CONTROL SYSTEM STUDIO INTEGRATED OPERATING, CONFIGURATION AND DEVELOPMENT

THC002

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Overview

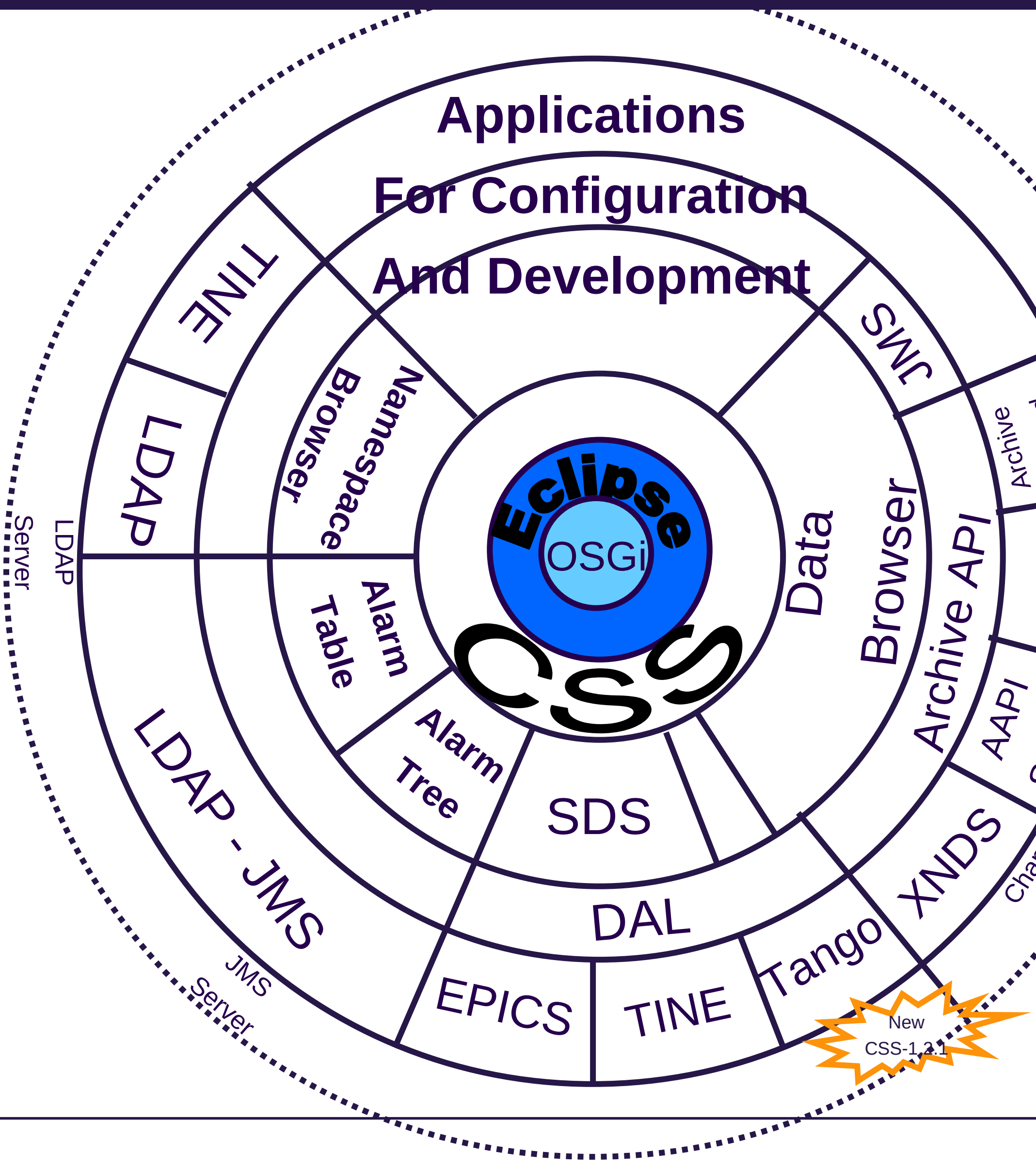
- Control System Studio Overview
- Operational Tools
  - Synoptic Display Studio (SDS)
  - Data Browser
  - Alarm Displays
- Configuration Tools
  - Database Creation Tool
  - Device Database
  - Digital Logic Editor and Simulator
  - Configuration of the
    Alarm Management System
- Development Editors
  - State Notation Language Editor
- Outlook

CSS – new release 1.2.0 http://css.desy.de

- CSS is an Eclipse runtime environment with an enhanced set of core functionalities specific to control system environments
  - Locale setting (e.g. to Japanese) are possible for all strings in CSS
- CSS releases consist of CSS core and a set of control application plug-ins
  They can be copied from the DESY ftp server.
- CSS sources are free available from the DESY cvs repository under the Eclipse Public License (EPL) policy (ask us for a DESY cvs account)
- Several sites create their own set of CSS products according to their desire

- CSS 1.2.0 is available since two weeks
  - Based on Eclipse 3.5
  - Java 1.6 (in a 1.5 compatible manner – to avoid conflicts with MAC users)
  - Using the Eclipse Communication Framework (ECF) for remote management
  - Bug fixes in CAJ
    Thread safety, synchronization …
  - SDS and ADL-Converter
    - ➔ Converting stripTool config files into dataBrowser config files
    - ➔ Calling dataBrowser from a related display button

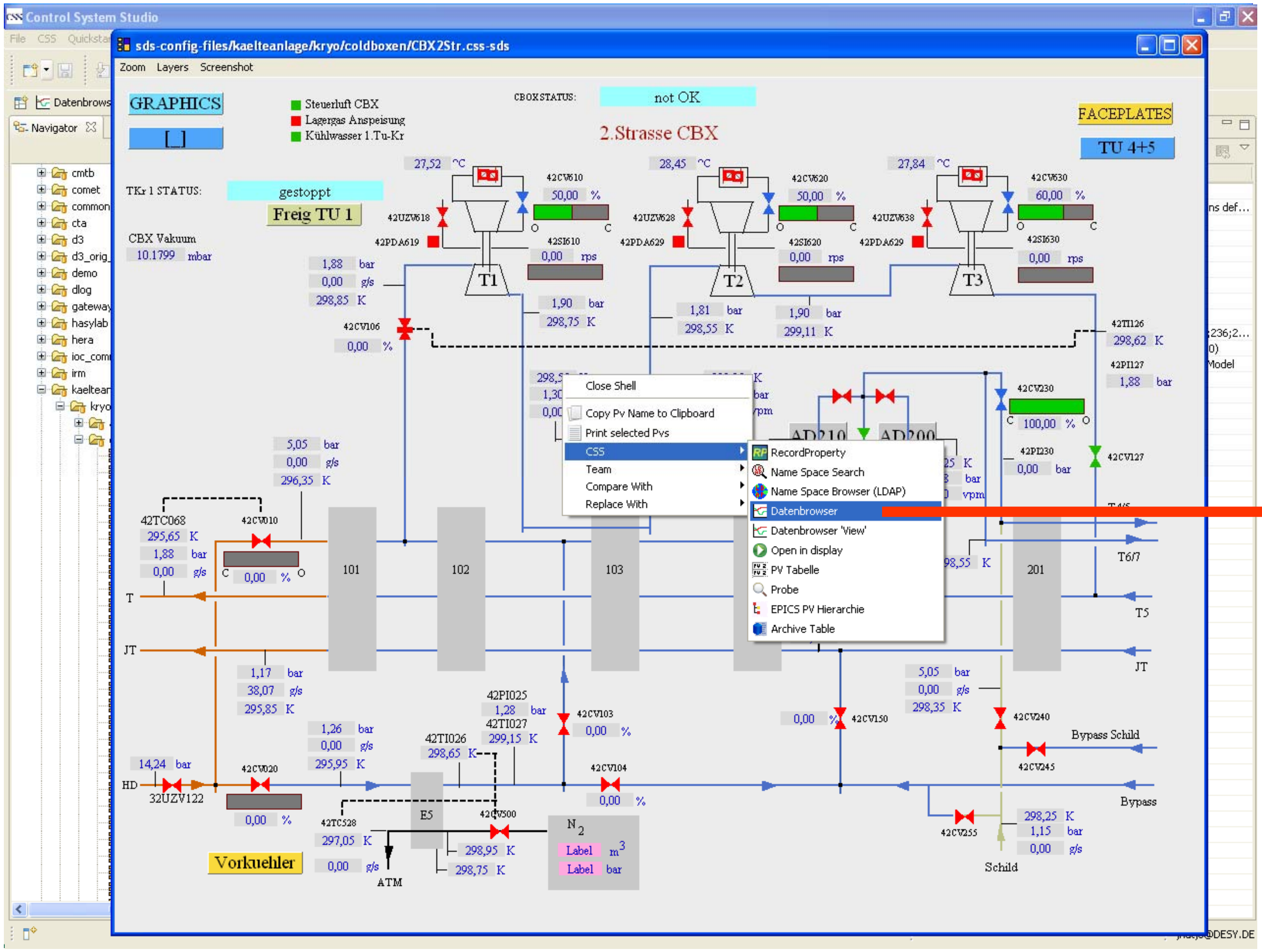
Components


Applications
For Configuration
And Development
Eclipse
OSGi
CSS
TINE
LDAP
Namespace Browser
Alarm Table
Alarm Tree
SDS
DAL
Data Browser
JMS
Archive API
Archive Record
IOC
TINE
TINE archiver
AAPI Server
XNDS
Channel archiver
Tango
TINE
EPICS
LDAP - JMS
JMS Server
LDAP Server
New CSS-1.2.1

Operational Tools

- The three most prominent applications:
  - Synoptic Display Studio (SDS)
  - Data Browser
  - Alarm Displays
- Data Interfaces
  - Data Access Layer (DAL)
  - Archive API (AAPI)
  - Java Message Service (JMS)

Operational Tools – Synoptic Display Studio (SDS)



