Elmo
Motion Control

Inspiring Motion

Since 1988

Product Catalogue Overview 2014

www.motiontech.com.au

About Us

Elmo Motion Control: Inspiring Motion Since 1988

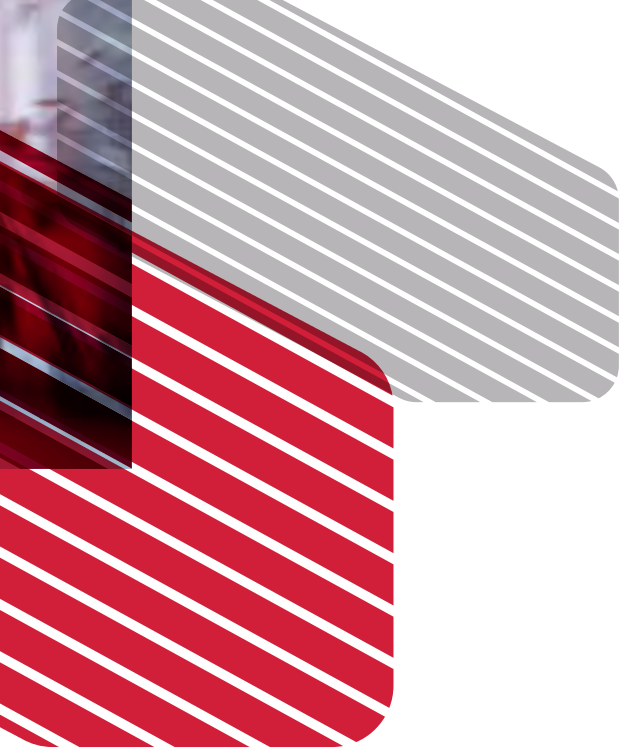
For the past 25 years, Elmo has been the preferred address for complete motion control solutions in a wide variety of industrial and military applications.

Proven Pioneers

Elmo is recognized as one of the innovator companies to enter the challenging field of Motion Control. We take pride in designing, developing, manufacturing and marketing a broad range of cutting-edge servo drives and network motion controllers to deliver complete solutions. Elmo's technologies feature distributed intelligence, certified EtherCAT and CANopen networking, and include built-in safety facilities.

Elmo Quick Facts

- Established in 1988
- 250 employees with over 60 engineering experts
- Headquarters located in Israel, Subsidiaries in USA, Europe, China and Korea
- Over 2,000,000 servo drives installed and operating globally
- Worldwide sales and support network



Uncompromising Quality & Reliability

The Elmo product family is unsurpassed in harnessing advanced, automated technology and compact rugged construction, with adherence to global standards of safety, quality and reliability.

The company's stringent quality control includes most strict design process, intensive verification and qualification procedures, our own state-of-the-art manufacturing facilities, 100% testing and 100% burn-in of all products. Our commitment to reliable lightweight design, superior intelligence and durability, further heightens the capabilities of modern high-tech manufacturing and provides the competitive market edge.

Global Presence

Elmo is acknowledged and celebrated around the world, with more than 2,000,000 servo drives, providing customers with smooth high capacity performance. Our motion control solutions power applications and machines in diverse industries, such as medical and laboratory equipment, semiconductors, solar energy, robotics, packaging, printing, the military and more. Elmo service branches are strategically placed in USA, China, Korea, Israel, Germany and Italy, providing our customers with personal support and prompt response to their requirements.

Our Commitment

- Top motion control technology to satisfy our customers' performance requirements
- Fast, efficient and cost-effective development of customers' new machines
- High-quality, highly rated stable machine throughput
- Long-term performance while adhering to safety rules
- The best solution to enhance customer competitiveness and profitability

Elmo Application Studio

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

EAS II, the new generation of Elmo's Application Studio, smart and EASy implementation tool, places the full power of Elmo's software tools at your fingertips, for optimal performance of your machine's motion control system.

Setup, tuning and maintenance of Elmo multi-axis controllers and drives are simpler and faster with EAS II. The Microsoft® Windows® -based platform simplifies complex motion environments by integrating all of the activities under one environment:

- Drive level configuration, setup and tuning
- Servo performance analysis and optimization
- Field bus network configuration, analysis and management
- Multi-axis motion control organization and sequencing
- Testing, monitoring, recording and troubleshooting
- Advanced scripting capabilities
- Integrated development environment for programming at the drive level
- Integrated development environment for IEC-61131 for multi-axis and machine motion control

Shortening Development Time

EAS-II shortens application development time by providing simple-to-use, fully automated configuration tuning and motion tools for the field engineer. At the same time, servo control experts are able to further optimize system performances using state of the art analysis tools in both Frequency and Time Domains. Advanced built-in motion sequencing, recording and analysis tools, further allow the user to monitor and optimize multi-axis motion control systems at the machine level.

