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› DWEII STM32F411 Development Board and ST-Link V2 Instruction Manual

DWEII STM32F411CEU6

DWEII STM32F411 Development Board and ST-Link V2 Instruction Manual

1. INTRODUCTION

This manual provides essential information for the DWEII STM32F411 Development Board and the accompanying ST-Link V2 Programming Emulator Downloader. It covers product overviews, setup procedures, operational guidelines, and technical specifications to assist users in effective utilization of these components for embedded systems development and programming.

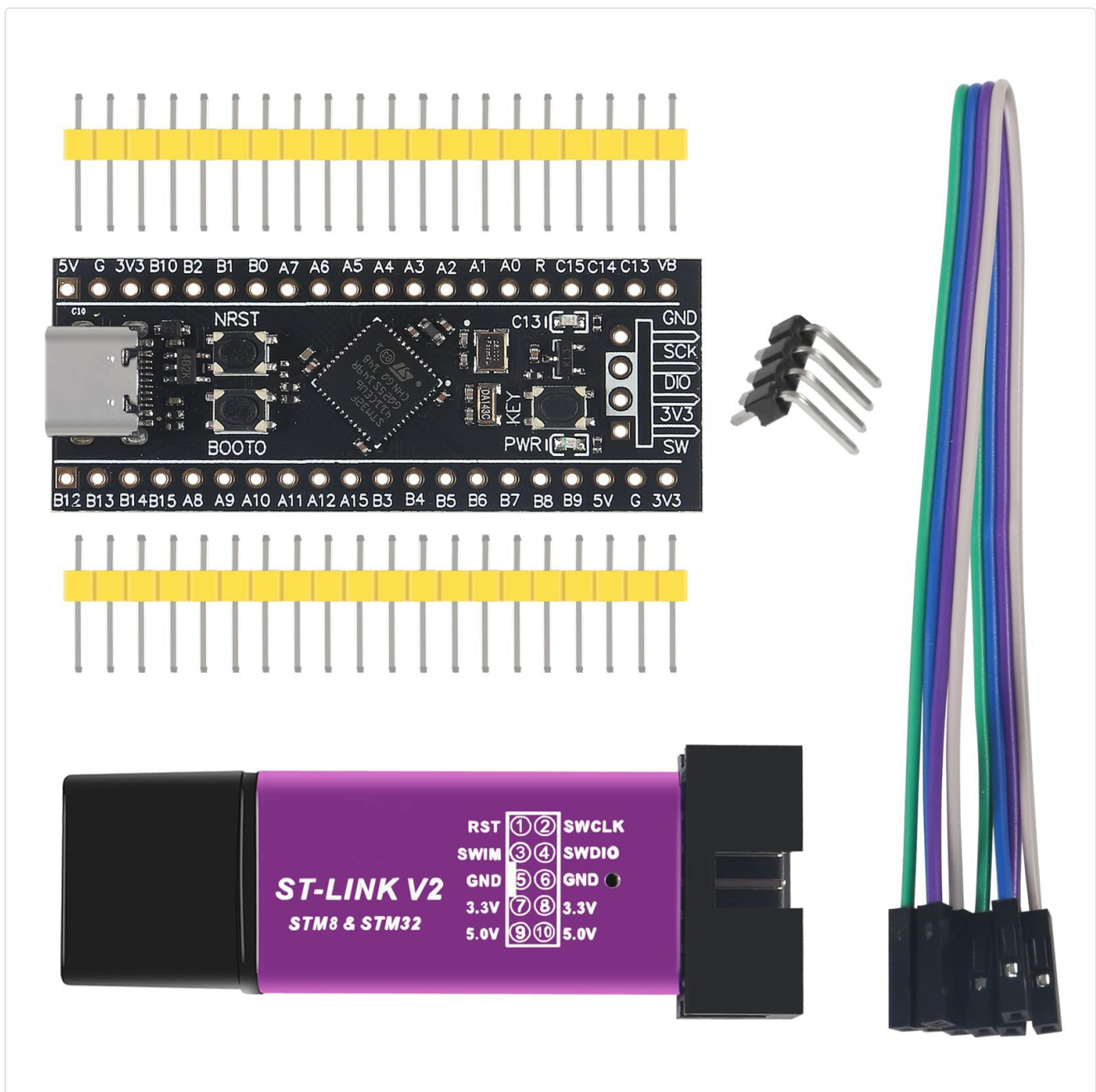


Image 1.1: Complete DWEII STM32F411 Development Board and ST-Link V2 Kit. This image displays the STM32F411 development board, the ST-Link V2 programmer, pin headers, and jumper wires, illustrating all components included in the package.

