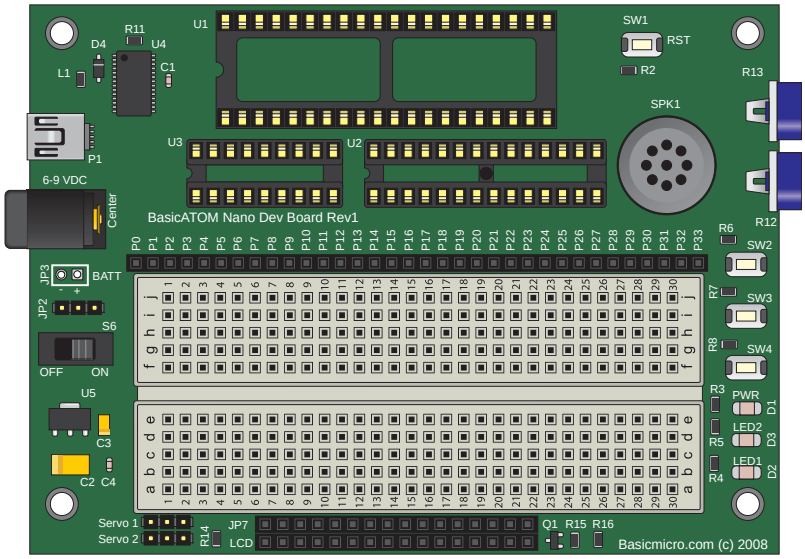
BASIC MICRO

TECHNOLOGY AT WORK

BasicATOM Nano Development Board
Data Sheet

Feature Overview:

- Prewired LCD Header
- Solderless Prototyping Board
- 2.1mm Center Positive Power
- USB 2.0 with FTDI
- Sockets for BasicATOM Nano Modules
- Power LED
- 2 User Controlled LEDs
- 3 Tactile Buttons
- 1 Potentiometer
- 1 Speaker
- 2 Servo Connectors
- Battery Connectors
- All Features Easily Accessible



