

jddd

XFEL Operator Training

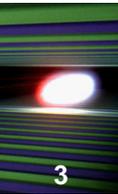
Elke Sombrowski



HELMHOLTZ
| GEMEINSCHAFT

jddd Technology

- JDDD = Java Doocs Data Display
- Developed at Desy (MCS4 group)
- Uses standard JAVA technology → available on many operating system
- Based on Java 1.8, upgrade planned
- Panel builder and runtime engine for control system displays
- Stores panels (XML format) on local file system or in central SVN repository
- NEW: Each control network has a separate copy of the main repository → ensure fail-safe operation



jddd supports all control systems used at DESY

- DOOCS
- TINE
- TANGO
- EPICS
- Karabo

jddd is the commonly used graphical interface for

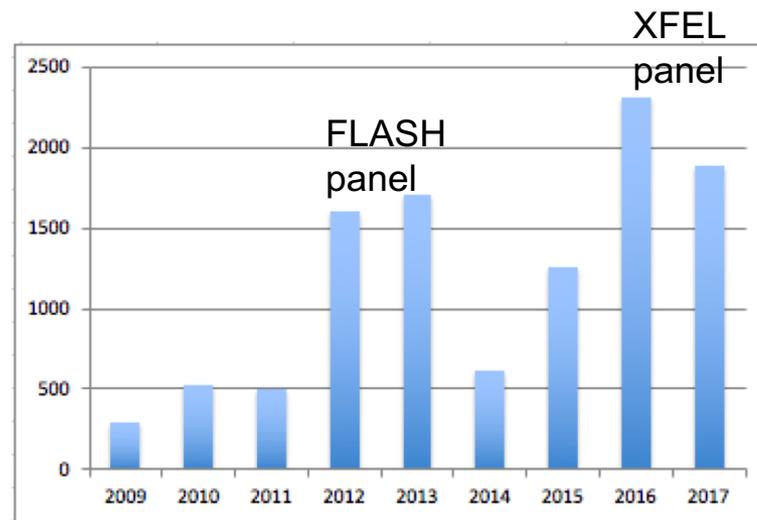
- FLASH
- XFEL
- PETRA vacuum

SVN repository

Number of added-deleted xml files
(excluding converted ddd panels)

May 2018

- ~ 12500 files total
- ~ 4700 files in user directory
- ~ 5000 files in Zeuthen



Usages statistics

January 2017

	# started panels per day	# started diff. panels per day	# diff. users per day	# sessions per day
average	2661	454	67	173
max	5445	737	124	337

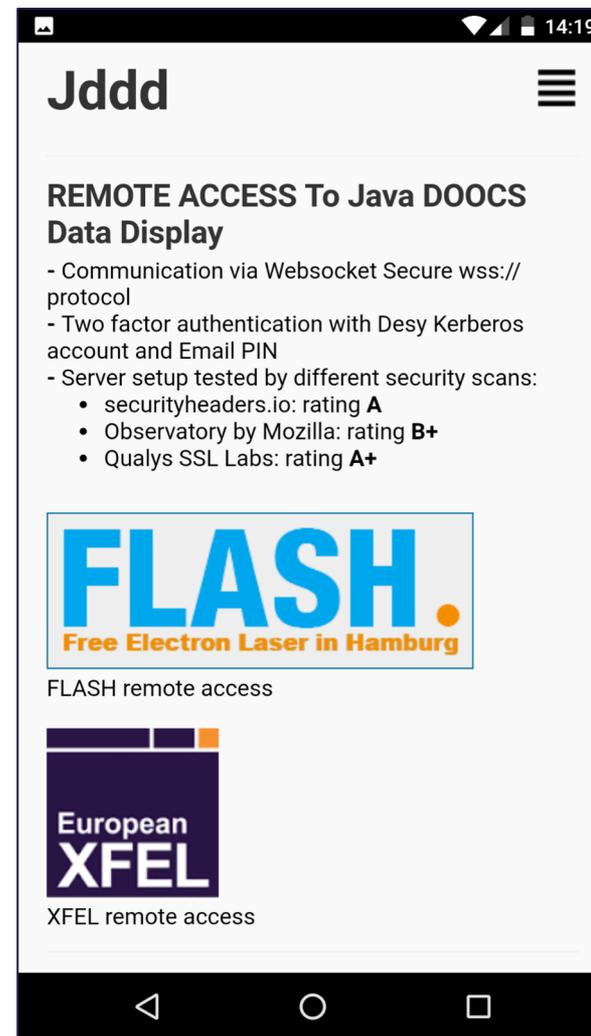
■ <https://jddd.desy.de>

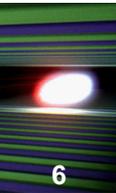
- jddd web interface
- Java Webstart (has to be replaced in future)

■ Linux/Mac: start scripts

- jddd, jddd-run
- jddd-exp, jddd-exp-run
- jFLASH, xfel
- jddd-run -file /svn/examples/bitMask.xml

■ Windows: Netinstall





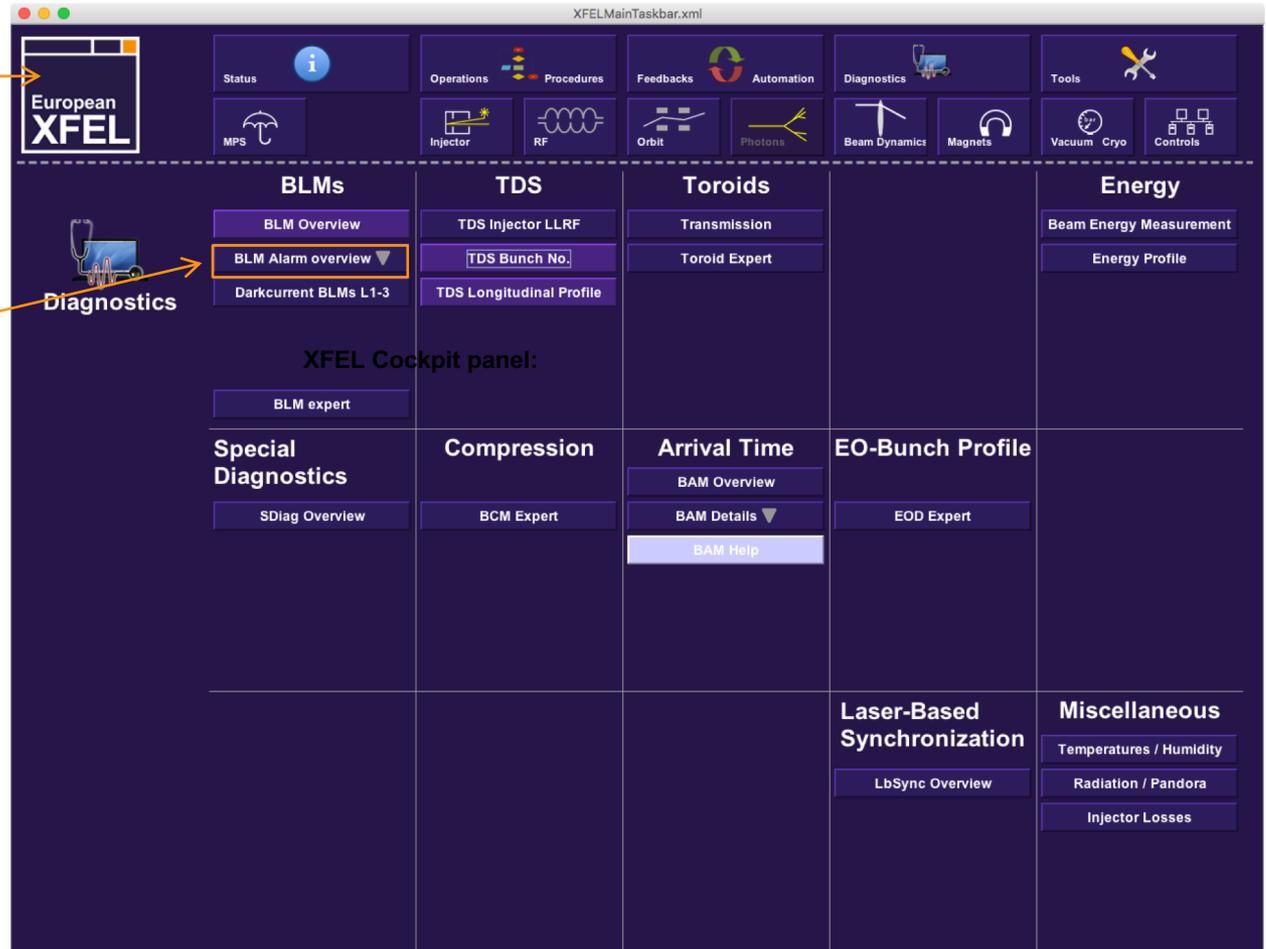
XFEL MainTaskbar panel:

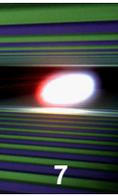
Click here to reduce the size of the panel

Dropdown Menu

The upper part is always visible.

