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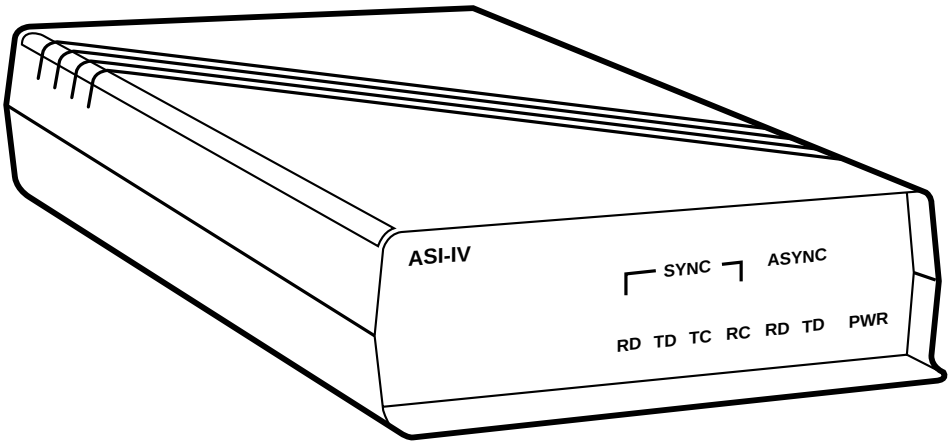
ASI-IV



CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)
FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
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FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT

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 required to correct the interference.

TRADEMARKS USED IN THIS MANUAL

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Contents

1.0 Specifications

Speed — 600, 1200, 2400, 4800, 7200, 9600 bps, 14.4 Kbps, 19.2 Kbps

Maximum distance — Follows the RS-232 standard: 50 ft. [15.2 m] using standard unshielded cable

Operation — Full- or half-duplex in point-to-point or multipoint environments

Leads supported — Sync port: 1-8, 15, 17, 20; async port: 1-8, 20

Indicators — LEDs: Power; async: TD, RD; sync: RC, TC, TD, RD

Flow control — User-selectable: transparent to flow control or DTR, DCD, DSR can be constantly ON

Interface — RS-232C/V.24

Connectors — To DTE: (1) DB25 female (async); to DCE: (1) DB25 male (sync)

Throughput delay — Receive: (1) character; transmit: (2) characters

DTE over/under speed tolerance — Basic mode: + 1.0%, -2.5%; extended mode: +2.3%, -2.5%

Mean Time Between Failure — 100,000 hrs.

Power — Primary: 115 VAC/60 Hz, 200 mA model or 230 VAC/50Hz, 100 mA model Secondary: 17 VCT, 700 mA

Power Supply Connector Pinning:

Pin	Color	Signal
1	White	SG/Center Tap
2	Black	AC/secondary source
3	Red	AC/secondary source
4	Green	Frame Ground

Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)

Weight — 1 lb. (0.45 kg)

2.0 Introduction

The ASI-IV is an asynchronous/synchronous standalone interface converter designed to help your asynchronous DTE equipment communicate over a synchronous communications line. It allows asynchronous devices like terminals, PCs, and midrange computers to communciate using synchronous modems or multiplexors.

The ASI-IV operates in either full- or half-duplex mode, in point-to-point or multipoint environments. It conforms to CCITT V.14, V.22, V.22bis, V.23, V.26 bis, V.26 ter, V.27 ter, and V.32 standards, so you can connect to a multitude of synchronous and asynchronous devices.

The ASI-IV automatically detects the baud rate of your devices so you don't have to set those variables yourself. And it automatically corrects for “speed drifting” between your devices, so if your async DTE is under or over speed, the ASI-IV shortens or lengthens stop bits as necessary to keep it aligned with your sync modem. (Both asynchronous and synchronous devices must be running the same baud rate.)

Internal DIP switches let you set the ASI-IV’s word length to match your devices’ at 8, 9, 10, or 11 bits. The ASI-IV is user-selectable either as transparent to hardware handshaking or as continually asserting the DSR, DCD, RTS, and DTR leads—whatever your devices require.

Special diagnostic features help you set up and troubleshoot your communications line. A digital loopback test enables you to check the signals that your devices are sending and receiving, while the sync bypass test lets you switch between async and sync communi-cations to find sources of trouble.

NOTE

The ASI-IV must be used in pairs, one interface converter at either end of your communication line.

