Memory Stick Datalogger (#27937)

General Description

The Memory Stick Datalogger is a USB Host Bridge which allows you to connect a USB Mass Storage Device, such as a Thumb Drive, to your BASIC Stamp® Module, Propeller chip or other microcontroller. The Vinculum IC/Firmware on the Datalogger Module handles the File System of the Memory Stick so that you can share the files with your PC. All of this control using simple serial commands.
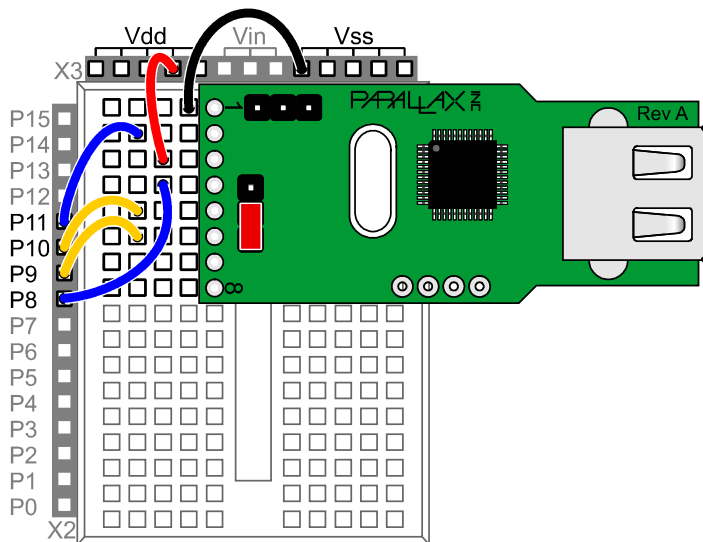
Features

- Simple Serial or SPI interface to microcontroller
- Extended or Short-Form Command Set/Responses
- 5V Supply with 3.3V/5V Safe I/O
- Low-power operation (25mA Run/2mA Standby)
- Easy firmware update (Can be field-updated)

Application Ideas

- Remote logging of large amounts of data
- Host large database for RFID or other application

Quick Start Circuit

Connecting and Testing

Connect the Datalogger board as shown above to your Board Of Education or Homework Board. If you have a different board please follow the pin out chart on page 3. Once your board is connected, insert a USB Thumb Drive then run the program DataloggerTestV1.2.bs2 to test it.

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Resources and Downloads

Check out the Memory Stick Datalogger product page for example programs, AppNotes, datasheet and more by going to http://www.parallax.com/

Search for "**27937**"

Theory of Operation

The heart of the Memory Stick Datalogger is the Vinculum Embedded USB Host Controller IC by FTDI. This integrated circuit allows the implementation of USB Host Controller functionality within products without having to deal with the low-level USB protocol. Besides providing the host interface the Vinculum also handles the FAT File System through upgradeable firmware in flash memory. This allows the user to access files on the drive using simple serial commands without having to deal with drive or file structure. Files are in standard FAT format and can be read and written from a PC as well providing excellent portability of the data and files. By formatting the output of the data going to the drive, files can be saved that can be imported directly into applications, such as spreadsheets, where the data can be plotted or graphed.

Command Set

The command set for the Memory Stick Datalogger is contained within the Vinculum Firmware Specifications on the Datalogger product page. Please see the section on Firmware Command Set. This sheet provides complete details of the command set used by this module as well as responses from the module. There is both a full verbose (DOS Style) command set as well as a condensed command set with less verbose responses which can make it easier on the microcontrollers such as the BASIC Stamp Module. FAT12, FAT16 and FAT32 formats are supported.

Precautions

Some USB drives may not properly initialize when connected to the Datalogger. If the light on your drive stays on when connected or if it doesn't blink, try removing and reconnecting the drive.

Removing or powering down a USB Drive while data is being written to it can corrupt both the data and the file system of the drive. Be sure the drive is not being written to when you disconnect or power off the Datalogger or Drive. Be sure that your program closes files that it opens for writing. Not closing these files can also cause corrupt data. A crashed program can also cause this if it never closes the file and the drive is shut down or removed.

