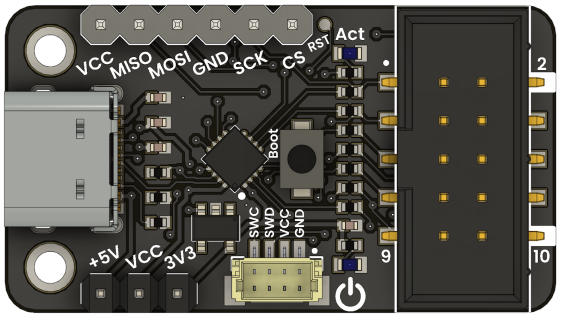
# Cocket Nova Programmer Product Brief

Universal Programmer for AVR, ARM (CMSIS-DAP), and CPLD (MAX II)

Version: 1.0 Modified: 2025-04-30

## Introduction




The Cocket Nova Programmer is a compact and versatile USB programming tool powered by the WCH CH552 microcontroller. Designed for developers, educators, and hobbyists, it supports programming and debugging across three key domains: AVR microcontrollers, ARM Cortex-M processors, and Intel/Altera CPLDs.

With multiple firmware profiles, this device can seamlessly switch between USBasp, CMSIS-DAP, and USB-Blaster compatible JTAG modes. Its hardware voltage selector ensures compatibility with target boards operating at 3.3V or 5V. The built-in USB bootloader simplifies firmware flashing, and compatibility with tools like ‘avrdude‘, ‘OpenOCD‘, and Quartus Programmer makes it an ideal choice for embedded development in diverse environments.

## Functional Description

- USB Full-Speed interface (CDC or HID, depending on firmware)
- Programmable firmware profiles: AVR, CMSIS-DAP, and CPLD
- CH552G / CH552E microcontroller
- Selectable target voltage: 3.3V or 5V
- Bootloader mode for firmware flashing

## Electrical Characteristics

- The target voltage can be toggled between 3.3V and 5V using a physical switch.
- Programming interfaces include JTAG (TCK, TMS, TDI, TDO, nTRST) via a 2x5 1.27mm header, SWD (SWDIO, SWCLK) via a standard or JST connector, and SPI (MISO, MOSI, SCK, CS) via an inline header.
- A dedicated JST 1.0mm connector provides SWDIO, SWCLK, VCC, and GND for quick connections.

## Features

- Multiple firmware modes: AVR, ARM CMSIS-DAP, CPLD JTAG
- Standard USB HID/CDC communication
- Compatible with major programming tools (avrdude, OpenOCD, Quartus)
- Small footprint, easy to integrate into projects
- SDCC-compatible source code
- Support for Linux, and macOS

## Applications

- AVR programming via USBasp and UPDI
- ARM Cortex-M debugging via CMSIS-DAP (OpenOCD, PyOCD)
- JTAG programming for Intel/Altera MAX II CPLDs
- Universal compact programmer for educational kits
- Embedded development and prototyping

## Settings

### Interface Overview

| Interface | Signals / Pins | Typical Use |
|---|---|---|
| JTAG | TCK, TMS, TDI, TDO, nTRST | Full chip programming, in-circuit test, debug |
| SPI | MOSI, MISO, SCK, CS | Flash memory programming, peripheral data exchange |
| SWD | SWCLK, SWDIO | Cortex-M programming and debugging |
| JST Header | SWCLK, SWDIO, VCC, GND | Quick-connect to target board for SWD and power |

### Supported Pins

| Symbol | I/O | Description |
|---|---|---|
| VCC | Input | Power supply (3.3V or 5V) |
| GND | - | Ground |
| BOOT | Input | Enter bootloader mode |
| P3.0 | I/O | General purpose (protocol-specific) |
| P3.1 | I/O | General purpose (protocol-specific) |
| P3.2 | Input | BOOT button |

### Firmware Modes: AVR Programmer

| Feature | Description |
|---|---|
| Protocols | USBasp, Serial UPDI |
| Targets | ATmega, ATtiny, other AVR MCUs |
| Tools Supported | avrdude, PlatformIO |
| USB Mode | HID (USBasp), CDC (UPDI) |
| Voltage Output | 3.3V / 5V selectable |

