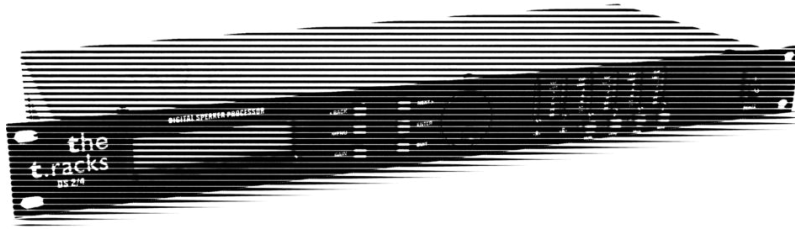




DS 2/4

digital speaker
management system



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1 General notes

This user manual contains important information on safe operation of the device. Read and follow all safety notes and all instructions. Save this manual for future reference. Make sure that it is available to all persons using this device. If you sell the device to other users, be sure that they also receive this manual.

Our products are subject to a process of continuous development. We therefore reserve the right to make changes without notice.

Symbols and signal words

This section provides an overview of the symbols and signal words used in this user manual.

Signal word	Meaning
DANGER!	This combination of symbol and signal word indicates an immediate dangerous situation that will result in death or serious injury if it is not avoided.
CAUTION!	This combination of symbol and signal word indicates a possible dangerous situation that can result in minor injury if it is not avoided.
NOTICE!	This combination of symbol and signal word indicates a possible dangerous situation that can result in material and environmental damage if it is not avoided.
Warning signs	Type of danger
	Warning – high-voltage.
	Warning – danger zone.

2 Safety notes

Intended use

This device serves sound control and distribution of incoming audio signals to the connected speakers. Use the device only as described in this user manual. Any other use or use under other operating conditions is considered to be improper and may result in personal injury or property damage. No liability will be assumed for damages resulting from improper use.

This device may be used only by persons with sufficient physical, sensorial, and intellectual abilities and having corresponding knowledge and experience. Other persons may use this device only if they are supervised or instructed by a person who is responsible for their safety.

Safety



DANGER!

Danger for children

Ensure that plastic bags, packaging, etc. are disposed of properly and are not within reach of babies and young children. Choking hazard!

Ensure that children do not detach any small parts (e.g. knobs or the like) from the unit. They could swallow the pieces and choke!

Never let children unattended use electrical devices.



DANGER!

Electric shock caused by high voltages inside

Within the device there are areas where high voltages may be present. Never remove any covers.

There are no user-serviceable parts inside.



DANGER!

Electric shock caused by short-circuit

Always use proper ready-made insulated mains cabling (power cord) with a protective contact plug. Do not modify the mains cable or the plug. Failure to do so could result in electric shock/death or fire. If in doubt, seek advice from a registered electrician.



CAUTION!

Possible hearing damage

With loudspeakers or headphones connected, the device can produce volume levels that may cause temporary or permanent hearing impairment.

Do not operate the device permanently at a high volume level. Decrease the volume level immediately if you experience ringing in your ears or hearing impairment.



NOTICE!

Risk of fire

Do not cover the device nor any ventilation slots. Do not place the device near any direct heat source. Keep the device away from naked flames.



NOTICE!

Operating conditions

This device has been designed for indoor use only. To prevent damage, never expose the device to any liquid or moisture. Avoid direct sunlight, heavy dirt, and strong vibrations.



NOTICE!

Power supply

Before connecting the device, ensure that the input voltage (AC outlet) matches the voltage rating of the device and that the AC outlet is protected by a residual current circuit breaker. Failure to do so could result in damage to the device and possibly injure the user.

Unplug the device before electrical storms occur and when it is unused for long periods of time to reduce the risk of electric shock or fire.

3 Performance characteristics

- Two inputs, four outputs (2 × 2-way, 3-way, 4-way, 2-way-sub)
- Three digital 24-bit signal processors
- Parametric five-band equalizers
- High- and low-pass filters
- Controllable input and output sensitivity
- Runtime delay of up to seven milliseconds
- Limiter with adjustable threshold, attack, hold and decay
- RS232 interface
- Installation in 19-inch racks (1 rack unit)

4 Installation and operation

Unpack and carefully check that there is no transportation damage before using the unit. Keep the equipment packaging. To fully protect the device against vibration, dust and moisture during transportation or storage use the original packaging or your own packaging material suitable for transport or storage, respectively.

