



# MP3 Node<sup>TM</sup>

## Stand Alone Triggerable MP3 Player Hardware Manual



Genave / NRC, Inc.

[www.genave.com](http://www.genave.com)

[support@genave.com](mailto:support@genave.com)

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If incorrectly used, this equipment can cause severe injury. Those who use and maintain the equipment should be trained in its proper use, warned of its dangers, and should read the manuals before attempting to set up, operate, adjust or service the equipment. Keep this manual for future reference.

## Important Safety Information

### Installation & Service Precautions



• Electrocutation, severe personal injury and damage to equipment can occur during installation or servicing this equipment. All electrical work should be performed by, or under the supervision of an experienced electrician and in accordance with all applicable electrical, fire, building and safety codes.



• This equipment can start at any time from local controls, automatic timers, radio remote, commands from a computer and many other sources. Attached equipment can cause personal injury when they engage. Whenever working in or around the equipment you must assume it could activate at any moment, and take appropriate precautions to protect yourself and others. You should completely disable the equipment before working on or in close proximity to any part of it.

• You must test the system and equipment to insure it is operating correctly after the installation, as well as after any work has been performed.

### System Operation

• Training is necessary to ensure those responsible can correctly control the system. It is also necessary that everyone understand the purpose of the equipment and the protective actions they need to take when the system is activated.

• You must carefully read and completely understand all the information about the system including its abilities and its limitations.

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## **MP3 Node™ Hardware**

Phone 952-236-6540

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# MP3 Node

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## Specifications

### General Specifications

#### Enclosure

Width:	36mm (1.417 inches)
Length:	100mm (3.937 inches)
Height:	80mm (3.149 inches)
Weight:	114.6 grams (5.10oz)

#### Input Connector

Header:	9 pos., 2.5mm
Mating Connector:	9 pos. cage clamp 28-16 AWG 0.25" Strip length P/N 6000-0101-124
Max Input Voltage:	30V <sub>DC</sub> (Pull to GND for active)

#### Output Connector

Header:	10 position dual row
Mating Connector:	10 pos. dual row female TE 1658621-1 or eqv. P/N 6000-0035-010
Audio Output	600 Ohms
Max Control Voltage:	12 V <sub>DC</sub>
Max Control Current:	70mA

#### Power Connector

Header:	2 pos., 3.81mm
Mating Connector:	2 pos. screw clamp 26-16 AWG 0.25" Strip length P/N 6000-0048-003
Input Voltage:	7.5 to 28 V <sub>DC</sub>

#### Display

Type:	OLED
Size:	128 x 64
Colors:	Blue & Yellow

#### MicroSD Card Slot

Accepts:	Transflash MicroSD SDHC, Class 10, FAT32, 4GB to 32GB
----------	---

## **Overview**

### **How it Works**

The MP3 Node is a stand-alone MP3 player which has 8 independent inputs (Channels) which are used as triggers to play 1 of up to 255 different MP3 files stored on a microSD card, or to play 1 of 8 internally stored files. There are actually 16 channels but only the first 8 are available as external inputs for user interfaces.

Each MP3 Node has an output port which is used to control an external amplifier.

The MP3 Node has the ability to change the acoustics of the MP3 file by altering the volume treble and bass.

Additionally, the MP3 node has a microphone input which can be used to record MP3 files as well as be used for Live PA messages.

Each of the 8 external inputs has 3 different audio files that it can play:

- 1) When an SD card is installed, the unit can play an MP3 (SFX) file that begins with the same number as the input... *i.e. Input 4 (Channel 4) can play "004-Hotel California.MP3"*
- 2) When there is no SD card installed, the unit can play an MP3 file that is stored in its internal memory that is associated with the input.
- 3) Play an MP3 file that was created with the microphone that is associated with the input..... *i.e. Input 4 can play "MIC-004.MP3" (Requires SD card)*

There are methods to associate any of the 255 MP3 files on a card with any input. This is called "Masking". This user guide is a beginner's guide and does not delve deeply into masking. For more information see "Custom Source"

When one of the 8 inputs is triggered (Pulled low to pin 9 of the input port), the unit looks to find which audio file has been assigned to the input (SD card file, Internal SFX file, or Microphone file). The Node then turns on the external amplifier, waits for a short time to let things settle, then it begins playing the MP3 file out of the amplifier port. At the same time, it plays the file out of the "Line Out" port, but the line out audio is raw audio. It has no volume control nor treble and bass adjustments.



