

Outline

Application example – CMS ECAL precision temperature monitoring (high accuracy required)

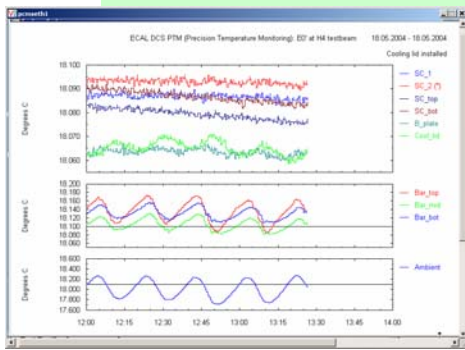
H4 testbeam – harsh electrical environment

ELMB failures – no control via CAN

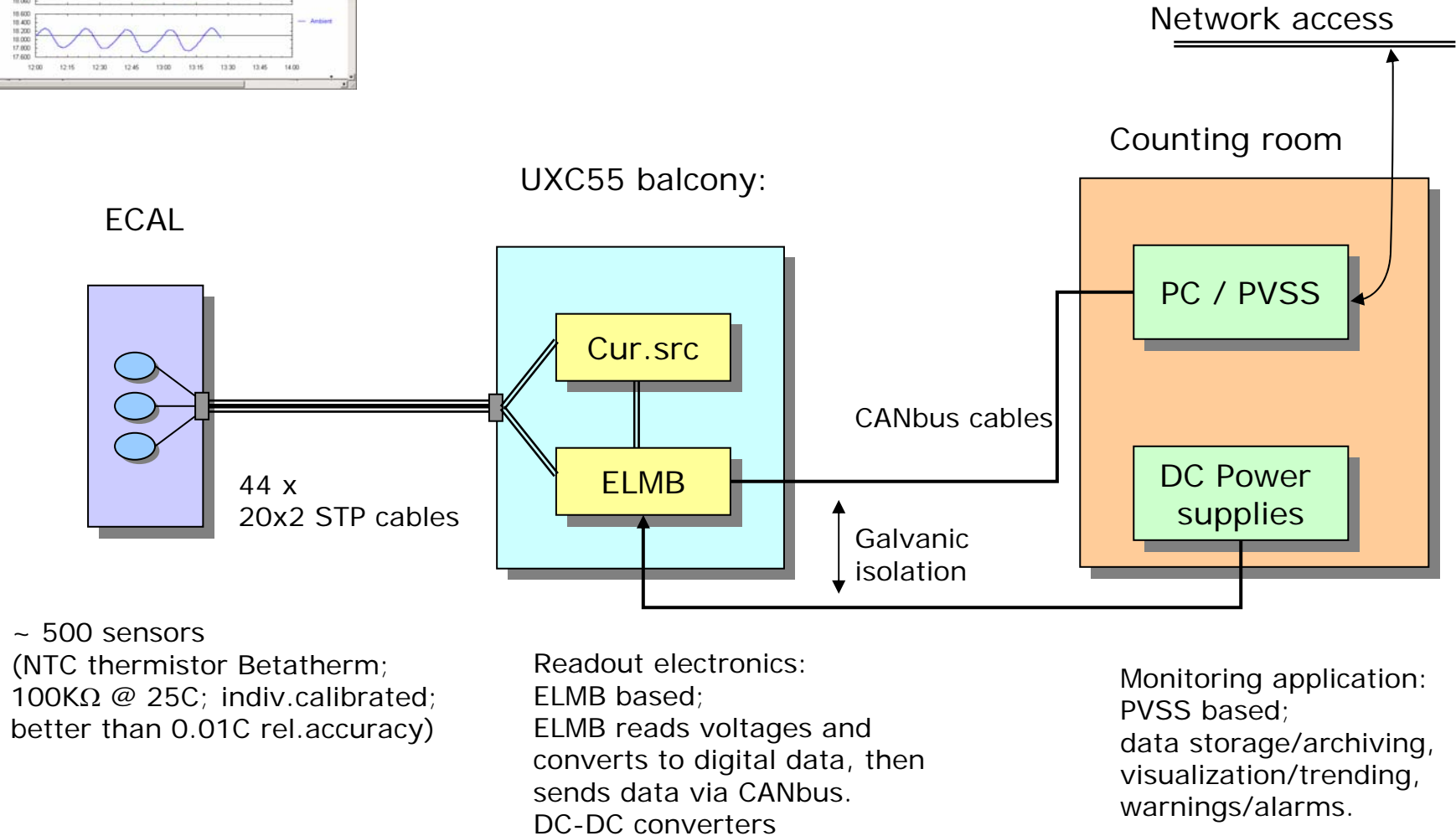
ATLAS solution

Latest ELMB version (HW/SW) -- many improvements and new features

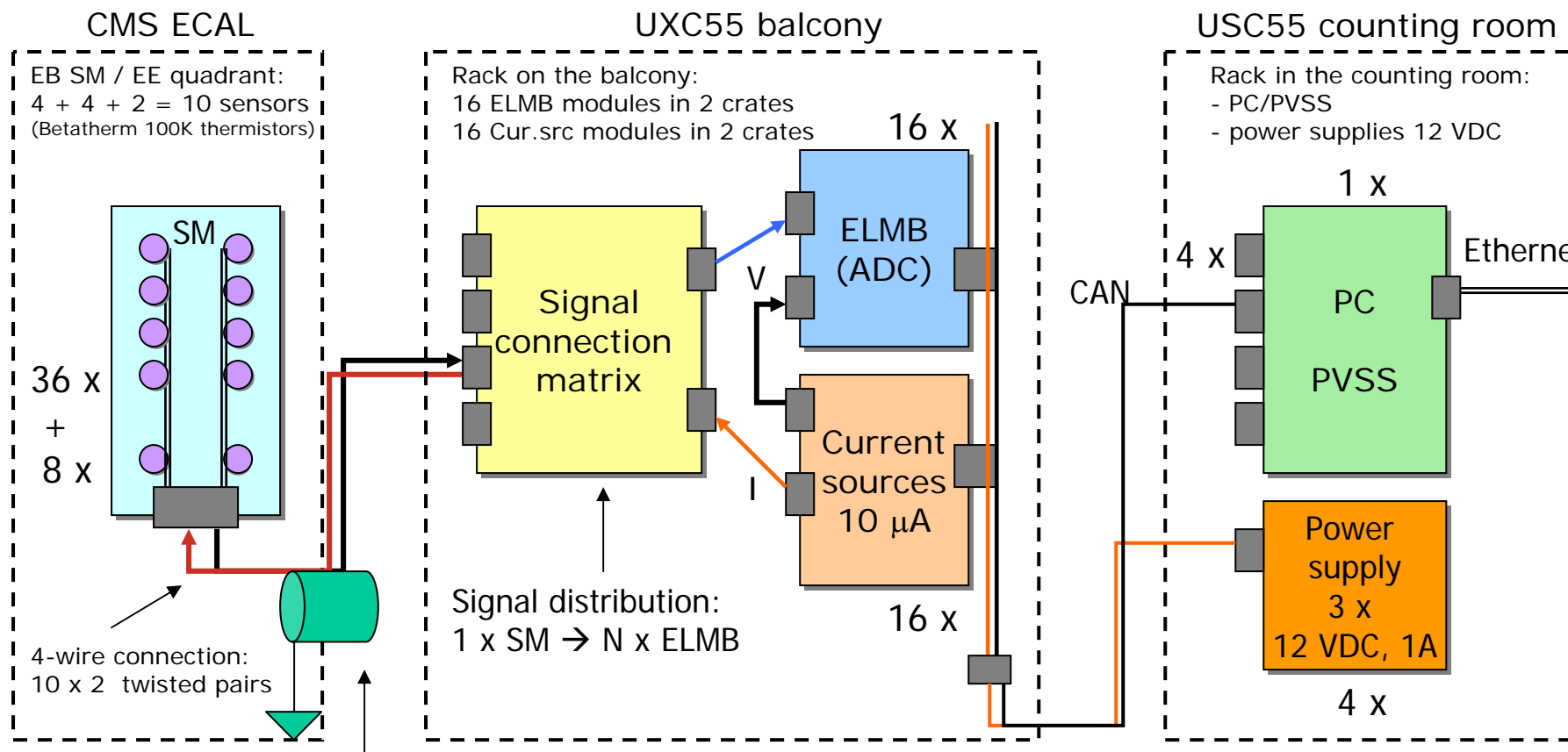
ECAL DCS PTM



PTM = Precision Temperature Monitoring
(rel.accuracy ~ 0.01C)



