# TC8928

## ANALOG BROADCASTER

# User's Manual

**MODEL:** _____

**S/N:** _____

**DATE:** _____

**Notice!**

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# Chapter 1 - Overview

## Description

Designed specifically for analog broadcasting applications, the TC8928 receives a 4-wire analog signal and broadcasts up to 7 remote analog lines.

The TC8928 has one HOST port and it can have up to seven remote analog ports. In normal mode, Channel 1 (Host port) can receive all analog signals from channels 2 - 8. The analog signal from channel 1 will be broadcasted to all channels 2 - 8. The analog signals from channels 2 - 8 can only go to channel 1 (Host port).

In bridge mode, all the analog signals from all channels 1 - 8 can communicate at the same time. It is recommended to reduce the volume by setting the front panel dip switch #6 (VOL1) to the "On" or down position when using bridge mode.

Diagnostic LEDs for signal IN and OUT are included for each channel. Additional LEDs are provided for Power A, Power B, and Vcc. Connectors are RJ-11 Female. Power is 12VDC standard, optional 24VDC, -48VDC, 125VDC, or 115/230VAC with an external power cube.

The TC8928R rackmount version requires the TCRM191 or TCRM195 19" rackmount card cage. High and extreme temperature versions (-20°C to 70°C, -40°C to 80°C), are also available for harsh environments.

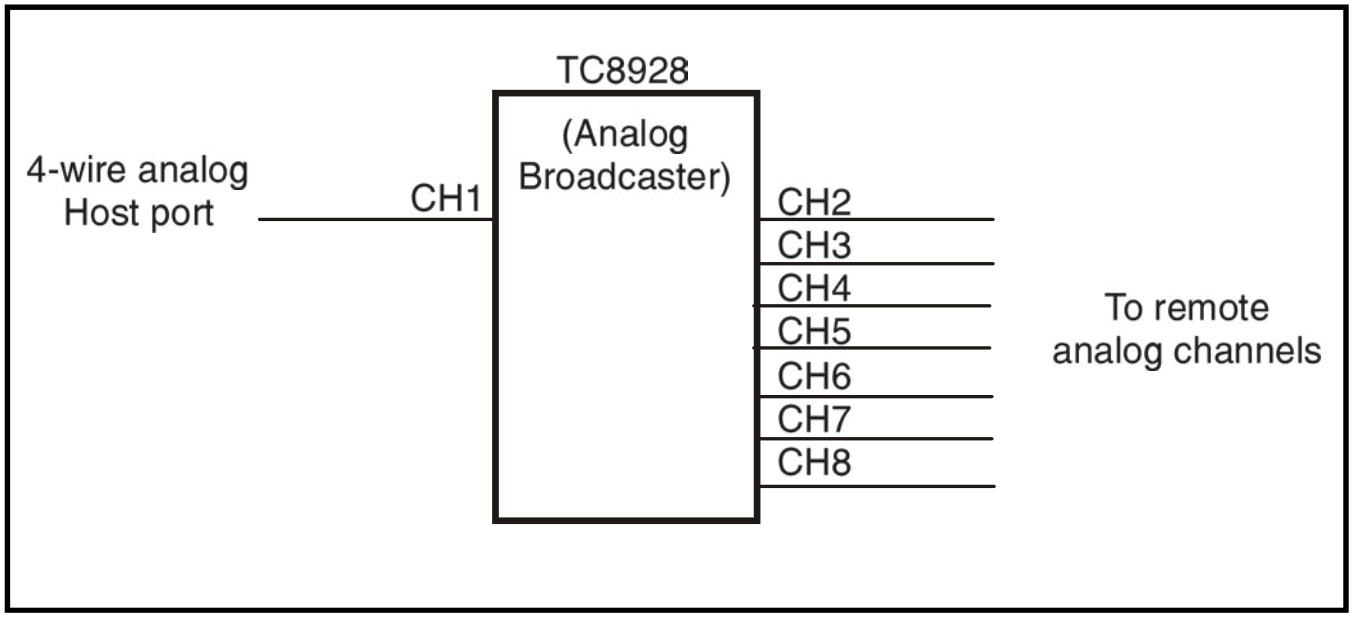


**Figure 1. TC8928 Connection Diagram**

The customer can order the TC8928 to broadcast up to seven 4-wire channels. For one to three broadcast channel unit, TC8928 contains only one card (Base card). For up to seven broadcast channel version, the unit contains two cards (Base card plus Expansion card). The unit can be ordered as standard standalone version which is a one card box or two card stackup box. The optional variation is so called "pizza box" (TCRM195) which is a 19" rackmountable with one U high horizontal box.

