

Instructions for the Computer Operated Network Interface used with IMPACC™ Networks



I.L. 17551

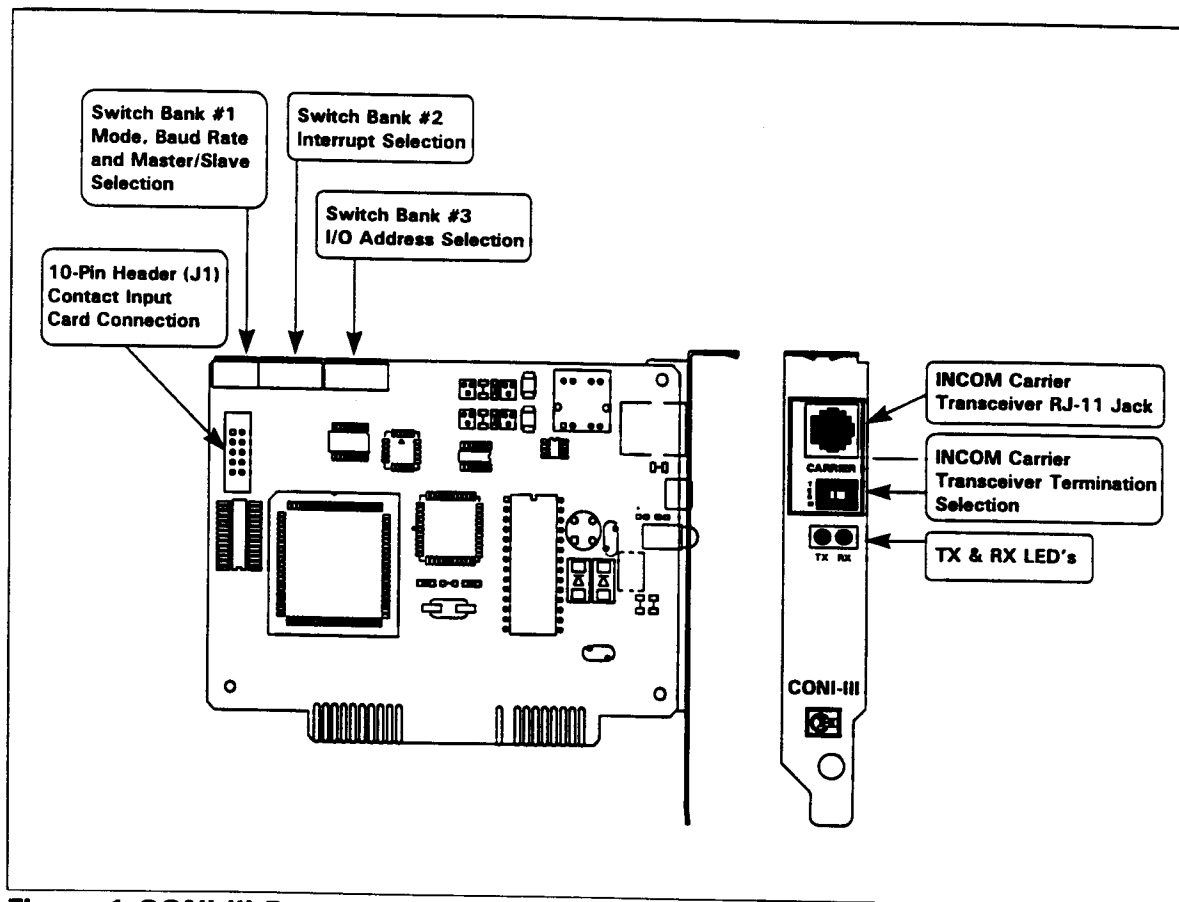


Figure 1 CONI-III Board

THE CONI-III

The Computer Operated Network Interface (CONI-III) is a key communications building block in an INCOM™ based network of industrial products. The CONI-III operates as the network master, i.e., the network is directed and controlled via this product in a PC.

A CONI-III installed in an 8-bit ISA slot of an IBM compatible PC provides a simple to use interface between the CONI-III and an INCOM™ carrier network. The user would access INCOM™ products using software operating on the PC. This type of interface gives the user access to many types of PC compatible devices, and a wide body of software. This also gives the user much flexibility in the implementation of an INCOM™ network.

The CONI-III is compatible with all previous versions of CONI's and may be used as a replacement for existing equipment. The CONI-III can also operate in an advanced mode that buffers both transmit and receive messages. This enables groups of commands to be processed very quickly. The small size of the CONI-III requires less than half the physical space of the existing CONI.