Motion System Development for All Levels of Expertise

EAS II includes a new quick-tuning wizard to streamline the machine preparation, and activates machine motion in a matter of minutes. Even newcomers to the field of motion control are able to use the advanced features of the Application studio without prior tuning experience. Motion control experts can accomplish even more from EAS II, more intuitively – meeting challenges with greater efficiency, quality and versatility.

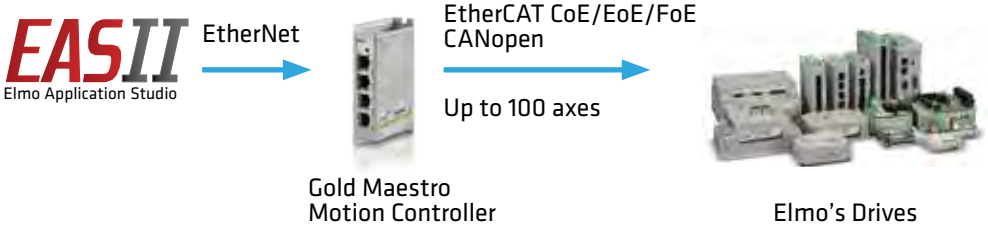
Initial drive configuration and tuning are fast and easy with EAS II's Quick Tuner.

EAS II provides comprehensive motion recording with advanced features.

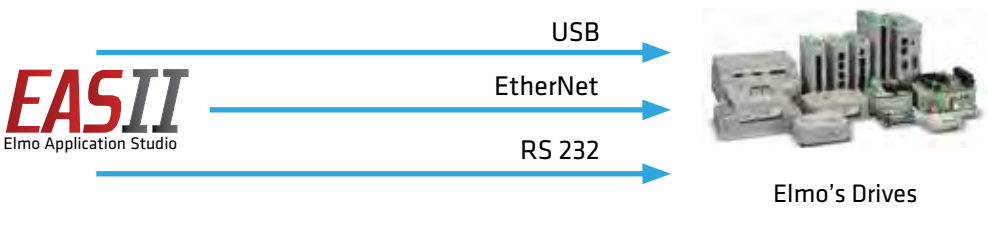
EAS II: The Single Tool that Achieves All

- Easy-to-use, Windows® based (32 and 64 bit) multi-language operating system support
- Customizable, System workspace-oriented interface formation
- EtherCAT network configuration and diagnostic tools
- Integrated IEC 61131-3 PLC programing based IDE (Integrated Development Environment)
- Drive level user programing development environment
- Fast, easy and efficient simplified and advanced Auto Tuning tools
- Numerous sensor types calibration support
- Flexible sensor setup in Dual Loop configuration
- Advanced System Identification and Controller design methods
- MIMO Based gantry and planar Controllers automatic tuning
- Single axis motion control testing tools
- Multi-axis motion control testing tools
- Advanced recording and analysis and capabilities
- Optimize your servo performance by using advanced filters
- EtherCAT implementation capabilities
  - CANOpen over EtherCAT (CoE): Real time communication with EtherCAT
  - Ethernet over EtherCAT (EoE): Axis remote control for update settings, monitoring and perform diagnostics
  - File over EtherCAT (FoE): Downloading firmware and configuration files
- Built-in Modbus TCP/IP tool
- Advanced DS402 multi-axis motion controller capabilities for CANopen and EtherCAT
  - Homing
  - Cyclic Position
  - Cyclic Velocity
  - Cyclic Torque
  - Interpolated Position
  - Profile Position
  - Profile Velocity
  - Profile Torque
- Write customized machine sequences in a simple manner using the Gold Maestro Script Manager tool

Connection to Drive via Elmo's Network Motion Controller



Peer-to-Peer Connection to Elmo's Drives



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 can control any multi-axis scenario, from simple point-to-point motion to complete multi-axis coordinated/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 Aapplications 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, cost-effective integration.

