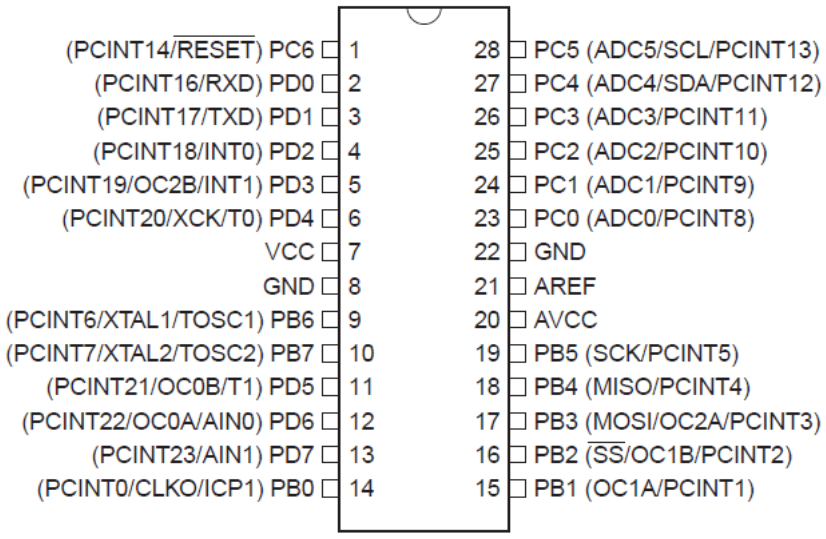
28-Pin Development Board used in 55:036 Embedded Systems, Spring 2013

The board is the AVR-P28 board from Olimex. SparkFun Electronics sells the board. This is an excellent entry level prototype board for 28 pin AVR microcontrollers with power supply circuit, crystal oscillator circuit, RS232 port, and STK 10 pin ICSP port.

- STK200 compatible ICSP 5×2 pin connector for in-circuit programming with AVR-PG1 or AVR-PG2
- RS232 Tx, Rx interface with MAX232 IC on socket
- 8 MHz crystal on socket (user replaceable)
- Reset IC ZM33064
- Reset button
- General purpose push button
- Status LED connected to PC5 via removable jumper
- DIL28 microcontroller socket
- Power plug-in jack
- Selectable +3.3V / +5V power supply voltage regulator
- Extension pin headers for each uC pin
- Four mounting holes 3.3 mm (0.13")
- GND bus
- Vcc bus

