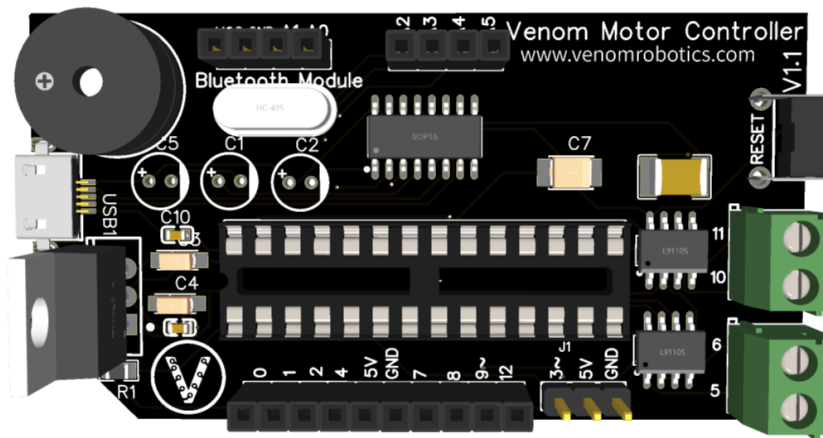




# VENOM

—R O B O T I C S—

## Venom Motor Controller V1.1 Datasheet



### Description

The Venom Motor Controller (VMC) is the perfect board to get familiar with Robotics and Electronics. This versatile microcontroller is equipped with the well-known ATmega328P and the common CH340G Serial Chip. VMC has 2 built-in motor controllers, a built-in buzzer, a servo port and a bluetooth port. Allowing you to easily downsize RC and robotic projects. This board will provide you a path into robotics and allow you to progress to more advanced practices.



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# **Features**

## **ATMega328P Processor**

### Memory

- AVR CPU at up to 16 MHz
- 32KB Flash
- 2KB SRAM
- 1KB EEPROM

### Security

- Power On Reset (POR)
- Brown Out Detection (BOD)

### Peripherals

- 2x 8-bit Timer/Counter with a dedicated period register and compare channels
- 1x 16-bit Timer/Counter with a dedicated period register, input capture and compare channels
- 1x USART with fractional baud rate generator and start-of-frame detection
- 1x controller/peripheral Serial Peripheral Interface (SPI)
- 1x Dual mode controller/peripheral I2C 1x Analog Comparator (AC) with a scalable reference input
- Watchdog Timer with separate on-chip oscillator
- Six PWM channels
- Interrupt and wake-up on pin change.

### Unique Features

- 2 x Built in Motor Controllers
- A servo port
- A built in buzzer and a bluetooth slot



# **The Board**

## *Application Examples*

The VMC board is the first product of Venom Robotics. This development board is incredibly easy to begin programming and start doing robotics projects. The board can be used to make anything from a bluetooth RC car to an intelligent robot.

## *First entry to electronics:*

If this is your first project with coding and electronics, this board can be programmed and used like an Arduino. It is equipped with the well-known ATmega328P processor, 14 digital input/output pins, 6 analog inputs, USB connections and a reset button. This board includes everything you will need for a great experience with Robotics and Development Boards .

## *Education purposes:*

The board is adept to introduce students into the world of motors and robotics, a simple bluetooth remote control car script will be available to download from our [website](#) upon the official release of the Venom Robotics Motor Controller along with CAD files for a baseplate.



# Ratings

## Recommended Operating Conditions

Symbol	Description	Min	Max
	Conservative thermal limits for the whole board:	-40 °C (-40°F)	85 °C ( 185°F)

**NOTE:** In extreme temperatures, EEPROM, voltage regulator, and the crystal oscillator, might not work as expected due to the extreme temperature conditions

## Power Consumption

Symbol	Description	Min	Typ	Max	Unit
VINMax	Maximum input voltage from VIN pad	6	-	20	V
VUSBMax	Maximum input voltage from USB connector		-	5.5	V
PMax	Maximum Power Consumption	-	-	xx	mA

