

M 20X Digital Mixer - User's Manual



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This document refers to Firmware version 158

M 20 series products offer all-in-one mixing, processing and routing capabilities, including a comprehensive set of recording and playback functions. The User Interface has been designed so that every parameter is reachable within few operations. All models are equipped with 20 analog inputs (16 of which are with remote controlled preamps) and 14 output channels, between the balanced analog outputs and the AES/EBU digital output.

M 20 series digital mixing consoles are based on floating-point DSP (digital signal processors), running at a sample rate of 48 kHz, ensuring maximum audio quality and low noise floor, an essential requirement for modern audio applications.

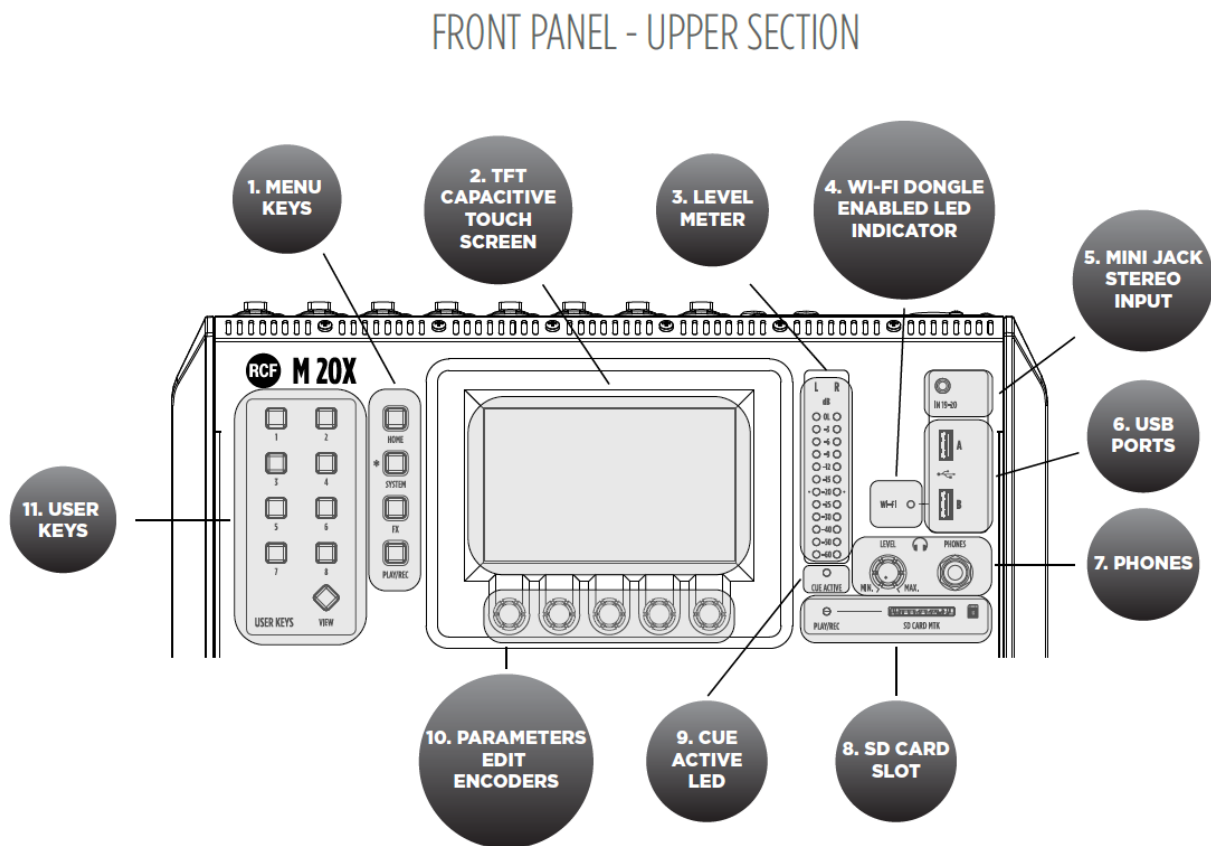
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1. OVERVIEW

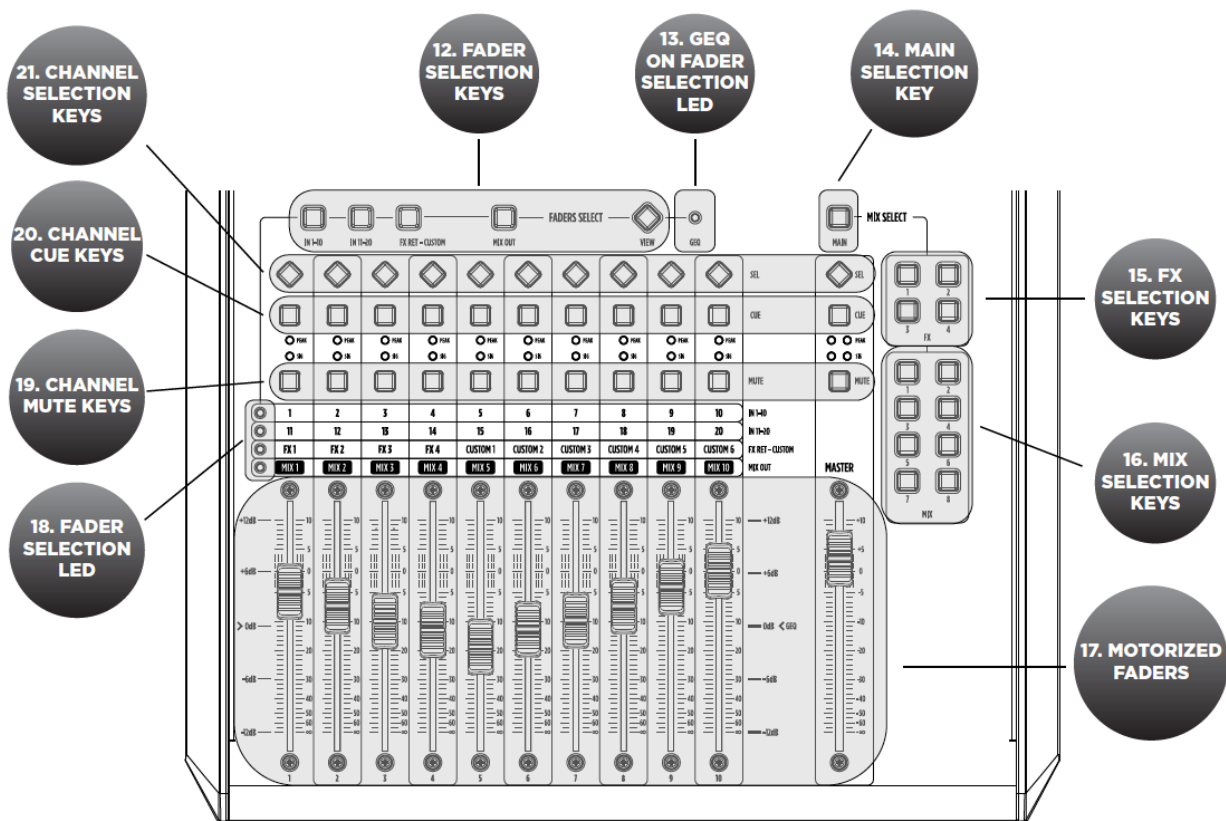
Hardware Description



- 1. MENU KEYS**
4 menu keys allow an intuitive and immediate navigation through menu pages.
- 2. TFT CAPACITIVE TOUCH SCREEN**
A highly responsive 5-inch TFT touchscreen offers intuitive navigation of all the available features, and can be optionally paired with an external tablet to augment interaction with the M 20X.
- 3. LEVEL METER**
This 12 LED elements level meter normally allows you to control the Main Mix output level. When a channel CUE button is pressed, the level meter shows the PFL level present in the selected channel. Keep the input level below the “-20” indication to avoid overloaded signals that can cause distortion.
- 4. WI-FI DONGLE ENABLED LED INDICATOR**
This led light up when the WI-FI AP function for the USB port “B” is enabled, allowing the use of a WiFi USB dongle.
- 5. MINI JACK STEREO INPUT 19-20**
Connect here your stereo line level sources like smartphones, laptops or others external audio devices.
- 6. USB PORTS**
Two USB host ports on the top panel are available for WiFi dongles, USB-MIDI devices, and USB mass storage devices that can be used for stereo audio record/ playback, system backups and firmware updates.
- 7. PHONES**
Connect your headphones here either for CUE or the Main Mix listening.

8. SD CARD SLOT
An integrated SD card multitrack engine offers a maximum of 20 simultaneous tracks at 24-bit, 48 kHz, with extensive routing options.
9. CUE ACTIVE LED
This led light up when one or more CUE button are pressed.
10. PARAMETERS EDIT ENCODERS
5 dedicated encoders allow an intuitive and immediate control of each function and parameter on the screen.
11. USER KEYS
A set of 8 User Keys with extensive programming option are always available, and offers immediate control of scene selection, play/record transport, tap tempo, user interface shortcuts. The USER KEYS functions can also be driven remotely via MIDI (through a MIDI-USB interface).

FRONT PANEL - LOWER SECTION



12. FADER SELECTION KEYS
4 layers of faders assignments allow immediate access to input channels 1-10 and 11-20, to FX returns and outputs.
13. GEQ ON FADER SELECTION LED
This LED lights up when the function Graphic EQ on Fader is enabled.
14. MAIN SELECTION KEY
The control surface can be assigned to the stereo MAIN mix buss; the MASTER fader is always associated to the output level of the selected bus.

15. FX SELECTION KEYS

The control surface can be assigned to 4 FX busses; the MASTER fader is always associated to the output level of the selected bus.

16. MIX SELECTION KEYS

The control surface can be assigned to 8 MIX busses; the MASTER fader is always associated to the output level of the selected bus.

17. MOTORIZED FADERS

11 x 100-mm motorized faders allow precise mix control with immediate visual feedback. Special care has been taken to minimize movement noise.

18. FADER SELECTION LED

These 4 leds light to show the current assigned layer of faders.

19. CHANNEL MUTE KEYS

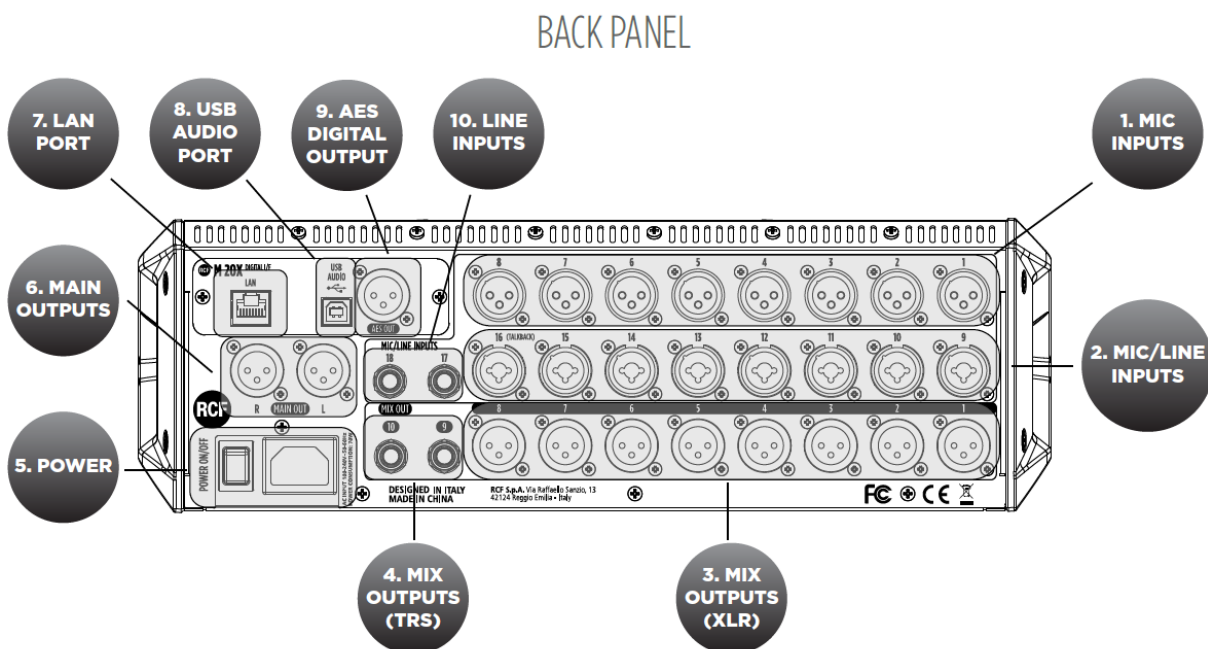
MUTE buttons when pressed inhibit the signal to flow to output bus or main mix paths.

20. CHANNEL CUE KEYS

The CUE keys allow to listen the signal present on the channel, through the cue bus routed to PHONES OUTPUT. All audio paths can be monitored at any time via the CUE bus, which features a real-time analyzer (RTA).

21. CHANNEL SELECTION KEYS

The SELECTION KEYS allow an intuitive and immediate navigation through channel functions and parameters.



1. MIC Inputs 1-8 Female XLR

Connect your Microphones to these remotely-controlled 60dB gain-range inputs. Use balanced XLR cables to obtain best performance from your microphones.

2. MIC/LINE Inputs 9-16 Combo

Input 9 to 16 provide Mic inputs on the XLR connection and Line input on the TRS jack connection.

3. MIX Outputs 1-8 Male XLR

Connect to these +24dBu balanced XLR outputs your stage monitors or external effects.

4. MIX Outputs 9-10 TRS

Connect to these +24dBu balanced TRS outputs your stage monitors or external effects.

5. POWER

Use this switch to turn On and Off your M 20X device. Connect to the VDE inlet the provided power cord.

6. MAIN OUTPUT

Connect your active speaker or your amplifier, in case of passive speakers, to these +24dBu balanced Output.

7. LAN PORT

The mixer can be remotely controlled via LAN, and an external Wi-Fi Access Point can be connected to the LAN port to communicate with remote control apps running on iOS and Android.

8. USB AUDIO PORT

A 24-track, 24-bit, 48-kHz audio interface is available and allows access to all inputs and several internal signal nodes. Extensive routing options allow both offline sound check and host-based effects processing.

9. AES DIGITAL OUTPUT

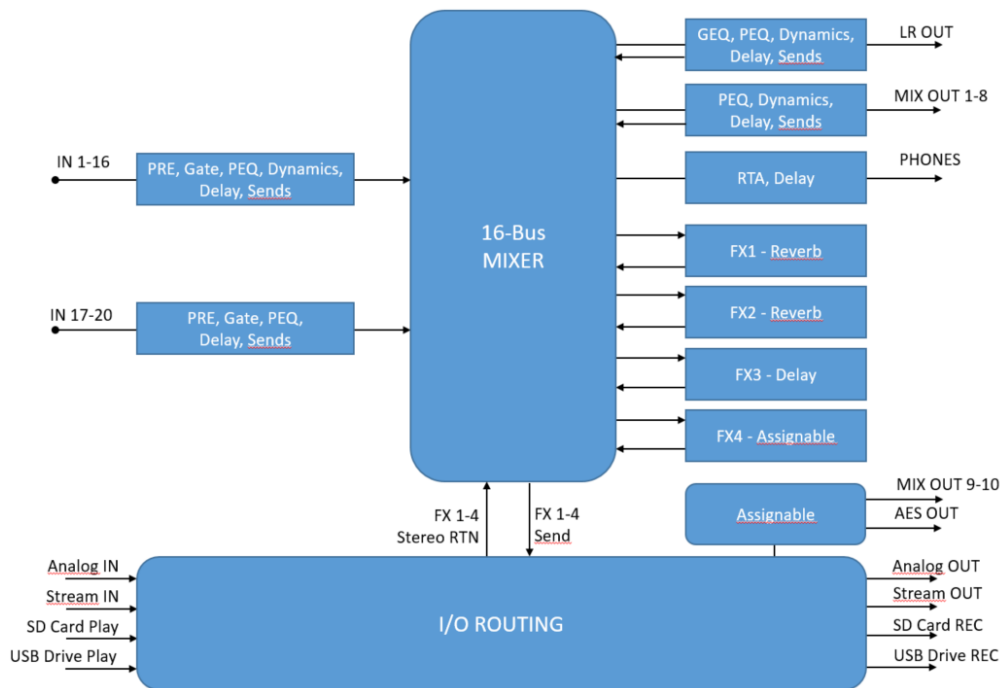
Connect here any AES/EBU device. Each of the audio output paths is routable to the AES/EBU port.

10. LINE INPUTS 17-18 TRS

Connect here your line level sources like keyboard, external audio device or other small analog consoles used for submix.

System Overview

The M 20X Digital Mixer is a feature-packed unit that includes several of the useful blocks required to arrange a good-sounding live act.



Signal processing capabilities of the M 20X Digital Mixer

A total of 16 summing bus are present in the M 20 Digital Mixer:

- MAIN LR bus
- FX SEND 1-4 bus
- MIX SEND 1-8 bus
- Stereo PHONES bus

Each of the 20 inputs features a 12 dB/oct HPF, a noise Gate, a Compressor/De-Esser (inputs 1-16 only), a flexible 4-band Parametric EQ, and a Delay line. The source can be selected between the analog inputs, the USB audio interface, the SD card player, into different insertion points for maximum flexibility.

M 20X boast 4 stereo FX engines available on dedicated busses, offering two high quality digital reverbs, a programmable delay and a 4th effect which can be configured as a modulation or a second delay. All FX Engines offer multiple algorithms to match the specific needs of a show.

A complete processing section is available on all outputs: a flexible 8-band Parametric EQ with several selectable modes that also allow different slopes, a Delay with up to 85 meters compensation, a Compressor/Limiter. A stereo 30-band Graphic Equalizer is available on the MAIN outputs for precise correction of the overall frequency response.

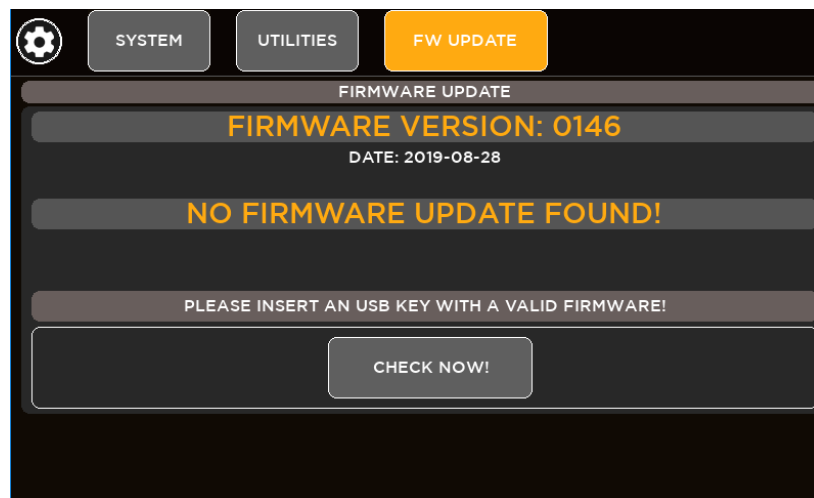
Extensive routing capabilities are available in the M 20 Digital Mixers to provide a wide flexibility for your live and studio sessions.

A fast reacting 5-inch capacitive touchscreen, 5 dedicated encoders and 4 menu keys allow an intuitive and immediate control of every function and parameter. You have full control of your live mix, all within one of the most compact systems on the market.

