MX396 -- Multi-Element Boundary Microphone

General Description

Shure MX396 Dual-Element and Tri-Element microphones provide full coverage of large tables with fewer microphones, and feature a low profile design. This makes them ideal for use in boardrooms and other installations where aesthetics are important.

Features

• Low profile, aesthetic design
• Wide dynamic range and smooth frequency response
• Configurable mute switch with logic output
• Logic input for external LED control
• RF filtering with CommShield® technology

Placement

Important: Align the Shure logo as shown for proper coverage.
MX396/C-TRI
300° @ -3 dB

MX396/C-DUAL & TRI
Reconfiguring the MX396-TRI for 360° Coverage

To configure the MX396 for 360° “omnidirectional” coverage, open the grille and reposition the internal mic elements as shown.
Permanent Installation

The MX396 comes with a 20 ft. attached, unterminated cable.

<table>
<thead>
<tr>
<th>Wire Color</th>
<th>Function</th>
<th>Mic Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Mic 1 Audio +</td>
<td>A</td>
</tr>
<tr>
<td>Green</td>
<td>Mic 1 Audio −</td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>Mic 2 Audio +</td>
<td>B</td>
</tr>
<tr>
<td>Blue</td>
<td>Mic 2 Audio −</td>
<td></td>
</tr>
</tbody>
</table>

Note: Overtightening the wing nut reduces shock isolation.

Cable
### Phantom Power

Each element in the microphone requires 12 to 48 V phantom power. The LED also uses phantom power, and dims slightly when phantom power voltage drops below 48 V DC.

The Tri-element model draws 22 mA at 48 V. The Dual-element model draws 19 mA at 48 Vdc. (Each element draws 3 mA and the LED draws 13 mA, distributed equally among each element.)

NOTE: Do not connect multiple elements in parallel to a single mic input. The phantom power current draw could exceed the maximum allowable for one mic input.

### Accessing the DIP Switches

**Caution:** Failure to reinstall the setscrew will reduce RF immunity.

#### DIP Switch Settings

<table>
<thead>
<tr>
<th>DOWN (Default)</th>
<th>UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Momentary</td>
<td>Toggle</td>
</tr>
<tr>
<td>DOWN (Default)</td>
<td>UP</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Push-to-Mute</td>
<td>Push-to-Talk</td>
</tr>
<tr>
<td>Mute button enabled, LED illuminates when mic is active</td>
<td>Disable mute button (microphone always on), logic controls LED</td>
</tr>
<tr>
<td>Full Frequency Range</td>
<td>6dB/octave Low Cut Filter</td>
</tr>
</tbody>
</table>

**Low Cut Filter**

Set **DIP Switch 4 up** to activate the low cut filter. Attenuates 6 dB per octave below 150 Hz.

**Local Mute Control**

The microphone ships configured for local (manual) mute control (**DIP Switch 3 down**). In this mode, the PUSH button on the microphone mutes the audio signal at the microphone. Audio is not sent to the audio outputs.
In this configuration, the LED color reflects the microphone state, as controlled by the user with the PUSH button.

**Green:** microphone active  
**Red:** microphone muted

## Button Configuration

For local mute control operation, use DIP Switches 1 and 2 to configure the button behavior.

<table>
<thead>
<tr>
<th>Button Behavior</th>
<th>SWITCH OUT Logic Signal</th>
<th>DIP Switch Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Momentary:</strong> push-to-mute (as shipped).</td>
<td>When pushed, SWITCH OUT (red wire) falls to 0 V. When released, SWITCH OUT returns to +5 V.</td>
<td><img src="image1" alt="DIP Switch Setting" /></td>
</tr>
<tr>
<td><strong>Momentary:</strong> push-to-talk</td>
<td></td>
<td><img src="image2" alt="DIP Switch Setting" /></td>
</tr>
<tr>
<td><strong>Toggle:</strong> Push and release to toggle the microphone on or off. Mic is <strong>active</strong> when powered on.</td>
<td>Push and release sets SWITCH OUT to 0 V. Push again to toggle back to +5 V.</td>
<td><img src="image3" alt="DIP Switch Setting" /></td>
</tr>
<tr>
<td><strong>Toggle:</strong> Push and release to toggle the microphone on or off. Mic is <strong>mute</strong> when powered on</td>
<td></td>
<td><img src="image4" alt="DIP Switch Setting" /></td>
</tr>
</tbody>
</table>

## Logic Mute Control (Automatic Mixing)

Set **DIP Switch 3 up** to configure the microphone for logic control applications where audio from the microphone is muted by an external device, such as an automatic mixer. In this mode, the local mute function of the PUSH button is bypassed (the microphone always sends audio) and the LED does not respond directly from pushing the button.
As required by the installation specifications, wire the SWITCH OUT conductor in the microphone cable to the automatic mixer or other TTL logic device. When the talker presses the button on the microphone, it changes the voltage level at the SWITCH OUT conductor, which signals the device to mute audio for that channel or perform some other function.

