

ABC Controller – Mini Board

Whether you are just starting out in the world of programming microcontrollers or need the power of the AVR, the ABC Mini Starter kit contains everything you need.

Included in the kit is: -

- Microcontroller Board
- Programming Cable
- Serial Cable
- Power Supply Cable for 9V Battery
- ABCedit Software

The ABC Mini Kit is ideal for hobbyists or beginners as it provides a low-cost solution for many tasks. The Mini Board features an ATMEL advanced RISC AVR 8535 processor. Most instructions on the board are single cycle giving up to 8 million instructions per second.

The ABC boards can be run as a standalone microcontroller or plugged into an existing circuit board using a 40 Pin DIL socket, the pins are also supplied in the kit.

What makes ABC different from existing microcontrollers?

- You are given all the information, nothing in the software remains hidden to you, and you are given full schematic diagrams and the source code for all examples and tutorials.
- The programme is stored in and run from internal flash memory which makes it FAST. This means all programming is done in-circuit using the cables and software supplied with the kit.
- You are given preloaded software so that you can easily power-up the board, which is already functioning with a small programme (known as 'hello').

Special Features

- External and internal interrupt modes
- Real Time Clock (RTC)
- Power saving modes
- Operating System - No built-in operating system or monitor, all resources are available to the user.
- Supply Voltage - 9-12V / 35 mA DC.

Connectors and Functions

- Power Connector to supply power to ABC Mini (9-12V @ 100mA DC)
- Serial (RS232) Connector to PC. Standard 9 way straight through cable is used. Only pins 2, 3 and 5 are used.
- On board TTL/RS232 level converter.
- Programming Connector for In-System Programming.
- 40 pin DIL connector. All signals are available directly connected to pins of AT90S8535.

Microcontroller and Memory

- ATMEL AVR AT90S8535
- Clock Speed - 8 MHz
- 8Kb of In-System Programmable Flash (1000 write/erase cycles)
- 512 bytes internal SRAM
- 512 bytes EEPROM

Peripherals

- Two 8-bit Timer/Counters with 32768Hz Crystal for Real Time Clock
- One 16-bit Timer/Counter
- Programmable Serial UART
- 8 x 10-bit Analog to Digital Converter (ADC)
- 32 programmable I/O lines

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Notes on the MiniBoard port pins

When users are designing their circuits to accept the MiniBoard they should be aware of some possible conflicts of some of the port bits and on-board functions provided by the MiniBoard.

The pin-out for the MiniBoard does NOT match the pin-out for the 40-pin DIP version of the AT90S8535.

Users should read the following notes to see how they affect their projects.

Port C Bits 6 and 7

When the AS2 bit in ASSR is set to enable asynchronous clocking of Timer/Counter2, pins PC6 and PC7 are disconnected from the port. In this mode a crystal oscillator is connected to the pins, and the pins cannot be used as I/O pins.

Currently the MiniBoard has a crystal oscillator connected to these pins. If not required, then the user may remove the crystal oscillator (which can be found on the underside of the board). If the crystal is not removed and these pins are used for I/O then the user should be aware of the effects of having this component in circuit.

When supplied as part of the WorkShop Kit, Port C bits 6 & 7 on the MiniBoard are connected to the 40-pin DIP header and also the 32kHz crystal. If you do intend to use these two bits as oscillator pins and would like the pins available for I/O connections then you should remove the 32kHz crystal found on the underside of the MiniBoard.

Port B Bits 4, 5, 6 and 7

These 4 bits are used to form the Serial Peripheral Interface port (serial programming port). This function is disabled for normal program operation by removing the programming cable. If the programming cable is left connected (to a

PC) then you cannot use these four port pins.

Port D Bits 0 and 1

These two bits are used to form an RS232 serial port which is used for functions such as communicating to your PC or a serial LCD display. As a consequence these pins are permanently connected to a MAXIM RS232 driver chip and cannot be used for I/O functions.