Elmo
Motion Control

Making Smart Machines **Smarter**

Driving Industry 4.0 Forward

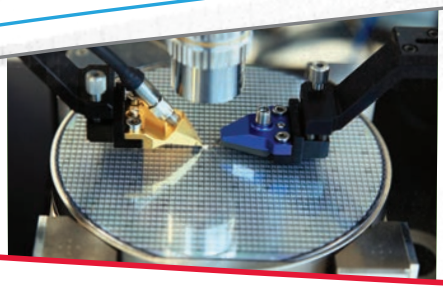
SMART SAFETY

PERFECT SERVO

FASTER

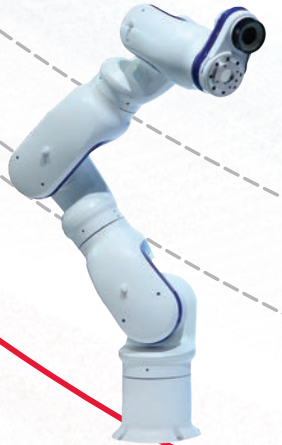
Any Motion ,Any Application

STABLE



SIMPLER

SMALLER



LIGHTER

Motion In Perfect Harmony

Elmo's perfectly tuned motion orchestra boosts your machine beyond its boundaries.

Elmo's Maestro series is , a state of the art Machine Motion Controller integrated with intelligent GOLD Servo drives provides the optimum solution to achieve rapid, simple, and unequaled machine operation. Optimized performance of any mechanical load using the built in advanced control algorithms and features of Elmo's powerful perfectly tuned servo drives.

Multi-axis advanced motion blending, superimposed motions, real-time updates of target positions, 1D, 2D, 3D high resolution error mapping, ECAM, smart Gearing, High Order Polynomial motion segment and trajectories build-up, PVT, PT, and spline profiling's will execute any multi-axis motion scenario with high precision and rapid response.

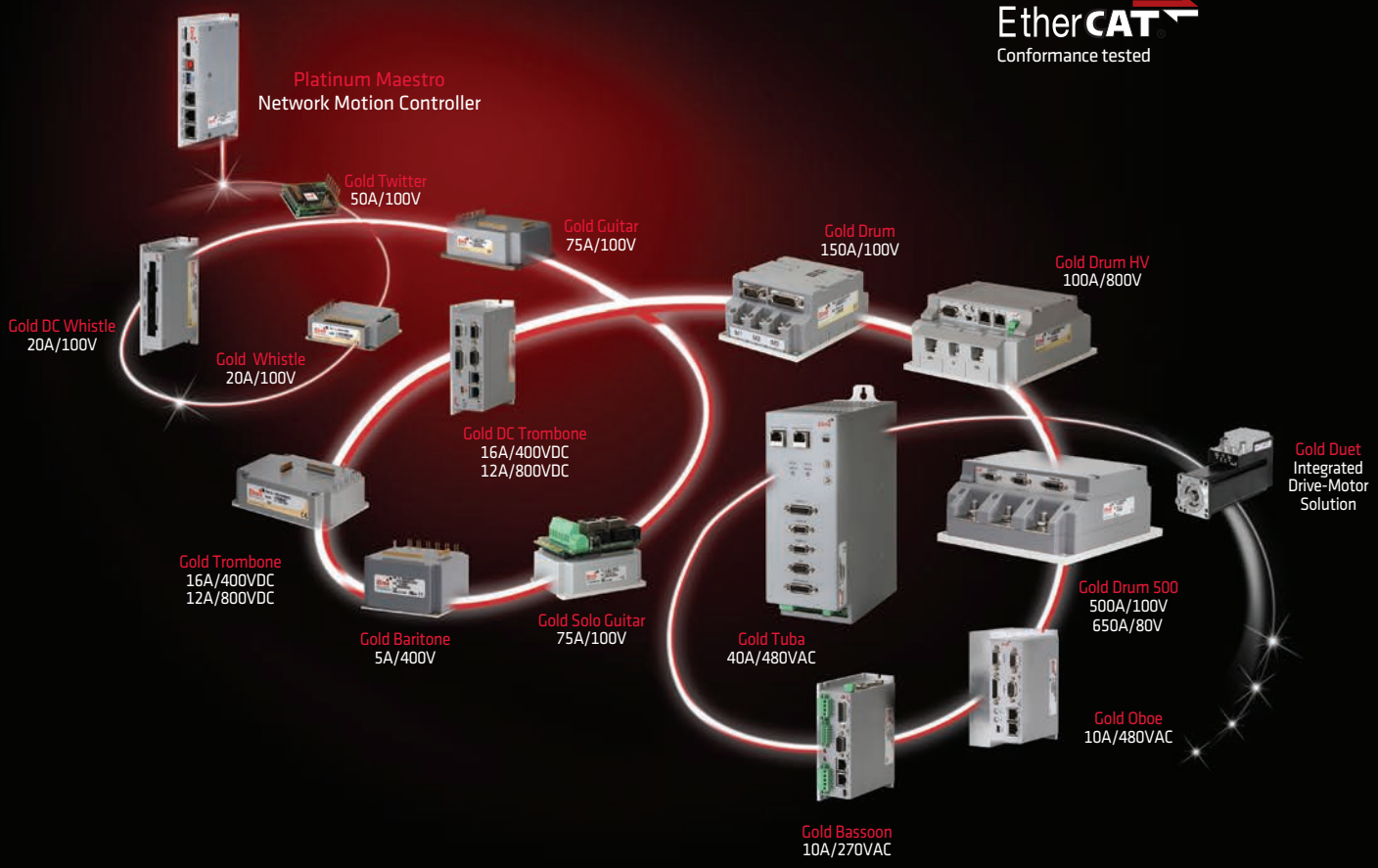
Controlled by the Maestro the best utilization of Elmo's smart drives is achieved for smooth, accurate, wide bandwidth and fast response movements. The "Motion-Without-Programming" evolution enables implementation of the most advanced applications by simply using "ready to use" "Smart Building Blocks" without the need for motion or servo expertise, ensuring the most efficient real time operation.

