Using NI Teststand for multiple parallel burn-in applications

Innovation is the essence
Dedication makes the difference

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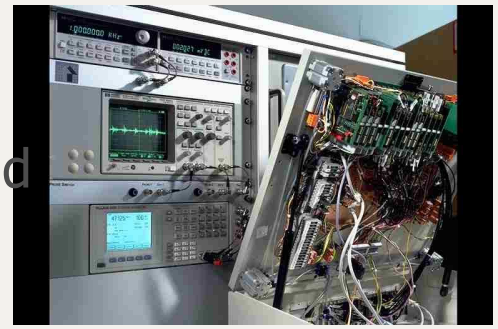
Presentation of DSE

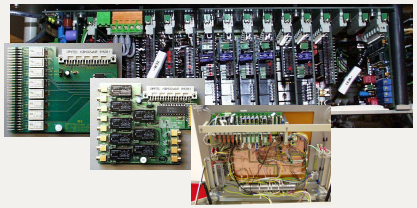
- Founded in 1981
- Location – Horsens DK
- 55 employees
  - Knowledge based organization
  - Approx. 60% with long educations (B.Sc, M.Sc., Phd)

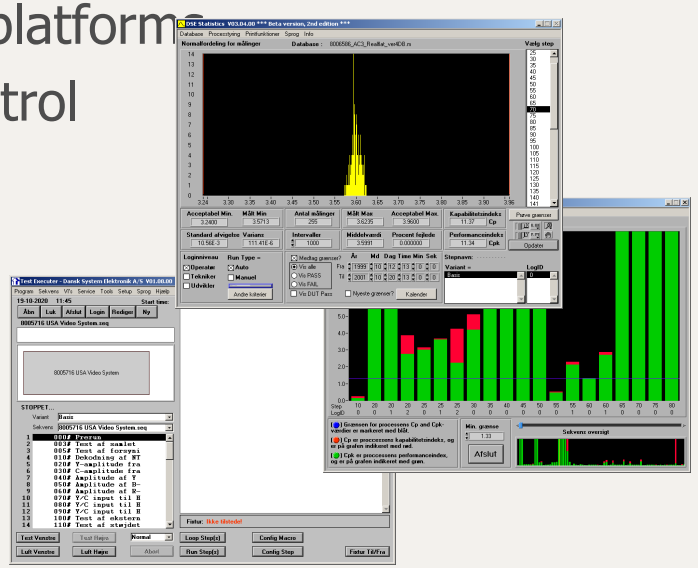
By utilising the in depth knowledge of our customers business processes we develop and integrate innovative and safe solutions
creating efficiency, operational value and profit for
our customers, our selves and our stakeholders.

Test Technology Division

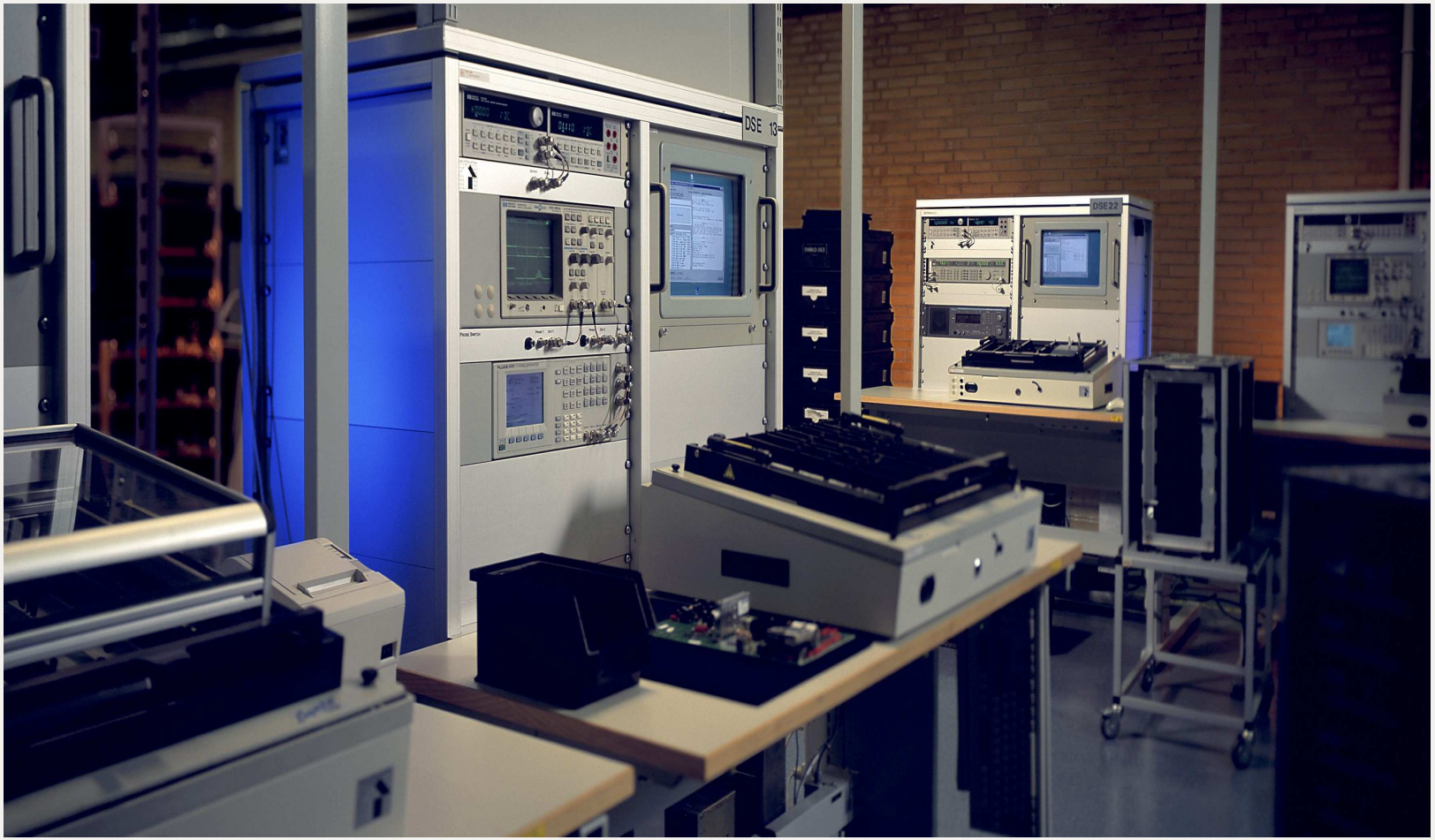
- Automated test execution
  - Specification, development and implementation
  - Manuel / automatic load
  - Concept based – focus on generic configurable platform
  - Statistics Process Control







