



DAQ update: jDTool application

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02/Feb/2009



Why Java DOOCS Tool ?

- **Large number** of device instances with the same type, e.g. hundreds of devices:
 - $ODR_1, ODR_2, \dots, ODR_n$;
 - $LDA_1, LDA_2, \dots, LDA_n$;
 - $DIF_1, DIF_2, \dots, DIF_n$;
- It's convenient to modify the configurations of properties **at run time** by changing the same property in several (even lots of) device instances **simultaneously**;
- Make all device instances **sortable**, easy to find;
- This is where the **jDTool** comes to play.



Add the tree of Facility / Device / Location / Property

Drag to display

The names of tree has been sorted!

Locations	NAME, STR...	STS.ERROR, B...	STS.NEWE...	STS.ERRO...	STS.ONLIN...
TESLAHB2._SYR	ill. property	0	0	0	1
SIN	SIN	0	0	0	1
COS	COS	0	0	0	1
TAN	TAN	0	0	0	1



Change it into Column-display

jdTool v1.6

File Edit View Transfer Setup Help

column-displayed

TEST.D00CS

- LOCALHOST_8888
- LOCALHOST_8889
- ODR
- PCIX_DMA
- RUN_CTR
- SINGENERATOR
 - COS
 - SIN
 - DATA cur. value of sine (FLOAT)
 - DATA.AMPL amplitude (FLOAT)
 - DATA.DESC ion of channel (STRING)
 - DATA.DIG_FILT dig. filter f. hist. (IFFF)
 - DATA.EGU engineering units y-scale (A_USTR)
 - DATA.FILT history data filter (IFFF)
 - DATA.FREQ frequency (FLOAT)
 - DATA.HIST history (A_TDS)
 - DATA.INC increment (stepi width) (INT)
 - DATA.NOISE ampl. of noise (FLOAT)
 - DATA.PHASESHIFT phase shift (FLOAT)
 - DATA.SAMPLE point f. hist booking (INT)
 - DATA.TD sine fct. (SPECTRUM)
 - DATA.TD.COMMENT description of spectrum (STRING)
 - DATA.TD.EGU engineering units y-scale (A_USTR)
 - DATA.TD.LIST stored spectra (USTR)
 - DATA.TD.SAVE current spectrum -> archive (NULL)
 - DATA.TD.XEGU engineering units x-scale (A_USTR)
 - DEVICE.INFO edit info about the dev (A_USTR)
 - ERROR general error code (A_USTR)
 - ERROR.STR error as string (A_USTR)
 - LAST_UPDATE last online time 1. Sec, 2. msec (TTII)
 - NAME = location (STRING)
 - SET.ONLINE command to set on-line (NULL)
 - STS.gen.Status word (INT)
 - STS.ERROR pending error status (BOOL)
 - STS.ERRORMASK disable new_error (BOOL)

