ISO-MAX® USER GUIDE

Audio Category-Cable Interfaces

Models CI-RJ2R-T and CI-RJ2R-R

Jensen ISO-MAX® Pro series audio interfaces are designed for use in the finest professional and audiophile sound systems. They use the same industry-benchmark Jensen transformers that are installed in tens of thousands of the world's best recording studios, broadcast facilities, and sound reinforcement venues because of their sonic transparency, ultra-wide bandwidth, and vanishingly low harmonic and phase distortion.

CI-RJ2R-T Transmitter

CI-RJ2R-R Receiver

Models CI-RJ2R-T and CI-RJ2R-R are stereo (two channel) transmit and receive units, respectively, that allow transmission of very high quality analog audio signals over standard "CAT" cables. Transmitter and receiver have an "Expand" connection that allows two pairs of units and a single cable to support four audio channels. The units are designed for consumer-level audio signals where the nominal or "reference level" signal is standardized at −10 dBV or 0.316 Vrms and a signal level of +5 dBV (1.75 Vrms) corresponds to 15 dB of "headroom." Even at this maximum level, distortion (THD) is typically under 0.05% at 20 Hz and drops to under 0.001% at frequencies over 500 Hz. Frequency response of the pair, linked by 50 feet of standard CAT-5 cable, is +0/−1 dB from 1 Hz to 20 kHz and has a phase distortion (deviation from linear phase or DLP) under 2 degrees from 20 Hz to 20 kHz. Their exceptional sonic transparency, transient response and imaging performance makes these units worthy of even the finest audiophile sound systems. Both transmitter and receiver are entirely passive and require no power supply.

FOR OPTIMUM PERFORMANCE, <u>PLEASE</u> REVIEW THE FOLLOWING PAGES!

General Application Guidelines

Load Impedance Range (***input impedance*** of equipment the receiver drives) .. . . . . 22 kΩ or more [Note 1]

Source Impedance Range (***output impedance*** of equipment driving the transmitter) . . . . . 2 kΩ or less [Note 1]

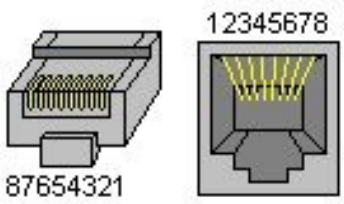
Maximum Input Cable (equipment outputs to transmitter inputs) Length. . . . . 10 feet (3 m) of typical cable [Note 2]

Maximum Transmitter to Receiver Cable Length, –1 dB @ 20 kHz. . . . . 50 feet (15 m) of typical cable [Note 3]
–1.3 dB @ 20 kHz.. . . . . 100 feet (30 m) of typical cable
–2 dB @ 20 kHz. . . . . 250 feet (76 m) of typical cable
–3 dB @ 20 kHz. . . . . 350 feet (107 m) of typical cable

Maximum Output Cable (receiver outputs to equipment inputs) Length .. . . . . 3 feet (1 m) of typical cable [Note 2]

Notes: 1. Typical performance is with source impedance of 600 Ω and load impedance of 22 kΩ. Source impedances less than 600 Ω will substantially reduce the effects of transmitter-to-receiver cable capacitance (cable length).
2. Cable capacitance of 50 pF/ft (160 pF/m)
3. Cable capacitance of 15 pF/ft (50 pF/m), Belden 1583A or equivalent

System Hookup



Cables known as CAT-5, CAT-5e, CAT-6, etc. have become standards for use in Ethernet and other digital applications. At audio frequencies, differences among the various category numbers are negligible. The cables consist of four twisted-pairs and are most commonly terminated with 8-position 8-contact (8P8C) "RJ-45" male connectors. The cable assembly used must be a standard or "straight-through" type wired according to TIA/EIA standard T-568A or T-568B. Pin numbering is shown at the right and pair color and audio channel assignments are shown below:

RJ-45 Pin	Wire Color	Function
1	**green/white**	**Channel 1, Left +**
2	**green**	**Channel 1, Left** –
3	orange/white	Channel 4, Right + *(via "EXPAND" interconnect of 2 units)*
4	blue	Channel 3, Left + *(via "EXPAND" interconnect of 2 units)*
5	blue/white	Channel 3, Left – *(via "EXPAND" interconnect of 2 units)*
6	orange	Channel 4, Right – *(via "EXPAND" interconnect of 2 units)*
7	**brown/white**	**Channel 2, Right +**
8	**brown**	**Channel 2, Right** –

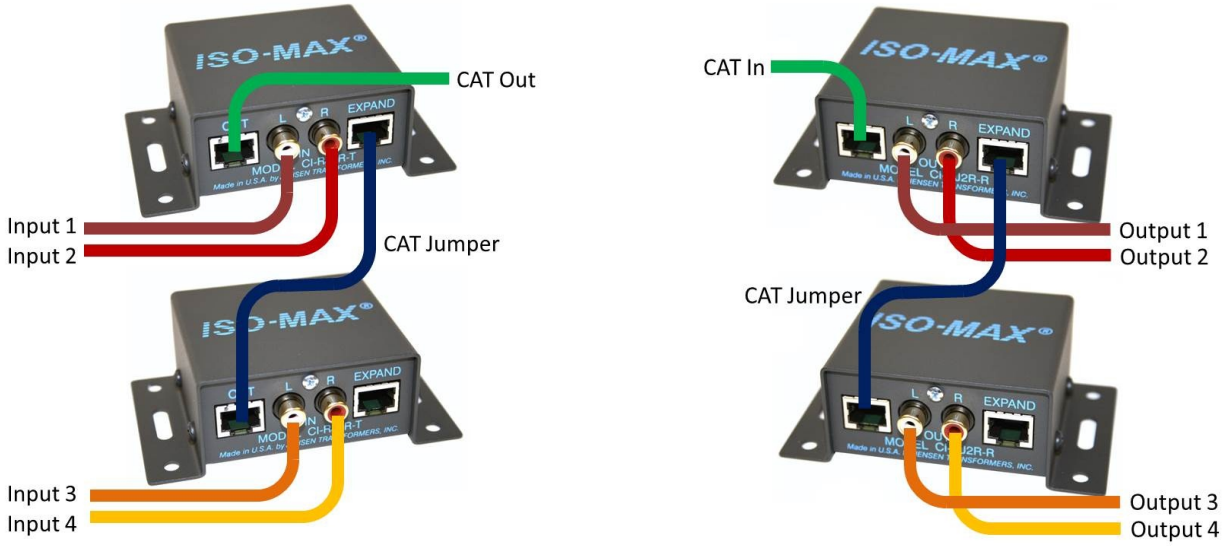
Note: Wire colors shown are for TIA/EIA standard T-568A. Standard T-568B simply swaps the green and orange pairs and has no effect on input to output channel assignments.

CAT cables and RJ-45 connectors are widely-available in either unshielded "UTP" or shielded "STP" varieties, either of which may be used with these ISO-MAX units. However, we recommend STP cable and shielded RJ-45 connectors (example at right) for improved immunity to both RF interference and channel-to-channel crosstalk. Because the STP cables use an overall shield rather than individual shields per pair, some crosstalk must be expected at high audio frequencies. Therefore, we also recommended that all channels carry related program content (such as stereo or four of the 6 channels of "5.1 surround" systems).

For a two-channel system, plug the cables from the signal source into to the transmitter RCA "IN" jacks "L" and "R." Plug the CAT cable into the transmitter RJ-45 "OUT" connector. At the destination end, plug the CAT cable into the receiver RJ-45 "IN" connector. Plug the cables to the destination equipment into the receiver RCA "OUT" jacks "L" and "R."

The EXPAND Connectors:

By using a **pair** of transmitters and a **pair** of receivers, and connecting the pairs with a standard "jumper" or "patch" cables as shown below, the single CAT cable between transmitter and receiver pairs can carry four channels (pair and pin assignments as shown in the table). The transmitter and receiver connected to the long CAT cable become channels 1 and 2. The units connected only by their "EXPAND" jumpers become channels 3 and 4.