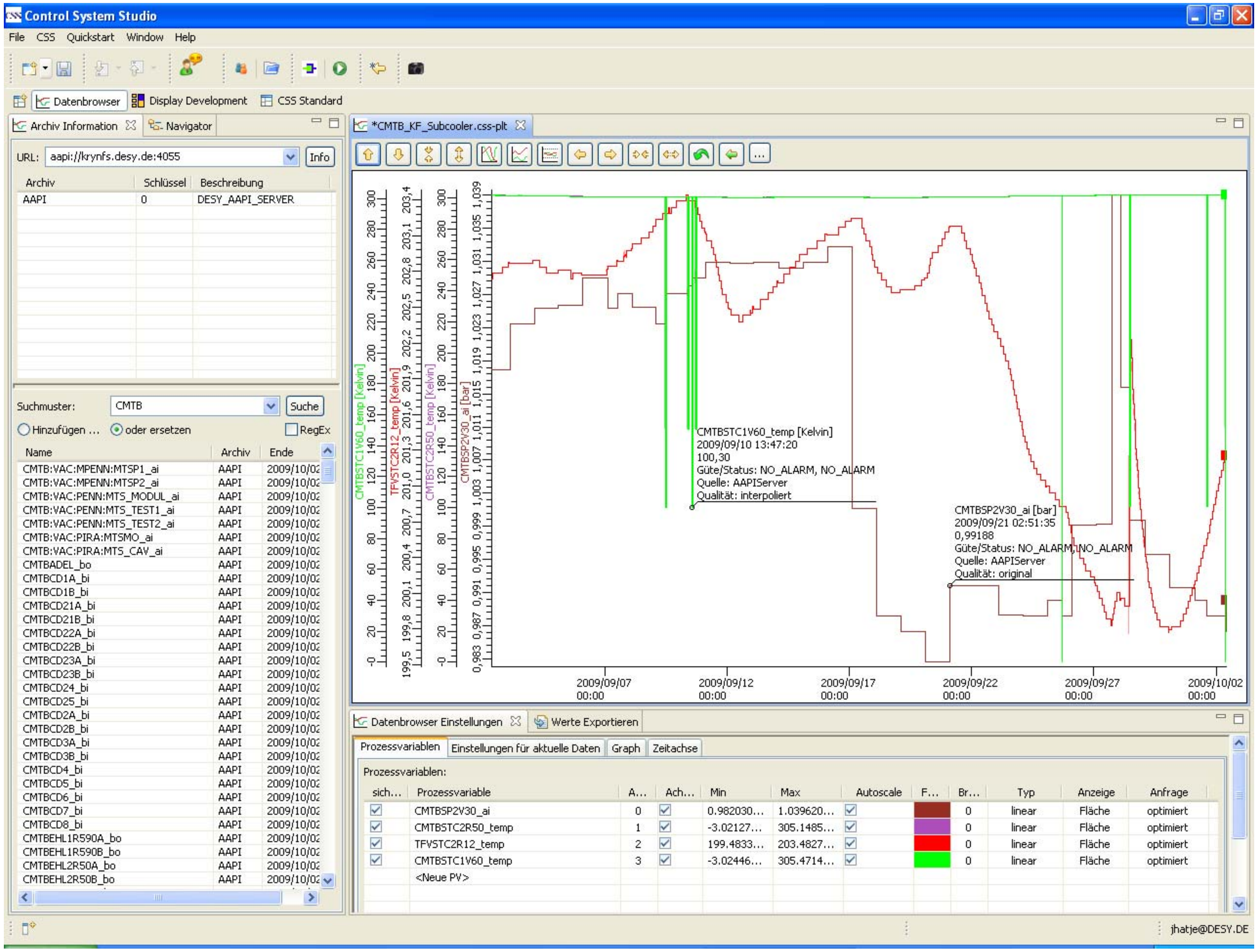
Based on GEF
The Eclipse
Graphical Editing Framework

Edit Mode
any property
can be dynamic

Runtime Mode

Contribution:
-> to DataBrowser

Operational Tools – Data Browser



URL: aapi://krynfs.desy.de:4055 Info

Archiv	Schlüssel	Beschreibung
AAPI	0	DESY_AAPI_SERVER

Suchmuster: CMTB Suche

Hinzufügen … [✓ oder ersetzen] RegEx

Name	Archiv	Ende
CMTB:VAC:MPENN:MTSP1_ai	AAPI	2009/10/02
CMTB:VAC:MPENN:MTSP2_ai	AAPI	2009/10/02
CMTB:VAC:PENN:MTS_MODUL_ai	AAPI	2009/10/02
CMTB:VAC:PENN:MTS_TEST1_ai	AAPI	2009/10/02
CMTB:VAC:PENN:MTS_TEST2_ai	AAPI	2009/10/02
CMTB:VAC:PIRA:MTSMO_ai	AAPI	2009/10/02
CMTB:VAC:PIRA:MTS_CAV_ai	AAPI	2009/10/02
CMTBADEL_bo	AAPI	2009/10/02
CMTBCD1A_bi	AAPI	2009/10/02
CMTBCD1B_bi	AAPI	2009/10/02
CMTBCD21A_bi	AAPI	2009/10/02
CMTBCD21B_bi	AAPI	2009/10/02
CMTBCD22A_bi	AAPI	2009/10/02
CMTBCD22B_bi	AAPI	2009/10/02
CMTBCD23A_bi	AAPI	2009/10/02
CMTBCD23B_bi	AAPI	2009/10/02
CMTBCD24_bi	AAPI	2009/10/02
CMTBCD25_bi	AAPI	2009/10/02
CMTBCD2A_bi	AAPI	2009/10/02
CMTBCD2B_bi	AAPI	2009/10/02
CMTBCD3A_bi	AAPI	2009/10/02
CMTBCD3B_bi	AAPI	2009/10/02
CMTBCD4_bi	AAPI	2009/10/02
CMTBCD5_bi	AAPI	2009/10/02
CMTBCD6_bi	AAPI	2009/10/02
CMTBCD7_bi	AAPI	2009/10/02
CMTBCD8_bi	AAPI	2009/10/02
CMTBEHL1R590A_bo	AAPI	2009/10/02
CMTBEHL1R590B_bo	AAPI	2009/10/02
CMTBEHL2R50A_bo	AAPI	2009/10/02
CMTBEHL2R50B_bo	AAPI	2009/10/02

CMTBSTC1V60_temp [Kelvin]
2009/09/10 13:47:20
100,30
Güte/Status: NO_ALARM, NO_ALARM
Quelle: AAPIServer
Qualität: interpoliert

CMTBSP2V30_ai [bar]
2009/09/21 02:51:35
0,99188
Güte/Status: NO_ALARM, NO_ALARM
Quelle: AAPIServer
Qualität: original

Prozessvariablen:

sich…	Prozessvariable	A…	Ach…	Min	Max	Autoscale	F…	Br…	Typ	Anzeige	Anfrage
✓	CMTBSP2V30_ai	0	✓	0.982030…	1.039620…	✓	🟫	0	linear	Fläche	optimiert
✓	CMTBSTC2R50_temp	1	✓	-3.02127…	305.1485…	✓	🟪	0	linear	Fläche	optimiert
✓	TFVSTC2R12_temp	2	✓	199.4833…	203.4827…	✓	🟥	0	linear	Fläche	optimiert
✓	CMTBSTC1V60_temp	3	✓	-3.02446…	305.4714…	✓	🟩	0	linear	Fläche	optimiert
	<Neue PV>										

Alarm Displays

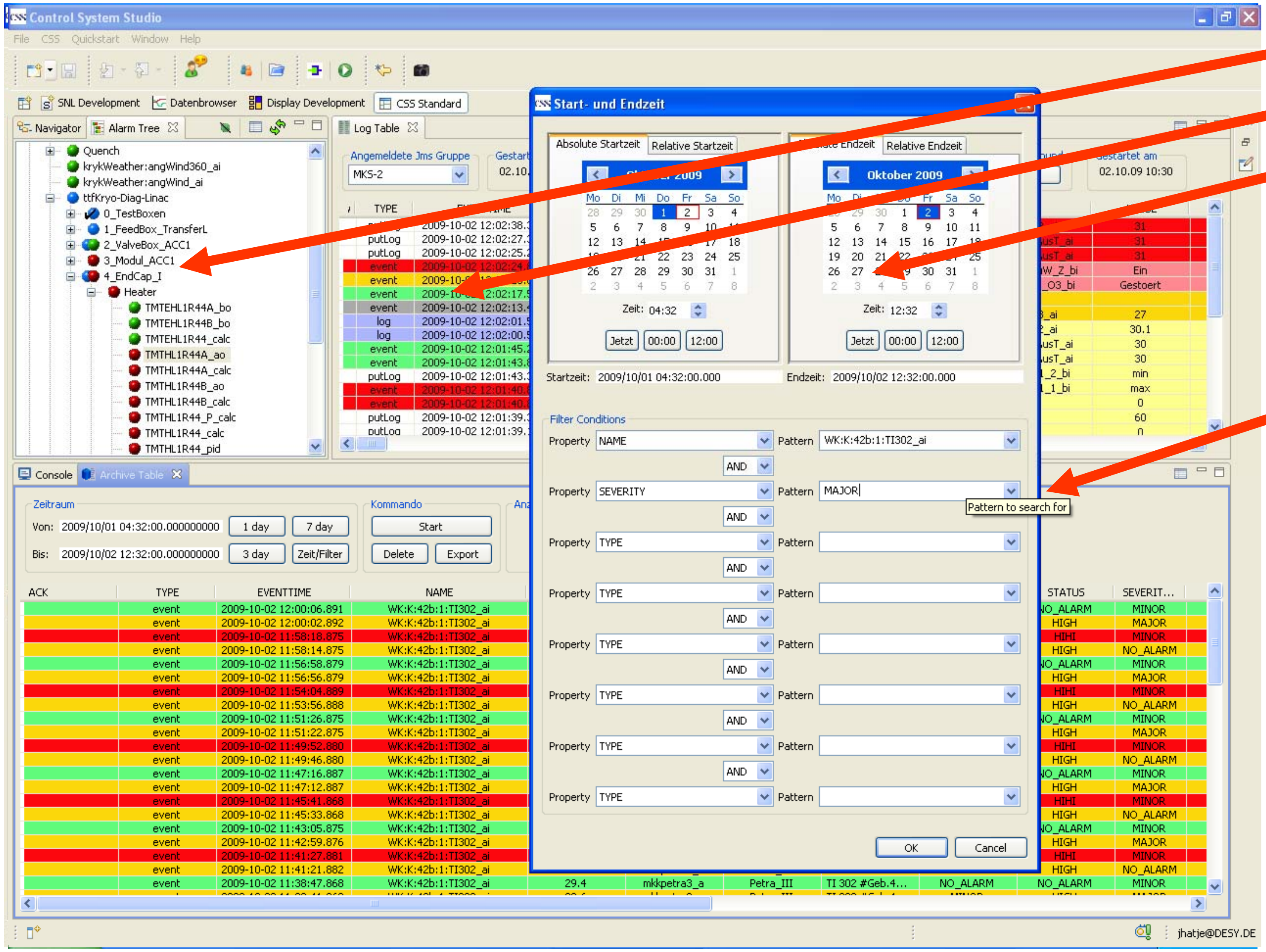
- Alarm- and Log-Tables are registered with **JMS** topics
  - ALARM (general alarm topic)
  - More topics can be configured in the Alarm Management System and are filled from the alarm filter system
  - Log topics: SYS_LOG, SNL_LOG, PUT_LOG

