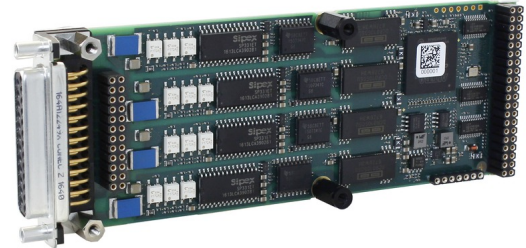


# M77N

## Mezzanine Card with 4 UARTs M-Module

- » 4 high-performance UARTs
- » Compatible to 16550 UART
- » 128 bytes FIFO buffer
- » Serial data rates up to 2 Mbit/s
- » Software programmable
- » Full and half duplex on 4 channels
- » 500 V AC optical isolation
- » -40°C to +85°C (qualified components)



### Quad Serial Interface M-Module

The M77N M-Module is a quad serial interface mezzanine card. It supports four high-performance UARTs with RS232 or RS422/485 level at the front-panel D-Sub connector or at its 24-pin onboard connector.

The 24-pin onboard connector is typically used to lead the I/O signals to the carrier board where they are transferred to the rear I/O connector.

The interface mode of the M77N can be changed by means of software. The termination resistor for RS422/485 must be set up through an external connection in the cable.

### Based on ANSI Standard

The M77N 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.

### Flexible and Cost Saving

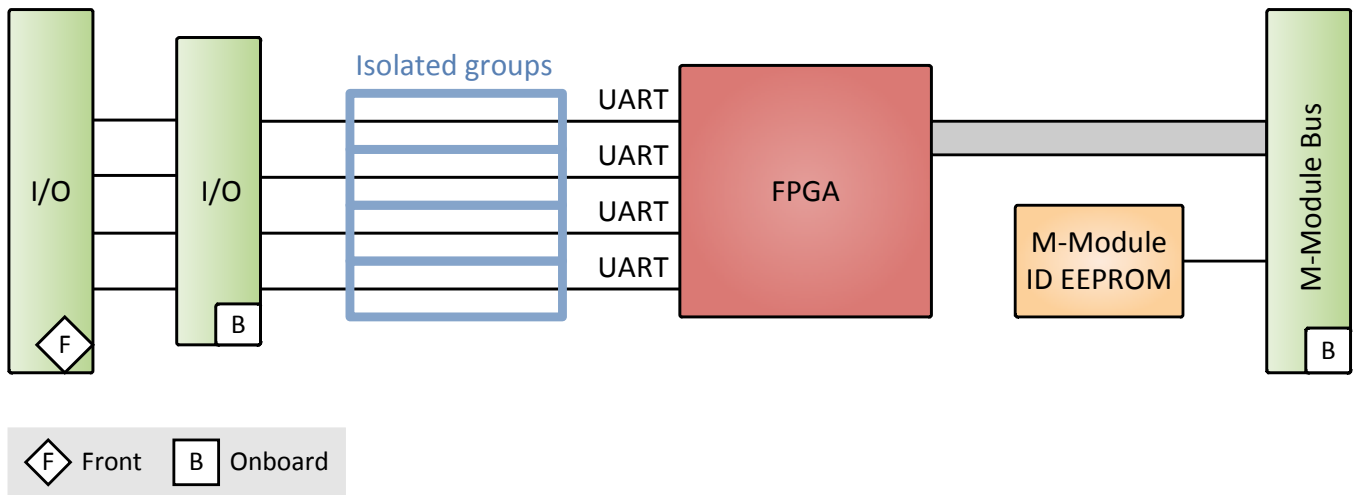
The M77N is fully compatible to the predecessor M77 M-Module, which means no changes in application design are necessary. Appropriate M-Module carrier cards in 3U, 6U and other formats are available from MEN or other manufacturers.

### Optical Isolation

All out-bound interface lines are optically isolated from the internal digital ground, board and system electronics, which is essential for advanced automotive and industrial applications. Optical isolation makes the module usable in critical environments, e.g., in trains, because it saves the controlling computer from external disturbances like high voltage pulses.

