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slow control for the lock system

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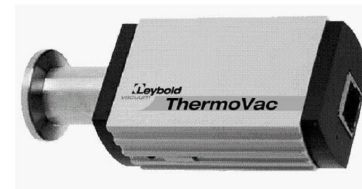
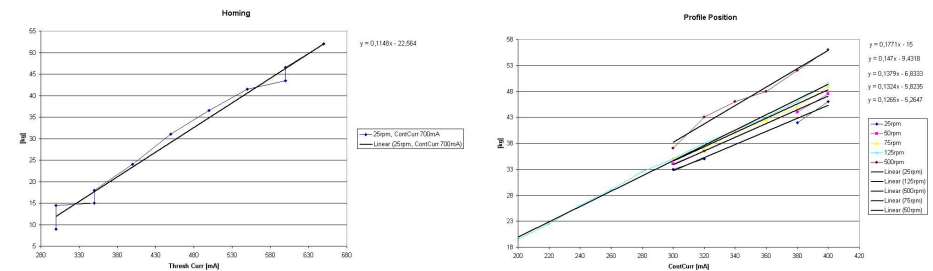


- hardware function tests
- communication
- PLC and Touchpanel programs
- LabView programs (lock system PC)
- next steps

hardware function tests

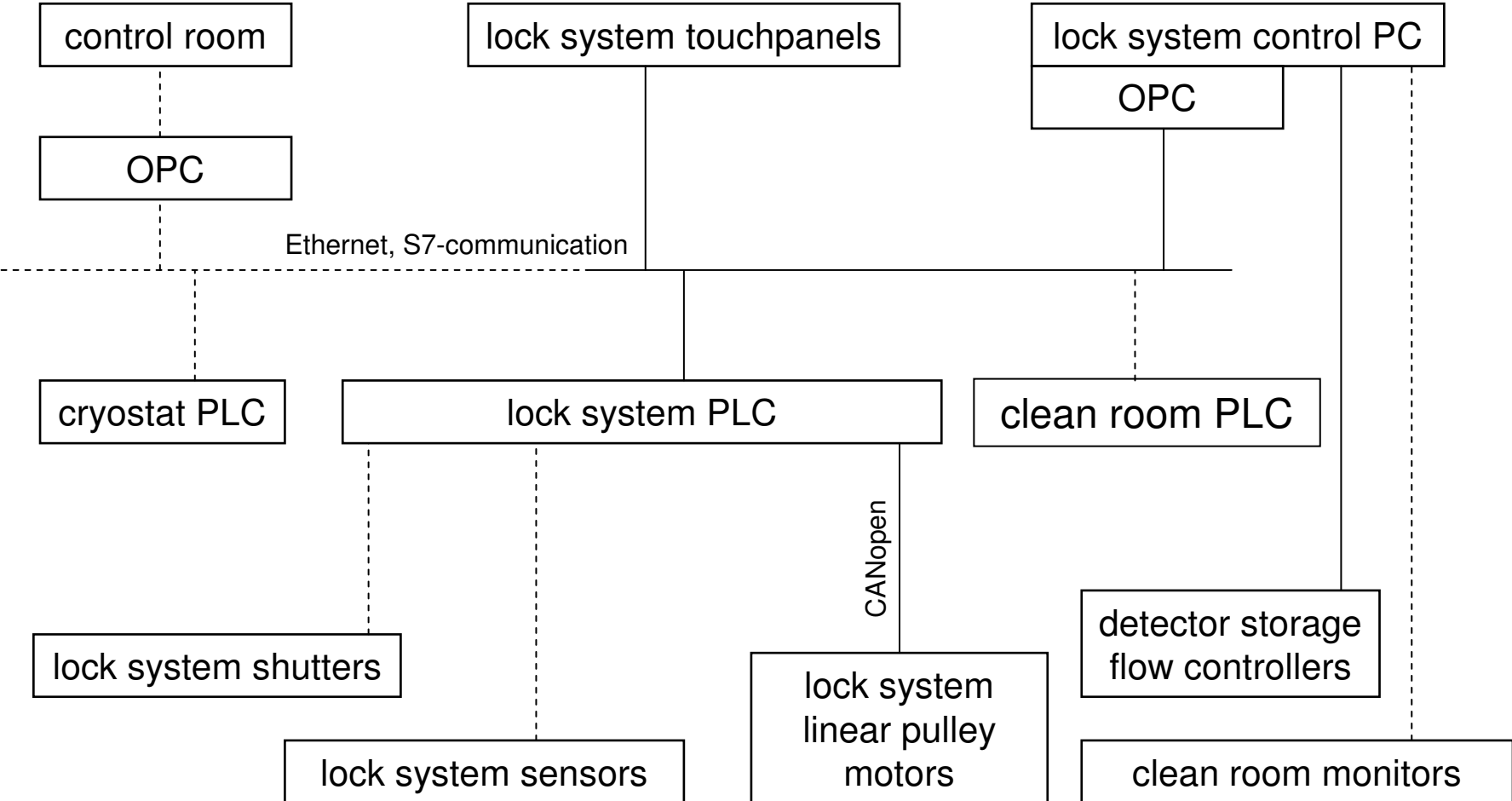
- motors
 - ✓ tested
 - ✓ wired
 - ✓ characteristics quantified
- pressure gauges
 - ✓ tested
- vacuum pumps
 - ✓ tested

