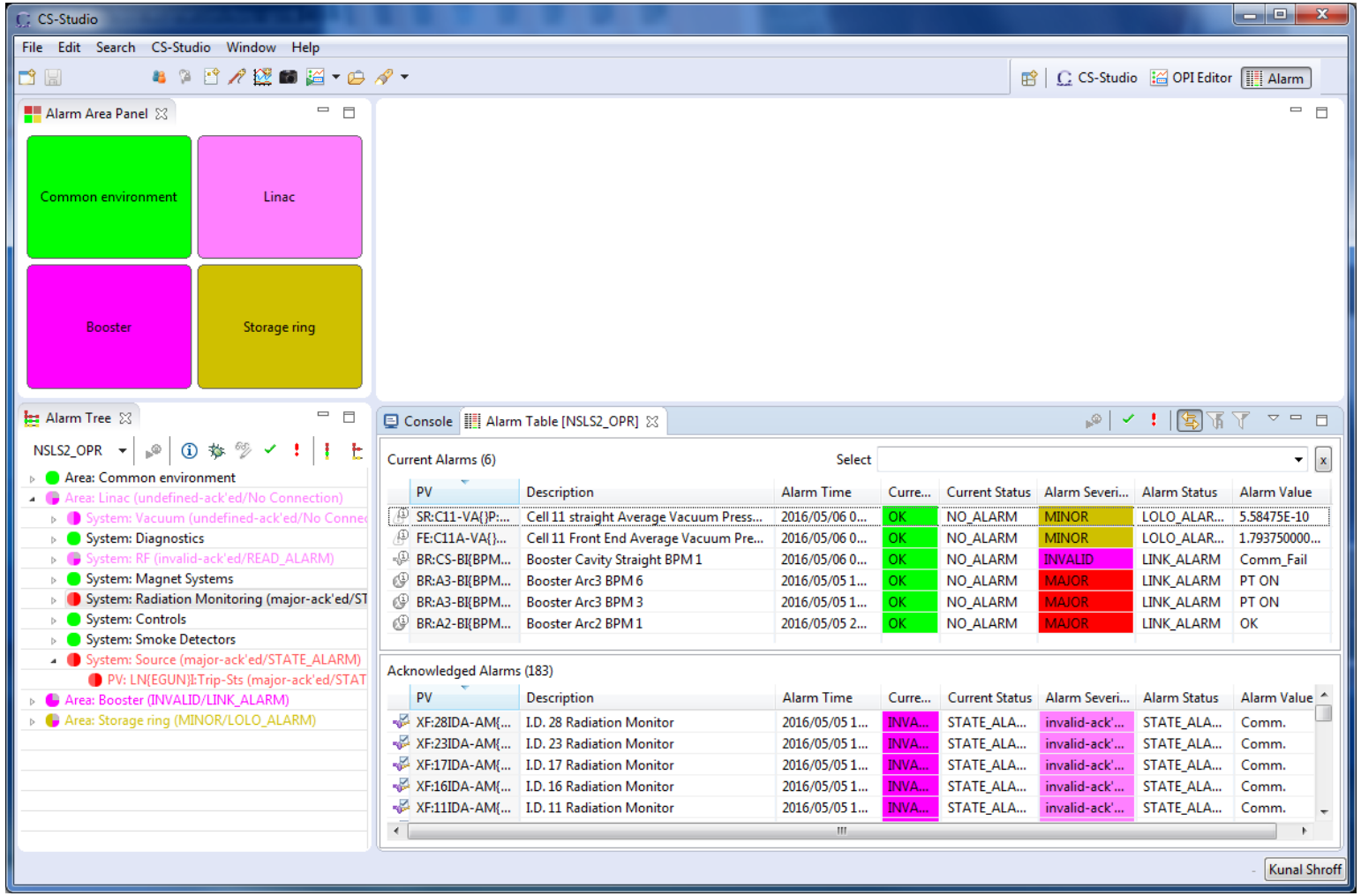
CS-Studio:
Alarms

BEAST

BEAST architecture

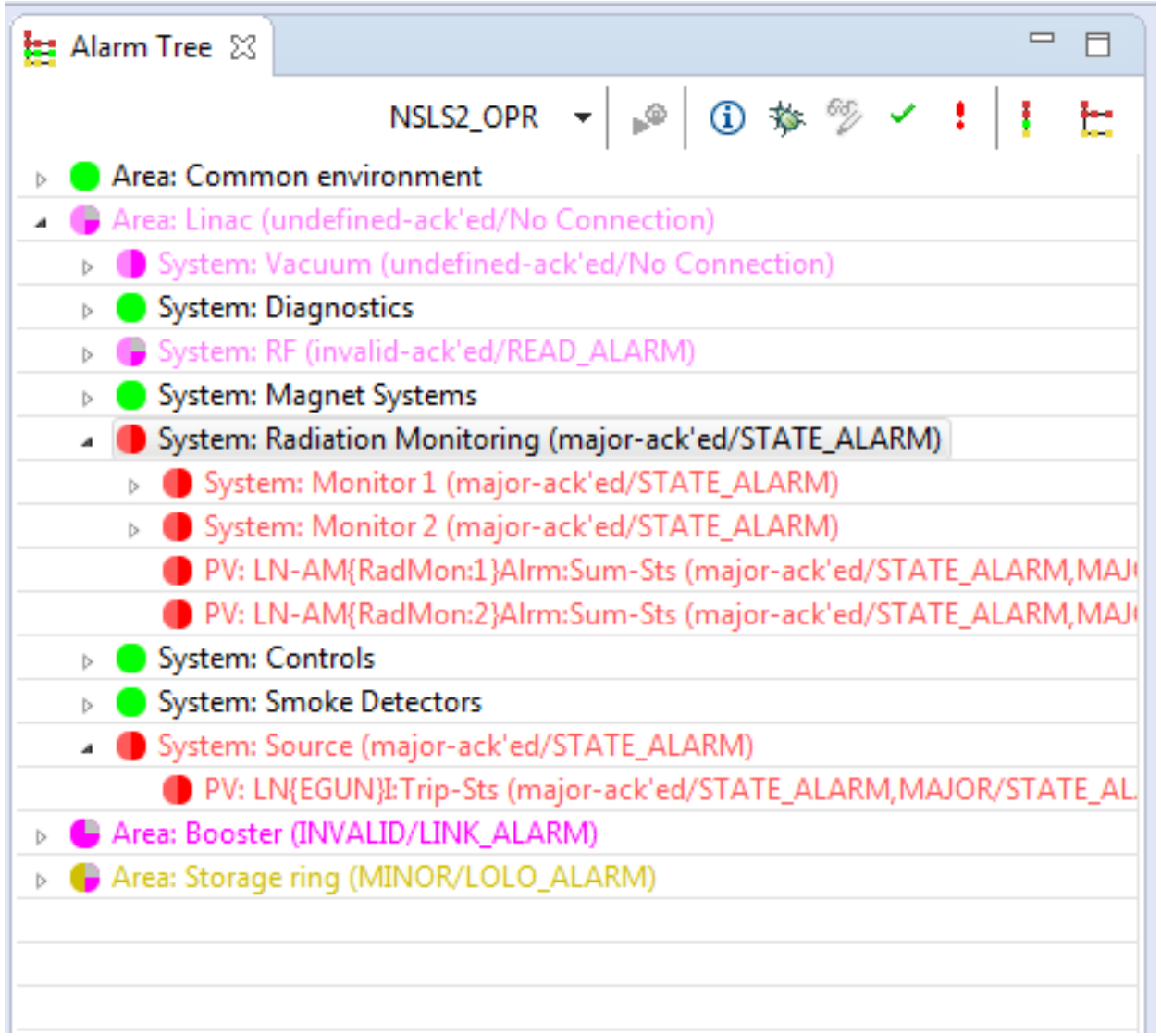
- Alarm Server
  - Handles Alarm logic
  - Stores alarm configuration
- Alarm Clients
  - GUI's display alarms
  - GUI's provide tools to handle alarms (enable, acknowledge, open related display, show guidance)
  - Annunciator
  - Alarm message loggers

