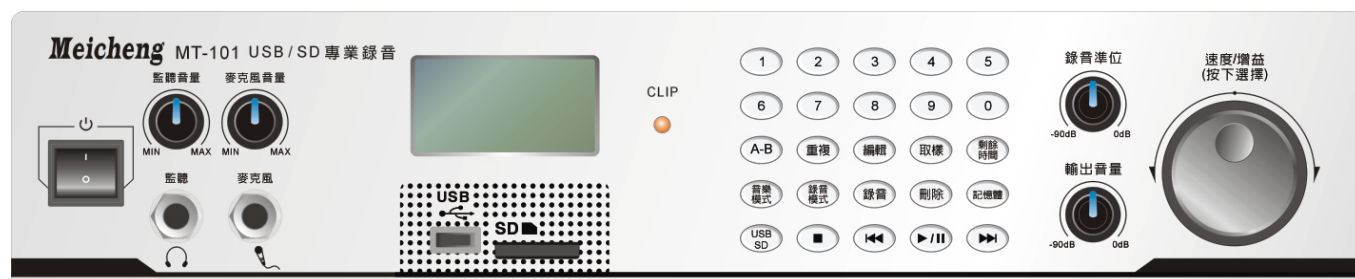




# MT-101

## FLASH RECORDER / PLAYER

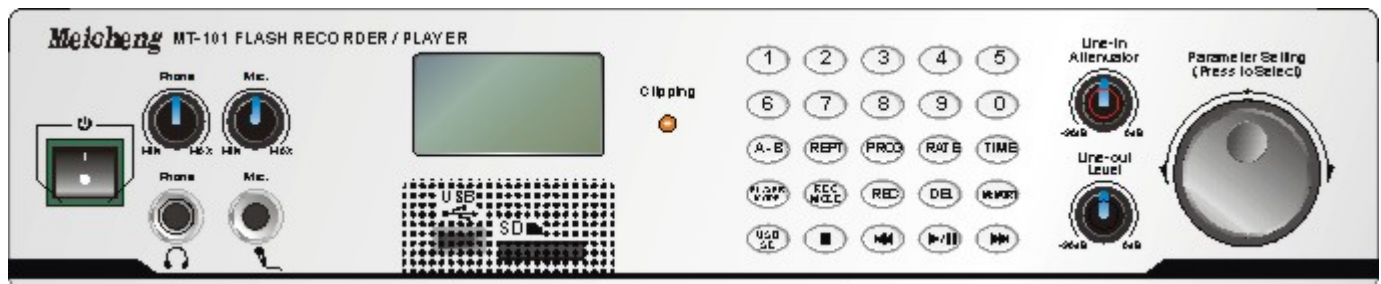


## User's Manual

# Meicheng

## MT-101 FLASH RECORDER / PLAYER

### User's Manual



#### **Notes on SD Cards & USB Flash Drives for Recording:**

1. Performance of an SD card memory is much better than that of a USB flash drive. The SD card is highly recommended as your first choice for recording.
2. To obtain the best performance, this apparatus requires writing speed of flash memory better than 2 MB / sec for recording.
3. To use a USB drive for recording, SanDisc Cruzer Blade series and SanDisc Cruzer Switch series are highly recommended. (USB flash drive: 128K)
4. When SD card can not be read, press delete button for 6~7 seconds, then choose "Format".
5. After setting the parameter, this apparatus still has the function of memory protection even if power supply is interrupted.

# IMPORTANT SAFETY INSTRUCTIONS

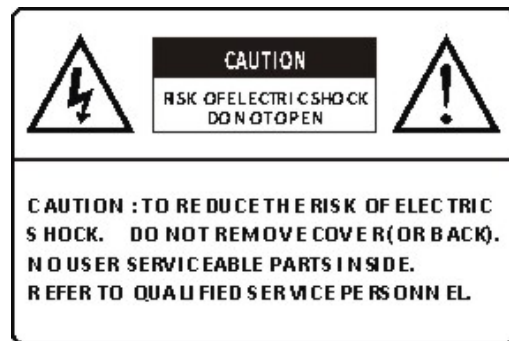
## Explanation of Graphical Symbols



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.



