Test Card (WBS 1.1.2.5), aka "Purple Card"

(R Sidwell, T Sobering, et al.) 08 Feb '02

This card will be used in test stands for testing and burn-in of hybrids and detectors. It buffers and translates signals between the stand-alone sequencer (SASEQ), a two-channel 6U version of the sequencer module that uses TTL logic, and the SVX4 using 2.5v differential logic. A similar module was built by KSU for run 2a teststands. The card, also known as the Purple Card, will be 6U sized or smaller and will have a connector for a 50-conductor cables from a SASEQ, and two output AVX connectors for jumper cables. Functionally the purple card is similar to the active adapter card, but with additional functions mentioned below and marked with an *. Every effort will be made to make it difficult for inexperienced operators to damage or destroy hybrids and detectors.

Agreed upon functionality (based on telephone meeting 1/8/02 of Gerber, Reay and Sidwell), and as amended by Nomerotski on 14 Jan, and KSU on 18 Jan):

1) Two channels per printed circuit board.

2) Size width 6", length TDB, location between SVX modules (per Leflat's drawing).

3) Voltage regulation of SVX4 power (and possibly board power if needed). SVX4 voltage controlled by HDI enable/disable. Power could be supplied via an 8-pin header. LEDs will indicate power status (on if LED is lit). Voltage regulator will be variable voltage version of ON regulator (part # CS5253B-1). Test points will be supplied to allow check of output voltages via well-shielded high impedance oscilloscope leads or DVM.

4) Temperature monitor (4-pin header): DC voltage out covering range -20 to 50 degrees centigrade. The target device is VMIC VMIVME3113 ADC, provides 8-bit digitization, and 64 inputs. Full range coverage is NOT mandatory. A temperature measurement of $+-2^0$C is adequate. Assumed temperature measuring device is 1000Ω platinum RTD used in Run2a. Full range of Vout will be 0-1v, so that x10 gain mode of VMIC ADC will need to be used. Vout= 50mV will correspond to –20 degrees, Vout=+1V to +50 degrees.

⇒* 5) HV (silicon bias) supplied via a SHV connector, and controlled by HDI enable/disable from the SASEQ (300V max.). HV is passed thru to the digital jumper cable. Provision will be made for 1kV bias path with jumpers to select between 0-300V switched bias and 1kV bias. No switching will be provided for 1kV.

6) CAL-SR: two LEMO connectors ***(question: are two connectors required?)***

⇒* 7) fuses on SVX4 power, and board power. KSU will use board sockets for small cartridge type fuses. Preferred location for fuses is along the back of the board where power enters the card.

* 8) Dvalid delay provision; SIP

* 9) clock conversion from TTL to low-voltage differential

* 10) one input 50-conductor connector from SASEQ or sequencer

* 11) two pairs of output connectors- digital jumper. (twisted pair option removed)

12) One power connector will be provided with separate SVX power for each channel (pre-regulator AVDD_A, DVDD_A, AVDD_B, DVDD_B, nominally 4-5V each) with provision for jumpering these

supplies on the board. Connector will also supply board power (nominally 5V) and analog (+12V) for temperature monitor. With returns, 12 pins will be required (depending on current handling capability). Connector is TBD. (Question: is it necessary/desirable to also double board power and analog to keep the channels completely isolated?)

Target date: July '02 for working prototype.
Schedule:

Feb 15 draft schematic
March 15 final schematic
May 1 final layout
June 15 first untested prototypes

Probable cost: as specified in KSU MOU.

Changes and remarks:

1) Dropped twisted pair connectors.
2) Changes since 9 Jan marked in red.
3) Resettable fuses require up to 2 sec to turn off- these are not viable in our opinion.
4) Should we put out SVX4 voltages on a header to be read out via twist and flat cable? We would prefer NOT to do this: provides an 8-10 antenna to pick up noise. However test points to probe voltages via DVM or oscilloscope will be provided. (I think the answer is "no" to remote monitoring, but I want to make sure the issue is closed. Testpoints on the board are no problem.)
5) Do we need to protect against scenarios where e.g. the DVDD line has blown a fuse, but AVDD and the transceiver power are still enabled?
6) Why is a 2" clear zone provided for behind the AVX connector on Leflat's drawing?

