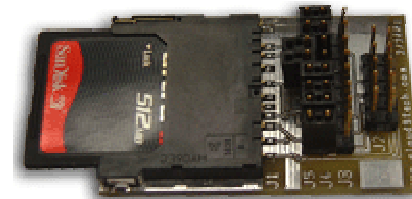
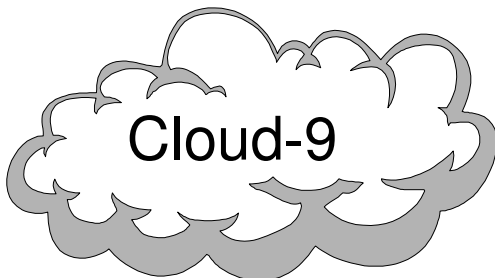


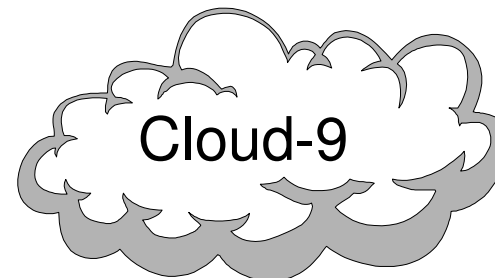
# SD/MMC Prototype Adapter User Manual



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# 1. Congratulations!

Thank you for purchasing the SD/MMC Prototype Adapter, another one of the fine products offered by Cloud-9. This product was designed to be used with the Atmel STK500<sup>1</sup>.

SD/MMC is a popular standard media for storage of digital information, and is widely used in digital cameras and MP3 players. Such wide usage has made the market for SD/MMC cards plentiful and inexpensive. With this adapter, you can now bring the advantage of popular and inexpensive storage to your computer.

The SD/MMC Adapter comes with a 10 pin female IDC cable and is meant to be mated directly to the STK500's PortB connector. The jumper field allows the use of devices that have their SPI ports on different pins. Atmel has these in two different classes. Devices that reside on the STK500 board, for example, ATmega16/32/164/324/644/8515.

## Features

- SD/MMC slot
- Mates directly to the STK500/501 connector.
- Card Detect and Write Protect status lines.
- Jumper fields to easily select proper SPI port on the Atmel Atmega series AVR's.

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### 3. If Problems Arise

Although our products are engineered with quality and care, Cloud-9 can not guarantee that you won't run into problems.

If you have a problem or question, please contact us via the Internet at [support@cloud9tech.com](mailto:support@cloud9tech.com). You can also visit our website at <http://www.cloud9tech.com> for up-to-date information on your product.

### 2. Getting Started

Installation of the SD/MMC Adapter to the STK500/501 is easy, but be sure to follow the steps below to insure proper operation.

1. **Verify which device is to be used.** Locate the jumper field labeled J3, J4 and J5 on the adapter. Per the following table, select the proper SPI PortB assignment.

SD/MMC	STK500 Device	STK501 Device
Pin 1, CS~, Jumper 1	PB.4	PB.0
Pin 2, MOSI, Jumper 2	PB.5	PB.2
Pin 3, GND	GND	GND
Pin 4, VDD	VTG	VTG
Pin 5, SCK, Jumper 3	PB.7	PB.1
Pin 6, GND	GND	GND
Pin 7, MISO, Jumper 4	PB.6	PB.3
Pin 8, DAT1, Jumper 5	-	-
Pin 9, DAT2, Jumper 6	-	-
Pin 10, CD~, Jumper 7	PB.2	PB.6
Pin 11, WP, Jumper 8	PB.3	PB.7

To select the STK500 device type, Install jumpers from J3 to J4.

To select the STK501 device type, Install jumpers from J4 to J5.

Please note that all part references on the printed circuit board (PCB) are on the pin 1 end. The board is shipped configured with STK500 support. Jumpers 5 & 6 are typically not connected.

2. **Connect the Adapter.** Attach one end of the supplied IDC10 ribbon cable to the adapter. Please note pin1 orientation. Place the red stripe of cable to Jx reference side of the circuit board. Pin1 is also noted on the bottom side of the PCB with a square. Reference name J2 indicates pin one end of the connector.

3. **Connect to STK50x.** Locate PORTB on the STK500's board. Observing pin 1's orientation, insert 10 pin IDC into connector so that red stripe is on the pin 1 side of PORTB. If a software SPI approach is taken then you will have to configure the card to your design. Please note that a SD/MMC's normal operating voltage is 2.4 to 3.6VDC. Please adjust the VTG setting to comply to the SD/MMC voltage operating range before inserting the SD/MMC device.

## The SD/MMC Card

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**While it is impossible to test every possible SD/MMC card for compatibility, we are virtually certain that any standard SD/MMC card will work with the adapter. SD/MMC is hot-swappable.**

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To use the adapter card, with either power applied or not, place the SD into the socket slot. The socket is keyed to the SD/MMC so that it can only be inserted one way.

That's it! Your SD/MMC device is ready for development on the Atmel platform.

For reference purposes

Card Detect $\sim$  = Lo = Card Detected, Hi = No Card Detected.

WP = Hi = Write Protect, Lo = Write Enabled.

Both CD $\sim$  and WP should have the AVR's input port configured to have the internal pullup enabled for proper detection with this device.