The above warnings are located on the back of the unit.

- 1 Read these instructions before operating this apparatus.
- 2 Keep these instructions for future reference.
- 3 Heed all warnings to ensure safe operation.
- 4 Follow all instructions provided in this document.
- 5 Do not use this apparatus near water or in locations where condensation may occur.
- 6 Clean only with dry cloth. Do not use aerosol or liquid cleaners. Unplug this apparatus before cleaning.
- 7 Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
- 8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifier that produce heat).
- 9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10 Protect the power cord from being walked on or pinched particularly at plug, convenience receptacles, and the point where they exit from the apparatus.
- 11 Only use attachments/accessories by the manufacturer.
- 12 Use only with a cart, stand, tripod, bracket, or table by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tipover.
- 13 Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14 Refer all servicing to service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

## MT-101 FLASH RECORDER / PLAYER

### ■ Table of Contents

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### ■ Functions

- 1 Recorder mode & player mode operation for SD card & USB flash drive memory  
(\* High-performance flash memory is recommended for recording )
- 2 MP3 playback with Constant Bit Rate (CBR) & Variable Bit Rate (VBR)
- 3 WMA playback ( V2 / V7 / V8 / V9 )
- 4 SD / SDHC / USB flash memory operation for up to 16G
- 5 Support FAT16 & FAT32
- 6 SD card & USB flash drive recording (mp3 format only)
- 7 SD card recording bit rates : 128K / 192K / 256K / 320K bps (44.1KHz sampling)  
USB flash drive recording bit rate : 128K bps (44.1KHz sampling)
- 8 One-touch recording (Recording Mode)
- 9 English & Chinese (Big-5) file name display
- 10 Instant file delete
- 11 Stereo recording level display
- 12 Clipping warning for recording
- 13 Remaining memory & remaining recording time display
- 14 Recording gain & playback speed adjustment
- 15 Program play function
- 16 Audio spectrum display
- 17 Remaining time display (MP3 only)
- 18 Segment repeat (A-B)
- 19 Four repeat modes (All → One track → One Shot → Random )
- 20 Number keypad for fast file access & operation
- 21 Auto file naming in increasing order for recording
- 22 Power-out protection for recording file
- 23 Auto chapter and Sound-Activated Recording (S.A.R.)
- 24 Microphone in & line in mixing recording
- 25 Monitor earphone output
- 26 Serial port control via RS-232 / RS-485 codes
- 27 Auto-initiated response for basic functions

## ■ 1 Front Panel

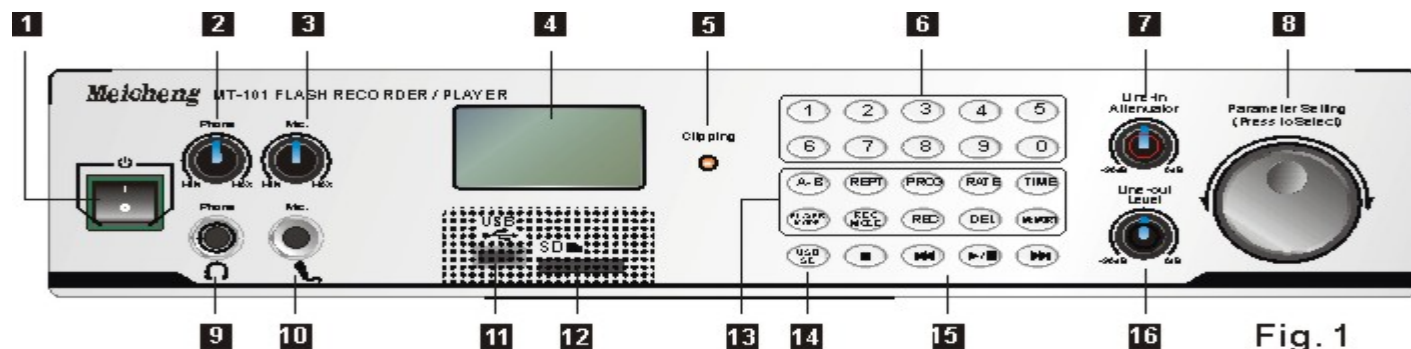


Fig. 1

### 1 Power Switch

Press this switch to turn power on or off.