### Firmware Modes: CMSIS-DAP Debugger

| Feature | Description |
|---|---|
| Protocols | SWD, JTAG (CMSIS-DAP v1) |
| Targets | ARM Cortex-M (STM32, nRF52, SAMD, etc.) |
| Tools Supported | OpenOCD, PyOCD, Keil µVision, SEGGER |
| USB Mode | HID + optional CDC UART |
| Drivers | Native (Linux/macOS), Zadig (Windows) |

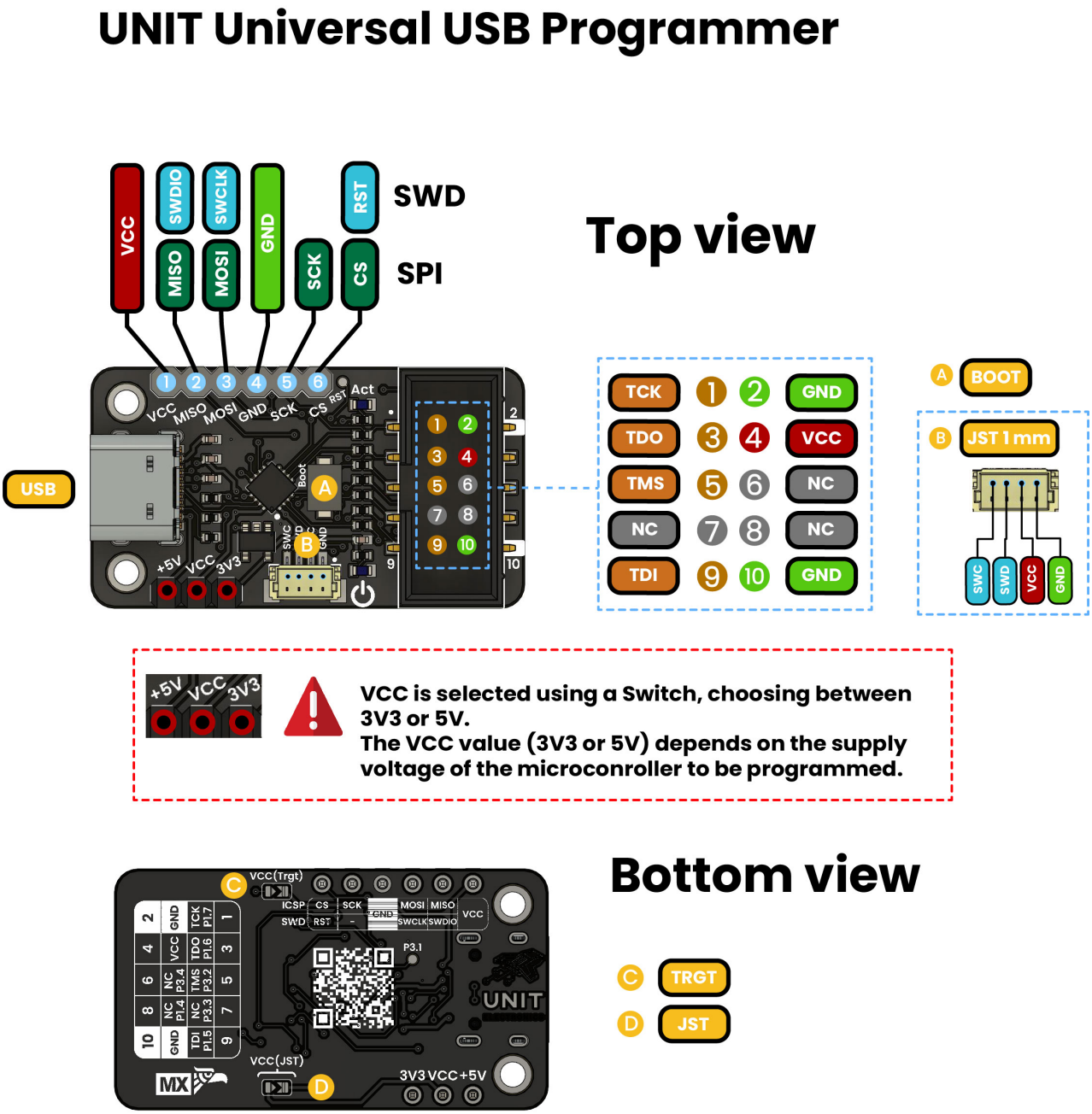
### Firmware Modes: CPLD Programmer

| Feature | Description |
|---|---|
| Protocol | JTAG via USB-Blaster emulation |
| Targets | Intel/Altera MAX II (e.g., EPM240) |
| Tools Supported | Quartus Programmer |
| USB VID/PID | Safe: 0x16C0:0x05DC, Compatible: 0x09FB:0x6001 |
| Voltage Output | 3.3V / 5V selectable |

