



Q-MIX Users Manual

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Q-MIX CONCEPT

Preface

Q-MIX is more than an automatic audio mixer. By using the Q-MIX, a radio station or cable text TV station can fully automate it's final audio output before it is broadcasted. Computer controlled fading and switching of multiple audio sources and controlling (or being controlled by) external equipment are the basic functions.

Q-MIX is a spin-off of the larger, modular FrameWork system. Q-MIX is intended for smaller sized installations and is therefore not modular. That does not mean that any trade-offs have been made when it comes to functionality and certainly not to the overall quality of the circuits and components being used!

In the end, the combination of the used hardware and software makes up the functionality of the system. For simple applications, the Q-MIX can function fully stand alone, in more complex situations full control can be accomplished by using a PC with special software. Interfacing to radio automation on-air PCs is the most common application.

RS-232 remote control

By design, the system can function stand alone. On top of that, it is possible to change settings dynamically. Think of automatic fades of audio inputs, setting fade-in and fade-out times and of course generating control signals. For all these functions, commands are available that can be sent to the controller via RS-232. Check out the 'Generic RS-232 protocol' addendum for a complete overview of the commands supported by Q-MIX.

To improve quality, the design and specifications of hardware and software can be changed by Audisi without prior notice.
No part of this manual may be used for whatever purpose without the prior written permission of Audisi.

SYSTEM CONFIGURATION

The 19" (1 unit high) aluminum housing contains 4 electronically balanced stereo audio inputs (can also be used as 8 mono inputs), 1 electronically balanced stereo audio output (can be switched to mono), 4 opto coupler inputs (GPI), 4 SPDT relay outputs (GPO), 4 function keys with built-in bi-color LED and a microprocessor with an opto coupler isolated RS-232 port to prevent earth loops between audio systems and controlling computer equipment.

Power supply

All circuits are provided with a stabilized power supply which is constructed with separate toroidal transformers for analog and digital circuitry. Also, all input and output circuits have a separate power supply. Forced cooling is not necessary, therefore the Q-MIX has no moving parts. The power supply has a large overcapacity and is therefore very reliable.

- Euro-style mains entrance with built-in mains filter and double fuses.
- LEDs for checking the various power supply voltages (V+, V- and +5V).

System Controller

All parts of the Q-MIX are controlled by a fast microprocessor. Since all functionality is put into the software of this processor, the system is very flexible and most of the time it is easy to adjust the possibilities to make the system suitable for special applications.

- Opto coupler isolated RS-232 connection (CONTROL) on a 9-pole D-Sub female connector for configuration and remote control by special management software.
- Check of the processor status on RUN LED.
- Check of the RS-232 connection on LINK and DATA-led.

Stereo Audio Inputs

Each audio input can be used to connect a balanced (or unbalanced) stereo audio signal. By means of a precise multi-turn trimmer, this signal can be adjusted to the desired level. The volume of the audio signal can be adjusted by the controller and will eventually be available at the audio output.

- Audio electronically balanced on Neutrik XLR-3 female connectors.
- Input level nominal at +6dBu, trimmable (± 12 dB).
- Input impedance 18k Ω , CMRR typical 85dB.
- Digital controlled analog fader (volume control in 0,5dB steps) for automatic- of manual fading. The fader curve which is used for all fades is configurable in 128 steps.

Stereo Audio Output

The stereo output signal can be used to drive the inputs of e.g. a transmitter, codec or STL.

- Audio electronically or transformer-balanced (option) on Neutrik XLR-3 male connectors.
- Output level nominal at +6dBu, fixed (not adjustable) level.
- Output impedance 50 Ω , auto sensing.
- Software controllable stereo/mono switch.

Opto coupler / TTL Inputs

These inputs can be used to control special software functions of the micro controller. Think of e.g. remote switching of audio inputs or generating automatic fades and mutes.

- 4 opto-coupler isolated GPI inputs (5..24VDC).
- Input functions fully configurable.
- Short-circuit protected +5VDC power supply present on the connector.

Relais Outputs

These outputs can be used for generating fader starts (pulse/continuous) or for e.g. on-air signalling purposes. Control of the outputs is done by system functions or by RS-232 remote control commands.

- 4 relay isolated GPO outputs.
- Output functions fully configurable.
- Short-circuit protected +5VDC power supply present on the connector.

Manual and external control

The front of the Q-MIX has 4 buttons of which the function can be software configurable. The buttons can be lit both red and green because of the built-in bi-color LED. Full external remote control of all functions of the Q-MIX can be accomplished by using the RS-232 connection to a host computer.

- 4 function keys with bi-color LEDs for status display.
- Functionality of the keys can be configured.
- Rich set of commands for external control via RS-232.

OPERATION (FRONT)

The front contains relatively few controls because most of the time the Q-MIX will be controlled from built-in I/O interface or via RS-232 commands.



POWER

On/off switch. If the device is switched on, the neon-lamp inside the switch will lit. This is also a check that the device is connected to the mains voltage.

STATUS

The blue 'Power' LED will lit continuous if the power supply is switched on. It is the check of the power supply of all digital circuits.

