



## **Introduction**

The **SCM SD Card Duplicator** is designed to meet SD card content duplication & verification manufacturing needs. **The copy station** features high-performance, independently operating SD card slots by one (1) master source and eight (8) target slots supporting mainstream SD cards with various form factors including SD, mini-SD and micro-SD card. **The copy station** offers Image Copy, Smart Copy and Verify operation modes along with optional PC control software, allows versatile usage model to meet most customers requirement in SD card content duplication process.

**The copy station** together with remote control software provides easy integration and customization path for customers requiring vendor-specific command sequence for data security, content protection or other functionality. (Customization requirement may require NRE fee.)

## **Features**

- ✚ 1x Master + 8x Target Independent SD Slots
- ✚ Supports SD ver. 1.1/2.0, Standard and SDHC SD Cards.
- ✚ Copy/Verification speeds up to 20MB/s.
- ✚ Copy/Verification operation in Auto / File / Mirror mode.
- ✚ Optional remote control software for easy control, logging and customer specific requirement.
- ✚ 2x RS232 interface for PC connection and daisy-chain connection up to 8 copy stations.
- ✚ Replaceable SD card slot module available.

## Specifications

- Card Slots: SD ver. 2.0, Master x 1, Target x 8
- Dimensions: L 293mm x W 129mm x H 51mm
- Weight: 1080g
- Display: 16x2 Backlit LCD
- Interface: RS232 DE9 x 2



## Operation

### 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
Verify	-	Verify content after copy completed.	ON
Mode	Auto	Automatic partition mapping copy/verify operation.	Auto
	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

## Operation Description

### 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.

### 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.

### Test Mode operation

A test utility is equipped in SD Card Duplicator for basic functionality test and ROM image update.

Follow the steps below to enter Test Mode:

Entering Test Mode

- a. Switch off power of SD Card Duplicator.
- b. Press ENTER button and then, while pressing down ENTER, switch on power of SD Card Duplicator.
- c. The Test Mode menu of SD Card Duplicator 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.

#### Updating ROM image

Follow the steps below to update ROM image of SD Card Duplicator:

- 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 (SDCPM100.BIN) to the memory card.
- d. Insert the SD memory card to SLOT-0 of the SD Card Duplicator.
- e. Turn on the SD Card Duplicator 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. SD Card Duplicator 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 SD Card Duplicator and then turn-on again for the changes to take effect.

To confirm a successful ROM image update, enter the tester again and use IMAGE VERSION to display ROM image versions.

**Operation Mode Description****AUTO MODE**

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

SD Card Duplicator will automatically re-map and adjust partition size to fully utilize target card capacity. At the mean time, SD Card Duplicator 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.

**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.

**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.

