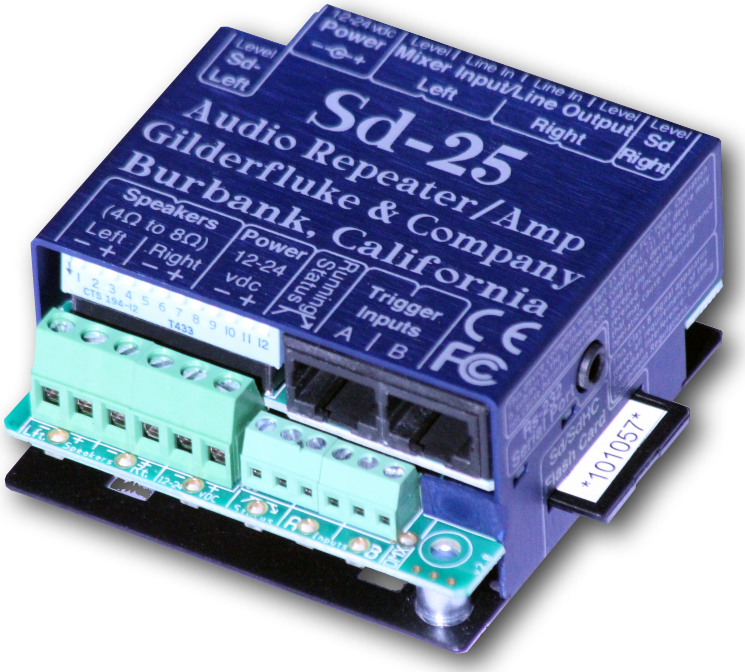
Sd-25 with DMX-512

v2.nn



Stereo Audio Playback System

with

Mp3 and .WAV Playback from Sd/SdHC flash Cards,
50 Watt Class-D Amplifier,
Stereo Mixer,
DMX-512 Receiver,
Rs-232 Port and
IR Receiver

The **Sd-25 w/DMX** is a complete stereo audio playback system. It can be used in Store-Casting, Music-On-Hold, Museum, Safety, Haunt, Industrial or Entertainment applications. Anywhere you need a solid state, high quality audio system that will play for years.

Safety Disclaimer: Any electronic or mechanical system has a potential to fail. Certain applications using Gilderfluke & Company equipment may involve potential risks of death, personal injury, or severe property, or environmental damage ("Critical Application"). Gilderfluke & Company equipment is not designed, intended, authorized, or warranted to be suitable in life support applications, devices, or systems, or other critical applications. Inclusion of Gilderfluke & Company products in such applications is understood to be fully at the risk of the customer. In order to minimize risks associated with the customer's applications, adequate design and operating safeguards should be provided by the customer to minimize inherent or procedural hazards.

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Sd-25 w/DMX Configuration & Installation

Before the **Sd-25 w/DMX** can be used, you will need to drag-n-drop your SoundFiles onto a Sd or SdHC flash card, attach a power supply, speakers, and (optionally) a switch or DMX-512 to start the **Sd-25 w/DMX** playing. Select the operating mode using the DipSwitch to tell the **Sd-25 w/DMX** how you would like your SoundFiles to be played.

Sd/SdHC Card:

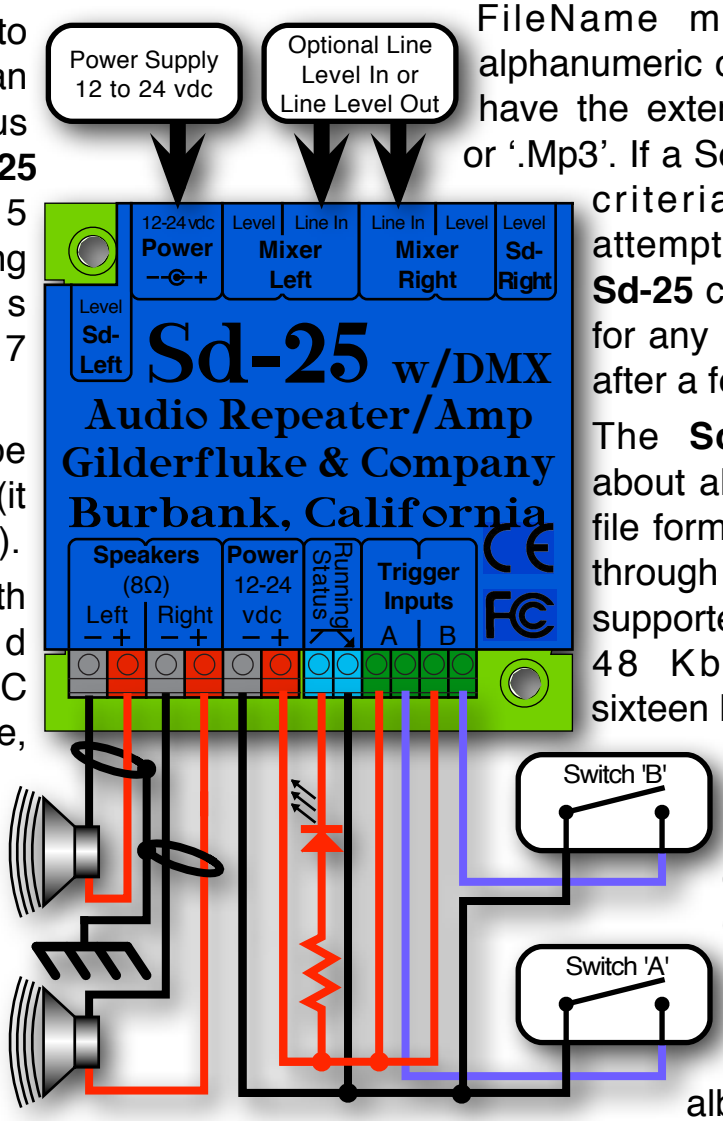
Any standard Secure Digital (Sd) or SdHC flash memory card can be used with the **Sd-25**. As of this writing, Sd and SdHC cards are available in sizes up to thirty-two GBytes. These can hold months of continuous audio playback. The **Sd-25** supports up to 255 SoundFiles in most operating modes. Some modes support up to 32,767 SoundFiles.

The flash card should be formatted 'FAT' or 'FAT32' (it will probably come that way).

Most laptops now come with a built-in Sd card reader/writer slot. If your PC doesn't have one of these, you will need to use an Sd card reader/writer attached to your PC or Mac through a USB port.

You load Mp3 and .wav files onto the Sd card by simply dragging-n-dropping them onto your Sd card.

On bootup, or when a Sd card is inserted in the **Sd-25**, it will sort the SoundFiles. For 255 or less SoundFiles, they are played in alphanumeric order, based upon the 8.3 DOS FileName. If there are more than 255 SoundFiles on the Sd card, then they will be played in Windows Drag-n-Drop order.



For the **Sd-25s** to recognize a SoundFile, its FileName must start with an alphanumeric character, and it must have the extension of either '.wav' or '.Mp3'. If a SoundFile meets these criteria, the **Sd-25** will attempt to play it. If the **Sd-25** can't play a SoundFile for any reason, it will give up after a few seconds.

The **Sd-25** will play just about all stereo Mp3 or .wav file formats. Mp3 bit rates up through 320 Kb/second are supported. .Wav files of up to 48 Kbytes/second and sixteen bit are supported.

If a file does not play, it is most often caused by a large (more than 2 MBytes) 'id3' tag at its front. These typically hold the album cover artwork for files downloaded from iTunes and similar sources. Since a **Sd-25** can't use album artwork, it simply takes up additional storage space, delays the time it takes a SoundFile to start playing, and (in the worst case), will keep a SoundFile from playing at all. Most

audio programs (including iTunes, Audacity, etc.) have an option to delete 'id3' tags.

Speaker Outputs:

The **Sd-25's** amplifier is a 'Class-D' design. Its efficiency is near 90%. If you feed 50 Watts of 24 vdc into the **Sd-25's** amplifier, you will get almost 50 Watts into your speakers. 'Linear' amplifiers have only about 20% efficiency. Fully 80% of the power you put into them goes into the heatsink as waste heat. A 50 Watt linear amplifier would only feed 10 Watts of power into your speakers, and 40 Watts into the heatsink. This makes the **Sd-25's** amplifier roughly equivalent to what would be a 200 to 250 Watt linear amplifier!

If you are going to run your speakers at high SPLs, you will need to select speakers that can handle at least **125 to 150 Watts or more of <u>continuous</u> power**. Speakers smaller than this may clip or be damaged if run at too high an output power level from the **Sd-25**.

The amplifier outputs from the **Sd-25** can be used with speakers of eight ohms (or higher) impedance, or four ohms when bridged. As with any amplifier, you can series/parallel a number of speakers, so long as the impedance remains within these limits.

In rare cases your speaker may clip out at an unusually low level. This may be that the protection circuitry inside the crossover is confused by the digital output of the **Sd-25's** amplifier. If this is the case, we have a small filter modules that can filter the high frequency spikes the speaker receives.

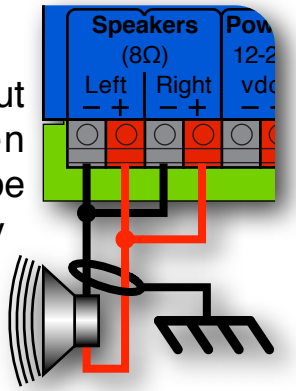
The **Sd-25's** amplifier is well protected from short circuits and overheating. You can stick a screwdriver right across the speaker terminals. The amplifier will instantly turn off. The **Sd-25's** amplifier will go back to work an instant after a fault is removed.

If the speaker impedance is too low and you are running at a high volume level, the amplifier may start to cut out. If you hear this, check the power supply voltage. If the power supply voltage is dropping, you might simply be drawing too much power for the power supply and a larger supply may fix your problem. If the power supply is OK, and you can't increase the speaker impedance, then you might simply be asking too much of the **Sd-25's** amplifier, and need to turn down the volume a tad.

If you wish to comply with FCC and CE standards for radio frequency emissions, you should use shielded speaker wires with the **Sd-25**. The shield should be attached to a good 'Earth' ground. If no 'Earth' ground is available, then attach the shields to the 'negative' power supply terminal, which is immediately adjacent to the speaker terminals. This will not effect the sound quality from the **Sd-25**, but will make the FCC and CE folks happy. Shielded speaker lines were used during all CE/FCC certification testing.

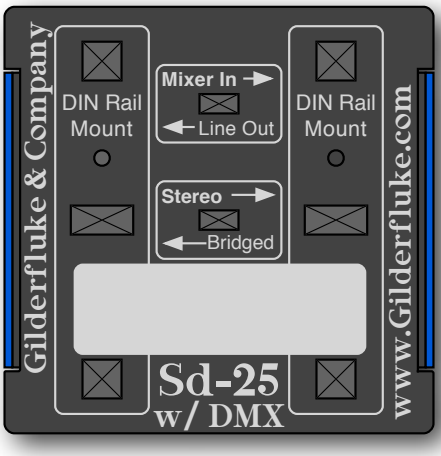
Bridged Amplifier:

If you need a mono output with more 'oomph', then amplifier in the **Sd-25** can be 'bridged'. Bridging will only have an effect with lower impedance speakers (4 ohms). You won't hear a bit of difference if you are using



Bridged Wiring

an 8 ohm speaker. The only audio which is amplified comes from the 'left' sources (mixer and repeater). The wiring to 'bridge' the amplifier is a little different from what you might be used to on a linear amplifier. The speaker is wired in parallel to both speaker outputs as shown in the drawing, and the 'Stereo/Bridged' switch on the bottom of the **Sd-25** is moved to the 'Bridged' position.



Wiring the speakers for a 'Bridged' output without throwing the 'Stereo/Bridged' switch to the 'Bridged' position can damage the Sd-25's amplifier.

DMX-512 Inputs:

If you are using the Sd-25 with any Gilderfluke & Co. controller other than a Br-miniBrick4[1], you will want to trigger and control the Sd-25 via the DMX-512 connection. This has several advantages:

- Instant access to any of 255 SoundFiles stored on the Sd-25
- Normally uses just one DMX-512 address
- Does NOT use any of the controller's digital outputs
- Your Sd-25s are Automatically configured & programmed by Pc•MACs. You just put markers on the timeline in your shows where you want SoundFiles to start, and Pc•MACs automatically does all the work for you:
  - Automatically programs in the sound triggers
  - Automatically creates a folder for each Sd-25 used with all the SoundFiles and settings in it. You just drag-n-drop the contents of this folder onto your Sd card for the Sd-25s, and set the Sd-25's DipSwitches as shown on the text file Pc•MACs automatically creates for you.
  - Supports virtually any number of Sd-25s, each with their own SoundFiles and triggers.
- Optional volume control using a second DMX-512 channel

The DMX-512 connections are through two RJ-45 connectors. These are the eight position, eight conductor plugs typically used for ethernet cables. They are also used for DMX-512. The pinout of the DMX-512 connectors follows the USITT wiring standards:

Pair	Wire #	Color	Function	DMX-512 Pin
Pair 2	1	White / Orange	Data 1+	DMX-512 Pin 3
	2	Orange	Data 1-	DMX-512 Pin 2
Pair 3	3	White / Green	no connection	no connection
	6	Green		
Pair 1	4	Blue		
	5	White / Blue		
Pair 4	7	White / Brown	Signal Common	DMX-512 Pin 1
	8	Brown		
Shield		Drain		

The two DMX-512 connectors are wired in parallel. Either one can be used as the 'input' or the 'thru'. You can easily daisy chain between multiple **Sd-25's,** v-HD-to-DMXs, Br-EFBs and other DMX-512 devices using standard (not crossover) ethernet patch cables.

Whenever it is receiving valid DMX-512, the **Sd-25s** will toggle its DMX-512 LED on each packet received.

If the DMX-512 is coming from another piece of GilderGear, it will automatically sense and start using the GilderCheckSums. These prevent the **Sd-25s** from triggering on any corrupted DMX-512 packet.

If you plug the **Sd-25's** Rs-232 port into a computer and fire up GilderTerm (or any other terminal program), it will display the current DMX-512 mode, DMX-512 address, if DMX-512 is being received and if

[1] The Br-miniBrick4 is the only Gilderfluke & Co. controller that can't transmit DMX-512

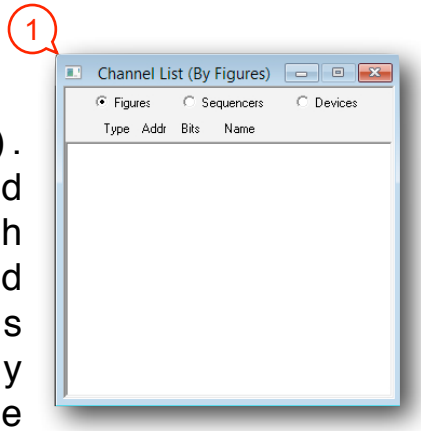
GilderCheckSums are being received in the DMX-512.

Automatic DMX-512 Triggering:

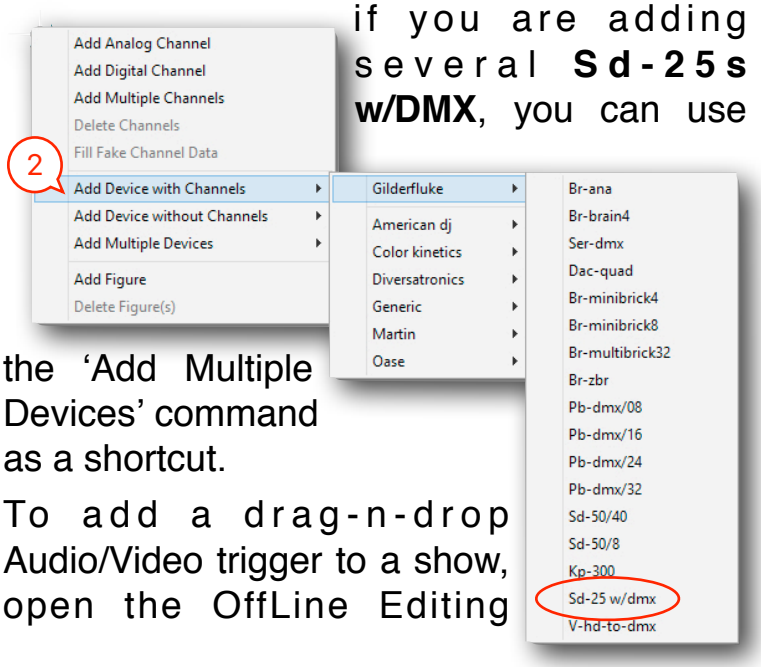
If you are controlling your **Sd-25** from GilderGear, you will probably be letting Pc•MACs automatically do all of the work for you.

