

## Introduction

This document is used to describe the use of the PYLink debugger.

PYLink is an open-source debugging adapter (DAPLink) that supports SWD and CDC debugging interfaces, suitable for various development environments, mainly used for programming and debugging with ARM Cortex-M series microcontrollers.

PYLink has released two hardware versions, PYLink V1 and PYLink V2. V1 uses GD32F103 as the main controller, while V2 uses PY32F403 as the main controller; V1 and V2 use PY\_LinkUpgrade and PYLinkV2Upgrade software respectively for firmware upgrade.

### ➤ Features

- Supports all PY32 microcontrollers
- Interface: USB 2.0, SWD, CDC
- Power supply: 3.3V/5.0V output, 1.7-5.5V external input
- Cross platform: compatible with Windows, MacOS, and Linux operating systems
- USB virtual serial port function: Simulate a serial port through USB connection to implement serial communication protocol
- Firmware upgrade: Use PY\_LinkUpgrade or PYLinkV2Upgrade software to upgrade the firmware of the debugger
- Supports multiple development environments: Keil MDK, IAR EWARM, GCC(openOCD, pyOCD)
- Online programming: With the PY32CubeProgrammer software, it is easy to program the PY32 microcontroller online
- ISP programming: With the PY32IspTool software, it is easy to program the PY32 microcontroller with ISP
- Touch debugging: With PYTouch software, it is easy to debug the PY32 touch microcontroller

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## Contents

|                                     |           |
|-------------------------------------|-----------|
| <b>Contents .....</b>               | <b>2</b>  |
| <b>1 Hardware Connection.....</b>   | <b>3</b>  |
| <b>2 Software Application .....</b> | <b>4</b>  |
| 2.1 Keil MDK.....                   | 4         |
| 2.2 IAR EWARM.....                  | 5         |
| 2.3 VSCode GCC .....                | 6         |
| 2.4 PY32CubeProgrammer .....        | 7         |
| 2.5 PY32IspTool .....               | 8         |
| 2.6 PYTouch.....                    | 9         |
| 2.7 PYLinkUpgrade .....             | 10        |
| <b>3 Version History .....</b>      | <b>11</b> |

1 Hardware Connection

Figure1-1. PYLink



Figure1-2. PYLink CON20 PIN SCH

|           |    |    |    |    |          |
|-----------|----|----|----|----|----------|
| TVCC      | 1  | 1  | 2  | 2  | 3.3V     |
| 5V        | 3  | 3  | 4  | 4  | TVCC     |
| TDI       | 5  | 5  | 6  | 6  | UART1 RX |
| TMS_SWDIO | 7  | 7  | 8  | 8  | UART1 TX |
| TCK_SWCLK | 9  | 9  | 10 | 10 | GND      |
| MCU_MCO   | 11 | 11 | 12 | 12 | GND      |
| TDO       | 13 | 13 | 14 | 14 | STANDBY  |
| RST       | 15 | 15 | 16 | 16 | BUSY     |
| OK        | 17 | 17 | 18 | 18 | NG       |
| START     | 19 | 19 | 20 | 20 | GND      |

CON20

Table1-1. SWD Interface

| PY-Link    | MCU          | Note                         |
|------------|--------------|------------------------------|
| VCC        | VCC          | Power                        |
| GND        | VSS          | Ground                       |
| SWDIO(TMS) | SWDIO (PA13) | Some chips may be other pins |
| SWCLK(TCK) | SWCLK (PA14) | Some chips may be other pins |

Table1-2. ISP/IAP-USART Interface

| PY-Link | MCU             | Note                         |
|---------|-----------------|------------------------------|
| VCC     | VCC             | Power                        |
| GND     | VSS             | Ground                       |
| TX      | USART_RX (PA10) | Some chips may be other pins |
| RX      | USART_TX (PA9)  | Some chips may be other pins |