Line out for testing.  
(See Line Out)

Amplifier Port. (See Amplifier Port)

Microphone Input.  
(See Microphone Port)



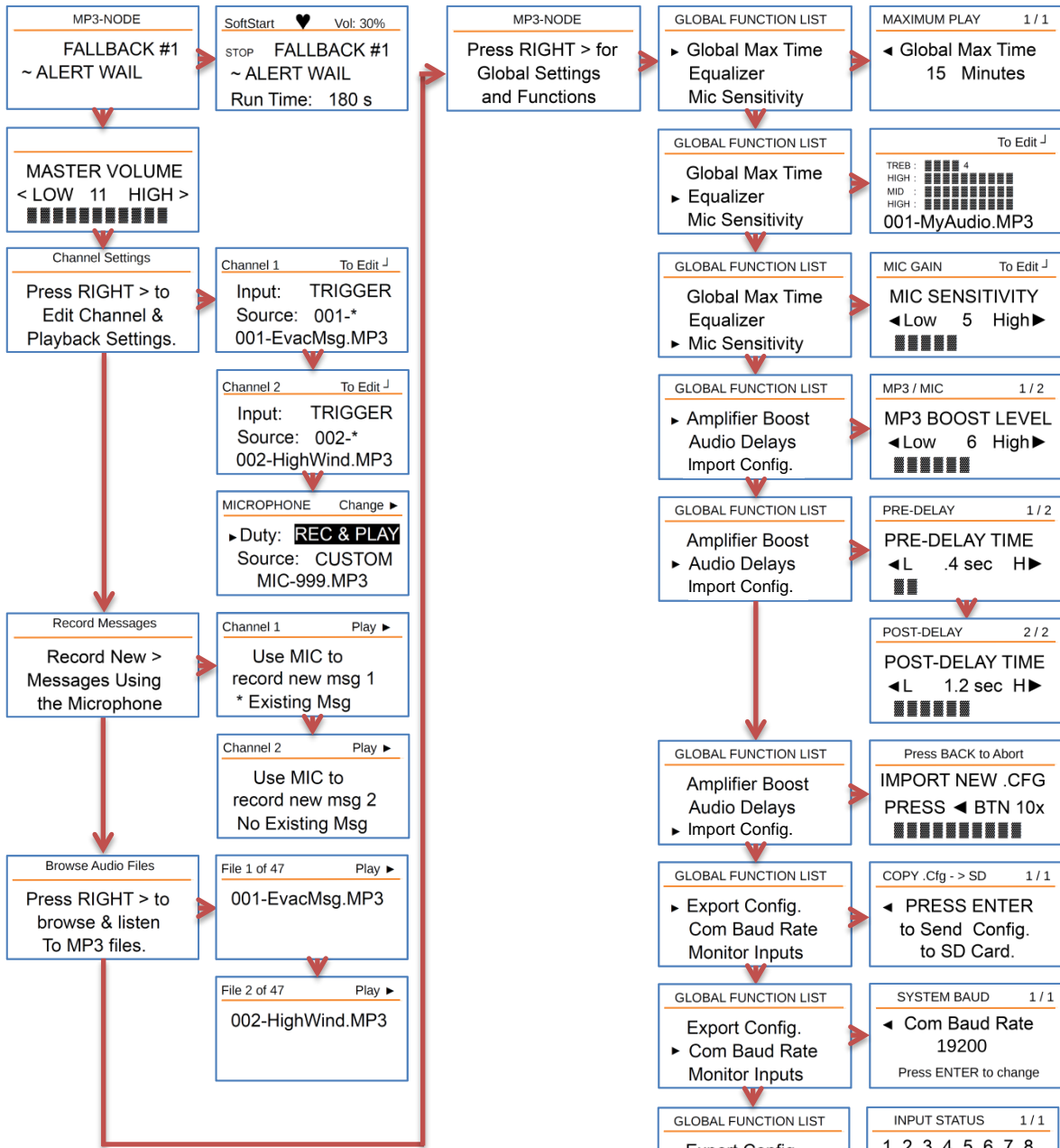
Communications Port.  
Do not use.

