5 January 2005 – This contact update page has been added to the Acrobat document you have downloaded. Please disregard any contact information printed within the document.

Our Mailing and Shipping Address:

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Phone: 512-389-5358
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World Wide Web Site: http://www.whiteinstruments.com/

Note: Repairs and packages should be shipped to Suite 202
CONGRATULATIONS!
You have purchased one of the finest IQ SYSTEM controlled equalizers available.

The White Instruments 4700IQ, 4700-2IQ and 4710IQ are professional quality single and dual channel one third and one sixth octave equalizers designed specifically to be operated on the Crown IQ SYSTEM communications network. Each of the 4700IQ series units has all of the filtering and memory functions found in its non IQ version. Therefore, users already familiar with our regular 4700 series will find all of the same functions available in the 4700IQ series units but, accessed through the IQ SYSTEM graphical interface. The 4700IQ series incorporates additional features over the regular series. Input and output level monitoring, selective output muting and a channel lock feature for the 4700-2IQ add more flexibility and greater ease in system set-up and troubleshooting.

This manual will help you get your new 4700IQ series unit quickly installed and working. However, please remember to fill out the User’s Service Card that came with the unit and send it to us at the address on the back cover of this manual. That way, we can get your valuable comments and help you recover your unit if it is ever lost or stolen.

OUR COMMITMENT TO QUALITY
White Instruments has manufactured the 4700IQ series to the same high standards that it has used in its products for 40 years. We have built our reputation on providing you with high quality products and prompt, personalized service. If you have questions or concerns about the 4700IQ series or any of our products, please contact us.
UNPACKING
Carefully unpack and inspect your new 4700IQ series unit for shipping damage. If the unit is damaged, immediately notify the carrier and us. For U.S. orders, your unit was shipped with full insurance unless you requested otherwise. In addition to this manual, the package should contain the following items:

1. The 4700IQ series unit.
2. Four rack mounting screws.
3. One user service card.

QUICK START
This section will help you connect your 4700IQ series unit as quickly as possible. Just follow these steps.

1. Using the 4 mounting screws provided, mount the unit into your rack.
2. Making sure that the power switch is off, plug your unit into the appropriate 105-130 or 210-260VAC 50/60Hz electrical outlet as indicated on the back panel of the unit.
3. Connect the signal input cable(s) for either balanced or unbalanced operation. The section entitled ‘Balanced/Unbalanced Operation’ on page 2 provides details.
4. Connect the output cable(s) for either balanced or unbalanced operation. Again, see the section entitled ‘Balanced/Unbalanced Operation’ for details.
5. Remove the IQ connector from the 4700IQ series unit back panel. Attach the IQ SYSTEM cable wires to the IQ connector screw terminals as described in the IQ system hardware section on page 4. Re-insert the connector back into its slot in the 4700IQ series back panel.
6. Set the 4700IQ series unit to the desired device address by setting the appropriate levers on the 8-segment dip switch. The section entitled ‘IQ Device Address Selection’ on page 5 details this procedure.
7. The unit is fully configured and may be powered-up.
FRONT PANEL CONTROLS
For all 4700IQ series units, the front panel has only a power switch, a green power-on LED and a green DSPI LED indicator. The DSPI LED indicates whenever that particular unit is being accessed by the IQ system. The user also has direct control over this LED and may turn it on or off as desired as an aid in physically locating a unit in a system.

REAR PANEL CONNECTIONS
The rear panel features of the 4700IQ series units are similar to those of the regular 4700 series. The audio signal connectors are barrier strips and are physically shown in shown, with appropriate signal connections, in the ‘Balanced/Unbalanced Operation’ section below. The IQ SYSTEM interface consists of a 4-conductor connector with screw terminals for attaching the IQ SYSTEM communication interface wires and a recessed 8-segment dip switch for selecting the device address.

SOUND SYSTEM CONNECTIONS
This manual is not intended to provide an exhaustive explanation of sound system connections, however, in the interest of getting the absolute best performance from your 4700IQ series unit, a brief summary is given below.

