

## How to use the AEK-MCU-SRLNK programmer and debugger for Stellar automotive microcontrollers

### Introduction

The **AEK-MCU-SRLNK** is a debugger/programmer dongle for Stellar family automotive microcontrollers.

It consists of a passive USB-to-JTAG debugger and programmer, which provides a cost-effective, small-size, and fast-prototyping solution for any vehicle application.

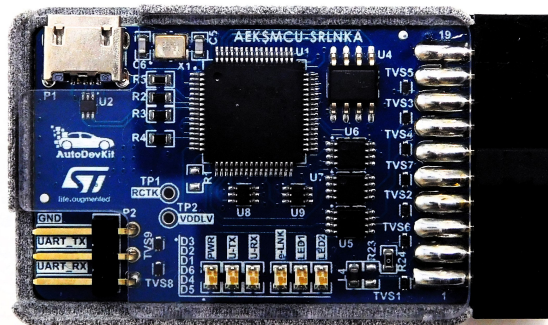
This dongle ensures short development time through easy-to-use hardware and simple software fully integrated in **StellarStudio** IDE.

The JTAG interface ensures an easy plug to any SR5 and SR6 Stellar family automotive microcontroller evaluation board (compliant with the IEEE 1149.1 JTAG protocol).

The **AEK-MCU-SRLNK** provides a virtual COM port interface that enables the host PC to communicate with the microcontroller through UART.

**Warning:** *The **AEK-MCU-SRLNK** evaluation dongle has not to be used in a vehicle as it is designed for R&D laboratory use only.*

**Figure 1. AEK-MCU-SRLNK**



**Notice:** *For dedicated assistance, submit a request through our online support portal at [www.st.com/support](http://www.st.com/support).*

## 1 Hardware description

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### 1.1 Features

- USB/JTAG debugger dongle for Stellar automotive MCU families
- USB connector for supply and data communication
- Application firmware directly downloaded into Stellar device FLASH or RAM memory
- Run and debug your application firmware
- Compliant with the IEEE 1149.1 JTAG protocol
- Integrates serial port connection via USB interface (virtualCOM)
- Provides NVM programming (erase/program/verify)
- Connectors:
  - 20-pin header connector for JTAG interface
  - 3-pin header connector for UART interface
- Status LEDs to indicate the target I/O voltage, connection state, and running state
- Operating temperature range: from 0 to 50°C
- Compatible with [StellarStudio](#)

## 2 Hardware configuration

The **AEK-MCU-SRLNK** is a USB adapter based on an FTDI FT2232HL interface chip. The user EEPROM is programmed with a unique serial number.

The debugger provides the interface between the PC USB port and the target device in-system debug / programming circuitry.

The USB connector provides a power supply and data communication line.

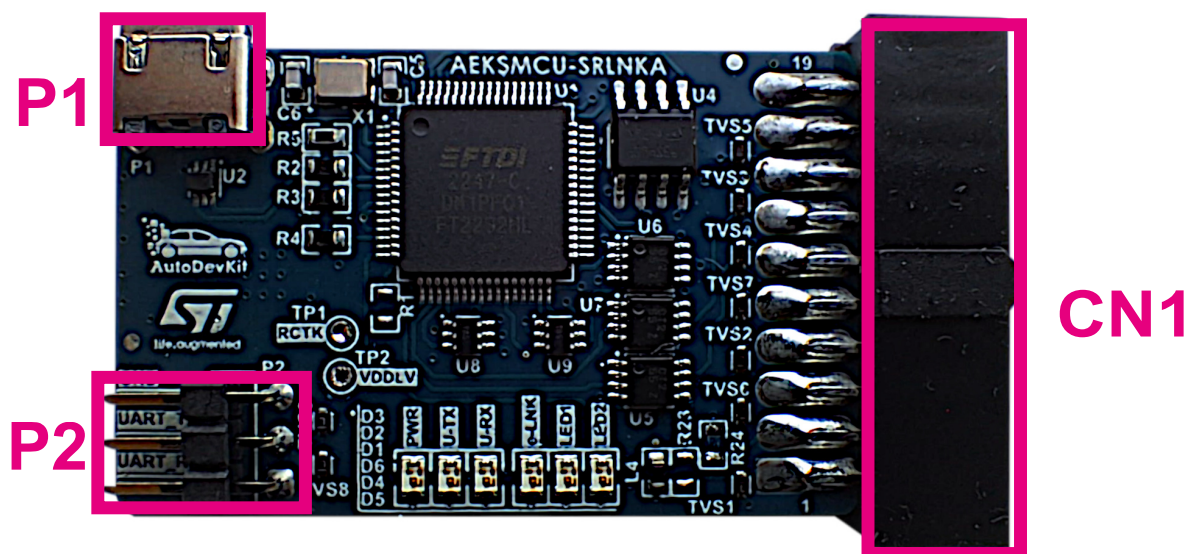
### 2.1 Connectors

Table 1 describes the connectors on the **AEK-MCU-SRLNK** board.

Table 1. Connectors

| Connector | Description                                |
|-----------|--------------------------------------------|
| P1        | Micro-USB female connector                 |
| CN1       | 20-pin header connector for JTAG interface |
| P2        | 3-pin header connector for UART interface  |

Figure 2. AEK-MCU-SRLNK connectors



## 2.2 CN1

**Table 2. CN1 pinout**

| Pin | Description |
|-----|-------------|
| 1   | VREF        |
| 2   | N.C.        |
| 3   | NTRST       |
| 4   | GND         |
| 5   | TDI         |
| 6   | GND         |
| 7   | TMS         |
| 8   | GND         |
| 9   | TCK         |
| 10  | GND         |
| 11  | N.C.        |
| 12  | GND         |
| 13  | TDO         |
| 14  | GND         |
| 15  | RST         |
| 16  | GND         |
| 17  | N.C.        |
| 18  | GND         |
| 19  | N.C.        |
| 20  | GND         |

## 2.3 P2

Table 3 describes the CN2 pinout.

**Table 3. CN2 pinout**

| Pin | Description |
|-----|-------------|
| 1   | UART_RX     |
| 2   | UART_TX     |
| 3   | GND         |

## 2.4 LEDs

Table 4. LEDs

| Connector | Description        |
|-----------|--------------------|
| D1        | U-RX (UART-RX)     |
| D2        | U-TX (UART-TX)     |
| D3        | PWR (Power on LED) |
| D4        | LED1               |
| D5        | LED2               |
| D6        | e-LINK             |

## 3 How to use the dongle

### 3.1 Prerequisites

Install [StellarLink](#) drivers.