### 2 Phones (Volume)

Turn this knob to control earphone output level **9**.

### 3 Mic. (Volume)

Turn this knob to control microphone output level **10**.

### 4 Liquid Crystal Display (LCD)

Displays operation status and system information.

### 5 Clipping

In recorder mode, clipping LED lights if audio input level exceeds 0dBV. Refer to 4 - 2 for details.

### 6 Number Keypad (0 ~ 9)

Select a function from **13** and use keypad to enter file number for direct file playback, program play editing or file deleting.

### 7 Line In Attenuator

In recorder mode, if line-in level clips, rotate this knob to attenuate source level. Refer to 4 - 2 for details.

### 8 Parameter Setting (Encoder)

Press encoder to select an item and shuttle to set parameters as follows:

- REC. GAIN: Recording gain / 0 dB ~ + 24 dB
- SPEED : Playback speed / -8x ~ +4x
- CHAPTER : Auto chapter / Disable → 5 min → 10 min → 15 min → 20 min → 30 min → 40 min → 50 min → 60 min → 90 min → 120 min.
- S.A.R. (Sound-Activated Recording):
  - Audio level > -30dB, recording activates.
  - Audio level < -30dB + preset time, recording stops.

Preset Time: Disable → 1 sec ~ 30 sec.

### 9 Phones

This output accepts a 1/4" (6.3mm) earphone to monitor mixed audio output.

### 10 Mic.

This input accepts a typical 1/4" (6.3mm) TS unbalanced dynamic microphone.

### 11 USB Slot

This port accepts a USB flash drive up to 16G to operate.

### 12 SD Card Slot (SDHC)

This port accepts an SD memory card up to 16G to operate.

### 13 Function Buttons

- A - B : Segment Repeat / Refer to 9 - 1 for details.
- REPT : Repeat Play Mode / Refer to 3 - 4 / 5 - 4.
- PROG : Program Play / Set to play files by edited playlist. Refer to 8 - 1 ~ 8 - 5 for details.
- RATE : Recording Rate for SD cards / Refer to 4 - 3 for details.
- TIME : Time Display for "Elapsed Time" or "Remaining Time."
- PLAYER MODE : Press to enter player mode. Refer to P.6 for operation details.
- REC MODE : Press to enter recorder mode. Refer to P.5 for operation details.
- REC : Press to start recording. Refer to P.5 for details.
- DEL : Press to delete a file at a time. Refer to 4 - 9 for details.
- MEMORY : When recording, press to display "Remaining Memory" & "Remaining Rec. Time".

### 14 USB / SD

If both SD card & USB drives are loaded, press this button to select one source to operate.

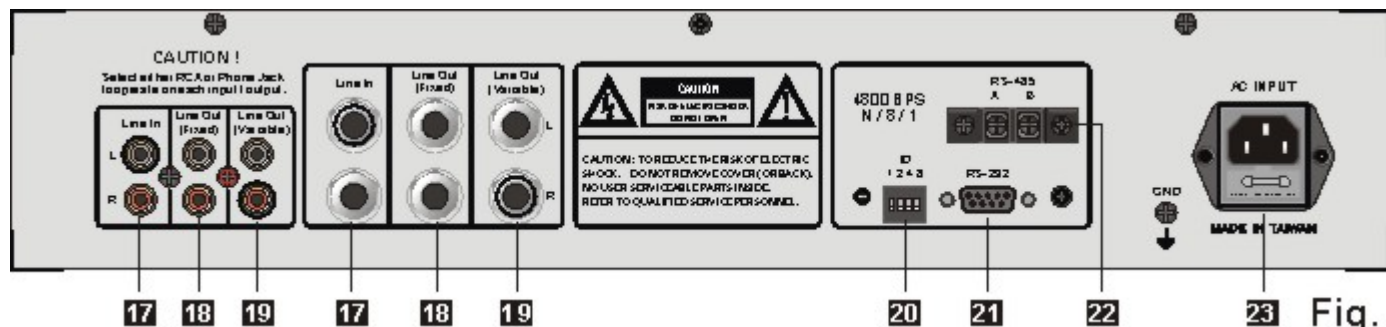
### 15 Playback Controls

- ▶|| : Play / Pause / Press to play or pause.
- : Stop / Press to stop or exit program play.
- ◀◀ : Previous / Press to skip to previous file.
- ▶▶ : Next / Press to skip to next file.