Temporary Attachments:

hi Ron,

towards the final specs on the purple card :

1) i thought it may be useful to output AVDD and DVDD after the voltage regulators
- the power supply measures the inputs of the regulator. VCC and 15V we don't need - you are right. Current measurement is more complicated and also we can have the currents from the power supplies. so we can have 12 pin header for these
voltages :
1. voltage corresponding to temperature1
2. voltage corresponding to temperature2
3. AVDD1
4. DVDD1
5. AVDD2
6. DVDD2 all after regulators
please let me know your thoughts about it and what we should do with Dave's proposal - i want to get back to him with a proposal. I thought that having a connector with voltages should satisfy everybody.

2) what scheme for the voltage regulation do you want to have and which voltage regulators do you want to use? old ones or new ones, current sensing or voltage sensing? we want it to be the same as at the adapter card, don't we? so we need to
settle this as well. this is may be a bigger issue than 1).

if we settle 1) then i think we are in good shape to converge on the specs sooner
than 1/31.

cheers Andrei

Andrei Nomerotski wrote:

> hi Ron,
>
> i did not mean measuring current - this is a complication indeed. all i was
> thinking about was a connector with
>
> 7. VCC
> 8. 15V (if needed)
>
> 3-8 came about because it doesn't cost anything to have them (is it right? the
> connector will get bigger) but i don't have strong arguments why we need them.
>
> cheers Andrei
>
> "Sidwell, Ron A." wrote:
>
> > Andrei- why is the chip voltage interesting, and which chip are
> > you referring to? I'm trying to keep this thing as simple as possible.
> > Maybe that is not what people want. I realize that DVDD current
> > was a useful diagnostic for SVX2. Do we care about it in the

> > future? We'll have it for the experiment with the interface board.
> > But for testands we can just look at power supplies. ron
> >
> > -----Original Message-----
> > From: Andrei Nomerotski
> > Sent: Mon 1/14/2002 6:51 PM
> > To: Ronald A Sidwell
> > Cc:
> > Subject: Re: temperature
> > hi Ron, did you assume that VMIC will be measuring the chip voltage as
> > well?
> >
> > after reading Dave's mail my feeling is that we should just have a
> > connector
> > which would output all voltages including the temperature and then
> > everybody can
> > use his favorite device to measure it. mine would be a pocket meter!
> >
> > if possible could you feed back on this before the meeting so we try to
> > settle
> > this tomorrow.
> >
> > cheers Andrei
> >
> > "David A. Buchholz" wrote:
> >
> > > Andrei,
> > > I was motivated in part by the assumption that there will be
> > test
> > > stands that will not have one of the VMIC ADC boards for measuring
> > > voltages. I suggested that you could add one of the Dallas/Maxim
> > > temperature chips on the new purple cards to measure the temperature.
> > For
> > > example the DS1621 chip reads out the temperature to +-0.5 degrees C
> > and
> > > uses a single 5V supply. It is read out as a digital voltage over a 2
> > wire
> > > serial system. the cost is of the order of $5 or less per chip.
> > > My proposal was to provide a microprocessor based system that
> > > could read the temperatures and low voltages instead of using the VME
> > > board. This microprocessor would then have to be read into the PC by
> > > either the PC's serial or parallel interface.
> > > I provided a similar system for the neutrino experiment to
> > read
> > > their power supplies, temperature, humidity, and atmospheric pressure.
> > This
> > > required that the system be interfaced to sensors spread over about
> > 200 feet.
> > > Of course another alternative would be to place an analog
> > > temperature sensor on the purple cards which could then be read either
> > by a
> > > VME ADC board or a microprocessor system.
> > > Dave
> > > At 1/14/2002 12:04 PM, Andrei Nomerotski wrote:
> > > >hi Dave,
> > > >
> > > >could you describe in few words your proposal on temperature

> > measurement
> > > >- i was slow today and did not understand well what you were
> > proposing.
> > > >we can discuss it then and decide what to do.
> > > >
> > > >it looks like the temperature is the only remaining issue to settle
> > on
> > > >specs. after the meeting we agreed with Ron to scrap twisted pair
> > > >connectors and reduce the HV requirement (for the purple board!) to
> > 200
> > > >V.
> > > >
> > > >thanks! Andrei
> > >
> > > David A. Buchholz, Professor
> > > Department of Physics and Astronomy
> > > Northwestern University, Evanston, IL. USA
> > > dbuchholz@northwestern.edu
> > >
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