

AVR104

AVR Embedded Board, Like PC/104



FEATURES

- ATmega128 AVR RISC microcontroller with up to 16 MIPS throughput
 - Two RS232 serial ports, with two IDC-10 connectors
 - 32 Kbyte external SRAM (62256)
 - 32 Kbyte serial eeprom (24LC256)
 - 34 programmable digital I/O lines (I/O connector)
 - 8-channel, 10-bit analog/digital converter
 - Real time clock (DS1307) with 3V lithium battery and 32.768KHz crystal
- A mini buzzer
- LCD connector with contrast adjustable and back-light controllable
 - PC/104 bus connector (look like)

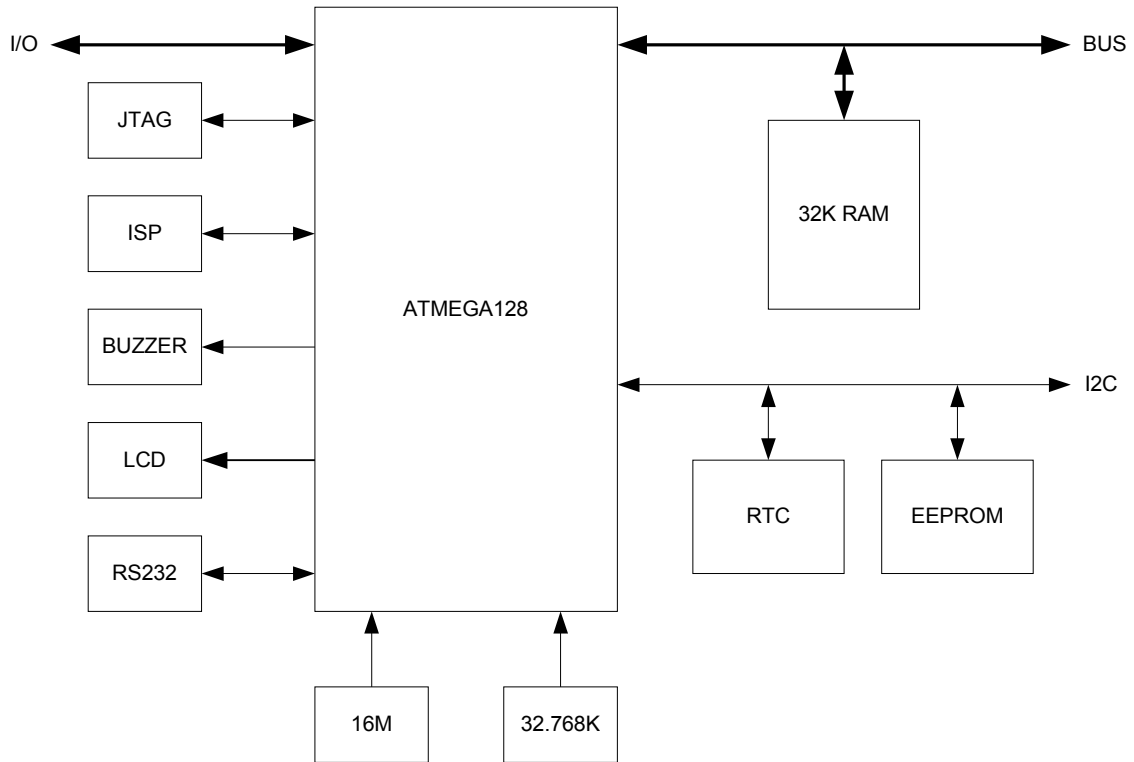
INTRODUCTION

The AVR104 is a look-like PC/104 embedded board then this board can stack on or under other expansion board that same as PC/104 because AVR104 has physical dimension same as PC/104. AVR104 use ATmega128 AVR RISC microcontroller from Atmel for a board processor and provides 32KByte external static ram. Moreover this board has 32KByte serial eeprom (24LC256) other than 4 KByte on-chip eeprom, typically used for configuration data storage. From the ATmega128 has on-chip real time clock function. So that, the AVR104 provides a space area for an additional 32.768KHz crystal. However a real time clock chip (DS1307) with 3V lithium battery and 32.768KHz crystal are provided on this board for easily real time clock application. The board has two serial port with RS232 line driver up to 115.2 Kbps for communication application.

