Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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USB Removable Memory Card Reader

**Please read these Getting Started instructions carefully
before using the memory card reader.**

This reader is for use with xD-Picture Card™ memory cards formatted for and
by Rabbit Semiconductor devices and the Dynamic C FAT software module. The
reader allows you to use a PC to read and write a memory card formatted in a
Rabbit-based system using the Dynamic C FAT library. This reader is not for use
with digital cameras.

NOTE: This reader is not intended for use with safety-critical systems.

SYSTEM REQUIREMENTS

Windows 2000® or Windows XP® operating system and a free USB slot.

Only 16MB–128MB xD-Picture Cards are supported at this time. M-type
xD-Picture Cards are *not* supported at this time.

Version 2.12 or later of the Dynamic C FAT File System is required for 16MB
and 32MB xD-Picture Cards, and v. 2.10 or later is required for larger cards.

CE COMPLIANCE

The memory card reader has been tested and was found to be in conformity with
applicable EN immunity and Class B emission standards.

- EN55024 (1998) immunity standards.

    EN61000-4-2 (ESD)
    EN61000-4-3 (Radiated Immunity)
    EN61000-4-4 (EFT)
    EN61000-4-5 (Surges)
    EN61000-4-6 (Conducted Immunity)
    EN61000-4-8 (Magnetic Fields)
    EN61000-4-11 (Voltage Dips and Interruptions)

- EN55022 (1998) emission standards.

    CISPR Class B
    FCC Class B
    IEC-003 Class B.

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INTRODUCTION

The memory card reader works like any other USB thumb drive or memory card reader when copying files to or from a PC or laptop, *but it will automatically format memory cards that haven't been formatted by the Dynamic C FAT file system! Never format a memory card via Windows File Explorer commands from the PC,* which may create a format that is inefficient or unusable when the card is returned to a Rabbit-based system. See the section below on formatting for more information.

USING THE USB MEMORY CARD READER

Insert either an unformatted or an already-formatted memory card from a Rabbit-based system into the reader's memory-card slot, then plug the card reader into an available USB slot on your PC or laptop.

Formatting Cards

If the memory card was not formatted in a Rabbit-based system, the LED on the card reader should flash rapidly (about two blinks per second) for several seconds to indicate that the card is about to be formatted. Formatting won't actually begin until the blinking stops. *If you accidentally plugged in a card with your vacation photos, remove it now!*

Once formatting begins, the LED will stay lit without blinking until formatting is complete. The memory card reader will not communicate with the PC until the formatting has been completed.

Driver Installation

If a memory card reader has never been used by your PC, you will probably see some messages about hardware being detected and software being automatically installed at this point. The card reader will initiate communication with the PC once this setup is complete.

Card Detection

Once a card formatted in a Rabbit-based system or by the card reader has been detected by your PC, a new removable drive should be visible in Windows Explorer. Which drive letter is used depends on what drive letters were available to the Windows operating system.
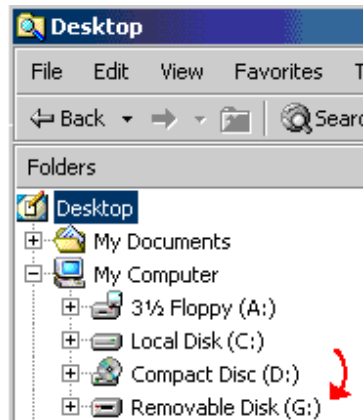
Removing the Memory Card Reader

Never remove the memory card reader while file operations are in progress! The icon shown at right will appear somewhere in the lower right PC status bar while any active, removable USB device is connected to your PC.
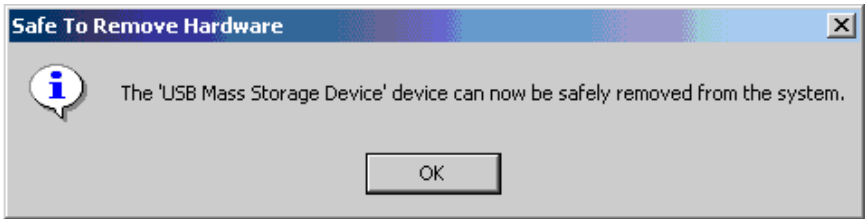

USB removable device icon

Place the mouse cursor over the icon and left click. Now click on the following message that pops up.

Stop USB Mass Storage Device - Drive(G:)   9:42 AM

This message should then appear. Click the **OK**.

Safe To Remove Hardware ⊗

The 'USB Mass Storage Device' device can now be safely removed from the system.

OK

It is now safe to physically remove either the whole card reader or just the memory card. If only the card is removed, the LED should begin to blink slowly. You may now insert a card, and the host PC should once again detect a removable USB device.

LED STATUS INDICATOR

The LED status indicator shows the status as follows.

- **Slow blinking** — the memory card reader is plugged in with no memory card inserted and is waiting for a card to be inserted, the card was removed from the card reader, or an internal error has occurred.

- **Fast blinking** (about two blinks per second) — a card that wasn't formatted in a Rabbit-based system has been detected, and the card reader will format the card when the blinking stops.

- **Continuously lit** — the card reader is doing a file read, file write, or format operation. (The LED may quickly blink off and back on sporadically in this mode. A memory card with many files will take longer to read than an empty card when first inserted.)

- **Unlit** — normal, idle operation.

IMPORTANT INFORMATION FOR RABBIT DEVELOPERS

Partitions

The USB memory card reader works only with a one-partition memory card.

Wear Reduction

One of the ways that the Dynamic C FAT file system reduces flash wear is to use the 16K erase block size for the cluster size. This prevents files from sharing erase units, and means that the smallest block of flash a file can use is 16K. Keep this in mind when designing FAT applications.

Caching and Power Failure

RabbitCore modules and Rabbit-based single-board computers using the Dynamic C FAT file system with memory cards do caching in battery-backed RAM as a way of reducing wear and to provide extra safety against data loss in the event of unexpected power cycling or card removal. The card reader doesn't do any caching. A power failure during a file-write operation to the memory card could therefore result in loss of *all* files on the card. The easiest way to prevent critical data loss from such a power failure is to use a laptop with a charged battery that will continue running if AC power cuts out. It is also suggested that existing critical data on a card be copied to the PC for backup before doing a file-write to the memory card. File-read operations will not corrupt the memory card.

Unique Volume Labels

Partitions created using the `fat_autoMount()` function call from the Dynamic C FAT file system have unique volume labels so that cache recovery operations are not attempted on a memory card that was not the one being used when a power failure or premature card removal occurred. The system timer is used as a random seed to create unique labels. Because the memory card reader has no battery-backed real-time clock, the reader uses factory-bad NAND blocks for entropy to create a random seed. It also uses a loop counter that runs on start-up while waiting for a card to be inserted. To minimize the chances of the same random label being created twice, format new cards by plugging in the card reader without a memory card, then insert the card.

Firmware Upgrades

Assuming the firmware is intact and the hardware undamaged, the card reader firmware can be upgraded by simply by inserting a memory card with a firmware update file on it and plugging the reader into a USB slot. Check the Rabbit Semiconductor Web site for firmware upgrades and instructions.