the t.mix

DM 20

digital mixer

th•mann
MUSIC IS OUR PASSION

user manual

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Table of contents

1 General information

This user manual contains important information on the 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 another user, be sure that they also receive this manual.

Our products and user manuals are subject to a process of continuous development. We therefore reserve the right to make changes without notice. Please refer to the latest version of the user manual which is ready for download under *www.thomann.de*.

1.1 Further information

On our website (*www.thomann.de)* you will find lots of further information and details on the following points:

Download	This manual is also available as PDF file for you to download.
Keyword search	Use the search function in the electronic version to find the topics of interest for you quickly.
Online guides	Our online guides provide detailed information on technical basics and terms.
Personal consultation	For personal consultation please contact our technical hotline.
Service	If you have any problems with the device the customer service will gladly assist you.

1.2 Notational conventions

This manual uses the following notational conventions:

Letterings

The letterings for connectors and controls are marked by square brackets and italics.

Examples: *[VOLUME]* control, *[Mono]* button.

Displays

Texts and values displayed on the device are marked by quotation marks and italics.

Examples: *'24ch'*, *'OFF'*.

Cross-references

References to other locations in this manual are identified by an arrow and the specified page number. In the electronic version of the manual, you can click the cross-reference to jump to the specified location.

Example: See *'Cross-references' on page 5*.

1.3 Symbols and signal words

In this section you will find an overview of the meaning of symbols and signal words that are used in this 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 – danger zone.

2 Safety instructions

Intended use

This device is intended to be used for the mixing of signals from audio equipment, musical instruments and microphones. 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.

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!

External power supply

The device is powered by an external power supply. Before connecting the external power supply, 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 the user.

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

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.

Only operate the device within the ambient conditions specified in the chapter 'Technical specifications' of this user manual. Avoid heavy temperature fluctuations and do not switch the device on immediately after it was exposed to temperature fluctuations (for example after transport at low outside temperatures).

Dust and dirt inside can damage the unit. When operated in harmful ambient conditions (dust, smoke, nicotine, fog, etc.), the unit should be maintained by qualified service personnel at regular intervals to prevent overheating and other malfunction.

NOTICE!

Possible staining

The plasticiser contained in the rubber feet of this product may possibly react with the coating of your parquet, linoleum, laminate or PVC floor and after some time cause permanent dark stains.

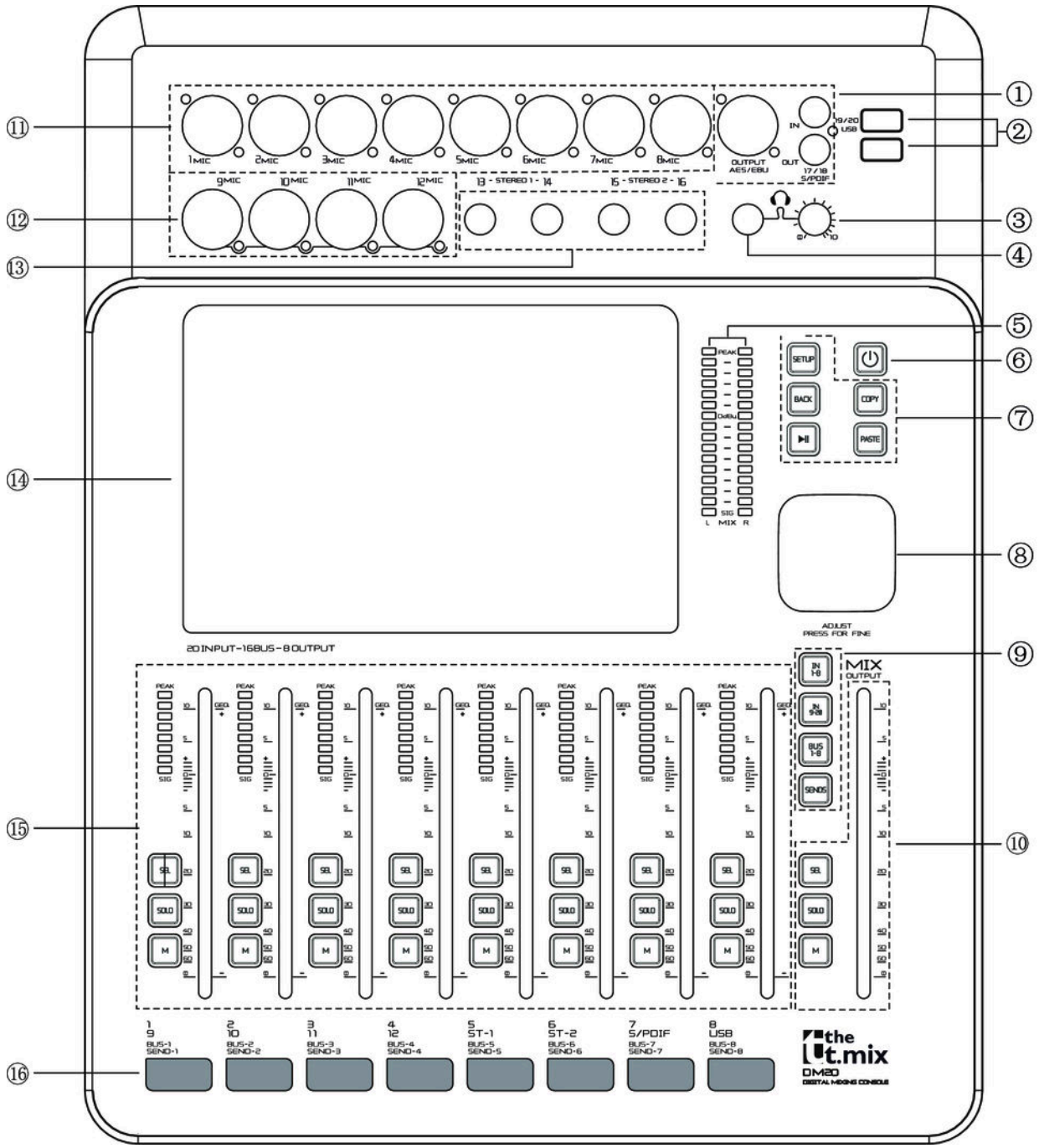
In case of doubt, do not put the rubber feet directly on the floor, but use felt-pad floor protectors or a carpet.

3 Features

- 12 × microphone inputs
- 2 × stereo inputs
- Stereo monitor output
- Headphones output
- 8 × XLR output sockets
- 16 × buses
  - 4 × mono output
  - 5 × stereo output
  - 1 × stereo monitor
- 7" IPS touch screen (1024 × 600) with adjustable angle
- 9 × motorized fader (100 mm)
- Rugged Neutrik connectors
- 8 × built-in effect modules
- 2 × USB ports for recording and playback, for software updates and for presets import and export
- Control via tablet possible (not included)

