

## DIGITAL SERVO & STEPPER DRIVE IONI

IONI is a digital motor drive designed for driving AC/BLDC and DC servo motors and steppers. IONI allows controlling motors in all three operating modes: position control, velocity control and torque control. Applications of such control methods include.

- Position control, such as CNC, machine automation and 3D printing
- Velocity control, such as spindles or feeders
- Force / torque control, such as winding applications or racing simulator wheels



Encoder  
feedback



SinCos  
feedback



Analog & Digital  
setpoint inputs



SimpleMotion  
field bus



AC / BLDC  
servo motors



Brush DC  
servo motors



Stepping  
motors



85-250 VAC  
power



Safety  
integrated



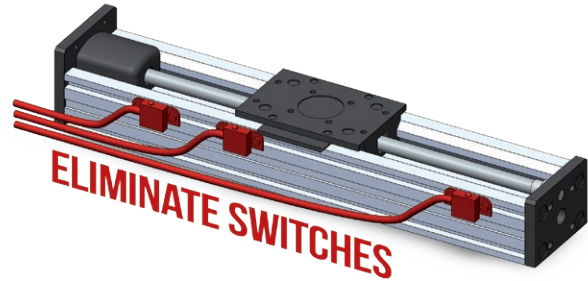
Homing  
function



# REMARKABLE TIME SAVER

## SENSORLESS HOMING

IONI's internal hard-stop homing function may be enabled to drive axis precisely to a reference point and sets soft travel limits without the need of any kind of sensors or switches thus eliminating many electromechanical parts and cabling on each axis. The homing function supports also the traditional sensor based operation.



## INTEGRATED SAFETY

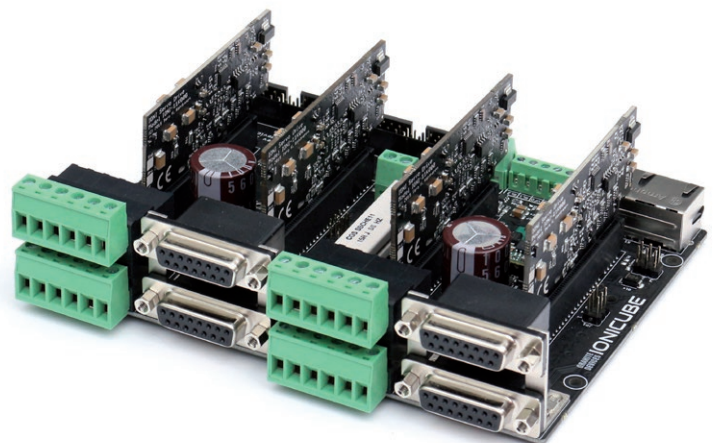
Building effective safety stopping functionality inside the drive has been one of the key points from the very beginning of the drive development. IONI features a safe torque off (STO) combined with configurable dynamic braking eliminating the need of external safety relays and components for emergency stopping.

## STREAMLINED SETUP

All historical payload of drive configuration habits were discarded while designing the new way of drive configuration software – Granity. By the means of the modern and robust set-up and servo tuning software, a servo axis can be fully set-up in minutes. A variety of online tutorials and examples are aimed to minimize the commissioning time.

## EMBED IN YOUR PROJECT OR KICKSTART WITH IONICUBE

IONICUBE motherboards carry up to four IONI drives and provide time saving interfacing between the drives and motors. IONICUBE allows chaining up to 32 axis on a single SimpleMotion field bus. In addition to this, the card-edge interface of IONI is openly documented to allow application specific motherboard designs.



# ONE DRIVE TO RULE THEM ALL

As making servo motors are not Granite Device's core business, we are allowed to assign a full concentration to the drives. IONI supports more than 90 percents of industrial servo motors in the market ranging from 5W to 500W, and most of stepping motors – all in the single drive model thanks to high dynamic range torque control (HDRT). With HDRT, IONI is capable of delivering an exceptional 14 bit torque precision over the full power range.

# PLETHORA OF SETPOINT & FEEDBACK OPTIONS

IONI drives have all-inclusive support for all major setpoint & feedback device in the one and only drive model. The flexible feedback device interface reads standard quadrature encoders, high precision analog Sin/Cos encoders as well as serial encoders.

Freedom of choice is present also in setpoint, or reference, signal sources – user may choose between de facto analog and digital sources as well as open source GPL licensed SimpleMotion V2 fieldbus suitable from low power microcontrollers to real-time PC's.