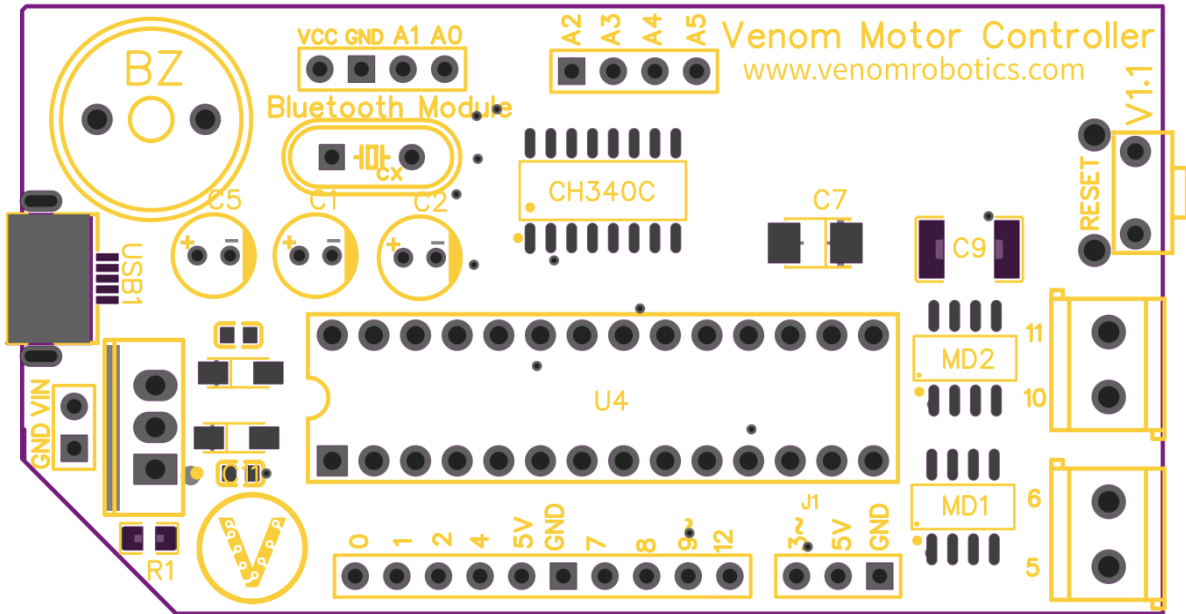
## Processor

The Main Processor is an ATmega328P running at up to 20 MHz. Most of its pins are connected to the external headers, however some are reserved for internal communication with the USB Bridge coprocessor.



# Functional Overview

## Board Topology



Ref.	Description	Ref.	Description
USB1	Micro USB Connector	CH340C	USB - Serial Module
C7	CA45-B-25V-10uF-K	C1	UVR1H0R1MDD 0.1UF
C2	UVR1H0R1MDD 0.1UF	BZ	Piezzo Buzzer
C5	UVR1H0R1MDD 0.1UF	MD1	L9110S_C725793 Motor Driver
U4	ATMEGA328P Module	MD2	L9110S_C725793 Motor Driver
CX	TAITIEN Elec XIHCELNANF-16MHZ		



# **Board Operation**

The following section was taken from the Arduino Uno Datasheet as the VMC uses the arduino bootloader and is coded in an identical fashion.

## **1.1 Getting Started - IDE**

If you want to program your Arduino UNO while offline you need to install the Arduino Desktop IDE [1] To connect the Arduino UNO to your computer, you'll need a Micro-B USB cable. This also provides power to the board, as indicated by the LED.

## **1.2 Getting Started - Arduino Web Editor**

All Arduino boards, including this one, work out-of-the-box on the Arduino Web Editor [2], by just installing a simple plugin.

The Arduino Web Editor is hosted online, therefore it will always be up-to-date with the latest features and support for all boards. Follow **[3]** to start coding on the browser and upload your sketches onto your board.

## **1.3 Getting Started - Arduino IoT Cloud**

All Arduino IoT enabled products are supported on Arduino IoT Cloud which allows you to Log, graph and analyse sensor data, trigger events, and automate your home or business.

## **1.4 Sample Sketches**

Sample sketches for the Arduino XXX can be found either in the “Examples” menu in the Arduino IDE or in the “Documentation” section of the Arduino Pro website [4]



### 1.5 Online Resources

Now that you have gone through the basics of what you can do with the board you can explore the endless possibilities it provides by checking exciting projects on ProjectHub [5], the Arduino Library Reference [6] and the online store [7] where you will be able to complement your board with sensors, actuators and more

