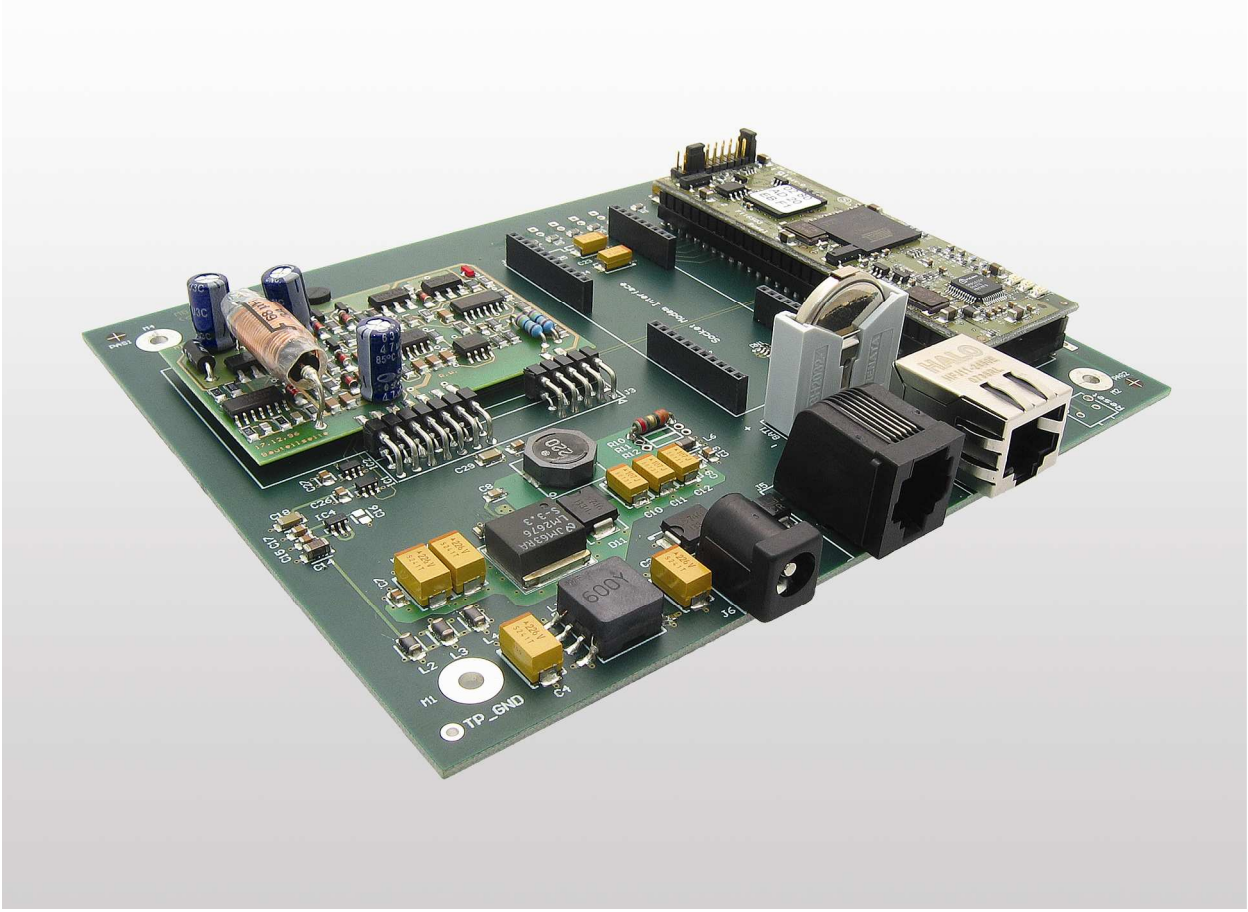
MB/920-E2M Base Board
Board Revision 1.0

Hardware Reference



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Document Revision: 1.1
Date: 2008-04-18

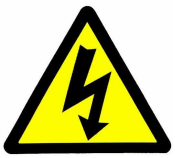
CONTENT

1 INTRODUCTION

This document describes the hardware components of the MB/920-E2M Base Board. For further information about the individual components of this product you may follow the links from our website at `http://www.ssv-comm.de`. Our website contains a lot of technical information, which will be updated in regular periods.

1.1 Safety Guidelines

Please read the following safety guidelines carefully! In case of property or personal damage by not paying attention to this document and/or by incorrect handling, we do not assume liability. In such cases any warranty claim expires.



