

User guide

UG_N32G430C8L7_STB Development board

hardware user guide

Introduction

The purpose of this document is to enable users to quickly get familiar with the N32G430C8L7_STB development board, understand the function of the development board, use instructions and precautions, so as to conduct MCU debugging and development based on the development board.

CONTENT

1	HARDWARE DEVELOPMENT INSTRUCTIONS.....	1
1.1	Overview	1
1.2	Development board function	1
1.3	Development board layout.....	2
1.4	Development board jumper instructions	4
1.5	Development board schematic diagram.....	5
1.6	NSLink instruction	10
2	VERSION HISTORY	21
3	NOTICE.....	22

1 Hardware Development Instructions

1.1 Overview

The N32G430C8L7_STB development board is used for sample development of Nations Technologies Inc. 's high-performance 32-bit N32G430C8L7 series chips. Intended Audience This document describes the functions, usage instructions, and precautions of the N32G430C8L7_STB development board.

1.2 Development board function

The main MCU chip model of the development board is N32G430C8L7 and LQFP48 pin package. The development board connects all functional interfaces to facilitate customer development.

1.3 Development board layout

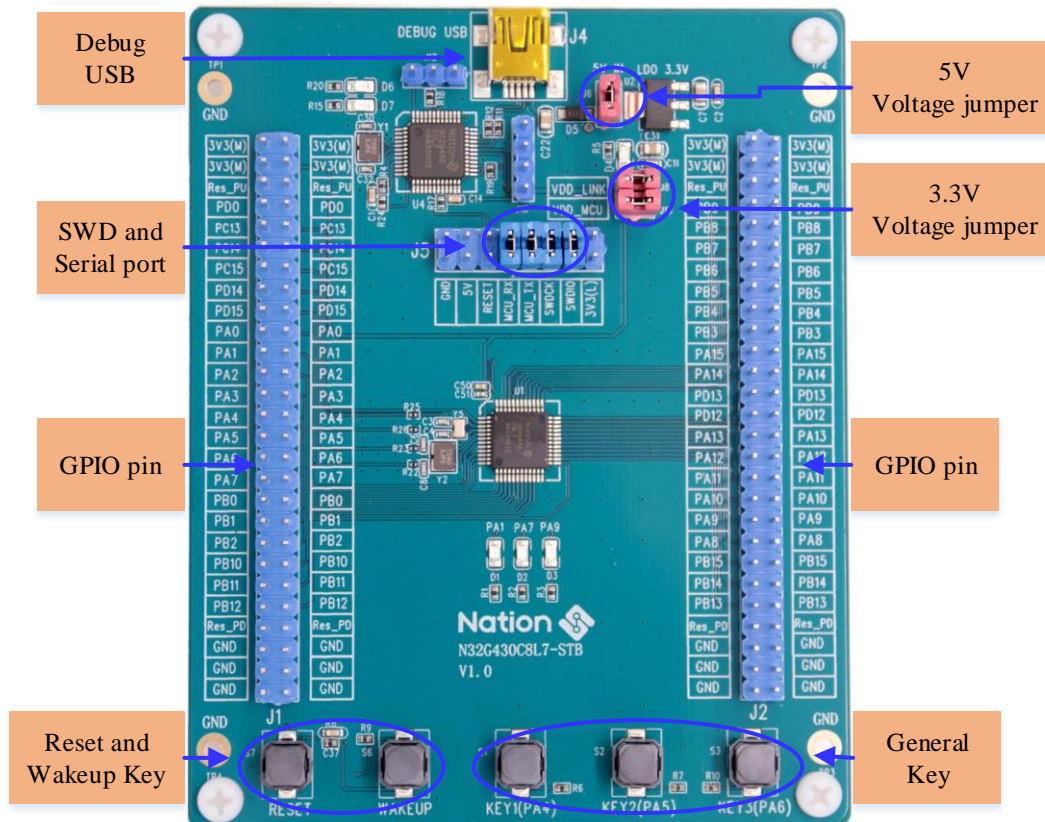


Figure 1-1 Development board layout1

1) Power supply for development board

The development board can be powered via Debug USB (J4) and connected to 3.3V LDO input via J6 jumper.

2) Debug USB (J4)

The MCU can be connected to the onboard NSLINK via Debug USB or used as a serial port (NSLINK as a serial to USB tool).

3) SWD and Serial Port (J5)

SWD interface: SWDIO and SWDCK, used to download and debug the main MCU program, you can use ULINK2 or JLINK to download and debug the MCU, or you can short the SWDIO signal pin and the SWDCK signal pin with the jumper cap, and download the MCU through DEBUG USB debugging.

Serial port: MCU_TX and MCU_RX, used as serial port external signal, PA9 (TX) and PA10 (RX) of MCU are used as serial port, you can connect external serial port device separately, or you can short the MCU_TX signal pin and MCU_RX signal pin with the jumper cap, Through the NS-LINK on the development board, the USB port is converted into a serial port, which is convenient for customers to use;

4) Reset and wake up buttons (S7, S6)

S7 and S6 are reset buttons and wake buttons respectively, which are connected to NRST pins and PA0-WKUP pins of the chip respectively for chip reset and wake functions.

5) General keys (S1, S2, S3)

S1, S2 and S3 are connected to chip PA4, PA5 and PA6 pins respectively as universal keys.

6) BOOT(J1 PIN12)

J1 PIN12 is the BOOT0 pin, which can be shorted to the adjacent power supply and ground through the jumper cap as needed.

7) GPIO port (J1, J2)

All the GPIO interfaces of the chip are elicited, and 3.3V voltage and GND pins are reserved on the pins for easy testing. Refer to DS_N32G430 Series Data Manual for the specific definition of the interface.