Grounding Lug: NEVER remove the grounding lug from the AC power cable. To do so is dangerous and unlawful in most areas! Further, it is unnecessary because the audio processed by these units is isolated from earth ground.

Cable Shield: The shield should not be thought of as part of the audio circuit. Rather, it simply helps protect the audio circuit from electromagnetic and RFI noise.

It is generally accepted practice to connect the shield to earth ground at only ONE end of the audio cable. The other end should be left open or connected to earth ground through a 0.01 microFarad capacitor.

Balanced/Unbalanced Operation
The 4700IQ series units can have any of its audio inputs or outputs connected for balanced or unbalanced operation. This feature, for example, allows the user to take an unbalanced input signal going into the unit and generate a balanced output signal. For minimum external noise pick-up, balanced connections are usually chosen. Unbalanced connections, which require two conductors instead of three, are sometimes chosen when cable cost is a factor and when external electromagnetic interference is minimal. The following two diagrams show the difference between balanced and unbalanced cable connections for the 4700IQ series units.
A Brief Note On Balanced Audio Transmission Lines

A balanced audio transmission line is a system which, like the shield, provides protection from electromagnetic disturbances of RFI noise.

In order for balancing to effectively reduce external noise, the following two conditions must be met:

ONE The + and - input or output conductors must be in close proximity to each other. This is usually achieved by twisting the pair together. As a result, it can be safely assumed that any external electromagnetic disturbance is equally imposed on both conductors.
TWO Both + and - leads must be referenced to a common point in the circuit.

The second condition is not met if 2 conductor shielded cable is used for balanced connections. However, it is common practice to omit the common conductor in a cable; for short cable runs, this is usually acceptable.

When operating in balanced mode, the 4700IQ series units amplify only the difference signal between the + and - signal inputs and therefore, reject any signal common to both. Thus, any external interference present on both + and - input leads is rejected in the input stage of the unit. The effectiveness of this rejection is given by the common mode rejection ratio (CMRR).

Important: A device's internal circuit design defines whether the unit is balanced or not. A balanced device may operate unbalanced by shorting together signal negative and common in the connecting cable going to or leaving the device. However, an unbalanced unit will only operate in an unbalanced system and cannot be balanced by changing cable connections. In addition, the type of connector used does not necessarily signify either a balanced or an unbalanced connection.

**IQ SYSTEM HARDWARE**

The Crown IQ communications bus is implemented as a 20 milliamp current loop operating at 38.4 kilobaud. The IQ components in each Crown Bus loop are wired in series. The output of one component is connected to the input of the next component and so on. The current loop makes the system relatively immune to external noise and allows the use of inexpensive twisted pair wiring. For most applications, good quality 26 AWG twisted pair wire with low capacitance (<30 pF/ft.) can be used. For high electromagnetic noise environments, shielded twisted pair wire, such as West Penn 452, is generally acceptable. As always, remember to tie the shield to ground at only one end of the cable, preferably at the input connector.

Some IQ components use separate 5-pin and 4-pin DIN connectors for Crown Bus input and output wiring rather than the 4-pin removable barrier block. The following 3 diagrams show the various connection schemes between the 4-pin DIN output connector, the 5-pin DIN input connector and the 4-pin removable barrier block. This allows components with either type of Crown Bus connectors to be used in the same system.
IQ DEVICE ADDRESS SELECTION

The final step in configuring an IQ system is selection of device addresses for each unit in a Crown Bus loop. Each device of a particular type in a particular loop must be assigned a unique address between 1 and 250. However, different components on the same bus loop may be assigned the same address. For example, it is theoretically possible to have 250 4700IQs, 250 4700-2IQs and 250 4710IQs on the same Crown Bus loop with the ability to access them all individually.

The 8-segment dip switch is used to assign a unit's device address. This is done by turning selected segments on (down). Addresses of zero (all segments in the 'up'
position) and addresses greater than 250, must not be used. The simplest way to
determine which segments to turn on is to look up the correct sequence in a table like
that given by Crown in their IQ SYSTEM manual, however, if that table is not
available, there is a way to translate from a decimal device address to the required dip
switch segment positions.