PTM electronics – general layout

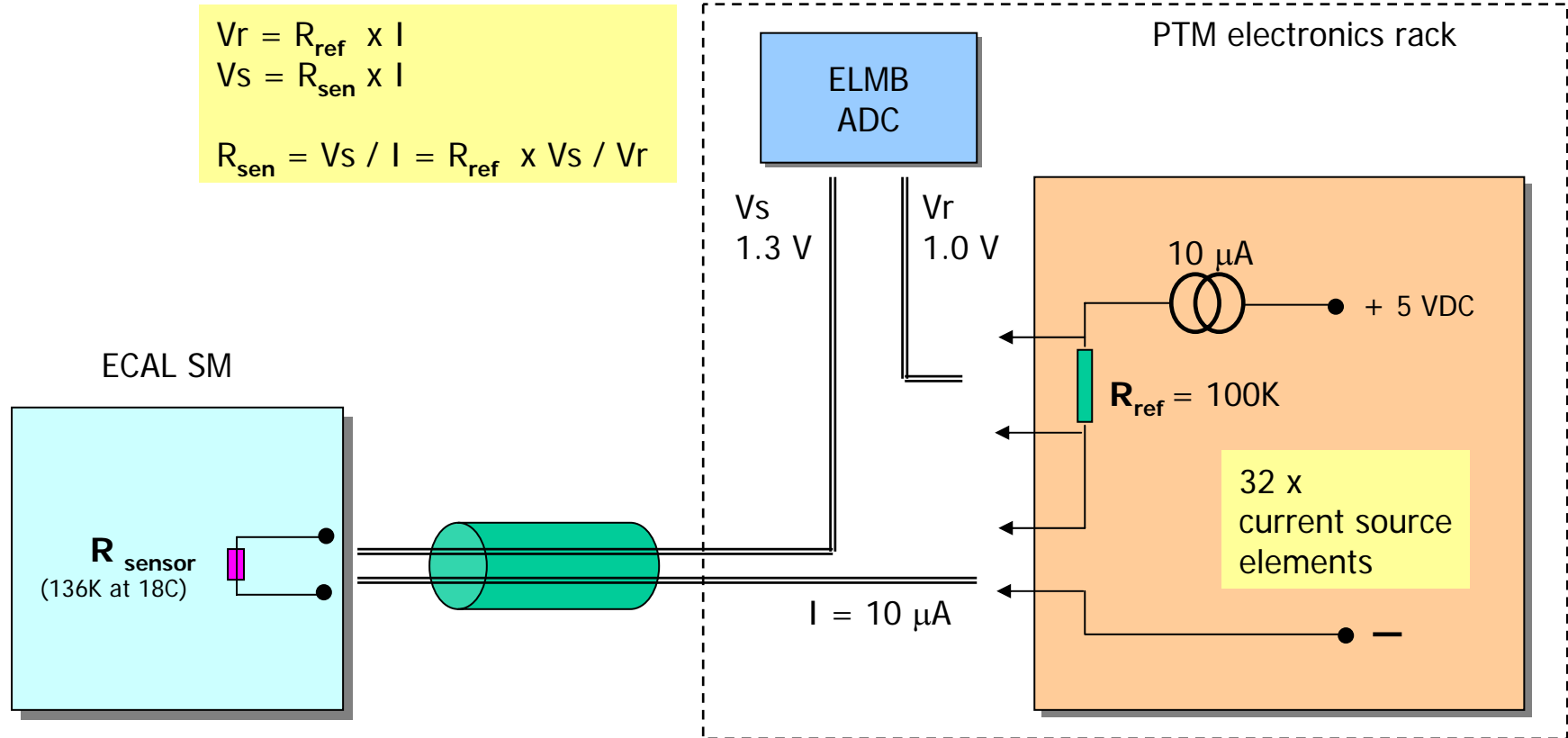


Sensor excitation + signals (DC, 1V / 10μA)
 36 + 8 + 2 = 46 cable sections (*)
 (section length 30 – 60 m)
 cable: STP 21x2x0,08mm² (SCEM: 04.21.51.410.5)

(*) – 2 additional cable sections are for 20x reference sensors outside ECAL

CANbus + power
 4 cable sections
 (section length ~ 120m)
 cable: STP 9x2x0.5mm²
 (SCEM 04.21.52.130.6)

