MIDI SWITCHER Z11-S.A.C.

Operator´s Manual

Please, first read this manual carefully!

The ENGL Z11 S.A.C. MIDI Switcher serves to switch certain functions of amps via MIDI. It works with all ENGL amps that are not equipped with MIDI interfaces, for example the Powerball 100, Thunder 50, Screamer, and E530 19" rack preamp models, as well as most other amps equipped with 1/4" jack plugs that accept single-pole, single-throw (SPST) footswitches. The Switcher lets you save the settings for these functions - Lead channel on, Hi Gain on, Mid Boost on, FX Loop on, and the like - to as many as 128 MIDI memory slots, and access these patches at will via a MIDI footcontroller. You can also selectively access eight POLY channels via MIDI or receive MIDI program change commands 1 to 128 in OMNI mode. The ENGL MIDI Switcher provides six switch loops, accessible via three stereo 1/4" jacks. These provide convenient connections to amps with multiple stereo 1/4" jack inputs, each wired to accept one dual footswitch.

The Switcher now also features an S.A.C. Out that lets you control ENGL amps with an S.A.C. port directly via MIDI using just one cable. The Switcher serves as an MIDI-to-S.A.C. interface, which affords you tremendous flexibility: You can use the device as a conventional switcher with six switch loops, as a MIDI-to-S.A.C. control unit (for ENGL amps only), and even as a MIDI switching center for two ENGL amps, addressing one amp like a conventional switcher and the other via the S.A.C. Out circuit. This comes in very handy when you want to do things like control two Powerball amps in parallel and simultaneously via MIDI.

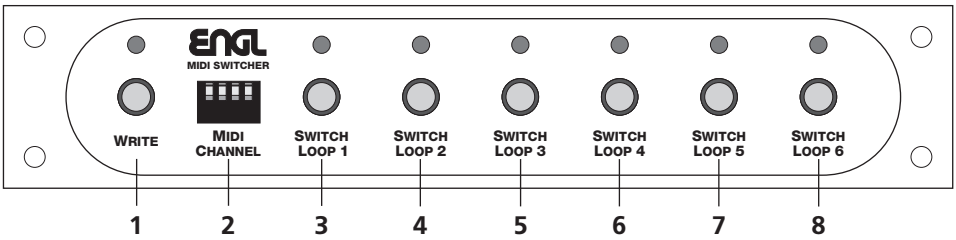
Another very practical feature of this device is its nifty power feed: When used in conjunction with an ENGL MIDI Z-9, Z- 12, or Z-15 Footcontroller, the Switcher provides power for the footcontroller via the MIDI cable. Just one cord is all it takes - the MIDI cable routed to the footcontroller! Although the Switcher is easy to operate and offers loads of comfortable handling options, you should nonetheless read this manual carefully and heed all cautions. Keep it in a safe place for further reference when you have questions or need to troubleshoot your setup.

To keep it simple, this manual uses the term amp to mean any type of amplifier - combo, head, and 19" preamp and power amp, and the term Switcher for the ENGL MIDI Switcher.

Components

1. ENGL Z-11 S.A.C.MIDI Switcher
2. 4 adhesive rubber pads
3. 2 velcro strips
4. Operator's Manual
5. AC power pack

Front Panel Features



1 WRITE

Press and hold the WRITE button for about one second to store the settings for switch loops 1 through 6 after you have selected a MIDI memory slot. The Status LED above this button lights up briefly to tell you this setting has been saved. You can update or change one or multiple settings whenever you wish. The new settings are stored when you press the WRITE button. A delay of about one second prevents inadvertent deleting or overwriting. The previous setting(s) is/are overwritten.

The red Status LED indicates the following:

A) The LED flashes slowly three times after you power the device up, indicating a system self-test is underway. The LED extinguishes to tell you that the system is operating normally.

B) The LED flashes rapidly after you switch the device on to indicate a system error. The problem may be a defective EEprom.