1.4 Development board jumper instructions

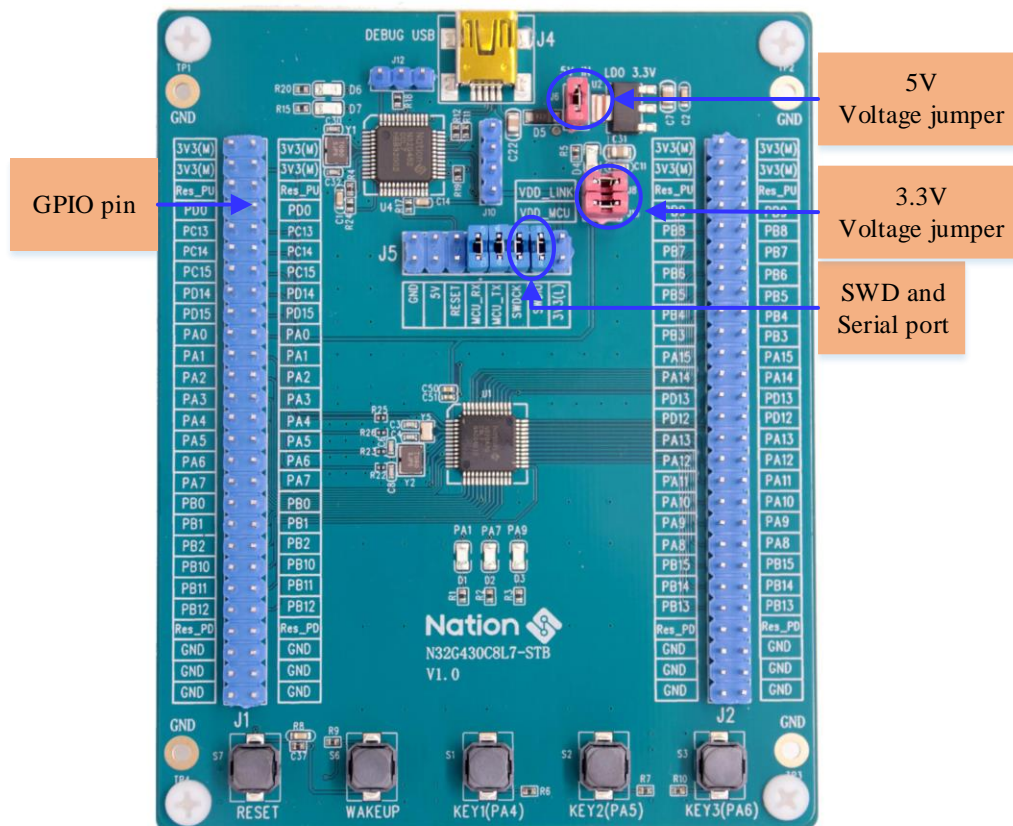


Figure 1-2 Development board jumper description

Table 1-1 Development board jumper description list

No.	Jump line item number	Jump line function	Directions for use
1	J6	5V voltage jumper	J6 jumper Connects to the USB port (J4) and supplies power to the LDO3.3V input port.
2	J8 and J15	3.3V power supply jumper	J8: Supply 3.3V power to NS-Link MCU chip. J15: Supply 3.3V power to master MCU chip.
3	J5	1. SWD jumper 2. Serial jumper	1. Use NS-Link to download programs to MCU through USB Debug port, and need to short-circuit SWDIO and SWDCK pins. 2. When NS-Link is used as a serial port through the USB Debug port, short connect the TX and RX pins.
4	J1 (Boot0 pin)	The BOOT jumper	The BOOT0 pin can be connected to GND and 3V3 through jumpers as close as required.

1.5 Development board schematic diagram

The schematic diagram of the N32G430C8L7_STB development board is described as follows (see N32G430C8L7_STB_V1.0 for details).

1) MCU connection

Refer to Figure 1-3 for the SCHEMATIC diagram of MCU connection. VDD and VDDA of MCU are both connected with capacitors, and all GPIO are led out and connected to J1 and J2 pins for easy debugging.

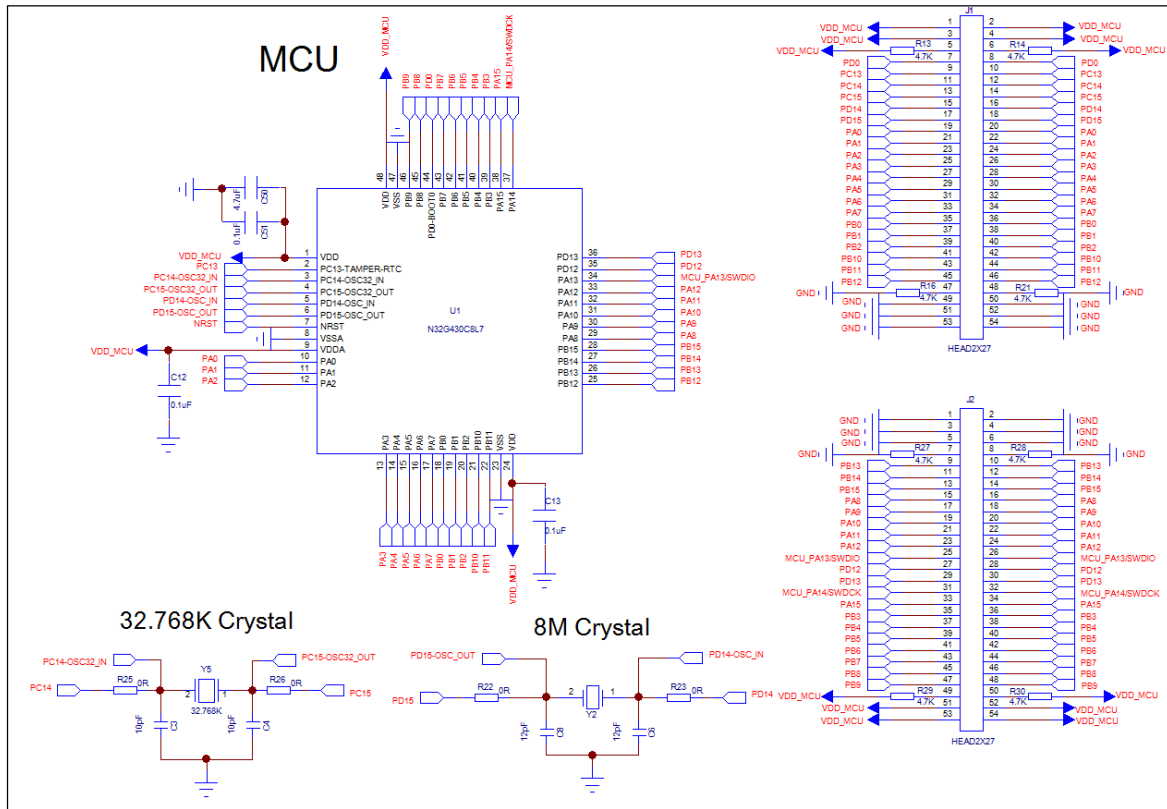
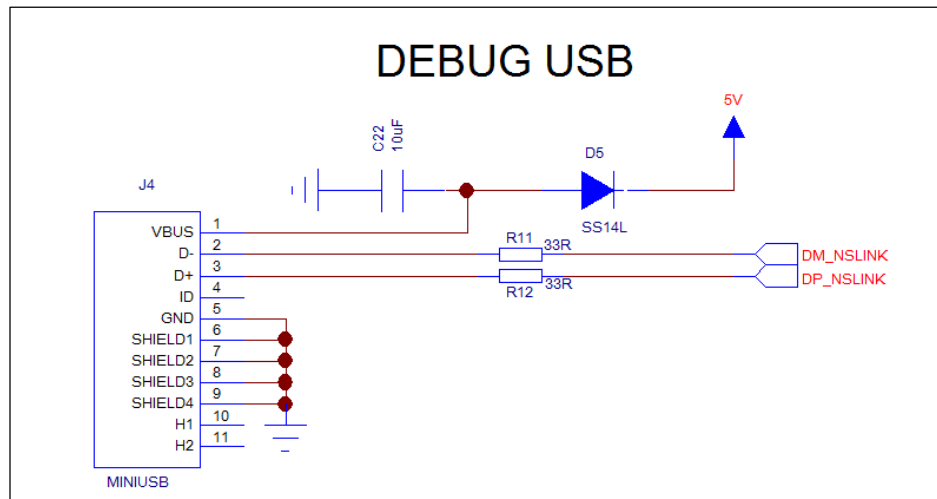


Figure 1-3 MCU connection diagram

2) Power supply design

Refer to Figure 1-4 for the schematic diagram of power supply design. PCB supplies 5V power through USB (J4) and 3.3V voltage through LDO (U2) to supply power to the whole PCB board.



