

MicroTech

MT ARMBBoard

V4.1

**Hardware
Reference**

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Warning:

Incorrect power connection to any electronic and electrical equipment may seriously damage them or even cause a fire hazard or explosion. Users must take care to identify the correct pins and supply an acceptable voltage to operate them safely.

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Introduction

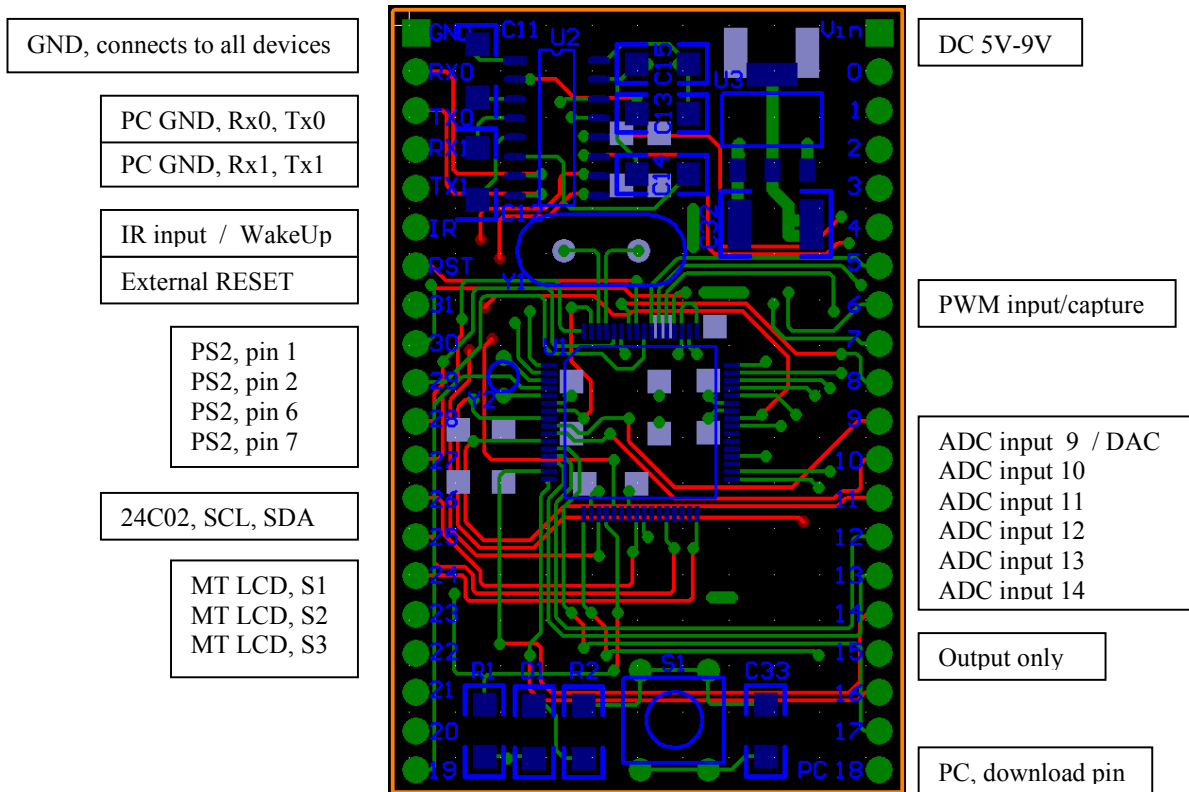
This brief technical guide describes the schematics and layouts for the new MT ARMBBoard. The ARMBBoard include the minimum components necessary for a basic controller, thus keeping the cost and board size to a minimum. Almost all the pins of the MCU have been brought out side-by-side to standard 0.1" headers for interfacing other circuits.

The MT ARMBBoard is supplied and programmed with the MT System Code to run TinyC programs. But the end-users can erase it and used it for normal ARM development. **WARNING**, after erasing the contents of the ARM chip, there is no way to get the MT System Code back, you have to buy a new one from the manufacturer!

These ARMBBoard is working on 3.3V and differ from those MT DemoBoards which are working on 5V. All the ARMBBoards have a 1117-3.3V Low-Drop-Out (1V) voltage regulator which accepts a power supply of 4.3V to 9V DC, a system reset button and a 3.3V operated RS232 MAX3232 communication IC.