Example on DSE Test platform



Example on DSE In-Line Handler & PXI Rack

Example on DSE High Voltage Tester

Main references

Testsystems:

- ABB Robotics (S)
- Peltor (S)
- Cefar (S)
- Autoliv Electronics (S)
- Ascom Tateco (S)
- SEM (Opcon) (S)

- Bang & Olufsen
- Flextronics International
- Linak A/S
- Danfoss
- bb electronics a/s
- Simens Wind Power
- Kirk Telecom
- Triax
- Navico

- FKI Logistex Crisplant
- Thrane & Thrane
- Velux
- LK
- APC
- Terma
- Epoke Deif
- Martin Professional
- Wittenborg
- GN Netcom
- Sennheiser
- Vestas

- Eltek (N)
- Kongsberg (N)
- Perlos (F)

Enviromental Simulation Systems

Temperature, Pressure, Humidity etc

- Long setup times
- Long Test cycles
- High Number of DUT's
- Build In Self Test (BIST)
- Traceability, Logging
- Active DUT's
- Connectivity

Environmental Simulation Systems

- ACTIVE BURN IN SYSTEMS
  - LONGTIME TEST WITH ENVIROMENTAL STRESS OF FINISHED PRODUCTS
- LINEARIZATION / COMPENSATION
  - FINALISING PRODUCTS BY LINERAISING/COMPENSATING PRODUCTS WITH REGARD TO ENVIROMENTAL STIMULUS

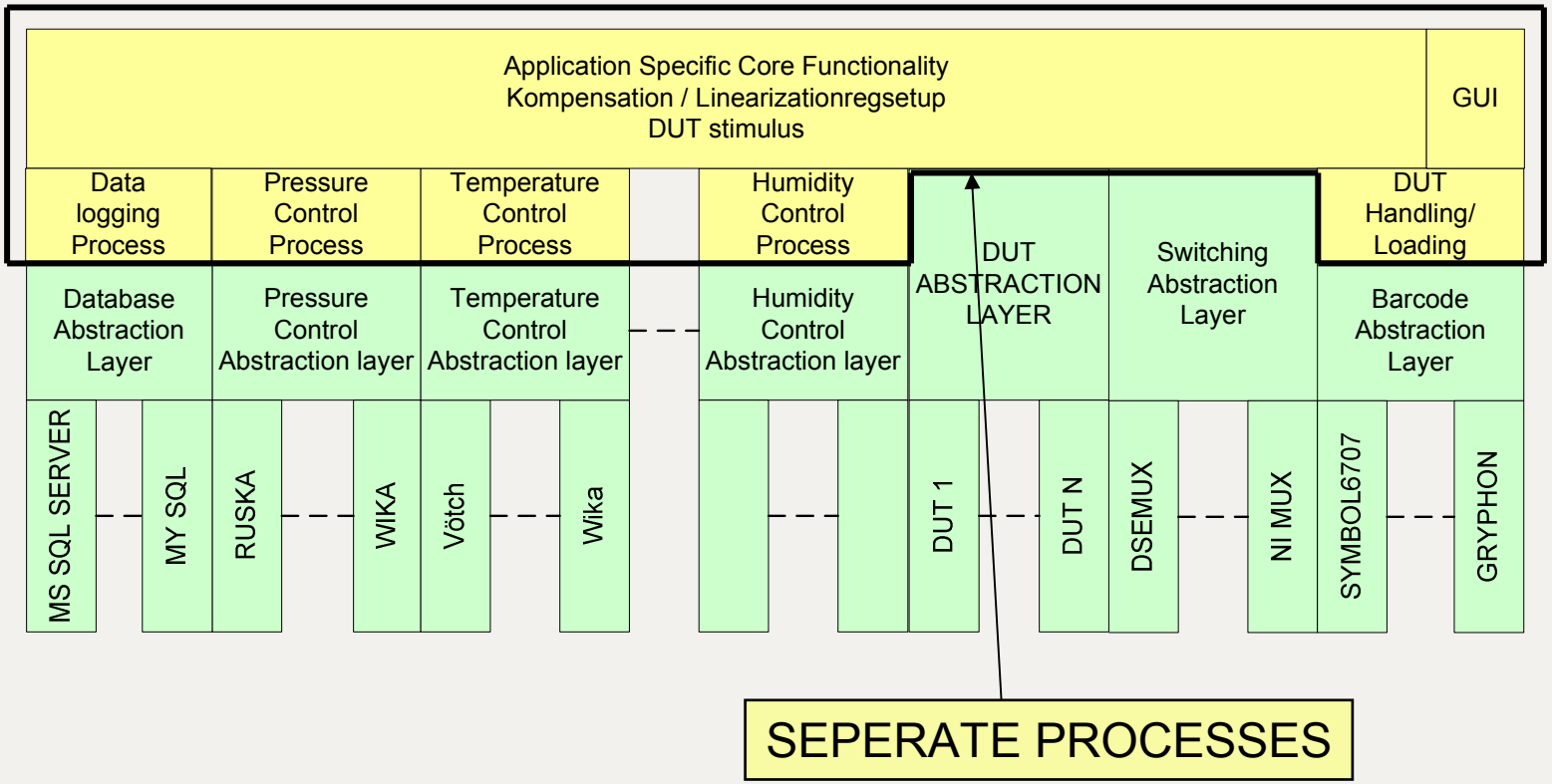
ACTIVE BURN IN SYSTEMS

- Long setup time of environmental parameters
- Long Test cycle time, up to 12-24 hours or more
- Controlling of a large number of DUT's (20 – 50 units per run)
- Low coupling between environmental state and DUT state ??
- Progressive stress test
- Controlling a large number of simultaneously test sequences
- Can include Build In Self Test (BIST) on DUT
- Repetitions of the same test(s) / real time measurements

