UNIDRIVE M700

Manufacturing Automation drive

Class leading induction and servo permanent magnet motor performance, with real-time Ethernet

NEW

- Unidrive M100
- Unidrive M200
- Unidrive M300
- Unidrive M400
- Unidrive M600
- ➡ Unidrive M700
- Unidrive M800

0.37 kW – 1.2 MW Heavy Duty
(0.5 hp – 1600 hp)
200 V | 400 V | 575 V | 690 V

CONTROL TECHNIQUES

EMERSON
Industrial Automation

The Unidrive M Manufacturing Automation drive family

Unidrive M – A Manufacturing Automation drive family that is tailored to customer needs

Led by the results of extensive customer-driven market research, we have tailored seven Unidrive M feature-sets to specific application needs identified within Manufacturing Automation. The Unidrive M700 brings onboard real-time Ethernet, comprehensive position feedback and high performance control of dynamic permanent magnet servo motors to the range. It also provides a fully compatible upgrade for existing Unidrive SP users within Manufacturing Automation.

For more information on the full Unidrive M family, please download the Unidrive M Overview brochure or the 'Discover Unidrive M' App (available on iOS, Android and online) from www.controltechniques.com

Unidrive M700 features

Easy click-in keypad connection

Slot for Smartcard / SD card for parameter, PLC and motion program storage

Optional range of multi-language LCD keypads available, for rapid set-up and superior diagnostics

Terminal cover for DC bus, braking terminal and onboard EMC filter*

Power on / Drive status LED

Industry standard dual port Ethernet switch supporting IEEE 1588 V2

Aluminium chassis - allows flexible mounting, with high performance extruded heatsink incorporated

3 x System Integration (SI) module slots for communications, I/O, additional feedback devices and automation/ motion controllers

User-friendly power connections with removable terminals*

Terminal cover

User replaceable fan (can be replaced in situ)

User-friendly pluggable control connections

Flexible universal encoder port supporting Incremental, SinCos, SSI, EnDAT, HIPERFACE and Resolver encoder types

Sturdy cable management system providing grounding point for shielded control and power cables

* Features and their locations vary on some drive sizes

Unidrive M700 AC and Servo drive

Class leading induction and servo permanent magnet motor performance, with real-time Ethernet

M700 delivers maximum machine throughput through precision motor control, onboard real-time Ethernet (IEEE 1588 V2 Precision Time Protocol), advanced motion control and high speed I/O for position capture, enabling machine builders to easily create more sophisticated and flexible machines.

Unidrive M700 Highlights

Maximum machine throughput with your choice of motor

Unidrive M maximizes machine throughput with exceptional control performance with virtually any industrial motor type:

- AC Induction Motors
- Permanent Magnet Motors
- Servo Motors
- Synchronous Reluctance Motors
- Linear Motors

Highly efficient permanent magnet motors from Leroy Somer

Maximum choice and performance with the right encoder technology

Unidrive M700 allows you to choose the right encoder technology, based on performance and cost for your application. The onboard feedback interface provides high performance connectivity to multiple encoder channels and supports virtually any standard encoder feedback technology, including Resolver, BISS and EnDAT devices.

Unimotor hd high dynamic brushless AC servo motor range

Choice and performance with open technologies

Unidrive M Intelligent Machine Architecture adopts high performance, open technologies, for Ethernet networking and Machine Control programming, giving machine builders access to the widest pool of engineering talent and choice of automation components.

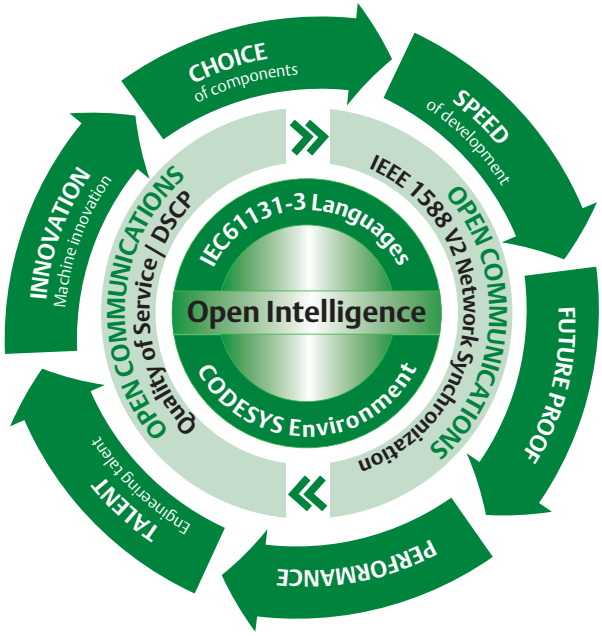
Easy to access machine control features

Software tools, keypads and memory storage devices provide easy and fast access to Unidrive M's machine control features for configuration, monitoring and diagnostics.

Add the extra features you need

Unidrive M700 supports up to three optional click-in System Integration (SI) modules that allow seamless integration with Manufacturing Automation systems and other vendor supplied equipment. Functions available include communications, additional I/O, feedback devices, enhanced safety features and scalable motion control.

Intelligent Machine Architecture – Open technology, exceptional performance



Control Techniques Intelligent Machine Architecture is an open approach to automation, designed to maximize machine throughput. This is achieved through a synchronized high performance network of intelligent control devices, sensors and actuators, linked together through open and globally available, industry standard Ethernet. Open standards provide significant benefits to machine builders and OEMs:

- Choice to select the 'best-in-class' for every machine component
- Familiarity with standards accelerates machine development and innovation
- Broad acceptance of open standards makes it easier to recruit skilled engineering staff with the required expertise

How is Intelligent Machine Architecture different?

- Standard networking hardware - no limits on integration possibilities
- Performance without effort - ease of use is prioritized with high level software tools that are proven to speed up machine development and maximize machine performance
- Increased network efficiency - intelligence is networked and not centralized, removing traffic bottlenecks
- Inclusive networking - support for PROFINET, Ethernet/IP and Modbus TCP/IP allows interaction with the widest range of automation equipment from a global pool of automation providers
- Only leading technologies - Intelligent Machine Architecture is based on feedback from customers and adopts only the leading open standards throughout

IEC 61131-3 motion and automation programming

Unidrive M offers the choice to integrate machine control functionality within the drive:

- Simple onboard CODESYS based PLC
- Advanced 1.5 axis Motion Controller, key features include:
  - 250 µs cycle time
  - Motion profile generator
  - Electronic gearbox
  - Interpolated CAM
  - Homing function
  - High speed position freeze
- High performance MCi200 and MCi210 Machine Control modules for extra control performance

Unidrive M700's onboard real-time Ethernet (using IEEE 1588 V2) provides improved machine control with fast and flexible communications. Synchronization can be achieved across the network below 1 µs, with update rates as low as 250 µs with a virtually unlimited node count.

