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**CONTROL  
TECHNIQUES**



# UNIDRIVE M700

HIGH POWER FLEXIBLE SERVO SOLUTION

**DRIVE OBSESSED**



# UNIDRIVE M700 SERVO MODE

**Control Techniques has set the standards in motor control since 1973.**

Unidrive M700 delivers maximum machine throughput through greater control with single- and multi-axis network synchronization. Onboard real-time Ethernet (IEEE 1588 V2), advanced motion control and high speed I/O for position capture enables machine builders to easily create more sophisticated and flexible machines.

## Other Unidrive M700 benefits include:

### Maximize machine productivity through integration with centralized control systems

- Ethernet IEEE 1588 V2 hardware implementation for maximum synchronization accuracy
- Integrated dual port Ethernet switch for easy connectivity
- Up to three SI modules to add position feedback, I/O, machine control and fieldbus communications

### Maximize machine productivity through shaft performance with any motor technology

- High bandwidth motor control algorithm for servo motors
- Flexible feedback from robust resolvers to high resolution encoders



# UNIDRIVE M700

# ONBOARD MOTION CONTROL

## Onboard PLC and Advanced Motion Controller

Simple onboard CODESYS-based PLC with a real-time task for interfacing with the drive's 1.5 axis Advanced Motion Controller. Key features include:

- 250 µs cycle time
- Electronic gearbox
- Homing function
- Motion profile generator
- Interpolated CAM
- High speed position freeze

## Plug in Motion and Machine Controllers

Expand the capabilities of this powerful drive series with plug-in option modules. Choose from:

- MCI200 Machine Controller programmed with Machine Control Studio IEC61131 software
- MCI210 Machine Controller with additional high speed I/O and Ethernet ports
- PTI210 Motion Made Easy controller programmed with PowerTools Studio software

## Flexible universal encoder port

Increase flexibility and reduce system costs through simultaneously connecting up to three\* high performance encoder channels as standard. As an example, the drive can interface with a feedback encoder, reference encoder and provide a simulated encoder output without the need for additional option modules.

- Two universal encoder input channels
  - Support for standard incremental and SinCos encoders, including those with absolute commutation signals
  - Support for communications based encoders with up to 4 Mb rate and line compensation to support long cable lengths of up to 100 m (support includes, EnDat 2.2, HIPERFACE and SSI)
  - Support for Resolver for feedback in harsh environments
- One simulated encoder output
  - Position reference for CAMs, digital lock and electronic gearbox applications
  - Implemented through hardware to maximize performance

\* Functionality is dependent upon the encoder types being used.

## Typical applications:

- Speed and position control for gearing and ratio control, winding (coilers), web handling, metal cutting, flying shear, rotary knife, test stands, printing, packaging machines, textiles, woodworking, tire manufacturing

## Unidrive M700 Series Variants:

**M700** – Servo Drive with Ethernet Communications and Single Safe Torque Off Channel

**M701** – Servo Drive with Modbus RTU Communications and Single Safe Torque Off Channel (Unidrive SP replacement)

**M702** – Servo Drive with Ethernet Communications and Dual Safe Torque Off Channels

# UNIDRIVE M700

# SERVO MODE

## Key data:

Input Power: 200 to 240 Vac or 380 to 480 Vac  
 Supply phases: 1Ø or 3Ø  
 Continuous output power rating: 0.75 kW to 2.8 MW

User-friendly control connections: **M700/M701 models**  
 3 x Analog inputs, 3 x Digital inputs,  
 2 x Analog outputs, 3 x Digital I/O,  
 1 x STO, 1 x Relay

**M702 models**  
 3 x Digital inputs, 3 x Digital output,  
 2 x STO, 1 x Relay

SI Modules: Machine Control  
 MCI200; MCI210; PTi210

Communications  
 SI-ETHERCAT, SI-PROFIBUS, SI-ETHERNET,  
 SI-DEVICENET, SI-CANOPEN, SI-PROFINET-V2

Additional I/O  
 SI-I/O

Feedback  
 SI-ENCODER  
 SI-UNI-ENCODER (Universal Encoder)

Safety  
 SI-SAFETY  
 MiS210

Legacy SyPT  
 SI-APPS-PLUS

## Standard features

Intelligence: Onboard PLC and Advanced Motion Controller  
 Onboard comms: M700 & M702 – Ethernet, M701 – RS485  
 Feedback: 2 x Encoder inputs  
 1 x Simulated encoder output  
 Machine safety: M700 & M701 – 1 x Safe Torque Off (STO) terminal  
 M702 – 2 x STO terminals  
 Keypad: No keypad as standard  
 Option slots: 3  
 Parameter cloning via: PC tools, Smartcard, SD card

