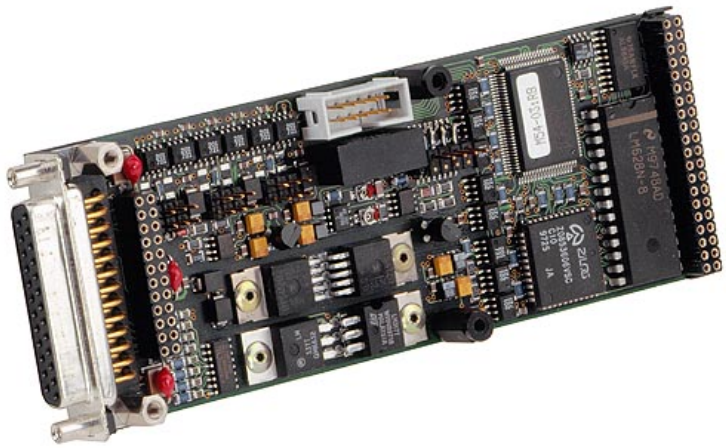
M54 – DC Motor Controller

- **1 LM628 supported channel**
- **For every motor type with ±10 V control input**
- **Position and velocity operation**
- **Quadrature incremental encoder interface**
- **PID values programmable**
- **RS422 or TTL, ±10 V, 1 relay output**
- **Additional binary I/O**
- **Optical isolation**
- **Not conforming to RoHS**



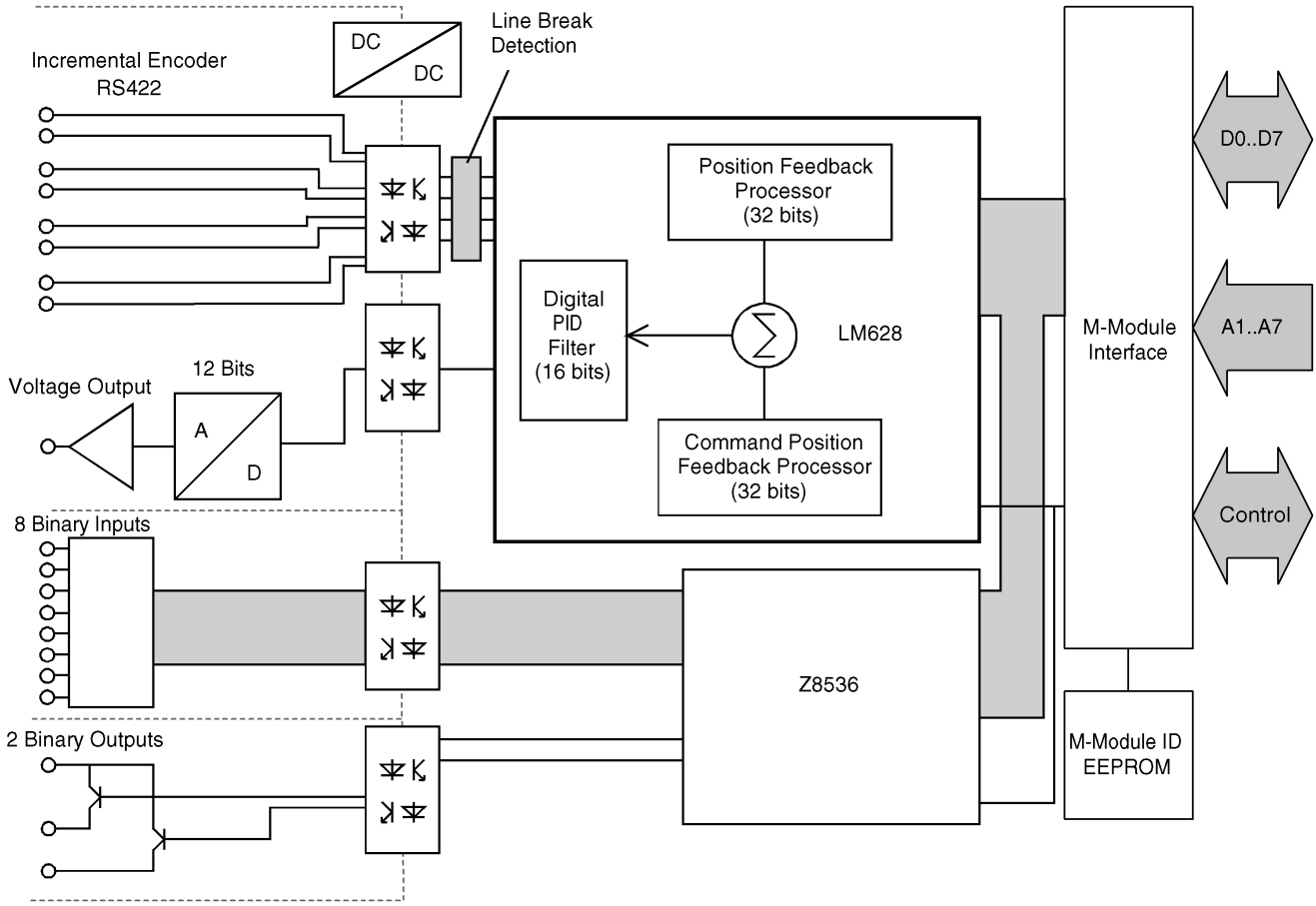
The mezzanine card M54 is a motor controller that is suited for all types of motors that have a ±10V DC control input and that can provide a position feedback information using an incremental encoder (e.g. servo motors).

