DEAR Technical Note IR-7

On an enhanced Slow Monitor and Control System

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1. Project goals

- To increase the reliability and the flexibility of the actual Slow Monitor and Control System
- To accommodate the possible modifications imposed by the new DEAR set-up

2. Description

The present Slow Monitor and Control System [1] requires two personal computers, connected through an local network, and is based on the following National Instruments hardware:

- GPIB PC AT-bus card
- AT-MIO-16 PC AT-bus card
- PC-TIO-10 PC AT-bus card
- SMD-2042-RTD interface card

With it we can visualize:

- CCD's temperatures and isolation vacuum
- cryogenic target temperature and pressure

and to control

- Calibration source status
- Safety valve position
- Power on/off the VME crate
- Power on/off the Command Box
- Power on/off one reserve channel.

The main weakness of this system is the location , DEAR platform very close to the interaction point, of the personal computer (Server PC) on which all the hardware is connected. Because of this, in case of a hardware or software failure we are loosing the

[1] DEAR Technical Note - The DEAR Slow Monitor and Control System by Ross King

control completely (up to now it was happened two times in one week of data taking) and we cannot restart the system without entering in DAFNE. Moreover, the signal conditioning card SC-2042-RTD has eight analog inputs of which six are already in use, the remaining being insufficient for the future DEAR set-up.

The new proposed system requires one personal computer, situated in the counting room, and the following National Instruments products:

- SCXI-1122 signal conditioning module
- SCXI-1322 terminal block for the SCXI-1122 module
- SCXI-1200 multifunction analog, digital and timing module
- SCXI-1302 terminal block for the SCXI-1200 module
- SCXI-2000 Chassis and Module with RS-232/RS-485 interface
- GPIB↔RS-485 Controller
- AT-485/2 (2-port) PC board

The SCXI-1122 is a 16-channel signal conditioning module with a programmable amplifier (gains from 0.01 to 2000) and 1.0 mA excitation source.
The SCXI-1200 can acquire data and control several SCXI signal conditioning modules installed in the same chassis. While the SCXI-1200 can digitize conditioned output signals from SCXI-1122, we can use the multifunction I/O channels of the SCXI-1200 itself to acquire and control I/O signals via the front connector module.
The SCXI-2000 is a chassis with a built-in RS-232 and RS-485 interface. It can house up to four signal conditioning and data acquisition modules.
The GPIB↔RS-485 Controller turns any computer with an RS-485 board into a full function IEEE 488.2 Controller. It can be used paired with an RS-485 board as a GPIB extender up to 1.2 km.
A brief scheme of the proposed system is shown in fig.1

3. Conclusions

The main advantages of this system are:

- one computer situated in the counting room will control all the hardware
- the RS-485 interface provides a reliable, long distance connection (max. 1.2 Km)
- the signal conditioning module SCXI-1122 has 16 channel analog inputs, more than enough to measure the temperature of sixteen CCD's (two per RTD).

The disadvantages are :

- we can't use any of the available National Instruments cards, which compose the present Slow Monitor and Control System, so the price of the system is high (around 10.000.000 itl)
- the existing software has to be modified

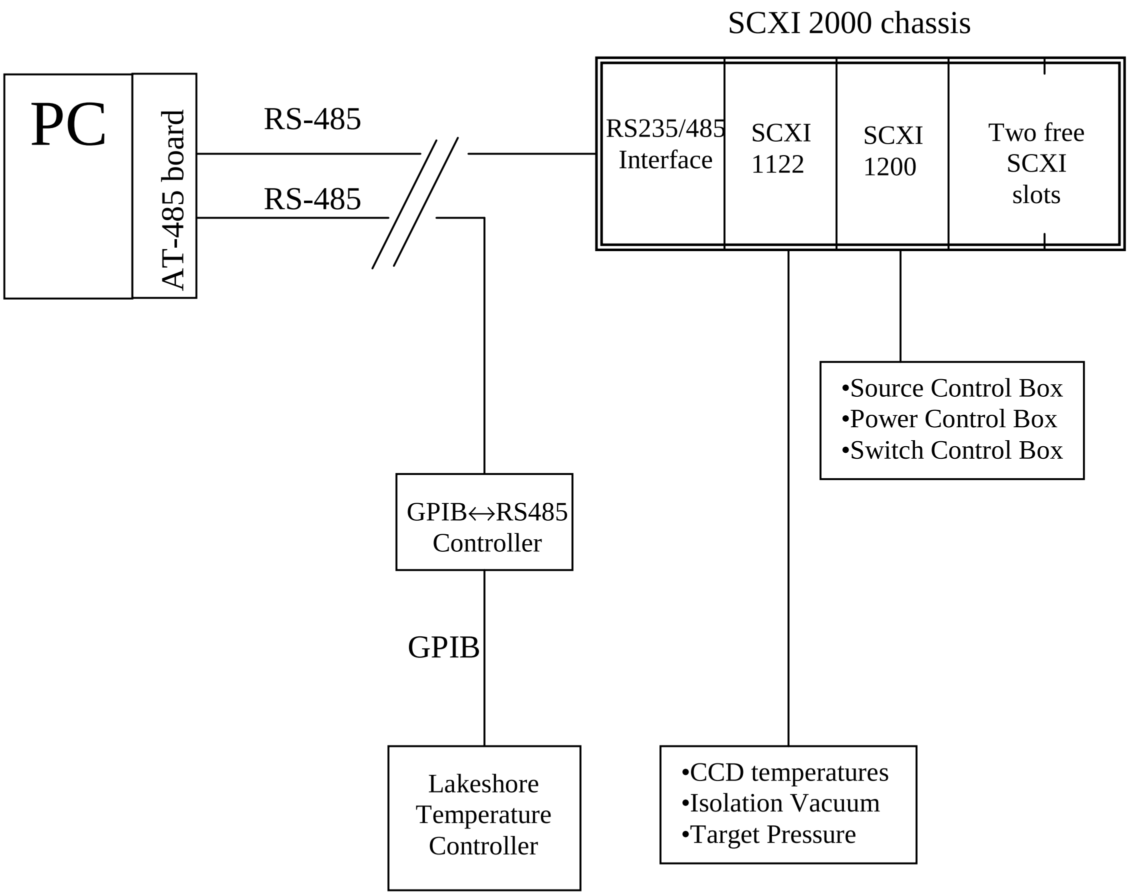

Fig.1 Schematic view of the proposed Slow Monitor and Control System