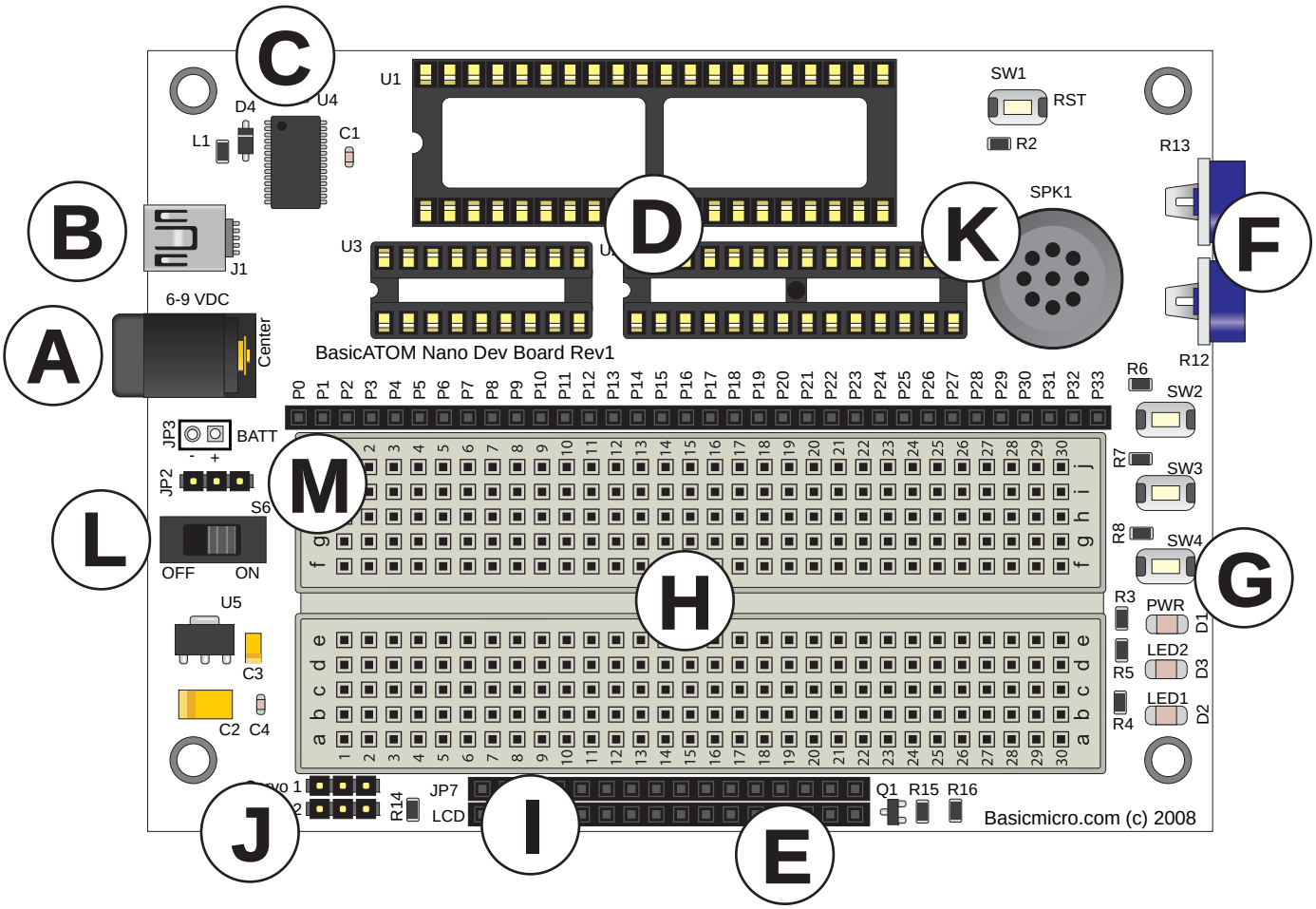
Basic Description

The BasicATOM Nano Development Board is designed to be a full experimentation center for the BasicATOM Nano. The development board includes a pre-wired LCD header for easy LCD connection, allowing you to easily integrate display technology into your next project. With the development board's included USB 2.0port you just connect to your computer and download your code.

The BasicATOM Nano Development Board also includes a solderless breadboard area for the construction of auxiliary circuitry, as well as built-in tactile switches, LED indicators, Potentiometer and a bank of female headers to easily access all I/O. Includes 2 male headers for controlling servos with switchable power to the headers.

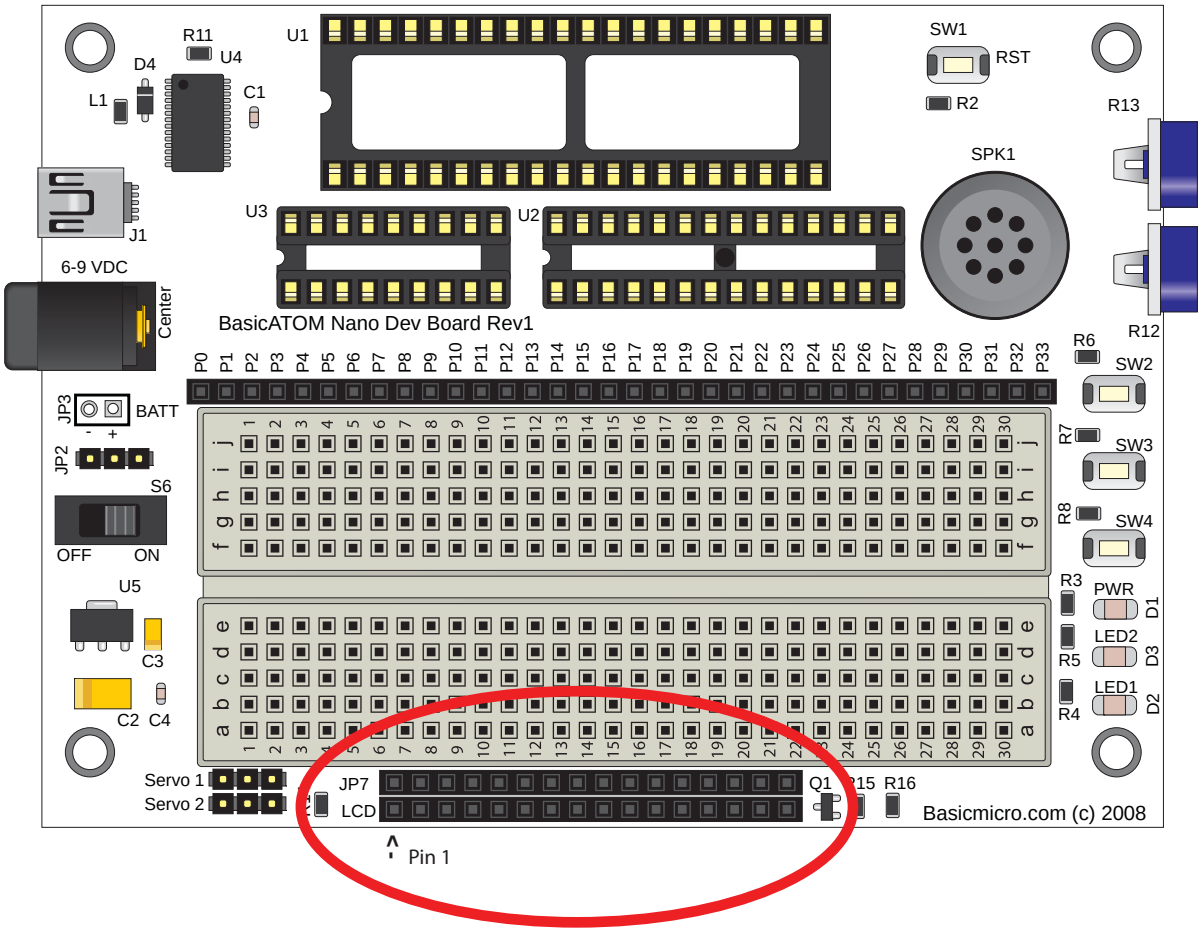
Note: The BasicATOM Nano Development Board can only be populated with one Nano chip at a time. USB is bus powered. COM port will remain connected as long as board is connected even after power is removed. Bus is isolated and will only power FTDI micro.

