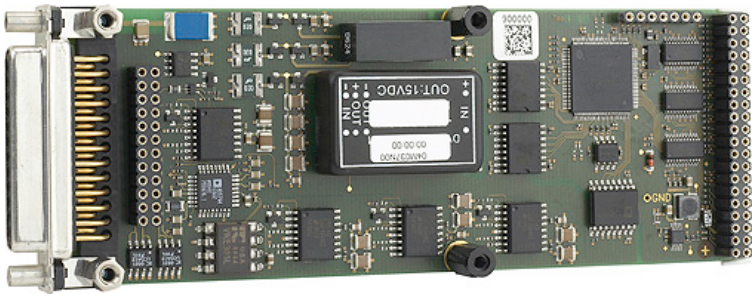
M37N – 4 Analog Outputs, 16 Bits

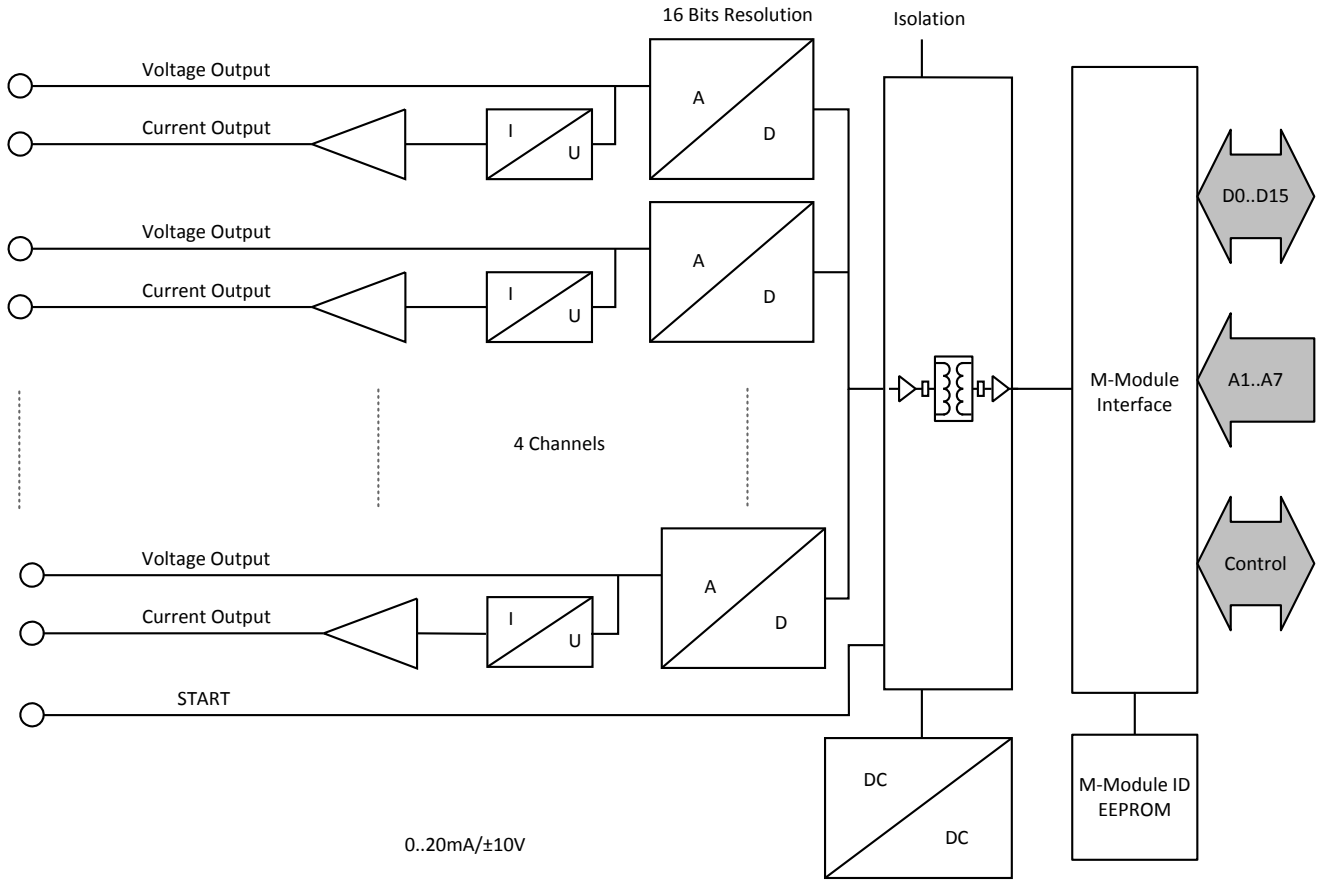
- **4 current or voltage outputs**
- **16 bits resolution**
- **<8.5 µs acquisition/conversion time**
- **+/-0.1% accuracy**
- **Simultaneous channel update**
- **Synchronization with external trigger**
- **Electrical isolation**
- **-40 to +85°C with qualified components**



