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IPack Logic Bus Extender Board (Types 1 & 2)

USER MANUAL

Document No. B-T-MU-IPLBE###-A-0-A2

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1. 0 INTRODUCTION

1.1 Purpose

This is a reference manual for the SYSTRAN IPack Logic Bus Extender (IPLBE) board, part number BHAS-IPBE1 for Type 1, and BHAS-IPBE2 for Type 2.

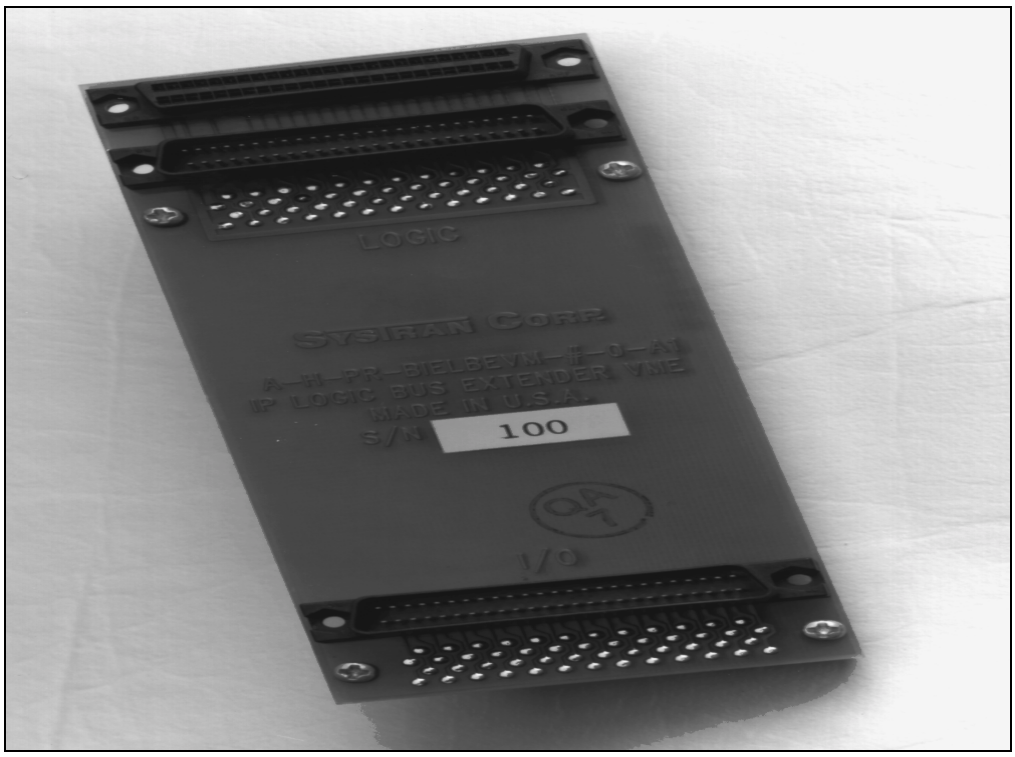


Figure 1-1 IPLBE Type 1

1.2 Scope

This reference manual covers the physical description and operation of the IPLBE. The reader should have a systems level understanding of general computer processing, memory and hardware operation, and a systems understanding of the IPack Logic Bus Interface.

1.3 Overview

The Type 1 board works on most VME carriers and NuBus carriers. Type 2 works on most ISA carriers and the Motorola MVME-162LX (MVME162-2XX Series) embedded controllers.

The IPLBE is similar to a singlewide IPack board with an extra connector at one end to provide physical access to the IPack Logic Bus. The IPLBE can be used stand-alone or in conjunction with the SYSTRAN Logic Bus HP Monitor board (part number BHAS-IPMBHP) or the SYSTRAN Logic Bus Breakout IPack board (part number BHAS-IPBB), via a 50-position ribbon cable, to form a user friendly IPack system integration kit.

The IPLBE is used to monitor all IPack Logic Bus transfer types, and is virtually transparent between the IPack Carrier and IPack board. The use of the IPLBE requires one additional slot adjacent to the carrier, and no additional power from the IPack carrier. The IPLBE was designed in accordance with the IndustryPack Logic Interface Specification Revision 0.7.1, but the IPLBE itself is not an IPack board.

