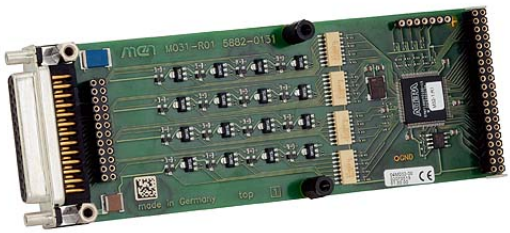
M31 – 16 Binary Inputs

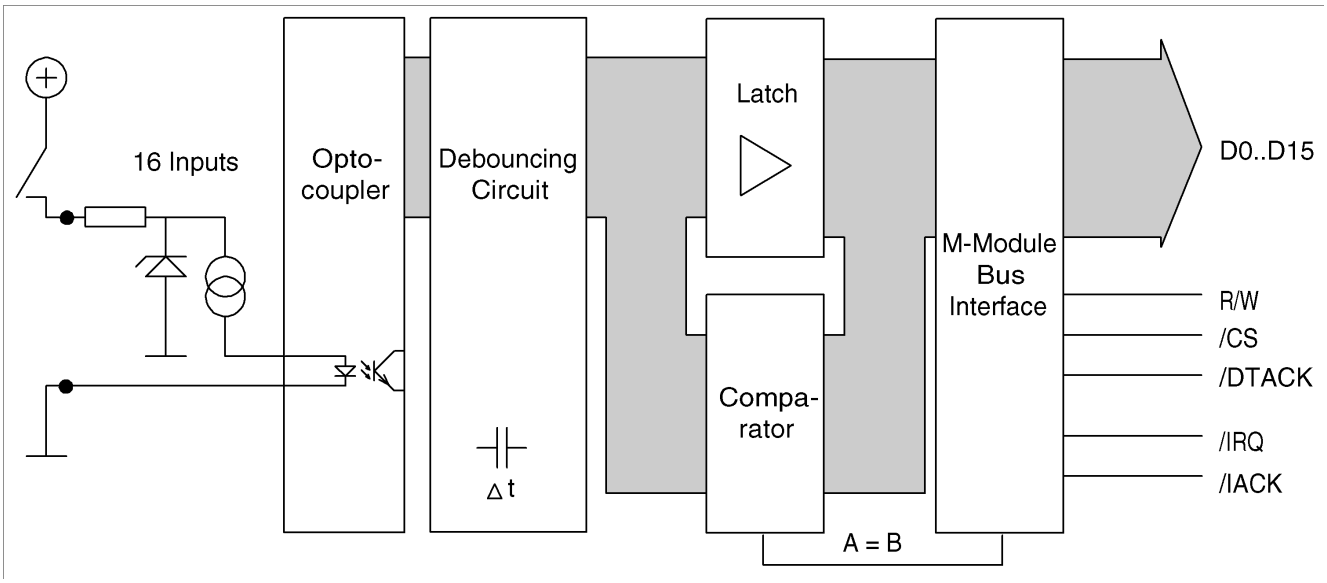
- **16 inputs 5..180 V**
- **Constant current inputs**
- **Debouncing circuit**
- **Interrupt generation**
- **Load on ground**
- **Optical isolation**
- **-40 to +85°C with qualified components**



The mezzanine card M31 is a 16-bit binary input M-Module with latching and comparator capabilities for industrial applications. The inputs are optically isolated with a high isolation voltage of 500V DC.
A current limit for each input guarantees a wide input voltage range of 5 to 180V.
Each input signal edge generates a maskable interrupt for each channel.

The signals of mechanical switches are debounced by a digital circuit. The precision debouncing time of 300ns to 100ms is software programmed in a PLD.
The M31 has its input load on ground which means that switching an input to an external supply activates the respective optocoupler.
The M31 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 Inputs
Opto-
coupler
Debouncing
Circuit
Δ t
Latch
Compa-
rator
A = B
M-Module
Bus
Interface
D0..D15
R/W
/CS
/DTACK
/IRQ
/IACK

Technical Data

Binary Inputs	■ Input load on ground ■ FET constant current source inputs ■ Input voltages and currents: □ 5..40V; 2.5..3.5mA (high level) □ 5..180V (M-Module version for extended temperature range) □ 0..1V; 0..0.2mA (low level) ■ Switching time for input change: 3µs typ.
Debouncing Time	■ 14ms (defined by PLD programming)
Miscellaneous	■ Debouncing circuit ■ Interrupt generation with maskable interrupt
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, INTB, IDENT
Electrical Specifications	■ Isolation voltage: □ 500V DC between isolated side and digital side □ Voltage between the connector shield and isolated ground is limited to 180V using a varistor; AC coupling between connector shield and isolated ground through 47nF capacitor ■ Supply voltage/power consumption: +5V (4.85V..5.25V), 50mA typ. ■ MTBF: 300,000h @ 50°C (derived from MIL-HDBK-217F)
Mechanical Specifications	■ Dimensions: conforming to M-Module Standard ■ Weight: 67.5g
Environmental Specifications	■ Temperature range (operation): □ 0..+60°C or -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 ■ 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.

Ordering Information

Standard M31 Models	**04M031-00**	16 binary sink inputs, 0..+60°C
	04M031-08	16 binary sink inputs, -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 all available separate software packages.	
	13MD05-90	MDIS5 System (and Device Driver) Package (MEN) for Linux. This software package includes most standard device drivers available from MEN.
Software: Windows®	This product is designed to work under Windows®. See below for all available separate software packages.	
	13M031-70	MDIS4/2004 / MDIS5 Windows® driver (MEN) for M31, M32 and M82
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.	
	13M031-06	MDIS5 low-level driver sources (MEN) for M31, M32 and M82
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.	
	13M031-06	MDIS5 low-level driver sources (MEN) for M31, M32 and M82
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.	
	13M031-06	MDIS5 low-level driver sources (MEN) for M31, M32 and M82

For operating systems not mentioned here contact MEN sales.

Documentation	Compare Chart binary I/O M-Modules » Download	
	20M000-00	M-Module Draft Specification, Rev. 3.0
	20M031-00	M31 User Manual

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