Mikro Elektronik M77

4-Channel RS232/RS422/RS485 M-Module

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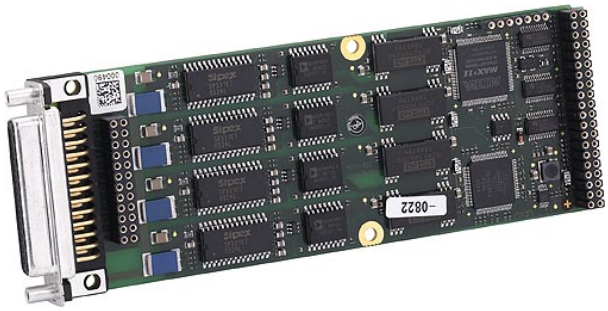
Embedded Solutions

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 equipped with an M-Module™-ID EEPROM. 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.

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Technical Data

Quad RS232/485/422 Interface
- All 4 channels with 4 lines (no handshake lines)
- All 4 channels electrically isolated from the system and from each other

UART Controller
- 4 independent full-duplex asynchronous 16C950 high performance UART channels each
- 128-byte FIFO for each transmitter and receiver
- UARTs fully software compatible with industry standard 16C55x type UARTs
- Data rates up to 115.2kbit/s
- Readable FIFO levels
- Automated in-band flow control using programmable Xon/Xoff characters, in both directions
- Automated out-of-band flow control using CTS/RTS and/or DSR/DTR
- Arbitrary trigger levels for receiver and transmitter FIFO interrupts
- Programmable special character detection
- 5-, 6-, 7-, 8- and 9-bits data framing
- Detection of bad data in receiver FIFO
- Independent channel reset by software
- Transmitter and receiver can be disabled
- Transmitter idle interrupt
- Sleep mode (low operating current)

Peripheral Connections
- Via front panel on a shielded 25-pin D-Sub receptacle connector
- Via carrier board (rear I/O)

M-Module™ Characteristics
- Compliant with M-Module™ standard
- A08, D08, INTA, IDENT

Electrical Specifications
- Isolation voltage:
  - 500V DC between isolated side and digital side
  - 180V DC between the channels
  - 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), 200mA typ.
- MTBF: 272,598h @ 40°C according to IEC/TR 62380 (RDF 2000)

Mechanical Specifications
- Dimensions: conforming to M-Module™ Standard
- Weight: 67g

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
- Linux driver
- Windows® driver
- VxWorks® driver
- QNX® driver
- OS-9® SPF driver
- For more information on supported operating system versions and drivers see Downloads.

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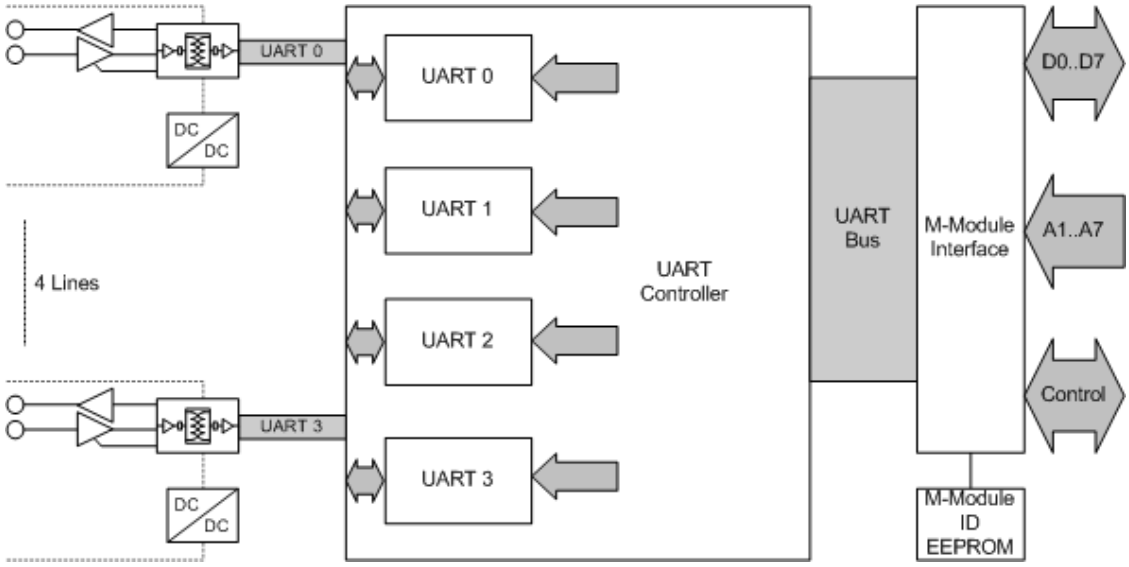
Diagram



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Ordering Information

Standard M77 Models

04M077-00 4-channels RS232/RS485/RS422, optically isolated UART, 0..+60°C

04M077-01 4-channel RS232/RS485/RS422, optically isolated UART, -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.

13M077-90 Linux TTY driver (MEN) for M77, M45N and M69N, source code

Software: Windows

This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.

13M077-70 Windows® native driver (MEN) for M77, M45N and M69N

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.

13M077-60 VxWorks® driver (MEN) for M77, M45N and M69N, source code

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.

13M077-40 QNX® native driver (MEN) for M77, M45N and M69N

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.

13M077-01 OS-9®/68k SCF driver for M77

13M077-02 OS-9®/PPC SCF driver for (MEN) M77, M45N and M69N, source code

For operating systems not mentioned here contact MEN sales.

Documentation

Compare Chart communication M-Modules™ Download

20M000-00 M-Module™ Draft Specification, Rev. 3.0

20M077-ER M77 Errata

20M077-00 M77 User Manual

For the most up-to-date ordering information and direct links to other data sheets and downloads, see the M77 online data sheet under » www.men.de.

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