

TAKSTAR® 得胜



DX-88

数字矩阵处理器

Digital Matrix Processor

使用手册 | User Manual

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DX-88 数字矩阵处理器

■ 前言

感谢您选购得胜DX-88数字矩阵处理器,设计使用全新硬件架构,高性能400 MHz浮点DSP处理器,双核1.2G主控芯片,linux内核,超低底噪前置放大电路,低失真度模拟电路,无音频信号输入时,-100dBu超低底噪,为项目应用带来更安静的用户体验。为了您能够更好地了解使用本产品,建议您在使用前仔细阅读本说明书。

若存在有疑问或者您有宝贵的建议,可通过拨打得胜官方服务热线400 6828 333或微信扫描二维码关注得胜官方公众号与我们联系。



■ 产品特性

- 采用高性能浮点DSP处理芯片,具有400Mhz DSP处理能力;
- 8×8全矩阵混音,能够实现任意输入通道的自由混音;
- 前后面板各带独立的USB接口,可进行播音和录音功能,且软件可识别中文歌曲名;
- 所有输入通道支持48V幻象供电的MIC输入、前级放大、噪声门、压限器、8段参量均衡、高通滤波器、低通滤波器、独立的自适应反馈抑制器;
- 输出每通道8段参量均衡、高低通滤波器、压限器、延时器(300ms);
- 1个开放RS-232、TCP/ IP协议接口,实现第三方设备控制音量、调用模式,设置静音,能够通过TCP/IP协议批量读取混音前电平表和混音后电平表,便于第三方软件集成;
- 1个RS485接口专用于墙面触摸屏,外接最大16个墙面触摸屏音量控制面板,可以实现静音,音量大小调节。音量大小可在PC软件端设置上限、下限,防止用户控制超出使用范围;
- 具有摄像跟踪代码输出,便于通过第三方中控实现摄像联动功能;
- 支持32组场景预设功能,可通过TCP/IP、RS-232协议调用;
- 内置正弦波信号、粉红噪声、白噪声信号发生器;
- 前面板带电源指示灯、以太网网指示灯、故障报警指示灯显示;
- 通道参数通过软件可以快速复制、粘贴,轻松实现多通道的数据复制,操作便捷。

■ 适用范围

适用于会议室,报告厅,宴会厅及展览馆等扩声场所

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■ 产品配置

处理器.....	1台
电源线.....	1根
网线	1根
说明书.....	1份

■ 技术参数

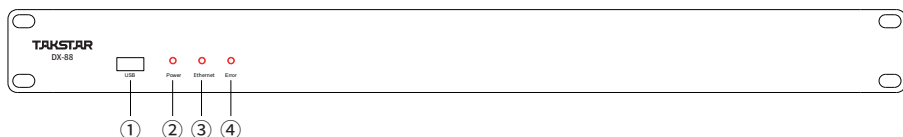
DSP 频率、处理能力	400Mhz DSP
采样频率/量化	48 kHz , 24Bit ADC , 24Bit DAC
输入到输出动态范围	110dB
总谐波失真	<0.004% @4dBu 20Hz -20kHz
频率响应	20Hz-20kHz , ± 0.5 dB @0dBu
共模抑制比(CMRR)	>80dB @1kHz MIC Gain 20dBu
通道串扰 Crosstalk	100dB $\pm$ 5dB @0dBu 1kHz
最大输入电平	+18dBu
音频接口标准	8 路平衡输入, 凤凰插头
默认输入、输出电平	+0dBu
话筒前置放大增益	0-40dB 模拟增益, 12dB 数字增益
输入阻抗	>5 k Ω 平衡, >3k Ω 非平衡
输出阻抗	600 Ω
前置放大等效输入噪声(EIN)	<-125dBu , 22Hz-22kHz
输出本底噪声	-100dBu (无记权)
幻象电源	+48V DC
设备尺寸 WxDxH	1U, 480mm $\times$ 250mm $\times$ 44mm
电源	100 $\sim$ 240VA , 50/60Hz , 55W
工作温度范围	0 $\sim$ 40 $^{\circ}$ C 操作温度

注:以上数据由得胜实验室测试得到,并拥有最终解释权!

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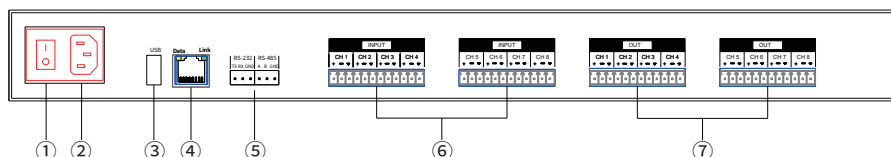
■ 功能示意

前面板



- ① USB接口:可进行USB录音、放音操作。
- ② 指示灯:分别为电源指示灯。
- ③ 以太网网指示灯。
- ④ 故障报警提示灯。

背面板



- ① 电源开关:按下上部(下部翘起)为打开设备电源,反之为关闭电源。
- ② 电源输入插座:三芯(电源插头需可靠接地保证安全)采用品字尾电源线。
- ③ USB接口:可进行USB录音、放音操作。
- ④ 网络接口:接入局域网实现网内电脑和设备的联机调试和设置。
- ⑤ PC连接口:RS-232/RS485两种连接方式。
- ⑥ 音频信号输入:8路凤凰接线端子平衡输入,支持线路/麦克风切换和麦克风输入时幻象电源开关。
- ⑦ 音频信号输出:8路凤凰接线端子,真电子平衡输出(若负端接地,正端2倍输出,以保证总输出不变)。

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■ 使用说明

一、控制软件运行环境

操作系统要求:Windows 7 32/64Bit、Windows 10、Windows11

网络环境:100M局域网或无线路由器

二、控制软件连接处理器

打开本数字音频处理器的电源,处理器的网线与控制电脑的网线,连接在同一台交换机。本数字音频处理器使用了自动发现协议,开启软件后,能够侦测到局域网内部的所有处理器。



首次打开软件,会出现以下提示窗口,请勾选允许在专用和公用网络上通信,并点击允许访问,否则有可能发现或连接不了处理器。以下截图为Windows 7系统截图。



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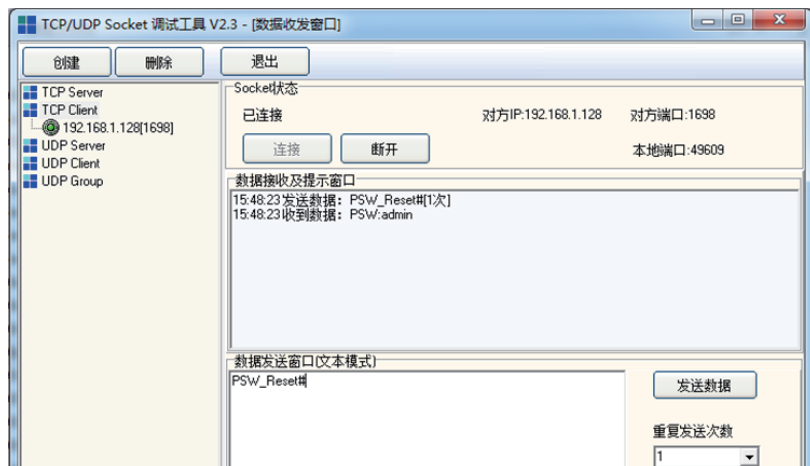
三、Password Login密码登录

每次连接处理器, 必须输入操作密码才能进行操作, 允许经过授权人员才能够对本处理器参数进行控制。出厂默认用户密码为: admin。



四、Reset Password登录密码恢复出厂设置

当登录密码因为某些原因遗失, 可以使用TCP指令: PSW_Reset#恢复出厂密码。



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五、IP Setting设置本机IP地址

当连接本处理器时,处理器的IP地址必须与控制电脑的IP地址处于同一个网段,例如下图所示处理器的IP地址为:192.168.1.128/255.255.255.0,而控制电脑的为192.168.10.123/255.255.255.0,此时控制软件无法连接到机器,因此需要首先设置处理器的IP地址或者电脑的IP,如下图所示。

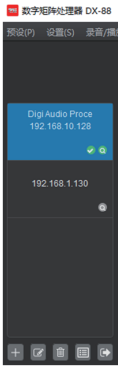


点击“立即修改设备IP”,输入新的IP地址点击确定,不用重启,即可修改到同一个网段。必要时,还可以修改子网掩码。此处,可将设备IP改为192.168.10.128即可正常登录设备。



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六、Device List Bar设备列表栏



控制软件左侧的设备列表栏,显示并记录设备,可选中登录、添加离线设备、修改设备网络参数、删除设备、断开连接等。

1、显示设备信息

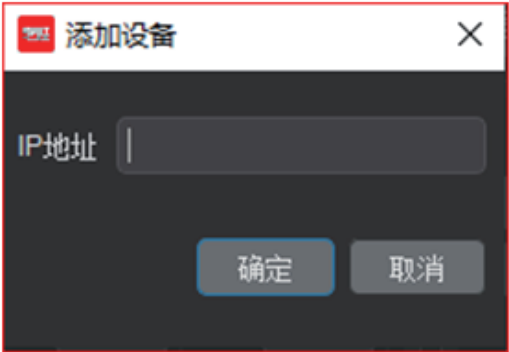
每个设备中,从上到下分别显示“设备型号”、“设备IP地址”、“当前预设名称”、“设备错误状态图标”和“设备在线/离线图标”。“设备错误状态图标”默认不显示,当设备出现DSP等错误时,图标就会显示。

2、连接登录设备

点击要连接在线的设备,如设备与电脑网络相通,则会弹出密码框,输入正确密码(默认密码是admin)即可登录设备。如设备与电脑网络不通,则会提示连接超时。

3、添加设备

由于某种原因,设备已正常接入网络,但在设备列表中没发现设备,可尝试手动添加设备。点击左下角的“+”图标或鼠标在设备列表处右键选择添加设备,弹出以上窗口,输入设备IP地址完成添加。设备IP地址出厂为192.168.1.128。



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4、修改网络参数

可免登录修改在线设备的IP地址、子网掩码和网关。通常，首次使用时出现电脑网络和设备网络不在同一个网段，或连接时提示连接超时时，可在此修改设备网络参数以正常连接。

5、移除设备

点击“移除设备”图标可移除离线设备。

6、设备列表

点击“设备列表”图标可查看设备的详细信息。

7、断开连接

如已登录设备，双击正在登录的设备或点击“断开连接”图标可退出登录并断开连接。

七、Device Information Status Bar设备信息状态栏



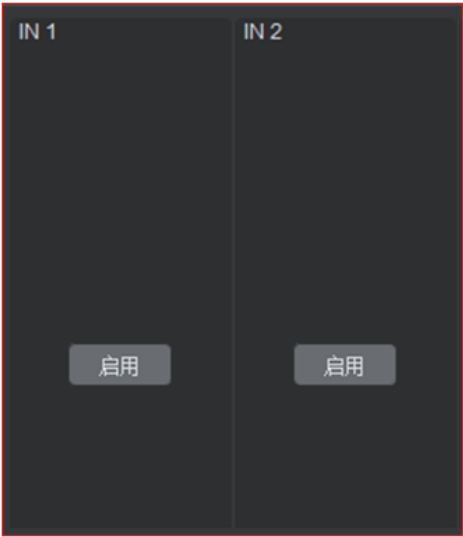
控制软件底部的状态栏，显示当前登录设备信息：DSP资源占用率（实时使用率和峰值）、序列号和软件版本。点击“系统静音”按键时，系统会静音。系统静音可以通过“Ctrl+M”快捷键进行操作，系统静音可使用第三方协议进行控制。

