



HY16F3910 Elementary Evaluation Kit HyTiny EVB User's Manual

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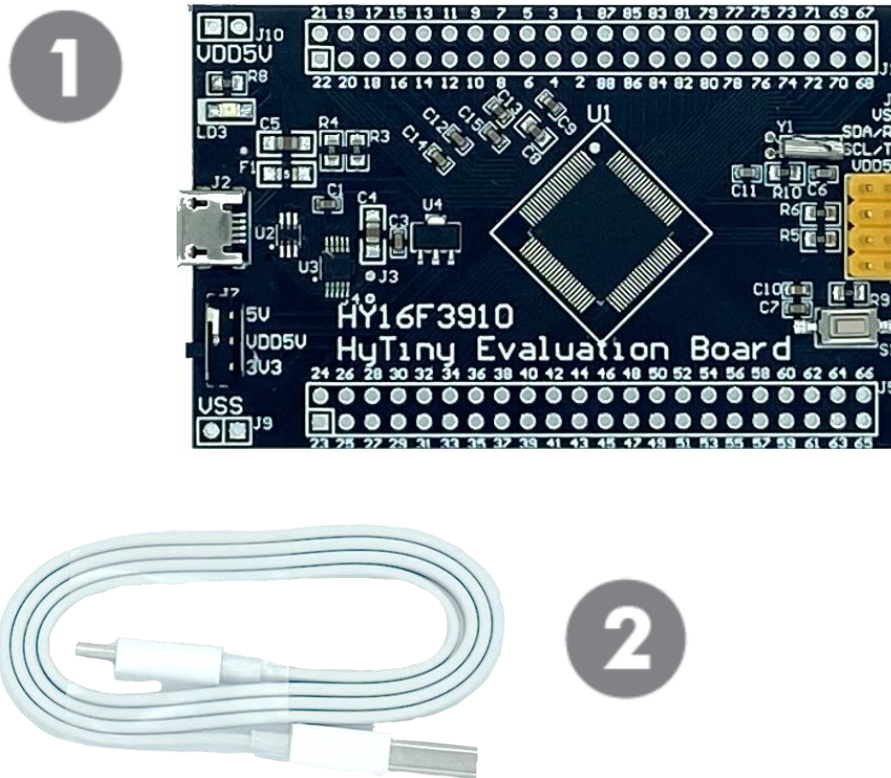
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1. Introduction

In order to allow users to quickly get started with the application of HY16F3910 series chips, HYCON has launched a dedicated elementary evaluation kit (Model: **HY16F3910-DS01**). It is mainly composed of **HY16F3910-IM02** target board (HY16F3910 HyTiny Evaluation Board, hereinafter called the '**HY16F3910 HyTiny EVB**') and Micro USB Cable (see Table 1-1). The PCB of **HY16F3910 HyTiny EVB** is very small (Size: 7x4.3 cm), but it contains a HY16F3910-N088 chip, and the chip is designed with a total of 88 pins output, which is convenient for engineers to test and develop; In addition, the **HY16F3910 HyTiny EVB** also contains a CH340E chip. This chip is used for USB to UART transmission applications. Therefore, the **HY16F3910 HyTiny EVB** can be directly connected to a computer through a Micro USB cable to achieve a 4-wire (Timeout Entry) Bootloader transmission function. The FW update of the HY16F3910 chip can be completed through the Bootloader, so that users can evaluate the performance of the HY16F3910 chip.



<i>Model No.</i>	<i>Part Name</i>	<i>Description</i>	<i>Qty.</i>
HY16F3910-DS01	1. HY16F3910-IM02	HY16F3910-N088 Target Board	1
	2. Cable line	USB-A to Micro USB Cable/60cm	1

Table 1-1

2. Safety Precautions

- Do not place heavy objects on the display panel, in order to avoid damage caused by stress.
- Place the application display boards at steady place, so as to avoid falling damage.
- Do not use this product with the input voltage which is not meeting the electrical specifications, , in order to avoid working abnormally or damage
- Avoid application display boards being touched by liquid, dirt and avoid being exposed to moisture during operation. This application should be kept in a dry environment, so as not to affect the function and performance
- Remove the power supply when not using it.
- When following status occurred, please remove the power supply immediately, and contact our engineer.
 - Power Supply line is worn or damaged.
 - Power source (battery) connected but no any light on while operating.
 - Component off.