C) The LED flashes rapidly after you have selected a MIDI memory slot. This means MIDI program change command was sent via a MIDI channel other than the channel selected on the Switcher, which is why the Switcher cannot go to this memory slot. See section 2, MIDI CHANNEL, for more on this. The LED will stop flashing as soon as the Switcher receives a new MIDI program change message on the selected MIDI channel, and the Switcher will go to the target memory slot.

D) The LED lights up briefly when you press the WRITE button or shortly thereafter. This tells you the settings for all switch loops have been saved to the selected memory slot.

E) If you press the WRITE button and the LED lights up constantly, this indicates that the device cannot store the setting because you did not select a MIDI memory slot after you powered the Switcher up. The LED also lights up constantly if you press the WRITE button while the Switcher's status is as described in scenario C) above to indicate that the device cannot store the setting because the sending device is communicating via a MIDI channel other than the channel selected on the Switcher.

F) If the LED flashes at regular intervals after you change the status of one or more switch loops, this indicates that the loop configuration and the loop configuration stored in the selected MIDI memory slot are no longer the same.

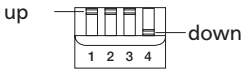
2 MIDI CHANNEL

Use these DIP switches to set the MIDI channels to OMNI or POLY 1 through 8 to enable MIDI data reception. The table below shows the DIP switch settings for the respective channels. You'll find the same table on the Switcher's top panel.

MIDI Data reception via	Switch settings 1	2	3	4
OMNI-Mode	up	x	x	x
POLY Channel 1	down	up	up	up
POLY Channel 2	down	up	up	down
POLY Channel 3	down	up	down	up
POLY Channel 4	down	up	down	down
POLY Channel 5	down	down	up	up
POLY Channel 6	down	down	up	down
POLY Channel 7	down	down	down	up
POLY Channel 8	down	down	down	down

x => setting does not affect mode

code switches:



3 SWITCH LOOP 1

Press this button to determine Switch Loop 1's status. This circuit is wired to a stereo 1/4" jack (12). The red LED above the button indicates the status:
LED off => Switch Loop 1 is an open circuit, which deactivates function* 1.
LED on => Switch Loop 1 is a closed circuit, which activates function* 1.
Changing Loop 1's status also triggers an S.A.C. message in serial data format that is sent to the S.A.C. Out (15) port. For Loop 1 this S.A.C. command lets you control a given ENGL amp function – for example Channel Up/Down on the Powerball-2 – directly via the S.A.C. port.

4 SWITCH LOOP 2

Press this button to determine Switch Loop 2's status. This circuit is wired to a stereo 1/4" jack (12). The red LED above the button indicates the status:
LED off => Switch Loop 2 is an open circuit, which deactivates function* 2.
LED on => Switch Loop 2 is a closed circuit, which activates function* 2.
Changing Loop 2's status also triggers an S.A.C. message in serial data format that is sent to the S.A.C. Out (15) port. For Loop 2 this S.A.C. command lets you control a given ENGL amp function – for example Channel 1/2 - 3/4 on the Powerball-2 – directly via the S.A.C. port.

5 SWITCH LOOP 3

Press this button to determine Switch Loop 3's status. This circuit is wired to a stereo 1/4" jack (13). The red LED above the button indicates the status:
LED off => Switch Loop 3 is an open circuit, which deactivates function* 3.
LED on => Switch Loop 3 is a closed circuit, which activates function* 3.
Changing Loop 3's status also triggers an S.A.C. message in serial data format that is sent to the S.A.C. Out (15) port. For Loop 3 this S.A.C. command lets you control a given ENGL amp function – for example Master A/B on the Powerball-2 – directly via the S.A.C. port.

6 SWITCH LOOP 4

Press this button to determine Switch Loop 4's status. This circuit is wired to a stereo 1/4" jack (13). The red LED above the button indicates the status:
LED off => Switch Loop 4 is an open circuit, which deactivates function* 4.
LED on => Switch Loop 4 is a closed circuit, which activates function* 4.
Changing Loop 4's status also triggers an S.A.C. message in serial data format that is sent to the S.A.C. Out (15) port. For Loop 4 this S.A.C. command lets you control a given ENGL amp function – for example Middle-boosted on the Powerball-2 – directly via the S.A.C. port.