### 16 Line Out Level

Turn this knob to control mixed audio output level

## ■ 2 Rear Panel



**Each port (17/18/19) has been parallelly connected internally.  
Please select either RCA or 1/4" (6.3mm) TS jack to operate.**

### 17 Line In

This unbalanced input feeds external audio source for recording.  
Please make sure its level reach -20dB ~ 0dB to optimize recording.

### 18 Line Out (Fixed)

This unbalanced output feeds fixed level of " Mic. In " and " Line In " mixing signal.

### 19 Line Out (Variable)

This unbalanced output feeds variable level of " Mic. In " & " Line In " mixing signal.  
Output level is controlled by **16** with - 90dBV ~ 0dBV attenuation.

### 20 ID

This DIP switch sets serial port ID 00 ~ 15 as follows:

00	01	02	03	04	05	06	07
08	09	10	11	12	13	14	15

Fig. 3

### 21 RS-232 (Do not use **21** or **22** simultaneously!)

RS-232 port is for serial control of one controlled unit from an external controller.  
Refer to fig. 10 and P.8 ~ P.10 for details.

### 22 RS-485 (Do not use **21** or **22** simultaneously!)

RS-485 communication port is for serial control of multiple controlled units from external controller.

Refer to fig. 11 and P.8 ~ P.10 for details.

### 23 AC IN

Plug in AC 100V ~ 230V / 60Hz to operate this unit

## ■ 3 Display for Recorder Mode

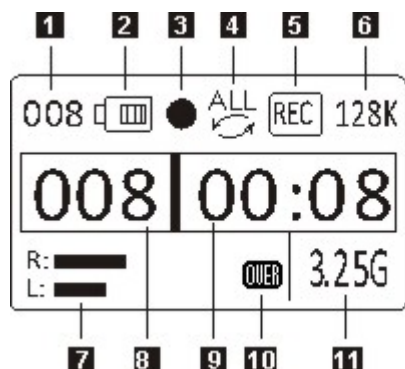


Fig. 4

### 1 Total File

Displays total number of files for recorder mode.

### 2 Port

Displays selected memory port for recorder mode operation as follows:



: SD card



: USB flash drive

### 3 Operation Status

Displays recorder mode operation status as follows:

● : Recording

▶ : Playback

|| : Pause

■ : Stop

### 4 Repeat Play Mode

Displays repeat play mode selected for recorder mode as follows :



: All File Repeat



: One file repeat



: One-Shot Playback



: Random Playback

### 5 Operation Mode

Displays current operation mode as follows:



: Recorder Mode



: Player Mode

### 6 Bit Rate

Displays selected recording bit rate as follows:

• SD card : 128K,192K, 256K or 320K

• USB flash drive: 128K only

### 7 Stereo Level Meter

• Displays source audio level w/solid bar graph



• Displays Rec. gain level w/non-solid bar graph



### 8 File Sequence

Displays file sequence of recorder mode with number.

### 9 Time Display

Displays "Elapsed Time " or " Remaining Time " for recorder mode playback or recording.

### 10 Clipping

When source level exceeds 0dBV. Clipping icon displays. Turn up attenuation or turn down recording gain to avoid distortion.

### 11 Remaining Memory / Remaining Rec. Time

Displays remaining memory or remaining recording time for recorder mode.



## ■ 4 Recorder Mode

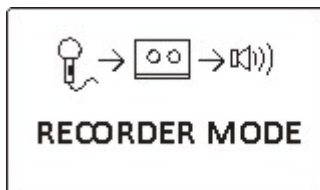


Fig. 5

### 1 Entering Recorder Mode

Turn power on and insert an SD card or a USB flash drive. Press **Record** or **Recorder Mode** to enter recorder mode (fig.5).

