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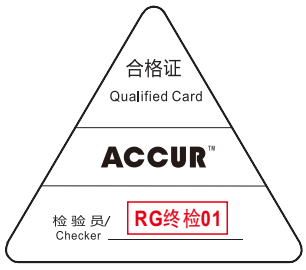
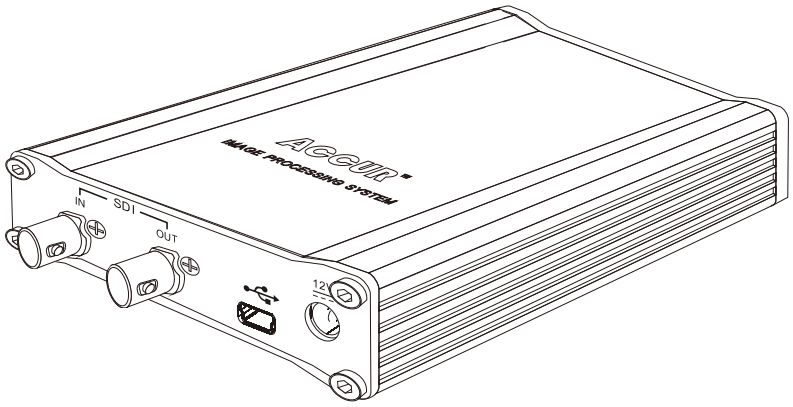
MAGIC BOX

# 魔盒 Global First BM-100

## Operating instruction

Hot Line:400-667-9369

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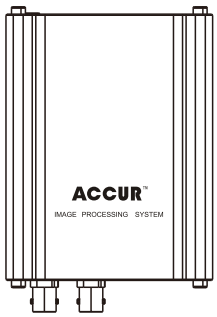
# BM-100 Function Brief

1. SDI output standard testing pattern
2. SDI output loading picture
3. LUT data loading and SDI input
4. SDI monitor color calibration (work with CalMan 5 calibration software)

## Attention:

1.Use the assorted power adaptor
2. Away from heat, keep ventilated
3. Connecting (plug) equipment, pay attention to esd protection
4.When equipment is on operation, note the waterproof, as well as the water splashed down

Packing list: BM-100
Power adapter (12V 2A)
USB cable (A-Mini B)

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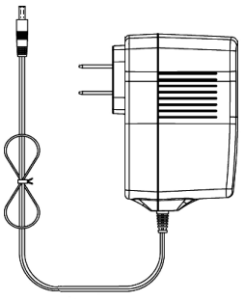

