

## 1.1 Processor modules ME203/x

The processor modules of the ME series are a cost effective alternative to the MP modules if the high power is not demanded.

The figure "3" stands for the clockrate of 33 MHz of the processor in the modules. The "E" in the name of the module stands for the Ethernet capability of the processor module whereas the "C" in the name indicates that a CAN interface is integrated.

The optionally integrated power supply signed by "N" can not only supply the processor module itself but also a number of I/O modules. Thus an extra power supply module is not necessary for smaller applications.

All modules have a PC-Card slot and a 2 MB Flash EPROM as program memory.



### 1.1.1 Features

Processor Module	ME203/E	ME203/EN	
CPU	80386 EX		
frequency	33 MHz		
SRAM data memory	128 kBytes with battery backup		
EEPROM	1 kBits , for set up and versions of the firmware		
DRAM memory	8 MBytes		
BIOS	in the 1 MByte Flash-EPROM		
MEMO program memory	PC-Card (max. 64 MBytes) + internal Flash 2 MBytes		
interfaces	Ethernet	1	
	COM1	DSub9m: RS 232 C (9-pin) with full signal set	
	COM2	DSub9m: RS 232 (reduced signal set), RS 422 or RS 485	
operating modes	two 16 position rotary switches <i>H/L</i> for the 224 selectable network addresses and operating modes <i>RUN</i> ning, <i>TES</i> Ting and <i>PRO</i> gramming		
state indicating LEDs	<i>RUN</i> ning green, <i>INI</i> Tialization yellow and <i>ERR</i> or red LED		
realtime clock	yes, with accu		
ambient temperature	up to 60° C (fanless operation)		
power supply	internal via backplanes	integrated power supply	
current consumption via backplane	700 mA @ + 5 V DC 15 mA @ + 15 V DC 40 mA @ - 15 V DC	-	
integrated power supply	no	yes	
output voltages / max. current	-	5 V DC @ 2 A + 15 V DC @ 250 mA - 15 V DC @ 200 mA	
galvanic isolation input / bus	-	yes, up to 500 V AC	
galvanic isolation input / earth	-	yes, up to 100 V AC	
galvanic isolation bus / earth	-	no	



**remark:** If the operating system and the drivers are installed on the PC-card, approximately 2 Mbyte are needed. If these software items are however installed on the FLASH, 1.5 MByte are needed.



**warning:** Only one processor module is allowed in each controller system. If more than one processor module is installed in one controller system the reactions of the digital and analog outputs are unpredictable, and serious damage may occur as a consequence.



**attention:** The printed circuit board of the processor module can be damaged when applying too much force onto the PC-Card. therefore, for example, the PC-Card must be removed from the PC-Card slot when packaging the processor module for transport.



**remark:** On stations with expansion backplane (i.e. the part which is connected to the main backplane via the backplane expansion cable), the processor module must be placed on the part of the backplane which holds the power supply. The module will not suffer any damage, but it will not work due to missing processor power supply lines.



**remark:** The backup battery prevents data from being lost for about 3 month. Hence processor modules can be stored without supplying power for a maximum of 3 month without losing data. Charging of a fully discharged battery takes about 48 hours. The customer must assume that the battery is discharged on the time of delivery by BE.

If the battery is low, the NV-Ram will be formatted at the next booting process. Time of the RTC will be lost. The red ERROR LED lights up and the error message `SYS_MAIN: MSys-Software booting aborted` will be shown at the console and will be listed in the logbook.

On the next booting the CPU starts to work as usual, but with empty NV-RAM. Remanent machine settings can be on the NV-RAM - depending on the application. These settings must be restored with a backup after formatting the NV-RAM or set to reasonable initial values. The adjustment of the booting parameters is described in the "Development Tools" manual, Register 1 "Concept" and Register 2 "M-Manager".

### Error messages

Error message	Meaning
Breakdown of the accu	On rebooting the NV-RAM will be deleted
SW-Watchdog	re-start of the control (independent from any specific condition)
Internal or external voltage missing	Message to the CPU module, where the <i>panic handler</i> is started, which guarantees a regular shut-down (only ME203/xN)



**remark:** Further information about the function of the *panic handler* can be found in the C manual, register 3 "System software".

