GRANITE DEVICES
...reliability first

DIGITAL SERVO DRIVE ARGON

Argon is world's first open source industrial servo motor drive with unforeseen degree of freedom and possibilities. Argon drives 97% of industrial servo motors between 50 and 1500 Watt power range making it the most versatile servo drive in the existence.

To make it even better, the device firmware source code has been released for download under GPL license. On hardware point of view, Argon provides phenomenal flexibility and reusability of the device while maintenaining uncompromised ruggedness.

| Encoder feedback | SnCos feedback | Serial feedback | Analog & Digital reference inputs | Dead-time distortion correction | SimpleMotion field bus | AC / BLDC servo motors | Brush DC servo motors | 85-250 VAC power | Safety integrated | Homing function |

COST & TIME SAVING FEATURES

SENSORLESS HOMING

Argon'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.


ELIMINATE SWITCHES
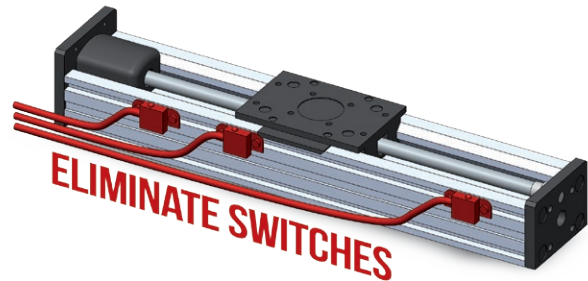
INTEGRATED SAFETY

Building effective safety stopping functionality inside the drive has been one of the key points from the very beginning of the drive development. Argon features a 3-way redundant 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.

THE FIRST OPEN SOURCE INDUSTRIAL DRIVE

Argon's dual CPU architecture with a dedicated open source ARM microcontroller for user programs and I/O allows implementing or customizing drive functionality which yields lower number of components in the system, lower costs and higher reliability. The programming is done in standard C++ with the provided no-cost development tools and source code.
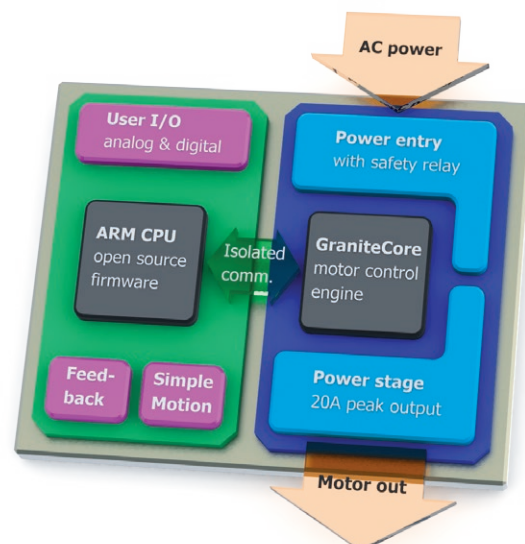
ONE DRIVE TO RULE THEM ALL

As making servo motors are not Granite Device's core business, we are allowed to assign a full concentration to the drives. Argon supports more than 97 percents of industrial servo motors in the market ranging from 50W to 1500W – all in the single drive model thanks to high dynamic range torque control (HDRT). With HDRT, Argon is capable of delivering an exceptional 14 bit torque precision over the full power range.

ARGON SPECIFICATIONS

PLETHORA OF SETPOINT & FEEDBACK OPTIONS

Unlike majority of the drives in the market, Argon has all-inclusive support for all major setpoint & feedback device in the one and only drive model. The flexible 15 pin feedback device port reads standard quadrature encoders, high precision analog Sin/Cos encoders and resolvers 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.

General

SERVO MOTORS	•	AC
	•	BLDC
	•	DC
	•	Linear
CONTROL MODES	•	Torque
	•	Velocity
	•	Position
SETPOINT CONTROL	•	Direct (immediate)
	•	Internal motion profiler (point-to-point)
	•	Buffered trajectory points (arbitrary multiaxis trajectory)
SETPOINT SOURCES [1]	•	Analog
	•	Pulse & direction
	•	Quadrature
	•	PWM
	•	SimpleMotion V2 (RS485 & USB)
	•	EtherCAT (optional)
FEEDBACK SOURCES [1]	•	Incremental encoder
	•	Analog Sin/Cos encoder
	•	Resolver/synchro
	•	Serial SSI & BiSS (upcoming feature)
	•	Tachogenerator
	•	Hall sensors
HOMING	•	Internal sensorless & sensored homing function for position control mode
DIMENSIONS	•	51×197×127 mm (W×H×D)
COMPLIANCE	•	CE (EMC & LVD)

I/O

DIGITAL INPUTS	•	Up to 16 digital inputs: drive enable, safe torque off (2 pcs), limit switch (2pcs), home switch, clear faults, digital setpoint (2pcs), digital feedback device (5 pcs [1, 2]), user specific (2 pcs [1])
DIGITAL OUTPUTS	•	Up to 7 digital outputs: servo ready, tracking error warning, fault stop, braking status, motor brake control (24V 1A), feedback device (2 pcs [1, 2])
ANALOG INPUTS	•	Up to 4 channels 12 bit analog inputs: ±10 V analog setpoint (2 pcs), 1 V_{p-p} analog feedback device (2 pcs [1])

1) Some of the I/O's share the same physical multifunction pin
2) Some of these I/O's can function as inputs or outputs

Safety & reliability

SAFE TORQUE OFF	•	3-way redundancy
	•	2 digital STO inputs
CONTROL ERROR DETECTION	•	Tracking error (velocity & position)
	•	Over speed error
	•	Limit switch
	•	DC motor runaway prevention on feedback loss
	•	Communication error
ELECTRICAL SAFETY	•	Galvanic isolation between I/O side and power side
	•	Internal fuse on AC input
	•	MOV based transient overvoltage protection
	•	Earth leakage current typ. < 0.5 mA
	•	ESD, short circuit, reverse polarity protection on all pins
	•	Surge protection on AC & DC power inputs
OVERLOAD SAFETY	•	Over current
	•	Short circuit (phase-to-phase)
	•	I2t motor thermal protection
	•	Over & under voltage
	•	Drive over temperature

Power

POWER SUPPLY	•	35 – 264 VAC 50/60 Hz, 0-15A, single phase
	•	45 – 380 VDC, 0-15A
LOGIC POWER SUPPLY	•	24 VDC 0.4 A
MOTOR OUTPUT CURRENT	•	0 – 12 A continuous
	•	0 – 18 A peak (peak of sine)
MOTOR OUTPUT VOLTAGE	•	0 – 88% of supply voltage
EFFICIENCY	•	90 – 95%

For full specifications, refer to
granitedevices.com/wiki/Argon_specifications

ABOUT GRANITE DEVICES

Granite Devices is on year 2007 established servo and stepping motor drive design and manufactu ing 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 providing GPL licensed open source firmware for Argon as well as SimpleMotion library, 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.

![Granite Devices logo]

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Granite Devices Oy
Tamppikuja 5 A 29
FI-33720 Tampere
Finland
Tel +358449917533
info@granitedevices.com
www.granitedevices.com