The mezzanine card M37N is a high-precision M-Module with four analog voltage, or alternatively current output channels for very fast signals. The output voltage range for each channel is -10 to +10 V. The current outputs are separately available and can be used as 0 to 20 mA outputs. The M-Module comes with 16 bits resolution at an ultra-high voltage accuracy of +/-0.1% which is valid for the complete temperature range from -40 to +85°C. Beyond that it is optionally possible to even extend these values by additional calibration.

The M37N supports a load resistance of 600 Ohms and more. The isolated supply voltages can be generated on the board by two low-noise DC/DC converters. The output load is driven to ground.
The M37N is designed for a large range of applications, for example in an automated test environment, in process control systems or for sensor measurements.
The M37N 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


16 Bits Resolution
Isolation
Voltage Output
Current Output
I
U
A
D
Voltage Output
Current Output
4 Channels
Voltage Output
Current Output
START
0..20mA/±10V
DC
DC
M-Module
Interface
M-Module ID
EEPROM
D0..D15
A1..A7
Control

Technical Data

D/A Conversion	■ 4 channels current or voltage output ■ 16 bits ■ Conversion time of D/A converter: <10.5µs ■ Time between trigger activation and new valid output voltage: <20µs ■ Output linearity: ±1LSB ■ Simultaneous updating of all channels ■ Synchronization with external trigger ■ Electrically isolated (500V DC isolation)
Voltage Output	■ Output current: ±6mA max. ■ Accuracy: ±0.1% (for whole temperature range) ■ Voltage range: -10V..+10V
Current Output	■ Accuracy: ±0.5% (for whole temperature range) ■ Current range: 0..20mA ■ Max. load resistance: 600 Ohm (or higher with external power supply)
Peripheral Connections	■ Via front panel on a shielded 25-pin D-Sub receptacle connector ■ Via carrier board (rear I/O)
M-Module Characteristics	■ A08, D16, INTA, IDENT
Electrical Specifications	■ Isolation voltage: 500V DC ■ Supply voltage/power consumption: □ Through M-Module-carrier with onboard DC/DC converter: +5V (4.85V..5.25V), 270mA typ., 620mA max. □ Optional supply current for current transmitters 100 mA typ. ■ MTBF: 1,012,625h @ 40°C according to IEC/TR 62380 (RDF 2000)
Mechanical Specifications	■ Dimensions: conforming to M-Module Standard ■ Weight: 90g
Environmental Specifications	■ Temperature range (operation): □ -40..+85°C □ 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 (according to EN60068-2-27) ■ Bump: 10g/16ms (according to EN60068-2-29) ■ Vibration (sinusoidal): 2g/10..150Hz (according to EN60068-2-6) ■ Conformal coating on request
Safety	■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers
EMC	■ Tested according to EN55022 Class A (radio disturbance), EN61000-4-2 (ESD) and EN61000-4-4 (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 M37N Models	**04M037N00**	4 analog current/voltage outputs, DC/DC converter, -40...+85°C with qualified components
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.	
	13M037-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M37 and M37N
Software: Windows®	This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.	
	13M037-70	MDIS4/2004 / MDIS5 Windows® driver (MEN) for M37 and M37N
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.	
	13M037-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M37 and M37N
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.	
	13M037-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M37 and M37N
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.	
	13M037-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M37 and M37N

For operating systems not mentioned here contact MEN sales.

Documentation	Compare Chart analog I/O M-Modules » Download	
	20M000-00	M-Module Draft Specification, Rev. 3.0
	20M037N00	M37N User Manual

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