Inputs. (See Inputs)

Power In.  
(See Power Connection)



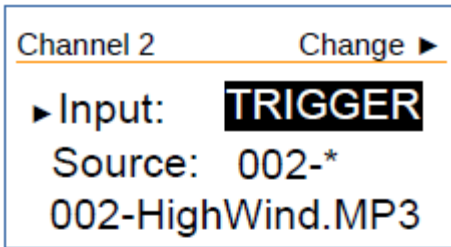
Menu Map



When SD card is inserted, this is the default screen showing the MP3 channel file information and what to do to play it again.

MP3-NODE  
CHANNEL #1  
001-EvacMsg.MP3  
Press > 2x to play

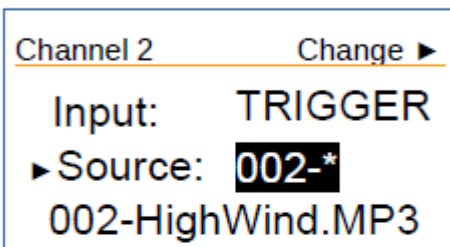
## Changing the Channel Settings



Press the Enter button to begin editing.

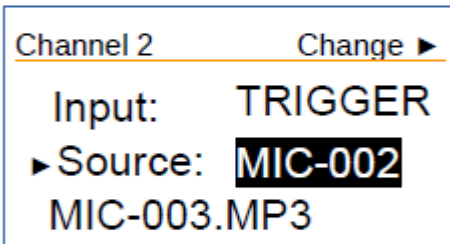
Top menu bar will change from “To Edit ↵” to “Change ▶”.

A pointer on screen left will show which line you’re editing and the value on that particular line will be highlighted.

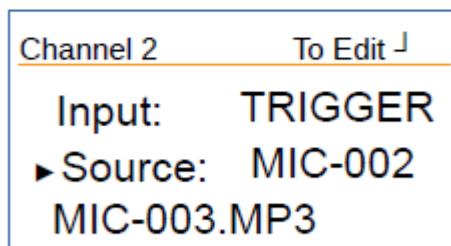


Use the Up and Down buttons to scroll to a different line.

Use the Left and Right buttons to select new values on the highlighted item.

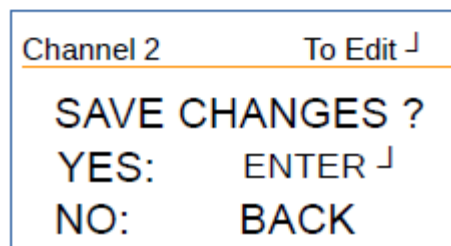


In this example, the Right button was pressed once to select a microphone file as the source and the filename automatically updated to show the recording name.



Pressing the Enter button will stop the editing process.

The top menu bar will again display “To Edit ↵”.



When you press the Back key to exit the menu, or change channels, you will be asked if you want to save any changes.

Press the Back button to discard changes. Press the Enter button to save and update the system with the new information.

**Inputs**

Channel 2 Change ▶

---

▶ Input: **TRIGGER**

Source: 002-\*

002-HighWind.MP3

Channel 2 Change ▶

---

▶ Input: **HOLD DN**

Source: 002-\*

002-HighWind.MP3

This determines what type of input will start and stop the channel.

**DISABLED:** The input does not perform any actions.

**TRIGGER:** The input activates the audio when it is turned on. The input may remain active or be turned off at any time, but the audio will have been started and will run to its completion.

**HOLD DN:** The audio runs as long as the input is turned on. It will stop when the input is turned off or when the audio has run to its completion, whichever is first.

**CANCEL:** The input will stop currently running audio.

**Source**

Channel 2 Change ▶

---

Input: TRIGGER

▶ Source: **002-\***

002-HighWind.MP3

Channel 2 Change ▶

---

Input: TRIGGER

▶ Source: **MIC-002**

MIC-002.MP3

Channel 2 Change ▶

---

Input: TRIGGER

▶ Source: **ALERT-2**

~SIREN STEADY

Channel 2 Change ▶

---

Input: TRIGGER

▶ Source: **CUSTOM**

STN-5-ALERT.MP3

Selects which type of audio will be played.