When you are creating your show, you need to tell Pc•MACs about any **Sd-25s w/DMX** you are using, just as you would with any other GilderGear or 3rd party gear. This is done on Pc•MACs Channels list.

1) Open the Channels List from the Channels menu (shortcut = F7). Select the 'Add Device with Channels' command from the Channels Menu, or by right+Clicking in the Channels List itself.

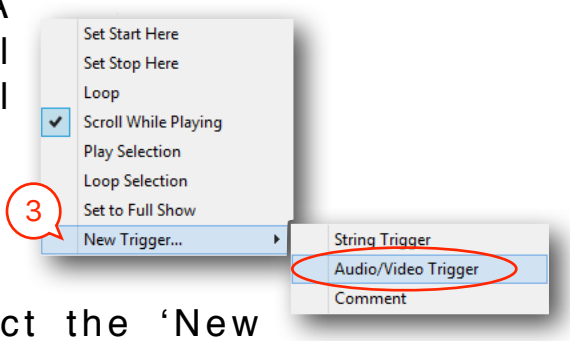


2) Slide over to pick the **Sd-25 w/DMX** to add to your show. Repeat this as needed, or if you are adding several **Sd-25s w/DMX**, you can use the 'Add Multiple Devices' command as a shortcut.



To add a drag-n-drop Audio/Video trigger to a show, open the OffLine Editing Window.

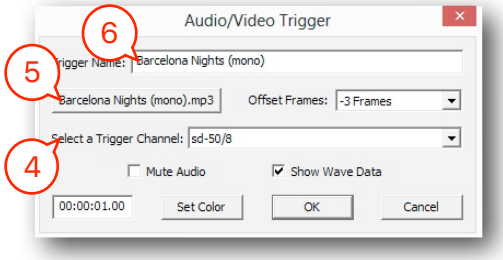
3) Right+Click at the time you would like the SoundFile to start playing, anywhere on the OffLine Editing Window (except on a channel). A contextual menu will appear. Slide down to the bottom and select the 'New Trigger'. This will give you the option of adding:



a) String Trigger
b) Audio/Video Trigger
c) Comment

Select 'Audio/Video Trigger'.

4) If you have more than one Audio/Video device already added to the Channels List, just pick the **Sd-25 w/DMX** you want to use from the pulldown list.



5) Click on this button to choose your Audio/Video file.

6) The default 'name' for the trigger is the name of the Audio/Video file, but you can change it if desired.

That's really all you need to do!

You can have multiple drag-n-drop Audio/Video triggers in each show, and Pc•MACs will keep track of them for you, only downloading the Audio/Video files you have used. Pc•MACs will automatically add an offset to compensate for any triggering

delays when it 'draws' in the Audio/Video triggers during the AutoDownload process. If needed, you can adjust this using the 'offset frames' dropdown on the Audio/Video trigger setup dialog. While you are working in Pc•MACs, you can also choose whether you want to mute audio output from your computer (normally unchecked), and if the waveform is displayed on the OffLine Window (normally checked).

If you hit 'play' on your computer, you will hear the audio play from your computer's speakers. You can start and stop anywhere in your show, and the sound will be in sync.

If you want your Audio/Video files to also play back from your **Sd-25s w/DMX** while you are programming from your PC, just do a quick AutoDownload. Drag the contents of the resulting drag-n-drop folder to a Sd card, plug the Sd card into the player and set the dipswitches as shown in the text file. Once the files are on the players, Pc•MACs will be able to trigger them too.

Manual DMX-512 Triggering:

SoundFiles are triggered by 'bumping' the data sent to the DMX-512 address you have set for the **Sd-25**. The bump should have no ramping, as that could trigger other SoundFiles as it ramps up and down.

With one through eight SoundFiles loaded on the **Sd-25**, each individual bit triggers each SoundFile. If you bump the channel to a value of:

Decimal Value	Hexadecimal	Bit Number	SoundFile played
1	0x01	0	SoundFile #1
2	0x02	1	SoundFile #2
4	0x04	2	SoundFile #3
8	0x08	3	SoundFile #4
16	0x10	4	SoundFile #5
32	ox20	5	SoundFile #6
64	0x40	6	SoundFile #7
128	0x80	7	SoundFile #8

With between nine and 255 SoundFiles loaded onto the **Sd-25**, You just 'Bump' the DMX-512 address you have set for the **Sd-25** to the value of the SoundFile you want to play. If you bump the channel to a value of:

Decimal Bump Value	Hexadecimal Bump Value	SoundFile played
1	0x01	SoundFile #1
10	0x0A	SoundFile #10
100	0x64	SoundFile #100
255	0xFF	SoundFile #255

If you have set the DipSwitches to DMX-512 mode 2 (DipSwitch #11 =Off and DipSwitch #12 = On), once you start a SoundFile playing, you will not be able to start another SoundFile until the first SoundFile has finished. This is called 'Unsteppable' mode.

If you have set the DipSwitches to DMX-512 mode 3 (both DipSwitch #11 and DipSwitch #12 = On), then the next consecutive DMX-512 address after the address used for selecting and playing the SoundFiles will be used to control the volume of the audio played from the Sd card. A 100% value will give you full volume, limited by both the volume control pots and any muting provided by the trigger inputs (see next paragraph). Serial and DMX-512 volume commands are not saved to non-volatile memory.

When in any of the DMX-512 operating modes, the two trigger inputs can be used to fully mute (input 'A') or partially mute (-12 dB on Input 'B') the audio from the Sd card. This is equivalent to the non-DMX mode-3 with the ramp speed set to the slowest rate.

The twelve position DipSwitch controls the DMX-512 address and mode of operation for the DMX-512 port on the **Sd-25**. The first nine positions set the address, and the last two switches control the DMX-512 mode. A pen or any other pointy object can be used

to flip the switches. Do not use a knife or other sharp object, as it might damage the switch.

Despite of what it may say on the switch, Down is Off and Up is On.

DMX Mode	Sw 1 - Sw 9	Sw 10	Sw 11	Sw 12	Description
Non-DMX	Mode & Options	Off = Amp on only when playing On = Amp always on	Off	Off	Not Using DMX-512. Select operating mode & options on Sw 1-9
DMX Mode 1	DMX Address		On	Off	One DMX address selects & plays SoundFiles
DMX Mode 2	DMX Address		Off	On	Same as above, but once playing, SoundFiles are Unsteppable
DMX Mode 3	DMX Address		On	On	1st addr. used to select & play SoundFiles, 2nd controls volume

The DMX-512 Address is set using DipSwitch positions #1 through #9 (down=Off, up = On).

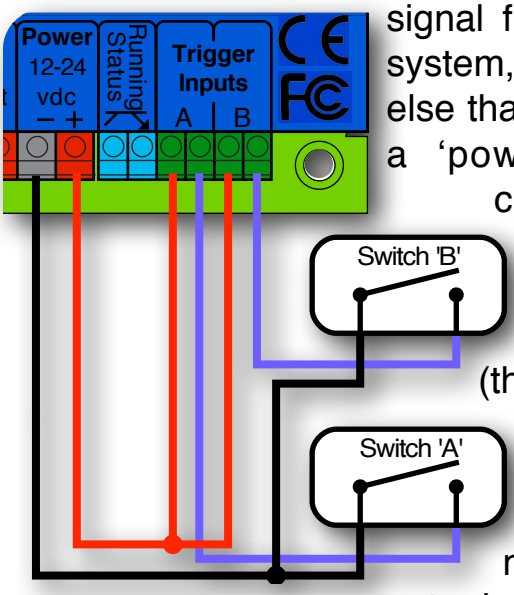
DMX-512 addresses are either 'One-Based' (addresses run from 1 to 512) or 'Zero-Based' (addresses run from 0 to 511).

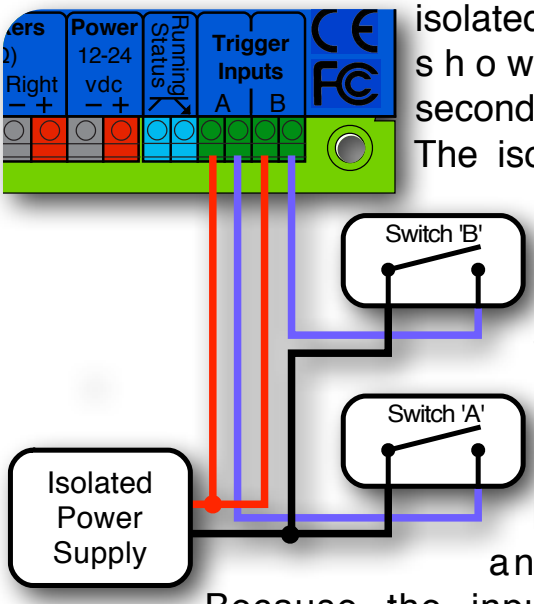
Zero-based DMX-512 addressing was originally used on all DMX-512 equipment. Some users had trouble with the idea of counting from 'zero', so one was added to the zero-based DMX-512 addresses to make them one-based. Most installations now use one-based DMX-512 addresses.

Use the first column to find a One-Based DMX-512 address. Use the second column for Zero-Based DMX-512 addresses. Then set DipSwitch positions one through nine as shown in the chart at the end of this manual.

Trigger Inputs:

The two trigger inputs can be used with any type of switch. This can be a pushbutton, motion detector, IR beam, step mat, a digital signal from a control system, or anything else that will give you a 'powered switch closure'. The trigger inputs are non-polarized (they don't care which terminal is positive or negative) and opto-isolated. You must feed a DC voltage into them. Just touching a pair of leads from a nine volt transistor radio battery is a good test of the inputs. As shown in the first illustration, you can 'borrow' some of the power that is running the **Sd-25** using the adjacent 'Power' screw terminals, or use a separate isolated supply (as shown in the second illustration). The isolated power supply can be any DC power supply or battery, as long as the output is between 5 and 24 vdc. Because the inputs are not polarity sensitive, you can wire the power





supply with either polarity. i.e.: You can't get it wrong.

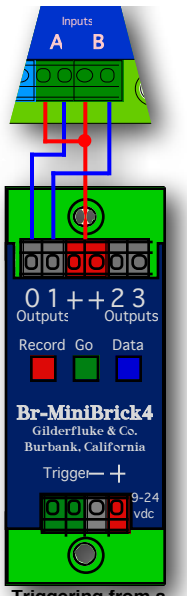
The best test for your wiring are the green 'Input' LEDs, located adjacent to the inputs' screw terminals. These LEDs are on the isolated side of the inputs, so if the **Sd-25** is powered and you apply a voltage to an input, the LED will light.

If these LEDs are 'glowing' even dimly when off, that is an indication that an AC voltage is being induced on the wires to your switches. Either separate the switch wires from the AC wires (this can include speaker lines), or add a small resistor across the input terminals to drain away this induced voltage.

Not surprisingly, all Gilderfluke & Co. control systems are easy to attach to an **Sd-25**. A **Br-miniBrick4** is shown because it is the only piece of GilderGear that doesn't have DMX-512 networking. We recommend attaching all other GilderGear to the **Sd-25's** using the DMX-512 network.

On the Br-miniBrick4, the common positive is run to one side of both **Sd-25** inputs, and the control system outputs are wired to the **Sd-25** inputs.

Sd-25 w/DMX



Triggering from a Control System

Power Supply:

The **Sd-25** will run on any voltage from 12 through 24 vdc. Size your power supply so it will provide enough current for the volume you are planning to run through your speakers. The amplifier will put out more power at 24 volts than it can at a lower voltage. If using all 50 Watts of the amplifier power, you will need to use a 24 volt supply rated for at least 60 Watts. By its nature, the Class-D amplifier can switch between drawing nothing to drawing 50+ Watts thousands of times per second. The power supply must be able to do this without dropping out. If you hear clipping, the speakers or power supply may be undersized for your application, or your speakers may have an impedance below 8 ohms.

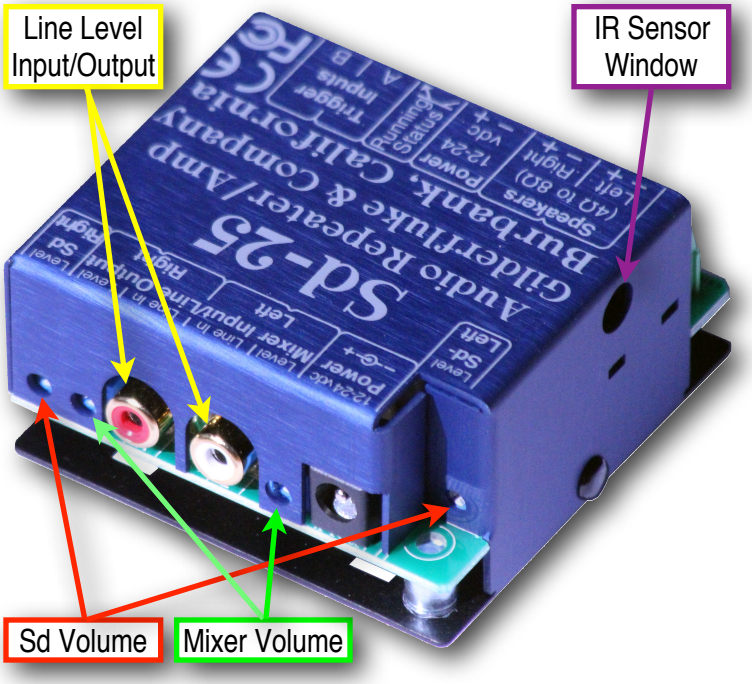
If you aren't using the amplifier, the **Sd-25** will run on as low as 7 volts. Below 12 volts the amplifier is disabled.

The power supply can be attached through either the 2.1 mm power jack, or the screw terminals. They are wired in parallel.

Power Supply voltages higher than 24 vdc can potentially damage the amplifier on the **Sd-25**. The ESD protection diodes on the power supply inputs are rated for 30 VDC before they kick in.

Volume Controls:

A pair of small trimpots on the **Sd-25** are used to set the maximum audio output level



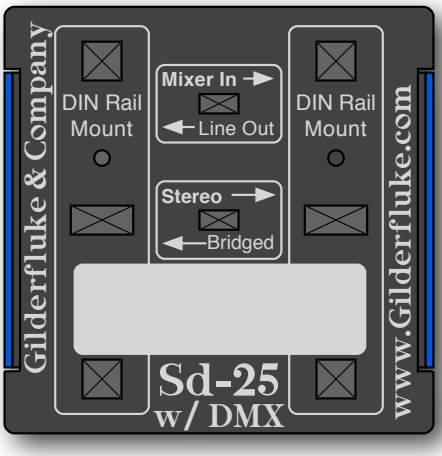
from the Sd card. The operating modes which ramp the audio up and down can never exceed the level set by these pots.

An additional pair of pots is used to set the levels for the 'mixer' inputs.

You can adjust these pots using a small 'trimmer' screwdriver. A suitable screwdriver comes as part of the Sd-25/Starter Kit.

These trimpots are smaller than you. Do not use a big screwdriver on them. Do not apply too much force. **They can be broken if you strong-arm them!**

Line Level Inputs and Outputs:



Two gold plated 'RCA' jacks are available on **Sd-25s** (as shown in the preceding photo). A switch on the bottom of the case allows you to switch these jacks between a line level output of the audio coming from the Sd card, or a line level input that gets mixed with the audio coming from the Sd card.