八、Input Setup输入设置

A screenshot of the 'Input Setup' interface. It has a dark background with several controls. At the top, it says 'IN 1'. Below that are two buttons: '话筒' (Microphone) and '线路' (Line). Below those are '静音' (Mute) and '48V'. Then there's a label '增益(dBu)' (Gain) and a slider set to '0.0'. At the bottom is a circular icon representing a microphone.	➤ 话筒按钮 当输入为动圈话筒时，需要按下此按钮。 ➤ 线路按钮 当输入为线路电平时，按下此按钮。 ➤ 48V 按钮 当话筒为电容话筒，需要 48V 幻象供电时，按下此按钮。 ➤ 模拟增益 选话筒模式时，范围是 0~50dBu，线路模式为 0~12dBu。用于放大话筒。
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九、Feedback自适应反馈抑制器



本反馈抑制器使用自适应反馈抑制，只需按下按钮，至少可以提高4~5dB传声增益。

十、AGC自动增益



本处理器支持每个通道独立的自动增益，启用、阈值、目标值、斜率、启动时间、恢复时间均可以调节。自动增益参数可以进行通道快速复制、粘贴，极大的提高了操作效率。

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十一、Gate噪声门



➤ **噪声门指示灯**

噪声门打开时，指示灯熄灭；噪声门关闭时，指示灯亮。

➤ **启用按钮**

用于启用或关闭噪声门。

➤ **阈值**

决定噪声门在多大输入信号后打开，即在多大输入信号后声音信号能够通过。范围-120~0dB。

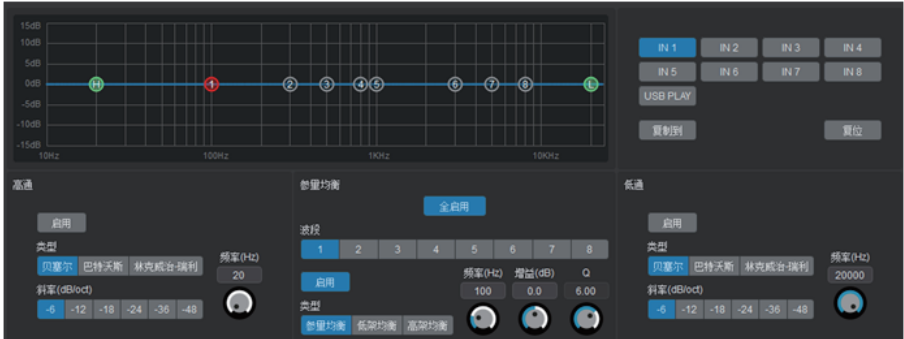
➤ **启动时间**

输入信号超过阈值后多长时间后噪声门打开，即噪声门从关门到开门所需要的时间。

➤ **恢复时间**

输入信号小于阈值后噪声门要花多长时间才能关闭，即从开门到关门所需要的时间。

十二、In Filter输入滤波器



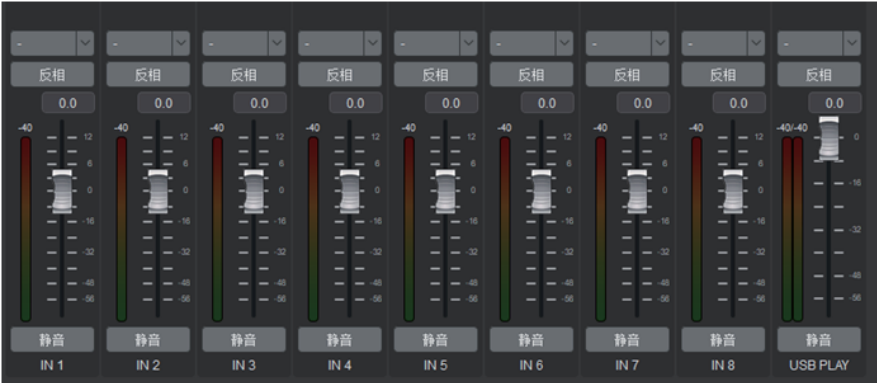
本处理器支持每个通道独立的滤波器，每通道8段PEQ，输入滤波器包含多种专业音频滤波模块：高通、低通、参量均衡、低架均衡、高架均衡。滤波器参数可以进行通道快速复制、粘贴，极大的提高了操作效率。

十三、In Limiter输入压限器



本处理器支持每个通道独立的输入压限器,启用、阈值、斜率、启动时间、恢复时间均可以调节。压限器参数可以进行通道快速复制、粘贴,极大的提高了操作效率。

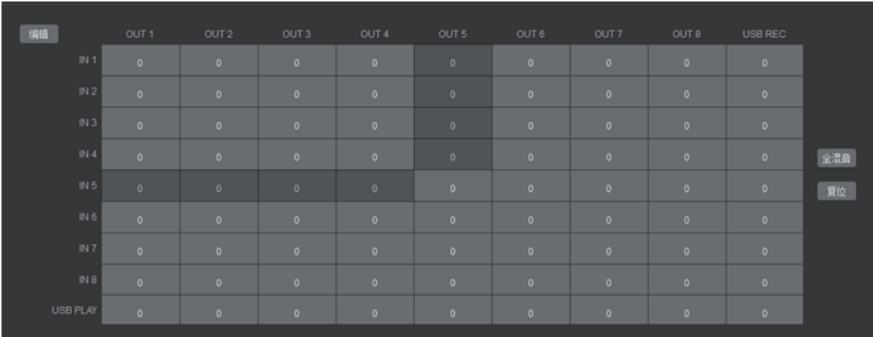
十四、Level Pre Mix混音前音量



矩阵混音前,可对每一通道的推子后电平进行监控,对音量进行控制,可对输入音频信号进行编组、反相、静音操作。此页面的音量推杆可通过第三方协议进行控制。

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十五、Matrix Mixer矩阵混音



矩阵混音支持任意交叉混音,可按住鼠标左键圈选进行多通道选择。点击左上角编辑按钮可设置混音量。点击输入通道名,可进行单个输入通道混音到所有输出通道。点击输出通道名,可进行所有输入通道混音到该输出通道。

十六、AutoMix 自动混音



自动混音算法通常应用于多话筒会议系统,能够有效避免多话筒同时打开时的啸叫。

自动混音使用说明:

1. 具有两个独立的自动混音组。
2. 选择AM 1或AM2按钮将通道分配给自动混音组1或2。

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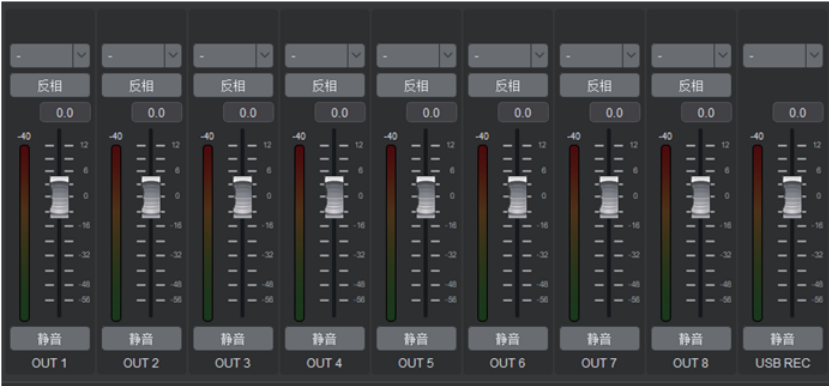
- 3. 使用推子修改分配给通道的音量的优先级。
- 一般而言,对于较为重要通道的声音,其权重分配得更多。通常,默认值为0。
- 4. 点击“AM X”启用按钮以启用或禁用自动混音组X。
- 5. 上方电平表示衰减量,下方电平表示衰减后的电平。

十七、Signal Generator信号发生器



信号发生器支持粉红噪声、正弦波、白噪声共三种,可分配到任意输出。

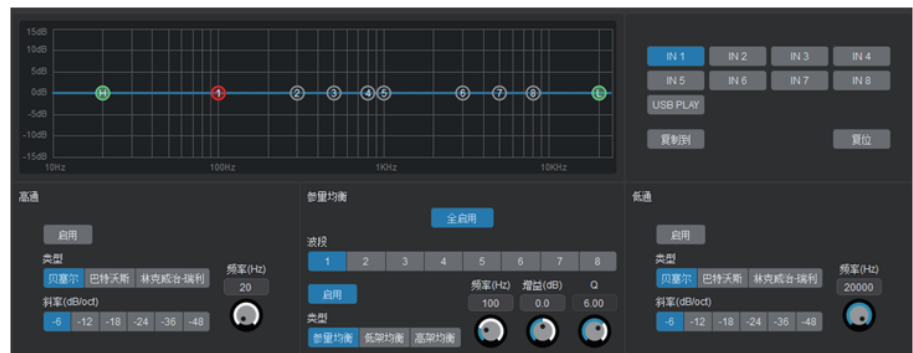
十八、Out Level输出音量



矩阵混音后,可对每一通道的推子后电平进行监控,对音量进行控制,可对输入音频信号进行编组、反相、静音操作。此页面的音量推杆可通过第三方协议进行控制。

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十九、Out Filter输出滤波器



本处理器支持每个通道独立的滤波器，每通道8段PEQ，输出滤波器包含多种专业音频滤波模块：高通、低通、参量均衡、低架均衡、高架均衡。滤波器参数可以进行通道快速复制、粘贴，极大的提高了操作效率。

