



JAVA D3

Jddd

a state-of-the-art
solution for control
panel development

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- What is jddd?
- Thin client versus rich client concept
- Advanced features/widgets of jddd:
 - Dynamic components
 - Logic components
 - Buttons with special function
 - Wildcards, filters and JavaScript
- Conclusion & Outlook

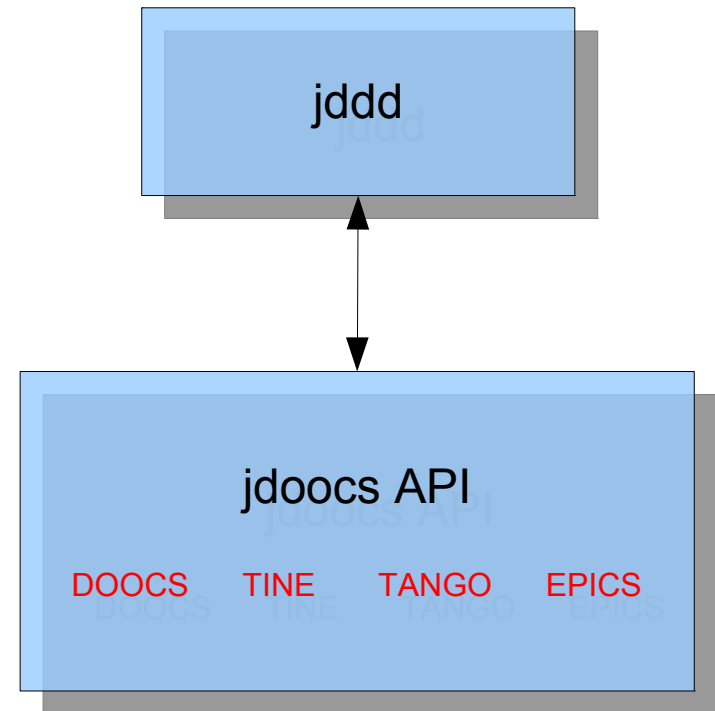
What is jddd?

- JDDD = Java Doocs Data Display
- Developed at DESY (MCS4 group)
- Panel builder and runtime engine for control system displays
- Editor is similar to the editor of standard IDEs like Netbeans
 - Rich set of predefined components / widgets
 - No programming skills needed
- Stores panels in XML format