Transformer core cutting line

Machine Control Studio - Powered by CODESYS

Control Techniques Machine Control Studio provides a flexible and intuitive environment for programming Unidrive M's new automation and motion control features. The new software offers programming for:

- Unidrive M700's onboard PLC
- High performance MCi200 and MCi210 Machine Control modules
- Ethernet network data configurations

Machine Control Studio is powered by CODESYS, the leading open software for programmable machine control. The programming environment is fully IEC 61131-3 compliant, meaning that it is familiar and therefore fast and easy to use for control engineers around the world.

The following IEC 61131-3 programming languages are supported:

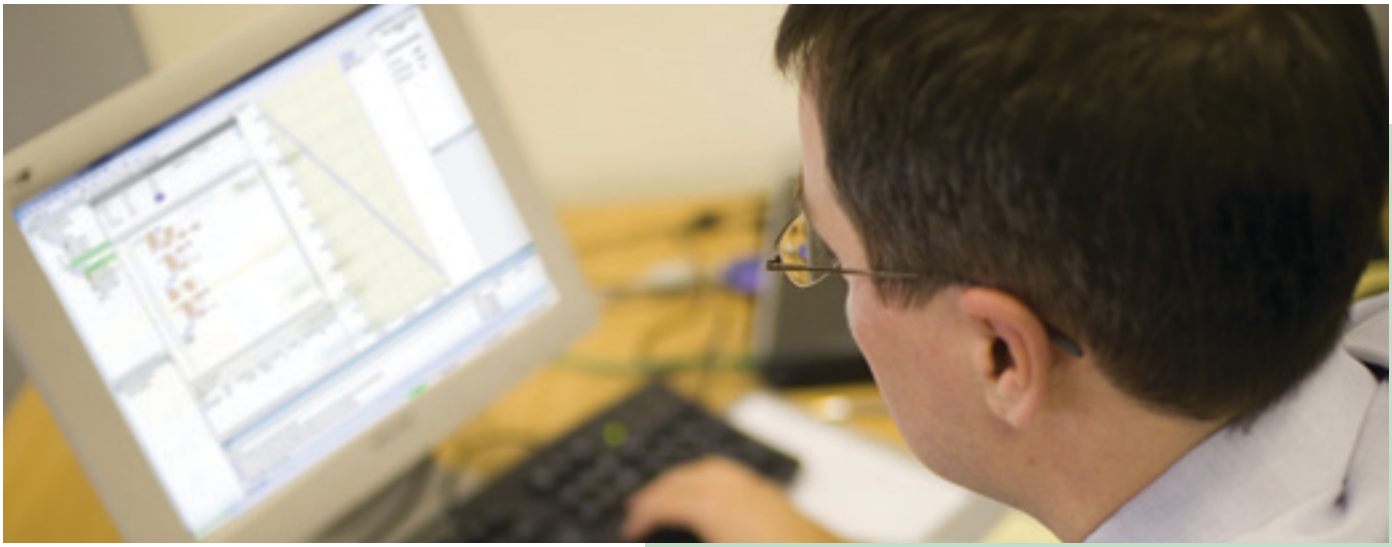
- Structured Text (ST)
- Function Block Diagram (FBD)
- Structured Function Chart (SFC)
- Ladder Diagram (LD)
- Instruction List (IL)

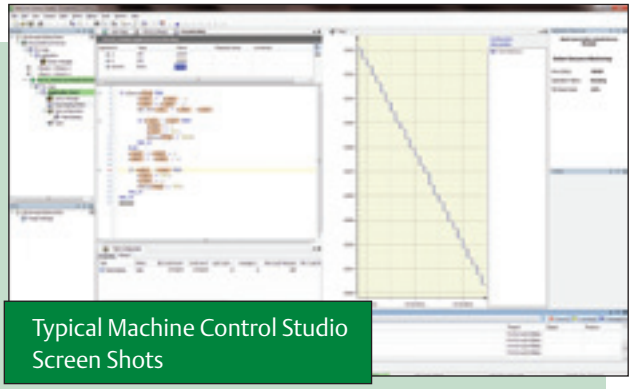
Also supported:

- Continuous Function Chart (CFC)

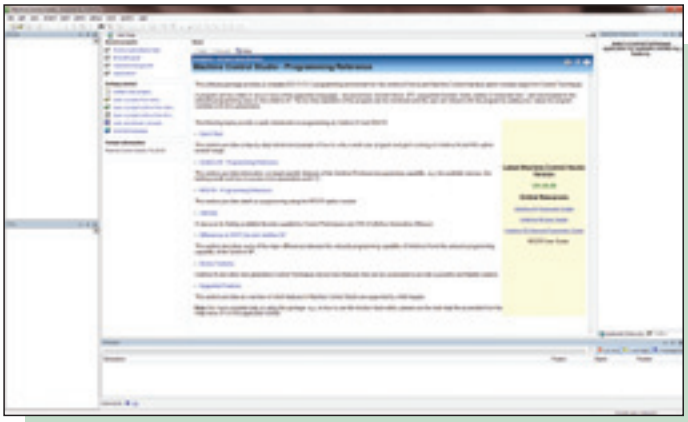
Intuitive IntelliSense functionality helps to write consistent and robust programming, speeding up software development. Programmers have access to a vibrant open-source community for function blocks. Control Techniques also provides support for customers' own function block libraries, with on-line monitoring of program variables with user defined watch windows and help for on-line change of program, in line with current PLC practice.

Features	Unidrive M onboard	MCi module
Breakpoints	No	Yes
Sourcecode upload/download	No	Yes
Online change	No	Yes
Trigonometric functions	No	Yes
64 bit data types	No	Yes
Real-time task(s)	Yes (min 4ms)	Yes (min 125 µs)
Customizable drive menu	Yes (menu 30)	Yes (Menu 27, 28, 29)
Variable tracing	No	Yes
Tasks available	1 x Freewheeling task, 1 x Clock task	1 x Freewheeling task, 1 x Position task, 1 x Initial task, 4 x Clock tasks, 1 x Error task, 4 x Event tasks