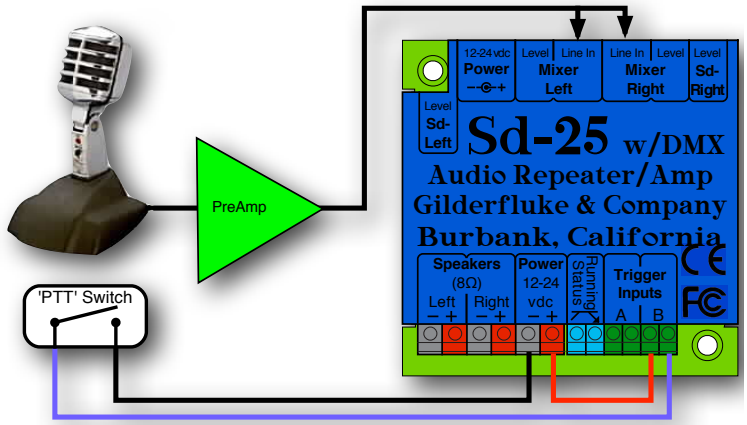
When the switch is set to the 'Line Out' position, the audio from the Sd Card is sent to both the amplifier and the RCA jacks. Only the audio going to the amplifier is routed through the 'Sd Level' pots. The RCA outputs will always be at full volume unless the audio level is reduced in the DSP by a serial volume command, DMX-512 volume command, or full or half muting command from the trigger inputs.

To use the line level outputs, just run a pair of RCA cables to your amplifier (or amplified speakers), just as you would if you were connecting an iPod or CD player. The line level outputs are robust enough to drive headphones and small speakers directly.

When the switch is set to the 'Line In' position, line level audio signal from a **Sd-10** or another **Sd-25** audio repeater, pre-amplified microphone or any other line-level audio source can be plugged into the two RCA jacks. Two 'Mixer Level' trimpots can be used to adjust the audio levels of the mixer inputs. These inputs'

levels are not effected by a serial volume command, DMX-512 volume command, or full or half muting command from the trigger inputs.

In this example, a pre-amplified (or line level) microphone is fed into the mixer inputs of the **Sd-25**. The 'Push to Talk' button on the microphone is fed into the 'b' input of the **Sd-25**. The **Sd-25** is configured to 'duck' the audio from Sd the card to a lower level when it sees a closure on the 'b' input. When the microphone button is pressed, the **Sd-25** ramps the prerecorded audio down to a lower level, and the microphone is used to make an announcement. When the 'PTT' button is released, the prerecorded audio ramps back up to the normal playback level.

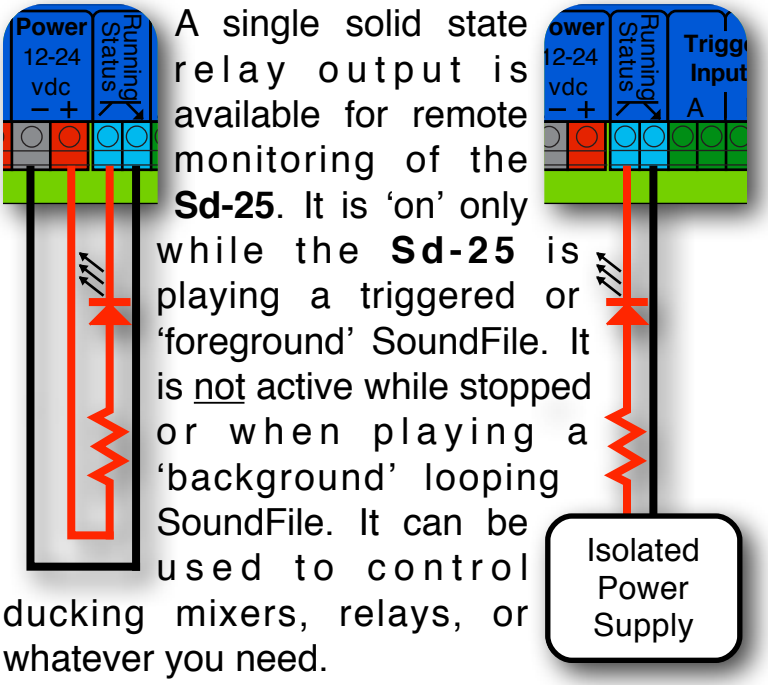


Modulation LEDs:

The two 'modulation' LEDs, which are located in front of the speaker screw terminals, blink to show audio as it is being reproduced. They pick up the audio signal coming from the repeater before the two volume control pots, so they are not affected by adjusting these pots or by the auxiliary 'mixer inputs. Reducing the audio level through one of the 'ramping' functions will reduce the intensity of these LEDs. Audio at too low a level will cause these LEDs to completely extinguish. Normalize your audio before loading it on the **Sd-25** so that it is near 100% modulation.

Sometimes additional safety system assurance above and beyond monitoring the 'Status' Relay Output output is needed to confirm that the **Sd-25** is actually playing. An external solid state relay or optoisolator can be attached in place of these LEDs. The safety system can then monitor this to confirm that an audio signal is indeed being generated. Contact Gilderfluke & Company for more information on this sort of application.

'Status' Relay Output:



A single solid state relay output is available for remote monitoring of the **Sd-25**. It is 'on' only while the **Sd-25** is playing a triggered or 'foreground' SoundFile. It is <u>not</u> active while stopped or when playing a 'background' looping SoundFile. It can be used to control ducking mixers, relays, or whatever you need.

This output is a solid state relay output, which is rated for up to 250ma at up to 24 Volts of AC or DC. Like the trigger inputs, this output is not polarity sensitive. Unless whatever you are controlling is polarity sensitive (like the input to a larger solid state relay or an LED, as shown in the illustrations), you can ignore power supply

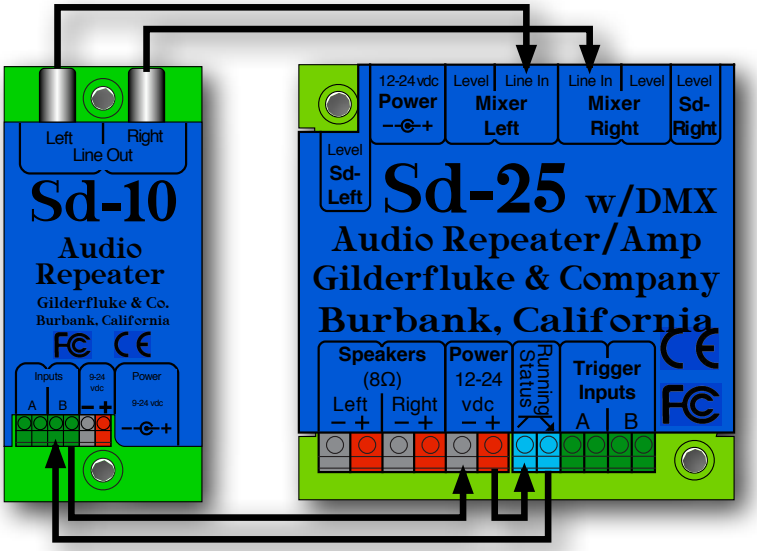
polarity and wire it up either way. You can power the 'Status' Relay Output from the adjacent Power Supply screw terminals (as shown at left), or use an isolated AC or DC power supply (as shown at the right).

To turn on a light, motor, or other electrical device while a triggered or foreground SoundFile is playing, just wire a solid state relay to the 'Status' Relay Output. Then wire the light, motor, or whatever you are controlling to this relay. This can be used in a museum, trade show, Point Of Sale (POS) and other applications where all you need to do is turn 'on' a light or other device while your SoundFile is playing.

HINT: If you need the 'Status' Relay Output to turn on after the **Sd-25** is triggered, but before your SoundFile starts playing, or stay on for a bit after the SoundFile ends, just pad out your SoundFile with silence. **Sd-25** turns on this output when a foreground sound is playing. It doesn't care if you happen to be playing 'silence'. It will turn on the output just the same.

Another application for the 'Status' Relay Output is when you need a background audio SoundFile to continue playing when a triggered foreground SoundFile is also playing, the BGM SoundFile can be played from a **Sd-10** or another **Sd-25** which feeds its audio into the 'mixer' inputs of the first **Sd-25**.

When the **Sd-25** plays a triggered SoundFile or a timed announcement (if using modes 16, 17 or StoreCaster mode) the 'Status' Relay Output will go active. This is wired into an input on the **Sd-10** which has been configured to partially duck, or fully mute its audio output. In this way, the **Sd-10** will duck (or mute) the BGM SoundFile (without stopping it) while the foreground SoundFile plays.



'Background' looping SoundFiles, like those in modes 16 and 17 will not turn on the 'Status' Relay Output. When in these modes, the 'Status' output will only be turned on when a triggered SoundFile is playing. In StoreCaster mode, the 'Status' Relay Output will only be turned on when playing SoundFile #1.

In a safety related application, such as a fire or emergency annunciator system, the safety system can monitor this output to confirm the **Sd-25** is receiving commands and playing SoundFiles. For absolute surety, you can monitor that this output goes active when a SoundFile is triggered, and goes inactive at the end of the SoundFile.

Status Output LED:

The LED which is next to the 'Status' relay output does not reflect the current state of the Status Output Relay. Instead, it flashes to show accesses to the Sd flash card by the **Sd-25**.

This LED will flicker when an **Sd-25** boots,

as it counts each SoundFile on the card[2]. When not playing, it will be very dim. While playing, it will flicker at a high rate of speed. The faster the flicker, the higher your SoundFile's bit rate.

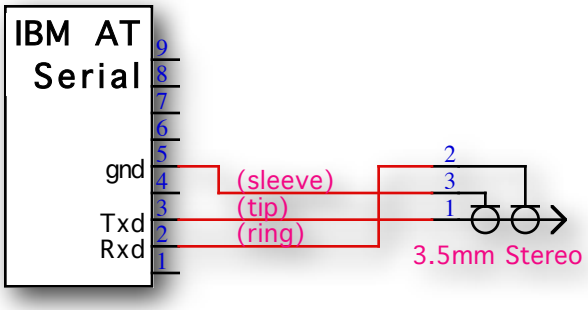
RS-232 Serial Port:

An RS-232 serial port is built in to every **Sd-25**. On the earlier versions of the **Sd-25**, the serial port was available only as an option (part #Sd-RS/232).

The serial port on a **Sd-25** runs at a fixed rate of 9600 baud, n, 8, 1.

Adapters to attach this port to a PC or Mac are available from Gilderfluke & Company as (as part numbers C-USB-RS232 or USB-RS232/422). It can also be controlled from a Gilderfluke & Co. **Br-SDC/09** (a null modem cable must be used to flip pins #2 and #3 when used with a **Br-SDC/09**).

The RS-232 serial port uses a ⅛" (3.5mm) stereo plug. The pinout to connect this to a standard DE-09 connector as found on a PC or our serial adapters is as shown:



We offer a ready-made cable as our part number Mp3-50/CBL.

When the **Sd-25** boots or a Sd card is inserted, the **Sd-25** will list all the SoundFiles that are found, as well as the order after sorting them alphanumerically:

```
Gilderfluke & Co. Sd-25w/DMX v1.28 copyright 2014 DCM
a=C, b=C, DipSw=_2______9___
mode=02, Volume Level=__0, Sd Card w/__0 SoundFiles
xxx: HERO____.MP3
SoundFileTime=____0

_SoundFiles__|__#__|_pos.
CLOCKS__.MP3 | __1 | ___0
HERO____.MP3 | __2 | ___1
LABAMBA_.MP3 | __3 | ___2
ROAM____.MP3 | __4 | ___3
SMOOTH__.MP3 | __5 | ___4
FARAWA~1.MP3 | __6 | ___5
BIGLOVE_.MP3 | __7 | ___6
CLDASICE.MP3 | __8 | ___7

sorted list...
__1 BIGLOVE_.MP3
__2 CLDASICE.MP3
__3 CLOCKS__.MP3
__4 FARAWA~1.MP3
__5 HERO____.MP3
__6 LABAMBA_.MP3
__7 ROAM____.MP3
__8 SMOOTH__.MP3
```

When any SoundFile is played, the configuration settings and the name and info about the SoundFile are displayed through the serial port. The **Sd-25** then reports the SoundFile time as it plays.

```
Gilderfluke & Co. Sd-25w/DMX v1.28 copyright 2014 DCM
a=0, b=0, DipSw=_2______9___
mode=02, Volume Level=255, Amp=ON, Sd Card w/__8 SoundFiles
__5 HERO____.MP3
SoundFileTime=____8
```

If set for DMX-512 input, the status report will show which DMX-512 mode the player is in, the DMX-512 address, if DMX-512 is being received, and if the DMX-512 packets

```
Gilderfluke & Co. Sd-25w/DMX (DEBUG!) v1.28 copyright 2014 DCM
a=0, b=0, DipSw=_2________B_
mode=is DMX-1 @ address: __2 DMX is active w/High CS
Volume Level=255, Amp=ON, Sd Card w/__8 SoundFiles
__5 HERO____.MP3
SoundFileTime=__103
```

contain GilderCheckSums.

[2] The speed at which the **Sd-25** counts the SoundFiles is perhaps the best indication of how 'fast' a SD flash card is. Fast cards will count up to ten SoundFiles each second. Slower cards may only count one SoundFile per second.

Using the Serial Port to Select and Play SoundFiles:

To select and play a SoundFile through the serial port, send the **Sd-25** an ASCII 'p' character ('p' is short for 'play'), followed by a two digit ASCII Hex number of the SoundFile you want to be played. Example: To play SoundFile 1, send 'p01'. To play SoundFile 5, send 'p05'. For SoundFile 25, send 'p19' (the value '19' is the hexadecimal equivalent of the decimal number '25').

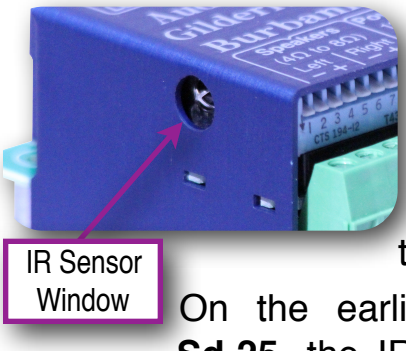
Using the Serial Port to Adjust Audio Playback Levels:

To set the 'normal' audio playback level for the Sd card through the serial port, send the **Sd-25** an ASCII <Control>+'V' character (0x16), followed by a two digit ASCII hexadecimal number of the level you want to use. Valid levels are '00' to 'FF'. Example: to set playback level to 0x80, send '<0x16>','80'.

You do this by holding down the <control> key and then pressing the letter 'v'. Release the <control> key and press '8' and then '0' to send the value for the audio level.

The volume control through the serial port is highly logarithmic. Once set, the **Sd-25** will scale all the 'mute' and 'duck' functions to the value you have set as the 'normal' playback level. Serial and DMX-512 volume commands are not saved to non-volatile memory.

InfraRed (IR) Port:



An IR port is built into every **Sd-25**. You can see the window on the left side of the case for the IR sensor.

On the earlier versions of the **Sd-25**, the IR port was available only as an option (part #Sd-IR/Rx). The IR receiver was used solely in one of the two IR modes (either mode 1A or 1B) to trigger sounds from an Ir-Tx. On the **Sd-25** it can also be used with an Apple IR remote control for triggering, testing and volume control.

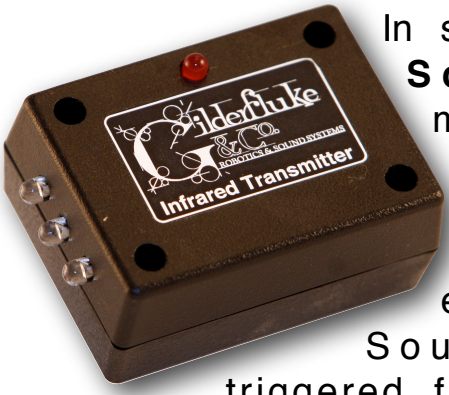
Whenever the **Sd-25** receives an IR signal, the DMX-512 LED will flash.

The IR receiver on the **Sd-25** has a fairly wide reception angle. In some applications you may need to 'snorkel' the receiver and/or transmitter to narrow the beam to suit your application. In outdoor applications you may need to do this just to keep sunlight from hitting the sensor directly and temporarily overwhelming it.

IR Port in Modes 1A or 1B:

These modes are typically used to trigger sound onboard a train, monorail, hay wagon, bus, or other vehicle.

