Arduino Micro
miniatmega168		ATMEGA168	16MHz	14KB	1KB	Arduino Mini ATmega168
miniatmega328		ATMEGA328P	16MHz	28KB	2KB	Arduino Mini ATmega328
atmegangatmega168		ATMEGA168	16MHz	14KB	1KB	Arduino NG or older ATmega168
atmegangatmega8		ATMEGA8	16MHz	7KB	1KB	Arduino NG or older ATmega8
nanoatmega168		ATMEGA168	16MHz	14KB	1KB	Arduino Nano ATmega168
nanoatmega328		ATMEGA328P	16MHz	30KB	2KB	Arduino Nano ATmega328
nanoatmega328new		ATMEGA328P	16MHz	30KB	2KB	Arduino Nano ATmega328 (New Bootloader)
pro8MHzatmega168		ATMEGA168	8MHz	14KB	1KB	Arduino Pro or Pro Mini ATmega168 (3.3V, 8 MHz)
pro16MHzatmega168		ATMEGA168	16MHz	14KB	1KB	Arduino Pro or Pro Mini ATmega168 (5V, 16 MHz)
pro8MHzatmega328		ATMEGA328P	8MHz	30KB	2KB	Arduino Pro or Pro Mini ATmega328 (3.3V, 8 MHz)
pro16MHzatmega328		ATMEGA328P	16MHz	30KB	2KB	Arduino Pro or Pro Mini ATmega328 (5V, 16 MHz)
robotControl		ATMEGA32U4	16MHz	28KB	2.50KB	Arduino Robot Control
robotMotor		ATMEGA32U4	16MHz	28KB	2.50KB	Arduino Robot Motor
uno		ATMEGA328P	16MHz	31.50KB	2KB	Arduino Uno
yun		ATMEGA32U4	16MHz	28KB	2.50KB	Arduino Yun
yunmini		ATMEGA32U4	16MHz	28KB	2.50KB	Arduino Yun Mini
zumbt328		ATMEGA328P	16MHz	28KB	2KB	BQ ZUM BT-328
raspduino		ATMEGA328P	16MHz	30KB	2KB	BitWizard Raspduino
controllino_maxi		ATMEGA2560	16MHz	248KB	8KB	Controllino Maxi
controllino_maxi_automation		ATMEGA2560	16MHz	248KB	8KB	Controllino Maxi Automation



board id



board name

BOARDS

Show only "sipeed longan nano" boards



```
~$ pio boards "sipeed longan nano"
```

```
Platform: Rath
```

ID	MCU	Frequency	Flash	RAM	Name
sipeed-longan-nano	GD32VF103CBT6	108MHz	128KB	32KB	Sipeed Longan Nano

```
Platform: gd32v
```

ID	MCU	Frequency	Flash	RAM	Name
sipeed-longan-nano	GD32VF103CBT6	108MHz	128KB	32KB	Sipeed Longan Nano
sipeed-longan-nano-lite	GD32VF103C8T6	108MHz	64KB	20KB	Sipeed Longan Nano Lite

```
Platform: nuclei
```

ID	MCU	Frequency	Flash	RAM	Name
gd32vf103c_longan_nano	GD32VF103CBT6	108MHz	128KB	32KB	Sipeed Longan Nano

```
~$ █
```

BOARDS

PlatformIO: QUICK ACCESS

- PIO Home
 - Open
 - PIO Account
 - Inspect
 - Projects & Configuration
 - Libraries
 - Boards
 - Platforms
 - Devices
- Debug
 - Start Debugging
 - Toggle Debug Console
- Updates
 - Library Updates
 - Platform Updates
 - Update All
- Miscellaneous
 - PlatformIO Core CLI
 - Clone Git Project
 - New Terminal
 - Upgrade PlatformIO Core

PIO Home

Get Started PIO Home

Home

Projects

Inspect

Libraries

Platforms









Devices

Board Explorer 4

PlatformIO currently supports over 800 boards from leading manufacturers, and we are constantly adding new ones. You can be part of the process by letting us know what board you wish to see supported next, by [submitting a feature request](#).

sipeed longan nano

Clear filters Certified IoT-enabled Debug: On-board External

Name	Platform	Frameworks	MCU	FRQ	ROM	RAM	Extra
+ Sipeed Longan Nano	GigaDevice GD32V	Arduino, GigaDevice GD32V SDK	GD32VF103CBT6	108 Mhz	128 KB	32 KB	 
+ Sipeed Longan Nano	Nuclei	Nuclei SDK	GD32VF103CBT6	108 Mhz	128 KB	32 KB	 
+ Sipeed Longan Nano	Rath RISC-V	GigaDevice GD32V SDK, Rath HAL SDK	GD32VF103CBT6	108 Mhz	128 KB	32 KB	 
+ Sipeed Longan Nano Lite	GigaDevice GD32V	Arduino, GigaDevice GD32V SDK	GD32VF103C8T6	108 Mhz	64 KB	20 KB	 

BOARDS

- Use: <https://platformio.org/boards>

Technology that Empowers and Unites [PlatformIO Labs Helps Imagination Technologies Improve RISC-V Computer Architecture Training.](#) Ad

[Share](#)

Name	Platform	Frameworks	MCU	Debug	Frequency	RAM	Flash
<input type="text" value="arduino uno"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Arduino Uno WiFi Rev2	Atmel megaAVR	Arduino	ATMEGA4809		16 MHz	6 kB	47.5 kB
Arduino Uno	Atmel AVR	Arduino, Simba	ATMEGA328P	On-board	16 MHz	2 kB	31.5 kB

15 30 50 100 1000

BOARDS

- Show only “sipeed longan nano” boards









Boards & dev-kits

PlatformIO currently supports over 1000 boards from leading manufacturers, and we are constantly adding new ones.

You can be part of the process by letting us know what board you wish to see supported next, by [submitting a feature request](#).

Technology that Empowers and Unites  [PlatformIO Labs Helps Imagination Technologies Improve RISC-V Computer Architecture Training.](#) Ad

 Share

Name ↕	Platform ▾	Frameworks	MCU ↕	Debug ↕	Frequency ↕	RAM ↕	Flash ↕
<input type="text" value="sipeed longan na"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Sipeed Longan Nano 	Rath RISC-V	GigaDevice GD32V SDK, Rath HAL SDK	GD32VF103CBT6	External 	108 MHz	32 kB	128 kB
Sipeed Longan Nano 	Nuclei	Nuclei SDK	GD32VF103CBT6	External 	108 MHz	32 kB	128 kB
Sipeed Longan Nano 	GigaDevice GD32V	GigaDevice GD32V SDK, Arduino	GD32VF103CBT6	External 	108 MHz	32 kB	128 kB
Sipeed Longan Nano Lite 	GigaDevice GD32V	GigaDevice GD32V SDK, Arduino	GD32VF103C8T6	External 	108 MHz	20 kB	64 kB

15 30 50 100 1000

PLATFORM

- **Platform refers to the actual hardware or software development platform upon which a software is built for.**
- The hardware refers to a particular microcontroller or processor architecture that PlatformIO projects can be compiled to run on.