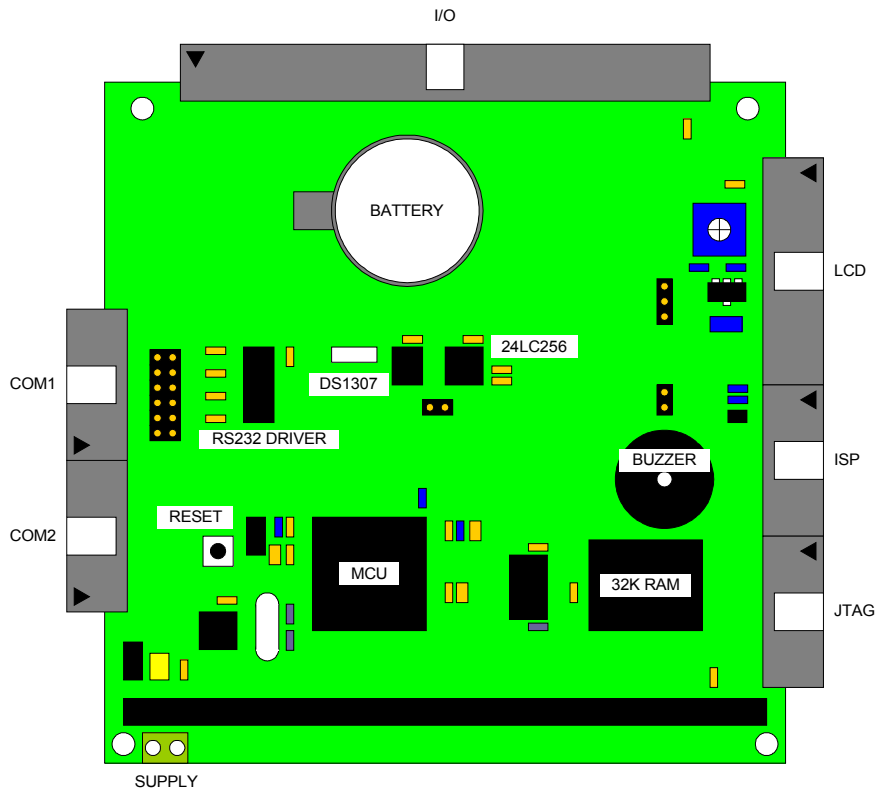
Character LCD module or 7SEG5 can be plugged on this board without additional external circuit because this board provides a contrast adjustable circuit and a back-light controllable circuit for LCD module. Signals on LCD connector are designed for 4 bits LCD controlling. Also this board provides a buzzer with an enable/disable jumper for some application that needed sound indicator.

For development, the board provides two connectors for programming (re-programming) that are ISP and JTAG connector. The ISP connector on this board supports both **ISPAVRU1 + ISTKX** and **ISPAVRP2** isp loader cable that use for code loading. For the JTAG connector, It supports **JTAGAVRU1** debugger/emulator cable, this port is used for programming and debugging.