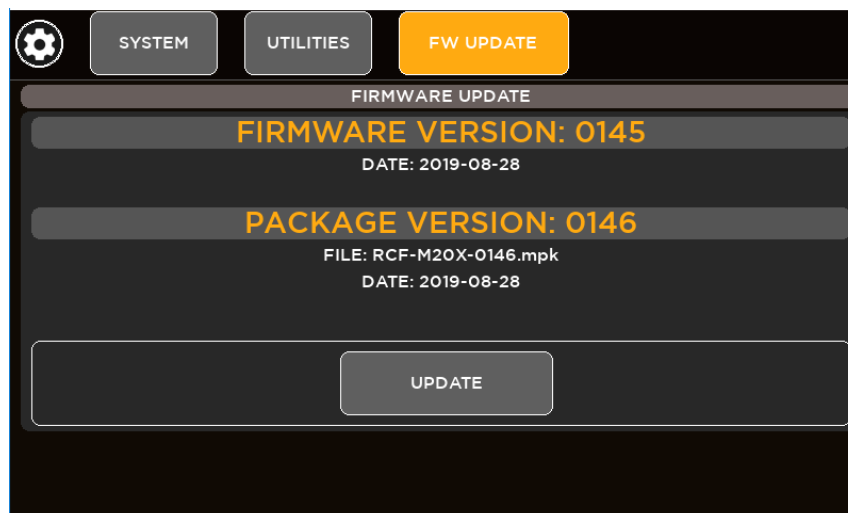
2. FIRMWARE UPDATE

FIRMWARE UPDATE PROCEDURE

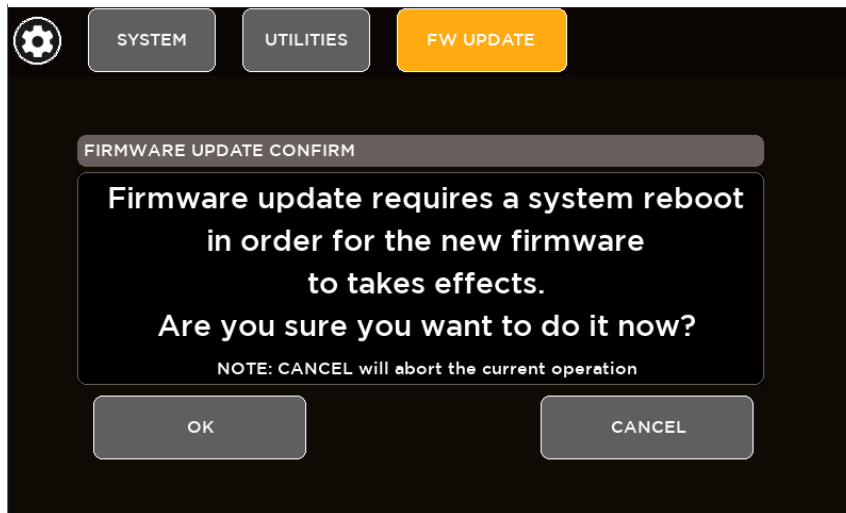
1. Download the latest firmware package available on the web page https://www.rcf.it/en_US/products/mixing-consoles/m-series/m-20-firmware-update
2. Unzip the .zip file and copy the **RCF-M20X-xxxx.mpk** file on the root directory of a FAT32 formatted USB stick. Be sure to have one .mpk file only in the USB stick, to avoid file mismatch.
3. Turn on the M 20X digital mixer.
4. Once the boot is completed, pressing SYSTEM button on the left side of the 5" touchscreen display, go to the page SYSTEM > UTILITIES > FIRMWARE UPDATE.



5. Insert your USB stick into the USB A port. The upper side shows the firmware version that is currently installed on the mixer. The bottom side shows the firmware version on the USB stick ready to be installed.
6. If the new package is not automatically detected, please press CHECK NOW



7. Once the new package is detected, press UPDATE and then confirm the system reboot required to apply the new firmware.



8. After a few seconds you will see a confirmation notice before mixer restart.



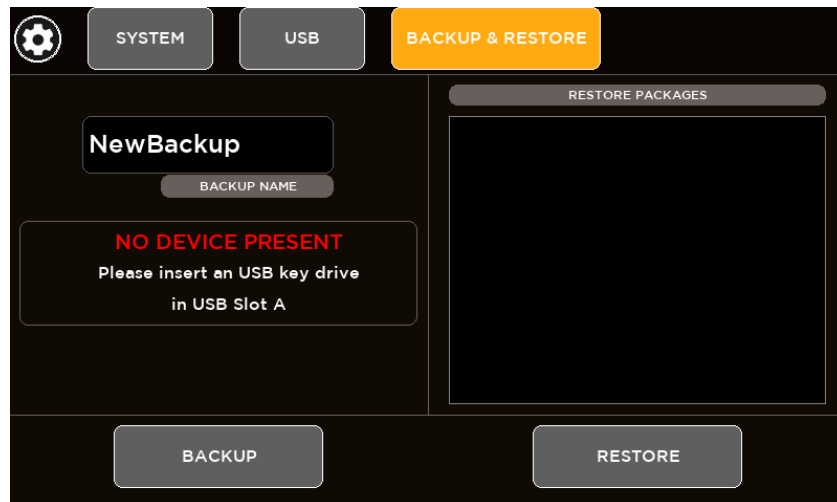
9. After rebooting the new features will be ready to be enjoyed.

3. BACKUP & RESTORE

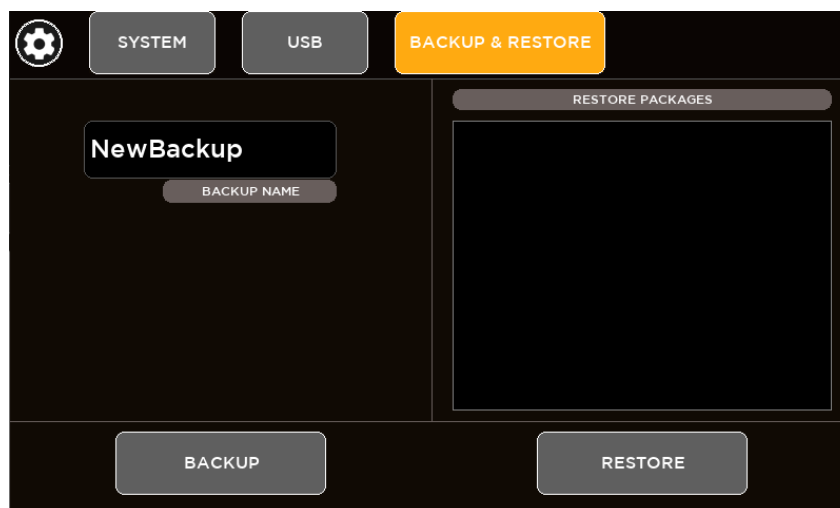
M 20 series digital mixers provide backup and restore utilities to save and recall the entire state of the mixer, including all presets, shows and global settings.

BACKUP FUNCTION PROCEDURE

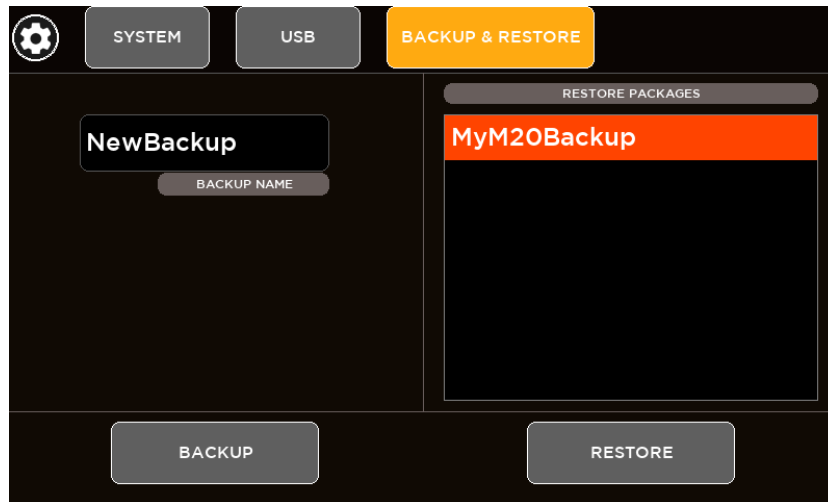
1. Go to page SYSTEM > USB STORAGE > BACKUP & RESTORE
2. If you do not connect a USB key drive, this screen will appear:



3. Insert your USB stick into the M 20 USB port A



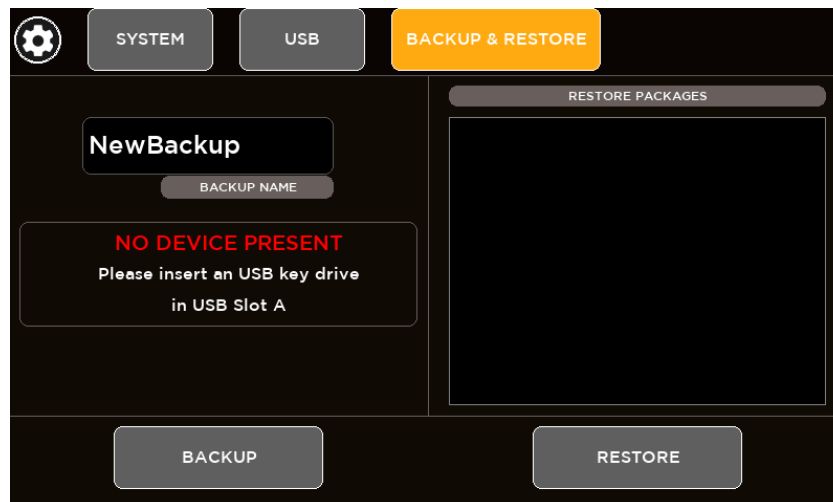
4. Type a name (a single word without space and special characters) of your backup in the BACKUP NAME area and then press the BACKUP button.



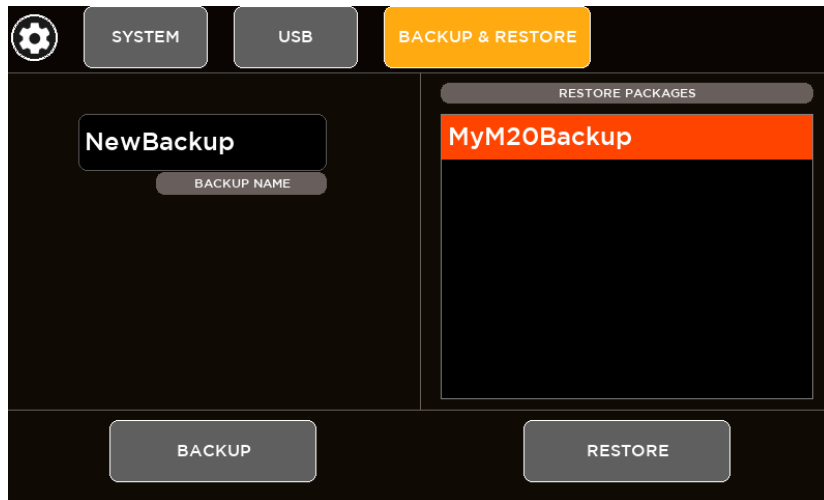
5. A full backup has been successfully created on the root of the USB stick (*.mbu file). The backup packages will be listed in the box on the right side of the page, ready to be restored.

RESTORE FUNCTION PROCEDURE

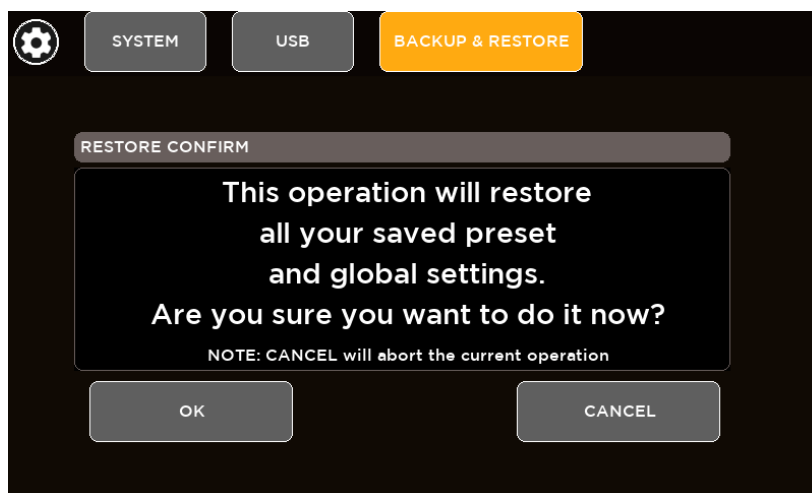
1. Go to page SYSTEM > USB STORAGE > BACKUP & RESTORE
2. If you do not connect a USB key drive, this screen will appear:



3. Insert your USB stick into the M 20 USB port A



4. From the list box in the right side of the page select the backup package that you want load on your mixer and then press RESTORE button. A message box will appear:



5. If you want to proceed, click on "OK"
6. The restore procedure has been completed

4. PROCESSING

Press any SEL button to select a channel and the touchscreen will display the dedicated channel processing. The display will automatically change every time the SEL button is pressed in order to cycling between the single processing pages. It's also possible to select the processing block touching the processing tabs on the upper side of the screen. Once a block is selected, the display changes accordingly and the parameters available in that section are assigned to surface encoders below the screen.

The screenshot shows a channel processing interface for channel 01. At the top, a yellow box highlights the 'Processing Tabs' which include icons for a microphone, EQ, dynamics, and faders. A yellow outline surrounds the main processing area, which is divided into sections for GAIN (20 dB), POLARITY, HPF FREQ (81.3 Hz), and DELAY (0 ms). A red box highlights the 'Encoder parameters' at the bottom, showing 'ANALOG', '20 dB', '81.3 Hz', and '0 ms'. A green box highlights the 'Channel strip area' on the left, showing a level meter at -7.3 dB and a pan control set to 'C'. A blue box highlights the 'Processing section' containing touch buttons for POLARITY, HPF, ROUTING, and DELAY. A red box highlights the 'Encoder parameters' at the bottom. A green box highlights the 'Channel strip area' on the left. A red box highlights the 'Encoder parameters' at the bottom. A blue box highlights the 'Processing section' containing touch buttons for POLARITY, HPF, ROUTING, and DELAY. A red box highlights the 'Encoder parameters' at the bottom.

Channel Number

Processing Tabs: Touch the block or press SEL to change view. The yellow outline indicate the current view. Each block also shows the preview of processing settings.

Processing section hold touch buttons and display boxes of to the encoders values

Encoder parameters change accordingly to the processing page

This status bar shows the on-off status of each function available on the selected channel.

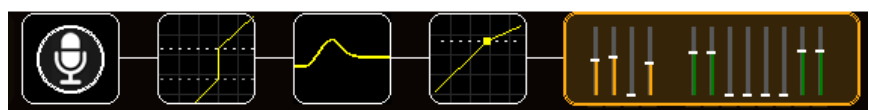
Encoder 1 is fixed to PAN control related to the selected Input or Output channel

Channel strip area that always shows the principal information of the selected channel: name, meter bar, fader level value, pan value and on-off processing status bar

INPUT PROCESSING

The Input Processing screen is divided into the following tabs (from left to right):

- CHANNEL
- GATE
- PARAMETRIC EQ
- DYNAMICS
- SENDS



You can touch each of these section to jump to the relevant page.

CHANNEL SECTION

The first block allow the channel settings accordingly to the input.

Input channels 1-16

PREAMP GAIN Value display

Phase inverter

Phantom Enable

HPF frequency value display

12 dB/oct HPF On/Off

Stereo Pairing Enable

Delay Time value display

Encoder Parameters assignment

Channel Rename Press Enter to confirm

Set the Input Routing: for each source type select which input is routed to the selected channel processing

The CHANNEL parameters assigned to the Encoders are:

IN SOURCE: this parameter allows to select the source type between these items:

- ANALOG: Mic Input
- STREAM: 24-track USB audio interface
- SD CARD: 20-track Player

GAIN: this parameter set the value of the input gain accordingly to the selected input source

- ANALOG: range [0: 60] dB with step of 1 dB
- STREAM: range [-10: 10] dB with step of 1 dB
- SD CARD: range [-10: 10] dB with step of 1 dB

HPF FREQ: this parameter set the value of the HPF cutoff frequency in the range [20: 1k] Hz

DELAY: this parameter set the value of the input Delay time in the range [0: 100] ms

Input channels 17-20

Hardware inputs from 17 to 20 have line connections, with no Phantom option and with the preamp gain parameter in the range [0: 10] dB.



Input channels **19-20** have an additional item in the Source Selector. Besides Analog, Stream and SD Card source, it's possible to select USB Stereo Player as input.

IN SOURCE: this parameter allows to select the source type between these items:

- ANALOG: Mic Input
- STREAM: 24-track USB audio interface
- SD CARD: 20-track Player
- DRIVE: USB Stereo Player (*for CH19-20 only*)

GAIN: this parameter set the value of the input gain accordingly to the selected input source

- ANALOG: range [0: 10] dB with step of 1 dB
- STREAM: range [-10: 10] dB with step of 1 dB
- SD CARD: range [-10: 10] dB with step of 1 dB
- DRIVE: range [-10: 10] dB with step of 1 dB

GATE SECTION

All inputs are equipped with a Noise Gate processor that allows to reduce the output signal by a specific amount (Range) when the input signal level is lower than a specific amount (Threshold). A gain reduction level (visible also when the processor is off) allows to set all parameters before hearing the effective sound.

Switch the Gate On or Off using the on-screen ON button

Viewing Area

Encoder Assignment

GATE PRESET

CATEGORY USER BANK

001 - empty

002 - empty

003 - empty

004 - empty

005 - empty

006 - empty

007 - empty

BACK

LOAD

SAVE

LIST SEL

Preset View shows the last chosen category of presets. For the GATE block are available 2 banks of presets:

- **USER BANK** – 100 locations where save your custom settings.
- **ROM BANK** – 10 locations with carefully crafted presets.

Press BACK to return to processing page.

Choose your preset directly scrolling on the screen or using the Encoder 3 (LIST SEL), then press LOAD to recall it.

PRESET BANK SELECTION

USER

ROM

Please select a bank preset

GATE PRESET

CATEGORY ROM BANK

001 - Kick #1

002 - Kick #2

003 - Snare #1

004 - Snare #2

005 - Toms

006 - Slow

007 - Delayed

BACK

LOAD

LIST SEL

The GATE parameters assigned to the Encoders are:

- ATTACK:** this parameter allows to set the value of the Attack Time in the range [1: 1000] ms
- RELEASE:** this parameter allows to set the value of the Release Time in the range [10: 1000] ms
- THRESHOLD:** set the value of the Threshold in the range [-100: 0] dB
- RANGE:** set the value of the Range in the range [0: 60] dB

PARAMETRIC EQ

All inputs are equipped with a 4-band Parametric EQ that allows an accurate equalization of signal input.

The image shows a screenshot of the Parametric EQ interface for Channel 01. The interface includes a main EQ curve display, a parameter table, and a control panel with various buttons and encoders. Callouts provide detailed instructions for using these features.

Reset the EQ parameters using the INIT button

Switch the PEQ On or Off using the on-screen ON button

Touch these boxes to select a band and automatically assign the 3 rightmost encoders to the related parameters

Viewing Area

Encoder Assignment

View and adjust HPF frequency in the EQ page also.