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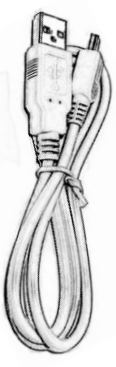
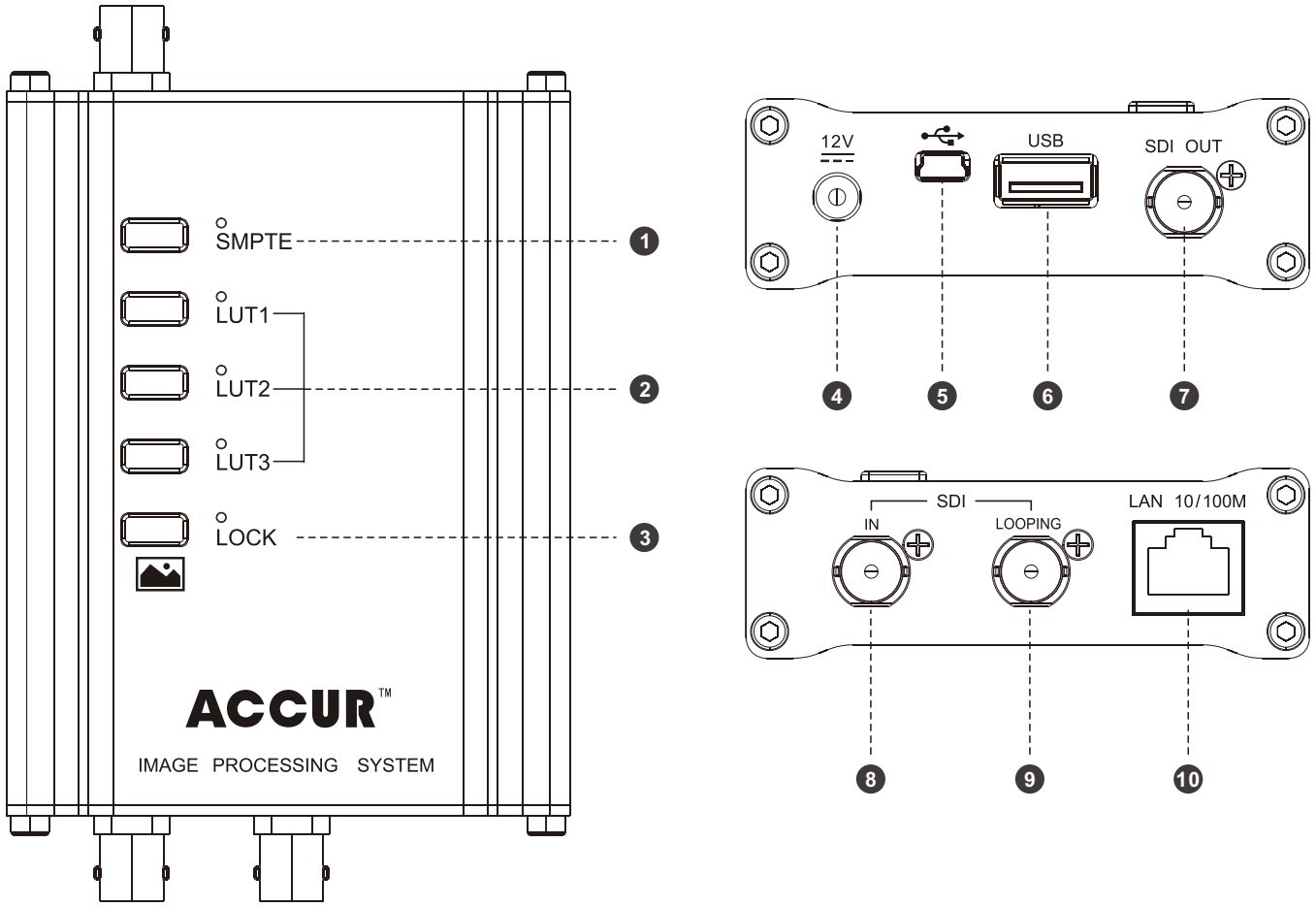


# Hardware (interface/key) functions description




## 1 Key functions description(❶-❷-❸)

| KEY | Short press | Press for 3s |
|---|---|---|
| **SMPTE** | 576 50i---1080 50i cyclic switching | Switch to the SDI input mode |
| **LUT1** | ON/OFF LUT1 data | Carrying LUT(U disc) in LUT1 |
| **LUT2** | ON/OFF LUT2 data | Carrying LUT(U disc) in LUT2 |
| **LUT3** | ON/OFF LUT3 data | Carrying LUT(U disc) in LUT3 |
| **LOCK** | Cyclic switching SMPTE test patterns and pictures | Settings（state）Lock/Unlock |

## 2 Interface functions description(❹-❺-❻-❼-❽-❾-❿)

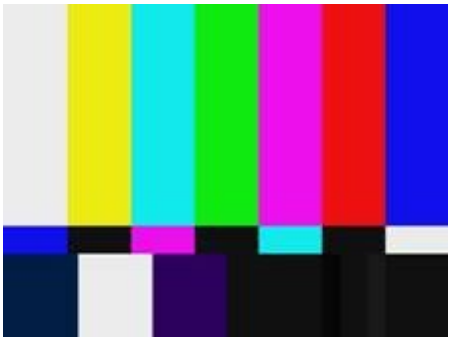
❹.DC 12V IN
❺.USBUSB data controlling port
❻.U disc port
❼.SDI output
❽.SDI input
❾.SDI LOOPING（Same as SDI-IN）
❿.Ethernet port

# Operation instruction and notes

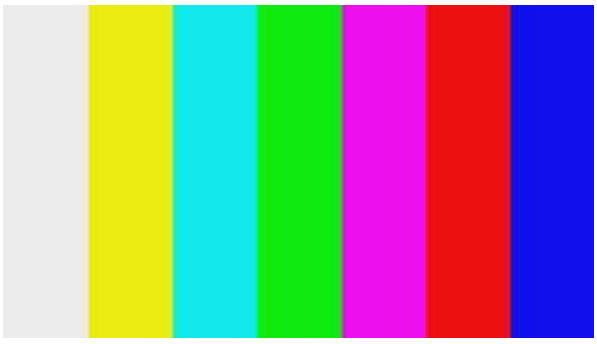
## 1 SDI output standard testing pattern