Typical Machine Control Studio Screen Shots



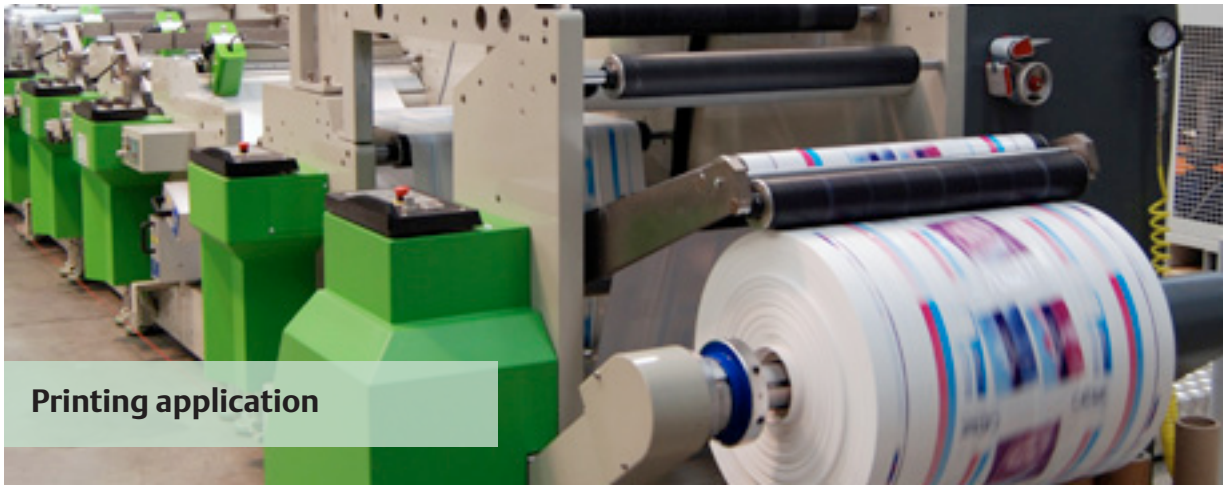
Open, Efficient, Synchronized Ethernet

Control Techniques Intelligent Machine Architecture uses standard Ethernet to connect the machine controller parts and other devices such as PCs, I/O and HMIs together. Ethernet provides machine builders and manufacturers with real benefits:

- Maximize machine productivity through high performance deterministic Ethernet, suitable for complete Machine Automation and demanding synchronized motion functions
- Access future developments in IT based industries where billions of nodes are installed, future proofing your investments
- Access to a massive choice of network monitoring and diagnostics tools

Through advances in Ethernet technology, standard Ethernet hardware now delivers the highest levels of machine performance in industrial networking. For communication between drives, PCs, I/O and other devices, Unidrive M uses open protocols such as TCP/IP and UDP, delivering exceptional performance:

- Network synchronization of less than 1 µs (typically <200 ns)
- 250µs cycle time for the most demanding motion applications
- Virtually unlimited node count
- Bandwidth protection through a network gateway that manages none real-time Ethernet messages
- Master/follower and peer-to-peer communications capabilities



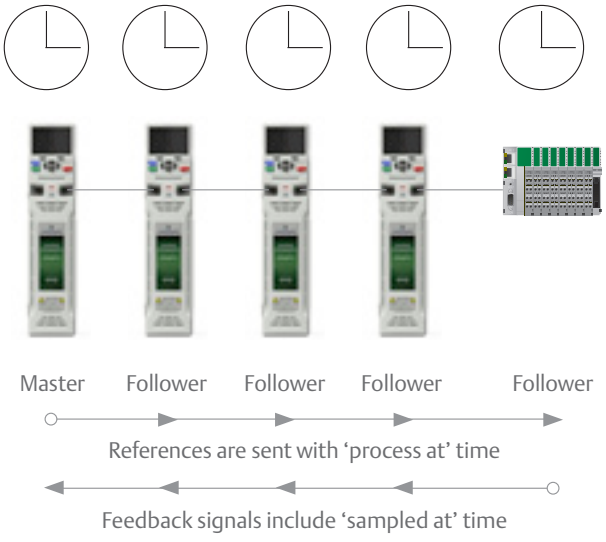
Network synchronization

Network synchronization is a common requirement across many industries including industrial automation, entertainment, telecommunications and power generation. This requirement led to the development of the Precision Time Protocol (PTP) standard which provides a mechanism for precisely synchronizing clocks across all PTP capable nodes in an Ethernet network. PTP is defined by the international standard IEEE 1588 V2.

The wide range of applications for PTP has driven demand for chip manufacturers to provide network controllers that economically support this protocol. This has led to a massive and increasing choice of networking products that cost-effectively integrate PTP, including industrial Ethernet switches and I/O. Unidrive M integrates PTP onboard the drive within a dual port Ethernet switch enabling high precision synchronization across the Ethernet network.

IEEE 1588 V2 clock explanation

IEEE 1588 V2 distributed clocks are used to automatically synchronize the position, speed and current loops across all drives.



Traffic management

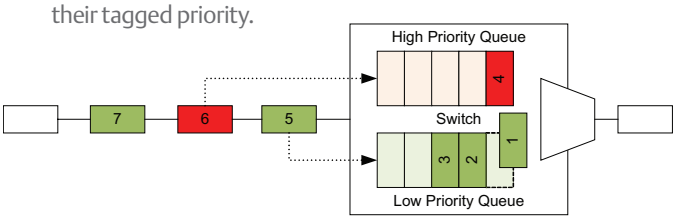
Manage non-critical network traffic through a network gateway

Unidrive M integrates a network gateway feature within the drive's dual port switch. This uses standards called Differentiated Services Code Point (DSCP) and Quality of Service (QoS) to protect network bandwidth by eliminating or delaying noncritical messages from outside the control network.

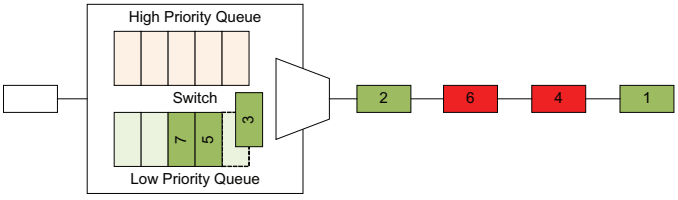
Minimising latency

Quality of Service (QoS)