ATTENTION: Observe precautions for handling – electrostatic sensitive device!

- Discharge yourself before you work with the device, e.g. by touching a heater of metal, to avoid damages.
- Stay grounded while working with the device to avoid damage through electrostatic discharge.

1.2 Conventions

Convention	Usage
bold	Important terms
italic	Filenames, user inputs and command lines
`monospace`	Pathnames, internet addresses and program code

Table 1: Conventions used in this document

1.3 Block Diagram

The MB/920-E2M Base Board offers a DIL-64 socket for the ARM9-based DIL/NetPC DNP/9200, a modem socket for wireless WAN (Wide Area Network) or PAN (Personal Area Network) expansion and an M-Bus interface for the connection to external metering devices.

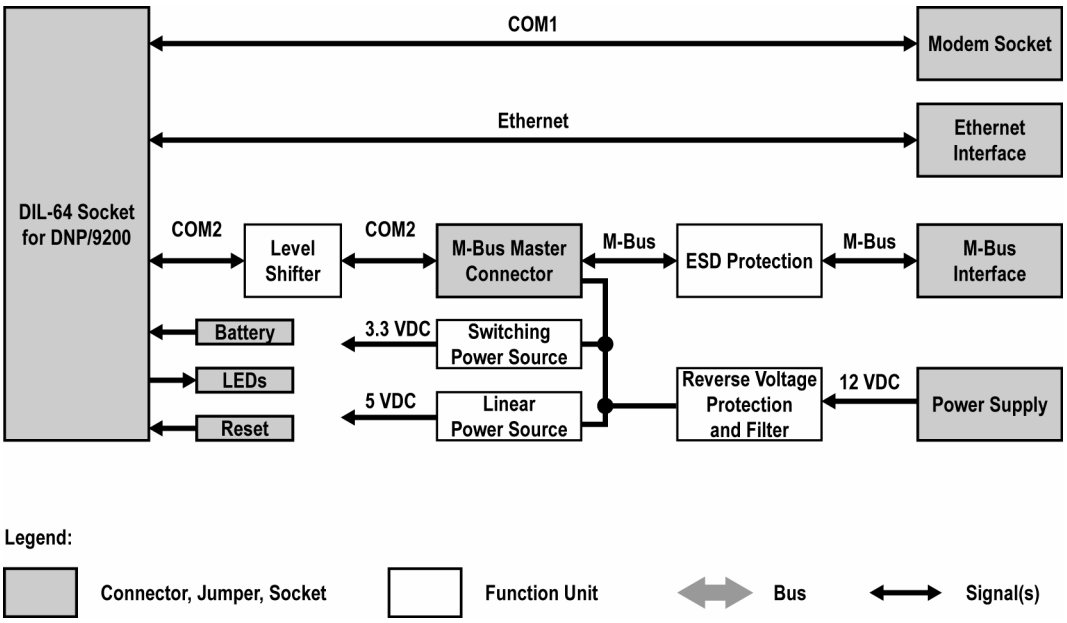


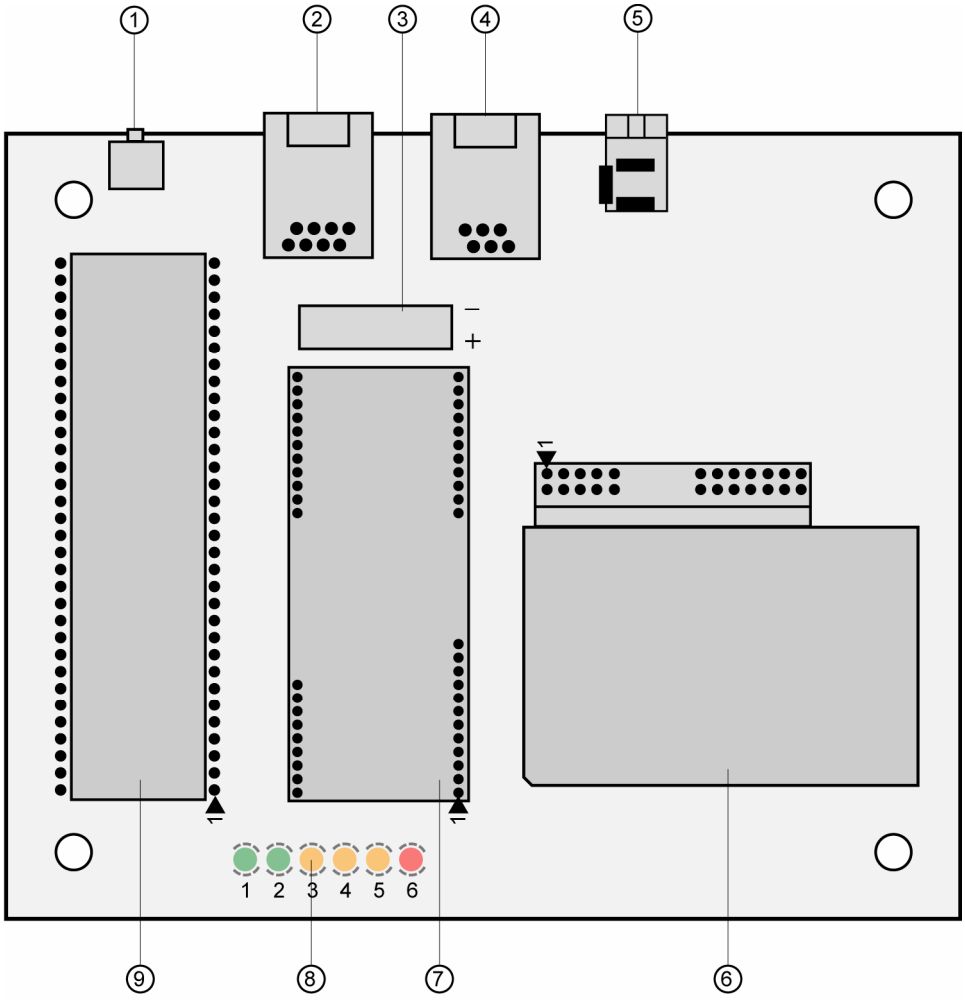
Figure 1: Block diagram of MB/920-E2M Base Board

