

## M37N – 4 Analog Outputs, 16 Bits

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

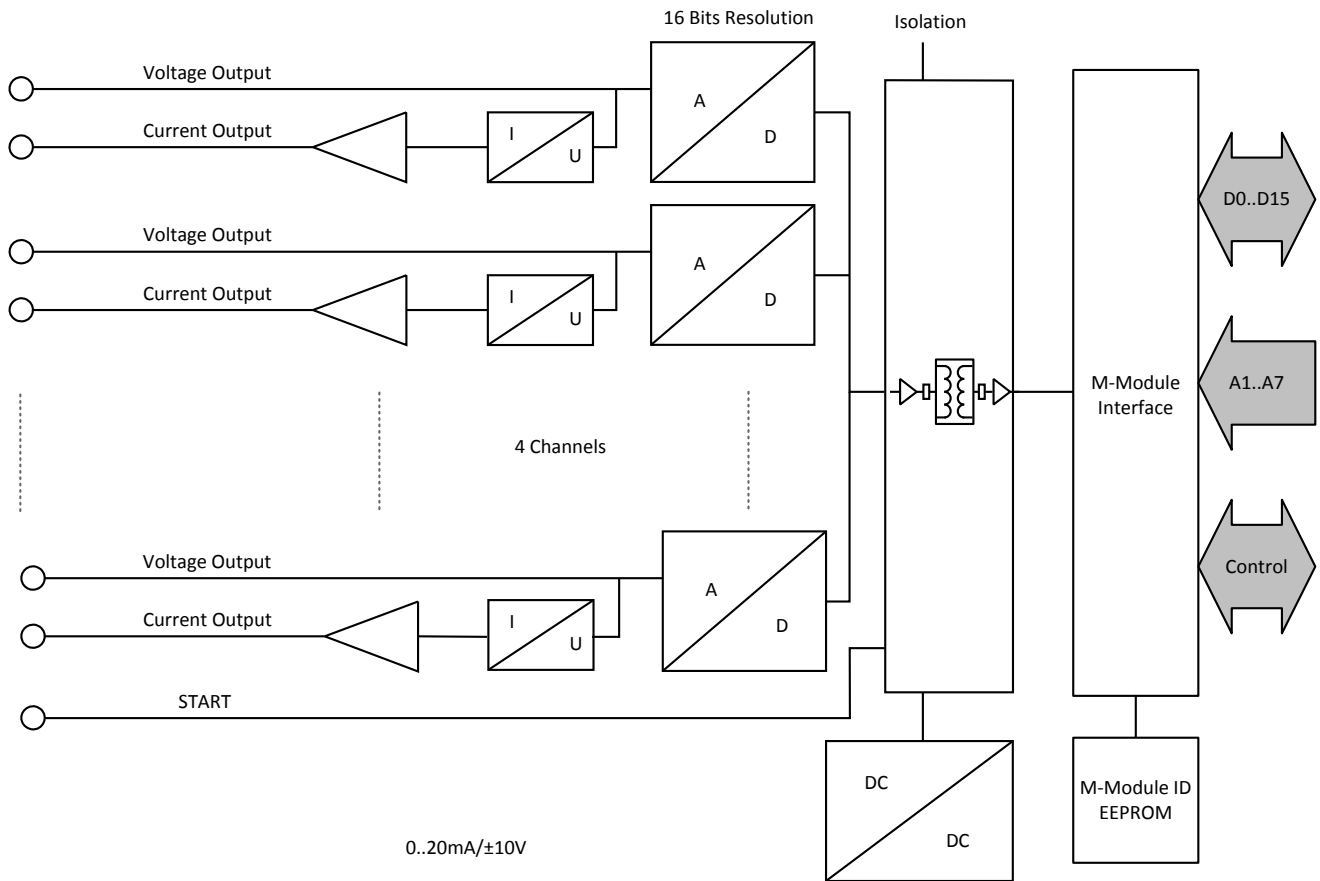


The mezzanine card M37N is a high-precision M-Module with four analog voltage, or alternatively current output channels for very fast signals. The output voltage range for each channel is -10 to +10 V. The current outputs are separately available and can be used as 0 to 20 mA outputs. The M-Module comes 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