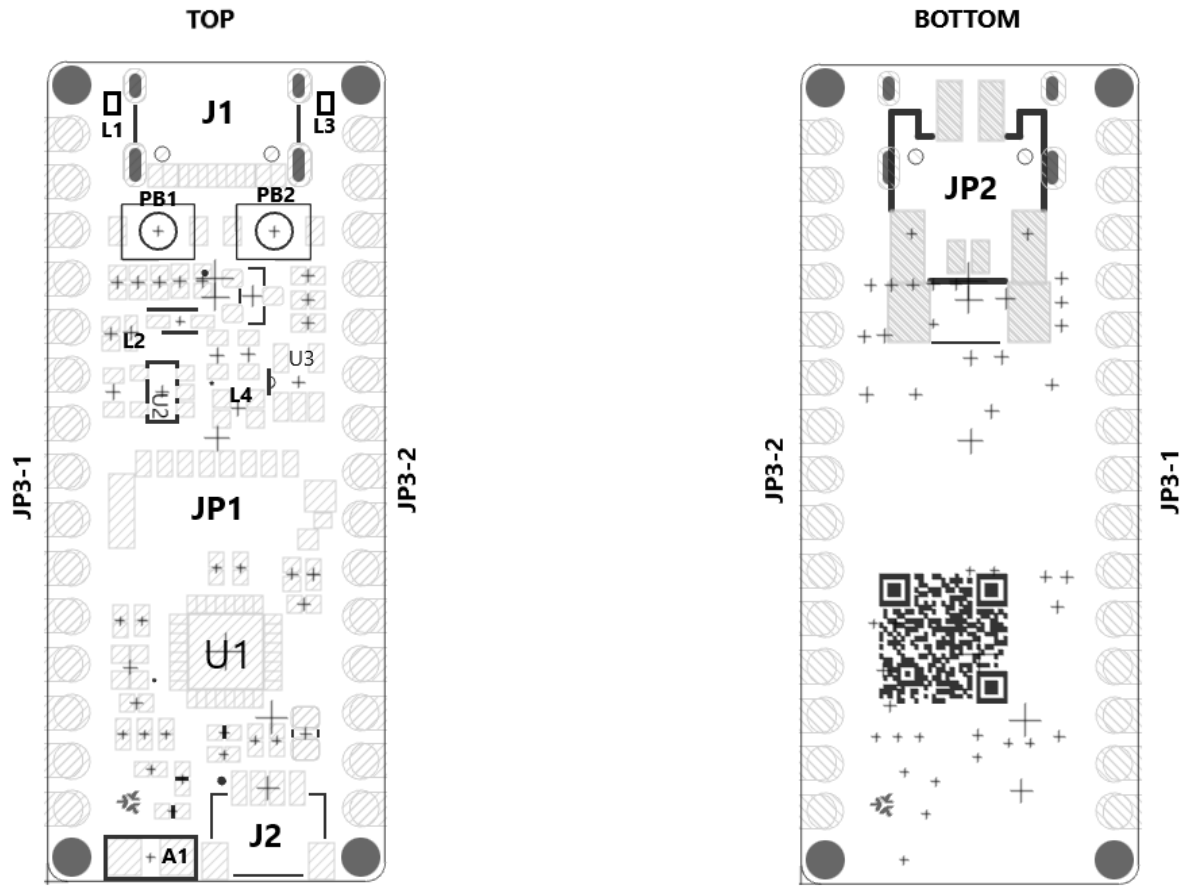
## Pin & Connector Layout

| Color | Signal Type | Description |
|---|---|---|
| Red | Power | Supply voltage (VCC) |
| Green | Ground | Common ground (GND) |
| Blue | SWD | SWDIO and SWCLK signals |
| Teal | SPI | SPI interface signals |
| Orange | JTAG | JTAG interface signals |
| Gray | Not Connected | Unused or reserved lines |
| Color | Signal Type | Description |

## Block Diagram



## Dimensions




## Usage

- Arduino AVR
- Raspberry Pi RP2040
- STM32
- NRF
- PY32
- MAX II

## Downloads

- Schematic PDF
- MAX1704X Library

## Purchase

- Buy from UNIT Electronics