Table Plot List

Properties	TEST.DOO...	TEST.DOO...	TEST.DOO...	Datatype
NAME = location	SIN	COS	TAN	STR16
STS.ERROR pending error status	0	0	0	B
STS.NEWERROR new error detected	0	0	0	B
STS.ERRORMASK disable new_error	0	0	0	B
STS.ONLINE device on-line status	1	1	1	B
SET.ONLINE command to set on-line	NULL	NULL	NULL	NULL
ERROR general error code	0	0	0	I
ERROR.STR error as string	0.0	0.0	0.0	F1
ERROR.STR error as string	0.0	0.0	0.0	F2
ERROR.STR error as string	0	0	0	I1
ERROR.STR error as string	OK	OK	OK	STR
ERROR.STR error as string	13:08.15 ...	16:48.48 ...	16:57.55 ...	TM
STS.gen.Status word	8	8	8	I
SYS_MASK bit mask: systems the device belongs to	1	1	1	I
Z_POS the position in meter in the machine	0.0	0.0	0.0	F
Z_POS.STRING the position as description	0.0	0.0	0.0	F1
Z_POS.STRING the position as description	0.0	0.0	0.0	F2
Z_POS.STRING the position as description	0	0	0	I1
Z_POS.STRING the position as description				STR
Z_POS.STRING the position as description	01:00.00 ...	01:00.00 ...	01:00.00 ...	TM
LAST_UPDATE last online time 1. Sec, 2. msec	11:30.16 ...	11:30.16 ...	11:30.17 ...	TM1
LAST_UPDATE last online time 1. Sec, 2. msec	01:12.26 ...	01:15.52 ...	01:00.55 ...	TM2
LAST_UPDATE last online time 1. Sec, 2. msec	0	0	0	I1
LAST_UPDATE last online time 1. Sec, 2. msec	0	0	0	I2
UPDATE_THREAD running thread counter	99011740	99011742	99011743	I
DEVICE.INFO edit info about the dev	0.0	0.0	0.0	F1
DEVICE.INFO edit info about the dev	0.0	0.0	0.0	F2
DEVICE.INFO edit info about the dev	0	0	0	I1
DEVICE.INFO edit info about the dev	Device OK	Device OK	Device OK	STR
DEVICE.INFO edit info about the dev	01:00.00 ...	01:00.00 ...	01:00.00 ...	TM

Done

D:0 Actual View



Any changes are highlighted!

jDTool v1.6

File Edit View Transfer Setup Help

TEST.DOOCS

- LOCALHOST_8888
- LOCALHOST_8889
- ODR
- PCIX_DMA
- RUN.CTR
- SINGENERATOR
 - COS
 - SIN
 - DATA cur. value of sine (FLOAT)
 - DATA.AMPL amplitude (FLOAT)
 - DATA.DESC ion of channel (STRING)
 - DATA.DIG_FILT dig. filter f. hist. (IFFF)
 - DATA.EGU engineering units y-scale (A_USTR)
 - DATA.FILT history data filter (IFFF)
 - DATA.FREQ frequency (FLOAT)
 - DATA.HIST history (A_TDS)
 - DATA.INC increment (stepi width) (INT)
 - DATA.NOISE ampl. of noise (FLOAT)
 - DATA.PHASESHIFT phase shift (FLOAT)
 - DATA.SAMPLE point f. hist booking (INT)
 - DATA.TD sine fct. (SPECTRUM)
 - DATA.TD.COMMENT description of spectrum (STRING)
 - DATA.TD.EGU engineering units y-scale (A_USTR)
 - DATA.TD.LIST stored spectra (USTR)
 - DATA.TD.SAVE current spectrum -> archive (NULL)
 - DATA.TD.XEGU engineering units x-scale (A_USTR)
 - DEVICE.INFO edit info about the dev (A_USTR)
 - ERROR general error code (A_USTR)
 - ERROR.STR error as string (A_USTR)
 - LAST_UPDATE last online time 1. Sec, 2. msec (TTU)
 - NAME = location (STRING)
 - SET.ONLINE command to set on-line (NULL)
 - STS gen.Status word (INT)
 - STS.ERROR pending error status (BOOL)
 - STS.ERRORMASK disable new error (BOOL)