Microcontroller

DIP28 pin configuration for ATmega88PA

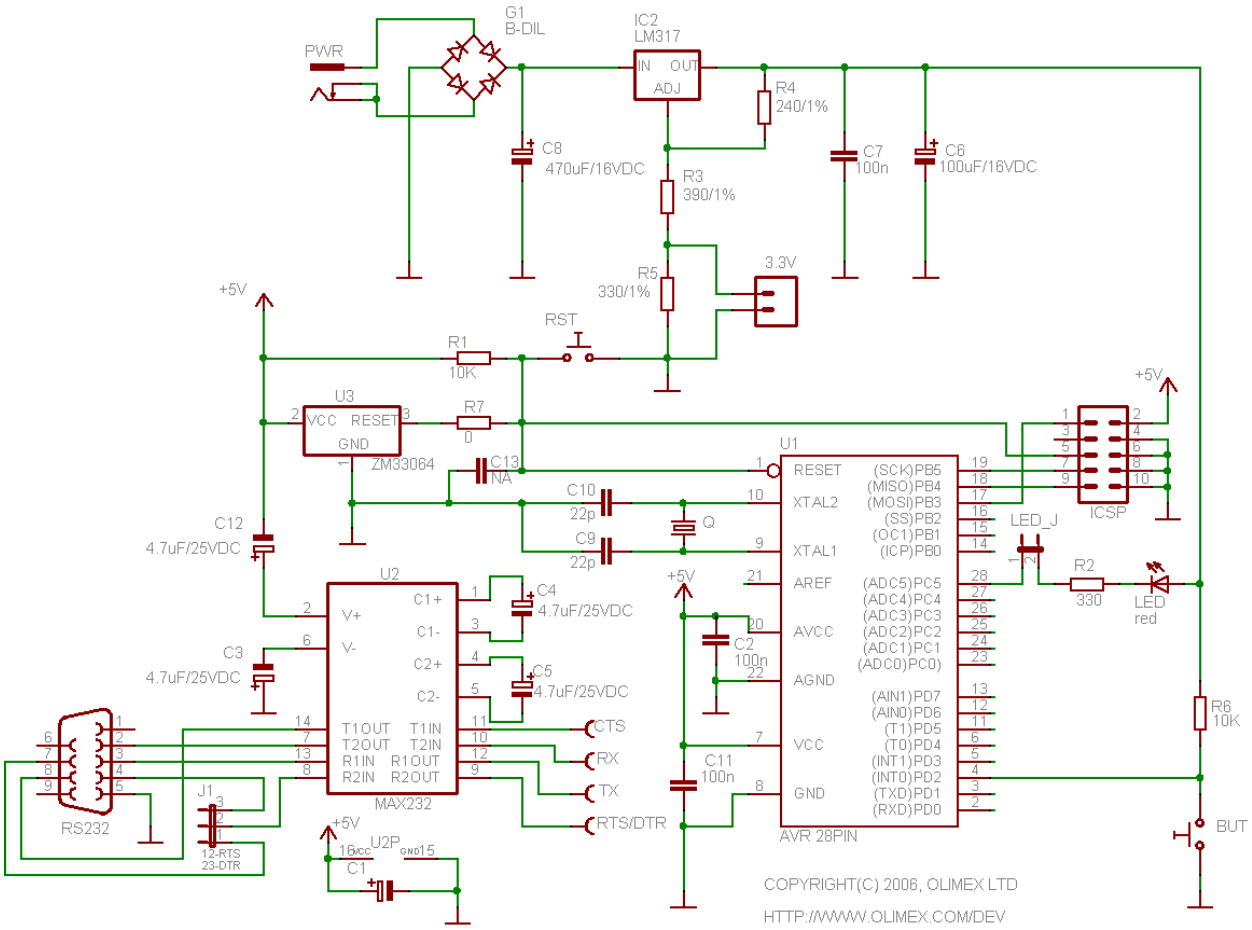


Power Supply

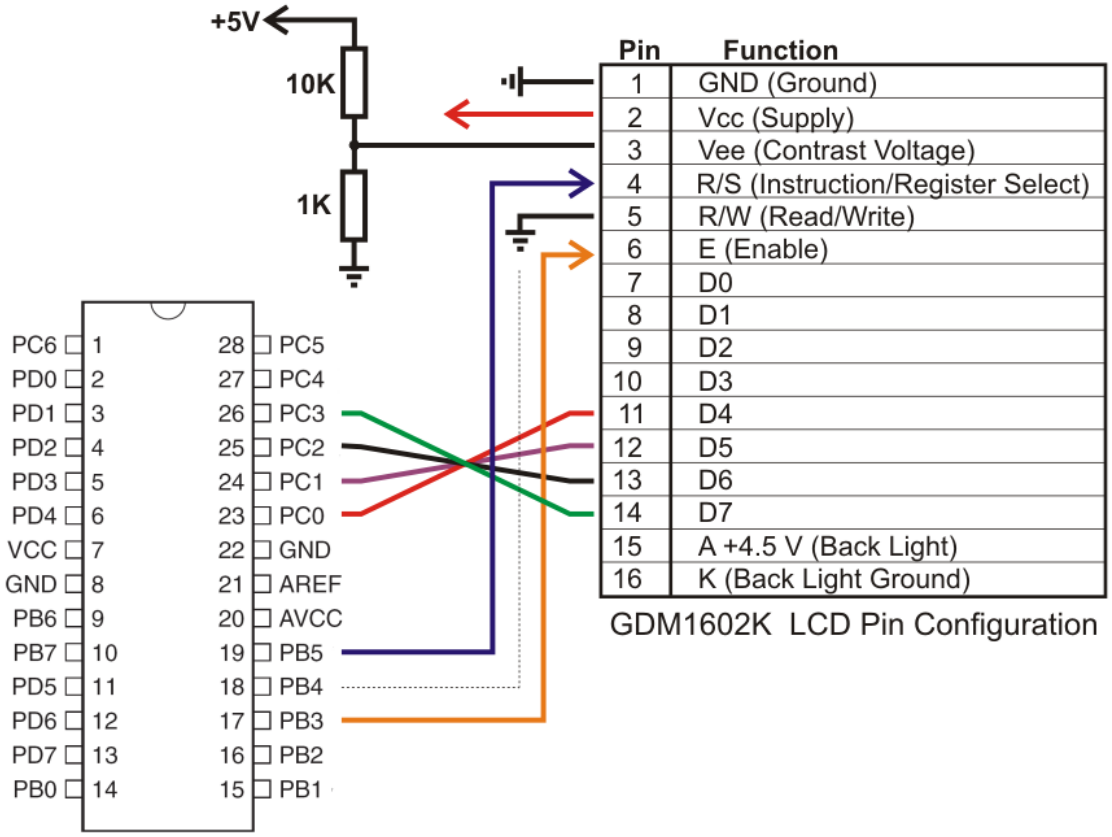
Switching “wall wart” power supply that supplies regulated to 9 V dc, and the capable output current is 650 mA. It has a center-positive 5.5×2.1 mm barrel connector. The input voltage is 100–240 VAC.