Highly efficient and certified EtherCAT networking with cycling time down to 100µs provide fast and precise machine motion. The innovative State of the Motion, Servo and Power control implemented by smart and simple application tools guarantee, in addition to best results, "Cutting Costs by Technology".

Motion Control Solutions for Any Application

CANopen

EtherCAT
Conformance tested



Boost your Motion

The advanced wizard-based Application Studio II

Elmo Application Studio II Software

The Ultimate Tool that "Walks You Through" the Entire Motion Implementation

Elmo's Application Studio II is the 2nd generation advanced wizard-based tuning tool providing a flexible, smart, advanced user-friendly tools, and easy motion-programming environment. It offers intuitive interfaces built to simplify complex advanced motion programming - EAS II contains many innovative capabilities.

EAS II configures programs, maintains, and analyzes every feature and capability in Elmo's servo drives and Maestro motion controllers. Elmo's hardware and software integration demands software usability to give motion designers the ability to translate specific motion control needs quickly and simply. New Features interface design walks through features, capabilities, configurations, motion programming, system integration, and monitoring tasks

- Software tools enable motion control innovation in every field. Explosion of innovation in robotics, unmanned vehicles, factory automation, and everything that moves
- User unit support, error mapping and correction, drive feedback emulation
- Maestro controller and servo drive ECAM configuration, with simplified external reference input processing, bode & Nichols tuning graphical analysis
- Management (upload/download) of numerous servo drives configurations
- Automated recording live scope
- Comprehensive inline help system and gauge displays

EASII
Elmo Application Studio

Elmo's Maestro Family -
The Perfect Motion Control
Best In Class Multi Axis Control since 1992

The Maestro is Elmo's Machine Motion Controllers family, featuring World-Class Multi-Axis Capabilities.
Advance machinery functionalities, highly efficient Network Mastering, and operation in conjunction with Elmo Servo drives creating unbeatable "World-Class" Solution.

Motion without limits

NEW Platinum Maestro

Pure Control, Pure Genius

The Platinum is Elmo's newest network motion controller.
Designed to reach extreme multi-axis performance with enhanced connectivity and countless features, it is truly the ideal controller where motion matters.

250µs Unprecedented cycle time for up to 8 axes

100µs For 32 synchronized axes

1ms For 100+ synchronized axes

SIL

Software-in-the-Loop (SIL) - User design and code running on the Platinum core in real time. Insert your own MATLAB/SIMULINK code to run the applications in the P-MAS real time.

5µs Jitter

Essential In Ensuring Efficient Real Time Networking. Minimal Jitter ensures that short cycle times are Fully utilized, without wasting most of the cycle handling the jitter.

State of Art Processing Power & Memory

4 Core Processing (2X1.5GHz)
Ultra-Fast Real Time Operating System
Unlimited memory:
GB DRAM / 4GB

SIL

Flexible developing environment IEC61131-3 (PLCOpen, Ladder, ST, SFC, Function Block), C/C++, .NET Simple to use Smart Motion Building Blocks

Gold Maestro

The Intelligent Motion Controller for Any Machine

Elmo's Gold Maestro is an advanced network based, multi-axis machine motion controller.

The Gold Maestro controls any multi-axis scenario, from simple point-to-point motion to complete multi-axis coordinated or synchronized motion. Elmo's Gold Maestro is based on years of industrial expertise in motion control engineering and on the most advanced algorithms in the industry.

When paired with Elmo's Gold Line of servo drives, our distributed motion control system offers the highest results in the market.

Achieve Your Application Goals with Ease

Gold Maestro makes today's most advanced multi-axis motion control capabilities available to virtually any type of machine, creating advanced motion control solutions with easy and cost effective integration, thanks to less hardware and less cabling.

The unifi development platform offers complete compatibility with known standardized networking and communication protocols, making them accessible to beginners and experienced programmers alike.

Networking Standards

The Gold Maestro is based on EtherCAT and CANopen networking standards for precise multi-axis control. Motion standards are based on the DS-301, DS-402, DS-406, and other motion standards. IOs and bus peripherals are also supported.

Programming and API Standards

Fast implementation is enabled using high-level, multi-axis programming environments such as IEC 61131-3, Microsoft .NET, Win32, Native C/C++ programming using the PLCopen for Motion API, and macro language.

