

## Altair - Specifications

### Summary

Microcontroller	ATmega256RFR2
Operating Voltage	3.3V
Input Voltage	4.4-15V
Digital I/O Pins	19 (8 with PWM output)
Analog Input Pins	8
DC current per I/O Pin	2-8 mA
Max. DC current for the 3.3V Pin	800 mA
Flash Memory (program)	256 KB
SRAM	32 KB
EEPROM	8 KB
Clock Speed	16 MHz

### Power

Altair can be powered with a source between 4.4V and 15V (like a USB port or a 9V Battery), connecting it to the VIN pin in the serial programming connector, or with a regulated source from 1.8 to 3.3V directly connected to the 3.3V pin.

The power pins are:

- VIN: Unregulated external power input. The integrated regulator supports inputs between 4.4V and 15V, and outputs 3.3V at maximum 800mA.
- 3.3V: Internal 3.3V regulator output.
- GND: Ground pins.

### Communication

- 2.4GHz Wireless using 802.15.4 standard
- EUI-64 unique address
- 2 UART Serial interfaces
- I2C
- SPI

### Inputs and Outputs

Pins 0 to 19 can be used as digital inputs or outputs with `pinMode()`, `digitalWrite()` and `digitalRead()` functions. These pins operate at 3.3V and have configurable internal pull-up resistors (disabled by default). Pins 9 to 15 and 19 can be used as PWM outputs via the `analogWrite()` function.

Pins A0 to A7 can be used as analog signal inputs using the `analogRead()` function. They can also be used as digital pins.

Analog pins use an internal 10-bit analog to digital converter (can output values from 0 to 1023). By default, they can take signals from 0 and 1.8V, however, the upper value can be changed via the AREF pin and the `analogReference()` function.

Special function pins:

- I2C Communication:

  - SCL (pin 0)

  - SDA (pin 1)

- SPI Communication:

  - MOSI, MISO and SCK in ICSP header.

- Serial Communication:

  - RX0 and TX0 in serial programming header

  - RX1 and TX1 in pins 2 and 3

The board has the following integrated devices:

- RGB LED: Multi-color Led, connected to pins 13 (Red), 14 (Green) and 15 (Blue). You can change the color by varying the intensity of each pin with the `analogWrite()` function.

- Push Button: General purpose button. It's connected to pin 33 (no external pin). You can check if it's pressed or not via the `digitalRead()` function (active low).

- Reset Button: Connected to the reset pin of the microcontroller. Resets the board.

- Serial Programming Header: For connecting the USB-Serial adaptor and programming the board. It has the following inputs: GND, VIN, RX0 and TX0.

- ICSP Programming Header: For low level programming of the microcontroller (example: modifying the Bootloader).

- AT24MAC602 address chip: Contains the EUI-64 unique address of the board (similar to the MAC Address of your PC), used for wireless communication.

## Programming

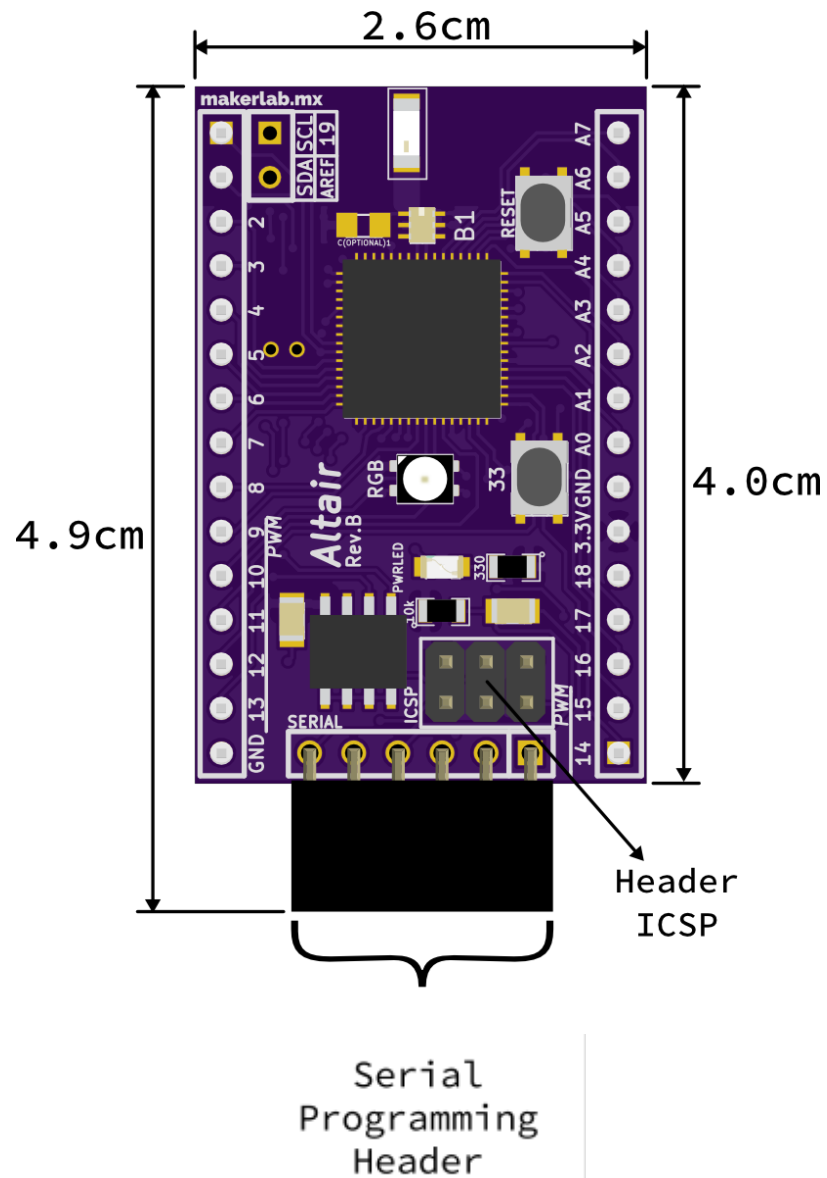
Programming is achieved by connecting the Altair to a PC through an USB to Serial adaptor (like USB-Serial from makerlab, FTDI Friend from Adafruit or compatible) via the serial programming connector.