Hardware Overveiw:



A: 2.1mm Power Jack, Center Positive. 6 to 9VDC.
B: MiniUSB 5 pin connector, type B. The cable is included.
C: FTDI chip FT232RL, USB to serial device.
D: 40, 28, 18 Pin BasicATOM Nano sockets. Only one can be populated at a time.
E: Header for LCD display. HD44780 based.
F: LCD contrast control potentiometer and user accessible potentiometer.
G: 2 LEDs and 3 Tactile Switches. User accessible though header shown in I.
H: Solderless Breadboard.
I: Peripherals header to access the LEDs, Switches, Potentiometers and Piezo Speaker.
J: Servo or I/O male headers. Male headers can be connected directly to a Servo motor or used for GPIO (General Purpose I/O). Power to headers can be set to regulated 5vdc or VIN by JP2 (VIN direct power in from 2.1mm connector). Headers are connected through JP7.
K: Piezo speaker.
L: ON-OFF power switch.
M: Power to servo headers can be set to regulated 5vdc or VIN by JP2 (VIN direct power in from 2.1mm connector).

Header Pinouts:



JP7 Header Pinout

Pin 1 ->	VCC
	VCC
	Servo2
	Servo1
	Speaker
	Button 1 (SW2)
	Button 2 (SW3)
	Button 3 (SW4)
	LED1
	LED2
	POT2
	POT1
	VSS
	VSS
	VSS
	VSS

LCD Header Pinout

Pin 1 ->	VSS	
	VCC	
	VO	<---- Wired to -> POT2
	RS	<---- Wired to -> P0
	R/W	<---- Wired to -> P2
	E	<---- Wired to -> P1
	NC	
	NC	
	NC	
	NC	
	DB4	<---- Wired to -> P4
	DB5	<---- Wired to -> P5
	DB6	<---- Wired to -> P6
	DB7	<---- Wired to -> P7
	LED+	<---- Wired to -> VCC
	LED-	<- ---Wired to -> P3

