

**ULINK**  
**In-Circuit Emulator (ICE)**  
**&**  
**In-System Programmer (ISP)**  
**User Guide**

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## 1. The Third Party Tools of ARM series IC

### 1.1 In-system Programmer (ISP) & In-Circuit Emulator (ICE)---Keil ULINK

The Keil ULINK series emulator (ULINK Debug and Trace adapters) is a multi-function ARM simulation tool, which can be connected to the Target Board of the ARM series IC through the JTAG/SWD interface for programming and emulation.

Currently, there are four ULINK series emulators available on the market, namely ULINKpro, ULINKpro D, ULINKplus, and ULINK2. You can purchase it on Keil official website (<http://www2.keil.com/mdk5/ulink>) or other major shopping Websites.

Figure 1 1 shows the four ULINK series emulators on the market.



Figure 1-1 ULINK Series Emulators

## 1.2 ULINK Series Emulators--- ULINK2

Features of ULINK2 Emulators are as below:

- JTAG supports ARM7, ARM9, 8051, C166, and all Cortex-M processors
- SWD/SWV supports all Cortex-M processors
- Support code download/programming and simulation (support the configuration of multiple breakpoints)
- Support the checking and modification of memory and register
- Working voltage range: 2.7V~5.5V
- Connect and communicate with the computer through the USB 2.0 interface
- Support 2 types of Target Board connectors:
  - 10-pin (0.05") – Cortex Debug Connector
  - 20-pin (0.10") – ARM Standard JTAGE Connector

Figure 1-2 shows the definition of the two Target Board connectors supported by ULINK2

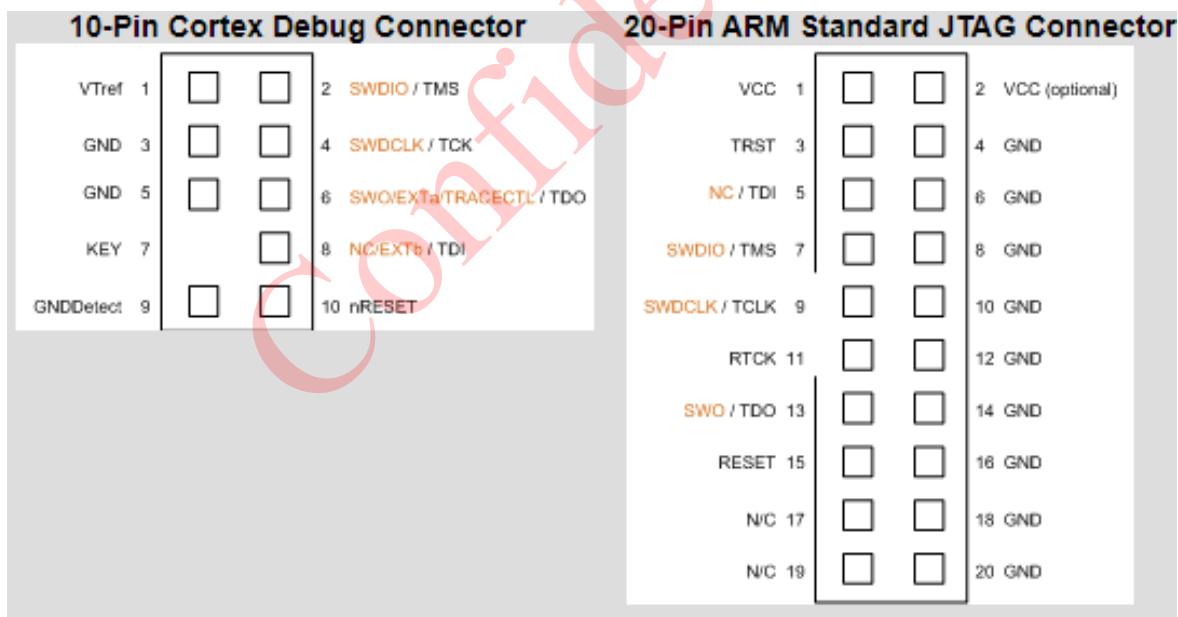


Figure 1-2 Definition of the two Target Board connectors supported by ULINK2

### 1.3 ULINK Series Emulators--- ULINK2 connecting methods

Prior to the usage of ULINK2, the system and the Target Board must be correctly connected in order to work normally:

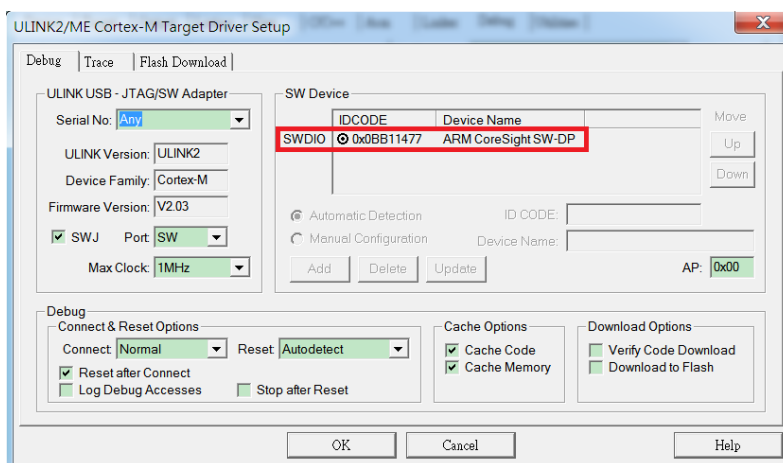
- Connect the USB port of ULINK2 to the computer
- Connect the JTAG/SWD interface of ULINK2 to the Target Board
- The Keil MDK development tool can be opened on the computer to verify whether the connection is normal

Figure 1-23 shows the illustration diagram of ULINK2 connection



**Figure 1-3 ULINK2 connection**

Figure 1-4 When the connection is correct, the correct IDCODE can be read in Keil MDK.



**Figure 1-4 The correct IDCODE read by Keil MDK**

## 2. Revision History

Version	History	Date
1.0	Initial issue	2021/04/23

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