

# KAMAMI

## ZL31ARM



Rev. 20200924095723

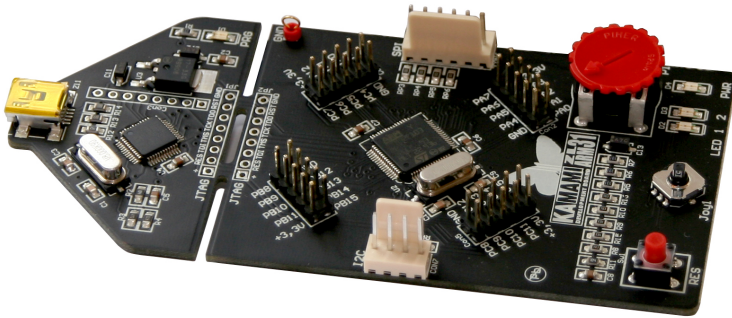
Źródło: <https://wiki.kamamilabs.com/index.php/ZL31ARM>

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## Description

ZL31ARM board with STM32 microcontroller (Cortex-M3 core) and built-in ST-Link programmer/debugger is a complete hardware environment for developing first ARM designs.



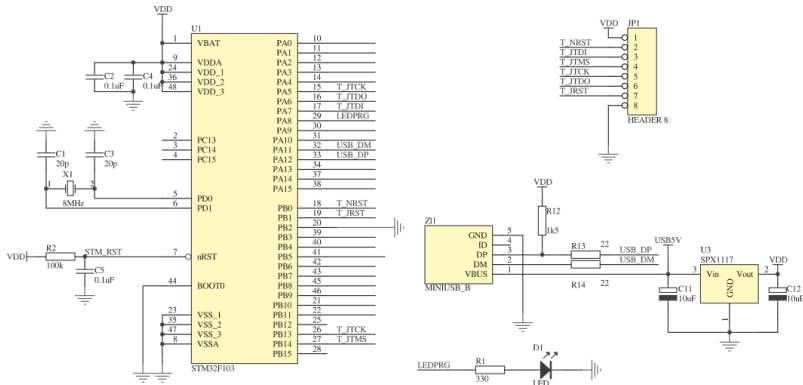
## Basic features

- STM32F103RB microcontroller (Cortex-M3 core), 128kB Flash, 20kB RAM, USB, CAN, 3×UART, 2×I2C, 2×SPI, ADC, LQFP64 package
- 8MHz crystal resonator
- Built-in ST-Link programmer/debugger with USB interface
- Programmer can be broken off and used as standalone device
- Two LEDs
- 5-position joystick
- Analog potentiometer connected to microcontroller's ADC
- Reset button
- I2C and SPI Kamami standard connectors
- Microcontroller I/O lines available on pin headers
- Supplied from USB

## Standard equipment

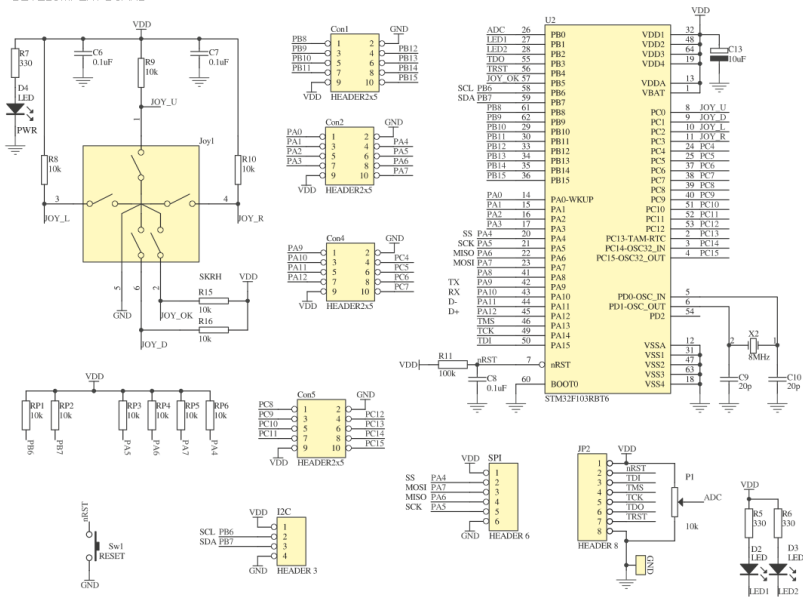
Kod	Opis
<b>ZL31ARM</b>	• Assembled board with programmer