Gold Maestro

The Ultimate Network Motion Controller

- Delta Robot and Kinematics support
- Motion blending & superimposed motion
- Coordinated group motion, blending and transitions
- Polynomial motion segments, PVT and spline support
- Real-time updates of target positions (Elmo's Flying VisionTM)
- 1D, 2D and 3D error mapping correction
- EtherCAT master for distributed networking, with distributed clock management
- CANopen master for distributed networking
- Host communications and protocols including Ethernet, TCP/IP, UDP (Fast Binary Protocols, Modbus, Ethernet/IP)
- Network statistics for diagnostics
- 64-bit processing

Gold Servo Drives

Servo Drives for Optimal Control of Any Machinery

Certified EtherCAT® Conformance tested

CANopen

TÜV SÜD Functional Safety

UL

CE

Elmo offers a wide range of versatile Gold Line servo drives as part of a motion control solution for every industrial automation application.

Providing Best Results

The Gold Servo Drives incorporate the most advanced control and power conversion technologies, which in conjunction with Elmo's EAS II (Elmo Application Studio), optimally moves any mechanical load scenario up to the limits of the mechanical system.

Fast, Flexible, Powerful

Providing total compliance with global industry standards, the Gold Line drives are unparalleled in performance, capabilities, and flexibility. They harness the full power of cutting-edge EtherCAT and CANopen networking communication.

Where Motion Matters

Gold Servo Drives

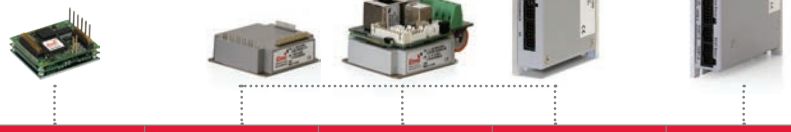
Outstanding Capabilities

- Best results with any servo load, even for the most demanding nonlinear, high resolution system mechanics.
- Fully automated, ultimate tuning tools, accomplish top performance “fast & easy”
- Widest range of sizes, operating voltages, output currents and feedbacks
- Lowered to a 50µs sampling rate at all servo loops
- “1:1:1” technology, same sample time for current, velocity and position loops resulting in very high bandwidths and robust stability margins
- Current Loop bandwidth as high as 4.5KHz
- High and flexible control loop order to deal with any mechanical dynamic system characteristic
- Very high linearity, current dynamic range of 2000:1 (100A drive smoothly runs a 0.05A load)
- Supports any “known” feedback sensor (incremental encoders, analog (sine/cosine) and resolvers with high precision, high resolution, built in multiplier, 2- and 3-Phase absolute analog halls, absolute serial encoders).
- Any feedback sensor combination for dual loop architecture, with flexible configuration of feedback organization via Elmo’s unique and advanced sensor socket interfaces
- 2 in 1, a drive can simultaneously control two independent motors using 2 advanced independent motion profilers
- Mastering gantry using only 2 Gold drives - no need for additional bulky controller
- By-the-book standard EtherCAT and CANopen networking capability
- Abundance of control and profiling features:
  - ECAM / Follower
  - Output Compare / PEGS
  - Master-Slave Current /Velocity/Position
  - Modulo
  - Dynamic Braking
  - Dual Loop
  - Gantry / Planar
  - Unlimited Control Numerical values
  - High order control filter structure
  - Advanced Scheduled Filters Support with multiple scheduling strategies: By Position, by Reference Velocity, by Actual Velocity, for Best Settling, Manual Scheduling, and from Network
- Utmost efficiency of up to 99%
- Ultra high current technology
- TUV Certified Safe Torque Off (STO)
- Complies with safety, EMC and Environmental standards
- Proven reliability of MTBF > 10^6 Hours

EtherCAT®
Conformance tested

CANopen

Gold Line:
DC Bus Servo Drives
10 VDC - 800 VDC



		G-Twitter	G-Whistle	G-Solo Whistle	G-DC Whistle	G-Duo
Power	Current/ Voltage ratings	80A/80V 3A/100V-70A/100V 3A/200V-R15A/200V	1A/100V-20A/100V 3A/200V-9A/200V			
	Output Power Range (kW)	0.14-4	0.08 to 1.60			
STO	STO Input	2	2	2	2	2
Digital Inputs	TTL or PLC Source or PLC Sink	6	6	6	6	6
Digital Outputs	TTL or PLC Source or PLC Sink	_	_	2	4	4
	Open Collector-Emitter	_	2	_	_	_
	TTL (non isolation)	4	2	_	_	_
Analog Input	Differential ±10V	1	1	1	1	1
	Single Ended	1	1	_	_	_
Feedback	Standard Port A, B, & C	V	V	V	V	V
Communication	USB	V	V	V	V	V
	EtherCAT	V	V	V	V	V
	EtherCAT with Switches	_	_	_	_	_
	CAN	V	V	V	V	_
	RS-232 TTL level	V	V	_	_	_
	EIA RS-232 (Standard)	V	_	V	_	_
	Differential RS-232	V	_	_	_	_
Other	STO Output Status	_	_	_	_	_
Auxiliary Supply	VL	12-40V <4W Including powering 1 encoder	12- 95V <6W (including powering 2 encoders)			
Weight	g (oz)	EtherCAT Version: 22.2 g (0.78 oz) CAN Version: 18.6 g (0.66 oz)	55 g (1.94 oz)	106 g (3.74 oz)	267 g (9.42 oz)	479 g (16.9 oz)
Dimensions	mm (in)	EtherCAT Version 35 x 30 x 14.4 mm (1.38" x 1.18" x 0.57") CAN Version 35 x 30 x 11.5 mm (1.38" x 1.18" x 0.45")	55 x 46 x 15 mm (2.2" x 1.8" x 0.6")	73.4 x 46.5 x 36.22 mm (2.89" x 1.83" x 1.425")	115 x 75 x 25.8 mm (4.5" x 3.0" x 1")	150 x 105 x 25.8 mm (5.9" x 4.13" x 98")

