Motherboard MB100
for
Universal Controller UC100

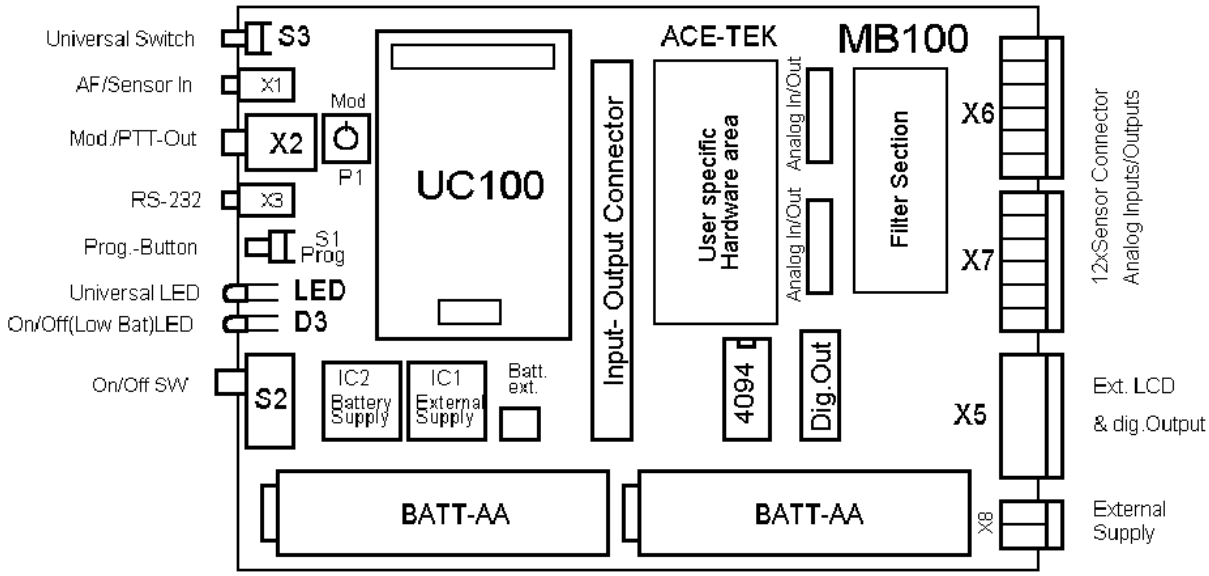
User´s Manual

HW Vers.2.1

Content

1. Introduction

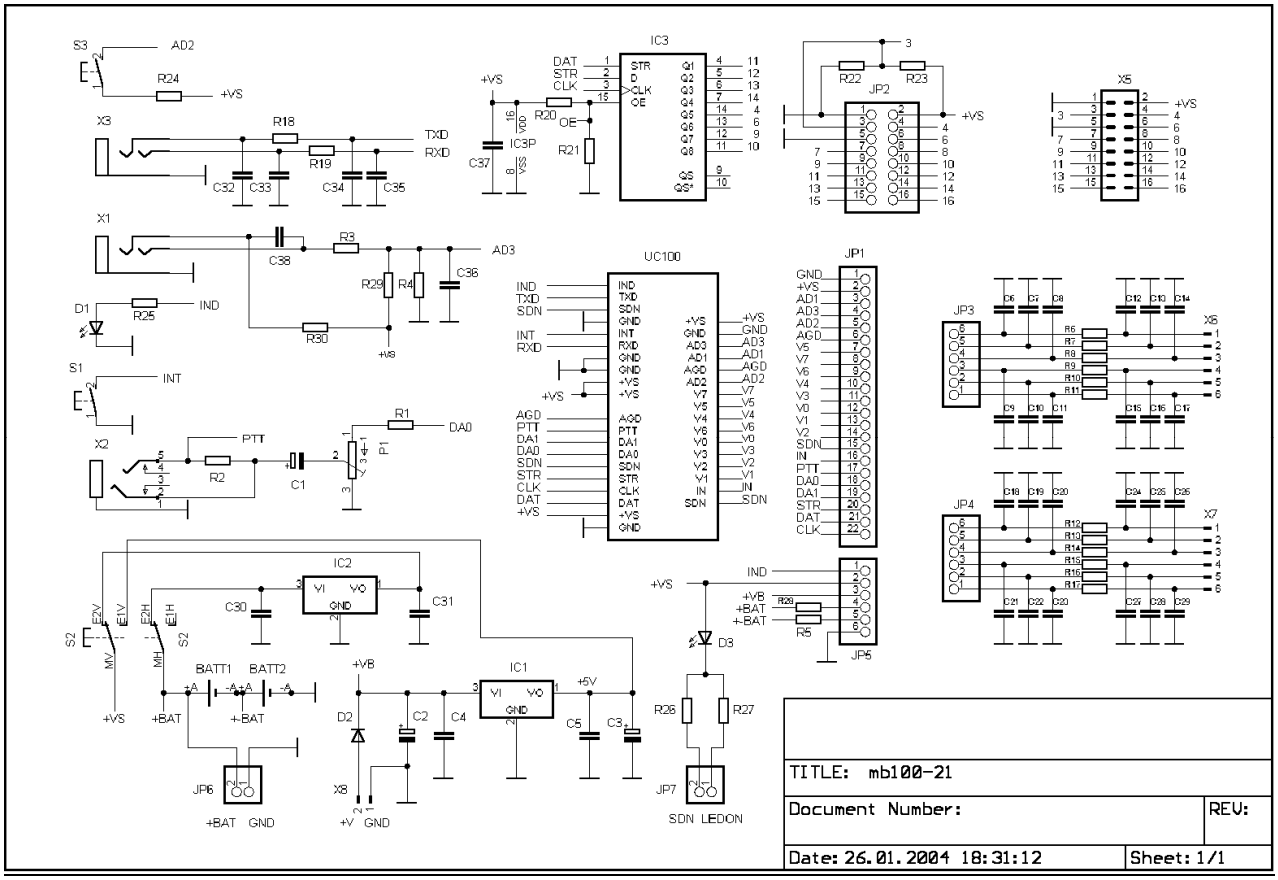
In order to create a convenient way to use the UC100 a motherboard MB100 