IDAM
INA DRIVES & MECHATRONICS

Series: IDAM® Servo Drive E
Digital Motor Drive - DMD-078.12

EtherCAT® *inside*

- Integrated amplifiers for 8 single-phase motors, 4 two-phases motors or 4 three-phases motors or combinations of them in one device

- Position feedback for Hall and optical measurement systems

- Continuous current: 7 A_{rms} per phase

- DC link voltage up to 120 V_{DC}

- Field bus: EtherCAT®

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■ Features

Digital Motor Drive DMD-078.12 was developed for digital controlling the current of multi-axes motor systems. Up to 8 independent coil systems can be driven. The high-speed control algorithm with a current controller sample time of 25 μs enables highly dynamic positioning tasks for ironless or low-induction motors. The process data are exchanged via EtherCAT$^{®}$ for very fast interconnection between drive and PLCs/NCs. Digital Motor Drive DMD-078.12 can supply digitized encoder signals to the superposed controller system. Very fast control loops can thus also be closed via the bus.
Two power supplies are needed to power the controller, the logic supply of 24 V and the DC link power supply with up to 120 V_{DC}.

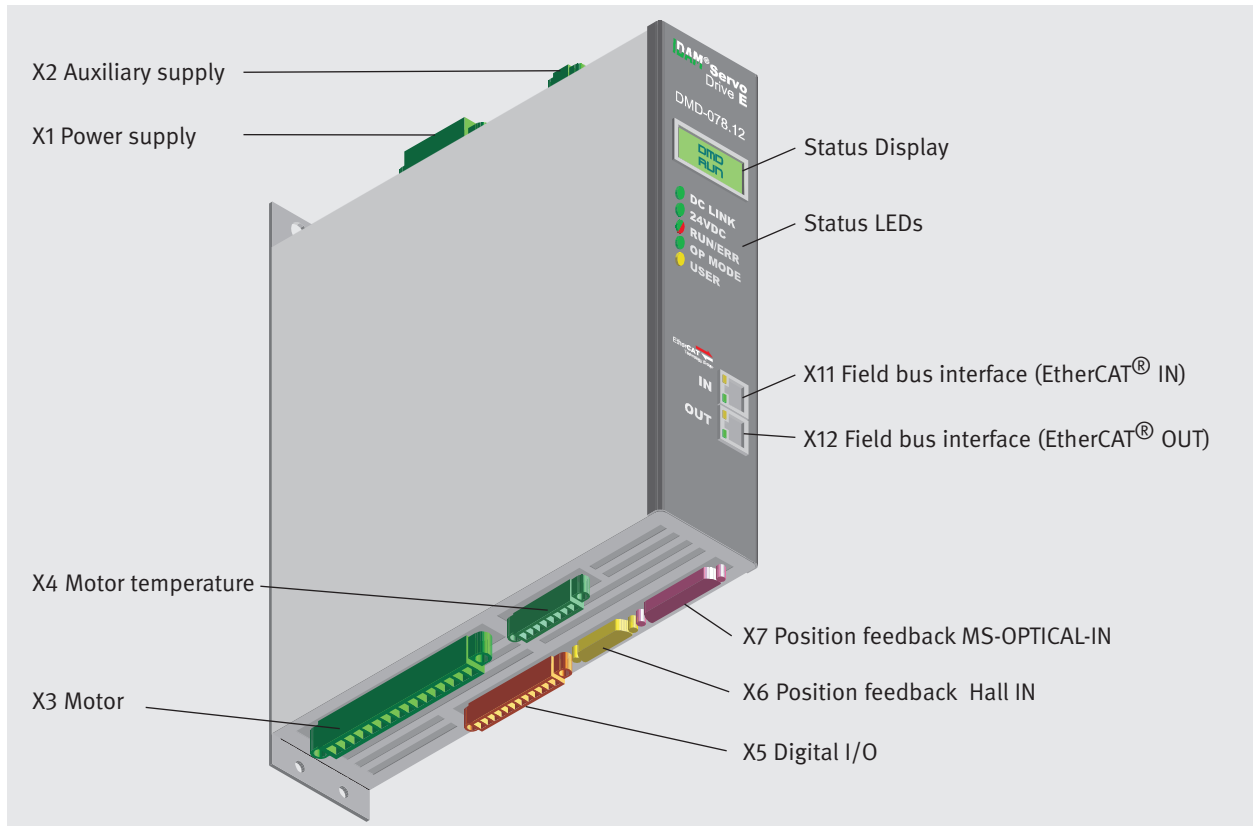**The firmware is divided into:**

- Current loop controller
- PWM unit
- I^2t monitoring
- Motor temperature monitoring
- Heat sink temperature monitoring
- Controlling of all input analogue digital converters
- Digital I/O processing
- Field bus data processing via EtherCAT$^{®}$
- Position interpolation for optical incremental feedback system (optical lattice)

