

Basic Operations

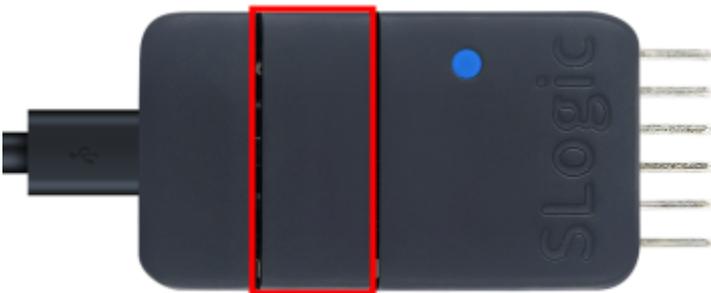
2023-07-26

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2023-07-26	v0.1	ctx	<ul style="list-style-type: none">Release docs

The SLogic Combo 8 has four functions (SLogic, CKLink Debugger, DAP-Link Debugger, USB2UART). This document is intended to guide you on how to select the functions.

1. Button Functions

After power on, **press the button** to switch functions, and you can see the **indicator light change** when the switching is successful.



(Up: The red box indicates the position of the function switch button)

Note: When switching functions, do not press the button more frequently than every 100ms; otherwise, it may cause the module to enter boot mode, and you will see that the indicator light will no longer change. If you encounter this situation, try to restart the power supply.

2. Indicator Light Color and Functions

Each function corresponds to a specific color, and you can determine the currently enabled function based on the indicator light color.

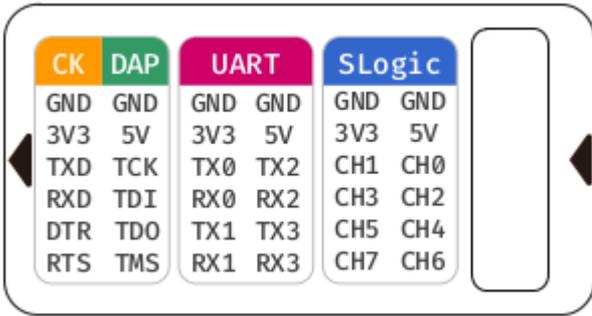
Function	Slogic	DAPLink	USB2UART	CKLink
Indicator Light Color	Blue	Green	Red	Yellow

(Up: Table of Indicator Light Color and Functions)

3. Panel Information

You can check the current function and corresponding wire sequence through the panel information:

- The left side shows the wire sequence for **CKLink (Yellow)** and **DAPLink (Green)** together, as their wire sequences are similar.
- The middle section shows the wire sequence for **UART (Red)**.
- The right side shows the wire sequence for **SLogic (Blue)**.



(Above: Color/Function/Wire Sequence Correspondence Diagram)

Here's an example:

1. If you want to use the SLogic function, press the button to switch the indicator light to blue. This will enable the SLogic function, and you can find the pin wire sequence for SLogic under the blue font on the panel.
2. If you want to use the UART function, press the button to switch the indicator light to red. This will enable the UART function, and you can find the pin wire sequence for UART under the red font on the panel.

Alright, now you can switch to the function you need and proceed to the next step!

Using as a Logic Analyzer

2023-07-26

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1. Enabling the Logic Analyzer Function

Press the button to switch the indicator light to blue. As shown below:



To verify if Slogic functionality is enabled:

Open the device manager in Windows environment, and use the `lsusb` command in Linux environment to find the "USB TO LA" device

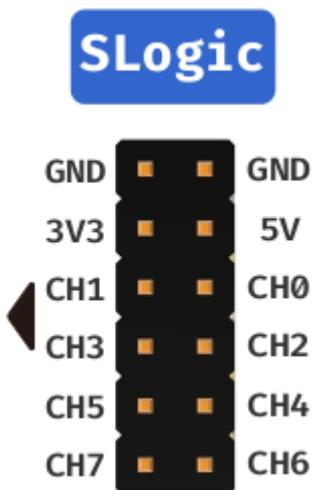
2. Getting Star

Notice:

1. The maximum transmission bandwidth of SLogic Combo 8 in Linux environment is 320Mb/s, and the typical configuration is 80M@4CH 40M@8CH.
2. The maximum transmission bandwidth of SLogic Combo 8 in Windows environment is 160Mb/s, and the typical configuration is 80M@2CH 40M@4CH.
3. If there is a disconnection during the startup process of the host software, please rescan and reconnect the device before performing other operations, otherwise it may lead to software crashes.

2.1. Quick Start

2.1.1. Pin Connections



The above diagram shows the pinout for the 8 channels of SLogic. Connect the target device's test signal points to any available CH port on SLogic, and ensure that the ground of the target device is connected to the ground of SLogic.

Note: The GND line of the SLogic needs to be as close as possible to the location of the point to be measured, even 1cm closer may increase the quality of the sample.

2.1.2. Downloading and Running the Host Computer

Download PulseView

PulseView is used for observing digital signals and decoding. Windows users should download files with the .exe extension, while Linux users should download files with the .AppImage extension. It is recommended to download the latest version with the most recent date.

Note:When the software is named `PulseView-xxxx-230811-xxx.AppImage`, the date is 11/08/2023. The date naming rules are similar for other software.

Linux Environment:

1. After downloading, navigate to the directory where the software is located. Open the terminal using the shortcut CTRL+ALT+T. Then, use the following command to give the software execution permissions and run it with administrator privileges:

```
1 | chmod +x PulseView-x86_64-032323-1101.AppImage
2 | sudo ./PulseView-x86_64-032323-1101.AppImage
```

Windows Environment:

1. After downloading, click on the .exe file to begin the installation. Follow the installation prompts and click "Next" consistently to complete the installation.

2. After the installation is complete, you can find the host computer software icon in the shortcut menu. Double-click to run it.

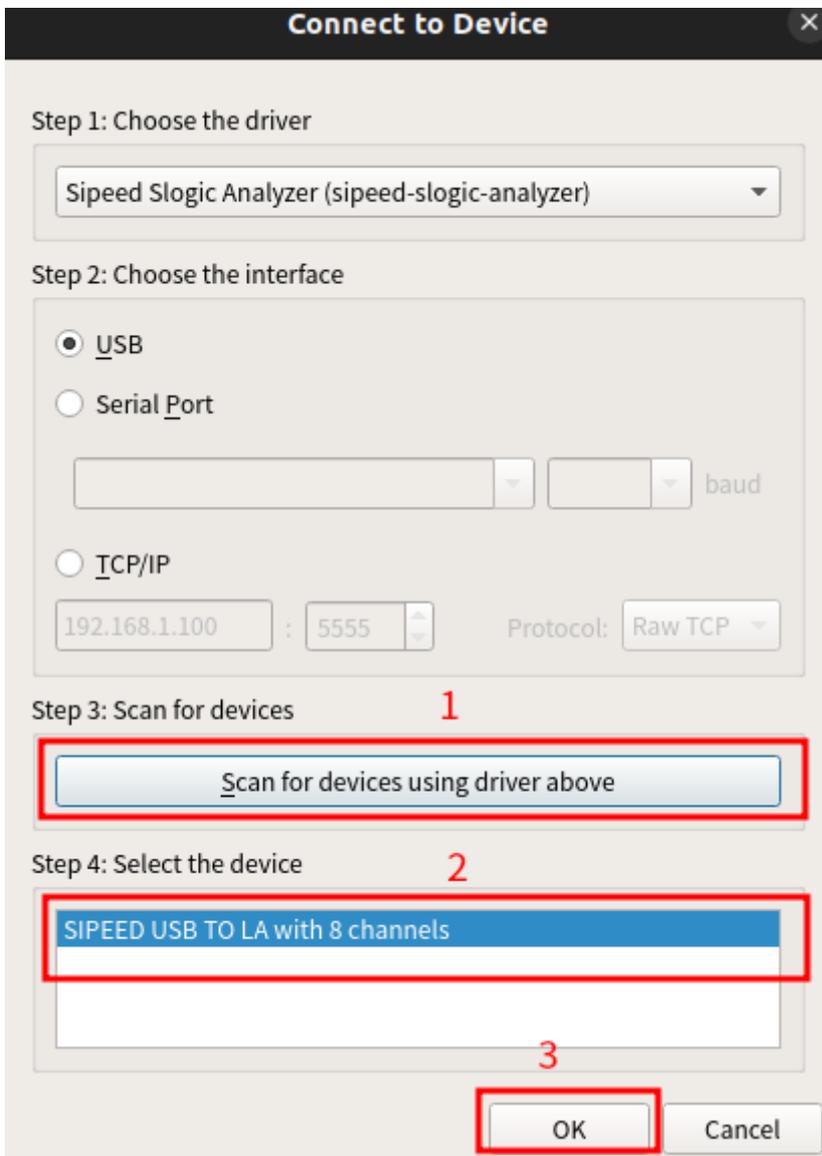
Note: In the Linux environment, the maximum supported sampling rate is 80M for 4 channels and 40M for 8 channels. Due to limitations in USB transmission stability on Windows, the maximum supported sampling rate is 80M for 2 channels and 20M for 8 channels.

2.1.3. Scan SLogic and Connect

The connection will be made automatically on first startup, or you can choose to connect SLogic manually.

Steps for manual connection

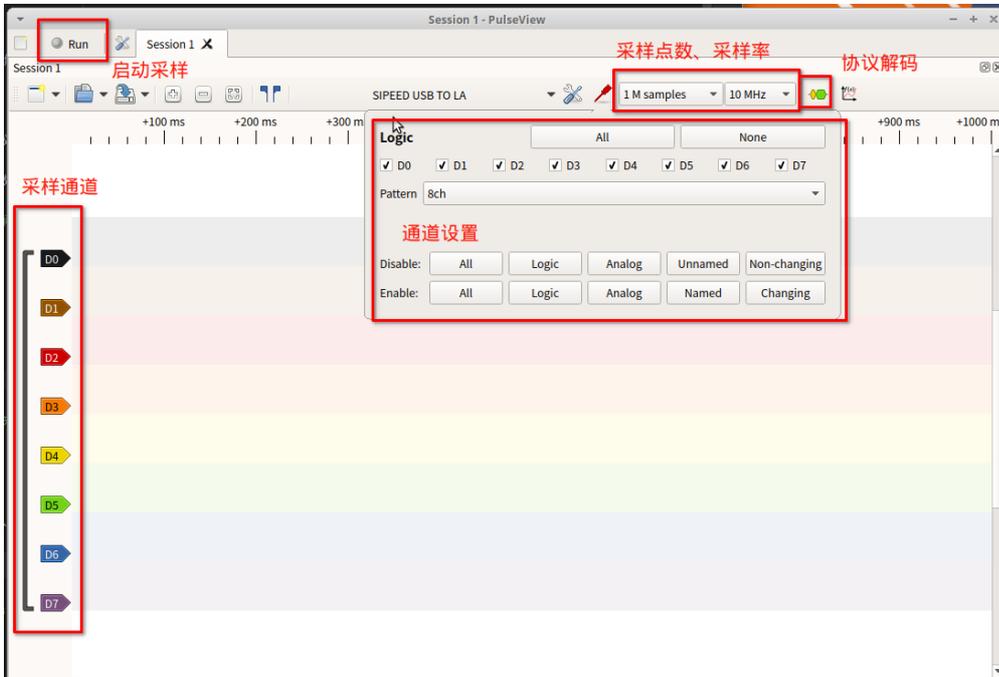
1. Click on "Scan for devices xxx" to scan for devices.
2. Choose "SIPEED USB TO LA xxx" and click OK to connect the device.