7 SWITCH LOOP 5

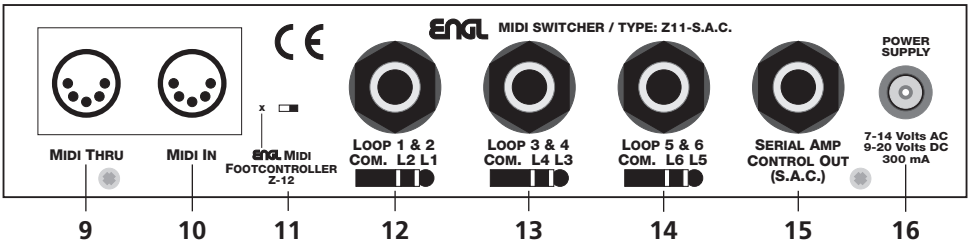
Press this button to determine Switch Loop 5's status. This circuit is wired to a stereo 1/4" jack (14). The red LED above the button indicates the status:
LED off => Switch Loop 5 is an open circuit, which deactivates function* 5.
LED on => Switch Loop 5 is a closed circuit, which activates function* 5.
Changing Loop 5's status also triggers an S.A.C. message in serial data format that is sent to the S.A.C. Out (15) port. For Loop 5 this S.A.C. command lets you control a given ENGL amp function – for example FX Loop Off/On on the Powerball-2 – directly via the S.A.C. port.

8 SWITCH LOOP 6

Press this button to determine Switch Loop 6's status. This circuit is wired to a stereo 1/4" jack (14). The red LED above the button indicates the status:
LED off => Switch Loop 6 is an open circuit, which deactivates function* 6.
LED on => Switch Loop 6 is a closed circuit, which activates function* 6.
Changing Loop 6's status also triggers an S.A.C. message in serial data format that is sent to the S.A.C. Out (15) port. For Loop 6 this S.A.C. command lets you control a given ENGL amp function – for example noise Gate Off/On on the Powerball-2 – directly via the S.A.C. port.

* This is the amp function controlled via the given loop. A function is normally activated by closing a switch loop circuit.

REAR PANEL



9 MIDI THRU
This standard 5-pin DIN port sends incoming MIDI data from the MIDI IN jack to another connected MIDI device.

10 MIDI IN
This standard 5-pin DIN ports jack receives MIDI data from a MIDI-enabled device such as the ENGL MIDI Footcontroller. It also providers power to Z-9, Z-12 and Z-15 ENGL MIDI Footcontrollers. See the next section for more on this.

11 POWER SUPPLY SELECTOR SWITCH
Engage this switch to feed power to an ENGL MIDI Footcontroller via the MIDI cable. When it is set to position x on the left, the MIDI IN port's pin 1 and pin 2 provide power to the Switcher. If you are using another make of MIDI footswitch, set the switch to the right to prevent it from being damaged. If this footswitch is also equipped with a phantom power circuit, refer to its manual to learn which of its terminals provide power and what its voltage and amperage requirements are. If the voltage and amperage values match those of the Switcher's phantom power circuit, you can set the switch to the left position to feed power to the MIDI footswitch via the MIDI cable.
NOTE: A standard AC power pack provides about 500 mA. The Switcher requires 160 mA maximum; ENGL MIDI Footcontrollers consume somewhat less than 340 mA. Any other MIDI footswitch that is powered remotely via the AC power pack may not consume more than 340 mA; otherwise it may overload the power pack. If you wish to power a MIDI footswitch that consumes more than 340 mA via the Switcher, be sure to use a power pack that provides sufficient amperage, for example, 1 A.

12 LOOP 1 & 2
Switch Loops 1 and 2 are wired to this stereo 1/4" jack.
Use button (3) to determine Loop 1's status and button (4) to do the same for Loop 2. These buttons configure the electrical circuit in one of two ways, open and passive or closed and active.
The figure on the last page shows the 1/4" jack's wiring.