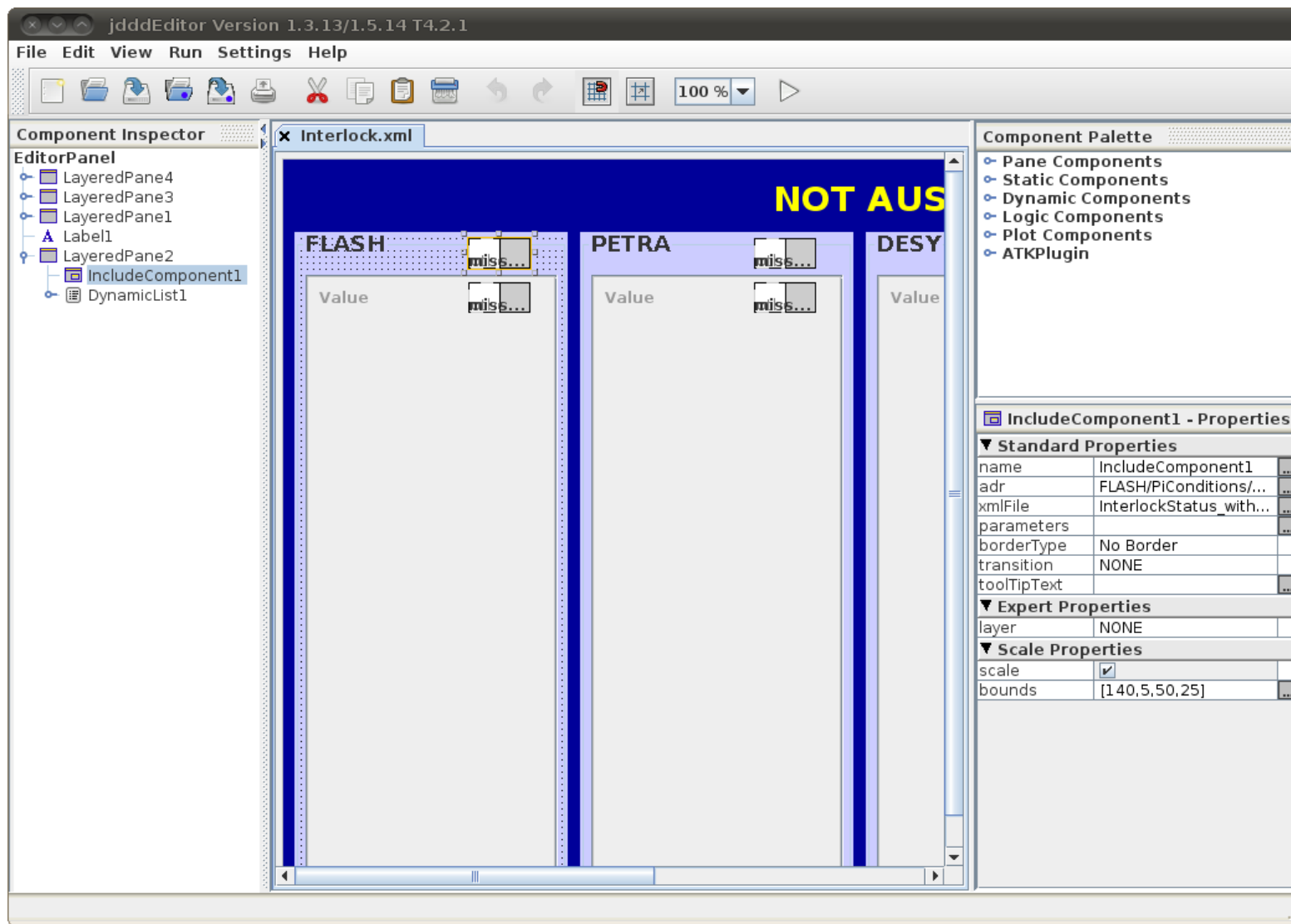
What is jddd? Jddd architecture

Jddd supports all control systems used at DESY.

- DOOCS
- TINE
- TANGO
- EPICS



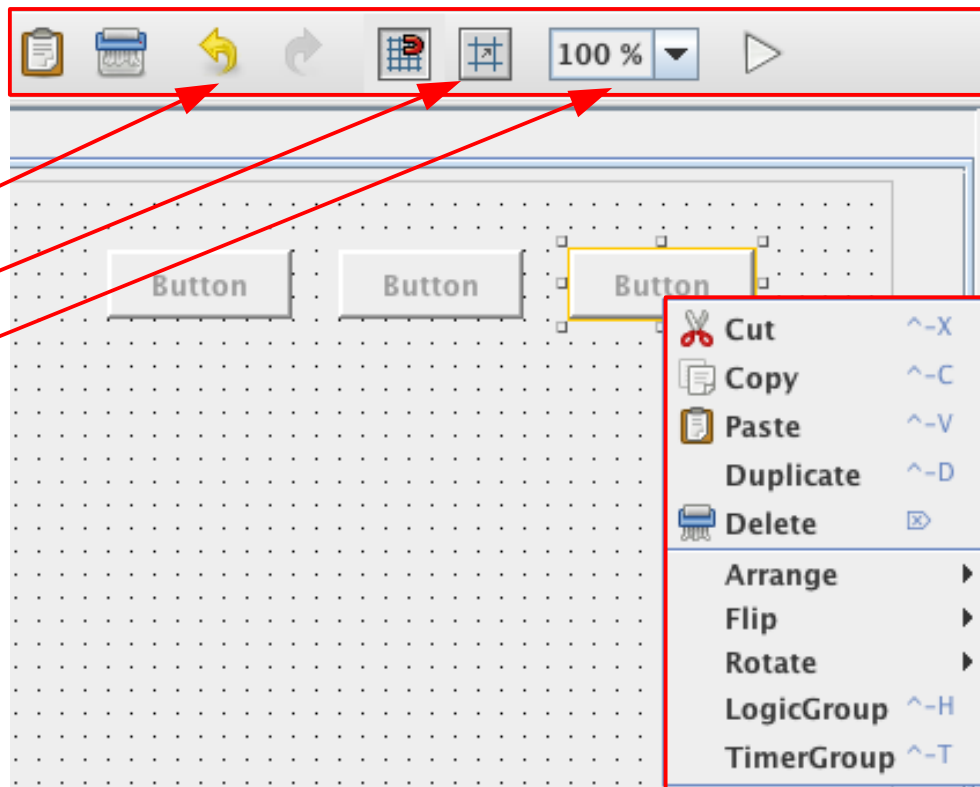
The jddd editor



The Editor has standard functions like:

- cut / copy / paste
- align
- flip
- rotate
- undo / redo
- snap to grid
- zoom

These functions are available in the context menu and in the icon bar.