The hardware is unitized into:

- Discrete power section with current sensing
- 2 x 10/100 MBit Ethernet port
- Encoder interface for HALL feedback system (3 axes)
- Encoder interface for optical feedback system (3 axes)
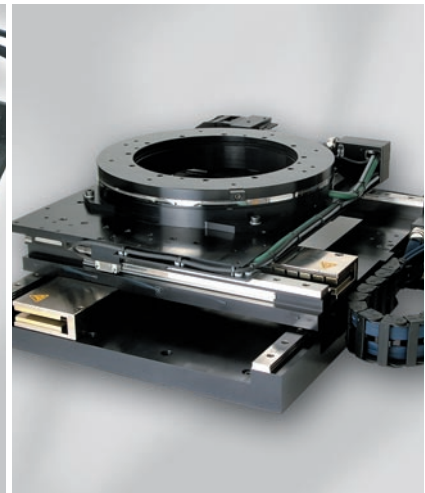- Digital I/O

■ Functionality

X2 Auxiliary supply — Status Display

X1 Power supply — Status LEDs

- DC LINK
- 24VDC
- RUN/ERR
- OP MODE
- USER

X11 Field bus interface (EtherCAT® IN)

X12 Field bus interface (EtherCAT® OUT)

X4 Motor temperature — X7 Position feedback MS-OPTICAL-IN

X6 Position feedback Hall IN

X3 Motor — X5 Digital I/O

Servo Planar System

LDDS49 with Pneumatic Collet Chuck

3-Axes Positioning System: Open Frame

DMD-078.12 is a multi-axis power amplifier which can control synchronous 1-phase motors, 2-phase motors and/or 3-phase motors. For example: systems consisting of a 3-phase rotary table, a 2-phase linear cross table und two force controlled voice coil motors can be controlled by one DMD.
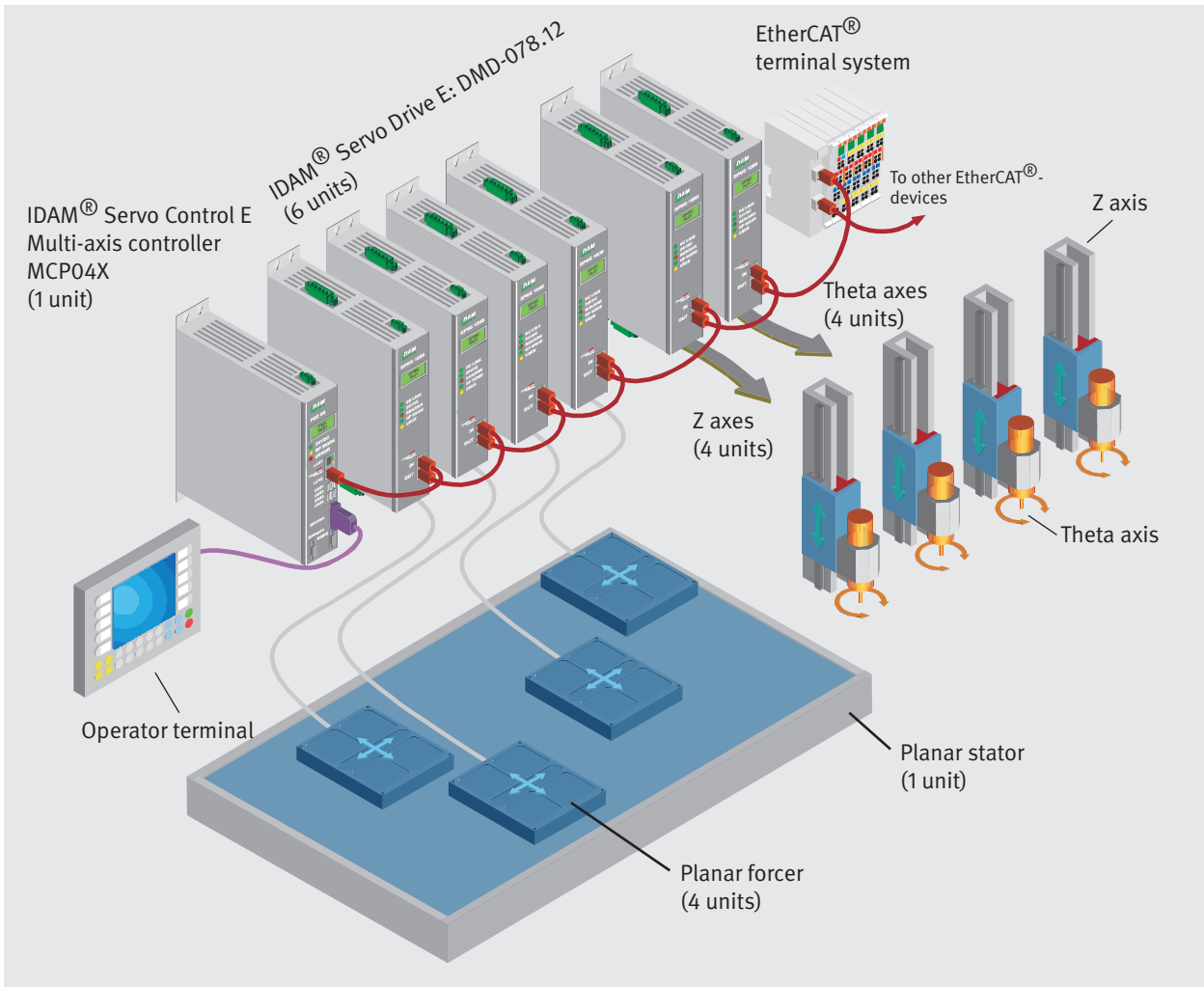
Technical Specifications