LINEARIZATION / COMPENSATION

- Varying the environmental parameters the DUT's are compensated as a finalization of the production process
- Optimizing setup time of environmental stimulus becomes important.
- High coupling between environmental state and DUT state
- Number of DUT's increase with increasing setup time.
- SPC, Yield, Pareto and tools to control linearization quality
- Need for high flexibility, with regard to changes in simulation and measuring hardware

DSE ENVIROMENTAL SIMULATION SOFTWARE OVERVIEW

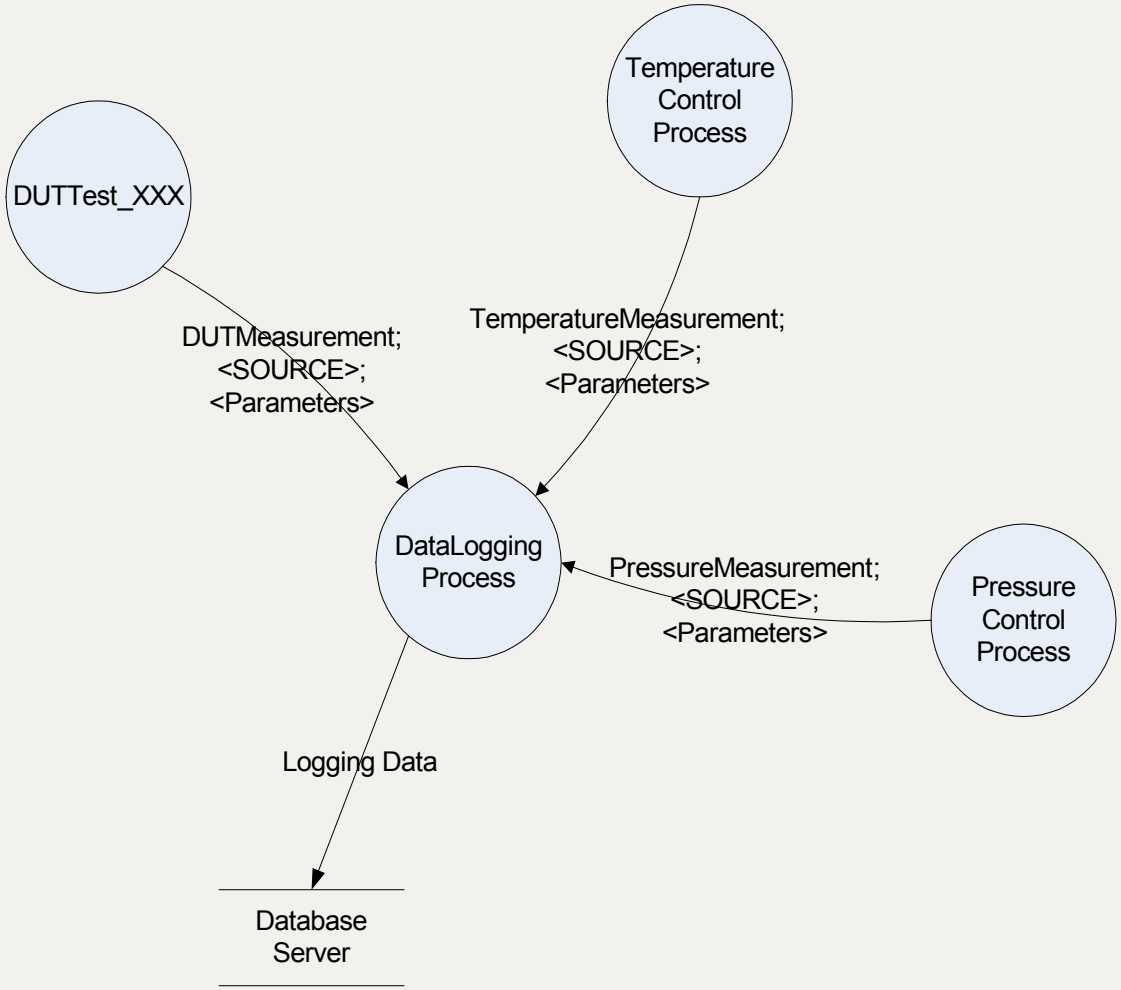


DSE

FEATURES OF MULTIPROCESS APPROACH

- Low coupling between individual software modules
- Easy to parallelize development process
- Testability is good due to well defined interfaces (known events)
- Bottlenecks can be moved into non time critical areas of code
- Scalability is made easy