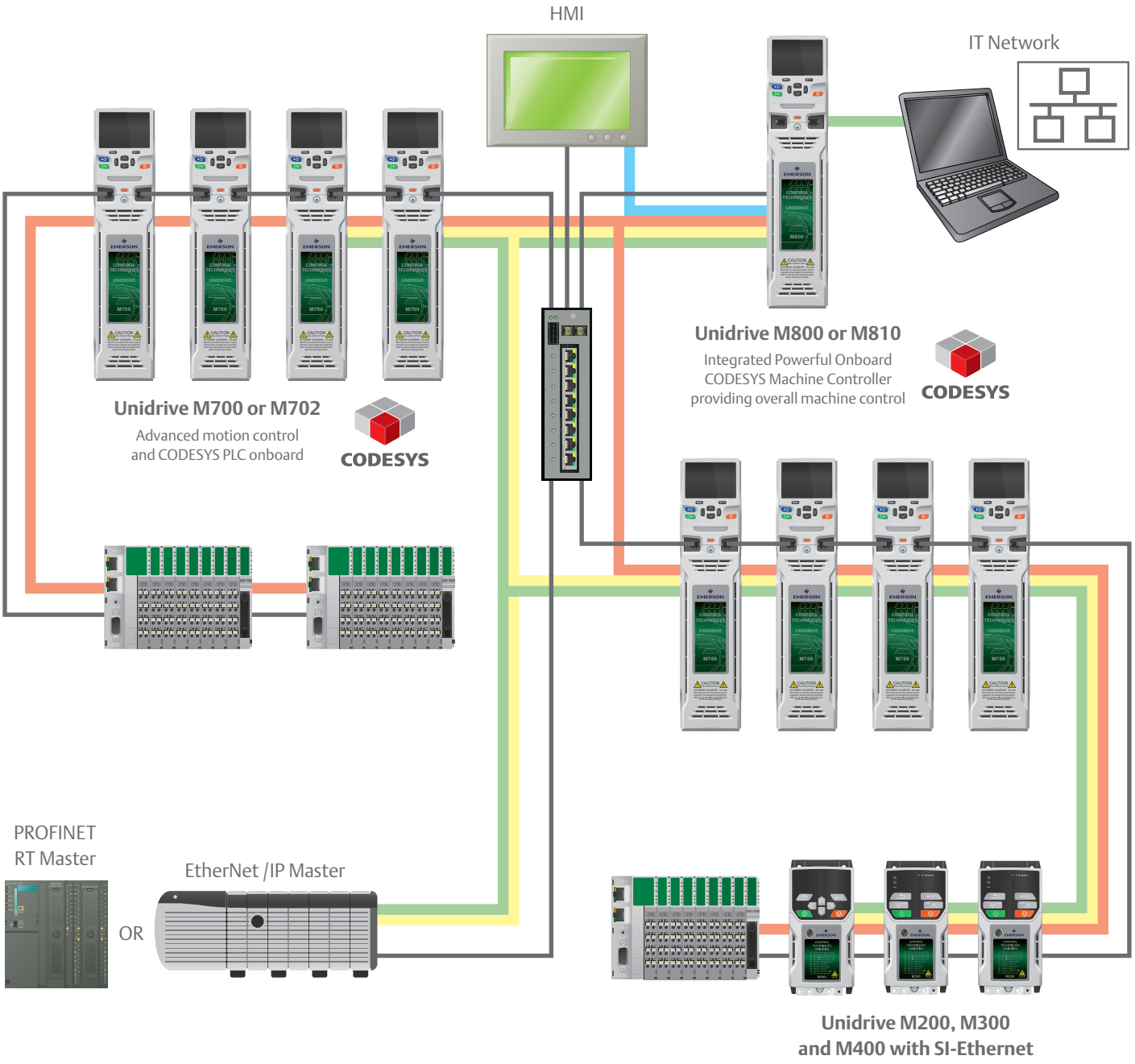
- Provides a method of prioritising time-critical messages.
- Messages entering the switch are placed in queues based on their tagged priority.



- Messages leaving the switch are taken from the higher priority queues first, allowing high priority frames to jump ahead of low priority frames.



Unidrive M700 Flexible Ethernet Communications

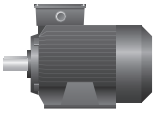


- Cable connections
- Synchronised communications using IEEE 1588 V2 PTP
- Profinet RT or Ethernet I/P communications
- Modbus TCP/IP communications
- IT communications - Managed using QoS to ensure network reliability

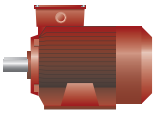
System Integration (SI) option modules allow additional connectivity with EtherCAT, PROFIBUS, DeviceNet CANopen and I/O. Plus connectivity to legacy CTNet system

Control Mode

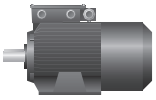
1. Open loop vector or V/Hz induction motor control
2. Open loop Rotor Flux Control for induction motors (RFC-A)



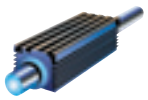
Open loop permanent magnet motor control (RFC-S)



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

Optional Drive Programming and Operator Interface

Unidrive M Connect

KI-Keypad

KI-Keypad RTC

Remote Keypad

Operator Interface

Smartcard

SD Card

Centralized PLC /Motion Control

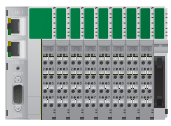
Motion Controller

PLC

Industrial Computer

Optional Input/Output

Remote I/O



SI-I/O

Standard

5 x Analog I/O

8 x Digital I/O (including 2 x high speed I/O [250 µs])

1 x STO

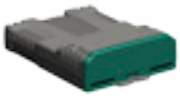
Applications with PLC or Motion Functionality

Standard

Easy to use onboard PLC and advanced motion control using industry standard CODESYS programming environment

SI-Applications compatible module which allows existing SyPTPro application programs to be re-compiled for M700

MCi200
Advanced machine control using industry standard CODESYS programming environment



MCi210
Extended advanced machine control using industry standard CODESYS programming environment with simultaneous connectivity to 2 separate Ethernet networks

Communications

Standard

Ethernet
(IEEE 1588 V2)
Profinet RT
Modbus TCP/IP
EtherNet IP
TCP/IP
UDP

SI-EtherCAT

SI-PROFIBUS

SI-Ethernet

SI-DeviceNet

SI-CANopen

Feedback

Standard

2 x universal encoder input channels
Support includes
BISS C, EnDat 2.2,
HIPERFACE and SSI

1 x simulated encoder output

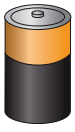
SI-Encoder

Safety

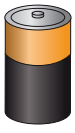
SI-Safety

DC back up power supply

24 - 1067 Vdc power



24V control



Enhanced Machine Integration

Scalable Safety

Machine safety features enhance machine throughput while protecting people and assets, helping to meet SIL3 (Safety Integrity Level 3). The M700 offers alternative levels of integrated safety functions to suit various manufacturing needs, reducing external components and machine costs.

- Safe Torque Off (STO) inputs provide an easy entry level for safety integration
- The SI-Safety module* provides an intelligent programmable solution to meet the IEC 61800-5-2 functional safety standard, covering numerous functions including STO, Safe Stop 1 and 2, Safe Limited Speed and Safe Speed Monitor