Alarm Perspective



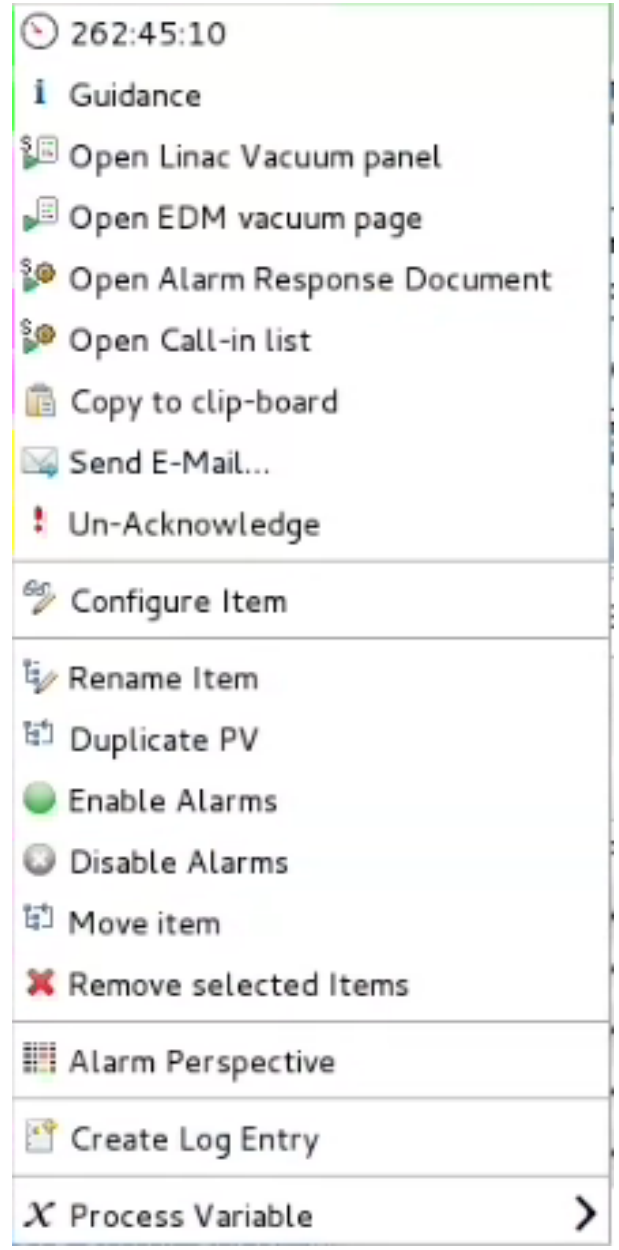
Alarm Tree

- Hierarchical view of alarms
  - Organizes alarms by Area, System, (sub system), PV
  - Organizes guidance and actions
- Alarm handling tools
  - Acknowledge/Un-acknowledge
  - Enable/Disable
  - Guidance, Instructions, and
- Alarm configuration actions

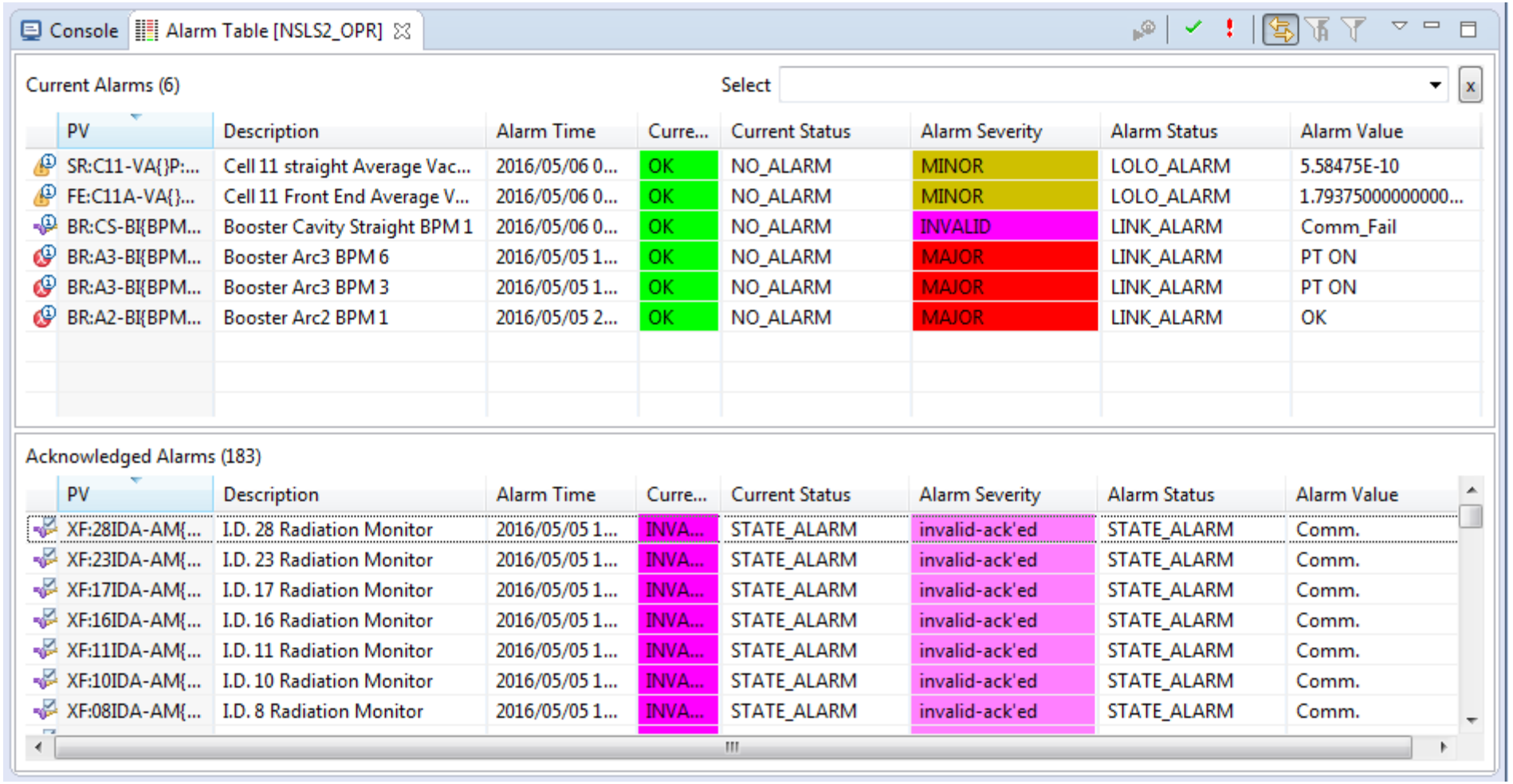


Alarm Context Menu

- Alarm information
- Alarm handling instructions and actions
- Alarm configuration tools

