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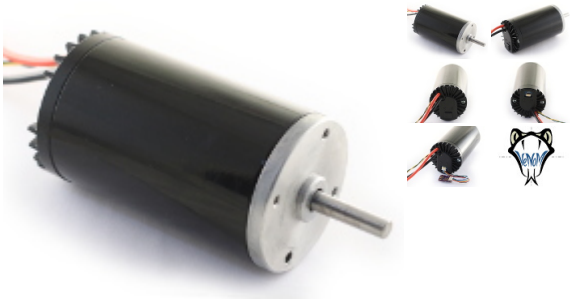
Venom 12V High Torque DC Motor with Integrated CAN Bus and PWM Controller



SKU: BDC-10001 **64** In stock

Price (ea)	Quantity
$119.95	1+

Higher Qty: Contact for quote

Option: New

Qty 1 Add to Cart

Description

Venom is a brushed DC motor based on the original 2.5" CIM, which has been used by FIRST Robotics Competition teams for the past 18 years. The traditional CIM is a "dumb" motor, requiring a suite of external controllers and sensors. Venom integrates all of these functions into a single, compact package.

So how "smart" is Venom? Speed, current, temperature, and position are all measured onboard, enabling advanced control modes without complicated sensing and wiring schemes. This includes proportional duty cycle and voltage control, closed-loop current (torque), speed, and servo (position) control, follow-the-leader, and motion profiling controls. There are also external inputs for limit switches and an analog signal. All of these features are accessed via the CAN (Controller Area Network) interface, which is designed for FRC communication. WPILib compatible libraries for LabVIEW, C++, and Java are provided.

Venom was designed for convenience and simplicity. The motor controller and speed encoder were designed around the CIM (its rear bearing actually). There are no concerns about mechanical compatibility between third party sensors. There are no calculations required to convert encoder counts into speed. All motor parameters are presented in native engineering units (speed in RPM, voltage in Volts, position in rotations, current in Amps, etc.).

For teams which prefer to avoid CAN communication, Venom may be controlled through a PWM signal.

Venom was designed for competition. Onboard thermal management protects the CIM and integrated controller from excessive duty cycles at high load. A rear-facing LED provides diagnostic trouble codes to help quickly diagnose issues. The integrated design allows the entire motor, controller, and sensor package to be replaced as a single compact assembly.

In addition to the “smart” upgrades, we’ve also made the CIM stronger. Front and rear bushings have been upgraded to ball bearings to reduce friction, increase efficiency and extend battery life. The wiring was also upgraded from 14 ga external wiring for 12 ga high-strand. These power lines are more flexible than the stock motor and serve to further increase electrical efficiency. A die-cast aluminum endplate protects the internal electronics and serves as an integrated heatsink.

Features

- Integrated smart controller
- Internal velocity/position sensing including signed speed output
- Front and rear ball bearings
- 12-ga flexible power connections
- Die cast rear endplate with integrated heatsink
- Onboard temperature sensing
- Onboard electrical current sensing
- CAN interface (1Mbps)
- PWM input (shared with CAN line)
- External header for limit switches, analog input

Control Modes

- Proportional duty cycle
- Proportional voltage
- Closed-loop current control
- Closed-loop velocity control
- Closed-loop position control
- True s-curve trajectory planning in velocity control mode
- Trapezoidal trajectory planning in position control mode
- Configurable PID gains including feedforward terms
- Motion profiling
- Configurable brake / coast
- "Follower" (of other Venom devices)

Other Integrated Controls / Software Features

- Thermal management / power limiting
- Resettable odometer (since power-up)
- Bi-color status LED to report connection status and internal errors
- Configurable CAN ID. Up to 63 devices supported on a single bus
- Unique Serial Number accessible via CAN
- CAN-updateable firmware

Venom price comparison

	Venom	CTRE/VEX Robotics Talon SRX	CTRE/VEX Robotics Falcon 500	Rev Robotics Neo 550
Motor	Integrated Smart Motor: $100-120	CIM: $33	Falcon 500: $140	NEO: $40
Smart Controller	integrated: $0 extra	Talon SRX: $90	Talon FX: integrated	REV SparkMax: $75
Encoder	integrated: $0 extra	External: $40+	integrated: $0 extra	integrated: $0 extra
Total Cost	$100/ea as a 5-pack	$163	$140	$115

	Upgrade My CIM!!!	Talon SRX w/ CIM
CIM Motor	Already owned: $0	Already owned: $0
Smart Controller	Venom Upgrade: $70-75	SRX: $90
Encoder	integrated: $0 extra	External: $40+
Cabling	not needed: $0 extra	$12+
Total Cost	$69.95/ea as at qty 6+	$142

Videos

Dual Venom Ball Shooter With Follower Mode for 2020 FRC Game

Related Files

bdc10001_3d_model.step	3D Model
bdc10001_drawing.pdf	Mounting Dimensions
bdc10001_frc_usermanual_r03.pdf	Venom FRC User Manual
playing_with_fusion_lib_for_frc-2022.1.3.1.vip	FRC LabView Library for 2022 roboRIO image
libPlayingWithFusionDriver.so	libPlayingWithFusionDriver version 2022.00.22 for 2022 roboRIO image
PlayingWithFusionLibrary2021.02.24.zip	FRC Library for 2021 roboRIO image
PlayingWithFusionLibrary2022.01.03.zip	FRC Library for 2022 beta roboRIO image
PlayingWithFusionLibrary2022.01.12.zip	FRC Library for 2022 roboRIO image

Tech Articles and External Links

FRC Software library Installation	Installation instructions for the Playing with Fusion device support library for the FRC roboRIO.
2022 C++ API Documentation	FRC API documentation for Playing With Fusion sensors and actuators
2022 Java API Documentation	FRC API documentation for Playing With Fusion sensors and actuators

Related Products

Venom Upgrade with Core

HUSKIE 2.0 roboRIO MXP

CANstar 4-Drop

Venom 6-pin Limit Switch and Analog Breakout

CANstar 2-Drop

Expansion Board