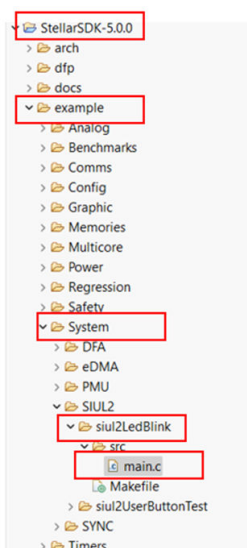
### 3.2 Using the dongle with StellarStudio IDE

To use the dongle, follow the procedure below:

**Step 1.** Open [StellarStudio](#).

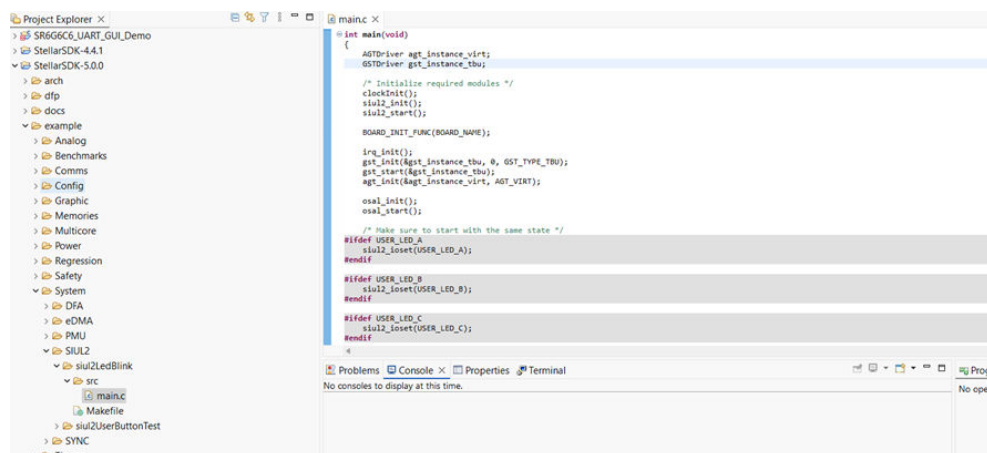
Open your project and double-click on your *main.c* file (example path: *StellarSDK-5.0.0 -> example -> System -> siul2LedBlink*).

Figure 3. AEK-MCU-SRLNK main.c file location



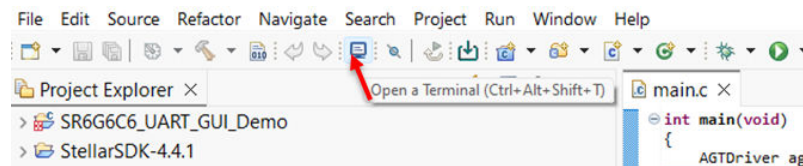
The following window appears:

Figure 4. AEK-MCU-SRLNK main.c file



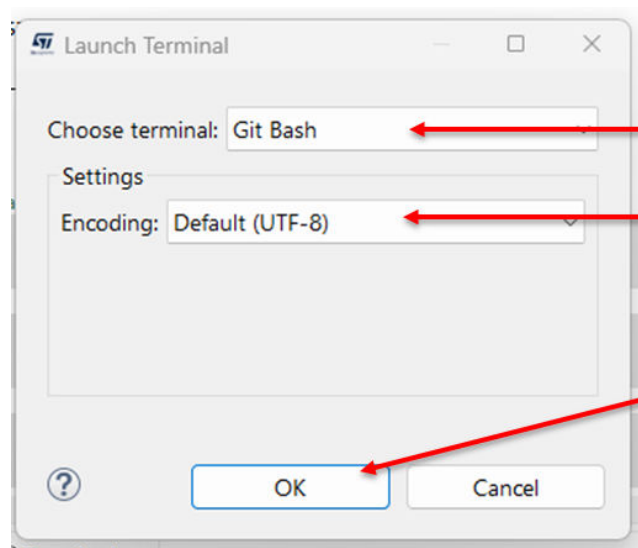
**Step 2.** Select the icon highlighted in the image below to open a terminal and compile your project

**Figure 5. Opening a terminal**



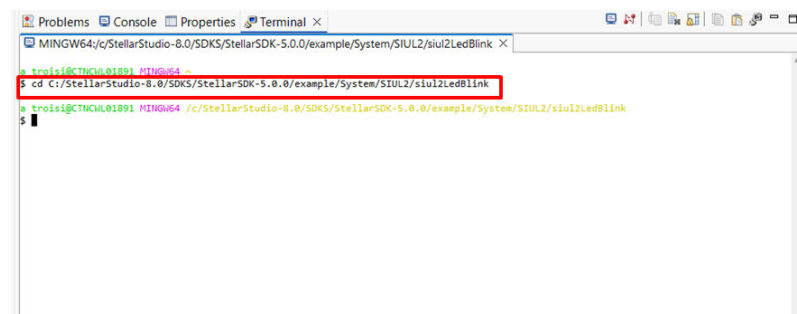
**Step 3.** When the window below appears, select the highlighted options in the drop-down menus. Then, click OK

**Figure 6. Selecting the terminal**



**Step 4.** When the terminal opens, move to the project directory by typing the “cd” command (Example string: “cd C:/StellarStudio-8.0/SDKS/StellarSDK-5.0.0/example/System/SIUL2/siul2LedBlink”). Then, click Return

**Figure 7. Selecting Stellar sample project**



- Step 5.** Type a “make” string to select the memory and the CONFIG\_DEVICE that specifies the microcontroller you want to program (example string: “make CONFIG\_TARGET\_MEMORY=nvm CONFIG\_DEVICE=sr6p6 TARGET\_BUILD=Debug”). Then, click Return to compile the project