Cloning: SMARTCARD-64; CTS08GB; SD-CARD-ADAPTOR

## Options

Keypad: Advanced plain-text, multi-language LCD with or without real-time clock  
 Remote mountable plain text multi-language LCD

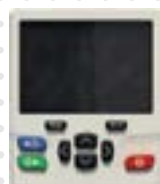


SMARTCARD-64



CTS08GB

SD-CARD-ADAPTOR



KI-KEYPAD-LCD  
 KI-KEYPAD-RTC



REMOTE-KEYPAD-RTC



REMOTE-KEYPAD

# UNIDRIVE M700

# ORDERING INFORMATION

230 VAC, Three Phase Input, 3-Phase Output, 50/60 Hz Input		
Unidrive M700 Order Code*	Current (Amps rms)	
	Continuous	Peak
M70x-03200050A10101AB100	5	10
M70x-03200066A10101AB100	6.6	13.2
M70x-03200080A10101AB100	8	16
M70x-03200106A10101AB100	10.6	21.2
M70x-04200137A10101AB100	13.7	27.4
M70x-04200185A10101AB100	18.5	37
M70x-05200250A10101AB100	25	50
M70x-06200330A10101AB100	33	66
M70x-06200440A10101AB100	44	88
M70x-07200610A10101AB100	61	122
M70x-07200750A10101AB100	75	150
M70x-07200830A10101AB100	83	166
M70x-08201160A10101AB100	113.7	232
M70x-08201320A10101AB100	114	264

460 VAC, Three Phase Input, 3-Phase Output, 50/60 Hz Input		
Unidrive M700 Order Code*	Current (Amps rms)	
	Continuous	Peak
M70x-03400025A10101AB100	2.5	5
M70x-03400031A10101AB100	3.1	6.2
M70x-03400045A10101AB100	4.5	9
M70x-03400062A10101AB100	6.2	12.4
M70x-03400078A10101AB100	7.8	15.6
M70x-03400100A10101AB100	9.2	18.4
M70x-04400150A10101AB100	15	30
M70x-04400172A10101AB100	16.1	32.2
M70x-05400270A10101AB100	20.3	40.6
M70x-05400300A10101AB100	24	48
M70x-06400350A10101AB100	35	70
M70x-06400420A10101AB100	35	84
M70x-06400470A10101AB100	35	94
M70x-07400660A10101AB100	57	132
M70x-07400770A10101AB100	59	154
M70x-07401000A10101AB100	73	200
M70x-08401340A10101AB100	109	268

Order String - Frame Size Key	M70x Drive Range:
Example: M70x-XX_ _ _ _ _Y	M700 = Ethernet M701 = Unidrive SP replacement (RS485) M702 = Dual STO inputs
XX = Frame Size (03-11 above)	
Y = A - built-in reactor E - External line reactor	

## Notes:

Ratings are at 6 kHz switching frequency.  
For ratings other than 6 kHz refer to appropriate Power Installation Guide.

Models M70x-03200050A to 03200106A and  
M70x-03400025A to 03400062A do not include an internal reactor.  
Higher power ratings are available.