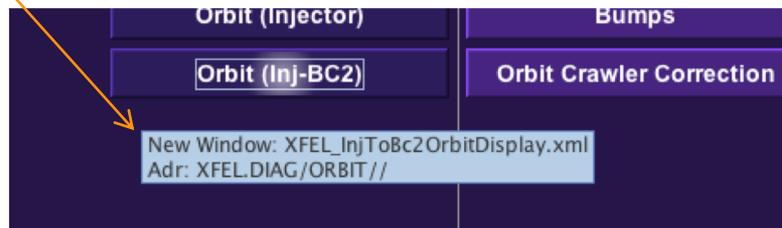
The lower part contains buttons to open special panels for the selected topic.

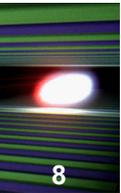




Button which opens a new panel:

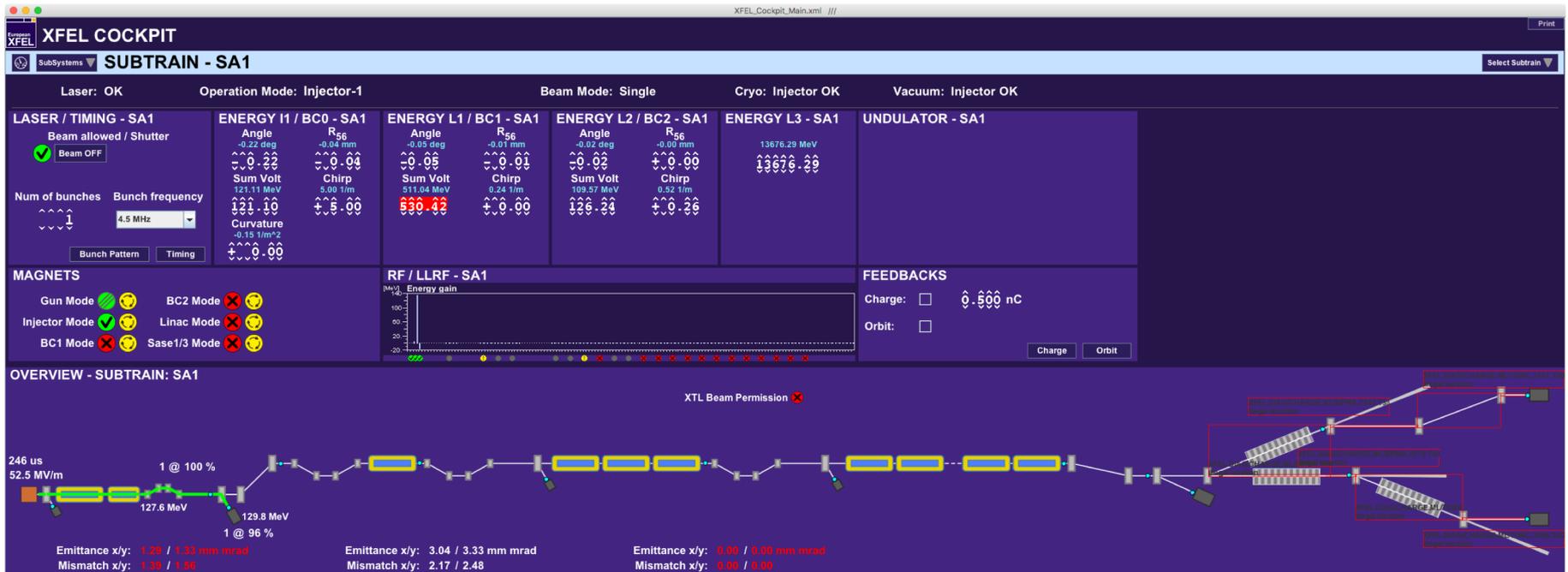
- Don't click panically: a drag event will not open a panel
- If the panel is already running, a new instance of the same panel will not be started
- If you want to force jddd to open the same panel twice: focus the panel with the button, then press shift and click the button
- The tooltip text displays the panel name and start address





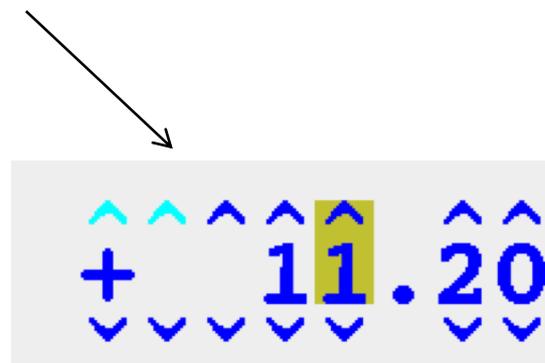
XFEL Cockpit panel:

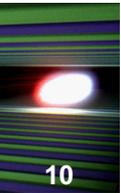
- Conceptual idea: Display all information in one panel
- Additional device panels (for magnets, bpms,...) can be opened with “New Window” buttons
- Most values from middle layer servers



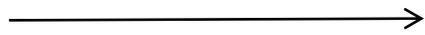
TickDials:

- The selected digit has a gray background →
- The tooltip text shows min. and max. values
- The number of digits is defined by min. and max. value
- Errors are indicated by a red background color, the full error message is displayed in the tooltip text
- After clicking on a TickDial, the digits become blue for some time to indicate that the value has changed (this “deadTime” default is 4 sec)
- A right click opens an input dialog



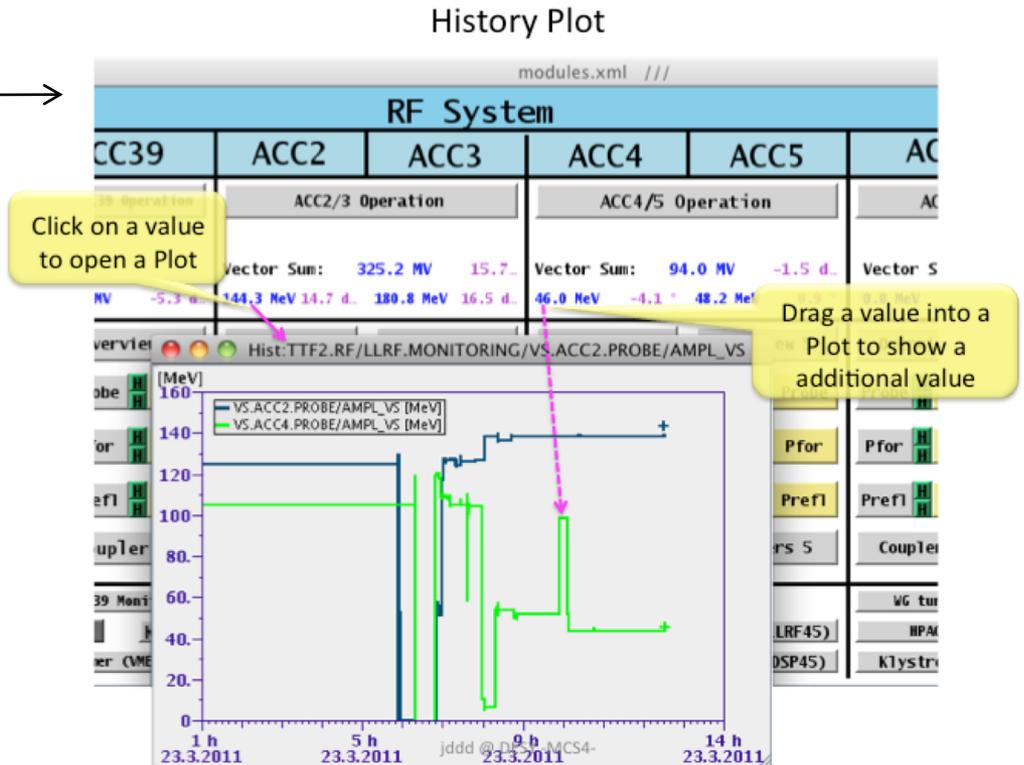


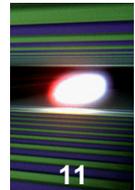
History plots



Zooming in plots:

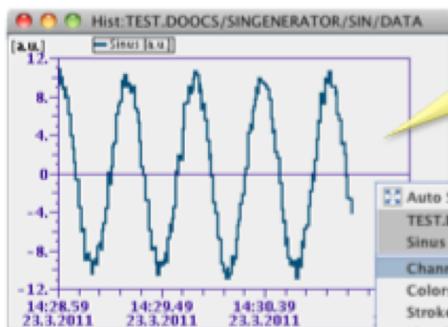
- Inside the plot
- Beside the axis
- Move the axis
- Autoscale in context menu





Adding a channel to a History plot:

Add a Channel Online



Right click in data area opens channel menu

- Auto Scale
- TEST.DOOC/SINGENERATOR/SIN/DATA
- Sinus [a.u.]
- Channel Add/Remove
 - Add DOOC channel
 - Add channel from file
 - Add DAQ channel
 - Remove this
- Colors
- Stroke size
- Line Style
- Line Mark
- Math (all visible data points)
- Set 10 sec Global Time Range
- add a Data Tip (not saved!)
- Print data --> console
- Save data --> File
- Plot from DAQ: not available

Doocs Address Chooser

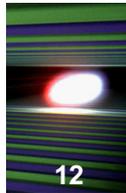
- TEST.SYSTEM
- TEST.DIAG
- TEST.CRYO
- TEST.HASYLAB
- TEST.DOOC
 - LOCALHOST_610498009
 - LOCALHOST_610498010
 - WATCHDOG
 - LOCALHOST_WATCHDOG
 - LOCALHOST_CAMERA
 - LPTPC.IOGAS
 - TTFMST1_8888
 - F2_11_8888
 - BIS
 - PLCMVPVM
 - KEITHLEY3760
 - READWRITE
 - BOGIE_FSM
 - BOGIE_FSM1
 - BOGIE
 - PINGPONG
 - BOGIE1
 - ALARM_SERVER
 - SINGENERATOR
 - FLASHUSER1_SVR
 - SIN
 - COUNTER to count the number of update calls
 - DATA cur. value of sine, filtered
 - DATA.AMPL amplitude
 - DATA.DESC ion of channel
 - DATA.DIG_FILTER dig. filter f. hist.
 - DATA.EGU engineering units y-scale
 - DATA.FILT history data filter
 - DATA.FREQ frequency
 - DATA.HIST history
 - DATA.INC increment in spectrum [us]
 - DATA.NOISE amp. of noise

facility
 device
 location
 property

TEST.DOOC/SINGENERATOR/SIN/DATA

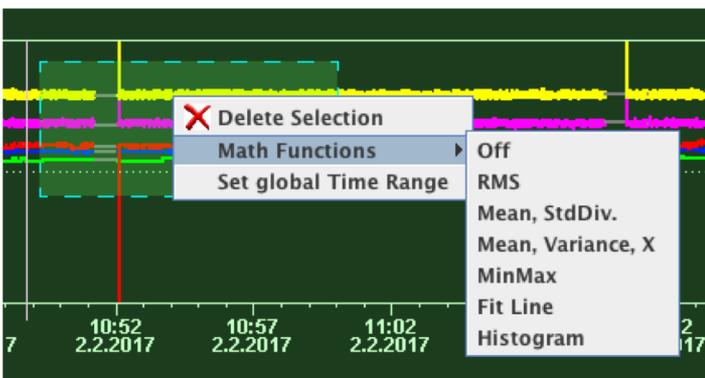
OK Cancel

jddd @ DESY -MCS4-



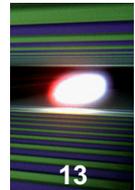
A plot has 3 different context menus:

- Axis menu
- Channel menu
- Selection menu



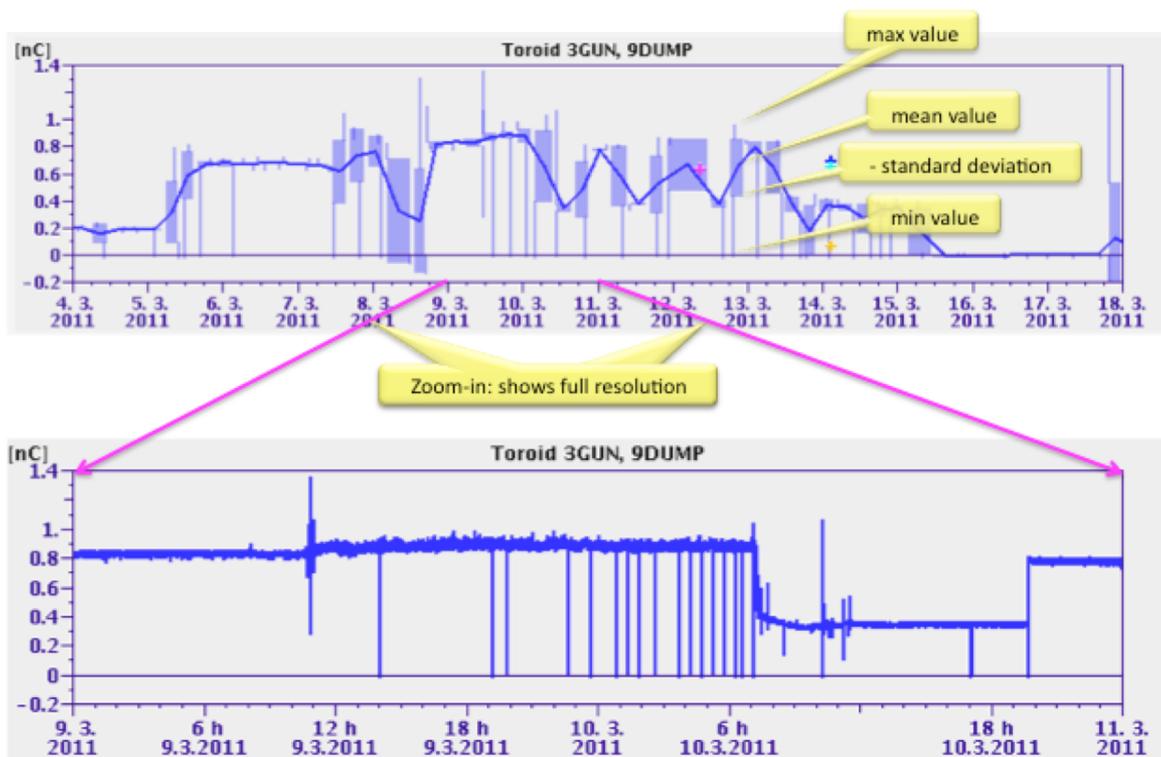
- Auto Scale
- Refresh
- TTF2.DIAG/ORBIT/1DBC2/Y.FLASH1**
- Channel Add/Remove
- Colors
- Stroke size
- Line Style
- Line Mark
- Math (all visible data points)
- Set EGU + filter properties on server
- Set 10 sec Global Time Range
- Add a Data Tip
- Print Panel...
- Print data --> console
- Save data --> File
- Save as png...
- Show as text...
- Correlation Plot
- Plot from DAQ: not available