- Configuration of Table settings in Preferences
  - Color Coding (not only for EPICS alarms)
  - Column Labels – and their order

- Alarm Trees are defined in LDAP
  (LDAP is also used as the EPICS name server at DESY)

TUP017: Managing Alarms and (Log)Messages - the CSS Way

Alarm Displays – Alarm(Log) Table(s)



Alarm Tree:

- Quench
- krykWeather:angWind360_ai
- krykWeather:angWind_ai
- ttfKryo-Diag-Linac
  - 0_TestBoxen
  - 1_FeedBox_TransferL
  - 2_ValveBox_ACC1
  - 3_Modul_ACC1
  - 4_EndCap_I
    - Heater
      - TMTEHL1R44A_bo
      - TMTEHL1R44B_bo
      - TMTEHL1R44_calc
      - TMTHL1R44A_ao
      - TMTHL1R44A_calc
      - TMTHL1R44B_ao
      - TMTHL1R44B_calc
      - TMTHL1R44_P_calc
      - TMTHL1R44_calc
      - TMTHL1R44_pid

Log Table — Angemeldete Jms Gruppe: MKS-2 — Gestartet am: 02.10.09 10:30

TYPE	EVENTTIME
putLog	2009-10-02 12:02:38.3
putLog	2009-10-02 12:02:27.3
putLog	2009-10-02 12:02:25.2
event	2009-10-02 12:02:24.6
event	2009-10-0
event	2009-10- 2:02:17.5
event	2009-10-02 12:02:13.4
log	2009-10-02 12:02:01.5
log	2009-10-02 12:02:00.5
event	2009-10-02 12:01:45.2
event	2009-10-02 12:01:43.8
putLog	2009-10-02 12:01:43.3
event	2009-10-02 12:01:40.8
event	2009-10-02 12:01:40.8
putLog	2009-10-02 12:01:39.3
putLog	2009-10-02 12:01:39.1

Alarm Table (partly visible): 31, 31, 31, Ein, Gestoert, 27, 30.1, 30, 30, min, max, 0, 60, 0

Start- und Endzeit

Absolute Startzeit | Relative Startzeit — Oktober 2009 — Zeit: 04:32 — Jetzt | 00:00 | 12:00

Absolute Endzeit | Relative Endzeit — Oktober 2009 — Zeit: 12:32 — Jetzt | 00:00 | 12:00

Startzeit: 2009/10/01 04:32:00.000 Endzeit: 2009/10/02 12:32:00.000

Filter Conditions

Property		Pattern
NAME		WK:K:42b:1:TI302_ai
	AND	
SEVERITY		MAJOR
	AND	
TYPE		
	AND	
TYPE		
	AND	
TYPE		
	AND	
TYPE		
	AND	
TYPE		
	AND	
TYPE		

Pattern to search for

OK Cancel

Archive Table — Zeitraum: Von: 2009/10/01 04:32:00.000000000 Bis: 2009/10/02 12:32:00.000000000 — 1 day | 7 day | 3 day | Zeit/Filter — Kommando: Start | Delete | Export

ACK	TYPE	EVENTTIME	NAME						STATUS	SEVERIT...
	event	2009-10-02 12:00:06.891	WK:K:42b:1:TI302_ai						NO_ALARM	MINOR
	event	2009-10-02 12:00:02.892	WK:K:42b:1:TI302_ai						HIGH	MAJOR
	event	2009-10-02 11:58:18.875	WK:K:42b:1:TI302_ai						HIHI	MINOR
	event	2009-10-02 11:58:14.875	WK:K:42b:1:TI302_ai						HIGH	NO_ALARM
	event	2009-10-02 11:56:58.879	WK:K:42b:1:TI302_ai						NO_ALARM	MINOR
	event	2009-10-02 11:56:56.879	WK:K:42b:1:TI302_ai						HIGH	MAJOR
	event	2009-10-02 11:54:04.889	WK:K:42b:1:TI302_ai						HIHI	MINOR
	event	2009-10-02 11:53:56.888	WK:K:42b:1:TI302_ai						HIGH	NO_ALARM
	event	2009-10-02 11:51:26.875	WK:K:42b:1:TI302_ai						NO_ALARM	MINOR
	event	2009-10-02 11:51:22.875	WK:K:42b:1:TI302_ai						HIGH	MAJOR
	event	2009-10-02 11:49:52.880	WK:K:42b:1:TI302_ai						HIHI	MINOR
	event	2009-10-02 11:49:46.880	WK:K:42b:1:TI302_ai						HIGH	NO_ALARM
	event	2009-10-02 11:47:16.887	WK:K:42b:1:TI302_ai						NO_ALARM	MINOR
	event	2009-10-02 11:47:12.887	WK:K:42b:1:TI302_ai						HIGH	MAJOR
	event	2009-10-02 11:45:41.868	WK:K:42b:1:TI302_ai						HIHI	MINOR
	event	2009-10-02 11:45:33.868	WK:K:42b:1:TI302_ai						HIGH	NO_ALARM
	event	2009-10-02 11:43:05.875	WK:K:42b:1:TI302_ai						NO_ALARM	MINOR
	event	2009-10-02 11:42:59.876	WK:K:42b:1:TI302_ai						HIGH	MAJOR
	event	2009-10-02 11:41:27.881	WK:K:42b:1:TI302_ai						HIHI	MINOR
	event	2009-10-02 11:41:21.882	WK:K:42b:1:TI302_ai						HIGH	NO_ALARM
	event	2009-10-02 11:38:47.868	WK:K:42b:1:TI302_ai	29.4	mkkpetra3_a	Petra_III	TI 302 #Geb.4...	NO_ALARM	NO_ALARM	MINOR

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Alarm – Tree

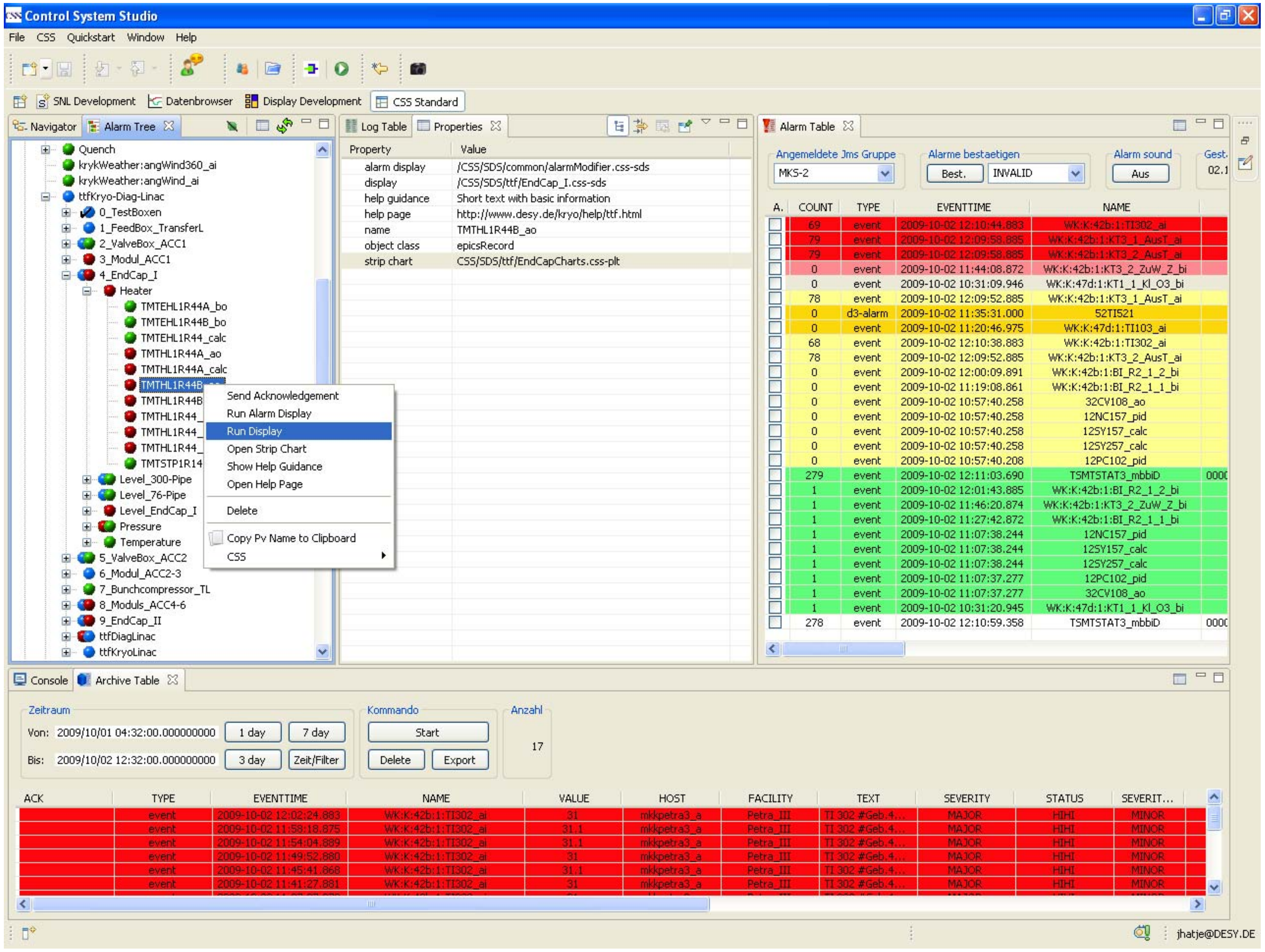
Log Table

Alarm Table

Archive Table

Contribution to Archive Table (default 24h)

Alarm Displays – Alarm Tree



Property	Value
alarm display	/CSS/SDS/common/alarmModifier.css-sds
display	/CSS/SDS/ttf/EndCap_I.css-sds
help guidance	Short text with basic information
help page	http://www.desy.de/kryo/help/ttf.html
name	TMTHL1R44B_ao
object class	epicsRecord
strip chart	CSS/SDS/ttf/EndCapCharts.css-plt