IPLBE IPACK DETAILS:

- Mechanical Interface: Similar to a Singlewide IPack
- Electrical Interface: Singlewide IPack Extension
- IPack Transfer Types: Monitors Memory, I/O, ID, and Interrupt

IPLBE ACCESSORIES:

- IPack Bus Extender Cable
- 18 inch length(BHAS-IPBEC18)*
- 24 inch length(BHAS-IPBEC24)*
- IPack Logic Bus Breakout Board (BHAS-IPBB)*
- IPack Bus Monitor Board (HPLA)(BHAS-IPBMHP)*
- Logic Analyzer Configuration Software
- SYSTRAN part/order numbers

1.4 Related Publications

IndustryPack Logic Interface Specification Synopsis published by SYSTRAN Corp.

(Doc number: B-T-SH-IPACKSUM-A-0-A2 Rev. 7/15/94)

IPack Logic Bus Breakout Board User Manual published by SYSTRAN Corp.

(Doc number: B-T-MU-IPLBB###-0-0-A1)

IPack Logic Bus Monitor Board User Manual (for HP 1650/16500 series)

(Doc number: B-T-MU-IPLBMHP#-0-0-A1)

IndustryPack Logic Interface Specification Revision 0.7.1 published by GreenSpring Computers, Inc. 1204 O'Brien Drive, Menlo Park, CA 94025.

1.5 Ordering Process

To order any of the items listed above, or other SYSTRAN products, call (513) 252-5601.

For additional product information you may call the above number, or send an E-Mail message to info@systran.com.

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2. 0 HARDWARE INSTALLATION

2.1 Unpacking the IPLBE

The IPLBE shipping package will contain the following:

Table 2-1 IPLBE Shipping Package Contents

QTY	DESCRIPTION
1	IPLBE Printed Circuit Assembly
4	Threaded Standoffs
4	M2 x 5mm flat head machine screws

2.2 Visual Inspection of the IPLBE

Examine the IPLBE to determine if any damage occurred during shipping.

2.3 IPLBE Installation



NOTE: Although the IPLBE is not an ESD sensitive product, acceptable ESD practices should be used during the assembly and installation to protect the IPack boards and carrier boards.

The IPLBE installation requires the following tools:

Table 2-2 IPLBE Installation Tools

QTY		DESCRIPTION
	1	ESD Static Control Kit/Ground Strap/Etc.
Optional	1	Standard Flat Head Screwdriver

Figure 2-1 shows the connections for installing the Type 1 IPLBE.

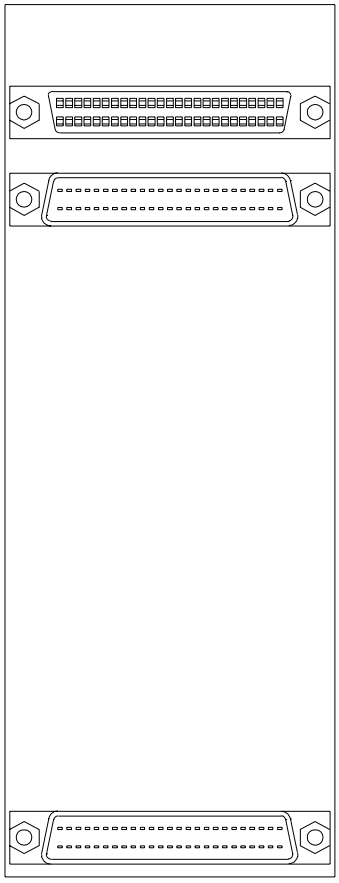


Figure 2-1 Type 1 Connection

Figure 2-2 shows the connections for installing the Type 2 IPLBE.
Figure 2-4 is a diagram of how the Type 1 IPLBE is installed on a VME IPack carrier, and Figure 2-5 is the installation of a Type 2 IPLBE on an ISA carrier.

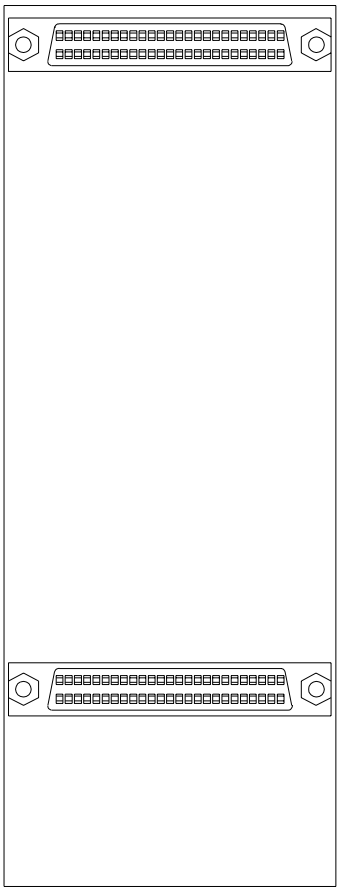


Figure 2-2 Type2 Connection

Table 2-3 on page 2-5 shows the pin assignments for the IPack Logic Bus connector. The signals on the left side of the connector are of the original IPack signal nomen-clature, and the signals on the right are those used by SYSTRAN Corp. Refer to the IPack Carrier board user's manual for more information.