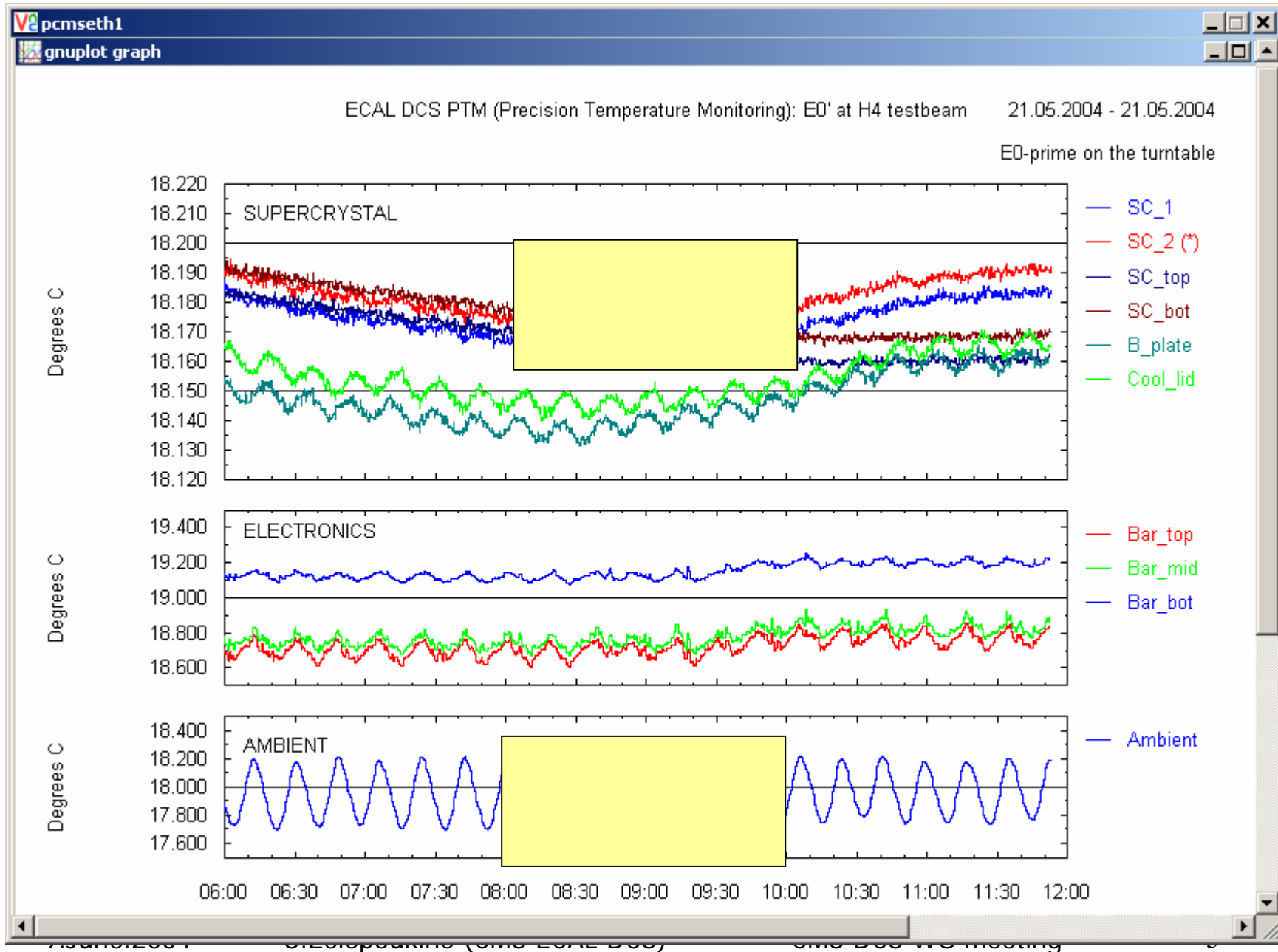
PTM electronics – current source module



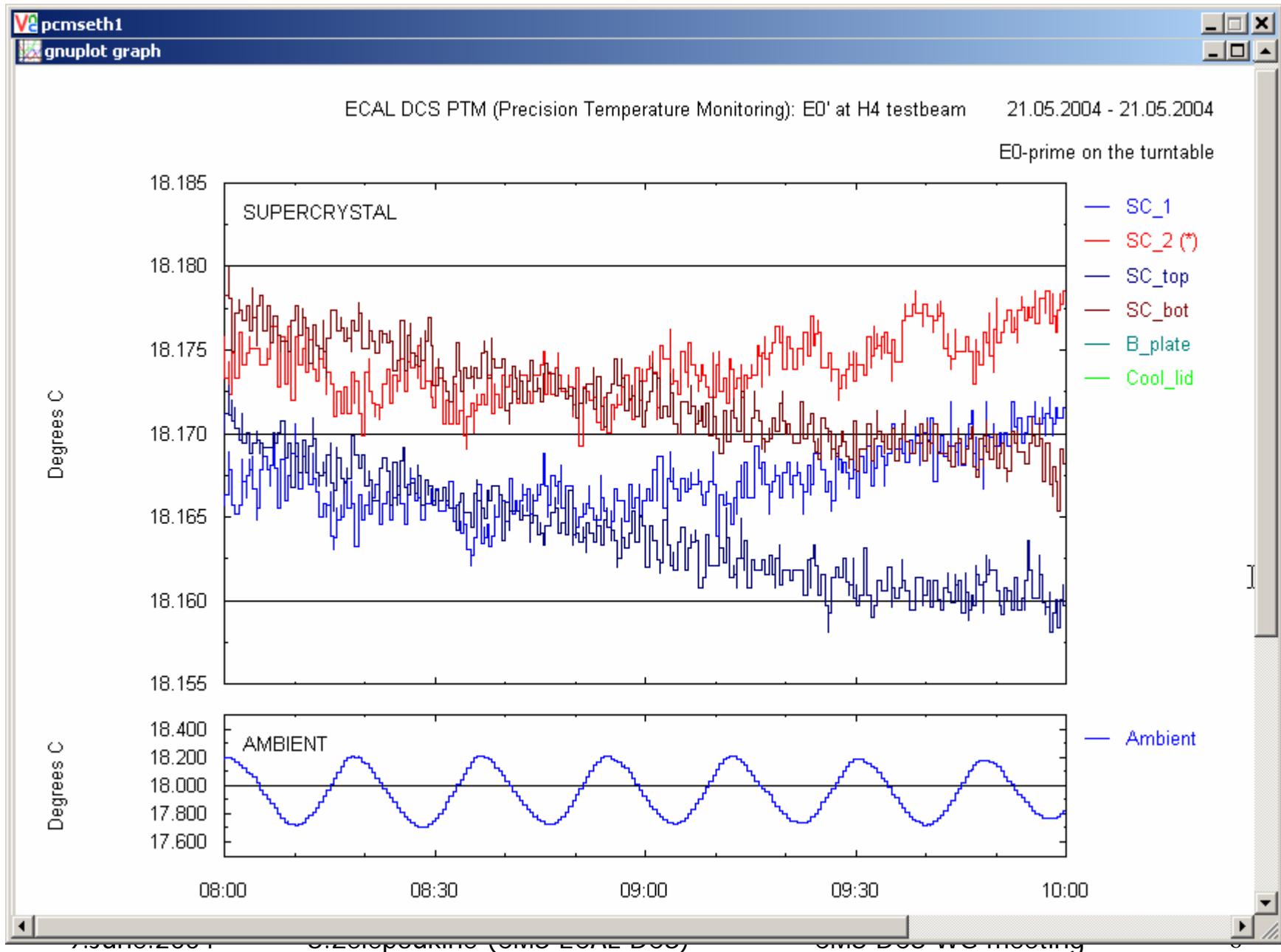
Current source module contains 32x identical current source elements. Each element provides 10 μ A constant current for sensor excitation.