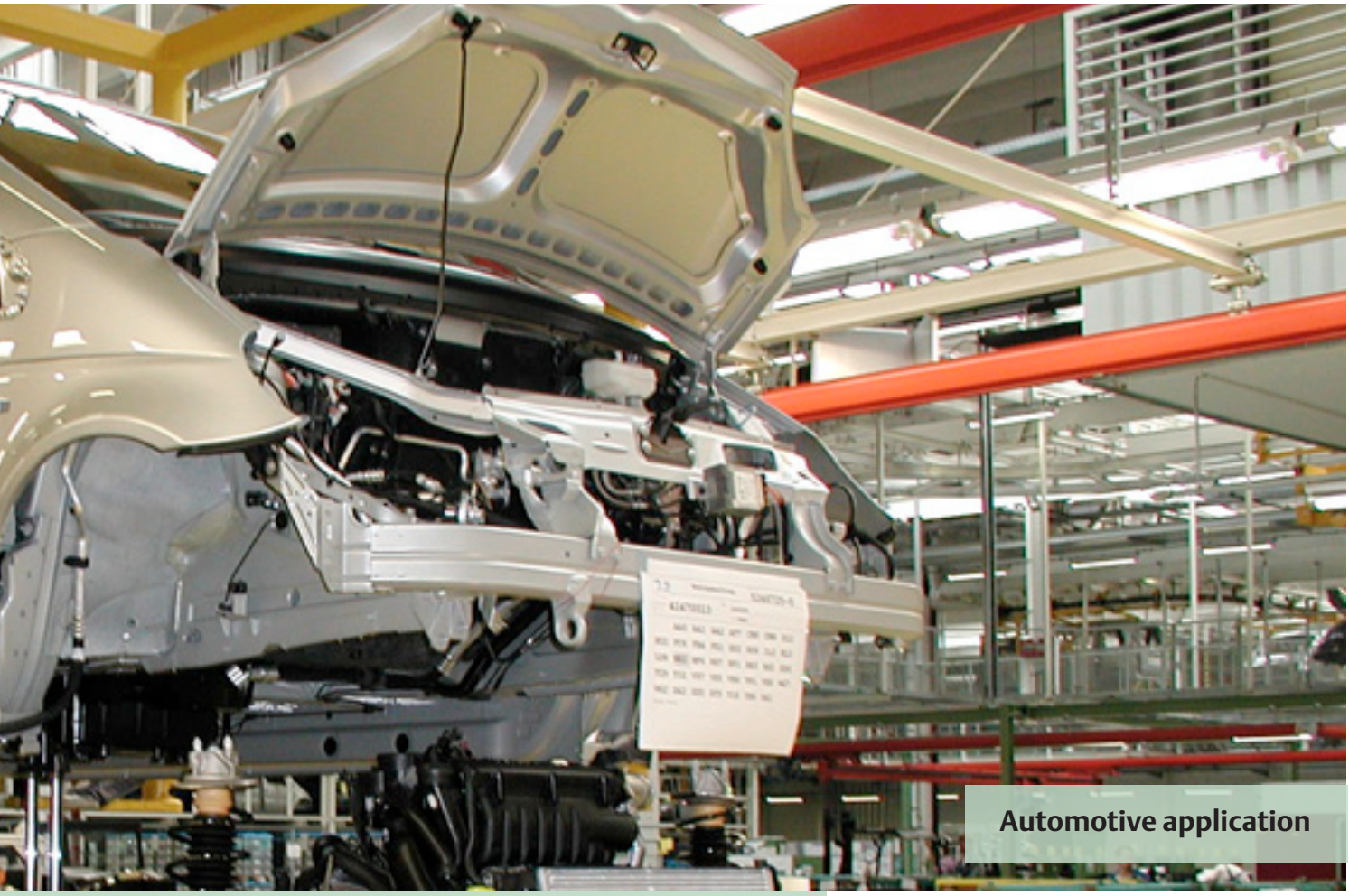
* Future release

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 System Integration 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 a 4 Mbaud rate and line compensation for long cable lengths of up to 100 m
- Support includes BISS C, EnDat 2.2, HIPERFACE and SSI
  - ➪ Resolver support 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

*The functionality is dependent upon the encoder types being used



Automotive application

Power System Flexibility

Unidrive M's power stage enhances flexibility and energy efficiency

- Easy common DC bus configuration enables braking energy to be recycled within the drive system, reducing energy usage and eliminating external supply components. This economic method also provides a minimum footprint for a multiple drives solution
- Unidrive M can run with a wide operating DC voltage input, from 24 V up to maximum volts, providing optimum choice of auxiliary power supply for back-up purposes
- Low losses, up to 98% efficient
- Low power standby mode. In some applications, drives can sit idle for significant periods; M700's reduced standby power saves energy
- M700 supports sensorless (open loop) control of compact high efficiency permanent magnet motors
- Active Front End to return braking energy to the power supply and minimize harmonic distortion

Common DC bus configuration enables braking energy to be recycled within the drive system

Test rig application

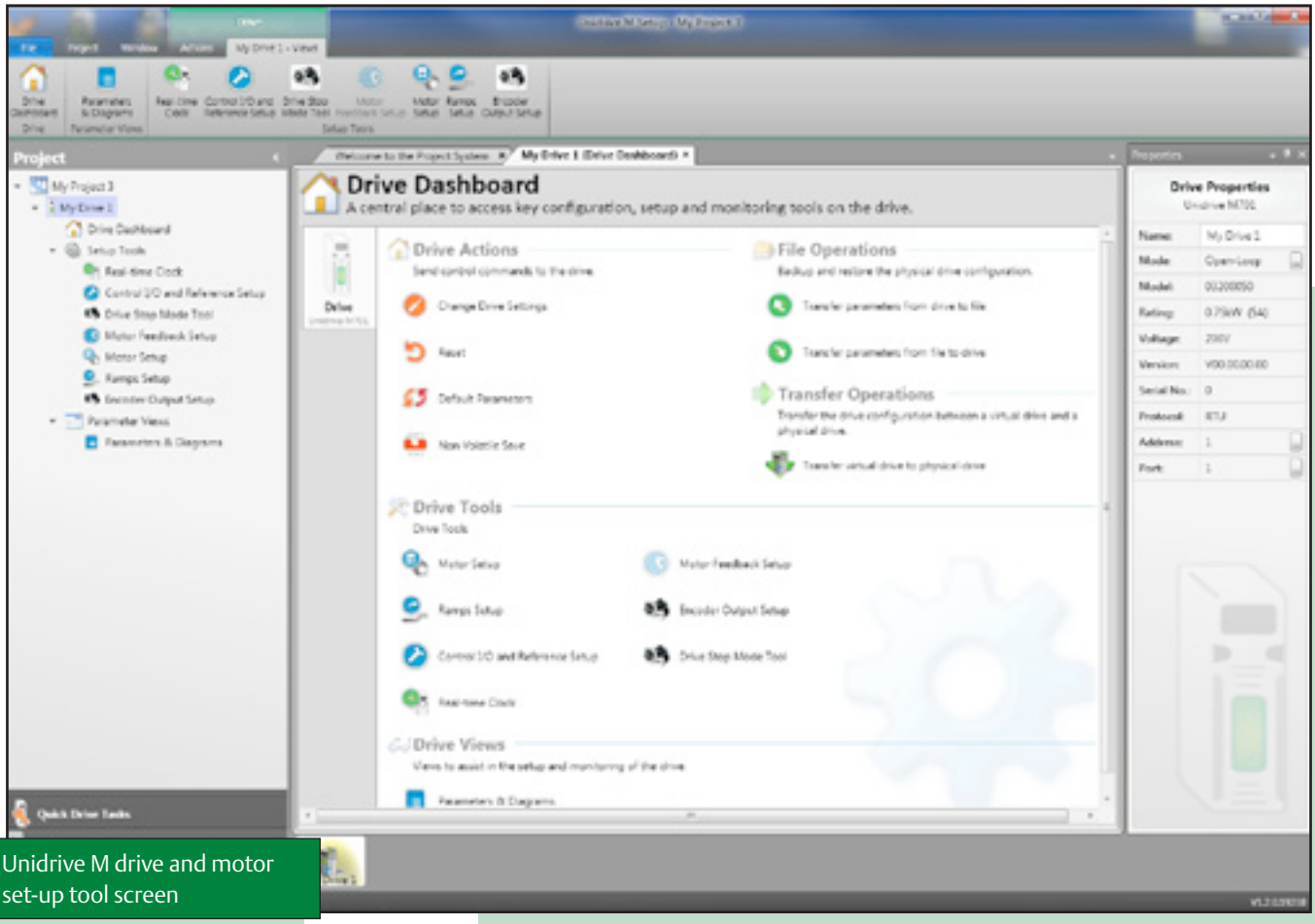
Fast and Easy access for Commissioning, Monitoring and Diagnostics