Refering to the appropriate figures, perform the following steps.

1. Turn off all power to the host system.
2. Remove the target IPack carrier and move it to the ESD controlled area where the installation of the IPLBE can be made.
3. Remove the IPLBE from the shipping package and place it on the ESD bench.
* 4. Install the four hex standoffs onto the IPLBE IPack connectors with four M2x5mm flat head machine screws.
5. Install the target IPack board on the IPLBE by applying adequate and equal pressure to the IPack board at both ends.
* 6. Install four M2x5mm flat head machine screws onto the IPack's IPack connectors.
7. Install the IPLBE, with the IPack board on it, onto the carrier board by applying adequate and equal pressure to the IPLBE board at both ends.
* 8. Install four M2x5mm flat head machine screws onto the IPack carrier's IPack connectors.
(* denotes optional steps)

This completes the installation of the IPLBE to the carrier board.

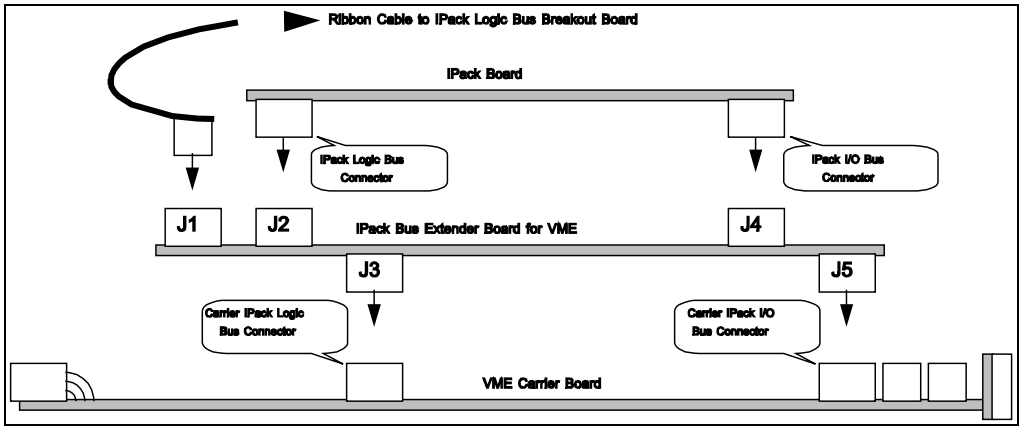


Figure 2-3 Type 1 IPLBE Assembly Diagram for a VME Carrier Board

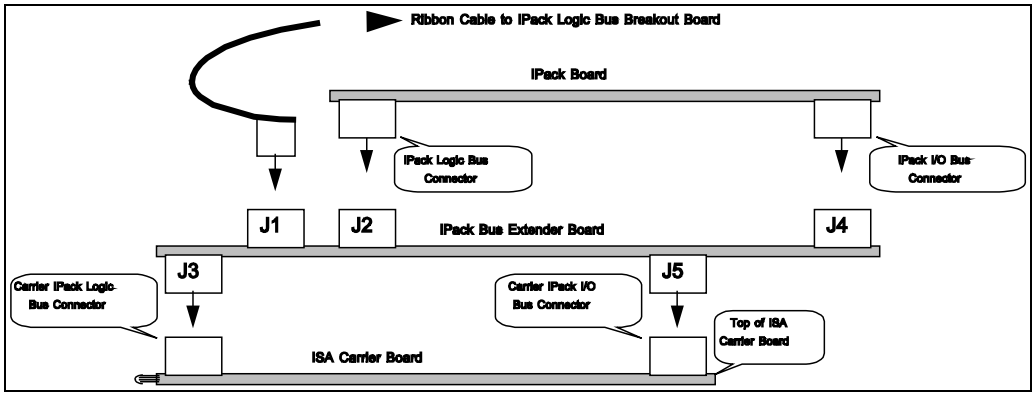


Figure 2-4 Type 2 IPLBE Assembly Diagram for an ISA Carrier Board

Table 2-3 IPack Logic Bus Pin Assignments

Original IPack Signals Names	IPack Logic Bus Pin #	SYSTRAN Signal Names
GND	50	GND
reserved	49	RESERVED1
Ack*	48	N_ACK
A6	47	IPA6
Strobe*	46	N_STROBE
A5	45	IPA5
IntReq1*	44	N_INTREQ1
A4	43	IPA4
IntReq0*	42	N_INTREQ0
A3	41	IPA3
Error*	40	N_ERROR
A2	39	IPA2
DMAEnd*	38	N_DMAEND
A1	37	IPA1
reserved	36	RESERVED2
IOSel*	35	N_IOSEL
DMAck0*	34	N_DMACK0
IntSel*	33	N_INTSEL
DMAReq1*	32	N_DMAREQ1
MemSel*	31	N_MEMSEL
DMAReq0*	30	N_DMAREQ0
IDSel*	29	N_IDSEL
R/W*	28	IPR_N_W
+5V	27	+5VDC
GND	26	GND
GND	25	GND
+5V	24	+5VDC
+12V	23	+12VDC
-12V	22	-12VDC
BS1*	21	N_BS1
BS0*	20	N_BS0
D15	19	IPD15
D14	18	IPD14
D13	17	IPD13
D12	16	IPD12
D11	15	IPD11
D10	14	IPD10
D9	13	IPD9
D8	12	IPD8
D7	11	IPD7
D6	10	IPD6
D5	9	IPD5
D4	8	IPD4
D3	7	IPD3
D2	6	IPD2
D2	5	IPD1
D0	4	IPD0
Reset*	3	N_RESET
CLK	2	ICLK
GND	1	GND

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3. 0 USING THE IPLBE

3.1 Purpose

This section describes the use of the IPLBE in a debugging/troubleshooting or systems integration environment.

3.2 IPLBE Stand-Alone Use