Each sensor has a 4-wire connection:
 2 wires – sensor excitation (10 μ A);
 2 wires – sensor signal (voltage drop on the sensor resistance, approx 1.3 V).

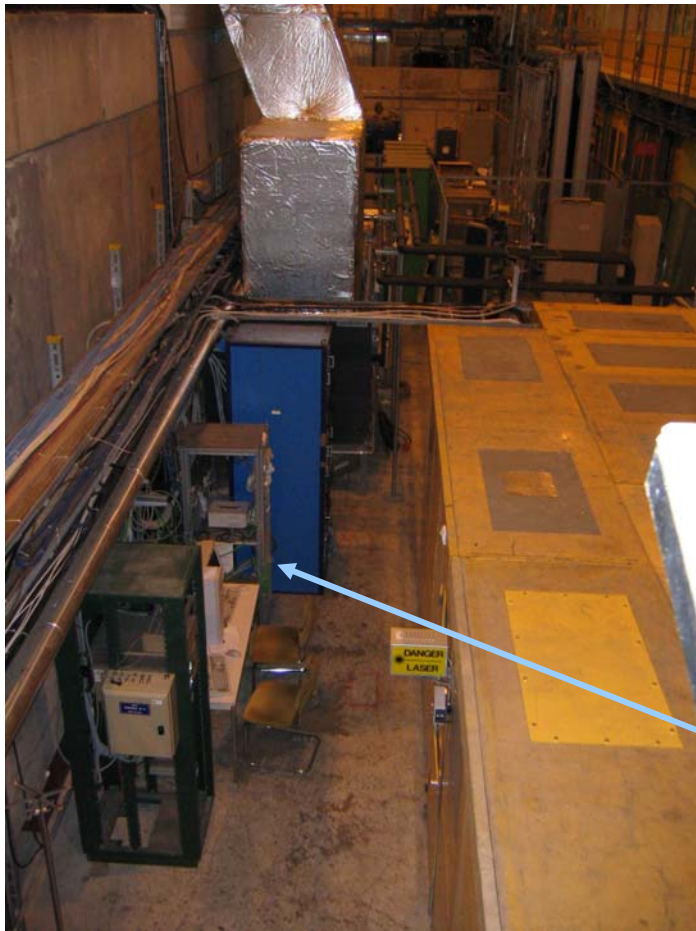
PTM : example measurement (ECAL E0', H4 2004)



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PTM in H4 testbeam



H4, outside beam area

Nearest neighbours (also on power mains supply):

- air conditioning system,
- cooling system,
- 3x powerful lasers, ...