## Schematic



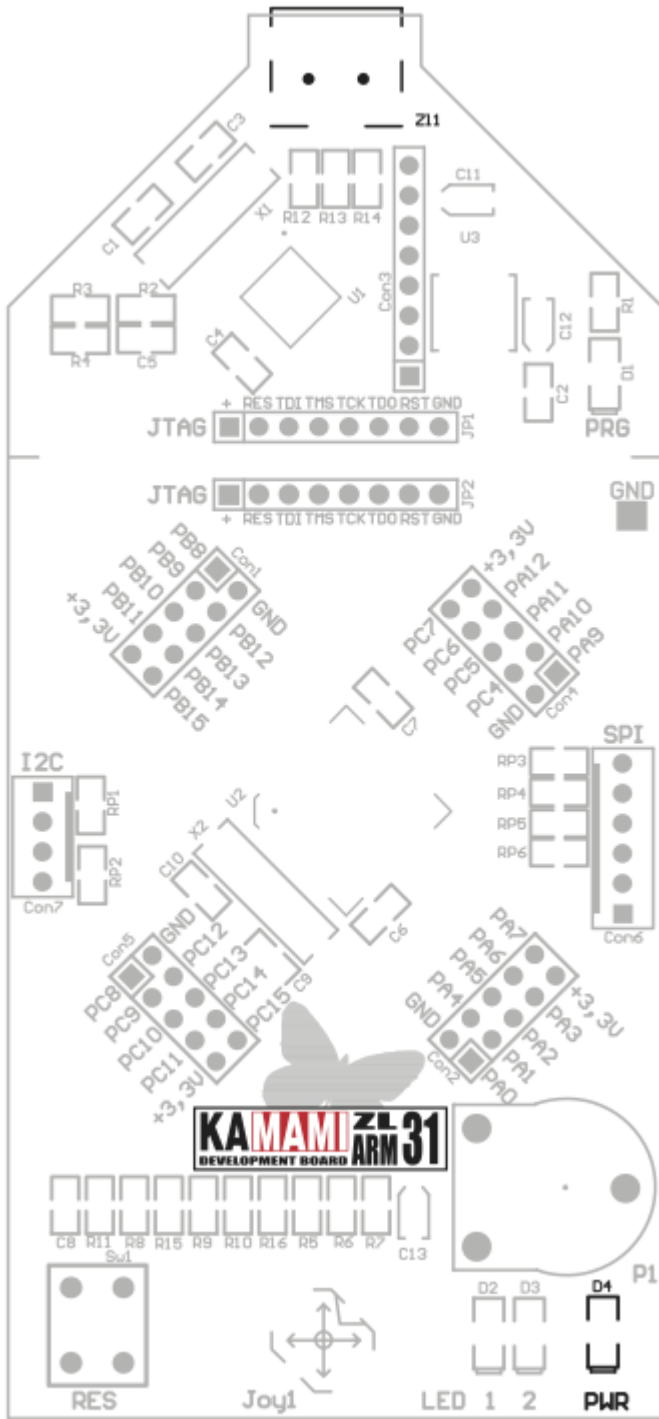
PROGRAMMER-DEBUGGER

DEVELOPMENT BOARD

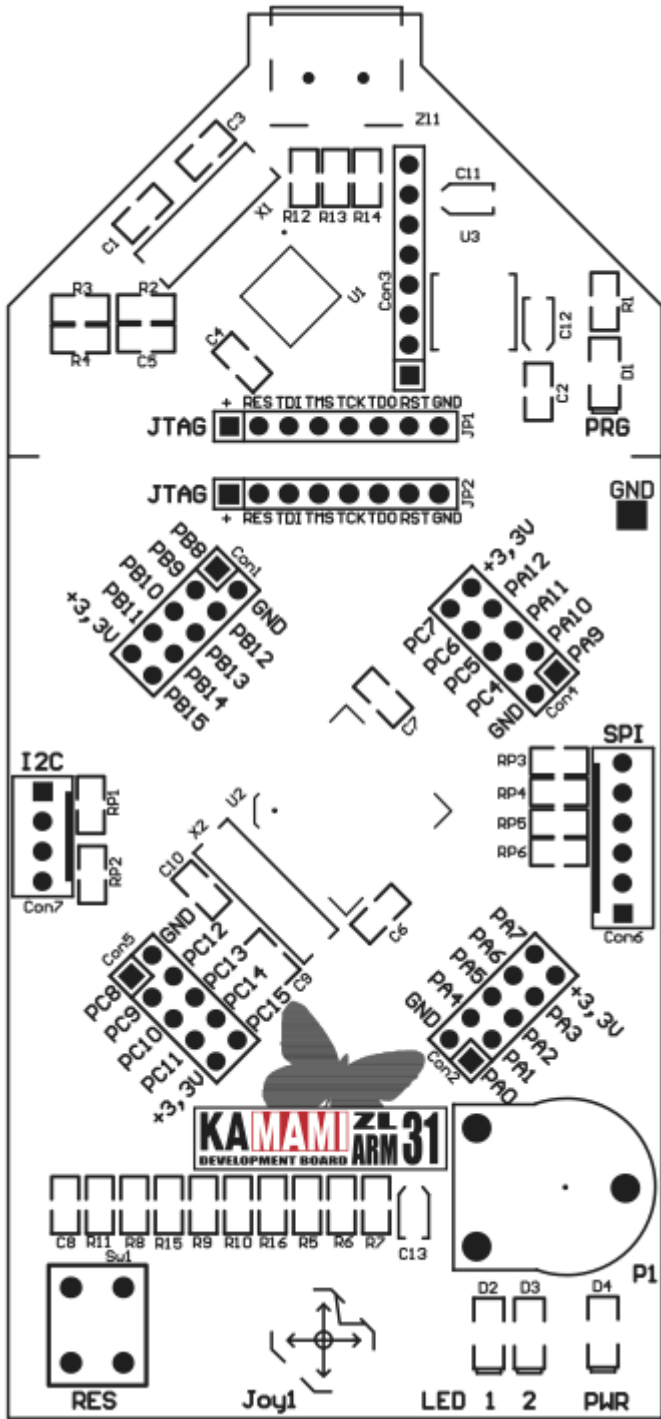


# Power supply

ZL31ARM is powered from computer's USB port, PWR LED indicates whether board is supplied.