Ultra Small

		G-Bell	G- DC Bell	G-Clarinet	G-Guitar	G-Solo Guitar	G-Cello
Power	Current/ Voltage ratings	Servo Stepper 1A/100V-20A/100V 3A/200V-9A/200V	Servo Stepper 1A/100V-15A/100V 3A/200V-9A/200V	Brushless & Stepper 1A/100V-20A/100V 3A/200V-9A/200V	20A/100V-50A/100V 10A/200V-20A/200V		20A/100V-50A/100V 10A/200V-20A/200V
	Output Power Range (kW)	0.08 to 1.60	0.08 to 1.20	0.08-1.6	1.60 to 4.10		1.60 to 4.10
STO	STO Input	2	2	2	2	2	2
Digital Inputs	TTL or PLC Source or PLC Sink	6	6	6	6	6	6
Digital Outputs	TTL or PLC Source or PLC Sink	_	4	4	_	4	4
	Open Collector-Emitter	_	4	_	2	2	_
	TTL (non isolation)	2	_	4	2	_	_
Analog Input	Differential ±10V	1	1	1	1	1	1
	Single Ended	1	_	_	1	_	_
Feedback	Standard Port A, B, & C	✓	✓	✓	✓	✓	✓
Communication	USB	✓	✓	✓	✓	✓	✓
	EtherCAT	✓	✓	✓	✓	✓	✓
	EtherCAT with Switches	_	_	✓	_	✓	_
	CAN	✓	✓	✓	✓	✓	✓
	RS-232 TTL level	✓	_	✓	✓	_	_
	EIA RS-232 (Standard)	_	_	✓	_	✓	_
	Differential RS-232	_	_	✓	_	_	_
Other	STO Output Status	_	_	_	_	_	_
Auxiliary Supply	VL	12- 95V <6W including powering 2 encoders			14- 95V, 100V models 23- 195V, 200V models <6W. including powering 2 encoders		
Weight	g (oz)	55 g (1.94 oz)	267 g (9.42 oz)	L-Shaped Heat-Sink 490 g (17.3 oz)	212 g (7.47 oz)	262 g (9.24 oz)	484 g (17.07 oz)
Dimensions	mm (in)	48.5 cc (2.96 in3) package (55±0.2 x 58.5±0.2 x 14.9±0.5 mm or 2.17" x 2.30" x 0.59")	115 x 75 x 26.4 mm (4.5" x 3.0" x 1.04")	L-Shaped Heat-Sink 46.9 x 140 x 105 (1.85" x 5.52" x 4.14")	80 x 61 x 31 mm (3.15" x 2.4" x 1.2")	80 x 61 x 53 mm (3.15" x 2.4" x 2.1")	150 x 105 x 29.8 mm (5.9" x 4.1" x 1.17")

Ultra Efficient

*Q1 2016

G-Mandolin	G-Trombone	G-Solo Trombone	G-DC Trombone	G-Drum	G-Drum HV	G-Drum 500
5A/400V 7A/400V	12A/400V-22A/400V 8A/800V-16A/800V			70A/48V, 70A/60V 50A/100V-R150A/100V 35A-200V-R60/200V 18A/400V, R26A/400V	50A/400V- R100/800V-900V 35A/800V-900V R100/800V	500A/100V 200A/200V
0.66-1.3	2.00 to 10.00			2.70 to 12	16.5 to 65.00	
2	2	2	2	2	2	2
6	6	6	6	6	6	6
4	4	4	4	4	4	4
_	4	4	4	4	4	4
2	_	_	_	_	_	_
1	1	1	1	1	1	1
1	1	_	_	_	_	_
V	V	V	V	V	V	V
V	V	V	V	V	V	V
V	V	V	V	V	V	V
V	_	_	_	V	V	V
V	V	V	V	V	V	V
_	V	_	_	_	_	_
V	_	V	_	V	_	V
V	_	_	_	V	_	V
_	_	_	_	V	V	V
18- 30V <6W including powering 2 encoders				12- 60V <6W including powering 2 encoders		10- 100V 20-200V <6W including powering 2 encoders
115 g (4.0 oz)	300 g (10.6 oz)	362 g (12.8 oz)	650 g (22.9 oz) for standard L shape 1100 g (38.8 oz) for L shape fins and fan	700 g (24.7 oz)	1.65 Kg (58.202 oz)	2 kg (70.55 oz)
58.4 x 55 x 34 (2.3" x 2.16" x 1.34")	111 x 76 x 34 (4.37" x 3" x 1.34")	111 x 76 x 60 (4.37" x 3" x 2.36")	105 x 140 x 47 (4.13" x 5.51" x 1.85")	134 x 95 x 72 (5.3" x 3.7" x 2.84")	180 x 142 x 75.2 (7.08" x 5.53" x 2.96")	222X195X100 (8.74"x7.67"x3.93")