二十、Out Limiter输出压限器



本处理器支持每个通道独立的输出压限器，启用、阈值、斜率、启动时间、恢复时间均可以调节。压限器参数可以进行通道快速复制、粘贴，极大的提高了操作效率。

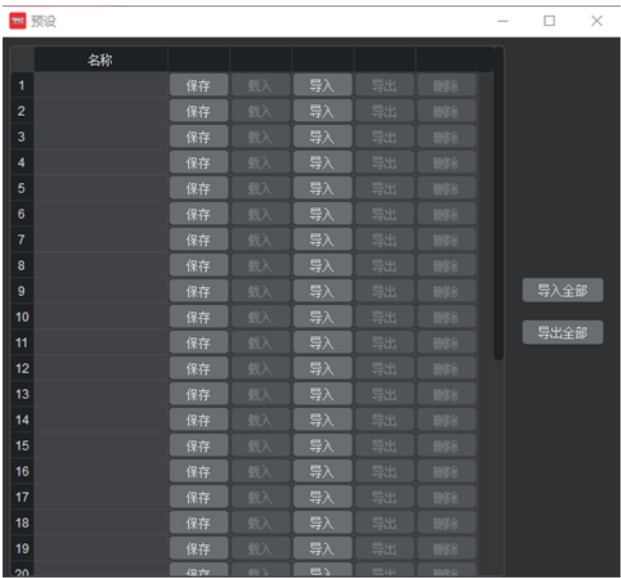
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二十一、Out Delay输出延时器



每个输出通道均有独立的延时器，最大可设置延时时间300毫秒。

二十二、Preset预设



本处理器共可存储32个模式，每个模式可以自定义名称。模式可通过控制软件调用，也可以通过开放的指令给第三方设备调用。预设参数支持数据导入、导出功能。

二十三、Setup设置



1、设备信息

- 设备型号
- ARM版本:ARM固件版本编号。
- DSP版本:DSP固件版本编号。
- 序列号:设备出厂序列号或正生产批次编码。
- 运行时间:设备上电后运行时间,断电后重新从0计时。
- USB状态:未插入/已插入。

2、设备状态

指示灯为灰色,未知状态;指示灯为绿色,表示正常;指示灯红色并闪烁,表示异常。

3、设备设置

- 设备ID
- 设备位置:标记设备位置。
- 设备描述:描述设备信息。
- IP地址、子网掩码、网关:设置网络参数。
- 噪声门吐码:是否打开噪声门中控码。
- RS232波特率:修改RS232波特率。
- RS485波特率:本参数已经固化,无法修改。
- 风扇测试:控制风扇开关。

4、通用设置

- 登录密码:设置PC软件或第三方中控连接登录设备的密码。

5、增益限制

设置各个通道允许增益设置范围。

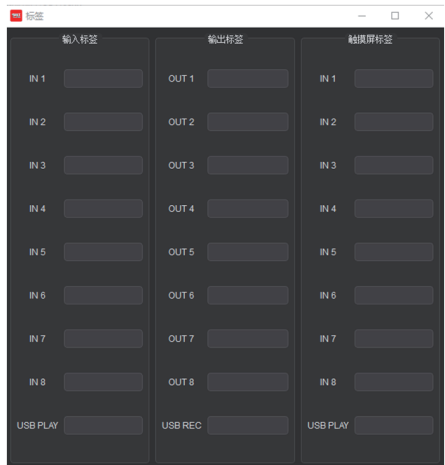
DX-88 数字矩阵处理器

二十四、Rec/Play录音/播放



- USB播放支持mp3、wav、ape、aac和flac文件格式；录音文件格式为wav。
- USB存储设备仅支持FAT32格式，播放文件固定存储在根目录文件名为“audio”文件夹中，录音文件固定存储在根目录文件名为“record”文件夹中。
- 播放开始、暂停、停止、上一曲、下一曲、播放模式。
- 录音开始/停止。

二十五、Label标签



在标签页面，可以对输入、输出通道进行标签管理，标签支持中文输入。标签输入完成后，当鼠标停留在对应的音量推杆或通道按钮上，会悬浮显示该通道标签内容。

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二十六、Meter 电平



在电平页面,实时监控所有输入输出通道推子前后的电平。

二十七、Device List设备列表

IP地址	设备型号	ARM版本	DSP版本	设备位置	设备描述	序列号	连接状态	运行时间	设备ID	
192.168.0.128	Digi Audio ...	1.0.31	1.22.20	test	test	CN-000-0907-...	离线		6233221841	移除

显示每个设备IP地址、设备型号、ARM版本、DSP版本、设备位置、设备描述、序列号、网络连接状态(离线/在线未登录/在线已登录/已登录)、运行时间和设备ID。

二十八、Command Assistant指令助手

The screenshot shows a software window titled "指令助手" (Command Assistant). It has a header bar with "RS232波特率: 115200 (默认)" and "TCP端口: 2698". Below the header is a tabbed interface with tabs: "登录" (Login), "混音前置量" (Mixing Pre-amount), "输出电平" (Output Level), "预设" (Presets), and "系统静音" (System Mute). The "登录" tab is active, showing a "登录 (仅TCP)" (Login (TCP only)) section with a "密码" (Password) input field and a "生成指令" (Generate Command) button. At the bottom, there is a "指令" (Command) input field and a "复制" (Copy) button.

用于生成Hex格式命令。

二十九、Communication protocol第三方通信协议-ASCII字符格式

通信协议类型:TCP sever 端口号:2698 (无需登录) RS232 默认波特率:115200				第三方设备指令发送时, 建议每条指令间隔50ms延时。	
序号	功能	TCP通信协议	RS-232协议	反馈码	备注
1	修改设备位置	Set_Loc [QC_Test_1]#	无	Location:QC_Test_1	括号内字符为ASCII 字符, 必须 无逗号等特殊字符, 限制在16 个字符范围内, 超过16个字符 LCD屏无法显示;
2	修改设备描述	Set_Des [QC_Test_2]#	无	Description:QC_Test_2	
3	调用预设	LOADP X#	LOADP X#	Preset:1	LOADP 1# 描述:加载并激活一个预设。 X变量代表预设号, 变量范围 1~32通道 1代表开机默认预设
4	读当前预设	ReadP#	ReadP#	Preset:0 Preset_Name:Boot Preset	
5	系统静音 控制无效	SYM 0#	SYM 0#	SYM 0#	参数0表示系统静音无效 参数1表示系统静音有效, 所 有输出静音
	系统静音 控制有效	SYM 1#	SYM 1#	SYM 1#	
6	读MatrixMix 混音前音量	ReadL1 X#	ReadL1 X#	PreLevel X:0dB	X变量为音频通道, 变量范围 1~16通道 Y为音量dB值, 变量范围: +12~-71 单步递加(递减)为1dB
7	混音前音 量递加	L1_add X#	L1_add X#	PreLevel X:-20dB	
8	混音前音 量递减	L1_sub X#	L1_sub X#	PreLevel X:-20dB	
9	混音后音 量递加	L2_add X#	L2_add X#	PostLevel X:0dB	
10	混音后音 量递减	L2_sub X#	L2_sub X#	PostLevel X:0dB	
11	设置MatrixMix 混音前音量	SetL1 X:Y# SetL1 1:-20#	SetL1 X:Y#	PreLevel X:-20dB	
12	读MatrixMix 混音后音量	ReadL2 X# ReadL2 16#	ReadL2 X#	PostLevel X:0dB	
13	设置MatrixMix 混音后音量	SetL2 X:Y# SetL2 1:-20#	SetL2 X:Y#	PostLevel X:-20dB	
14	读噪声门状 态输出	Read_Gate#	Read_Gate#	0100000000000000	0~1为噪声门状态, 0表示噪声 门未开启, 1表示噪声门开启 例如: 0100000000000000 标 识通道2噪声门开启

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15	密码复位	PSW_Reset#		PSW:admin	复位后密码为admin
16	RS-232复位 IP地址		IP_Reset#	IP_Reset OK	IP地址:192.168.1.128 子网掩码:255.255.255.0 网关:192.168.1.1
17	混音前通道静音	L1_Mute X#	L1_Mute X#	L1_Mute X	X变量为音频通道, 变量范围 1~16通道
	混音前通道解静音	L1_UnMute X#	L1_UnMute X#	L1_UnMute X#	
18	混音后通道静音	L2_Mute X#	L2_Mute X#	L2_Mute X#	
	混音后通道解静音	L2_UnMute X#	L2_UnMute X#	L2_UnMute X#	
19	读混音前通道静音状态	ReadL1 Mute#	ReadL1 Mute#	L1Mute: 0000111100000000 L1Mute: 0000000000000000	参数0表示通道静音无效 参数1表示通道静音有效, 声音禁止输出
20	读混音后通道静音状态	ReadL2 Mute#	ReadL2 Mute#	L2Mute: 0000111100000000 L2Mute: 0000000000000000	

三十、Communication protocol第三方通信协议：TCP HEX格式

1. 数据发送格式

读数据

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能 ID (1byte)	命令 (1byte)	数据长度 (2byte)		数据 (n byte)	结束符
						Low	High		
0x7D82					0x00				0x827D

写数据

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能 ID (1byte)	命令 (1byte)	数据长度 (2byte)		数据 (n byte)	结束符
						Low	High		
0x7D82					0x01				0x827D

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2. 设备返回数据格式

数据正常响应回码

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能 ID (1byte)	命令 (1byte)	数据长度 (2byte)	数据 (n byte)	结束符
0x7D82					0x80			0x827D

指令参数错误回码

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能ID (1byte)	命令 (1byte)	数据长度 (2byte)	结束符
0x7D82					0x81	0x0000	0x827D

指令未识别回码

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能ID (1byte)	命令 (1byte)	数据长度 (2byte)	结束符
0x7D82					0x82	0x0000	0x827D

3. 示例

序号	功能	TCP 通信协议	备注
1	登录	82 7D 01 00 02 01 01 01 05 00 61 64 6D 69 6E 7D 82	默认密码admin
2	混音前通道静音	82 7D 01 00 03 07 01 01 02 00 00 01 7D 82 82 7D 01 00 03 07 01 01 02 00 00 00 7D 82	输入1静音 输入1取消静音
3	混音前通道增益	82 7D 01 00 03 07 02 01 05 00 00 00 00 40 C0 7D 82	通道1增益为-3.0dB
4	混音前通道增益累加/减	82 7D 01 00 03 07 05 01 05 00 00 00 00 80 3F 7D 82 82 7D 01 00 03 07 05 01 05 00 00 00 00 80 BF 7D 82	输入1增益+1 输入1增益-1
5	混音后通道静音	82 7D 01 00 03 0B 02 01 02 00 00 01 7D 82 82 7D 01 00 03 0B 02 01 02 00 00 00 7D 82	输出1静音 输出1取消静音
6	混音后通道增益	82 7D 01 00 03 0B 03 01 05 00 00 00 00 40 40 7D 82	输出1增益为3.0dB

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7	混音后通道增益累加/减	82 7D 01 00 03 0B 06 01 05 00 00 00 00 80 3F 7D 82 82 7D 01 00 03 0B 06 01 05 00 00 00 00 80 BF 7D 82	输出1增益+1 输出1增益-1
8	载入预设	82 7D 01 00 03 20 03 01 01 00 04 7D 82	载入预设5
9	混音前通道电平表	82 7D 01 00 03 01 01 00 00 00 7D 82	读取输入通道推子后电平 反馈码： 82 7D 01 00 03 01 01 80 10 00 (输入1~16电平值共16个字节) 7D 82
10	混音后通道电平表	82 7D 01 00 03 0B 01 00 00 00 7D 82	读取输出通道推子后电平 反馈码： 82 7D 01 00 03 0B 01 80 10 00 (输出1~16电平值共16个字节) 7D 82