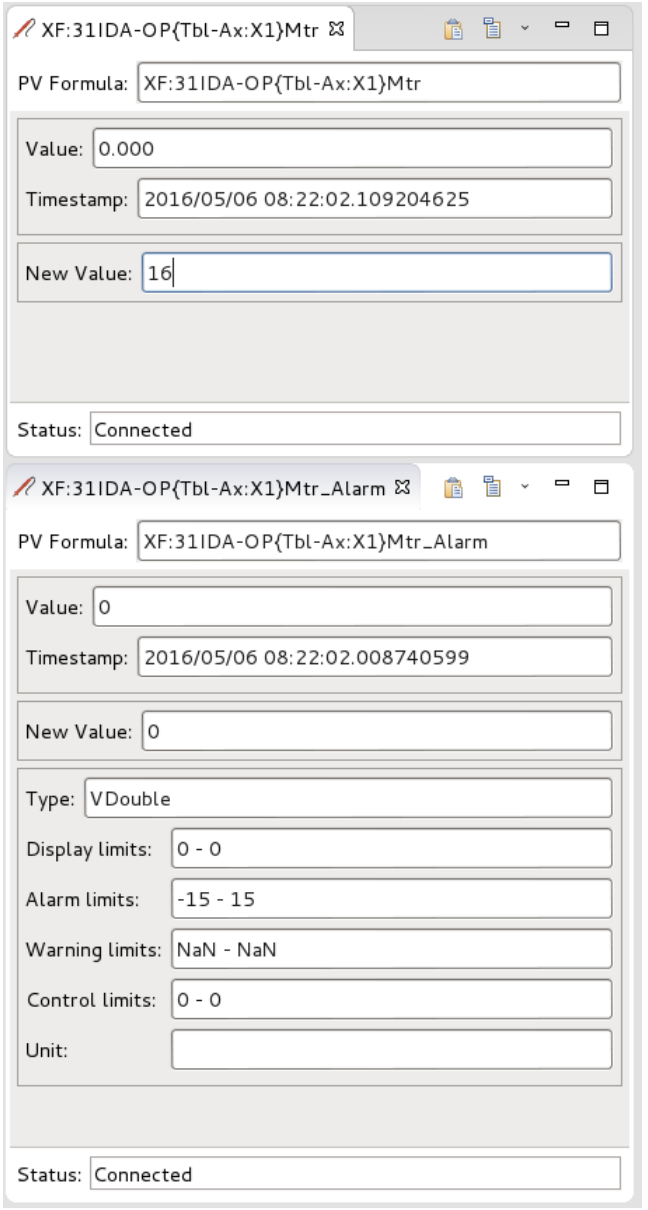


Alarm Table


Console
Alarm Table [NSLS2_OPR]
Current Alarms (6)
Select
PV
Description
Alarm Time
Curre...
Current Status
Alarm Severity
Alarm Status
Alarm Value
SR:C11-VA{}P:...
Cell 11 straight Average Vac...
2016/05/06 0...
OK
NO_ALARM
MINOR
LOLO_ALARM
5.58475E-10
FE:C11A-VA{}...
Cell 11 Front End Average V...
2016/05/06 0...
OK
NO_ALARM
MINOR
LOLO_ALARM
1.79375000000000...
BR:CS-BI{BPM...
Booster Cavity Straight BPM 1
2016/05/06 0...
OK
NO_ALARM
INVALID
LINK_ALARM
Comm_Fail
BR:A3-BI{BPM...
Booster Arc3 BPM 6
2016/05/05 1...
OK
NO_ALARM
MAJOR
LINK_ALARM
PT ON
BR:A3-BI{BPM...
Booster Arc3 BPM 3
2016/05/05 1...
OK
NO_ALARM
MAJOR
LINK_ALARM
PT ON
BR:A2-BI{BPM...
Booster Arc2 BPM 1
2016/05/05 2...
OK
NO_ALARM
MAJOR
LINK_ALARM
OK
Acknowledged Alarms (183)
PV
Description
Alarm Time
Curre...
Current Status
Alarm Severity
Alarm Status
Alarm Value
XF:28IDA-AM{...
I.D. 28 Radiation Monitor
2016/05/05 1...
INVA...
STATE_ALARM
invalid-ack'ed
STATE_ALARM
Comm.
XF:23IDA-AM{...
I.D. 23 Radiation Monitor
2016/05/05 1...
INVA...
STATE_ALARM
invalid-ack'ed
STATE_ALARM
Comm.
XF:17IDA-AM{...
I.D. 17 Radiation Monitor
2016/05/05 1...
INVA...
STATE_ALARM
invalid-ack'ed
STATE_ALARM
Comm.
XF:16IDA-AM{...
I.D. 16 Radiation Monitor
2016/05/05 1...
INVA...
STATE_ALARM
invalid-ack'ed
STATE_ALARM
Comm.
XF:11IDA-AM{...
I.D. 11 Radiation Monitor
2016/05/05 1...
INVA...
STATE_ALARM
invalid-ack'ed
STATE_ALARM
Comm.
XF:10IDA-AM{...
I.D. 10 Radiation Monitor
2016/05/05 1...
INVA...
STATE_ALARM
invalid-ack'ed
STATE_ALARM
Comm.
XF:08IDA-AM{...
I.D. 8 Radiation Monitor
2016/05/05 1...
INVA...
STATE_ALARM
invalid-ack'ed
STATE_ALARM
Comm.