The value of each dip switch segment, as read from left to right, is 1, 2, 4, 8, 16, 32,
64, and 128. All device addresses between 1 and 250 can be derived from the sum of
some or all of these numbers. For instance, an address of 43 can be obtained from the
sum of 1+2+8+32 which means that the first, second, fourth and sixth segments
should be turned on to encode this address in the unit.

GRAPHIC DEVICE MODULE

Each IQ compatible device has its own graphic device module, which is a graphical
picture of the device with all of its controls and displays. All device settings are
performed on this graphic using the mouse. The following figure shows the front panel
4700IQ graphic display. Faders are moved using the ‘click-and-drag’ method with the
left or center mouse keys. Using the center key shows the actual slider setting while
adjusting it. Buttons are toggled ‘on’ or ‘off’ with a simple click of the left mouse
button. To ‘draw’ a graphic EQ curve with the sliders, press the Alt key, click on the
first EQ filter knob and drag the cursor along the shape of the desired curve. The EQ
sliders will automatically snap to that curve.

![Diagram of graphic device module](image)

*Figure Six: 4700-2IQ graphic device module (one channel shown)*
FEATURES
The White Instruments 4700IQ series equalizers are similar in function to the regular 4700 front panel controlled equalizers in that the 4700IQ series incorporates all of the filter functions found in the regular series. These features are given below and detailed specifications are given on page 8. The essential differences occur in communication. The 4700IQ series units are designed to operate only on the Crown IQ SYSTEM network.

The 4700IQ is a 1/3 octave, digitally controlled analog equalizer with variable highpass filtering, variable lowpass filtering, gain, EQ filter bypass, hardwire bypass, flat button (sets all EQ filters to flat setting), servo-balanced inputs and outputs, input and output signal level monitoring, selective output muting and 10 memories to store device settings.

The 4700-2IQ is the dual channel version of the 4700IQ. In the 4700-2IQ, each channel has 10 memories which can be programmed as desired. In addition, a channel lock feature, for stereo operation, is incorporated. The lock operates on the EQ filters, gain, highpass filters, lowpass filters, mute, flat and EQ in/out functions. When locked, all slider controls maintain any offset present between channels. The highpass filters, lowpass filters, mute, flat, and EQ in/out functions do not lock to the same setting unless the setting is changed while the units are locked together.

The 4710IQ is a 1/6 octave digitally controlled analog equalizer with all of the basic features of the 4700IQ, but with 1/6 octave filter resolution. This allows very accurate EQ filter adjustments over the entire audio frequency range.

Options exist for the 4700IQ unit only and consist of a pink/white noise generator card (p/n 4706), a bi-amp crossover card (p/n 4707) and a tri-amp crossover card (p/n 4708).
Specifications

**Number of Channels:**
4700IQ, 4710IQ - One.
4700-2IQ - Two.

**Number of Memories:**
Ten per channel, non-volatile.

**Frequency Response:**
10 Hz to 32 kHz (-3dB points).

**Dynamic Range:**
4700IQ, 4700-2IQ - >100 dBu.
4710IQ - >96 dBu.

**Distortion:**
Less than 0.05% THD.

**Maximum Operating Level:**
+18 dBu, 600 ohms, balanced or unbalanced.

**Input Impedance:**
60 kilohms balanced, 20 kilohms unbalanced.

**Input Circuit:**
Active servo-balanced. Can operate unbalanced with no gain change.

**Output Impedance:**
102 ohms balanced, 51 ohms unbalanced.

**Output Circuit:**
Active servo-balanced. Can operate unbalanced with no gain change.

**Common Mode Rejection:**
>85 dB @ 1 kHz, >65 dB @ 10 kHz.

**Muting:**
IQ user controlled. Automatic on power-up and power-down.

**Frequency Centers:**
4700IQ, 4700-2IQ - 28 1/3 octave, ISO centered filters from 31.5 Hz to 16 kHz.
4710IQ - 55 1/6 octave, ISO centered filters from 25 Hz to 12.5 kHz, 1/3 octave @ 16 kHz.