Select band rotating Encoder 2

ZOOM View allows a more accurate setting of the equalizer curve using touch screen

FREQ	GAIN	TYPE/Q
32 Hz	0.0 dB	SHELF
202 Hz	-11.3 dB	5.31
1.7 KHz	5.0 dB	1.89
2 KHz	5.2 dB	SHELF

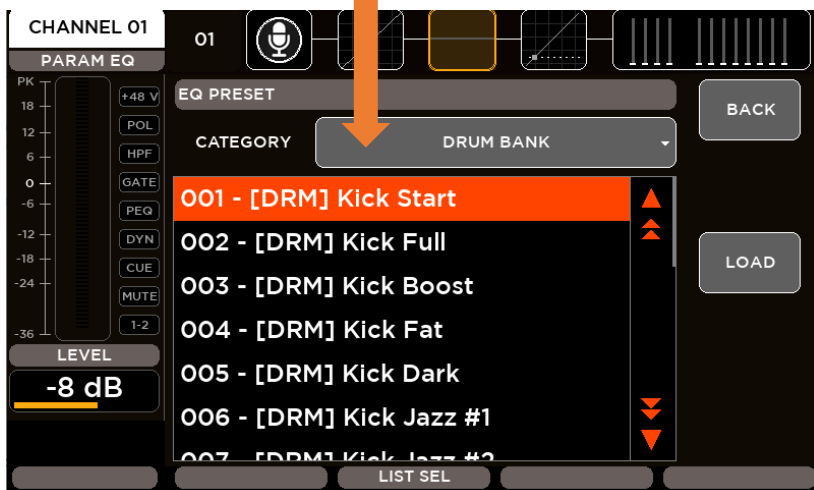
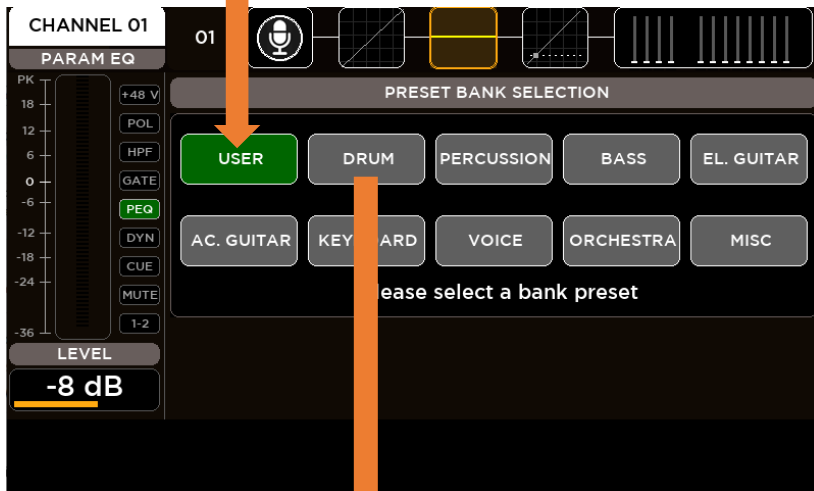
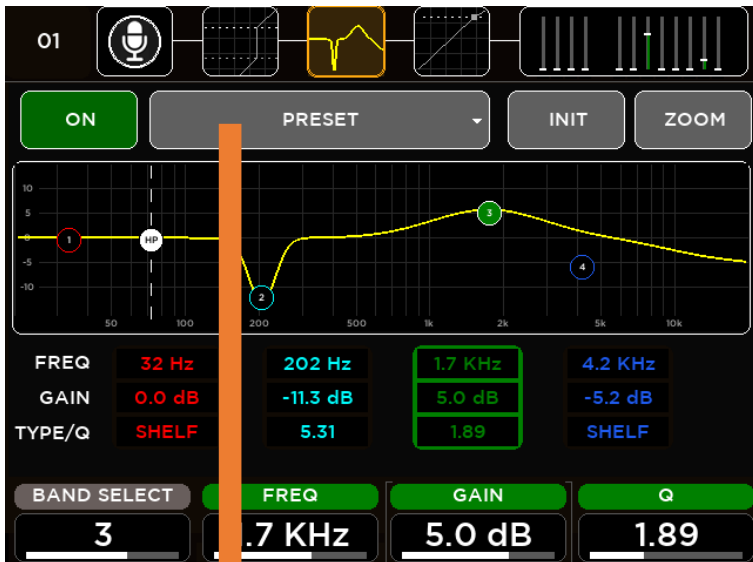
HPF FREQ: 72.3 Hz

BAND SELECT: 3

FREQ: 1.7 KHz

GAIN: 5.0 dB

Q: 1.89



For the input Parametric Equalizers are available 10 banks of presets divided into categories:

- **USER BANK** – 100 locations where save your custom settings.
- **ROM BANKS**
 - **DRUM**
20 locations with carefully crafted drum presets
 - **PERCUSSION**
10 locations with carefully crafted percussion presets
 - **BASS**
10 locations with carefully crafted bass presets
 - **EL. GUITAR**
10 locations with carefully crafted el. guitar presets
 - **AC. GUITAR**
10 locations with carefully crafted ac. guitar presets
 - **KEYBOARD**
10 locations with carefully crafted keyboard presets
 - **VOICE**
10 locations with carefully crafted voice presets
 - **ORCHESTRA**
10 locations with carefully crafted orchestra presets
 - **MISC**
10 locations with carefully crafted miscellaneous presets

Press BACK to return to processing page.
 Choose your preset directly scrolling on the screen or using the Encoder 3 (**LIST SEL**), then press LOAD to recall it.

PEQ parameters assigned to the Encoders are:

BAND SELECT: this parameter allows to select the single filter band
FREQ: set the value of Frequency of the selected band in the range [20: 20k] Hz
GAIN: set the value of Gain of the selected band in the range [-12: 12] dB
TYPE/Q: this parameter change according to the selected filter band:

- Band1
 - Low SHELF Filter type
 - HP Filter type
 - Peaking Filter Q parameter in the range [1: 20]
- Band2 & Band3
 - Peaking Filter Q parameter in the range [1: 20]
- Band4
 - High SHELF Filter type
 - LP Filter type
 - Peaking Filter Q parameter in the range [1: 20]

DYNAMICS – Compressor/DeEsser

All 16 MIC inputs are equipped with a Dynamics processor that can be setted as **Compressor** or as **De-Esser**.

The screenshot shows a digital mixer interface for channel 01. At the top, there is a microphone icon, a gain knob, and a 'DYN' button set to 'ON'. Below this is a 'PRESET' dropdown menu. The main control area is divided into two modes: 'DE-ESSER' (highlighted in green) and 'HI PASS' (highlighted in blue). In 'DE-ESSER' mode, parameters include ATTACK (1 ms), RELEASE (1 ms), THRESHOLD (-56 dB), RATIO (4.0), and POST GAIN (18.0 dB). A 'FREQ' knob is set to 1361 Hz. A graph on the right shows a frequency response curve. At the bottom, there are large touchable buttons for THRESHOLD (-56 dB), RATIO (4.0), POST GAIN (18.0 dB), and FREQ (361 Hz). A yellow label 'FREQ' is positioned above the bottom FREQ button.

Switch the DYN On or Off using the on-screen ON button

Switch DE-ESSER On to enable the De-Esser mode. Switch DE-ESSER Off to enable the Compressor mode.

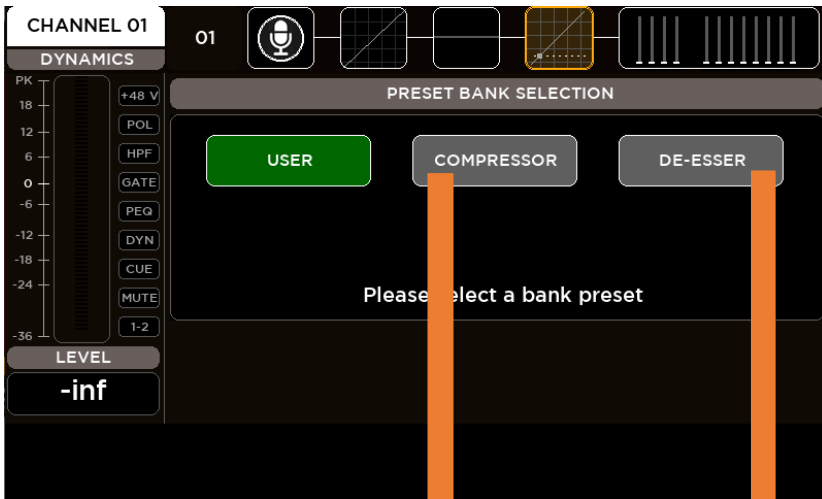
Encoder Assignmen

When in De-Esser mode select the **Filter Type** (between **High Pass** and **Band Pass**) of the Side Chain and adjust the **Frequency**

Viewing Area and assign Parameters

The yellow label indicates which parameter has been assigned to ENCODER 5

Touch & Adjust function is available for ATTACK, RELEASE and FREQ. Touch one of these parameters and adjust the value using Encoder 5.

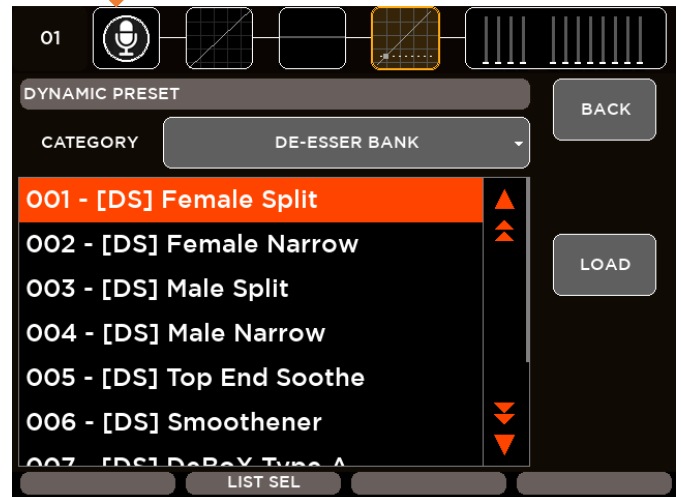


For the input Parametric Equalizers are available 10 banks of presets divided into categories:

- **USER BANK** – 100 locations where save your custom settings
- **ROM BANKS**
 - COMPRESSOR
10 locations with carefully crafted compressor presets
 - DE-ESSER
10 locations with carefully crafted de-esser presets

Press BACK to return to processing page.

Choose your preset directly scrolling on the screen or using the Encoder 3 (LIST SEL), then press LOAD to recall it.



DYN parameters assigned to the Encoders are:

THRESHOLD: set the value of the compressor threshold in the range [-80: 0] dB

RATIO: set the value of the Ratio in the range [1: 20]

POST GAIN: set the value of Gain of in the range [-30: 30] dB

ASSIGNABLE: this parameter change according to the selected parameter:

- **ATTACK:** set the value of the Attack Time in the range [1: 1000] ms
- **RELEASE:** set the value of the Release Time in the range [1: 1000] ms
- **FREQ:** set the value of the Side Chain Frequency in the range [200: 8000] Hz

SENDS

For each input channel, the SENDS page allows to control all channel sends to every mix bus: FX [1-4], MIX [1-8], and APFL. For each send-on-mix are available different parameters: Pre/Post, on/off and Level. The encoder parameters change according to the selected block send-on-mix.

APFL channel send

- PRE / POST
- ON/OFF

4 FX channel sends

- PRE / POST
- ON/OFF
- Level

DCA and MUTE GROUPS assignment

8 MIX channel sends

- PRE / POST
- ON/OFF
- Level

Select Send block by moving Encoder 2

Encoder Assignment

MIX 1	MIX 2	MIX 3	MIX 4	MIX 5	MIX 6	MIX 7	MIX 8
POST	PRE	PRE	PRE	PRE	PRE	PRE	PRE
ON	ON	OFF	OFF	OFF	OFF	ON	ON
-16.4 dB	-12.1 dB	-inf	-inf	-inf	-inf	-19.3 dB	-20.7 dB

The SENDS parameters assigned to the Encoders are:

SEND SEL: this parameter allows to select the single send-on-mix block

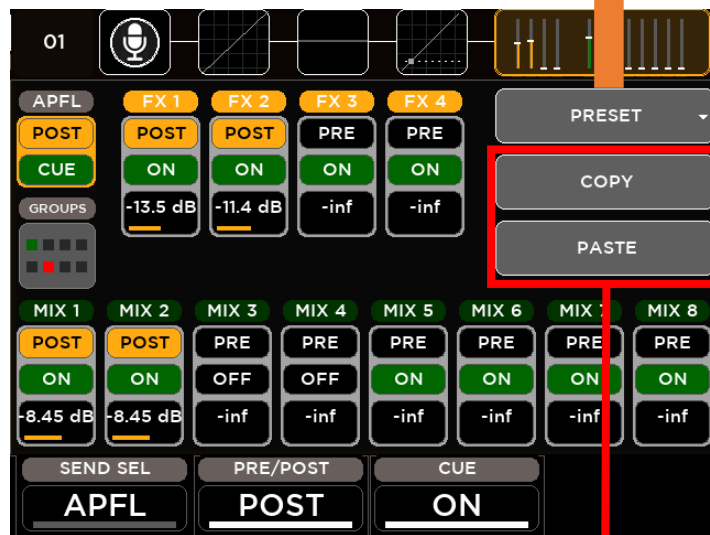
PRE/POST: this parameter allows to select if the selected send-on-mix is Pre or Post Fader

ON/OFF: this parameter allows to enable or disable the selected send-on-mix

LEVEL: according to the send type, this parameter allows to set the send level in the range [-inf: +10] dB

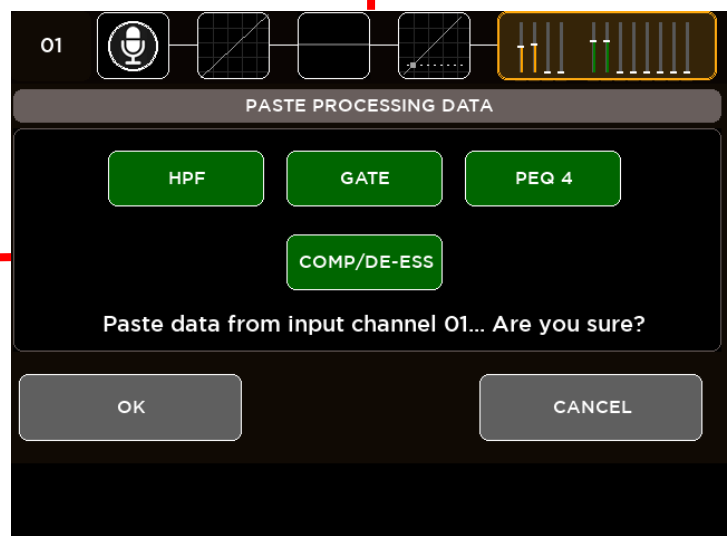
CHANNEL PRESET

M 20 digital mixers provide 100 locations where save your custom settings of all input processing chain. Press **BACK** to return to processing page. Choose your preset directly scrolling on the screen or using the Encoder 3 (**LIST SEL**), then press **LOAD** to recall it.



COPY & PASTE

M 20 digital mixers provide the possibility to copy the current processing parameters of a channel and to paste them to other channels. Press **COPY** on the channel that you want to replicate. Go to desiderata channel, press **PASTE** and select which processing blocks you want to overwrite selecting the relative buttons.

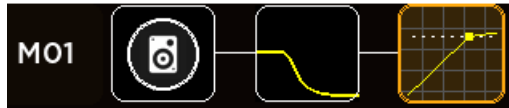


OUTPUT PROCESSING

A complete processing section is available on all outputs: a flexible 8-band parametric EQ with several selectable modes, that also allow different slopes, a delay with up to 85 meters compensation, a compressor/limiter. A stereo 30-band graphic equalizer is available on the MAIN outputs for precise correction of the overall frequency response. Extensive routing options allows flexible use of physical outputs.

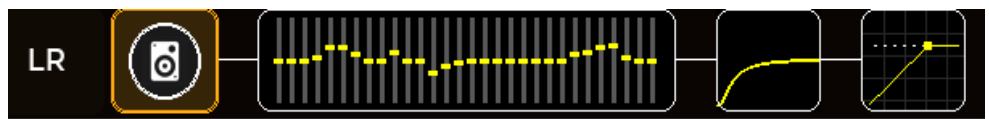
The MIX [1:8] output processing screen is divided into the following tabs:

- CHANNEL VIEW
- PARAMETRIC EQ
- DYNAMICS



The Main LR processing screen is divided into the following tabs:

- CHANNEL VIEW
- GRAPHIC EQ
- PARAMETRIC EQ
- DYNAMICS



Similarly to the input channels, the left side of the screen doesn't change when navigate between the processing pages of the channel. The left column is the Channel strip that shows the principal information of the selected channel: name, meter bar, fader level value, balance value (for the stereo channels) and on-off processing status bar.

On-Off processing status bar

Output Channel

Processing Tabs: Touch the block or press SEL to change view. The yellow outline indicate the current view. Each block also shows the preview of processing settings.

Channel Name

Current Page

Meter bar

Fader Level Value

Balance Value

Encoder parameters change accordingly to the processing page

CHANNEL VIEW

The first page allows the channel settings accordingly to the output.

CHANNEL PRESET
 M 20 digital mixers provide 100 locations where save your custom settings of all input processing chain.
 Press BACK to return to processing page.
 Choose your preset directly scrolling on the screen or using the Encoder 3 (LIST SEL), then press LOAD to recall it.



Send the output mix channel to:

- APFL bus to monitoring and analyzing the audio mix
- LR bus if you want to use mix as a subgroup

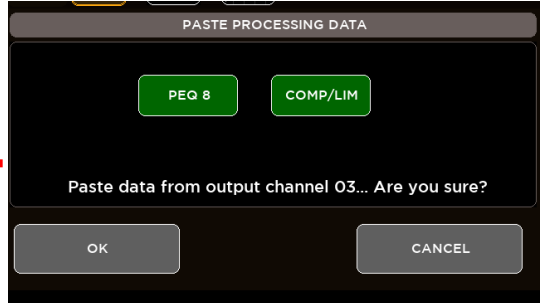
DCA and MUTE GROUPS assignment (points to GROUPS button)

Stereo Pairing Enable (points to LINK 1-2 button)

Encoder Parameters (points to APFL, PRE, OFF, 0 ms buttons)

Channel Rename (Press Enter to confirm) (points to MIX OUT 01 CHANNEL NAME)

COPY & PASTE
COPY the current processing parameters of an output and to paste them to other outputs.
 Go to desiderata output, press **PASTE** and select which processing blocks you want to overwrite selecting the relative buttons.



CHANNEL VIEW parameters assigned to the Encoders are:

SEND SEL: this parameter allows to select the send-on-mix block:

- Send to APFL (for LR and MIX outputs)
- Send to LR (for MIX outputs only)

PRE/POST: this parameter allows to select if the selected send-on-mix is Pre or Post Fader

ON/OFF: this parameter allows to enable or disable the selected send-on-mix

DELAY: this parameter set the value of the input Delay time in the range [0: 250] ms

8-Band PARAMETRIC EQ

All outputs are equipped with an 8-band Parametric EQ that allows an accurate equalization of signal output and that can be configured in various operating modes: the first two and last two bands have selectable filter types, and they can be combined into a single, 24-dB/oct HPF or LPF. This also allows for crossover filtering, useful in combination with the extensive routing capabilities, when a subwoofer is connected to one of the MIX outputs.

The interface includes the following elements and callouts:

- ON/OFF:** A green button to switch the PEQ On or Off using the on-screen ON button.
- PRESET:** A dropdown menu to select a preset.
- INIT:** A button to reset the EQ parameters using the INIT button.
- ZOOM:** A button to zoom in for a more accurate setting of the equalizer curve using touch screen.
- Viewing Area:** A graph showing the equalizer curve with 8 numbered bands.
- Parameter Table:** A table of parameters for each band, including frequency, gain, and shelf type.

Band	20 Hz	66 Hz	112 Hz	289 Hz	632 Hz	1.8 KHz	3.6 KHz	4.2 KHz
Gain	0.0 dB	-10.0 dB	0.0 dB	5.7 dB	0.0 dB	1.8 dB	0.0 dB	4.5 dB
Shelf	SHELF	5.31	1.41	3.24	1.41	5.75	1.41	SHELF
- Encoder Parameters:** A row of four encoders labeled BAND SELECT, FREQ, GAIN, and TYPE/Q. The current values are 8, 4.2 KHz, 4.5 dB, and SHELF. Encoder parameters change according to the selected band.
- Band Selection:** A callout indicates that touching these boxes selects a band and automatically assigns the last 3 encoders to the related parameters.
- Custom Settings:** A callout notes that for the output Parametric EQ, 100 locations are available where custom settings can be saved and recalled.
- Band Moving:** A callout indicates that the BAND SELECT encoder is used to select band moving Encoder 2.