Table Plot List

Properties	TEST.DOO...	TEST.DOO...	TEST.DOO...	TEST.C...
DATA.TD.EGU	ill. property	a.u.	a.u.	
DATA.TD.EGU	ill. property	01:00.00 ...	01:00.00 ...	01:00.
DATA.TD.XEGU	ill. property	0.0	0.0	
DATA.TD.XEGU	ill. property	0.0	0.0	
DATA.TD.XEGU	ill. property	1	0	
DATA.TD.XEGU	ill. property	x	x	
DATA.TD.XEGU	ill. property	01:00.00 ...	01:00.00 ...	01:00.
DATA.INC	ill. property	5	1	
DATA.AMPL	ill. property	45.9	4.0	
DATA.FREQ	ill. property	2.1	3.31	
DATA.PHASESHIFT	ill. property	2.0	4.0	
DATA.NOISE	ill. property	0.02	0.1	
DATA.SAMPLE	ill. property	1000	0	
DATA.HIST	ill. property	13:00.09 ...	12:59.06 ...	13:00.
DATA.HIST	ill. property	-27.9208...	-3.59268...	-0.050
DATA.HIST	ill. property	0	0	
DATA.FILT	ill. property	1	0	
DATA.FILT	ill. property	0.0	0.05	
DATA.FILT	ill. property	0.0	0.0	
DATA.FILT	ill. property	0.0	0.0	
DATA.EGU	ill. property	-120.0	0.0	
DATA.EGU	ill. property	120.0	0.0	
DATA.EGU	ill. property	0	455400	45
DATA.EGU	ill. property			
DATA.EGU	ill. property	01:00.00 ...	01:00.00 ...	01:00.
DATA.DIG_FILT	ill. property	1	0	
DATA.DIG_FILT	ill. property	0.05	0.05	
DATA.DIG_FILT	ill. property	0.0	0.0	
DATA.DIG_FILT	ill. property	0.0	0.0	
Differences		3	7	7

TEST.DOOCS[*//]

D:24 Actual View

They are counted!



Online spectra and histories

jdTool v1.6

File Edit View Transfer Setup Help

NEW [Icons]

PCIX_DMA
RUN.CTR
SINGENERATOR
COS
SIN

- DATA cur. value of sine (FLOAT)
- DATA.AMPL amplitude (FLOAT)
- DATA.DESC ion of channel (STRING)
- DATA.DIG_FILT dig. filter f. hist. (IFFF)
- DATA.EGU engineering units y-scale (A_USTR)
- DATA.FILT history data filter (IFFF)
- DATA.FREQ frequency (FLOAT)
- DATA.HIST history (A_TDS)
- DATA.INC increment (stepi width) (INT)
- DATA.NOISE ampl. of noise (FLOAT)
- DATA.PHASESHIFT phase shift (FLOAT)
- DATA.SAMPLE point f. hist booking (INT)
- DATA.TD sine fct. (SPECTRUM)**
- DATA.TD.COMMENT description of spectrum (STRING)
- DATA.TD.EGU engineering units y-scale (A_USTR)
- DATA.TD.LIST stored spectra (USTR)
- DATA.TD.SAVE current spectrum -> archive (NULL)
- DATA.TD.XEGU engineering units x-scale (A_USTR)
- DEVICE.INFO edit info about the dev (A_USTR)
- ERROR general error code (A_USTR)
- ERROR.STR error as string (A_USTR)
- LAST_UPDATE last online time 1. Sec, 2. msec (TTII)
- NAME = location (STRING)
- SET.ONLINE command to set on-line (NULL)
- STS gen.Status word (INT)
- STS.ERROR pending error status (BOOL)
- STS.ERRORMASK disable new_error (BOOL)
- STS.NEWERROR new error detected (BOOL)
- STS.ONLINE device on-line status (BOOL)
- SVR.CONTR reg internal only (INT)

Table Plot List

TEST.DOOC/SINGENERATOR/SIN/ DATA.TD

Online spectrum

TEST.DOOC/SINGENERATOR/SIN/ DATA.HIST

Online history

TEST.DOOC/SINGENERATOR/SIN/ DATA.TD

D:24 Actual View

Drag to display



Display special interested properties

The screenshot shows the JDTool v1.6 interface. The left pane displays a tree view of properties under the 'SINGENERATOR' folder. The right pane shows a list of values for these properties. A red arrow points from the 'DATA.SAMPLE' property in the tree to its value '1000' in the list. A red text box with the text 'Drag to display' is positioned below the arrow.