## Technical Data

<b>D/A Conversion</b>	<ul style="list-style-type: none"> <li>■ 4 channels current or voltage output</li> <li>■ 16 bits</li> <li>■ Conversion time of D/A converter: &lt;10.5µs</li> <li>■ Time between trigger activation and new valid output voltage: &lt;20µs</li> <li>■ Output linearity: ±1LSB</li> <li>■ Simultaneous updating of all channels</li> <li>■ Synchronization with external trigger</li> <li>■ Electrically isolated (500V DC isolation)</li> </ul>
<b>Voltage Output</b>	<ul style="list-style-type: none"> <li>■ Output current: ±6mA max.</li> <li>■ Accuracy: ±0.1% (for whole temperature range)</li> <li>■ Voltage range: -10V..+10V</li> </ul>
<b>Current Output</b>	<ul style="list-style-type: none"> <li>■ Accuracy: ±0.5% (for whole temperature range)</li> <li>■ Current range: 0..20mA</li> <li>■ Max. load resistance: 600 Ohm (or higher with external power supply)</li> </ul>
<b>Peripheral Connections</b>	<ul style="list-style-type: none"> <li>■ Via front panel on a shielded 25-pin D-Sub receptacle connector</li> <li>■ Via carrier board (rear I/O)</li> </ul>
<b>M-Module Characteristics</b>	<ul style="list-style-type: none"> <li>■ A08, D16, INTA, IDENT</li> </ul>
<b>Electrical Specifications</b>	<ul style="list-style-type: none"> <li>■ Isolation voltage: 500V DC</li> <li>■ Supply voltage/power consumption: <ul style="list-style-type: none"> <li>□ Through M-Module-carrier with onboard DC/DC converter: +5V (4.85V..5.25V), 270mA typ., 620mA max.</li> <li>□ Optional supply current for current transmitters 100 mA typ.</li> </ul> </li> <li>■ MTBF: 1,012,625h @ 40°C according to IEC/TR 62380 (RDF 2000)</li> </ul>
<b>Mechanical Specifications</b>	<ul style="list-style-type: none"> <li>■ Dimensions: conforming to M-Module Standard</li> <li>■ Weight: 90g</li> </ul>
<b>Environmental Specifications</b>	<ul style="list-style-type: none"> <li>■ Temperature range (operation): <ul style="list-style-type: none"> <li>□ -40..+85°C</li> <li>□ Airflow: min. 10m³/h</li> </ul> </li> <li>■ Temperature range (storage): -40..+85°C</li> <li>■ Relative humidity range (operation): max. 95% non-condensing</li> <li>■ Relative humidity range (storage): max. 95% non-condensing</li> <li>■ Altitude: -300m to + 3,000m</li> <li>■ Shock: 15g/11ms (according to EN60068-2-27)</li> <li>■ Bump: 10g/16ms (according to EN60068-2-29)</li> <li>■ Vibration (sinusoidal): 2g/10..150Hz (according to EN60068-2-6)</li> <li>■ Conformal coating on request</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers</li> </ul>
<b>EMC</b>	<ul style="list-style-type: none"> <li>■ Tested according to EN55022 Class A (radio disturbance), EN61000-4-2 (ESD) and EN61000-4-4 (burst)</li> </ul>
<b>Software Support</b>	<ul style="list-style-type: none"> <li>■ MEN Driver Interface System (MDIS for Windows®, Linux, VxWorks®, QNX®, OS-9®)</li> <li>■ <a href="#">For more information on supported operating system versions and drivers see Downloads.</a></li> </ul>

## Ordering Information

<b>Standard M37N Models</b>	<b>04M037N00</b>	4 analog current/voltage outputs, DC/DC converter, -40...+85°C with qualified components
<b>Miscellaneous Accessories</b>	<b>05M000-00</b>	M-Module cable, 2m, with 25-pin D-Sub plug/housing to pig tail
	<b>05M000-17</b>	25 mounting screw sets to fix M-Modules on carrier boards
<b>Software: Linux</b>	This product is designed to work under Linux. See below for potentially available separate software packages from MEN.	
	<b>13M037-06</b>	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M37 and M37N
<b>Software: Windows®</b>	This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.	
	<b>13M037-70</b>	MDIS4/2004 / MDIS5 Windows® driver (MEN) for M37 and M37N
<b>Software: VxWorks®</b>	This product is designed to work under VxWorks®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.	
	<b>13M037-06</b>	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M37 and M37N
<b>Software: QNX®</b>	This product is designed to work under QNX®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.	
	<b>13M037-06</b>	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M37 and M37N
<b>Software: OS-9®</b>	This product is designed to work under OS-9®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.	
	<b>13M037-06</b>	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M37 and M37N
For operating systems not mentioned here <a href="#">contact MEN sales</a> .		
<b>Documentation</b>	Compare Chart analog I/O M-Modules » <a href="#">Download</a>	
	<b>20M000-00</b>	M-Module Draft Specification, Rev. 3.0
	<b>20M037N00</b>	M37N User Manual

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