2.1.4. Ready to Sample

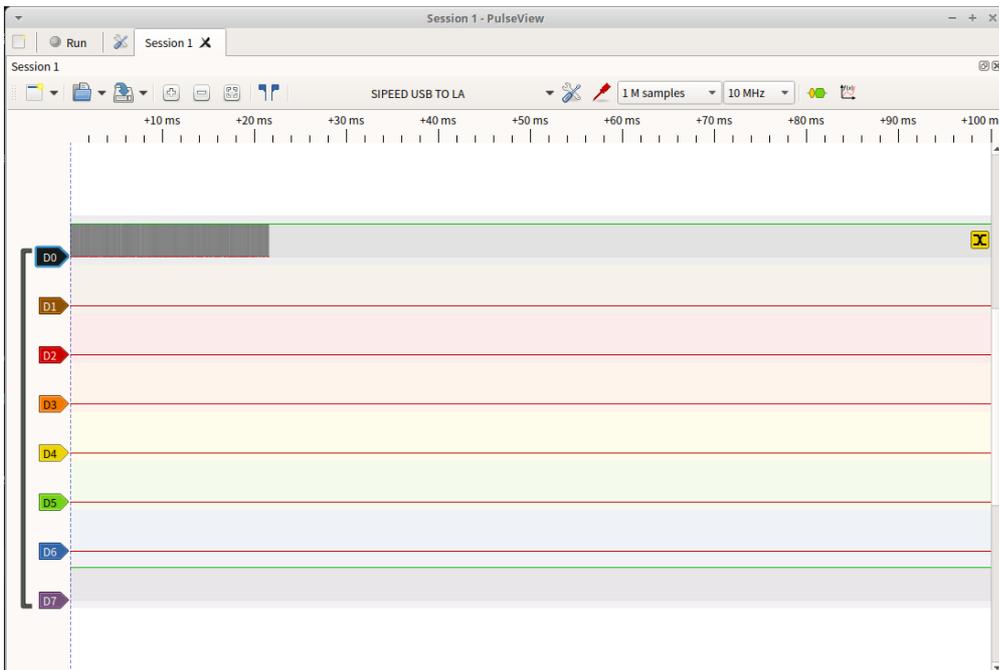
1. Set the sampling parameters

The following figure sets the number of channels to **8**, the number of samples to **1M samples**, and the sampling rate to **10Mhz**. At this time the **sampling time** is $1M / 10Mhz = 0.1s$



2.1.5. Start Sampling

1. Click on the "run" button to start sampling.



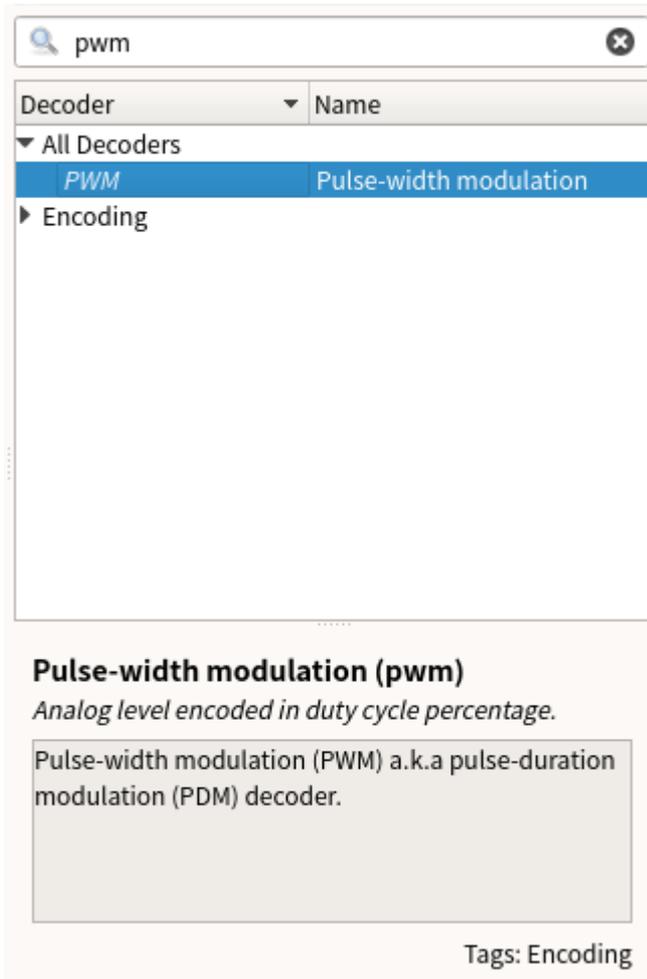
Note: If the D7 channel is not used during the sampling process, a level inversion of the channel may be observed, but this is normal and does not affect normal use.

2.1.6. Analyze the Sampling Result

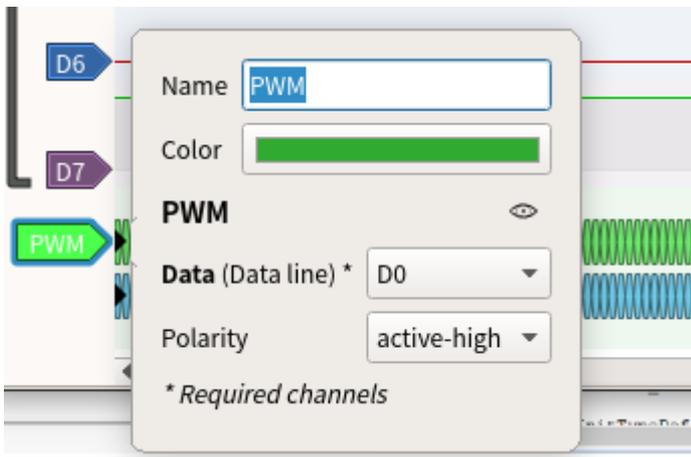
1. Open the protocol analysis function



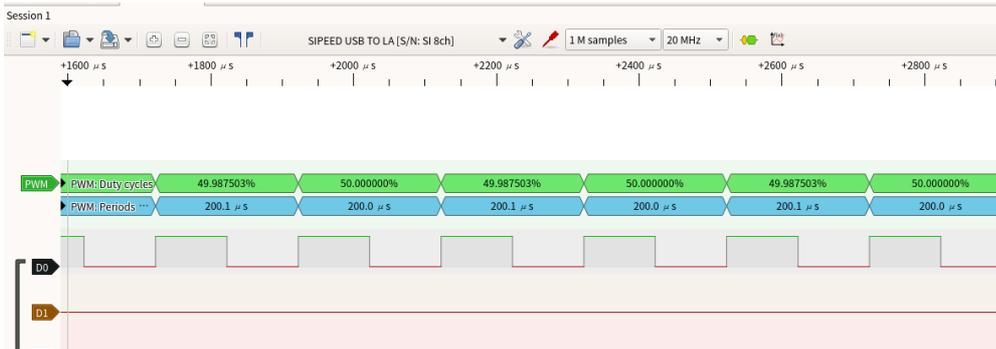
2. Select the target protocol



3. Configure the protocol parameters



4. Observe the analysis results



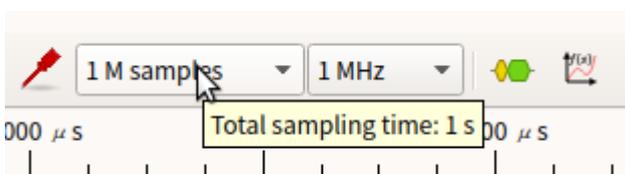
Based on the results of the analysis, let's start debugging.

2.2. Detailed Configuration

2.2.1. Sampling Parameters

Sampling parameters include the sample count, sampling frequency, and sampling time.

1. Sample Count: Choose an appropriate value for the sample count based on your requirements.
2. Sampling Frequency: Select a value greater than 10 times the frequency of the signal under test (**recommended** to adhere to Nyquist theorem).
3. Sampling Time: Calculate the sampling time based on the **sample count** and **sampling frequency** using the formula:
Time (seconds) = Sample Count / Sampling Rate
 For example, with 1M samples and 1MHz sampling rate, the sampling time would be 1 second.

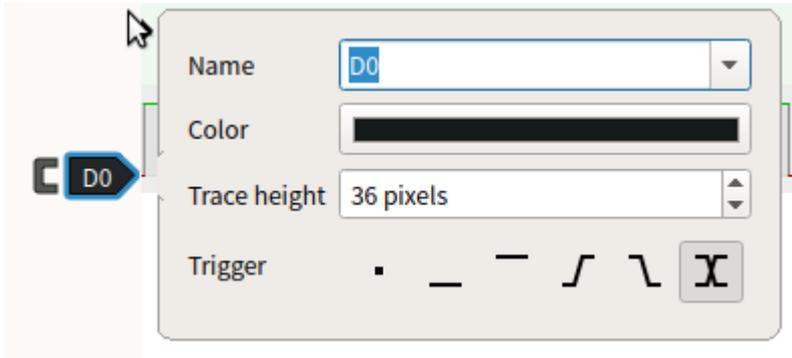


After setting the sample count and sampling frequency, placing the mouse cursor over the sample count selection box will display the calculated sampling time for the current parameters.

2.2.2. Channel Parameters

Click on a channel's label to set its parameters. Channel parameters include label name, label color, channel waveform display window width, and signal triggering mode.