13 LOOP 3 & 4
Switch Loops 3 and 4 are wired to this stereo 1/4" jack.
Use button (5) to determine Loop 3's status and button (6) to do the same for Loop 4. These buttons configure the electrical circuit in one of two ways, open and passive or closed and active.
The figure on the last page shows the 1/4" jack's wiring.

14 LOOP 5 & 6
Switch Loops 5 and 6 are wired to this stereo 1/4" jack.
Use button (7) to determine Loop 5's status and button (8) to do the same for Loop 6. These buttons configure the electrical circuit in one of two ways, open and passive or closed and active.
The figure on the last page shows the 1/4" jack's wiring.

15 SERIAL AMP CONTROL OUT (S.A.C.)
This stereo ¼" jack sends Serial Amp Control (S.A.C.) data when the configuration of the Switcher's six switch loops is changed manually using buttons (3 - 8) or by selecting another MIDI memory slot. It lets you control various channel selection and sound-shaping functions on ENGL amps equipped with a Serial Amp Control input. Use a ¼" stereo jack cable to connect this output to the ENGL amp's S.A.C. port.
Note: The settings of a few functions (FX Loop active, Mid boost active, etc.) on an ENGL amp controlled via the MIDI Switcher's S.A.C. Out may not match the Z11's Switch Loop settings when you switch the amp on. The amp and Switch Loop settings will be synchronized as soon as you change a Switch Loop's status manually or via a MIDI preset.
CAUTION: Connect the Z11 Switcher's S.A.C. Out stereo ¼" jack to the S.A.C. port of an ENGL Amp only! Connecting it to any other ¼" jack may damage the Switcher and the amp!

16 POWER SUPPLY
Plug a suitable AC power pack into this socket to power the MIDI Switcher. The polarity is irrelevant; the socket handles both AC and DC. The Switcher is ready to operate as soon as adequate power is provided to this socket. If you are using a switchable universal AC power pack, set it to at least of 9 volts. If you also wish to power a MIDI footswitch, set it to at least 12 volts.

Setup and Installation:

You have several setup and installation options:
1. To set the Switcher on a flat surface, first stick the four adhesive rubber pads to the bottom of the device.
2. Attach it to your ENGL device using the velcro strips, for instance, to the Powerball's rear panel or inside the speaker cabinet area of a combo's housing.
3. To install it in a 19" rack, attach the optional rack-mount panel to the Switcher's front face using four screws.

Connections:

1. CAUTION: Make sure the amp and Switcher are both off when you connect the two.
2. Use conventional cables equipped with stereo 1/4" jack plugs to connect the Switcher and amp. If necessary, you can use a Y adapter to split a stereo plug and access the two switch loops via two mono plugs. Always choose the shortest possible cord to connect the Switcher's S.A.C. Out to the amp's S.A.C. port.
3. Use a standard cord with 5-pin connectors to connect a MIDI footswitch such as an ENGL Z-9, Z-12 or Z-15 MIDI Footcontroller or other MIDI-enabled device to the MIDI IN port (10). Use a MIDI cable to connect other MIDI devices such as signal processors and the like to the MIDI-THRU port.
4. Heads up: Never bend cords at excessive angles anywhere near the plugs inserted in the amp and Switcher. Make sure nothing pulls on or otherwise exerts undue force on the connectors. The same goes for MIDI cables.

Operating the Switcher and other practical tips:

Once you have plugged in all the necessary cords, first check the switch loops' allocations to the amp's various functions. You can do this after powering the amp and the Switcher up, without first selecting a MIDI memory slot. The switches or buttons controlling Channel, Clean/Lead, and similar functions on ENGL amps are deactivated as soon as a 1/4" plug is inserted in the corresponding jack. Be sure to use a stereo 1/4"plug for stereo 1/4" jacks because all jacks control two functions and using a mono plug would disable the second function.

Here's a helpful tip: Make labels designating amp switching functions such as Clean/Lead, High Gain, and so forth, and stick each near the corresponding button on the Switcher before you start programming individual MIDI memory slots. If you plan to frequently tear down and set up your rig elsewhere, you may want to use different colored cables or another color code of your own devising to mark the connections between the amp and Switcher. Stick a piece of tape of the same color to the jacks and ports on both devices or number the cords and jacks to avoid confusion when you set your rig up again. This will spare you headaches once you have finished programming, because malfunctions are guaranteed if switch loops are incorrectly allocated to amp functions.