- Auto Scale X, Y
- Auto Scale X
- Auto Scale X once
- Auto Scale X with Xmin fixed
- Restore X to 1.01.70 01:00 .. 1.01.70 01:00
- All X to this X
- Set X range to actual:
- Scale Panel
- Full Attribute Panel
- Background Color
- Print Plot...
- Re-initialize Plot
- Print Panel...
- Refresh
- Show Data Tips
- Show Tool Tip
- Show Legend
- show as Candle Stick
- show Status Colors
- Update Time
- Event Control Panel (DAQ)
- Print Debug data

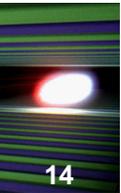


Plots with candle stick representation:

Long Time Span Plots with Thumbnail Option

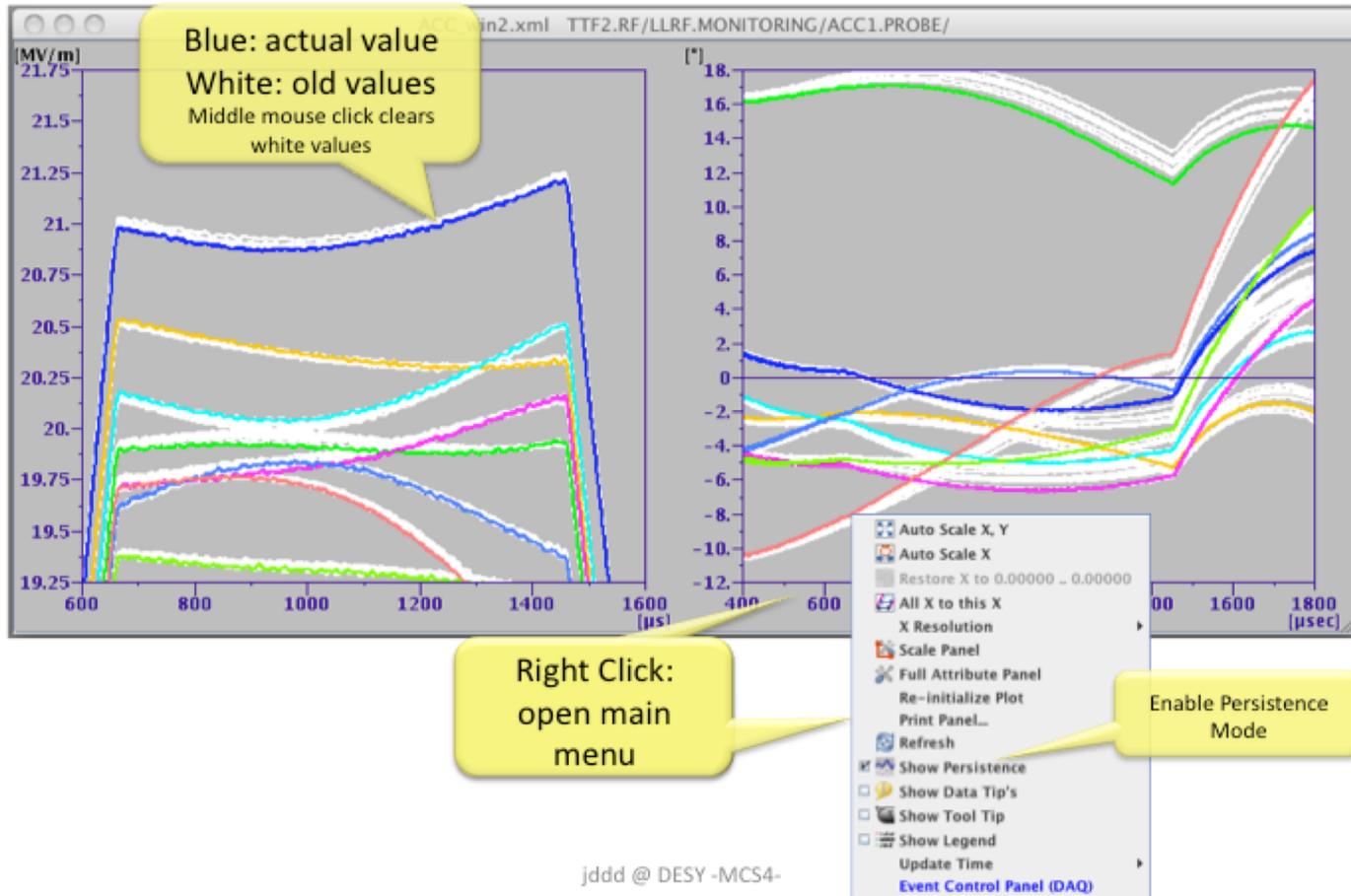


jddd @ DESY -MCS4-

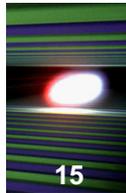


Persistence Plots:

Persistence Plot: Display Noise Bands

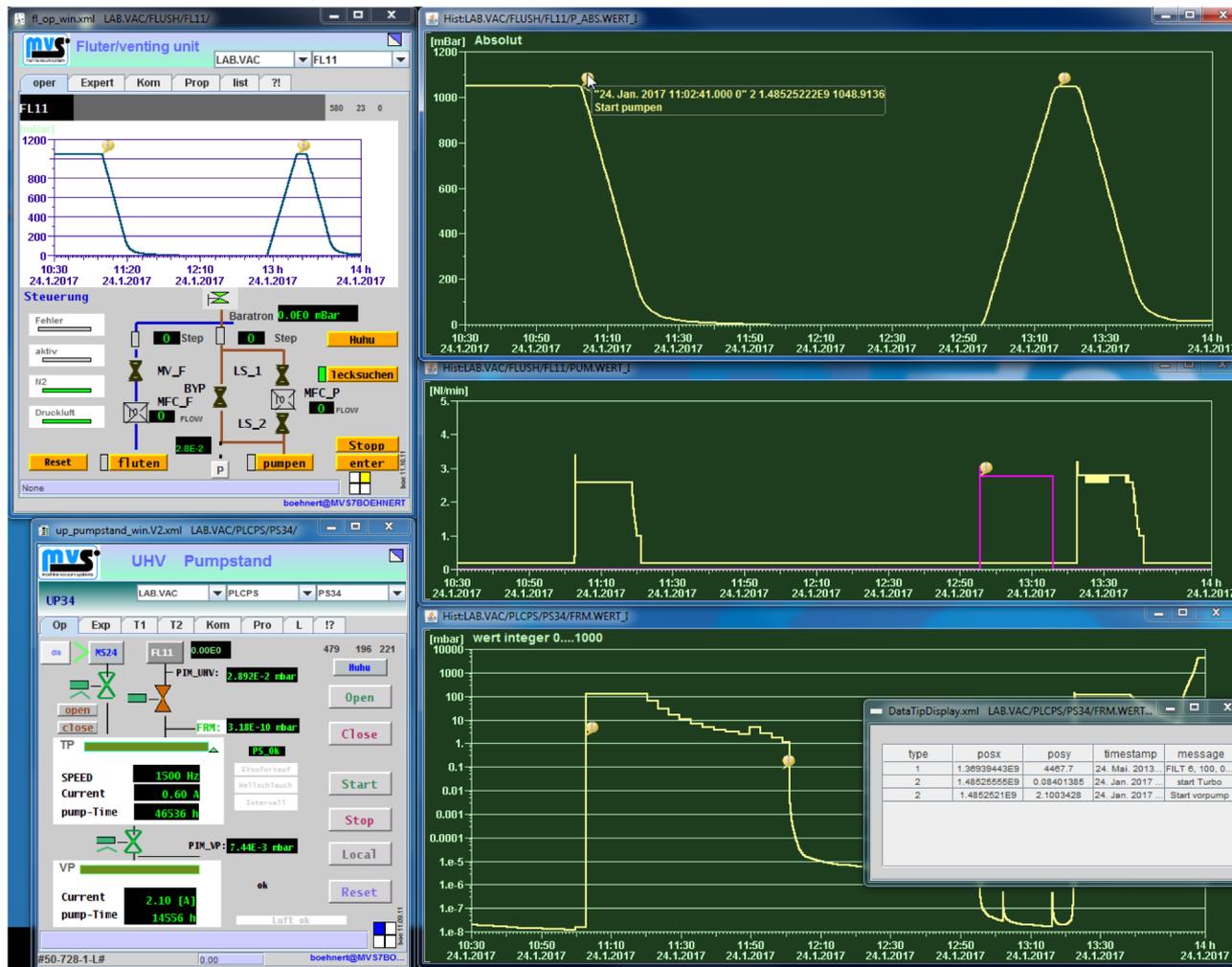


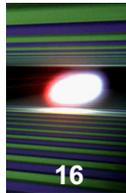
jddd @ DESY -MCS4-



Plot data tips:

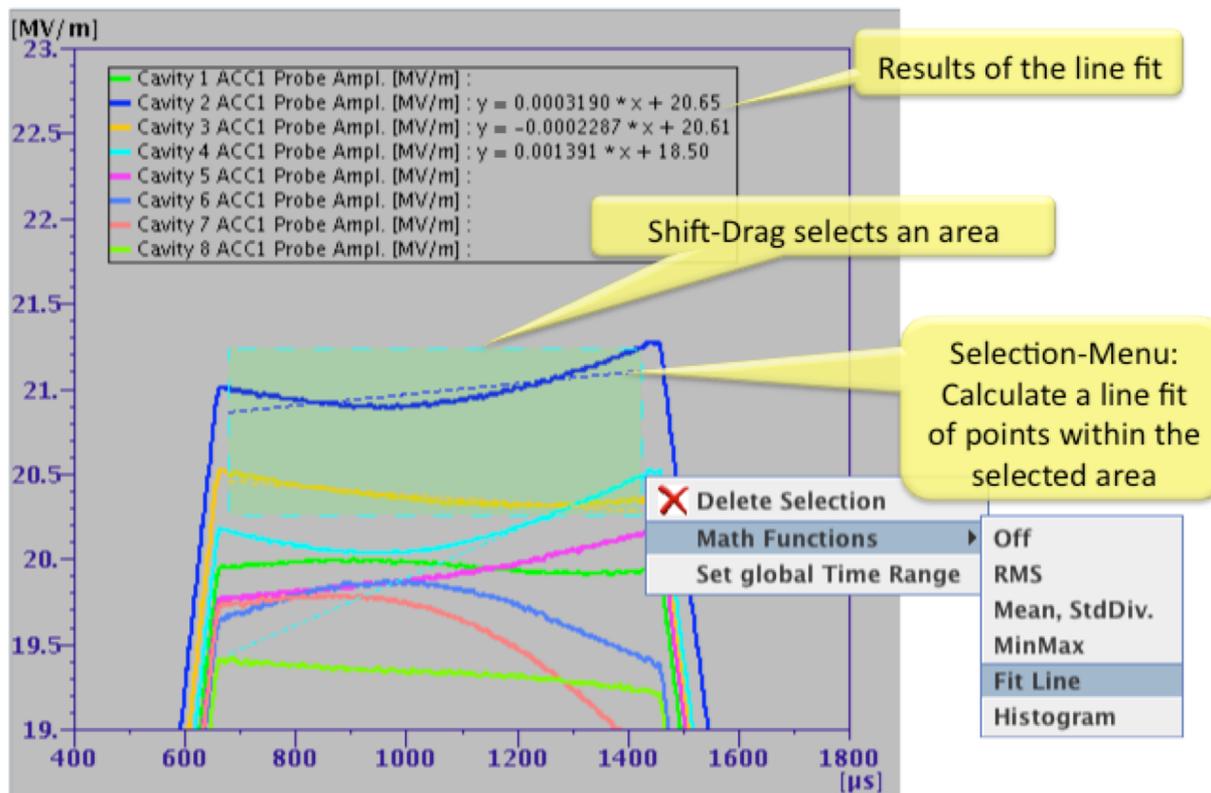
- Axis menu: show data tips
- Channel menu: add data tip



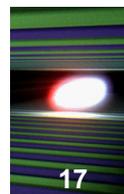


Math functions in plots:

Time-domain (Spectrum) Plots with Math Functions



jddd @ DESY -MCS4-



Histogram Plots:

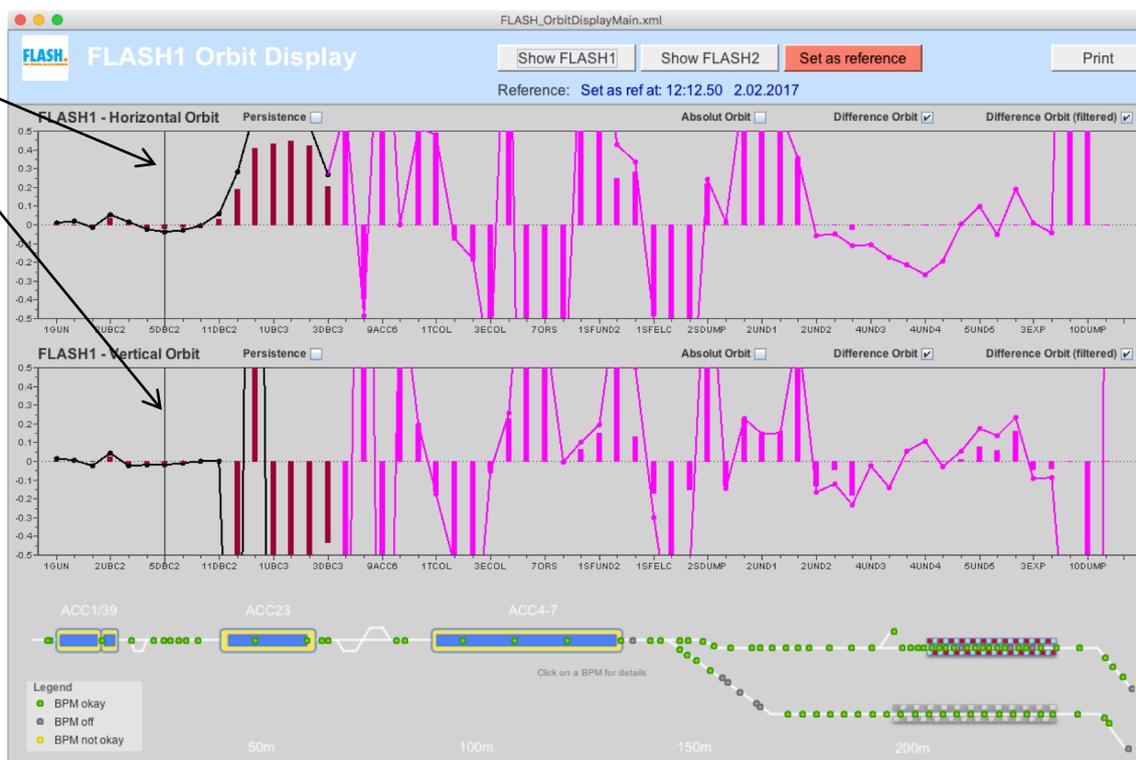
Histogram of All or Selected Points



jddd @ DESY -MCS4-

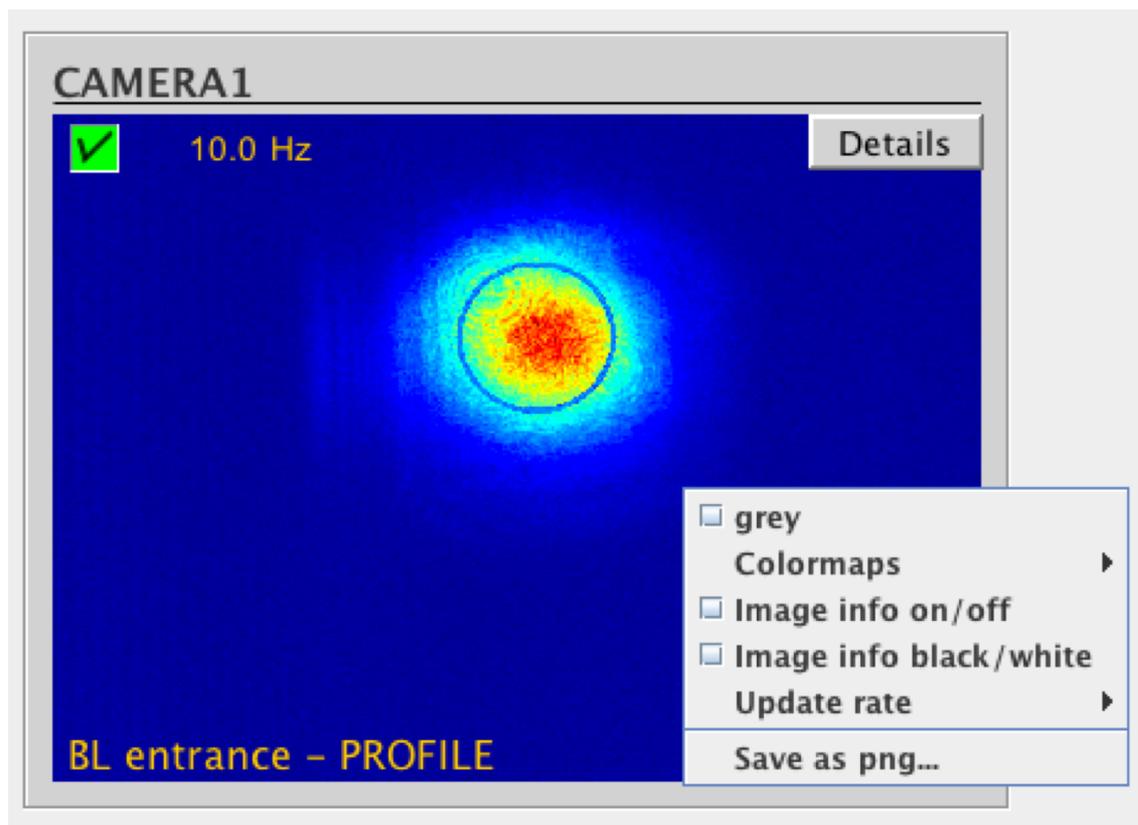
Plots with MasterXScale:

- Plots with the same master scale change their axis simultaneously
- Click into the plot and move the mouse -> a hairline indicates the connected plots



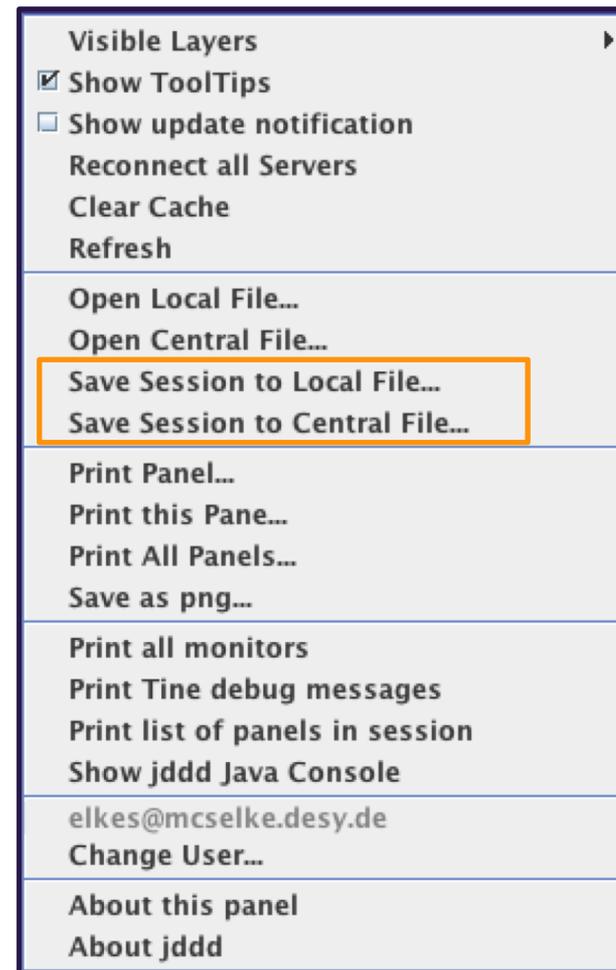
Camera images:

- Have a context menu
- Zoom with mouse



Sessions:

- A session saves a set of jddd panel names, sizes, positions and special settings
- Save your special session file via the context menu



Unsatisfied with the panel design?

- Talk to the machine coordinators
- But think about the following points at first:
 - Colors are a matter of taste, if you ask 10 people to select a panel background color you will get 10 different colors
 - Changing colors is a lot of work, because you can't change just the background color
 - Many people discussed about the design of each panel before Jan generated it
- Don't hesitate to do simple panel changes yourself
 - Note the `design_hints.xml`
 - Ask me if you want to attend a jddd training
 - Don't touch important panels like the Cockpit panel

The jddd editor is easy to use:

- Rich set of predefined widgets
- No programming skills are needed



Saving panels:



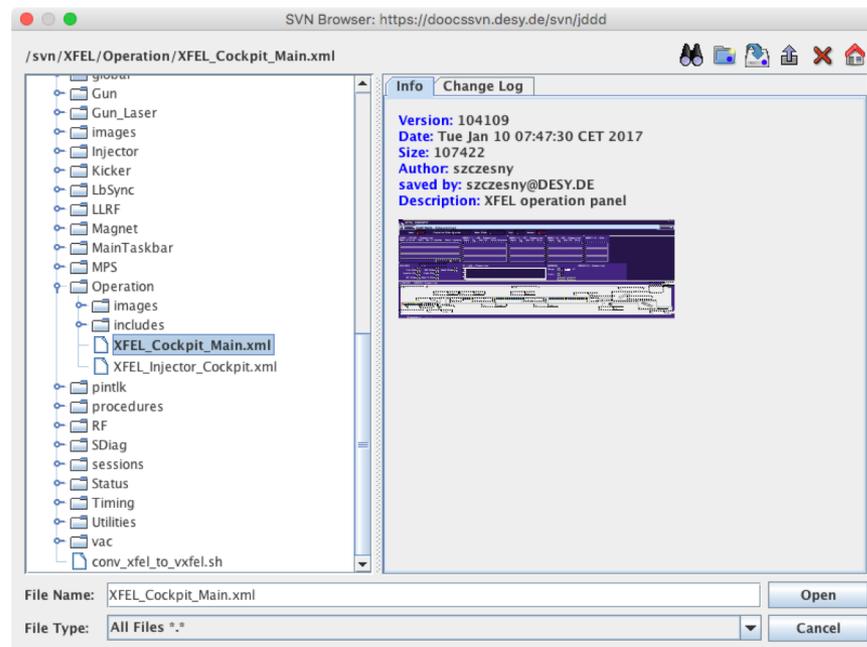
To local file system



To central SVN repository: the SVN keeps the history of the edited files (see Change Log tab)

SVN folder structure

- User directories for testing panels
- Experiment folders XFEL, PETRA FLASH,... for special experiment panels
- „global“ folder for standard panels