Gold Line:
AC Bus Servo Drives
30 VAC - 530 VAC

		G-Oboe	G-Bassoon	G-Tuba
Power	Power Types	3/230- 13/230 3/480-10/480	3/230-10/230	30/230-40/230 30/480-40/480
	Output Power Range (kW)	1 - 5.7	0.95 to 3.25	9.50 to 25.00
STO	STO input	2	2	2
Digital Inputs	TTL or PLC source or PLC sink	6	6	6
Digital Outputs	TTL or PLC source or PLC sink	4	4	4
Analog Input	Differential ±10V	1	1	1
Feedback	Standard Port A, B, & C	V	V	V
Communication	USB	V	V	V
	EtherCAT	V	V	V
	EtherCAT with Switches	V	V	V
	CAN	V	V	V
Other	STO Output Status	V	V	V
	Network IO	_	_	V
Auxiliary Supply	VL	18- 30V <6W including powering 2 encoders With Fan 16W		18- 30V <16W including powering 2 encoders
Weight	g (oz)	Fins Heat-Sink + Fan 1.10 Kg (36.70 oz)	L-Shaped Heat-Sink 0.65 Kg (22.90 oz) Fins Heat-Sink 1.10 Kg (36.70 oz)	3.25 Kg (114.64 oz)
Dimensions	mm (in)	Fins Heat-Sink 72.3 x 140 x 109 (2.82" x 5.52" x 4.29")	L-Shaped Heat-Sink 46.9 x 140x 105 (1.85" x 5.52" x 4.14") Fins Heat-Sink 71.4 x 140x 105 (2.82" x 5.52" x 4.14")	241 x 86.1 x 180.1 (9.45" x 3.39" x 7.09")

Top Performance

SimplIQ Servo Drives

Senior Intelligent High Performance Servo Drives

Since 2002, Elmo has been providing its proven and trustworthy SimplIQ digital servo drives that combine high power density, intelligent functionality and space-friendly design. The drives integrate Elmo's advanced, SimplIQ motion control core technology, which enables superior control performance, offers advanced programming capabilities and supports standard communication protocols.

All the servo drives include a fully digital motion controller and a wide range of commutation types and position feedbacks. The SimplIQ Line is based on intelligent CANopen network-based motion control technology for fast and powerful implementation of sophisticated motion control system capabilities. SimplIQ servo drives can be configured, tuned and programmed using Elmo's Composer software. SimplIQ servo drives are fully compliant with UL standards.

Differences Between Gold and SimplIQ Servo Drives

- Higher servo performance
- SimplIQ servo drives support CANopen; Gold servo drives support EtherCAT and CANopen
- Gold servo drives support any feedback
- STO (Safety Torque Off) only in the GOLD

Long Term Value

SimplIQ Servo Drives

Extensive Capabilities

- Motion control which operates in Current, Velocity and Position modes.
  Supports 1.5 Axis and a half master/slave and filters.
- PTP, PT, PVT, ECAM/Follower, Pulse and Direction, Dual Loop
- Real-time communication that supports CANopen, DS301, DS402 and DS305 protocols as well as RS-232.
- Variety of feedback sensors (Incremental Encoder, Resolver, Analog Encoder, Analog Halls, Digital Halls, Potentiometer, Absolute Encoder)
- Current/Torque (up to a 14 KHz sampling rate), Velocity (up to a 7 KHz sampling rate), and Position (up to a 3.5 KHz sampling rate)
- Advanced on-the-fly filtering and gain scheduling of current and velocity, velocity and position with 1-2-4 PIP controller automatic commutation alignment, and phase sequencing
- Fast event capturing inputs, and output compare (OC)
- Emulated output of the resolver or interpolated analog encoder
- Buffered output of the main and auxiliary encoder
- Fully programmable using composer or another third generation programming structure with motion commands, including event capturing interrupts, and event triggered programming
- Fast event capture programmable digital inputs optically isolated, and programmable digital outputs with fast output compare (OC), optically isolated
- Software error handling, with abort (hard stop and soft stop), and status reporting
- Motion Commands: Analog, PWM, SW, Pulse and Direction
- Event Programming which supports Fast I/O
- Power Switching which uses FASST technology for fast and highly efficient switching
- Auxillary 24 VDC external power source (HAR, BAS, COR, TUB, WHI, TWE) or 24 VDC external or internal from power bus (CEL)
- Protection against failure of internal power supplies, overheating, over/under voltage, loss of velocity feedback, following error, current limits
- Protection against short circuiting between motor power outputs
- Analog inputs with up to 14-bit resolution
- Brake control
- Motion limit switches, including begin on input, abort motion, homing

