IQ-INT 3

REFERENCE MANUAL



IQ System® to Host Computer Interface

© 2002 by Crown Audio, Inc., P.O. Box 1000, Elkhart, Indiana 46515-1000 U.S.A. Telephone: 574-294-8000. The *IQ-INT 3* is produced by Crown Audio, Inc. Trademark Notice: Crown, IQ, and IQ System are registered trademarks of Crown International. Other trademarks are the property of their respective owners.

Obtaining Other Language Versions:
To obtain information in another language about the use of this product, please contact your local Crown Distributor. If you need assistance locating your local distributor, please contact Crown at 574-294-8200.

Note: The information provided in this manual was deemed accurate as of the publication date. However, updates to this information may have occurred. To obtain the latest version of this manual, please visit the Crown website at www.crownaudio.com.

Printed on recycled paper.

A Harman International Company

132358-2
4/02

THREE YEAR FULL WARRANTY

UNITED STATES AND CANADA

SUMMARY OF WARRANTY

Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship. We further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at the factory. Warranty work for some products can only be performed at our factory. We will remedy the defect and ship the product from the service center or our factory within a reasonable time after receipt of the defective product at our authorized service center or our factory. All expenses in remedying the defect, including surface shipping costs in the United States, will be borne by us. (You must bear the expense of shipping the product between any foreign country and the port of entry in the United States including the return shipment, and all taxes, duties, and other customs fees for such foreign shipments.)

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service within the warranty period. All components must be shipped in a factory pack, which, if needed, may be obtained from us free of charge. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by us or our authorized service center. If the repairs made by us or our authorized service center are not satisfactory, notify us or our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

THIS CROWN WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 12/01

WORLDWIDE EXCEPT UNITED STATES AND CANADA

SUMMARY OF WARRANTY

Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown1 product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship, and we further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty. Note: If your unit bears the name "Amcron," please substitute it for the name "Crown" in this warranty.

ITEMS EXCLUDED FROM THIS CROWNWARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers. We will remedy the defect and ship the product from the service center within a reasonable time after receipt of the defective product at our authorized service center.

HOW TO OBTAIN WARRANTY SERVICE

You must notify your local Crown importer of your need for warranty service within the warranty period. All components must be shipped in the original box. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by our authorized service center. If the repairs made by our authorized service center are not satisfactory, notify our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 7/01

Telephone: 574-294-8200. Facsimile:574-294-8301

The information furnished in this manual does not include all of the details of design, production, or variations of the equipment. Nor does it cover every possible situation which may arise during installation, operation or maintenance. If you need special assistance beyond the scope of this manual, please contact our Technical Support Group.

Crown Technical Support Group
Plant 2 SW, 1718 W. Mishawaka Rd., Elkhart, Indiana 46517 U.S.A.
Phone: **800-342-6939** (North America, Puerto Rico and Virgin Islands) or 574-294-8200
Fax: 574-294-8301 Internet: http://www.crownaudio.com email: iqsupport@crownintl.com



WARNING

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE!

PLEASE NOTE

The following universal symbols may appear on your product and/or in various sections of this manual. Wherever they appear, they are to be interpreted as follows:



Lightning Bolt Symbol:

This symbol is used to alert the user to the presence of dangerous voltages and the possible risk of electric shock.



Exclamation Mark Symbol:

This symbol is used to alert the user to refer to the instruction manual for important operating or maintenance instructions.

FCC Class B Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: For a system to comply with FCC rules, all components in the system must be in compliance. Please consult the instruction manuals of all components in an IQ System for FCC compliance.

Important Safety Instructions

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings.
4) Follow all instructions.
5) Do not use this apparatus near water.
6) Clean only with a dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11) Only use attachments/accessories specified by the manufacturer.



12) Use only with a cart, stand, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13) Unplug this apparatus during lightning storms or when unused for long periods of time.
14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15) To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

Quick Install Procedure

This procedure is provided for those who are already familiar with the IQ System and would like to install the IQ-INT 3 in the shortest time possible. Less experienced installers or those wishing a full explanation of the installation procedure are encouraged to refer to Section 3.

Mounting:

1 Mount the unit into a standard 19-inch (48.3-cm) equipment rack or cabinet, or it can be stacked.

Install the wiring:

2 Connect the IQ Bus loops to the IQ-INT 3 (see Section 3.1).

3 Connect the IQ-INT 3 either to a host computer via RS232 (see Section 3.2) or to a modem via RS232 (see Section 3.2.1).

4 Connect the unit to the AC receptacle.

Configure the IQ-INT 3:

5 Set the communication baud rate (see Section 3.2.2).

CONTENTS

Quick Install Procedure 5

1 Welcome 7
1.1Unpacking 7

2 Controls, Connectors and Indicators 7

3 Installation 8
3.1 Connecting to a IQ Bus Loop 8
3.2 Connecting to a Host Computer 10
3.2.1 Connecting to a Modem 10
3.2.2 Baud Rate Setting 12

