

## Quick Start

This section intends to help with the physical connections necessary to get up and running with your snazzy new ML 1. If you don't read the entire Hardware Manual, at least read this section.

As a safety precaution, turn all devices (especially power amplifiers) OFF when making connections. Doing so gives you a chance to find and correct wiring mistakes and prevent damage to your amplifiers, speakers, ears and spilling a hot drink in your lap.

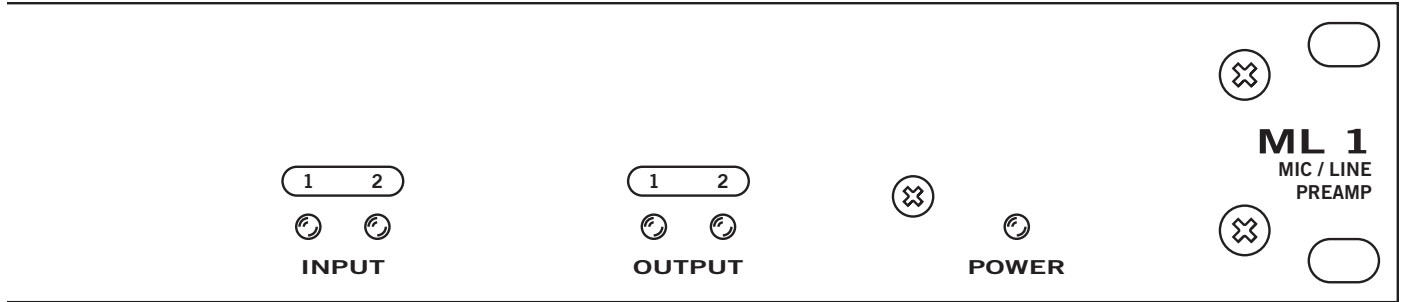
Connect balanced audio sources or microphones to the Euroblock or XLR INPUT connectors. You may connect either or both jack types (if you wish) of the OUTPUTS to your mixer, recorder or amplifier. Set the GAIN control to the half-way (12:00) position. Set the MIC / LINE switch to "LINE" for a gain of +3 dB, or to the "MIC" position for a gain of +35 dB. If a microphone requires phantom power, punch in the "PHANTOM POWER" switch and the corresponding red LED will light up.

If the ML 1 is being used as a dual analog preamp, connect balanced audio OUTPUTS to the Euroblock or XLR connectors. To talk to the digital audio world, connect to your choice of AES3, SPDIF or TOSLINK digital audio outputs.

Connect the IEC320-C5 power cord. Observe that the POWER LED on the front panel illuminates.

Now you may turn on any power amps and make final adjustments with the GAIN controls.

# Operation Details



## Analog Connections

The ML 1 has two balanced analog Inputs, two balanced analog Outputs. XLR and euroblock connectors are both provided for your convenience. Feel free to use either Input (*but not both*). Both Output types may be used simultaneously if desired. For each Input or Output Euroblock connector:

- Connect the (positive) audio line to the '+' terminal.
- Connect the (negative) audio line to the '-' terminal.
- Connect the cable shield to the ⚡ terminal.

The XLRs use the polarity convention per IEC/ANSI/AES standards of pin 2 positive, pin 3 negative and pin 1 shield. The ML 1 does not invert the signal. For optimum Electromagnetic Interference (EMI) immunity, connect the shields at both ends of the cable. See the RaneNote "Sound System Interconnection" (included) for more information on system connections and proper grounding practices.

## Analog Input Stage

Each analog input uses a studio-grade microphone preamp and a 32 dB pad for use as a line-stage input. The mic preamp has a single analog gain stage. When the Mic / Line switch is in MIC position the gain control adjusts between 18 to 64 dB. When the Mic / Line switch is in LINE position then a 32 dB pad is inserted on the input to yield a gain range from -14 dB to +32 dB. This configures the input of the ML 1 as a high-performance line stage that happily accepts the hot +24 dBu signals from professional audio sources.

When using non-pro -10 dBV audio sources, set the GAIN control to +12 dB line gain by rotating it to the 2:00 position. When you're hooking up a consumer CD player with a single-

ended output (for example) and you really need an extra 6 dB of gain (for a total of 18 dB of front-end gain), set the GAIN control just past the 3:00 position.

## Analog Output Stage

Analog output is real easy. Just hook it up. All gain in the ML 1 is adjusted at the Inputs just as it should be. It's OK to use all of the analog Outputs at the same time and to use the analog and the digital outputs together.

## Digital Outputs

The ML1 has one AES3 Digital Output, one SPDIF Digital Output and one Optical Digital Output (also called TOSLINK).