4 Connections and controls

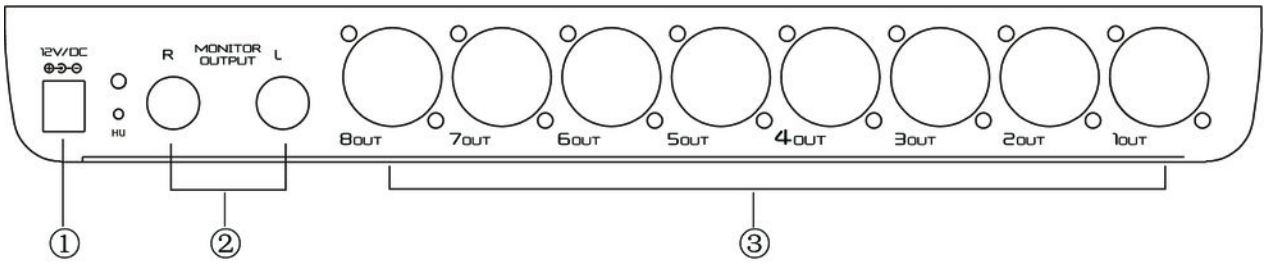
Front panel



1	S/PDIF input/output, AES/EBU output.
2	USB 2.0 ports.

3	Volume control for the headphones.
4	Headphones output.
5	16-segment master level display.
6	*[POWER]* Press the button for at least three seconds to switch the device on or off. Press the button for about one second to lock all functions and buttons against unintended changes. The display turns dark. Press button again to cancel the lock.
7	*[SETUP]*: Open main menu. *[BACK]*: Exit main menu. *[COPY]*, *[PASTE]*: Copy / paste channel parameter settings. *[PLAY]*, *[PAUSE]*: Play / pause audio files from a connected USB volume.
8	Parameter settings.
9	Toggle between *[INPUT1-8]*, *[INPUT9-12]*, *[ST-USB]*, *[BUS1-8]* *[SENDS]*: Send mode for the faders. If the system is in In1 or In2, press *[SEL]* to select a channel. Press *[SENDS]*. You can use the faders on the device to control the bus level (bus 1 - bus 8, LR). Then press *[MUTE]* to enable or disable the transfer function for the bus. When pressing *[SOLO]*, the fader automatically jumps to 0 dB.
10	Channel strip with *[SELECT]*, *[SOLO]*, *[MUTE/ON]* and motorized fader.
11	Eight microphone inputs (XLR).
12	Four Line inputs (XLR / phone jack combo sockets).
13	Two 1/4" stereo inputs.
14	7" touch screen.
15	*[SELECT]*, *[SOLO]*, *[MUTE/ON]*, 8-segment level display and 100 mm motorized fader.
16	Space for channel labelling.

Rear panel



1	Connection for the 12 V power supply unit.
2	1/4" stereo output (left / right).
3	Eight balanced XLR chassis plug outputs.

5 Operating

The DM20 can be controlled via tablet or directly via the buttons and fader on the device. To access and edit the individual functions via the controls on the device, see *Chapter 4 'Connections and controls' on page 9*. The individual functions and options for adapting the stored parameters are described in more detail in the following chapters.

5.1 Microphone inputs

The settings for input, equalizer, dynamics, bus send and output can be adjusted for each microphone input.

1	Display for the channel-related settings for phantom power, phase, delay, HPF, and effect.
2	Display of the channel-related EQ settings.
3	Display of the channel-related dynamics settings.
4	Display of channel-related transmission settings, including bus, level and pan.
5	Display of the channel description and the settings for pan, solo, mute, and signal level. A double-tap on *[CH1]* opens the menu and the keypad to enter a customized channel description.

Adjustment of the channel-related settings for phantom power, phase, delay, HPF, and effect

1	Button for switching the 48 V phantom power for a connected microphone on and off.
2	Channel selection.
3	*[Gain]*: To adjust the channel's input gain. Press *[REV]* to enable phase reversal. Press the button again to cancel phase reversal. When switched on, the function is deactivated.
4	*[Delay]*: Press *[IN]* to enable the delay function which can be used to delay the input signal. Setting the delay time between 0 ms…200 ms (default setting: 0 ms) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. When switched on, the function is deactivated.
5	*[HPF]* (High Pass Filter): Press *[IN]* to enable the selection of the frequency below which the signal should be attenuated. Setting the frequency between 16 Hz…400 Hz (default setting: 16 Hz) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. When switched on, the function is deactivated.
6	*[Insert]*: Use the buttons *[Modul]*, *[Delay]*, *[Reverb]* and *[GEQ]* to select the desired effect. An effect can only be assigned to one channel at a time. In case of multiple assignments, a warning message appears on the display. A maximum of two effects can be assigned to a channel, the priority corresponds to the order of the selection. A double-tap on *[FX]* opens the menu to edit the effect parameters.

Adjustment of channel-related EQ settings

1	Channel selection.
2	*[Bypass]*: Press *[Bypass]* to enable the Bypass function and disable the EQ function for the channel. Press the button again to deactivate the function. When switched on, the function is deactivated.
3	*[Flat]*: Press *[Flat]* to set the EQ characteristics to zero. When switched on, the function is deactivated.
4	Graphic 4-band equalizer: Four anchor points along the characteristic mark the basic frequencies of the four possible filter settings *[High]*, *[High Mid]*, *[Low Mid]* and *[Low]*. Move the anchor points to adjust the basic frequency as desired within the possible frequency range of 20 Hz…20 kHz.
5	Direct selection buttons for activating a filter setting: *[High]*, *[High Mid]*, *[Low Mid]* and *[Low]*.
6	Controller for adjusting the filter settings of the 4-band equalizer: ■ *[Freq]*: Base frequency, preset High = 4 kHz, High Mid = 1 kHz, Low Mid= 200 Hz and Low = 60 Hz. ■ *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. ■ *[Q]*: Bandwidth, selection between 0.5 (high) and 10.0 (low). Default setting: 0.5.
7	*[Library]*: Use the right arrow button to open the selection list *[select]* and select the memory location for the current filter settings. A total of 16 memory locations are available. If desired, use the embedded SW keyboard to adjust the description of the memory location. Confirm to save the filter settings with *[Save]*.

Adjustment of channel-related Dynamics settings

1	Channel selection.
2	*[Side Chain]*: Open the selection list with the right arrow button and select the desired setting pre- or post-EQ for the Dynamics unit (CH1…CH12, ST1…ST12).
3	*[Gate]*: Press *[IN]* to enable or disable the function. When switched on, the function is deactivated. Gate characteristic: The Y axis corresponds to the threshold value, and the X axis to the time factor. The curve profile corresponds to the signal behaviour with attack, hold, and release. Controller for adjusting the signal settings of the gate function: ■ *[Threshold]*: Threshold value in the range –80 dB…0 dB. Signals below threshold are not routed. ■ *[Attack]*: Slew rate in the range 0.5 dB…100 dB. Default setting: 3 ms. ■ *[Hold]*: Hold time in the range 2 ms…2000 ms. Default setting: 2 ms. ■ *[Release]*: Release time in the range 2 ms…2 s. Default setting: 350 ms. ■ *[Depth]*: Signal attenuation for signals below the threshold in the range 0 dB…–80 dB. Default setting: –80 dB.

4	*[Compressor]*: Press *[IN]* to enable or disable the function. When switched on, the function is deactivated. Controller to adjust the compressor settings: ■ *[Threshold]*: Threshold value in the range –80 dB…0 dB. Default setting: -20 dB. The threshold corresponds to the level above which the compressor begins to attenuate the signal. ■ *[Attack]*: Slew rate in the range 0.5 dB…100 dB. Default setting: 25 ms. ■ *[Release]*: Release time in the range 20 ms…5 s. Default setting: 350 ms. ■ *[Gain]*: Signal gain in the range –12 dB…+12 dB. Default setting: 0 dB. ■ *[Ratio]*: Ratio of input level change to output level change in the range 1.0…20.0. Default setting: 1.0.
5	*[Library]*: Use the right arrow button to open the selection list *[select]* and select the memory location for the current filter settings. A total of 16 memory locations are available. If desired, use the embedded SW keyboard to adjust the description of the memory location. Confirm to save the compressor settings with *[Save]*.
6	*[Bypass]*: Press *[Bypass]* to enable the bypass function for the dynamic functions Gate and Compressor. Press the button again to deactivate the function. When switched on, the function is deactivated.

Adjustment of channel-related transmission settings, including bus, level and pan

1	Channel selection.
2	*[Bus 1]*…*[Bus 8]*: Buttons for turning the channel on or off.
3	*[Pre-fader]*: Buttons for activating the signal tap before (pre-fader, for monitor purposes) or behind the channel fader (post-fader).
4	*[PAN]*: This control lets you arrange the signal within the stereo panorama. Default setting: 50/50. Double-tapping on the PAN field restores the value to the default value.
5	Volume control for the channel's output signal.

Adjusting of channel description and channel-related settings for pan, solo, mute, and signal level

1	Channel selection.
2	*[PAN]*: This control lets you arrange the signal within the stereo panorama. Default setting: 50/50. Double-clicking on the controller restores the value to the default value.
3	*[Solo]*: Press *[Solo]* to enable the Solo mode. Press the button again to deactivate the mode. When switched on, the function is deactivated.
4	*[Mute]*: Press *[Mute]* to mute the channel. Press the button again to unmute the channel. When switched on, the function is deactivated.
5	*[Fader]*: Controller to adjust the channel's signal level. Double-tapping on the controller sets the value to 0 dB.
6	*[Meter]*: Signal level display (post fader).