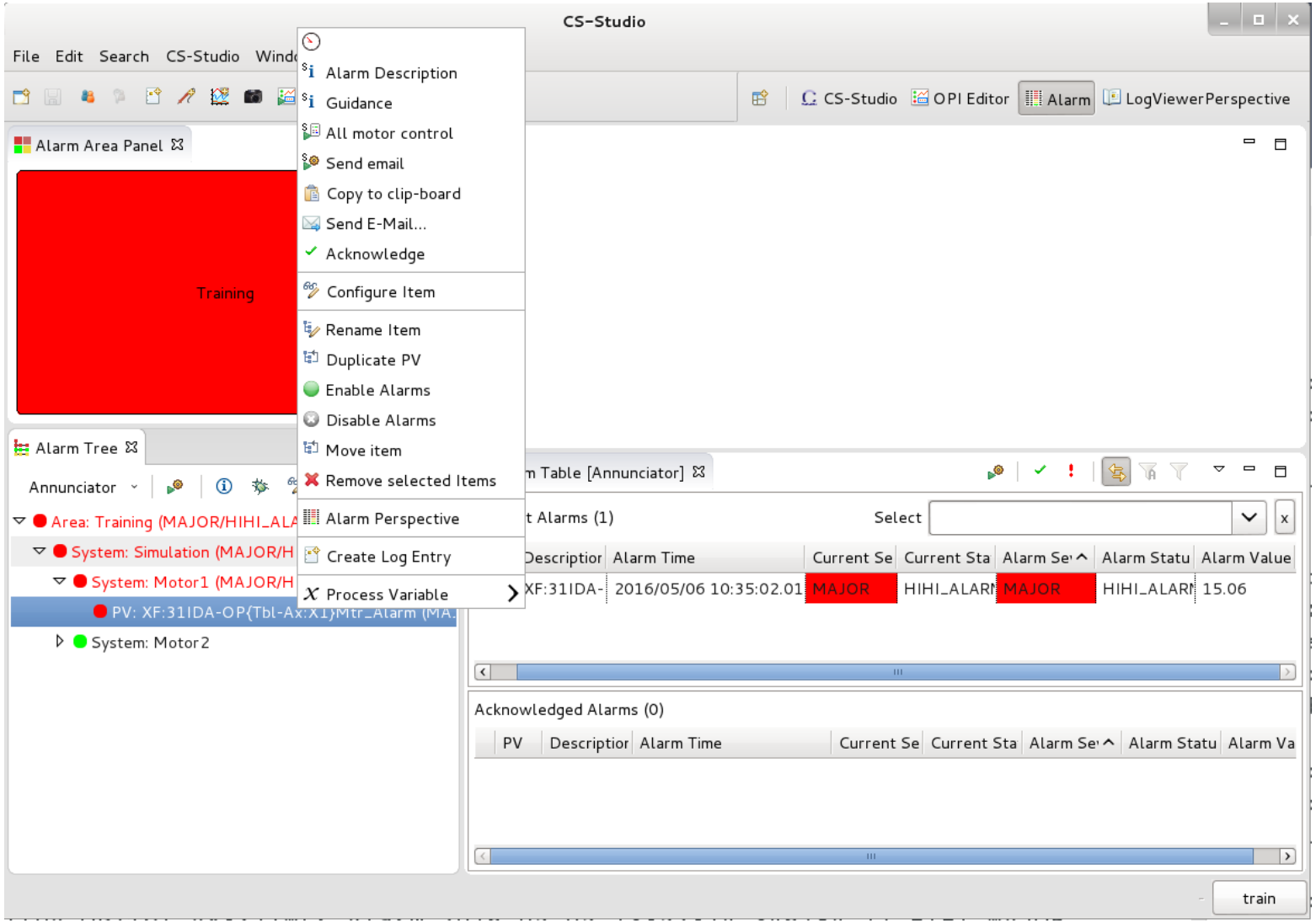
Exercise: Handling Alarms

- We shall create an alarm by moving a motor beyond the safe range or +/- 15
- Motor setpoint pv
  - XF:31IDA-OP{Tbl-Ax:X1}Mtr
- Alarm PV
  - XF:31IDA-OP{Tbl-Ax:X1}Mtr_Alarm



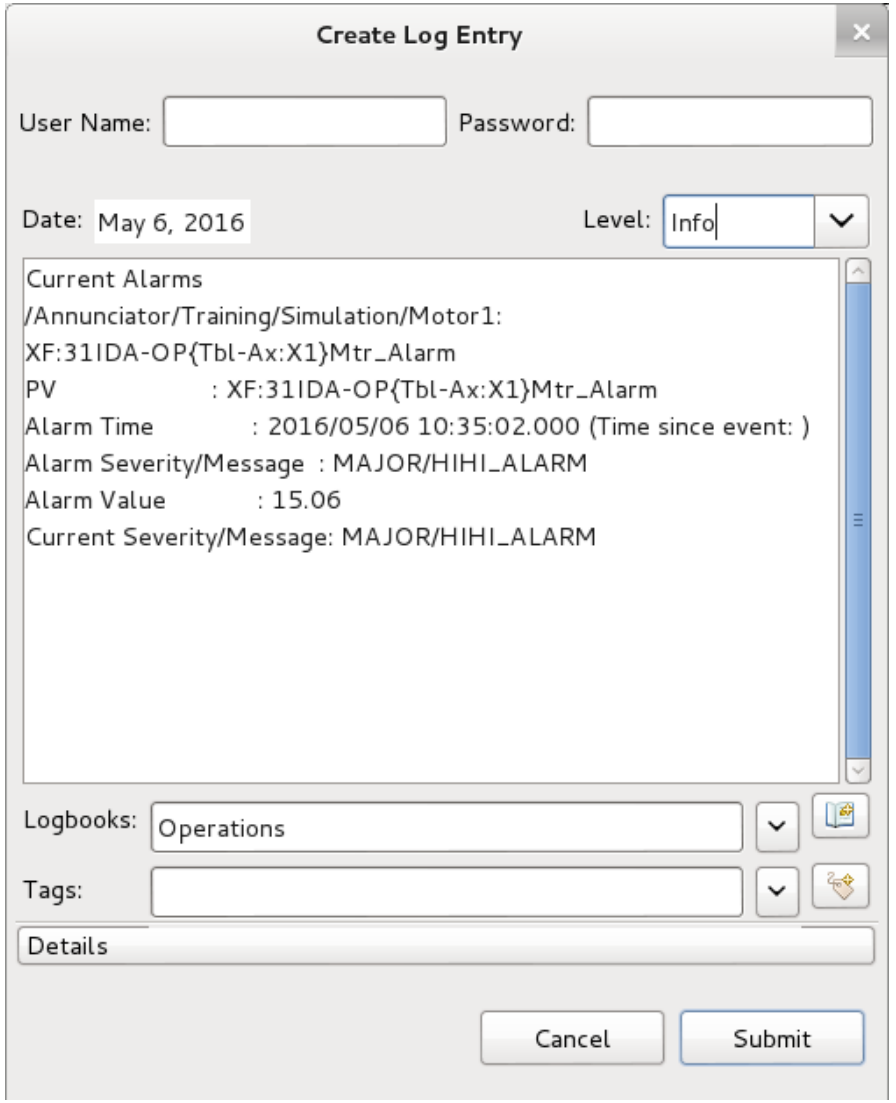
Exercise: Handling Alarms

- Open the context menu which contains
  - Alarm Description
  - Guidance (how the alarm should be handled)
  - Actions to open related opi screens and/or commands



