Crumbuino-Nano Infosheet

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Crumbuino-Nano

Arduino-compatible OEM module with ATmega328 controller and CP2102 USB UART converter.
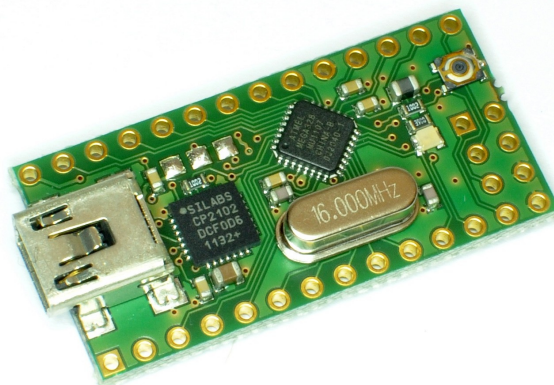
AVAILABLE OPTIONS

Module	Processor	RAM	EEPROM	Flash	Peripherals
Crumbuino-Nano	ATmega328	2kB SRAM	1kB EEPROM	32kB Flash	- CP2102 USB-UART converter - mini USB B 5pin connector - status LED and tiny reset button

ARDUINO BOOTLOADER

The Crumbuino-Nano module comes preloaded with the Arduino ATmega328 bootloader. Also actived is the auto-reset function, providing a seamless integration to the Arduino IDE for uploading of a program without the need to reset the module in advance.

AUTO RESET FEATURE

Jumper J1 (on the bottom of the module) is closed by default, thus enabling the automatic reset of the ATmega328 by the Arduino IDE before connecting the bootloader and upload a program.

USB INTERFACE

A USB UART converter CP2102 by Silabs is connected to the MCU's USART RXD/PD0 and TXD/PD1. A standard 5pin mini USB B connector is available onboard and allows for easy connection to a host PC. The CP2102 is always powered from USB bus.

POWER SUPPLY OPTIONS

The module can be power either externally (VCC pin on the expansion headers) or from USB bus 5V or from the CP2102's internal 3.3V regulator.

J2 selects between these options:
- open: external power supply (1.8V – 5.5V)
- 1-2: USB bus powered (approx. 5V)
- 2-3: CP2102 3.3V powered

If you add external components in case of USB power supply, make sure to stay within the allowed current consumption for USB powered devices (100mA/500mA)! When powering from CP2102 3.3V regulator, a maximum current of 100mA may be drawn. Please read the CP2102 data sheet on maximum power dissipation of the CP2102 and requirements on power consumption from the USB bus!!!
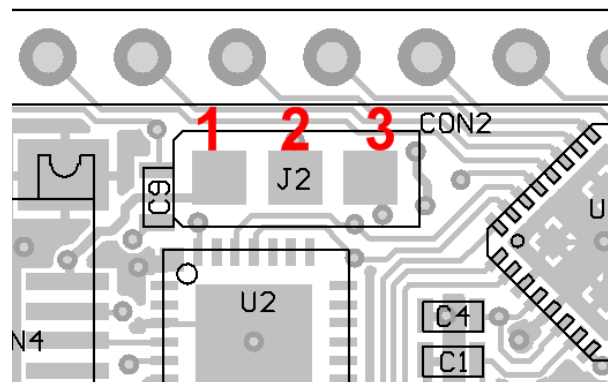
RESET BUTTON

A tiny reset button is available to force a manual reset of the MCU. A 10kOhm pullup resistor is connected to the MCU's reset signal to make it less susceptible to EMI, than with just the MCU-internal pullup resistor.

STATUS LED

A green low-current status LED is connected low-active to the Arduino Pin 10, corresponding to MCU's signal PB2. Setting this pin to output and low will turn on the LED.
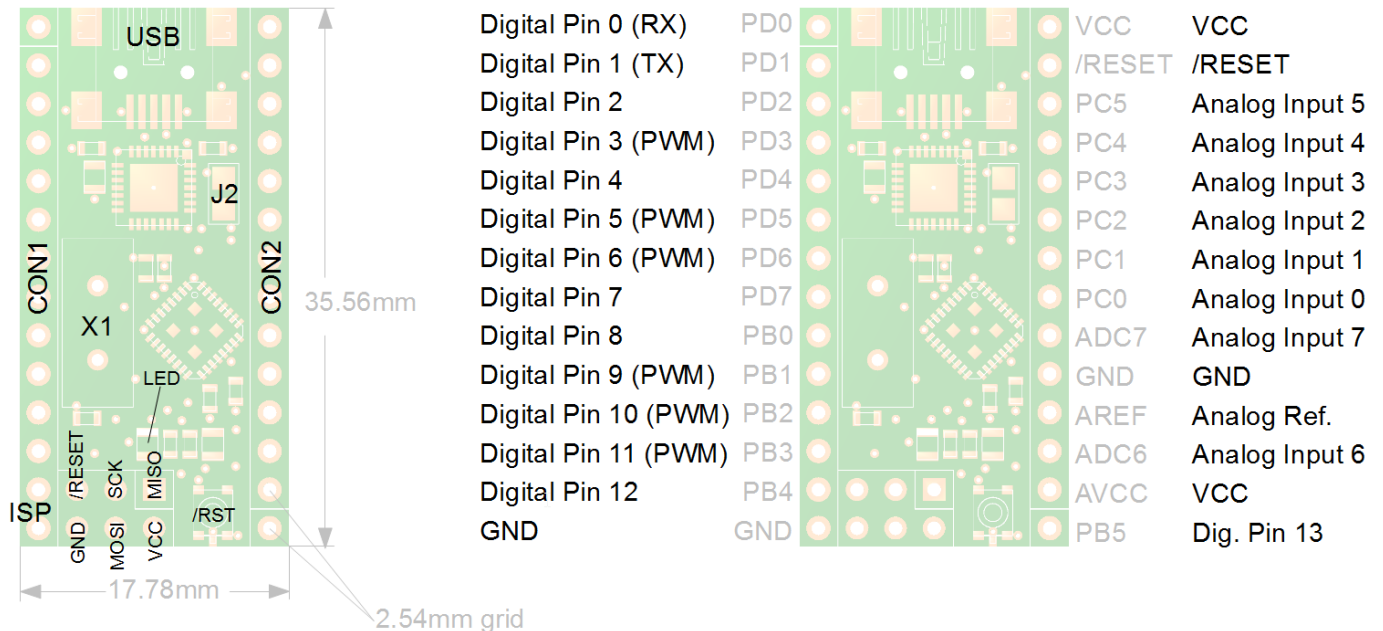
ISP CONNECTOR