Note: The letter X in this group is filled in with the channel number currently being edited. The example to the left is Channel 2 which would make 00X-\* in below descriptions actually be presented as shown. In this instance it is shown as 002-\*

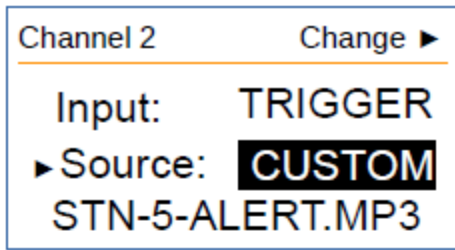
**00X-\***: Use any MP3 file beginning with three digits (the last digit matching the channel number) and a hyphen as the fourth character in the name.

**MIC-00X:** Use MP3 file beginning with the work MIC- and the following three digits (the last digit matching the channel number). MIC- is a reserved keyword which the MP3-NODE automatically assigns new microphone messages.

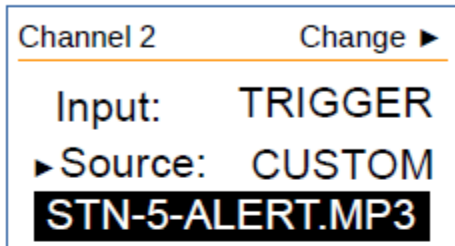
**ALERT-2:** The SFX alert sound assigned to this input.

**CUSTOM:** An MP3 selected by browsing the SD memory card. The name does not need to follow the 00X- naming convention. Press the > button on the custom filename line to scroll and find the desired file. After finding the file, press the Enter button to select and transfer to the channel, or press Back to return to this edit screen without changing the filename.

**Custom Source**



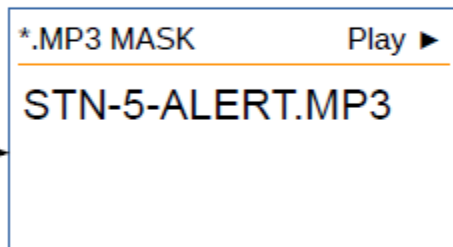
**CUSTOM:** The Custom source allows any mp3 file to be played.



Select the Custom option.

Move the cursor down to the filename.

Press the Right button to search for the MP3 filename.

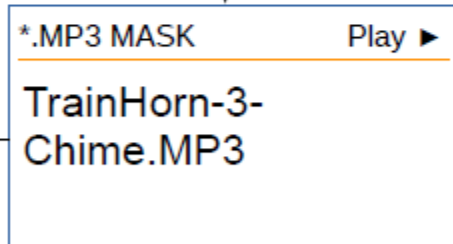


MP3 file will be presented one screen at a time.

The Up and Down buttons scroll thru the files on the micro SD memory card.

Filenames are sorted by directory location, not alphabetically.

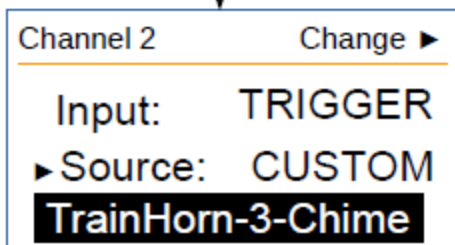
Pressing the Right button will play the audio.



In this example, pressing the Up button shows the next file on the SD memory card.

Pressing the Enter button will exit file browsing and enter the current MP3 into the Custom filename.

Press the Back button to exit without change.



The Enter button was pressed in this example so the selected audio is entered into the Custom filename.

Move the cursor down to the filename.

Press the Right button to search for the MP3 filename.

**Max Vol (Per channel)**

Channel 2	Change ▶
Source: 002-*	
002-HighWind.MP3	
▶ Max Vol:	<b>100%</b>

This is the channel volume in relation to the Master Volume.

Use the Left and Right buttons to select the percentage value.

The values change in 10% steps.

**Loop**

Channel 2	Change ▶
002-HighWind.MP3	
Max Vol:	100%
▶ Loop:	<b>1</b>

The number of times the audio will play from the beginning after the first run is completed.

In this example, the audio will play twice. The first run plus one loop.