2. PRODUCT OVERVIEW: STM32F411 DEVELOPMENT BOARD

The DWEII STM32F411CEU6 Development Board is a compact and powerful learning platform based on the STM32F411CEU6 microcontroller. It features a 100MHz clock, 512kB Flash memory, and 128kB RAM, making it suitable for various embedded applications and MicroPython programming.

Key Features:

- **Microcontroller:** STM32F411CEU6
- **I/O Ports:** 32 total, including 14 analog inputs
- **Power Supply:** Supports 5V and 3.3V logic levels
- **Real-Time Clock (RTC):** On-board RTC with its own clock base and connections for a backup battery
- **Interface:** USB-C for power and data communication (OTG capable)
- **Programming Support:** Compatible with MicroPython

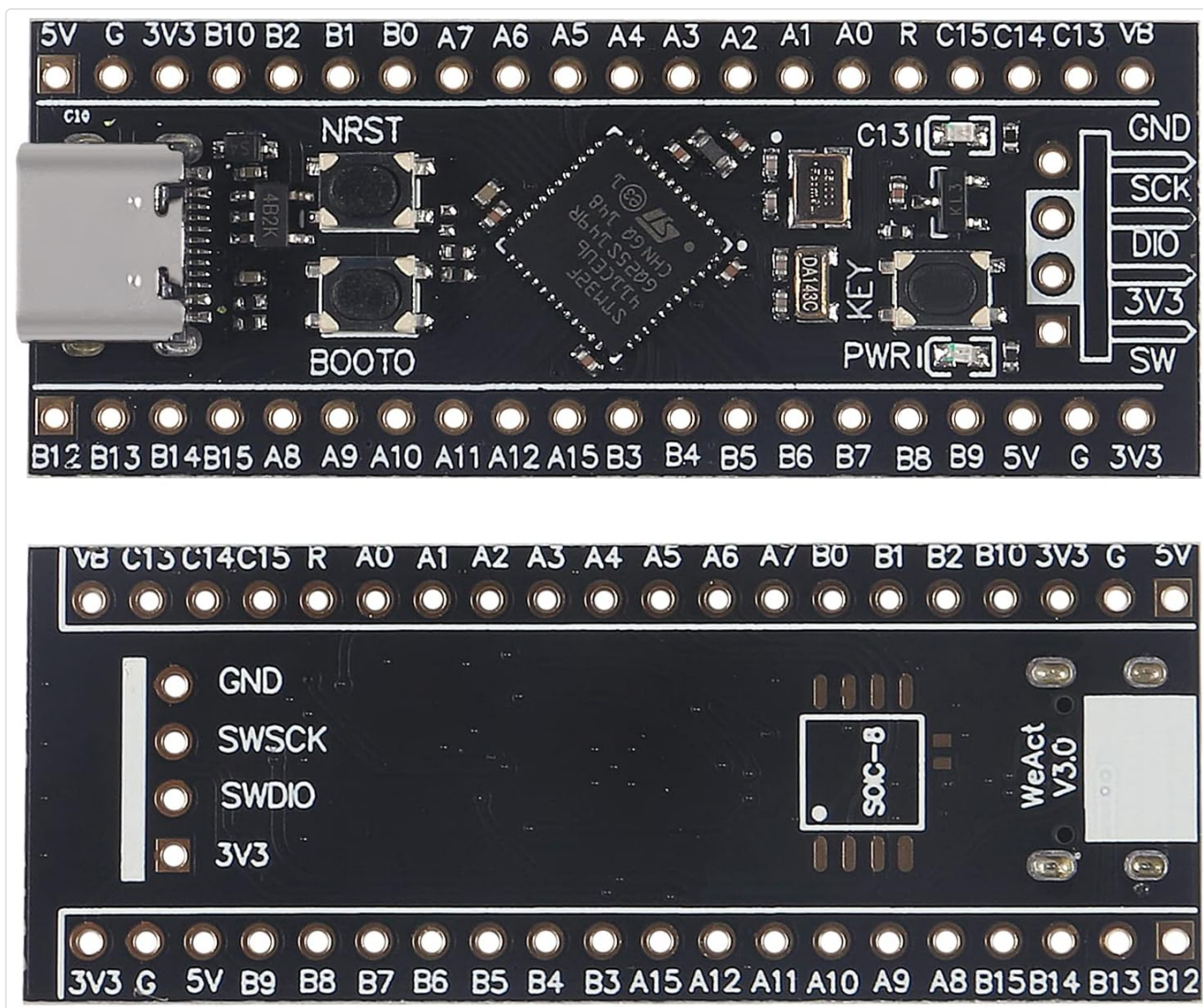


Image 2.1: Top and bottom view of the STM32F411 Development Board. This image provides a detailed look at the component layout on both sides of the development board, highlighting the USB-C port, microcontroller, and pin headers.

3. PRODUCT OVERVIEW: ST-LINK V2 PROGRAMMING EMULATOR DOWNLOADER

The ST-Link V2 is a programming and debugging tool designed for STM32 and STM8 microcontrollers. It facilitates firmware uploads and debugging processes, supporting various integrated development environments (IDEs).

Key Features:

- **Debugging Interface:** Supports full range of STM32 SWD (Serial Wire Debug) debugging interface.
- **Programming Interface:** Supports full range of STM8 SWIM (Single Wire Interface Module) download debugging.
- **Firmware:** Supports automatic firmware upgrades.
- **Power Output:** Provides both 5V and 3.3V power outputs.