### 2 Setting Proper Line-in Levels

- (1) Set Rec. Gain **8**(P.3) and **Line-in Attenuator 7**(P.3) at 0 dB.
- (2) Feed audio sources such as microphone signal and / or an external audio source such as an electronic guitar or CD player.
- (3) Refer to level meter **7**(P.5), if source level is far below 0 dB, press **8**(P.3) and turn up **Rec. Gain** until maximum level reach 0 dB. If **Clipping** lights constantly, attenuate line level **7**(P.3) or mic level **3**(P.3) to eliminate clipping. It is ok to clip few times but do not clip frequently.

### 3 Setting a Bit Rate

Press **RATE** button to select a bit rate for SD card recording. Higher bit rate will get a better recording quality but it depends on performance of SD cards. If errors occur, please lower bit rate or try another SD card, which is higher in performance.

### 4 Start Recording

Press **REC** button to start recording.

A maximum of 500 files could be recorded.

### 5 Automatic Recorded File Naming

When recording completes, press ■ to stop recording. Recorded file will be named "REC\_001.mp3" as the first file name and stored in "RECORD" automatically. The second file will be named REC\_002.mp3 in increasing order and so forth.

### 6 Recorded File Playback

Press **Play** ► button to play from the first recorded file. You may use number keypad 1 ~ 0 to enter a file number you wish to play and press **Play** ► button to start playback.

### 7 One - touch Recording

While recorder is recording, press **Rec.** button to end current file and start a new recording session simultaneously.

### 8 Remaining Memory / Rec. Time Display

While recorder is recording, press **TIME** to toggle between " Remaining Memory " / " Remaining Recording Time " display.

### 9 Deleting a Recorded File

Use **Number Keypad** to enter the number of file to delete and press **Del.** Button again to execute. A dialogue window will pop up (fig.6). Press **Del.** button again to proceed; press **Stop** button to cancel.

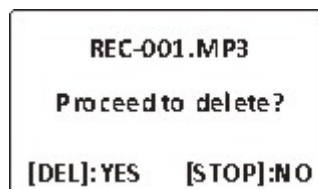


Fig. 6

### 10 Auto Renaming (Recorder Mode)

If "REC\_003.mp3" is deleted, **all files afterwards will be renamed automatically.** "REC\_004.mp3" will be renamed "REC\_003.mp3" and so for the in increasing order.



## ■ 5 Display for Player Mode

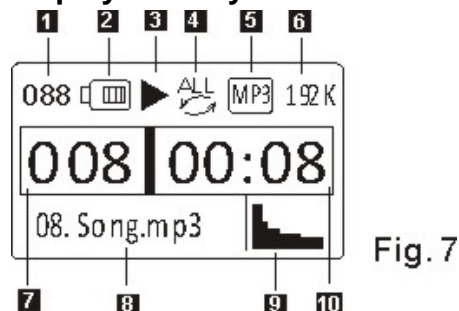


Fig. 7

### 1 Total File

Displays total files of player mode.

### 2 Port

Displays selected port for player mode.

: SD card

: USB flash drive

### 3 Operation Status

Displays player mode operation status.

: Playback

: Pause

: Stop

### 4 Repeat Mode Selection

Displays repeat mode selected for player.

: All file repeat

: One file repeat

: One-shot play

: Random play

### 5 File Format Display

Displays current file format for player mode.

: mp3

: wma

### 6 Bit Rate

Displays bit rate of current playback file.

### 7 File Sequence

Displays file sequence of player mode with number.

### 8 File Name

Displays file name in Chinese Big-5 or English.

### 9 Audio Spectrum

Displays playback audio spectrum.

### 10 Time Display

Displays "Elapsed Time " or " Remaining Time " for player.

## ■ 6 Player Mode



Fig. 8

### 1 Entering Player Mode

Insert an SD card or a USB flash drive. Press **Player Mode** button to enter player mode. LCD displays mode confirmation for 1 second (Fig.8) and player mode activates (Fig.4).