Once it's connected to the PC, it can be programmed from the Arduino IDE or from the Atmel gcc toolchain and avrdude.

## Physical Dimensions

The Altair PCB measures 2.6cm x 4cm. With the serial programming connector, the dimensions are 2.6cm x 4.9 cm.

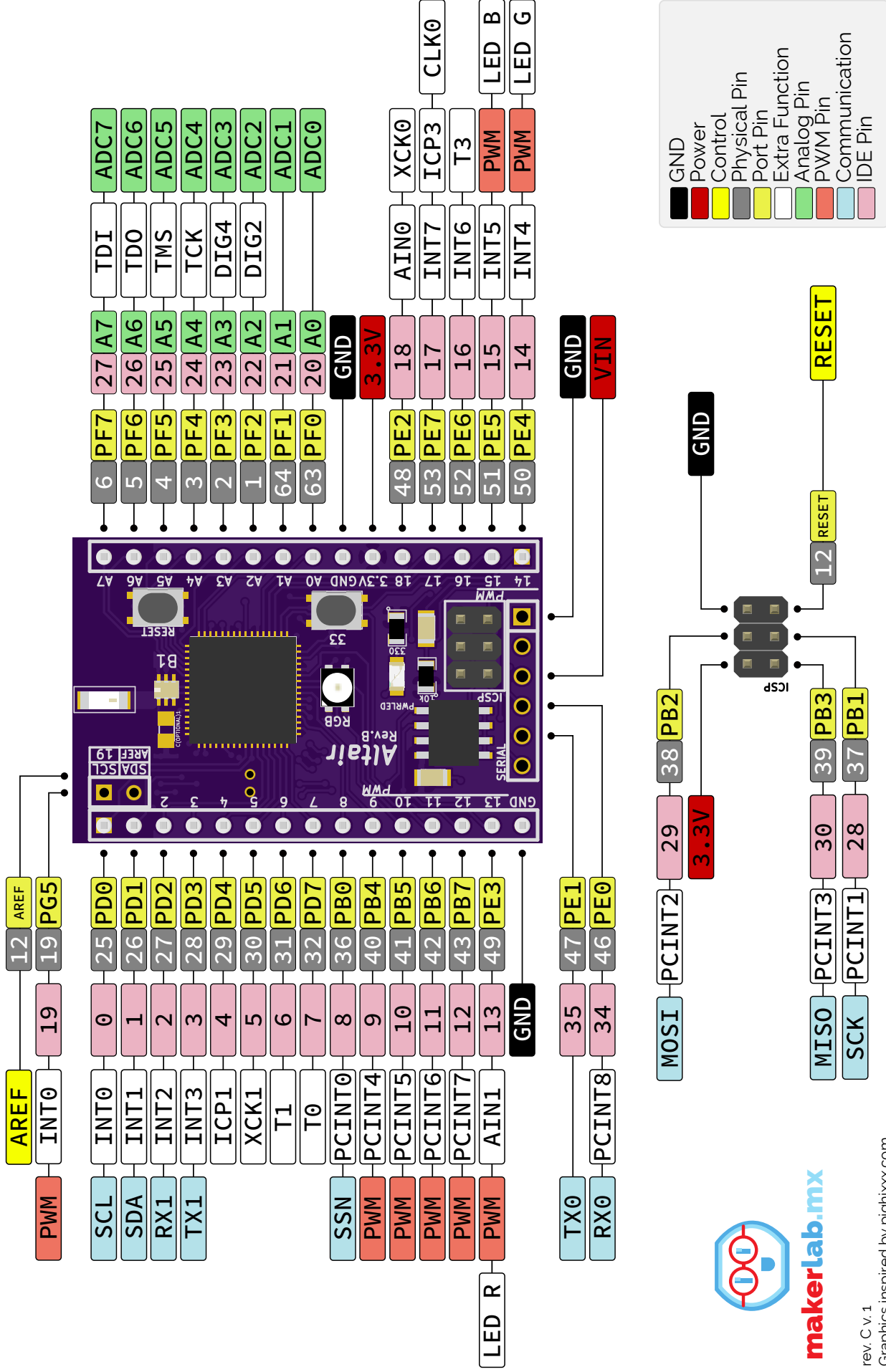
The pins are designed for fitting in a standard breadboard with 2.54mm spacing.



# Altair

## PINOUT DIAGRAM

# AQUILA



makerlab.mx

rev. C v. 1  
Graphics inspired by pighixx.com