slow control GERDA lock system



communication

slow control GERDA lock system



communication interfaces

- ✓ flow controllers detector storage
- ✓ lock system control PC w/ OPC server
- ✓ linear pulley motors (CAN)
- ✓ touchpanels

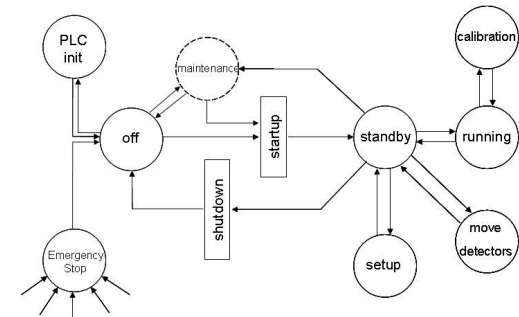
- ✓ control room main system (OPC)
- ✓ cryostat PLC (S7 communication)
- ✓ clean room PLC (S7 communication)

- clean room monitors
- sensors
- shutters

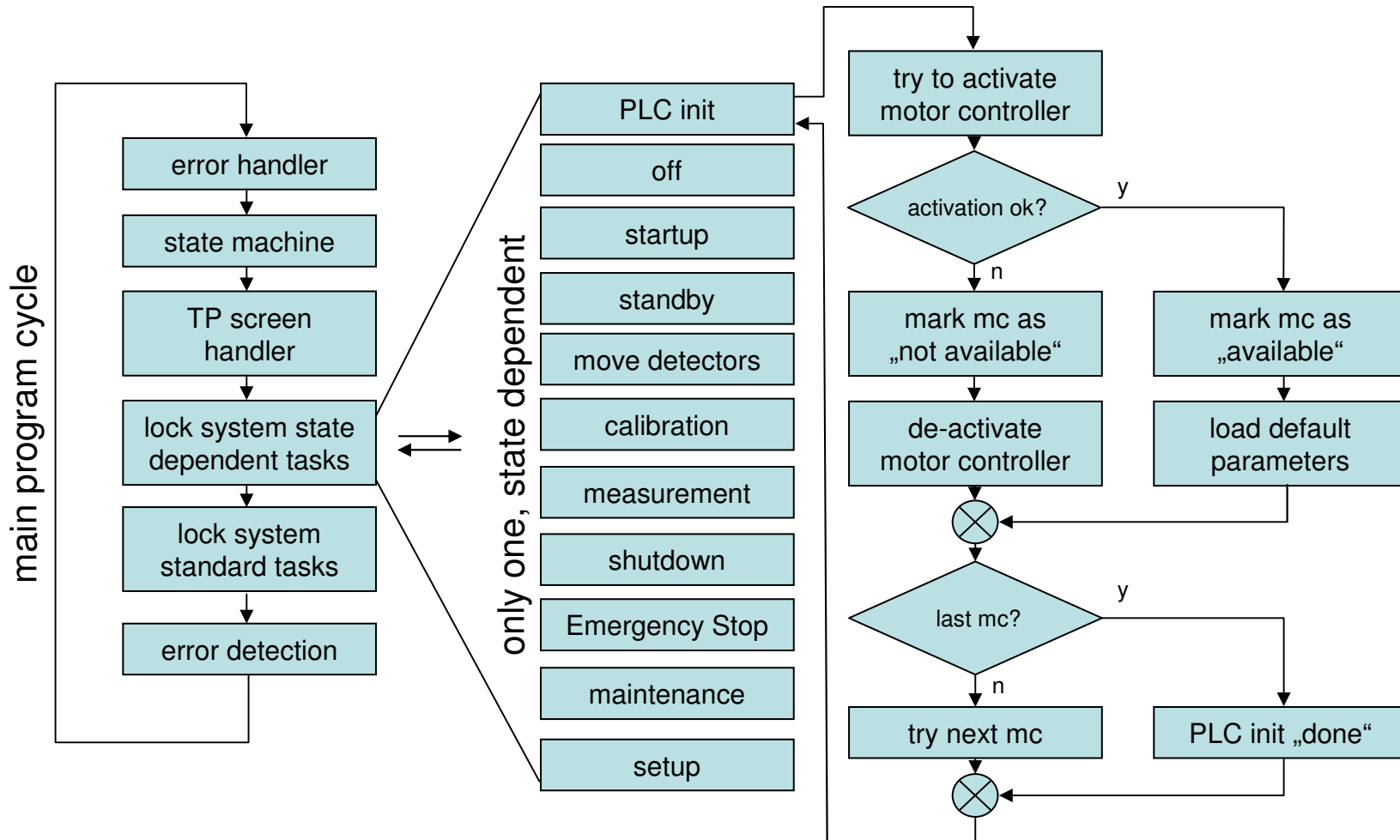
PLC program progress

- program structure definition finalized
- basic state machine running
- state „PLC init“ runs stable
 - detect available motor controllers
 - initialization of available controllers
 - realtime read-out of status and position

- motor movement control
 - default parameters defined
- touchpanel control
 - force screen changes
 - block/allow pushbuttons