An ISP header with Atmel's standard 6-pin pinout is available on the module, see pictures below for location and pinout.

EXPANSION CONNECTORS

Two 14 pin headers provide all free MCU signals.

PIN CONFIGURATION AND DIMENSIONS

The picture on the right shows the pin names in Arduino environment (black) as well as the original ATmega328 pin names (grey).

Digital Pin 0 (RX)	PD0	VCC	VCC
Digital Pin 1 (TX)	PD1	/RESET	/RESET
Digital Pin 2	PD2	PC5	Analog Input 5
Digital Pin 3 (PWM)	PD3	PC4	Analog Input 4
Digital Pin 4	PD4	PC3	Analog Input 3
Digital Pin 5 (PWM)	PD5	PC2	Analog Input 2
Digital Pin 6 (PWM)	PD6	PC1	Analog Input 1
Digital Pin 7	PD7	PC0	Analog Input 0
Digital Pin 8	PB0	ADC7	Analog Input 7
Digital Pin 9 (PWM)	PB1	GND	GND
Digital Pin 10 (PWM)	PB2	AREF	Analog Ref.
Digital Pin 11 (PWM)	PB3	ADC6	Analog Input 6
Digital Pin 12	PB4	AVCC	VCC
GND	GND	PB5	Dig. Pin 13

Board labels: USB, J2, CON1, CON2, X1, LED, ISP, /RESET, SCK, MISO, GND, MOSI, VCC, /RST
Dimensions: 35.56mm, 17.78mm, 2.54mm grid

Note: J2 has three pads on V2.3! See section "Power Supply Options"

DESIGN AND HANDLING GUIDELINES

This module – just like any other semiconductor devices – is susceptible to damage by ESD. Suitable precautions should be taken when handling and transporting devices. The possible damage to devices depends on the circumstances of the handling and transporting, and the nature of the device. The extent of damage can vary from immediate functional or parametric malfunction to degradation of function or performance in use over time. Devices suspected of being affected should be replaced.

OPERATING CHARACTERISTICS

Symbol	Parameter	Condition	Min	Typ	Max	Units
Vcc	Supply Voltage	16 MHz	4.5		5.5	V
Icc	Power Supply Current *(Icc strongly depends on CPU activity, like frequency, power saving modes, etc. as well as external circuitry, io pin input and output current, etc. The values denoted here are for reference only and can differ from final application vallues.)*	Active 16MHz Vcc = 5V		10		mA
		USB bus active *(power is drawn from USB bus)*		+20		mA
T	Operating Temperature *(industrial temperature range on request)*		-20		+70	°C

SCOPE OF DELIVERY

This module is being shipped with preloaded Arduino bootloader, mounted 16MHz crystal and a set of headers/receptacles (each 2x 16 pin + ISP header) added to the module separately (not mounted).

DEVELOPMENT TOOLS

As an Arduino-compatible module, the Crumbuino-Mega is indendet to be used with the Arduino IDE as development environment.

– Arduino Homepage: http://arduino.cc/en/
– Getting Started Page: http://arduino.cc/en/Guide/HomePage
– Arduino Software Page: http://arduino.cc/en/Main/Software

– chip45 Arduino Extensions: http://download.chip45.com/chip45-arduino-extension.zip

– Crumbuino-Nano LED blink example sketch: http://download.chip45.com/Blink_Crumbuino-Nano.zip

WHAT ELSE DO YOU NEED?

The only thing you really need, is a USB cable to connect the Crumbuino-Mega to a PC or Mac:

– Cable mini-USB-B to USB-A: http://go.chip45.com/KAB-USB-A-miniB-1.5

Declaration of Electro Magnetic Conformity of the

CHIP45 „Crumbuino-Nano"

CHIP45 embedded microcontroller modules (henceforce products) are designed for installation in electrical appliances or as dedicated evaluation boards (i.e.: for use as a test and prototype platform for hardware/software development) in laboratory environments.

Caution:

CHIP45 products lacking protective enclosures are subject to damage by ESD and, hence, may only be unpacked, handled or operated in environments in which sufficient precautionary measures have been taken in respect to ESD-dangers. It is also necessary that only appropriately trained personnel (such as electricians, technicians and engineers) handle and/or operate these products. Moreover, CHIP45 products should not be operated without protection circuitry if connections to the product's pin header rows are longer than 3m.

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Implementation of CHIP45 products into target devices, as well as user modifications and extensions of CHIP45 products, is subject to renewed establishment of conformity to, and certification of, Electro Magnetic Directives. Users should ensure conformance following any modifications to the products as well as implementation of the products into target systems

DISCLAIMER

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