**SoftStart**

To help prevent startling or hearing damage to persons close to the speakers when the audio begins, MP3 audio, pre-recorded messages, SFX alerts and live PA can be set to ramp the volume up from minimum to maximum over a period of time. This feature is named **SoftStart**.

SoftStart has five settings. The timing shown is approximate.

Channel 2	Change ▶
Max Vol:	100%
Loop:	1
▶ SoftStart:	<b>MEDIUM</b>

**OFF:** SoftStart is disabled.

**FAST:** Three seconds.

**MEDIUM:** Eight seconds.

**NORMAL:** Twelve seconds.

**SLOW:** Fifteen seconds.

**Equalizer (On/Off per channel)**

Channel 2	Change ▶
Loop:	1
SoftStart:	MEDIUM
▶ Equalizer:	<b>OFF</b>

The MP3-Node includes a four channel audio equalizer to help match the response of your audio to the amplifier and speakers. Value range is OFF or ON. Factory default is OFF.

The equalizer settings are adjusted in the Global Settings. This setting adjusts if the specific channel should use the equalizer.

**OFF:** Equalizer is disabled for this channel.

**ON:** This channel will use the equalizer.

Channel 2	Change ▶
Loop:	1
SoftStart:	MEDIUM
▶ Equalizer:	<b>ON</b>

**Max Run Time**

Channel 2	Change ▶
SoftStart:	MEDIUM
Equalizer:	OFF
▶ Max Time:	<b>NONE</b>

Maximum time in seconds for a channel to remain active and playing audio. Value range is None to 60000 seconds. Factory default is NONE.

To prevent overheating to some amplifiers or speakers, or to conserve battery power on solar charging systems, it may be useful to limit the run time of any audio or SFX.

**NONE:** No limit on the channel run time.

Channel 2	Change ▶
SoftStart:	MEDIUM
Equalizer:	OFF
▶ Max Time:	<b>180</b>

To change the time, use the Left and Right buttons to increase or decrease the time in seconds. While adjusting the time, the count speed will increase as the button remains pressed to quickly traverse a large number range.

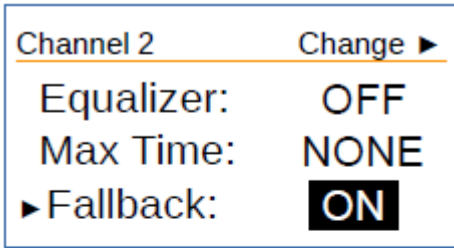
**Fallback**

Channel 2	Change ▶
Equalizer:	OFF
▶ Max Time:	NONE
Fallback:	<b>ON</b>

Enable or disable the fallback feature. Valid range is OFF or ON. Factory default is ON.

If the SD memory card is missing or the MP3 file cannot be found on the card, this feature enables the MP3-NODE to substitute a computer generated SFX sound for the missing audio file.

Each input has its own unique SFX sound.



Enable or disable the fallback feature. Valid range is OFF or ON. Factory default is ON.

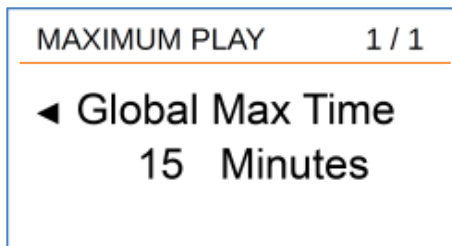
If the SD memory card is missing or the MP3 file cannot be found on the card, this feature enables the MP3-NODE to substitute a computer generated SFX alert sound for the missing audio file.

Each input has its own unique SFX alert sound.

- Channel 1 - ~ALERT WAIL
- Channel 2 - ~ALERT STEADY
- Channel 3 - ~HI-LOW-A
- Channel 4 - ~ALERT STUTTER
- Channel 5 - ~DOUBLE HI-LOW
- Channel 6 - ~WHOOOP UP
- Channel 7 - ~WHOOOP DOWN
- Channel 8 - ~PHASER

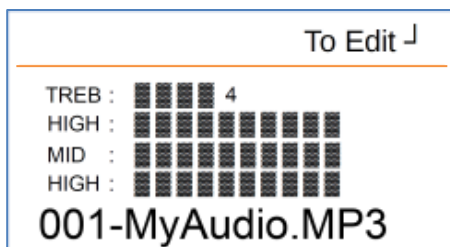
## Changing Global Settings

### Global Max Time



The Global Max Time sets the cumulative run time allowed for any set of MP3 files. If this value is exceeded, the unit will stop playing completely. It can be retriggered again.