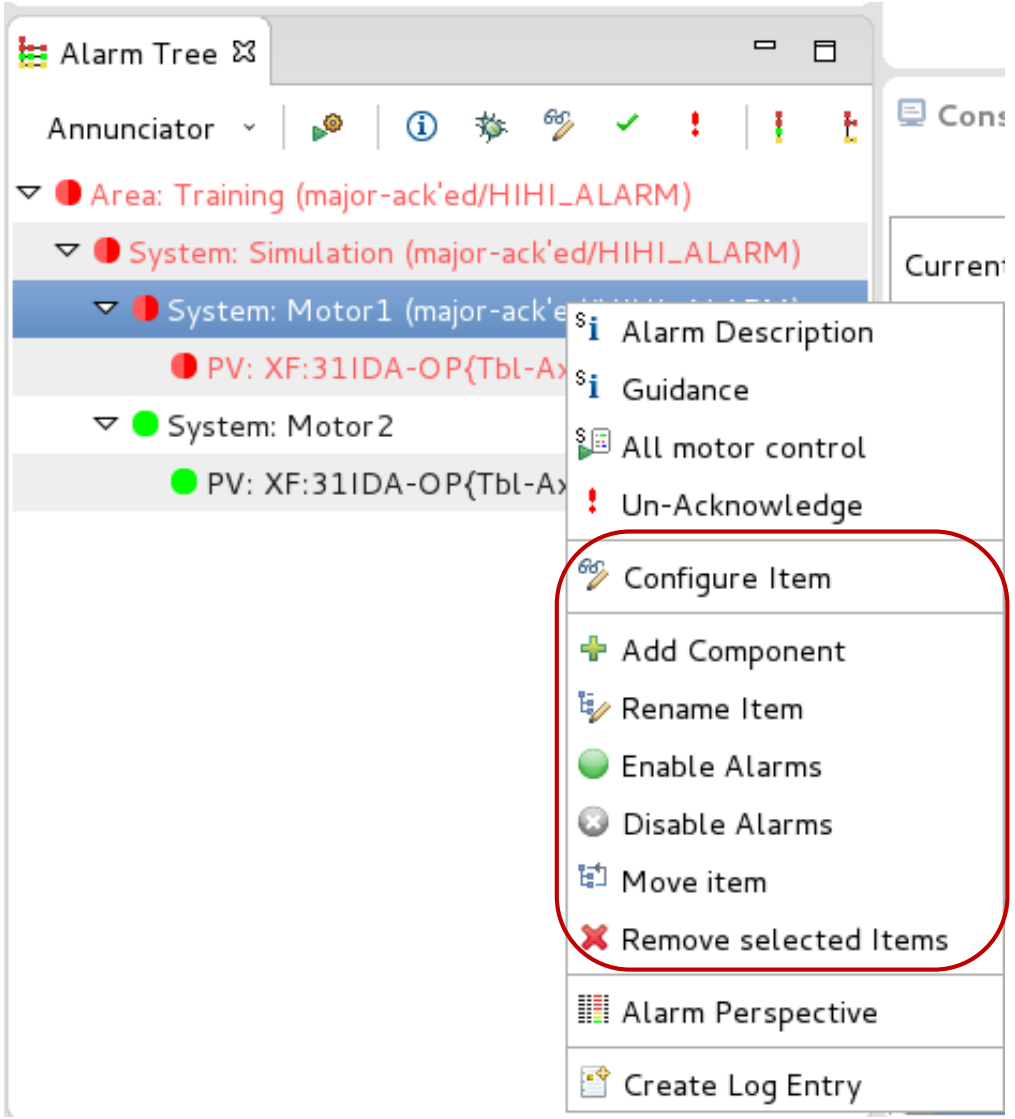
Exercise: Handling Alarms

- Acknowledge alarm
- Create a log entry for the alarm
- Open related motor control opi and set the motor position set point with in the appropriate range



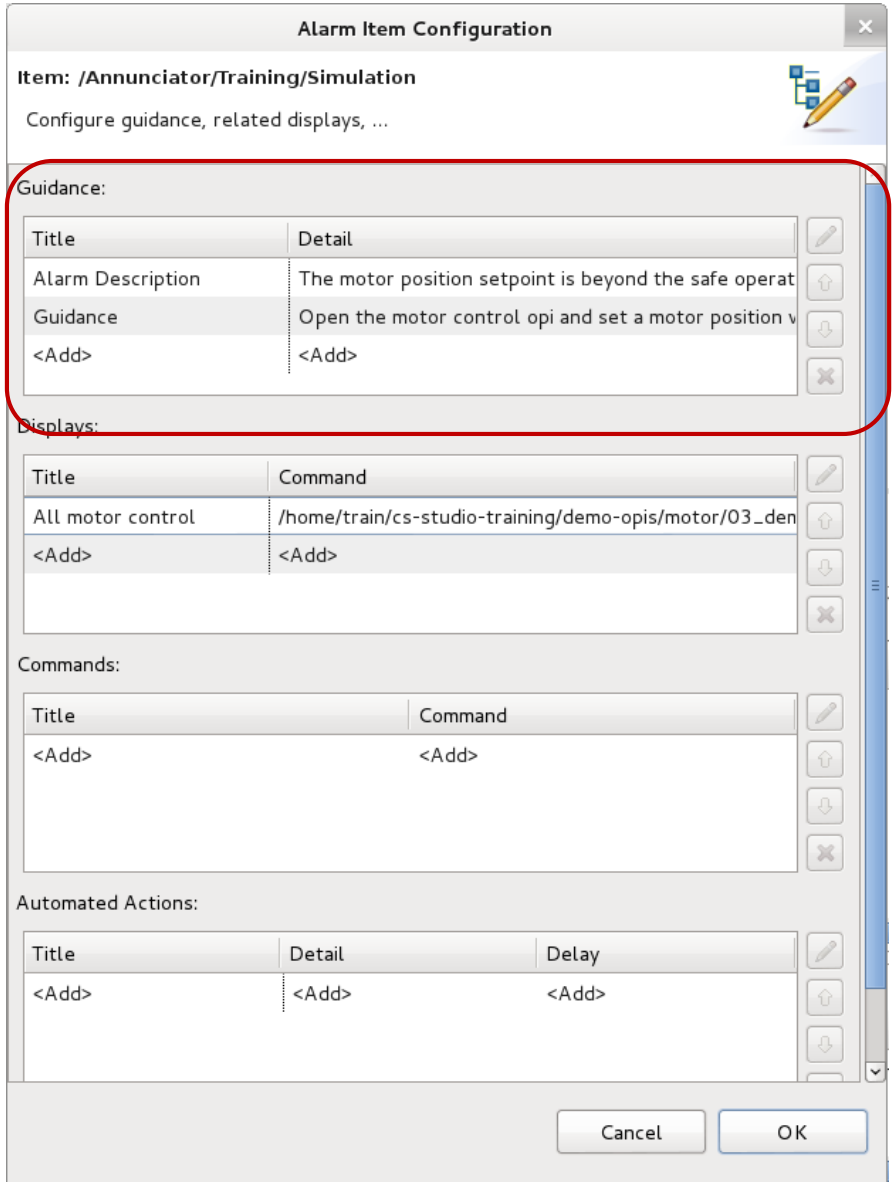
Configuring BEAST

- The context menu of the alarm tree provides commands to
  - Add/Remove new alarm components
  - Reorganize existing components in the alarm hierarchy
  - Configure the information and actions associated with alarms



