APPLICATION NOTE

Wasp Data Logger Sample Application

Version 0.90

Introduction

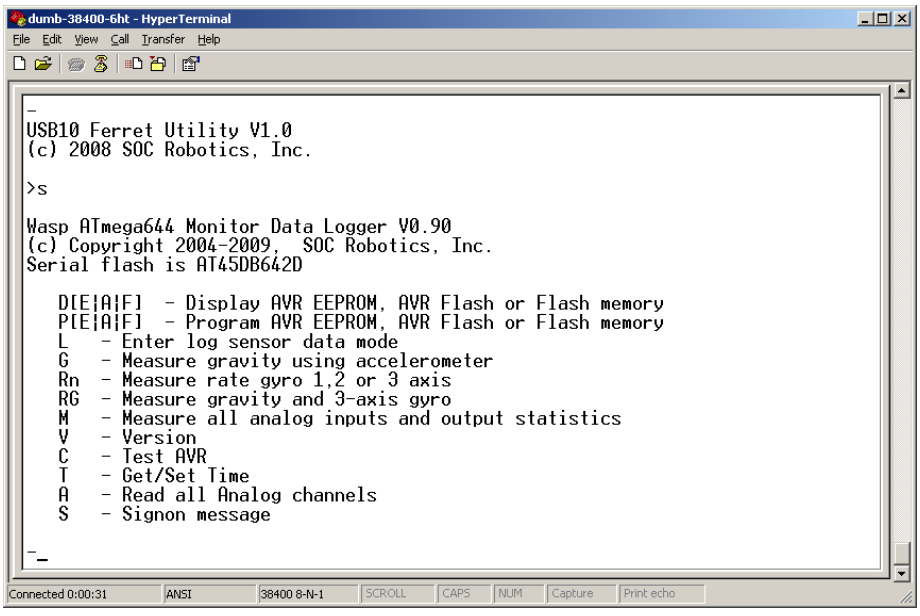
The Wasp data logger application is an embedded data logger that runs on an Atmega644 Wasp Embedded processor. The application allows the user to set log rate (samples per second) that are recorded to a small onboard Serial Flash. The Wasp can be shipped with a 3-axis accelerometer, 3-axis rate gyro (WS12/RG30 optional daughter card) and a digital compass (mounts to WS12). The default Serial Flash is 1Mx8 but an 8Mx8 version can be installed.

The data logger can be started using the console interface or by pressing a switch pulled high attached to data port pin PD2. The data logger erases any stored data in the serial flash before starting to log new data. The Wasp can be shipped with a coin cell option or attached to a USB10 USB 2.0 interface board. Configuration options are stored in on chip EEPROM. If standalone operation is required then the device can be configured using the USB10 interface with the PD2 pin armed.

A typical configuration is a Wasp attached to a USB10 that is in turn connected to a Windows PC. To setup the Wasp/USB10 download the myUSB package from the www.soc-robotics.com download page. Plug the Wasp/USB10 into the PC's USB port. You will be prompted for a driver that is located in the myUSB distribution under the USB10 project folder. Once installed the USB10 will be allocated a COM port (start control panel, select system and display hardware configuration). The USB10 should show up as a COMX port where X is the port id.

Example Session

Start Hyperterminal and set communications to 38,400,N,1 with no hardware flow control and the correct COM port selected. The USB10 will output a sign-on message. Type "s" return at the command prompt – this starts the Wasp Data Logging Application Monitor which outputs the menu below.



