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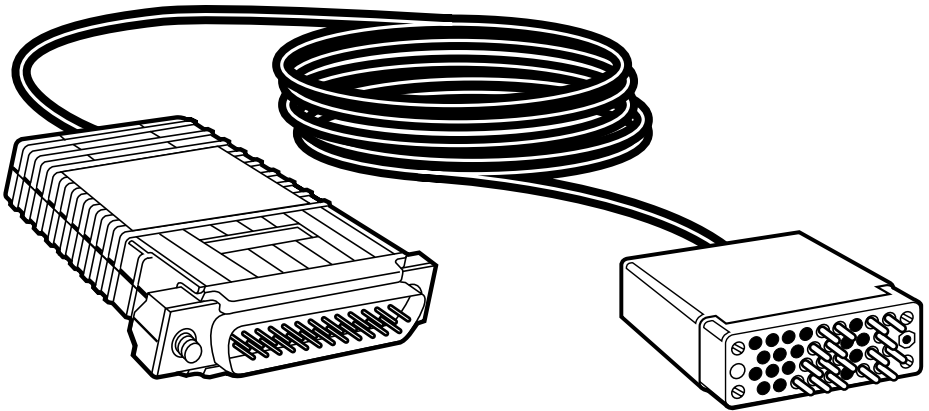
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1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746



IC222A-F	IC955A-F
IC222A-M	IC955A-M
IC223A-F	IC956A-F
IC223A-M	IC956A-M

# Mini Converter RS-232↔V.35



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**FEDERAL COMMUNICATIONS COMMISSION  
AND  
INDUSTRY CANADA  
RADIO FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

*This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.*

*Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.*

**NORMAS OFICIALES MEXICANAS (NOM)  
ELECTRICAL SAFETY STATEMENT**

**INSTRUCCIONES DE SEGURIDAD**

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico debe ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
  - A: El cable de poder o el contacto ha sido dañado; u
  - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
  - C: El aparato ha sido expuesto a la lluvia; o
  - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
  - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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# 1. Specifications

<b>Data Rates</b>	Up to 384 Kbps
<b>Clocking</b>	Set by connected devices
<b>Interfaces</b>	EIA RS-232/CCITT V.24 to CCITT V.35
<b>Connectors</b>	All models: DB25 male or female on RS-232 side; IC222A, IC223A: M/34 male or female on V.35 side at the end of the cable; IC955A, IC956A: RS-232 male with M/34 male or female on V.35 side <i>or</i> , RS-232 female with M/34 male
<b>Transmission Mode</b>	Full or half-duplex
<b>Protocol</b>	Transparent to protocol
<b>MTBF</b>	174,025 hours
<b>Operating Temperature</b>	32° to 140°F (0° to 60°C)
<b>Humidity</b>	5 to 95%, noncondensing
<b>Altitude</b>	Up to 15,000 feet (4570 m)
<b>Power</b>	None required; Uses power from NIC data and control signals
<b>Size</b>	IC222A, IC223A: 0.7"H x 2.1"W x 2.7"D (1.8 x 5.3 x 6.9 cm); Cable: 6.5 ft. (2 m); IC955A, IC956A: 0.9"H x 1.7"W x 2.4"D (2.3 x 4.3 x 6.1 cm)
<b>Weight</b>	IC222A, IC223A: 14 oz. (397 g), including cable and connectors; IC955A, IC956A: 2.2 oz. (62.4 g)

## 2. Introduction

The Mini Converter RS-232↔V.35 lets a synchronous RS-232 device communicate bi-directionally with a synchronous V.35 device. The Mini Converter is typically used in LAN-WAN connectivity, video conferencing, and other high-speed applications where one DCE is required to communicate with a DTE.

The Mini Converter requires no AC power or batteries to operate and supports data rates to 384 Kbps. Operating at full or half-duplex, the Mini Converter passes all necessary clocking and control signals and is transparent to protocol. It fully complies with EIA RS-232C/CCITT V.24 and CCITT V.35 standards.