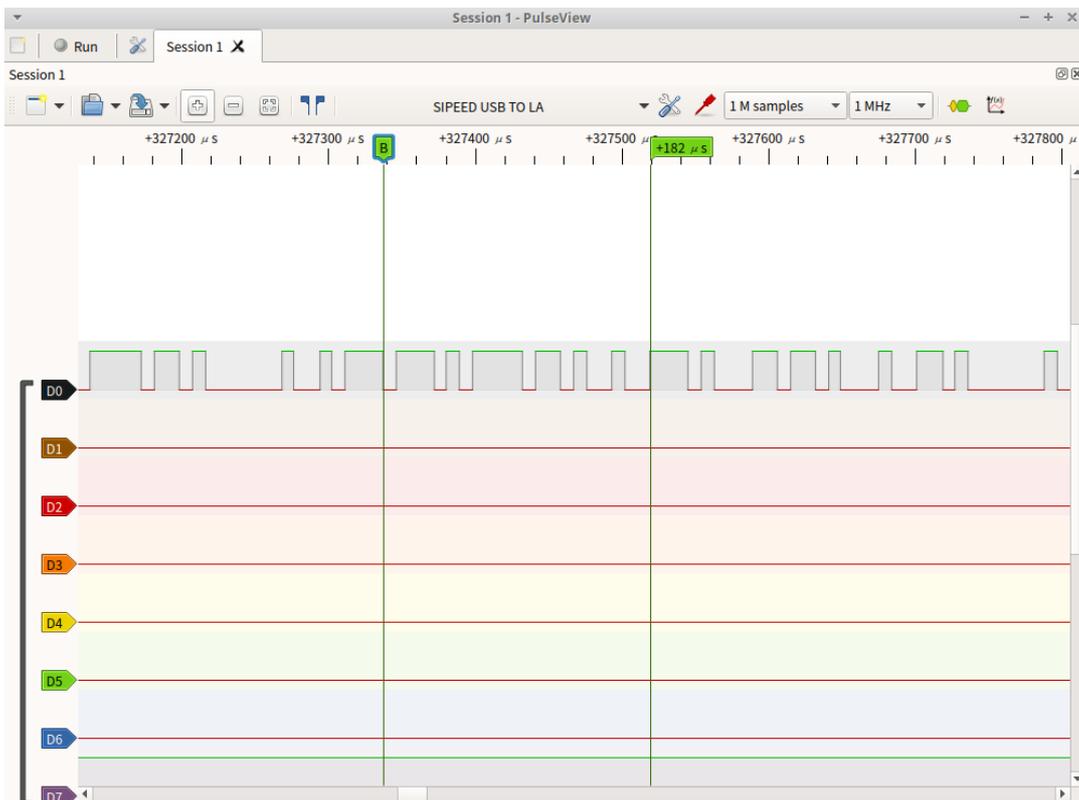
1. **Label Name:** Set based on the meaning of the sampled signal to facilitate distinguishing between multiple signals.
2. **Label Color:** Set according to personal preference to differentiate between different signals during multi-signal sampling.
3. **Channel Waveform Display Window Width:** Adjust based on the signal amplitude. This value is in pixels. When the signal amplitude changes significantly, increasing this parameter can help observe amplitude changes more clearly.
4. **Signal Triggering Mode:** Choose from **Direct Sample**, **High Level Trigger**, **Low Level Trigger**, **Falling Edge Trigger**, **Rising Edge Trigger**, and **Edge Trigger**.
(Prior to signal collection, there might be many irrelevant signals. Setting the triggering mode based on the signal pattern can effectively filter out irrelevant signals, thereby improving sampling efficiency and accuracy.)



2.3. Debugging Waveforms

2.3.1. View Operations

Through view operations, you can observe waveforms in more detail.



Waveform Zoom: Use the mouse scroll wheel (middle button) to zoom in and out of the waveform.

Drag Waveform: Hold down the left mouse button to drag the waveform display area horizontally and vertically.

Region Zoom: Double-click on a specific region to zoom in on that area of the waveform.

Channel Scroll: In the waveform display area, use Ctrl + scroll wheel (middle button) to quickly scroll the channels up and down.

Time Measurement: You can create marker points by right-clicking the desired position and selecting "Create Marker Here." The software will automatically calculate and display the time length between two marker points on the time axis.

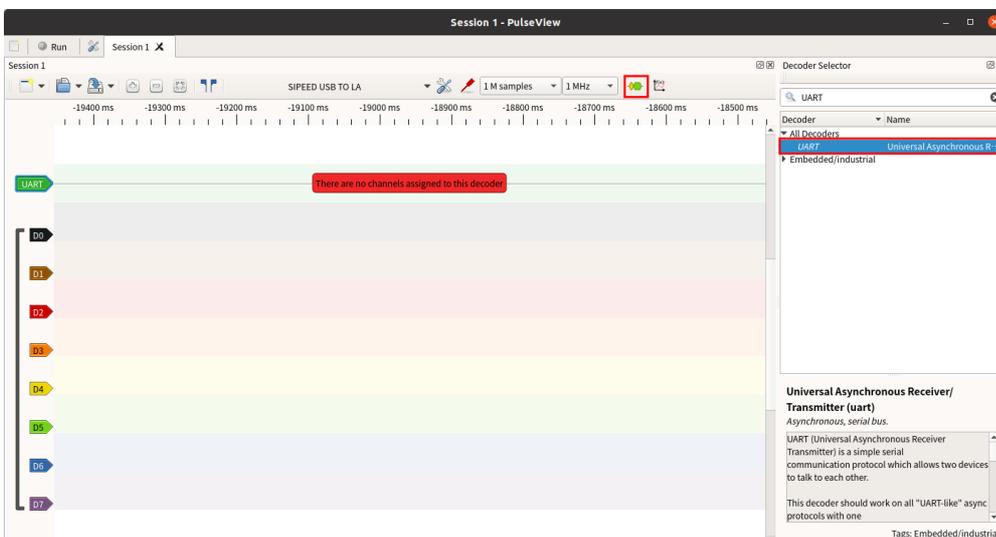
Adjust Channel Order: Drag and drop a channel's label to rearrange the order of channels as needed.

2.3.2. Protocol Decoding

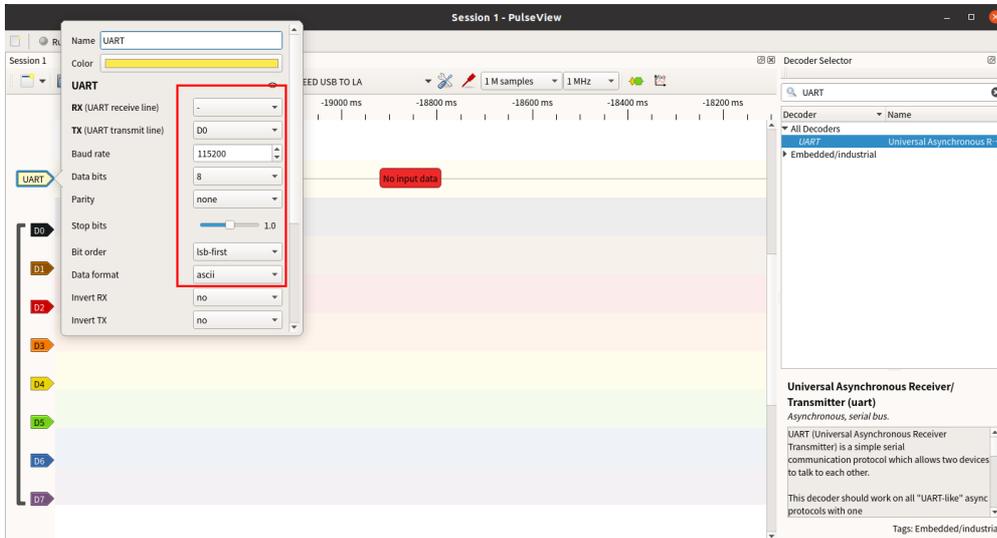
After capturing the required data, protocol decoding can be used to analyze the data more effectively. Below are the decoding processes for some common protocols.

UART Protocol Data Decoding

1. Connect the TX pin of the UART to the D0 channel.
2. Click on the **Yellow and Blue waveform icon** in the top toolbar, search for "UART," and double-click to select the UART option.

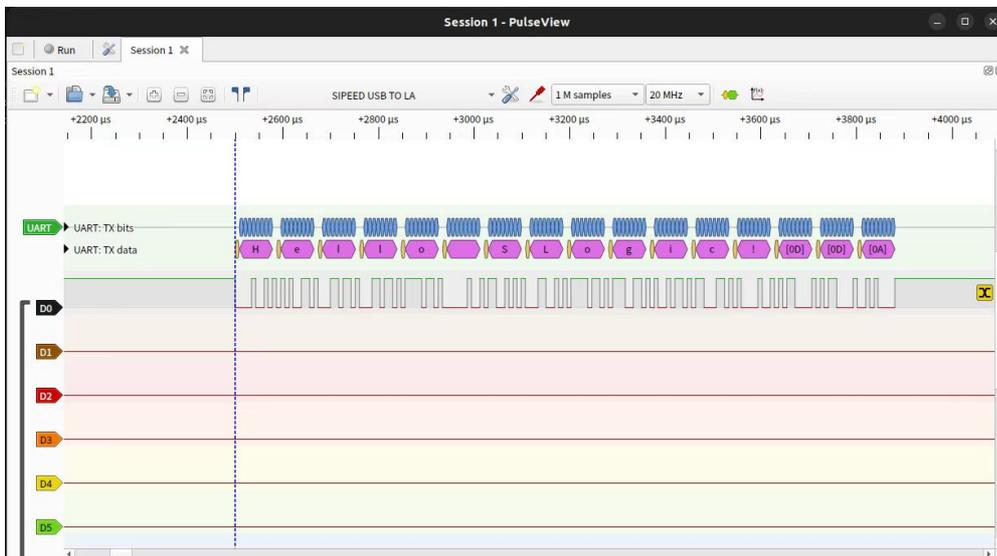


- Click on the **protocol label** of the newly added UART channel in the waveform display window.
Set the TX corresponding channel, data format, signal baud rate, and byte order.