These two modes are used with Ir-Tx transmitters. Each Ir-Tx is set to send out a continuous request for a specific SoundFile. When the IR receiver comes into range of the Ir-Tx, it will play the requested SoundFile.



In some cases, the **Sd-25s** are mounted next to the path of the vehicle. An **Ir-Tx** is mounted on each vehicle, and SoundFiles are triggered from stationary speakers as each of the vehicles pass them.

In most applications, the **Sd-25** is mounted where the IR sensor can see out the left or right side of the vehicle. As the vehicle passes **Ir-Txs** along its route (and on the same side of the vehicle as the **Sd-25's** IR port is facing), the desired SoundFiles are played through on-board speakers.

Even if the route of the vehicle is 'random', the proper SoundFile will always be triggered as it passes each **Ir-Tx** transmitter. You can even have different **Ir-Txs** on each side of a roadway, transmitting requests for different SoundFiles. One set of SoundFiles will be triggered when the vehicle goes in one direction, and a completely different set of SoundFiles will be triggered when the vehicle travels in the opposite direction.

HINT: if you have different SoundFiles that are played at different times (example: One set of SoundFiles that plays during the daytime, and another set that plays during the night), you can used two sets of **Ir-Tx** transmitters to select which plays. Load the **Sd-25s** with both sets of SoundFiles. Power up one set of **Ir-Tx**s, and only the SoundFiles it requests are played. Swap power to the other set of **Ir-Txs**, and then only the second set of SoundFiles will be played. One major theme park does a 'holiday' redecoration of their major shows. They used this technique to change their audio systems between the 'normal' show and the 'holiday' show with the flick of a single switch.

IR Port with Apple IR Remote:

When not set to either of the IR modes (modes 1A or 1B), or set to listen to DMX-512, the IR port on the **Sd-25** can be used with an Apple IR remote control. These can be used for testing and adjusting audio levels, or as the permanent method of triggering SoundFiles from a handheld button by an actor or docent in an attraction or museum.

The Apple IR remotes have been manufactured in two different models: The older all-plastic (right) and newer all-aluminum (left). Either one will work with the **Sd-25**. The aluminum remote has one more button than the plastic model, but other than that, they are operationally identical. If you don't already have a drawer full of Apple remotes laying around, you can purchase a new All-Aluminum remote for $19 from Apple. It is their product number MC377LL/A. There are also lots of covers and cozies available for the Apple Remotes from third party vendors.

The buttons are used as follows on the Apple IR Remotes:

Apple Plastic IR Remote	Apple Aluminum IR Remote	Function
+	Up	Volume Up
-	Down	Volume Down
Left	Left	Select & Play 'Previous' SoundFile

Apple Plastic IR Remote	Apple Aluminum IR Remote	Function
Right	Right	Select & Play 'Next' SoundFile
Menu	Menu	Player Status Updated on RS-232 Port
Center	Pause/Play	Play/Pause/Continue
	Center	Play/Stop

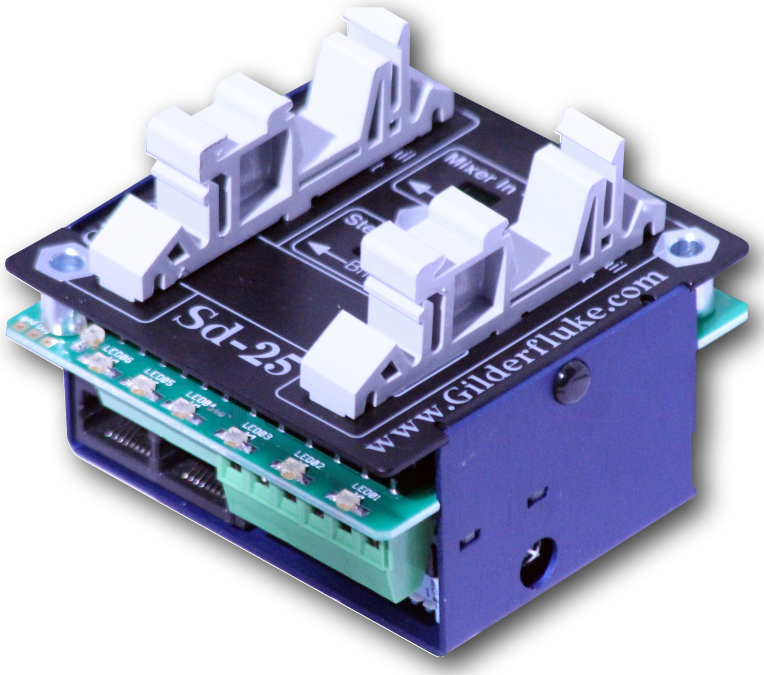
A few seconds after adjusting the volume level through Apple IR Remote, the volume setting will be saved into non-volatile memory in the **Sd-25**. If you power the unit down, the next time you power it up it will return to playing at this preset level. This is useful for adjusting the audio levels in applications where the **Sd-25** is mounted in a difficult-to-reach location.

If you have the RS-232 port connected to your computer, it will display all IR commands as they are received.

HINT: If mounting the **Sd-25** in a hard-to-reach location, use the pots to set the 'worst case' maximum volume for the speakers as it is being hung. When you climb down off the ladder, then use the Apple remote to set the final audio levels.

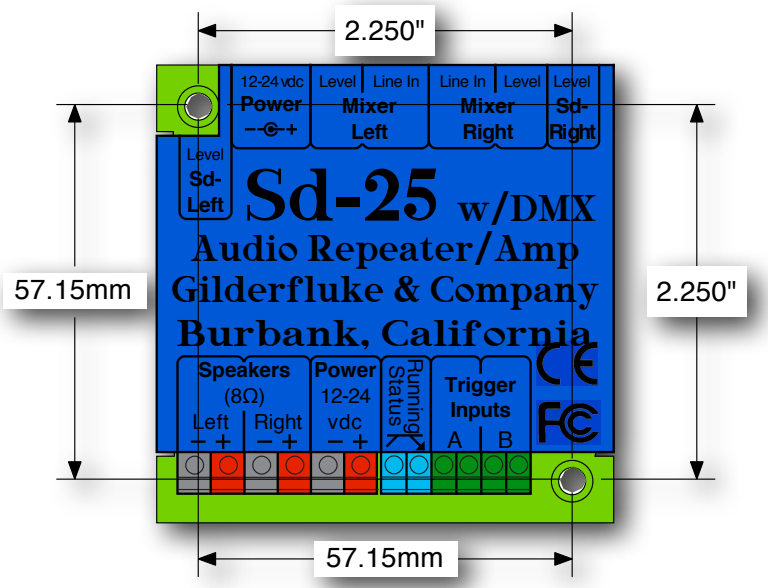
Sd-25 Installation:

The **Sd-25** can be mounted using two screws on 2-1/4" centers; 2-3/4" Augat 'Snap-Track' (which itself can be DIN rail mounted); using DIN rail adapters; or just Velcro'd down. In many applications, the **Sd-25** can be attached on (or in) the speakers it is feeding. The **Sd-25** must not be mounted where it might get wet, or suffer from extremes of temperature.



The optional DIN rail mounts just snap onto the back of the **Sd-25**. Once they are snapped on, they are wicked hard to get back off.

The Sd-25 has two 0.156" (4mm) diameter mounting holes. You can use these if you are just screwing the unit down:



An **Sd-25** is just the right size to fit into a four x four J-Box (standard electrical junction box typically used to mount two duplex electrical outlets). Run 12 to 24 vdc in to power the unit, and conduit to where your speakers are mounted. Then put a 'blank' cover onto the J-Box. No one will ever guess that this little J-Box is where the audio system is hiding. If no one knows where it is, unauthorized personnel are unlikely to mess with it.

Zoos, water parks and miniature golf courses often mount their **Sd-25s** in this way in the landscaping. They just use outdoor-rated J-Boxes and conduit.

Museums, retail stores and other indoor venues often mount them this way, since they don't need to dedicate an electrical closet to holding a traditional rack mounted sound system.

If the **Sd-25** is to be mounted in an enclosure to protect it from weather, it should be mounted in a shaded location so that the sun hitting the case directly won't overheat it.

Unless the amplifier is being run at extreme output levels, the **Sd-25** will generate very little heat. Attaching it to something metal will allow it to dissipate what little heat it does generate.

Sd-25 w/DMX non-DMX Configuration

This chart is used to configure the **Sd-25** if DMX-512 is not being used (Dipswitch #11 & #12 = off). A ball point pen or any other pointy object can be used to flip the twelve switches. Do not use a knife or other sharp object, as it might damage the switch. Despite of what it may say on the switch, Down is Off and Up is On.

Mode Name	Mode #	Trig-gers	Trigger Input 'A'	Trigger Input 'B'	DipSwitches 1	2	3	4	5	Options (see next page)
Looping SoundFiles with Mutes	**0**	0	Ramps to Muted	**Ramps to -3dB**	**Off**	**Off**	**Off**	**Off**	**Off**	**1,8,10**
	1			Ramps to -6dB	**On**	**Off**	**Off**	**Off**	**Off**	**1,8,10**
	2			Ramps to -9dB	**Off**	**On**	**Off**	**Off**	**Off**	**1,8,10**
	3			Ramps to -12dB	**On**	**On**	**Off**	**Off**	**Off**	**1,8,10**
	4			Ramps to -18dB	**Off**	**Off**	**On**	**Off**	**Off**	**1,8,10**
	5			Ramps to -24dB	**On**	**Off**	**On**	**Off**	**Off**	**1,8,10**
	6			Ramps to -33dB	**Off**	**On**	**On**	**Off**	**Off**	**1,8,10**
	7			Ramps to -48dB	**On**	**On**	**On**	**Off**	**Off**	**1,8,10**
Fast access to 1st SoundFile	**8**	2	Play 1st SoundFile only	Play All SoundFiles	**Off**	**Off**	**Off**	**On**	**Off**	**2,6,7,8,9,10**
Exclusive access to 1st SoundFile	**9**	2		Play 2nd thru Last	**On**	**Off**	**Off**	**On**	**Off**	**2,6,7,8,9,10**
Two Triggers and One Reshuffle	**A**	2	Reshuffle & Play 1st SoundFile	Play All SoundFiles	**Off**	**On**	**Off**	**On**	**Off**	**2,6,7,8,9,10**
Two Triggers with Exclusive access to 1st SoundFile/Reshuffle	**B**	2		Play 2nd thru Last	**On**	**On**	**Off**	**On**	**Off**	**2,6,7,8,9,10**
Single trigger with Reshuffle	**C**	**1**	**Play All SoundFiles**	**Reshuffle**	**Off**	**Off**	**On**	**On**	**Off**	**2,6,7,8,9,10**
Single trigger with Mute	**d**	1	Play All SoundFiles	Ramps to -6dB	**On**	**Off**	**On**	**On**	**Off**	**1, 8, 9, 10**
	E			Ramps to -12dB	**Off**	**On**	**On**	**On**	**Off**	**1, 8, 9, 10**
	F			Ramps to -24dB	**On**	**On**	**On**	**On**	**Off**	**1, 8, 9, 10**
	10			Ramps to Muted	**Off**	**Off**	**Off**	**Off**	**On**	**1, 8, 9, 10**
Single trigger, Mute or Reshuffle Short Pulses on 'B' Reshuffle SoundFiles, Long pulses on 'B' ramp audio levels.	**11**	1	Play All SoundFiles	Short = Reshuffle Long = Ramps to -6dB	**On**	**Off**	**Off**	**Off**	**On**	**1, 8, 9, 10**
	12			Short = Reshuffle Long = Ramps to -12dB	**Off**	**On**	**Off**	**Off**	**On**	**1, 8, 9, 10**
	13			Short = Reshuffle Long = Ramps to -24dB	**On**	**On**	**Off**	**Off**	**On**	**1, 8, 9, 10**
	14			Short = Reshuffle Long = Ramps to Mute	**Off**	**Off**	**On**	**Off**	**On**	**1, 8, 9, 10**
Two Playlists	**15**	2	Play 1st Half SoundFiles	Play 2nd Half SoundFiles	**On**	**Off**	**On**	**Off**	**On**	**2,6,7,8,9,10**
Two Playlists, First SoundFile Loops between Triggered SoundFiles	**16**	2	1st Half SoundFiles (except First SoundFile)		**Off**	**On**	**On**	**Off**	**On**	**2,6,7,8,9,10**
Two Playlists, Last SoundFile Loops between Triggered SoundFiles	**17**	2	Play 1st Half SoundFiles	2nd Half SoundFiles (except Last SoundFile)	**On**	**On**	**On**	**Off**	**On**	**2,6,7,8,9,10**
Two Triggers, SoundFiles 3 thru Last Loop between Triggered SoundsFiles	**18**	2	Plays 1st SoundFile	Plays 2nd SoundFile	**Off**	**Off**	**Off**	**On**	**On**	**2,6,7,8,9,10**
Store Caster/Safety Messages/Music On Hold	**19**	0	Mutes All Audio	Ramps to -24dB	**On**	**Off**	**Off**	**On**	**On**	**1, 8, 10**
IR Normal Mode	**1A**	0			**Off**	**On**	**Off**	**On**	**On**	**1, 8, 9, 10**
IR Odd Mode	**1B**	0			**On**	**On**	**Off**	**On**	**On**	**1, 8, 9, 10**
Doug's Doorbell Mode (v1.16+ only)	**1C**	1	Plays All SoundFiles	Reshuffle	**Off**	**Off**	**On**	**On**	**On**	**2,6,7,8,10**
Two Playlists, Last SoundFile Loops between Triggered SoundFiles	**1d**	2	Short = Reshuffle Long = Fade Out then Play 1st Half of all SoundFiles Both A & B = Fade Out to level set by Option #3	Short = Reshuffle Long = Fade Out then Play 2nd Half of all SoundFiles (except Last SoundFile) Both A & B = Fade Out to level set by Option #3	**On**	**Off**	**On**	**On**	**On**	**3, 8, 9, 10**
Two Triggers, SoundFiles 3 thru Last Loop between Triggered SoundsFiles	**1E**	2	Short = Reshuffle Long = Fade Out then Plays 1st SoundFile Both A & B = Fade Out to level set by Option #3	Short = Reshuffle Long = Fade Out then Plays 2nd SoundFile Both A & B = Fade Out to level set by Option #3	**Off**	**On**	**On**	**On**	**On**	**3, 8, 9, 10**
Reserved for Custom Aplications	**1F**	tbd	tbd	tbd	**On**	**On**	**On**	**On**	**On**	**tbd**

Trigger Options ('Option #' in the left column comes from the far right column in previous chart):

Option Number	Option Name	What it Does	Switches Used to Select Options	
Option #1	Audio Ramping Speeds	Immediate Ramping Speed	**DipSw. #6 = Off**	**DipSw. #7 = Off**
		Fast Ramping Speed	**DipSw. #6 = On**	**DipSw. #7 = Off**
		Medium Ramping Speed	**DipSw. #6 = Off**	**DipSw. #7 = On**
		Slow Ramping Speed	**DipSw. #6 = On**	**DipSw. #7 = On**
Option #3 (Modes 1d and 1E only)	Audio Mute Levels (Fades background SoundFiles(s) to this level before starting foreground SoundFiles)	Ramps to Muted	**DipSw. #6 = Off**	**DipSw. #7 = Off**
		Ramps to -33dB	**DipSw. #6 = On**	**DipSw. #7 = Off**
		Ramps to -18dB	**DipSw. #6 = Off**	**DipSw. #7 = On**
		Ramps to -9dB	**DipSw. #6 = On**	**DipSw. #7 = On**
Option #2	Loop selected SoundFiles on sustained inputs		**DipSw. #6 = Off**	**DipSw. #7 = Off**
Option #6	SoundFiles do not Loop on sustained inputs (v1.16+ only)		**DipSw. #6 = On**	**DipSw. #7 = Off or On**
Option #7	Loop ALL selected SoundFiles on sustained inputs (v1.16+)		**DipSw. #6 = Off**	**DipSw. #7 = On**
Option #8	**DipSw. #8 = Off:** SoundFiles played sequentially		**DipSw. #8 = On:** Selected SoundFiles played randomly	
Option #9	**DipSw. #9 = Off:** Triggered SoundFiles steppable		**DipSw. #9 = On:** Triggered SoundFiles Unsteppable	
Option #10	**DipSw. #10 = Off:** Amplifier enabled only while playing		**DipSw. #10 = On:** Amplifier always Enabled	

Operating Modes:

The first five DipSwitches are used to set the mode of operation for the **Sd-25** when it isn't set to receive DMX-512. The remaining five DipSwitches set the 'options'. The 'on'/'off' after each 'mode' shows which of the first five DipSwitches need to be turned 'on' or 'off' to select that mode. As an example; to select 'mode B', you would turn 'on' switches one, two and four. Switches three and five would be turned 'off'.