- **Protection:** All I/O output ports are protected.

Supported Software Versions:

- ST-LINK Utility 2.0 and 4.2.1 or above
- STVD and above
- STVP 3.2.3 and above
- IAR EWARM V6.20 and above

- IAR EWSTM8 V1.30 and above
- KEIL RVMDK V4.21 and above



Image 3.1: ST-Link V2 programmer with pinout diagram. This image shows the ST-Link V2 device and a clear diagram indicating the function of each pin for connection to the development board.

4. SETUP INSTRUCTIONS

Follow these steps to set up your DWEII STM32F411 Development Board with the ST-Link V2 programmer.

1. **Attach Pin Headers:** Solder the included pin headers to the STM32F411 Development Board if they are not pre-soldered. Ensure proper alignment and secure connections.
2. **Connect ST-Link V2:** Use the provided jumper wires to connect the ST-Link V2 programmer to the STM32F411 Development Board. Refer to the pinout diagram on the ST-Link V2 for correct connections. Key pins typically include SWCLK, SWDIO, GND, and VCC (3.3V or 5V depending on your setup).
3. **Connect to Computer:** Plug the ST-Link V2 into a USB port on your computer. The STM32F411 Development Board can also be connected directly via its USB-C port for power and serial communication.
4. **Install Drivers:** Install the necessary drivers for the ST-Link V2 and any required UART drivers for the STM32F411 board. These drivers are typically available from STMicroelectronics or your operating system's device manager.
5. **Prepare IDE:** Configure your chosen Integrated Development Environment (IDE) (e.g., Keil MDK, IAR Embedded Workbench, STM32CubeIDE) to recognize the ST-Link V2 as the debugger/programmer.