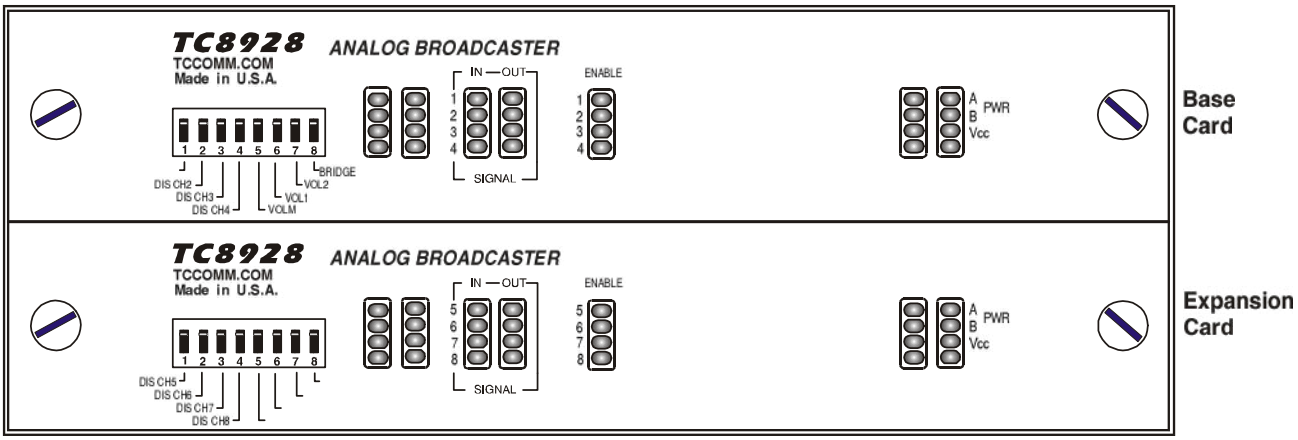


**Figure 2. Standalone Version Front Panel**

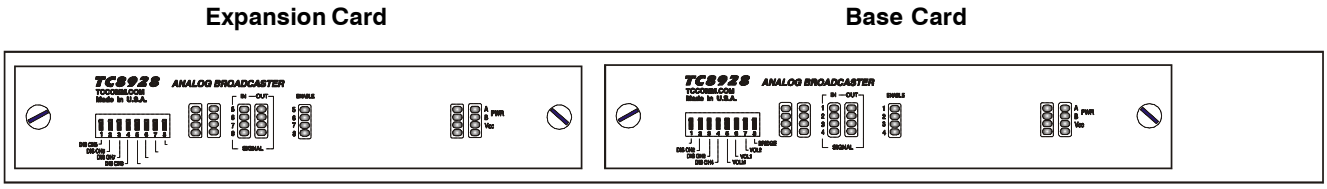


**Figure 3. Pizza Box Version Front Panel**

The **"BASE"** card supports up to three analog channels for broadcasting. The optional "**EXPANSION**" card supports an additional four analog channels for broadcasting.

On the front panel there are various LEDs to indicate each channel's status and power supply status condition. These LEDs can help user or service personnel to troubleshoot the malfunction.

The pizza box version of TC8928 has the same card installed except the sheet metal packaging.

The front panel DIP switches, LEDs and rear panel connectors are all the same on the standalone version as on the rackmount version of TC8928.