BOARD DIAGRAM

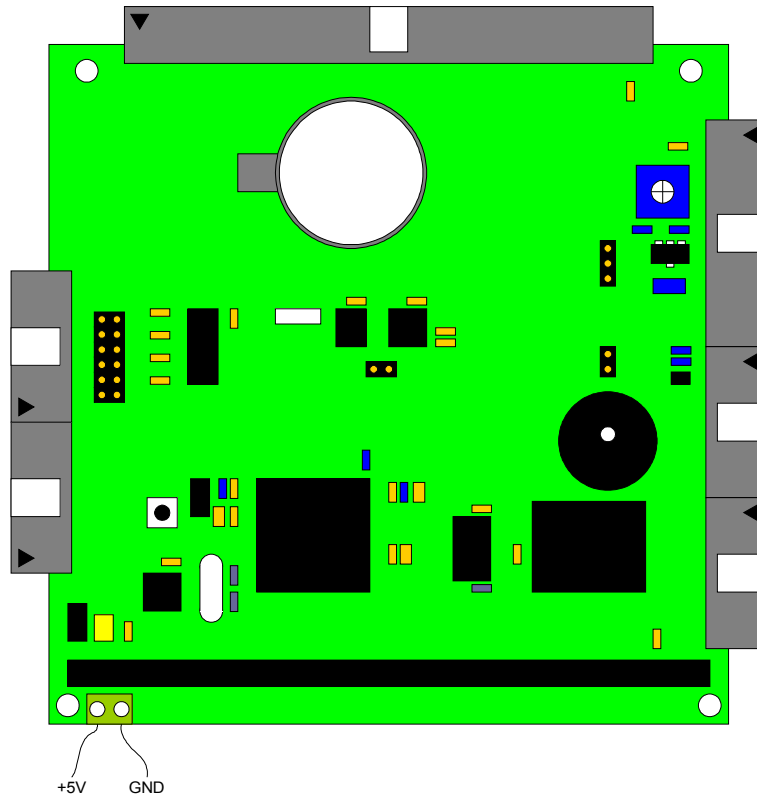


BOARD OVERLAY

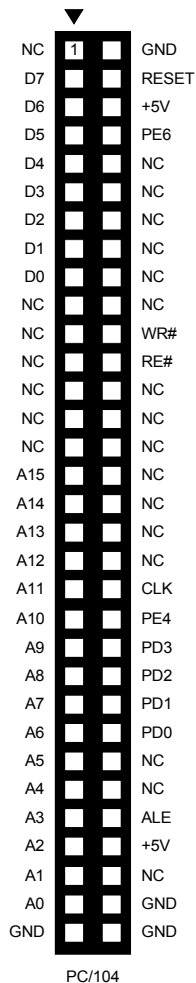


POWER SUPPLY

The AVR104 need regulated +5Vdc power supply

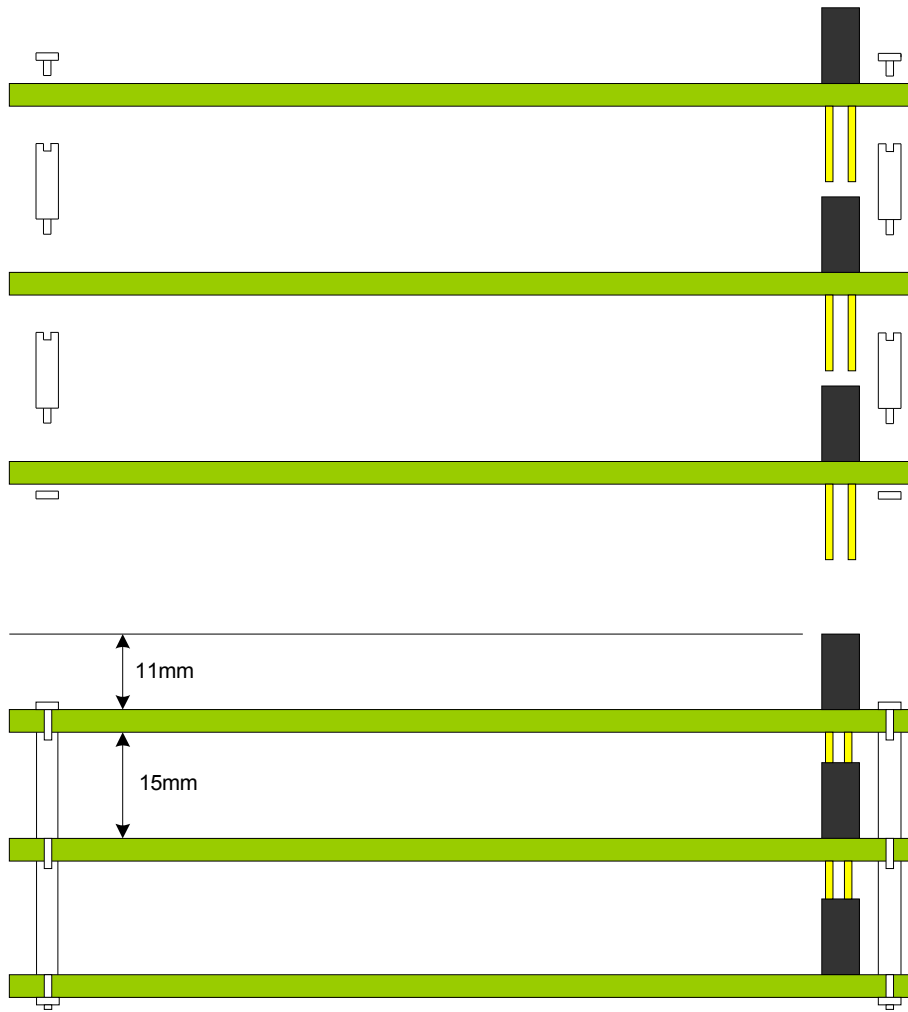


PC104 BUS

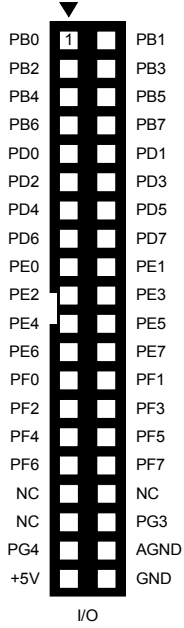


Signal	Function
D0 - D7	8-bit data bus
A0 - A15	16-bit address bus
RESET	reset signal from MCU
WR#	write signal
RD#	read signal
CLK	system clock
PE6	bi-directional digital I/O bit6 (INT6) of PortE
PE4	bi-directional digital I/O bit4 (INT4) of PortE
PD3	bi-directional digital I/O bit3 (INT3) of PortD
PD2	bi-directional digital I/O bit2 (INT2) of PortD
PD1	bi-directional digital I/O bit1 (INT1) of PortD
PD0	bi-directional digital I/O bit0 (INT0) of PortD
ALE	address latch enable signal
+5V	5V power supply
GND	ground
NC	no connect