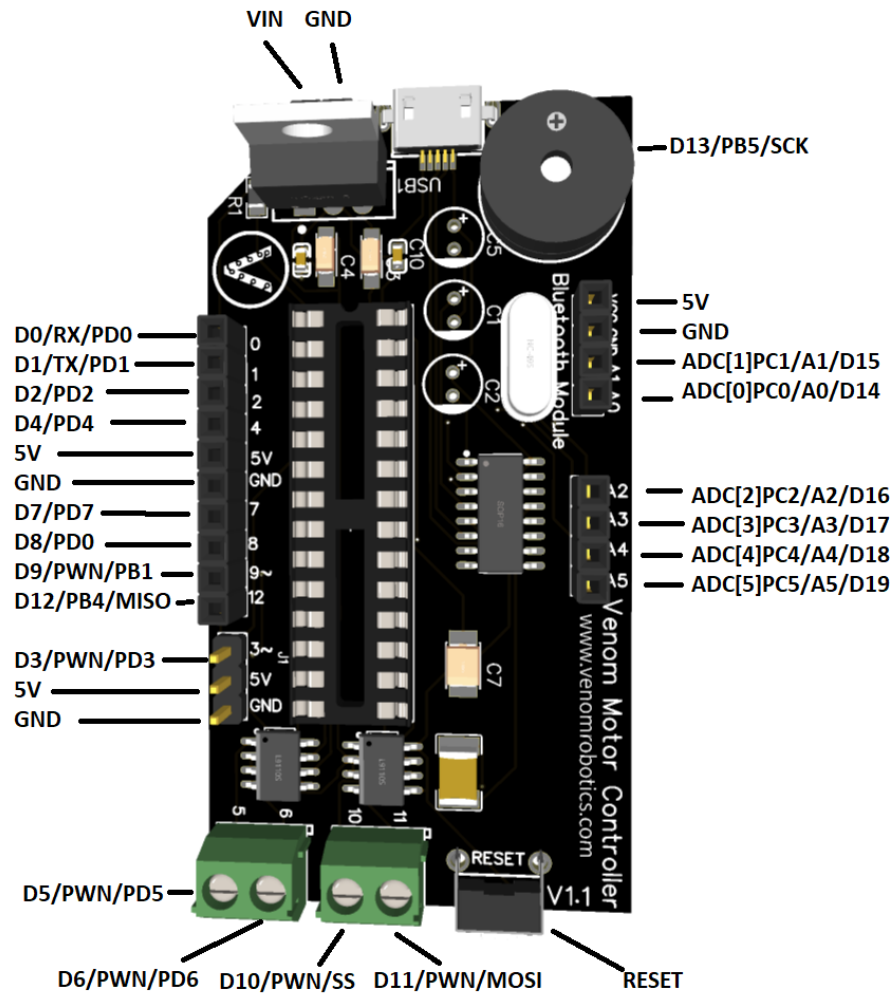
### 1.6 Board Recovery

All Arduino boards have a built-in bootloader which allows flashing the board via USB. In case a sketch locks up the processor and the board is not reachable anymore via USB it is possible to enter bootloader mode by double- tapping the reset button right after power up.





# Venom Motor Controller Pinout





## ANALOG

	Function	Type	Description
	NC	NC	Not connected
	IOREF	IOREF	Reference for digital logic V - connected to 5V
	Reset	Reset	Reset
	+5V	Power	+5V Power Rail
	GND	Power	Ground
	GND	Power	Ground
	VIN	Power	Voltage Input
	A0	Analog/GPIO	Analog input 0 /GPIO
	A1	Analog/GPIO	Analog input 1 /GPIO
	A2	Analog/GPIO	Analog input 2 /GPIO
	A3	Analog/GPIO	Analog input 3 /GPIO



	A4/SDA	Analog input/I2C	Analog input 4/I2C Data line
	A5/SCL	Analog input/I2C	Analog input 5/I2C Clock line

### DIGITAL

	Function	Type	Description
	D0	Digital/GPIO	Digital pin 0/GPIO
	D1	Digital/GPIO	Digital pin 1/GPIO
	D2	Digital/GPIO	Digital pin 2/GPIO
	D3	Digital/GPIO	Digital pin 3/GPIO
	D4	Digital/GPIO	Digital pin 4/GPIO
	D5	Digital/GPIO	Digital pin 5/GPIO/MotorController
	D6	Digital/GPIO	Digital pin 6/MotorController
	D7	Digital/GPIO	Digital pin 7/GPIO
	D8	Digital/GPIO	Digital pin 8/GPIO



	D9	Digital/GPIO	Digital pin 9/GPIO
	SS/D10	Digital	SPI Chip Select/MotorController
	MOSI/D11	Digital	SPI1 Main Out Secondary In/MotorController
	MISO/D12	Digital	SPI Main In Secondary Out
	SCK/D13	Digital	SPI serial clock output/Buzzer
	GND	Power	Ground
	AREF	Digital	Analog reference voltage



## Reference Documentation

Reference	Link
Arduino IDE (Desktop)	<a href="https://www.arduino.cc/en/Main/Software">https://www.arduino.cc/en/Main/Software</a>
Arduino IDE (Cloud)	<a href="https://create.arduino.cc/editor">https://create.arduino.cc/editor</a>
Cloud IDE Getting Started	<a href="https://create.arduino.cc/projecthub/Arduino_Genuino/getting-started-with-arduino-web-editor-4b3e4a">https://create.arduino.cc/projecthub/Arduino_Genuino/getting-started-with-arduino-web-editor-4b3e4a</a>
Arduino Pro Website	<a href="https://www.arduino.cc/pro">https://www.arduino.cc/pro</a>
Project Hub	<a href="https://create.arduino.cc/projecthub?by=part&amp;part_id=11332&amp;sort=trending">https://create.arduino.cc/projecthub?by=part&amp;part_id=11332&amp;sort=trending</a>
Library Reference	<a href="https://www.arduino.cc/reference/en/">https://www.arduino.cc/reference/en/</a>
Online Store	<a href="https://store.arduino.cc/">https://store.arduino.cc/</a>

## Revision History

Date	Revision	Changes
21/05/2021	1	Datasheet release