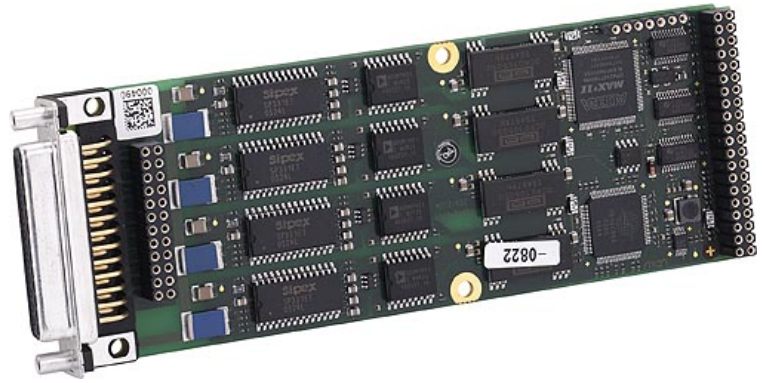


# M77 – Quad RS232/RS422/RS485 UART

- 4 high-performance UARTs
- 128 bytes FIFO buffer
- Serial data rates up to 1.152 Mbit/s
- Software programmable
- Full and half duplex on 4 channels
- 500 V DC optical isolation
- 180 V DC isolation between channels
- -40 to +85°C screened versions



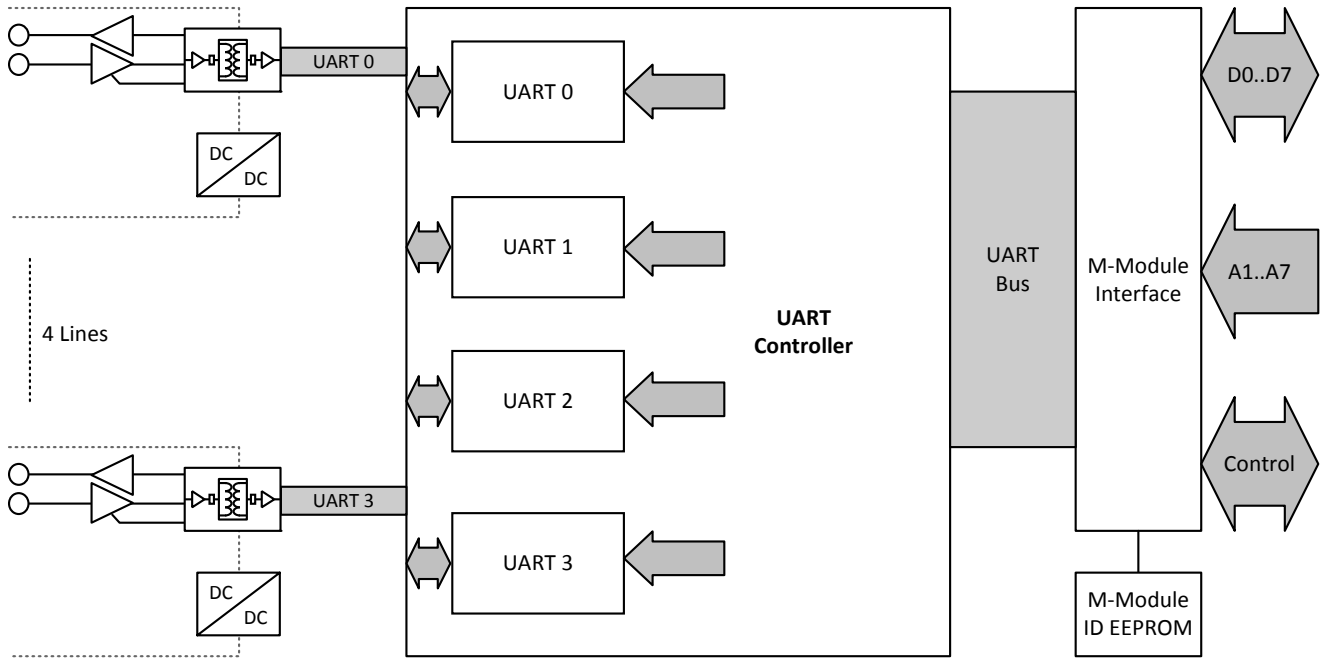
The mezzanine card M77 is a quad serial interface M-Module which supports four high-performance UARTs with RS232 or RS422/485 level at the front-panel D-Sub connector or at the rear I/O connector of the M-Module.

The interface mode of the M77 can be changed by means of software. The termination resistor for RS422/485 must be set up through an external connection in the cable.

All interface lines are electrically isolated from the system and from each other, which is essential for advanced automotive and industrial applications.