Angemeldete Jms Gruppe: MKS-2
Alarme bestaetigen: Best. INVALID
Alarm sound: Aus
Gest. 02.1

A.	COUNT	TYPE	EVENTTIME	NAME	
☐	69	event	2009-10-02 12:10:44.883	WK:K:42b:1:TI302_ai	
☐	79	event	2009-10-02 12:09:58.885	WK:K:42b:1:KT3_1_AusT_ai	
☐	79	event	2009-10-02 12:09:58.885	WK:K:42b:1:KT3_2_AusT_ai	
☐	0	event	2009-10-02 11:44:08.872	WK:K:42b:1:KT3_2_ZuW_Z_bi	
☐	0	event	2009-10-02 10:31:09.946	WK:K:47d:1:KT1_1_Kl_O3_bi	
☐	78	event	2009-10-02 12:09:52.885	WK:K:42b:1:KT3_1_AusT_ai	
☐	0	d3-alarm	2009-10-02 11:35:31.000	52TI521	
☐	0	event	2009-10-02 11:20:46.975	WK:K:47d:1:TI103_ai	
☐	68	event	2009-10-02 12:10:38.883	WK:K:42b:1:TI302_ai	
☐	78	event	2009-10-02 12:09:52.885	WK:K:42b:1:KT3_2_AusT_ai	
☐	0	event	2009-10-02 12:00:09.891	WK:K:42b:1:BI_R2_1_2_bi	
☐	0	event	2009-10-02 11:19:08.861	WK:K:42b:1:BI_R2_1_1_bi	
☐	0	event	2009-10-02 10:57:40.258	32CV108_ao	
☐	0	event	2009-10-02 10:57:40.258	12NC157_pid	
☐	0	event	2009-10-02 10:57:40.258	12SY157_calc	
☐	0	event	2009-10-02 10:57:40.258	12SY257_calc	
☐	0	event	2009-10-02 10:57:40.208	12PC102_pid	
☐	279	event	2009-10-02 12:11:03.690	TSMTSTAT3_mbbiD	0000
☐	1	event	2009-10-02 12:01:43.885	WK:K:42b:1:BI_R2_1_2_bi	
☐	1	event	2009-10-02 11:46:20.874	WK:K:42b:1:KT3_2_ZuW_Z_bi	
☐	1	event	2009-10-02 11:27:42.872	WK:K:42b:1:BI_R2_1_1_bi	
☐	1	event	2009-10-02 11:07:38.244	12NC157_pid	
☐	1	event	2009-10-02 11:07:38.244	12SY157_calc	
☐	1	event	2009-10-02 11:07:38.244	12SY257_calc	
☐	1	event	2009-10-02 11:07:37.277	12PC102_pid	
☐	1	event	2009-10-02 11:07:37.277	32CV108_ao	
☐	1	event	2009-10-02 10:31:20.945	WK:K:47d:1:KT1_1_Kl_O3_bi	
☐	278	event	2009-10-02 12:10:59.358	TSMTSTAT3_mbbiD	0000

Zeitraum
Von: 2009/10/01 04:32:00.000000000 — 1 day — 7 day
Bis: 2009/10/02 12:32:00.000000000 — 3 day — Zeit/Filter
Kommando: Start, Delete, Export
Anzahl: 17

ACK	TYPE	EVENTTIME	NAME	VALUE	HOST	FACILITY	TEXT	SEVERITY	STATUS	SEVERIT...
	event	2009-10-02 12:02:24.883	WK:K:42b:1:TI302_ai	31	mkkpetra3_a	Petra_III	TI 302 #Geb.4...	MAJOR	HIHI	MINOR
	event	2009-10-02 11:58:18.875	WK:K:42b:1:TI302_ai	31.1	mkkpetra3_a	Petra_III	TI 302 #Geb.4...	MAJOR	HIHI	MINOR
	event	2009-10-02 11:54:04.889	WK:K:42b:1:TI302_ai	31.1	mkkpetra3_a	Petra_III	TI 302 #Geb.4...	MAJOR	HIHI	MINOR
	event	2009-10-02 11:49:52.880	WK:K:42b:1:TI302_ai	31	mkkpetra3_a	Petra_III	TI 302 #Geb.4...	MAJOR	HIHI	MINOR
	event	2009-10-02 11:45:41.868	WK:K:42b:1:TI302_ai	31.1	mkkpetra3_a	Petra_III	TI 302 #Geb.4...	MAJOR	HIHI	MINOR
	event	2009-10-02 11:41:27.881	WK:K:42b:1:TI302_ai	31	mkkpetra3_a	Petra_III	TI 302 #Geb.4...	MAJOR	HIHI	MINOR

Configuration Tools

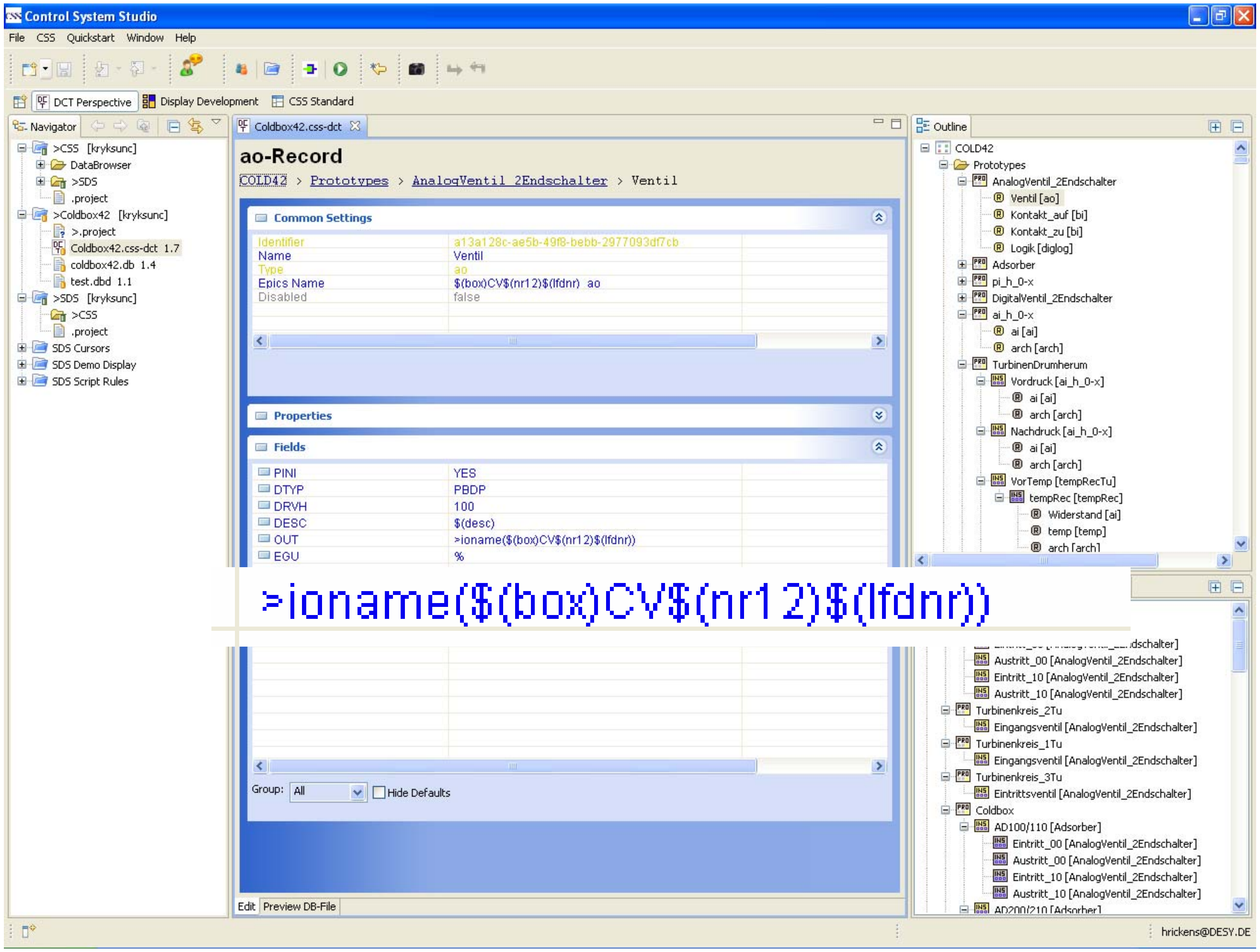
- Configuration Tools
  - Database Creation Tool
  - I/O Configurator -> Device Database
  - Digital Logic Editor and Simulator (Diles)
  - Configuration of the
    Alarm Management System

Configuration Tools - Database Creation Tool

- EPICS specific database creation tool
- Starting from a hierarchical approach of so called prototypes.
  - Prototypes can consist of records and other prototypes
- Names are created in the prototype hierarchy according to naming macro substitutions (rules)
- Instances are created by resolving the final level of macro substitution
- Persistence in XML file
- Output is an EPICS db file

- Plan:
- *Record names and IO_NAMES are stored in a RDB*
- *Graphical display of the prototype hierarchy - for documentation purpose only (for now)*

Configuration Tools - Database Creation Tool



Control System Studio

File CSS Quickstart Window Help

DCT Perspective | Display Development | CSS Standard

Navigator

- >CSS [kryksunc]
  - DataBrowser
  - >SDS
  - .project
- >Coldbox42 [kryksunc]
  - >.project
  - Coldbox42.css-dct 1.7
  - coldbox42.db 1.4
  - test.dbd 1.1
- >SDS [kryksunc]
  - >CSS
  - .project
- SDS Cursors
- SDS Demo Display
- SDS Script Rules

Coldbox42.css-dct

ao-Record

COLD42 > Prototypes > AnalogVentil_2Endschalter > Ventil

Common Settings

Identifier	a13a128c-ae5b-49f8-bebb-2977093df7cb
Name	Ventil
Type	ao
Epics Name	$(box)CV$(nr12)$(lfdnr)_ao
Disabled	false

Properties

Fields

PINI	YES
DTYP	PBDP
DRVH	100
DESC	$(desc)
OUT	>ioname($(box)CV$(nr12)$(lfdnr))
EGU	%

>ioname($(box)CV$(nr12)$(lfdnr))