Sometimes when the operating mode is switched, you may need to cycle power to the **Sd-25** to assure it operates as expected.

If you need your SoundFiles(s) to just loop: use mode 0.

If you need to trigger one or more SoundFiles(s): use mode C.

Mode 0 / off/off/off/off/off:
Loops with Mutes
Fade to -3dB on 'b'

Mode 1 / on/off/off/off/off:
Loops with Mutes
Fade to -6dB on 'b'

Mode 2 / off/on/off/off/off:
Loops with Mutes
Fade to -9dB on 'b'

Mode 3 / on/on/off/off/off:
Loops with Mutes
Fade to -12dB on 'b'

Mode 4 / off/off/on/off/off:
Loops with Mutes
Fade to -18dB on 'b'

Mode 5 / on/off/on/off/off:
Loops with Mutes
Fade to -24dB on 'b'

Mode 6 / off/on/on/off/off:
Loops with Mutes
Fade to -33dB on 'b'

Mode 7 / on/on/on/off/off:
Loops with Mutes
Fade to -48dB on 'b'

Loop all the SoundFiles on the **Sd-25**, starting at PowerUp. Input 'a' will ramp the audio to a fully muted level when activated. The 'b' input ramps the audio to a 'half muted' (lower) volume. The only difference among these eight modes is the 'muted' volume level the 'b' input selects. These modes will support up to 32,767 SoundFiles.

Options:

Option #1: DipSwitches #6 and #7 are used to select the speed at which the audio ramps in/out.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially. If less than 255 SoundFiles are loaded on the **Sd-25**, then the randomizer checks off each SoundFile as it is played. It will not play the same SoundFile a second time until it has played all the other SoundFiles. If more than 255 SoundFiles are loaded on to the **Sd-25**, then the SoundFiles are played randomly. It does not check to see whether the same SoundFile has been played recently.

Mode 8 / off/off/off/on/off:
Two triggers, with fast access to 1st SoundFile

Input 'a' plays the first SoundFile ONLY, Input 'b' plays ALL of the SoundFiles on the **Sd-25** (SoundFiles 1 through ??). This mode is used when you want to use the 'b' input to trigger all of the SoundFiles, but occasionally want to play the first SoundFile an extra time.

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop SoundFile #1 as long as the input stays active, and input 'b' will loop through ALL of the SoundFiles on the **Sd-25** (SoundFiles 1 through ??) as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

Mode 9 / on/off/off/on/off:

Two triggers, with exclusive access to 1st SoundFile

Like Mode 8, except the B input plays SoundFiles 2 through ?? instead of 'All' the SoundFiles. This mode is used when you need a method of triggering an emergency or other 'special' announcement.

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop SoundFile #1 as long as the input stays active, and input 'b' will loop through SoundFiles 2 through ?? as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

Mode A / off/on/off/on/off:

Trigger + reshuffle and a second trigger

Similar to Mode 8, except that input 'a' plays the first SoundFile ONLY and also 'reshuffles' the 'PlayList' triggered by the 'b' input. Input 'b' plays ALL of the SoundFiles on the **Sd-25** (SoundFiles 1 through ??).

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop SoundFile #1 as long as the input stays active, and input 'b' will loop through ALL of the SoundFiles on the **Sd-25** (SoundFiles 1 through ??) as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

Mode B / on/on/off/on/off:

Like Mode A, except the 'b' input plays 2 thru ?? instead of 'All' SoundFiles

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop SoundFile #1 as long as the input stays active, and input 'b' will loop through SoundFiles 2 through ?? as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random

order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

Mode C / off/off/on/on/off:

Single trigger with reshuffle

Input ‘a’ plays ALL of the SoundFiles on the **Sd-25** (SoundFiles 1 through ??). Input ‘b’ reshuffles the ‘PlayList’ triggered by the ‘a’ input.

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input ‘a’ will loop through SoundFiles 1 through ?? as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

Mode D / on/off/on/on/off:

Single trigger with mute on ‘a’
Fade to -6dB on ‘b’

Mode E / off/on/on/on/off:

Single trigger with mute on ‘a’
Fade to -12dB on ‘b’

Mode F / on/on/on/on/off:

Single trigger with mute on ‘a’
Fade to -24dB on ‘b’

Mode 10 / off/off/off/off/on:

Single trigger with mute on ‘a’
Fade to muted on ‘b’

Input ‘a’ plays ALL of the SoundFiles on the **Sd-25** (SoundFiles 1 through ??) on each successive button press. The **Sd-25** will loop through ALL the SoundFiles on the Sd card on sustained ‘a’ input closures.

Input ‘b’ ramps the audio down -6dB from full volume. The only difference among the next three modes is the ‘muted’ volume level the ‘b’ input selects.

Options:

Option #1: DipSwitches #6 and #7 are used to select the speed at which the audio ramps in/out.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

Mode 11 / on/off/off/off/on:

Single trigger with mute/reshuffle on 'a'
Fade to -6dB on 'b'

Mode 12 / off/on/off/off/on:

Single trigger with mute/reshuffle on 'a'
Fade to -12dB on 'b'

Mode 13 / on/on/off/off/on:

Single trigger with mute/reshuffle on 'a'
Fade to -24dB on 'b'

Mode 14 / off/off/on/off/on:

Single trigger with mute/reshuffle on 'a'
Fade to muted on 'b'

Input 'a' plays ALL of the SoundFiles on the **Sd-25** (SoundFiles 1 through ??) on each successive button press. The **Sd-25** will loop through ALL the SoundFiles on the Sd card on sustained 'a' input closures.

A 'short' pulse (more than ⅛ second, but less than ¼ second) on input 'b' 'reshuffles' the 'PlayList' triggered by the 'a' input. A longer closure on input 'b' ramps the audio down -6dB from full volume when activated. The only difference among the next three modes is the 'muted' volume level the 'b' input selects.

Options:

Option #1: DipSwitches #6 and #7 are used to select the speed at which the audio ramps in/out.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

When set to any of these four modes, SoundFile requests made through the serial port will be stored up to ten deep, if you try to start any SoundFile while an unsteppable SoundFile is already playing.

Mode 15 / on/off/on/off/on:

Two PlayLists

This mode divides all of the SoundFiles into two evenly sized 'PlayLists'.

Input 'a' triggers SoundFiles from the first half, and input 'b' triggers SoundFiles from the second half.

There must be at least two SoundFiles on the **Sd-25** for this mode. If there is an odd number of SoundFiles, then the second PlayList (triggered by the 'b' input) will have one more SoundFile than the first PlayList (triggered by 'a' input).

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop through the first half of the SoundFiles as long as the input stays active. Input 'b' loops through the second half of the SoundFiles as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

Mode 16 / off/on/on/off/on:

Two PlayLists, with looping background SoundFile

Like Mode 15, except that the **Sd-25** will loop the first SoundFile on the card whenever it isn't playing a triggered SoundFile.

This mode divides all of the SoundFiles into two evenly sized 'PlayLists'. Input 'a' triggers SoundFiles from the first half, and input 'b' triggers SoundFiles from the second half. The first 'PlayList' starts at the second SoundFile.

The background looping SoundFile will start playing as soon as the **Sd-25** is powered up.

Even if the 'no step' switch is 'on' (**DipSwitch #9**), the background SoundFile can be stepped upon by a trigger to play a SoundFile from the 'a' or 'b' inputs.

There must be at least three SoundFiles on the **Sd-25** for this mode. If there is an even number of SoundFiles on the **Sd-25**, then the second PlayList (triggered by the 'b' input) will have one more SoundFile than the first PlayList (triggered by 'a' input). When in this mode, the 'status' relay output only goes active when it is playing a triggered SoundFile.

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop through the first half of the SoundFiles as long as the input stays active. Input 'b' loops through the second half of the SoundFiles as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the **Sd-25** will be ignored until the currently playing triggered SoundFile has completed.

Mode 17 / on/on/on/off/on:

Two PlayLists, with looping background SoundFile

Like Mode 16, except the LAST SoundFile is used as the background looping SoundFile. If there is an even number of SoundFiles on the **Sd-25**, then the first PlayList (triggered by the 'a' input) will have one more SoundFile than the second PlayList (triggered by 'b' input). There must be at least three SoundFiles on the **Sd-25** for this mode.

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop through the first half of the SoundFiles as long as the input stays active. Input 'b' loops through the second half of the SoundFiles as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the

Sd-25 will be ignored until the currently playing triggered SoundFile has completed.

Mode 18 / off/off/off/on/on:

Trigger SoundFiles one or two, with a background SoundFile PlayList

Input 'a' plays the first SoundFile on the Sd Flash card.

Input 'b' plays the second SoundFile on the Sd Flash card.

If not playing either of these SoundFiles, then SoundFiles 3 through ?? will be played. If the 'Random' switch (**DipSwitch #8**) is 'on', the background SoundFiles will be played in a Random order.

Even if the 'no step' switch is 'on' (**DipSwitch #9**), the background SoundFile can be stepped on by a trigger to play a SoundFile from the 'a' or 'b' inputs. There must be at least three SoundFiles on the **Sd-25** for this mode.

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop SoundFile one as long as the input stays active. Input 'b' loops SoundFile two as long as the input stays active.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When on, additional start commands to the

Sd-25 will be ignored until the currently playing triggered SoundFile has completed.

Mode 19 / on/off/off/on/on:

'StoreCaster', 'Safety Message' and 'Music-On-Hold' mode

From PowerUp, all but the first SoundFile will play in a loop. Between each of these SoundFiles, it will play the first SoundFile. This allows the first SoundFile to be used as an advertisement or safety announcement that plays between your background music. There must be at least two SoundFiles on the **Sd-25** for this mode. Input 'a' ramps the audio down to full mute when activated. Input 'b' ramps the audio down -24dB from full volume when activated.

Options:

Option #1: DipSwitches #6 and #7 are used to select the speed at which the audio ramps in/out.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Mode 1A / off/on/off/on/on:

'IR Normal' mode

Mode 1B / on/on/off/on/on:

'IR Odd' mode

Either IR mode sets the IR port to 1200 baud. Ten repeats of SoundFile number through IR port (in binary) starts the requested SoundFile playing.

In Even mode, **DipSwitch #8** on the IR Transmitter must be 'off' or the IR beam will be ignored. (This limits IR requests to numbers 01h through 7Fh, which will play SoundFiles 1 through 127.)

In Odd mode, **DipSwitch #8** on the IR

Transmitter must be 'on' or the IR beam will be ignored. (This limits IR requests to numbers 80h through FFh, which will play SoundFiles 1 through 127.)

These modes are used with our IR transmitters and receivers to trigger specific SoundFiles to play at specific points along a path on trains, ride vehicles, rollercoasters, monorails, hay rides, tour busses and other similar vehicles.

If operating in either IR mode, **DipSwitch #8**, when 'on' tells the **Sd-25** to never play the same SoundFile twice in a row. Use this DipSwitch when there is a possibility that the IR receiver will park on a IR transmitter's beam, and you don't want it to repeat the same SoundFile over and over and over……

If operating in either IR mode, **DipSwitch #9** is normally set to 'on'. If it is 'off', the SoundFile will be continuously retriggered as long as the IR receiver remains inside the IR transmitter's beam. The SoundFile will not be allowed to play through until the IR receiver leaves the transmitter's IR beam.

Input 'a' will ramp the audio to a fully muted level when activated. The 'b' input ramps the audio to a -24dB 'half muted' (lower) volume.

Options:

Option #1: DipSwitches #6 and #7 are used to select the speed at which the audio ramps in/out.

Mode 1C / off/off/on/on/on:

'Doug's Doorbell' mode

Single Trigger with Reshuffle. This mode is very similar to mode C, but supports 32,767 possible SoundFiles on the **Sd-25**. All SoundFiles are 'Unsteppable' when operating in this mode. Input 'a' plays ALL of the SoundFiles on the **Sd-25** (SoundFiles 1 through ??). Input 'b' reshuffles the 'PlayList' triggered by the 'a' input.

Options:

Option #2: The one SoundFile that is selected will loop as long as the input stays active: unless **DipSwitch #6** or **DipSwitch #7** are on.

Option #6: DipSwitch #6: When on, the SoundFile will only play once (no looping).

Option #7: DipSwitch #7: When on, input 'a' will loop through SoundFiles 1 through ?? as long as the input stays active. Short pulses on the 'a' input tend to play sequentially, even if **DipSwitch #8** is on.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially. Unlike most other modes where the SoundFiles are played randomly, this mode does not check to see whether the same SoundFile has been played recently. This means that it is possible for the same SoundFile to be played twice in a row.

Mode 1d / on/off/on/on/on:

Fade out and Trigger 2 PlayLists, with 1 background looping SoundFile

Like Mode 17, except it fades out the SoundFile that is playing to the level set by **DipSwitches #6 and #7** BEFORE starting the newly triggered SoundFile at the 'normal' playback volume. At the end of the triggered sound, the background SoundFile will be restarted at the 'ramped down' volume level, then fade back up to the 'normal' audio playback level.

This mode divides all of the SoundFiles into two evenly sized 'PlayLists'. Input 'a' triggers SoundFiles from the first half, and input 'b' triggers SoundFiles from the second half.

There must be at least three SoundFiles on the **Sd-25** for this mode. If there is an even number of SoundFiles on the **Sd-25**, then the first PlayList (triggered by the 'a' input) will have one more SoundFile than the second PlayList (triggered by 'b' input).

The **Sd-25** will loop the last SoundFile on the card whenever it isn't playing a triggered SoundFile. The background looping SoundFile will start playing as soon as the **Sd-25** is powered up.

Even if the 'no step' switch is 'on' (**DipSwitch #9**), the background SoundFile can be stepped upon by a trigger to play a SoundFile from the 'a' or 'b' inputs. The **Sd-25's** 'status' relay output only goes active when it is playing a triggered SoundFile.

If both the 'a' and 'b' inputs are held simultaneously, the audio will fade out to the level set by **DipSwitches #6** and **#7** and stay there until at least one of the inputs is released.

A 'short' pulse (more than ⅛ second, but less than ¼ second) on the 'a' or 'b' (or both) inputs 'reshuffles' the 'PlayLists'.

The one triggered SoundFile that is selected will only play once (no looping).

The fade rate is fixed in this mode to the 'slowest' possible speed.

Options:

Option #3: The fade level (fully muted, -9 dB, -18 dB or -33 dB) is selected using **DipSwitches #6 and #7**.

Option #8: DipSwitch #8: Randomizer. When on, SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When this switch is 'off', if the 'a' or 'b' trigger input is pressed, then released before the triggered SoundFile has played, the audio will simply ramp back up to the normal level. When this switch is 'on', then even a short press of the 'a' or 'b' trigger input will ramp the background sound and play the triggered sound, restart the background sound and ramp the volume back up to the 'normal' audio playback level. A second trigger will not be accepted until after the triggered sound has played. Reshuffles are disabled when this switch is 'on'.

Mode 1E / off/on/on/on/on:

Fade out and Trigger SoundFiles one or two, with a background Looping PlayList

Like Mode 18, except it fades out the SoundFile that is playing to the level set by **DipSwitches #6 and #7** BEFORE starting the newly triggered SoundFile.

Input 'a' plays the first SoundFile on the Sd Flash card. Input 'b' plays the second SoundFile on the Sd Flash card. If not playing either of these SoundFiles, then SoundFiles 3 through ?? will be played. If the 'Random' switch (**DipSwitch #8**) is 'on', the background SoundFiles will be played in a Random order.

Even if the 'no step' switch is 'on' (**DipSwitch #9**), the background SoundFile can be stepped on by a trigger to play a SoundFile from the 'a' or 'b' inputs. The **Sd-25's** 'Status' Relay Output only goes active when it is playing a triggered SoundFile.