## Front Panel Base Card LEDs and DIP Switches

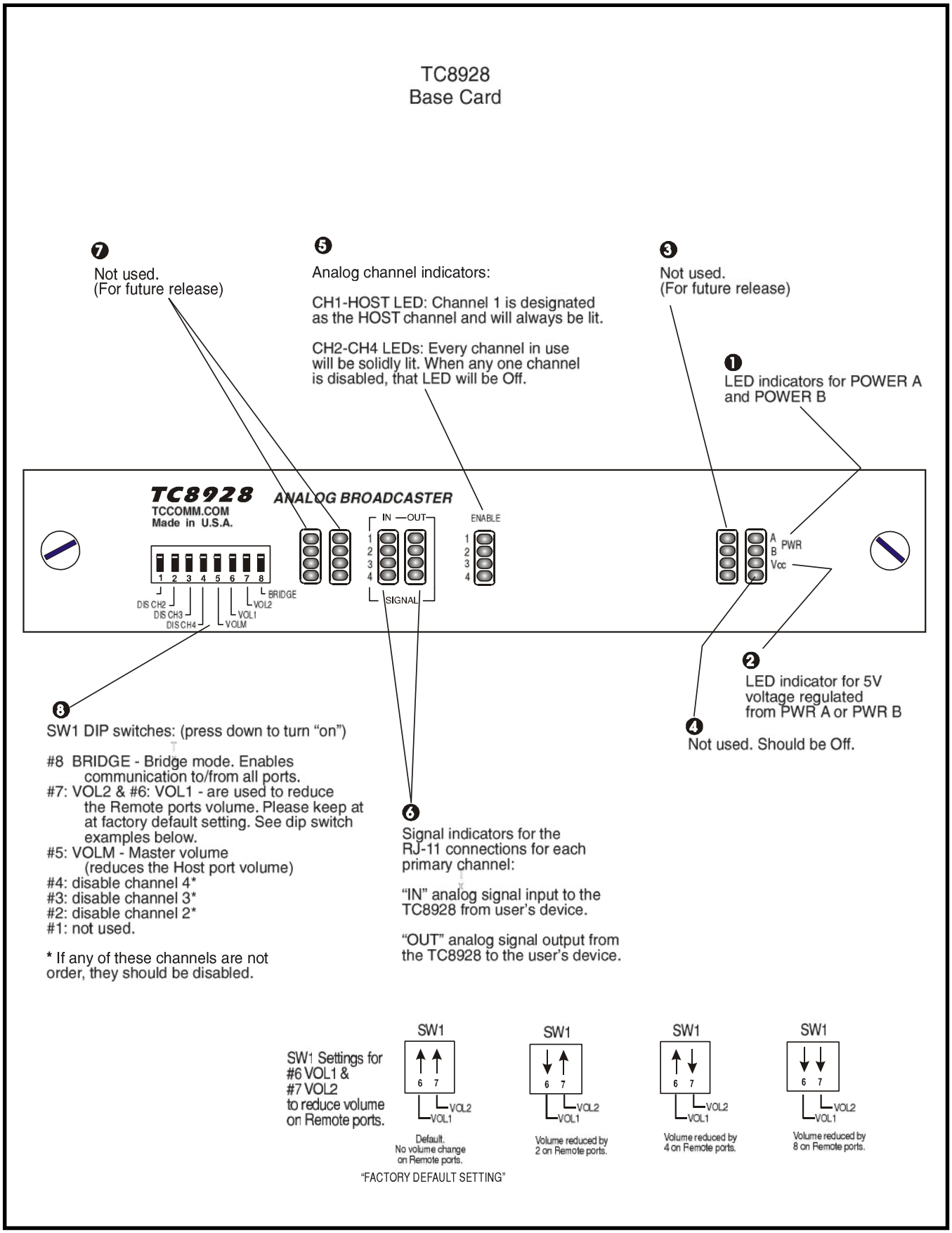


**Figure 4. TC8928 Front Panel (Base Card)**

## Front Panel Expansion Card LEDs and DIP Switches

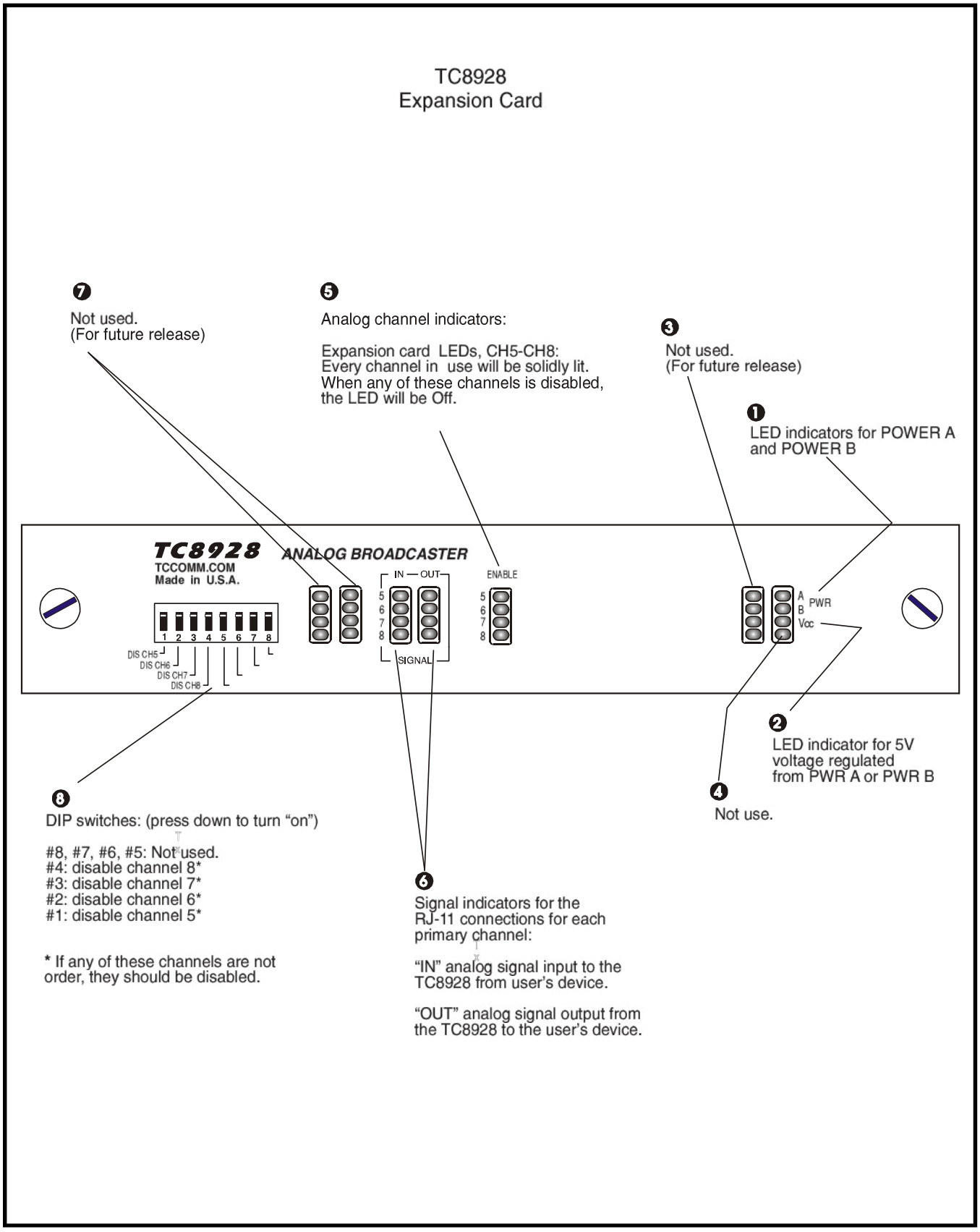


**Figure 5. TC8928 Front Panel (Expansion Card)**

## Rear Panels of Standalone and Pizza Box Versions

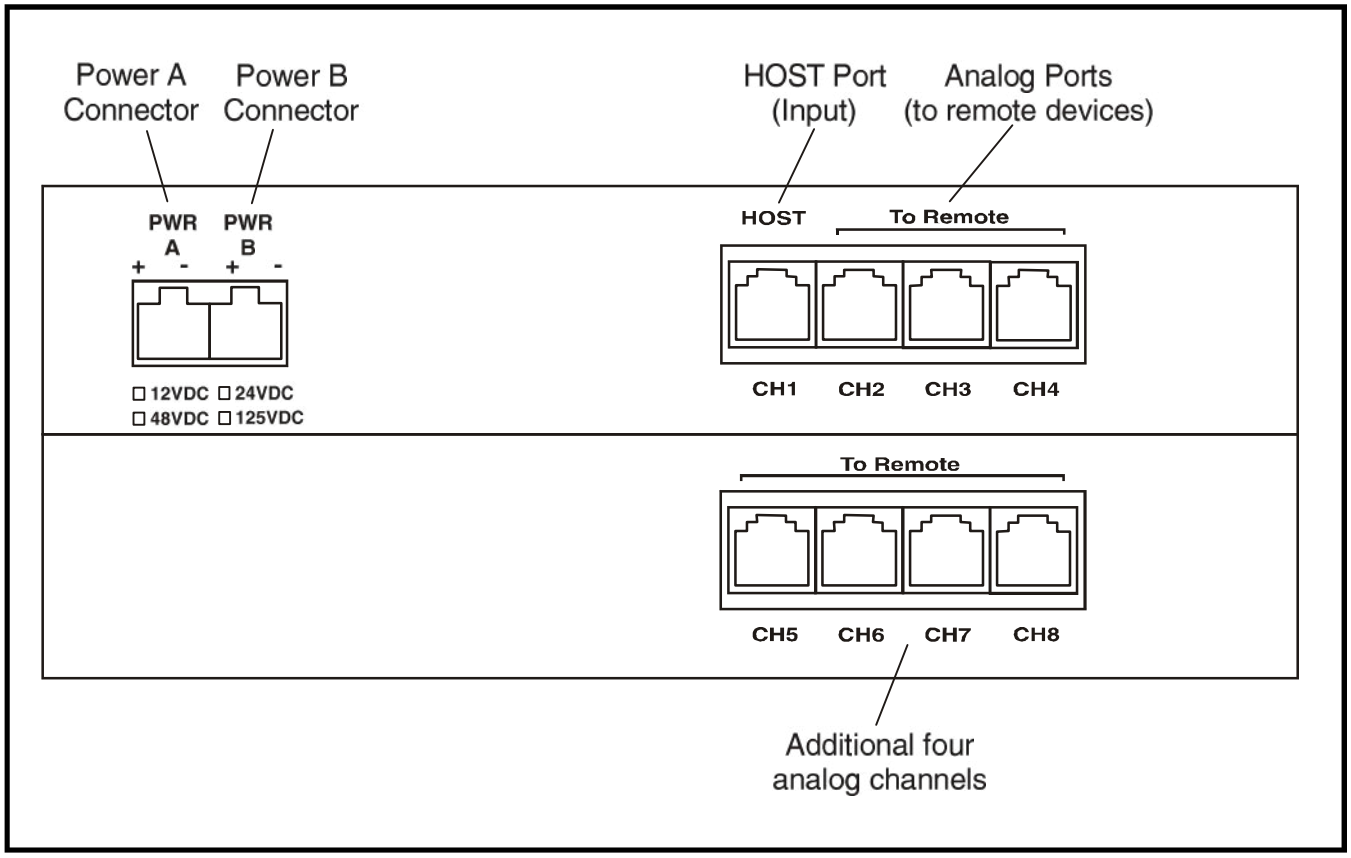