Group: All ☐ Hide Defaults

Edit | Preview DB-File

Outline

- COLD42
  - Prototypes
    - AnalogVentil_2Endschalter
      - Ventil [ao]
      - Kontakt_auf [bi]
      - Kontakt_zu [bi]
      - Logik [diglog]
    - Adsorber
    - pi_h_0-x
    - DigitalVentil_2Endschalter
    - ai_h_0-x
      - ai [ai]
      - arch [arch]
    - TurbinenDrumherum
      - Vordruck [ai_h_0-x]
        - ai [ai]
        - arch [arch]
      - Nachdruck [ai_h_0-x]
        - ai [ai]
        - arch [arch]
      - VorTemp [tempRecTu]
        - tempRec [tempRec]
          - Widerstand [ai]
          - temp [temp]
          - arch [arch]

- ...dschalter]
- Austritt_00 [AnalogVentil_2Endschalter]
- Eintritt_10 [AnalogVentil_2Endschalter]
- Austritt_10 [AnalogVentil_2Endschalter]
- Turbinenkreis_2Tu
  - Eingangsventil [AnalogVentil_2Endschalter]
- Turbinenkreis_1Tu
  - Eingangsventil [AnalogVentil_2Endschalter]
- Turbinenkreis_3Tu
  - Eintrittsventil [AnalogVentil_2Endschalter]
- Coldbox
  - AD100/110 [Adsorber]
    - Eintritt_00 [AnalogVentil_2Endschalter]
    - Austritt_00 [AnalogVentil_2Endschalter]
    - Eintritt_10 [AnalogVentil_2Endschalter]
    - Austritt_10 [AnalogVentil_2Endschalter]
  - AD200/210 [Adsorber]

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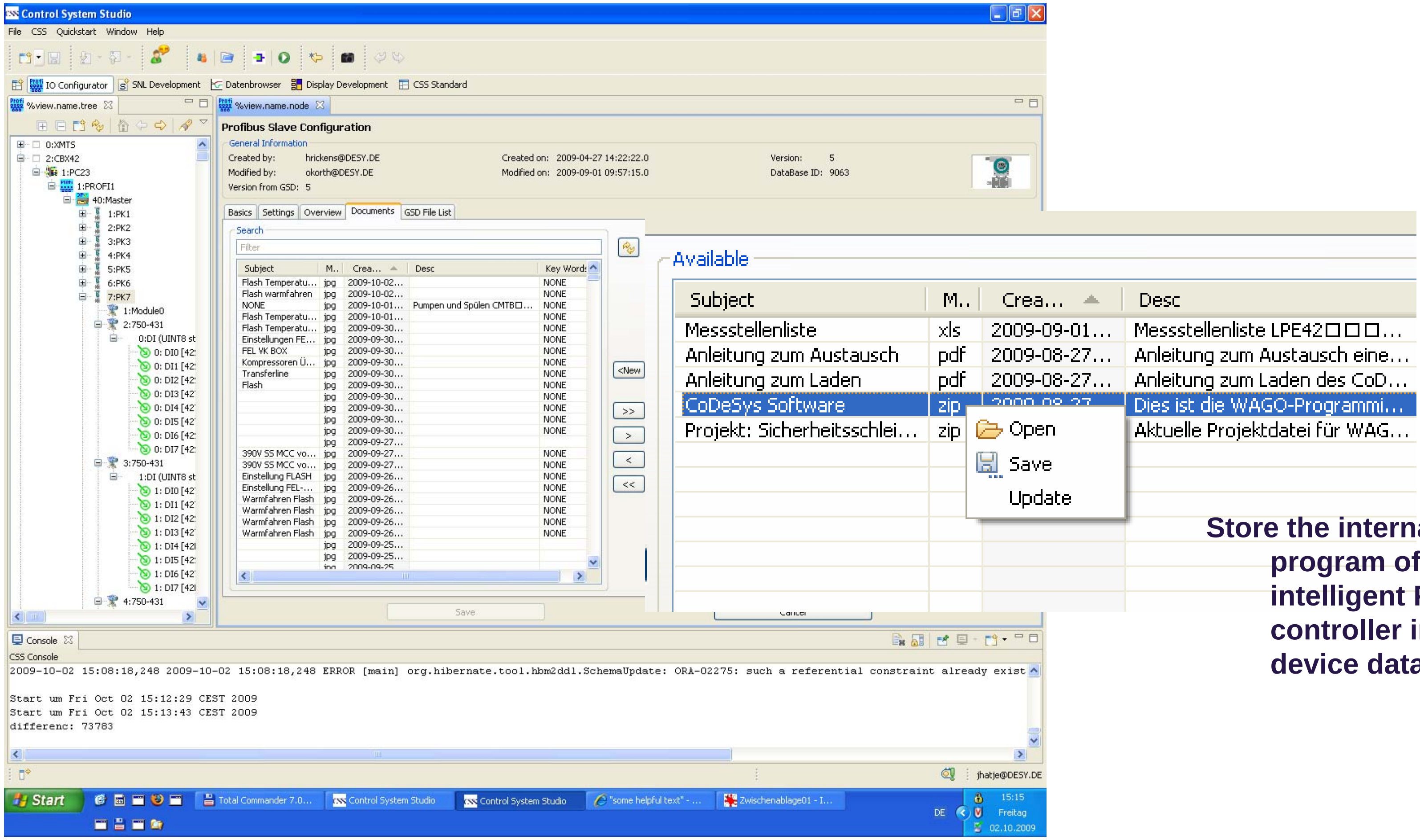
Configuration Tools – I/O Configurator and Device Database

- Configuring the structure of I/O devices
  - First implementation is available for Profibus I/O
    - ➔ Necessary to configure Profibus I/O on NON-Windows Systems
      - Standard Tools only run **on** Windows and configure Profibus Systems running in PLCs or **on** Windows
    - ➔ It is using the Profibus configuration files provided by the hardware vendor GSD (Geräte Stamm Datei) to configure the actual installed hardware
  - *Second implementation planned for Siemens S7*
- Writing configuration into XML (not EPICS specific)
  - Parsed by Profibus driver on the EPICS IOC to configure the DPM memory in the Profibus controller card
- Central store for documentation ('information on your fingertip') EPICS channel -> IO_NAME -> I/O device -> Documentation

Configuration Tools – Device Database Storing Documentation and/or Configuration Data



Profibus Slave Configuration

General Information

Created by:	hrickens@DESY.DE	Created on:	2009-04-27 14:22:22.0	Version:	5
Modified by:	okorth@DESY.DE	Modified on:	2009-09-01 09:57:15.0	DataBase ID:	9063
Version from GSD:	5				

Subject	M..	Crea…	Desc	Key Words
Flash Temperatu…	jpg	2009-10-02…		NONE
Flash warmfahren	jpg	2009-10-02…		NONE
NONE	jpg	2009-10-01…	Pumpen und Spülen CMTB□…	NONE
Flash Temperatu…	jpg	2009-10-01…		NONE
Flash Temperatu…	jpg	2009-09-30…		NONE
Einstellungen FE…	jpg	2009-09-30…		NONE
FEL VK BOX	jpg	2009-09-30…		NONE
Kompressoren Ü…	jpg	2009-09-30…		NONE
Transferline	jpg	2009-09-30…		NONE
Flash	jpg	2009-09-30…		NONE
	jpg	2009-09-30…		NONE
	jpg	2009-09-30…		NONE
	jpg	2009-09-30…		NONE
	jpg	2009-09-30…		NONE
	jpg	2009-09-27…		
390V SS MCC vo…	jpg	2009-09-27…		NONE
390V SS MCC vo…	jpg	2009-09-27…		NONE
Einstellung FLASH	jpg	2009-09-26…		NONE
Einstellung FEL-…	jpg	2009-09-26…		NONE
Warmfahren Flash	jpg	2009-09-26…		NONE
Warmfahren Flash	jpg	2009-09-26…		NONE
Warmfahren Flash	jpg	2009-09-26…		NONE
Warmfahren Flash	jpg	2009-09-26…		NONE
	jpg	2009-09-25…		
	jpg	2009-09-25…		
	jpg	2009-09-25		

Available

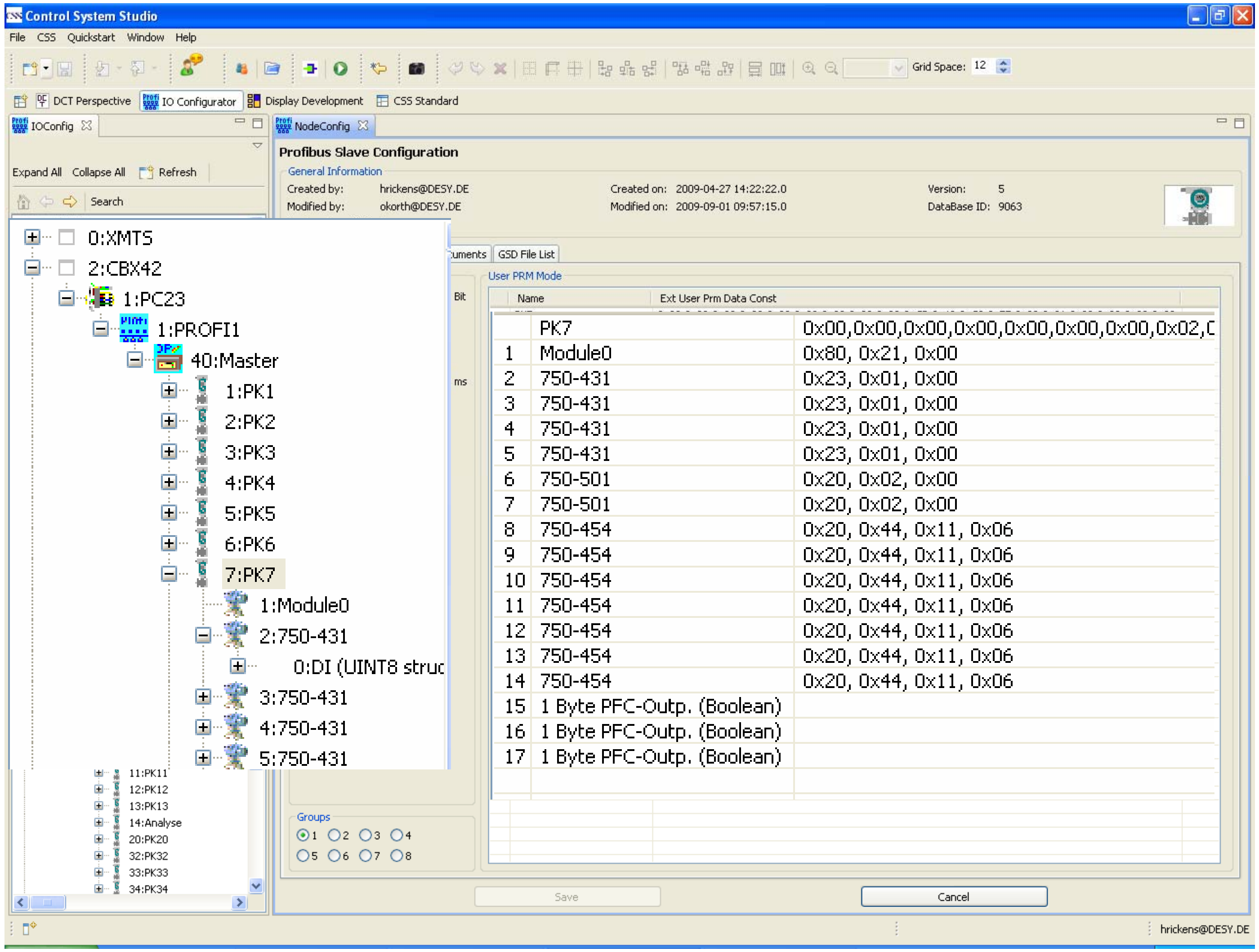
Subject	M..	Crea…	Desc
Messstellenliste	xls	2009-09-01…	Messstellenliste LPE42□□□…
Anleitung zum Austausch	pdf	2009-08-27…	Anleitung zum Austausch eine…
Anleitung zum Laden	pdf	2009-08-27…	Anleitung zum Laden des CoD…
CoDeSys Software	zip	2009-08-27	Dies ist die WAGO-Programmi…
Projekt: Sicherheitsschlei…	zip		Aktuelle Projektdatei für WAG…

