eMMC/SD Card Duplicator

SDCPM-I1

Introduction

The **SDCPM-I1 eMMC/SD Card Duplicator** is designed to meet eMMC/SD card content duplication & verification manufacturing needs.

SDCPM-I1 features high-performance, independently operating eMMC/SD card slots by 1 master source and 8 target slots supporting mainstream eMMC/SD cards with various form factors.

SDCPM-I1 offers Partition, Auto, Mirror, and File mode of both Copy and Verify operations suitable for various applications.

Features

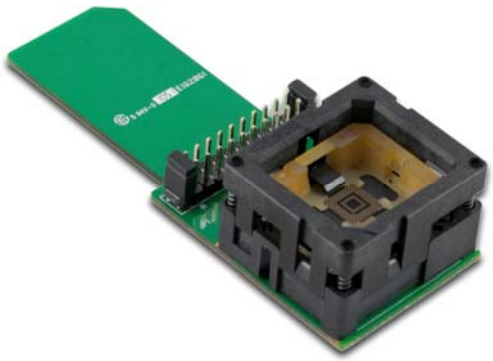
- 1x Master + 8x Target Independent eMMC/SD Slots.
- Supports eMMC General Purpose Partition/Enhanced User Area copy and verify operation.
- Support MMC ver. 4.3/4.4/4.41 compatible eMMC/MMC/RS-MMC cards.
- Supports SD ver. 1.1/2.0/3.0 compatible SD/SDHC/SDXC cards.
- Copy/Verification speed up to 22MB/s.
- Copy/Verification operation in Partition / Auto / File / Mirror mode.
- On-the-fly checksum generation during verify operation.
- 2x RS232 interface for PC connection and daisy-chain connection up to 8 SDCPM-I1.
- Replaceable eMMC/SD card slot module available.

C-Ming Technology Co., Ltd.
2F., No.104, Minzu Rd., Sindian City,
Taipei County 231, Taiwan (R.O.C.)
TEL: 886-2-22181670 FAX: 886-2-22181570
www.cm-tech.com.tw

eMMC/SD Card Duplicator

Specifications

- Power Requirements: AC 100V/220V ~ 60Hz, 0.5A
- Card Slots: MMC ver. 4.41 / SD ver. 3.0 ; Master x 1, Target x 8
- Dimensions: L 293mm x W 128mm x H 50mm
- Weight: 1080g
- Display: 16x2 Backlit LCD
- Interface: RS232 DE9 x 2



Operation

1 Introduction

Pushbutton Description:

KEY	DESCRIPTION
UP	Scroll up menu.
DOWN	Scroll down menu.
LEFT	Toggle option ON/OFF or decrease value.
RIGHT	Toggle option ON/OFF or increase value.
ENTER	Toggle option ON/OFF or confirm selection.
START	Back to root menu or start selected operation.

Root menu description:

MENU	OPTION	DESCRIPTION	DEFAULT
COPY GO!	-	Start COPY operation.	IDLE
VRFY GO!	-	Start VERIFY operation.	IDLE
FORMAT GO!	-	Start format target card operation.	IDLE
SrcChksum GO!	-	Start source card checksum generation operation.	IDLE
Verify	-	Verify content after copy completed.	ON
Mode	Partition	Complete partitioned area sector by sector copy and/or verify operation.	Partition
	Auto	Automatic partition mapping copy/verify operation.	
	File	File by file copy/verify operation.	
	Mirror	Sector by sector copy/verify operation.	
Rewrite	-	Re-write erroneous data sector in verification after copy.	ON
Erase	-	Erase sectors before copy.	ON
RETRY CNT -	-	Number of RETRY verifying data error.	5
CDn Mode	AUTO	Automatic card detect mode.	HOST
	HOST	Host preferred card detect mode.	
	OPRN	Operation triggered card detect mode.	

2 Operation Description

2.1 Copy operation

Follow the steps below to begin copy operation:

a. Make sure that the capacity of memory card receiving content is adequate (larger than or equal to) the size of allocated space of memory card containing original copy of content.
b. Insert memory card with original copy of content to SLOT-0.
c. Insert memory card receiving content to SLOT-1, 2, 3 to 8.
d. Wait until all slots with memory card illuminated “BLUE” led.
   (“BLUE” led indicates memory card properly initialized & identified.)
   (“RED” led indicates possibly defective or incompatible memory card.)
e. Scroll up/down menu to “COPY GO!”.
f. Press “ENTER” button to start copy operation.
g. “AMBER” led will be lit indicating active data transfer or “BUSY” status.
h. When copy operation is completed, content will be automatically verified if “VERIFY” option is toggled ON.
i. If content in memory card is verified successfully, “GREEN” led will be lit. Otherwise, “RED” led will be lit.