**Figure 6. Standalone Version Rear Panel**

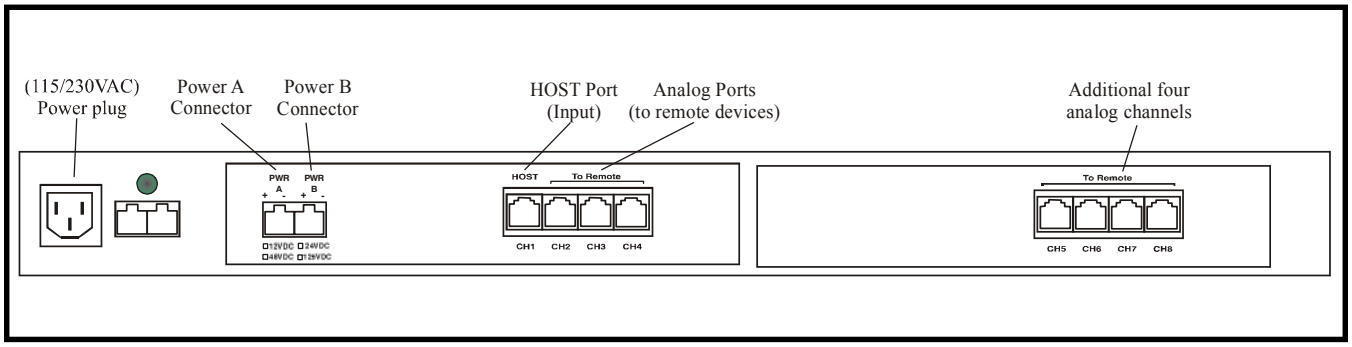


**Figure 7. Pizza Box Version Rear Panel**

## Electrical Signal Interface Connection & Pin Assignments

Four RJ-11 Female sockets are provided (on the rear panel) for each card to connect the 4-wire analog electrical signals. On the Base card, the first channel, HOST is for connection of the user's host signal. The remaining three analog channels are for broadcasting the incoming host signal.

On the Expansion card, all four analog channels are for broadcasting the host signal.

On the Standalone unit, when facing the rear panel, the card above is the base card; "HOST" Channel #1 is the furthest RJ-11 port to the left. On the "Pizza Box" when facing the rear panel, the card furthest to the left is the base card; "HOST" Channel #1 is the furthest RJ-11 port to the left.