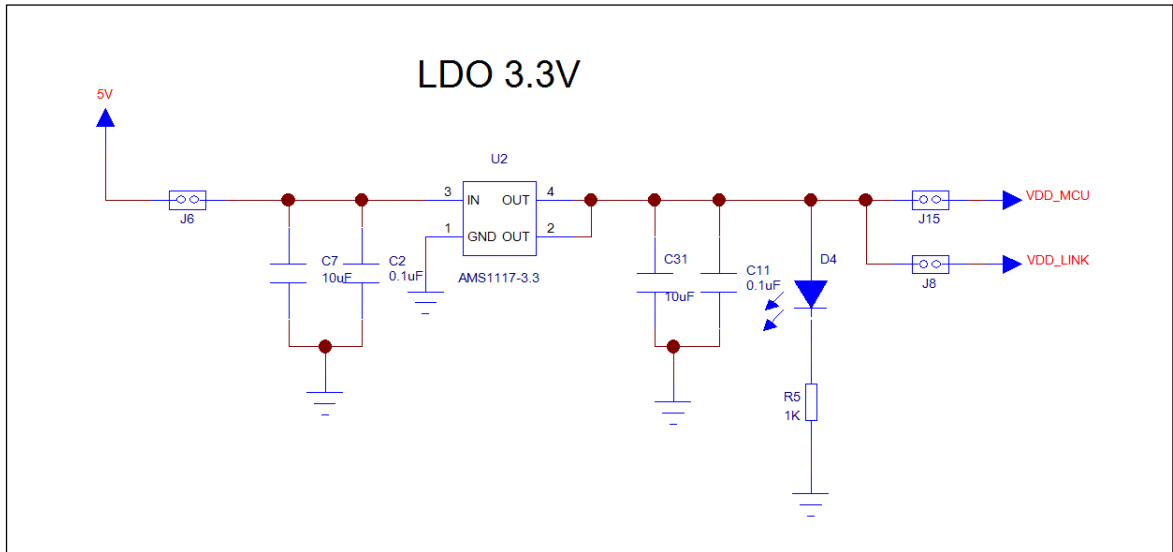


Figure 1-4 Power supply design

3) The key design

Refer to Figure 1-5 for the schematic diagram of button design. There are five buttons in total, namely MCU reset button, wake up button and three universal buttons.

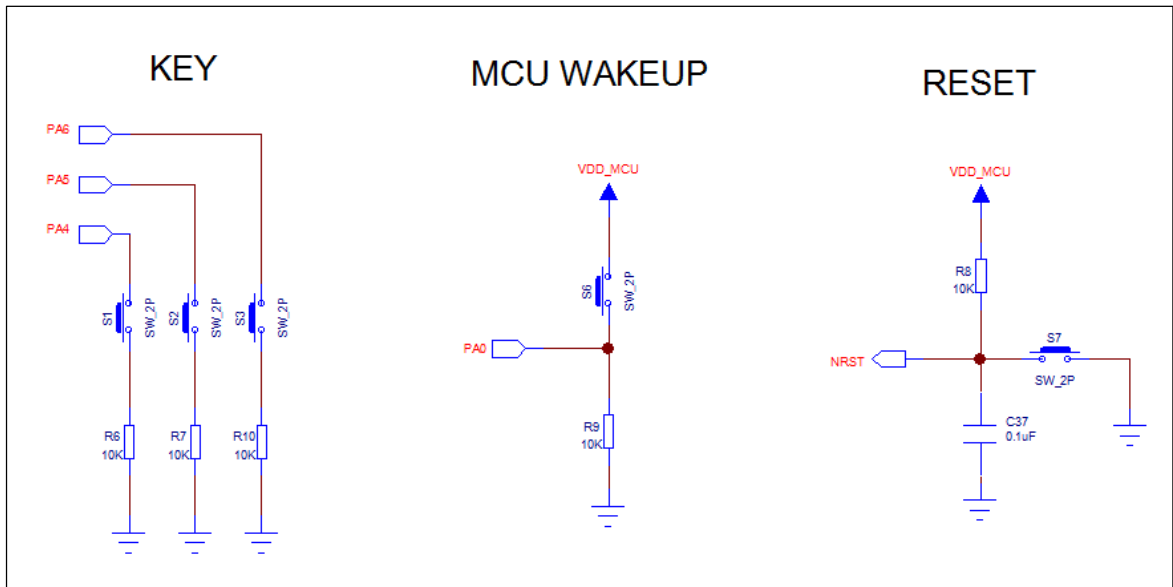


Figure 1-5 Key design

4) LED lighting design

Refer to Figure 1-6 for the principle diagram of LED lamp design. There are 5 LED lamps in total. D1, D2 and D3 are connected to PB1, PB6 and PB7 of main MCU respectively, which can be used for debugging. D6 and D7 are used for NS-link MCU control to monitor the running status of

NS-Link.

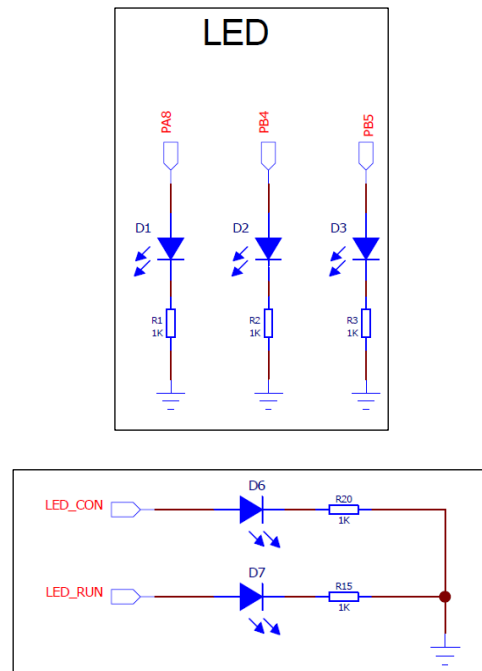
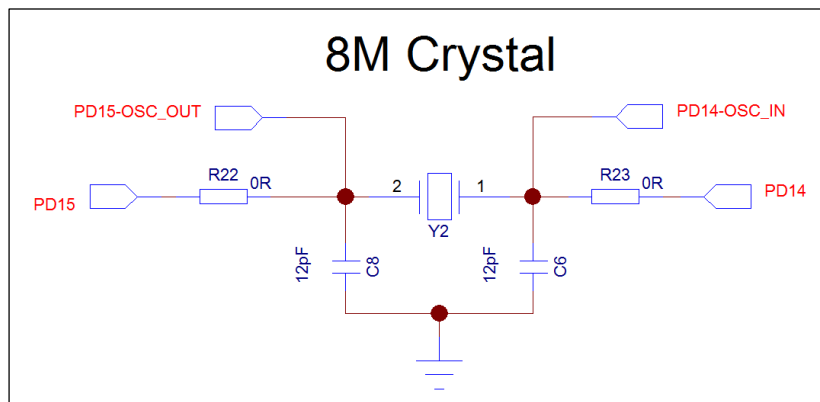


Figure 1-6 LED lamp design-

5) Crystal

Refer to Figure 1-7 for the crystal connection diagram. The chip has two external crystals, 32.768 KHz and 8 MHz respectively.



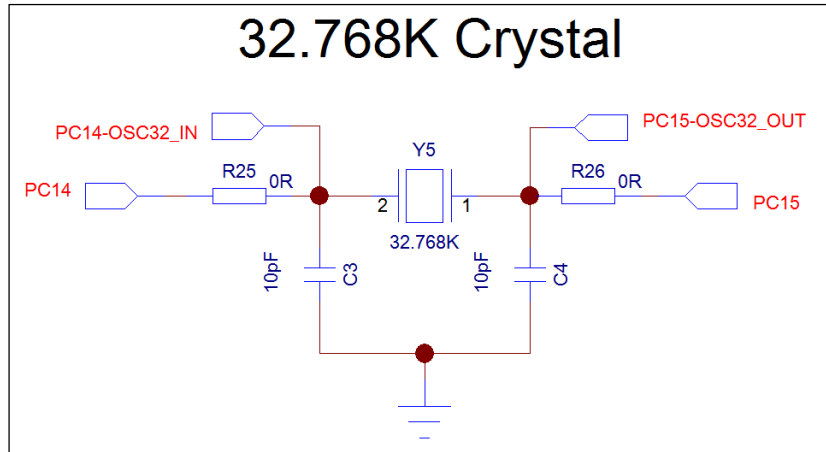


Figure 1-7 Crystal design

6) NS-LINK

See Figure 1-8 for the NS-Link schematic diagram. Users can download programs by directly connecting the USB cable through the DEBUG USB port, without ULINK or JLINK burner. You can also use the DEBUG USB analog serial port to perform debugging.