4 Technical Information 13

5 Specifications 14

6 Service 15

ILLUSTRATIONS

2.1 IQ-INT 3 Controls, Connectors and Indicators 7
3.1 An IQ System with a Host Computer and a IQ-INT 3 8
3.2 RJ-45 Plug 9
3.3 RJ-45 Output to RJ-45 Input 9
3.4 RJ-45 Output to Din Input 9
3.5 RJ-45 Output to Terminal Block Input 10
3.6 Din Output to RJ-45 Input 10
3.7 Terminal Block Output to RJ-45 Input 10
3.8 RS232 Cable Wiring 10
3.9 IQ Bus Wiring "Loop" from Output to Input of Each IQ Component ... 11
3.10 Modem Hookup 11
3.11 IQ System with a Modem 11
3.12 Baud Rate Settings for the IQ-INT 3 11
4.1 IQ-INT 3 Block Diagram 13

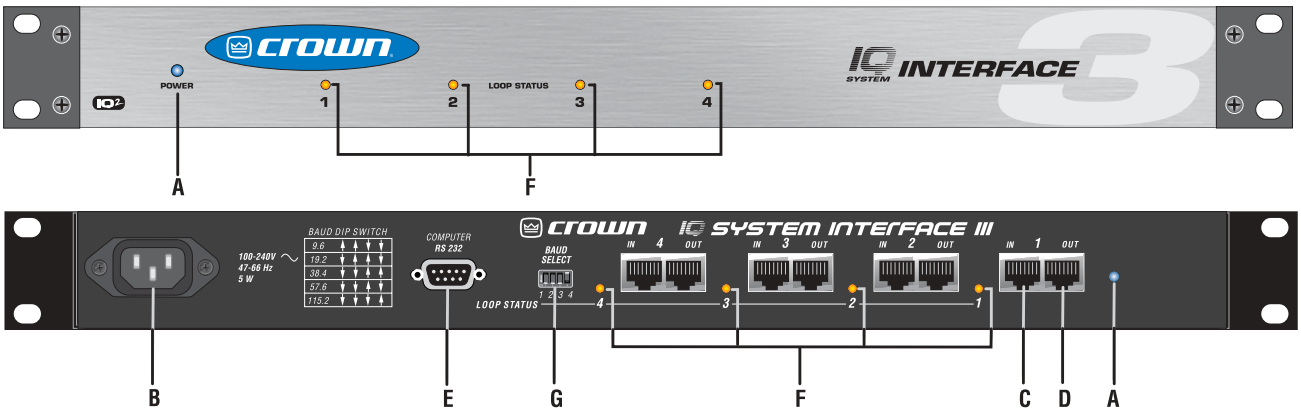
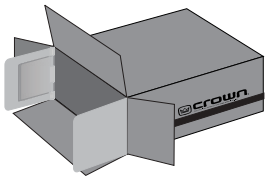


Figure 2.1 IQ-INT 3 Controls, Connectors and Indicators

1 Welcome

The *Crown® IQ-INT 3* is an *IQ System®* interface that connects up to four different IQ Bus loops to a host computer. It is a self-contained unit with its own IQ Bus drivers, RS232 drivers and power supply. It has a microprocessor that can be directed by the host computer to send and receive commands and data to and from IQ components connected to its IQ Bus loops.

This manual will help you successfully install and use your new interface. Please read all the instructions, warnings and cautions contained within it. Consult the *IQ for Windows* software documentation for descriptions of the software controls for this unit. Also, for your protection, please send in the warranty registration card today. And save the bill of sale—it is your official proof of purchase.



1.1 Unpacking

Please inspect the unit for any damage that may have occurred during transit. If damage is found, notify the transportation company immediately. Only you, the consignee, may initiate a claim with the carrier for shipping damage. Crown will cooperate fully as needed. Save the shipping carton as evidence of damage for the shipper's inspection.

Please save all packing materials. **NEVER SHIP THE UNIT WITHOUT THE FACTORY PACK.**

2 Controls, Connectors and Indicators

A. Power Indicator

Blue front and rear panel LEDs light when the power cord is connected to the AC mains and the unit is receiving power. The IQ-INT 3 has no on/off switch.

B. AC Line Connector

A rear panel IEC320 connector for attaching the power cord. The IQ-INT 3 has a universal power supply, and may be operated on AC line voltages from 100VAC to 240VAC at 47 Hz to 66 Hz.

C. IQ Bus Input Connector

An RJ-45 connector provides input connection to each of four separate IQ Bus loops.

D. IQ Bus Output Connector

An RJ-45 connector provides output connection to each of four separate IQ Bus loops.

E. Computer RS232 Connector

A female, 9-pin D-subminiature connector provides serial connection to a host computer.

F. Loop Status Indicators

Yellow front and rear panel LEDs for each IQ Loop indicate data activity.

G. Baud Select DIP Switch

A four-segment DIP switch located on the rear panel used to set the data rate for communication with the host computer. Available data rates are 9,600, 19,200, 38,400, 57,600 and 115,200 baud. Factory default setting is 115,200 baud.

