Power Supplies for Sub-Structures and Sub-Detectors

On behalf of Giuliano Parrini

Power Supplies in Large Structure Tests

- In Firenze we asked CAEN and LABEN (the two firms which made prototypes for CMS Tracker PS) to give a price quote for Power Supply Units to be used during the test of structures with "large" number of detector modules

- Boundary conditions:
  - Performances and features "similar" to the ones of the prototype PS
  - Limited number of such a system
  - No special SW

The Answers

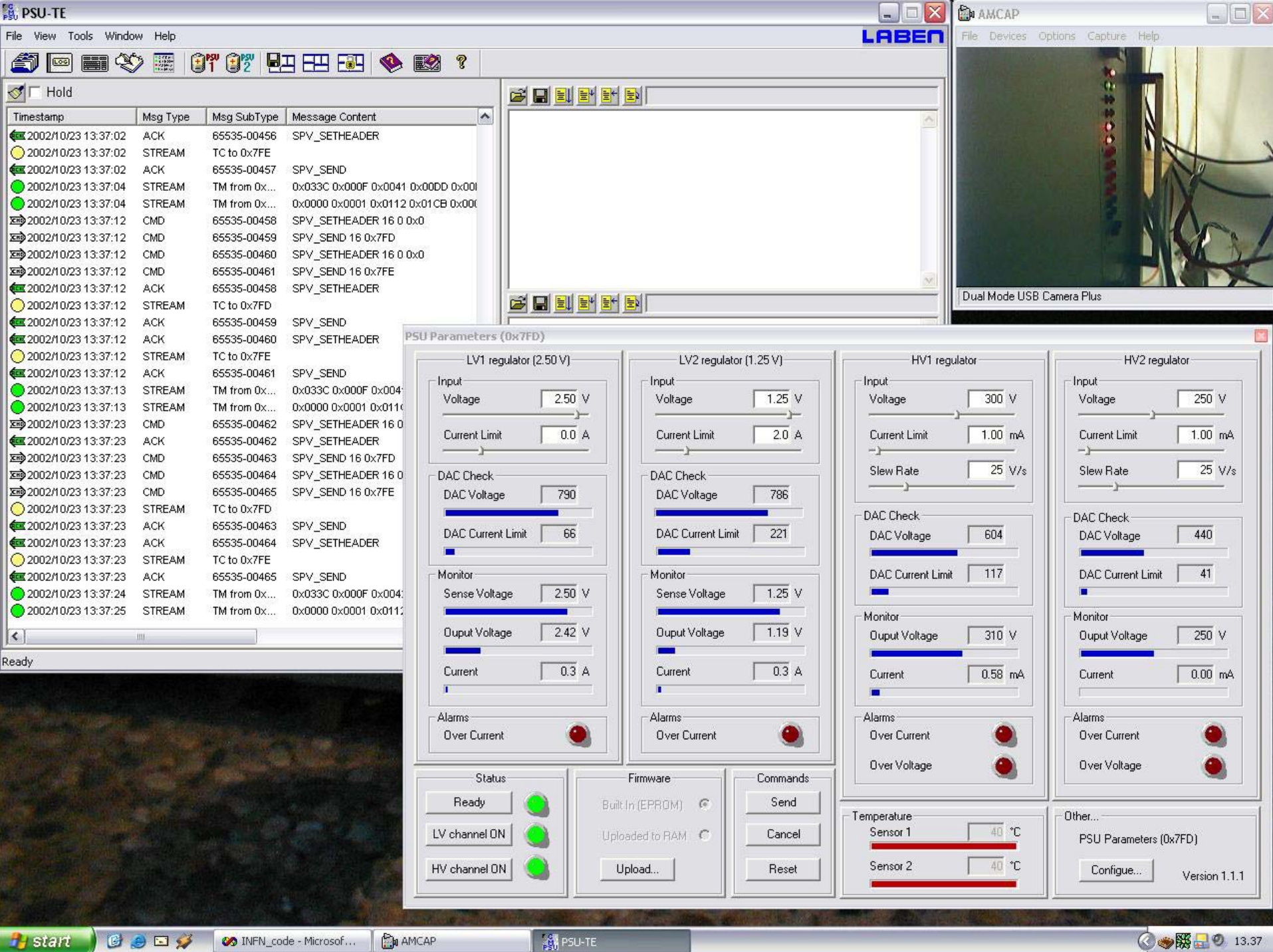
- CAEN: off-the-catalog units
- LABEN: custom PSU, following the prototypes development

CAEN Proposal

- SY1527 or SY2527 product line, floating PS
- LV: A1518, 6 channels, **4.5 V** max on board output, sense lines, **6A**
- HV: A1511, 12 channels, 500 V, dual current range 1/10 mA, 12 bit resolution
- The cost: 1 crate 2527 + 2 LV modules + 1 HV module = **21 KEuro**
- This is equivalent to 6 PSU in the prototype terminology
- Delivery: 4 months from order
- Caen is starting to check if its products meet the isolation, noise, overshoots requirements of the CMS Tracker prototype. SW fulfills needs.