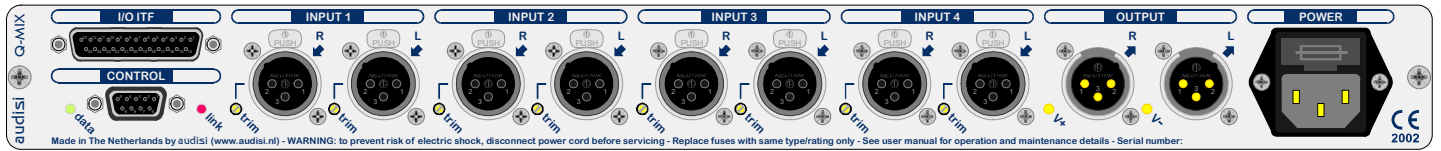
The 'Run' LED will flash green during normal operation. If the memory of the controller contains invalid configuration data, this LED will flash red. The device must be re-configured in that case.

FUNCTION KEYS

The function of these keys can be configured by software. Depending on the selected function, the LED inside the key will lit/flash red or green.

OPERATION (BACK)

At the back of the device you will find all connectors and level controls. The connection information of the various connectors can be found in the next chapter.



I/O ITF

Connector for 4 opto coupler inputs, 4 relay outputs and 5VDC power supply.

CONTROL

RS-232 connection for configuration and remote control of the Q-MIX. If a fully wired RS-232 cable is used, the red 'link' LED will lit as soon as the COM-port on the connected PC is opened.

The 'data' LED will flash if there is any activity on the RS-232 connection: green if data is received, red if data is transmitted by the Q-MIX.

INPUT X

Stereo audio inputs, 4 in total. The inputs are electronically balanced, the level can be set precise by means of the multi-turn 'trim' potentiometers. The control range is ± 12 dB.

OUTPUT

Stereo audio output. The output is electronically balanced by default, transformers for electrical isolation of the circuits can be fitted as an option.

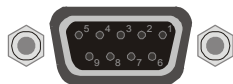
V+ / V-

These yellow LEDs indicate the presence of the symmetrical analog power supply voltages for the audio input- and output circuits.

POWER

Euro-style connector for the 230VAC mains. This connector also houses a double fuse holder (160mA, 20x5mm) and a mains filter.

CONNECTIONS



CONTROL

RS-232 port (DB9 female), used for both configuration and remote control of the Q-MIX

Pin	Function
1, 6, 4	DTR, only used for connection indicator led
2	TXD, transmitted data
3	RXD, received data
5	GND, reference voltage
7, 8	RTS/CTS, interconnected handshake lines

Use a 1:1 male/female cable (not a null-modem / cross cable) to connect the Q-MIX to a Com-port of a PC

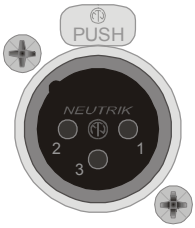


I/O ITF

4 GPO / 4 GPI interface (DB25 female), for control of/by external systems

Pin	Functie	Type
1	GPO output 1 n.o.	Relais
14	GPO output 1 n.c.	Relais
2	GPO output 1 common	Relais
15	GPO output 2 n.o.	Relais
3	GPO output 2 n.c.	Relais
16	GPO output 2 common	Relais
4	GPO output 3 n.o.	Relais
17	GPO output 3 n.c.	Relais
5	GPO output 3 common	Relais
18	GPO output 4 n.o.	Relais
6	GPO output 4 n.c.	Relais
19	GPO output 4 common	Relais
7	GPI input 1 opto-coupler anode (+)	Opto-coupler
20	GPI input 1 opto-coupler cathode (-)	Opto-coupler
8	GPI input 2 opto-coupler anode (+)	Opto-coupler
21	GPI input 2 opto-coupler cathode (-)	Opto-coupler
9	GPI input 3 opto-coupler anode (+)	Opto-coupler
22	GPI input 3 opto-coupler cathode (-)	Opto-coupler
10	GPI input 4 opto-coupler anode (+)	Opto-coupler
23	GPI input 4 opto-coupler cathode (-)	Opto-coupler
11, 24	Power supply +5VDC, 100mA max	Supply
12, 25	Digital ground	DGND
13	Frame, shield	FRAME

The opto-couplers can be activated by applying 5mA @ 5..24VDC. The relays can switch a maximum load of 1A @ 30VDC or 0,3A @ 150VAC. If a power supply is needed to connect system interfaces, the 5VDC power supply which is present at this connector may be used. Be sure the total amount of current will not exceed 100mA in that case.



INPUT

Audio input (XLR3 female), nominal +6dBu, electronically balanced

Pin	Functie	Type
1	Frame, shield	FRAME
2	Audio (+) in phase, 'hot'	Audio
3	Audio (-) out of phase, 'cold'	Audio



OUTPUT

Audio output (XLR3 male), nominal +6dBu, electronically balanced (transformers optional)

Pin	Functie	Type
1	Frame, shield	FRAME
2	Audio (+) in phase, 'hot'	Audio
3	Audio (-) out of phase, 'cold'	Audio