5.2 Stereo inputs

For the stereo inputs, the input, equalizer, dynamic, bus-send and output settings can be adjusted analogously to the microphone inputs.

Adjustment of the channel-related settings for phase, delay, HPF, and effect

1	Channel selection.
2	*[SUM]*: Press *[SUM]* to activate the sum function when connecting a single plug (left / right socket). The input signal is copied to the free channel and processed as a stereo signal. Press the button again to deactivate the function. When switched on, the function is deactivated.
3	*[REV]*: Press *[REV]* to enable phase reversal. Press the button again to cancel phase reversal. When switched on, the function is deactivated.
4	*[Trim]*: Press *[IN]* to enable the level adjustment. The adjustment in a range of –20 dB…20 dB (default setting: 0 dB) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. When switched on, the function is deactivated.
5	*[HPF]*: Press *[IN]* to enable the frequency selection. Setting the frequency between 16 Hz…400 Hz (default setting: 16 Hz) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. When switched on, the function is deactivated.
6	*[Insert]*: Use the buttons *[Modul]*, *[Delay]*, *[Reverb]* and *[GEQ]* to select the desired effect. An effect can only be assigned to one channel at a time. In case of multiple assignments, a warning message appears on the display. A maximum of two effects can be assigned to a channel, the priority corresponds to the order of the selection. A double-tap on *[FX]* opens the menu to edit the effect parameters.

Adjustment of channel-related EQ settings

1	Channel selection.
2	*[Bypass]*: Press *[Bypass]* to enable the Bypass function and disable the EQ function for the channel. Press the button again to deactivate the function. When switched on, the function is deactivated.
3	*[Flat]*: Press *[Flat]* to set the EQ characteristics to zero. When switched on, the function is deactivated.
4	Graphic 4-band equalizer: Four anchor points along the characteristic mark the basic frequencies of the four possible filter settings *[High]*, *[High Mid]*, *[Low Mid]* and *[Low]*. Move the anchor points to adjust the basic frequency as desired within the possible frequency range of 20 Hz…20 kHz.
5	Direct selection buttons for activating a filter setting: *[High]*, *[High Mid]*, *[Low Mid]* and *[Low]*.
6	Controller for adjusting the filter settings of the 4-band equalizer: ■ *[Freq]*: Base frequency, preset High = 4 kHz, High Mid = 1 kHz, Low Mid= 200 Hz and Low = 60 Hz. ■ *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. ■ *[Q]*: Bandwidth, selection between 0.5 (high) and 10.0 (low). Default setting: 0.5.
7	*[Library]*: Use the right arrow button to open the selection list *[select]* and select the memory location for the current filter settings. A total of 16 memory locations are available. If desired, use the embedded SW keyboard to adjust the description of the memory location. Confirm to save the filter settings with *[Save]*.

Adjustment of channel-related Dynamics settings

1	Channel selection.
2	*[Side Chain]*: Open the selection list with the right arrow button and select the desired setting pre- or post-EQ for the Dynamics unit (CH1…CH12, ST1…ST12).
3	*[Gate]*: Press *[IN]* to enable or disable the function. When switched on, the function is deactivated. Gate characteristic: The Y axis corresponds to the threshold value, and the X axis to the time factor. The curve profile corresponds to the signal behaviour with attack, hold, and release. Controller for adjusting the signal settings of the gate function: ■ *[Threshold]*: Threshold value in the range –80 dB…0 dB. Signals below threshold are not routed. ■ *[Attack]*: Slew rate in the range 0.5 dB…100 dB. Default setting: 3 ms. ■ *[Hold]*: Hold time in the range 2 ms…2000 ms. Default setting: 2 ms. ■ *[Release]*: Release time in the range 2 ms…2 s. Default setting: 350 ms. ■ *[Depth]*: Signal attenuation for signals below the threshold in the range 0 dB…–80 dB. Default setting: –80 dB.

4	*[Compressor]*: Press *[IN]* to enable or disable the function. When switched on, the function is deactivated. Controller to adjust the compressor settings: ■ *[Threshold]*: Threshold value in the range –80 dB…0 dB. Default setting: -20 dB. The threshold corresponds to the level above which the compressor begins to attenuate the signal. ■ *[Attack]*: Slew rate in the range 0.5 dB…100 dB. Default setting: 25 ms. ■ *[Release]*: Release time in the range 20 ms…5 s. Default setting: 350 ms. ■ *[Gain]*: Signal gain in the range –12 dB…+12 dB. Default setting: 0 dB. ■ *[Ratio]*: Ratio of input level change to output level change in the range 1.0…20.0. Default setting: 1.0.
5	*[Library]*: Use the right arrow button to open the selection list *[select]* and select the memory location for the current filter settings. A total of 16 memory locations are available. If desired, use the embedded SW keyboard to adjust the description of the memory location. Confirm to save the compressor settings with *[Save]*.
6	*[Bypass]*: Press *[Bypass]* to enable the bypass function for the dynamic functions Gate and Compressor . Press the button again to deactivate the function. When switched on, the function is deactivated.

Adjustment of channel-related transmission settings, including bus, level and pan

1	Channel selection.
2	*[Bus 1]…[Bus 2]*: Buttons for turning the channel on or off.
3	*[Pre-fader]*: Buttons for activating the signal tap before the channel fader (pre-fader, for monitor purposes) or behind the channel fader (post-fader).
4	*[PAN]*: This control lets you arrange the signal within the stereo panorama. Default setting: 50/50. Double-clicking on the PAN field restores the value to the default value.
5	Volume control for the channel's output signal.

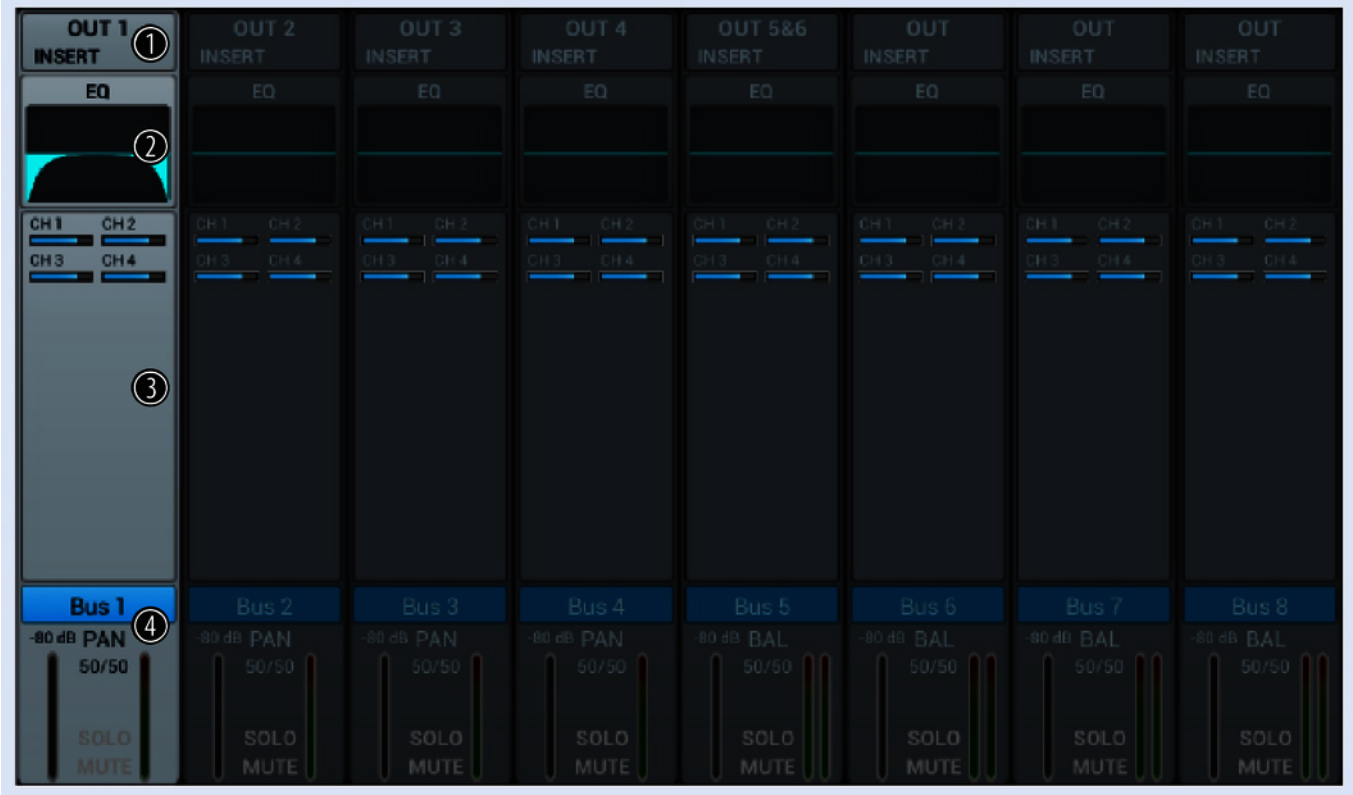
Adjusting of channel description and channel-related settings for pan, solo, mute, and signal level

