Instructions for Master INCOM Network Translator II
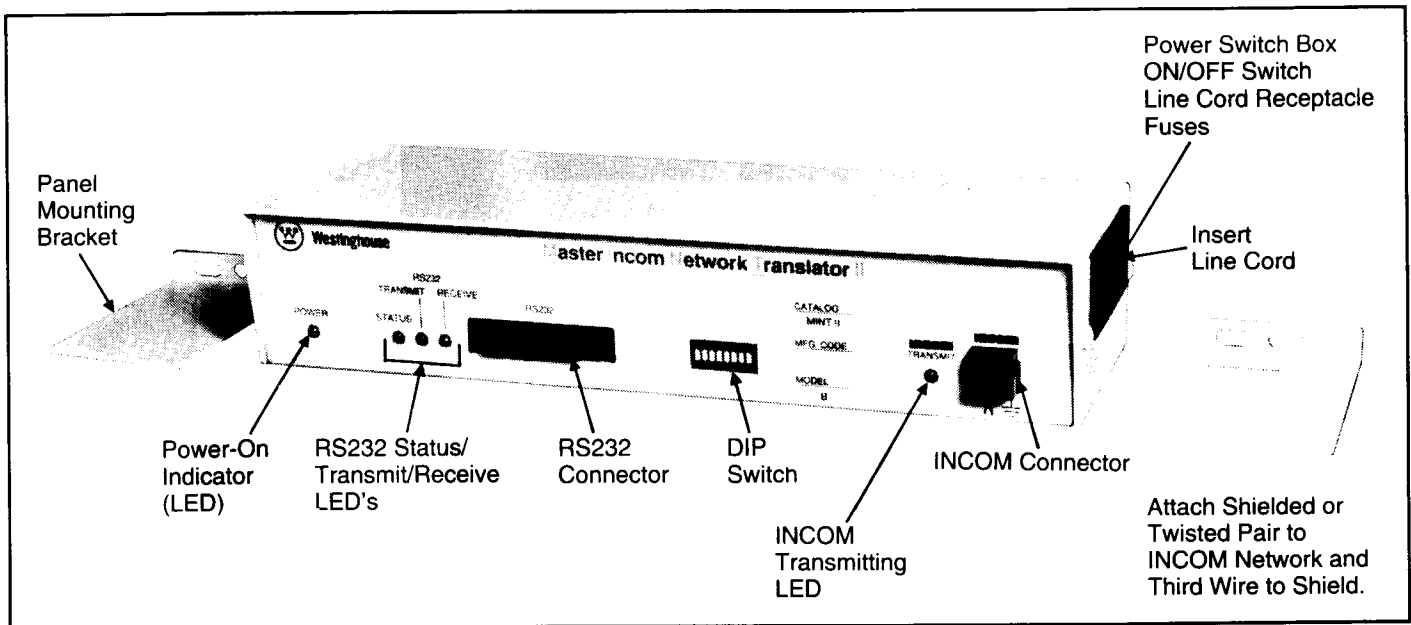
Fig. 1   Master INCOM Network Translator II

Reference Documents: (1) RS232C/INCOM Network Protocol Manual and (2) EIA Standard RS232C

DEFINITIONS

IMPACC = The Westinghouse communications system, which includes computer interface cards, WPONI modules, INCOM network, Advantage motor controllers, twisted wire, IQ products, etc.

INCOM = The network that is part of the IMPACC system

MINT = Master INCOM Network Translator
(MINT's exist as Model A and Model B versions.)

MASTER INCOM NETWORK TRANSLATOR II

The Master INCOM Network Translator version 2, Model B (MINTII) (depicted in Figure 1) translates a Westinghouse INCOM network signal to and from a 10-character ASCII encoded RS232 message. See Figure 2.