- Capture the data and the decoded result will be displayed:

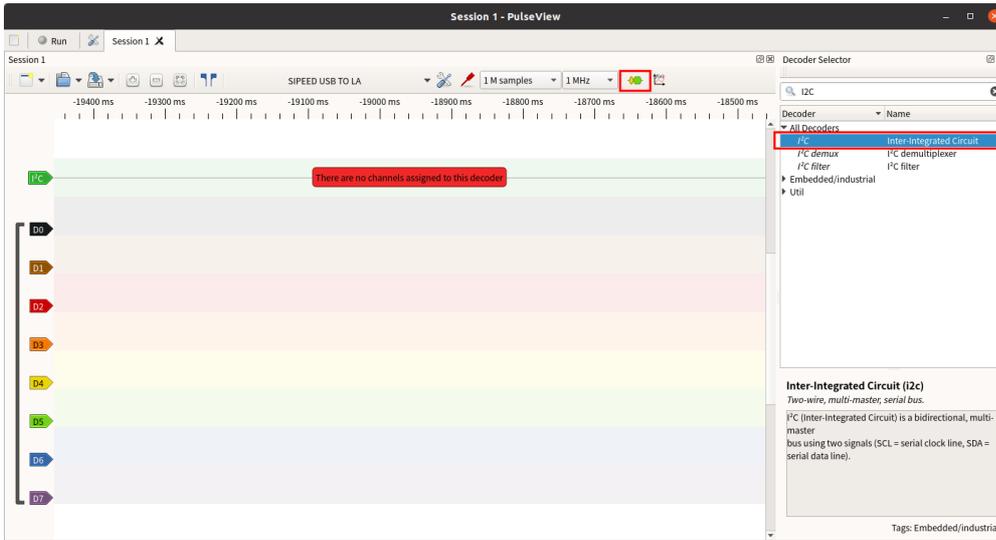
Example: UART's TX pin sends data "Hello SLogic!" (ASCII data format, baud rate 115200, little-endian byte order)



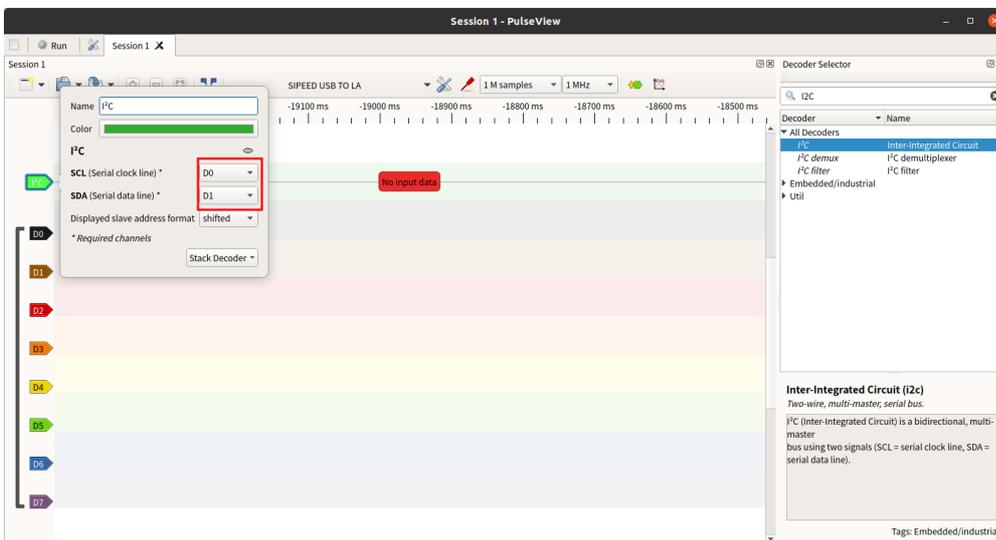
I2C Protocol Data Decoding

- Connect the SCL pin of the I2C to the D0 channel and the SDA pin to the D1 channel.

- Click on the **Yellow and Blue waveform icon** in the top toolbar, search for "I2C," and double-click to select the first option.

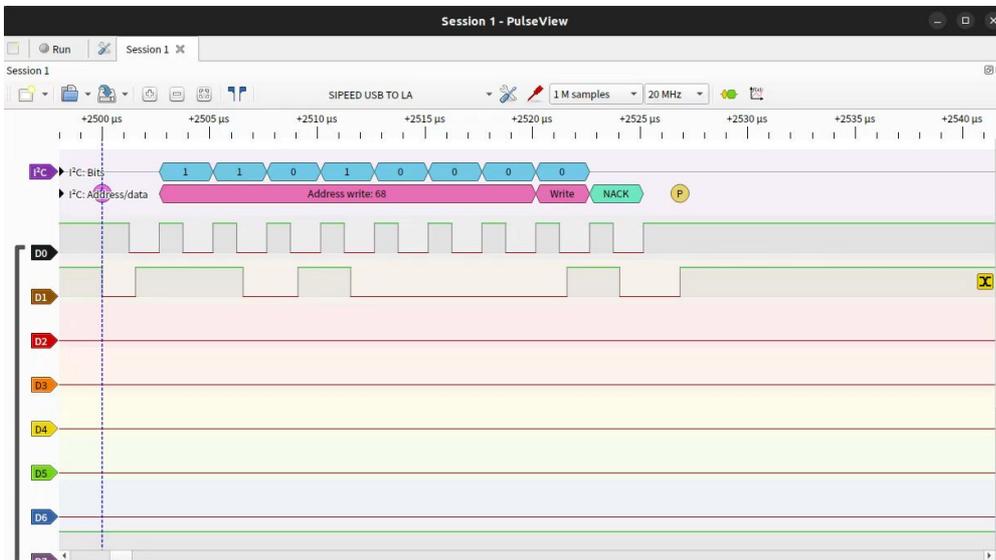


- Click on the **protocol label** of the newly added I2C channel in the waveform display window. Click on the added I2C **protocol label** and set the SCL and SDA channels.



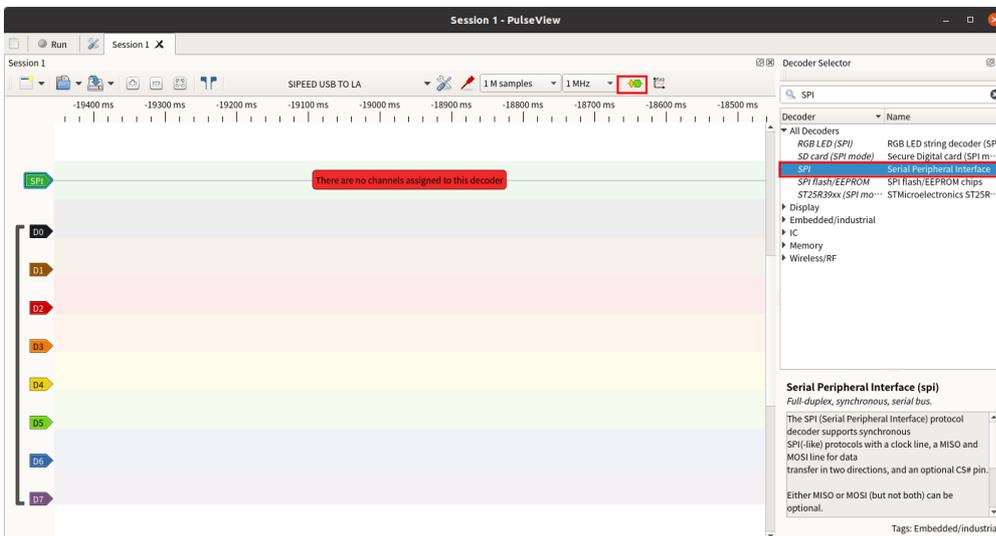
- Capture the data and the decoded result will be displayed:

Example: I2C sends 0x68

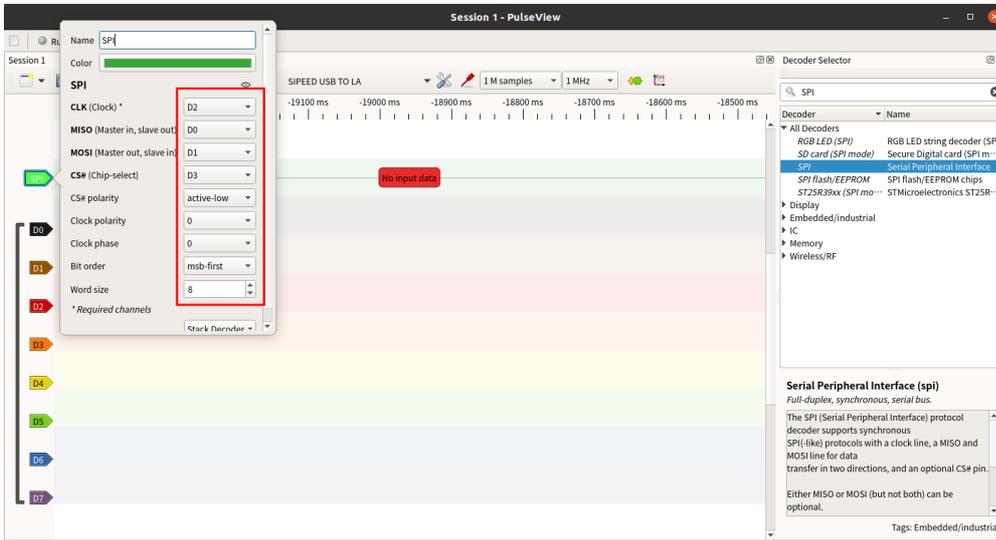


SPI Protocol Data Decoding

1. Connect the MISO, MOSI, CLK, and CS pins of the SPI to the D0, D1, D2, and D3 channels respectively.
2. Click on the **Yellow and Blue waveform icon** in the top toolbar, search for "SPI," and double-click to select the SPI option.



3. Click on the **protocol label** of the newly added SPI channel in the waveform display window.
Set the CLK, MISO, MOSI, and CS corresponding channels, and specify the active level of the chip select signal.



4. Capture the data and the decoded result will be displayed:

Example: SPI sends 0x00~0x09 (clock 10MHz, low-active chip select)



Example: SPI sends 0x00~0x09 (clock 26MHz, low-active chip select)



2.4. Precautions

When connecting the logic analyzer to the system under test, please note the following precautions:

1. The logic analyzer shares a common ground with the computer. If the system under test is a high-voltage system, be sure to use a "USB isolator" for isolation. Otherwise, there is a risk of damaging the logic analyzer or computer.
2. The GND channel must be reliably connected to the ground of the system under test and kept as short as possible.
3. The signal channels must be securely connected to the test points of the system under test. Avoid haphazard "tapping" that could introduce interference.
4. Improper wiring may introduce glitches that could prevent proper data analysis in the software.

Using as CKLink

2023-07-26

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2023-07-26	v0.1	ctx	<ul style="list-style-type: none">• Release docs

SLogic Combo 8 features high-speed CK-Link functionality, with a speed that surpasses CK-Link Lite and comes close to CK-Link Pro, making it a great tool for debugging RISC-V chips. In this mode, it also has a high-speed serial port (20Mbps).

Let's get started with using CK-LINK!

1. Enable CKLink Functionality

Press the toggle button to switch the indicator light to yellow.



To verify if CKLink functionality is enabled:

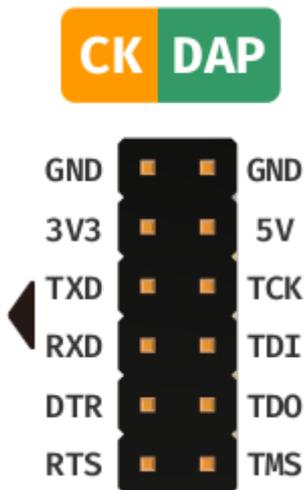
Open the device manager in Windows environment, and use

the lsusb command in Linux environment to find the "CKLink HS" device

2. Getting Started

2.1. Pin sequence

CKLink and DAPLink have similar pin connections, so they are shown together in one diagram. Please ignore the 'DAP' label.



In CKLink mode, it can simultaneously support one CKLink interface and one UART interface.

The pins on the left side of the diagram (TXD, RXD, DTR, RTS) can be used as a UART interface.

The pins on the right side of the diagram (TCK, TDI, TDO, TMS) are used for CKLink debugging.