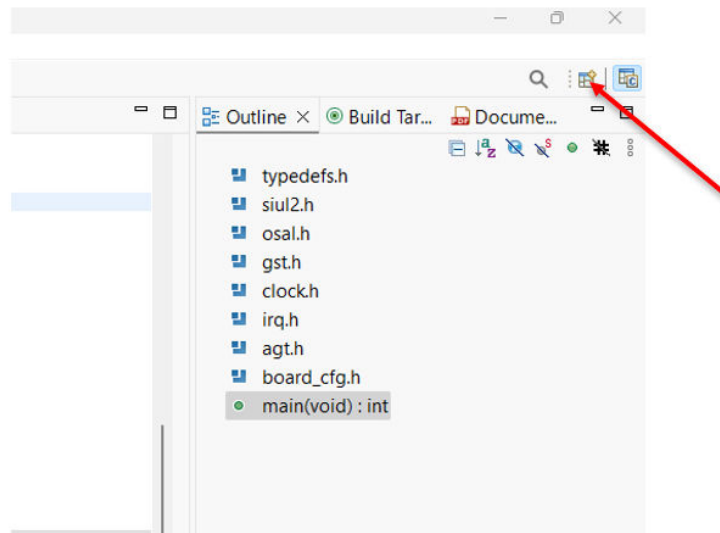
**Figure 8. Compiling the project**

```

MINGW64:/c:/StellarStudio-8.0/SDKS/StellarSDK-5.0.0/example/System/STUL2/siul2LedBlink
$ make CONFIG_TARGET_MEMORY=nvm CONFIG_DEVICE=sr6p6 TARGET_BUILD=Debug
Build time      : 2025-Sep-09 @ 11:25:41
Toolchain      : GNU ARM Cross C Compiler (RS2)
Cluster/Core   : cluster0/core0
Device         : sr6p6
Board          : sr6px-evbc8000p_b
Build          : Debug (nvm)
Linker script  : application-arm_r52.ld
Building file  : main.c
Building file  : mpu_config.c
Building file  : mem_utils.c
Building file  : memory.c
Building file  : init.c
Building file  : irq.c
Building file  : clock.c
Building file  : intc.c
Building file  : ibcn.c
Building file  : mcu_dev.c
Building file  : core.c
Building file  : siul2.c
  
```

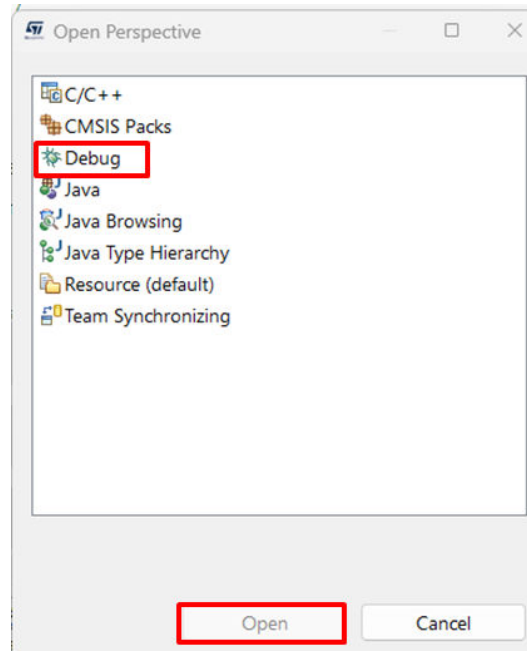
- Step 6.** Select the icon highlighted below to change the perspective window

**Figure 9. Changing perspective window**



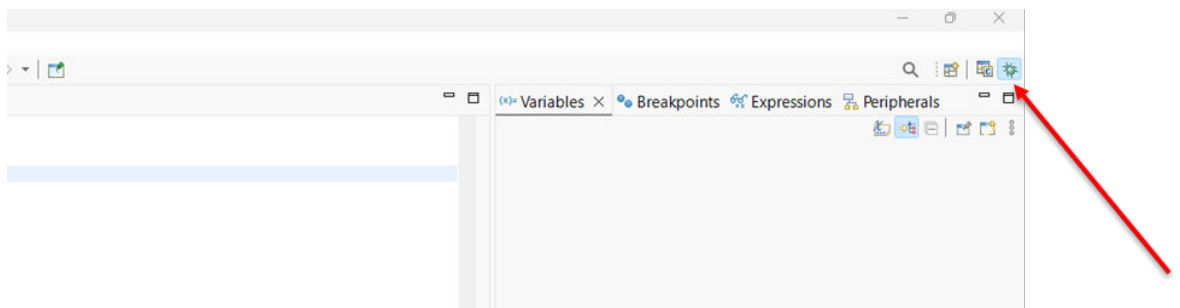
**Step 7.** Switch to debug by selecting the item below and clicking Open

**Figure 10. Switching to debug perspective window**



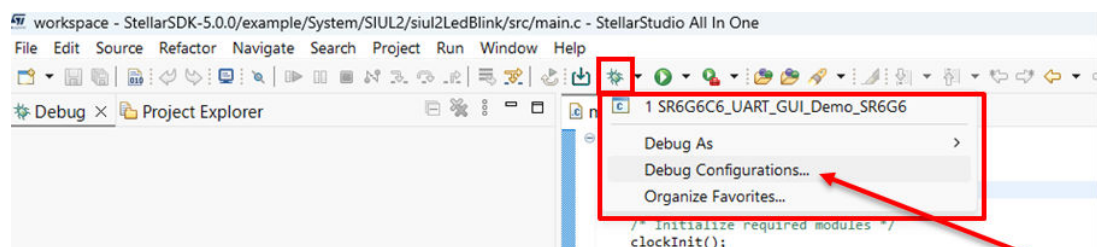
**Step 8.** Select the green beetle icon to switch to debug perspective