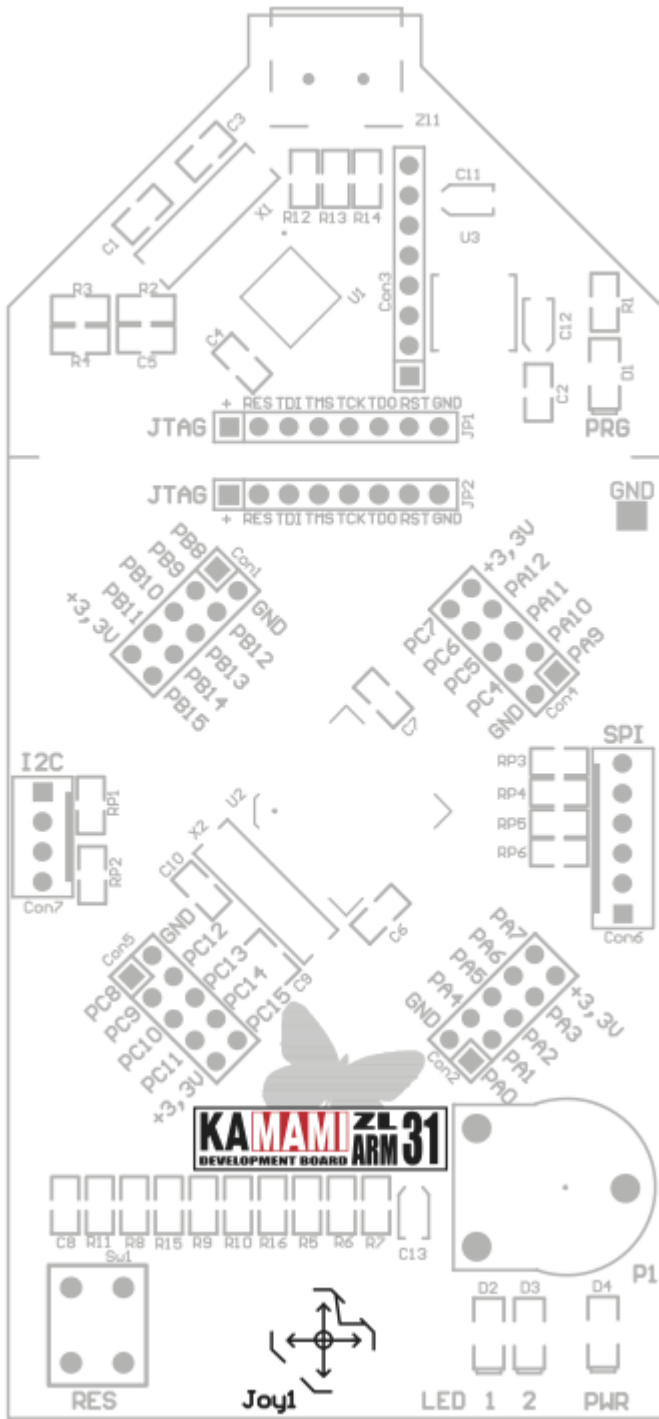


# Board layout

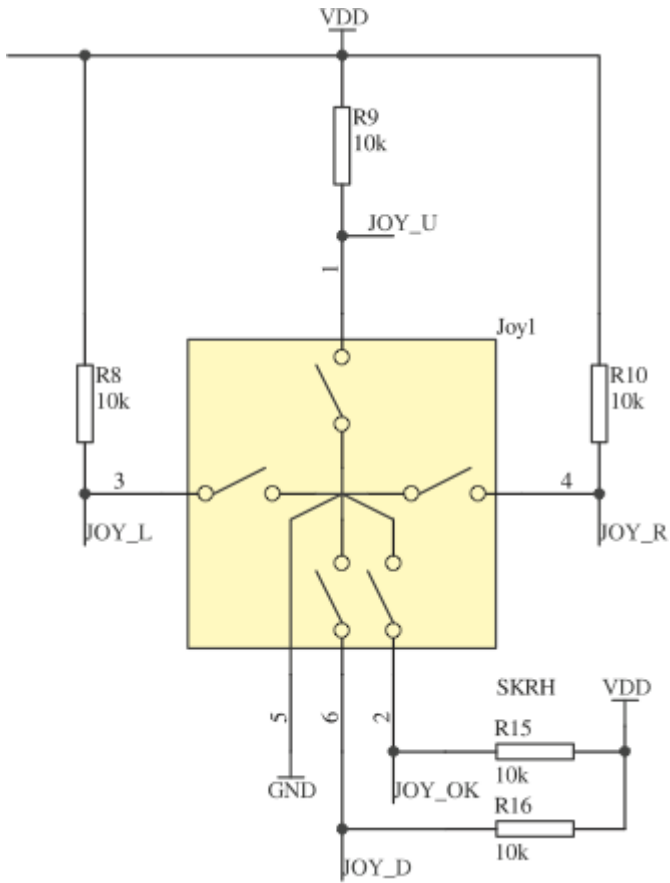


# Joystick

ZL31ARM is equipped with 5-position joystick. All joystick lines have pull-up resistors.