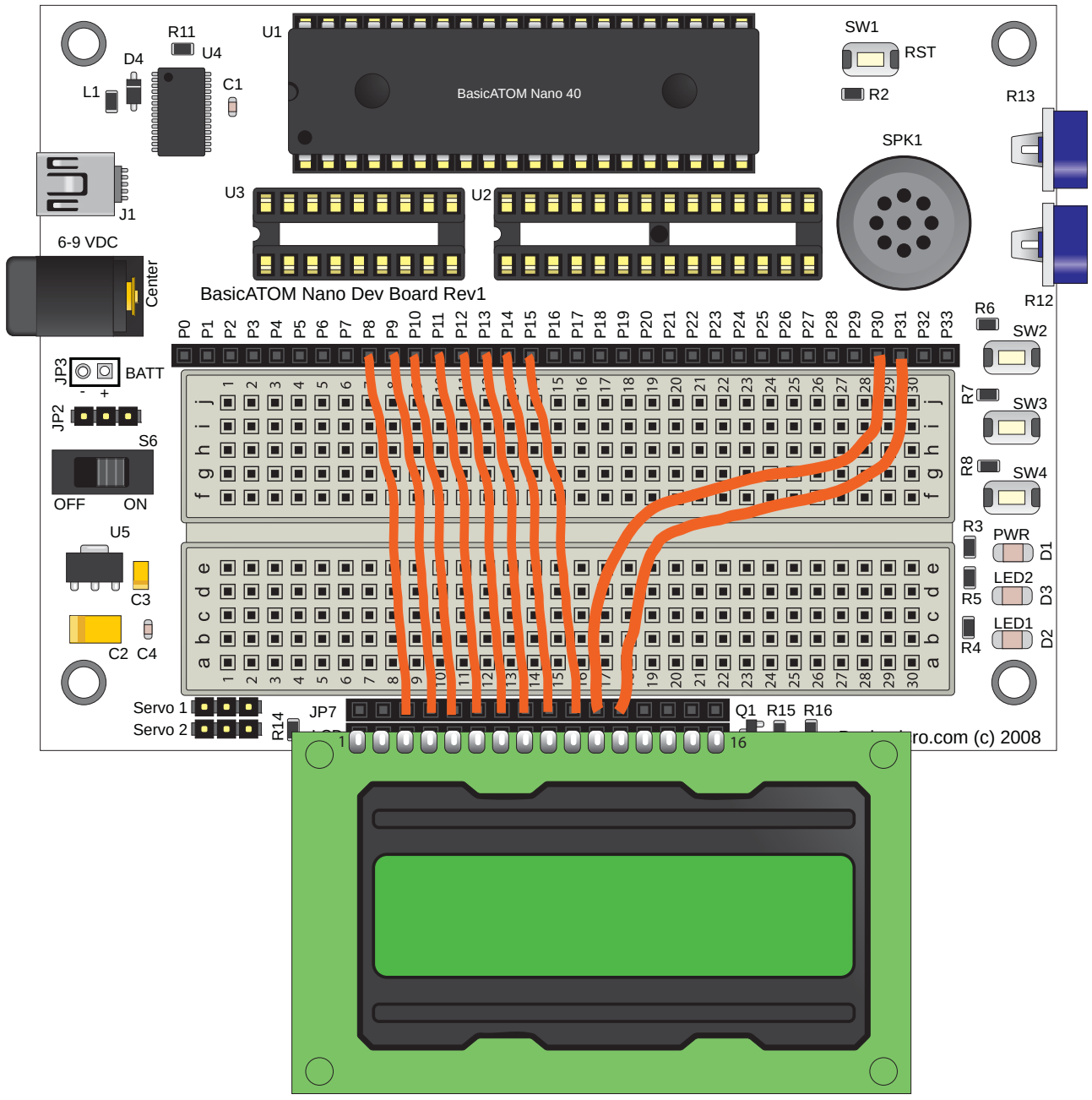
Note: LCD header is pre-wired to pins shown. If LCD is installed, I/O pins should be left unused otherwise erratic behaviour can be expected.

Demo Program

The following demo program runs all the peripherals on the development board. An optional LCD can be used with the demo program. Not all LCDs will be installed in the same orientation as shown below. Reference the LCD data sheet for pin outs. The LCD is setup to run in 4bit mode.

The provided demo code will blink LEDs, each tactile switch will blink a LED or turn off the LCD backlight, if the optional LCD is installed an analog value is displayed and will change by adjusting potentiometer 1 or 2 (1=R13, 2=R12). **Note:** The sample code is commented to explain each section. Comments are marked with ";".

Wire the Nano Board as shown below to run the demo code. Open Com port with IDE terminal window set to 9600 baud. **Note:** Install Atom Nano 40. Only one Nano can be installed at any given time.