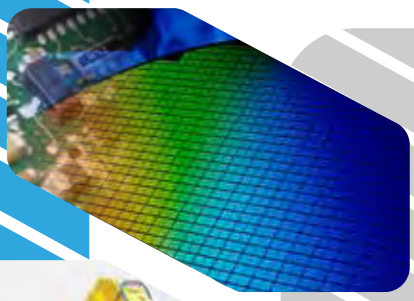
The unified development platform offers complete compatibility with known standardized networking and communication protocols, making them accessible to beginners and expert programmers alike.

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-402 motion standard. IOs and bus peripherals are also supported.

Programming and API Standards

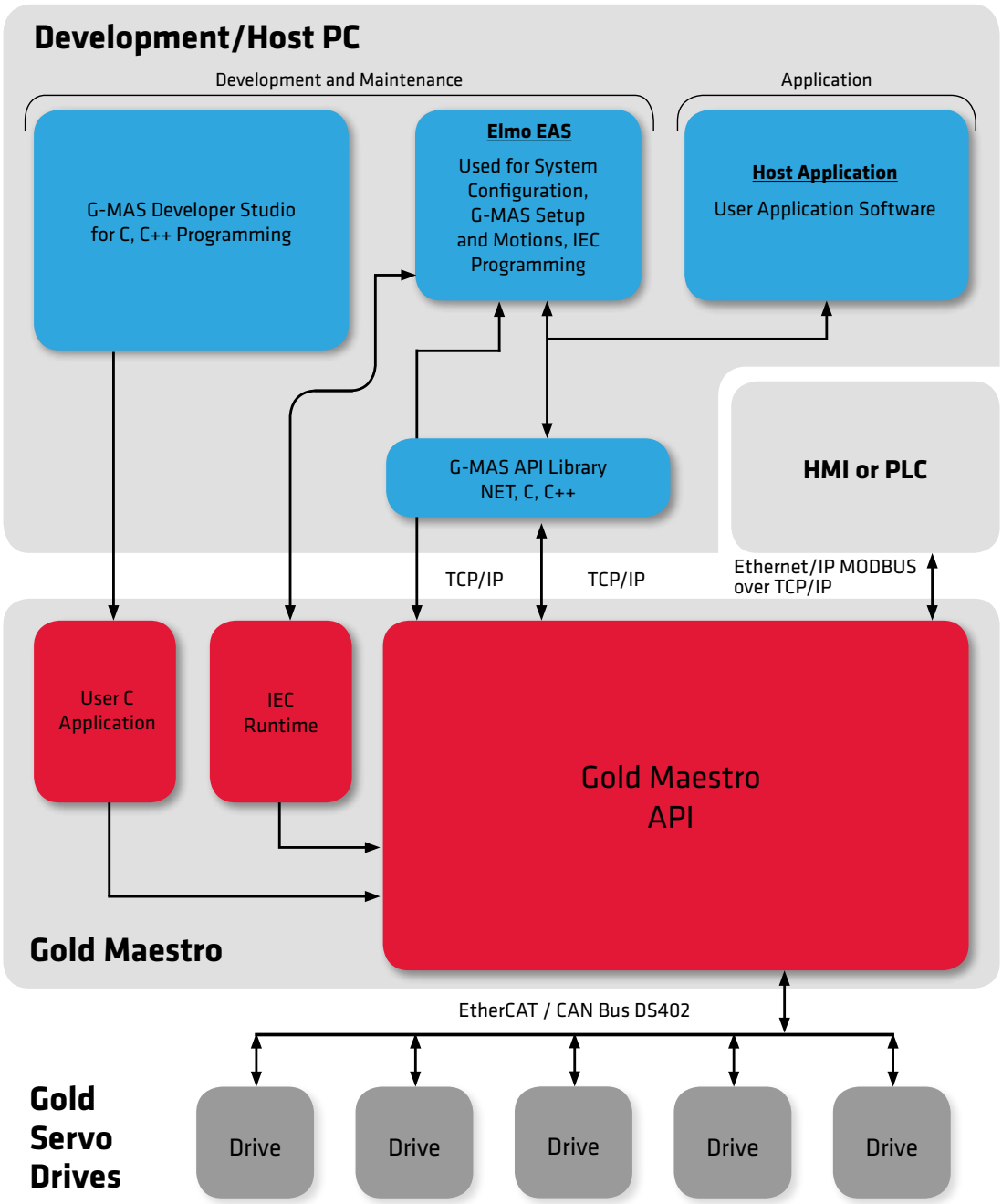
Fast implementation is enabled using standard programming environments such as IEC 61131-3, .NET and C/C++ – all based on the PLCopen motion standard.