1	Channel selection.
2	*[PAN]*: This control lets you arrange the signal within the stereo panorama. Default setting: 50/50. Double-clicking on the controller restores the value to the default value.
3	*[Solo]*: Press *[Solo]* to enable the Solo mode. Press the button again to deactivate the mode. When switched on, the function is deactivated.
4	*[Mute]*: Press *[Mute]* to mute the channel. Press the button again to unmute the channel. When switched on, the function is deactivated.
5	*[Fader]*: Controller to preset the fader level range. Double-clicking on the controller restores the value to the default value.
6	*[Meter]*: Signal level display (post fader).

5.3 Output channels

DM20 provides 14 output channels in total: 4 × mono *[Bus 1]*…*[Bus 4]*, 4 × stereo *[Bus 5]*…*[Bus 8]* and Master *[L&R]*. The main display shows the channels *[Bus 1]*… *[Bus 8]* . If you use *[SEL]* to enable the Master bus, the masters of the other channels are displayed.

For each output channel, the settings for insert, equalizer, channel-info, and output can be adjusted.



1	Displays the assigned outputs and effect settings.
2	Display of the channel-related EQ settings.
3	Display of channel info.
4	Display of the channel-related settings for pan, solo, mute, and signal level. A double-tap on *[OUT1]* opens the menu and the keypad to enter a customized channel description.

Outputs and effect settings

The signal of channels *[Bus 1]*…*[Bus 4]* can be routed to channels *[Bus 5]*…*[Bus 8]* and the master *[L&R]* . The signal of channels *[Bus 5]*…*[Bus 8]* can only be routed to the master *[L&R]* .

The description *[OUT]* corresponds to the assignment of the physical output: *[OUT3]* = physical output 3, *[OUT]* = no physical output assigned. The channel assignment is described in more detail in the section *Chapter 5.6 'Channel assignment' on page 33*.

1	Bus selection.
2	*[Bus 1]*…*[Bus 8]*: Buttons for turning the channel on or off.
3	*[Pre-fader]*: Buttons for activating the signal tap before the channel fader (pre-fader, for monitor purposes) or behind the channel fader (post-fader).
4	*[PAN]*: This control lets you arrange the signal within the stereo panorama. Default setting: 50/50. Double-clicking on the PAN field restores the value to the default value.
5	Volume control for the channel's output signal.
6	*[Insert]*: Use the buttons *[Modul]*, *[Delay]*, *[Reverb]* and *[GEQ]* to select the desired effect. An effect can only be assigned to one channel at a time. In case of multiple assignments, a warning message appears on the display. A maximum of two effects can be assigned to a channel, the priority corresponds to the order of the selection. A double-tap on *[FX]* opens the menu to edit the effect parameters.

Adjustment of channel-related EQ settings

1	Channel selection.
2	*[Bypass]*: Press *[Bypass]* to enable the Bypass function and disable the EQ function for the channel. Press the button again to deactivate the function. When switched on, the function is deactivated.
3	*[Flat]*: Press *[Flat]* to set the EQ characteristics to zero. When switched on, the function is deactivated.
4	Graphic 4-band equalizer: Four anchor points along the characteristic mark the basic frequencies of the four possible filter settings *[High]*, *[High Mid]*, *[Low Mid]* and *[Low]*. Move the anchor points to adjust the basic frequency as desired within the possible frequency range of 20 Hz…20 kHz.
5	Direct selection buttons for activating a filter setting: *[High]*, *[High Mid]*, *[Low Mid]* and *[Low]*.
6	Controller for adjusting the filter settings of the 4-band equalizer: ■ *[Freq]*: Base frequency, preset High = 4 kHz, High Mid = 1 kHz, Low Mid= 200 Hz and Low = 60 Hz. ■ *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. ■ *[Q]*: Bandwidth, selection between 0.5 (high) and 10.0 (low). Default setting: 0.5.
7	*[Library]*: Use the right arrow button to open the selection list *[select]* and select the memory location for the current filter settings. A total of 16 memory locations are available. If desired, use the embedded SW keyboard to adjust the description of the memory location. Confirm to save the filter settings with *[Save]*.

Adjustment of the channel-related settings for pan, solo, mute, and signal level

1	Bus selection.
2	*[Delay]*: Press *[IN]* to enable the delay function. Setting the delay time between 0 ms…200 ms (default setting: 0 ms) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. When switched on, the function is deactivated.
3	*[PAN]*: This control lets you arrange the signal within the stereo panorama. Default setting: 50/50. Double-clicking on the controller restores the value to the default value.
4	*[Solo]*: Press *[Solo]* to enable the Solo mode. Press the button again to deactivate the mode. When switched on, the function is deactivated.
5	*[Mute]*: Press *[Mute]* to mute the channel. Press the button again to unmute the channel. When switched on, the function is deactivated.
6	*[Fader]*: Controller to preset the fader level range. Double-clicking on the controller restores the value to the default value.
7	*[Meter]*: Signal level display (post fader).

5.4 System settings

In this menu, system parameters and device information can be displayed and adjusted.

1	Display field for the description of a scene.
2	*[Information]*: Displays the system version and serial number of the device as well as the IP address.
3	*[Sample Rate]*: Sample rate display.
4	*[Delay Unit]*: Buttons to select the unit for Delay time display. Default setting: ms. The unit starts with the last selected setting after switching off.
5	*[System]*: Selection buttons for opening the menus *'Maintenance'*, *'Home Screen'* and *'Setup Wifi'*. Only available in Debug mode.

6	*[Brightness]*: Display brightness indicator. Default setting: three fields. Adjust the setting by touching the fields. The unit starts with the last selected setting after switching off.
7	*[Crossover]*: To turn on the Crossover function for bus 8, press *[IN]*. Channel 8 then operates in bass mode. The crossover frequency can be adjusted with the associated controller in a range of 40 Hz…300 Hz. The edge steepness is 24 dB/oct. To turn on the Crossover function for Master L/R, press *[IN]*. The master channel then operates in full-range mode. The crossover frequency can be adjusted with the associated controller in a range of 40 Hz…300 Hz. The edge steepness is 24 dB/oct.