PEQ8 Operating Modes



PEQ parameters assigned to the Encoders are:

BAND SELECT: this parameter allows to select the single filter band

FREQ: set the value of Frequency of the selected band in the range [20: 20k] Hz

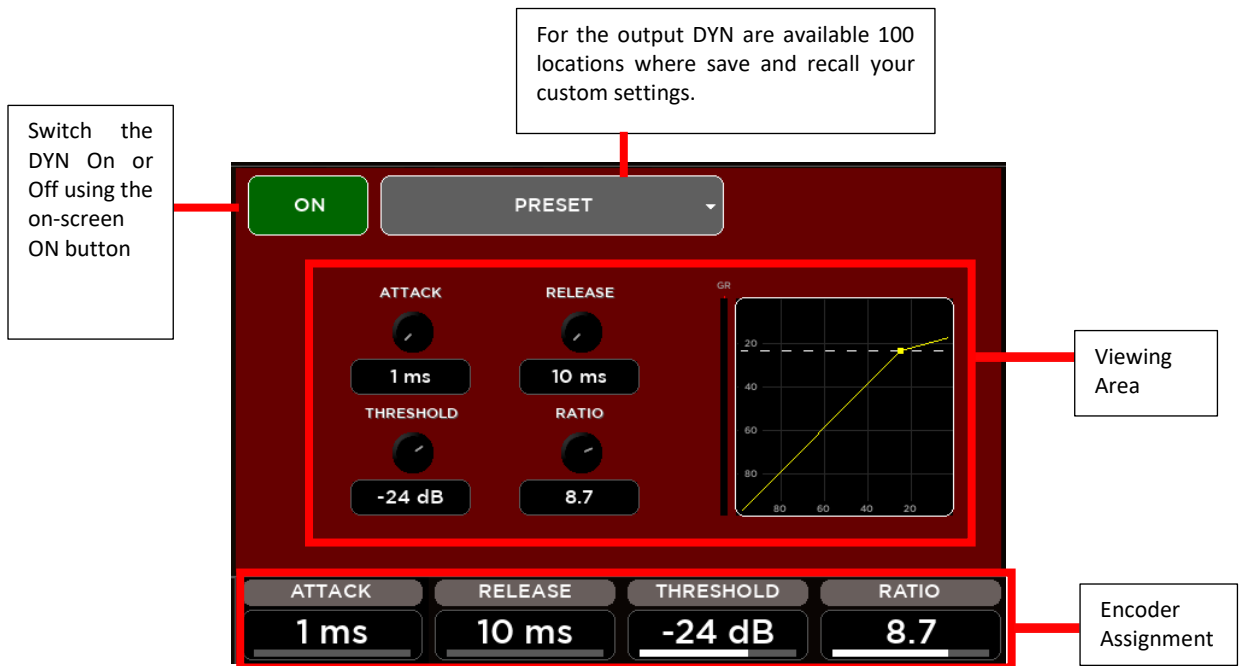
GAIN: set the value of Gain of the selected band in the range [-12: 12] dB

TYPE/Q: this parameter change according to the selected filter band:

- Band1
 - Low SHELF Filter type
 - High Pass 12 dB/oct Filter type
 - High Pass 24 dB/oct Filter type → Band1 combined with Band2
 - Peaking Filter Q parameter in the range [1: 20]
- Band2, Band3, Band4, Band5, Band6, Band7
 - Peaking Filter Q parameter in the range [1: 20]
- Band8
 - High SHELF Filter type
 - Low Pass 12 dB/oct Filter type
 - Low Pass 24 dB/oct Filter type → Band7 combined with Band8
 - Peaking Filter Q parameter in the range [1: 20]

DYNAMICS – Master Compressor/Limiter

All outputs are equipped with a Dynamics processor configured as a Compressor/Limiter



DYN parameters assigned to the Encoders are:

ATTACK: set the value of the Attack Time in the range [1: 1000] ms

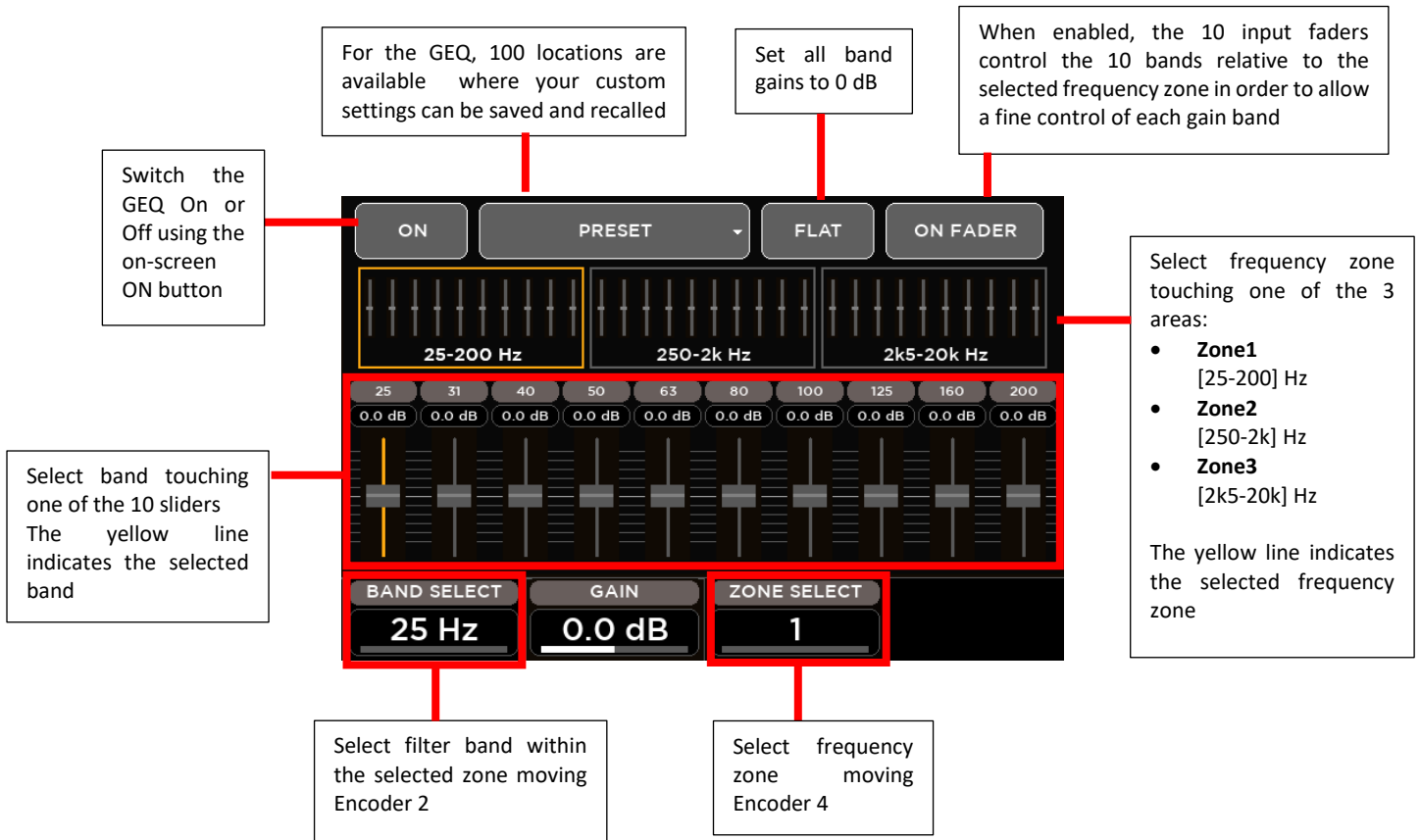
RELEASE: set the value of the Release Time in the range [10: 1000] ms

THREASHOLD: set the value of the compressor threshold in the range [-80: 0] dB

RATIO: set the value of the Ratio in the range [1: 20]

30-Band GRAPHIC EQ

The Main OUT processing provides a 30-Band GEQ with the center frequency of each band spaced 1/3 of an octave away from the center frequency of the adjacent bands, so that three bands (three sliders on the front panel) cover a combined bandwidth of one octave.



GEQ parameters assigned to the Encoders are:

BAND SELECT: select one of the 10 bands for each selected zone

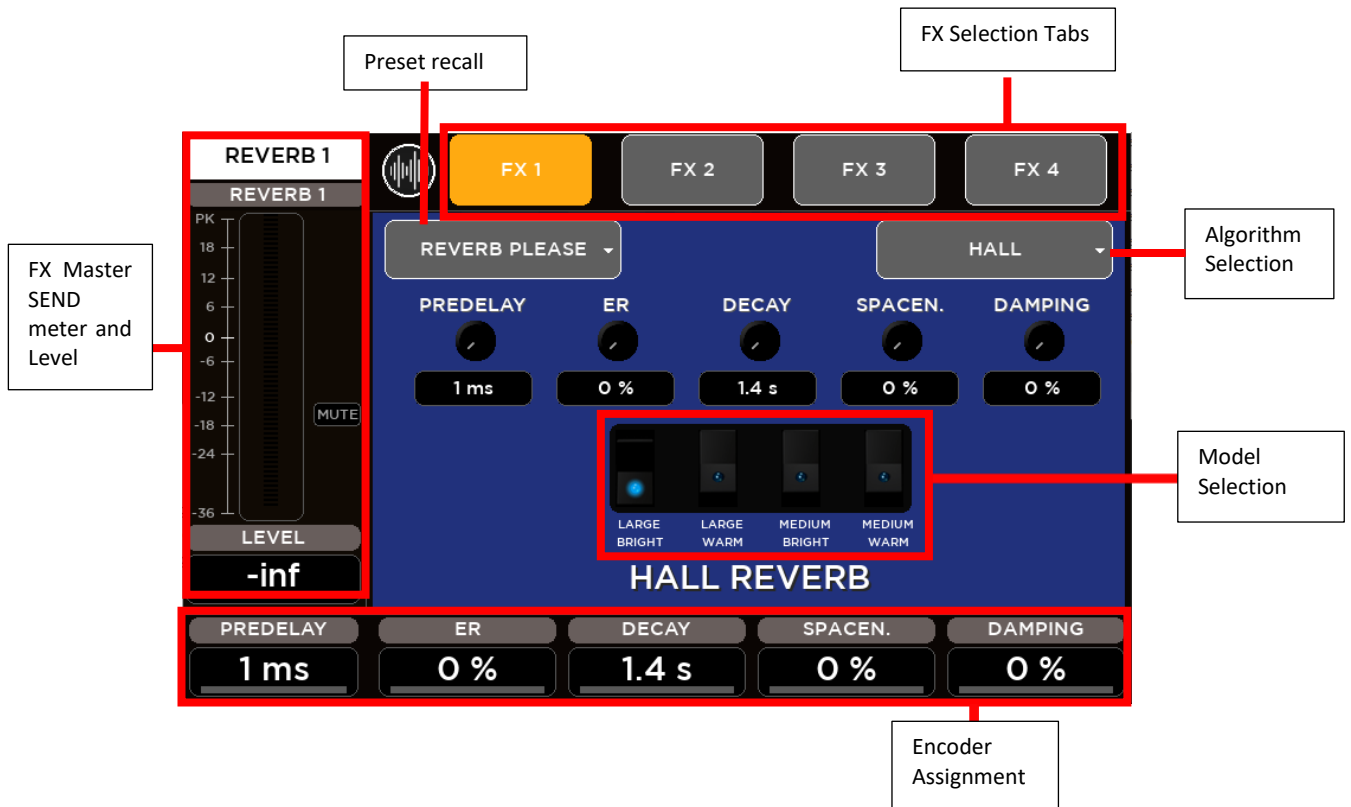
- **Zone1** Bands: 25, 31, 40, 50, 63, 80, 100, 125, 160, 200 Hz
- **Zone2** Bands: 250, 315, 400, 500, 630, 800, 1k, 1k25, 1k6, 2k Hz
- **Zone3** Bands: 2k5, 3k15, 4k, 5k, 6k3, 8k, 10k, 12k5, 16k, 20k Hz

GAIN: set the value of the selected band in the range [-12; +12] dB

ZONE SELECT: select the frequency zone

EFFECTS

All M 20 models boast 4 stereo FX engines available on dedicated buses, offering two high quality digital reverbs, a programmable delay and a 4th effect which can be configured as a modulation or a second delay. All FX Engines offer multiple algorithms to match the specific needs of a show. The internal effects pages are accessible through the FX button on the left side of 5" TFT Display or through the SEL button on each Master FX strips.



FX ALGORITHM LIST

FX1 – REVERB

- HALL: Large Bright/Warm, Medium Bright/Warm
- PLATE: Vintage, Modern
- ROOM: Medium Bright/Warm, Small Bright/Warm
- AMBIENCE: 2 models

FX2 - REVERB

- same Reverb models as FX1

FX3 - DELAY

- Stereo
- Modern
- Vintage
- Dual
- ER

FX4 – DELAY or MODULATION

- same Delay models as FX3
- Chorus
- Flanger
- Tremolo

REVERB

The M Series provides two simultaneous full **Digital Reverbs** available on Send **FX1** and Send **FX2**. Digital Reverb is a very intuitive and smooth sounding processor and represents an essential ingredient of the final mix. Great care has been taken to provide the highest quality algorithms and presets.



Based on 12 algorithms, it allows to easily find the perfect reverberation for every kind of application in a few clicks. The algorithms are been designed and tailored to focus immediately the sound you are looking for and then fine tune it with the essential parameters available through the five pots.

The algorithms are also available in some cases into two variations (Bright/Warm or Digital/Vintage) to further help in selecting the proper starting point.

Four different reverb types are available:

TYPE	VARIATIONS	
Hall	usually perfect for smooth and deep reverberations	large/medium warm/bright
Room	the algorithm to start with if you are looking for hi impact reverberations	large/medium warm/bright
Plate	classic "all purpose" algorithm with unique character the first choice if you are looking for something to	digital/vintage
Ambience	expand the stereo field or to somehow enhance the sounds	model 1, model 2

You can create your own configurations for **Hall** and **Room** by modifying the following parameters:

- PreDelay (delay before reverb)
- ER (amount of primary reflections)
- Decay (time decay)
- Spaceness (percentage of spatialization)
- Damping (percentage of absorption of the higher frequencies)

Plate reverb parameters:

- Smoothness
- Colour

Ambience reverb parameters:

- Richness

TIP

The reverberation is one of the most crucial signal processors to achieve a correct mix, so it's very important to use it with care. Often the reverberation of the venue affects our overall sound, especially because usually the sound check is done without audience that is another element that can drastically change the reverberation time of the venue.

So keep in mind to evaluate the reverberation time of the empty venue, and then consider that it will be shorter with the audience during the live gig; for these reasons, it could be useful to check the amount of the reverb also on headphones.

DELAY

The M Series provides two simultaneous full **Digital Delays** available on Send **FX3** and Send **FX4**.



Five different delay types are available:

TYPE		VARIATIONS
Stereo	usually perfect for smooth and deep reverberations	large/medium warm/bright
Vintage	the algorithm to start with if you are looking for hi impact reverberations	large/medium warm/bright
Modern	classic "all purpose" algorithm with unique character	digital/vintage
Dual	the first choice if you are looking for something to expand the stereo field or to somehow enhance the sounds	model 1, model 2
ER	Early reflections to simulate the sound of a room without introducing an audible tail	

You can create your own settings for **Stereo** and **ER** by changing the following parameters:

- Time (length of the delay)
- Feedback (% of delay feedback)
- Lo Cut (low cut filter frequency)
- Hi Cut (high cut filter frequency)
- Width (amplitude)

Vintage delay parameters:

- Offset (offset time compared with main Time) instead of Feedback
- Filter (da 0,00 a 100) is a Band-pass filter

Modern delay parameters:

- Offset (offset time related to main Time) instead of Feedback
- LoCut (low cut filter frequency) instead of Hi Cut.

Dual delay parameters:

- Factor (1/2, 1/3, 1/4, 1/6, 1/8 and 1/16) instead of Feedback
- Feedback 2 (% of delay 2 feedback) instead of Hi Cut

MODULATION

The M Series provides a **Modulation** processor available on Send **FX4**. The Modulation processor can be configure as Chorus-Flanger or as Tremolo effect.



Chorus-Flanger parameters:

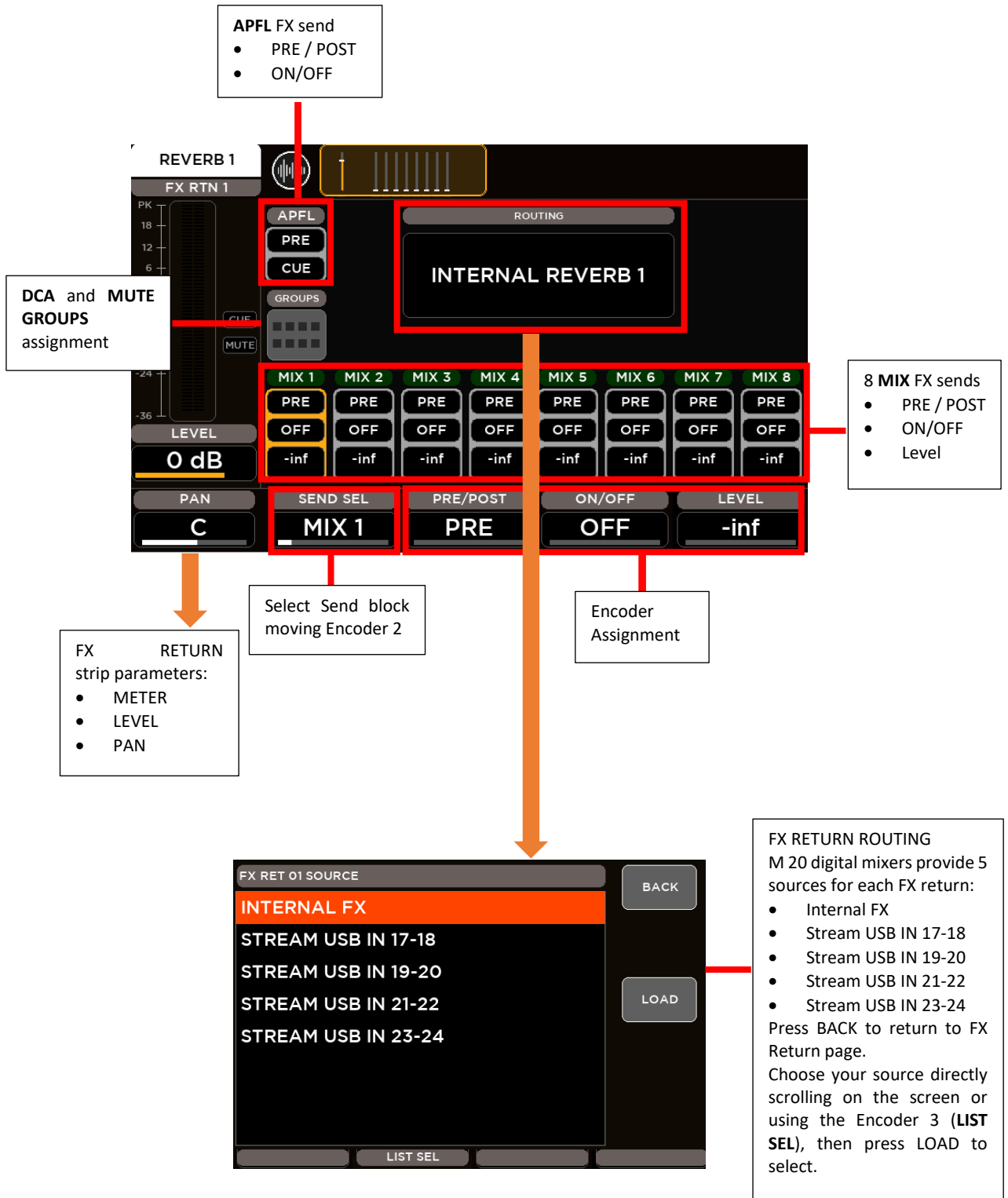
- Rate (frequency swing)
- Width (amplitude)
- Depth (depth swing)
- Feedback (% effect feedback)
- Blend (% mix between dry signal and processed)

Tremolo parameters:

- Rate (frequency rate)
- Depth (depth swing)

FX RETURN

For each effect is available an FX RETURNS send-on-mix page accessible through the first four SEL buttons on the FX RET – CUSTOM faders layer.