Tree View (Left Pane):

- LOCALHOST_8888
- LOCALHOST_8888
- ODR
- PCIX_DMA
- RUN_CTR
- SINGENERATOR
 - COS
 - SIN
 - DATA cur. value of sine (FLOAT)
 - DATA.AMPL amplitude (FLOAT)
 - DATA.DESC ion of channel (STRING)
 - DATA.DIG_FILTER dig. filter f. hist. (IFFF)
 - DATA.EGU engineering units y-scale (A_USTR)
 - DATA.FILT history data filter (IFFF)
 - DATA.FREQ frequency (FLOAT)
 - DATA.HIST history (A_TDS)
 - DATA.INC increment (stepi width) (INT)
 - DATA.NOISE ampl. of noise (FLOAT)
 - DATA.PHASESHIFT phase shift (FLOAT)
 - DATA.SAMPLE point f. hist booking (INT)**
 - DATA.TD sine fct. (SPECTRUM)
 - DATA.TD.COMMENT description of spectrum (STRING)
 - DATA.TD.EGU engineering units y-scale (A_USTR)
 - DATA.TD.LIST stored spectra (USTR)
 - DATA.TD.SAVE current spectrum -> archive (NULL)
 - DATA.TD.XEGU engineering units x-scale (A_USTR)
 - DEVICE.INFO edit info about the dev (A_USTR)
 - ERROR general error code (A_USTR)
 - ERROR.STR error as string (A_USTR)
 - LAST_UPDATE last online time 1. Sec, 2. msec (TTII)
 - NAME = location (STRING)
 - SET.ONLINE command to set on-line (NULL)
 - STS.gen.Status word (INT)
 - STS.ERROR pending error status (BOOL)
 - STS.ERRORMASK disable new_error (BOOL)
 - STS.NEWERROR new error detected (BOOL)

List View (Right Pane):

Property	Value
TEST.DOOC/SINGENERATOR/SIN/SET.ONLINE	
TEST.DOOC/SINGENERATOR/SIN/DATA.NOISE	[0] 0.02
TEST.DOOC/SINGENERATOR/SIN/DATA.PHASESHIFT	[0] 2.0
TEST.DOOC/SINGENERATOR/SIN/DEVICE.INFO	[0] 0 0 0 0 "Thu Jan 01 01:00:00 GMT 1970" 0 Device OK
TEST.DOOC/SINGENERATOR/SIN/DATA	[0] -45.402027
TEST.DOOC/SINGENERATOR/SIN/DATA.AMPL	[0] 45.9
TEST.DOOC/SINGENERATOR/SIN/DATA.FREQ	[0] 2.1
TEST.DOOC/SINGENERATOR/SIN/DATA.NOISE	[0] 0.02
TEST.DOOC/SINGENERATOR/SIN/DATA.SAMPLE	[0] 1000

Drag to display



Features of jDTool

- Very **flexible**: just drag to display;
- Very **selective**: just pick the parts you are interested;
- Very **operable**: can online edit values of properties simultaneously for the same type of device;
- Changes are **notified**: if different values between shown in a table and from a server, they will be highlighted, and the number of deviations will be counted!
- Directly **visualized**: drag to plot online spectra and histories!



The format of data & information

- Two types of data & info are handled in ways of:
 - **CSV format**: the data of shown table are saved or loaded in CSV format, can be operated by other programs, MATLAB, Excel etc.;
 - **XML format**: the information of interested device instances and its properties are hold by profiles in XML format, which could be saved and reloaded as a file or a version of system.



Profile example: XML format

```
1 <?xml version='1.0' encoding='utf-8'?>
2
3 <profile>
4
5   <panel type="DOOCSTablePanel" name="Table">
6     <locations>
7       <location>TEST.DOOCS/SINGENERATOR/TESLAHB2._SVR</location>
8       <location>TEST.DOOCS/SINGENERATOR/SIN</location>
9       <location>TEST.DOOCS/SINGENERATOR/COS</location>
10      <location>TEST.DOOCS/SINGENERATOR/TAN</location>
11    </locations>
12
13    <properties>
14      <property type="STRING16">NAME</property>
15      <property type="BOOL">STS.ERROR</property>
16      <property type="BOOL">STS.NEWERROR</property>
17      <property type="BOOL">STS.ERRORMASK</property>
18      <property type="BOOL">STS.ONLINE</property>
19      <property type="NULL">SET.ONLINE</property>
20      <property type="INT">ERROR</property>
21      <property type="A_USTR">ERROR.STR</property>
22      <property type="INT">STS</property>
23      <property type="INT">SYS_MASK</property>
24      <property type="FLOAT">Z_POS</property>
```