PLATFORM

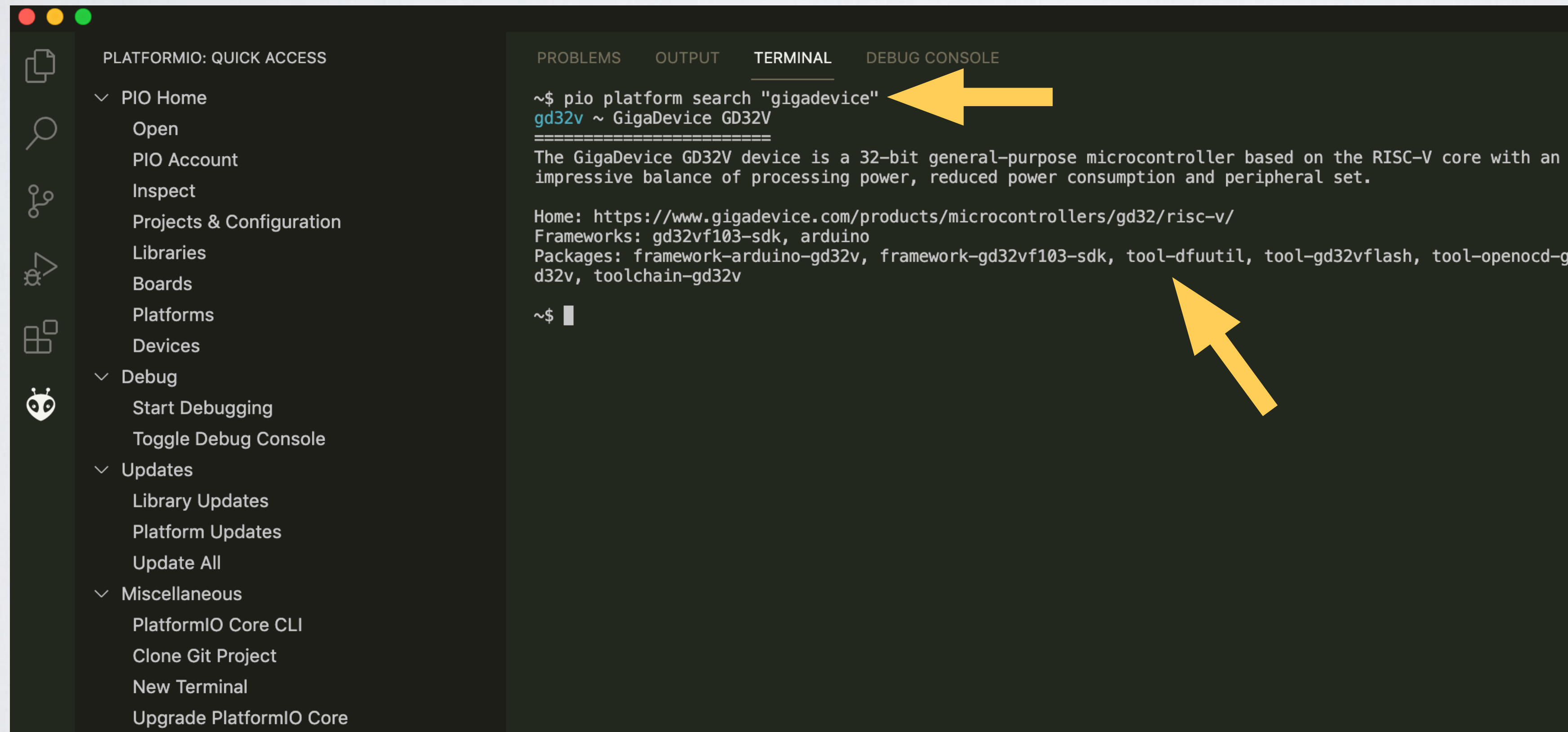
- For each platform, PlatformIO defines:
 - The PlatformIO Build System build scripts for the supported frameworks and SDKs
 - Pre-configured presets for embedded circuit boards
 - Pre-compiled toolchains and related tools for the architecture(s) to be installed
- More information: <https://docs.platformio.org/en/latest/platforms/>

PLATFORM

- Using the PlatformIO Core Command Line Interface (CLI):

Type: `pio platform search "gigadevice"`

CLI guide: <https://docs.platformio.org/en/latest/core/userguide/index.html>



The screenshot shows the PlatformIO IDE interface. On the left is a sidebar with a 'PLATFORMIO: QUICK ACCESS' menu containing options like 'PIO Home', 'Open', 'PIO Account', 'Inspect', 'Projects & Configuration', 'Libraries', 'Boards', 'Platforms', 'Devices', 'Debug', 'Updates', and 'Miscellaneous'. The main area is a terminal window with tabs for 'PROBLEMS', 'OUTPUT', 'TERMINAL', and 'DEBUG CONSOLE'. The terminal shows the command `~$ pio platform search "gigadevice"` being executed, with a yellow arrow pointing to it. The output shows the search results for the 'gd32v' platform, including a description of the GigaDevice GD32V device, its home page, frameworks, and packages. A second yellow arrow points to the package list at the bottom of the output.

```
~$ pio platform search "gigadevice"
gd32v ~ GigaDevice GD32V
=====
The GigaDevice GD32V device is a 32-bit general-purpose microcontroller based on the RISC-V core with an
impressive balance of processing power, reduced power consumption and peripheral set.

Home: https://www.gigadevice.com/products/microcontrollers/gd32/risc-v/
Frameworks: gd32vf103-sdk, arduino
Packages: framework-arduino-gd32v, framework-gd32vf103-sdk, tool-dfuutil, tool-gd32vflash, tool-openocd-g
d32v, toolchain-gd32v

~$
```

PLATFORM

The screenshot displays the PlatformIO IDE interface. On the left is a sidebar with a 'PLATFORMIO: QUICK ACCESS' menu. The main window shows the 'PIO Home' page with a search bar containing 'G' and two buttons: 'Advanced Installation' and 'Custom Platform'. Below the search bar, there are two platform cards. The first card is for 'Atmel megaAVR' with an 'Arduino' framework button. The second card is for 'GigaDevice GD32V' with 'GigaDevice GD32V SDK' and 'Arduino' framework buttons. A yellow arrow points from the word 'platform' to the 'GigaDevice GD32V' card, and another yellow arrow points from the word 'frameworks' to the 'GigaDevice GD32V SDK' and 'Arduino' buttons.

PLATFORMIO: QUICK ACCESS

- PIO Home
 - Open
 - PIO Account
 - Inspect
 - Projects & Configuration
 - Libraries
 - Boards
 - Platforms
 - Devices
- Debug
 - Start Debugging
 - Toggle Debug Console
- Updates
 - Library Updates
 - Platform Updates
 - Update All
- Miscellaneous
 - PlatformIO Core CLI
 - Clone Git Project
 - New Terminal
 - Upgrade PlatformIO Core

PIO Home

Get Started PIO Home

Home

Projects

Inspect

Libraries

Boards

Platforms

Devices

Installed Embedded Desktop Frameworks Updates

G

Advanced Installation Custom Platform

Atmel megaAVR

8-bit MCUs Built for Real-time Control with Core Independent Peripherals combining intelligent hardware peripherals along with the low-power capability of an AVR core, megaAVR microcontrollers (MCUs) broaden the effectiveness of your real-time control systems.

Arduino

GigaDevice GD32V

platform

The GigaDevice GD32V device is a 32-bit general-purpose microcontroller based on the RISC-V core with an impressive balance of processing power, reduced power consumption and peripheral set.




GigaDevice GD32V SDK Arduino

frameworks

PLATFORM

- Filter for platform “gigadevice”.
See: <https://platformio.org/platforms>

Development Platforms

Embedded and Desktop development platforms with pre-built toolchains, debuggers, uploaders and frameworks which work under popular systems:  *Mac*,  *Linux (+ARM)* and  *Windows*.