AVOIDING BOTTLENECKS

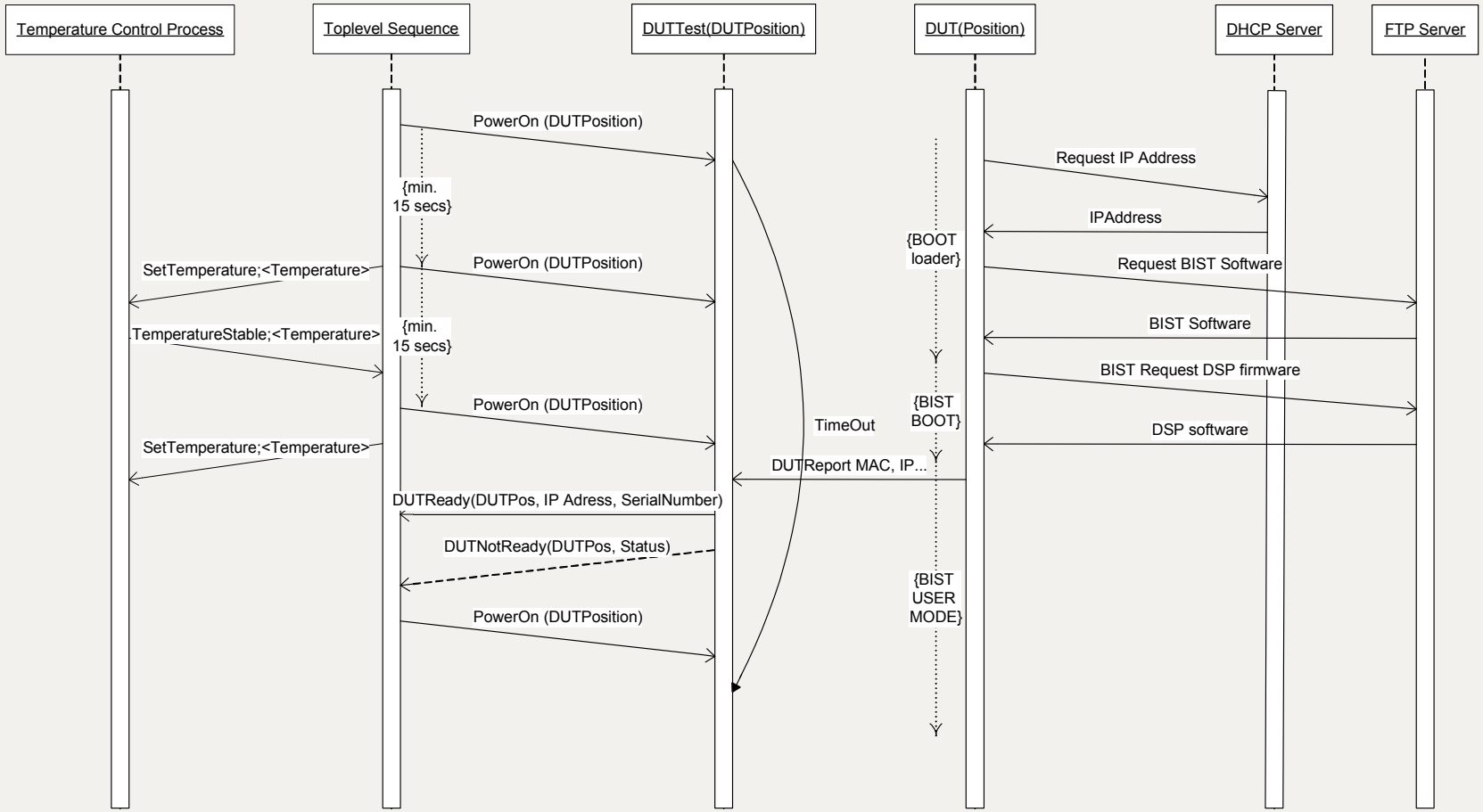


Potential Bottlenecks:
Database access on enterprise database servers and general network traffic load

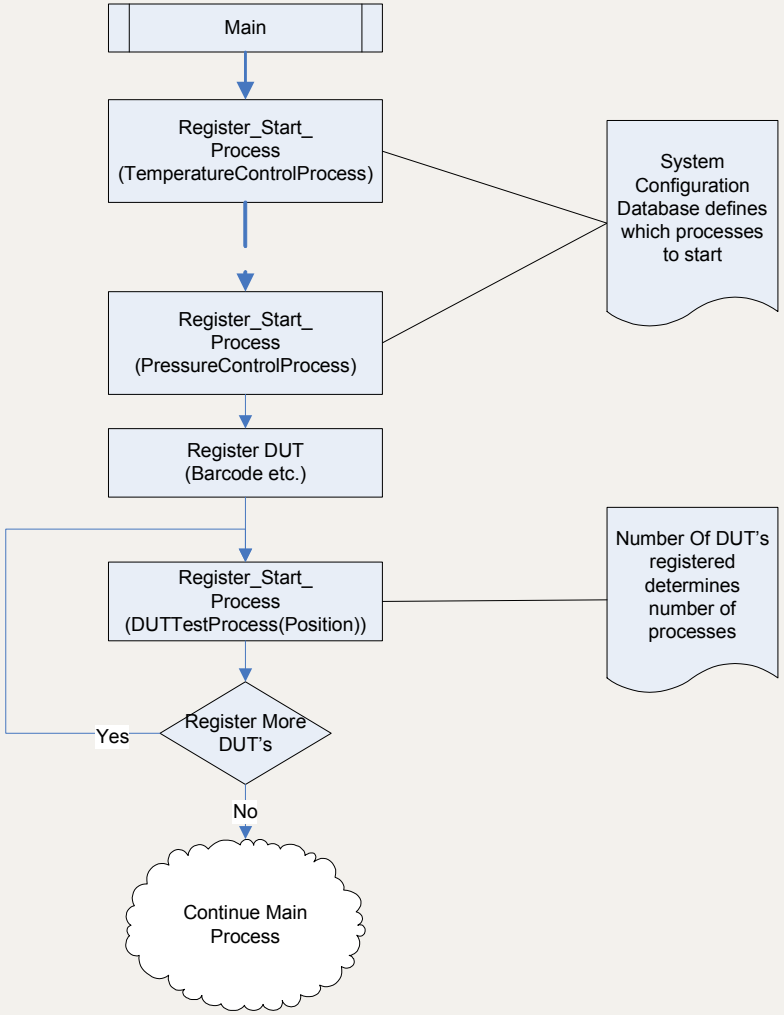
Possible solutions:
Use separate process for database logging. The Event-q along with timestamps ensures data integrity. Events for Flushing all pending data to databases