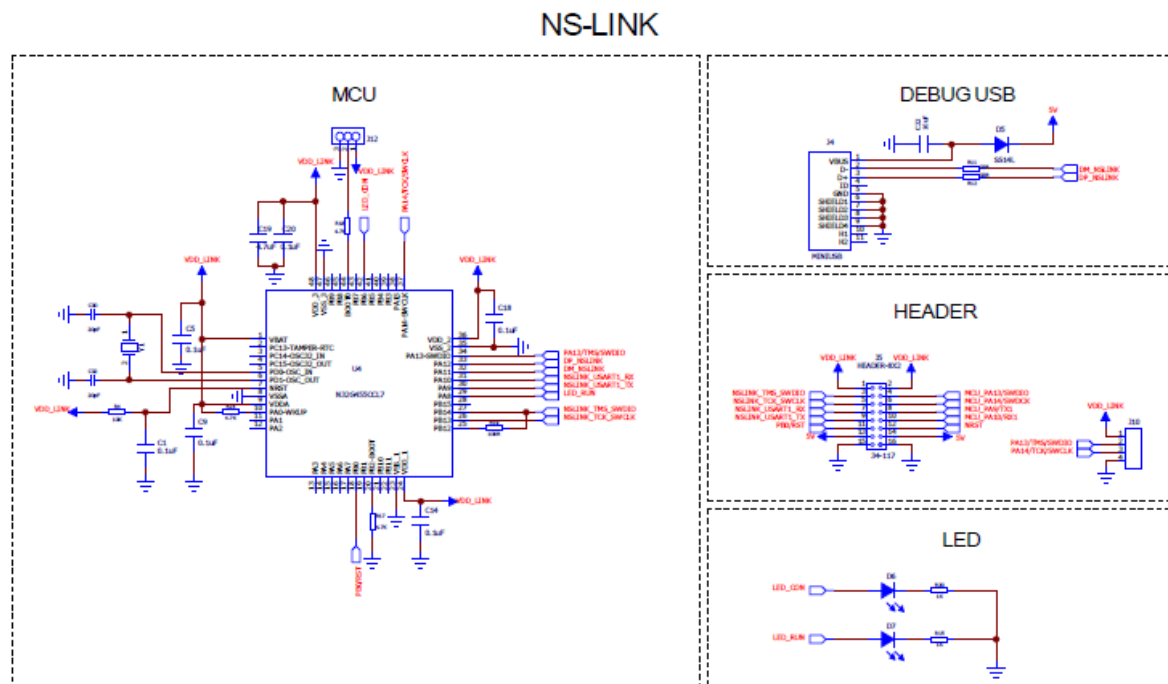


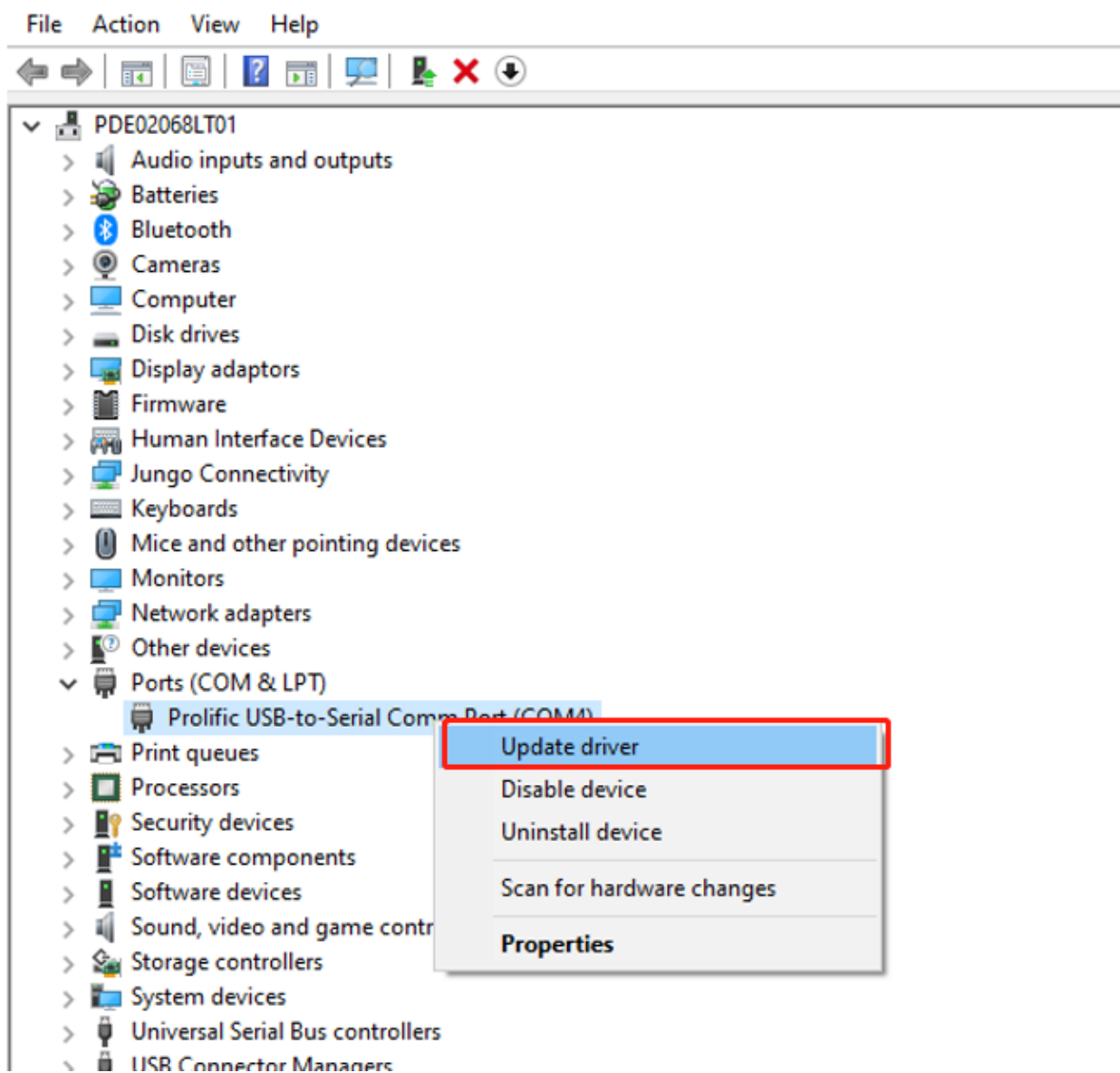
Figure 1-8 NS – LINK

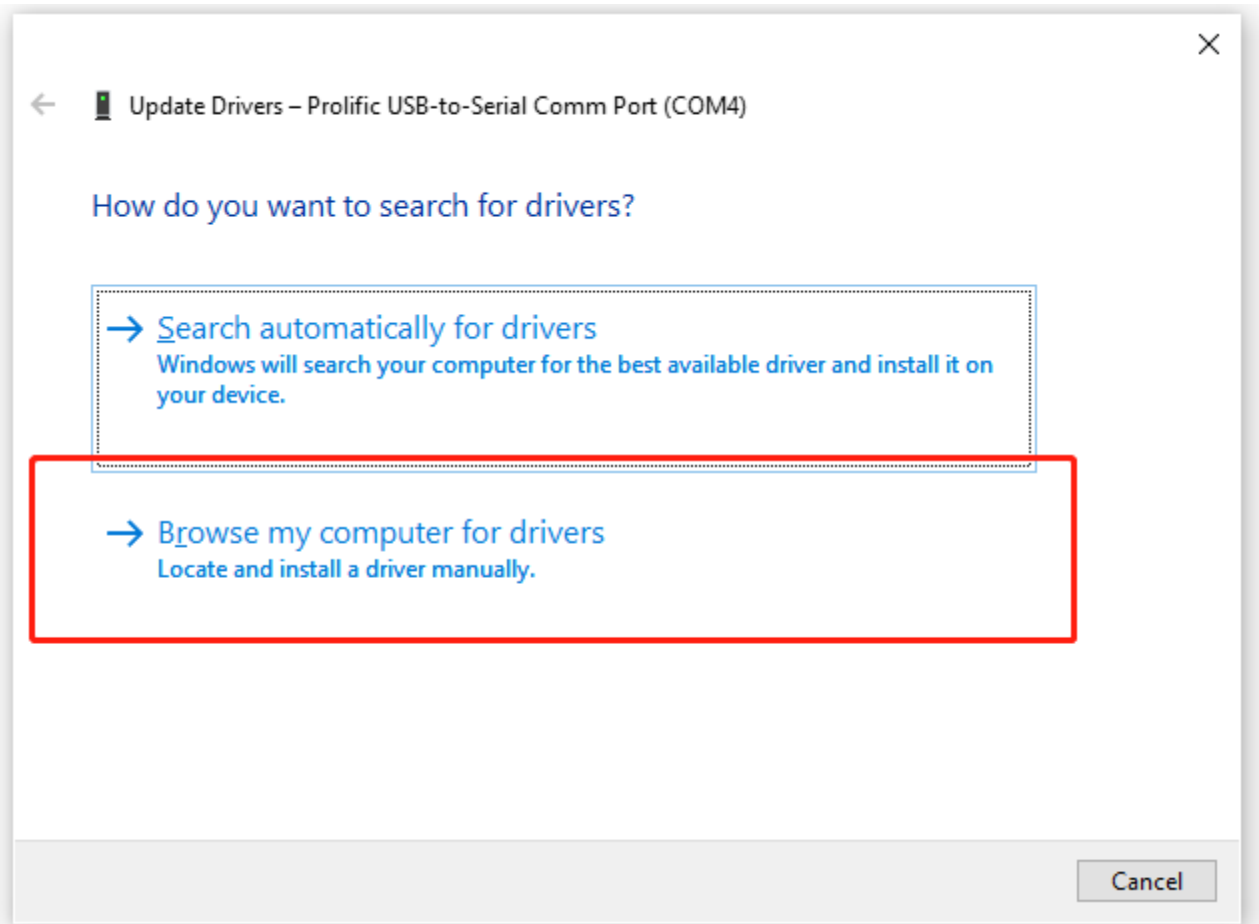
● Description of peripheral devices:

- 1) When designing PCB LAYOUT, place two capacitors near VDD (PIN1), 4.7uF and 0.1uF respectively, and place 0.1uF capacitors near the other VDD pins.
- 2) PC14-OSC32_IN, PC15-OSC32_OUT: When there is a need for an external high-precision RTC clock, a 32.768KHz crystal should be connected close to the pin, and it can be omitted if there is no need.
- 3) DP, DM: 33Ω series resistance, placed close to the pins.