### Equalizer



The Equalizer makes global adjustments to the audio levels. If you highlight the audio file shown at the bottom of the screen, you can play that file as you make adjustments.




**Mic Sensitivity**

MIC GAIN To Edit ↵

---

**MIC SENSITIVITY**

◀ Low 5 High ▶



Mic Sensitivity adjusts the amplification of the incoming audio from a microphone.


**Amplifier Boost**

MP3 / MIC 1 / 2

---

**MP3 BOOST LEVEL**

◀ Low 6 High ▶




Amplifier boost is used to adjust levels between the embedded SFX MP3 files and the MP3 files stored on the card.

SFX BOOST 2 / 2

---

**SFX BOOST LEVEL**

◀ Low 3 High ▶

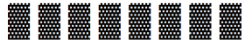

**Audio Delays**

PRE-DELAY 1 / 2

---

**PRE-DELAY TIME**

◀ L 1.4 sec. H ▶




Audio delays adjust the time between power up of the amplifier (pre-delay) and playing of the MP3, as well as the time from end of MP3 until power down (post-delay).

POST-DELAY 2 / 2

---

**POST-DELAY TIME**

◀ L .6 sec. H ▶





**Import Config**

```

Press BACK to Abort
-----
IMPORT NEW .CFG
PRESS ◀ BTN 10x
████████████████

```

Used to read the CFG file from the SD card. The CFG file holds the configuration of the MP3 node. When cloning nodes or changing configuration of multiple nodes, reading the CFG file is the easiest method to make changes.

**Export Config**

```

COPY .Cfg -> SD      1 / 1
-----
◀ PRESS ENTER
  to Send Config.
  to SD Card.

```

Used to write the CFG file to the SD card. The CFG file holds all of the configuration data of the MP3 node.

**Com Baud Rate**

```

SYSTEM BAUD      1 / 1
-----
◀ Com Baud Rate
  19200
  Press ENTER to change

```

Do not change. Please call Genave if you want to use the Com Port.

**Monitor Inputs**

```

INPUT STATUS      1 / 1
-----
1 2 3 4 5 6 7 8
INPUT STATUS
Highlighted = ACTIVE

```

Used to see if an input is working when pulled low (triggered) the input number is highlighted.

**Config Name**

CONFIG. NAME	1 / 1
<p>Config. Name: MP3-Node.cfg</p>	

Change config name (MP3-Node.cfg).

**Firmware Info**

FIRMWARE	1 / 1
<p>◀ GenOS MP3N-AA 8.1809.1501</p> <p>(c) 2018 Genave / NRC</p>	

Shows which firmware is installed in the node. Only Genave can change the firmware.

**Factory Reset**

Channel 2	Change ▶
Max Time:	NONE
Fallback:	ON
▶ Fact Dflt?	<b>NO</b>

Return the settings on the channel to the Factory Default. Valid range is YES or NO. Factory default is NO.

Individual channels may have their settings restored to the original factory defaults.

Channel 2	Change ▶
Max Time:	NONE
Fallback:	ON
▶ Fact Dflt?	<b>YES</b>

To restore factory defaults for this channel only, use the left right buttons to select YES, then press the ENTER button.

Channel 2	Confirm !
<p>Restore defaults To this Channel ?</p> <p>N: BACK Y: Enter</p>	