- Cashing of log data. Perform database access in non critical parts of the code

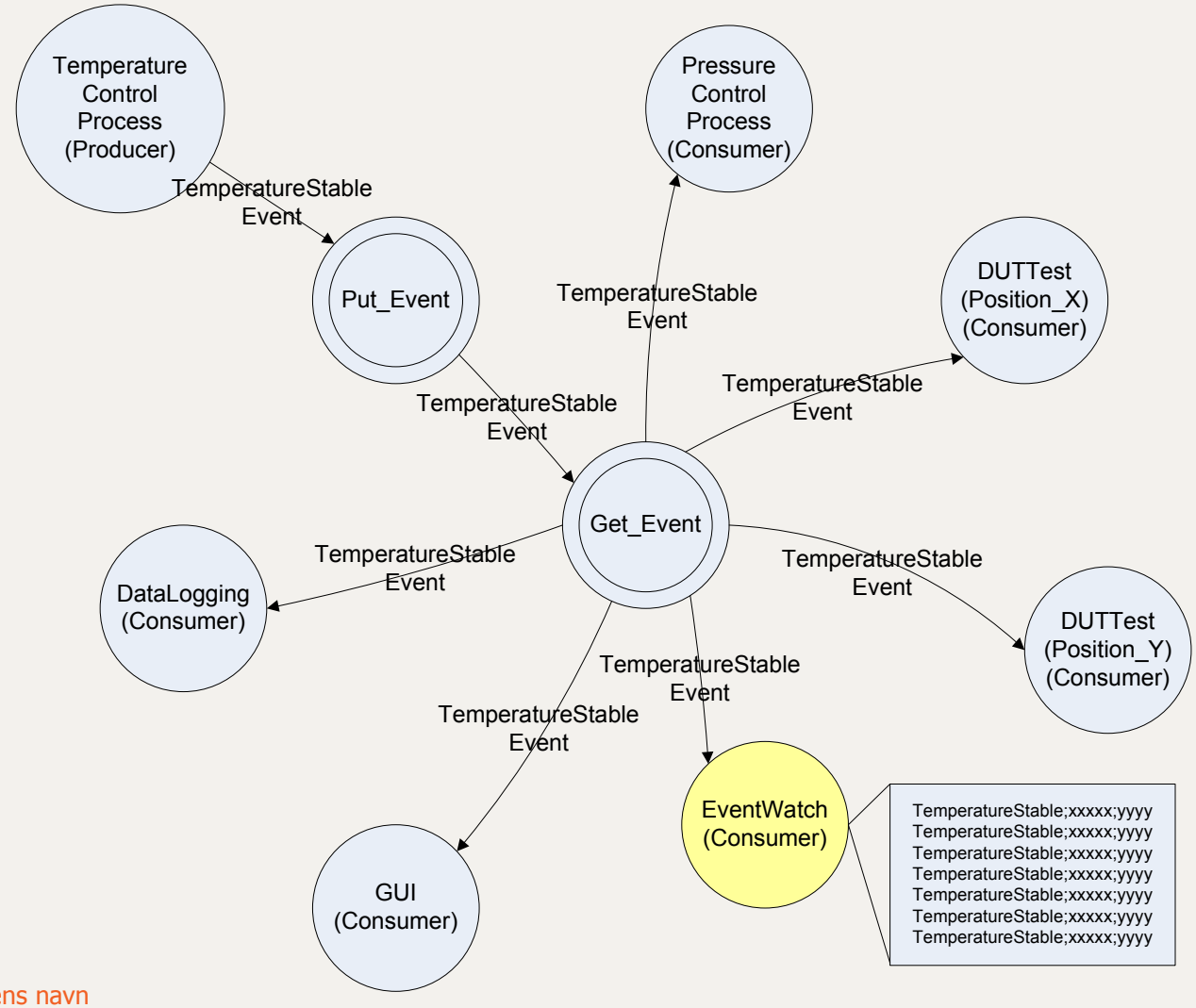
PROCESS SCHEEM EXAMPLE



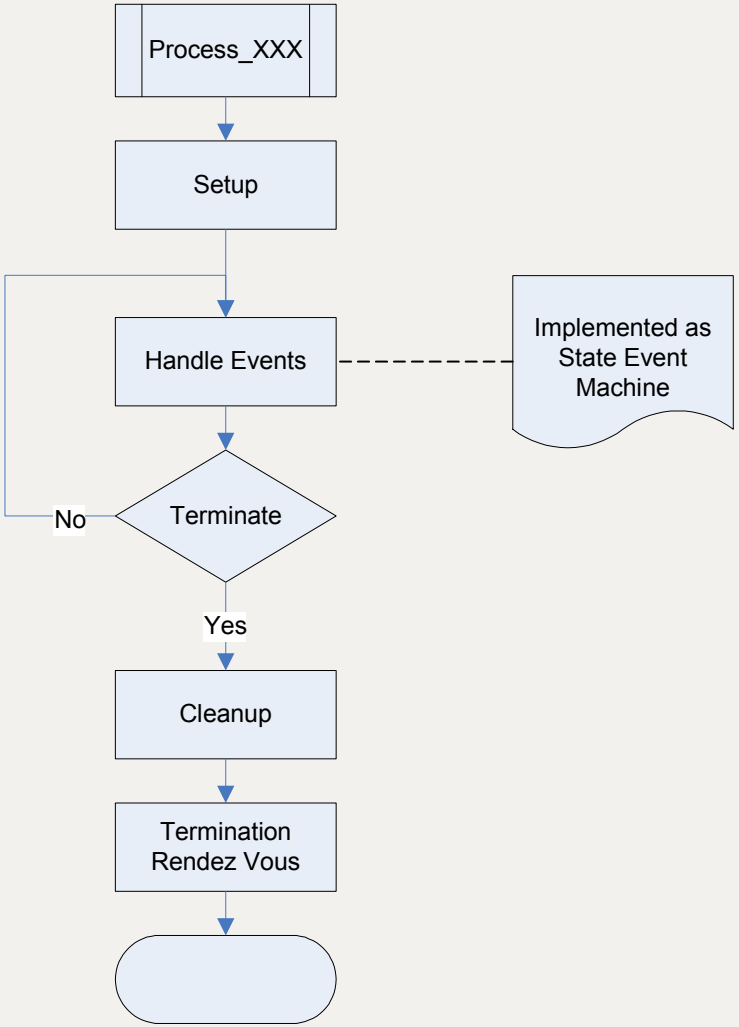
PROCESS REGISTRATION



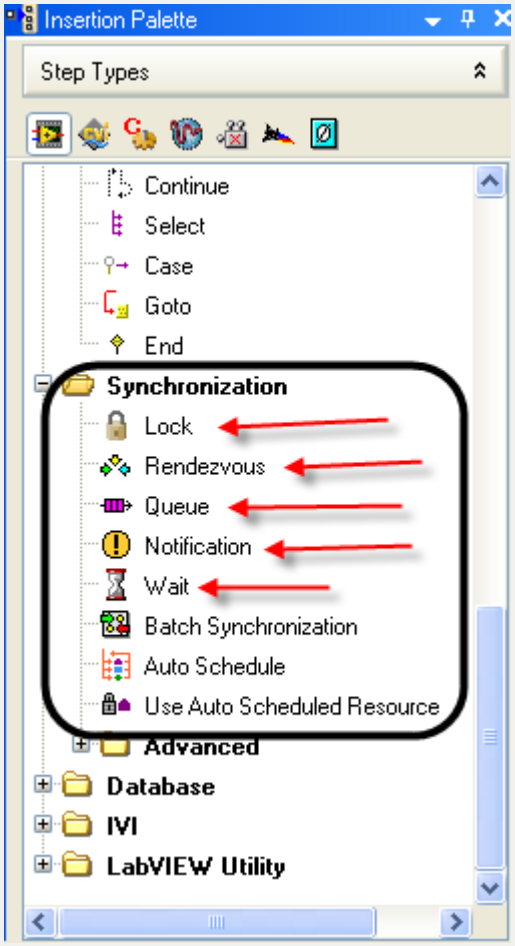
EVENT BROADCASTING SYSTEM



BASIC PROCESS DESIGN