3. Software Installation Requirements

- (1) PC/NB hardware requirement:
 - IBM PC compatible X86 system CPU
 - 4GB DDR Memory
 - 8GB HD Hard Disk Drive Capacity
- (2) Supported Products:
 - HY16F3910 Series
- (3) Supported Hardware Model No.:
 - HY16F3910-DS01
- (4) Supported software version:
 - AndeSight RDS V3.2.1 above (32-bit MCU IDE development environment)
 - HYCON 32-bit MCU Device V0.34 above (32-bit MCU Driver)
 - HYCON Bootloader V1.3 above (HYCON Bootloader software)
- (5) Supported Operating system:
 - Win XP (32-Bit), Win 7 (32/64-Bit), Win 8 (32/64-Bit), Win10 (32/64-Bit)
- (6) Apply the following interface mode:
 - USB COM Port mode, USB device drivers for Windows operating systems. (Figure 3-1)

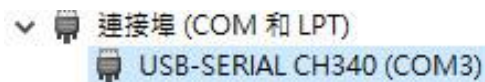


Figure 3-1

Note: When the PC is connected to the USB port of the HY16F3910 HyTiny EVB for the first time, it may encounter the problem of installing the USB driver. The following two methods can be used to install the CH340 USB driver:

- Search automatically for USB driver through the internet
- Search manually for USB driver and install

4. Description of the Hardware tool

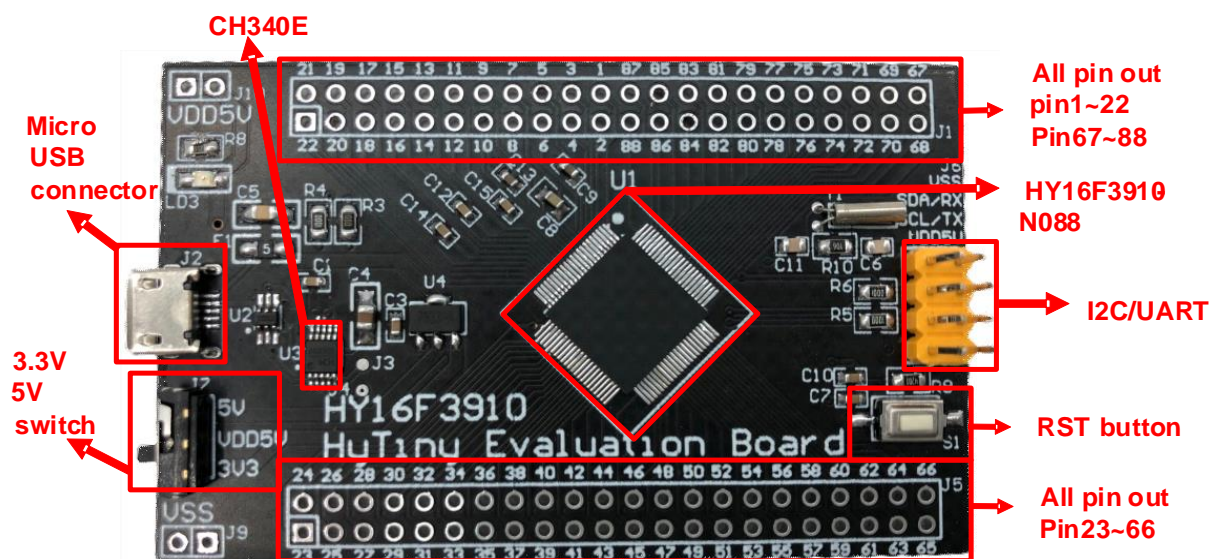
HY16F3910 HyTiny EVB has the following features:

1. Supported HY16F3910 (Timeout Entry) 4-wire Bootloader
2. Two power switching outputs (3.3V/5V)
3. Micro USB connector, provides I²C/UART communication interface
4. All pin output design of HY16F3910-N088, convenient for program development and testing

Description of the front side and back side illustrations of HY16F3910 HyTiny EVB:

- Description of the front side illustration

U1 on the PCB is designed as 88-pin output. If you see the numbers 1 to 88 on J1 and J5, it represents the pin number of the HY16F3910-N088. The chip's working voltage VDD5V can be powered by 3.3V or 5V. When the USB is powered on, LD3 will light on. For the convenience of testing, we also design an I²C/UART transmission port (such as the yellow connector in the picture). In order to meet customer application requirements, the PCB is also designed with an external 32768Hz low frequency oscillation circuit.



PCB size : 7cm x 4.3cm

Figure 4-1 The front side of PCB

4.1. HY16F3910 HyTiny EVB Application Architecture Description

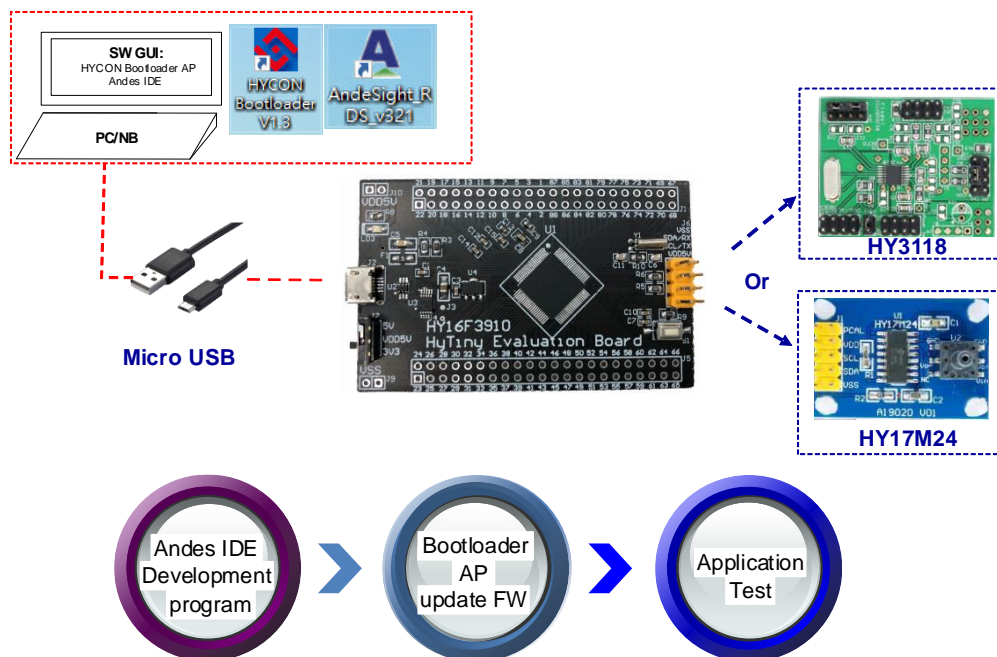
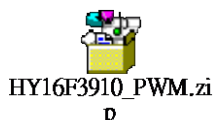


Figure 4-3

Figure 4-3 is the system application connection diagram of **HY16F3910 HyTiny EVB**. After Andes IDE develops the program, update the compiled bin file to the HY16F3910 chip through the Bootloader AP and directly apply the test. The program development process does not need to connect the HY16F Mini Link or the burner to update the FW (bin file) through the EDM port. As long as the PC is connected with a Micro USB cable to the **HY16F3910 HyTiny EVB**, the rest are only software operations, which makes it much easier to develop programs and test applications.