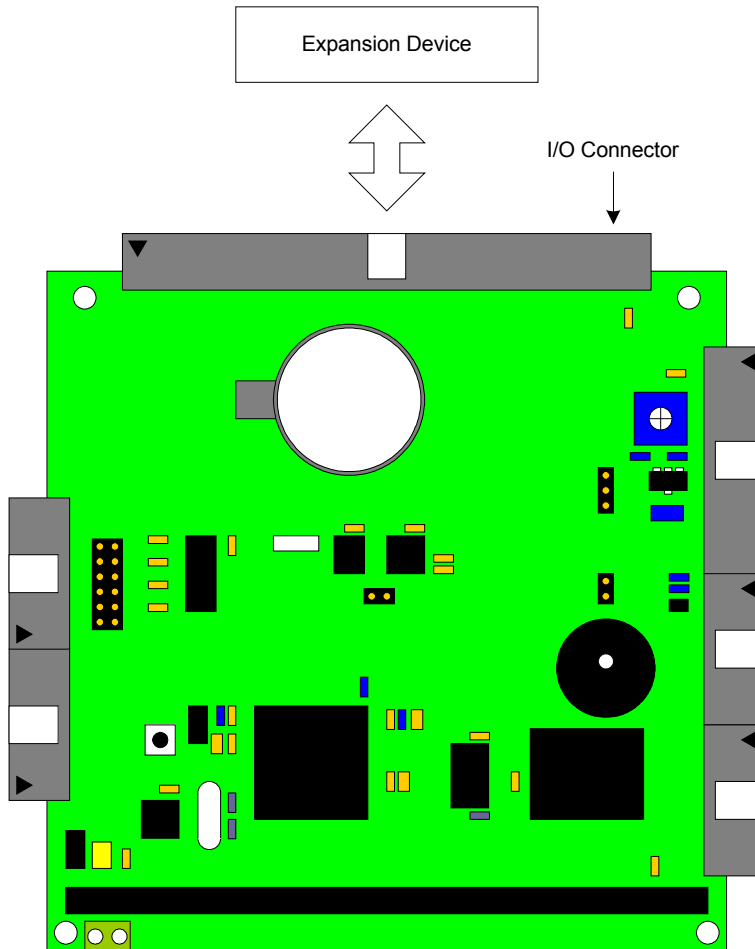
INSTALLATION



I/O PORTS

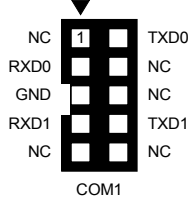


Signal	Function
PB0 - PB7	8-bit bi-directional digital I/O PortB
PD0 - PD7	8-bit bi-directional digital I/O PortD
PE0 - PE7	8-bit bi-directional digital I/O PortE
PF0 - PF7	8-bit bi-directional digital I/O PortF
PG3 - PG4	bi-directional digital I/O bit3,bit4 of PortG
+5V	power supply
GND	ground
AGND	analog ground
NC	no connect