The jddd editor: Predefined component/widget types

Pane Components:

- LayeredPane
- TabbedPane
- IncludeComponent
- DynamicList
- DynamicIncludes
- Alive

Static Components:

- Label
- Line
- Oval
- Rectangle
- Triangle
- Icon

Dynamic Components:

- Button
- ToggleButton
- MouseOver
- Value
- Dial
- TextField
- ComboBox
- CheckBox
- ProgressBar
- Slider
- StatusRegister
- Audio
- ColouredIndicator
- LocationChooser
- CameraImage
- TextArea
- HtmlArea
- XmlViewer
- PropertiesTable
- DeviceTree

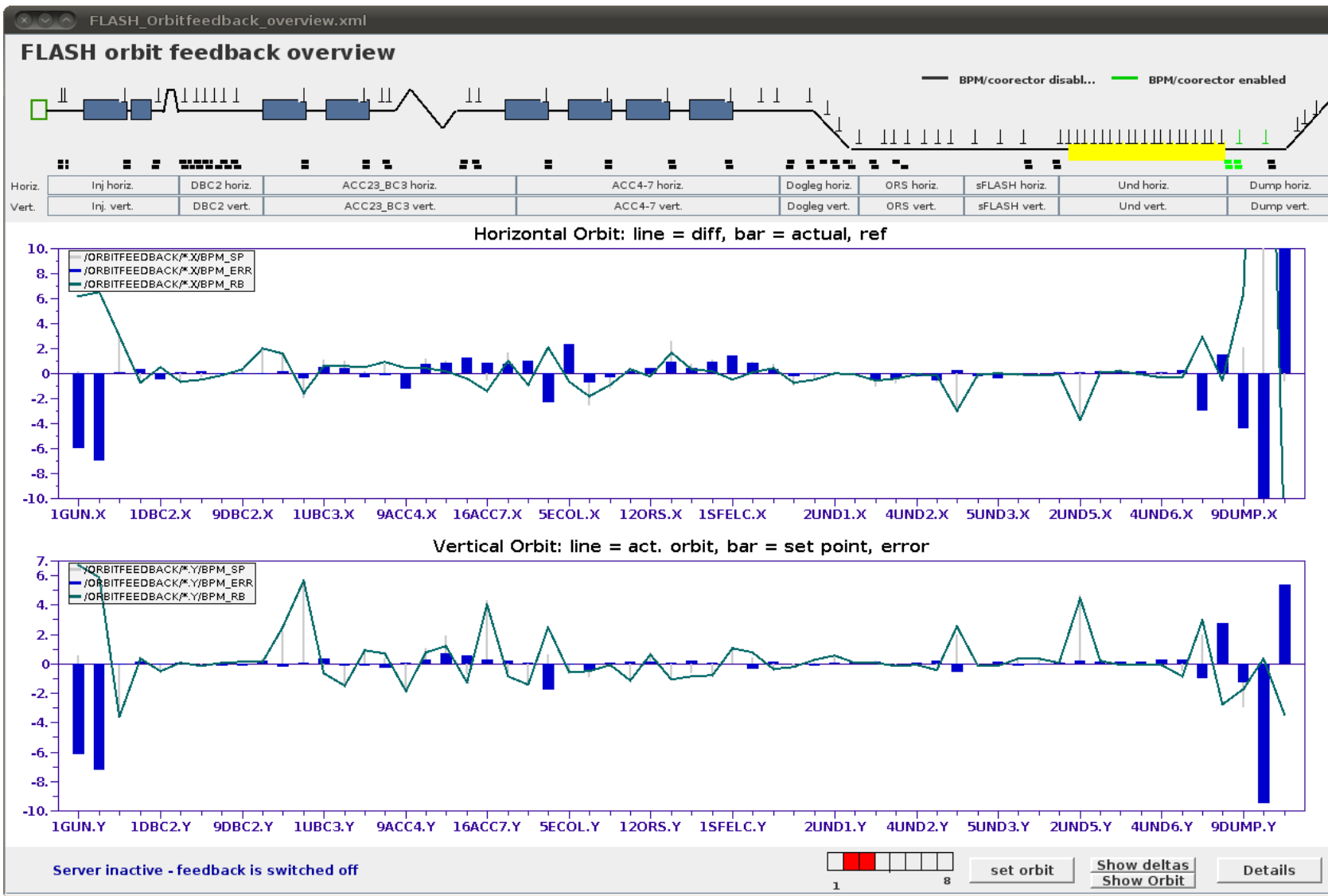
Logic Components:

- If
- Switch

Plot Component:

- PlotSpectrum
- PlotHist
- PlotLocation
- PlotXY

Jddd screenshot



Thin clients do as little processing as possible on the client side and rely on accessing the server to get data.