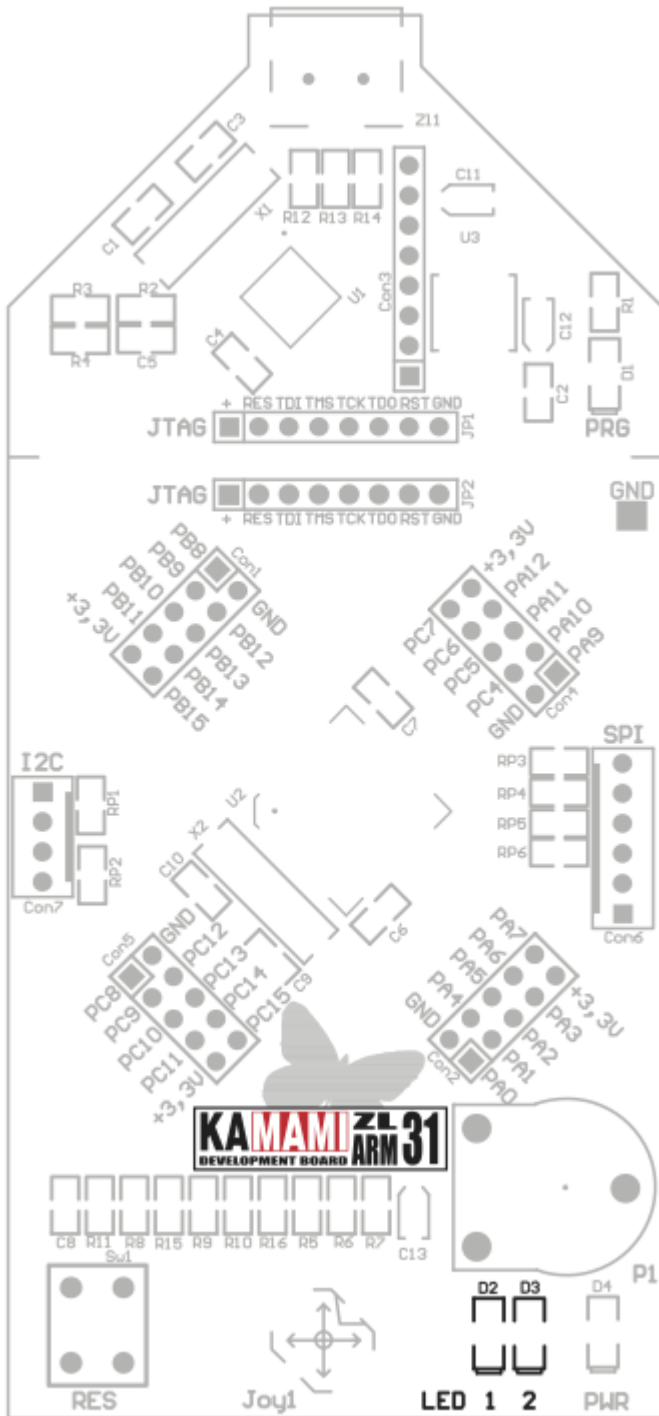


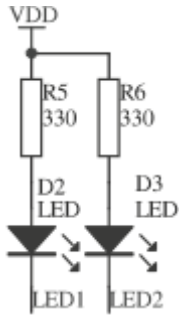
Joystick to microcontroller connection

Position	Microcontroller line
Up	PC0
Right	PC3
Botton	PC1
Left	PC2
Enter	PB5

# LEDs

ZL31ARM board is equipped with two LEDs (lit by low logic level).