The Mini Converter connects directly to the synchronous RS-232 interface using a male or female DB25 connector. In the IC222A and IC223A models, a male or female M/34 connector at the end of an integral 6.5-foot (2-m) cable plugs into the V.35 device. The IC955A and IC956A models house both DB25 and M/34 connectors within the same enclosure. For all models, an internal DCE/DTE strap allows the user to configure the Mini Converter as “DCE to DTE” or “DTE to DCE.” In most cases, this eliminates the need for special crossover cables.



## 3. Configuration

The Mini Converter is designed to be easy to use. In most cases you will not need to configure the Mini Converter in *any* way: just plug it in and go. The Mini Converter is transparent to protocol, including data rate and clocking method. The only configuration you may need to do is for DTE/DCE orientation. This procedure is described below.

### 3.1 Setting DTE/DCE Orientation

The Mini Converter installs between DTE devices such as terminals and host computers, and DCE devices such as modems, multiplexors, and CSU/DSUs. Most often the DTE device will be RS-232, and the DCE device will be V.35. Therefore, *the default DCE/DTE setting for the Mini Converter is RS-232 DCE to V.35 DTE*, based on how the Mini Converter “sees” its *own* orientation. For example, if the Mini Converter sees its own RS-232 port as DCE, it will want to plug into an RS-232 DTE device such as a terminal.

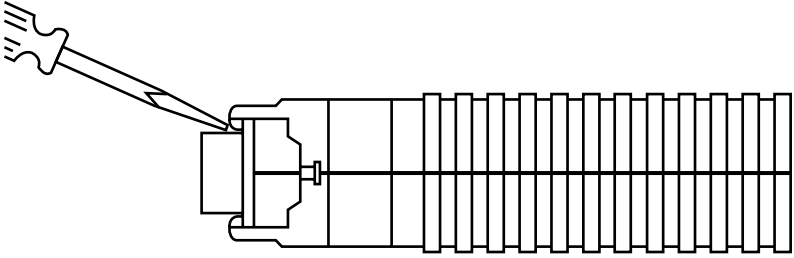
If you need to reverse the DCE/DTE orientation of the Mini Converter so that the RS-232 port is DTE and the V.35 port is DCE, follow the instructions below.

### NOTE

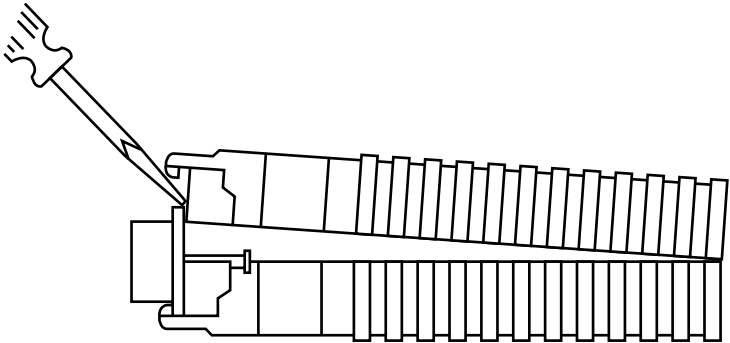
**It is not possible to configure the Mini Converter so that both ports are DTE or DCE.**

### 3.2 Opening the Case

The DCE/DTE strap on the Mini Converter is located on the PC board. To access the PC board you will need to open the plastic case that houses the DB25 connector. Simply insert a small flathead screwdriver or similar tool between the DB25 connector and the lip of the case as shown in Figure 1. Then *gently* twist the screwdriver to pop the case open as shown in Figure 2. Be careful not to damage the case or connector as you twist the screwdriver.



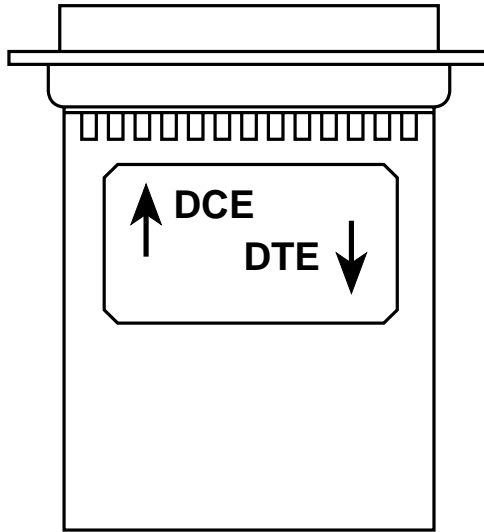
**Figure 1. Inserting the screwdriver.**