Step1. Plug the AC/DC adapter into the “ 12V ”input in BM-100

Step2. Link BM-100 SDI OUT and SDI IN on the tested equipment by coaxial cable, switch the signal channel of the device to SDI mode, the tested pattern displayed.
Step3. Press the key“SMPTE”, “SDI OUT”signal output switches between high definition(1080 50i)and standard definition(576 50i).
Step4. Press the key“LOCK”, switch the test pattern or signal formats.



SMPTE RP 219 SDTV/HDTV



ColorBar100%

Checkfield

## 2 Picture loading output（SDI interface）

Step1. Copy the test pattern from CD to the root of USB drive,customer can self-define other pictures according to their needs,but the size& format must be accordance with the provided one. The maximum storage are four for HD and SD respectively.)

Step2. Insert the USB drive onto the USB input on BM-100

Step3. Now press（3s）LUT2， LUT2 corresponding LED light flash red, the upload time is in proportion to the size of the picture), when the LED light extinguish,the picture is successfully uploaded. Now the “SDI OUT”output displays the picture signal.

Step4. Click“LOCK”,quit the display of upload picture, back to test pattern display. Please click“LOCK”again, provided the picture is needed to be rechecked.

Step5. If you want to see other pictures, please press “SMPTE” to switch to SDI output format, then press “lock” to choose the picture you need to see.

**Notice:**

1、The files uploaded from USB drive can be only saved under root catalog, the route cannot be chosen at present.

2、Format of picture can be only BMP (24bit or 32bit）

3、Customer can self-define other pictures according to their needs, but please make sure the size& format be consistent with the provid--ed on, in addition, Chinese character could not be included in the name of the picture.

Size of HD pic:1920×1080
Size of SD pic:720×576

## 3 LUT data upload and SDI input mode

Step1. Copy 3D LUT data to the root catalog of the USB drive.

Step2. Insert the USB drive onto the USB input on BM-100;

Step3. Press corresponding LUT, （light shows green), Now press LUT1 for 3 seconds, the corresponding LED light flash red fast, when the LED light extinguish, the data is successfully uploaded. (upload LUT2、LUT3 in the same way)

Step4. Click corresponding LUT，open/close the loaded LUT effect, recheck whether it was uploaded successfully by the test pattern in BM-100, if there is no difference by click open/close, repeat step 3.

Step5. Press“SMPTE”（3s）, the corresponding LED light turns red, at that moment BM-100 switch to SDI input mode，Now connect original signal by BM-100 “SDI IN”, connect BM-100“SDI OT”to display and you can check real time video image with LUT effect.

Step6. Press“LUT3” to save the current state.

Step7. Press“LOCK”（3s）to lock the current set, the corresponding LED light turns red, at that moment, all the keys will invalidate. Press “LOCK”（3s）again to unlock, and the corresponding LED light turns green.

