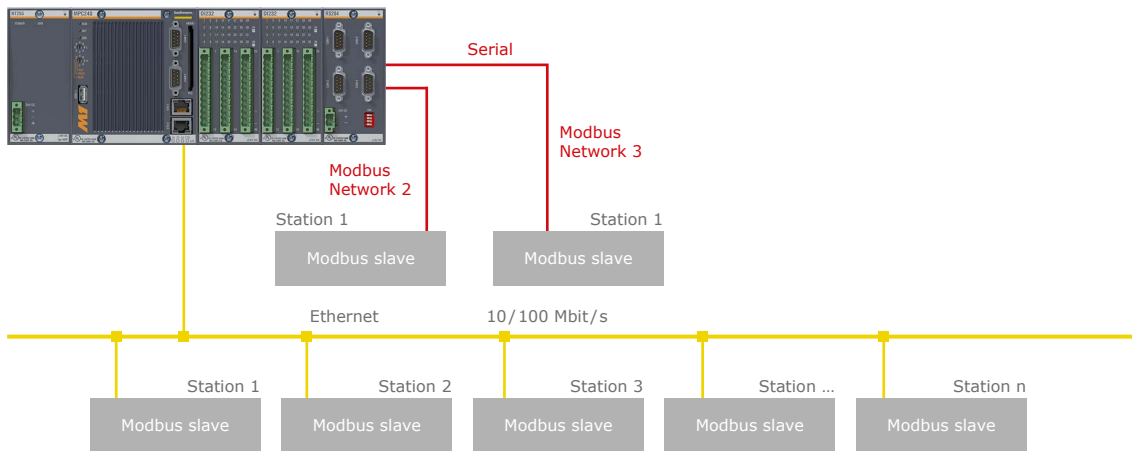
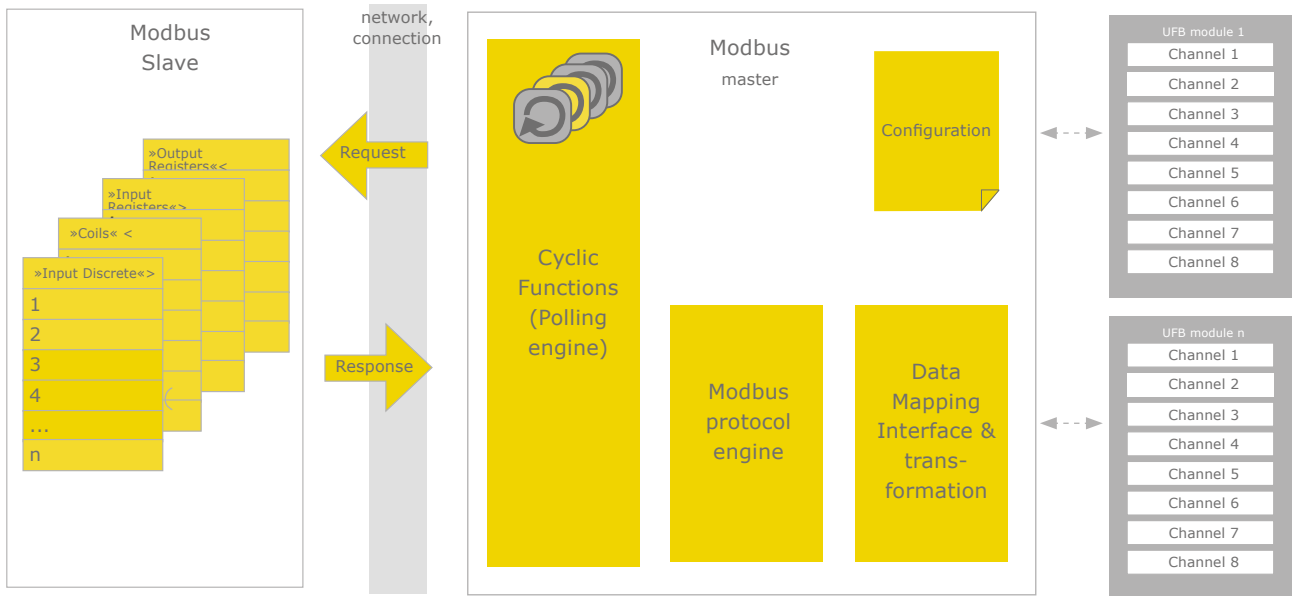




Modbus Master

With the Bachmann M1 Modbus master read/write access to the data from any external standard-conformant Modbus slave device is possible. The holding register, register, coils and discrete inputs of the external slave-devices are mapped to logical hardware modules of the control system per hardware modules. The cyclic update is executed automatically, the values remain available in the process image. Queries to the slaves are summarized automatically in this process to reduce the load. In addition, the Modbus master offers a function interface via which any Modbus requests can be sent to the slaves. The standardised error messages (Modbus exceptions) are passed through to the application software, the connection status is identified via diagnostics variables. All Ethernet ports for Modbus TCP and UDP, as well as all serial interfaces for Modbus ASCII and RTU, are available. These can also be distributed spatially to substations of the control system.

- Supported protocols:
 - Modbus TCP
 - Modbus UDP
 - Modbus ASCII
 - Modbus RTU
- Use of the onboard interfaces of the CPUs
- Possibility of spatial distribution of the interfaces via FAST substations with EM213 or RS204 modules
- Mapping of the contents of the »Modbus Primary Tables« to virtual channel values
- Multiple networks parallel (also for different modes)
- Gateway functionality (also to other bus systems)
- Investment protection thanks to extremely wide distribution
- Compatibility and openness
- Easy handling



Application example Modbus master

Modbus Master	
Protocols	Modbus TCP, Modbus UDP, Modbus RTU and Modbus ASCII
Protocol version	Modbus Application Protocol Specification V1.1b
Supported function codes	1, 2, 3, 4, 15, 16 (are used automatically purely through configuration). Via a function interface any function codes can be called directly from the application program.
Interfaces	
Physical layer – Modbus RTU, ASCII	RS232, RS422, RS485
Interfaces – Modbus RTU, ASCII	Serial interfaces to M1-CPU
Nominal transfer rates serial (RTU)	38400, 19200, 9600, 4800 bits/s (gross)
Distributability – Modbus RTU, ASCII	Yes (FASTBUS or BEM / BES substation with RS204 module)
Physical layer – Modbus TCP, UDP	Ethernet 10 / 100 MBit in accordance with IEEE 802.3
Interfaces – Modbus TCP, UDP	Ethernet ports of the CPU or of EM213 module
Distributability – Modbus TCP, UDP	Yes (FASTBUS or BEM / BES substation with EM213 module)
Performance data	
Multiple Modbus networks simultaneously	Yes (up to 8 networks per controller)
Connection to multiple slaves	Yes, only limited by bandwidth and memory
Baud rates with RTU, ASCII	All baud rates offered by the interface can be used
Parallel operation of other protocols	With TCP, UDP other TCP/IP-based protocols (FTP, web server, HMI etc.) can be run on the same connection. Serial interfaces (ASCII, RTU) require the COM port exclusively.
Word order	Configurable per data point
Optimization	Automatic summary of requests
Diagnostics	
Status of the connection	Can be indicated via channel module error states of the M1 I/O system
Diagnosis of the connection quality	Counter variables of the number of sent requests, received responses, CRC errors, connection errors etc.
Error messages in plain text	Entry in the M1 log book
Implementation	
Form of delivery	Driver MBM201 as part of the M-Base installation
Interface to the application	Virtual modules in accordance with the »Unified Fieldbus Model« for access via MIO or process image
Configuration data format	mconfig.ini (ASCII)