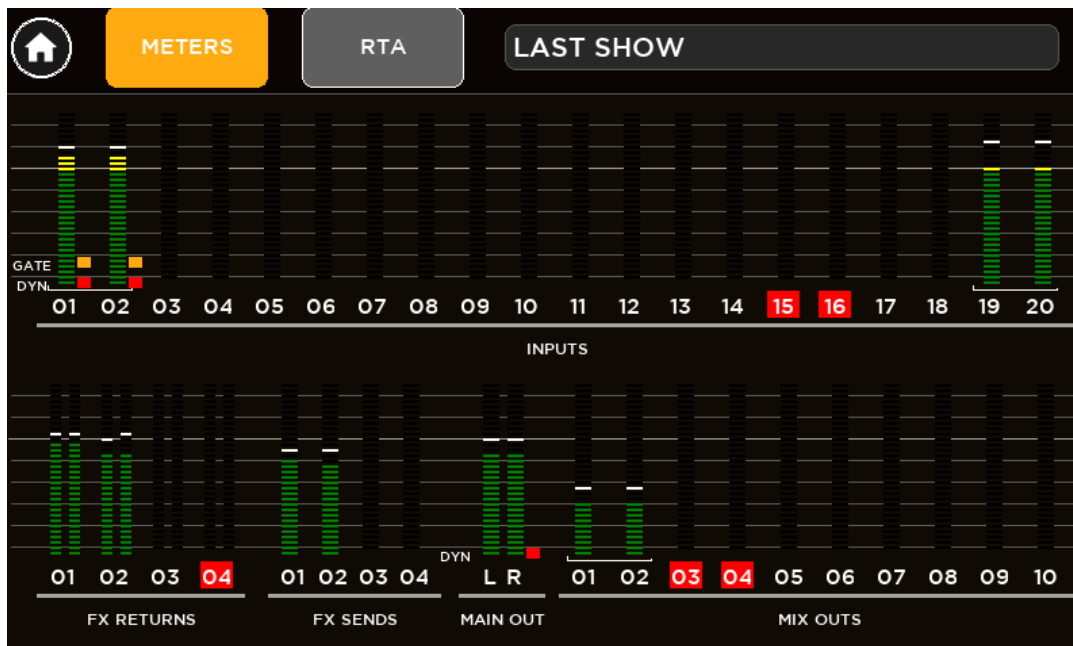
MONITORING

Through the **HOME** button is possible to enter in the monitoring pages, organized into two tabs: **METERS** and **RTA**



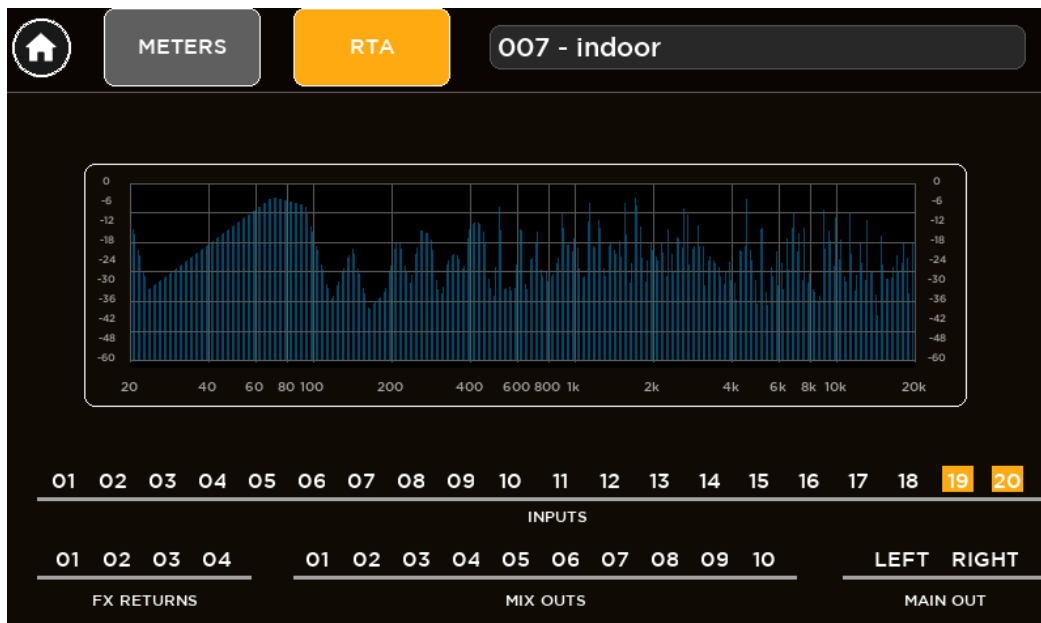
METERS

A dedicated page is available to monitor all Input, Output, FX signal levels of your session. This page also contains all mutes on/off information, channel stereo pairing indication and Gain Reductions indication for all dynamics processors available on inputs and outputs (Gate, Compressor/DeEsser and Master Compressor/Limiter). As additional information, the last loaded show is shown on the upper side of the page.



RTA

M 20 Series Digital Mixers provide a **Real-Time Analyzer** available on the CUE bus. In this way is possible to analyze the frequency content of the audio signal of all Inputs, Outputs and FX Returns with CUE button activated. For each channel, CUE activation is shown with a yellow square behind the channel number.



PHONES

If one or more CUE are activated, the CUE ACTIVE led is on and the audio signal of CUE bus is routed to PHONES output and monitored by the Vu-Meter bars on the right side of the 5" TFT Display. Otherwise, when no CUE is activated, the CUE ACTIVE led is off and the audio signal of MAIN LR output is routed to PHONES output. The Vu-Meter bars will show the Master Level of the selected MIX.



PLAY/REC

The M 20 Series Digital Mixers offer both Multitrack Player/Recorder and Stereo Player/Recorder that can be combined together for high versatility. Different Play/Rec modes correspond to different external storage devices:

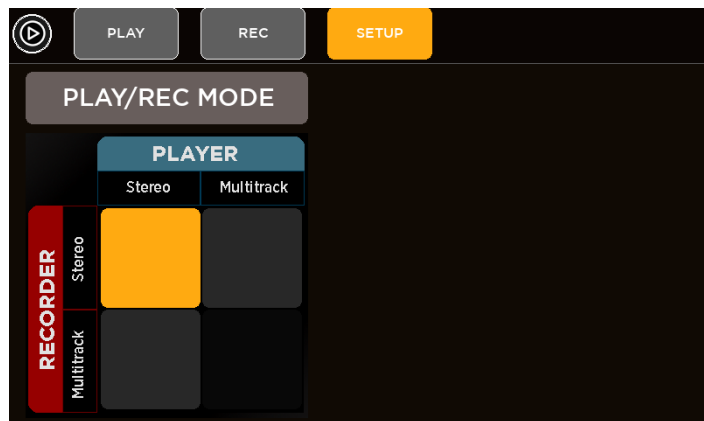
- **Multitrack** Player/Recorder manage up to 20 tracks from/to **SD Card**
- **Stereo** Player/ Recorder manage stereo tracks from/to **USB Mass Storage** device (USB pen drive, or external HDD) in different file formats

From PLAY/REC button on the left side of display you access PLAY, REC and SETUP pages.

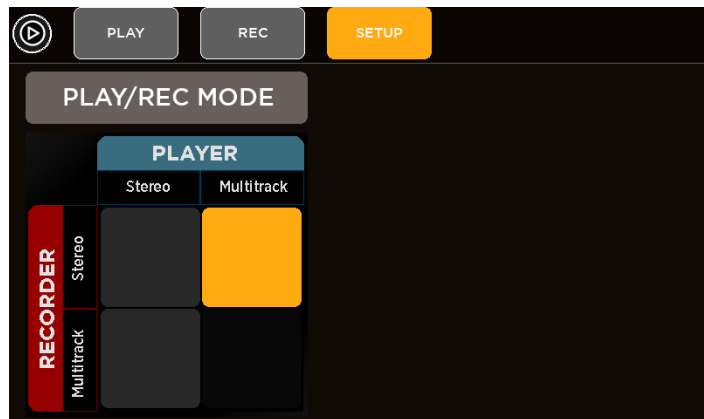
SETUP

SETUP page allows to configure the Player and Recorder modes. The allowed possibilities are:

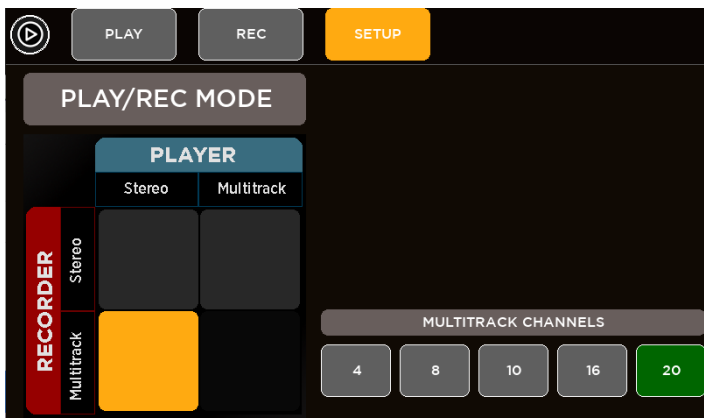
STEREO Player / STEREO Recorder
Playback and recording from USB Drive.



MULTITRACK Player / STEREO Recorder
Playback from SD Card and record to USB drive.



STEREO Player / MULTITRACK Recorder
Playback from USB drive and record to SD Card.
In Multitrack Recorder mode, according to your live session, it's possible to select how many tracks will be recorded, to optimize SD Card usage.



PLAYER

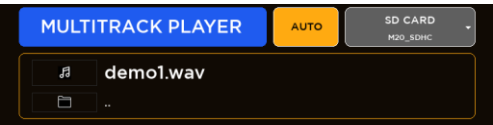
The internal PLAYER change in Stereo Mode or Multitrack Mode according to the SETUP configuration. The PLAY tab allows to control the playback functions.

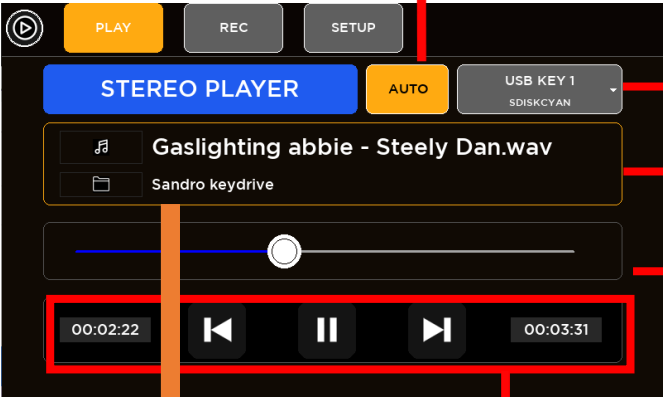
When in **STEREO** mode, a flexible stereo file player can access USB mass storage devices (up to four different drives), with arbitrary sample rate, in MP3, WAV and AIFF formats.

AUTO Mode
When the current song reaches the end, the next track is automatically loaded and played.

USB key select (STEREO mode)
Up to 4 USB flash drives can be managed; this is required in case multiple USB flash drives are connected through a USB hub.

SD CARD (MULTITRACK mode)






Current Song

Scroll bar
Shows the current position within the file. You can grab the scroll bar and move to the desired position, either when in playback mode or stop mode.

Playback bar

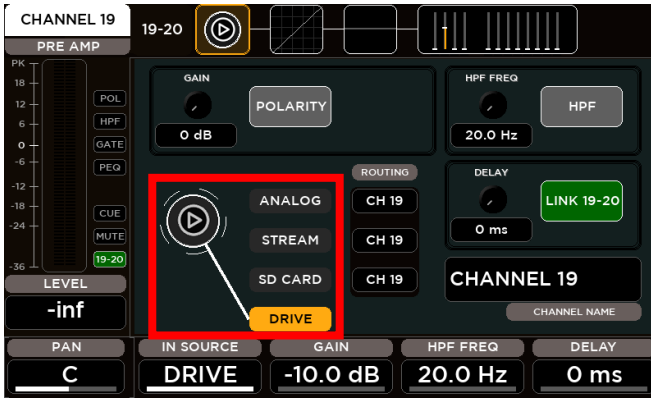
- Play/Pause
- Previous track
- Next track
- Elapsed Time
- Remaining Time



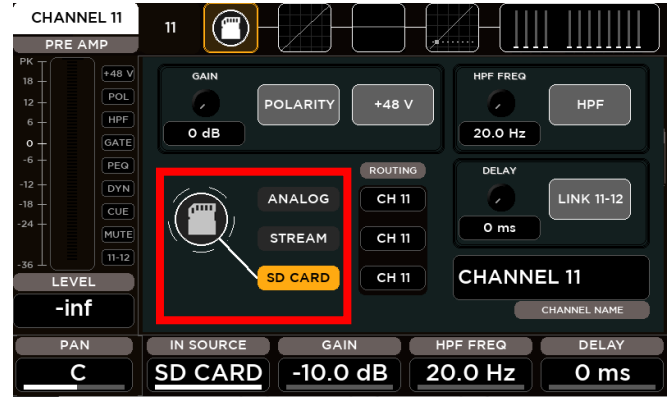
FILE BROWSER
Navigate through the device folder and choose your song directly scrolling on the screen or using the Encoder 3 (**LIST SEL**), then press OK to select it.

Press CANCEL to return to Player page.

When in **MULTITRACK** mode, the 20-tracks file player can access SD Card, in multichannel WAV format, and is enabled only for 48 kHz sample rate.



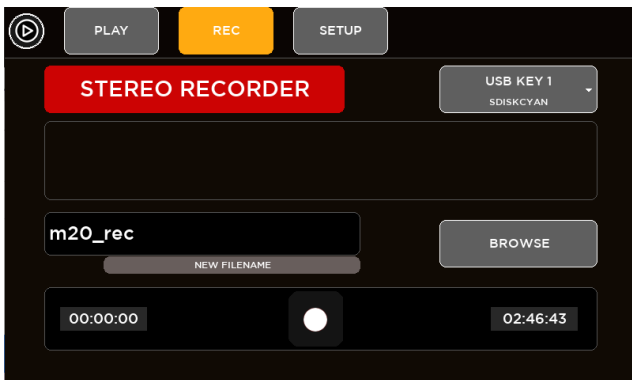
Stereo Player files can be reproduced by channels 19-20 according to channel routing.



Multitrack Player files can be reproduced on the corresponding channels when SD CARD source is selected for each channel.

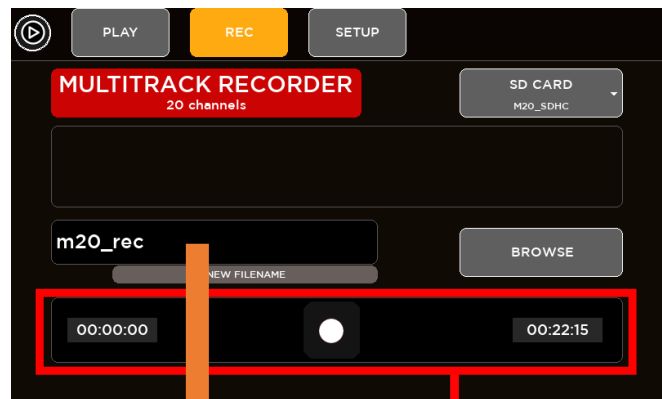
RECORDER

The REC tab allows high-quality, stereo or multitrack recordings according to the SETUP configuration. The currently available format is 24-bit, 48 kHz (the internal sample rate of the M 20 Digital Mixer).



When in STEREO mode, all stereo recordings are stored in the /REC folder within the USB Mass Storage devices (up to four different drives), with source points fully configurable through the IO routing page.

When in MULTITRACK mode, all multichannel recordings are stored in the /REC folder within the SD Card, with channels tap points configurable through the IO routing page. You can record all 20 input channels or you can configure your recorder with a reduced number of channels to optimize the SD Card files size.



A default name is generated if no specific name is entered, of the form m20_rec_XXXX_0.wav, where XXXX is a numeric counter to ensure a unique filename.

To modify the filename touch this area and type the new file name; press Enter to confirm

Record bar

- Rec/Stop
- Elapsed Time
- Remaining Time (size available on your device)

FAT32 is the only supported file format on M series digital mixers and is also the safest cross-platform (Mac / PC) format. Avoid FAT16 formatting, as random problems in audio file playback have been noticed.

Please notice that the minimum supported device size for audio recording is 4 GB (mainly due to variations if formatting results for smaller sized devices).

For **STEREO** mode, USB 3.0 compatible storage devices are recommended, as these guarantee higher data throughput. Furthermore, consistent and error-free results have been obtained with premium, good-quality USB pens. Several lower-quality devices can cause random errors due to their lower data transfer performance. We have found that on several USB devices it is recommended to have at least 50% free space on the USB key; beyond this percentage, most USB keys show significant fragmentation and in this case, glitches can appear in recorded files.

For **MULTITRACK** mode, SDHC and SDXC formats are supported.

Due to filesystem limitations, the internal recorder can generate a file with maximum size of 4 GB, corresponding to about 4 hours of continuous stereo recording or 20 minutes of continuous 20 channels recording. If this limit is exceeded, the recorder closes the current file and creates another file with no audio gap, without interrupting the recording process. Thus, the complete recording can be reconstructed on audio editing software.

In case you need to reformat a USB pen or SD Card for audio recording, the M 20 digital mixer provides Format tools between the System utilities.

5. SYSTEM

The SYSTEM button enables access to all global configuration parameters and miscellaneous settings.

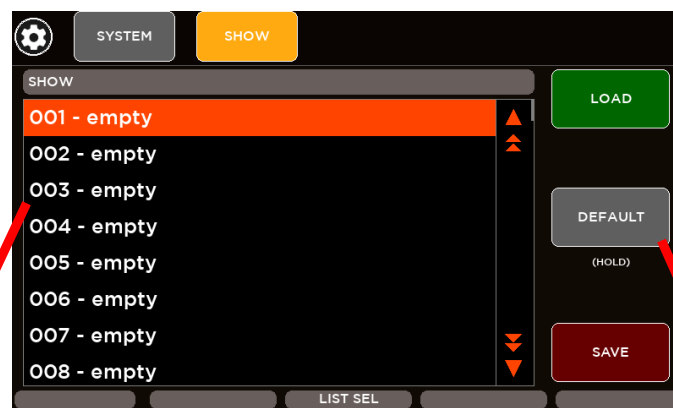
SHOW

M 20 digital mixer provides 100 **SHOW** memories used to store and recall all mixer parameters. The SHOW is suited to save all settings after a sound check for immediate recall when doing a live act in the same venue.

In addition to SHOWs, the M 20 provides **Global Configuration** parameters that are stored in the mixer as soon as they are modified.