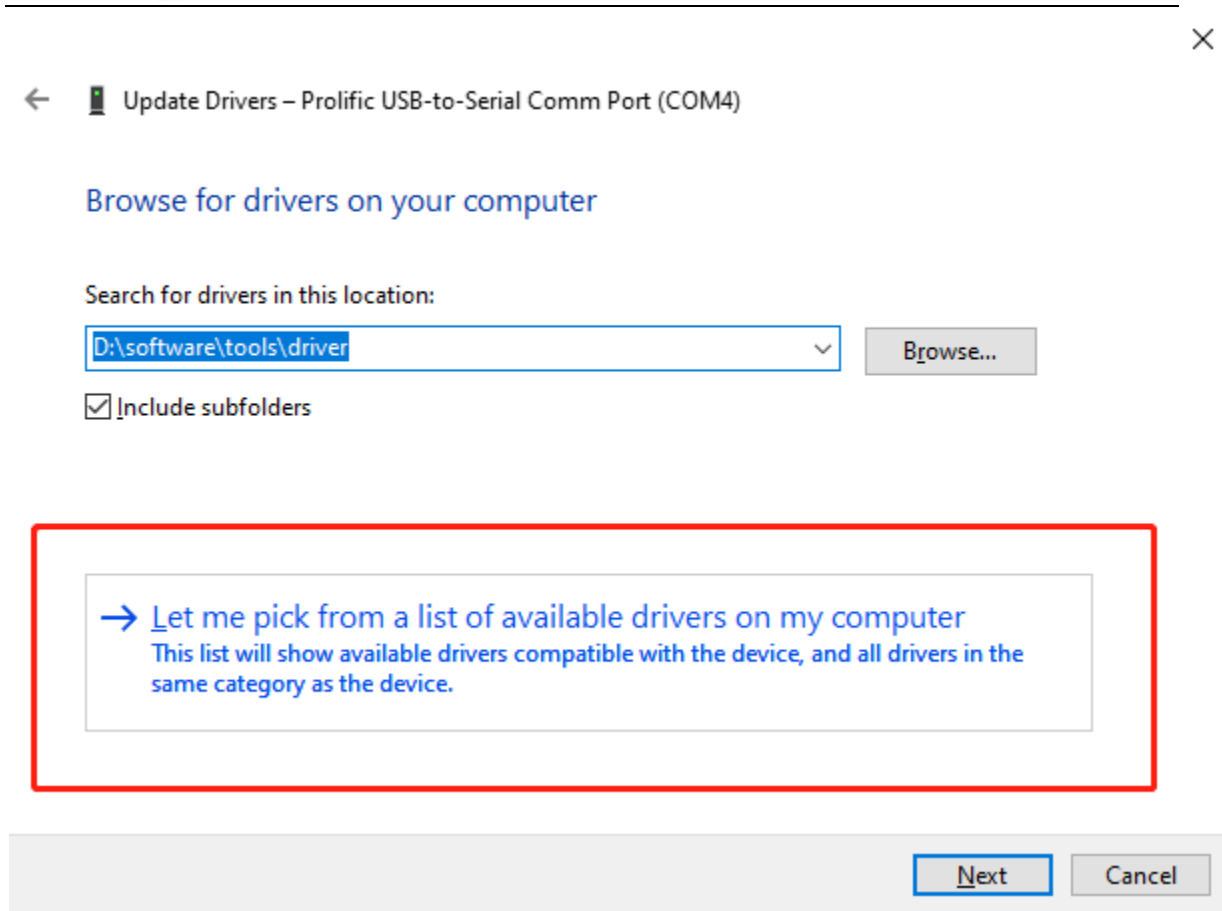
1.6 NSLink instruction

Computer-right-click-management-device manager, find the device you want to install the driver, right-click-update driver-browse the folder where the driver is located.






Browse to select the path of the driver file



Select the type of device to update the driver








←  Update Drivers – Prolific USB-to-Serial Comm Port (COM4)

Select the device driver you want to install for this hardware.



Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver that you want to install, click Have Disk.