Unidrive M keypads, memory devices and software tools make it easy to access Unidrive M700's full feature set, allowing users to optimize drive tuning, back-up the configuration set and troubleshoot more quickly.

User interface options

Unidrive M benefits from a number of optional keypad choices to meet your application needs.

Type		Benefit
KI-Keypad: Removable plain text LCD keypad		Advanced plain text, multi-language LCD keypad for in depth parameter and data descriptions for an enhanced user experience
KI-Keypad RTC: Removable plain text LCD with real-time clock		All the features of the KI-Keypad, but with battery operated real-time clock, allowing accurate time stamping of diagnostics and aiding quick resolution
Remote Keypad		Allows rapid set-up and superior diagnostics. Flexible mounting is possible on the outside of a panel when tile mounted



Unidrive M drive and motor set-up tool screen

Unidrive M Connect commissioning tool

Based on Control Techniques' 25 years experience, Unidrive M Connect is our latest drive configuration tool for commissioning, optimizing and monitoring drive/system performance. Its development draws from extensive user research, using human centred design principals to give the ultimate user experience:

- Fast task based commissioning and easy maintenance of the Unidrive M family is simplified via familiar Windows interface
- Intuitive graphical tools enhance and simplify user experience
- For experienced users, dynamic drive logic diagrams and enhanced searchable listings are present
- Drive and motor performance can be optimized with minimal specialized drive knowledge
- Tool is scalable to match application requirements
- Supports the import of Unidrive SP parameter files and allows full drive cloning (i.e. parameter sets and application program)
- Multiple simultaneous comms channels for a more complete overview of the system
- Drive discovery gives the ability to find drives on a network automatically without the user having to specify their addresses
- Automatic RTU baud rate scanning on the M701 485 connection

Unidrive M's portable memory devices

Smartcard

The optional Smartcard memory device can be used to back-up parameter sets and basic PLC programs, as well as copying them from one drive to another. It also allows:

- Simplified drive maintenance and commissioning
- Quick set-up for sequential build of machines
- Machine upgrades to be stored on a Smartcard and sent to the customer for installation

SD card

Unidrive M700 uses popular SD cards for quick and easy parameter and program storage using an adaptor, allowing them to fit in the drive Smartcard slot. SD cards provide a huge memory capability allowing a complete system reload if required, and can be easily pre-programmed on a common PC.

Lazer cutting application

Select the M700 feature-set for your application

To maximize customer choice, the M700 offers the following 3 variants:

M700 - Ethernet

Onboard real-time Ethernet is included on the standard M700, with 1 x Safe Torque Off (STO) and both analog and digital I/O, making it an incredibly versatile high performance AC drive.

M701 - Unidrive SP replacement

Designed to match Control Techniques' highly popular Unidrive SP feature-set. This includes RS485 communications, 1 x STO, analog and digital I/O, identical control connectors, with Unidrive SP Smartcard parameter sets supported to make upgrading to Unidrive M as simple as possible.

M702 - Safety Enhanced

The safety enhanced M700 has 2 x STO, onboard real-time Ethernet and digital I/O; where easy integration with modern control and safety systems is paramount.

Powerful and easy field service and upgrade

The M700 is designed to extend the field service life of previous generations of products. It also provides the easiest possible upgrade for OEM machine designs that currently use Unidrive SP drives.

- M701 provides a direct upgrade path from Unidrive SP:
  - RS485 communications
  - 1 x STO terminal
  - Analog and digital I/O
- Unidrive M700 and M701 are able to take a Smartcard (parameter copying device) from Unidrive SP and import drive settings
- Unidrive M700 and M701 have the same control connector terminal layout as Unidrive SP
- The SI-Applications module allows existing Unidrive SP SyPTPro programs to be easily recompiled for Unidrive M700
- Unidrive M700 has more compact dimensions than Unidrive SP. However, easy retrofit is ensured as fixing points for existing Unidrive SP installations can be used either with standard Unidrive M mounting brackets or optional conversion kits where required

Performance control for every motor

Control Techniques' unique motor control algorithms combined with the latest microprocessor technology ensure that Unidrive M drives offer the highest stability and bandwidth for all industrial motor types. This enables you to maximize machine throughput in every application and with every motor, from standard AC induction motors to high dynamic linear motors and from energy saving permanent magnet motors to high performance servo motors.

- Unidrive M700 can compensate for mechanical load resonance in motors, ensuring optimal performance
- High bandwidth motor control algorithm for open and closed loop induction, synchronous reluctance and PM servo motors with up to 3,300 Hz current loop bandwidth and 250 Hz speed loop bandwidth

Motor control options available include:

Control Mode	Control Strategy	Features
Open loop vector or V/Hz induction motor control	Frequency Speed	Open loop motor control for induction motors, providing the easiest configuration. V/Hz can be used in multi-motor systems
Enhanced open loop Rotor Flux Control for induction motors (RFC-A)	Speed Torque	Vector algorithm utilizing closed loop current control to greatly enhance performance for all induction motor sizes
New open loop permanent magnet motor control (RFC-S)	Speed Torque Position	Open loop motor control for permanent magnet motors utilizing closed loop current control. This mode offers good dynamic performance and enables more compact and higher efficiency motor technologies to be used. This mode also supports simple positioning without the need for encoder position feedback
Enhanced closed loop Rotor Flux Control for induction motors (RFC-A)	Speed Torque Position	Dynamic speed or position control of induction motors, supporting a wide range of feedback devices
Enhanced closed loop permanent magnet/servo motor control (RFC-S)	Speed Torque Position	Closed loop control of high efficiency and servo permanent magnet motors supporting a wide range of feedback devices. This mode also supports the control of Synchronous Reluctance Motors
Enhanced Active Front End (AFE) Power Quality Convertor	Regenerative	Active Front End (AFE) to return excess braking energy back onto the power line, reducing energy costs instead of dissipating this energy as heat. The AFE provides power factor control for power quality management and greatly reduces unwanted power harmonics