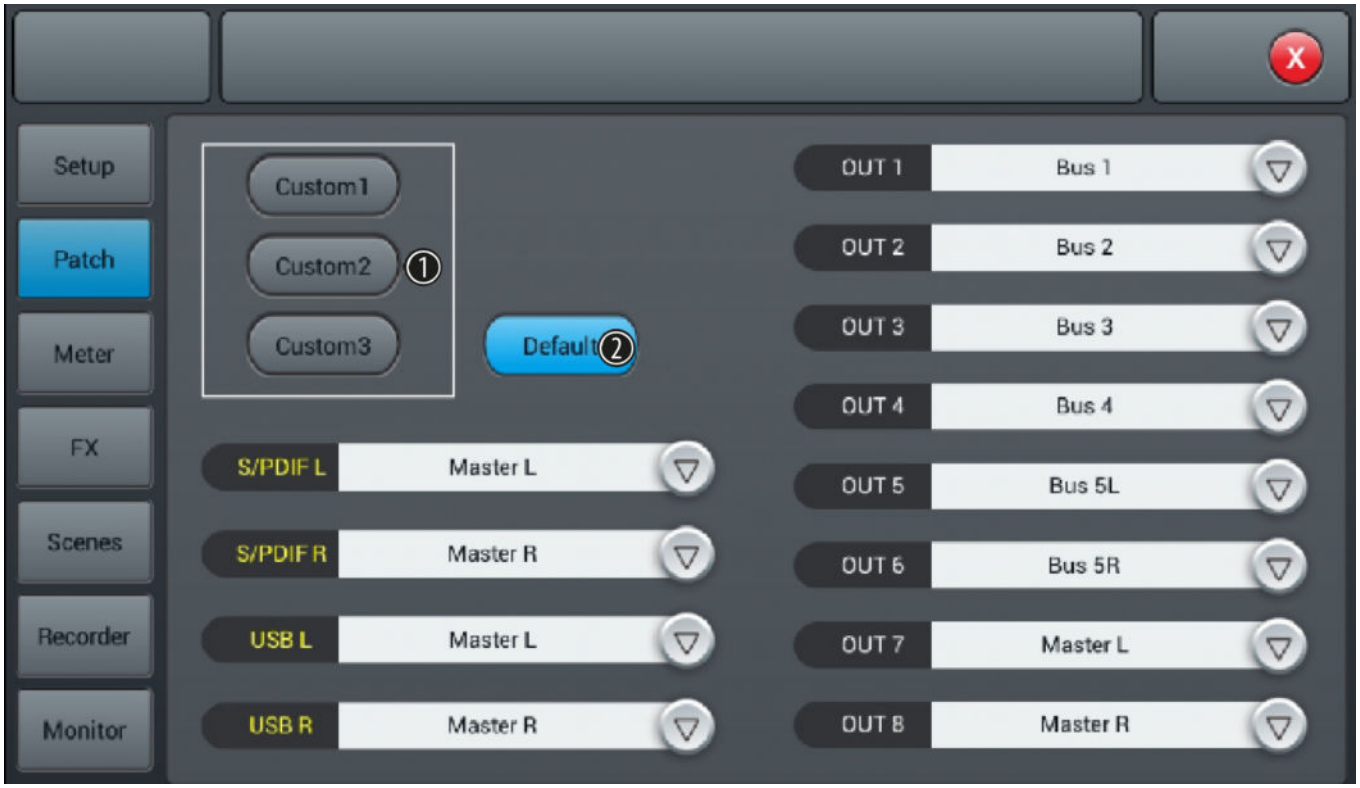
5.5 System menu ‘Maintenance’

Various maintenance and service functions can be performed in this menu.

1	*[Update from USB]*: Connect a USB data source containing the update file and press *[Update from USB]*. Confirm the security prompt *‘After the update the System will reboot automatically. Are you sure you want to update the System?’* and follow the instructions on the display.
2	*[Factory Reset]*: To reset the device to its factory default settings, press *[Factory Reset]*. Confirm the security prompt *‘Do you want to do a Factory Reset? This reset your Settings to factory defaults. The System will restart automatically after finishing’* with *[Factory Reset]*. This process restores all parameters to the factory settings and deletes stored data! If necessary, export all user settings.
3	*[Toggle Dev Mode]*: Debug mode. Only for experienced users.
4	*[Android Home Screen]*: Debug mode. Only for experienced users.
5	*[Import Settings]*: Debug mode. Only for experienced users.
6	*[Export Settings]*: Debug mode. Only for experienced users.
7	*[Calibrate Screen]*: To calibrate the display, press *[Calibration Screen]*. Confirm the security prompt *‘this will start a calibration software for your touch screen. Please touch the white crosses. If the calibrations messes up, you will have to connect a mouse to the device and repeat it’* with *[Calibration Screen]*. If necessary, this process can be repeated as desired.
8	*[Save Log]*: Debug mode. Only for experienced users.

5.6 Channel assignment

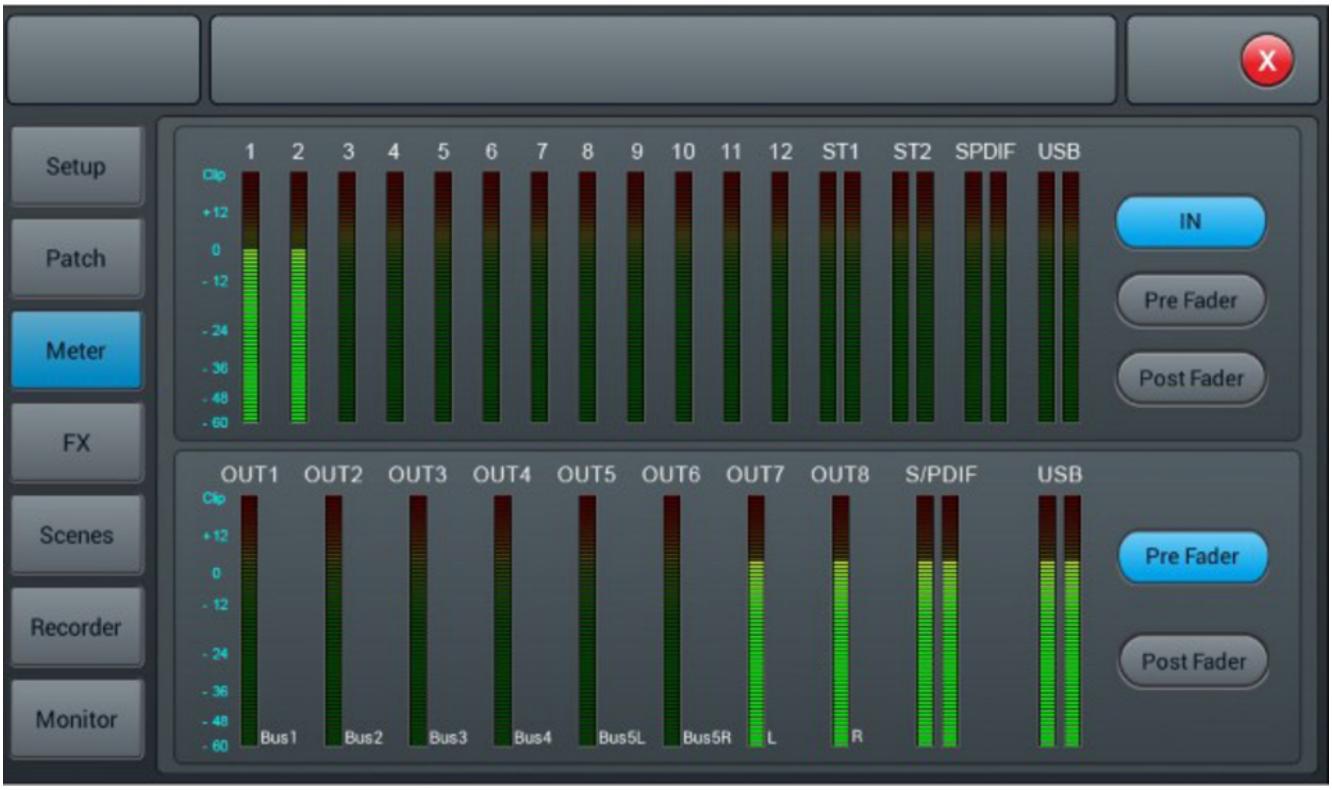
In this menu, the assignment of the channels to the available outputs can be adjusted.