Gold Maestro
The Ultimate Network Motion Controller

- Delta Robot and Kinematics support
- Motion blending and superimposed motion
- Coordinated group motion, blending and transitions
- Polynomial motion segments, PVT and Spline support
- Real-time updates of target positions (Elmo's Flying Vision™)
- 1D, 2D and 3D error correction
- EtherCAT master for distributed networking, with distributed clock management
- CANopen master for distributed networking
- Host communications and protocols:
  - Ethernet, TCP/IP, UDP (Fast Binary Protocols, Modbus, Ethernet/ IP)
  - USB 2.0
- Rich, high-level, multi-axis programming environment:
  - Microsoft .NET
  - IEC 61131-3, PLCopen
  - Native C/C++ programming using the PLCopen for Motion API
  - Win32 C/C++
- Network statistics for diagnostics

Gold Maestro Software Model



Gold Servo Drives

The Servo Drives for Optimal Control of Mechanics

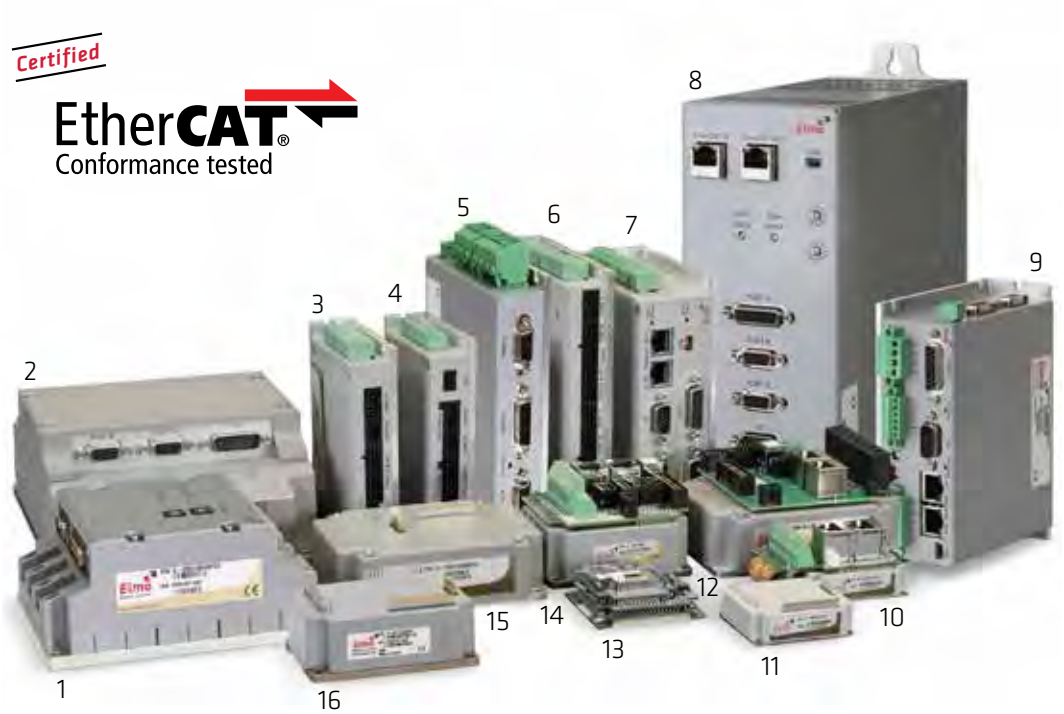
Elmo offers a wide range of versatile Gold Line servo drives as part of a motion control solution for every industrial automation application.

For Best Results

The Gold Servo Drives incorporate the most advanced Control and Power Conversion Technologies, which in conjunction with Elmo's EAS (Elmo Application Studio) can optimally move 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 performances, capabilities, and flexibility. They harness the full power of cutting-edge EtherCAT networks, with industry leading servo control performance and capabilities.