**Figure 2. Popping open the case.**

### 3.3 Changing the Strap

Once you have opened the case of the Mini Converter, you will see the green DCE/DTE strap located on the PC board (see Figure 3). The arrows on top of the strap indicate the orientation of the Mini Converter's ports. For example, if the "DCE" arrow is pointing toward the DB25 connector, then the Mini Converter's strap is set so that it sees its DB25 port as DCE. It wants to plug into the DB25 port of a terminal or other DTE. The arrow pointing toward the cable at the rear of the PC board shows the orientation of the Mini Converter's V.35 port.



**Figure 3. DCE/DTE strap orientation on PC board.**

To reverse the DCE/DTE orientation, pull the entire green strap out of its socket and rotate it 180°. Then plug it back into the socket. You will see that the arrows on top now point in the opposite directions, showing the new DCE/DTE orientation of the Mini Converter. When you're done, realign case halves (don't forget the captive screws and saddle washers) and snap them back together.

## 4. Installation

Once you have properly configured the Mini Converter's DCE/DTE orientation, all you need to do is plug it into the proper device ports. Figures 4 and 5 show the two possible Mini Converter installations according to DCE/DTE orientation.

### NOTE

The diagrams in this chapter show the IC222A or IC223A in the installed application. If you're using an IC955A or IC956A, connect the RS-232 interface directly to the RS-232 equipment and connect the V.35 interface to the V.35 interface using a cable no longer than 164 feet (50 m).

### 4.1 Connecting an RS-232 DTE to a V.35 Device

This is the most common application for the Mini Converter, and requires no special configuration or crossover cabling. Figure 4 illustrates proper connection of an RS-232 DTE to a V.35 DCE using the Mini Converter.

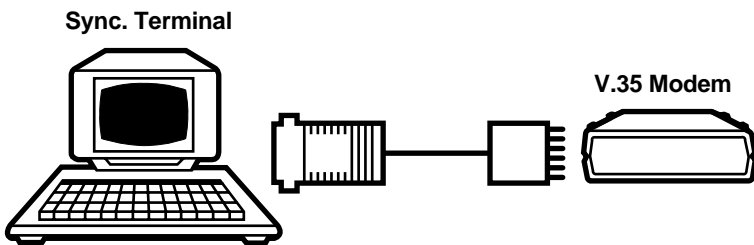


Figure 4. A common RS-232-DTE-to-V.35-DCE installation.

## 4.2 Connecting a V.35 DTE to an RS-232 DCE

This is a less common application. It requires re-orientation of the DCE/DTE strap inside the Mini Converter (refer to **Chapter 3**). With proper DCE/DTE orientation, no crossover cabling is required. Figure 5 illustrates proper connection of a V.35 DTE to an RS-232 DCE using the Mini Converter.