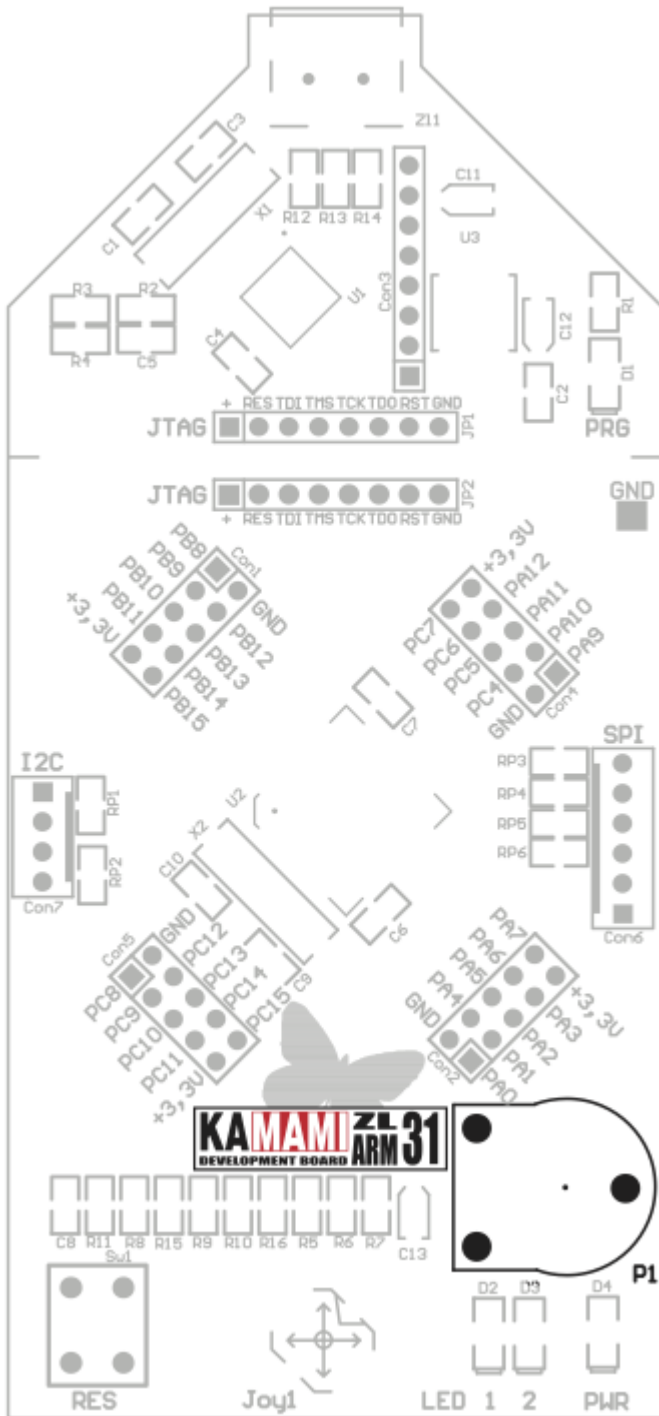


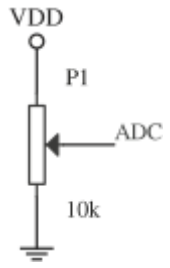
LED to microcontroller connection

Dioda	Microcontroller line
LED1	PB1
LED2	PB2

# Analog potentiometer

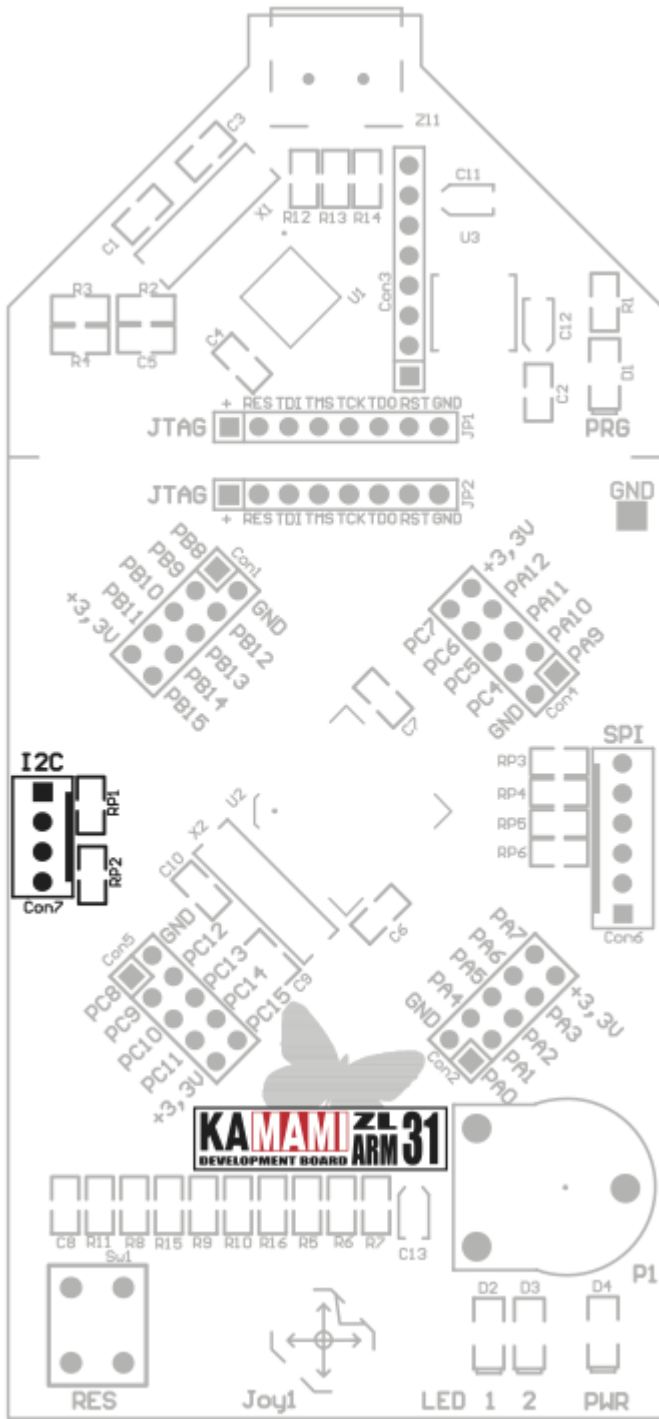
ZL31ARM board is equipped with P1 potentiometer, that controls voltage (0-3.3V) on microcontrollers ADC input (PB0 line).