**EQ Filter Range:**
+/- 10 dB in 0.5 dB steps.

**High Pass Filter:**
12 dB/octave, adjustable from 10 Hz to 160 Hz in 8 steps.

**Low-Pass Filter:**
12 dB/octave, adjustable from 6 kHz to 32 kHz in 8 steps.

**Gain:**
0 dB to 12 dB in 0.5 dB steps.

**Signal Level Monitoring:**
Input and output levels displayed through IQ software.

**EQ In/Out:**
IQ software controlled EQ filter bypass, back panel hardwire bypass switch.

**Connector Types:**
Audio: Input/output - barrier strip.
IQ: Buchanan B52C4U04T (White p/n 190121)

**Power Requirements:**
105-130/210-260 VAC, 50/60 Hz, factory set.

**Mechanical:**
175"(4.5cm) X 19"(48.3cm) X 12"(30.5cm),
9lbs (4.1 kg), rack mount.

**Operating Temperature Range:**
0 - 70 degrees Celsius.

**Finish:**
Black with white nomenclature.

**Options (4700IQ only):**
Pink/white noise generator card (p/n 4706)
Bi-amp crossover card (p/n 4707)
Tri-amp crossover card (p/n 4708)
WARRANTY POLICY

Your White Instruments 4700IQ series unit is warranted against defects in manufacturing, workmanship and original components for a period of ONE YEAR from the date of purchase. During this period, White Instruments will repair or replace the unit, at our option, so long as it has not been subjected to abuse. Abuse may be physical and/or electrical in nature. White Instruments will be the sole judge of this criteria.

White Instruments is the only warranty repair facility in the United States. Outside the United States, White Instruments distributors are authorized to make warranty repairs.

HOW TO OBTAIN WARRANTY REPAIRS

Your 4700IQ series unit should be securely packed and shipped, prepaid, to White Instruments or one of its authorized offshore distributors. Our U.S.A. shipping address is given in the COMMUNICATIONS section below. Contact the factory for the name and address of the distributor nearest you.

A copy of your sales receipt should be included to establish the warranty date. Without it we will have to rely on the serial number and our own records to verify the date of shipping to a dealer.

A completed trouble report or letter detailing the unit's malfunction must be included. A copy of this form appears on the back page of this manual.

Every effort will be made to complete warranty repairs within 5 working days of receipt of the unit. Your 4700IQ series unit will be returned to you via surface freight, prepaid. If you instruct us to return your 4700IQ series unit via air freight, it will be shipped with freight charges collect.

HOW TO OBTAIN OUT-OF-WARRANTY REPAIRS

Should the required repairs not be covered by our warranty you will be charged for the parts and labor required to repair the unit. Should you require an estimate of charges prior to repairing the unit you should notify White Instruments of this when returning the unit. Every effort will be made to complete the repair within 5 working days. The unit will be returned C.O.D. unless other arrangements have been made.

As a service to our customers, our repair center is non-profit.

COMMUNICATIONS

White Instruments, division of C VAN R, Inc.
Telephone: (512) 389-3800
Fax: (512) 389-1515
Mailing Address: P.O. Box 698, Austin, Texas 78767
Shipping Address: #306, 1514 Ed Bluestein Blvd., Austin, Texas 78721

4700IQ
TROUBLE REPORT
Should your 4700IQ series unit require either warranty or out-of-warranty factory service, please include a copy of this report with it.

Service Information

Model Number __________________ Serial Number __________________ Date of Purchase __________________

Dealer or Contractor __________________

Is your 4700IQ series unit under warranty? If so, include a copy of the sales receipt.

Is an Estimate Required? __________________ Return Shipping? (default: UPS ground) __________________

Date & Method of Shipment to White __________________ List Attached Accessories __________________

Your Name __________________ Company Name __________________

Address (Please do not use P.O. Box) __________________ City __________________

State __________________ Zip Code __________________ Bus. Phone Number __________________

Business Hours __________________ Fax Number __________________

Brand/Model of unit driving 4700IQ series unit __________________

Brand/Model of unit loading 4700IQ series unit __________________

Description of Trouble __________________

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