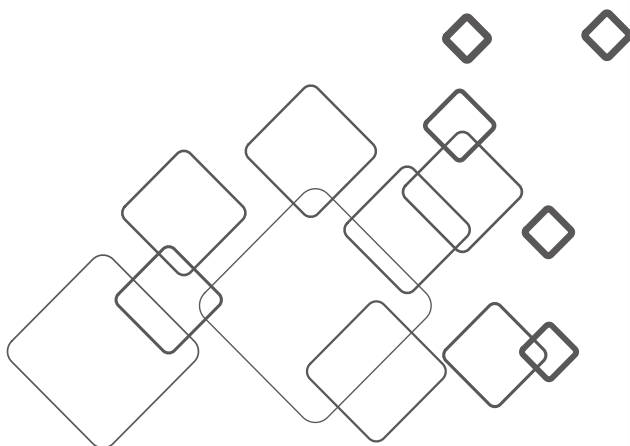


使用说明书

User Manual

LED 视频处理器
Video Processor

LVP9000



JSTRON • 杰思创视讯

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声明

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在使用本设备前，请认真阅读本手册，所提到的产品规格和资讯仅供参考，如有内容更新，恕不另行通知。除非有特别约定，本手册仅作为使用指导，所有陈述、信息等均不构成任何形式的担保。

商标信用

VESA 是视频电子标准协会的商标。

HDMI 标志以及 High-Definition Multimedia Interface (高清多媒体数字接口)都是 HDMI Licensing LLC. 的商标。

安全须知

- 本设备必须接有地线。
- 本设备需使用具有额定功率的电压。保证输入电压误差在 $\pm 10\%$ 之间。
- 切勿将 AC 电源与某根可能导致过大噪音的 AC 电源线连接。
- 请在环境温度为 -10°C 到 45°C ，并且相对湿度 $\leq 90\%$ 的环境下使用本设备。
- 切勿在某些特殊环境下使用本设备，比如靠近热源，可能导致设备过热而损坏。请在通风良好的地方使用本设备，并且注意防止设备通风口阻塞。
- 切勿将本设备暴露于可能发生意外碰撞或者振动的地方，如有振动请做好加固处理。
- 切勿将外物，比如水和金属物体放入本设备后使用。否则，会导致设备损坏并引起火灾。
- 如果发现有任何不规则的或者异常现象，请立即关掉电源，断开 AC 电源线，并参见“故障排除”进行处理。
- 如果本设备有所损坏，切勿自行拆卸。请联系维修服务部。

附件

表 1.1 产品包装内容

项 目	名 称	数 量
	LVP9000	1
	电源线	1
	DVI 线	2
	用户手册	1
	合格证	1
	保修卡	1

* 以上配件可根据用户的使用情况合理配置。

型号说明

表 2.1 型号说明

型 号	描 述	
	输入板（数量）	输出板（数量）
LVP9000 （出厂默认）	2 DVI	2 DVI
LVP9000-A	1 HDMI、1 DP、1 DVI、1 SDI	4 DVI
LVP9000-B	1 DP + 1 HDMI	4 DVI
LVP9000-C	2 DP + 2 HDMI	4 DVI
LVP9000-D	2 DP	4 DVI
LVP9000-E	4 DP	4 DVI
LVP9000-F	2 HDMI	4 DVI
LVP9000-G	4 HDMI	4 DVI

* 以上型号可根据用户的使用情况合理选配。

概述

LVP9000 系列是一款高性能的超高清拼接器，它采用了 30 位数字图像处理、先进的去隔行信号处理和专业级缩放处理技术。支持 4K*2K 输入输出、4K60 无损分割、内嵌混合矩阵功能、超大分辨率带载（最高支持 8K*4K）、可接收多种类型的视频输入格式，如 DP、HDMI、DVI 和 SDI。

超高清拼接器

LVP9000 系列拼接器支持多种视频输入格式，通过简单的拼接设置，即可实现超大分辨率 8K*4K 的显示需求。

接收超高清 4K（UHD）信号

LVP9000 系列拼接器接收 4K（UHD）信号，相比于 1080P 画面细节提升四倍，很好的保留了画面色彩细节。

4K60 无损分割

LVP9000 支持超高清 4K60（UHD）信号，可将其画面以 1080P 进行无损分割。

超大分辨率带载，横向纵向自定义排布

最大支持 8K*4K，解决普通拼接器带载能力不足的问题。

混合矩阵

LVP9000 系列拼接器具备内嵌混合矩阵功能，可当作混合矩阵使用。

多机级联

支持多台设备级联，实现同步传输多路信号。

自定义 EDID

根据实际应用设置合适的 EDID，操作简单快捷。

输入信号

选配：2 路 DP 输入，2 路 HDMI 输入，2 路 DVI 输入，2 路 SDI 输入。可根据实际应用合理选配。

输出信号

选配：2 路 DP 输出、2 路 HDMI 输出、2 路 DVI 输出、2 路 SDI 输出。可根据实际应用合理选配。

便捷的前面板

直观的 OLED 显示界面，便捷的旋钮控制和清晰的按键灯，简化了系统的安装与控制。

功能按键

快捷进入窗口设置、拼接设置、截取设置和画质设置。

面板简介

前面板简介

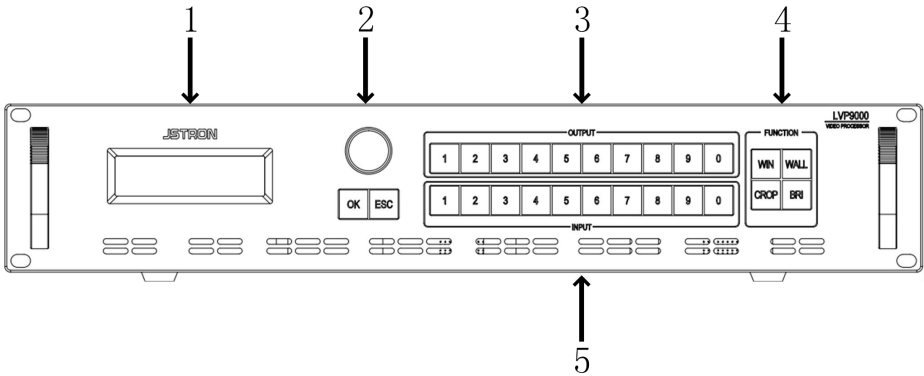


图 1.1 前面板

表 3.1 前面板说明

序号	名称	操作说明
1	OLED 显示屏	显示菜单信息和当前界面信息
2	旋钮	上下左右方向选择和参数的调节，轻按为确认键
	OK	确认键
	ESC	返回键
3	输出	输出通道选择键，数字键 0-9
4	WIN	窗口大小调节快捷键
	WALL	拼接调节快捷键
	CROP	截取调节快捷键
	BRI	图像亮度调节快捷键
5	输入	输入信源选择键，数字键 0-9

后面板简介

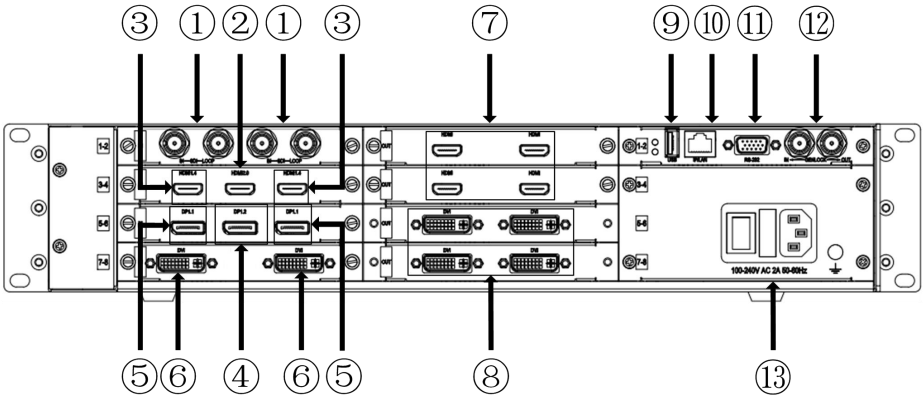


图 1.2 后面板

表 3.2 后面板说明

序号	名称	定义	说明/支持
*①	IN-SDI-LOOP	输入/环出	1080p60, 3G-SDI 向下兼容
*②	HDMI	输入	EIA/CEA-861 标准, HDMI2.0
*③	HDMI	输入	EIA/CEA-861 标准, HDMI1.4 向下兼容
*④	DP	输入	VESA 标准, DP1.2 向下兼容
*⑤	DP	输入	VESA 标准, DP1.1 向下兼容
*⑥	DVI	输入	DVI1.0, HDMI1.4 向下兼容 VESA 标准, PC to 1920*1200 HD 4K30 (UHD)
*⑦	HDMI	输出	EIA/CEA-861 标准, HDMI1.4 向下兼容
*⑧	DVI	输出	DVI1.0, HDMI1.4 向下兼容 VESA 标准, PC to 1920*1200 HD 4K30 (UHD)
⑨	USB	升级	插入 U 盘升级程序
⑩	TCP/IP	网口	网络通信

⑪	RS232	串口	串口通信
⑫	IN-GENLOCK- OUT	级联	多台设备级联
⑬	AC	电源	设备供电
注：1、带*号项为选配项 2、技术参数如有变化，恕不另行通知			

菜单介绍

默认界面概况

LVP9000 拥有直观的显示界面，如图 2.1 是 LVP9000 开机后的默认界面。用户可以通过此界面得到当前输入输出信号配置信息。

输出	01	02	03	04	05	06	07	08
输入	01	02	03	04	05	06	07	08

图 2.1 默认界面

旋钮左旋界面概况

旋钮左旋，LVP9000 进入输入分辨率显示界面，如图 2.2 界面所示。当有信号接入时，对应通道信号会高亮显示。

输入	01 1920x1080p60	05 No Signal
	02 No Signal	06 No Signal
	03 No Signal	07 No Signal
	04 No Signal	08 No Signal

图 2.2 左旋界面

旋钮右旋界面概况

旋钮右旋，LVP9000 进入输出窗口大小及分辨率显示界面。例如：输出分辨率为 2048*1152p60，输出窗口大小调节为 1024*768，则显示如图 2.3 界面所示。