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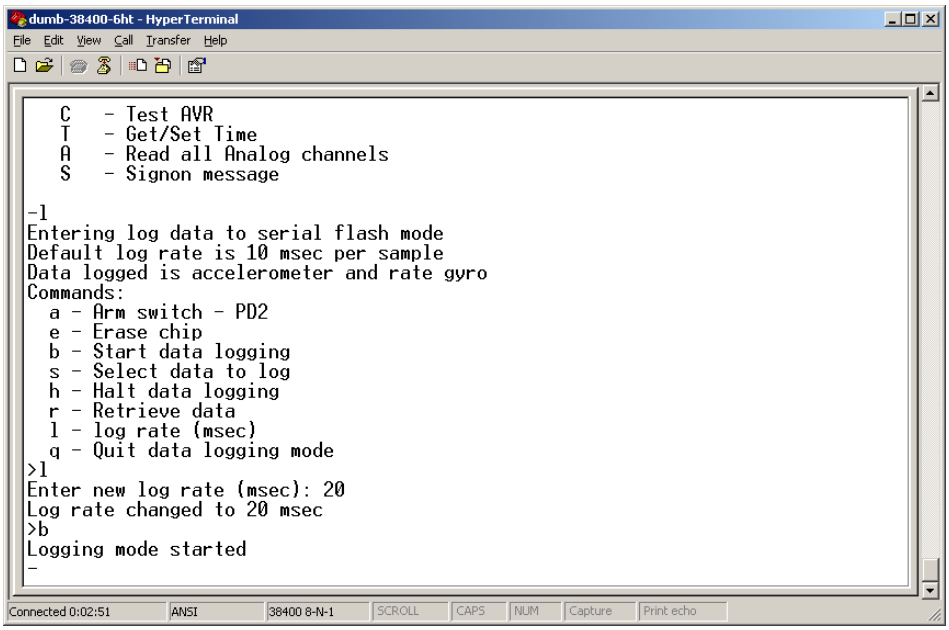
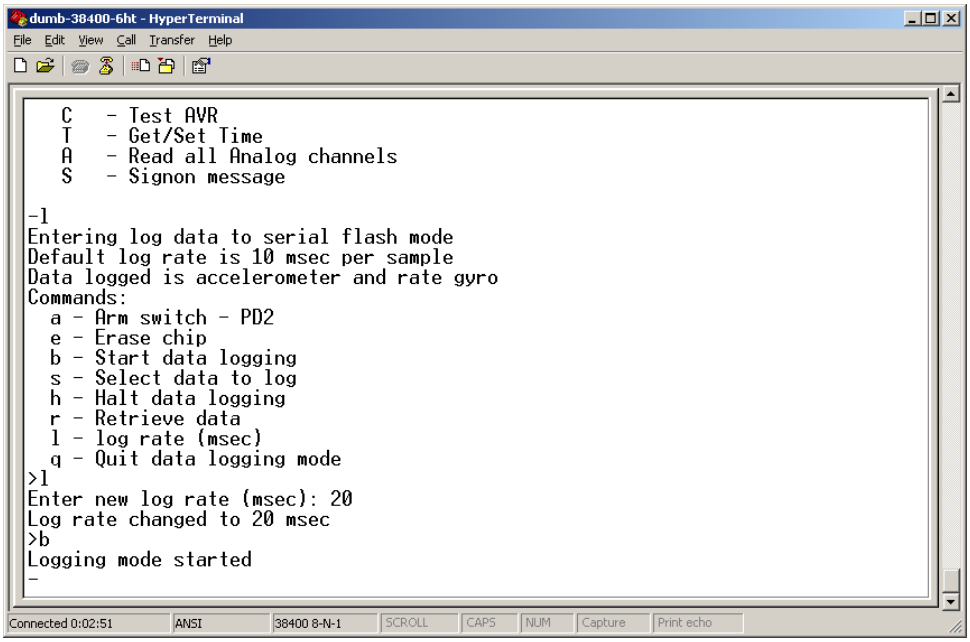
Now enter "l" return to enter the Logging Mode setup menu:



You can change the logging rate from the default to another setting by typing the "l" command as shown above. Logging starts either by arming PD2 (if you have a start button with pull up attached to PD2) or by pressing the "s" command as show below. Once logging starts the applications checks that the serial flash is empty and erases it if not prior to starting to log.



Once logging starts the application returns to the top level menu waiting for another command. To stop logging enter the log mode menu again and press "h" to halt logging.

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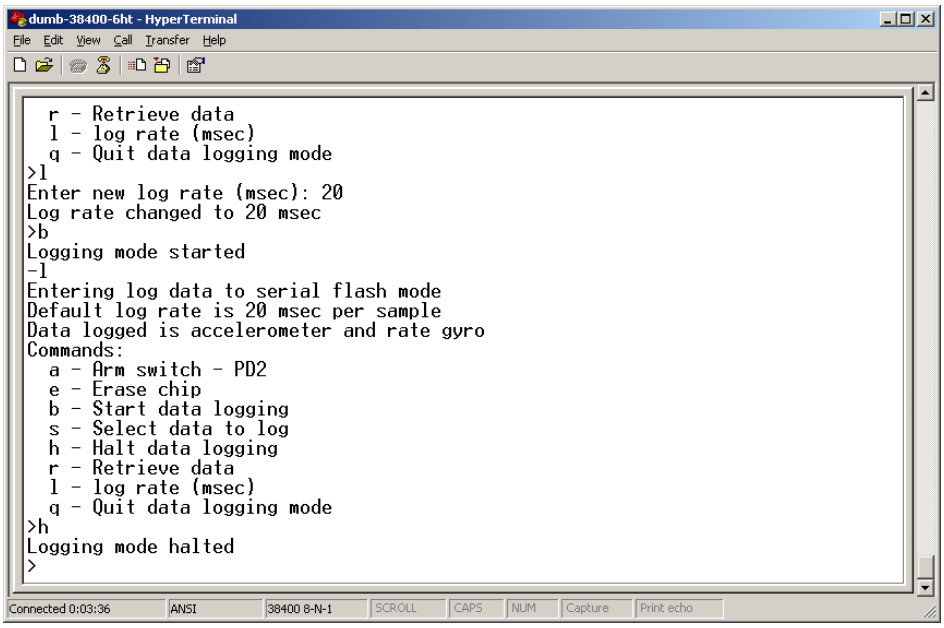
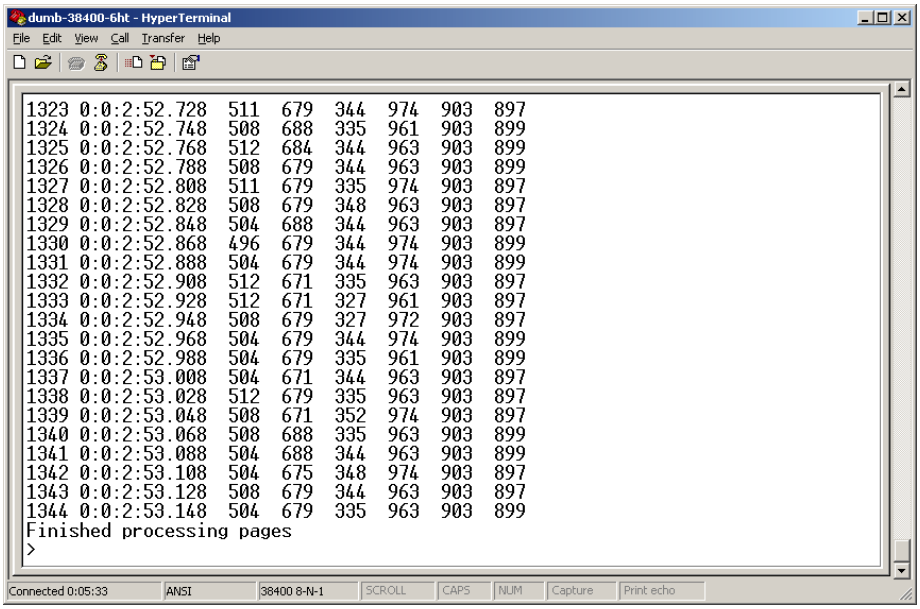