三十一、混音矩阵TCP/IP、RS-232控制指令

本协议支持TCP和RS232控制，TCP端口号为1698或1699或2698，其中使用2698端口需要先登录，1698或1699端口无需登录。RS232默认波特率115200。默认密码TCP登录密码admin，所有指令需要登录后才能够进行控制。默认编码为1（即0x0001）。

1. 控制混音状态(功能ID:01H [R/W])

读数据格式

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能ID (1byte)	命令 (1byte)	数据长度 (2byte)	数据 (1byte)	结束符
0x7D82		0x03	0x08	0x01	0x00	0x0001	输出通道	0x827D

写数据格式

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能ID (1byte)	命令 (1byte)	数据长度 (2byte)	数据 (n byte)					结束符
0x7D82		0x03	0x08	0x01	0x01		输出通道	输入通道	...	输入通道	状态	0x827D

说明：数据中第1字节为输出通道，第2到第n-1字节为输入通道，最后1个字节为状态字节，0x00表示取消混音，0x01表示混音。
例如：将输入1、2、3通道混音到输出1，则发送数据为：
0x82 0x7D 0x01 0x00 0x03 0x08 0x01 0x01 0x05 0x00 0x00 0x00 0x01 0x02 0x01 0x7D 0x82

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设备返回数据格式

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能ID (1byte)	命令 (1byte)	数据长度 (2byte)	数据 (17 byte)				结束符
0x7D82		0x03	0x08	0x01	0x80	0x0011	输出通道	输入1通道状态	...	输入16通道状态	0x827D

2. 控制混音值(功能ID:02H [R/W])

读数据格式

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能ID (1byte)	命令 (1byte)	数据长度 (2byte)	数据 (1byte)	结束符
0x7D82		0x03	0x08	0x02	0x00	0x0001	输出通道	0x827D

写数据格式

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能ID (1byte)	命令 (1byte)	数据长度 (2byte)	数据 (n byte)				结束符
0x7D82		0x03	0x08	0x02	0x01		输出通道	输入通道	...	输入通道混音值 (1byte)	0x827D

说明: 数据中第1字节为输出通道, 第2到第n-1字节为输入通道, 最后1个字节为混音值, 范围:-70到12dB, -70表示静音。
例如: 将输入1、2、3通道混音到输出1的混音值设为-10dB, 则发送数据为:
0x82 0x7D 0x01 0x00 0x03 0x08 0x02 0x01 0x05 0x00 0x00 0x00 0x01 0x02 0xF6 0x7D 0x82

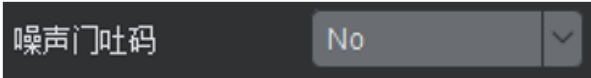
设备返回数据格式

帧头 (2byte)	编码 (2byte)	类型 (1byte)	子类 (1byte)	功能ID (1byte)	命令 (1byte)	数据长度 (2byte)	数据 (17 byte)				结束符
0x7D82		0x03	0x08	0x01	0x80	0x0011	输出通道	输入1混音值	...	输入16混音值	0x827D

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三十二、Gate report 噪声门吐码与摄像联动

在设备设置页面有一个噪声门吐码控件，默认为No状态。当切换到Yes状态时，Gate处于激发状态时，会自动发出一串代码，用于实现摄像联动触发。



摄像联动的实现方式：

方式1：

此种方式适合编程不太灵活的中控品牌，Gate噪声门在话筒模式下，16个通道阈值全部调整到-15dBu(现场根据情况调节)，在软件界面找到如下按钮：设置/设备信息/噪声门主动吐码/NO。话筒噪声门主动吐码功能默认是关闭的，需要设置为YSE马上生效，重启处理后为YES状态。

例如：

打开了第二路话筒，处理器发出码AA 02 01 0D；(AA：字头；02：第一路话筒；01话筒打开；0D：结束码)

关闭了第二路话筒，处理器发出码AA 02 00 0D；(AA：字头；02：第一路话筒；00话筒关闭；0D：结束码)

当打开了第一、三话筒，再打开第六支话筒，发码顺序如下：

当打开第一支话筒时，处理器发码AA 01 01 0D

当打开第二支话筒时，处理器发码AA 02 01 0D

..

当打开第六支话筒时，处理器发码AA 06 01 0D

..

同时打开几支话筒时，就需要中控编程来判断哪只话筒在持续讲话(利用关闭指令)；

因为处理器无法判断话筒是正常讲话，还是被茶杯、咳嗽声音激发。

方式2：

此种方式适合AMX、Crestron品牌，中控主机需要循环50ms主动发Read_Gate#，音频处理器会返回“1010000000000001”，Gate噪声门在话筒模式下，阈值调整到-15dBu(现场根据情况调节)，中控主机，需发码给处理器，方可知道话筒的状态。

例如：读取到的话筒状态码是“1010000000000001”表示打开了三支话筒(即第一路、第三路，第十六路)，如做摄像自动跟踪，读取到的是三支话筒都是打开的，需要中控主机去识别，就需要中控判断那只话筒在持续讲话

因为处理器无法判断话筒是正常讲话，还是被茶杯、咳嗽声音激发。

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三十三、System Upgrade系统升级

本处理器可以通过以太网升级固件。操作步骤如下:菜单栏点击“系统升级”,会弹出一个对话框,选择后缀为img的固件,点击确定出现升级进度条,升级完成后机器会自动重启。

三十四、System Reset系统复位

连接登录处理器后,可通过点击菜单栏“系统复位”,即清除所有参数。

■ 注意事项

注意:

- 整机电源:整机供电必须为100V~240V电压范围。
- 电源线保护:妥善布线,避免被踩踏或重物挤压。
- 维护:所有维修需由认证的维修人员进行。为避免出现触电危险不要自己试图打开设备维修该设备。
- 通风孔:有些设备机壳上有通风槽或孔,它们是用来防止机内敏感元件过热,不要用任何东西挡住通风孔。

电源相关内容:

- 请务必将插头插紧,线缆接牢,否则可能会引起故障。
- 请勿使用松动的电源插座或破损电源线,否则有触电或引起火灾的危险。
- 任何情况下都切勿用湿手触碰电源插头,否则有触电的危险。
- 请勿将多台设备的电源插头插到一个插座上,否则有引起火灾的危险。
- 请勿将重物压在电源线上,防止弯曲、拉扯或缠绕电源线。

附加安全信息:

- 用户使用该套装设备前必须阅读并理解所有安全和使用说明。
- 用户应保存安全说明书以备将来使用。

■ 故障排除

1. 控制软件无法查找到处理器

控制软件的功能被Windows防火墙屏蔽,或者被您电脑上的杀毒软件禁用了部分功能,导致无法正常工作。因此,请使用系统管理员权限运行处理器的exe文件。如果杀毒软件直接删除或者隔离了本软件中的部分文件,请把隔离的文件释放。

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2. 控制软件查找到设备但无法建立连接

控制软件工作在双网络环境，例如笔记本电脑同时连接了有线网络、无线路由器，此时可能会出现这种情况，禁用另外一个网络会解决这个问题。

3. PC控制软件无法修改IP地址

由于本音频处理器使用UDP协议进行IP地址设置，如果您使用无线路由器连接到处理器，无线路由器会阻挡音频处理器的UDP协议，造成无法修改，您需要使用笔记本电脑与音频处理器建立直接连接进行修改。

4. 第三方TCP指令无法控制

- A、一旦设置了第三方TCP指令控制，则主机的IP地址不能任意更改，否则控制无效。
- B、请检查控制端口是否正确；
- C、请检查控制代码是否准确无误；
- D、如上述问题不能解决，请使用通用TCP指令调试工具测试，具体操作方法请参见“通信协议测试视频指导”。

■ 环保说明

产品中有毒有害物质或元素的名称及含量标识表

部件名称	有毒有害物质或元素									
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)	邻苯二甲酸 二正丁酯 (DBP)	邻苯二甲酸 二异丁酯 (DIBP)	邻苯二甲酸 丁基苄酯 (BBP)	邻苯二甲酸 二(2-乙基)己酯 (DEHP)
塑料部件	○	○	○	○	○	○	○	○	○	○
金属部件	×	○	○	○	○	○	○	○	○	○
电路板组件	×	○	○	○	○	○	○	○	○	○
线缆	×	○	○	○	○	○	○	○	○	○
注1：○：表示该有害物质在该部件所有均质材料中的含量均不超出电器电子产品有害物质限制使用国家标准要求。 ×：表示该有害物质至少在该部件的某一均质材料中的含量超出电器电子产品有害物质限制使用国家标准要求。 注2：以上未列出的部件，表明其有害物质含量均不超出电器电子产品有害物质限制使用国家标准要求。										
此标志为产品的环保使用期限标志， 且此环保使用期限只适用于产品正常工作的温度和湿度等条件。										

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1. 使用产品时请确认所连设备与本产品是否匹配以及合理调整音量大小，不要在超过产品功率及大音量下长时间使用，以免造成产品异常；
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DX-88 数字矩阵处理器

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■ 应将本产品应交由授权的电气和电子设备(WEEE)回收站回收。同时,您在正确处理本产品的同时将有助于自然资源的有效利用。如需了解更多有关您可以在何处放置废物回收设备的信息,请联系您当地的城市办事处、废物管理局或家庭废物处理服务部门。

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DX-88 Digital Matrix Processor

■ Preface

Dear Customer,

Thank you for purchasing our product. This product features an all-new hardware architecture, equipped with a high-performance 400MHz floating-point DSP processor, a dual-core 1.2G main control chip, and a Linux kernel. With ultra-low-noise preamplifier circuitry and low-distortion analog circuits, it delivers an ultra-low noise floor of -100dBu when no audio signal is input, ensuring a quieter audio experience for project applications. Read this manual thoroughly to use the product properly.

If you have any questions or suggestions, please contact our local sales service.

■ Features

- High-performance floating-point DSP with 400MHz processing power.
- 8×8 full matrix mixing for flexible routing of any input channels.
- Independent USB ports on both front and rear panels for audio playback and recording; software supports Chinese song title recognition.
- All input channels feature 48V phantom power for MIC inputs, preamplification, noise gate, compressor, 8-band parametric EQ, high-pass filter, low-pass filter, and independent adaptive feedback suppressor.
- Each output channel is equipped with 8-band parametric EQ, high/low-pass filters, compressor, and delay (300ms).
- One open RS-232 and TCP/IP port enables third-party control of volume, preset recall and mute; supports batch reading of pre-mix and post-mix level meters via TCP/IP for seamless third-party software integration.
- One dedicated RS485 port for wall-mounted touch panels, supporting up to 16 wall-mounted volume control panels for mute and volume adjustment; volume upper and lower limits can be set via PC software to prevent out-of-range operation.
- Camera tracking code output for camera linkage via third-party control systems.
- 32 scene presets, recallable via TCP/IP and RS-232 protocols.
- Built-in signal generators: sine wave, pink noise and white noise.
- Front panel indicators: Power, Ethernet Link, Fault Alarm.
- Quick copy and paste of channel parameters via software for easy multi-channel data duplication.