## 2 Software Application

### 2.1 Keil MDK

Reference document: PY32\_Keil\_DFP\_UserManual\_EN.pdf

Figure2.1-1. Options for Target

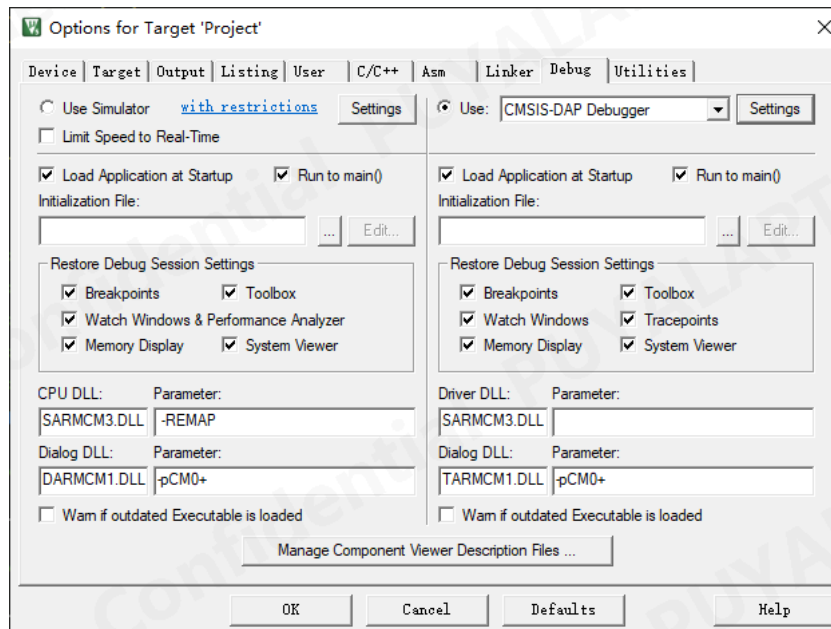
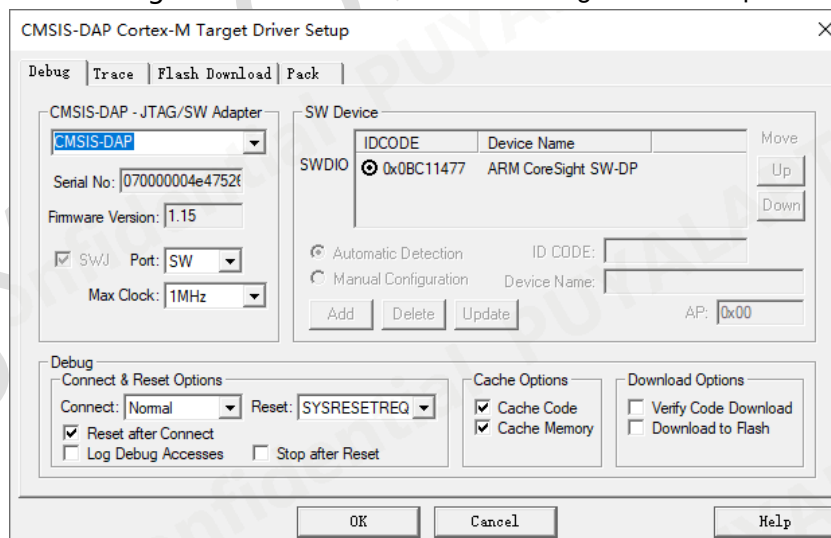