To control the LED on the microphone, wire the LED IN conductor to the gate output on the automatic mixer (or any TTL logic device).

**Button Configuration**

For logic control operation, DIP Switch 1 determines the button behavior (DIP Switch 2 has no effect).

<table>
<thead>
<tr>
<th>Button Behavior</th>
<th>DIP Switch Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Momentary:</strong></td>
<td><img src="image" alt="DIP Switch Setting" /></td>
</tr>
<tr>
<td>When pushed, SWITCH OUT (red wire) falls to 0 V. When released, SWITCH OUT returns to +5 V.</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

| **Toggle:**    | ![DIP Switch Setting](image) |
| Push and release sets SWITCH OUT to 0 V. Push again to toggle back to +5 V. | 1 2 3 4 |

**Controlling the LED Using Logic LED IN**

When configured for logic mute control, connect the LED IN conductors to an external switch, relay, or a TTL gate (gate out) on an automatic mixer.

- The LED illuminates **green** when the MX396 LED IN is **grounded** (black wire connected to the bare silver wire).
- The LED illuminates **red** when LED IN is **lifted** (black wire is NOT connected to the bare silver wire).
Accessories

Replacement Parts

Fastening Wing Nut [65A2190]

Mounting Tube [31A2165]

Rubber Isolation Rings (2) [66A405]
Mic Cartidge (Cardioid) [R185B]

Specifications
All measurements taken with microphone mounted on a wooden surface (76 x 76 cm)

Cartridge Type
Electret Condenser

Frequency Response
50–17000 Hz

Polar Pattern

<table>
<thead>
<tr>
<th>MX396/C-DUAL</th>
<th>Cardioid (x2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX396/C-TRI</td>
<td>Cardioid (x3)</td>
</tr>
</tbody>
</table>

Output Impedance
170 Ω

Output Configuration
Active Balanced

Sensitivity
@ 1 kHz, open circuit voltage
−35 dBV/Pa (18 mV)
1 Pa=94 dB SPL

Maximum SPL
1 kHz at 1% THD, 1 kΩ load
122 dB

Equivalent Output Noise
A-weighted
30 dB SPL

Signal-to-Noise Ratio
Ref. 94 dB SPL at 1 kHz
64 dB
Dynamic Range
1 kΩ load, @ 1 kHz
92 dB

Common Mode Rejection
10 to 100,000 kHz
45 dB, minimum

Preamplifier Output Clipping Level
at 1% THD
−7 dBV (0.5 V)

Mute Switch
−50 dB minimum

Logic Connections

<table>
<thead>
<tr>
<th>LED IN</th>
<th>Active low (≤1.0V), TTL compatible. Absolute maximum voltage: -0.7V to 50V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOGIC-OUT</td>
<td>Active low (≤0.5V), sinks up to 20mA, TTL compatible. Absolute maximum voltage: -0.7V to 24V (up to 50V through 3kΩ).</td>
</tr>
</tbody>
</table>

Cable
6.1 m (20 ft), attached, unterminated, three shielded audio pairs and three shielded conductors for logic control

Net Weight
594 g (1.3 lbs)

Environmental Conditions

<table>
<thead>
<tr>
<th>Operating Temperature</th>
<th>−18–57°C (0–135°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature</td>
<td>−29–74°C (−20–165°F)</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>0–95%</td>
</tr>
</tbody>
</table>

Power Requirements

<table>
<thead>
<tr>
<th>MX396/C-DUAL</th>
<th>48–52 V DC, 19.0 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX396/C-TRI</td>
<td>48–52 V DC, 22.0 mA</td>
</tr>
</tbody>
</table>
Certifications

Meets essential requirements of all applicable European Directives.

Eligible for CE marking.

The CE Declaration of Conformity can be obtained from Shure Incorporated or any of its European representatives. For contact information please visit www.shure.com

The CE Declaration of Conformity can be obtained from: www.shure.com/europe/compliance

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