1. Gold Drum
2. Gold Drum HV
3. Gold DC Whistle
4. Gold DC Bell
5. Gold Cello
6. Gold Duo
7. Gold DC Trombone
8. Gold Tuba
9. Gold Bassoon
10. Gold Solo Whistle
11. Gold Whistle
12. Gold Solo Trombone
13. Gold Bell
14. Gold Solo Guitar
15. Gold Trombone
16. Gold Guitar

Outstanding Capabilities

- Best results with Any Servo Load, even for the most demanding nonlinear, high resolutions system mechanics.
- Fully automated, Ultimate tuning tools, accomplishing top performance "fast & easy"
- Widest range of sizes, operating voltages, output currents, feedbacks
- Lowered to 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 system dynamic characteristics
- Very high linearity, current dynamic range of 2000:1 (100A drive runs smoothly 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 of 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 by 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 / Position Follower
  - Modulo
  - Dynamic Braking
  - Dual Loop
  - Gantry / Planar
  - 1 Dimension Error Correction
  - Error correction of one sensor by another (1/2 D Error Mapping)
  - 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
- Certified Safe Torque Off (STO)
- Complies with Safety, EMC and Environmental standards
- Proven reliability of MTBF > 10^6 Hours

Elmo's Gold Line: DC Bus Servo Drives

		G-Whistle	G-Solo Whistle	G-DC Whistle	G-Duo	G-Guitar	G-Solo Guitar	G-Cello
Power	Operating Voltage Range (VDC)	12 to 195				14 to 195		
	Continuous Output Current (A)	1 to 20				10 to 50		
	Output Power Range (kW)	0.08 to 1.60				1.60 to 4.10		
STO	STO input	2	2	2	2	2	2	2
Digital Input	TTL	6	6	6	6	6	6	6
	PLC source	-	6	6	6	-	6	6
	PLC sink	-	-	6	-	-	6	6
Digital Output Options	TTL	-	2	4	4	-	4	4
	PLC source	-	2	4	4	-	4	4
	PLC sink	-	-	4	-	-	4	4
	Open collector-emitter	2	-	-	-	2	-	-
	TTL (non isolation)	2	-	-	-	2	-	-
Analog Input	Differential ±10V	1	1	1	1	1	1	1
	Single Ended	1	-	-	-	1	-	-
Feedback	Standard Port A, B, & C	v	v	v	v	v	v	v
Communication	USB	v	v	v	v	v	v	v
	EtherCAT	v	v	v	v	v	v	v
	EtherCAT with Switches	-	-	-	-	-	v	-
	CAN	v	v	v	-	v	v	v
	RS-232 TTL level	v	-	-	-	v	-	-
	EIA RS-232 (Standard)	-	v	-	-	-	v	-
	Differential RS-232	-	-	-	-	-	-	-
Other	STO Output Status	-	-	-	-	-	-	-
	Network IO	-	-	-	-	-	-	-
Mounting		PCB Mounted	Panel Mounted			PCB Mounted	Panel Mounted	
Dimensions	mm (in)	55 x 46 x 15 mm (2.2" x 1.8" x 0.6")	73.4 x 46.5 x 35.8 mm (2.89" x 1.8" x 1.4")	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 1")	80 x 61 x 31 mm (3.15" x 2.4" x 1.2")	51.8 x 80 x 61 mm (2.04" x 3.15" x 2.4")	150 x 105 x 29.8 mm (5.9" x 4.1" x 1.17")
Weight	g (oz)	55 g (1.94 oz)	106 g (3.74 oz)	267 g (9.42 oz)	479 g (16.9 oz)	179 g (6.3 oz)	239 g (8.44 oz)	484 g (17.07 oz)
Auxiliary Supply	Auxiliary power supply	Isolated DC source only				Isolated DC source only		
	Auxiliary supply input voltage	12 VDC to 95 VDC				14 VDC to 95 VDC (100 V models) 23 VDC to 195 VDC (200 V models)		
	Auxiliary supply input power	≤ 4 VA without external loading ≤ 6 VA with full external loading				≤ 5 VA without external loading ≤ 8 VA with full external loadingv		