Figure2.1-2. CMSIS-DAP Cortex-M Target Driver Setup



## 2.2 IAR EWARM

Reference document: PY32\_IAR\_DFP\_UserManual\_EN.pdf

Figure2.2-1.Options for node - Debugger

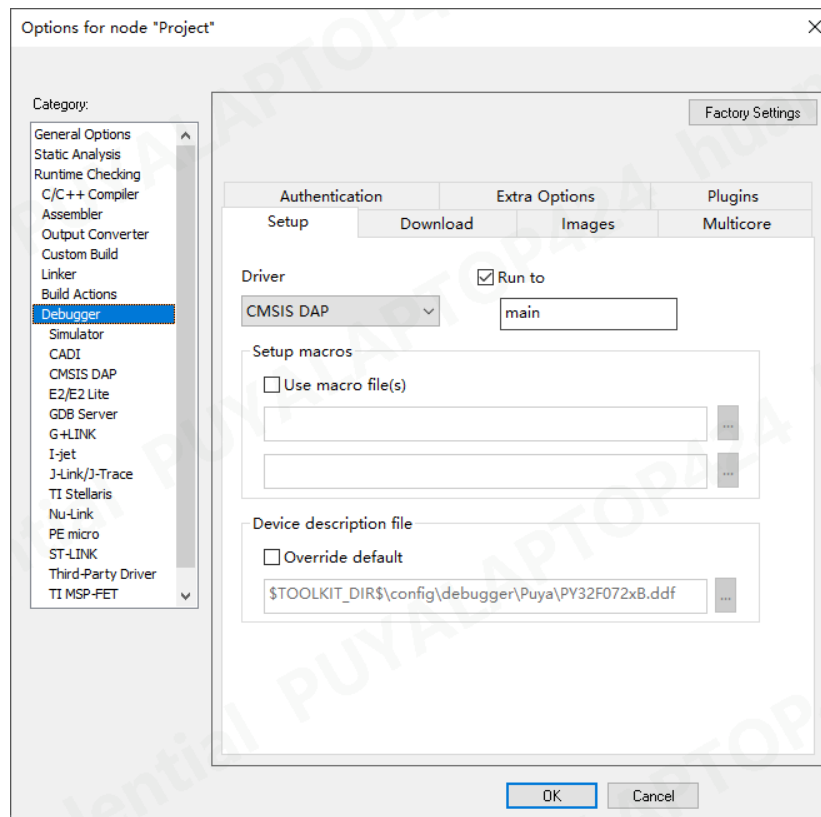
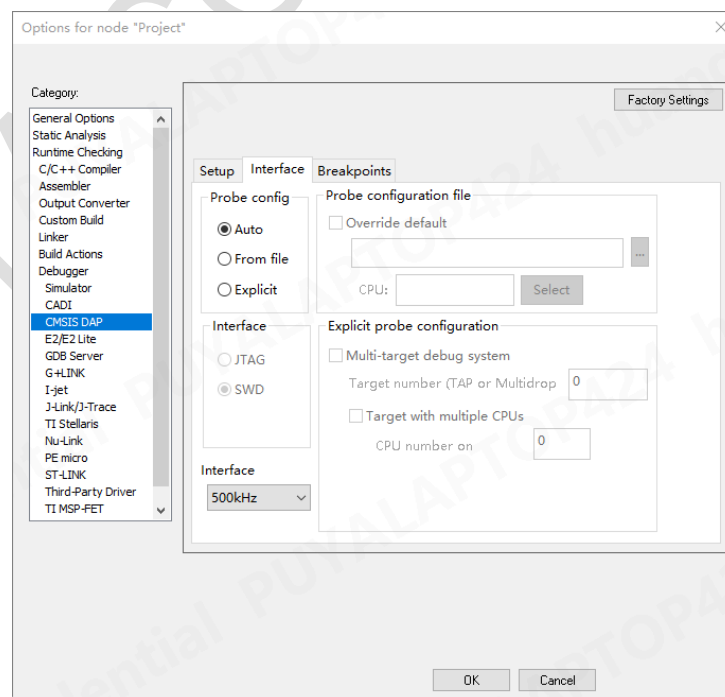


Figure2.2-2. Options for node – CMSIS DAP



## 2.3 VSCode GCC

Reference document: PY32\_GCC\_EIDE\_UserManual\_EN.pdf, PY32\_GCC\_Makefile\_UserManual\_EN.pdf