IPack manufacturers or companies using IPacks in their systems can use the IPLBE to monitor the IPack signals for system integrity of all the IPack Logic Bus transfer types. If the IPLBE is configured as stand-alone, a logic analyzer or oscilloscope probe can be used to monitor any of the IPack Logic Bus signals via the J1 connector on the IPLBE (Refer to Table 2-3 for the IPack Logic Bus pinout). The signals can be accessed right on the J1 connector or brought out off the IPLBE via the optional 50-pin ribbon cable for easier access.

3.3 IPack Product Development and Upgrades

For companies developing or upgrading new IPack products, using the IPLBE will significantly shorten the design to production cycle. The IPLBE gives IPacks users the ability to quickly and easily monitor specific IPack transfer cycles for IPack board prototyping through alpha and beta board testing.

3.4 IPack Systems Integration

For systems integration companies using IPacks, the IPLBE is a simple tool to provide information such as IPack board response or carrier board performance. This type of IPack logic bus monitoring is made much easier by using the IPLBE.

The IPLBE schematics are included in Figures 3-7 and 3-8

3.5 IPLBE IPack Signal Specifications

Timing measurements were conducted using the HP model 16500A Logic Analyzer with a 400 megasamples per second Digitizing Oscilloscope Module, model 16530A, plugged into slot E. Figures 3-1 through 3-6 show the IPLBE's negligible affect on the IPack Logic Bus signals making the IPLBE a very effective and non-intrusive troubleshooting aid in IPACK integration.

Figures 3-1 and 3-2 show typical rising and falling edges of the IPack 8 MHz Clock measured on the SYSTRAN TRIDO48 IPack board (BHAS-TRIDO48) mounted on a Motorola MVME-162-23 IPack Carrier board without the IPLBE.

Figures 3-3 and 3-4 show the same IPack Clock edges with the Type 1 version of the IPLBE installed on the MVME-162-23. Figures 3-5 and 3-6 show typical IPack Data Bit 0 signal drive without and with the IPLBE installed, respectively.

The following summary is based on these results:

Table 3-1 **IPLBE Timing Measurements**

SIGNAL/EDGE	WITHOUT	WITH	IPLBE INSTALLED DIFFERENCES
8MHz ICLK/Rising	6.80ns	8.20ns	+1.40ns
8MHz ICLK/Falling	8.00ns	8.60ns	+0.60ns
IPD0/Falling	11.00ns	12.10ns	+1.10ns



NOTE: All of the above measurements were made on the IPack Logic Bus connector Pin #2 for the 8 MHz Clock and Pin #4 for IPD0.