Saved in each Show
Input Processing
Output Processing
Effects
Play/Rec Setup
I/O Routing
DCA & MUTE Groups settings
Custom Faders settings
AES OUT and PHONES settings

Saved in Global Configuration
Network & WiFi settings
User Keys settings
Talkback settings
Signal Generator settings
Fader Calibration
Surface settings
MIDI settings



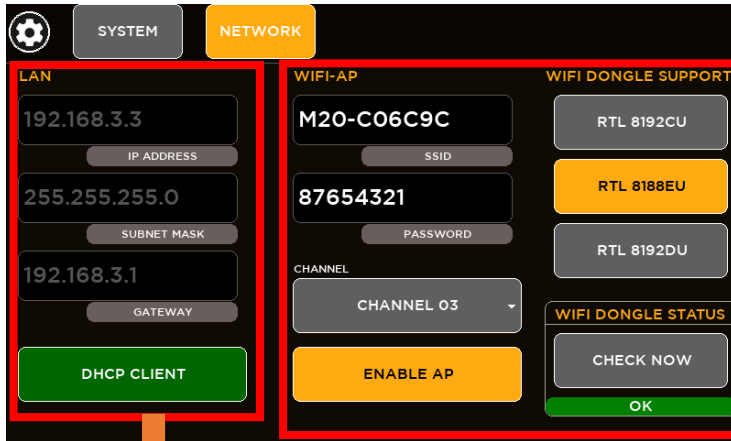
SHOW

M 20 digital mixers provides 100 locations where shows can be saved. Select the show location you want to load from or save to by scrolling on the screen or using Encoder 3 (**LIST SEL**), then press **LOAD** to recall it, or **SAVE** to store all parameters into the selected location.

Holding **DEFAULT** button will load default values for all parameters, without changing the Global settings.

NETWORK AND WIFI

The NETWORK view allows configuration of both LAN settings and of the local WiFi Access Point, available when a suitable USB WiFi adapter is used. Please notice that the right part of this settings page does not related to any external WiFi AP connected to the LAN, but only to the specific case of a USB WiFi dongle connected to USB port B.



LAN Settings

Touch the **DHCP Client** button to switch DHCP mode on or off. Static settings cannot be adjusted if DHCP mode is on.

If DHCP Client is OFF, IP Address, Subnet Mask and Gateway can be set manually, according to the addresses of external equipment connected to the LAN port.

WiFi AP Settings

Touch the **ENABLE AP** button to configure **USB port B** to manage external wifi adapters.

M 20 digital mixers support several WiFi chipsets:

- RTL 8192CU
- RTL 8188EU
- RTL 8192DU

Select the driver relative to your wifi dongle.

Some WiFi-related adjustments can be made:

- **SSID** - modify the factory name to provide a name you can remember. The default name is in the form M20-XXXXXX where the latter are a combination of letters and numbers.
- **PASSWORD** - WiFi security is always enabled (WPA2/PSK). You can modify the default password. This is strongly suggested to improve security of the system.
- **WiFi Channel** – you can select a specific channel to minimize interference with other WiFi AP.

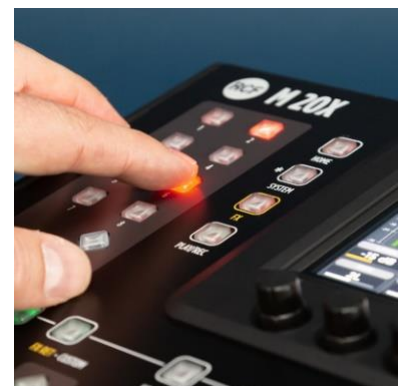
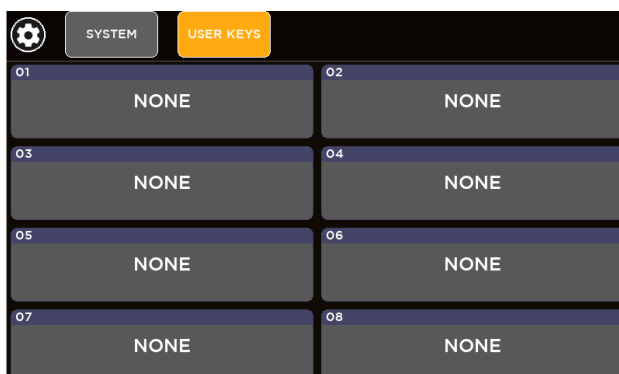
The CHECK NOW button allows you to verify if the driver is correctly interacting with the WiFi dongle. If it running fine, it will display "OK" just below the CHEK NOW button.

When you insert a WiFi dongle and you do not need to modify any of the WiFi AP parameters, it is strongly recommended to press CHECK NOW to ensure a proper initialization.

USER KEYS

A set of 8 User Keys with extensive programming options is available, offering immediate control of scene selection, play/record transport, tap tempo, user interface shortcuts.

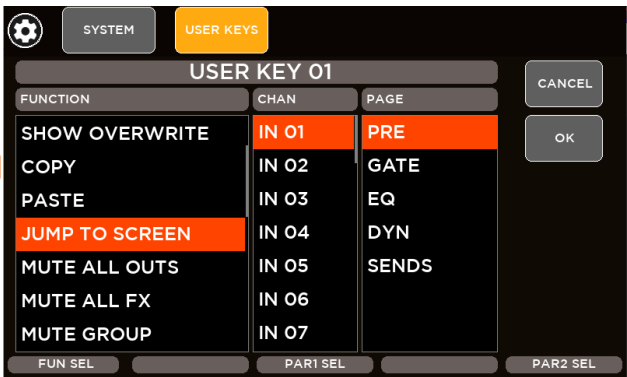
Go to SYSTEM > USER KEYS page to configure each key:



Depending on the selected function, one or two extra lists can appear on the right, to show all programming options. An overview of functions associated to user keys is available when pressing the VIEW button located just below the USER KEYS.

USER KEYS PROGRAMMING

- Choose your function by scrolling directly in the screen's function area or using the Encoder 1 (**FUN SEL**),
- If available, choose your param1 by scrolling directly on the screen or using the Encoder 3 (**PAR1 SEL**),
- If available, choose your param2 by scrolling directly on the screen or using the Encoder 5 (**PAR2 SEL**),
- Then press **OK** to configure the selected user key.



Function List	PAR1 List	PAR2 List
None	-	-
Show Recall	Show Sel [1: 100]	-
Show Save	Show Sel [1: 100]	-
Show Overwrite	-	-
Copy	-	-
Paste	-	-
Jump to Screen	Chan: IN [1: 20], FX[1: 4], Main OUT, MIX [1:8], Utilities	choose the page depending on selected channel
Mute all Outs	Toggle/Momentary	-
Mute all FX	Toggle/Momentary	-
Mute Group	Mute Group [1: 4]	-
Mute DCA	DCA Group [1: 4]	-
Mute Chan	IN [1: 20], Main L, Main R, MIX [1:10], FX RTN [1: 4], FX SEND[1: 4]	-
GEQ on Fader	-	-
Tap Tempo Delay 1	-	-
Player Play/Pause	-	-
Player Next	-	-
Player Prev	-	-
Record Start/Stop	-	-
Routing Recall	Preset Sel [1: 100]	-
Routing Save	Preset Sel [1: 100]	-
Routing Overwrite	-	-
Talkback	Toggle/Momentary	-
Tap Tempo Delay 2	-	-

I/O ROUTING

The IO Routing page allows to set the routing of Input Channels, Output Channels, Record Outputs, Streaming Outputs and Direct Patch. Furthermore it's possible to save and recall your routing presets.

INPUTS

Through the Input page it's possible to select the source for each input channel and FX return channel.

SYSTEM						IO ROUTING						INPUTS											
CH 01	CH 02	CH 03	CH 04	CH 05	CH 06	CH 07	CH 08	CH 09	CH 10	CH 11	CH 12	CH 13	CH 14	CH 15	CH 16	CH 17	CH 18	CH 19	CH 20	FX RET 01	FX RET 02	FX RET 03	FX RET 04
ANALOG IN 01	ANALOG IN 02	ANALOG IN 03	ANALOG IN 04	ANALOG IN 05	ANALOG IN 06	ANALOG IN 07	ANALOG IN 08	ANALOG IN 09	ANALOG IN 10	ANALOG IN 11	ANALOG IN 12	ANALOG IN 13	ANALOG IN 14	ANALOG IN 15	ANALOG IN 16	ANALOG IN 17	ANALOG IN 18	ANALOG IN 19	ANALOG IN 20	INTERNAL FX	INTERNAL FX	INTERNAL FX	INTERNAL FX

Based on available sources, M 20 digital mixers provide 3 groups of Input routing:

CH 01:16

Analog[1 : 16] Stream[1: 16] SD Play[1: 20]

CH 17:20

Analog[17: 20] Stream[17: 20] SD Play[1: 20]

FX RET 01:04

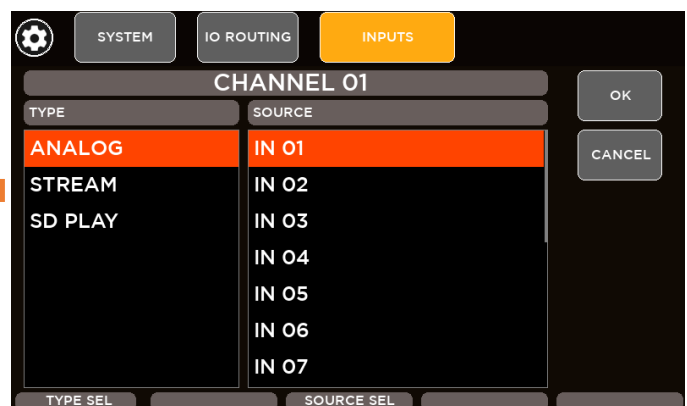
Internal FX Stream[17: 18] Stream[19: 20] Stream[21: 22] Stream[23: 24]

When select Internal FX, the relative internal effect will be route to the FX return:

- For FX RET1 the relative internal effect is Reverb 1,
- for FX RET2 the relative internal effect is Reverb 2,
- for FX RET3 the relative internal effect is Delay 1,
- for FX RET4 the relative internal effect is Modulation / Delay 2

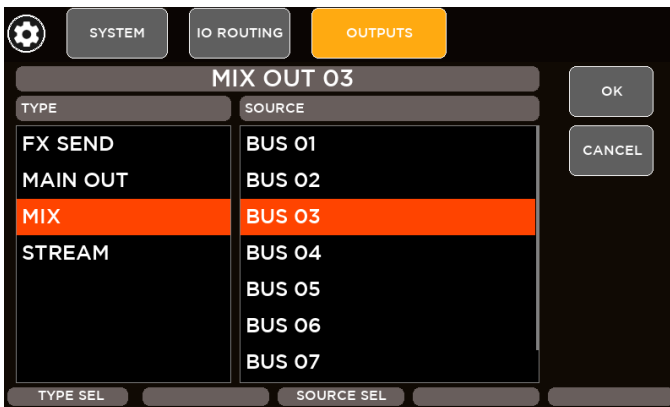
IO ROUTING SETUP

- Choose your source type by scrolling directly in the screen's function area or using the Encoder 1 (**TYPE SEL**),
- choose your channel source by scrolling directly on the screen or using the Encoder 3 (**SOURCE SEL**),
- Then press **OK** to confirm your routing



OUTPUTS

Through the Output page it's possible to select the source for these output channels: MIX OUT 1:10, AES OUT LR and PHONES LR



Available sources for all outputs:

MIX OUT 01: 10, AES OUT LR, PHONES LR

- | | | | |
|------------------|----------|-----------------|--------------------|
| FX Send [01: 04] | MAIN OUT | MIX Bus [01:08] | Stream IN [17: 24] |
|------------------|----------|-----------------|--------------------|
- L Post GEQ
 - L PFL
 - R Post GEQ
 - R PFL
 - L+R Post GEQ
 - L+R PFL

REC OUTPUTS

Based on available sources, M 20X digital mixers provide 2 groups of Record Outputs routing:

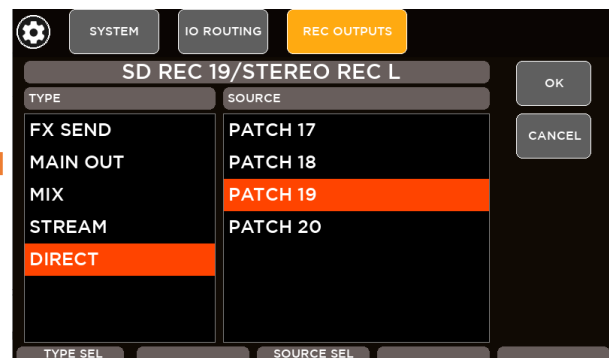
REC OUT 1:16

Direct Patch [01: 16]

REC OUT 17:20

- | | | | | |
|------------------|----------|-----------------|--------------------|-----------------------|
| FX Send [01: 04] | MAIN OUT | MIX Bus [01:08] | Stream IN [17: 24] | Direct Patch [17: 20] |
|------------------|----------|-----------------|--------------------|-----------------------|
- L Post GEQ
 - L PFL
 - R Post GEQ
 - R PFL
 - L+R Post GEQ
 - L+R PFL

Tracks 19-20 of the SD Card multitrack record correspond to the L-R tracks of the USB Drive Stereo record.



STREAM OUTPUTS

Based on available sources, M 20 digital mixers provide 2 groups of STREAM OUT routing:

STREAM OUT 1:16

Direct Patch [01: 16]

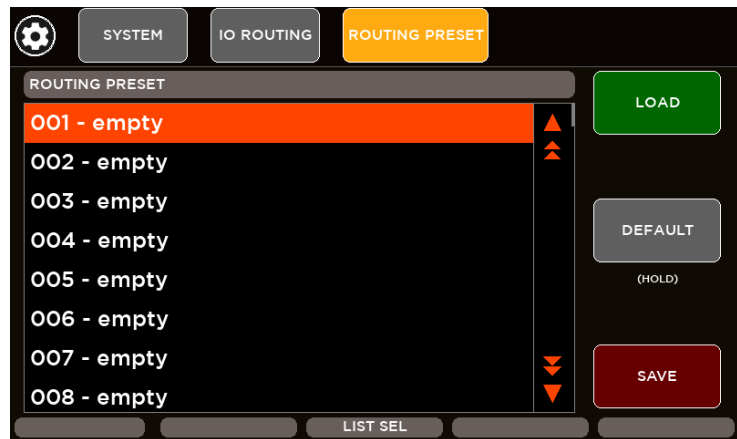
STREAM OUT 17:24

FX Send [01: 04] MAIN OUT MIX Bus [01:08] Stream IN [17: 24] Analog IN [17: 20]

- L Post GEQ
- L PFL
- R Post GEQ
- R PFL
- L+R Post GEQ
- L+R PFL

ROUTUNG PRESETS

M 20 digital mixer provides 100 **I/O Routing Presets** used to store and recall all your routing configurations, as for example virtual sound check of your live session. Holding DEFAULT button, M 20 will load the default routing values for each channel:



Default INPUTS routing

CH 01	Analog IN 1
CH 02	Analog IN 2
CH 03	Analog IN 3
CH 04	Analog IN 4
CH 05	Analog IN 5
CH 06	Analog IN 6
CH 07	Analog IN 7
CH 08	Analog IN 8
CH 09	Analog IN 9
CH 10	Analog IN 10
CH 11	Analog IN 11
CH 12	Analog IN 12
CH 13	Analog IN 13
CH 14	Analog IN 14
CH 15	Analog IN 15
CH 16	Analog IN 16
CH 17	Analog IN 17
CH 18	Analog IN 18
CH 19	Analog IN 19
CH 20	Analog IN 20
FX1 RET	Internal FX – Reverb 1
FX2 RET	Internal FX – Reverb 2
FX3 RET	Internal FX – Delay 1
FX4 RET	Internal FX – Modulation

Default OUTPUTS routing

MIX OUT 01	MIX BUS 01
MIX OUT 02	MIX BUS 02
MIX OUT 03	MIX BUS 03
MIX OUT 04	MIX BUS 04
MIX OUT 05	MIX BUS 05
MIX OUT 06	MIX BUS 06
MIX OUT 07	MIX BUS 07
MIX OUT 08	MIX BUS 08
MIX OUT 09	MAIN OUT L PFL
MIX OUT 10	MAIN OUT R PFL
AES OUT L	MAIN OUT L PFL
AES OUT R	MAIN OUT R PFL
PHONES L	MAIN OUT L PFL
PHONES R	MAIN OUT R PFL

Default DIRECT PATCH routing

DIRECT PATCH 01	PRE EQ
DIRECT PATCH 02	PRE EQ
DIRECT PATCH 03	PRE EQ
DIRECT PATCH 04	PRE EQ
DIRECT PATCH 05	PRE EQ
DIRECT PATCH 06	PRE EQ
DIRECT PATCH 07	PRE EQ
DIRECT PATCH 08	PRE EQ
DIRECT PATCH 09	PRE EQ
DIRECT PATCH 10	PRE EQ
DIRECT PATCH 11	PRE EQ
DIRECT PATCH 12	PRE EQ
DIRECT PATCH 13	PRE EQ
DIRECT PATCH 14	PRE EQ
DIRECT PATCH 15	PRE EQ
DIRECT PATCH 16	PRE EQ
DIRECT PATCH 17	PRE EQ
DIRECT PATCH 18	PRE EQ
DIRECT PATCH 19	PRE EQ
DIRECT PATCH 20	PRE EQ

Default REC OUTS routing

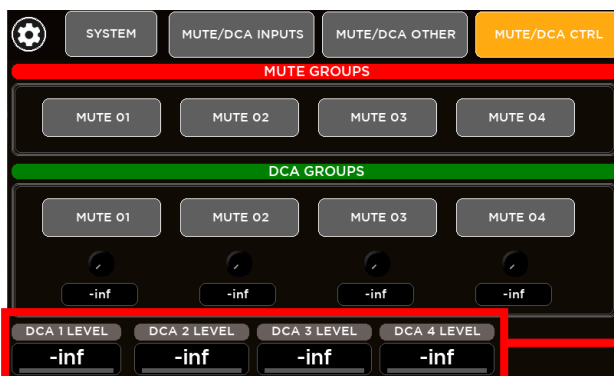
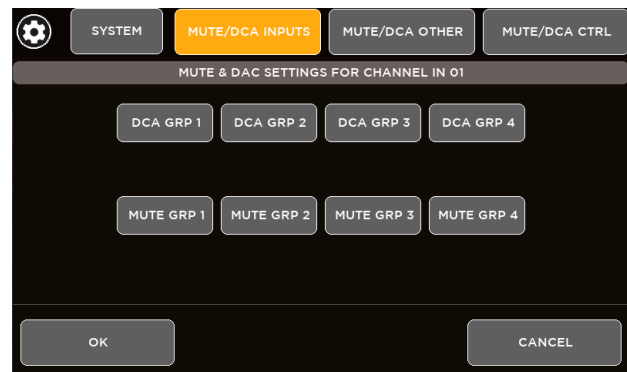
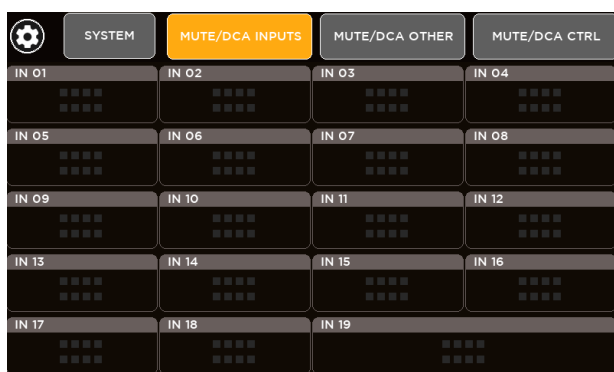
TRACK 01	DIRECT PATCH 01
TRACK 02	DIRECT PATCH 02
TRACK 03	DIRECT PATCH 03
TRACK 04	DIRECT PATCH 04
TRACK 05	DIRECT PATCH 05
TRACK 06	DIRECT PATCH 06
TRACK 07	DIRECT PATCH 07
TRACK 08	DIRECT PATCH 08
TRACK 09	DIRECT PATCH 09
TRACK 10	DIRECT PATCH 10
TRACK 11	DIRECT PATCH 11
TRACK 12	DIRECT PATCH 12
TRACK 13	DIRECT PATCH 13
TRACK 14	DIRECT PATCH 14
TRACK 15	DIRECT PATCH 15
TRACK 16	DIRECT PATCH 16
TRACK 17	DIRECT PATCH 17
TRACK 18	DIRECT PATCH 18
TRACK 19/Stereo L	MAIN OUT L PFL
TRACK 20/Stereo R	MAIN OUT R PFL

Default STREAM OUTPUTS routing

CH 01	DIRECT PATCH 01
CH 02	DIRECT PATCH 02
CH 03	DIRECT PATCH 03
CH 04	DIRECT PATCH 04
CH 05	DIRECT PATCH 05
CH 06	DIRECT PATCH 06
CH 07	DIRECT PATCH 07
CH 08	DIRECT PATCH 08
CH 09	DIRECT PATCH 09
CH 10	DIRECT PATCH 10
CH 11	DIRECT PATCH 11
CH 12	DIRECT PATCH 12
CH 13	DIRECT PATCH 13
CH 14	DIRECT PATCH 14
CH 15	DIRECT PATCH 15
CH 16	DIRECT PATCH 16
CH 17	Analog IN 17
CH 18	Analog IN 18
CH 19	Analog IN 19
CH 20	Analog IN 20
CH 21	FX SEND 01
CH 22	FX SEND 02
CH 23	FX SEND 03
CH 24	FX SEND 04

MUTE AND DCA GROUPS

M 20 digital mixers provide four DCA Groups and four MUTE Groups fully independent and configurable. It's possible map each input channel, each Mix Out channel and each FX return channel to one of four DCA Groups and to one of four MUTE Groups. The DCA Group is a combination of level and relative mute; the MUTE Group is a dedicated mute control. In this way you can create your customized groups of channels to be controlled with a single strip (level + mute) and with a single mute button. To guarantee a fully flexibility, DCA and Mute configurations are completely independent for each channel.