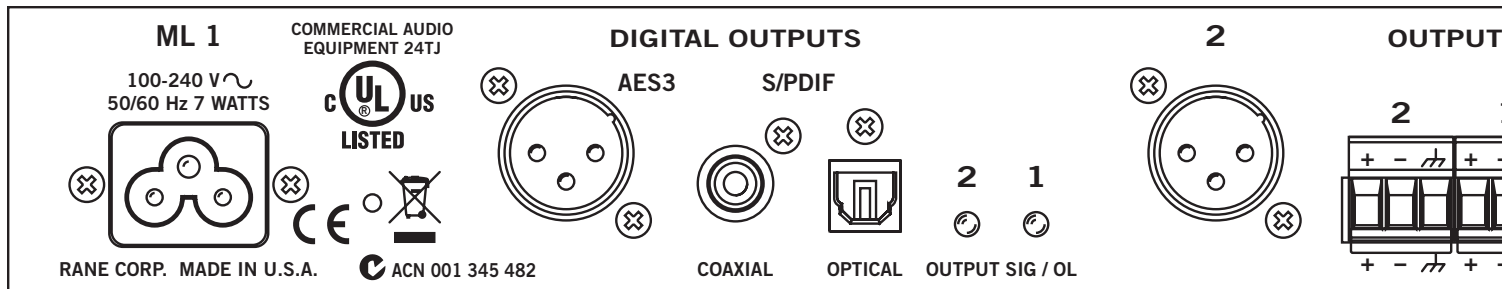
AES3 is a popular 2-channel (stereo) digital audio interface commonly found on professional digital audio equipment. Each channel of the AES3 digital stream is treated independently within the ML 1.

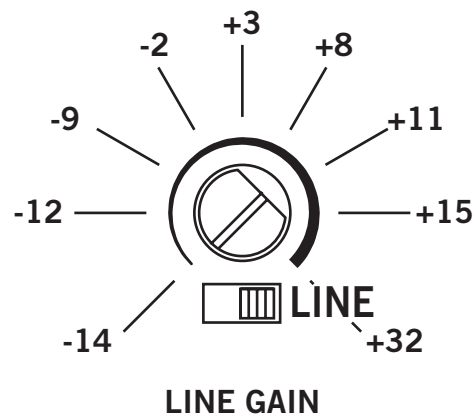
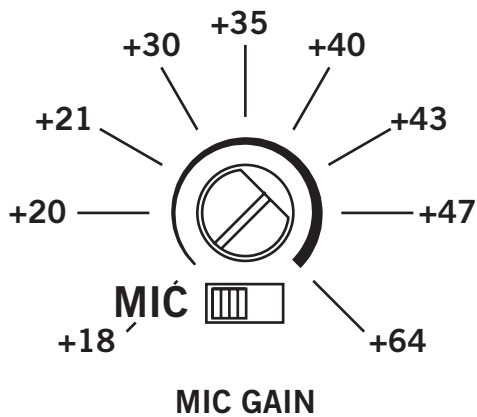
Use the AES3 Output to:

- Feed audio to an RPM 88/44/22/26z to create a 2-channel digital "bus" between devices.
- Connect directly to the AES3 input of a digital mixer.
- Connect directly to the AES3 input of a DAT machine for recording.

The SPDIF coaxial and optical digital outputs allow the ML 1 to interface with a wide variety of commercial and semi-pro equipment. Just verify that the device connected to the ML 1's SPDIF digital outputs can accept 24-bit audio at a 48 kHz rate.

All three digital outputs are always active and can be used simultaneously.





**Phantom Power**

When the Phantom Power button is selected, two things happen. First, a red LED illuminates so that there is little doubt that phantom power is on. Second phantom power is turned on only for inputs that have the mic/line switch in the “MIC” position. Microphones can be plugged into the XLR connectors or the euroblock connectors and both connectors have phantom power available. Microphones receive a full 48 volts of Phantom Power from the ML 1.

**Mic/Line Switch**

Phantom Power is only available on an Input when the Mic/Line switch is in the MIC position *and* Phantom Power is turned on — the input impedance for that channel is 2.6 kΩ. When the Mic/Line switch is in the LINE position, phantom power is disabled, the gain for the channel is reduced by 32 dB and the input impedance for that channel is 96 kΩ.

**Gain Settings**

The GAIN controls set the gain through the ML 1 for each channel. The approximate gain when the Mic/Line switch is in the either setting is shown in the figure above.

A security cover is included to cover just the GAIN controls for those installations needing a little protection.

**Input LEDs**

There is a green input LED for each channel on both the front and on the back of the ML 1. These light up when an input signal is at a high enough level to trigger the LED. For the math inclined, the amount of signal required to light the LED is equal to the negative of the ML 1 Gain minus 6 dBu. The formula is: Threshold dBu = – (Gain dB) – 6 dB.

So if the ML 1 Gain is set to 20 dB, the input LED threshold is -26 dBu measured at the input jacks.

Another example: if the ML 1 Gain is set to -10 dB then the input LED threshold is +4 dBu measured at the input jacks.

The bottom line is if there is an input signal present and the gain of the ML 1 is set high enough, the green input LED of the ML 1 should be on.

**Output LEDs**

There is a bi-color green/red output LED for each channel on both the front and back of the ML 1. These LEDs light up green when there is a digital output signal present. They will be green most of the time as the digital output should always be active. The LEDs light up red instantaneously if the output waveform clips. Since clipping is brief, the red together with green appears yellow. So when a output LED starts to turn color it is time to back down on the Gain for that channel to prevent signal distortion.

**Power LED**

This LED lights up yellow when the IEC320-C5 power jack is properly receiving 100 to 240 volts from any power source in the whole wide world. That should be just about everywhere you would want an ML 1.