1.4 Board Features and Technical Data

- 1x DIL-64 socket for DIL/NetPC DNP/9200
- 1x 10/100 Mbps Ethernet LAN interface
- 1x M-Bus master interface
- 1x modem socket (for wireless modems only)
- 6x status LED
- 1x reset switch (optional)
- Supply voltage 12 VDC (±10 %)
- 0 °C to +70 °C operating temperature
- RoHS conform

The M/B920-E2M M-Bus (metering bus) master interface supports up to ten external M-Bus meters and a max. distance of 10 km. The M-Bus communication speed can range from 300 to 19.200 bps.

2 BOARD LAYOUT



① S1 - Reset switch (optional)
② J4 - 10/100 Mbps Ethernet interface (RJ45)
③ BAT1 - RTC battery holder
④ J5 - M-Bus master interface (RJ12)
⑤ J6 - Power connector
⑥ J3 - M-Bus master module and connector
⑦ J2 - Modem socket
⑧ D1 - D6 status LEDs 1-6 (bottom side)
⑨ J1 - DIL-64 socket

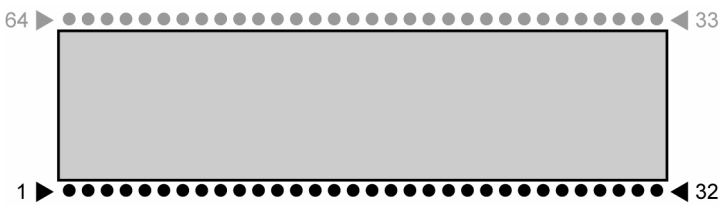
Table 2: Board layout MB/920-E2M Base Board