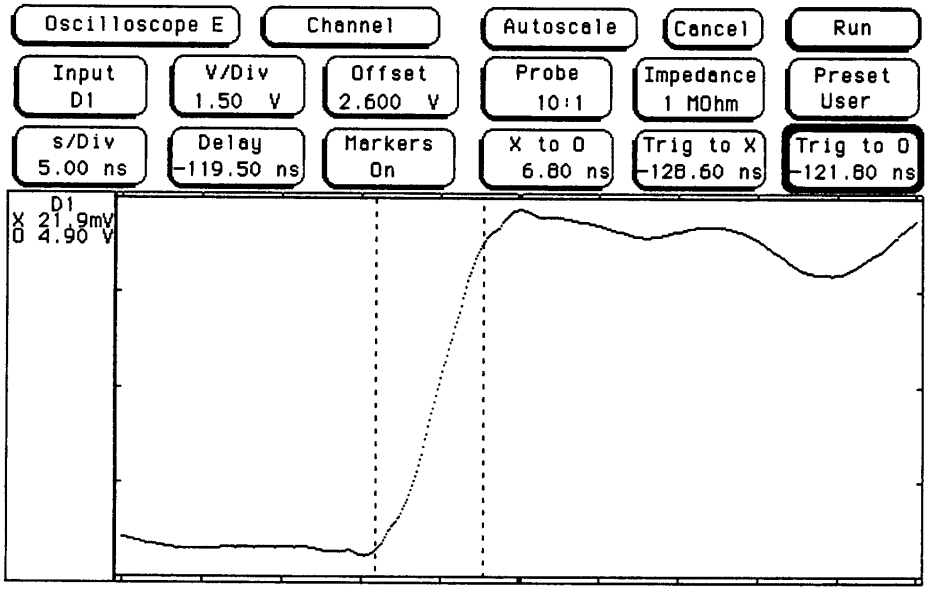


Figure 3-1 IPACK 8MHz Clock (Rising Edge) Without IPLBE Installed

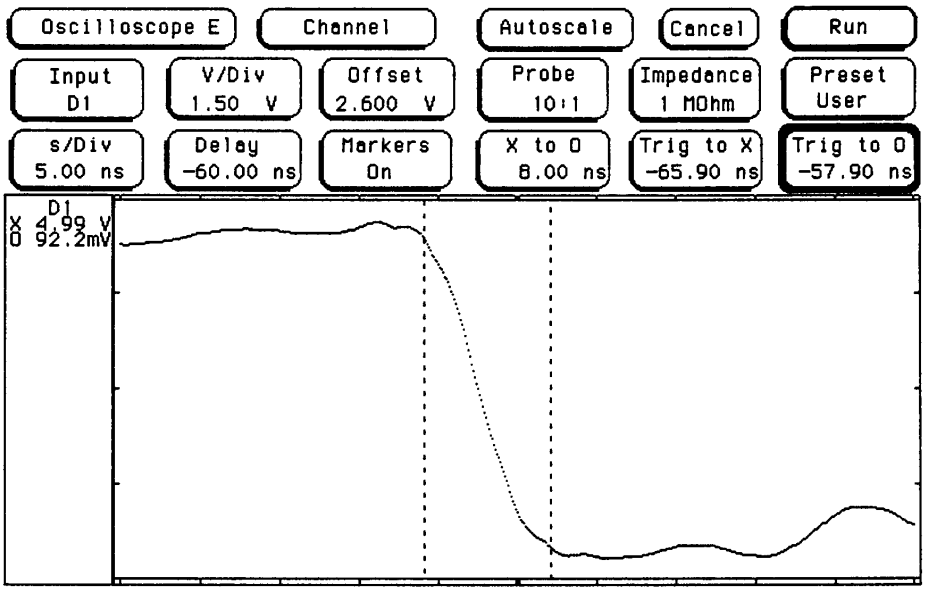


Figure 3-2 IPACK 8MHz Clock (Falling Edge) Without IPLBE Installed