3.0 Installation

Follow these steps to set the ASI-IV for your application:

1. Remove the screw on the bottom of the ASI-IV housing. Then lift off the top of the housing to reveal the circuit board within.
2. Set Switches S1 and S2 for your application. See Figure 3-1 for the locations of Switches S1 and S2 on the circuit board, and Tables 3-1 and 3-2 for their settings.
3. Attach the ASI-IV power supply connector to P1 (see Fig. 3-1).
4. Replace the converter housing.
5. Plug the cable from your asynchronous device into the female connector J1.
6. Plug the cable from your synchronous device into the male connector J2.
7. Plug the converter's power supply into the wall outlet, and power up your other devices.

The ASI-IV is now ready to operate.

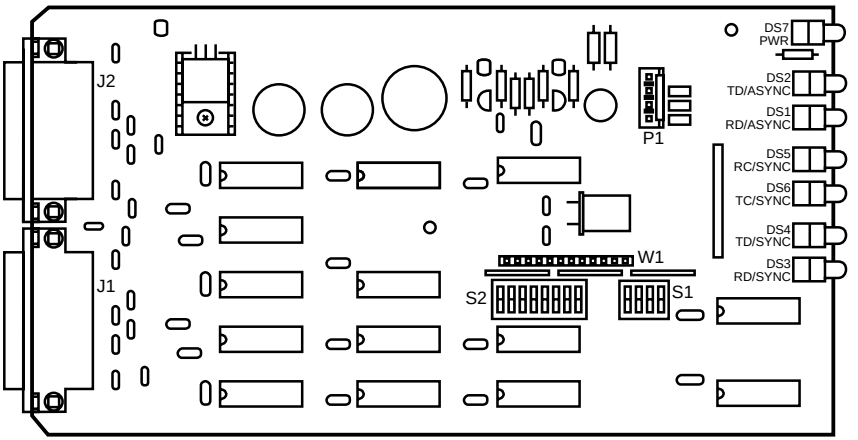

Fig. 3-1. The ASI-IV Circuit Board.

Table 3-1. Settings for DIP Switch S1

Signal	Position 1	2	3	4
DSR				
*Switched	ON			
Constant	OFF			
DCD				
*Switched		ON		
Constant		OFF		
RTS				
*Switched			ON	
Constant			OFF	
DTR				
*Switched				ON
Constant				OFF

Table 3-2. Settings for DIP Switch S2

Feature	Position 1	2	3	4	5	6	7	8
Loopback test								
ON	ON							
*OFF	OFF							
DTE speed								
adjustment range								
*Basic		ON						
Extended		OFF						
Synchronization								
*Normal			ON					
Bi-directional			OFF					
asynchronous								
**Bit length								
8				ON	OFF	OFF	ON	ON
9				OFF	ON	ON	ON	OFF
*10				OFF	ON	ON	OFF	ON
11				OFF	ON	OFF	OFF	OFF

* These are the factory default settings.
**Bit length includes start and stop bits. For example, a length of 10 bits = Start bit + bit1 + bit2 + bit3 +bit4 + bit5 + bit6 + bit7 + bit 8 +Stop bit

3.1 The Loopback Test

Once you've selected the loopback test (Position 1 of S2 set to ON) the asynchronous transmit and receive data leads are tied together, and the synchronous receive and transmit data leads are also tied together.

None of the other control signals, such as RTS or CTS, are looped.

3.2 The Control Leads (DIP Switch 1)

The control leads RTS, DTR, DCD, and DSR can be set constantly ON (if these signals are not provided by your attached devices), or they can be set to switched, and the ASI-IV will simply pass on your devices' control signals.

TC must be active for the converter to pass RTS and DTR, and RC must be active for it to pass DCD and DSR (The clocking signals are required because the leads are passed in a synchronous manner to compensate for data delays through the converter. For example, if your synchronous device dropped DCD before the data it sent had completely shifted out of the unit, some of that data could be lost.

3.3 The EIA Connectors

The two connectors on the rear panel accept standard RS-232 connections. The converter either connects the RS-232 control leads between your devices, or it can provide +12 volts for certain signal leads. See Appendix A for an illustration of RS-232 connector pinning and signal directions.

4.0 Operation

4.1 Indicators

You can observe the operation of the ASI-IV at a glance via the seven LED indicators located on the converter's front panel (as shown in Fig. 4-1). Table 4-1 gives the function of each of these LEDs.