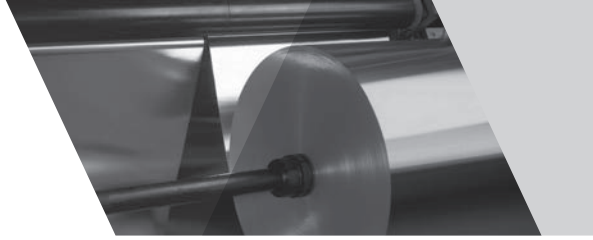
CANopen

The Highest Density in the Market

SimplIQ Line
AC Bus Servo Drives
30 VAC - 530 VAC

CANopen

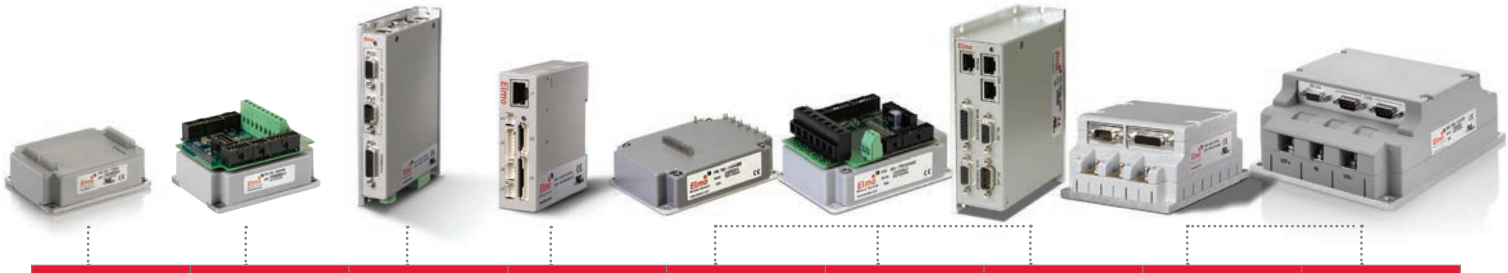
Feature / Product	Bassoon	Cornet	Tuba
Supply Voltage Range (VAC)	30-270	60-270 140-505	60-270 140-505
Continuous Output Current (A)	1-9	1.4-9	12-20
Output Power Range (kW)	0.3-2.8	0.42-3.4	3.6-11.3
Digital In/ Digital Out / Analog In	6/2/1	10/6/2	10/6/2
Motor Types	DC Brush, Sinusoidal, Trapezoidal		
Operating Mode	Current, Velocity, Position and Advanced Position		
Commands	Analog, PWM, Pulse and Direction,Software Commands		
Weight g (oz)	350 g (12.35 lbs)	1.1 kg (2.4 lbs)	2.7 kg (5.9 lbs)
Dimensions mm (in)	105 x 44 x 76 (4.13" x 1.73" x 3")	180 x 123 x 75 mm (7.1 x 4.8 x 3)	247 x 190 x 92 mm (9.7" x 7.5" x 3.6")



SimplIQ Line
DC Bus Servo Drives
10 VDC - 800 VDC

Feature / Product	Twitter	Whistle	Solo Whistle	DC Whistle	Duo Whistle	Trio Whistle
Supply Voltage Range (VDC)	7.5-59 12-95	6-48, 7.5-59, 12-95, 24-195				
Continuous Output Current (A)	2.5-3.3	1-20	1-20	1-20	1-15	1-10
Output Power Range (kW)	0.16-0.2	0.05-1.6	0.05-1.6	0.05-1.6	0.05-1.2	0.05-0.8
Digital In/ Digital Out / Analog In	6/2/1	6/2/1	4/2/1	6/2/1	6/2/1 (X2)	6/2/1 (x 3)
Motor Types	DC Brush, Sinusoidal, Trapezoidal					
Operating Mode	Current, Velocity, Position and Advanced Position					
Commands	Analog, PWM, Pulse and Direction,Software Commands					
Weight g (oz)	~ 50 gr (1.8 oz)	50 g (1.8 oz)	68.4 g (2.4 oz)	55 g (1.94 oz)	~ 450 g	815 g
Dimensions mm (in)	55 x 15 x 46.5 mm (2" x 0.6" x 1.8")	55 x 15 x 46.5 (2" x 0.6" x 1.8")	58.25 x 28.5 x 46.5 (2.3" x 1.1" x 1.8")	115 x 75 x 25.8 mm (4.53" x 2.95" x 1.02")	150 X 105 X 25.4 (5.9" X 4.13" X 1")	220 X 140 X 30 mm

Highest Throughput



Guitar	Solo Guitar	Cello	Harmonica	Trombone	Solo Trombone	DC Trombone	Drum	Drum HV
11-48 14-59 23-95 46-195		10-59 20-95 40-195	10-59 20-95 40-195	50-400 95-780			11-48, 14-59 23-95, 46-195 92-390	50-400 100-780
3-50	1.6-4	2.25-30	2-13.3	6-22	6-22	6-22	18-100	35-100
0.48-4.8	4-4.8	0.24-3.4	0.2-1.1	10	10	10	2.7-9.6	16- 65
6/4/1	5/4/1	10/5/2	6/2/1	6/4/1	6/4/1	6/4/1	6/2/1	6/2/1
DC Brush, Sinusoidal, Trapezoidal								
Current, Velocity, Position and Advanced Position								
Analog, PWM, Pulse and Direction,Software Commands								
165 g (5.8 oz)	200 g (7.05 oz)	640 g (22.6 oz)	150 g (5.3 oz)	250 g (8.8 oz)	350 g (12.3 oz)	650 g (22.9 oz) for standard L shape 1100 g (38.8 oz) for L shape fins and fan	700 g (24.7 oz)	1.623 kg (57.25 oz)
80 x 61 x 24.5 (3.15"x 2.4" x 0.965")	80 x 61 x 46.7 (3.15" x 2.4" x 1.84")	150 x 105 x 25.4 mm (5.9" x 4.13" x 1")	82 x 25.4 x 75 (3.2" x1.0" x 3.0")	111 x 76 x 30 (4.33" x 2.95" x 1.18")	111 x 76 x 56 (4.37" x 2.99" x 2.21")	140 x 105 x 43 (5.51" x 4.13" x 1.7")	134 x 95 x 60 (5.3" x 3.7" x 2.4")	180 x 142 x 75.2 (7.08" x 5.59" x 2.96")

