TECH NOTE

PRODUCTS SUPPORTED:

All Converge Pro Products
except the TH20 and VH20

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CONNECTING CLOCKAUDIO MICROPHONES WITH DUAL COLOR
LIGHT RING AND MUTE BUTTON TO THE CONVERGE PRO

OVERVIEW

ClockAudio is a manufacturer of innovative professional microphone systems with Dual Color Halo and Light Rings which allow users to easily identify microphone status as well as mute control. Microphones using Light Rings and Halo Light Rings have been updated to use the same wiring, connections, and color codes creating a single standard for ease of installation. This document provides updated instructions on how to wire ClockAudio products with Halo Light Rings, Bi-Color LEDs, and mute buttons to the ClearOne CONVERGE Pro and the necessary programming in CONVERGE Console.

- CH32
- TS001
- CS1S-RF, CS2S-RF, CS3S-RF & CS4S-RF
- S80S & SM80S
- CRM202S-RF

» **NOTE:** The wiring color codes may be different from those listed in this document if you are using an older ClockAudio product.

This Tech Note applies to the following CONVERGE Pro systems:

- 880
- 880T
- 880TA
- 8i
- 840T
- SR1212
- SR1212A

ClockAudio Light Rings require 12 or 24 VDC for operation but CONVERGE Pro only provides 3.3 VDC via the programmable GPIO and cannot supply the required voltage. Therefore, an external 12 or 24 volt power supply is required for proper operation of ClockAudio Dual Color Halo and Light Rings. Dual Color Halo and Light Rings also require two separate control pins to be alternately grounded to activate the two different colors. ClearOne Converge Pro GPIO ports only provide a single status pin that switch between a high and low state. In order to operate a dual color Light Ring via Converge Pro GPIO pins an external Relay must be used. There are also additional requirements when using 24 VDC to power Clock Audio products. This document has been written using a 24 VDC power supply; please refer to the following User Guide from ClockAudio for more information when using a different supply voltage.

http://cdn.clockaudio.com/image/data/technical%20library/user-guides/CH%2032v05%20user%20guide%20full.pdf

OPERATION OF THE CLOCKAUDIO DUAL COLOR LIGHT RING

Either a ClockAudio Dual Color Halo or Light Ring consists of a touch sensitive switch which supplies a logic low when pressed and a halo of red and green LED's. Whether the halo or light ring will illuminate red or green depends which wire is grounded. When ground is provided for the red LED the ground for the green LED is lifted and vise versa. This ensures the halo or light ring does not illuminate both red and green at the same time. If all eight microphone channels on the CONVERGE Pro are to be connected with their own ClockAudio Light Ring, a total of 16 switchable grounds, or status pins, are required. Because the CONVERGE Pro GPIO port only provides eight user assignable status pins an external relay will be required to provide the additional control pins necessary for switching between the two different colors.
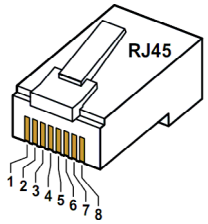
> » **NOTE:** The four microphone channel **Converge Pro 840T** contains 8 user programmable status pins, two for each microphone, on **Control Port A**. Because of this a relay is not required with the 840T. Please contact ClearOne Technical Support if assistance is required with setup of the 840T.

This document assumes the reader has knowledge of programming with ClearOne Console. If further assistance is needed please refer to the CONVERGE Pro user manual or available technical documents in the Resources section of the ClearOne website at http://www.clearone.com, or call ClearOne Technical Support at 1-800-283-5936.