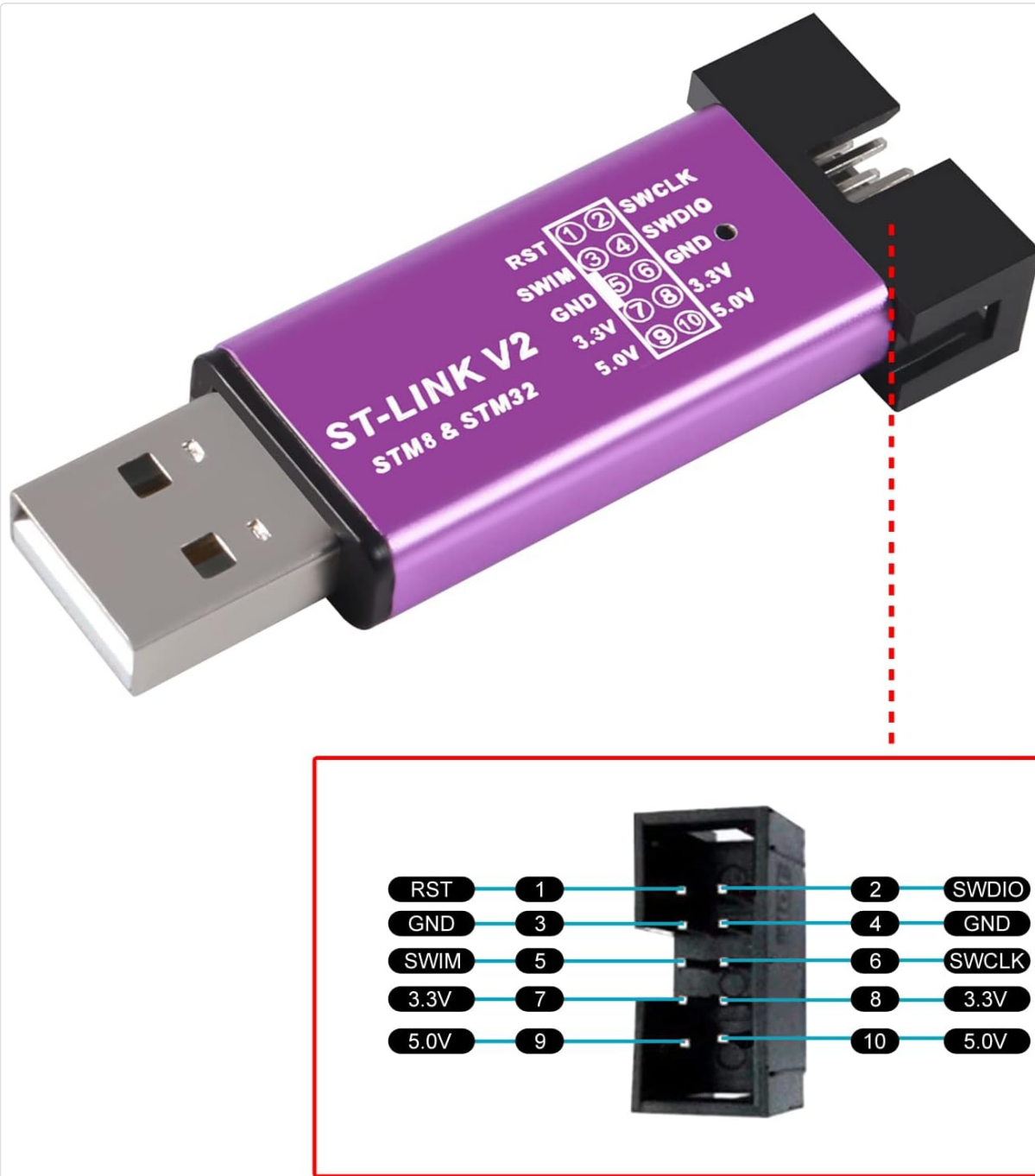


Image 4.1: ST-Link V2 connected to a development board via jumper wires. This image illustrates a typical connection setup between the ST-Link V2 programmer and a development board using multi-colored jumper wires.