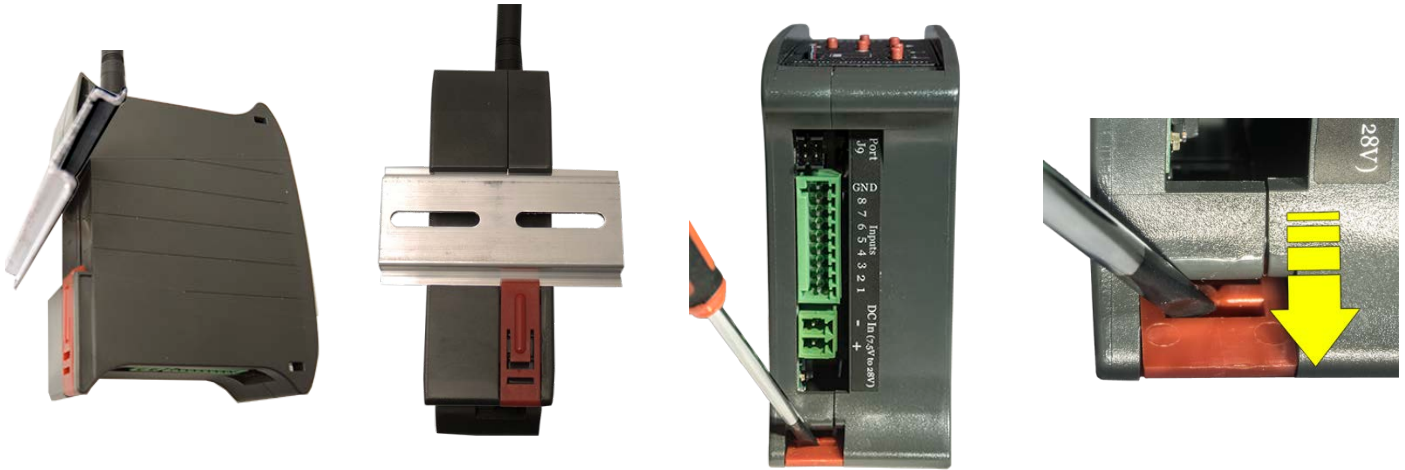
The Confirm screen will appear.

Press the ENTER button to proceed and restore Factory Default Settings to this channel.

Press the BACK button to abort changing back to defaults.

### Installing & Use Mounting the MP3 Node

To remove the node from a Din rail, use a screw driver to pull and hold down on the red latch on the enclosure while pulling the bottom of the case forward.

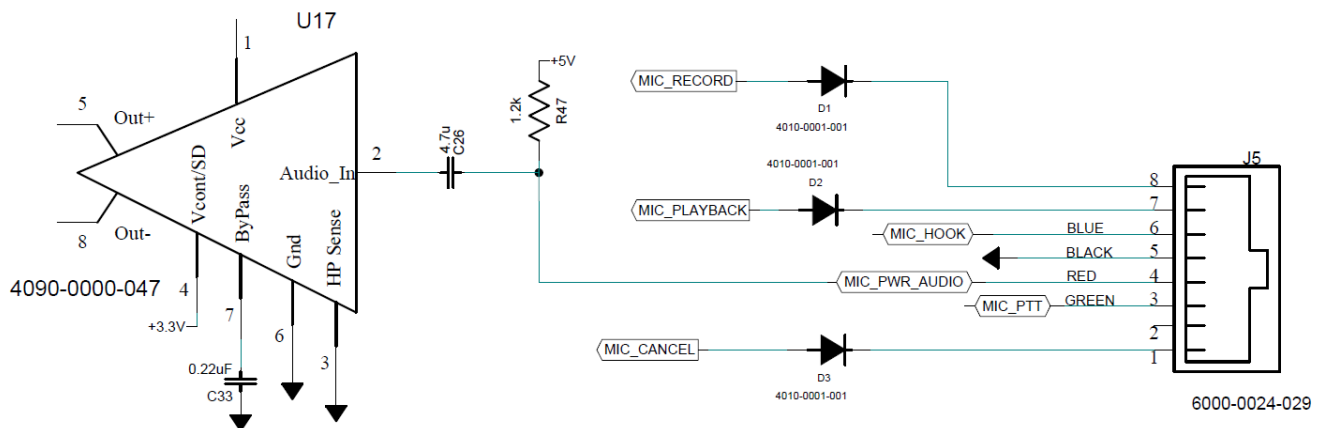


### Power Connection

The MP3 Node operates from 7.5VDC to 28 VDC. The power input is also reverse voltage protected. The polarity of the connections is displayed on the label.

### Microphone Port

The Microphone Port is used to create MP3 files for storage on the SD card as well as a store-and-forward PA function. Use only Genave 8032-0000-004 microphones. The microphone is biased with a 5 Volt supply.