**Notice:**

1. The files uploaded from USD drive can be only saved under root catalog, the route cannot be chosen at present.

2. The files format of 3D LUT can only support CSV、3DL、CUBE with 17、26、33points

3. The name of LUT file can include letter, number, underline, but not Chinese characters.

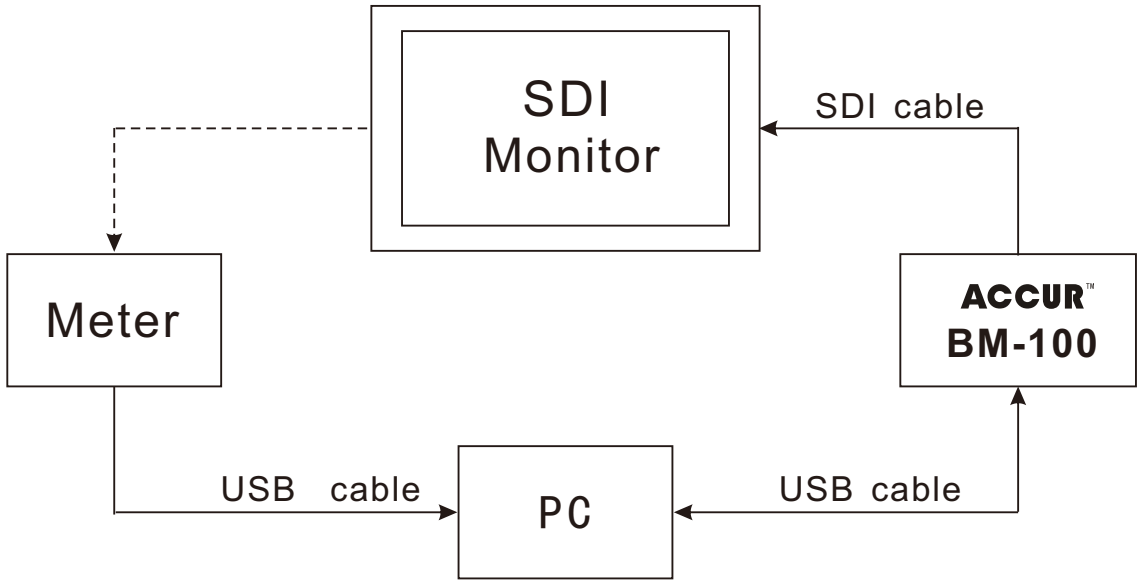
4. Open LUT effect, the corresponding LUT LED turns green, when shut down LUT effect, LED light extinguish.

5. BM-100 can provide“SDI LOOPING”loop out, which is convenient for your comparison.

6. Please name the file “DavAdj.cube” when loading DaVinchi color adjustment LUT file.

## 4 SDI monitor color calibration

Hardware equipment connection diagram




Calibration PC System Requirements:

- Windows® Vista™ or later with latest operating system updates installed (recommended: Windows 7® or later)
- 2 GHz processor (recommended: 2 GHz Dual Core Processor)
- 2 GB RAM (recommended: 4 GB RAM)
- Microsoft® .NET Framework 4.5 or later

Note: for the use of the calibration software and the relating notes , please refer to《CalMAN for Ruige PCC use instruction》

# Program software upgrade

## 1 MCU program upgrade

Step1. copy the MCU upgrade program to the root directory under DISC U

Step2. connect the U disc with the BM-100 “ ”

Step3. Keep pressing the LOCK key , power the BA-100, once the LOCK green light flash , release the LOCK key , after finishing the upgrade , flashing status disappear , if the light flashing is always on , meaning MCU .FPGA upgrade failed

## 2 FPGA program upgrade

Step1. copy the FPGA upgrade program to the root directory under DISC U

Step2. Power the BM-100

Step3. connect the U disc with the BM-100 “ ”

Step4. Now press LUT2 for 3 seconds, the corresponding LED light flash red fast,when the LED light extinguish, the data is success--fully uploaded.

File name：Mcu***.bna，Fpga***.bnb
Such as：McuUpdateForLutLoader_150727.bna
FpgaUpdateForLutLoader_150727.bnb

# BM-100 Technique Specification

1、SDI input distance , the testing of the breakdown point (real testing data)

| Model/Distance | SD-SDI | HD-SDI | 3G-SDI |
|---|---|---|---|
| Belden 1694A | 400M | 160M | 120M |

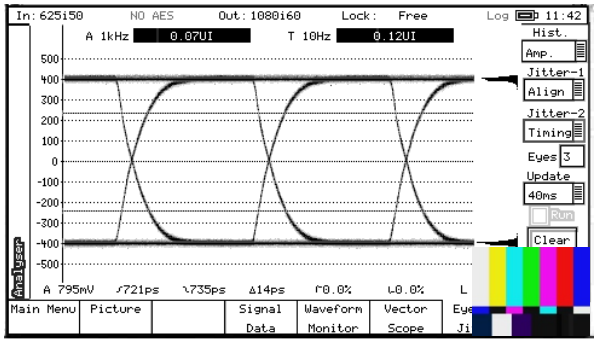
Other cable transmission , refer to the below standard

| Criterion | SMPTE 344M | SMPTE 292M | SMPTE 424M |
|---|---|---|---|
| Video format | SD-SDI | HD-SDI | 3G-SDI |
| Baud rate | 540Mb/s | 1.5Gb/s | 3.0Gb/s |
| Model/Unit | M | M | M |
| L-2. 5CFB | 139 | 54 | 36 |
| L-2. 5CHD | 168 | 66 | 46 |
| L-3CFB | 179 | 68 | 46 |
| L-4CFB | 216 | 82 | 55 |