### 2 Port Selection

If both SD card & USB drive are inserted, press USB / SD button to select a source memory to operate.

### 3 File playback

Press **Play** to start file playback. When playing back, press this button to pause playback; press again to resume.

### 4 Direct Playback

Use number keypad to enter the file number you wish to play and **press Play** to play a specific file directly.

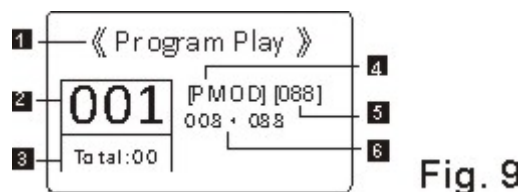
### 5 Deleting a File

Use **Number Keypad** to enter the number of file to delete and press **Del.** Button. A dialogue window will pop up (fig.6). Press **Del.** Button again to execute; press **Stop** button to cancel.

### 6 Time Display

While the player is playing, press **TIME** to toggle display between "Elapsed Time " and " Remaining Time".

## ■ 7 Display for Program Play



### 1 Operation Mode

Displays operation mode - Program Play.

### 2 Source File Sequence

Displays recorder or player source file sequence for program play editing reference.

### 3 Total Playlist Files

Displays total number of programmed files in playlist.

### 4 Source File Type

Displays source file type as follows:

- P MOD : Player Mode - Normal text.
- **R MOD**: Recorder Mode - Highlighted text

### 5 Total Source File Number

Displays total number of source mode from recorder mode or player mode.

### 6 Last 6 Playlist Files

Displays the last 6 files in source file sequence number. Files from player mode are displayed in normal text; recorded files are displayed in highlighted text.

## ■ 8 Program Play

### 1 Editing a Program playlist

While the player is **NOT** playing, press and hold **PROG** button to enter program play editing page (fig.9).

### 2 Adding files to Program Playlist

- (1) Press **Mode** button to select source files from **Recorder** or **Player**.
- (2) Use **Number Keypad** to enter the number of file.
- (3) Press **PROG** or **REC** button to add the file to playlist.
- (4) Repeat steps (1) ~ (3) until playlist is completed. A maximum of 60 files can be added to playlist.

### 3 Starting Program Play

Press **Play ▶||** button to start program play.

### 4 Deleting Files from Playlist

Press **Del.** button to delete one file from the end of playlist.

### 5 Exiting Program Play Mode

Press and hold **Stop** button to exit program play mode.

## ■ 9 Segment Repeat

### 1 A- B Segment Repeat (MP3 format only)

While the player is playing, press A- B button to set beginning point A.

Wait for proper time to press A- B button again to set ending point B.

The player will play the loop repeatedly until A - B is pressed again to resume normal playback.

\* WMA file does not apply to this function.