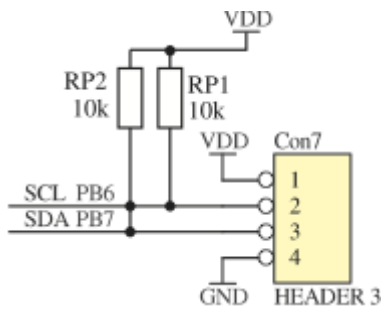




## I2C connector

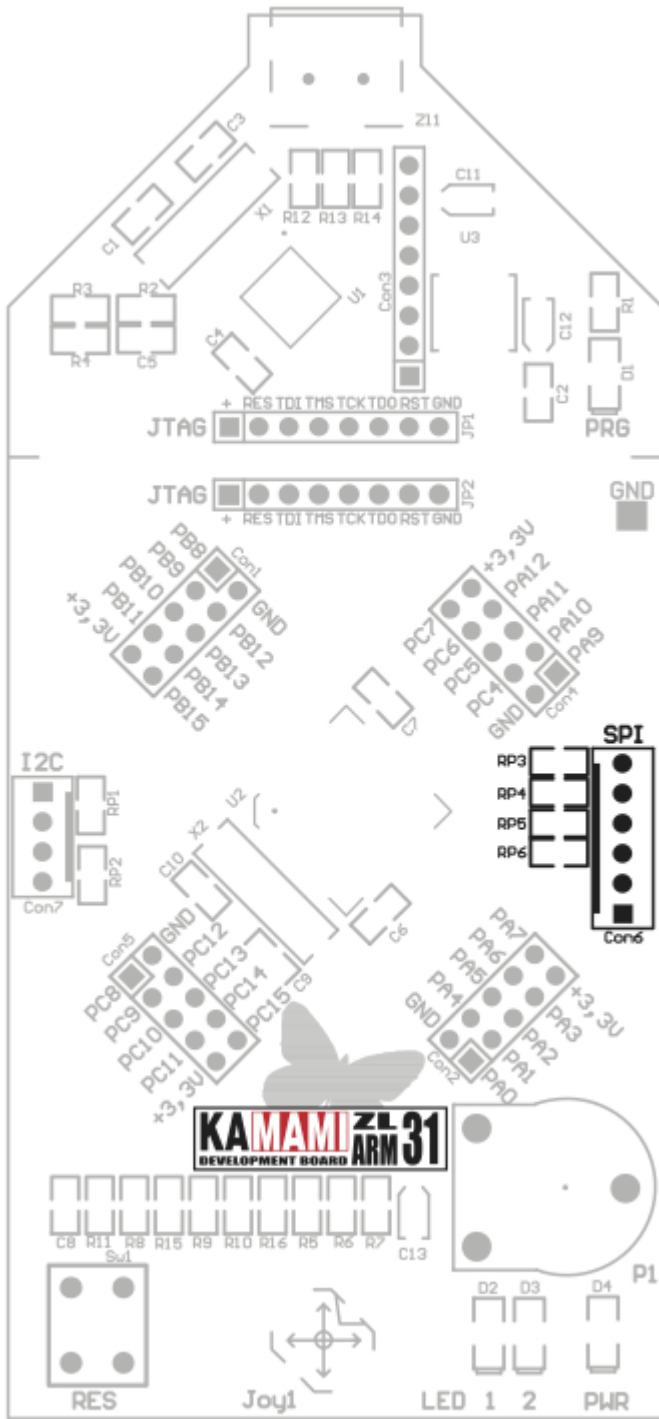
ZL31ARM has Con7/I2C connector for external devices with I2C bus. SDA (PB7) and SCL (PB6) lines have pull-up resistors.



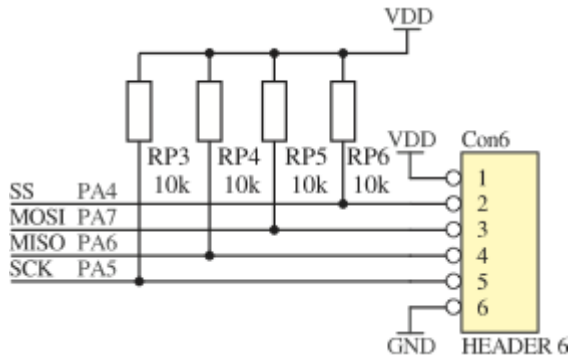


# SPI connector

ZL31ARM board is equipped with Con6/SPI connector for external devices with SPI bus. All SPI lines have pull-up resistors.