A MINTII includes the following additional items:
Instruction Leaflet
Plug-in Line Cord
Three-Wire INCOM connector
Panel Mounting Brackets
Panel Mounting Screws

INSTALLATION

This device is designed to be installed, operated, and maintained by adequately trained workmen. These instructions do not cover all details, variations, or combinations of the equipment, its storage, delivery, installation, check-out, safe operation, or maintenance. Care must be exercised to comply with local, state, and national regu-
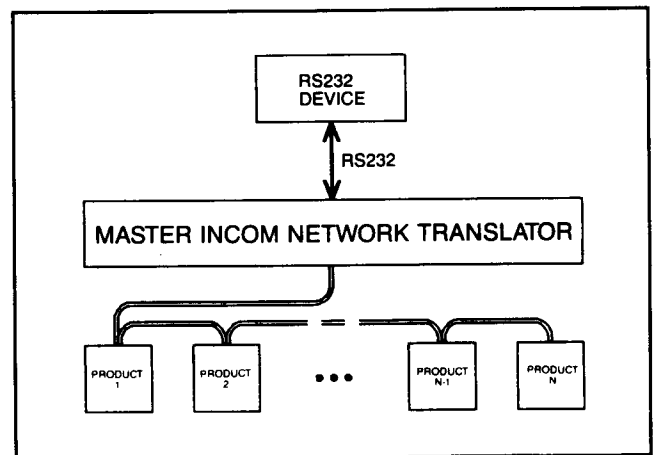

Fig. 2   Network Interwiring

lations, as well as safety practices, for this class of equipment.