### Reliable and Robust

The M77N can operate in a -40°C to +85°C temperature range according to EN 50155 class TX. All components in the cable-less design are soldered and the board withstands shock and vibration for reliable operation. With a guaranteed standard life-time of seven years from product start, M77N facilitates the client's life-cycle management by making the board available at least for this period of time.



## Diagram

**UART**

- Four independent full-duplex asynchronous high-performance UART channels
- Four isolated groups, optical isolation
- 128-byte FIFO for each transmitter and receiver
- UARTs fully software compatible with industry standard 16C55x type UARTs
- Data rates up to 2 Mbit/s
- Automated in-band flow control using programmable Xon/Xoff characters, in both directions
- 5-, 6-, 7-, 8- and 9-bits data framing
- Independent channel reset by software
- Transmitter and receiver can be disabled

**Front Interfaces**

- UART
  - Four interfaces on one 25-pin D-Sub connector
  - Software-configurable as RS232/RS422/RS485

**Onboard Interfaces**

- UART
  - Four interfaces on one 24-pin I/O connector
- M-Module Bus
  - One 40-pin M-Module bus connector

**Mezzanine Module Standard**

- Compliant with M-Module standard ANSI/VITA 12-1997 (S2012)
- A08, D08, INTA, IDENT

**Electrical Specifications**

- Supply voltage
  - +5 V (-3%/+5%)
- Power consumption
  - 4.5 W max.
- Isolation voltage
  - 500 V AC

**Mechanical Specifications**

- Dimensions: conforming to M-Module standard
- Weight
  - 78 g (model 04M077N00)

**Environmental Specifications**

- Temperature range (operation)
  - -40°C to +85°C (qualified components), compliant with EN 50155, class TX
- Temperature range (storage): -40°C to +85°C
- Cooling concept
  - Air-cooled, airflow 1.0 m/s min.
- Humidity
  - EN 60068-2-30
  - EN 50155
- Altitude: -300 m to +3000 m
- Shock: EN 50155 (12.2.11)
- Vibration: EN 50155 (12.2.11)
- Conformal coating; optional

**Reliability**

- MTBF: 1 360 992 h @ 40°C according to IEC/TR 62380 (RDF 2000)

**Safety**

- Electrical Safety
  - EN 62368-1 (former EN 60950-1) class II equipment
- Flammability (PCBs)
  - UL 94 V-0

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## **EMC**

- EN 55022 class B (emission)
  - EN 50121-3-2 class B (emission)
  - EN 55024 class A (immunity)
  - EN 50121-3-2 class A (immunity)
- 

## **Software Support**

- Linux
- VxWorks
- QNX
- OS-9
- For more information on supported operating system versions and drivers see Software.

## Germany

### **MEN Mikro Elektronik GmbH**

Neuwieder Straße 3-7  
90411 Nuremberg  
Phone +49-911-99 33 5-0

sales@men.de  
[www.men.de](http://www.men.de)

## USA

### **MEN Micro Inc.**

860 Penllyn Blue Bell Pike  
Blue Bell, PA 19422  
Phone 215-542-9575

sales@menmicro.com  
[www.menmicro.com](http://www.menmicro.com)

## France

### **MEN Mikro Elektronik SAS**

18, rue René Cassin  
ZA de la Châtelaine  
74240 Gaillard  
Phone +33-450-955-312

sales@men-france.fr  
[www.men-france.fr](http://www.men-france.fr)

## China

### **MEN Mikro Elektronik (Shanghai) Co., Ltd.**

Room 808-809, Jiaxing Mansion, No. 877 Dongfang Road  
200122 Shanghai  
Phone +86-21-5058-0961

sales@men-china.cn  
[www.men-china.cn](http://www.men-china.cn)

### **Up-to-date information, documentation and ordering information:**

[www.men.de/products/m77n/](http://www.men.de/products/m77n/)

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