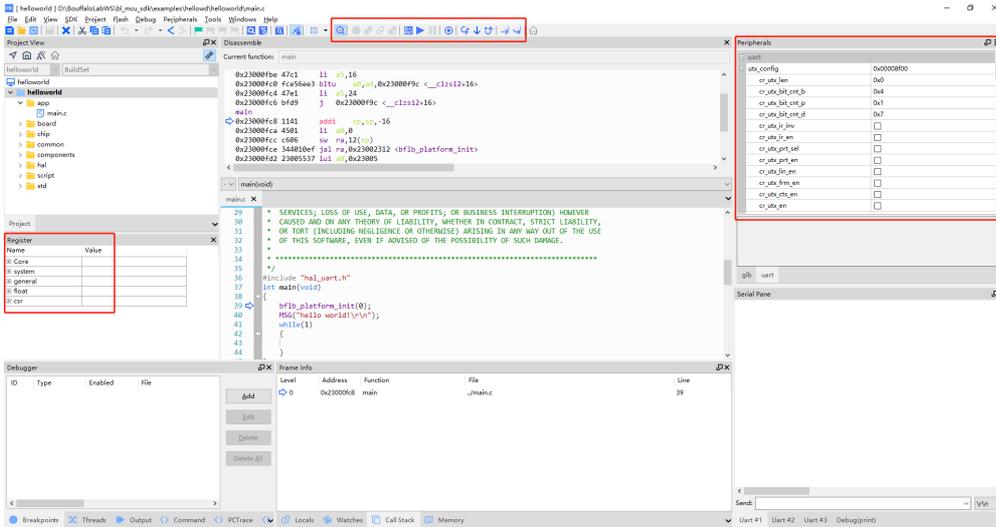
2.2. Instructions

On both Windows and Linux systems, you can directly refer to [Using CDK + Sipeed RV-Debugger Plus for Compilation and](#)

Debugging and T-HEAD Debug Server User Manual, the usage is exactly the same.

2.2.1. Debugging with CDK

- Click the **Start/Stop Debugger** button on the toolbar to enter the debug interface, as shown in the image below:



Debug HelloWorld!

- Under the **debug** interface, you can view the internal register data of the CPU in the **Register** window on the left side. At the same time, in the **Peripherals** peripheral panel on the right side, you can browse the corresponding peripheral register data. You can select the desired peripherals by using the **Peripherals->System Viewer** option in the top menu bar. Additionally, in the toolbar above the interface, you will find relevant debugging buttons that can be used for setting breakpoints, single-stepping, executing instructions one by one, and running at full speed. Of course, all these operations have corresponding shortcuts and quick setup methods. For detailed information, please refer to the CDK documentation, which will provide a comprehensive guide.

- Click the single-step run button to execute the code. You will see the cursor move to the next line of code, and at the same time, the serial panel will display the output "Hello World!"

2.2.2. Debugging with T-HEAD Debug Server

Please refer to the **Section Ten: Debugging with JTAG** in the **Getting Started with M1s DOCK** guide for details.

Using as DAPLink

2023-07-26

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SLogic Combo 8 features high-speed DAP-Link functionality, suitable for various common chips, especially for debugging STM32 chips using IDE on Windows.

1. Enable DAPLink Functionality

Press the toggle button to switch the indicator light to green.



To verify if DAPLink functionality is enabled:

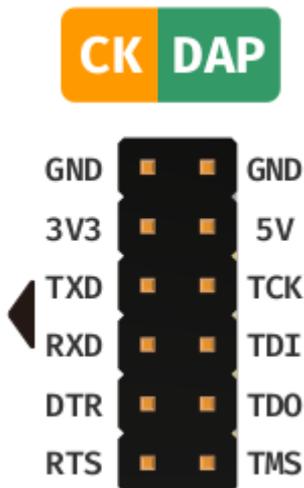
Open the device manager in Windows environment, and use the `lsusb` command in Linux environment to find the "RV CMSIS-DAP" device

2. Getting Started

Here's a step-by-step guide on using the STM32F103C8T6 chip with Windows MDK IDE as an example:

2.1. Pin sequence

CKLink and DAPLink have similar pin connections, so they are shown together in one diagram. Please ignore the 'CK' label.



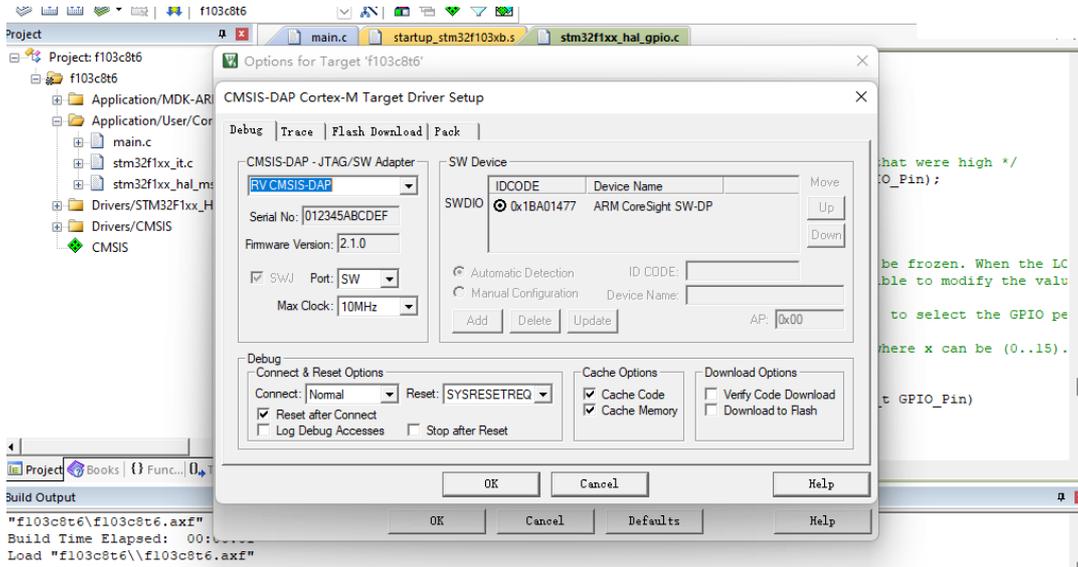
In DAPLink mode, it can simultaneously support one DAPLink interface and one UART interface.

The pins on the left side of the diagram (TXD, RXD, DTR, RTS) can be used as a UART interface.

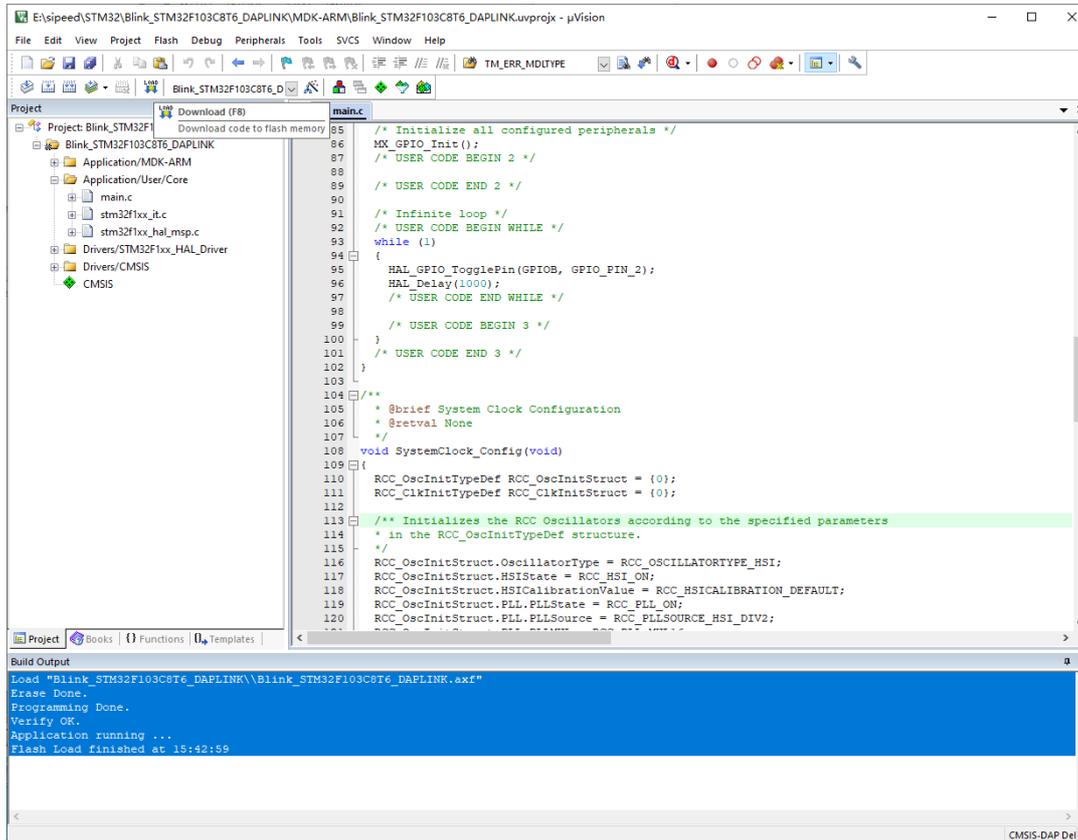
The pins on the right side of the diagram (TCK, TDI, TDO, TMS) are used for DAPLink debugging.