USER INTERFACES

On the end plate of the CONI-III, there is an RJ-11 jack, a DIP switch and 2 LED's (see Figure 1). The RJ-11 jack is used to connect the INCOM™ carrier network to the CONI-III. The DIP switch "TERM" selects (on position) or deselects (off position) a 100Ω termination resistor for the INCOM™ carrier network. The resistor is required if the PC is at the end of a single data line network, it is not required if the PC is connected to more than 1 data line (Refer to I.L. 17513 for more information). The two LED's indicate network activity. "TX" indicates the CONI-III is transmitting a message, and "RX" indicates it is receiving a message.

ISA INTERFACE

The details of the CONI-III to ISA interface can be found in Section 6 of I.L. 17384. All of the registers read or written by the CONI-III are described in full detail along with a discussion of the two operating modes.

SWITCH SETTINGS

Baud rate, mode, master/slave, interrupt level and I/O address selection are all user selectable via three switch banks on the top edge of the CONI-III.

MODE AND BAUD RATE SELECTION

Switch Bank #1 is used to make the baud rate, mode and master/slave selections (see Figure 2). Switch #1 is used to select between standard CONI-1A mode (MODE 1) and the new message buffering mode (MODE 2). Switch #2 is used to select between 9600 baud and 1200 baud. Switch #3 is used to select between master and slave modes. Slave mode is only available in MODE 2. Switch #4 is not used. The factory default settings are MODE 1, 9600 baud and MASTER.

Replacing a CONI-1A will require setting switch #1 to MODE 1 and setting switch #2 to the baud rate used. Switch #3 and 4 should be "OFF"..

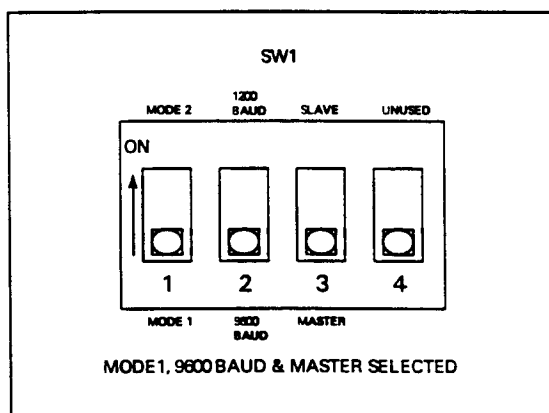


Figure 2 Switch Bank #1 Example

INTERRUPT SELECTION

Switch Bank #2 is used to select the PC interrupt (see Figure 3). The available interrupt options are IRQ3, IRQ4, IRQ5, IRQ7 and IRQ9. An interrupt is selected by placing the switch in the ON position. **Only one interrupt can be selected at any one time.** The factory default setting is IRQ5 selected.

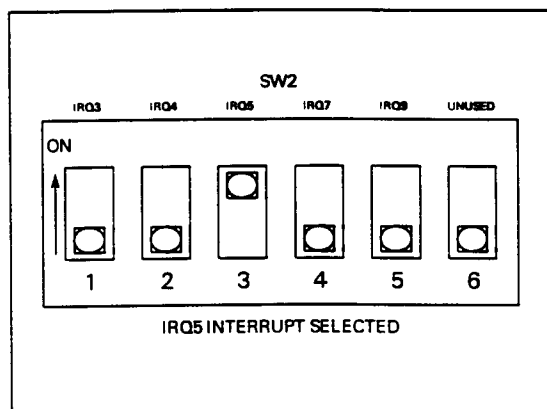


Figure 3 Switch Bank #2 Example

I/O ADDRESS SELECTION

Switch Bank #3 is used to select the base I/O address (see Figure 4). Any base address from 000 (hex) to 3F0 (hex) is available although many of these addresses are used by other devices in the PC (see Table 1 for a list of possible address selections). Address 300 (hex) is the factory default setting and the address used if replacing a CONI-1A.