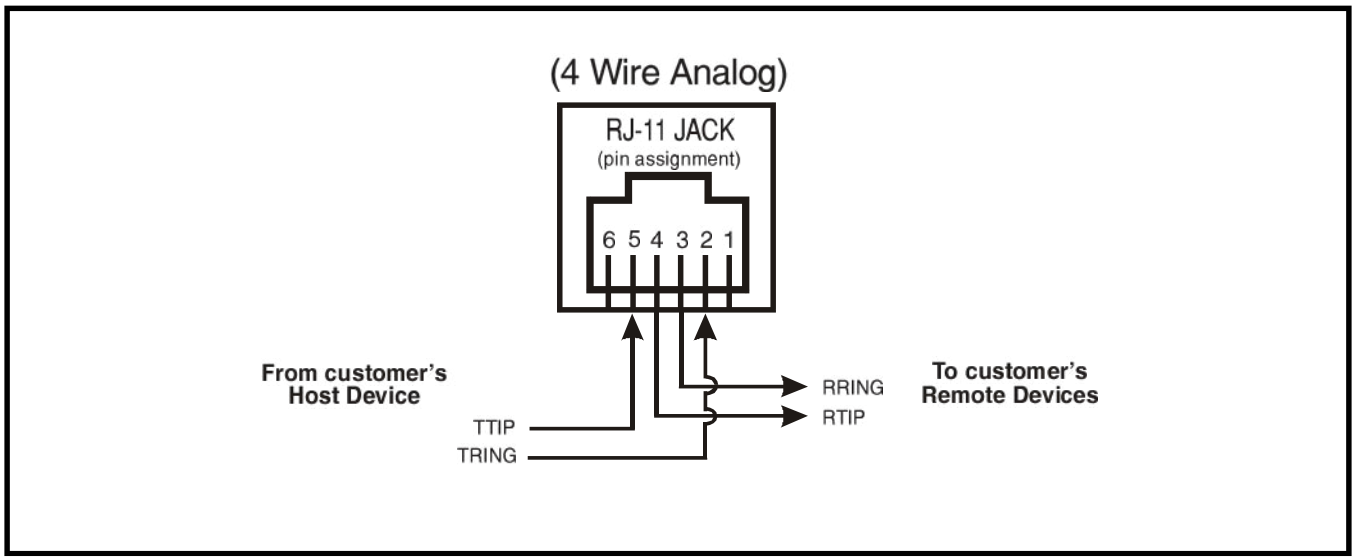


**Figure 8. RJ-11 Pin Assignments**

There are six pins in an RJ-11 Jack. The pin numbers are assigned as follows:

When you look into the RJ-11Jack and the copper contact pins are at the lower side, pin "1" is on the right-most side and pin "6" is on the left-most side as shown on Figure 8, above.

# Chapter 2 - Installation

## Unpacking the Unit

Before unpacking any equipment, inspect all shipping containers for evidence of external damage caused during transportation. The equipment should also be inspected for damage after it is removed from the container(s). Claims concerning shipping damage should be made directly to the pertinent shipping agencies. Any discrepancies should be reported immediately to the Customer Service Department at TC Communications, Inc.

## Equipment Location

TC8928 should be located in an area that provides adequate light, work space and ventilation. Avoid locating it next to any equipment that may produce electrical interference or strong magnetic fields, such as elevator shafts or heavy duty power supplies. As with any electronic equipment, keep the unit from excessive moisture, heat, vibration and freezing temperatures.

## System Configuration

TC8928 has been pre-tested and switches have been set per factory specifications.

## Power Supply

Each TC8928 unit is powered via rear panel's connector. There are two pair of connectors ( "PWR A" and "PWR B" ) for power redundancy. Depending on the power option ordered, it could be one of following: 12VDC standard or optional 24VDC power supply. When AC power is ordered, an universal external power adapter is supplied which can support AC 90 VAC to 240 VAC and 50 Hz to 60 Hz. When unit contains more than one card, only one pair of power connectors needed to connect to a power source.

Each TC8928 card consumes 800mA of current. If your system has two TC8928 cards, the power supply requirement is 2 x 800 mA = 1.6A.

## Power-Up Test

Before applying the power to the TC8928, make sure all DIP switches are in the up (off) position.

Apply the power by plugging the power card's plug into a power jack. After power is applied, all the LEDs should flash for about two seconds (except PWR A, PWR B and Vcc).

The following LED status should be observed from the front panel:

**1.** The Power "A" and/or "B" LED should be lit (depending on which power jack(s) is/are connected. The "Vcc" LED should also be lit. (On both, Base & Expansion Cards)

2. The "ENABLE" Channels 1 through 4 should be solidly lit, if all three channels are being used. Otherwise, any channel not being used, that LED will be Off and that channel should be disabled using the front panel DIP switches.

