

MCU Link Pro Introduction

1. General

Jointly developed by NXP and Embedded Artists, the MCU-Link Pro is a fully featured debug probe that can be used with MCUXpresso IDE and 3rd party IDEs that support CMSIS-DAP and/or J-Link protocols. MCU-Link Pro is based on NXP's MCU-Link architecture, found in the MCU-Link low cost debug probe and on board evaluation boards, and runs the same firmware as all these implementations. In addition to SWD debug, SWO profiling and a USB to UART bridge features (VCOM) found in the base MCU-Link, the Pro model adds a J-Link LITE firmware option, energy measurement, analog signal monitor, USB to SPI and I2C bridging capability and an on-board LPC804 for peripheral emulation. MCU-Link Pro is based on the dual Arm® Cortex-M33® core LPC55S69 microcontroller, and features a high speed USB interface, providing high performance debug at low cost.

The USB bridging feature is supported by the free LIBUSBIO host library from NXP.

MCU-Link Pro is compatible with Windows 10, MacOS and Linux. The product comes with the necessary firmware installed, with free utilities provided to enable future firmware updates from NXP to be installed.

MCU-Link Pro kit provides all parts that need to be used.

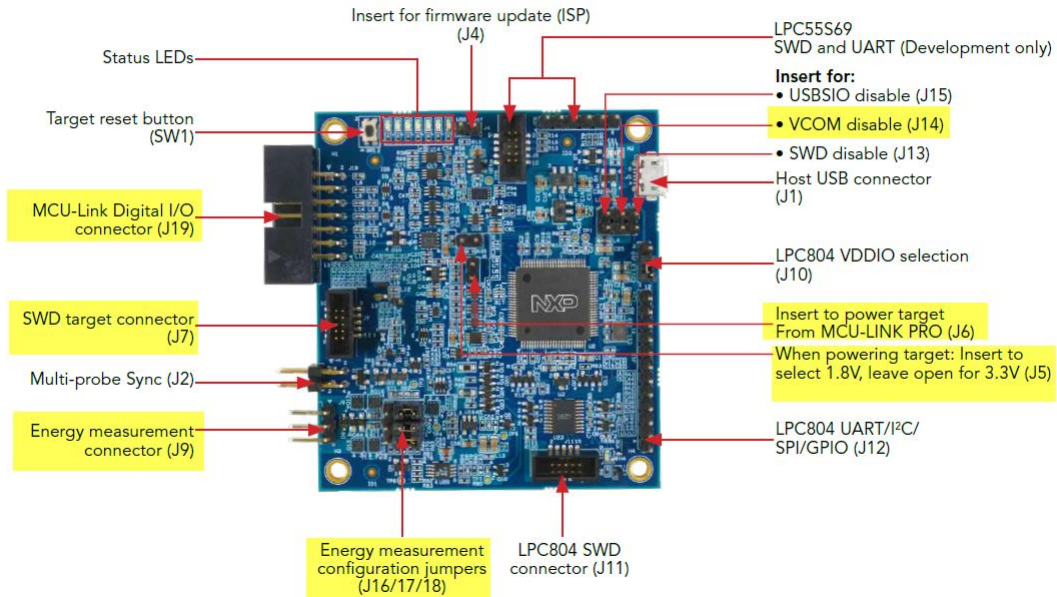
- **Kit Contains**
 - MCU-Link Pro debug probe
 - 10 pin to 10 pin Cortex debug cable
 - 10 pin to 20 pin Cortex debug cable
 - Digital port / analog input adapter cable
 - Spare jumpers

2. MCU-Link Pro Overview

MCU-Link Pro has complete functions. This article mainly introduces the usage and precautions of several basic functions, including SWD debugging, UART (VCOM) and energy measurement.

The following figure is the reference diagram of MCU Link Pro, covering all functions, and the highlighted part is the function used in this article.