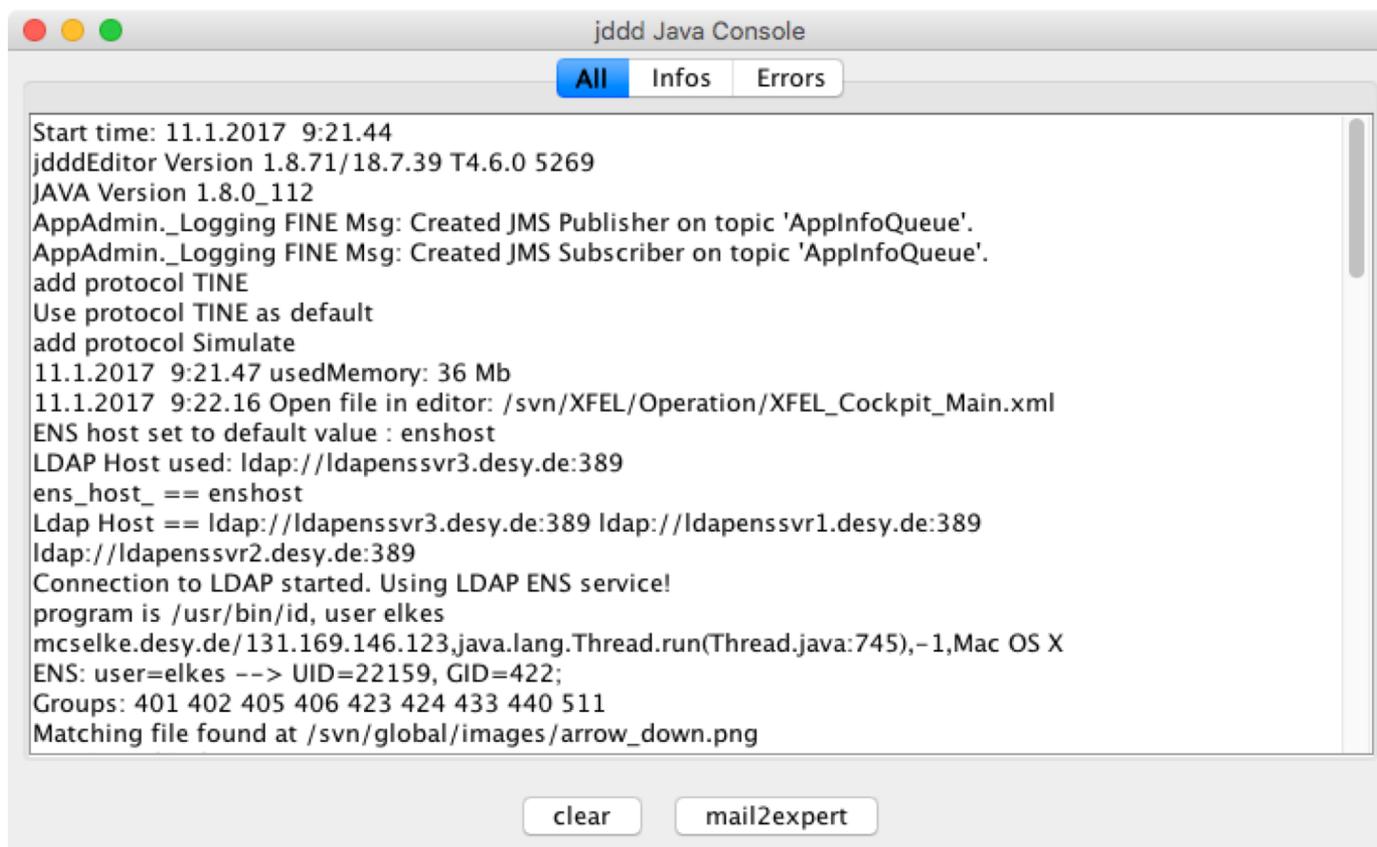


If you observe any problems with jddd:

- Close all panels which are not needed
- Check for error messages on the jddd Java console
- Watch the memory bar in the upper right corner of the first frame
 - It displays used/max memory
- In the About panel:
 - Check the component count
 - Check the number of calls per second
- Write an email to jddd@desy.de and the panel author

The jddd Java console:

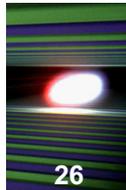
- Open via context menu -> Show jddd Java console



The screenshot shows a window titled "jddd Java Console" with three tabs: "All", "Infos", and "Errors". The "All" tab is selected. The console displays the following text:

```
Start time: 11.1.2017 9:21.44
jdddEditor Version 1.8.71/18.7.39 T4.6.0 5269
JAVA Version 1.8.0_112
AppAdmin_Logging FINE Msg: Created JMS Publisher on topic 'AppInfoQueue'.
AppAdmin_Logging FINE Msg: Created JMS Subscriber on topic 'AppInfoQueue'.
add protocol TINE
Use protocol TINE as default
add protocol Simulate
11.1.2017 9:21.47 usedMemory: 36 Mb
11.1.2017 9:22.16 Open file in editor: /svn/XFEL/Operation/XFEL_Cockpit_Main.xml
ENS host set to default value : enshost
LDAP Host used: ldap://ldapenssvr3.desy.de:389
ens_host_ == enshost
Ldap Host == ldap://ldapenssvr3.desy.de:389 ldap://ldapenssvr1.desy.de:389
ldap://ldapenssvr2.desy.de:389
Connection to LDAP started. Using LDAP ENS service!
program is /usr/bin/id, user elkes
mcselke.desy.de/131.169.146.123.java.lang.Thread.run(Thread.java:745),-1,Mac OS X
ENS: user=elkes --> UID=22159, GID=422;
Groups: 401 402 405 406 423 424 433 440 511
Matching file found at /svn/global/images/arrow_down.png
```

At the bottom of the window, there are two buttons: "clear" and "mail2expert".



The memory bar:

File View Help 41Mb/1820Mb

Facility Filter sorted Device Filter sorted Location Filter sorted Properties Filter sorted filtered

Facility Filter	Device Filter	Location Filter	Properties Filter	filtered
TTF2.DIAG	KLY.CONTROL	KLY.LOLA	ALIAS	<input type="checkbox"/>

TTF2.DIAG/KLY.CONTROL/KLY.LO...	482 Values	type
NAME = location	KLY.LOLA	ABC
STS_gen.Status word	24	123
STS.ERROR pending error status	0	0/1
STS.NEWERROR new error detected	0	0/1
STS.ERRORMASK disable new_error	1	0/1
STS.ONLINE device on-line status	1	0/1
SET.ONLINE command to set on-line	1	123
ERROR general error code	0	123
ERROR.STR error as string	0 0.0 378.0 1326097909 ok	U STR
SYS_MASK bit mask: systems the	0	123
FCT_CODE the location code	151	123
FCT_PANEL the panel to open for		ABC
X_POS the position in meter in the	0.0	0.3
Z_POS the position in meter in the	0.0	0.3
Z_POS.STRING the position as		ABC
DEVICE.INFO edit info about the	0 0.0 0.0 0 None	U STR
MESSAGE what the location is doing		ABC
LAST_UPDATE last online time 1.	"11. Jan. 2017 10:03:50.000" 1484...	TTF
LAST_USR1 last online time 1. Sec.	"01. Jan. 1970 01:00:00.000" 0 "0...	TTF
SPN subscription port number	0 0.0 0.0 0	U STR
SVR.ADDR string to the server	TTF2.DIAG/KLY.CONTROL/FLASHPL...	ABC
ALIAS PS name		ABC
PLC.IP_PLG alias name for plc		ABC
PLC.IP_PLG_ADDR in-address of	131 169 149 83	ABC

SysMask Filter Read Send

If one specific panel is slow:

- Open via context menu -> About this panel

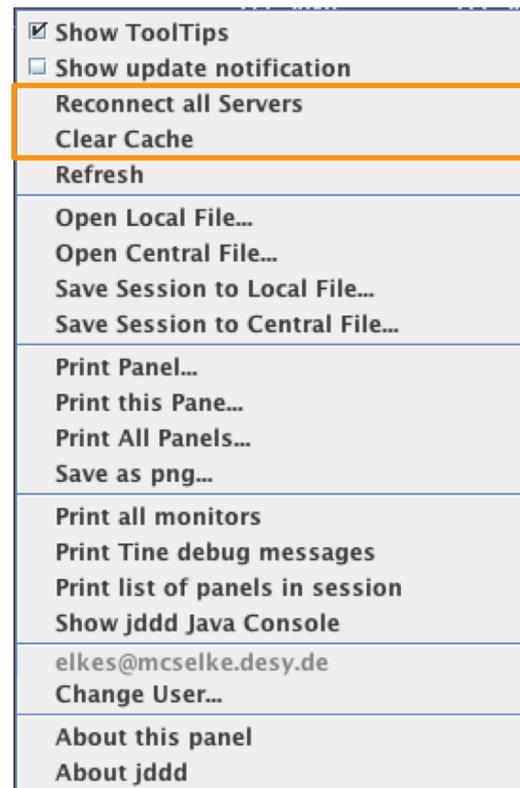


If you don't get the current panel version:

- Open context menu -> Clear cache

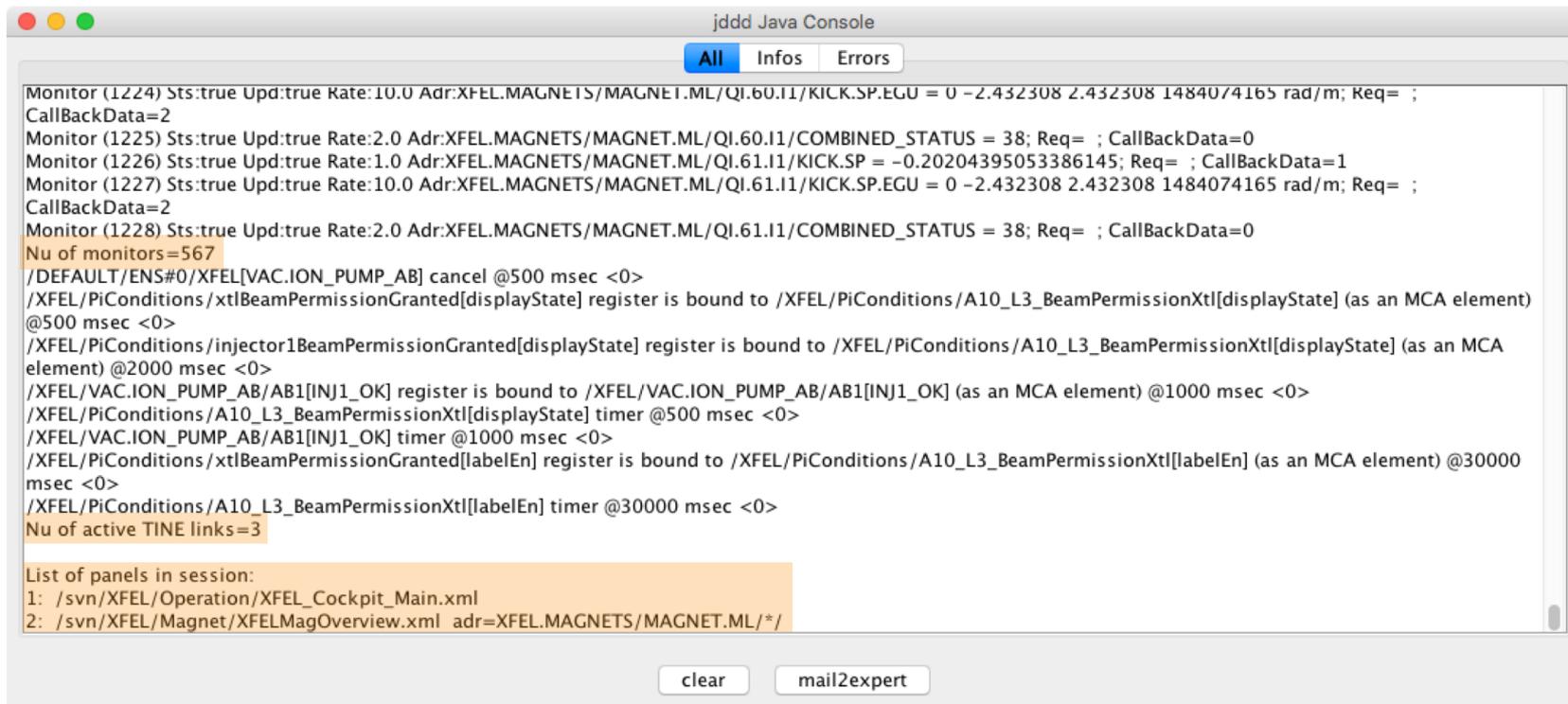
On Connection problems:

- Open context menu -> Reconnect all Servers



Additional information available via the context menu:

- Print list of panels in session
- Print all monitors



The screenshot shows a Java console window titled "jddd Java Console" with tabs for "All", "Infos", and "Errors". The console output displays several monitor status lines, followed by a summary of monitors and active TINE links, and finally a list of panels in session.

```

Monitor (1224) Sts:true Upd:true Rate:10.0 Adr:XFEL.MAGNETS/MAGNET.ML/QI.60.I1/KICK.SP.EGU = 0 -2.432308 2.432308 1484074165 rad/m; Req= ;
CallBackData=2
Monitor (1225) Sts:true Upd:true Rate:2.0 Adr:XFEL.MAGNETS/MAGNET.ML/QI.60.I1/COMBINED_STATUS = 38; Req= ; CallBackData=0
Monitor (1226) Sts:true Upd:true Rate:1.0 Adr:XFEL.MAGNETS/MAGNET.ML/QI.61.I1/KICK.SP = -0.20204395053386145; Req= ; CallBackData=1
Monitor (1227) Sts:true Upd:true Rate:10.0 Adr:XFEL.MAGNETS/MAGNET.ML/QI.61.I1/KICK.SP.EGU = 0 -2.432308 2.432308 1484074165 rad/m; Req= ;
CallBackData=2
Monitor (1228) Sts:true Upd:true Rate:2.0 Adr:XFEL.MAGNETS/MAGNET.ML/QI.61.I1/COMBINED_STATUS = 38; Req= ; CallBackData=0
Nu of monitors=567
/DEFAULT/ENS#0/XFEL[VAC.ION_PUMP_AB] cancel @500 msec <0>
/XFEL/PiConditions/xtlBeamPermissionGranted[displayState] register is bound to /XFEL/PiConditions/A10_L3_BeamPermissionXtl[displayState] (as an MCA element)
@500 msec <0>
/XFEL/PiConditions/injector1BeamPermissionGranted[displayState] register is bound to /XFEL/PiConditions/A10_L3_BeamPermissionXtl[displayState] (as an MCA
element) @2000 msec <0>
/XFEL/VAC.ION_PUMP_AB/AB1[INJ1_OK] register is bound to /XFEL/VAC.ION_PUMP_AB/AB1[INJ1_OK] (as an MCA element) @1000 msec <0>
/XFEL/PiConditions/A10_L3_BeamPermissionXtl[displayState] timer @500 msec <0>
/XFEL/VAC.ION_PUMP_AB/AB1[INJ1_OK] timer @1000 msec <0>
/XFEL/PiConditions/xtlBeamPermissionGranted[labelEn] register is bound to /XFEL/PiConditions/A10_L3_BeamPermissionXtl[labelEn] (as an MCA element) @30000
msec <0>
/XFEL/PiConditions/A10_L3_BeamPermissionXtl[labelEn] timer @30000 msec <0>
Nu of active TINE links=3

List of panels in session:
1: /svn/XFEL/Operation/XFEL_Cockpit_Main.xml
2: /svn/XFEL/Magnet/XFELMagOverview.xml adr=XFEL.MAGNETS/MAGNET.ML/*
  
```

Buttons at the bottom of the console window are "clear" and "mail2expert".

A bug report should contain the following information:

- Operating system, how jddd was started
- jddd version number
- Panel name and path in SVN
- Screenshot
- Detailed description

Please send your bug report to jddd@desy.de