Thick/rich clients do a significant amount of data processing on the client system, while relatively little is done on the server.

Jddd uses the thin client approach!

Advantages of thin clients

- The interface between client and server is clearly defined.
- Control panels are rapidly developed using a set of predefined components/widgets.
- No programming skills are needed. Engineers, technicians and operators are able to design their own panels.
- Panels are easily adapted to changing server properties and new hardware.
- Thin client software provides a standard look&feel and uniform functionality.

Advantages of rich clients

- The functionality is not restricted to generic possibilities of thin client software. Graphical components can be adapted to special use cases. The display design is more user-friendly.
- Sometimes it's difficult to put all functionality in a server. Mathematical operations or data analysis might be included on the client side.

→ Jddd has advanced widgets and features for reaching more flexibility in control panel design

A dynamic list is a scroll pane where multiple components can be placed. In run mode the specified data is read from the name server and the list is filled automatically.

in edit mode:

DynamicList of pump stations

Name	Rotation Speed	current	Status
Value	Value	no value	<input type="checkbox"/>

in run mode:

dynamicList.xml

DynamicList of pump stations

Name	Rotation Speed	current	Status
7ACC6.1.PS	734.496	0.70	<input checked="" type="checkbox"/>
PS.86	0.000	0.00	<input type="checkbox"/>
PS.85	0.000	0.00	<input type="checkbox"/>
PS.115	0.000	0.00	<input type="checkbox"/>
PS.111	0.000	0.77	<input type="checkbox"/>
PS.119	0.000	0.00	<input type="checkbox"/>
PS.117	0.000	0.00	<input type="checkbox"/>
PS.120	0.000	0.00	<input type="checkbox"/>
PS.45	565.470	0.00	<input type="checkbox"/>
PS.112	0.000	0.00	<input type="checkbox"/>
PS.113	0.000	1.08	<input type="checkbox"/>
PS.116	779.880	0.00	<input type="checkbox"/>
PS.43	0.000	0.00	<input type="checkbox"/>
PS.114	0.000	0.00	<input type="checkbox"/>

Example for using a dynamic list in a watchdog overview panel.

The dynamic list displays the server status for a selected hardware device.



ttf2xplcs-exp 0476 days, 00:42 0.04 load

1 + Dual 2792.578 MHz, 6983.84 bogomips
 Linux version 2.6.18-6-zen-amd64 (Debian 2.6.18.dfsg.1-26etch1) (dannf@debian.or) ...

17 online 0 errors offline 0

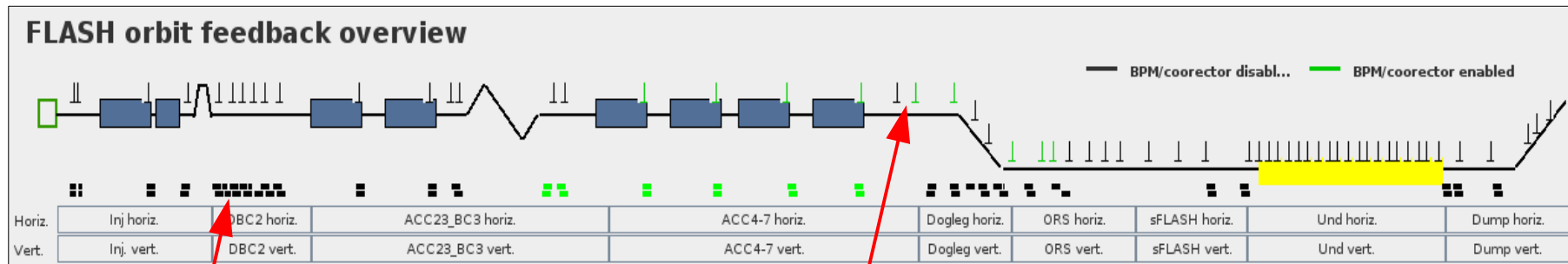
TTF2.SYSTEM/TTF2XPLCS-EXP/ doocsadm login

TTF2.SYSTEM TTF2XPLCS-EXP root login

SYS	no error	no info	Set Offline	P
DISK	no error	no info	Set Offline	P
NET	no error	IB: 147746.70 OB: 42252.00	Set Offline	P
FS.ROOT	no error	FREE: 11832.71 MB	Set Offline	P
FS.EXPORT	no error	FREE: 11832.71 MB	Set Offline	P
CAREPEATER	no error	CPU: 0.00 %	Set Offline	L P
SVR.WATCHDOG	no error	CPU: 0.00 %	Set Offline	L P

The dynamic includes component is a transparent layered pane which displays automatically multiple IncludeComponents according to their Z_POS and X_POS.