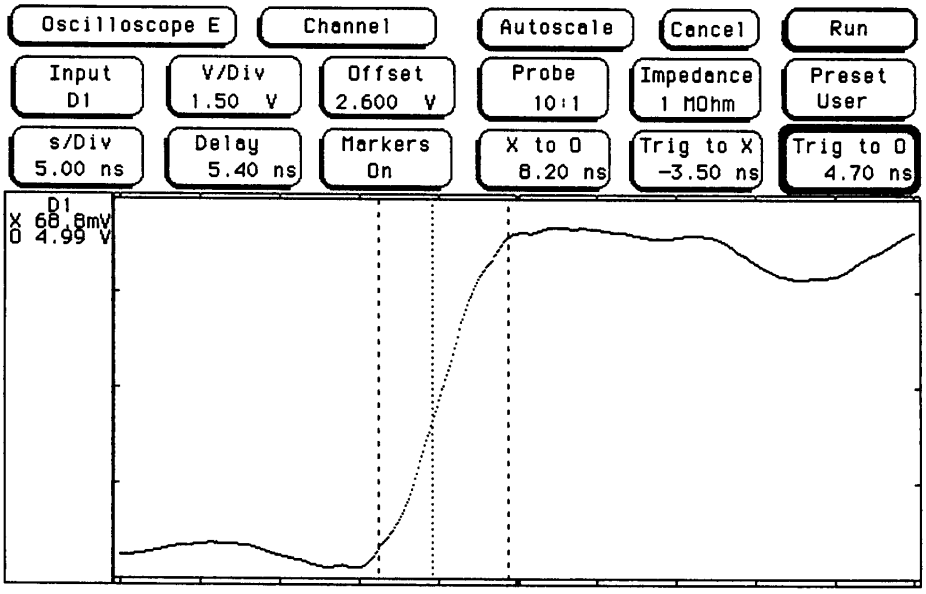


Figure 3-3 IPACK 8MHz Clock (Rising Edge) With IPLBE Type 1

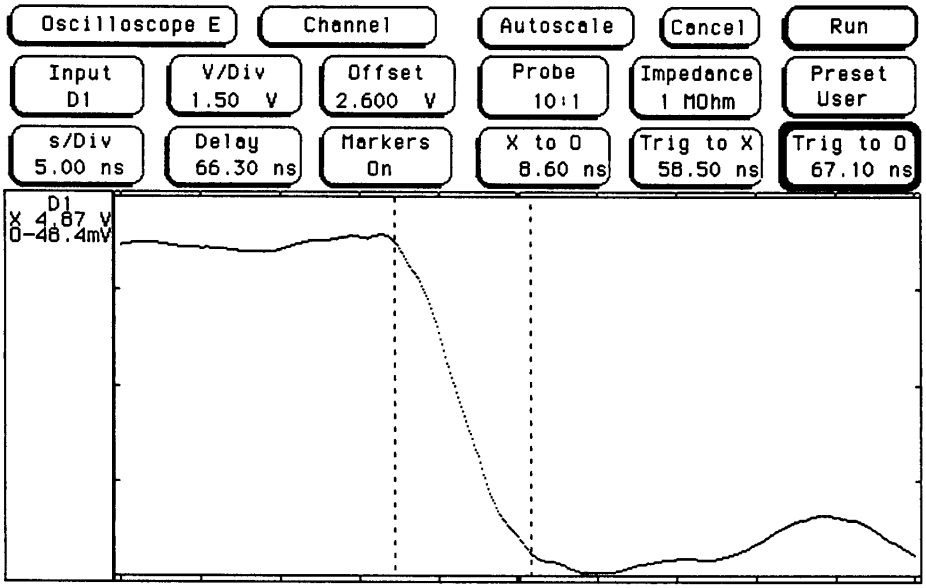


Figure 3-4 IPACK 8MHz Clock (Falling Edge) With IPLBE Type 1