PlatformIO Best Practices  [Enabling PlatformIO and Zephyr on custom hardware.](#) Ad

[Home](#) / Platforms

Embedded Platforms **Desktop Platforms** **+ Create Platform**

gigadevice

GigaDevice GD32V

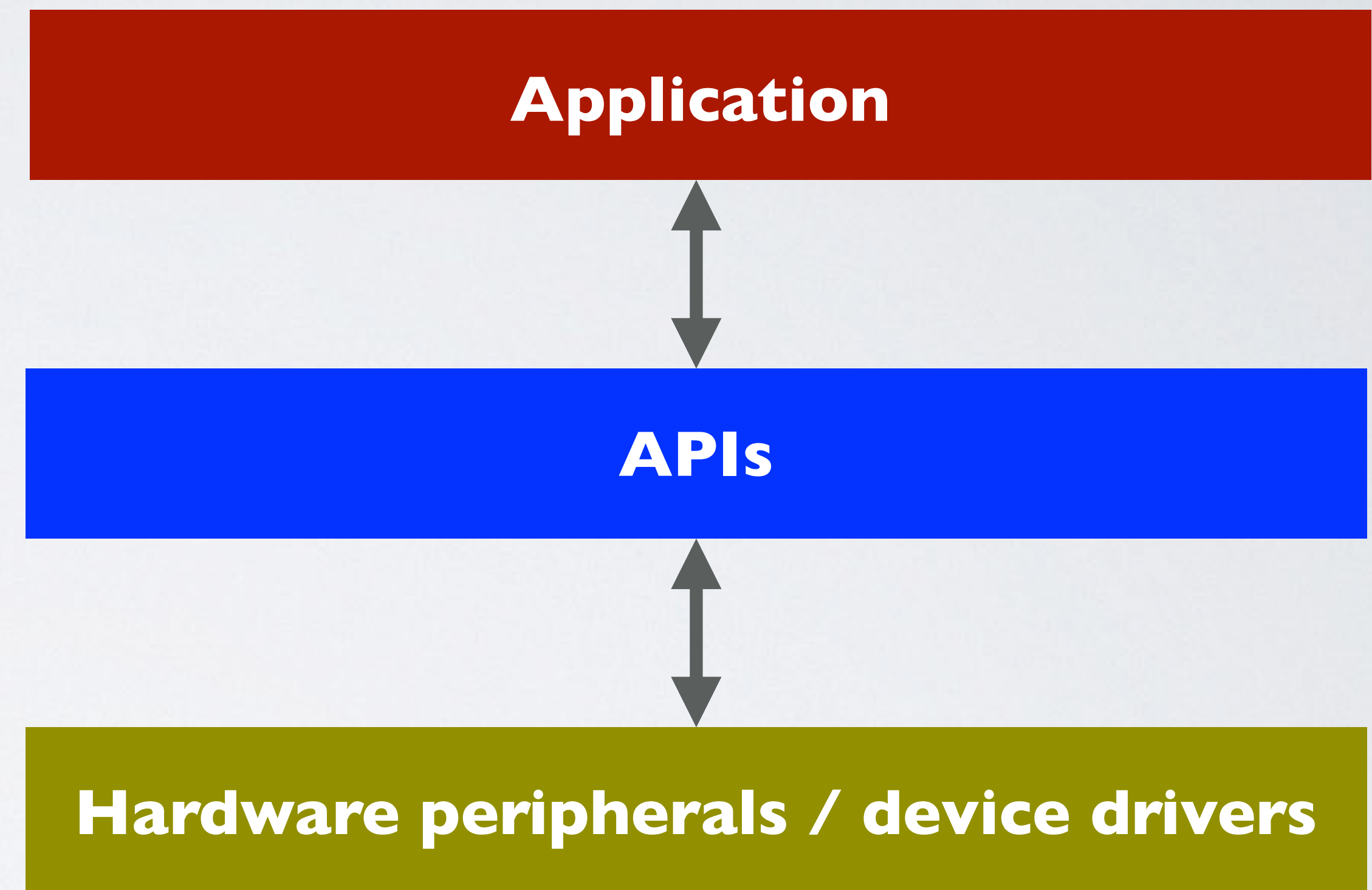
The GigaDevice GD32V device is a 32-bit general-purpose microcontroller based on the RISC-V core with an impressive balance of processing power, reduced power consumption and peripheral set.