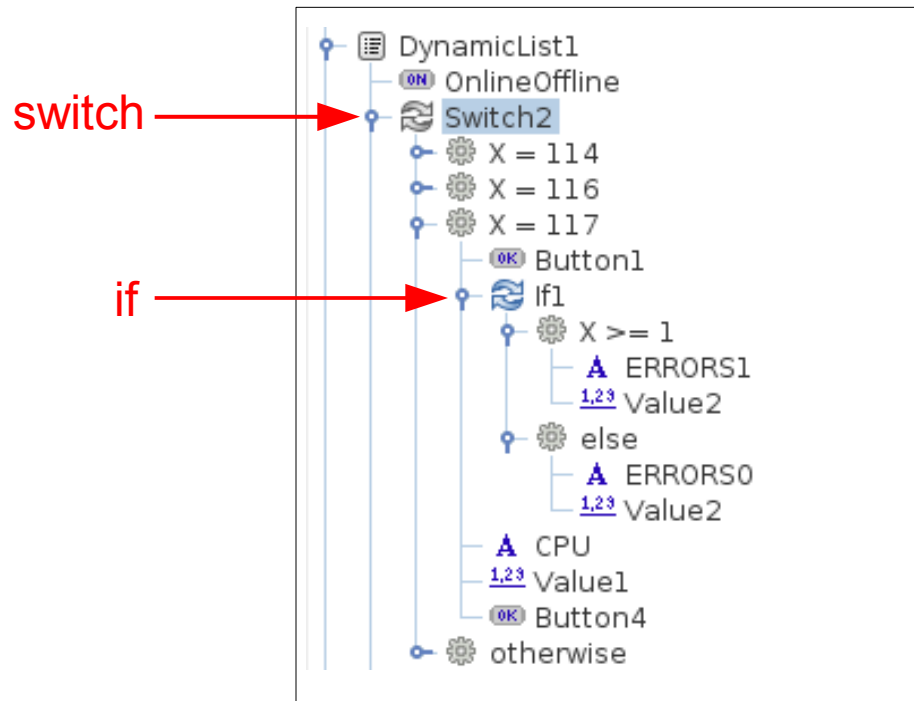
FLASH orbit feedback display: Dynamic includes are used for displaying BPMs and steerer magnets.



steerer magnets

BPMs

The if component displays one of two different layers (cases).
The switch component displays one of multiple layers.
Any case may contain nested logic components.



Buttons with “Set Component Property” function

OK Button10 - Properties

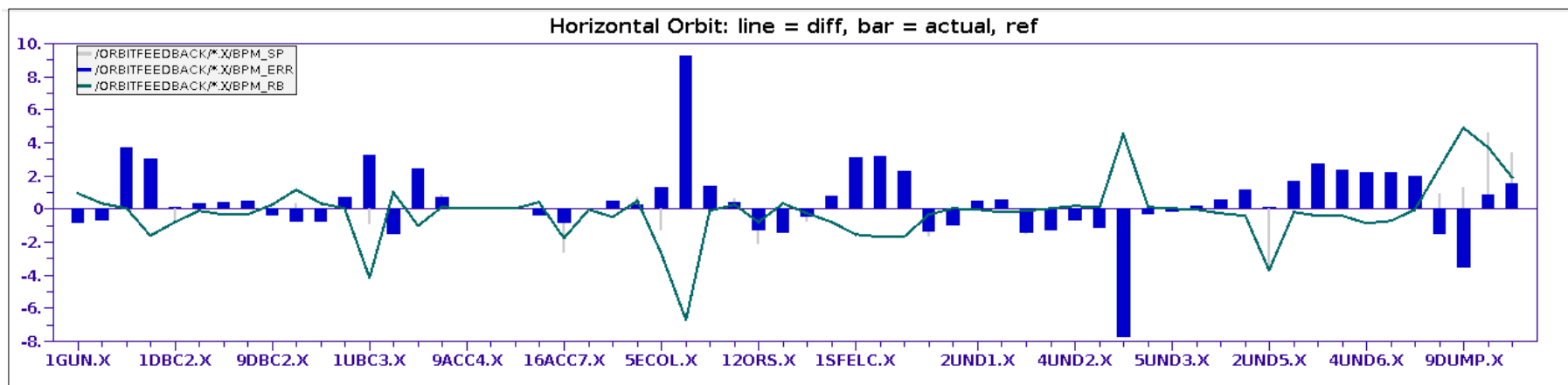
Standard Properties	
name	Button10
function	Set Component Property
text	SWR
textColor	■ [51,51,51]
textFont	Dialog,1,12
buttonColor	■ [204,204,204]
buttonTranspa...	<input type="checkbox"/>
button3D	<input checked="" type="checkbox"/>
adr	PETRA.VAC///
indirectAdr	
component0	oktant
property0	xmlFile
propertyValue0	_p3_swr.xml
component1	DynamicList1
property1	adr
propertyValue1	//SWR*/
component2	PinkRect
property2	bounds
propertyValue2	24,150,44,20
component3	
property3	