A try on ODR server

JDTool v1.6

File Edit View Transfer Setup Help

TEST.DOOCs

- RUN.CTR
- LOCALHOST_8888
- LOCALHOST_8889
- SINGENERATOR
- ODR
 - ODR_SVR
 - ODR1
 - ABC NAME = location (STRING)
 - Q1 STS.ERROR pending error status (BOOL)
 - Q1 STS.NEWERROR new error detected (BOOL)
 - Q1 STS.ERRORMASK disable new_error (BOOL)
 - Q1 STS.ONLINE device on-line status (BOOL)
 - SET.ONLINE command to set on-line (NULL)
 - STR ERROR general error code (A_USTR)
 - STR ERROR.STR error as string (A_USTR)
 - 123 STS.gen.Status word (INT)
 - 123 SYS_MASK bit mask: systems the device belongs to (INT)
 - Q3 Z_POS the position in meter in the machine (FLOAT)
 - ABC Z_POS.STRING the position as description (STRING)
 - TTT LAST_UPDATE last online time 1. Sec, 2. msec (TTI)
 - 123 UPDATE_THREAD running thread counter (INT)
 - STR DEVICE.INFO edit info about the dev (A_USTR)
 - 123 PORT_NUM integer test value (INT)
 - ABC PC_HOSTNAME a machine hostname (STRING)
 - 123 ERRTYPE device error type (INT)
 - 123 MARKER choose marker 1:odr 2:lda (INT)
 - 123 PARAM.ITEM i'th parameter to be set: (INT)
 - 123 PARAM.DATASIZE Data size (bytes) (INT)
 - 123 PARAM.NUMMESS Number of outstanding messages (INT)
 - 123 PARAM.RUNTIME run time (s) (INT)
 - 123 PARAM.DUMPSCR Dump data to screen (INT)
 - 123 PARAM.GROUP Grouping (INT)
 - 123 PARAM.IOTHREADS Number IO threads (INT)
 - 123 PARAM.DUMPTOHD Dump data on disk [0/1] (INT)
 - 123 PARAM.DUMPSIZE Data dump size (INT)

Table Plot List

TEST.DOOCs/ODR/ODR1/DATARA.RA

TEST.DOOCs/ODR/ODR1/DATARA.HIST

TEST.DOOCs/ODR/ODR1/DATARA.HIST

D:0 Actual View

Online spectrum

Online history



Detecting a fake error

DOOCS Error Monitor (Version 5.1.39) wutao@larch.pp.rhul.ac.uk

List of Subsystems :

Facility	Object
TTF	WATCHDOG
TEST.DOOCS	ODR
TEST.DOOCS	SINGENERATO

Scan Time [sec] : 90 [Slider] Stop

New Errors Pending Errors Error Masks All Devices

Errors in Subsystem :

Location	New	Pending	Mask	Code	Time	Date	Error
ODR._SVR	0	0	1	0	16:57.56	4. Dec. 2008	OK
ODR1	1	1	0	32	11:02.44	27. Jan. 2009	ODR Mem Alloc

Functions on selected items : Acknowledge Enable Disable Mask Choice: local mask

Print complete list: Print Log Files: History

A fake error: "ODR Mem Allocation Error"