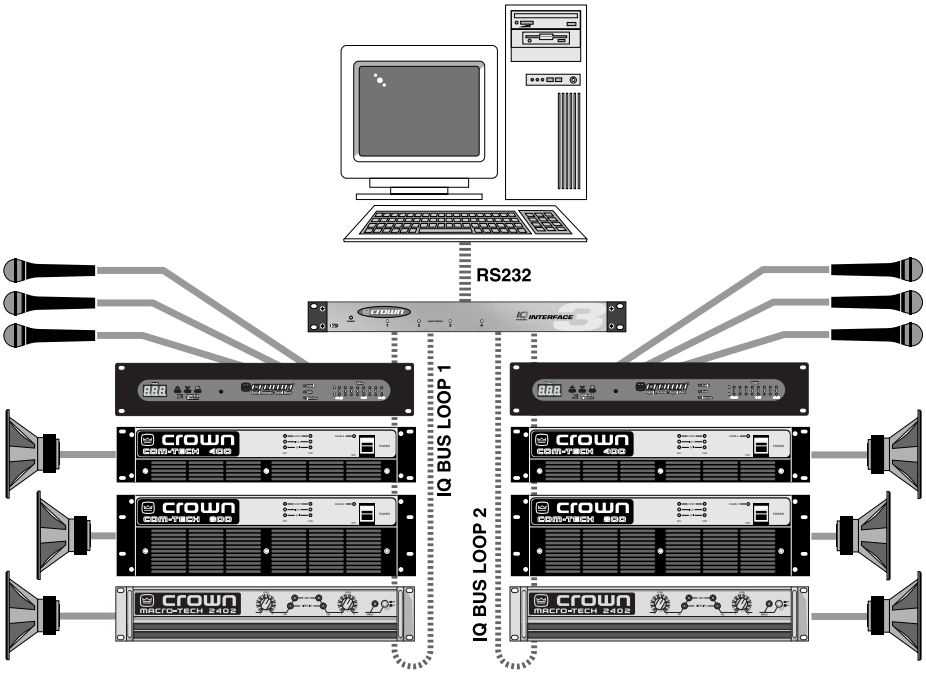


Figure 3.1 An IQ System with a Host Computer and an IQ-INT 3

3 Installation

IQ-INT 3 installation can be divided into the following major parts: Connecting to one or more IQ Bus loops, connecting to the host computer or modem, and setting the communication baud rate.

3.1 Connecting to an IQ Bus Loop

The IQ Bus is a serial communication loop designed to transmit IQ commands and data. As a communication standard, it is independent of its wiring. This characteristic allows you to wire an IQ Bus loop with either fiber optic cabling or with inexpensive twisted-pair wire, whichever is most appropriate. One IQ System can have more than one IQ Bus loop, and each loop must be unbroken for proper operation.

The IQ-INT 3 supports up to four IQ Bus loops. This makes it possible to divide the system into zones, each with its own loop. Single and multiple IQ Bus loops each have their own advantages that are listed next.

Multiloop Advantages

- A break in communication in one loop does not affect other loops.
- Over 250 IQ components of the same model can be used in a system.
- The same IQ address can be used more than once (once for each type of unit on each loop).
- Larger areas can often be covered without using repeaters or fiber optic cabling.

Single Loop Advantages

- The IQ-INT 3 can send and receive data slightly faster using a single loop.
- "Real-time" levels can be displayed for a greater number of units.

The IQ-INT 3 is designed to work with inexpensive twisted-pair wire, so it implements the IQ Bus as a 20-milliamp current loop operating at a baud rate of 38,400. If you want to use fiber optic cabling, contact Crown's Technical Support Group for information on the appropriate transceivers.

Here are some guidelines for twisted-pair wiring:

- **An IQ Bus loop must be unbroken** to carry commands and data to and from connected units.
- **Never cross-connect IQ Bus loops.** Each IQ Bus loop is an independent serial communication circuit. An IQ Bus output is connected to the input of the first IQ component on the loop. Each unit's output connects to the next unit's input until the loop returns to the interface where it is connected to the input for the same loop.

- **Use twisted-pair wire** at least 26 AWG in size. Use twisted-pair wire **with a shield** when interference is a concern. The wire should be of good quality and should have low capacitance (30 picofarads/foot or less). In most cases, interference is not a problem and unshielded wire is a better choice because of its lower capacitance. When used with the IQ Bus, a shield serves two purposes: it helps prevent data signals from being transmitted to nearby audio wiring, and helps prevent high external RF levels from interfering with data transmissions. If you must install shielded wire, use a low-capacitance shielded data wire.
- **The total capacitance for each loop should be 30 nanofarads or less.** Add up the loop's total capacitance based on the wire's rating in picofarads per foot, and allow approximately 60 picofarads for each connected IQ component. Experience has shown that loops with 50 or more components usually require at least one repeater.

IQ Bus: 20mA Current Loop

Loop Calculator

Loop Capacitance =

[(Wire Length (in ft.)) X (Capacitance of Wire per foot (in pf/ft))] + [(Number of IQ components On Loop) X (60 pf)]

Loop Capacitance =

[(Wire Length (in Meters)) X (Capacitance of Wire per meter (in pf/M))] + [(Number of IQ components On Loop) X (60 pf)]

A Harman International Company

- **Add an IQ Repeater** for long loops greater than 1,000 feet (305 m) or when required by high-capacitance wire. Although repeaters are recommended for loops longer than 1,000 feet, it is often possible to set up reliable loops of 2,000 feet (610 m) or more without a repeater. Although we recommend shielded wire, unshielded wire typically has less capacitance and can support longer loops.
- **Never use the ground wire in a mic snake.** At times, it may be convenient to run IQ Bus data signals to and from stage monitor amplifiers along unused wires in a mic snake. If this is done, do not use the ground wire which is normally connected to pin 1 on an XLR connector, or data noise will be added to the audio lines. Use only the signal lines which normally connect to pins 2 and 3 of the XLR's. Note: Because typical mic cables have higher capacitance, the maximum possible IQ Bus loop will be shorter than low-capacitance twisted-pair wire.

