Using GadgetPC with FTDI Peripherals

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BiPOM Electronics

16301 Blue Ridge Road, Missouri City, Texas 77489
Telephone: (713) 283-9970 Fax: (281) 416-2806
E-mail: info@bipom.com
Web: www.bipom.com

Overview

GadgetPC is a powerful, low-cost, 32-bit ARM9 (AT91SAM9260) based microcontroller system with 5 USB ports for interfacing to a variety of off-the-shelf USB devices. It is capable of running Linux.

Being a USB-only solution, GadgetPC is a much lower cost, lower power alternative to PC's in many embedded applications. GadgetPC can run ARM9 Linux that has a driver for FTDI chipsets (www.ftdichip.com) for easy interfacing with a large variety of RS232 devices and sensors.

Interfacing with USB Serial cables

FTDI manufactures a USB to COM (RS232 serial) cable that converts a USB host port to a DB9 RS232 connector. BiPOM distributes this product with part number CBL-USB-COM-1.

Up to 3 (or more with USB hub) of these cables can be connected to GadgetPC at the same time so GadgetPC can have up to 3 or more RS232 Serial ports as shown in *Figure 1*. Each serial port appears as a terminal device (tty0, tty1, etc.) under Linux as shown in *Figure 2*.

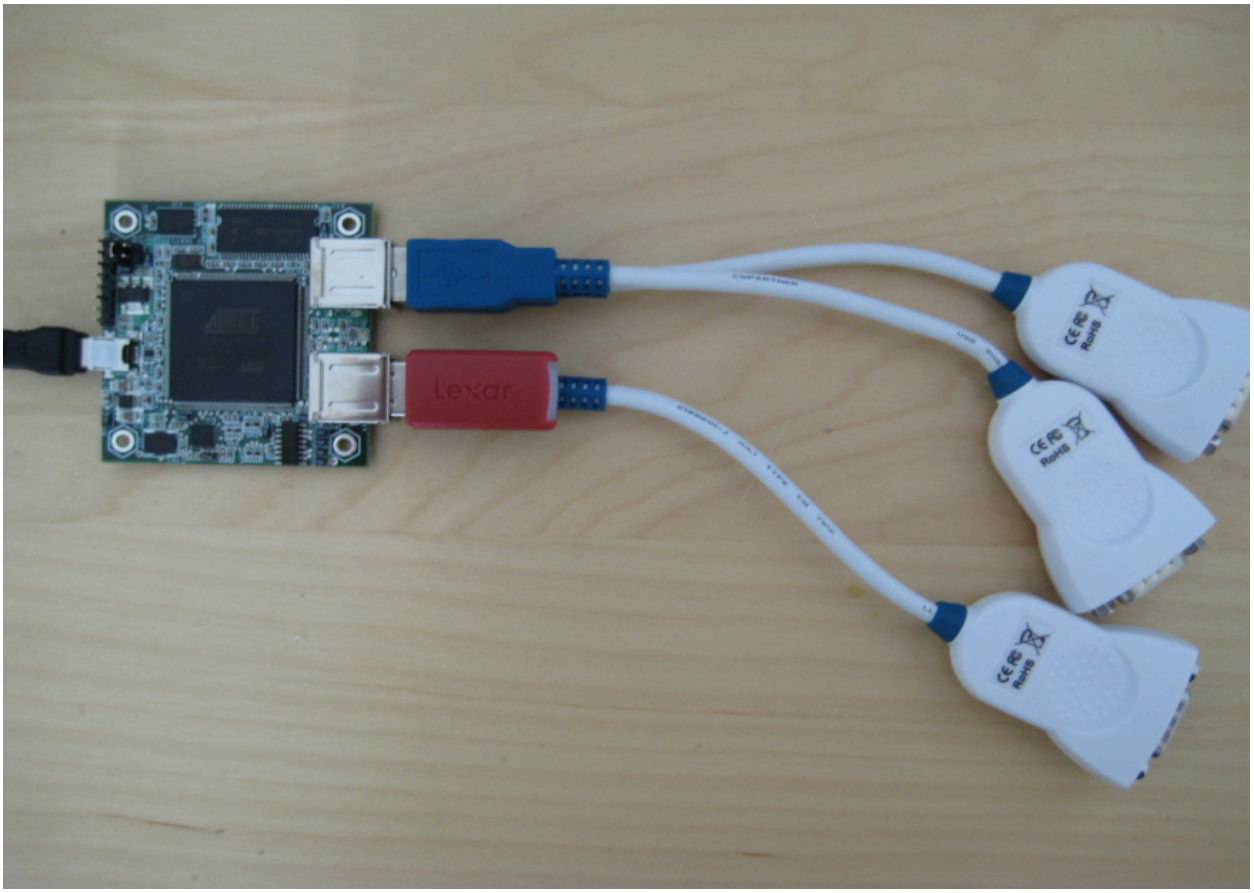


Figure 1.

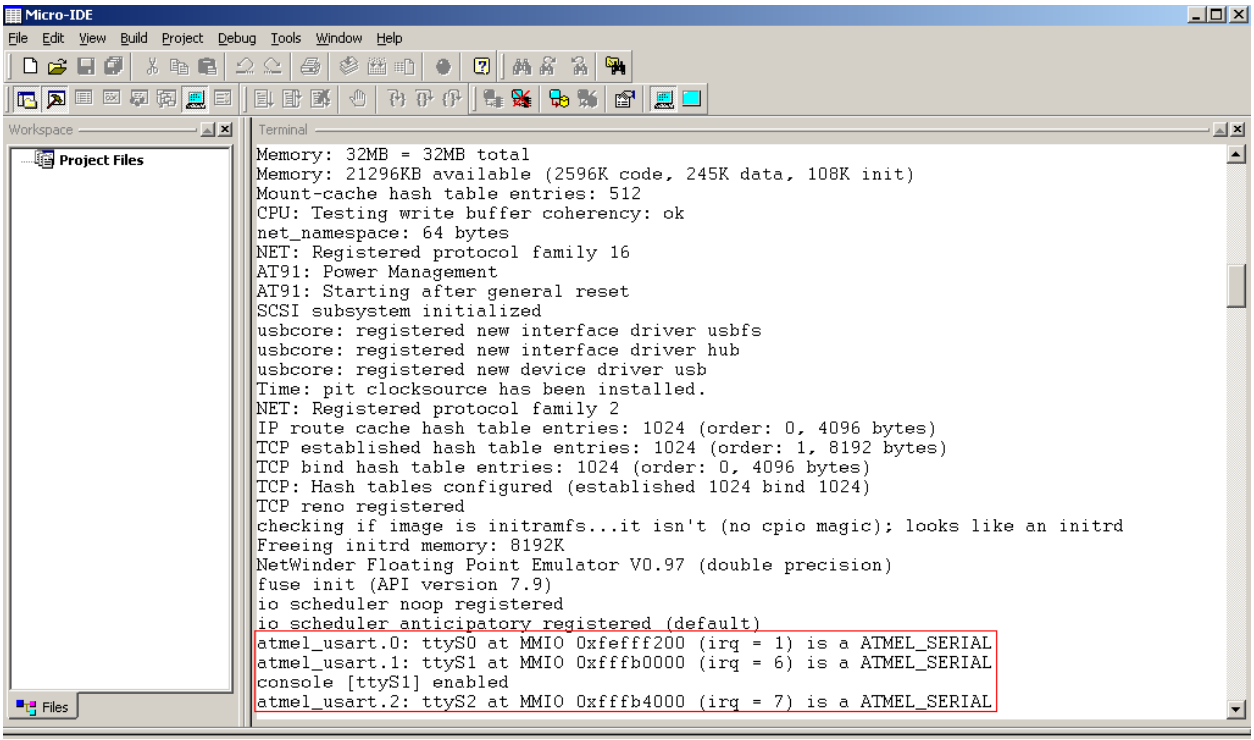
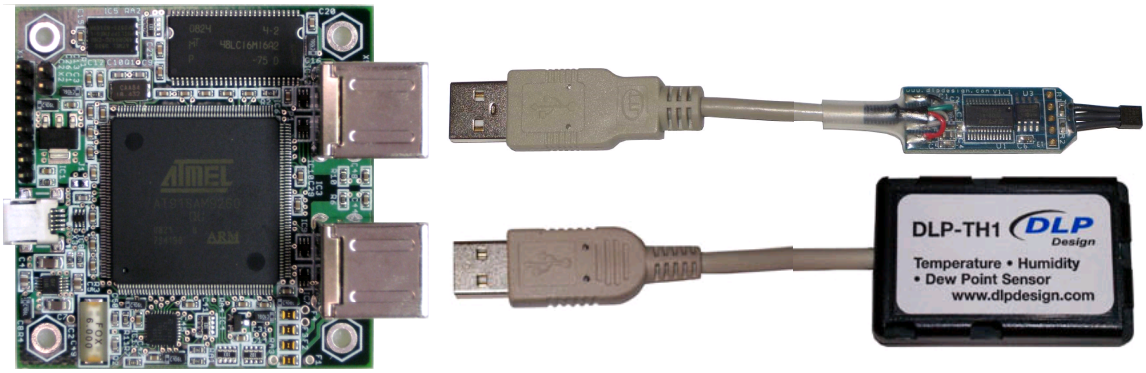