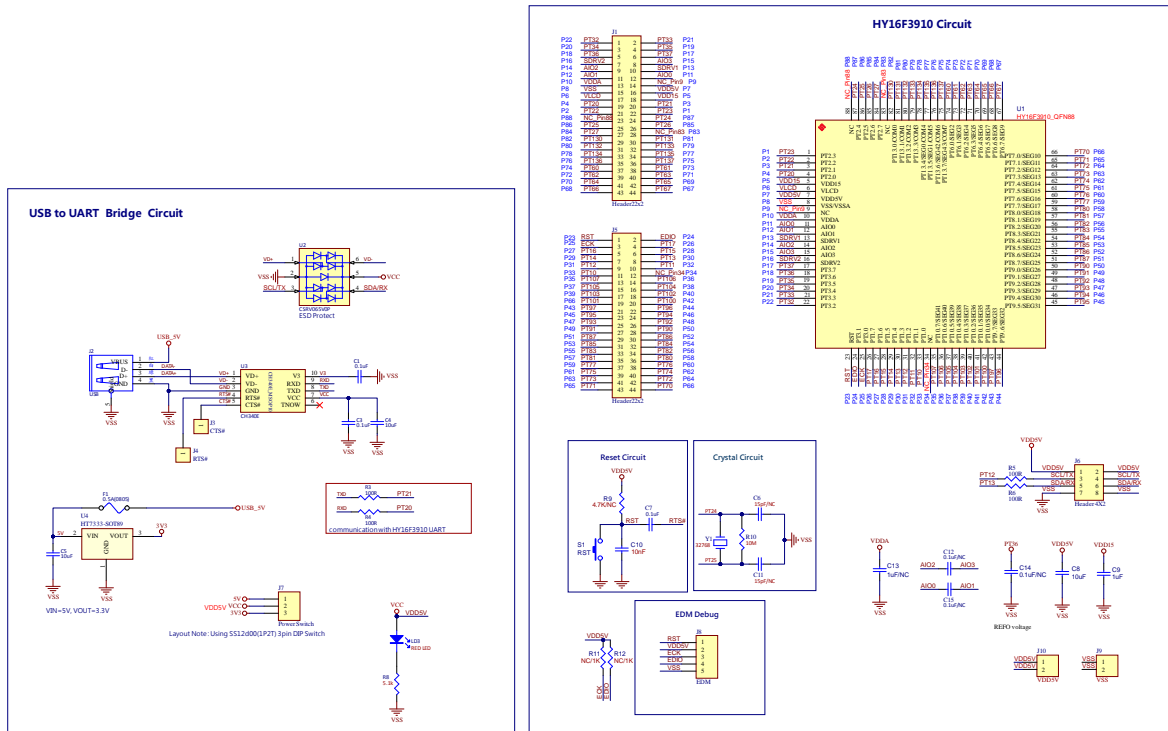
HY16F3910 HyTiny EVB has a reserved UART/I2C port, which can be connected to HYCON's existing development board (e.g., HY3118, and HY17M24). After confirming that the Bootloader in the HY16F3910 chip is turned on, you can use the Andes IDE to develop the program, update the FW through the Bootloader AP, and then execute the application test directly.

Note: The **HY16F3910 HyTiny EVB** provided by HYCON enables the 4-wire Bootloader by default, and has programmed the Bin file of the "HY16F3910_PWM" demo code (Project code is attached below). After Micro USB is connected to 5V power supply to **HY16F3910 HyTiny EVB**, PT2.6 (pin85) and PT2.7 (pin84) will output PWM square wave of 60Hz and 50% duty.



HY16F3910 Elementary Evaluation Kit HyTiny EVB User's Manual

4.2. HY16F3910 HyTiny EVB Circuit Diagram



HY16F3910 HyTiny Evaluation Board(Micro USB)
A21017 V02

Figure 4-4

4.3. HY16F3910 HyTiny EVB and PC Connection Diagram

Refer to the following Micro USB connection PC diagram (Figure 4-5), as long as the FW is developed in the IDE software and the bin file is generated, and then the HYCON Bootloader AP is opened, the bin file can be burned into the HY16F3910 chip to complete the FW update. Application test development is done only with software operations.