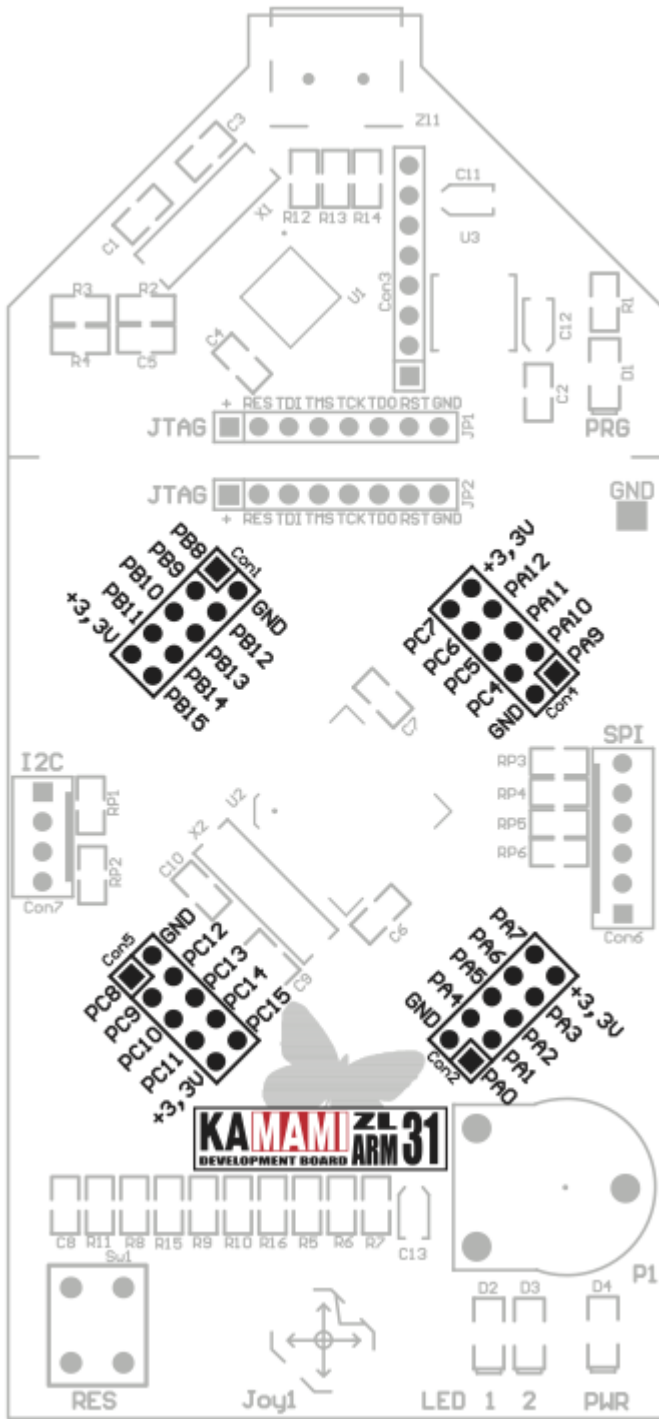


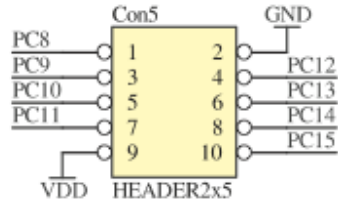
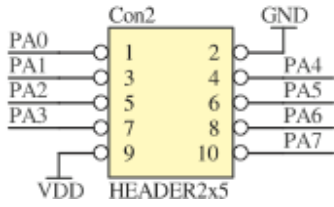
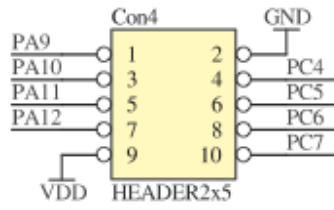
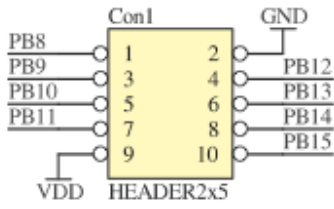
SPI lines are connected to the microcontroller as described below

SPI line	Microcontroller line
SS	PA4
MOSI	PA7
MISO	PA6
SCK	PA5

## I/O pin headers

Some I/O lines are connected to Con1, Con2, Con4 and Con5 pin headers. Every pin header has also +3.3V and GND pins.