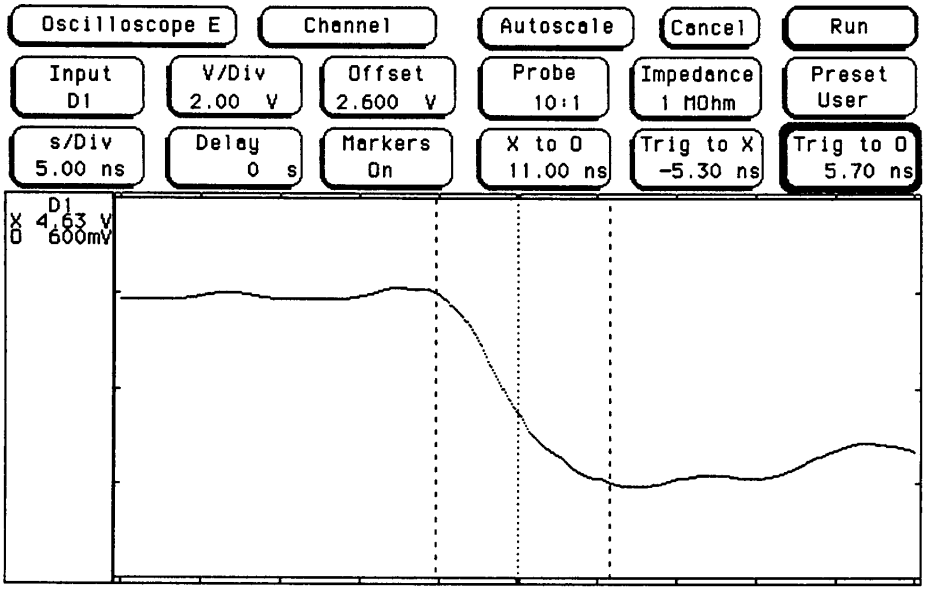


Figure 3-5 IPACK Data Bit 0 Without IPLBE

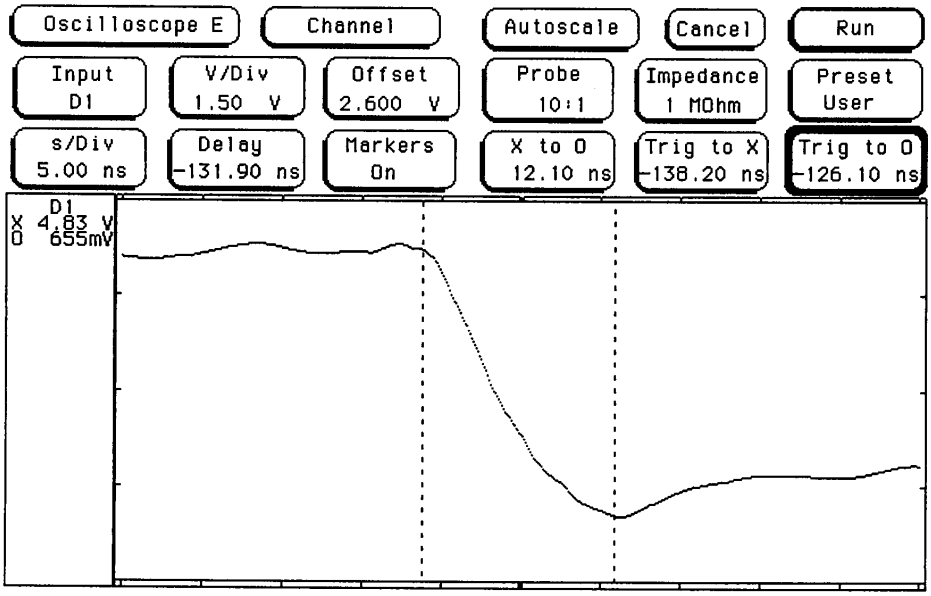


Figure 3-6 IPACK Data Bit 0 With IPLBE