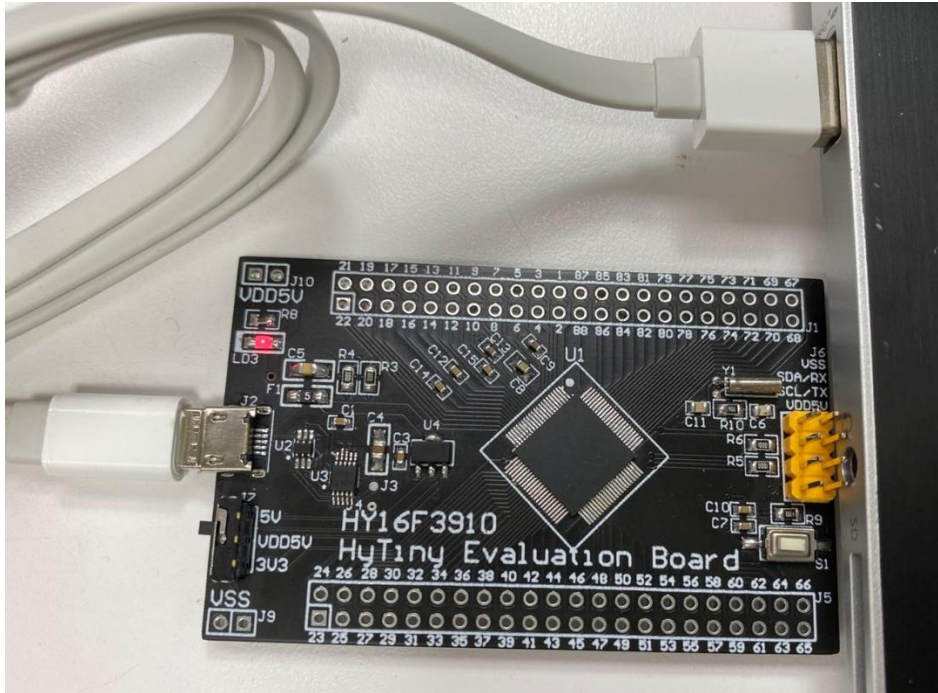


Figure 4-5

5. Description of the Software tool

Download 32-bit MCU IDE development environment and HYCON Bootloader software for HY16F39 series products on HYCON official website:

HY16F39 Series web-site: <https://www.hycontek.com/products/3289>

32-bit MCU IDE: https://www.hycontek.com/hy_mcu/HYCON-32-bit-MCU-IDE.zip

32-bit MCU Device: https://www.hycontek.com/hy_mcu/HYCON-32-bit-MCU-Device.zip

HYCON Bootloader: https://www.hycontek.com/hy_mcu/HYCON-Bootloader.zip

After installing the 32-bit MCU IDE and 32-bit MCU Device (Please install HYCON-32-bit-MCU-IDE first and then install HYCON-32-bit-MCU-Device. Note: Both must be installed in the same directory on the computer, and the installation order cannot be wrong), you can start the FW development and compilation of the HY16F3910; After installing the HYCON Bootloader software, FW update and application testing can be performed through the HYCON Bootloader.

5.1. Andes V3.2.1 32-bit MCU IDE development environment

For detailed Andes V3.2.1 instructions, please refer to the file "HY16F Series IDE Software Instruction Manual (AndeSightV3.x)". HYCON official website to download the manual: https://www.hycontek.com/hy_mcu/APD-HY16IDE030_EN.pdf

After installing 32-bit MCU IDE and 32-bit MCU Device correctly, you can start developing HY16F3910 in Andes V3.2.1 to write code and compile to generate bin file. Refer to the following illustration of Andes V3.2.1 development environment (Figure 5-1):

Step1: Load the "HY16F3910_PWM" demo code by Import. Click on the Build All graphic (or compile from Project). After the compilation is completed, three bin files will be generated in the Debug\output folder.