Power Unit	Unit	Value
External fuse for DC link input	A	16
DC link voltage	V_{DC}	24 ... 120
PWM frequency	kHz	20
Maximum peak load current per phase (1 s)	A_{rms} A_{peak}	10 15
Maximum continuous load current per phase (I_N @ 40 °C ambient; reduction 1,5% per °C)	A_{rms}	7

Auxiliary Power Supply	Unit	Value
Supply voltage	V_{DC}	24 ± 20%
Current consumption during operation	A	0.5 (externally fused)

Thermal overload protection	Unit	Value
Number of feedback signals		1 line for KTY-84 1 line for PTC quadruple
ADC resolution	Bit	12

Digital I/O	Unit	Value
Number of free configurable I/O		8
Number of dedicated IN		2
Output switching voltage	V_{DC}	24 (derived from auxiliary supply)
Continuous switching current	A	0.4
Peak switching current	A	0.6

Technical Specifications

Position Encoder HALL-IN Differential signal, voltage type, sin/cos without index	Unit	Value
Number of encoders		3
Input voltage	V_{pp}	1.0 ± 0.5
ADC resolution	Bit	14
Maximum input frequency	kHz	16

Position Encoder MS-OPTICAL-IN Differential signal, voltage type, sin/cos and reference signals	Unit	Value
Number of encoders		3
Input voltage	V_{pp}	1.0 ± 0.2
ADC resolution	Bit	12
Maximum input frequency	kHz	100
Reference signal conditioning		Analogue comparator

Field Bus Interface		Value
Type		EtherCAT®
Transfer rate		100 BASE TX
Transmission protocol		Product specific PDO (process data objects) and service data objects

Mechanical Dimensions (This product is intended for panel mounting.)	Unit	Value
Installation space (height x width x depth, incl. mounting plates)	mm	310 x 60 x 244
Total weight	kg	2.4

■ System Configuration (Example)

IDAM® Servo Drive E: DMD-078.12

EtherCAT® terminal system

IDAM® Servo Drive E: DMD-078.12 (6 units)

IDAM® Servo Control E Multi-axis controller MCP04X (1 unit)

To other EtherCAT®-devices

Z axis

Theta axes (4 units)

Z axes (4 units)

Theta axis

Operator terminal

Planar stator (1 unit)

Planar forcer (4 units)