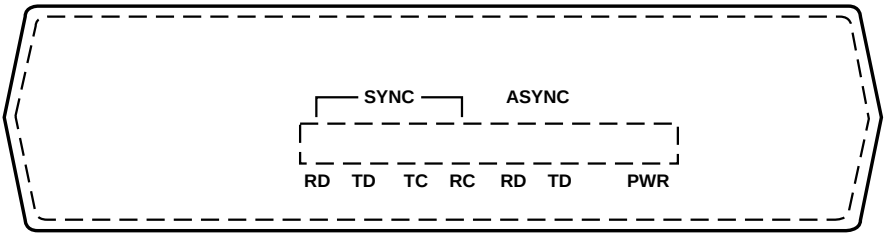

Fig. 4-1. The ASI-IV Front Panel

Table 4-1. The ASI-IV Front Panel LEDs

LED	Name	Function
On the sync side:		
RD	Receive data	Indicates the converter is receiving synchronous data.
TD	Transmit data	Indicates the converter is transmitting synchronous data.
RC	Receive clock	Indicates the converter is receiving clock signals.
TC	Transmit clock	Indicates the converter is transmitting clock signals.
On the async side		
RD	Receive data	Indicates the converter is receiving asynchronous data.
TD	Transmit data	Indicates the converter is receiving synchronous data.
PWR	Power	Indicates the converter is receiving power.

4.2 Matching Data Speeds Between Your Devices

When converting communications between synchronous and asynchronous devices, the asynchronous data rate must be adjusted to match the speed of the synchronous device.

If your synchronous device is overspeed, the ASI-IV will delete one or more stop bits from the transmit side. The ASI-IV on the receiving end will detect the missing stop bit and restore it to the data stream. The restored stop bit is typically 12.5% shorter than the normal bits. As a result, one missing stop bit will cause the receiver to squeeze eight "shorter" stop bits. In the extended mode, the stop bit can be 25% shorter than the normal bit size.

If the asynchronous device is under speed, the transmitting ASI-IV will fill in additional stop bits as necessary, in the same percentages.

4.3 The Break Signal

If the converter receives from M to 2 x M + 3 bits of "space" (where M is a positive integer that represents the word length), it will send out 2 x M + 3 bits of “space.” If more than 2 x M + 3 bits of "space" are received from the synchronous device, all will be transmitted as spaces. This is to satisfy V.14 requirements. In the receiver, all the received space is to be sent out to the terminal.

5.0 Troubleshooting

Symptom: All front panel LEDs are dark, including PWR LED.

a) Check the wallmount power supply connection to the wall plate.

b) Check the AC power source's fuse or circuit breaker.

Symptom: No data is received in either direction.

a) Check that all attached units are powered up and all data lines are properly connected.

Symptom: No data or erroneous data is received in one or both directions.

a) Working from an end receiving erroneous or no data, do the following in order:

1) Put the local ASI-IV in loopback mode (SW2, pos 1-on) and send data from the attached DTE/async device. If the DTE/async device does not receive its data, attach a self-powered breakout box to the DTE/async device cable and first verify that the DTE/async device is using Pin 2 of the RS-232 interface as Transmit Data.

If no LEDs light on the breakout box when the DTE/async device is transmitting, the cable is faulty. Activity on Pin 3 indicates that you need to use a cross (null modem) cable between the DTE/async device and the ASI-IV. Using the breakout box, loop Pin 2 to Pin 3 on the DTE/async device interface and send data from the DTE/async device. If the DTE/async device receives no data, it may need some RS-232 control lines such as DSR, CD, or CTS. Using the powered breakout box, assert these lines to see which are required.

NOTE

The ASI-IV needs the clocking signals from the modem to properly present the control lines it supports.

If you see activity on Pin 2 and the modem is clocking the ASI-IV and the modem, and/or ASI-IV is properly providing the handshake signals the DTE/async device needs, but the DTE/async device's data is not returned by the ASI-IV when in loopback mode, contact Technical Support.

2). After you complete Step 1, restore normal operation of the ASI-IV by returning SW2, Position 1 to the OFF state. Configure the modem attached to the local ASI-IV to digital loopback mode and attach data cabling. Send data from the DTE/async device. If the DTE/async device sees no data returned, check that both the TC and RC LEDs are lit on the ASI-IV front panel—indicating that clock signals are being received from the modem. Swap out the cable and/or modem as warranted.

If the DTE/async device is getting data returned but it is corrupt, verify that the ASI-IV is set for the correct number of bits per data word. Correct as warranted.

If the loopback configuration is still corrupting the data, the DTE/async device may be operating outside the basic over/under speed range. Change to the extended mode by putting SW2, Position 2 in the OFF position. If the problem is not corrected, return Position 2 to its ON state and check that the ASI-IV has not inadvertently been put in BYPASS mode (SW2, Position 3-OFF). Correct as warranted.

