

Centronics™ to Versatec™
Interface Conversion Box

User Guide

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This user guide is provided to help you install and operate your new **CtoV box**. It contains important information on the features and functions.

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1. INTRODUCTION

The Centronics™ to Versatec™ (VPI) interface conversion box allows a Versatec™ interface equipped peripheral to connect to a Centronics™ parallel host. High speed data throughput and full Versatec™ functionality are maintained while the high cost of a Versatec™ VPI compatible host interface card is eliminated.

2. WHAT IS INCLUDED

The Centronics™ to Versatec™ (CtoV) Box shipment includes the following **standard items**:

- | | |
|---|--|
| 1 | CtoV Box |
| 1 | Power supply |
| 2 | Mounting brackets |
| 4 | 6-32 X 1/4. mounting bracket screws |
| 4 | 6-32 internal star lock washers |
| 1 | Hardware manual |

Order Part Number:

CTOVXL

(where X = S for shortline TTL Versatec™ output configured at factory)

(where X = L for longline differential Versatec™ output configured at factory)

Either of the following two options can be ordered:

OPTION 1:

CTOVXLP8MM - includes all the **standard items** plus an 8ft DB-25M to DB-25M Centronics cable.

OPTION 2:

CTOVXLADAPT - includes all the **standard items** plus a 36 pin Centronics female to DB-25 male adapter.

3. CONFIGURING THE BOX

The CtoV box ships from the factory with a sticker on the plastic bag indicating which mode the VPI output is configured for - either **TTL** or **Differential**. Ensure that the CTOV VPI configuration matches the peripheral that it will be connected to.

WARNING:

DO NOT CONNECT THE CTOV BOX TO A VERSATEC PERIPHERAL IF YOU ARE UNSURE OF THE TTL/DIFFERENTIAL SETTINGS. DAMAGE TO THE CTOV BOX OR TO THE PERIPHERAL MAY RESULT.

To Change the VPI configuration, follow these steps: (refer to **Section 6, Figures 1 to 3** for these steps)

1. Remove the 4 Philips screws from the end plates of the box.
2. Pull the Centronics endplate out slightly and disconnect the power and ribbon cables from the circuit card.
3. Slide the circuit card and VPI endplate out of the box, taking care to note the location of the circuit card slots.
4. Change the Differential /TTL Selector Jumper to the appropriate setting. The TTL DIFF indicators are printed directly above the jumper block.
5. Move the 40 pin ribbon cable to the **Differential or TTL Connector**.

NOTE:

The jumper **MUST** match the 40 pin connector that the ribbon cable is plugged into. **DO NOT CROSS CONNECT!**

6. Reverse steps 1 to 3 to re-assemble the box.

4. CONNECTING THE BOX

(refer to **Figures 1 and 2 in Appendix A** for these steps)

1. Connect a Centronics parallel host interface to the 25 pin "D" connector shown in **Figure 1**
2. Connect a Versatec compatible peripheral to the 37 pin "D" connector shown in **Figure 2**.
3. Connect the +5V power supply to the power input connector shown in **Figure 1**. Plug the Power Supply into a 120V 60Hz A.C. outlet.
4. The green power LED should light. The Box is now ready for operation.

WARNING:

DO NOT SUBSTITUTE A DIFFERENT POWER SUPPLY TO POWER THE CTOV BOX. THE RESULT MAY BE SERIOUS DAMAGE TO THE CTOV BOX.

5. C to V BOX PROGRAMMING SPECIFICATIONS

1.0 - Introduction

The Centronics to Versatec Interface Box is a stand-alone interface converter containing a Centronics parallel compatible input and a TTL or Differential Versatec parallel interface output. Using various control strings and command bytes, most of the features of a true Versatec interface are available from a Centronics equipped host.

The CTOV box supports both **print mode** and **raster mode**.

1.1 - Host Transfer Formats

NOTE:

The CtoV box should be initialized before sending any data or using any of the transfer formats in this section. Initialization can be accomplished by either cycling the power to the box or strobing the Centronics port init line (see section 4.0). After initialization, the CTOV box will be in print mode.