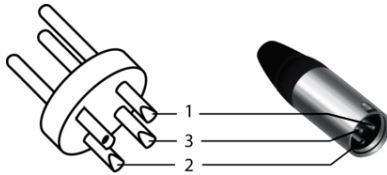
Establish all connections as long as the unit is switched off. Use the shortest possible high-quality cables for all connections.

Rack mounting

The unit has been designed for rack mounting in a standard 19-inch rack; it occupies one rack unit.

4.1 Pin assignment

XLR-connections for signal in-/outputs

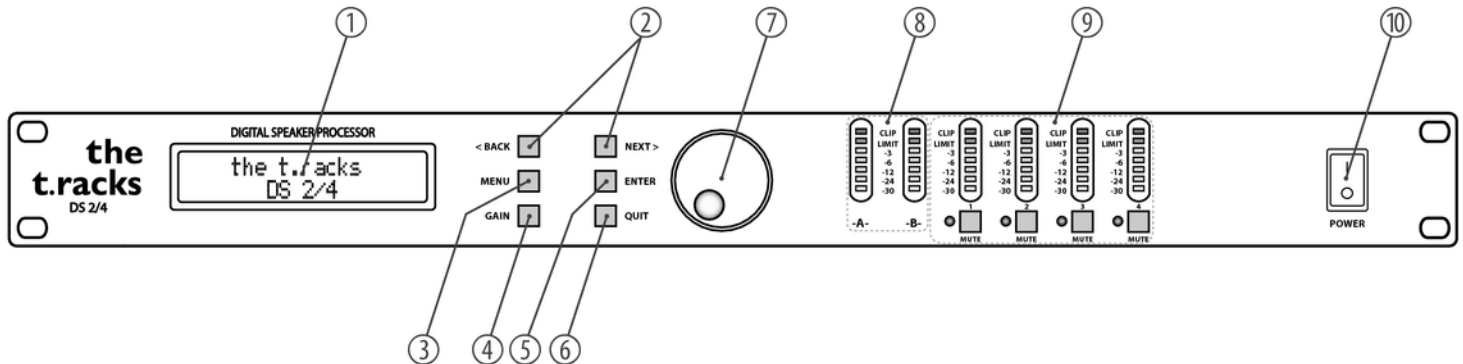


XLR mounting sockets are provided for signal inputs. XLR mounting plugs are provided for signal outputs. The figure and the table show the XLR pin assignment for balanced wiring.

1	Ground
2	Positive signal (+)
3	Negative signal (-)

5 Connectors and controls

Front panel

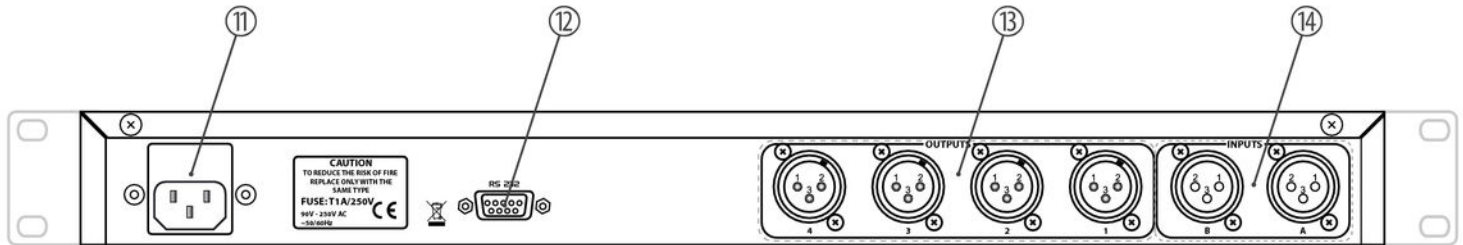


DS 2/4

1	Display
2	BACK / NEXT Cursor and navigation buttons. With the help of these buttons, you can place the cursor at the desired point in the display text and switch between the different menus.
3	MENU Button to call the menu function.
4	GAIN Button to activate the parameterisation mode. Operate the button repeatedly to switch between the channels.
5	ENTER Button to confirm changes and input values and to open the different submenus.
6	QUIT Button to leave the opened menu or the menu function.

7	Jog wheel The jog wheel can be used to set parameters, enter values and select menu options.
8	LED-display input channel A / B The LEDs show the signal strength of the input signal. Reduce the output level of the device connected to the affected channel in the event of overdrive ("CLIP" LED flickers or is permanently lit).
9	LED-display output channel 1 to 4 with MUTE switch The LEDs show the signal strength of the output signal. In the event of overdrive ("CLIP" LED flickers or is permanently lit), reduce the output level of the affected channel. The MUTE switch can be used to mute the channels individually; in this case, the associated display LED lights up.
10	Mains switch to activate/deactivate the device.