There must be at least three SoundFiles on the **Sd-25** for this mode.

If both the 'a' and 'b' inputs are held simultaneously, the audio will fade out to the level set by **DipSwitches #6 and #7** and stay there until at least one of the inputs is released.

A ‘short’ pulse (more than ⅛ second, but less than ¼ second) on the ‘a’ or ‘b’ (or both) inputs ‘reshuffles’ the ‘PlayList’.

The one triggered SoundFile that is selected will only play once (no looping).

The fade rate is fixed in this mode to the ‘slowest’ possible speed.

Options:

Option #3: DipSwitches #6 and #7. The fade level (fully muted, -9 dB, -18 dB or -33 dB) is selected using **DipSwitches #6 and #7**.

Option #8: DipSwitch #8: Randomizer. When on, background looping SoundFiles are played in random order, rather than sequentially.

Option #9: DipSwitch #9: Unsteppable. When this switch is ‘off’, if the ‘a’ or ‘b’ trigger input is pressed, then released before the triggered SoundFile has played, the audio will simply ramp back up to the normal level. When this switch is ‘on’, then even a short press of the ‘a’ or ‘b’ trigger input will ramp the background sound and play the triggered sound, restart the background sound and ramp the volume back up to the ‘normal’ audio playback level. A second trigger will not be accepted until after the triggered sound has played. Reshuffles are disabled when this switch is ‘on’.

Mode 1F / on/on/on/on/on:

Reserved for Future Use

This setting is reserved for ‘custom’ settings on the Sd-25s. If none of the standard modes of operation suit your needs, we can modify the firmware to do exactly what you need.

Trigger Options:

Audio Ramp Speed:

Several of the operating modes allow you to ramp the audio level up and down. **DipSwitches #6 and #7** are used to set the speed at which audio is ramped:

DipSwitch #6 ‘off’, DipSwitch #7 ‘off’ = immediate

DipSwitch #6 ‘on’, DipSwitch #7 ‘off’ = fast ramp

DipSwitch #6 ‘off’, DipSwitch #7 ‘on’ = medium

DipSwitch #6 ‘on’, DipSwitch #7 ‘on’ = slow ramp

Sequential/Random:

DipSwitch #8 is used to select whether the audio files are played in sequential order (alphanumerically for less than 256 SoundFiles, in the order in which the files were loaded onto the flash card if more than 256 SoundFiles) when **DipSwitch #8** is ‘off’, or in random order (**DipSwitch #8** ‘on’). When playing in random order, a flag is set for each SoundFile. It will randomly pick the SoundFile to play, and reset this flag until it runs out of SoundFiles which haven’t yet been played. It will then reshuffle the SoundFiles. This means that the same SoundFile won’t be played a second time until after the next reshuffle happens. The only time the same SoundFile will play two times in a row is if the reshuffle happens and the next file which is chosen at random happens to be the same SoundFile. It can happen, but it won’t often. Any of the command modes which ‘reshuffle’ the SoundFiles will reset all the SoundFile flags. If playing ‘randomly’, then any SoundFile in

the PlayList can be played. If playing sequentially, it will start playing with the first SoundFile in the PlayList.

If operating in either IR mode, **DipSwitch #8**, when 'on' tells the **Sd-25** to never play the same SoundFile twice in a row. Use this DipSwitch when there is a possibility that the IR receiver will park on the same IR beam, and you don't want it to repeat the same SoundFile over and over and over……

Steppable/Non-Steppable:

DipSwitch #9 is used to select whether the triggered SoundFiles are protected against another SoundFile being triggered while it is still playing. If this switch is 'off', then a triggered SoundFile can be started at any time. If this switch is 'on', then additional trigger inputs will be ignored if another triggered SoundFile is already playing.

This switch is normally used in application where the SoundFile is triggered by a motion detector or guest triggered button. Motion detectors and user operated buttons can give multiple triggers. If this switch was 'off', would cause the SoundFile to re-trigger. With it 'on' each triggered SoundFile will always play to completion.

'Background' looping SoundFiles, like those in modes 16, 17 and 19 ignore this switch. Even if it is 'on' the 'background' SoundFile will be stepped upon if a trigger input comes in via 'a' or 'b' inputs.

If operating in either IR mode, **DipSwitch #9** is normally set to 'on'. If it is 'off', the SoundFile will be continuously retriggered as long as the IR receiver remains inside the IR transmitter's beam. The SoundFile will not be allowed to play through until the IR receiver leaves the transmitter's IR beam.

Amplifier Enable:

DipSwitch #10 is used to permanently enable the **Sd-25's** amplifier when 'on'. If you are not using the mixer, you will reduce power consumption by moving this switch to the 'off' position. The amplifier will then turn off if no audio is being played from the Sd card. If you are using the mixer inputs, then you will probably need to leave this switch 'on', unless the repeater is also running whenever the mixer is needed.

Seamless Looping:

For 'seamless' looping, use .wav encoding. Mp3 encoded SoundFiles need a fraction of a second to get the SoundFile rolling, and so will not loop as seamlessly. You should cut your audio file so that it loops on a 32 byte boundary.

Using Triggers to Randomly Access SoundFiles:

With only two trigger inputs, random access to individual SoundFiles can't be done with the **Sd-25** alone.

If being run from a control system (PLC, fire system, or any Gilderfluke Show Control system), SoundFiles can be randomly accessed by giving multiple pulses to the **Sd-25**.

You would typically choose a mode that allows the SoundFiles to be 'reshuffled' and leave the 'Random' and 'Non-Steppable' switches 'off'. Mode 'C' is commonly used for this.

An example: Two outputs from a PLC are attached to the 'A' and 'B' inputs of the **Sd-25**, which has been configured for mode 'C', 'Steppable' and 'Sequential' play. A single pulse on the 'b' trigger input 'reshuffles' the PlayList. The Sd-25 is now 'pointing' at the first SoundFile. One or more positive pulses (typically at about 15 Hz) are now sent to the 'a' input to step the **Sd-25** forward to select and play the desired SoundFile. The number of pulses are used to select which SoundFile is played. One pulse would play the first SoundFile. Ten pulses would play the tenth.

Special Orders:

If none of the standard operating modes available on the **Sd-25** meet your needs, we can modify the existing modes, or put in a new mode to suit your special needs. We reserve mode '1F' in the DipSwitches for adding custom operating modes for customers.

One-Based DMX	Zero-Based DMX	+1 Sw #1	+2 Sw #2	+4 Sw #3	+8 Sw #4	+16 Sw #5	+32 Sw #6	+64 Sw #7	+128 Sw #8	+256 Sw #9
1	0	Off	Off	Off	Off	Off	Off	Off	Off	Off
2	1	On	Off	Off	Off	Off	Off	Off	Off	Off
3	2	Off	On	Off	Off	Off	Off	Off	Off	Off
4	3	On	On	Off	Off	Off	Off	Off	Off	Off
5	4	Off	Off	On	Off	Off	Off	Off	Off	Off
6	5	On	Off	On	Off	Off	Off	Off	Off	Off
7	6	Off	On	On	Off	Off	Off	Off	Off	Off
8	7	On	On	On	Off	Off	Off	Off	Off	Off
9	8	Off	Off	Off	On	Off	Off	Off	Off	Off
10	9	On	Off	Off	On	Off	Off	Off	Off	Off
11	10	Off	On	Off	On	Off	Off	Off	Off	Off
12	11	On	On	Off	On	Off	Off	Off	Off	Off
13	12	Off	Off	On	On	Off	Off	Off	Off	Off
14	13	On	Off	On	On	Off	Off	Off	Off	Off
15	14	Off	On	On	On	Off	Off	Off	Off	Off
16	15	On	On	On	On	Off	Off	Off	Off	Off
17	16	Off	Off	Off	Off	On	Off	Off	Off	Off
18	17	On	Off	Off	Off	On	Off	Off	Off	Off
19	18	Off	On	Off	Off	On	Off	Off	Off	Off
20	19	On	On	Off	Off	On	Off	Off	Off	Off
21	20	Off	Off	On	Off	On	Off	Off	Off	Off
22	21	On	Off	On	Off	On	Off	Off	Off	Off
23	22	Off	On	On	Off	On	Off	Off	Off	Off
24	23	On	On	On	Off	On	Off	Off	Off	Off
25	24	Off	Off	Off	On	On	Off	Off	Off	Off
26	25	On	Off	Off	On	On	Off	Off	Off	Off
27	26	Off	On	Off	On	On	Off	Off	Off	Off
28	27	On	On	Off	On	On	Off	Off	Off	Off
29	28	Off	Off	On	On	On	Off	Off	Off	Off
30	29	On	Off	On	On	On	Off	Off	Off	Off
31	30	Off	On	On	On	On	Off	Off	Off	Off
32	31	On	On	On	On	On	Off	Off	Off	Off
33	32	Off	Off	Off	Off	Off	On	Off	Off	Off
34	33	On	Off	Off	Off	Off	On	Off	Off	Off
35	34	Off	On	Off	Off	Off	On	Off	Off	Off
36	35	On	On	Off	Off	Off	On	Off	Off	Off
37	36	Off	Off	On	Off	Off	On	Off	Off	Off
38	37	On	Off	On	Off	Off	On	Off	Off	Off
39	38	Off	On	On	Off	Off	On	Off	Off	Off
40	39	On	On	On	Off	Off	On	Off	Off	Off
41	40	Off	Off	Off	On	Off	On	Off	Off	Off
42	41	On	Off	Off	On	Off	On	Off	Off	Off
43	42	Off	On	Off	On	Off	On	Off	Off	Off
44	43	On	On	Off	On	Off	On	Off	Off	Off
45	44	Off	Off	On	On	Off	On	Off	Off	Off
46	45	On	Off	On	On	Off	On	Off	Off	Off
47	46	Off	On	On	On	Off	On	Off	Off	Off
48	47	On	On	On	On	Off	On	Off	Off	Off
49	48	Off	Off	Off	Off	On	On	Off	Off	Off
50	49	On	Off	Off	Off	On	On	Off	Off	Off
51	50	Off	On	Off	Off	On	On	Off	Off	Off
52	51	On	On	Off	Off	On	On	Off	Off	Off
53	52	Off	Off	On	Off	On	On	Off	Off	Off
54	53	On	Off	On	Off	On	On	Off	Off	Off
55	54	Off	On	On	Off	On	On	Off	Off	Off
56	55	On	On	On	Off	On	On	Off	Off	Off
57	56	Off	Off	Off	On	On	On	Off	Off	Off
58	57	On	Off	Off	On	On	On	Off	Off	Off
59	58	Off	On	Off	On	On	On	Off	Off	Off
60	59	On	On	Off	On	On	On	Off	Off	Off
61	60	Off	Off	On	On	On	On	Off	Off	Off
62	61	On	Off	On	On	On	On	Off	Off	Off
63	62	Off	On	On	On	On	On	Off	Off	Off
64	63	On	On	On	On	On	On	Off	Off	Off
65	64	Off	Off	Off	Off	Off	Off	On	Off	Off
66	65	On	Off	Off	Off	Off	Off	On	Off	Off
67	66	Off	On	Off	Off	Off	Off	On	Off	Off

One-Based DMX	Zero-Based DMX	+1 Sw #1	+2 Sw #2	+4 Sw #3	+8 Sw #4	+16 Sw #5	+32 Sw #6	+64 Sw #7	+128 Sw #8	+256 Sw #9
68	67	On	On	Off	Off	Off	Off	On	Off	Off
69	68	Off	Off	On	Off	Off	Off	On	Off	Off
70	69	On	Off	On	Off	Off	Off	On	Off	Off
71	70	Off	On	On	Off	Off	Off	On	Off	Off
72	71	On	On	On	Off	Off	Off	On	Off	Off
73	72	Off	Off	Off	On	Off	Off	On	Off	Off
74	73	On	Off	Off	On	Off	Off	On	Off	Off
75	74	Off	On	Off	On	Off	Off	On	Off	Off
76	75	On	On	Off	On	Off	Off	On	Off	Off
77	76	Off	Off	On	On	Off	Off	On	Off	Off
78	77	On	Off	On	On	Off	Off	On	Off	Off
79	78	Off	On	On	On	Off	Off	On	Off	Off
80	79	On	On	On	On	Off	Off	On	Off	Off
81	80	Off	Off	Off	Off	On	Off	On	Off	Off
82	81	On	Off	Off	Off	On	Off	On	Off	Off
83	82	Off	On	Off	Off	On	Off	On	Off	Off
84	83	On	On	Off	Off	On	Off	On	Off	Off
85	84	Off	Off	On	Off	On	Off	On	Off	Off
86	85	On	Off	On	Off	On	Off	On	Off	Off
87	86	Off	On	On	Off	On	Off	On	Off	Off
88	87	On	On	On	Off	On	Off	On	Off	Off
89	88	Off	Off	Off	On	On	Off	On	Off	Off
90	89	On	Off	Off	On	On	Off	On	Off	Off
91	90	Off	On	Off	On	On	Off	On	Off	Off
92	91	On	On	Off	On	On	Off	On	Off	Off
93	92	Off	Off	On	On	On	Off	On	Off	Off
94	93	On	Off	On	On	On	Off	On	Off	Off
95	94	Off	On	On	On	On	Off	On	Off	Off
96	95	On	On	On	On	On	Off	On	Off	Off
97	96	Off	Off	Off	Off	Off	On	On	Off	Off
98	97	On	Off	Off	Off	Off	On	On	Off	Off
99	98	Off	On	Off	Off	Off	On	On	Off	Off
100	99	On	On	Off	Off	Off	On	On	Off	Off
101	100	Off	Off	On	Off	Off	On	On	Off	Off
102	101	On	Off	On	Off	Off	On	On	Off	Off
103	102	Off	On	On	Off	Off	On	On	Off	Off
104	103	On	On	On	Off	Off	On	On	Off	Off
105	104	Off	Off	Off	On	Off	On	On	Off	Off
106	105	On	Off	Off	On	Off	On	On	Off	Off
107	106	Off	On	Off	On	Off	On	On	Off	Off
108	107	On	On	Off	On	Off	On	On	Off	Off
109	108	Off	Off	On	On	Off	On	On	Off	Off
110	109	On	Off	On	On	Off	On	On	Off	Off
111	110	Off	On	On	On	Off	On	On	Off	Off
112	111	On	On	On	On	Off	On	On	Off	Off
113	112	Off	Off	Off	Off	On	On	On	Off	Off
114	113	On	Off	Off	Off	On	On	On	Off	Off
115	114	Off	On	Off	Off	On	On	On	Off	Off
116	115	On	On	Off	Off	On	On	On	Off	Off
117	116	Off	Off	On	Off	On	On	On	Off	Off
118	117	On	Off	On	Off	On	On	On	Off	Off
119	118	Off	On	On	Off	On	On	On	Off	Off
120	119	On	On	On	Off	On	On	On	Off	Off
121	120	Off	Off	Off	On	On	On	On	Off	Off
122	121	On	Off	Off	On	On	On	On	Off	Off
123	122	Off	On	Off	On	On	On	On	Off	Off
124	123	On	On	Off	On	On	On	On	Off	Off
125	124	Off	Off	On	On	On	On	On	Off	Off
126	125	On	Off	On	On	On	On	On	Off	Off
127	126	Off	On	On	On	On	On	On	Off	Off
128	127	On	On	On	On	On	On	On	Off	Off
129	128	Off	Off	Off	Off	Off	Off	Off	On	Off
130	129	On	Off	Off	Off	Off	Off	Off	On	Off
131	130	Off	On	Off	Off	Off	Off	Off	On	Off
132	131	On	On	Off	Off	Off	Off	Off	On	Off
133	132	Off	Off	On	Off	Off	Off	Off	On	Off
134	133	On	Off	On	Off	Off	Off	Off	On	Off