2.2. Connecting DAPLink using MDK

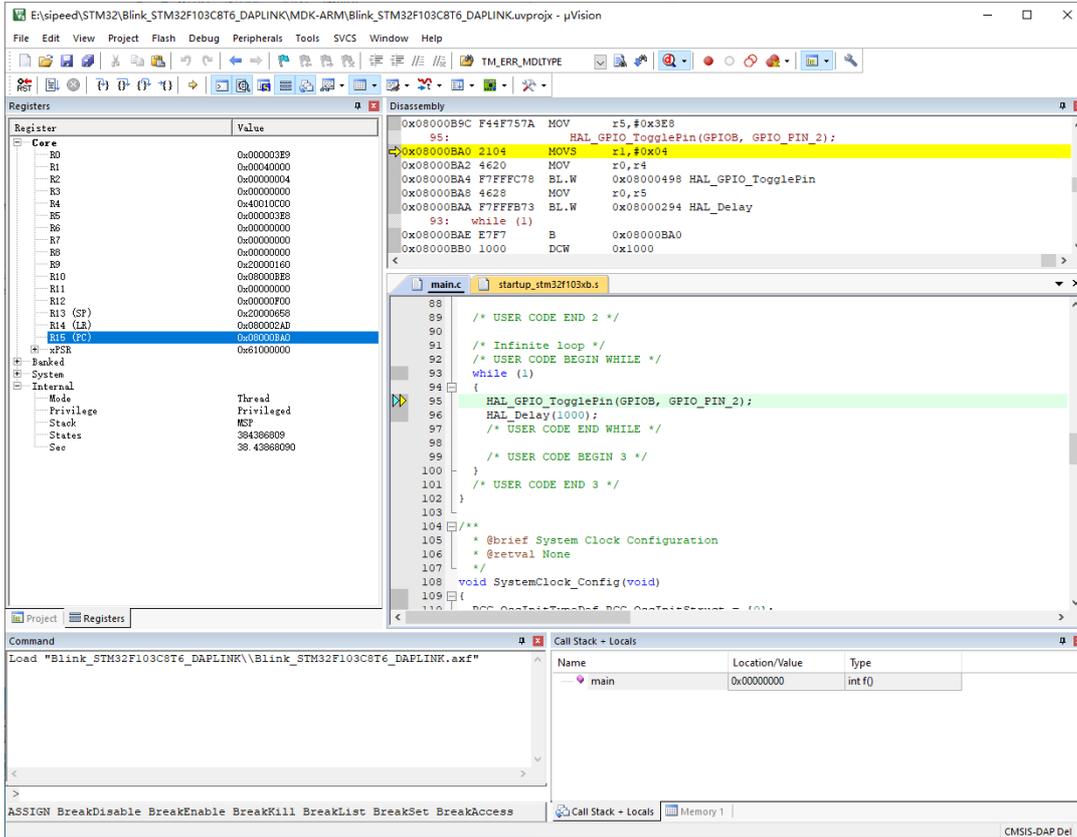
- Set the Reset Options to SYSRESETREQ.
- In CMSIS-DAP, locate and select the RV CMSIS-DAP device.



2.3. Download the firmware using MDK:



2.4. Debug the firmware using MDK:



Thank you for the document contribution from 'dragonforward'.

Using as Serial Module

2023-07-26

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2023-07-26	v0.1	ctx	<ul style="list-style-type: none">Release docs

SLogic Combo 8 has 4 independent high-speed serial port functionalities. The first two ports based on UART can achieve a super-high speed baud rate of up to 20Mbps simultaneously, while the latter two ports can reach up to 1Mbps through IO simulation. It is highly suitable for scenarios such as batch programming and production testing.

1. Enable Serial Module Functionality

Press the toggle button to switch the indicator light to red.

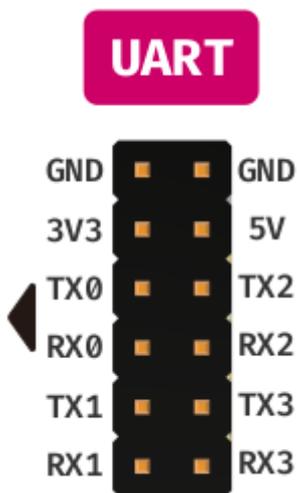


To verify if Serial Module functionality is enabled:

Open the device manager in Windows environment, and use the lsusb command in Linux environment to find the "UARTx4 HS" device

2. Getting Started

2.1. Pin sequence



SLogic Combo 8 has a total of 4 serial ports. UART0 and UART1 support a maximum baud rate of 20M, while UART3 and UART4 support a maximum baud rate of 1M.

Note:

1. Ensure that the module and the target device share a common ground to prevent issues such as garbled data.
2. The device numbers on Windows may be in random order, so manual trial-and-error may be required to find the corresponding serial port.

2.2. Linux

Please note: Due to system reasons, Linux may consider the device as a modem when it has more than one ttyACM. This may temporarily occupy the device for sending AT commands. In this situation, you may not be able to open the serial port, and it may report "Resource busy" due to device being occupied. This is normal, and it will return to normal after a while. To solve this problem, you can add a udev rule to avoid this issue. Please refer to the following commands:

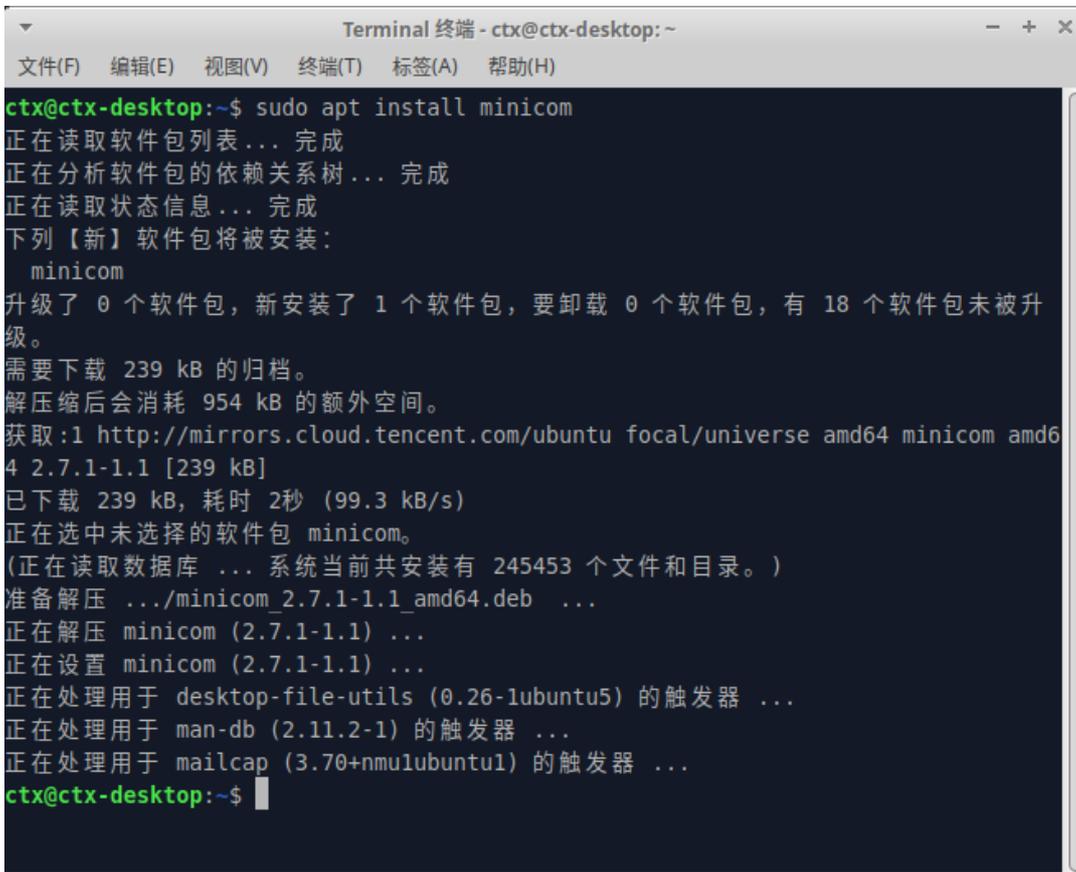
```
1 | sudo touch /etc/udev/rules.d/49-sipeed.rules
2 | sudo echo "ATTRS{idVendor}==\"359f\",
  | ATTRS{idProduct}==\"3101\",
  | ENV{ID_MM_DEVICE_IGNORE}=\"1\" >
  | /etc/udev/rules.d/49-sipeed.rules
3 | sudo udevadm control --reload
```

2.3. Data Transmission and Reception

For Linux, you can use **picocom** or **minicom** as the serial communication tool. Install it using the following commands:

```
1 | sudo apt install picocom
2 | sudo apt install minicom
```

For example, to use **minicom** with UART0 to communicate with the test device, open the Linux terminal using **CTRL+ALT+T**, enter the installation commands, and enter the administrator user password when prompted. Wait for the package installation to complete.

A terminal window titled "Terminal 终端 - ctx@ctx-desktop: ~" with a menu bar containing "文件(F)", "编辑(E)", "视图(V)", "终端(T)", "标签(A)", and "帮助(H)". The terminal output shows the command "sudo apt install minicom" and its execution details in Chinese. It reports that 0 packages were upgraded, 1 was newly installed, and 18 were not upgraded. It shows the download of minicom 2.7.1-1.1 amd64 (239 kB) from a mirror. The installation process includes decompression, setting up triggers for desktop-file-utils, man-db, and mailcap, and finally returning to the prompt "ctx@ctx-desktop:~\$".

```
ctx@ctx-desktop:~$ sudo apt install minicom
正在读取软件包列表... 完成
正在分析软件包的依赖关系树... 完成
正在读取状态信息... 完成
下列【新】软件包将被安装：
  minicom
升级了 0 个软件包，新安装了 1 个软件包，要卸载 0 个软件包，有 18 个软件包未被升级。
需要下载 239 kB 的归档。
解压缩后会消耗 954 kB 的额外空间。
获取：1 http://mirrors.cloud.tencent.com/ubuntu focal/universe amd64 minicom amd64 2.7.1-1.1 [239 kB]
已下载 239 kB，耗时 2秒 (99.3 kB/s)
正在选中未选择的软件包 minicom。
(正在读取数据库 ... 系统当前共安装有 245453 个文件和目录。)
准备解压 .../minicom_2.7.1-1.1_amd64.deb ...
正在解压 minicom (2.7.1-1.1) ...
正在设置 minicom (2.7.1-1.1) ...
正在处理用于 desktop-file-utils (0.26-1ubuntu5) 的触发器 ...
正在处理用于 man-db (2.11.2-1) 的触发器 ...
正在处理用于 mailcap (3.70+nmulubuntu1) 的触发器 ...
ctx@ctx-desktop:~$
```

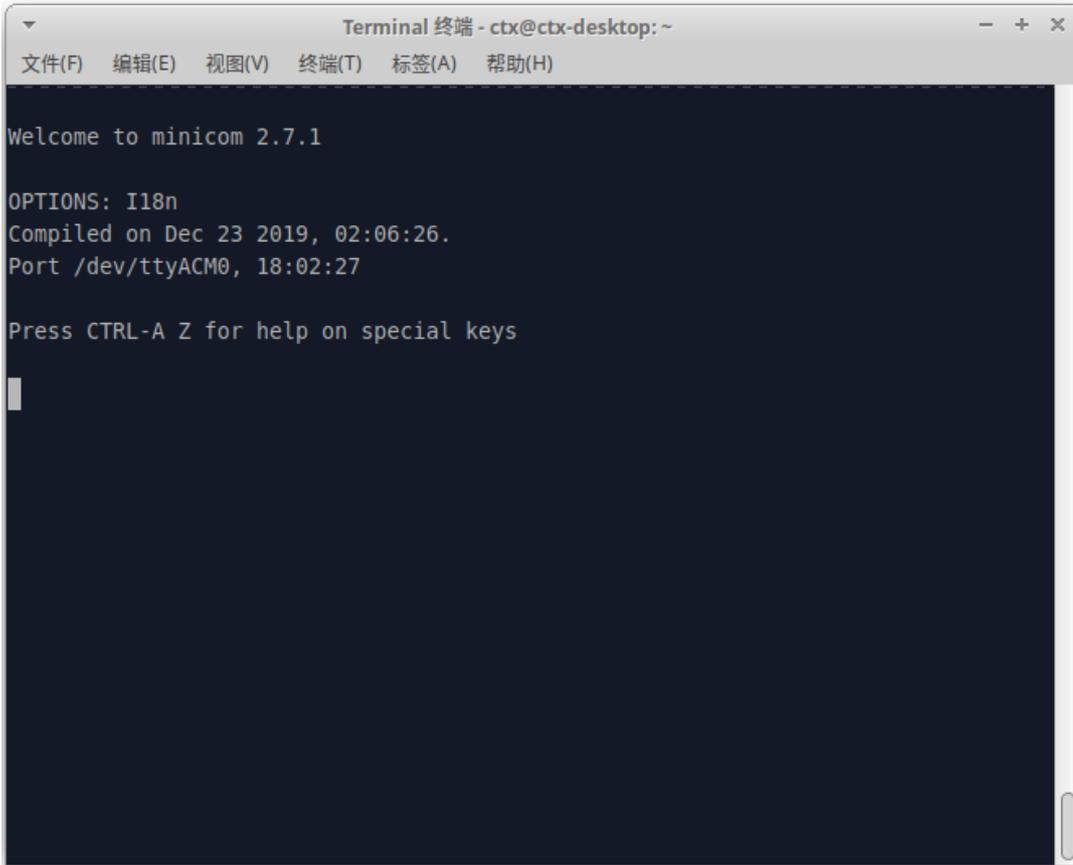
After installation, communicate with the test device using UART0.