TESTSTAND TOOLS USED



- Syncronization
  - Lock's (ressource sharing)
  - Rendezvous (syncronization)
  - Queue (Inter process communication)
  - Notifications (certain syncronisation issues)
  - Wait's (CPU release)

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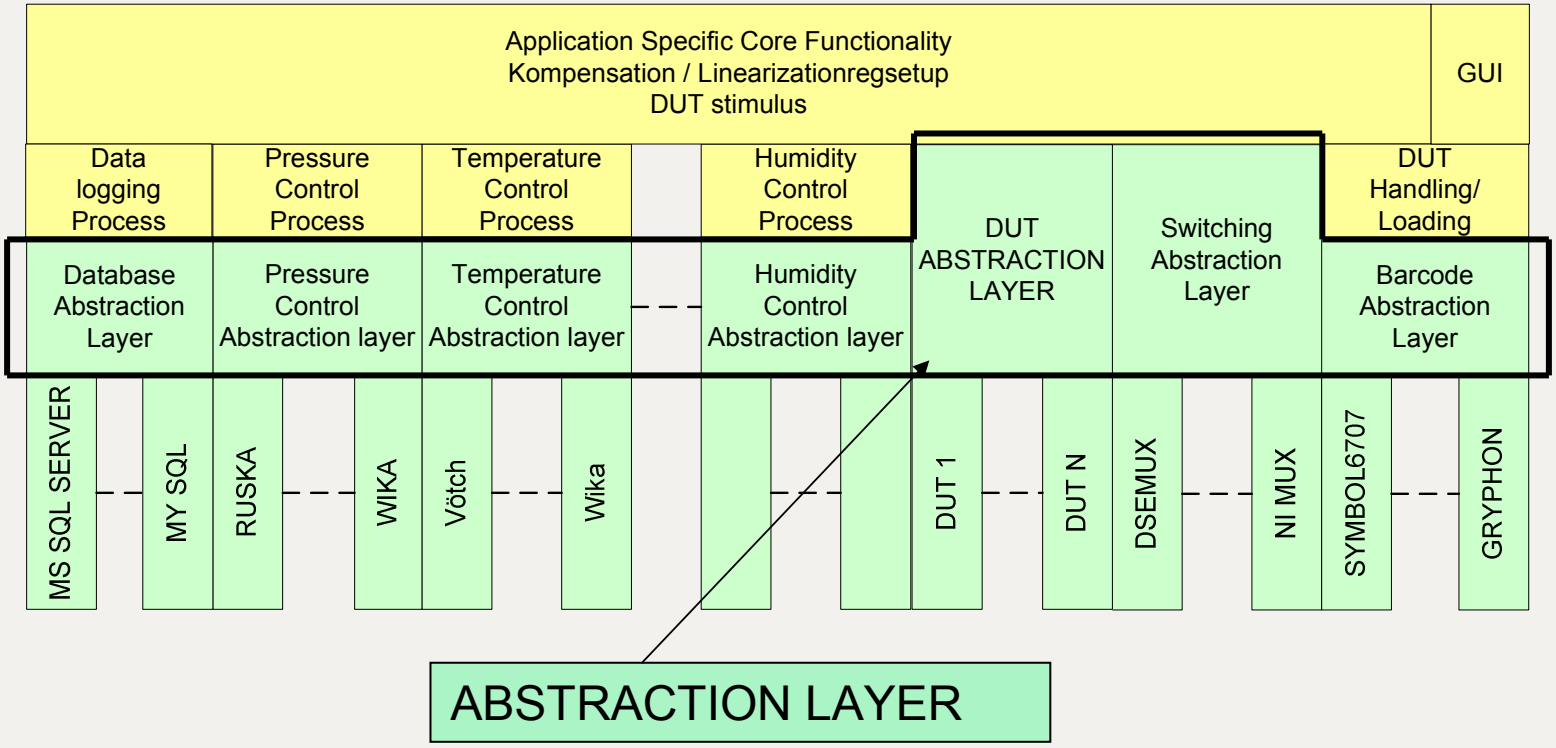