Rear panel



11	Plug for mains cable with fuse holder.
12	RS232 interface, 9-pin D-SUB socket.
13	OUTPUTS Signal output 4 to 1 (male XLR panel connector).
14	INPUTS Signal input channel A and B (female XLR panel connector).

6 Functions



First switch on the speaker management system and then switch on the connected devices to avoid activation crackling and possible damage to the connected speakers.

"Xover sub menu"

Operate the *[MENU]* button to open the "Xover sub menu". The settings of the crossover frequencies are stored in this menu.

"load a Xover"

This submenu permits calling of a stored configuration.

- 1.** ▶ Operate the *[ENTER]* button to activate the "load a Xover" option.
- 2.** ▶ Select the desired configuration with the jog wheel (1 to 10).
- 3.** ▶ Confirm your selection with *[ENTER]*. The display shows 'loading ...'.

"design a Xover"

A user configuration can be created in this submenu.

1. ➤ Operate the [ENTER] button and then [NEXT] to activate the "design a Xover" option.
2. ➤ Select the desired mode with the [NEXT] / [BACK] buttons or with the jog wheel, e.g. "type: 2×2 way crossover".
3. ➤ Confirm the selection with [ENTER]. The display shows 'out 3&4 source B'. Use the [NEXT] / [BACK] buttons or the jog wheel to select the desired channel assignment.



*Since the channels cannot be freely assigned to the controller channels, the sum formation function "source A+B" should **not** be assigned here. This can lead to problems in stereo operation. The controller assigns the channels as follows: INPUT A to OUTPUT 1 and 2, INPUT B to OUTPUT 3 and 4.*

4. ➤ Confirm your selection with [ENTER]. The display shows 'stereo links: off'. Use the [NEXT] / [BACK] buttons or the jog wheel to select the desired option.



The "stereo links" option can be selected when the channels OP (OUTPUT) 1 and 3 as well as 2 and 4 are parameterised identically. The OUT1+3 and OUT2+4 values are then copied automatically and do not have to be entered repeatedly.

5. ➤ Confirm the selection with *[ENTER]*. The display shows '*new xover, [ENTER] to confirm*'.

"store a Xover"

This submenu permits saving the user-specific and changed configurations in the device.

1. ➤ Operate the *[ENTER]* button and then twice the *[NEXT]* button to activate the "store a Xover" option. The display shows '*... store a xover*'.
2. ➤ Operate the *[ENTER]* button and use the jog wheel to select the desired memory slot (1 to 10).
3. ➤ Operate the *[ENTER]* button. You may then select a user-specific designation. Use the jog wheel and the *[NEXT]* button for this.
4. ➤ Confirm the selection with *[ENTER]*. The display shows '*stored*'.

"erase a Xover"

Use this submenu to delete configurations stored in the device.

1. ➤ Operate the *[ENTER]* button and then three times the *[NEXT]* button to activate the "erase a Xover" option. The display shows '*... erase a xover*'.
2. ➤ Operate the *[ENTER]* button and select the memory slot of the configuration you want to delete with the jog wheel (1 to 10). The display shows the safety prompt '*erase xover memory?*'.
3. ➤ Confirm with *[ENTER]* to delete the configuration.

"security sub menu"

The "security sub menu" can specify the access rights for different device parameters to prevent undesired or unauthorised changes. The following options are available:

- change only (read access to the parameters, MUTE function available)
- change + view (no access to parameters, MUTE function available)
- change + mute (read access to the parameters, MUTE function not available)
- everything (no access to parameters, MUTE function not available)

Select the desired option with the *[BACK]* and *[NEXT]* buttons or the jog wheel and confirm the selection with *[ENTER]*. The access lock can be revoked by input of a valid password.

Password input

Access to the different device parameters is password-protected. Proceed as follows to enter the password:

- Push the *[BACK]* and *[NEXT]* buttons at once.
- Select one character at a time with the jog wheel and confirm each with *[ENTER]*.
- Confirm the input of the last character again with *[ENTER]*.

Then the device parameters can be changed as desired.

"setup" menu

Different settings can be made in the setup menu.

"stereo Link"

The "stereo Link" function can be used to link two outputs. Confirm your selection with *[ENTER]*.

"wake up time"

The "wake up time" menu item can be used to determine the activation conduct of the digital speaker management system. The following options are available:

- fade in (the outputs slowly move up to the set level at activation)
- mute hold (all outputs remain muted)

Confirm your selection with *[ENTER]*.