DCS rack
PTM/HM prototype (2003)

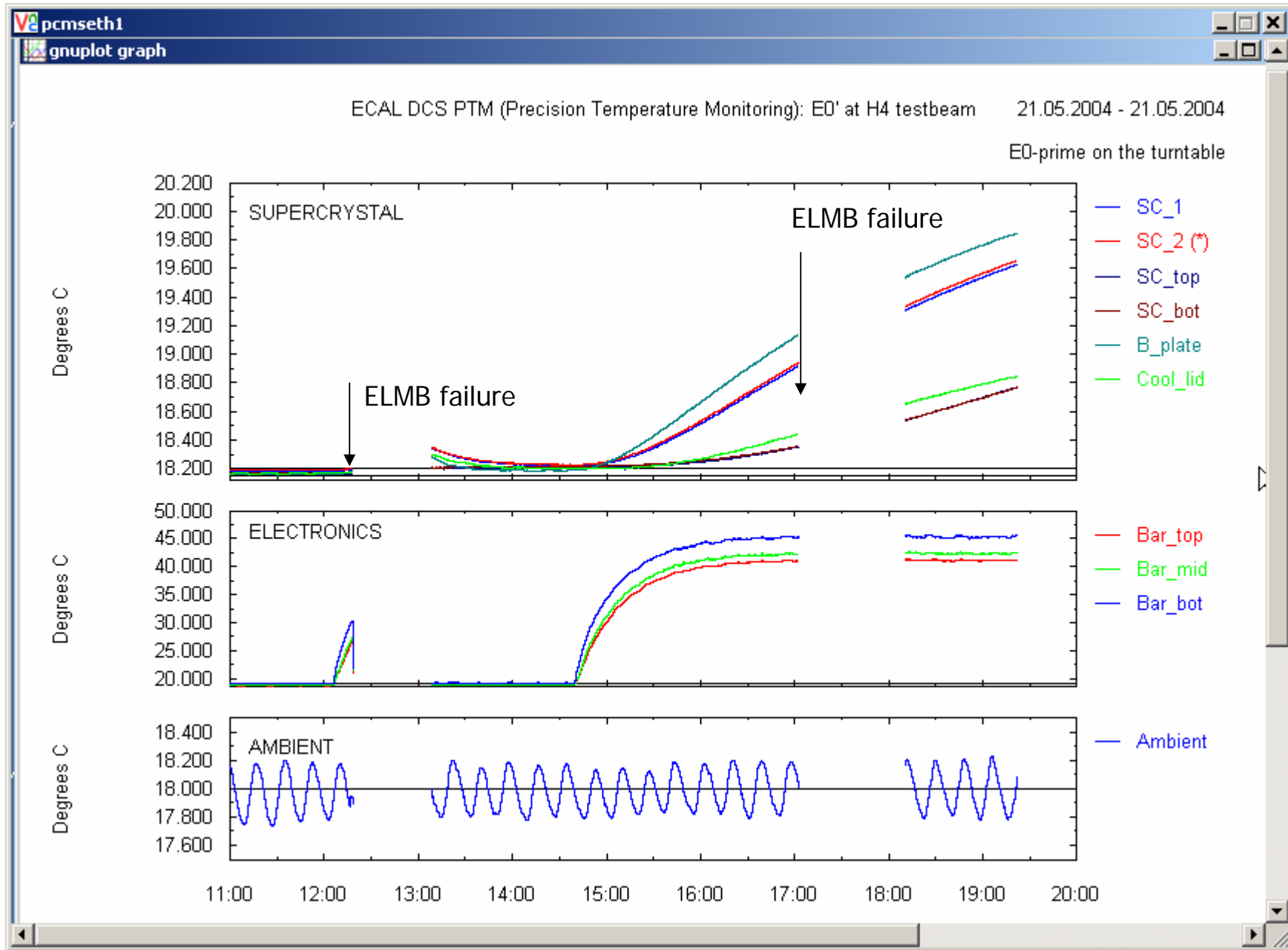
Previous experience: Stable operation during at least 2 months
(since 2000) (no statistics for longer periods).