Figure2.3-1. VSCode EIDE - OpenOCD

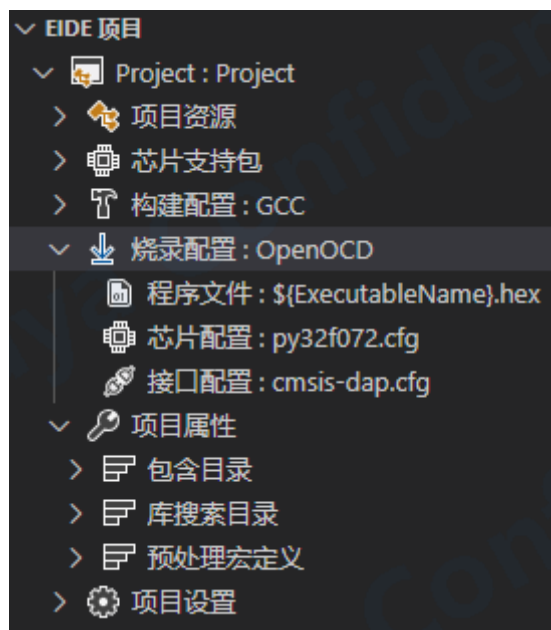
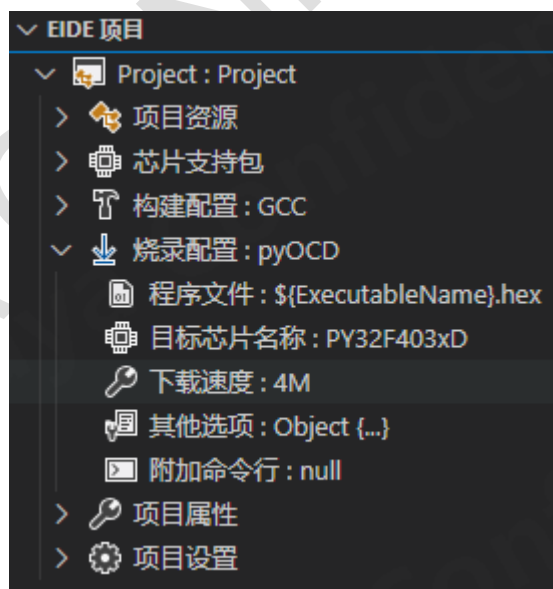