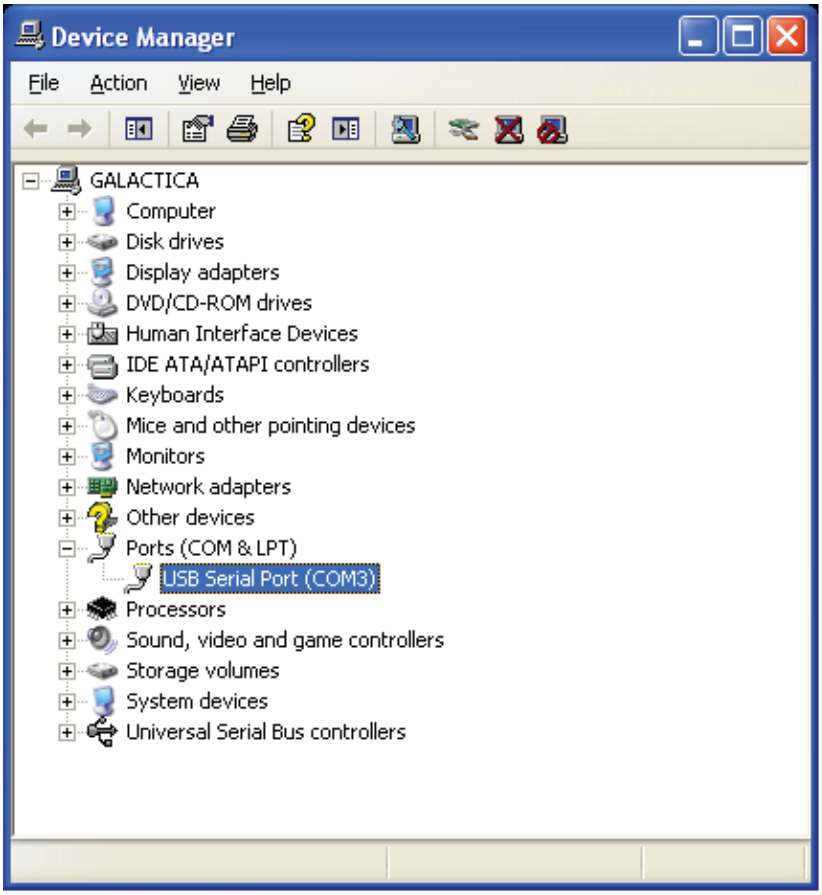


```
;%CONFIG% BASICATOM40NANO $1312d00 $0 $0 $0  $0  $0  $0  $0  $0  $0  $0  $0  $0  $0  $0  $0  $0  $0  $0

; Set floating point variable
volume var float
oldvolume var float

; Setup LCD
lcdinit  p0\p1\p2,outb
lcdwrite p0\p1\p2,outb,[CLEARLCD,HOMELCD,SCR,TWOLINE,"Hello World"]

;Set pins to known state
low p15
low p14
high p3

;Setup 32 bit variable
audio var long
temp var long
temp2 var long
cnt var long
cnt=0

;Enter main program. Read adin pins, load value into variable
main
        cnt=cnt+1
        adin AX3,temp
        output p3
        adin AX2,temp2
        temp = temp
        oldvolume = volume
        volume = 1.0 - (TOFLOAT(temp2)/1024.0)

        ;Write value to LCD
        lcdwrite p0\p1\p2,outb,[SCRRAM+40,dec4 temp\4," ",dec4 temp2\4]

        ;Send analog values to serial port
        serout S_OUT,i9600,[dec temp," ",dec temp2," ",real volume\2,13]

        ;Button state is loaded to output pin.
        out15=in13
        out14=in12
        out3=in11

        ;Change volume level of speaker based on potientometer value
        if(TOINT(oldvolume<>volume) OR temp<>audio)then
                audio = temp
                hpwm 0,audio*16,TOINT(TOFLOAT(audio*8)*volume)
        endif
        goto main
```