DX-88 Digital Matrix Processor

■ Applications

Suitable for sound reinforcement venues including conference rooms, lecture halls, banquet halls and exhibition halls.

■ Package Contents

- 1 x Digital Matrix Processor
- 1 x Power Cord
- 1 x Network Cable
- 1 x User Manual

■ Specifications

DSP Frequency & Processing Power	400MHz DSP
Sampling Frequency/Quantization	48kHz, 24-bit ADC, 24-bit DAC
Input-to-Output Dynamic Range	110dB
Total Harmonic Distortion (THD)	<0.004% @ 4dBu, 20Hz–20kHz
Frequency Response	20Hz–20kHz, $\pm 0.5\text{dB}$ @ 0dBu
Common Mode Rejection Ratio (CMRR)	>80dB @ 1kHz, MIC Gain 20dBu
Channel Crosstalk	100dB $\pm$ 5dB @ 0dBu, 1kHz
Maximum Input Level	+18dBu
Audio Interface Standard	8-channel balanced inputs, phoenix connectors
Default Input/Output Level	+0dBu
Mic Preamplifier Gain	0–40dB analog gain, 12dB digital gain
Input Impedance	>5k Ω balanced, >3k Ω unbalanced
Output Impedance	600 Ω
Equivalent Input Noise (EIN) of Preamplifier	< -125dBu, 22Hz–22kHz
Output Noise Floor	-100dBu (unweighted)
Phantom Power	+48V DC
Dimensions (W×D×H)	1U, 480mm × 250mm × 44mm
Power Supply	100–240V, 50/60Hz, 55W
Operating Temperature Range	0°C to 40°C

Note: The above data are measured by Takstar laboratory which has the final interpretation right!

DX-88 Digital Matrix Processor

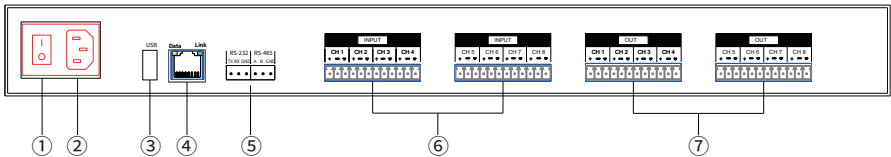
■ Function Descriptions

Front Panel



- ① USB Port: Supports USB audio recording and playback.
- ② Power Indicator
- ③ Ethernet Link Indicator
- ④ Fault Alarm Indicator

Rear Panel



- ① Power Switch: Press the upper section to power on (lower section pops up); press the lower section to power off.
- ② Power Input: 3-pin IEC power cord. Ensure the power plug is properly grounded for safety.
- ③ USB Port: Supports USB audio recording and playback.
- ④ Network Port: LAN connection for PC-based device configuration and setup.
- ⑤ PC Port: RS-232/RS-485 (two connection options).
- ⑥ Audio Inputs: 8-channel balanced phoenix terminal inputs, with line/mic select and phantom power switch for mic inputs.
- ⑦ Audio Outputs: 8-channel phoenix terminals with true electronic balanced output. If the negative terminal is grounded, the positive terminal delivers double output level to maintain constant total output.

DX-88 Digital Matrix Processor

■ Operating Instructions

1. Control Software Operating Environment

OS Requirements: Windows 7 (32/64-bit), Windows 10, Windows 11

Network Environment: 100 Mbps LAN or wireless router

2. Connecting Control Software to Processor

Power on the digital audio processor, and connect both the processor and the control PC to the same Ethernet switch. The processor supports an auto-discovery protocol. Once the software is launched, it will automatically detect all processors on the local network.

When you launch the software for the first time, the following prompt window will appear. Please check to allow communication on both private and public networks, then click Allow access. Failure to do so may prevent the software from detecting or connecting to the processor.

3. Password Login

A password is required for operation each time you connect to the processor. Only authorized personnel can adjust the processor parameters. Factory default user password: admin.

4. Reset Password — Restore Factory Login Password

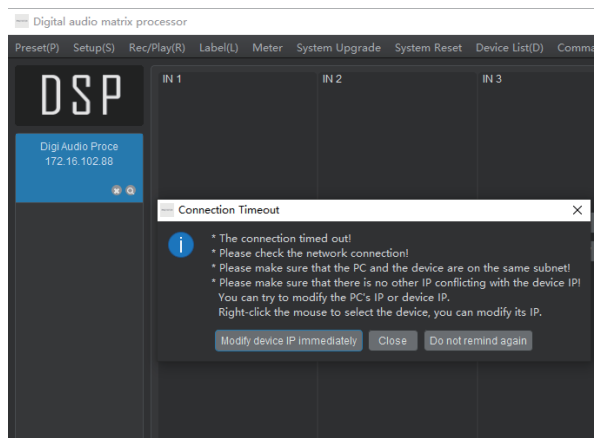
If the login password is lost, send the TCP command `PSW_Reset#` to restore the factory default password.

5. IP Setting — Set the Unit's IP Address

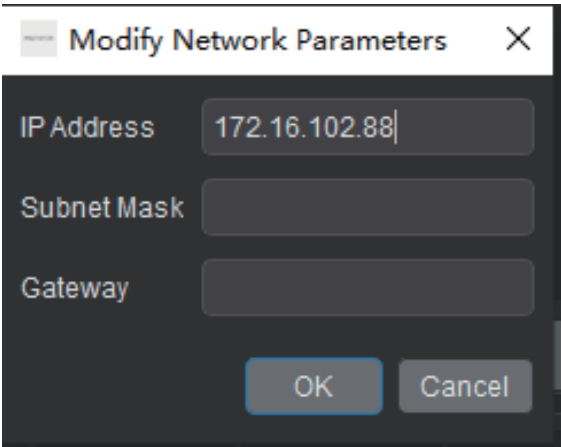
To connect to the processor, its IP address must be on the same network segment as the control computer.

For example, if the processor is set to 192.168.1.128/255.255.255.0 and the control PC is set to 192.168.10.123/255.255.255.0, the control software will fail to connect. You must first adjust either the processor IP or the PC IP to the same segment, as shown below.

DX-88 Digital Matrix Processor

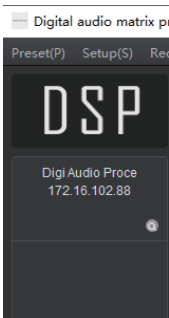


Click "Modify Device IP Now", enter the new IP address and confirm. The change takes effect immediately with no reboot required. You can also modify the subnet mask if needed. In this example, changing the device IP to 192.168.10.128 will enable normal device login.



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6. Device List Bar



The device list bar on the left side of the control software displays and manages all devices, supporting operations including device login, offline device addition, network parameter modification, device deletion, and connection disconnection.

(1) Device Information Display

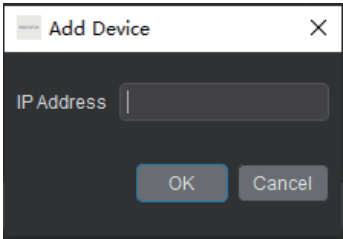
Each device entry shows the following details from top to bottom: device model, IP address, current preset name, error status icon, and online/offline status icon. The error status icon is hidden by default, and only appears when errors such as DSP faults occur.

(2) Device Connection & Login

Click an online device to initiate connection. If the device is reachable on the network, a password dialog will pop up. Enter the correct password (default: admin) to log in. If the device is unreachable, a connection timeout prompt will appear.

(3) Add Device

If a properly connected device is not detected in the device list, you can add it manually. Click the "+" icon at the bottom left, or right-click in the device list area and select Add Device. Enter the device IP address in the pop-up window to complete the addition. The factory default device IP address is 192.168.1.128.



DX-88 Digital Matrix Processor

(4) Modify Network Parameters

This function allows you to modify the IP address, subnet mask and gateway of an online device without logging in. It is typically used when the PC and device are on different network segments during initial setup, or when a connection timeout occurs.

(5) Remove Device

Click the Remove Device icon to remove offline devices from the list.

(6) Device List

Click the Device List icon to view detailed device information.

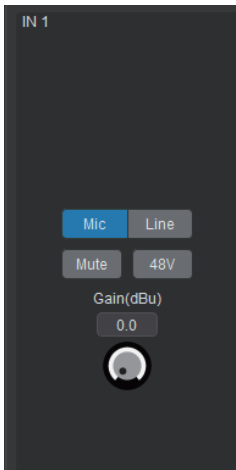
(7) Disconnect

For a logged-in device, double-click the active device or click the Disconnect icon to log out and disconnect.

7. Device Information Status Bar

This is the bottom status bar of the control software, which displays information of the currently-logged-in device: DSP resource utilization (real-time usage and peak value), serial number, and software version. Click "System Mute" to activate system mute. System mute can also be triggered via the shortcut key "Ctrl+M" and controlled by third-party protocols.

8. Input Setup



➤ Mic Button

Press this button when a dynamic microphone is used for input.

➤ Line Button

Press this button for line-level input.

➤ 48V Button

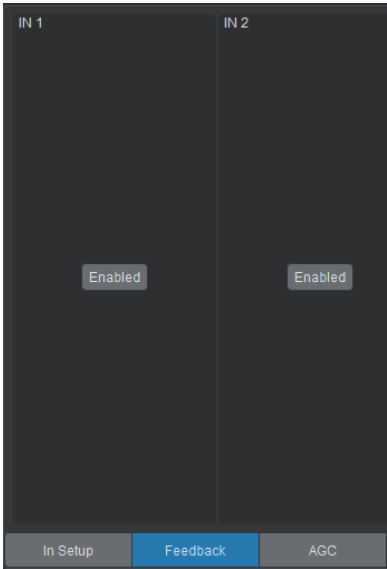
Press this button when a condenser microphone requires 48V phantom power.

➤ Analog Gain

The gain range is 0-50dBu under Mic mode and 0-12dBu under Line mode. It is used for microphone signal amplification.