EQUIPMENT LIST

- Converge Pro
- Clock Audio Light Ring (any of the above listed compatible devices)
- Relay (RDL ST-LCR)
- External 24 Volt DC power supply
- 2 - 300 Ω, 1 Watt resistors
- DB25 male connector
- Wire (Recommended 22 Gauge)

CLOCK AUDIO CONNECTIONS

WIRE COLOR	FUNCTION	RJ45 PIN NUMBER	
Red	Grounded provides Red LED illumination	2	
Blue	Ground	3	
Brown	+ 12 / 24 VDC	4	
Yellow	Switch Logic control	5	
Green	Grounded provides Green LED illumination	6	

WIRING

The ClockAudio devices covered in this note are all wired and function the same. The following diagram shows the wiring required between a CONVERGE Pro control port DB25 connector, the logic controlled relay, power and a Clock Audio CH32 device. (The RJ45 connection is not shown.)
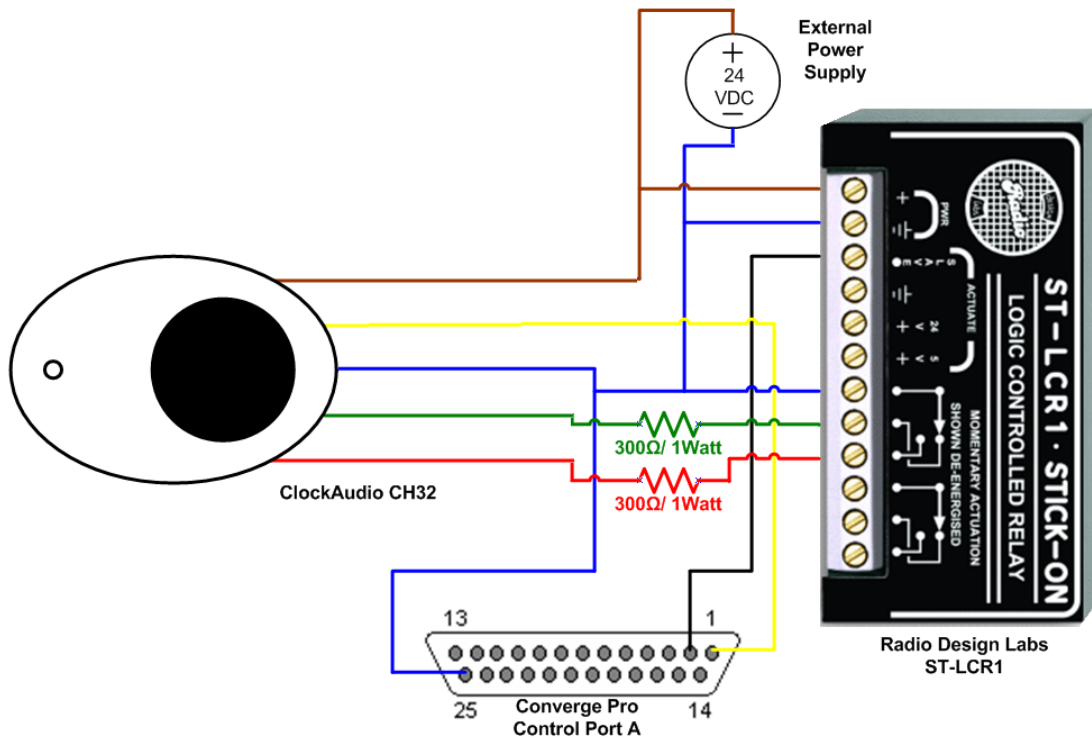

FUNCTION

Assuming the current state of the relay is de-energized, there is contact closure between the Blue Ground Wire and the Green Status Wire. In this state the Green LED's will be illuminated. When the ClockAudio device is switched a status change is sent via the Yellow Wire to CONVERGE Pro Control Pin 1 setting it to ground. The CONVERGE Pro has been programmed to mute the microphone channel and send out a "Mute On" response on Pin 2 (the Black wire). Programming inside the CONVERGE Pro sets the status of Pin 2 to ground with the "Mute On" response. The Slave pin on the relay is now grounded and is energized pulling the relay down to make contact with the red wire thus causing the red LED's illuminate.

Touching the ClockAudio Halo again toggles the state of Control Pin 1 on CONVERGE Pro GPIO and changes it from a low grounded state to a high state. The CONVERGE Pro has been programmed to un-mute the microphone channel and send out a "Mute off" response on Status Pin 2 (the black wire) and changes it from a low grounded state to a high state. The Slave pin on the relay is now de-energized allowing the relay to go back to its original state connecting the Green Wire to ground and illuminating the green LED's.