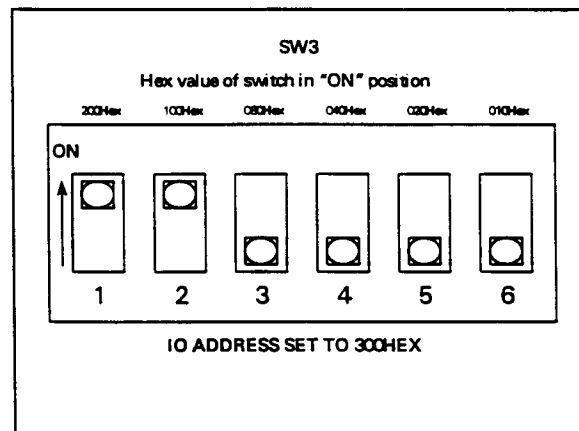


Figure 4 Switch Bank #3 Example

Base I/O Address	SW3					
	1	2	3	4	5	6
390	ON	ON	ON	OFF	OFF	ON
360	ON	ON	OFF	ON	ON	OFF
350	ON	ON	OFF	ON	OFF	ON
340	ON	ON	OFF	ON	OFF	OFF
330	ON	ON	OFF	OFF	ON	ON
310	ON	ON	OFF	OFF	OFF	ON
300	ON	ON	OFF	OFF	OFF	OFF
2A0	ON	OFF	ON	OFF	ON	OFF
290	ON	OFF	ON	OFF	OFF	ON
280	ON	OFF	ON	OFF	OFF	OFF
260	ON	OFF	OFF	ON	ON	OFF
250	ON	OFF	OFF	ON	OFF	ON
240	ON	OFF	OFF	ON	OFF	OFF
220	ON	OFF	OFF	OFF	ON	OFF

Table 1 I/O Address Selections

The I/O address consists of three hexadecimal numbers. The least significant hexadecimal number is not selectable. The middle number is set by positions 3,4,5 and 6. The most significant number is set by positions 1 and 2. If the switch is ON, the hex value it represents is shown above the switch in Figure 1.

CONTACT INPUT CARD CONNECTION

The CONI-III also has a 10 position male header (see Figure 1). This connection labeled J1 is used to add a daughter board to the CONI-III to accept an external contact input into the CONI-III. The daughter board, called the **CONTACT INPUT CARD (CIC)**, accepts a digital input (i.e. a demand synch pulse from a utility) and allows the CONI-III to pass the contact closure to the application software running on the PC. The CIC only works in MODE 2 (see SW1) of the CONI-III, and is completely described in I.L. 17552.

HARDWARE INSTALLATION

The CONI-III is designed to be installed, operated and maintained by adequately trained people. These instructions do not cover all details, variations, or combinations of the equipment, its storage, delivery, installation, check-out, safe operation or maintenance. The installer must comply with local, state and national regulations, as well as safety practices for this class of equipment. Please refer to the IMPACC™ Wiring Specification (T.D. 17513) for more detail.

NOTE: Electrostatic discharge (ESD) can damage a CONI-III. Use ESD precautions when removing or installing the CONI-III from its anti-static bag. When not installed in a PC the CONI-III should be kept in its anti-static bag.

Obtain the following items before installation:

1. Sufficient twisted pair cable (IMPCABLE or Belden 9463 family) to reach from the Modular Interface Adapter to the products in the INCOM™ network..
2. One IBM compatible PC with a spare ISA expansion slot.
3. A Cutler-Hammer CONI-III card with the supplied Modular Interface Adapter and RJ-11 cable.

To install the CONI-III into an ISA slot of an IBM compatible PC, perform the following steps:

1. Set the base address in Switch Bank #3 to a value that is unused by other devices in the PC.
2. Set the interrupt in Switch Bank #2 to an interrupt which is unused by other device in the PC.
3. Setup for mode 1 or 2 operation by setting Switch Bank #1 position #1 to the appropriate position.
Note: The application software you are using must support the mode selected. Contact the software manufacturer for compatibility.
4. Set the baud rate for the main IMPACC™ network by setting Switch Bank #1 position #2 to the appropriate position.
5. Setup for master or slave operation by setting Switch Bank #1 position #3 to the appropriate position. (Master mode is used for all but a few applications. Slave mode is only available in MODE 2. The address for slave mode applications is FFF (hex).)
6. With the PC power OFF, install the CONI-III in the PC. (Remove the CONI-III with power off as well)
7. Screw the CONI-III board bracket down to the PC case.

To connect the CONI-III to the INCOM™ carrier network, perform the following steps (see Figure 5):

1. Attach one of the network wires to terminal number 2 of the Modular Interface Adapter.

2. Attach the other network wire to terminal number 5 of the Modular Interface Adapter.
NOTE: In this case, polarity of the network is not important.
3. Attach the shield of the network cable to one of the spare terminals of the Modular Interface Adapter.
4. Attach one end of the supplied RJ-11 cable to the RJ-11 jack on the CONI-III, accessible from the back of the PC.
5. Attach the other end of the RJ-11 cable to the Modular Interface Adapter.

The PC system with installed CONI-III is now physically tied into the INCOM™ carrier network. Provided the proper software is installed in the PC, the CONI-III is ready to begin operating.