QUICK REFERENCE GUIDE



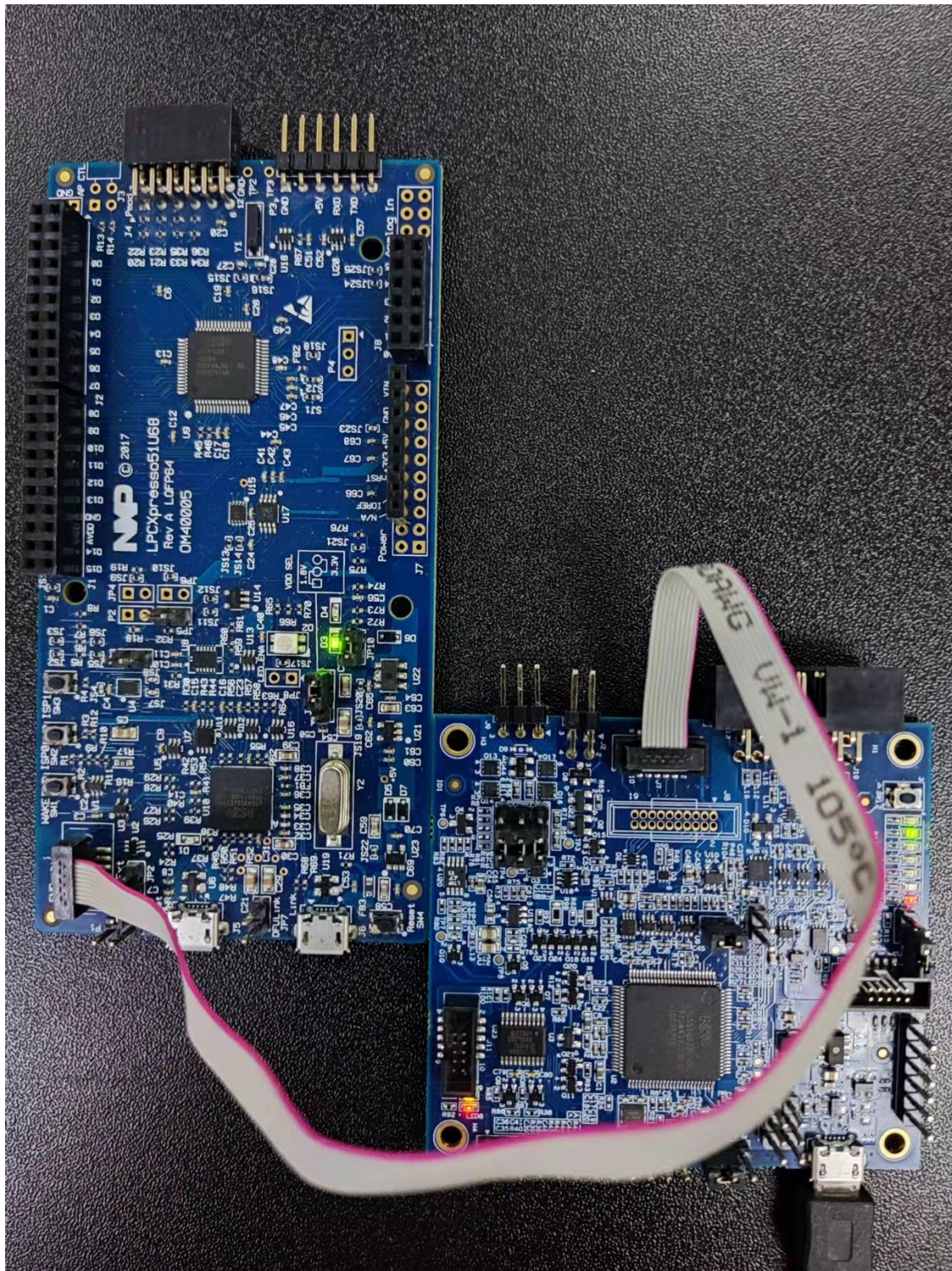
2.1 SWD debug

As a debugger, the most basic function of MCU Link Pro is debugging, and now commonly used is SWD debug. When you get the development board, you can see that there are three SWD interfaces on it. Only J7 is the SWD interface to debug target board. It is on the opposite side of the USB interface to facilitate the connection and debugging of the target board. The other two interfaces J3 and J11 are SWD interfaces of LPC55s69 and LPC804 respectively.

Another important function of this debugger is that **it can supply power to the target board.** The use method is to connect J6 with jumper, and 1.8V and 3.3V power supply can be selected through J5.

The specific connection is shown in the figure below:

- Connect the SWD interface of J7 and target board with debug line.
- J6 connecting jumper cap (supplying power to target board).



The USB cable connects J1 and the computer, so you can debug with MCUXpresso IDE or other IDEs.

CMSIS-DAP and J-Link debugging protocols are supported. For how to update the debugger firmware, please refer to: <https://www.nxp.com/document/guide/getting-started-with-the-mcu-link-pro:GS-MCU-LINK-PRO>