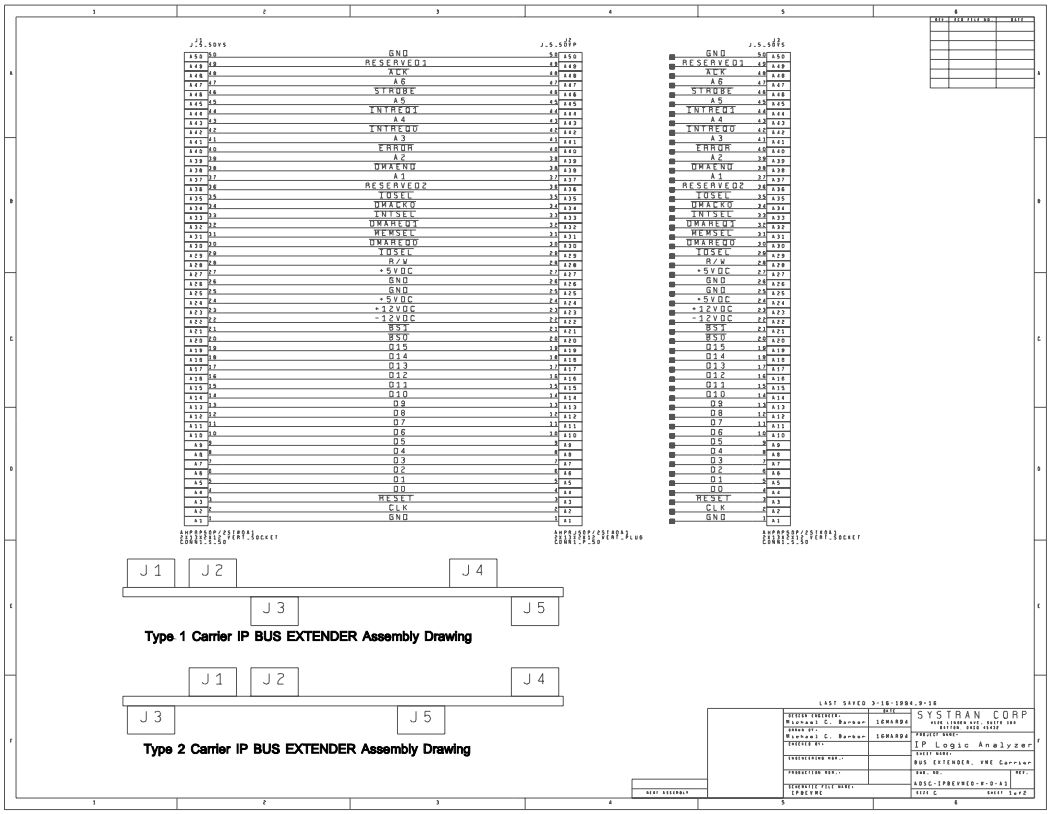


Figure 3-7 IPLBE Schematic Sheet 1

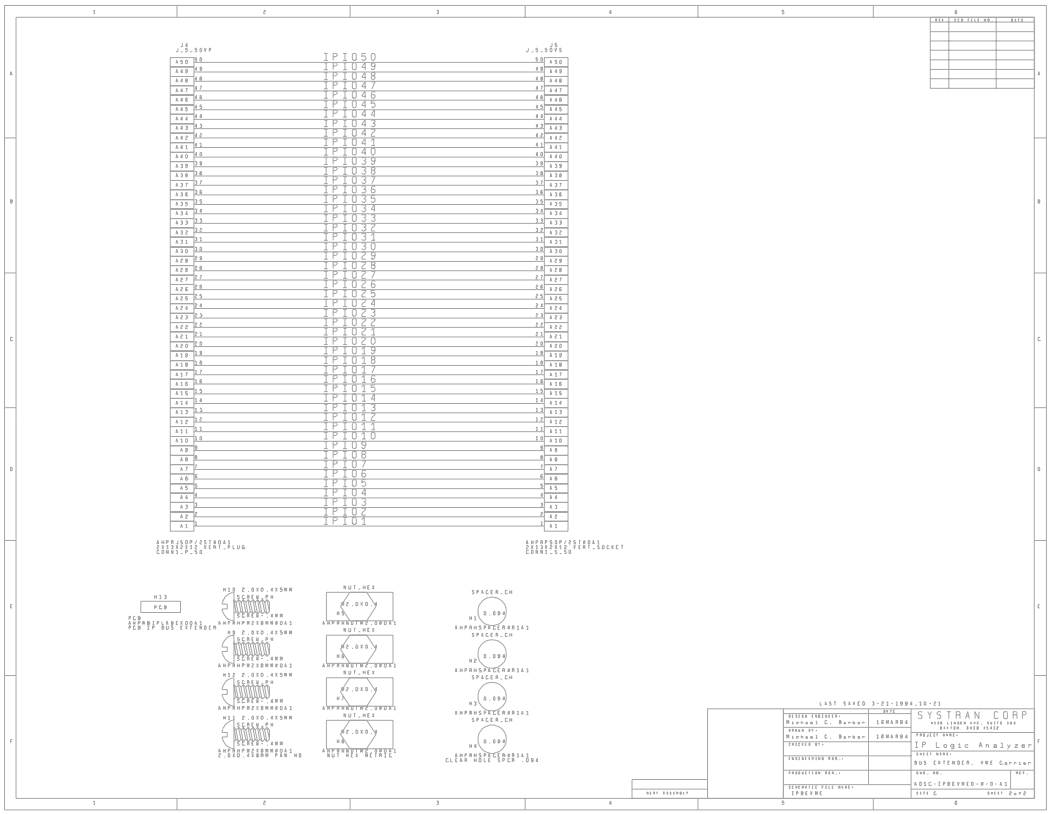


Figure 3-8 IPLBE Schematic Sheet 2

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