 GigaDevice GD32V SDK

 Arduino

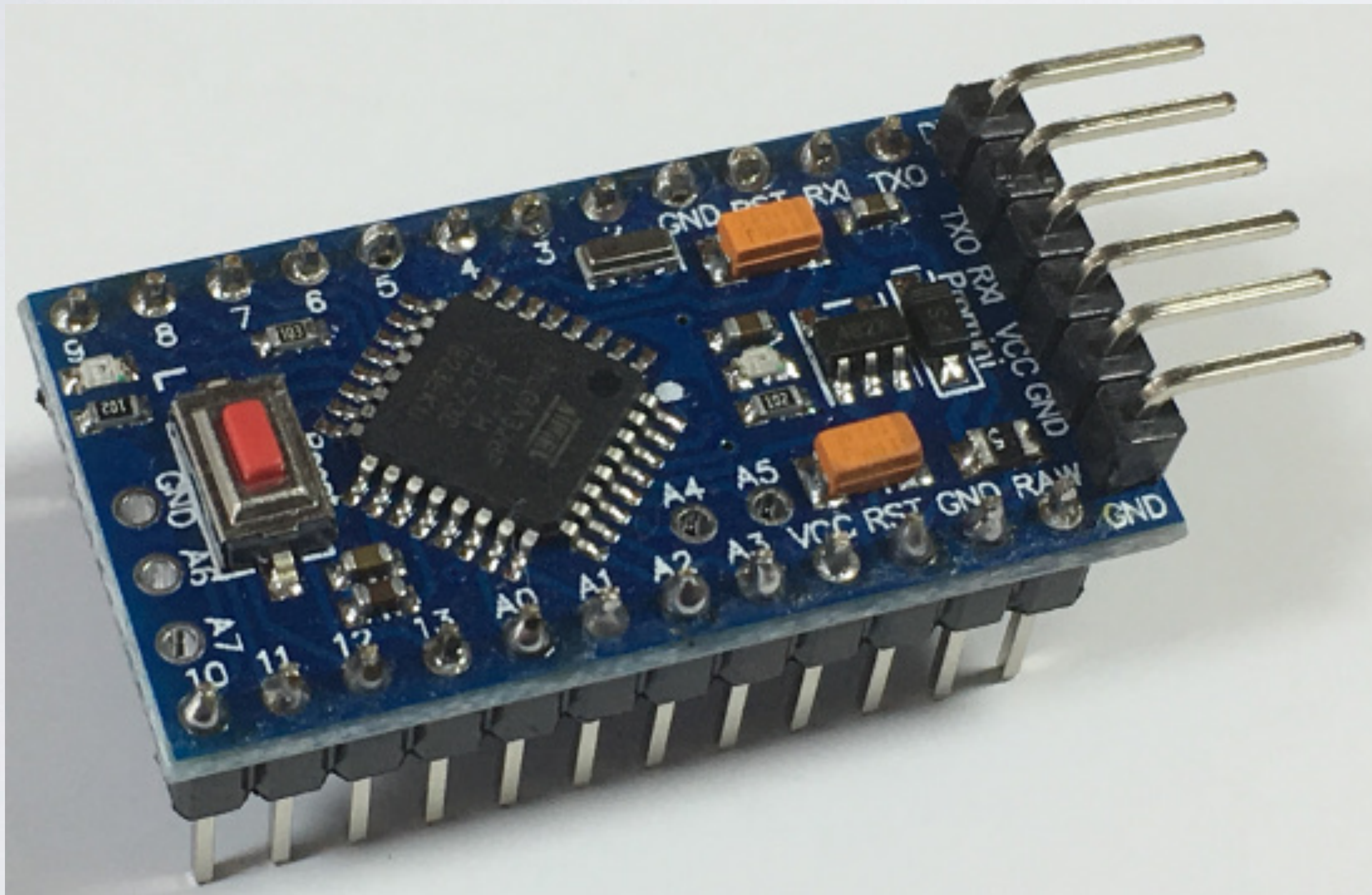
FRAMEWORK

- **Framework refers to a collection of libraries/classes providing a scaffold for building software.**
- The framework provides the APIs to call from your application to interface with hardware peripherals or device drivers.
- By selecting a framework, it also means your project can only use a certain set of libraries.



FRAMEWORK

- The Arduino Pro or Pro Mini ATmega328 (3.3V, 8 MHz) only supports the Arduino framework.



```
1  /*
2   * Blink
3   * Turns on an LED on for one second,
4   * then off for one second, repeatedly.
5   */
6
7  #include <Arduino.h>
8
9  void setup()
10 {
11   // initialize LED digital pin as an output.
12   pinMode(LED_BUILTIN, OUTPUT);
13 }
14
15 void loop()
16 {
17   // turn the LED on (HIGH is the voltage level)
18   digitalWrite(LED_BUILTIN, HIGH);
19   // wait for a second
20   delay(1000);
21   // turn the LED off by making the voltage LOW
22   digitalWrite(LED_BUILTIN, LOW);
23   // wait for a second
24   delay(1000);
25 }
26
```


FRAMEWORK

- The Sipeed Longan Nano, platform “GigaDevice GD32V” supports 2 frameworks: Arduino and GigaDevice GD32V SDK.

```
1  /*
2  * Blink
3  * Turns on an LED on for one second,
4  * then off for one second, repeatedly.
5  */
6
7  #include <Arduino.h>
8
9  void setup()
10 {
11     // initialize LED digital pin as an output.
12     pinMode(LED_BUILTIN, OUTPUT);
13 }
14
15 void loop()
16 {
17     // turn the LED on (HIGH is the voltage level)
18     digitalWrite(LED_BUILTIN, HIGH);
19     // wait for a second
20     delay(1000);
21     // turn the LED off by making the voltage LOW
22     digitalWrite(LED_BUILTIN, LOW);
23     // wait for a second
24     delay(1000);
25 }
26
```

arduino-blink
example

longan-nano-blink
example

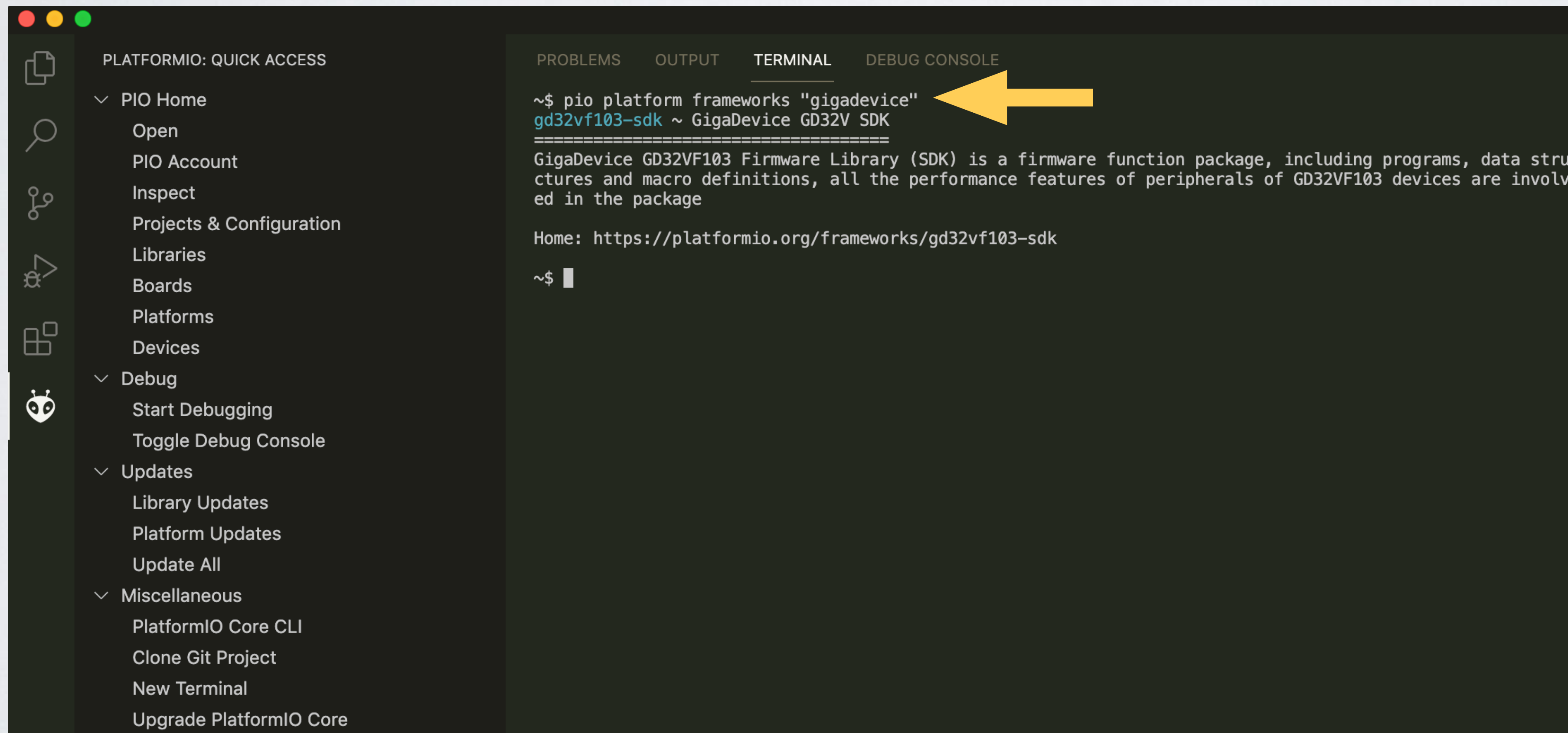
```
35 #include "gd32vf103.h"
36 #include "systick.h"
37 #include <stdio.h>
38
39 /* BUILTIN LED OF LONGAN BOARDS IS PIN PC13 */
40 #define LED_PIN GPIO_PIN_13
41 #define LED_GPIO_PORT GPIOC
42 #define LED_GPIO_CLK RCU_GPIOC
43
44 void longan_led_init()
45 {
46     /* enable the led clock */
47     rcu_periph_clock_enable(LED_GPIO_CLK);
48     /* configure led GPIO port */
49     gpio_init(LED_GPIO_PORT, GPIO_MODE_OUT_PP, GPIO_OSPEED_50MHZ, LED_PIN);
50
51     GPIO_BC(LED_GPIO_PORT) = LED_PIN;
52 }
53
54 void longan_led_on()
55 {
56     /*
57     * LED is hardwired with 3.3V on the anode, we control the cathode
58     * (negative side) so we need to use reversed logic: bit clear is on.
59     */
60     GPIO_BC(LED_GPIO_PORT) = LED_PIN;
61 }
```