**Figure 11. Selecting the debug icon**



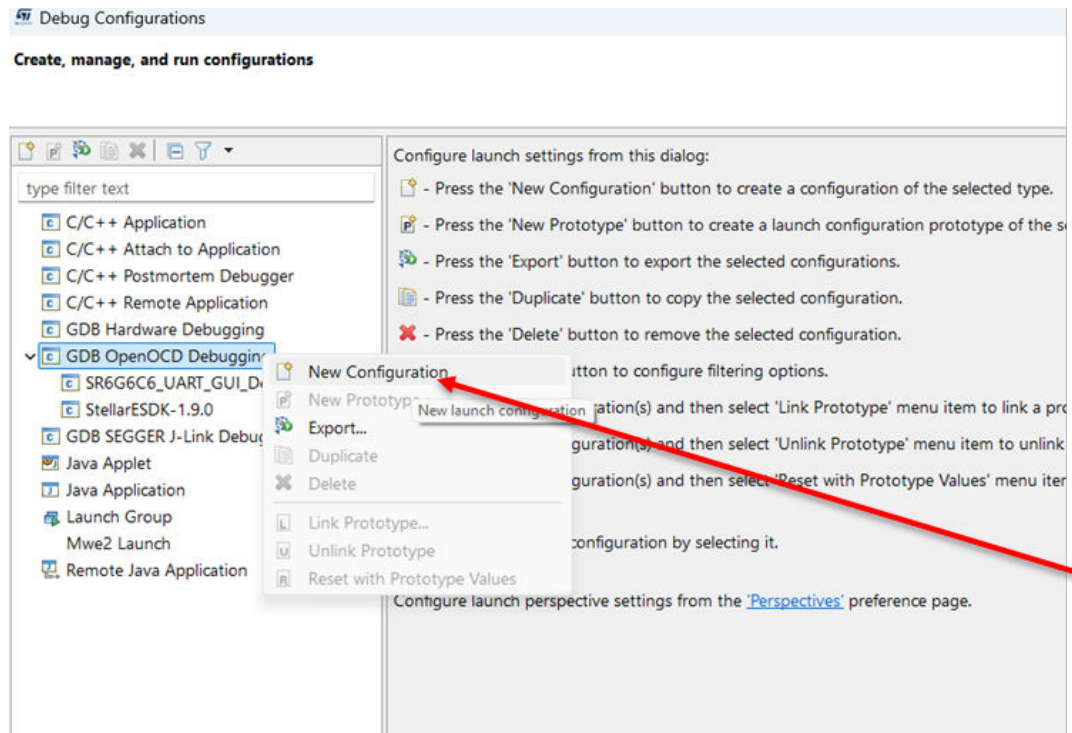
**Step 9.** Select the other green beetle icon and then "Debug Configurations"

**Figure 12. Selecting debug configurations**



**Step 10.** Right-click on “GDB OpenOCD Debugging” and select “New Configuration”

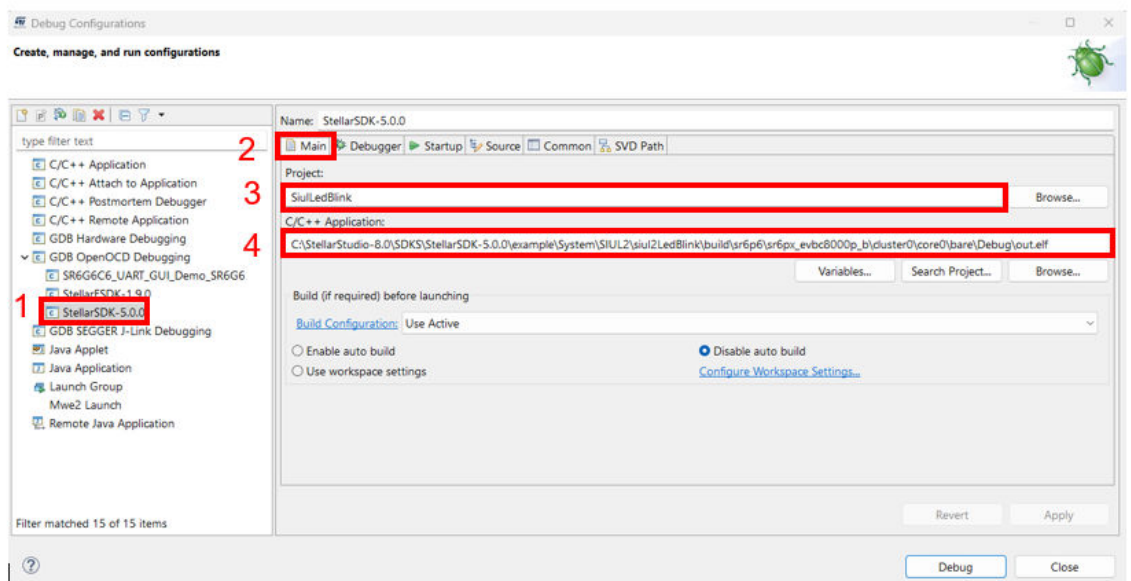
**Figure 13. Selecting a new configuration**



**Step 11.** Select StellarSDK-5.0.0 and then the Main tab

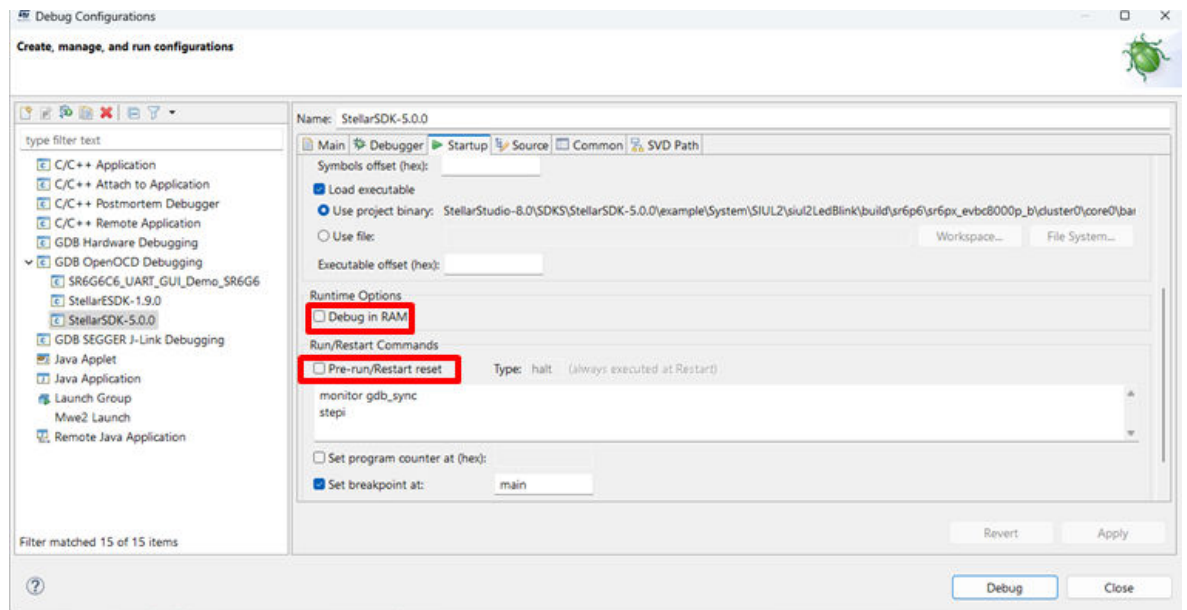
In the Project field, type the name of your project (in this example, “SiulLedBlink”) and then the path of the .elf file to be downloaded onto the microcontroller