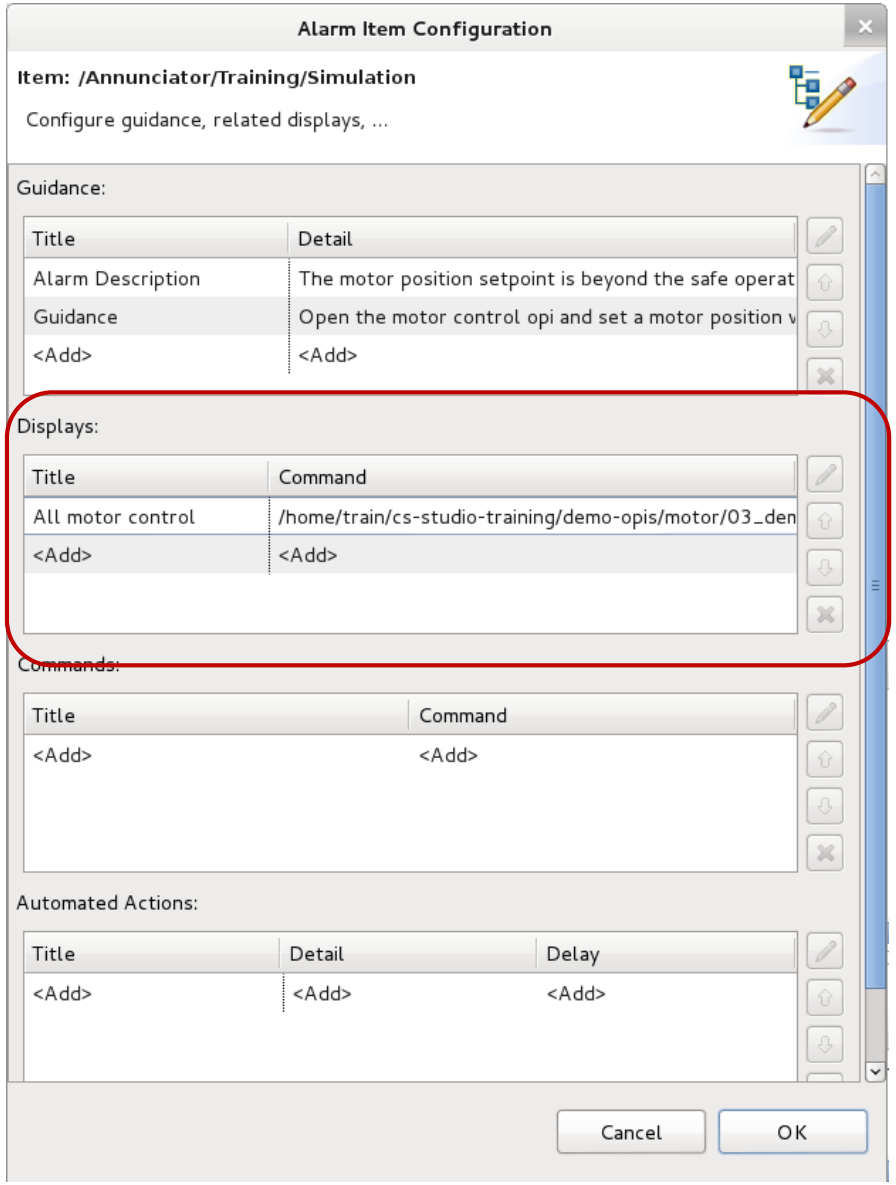
BEAST configuration dialog

- Guidance:
  These are simple text messages which can be used to
  - Describe the alarm condition, including possible causes
  - Provide information/instructions on how this alarm should be handled



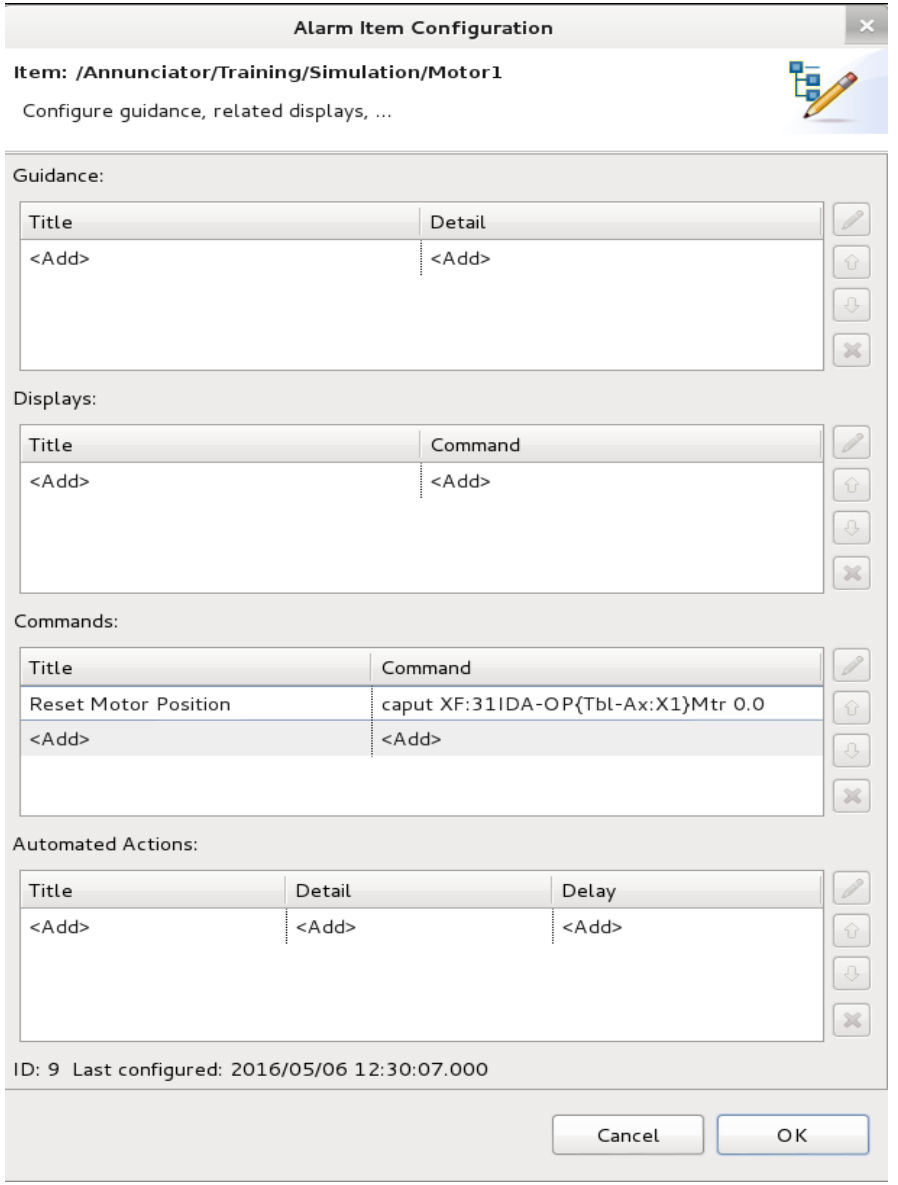
BEAST configuration dialog

- Links alarms with the related opi screens
  - Allow users to directly open BOY/databrowsers files without navigation
  - Link to .opi, .plt,



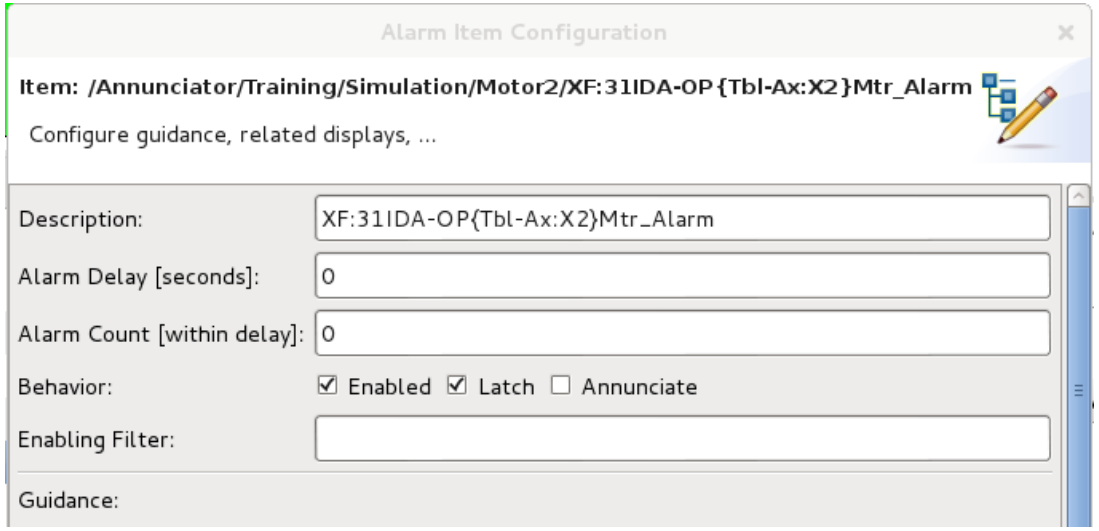
BEAST configuration dialog

- Commands:
  - Allows defining actions which invoke external commands
- Automated Actions:
  - If alarms persist for a certain time without being acknowledged or cleared, and automated notification can be generated.



