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TB8204
32-CHANNEL ANALOGUE I/O
VME64X TRANSITION BOARD

USERS MANUAL

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1. INTRODUCTION

The Hytec TB8204 is a single-width VME64X Transition Board which routes 32 channels of analogue I/O to/from rear panel mounted Lemo connectors with the following characteristics:-

- 4 groups of 8 analogue channel pairs
- 32 single pole Lemo connectors routed to 8002 Carrier Board sites A-D respectively
- 8 channels of differential filters condition 8401 inputs
- Filter circuits enabled by jumper selection
- Common mode bias resistors for differential inputs
- 4 DC-DC Converter socketed sites allow 5V to +/-12V isolated power for each group
- 4 Lemos for External Trigger
- 4 Lemos for External Clock
- Ground discharge limited on insertion

2. PRODUCT SPECIFICATIONS

Size:	Single width Transition Board 6U x 80mm
Operating temp:	0 to 45 deg C ambient
Power Requirements:	+5V @ 2A from VME bus (4A fuse fitted) for DC-DC converters
Number of channels:	32 signal pairs
Number of strobes:	8 signal pairs
Connectors:	40 Lemo 00 sockets mounted on the rear panel (Central conductor is signal high, screen is signal return) 160 way DIN mates with P2 pins 5x19 way 2mm socket mates with P0

3. BOARD DESCRIPTION

The board is primarily intended to route 4 groups of 8 analogue inputs to IP-8401-ADC boards from rear panel Lemo connectors. However, it may also be used for IP-8402-DACs. It has provision to fit R-C filters across the differential inputs of the ADCs.
Viewing the component side of the board there are four similar groups each with two 5-pin sockets. These allow Hytec DC-DC Converter boards to be fitted which supply +/-12V to their respective sites via the P0/P2 VME connectors. Each converter's output is smoothed by two 100uF tantalum bead capacitors.
The P2 mating connector is the 160 way DIN connector at the base of the board. The P0 mating connector is situated above it. The four analogue groups are designated A-D from the base upwards.
Front panel Lemo connectors feed sites A-D.
Provision is made to fit noise filters in the 8 channels of each group.
The capacitors for these are situated to the left of the jumpers (C1-C8 for the first group). Values of up to 22uF can be fitted. A typical value is 3900pF.
The filters usually incorporate 1K in series with each analogue signal (high and low). The first channel uses R1 and R3, the second R5 and R7 and so on.
Common mode biasing resistors may also be fitted for the ADC inputs. These usually have the values 1Mohms. These are R2/R4 for channel 1, R6/R8 for channel 2 and so on.

The jumpers can be used to select straight through connection (positions 2-3) or filtered (positions 1-2).
Ground discharge resistors are fitted at the base of the board.

4. OPERATION

Select straight-through or filtered mode according to whether an 8402 DAC or 8401 ADC is used by setting the jumpers 2-3 (right position) for straight-through or 1-2 (left) for filtered mode.
If isolated power is required plug-in the DC-DC Converter boards and if necessary secure them with appropriate screws through the holes provided. Ensure that a 4A fuse is fitted at the base of the board.
LK1-LK4 connect isolated analogue grounds to VME ground for each group 1-4.
These should only be inserted if isolation is not required.
Connect the signals according to the table of connections shown in appendix A.

APPENDIX A

Connection tables for TB8204 Analogue I/O Transition Board

Connector Group: 1 IP Site: A							
Lemo Screen	VME	IP	Signal	Lemo Signal	VME	IP	Signal
1a	P2-C6	2	Sig_Lo1	1a	P2-A6	1	Sig_Hi1
1b	P2-C7	4	Sig_Lo2	1b	P2-A7	3	Sig_Hi2
2a	P2-C8	6	Sig_Lo3	2a	P2-A8	5	Sig_Hi3
2b	P2-C9	8	Sig_Lo4	2b	P2-A9	7	Sig_Hi4
3a	P2-C10	10	Sig_Lo5	3a	P2-A10	9	Sig_Hi5
3b	P2-C11	12	Sig_Lo6	3b	P2-A11	11	Sig_Hi6
4a	P2-C12	14	Sig_Lo7	4a	P2-A12	13	Sig_Hi7
4b	P2-C13	16	Sig_Lo8	4b	P2-A13	15	Sig_Hi8
5a	P2-C23	36	XTrigN1	5a	P2-A23	35	XTrigP1
5b	P2-C25	40	XClk N1	5b	P2-A25	39	XClk P1