Grounding

Shields of RCA inputs L and R are internally connected together and to the shield of the CAT output cables in the transmitter. These "grounds" are capacitively bypassed to the metal enclosure to help control RF interference. In the receiver, shields of RCA outputs L and R are internally connected together and capacitively bypassed to the metal enclosure. The CAT input cable shield is separately bypassed to the metal enclosure - again to help control RF interference.

Since the audio inputs and audio outputs are completely electrically isolated at audio frequencies, noise coupling due to "ground loop" effects are eliminated. However, there are situations where supplemental grounding of either source or destination equipment may be necessary. This generally happens only when either source or destination equipment (or any piece in an interconnected equipment group) has no 3rd-prong AC power safety-ground connection. ***CAUTION: if ANY piece of equipment in your system uses a 3-to-2 prong "adapter" or other means (such as a clipped-off 3rd prong) to defeat safety grounding provided by its 3-prong plug and power cord, we STRONGLY urge you to remove it ... this is an extremely dangerous practice, promoted by the technically naive, that may result in fire, severe shock or electrocution.***

In many systems, equipment grounding occurs automatically when it's mounted in a rack ... provided, of course, that paint has been scraped away to enable electrical contact between chassis and rack rails. In some cases, added equipment grounding may be necessary (to prevent excessive common-mode voltage across the CAT interface). An effective and straightforward way to do this is to have a reputable technician replace the existing 2-prong power cord with a 3-prong (grounding) one. The green wire of the new cord is connected to the equipment chassis. An alternative is to replace only the AC plug with a 3-prong version and connect the 3rd (grounding) prong to the equipment chassis with an insulated wire (stranded #18 or #20 AWG, green, length as required) spiral-wrapped around the existing power cord. Sometimes there is already a convenient "ground" terminal on the equipment for the purpose. If not, you can attach the wire under an existing screw somewhere on the equipment's metal chassis.

In Case of Problems

All Jensen products are proudly made in the United States of America. If you have problems or questions about these products, contact techsupport@jensen-transformers.com or call us at (818) 374-5857, Monday through Thursday, 9 AM to 5 PM, Pacific time. For detailed specifications, please see the product data sheets at www.jensen-transformers.com.

ISO-MAX® PRODUCT WARRANTY

For a period of 1 YEAR after purchase, Jensen Transformers, Inc. will, free of charge, repair or replace any part of an *ISO-MAX®* product that fails due to defective materials or workmanship. For a period of 20 YEARS after purchase, Jensen Transformers, Inc. will, free of charge, repair or replace any Jensen OEM transformer or any Jensen transformer contained in an *ISO-MAX®* product that fails due to defective materials or workmanship.

Both limited warranties are subject to the following limitations:

1) Defects that are, in the sole judgement of Jensen, the result of accident, misuse, abuse, neglect, mishandling, misapplication, faulty installation, unauthorized repair, modification, or acts of God will not be covered by this warranty.

2) In the absence of proof of date of purchase, the date of manufacture (as determined from lot numbers of internal parts and the records of Jensen Transformers, Inc.) shall be used in its place.

3) There are no express warranties except as listed above.

4) JENSEN TRANSFORMERS, INC. SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT OR ARISING OUT OF THE BREACH OF THIS WARRANTY. Duration of implied warranties, if any, is limited to 12 months. If a problem develops with this product during the warranty period, call or write us before attempting any repair. We can help you identify specific problems, and possibly solve the problem, before the unit is returned to us for repair or replacement. In any case, DO NOT RETURN THE UNIT WITHOUT AUTHORIZATION and instructions from us. Jensen cannot be responsible for damage due to shipping or improper packaging.

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Jensen Transformers, Inc.
9304 Deering Avenue
Chatsworth, CA 91311
United States of America
Tel: (818) 374-5857
Fax: (818) 374-5856
www.jensen-transformers.com

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