Step2: Click Problems to see if there are any error messages.

Step3: Check the Console to confirm that the Flash ROM usage of the demo code is text=3916Byte, and the SRAM usage is data=0Byte.

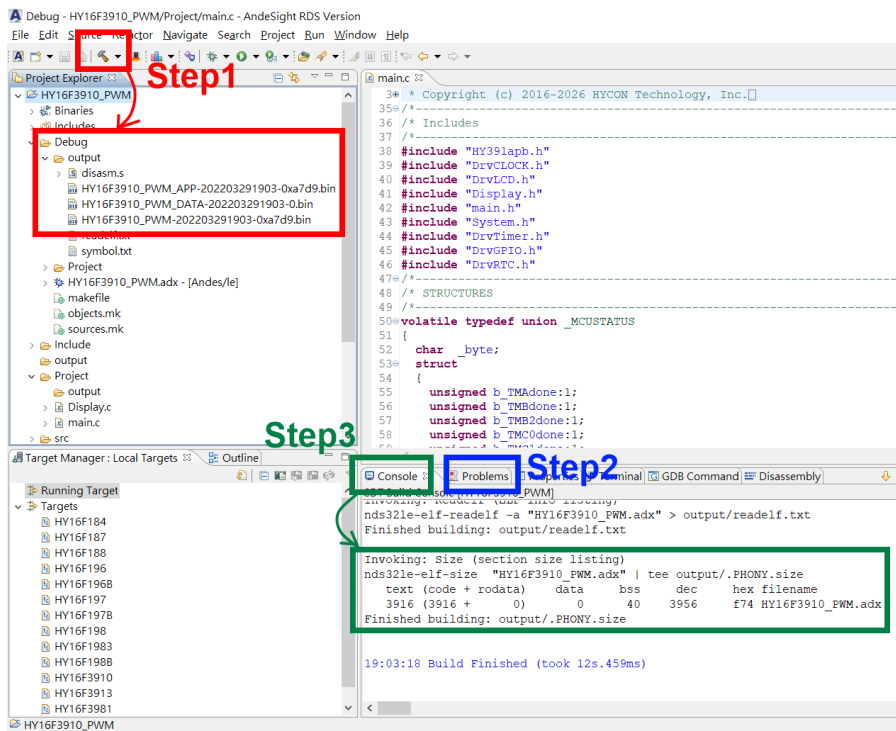


Figure 5-1

The three bin files generated by the Debug folder can be burned into the HY16F3910 chip through the HYCON Bootloader software. The contents of the following three bin files are explained:

1. App Bin File: This programmed code is generated by the user application program, programmed in the chip's App Flash ROM area, this code is necessary during the programming.
2. Data Bin File: This programmed code is generated by the user own fixed parameters or calibration parameters, programmed in the chip's Data Flash ROM area, this code is no necessary, depending on the actual needs of customers.
3. App Bin and Data Bin is separated by the BIN File, the purpose is to do the application of partition programming, if you do not need to do partition programming, you can directly use the BIN file to replace the App Bin file.