DCA and Mute Groups can be assign to **Custom Faders** and to **User keys**. Furthermore, you can directly control mute activation and fader levels through the dedicated page SYSTEM > MUTE AND DCA GROUPS > MUTE/DCA CTRL.

Encoder Assignment

UTILITIES

Several utility tools are provided in order to meet every sound engineer's needs.

AUDIO OUTPUTS

In the AUDIO OUTPUTS page it's possible to adjust the AES OUT and PHONES parameters.



The screenshot shows the 'AUDIO OUTPUT' menu with two main sections: 'AES OUT' and 'PHONES'. Both sections have a 'ROUTING' area with 'L MAIN OUT L PFL' and 'R MAIN OUT R PFL' options, and a 'LEVEL' or 'DELAY' section with a knob and a digital display. The 'AES OUT' section shows '0 dB' and 'AES OUT LVL' with a '0 dB' display. The 'PHONES' section shows '0 ms' and 'PHONES DELAY' with a '0 ms' display. Red boxes highlight the routing and level/adjustment areas for both sections.

AES OUT
Configure the routing settings touching in the **ROUTING** area and adjust the output **LEVEL** value using Encoder 2

PHONES
Configure the routing settings touching in the **ROUTING** area and adjust the **DELAY** value using Encoder 4

SURFACE UTILITIES



The screenshot shows the 'SURFACE UTILS' menu with a 'CALIBRATE FADER' button at the top. Below it are two sliders for 'LCD BRIGHTNESS' and 'LED BRIGHTNESS', both set to '10'.

CALIBRATE FADER button performs 5 points fader calibration through the following operations:

- Move all faders to +10 dB
- Move all faders to 0 dB
- Move all faders to -10 dB
- Move all faders to -30 dB
- Move all faders to -inf dB

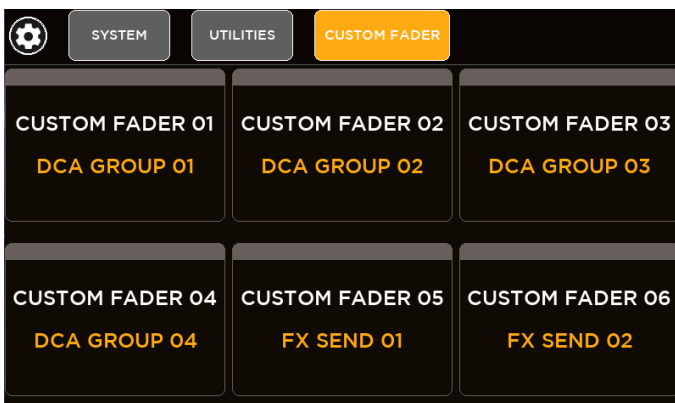
For each step, check the position of all faders and adjust them manually in the event of misalignment

Using Encoder 2 to adjust the **LCD Brightness**

Using Encoder 4 to adjust the **Brightness** of all **LEDs**

CUSTOM FADERS

On M 20X digital mixers are available six custom faders fully configurable.



The screenshot shows the 'CUSTOM FADER' menu with six buttons arranged in a 2x3 grid. The top row contains 'CUSTOM FADER 01' (DCA GROUP 01), 'CUSTOM FADER 02' (DCA GROUP 02), and 'CUSTOM FADER 03' (DCA GROUP 03). The bottom row contains 'CUSTOM FADER 04' (DCA GROUP 04), 'CUSTOM FADER 05' (FX SEND 01), and 'CUSTOM FADER 06' (FX SEND 02).

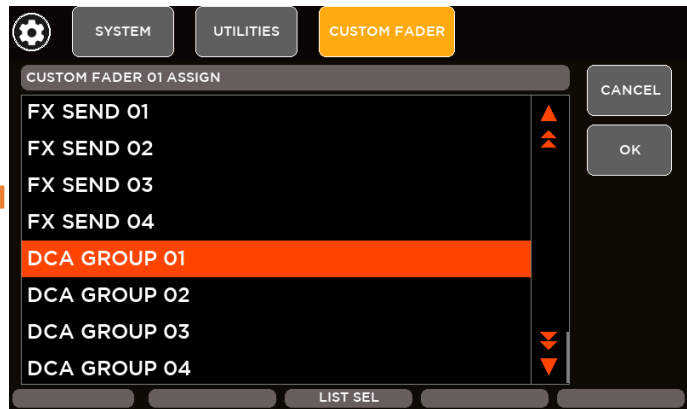
Default values of the Custom Faders are:

- Custom Fader 1: DCA Group 01
- Custom Fader 2: DCA Group 02
- Custom Fader 3: DCA Group 03
- Custom Fader 4: DCA Group 04
- Custom Fader 5: FX SEND 01
- Custom Fader 6: FX SEND 02

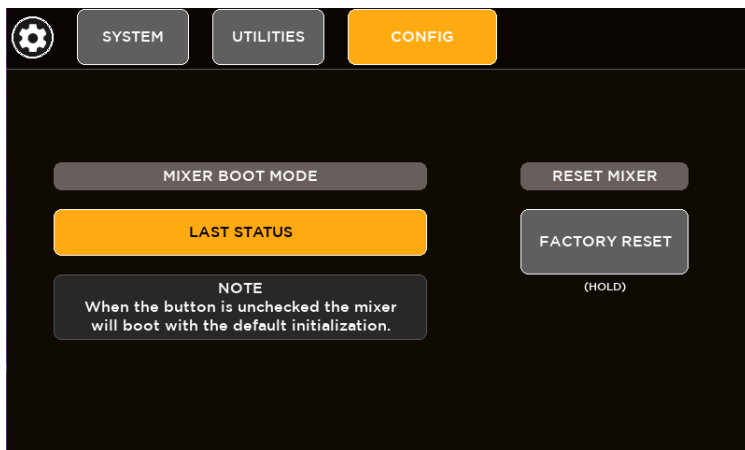
Each custom fader can be configured to control one of these faders:

- IN [01: 20]
- MAIN OUT L, MAIN OUT R
- MIX OUT [01:10]
- FX RTN [01:04]
- FX SEND [01: 04]
- DCA GROUP [01: 04]
- Press CANCEL to return to CUSTOM FADER page.

Choose your option directly scrolling on the screen or using the Encoder 3 (LIST SEL), then press OK to confirm.



CONFIG MIXER



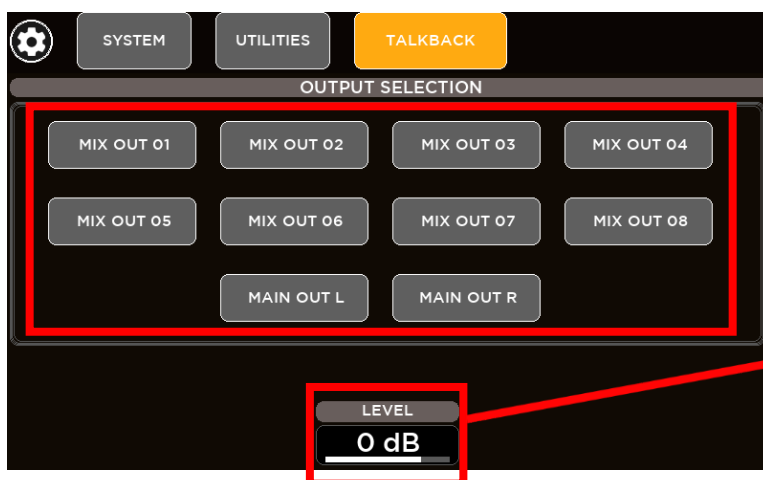
M 20 digital mixers periodically (every 5 seconds) save the current configuration of the machine. It's possible program the start-up mode of the mixer to recall last configuration or to load the default values of console's parameters.

Holding **FACTORY RESET** button, the console will be resetted to factory state.

WARNING: all saved SHOWS and PRESETS will be erased and all configuration parameters and processing parameters will be reset to default values.

TALKBACK

Analog Channel 16 can be configured as Talkback source. Through the SYSTEM > TALKBACK page it's possible setup the talkback options.

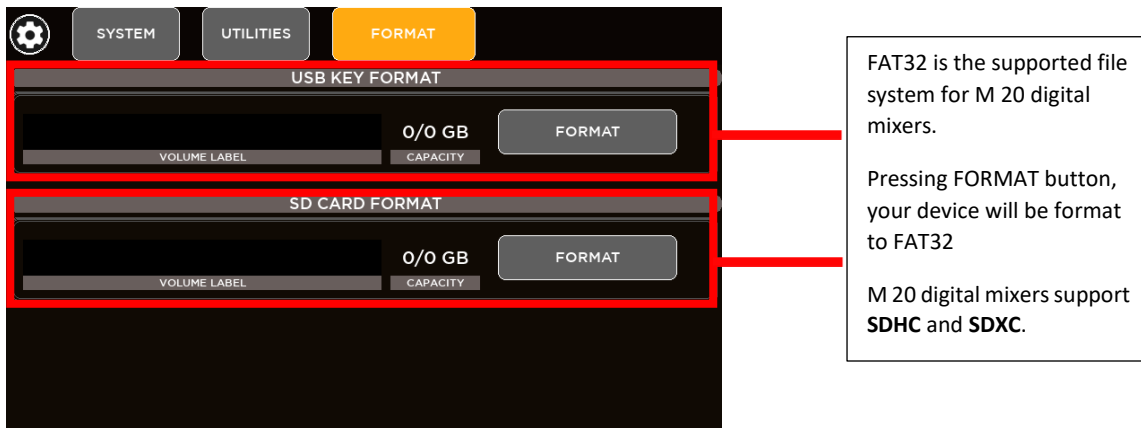


Select the outputs where automatically route CH16 when talkback is activated.

Adjust the global level of talkback using Encoder 3

USB & SD CARD FORMAT

M 20 digital mixers provide internal tools to format both USB key drive and SD Card in order to make them compatible with the system, ready to be used for multitrack and stereo playback and record.



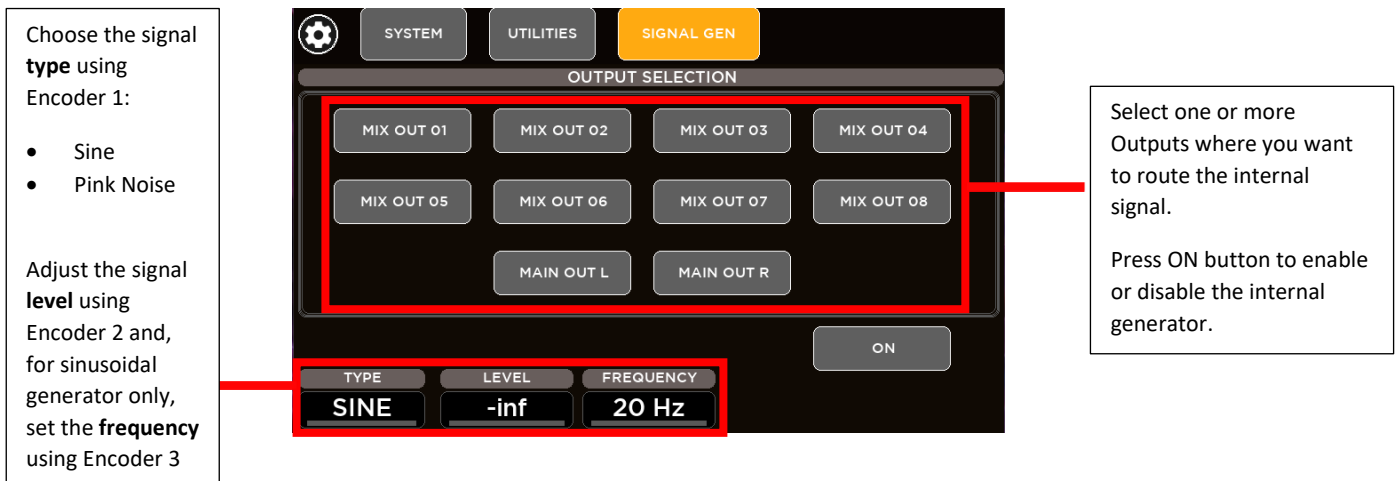
FAT32 is the supported file system for M 20 digital mixers.

Pressing FORMAT button, your device will be format to FAT32

M 20 digital mixers support **SDHC** and **SDXC**.

SIGNAL GENERATOR

An internal signal generator is available on M 20 series consoles.



Choose the signal **type** using Encoder 1:

- Sine
- Pink Noise

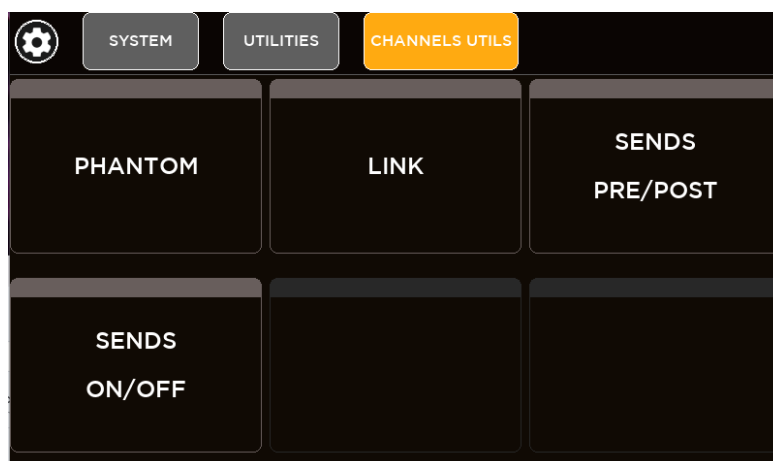
Adjust the signal **level** using Encoder 2 and, for sinusoidal generator only, set the **frequency** using Encoder 3

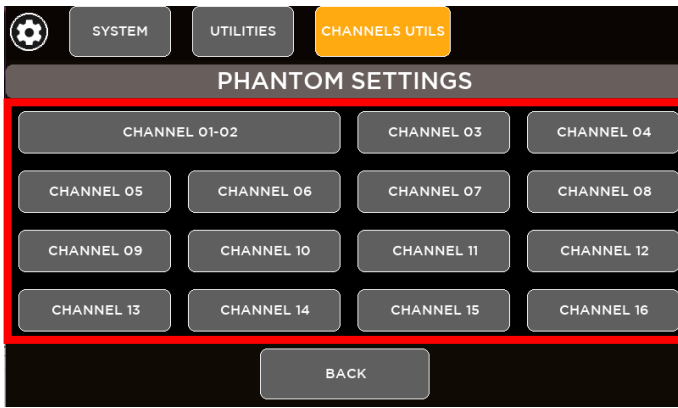
Select one or more Outputs where you want to route the internal signal.

Press ON button to enable or disable the internal generator.

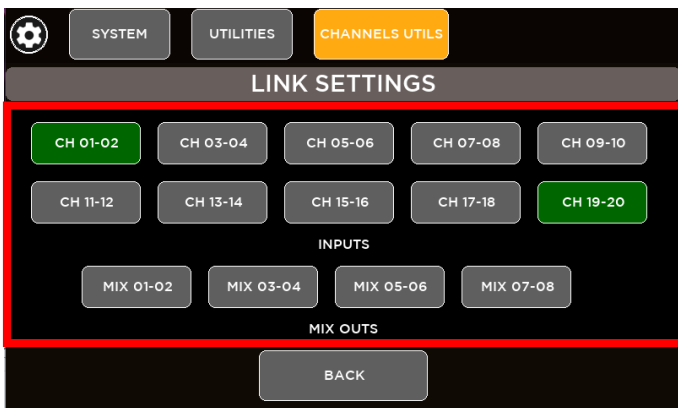
CHANNEL UTILITIES

Channels Utilities summarize some Channel parameters into individual pages divided by category.

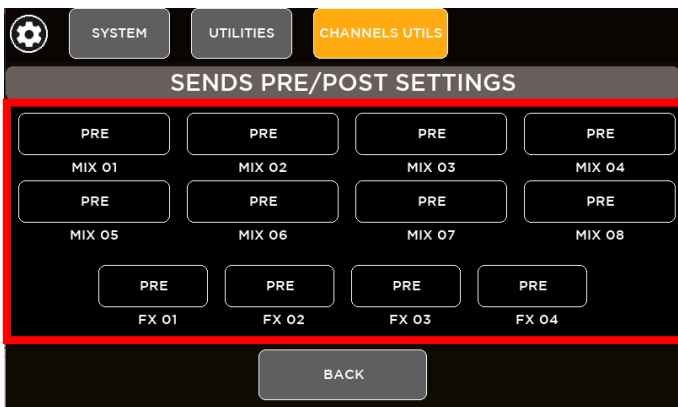




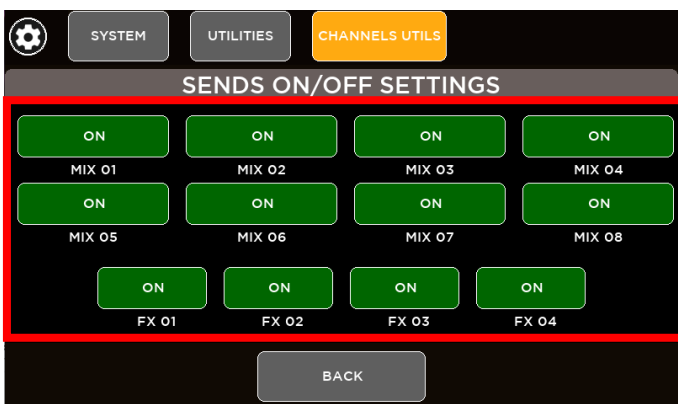
PHANTOM page allows to view and set +48V power on each MIC input channel.



LINK page allows to view and set stereo link on every couple of input and output channel.



SENDS PRE/POST page allows you to set the Pre/Post values of all input channels Sends on each MIX and FX bus with a single button.



SENDS ON/OFF page allows you to set the On/Off values of all input channel Sends on each MIX and FX bus with a single button.