The individuals installing, maintaining and troubleshooting a MINTII installation should be familiar with RS232 terminology, protocol and conventional abbreviations.

The MINTII may be installed on a flat surface or attached to a vertical surface or panel. See Figure 3.

FEATURES

The MINTII has a female 25-pin "D" size subminiature connector which allows the connection of the MINTII to
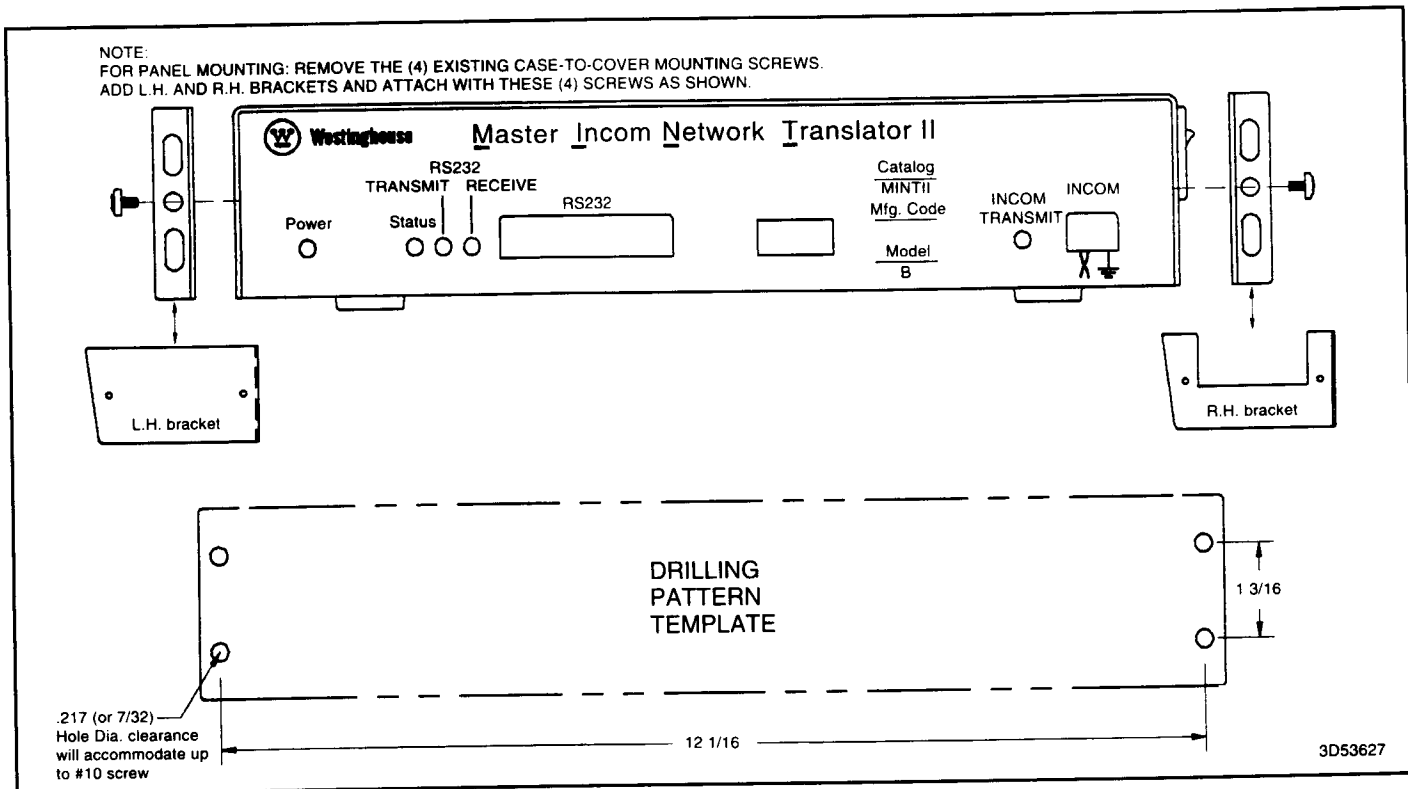
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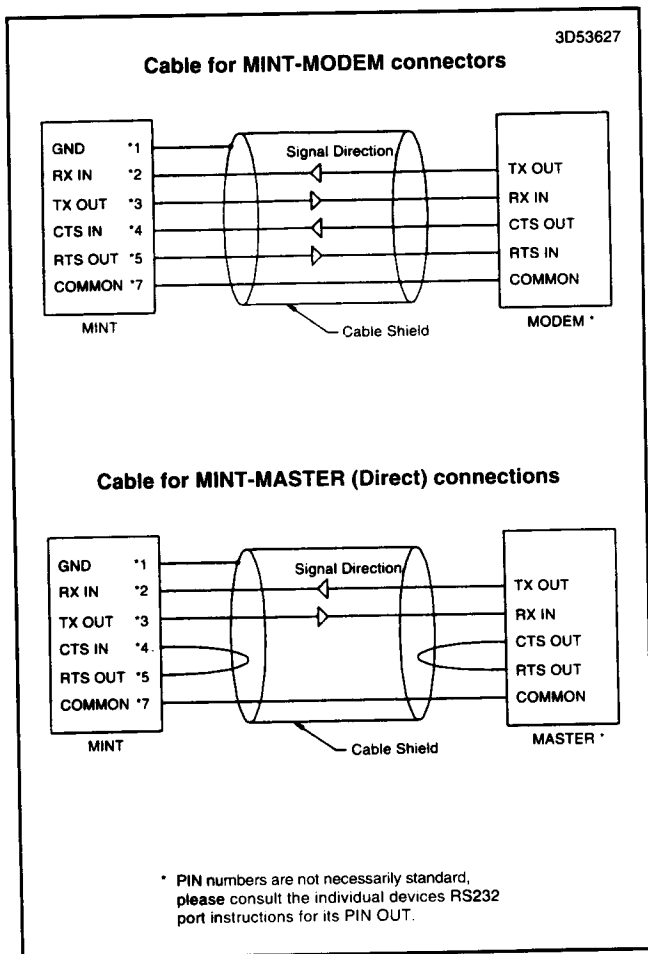*Fig. 3   Panel Mounting for MINTII (Dimensions are in inches)*