Connector Group: 2 IP Site: B							
Lemo Screen	VME	IP	Signal	Lemo Signal	VME	IP	Signal
6a	P2-Z5	2	Sig_Lo9	6a	P2-D4	1	Sig_Hi9
6b	P2-D6	4	Sig_Lo10	6b	P2-D5	3	Sig_Hi10
7a	P2-D7	6	Sig_Lo11	7a	P2-Z7	5	Sig_Hi11
7b	P2-Z9	8	Sig_Lo12	7b	P2-D8	7	Sig_Hi12
8a	P2-D10	10	Sig_Lo13	8a	P2-D9	9	Sig_Hi13
8b	P2-D11	12	Sig_Lo14	8b	P2-Z11	11	Sig_Hi14
9a	P2-Z13	14	Sig_Lo15	9a	P2-D12	13	Sig_Hi15
9b	P2-D14	16	Sig_Lo16	9b	P2-D13	15	Sig_Hi16
10a	P2-D27	36	XTrig N2	10a	P2-Z27	35	XTrig P2
10b	P2-D30	40	XClk N2	10b	P2-D29	39	XClk P2

Connector Group: 3 IP Site: C							
Lemo Screen	VME	IP	Signal	Lemo Signal	VME	IP	Signal
11a	P0-B11	2	Sig_Lo17	11a	P0-A11	1	Sig_Hi17
11b	P0-D11	4	Sig_Lo18	11b	P0-C11	3	Sig_Hi18
12a	P0-A12	6	Sig_Lo19	12a	P0-E11	5	Sig_Hi19
12b	P0-C12	8	Sig_Lo20	12b	P0-B12	7	Sig_Hi20
13a	P0-E12	10	Sig_Lo21	13b	P0-D12	9	Sig_Hi21
13b	P0-B13	12	Sig_Lo22	13b	P0-A13	11	Sig_Hi22
14a	P0-D13	14	Sig_Lo23	14a	P0-C13	13	Sig_Hi23
14b	P0-A14	16	Sig_Lo24	14b	P0-E13	15	Sig_Hi24
15a	P0-A18	36	XTrig N3	15a	P0-E17	35	XTrig P3
15b	P0-E18	40	XClk N3	15b	P0-D18	39	XClk P3

Connector Group: 4 IP Site: D							
Lemo Screen	**VME**	**IP**	**Signal**	**Lemo Signal**	**VME**	**IP**	**Signal**
16a	**P0-B1**	**2**	**Sig_Lo25**	**16a**	**P0-A1**	**1**	**Sig_Hi25**
16b	**P0-D1**	**4**	**Sig_Lo26**	**16b**	**P0-C1**	**3**	**Sig_Hi26**
17a	**P0-A2**	**6**	**Sig_Lo27**	**17a**	**P0-E1**	**5**	**Sig_Hi27**
17b	**P0-C2**	**8**	**Sig_Lo28**	**17b**	**P0-B2**	**7**	**Sig_Hi28**
18a	**P0-E2**	**10**	**Sig_Lo29**	**18a**	**P0-D2**	**9**	**Sig_Hi29**
18b	**P0-B3**	**12**	**Sig_Lo30**	**18b**	**P0-A3**	**11**	**Sig_Hi30**
19a	**P0-D3**	**14**	**Sig_Lo31**	**19a**	**P0-C3**	**13**	**Sig_Hi31**
19b	**P0-A4**	**16**	**Sig_Lo32**	**19b**	**P0-E3**	**15**	**Sig_Hi32**
20a	**P0-A8**	**36**	**XTrig N4**	**20a**	**P0-E7**	**35**	**XTrig P4**
20b	**P0-E8**	**40**	**XClk N4**	**20b**	**P0-D8**	**39**	**XClk P4**

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