3. On Expansion Card: The "ENABLE" channels 5 through 8 should be solidly lit, if all four channels are being used. Otherwise, any channel not being used, that LED will be Off and that channeL should be disabled using the front panel DIP switches.

The remaining LEDs should be off.

## Installation Procedure Summary

1. Apply the power by plugging the power plug into a power jack. The power source can be from a power adaptor or from AC 115/230V if AC adapter is built in the unit.

2. Verify that the Base and Expansion cards DIP switches are to the up (Off) position for normal operation.

   ***Note*:** If any channel is not being used, that channel should be disabled using the front panel DIP switches. When any channel is disabled, that corresponding channel LED will be Off.

3. At the rear panel, apply a 4-wire analog line to channel one on the base card labeled "HOST". This line is to be broadcasted to three remote analog channels on the base card or an additional (optional) four remote analog channels utilizing the expansion card.

4. Connect (up to 7) 4-wire devices to the "remote analog" channels on the rear panel.

5. When proper connections are made and communication is established, all the analog extensions should be able to receive the host signal and transmit to the host.

# Chapter 3 - Troubleshooting

## All LEDs are Off

If no LEDs are lit on the unit, check the DC power supply, connector plug, and/or the power source. If the problem persists, contact the Technical Support Department at TC Communications, Inc @ (949) 852-1973.

## Re-powering the TC8928 units

If the need arises to power off and power on the TC8928 units for any reason, you will need to wait about five minutes to re-power the units for proper re-initialization.

If you have already powered on the units, turn the power off and wait for about five minutes to turn the power back on. The unit(s) should now initialize properly. For assistance, please contact the Technical Department at TC Communications, Inc @ (949) 852-1973.

# Chapter 4 - Specifications

### Audio Bandwidth

Telephone.....300 Hz to 3.4 Khz

### Channel Capacity

Standalone Single Card ..... 1 Host analog +3 Remote analog
Expansion Card (Optional) ..... 4 Remote analog

### Electrical

Connector ..... RJ-11 Female
4-Wire Impedance ..... 600 Ohm

### System

Channel Indicators (each channel) ..... IN, OUT
Visual Indicators ..... Power A & B, Vcc, IN, OUT, ENABLE

### Power Source

Standard ..... 12VDC @800mA
Optional(Use factory AC Adapter ONLY) .....
..... 115V AC @ 0.20A (23 Watts) or 230V AC, or 24V DC

### Temperature

Operating ..... -10°C to 50°C
..... (Optional Hi-Temp Version) -20°C to 70°C
Storage ..... -40°C to 90°C
Humidity ..... 95% non-condensing

### Physical Characteristics (for Standalone with two cards)

Height ..... (6.71 cm) 2.62"
Width ..... (18.1 cm) 7.10"
Depth ..... (24.8 cm) 9.75"
Weight ..... (1.46 Kg) 51.4 oz

### Physical Characteristics (for "Pizza Box" with two cards)

Height ..... (4.44 cm) 1.75"
Width ..... (48.3 cm) 19"
Depth ..... (24.8 cm) 9.75"
Weight ..... (1.86 Kg) 65.6 oz

# Appendix A - 19" Card Cage

## Features

- ❒ **1 U height (1.75")**
- ❒ **Universal Power Supply Accepts 90V to 264V AC and 47 to 63 Hz AC**
- ❒ **Standard Power Supply is 12VDC, Optional 24VDC Power Supply Available**
- ❒ **Over Load & Short Circuit Protection**

## Description

The TCRM195 "Pizza Box" Rack Mount Card Cages hold up to 2 single multiplexer type cards.

It operates with one power supply. The AC power supply automatically adjusts for 90V to 264V AC input and 47 to 63 Hz operation. The DC power supply accepts 24VDC input (Optional).

The rack assemblies are 19" wide by 1.75" high. The TCRM195 is 9" deep.