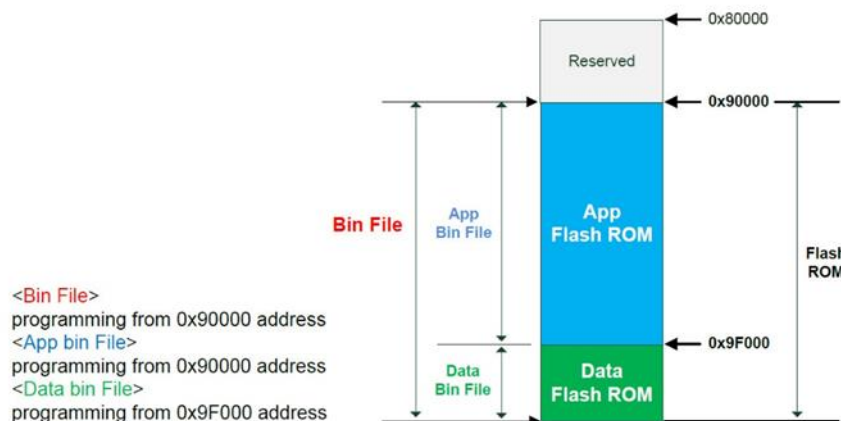


Figure 5-2

5.2. HYCON Bootloader Software

For detailed HYCON Bootloader instructions, please refer to the file "HY16F Series ISP Bootloader Instruction Manual". HYCON official website to download the manual: https://www.hycontek.com/hy_mcu/APD-HY16IDE031_EN.pdf

As shown in the figure below, the operation screen 1 that will pop up after executing HYCON Bootloader. Confirm that the USB of HY16F3910 HyTiny EVB is connected to the computer, then the port number should appear in the column of Com Num, select the correct IC Type and baudrate, press the OK button, it will automatically jump to the operation screen 2.

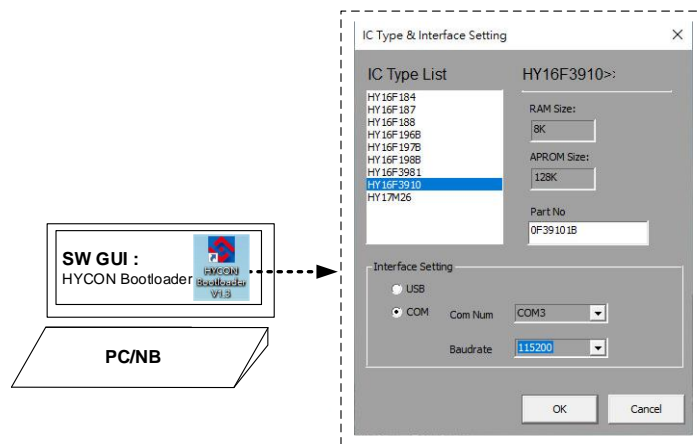


Figure 5-3 (HYCON Bootloader Operation screen 1)

As shown in the figure below, enter the operation screen 2, load the bin file generated by the compilation of Andes V3.2.1, and then press the Write button. When the progress bar reaches 100%, it means that the FW update of the HY16F3910 is completed.

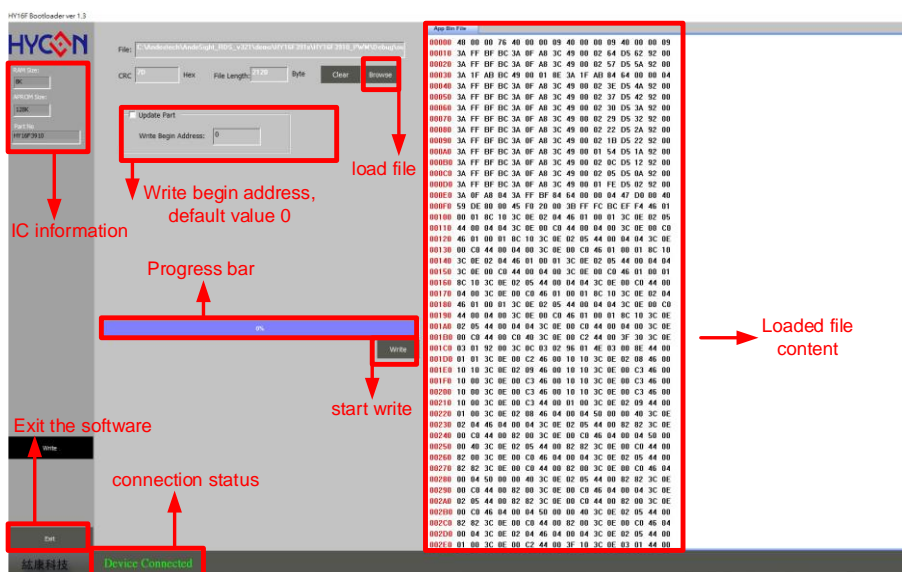


Figure 5-4 (HYCON Bootloader Operation screen 2)

5.3. HY16F Writer Software

This chapter is for demonstration only.