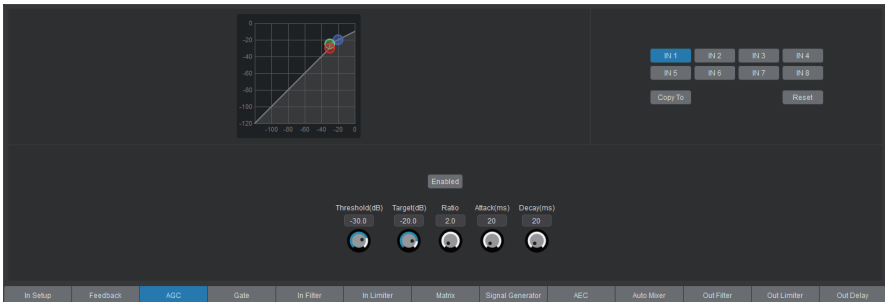
DX-88 Digital Matrix Processor

9. Adaptive Feedback Suppressor



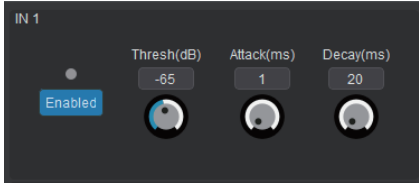
This unit adopts adaptive feedback suppression. One-button activation boosts transmission gain by at least 4–5dB.

10. AGC (Automatic Gain Control)



Each channel supports independent AGC with adjustable enable status, threshold, target level, slope, attack time and release time. Quick cross-channel copy and paste of AGC parameters greatly improves operation efficiency.

11. Noise Gate



➤ **Noise Gate Indicator**

Off when the gate is open; on when the gate is closed.

➤ **Enable Button**

Use this button to enable or disable the noise gate

➤ **Threshold**

Input level at which the gate opens (allows signal through). Range: -120 to 0dB.

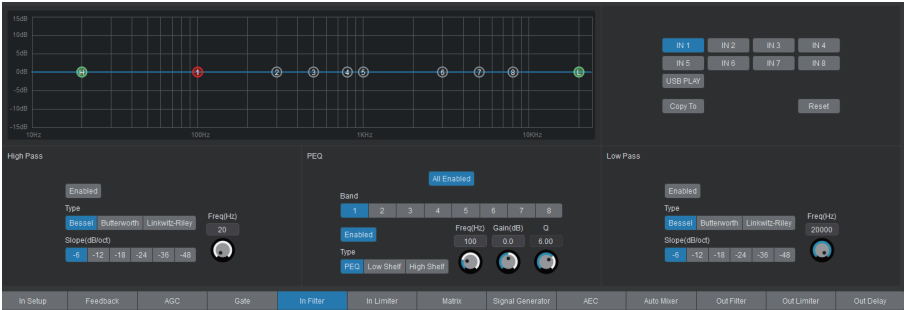
➤ **Attack Time**

Time for the gate to open after input exceeds the threshold (closed to open).

➤ **Release Time**

Time for the gate to close after input falls below the threshold (open to closed).

12. In Filter



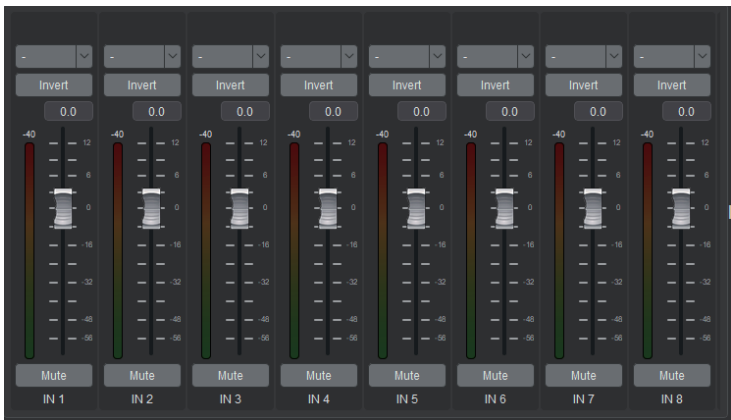
Each channel supports independent filters with 8-band PEQ per channel. The input filter includes multiple professional audio filtering modules: high-pass, low-pass, parametric EQ, low shelf EQ and high shelf EQ. Quick cross-channel copy and paste of filter parameters greatly improves operation efficiency.

13. In Limiter



Each channel supports an independent input limiter with adjustable enable status, threshold, slope, attack time and release time. Quick cross-channel copy and paste of limiter parameters greatly improves operation efficiency.

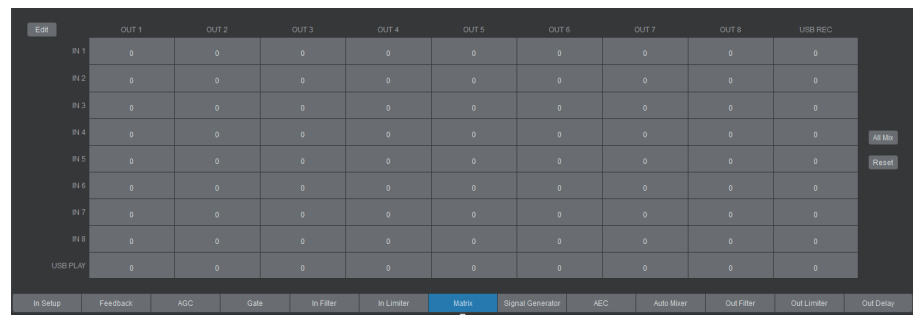
14. Level Pre Mix



Before matrix mixing, the post-fader level of each channel can be monitored and volume controlled. Input audio signals support grouping, phase inversion and muting. The volume faders on this page can be controlled via third-party protocols.

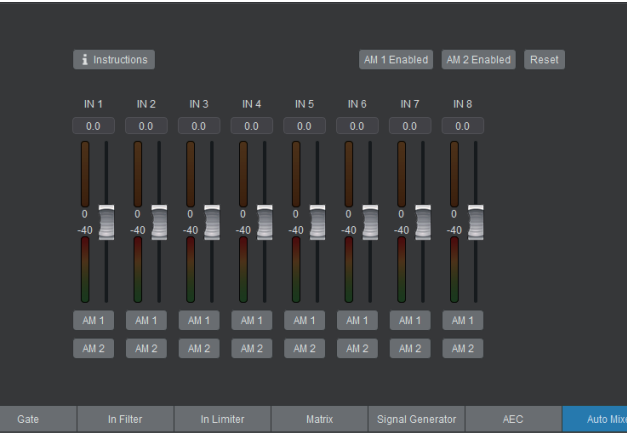
DX-88 Digital Matrix Processor

15. Matrix Mixer



The matrix mixer supports free cross-mixing. Multi-channel selection is available by left-click dragging and marquee selection. Click the Edit button in the top left to set mix levels. Click an input channel name to route a single input to all output channels. Click an output channel name to route all inputs to that output channel.

16. AutoMix



The automatic mixing algorithm is designed for multi-microphone conference systems, effectively suppressing acoustic feedback when multiple microphones are active simultaneously.

Operating Instructions:

- (1) Two independent AutoMix groups are provided.
- (2) Click the AM 1 or AM 2 button to assign the channel to AutoMix group 1 or 2.

DX-88 Digital Matrix Processor

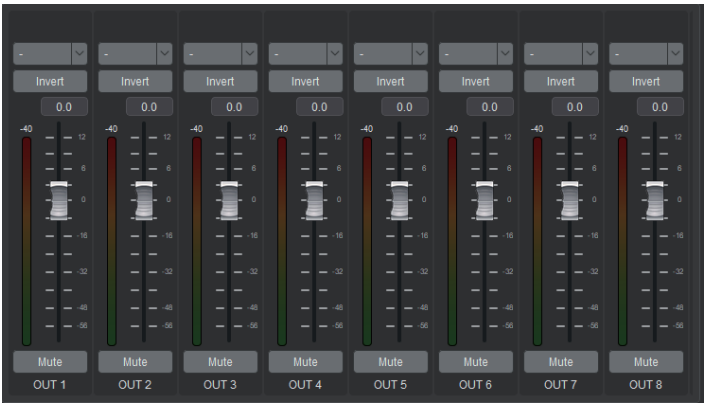
- (3) Use the fader to adjust the volume weight of the assigned channel. Higher-priority channels are assigned greater weight. The default value is 0.
- (4) Click the "AM X" enable button to enable or disable AutoMix group X.
- (5) The upper level meter indicates attenuation amount; the lower one indicates post-attenuation level.

17. Signal Generator



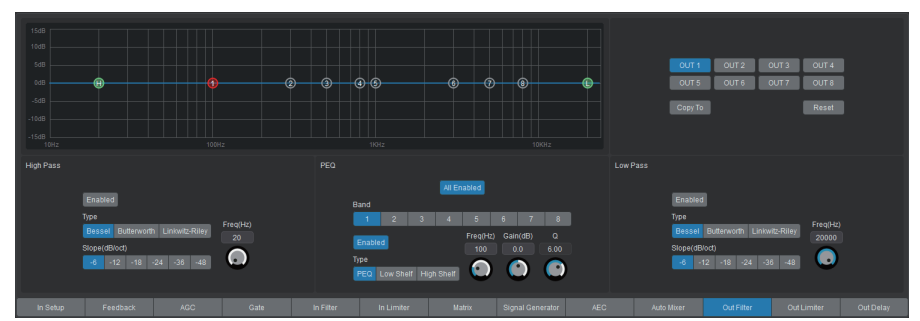
Supports pink noise, sine wave, and white noise; assignable to any output.

18. Out Level



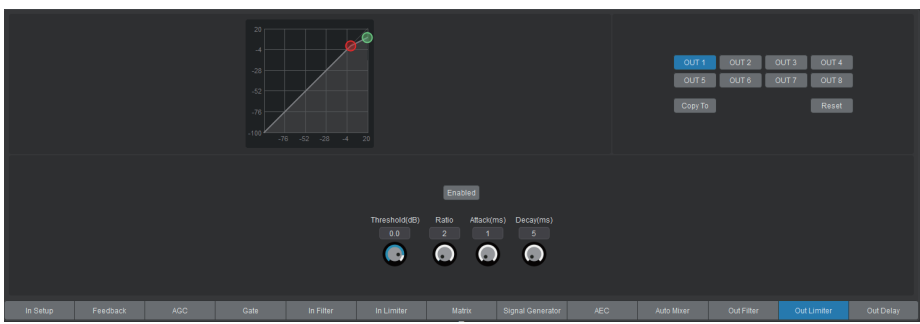
After matrix mixing, monitor post-fader level per channel and control volume. Input signals can be grouped, inverted, and muted. Volume faders on this page can be controlled via third-party protocols.

19. Out Filter



Supports independent filters per channel, 8-band PEQ per channel. Output filters include HPF, LPF, PEQ, Low Shelf, and High Shelf. Filter parameters can be quickly copied and pasted across channels for higher efficiency.

