



Item	Device	Item No..
MH230 <sup>1)</sup>		00031521-00
MH230 <sup>1)</sup>	4GB CFA	00031521-03
MH230 CC <sup>1)</sup>		00031673-00
MH230 CC <sup>1)</sup>	4GB CFA	00031673-03
MH230		00032783-00
MH230	4GB CFA	00032783-03
MH230 CC		00032784-00
MH230 CC	4GB CFA	00032784-03

1) Hardware revision <KR110.000: 512 kB NVRAM, 16 MB internal memory device, USB 2.0 (incl. 500 mA supply), 30 W for I/O, no TPM-Chip, minimum version M-Base 4.30

## MH200 - Series (High Performance)

Processor modules of the MH200 series combine maximum processing performance with outstanding environmental robustness. Thanks to multicore technology and symmetrical multi-processing for real-time systems, the 2.3 GHz CPU is also suitable for demanding applications with very high volume requirements and short cycle times.

Specific tasks such as complex motion control, image processing or higher-level control and communication tasks benefit from the parallel processing of up to 4 tasks. Data centric applications, such as process diagnostics, machine learning or the predictive maintenance of large machine parks can be implemented easily thanks to the large working memory.

The generous thermal design and special coating processes enable fan-free use in extreme operating conditions from -30 to +60 °C. The integrated power supply unit, which also provides the I/O module supply, enables the installed volume to be kept very compact.

- Industrial 2.3 GHz Dual-Core-Processor
  - 4 logical Cores via Hyper-Threading
  - Realtime Symmetrical Multi Processing
  - 2 GB DDR4 RAM
  - CFast card slot for removable media
  - 2x Ethernet 10/100/1000 Mbit/s with IEEE 1588
  - 1x RS232, 1x RS232/RS422/RS485
  - Integrated power supply for I/Os
- Depending on the version (Engineering Part Revision):
  - 512 kB or 1 MB remanent memory (Retain)<sup>1)</sup>
  - 16 MB or 2 GB internal memory device<sup>1)</sup>
  - 1 x USB 2.0 or 1x USB 3.0<sup>1)</sup>
  - Without Trusted Platform Module (TPM) or with TPM<sup>1)</sup>

MH200 Series	MH230
<b>Processor</b>	
Architecture	x86 / Pentium® / IntelCore®
CPU	Industrial Low Voltage
Clock frequency	2300 MHz
Processor Cores	2
Hyper-Threading	Yes (4 logical cores)
Multitasking	Yes
Realtime-SMP / Core reservation	Yes / Yes
<b>Memory</b>	
Main memory / partitions	2 GB DDR4 / Yes
Ramdisk	Yes
Retentive memory (Retain)	1 MB NVRAM <sup>1)</sup>
Mass storage integrated	2 GB pSLC Flash <sup>1), 3)</sup>
Mass storage removable	CFast Type I <sup>2)</sup> (via side cover)
<b>Interfaces</b>	
I/O Subsystem	Bachmann M1 Backplane Interface
	Process Image Controller integrated
	Cyclic process images and on-event single channel access
	Synchronisation pulse for I/O & field busses
Ethernet	2x 10/100/1000 Base-T (RJ45)
	AutoNegotiation, AutoCrossing, IEEE 1588
Serial ports / COM	1x RS232 (D-SUB-9 m)
	1x RS232 / RS422 / RS485 galvanisch getrennt (D-SUB-9 m)
USB	1x USB 3.0 <sup>1)</sup> (incl. 900 mA <sup>1)</sup> supply)
<b>Indication &amp; Operation</b>	
Status indications	3x LED for CPU status (RUN / INIT / ERR)
	2x LED for status and link speed per ETH port
Operating elements	2x 16-position rotary switch (Hex-switch)
	For operation mode, programming, boot mode, address setting etc.
<b>Programming</b>	
Generic build target	Yes, across all model families
Languages	IEC 61131-3, C/C++, MATLAB®/Simulink® <sup>4)</sup>
Functional modules	Yes (MotionControl, Camming, CNC, adaptive temperature control ...) <sup>4)</sup>
<b>Monitoring</b>	
Processor temperature	Yes
Processor load	Yes
Runtime behaviour	Yes, cycle monitoring & watchdog
Network load	Yes
Memory protection	Yes, per partition
Supply voltage	Yes, with interrupt signal

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2) Memory card not included if not mentioned explicitly in order text

3) By default 13 MB used for system software at shipping

4) May include additional costs

5) Hardware revision <KR110.000: power consumption total: 55 W, without I/O: 20 W, output to I/O: 30 W (+5 V / 3000 mA; +15 V / 500 mA; -15 V / 500 mA)

For details on shock and vibration robustness, EMC robustness and interference see **User manual M-Base**.