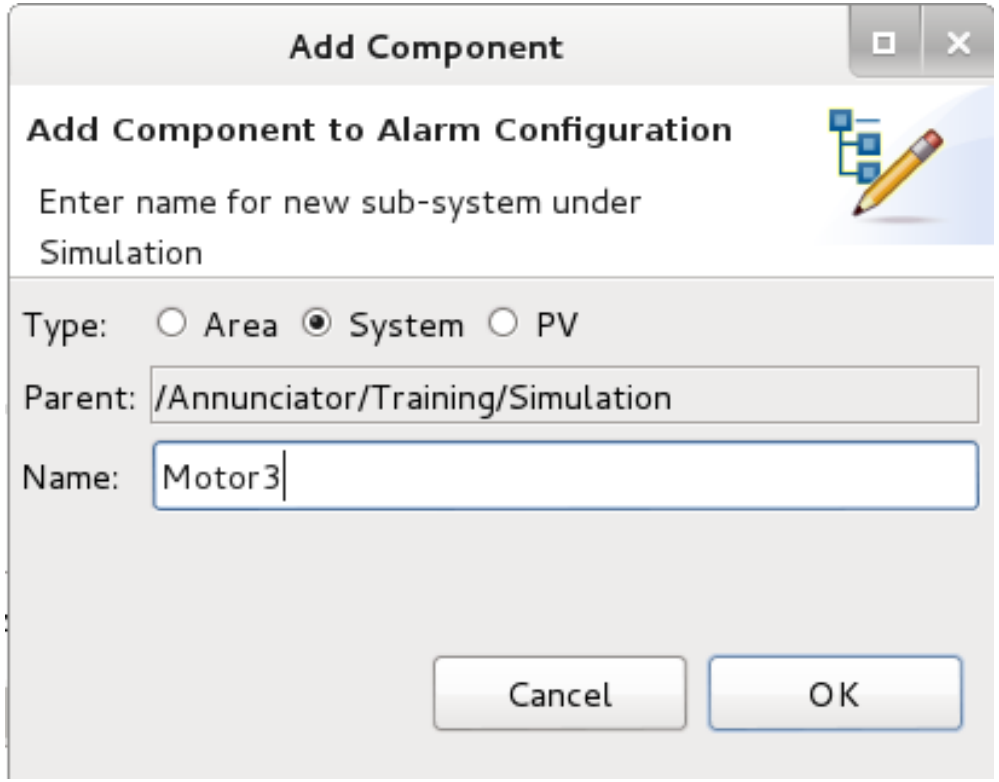
BEAST configuration dialog

- Alarm Trigger PV Configuration
- Alarm Delay and Alarm Count
  - Wait for alarms that are active for at least the specified delay or occur more than the specified count
- Latch
  - The highest alarm states are remembered until acknowledged
- Enable (discouraged)
- Filter (discouraged)



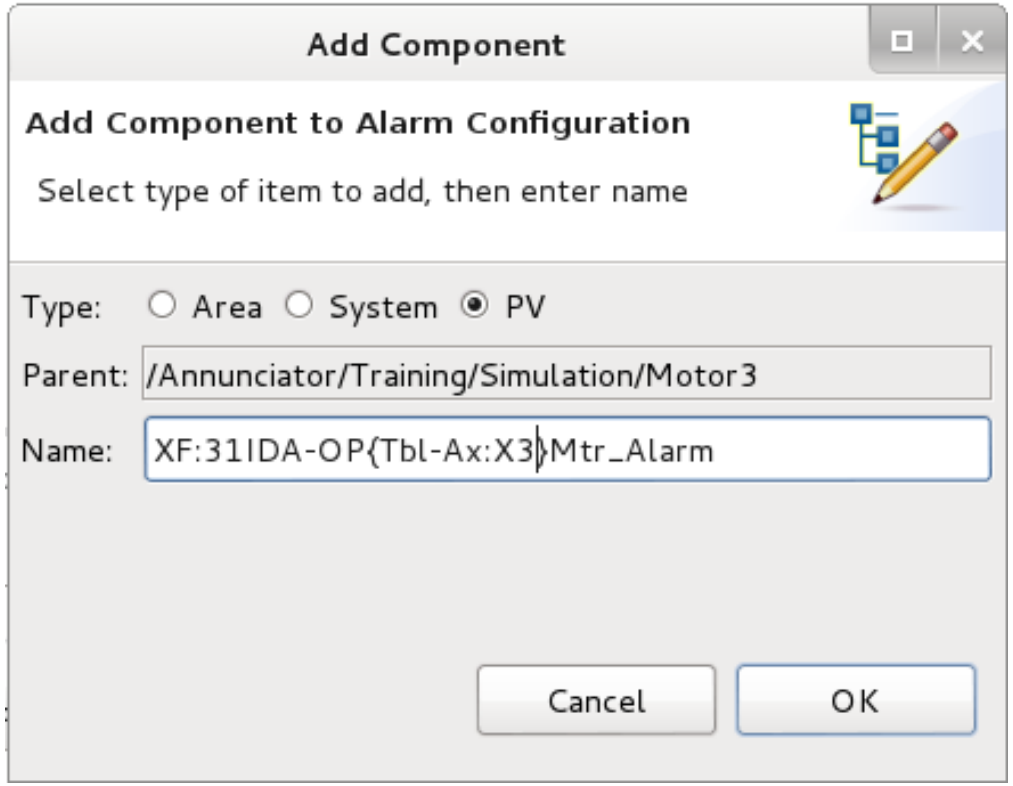
Exercise: Configuring Alarms

- Goal: To create a new set of alarms for Simulated Motor 3
  - Under System: Simulation add a new component
    - Type: System
    - Name: Motor3