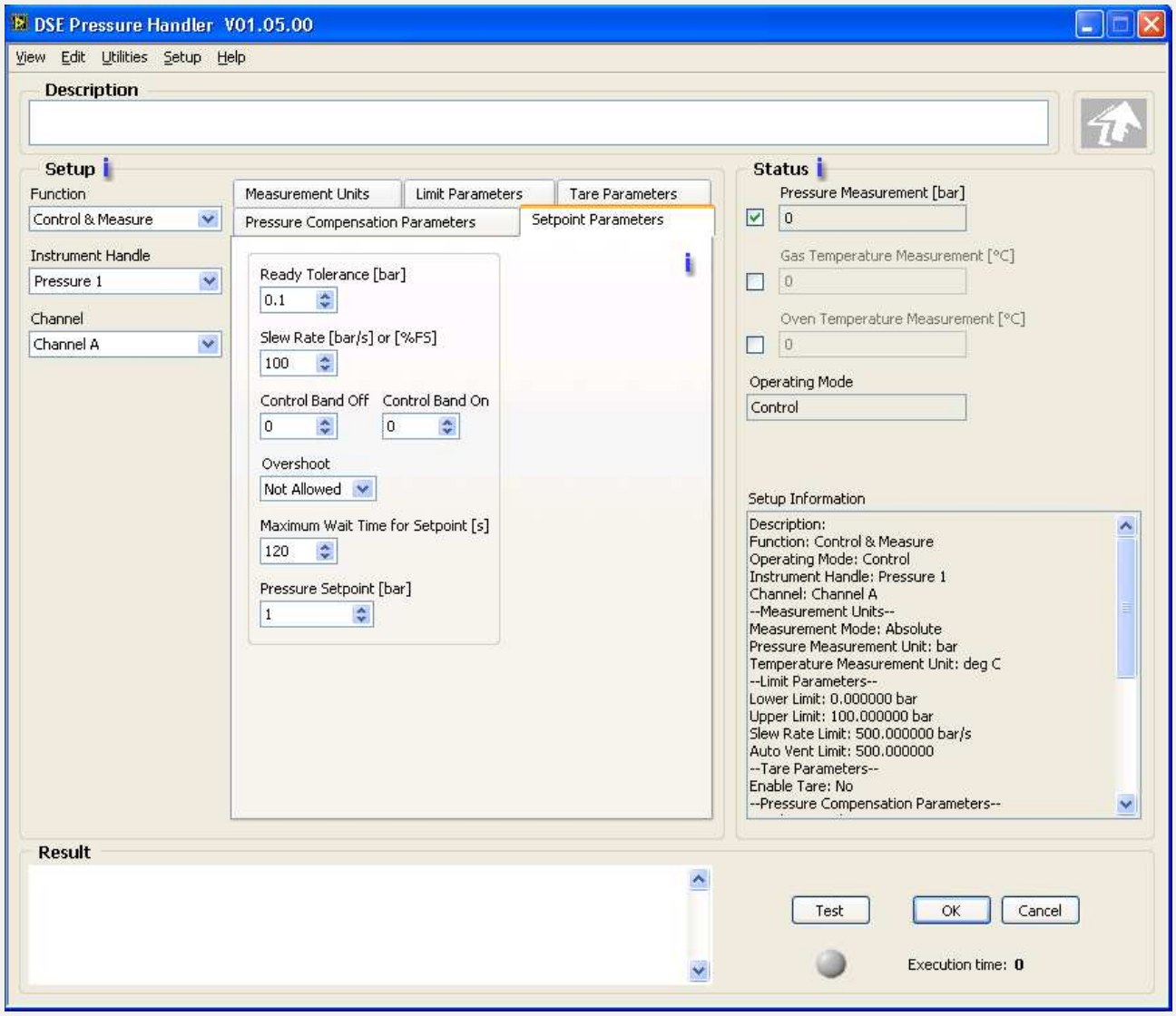

Pressure Control Abstraction Layer:

General Interactive setup of Pressure setting Parameters during Sequence development

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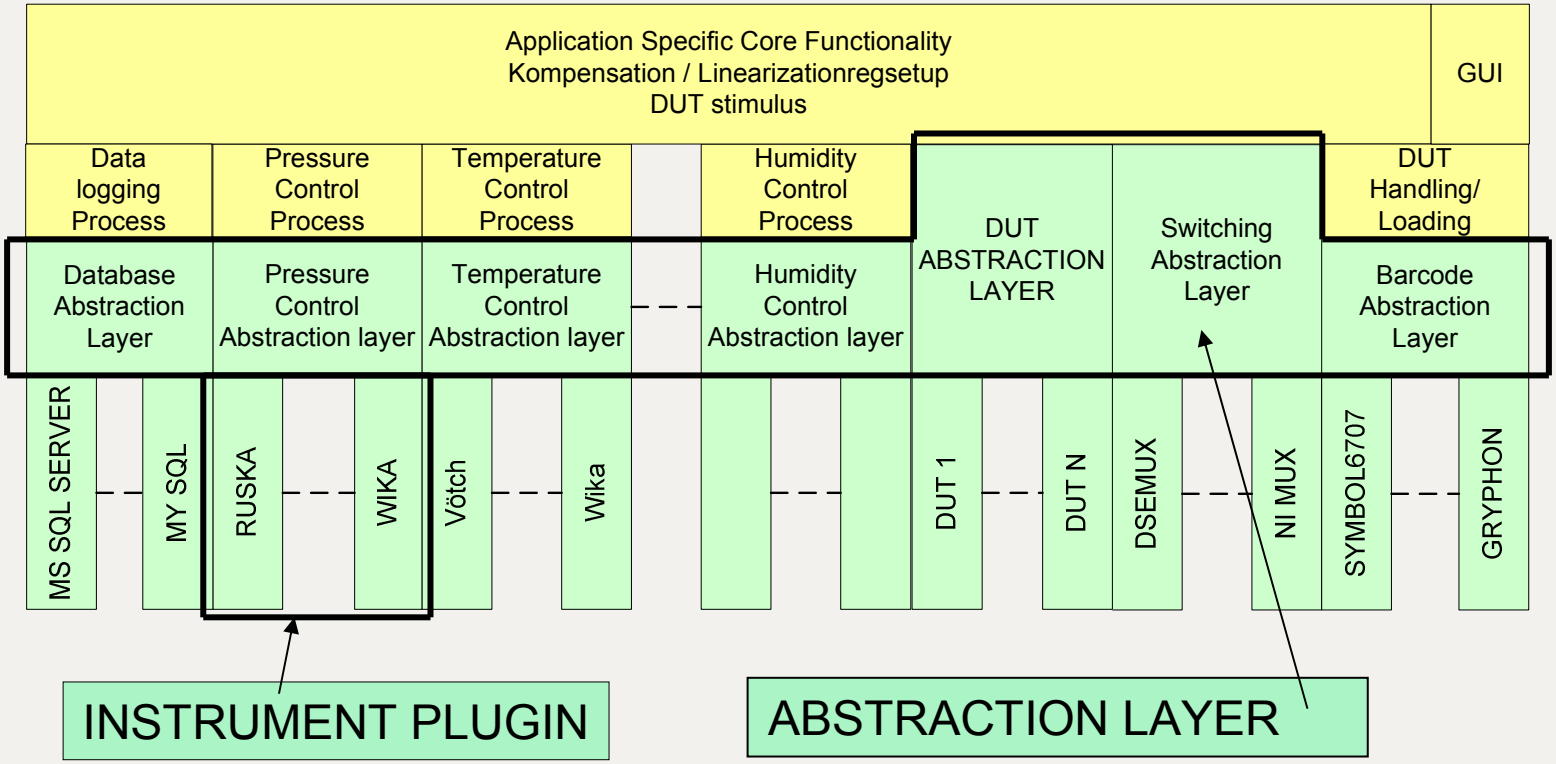

