I2C CONTROL SYSTEM 20130123

Task is to:
Set DAC values for the SALTRO
monitor the temperature on each MCM
monitor voltages and currents on each LV panel
enable/disable voltage regulators

Proposed layout

The control system is divided in two parts: slaves, and a main controller.

Slaves:

*Each LV panel is controlled from a microprocessor with two I2C interfaces:
one (I2C mastet) for communicating with the LV panel
one (RS422/RS485 slave) for communicating with a remote main controller
*The task is
automatically monitor temperature, voltages, currents
on request report alarms & values to the remote main controller
execute commands from the main controller, e.g. switch on/off regulators
automatically switch off regulators in case of fatal failures
act as relay of commands from the main controller to the CPLD
*The 5 slaves (S1,..,S5) for a module with 5 LV panels (LV1,..,LV5) are in the same physical box. The five processors are independent and operate in parallel.
*The slave box can be placed where? It would be good if one could drive the I2C between the LV panel and the box a distance of a few meters, in case space is a problem.

Power options:
It can get the power from the LV panel
It has a separate power and provides the power to the I2C devices on the LV panel
It has a separate power and do not provide the power to the I2C devices on the LV panel

Cabling:
between the box and LV panel, five cables with at least the two I2C signals (Clock and Data).
If power is to be provided as well then one need power and GND for each LV panel.
The connectors used must be robust and nonmagnetic.

Main controller:

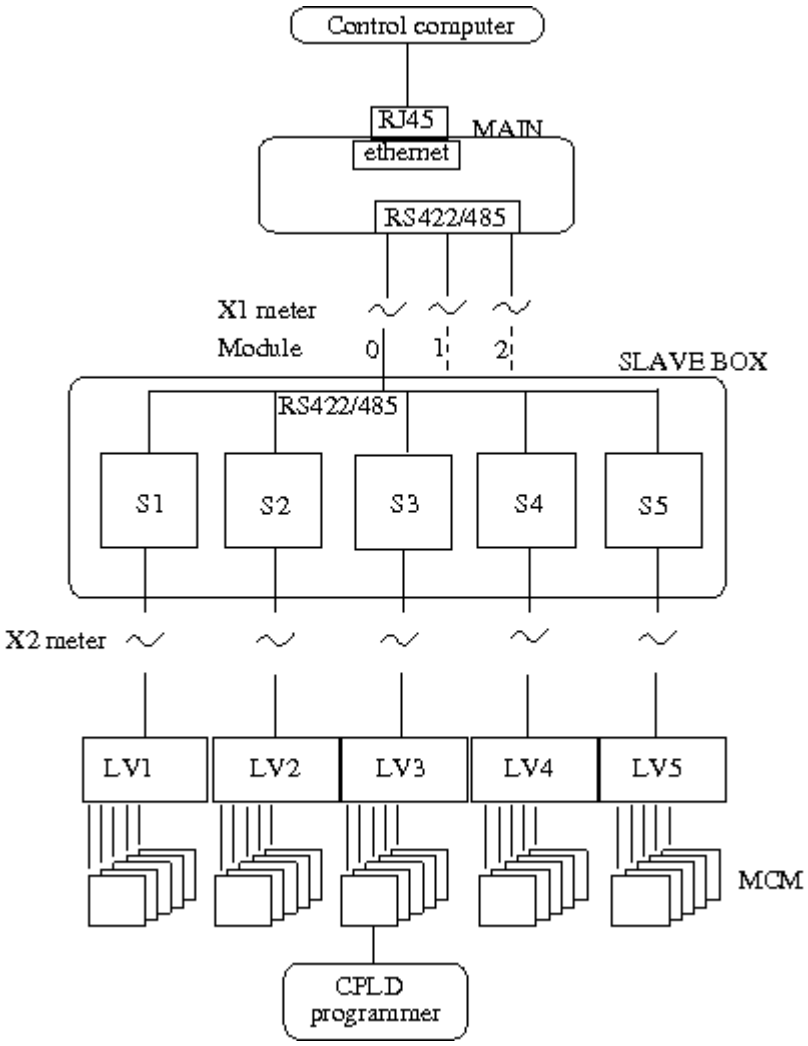
The slaves are connected with a long cable (RS422/485 serial interface) to the main controller. The main controller is equipped with an ethernet interface and must therefore not be close to the magnet. Perhaps as far away as in the control room. It can handle up to three slaves.

*The task is
collect information from the slaves and send it using ethernet to a controlling computer
Instruct the slaves to switch off the regulators in case of failure.

Act as a relay of commands from the controlling computer to the slaves, e.g. switch on/off regulators, and the CPLD, e.g. configure registers in the CPLD if needed.

Hardware/Software

The slave and the main controller must be built and the software written



CPLD programmer

For programming of the CPLD the LV panel will not be used, we do not foresee to reprogram the CPLD in place on a module. The plan is connect a programming device with I2C which is capable of directly programming the CPLD on a MCM. Do we have to build the programming device?