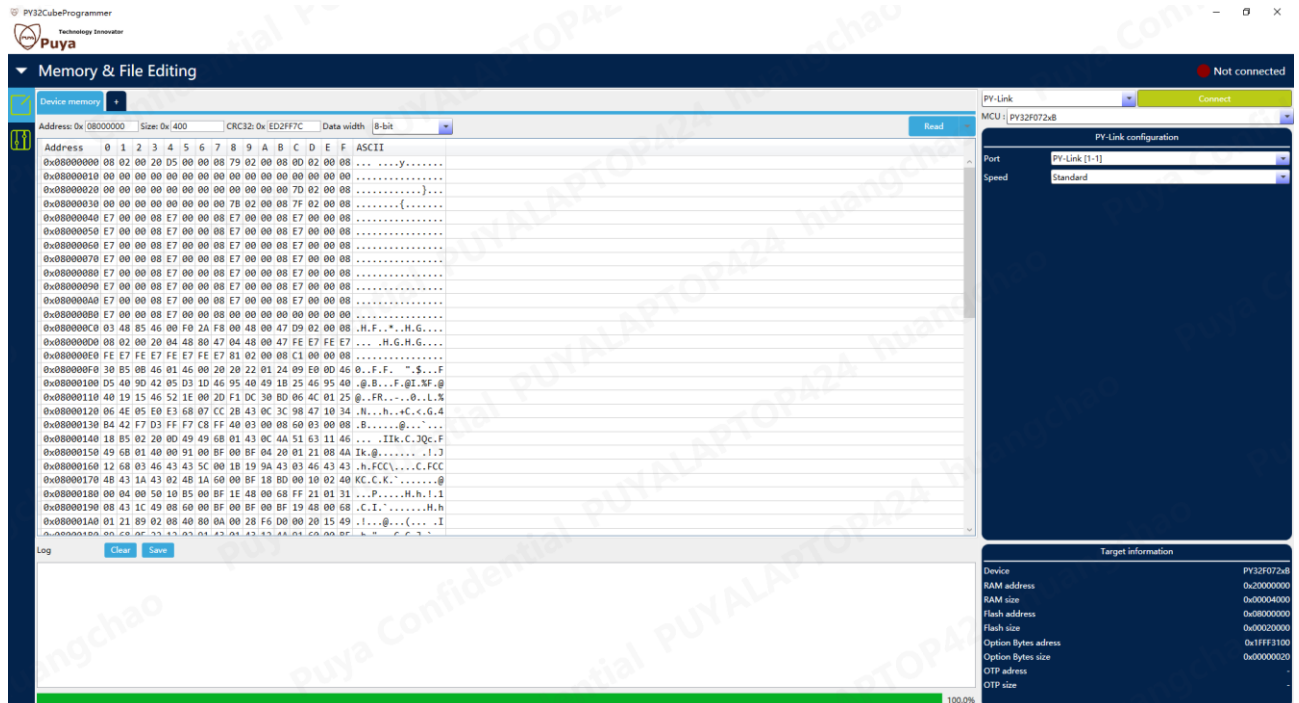
Figure2.3-2. VSCode EIDE - pyOCD



## 2.4 PY32CubeProgrammer

Reference document: PY32\_CubeProgrammer\_UserManual\_EN.pdf

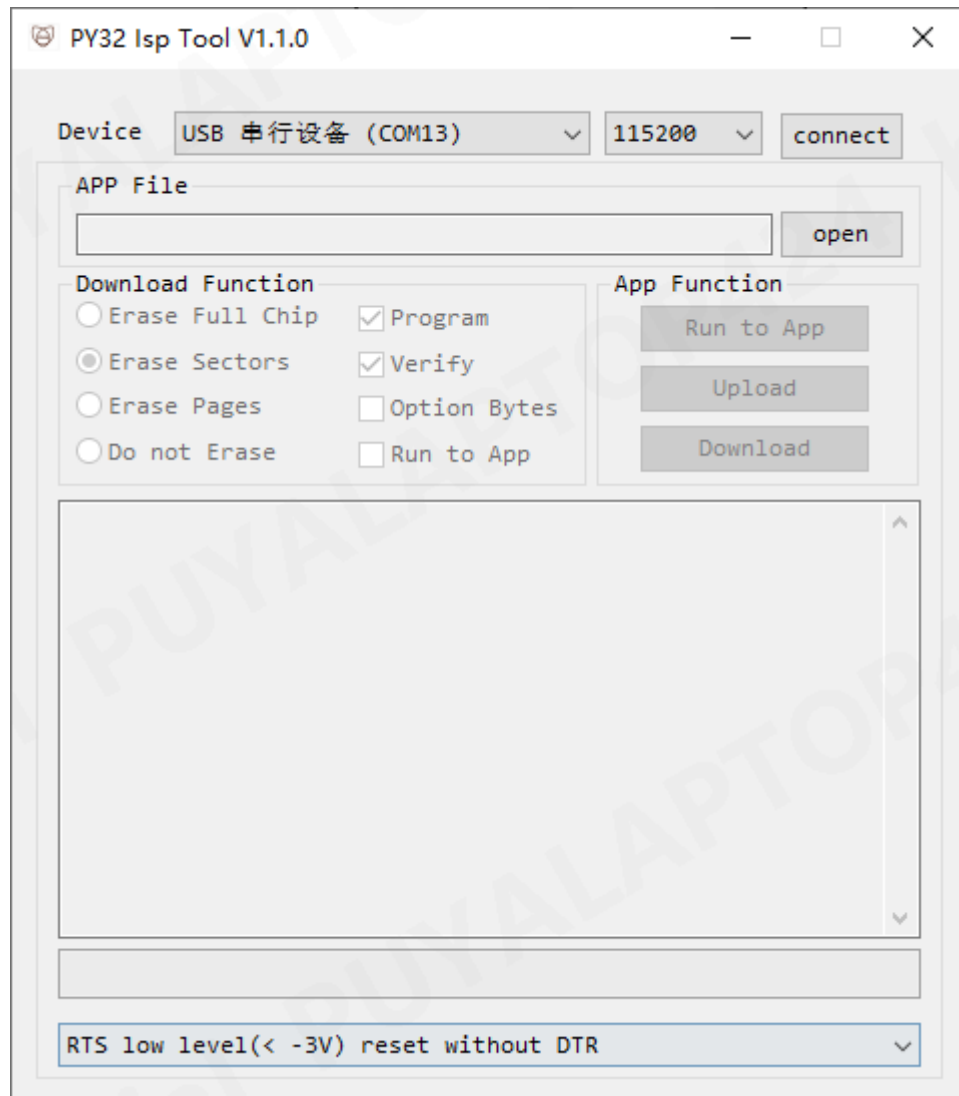
Figure2.4-1. PY32CubeProgrammer