The Solution for any application

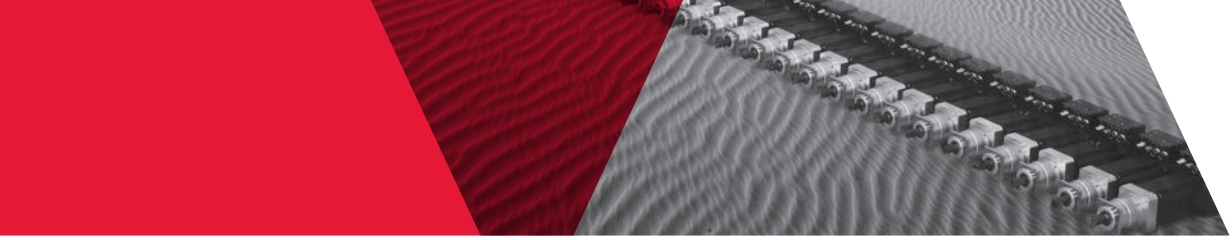
The DUET

The Ultimate Integrated Motor Servo Drive

Certified
EtherCAT®
Conformance tested
CANopen

The innovative Drive and Motor integration significantly enhances the performance of the servo system, simplifying the electrical machine topology, minimizing cabling and wires, and eliminates EMI induced by bulky long cabling. It also improves encoder noise immunity and reduces the size of the electrical cabinet by at least 80%.
Elmo DUETs are designed to operate in three voltage ranges:

- GD-.../100, Low Voltage: 23VDC - 96VDC (Integrated GOLD TWITTER Servo Drive),
- GD-.../200 , Low Voltage:: 23VDC- 196VDC (Integrated GOLD TWITTER Servo Drive)
- GD-../400, High Voltage Direct to Mains: 50 VDC- 396VDC (Integrated GOLD BARITON & GOLD Trombone Servo Drives),
- The GD-../400 series is designed to operated directly from the mains (no need for isolation transformer)
- Powered by Elmo's most advanced GOLD Line Servo drives
- Extremely Rugged High Performance Servo Solution
- Certified EtherCAT highly efficient networking
- Certifies STO (Safety Torque Off): IEC 61800-5-2:2007 SIL , EN ISO 13849-1:2008 Cat 3, PLe
- Ultimate space saver, most compact package
- Reduce most of the cabling &wiring and most of the electrical cabinet
- Rated Peak Torque = 3 X Rated Torque
- Rated speed : 3000 RPM
- Feedbacks:
  - STD (default): Single turn 20 bits Absolute Encoder
  - Option: Multi-turn, 20 bits single turn + 16 bits multi-turn, including battery
  - Option: Quadrature 2500 ppr + commutation signals (Hall signals),
    Other resolution on request
- 2 "General Purpose" optically isolated "24V logic" level inputs (PLC Source or PLC Sink)
- 1 High Current (0.3A) general purpose
- Brake Option: "internal" brake control and powering
- Reducers (gear head): on request
- Higher Power, larger frame, other windings: On request



	Power Frame	50W 40mm	100W 40mm	200W 60mm	400W 60mm	750W 80mm	1000W 80mm
Rated Torque	NM	0.16	0.32	0.64	0.64	2.4	3.2
Min DC bus for Rated Speed @ 3XRated Torque VDC	GD-../100	46	47	47	46	48	NA
	GD-../200	115	110	155	155	155	155
	GD-../400	115	110	155	155	155	155
Operating Voltage range VDC	GD-../100	24-96					
	GD-../200	24-196					
	GD-../400	50-396					

Environmentally Resistant

Elmo Duets together with all standard servo drives (GOLD & SimplIQ) are designed, tested and qualified to meet the following Environmental conditions

Feature	Details
Operating ambient temperature according to IEC60068-2-2	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	-20 °C to +85 °C (-4 °F to +185 °F)
Maximum non-condensing humidity according to IEC60068-2-78	95%
Maximum Operating Altitude	2,000 m (6562 feet) It should be noted that servo drives capable of higher operating altitudes are available on request.
Mechanical Shock according to IEC60068-2-27	15g / 11ms Half Sine
Vibration according to IEC60068-2-6	5 Hz ≤ f ≤ 10 Hz: ±10mm 10 Hz ≤ f ≤ 57 Hz: 4G 57 Hz ≤ f ≤ 500 Hz:5G

DUET "400VDC", rugged, compact, endures tough environmental conditions, operating directly from the mains.

Smart ,small & simple

Elmo Motors

Driven by Excellence

Elmo's superior motion control drives enable achieving the highest results from the servo motor in the most demanding machines and challenging applications.

Elmo's motors are durable, extremely versatile, and used in a wide range of applications and industries.