Outside RF interference is seldom a problem for an IQ Bus loop—especially if shielded twisted-pair wire is used. However, there are extreme situations when fiber optic wiring is recommended. For example, locating an IQ Bus loop next to an AM radio transmission line may require fiber optic transceivers and cabling. It may also be more practical to use fiber optics for extremely long IQ Bus loops when distances exceed several miles.

Three different types of connectors are used for IQ Bus wiring on IQ components. These include RJ-45 connectors, DIN connectors and removable terminal block connectors. The IQ-INT 3 uses RJ-45 connectors that accept standard RJ-45 plugs like the one shown in Figure 3.2, allowing the use of industry-standard straight-thru type network cables for input and output wiring.

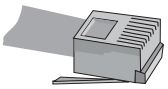


Figure 3.2 RJ-45 Plug

Figures 3.3 through 3.7 show how to connect IQ components the IQ Bus inputs and outputs.

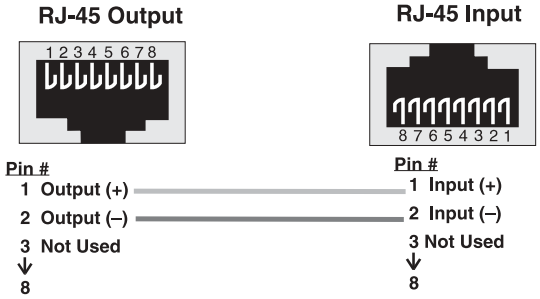


Figure 3.3 RJ-45 Output to RJ-45 Input

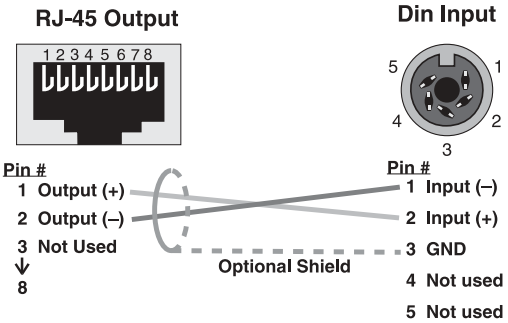


Figure 3.4 RJ-45 Output to Din Input

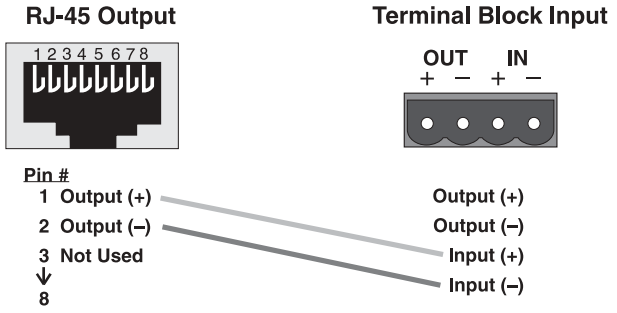


Figure 3.5 RJ-45 Output to Terminal Block Input

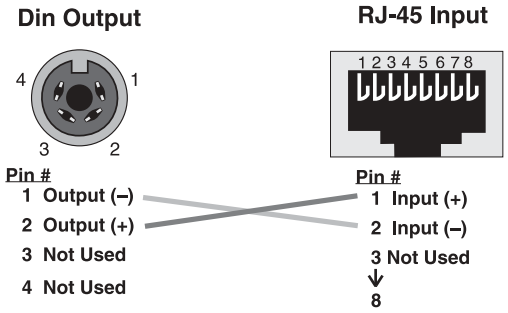


Figure 3.6 Din Output to RJ-45 Input

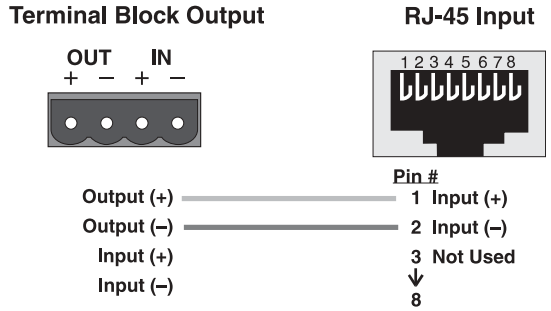


Figure 3.7 Terminal Block Output to RJ-45 Input

The IQ components on each IQ Bus loop are connected in succession. Each loop begins and ends with the IQ-INT 3. The output of the interface connects to the input of the first unit, then each unit's output is connected to the next unit's input until the loop returns to the interface. This is shown in Figure 3.9.

3.2 Connecting to a Host Computer

RS232 is the communication standard supported by the IQ-INT 3 for serial communication with a host computer.

RS232 is commonly used with IBM® PCs and compatibles. Because it uses unbalanced signal wiring, it cannot be used for distances over 50 feet (15.2 m). You can use an RS232-to-RS422 adapter for serial communication across distances of greater than 50 feet (15.2 m). Contact the Crown Technical Support Group if you need more information about using an RS232-to-RS422 adapter.

Figure 3.8 shows how to connect the IQ-INT 3 to the host RS232 serial port.

IMPORTANT: The host computer serial interface must have a 16550-compatible UART.