One-Based DMX	Zero-Based DMX	+1 Sw #1	+2 Sw #2	+4 Sw #3	+8 Sw #4	+16 Sw #5	+32 Sw #6	+64 Sw #7	+128 Sw #8	+256 Sw #9
135	134	Off	On	On	Off	Off	Off	Off	On	Off
136	135	On	On	On	Off	Off	Off	Off	On	Off
137	136	Off	Off	Off	On	Off	Off	Off	On	Off
138	137	On	Off	Off	On	Off	Off	Off	On	Off
139	138	Off	On	Off	On	Off	Off	Off	On	Off
140	139	On	On	Off	On	Off	Off	Off	On	Off
141	140	Off	Off	On	On	Off	Off	Off	On	Off
142	141	On	Off	On	On	Off	Off	Off	On	Off
143	142	Off	On	On	On	Off	Off	Off	On	Off
144	143	On	On	On	On	Off	Off	Off	On	Off
145	144	Off	Off	Off	Off	On	Off	Off	On	Off
146	145	On	Off	Off	Off	On	Off	Off	On	Off
147	146	Off	On	Off	Off	On	Off	Off	On	Off
148	147	On	On	Off	Off	On	Off	Off	On	Off
149	148	Off	Off	On	Off	On	Off	Off	On	Off
150	149	On	Off	On	Off	On	Off	Off	On	Off
151	150	Off	On	On	Off	On	Off	Off	On	Off
152	151	On	On	On	Off	On	Off	Off	On	Off
153	152	Off	Off	Off	On	On	Off	Off	On	Off
154	153	On	Off	Off	On	On	Off	Off	On	Off
155	154	Off	On	Off	On	On	Off	Off	On	Off
156	155	On	On	Off	On	On	Off	Off	On	Off
157	156	Off	Off	On	On	On	Off	Off	On	Off
158	157	On	Off	On	On	On	Off	Off	On	Off
159	158	Off	On	On	On	On	Off	Off	On	Off
160	159	On	On	On	On	On	Off	Off	On	Off
161	160	Off	Off	Off	Off	Off	On	Off	On	Off
162	161	On	Off	Off	Off	Off	On	Off	On	Off
163	162	Off	On	Off	Off	Off	On	Off	On	Off
164	163	On	On	Off	Off	Off	On	Off	On	Off
165	164	Off	Off	On	Off	Off	On	Off	On	Off
166	165	On	Off	On	Off	Off	On	Off	On	Off
167	166	Off	On	On	Off	Off	On	Off	On	Off
168	167	On	On	On	Off	Off	On	Off	On	Off
169	168	Off	Off	Off	On	Off	On	Off	On	Off
170	169	On	Off	Off	On	Off	On	Off	On	Off
171	170	Off	On	Off	On	Off	On	Off	On	Off
172	171	On	On	Off	On	Off	On	Off	On	Off
173	172	Off	Off	On	On	Off	On	Off	On	Off
174	173	On	Off	On	On	Off	On	Off	On	Off
175	174	Off	On	On	On	Off	On	Off	On	Off
176	175	On	On	On	On	Off	On	Off	On	Off
177	176	Off	Off	Off	Off	On	On	Off	On	Off
178	177	On	Off	Off	Off	On	On	Off	On	Off
179	178	Off	On	Off	Off	On	On	Off	On	Off
180	179	On	On	Off	Off	On	On	Off	On	Off
181	180	Off	Off	On	Off	On	On	Off	On	Off
182	181	On	Off	On	Off	On	On	Off	On	Off
183	182	Off	On	On	Off	On	On	Off	On	Off
184	183	On	On	On	Off	On	On	Off	On	Off
185	184	Off	Off	Off	On	On	On	Off	On	Off
186	185	On	Off	Off	On	On	On	Off	On	Off
187	186	Off	On	Off	On	On	On	Off	On	Off
188	187	On	On	Off	On	On	On	Off	On	Off
189	188	Off	Off	On	On	On	On	Off	On	Off
190	189	On	Off	On	On	On	On	Off	On	Off
191	190	Off	On	On	On	On	On	Off	On	Off
192	191	On	On	On	On	On	On	Off	On	Off
193	192	Off	Off	Off	Off	Off	Off	On	On	Off
194	193	On	Off	Off	Off	Off	Off	On	On	Off
195	194	Off	On	Off	Off	Off	Off	On	On	Off
196	195	On	On	Off	Off	Off	Off	On	On	Off
197	196	Off	Off	On	Off	Off	Off	On	On	Off
198	197	On	Off	On	Off	Off	Off	On	On	Off
199	198	Off	On	On	Off	Off	Off	On	On	Off
200	199	On	On	On	Off	Off	Off	On	On	Off
201	200	Off	Off	Off	On	Off	Off	On	On	Off

One-Based DMX	Zero-Based DMX	+1 Sw #1	+2 Sw #2	+4 Sw #3	+8 Sw #4	+16 Sw #5	+32 Sw #6	+64 Sw #7	+128 Sw #8	+256 Sw #9
202	201	On	Off	Off	On	Off	Off	On	On	Off
203	202	Off	On	Off	On	Off	Off	On	On	Off
204	203	On	On	Off	On	Off	Off	On	On	Off
205	204	Off	Off	On	On	Off	Off	On	On	Off
206	205	On	Off	On	On	Off	Off	On	On	Off
207	206	Off	On	On	On	Off	Off	On	On	Off
208	207	On	On	On	On	Off	Off	On	On	Off
209	208	Off	Off	Off	Off	On	Off	On	On	Off
210	209	On	Off	Off	Off	On	Off	On	On	Off
211	210	Off	On	Off	Off	On	Off	On	On	Off
212	211	On	On	Off	Off	On	Off	On	On	Off
213	212	Off	Off	On	Off	On	Off	On	On	Off
214	213	On	Off	On	Off	On	Off	On	On	Off
215	214	Off	On	On	Off	On	Off	On	On	Off
216	215	On	On	On	Off	On	Off	On	On	Off
217	216	Off	Off	Off	On	On	Off	On	On	Off
218	217	On	Off	Off	On	On	Off	On	On	Off
219	218	Off	On	Off	On	On	Off	On	On	Off
220	219	On	On	Off	On	On	Off	On	On	Off
221	220	Off	Off	On	On	On	Off	On	On	Off
222	221	On	Off	On	On	On	Off	On	On	Off
223	222	Off	On	On	On	On	Off	On	On	Off
224	223	On	On	On	On	On	Off	On	On	Off
225	224	Off	Off	Off	Off	Off	On	On	On	Off
226	225	On	Off	Off	Off	Off	On	On	On	Off
227	226	Off	On	Off	Off	Off	On	On	On	Off
228	227	On	On	Off	Off	Off	On	On	On	Off
229	228	Off	Off	On	Off	Off	On	On	On	Off
230	229	On	Off	On	Off	Off	On	On	On	Off
231	230	Off	On	On	Off	Off	On	On	On	Off
232	231	On	On	On	Off	Off	On	On	On	Off
233	232	Off	Off	Off	On	Off	On	On	On	Off
234	233	On	Off	Off	On	Off	On	On	On	Off
235	234	Off	On	Off	On	Off	On	On	On	Off
236	235	On	On	Off	On	Off	On	On	On	Off
237	236	Off	Off	On	On	Off	On	On	On	Off
238	237	On	Off	On	On	Off	On	On	On	Off
239	238	Off	On	On	On	Off	On	On	On	Off
240	239	On	On	On	On	Off	On	On	On	Off
241	240	Off	Off	Off	Off	On	On	On	On	Off
242	241	On	Off	Off	Off	On	On	On	On	Off
243	242	Off	On	Off	Off	On	On	On	On	Off
244	243	On	On	Off	Off	On	On	On	On	Off
245	244	Off	Off	On	Off	On	On	On	On	Off
246	245	On	Off	On	Off	On	On	On	On	Off
247	246	Off	On	On	Off	On	On	On	On	Off
248	247	On	On	On	Off	On	On	On	On	Off
249	248	Off	Off	Off	On	On	On	On	On	Off
250	249	On	Off	Off	On	On	On	On	On	Off
251	250	Off	On	Off	On	On	On	On	On	Off
252	251	On	On	Off	On	On	On	On	On	Off
253	252	Off	Off	On	On	On	On	On	On	Off
254	253	On	Off	On	On	On	On	On	On	Off
255	254	Off	On	On	On	On	On	On	On	Off
256	255	On	On	On	On	On	On	On	On	Off
257	256	Off	Off	Off	Off	Off	Off	Off	Off	On
258	257	On	Off	Off	Off	Off	Off	Off	Off	On
259	258	Off	On	Off	Off	Off	Off	Off	Off	On
260	259	On	On	Off	Off	Off	Off	Off	Off	On
261	260	Off	Off	On	Off	Off	Off	Off	Off	On
262	261	On	Off	On	Off	Off	Off	Off	Off	On
263	262	Off	On	On	Off	Off	Off	Off	Off	On
264	263	On	On	On	Off	Off	Off	Off	Off	On
265	264	Off	Off	Off	On	Off	Off	Off	Off	On
266	265	On	Off	Off	On	Off	Off	Off	Off	On
267	266	Off	On	Off	On	Off	Off	Off	Off	On
268	267	On	On	Off	On	Off	Off	Off	Off	On

One-Based DMX	Zero-Based DMX	+1 Sw #1	+2 Sw #2	+4 Sw #3	+8 Sw #4	+16 Sw #5	+32 Sw #6	+64 Sw #7	+128 Sw #8	+256 Sw #9
269	268	Off	Off	On	On	Off	Off	Off	Off	On
270	269	On	Off	On	On	Off	Off	Off	Off	On
271	270	Off	On	On	On	Off	Off	Off	Off	On
272	271	On	On	On	On	Off	Off	Off	Off	On
273	272	Off	Off	Off	Off	On	Off	Off	Off	On
274	273	On	Off	Off	Off	On	Off	Off	Off	On
275	274	Off	On	Off	Off	On	Off	Off	Off	On
276	275	On	On	Off	Off	On	Off	Off	Off	On
277	276	Off	Off	On	Off	On	Off	Off	Off	On
278	277	On	Off	On	Off	On	Off	Off	Off	On
279	278	Off	On	On	Off	On	Off	Off	Off	On
280	279	On	On	On	Off	On	Off	Off	Off	On
281	280	Off	Off	Off	On	On	Off	Off	Off	On
282	281	On	Off	Off	On	On	Off	Off	Off	On
283	282	Off	On	Off	On	On	Off	Off	Off	On
284	283	On	On	Off	On	On	Off	Off	Off	On
285	284	Off	Off	On	On	On	Off	Off	Off	On
286	285	On	Off	On	On	On	Off	Off	Off	On
287	286	Off	On	On	On	On	Off	Off	Off	On
288	287	On	On	On	On	On	Off	Off	Off	On
289	288	Off	Off	Off	Off	Off	On	Off	Off	On
290	289	On	Off	Off	Off	Off	On	Off	Off	On
291	290	Off	On	Off	Off	Off	On	Off	Off	On
292	291	On	On	Off	Off	Off	On	Off	Off	On
293	292	Off	Off	On	Off	Off	On	Off	Off	On
294	293	On	Off	On	Off	Off	On	Off	Off	On
295	294	Off	On	On	Off	Off	On	Off	Off	On
296	295	On	On	On	Off	Off	On	Off	Off	On
297	296	Off	Off	Off	On	Off	On	Off	Off	On
298	297	On	Off	Off	On	Off	On	Off	Off	On
299	298	Off	On	Off	On	Off	On	Off	Off	On
300	299	On	On	Off	On	Off	On	Off	Off	On
301	300	Off	Off	On	On	Off	On	Off	Off	On
302	301	On	Off	On	On	Off	On	Off	Off	On
303	302	Off	On	On	On	Off	On	Off	Off	On
304	303	On	On	On	On	Off	On	Off	Off	On
305	304	Off	Off	Off	Off	On	On	Off	Off	On
306	305	On	Off	Off	Off	On	On	Off	Off	On
307	306	Off	On	Off	Off	On	On	Off	Off	On
308	307	On	On	Off	Off	On	On	Off	Off	On
309	308	Off	Off	On	Off	On	On	Off	Off	On
310	309	On	Off	On	Off	On	On	Off	Off	On
311	310	Off	On	On	Off	On	On	Off	Off	On
312	311	On	On	On	Off	On	On	Off	Off	On
313	312	Off	Off	Off	On	On	On	Off	Off	On
314	313	On	Off	Off	On	On	On	Off	Off	On
315	314	Off	On	Off	On	On	On	Off	Off	On
316	315	On	On	Off	On	On	On	Off	Off	On
317	316	Off	Off	On	On	On	On	Off	Off	On
318	317	On	Off	On	On	On	On	Off	Off	On
319	318	Off	On	On	On	On	On	Off	Off	On
320	319	On	On	On	On	On	On	Off	Off	On
321	320	Off	Off	Off	Off	Off	Off	On	Off	On
322	321	On	Off	Off	Off	Off	Off	On	Off	On
323	322	Off	On	Off	Off	Off	Off	On	Off	On
324	323	On	On	Off	Off	Off	Off	On	Off	On
325	324	Off	Off	On	Off	Off	Off	On	Off	On
326	325	On	Off	On	Off	Off	Off	On	Off	On
327	326	Off	On	On	Off	Off	Off	On	Off	On
328	327	On	On	On	Off	Off	Off	On	Off	On
329	328	Off	Off	Off	On	Off	Off	On	Off	On
330	329	On	Off	Off	On	Off	Off	On	Off	On
331	330	Off	On	Off	On	Off	Off	On	Off	On
332	331	On	On	Off	On	Off	Off	On	Off	On
333	332	Off	Off	On	On	Off	Off	On	Off	On
334	333	On	Off	On	On	Off	Off	On	Off	On
335	334	Off	On	On	On	Off	Off	On	Off	On

One-Based DMX	Zero-Based DMX	+1 Sw #1	+2 Sw #2	+4 Sw #3	+8 Sw #4	+16 Sw #5	+32 Sw #6	+64 Sw #7	+128 Sw #8	+256 Sw #9
336	335	On	On	On	On	Off	Off	On	Off	On
337	336	Off	Off	Off	Off	On	Off	On	Off	On
338	337	On	Off	Off	Off	On	Off	On	Off	On
339	338	Off	On	Off	Off	On	Off	On	Off	On
340	339	On	On	Off	Off	On	Off	On	Off	On
341	340	Off	Off	On	Off	On	Off	On	Off	On
342	341	On	Off	On	Off	On	Off	On	Off	On
343	342	Off	On	On	Off	On	Off	On	Off	On
344	343	On	On	On	Off	On	Off	On	Off	On
345	344	Off	Off	Off	On	On	Off	On	Off	On
346	345	On	Off	Off	On	On	Off	On	Off	On
347	346	Off	On	Off	On	On	Off	On	Off	On
348	347	On	On	Off	On	On	Off	On	Off	On
349	348	Off	Off	On	On	On	Off	On	Off	On
350	349	On	Off	On	On	On	Off	On	Off	On
351	350	Off	On	On	On	On	Off	On	Off	On
352	351	On	On	On	On	On	Off	On	Off	On
353	352	Off	Off	Off	Off	Off	On	On	Off	On
354	353	On	Off	Off	Off	Off	On	On	Off	On
355	354	Off	On	Off	Off	Off	On	On	Off	On
356	355	On	On	Off	Off	Off	On	On	Off	On
357	356	Off	Off	On	Off	Off	On	On	Off	On
358	357	On	Off	On	Off	Off	On	On	Off	On
359	358	Off	On	On	Off	Off	On	On	Off	On
360	359	On	On	On	Off	Off	On	On	Off	On
361	360	Off	Off	Off	On	Off	On	On	Off	On
362	361	On	Off	Off	On	Off	On	On	Off	On
363	362	Off	On	Off	On	Off	On	On	Off	On
364	363	On	On	Off	On	Off	On	On	Off	On
365	364	Off	Off	On	On	Off	On	On	Off	On
366	365	On	Off	On	On	Off	On	On	Off	On
367	366	Off	On	On	On	Off	On	On	Off	On
368	367	On	On	On	On	Off	On	On	Off	On
369	368	Off	Off	Off	Off	On	On	On	Off	On
370	369	On	Off	Off	Off	On	On	On	Off	On
371	370	Off	On	Off	Off	On	On	On	Off	On
372	371	On	On	Off	Off	On	On	On	Off	On
373	372	Off	Off	On	Off	On	On	On	Off	On
374	373	On	Off	On	Off	On	On	On	Off	On
375	374	Off	On	On	Off	On	On	On	Off	On
376	375	On	On	On	Off	On	On	On	Off	On
377	376	Off	Off	Off	On	On	On	On	Off	On
378	377	On	Off	Off	On	On	On	On	Off	On
379	378	Off	On	Off	On	On	On	On	Off	On
380	379	On	On	Off	On	On	On	On	Off	On
381	380	Off	Off	On	On	On	On	On	Off	On
382	381	On	Off	On	On	On	On	On	Off	On
383	382	Off	On	On	On	On	On	On	Off	On
384	383	On	On	On	On	On	On	On	Off	On
385	384	Off	Off	Off	Off	Off	Off	Off	On	On
386	385	On	Off	Off	Off	Off	Off	Off	On	On
387	386	Off	On	Off	Off	Off	Off	Off	On	On
388	387	On	On	Off	Off	Off	Off	Off	On	On
389	388	Off	Off	On	Off	Off	Off	Off	On	On
390	389	On	Off	On	Off	Off	Off	Off	On	On
391	390	Off	On	On	Off	Off	Off	Off	On	On
392	391	On	On	On	Off	Off	Off	Off	On	On
393	392	Off	Off	Off	On	Off	Off	Off	On	On
394	393	On	Off	Off	On	Off	Off	Off	On	On
395	394	Off	On	Off	On	Off	Off	Off	On	On
396	395	On	On	Off	On	Off	Off	Off	On	On
397	396	Off	Off	On	On	Off	Off	Off	On	On
398	397	On	Off	On	On	Off	Off	Off	On	On
399	398	Off	On	On	On	Off	Off	Off	On	On
400	399	On	On	On	On	Off	Off	Off	On	On
401	400	Off	Off	Off	Off	On	Off	Off	On	On
402	401	On	Off	Off	Off	On	Off	Off	On	On