When doing I/O experiments using the MT IOBoard with an ARMBBoard, it is recommended the power supply to the ARMBBoard should be drawn from the IOBoard. Because the ARMBBoard(3.3V) and the IOBoard(5V) are working under different voltages, and the current output from the ARMBBoard may not be strong enough to power the inputs of the IOBoard. However, this can simply be remedied by using some I/O buffering ICs, such as 74LS573, to interface between the 2 boards.

Please refer to the "**MT Chips Hardware Reference**" for detailed interfacing information for connection with other components and circuits.



Note: The upper left corner 3-pins connect to the MT PC serial download cable. The **Ground** wires of all the hardware devices **MUST** be connected together to act as the common voltage reference point.

I/O Pins Configuration (for used as MT chip)

MT I/O Pin	MT I/O Pin
GND	VCC (5V-9V)
RX0	0
TX0	1
RX1	2
TX1	3
IR / WU	4
RST	5
31	6 / PWM capture & measure
30 / PS2-1	7
29 / PS2-2	8
28 / PS2-6	9 / ADC / DAC
27 / PS2-7	10 / ADC
26 / 24-SCL	11 / ADC
25 / 24-SDA	12 / ADC
24 / MT LCD-S1	13 / ADC
23 / MT LCD-S2	14 / ADC
22 / MT LCD-S3	15
21	16
20	17
19	18 / PC

The total numbers and sizes of TinyC programs that can be stored within the chips and the numbers of ADC available amongst different types of ARM chips used are listed as follows:

Chip Type	System Clock	Program Storage	Run-Time Memory	No. of ADC	USB
LPC2132	60MHz	1 x 16K words	7K words	6 (10bits)	No

Note:

- I/O pins are designed and counted in a clockwise direction, in contrast to conventional IC pins which are counted anti-clockwise. The bottom-right pin of ARMBBoard is the PC Download pin.
- TinyC text output functions, writes(), writei() and writec() output data to a MT serial LCD display via the pins marked 'MT LCD-S1,S2,S3'.
- User can disable the three LCD pins and use them for normal I/O by connecting a 10K pull-down resistor on the S1 pin. i.e. connecting a 10K resistor between S1 and GND.
- Certain I/O pins might need pull-high resistors (1K) to work properly, when output logic high.
- I/O pin 15 is output only.
- I/O pin 31 MUST be connected to RESET pin.

I/O Pins Configuration (for used as normal ARM chip development)

Original ARM function	Original ARM function
Ground	VCC
232->P0.1/RXD0/PWM3/EINT0	P0.15/EINT2
232->P0.0/TXD0/PWM1	P0.16/EINT0/MAT0.2/CAP02
232->P0.9/RXD1/PWM6/EINT3	P0.17/CAP1.2/SCK1/MAT1.2
232->P0.8/TXD1/AD1.1/PWM4	P0.18/CAP1.3/MISO1/MAT1.3
P0.14/EINT1/SDA1	P0.19/MAT1.2/MOSI1/CAP1.2
RESET	P0.20/MAT1.3/SSEL1/EINT3
P1.31	P0.21/PWM5/CAP1.3
P1.30/TMS	P0.22/CAP0.0/MAT0.0
P1.29/TCK	P0.23
P1.28/TDI	P0.25/AD0.4/AOUT
P1.27/TDO	P0.26/AD0.5
P1.26/RTCK	P0.27/AD0.0/CAP0.1/MAT0.1
P1.25/EXTIN0	P0.28/AD0.1/CAP0.2/MAT0.2
P1.24/TRACECLK	P0.29/AD0.2/CAP0.3/MAT0.3
P1.23/PIPESTAT2	P0.30/AD0.3/EINT3/CAP0.0
P1.22/PIPESTAT1	P0.31
P1.21/PIPESTAT0	P1.16/TRACEPKT0
P1.20/TRACESYNC	P1.17/TRACEPKT1
P1.19/TRACEPKT3	P1.18/TRACEPKT2

When used as normal ARM development, these LPC series of ARM chips can simply be programmed through RS232 by using NXP's (Philips) "LPC210x_ISP.exe" or "FlashMagic.exe" ISP program. To activate ISP function, simply pull pin P0.14 LOW while resetting the MCU.