☐ Show compatible hardware

Manufacturer	Model
(Standard port types)	 Communications Port
Compaq GSM Radio Card	 ECP Printer Port
DBC	 Multiport Communications Port
Ericsson GC25	 Printer Port
< >	 Serial



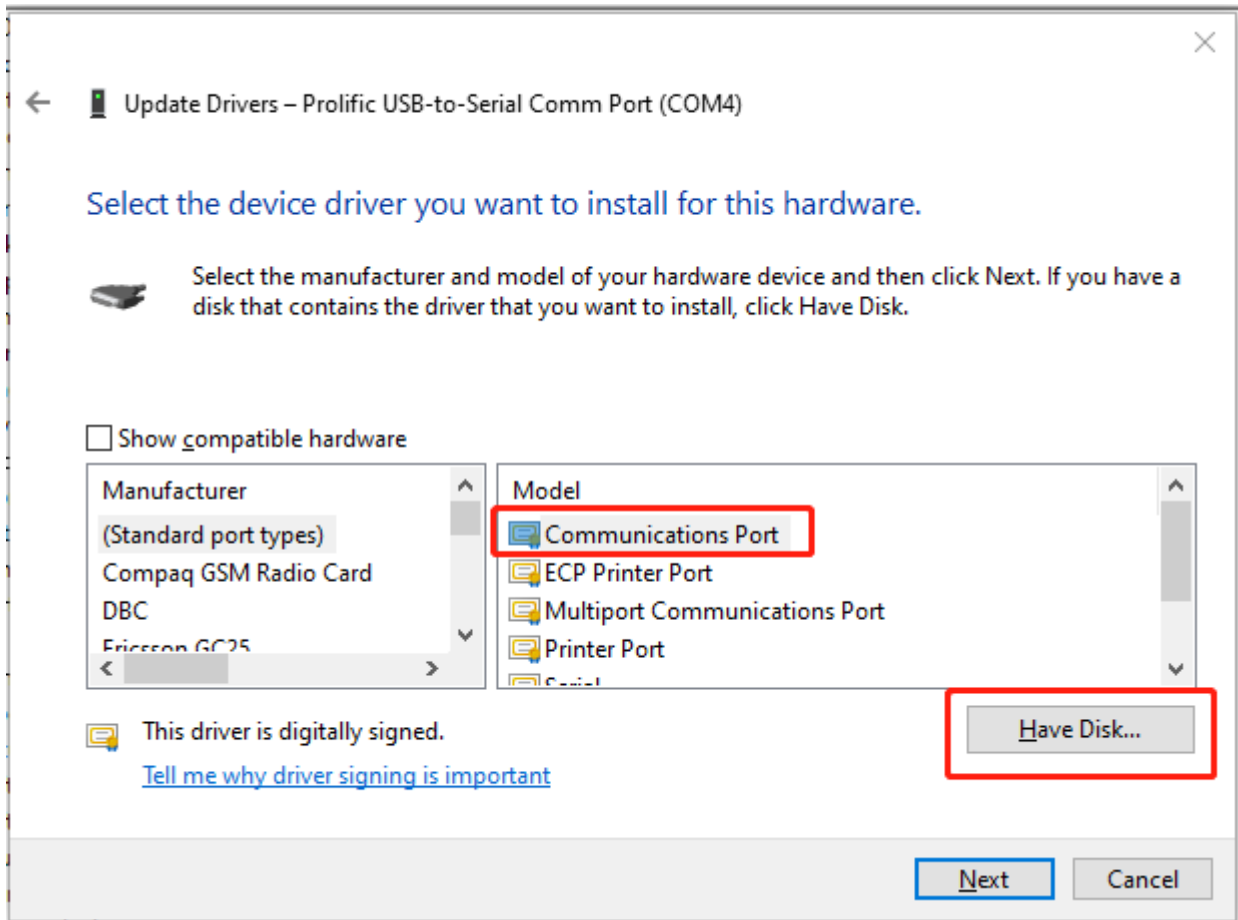
This driver is digitally signed.

[Tell me why driver signing is important](#)


Have Disk...

Next

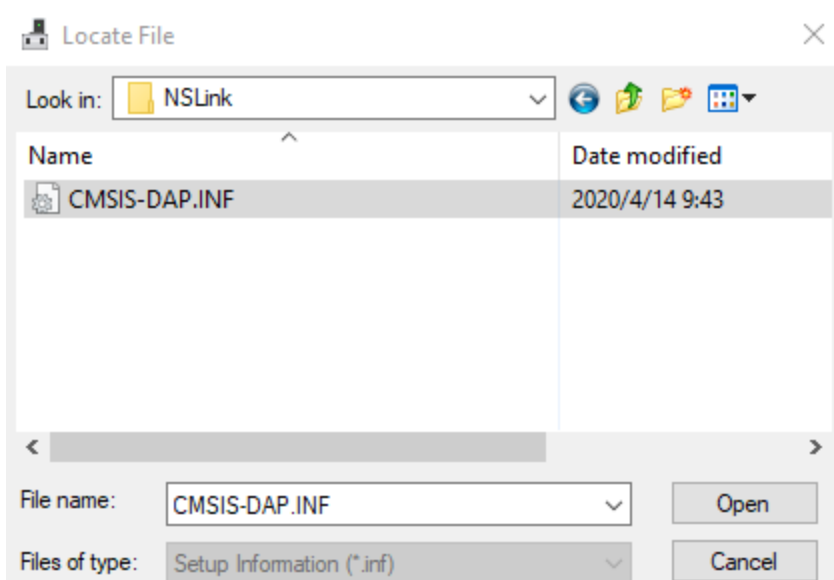
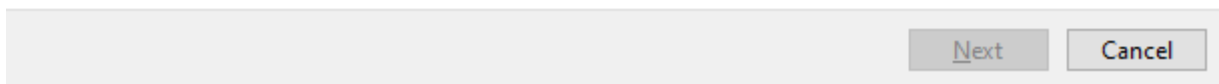
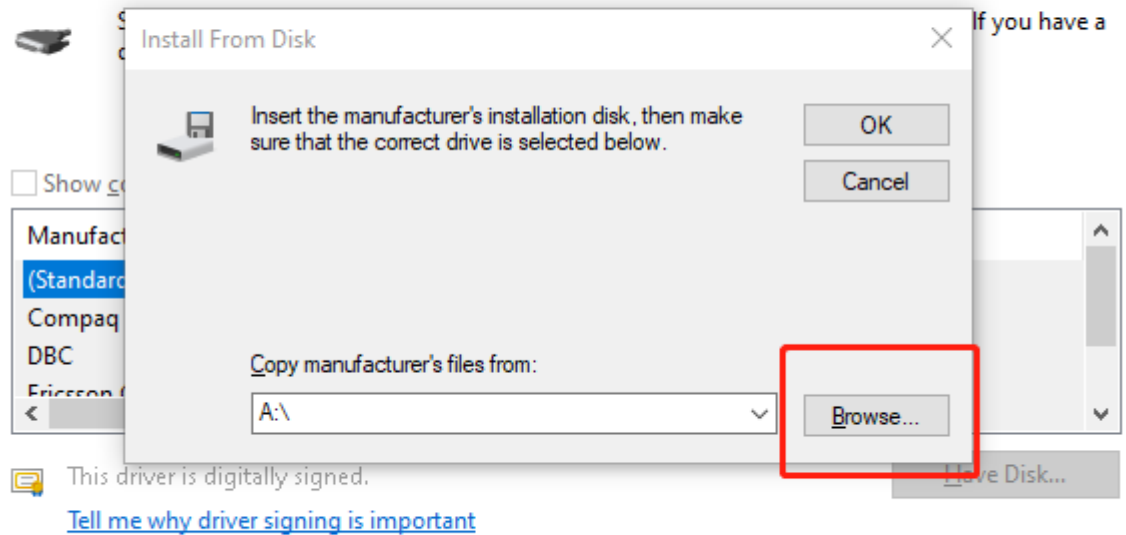
Cancel