**Figure 14. New project**



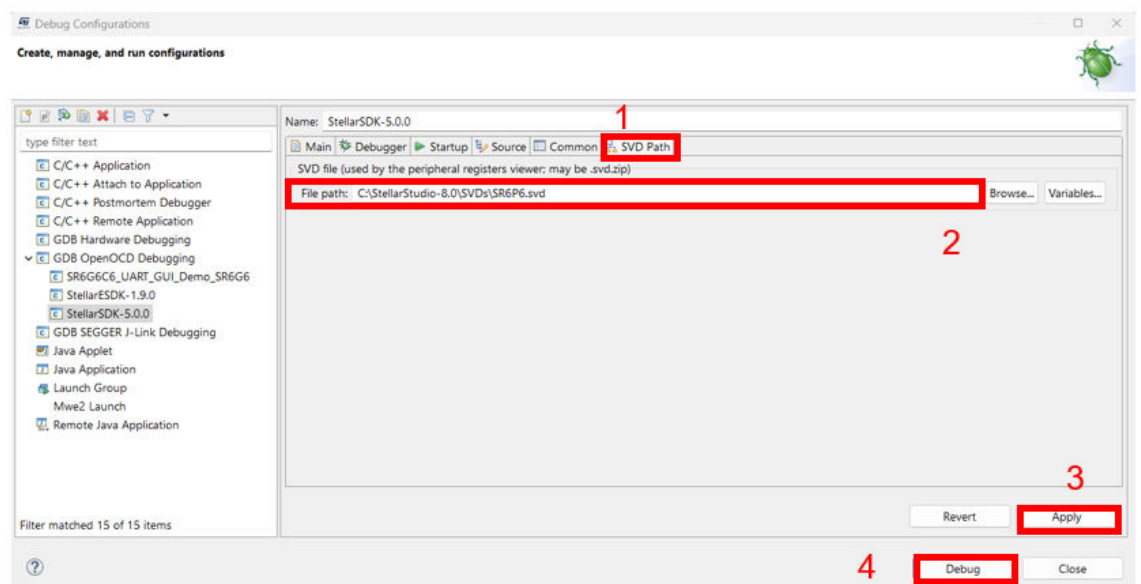
**Step 12.** Untick the fields highlighted below

**Figure 15. Deselecting commands**



**Step 13.** Under the StellarStudio installation folder, go to the SVDs folder and select the SVD file corresponding to the microcontroller you are using (example path: C:\StellarStudio-8.0\SVDs\SR6P6.svd). Then, click on "Apply" and finally on "Debug"

**Figure 16. Inserting SVD path and debugging**



### 3.2.1 Troubleshooting

When connecting the dongle to your PC, it should be automatically recognized by the task manager:

**Figure 17. Task manager: dongle correctly recognized**

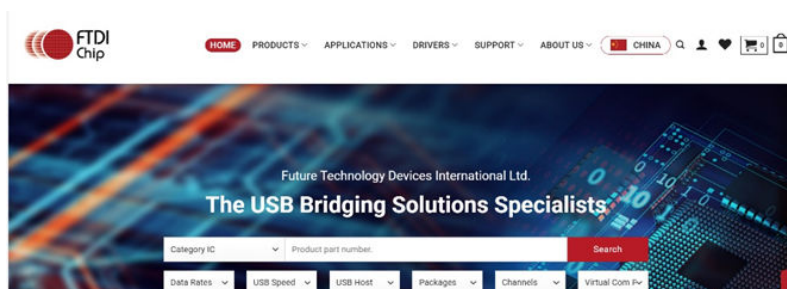


In case of issues, install FTDI drivers as follows:

**Step 1.** Go to [Future Technology Devices International Ltd - FTDI \(ftdichip.com\)](http://Future Technology Devices International Ltd - FTDI (ftdichip.com))

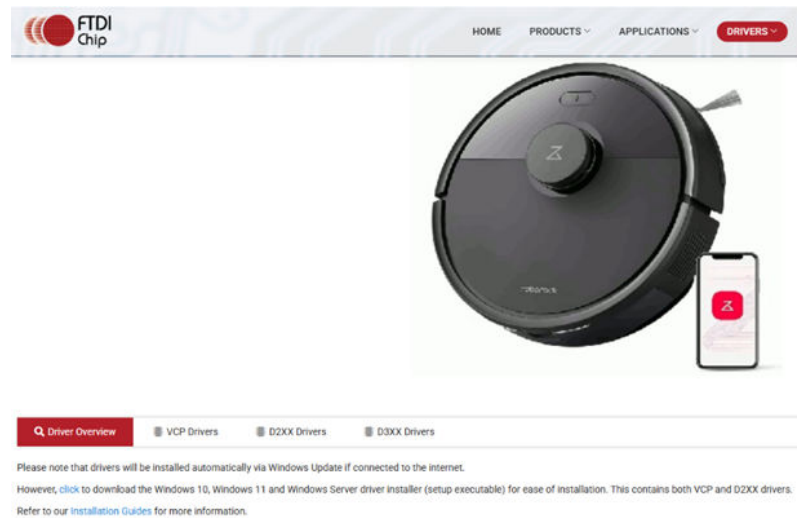
**Step 2.** Select the *Drivers* tab

**Figure 18. Selecting Drivers tab**



**Step 3.** When the Drivers - FTDI (ftdichip.com) page opens, select the *VCP Drivers* tab:

**Figure 19. Selecting VCP Drivers tab**



**Step 4.** Download the operating system version highlighted below

**Figure 20. Selecting operating system version**

The screenshot shows the 'VCP Drivers' page on the FTDI Chip website. It includes a disclaimer about the software being provided 'as is' and a note about the responsibility of the product manufacturer. Below the disclaimer, there is a table titled 'Currently Supported VCP Drivers:'.