## 2.5 PY32IspTool

Reference document: PY32\_IspTool\_UserManual\_EN.pdf

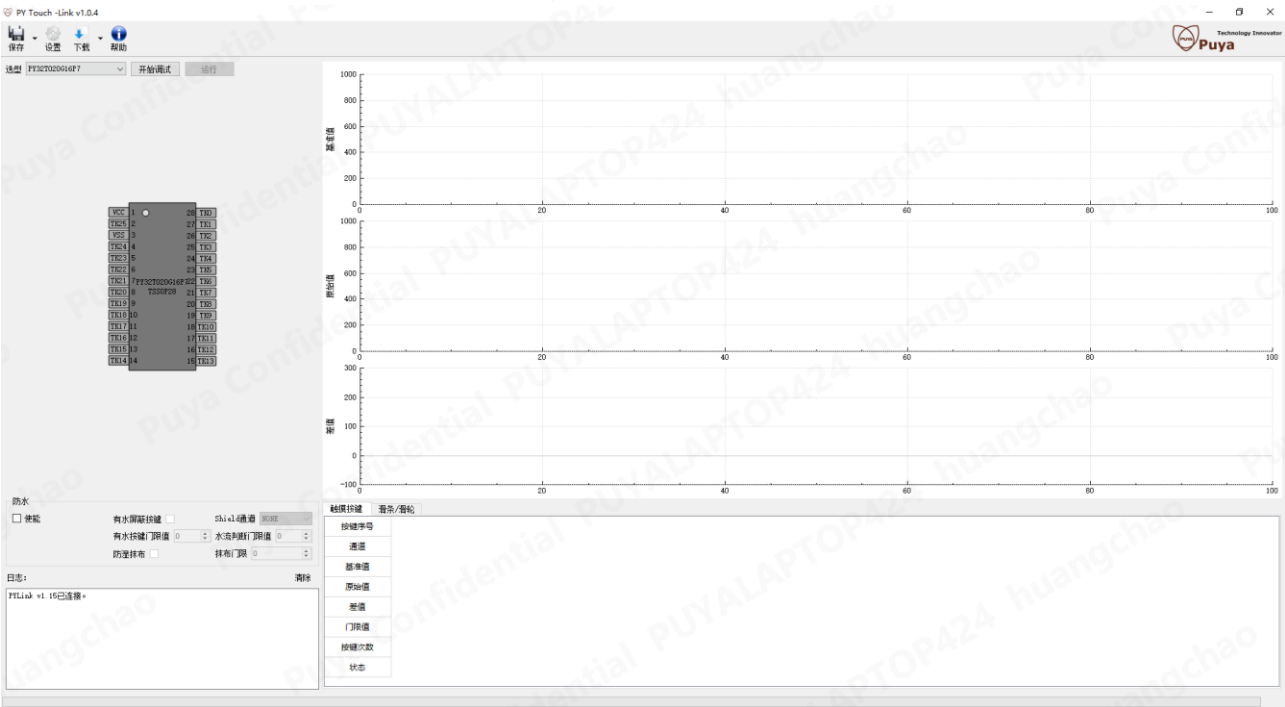
Figure2.5-1. PY32 ISP Tool





2.6 PYTouch

Figure2.6-1. PYTouch



## 2.7 PYLinkUpgrade

Figure2.7-1. PY-Link Upgrade<Click Device Connect button first, then click Yes button>