You have another remote-control option for ENGL amps alongside the six switch loops: Simply connect your ENGL amp that is equipped with a S.A.C. Port to the S.A.C. Out (15) port to send MIDI messages via the S.A.C. interface. This lets you do things like switch two ENGL Powerball-2 amps or an early Powerball version and a later Powerball-2 version in parallel via MIDI. The six switch loops serve to control amp #1, while amp #2 is switched via the S.A.C. Out. The switch loops and S.A.C. Out's ground circuits are split inside the Z11 Switcher, thereby preventing hum caused by control circuit ground loops. Of course, you are free to control one ENGL amp that is equipped with a S.A.C. Port via the S.A.C. Out without configuring switch loops for a second amp.

Programming and storing switch loop configurations to MIDI memory slots:

1. Select a MIDI memory slot using a MIDI footcontroller such as the ENGL Z-9, Z-12 or Z-15.
2. Use buttons (3) through (8), (depending on the employed switch loops) to configure amp functions, for example, Channel selection, Master A or B, Mid Boost off/ on, FX Loop off / on, and so forth.
3. Press and hold the WRITE button (1) for about one second. The brief delay serves to prevent accidental programming or deleting.
4. The Status LED lights up briefly to indicate the program is being saved.
5. Repeat steps 1 to 4 to program further MIDI memory slots.
6. Follow the same procedure to edit any previously stored MIDI patch.

Note: The status LED flashes slowly when you edit switch loop settings. It will do this only after you have selected a MIDI Preset via a MIDI footcontroller.

Troubleshooting

*** The MIDI Switcher fails to respond. It will not power up even though you have connected its power pack to an AC outlet. The Status LED above the WRITE button is not flashing, and you are unable to activate any of the switch loops.**

-> Is the power pack providing the necessary voltage and sufficient amperage?
(See Technical Data for specifications.)
-> Is the power pack defective?
-> Is the cord connecting the power pack and Switcher intact?
-> Is the power pack connected to a live socket?
-> Is the connector properly seated in the Power Supply socket (16)?

*** The MIDI Switcher fails to respond to MIDI data sent from a MIDI device such as a footcontroller.**

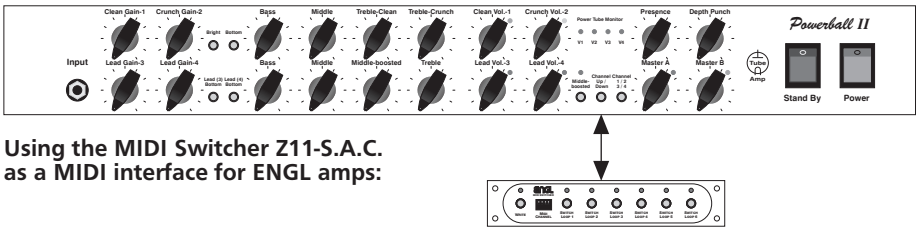
-> Is the MIDI footcontroller connected to the MIDI In port (15)?
-> Is the MIDI cable in good working order and is it wired properly?
(You'll find the MIDI connector's wiring pictured on the last page.)
-> Is the Switcher set to the MIDI channel on which the MIDI footcontroller is sending program change commands? You can check if the Switcher is receiving MIDI data by setting the DIP switch (2) to OMNI reception.
If MIDI program change messages are sent via a MIDI channel other than the one selected at the Switcher, it will not switch to the target memory slot.
The Status LED above the WRITE button flashes rapidly to indicate that the MIDI channels do not match. Now if you press the WRITE button, the Status LED will light up constantly until you release the button to indicate that your setting cannot be stored because the target memory slot cannot be addressed. In other words, a flashing LED tells you what is causing the communication problem; a statically illuminated LED tells you why you cannot store a setting.