INFO

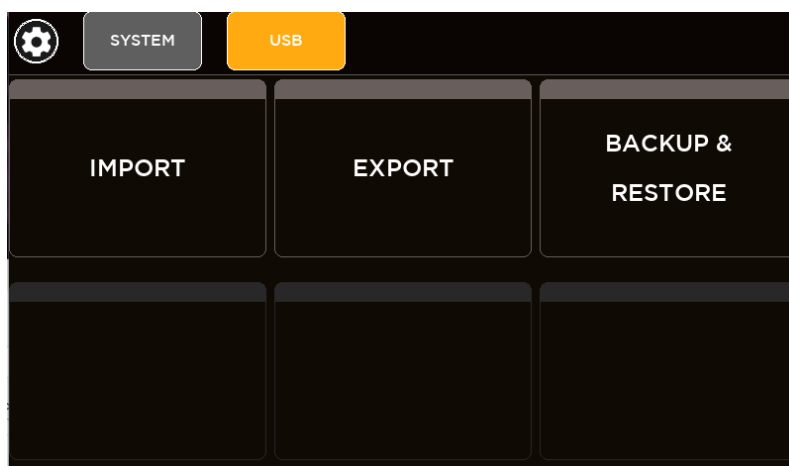
Through the INFO page it's possible to check the information about your machine such as the current Firmware Versions.



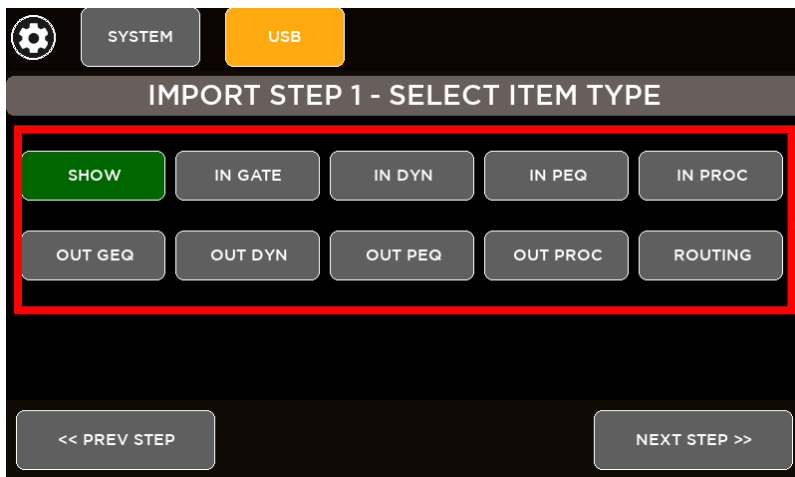
USB STORAGE

Data transfers are allowed using an external USB drive. It's possible to import and export USB packages for each categories of internal user memories:

- Show
- Input Gate User Presets
- Input Dynamics User Presets
- Input PEQ User Presets
- Input Channel User Presets
- Output GEQ User Presets
- Output Dynamics User Presets
- Output PEQ User Presets
- Output Channel User Presets
- IO Routing Presets



IMPORT



Select the category of memories that you want to import and then press NEXT STEP



Preview of the items inside the selected package

In this window are shown the previously exported packages available on the plugged USB drive.

Select the package to import and the press NEXT STEP



The selected number of Import Items will be copied to the internal memory starting from the selected target place. WARNING: The previous internal items following the starting point will be overwritten.

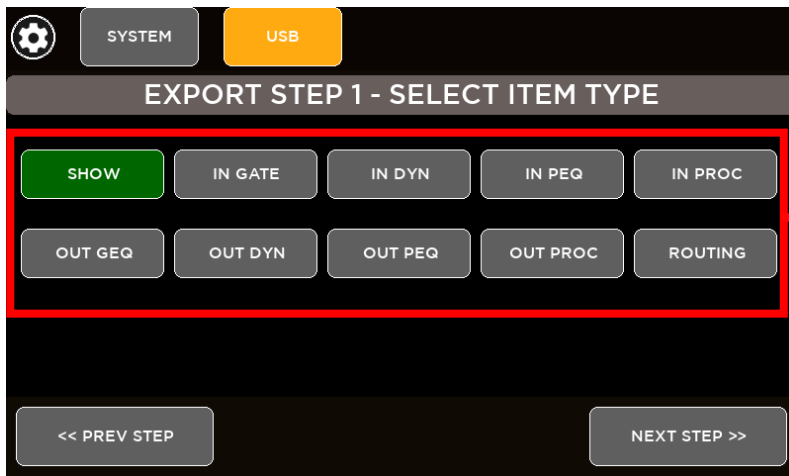
Press **EXECUTE** button to import.

Select range of memories touching first and last item of your set of memories directly on the screen.

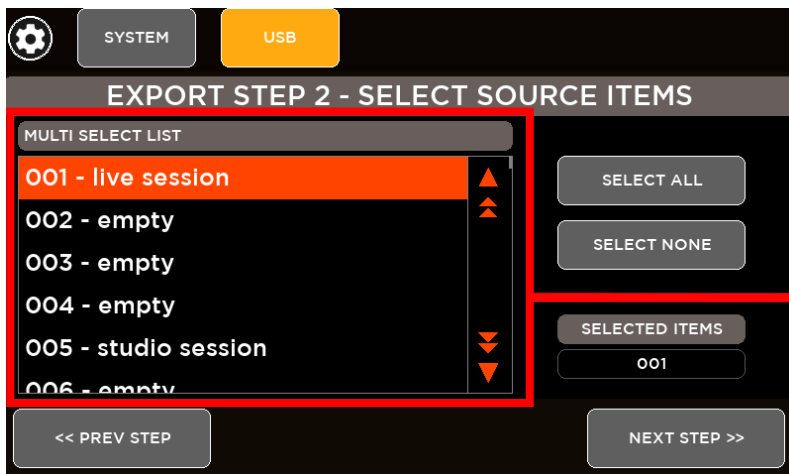
IMPORT ITEMS window shows the number of selected items.

EXPORT

Export your saved shows and presets to a USB drive.



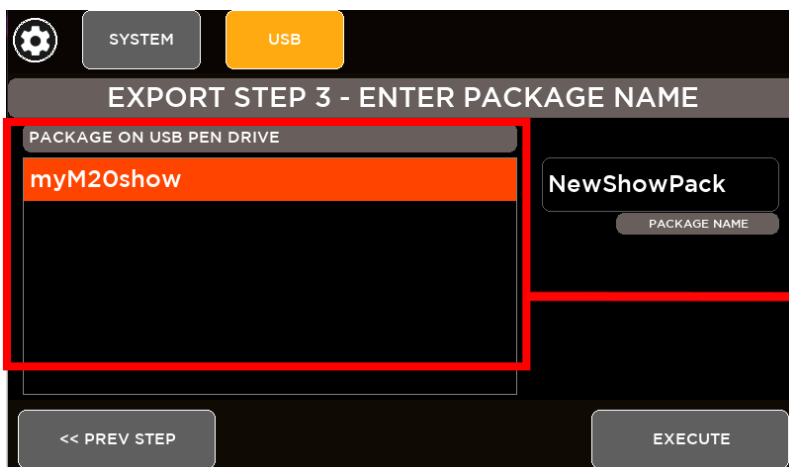
Select the category of memories that you want to export and then press NEXT STEP



Select range of memories touching first and last item of your range of memories directly on the screen.

SELECTED ITEMS window shows the number of selected items.

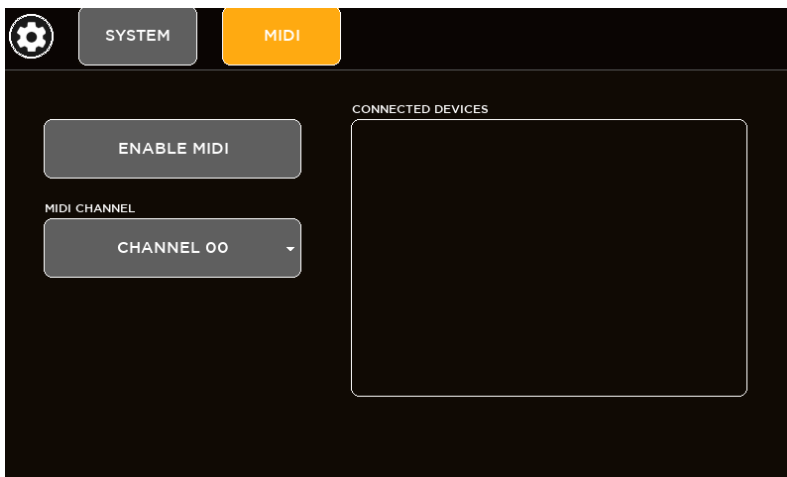
Then press NEXT STEP



In this window are shown the existing packages on your USB drive.

Enter a valid name of your new package and then press **EXECUTE** to export. The default name of Package is NewShowPack.

MIDI SETTINGS



Plug an external MIDI CONTROLLER to expand your surface control of M 20 digital consoles.

Through MIDI SETTING page it's possible to **ENABLE** the internal MIDI and to select the working MIDI Channel in the range [01:16]

MIDI MAPPING

Control Change

1	Fader CH01	9	Fader CH09	17	Fader CH17	25	Fader MAIN LR	33	Fader MIX4 OUT
2	Fader CH02	10	Fader CH10	18	Fader CH18	26	Fader FX1 SEND	34	Fader MIX5 OUT
3	Fader CH03	11	Fader CH11	19	Fader CH19	27	Fader FX2 SEND	35	Fader MIX6 OUT
4	Fader CH04	12	Fader CH12	20	Fader CH20	28	Fader FX3 SEND	36	Fader MIX7 OUT
5	Fader CH05	13	Fader CH13	21	Fader FX1 RTN	29	Fader FX4 SEND	37	Fader MIX8 OUT
6	Fader CH06	14	Fader CH14	22	Fader FX2 RTN	30	Fader MIX1 OUT	38	Fader MIX9 OUT
7	Fader CH07	15	Fader CH15	23	Fader FX3 RTN	31	Fader MIX1 OUT	39	Fader MIX10 OUT
8	Fader CH08	16	Fader CH16	24	Fader FX4 RTN	32	Fader MIX1 OUT	40	CUSTOM FADER 1

41	CUSTOM FADER 2
42	CUSTOM FADER 3
43	CUSTOM FADER 4
44	CUSTOM FADER 5
45	CUSTOM FADER 6

Program Change

01:100	SHOW [01: 100] Recall
--------	-----------------------

Note ON

1	Mute CH01	9	Mute CH09	17	Mute CH17	25	Mute MAIN LR	33	Mute MIX4 OUT
2	Mute CH02	10	Mute CH10	18	Mute CH18	26	Mute FX1 SEND	34	Mute MIX5 OUT
3	Mute CH03	11	Mute CH11	19	Mute CH19	27	Mute FX2 SEND	35	Mute MIX6 OUT
4	Mute CH04	12	Mute CH12	20	Mute CH20	28	Mute FX3 SEND	36	Mute MIX7 OUT
5	Mute CH05	13	Mute CH13	21	Mute FX1 RTN	29	Mute FX4 SEND	37	Mute MIX8 OUT
6	Mute CH06	14	Mute CH14	22	Mute FX2 RTN	30	Mute MIX1 OUT	38	Mute MIX9 OUT
7	Mute CH07	15	Mute CH15	23	Mute FX3 RTN	31	Mute MIX1 OUT	39	Mute MIX10 OUT
8	Mute CH08	16	Mute CH16	24	Mute FX4 RTN	32	Mute MIX1 OUT	40	Mute Custom FADER1

41	Mute Custom FADER2	49	CUE CH04	57	CUE CH12	65	CUE CH20	73	CUE FX3 SEND
42	Mute Custom FADER3	50	CUE CH05	58	CUE CH13	66	CUE FX1 RTN	74	CUE FX4 SEND
43	Mute Custom FADER4	51	CUE CH06	59	CUE CH14	67	CUE FX2 RTN	75	CUE MIX1 OUT
44	Mute Custom FADER5	52	CUE CH07	60	CUE CH15	68	CUE FX3 RTN	76	CUE MIX2 OUT
45	Mute Custom FADER6	53	CUE CH08	61	CUE CH16	69	CUE FX4 RTN	77	CUE MIX3 OUT
46	CUE CH01	54	CUE CH09	62	CUE CH17	70	CUE MAIN LR	78	CUE MIX4 OUT
47	CUE CH02	55	CUE CH10	63	CUE CH18	71	CUE FX1 SEND	79	CUE MIX5 OUT
48	CUE CH03	56	CUE CH11	64	CUE CH19	72	CUE FX2 SEND	80	CUE MIX6 OUT

81	CUE MIX7 OUT	89	SEL CH05	97	SEL CH13	105	SEL FX1 RTN	113	SEL FX4 SEND
82	CUE MIX8 OUT	90	SEL CH06	98	SEL CH14	106	SEL FX2 RTN	114	SEL MIX1 OUT
83	CUE MIX9 OUT	91	SEL CH07	99	SEL CH15	107	SEL FX3 RTN	115	SEL MIX2 OUT
84	CUE MIX10 OUT	92	SEL CH08	100	SEL CH16	108	SEL FX4 RTN	116	SEL MIX3 OUT
85	SEL CH01	93	SEL CH09	101	SEL CH17	109	SEL MAIN LR	117	SEL MIX4 OUT
86	SEL CH02	94	SEL CH10	102	SEL CH18	110	SEL FX1 SEND	118	SEL MIX5 OUT
87	SEL CH03	95	SEL CH11	103	SEL CH19	111	SEL FX2 SEND	119	SEL MIX6 OUT
88	SEL CH04	96	SEL CH12	104	SEL CH20	122	SEL FX3 SEND	120	SEL MIX7 OUT

121	SEL MIX8 OUT
122	SEL MIX9 OUT
123	SEL MIX10 OUT
124	Player Prev
125	Player Next
126	Player Play
127	Recorder Stop

6. VIEW BUTTONS



M 20 digital mixers has two VIEW buttons, characterized by a rhomboid shape, that provide a very useful summary pages to know the current status of the machine and to quick access to main settings.

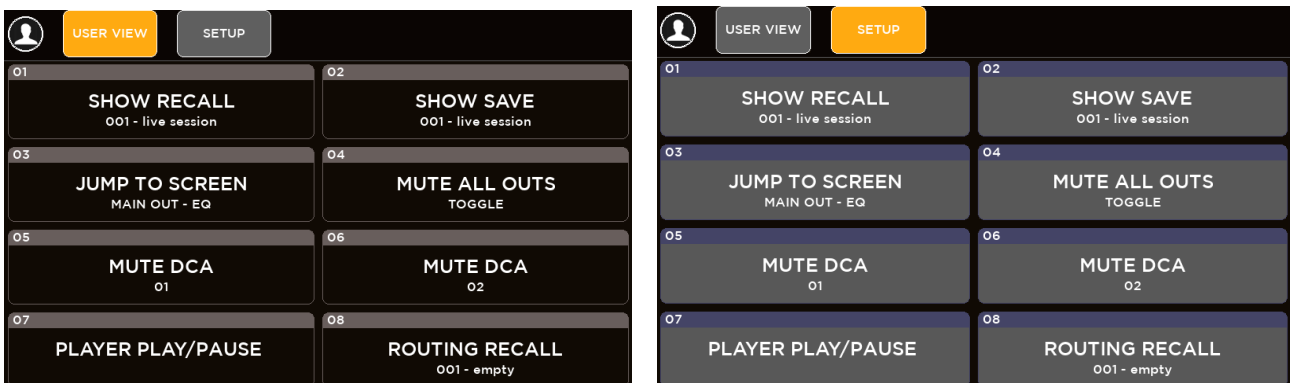
FADER SELECT VIEW

FADER SELECT VIEW provide the main information for each channel of the four fader banks: assigned name, routing source, fader level, mute value, phantom and stereo pair link. Each channel tab allows you to jump to the related processing page in order to minimize the number of operations.



USER KEYS VIEW

USER KEYS VIEW provide a summary page of USER KEYS configurations. Each of the 8 User Key tabs, when pressed, applies the programmed function. In the SETUP page specific functions can be assigned to each User Key. For details about User Keys functions, please refer to Chapter 5, SYSTEM > USER KEYS



7. TECHNICAL SPECIFICATIONS

INPUTS	
MIC preamps CH 1-8	XLR input connectors
	Gain range = 60 dB
	Input impedance = 3.3 k Ω
	Maximum input level = +18dBu
MIC/LINE preamps CH 9-16	COMBO input connectors
	Gain range = 60 dB
	Input impedance (XLR/TRS) = 3.3 k Ω / 12.8 k Ω
	Maximum input level (XLR/TRS) = +18dBu / 29dBu
Balanced Line inputs CH 17-18	2 channels 1/4" TRS jack
	Input impedance = 18 k Ω
	Maximum input level = +18 dBu
Unbalanced inputs CH 19-20	Stereo 3.5mm mini jack
	Input impedance = 15 k Ω
	Maximum input level = +18 dBu
OUTPUTS	
MAIN LR	Balanced XLR
	Output impedance = 50 Ω
	Maximum output level = +24 dBu
MIIX 1-8	Balanced XLR
	Output impedance = 150 Ω
	Maximum output level = +24 dBu
OUT 9-10, routable	2 channels 1/4" TRS jack
	Output impedance = 150 Ω
	Maximum output level = +24 dBu
Digital output, routable	AES3 (XLR)
DSP ENGINE	
Processing	32-bit floating-point, 48 kHz Sample Rate
Internal Mixing Matrix	28 x 16
INPUT PROCESSING	
CH 1-16	Hi-Pass filter
	Delay (up to 100 ms)
	Gate
	4-band Parametric EQ
	Compressor / De-Esser
CH 17-20	Hi-Pass filter
	Delay (up to 100 ms)
	Gate
	4-band Parametric EQ

OUTPUT PROCESSING	
MIX 1-8 (option to link in stereo pairs)	8-band Parametric EQ
	Compressor/Limiter
	Delay (up to 250 ms)
MAIN LR output (with Stereo/Mono switch)	30-band Graphic EQ
	8-band Parametric EQ
	Compressor/Limiter
	Delay (up to 250 ms)
PAFL	Real-Time Analyzer
	Delay (up to 250 ms)
INTERNAL FX (4x Z-CORE FX Engine)	
FX1 bus	Stereo Reverb (Hall, Plate, Room, Ambience)
FX2 bus	Stereo Reverb (Hall, Plate, Room, Ambience)
FX3 bus	Stereo Delay (Stereo, Modern, Vintage, Dual, ER)
FX4 bus	Stereo Delay / Modulation (Chorus, Flanger, Tremolo)
ON-BOARD MULTITRACK	
SD Card Play/Rec	Recording: 20 channel WAV, 48kHz 24-bit, patchable
	Playback: 20 channel WAV, 48kHz 24-bit, patchable
USB Audio Interface	Upstream: 24 channel WAV, 48kHz 24-bit, patchable
	Downstream: 24 channel WAV, 48kHz 24-bit, patchable
USB DRIVE PLAY/REC	
2-channel Play/Rec	Recording: WAV 48kHz, 24-bit
	Playback: WAV (16/24-bit), MP3, AIFF; allowed sample rates from 44.1 to 96 kHz
CONTROL INTERFACES	
LAN	1000-BaseTX for remote control
	Dual 1000-BaseTX for Dante audio streaming (M 20XD / M 20RD)
USB host	2 ports
	MIDI interface, WiFi dongle (must be enabled), USB mass storage
POWER	
Input Voltage Range	100-240 VAC, 50/60 Hz
Power Requirements	70 W (M 20X/M 20XD) / 70 W (M 20R/M 20RD)
PHYSICAL	
Ambient Operating Temperature	35°C
Weight	7.9 kg (M 20X / M 20XD) / 5.9 kg (M 20R / M 20RD)
Dimensions [D x L x H]	428 x 388 x 131 mm (M 20X / M 20XD) / 285 x 440 x 132.5 mm (M 20R / M 20RD)

8. BLOCK DIAGRAM