"delay time/distance"

The "delay time/distance" menu item can be used to set the runtime delay of the digital speaker management system. Available units are meter (m), feet (ft) and milliseconds (ms). Confirm your selection with *[ENTER]*.

"interface"

The "interface" menu item can be used to determine the transfer speed of the RS232 interface (2400, 4800, 9600, 19200 or 38400 Bd) and the device ID (Remote-ID 1 to 32) of the digital speaker management system. Confirm your selection with *[ENTER]*.

"name"

The "name" menu item can be used to assign designations from the present list to the outputs. Select the desired designation with the jog wheel and confirm your selection with *[ENTER]*.

"source"

The "source" menu item can be used to verify assignment of the inputs A and B. Changes are not possible in this place.

"parameter" menu

In the "parameter" menu, different device parameters can be adjusted. Open the menu with *[GAIN]*, select the desired option with the *[BACK]* and *[NEXT]* buttons and confirm the selection with *[ENTER]*. The access lock can be revoked by input of a valid password.

Parameter	Function	Value range
Input gain	Input amplification	-40 ... +6 dB
Output Gain	Output amplification	-40 ... +6 dB
Output Phase	Polarity This parameter can be used to compensate for possible phase errors (deletion of certain frequency areas) at the outputs by phase reversal.	+ / -
Delay	Runtime delay This parameter can be used to compensate for constructively caused different signal runtimes of speakers or spatially caused runtime differences (speaker distance).	0 ... 7 ms
High Pass	High-pass filter	< 10 Hz... 16 kHz
Low Pass	Low-pass filter	35 Hz ... 22 kHz

Equalizer

A parametric 5-band equalizer is available per output. Additionally, a high- or low-shelf filter can be set. For this, set the gain to 0 dB and the Q-factor to "Hishelf/Loshelf". To deactivate a certain EQ-band (bypass mode), push the *[ENTER]* button.

Parameter	Value range
Frequency	20 Hz ... 20 kHz
Q-factor	0,5...10
Gain	± 12 dB, ± 1 dB
High-Shelf	1 kHz ... 20 kHz
Low-Shelf	20 Hz ... 1 kHz

Limiter

There is a limiter available for each output. These limiters limit the signal level for each channel to a specific threshold and therefore offer additional protection against overdrive and damage to the connected speakers.

Parameter	Function	Value range
Threshold	Threshold	-20 ... +15 dB
Attack	Attack time	1 ... 100 ms
Hold	Holding time	0 ... 100 ms
Decay	Decay time	10 ... 1000 ms

7 Technical data

Input impedance	10 k Ω
Common-mode rejection ratio (CMRR)	> 50 dB (30 Hz...20 kHz)
Output impedance	< 50 Ω
Max. voltage difference between positive and negative peak voltage	V _{pp} = 4 V, V _{pp} = 7.6 V
Frequency response	20 Hz ... 20 kHz
Total harmonic distortion (THD)	0,01 %
Maximum runtime delay	7 ms
Output amplification	-40 dB ... +6 dB (± 0.5 dB)
Input amplification	-40 dB ... +6 dB (± 0.5 dB)
Mains power supply	AC 100 V ... 240 V \sim , 50/60 Hz
Fuse	5 mm \times 20 mm, 1 A, 250 V, slow-blow

Technical data

Dimensions (H × W × D)	44 mm × 480 mm × 220 mm (1.73 in. × 19.90 in. × 8.67 in.)
Weight	3.6 kg (7.94 lbs.)

8 Cleaning

Fan grids

The fan grids of the device must be cleaned on a regular basis to remove dust and dirt. Before cleaning, switch off the device and disconnect AC-powered devices from the mains. Use a lint-free damp cloth for cleaning. Never use solvents or alcohol for cleaning.

9 Protecting the environment

Disposal of the packaging material



For the transport and protective packaging, environmentally friendly materials have been chosen that can be supplied to normal recycling.

Ensure that plastic bags, packaging, etc. are properly disposed of.

Do not just dispose of these materials with your normal household waste, but make sure that they are collected for recycling. Please follow the notes and markings on the packaging.

Disposal of your old device



This product is subject to the European Waste Electrical and Electronic Equipment Directive (WEEE). Do not dispose with your normal household waste.

Dispose of this device through an approved waste disposal firm or through your local waste facility. When discarding the device, comply with the rules and regulations that apply in your country. If in doubt, consult your local waste disposal facility.



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