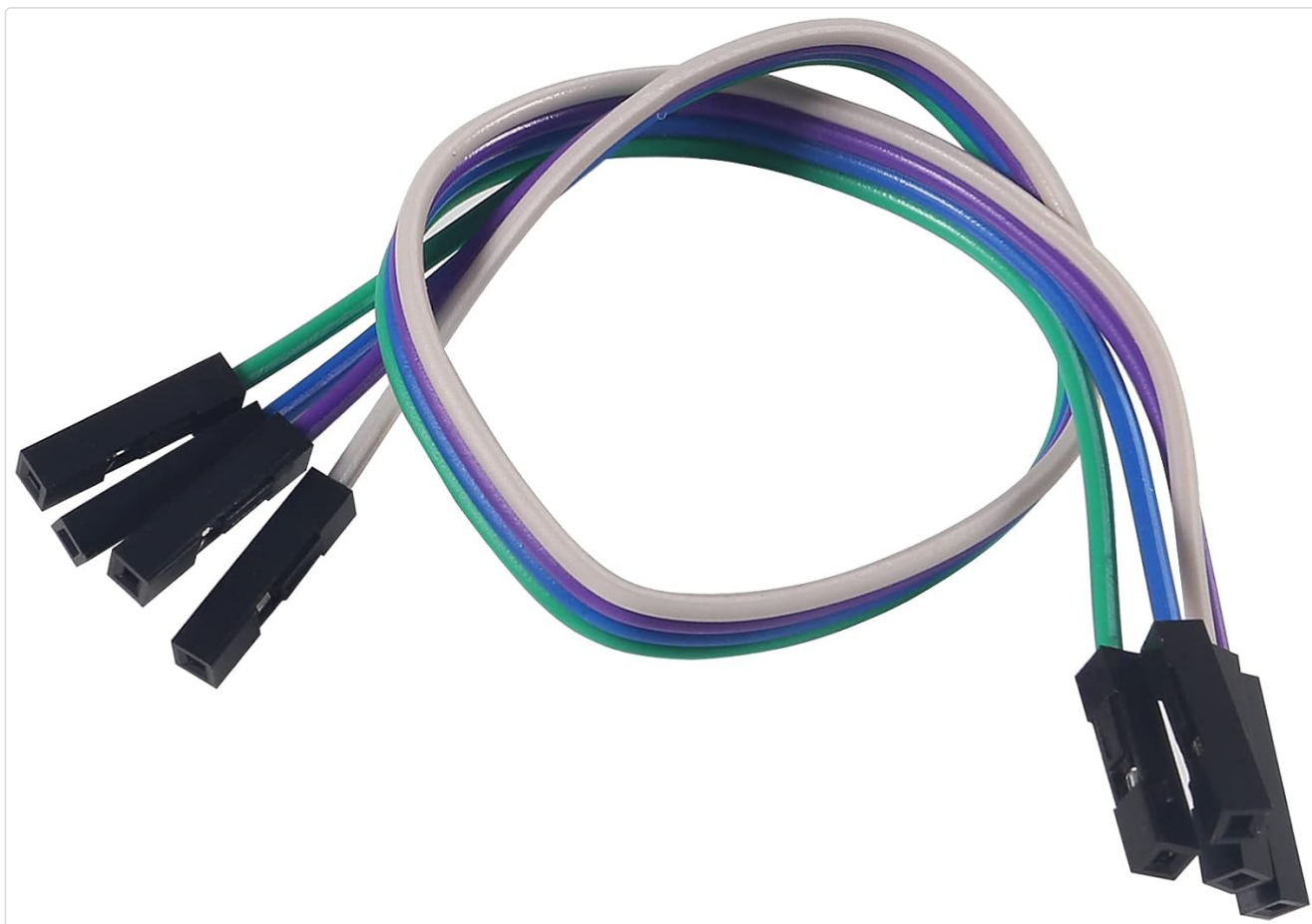


Image 4.2: Assortment of jumper wires. This image shows the various colored jumper wires included, which are used for making connections between the ST-Link V2 and the development board.

5. OPERATING INSTRUCTIONS

Once the hardware is set up and drivers are installed, you can proceed with programming and debugging your STM32F411 Development Board.

1. **Load Firmware:** In your IDE, compile your project and use the ST-Link V2 to upload the compiled firmware to the STM32F411 board.
2. **Debugging:** Utilize the debugging features of your IDE to step through code, set breakpoints, and monitor variables on the STM32F411 board via the ST-Link V2.
3. **Serial Communication:** If your program uses serial communication (e.g., via UART), open a terminal program (like Tera Term or PuTTY) on your computer and connect to the virtual COM port associated with the STM32F411 board's USB-C interface.