2.1 - Standard Transfer Format

To place the CtoV box in raster mode, the following 3 bytes (hex) must be sent to the CtoV box Centronics port:

1B 2A 00

Once these 3 bytes are sent, raster plot data can be sent to the CtoV box. The VPI output of the box will remain in raster mode until the init line of the Centronics port is strobed or the CTOV box power is cycled. This will return the CtoV box to print mode.

2.2 - Enhanced Transfer Format

For more flexibility, a 6 byte header can be sent before each scan of raster data. This header allows variable bytes/scan plotting. The CtoV box returns to print mode at the end of every scan using this transfer method. This allows the five 1B, 4X commands or the standard ASCII control codes listed below in section 3 to be used during plotting. The format of the 6 byte header is:

1B 2A 72 XX YY 01

where XX = high byte of the number of bytes/scan
YY = low byte of the number of bytes/scan

Example:

To send a plot that is rastered to 200 bytes/scan, send the following 6 byte header before each and every scan of 200 bytes:

1B 2A 72 00 C8 01 00C8 hex = 200 decimal

for a plot consisting of 1728 bytes/scan, send

1B 2A 72 06 C0 01 06C0 hex = 1728 decimal

2.3 - Enhanced Transfer Format with Run Length Encoding (RLE)

This transfer format allows raster data to be run length encoded for smaller file storage size and higher effective interface throughput. The format of the 6 byte header is:

1B 2A 72 XX YY 02

where XX = high byte of the number of bytes/scan
YY = low byte of the number of bytes/scan

Once the scan header is sent, the raster data must be sent using the following format:

byte1, byte2, byte1, byte2...

where byte1 = run length number of similar bytes: 01H <= byte1 <=FFH
byte2 = raster byte value

the sum total of all byte1 values in a given scan must equal the XX, YY value sent in the 6 byte scan header.

Example:

1B 2A 72 00 C8 02 00C8 hex = 200 decimal

then

03 FA, 29 31, 9C 0F (03 + 29 + 9C = C8 hex or 200 decimal)

This would be a complete and valid scan.

NOTE:

Scans can be inter-mixed in any combination between (2.2) and (2.3) above. This allows scans that can be efficiently compressed to be sent using (3), while scans that do not run length compress efficiently can be sent using (2). This will help maximize total file compression.

3.0 - 1B 4X and Control Characters

Sending the following command bytes to the CTOV box will cause the VPI output to assert the appropriate remote function line. The VPI print/plot line will be placed low (raster mode) before the remote function line is asserted:

- 1B 41** remote clear
- 1B 42** remote line terminate
- 1B 43** remote end of transmission
- 1B 44** remote form feed
- 1B 45** remote reset

1B 50 ZZ asserts repeating remote line terminates from ZZ = 01 hex to FF hex

NOTE:

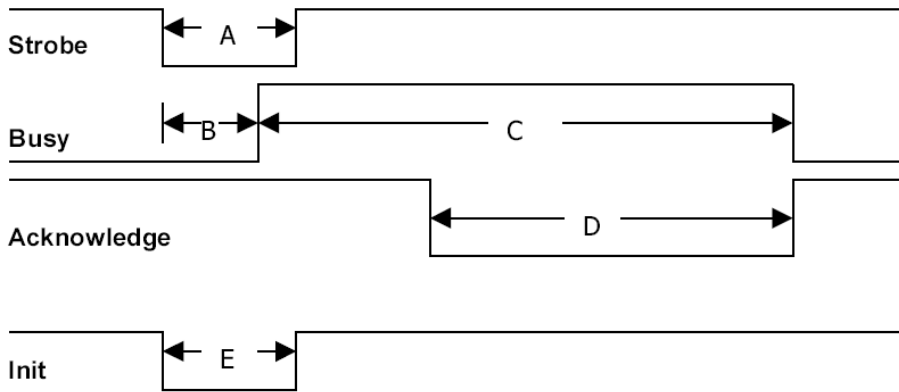
These commands must be sent when the CtoV box is in print mode (section 2). The commands will be ignored and interpreted as raster data if they are sent at any other time.