*** The remote-controlled amp's switching functions do not respond to switch loop changes.**

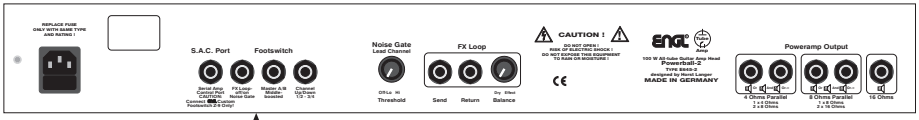
-> Check if the cord(s) equipped with the stereo 1/4" jack plugs is/are connected properly to the amp and Switcher.
-> Are the 1/4" jack plugs on the cords connecting the Switcher and amp wired in stereo and in good working order? Check them for broken wires, bad solder joints, and short-circuits.
-> If the Switcher is unable to address an amp via the switch loops, the wiring on this amp's stereo 1/4" jacks may not match the wiring of the jacks on the opposite end; that is, the switcher's control inputs.
If you need to check the wiring, you'll find the scheme for the 1/4" stereo jacks pictured on the last page.
-> If you are dealing with an amp other than ENGL, is it designed to respond to a simple on/off electrical circuit controlled by a single-pole, single-throw switch?
If you are unsure, contact your local authorized service center or consult a professional.

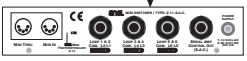
*** The switchable functions on an ENGL amp controlled remotely using the S.A.C. Out (15) do not respond when you activate or deactivate a switch loop.**

-> Check if the cord equipped with the stereo 1/4" jack plugs is connected properly to the amp (-> S.A.C. Port) and Switcher (-> S.A.C. Out).
-> Are the 1/4" jack plugs on the cords connecting the Switcher and amp wired in stereo and in good working order? Check them for broken wires, bad solder joints, and short-circuits.



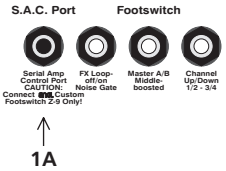
Using the MIDI Switcher Z11-S.A.C. as a MIDI interface for ENGL amps:



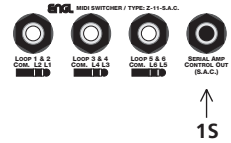


See the next page for practical examples, wiring instructions, and useful tips.

Practical examples: the ENGL Z11-S.A.C. used as a MIDI Switcher and as a MIDI-to-S.A.C. interface for ENGL Powerball amps

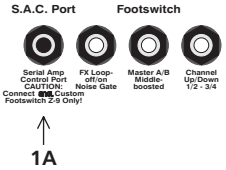


Footcontroller connector panel (4 stereo ¼" jacks) on the ENGL Powerball 2's rear panel.
1A: Serial Amp Control port

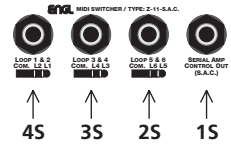


Switch loop connectors and S.A.C. Out (4 stereo ¼" jacks) on the back of the Switcher.
1S: Serial Amp Control Out

Example 1:
In this scenario, the Switcher serves as a MIDI-to-S.A.C. interface to control an ENGL Powerball-2 amp.
Connections:
Use a stereo ¼" jack cable to connect the amp's S.A.C. Port (1A) to the Switcher's S.A.C. Out (1S).
These functions on the Powerball 2 are MIDI-switchable:
Channel switching, Master A/B, Middle-boosted, FX Loop off/on, Noise Gate

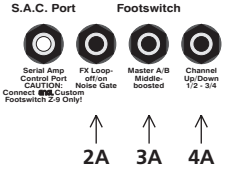


Footcontroller connector panel (4 stereo ¼" jacks) on the ENGL Powerball-2's rear panel.
1A: Serial Amp Control port



Switch loop connectors and S.A.C. Out (4 stereo ¼" jacks) on the back of the Switcher.
1S: Serial Amp Control Out
2S: Switch loop 5 & 6
3S: Switch loop 3 & 4
4S: Switch loop 1 & 2

Example 2:
In this scenario, the Switcher serves as a MIDI-to-S.A.C. interface and as MIDI Switcher to control two ENGL Powerball-2 amps simultaneously and in parallel.
Connections:
Use a stereo ¼" jack cable to connect amp #1's S.A.C. Port (1A) to the Switcher's S.A.C. Out (1S). Use three stereo 1/4" jack cables to connect amp #2's footswitch jacks (2A, 3A, 4A) to the Switcher's switch loop jacks (2S, 3S, 4S).
These functions on both Powerball-2 amps are MIDI-switchable:
Channel switching, Master A/B, Middle-boosted, FX Loop off/on, Noise Gate.