| Operating System   | Release Date | Processor Architecture     |                            |     |                                |        |        |     |
|--------------------|--------------|----------------------------|----------------------------|-----|--------------------------------|--------|--------|-----|
|                    |              | X86 (32-Bit)               | X64 (64-Bit)               | PPC | ARM                            | MIPSII | MIPSIV | SH4 |
| Windows (Desktop)* | 2025-03-04   | <a href="#">2.12.36.20</a> | <a href="#">2.12.36.20</a> | -   | <a href="#">2.12.36.20A***</a> | -      | -      | -   |

Figure 21. AEK-MCU-SRLNK circuit schematic (1 of 3)

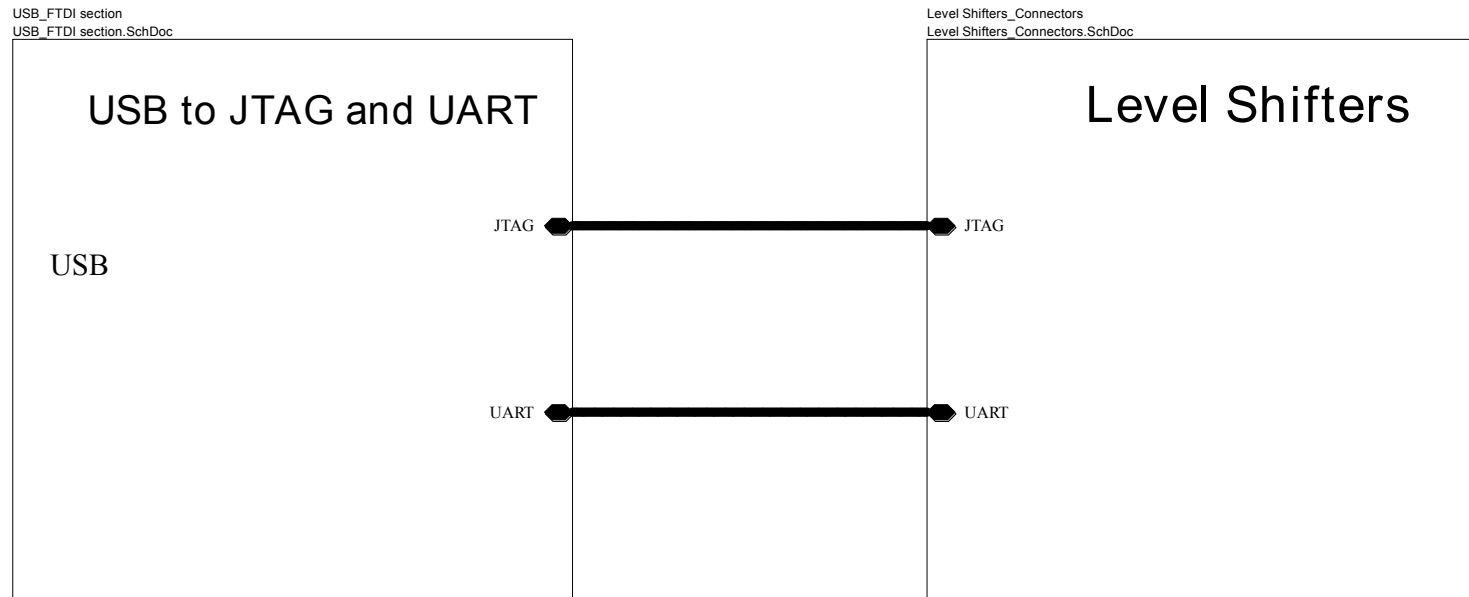


Figure 22. AEK-MCU-SRLNK circuit schematic (2 of 3)