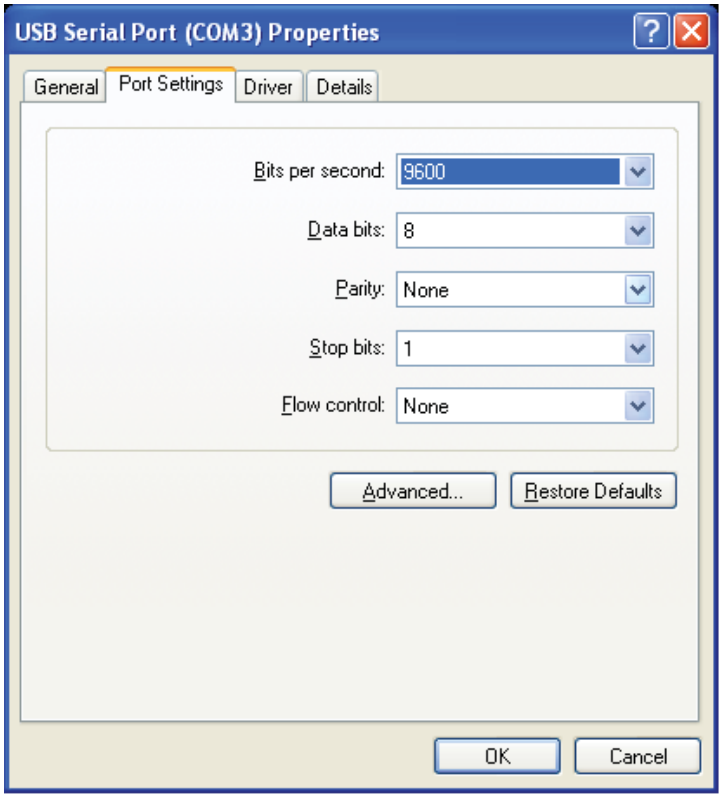
Driver Installation

You can download the FTDI customized driver from http://www.basicmicro.com. Some computers might have a default driver loaded. Or during installation a com port number over 20 is assigned. There is also a latency setting, this is used to delay bits sent to the device. Latency settings other than 1 will slow the programming. The following steps will cover proper driver installation and fixing potential issues that may occur.

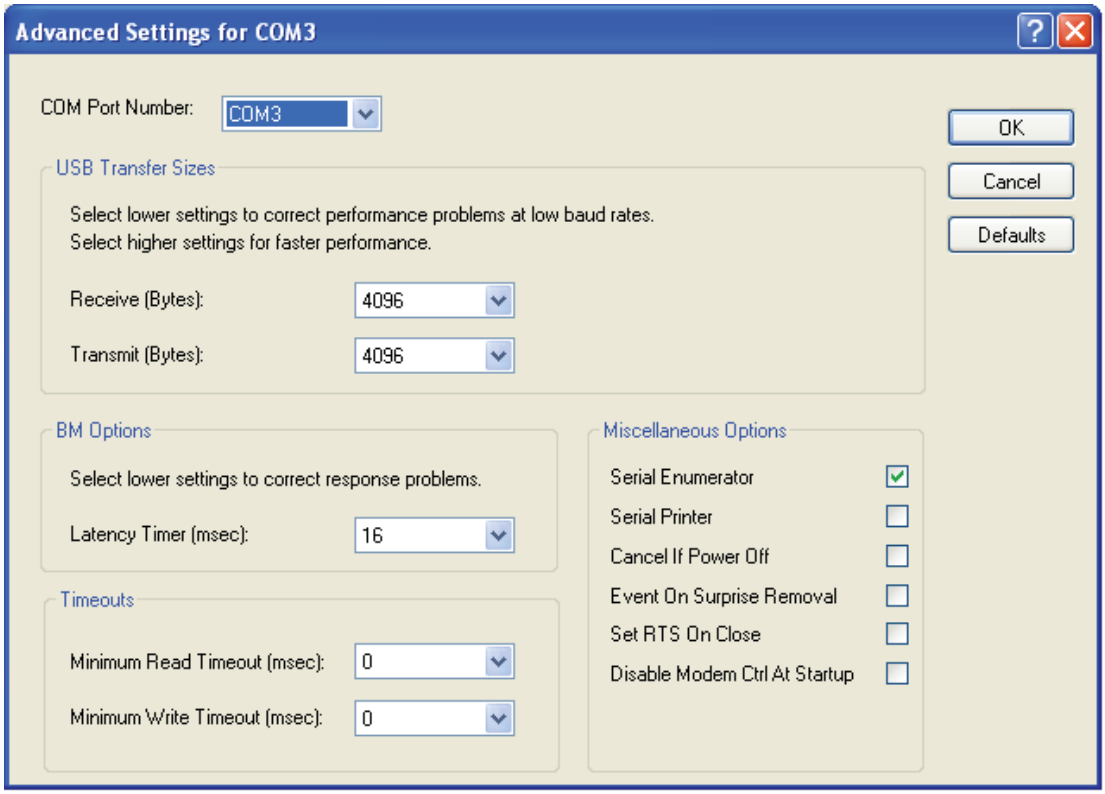
Open Device Manager -> Select Ports (COM & LPT), Right Click, Select “Properties”.