Fig. 4   MINTII Cable Connections

any RS232 device. This allows many different types of controllers to be the IMPACC master, including personal or mainframe computers, programmable controllers, workstations, or modems which allow the control of the INCOM network from a distance. A typical configuration for the MINTII is pictured in Figure 2.

Circuit isolation is maintained between the RS232 channel, the INCOM channel and the incoming 115-120 VAC power. If the ground connections shown in Figure 4 cannot be maintained, consult the Westinghouse Advanced Product Support Center (A PSC) at 1-800-542-7883.

ELECTRICAL CONNECTIONS

After mounting the MINTII make the following electrical connections:

a. To a male 25-pin "D" size subminature connector for the RS232 port, as follows.

Pin #1 – Chassis Ground

Pin #2 – Receive Data (RX IN) – This is data input to the MINTII.

Pin #3 – Transmit Data (TX OUT) – This is data output from the MINTII.

Pin #4 – Modem Control In; this is an input to the MINTII. See * below.

Pin #5 – Modem Control Out; this is an output from the MINTII. See * below.

Pin #7 – Signal Common.

* Because the MINTII can attach to a data terminal OR to a modem it has to behave in two distinctly different ways.

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1) When the MINTII is attached to a data terminal device, the MINTII will behave as a modem and the output pin (#5) of the MINTII will look like Clear-to-Send (CTS) signal to the terminal. This adds little value to an application and should be disabled. *Dipswitch #5 should be set to the ON position.*

2) When the MINTII is attached to a modem, the MINTII behaves as a data terminal. This is so that the MINTII may be used in remote applications. The MINTII will signal "Request to Send" (RTS) on its output pin (#5) and will wait to transmit until it sees a CTS on its input pin (#4). *Dipswitch #5 should be set to the OFF position.*

b. To the INCOM network, using shielded conductors whenever possible, via a twisted or untwisted pair, connected as a daisy chain. Connect the third wire to the shield.

c. To a 115-120 VAC, 60 Hz, single-phase source of control power.

d. Set each of the seven switches on the eight-position DIP switch shown in Figure 5. Switch 8 is not used.

1) Choose the RS232 baud rate according to the software and hardware capabilities of the device to which the MINTII will connect.

2) Choose the INCOM baud rate. All devices that connect to the same network as this MINTII must be the same baud rate.

3) Choose the number of stop bits. When the MINTII is replacing the original MINT, 2 stop bits is correct. In most other applications it is desirable to use 1 stop bit.

4) Select whether or not RTS/CTS is used. In most applications, especially 3 wire (RX, TX, COMMON) RTS/CTS is not used. In some modem applications, RTS/CTS is used to switch the carrier on and off.

5) Select the usage of the ACK/NACK byte. When the MINTII is replacing the original MINT, ACK/NACK being sent is correct. In most other applications, it is desirable not to send the ACK/NACK byte. This byte signals the host that the MINTII has received a valid RS232 message.

6) Select the usage of the handshake byte. When using the MINTII in situations where high baud rates are desirable, but the host cannot remove the incoming data from the serial buffer faster than the MINTII can send the data, the handshake byte may be desirable. Host software should always accept the data from the serial port as fast as possible. Most applications will not use the handshake byte.

OPERATION

Turn on the Power switch on the side of the MINTII.

Observe that the POWER LED light is full on and that the STATUS LED light blinks on and off approximately every second. The MINTII is ready to communicate.
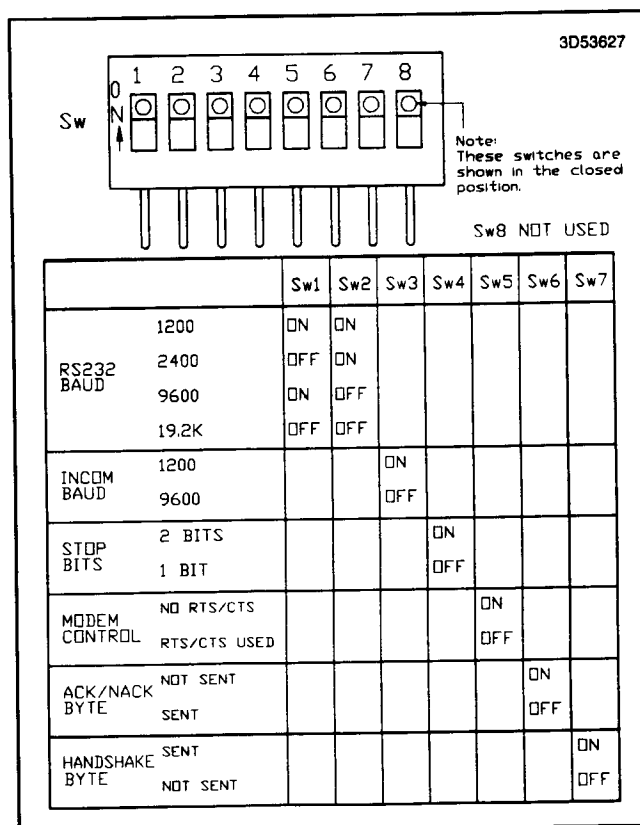

Fig. 5   Dip Switch Settings

		Sw1	Sw2	Sw3	Sw4	Sw5	Sw6	Sw7
RS232 BAUD	1200	ON	ON					
	2400	OFF	ON					
	9600	ON	OFF					
	19.2K	OFF	OFF					
INCOM BAUD	1200			ON				
	9600			OFF				
STOP BITS	2 BITS				ON			
	1 BIT				OFF			
MODEM CONTROL	NO RTS/CTS					ON		
	RTS/CTS USED					OFF		
ACK/NACK BYTE	NOT SENT						ON	
	SENT						OFF	
HANDSHAKE BYTE	SENT							ON
	NOT SENT							OFF

COMMUNICATIONS

Protocol: The MINTII uses a ten character ASCII protocol. (See I.L.17384, "IMPACC Communication Specification," which describes the IMPACC protocol and all the communications functions available in an IMPACC system and IMPACC compatible products.) A transmitted character has 8 data bits, no parity, and 1 or 2 stop bits depending on the configuration.