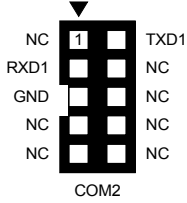
SERIAL PORTS

COM1

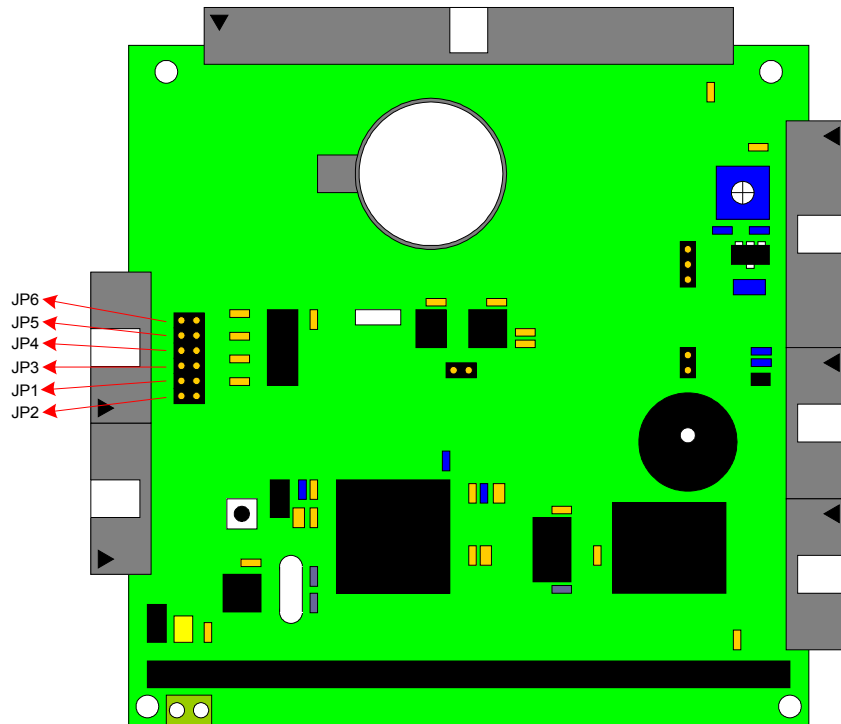


Signal	Function
TXD0	transmit signal from UART0
RXD0	received signal from UART0
TXD1	transmit signal from UART1
RXD1	receive signal from UART1
GND	ground
NC	no connect

COM2



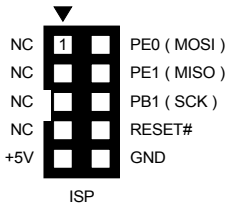
Signal	Function
TXD1	transmit signal from UART1
RXD1	receive signal from UART1
GND	ground
NC	no connect



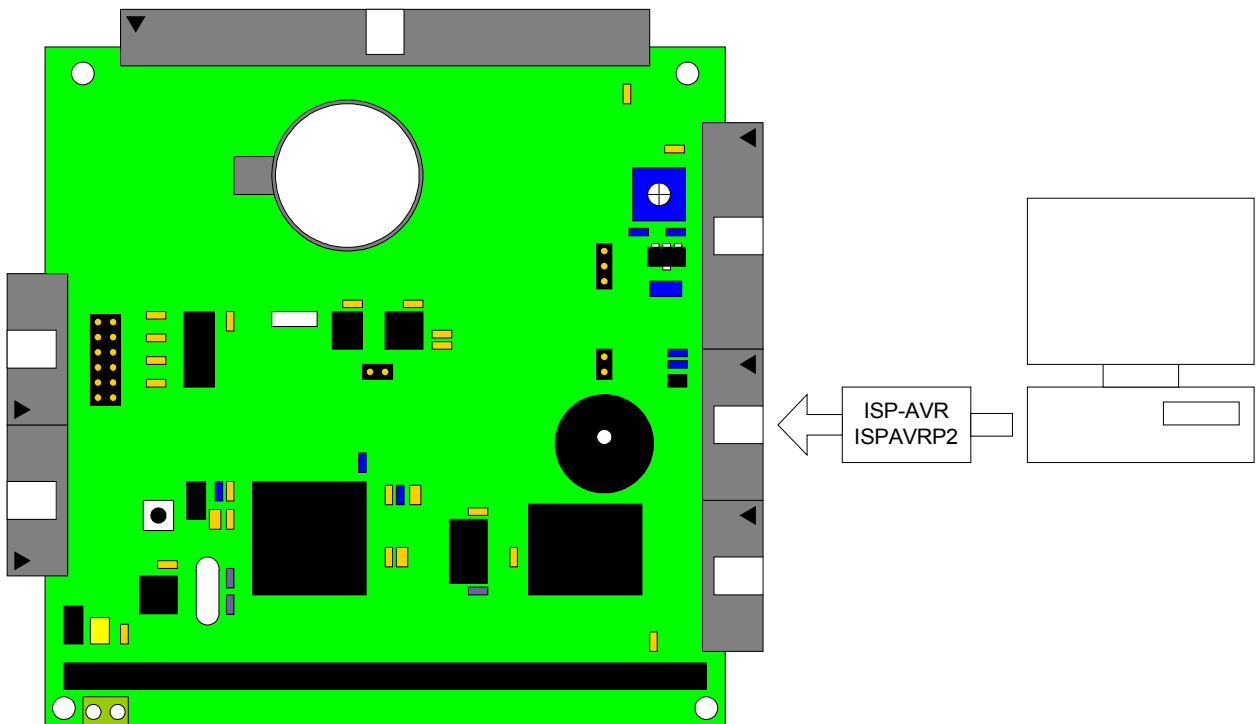
Please refer in the schematic for jumpers setting

IN-SYSTEM PROGRAMMING (ISP) PORT

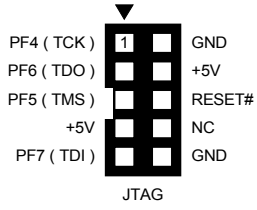
The ISP connector is *not compatible to Atmel's ISP connector*. You must use the ISTKX to convert signals if you use compatible Atmel programmer such as ISPAVRU1. However you don't use the ISTKX if you use the ISPAVRP2 programmer.