<div>输出</div>	01 (1024, 768)	03. 2048x1152p60
	02 (1920, 1080)	02. 1920x1080p60
	03 (1920, 1080)	02. 1920x1080p60
	04 (1920, 1080)	02. 1920x1080p60

图 2.3 右旋界面

默认菜单概况

轻触旋钮或按下“OK”键，LVP9000 进入主菜单界面，如图 2.4 所示。用户可使用旋钮轻触确认和左右旋转来对各功能进行选择。

输入设置	→
输出时序	→
窗口设置	→
拼接设置	→ ▼

图 2.4 主菜单

主菜单介绍

输入设置

在主菜单下，旋转旋钮，选择“输入设置”，轻触旋钮，出现图 2.5 所示界面。我们对输入设置下级菜单的 4 项进行介绍。

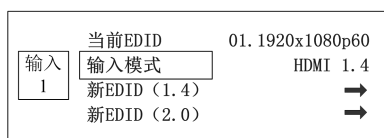


图 2.5 输入设置

①当前 EDID

- 显示当前输入源信号的 EDID，可通过输入区按键选择不同的信号源。

②输入模式

- 协议版本——有 HDMI 1.4、HDMI 2.0 、DP1.1、DP1.2 等版本类型。

（★注意：在接入信号的过程中，单张板卡只能接入一种规格的信号，例如：DP 板卡不能同时接入 DP1.1、DP1.2 规格的信号）

③新 EDID (1.4)

- 轻触旋钮，进入新 EDID (1.4) 下级菜单，里面可设置标准 EDID 和自定义 EDID。

④新 EDID (2.0)

- 轻触旋钮，进入新 EDID (2.0) 下级菜单，里面可设置标准 EDID 和自定义 EDID。

输出时序

在主菜单下，旋转旋钮，选择“输出时序”，轻触旋钮，出现图 2.6 所示界面，我们对输出时序下级菜单的 2 项进行介绍。

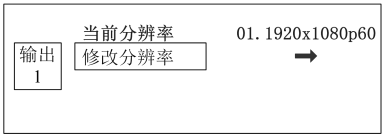


图 2.6 输出时序

①当前分辨率

- 显示当前输出通道信号的分辨率，可通过输出区按键选择不同的输出信道。

②修改分辨率

- 轻触旋钮，进入修改分辨率下级菜单，里面有多种固定的 HDMI、DVI 接口类型的 EDID 和自定义可供选择。

窗口设置

在主菜单下，旋转旋钮，选择“窗口设置”，轻触旋钮进入“窗口设置”下级菜单，如图 2.7 界面所示，我们对窗口设置中的下级菜单进行介绍。

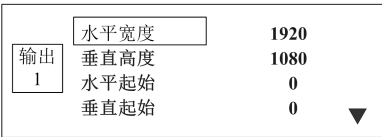


图 2.7 窗口设置

- 水平宽度——默认值：输出时序的宽度，范围：16~输出时序的宽度
- 垂直高度——默认值：输出时序的高度，范围：16~输出时序的高度
- 水平起始——默认值：0，范围：0~（输出时序的宽度-水平宽度）
- 垂直起始——默认值：0，范围：0~（输出时序的高度-垂直高度）
- 窗口设置——默认是部分，可选部分和全屏两种模式
- 复位——对当前通道下的上述窗口设置模式参数进行初始化

拼接设置

在主菜单下，旋转旋钮，选择“拼接设置”，轻触旋钮进入“拼接设置”下级菜单，如图 2.8 界面所示，我们对拼接设置中的下级菜单进行介绍。

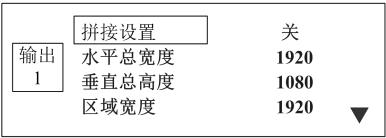


图 2.8 拼接设置

- 拼接设置——默认是关，可选开和关两种模式
- 水平总宽度——默认值：1920，范围：1920~61440
- 垂直总高度——默认值：1080，范围：1080~34560
- 区域宽度——默认值：1920，范围：64~水平总宽度
- 区域高度——默认值：1080，范围：32~垂直总高度
- 水平拼接起始——默认值：0，范围：0~（水平总宽度-区域宽度）
- 垂直拼接起始——默认值：0，范围：0~（垂直总高度-区域高度）
- 复位——对当前通道下的上述拼接设置模式参数进行初始化

截取设置

在主菜单下，旋转旋钮，选择“截取设置”，轻触旋钮进入“截取设置”下级菜单，如图 2.9 界面所示，我们对截取设置中的下级菜单进行介绍。（★ 注意：“拼接设置”未开启，“截取设置”才有效）

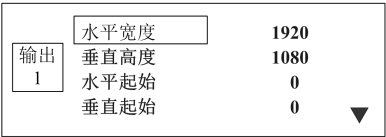


图 2.9 截取设置

- 水平宽度——默认值：输入时序的宽度，范围：16~输入时序的宽度
- 垂直高度——默认值：输入时序的高度，范围：16~输入时序的高度
- 水平起始——默认值：0，范围：0~（输入时序的宽度-水平宽度）
- 垂直起始——默认值：0，范围：0~（输入时序的高度-垂直高度）
- 截取开关——默认是关，可选开和关两种模式
- 复位——对当前通道下的上述截取设置模式参数进行初始化

画质设置

在主菜单下，旋转旋钮，选择“画质设置”，轻触旋钮进入“画质设置”下级菜单，如图 2.10 界面所示。我们对画质设置中的下级菜单进行介绍。

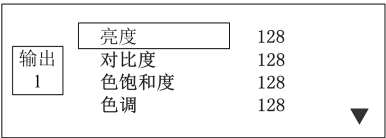


图 2.10 画质设置

- 亮度——默认值：128，范围：0~255
- 对比度——默认值：128，范围：0~255
- 色饱和度——默认值：128，范围：0~255
- 色调——默认值：128，范围：0~255
- 亮平衡——可选红、绿、蓝三种模式，默认值：128，范围：0~255
- 暗平衡——可选红、绿、蓝三种模式，默认值：128，范围：0~255
- 伽马——默认值：1.0，范围：0.3~3.3
- 复位——对当前通道下的上述画质设置参数进行初始化

预设管理

在主菜单下，旋转旋钮，选择“预设管理”，轻触旋钮进入“预设管理”下级菜单。

如图 2.11 界面所示，我们对预设管理下级菜单的 4 项进行介绍。

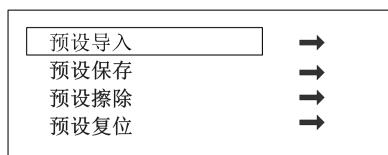


图 2.11 预设管理

- 预设导入——调取预先保存的用户配置，简化操作步骤
- 预设保存——保存预设，方便再次调取
- 预设擦除——擦除预先保存的用户配置
- 预设复位——对当前通道下的上述预设管理参数进行初始化

高级设置

在主菜单下，旋转旋钮，选择“高级设置”，轻触旋钮进入“高级设置”下级菜单，如图 2.12 界面所示，我们对高级设置下级菜单中的 3 项进行介绍。（★ 注意：当输出信号画面不是输入源信号画面时，检查输入、输出测试图卡是否打开）

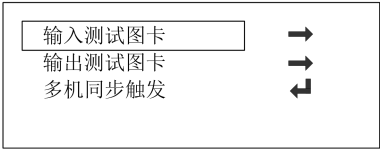


图 2.12 高级设置

- 输入测试图卡——测试输入板输入画面是否正常
- 输出测试图卡——测试输出板输出画面是否正常
- 多机同步触发——多台设备级联时，主机按下多机同步触发可使多台设备同步

系统设置

在主菜单下，旋转旋钮，选择“系统设置”，轻触旋钮，进入“系统设置”下级菜单，如图 2.13 界面所示，我们对系统设置中的下级菜单进行介绍。

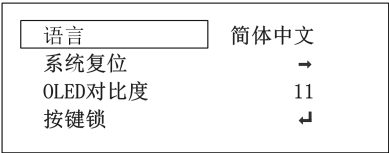


图 2.13 系统设置

①语言

- 默认简体中文，有英语、简体中文、繁体中文三种语言可供选择。

②系统复位

旋转旋钮，选择“系统复位”，轻触旋钮进入“系统复位”下级菜单，如图 2.14 界面所示，下级菜单包含 3 级子菜单：输出复位、输入复位、全部复位。

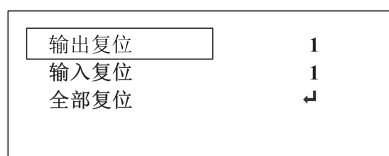


图 2.14 系统复位

- 输出复位

可通过按下输出区按键或旋转旋钮选择某个输出通道，后轻触旋钮确定复位。复位后参数恢复默认值。

- 输入复位

可通过按下输入区按键或旋转旋钮选择某个输入通道，后轻触旋钮确定复位。复位后输入测试图卡关闭，EDID 复位。（★ 注意：复位后 HDMI2.0 变为 HDMI1.4，DP1.2 变为 DP1.1，其他 EDID 恢复到初始值）

- 全部复位

系统设置参数恢复出厂默认值。

③OLED 对比度

- 调节屏幕亮度，默认值：10，范围：2~11。

④按键锁

- 默认关闭，轻触旋钮，开启按键锁，此时按下按键无任何效果，并提示：请按住 OK 键 3 秒解锁，按提示操作即可解锁。

⑤菜单超时

- 设置菜单超时时间，默认：30 秒，30 秒内无任何操作则跳回主界面，有 20 秒、30 秒、45 秒、1 分钟、90 秒、2 分钟、3 分钟共 7 种超时时间可供选择。

⑥屏保时间

- 设置屏幕保护时间，默认：2 分钟，2 分钟内无任何操作则屏幕进入保护状态。有 2 分钟、10 分钟、30 分钟、6 小时、12 小时、18 小时共 6 种屏幕保护时间可供选择。
(★从默认界面开始计时)