CSS Console

```
2009-10-02 15:08:18,248 2009-10-02 15:08:18,248 ERROR [main] org.hibernate.tool.hbm2ddl.SchemaUpdate: ORA-02275: such a referential constraint already exist

Start um Fri Oct 02 15:12:29 CEST 2009
Start um Fri Oct 02 15:13:43 CEST 2009
differenc: 73783
```

Store the internal logic program of the intelligent Profibus controller in the device database

Configuration Tools – Device Database Profibus Slave Configuration



Profibus Slave Configuration

General Information

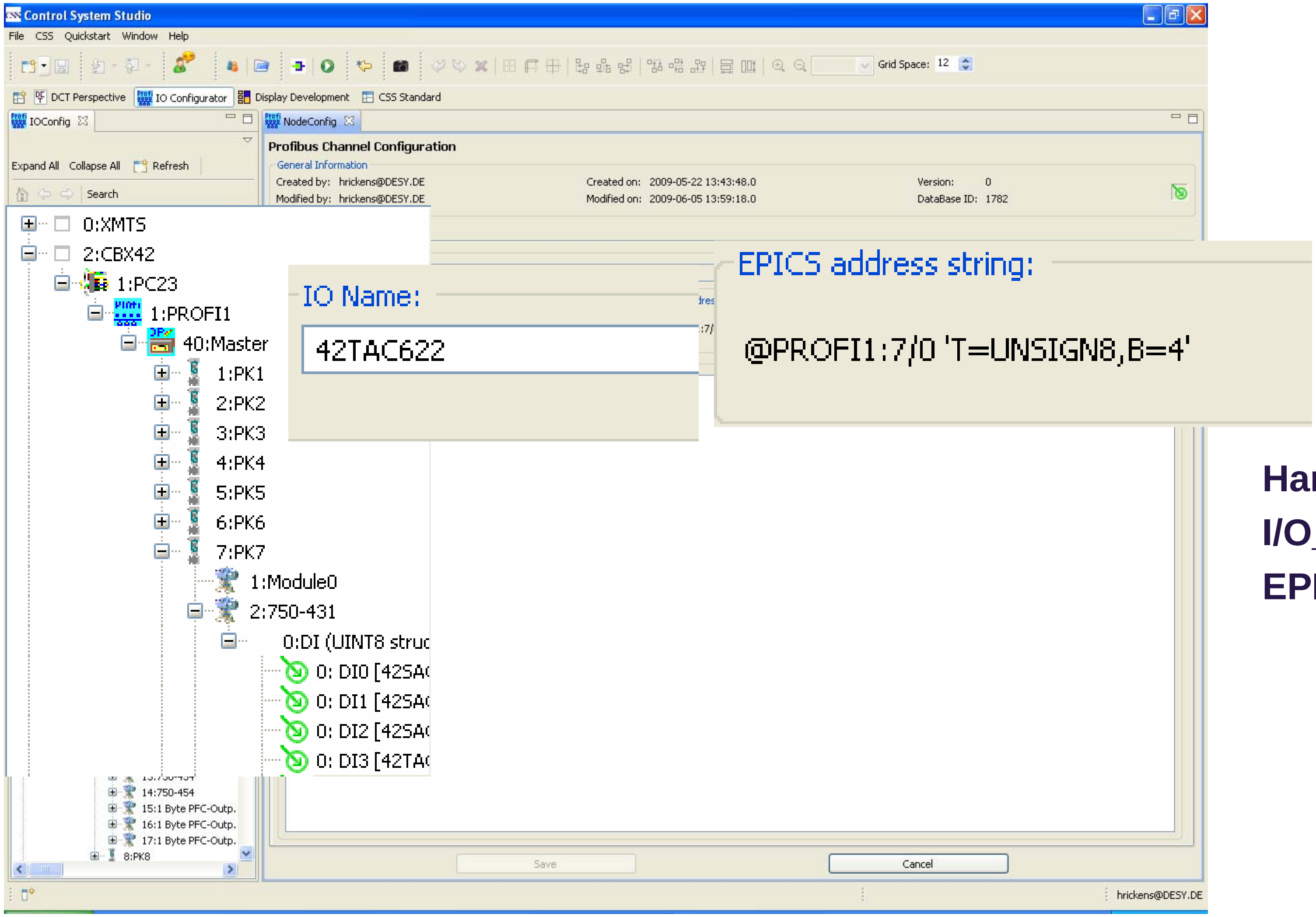
Created by: hrickens@DESY.DE Created on: 2009-04-27 14:22:22.0 Version: 5
Modified by: okorth@DESY.DE Modified on: 2009-09-01 09:57:15.0 DataBase ID: 9063

User PRM Mode

	Name	Ext User Prm Data Const
	PK7	0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x02,C
1	Module0	0x80, 0x21, 0x00
2	750-431	0x23, 0x01, 0x00
3	750-431	0x23, 0x01, 0x00
4	750-431	0x23, 0x01, 0x00
5	750-431	0x23, 0x01, 0x00
6	750-501	0x20, 0x02, 0x00
7	750-501	0x20, 0x02, 0x00
8	750-454	0x20, 0x44, 0x11, 0x06
9	750-454	0x20, 0x44, 0x11, 0x06
10	750-454	0x20, 0x44, 0x11, 0x06
11	750-454	0x20, 0x44, 0x11, 0x06
12	750-454	0x20, 0x44, 0x11, 0x06
13	750-454	0x20, 0x44, 0x11, 0x06
14	750-454	0x20, 0x44, 0x11, 0x06
15	1 Byte PFC-Outp. (Boolean)	
16	1 Byte PFC-Outp. (Boolean)	
17	1 Byte PFC-Outp. (Boolean)	

Groups: [✓ 1] 2 3 4 5 6 7 8

Configuration Tools – Device Database



Profibus Channel Configuration

General Information

Created by: hrickens@DESY.DE Created on: 2009-05-22 13:43:48.0 Version: 0

Modified by: hrickens@DESY.DE Modified on: 2009-06-05 13:59:18.0 DataBase ID: 1782

IO Name: 42TAC622

EPICS address string: @PROFI1:7/0 'T=UNSIGN8,B=4'

Hardware Channel

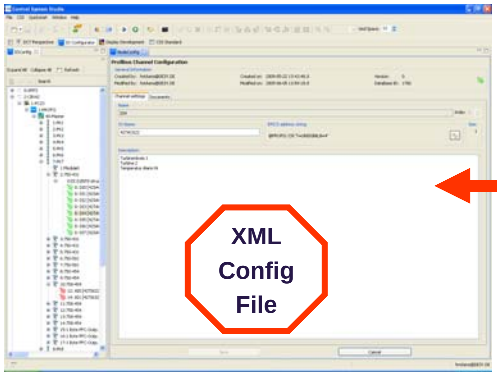
I/O_NAME

EPICS address string

IO_NAME the Link between I/O Data and DCT

CSS I/O Configurator

CSS DCT



XML Config File

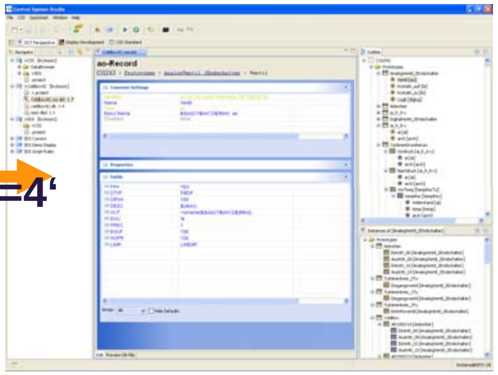
RDB

cvs

@PROFI1:7/0'T=UNSIGN8,B=4'