FRAMEWORK

- Using the PlatformIO Core Command Line Interface (CLI):

Type: `pio platform frameworks "gigadevice"`

CLI guide: <https://docs.platformio.org/en/latest/core/userguide/index.html>



The screenshot shows the PlatformIO IDE interface. On the left is a sidebar with a 'QUICK ACCESS' menu containing items like 'PIO Home', 'Open', 'PIO Account', 'Inspect', 'Projects & Configuration', 'Libraries', 'Boards', 'Platforms', 'Devices', 'Debug', 'Start Debugging', 'Toggle Debug Console', 'Updates', 'Library Updates', 'Platform Updates', 'Update All', and 'Miscellaneous'. The main area is a terminal window with tabs for 'PROBLEMS', 'OUTPUT', 'TERMINAL', and 'DEBUG CONSOLE'. The 'TERMINAL' tab is active, showing the command `~$ pio platform frameworks "gigadevice"` and its output: `gd32vf103-sdk ~ GigaDevice GD32V SDK`, followed by a separator line and a description of the GigaDevice GD32VF103 Firmware Library (SDK). A yellow arrow points to the command line. Below the description is the URL `Home: https://platformio.org/frameworks/gd32vf103-sdk` and a prompt `~$`.

```
PLATFORMIO: QUICK ACCESS
  ▾ PIO Home
    Open
    PIO Account
    Inspect
    Projects & Configuration
    Libraries
    Boards
    Platforms
    Devices
  ▾ Debug
    Start Debugging
    Toggle Debug Console
  ▾ Updates
    Library Updates
    Platform Updates
    Update All
  ▾ Miscellaneous
    PlatformIO Core CLI
    Clone Git Project
    New Terminal
    Upgrade PlatformIO Core

PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE
~$ pio platform frameworks "gigadevice"
gd32vf103-sdk ~ GigaDevice GD32V SDK
=====
GigaDevice GD32VF103 Firmware Library (SDK) is a firmware function package, including programs, data structures and macro definitions, all the performance features of peripherals of GD32VF103 devices are involved in the package

Home: https://platformio.org/frameworks/gd32vf103-sdk

~$
```

FRAMEWORK

The screenshot displays the PlatformIO IDE interface. On the left, the 'PLATFORMIO: QUICK ACCESS' sidebar is visible, with the 'Platforms' option highlighted. A blue arrow points from this sidebar item to the 'Platforms' button in the bottom navigation bar. The main workspace shows the 'PIO Home' page with the 'Installed' tab selected. A search bar contains the letter 'G', and the 'GigaDevice GD32V' platform is highlighted. A yellow arrow points from the word 'platform' to the 'GigaDevice GD32V' text. Below the platform name, there is a description and a list of installed frameworks: 'Arduino' and 'GigaDevice GD32V SDK'. An 'Uninstall' button is located at the bottom right of the platform card.

PLATFORMIO: QUICK ACCESS

- PIO Home
 - Open
 - PIO Account
 - Inspect
 - Projects & Configuration
 - Libraries
 - Boards
 - Platforms
 - Devices
- Debug
 - Start Debugging
 - Toggle Debug Console
- Updates
 - Library Updates
 - Platform Updates
 - Update All
- Miscellaneous
 - PlatformIO Core CLI
 - Clone Git Project
 - New Terminal
 - Upgrade PlatformIO Core

PIO Home

Get Started PIO Home

Home Projects Inspect Libraries Boards Platforms

Installed Embedded Desktop Frameworks Updates

Project can depend on a specific version of development platform or VCS (Git, Mercurial and Subversion).
[More details...](#)

G

Advanced Installation Custom Platform

GigaDevice GD32V ← platform 1.2.1

The GigaDevice GD32V device is a 32-bit general-purpose microcontroller based on the RISC-V core with an impressive balance of processing power, reduced power consumption and peripheral set.

Arduino GigaDevice GD32V SDK Uninstall

FRAMEWORK

The screenshot shows the PlatformIO IDE interface. On the left is a sidebar with a 'PLATFORMIO: QUICK ACCESS' menu. The main window is titled 'PIO Home' and has a top navigation bar with tabs for 'Installed', 'Embedded', 'Desktop', 'Frameworks', and 'Updates'. The 'Frameworks' tab is active. A search bar contains the letter 'g'. Below the search bar, two framework entries are visible: 'GigaDevice GD32V SDK' and 'LOGICROM SDK'. A yellow arrow points from the word 'framework' to the 'GigaDevice GD32V SDK' entry. A blue arrow points to the 'Platforms' button in the left sidebar.

PLATFORMIO: QUICK ACCESS

- PIO Home
 - Open
 - PIO Account
 - Inspect
 - Projects & Configuration
 - Libraries
 - Boards
 - Platforms
 - Devices
- Debug
 - Start Debugging
 - Toggle Debug Console
- Updates
 - Library Updates
 - Platform Updates
 - Update All
- Miscellaneous
 - PlatformIO Core CLI
 - Clone Git Project
 - New Terminal
 - Upgrade PlatformIO Core

PIO Home

Get Started PIO Home X

Home Projects Inspect Libraries Boards Platforms Devices

Installed Embedded Desktop Frameworks Updates

g

GigaDevice GD32V SDK ← framework

GigaDevice GD32VF103 Firmware Library (SDK) is a firmware function package, including programs, data structures and macro definitions, all the performance features of peripherals of GD32VF103 devices are involved in the package

GigaDevice GD32V Rath RISC-V

LOGICROM SDK

LOGICROM Software Development Kit is a unified framework for IoT development on 4G LTE (RDA8910), GSM (MT2503/MT6261) and NBIoT (MT2625) chipsets/modules.

LOGICROM Development Platform

FRAMEWORK

- Filter for framework “gigadevice”.
See: <https://platformio.org/frameworks>

Frameworks

Keep the unified workflow using the most popular embedded frameworks

Need help  [Rely on the expertise of our highly skilled technical support specialists to answer your questions.](#) Ad

[Home](#) / Frameworks

[gigadevice](#)