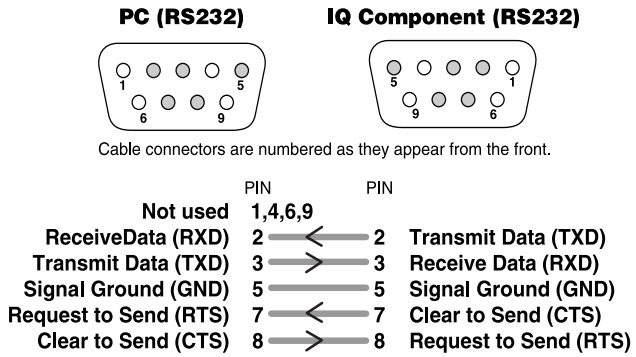


Figure 3.8 RS232 Cable Wiring

3.2.1 Connecting to a Modem

The IQ-INT 3 is also modem compatible. The IQ-INT3 periodically sends out an "AT" command string {ATS0=1} that automatically initializes a connected modem to its max baud rate and auto-answer mode. A standard null modem cable should be used between the interface and modem. Refer to the diagram in Figure 3.10 for modem wiring detail. Figure 3.11 shows an example IQ System with a modem.

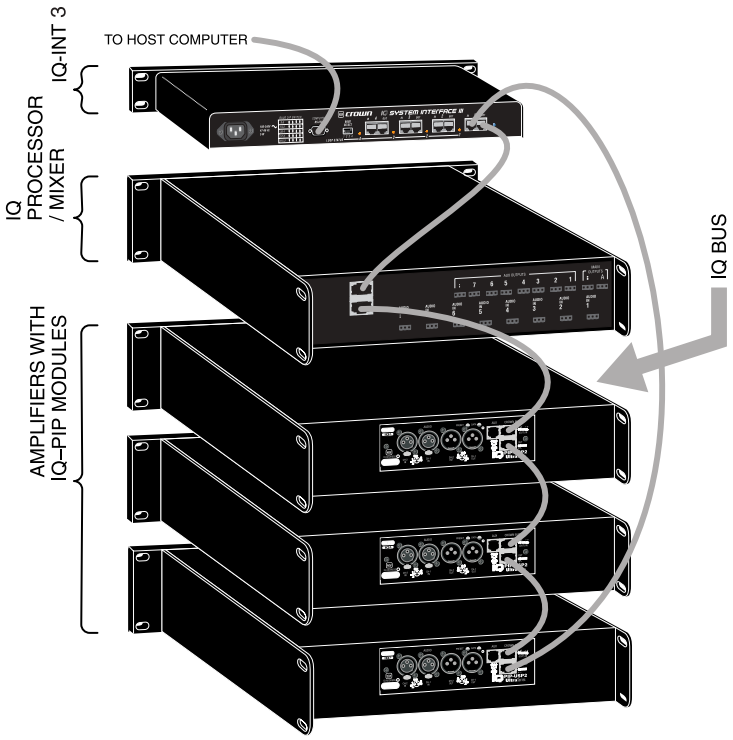


Figure 3.9 IQ Bus Wiring "Loop" from Output to Input of Each IQ Component

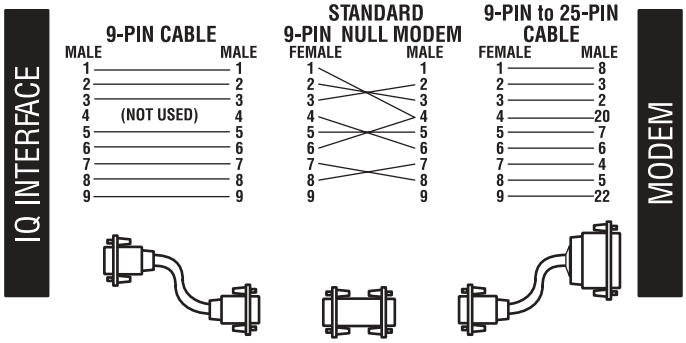


Figure 3.10 Modem Hookup

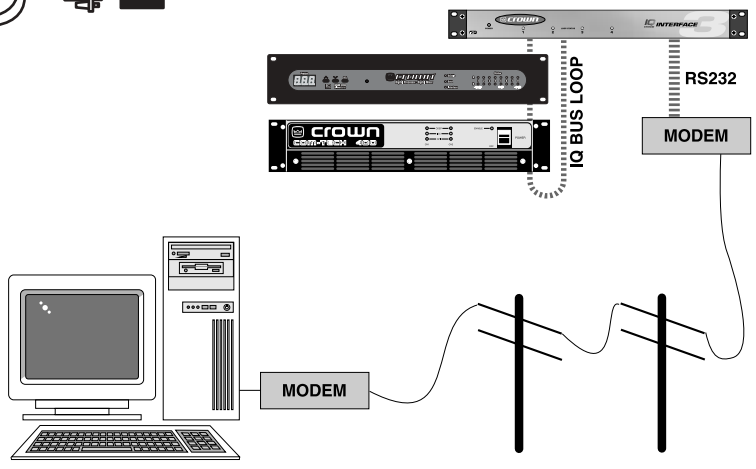


Figure 3.11 IQ System with a Modem

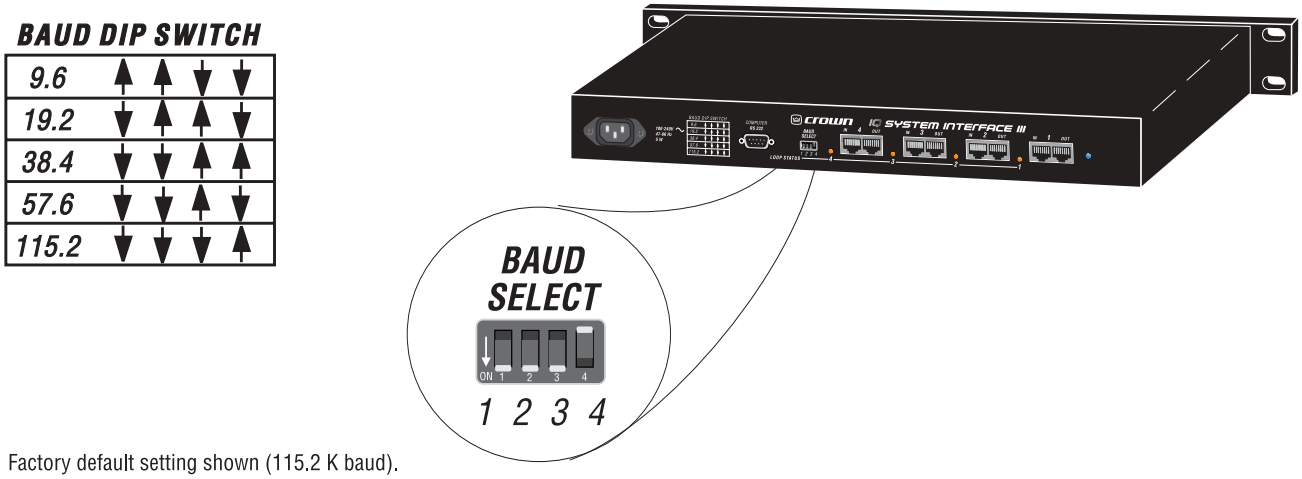


Figure 3.12 Baud Rate Settings for the IQ-INT 3

3.2.2 Baud Rate Setting

IMPORTANT: Be sure to disconnect the AC power from the unit before changing the communication standard or parameters.

Setting the baud rate for RS232 serial communication is accomplished using the four-segment DIP switch shown in Figure 3.12. Switch settings for all possible baud rate settings are shown in the table in Figure 3.12. Use the fastest baud rate possible.

IMPORTANT: The communication standard and parameters of the IQ-INT 3 and the host computer must be the same. Any mismatch will prevent communication from taking place.

The communication parameters of the host computer are set automatically by IQ for Windows software. Please refer to the IQ for Windows documentation for details.

IMPORTANT: The IQ-INT 3 is compatible with IQ for Windows, version 5.0 or newer. Older versions of the software cannot recognize the interface. For the most current version of IQ for Windows software, visit www.iqaudiosystems.com.

Here are some important guidelines when configuring serial communication:

- The IQ-INT 3 should be set at one baud rate below the host computer (refer to the *IQ for Windows* documentation). The IQ-INT 3 can be set as high as 115.2 K baud. Use the highest baud rate possible, but be aware that the communication circuitry (UART) in some PC's cannot function over 9600 baud. We strongly recommend using a host computer serial interface with a 16550-compatible UART.
- Do not use twisted-pair wire for RS232 cables because the unbalanced wiring of RS232 is susceptible to crosstalk. Instead use an untwisted cable, ribbon cable, or a certified RS232 cable.