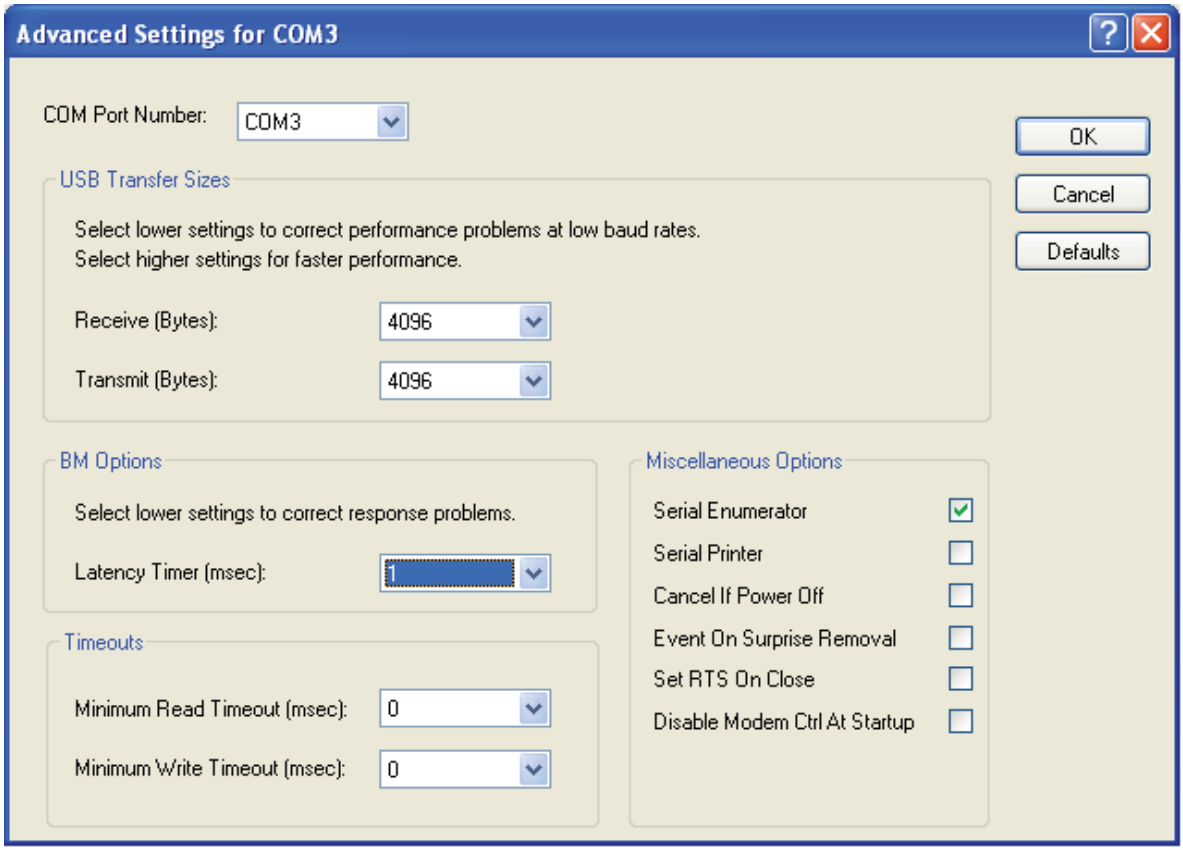
Properties Dialog -> Select “Port Settings” tab, Select “Advance” button.



Advance Settings Dialog -> Make sure COM port number is set to something lower than 25.