⑦通信设置

旋转旋钮，选择“通信设置”，轻触旋钮进入“通信设置”下级菜单，下级菜单包含 2 级子菜单：LAN 设置、RS232 波特率。(★ 更改“LAN 设置”网络参数、“RS232 波特率”串口参数用于上位机软件与设备之间的通信，实现远程控制设备)

● LAN 设置

轻触旋钮，进入“LAN 设置”菜单，根据实际应用更改 IP 地址、子网掩码、网关、端口号、DHCP 开关、MAC 地址信息。

● RS232 波特率

默认：115200，有 115200、38400、19200、9600 共 4 种波特率可供选择。

⑧日程设置

轻触旋钮，进入“日程设置”下级菜单，下级菜单包含 6 个子菜单：日程总开关、日程表全关、日程表设置、时段表设置、时间设置、恢复默认值。具体操作请参考本用户手册功能说明中的日程管理设置内容。(★可用于场馆轮播、工程项目定时播放、纪念日播

放等应用场景)

- 日程总开关
日程设置的开启与关闭
- 日程表全关
关闭所有日程表
- 日程表设置
设置日程表的编号、开关、类型、时段表编号、时间、星期等参数
- 时段表设置
设置时段表的编号、时间参数和预设参数
- 时间设置
设置年、月、日、小时、分钟、秒等参数
- 恢复默认值
对所有日程设置参数进行初始化

机器信息

在主菜单下，旋转旋钮，选择“机器信息”，轻触旋钮，进入“机器信息”下级菜单，如图 2.15 界面所示，我们对机器信息中的下级菜单进行介绍。

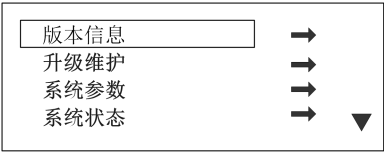


图 2.15 机器信息

①版本信息

- 轻触旋钮，进入“版本信息”下级菜单，通过旋转旋钮查看当前 MCU、FPGA、输入、输出四种板卡版本信息。

②升级维护

轻触旋钮，进入“升级维护”下级菜单，下级菜单包含3个子菜单：操作类型、板编号、应用。（★ 注意：提示升级成功后，需要重新上电。设备成功启动后可通过查看“机器信息”菜单下的“版本信息”确定本次升级是否成功）

- 轻触旋钮，进入“操作类型”子菜单，根据实际应用选择升级文件：控制板程序、控制板 FPGA、输出板程序、输出板芯片、输出板所有、输入板程序、所有程序，并可将当前使用的程序备份到 FAT32 格式的 U 盘中，也可从 FAT32 格式的 U 盘中导入需要升级的程序文件。
- 轻触旋钮，进入“板编号”子菜单，根据实际应用选择“操作类型”子菜单下的程序文件编号，可单独对一块板卡和所有板卡进行升级，有 1、2、3、4、所有共 5 种编号可供选择。
- “操作类型”、“板编号”配置好后，轻触旋钮，进入“应用”子菜单，按提示插入 FAT32 格式的 U 盘后即可升级程序。（★ 注意：U 盘为 FAT32 格式，若不是可格式化 U 盘，设置为 FAT32 格式）

③系统参数

- 轻触旋钮，进入“系统参数”下级菜单，通过旋转旋钮查看当前系统 CPU 频率、LAN 配置、温度、运行时间、当前时间、时钟、日程表、时段表等参数。

④系统状态

- 轻触旋钮，进入“系统状态”下级菜单，显示当前系统运行状态，正常则提示：系统运行良好

⑤系统日志

- 记录当前系统状态

⑥清除日志

- 清除系统日志

功能说明

用户对主要功能的理解，可快速的配置机器以完成工程安装调试。在设置各功能之前，请确认设备已正确连接，信号显示正常。

拼接功能

拼接功能是为了解决单个视频无法驱动超大 LED 屏的问题而采用的解决方案。其拼接的方式自由，可应用到各种 LED 拼接系统中。

信号连接与分辨率设定

根据 LED 大屏物理分辨率选择合适的输入分辨率，在主菜单中选择“输入设置”→“输入模式”，选择 HDMI 1.4、HDMI2.0、DP1.1、DP1.2 等模式，根据实际需要设定所需的输入分辨率，并按实际应用接线。

拼接功能的设置

根据 LED 大屏物理分辨率，确定输出信号分辨率，然后在“拼接设置”中打开拼接开关，并自定义水平总宽度、垂直总高度、区域宽度、区域高度、水平拼接起始、垂直拼接起始等参数。

例如：输入接入 1920*1080@60Hz 的信号 A，输出接到 3840*2160 的 LED 屏上，拼接设置如图 3.1 拼接示例所示。正确连接好设备，并设置好拼接参数后，即可在 3840*2160 的 LED 屏上看到放大的信号 A 的画面。

拼接设置

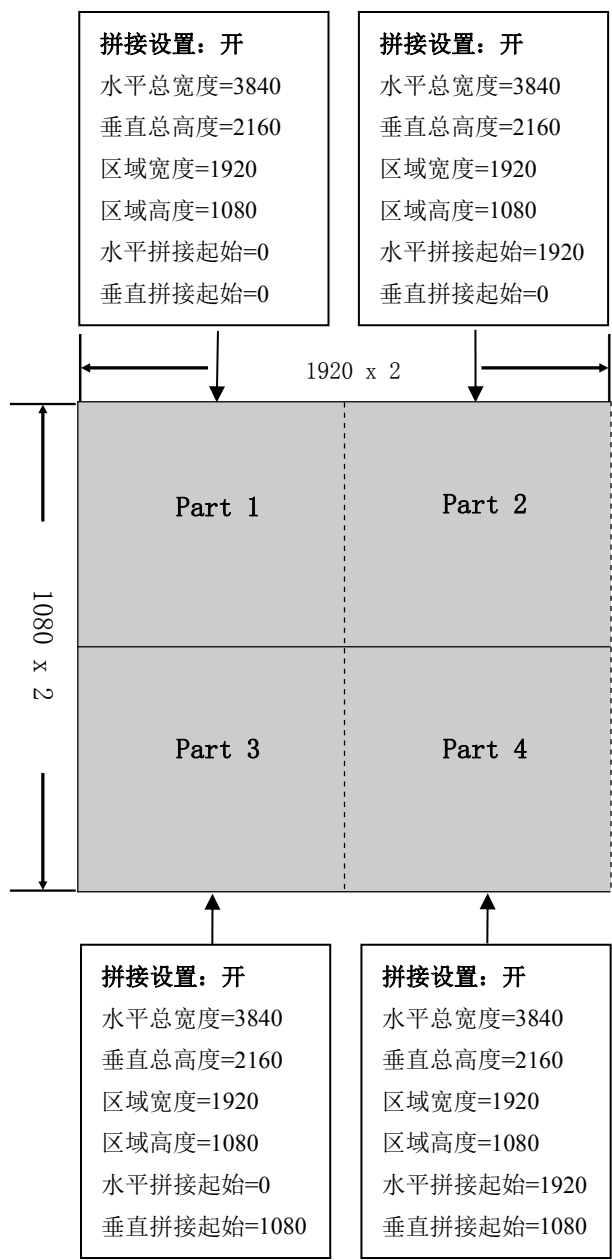


图 3.1 拼接设置示例

自定义 EDID

LVP9000 系列支持输入输出自定义 EDID，可根据实际应用更改图 3.2 界面参数。

用户一般只需要更改宽度、高度、场频三个参数，Hfp、Vfp、Hsyn、Vsyn 等参数为工程调试参数，对画面大小画质无影响，只影响带宽以及画面不正常时进行微调选项。

宽度	1920	高度	1080	场频	60
Htot	2200	Vtot	1125	应用	↵
Hfp	48	Vfp	3	148.500000	
Hsyn	32	Vsyn	10		
Hpol	P+	Vpol	P+	复位	↵

图 3.2 自定义 EDID

- 宽度——水平宽度，默认值：EDID 时序的宽度
- 高度——垂直高度，默认值：EDID 时序的高度
- 场频——刷新率，默认值：EDID 时序的频率
- Htot——水平总像素， $Htot = Hact + Hfp + Hsyn + \text{水平后廊}$ （菜单中未显示）
- Vtot——垂直总像素， $Vtot = Vact + Vfp + Vsyn + \text{垂直后廊}$ （菜单中未显示）
- 应用——保存当前配置并烧录 EDID
- Hfp——水平前廊
- Hsyn——水平同步宽度
- Vfp——垂直前廊
- Vsyn——垂直同步宽度
- 148.500000——总带宽， $\text{总带宽} = Htot * Vtot * FPS$
- Hpol——水平极性
- Vpol——垂直极性
- P+ ——极性为正
- 复位——EDID 参数复位

矩阵功能

LVP9000 系列内嵌混合矩阵功能，可以用作混合矩阵。如图 3.3 矩阵示意所示。

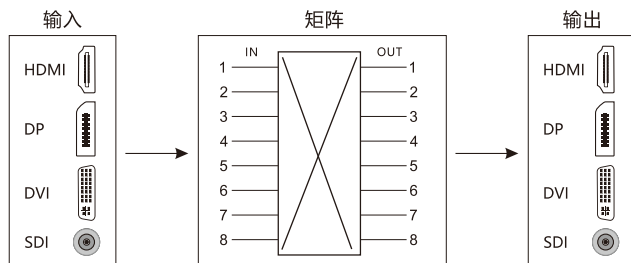


图 3.3 矩阵功能示例

预设管理设置

预设模式方便用户在使用时快速地调出预设应用场景，减少用户在操作时重复设置参数的麻烦，提高了工作效率。每一个预设模式都包含了输入通道、输出通道、窗口大小、截取、拼接和画质相关参数。下面介绍预设模式的保存、擦除和导入模板的操作。

预设场景保存

设置好当前通道参数，轻压旋钮进入主菜单，选择“预设管理”→“预设保存”按数字键 0~9 即可保存相应模版，最大可保存 30 种不同的预设场景。保存后相应数字的横线将变成实心五角星，如图 3.4 预设保存中的数字 1、2 所示。