Unidrive M700 feature and specification table

Performance	Current loop update: 62 µs
	Heavy Duty peak rating: 200 % (3s)
	Maximum output frequency: 550 Hz*
	Switching frequency range: 2, 3, 4, 6, 8, 12, 16 kHz (3 kHz default)
	High performance current controllers
Onboard intelligence	Programmable Logic Control (PLC)
	Real-time tasks
	Digital lock control
	Advanced Motion Controller
Onboard comms	Ethernet (2 switched ports), (M701: RS485)
Mechanical attributes	Tile mounting on sizes 3, 4, 5
	Unidrive SP compatible mechanical footprint either as standard or with conversion plates
	Common DC bus connections on sizes 3, 4, 5, 6
Parameter back-up	Ethernet/serial port cloning
	SD card (using SD-Smartcard adaptor)
	Smartcard reader support
	Electronic motor nameplate parameter storage (EnDat, HIPERFACE, BISS encoders)

Feedback	2 x Encoder input and 1 x Simulated encoder output
Onboard I/O	3 x Analog inputs, 2 x Analog outputs
	4 x Digital inputs, 1 x Digital output, 3 x Bidirectional digital inputs or outputs
	(M702: 3 x Digital inputs, 3 x Digital outputs and no Analog I/O)
	1 x Relay output
Machine safety	1 x Safe Torque Off (STO) terminal, (M702: 2 x STO)
Power and motor control	Stationary autotune for permanent magnet motors
	Mechanical load resonance compen-sation
	Wide operating range back-up DC supply
	24 V control back-up
Other	Temperature controlled fan operation with user adjustable speed limit
	User replaceable fan(s) in situ
	Conformal coating
	Standy mode (energy saving)

*Higher output frequencies are optionally available. Please contact your local Drive Center or distributor for details

Unidrive M700 ratings and specifications

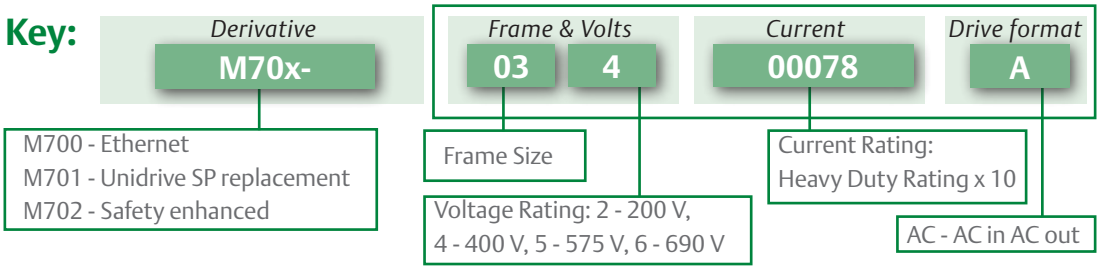
200/240 Vac ±10%						
Order Code	Heavy Duty			Normal Duty		
	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (HP)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (HP)
M70x-032 00050 A	5	0.75	1	6.6	1.1	1.5
M70x-032 00066 A	6.6	1.1	1.5	8	1.5	2
M70x-032 00080 A	8	1.5	2	11	2.2	3
M70x-032 00106 A	10.6	2.2	3	12.7	3	3
M70x-042 00137 A	13.7	3	3	18	4	5
M70x-042 00185 A	18.5	4	5	24	5.5	7.5
M70x-052 00250 A	25	5.5	7.5	30	7.5	10
M70x-062 00330 A	33	7.5	10	50	11	15
M70x-062 00440 A	44	11	15	58	15	20
M70x-072 00610 A	61	15	20	75	18.5	25
M70x-072 00750 A	75	18.5	25	94	22	30
M70x-072 00830 A	83	22	30	117	30	40
M70x-082 01160 A	116	30	40	149	37	50
M70x-082 01320 A	132	37	50	180	45	60
M70x-092 01760 A	176	45	60	216	55	75
M70x-092 02190 A	219	55	75	266	75	100
M70x-102 01760 A	176	45	60	216	55	75
M70x-102 02190 A	219	55	75	266	75	100
M70x-102 02830 A	283	75	100	325	90	125
M70x-102 03000 A	300	90	125	360	110	150

380/480 Vac ±10%						
Order Code	Heavy Duty			Normal Duty		
	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (HP)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (HP)
M70x-034 00025 A	2.5	0.75	1	3.4	1.1	1.5
M70x-034 00031 A	3.1	1.1	1.5	4.5	1.5	2
M70x-034 00045 A	4.5	1.5	2	6.2	2.2	3
M70x-034 00062 A	6.2	2.2	3	7.7	3	5
M70x-034 00078 A	7.8	3	5	10.4	4	5
M70x-034 00100 A	10	4	5	12.3	5.5	7.5
M70x-044 00150 A	15	5.5	10	18.5	7.5	10
M70x-044 00172 A	17.2	7.5	10	24	11	15
M70x-054 00270 A	27	11	20	30	15	20
M70x-054 00300 A	30	15	20	30	15	20
M70x-064 00350 A	35	15	25	38	18.5	25
M70x-064 00420 A	42	18.5	30	48	22	30
M70x-064 00470 A	47	22	30	63	30	40
M70x-074 00660 A	66	30	50	79	37	50
M70x-074 00770 A	77	37	60	94	45	60
M70x-074 01000 A	100	45	75	112	55	75
M70x-084 01340 A	134	55	100	155	75	100
M70x-084 01570 A	157	75	125	184	90	125
M70x-094 02000 A	200	90	150	221	110	150
M70x-094 02240 A	224	110	150	266	132	200
M70x-104 02000 A	200	90	150	221	110	150
M70x-104 02240 A	224	110	150	266	132	200
M70x-104 02700 A	270	132	200	320	160	250
M70x-104 03200 A	320	160	250	361	200	300
M70x-114 03770 A	377	185	300	437	225	300
M70x-114 04170 A	417	200	300	487	250	400
M70x-114 04800 A	480	250	400	585	315	450