Figure 2.

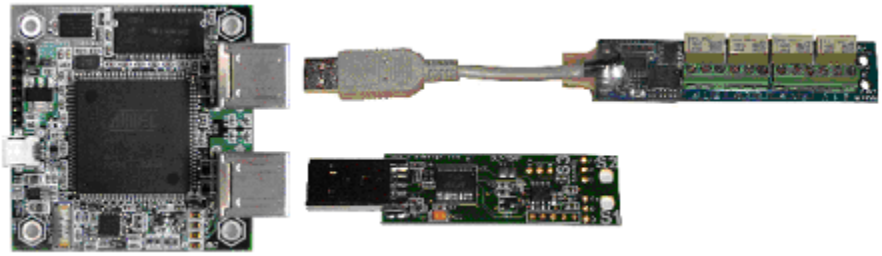
Interfacing with sensors from DLP Design

DLP Design (www.dlpdesign.com) is a producer of USB Adapter modules, USB Data Acquisition modules and USB sensors that use FTDI chipset.

Such USB devices expand the capabilities of GadgetPC in robotics and other embedded applications, adding temperature, humidity, tilt, acceleration and many other measurement capabilities.



Acquire data from and control the world around you using these USB based data acquisition boards.



Interfacing with temperature sensors

1) Start up **Microsoft Telnet**.
   - Connect to the IP address of GadgetPC
     - o open xxx.xxx.xxx.xxx (where xxx.xxx.xxx.xxx is your IP address)
   - Sign in with your username and password (default username/password: root/newpassword)

2) Issue the following command **lsusb** as a root user:

[root@GadgetPC /]$lsusb

Bus 001 Device 010: ID 08f7:0002 Vernier EasyTemp
_Bus 001 Device 008: ID 0403:fbfd Future Technology Devices International, Ltd _
Bus 001 Device 004: ID 05dc:a701 Lexar Media, Inc.

Bus 001 Device 003: ID 2001:1a00 D-Link Corp. [hex]
Bus 001 Device 002: ID 0451:2046 Texas Instruments, Inc. TUSB2046 Hub
Bus 001 Device 001: ID 0000:0000

3) Add specific VID/PID on the command line

[root@GadgetPC /root]$/sbin/modprobe ftdi_sio _vendor=0x403 product=0xfbfd_
[root@GadgetPC /root]$dmesg

usbcore: registered new interface driver usbserial
drivers/usb/serial/usb-serial.c: USB Serial Driver core
drivers/usb/serial/usb-serial.c: USB Serial support registered for FTDI USB Serial Device
ftdi_sio 1-1.3:1.0: FTDI USB Serial Device converter detected
drivers/usb/serial/ftdi_sio.c: Detected FT232RL
usb 1-1.3: FTDI USB Serial Device converter now attached to ttyUSB0
usbcore: registered new interface driver ftdi_sio
drivers/usb/serial/ftdi_sio.c: v1.4.3:USB FTDI Serial Converters Driver
[root@GadgetPC /root]$