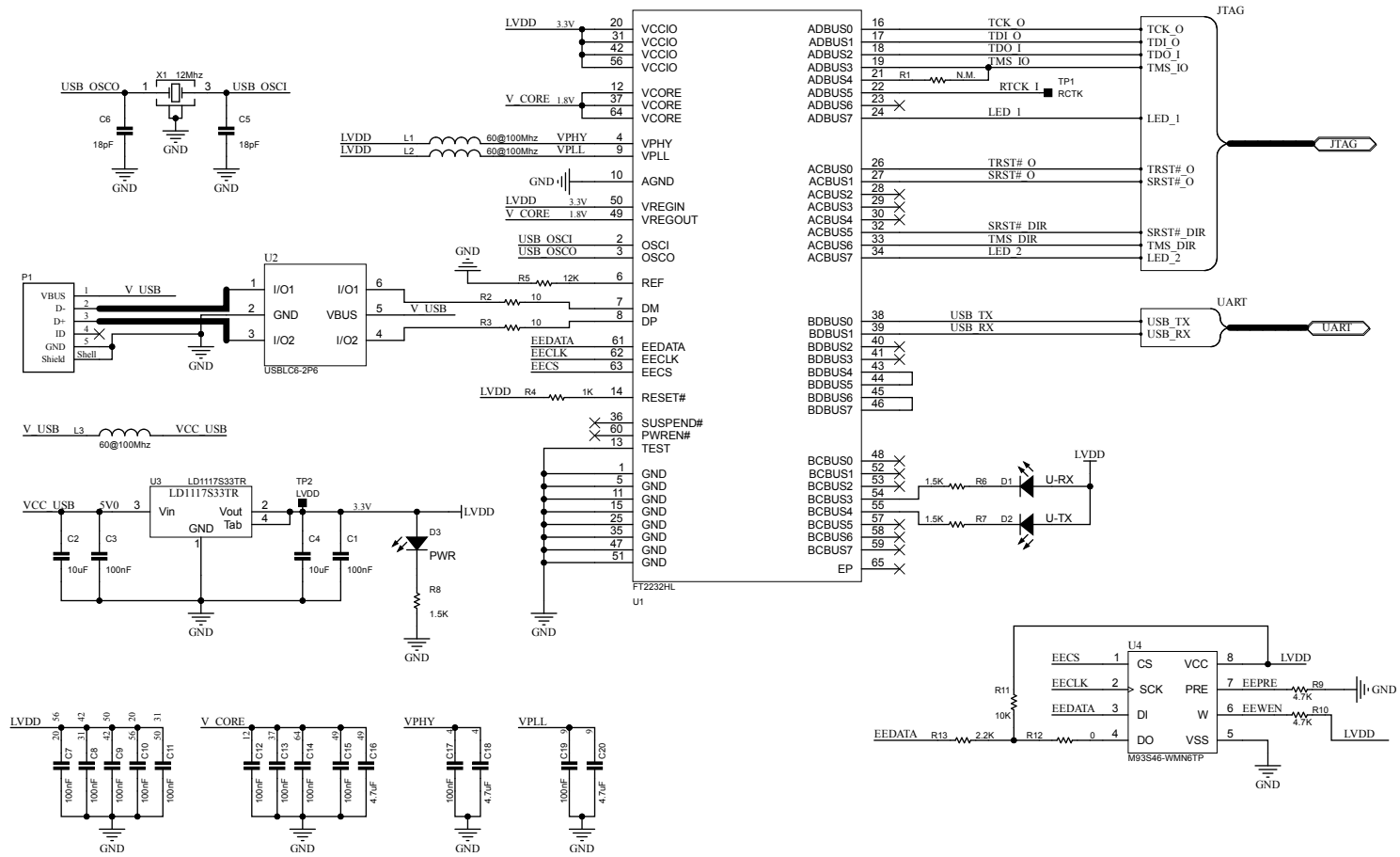
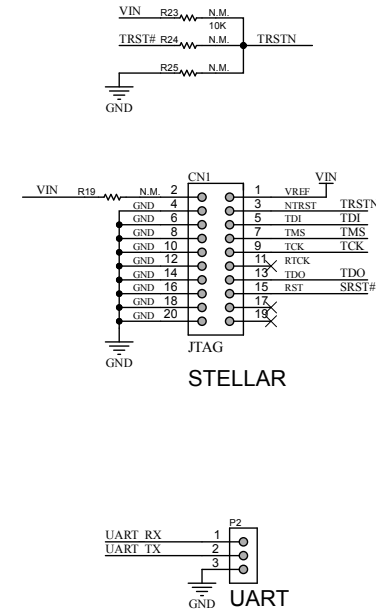
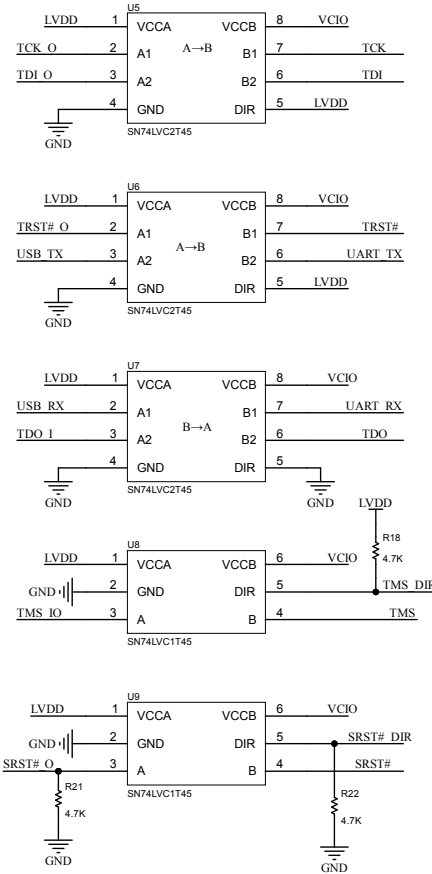
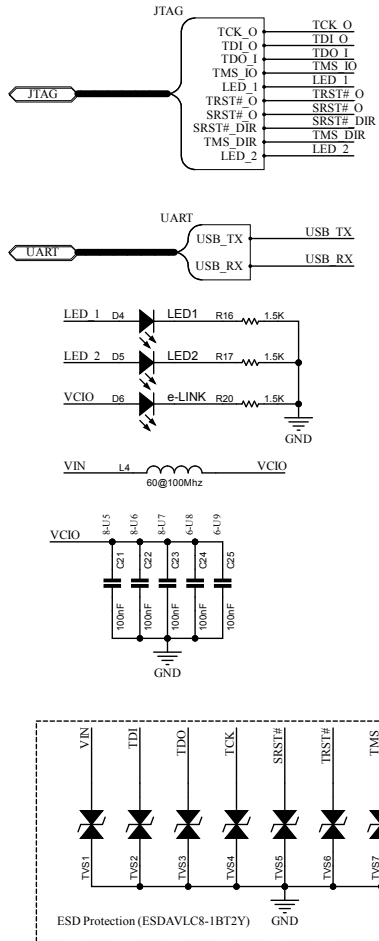


Figure 23. AEK-MCU-SRLNK circuit schematic (3 of 3)