- If the host computer fails to communicate or reports communication errors with the IQ-INT 3 and the communication standard and parameters are identical, try reducing the baud rate for the interface and the computer. This may be especially useful when configuring for communication via modem. **IMPORTANT: The IQ-INT 3 should be set at one baud rate slower than the modem is set for accurate communication. (Example: 38.4 K modem, set the IQ INT 3 at 19.2 K.)**
- If communication problems persist, check the serial cable for improper wiring or possible shorted or broken wires.
- For further assistance, refer to the *IQ for Windows* documentation, or contact Crown's Technical Support Group.

4 Technical Information

The purpose of the IQ-INT 3 is to provide a means for the IQ System host computer to communicate with the IQ components. The interface supports the RS232 serial data standard. It accepts host computer communication rates from 9,600 to 115,200 baud, and can drive up to four independent IQ Bus loops for a high level of fault tolerance. In addition, the IQ-INT 3 supports both the original IQ System and the newer IQ^2 (Ucode) protocols, and it provides Crown's own robust network transport layer.

Figure 4.1 shows a block diagram of the IQ-INT 3.

The interface is equipped with an auto-reset feature. The microprocessor generates an auto-reset signal that can be used as a reliable power-on reset and an automatic "warm" reset in case control is lost due to noise or other anomalies.

The baud rate for communication with the host computer is determined by the baud rate generator which is controlled by a four-segment DIP switch (SW1).

The interface's microprocessor communicates with other IQ components using its internal UART to drive each loop at 38,400 baud.

Data from the host computer arrives at the IQ-INT 3 serial port which accepts the RS232 data standard. From here the signal goes to the serial input, Sci1 (Rx) of the microprocessor. Next, the interface takes care of any required checksum calculations and other transport layer processing. Finally, all of the data bytes are dumped out the microprocessor's Sci0 port (the Tx. pin) at 38,400 baud.

The microprocessor controls the input and output selectors that control which loop will receive data. Data sent to the selected line driver, which sends the data onto the current loop to the appropriate IQ component.