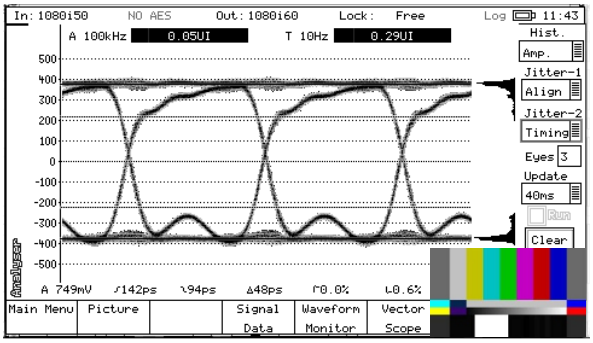
The quoted standard is from CANARE

## 2、Time delay : 40ns

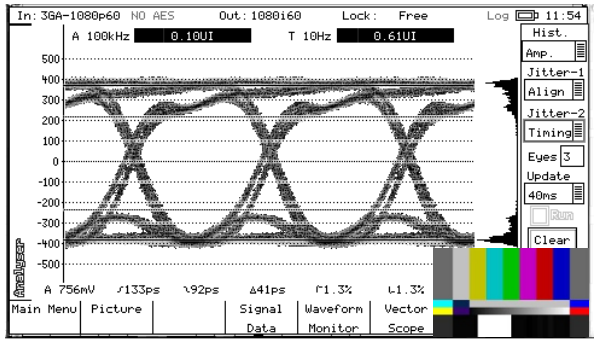
## 3、SDI signal Eye Diagram testing and signal quality characteristic parameter




576 50i




1080 50i




1080 60p

Note : Eye diagram testing use the SDI cable from Canare L-3C2VS, length is 300mm.

## SDI digital signal quality characteristic parameter(testing)

| Interface | SDI-OUT | | | SDI-LOOPING | | |
|---|---|---|---|---|---|---|
| Video format | SD-SDI | HD-SDI | 3G-SDI | SD-SDI | HD-SDI | 3G-SDI |
| Amplitude（mv） | 801 | 783 | 786 | 795 | 749 | 756 |
| Over/Undershoot | 0%/0% | 0.6%/0% | 1.2%/0.6% | 0%/0% | 0%/0.6% | 1.3%/1.3% |
| Rise/Fall Time | 678ps/ 649ps | 85ps/ 83ps | 94ps/ 90ps | 721ps/ 735ps | 142ps/ 94ps | 133ps/ 92ps |
| Timing jitter （10Hz） | 0.09UI | 0.22UI | 0.48UI | 0.12UI | 0.29UI | 0.61UI |
| Alignment jitter SD（1KHz） HD（100kHz） 3G（100kHz） | 0.06UI | 0.05UI | 0.11UI | 0.07UI | 0.05UI | 0.10UI |

NOTE: the above technical parameter are all real testing value, but the relating data testing can be affected by testing environment , SDI cable quality , transmission distance, maching impedance, BNC connector.,etc , thereby , the related technical parameters will be subject to the actual testing data based on customer’s use environment.

# Specification

Name：IMAGE PROCESSING SYSTEM
Model：BM-100
Interface type：USB2.0 × 1
Mini USB2.0（ ） × 1
SDI（Input × 1， Output × 1）
HDMI（Output × 1）
SDI IN：1080/24p/24psf/25p/30p/50i//60i/50p/60p
720/50p/60p、480i/576i
Input voltage：DC 12V 2A（jack plug）
Dimension：133.8（W）× 84.2（D）× 28.4（H）mm
Power consumption：6W（Max）
Weight：0.7Kg（Including Packing and spare parts ）

# Problem solution

1、When reading data , but no LED green light flash , please check your U disc ,or change a new U disc.

2、If monitor can not display test/loading image
a:Please check whether monitor supports HD signal , if not , and just supports SD , press the “SMPTE”key to switch the “SDI OUT” format into SD（576 50i）
b:Check SDI cable connection well or not , and whether SDI signal in/out is connected well or not
c:Check monitor is set in SDI channel or not;

3、When calibration , “Source”、“Displays” can not set well
a:Please check USB cable connection well or not;
b:Please check whether the BA-100 driving file（.dll）is installed well or not