G-Trombone	G-Solo Trombone	G-DC Trombone	G-Bell	G- DC Bell	G-Drum	G- Drum HV
50 to 780			12 to 195		11 to 390	50 to 780
6 to 22			1 to 20	1 to 15	18 to 100	35 to 100
2.00 to 10.00			0.08 to 1.60	0.08 to 1.20	2.70 to 9.60	16.5 to 65.00
2	2	2	2	2	2	2
6	6	6	6	6	6	6
6	6	6	-	6	6	6
-	6	6	-	6	6	6
4	4	4	-	4	4	4
4	4	4	-	4	4	4
-	4	4	-	4	4	4
-	-	-	2	-	-	-
-	-	-	2	-	-	-
1	1	1	1	1	1	1
1	-	-	1	-	-	-
✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓
-	-	-	-	-	✓	✓
✓	✓	✓	✓	✓	✓	✓
✓	-	-	✓	-	-	-
-	-	-	-	-	✓	-
-	-	-	-	-	✓	-
-	-	-	-	-	✓	✓
-	-	-	-	-	-	-
PCB Mounted	Panel Mounted		PCB Mounted	Panel Mounted	Panel Mounted	
111 x 76 x 34 mm (4.37" x 3" x 1.34")	111 x 76 x 60 mm (4.37" x 3" x 2.36")	105 x 140 x 47 mm (4.13" x 5.51" x 1.85")	55 x 59 x 15 mm (2.17" x 2.32" x 0.6")	115 x 75 x 26.4 mm (4.5" x 3.0" x 1.04")	134 x 95 x 72 mm (5.3" x 3.7" x 2.84")	180 x 142 x 75.2 mm (7.08" x 5.53" x 2.96")
300 g (10.6 oz)	362 g (12.8 oz)	650 g (22.9 oz)	55 g (1.94 oz)	267 g (9.42 oz)	700 g (24.7 oz)	1.65 Kg (58.20 oz)
Isolated DC source only			Isolated DC source only		Isolated DC source only	
18 VDC to 30 VDC			12 VDC to 95 VDC		12 VDC to 60 VDC	18 VDC to 30 VDC
≤7 VA			≤4 VA without external loading ≤6 VA with full external loading		≤ 4 VA without external loading ≤ 6 VA with full external loading	≤7 VA

Elmo's Gold Line:
AC Bus Servo Drives

		G- Tuba	G-Bassoon
Power	Operating Voltage Range (VAC)	1x60 or 3x60 to 3x528	1x50 or 3x50 to 1x270 or 3x270
	Continuous Output Current (A)	30 to 40	3 to 10
	Output Power Range (kW)	9.50 to 25.00	0.95 to 3.25
STO	STO input	2	2
Digital Input	TTL	6	6
	PLC source	6	6
	PLC sink	6	6
Digital Output	TTL	4	4
	PLC source	4	4
	PLC sink	4	4
Analog Input	Differential ±10V	1	1
Feedback	Standard Port A, B, & C	V	V
Communication	USB	V	V
	EtherCAT	V	V
	EtherCAT with Switches	V	V
	CAN	V	V
Other	STO Output Status	V	V
	Network IO	V	-
Mounting		Panel Mounted	Panel Mounted
Dimensions	mm (in)	241 x 86.1 x 180.1 mm (9.45" x 3.39" x 7.09")	L-Shaped Heat-Sink 46.9 x 140 x 105 mm (1.85" x 5.52" x 4.14") Fins Heat-Sink 71.4 x 140 x 105 mm (2.82" x 5.52" x 4.14")
Weight	g (oz)	3.25 Kg (114.64 oz)	L-Shaped Heat-Sink 0.65 Kg (22.90 oz) Fins Heat-Sink 1.10 Kg (36.70 oz)
Auxiliary Supply	Auxiliary power supply	Isolated DC source only	
	Auxiliary supply input voltage	18 VDC to 30 VDC	
	Auxiliary supply input power	≤7 VA	

Power Supplies

Energized to Perform

Elmo offers three distinct power supplies 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 20 A, 30 A and 100 A, respectively.

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
Weight	1,155 gr	1,155 gr	5 Kg
Operating Temperature	0° C - 40° C	0° C - 40° C	0° C - 40° C
Size	190 x 115 x 55mm (7.48" x 4.53" x 1.18") or 185 x 115 x 55mm (7.29" x 4.53" x 1.18") for 480 VAC models		345 x 136 x 152 mm (13.58" x 5.35" x 5.98")

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
- “Inside” EMC filtering
- UL approved and CE compliant

Standards and Certifications

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. It enables unsurpassed machine performance.

With our Gold Line servo drives fully EtherCAT Compliant, Elmo is among a handful of 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. CANopen brings high flexibility to the design and configuration of complex automation systems.

Safety tested · Production monitored · TÜV SÜD · Functional Safety

Elmo's Gold Line of Servo Drives support Safe Torque Off (STO) according to the following industry safety standards:

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

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)
- CSA C22.2 (Industrial Control Equipment)
- UL 60950 (Safety of Information Technology Equipment)

Inspiring Motion

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Haydon kerk Motion Solutions™

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Zettlex

Precision in the Extreme

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TRIO MOTION TECHNOLOGY

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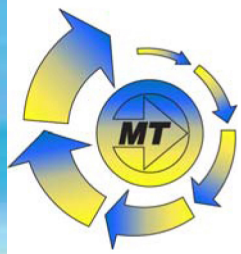

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