MH200 Series		MH230	
<b>Subsystems</b>			
Real time clock	Yes (rechargeable battery buffered RTC for time/date), sync capability over IEEE 1588, SNTP		
Trusted platform module	Yes (TPM 2.0) <sup>1)</sup>		
<b>Energy Supply</b>			
Supply voltage	24 VDC (18 to 34 V)		
Connector terminal for socket	KZ 51/03 RM 5.08; 3-pol.		
Polarity reversal protection	Yes		
Isolation of supply	Yes		
Voltage interruptions immunity (IEC 61131-2)	PS2		
Rated power consumption without I/O	22 W <sup>5)</sup> (no supply via NT255 possible)		
Rated power consumption with I/O	63 W <sup>5)</sup>		
Rated power output for I/O	36 W <sup>5)</sup>		
Maximum currents for I/O	+5 V / 4200 mA <sup>5)</sup> ; +15 V / 500 mA; -15V / 500 mA		
<b>Electrical Safety</b>			
Protection class (DIN EN 61140)	III		
Protection type (IEC 60529)	IP20		
<b>Environmental Conditions</b>		Standard	ColdClimate (✱)
Operating temperature	-30 to +60 °C fanless		
Relative air humidity, operation	5 to 95 % without condensation	5 to 95 % with condensation	
Storage temperature	-40 to +85 °C		
Relative air humidity, storage	5 to 95 % without condensation	5 to 95 % with condensation	
Maximum operating altitude	2000 m above sea level (with derating up to 4500 m)		
Pollution degree (IEC 60664-1)	2 (without condensation)	2	
<b>Approvals/Certificates</b>			
Product safety	CE, cULus, CCC		
Maritime	DNV, LR, ABS, BV, NK, KR, RINA		
<b>Dimensions</b>			
Number of slots / module units	4		
Width x Height x Depth	220 x 119 x 96 mm		
Weight / Mass	Approx. 1835 g		
<b>System Requirements</b>			
Backplane	BS2xx, BS2xx/S, BS2xx/E		
Software	MHOS (VxWorks 7) from M-Base 4.39 <sup>1)</sup> or higher (pre installed on internal memory device), for application development ToolChain from V4.31 or higher is recommended (to utilize MultiCore/SMP)		

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Order Codes		
Item	Item No.	Description
MH230	00031521-00	CPU module MH230 (2,3GHz) DualCore HT; 2GB DDR4; 512kB nvRAM; 16MB File-Flash; 2x Eth100/1000; 1xRS232; 1xRS232/422/485 isolated; 1xUSB2.0; I/O-supply 30W; CFast-Slot
MH230 4GB CFA	00031521-03	CPU module MH230 (2,3GHz) DualCore HT; 2GB DDR4; 512kB nvRAM; 16MB File-Flash; 2x Eth100/1000; 1xRS232; 1xRS232/422/485 isolated; 1xUSB2.0; I/O-supply 30W; CFast-Slot; 4GB CFast-Card
MH230 CC	00031673-00	Like MH230 00031521-00; ColdClimate (❄)
MH230 4GB CFA CC	00031673-03	Like MH230 4GB CFA 00031521-03; ColdClimate (❄)
MH230	00032783-00	CPU module MH230 (2,3GHz) DualCore HT; 2GB DDR4; 1MB nvRAM; 2GB File-Flash; 2x Eth100/1000; 1xRS232; 1xRS232/422/485 isolated; 1xUSB3.0; TPM; I/O-supply 36W; CFast-Slot
MH230 4GB CFA	00032783-03	CPU module MH230 (2,3GHz) DualCore HT; 2GB DDR4; 1MB nvRAM; 2GB File-Flash; 2x Eth100/1000; 1xRS232; 1xRS232/422/485 isolated; 1xUSB3.0; TPM; I/O-supply 36W; CFast-Slot; 4GB CFast-Card
MH230 CC	00032784-00	Like MH230 00032783-00; ColdClimate (❄)
MH230 4GB CFA CC	00032784-03	Like MH230 4GB CFA 00032783-03; ColdClimate (❄)
Accessories		
KZ 51/03 B	00012052-00	Supply connector: Terminal 03-pins pitch 5.08; cage clamp terminal with labeling strips
CFA200/4GB	00017355-00	CFast Card 4GB
CFA200/8GB	00021781-00	CFast Card 8GB
CFA200/16GB	00019082-00	CFast Card 16GB