500/575 Vac ±10%						
Order Code	Heavy Duty			Normal Duty		
	Max Continuous Current (A)	Typical Output (kW)	Motor Power (HP)	Max Continuous Current (A)	Typical Output (kW)	Motor Power (HP)
M70x-055 00030 A	3	1.5	2	3.9	2.2	3
M70x-055 00040 A	4	2.2	3	6.1	4	5
M70x-055 00069 A	6.9	4	5	10	5.5	7.5
M70x-065 00100 A	10	5.5	7.5	12	7.5	10
M70x-065 00150 A	15	7.5	10	17	11	15
M70x-065 00190 A	19	11	15	22	15	20
M70x-065 00230 A	23	15	20	27	18.5	25
M70x-065 00290 A	29	18.5	25	34	22	30
M70x-065 00350 A	35	22	30	43	30	40
M70x-075 00440 A	44	30	40	53	45	50
M70x-075 00550 A	55	37	50	73	55	60
M70x-085 00630 A	63	45	60	86	75	75
M70x-085 00860 A	86	55	75	108	90	100
M70x-095 01040 A	104	75	100	125	110	125
M70x-095 01310 A	131	90	125	150	110	150
M70x-105 01040 A	104	75	100	125	110	125
M70x-105 01310 A	131	90	125	150	110	150
M70x-105 01520 A	152	110	150	200	130	200
M70x-105 01900 A	190	132	200	200	150	200
M70x-115 02000 A	200	150	200	248	175	250
M70x-115 02540 A	254	185	250	288	225	300
M70x-115 03020 A	302	225	300	339	250	350

500/690 Vac ±10%						
Order Code	Heavy Duty			Normal Duty		
	Max Continuous Current (A)	Typical Output (kW)	Motor Power (HP)	Max Continuous Current (A)	Typical Output (kW)	Motor Power (HP)
M70x-076 00190 A	19	15	20	23	18.5	25
M70x-076 00240 A	24	18.5	25	30	22	30
M70x-076 00290 A	29	22	30	36	30	40
M70x-076 00380 A	38	30	40	46	37	50
M70x-076 00440 A	44	37	50	52	45	60
M70x-076 00540 A	54	45	60	73	55	75
M70x-086 00630 A	63	55	75	86	75	100
M70x-086 00860 A	86	75	100	108	90	125
M70x-096 01040 A	104	90	125	125	110	150
M70x-096 01310 A	131	110	150	150	132	175
M70x-106 01040 A	104	90	125	125	110	150
M70x-106 01310 A	131	110	150	155	132	175
M70x-106 01500 A	150	132	175	172	160	200
M70x-106 01780 A	178	160	200	197	185	250
M70x-116 02100 A	210	185	250	225	200	250
M70x-116 02380 A	238	200	250	275	250	300
M70x-116 02770 A	277	250	300	325	315	400

Key:



Information on higher powers will appear in subsequent issues of this brochure.
See overleaf for Normal Duty and Heavy Duty definitions.

Unidrive M700 ratings and specifications

Normal Duty

Suitable for most applications, with a current overload capacity of 110%.

Heavy Duty

Suitable for demanding applications, current overload of 200% is available for dynamic loads.

Environmental safety and electrical conformance

- IP20 / NEMA1 / UL TYPE 1*
  *UL open class as standard, additional kit needed to achieve Type 1
- IP65 / NEMA4 / UL TYPE 12 rating is achieved on the rear of the drive when through panel mounted
- Ambient temperature -20 °C to 40 °C as standard. Up to 55 °C with derating
- Humidity 95 % maximum (non condensing) at 40 °C
- Altitude: 0 to 3000m, derate 1 % per 100 m between 1000 m and 3000 m
- Random Vibration: Tested in accordance with IEC 60068-2-64
- Mechanical Shock Tested in accordance with IEC 60068-2-29
- Storage temperature -40 °C to 70 °C
- Electromagnetic Immunity complies with EN 61800-3 and EN 61000-6-2
- With onboard EMC filter, complies with EN 61800-3 (2nd environment)
- EN 61000-6-3 and EN 61000-6-4 with optional footprint EMC filter
- IEC 60146-1-1 Supply conditions
- IEC 61800-5-1 (Electrical Safety)
- IEC 61131-2 I/O
- Safe Torque Off, independently assessed by TÜV to IEC 61800-5-2 SIL 3 and EN ISO 13849-1 PL
- UL 508C (Electrical Safety)

Optional media and accessories

Description	Order code
SD-Smartcard Adaptor	3470-0047
Smartcard (64 kb)	2214-0010

Heatsink mounted braking resistor

Frame size	Order code
3	1220-2752
4	1299-0003

DC bus paralleling kit

Frame size	Order code
3	3470-0048
4	3470-0061
5	3470-0068
6	3470-0063

Dimensions and Weight

Frame Size		3	4	5	6	7	
Dimensions (H x W x D)	mm	379 x 83 x 200	379 x 123.5 x 200	379x 141x 200	379 x 210 x 227	548 x 270 x 280	
	in	14.9 x 3.3 x 7.9	14.9 x 4.9 x 7.9	14.9 x 5.6 x 7.9	14.9 x 8.3 x 8.9	21.6 x 10.6 x 11.0	
Weight	kg (lb)	4.5 (9.9)	6.5 (14.3)	7.4 (16.3)	14 (30.9)	45 (99.2)	

Through panel mounting kit

Frame size	Order code
3	3470-0053
4	3470-0056
6	3470-0055

Tile mounting kit

Frame size	Order code
3	3470-0049
4	3470-0060
	3470-0073

UL Type 1 kit

Frame size	Order code
3 & 4	6521-0071
6	3470-0059

Panel mount retrofit kits

To match Unidrive SP mounting holes.

Frame size	Order code
4	3470-0062
6	3470-0074

General kit items

Item	Order code
Keypad blanking cover (10 pieces in pack)	3470-0058
Frame 3 & 4 power connector terminal splitter	3470-0064

Optional external EMC filters

Unidrive M built-in EMC filter complies with EN 61800-3. External EMC filters are required for compliance with EN 61000-6-4.

Model	Order code
200V	
M70x-032 00050 to M70x-032 00106	4200-3230
M70x-062 00330 to M70x-062 00440	4200-2300
400 V	
M70x-034 00025 to M70x-034 00100	4200-3480
M70x-064 00350 to M70x-064 00470	4200-4800
575 V	
M70x-065 00100 to M70x-065 00350	4200-3690

For a full list of patents and patent applications, visit www.controltechniques.com/patents.

	8	9	10	10	11	11
	785 x 310 x 290	940 x 310 x 290	1054 x 310 x 290	Rectifier 400 x 310 x 290	1410 x 310 x 290	Rectifier 570 x 310 x 290
				Inverter 730 x 310 x 290		Inverter 880 x 310 x 290
	30.9 x 12.2 x 11.4	37.0 x 12.2 x 11.4	41.5 x 12.2 x 11.4	Rectifier 15.8 x 12.2 x 11.4	55.5 x 12.2 x 11.4	Rectifier 22.4 x 12.2 x 13.9
				Inverter 28.7 x 12.2 x 11.4		Inverter 34.7 x 12.2 x 11.4
	50 (110.2)					

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