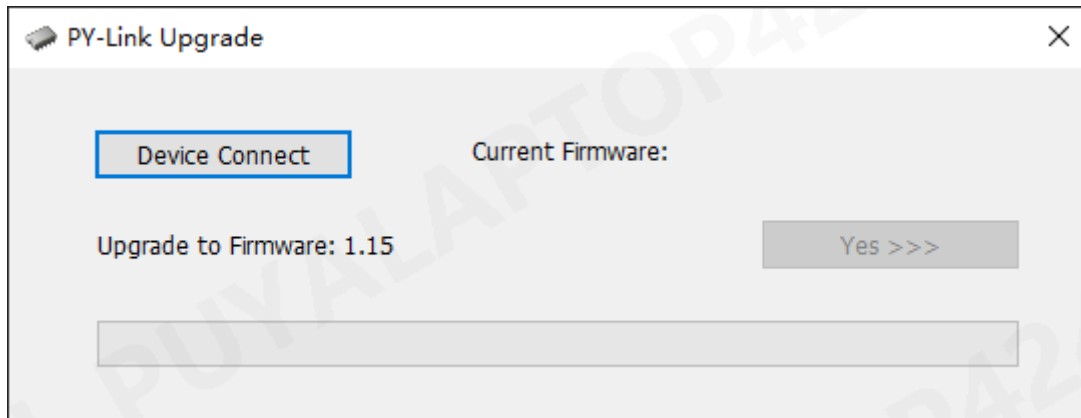
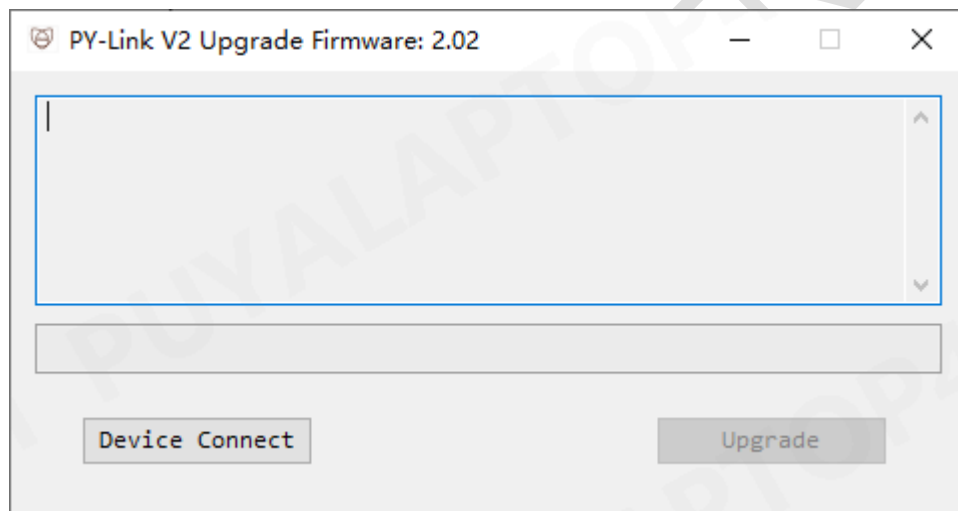


Figure2.7-2. PYLinkV2Upgrade< Click Device Connect button first, then click Yes button>



3 Version History

| Version | Date       | Description      |
|---------|------------|------------------|
| V1.0    | 2025/01/02 | Initial Version. |
|         |            |                  |
|         |            |                  |
|         |            |                  |
|         |            |                  |
|         |            |                  |
|         |            |                  |



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