Example with 4 planar forcers, 4 multi-axis systems (4 Z axes and 4 Theta axes), 6 DMD-078.12 and 1 motion controller MCP04X
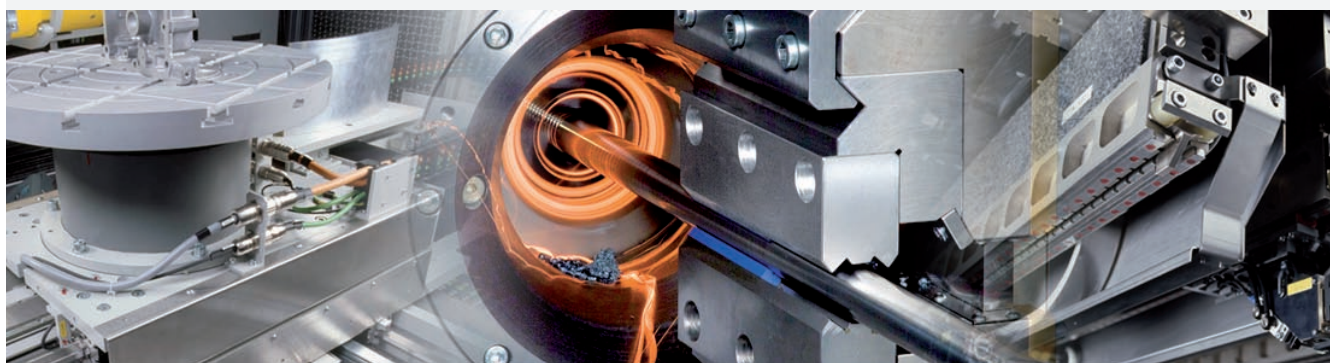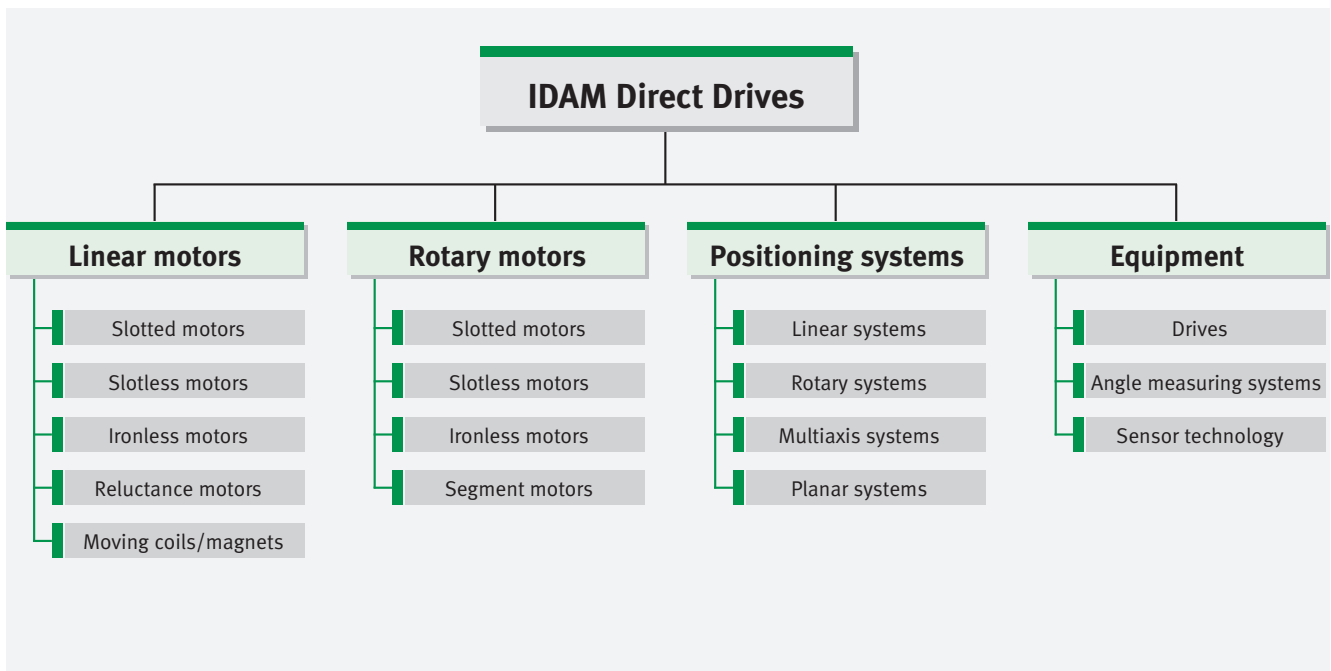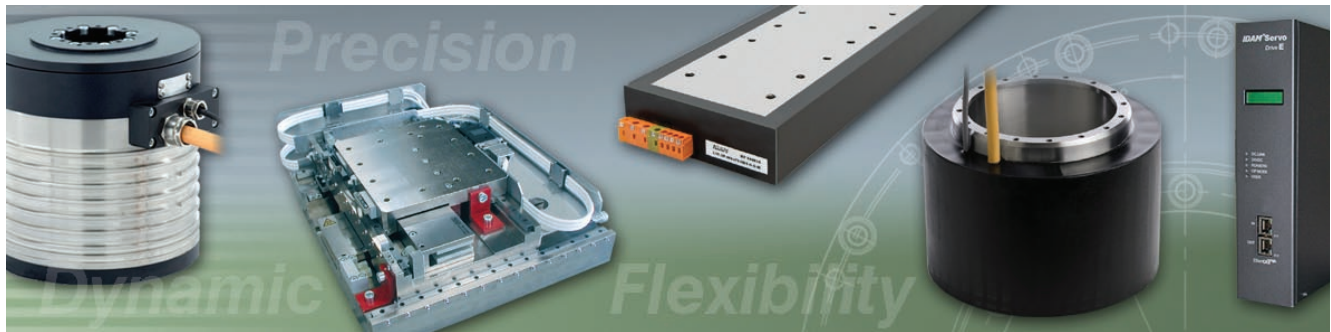
■ Type Designation