In the terminal, enter the command:

```
1 | sudo minicom -b 2000000 -D /dev/ttyACM0
```

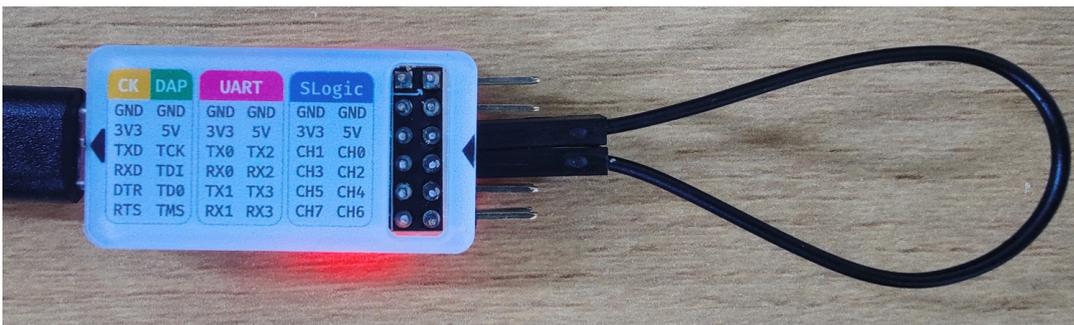
The **-b** parameter specifies the desired baud rate, which should be the same as the UART baud rate setting of the test device.

The **-D** parameter specifies the port to listen to.



After entering the command, you can communicate with the test device, receive and print messages in the terminal, and send data to the test device.

2.3.1. Serial Loopback Test:



(Above: Serial module wiring diagram)

Loopback test result:

A terminal window titled "Terminal 终端 - ctx@ctx-desktop: ~" with a menu bar containing "文件(F)", "编辑(E)", "视图(V)", "终端(T)", "标签(A)", and "帮助(H)". The terminal content shows the output of minicom 2.7.1, including the welcome message, options (I18n), compilation date (Dec 23 2019, 02:06:26), port (/dev/ttyACM0, 17:59:25), and a prompt to press CTRL-A Z for help. The current line shows "test test test !!!" with a cursor at the end.

```
Terminal 终端 - ctx@ctx-desktop: ~
文件(F) 编辑(E) 视图(V) 终端(T) 标签(A) 帮助(H)

Welcome to minicom 2.7.1

OPTIONS: I18n
Compiled on Dec 23 2019, 02:06:26.
Port /dev/ttyACM0, 17:59:25

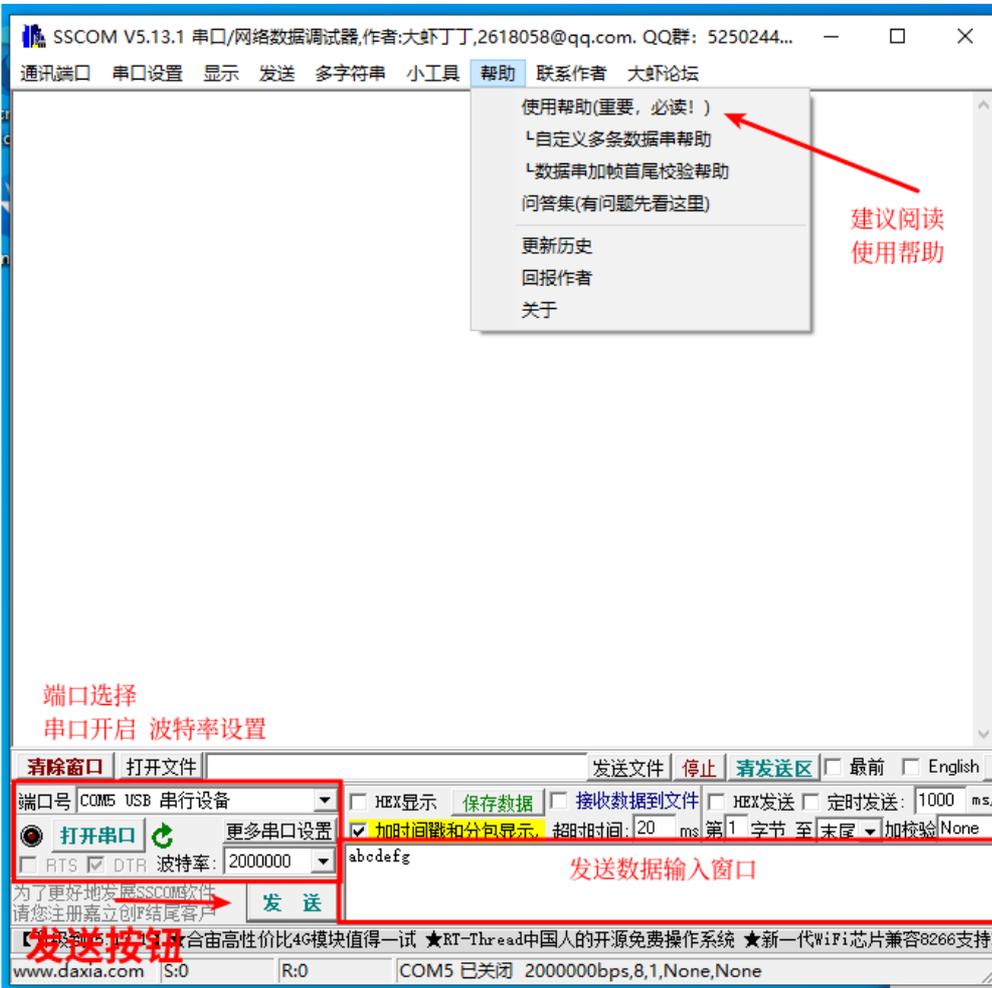
Press CTRL-A Z for help on special keys

test test test !!!
```

2.4. Windows

In the Windows operating system, you can use tools like SSCOM, MobaXterm, and others as serial port communication tools. Here, we'll use **SSCOM** as an example to demonstrate how to perform serial communication tests.

1. First, download SSCOM. This software is open source, so please search and download it via an online search.
2. After the download is complete, extract and launch the serial port tool. You will see the following interface:



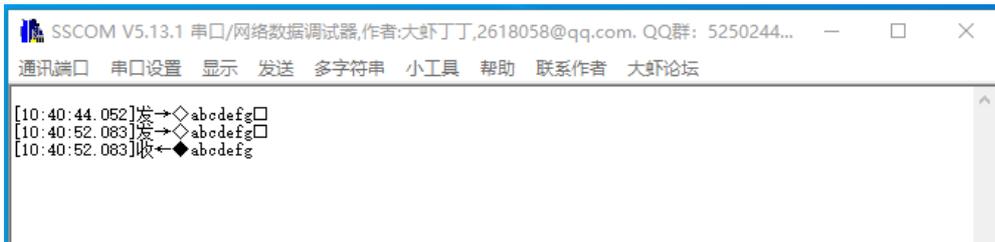
3. Connect the module to your PC. Then, in the Windows Device Manager (shortcut **Win + X + M**), check if the connection was successful and obtain the port number information.



Due to the nature of Windows systems, the port numbers might be in a disordered sequence. Therefore, you can follow

these steps to test the corresponding port number

- Connect the TX* and RX* pins of the module (* can be 0-3).
- Set the baud rate, typically using 115200.
- Open the serial port.
- Sequentially try different port device numbers, click the "Send" button, and check if data is received to confirm the corresponding serial port for each.



4. After confirming the port numbers for each serial port, you can input the data you want to send in the data input window. Simultaneously, received data will also be displayed in the window.

2.4.1. Transmission and Reception Testing

Using the SLogic 4xUART module for serial communication testing, the first two virtual serial ports can achieve a maximum speed of 20Mbps. Here's an example of testing performance using SSCOM.

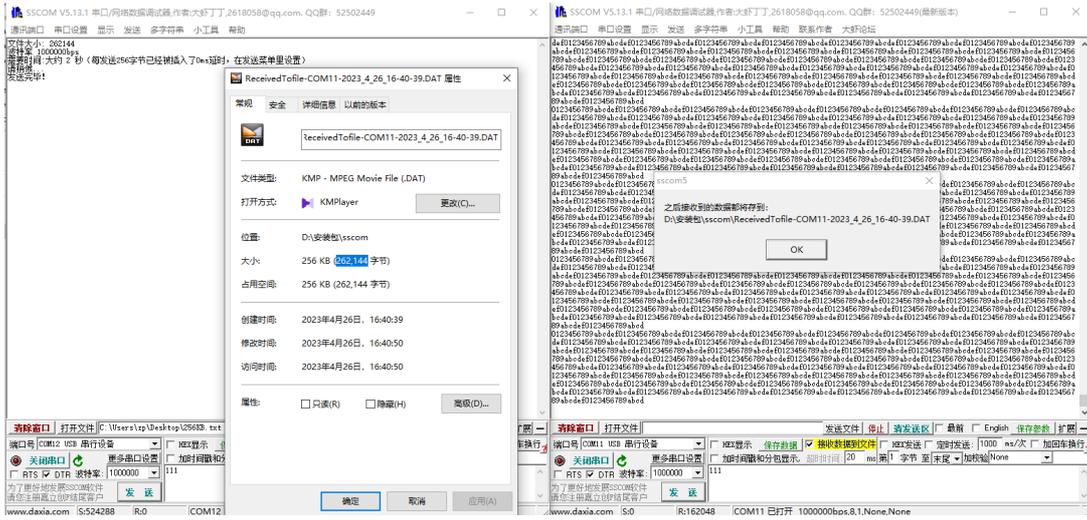
1Mbps Test (256kbps, 512kbps)

1. Connect TX2 and RX3.
2. Start two instances of SSCOM, connecting them to the respective serial ports.
3. Set the baud rate to 1000000 and open the serial port.
4. Create a 256KB text file with repetitive common characters.