Device Database

Cvs repository



Create EPICS db file

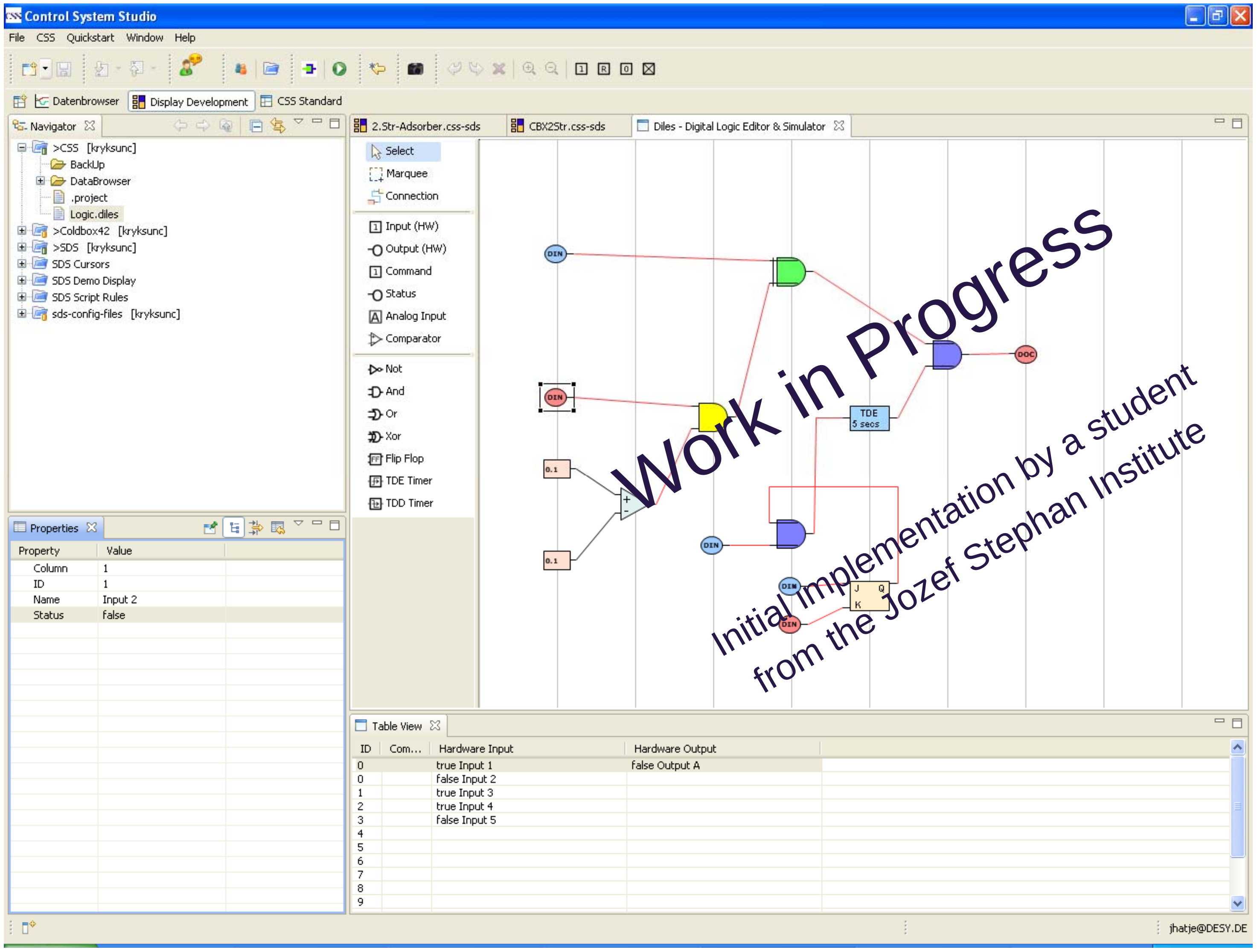
INP: @PROFI1:7/0'T=UNSIGN8,B=4'

42TAC622 (IO_NAME)

EPICS DB file

EPICS IOC

Configuration Tools – Digital Logic Editor and Simulator



Property	Value
Column	1
ID	1
Name	Input 2
Status	false

ID	Com...	Hardware Input	Hardware Output
0		true Input 1	false Output A
0		false Input 2	
1		true Input 3	
2		true Input 4	
3		false Input 5	
4			
5			
6			
7			
8			
9			

Work in Progress

Initial implementation by a student from the Jozef Stephan Institute

Configuration Tools – AMS Configuration

- Configuration of the Alarm Management System
  - User
  - User-Groups
  - Filter conditions
  - Filter (set of conditions)
  - Actions
    - ➔ Short Message Service (SMS)
    - ➔ Into another JMS topic
    - ➔ Mail
    - ➔ Voice mail

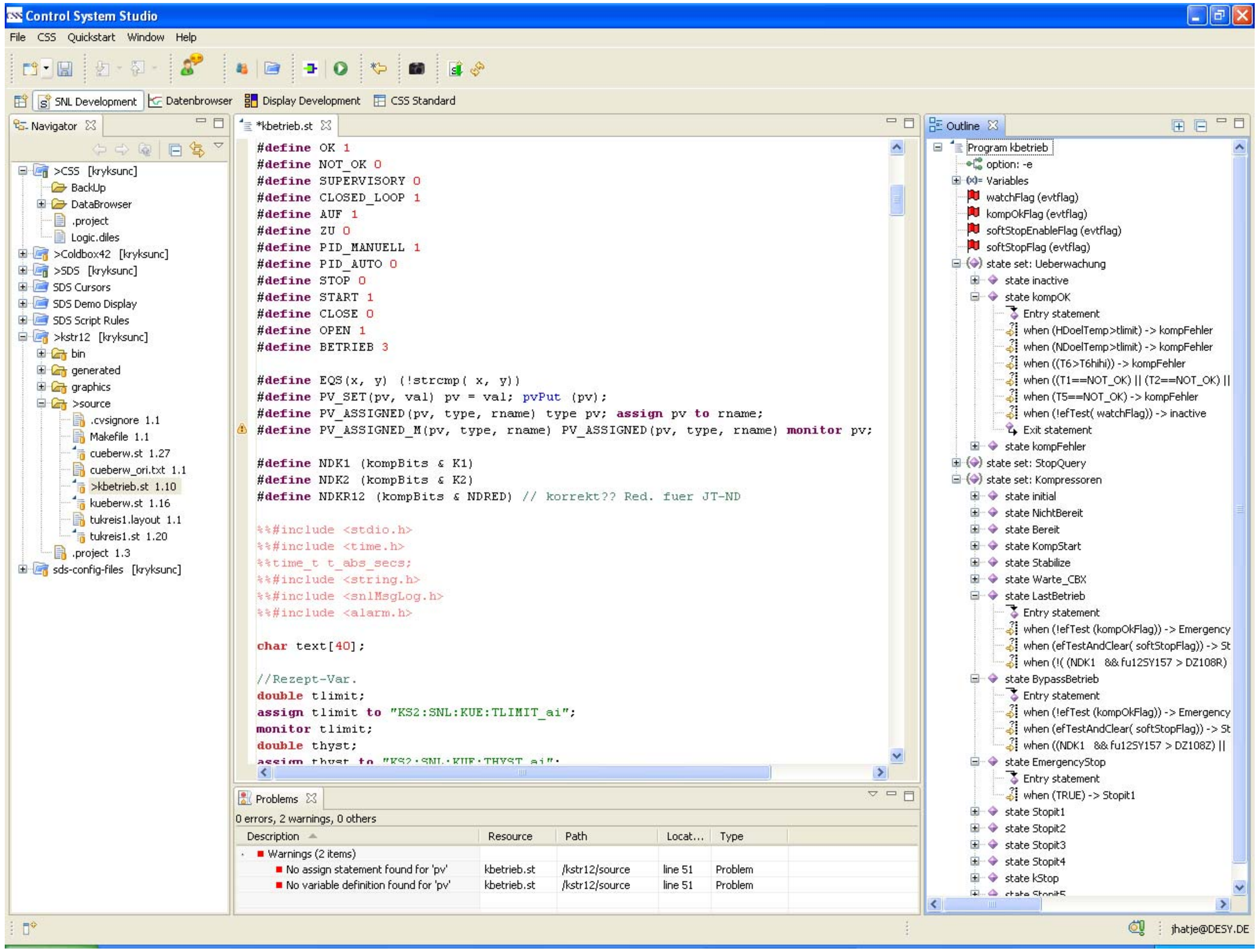
- Activation of this plug-in is controlled by the role based authentication/ authorization scheme which is part of the core CSS functionality

TUP015: A Framework for Authentication and Authorization in Plug-in-Based Control System Software

Development Editors – SNL Editor

- Special Features
  - Language Sensitive Editor (LSE)
  - Syntax check
    (no code completion – yet)
  - Colour coded keywords
  - Start compiler on save operation
    - → Return compiler warnings into problem view
  - Outline View showing variables, event flags, state sets, states
    Jump from Outline View back into editor
  - SNL Diagram Editor illustrates states and conditions

Development Editors – SNL Editor



```
>CSS [kryksunc]
    BackUp
    DataBrowser
    .project
    Logic.diles
>Coldbox42 [kryksunc]
>SDS [kryksunc]
SDS Cursors
SDS Demo Display
SDS Script Rules
>kstr12 [kryksunc]
    bin
    generated
    graphics
    >source
        .cvsignore 1.1
        Makefile 1.1
        cueberw.st 1.27
        cueberw_ori.txt 1.1
        >kbetrieb.st 1.10
        kueberw.st 1.16
        tukreis1.layout 1.1
        tukreis1.st 1.20
    .project 1.3
sds-config-files [kryksunc]
```