GigaDevice GD32V SDK

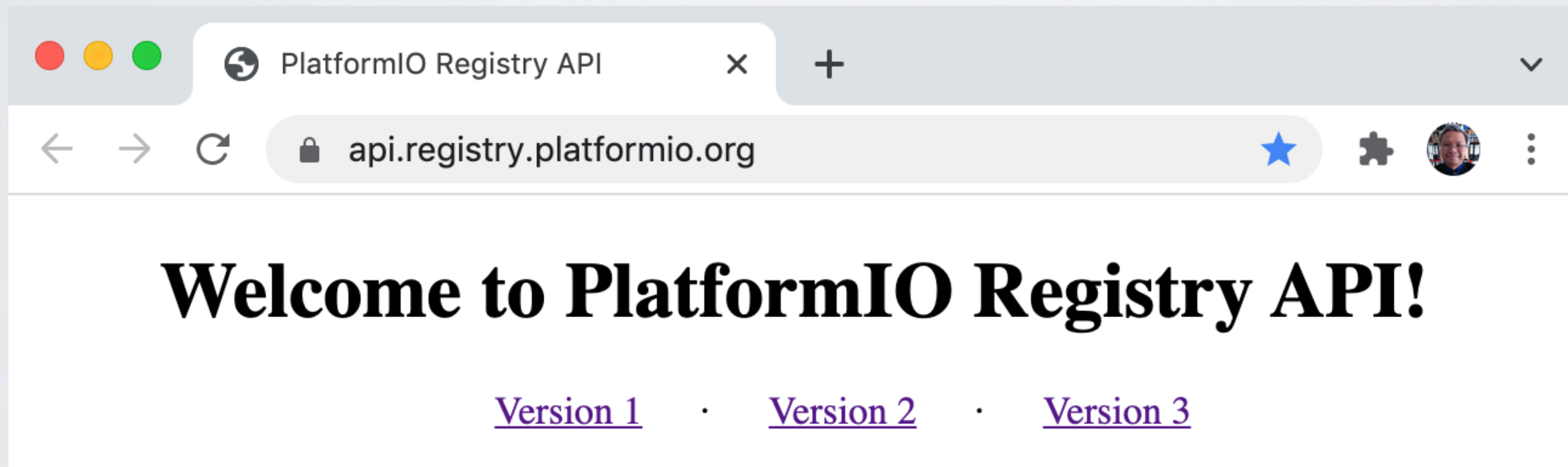
GigaDevice GD32VF103 Firmware Library (SDK) is a firmware function package, including programs, data structures and macro definitions, all the performance features of peripherals of GD32VF103 devices are involved in the package

 GigaDevice GD32V

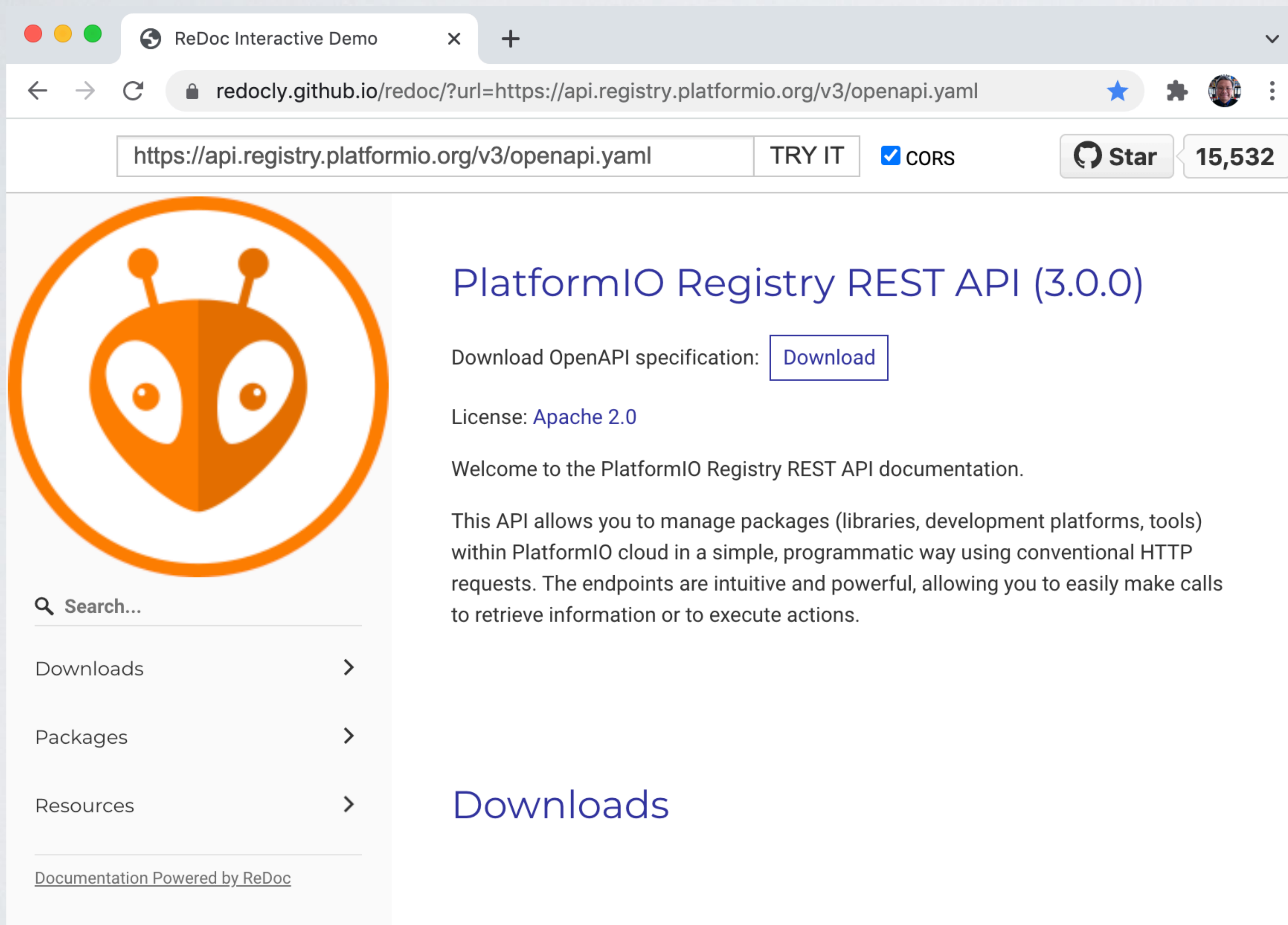
 Rath RISC-V

PACKAGE

- **A package is a tool or framework that can be used when compiling one or more platforms.**
- PlatformIO has a registry with pre-built packages for the most popular operating systems, see: <https://api.registry.platformio.org>