Logged data can now be output by selecting Retrieve Data using the "r" command. Note that logged data is streamed to the console. If you wish to store this data on the PC use the Hyperterminal Transfer menu to assign the retrieved data to a file on the PC.



Retrieved data records are time stamped with the day, hour, minute, seconds and mseconds. The Wasp has a crystal controlled real time clock so the stored data is accurately time stamped. Analog data representing acceleration and rate gyro are stored as 10 bit binary data.

You can also display accelerometer and rate gyro information in real time by entering the "g", "rn" or "rg" commands as shown in the example below.

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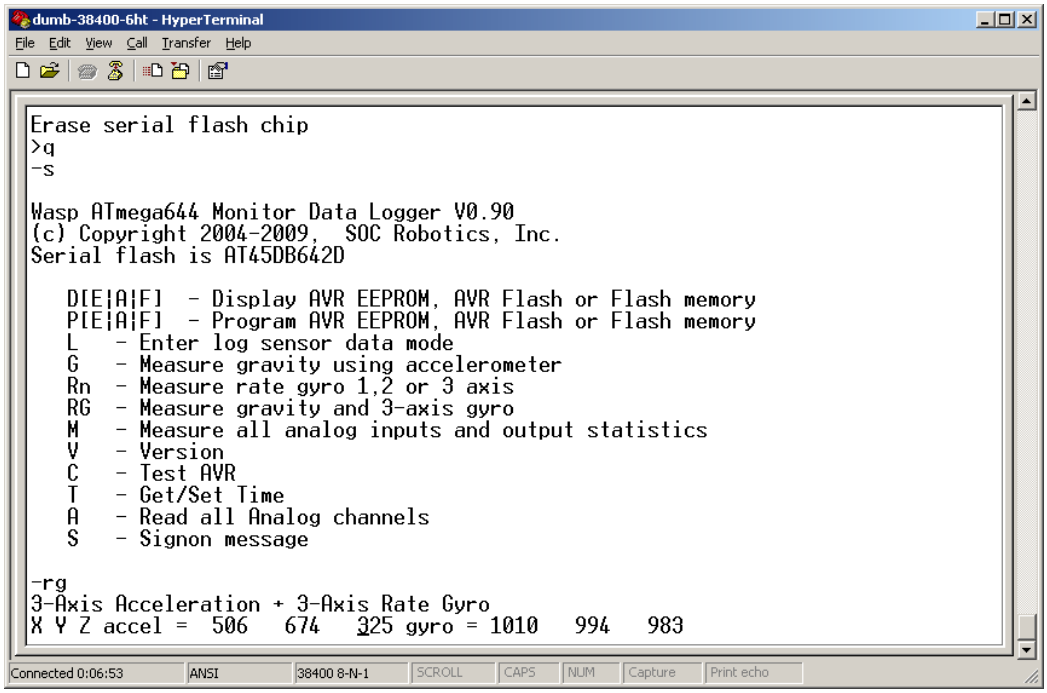

Complete source code for this application is provided so it is possible to modify the application to suit your own particular needs.

A desktop application is also available to allow you to configure what is logged by the Wasp using a desktop application called the Data Acquisition Device (DAD). Logged data can be stored on the Wasp for later retrieval or returned in real time and graphically displayed. DAD is designed to work with the Wasp, WaspARM and SAM48.

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