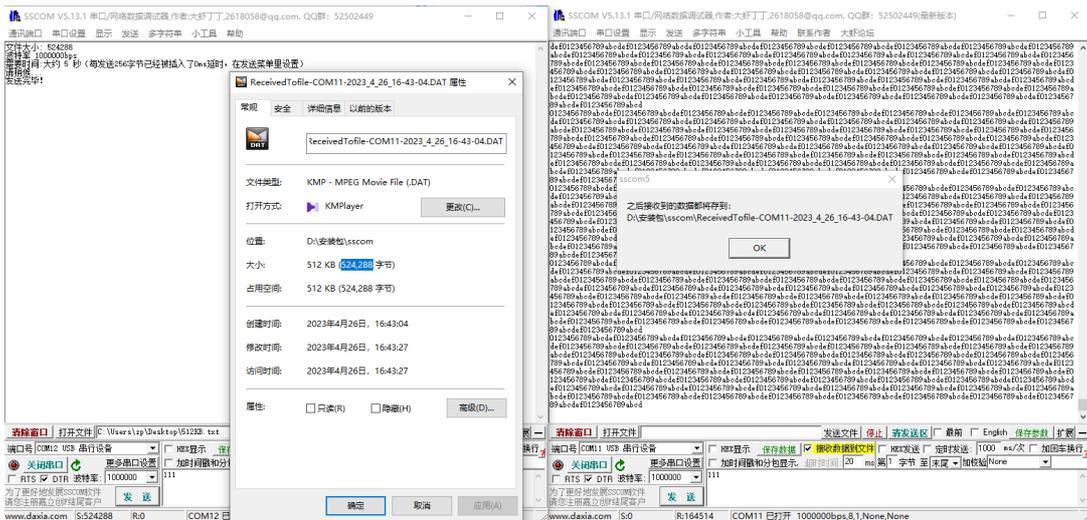
5. Use SSCOM's file sending feature, select the newly text file and send it.

6. The other instance of SSCOM will receive the data and verify the received file content.

Below is the result of the 1Mbps test (256KB). Confirm the success of the test by checking the file size and data content.



Increase the data size of the text file to 512KB and repeat the test to confirm the success of sending and receiving 512KB of data at 1Mbps.

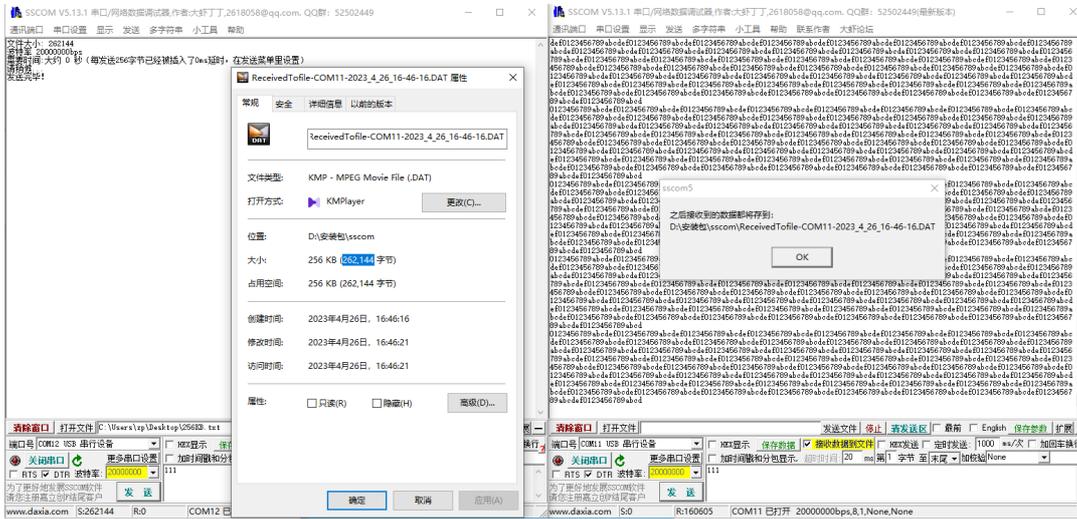


20Mbps Test (256kbps)

1. Connect TX0 and RX1.

2. Start two instances of SSCOM, connecting them to the respective serial ports.
3. Set the baud rate to 2000000 and open the serial port.
4. Create a 256KB text file with repetitive common characters.
5. Use SSCOM's file sending feature, select the newly created text file and send it.
6. The other instance of SSCOM will receive the data and verify the received file content.

Below is a screenshot of the test results. Confirm the success of the test by checking the file size and data content.



FAQ

2023-09-12

▼ Update history			
Date	Version	Author	Update content
2023-09-12	v0.1	lxo	<ul style="list-style-type: none">• Release docs

The following lists some common problems according to the form of Q&A, please try to find a solution in the following if you find any problem when using it, if the above record doesn't solve your problem, you can try to ask the question in [Community](#), reasonable questions will be answered by the technical staff for you.

1. General Question

Q:There are some functional defects when using the logic analyzer/DAPLink/JLink/serial port module.

A:Please try to find and resolve your issue first in the Q&A section. If the problem persists, click [here](#) to update the firmware and try again.

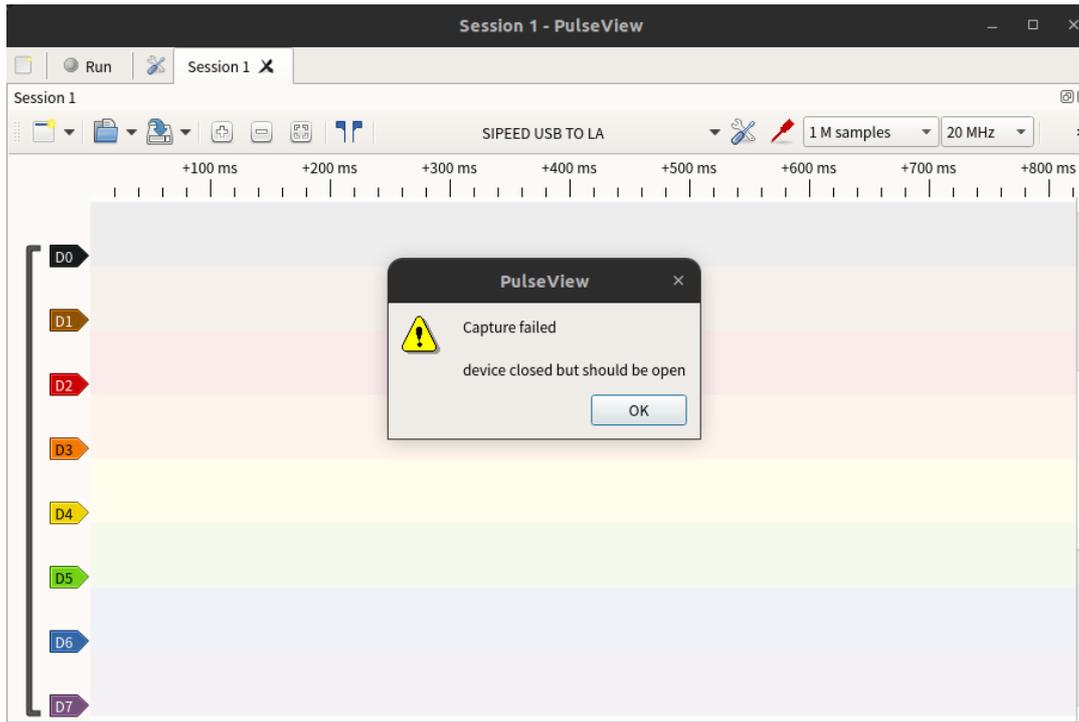
Q:The LED doesn't change after pressing the button?

A:Check that the interval between key presses is not less than 100ms, otherwise it may cause the module to enter boot mode

and you will see that LED no power up the module to restore it

2. Logic Analyzer

Q: After clicking "run", the prompt "device closed but should be open."



A: This may be the result of unstable contact that causes the device to disconnect, try to re-plug the device and then reconnect it to solve the problem.

Q: When using 8-channel sampling, it was found that waveforms also appeared when the D7 channel was not connected.

A: This is a problem to be solved, but this problem will not affect the sampled waveforms, and the waveform can still be acquired normally after connecting an external signal to the D7 channel.

Q: When sampling waveforms, the waveforms in the display window do not match the actual waveforms.

A:Make sure that you connect to the GND of the target device, and make sure that the GND wire is as close as possible to the location of the point to be measured. Be aware that even at a distance of 1cm, there may be many components in between that can interfere with the signal, so even 1cm closer is likely to give better signal quality.

Q:Logic analyser can't sample for long periods of time

A:There are multiple situations:

Situation 1: Sampling time is very small due to incorrect setting of sampling points and sampling rate, sampling time (unit:s) = sampling points/sampling rate, please make sure that the sampling points and sampling rate are set correctly.

Situation 2: Effect from PC performance. As PulseView needs to use a lot of USB bandwidth, but if the PC performance is poor at this time, it will also result in shorter sampling times.

Situation 3: If everything is fine, check if the number of sampling points is set too large, resulting in a memory overflow that prevents sampling

3. DAPLink

Q:MDK can't find DAPLink device

A:It is possible that the MDK version is too low, and a low version of MDK may not be able to recognise DAPLink (the MDK version used for testing in this article is V5.38). If the MDK version is too low to recognise DAPLink, if you don't want to upgrade the version, you can refer to the method [here](#) to update the debug driver of CMSIS-DAP.

是否将当前网页翻译成中文 网页翻译 中英对照 关闭

Q:The serial port function in D properly and messages are echoed back

A:Please refer [here](#) to update the firmware to the latest version before trying again

Q:DAPLink error while burning firmware: **Connection refused due to device mismatch!**

 image-20230816113213933

A:It may be caused by the mismatch between the chip package and the actual chip. For example, MDK uses **STM32F103** configuration, but the actual chip is **CS32F103**, the IDCODE of **STM32F103** is **0x1B10417**, and the IDCODE of **CS32F103** is **0x2BA01477**, which causes a device mismatch and refuses to connect. The solution is to find and install the software package for the actual chip, and since there are so many packages, please find the download method by yourself.

4. CKLink

None

5. Serial Module

Q:The serial terminal cannot open the serial port.

A:Try using a different serial terminal. For Windows, you can try using XCOM, and for Linux, you can try using Minicom.