The line receiver takes incoming data from IQ components and sends it through the input selector to the microprocessor's Sci0 input Rx. pin. The microprocessor stores the data in memory and handles the required transport layer processing. The remaining protocol data is then sent to the serial output buffer for transmission to the host computer via the Sci1 (Tx.) pin.

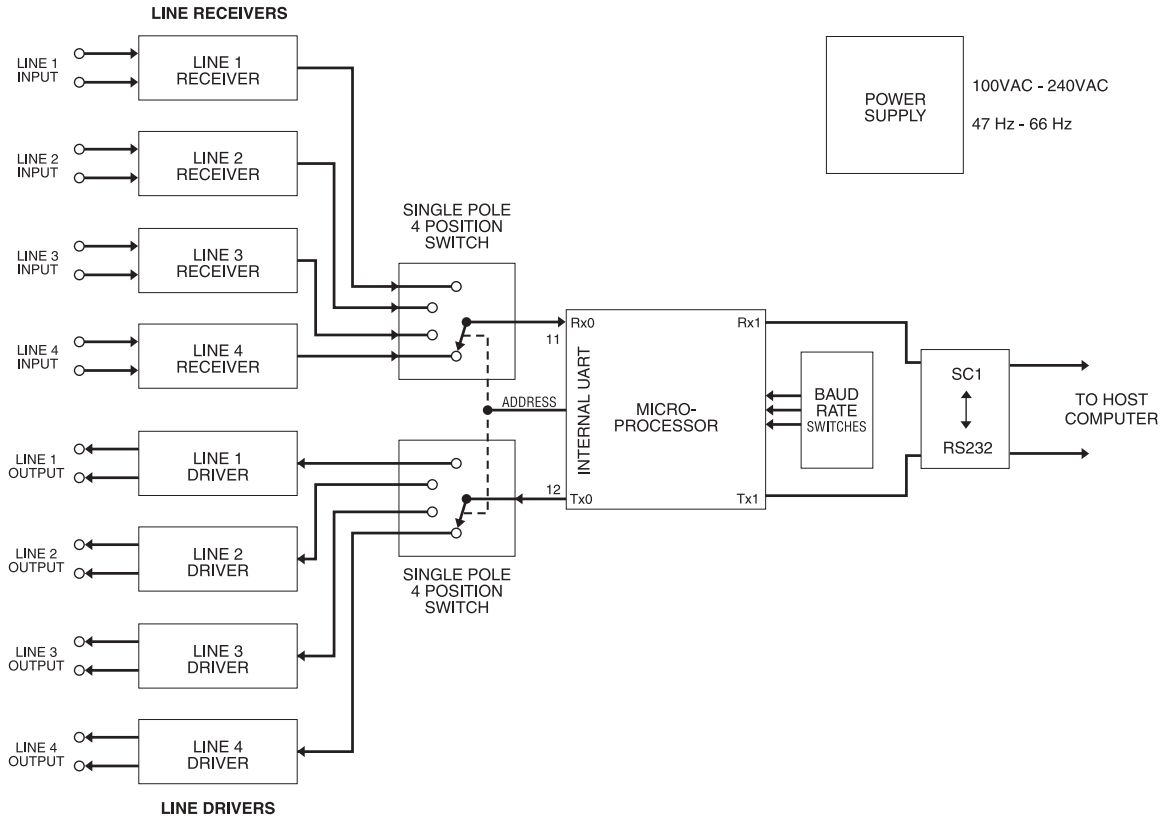


Figure 4.1 IQ-INT 3 Block Diagram

5 Specifications

General

Controls: A four-segment DIP switch located on the rear panel is used to configure the data rate for communication with the host computer. Factory default setting is 115,200 baud.

Connectors: IQ Bus Input: Four RJ-45 connectors. IQ Bus Output: Four RJ-45 connectors. (The IQ Bus Input and Output connectors are grouped in pairs to accommodate four different loops.) Computer: Female 9-pin "D-shell" connector. AC Power: IEC320 connector for AC power cord. All connectors are located on the rear panel.

Indicators: A blue front and rear panel Power indicator shows that the unit is plugged in and receiving power. Yellow front and rear panel indicators for each IQ Loop show loop data activity.

Power Supply: Universal input switching power supply.

Power Requirements: 100VAC to 240VAC, 47 Hz to 66 Hz.

Power Consumption:

	60 Hz	50 Hz
100VAC	3.70W	3.71W
120VAC	3.92W	3.92W
220VAC	5.03W	5.03W
230VAC	5.23W	5.18W
240VAC	5.59W	5.41W

Crown Bus Data Communication

Protection: The auto-reset feature is controlled by the microprocessor. Optically coupled 20-milliamp current loop receivers provide ground isolation.

Data Rate: 38.4 K baud.

Data Format: Asynchronous binary serial data with 1 start bit, 1 stop bit, 8 data bits and no parity check.

Interface Type: 20-milliamp current loop.

Operation: Half duplex.

Intelligence: 16-bit microprocessor.

Transmission Distance: Variable up to 3,000 feet (914 meters) depending on wire capacitance. 1,000 feet (305 meters) is typical with shielded 26 AWG twisted pair wire. IQ repeaters or fiber optic transceivers can be used to cover greater distances.

Host Computer Data Communication

Data Rate: 9,600, 19,200, 38,400, 57,600 or 115,200 baud.