4) The sensor is now detected as a serial port; Now, execute the following comannds:

/mnt/usb/ncurses/bin/tic /etc/termcap
/mnt/usb/minicom/bin/minicom -l -c on -s

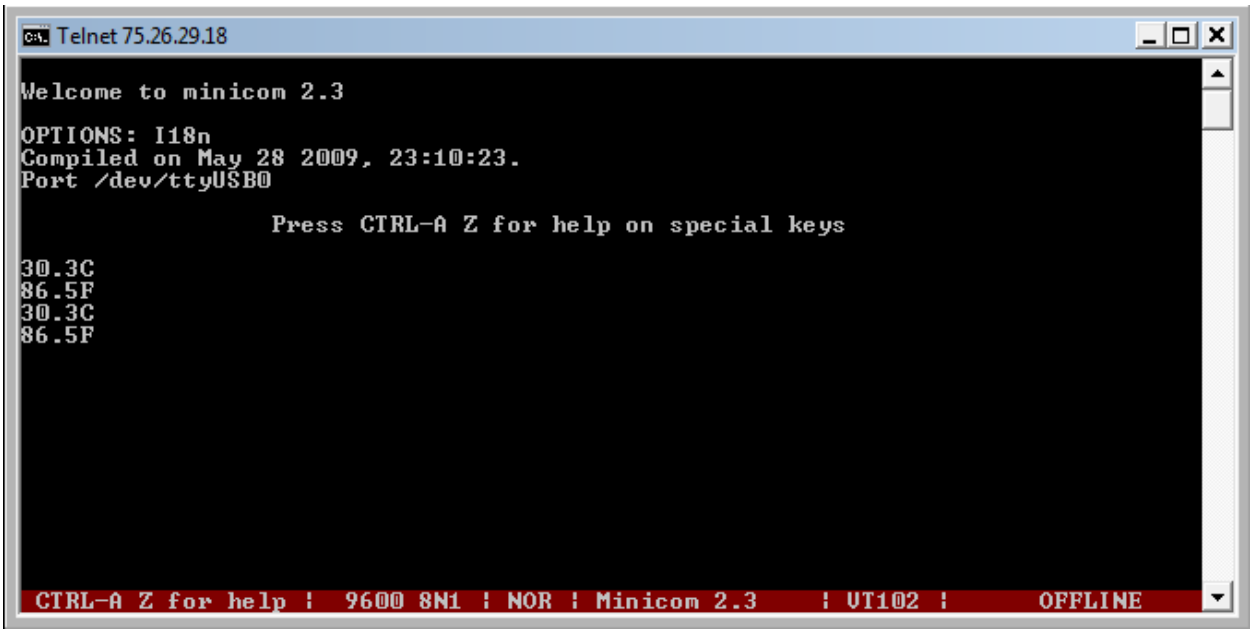
5) Now, you can assign /dev/ttyUSB0 for minicom terminal.

Note: Baud rate is 9600 (1 start bit, no parity, 8 data bits, 1 stop bit). Hardware control is No.

6) Start the following command:

/mnt/usb/minicom/bin/minicom -l -c on

7) This should open a minicom window. So, you can type C. The sensor board will reply a number like 30.6C. When you type F, the sensor board will reply a number like 87.1F.


Telnet 75.26.29.18
Welcome to minicom 2.3
OPTIONS: I18n
Compiled on May 28 2009, 23:10:23.
Port /dev/ttyUSB0
Press CTRL-A Z for help on special keys
30.3C
86.5F
30.3C
86.5F
CTRL-A Z for help | 9600 8N1 | NOR | Minicom 2.3 | VT102 | OFFLINE