**Line Out**

The “Line Out” port is a direct output from the MP3 player. Line Out is not buffered. It does not go through the final amplifier, hence the volume of audio from Line Out cannot be adjusted. Line Out is to be used for testing purposes only.

**Amplifier Port**

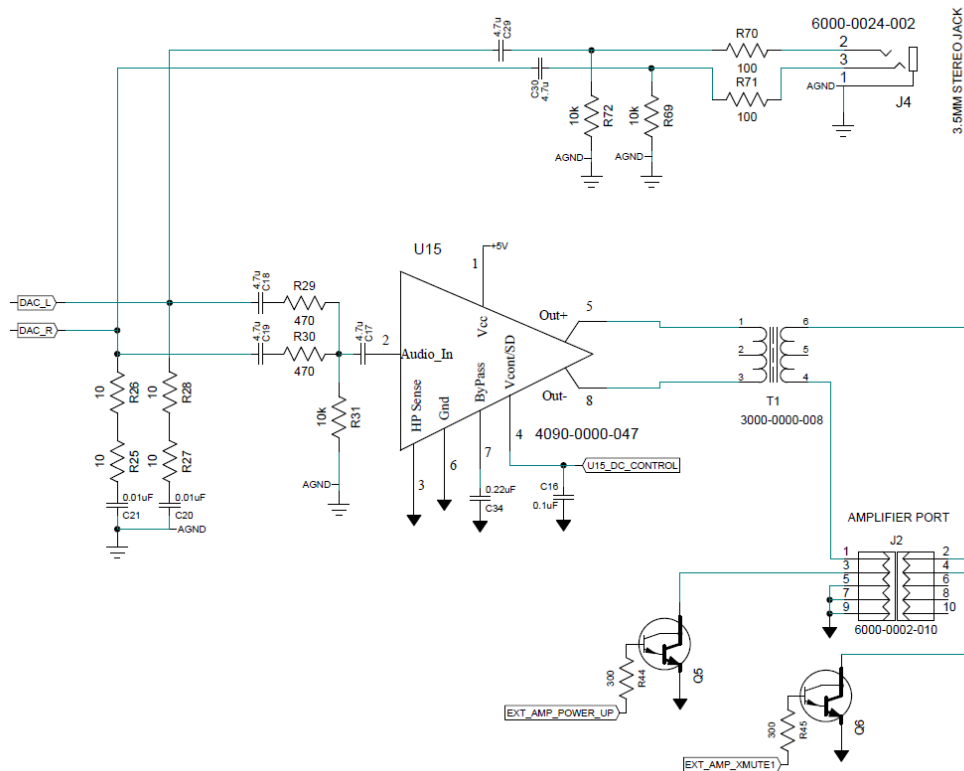
The “Amplifier Port” is specially designed to control a Genave amplifier type but it can control other amplifiers as well. There are two control lines (Power Up and Mute) and a 600 Ohm isolated audio output.

The Power Up line is pulled low before the audio begins. Power Up is used to control a relay or mosfet which in turn supplies power to an amplifier. The maximum voltage controlled by Power Up is 60 VDC and the maximum current passed by Power Up is ½ Amp. When the MP3 Node is playing sequential files, Power Up is kept on for the entire run.

The second control line is “Mute” which is used to mute and unmute the amplifier between sequential MP3 files.

Both control lines are active Low (Mute = 0 and Power Up = 0)

The 600 Ohm output has a DC resistance of 58 Ohms. Do not apply and DC voltages to the audio output.



## Inputs

### Input Header Characteristics

The inputs for the MP3 Node are used to trigger actions. When an input is pulled low (shorted to pin 9 of J9) the MP3 Node turns on the amplifier output and plays the associated file.

Some features of the inputs:

- 1) **DO NOT** apply any voltage to the inputs. Only connect an input to pin 9 of J1. Although the inputs have diodes to protect them from incoming voltages, they should only be pulled low.
- 2) The inputs are protected from moderate voltage spike. Large voltage spikes will overwhelm the input protection and damage the processor. Therefore keep wires leading to the inputs as short as possible and twist the wires to reduce voltage spikes.
- 3) Each input has a pull up resistor of 470 Ohms.

### Input Header Pinout