If you continue having trouble reading from or writing to your USB drive, try the following.

Connect the USB drive to your PC. Open a My Computer window so you can see what drive letter was assigned to the drive. Open a command prompt (DOS) window and type the following (replacing x with the letter assigned to your drive):

chkdsk x: /f

This will scan the drive for any file system errors and repair them. Always back up important data on the drive before running chkdsk or even before logging any data to it to avoid losing important information.

Specifications

Symbol	Quantity	Minimum	Typical	Maximum	Units
Vdd	Supply Voltage	4.75	5.0	5.25	V
-	Storage Temperature	-65°	-	150°	C
-	Operating Temperature	0°	-	70°	C
Ivdd	Supply Current (Running)	-	25	-	mA
Ivdd	Supply Current (Standby)	1	2	2	mA

Pin Definitions (UART Mode)

| Pin	Name	Description
1	Vss	Connects to System Ground
2	RTS#	Request To Send (Connects to MCU CTS)
3	Vdd	Connects to +5V (Regulated)
4	RXD	Receive Data (Connects to MCU TXD)
5	TXD	Transmit Data (Connects to MCU RXD)
6	CTS#	Clear To Send (Connects to MCU RTS)
7	NC	No Connection
8	RI#	Ring Indicator (Making this input low resumes from Suspend)

Jumper in UART Mode
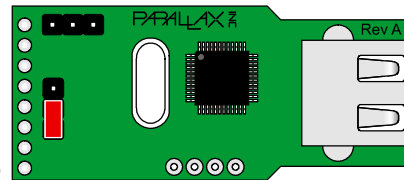
Pin Definitions (SPI Mode)

| Pin	Name	Description
1	Vss	Connects to System Ground
2	SDO	Serial Data Output
3	Vdd	Connects to +5V (Regulated)
4	SDI	Serial Data Input
5	SCLK	Serial Clock Input (12 MHz Max)
6	CS	Chip Select Input
7	NC	No Connection
8	NC	No Connection

Jumper in SPI Mode
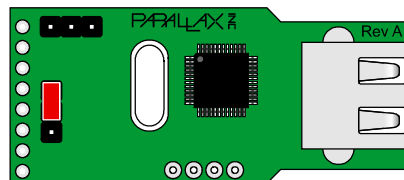
LED Definitions

Operation	LED Behavior
Power On	Green LED and Red LED flash alternately for 2 seconds Repeated until monitor connects
USB Disk Initialization	Green LED on, Red LED off
USB Disk Ready	Green LED off, Red LED on
USB Disk Removed	Green LED off, Red LED off
Commands From Monitor Port to USB Disk	Green LED off, Red LED flashes
Commands From Monitor Port with USB Disk Removed	Green LED off, Red LED off

Module Dimensions
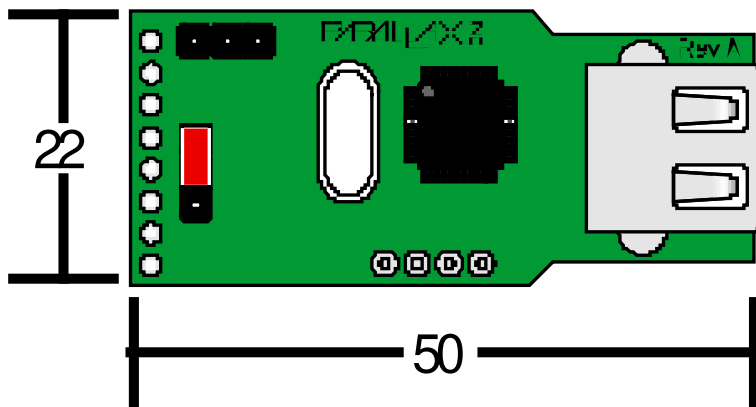
units = mm

Revision History

V1.2 – Removed references to obsolete parts; updated code references.