### 1.1.2 External Power Supply ME203/xN

External Power Supply	Description
input voltage, nominal	24 V DC
input voltage, range	18 .. 34 V DC
input voltage, peak value, if t < 1 s / min	40 V DC
starting current	< 5 A @ t < 0.5 ms
power consumption	typ. 1.2 A @ 24 V DC
polarity reversal protection	yes

The integrated power supply is an isolated DC/DC converter, which generates the voltages for the backplane. It is automatically detected, if an NT250 module is installed on the backplane. Therefore an NT250 can be added, if the modules on the backplane needs more power.

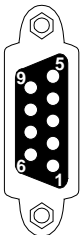
### 1.1.3 State Indicating LEDs

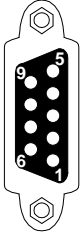
RUN	INIT	ERR	State
OFF	OFF	OFF	power off

RUN	INIT	ERR	State
OFF	ON	OFF	booting (about 10..15 s)
OFF	ON	ON	debug mode, waiting for instruction
ON	OFF	OFF	booting finished successfully and ready
OFF	OFF	ON	booting terminated because of failure (see console messages)

### 1.1.4 Pin Assignments

Connectors are shown as seen from the cable, not from the module side!

Connector	Pin	Signal	Description
COM 1 DSub9wL 	1	DCD	Data Carrier Detect
	2	RXD	Receive Data
	3	TXD	Transmit Data
	4	DTR	Data Terminal Ready
	5	GND	Ground
	6	DSR	Data Set Ready
	7	RTS	Request To Send
	8	CTS	Clear To Send
	9	RI	Ring Indicator



Connector	Pin	Signal	Description
COM 2 DSub9wL 	1	+TX	Transmit Data+ (RS 422)
	2	RXD	Receive Data (RS 232)
	3	TXD	Transmit Data (RS 232)
	4	-TX	Transmit Data- (RS 422)
	5	GND	Ground
	6	+RX	Receive Data+ (RS 422) / Data+ (RS 485)
	7	RTS	Request To Send (RS 232)
	8	CTS	Clear To Send (RS 232)
	9	-RX	Receive Data- (RS 422) / Data- (RS 485)

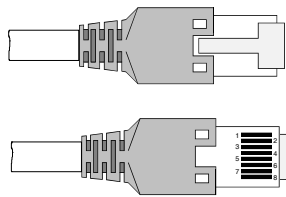


**attention:** No nullmodem cable may be connected to the serial interface COM2 as signals would be short-circuited which would damage the module. Suitable cables are described in Index 4.



**remark:** The processor modules contain a terminator for the RS 485 interface. Therefore the module must be placed at the end of an RS 485 network.

Connector (ME203/xN)	Pin	Signal	Description
	1	+	external power supply + 24 V DC
	2	-	external power supply ground
	3		functional earthing

Connector (ME203/E)	Pin	Signal	Description
Ethernet RJ45 	1	TXD+	Transmit Data+
	2	TXD-	Transmit Data-
	3	RXD+	Receive Data+
	4	n.c.	not connected
	5	n.c.	not connected
	6	RXD-	Receive Data-
	7	n.c.	not connected
	8	n.c.	not connected

### 1.1.5 Order Codes for Connectors

Order Code	Description	203	/N	/E	/EN	/C	/CN
DSub09wL	9 pin DSub connector, female, soldering connection	2	2	2	2	4	4
DSub/GB	DSub housing 37 mm high, shielded, 45°-outlet	2	2	2	2	4	4
RJ45	connector RJ 45 Ethernet			1	1	-	-
SS51/03	3 pin connector; R. = 5.08 screw terminals, side	-	1	-	1	-	1
SV51/03	3 pin connector; R. = 5.08 screw terminals, front						
KZ51/03	3 pin connector; R. = 5.08 cage clamp terminal						
KZ51/03B	KZ51/03 with label strips						

### 1.1.6 Order Codes for Modules and Accessories

Order Code	Description
RMME203/E	CPU 33 MHz, 8MB
RMME203/EN	ICPU 33MHz, 8MB + integrated power supply 17 W
RJ45	Ethernet cable per meter for self manufacturing
RMKZ51.03	Terminal for RMME203/Ex

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