One-Based DMX	Zero-Based DMX	+1 Sw #1	+2 Sw #2	+4 Sw #3	+8 Sw #4	+16 Sw #5	+32 Sw #6	+64 Sw #7	+128 Sw #8	+256 Sw #9
403	402	Off	On	Off	Off	On	Off	Off	On	On
404	403	On	On	Off	Off	On	Off	Off	On	On
405	404	Off	Off	On	Off	On	Off	Off	On	On
406	405	On	Off	On	Off	On	Off	Off	On	On
407	406	Off	On	On	Off	On	Off	Off	On	On
408	407	On	On	On	Off	On	Off	Off	On	On
409	408	Off	Off	Off	On	On	Off	Off	On	On
410	409	On	Off	Off	On	On	Off	Off	On	On
411	410	Off	On	Off	On	On	Off	Off	On	On
412	411	On	On	Off	On	On	Off	Off	On	On
413	412	Off	Off	On	On	On	Off	Off	On	On
414	413	On	Off	On	On	On	Off	Off	On	On
415	414	Off	On	On	On	On	Off	Off	On	On
416	415	On	On	On	On	On	Off	Off	On	On
417	416	Off	Off	Off	Off	Off	On	Off	On	On
418	417	On	Off	Off	Off	Off	On	Off	On	On
419	418	Off	On	Off	Off	Off	On	Off	On	On
420	419	On	On	Off	Off	Off	On	Off	On	On
421	420	Off	Off	On	Off	Off	On	Off	On	On
422	421	On	Off	On	Off	Off	On	Off	On	On
423	422	Off	On	On	Off	Off	On	Off	On	On
424	423	On	On	On	Off	Off	On	Off	On	On
425	424	Off	Off	Off	On	Off	On	Off	On	On
426	425	On	Off	Off	On	Off	On	Off	On	On
427	426	Off	On	Off	On	Off	On	Off	On	On
428	427	On	On	Off	On	Off	On	Off	On	On
429	428	Off	Off	On	On	Off	On	Off	On	On
430	429	On	Off	On	On	Off	On	Off	On	On
431	430	Off	On	On	On	Off	On	Off	On	On
432	431	On	On	On	On	Off	On	Off	On	On
433	432	Off	Off	Off	Off	On	On	Off	On	On
434	433	On	Off	Off	Off	On	On	Off	On	On
435	434	Off	On	Off	Off	On	On	Off	On	On
436	435	On	On	Off	Off	On	On	Off	On	On
437	436	Off	Off	On	Off	On	On	Off	On	On
438	437	On	Off	On	Off	On	On	Off	On	On
439	438	Off	On	On	Off	On	On	Off	On	On
440	439	On	On	On	Off	On	On	Off	On	On
441	440	Off	Off	Off	On	On	On	Off	On	On
442	441	On	Off	Off	On	On	On	Off	On	On
443	442	Off	On	Off	On	On	On	Off	On	On
444	443	On	On	Off	On	On	On	Off	On	On
445	444	Off	Off	On	On	On	On	Off	On	On
446	445	On	Off	On	On	On	On	Off	On	On
447	446	Off	On	On	On	On	On	Off	On	On
448	447	On	On	On	On	On	On	Off	On	On
449	448	Off	Off	Off	Off	Off	Off	On	On	On
450	449	On	Off	Off	Off	Off	Off	On	On	On
451	450	Off	On	Off	Off	Off	Off	On	On	On
452	451	On	On	Off	Off	Off	Off	On	On	On
453	452	Off	Off	On	Off	Off	Off	On	On	On
454	453	On	Off	On	Off	Off	Off	On	On	On
455	454	Off	On	On	Off	Off	Off	On	On	On
456	455	On	On	On	Off	Off	Off	On	On	On
457	456	Off	Off	Off	On	Off	Off	On	On	On
458	457	On	Off	Off	On	Off	Off	On	On	On
459	458	Off	On	Off	On	Off	Off	On	On	On
460	459	On	On	Off	On	Off	Off	On	On	On
461	460	Off	Off	On	On	Off	Off	On	On	On
462	461	On	Off	On	On	Off	Off	On	On	On
463	462	Off	On	On	On	Off	Off	On	On	On
464	463	On	On	On	On	Off	Off	On	On	On
465	464	Off	Off	Off	Off	On	Off	On	On	On
466	465	On	Off	Off	Off	On	Off	On	On	On
467	466	Off	On	Off	Off	On	Off	On	On	On
468	467	On	On	Off	Off	On	Off	On	On	On
469	468	Off	Off	On	Off	On	Off	On	On	On

One-Based DMX	Zero-Based DMX	+1 Sw #1	+2 Sw #2	+4 Sw #3	+8 Sw #4	+16 Sw #5	+32 Sw #6	+64 Sw #7	+128 Sw #8	+256 Sw #9
470	469	On	Off	On	Off	On	Off	On	On	On
471	470	Off	On	On	Off	On	Off	On	On	On
472	471	On	On	On	Off	On	Off	On	On	On
473	472	Off	Off	Off	On	On	Off	On	On	On
474	473	On	Off	Off	On	On	Off	On	On	On
475	474	Off	On	Off	On	On	Off	On	On	On
476	475	On	On	Off	On	On	Off	On	On	On
477	476	Off	Off	On	On	On	Off	On	On	On
478	477	On	Off	On	On	On	Off	On	On	On
479	478	Off	On	On	On	On	Off	On	On	On
480	479	On	On	On	On	On	Off	On	On	On
481	480	Off	Off	Off	Off	Off	On	On	On	On
482	481	On	Off	Off	Off	Off	On	On	On	On
483	482	Off	On	Off	Off	Off	On	On	On	On
484	483	On	On	Off	Off	Off	On	On	On	On
485	484	Off	Off	On	Off	Off	On	On	On	On
486	485	On	Off	On	Off	Off	On	On	On	On
487	486	Off	On	On	Off	Off	On	On	On	On
488	487	On	On	On	Off	Off	On	On	On	On
489	488	Off	Off	Off	On	Off	On	On	On	On
490	489	On	Off	Off	On	Off	On	On	On	On
491	490	Off	On	Off	On	Off	On	On	On	On
492	491	On	On	Off	On	Off	On	On	On	On
493	492	Off	Off	On	On	Off	On	On	On	On
494	493	On	Off	On	On	Off	On	On	On	On
495	494	Off	On	On	On	Off	On	On	On	On
496	495	On	On	On	On	Off	On	On	On	On
497	496	Off	Off	Off	Off	On	On	On	On	On
498	497	On	Off	Off	Off	On	On	On	On	On
499	498	Off	On	Off	Off	On	On	On	On	On
500	499	On	On	Off	Off	On	On	On	On	On
501	500	Off	Off	On	Off	On	On	On	On	On
502	501	On	Off	On	Off	On	On	On	On	On
503	502	Off	On	On	Off	On	On	On	On	On
504	503	On	On	On	Off	On	On	On	On	On
505	504	Off	Off	Off	On	On	On	On	On	On
506	505	On	Off	Off	On	On	On	On	On	On
507	506	Off	On	Off	On	On	On	On	On	On
508	507	On	On	Off	On	On	On	On	On	On
509	508	Off	Off	On	On	On	On	On	On	On
510	509	On	Off	On	On	On	On	On	On	On
511	510	Off	On	On	On	On	On	On	On	On
512	511	On	On	On	On	On	On	On	On	On

FCC and CE Compliance:

Sd-25s w/DMX which are revision 1.6 or later have been tested to comply with FCC and CE requirements. Revisions earlier than this may have passed testing, but were not certified at the time of manufacture.

Because **Sd-25s w/DMX** are low voltage DC devices, neither UL or CE require safety testing.

For fireproofing or additional radio frequency interference shielding, **Sd-25s w/DMX** can be mounted in a fire rated metallic case. Typically, this would be a NEMA-rated electrical enclosure or 19" electrical rack.

FCC Instruction to User:

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment has been verified to comply with the limits for a class B computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe B respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

EC DECLARATION OF CONFORMITY

Monday, February 22, 2021

Application of Council Directives:	EMC Directive, 89/336/EEC
Manufacturer's Name:	Gilderfluke & Co., Inc.
Manufacturer's Address:	205 South Flower St., Burbank, California 91502 USA
Importer's Name:	_____
Importer's Address:	_____
Type of Equipment:	Professional Audio
Equipment Class:	Commercial and Light Industrial
Model:	**Sd-25 w/DMX**
Conforms to the following Standards:	EN 55103-1: 1996 and EN 55103-2: 1996
Year of Manufacture:	2006

I the undersigned, hereby declare that the equipment specified above conforms to the above directive(s) and standard(s).

Place: Burbank, California

Date: August 1, 2006

Signature: (signed)

Full Name: Doug Mobley

Position: CEO

HEXadecimal to Decimal to Percentage

The following chart shows decimal, HEXadecimal, and a few percentage equivalents to aid you when you need to convert between numbering bases:

decimal	HEX	ASCII	%	decimal	HEX	ASCII	%	decimal	HEX	ASCII	%	decimal	HEX	ASCII	%
00	00	null	0	64	40	@	25%	128	80	(null)	50%	192	C0	(@)	75%
1	01	soh/^A		65	41	A		129	81	(soh)		193	C1	(A)	
2	02	stx/^B		66	42	B		130	82	(stx)		194	C2	(B)	
3	03	etx/^C		67	43	C		131	83	(etx/)		195	C3	(C)	
4	04	eot/^D		68	44	D		132	84	(eot)		196	C4	(D)	
5	05	eng/^E		69	45	E		133	85	(eng)		197	C5	(E)	
6	06	ack/^F		70	46	F		134	86	(ack)		198	C6	(F)	
7	07	bell/^G		71	47	G		135	87	(bell)		199	C7	(G)	
8	08	bs/^H		72	48	H		136	88	(bs)		200	C8	(H)	
9	09	ht/^I		73	49	I		137	89	(ht)		201	C9	(I)	
10	0A	lf/^J		74	4A	J		138	8A	(lf)		202	CA	(J)	
11	0B	vt/^K		75	4B	K		139	8B	(vt)		203	CB	(K)	
12	0C	ff/^L		76	4C	L		140	8C	(ff)		204	CC	(L)	
13	0D	cr/^M		77	4D	M		141	8D	(cr)		205	CD	(M)	
14	0E	so/^N		78	4E	N		142	8E	(so)		206	CE	(N)	
15	0F	si/^O		79	4F	O		143	8F	(si)		207	CF	(O)	
16	10	dle/^P		80	50	P		144	90	(dls)		208	D0	(P)	
17	11	dc1/^Q		81	51	Q		145	91	(dc1)		209	D1	(Q)	
18	12	dc2/^R		82	52	R		146	92	(dc2)		210	D2	(R)	
19	13	dc3/^S		83	53	S		147	93	(dc3)		211	D3	(S)	
20	14	dc4/^T		84	54	T		148	94	(dc4)		212	D4	(T)	
21	15	nak/^U		85	55	U		149	95	(nak)		213	D5	(U)	
22	16	syn/^V		86	56	V		150	96	(syn)		214	D6	(V)	
23	17	etb/^W		87	57	W		151	97	(etb)		215	D7	(W)	
24	18	can/^X		88	58	X		152	98	(can)		216	D8	(X)	
25	19	em/^Y		89	59	Y		153	99	(em)		217	D9	(Y)	
26	1A	sub/^Z		90	5A	Z		154	9A	(sub)		218	DA	(Z)	
27	1B	ESC		91	5B	[		155	9B	(ESC)		219	DB	([)	
28	1C	FS		92	5C	\		156	9C	(FS)		220	DC	(\)	
29	1D	GS		93	5D	]		157	9D	(GS)		221	DD	(])	
30	1E	RS		94	5E	^		158	9E	(RS)		222	DE	(^)	
31	1F	VS		95	5F			159	9F	(VS)		223	DF	( )	
32	20	SP	12.5%	96	60	`	37.5%	160	A0	(SP)	62.5%	224	E0	(`)	87.5%
33	21	!		97	61	a		161	A1	(!)		225	E1	(a)	
34	22	“		98	62	b		162	A2	(“)		226	E2	(b)	
35	23	#		99	63	c		163	A3	(#)		227	E3	(c)	
36	24	$		100	64	d		164	A4	($)		228	E4	(d)	
37	25	%		101	65	e		165	A5	(%)		229	E5	(e)	
38	26	&		102	66	f		166	A6	(&)		230	E6	(f)	
39	27	‘		103	67	g		167	A7	(‘)		231	E7	(g)	
40	28	(		104	68	h		168	A8	(()		232	E8	(h)	
41	29	)		105	69	i		169	A9	())		233	E9	(i)	
42	2A	*		106	6A	j		170	AA	(*)		234	EA	(j)	
43	2B	+		107	6B	k		171	AB	(+)		235	EB	(k)	
44	2C	‘		108	6C	l		172	AC	(‘)		236	EC	(l)	
45	2D	-		109	6D	m		173	AD	(-)		237	ED	(m)	
46	2E	•		110	6E	n		174	AE	(•)		238	EE	(n)	
47	2F	/		111	6F	o		175	AF	(/)		239	EF	(o)	
48	30	0		112	70	p		176	B0	(0)		240	F0	(p)	
49	31	1		113	71	q		177	B1	(1)		241	F1	(q)	
50	32	2		114	72	r		178	B2	(2)		242	F2	(r)	
51	33	3		115	73	s		179	B3	(3)		243	F3	(s)	
52	34	4		116	74	t		180	B4	(4)		244	F4	(t)	
53	35	5		117	75	u		181	B5	(5)		245	F5	(u)	
54	36	6		118	76	v		182	B6	(6)		246	F6	(v)	
55	37	7		119	77	w		183	B7	(7)		247	F7	(w)	
56	38	8		120	78	x		184	B8	(8)		248	F8	(x)	
57	39	9		121	79	y		185	B9	(9)		249	F9	(y)	
58	3A	:		122	7A	z		186	BA	(:)		250	FA	(z)	
59	3B	;		123	7B			187	BB	(;)		251	FB	( )	
60	3C	<		124	7C			188	BC	(<)		252	FC	( )	
61	3D	=		125	7D	l		189	BD	(=)		253	FD	(l)	
62	3E	>		126	7E	~		190	BE	(>)		254	FE	(~)	
63	3F	?		127	7F	del		191	BF	(/)		255	FF	(del)	100%