1	*[Custom]*: Press *[Custom1]*, *[Custom2]* or *[Custom3]* to adjust the channel assignment. Use the arrow buttons to open the drop-down list of an output and highlight the desired channel to assign it. The outputs S/PDIF L and S/PDIF R as well as USB L and USB R can only be assigned in pairs or to a master. The unit starts with the last selected setting after switching off.
2	*[Default]*: Press *[Default]* to restore the channel assignment in delivery condition: Bus 1…Bus 6 to OUT 1…OUT 6, Master L and Master R to OUT 7/8, S/PDIF OUT and USB OUT.

5.7 Input and output level

The settings for input and output levels can be adjusted in this menu.



The input signals are processed in the IN, pre-fader and post-fader modes. Default setting: Pre-Fader. The selection is made using the three buttons to the right of the input displays.

The output signals are processed in the pre-fader and post-fader modes. Default setting: Pre-Fader. The selection is made using the two buttons to the right of the output displays.

5.8 Effects settings (FX menu)

The settings of the available effects can be adjusted in this menu.

1	Use the buttons *[Modul]*, *[Delay]*, *[Reverb]* and *[GEQ]* to open the parameters menu. Adjust the values as described. All changes are applied immediately.
2	*[Busses]*: Channel assignment. An effect can only be assigned to one channel at a time. In case of multiple assignments, a warning message appears on the display. A maximum of two effects can be assigned to a channel, the priority corresponds to the order of the selection.

Modulation

Open the menu by double-tapping on *[Modul1]* or *[Modul2]* in the FX menu.

1	Effects selection
2	*[Type]*: Use the right arrow button to open the selection list *[Select]* and select the desired effects type from: *'Chorus Slow/Fast'*, *'Flanger Slow/Fast'*, *'Celeste Slow/Fast'*, *'Rotor Slow/Fast'*.
3	*[Dry – Wet]*: Controller to adjust the effect portion of the unprocessed signal in a range of 0…100. Default setting: 0.
4	*[EQ LS]* LS characteristic *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. Default setting: 0 dB. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. *[Freq]*: Frequency adjustment in a range of 20 Hz…200 Hz (default setting: 100 Hz) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value.

5	*[EQ HS]* HS characteristic *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. Default setting: 0 dB. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. *[Freq]*: Frequency adjustment in a range of 1.5 kHz…15 kHz (default setting: 6.3 Hz) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value.
6	*[Speed]*: Controller for adjusting the effects speed in a range of 50…200. Default setting: 100. Press on the controller to activate the fine adjustment. *[Intensity]*: Controller for adjusting the effects depth in a range of 50…200. Default setting: 100. Press on the controller to activate the fine adjustment. *[Pre Delay]*: Controller for adjusting the pre-delay time in a range of 0 ms…100 ms. Default setting: 0 ms. Press on the controller to activate the fine adjustment.

Delay Open the menu by double-tapping on *[Delay1]* or *[Delay2]* in the FX menu.

1	Effects selection
2	*[Type]*: Use the right arrow button to open the selection list *[Select]* and select the desired effects type from: *'One Echo 1/4'*, *'Two Echo 1/8'*, *'Three Echo 1/16'*, *'Three Echo 1/16 Delayed'*, *'Four Echo 1/16'*, *'One Echo 1/4 with 4 Reflect'*.
3	*[Dry – Wet]*: Controller to adjust the effect portion of the unprocessed signal in a range of 0…100. Default setting: 0.
4	*[EQ LS]* LS characteristic *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. Default setting: 0 dB. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. *[Freq]*: Frequency adjustment in a range of 20 Hz…200 Hz (default setting: 100 Hz) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value.

5	*[EQ HS]* HS characteristic *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. Default setting: 0 dB. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. *[Freq]*: Frequency adjustment in a range of 1.5 kHz…15 kHz (default setting: 6.3 Hz) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value.
6	*[Factor]*: Controller to adjust the ratio of delay time and tempo in a range of 1/32…6. Default setting: 1. Press on the controller to activate the fine adjustment. *[Tempo]*: Controller for tempo adjustment in a range of 40 BPM…240 BPM. Default setting: 80. Press on the controller to activate the fine adjustment. *[Tap Tempo]*: Button for adjusting the tempo by keystroke. Press the button at least three times in succession at the desired tempo to accept the value in the system. *[Delay Time]*: Controller for adjusting the delay time in a range of 0 ms…2000 ms. Default setting: 750 ms. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. The delay time can be defined by the parameters factor and tempo. The parameter factor specifies the normal setting, Tempo is used for the fine adjustment. *[Feedback]*: Controller for adjusting the feedback in a range of 0…90. Default setting: 0. Press on the controller to activate the fine adjustment.

Reverb Open the menu by double-tapping on *[Reverb1]* or *[Reverb2]* in the FX menu.

1	Effects selection
2	*[Type]*: Use the right arrow button to open the selection list *[Select]* and select the desired effects type from: *'Hall Bright'*, *'Hall Warm'*, *'Room Bright'*, *'Room Warm'*, *'Plate Bright'*, *'Plate Warm'*.
3	*[Dry – Wet]*: Controller to adjust the effect portion of the unprocessed signal in a range of 0…100. Default setting: 0.
4	*[EQ LS]* LS characteristic *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. Default setting: 0 dB. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. *[Freq]*: Frequency adjustment in a range of 20 Hz…200 Hz (default setting: 100 Hz) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value.

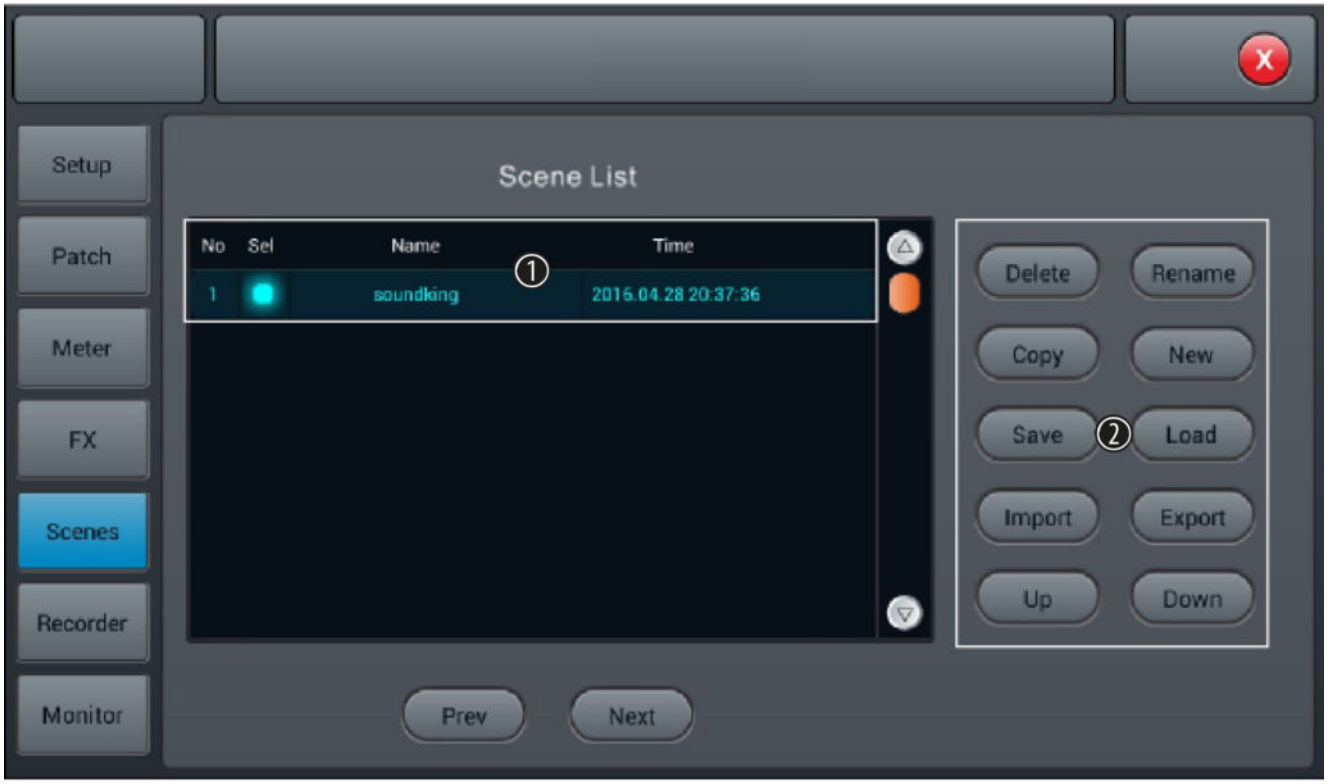
5	*[EQ HS]* HS characteristic *[Gain]*: Input gain, the signal strength can be increased or decreased by 18 dB. Default setting: 0 dB. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. *[Freq]*: Frequency adjustment in a range of 1.5 kHz…15 kHz (default setting: 6.3 Hz) is done using the hardware controller on the device or the software controller on the display. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value.
6	*[Time]*: Controller to adjust the runtime depending on a virtual room size in a range of 0 s…15 s. Default setting: 8 s. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. Runtime settings for the various effect types: ■ Reverb: Min. 0.8 s, max. 12 s, default setting 1.6 s ■ Room: Min. 0.4 s, max. 8 s, default setting 0.8 s ■ Plate: Min. 0.4 s, max. 6 s, default setting 0.6 s