Testbeam 2003: **2-3 times** (in a week while preparing for the testbeam
then stable operation during the testbeam period
(> month).

Power glitches were suspected – but the actual reason
remained unidentified...

Testbeam 2004: **multiple and frequent failures** (testbeam preparation)
sometimes 1/per hour...

ELMB failures, H4 testbeam 2004



ATLAS solution

ATLAS DCS: → set “lifeguard” parameter $T_g > 0$

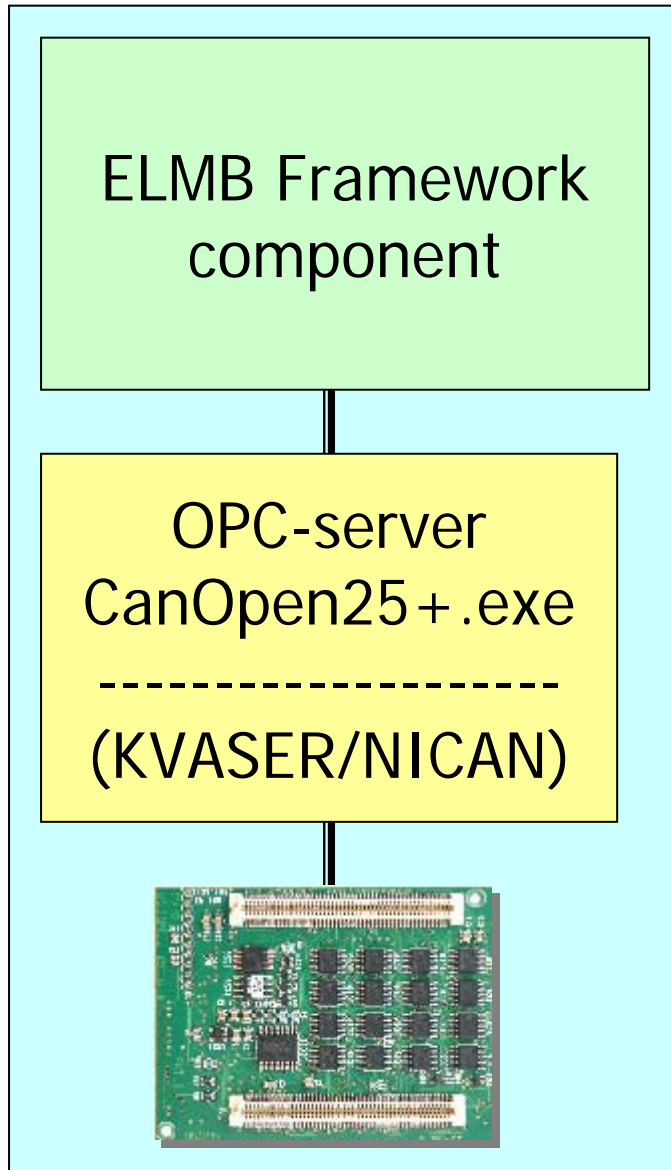
function:

reset CAN controller if no CAN activity during T_g



Stable operation since setting the “lifeguard” till now!

Many thanks to ATLAS DCS for their fast and very efficient reaction !



fwElmb_v3.0.0.zip updated: 17.05.2004 192 kbytes

ELMB framework component v2.0.x for JCOP Framework
This component is for use with the Framework version 2.0 or higher and is for use with ONLY the ELMB128

Note: The new extended OPC Server must be downloaded and installed for this version of the ELMB Framework component

OPCSetup.zip updated: 17.04.2004 1.3 Mbytes

CANopen OPC Server+ DA 2.0
(contains example configuration files, user manual, all components of extended OPC Server v2.5 and diagnostic tools).

- Data conversions in OPC server (arithmetic + math)
- Several CAN interface cards are supported
- Robust CAN mgt (restarts, etc)

- New firmware version
- Slight HW changes (replace your cards of series Axxx)