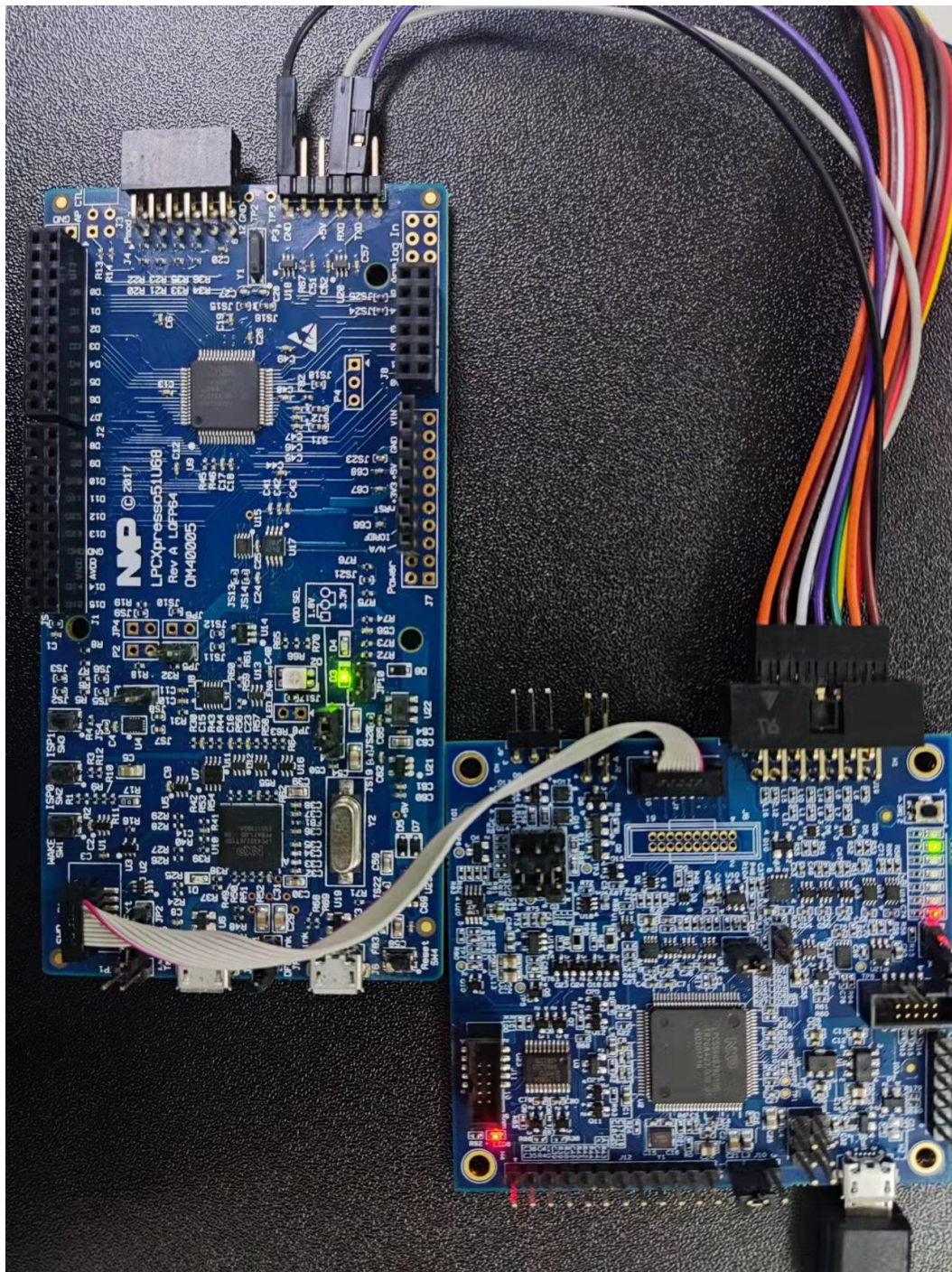
2.2 UART (VCOM) Usage

In the development and debug stage, users often need to print information through the serial

port. Using MCU Link Pro, without additional hardware, directly connect the TX and Rx of target UART with the Rx / TX of UART of MCU Link Pro. Through the VCOM function, you can print information from the USB port to the serial port assistant at the PC end.

The specific connection is shown in the figure below:

- J19-8 (purple line) connects UART TX of target board
- J19-9 (gray line) connects the UART RX of the target board
- J19-1 (GND) connect GND of target board
- J14 disconnected
- J6 plug in the jumper cap (supply power to the target board)



2.3 Energy measurement

The MCU Link Pro board contains a circuit that can measure the current or voltage of the target board, and it can be calibrated automatically every time it is powered on without manual intervention. There are two maximum measurement ranges for energy measurement. If the data is higher than the maximum range, the measurement result is inaccurate.

The two maximum measurement ranges are as follows, which need to be configured with J16, J17 and J18.