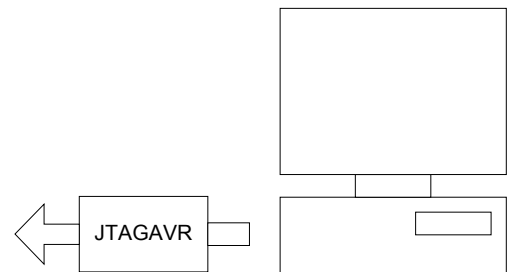
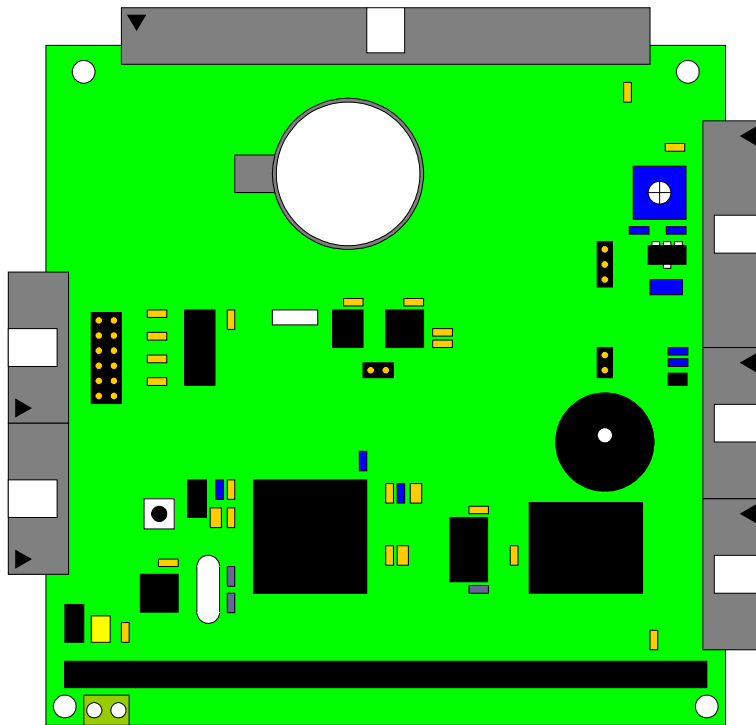
Signal	Function
MOSI	slave serial data input
MISO	slave serial data output
SCK	slave input for serial clock
RESET#	reset signal
+5V	5V power supply for programming adapter
GND	ground
NC	no connect



JTAG PORT

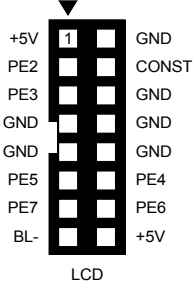


Signal	Function
TDI	JTAG test data in
TDO	JTAG test data out
TCK	JTAG test clock
TMS	JTAG test mode select
RESET#	reset signal
+5V	+5V power supply
GND	ground
NC	no connect