## OPTIONS AT-A-GLANCE

Option	Description	Order Code
Drive Configuration & Programming	Configuration software	UNIDRIVE-M-CONNECT
	Drive to PC USB cable (requires a 485 adaptor)	CT-USB-CABLE
	8 GB SD card	CTSD8GB
	Smartcard 8k memory	SMARTCARD
	Smartcard 64k memory	SMARTCARD-64
Operator Interfaces	Smartcard with SD card adaptor, no SD card	SD-CARD-ADAPTOR
	Plain text LCD display	KI-KEYPAD-LCD
	Plain text LCD keypad with real-time clock	KI-KEYPAD-RTC
	Remote LCD display	REMOTE-KEYPAD
	Remote LCD display with real-time clock	REMOTE-KEYPAD-RTC
Input / Output	Remote display cable	UM-LCD-485-XXX***
	Extended I/O	SI-I/O
Communications	Modbus RTU	KI-485-ADAPTOR
	PROFIBUS DP	SI-PROFIBUS
	DeviceNet	SI-DEVICENET
	CANopen	SI-CANOPEN
	PROFINET RT	SI-PROFINET-V2
	EtherCAT	SI-ETHERCAT
Machine Control	EtherNet/IP, Modbus TCP	SI-ETHERNET
	Applications, SyPTPro	SI-APPS-COMPACT
	Advanced machine control	MCi200
	Advanced machine control, ethernet	MCi210
Application Programming Software & Diagnostics	Motion control	PTi210
	PLC programming	MACHINE-CONTROL-STUDIO
	Digital oscilloscope	CTSCOPE
Feedback	Motion programming	POWERTOOLS-PRO-STUDIO
	DB15 to terminal breakout board for encoder feedback cable	SM-ETC
	Encoder module****	SI-ENCODER
Power Accessories	Universal encoder****	SI-UNI-ENCODER
	External EMC filter	Consult factory
	Line & load reactors	
Environmental Protection & Cable Management	Dynamic braking resistors	
	UL Type 1 conduit kits	Consult factory
	Retrofit kits for Unidrive SP	
	Fan replacement kits	
	IP65 & IP55 through panel mounting kits	

\*\*\*Shielded RS485 patch cable, CAT5e, conductive metal RJ45 connectors, XXX=cable length in 5 foot increments (max 330 ft), standard lengths are (005, 010, 015, 025 and 050)

\*\*\*\*See Unidrive M700 Brochure for complete product details

See the Unidrive brochure for our full product offering including  
575 V, 690 V solutions and high horsepower solutions up to 4,200 HP.

# UNIDRIVE M700

# RATINGS & DIMENSIONS

## Ratings

Voltage ratings	
200 V - 240 V $\pm 10\%$	✓
380 V - 480 V $\pm 10\%$	✓
500 V - 575 V $\pm 10\%$	✓
500 V - 690 V $\pm 10\%$	✓
Control mode	
Open loop vector or V/Hz control for induction motor control	✓
Open loop Rotor Flux Control for induction motor control (RFC-A)	✓
Open loop permanent magnet motor control (RFC-S)	✓
Closed loop Rotor Flux Control for induction motors (RFC-A)	✓
Closed loop permanent magnet motor control (RFC-S)	✓
Active Front End (AFE) power quality converter	✓

## Dimensions & Weights

Frame Size	Dimensions H x W x D (in)	Weight (lbs)
03	14.4 x 3.3 x 7.9	9.9
04	14.4 x 4.9 x 7.9	14.3
05	14.4 x 5.6 x 7.6	16.3
06	14.4 x 8.3 x 8.9	30.9
07	20 x 10.6 x 11.0	61.7
08	29.7 x 12.2 x 11.4	114.6
09A	41.3 x 12.2 x 11.4	146.6
09E	41.3 x 12.2 x 11.4	101.4
10E	41.3 x 12.2 x 11.4	101.4
11E	46.9 x 12.2 x 12.3	138.9



Heavy Duty rating:	1.0 HP to 4,200 HP (0.75 kW to 2.8 MW)
Normal Duty rating:	1.5 HP to 4,200 HP (1.0 kW to 2.8 MW)
Control connections:	<b>M700/M701 models</b> 3 x Analog inputs, 3 x Digital inputs, 2 x Analog outputs, 3 x Digital I/O, 1 x Safe torque off input (STO), 1 x Relay <b>M702 models</b> 3 x Digital inputs, 3 x Digital output, 2 x Safe torque off input (STO), 1 x Relay Onboard PLC and Advanced Motion Controller
Intelligence:	M700 & M702 – Ethernet, M701 – RS485
Onboard comms:	
Feedback:	2 x Encoder inputs 1 x Simulated encoder output
Keypad:	No keypad as standard, order separately
SI option slots:	3
Parameter cloning via:	PC tools, Smartcard, SD card

# UNIDRIVE M700

# HOW TO SELECT A DRIVE

## 1. Motor Selection and Sizing

- Drive is selected to optimize motor performance in the application

## 2. Electrical Considerations

- What is the supply voltage?
  - Single or three phase input power?
- What is rms and peak motor current requirements for the application?
  - Select drive based on continuous current (Arms) and peak current requirements of the servo motor
  - In servo mode(RFC-S) drives offer 200% peak current based on Heavy Duty Amps rating
- What switching frequency are the motor ratings based on?

## 3. Drive Mechanical Mounting

- Panel mounting – as standard
- Wall mounting – consult website



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