PACKAGE



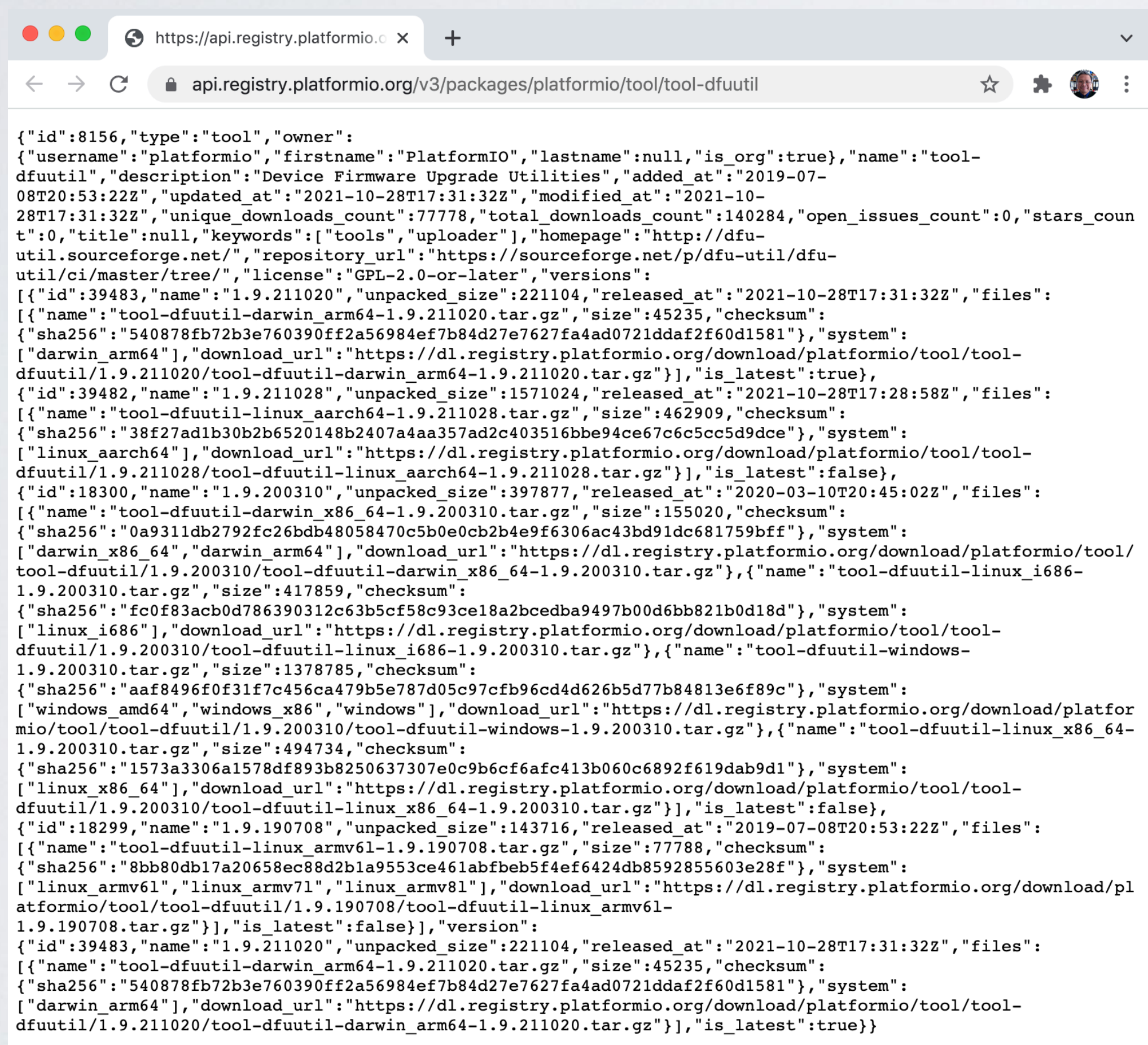
The screenshot shows a web browser window with the following elements:

- Browser Tab:** ReDoc Interactive Demo
- Address Bar:** redocly.github.io/redoc/?url=https://api.registry.platformio.org/v3/openapi.yaml
- URL Input:** https://api.registry.platformio.org/v3/openapi.yaml
- Buttons:** TRY IT, CORS, Star, 15,532
- Logo:** PlatformIO logo (an orange bee-like character in a circle).
- Section Header:** PlatformIO Registry REST API (3.0.0)
- Text:** Download OpenAPI specification: [Download](#)
- Text:** License: [Apache 2.0](#)
- Text:** Welcome to the PlatformIO Registry REST API documentation.
- Text:** This API allows you to manage packages (libraries, development platforms, tools) within PlatformIO cloud in a simple, programmatic way using conventional HTTP requests. The endpoints are intuitive and powerful, allowing you to easily make calls to retrieve information or to execute actions.
- Section Header:** Downloads
- Footer:** Documentation Powered by ReDoc

After selecting V3

PACKAGE

- For example the package “tool-dfuutil”:
<https://api.registry.platformio.org/v3/packages/platformio/tool/tool-dfuutil>



```
{
  "id": 8156,
  "type": "tool",
  "owner": {
    "username": "platformio",
    "firstname": "PlatformIO",
    "lastname": null,
    "is_org": true,
    "name": "tool-dfuutil",
    "description": "Device Firmware Upgrade Utilities",
    "added_at": "2019-07-08T20:53:22Z",
    "updated_at": "2021-10-28T17:31:32Z",
    "modified_at": "2021-10-28T17:31:32Z",
    "unique_downloads_count": 77778,
    "total_downloads_count": 140284,
    "open_issues_count": 0,
    "stars_count": 0,
    "title": null,
    "keywords": ["tools", "uploader"],
    "homepage": "http://dfu-util.sourceforge.net/",
    "repository_url": "https://sourceforge.net/p/dfu-util/dfu-util/ci/master/tree/",
    "license": "GPL-2.0-or-later",
    "versions": [
      {
        "id": 39483,
        "name": "1.9.211020",
        "unpacked_size": 221104,
        "released_at": "2021-10-28T17:31:32Z",
        "files": [
          {
            "name": "tool-dfuutil-darwin_arm64-1.9.211020.tar.gz",
            "size": 45235,
            "checksum": {
              "sha256": "540878fb72b3e760390ff2a56984ef7b84d27e7627fa4ad0721ddaf2f60d1581"
            },
            "system": ["darwin_arm64"],
            "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.211020/tool-dfuutil-darwin_arm64-1.9.211020.tar.gz"
          },
          {
            "id": 39482,
            "name": "1.9.211028",
            "unpacked_size": 1571024,
            "released_at": "2021-10-28T17:28:58Z",
            "files": [
              {
                "name": "tool-dfuutil-linux_aarch64-1.9.211028.tar.gz",
                "size": 462909,
                "checksum": {
                  "sha256": "38f27ad1b30b2b6520148b2407a4aa357ad2c403516bbe94ce67c6c5cc5d9dce"
                },
                "system": ["linux_aarch64"],
                "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.211028/tool-dfuutil-linux_aarch64-1.9.211028.tar.gz"
              },
              {
                "id": 18300,
                "name": "1.9.200310",
                "unpacked_size": 397877,
                "released_at": "2020-03-10T20:45:02Z",
                "files": [
                  {
                    "name": "tool-dfuutil-darwin_x86_64-1.9.200310.tar.gz",
                    "size": 155020,
                    "checksum": {
                      "sha256": "0a9311db2792fc26bdb48058470c5b0e0cb2b4e9f6306ac43bd91dc681759bff"
                    },
                    "system": ["darwin_x86_64", "darwin_arm64"],
                    "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.200310/tool-dfuutil-darwin_x86_64-1.9.200310.tar.gz"
                  },
                  {
                    "name": "tool-dfuutil-linux_i686-1.9.200310.tar.gz",
                    "size": 417859,
                    "checksum": {
                      "sha256": "fc0f83acb0d786390312c63b5cf58c93ce18a2bcedba9497b00d6bb821b0d18d"
                    },
                    "system": ["linux_i686"],
                    "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.200310/tool-dfuutil-linux_i686-1.9.200310.tar.gz"
                  },
                  {
                    "name": "tool-dfuutil-windows-1.9.200310.tar.gz",
                    "size": 1378785,
                    "checksum": {
                      "sha256": "aaf8496f0f31f7c456ca479b5e787d05c97cfb96cd4d626b5d77b84813e6f89c"
                    },
                    "system": ["windows_amd64", "windows_x86", "windows"],
                    "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.200310/tool-dfuutil-windows-1.9.200310.tar.gz"
                  },
                  {
                    "name": "tool-dfuutil-linux_x86_64-1.9.200310.tar.gz",
                    "size": 494734,
                    "checksum": {
                      "sha256": "1573a3306a1578df893b8250637307e0c9b6cf6afc413b060c6892f619dab9d1"
                    },
                    "system": ["linux_x86_64"],
                    "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.200310/tool-dfuutil-linux_x86_64-1.9.200310.tar.gz"
                  },
                  {
                    "id": 18299,
                    "name": "1.9.190708",
                    "unpacked_size": 143716,
                    "released_at": "2019-07-08T20:53:22Z",
                    "files": [
                      {
                        "name": "tool-dfuutil-linux_armv6l-1.9.190708.tar.gz",
                        "size": 77788,
                        "checksum": {
                          "sha256": "8bb80db17a20658ec88d2b1a9553ce461abfbeb5f4ef6424db8592855603e28f"
                        },
                        "system": ["linux_armv6l", "linux_armv7l", "linux_armv8l"],
                        "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.190708/tool-dfuutil-linux_armv6l-1.9.190708.tar.gz"
                      },
                      {
                        "id": 39483,
                        "name": "1.9.211020",
                        "unpacked_size": 221104,
                        "released_at": "2021-10-28T17:31:32Z",
                        "files": [
                          {
                            "name": "tool-dfuutil-darwin_arm64-1.9.211020.tar.gz",
                            "size": 45235,
                            "checksum": {
                              "sha256": "540878fb72b3e760390ff2a56984ef7b84d27e7627fa4ad0721ddaf2f60d1581"
                            },
                            "system": ["darwin_arm64"],
                            "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.211020/tool-dfuutil-darwin_arm64-1.9.211020.tar.gz"
                          },
                          {
                            "id": 18299,
                            "name": "1.9.190708",
                            "unpacked_size": 143716,
                            "released_at": "2019-07-08T20:53:22Z",
                            "files": [
                              {
                                "name": "tool-dfuutil-linux_armv6l-1.9.190708.tar.gz",
                                "size": 77788,
                                "checksum": {
                                  "sha256": "8bb80db17a20658ec88d2b1a9553ce461abfbeb5f4ef6424db8592855603e28f"
                                },
                                "system": ["linux_armv6l", "linux_armv7l", "linux_armv8l"],
                                "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.190708/tool-dfuutil-linux_armv6l-1.9.190708.tar.gz"
                              },
                              {
                                "id": 18299,
                                "name": "1.9.190708",
                                "unpacked_size": 143716,
                                "released_at": "2019-07-08T20:53:22Z",
                                "files": [
                                  {
                                    "name": "tool-dfuutil-linux_armv6l-1.9.190708.tar.gz",
                                    "size": 77788,
                                    "checksum": {
                                      "sha256": "8bb80db17a20658ec88d2b1a9553ce461abfbeb5f4ef6424db8592855603e28f"
                                    },
                                    "system": ["linux_armv6l", "linux_armv7l", "linux_armv8l"],
                                    "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.190708/tool-dfuutil-linux_armv6l-1.9.190708.tar.gz"
                                  },
                                  {
                                    "name": "tool-dfuutil-linux_i686-1.9.200310.tar.gz",
                                    "size": 417859,
                                    "checksum": {
                                      "sha256": "fc0f83acb0d786390312c63b5cf58c93ce18a2bcedba9497b00d6bb821b0d18d"
                                    },
                                    "system": ["linux_i686"],
                                    "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.200310/tool-dfuutil-linux_i686-1.9.200310.tar.gz"
                                  },
                                  {
                                    "name": "tool-dfuutil-windows-1.9.200310.tar.gz",
                                    "size": 1378785,
                                    "checksum": {
                                      "sha256": "aaf8496f0f31f7c456ca479b5e787d05c97cfb96cd4d626b5d77b84813e6f89c"
                                    },
                                    "system": ["windows_amd64", "windows_x86", "windows"],
                                    "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.200310/tool-dfuutil-windows-1.9.200310.tar.gz"
                                  },
                                  {
                                    "name": "tool-dfuutil-linux_x86_64-1.9.200310.tar.gz",
                                    "size": 494734,
                                    "checksum": {
                                      "sha256": "1573a3306a1578df893b8250637307e0c9b6cf6afc413b060c6892f619dab9d1"
                                    },
                                    "system": ["linux_x86_64"],
                                    "download_url": "https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.200310/tool-dfuutil-linux_x86_64-1.9.200310.tar.gz"
                                  }
                                ]
                              }
                            ]
                          }
                        ]
                      }
                    ]
                  }
                ]
              }
            ]
          }
        ]
      }
    ]
  }
}
```