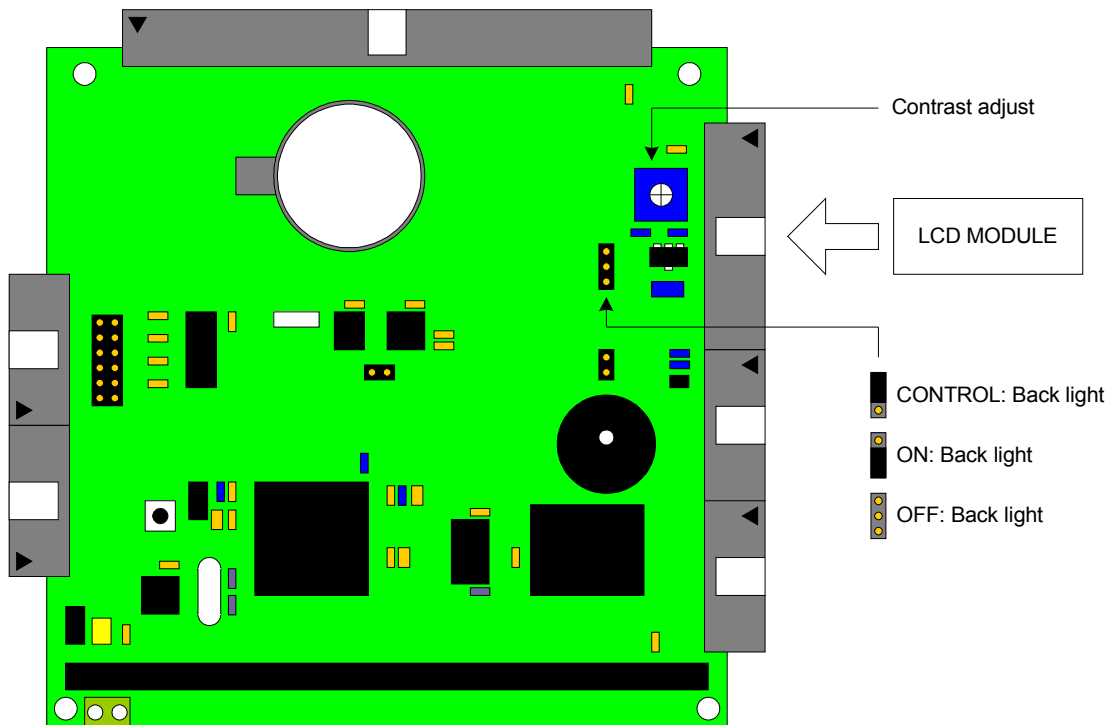


LCD PORT

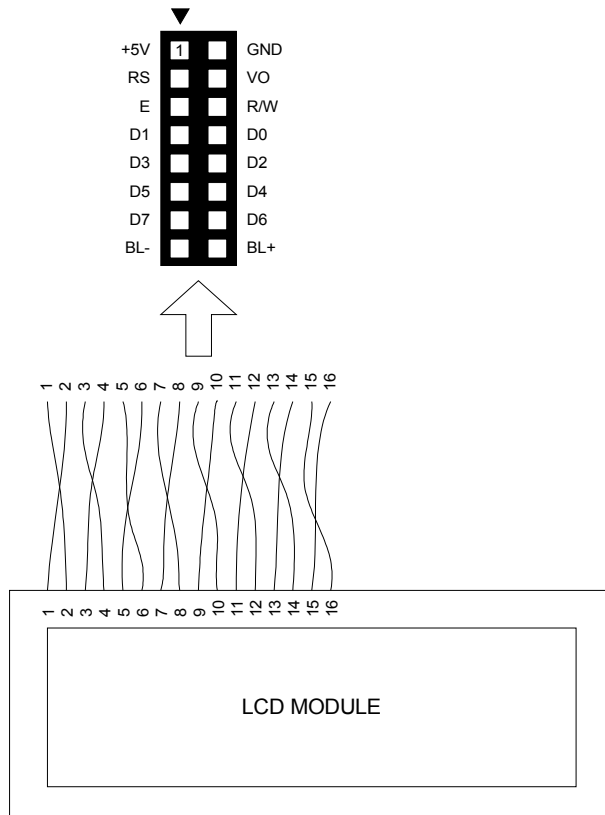
The LCD port of AVR104 board is designed for character lcd module. Also it can use for 7SEG5 LED display board.



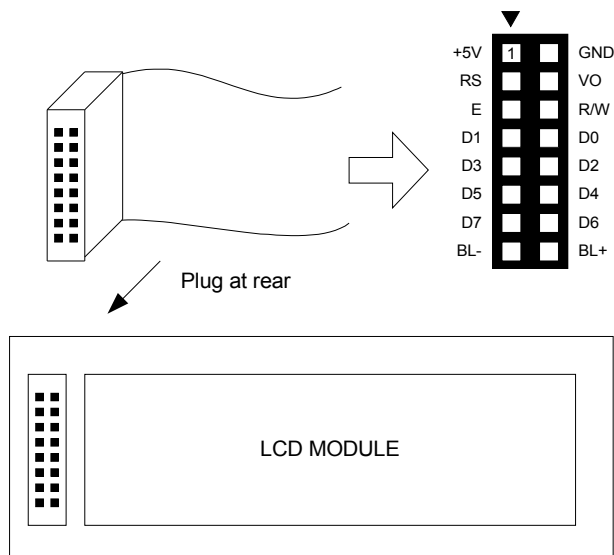
Signal	Function
CONST	contrast adjusting signal
PE2	use PE2 as RS signal
PE3	use PE3 as E signal
PE4	use PE4 as D4 signal
PE5	use PE5 as D5 signal
PE6	use PE6 as D6 signal
PE7	use PE7 as D7 signal
BL-	back-light control
+5V	+5V power supply
GND	ground