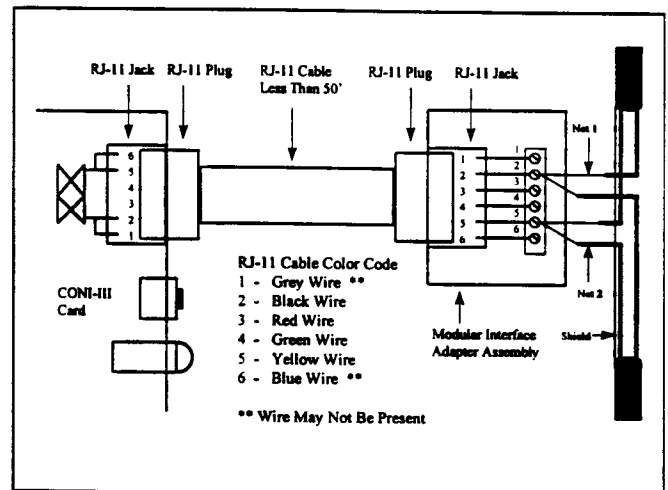


Figure 5 Modular Interface Adapter

CONI-III SERVICING

In the unlikely event that there is a problem with the INCOM™ carrier network and it is suspected that the CONI-III is the problem try the following items:

1. Check the network connections.
2. Check the baud rate selection.
3. Check the interrupt level selection.
4. Check the base address selection.
5. Check the application software installation and device configuration.
6. Change the interrupt level of the CONI-III.
7. Observing ESD precautions, remove and replace the CONI-III in the PC card slot.
8. If this does not solve the problem, check the CONI-III's LED's located at the rear of the PC, while the application software is running. If the LED's never light or are constantly on, the CONI-III card may need servicing.

There are no user serviceable parts on the CONI-III. The user should not attempt servicing this equipment. Please contact your local Cutler-Hammer representative or the Cutler-Hammer Advanced Product Support Center for service information or additional questions regarding the CONI-III or any other IQ/IMPACC™ product.

CONI-III COMPATIBILITY

The following table shows most of the IMPACC™ and INCOM™ products that are compatible with the CONI-III. The table separates products into four groups. The groups are products that require an I-PONI for communications, products that require a B-PONI for communications, products that require a W-PONI for communications and products that don't require a PONI for communications.

I-PONI (Style Number 8793C38G01)		
• AEM II	• IQ 1000 II	• IQ Data Plus II
• AF 95	• IQ Analyzer	• IQ Data Plus II HV
• AF 97	• IQ CED II	• IQ Generator
• BIM	• IQ Data	• IQ Transfer
• CMU	• IQ Data Plus	• MMCO Relay
• IQ CED		
B-PONI (Style Number 8793C35G01)		
• AEM (TSF Mode)	• IQ 500	• URTD Module
• IQ 1000		• Accutrol 400
No PONI Required		
• Addressable Relay II	• Digitrip OPTIM	
• Alarm Relay	• Digitrip RMS	
• Breaker Controller	• IQ Energy Sentinel	
• Digitrip MV		
W-PONI (Style Number 2D79735G04)		
• ACM	• Advantage	

Table 2 CONI-III Compatibility Guide

CONI-III SOFTWARE COMPATIBILITY

The CONI-III is compatible with each of the following software programs:

- IMPACC Series III Software
- DrIMPACC IMPACC Network Diagnostic
- IMPACC Modbus Gateway Interface
- IMPACC Energy Logging Software
- IMPACC Ethernet Gateway

SIMPLIFIED WIRING RULES

The following simplified rules apply given a system consisting of a single daisy chained main cable link between master and slave devices. For more complex considerations including star configurations please refer to the IMPACC™ Wiring Specification or the APSC for wiring instructions and system capacity considerations. The IMPACC™ Wiring Spec is T.D. 17513 or FRED (Fax Retrieval of Engineering Documents) Document 17513.

- The maximum RJ-11 cable length is 50 feet.
- The maximum system capacity is 10,000 feet of communications cable and 1000 slave devices.
- Main cable link must be terminated at each end by a 1/4 watt, 100Ω, carbon resistor. When the CONI-III is at an end of the line, place the switch on the end plate in the ON position to terminate the line.
- Non terminated taps, up to 200 feet in length, off the main link are permitted, but add to the total cable length.
- Make sure that there is a twisted wire pair present that is intended for IMPACC™ network use. Use shielded twisted pair wire (IMPCABLE or Belden 9463 family) to connect each slave device to the IMPACC™ network, daisy-chain style. The polarity of the twisted pair is not important.

CONTACT PHONE NUMBERS

APSC	1-800-809-2772
	412-494-3750
APSC BBS	412-494-3746
FRED	412-494-3745
(When using FRED dial the number from the handset of your fax machine.)	

Drawing Number 8793C71H01

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