NOTE

In BYPASS mode, the ASI-IV passes data asynchronously in both directions without reclocking or otherwise altering the data. This mode may be useful in some test arrangements or in passing low speed data such as 300 baud. Use as appropriate.

If all configurations, connections, and functions check out thus far, but the data is still corrupted, call Technical Support.

30. After you complete Step 2, verify that the ASI-IV is in its desired modes and configurations, then put the local modem into analog loopback mode. If the return of DTE/async device data is now faulty, repeat the procedures in Step 2 with the modem in analog (line) loopback. If the problem still exists, swap out the modem.

40. Return all units to their standard operating configurations, verify, and then put the remote modem into analog (line) loopback. If the fault appears, the data line path between the two modems is faulty. Correct as warranted.

NOTE

If you're troubleshooting an installation that has bidirectional problems, isolate the fault by performing Steps 1 through 4 at each local end.

Appendix A:
RS-232 Pinning and Signal Flow

The ASI-IV interface converter connects to your devices via the RS-232 interface and DB25 connectors. Table A-1 describes the synchronous and asynchronous signals passing through the ASI-IV and shows the direction of each signal. Figures A-1 and A-2 show the pinning for the converter's connectors.

Table A-1. RS-232 Signal Description and Direction

Synchronous port (J2, male connector, DTE)			Asynchronous port (J1, female connector, DCE)	
Pin	**Description**	**Signal direction**	**Description**	**Signal direction**
1	FG	--	FG	--
2	TD	OUTPUT	TD	INPUT
3	RD	INPUT	RD	OUTPUT
4	RTS	OUTPUT	RTS	INPUT
5	CTS	INPUT	CTS	OUTPUT
6	DSR	INPUT	DSR	OUTPUT
7	SG	--	SG	--
8	DCD	INPUT	DCD	OUTPUT
15	TC	INPUT		
17	RC	INPUT		
20	DTR	OUTPUT	DTR	INPUT

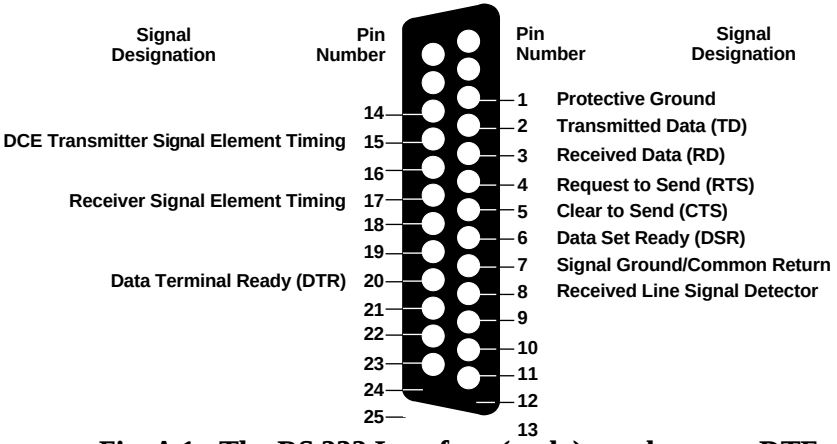

Fig. A-1. The RS-232 Interface (male) synchronous DTE

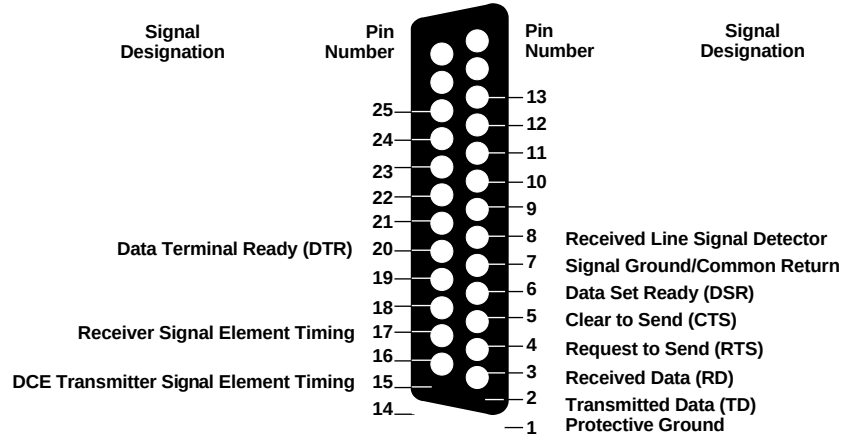

Fig. A-2. The RS-232 Interface (female) asynchronous DCE

NOTES

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