GEQ Open the menu by double-tapping on *[GEQ1]* or *[GEQ2]* in the FX menu.

1	Effects selection
2	*[Library]*: Use the right arrow button to open the selection list *[select]* and select the settings (preset 1…16) that you want to enable or customize. If desired, use the embedded SW keyboard to adjust the values. Confirm to save the new settings with *[Save]*.
3	GEQ matrix of frequencies and gain settings. Adjust the settings with the controls as desired.
4	*[Bypass]*: Press *[Bypass]* to enable the Bypass function and disable the effect for the channel. Press the button again to deactivate the function. When switched on, the function is deactivated. *[Flat]*: Press *[Flat]* to set all controllers of the GEQ matrix to zero.
5	Fader selection.

5.9 Scene selection

In this menu, the available scenes can be selected and adjusted, as well as new scenes can be created.



1	*[Scene List]*: List of available scenes. To select the scene, check the box *[Sel]* box.
2	*[Delete]*: Selection to delete a scene. Highlight the desired scene and confirm the security prompt *'Are you sure you Want to delete this scene?'* with *[Yes]*. *[Rename]*: Selection to rename a scene. Highlight the desired scene, press the button and use the SW keyboard to enter a desired description. Confirm the input with *[Save]*. *[Copy]*: Selection to copy a scene. Highlight the desired scene and press the button. The copy will be labelled with the source's name plus *'*_copy'*. *[New]*: Selection to create a new scene. New scenes are added to the list after the highlighted scene. The description for new scenes consists of the word *'New'* and an automatically assigned consecutive number. *[Save]*: Selection to save the current settings under the highlighted scene. *[Load]*: Selection to load the highlighted scene. *[Import]*: Selection for importing a scene from a USB storage medium. Press the button and select the desired scene from the list *'Compressed file list'*. If the scene could be successfully imported, the message *'Import success'* appears. Confirm with *[Confirm]*. If no USB storage medium is detected, the message *'No USB stick detected, please reconnect and try again.'* appears. Check the storage medium for proper connection. If no scene can be read on the USB storage medium, the message *'Scenes file not found on USB stick!'* appears. If a scene with an identical description is already stored in the device memory, *'*_USB'* will automatically be added to the original description of the import file. *[Export]*: Selection for exporting a scene to a USB storage medium. Highlight any number of scenes for export in the selection list (*[Sel]*) and press the button to start the export. If all highlighted scenes could be successfully exported, the message *'Export success'* appears. Confirm with *[Confirm]*. If no USB storage medium is detected, the message *'No USB stick detected, please reconnect and try again.'* appears. Check the storage medium for proper connection. *[Up]*: Selection to move the highlighted scene by one list position up. *[Down]*: Selection to move the highlighted scene by one list position down. *[Prev]*: Return to the previous scene. *[Next]*: Move to the next scene.

5.10 Recording function

In this menu, the available scenes can be selected and adjusted, as well as new scenes can be created.

1	Control buttons for the playback and recording functions of the unit.
2	*[Record]*, *[Playback]*: Level indicators for the playback and recording functions of the unit.
3	*[Play List]*: List of audio files found on a connected USB storage media.
4	Record button. The device records the Master L / R signal, the recording is stored as a WAV file on a connected USB storage medium.

5.11 Monitoring setting

This menu allows you to adjust the monitoring settings.

1	*[Oscillator]*: With this function the device can be tested and calibrated. Turn the function on and off with *[On]* . *[Type]*: Signal type selection (*[White noise]*, *[Sine wave]*, *[Pink noise]*). *[Level]*: Level adjustment in a range of -8 dB…0 dB (default setting: -30 dB. Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. *[Frequency]*: Frequency setting for the signal type *[Sine wave]* in a range of 10 Hz…20 kHz (default setting: 1 kHz). Press on the controller to activate the fine adjustment. Double-clicking on the value accepts it as the default value. *[Destination]*: Activate the desired target channel by double-tapping the list entry.
2	*[Monitor/Phones]* *[Level]*: Level adjustment of headphones / monitor outputs in a range of –8 dB…0 dB (default setting: -20 dB. Press on the controller to activate the fine adjustment. Double-tapping on the value accepts it as the default value. *[Mute]*: Button to mute the headphones / monitor outputs.
3	*[Solo]*: Once a solo button is pressed on the device, an AFL or PFL signal is sent to the monitor. In the PFL mode, the signal is tapped before the faders. For stereo channels, the mix of the right and left channels are sent as a combined signal to the monitor. In the AFL mode, the signal is tapped behind the faders. *[AFL/PFL]*: Toggle button to change AFL and PFL mode. *[Trim]*: Level adjustment of AFL / PFL signals in a range of –8 dB…0 dB (default setting: -20 dB. Press on the controller to activate the fine adjustment. Double-tapping on the value accepts it as the default value.

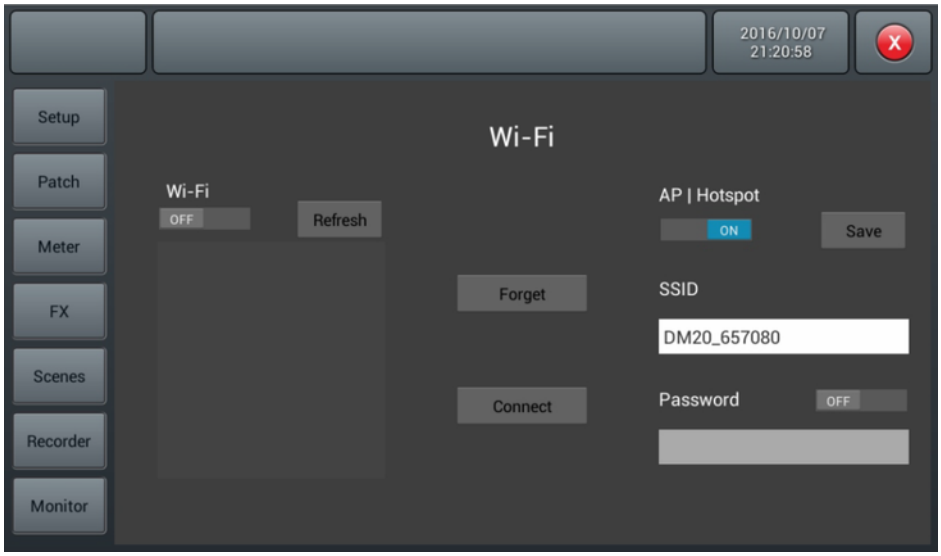
5.12 WiFi / AP operation

In this menu, the settings for WiFi operation can be set. Make sure the WiFi module is connected to the device, and then press *[Setup]* to open the menu. „Device Settings“.

Press *[SetupWifi]*. When the WiFi module is connected to the device, the following screen appears.

If necessary, activate the WiFi function *[WiFi - ON]* and tap the desired list entry to select a network. Press *[Connect]* to establish the connection. Use *[Refresh]* to perform a new search for networks, use *[Forget]* to delete the marked network from the list.