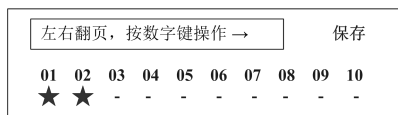


图 3.4 预设保存

预设场景擦除

轻压旋钮进入主菜单, 选择“预设管理”→“预设擦除”按数字键 0~9 即可擦除原先保存的相应模版, 可通过旋转旋钮左右翻页擦除对应的预设。擦除后相应数字所对应的五角星将变成横线, 如图 3.5 数字 2 所示。

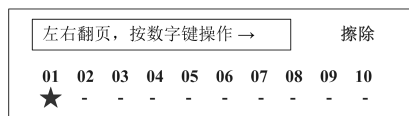


图 3.5 预设擦除

预设模板导入

轻压旋钮进入主菜单, 选择“预设管理”→“预设导入”按数字键 0~9 即可导入原先保存的相应模版, 导入后系统提示: 导入预设 X 成功。成功导入预设, 则系统按预设进行显示。如图 3.6 所示。

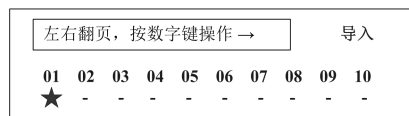


图 3.6 模板导入

预设复位

轻压旋钮进入主菜单，选择“预设管理”→“预设复位”按提示操作即可复位到初始状态即无预设的状态。

日程管理设置

日程管理方便用户按照预设时间运行配置，减少重复配置参数的麻烦，提高了工作效率。日程管理有 3 种方式：计数定时、按日期执行、按星期执行，可根据具体使用情况合理配置。

轻压旋钮进入主菜单，选择“系统设置”→“日程管理”进入日程管理设置子菜单。如图 3.7 界面所示（★在预设时间参数配置之前，先关闭日程总开关，防止配置参数的同时系统按预设时间运行）。

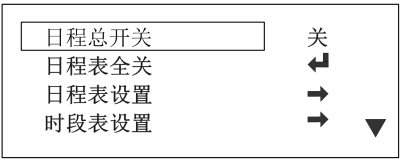


图 3.7 日程管理

旋转旋钮，选择“日程表设置”，轻触旋钮进入日程表参数配置界面，如图 3.8 日程表设置界面所示。通过旋转旋钮设置日程表编号、开关、类型、时段表编号、年份、月份、日期、小时、分钟、秒、星期、恢复默认值等参数。

日程表编号	1
开关	开
类型	计数定时
时段表编号	1 ▼

图 3.8 日程表设置

- 日程表编号——默认值：1，范围：1~16
- 开关——默认值：关，可选开、关两种模式
- 类型——默认值：计数定时，可选计数定时、按日期执行、按星期执行
- 时段表编号——默认值：1，范围：1~16
- 年份——默认值：0，范围：0~255
- 月份——默认值：1，范围：1~12
- 日期——默认值：1，范围：1~31
- 小时——默认值：0，范围：0~23
- 分钟——默认值：1，范围：0~59
- 秒——默认值：0，范围：0~59
- 星期——默认值：关，范围：周一 ~ 周日
- 恢复默认值——复位日程表设置所有参数

计数定时

- ①日程总开关：关；
- ②日程表配置：设置日程表编号、开关、类型、时段表编号、定时时长等参数；
- ③时段表配置：设置时段表编号、预设编号（在**计数定时模式**下，时段表均只配置时段01）；
- ④日程总开关：开；

例如：设置 3 个日程表，预设 1 持续 1 分 30 秒，预设 2 持续 2 分 30 秒，预设 3 持续 3 分 30 秒，预设 1、2、3 来回切换：

日程表配置：

I、日程表编号设为 1，开关设为开，类型设置为计数定时，时段表设为 1，分钟设为 1，秒设为 30，其他参数默认；

II、日程表编号设为 2，开关设为开，类型设置为计数定时，时段表设为 2，分钟设为 2，秒设为 30，其他参数默认；

III、日程表编号设为 3，开关设为开，类型设置为计数定时，时段表设为 3，分钟设为 3，秒设为 30，其他参数默认。

时段表配置：

I、时段表编号设为 1，**时段 01**：预设编号设为 1，其他参数默认；

II、时段表编号设为 2，**时段 01**：预设编号设为 2，其他参数默认。

III、时段表编号设为 3，**时段 01**：预设编号设为 3，其他参数默认。

按日期执行

①日程总开关：关；

②日程表配置：设置日程表编号、开关、类型、时段表编号、年、月、日，其他参数默认；

③时段表配置：设置时段表编号、时间、预设编号，其他参数默认；

④时间设置：设置时间为当前时间，若是当前时间则忽略；

⑤日程总开关：开；

例如：设置 1 个日程表，2018 年 3 月 20 日早上 9 点打开预设 1, 9 点 30 分打开预设 2, 10 点打开预设 3:

日程表配置:

1、日程表编号设为 1，开关设为开，类型设置为按日期执行，时段表编号设为 1，年份设为 18，月份设为 3，日期设为 20，其他参数默认;

时段表配置:

1、时段表编号设为 1，时段 01：小时 9、分钟 0、秒 0、预设 1;

时段 02：小时 9、分钟 30、秒 0、预设 2;

时段 03：小时 10、分钟 0、秒 0、预设 3;

按星期执行

①日程总开关：关;

②日程表配置：设置日程表编号、开关、类型、时段表编号、星期，其他参数默认;

③时段表配置：设置时段表编号、时段、预设编号，其他参数默认;

④时间设置：设置时间为当前时间，若是当前时间则忽略;

⑤日程总开关：开;

例如：设置 1 个日程表，每周一早上 8 点打开预设 1, 8 点 5 分打开预设 2, 8 点 10 分打开预设 3:

日程表配置:

1、日程表编号设为 1，开关设为开，类型设置为按星期执行，时段表编号设为 1，星期设为周一，其他参数默认;

时段表配置：

1、时段表编号设为 1，时段 01：小时 8、分钟 0、秒 0、预设 1；

时段 02：小时 8、分钟 5、秒 0、预设 2；

时段 03：小时 8、分钟 10、秒 0、预设 3；

多机级联

每台设备均配置有 IN-GENLOCK-OUT 接口，通过 SDI 线将多台设备级联在一起，SDI 线的一端接到设备的输出端，另一端接到另一台设备的输入端，按照此方法可将多台设备级联在一起，实现同步传输信号。如图 3.9 示例图所示。（★输出端输出的为主机，输入端接入的为从机，从机 OLED 显示屏会显示一个闪电标志）

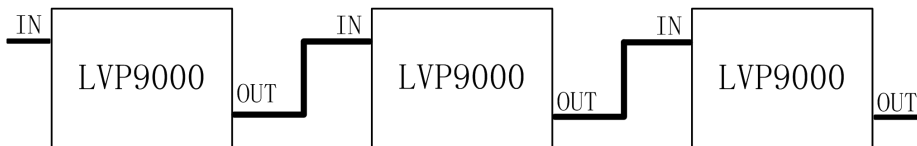


图 3.9 多机级联

当多台设备级联时，若画面不同步，可通过以下两种方法解决：

①主机关机后重新启动；

②主机轻触旋钮，在主菜单界面下选择“高级设置”→“多机同步触发”，按下后即可触发同步；

规格参数

端口	数量	接口形态	规格
视频输入（可选配）			
DP	2	DP1.2	信号标准：DP1.2 向下兼容 支持分辨率：VESA 标准，4K60（UHD）向下兼容
		DP1.1	信号标准：DP1.1 向下兼容 支持分辨率：VESA 标准，4K30（UHD）向下兼容
		★DP1.1、DP1.2 每次只能接入一种规格	
DVI	2	DVI-I	信号标准：DVI1.0，HDMI1.4 向下兼容 支持分辨率：VESA 标准，PC to 1920×1200HD 4K30（UHD）
HDMI	2	HDMI 1.4	信号标准：EIA/CEA-861 标准，HDMI1.4 向下兼容
		HDMI 2.0	信号标准：EIA/CEA-861 标准，HDMI2.0 向下兼容
		★HDMI 1.4、HDMI 2.0 每次只能接入一种规格	
SDI	2	SDI 标准接口	信号标准：1080p60，3G-SDI 向下兼容
视频输出（可选配）			
DP	2	DP 标准接口	信号标准：DP1.2 向下兼容 支持分辨率：VESA 标准，4K60（UHD）向下兼容
DVI	2	DVI-I	信号标准：DVI1.0，HDMI1.4 向下兼容 支持分辨率：VESA 标准，PC to 1920×1200HD 4K30（UHD）
HDMI	2	HDMI 标准接口	信号标准：EIA/CEA-861 标准，HDMI1.4 向下兼容
SDI	2	SDI 标准接口	信号标准：1080p60，3G-SDI 向下兼容
通信接口			
LAN	1	RJ45	远程控制（网络通信）
RS232	1	DB9	远程控制(串口通信)
USB	1	USB2.0	设备升级

整机参数	
重量	6.3kg
尺寸	44cm(长)×30cm(宽)×8.8cm(高)
输入电源	100～240V AC 0.5A 50～60Hz
最大功率	50W
工作温度	0℃～45℃

故障排除

在安装或使用过程中，可能会遇到问题，用户可按以下步骤尝试排除故障。仍无法解决，可与当地的经销商联系。

1. 设备无图像，电源指示灯不亮

- ①电源开关是否打开
- ②检查电源是否接触不良

2. OLED 屏有显示，但无图像输出

- ①左旋旋钮进入左旋界面，查看信号有无接入
- ②输入通道与输入设置中输入模式是否统一，都为同一接口形态，如 HDMI2.0
- ③轻触旋钮进入主界面，查看输入输出配置是否与实际连接相符
- ④检查是否正确连接信号
- ⑤检查线材，是否视频传输无问题
- ⑥检查设备是否支持该分辨率和刷新频率
- ⑦进行工厂复位

3. 图像画面显示不正常（缺色、画质模糊、窗口显示不全等）

- ①“高级设置”菜单中输入输出图卡是否关闭
- ②信号源信号是否正常
- ③检查连接线是否连接好
- ④设备接口是否已出现损坏
- ⑤视频连接线接口以及线管是否正常
- ⑥检查设备是否支持该分辨率和刷新频率
- ⑦进行工厂复位

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Representation

The manual must not be copied, reproduced or transcribed or translated in whole or part, or disclosed commercially in any means (electronic, mechanical, photocopying, recording or otherwise) or used for any commercial profit without prior written consent of our company.

Please read this manual carefully before use. Any product specification and information in the manual are only for reference and subject to improvement without further notice. Unless otherwise specified, the manual herein is acted as directions to use only and all statements, information, etc. do not constitute the warranty of any kind.

Trademarks

VESA is the trademark of Video Electronics Standards Association.

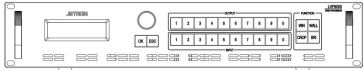





HDMI and High-Definition Multimedia Interface are the trademarks of HDMI Licensing LLC.

Safety Precautions

- The equipment must be connected with ground wires.
- Voltage with rated power shall be employed by the equipment and the input voltage error shall be $\pm 10\%$.
- Do not connect AC power with another AC power cable that may cause excessive noise.
- Please use the equipment in the environment where the temperature is -10°C to 45°C and the relative humidity is 90% or below.
- Do not use the equipment in the special environment, such as near heat source where the equipment may be overheated to damage. Please use the equipment at the well-ventilated place and keep the air vent smooth.
- Do not expose the equipment at the place where the equipment may be collided accidentally or vibrated and reinforce the equipment in case of the vibration.
- Do not put such other objects as water and metal objects into the equipment. Otherwise, the equipment is damaged to cause a fire.
- In case of any irregular or abnormal phenomenon, cut off the power supply instantly, disconnect the AC power cord and remove troubles in time as per "Troubleshooting".
- Do not dismantle the equipment by yourself in case of any damage and contact the designated maintenance center for repair.

Accessories

Table 1.1 Packing List

Items	Name	Quantity
	LVP9000	1
	Power cord	1
	DVI cord	2
	User Manual	1
	Certificate of conformity	1
	Warranty card	1

***Above accessories may differ upon service condition of the user.**

Model Descriptions

Table 2.1 Model Descriptions

Model	Descriptions	
	Input board (quantity)	Output board (quantity)
LVP9000 (factory default)	2 DVI	2 DVI
LVP9000-A	1 HDMI、1 DP、1 DVI、1 SDI	4 DVI
LVP9000-B	1 DP + 1 HDMI	4 DVI
LVP9000-C	2 DP + 2 HDMI	4 DVI
LVP9000-D	2 DP	4 DVI
LVP9000-E	4 DP	4 DVI
LVP9000-F	2 HDMI	4 DVI
LVP9000-G	4 HDMI	4 DVI

***Above models may differ upon service condition of the user.**

Overview

LVP9000 series is a high-performance ultra-high definition splicer, which adopts 30-bit digital image processing, advanced deinterlacing signal processing and professional scale processing technology. It can support 4K*2K inputs and outputs as well as 4K60 lossless segmentation. It also supports embedded hybrid matrix functions, can take up super-resolution loads (up to 8K*4K) and can receive a variety of video input formats such as DP, HDMI, DVI and SDI.

Ultra High Definition Splicer

LVP9000 series splicer can support a variety of video input formats and can meet up to 8K*4K super-resolution display requirements through simple splicing settings.

Receive Ultra HD 4K (UHD) Signals

LVP9000 series splicer can receive 4K (UHD) signals, which can promote four times more details than 1080P images and retains brilliant image color details.

4K60 Lossless Segmentation

LVP9000 supports ultra HD 4K60 (UHD) signals and can split its image as 1080 resolution in a lossless manner.

Super-resolution Loads , Horizontal and Vertical User-defined Layouts

It can support up to 8K*4K, which provides a solution to the insufficient load capacity of general splicers.

Hybrid Matrix

LVP9000 series splicer integrates with embedded hybrid matrix functions, which can be

used as hybrid matrix.

Multi-machine Cascading

It supports the cascading of multiple equipment for synchronous transmission of multi-channel signals.

Customized EDID

EDID should be set properly based on actual applications for easy and convenient operation.

Input signal

Optional: two DP inputs, two HDMI inputs, two DVI inputs, two SDI inputs. A reasonable choice can be made based on actual applications.

Output signal

Optional: two DP outputs, two HDMI outputs, two DVI outputs, two SDI outputs. A reasonable choice can be made based on actual applications.

Front Panel Used Conveniently

Visualized OLED display interface, rotary knob used conveniently for control and clear key lights make the installation and control of the system simplified.

Function Keys

Use shortcut keys to enter window settings, splicing settings, crop settings and image quality settings.

Panels

Front Panel

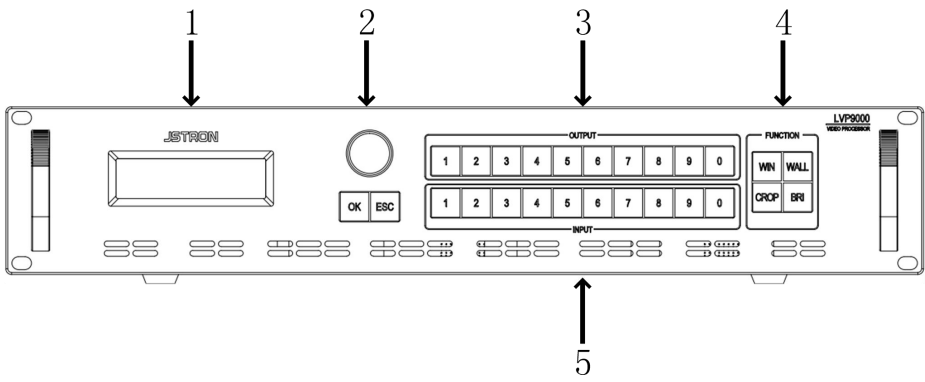


Figure 1.1 Front Panel

Table 3.1 Descriptions on Front Panel

Serial No.	Name	Operating instructions
1	OLED display screen	Display menus and current interface information
2	Knob	Select up, down, left and right menus or adjust the parameters; pressing slightly means pressing an enter key
	OK	Enter key
	ESC	Return key
3	Output	Output channel selection key, numeric key 0-9
4	WIN	Adjustment shortcut key for window size
	WALL	Adjustment shortcut key for splicing
	CROP	Crop adjustment shortcut key
	BRI	Adjustment shortcut key for image brightness
5	Input	Input source selection key, numeric key 0-9

Rear Panel

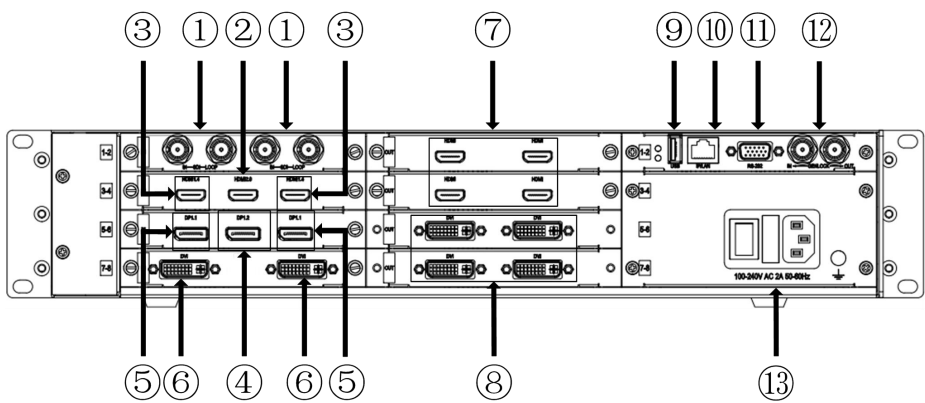


Figure 1.2 Rear Panel

Table 3.2 Descriptions on Rear Panel

Serial No.	Name	Definition	Instruction/Support
*①	IN-SDI-LOOP	Input/Loop	1080p60, 3G-SDI downward compatibility
*②	HDMI	Input	EIA/CEA - 861 standard, HDMI2.0
*③	HDMI	Input	EIA/CEA-861 standard, HDMI1.4 with downward compatibility
*④	DP	Input	VESA standard, DP1.2 downward compatibility
*⑤	DP	Input	VESA standard, DP1.1 downward compatibility
*⑥	DVI	Input	DVI1.0, HDMI1.4 downward compatibility VESA standard, PC to 1920*1200 HD 4K30 (UHD)
*⑦	HDMI	Output	EIA/CEA-861 standard, HDMI1.4 with downward compatibility
*⑧	DVI	Output	DVI1.0, HDMI1.4 downward compatibility

			VESA standard, PC to 1920*1200 HD 4K30 (UHD)
⑨	USB	Upgrade	Insert U disk upgrade program
⑩	TCP/IP	Network port	Network communication
⑪	RS232	Serial port	Serial port communication
⑫	IN-GENLOCK -OUT	Cascading	Cascading of multiple equipment
⑬	AC	Power	Power supply of equipment
Notes: 1. All items with * mark are optional. 2. All technical parameters are subject to change without further notice			

Menu

Default Interface Overview

LVP9000 has a visualized display interface, as shown in Figure 2.1, which is the default interface on LVP9000 after starting. The user can obtain the configured information about the current input and output signals via the interface.

OUT	01	02	03	04	05	06	07	08
I N	01	02	03	04	05	06	07	08

Figure 2.1 Default Interface

Left-handed Interface Overview of Knob

Rotate the knob left, and then the LVP9000 enters the display interface of input resolution, as shown in Figure 2.2. In the case that the signal is connected, the corresponding channel signal will be highlighted.

I N	01 1920x1080p60	05 No Signal
	02 No Signal	06 No Signal
	03 No Signal	07 No Signal
	04 No Signal	08 No Signal

Figure 2.2 Left-handed Interface

Right-handed Interface Overview of Knob

Rotate the knob right, and then the LVP9000 enters the display interface of output window size and resolution. For example: if the output resolution is 2048*1152p60 and adjustment window size is 1024*768, an interface will be as shown in Figure 2.3.

OUT	01 (1024, 768)	03. 2048x1152p60
	02 (1920, 1080)	02. 1920x1080p60
	03 (1920, 1080)	02. 1920x1080p60
	04 (1920, 1080)	02. 1920x1080p60

Figure 2.3 Right-handed Interface

Default Menu Overview

Press the knob slightly or press the "OK" key, then the LVP9000 enters a main menu interface as shown in Figure 2.4. The user can press the knob to confirm and rotate it left or right to select each function.



Figure 2.4 Main Menu

Description on Main Menu

Input Settings

At the main menu, rotate the knob, select "Input" and press the knob slightly, then the interface as shown in Figure 2.5 will pop up. We will introduce the four sub-menus of input settings.

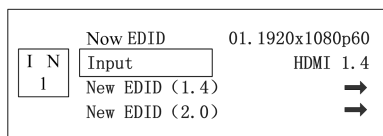


Figure 2.5 Input Settings

① Now EDID

- Display the EDID of the current input signal source and use the keys in the input area to select different signal sources.

② Input mode

- Protocol versions-include HDMI 1.4, HDMI 2.0, DP1.1, DP1.2 and other version types.

(★Note: In the process of connecting the signal, a single board can only be connected to one signal type. For example, the DP board cannot be connected to both DP1.1 and DP1.2 signals at the same time)

③ New EDID (1.4)

- Press the knob slightly to enter the sub-menus of New EDID (1.4) where standard EDID and customized EDID can be set.

④ New EDID (2.0)

- Press the knob slightly to enter the sub-menus of New EDID (2.0) where standard EDID and customized EDID can be set.

Output Timing

At the main menu, rotate the knob, select "Timing" and press the knob slightly, then the interface as shown in Figure 2.6 will pop up. We will introduce the two sub-menus of output timing.

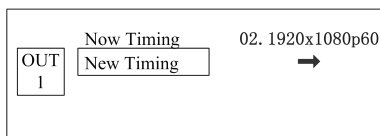


Figure 2.6 Output Timing Sequence

① Now Timing

- Display the resolution of the current output channel signal and use the keys in the output area to select different output channels.

② New Timing

- Press the knob to enter the sub-menus of change resolution where various fixed EDID and user-defined EDID are optional for HDMI and DVI interfaces.

Window Settings

At the main menu, rotate the knob, select "Window" and press the knob slightly to enter the sub-menus of "Window" as shown Figure 2.7. We will introduce the sub-menus of window

settings.

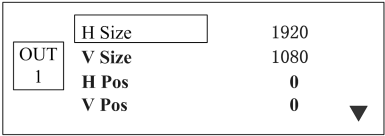


Figure 2.7 Window Setting

- H Size -- default value: output timing width, range: 16 - output timing width
- V Size -- default value: output timing height, range: 16 - output timing height
- H Pos -- default value: 0, range: 0 - (output timing width - H Size)
- V Pos -- default value: 0, range: 0 - (output timing height - V Size)
- WinSet -- default: part mode, part mode and full-screen mode are optional
- Reset -- initialize above window setting parameters under the current channel

Splicing Settings

At the main menu, rotate the knob, select "Wall" and press the knob slightly to pop out the sub-menus of "Wall" as shown Figure 2.8. We will introduce the sub-menus of splicing settings.

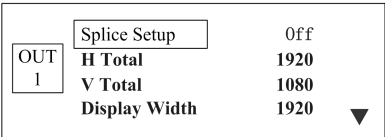


Figure 2.8 Splicing Settings

- Splice Setup -- Default: Off; On mode and Off mode are optional

- H Total -- default value: 1920, range: 1920-61440
- V Total -- default value: 1080, range: 1080-34560
- Display Width -- default value: 1920, range: 64 - H Total
- Display Height -- default value: 1080, range: 32 - V Total
- Splice H Start -- default value: 0, range: 0 - (H Total - Display Width)
- Splice V Start -- default value: 0, range: 0 - (V Total - Display Height)
- Reset -- initialize above splicing setting parameters under the current channel

Crop Settings

At the main menu, rotate the knob, select "Crop" and press the knob slightly to pop out the sub-menus of "Crop" as shown Figure 2.9. We will introduce the sub-menus of crop settings.

(★ Note: only in the case that "splicing settings" are off, "crop settings" can be valid)

OUT 1	H Size	1920
	V Size	1080
	H Pos	0
	V Pos	0

Figure 2.9 Crop Settings

- H Size -- default value: input timing width, range: 16 - input timing width
- V Size -- default value: input timing height, range: 16 - input timing height
- H Pos -- default value: 0, range: 0 - (Input timing width - H Size)
- V Pos -- default value: 0, range: 0 - (Input timing height - V Size)
- CropOn -- default: Off; On mode and Off mode are optional
- Reset -- initialize above crop setting parameters under the current channel

Image Quality Settings

At the main menu, rotate the knob, select "Color" and press the knob slightly to pop out the sub-menus of "Color" as shown Figure 2.10. We will introduce the sub-menus of image quality settings.

OUT 1	Brightness	128
	Contrast	128
	Saturation	128
	Hue	128
		▼

Figure 2.10 Image Quality Setting

- Brightness -- default value: 128, range: 0-255
- Contrast -- default value: 128, range: 0-255
- Saturation -- default value: 128, range: 0-255
- Hue -- default value: 128, range: 0-255
- Brightness Gain -- red mode, green mode and blue mode are optional; default value: 128, range: 0-255
- Dark Offset -- red mode, green mode and blue mode are optional; default value: 128, range: 0-255
- Gamma -- default value: 1.0, range: 0.3-3.3
- Reset -- initialize above image quality setting parameters under the current channel

Preset Management

At the main menu, rotate the knob, select "Preset" and press the knob slightly to pop out the sub-menus of "Preset" as shown Figure 2.11. We will introduce the four sub-menus of preset

management.

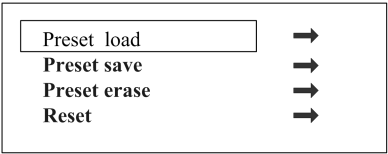


Figure 2.11 Preset Management

- Preset load -- Load the user configuration saved before to reduce operation steps
- Preset save-- Save the preset so that the user can load them conveniently
- Preset erase-- Erase the user configuration saved before
- Reset -- Initialize above preset management parameters of the current channel

Advanced Settings

At the main menu, rotate the knob, select "Advance" and press the knob slightly to pop out the sub-menus of "Advance" as shown Figure 2.12. We will introduce the two sub-menus of advanced settings. (★ **Note: in the case that the image of the output signal is not the image of the input signal, check if the input and output test pattern cards are open**)

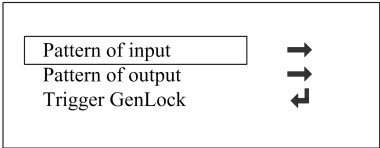


Figure 2.12 Advanced Settings

- Pattern of input -- test if the image of the input panel is normal
- Pattern of output -- test if the image of the output panel is normal
- Trigger GenLock -- When multiple devices are cascaded, the host can use Trigger

GenLock function to synchronize multiple devices.

System Settings

At the main menu, rotate the knob, select "System" and press the knob slightly to pop out the sub-menus of "System" as shown Figure 2.13. We will introduce the sub-menus of system settings.

Language	English
Reset	→
OLED Contrast	11
Key Lock	↵

Figure 2.13 System Settings

① Language

- English is the default language. There are altogether three optional languages including English, Simplified Chinese and Chinese Traditional.

② Reset

Rotate the knob, select "Reset" and press the knob slightly to enter the sub-menus of "reset". As shown in Figure 2.14, and the sub-menus include three items: Output Reset, Input Reset and Total Reset.

Output reset	1
Input reset	1
All reset	↵

Figure 2.14 System Reset

- Output Reset

Select an output channel by pressing output area button or rotating the knob, press the knob slightly, and confirm reset. Restore parameter to the default value after reset.

- Input Reset

Select an input channel by pressing input area button or rotating the knob, press the knob slightly, and confirm reset. Pattern of input is closed after reset, and the EDID is reset. (★ **Note:** after reset HDMI2.0 to HDMI1.4, DP1.2 to DP1.1, and the other EDID Restore to initial value)

- Total Reset

Restore system setting parameter to factory default value.

③ OLED Contrast

- Adjust the screen brightness; the default value: 10, range: 2-11.

④ Key Lock

- The default is off. Touch the knob slightly, turn on key lock. At this time, press the key without any effect and there is a prompt: Press OK 3 seconds to unlock! And then unlock following the prompts.

⑤ Menu Timeout

- Set menu timeout, default: 30 seconds. The menu will bounce back to the main interface if there is no operation within 30 seconds. There are a total of 7 optional timeouts such as 20 seconds, 30 seconds, 45 seconds, 1 minute, 90 seconds, 2 minutes and 3 minutes.

⑥ Screen Timeout

- Set the screen time, default: 2 minutes. The screen will enter into protection state if there is no operation within 2 minutes. There are a total of 6 screen timeout such as 2 minutes, 10 minutes, 30 minutes, 6 hours, 12 hours and 18 hours. (★ **Start timing at default interface**)

⑦ Communication Settings

Rotate the knob, select "Comm Setting" and press the knob slightly to pop out the sub-menus of "Comm Setting". The sub-menus contain 2 levels of sub-menus: LAN Setup and RS232 Baudrate. (★ **Change "LAN Setup" network parameter and "RS232 Baudrate" serial port parameter for the use of communication between the host computer software and equipment, so as to realize remote control of equipment**)

● LAN Setup

Press the knob slightly to enter the "LAN Setup" menu, and change the IP address, subnet mask, gateway, port number, DHCP switch, and MAC address according to the actual applications.

● RS232 Baudrate

Default: 115200. There are a total of 4 optional baud rates such as 115200, 38400, 19200 and 9600.

⑧ Schedule Settings

Press the knob slightly to enter the sub-menus of "Schedule" and the sub-menus contains 6 lower submenus: schedule ON, ctrl table OFF, schedule ctrl table, schedule date table, time setting, reset. Please refer to the schedule management settings of the function description of this User Manual for details. (★ **It can be used stadium rotation, timing broadcast of engineering projects, and broadcast of day of commemoration and other application scenarios**)

- Schedule ON -- On/Off of schedule
- Ctrl table OFF-- Close all the schedules
- Schedule ctrl table-- Set the ctrl number, On/Off, type, date table number, time, week, and other parameters of schedule
- Schedule date table-- Set the number of date table, time parameter and preset parameter
- Time setting -- Set parameters such as year, month, day, hour, minute and second
- Reset -- Initialize all the schedule setting parameters

Machine Information

At the main menu, rotate the knob, select "Information" and press the knob slightly to enter sub-menu of "Information" as shown in the interface of Figure 2.15. We will introduce the sub-menus of machine information.

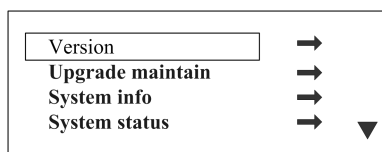


Figure 2.15 Machine Information

① Version information

- Rotate the knob slightly to enter the sub-menu of "Version" and check version information of four boards such as MCU, FPGA, input, and output by rotating the knob.

② Upgrade maintain

Press the knob slightly to enter the sub-menus of "Upgrade maintain" and the sub-menus contains 3 lower submenus: operation type, board ID and Apply. (★ **Note: power on again**

after successful upgrade. You can confirm whether the upgrade is successful by checking the "version information" under the "machine information" menu after the successful starting of the equipment)

- Operation type -- Press the knob slightly to enter the sub-menus of "Opt type" and select the upgrade file according to the actual application: MCU App, MCU FPGA, Output App, Output Chip, Output All, Input App, All App. The program for the current use can be backed up to U disk of FAT32 format, and program files which need to be upgraded also can be loaded from the U disk of FAT32 format.
- Board ID -- Press the knob slightly to enter the sub-menus of "Board ID" and select program file number of sub-menu of "Opt type" according to the actual application. One board and all boards can be upgraded individually, and there are 5 optional numbers such as 1, 2, 3, 4 and All.
- Apply -- Press the knob slightly to enter "Apply" sub-menu after the configuration of "Opt type" and "Board ID", and insert U disk of FAT32 format according to the prompts to upgrade the program. (★ Note: U disk is FAT32 format, and if not, **set it to FAT32 format**)

③ System info

- Press the knob slightly to enter the sub-menus of "System info", and check current system CPU frequency, LAN configuration, temperature, operation time, current time, clock, schedule, date table, and other parameters by rotating the knob.

④ System status

- Press the knob slightly to enter the sub-menus of "System status", and the operation status will display. If the status is normal, then prompt : System operates well (System is running well).

⑤ System log

- Record the current system status

⑥ Clear log

- Clear the system log

Function Descriptions

The understanding of the main functions of users can configure the machine rapidly to complete the installation and debugging of the project. Please confirm that the equipment is correctly connected and the display of signal is normal before setting various functions.

Splicing Function

The splicing function is a solution which is used to solve the problem that a single video processor cannot drive a large LED screen. The splicing with free method is applied to various LED splicing systems.

Signal Connection and Resolution Settings

Select appropriate input resolution according to the physical resolution of large LED screen, select "Input" → "input mode" in the main menu, select modes such as HDMI 1.4, HDMI2.0, DP1.1 and DP1.2, set the required input resolution according to actual needs and wire based on the actual application.

Splicing Function Settings

Confirm output signal resolution according to the physical resolution of large LED screen, open the splicing switch in the "Wall", and customize H Total, V Total, Display Width, Display Height, Splice H Start, Splice V Start and other parameters.

For example: the Signal A shall be input to access 1920*1080@60Hz, and output to access 3840*2160 LED screen. The splicing setting is shown in splicing samples of Figure 3.1. After

correctly connecting the equipment and setting the splicing parameters, the picture of magnified
Signal A can be seen on the 3840*2160 LED screen.

Splicing Settings

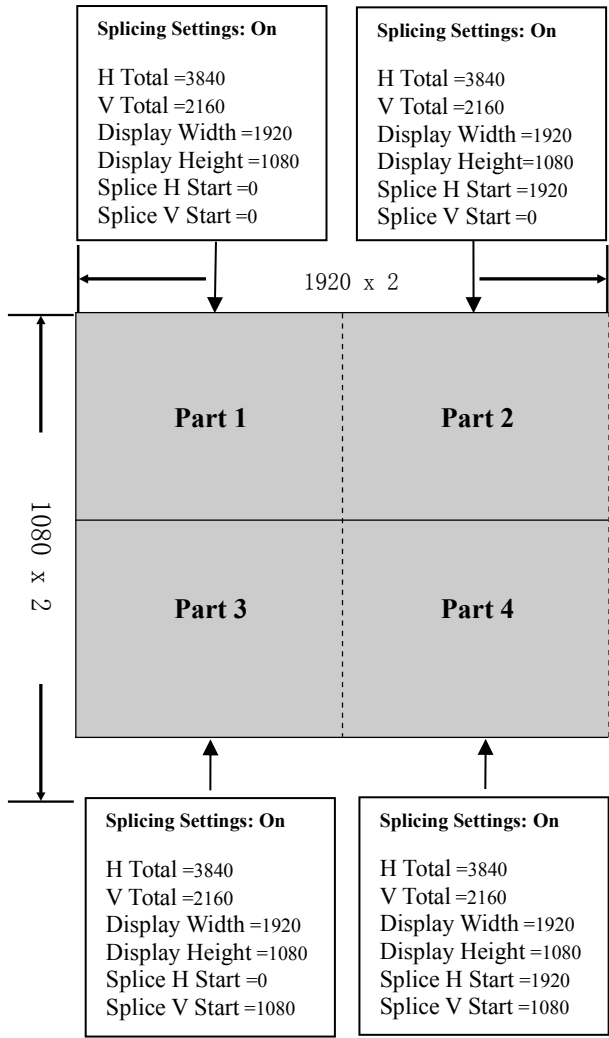


Figure 3.1 The Samples of Splicing Settings

Customized EDID

The LVP9000 series can support the customized EDID when inputting and outputting, and change the interfacial parameters of Figure 3.2 according to practical application. **The users generally need to change Hact, Vact and FPS only. Hfp, Vfp, Hsyn, Vsyn and other parameters are the project debugging parameters, having no effect on the size and quality of pictures but the bandwidth, and are the fine-tuning options when the pictures are abnormal.**

Hact	1920	Vact	1080	FPS	60
Htot	2200	Vtot	1125	Aply	↵
Hfp	48	Vfp	3	148.500000	
Hsyn	32	Vsyn	10		
Hpol	P+	Vpol	P+	Rst	↵

Figure 3.2 Customized EDID

- Hact -- horizontal width, default value: the width of EDID timing
- Vact -- vertical height, default value: the height of EDID timing
- FPS -- refresh rate, default value: the frequency of EDID timing
- Htot -- total horizontal pixel, $Htot = Hact + Hfp + Hsyn +$ horizontal back porch (not shown in the menu)
- Vtot -- total vertical pixel, $Vtot = Vact + Vfp + Vsyn +$ vertical back porch (not shown in the menu)
- Aply -- save the current configuration and program EDID of input or output
- Hfp -- horizontal front porch
- Hsyn -- horizontal synchronous width

- Vfp-- vertical front porch
- Hsyn -- vertical synchronous width
- 148.500000 -- total bandwidth, the total bandwidth = Htot * Vtot * FPS
- Hpol -- horizontal polarity
- Vpol -- vertical polarity
- P+ -- positive polarity
- Rst -- EDID parameter reset

Matrix Function

The LVP9000 series has embed function of hybrid matrix that can be used as the hybrid matrix. As shown in the matrix schematic of Figure 3.3.

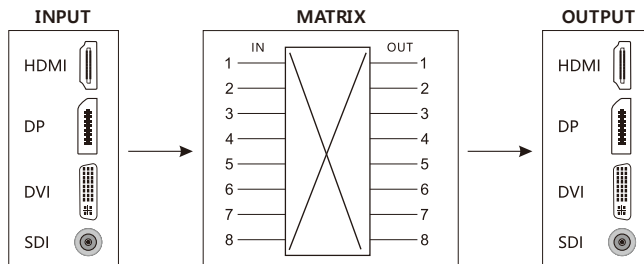


Figure 3.3 The Samples of Matrix Function

Preset Management Settings

The preset mode can facilitate the user to rapidly load the preset application scene when using, which can reduce the trouble of the user to repeatedly set parameters during operation, and improve work efficiency. Each preset mode includes the parameters related to input channel, output channel, window size, crop, splicing and picture quality. The following introduces the saving, erasing and template loading of the preset mode.

Save Preset

Set the current channel parameters, press the knob to enter the main menu, select the "Preset" → "preset save", and press numeric keys 0-9 to save corresponding templates, which can save up to 30 preset scenes. After saving, the horizontal lines of the corresponding numbers will become solid five-pointed stars, as shown in the number 1 and 2 of Save Preset of Figure 3.4.

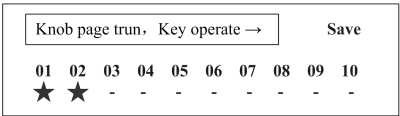


Figure 3.4 Preset Save

Erase Preset

Press the knob to enter the main menu, select the "Preset" → "Preset erase", and press numeric keys 0-9 to erase original saved corresponding templates. According to the above-mentioned methods, turn left and right through the rotary knob to erase corresponding

presets. After erasing, the five-pointed stars of the corresponding numbers will become horizontal lines, as shown in the number 2 of Figure 3.5.

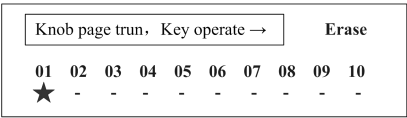


Figure 3.5 Preset Erase

Load Preset Template

Press the knob to enter the main menu, select the "Preset" → "Preset load", and press numeric keys 0-9 to load original saved corresponding templates. After loading, the system will remind that the preset X is load successfully. If the preset is load successfully, the system will display according to it. As shown in Figure 3.6.

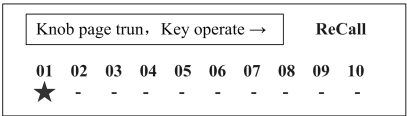


Figure 3.6 Preset Load

Reset Preset

Press the knob to enter the main menu, select the "Preset" → "Reset", and operate according to the prompts to reset to the initial state – No Preset.