2.2 Verify operation

Follow the steps below to begin verify operation.

a. Insert memory card with original content to SLOT-0.
b. Insert memory card to be verified to SLOT-1, 2, 3 to 8.
c. Wait until all slots with memory card illuminated “BLUE” led.
   (“BLUE” led indicates memory card properly initialized & identified.)
   (“RED” led indicates possibly defective or incompatible memory card.)
d. Scroll up/down menu to “VRFY GO!”.
e. Press “ENTER” button to start copy operation.
f. “AMBER” led will be lit indicating active data transfer or “BUSY” status.
g. If content in memory card is verified successfully, “GREEN” led will be lit. Otherwise, “RED” led will be lit.

NOTE: Depends on setting of operation mode, verification will be performed on sector-to-sector based (ON) or file-to-file based.

2.3 Operation Statistics Display

Operation statistics is displayed after selected operation is finished. Statistics includes:

Copy / Verify Speed

Indicate average user data copy and/or verify speed. (in MB/sec)

Total Operation Time

Indicate period of time elapsed during selected operation. (in second)

Total Operation Data Capacity

Indicate total amount of data being copy and/or verified. (in KB)

Source Data Checksum (32 bits)

Indicate source data checksum generated during VERIFY operation.
Checksum is displayed only after COPY+VERIFY or VERIFY operation.

2.4 Test Mode operation

A test utility is equipped in SDCPM-I1 for basic functionality test and ROM image update.

Follow the steps below to enter Test Mode:

2.4.1 Entering Test Mode

a. Switch off power of SDCPM-I1.

b. Press ENTER button and then, while pressing down ENTER, switch on power of SDCPM-I1.

c. The Test Mode menu of SDCPM-I1 is available and described as below:

d. Scroll UP/DOWN the menu and select desire item by pressing ENTER.

MENU	DESCRIPTION
TEST: ALL	Auto-run all tests for 1 cycle.
TEST: AUTO	Auto-cycle all tests for indefinite cycles.
TEST: LCM	Test LCM display function.
TEST: LED	Test LED indicator function.
TEST: PushBTN	Test PUSH-BUTTON.
TEST: SD CDn+WP	Test SD slots card detect and write protect switch.
TEST: SDIF	Test SD slots interface signal connectivity.
TEST: SDRAM	Test SDRAM memory.
TEST: RS232	Test RS232 ports.
IMAGE UPDATE	Perform ROM image update.
IMAGE VERSION	Display ROM image version information.

Operation of updating ROM image is described in more detail as below.

2.4.2 Updating ROM image

Follow the steps below to update ROM image of SDCPM-I1:

a. Prepare a SD memory card.
b. Quick - format the SD memory card using PC & memory card reader.
c. Copy the released ROM image file (SDCPMxxx.BIN) to the memory card.
d. Insert the SD memory card to SLOT-0 of the SDCPM-I1.
e. Turn on the SDCPM-I1 and enter test mode.
f. Select IMAGE UPDATE and press Enter.
g. LCM display confirmation page, press RIGHT and then ENTER for confirmation.
(Press ENTER directly to return to root menu.)
h. SDCPM-I1 will query SLOT-0 and search for ROM image file and automatically finish the ROM image update.
i. Wait until LCM display returns to IMAGE UPDATE page.
j. The ROM image update is now complete. Turn off SDCPM-I1 and then turn-on again for the changes to take effect.
k. To confirm a successful ROM image update, enter the tester again and use IMAGE VERSION to display ROM image versions.

3 Operation Mode Description

3.1 Partition Mode

Partition Mode copy entire only partitioned area designated by MBR partition table entries in exact sector by sector, byte by byte mirroring manner.

In the case if only a portion of the source card is used while only the allocated areas are to be copied and verified, using Partition Mode can reduce the operation time and pertaining the exactness of copy required.

This allows source card with multiple partitions or partitions formatted to file system other than FAT16/32 to be copied and/or verified, provided that the partitions are made based on MBR and partition table entry.

The MS extended partition table entry format is also supported.

It is recommended to use Partition Mode, when sector-by-sector, byte-by-byte exactness of new copies required and the MBR partition table allocated area is smaller than the card capacity.

3.2 AUTO MODE

Auto Mode allows target card with +/- 5% variation from source card.

SDCPM-I1 will automatically re-map and adjust partition size to fully utilize target card capacity. At the mean time, SDCPM-I1 will identify the storage area that is being allocated and used by the source card. Only the storage area with valid data will be copied and verified to reduce operation time.

However, only partitions with FAT16/32 file system will be supported. Partition with other file systems will be treated the same as under Mirror mode.