CONVERGE PRO CONTROL STATUS PORT PROGRAMMING

The **CONVERGE Pro Control Status Port A** must be programmed to control the muting of the microphone input and illuminate the LED's in the halo. This programming may be done while connected to the unit or while offline and saved to your site file for future use.

Refer to the image and the steps below.
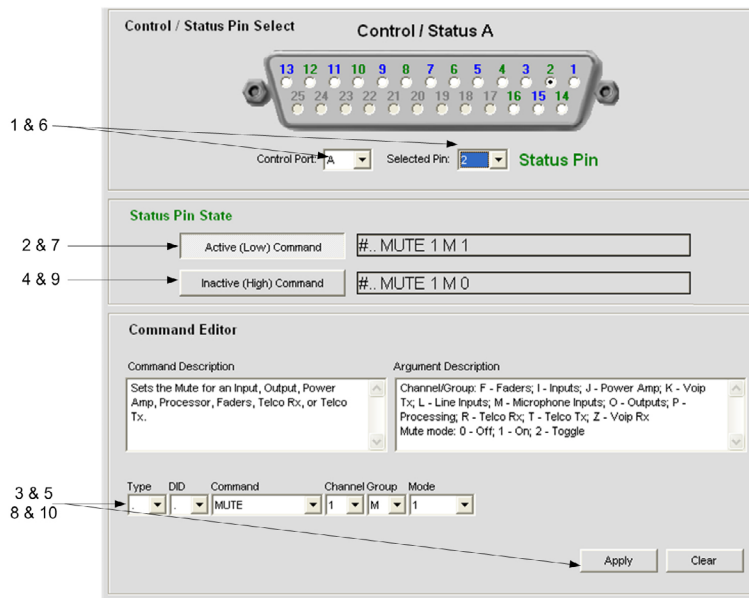
1. In the CONVERGE Console, go to the **Control Tab** section and select **Control Port A** and **Selected Pin 1** from the respective drop-down lists.

2. Click on the **Active (Low) Command** button.

3. In command editor select the appropriate **Unit Type** and **DID** then choose command of **MUTE**, **Channel 1** and **Group M**:

    a. If the touch pad switch is to act as a toggle (press once the channel mutes, press again the channel un-mutes) choose **Mode 2**. Advance to step 6 below.

    b. If the touch pad switch is to act as a push to talk (press and hold the switch to un-mute, talk, and release to mute) choose **Mode 0**.

    c. If the touch pad switch is to act as a push to mute (press and hold to mute, release to un-mute) choose **Mode 1**.

    d. Click the **Apply** button located in the lower-right.

4. Click on **Inactive (High) Command** button.

5. In command editor select the appropriate **Unit Type** and **DID** then choose command of **MUTE**, **Channel 1** and **Group M**:

    a. If the touch pad switch is to act as a push to talk choose **Mode 1**.

    b. If the touch pad switch is to act as a push to mute choose **Mode 0**.

    c. Click the **Apply** button located in the lower-right.

6. Select **Control Port A** and **Select Pin 2**.

7. Click on the **Active (Low) Command** button.

8. In command editor choose command of **MUTE**, **Channel 1** and **Group M**, and **Mode 1** from the pull down lists. When microphone Channel 1's Mute state is ON, Pin 2 will be pulled low to ground and relay will energize. The relay will switch the ground to red wire, thus the red LED's illuminate.

9. Click on the **Inactive (High) Command** button.

10. In command editor choose command of **MUTE**, **Channel 1** and **Group M**, and **Mode 0** from the pull down lists. When microphone Channel 1's Mute state is OFF, Pin 2 will go high or float and the relay will de-energize. The relay will switch the ground to green wire, thus the green LED's illuminate.

    Repeat the above process for microphone Channel 2 using **Control Port A Select Pins 3** and **4**, microphone Channel 3 using **Control Port A Select Pins 5** and **6**, and so on for all 8 microphone channels.

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