

# Specification of Transition Module for Autonomous inputs to PreFRED

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This note specifies a VME transition module to allow single NIM, ECL, TTL or LVDS signals to be brought to a PreFRED module for the L1 Trigger. The purpose is to allow special input from scintillators, luminosity counters etc to be easily incorporated into the L1 system. This is an important function that gives CDF II more flexibility and room to evolve than it had before.

The form of the module is a simplified version of the existing L1AUX card used with DIRAC and PreFRED modules.

## Mechanical:

- Board dimensions: 9Ux400mm Eurocard following IEE 1101.11 specs
- Board thickness: 0.093"
- P0 connector: (95 pin 2mm Hard Metric) for power connections
- P2 connector: not required but the foot print will be provided to mount a connector shell for alignment
- P3 connector: 220pin 2mm Hard Metric for output to PreFRED
- A board stiffener will be installed as close to the backplane connectors as feasible. This will be of the type described by Fermilab drawing: Drawing WS-9USTIF-032597.

## Inputs:

- 30 single bit inputs divided up by logic level
- 4 single ended NIM Channels (channels 0-3)
- 2 single ended TTL channels (channels 4-5)
- 2 single ended ECL channels (channels 6-7)

- 2 differential LVDS channels (channels 8-9)
- 20 differential LVDS channels on two standard L1 input connectors (channels 10-29)

### **Input Connectors:**

- Channels 0-5: NIM and TTL use LEMO type coaxial connectors, preferably a right angle board mount.
- Channels 6-9: LVDS and ECL use LEMO Differential connector, right angle board mount. LEMO P/N EPG.0B.302.HLN board mount.
- Channels 10-29: use the standard L1 input connector, Fujitsu FCN235D020-G/E

### **Connector shield connections:**

- Connector shields *do not* connect directly to board ground.
- Allowance for AC connection to board ground should be made in the same fashion as the standard L1AUX card.
- Connector shields must not make electrical contact to the board front panel. This is most easily accomplished through the use of a non conductive panel as is done with the standard L1AUX card.

### **Outputs:**

- 16 single ended TTL
- Connector 220 pin HM connector in VME J3 position
- Pinout of J3 connector given in Table 1

### **Power**

- +5V xxmA from P0 connector (pins a1, b1, c1, d1, e1, c2)
- -5.2V yy mA from P0 connector (pins a4, a5, a9, a10, a11, a12, a16, a17)
- There will be a panel indicator for each voltage
- Power supplies will be fused and have transient suppressors

Table 1: J3 connector pin assignments for the Autonomous PreFRED Transition module. **TRIGBIT** = output trigger bits to FRED, these are No Connects on the transition module. **IN(x)** = Input: 0-3 correspond to single bit input NIM, 4-5 correspond to single bit input ECL, 6-7 correspond to single bit input ECL, 8-9 correspond to single bit input LVDS, 10-19 correspond to 10 channels on one L1 connector and 20-29 to 10 bits on the other L1 connector. **Not Used** means these are not provided by the transition these should be No Connects or grounded, whichever is better for the Altera chip on PreFRED.

Pin #	Row						
	z	a	b	c	d	e	f
1	GND	GND	TRIGBIT(0)	TRIGBIT(1)	TRIGBIT(2)	TRIGBIT(3)	GND
2	GND	N/C	TRIGBIT(4)	TRIGBIT(5)	GND	TRIGBIT(6)	GND
3	GND	N/C	TRIGBIT(7)	GND	TRIGBIT(8)	TRIGBIT(9)	GND
4	GND	N/C	TRIGBIT(10)	TRIGBIT(11)	GND	TRIGBIT(12)	GND
5	GND	GND	TRIGBIT(13)	GND	TRIGBIT(14)	TRIGBIT(15)	GND
6	GND	N/C	NIM1	GND	GND	GND	GND
7	GND	N/C	GND	GND	GND	GND	GND
8	GND	N/C	GND	GND	GND	NIM2	GND
9	GND	GND	GND	GND	GND	GND	GND
10	GND	N/C	GND	GND	GND	GND	GND
11	GND	N/C	GND	GND	GND	NIM3	GND
12	GND	N/C	GND	GND	GND	GND	GND
13	GND	GND	GND	GND	GND	GND	GND
14	GND	N/C	GND	GND	NIM4	GND	GND
15	GND	N/C	GND	GND	GND	GND	GND
16	GND	N/C	GND	GND	GND	GND	GND
17	GND	GND	GND	GND	TTL1	GND	GND
18	GND	N/C	GND	GND	GND	GND	GND
19	GND	N/C	GND	GND	GND	GND	GND
20	GND	N/C	GND	TTL2	GND	GND	GND
21	GND	GND	GND	GND	GND	GND	GND
22	GND	N/C	GND	GND	GND	GND	GND
23	GND	N/C	ECL1	GND	GND	GND	GND
24	GND	N/C	GND	GND	GND	GND	GND
25	GND	GND	GND	GND	GND	GND	GND
26	GND	N/C	ECL2	GND	GND	GND	GND
27	GND	N/C	GND	GND	GND	GND	GND
28	GND	N/C	GND	GND	GND	LVDS1	GND
29	GND	GND	GND	GND	GND	GND	GND
30	GND	N/C	GND	GND	GND	GND	GND
31	GND	N/C	GND	GND	GND	LVDS2	GND
32	GND	N/C	GND	GND	GND	GND	GND
33	GND	GND	GND	GND	GND	GND	GND
Connector Key (equivalent to 3 pins)							
34	GND	N/C	GND	GND	LVDS3(0)	LVDS3(1)	GND
35	GND	N/C	LVDS3(2)	LVDS3(3)	GND	LVDS3(4)	GND
36	GND	N/C	LVDS3(5)	LVDS3(6)	LVDS3(7)	LVDS3(8)	GND
37	GND	GND	LVDS3(9)	GND	LVDS4(0)	LVDS4(1)	GND
38	GND	N/C	LVDS4(2)	LVDS4(3)	LVDS4(4)	LVDS4(5)	GND
39	GND	N/C	LVDS4(6)	LVDS4(4)	GND	LVDS4(8)	GND
40	GND	N/C	LVDS4(9)	N/C	TRIGBIT(16)	TRIGBIT(17)	GND
41	GND	GND	TRIGBIT(18)	N/C	TRIGBIT(19)	B0_DELAYED	GND
42	GND	N/C	BP_SPARE(0)	BP_SPARE(1)	GND	BP_SPARE(2)	GND
43	GND	N/C	N/C	AUX_ENABLE	N/C	N/C	GND
44	GND	N/C	N/C	N/C	N/C	N/C	GND