The screenshot shows the 'P3_overview_win_3.xml' window. It features a central circular overview of the vacuum chamber with various sections labeled (NL, NR, NOL, NOR, OL, OR, SOL, SWR, SWL, SR, SL). A table on the right lists 'IonPumps' with columns for Section, Valves, TSP, and PumpStation. Below the table is a 'History' graph showing pressure in mbar over time for various sections. At the bottom, there is a schematic diagram of the vacuum system with pressure gauges and control buttons for 'All HV OFF' and 'All HV ON'.

IonPumps	Section	Valves	TSP	PumpStation
+ SOR001.9_003.9		1.73E-10	<input checked="" type="checkbox"/>	HV_ON 4866 4
+ SOR005.8		1.61E-9	<input checked="" type="checkbox"/>	HV_ON 4762 4
+ SOR009		1.73E-10	<input checked="" type="checkbox"/>	HV_ON 4568 4
+ SOR011_011.8_012.3		1.72E-9	<input checked="" type="checkbox"/>	HV_ON 4782 4
+ SOR015_015.5_016.4		1.73E-9	<input checked="" type="checkbox"/>	HV_ON 4624 4
+ SOR018.4_019.1_01...		1.55E-9	<input checked="" type="checkbox"/>	HV_ON 4730 4
+ SOR020.5_021_021.7		4.52E-9	<input checked="" type="checkbox"/>	HV_ON 4934 4
+ SOR025_030		4.80E-8	<input checked="" type="checkbox"/>	HV_ON 4372 10
+ SOR038.SEPA		5.76E-9	<input checked="" type="checkbox"/>	HV_ON 4606 10
+ SOR038.SEPB		6.55E-9	<input checked="" type="checkbox"/>	HV_ON 4640 10
+ SOR040_045		9.91E-9	<input checked="" type="checkbox"/>	HV_ON 4596 10

Wilcards and **regular expression** filters are used to specify a dedicated subset of data.

Example: In the location plot below the channel address is:
TTF2.DIAG/ORBITFEEDBACK/* .X/BPK_XYZ_RB



Mathematical operations on control system values can be performed using **JavaScript** syntax.

Example:

$\$address1 * 44 + \$address2$

At runtime “\$address1” and “\$address2” are replaced by the current channel values.

In general:

- Thin clients have a lot of benefits, especially because they are easy-to-use and control panels can rapidly be developed. They are a good choice for simple control panels.
- Thick clients offer more possibilities, but the development is time consuming. They should only be used for high-level control displays.

But jddd is more than an editor for simple thin clients:

- Jddds advanced widgets, filters and JavaScript support offer the possibility for nearly rich client development. Most control system displays with complex display logic can be implemented with this software.

Next steps in jddd development:

- We will focus on performance tuning:
 - Improve startup speed
 - Implement search index for SVN
- Improve jddd widgets according to wishes of the users.
- Improve EPICS interface.



- Introduction
- + Special Features
- + Screenshots
- JAVA Web Start
- Start Panels
- Flash Tutorial
- Help
- Papers
- License
- Contact

- Webpage:
 - <http://jddd.desy.de>
- Documentation:
 - <http://jddd.desy.de> -> Help
- Examples:
 - <http://jddd.desy.de> -> Start Panels
- Contact:
 - jddd@desy.de