3 PINOUTS

3.1 DIL-64 Socket – J1 (1. Part)

Pin	Name	Group	Function
1	MOD_RST#	PIO	Modem Reset (PIO Port A0)*
2	---	---	Not Connected
3	---	---	Not Connected
4	LED_SYS_ACT	PIO	System Activity LED (PIO Port A3)
5	LED_LAN_ACT	PIO	LAN Activity LED (PIO Port A4)
6	LED_MOD_ACT	PIO	Modem Activity LED (PIO Port A5)
7	LED_MBUS_ACT	PIO	M-Bus Activity LED (PIO Port A6)
8	LED_SYS_ERR	PIO	System Error LED (PIO Port A7)
9	---	---	Not Connected
10	---	---	Not Connected
11	---	---	Not Connected
12	---	---	Not Connected
13	---	---	Not Connected
14	---	---	Not Connected
15	---	---	Not Connected
16	---	---	Not Connected
17	---	---	Not Connected
18	---	---	Not Connected
19	---	---	Not Connected
20	---	---	Not Connected
21	RXD1	SIO	COM1 Serial Port, RXD Pin
22	TXD1	SIO	COM1 Serial Port, TXD Pin
23	CTS1	SIO	COM1 Serial Port, CTS Pin
24	RTS1	SIO	COM1 Serial Port, RTS Pin
25	DCD1	SIO	COM1 Serial Port, DCD Pin
26	DSR1	SIO	COM1 Serial Port, DSR Pin
27	DTR1	SIO	COM1 Serial Port, DTR Pin
28	RI1	SIO	COM1 Serial Port, RI Pin
29	RESIN	RESET	RESET Input
30	TX+	LAN	10/100 Mbps Ethernet Interface, TX+ Pin
31	TX-	LAN	10/100 Mbps Ethernet Interface, TX- Pin
32	GND	---	Ground

Table 3: Pinout DIL-64 socket – pin 1 to 32

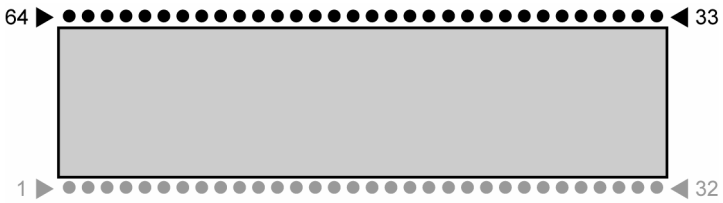


* PIO PA0 = 0 | 1 : modem reset active | inactive

3.2 DIL-64 Socket – J1 (2. Part)

Pin	Name	Group	Function
33	RX+	LAN	10/100 Mbps Ethernet Interface, RX+ Pin
34	RX-	LAN	10/100 Mbps Ethernet Interface, RX- Pin
35	---	---	Not Connected
36	VBAT	---	Real Time Clock Battery Input
37	---	---	Not Connected
38	TXD2	SIO	COM2 Serial Port, TXD Pin
39	RXD2	SIO	COM2 Serial Port, RXD Pin
40	---	---	Not Connected
41	---	---	Not Connected
42	---	---	Not Connected
43	---	---	Not Connected
44	---	---	Not Connected
45	---	---	Not Connected
46	---	---	Not Connected
47	---	---	Not Connected
48	---	---	Not Connected
49	---	---	Not Connected
50	---	---	Not Connected
51	---	---	Not Connected
52	---	---	Not Connected
53	---	---	Not Connected
54	---	---	Not Connected
55	---	---	Not Connected
56	---	---	Not Connected
57	---	---	Not Connected
58	---	---	Not Connected
59	---	---	Not Connected
60	---	---	Not Connected
61	---	---	Not Connected
62	---	---	Not Connected
63	---	---	Not Connected
64	VCC	---	3.3 Volt Power Input

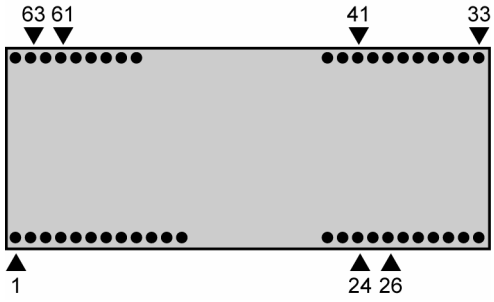
Table 4: Pinout DIL-64 socket – pin 33 to 64



3.3 Modem Socket – J2

Pin	Name	Function
24	RESET#	Reset Input (Low Active)
25	---	Not Connected
26	GND	Ground
33	RTS1	COM1 Serial Port, RTS Pin
34	RXD1	COM1 Serial Port, RXD Pin
35	TXD1	COM1 Serial Port, TXD Pin
36	RI1	COM1 Serial Port, RI Pin
37	DSR1	COM1 Serial Port, DSR Pin
38	CTS1	COM1 Serial Port, CTS Pin
39	DCD1	COM1 Serial Port, DCD Pin
40	DTR1	COM1 Serial Port, DTR Pin
41	GND	Ground
61	VCC3	3.3 VDC Power Input
62	---	Not Connected
63	GND	Ground

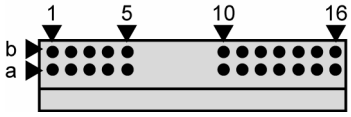
Table 5: Pinout modem socket



3.4 M-Bus Master Module Connector – J3

Pin	Name	Function
1a	---	Not Connected
2a	---	Not Connected
3a	---	Not Connected
4a	---	Not Connected
5a	---	Not Connected
6a	---	Not Connected
7a	---	Not Connected
8a	---	Not Connected
9a	---	Not Connected
10a	---	Not Connected
11a	---	Not Connected
12a	---	Not Connected
13a	---	Not Connected
14a	---	Not Connected
15a	---	Not Connected
16a	---	Not Connected
1b	---	Not Connected
2b	MBUS2	M-Bus Signal 2 (+)
3b	MBUS1	M-Bus Signal 1 (-)
4b	---	Not Connected
5b	---	Not Connected
6b	---	Not Connected
7b	---	Not Connected
8b	---	Not Connected
9b	---	Not Connected
10b	VCC12	12 VDC Power Input
11b	---	Not Connected
12b	GND	Ground
13b	RXD2	COM2 Serial Port, RXD Pin
14b	TXD2	COM2 Serial Port, TXD Pin
15b	---	Not Connected
16b	---	Not Connected

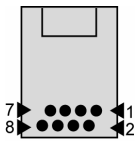
Table 6: Pinout M-Bus master module connector



3.5 Ethernet Interface (RJ45) – J4

Pin	Name	Function
1	TX+	10/100 Mbps LAN, TX+ Pin
2	TX-	10/100 Mbps LAN, TX- Pin
3	RX+	10/100 Mbps LAN, RX+ Pin
4	---	Not Connected
5	---	Not Connected
6	RX-	10/100 Mbps LAN, RX- Pin
7	---	Not Connected
8	---	Not Connected

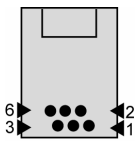
Table 7: Pinout Ethernet interface



3.6 M-Bus Master Interface (RJ12) – J5

Pin	Name	Function
1	---	Not Connected
2	---	Not Connected
3	MBUS2	M-Bus Signal 2 (+)
4	MBUS1	M-Bus Signal 1 (-)
5	---	Not Connected
6	---	Not Connected

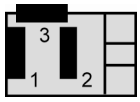
Table 8: Pinout M-Bus master interface

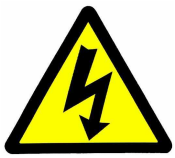


3.7 Power Connector – J6

Pin	Name	Function
1	12 VDC	Power In (max. 12 VDC)
2	GND	Ground
3	GND	Ground

Table 9: Pinout power connector





CAUTION: Providing the MB/920-E2M Base Board with a higher voltage than the regular 12 VDC ±10 % could cause damaged board components!

3.8 LED CPU Port Assignment

The following table shows which port of the DNP/9200 is connected to which LED.

LED	Color	Function	DNP/9200 Port
D1	Green	Power LED	---
D2	Green	System Activity	PIO PA3 = 0 | 1 : LED Off | LED On
D3	Yellow	LAN Activity LED	PIO PA4 = 0 | 1 : LED Off | LED On
D4	Yellow	Modem Activity LED	PIO PA5 = 0 | 1 : LED Off | LED On
D5	Yellow	M-Bus Activity LED	PIO PA6 = 0 | 1 : LED Off | LED On
D6	Red	System Error LED	PIO PA7 = 0 | 1 : LED Off | LED On

Table 10: CPU port assignment of status LEDs

4 MOUNTING A SOCKET MODEM

When mounting a socket modem on the MB/920-E2M Base Board pin 1 of the modem must be connected with pin 1 of the modem socket like shown in the following figure. Pin 1 of the modem should be on the same side as the antenna connector.

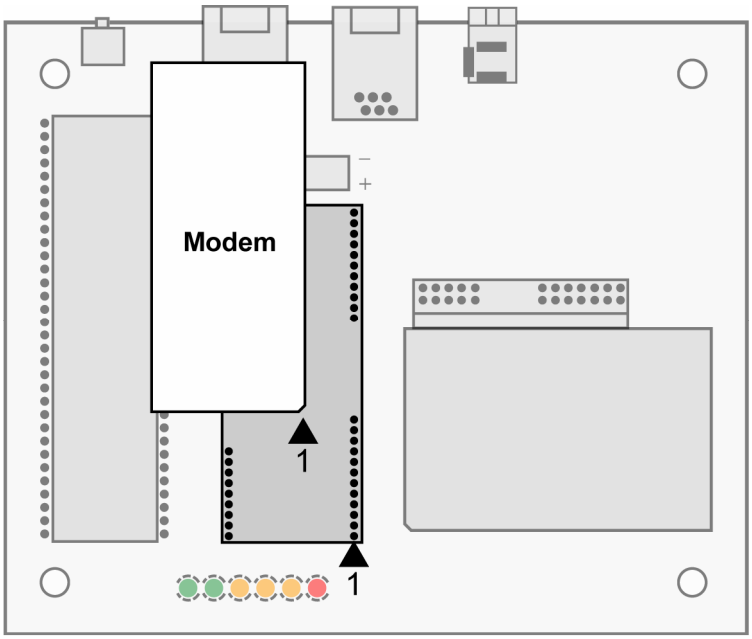


Figure 2: Mounting a modem on the MB/920-E2M Base Board

5 MECHANICAL DIMENSIONS

All length dimensions are in millimeters and have a tolerance of 0.5 mm. The drillings are suitable for M3 screws.

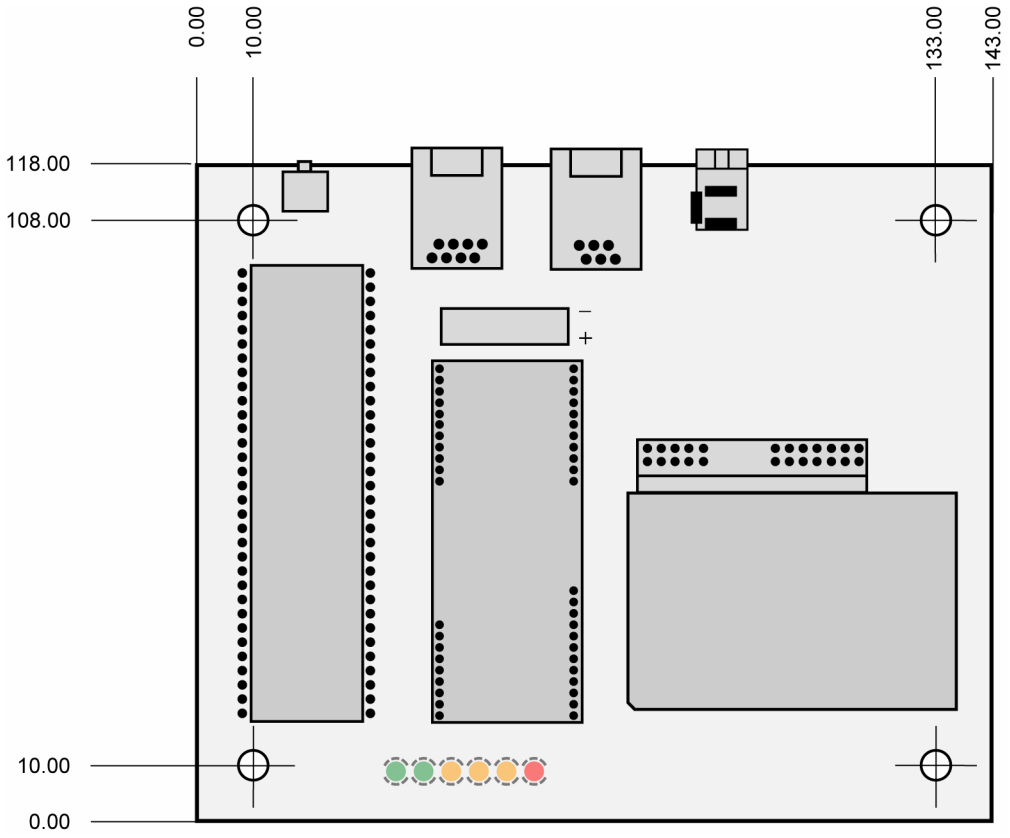


Figure 3: Mechanical dimensions of MB/920-E2M Base Board

6 HELPFUL LITERATURE

- DIL/NetPC DNP/9200 hardware reference
- Modem socket developer guide (Multitech)
- M-Bus specification rev. 4.8 (www.m-bus.com)

CONTACT

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Support: www.ssv-comm.de/forum

For actual information about the MB/920-E2M Base Board visit us at www.ssv-comm.de.

DOCUMENT HISTORY

Revision	Date	Remarks	Name
1.0	2008-03-27	first version	WBU
1.1	2008-04-18	errors corrected	WBU