Detecting all changes

jDTool v1.6

File Edit View Transfer Setup Help

TEST.DOOCs

- LOCALHOST_8888
- LOCALHOST_8889
- ODR
 - ODR_SVR
 - ODR1
 - CTL_CMD Control Commands (INT)
 - DATARA data rate of odr transfer (FLOAT)
 - DATARA.DESC data rate of ODR channel (STRING)
 - DATARA.EGU engineering units y-scale (A_USTR)
 - DATARA.FILT history data filter (IFFF)
 - DATARA.HIST data rate history (A_TDS)
 - DATARA.RA odr rate spec. (SPECTRUM)
 - DATARA.RA.COMMENT description of spectrum (STRING)
 - DATARA.RA.EGU engineering units y-scale (A_USTR)
 - DATARA.RA.LIST stored spectra (USTR)
 - DATARA.RA.SAVE current spectrum -> archive (NULL)
 - DATARA.RA.XEGU engineering units x-scale (A_USTR)
 - DATARA.SAMP data rate hist sample (INT)
 - DATASZ data size of odr transfer (FLOAT)
 - DATASZ.DESC data size of ODR channel (STRING)
 - DATASZ.EGU engineering units y-scale (A_USTR)
 - DATASZ.FILT history data filter (IFFF)
 - DATASZ.HIST data size history (A_TDS)
 - DATASZ.SAMP data size hist sample (INT)
 - DATASZ.SZ odr size spec. (SPECTRUM)
 - DATASZ.SZ.COMMENT description of spectrum (STRING)
 - DATASZ.SZ.EGU engineering units y-scale (A_USTR)
 - DATASZ.SZ.LIST stored spectra (USTR)
 - DATASZ.SZ.SAVE current spectrum -> archive (NULL)
 - DATASZ.SZ.XEGU engineering units x-scale (A_USTR)
 - DEVICE.INFO edit info about the dev (A_USTR)
 - ERROR general error code (A_USTR)
 - ERROR.STR error as string (A_USTR)
 - ERRTYPE device error type (INT)
 - EXITCMD Exit Commands (INT)

Plot List Table

Properties	TEST.DOOCs/ODR/...	Datatype
NAME = location	ODR1	STR16
STS.ERROR pending error status	0	B
STS.NEWERROR new error detected	0	B
STS.ERRORMASK disable new_error	0	B
STS.ONLINE device on-line status	1	B
SET.ONLINE command to set on-line	NULL	NULL
ERROR general error code	0	I
ERROR.STR error as string	0.0	F1
ERROR.STR error as string	0.0	F2
ERROR.STR error as string	0	I1
ERROR.STR error as string	OK	STR
ERROR.STR error as string	11:03.11 27. Jan. ...	TM
STS.gen.Status word	8	I
SYS_MASK bit mask: systems the device belongs to	1	I
Z_POS the position in meter in the machine	0.0	F
Z_POS.STRING the position as description	0.0	F1
Z_POS.STRING the position as description	0.0	F2
Z_POS.STRING the position as description	0	I1
Z_POS.STRING the position as description		STR
Z_POS.STRING the position as description	01:00.00 01. Jan. ...	TM
LAST_UPDATE last online time 1. Sec, 2. msec	11:03.28 27. Jan. ...	TM1
LAST_UPDATE last online time 1. Sec, 2. msec	01:00.50 01. Jan. ...	TM2
LAST_UPDATE last online time 1. Sec, 2. msec	0	I1
LAST_UPDATE last online time 1. Sec, 2. msec	0	I2
UPDATE_THREAD running thread counter	98965740	I
PORT_NUM integer test value	1523	I
PC_HOSTNAME a machine hostname	134.219.108.70	STR16
LDA.DATASIZE LDA Data Size	512	I
LDA.DATATYPE LDA Data Type	3	I
LDA.PCKDELAY LDA Pack Delay	11	I
CTL_CMD Control Commands	0	I

TEST.DOOCs/ODR/ODR1/ERROR.STR

D:6 Actual View



Summary

- Java DOOCS Tool is convenient and powerful:
 - DAQ experts customise and save profiles & data into files;
 - Users do checking & monitoring by reloading;
 - Any significant changes will be notified and highlighted.
- The test has been done for ODR device server.