Schematic

Note that the factory default is that the crystal is no connected. To use the crystal, bridge the jumpers as indicated above.



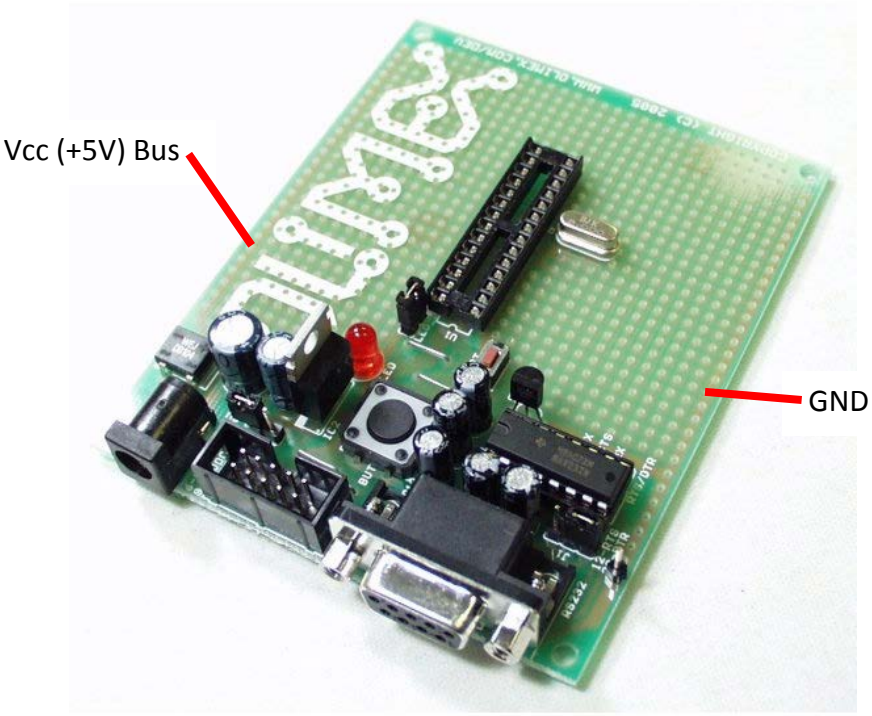
Connection for LCD

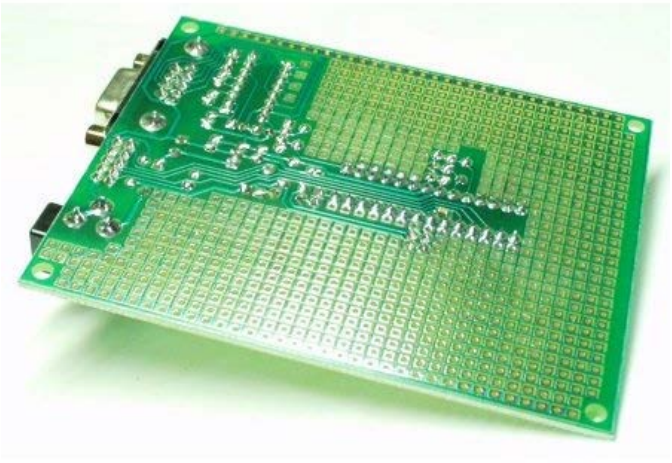


Pin	Function
1	GND (Ground)
2	Vcc (Supply)
3	Vee (Contrast Voltage)
4	R/S (Instruction/Register Select)
5	R/W (Read/Write)
6	E (Enable)
7	D0
8	D1
9	D2
10	D3
11	D4
12	D5
13	D6
14	D7
15	A +4.5 V (Back Light)
16	K (Back Light Ground)