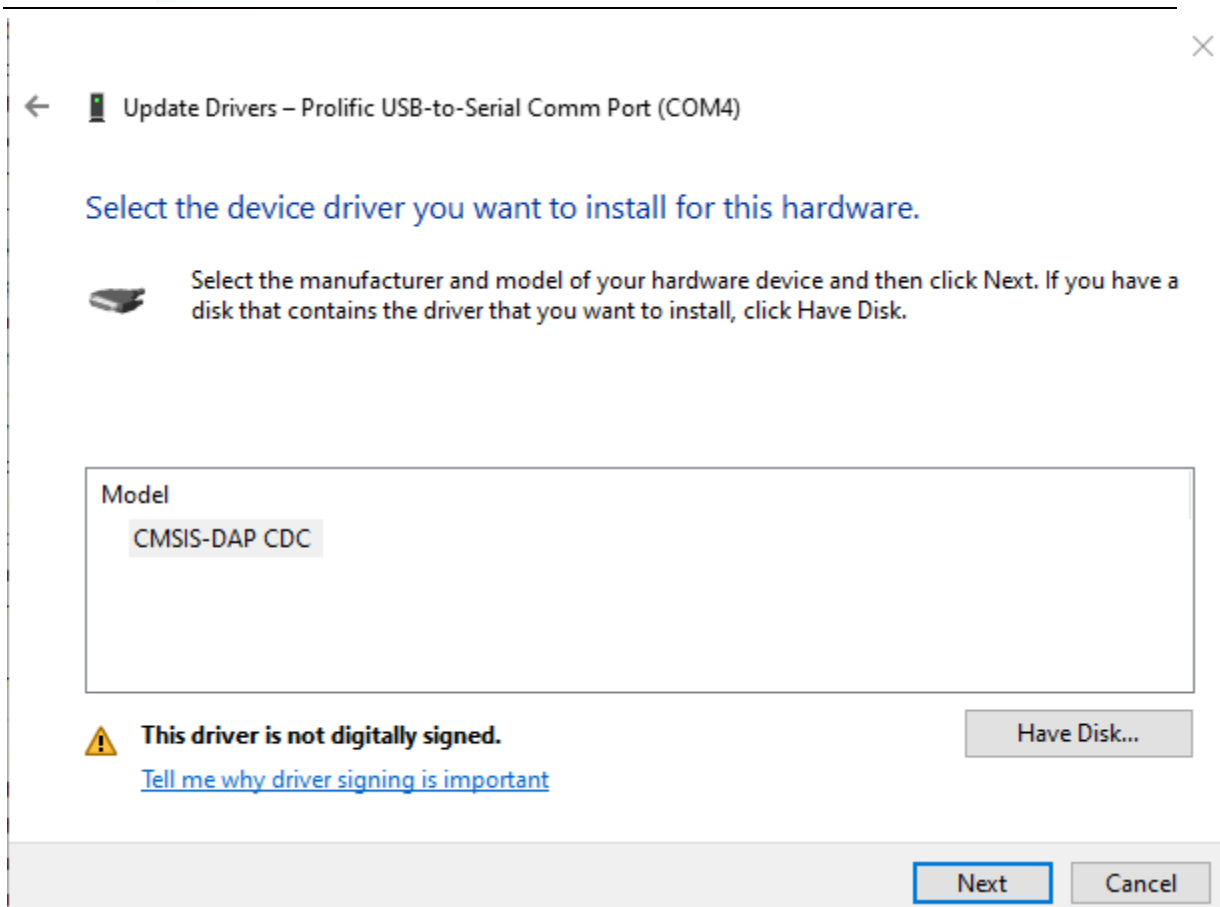


Browse to select the CMSIS-DAP.INF driver file


←  Update Drivers – Prolific USB-to-Serial Comm Port (COM4)

Select the device driver you want to install for this hardware.





After the driver is installed, the prompt interface is as follows:

←  Update Drivers – Prolific USB-to-Serial Comm Port (COM4)

Windows encountered a problem installing the drivers for your device

Windows found drivers for your device but encountered an error while attempting to install them.



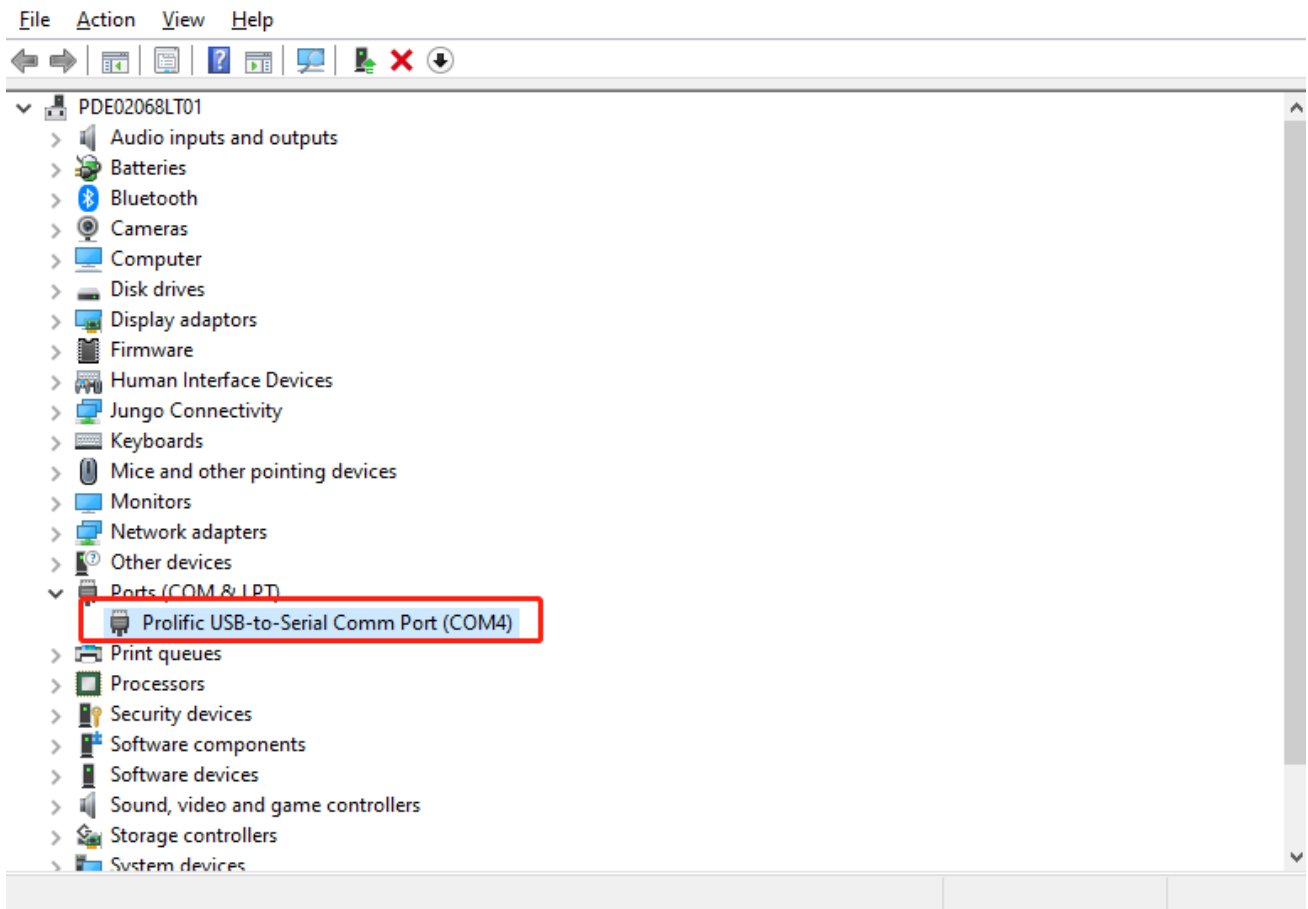
CMSIS-DAP CDC

The third-party INF does not contain digital signature information.