- High Servo performance
- Wide power range: standard 50W to 1000W (up to 5kw are available upon request)
- Low cogging
- Rugged design
- Rated Peak Torque = 3 X Rated Torque
- Rated speed : 3000 RPM
- Feedback Options:
  - Single turn 20 bits Absolute Encoder
  - Multi-turn, 20 bits single turn + 16 bits multi-turn (Battery is required for the Multi turn)
  - Option: Quadrature 2500 ppr + commutation signals (Hall signals),
    Other resolution on request
- 24VDC Brake Option
- Higher Power, larger frame, other windings: On request
- Reducer-gear on request

Feature	Frame 40				Frame 60				Frame 80			
Rated power W	50		100		200		400		750		1000	
Nominal DC Bus voltage	48	300	48	300	48	300	48	300	48	300	48	300
Min VDC for rated speed at peak torque*	46	112	44	99	46	179	46	173	46	211	NA	185
Rated torque Nm (in.lb)	0.16 (1.4)		0.32 (2.8)		0.64 (5.6)		1.27 (11.2)		2.39 (21.1)		NA	3.18 (28.1)
Rated speed RPM	3000											
Rated current A RMS/ Amplitude	1.5/2.1	0.7/0.9	3.5/5	1.4/2	6/8.4	1.6/2.3	11/15.5	3.1/4.3	16.5/23	3.9/5.5	NA	6.3/9
Peak torque Nm (in.lb)	0.48 (4.2)		0.96 (8.5)		1.92 (17)		3.81 (33.7)		7.17 (63.4)		NA	9.48 (84)
Peak current A RMS/ Amplitude	4.5/6.3	2.1/3	10.5/15	4.2/6	17.7/25	4.8/6.8	33/47	9.3/13.1	50/70	11.7/16.5	NA	18.9/26.7

Power Supplies

Energized to Perform

Elmo offers three distinct power supply unit to cover a wide range of servo drives, rectifying AC input voltage of up to 3 x 528 VAC and producing continuous output current of up to 20A, 30A and 100A, respectively.

Tambourine Power Supply	TAM-20/XXX VAC	TAM-30/XXX VAC	TAM-100/XXX VAC
Nominal Input AC Voltage	36 – 480 VAC	120 - 480 VAC	120 – 480 VAC
Max. Input AC Voltage	Up to 3x 528 VAC	Up to 3x 528 VAC	Up to 3x 528 VAC
Max. Output Power Cont.	Up to 14 kW	Up to 22.5 kW	Up to 75 kW
Max. Output Power Peak	Up to 28 kW	Up to 45 kW	Up to 150 kW
Shunt Power (Peak)	Up to 6.7 kW	Up to 6.7 kW	Up to 23 kW
DC Output Cont. Current	20 A	30 A	100 A
DC Output Peak Current	40 A	60 A	200 A
Operating Temperature	0° C - 40° C	0° C - 40° C	0° C - 40° C
Weight g (oz)	1155 gr	1156 gr	5 kg
Dimensions mm (in)	190 x 115 x 55 mm (7.48" x 4.53" x 1.18")	190 x 115 x 55 mm (7.48" x 4.53" x 1.18")	345 x 136 x 152 mm (13.58" x 5.35" x 5.98")

Tambourine Power Supply Technical Features

- Designed to power multiple servo drives
- Single-phase or three-phase operation
- Direct-to-mains operation capability
- High regenerative (braking) capability
- Inrush current limit
- "Internal" EMC filtering
- UL approved and CE compliant

Certified is standard, anything else is neither

EtherCAT Conformance tested

Ethernet for Control Automation Technology (EtherCAT) is the leading protocol for state-of-the-art control of industrial machinery in distributed networks. With our Gold Line servo drives fully EtherCAT compliant, Elmo is among a handful of certified companies to have passed rigorous EtherCAT conformance testing.

CANopen

Elmo fully supports the CANopen protocol (specification EN 50325-4) which enables standardized control in embedded systems for an extensive range of applications.

It Must Be Certified or it's Not STO

Elmo's Gold Line of servo drives support Safe Torque Off (STO) with the highest safety standards:

- IEC 61800-5-2:2007 SIL3
- EN ISO 13849-1:2008 Cat 3, PL e
- EN 61508-1:2010 SIL3
- EN 61508-2:2010 SIL3
- EN 61508-3:2010 SIL3
- IEC / EN 61800-5-1

UL

Elmo products are fully compliant with UL standards, including:

- UL 61800-5-1 (Adjustable speed electrical power drive systems)
- UL 508C (Power Conversion Equipment)
- UL 840
- UL 60950 (Safety of Information Technology Equipment)
- CSA C22.2 (Industrial Control Equipment)

EMC

- EN 61800-3
- EN 55011
- IEC 61000-4-x
- IEC 61326-3-1

Environmental Testing International Standard

- IEC 60068-2-X

Specification	Details
Approved IEC60068-2-78	Environmental testing – Damp heat, steady state
Approved IEC60068-2-6	Environmental testing –Vibration (sinusoidal)
Approved IEC60068-2-2	Environmental testing – Dry heat
Approved IEC60068-2-27	Basic environmental testing procedures - Shock

Global Presence

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About Elmo Motion Control
Elmo Motion Control (Elmo) designs, produces and implements comprehensive, field-proven motion control solutions that make clients' data-driven, smart machines smarter. Inspired by future needs the company's R&D department combines intelligent motion control technologies, real-time programming and control algorithms with advanced digital hardware to enable leaner, more flexible machines. Controlled by the Elmo application studio (EAS)—a software environment that cuts integration time and maintenance costs—Elmo's servo drives and multi-axis motion controllers minimize a machine's footprint and cabling, improve throughput, and give original equipment manufacturers (OEMs) a competitive edge. Founded in 1988, the company is headquartered in Israel, employs more than 350 staff worldwide, and has a dedicated presence in the United States, China, Germany, Italy, Korea, Poland and the United Kingdom. For more information, visit www.elmomc.com.