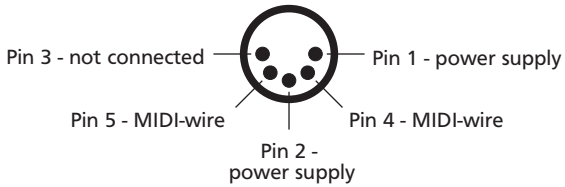
Footcontroller connector panel (4 stereo ¼" jacks) on ENGL Powerball-2 amp #2's rear panel.
2A: Footswitch FX Loop off/on, Noise Gate
3A: Footswitch Master A/B, Middle-boosted
4A: Footswitch Channel

Some more hot tips:
The Switcher also lets you combine a later Powerball-2 version with an earlier Powerball-1 version. The S.A.C. interface controls the Powerball-2 amp; four switch loops control the older version of the E645.
You can also combine two Switchers in a MIDI setup to store different settings for two Powerball-2 amps in one MIDI memory slot, for example, to activate the FX Loop and select the Crunch channel on amp #1, and to deactivate the FX Loop and select the Lead channel on amp #2.
What's more, you can use the Switcher to remote-control other ENGL amps equipped with an S.A.C. Port and/or footswitch inputs via MIDI, for example, the Gig Master Amp, Raider 100 Combo, and more.
You do not need the Switcher for ENGL amps that are equipped with an S.A.C. port and a MIDI Input. Also, these amps' functions cannot be controlled via the S.A.C. interface using the Switcher!

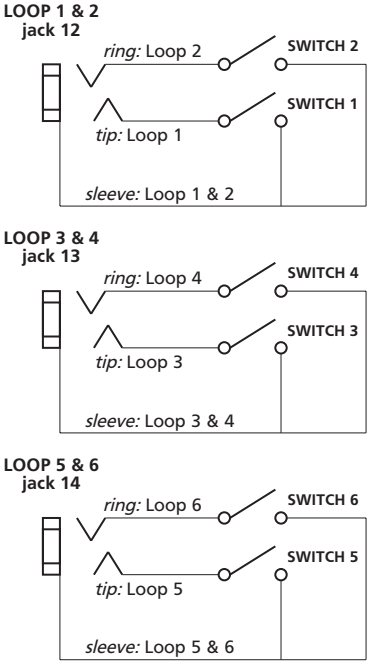
Technical Data:

Power supply: Via an external 12-volt DC or 12-volt AC power pack with approx. 500 mA current
Switcher's max. power consumption: approx. 160 mA, all Switch Loops active.
Switchable phantom power for ENGL MIDI footcontrollers via MIDI cable; see table below for pin assignments.
System: Controller AT89S52 with internal 8k FLASH memory for software,
12 MHz system clock; Memory: EEprom (no backup battery required).
Dimensions: 18 x 3.5 x 11 cm; Switcher installs in one 19" rack space with optional rack front panel
Weight: Approx. 0.7 kg

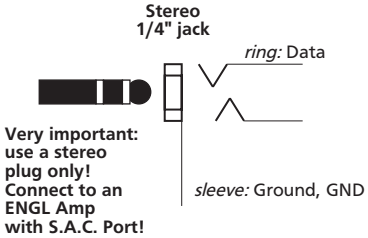
MIDI INPUT Port pin assignment:

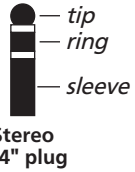


Switching loop´s schematics:



Serial Amp Control Out (15)





ENGL Gerätebau GmbH, Germany
Internet: **http://www.engl-amps.com**
Text, design, graphics and layout
by Horst Langer