Buffering: The MINTII will buffer all incoming messages from the INCOM network. The user can set the baud rates on either system without worrying about losing data.

Handshaking: Handshaking has been implemented per the RS232 specification. Model A MINT compatability is affected by this fact. In three-wire applications where the Model A MINT was used, the Handshaking option should be disabled by setting DIP switch position #5 to the ON position.

RS232 Notes: RTS/CTS is not used for flow control as in the Model A MINT. The MINTII can accept all ten characters at 19.2 Kbaud. The protocol does not send a second message from a master without first

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COMMUNICATIONS (cont.)

receiving a reply from a network slave. Where two consecutive messages are required in a row without a reply, one millisecond is required between messages. This one millisecond gap is also an IMPACC product requirement.

Transmit-on and transmit-off (XON/XOFF) flow control cannot be initiated by the MINTII, but can be activated by the RS232 master for large high-speed buffer dumps. It is a better practice to design the master RS232 software for full speed communications which will also increase the overall system throughput.

MODEL A VERSUS MODEL B MINTS

A MINTII (Model B) differs from a Model A MINT in that in the case of a MINTII:

- RST/CTS is no longer used for flow control with the MINTII. RTS/CTS has been implemented to optimize the MINTII to operate in a single or multipoint modem environment.

- XON/XOFF cannot be initiated by a MINTII. The Westinghouse IMPACC protocol has few situations in which speed of communication to the MINTII would require flow control. The MINTII input buffers are large enough to allow communications without flow control.

- The IMPACC buffer size for messages being returned to the MINTII is 100 messages as opposed to 49.

- Baud rates of 600 and 300 are not available.

TROUBLESHOOTING GUIDE

Before calling the APSC (1-800-542-7883) with a MINTII question, be prepared to provide the answers to these questions to our technical support staff.

Q) The POWER LED is not lit.
   1) *Is the MINTII plugged in?*
   2) *Is the MINTII powered ON?*
   3) *Is the outlet that the MINTII is plugged into working?*

Q) The POWER LED is lit but the STATUS LED is NOT BLINKING.
   Try toggling the power on the MINTII. If this does not help, the MINTII may need servicing.

Q) The POWER LED is lit, the STATUS LED is BLINKING, but the RS232 RECEIVE LED or TRANSMIT LED never light.
   1) *Is the RS232 cable connected?*
   2) *Is the host software operating correctly?*
   3) *Is the RS232 cable correctly wired? Consult the connection diagram.*

Q) The POWER LED is lit, the STATUS LED is BLINKING, the RS232 RECEIVE LED is blinking, but the INCOM TRANSMIT LED and the RS232 TRANSMIT LED never light.
   1) *Are the baud rates for the MINTII and the RS232 master the same?*
   2) *Is the RS232 master set for 8 data bits, no parity, and 1 stop bit? When the MINTII is set for Model A MINT compatibility, the setting is 8 data bits, no parity, and 2 stop bits.*

Q) The POWER LED is lit, the STATUS LED is BLINKING, the RS232 RECEIVE LED is blinking, the INCOM TRANSMIT LED is blinking, but the RS232 TRANSMIT LED never lights.
   1) *Is there a product present that the MINTII can talk to?*
   2) *Is the command correct for the product?*
   3) *Is the INCOM cable attached to the MINTII?*
   4) *Is the INCOM cable attached to the product?*
   5) *Is the product powered?*
   6) *Is the INCOM plug wired correctly at the MINTII? Is it plugged in correctly?*
   7) *If the RS232 cable is a 3-wire cable, is RTS wired to CTS for the MINTII?*
   8) *If the RS232 cable has the RTS and CTS wires connected, (1) are they connected properly and (2) are they being handled by the RS232 master?*

Cutler-Hammer

F·T·N