LABEN Proposal

- According to our specifications a PSU unit has 2 HV channels, 500 V, 20 mA, 1 channel **2.5 V, 13A**, 1 channel **1.25 V, 7A**.
- 1 crate houses up to 3 PSM modules, each PSM consisting of 2 PSU
- PSU Controlled via CAN bus
- The cost: 1 crate + 6 PSU = **28 KEuro**
- (The cost for 1 crate + 2 PSU = 16 KEuro)
- Prices include PCI CAN bus interface PCI card (computer not included!)
- Delivery: 5 months from order
- SW developed in Firenze (A. Bocci); new 'smart' firmware by end 2002. SW upgrades in progress.


PSU-TE
File View Tools Window Help
LABEN
Hold
Timestamp Msg Type Msg SubType Message Content
2002/10/23 13:37:02 ACK 65535-00456 SPV_SETHEADER
2002/10/23 13:37:02 STREAM TC to 0x7FE
2002/10/23 13:37:02 ACK 65535-00457 SPV_SEND
2002/10/23 13:37:04 STREAM TM from 0x... 0x033C 0x000F 0x0041 0x00DD 0x00
2002/10/23 13:37:04 STREAM TM from 0x... 0x0000 0x0001 0x0112 0x01CB 0x00
2002/10/23 13:37:12 CMD 65535-00458 SPV_SETHEADER 16 0 0x0
2002/10/23 13:37:12 CMD 65535-00459 SPV_SEND 16 0x7FD
2002/10/23 13:37:12 CMD 65535-00460 SPV_SETHEADER 16 0 0x0
2002/10/23 13:37:12 CMD 65535-00461 SPV_SEND 16 0x7FE
2002/10/23 13:37:12 ACK 65535-00458 SPV_SETHEADER
2002/10/23 13:37:12 STREAM TC to 0x7FD
2002/10/23 13:37:12 ACK 65535-00459 SPV_SEND
2002/10/23 13:37:12 ACK 65535-00460 SPV_SETHEADER
2002/10/23 13:37:12 STREAM TC to 0x7FE
2002/10/23 13:37:12 ACK 65535-00461 SPV_SEND
2002/10/23 13:37:13 STREAM TM from 0x... 0x033C 0x000F 0x004
2002/10/23 13:37:13 STREAM TM from 0x... 0x0000 0x0001 0x011
2002/10/23 13:37:23 CMD 65535-00462 SPV_SETHEADER 16 0
2002/10/23 13:37:23 ACK 65535-00462 SPV_SETHEADER
2002/10/23 13:37:23 CMD 65535-00463 SPV_SEND 16 0x7FD
2002/10/23 13:37:23 CMD 65535-00464 SPV_SETHEADER 16 0
2002/10/23 13:37:23 CMD 65535-00465 SPV_SEND 16 0x7FE
2002/10/23 13:37:23 STREAM TC to 0x7FD
2002/10/23 13:37:23 ACK 65535-00463 SPV_SEND
2002/10/23 13:37:23 ACK 65535-00464 SPV_SETHEADER
2002/10/23 13:37:23 STREAM TC to 0x7FE
2002/10/23 13:37:23 ACK 65535-00465 SPV_SEND
2002/10/23 13:37:24 STREAM TM from 0x... 0x033C 0x000F 0x004
2002/10/23 13:37:25 STREAM TM from 0x... 0x0000 0x0001 0x011
Ready
AMCAP
File Devices Options Capture Help
Dual Mode USB Camera Plus
PSU Parameters (0x7FD)
LV1 regulator (2.50 V)
Input
Voltage 2.50 V
Current Limit 0.0 A
DAC Check
DAC Voltage 790
DAC Current Limit 66
Monitor
Sense Voltage 2.50 V
Ouput Voltage 2.42 V
Current 0.3 A
Alarms
Over Current
LV2 regulator (1.25 V)
Input
Voltage 1.25 V
Current Limit 2.0 A
DAC Check
DAC Voltage 786
DAC Current Limit 221
Monitor
Sense Voltage 1.25 V
Ouput Voltage 1.19 V
Current 0.3 A
Alarms
Over Current
HV1 regulator
Input
Voltage 300 V
Current Limit 1.00 mA
Slew Rate 25 V/s
DAC Check
DAC Voltage 604
DAC Current Limit 117
Monitor
Ouput Voltage 310 V
Current 0.58 mA
Alarms
Over Current
Over Voltage
HV2 regulator
Input
Voltage 250 V
Current Limit 1.00 mA
Slew Rate 25 V/s
DAC Check
DAC Voltage 440
DAC Current Limit 41
Monitor
Ouput Voltage 250 V
Current 0.00 mA
Alarms
Over Current
Over Voltage
Status
Ready
LV channel ON
HV channel ON
Firmware
Built In (EPROM)
Uploaded to RAM
Upload...
Commands
Send
Cancel
Reset
Temperature
Sensor 1 40 °C
Sensor 2 40 °C
Other...
PSU Parameters (0x7FD)
Configue...
Version 1.1.1
start
INFN_code - Microsof...
AMCAP
PSU-TE
13.37

Remarks

- CAEN
  - PSU has 6 A max: is this suitable for our needs?
  - Will it satisfy noise, isolation etc. requirements?
  - Discount foreseen if we buy more than 3 systems
- LABEN
  - Extra cost to start production "una tantum"....
  - We have to tell them the minimum quantity we will buy before they start