Data Format: Asynchronous binary serial data with 1 start bit, 1 stop bit, 8 data bits and no parity check.

Interface Type: RS232.

Operation: Half duplex.

Data Buffer: 255 bytes.

Intelligence: 16-bit microprocessor.

RS232 Transmission Distance: 50 feet (15.2 m).

Mechanical

Finish: Charcoal powder-coated steel chassis and front panel with Lexan® front and rear overlays.

Dimensions: 19-inch (48.3 cm) standard rack mount width (EIA RS-310-B), 1.75-inch (4.4 cm) height and 6.5-inch (16.5 cm) depth.

Weight,
Net: 6 lbs., 4 oz (2.8 kg);
Shipping: 9 lbs., 5 oz (4.21 kg).

6 Service

Crown IQ products are quality units that rarely require servicing. Before returning your unit for servicing, please contact Crown Technical Support to verify the need for servicing.

This unit has very sophisticated circuitry which should only be serviced by a fully trained technician. This is one reason why each unit bears the following label:

CAUTION: To prevent electric shock, do not remove covers. No user serviceable parts inside. Refer servicing to a qualified technician.

6.1 Worldwide Service

Service may be obtained from an authorized service center. (Contact your local Crown/Amcron representative or our office for a list of authorized service centers.) To obtain service, simply present the bill of sale as proof of purchase along with the defective unit to an authorized service center. They will handle the necessary paperwork and repair.

Remember to transport your unit in the original factory pack.

6.2 US and Canada Service

Service may be obtained in one of two ways: from an authorized service center or from the factory. You may choose either. It is important that you have your copy of the bill of sale as your proof of purchase.

6.2.1 Service at a US or Canada Service Center

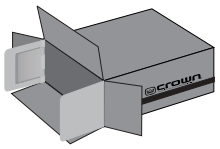
This method usually saves the most time and effort. Simply present your bill of sale along with the defective unit to an authorized service center to obtain service. They will handle the necessary paperwork and repair. Remember to transport the unit in the original factory pack. A list of authorized service centers in your area can be obtained from our Technical Support Group.

6.2.2 Factory Service

To obtain factory service, fill out the service information page found in the back of this manual and send it along with your proof of purchase and the defective unit to the Crown factory.

For warranty service, we will pay for ground shipping both ways in the United States. Contact Crown Factory Service or Technical Support to obtain prepaid shipping labels prior to sending the unit. Or, if you prefer, you may prepay the cost of shipping, and Crown will reimburse you. Send copies of the shipping receipts to Crown to receive reimbursement.

Your repaired unit will be returned via UPS ground. Please contact us if other arrangements are required.



Always use the original factory pack to transport the unit.

Factory Service Shipping Instructions

1. Before sending a Crown product to the factory for service, first call the Crown Service Department for a return authorization (RA) number.
2. Be sure to fill out the service information form that follows and enclose it with your shipment, either inside the box or in a packing slip envelope *securely attached* to the outside of the shipping carton. Do not send the service information form separately.
3. To ensure the safe transportation of your unit to the factory, ship it in an original factory packing container. If you don't have the original carton, you may obtain a product service foam-in-place shipping pack from the Crown Factory Service Department at the number listed below. For non-warranty service, you may also provide your own shipping pack. Minimum recommended requirements for materials are as follows: 275 P.S.I. burst test Double-Wall carton that allows for 2-inch solid Styrofoam on all six sides of unit or 3 inches of plastic bubble wrap on all six sides of unit; securely seal the package with an adequate carton sealing tape. **Do not use light boxes or "peanuts." Damage caused by poor packing cannot be covered under warranty.**
4. Do not ship the unit in any kind of cabinet (wood or metal). Ignoring this warning may result in extensive damage to the unit and the cabinet. Accessories are not needed—do not send the product documentation, cables and other hardware.

If you have any questions, please call or write the Crown Technical Support Group.

Crown Customer Service

Technical Support / Factory Service
Plant 2 SW, 1718 W. Mishawaka Rd., Elkhart, Indiana 46517 U.S.A.

Telephone: 574-294-8200
800-342-6939 (North America, Puerto Rico, and Virgin Islands only)

Facsimile: 574-294-8301 (Technical Support)
574-294-8124 (Factory Service)

Internet: http://www.crownaudio.com
Email: technicalsupport@crownintl.com

Crown Factory Service Information

Shipping Address: Crown Factory Service, 1718 W. Mishawaka Rd., Elkhart, IN 46517
Phone: 1-800-342-6939 or 1-574-294-8200 Fax: 1-574-294-8124

Owner's Name: _____

Shipping Address _____

Phone Number:_____ **Fax Number:** _____

Email: _____

Model: _____ **Serial Number:** _____

Purchase Date: _____

NATURE OF PROBLEM

(Be sure to describe the conditions that existed when the problem occurred and what attempts were made to correct it.)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Other equipment in system: _____

_____

_____

_____

IF WARRANTY HAS EXPIRED, PAYMENT WILL BE:

❑ **Cash/Check** ❑ **VISA** ❑ **MasterCard** ❑ **C.O.D.** ❑ **Purchase Order for Crown Dealer**

Card Number: _____ **Exp. Date:** _____

Signature: _____

ENCLOSE THIS PORTION WITH THE UNIT. DO NOT MAIL SEPARATELY.