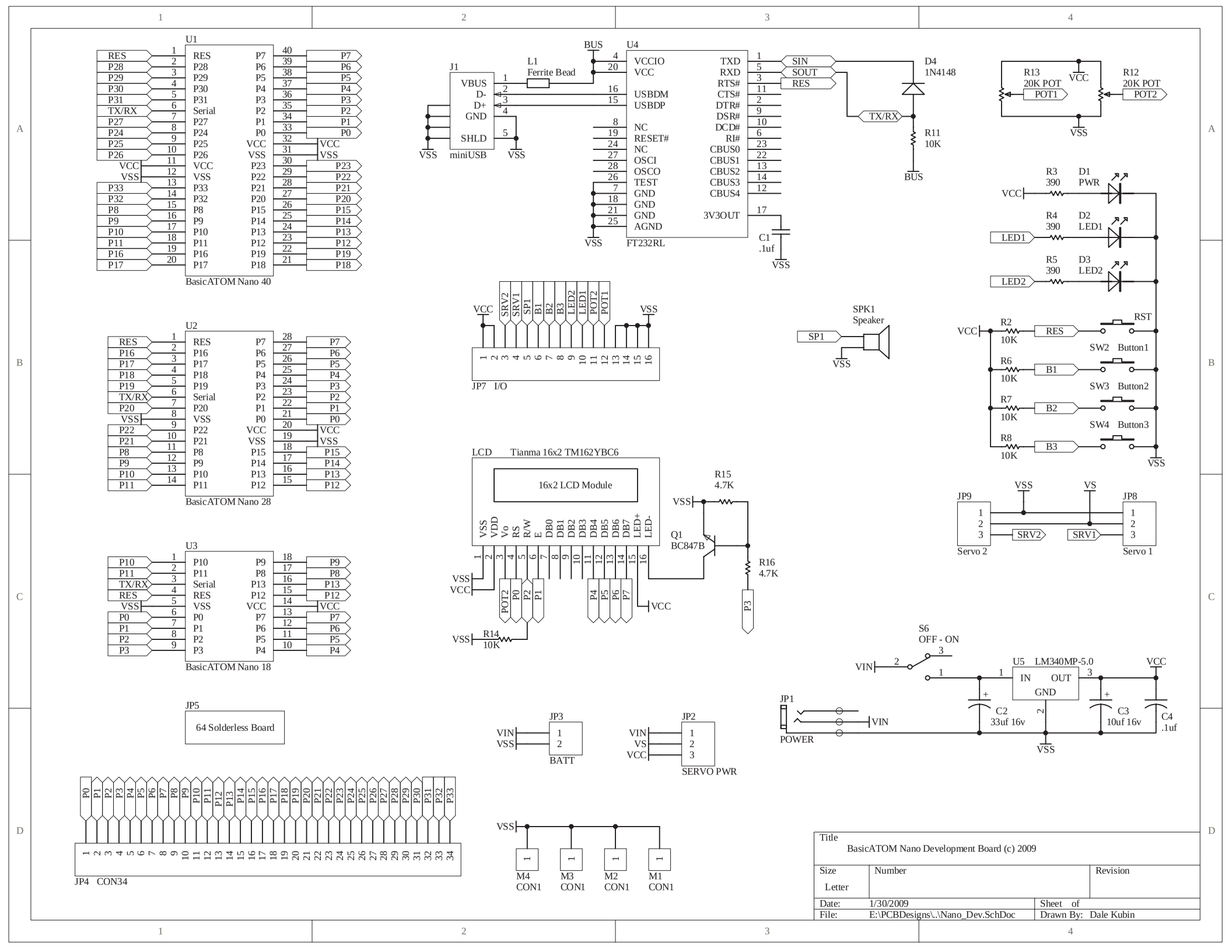
Advance Settings Dialog -> Make sure the “Latency Timer (msec)” option is set to “1”.



After completing the above steps click “OK”. The changes will not show right away until you restart your computer. However this is not necessary. The BasicATOM software will display the COM port you selected. Make sure you select the proper COM port setting in BasicATOM software.

Electrical Characteristics

Characteristic	Value (Units)
VIN Range (min - max)	6 – 9VDC
Current Draw (Idle)	50 mA
Current Draw (Max)	600 mA


U1
BasicATOM Nano 40
U2
BasicATOM Nano 28
U3
BasicATOM Nano 18
U4
FT232RL
J1
miniUSB
L1
Ferrite Bead
D4
1N4148
R11
10K
C1
.1uf
R12
20K POT
R13
20K POT
POT1
POT2
R3
390
D1
PWR
R4
390
D2
LED1
R5
390
D3
LED2
R2
10K
RES
RST
SW2 Button1
R6
10K
B1
SW3 Button2
R7
10K
B2
SW4 Button3
R8
10K
B3
JP7 I/O
SPK1
Speaker
LCD Tianma 16x2 TM162YBC6
16x2 LCD Module
R15
4.7K
Q1
BC847B
R16
4.7K
R14
10K
JP9
Servo 2
JP8
Servo 1
S6
OFF - ON
U5 LM340MP-5.0
C2
33uf 16v
C3
10uf 16v
C4
.1uf
JP1
POWER
JP3
BATT
JP2
SERVO PWR
JP5
64 Solderless Board
JP4 CON34
M4 CON1
M3 CON1
M2 CON1
M1 CON1
Title
BasicATOM Nano Development Board (c) 2009
Size
Letter
Number
Revision
Date: 1/30/2009
Sheet of
File: E:\PCBDesigns\..\Nano_Dev.SchDoc
Drawn By: Dale Kubin

Warranty

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Contacts

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Tech support: support@basicmicro.com
Web: http://www.basicmicro.com

Discussion List

A web based discussion board is maintained at http://www.basicmicro.com.

Technical Support

Technical support is made available by sending an email to support@basicmicro.com. All email will be answered within 48 hours. All general syntax and programming questions, unless deemed to be a software issue, will be referred to the on-line discussion forums.