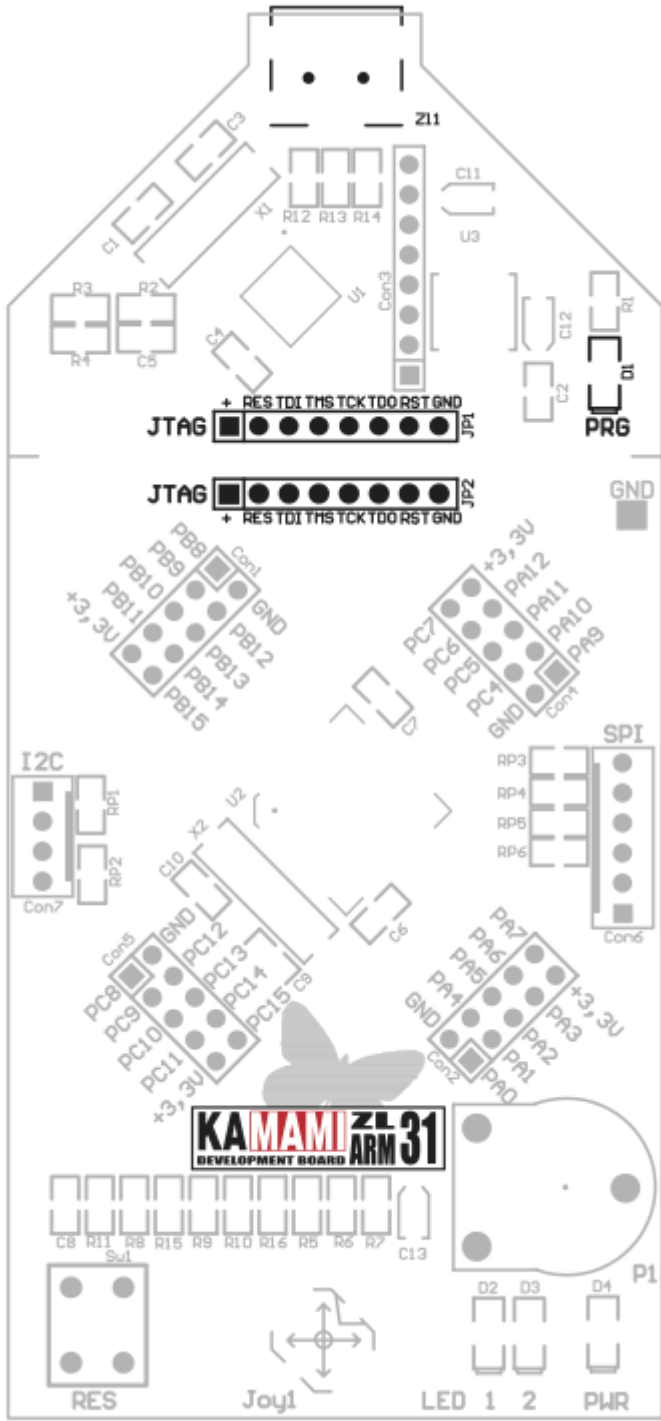


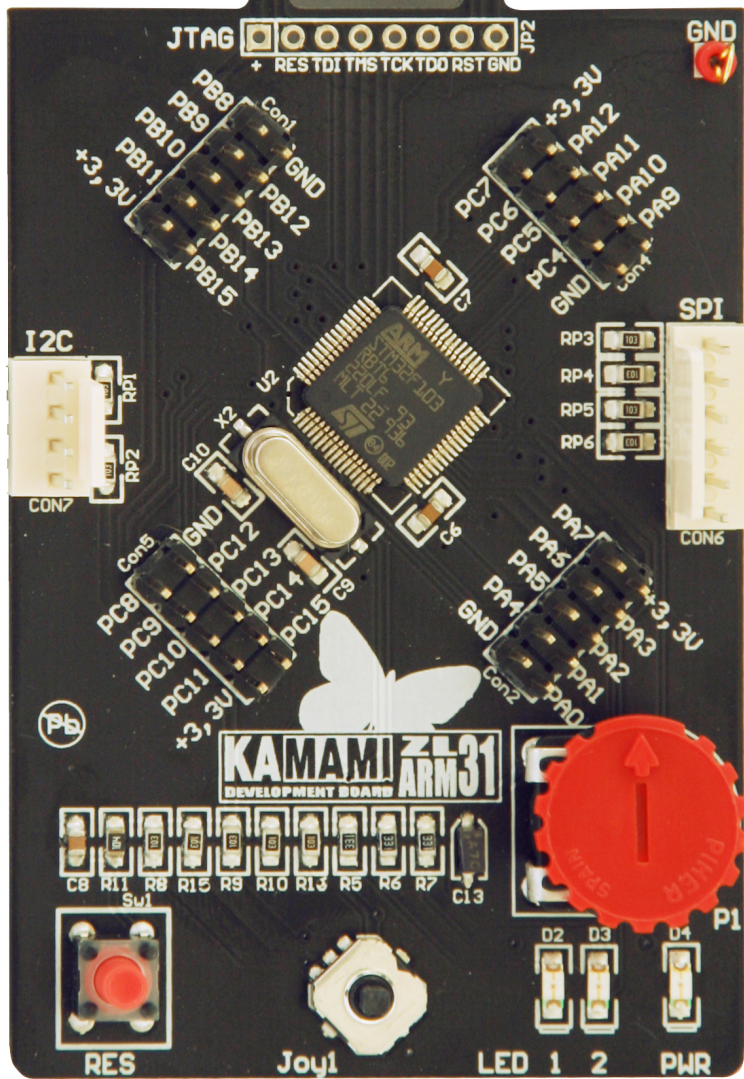
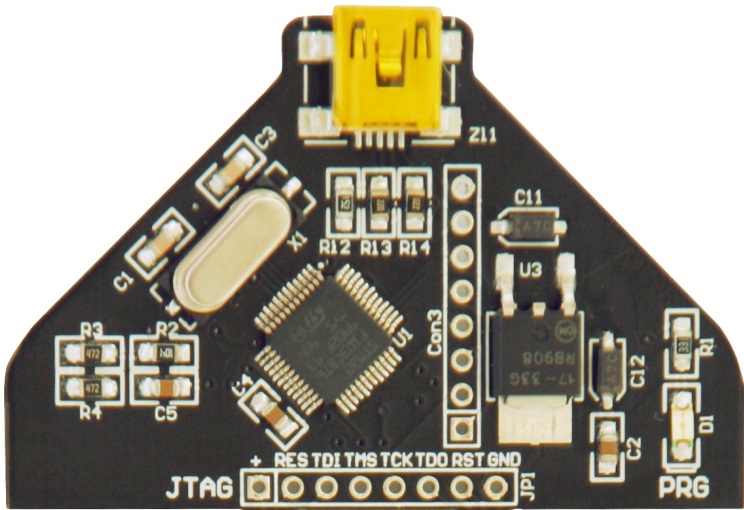
## Programmer/debugger (ST-Link)

Part of ZL31ARM is programmer/debugger with USB interface. Programmer is compatible with ST-Link by STM, it is supported by following IDEs:

- Keil  $\mu$ Vision
- IAR Embedded Workbench
- Atollic TrueSTUDIO
- STMicroelectronics STVP
- STMicroelectronics STM32 ST-Link Utility

Out of the box programmer is joined to evaluation board, but it can be broken off and used with other STM32 evaluation boards. To use programmer as separate device you need to equip it with JP1 pin header (1x6 pin) to connect it to programmed devices. Evaluation board can be equipped with JP2 pin header, that can be connected pin-to-pin to JP1. PRG LED indicates programming.







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