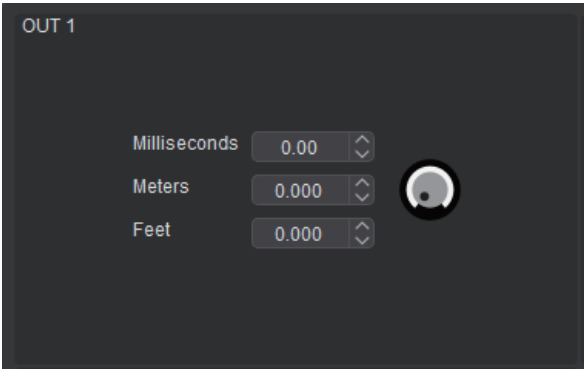
20. Out Limiter



Each output channel has an independent output limiter. Enable, threshold, ratio, attack, and release are adjustable. Parameters can be quickly copied and pasted across channels for higher efficiency.

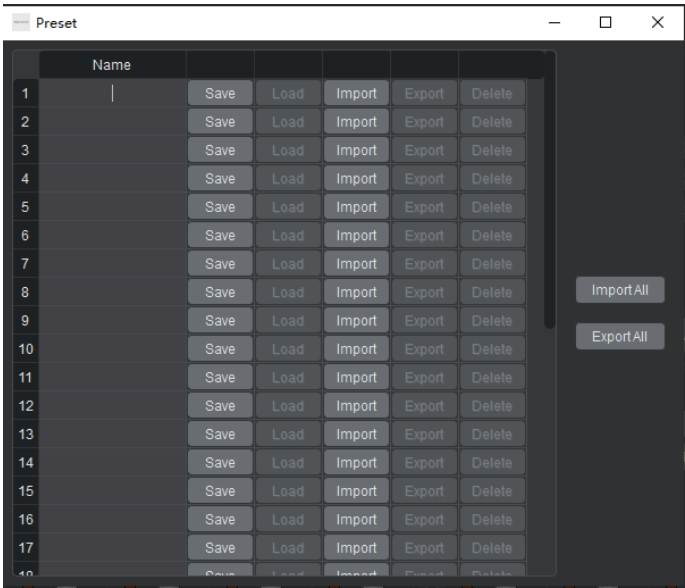
DX-88 Digital Matrix Processor

21. Out Delay



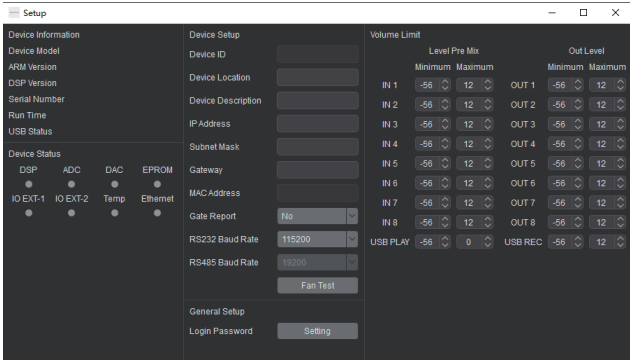
Each output channel has an independent delay. Maximum delay time: 300ms.

22. Preset



Stores up to 32 presets, each custom-nameable. Presets can be recalled via control software or third-party commands. Supports data import and export.

23. Setup



(1) Device Info

- Device Model
- ARM Version: ARM firmware version.
- DSP Version: DSP firmware version.
- Serial Number: Factory serial number or production batch code.
- Uptime: Time since power-on; resets to 0 after power-off.
- USB Status: Disconnected/Connected.

(2) Device Status

Gray LED: Unknown. Green LED: Normal. Flashing red LED: Error.

(3) Device Settings

- Device ID
- Device Location: Marks device location.
- Device Description: Describes device info.
- IP Address, Subnet Mask, Gateway: Set network parameters.
- Noise Gate Control Code: Enable/disable noise gate control code.
- RS-232 Baud Rate: Modify RS-232 baud rate.
- RS-485 Baud Rate: Fixed; cannot be modified.
- Fan Test: Control fan on/off.

(4) General Settings

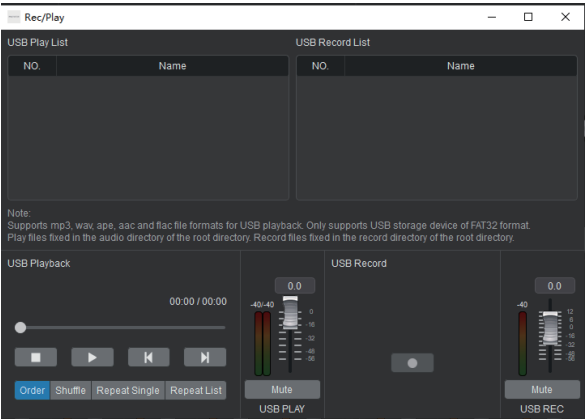
- Login Password: Set password for PC software or third-party central control login.

(5) Gain Limit

Set the allowable gain range for each channel.

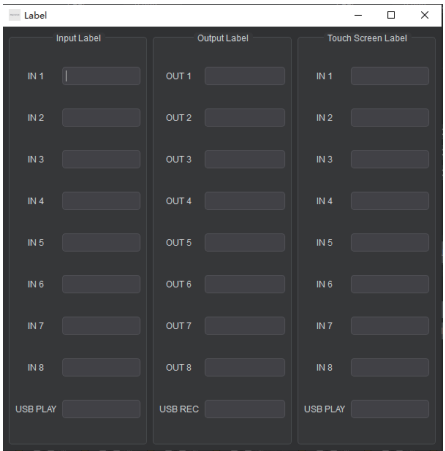
DX-88 Digital Matrix Processor

24. Rec/Play



- USB playback supports MP3, WAV, APE, AAC, and FLAC. Recording format: WAV.
- USB storage: FAT32 only. Playback files stored in root "audio" folder; recordings stored in root "record" folder.
- Playback: Start, Pause, Stop, Previous, Next, Play Mode.
- Recording: Start/Stop.

25. Label



Manage input/output channel labels on the Label page. Supports Chinese input. Hover over a volume fader or channel button to display the channel label.

DX-88 Digital Matrix Processor

26. Meter



Real-time monitoring of pre-fader and post-fader levels for all input/output channels on the Meter page.

27. Device List

Device List										
IP Address	Model	ARM Version	DSP Version	Location	Description	Serial Number	Link Status	Run Time	Device ID	
172.16.102.88	Digi Audio ...	1.0.35	1.22.21	test	test	CN-000-09C8...	Offline		6589862551	<button>Remove</button>

Displays IP address, model, ARM version, DSP version, location, description, serial number, network status (Offline/Online Not Logged In/Online Logged In/Logged In), uptime, and device ID.

28. Command Assistant

Command Assistant

RS232 Baud Rate : 115200 (Default)
TCP Port : 2698

Login

Level Pre Mix

Out Level

Preset

System Mute

Login(TCP Only)

Password

Generate Command

Command

Copy

Generates Hex format commands.

DX-88 Digital Matrix Processor

29. Communication Protocol-ASCII Character Format

Comm Protocol: TCP Server, Port: 2698 (No login required). RS-232 default baud rate: 115200.				Allow 50ms delay between each third-party command.	
No.	Function	TCP Communication Command	RS 232 Command	Feedback Code	Remarks
1	Modify Device Location	Set_Loc [QC_Test_1]#	None	Location:QC_Test_1	Characters inside brackets are ASCII characters. No commas or special symbols allowed, limited to 16 characters; characters exceeding 16 cannot be displayed on the LCD screen.
2	Modify Device Description	Set_Des [QC_Test_2]#	None	Description:QC_Test_2	
3	Recall Preset	LOADP X#	LOADP X#	Preset:1	LOADP 1# Description: Load and activate one preset. X represents preset number, range 1-32. 1 indicates the power on default preset.
4	Read Current Preset	ReadP#	ReadP#	Preset:0 Preset_Name:Boot Preset	
5	System Mute Control-Disable	SYM 0#	SYM 0#	SYM 0#	Parameter 0: system mute disabled; Parameter 1: system mute enabled, all outputs muted.
	System Mute Control-Enable	SYM 1#	SYM 1#	SYM 1#	
6	Read Pre-Mix Channel Level of MatrixMix	ReadL1 X#	ReadL1 X#	PreLevel X:0dB	X = audio channel number (1-16); Y = dB value (+12 to -71); each single-step increment/decrement = 1dB
7	Increase Pre-Mix Level	L1_add X#	L1_add X#	PreLevel X:-20dB	
8	Decrease Pre-Mix Level	L1_sub X#	L1_sub X#	PreLevel X:-20dB	
9	Increase Post-Mix Level	L2_add X#	L2_add X#	PostLevel X:0dB	
10	Decrease Post-Mix Level	L2_sub X#	L2_sub X#	PostLevel X:0dB	
11	Set MatrixMix Pre-Mix Level	SetL1 X:Y# SetL1 1:-20#	SetL1 X:Y#	PreLevel X:-20dB	
12	Read MatrixMix Post-Mix Level	ReadL2 X# ReadL2 16#	ReadL2 X#	PostLevel X:0dB	
13	Set MatrixMix Post-Mix Level	SetL2 X:Y# SetL2 1:-20#	SetL2 X:Y#	PostLevel X:-20dB	
14	Read Noise-Gate Status Output	Read_Gate#	Read_Gate#	0100000000000000	0-1 indicates noise gate status: 0 gate off, 1 gate on. Example: 0100000000000000 means channel 2 noise gate is turned on.

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15	Password Reset	PSW_Reset#		PSW:admin	After reset, the default password is admin.
16	Reset IP Address via RS-232		IP_Reset#	IP_Reset OK	IP: 192.168.1.128 Subnet Mask: 255.255.255.0 Gateway: 192.168.1.1
17	Pre-Mix Channel Mute	L1_Mute X#	L1_Mute X#	L1_Mute X	X = audio channel number, range 1-16
	Pre-Mix Channel UnMute	L1_UnMute X#	L1_UnMute X#	L1_UnMute X#	
18	Post-Mix Channel Mute	L2_Mute X#	L2_Mute X#	L2_Mute X#	
	Post-Mix Channel UnMute	L2_UnMute X#	L2_UnMute X#	L2_UnMute X#	
19	Read Pre-Mix Channel Mute Status	ReadL1 Mute#	ReadL1 Mute#	L1Mute: 0000111100000000 L1Mute: 0000000000000000	Parameter0: channel mute inactive; Parameter1: channel mute active, audio output blocked.
20	Read Post-Mix Channel Mute Status	ReadL2 Mute#	ReadL2 Mute#	L2Mute: 0000111100000000 L2Mute: 0000000000000000	

30. Communication Protocol: TCP HEX Format

1. Data Transmission Format

Read Data

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)		Data (n byte)	End Character
						Low	High		
0x7D82					0x00				0x827D

Write Data

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)		Data (n byte)	End Character
						Low	High		
0x7D82					0x01				0x827D

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2. Device Response Data Format

Normal Response Return-Code

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	Data (n byte)	End Character
0x7D82					0x80			0x827D

Instruction Parameter Error Return-Code

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	End Character
0x7D82					0x81	0x0000	0x827D

Unrecognized Instruction Return-Code

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	End Character
0x7D82					0x82	0x0000	0x827D

3. Examples

No.	Function	TCP Communication Protocol	Remarks
1	Login	82 7D 01 00 02 01 01 01 05 00 61 64 6D 69 6E 7D 82	Default password: admin
2	Pre-mix Channel Mute	82 7D 01 00 03 07 01 01 02 00 00 01 7D 82 82 7D 01 00 03 07 01 01 02 00 00 00 7D 82	Mute Input 1 Unmute Input 1
3	Pre-mix Channel Gain	82 7D 01 00 03 07 02 01 05 00 00 00 00 40 C0 7D 82	Channel 1 gain:-3.0dB
4	Pre-mix Channel Gain Inc/Dec	82 7D 01 00 03 07 05 01 05 00 00 00 00 80 3F 7D 82 82 7D 01 00 03 07 05 01 05 00 00 00 00 80 BF 7D 82	Input 1 gain +1 Input 1 gain 1
5	Post-mix Channel Mute	82 7D 01 00 03 0B 02 01 02 00 00 01 7D 82 82 7D 01 00 03 0B 02 01 02 00 00 00 7D 82	Mute Output 1 Unmute Output 1
6	Post-mix Channel Gain	82 7D 01 00 03 0B 03 01 05 00 00 00 00 40 40 7D 82	Output 1 gain:+3.0dB

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7	Post-mix Channel Gain Inc/Dec	82 7D 01 00 03 0B 06 01 05 00 00 00 00 80 3F 7D 82 82 7D 01 00 03 0B 06 01 05 00 00 00 00 80 BF 7D 82	Output 1 gain +1 Output 1 gain -1
8	Load Preset	82 7D 01 00 03 20 03 01 01 00 04 7D 82	Load Preset 5
9	Pre-mix Channel Level Meter	82 7D 01 00 03 01 01 00 00 00 7D 82	Feedback code for reading input post fader level (16 byte for Input 1-16): 82 7D 01 00 03 01 01 80 10 00 7D 82
10	Post-mix Channel Level Meter	82 7D 01 00 03 0B 01 00 00 00 7D 82	Feedback code for reading output post fader level (16 byte for Output 1-16): 82 7D 01 00 03 0B 01 80 10 00 7D 82

31. Mixing Matrix TCP/IP & RS-232 Control Commands

This protocol supports TCP and RS-232 control. The available TCP port numbers are 1698, 1699 and 2698. Port 2698 requires prior login, while ports 1698 and 1699 do not require login. The default baud-rate for RS-232 is 115200. The default TCP login password is admin. All control commands are executable only after successful login. The default encoding value is 1 (0x0001).

1. Mixing Status Control (Function ID: 01H [R/W])

Read Data Format

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	Data (1byte)	End Terminator
0x7D82		0x03	0x08	0x01	0x00	0x0001	Output Channel	0x827D

Write Data Format

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	Data (n byte)	End Terminator
0x7D82		0x03	0x08	0x01	0x01		Output Channel, Input Channel, ..., Input Channel, Status	0x827D

Description: In the data field, the 1st byte is the output channel; bytes 2 to n-1 are input channels; the last byte is the status byte. 0x00: Cancel mixing; 0x01: Enable mixing.

Example: Mix Input 1, 2, 3 to Output 1, the transmitted data is:

0x82 0x7D 0x01 0x00 0x03 0x08 0x01 0x01 0x05 0x00 0x00 0x00 0x01 0x02 0x01 0x7D 0x82

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Device Return Data Format

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	Data (17 byte)	End Terminator
0x7D82		0x03	0x08	0x01	0x80	0x0011	Output Channel, Input 1 Channel Status, ..., Input 16 Channel Status	0x827D

2. Control Mixing Gain (Function ID:02H [R/W])

Read Data Format

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	Data (1byte)	End Terminator
0x7D82		0x03	0x08	0x02	0x00	0x0001	Output Channel	0x827D

Write Data Format

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	Data (n byte)	Frame Terminator
0x7D82		0x03	0x08	0x02	0x01		Output Channel, Input Channel, ..., Input Channel, Mixing Gain (1 byte)	0x827D

Description: In the data field, the 1st byte is the output channel; bytes 2 to n-1 are input channels; the last byte is mixing gain.
Range: -70 to 12dB; -70 indicates mute.
Example: Set mixing gain of Input 1,2,3 to Output 1 to -10dB, send data:
0x82 0x7D 0x01 0x00 0x03 0x08 0x02 0x01 0x05 0x00 0x00 0x00 0x01 0x02 0xF6 0x7D 0x82

Device Return Data Format

Frame Header (2byte)	Encoding (2byte)	Type (1byte)	Sub Type (1byte)	Function ID (1byte)	Command (1byte)	Data Length (2byte)	Data (17 byte)	End Terminator
0x7D82		0x03	0x08	0x01	0x80	0x0011	Output Channel, Input 1 Mixing Gain, ..., Input 16 Mixing Gain	0x827D

32. Gate Report – Noise-Gate Output Code & Camera Linkage

On the device-settings page, there is a control for noise-gate output code. Its default status is No. When switched to Yes, a sequence of codes will be automatically sent upon Gate activation to trigger camera linkage.

Implementation of Camera Linkage:

Method 1:

This method applies to central-control brands with less flexible programming. With the Gate noise-gate working in microphone mode, adjust thresholds for all 16 channels to -15dBu (adjust value on-site as needed). In the software interface: Settings/Device Information/Noise-Gate Active Output Code/NO. The microphone noise-gate active output code is disabled by default. Switch to YES to take effect immediately; the setting stays YES after the processor restarts.

Example:

When microphone channel 2 is activated, the processor outputs code AA 02 01 0D (AA: header byte; 02: microphone channel 2; 01: microphone ON; 0D: end byte)

When microphone channel 2 is de-activated, the processor outputs code AA 02 00 0D (AA: header byte; 02: microphone channel 2; 00: microphone OFF; 0D: end byte)

If microphone-1 and microphone-3 are already active, then microphone-6 is enabled, the output-code sequence is shown below:

Activating microphone-1: processor sends AA 01 01 0D

Activating microphone-2: processor sends AA 02 01 0D

..

Activating microphone-6: processor sends AA 06 01 0D

..

When several microphones are active at the same time, the central-control program needs to judge which microphone is delivering continuous speech (by using the OFF command).

The processor cannot differentiate genuine voice from noise triggers such as placing a cup or coughing.

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Method 2:

This method applies to AMX and Crestron systems. The control host sends Read_Gate# cyclically every 50ms, and the audio processor returns a status code such as "101000000000001". Set the noise gate threshold to -15dBu in microphone mode (adjust on site as needed). The control host can only obtain microphone status by sending commands to the processor.

Example:

The status code "101000000000001" indicates 3 microphones are active (Channel 1, Channel 3 and Channel 16). For camera auto-tracking, when 3 microphones are detected active, the control host needs to determine which one is picking up continuous speech. The processor cannot distinguish between normal speech and triggers from ambient noises like teacup clinks or coughing.

33. System Upgrade

The processor firmware can be upgraded via Ethernet. Steps: Click System Upgrade on the menu bar. In the pop-up dialog, select the firmware file with img suffix and confirm. A progress bar will appear, and the device will reboot automatically when the upgrade finishes.

34. System Reset

After connecting and logging into the processor, click System Reset on the menu bar to clear all parameters.

■ Cautions

Notice:

- Power supply: The unit must operate within a 100V-240V voltage range.
- Power cord protection: Route the cord properly. Do not step on it or crush it with heavy objects.
- Maintenance: All repairs must be performed by certified technicians. Do not attempt to open the device yourself to avoid electric shock.
- Ventilation: Vent slots/holes on the enclosure prevent overheating of internal sensitive components. Do not block them with any objects.

Power-related Notes:

- Fully insert plugs and secure cable connections. Loose connections may cause malfunctions.

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- Do not use loose power outlets or damaged power cords. Risk of electric shock or fire.
- Never touch the power plug with wet hands. Risk of electric shock.
- Do not plug multiple devices into a single outlet. Risk of fire.
- Do not place heavy objects on the power cord. Avoid bending, pulling or twisting the cord.

Additional Safety Information:

- Read and understand all safety and operating instructions before use.
- Keep this safety manual for future reference.

■ Troubleshooting

1. Control software cannot detect the processor

Windows Firewall or antivirus software may block the software. Run the processor .exe file as administrator. Restore any files quarantined by antivirus software.

2. Software detects the device but cannot establish a connection

This happens in dual-network setups (e.g. a laptop on both wired and Wi-Fi networks). Disable one network to resolve.

3. Cannot modify IP address via PC control software

The processor uses UDP for IP configuration. Wireless routers may block UDP traffic. Connect your laptop directly to the processor to make changes.

4. Third-party TCP commands fail to control

- A. Do not change the host IP after TCP setup, or control will stop working.
- B. Verify the control port is correct.
- C. Confirm the control code is accurate.
- D. If issues remain, test with a general TCP debug tool. See Communication Protocol Test Video Guide for details.

■ Safety Instructions

To avoid electric shock, overheat, fire, radiation, explosion, mechanical risk and injury or property loss due to improper use, please read and observe the following items before use:

1. Please check if the power of the connected equipment matches with that of this product before operation. Adjust the volume to proper level during operation. Do not operate at over-power or high-volume level for extended time to avoid product malfunction.
2. If there is any abnormality during use (e.g., smoke, strange odor), please kill the power switch and unplug from power source, then send the product to the local after-sales service for repair.
3. Keep this product and its accessories in a dry and ventilated area. Do not store in a humid or dusty area for extended time. Keep away from fire, rain, liquid intrusion, bumping, throwing, vibrating, or from blocking any ventilation openings, to prevent malfunction.
4. The product must, when installed on walls or ceilings, be fixed firmly in place at adequate strength to prevent from falling.
5. Please abide by safety rules during operation. Do not use the product in places prohibited by laws or regulations to avoid accident.
6. Do not disassemble or repair the product unauthorized to avoid injury. If you have any questions or require any services, please contact our local after-sales service.

■ Label Meanings



This symbol indicates that this product should not be disposed of with your household waste, according to the WEEE directive (2012/19/EU) and your national law. This product should be handed over to an authorized collection site for recycling waste electrical and electronic equipment (WEEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with WEEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, or your household waste disposal service.

About This Manual

This manual contains up-to-date technical specifications as of printing. However, specifications contained herein may not conform to your particular product since Takstar is constantly improving its products. Also, specifications, devices or accessories available may vary from region to region. If you have any questions, please contact our local sales outlet. For the latest version/more information, please visit our website: <https://www.takstar.com/>

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