The CtoV box also obeys standard control characters that must be sent when the CtoV box is in print mode:

- 04** end of transmission
- 0A** line feed
- 0C** form feed
- 0D** (carriage return - this byte is ignored)

4.0 - Interface Timing

Centronics Timing



Parameter	Minimum	Maximum
strobe width (A)		200nS
strobe to busy (B)		125nS
busy width (C)		900nS
acknowledge width (D)		550nS
init width (E)		200nS
		-
		150nS
		note 1
		note 2
		no max

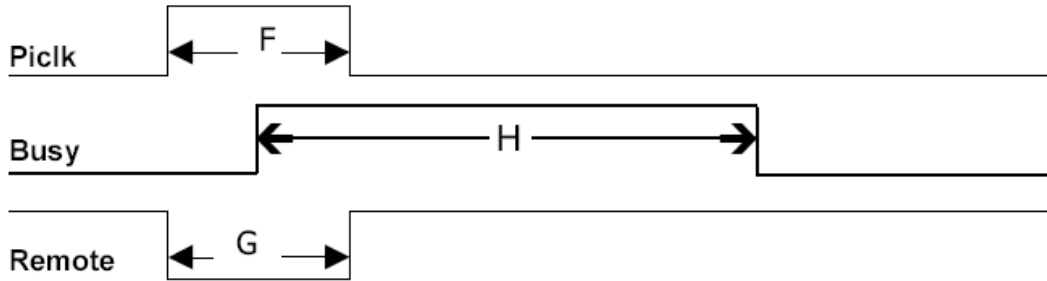
Note 1:

The busy width is dependent on the received busy from the VPI port and the width of the Centronics strobe.

Note 2:

The acknowledge width is dependent on the busy width (c).

VPI Timing



Parameter	Minimum	Maximum
pickk width (F)		300nS
remote width (G)		300nS
peripheral busy (H)		250nS
		300nS
		300nS
		note 4

Note 3:

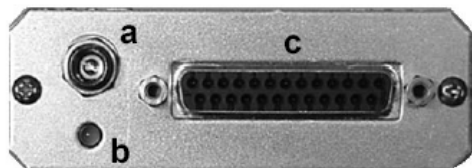
Pickks and remote functions will only be asserted if the peripheral is ready (not busy).

Note 4:

Peripheral busy maximum width (H) is peripheral dependent.

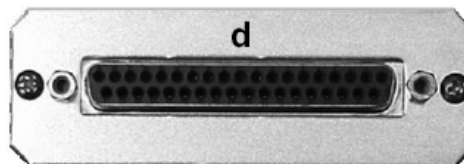
6. FIGURES

Figure 1 - Input Connections



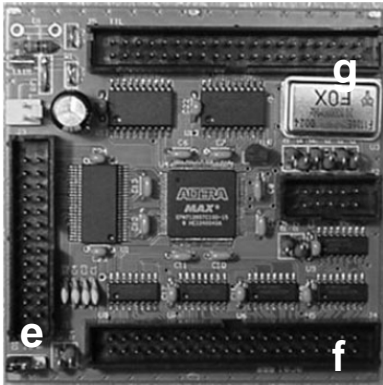
- a - Power input connector
- b - power indicator
- c - Centronics. parallel host input

Figure 2 - Output Connection



d - Versatec (VPI) output to peripheral

Figure 3 - Circuit Card



- e - Differential / TTL selector jumper
- f - Differential VPI connector
- g - TTL VPI connector

7. Centronics™ parallel25 pin D-sub Connector Pinouts

Pin number 25 pin D-sub connector	Source (P=peripheral, H=host)	Signal
1	H	nSTROBE
2	H	DATA 0
3	H	DATA 1
4	H	DATA 2
5	H	DATA 3
6	H	DATA 4
7	H	DATA 5
8	H	DATA 6
9	H	DATA 7
10	P	nACK
11	P	BUSY
12	P	PERROR
13	P	SELECT
14	H	nAUTOFD
15	P	nFAULT
16	H	nINIT
17	H	nSELECTIN
18	-	GND (nSTROBE)
19	-	GND (D0, D1)
20	-	GND (D2, D3)
21	-	GND (D4, D5)
22	-	GND (D6, D7)
23	-	GND (BUSY, nFAULT)
24	-	GND (PERROR, SELECT, nACK)
25	-	GND (nAUTOFD, nSELECTIN)