**19" Card Cage (19" x 8.5)**

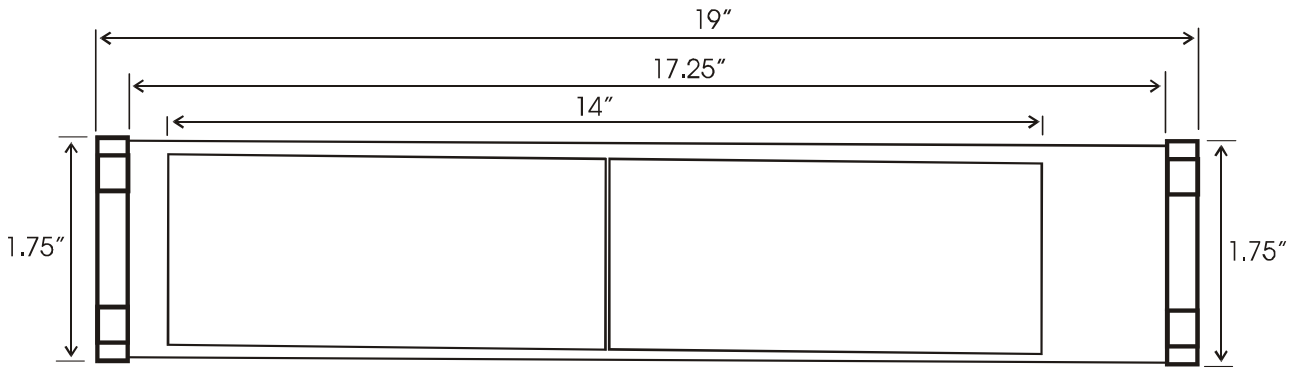


**Figure 9. TCRM195 " Pizza Box" Rack Mount Card Cage**

# Appendix B - Warranty

## Return Policy

To return a product, you must first obtain a Return Material Authorization number from the Customer Service Department. If the product's warranty has expired, you will need to provide a purchase order to authorize the repair. When returning a product for a suspected failure, please provide a description of the problem and any results of diagnostic tests that have been conducted.

## Warranty

Damages by lightning or power surges are not covered under this warranty.

All products manufactured by TC Communications, Inc. come with a five year (beginning 1-1-02) warranty. TC Communications, Inc. warrants to the Buyer that all goods sold will perform in accordance with the applicable data sheets, drawings or written specifications. It also warrants that, at the time of sale, the goods will be free from defects in material or workmanship. This warranty shall apply for a period of five years from the date of shipment, unless goods have been subject to misuse, neglect, altered or destroyed serial number labels, accidents (damages caused in whole or in part to accident, lightning, power surge, floods, fires, earthquakes, natural disasters, or Acts of God.), improper installation or maintenance, or alteration or repair by anyone other than Seller or its authorized representative.

Buyer should notify TC Communications, Inc. promptly in writing of any claim based upon warranty, and TC Communications, Inc., at its option, may first inspect such goods at the premises of the Buyer, or may give written authorization to Buyer to return the goods to TC Communications, Inc., transportation charges prepaid, for examination by TC Communications, Inc. Buyer shall bear the risk of loss until all goods authorized to be returned are delivered to TC Communications, Inc. TC Communications, Inc. shall not be liable for any inspection, packing or labor costs in connection with the return of goods.

In the event that TC Communications, Inc. breaches its obligation of warranty, the sole and exclusive remedy of the Buyer is limited to replacement, repair or credit of the purchase price, at TC Communications, Inc.'s option.

To return a product, you must first obtain a Return Material Authorization (RMA) number and RMA form from the Customer Service Department. If the product's warranty has expired, you will need to provide a purchase order to authorize the repair. When returning a product for a suspected failure, please fill out RMA form provided with a description of the problem(s) and any results of diagnostic tests that have been conducted. The shipping expense to TC Communications should be prepaid. The product should be properly packaged and insured. After the product is repaired, TC Communications will ship the product back to the shipper at TC's cost to U.S. domestic destinations. (Foreign customers are responsible for all shipping costs, duties and taxes [both ways]. We will reject any packages with airway bill indicating TC communications is responsible for Duties and Taxes. To avoid Customs Duties and Taxes, please include proper documents indicating the product(s) are returned for repair/retest).

## Limitation of Liability

In no event shall the total liablility of TC Communications, Inc. to purchaser and/or end user for all damages including but not limited to compensatory, consequential and punitive damages, exceed the total amount paid to TC Communications, Inc. by purchaser for the goods from which the claim arose, in no event shall TC Communications, Inc. be responsible for indirect and consequential damages.

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## Limitation of Liability (Cont.)

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TC Communications, Inc. shall not be responsible for delays or non-deliveries directly or indirectly resulting from or contributed to by foreign or domestic embargoes, seizure, fire, flood, explosion, strike, act of God, vandalism, insurrection, riot, war, or the adoption or enactment of any law, ordinances, regulation, or ruling or order or any other cause beyond the control of TC Communications, Inc.

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