## IONI SPECIFICATIONS

General	SUPPORTED MOTORS	<ul style="list-style-type: none"> <li>AC</li> <li>BLDC</li> <li>DC</li> <li>Linear</li> <li>Stepping motor</li> </ul>
	CONTROL MODES	<ul style="list-style-type: none"> <li>Torque</li> <li>Velocity</li> <li>Position</li> </ul>
	SETPOINT CONTROL	<ul style="list-style-type: none"> <li>Direct (immediate)</li> <li>Internal motion profiler (point-to-point)</li> <li>Buffered trajectory points (arbitrary multiaxis trajectory)</li> </ul>
	SETPOINT SOURCES <sup>1</sup>	<ul style="list-style-type: none"> <li>Analog</li> <li>Pulse &amp; direction</li> <li>Quadrature</li> <li>PWM</li> <li>SimpleMotion V2 (RS485 &amp; USB)</li> <li>EtherCAT (optional)</li> </ul>
	FEEDBACK SOURCES <sup>1</sup>	<ul style="list-style-type: none"> <li>Incremental encoder</li> <li>Analog Sin/Cos encoder</li> <li>Hall sensors</li> </ul>
	HOMING	<ul style="list-style-type: none"> <li>Internal sensorless &amp; sensed homing function for position control mode</li> </ul>
	DIMENSIONS	70 × 37 × 7 mm (W×H×D)
	COMPLIANCE	CE (EMC & LVD)

I/O	DIGITAL INPUTS	<ul style="list-style-type: none"> <li>Drive enable, safe torque off, limit switches, home switch, clear faults, digital setpoint (selectable type), start homing</li> </ul>
	DIGITAL OUTPUTS	<ul style="list-style-type: none"> <li>Servo ready, tracking error warning, fault stop, braking status, motor brake control, feedback device (selectable type)</li> </ul>
	ANALOG INPUTS	<ul style="list-style-type: none"> <li>Up to 4 channels 12 bit analog inputs: ±10 V analog setpoint (2 pcs), 1 V<sub>P-P</sub> analog feedback device (2 pcs<sup>1</sup>)</li> </ul>

SAFE TORQUE OFF	<ul style="list-style-type: none"> <li>2-way redundancy</li> <li>Dedicated digital STO input</li> </ul>	Safety & reliability
CONTROL ERROR DETECTION	<ul style="list-style-type: none"> <li>Tracking error (velocity &amp; position)</li> <li>Over speed error</li> <li>Limit switch</li> <li>DC motor runaway prevention on feedback loss</li> <li>Communication error</li> </ul>	
I/O RUGGEDNESS	<ul style="list-style-type: none"> <li>ESD protection</li> <li>Short circuit protection</li> <li>Reverse polarity protection on all pins</li> </ul>	
OVERLOAD SAFETY	<ul style="list-style-type: none"> <li>Over current</li> <li>Short circuit (phase-to-phase)</li> <li>I2t motor thermal protection</li> <li>Over &amp; under voltage</li> <li>Drive over temperature</li> </ul>	

POWER SUPPLY	5 – 52 VDC, 0-22A	Power
LOGIC POWER SUPPLY	5 VDC 0.2 A	
MOTOR OUTPUT CURRENT	0 – 22 A (cooling dependant)	
MOTOR OUTPUT VOLTAGE	0 – 95% of supply voltage	
EFFICIENCY	96% typ	

For full specifications, refer to [granitedevices.com/wiki/IONI](https://granitedevices.com/wiki/IONI)

## ABOUT GRANITE DEVICES

Granite Devices is on year 2007 established servo and stepping motor drive design and manufacturing company based in Finland.

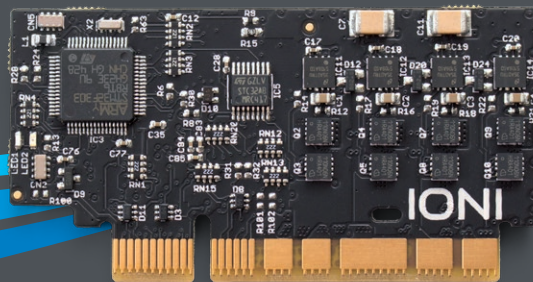
An unusually high cost efficiency of products combined with high technology and quality provide unparalleled advantages to OEM customers. Granite Devices is entitled to establish long term relationships with customers and provide professional support through target product's life cycle.

We strive to serve customers the best possible ways prior and after sales covering the whole lifetime of target application. Technical questions are directly answered by product design engineers to guarantee the most experienced support.

Granite Device's core strength is professional engineering staff who can be described as motion control enthusiasts. High motivation and perfection of work leads to unparalleled cost and quality efficiency in our R&D activities.

## PRODUCT CUSTOMIZATION

In addition to having open design of products, we offer product customization service in several levels: firmware customization, hardware customization and even product design licensing to allow customer to embed a phenomenal servo drive performance directly into their end product.



Actual size  
70 × 37 × 7 mm



**GRANITE  
DEVICES**

*...reliability first*

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