

M33 – 8 Analog Outputs

- 8 current or voltage outputs
- 12 bits resolution
- 10 μ s acquisition/conversion time
- Simultaneous channel update
- Optical isolation
- -40 to +85°C screened versions



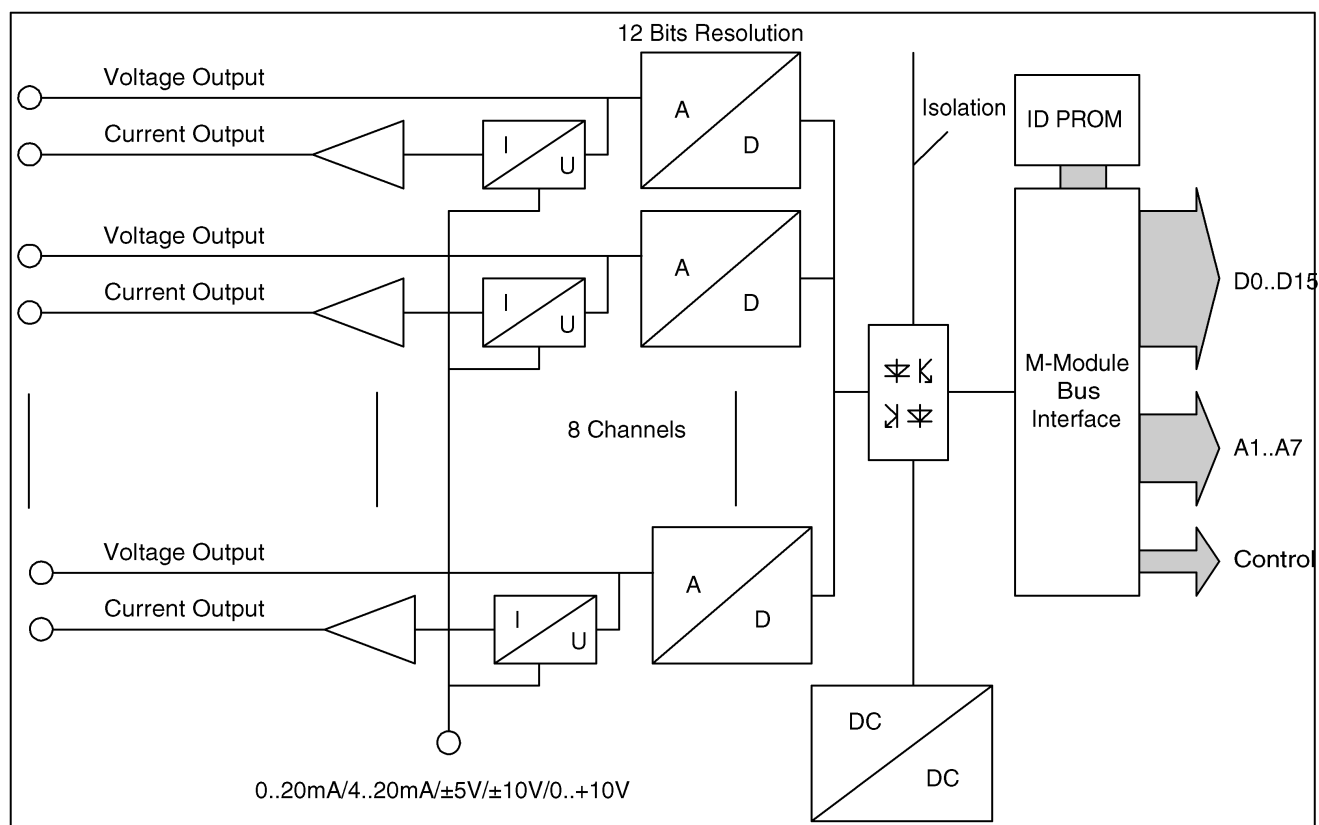
The mezzanine card M33 is a highly flexible M-Module™ for analog output signals. The isolated supply voltages can be generated by an on-board DC/DC converter. The output voltage range can be set to 0..10V, -5..+5V or -10..+10V for each channel by

software. In addition, the current outputs can be used with 0..20mA or 4..20mA. The output load is driven to ground.

Attention: An external supply is needed with 8 current outputs!

The M33 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

D/A Conversion	■ 8 channels ■ 12 bits ■ DAC conversion time 10µs ■ ±5 LSB gain ■ Simultaneous update of all channels possible
Voltage Output	■ Output current: 5mA max. ■ Output linearity: ±1 LSB ■ Accuracy: ±0.2%, ±1 LSB differential ■ Voltage ranges: 0..10V; -5V..+5V; -10V..+10V ■ Voltage output stable up to 1µF capacitive load
Current Output	■ Accuracy: ± 0.5% ■ Current range: 0..20mA; 4..20mA ■ Max. output voltage 10V ■ Load resistance range: 0..500 Ohm
Slew Rates for Voltage Output	■ 0V..+10V mode: switch from 0V to +10V; slew rate (SR) = 4V/µs ■ -5V..+5V mode: switch from -5V to +5V; slew rate (SR) = 4V/µs ■ -10V..+10V mode: switch from -10V to +10V; slew rate (SR) = 4V/µs
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, IDENT
Electrical Specifications	■ Isolation voltage: 500V DC ■ Supply voltage/power consumption: □ +5V (4.85V..5.25V), 480mA quiescent current, 600mA with 8 channels voltage output, 650mA with 4 channels current output □ External supply voltage +24V: 15.6V..30V ■ MTBF: 200,000h @ 50°C (derived from MIL-HDBK-217F)
Mechanical Specifications	■ Dimensions: conforming to M-Module™ Standard ■ Weight: 80g
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
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.

Configuration & Options

Standard Configurations

Article No.	Channels	Operation Temperature
04M033-10	4	0..+60°C
04M033-11	4	-40..+85°C
04M033-12	8	0..+60°C
04M033-13	8	-40..+85°C

Options

Channels	■ 4 or 8
Operation Temperature	■ 0..+60°C ■ -40..+85°C

Ordering Information

Standard M33 Models	04M033-10	4 analog outputs, 0..+60°C
	04M033-11	4 analog outputs, -40..+85°C screened
	04M033-12	8 analog outputs, 0..+60°C
	04M033-13	8 analog outputs, -40..+85°C screened
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.	
	13M033-06	MDIS4™/2004/MDIS5™ low-level driver sources (MEN) for M33
Software: Windows®	This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.	
	13M033-70	MDIS4™/2004/MDIS5™ Windows® driver (MEN) for M33
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.	
	13M033-06	MDIS4™/2004/MDIS5™ low-level driver sources (MEN) for M33
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.	
	13M033-06	MDIS4™/2004/MDIS5™ low-level driver sources (MEN) for M33
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.	
	13M033-06	MDIS4™/2004/MDIS5™ low-level driver sources (MEN) for M33
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
	20M033-00	M33 User Manual

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