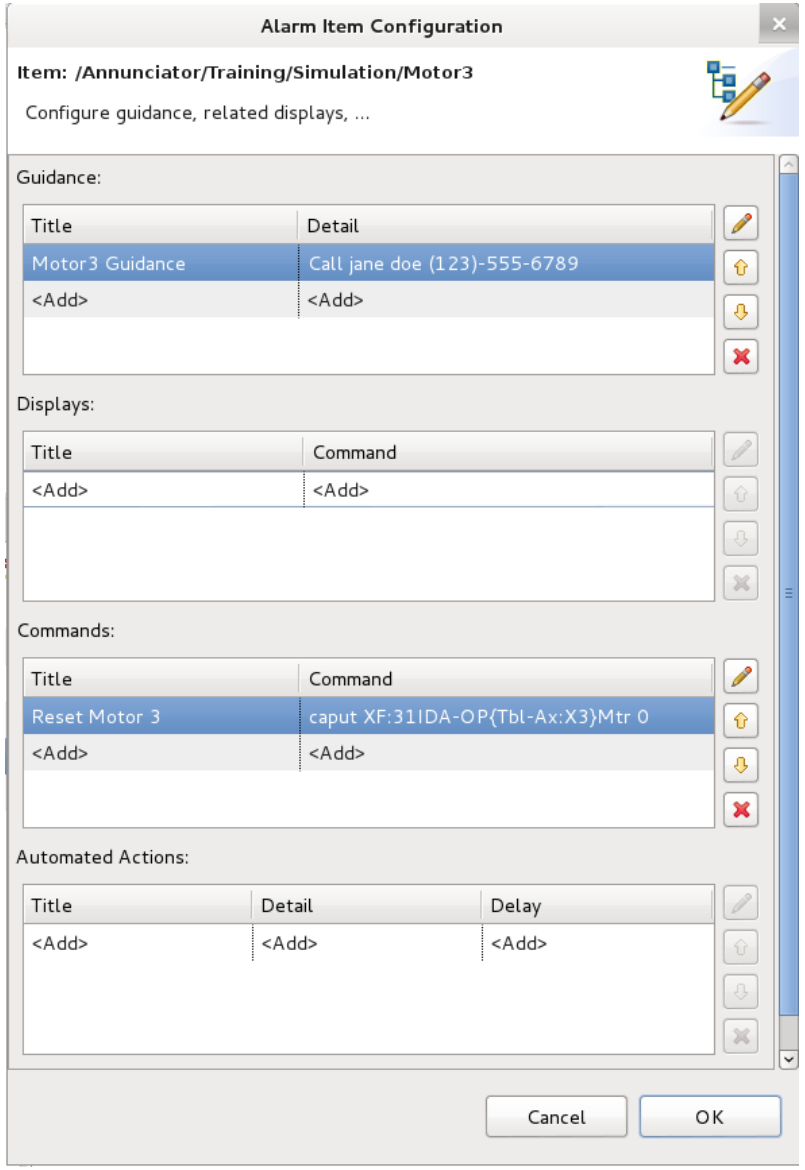
Exercise: Configuring Alarms

- Goal: To create a new set of alarms for Simulated Motor 3
- Under System: Motor3 add a new component
  - Type: PV
  - Name: XF:31IDA-OP{Tbl-Ax:X3}Mtr_Alarm



Exercise: Configuring Alarms

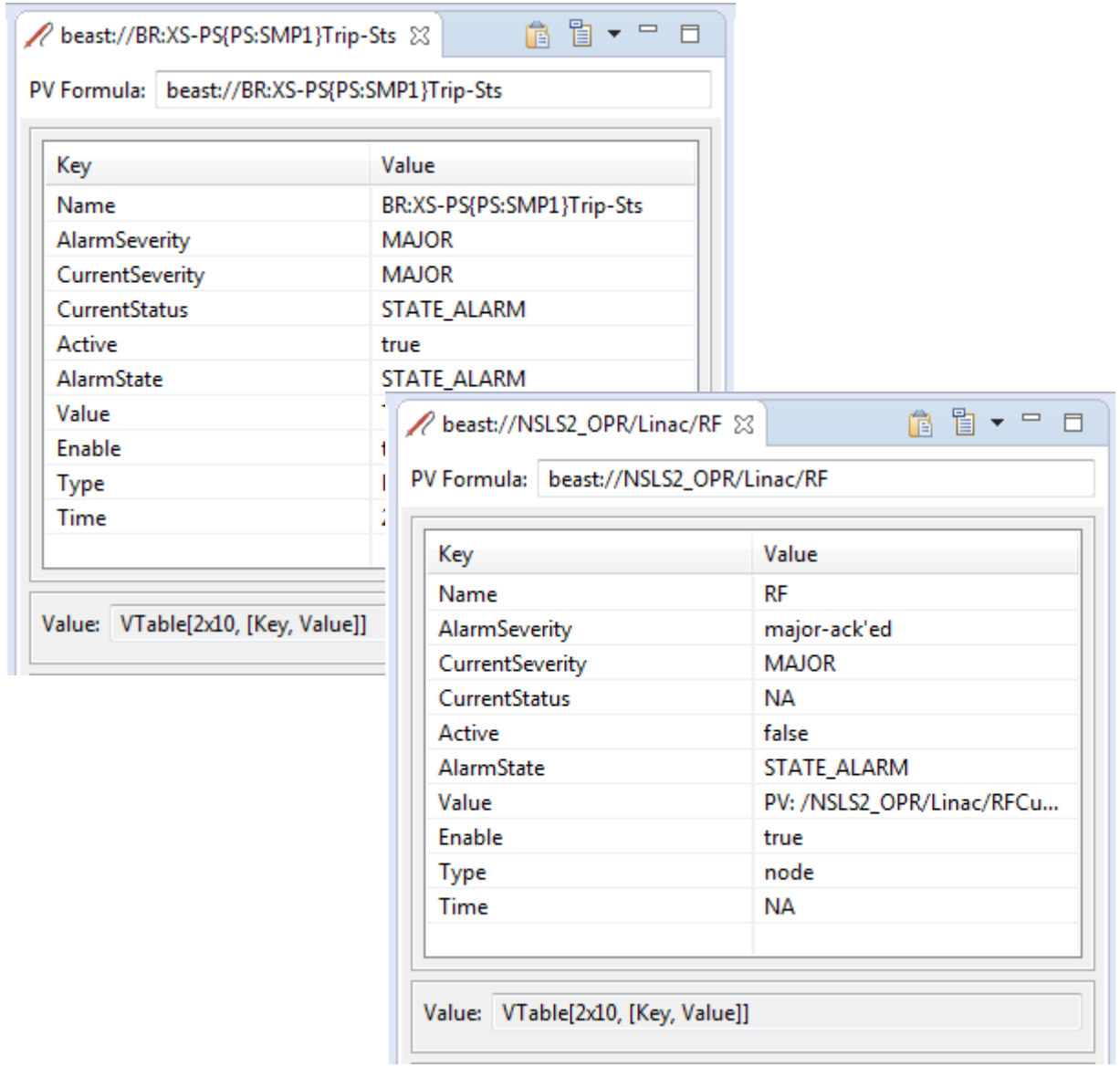
- Add Guidance/Instructions on how this alarm should be handled
- Add a command that will reset the motor set point
  - Title:
    Reset Motor 3
  - Command:
    caput caput XF:31IDA-OP{Tbl-Ax:X3}Mtr 0.0



Alarm Datasource

- 'beast' pvs can be used to connect to any node or leaf from the alarm tree.

  beast://alarm_trigger_pvName
  beast://complete_path_to_area
  beast://complete_path_to_system



Alarm Datasource

- In addition of the table it is also possible to create a channel directly to some of the fields of the table
  - beast://complete_path_to_system.AlarmSeverity

    The severity of the PV remembered by alarm server. When the PV is configured to "latch", the alarm server remembers the highest alarm severity of the PV until it is manually acknowledged.
  - beast://complete_path_to_area.Acknowledge

    Returns a boolean value representing is the Alarm has been acknowledged. true if severity indicates an acknowledged alarm (AlarmSeverity is *-ack'ed). false for unacknowledged or OK state.
  - beast://complete_path_to_system.Active

    Creates a Channel which represents if the alarm is active.

Exercise: Alarm Datasource