The M77 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>Quad RS232/485/422 Interface</b>	<ul style="list-style-type: none"> <li>■ All 4 channels with 4 lines (no handshake lines)</li> <li>■ All 4 channels electrically isolated from the system and from each other</li> </ul>
<b>UART Controller</b>	<ul style="list-style-type: none"> <li>■ 4 independent full-duplex asynchronous 16C950 high performance UART channels each</li> <li>■ 128-byte FIFO for each transmitter and receiver</li> <li>■ UARTs fully software compatible with industry standard 16C55x type UARTs</li> <li>■ Data rates up to 115.2kbit/s</li> <li>■ Readable FIFO levels</li> <li>■ Automated in-band flow control using programmable Xon/Xoff characters, in both directions</li> <li>■ Arbitrary trigger levels for receiver and transmitter FIFO interrupts</li> <li>■ Programmable special character detection</li> <li>■ 5-, 6-, 7-, 8- and 9-bits data framing</li> <li>■ Detection of bad data in receiver FIFO</li> <li>■ Independent channel reset by software</li> <li>■ Transmitter and receiver can be disabled</li> <li>■ Transmitter idle interrupt</li> <li>■ Sleep mode (low operating current)</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>■ Compliant with M-Module standard</li> <li>■ A08, D08, INTA, IDENT</li> </ul>
<b>Electrical Specifications</b>	<ul style="list-style-type: none"> <li>■ Isolation voltage: <ul style="list-style-type: none"> <li>□ 500V DC between isolated side and digital side</li> <li>□ 180V DC between the channels</li> <li>□ 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</li> </ul> </li> <li>■ Supply voltage/power consumption: +5V (4.85V..5.25V), 200mA typ.</li> <li>■ MTBF: 272,598h @ 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: 67g</li> </ul>
<b>Environmental Specifications</b>	<ul style="list-style-type: none"> <li>■ Temperature range (operation): <ul style="list-style-type: none"> <li>□ 0..+60°C or -40..+85°C</li> <li>□ Airflow: min. 10m<sup>3</sup>/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</li> <li>■ Bump: 10g/16ms</li> <li>■ Vibration (sinusoidal): 2g/10..150Hz</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 EN 55022 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst)</li> </ul>
<b>Software Support</b>	<ul style="list-style-type: none"> <li>■ Linux driver</li> <li>■ Windows® driver</li> <li>■ VxWorks® driver</li> <li>■ QNX® driver</li> <li>■ OS-9® SPF driver</li> <li>■ <a href="#">For more information on supported operating system versions and drivers see Downloads.</a></li> </ul>

## Ordering Information

<b>Standard M77 Models</b>	<b>04M077-00</b>	4-channels RS232/RS485/RS422, optically isolated UART, 0..+60°C
	<b>04M077-01</b>	4-channel RS232/RS485/RS422, optically isolated UART, -40..+85°C screened
<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>13M077-90</b>	Linux TTY driver (MEN) for M77, M45N and M69N, source code
<b>Software: Windows®</b>	This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.	
	<b>13M077-70</b>	Windows® native driver (MEN) for M77, M45N and M69N
<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>13M077-60</b>	VxWorks® driver (MEN) for M77, M45N and M69N, source code
<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>13M077-40</b>	QNX® native driver (MEN) for M77, M45N and M69N
<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>13M077-01</b>	OS-9®/68k SCF driver for M77
	<b>13M077-02</b>	OS-9®/PPC SCF driver for (MEN) M77, M45N and M69N, source code
For operating systems not mentioned here <a href="#">contact MEN sales</a> .		
<b>Documentation</b>	Compare Chart communication M-Modules » <a href="#">Download</a>	
	<b>20M000-00</b>	M-Module Draft Specification, Rev. 3.0
	<b>20M077-00</b>	M77 User Manual
	<b>20M077-ER</b>	M77 Errata

## Contact Information

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### Germany

MEN Mikro Elektronik GmbH  
Neuwieder Straße 3-7  
90411 Nuremberg  
Phone +49-911-99 33 5-0  
Fax +49-911-99 33 5-901

info@men.de  
www.men.de

### France

MEN Mikro Elektronik SAS  
18, rue René Cassin  
ZA de la Châtelaine  
74240 Gaillard  
Phone +33 (0) 450-955-312  
Fax +33 (0) 450-955-211

info@men-france.fr  
www.men-france.fr

### USA

MEN Micro Inc.  
860 Penllyn Blue Bell Pike  
Blue Bell, PA 19422  
Phone (215) 542-9575  
Fax (215) 542-9577

sales@menmicro.com  
www.menmicro.com

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