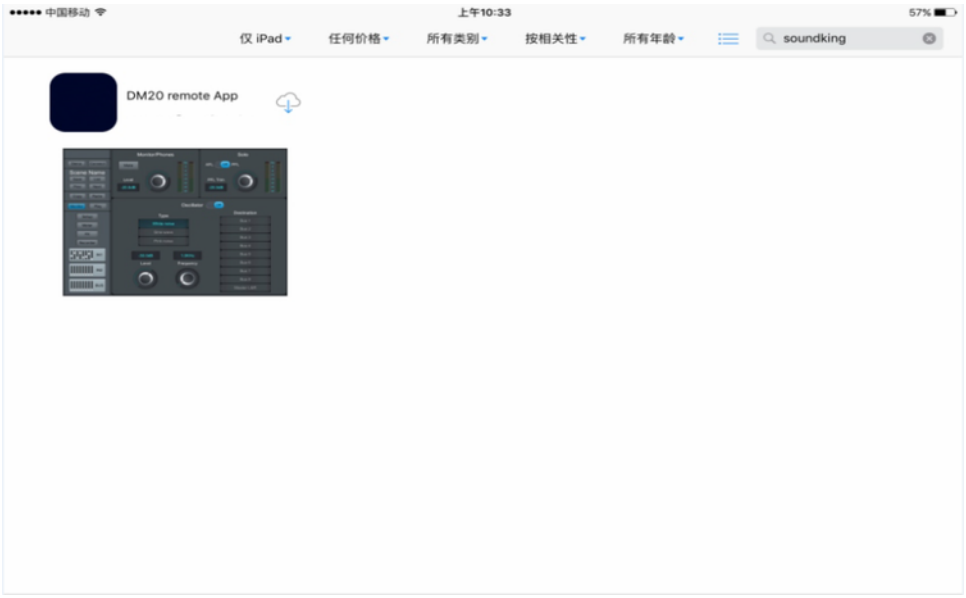
If there is no WiFi network available, you can operate the unit in the AP / Hotspot mode.



Deactivate the WiFi function *[WiFi - OFF]* and activate the AP function *[AP-/Hotspot - ON]*. Enter the standard AP name for the mixer under *[SSID]*. This name can be changed. Set a password if desired.

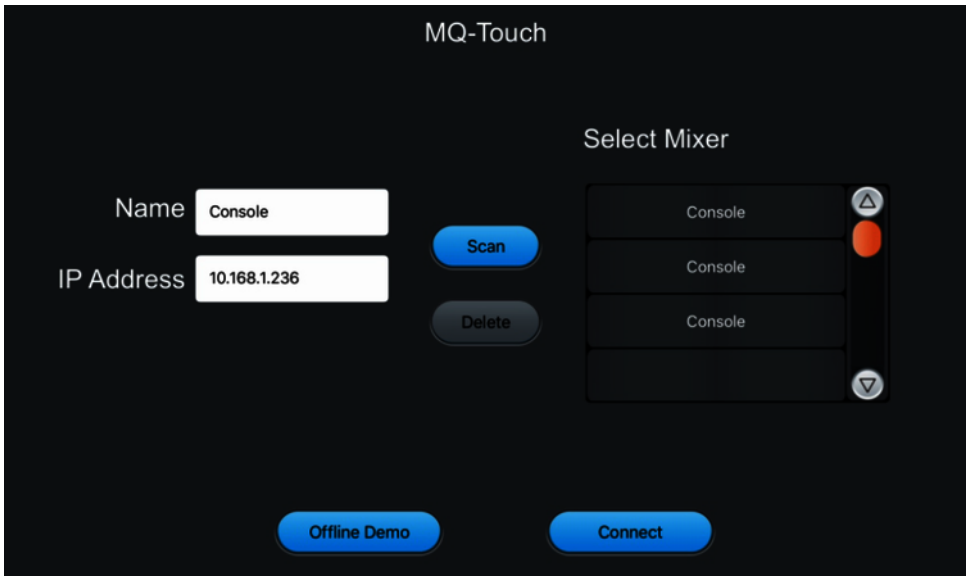
iPad control

If you want to control the device via an iPad, first download the necessary app from the Apple Store. Use the search term ‘DM20’ or ‘soundking’.



Make the necessary connection settings on the iPad.

Open the app on the iPad.



Enter the mixer name and the IP address manually or select the mixer from the list of found devices (*[Scan]*). Use *[Connect]* to establish the connection. Use *[Delete]* to delete a marked list entry.

After a successful connection the following screen appears:

6 Technical specifications

Input connectors	Voltage supply		Connector for power adapter
	Line		4 × XLR / 1/4" combo jack
			2 × 1/4" stereo phone socket
	Microphone		8 × XLR chassis socket, 3-pin
	USB port		1 × USB 2.0
	Digital interface		1 × S/PDIF
Output connectors	Buses	Mono	4 × XLR chassis socket, 3-pin
		Stereo	4 × XLR chassis socket, 3-pin
		Headphones	1 × 1/4" stereo phone socket
		Master	2 × 1/4" stereo outputs (left / right).
	Digital interface		1 × S/PDIF
			1 × AES/EBU
Digital signal processing			Digital signal processor: 40 bit
			A/D-D/A converter: 24 bit
			Sampling rate: 192 kHz
Phantom power			48 V
Power supply			Power adapter (12 V, ⎓, centre negative)
Dimensions (W × H × D)			429 mm ×83 mm ×335 mm
Weight			3.25 kg
Ambient conditions		Temperature range	0 °C…40 °C
		Relative humidity	50 %, non condensing

Further information

Buses	16
Physical inputs	20
Max. number of channels	20
DCA	No
External card slot	No
Touch Screen	Yes
Offline Editing	No
Detachable stage box	No
External power supply	Yes
Backup power supply	No
19" rack format	No
Built-in audio player	Yes

7 Plug and connection assignment

Introduction

This chapter will help you select the right cables and plugs to connect your valuable equipment in such a way that a perfect sound experience is ensured.

Please note these advices, because especially in 'Sound & Light' caution is indicated: Even if a plug fits into the socket, an incorrect connection may result in a destroyed power amp, a short circuit or 'just' in poor transmission quality!

Balanced and unbalanced transmission

Unbalanced transmission is mainly used in semi-professional environment and in hifi use. Instrument cables with two conductors (one core plus shielding) are typical representatives of the unbalanced transmission. One conductor is ground and shielding while the signal is transmitted through the core.

Unbalanced transmission is susceptible to electromagnetic interference, especially at low levels, such as microphone signals and when using long cables.

In a professional environment, therefore, the balanced transmission is preferred, because this enables an undisturbed transmission of signals over long distances. In addition to the conductors 'Ground' and 'Signal', in a balanced transmission a second core is added. This also transfers the signal, but phase-shifted by 180°.

Since the interference affects both cores equally, by subtracting the phase-shifted signals, the interfering signal is completely neutralized. The result is a pure signal without any noise interference.

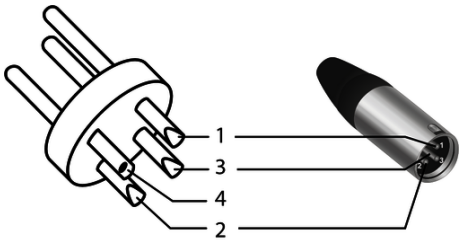
1/4" TS phone plug (mono, unbalanced)

1	Signal
2	Ground, shielding

1/4" TRS phone plug (mono, balanced)

1	Signal (in phase, +)
2	Signal (out of phase, –)
3	Ground

XLR plug (balanced)



1	Ground, shielding
2	Signal (in phase, +)
3	Signal (out of phase, –)
4	Shielding on plug housing (option)

8 Cleaning

Fan grids

The fan grids of the device must be cleaned of any contamination, such as dust, etc. on a regular basis. Before cleaning, switch off the device and disconnect mains-operated devices from the mains. Only use pH-neutral, solvent-free and non-abrasive cleaning agents. Clean the unit with a slightly damp lint-free cloth.

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) in its currently valid version. 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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