Note:

Where I got this link from, will be explained in part 2

PACKAGE

```
{
  "id":8156,
  "type":"tool",
  "owner":{
    "username":"platformio",
    "firstname":"PlatformIO",
    "lastname":null,
    "is_org":true
  },
  "name":"tool-dfuutil",
  "description":"Device Firmware Upgrade Utilities",
  "added_at":"2019-07-08T20:53:22Z",
  "updated_at":"2021-10-28T17:31:32Z",
  "modified_at":"2021-10-28T17:31:32Z",
  "unique_downloads_count":77778,
  "total_downloads_count":140284,
  "open_issues_count":0,
  "stars_count":0,
  "title":null,
  "keywords":[
    "tools",
    "uploader"
  ],
  "homepage":"http://dfu-util.sourceforge.net/",
  "repository_url":"https://sourceforge.net/p/dfu-util/dfu-util/ci/master/tree/",
  "license":"GPL-2.0-or-later",
  "versions":[
    {
      "id":39483,
      "name":"1.9.211020",
      "unpacked_size":221104,
      "released_at":"2021-10-28T17:31:32Z",
      "files":[
        {
          "name":"tool-dfuutil-darwin_arm64-1.9.211020.tar.gz",
          "size":45235,
          "checksum":{
            "sha256":"540878fb72b3e760390ff2a56984ef7b84d27e7627fa4ad0721ddaf2f60d1581"
          },
          "system":[
            "darwin_arm64"
          ],
          "download_url":"https://dl.registry.platformio.org/download/platformio/tool/tool-dfuutil/1.9.211020/tool-dfuutil-darwin_arm64-1.9.211020.tar.gz"
        }
      ],
      "is_latest":true
    }
  ],
}
```

**Using a JSON formatter
to make it more readable**



OVERVIEW: SIPEED LONGAN NANO BOARD

	Platform			
	gd32v	gd32v	nuclei	rath
Framework	arduino	gd32vfl03-sdk	nuclei-sdk	rath-hal
Package	<ul style="list-style-type: none"> - framework-arduino-gd32v - tool-dfuutil - tool-gd32vflash - tool-openocd-gd32v - toolchain-gd32v 	<ul style="list-style-type: none"> - framework-gd32vfl03-sdk - tool-dfuutil - tool-gd32vflash - tool-openocd-gd32v - toolchain-gd32v 	<ul style="list-style-type: none"> - framework-nuclei-sdk - tool-link - tool-openocd-nuclei - toolchain-riscv-gcc-nuclei 	<ul style="list-style-type: none"> - framework-rath-hal - tool-dfuutil - tool-gd32vflash - tool-openocd-gd32v - toolchain-gd32v

	Platform
	rath
Framework	gd32vfl03-sdk
Package	<ul style="list-style-type: none"> - framework-gd32vfl03-sdk - tool-dfuutil - tool-gd32vflash - tool-openocd-gd32v - toolchain-gd32v

Platform gd32v - <https://github.com/sipeed/platform-gd32v.git>
 Platform nuclei - <https://github.com/Nuclei-Software/platform-nuclei.git>
 Platform rath - <https://github.com/uncertainty-cc/TEMPORARY-PlatformIO-RATH-HAL.git>

NEXT

- In part 2 I will go in detail what happens under the hood when using the PlatformIO extension in the Visual Studio Code IDE.
- In particular I will focus where the PlatformIO extension gets its boards, platforms, frameworks and packages information from.