Schedule Management Settings

The schedule management can facilitate the user to run the configuration according to the present time, which can reduce the trouble of the user to repeatedly set parameters, and improve work efficiency. There are 3 methods of schedule management: counting and timing, execution by date, and execution by week, which can be reasonably configured according to specific usage conditions.

Press the knob gently to enter the main menu and select the "System" → "Schedule" to enter the submenu of schedule management settings. As shown in the interface of Figure 3.7 (★ Before configuring the preset time parameters, turn off the main switch of schedule firstly to prevent the situation that run the system according to preset time while configuring the parameters).

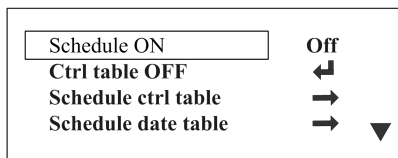


Figure 3.7 Schedule Management

Rotate the knob to select "Schedule", and press the knob to enter the interface of schedule parameter configuration, as shown in the interface of schedule setting of Figure 3.8. Through rotating the knob, set the schedule parameters such as date table number, on/off, type, number, year, month, date, hour, minute, second, week and default value restoring.

Ctrl ID	1
Enable	Off
Type	Timer
Date ID	1 ▼

Figure 3.8 Schedule Settings

- The schedule number -- default value: 1, range: 1-16
- On/Off -- default value: Off; two modes (On and Off) can be selected
- Type -- default value: counting and timing; counting and timing, execution by date, and execution by week can be selected
- The date table number -- default value: 1, range: 1-16
- Year -- default value: 0, range: 0-255
- Month -- default value: 1, range: 1-12
- Date -- default value: 1, range: 1-31
- Hour -- default value: 0, range: 0-23
- Minute -- default value: 1, range: 0-59
- Second -- default value: 0, range: 0-59
- Week -- default value: Off, range: Monday-Sunday
- Reset-- reset all parameters of schedule settings

Counting and Timing

- ① Schedule ON: Off;
- ② Schedule configuration: set the number, On/Off, type, date table number, timing length, and other parameters of schedule;
- ③ Date table configuration: set the number of date table and preset (**under the mode of**

counting and timing, all date tables only configure the period 01);

④ Schedule ON: On;

For example: set three schedules, the Preset 1 can sustain 1 minute and 30 seconds, Preset 2 can sustain 2 minutes and 30 seconds, and Preset 3 can sustain 3 minutes and 30 seconds. The above three presets can be switched back and forth:

Schedule configuration:

I. The number of schedule is set to 1, the state is set to On, the type is set to counting and timing, the date table is set to 1, the minute is set to 1, the second is set to 30, and other parameter is set to defaulted;

II. The number of schedule is set to 2, the state is set to On, the type is set to counting and timing, the date table is set to 2, the minute is set to 2, the second is set to 30, and other parameter is set to defaulted;

III. The number of schedule is set to 3, the state is set to On, the type is set to counting and timing, the date table is set to 3, the minute is set to 3, the second is set to 30, and other parameter is set to defaulted.

Date table configuration:

I. The number of date table is set to 1, the period is set to 01: the preset number is set to 1, and other parameter is set to defaulted;

II. The number of date table is set to 2, the period is set to 01: the preset number is set to 2, and other parameter is set to defaulted.

III. The number of date table is set to 3, the period is set to 01: the preset number is set to 3, and other parameter is set to defaulted.

Execution by Date

① Schedule ON: Off;

② Schedule configuration: set the number of schedule, On/Off, type, number of date table, year, month, day, and other parameter is set to defaulted;

③ Date table configuration: set date table sernumber, time, preset number, and other parameter is set to defaulted;

④ Time settings: set time as the current time, and the operation can be ignored if it is already the current time;

⑤ Schedule ON: On;

For example: set a schedule, and turn on Preset 1 at 9:00 on the morning of March 20, 2018, and Preset 2 at 9:30, and Preset 3 at 10:00:

Schedule configuration:

I. The number of schedule is set to 1, the state is set to On, the type is set to execution by date, the number of date table is set to 1, the year is set to 18, the month is set to 3, the date is set to 20, and other parameter is set to defaulted;

Date table configuration:

II. The number of date table is set to 1, the period is set to 01: hour is set to 9, minute is set to 0, second is set to 0, and preset is set to 1;

Period 02: hour is set to 9, minute is set to 30, second is set to 0, and preset is set to 2;

Period 03: hour is set to 10, minute is set to 0, second is set to 0, and preset is set to 3;

Execution by Week

① Schedule ON: Off;

② Schedule configuration: set the number of schedule, On/Off, type, number of date table, week, and other parameter is set to defaulted;

③ Date table configuration: set date table the number, period, preset number, and other parameter is set to defaulted;

④ Time settings: set time as the current time, and the operation can be ignored if it is already the current time;

⑤ Schedule ON: On;

For example: set a schedule, and turn on Preset 1 at 8:00 on the morning of every Monday, and Preset 2 at 8:05, and Preset 3 at 8:10:

Schedule configuration:

I. The number of schedule is set to 1, the state is set to On, the type is set to execution by week, the number of date table is set to 1, week is set to Monday, and other parameter is set to defaulted;

Date table configuration:

I. The number of date table is set to 1, the period is set to 01: hour is set to 8, minute is set to 0, second is set to 0, and preset is set to 1;

Period 02: hour is set to 8, minute is set to 5, second is set to 0, and preset is set to 2;

Period 03: hour is set to 8, minute is set to 10, second is set to 0, and preset is set to 3;

Multi-Machine Cascading

Each equipment, equipped with an IN-GENLOCK-OUT interface, can be cascaded through SDI lines. One end of the SDI line is connected to the output of the equipment, and the other end is connected to the input of another equipment. According to the above method, many equipments can be cascaded together to achieve synchronous transmission of signals. As shown in the example diagram in Figure 3.9. (★The output equipment is the host, the input one is the slave. And the OLED display screen of the slave will show the lightning symbol.)

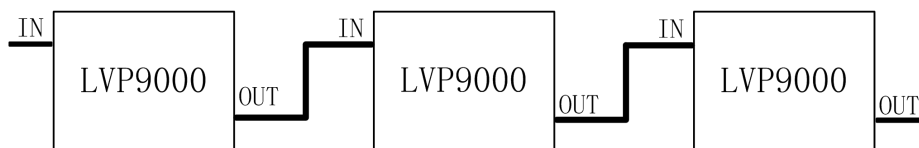


Figure 3.9 Multi-machine Cascading

When multiple devices are cascaded, if the screen is not synchronized, it can be solved by the following two methods:

- ① Restart the machine after the host shuts down;
- ② Press the knob of host slightly, select "Advanced Settings" → "Trigger GenLock"

under the main menu interface , and press it to trigger Synchronization;

SPECIFICATIONS

Port	Quantity	Interface pattern	Specifications
Video input (optional)			
DP	2	DP1.2	Signal standard: DP1.2 Downward compatibility Supporting resolution : VESA standard, 4K60 (UHD) with downward compatibility
		DP1.1	Signal standard: DP1.1 Downward compatibility Supporting resolution : VESA standard, 4K30 (UHD) with downward compatibility
		★Only one kind of specification can be connected to DP1.1 and DP1.2 each time.	
DVI	2	DVI-I	Signal standard: DVI1.0, HDMI1.4 downward compatibility Supporting resolution : VESA standard, PC to 1920*1200HD 4K30 (UHD)
HDMI	2	HDMI 1.4	Signal standard: EIA/CEA-861 standard, HDMI1.4 downward compatibility
		HDMI 2.0	Signal standard: EIA/CEA - 861 standard, HDMI2.0 downward compatibility
		★Only one kind of specification can be connected to HDMI 1.4 and HDMI 2.0 each time.	
SDI	2	SDI standard interface	Signal standard: 1080p60, 3G-SDI downward compatibility
Video output (optional)			
DP	2	DP standard interface	Signal standard: DP1.2 Downward compatibility Supporting resolution ratio: VESA standard, 4K60 (UHD) with downward compatibility

DVI	2	DVI-I	Signal standard: DVI1.0, HDMI1.4 downward compatibility Supporting resolution ratio: VESA standard, PC to 1920×1200HD 4K30 (UHD)
HDMI	2	HDMI standard interface	Signal standard: EIA/CEA-861 standard, HDMI1.4 downward compatibility
SDI	2	SDI standard interface	Signal standard: 1080p60, 3G-SDI downward compatibility

Communication interface			
LAN	1	RJ45	Remote control (network communications)
RS232	1	DB9	Remote control (serial port communication)
USB	1	USB2.0	Equipment upgrade

Whole machine parameter	
Weight	6.3kg
Size	44cm (length) × 30cm (width) × 8.8cm (height)
Input power	100-240V AC 0.5A 50-60Hz
Maximum power	50W
Working temperature	0℃-45℃

Troubleshooting

During the installation or application, the users may run into various problems, and they can take the following steps to eliminate faults. If it still cannot be solved, please contact with local dealers.

1. No image is output, and the power indicator light is off

- ① Whether the power switch is on
- ② Check if the connection with power is good

2. OLED screen can display, but there is no image output

- ① Rotate the knob to the left to enter the left-handed interface, and check whether the signals has accessed
- ② Rotate the knob to enter the main interface, and check whether the input and output configurations match the actual connection
- ③ Whether the input modes in the input channel and input settings are unified with the same interface format, for example, HDMI2.0
- ④ Check if the signal is correctly connected
- ⑤ Check the wire rod to determine whether video transmission has problems
- ⑥ Check if the equipment support such resolution and refresh frequency
- ⑦ Factory reset

3. The display of images is abnormal (such as color deletion, blurred picture quality, and incomplete window display)

- ① Whether the input and output graphic cards in the menu of "advanced settings" is off
- ② Whether the signal of the signal source is normal
- ③ Check whether the connection line is connected properly

- ④ Whether the equipment interface has been damaged
- ⑤ Whether the interface and line pipe of video connecting line are normal
- ⑥ Check if the equipment support such resolution and refresh frequency
- ⑦ Factory reset

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