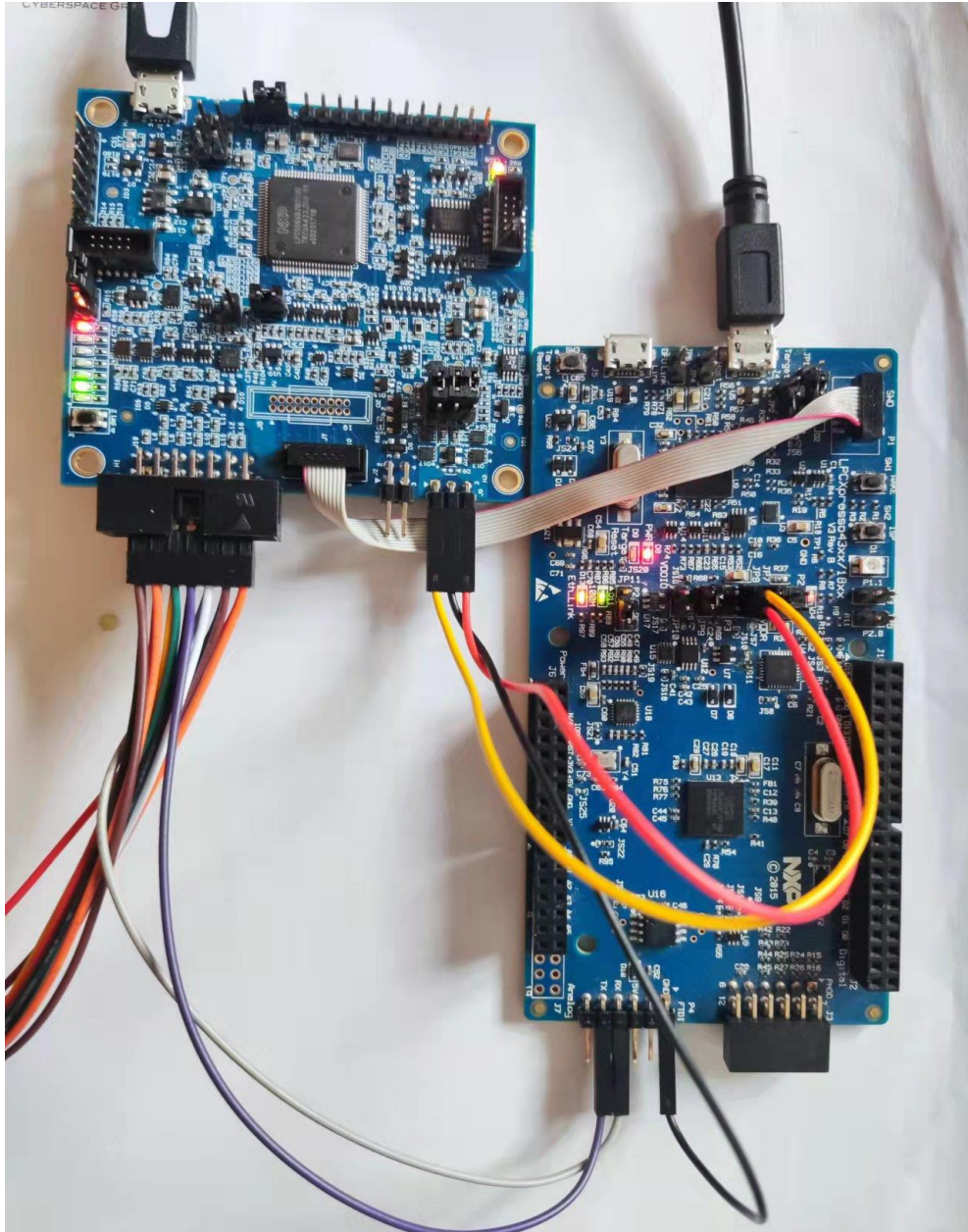
Table 3. Energy measurement range configuration (as at firmware revision 2.243)

Maximum measureable current	J16 setting	J17 setting	J18 setting	Measurement ranges	Resolution	Accuracy (typical)
50mA	2-3	2-3	2-3	200nA to 400uA >400uA to 50mA	200nA 5uA	1% 1%
350mA	1-2	1-2	1-2	10uA to 1.5mA >1.5mA to 350mA	1uA 20uA	1% 5%

Energy measurement needs to be used with MCUXpresso IDE, and the results are displayed in the IDE interface. Use J9 port on the board.

The specific connection is shown in the figure below:

- J9-1 connects the power supply end of the target board.
- J9-3 connects the chip ends of the target board.
- J9-2 connects the GND of the target board.



For details on how to use the MCU Xpresso IDE interface, please refer to:
<https://www.nxp.com/module/forum/forum.php?mod=viewthread&tid=623014&fromuid=3253523>
or <MCUXpresso_IDE_Energy_Measurement.pdf>

3. Test result

The test results are as follows:

