Application Note

Remote control of MXE Matrix Mix Engines via the MXE control port (GPIOs) using RDL (Radio Design Labs) analog control panels

MXE Matrix Mix Engines are equipped with a control port for interfacing to other systems, using analog control wiring and controls.

Image 1: MXE rear view

The control port (GPIO) can be found on the MXE’s rear panel. It offers in total eight freely configurable GPIOs (General Purpose Inputs and Outputs), a Ready/Fault relay (RDY/FLT) and 10 V (V) and ground (⊥) reference pins.

The eight GPIOs can be configured via SONICUE as either Analog In, Digital In or Digital Out.

Image 2: MXE control port detail view

Requirements

MXE Matrix Mix Engine with firmware 1.0.2470 (or higher)
SONICUE Sound System Software 1.2 EA (or higher) installed on computer

RDL control panels (3rd party)

RDL’s analog control panels are designed as “problem solvers” for simple control tasks.

All panels come in a range of colors, typically in white, black or stainless. Please refer to the RDL website for more information.

The following RDL analog control panels have been successfully tested with MXE:

- D-RLC10K (white) Remote Level Control
  - Variants DB-RLC10K (black), DS-RLC10K (stainless)
- D-RLC10M (white) Remote Level Control with Muting
  - Variants DB-RLC10M (black), DS-RLC10M (stainless)
- D-RC4RU (white) 4-Channel Remote Control
  - Variants DB-RC4RU (black), DS-RC4RU (stainless)
  - Please note that similar devices such as D/DS/DB-RC4M are not compatible.
1. RDL D-RLC10K Remote Level Control

Product images

![RLC10K variants and rear view (right)](image)

Image 3: RLC10K variants and rear view (right)

Brief description and application example

The RLC10K is a passive, analog LEVEL control panel based on a 10 kΩ potentiometer. It features a knob with scale and can be used for controlling MXE DSP parameters – such as MXE input, output or zone levels – by applying a voltage of 0…10 V to one of the MXE’s GPIs. This voltage is then translated by the MXE logic to a DSP level value.

As this is a passive design, no separate power supply is required.

Basic set up – hardware wiring

![RLC10K wiring to MXE control port](image)

Image 4: RLC10K wiring to MXE control port
Wiring table

<table>
<thead>
<tr>
<th>Dynacord MXE control port pin</th>
<th>RDL RLC10K pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>V (10 V reference)</td>
<td>IN</td>
</tr>
<tr>
<td>GPI 1</td>
<td>C</td>
</tr>
<tr>
<td>⊥ (ground)</td>
<td>⊥ (ground)</td>
</tr>
</tbody>
</table>

Basic set up – software configuration

In SONICUE under Setup->GPIO, the MXE GPI1 needs to be configured as “GPI Analog”.

Then the MXE Logic needs to be programmed. To translate a GPI voltage to a DSP level, the *Analog Task* block needs to be used and configured as shown in the screenshot below (Image 5). The *MXE Level* block allows for configuration of the voltage range and the corresponding level range.

![Analog Task](image)

**Image 5:** MXE logic with Analog Task to translate a voltage at GPI1 to a level in DSP (Zone 1, Input 1)
2. RDL D-RLC10M Remote Level Control with Muting

Product images

Image 6: RLC10M variants and rear view (right)

Brief description and application example

The RLC10M is an active, analog LEVEL plus MUTE control panel.

It features a rotary encoder with knob for LEVEL control and an LED ring as visual feedback of the level set, plus a separate MUTE button. The panel can be used for controlling MXE DSP parameters – such as input, output and zone level – by applying a voltage of 0…10 V to one of the MXE’s GPIs. This voltage is then translated by the MXE logic to a DSP level value.

Pushing the MUTE button will set the output control voltage to 0V as longs as mute is active and back to the previous voltage when the MUTE button is pushed again. Thus for MXE mute means the lowest MXE DSP level programmed via MXE logic for the 0…10V input voltage range.