was designed. It offers easy access to all In- and Outputs as well as a versatile power supply. The UC100 just has to be plugged in. The board may also be configured for specific applications.



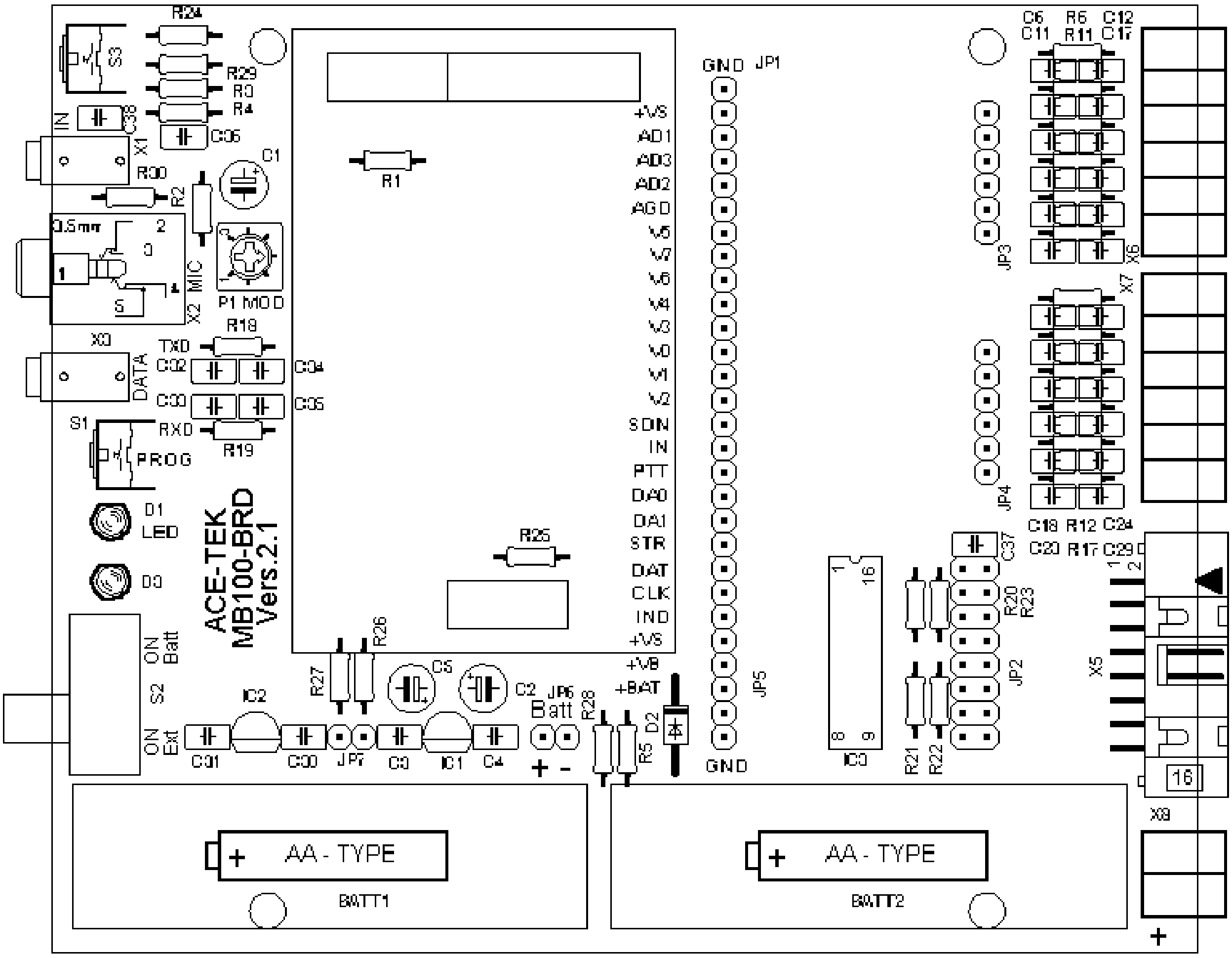
MB100 features:

- Power Supply by 2xAA batteries (NiCd or NiMH) and on-board voltage converter (VC100)
- Power Supply by external Batt.-Pack of higher nominal voltage combined with linear regulation
- Power Supply by external source of 3,3 … 5VDC
- Power Supply by external source of > 5,5VDC and additional linear regulation (IC1)
- Power Supply by external source of > 5,5VDC and additional switching regulator
- fixed by 4 through holes
- fits into standard plastic enclosure LH55 by Pac-Tec (2 heights available)
- On/Off slide switch for battery as well as external supply
- RS-232 connection via 2,5mm Jack
- Transmitter control via 3,5mm Jack (Mod., PTT and GND)
- PTT Signal either by UC100 FET or via resistor across Mic.-Input (various handhelds)
- Mod level control by variable resistor
- AF input via 2,5mm Jack (tone control)
- Sensor connection possible via 2,5mm Jack (supply voltage provided if necessary)
- Program button
- Universal LED in parallel to UC100 LED
- Additional LED for ON/OFF or Low-Batt.-indicator (can be controlled by SDN as well)
- Additional push button zur freien Verfügung (z.B. zum manuellen Starten des Userprogramms)
- Provided for placing the external shift register (4094 for digital outputs or driving LCDs)
- User defined hardware area for placing additional interface components
- Pinheads providing all necessary signals and voltages for connecting interface boards
- EMI filter area for protecting the I/O section
- Connectors for sensors and supply plug- or solderable
- standard 16-pin connector for LCDs, contrast setting by voltage divider

2. Circuit Diagram



3. Place Plan


ACE-TEK
MB100-BRD
Vers.2.1
R24
S3
R29
R3
R4
C38
C36
IN
X1
R30
C1
R1
R2
0.5mm
2
1
S
MIC
X2
P1 MOD
R18
X3
TXD
C32
C34
DATA
C33
C35
S1
RXD
R19
PROG
D1
LED
D3
R25
ON
Batt
S2
ON
Ext
IC2
C31
C30
JP7
C3
IC1
C4
R27
R26
C5
C2
JP6
Batt
R28
R5
D2
+VS
AD1
AD3
AD2
AGD
V5
V7
V6
V4
V3
V0
V1
V2
SDN
IN
PTT
DA0
DA1
STR
DAT
CLK
IND
+VS
+VB
+BAT
GND
JP1
GND
JP5
JP3
JP4
C37
IC3
JP2
R20
R23
R21
R22
C6
C11
R6
R11
C12
C17
X6
X7
C18
C20
R12
R17
C24
C29
X5
16
X8
AA - TYPE
BATT1
AA - TYPE
BATT2

4. Bill of Material

Ref.	Component	Function	Value	Remark
R1	Resistor	Fixed resistor for Mod.-control	10k	Matched to value of P1
R2	Resistor	PTT control for various handhelds	2k7	not used if separate PTT contact
R3	Resistor	Divider for audio input		at AF levels >1Veff
R4	Resistor	Divider for audio input		for AF detection purp. (equal to R29)
R5	Resistor	Battery voltage monitoring	10k	Protection against short circuit
R6...R17	Resistor	Resistor or choke for EMI filter		Depending on external circuitry
R18	Resistor	Resistor or choke for EMI filter		if necessary for EMI purposes
R19	Resistor	Resistor or choke for EMI filter		if necessary for EMI purposes
R20	Resistor	Output Enable High for 4094	10k	4094 outputs active
R21	Resistor	Output Enable Low for 4094		High at OE activates 4094-outputs
R22	Resistor	contrast setting for LCD	470R	depending on LCD type
R23	Resistor	contrast setting for LCD		depending on LCD type
R24	Resistor	Serial resistor for push button	10k	up to 100k possible
R25	Resistor	Serial resistor for LED	100R	in addition to 1k on UC100
R26	Resistor	Power-On-LED (SDN)	1k	value for Vs=3,3V (1k8 at 5V)
R27	Resistor	Power-On-LED (On/Off)	1k	value for Vs=3,3V (1k8 at 5V)
R28	Resistor	Battery voltage monitoring	10k	Protection against short circuit
R29	Resistor	Voltage offset for audio input		for AF detection purp. (equal to R4)
R30	Resistor	Supply for active sensor		Depending on external circuitry
P1	Potentiometer	Mod.-level control	1k lin.	if R1<4k7, then P1=10k lin
C1	Tantalum Cap.	Mod. DC-Decoupling	1µF	determines low-frequency limit
C2	Tantalum Cap.		100µF	
C3	Tantalum Cap.		10µF	
C4	Ceramic Cap.		100nF	not there if PS-module is used
C5	Ceramic Cap.		100nF	not there if PS-module is used
C6...C29	Ceramic Cap.			Depending on external circuitry
C30	Ceramic Cap.		100nF	not there if PS-module is used
C31	Ceramic Cap.		100nF	not there if PS-module is used
C32..C35	Ceramic Cap.	Filter Cap. for RS-232		if necessary for EMI purposes
C36	Ceramic Cap.	Filter Cap. for RS-232	100nF	Abhängig von externer Beschaltung
C37	Ceramic Cap.	Bypass Cap. for 4094	100nF	
C38	Polystyrene-Cap.	Audio Input DC-Decoupling	220nF	decoupling DC-Offset
S1	Push Button	For program mode	1xON	abt. 6mm long
S2	Slide Switch	On/Off		diff.On positions for Batt.and external
S3	Push Button	User defined	1xON	abt. 6mm long
IC1	Regulator LDO	Linear-or Switchmode for ext. supply		TO92 or PS-module
IC2	Regulator LDO	Linear-or Switchmode for batt. supply		TO92 or PS-module
IC3	HEF4094BP	Shift register for LCD		any type of 4094 useable

D1	LED Low-Current	Universal LED		in parallel to UC100 LED
D2	Diode	Protection against wrong polarization	1N4001	
D3	LED Low-Current	Power-On LED		selected by R26 or R27
JP1	Pinhead 1x22		2,54mm	for connecting interface boards
JP2	Pinhead 2x8		2,54mm	for connecting interface boards
JP3	Pinhead 1x6		2,54mm	for connecting interface boards
JP4	Pinhead 1x6		2,54mm	for connecting interface boards
JP5	Pinhead 1x6		2,54mm	for connecting interface boards
JP6	Pinhead 1x2	Connector for battery-pack	2,54mm	
JP7		Part of the PS-module (if used)		
X1	Jack	Audio or sensor input	2,5mm	Stereo jack
X2	Jack	Transmitter control	3,5mm	Stereo jack
X3	Jack	RS-232 connection	2,5mm	Stereo jack
X4				not used
X5	IDC Connector	90°, 16 pins		LCD & digital output connector
X6	Connector	6 pins for sensors	3,81mm	
X7	Connector	6 pins for sensors	3,81mm	
X8	Connector	2 pins for external power supply	3,81mm	
Bat-Conn	Battery Clips			for AA Battery type
UC-Con1	Connector	For UC100	2x5-pin	2,54mm
UC-Con2	Connector	For UC100	2x13-pin	2,54mm