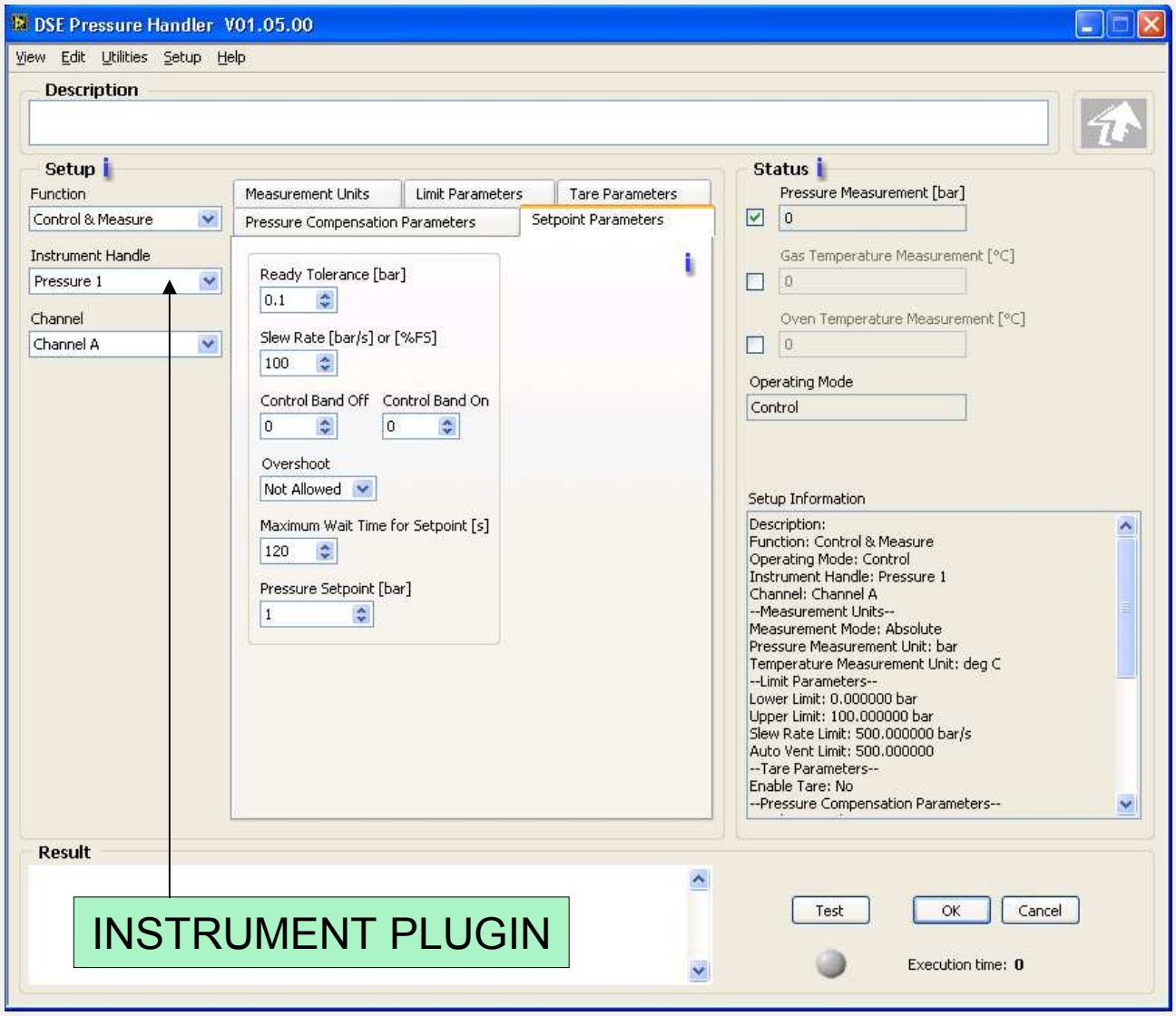

Pressure Control Abstraction Layer:

General Interactive setup of Pressure setting Parameters during Sequence development

PITFALLS USING TESTSTAND

- FOR-EACH LOOP (ERROR -17502) CAN NOT BE THE LAST LINE IN A SEQUENCE !!! OK from version 4.1+
- SETUP PROCESS MODEL TO AVOID MEMORYLEAKS
- MAKE SURE YOU HAVE FULL CONTROL OF LABVIEW REFERENCES OPEN/CLOSING
- AVOID RESULT COLLECTION OR TESTSTAND WILL DIE IN SECONDS

QUESTIONS ?