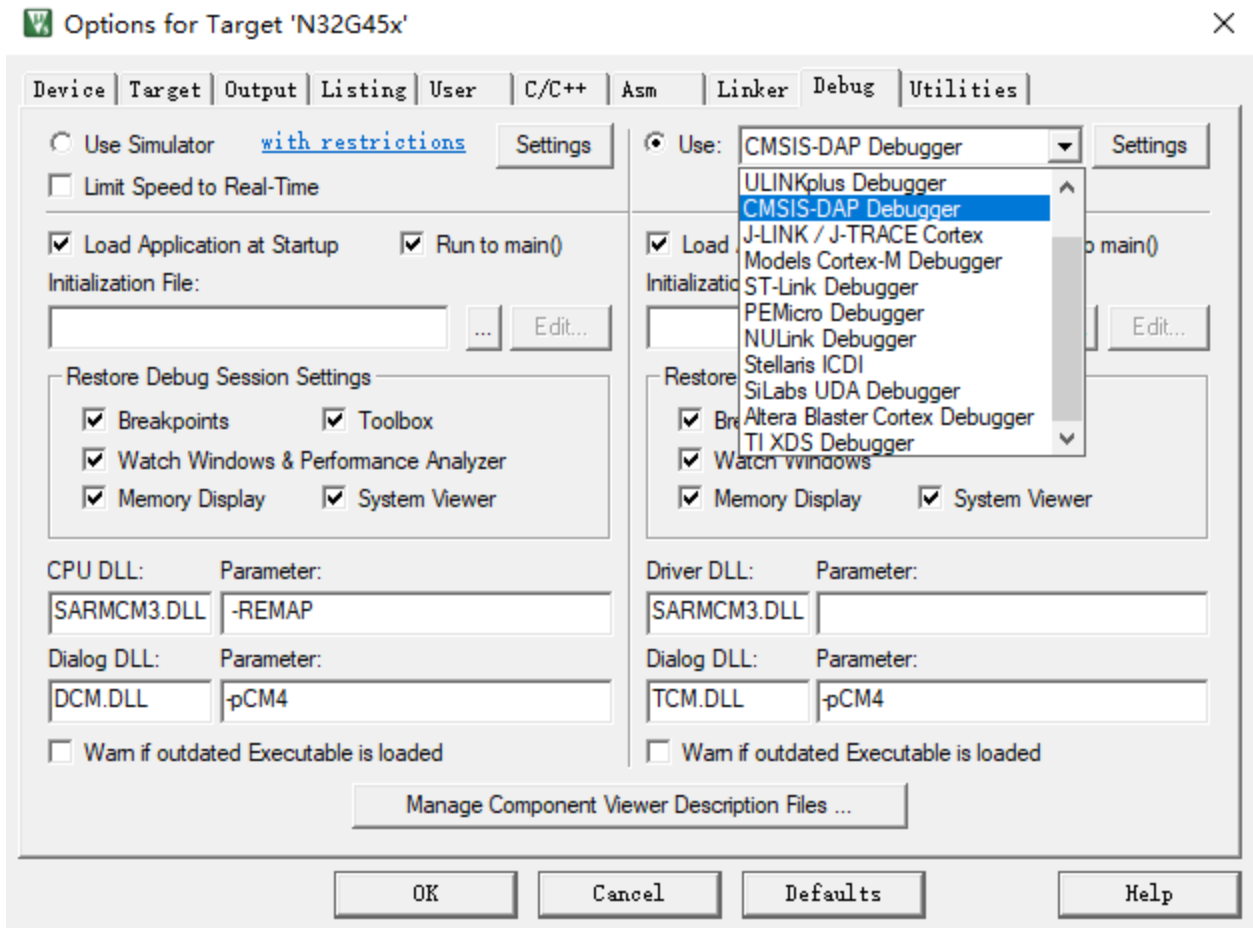
If you know the manufacturer of your device, you can visit their website and check the support section for drivers.

Close

After the driver is installed successfully, you can find the CMSIS-DAP CDC serial port in the port column. At this point, you can use the CDC function of NSLink, the serial port parameters are 115200bps baud rate, data bit 8, stop bit 1, no parity bit.



Open the Keil development environment, select the menu Project-Options-Debug



Select CMSIS-DAP Debugger, click Settings, you can see the emulator CMSIS-DAP-NSLink, after successfully connecting to the target board, IDCODE information will be displayed on the right.

Options for Target 'N32G45x'

CMSIS-DAP Cortex-M Target Driver Setup

Debug

Trace

Flash Download

CMSIS-DAP - JTAG/SW Adapter

CMSIS-DAP-NSLink

Serial No: 0001A0000002

Firmware Version: 2.0.0

☒ SWJ
 Port: SW

Max Clock: 10MHz

SW Device

IDCODE	Device Name	Move
0x2BA01477	ARM CoreSight SW-DP	Up Down

☒ Automatic Detection
 ID CODE:

☐ Manual Configuration
 Device Name:

Add

Delete

Update

AP: 0x00

Debug

Connect & Reset Options

Connect: Normal
 Reset: Autodetect

☒ Reset after Connect
 ☐ Log Debug Accesses
 ☐ Stop after Reset

Cache Options

☒ Cache Code
 ☒ Cache Memory

Download Options

☐ Verify Code Download
 ☐ Download to Flash

OK

Cancel

Help

OK

Cancel

Defaults

Help

2 Version history

Version	Date	Note
V1.0	2022-2-25	Create a document

3 Notice

This document is the exclusive property of Nations Technologies Inc. (Hereinafter referred to as NATIONS). This document, and the product of NATIONS described herein (Hereinafter referred to as the Product) are owned by NATIONS under the laws and treaties of the People's Republic of China and other applicable jurisdictions worldwide.

NATIONS does not grant any license under its patents, copyrights, trademarks, or other intellectual property rights. Names and brands of third party may be mentioned or referred thereto (if any) for identification purposes only.

NATIONS reserves the right to make changes, corrections, enhancements, modifications, and improvements to this document at any time without notice. Please contact NATIONS and obtain the latest version of this document before placing orders.

Although NATIONS has attempted to provide accurate and reliable information, NATIONS assumes no responsibility for the accuracy and reliability of this document.

It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. In no event shall NATIONS be liable for any direct, indirect, incidental, special, exemplary, or consequential damages arising in any way out of the use of this document or the Product.

NATIONS Products are neither intended nor warranted for usage in systems or equipment, any malfunction or failure of which may cause loss of human life, bodily injury or severe property damage. Such applications are deemed, "Insecure Usage".

Insecure usage includes, but is not limited to: equipment for surgical implementation, atomic energy control instruments, airplane or spaceship instruments, all types of safety devices, and other applications intended to support or sustain life.

All Insecure Usage shall be made at user's risk. User shall indemnify NATIONS and hold NATIONS harmless from and against all claims, costs, damages, and other liabilities, arising from or related to any customer's Insecure Usage.

Any express or implied warranty with regard to this document or the Product, including, but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement are disclaimed to the fullest extent permitted by law.

Unless otherwise explicitly permitted by NATIONS, anyone may not use, duplicate, modify, transcribe or otherwise distribute this document for any purposes, in whole or in part.