The Bootloader status in the **HY16F3910 HyTiny EVB** provided by HYCON is already enabled, so the user does not need to connect the EDM Port to start the HY16F3910 Bootloader.

The EDM Port reserved on the back of the PCB can be used to connect the HY16F Writer. Write the value of ISP Resource Setting from the HY16F Writer software operation interface (refer to Figure 5-4). Press Write and then OK to get the value of 01000355. After writing this code, the HY16F3910 HyTiny EVB can use the Bootloader function.

HY16F Writer ISP Resource Setting Interface:

The following figure selects a 4-wire UART (Timeout Entry), ISP Uart Port=PT2.0&PT2.1, and the value of the ISP Resource Setting that will be obtained is the code of 01000355.

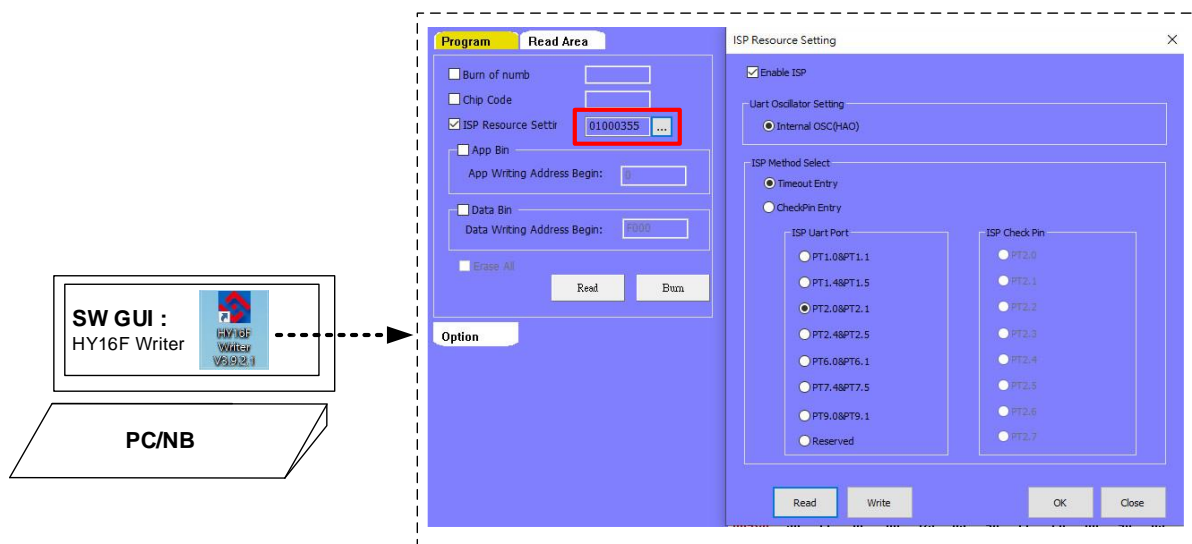


Figure 5-5 (HY16F Writer ISP Resource Setting)

6. Summary

This article not only introduces the hardware circuit description of HY16F3910 HyTiny EVB, but also introduces the related software instructions. The software includes MCU IDE development environment Andes V3.2.1 of HY16F3910 and HYCON Bootloader. The user only needs to compile the bin file in Andes V3.2.1, and then use the HYCON Bootloader software to burn the bin file into the HY16F3910 chip to complete the FW update, which is convenient for the user to do subsequent application testing. This article has introduced the software operation process in detail, so that users can better understand how to use the HY16F3910 HyTiny EVB for program development and application.

7. Revisions

The following describes the major changes made to the document, excluding the font and punctuation changes.

Date	Version	Page	Revision Summary
2022/10/28	V01	ALL	First edition