As this is an active electronic design, a separate 24 V DC power supply is required. For testing the power supply (24 Vdc, 500 mA) has been used.

Basic set up – hardware wiring

Image 7: RLC10M wiring to MXE control port
Wiring table

<table>
<thead>
<tr>
<th>Dynacord MXE control port pin</th>
<th>RDL RLC10M pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPI 5</td>
<td>3 RAMP</td>
</tr>
<tr>
<td>⊥ (ground)</td>
<td>2 GROUND</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RDL PS-24AX</th>
<th>RDL RLC10M pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>1 +24Vdc</td>
</tr>
<tr>
<td>-</td>
<td>2 GROUND</td>
</tr>
</tbody>
</table>

**Important hint: the MODE switch on the RC4RU rear panel must be set to MSTR (Master).**

The RC4RU control panel basically offers the connection of multiple RC4RU units in parallel, one configured as master (MSTR) and all others as slaves (SLV). This mode of operation has not been tested with MXE. See RDL RC4RU manual for further details.

**Basic set up – software configuration**

In SONICUE under Setup->GPIO, the MXE GPI5 needs to be configured as “GPI Analog”.

Then the MXE Logic needs to be programmed. To translate a GPI voltage to a DSP level, the Analog Task block needs to be used and configured as shown in the screenshot below (Image 8). The MXE Level block allows for configuration of the voltage range and the corresponding level range.

**Image 8:** MXE logic with Analog Task to translate a voltage at GPI5 to a level in DSP (Zone 2, Input 7)
3. RDL D-RC4RU 4-Channel Remote Control

Product images

Image 9: RC4RU variants and rear view (right)

Brief description and application example

The RLC4RU is an active, analog SELECT control panel.

It features four pushbutton controls (1 / 2 / 3 / 4) with four corresponding LEDs that act as a radio button group and can be used for controlling MXE DSP parameters – such as selecting an input source or loading a preset – by activating one of four open collector outputs. The status of these open collector outputs, which need to be wired to (up to) four GPIs of the MXE’s control panel, is then translated by MXE logic to the desired MXE DSP functions or parameters.

Pushing one of the four pushbutton controls (1 / 2 / 3 / 4) will activate the corresponding LED and open collector output. Only one selection can be active at a time (radio button group).

As this is an active electronic design, a separate 24 V DC power supply is required. For testing the RDL PS-24AX power supply (24 Vdc, 500 mA) has been used.

Basic set up – hardware wiring

Image 10: RC4RU wiring to MXE control port
Wiring table

<table>
<thead>
<tr>
<th>Dynacord MXE control port pin</th>
<th>RDL RC4RU pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPI 1</td>
<td>CONTROL OUTPUT 1</td>
</tr>
<tr>
<td>GPI 2</td>
<td>CONTROL OUTPUT 2</td>
</tr>
<tr>
<td>GPI 3</td>
<td>CONTROL OUTPUT 3</td>
</tr>
<tr>
<td>GPI 4</td>
<td>CONTROL OUTPUT 4</td>
</tr>
<tr>
<td>⊥ (ground)</td>
<td>CONTROL GND</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RDL PS-24AX</th>
<th>RDL RC4RU pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>POWER +24Vdc</td>
</tr>
<tr>
<td>-</td>
<td>POWER GND</td>
</tr>
</tbody>
</table>

Basic set up – software configuration

In SONICUE under Setup->GPIO, the MXE GPI1, GPI2, GPI3 and GPI4 need to be configured as “GPI Digital”.

Then the MXE logic needs to be programmed. To translate a GPI status (active / not active) to a DSP function, the Logic Task block needs to be used and configured for each of the GPIs individually, as shown in the screenshot below (Image 11).

Image 11: MXE logic with Logic Task to translate the status of GPI1-GPI4 to a command to load Preset 1-4

Third party product disclaimer:
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