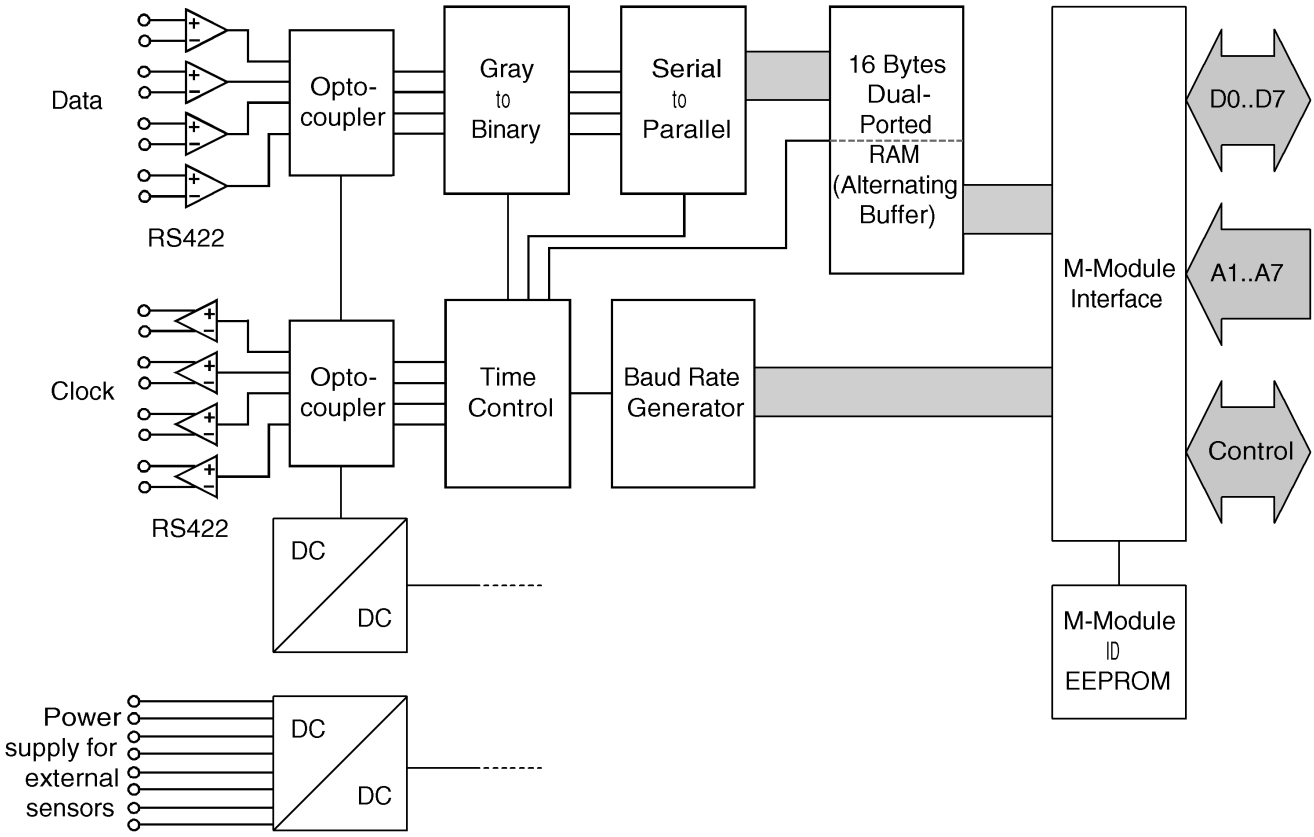
M47 – SSI Controller

- **4-channel 32-bit SSI**
- **Serial Synchronous Interface**
- **RS422A interface**
- **Automatic communication**
- **RAM-like double buffer user interface**
- **Gray/binary decoding for each channel**
- **Line-break detection**
- **Absolute value data input**
- **External Baud rate possible**
- **Optical isolation for each channel**
- **-40 to +85°C screened versions**

The mezzanine card M47 is a Serial Synchronous Interface M-Module for connection of up to four sensors to optically isolated SSI outputs. Serial synchronous interfaces are commonly used for many kinds of sensors such as rotary encoders. Connection to the sensors is made by two signals - a transmit clock and a receive data signal.

All communication and signal decoding is done in an FPGA. Gray and binary decoding, the baud rate and word length are programmable for every single channel. The current value can be read from the DPR at any time.
In addition, the M47 features line-break detection.
The M47 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


Data
RS422
Opto-
coupler
Gray
to
Binary
Serial
to
Parallel
16 Bytes
Dual-
Ported
RAM
(Alternating
Buffer)
M-Module
Interface
D0..D7
A1..A7
Control
Clock
RS422
Opto-
coupler
Time
Control
Baud Rate
Generator
DC
DC
M-Module
ID
EEPROM
Power
supply for
external
sensors
DC
DC

Technical Data

SSI Interface	■ 4-channel Serial Synchronous Interface (SSI) ■ Optical isolation ■ RS422A interface
Data Transmission	■ Baud rate □ 62.5 kbaud, 125 kbaud, 250 kbaud, 500 kbaud □ Programmable for each channel ■ Word length □ 1..32 bits □ Programmable for each channel
Memory	■ 16-byte RAM-like double buffer user interface
Interfaces	■ 4 RS422 ports, optically isolated ■ Supply voltage for external sensors etc.: 5V (±10%), 400mA max. all channels summed up
Miscellaneous	■ Automatic communication ■ Gray and binary decoding, programmable for each channel ■ Sensor connection detection ■ Interrupt triggering on a new data transmission
Peripheral Connections	■ Via front panel on a shielded 25-pin D-Sub receptacle connector ■ Via carrier board (rear I/O)
M-Module Characteristics	■ A08, D08, INTA, IDENT
Electrical Specifications	■ Isolation voltage □ 500V DC between M-Module interface and external sensor interface □ Voltage between the connector shield and sensor interface is limited to 180V using a varistor; AC coupling between connector shield and sensor interface through 10nF capacitor ■ Supply voltage/power consumption: +5V (4.85V..5.25V), 150mA without external sensors connected, max. 850mA with 4 sensors connected ■ MTBF: 33,000h @ 50°C (derived from MIL-HDBK-217F)
Mechanical Specifications	■ Dimensions: conforming to M-Module Standard ■ Weight: 60g
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 M47 Models	**04M047-00**	Synchronous Serial Interface (SSI), 0..+60°C
	04M047-01	M47, M-Module, Synchronous Serial Interface (SSI), -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.	
	13M047-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M47
Software: Windows®	This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.	
	13M047-70	MDIS4/2004 / MDIS5 Windows® driver (MEN) for M47
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.	
	13M047-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M47
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.	
	13M047-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M47
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.	
	13M047-06	MDIS4/2004 / MDIS5 low-level driver sources (MEN) for M47

For operating systems not mentioned here contact MEN sales.

Documentation	Compare Chart robotics and motion M-Modules » Download	
	20M000-00	M-Module Draft Specification, Rev. 3.0
	20M047-00	M47 User Manual

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