8. VERSATC™ VPI

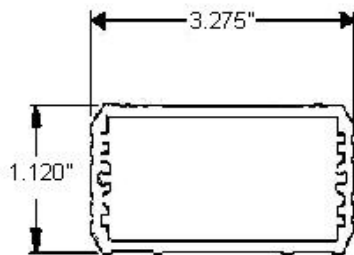
37 pin D-sub connector pinouts

Pin number 37 pin D-sub connector	Differential signal name	TTL signal name
1	DATA 0+	DATA 0
2	DATA 1+	DATA 1
3	DATA 2+	DATA 2
4	DATA 3+	DATA 3
5	DATA 4+	DATA 4
6	DATA 5+	DATA 5
7	DATA 6+	DATA 6
8	DATA 7+	DATA 7
9	CLEAR-	nCLEAR
10	PICLK+	PICLK
11	READY-	nREADY
12	PRINT+	PRINT
13	N/C	N/C
14	SPP-	nSPP
15	RESET-	nRESET
16	REMFFD-	nREMFFD
17	REMEOT-	NREMEOT
18	REMLNTR-	NREMLNTR
19	INOP+	NOMEDIA
20	DATA 0-	GND
21	DATA 1-	GND
22	DATA 2-	GND
23	DATA 3-	GND
24	DATA 4-	GND
25	DATA 5-	GND
26	DATA 6-	GND
27	DATA 7-	GND
28	CLEAR+	GND
29	PICLK-	GND
30	READY+	GND
31	PRINT-	GND
32	INOP-	nONLINE
33	SPP+	GND
34	RESET+	GND
35	REMFFD+	GND
36	REMEOT+	GND
37	REMLNTR+	GND

Centronics™ to Versatec™ Interface Converter Box

KEY FEATURES

The iSys Centronics™ to Versatec™ (CtoV) Interface Converter Box brings new life to any device equipped with a Versatec™ parallel interface. The CtoV Box allows connection between any Centronics™ compatible host port and a Versatec™ interface equipped peripheral. Full Versatec™ functionality and speed is maintained with the low cost of the standard Centronics™ parallel host port. Open up new connectivity options with third party USB to Centronics™ parallel adapters and network print servers. You can be sure of rugged construction and unmatched reliability for trouble free operation.



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SPECIFICATIONS

INTERFACE CHARACTERISTICS

Input	Centronics compatible 8 bit parallel IEEE 1284 Compatible 1.0 MB/sec maximum input transfer rate
Output	Versatec Greensheet shortline(TTL) or Longline(differential) 1.0 MB/sec maximum output transfer rate
Functionality	Supports both print and lot modes Variable bytes/scan support -1 to 65,535 bytes/scan Full remote function support -Remote Line Terminate -Remote Clear -Remote Reset -Remote Form Feed -Remote End of Transmission Normal or run length compressed data input

POWER REQUIREMENTS

Input Power	5.0V D.C. Regulated 2.0A maximum input current
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PHYSICAL CHARACTERISTICS

Dimensions	Length: 4.0 inches Width: 3.275 inches Height: 1.125 inches Weight: 1.5 lbs
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ENVIRONMENTAL CHARACTERISTICS

Storage Temp.	-50C to +75C
Storage Humidity	5% to 95% R.H. (no condensation)
Operation Temp.	0C to +50C
Operation Humidity	5% to 95% R.H. (no condensation)
Vibration	3 axis 1G at 5Hz, 3 G at 10-60Hz, 30 minute Duration in X, Y, Z axis (Non-operating)

WHAT'S INCLUDED

Standard	120V to 240V switching D.C. adapter with screw locking power connector Mounting Brackets
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