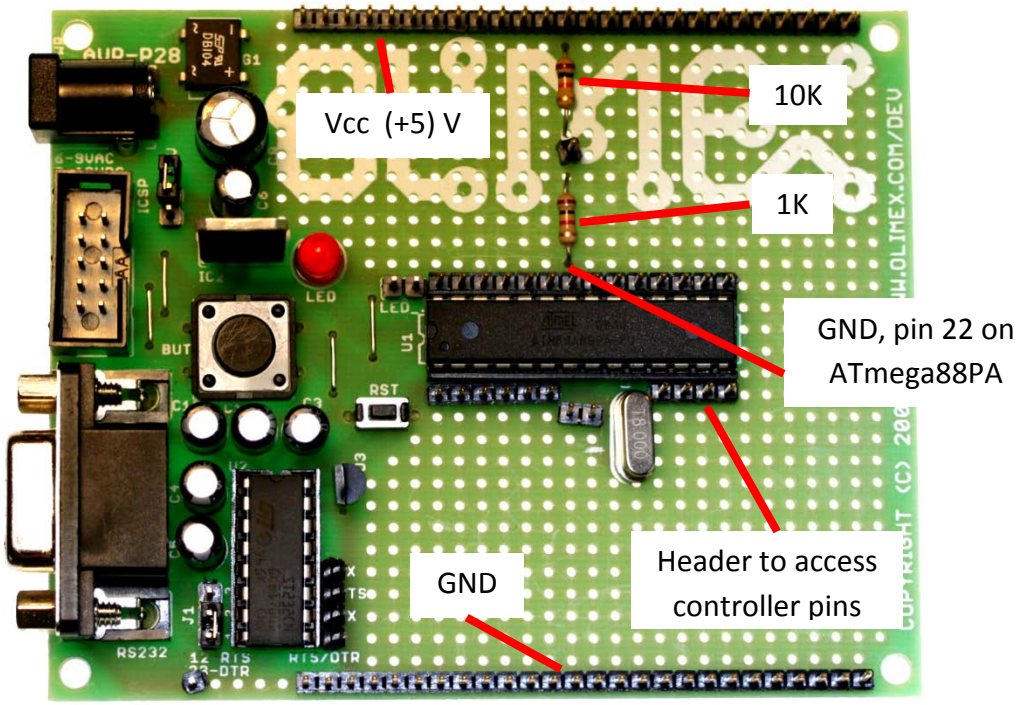
GDM1602K LCD Pin Configuration

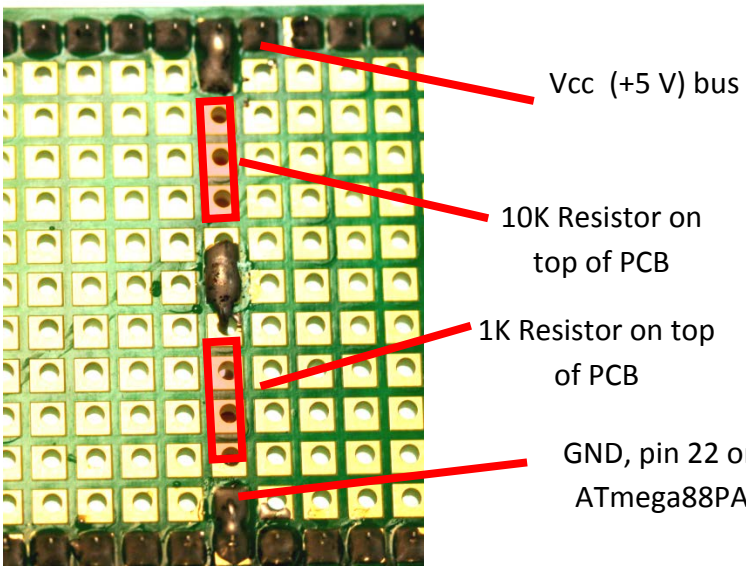
Development board before adding headers, contrast resistor for LCDdisplay etc.





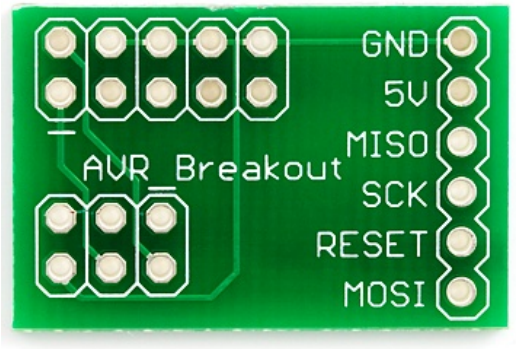
Add male headers as well as 1K and 10K resistors as shown to generate contrast voltage for LCD.





Programming

The programmers in the lab have 6-pin headers, while the AVR-8P uses a 10-pin headers. A small breakout board provides the 6-pin to 10-pin conversion.



10-Pin to 6-Pin Programming Adapter