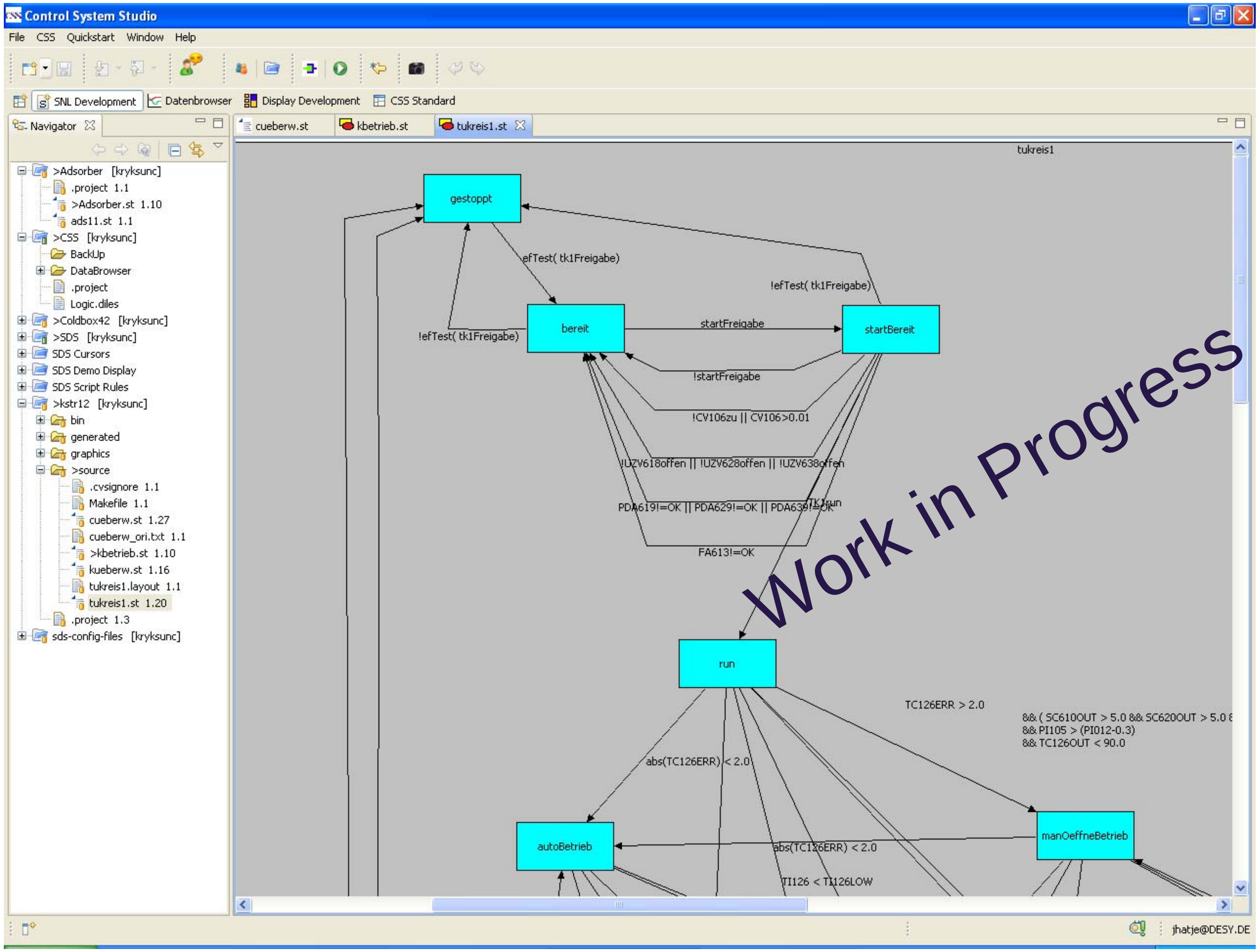
```
#define OK 1
#define NOT_OK 0
#define SUPERVISORY 0
#define CLOSED_LOOP 1
#define AUF 1
#define ZU 0
#define PID_MANUELL 1
#define PID_AUTO 0
#define STOP 0
#define START 1
#define CLOSE 0
#define OPEN 1
#define BETRIEB 3

#define EQS(x, y) (!strcmp( x, y))
#define PV_SET(pv, val) pv = val; pvPut (pv);
#define PV_ASSIGNED(pv, type, rname) type pv; assign pv to rname;
#define PV_ASSIGNED_M(pv, type, rname) PV_ASSIGNED(pv, type, rname) monitor pv;

#define NDK1 (kompBits & K1)
#define NDK2 (kompBits & K2)
#define NDKR12 (kompBits & NDRED) // korrekt?? Red. fuer JT-ND

%%#include <stdio.h>
%%#include <time.h>
%%time_t t_abs_secs;
%%#include <string.h>
%%#include <snlMsgLog.h>
%%#include <alarm.h>

char text[40];

//Rezept-Var.
double tlimit;
assign tlimit to "KS2:SNL:KUE:TLIMIT_ai";
monitor tlimit;
double thyst;
assign thyst to "KS2:SNL:KUE:THYST_ai";
```

```
Program kbetrieb
    option: -e
    Variables
    watchFlag (evtflag)
    kompOkFlag (evtflag)
    softStopEnableFlag (evtflag)
    softStopFlag (evtflag)
    state set: Ueberwachung
        state inactive
        state kompOK
            Entry statement
            when (HDoelTemp>tlimit) -> kompFehler
            when (NDoelTemp>tlimit) -> kompFehler
            when ((T6>T6hihi)) -> kompFehler
            when ((T1==NOT_OK) || (T2==NOT_OK) ||
            when (T5==NOT_OK) -> kompFehler
            when (!efTest( watchFlag)) -> inactive
            Exit statement
        state kompFehler
    state set: StopQuery
    state set: Kompressoren
        state initial
        state NichtBereit
        state Bereit
        state KompStart
        state Stabilize
        state Warte_CBX
        state LastBetrieb
            Entry statement
            when (!efTest (kompOkFlag)) -> Emergency
            when (efTestAndClear( softStopFlag)) -> St
            when (!( (NDK1 && fu12SY157 > DZ108R)
        state BypassBetrieb
            Entry statement
            when (!efTest (kompOkFlag)) -> Emergency
            when (efTestAndClear( softStopFlag)) -> St
            when ((NDK1 && fu12SY157 > DZ108Z) ||
        state EmergencyStop
            Entry statement
            when (TRUE) -> Stopit1
        state Stopit1
        state Stopit2
        state Stopit3
        state Stopit4
        state kStop
        state Stopit5
```

0 errors, 2 warnings, 0 others

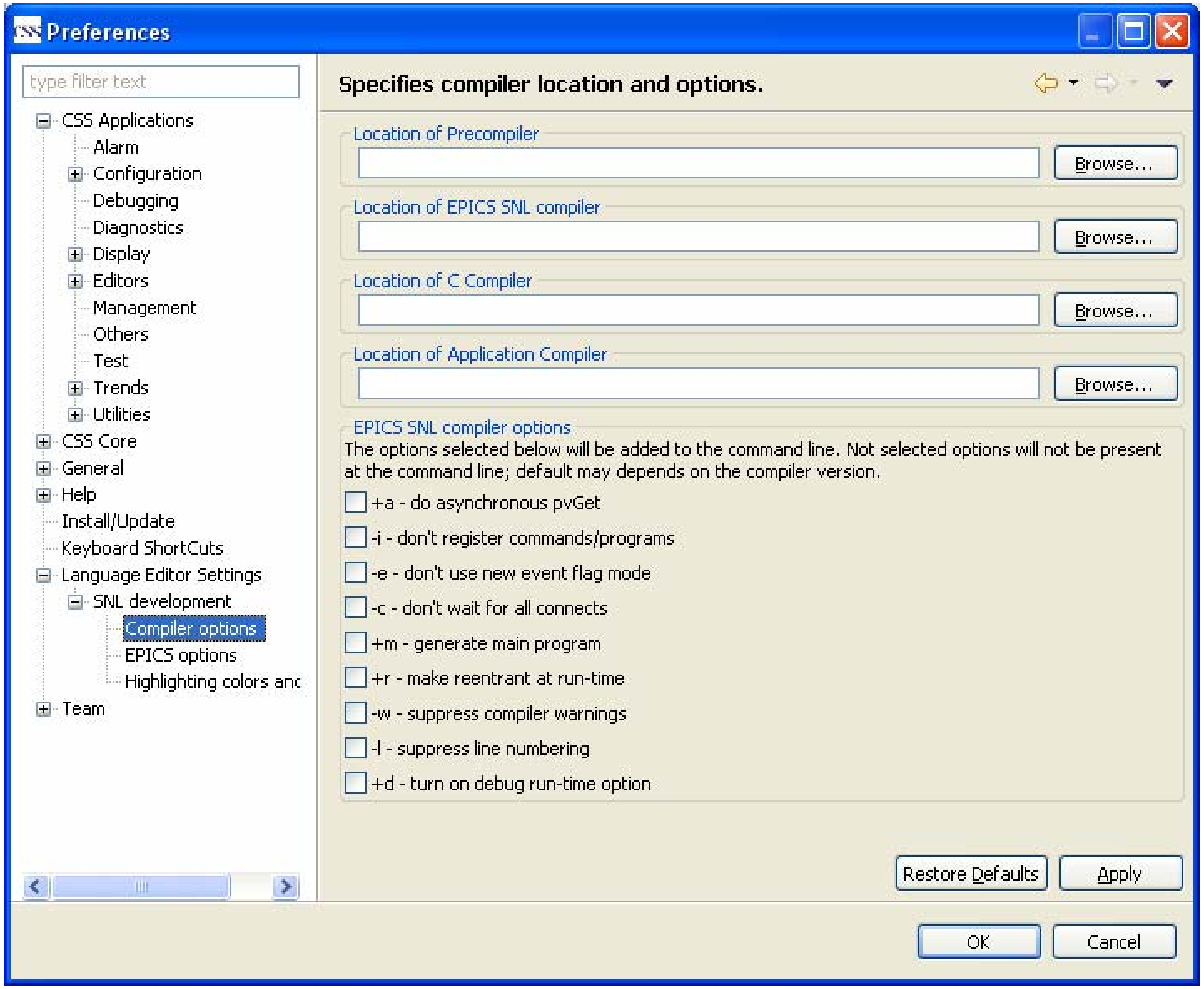
Description	Resource	Path	Locat...	Type
Warnings (2 items)				
No assign statement found for 'pv'	kbetrieb.st	/kstr12/source	line 51	Problem
No variable definition found for 'pv'	kbetrieb.st	/kstr12/source	line 51	Problem

Development Editors – SNL Diagram Editor



Work in Progress

SNL Editor – Configuration / Preferences



Specifies compiler location and options.

Location of Precompiler

Location of EPICS SNL compiler

Location of C Compiler

Location of Application Compiler

EPICS SNL compiler options

The options selected below will be added to the command line. Not selected options will not be present at the command line; default may depends on the compiler version.

- [ ] +a - do asynchronous pvGet
- [ ] -i - don't register commands/programs
- [ ] -e - don't use new event flag mode
- [ ] -c - don't wait for all connects
- [ ] +m - generate main program
- [ ] +r - make reentrant at run-time
- [ ] -w - suppress compiler warnings
- [ ] -l - suppress line numbering
- [ ] +d - turn on debug run-time option

- Preferences
  - Compiler Options (Linux)
  - EPICS Base
  - Colour coding

Outlook

- Preparation for CSS 1.2.1
  - Collecting requirements based on the experience during the current commissioning phase with the configuration tools and the synoptic displays
  - Change requests from other CSS/SDS users
  - Merge in the SDS enhancements shown during the EPICS meeting
  - Adding DAL plugs (basic-TANGO, CA-V4?)

- Collect requirements for an EPICS Integrated Configuration Environment (EPICS-ICE)
  An initial implementation by Kenneth Evans might be a good starting point
  http://aps.anl.gov/epics/eclipse/plugins/epicsIde/epicsIde.html
- Closely following the 'Eclipse Way to the Web'

THP109: Eclipse RCP on the Way to the Web

Summary

- CSS core provides an excellent platform to integrate new applications.
- New CSS configuration and editing plug-ins were successfully used to improve the development cycles for the ongoing commissioning of the (former HERA) now FLASH cryogenic plant.
- Decoupling the definition of the I/O address space from the EPICS database configuration by unique IO_NAMES reduces the potential risk of address mismatches.
- A new EPICS ICE would help to organize the configuration of bigger installations.
- CSS 1.2.0 is now available
  requirements for 1.2.1 are currently collected

Thank you for listening

CSS 1.2.0 is available from:

http://css.desy.de