IDAM® Servo Drive E - DMD - 07 8. 12 ‹version›

Series
IDAM® Servo Drive E

Type, design
DMD - Digital Motor Drive

Continuous current (rms) per phase

Number of controllable phases

Maximum DC link voltage x 10

Customer-specific version
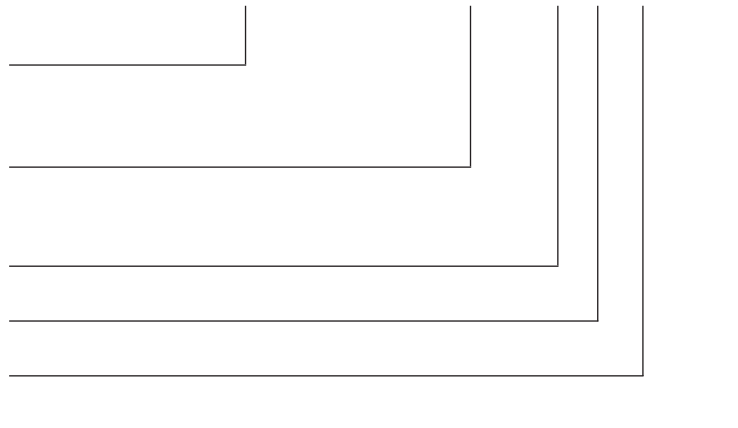
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IDAM – Your Partner for Direct Drive Technology!
The Perfect Drive For Every Application.

IDAM Direct Drives

Linear motors
- Slotted motors
- Slotless motors
- Ironless motors
- Reluctance motors
- Moving coils/magnets

Rotary motors
- Slotted motors
- Slotless motors
- Ironless motors
- Segment motors

Positioning systems
- Linear systems
- Rotary systems
- Multiaxis systems
- Planar systems

Equipment
- Drives
- Angle measuring systems
- Sensor technology

INA – Drives & Mechatronics AG & Co. KG (IDAM), a member of the Schaeffler Group, specializes in direct drive solutions. Direct drive technology is fascinating not only because of its precision and dynamic performance but also because of the many application options. IDAM engineers have expert knowledge in many different industries, e.g. machine tools, automation, productronics, measuring technology and medical engineering.

IDAM direct drives are at the forefront of modern technology and are an optimal solution for many applications. Let IDAM custom-made, high performance direct drive systems enable your company to gain a competitive edge. Partner with IDAM on your next project and receive the most advanced direct drive solutions available today.

INA – Drives & Mechatronics AG & Co. KG

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