## 5 Bill of materials

**Table 5. AEK-MCU-SRLNK bill of materials**

| Item | Q.ty | Ref.                                                                                | Part/value                      | Description                                                                    | Manufacturer | Order code           |
|------|------|-------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------|--------------|----------------------|
| 1    | 18   | C1, C3, C7, C8, C9, C10, C11, C12, C13, C14, C15, C17, C19, C21, C22, C23, C24, C25 | 100nF                           | 0603 - 50V - X7R Class II                                                      | WE           | 885012206095         |
| 2    | 2    | C2, C4                                                                              | 10uF                            | 0603 - 25V - X5R Class II                                                      | WE           | 885012106031         |
| 3    | 2    | C5, C6                                                                              | 18pF                            | 0603 - 50V - C0G                                                               | TDK          | C1608C0G1H180J080AA  |
| 4    | 3    | C16, C18, C20                                                                       | 4.7uF                           | 0603 - 10V - X5R Class II                                                      | WE           | 885012106012         |
| 5    | 1    | CN1                                                                                 | Con JTAG                        | 2.54mm - Contact Centers, Female Headers, Straight - SFH11 Series              | Sullins      | SFH11-PBPC-D10-ST-BK |
| 6    | 6    | D1, D2, D3, D4, D5, D6                                                              | Green                           | 0805 - Led Green - 3.2V                                                        | WE           | 150080GS75000        |
| 7    | 2    | F1, F2                                                                              |                                 | Fiducial (Top, Bottom)                                                         | N.A.         | N.A.                 |
| 8    | 4    | L1, L2, L3, L4                                                                      | 60@100Mhz                       | WE-CBF SMT EMI Suppression Ferrite Bead. 60 Ohm, 500mA                         | WE           | 74279267             |
| 9    | 1    | P1                                                                                  | USB 2.0 Type B Micro Receptacle | WR-COM Micro USB 2.0 SMT Type B Horizontal 5 Contacts High Current             | WE           | 629105150521         |
| 10   | 1    | P2                                                                                  | 61300311021                     | 2.54mm - WR-PHD Angled Pin Header, THT, pitch 2.54mm, Single Row, Vertical, 3p | WE           | 61300311021          |
| 11   | 5    | R1, R19, R23, R24, R25                                                              | N.M.                            | 0603                                                                           | N.A.         | N.A.                 |
| 12   | 2    | R2, R3                                                                              | 10                              | 0603 - $\pm 1\%$ - 0.25W                                                       | Panasonic    | ERJPA3F10R0V         |
| 13   | 1    | R4                                                                                  | 1K                              | 0603 - $\pm 1\%$ - 0.25W                                                       | Panasonic    | ERJPA3F1001V         |
| 14   | 1    | R5                                                                                  | 12K                             | 0603 - $\pm 1\%$ - 0.1W                                                        | Panasonic    | ERJ-3EKF1202V        |
| 15   | 6    | R6, R7, R8, R16, R17, R20                                                           | 1.5K                            | 0603 - $\pm 1\%$ - 0.25W                                                       | Panasonic    | ERJ-PA3F1501V        |
| 16   | 5    | R9, R10, R18, R21, R22                                                              | 4.7K                            | 0603 - $\pm 1\%$ - 0.25W                                                       | Panasonic    | ERJPA3F4701V         |
| 17   | 1    | R11                                                                                 | 10K                             | 0603 - $\pm 1\%$ - 0.2W                                                        | Panasonic    | ERJP03F1002V         |
| 18   | 1    | R12                                                                                 | 0                               | 0603 - $\pm 1\%$ - 0.1W                                                        | Panasonic    | ERJ3GEY0R00V         |
| 19   | 1    | R13                                                                                 | 2.2K                            | 0603 - $\pm 1\%$ - 0.1W                                                        | Panasonic    | ERJ-3EKF2201V        |

| Item | Q.ty | Ref.                                                                         | Part/value                  | Description                                                                                                   | Manufacturer      | Order code                     |
|------|------|------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------|
| 20   | 9    | TVS1,<br>TVS2,<br>TVS3,<br>TVS4,<br>TVS5,<br>TVS6,<br>TVS7,<br>TVS8,<br>TVS9 | ESDAVLC8-1BT2Y,<br>SOD882TB | Automotive single-line low capacitance Transil™, transient surge voltage suppressor (TVS) for ESD protection  | ST                | <a href="#">ESDAVLC8-1BT2Y</a> |
| 21   | 1    | U1                                                                           | FT2232HL                    | USB Hi-Speed to Dual Channel Serial UART/FIFO/JTAG/SPI/I2C                                                    | FTDI Chip         | FT2232HL                       |
| 22   | 1    | U2                                                                           | USBLC6-2P6,<br>SOT-666      | Automotive ESD protection for high speed interfaces in SOT-666                                                | ST                | <a href="#">USBLC6-2P6</a>     |
| 23   | 1    | U3                                                                           | LD1117S33TR,<br>SOT-223     | The LD1117330TR is a low drop voltage regulator able to provide up to 800 mA of output current. Vout is 3.3V. | ST                | <a href="#">LD1117S33TR</a>    |
| 24   | 1    | U4                                                                           | M93S46-WMN6TP,<br>SO-8      | 1Kbit (64x16) Serial Microwire Bus EEPROM With Block Protection                                               | ST                | <a href="#">M93S46-WMN6TP</a>  |
| 25   | 3    | U5, U6, U7                                                                   | SN74LVC2T45                 | SN74LVC2T45 Dual-Bit Dual-Supply Bus Transceiver With Configurable Voltage Translation                        | Texas Instruments | SN74LVC2T45DCTR                |
| 26   | 2    | U8, U9                                                                       | SN74LVC1T45                 | Single-Bit Dual-Supply Bus Transceiver With Configurable Voltage Translation and 3-State Outputs              | Texas Instruments | SN74LVC1T45DCKT                |
| 27   | 1    | X1                                                                           | 12Mhz                       | WE-XTAL Quartz Crystal, SMT, CFPX-180, 12MHz, +/-10ppm                                                        | WE                | 830108206909                   |

## 6 Board versions

**Table 6. AEK-MCU-SRLNK versions**

| PCB version                    | Schematic diagrams                                 | Bill of materials                                 |
|--------------------------------|----------------------------------------------------|---------------------------------------------------|
| AEK\$MCU-SRLNKA <sup>(1)</sup> | <a href="#">AEK\$MCU-SRLNKA schematic diagrams</a> | <a href="#">AEK\$MCU-SRLNKA bill of materials</a> |

1. This code identifies the AEK-MCU-SRLNK evaluation board first version. It is printed on the board PCB.

## 7 Regulatory compliance information

### Notice for US Federal Communication Commission (FCC)

For evaluation only; not FCC approved for resale

FCC NOTICE - This kit is designed to allow:

(1) Product developers to evaluate electronic components, circuitry, or software associated with the kit to determine

whether to incorporate such items in a finished product and

(2) Software developers to write software applications for use with the end product.

This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter 3.1.2.

### Notice for Innovation, Science and Economic Development Canada (ISED)

For evaluation purposes only. This kit generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to Industry Canada (IC) rules.

À des fins d'évaluation uniquement. Ce kit génère, utilise et peut émettre de l'énergie radiofréquence et n'a pas été testé pour sa conformité aux limites des appareils informatiques conformément aux règles d'Industrie Canada (IC)

### Notice for the European Union

This device is in conformity with the essential requirements of the Directive 2014/30/EU (EMC) and of the Directive 2011/65/EU (RoHS II), including subsequent revisions and additions, as well as amended by the Delegated Directive 2015/863/EU (RoHS III).

### Notice for the United Kingdom

This device is in conformity with the relevant provisions of the following EU legislation recognized by the United Kingdom:

- Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091) implementing Directive 2014/30/EU (EMC)
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (RoHS) (S.I. 2012/3032) implementing Directive 2011/65/EU (RoHS II), including subsequent revisions and additions, as well as amended by the Delegated Directive 2015/863/EU (RoHS III).

## Revision history

**Table 7. Document revision history**

| Date        | Revision | Changes          |
|-------------|----------|------------------|
| 14-Jan-2026 | 1        | Initial release. |

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