## ■ 10 Control Commands ( RS-232 / RS-485 )

Hexadecimal	Start Code 1	Start Code 2	ID	Function	Parameter	Check Sum	End Code	Note
Number	0xFA	0xAF	(00~15)	0 x 01	0 x 01~0x09	*7	0 x FF	
Play / Pause				0 x 02	0 x 02			
Stop / Cancel				0 x 03	0 x 03			
Next				0 x 04	0 x 04			
Previous				0 x 05	0 x 05			
Record				0 x 06	0 x 06			
Erase File				0 x 07	0 x 07			
A-B				0 x 08	0 x 08			
Repaet				0 x 09	*1			
Bit Rate				0 x 0A	*2			
Mode				0 x 0B	*3			
Port				0 x 0C	*4			
Speed				0 x 10	0xF8~0x04			*8 *10
Pitch				0 x 11	0xFD~0x04			*8 *10
Line-in Gain				0 x 12	0x00~0x18			*9
Treble				0 x 13	0 x F1~0x0F			*8 *10
Bass	0 x 14	0 x F1~0x0F	*8 *10					
Auto Chapter	0 x 15	*5	*8					
S.A.R.	0 x 16	*6	*8					
*1 Repeat Parameters : 0x00 = All    0x01 = Rep-1    0x02=1Shot    0x03= Random								
*2 Bit Rate Parameters : 0x01=128K    0x02=192K    0x03=256K    0x04=320K								
*3 Mode Parameters : 0x00=Play    0x01= Record								
*4 Source Parameters : 0x00=SD    0x01=USB								
*5 Auto Chapter Parameters : 0x00=Disable 0x01=5min 0x02=10min 0x03=15min 0x04=20min 0x05=30min 0x06=40min 0x07=50min 0x08=60min 0x09=90min 0x0A=120min								
*6 S.A.R. Parameters : 0x00=Disable 0x01=1sec. 0x02=2sec.~ 0x0A=10sec.0x0B=11sec. 0x0C=12sec. 0x0D=13sec. 0x0E=14sec. 0x0F=15sec.~0x1C=28sec. 0x1D=29sec. 0x1E=30sec.								
*7 Check Sum: Byte 0 XOR Byte 1 XOR Byte 2 XOR Byte 3 XOR Byte 4 XOR Byte6								
*8 While recording or program-play editing proceeds, this function will not be effective.								
*9 While program-play editing proceeds, this function will not be effective.								
*10 Negative hexadecimal codes: -15=0xF1    -14=0xF2    -13=0xF3    -12=0xF4    -11=0xF5    -10=0xF6 -9=0xF7    -8=0xF8    -7=0xF9    -6=0xFA    -5=0xFB    -4=0xFC -3=0xFD    -2=0xFE    -1=0xFF								

## ■ 11 Status Query ( RS-232 / RS-485 )

Status Query	0xFA	0xAF	ID(00~15)	0xF0	Category	Check Sum	0xFF
Response	0xFA	0xAF	ID(00~15)	<b>Data1</b>	<b>Data2</b>	Check Sum	0xFF

## ■ 12 Data 1 / Data 2 Response Table

	<b>Bit 7</b>	<b>Bit 6</b>	<b>Bit 5</b>	<b>Bit 4</b>	<b>Bit 3</b>	<b>Bit2</b>	<b>Bit1</b>	<b>Bit0</b>
<b>Category 1</b>	0x01= Query Status							
Data1	USB Inserted	SD Inserted	0	USB Activated	SD Activated	Ready	Busy	Mode
Data 2	A ->	B	Program	Delete	Record	Play	Pause	Stop
<b>Category 2</b>	0x02=Query Total Player Mode File Number (0~500)							
Data1	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Data2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Category 3</b>	0x03=Query Total Recorder Mode File Number (0~500)							
Data 1	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Data 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Category 4</b>	0x04=Spare							
Data 1	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Data 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Category 5</b>	0x05=Query Elapsed Time (Second)							
Data 1	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Data 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Category 6</b>	0x06=Query Total Playback Time(Second)							
Data 1	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Data 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Category 7</b>	0x07=Query Current selected File (0~500)							
Data 1	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Data 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Category 8</b>	0x08=Query Total Memory Left (MB)							
Data 1	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit8
Data 2	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

## ■ 13 Auto-initiated Response

### 1 Auto-initiated Response Table

Basic function and button-press of the following functions will initiate response message automatically.

Category 1	0x01=Query System Status							
Data 1	USB Inserted	SD Inserted	0	USB Activated	SD Activated	Ready	Busy	Mode
Data 2	A ->	B	Program	Delete	Record	Play	Pause	Stop

## ■ 14 System Integration

### Never use RS-232 and RS-485 Ports Simultaneously !

### 1 Connections & Control via RS-232 Port

Please use a 9-pin D-sub RS-232C cable to connect RS-232 port on rear panel **20** P.4 to an external controller as fig.10. Set communication parameters as 14-3. One unit of recorder / player can be remotely controlled via RS-232 port.

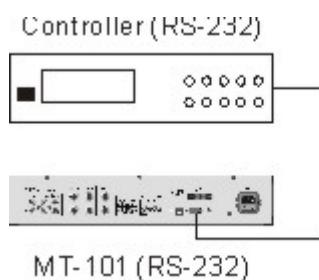


Fig. 10

### 2 Connections & Control via RS-485 Port

Please use a RS-485 cable to connect RS-485 port on rear panel **21** P.4 to an external controller. Set communication parameters as 14-3. Up to 16 units of controlled units can be controlled via RS-485 port.