It is recommended to use AUTO mode, when Source and Target are with the same labeled capacity and are formatted to FAT16/32 file systems.

3.3 FILE MODE

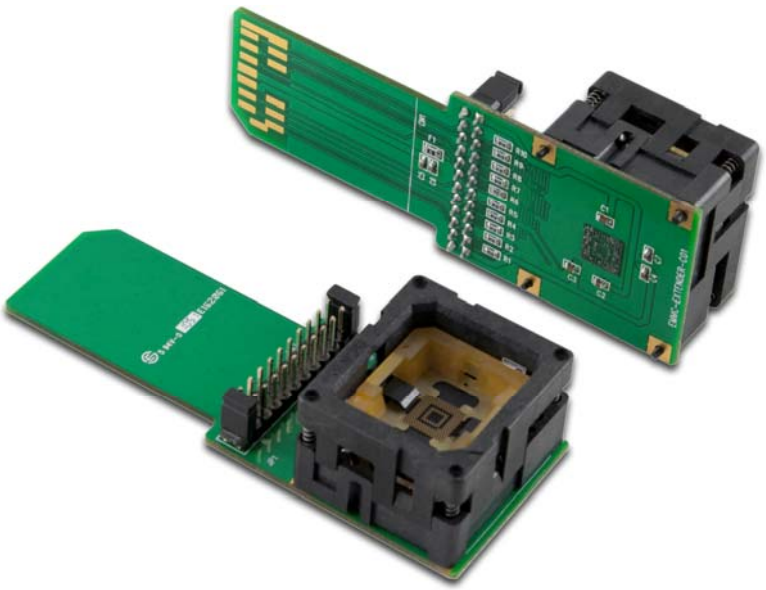
File Mode allows target card with difference capacity from source card to be supported. Source card must be formatted under FAT16/32 file system. Target card will be re-formatted to FAT16/32 in Copy operation.

It is recommended to use FILE mode, when Source and Target are with different labeled capacity and are formatted to FAT16/32 file systems.

3.4 MIRROR MODE

Mirror Mode allows target card to be copied and verified in manner of sector-by-sector exactly.

It is recommended to use Mirror mode, when sector-by-sector exactness are required.



Appendix

1 eMMC Support List

SDCPM-I1	VER.02.01.48								
VENDOR	PART NUMBER	MMC VER	PACKAGE	CAPACITY (GB)	CHKSUM (MB/s)	COPY (MB/s)	VRFY (MB/s)	PKG. CODE	PKG. DETAIL
TOSHIBA	THGBM2G7D4FBAI9	4.4	AA	16	23.2	13.1	21.2	AA	169 ball, 12x16x1.4mm
TOSHIBA	THGBM2G8D8FBAIB	4.4	AA	32	23.2	13.1	21.2	AB	169 ball, 12x18x1.4mm
KINGSTON	KE44B-25AN/2GB	4.41	BA	2	22.2	13.1	21.2	AC	169 ball, 14x18x1.4mm
KINGSTON	KE44A-26BN/4GB	4.4	AA	4	22.2	10.1	21.2	BA	153 ball, 11.5x13x1.3mm
SANDISK	SDIN5C2-4G	4.41	AA	4	23.2	8.0	21.2		
SANDISK	SDIN4C2-2G	4.3	AA	2	23.2	11.1	22.2		
SAMSUNG	KLM4G2DEJE	4.41	AA	4	22.2	15.1	21.2		
PHISON	PSW4A11-2G	4.41	AA	2	22.2	11.1	21.2		

2 SD Support List

SDCPM-I1	VER.02.01.48							
VENDOR	CLASS	PART NUMBER	SD VER	PACKAGE	CAPACITY (GB)	CHKSUM (MB/s)	COPY (MB/s)	VRFY (MB/s)
SANDISK	-	-	SD	microSD	1	11.1	6.0	11.1
SANDISK	4	-	SDXC	SD	64	23.2	10.1	21.2
TOSHIBA	4	-	SDHC	SD	8	23.2	8.0	21.2
KINGSTON	4	SD4	SDHC	SD	4	23.2	9.0	21.2
TRANSCEND	6	-	SDHC	SD	4	22.2	11.1	21.2
APACER	60x	-	SD	SD	2	23.2	6.0	21.2
SILICONPOWER	45x	-	SD	SD	2	7.0	3.0	11.1
ATP	6	-	SDHC	SD	4	23.2	20.2	22.2
KINGSTON	4	SDC/4GB	SDHC	microSD	4	14.1	8.0	13.1
KINGSTON	-	SDC/2GB	SD	microSD	2	19.1	7.0	18.1