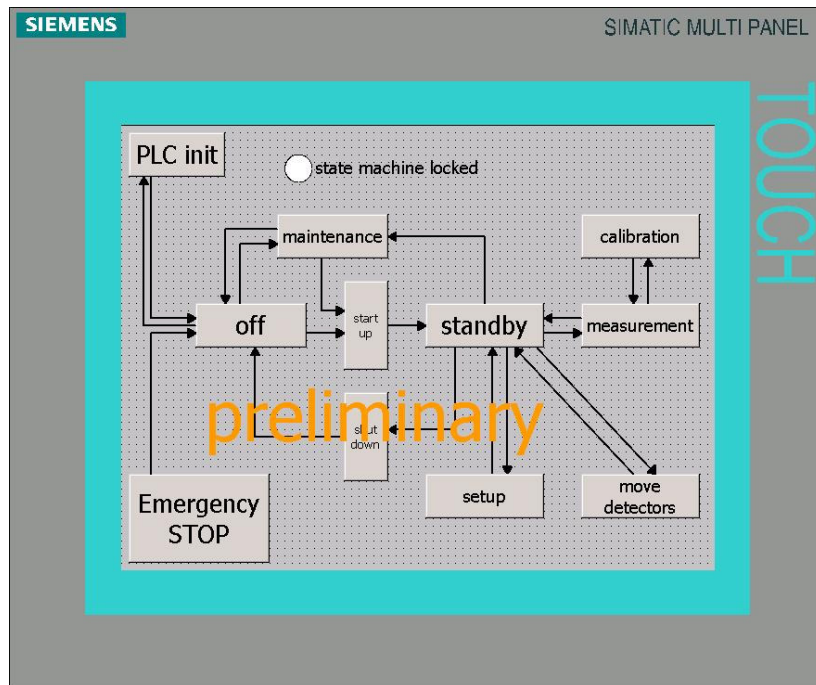
program structure



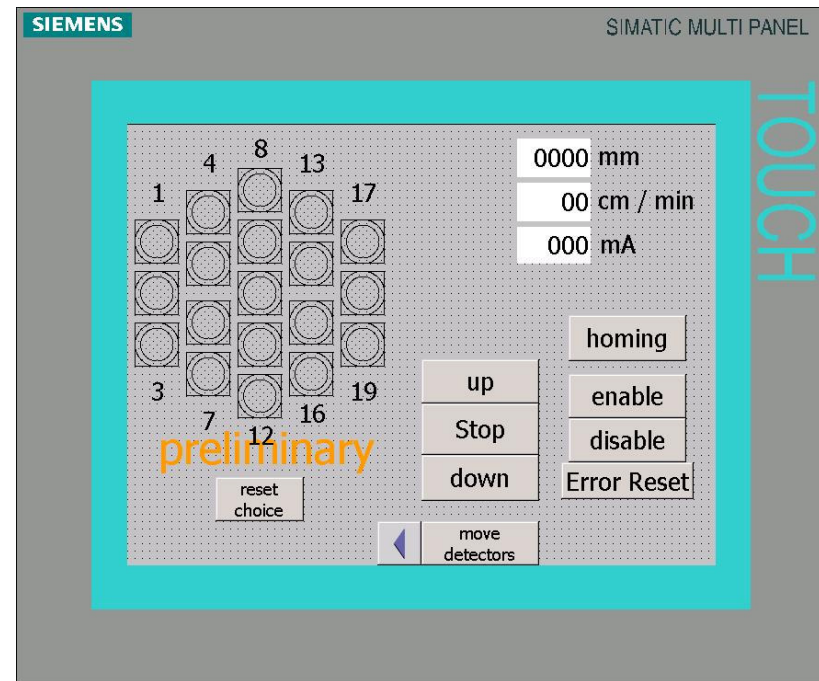
Touchpanel programming

slow control GERDA lock system

already implemented Touchpanel program parts



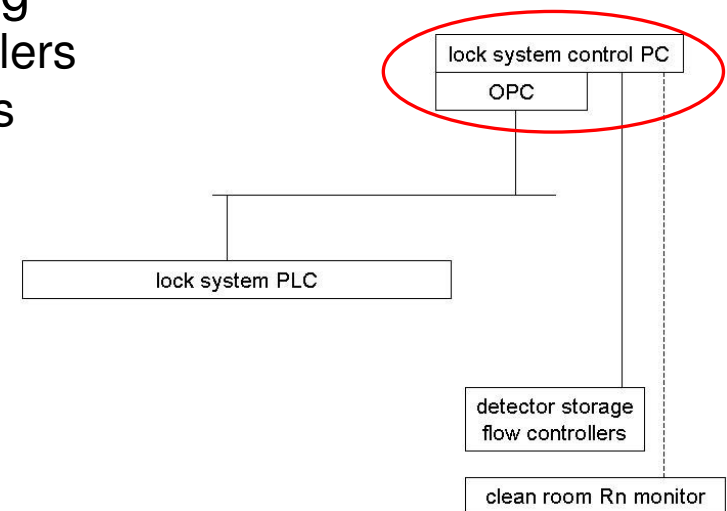
state machine screen
operational concept
is tested



move detectors screen
basic operational concept
is tested

lock system control PC – Tasks

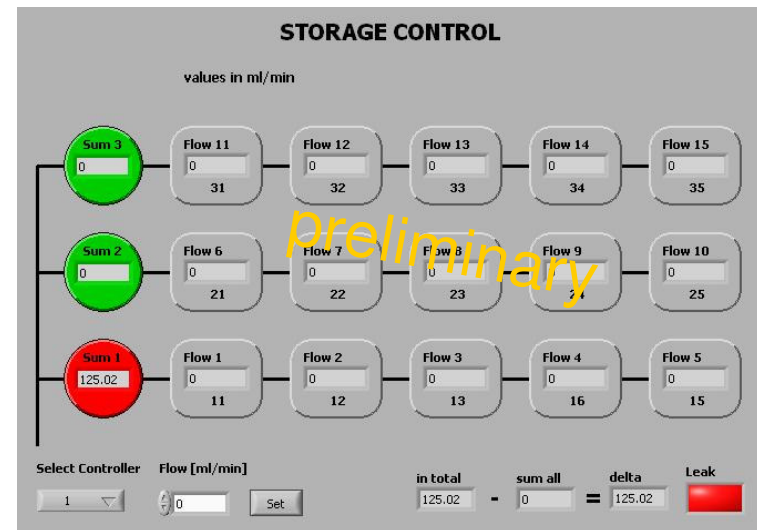
- run LabView „CLEanroomMOnitoring“
 - control detector storage flow controllers
 - log lock system detector movements
 - log lock system parameters
 - log lock system errors
 - log clean room parameters
 - monitor lock system
- run lock system OPC server
 - data connection (PLC to LabView)
 - enables special „control room“ control channel



LabView – screenshots

lock PLC monitoring

detector storage flow control



lock sensor
show states

log file
configuration

flow controller
show states

flow controller
set values

string
states

motor controllers
states and errors

PLC
show state

single storage and
summarized flows

next steps

slow control GERDA lock system

- detail interfaces
- continue wiring
- program PLC
 - motor movement control
 - error detection and handling
- program touchpanels
 - menu structure
- program LabView
- test programs
- definition / tests of precise movement parameters
 - immersion speed
 - cable warming time (for detector upward movements)
 - ...

conclusion

- main hardware parts are tested and working
- lock system internal interfaces tested
- lock system external interfaces needs detailing
- programming is in progress

→ lock system slow control is still on the way