The motor controller component on the M54 is able to move a motor to a specific position at a specific speed. The PID values for the controller can be defined by software and thus be adapted to the motor used.

In addition there are eight binary inputs and two binary outputs, which are isolated from each other, from the analog output and from the system.

The M54 is based on the M-Module ANSI mezzanine standard. It can be used as an I/O extension in any type of bus system, i.e. CPCI, VME or on any type of stand-alone SBC. Appropriate M-Module carrier cards in 3U, 6U and other formats are available from MEN or other manufacturers.

Diagram


Incremental Encoder
RS422
DC
DC
Line Break
Detection
Position Feedback
Processor
(32 bits)
Digital
PID
Filter
(16 bits)
LM628
Command Position
Feedback Processor
(32 bits)
M-Module
Interface
D0..D7
A1..A7
Control
12 Bits
Voltage Output
A
D
8 Binary Inputs
2 Binary Outputs
Z8536
M-Module ID
EEPROM

Technical Data

LM628 Motor Controller	■ LM628 precision motor controller ■ 32-bit position, velocity and acceleration registers ■ 256µs control-loop update time ■ Programmable digital PID filter with 16-bit coefficients ■ Operating modes: position and velocity ■ Position feedback interface □ Incremental encoder □ Quadrature signals with optional index □ RS422 or TLL signal level
Motor Interface	■ Optically isolated from all other parts ■ ±10V analog output ■ Resolution: 12 bits, ±2 LSB
Quadrature Incremental Encoder Interface	■ Index pulse ■ RS422 or TTL signal level ■ Line break monitor ■ Plausibility check for glitch detection
Binary I/O	■ I/O controller Zilog Z8536 ■ Optically isolated from all other parts ■ Supply: 12..36V, 50mA typ. ■ Binary inputs: □ 8 inputs connected to port A of Z8536 (6 inputs digitally debounced) □ Switching voltage: 1.2V nominal □ Input frequency: I0/I1 max. 125Hz, I2..I7 max. 50Hz □ Input resistance: 12 kOhm, ±10% ■ Binary outputs: □ 2 outputs connected to port B of the Z8536 □ Protected highside outputs (BTS412) □ Switching current: Imax = -1A □ Overload protection: Imax = -10A typ.
Peripheral Connections	■ Via front panel on a shielded 25-pin D-Sub receptacle connector ■ Via carrier board (rear I/O)
M-Module Characteristics	■ A08, D08, INTA, IDENT
Electrical Specifications	■ Isolation voltage: □ 500V DC from M-Module interface □ 100V DC from binary I/O □ 100V DC from motor interface ■ Supply voltage/power consumption: +5V (4.85V..5.25V), 1A typ. ■ MTBF: tbd. (derived from MIL-HDBK-217F)
Mechanical Specifications	■ Dimensions: conforming to M-Module Standard ■ Weight: 108g
Environmental Specifications	■ Temperature range (operation): □ 0..+60°C □ Industrial temperature range on request □ Airflow: min. 10m³/h ■ Temperature range (storage): -40..+85°C ■ Relative humidity range (operation): max. 95% non-condensing ■ Relative humidity range (storage): max. 95% non-condensing ■ Altitude: -300m to + 3,000m ■ Shock: 15g/11ms ■ Bump: 10g/16ms ■ Vibration (sinusoidal): 2g/10..150Hz ■ Conformal coating on request

Technical Data

Safety	■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers
EMC	■ Tested according to EN 55022 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst)
Software Support	■ MEN Driver Interface System (MDIS for Windows®, Linux, VxWorks®, QNX®, OS-9®) ■ For more information on supported operating system versions and drivers see Downloads.

Ordering Information

Standard M54 Models	**04M054-00**	DC-motor controller with binary I/O, 0..+60°C, no RoHS
Miscellaneous Accessories	**05M000-00**	M-Module cable, 2m, with 25-pin D-Sub plug/housing to pig tail
	05M000-17	25 mounting screw sets to fix M-Modules on carrier boards
Software: Linux	This product is designed to work under Linux. See below for potentially available separate software packages from MEN.	
	13M054-06	MDIS4/2004 low-level driver sources (MEN) for M54
Software: Windows®	This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.	
	13M054-70	MDIS4/2004 Windows® driver (MEN) for M54
Software: VxWorks®	This product is designed to work under VxWorks®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.	
	13M054-06	MDIS4/2004 low-level driver sources (MEN) for M54
Software: QNX®	This product is designed to work under QNX®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.	
	13M054-06	MDIS4/2004 low-level driver sources (MEN) for M54
Software: OS-9®	This product is designed to work under OS-9®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.	
	13M054-06	MDIS4/2004 low-level driver sources (MEN) for M54

For operating systems not mentioned here contact MEN sales.

Documentation	Compare Chart robotics and motion M-Modules » Download	
	20M000-00	M-Module Draft Specification, Rev. 3.0
	20M054-00	M54 User Manual

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