MicroPython Programming:

The STM32F411 Development Board supports MicroPython. To use MicroPython, you will need to flash the MicroPython firmware onto the board. Specific MicroPython firmware and configuration files are available for this board. Consult MicroPython documentation and community resources for detailed instructions on flashing and programming with MicroPython.

6. MAINTENANCE

To ensure the longevity and reliable operation of your DWELL STM32F411 Development Board and ST-Link V2, observe the following general maintenance guidelines:

- **Storage:** Store the components in a dry, anti-static environment away from direct sunlight and extreme temperatures.
- **Handling:** Handle the boards by their edges to avoid touching sensitive electronic components. Use anti-static precautions when handling.
- **Cleaning:** If necessary, gently clean the boards with a soft, dry brush or compressed air to remove dust. Avoid using liquids or abrasive materials.
- **Connections:** Ensure all connections (pin headers, jumper wires, USB cables) are secure but not forced, to prevent damage to pins or ports.

7. TROUBLESHOOTING

If you encounter issues during setup or operation, consider the following troubleshooting steps:

- **Connection Issues:**
 - Verify all jumper wire connections between the ST-Link V2 and the development board are correct according to the pinout diagram.
 - Ensure the ST-Link V2 is securely plugged into a functional USB port on your computer.
 - Check that the USB-C cable for the development board is properly connected.
- **Driver Problems:**
 - Confirm that all necessary ST-Link V2 drivers and UART drivers are correctly installed. Check your computer's Device Manager for any unrecognized devices or driver errors.
 - Try reinstalling the drivers from the official STMicroelectronics website.
- **IDE/Programming Errors:**
 - Ensure your IDE is configured to use the ST-Link V2 as the programmer/debugger.
 - Check your project settings for correct target device selection (STM32F411CEU6) and clock configurations.
 - If programming fails, try a different USB port or computer.
- **Serial Terminal Not Working:**
 - Verify that the correct COM port is selected in your terminal program.
 - Ensure the baud rate and other serial settings in your terminal program match those configured in your firmware.
 - Confirm that the UART driver for the STM32F411 board is installed and functioning.
- **Board Not Responding:**
 - Check for any visible damage to the board or components.
 - Ensure the board is receiving adequate power (e.g., from USB or external supply).
 - If the board was previously working and now isn't, consider if any recent changes to hardware or software might be responsible.

8. SPECIFICATIONS

STM32F411 Development Board:

- **Model:** STM32F411CEU6

- **Processor:** STMicroelectronics Core M Family
- **Clock Speed:** 100 MHz
- **Flash Memory:** 512 KB
- **RAM:** 128 KB (SRAM)
- **I/O Ports:** 32 (14 analog inputs)
- **Power Supply:** 5V / 3.3V logic level
- **RTC:** On-board with clock base and backup battery connections
- **Interface:** USB-C (OTG capable)
- **Operating System Support:** MicroPython
- **Item Weight:** Approximately 0.634 ounces
- **Package Dimensions:** Approximately 4.13 x 2.95 x 0.59 inches

ST-Link V2 Programming Emulator Downloader:

- **Supported MCUs:** STM32 (SWD), STM8 (SWIM)
- **Power Output:** 5V and 3.3V
- **Features:** Automatic firmware upgrades, I/O port protection

9. PACKAGE CONTENTS

The DWEII STM32F411 Development Board and ST-Link V2 kit typically includes the following items:

- 1x STM32F411CEU6 Development Board
- 1x ST-Link V2 Programming Emulator Downloader (Random Color)
- Pin Headers (for the development board)
- Jumper Wires (for connecting ST-Link V2 to the development board)

10. WARRANTY AND SUPPORT

For information regarding product warranty, technical support, or returns, please refer to the specific terms and conditions provided by your retailer or contact the manufacturer, DWEII, directly. Details may vary based on your purchase location and vendor.

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After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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