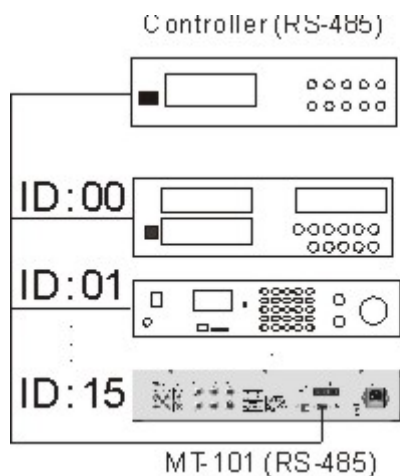


Fig. 11

### 3 Serial Port Settings

After controller connections are completed, be very sure to set serial port communication settings of your controller as follows :

- Baud Rate : 4800
- Parity : N
- Data Bits : 8
- Stop Bits : 1
- Flow Control : N

### 4 Examples

**Q1** : How do I use a Crestron controller to operate " Play " and " Stop " ?

**A1** : Please refer to 10 / P.8 control commands, set communication settings as 14-3 / P.10 and start to send command. Recorder / Player will react instantly upon receiving the following codes (e.g. ID=00) :

Play	\xFA\xAF\x00\x02\x02\xAA\xFF
Stop	\xFA\xAF\x00\x03\x03\xAA\xFF

**Q2** : When I insert an SD card or a USB flash drive to SR-101 PRO, how do I query system status?

**A2** : When Recorder / Player detects SD card or a USB flash drive, basic response will be initiated automatically. Please refer to 13 / P.10 for details. System integrators may decide to execute or ignore the automatic response (e.g. ID=00).

SD Inserted	0xFA0xAF0x000x4C0x010xE70xFF
USB Inserted	0xFA0xAF0x000x940x010x3F0xFF

## ■ Specifications

### General

AC Power ..... AC 100V ~ 230V  
Operation Humidity ..... 5% - 90% (non condensation)  
Operating temperature ..... -10°C ~ +55°C  
Power Consumption..... < 15W

### LCD

Resolution ..... 128 x 64  
Text Color ..... White text in blue background  
Visible Area ..... 63.84 x 35.68 mm

### Recording

Input Attenuation (Variable) ..... -110dB ~ 0 dB  
Input Impedance ..... 20KΩ  
Gain ..... 0dB ~ +24 dB  
S / N Ratio ..... 102 dB / 0dB Gain / Fs = 48KHz  
T. H. D. .... -90 dB / 1KHz, 0dBFS  
Dynamic Range ..... 102 dB / -60dBFS Input  
Channel Separation ..... 90 dB / 1KHz Input  
Microphone ..... Dynamic Type

### Fixed Output

Output Level ..... 0 dBV / Unbalanced  
S/N Ratio ..... 108 dB / Fs = 48KHz  
T.H.D. .... -97 dB / 1KHz, 0dBFS  
Dynamic Range ..... 108 dB / -60dBFS Input  
Channel Separation ..... 100 dB

### Variable Output

Output Level..... -90dBV ~ 0 dBV / Unbalanced  
S/N Ratio ..... 105 dB / Fs = 48KHz  
T.H.D. .... -97 dB / 1KHz, 0dBFS  
Dynamic Range ..... 102 dB / -60dBFS Input  
Channel Separation ..... 97 dB

### Monitor Earphone

Output Wattage ..... 45mW @THD=0.1%, RL=32  
S/N Ratio ..... 105 dB @ input=GND  
T.H.D. .... 0.03% @ Vin=1Vrms, RL=32Ω  
Channel Separation ..... 100 dB @1KHz

### Serial Port

Serial Communications ..... RS-232 / RS-485  
Connectors ..... 9 Pin D-sub / 2 Pin Euro Block  
Port ID ..... 00 ~ 15- 12 -

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