V.35 Mini Computer

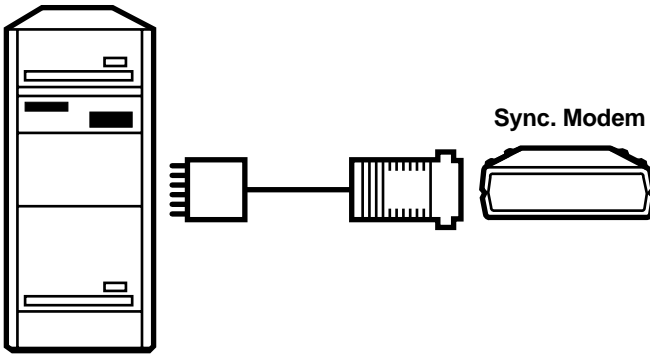
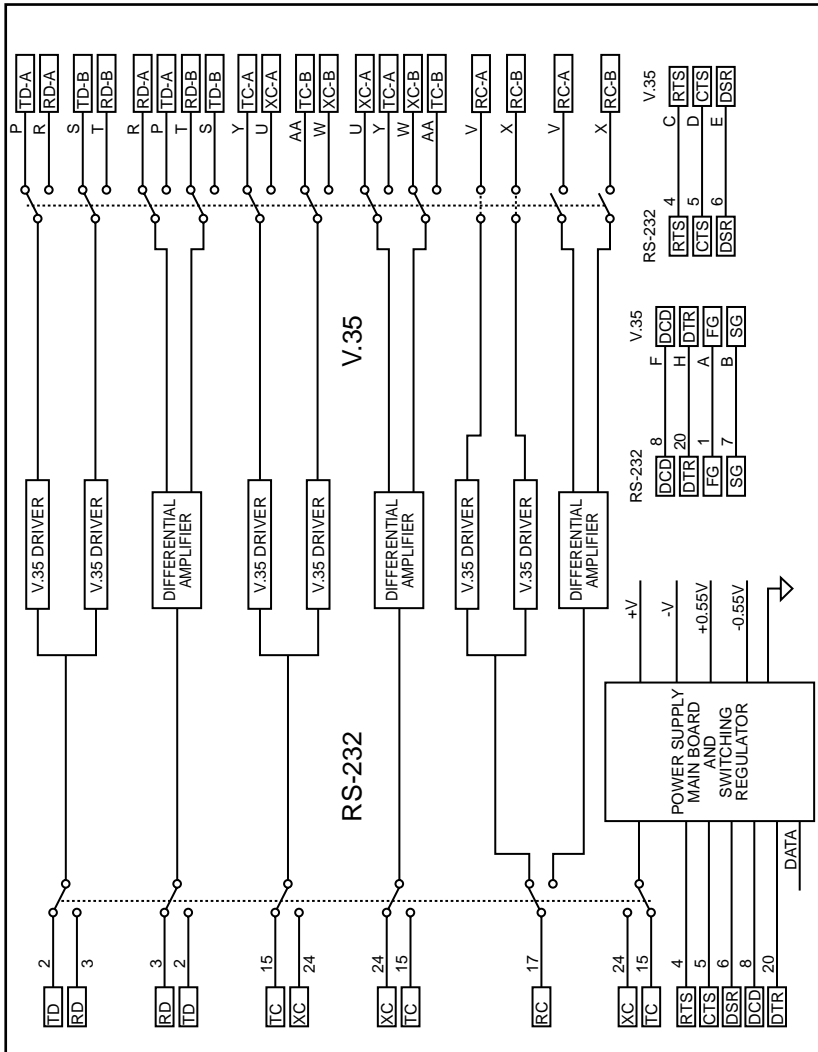


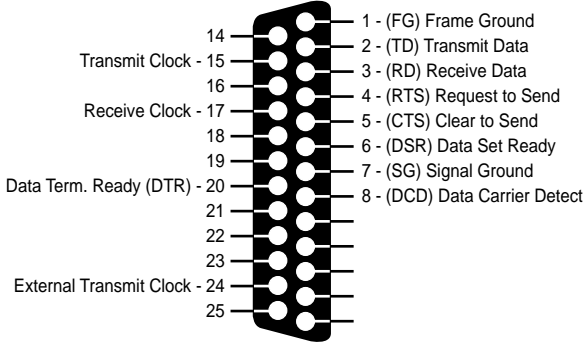
Figure 5. A common V.35-DTE-to-RS-232-DCE installation.

# Appendix A. Block Diagram

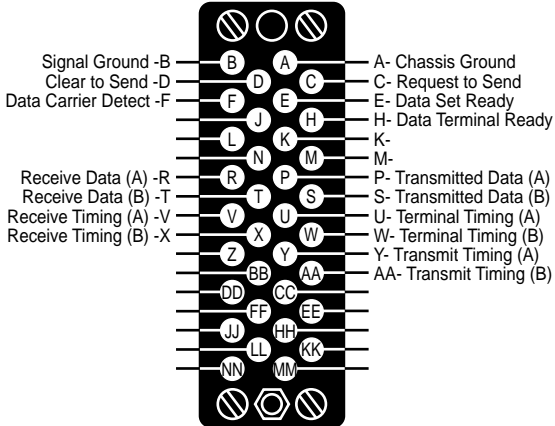


# Appendix B. Interface Standards

## Mini Converter RS-232 Interface



## Mini Converter V.35 Interface (M/34 Male)



## NOTES