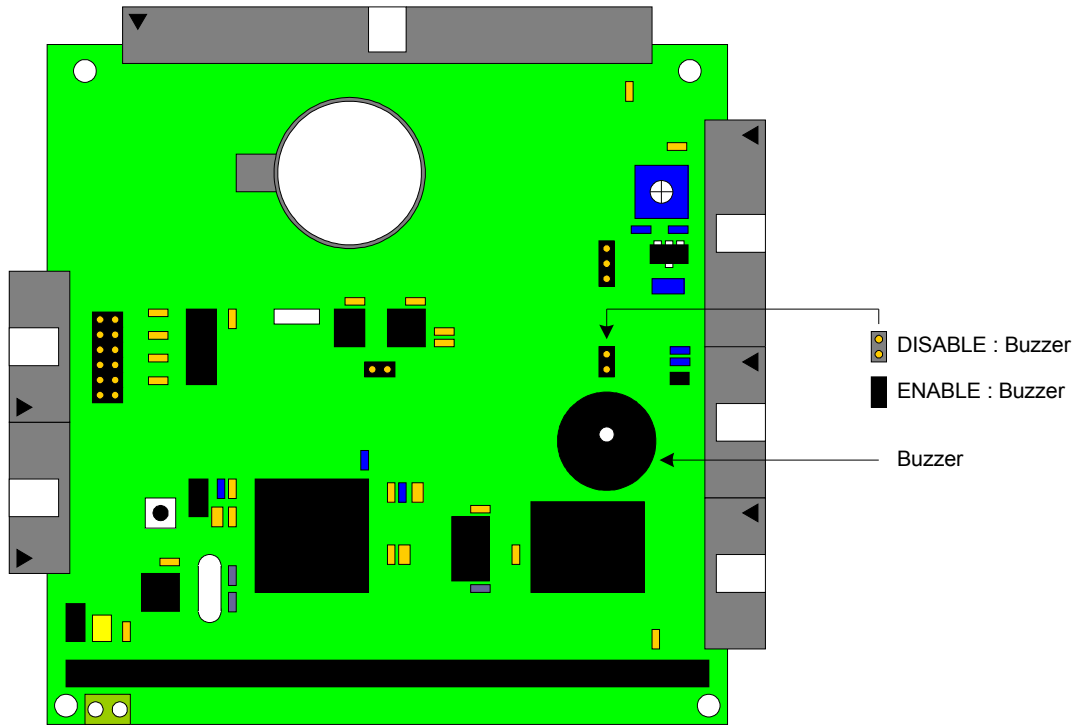
Connector A



Connector B

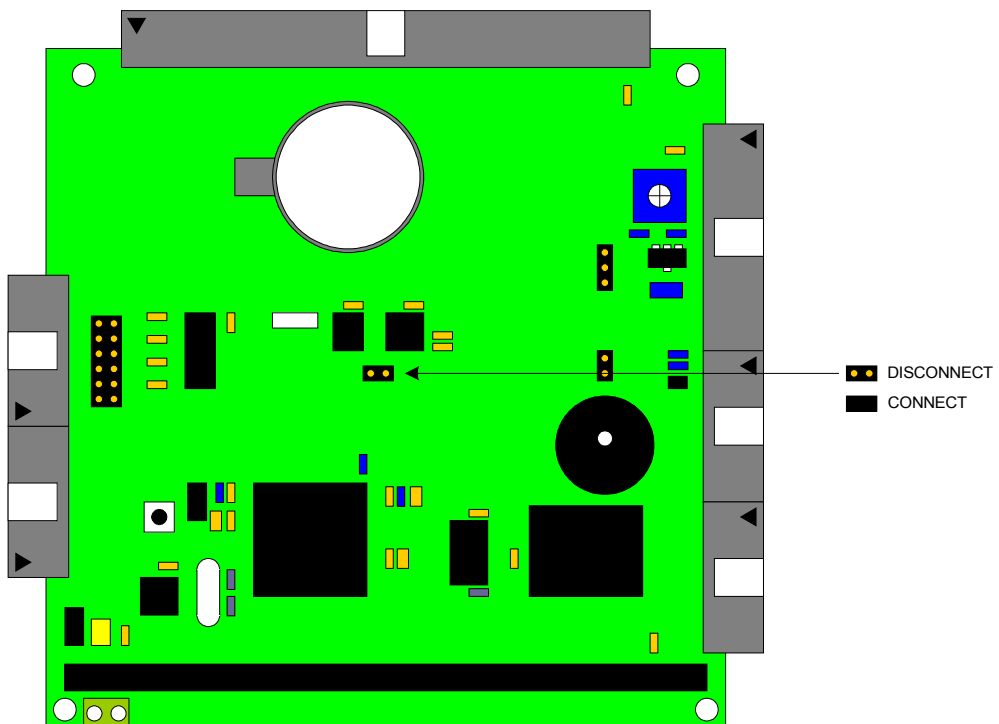


BUZZER



REAL TIME CLOCK (DS1307)

Use real time clock, DS1307. It has a jumper to connect interrupt line to MCU



If you need to create real time clock from MCU, Use additional crystal 32.768KHz.

