

From an Empty PC to a Running Control System: A KNOPPIX Live-CD for DOOCS



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Abstract

Software deployment of operating and control systems is a hard task for beginners and can be an error prone one for experts. As an evaluation of a potential, fast deployment technique, a Linux/KNOPPIX Live-CD for the DOOCS control system software has been developed. This CD contains a DOOCS core system, some example and middle layer server programs and basic client applications. Optionally, one can install a KNOPPIX and DOOCS system directly from the CD. All DOOCS and operating system software are provided as Debian packages. This paper will describe the Live system CD in more detail and discuss the interaction of Java Web-start based applications, other control system client applications, DOOCS name service and device servers.

Motivation

The idea is to run the DOOCS control systems with all major programs directly from a CD. The 'experts' have then an always available and workable system and this e.g. is an USB flash drive on the keychain. It's ment to provide an overview of the entire system, without complex installation and configuration. A beginner receives a fully equipped and functional system. It is possible to start immediately with the development of control system servers and having all tools at hand. The Live-CD also demonstrates the integration of the various controls system architectures, like DOOCS, EPICS [4] or TINE [5], used at modern accelerator facilities.

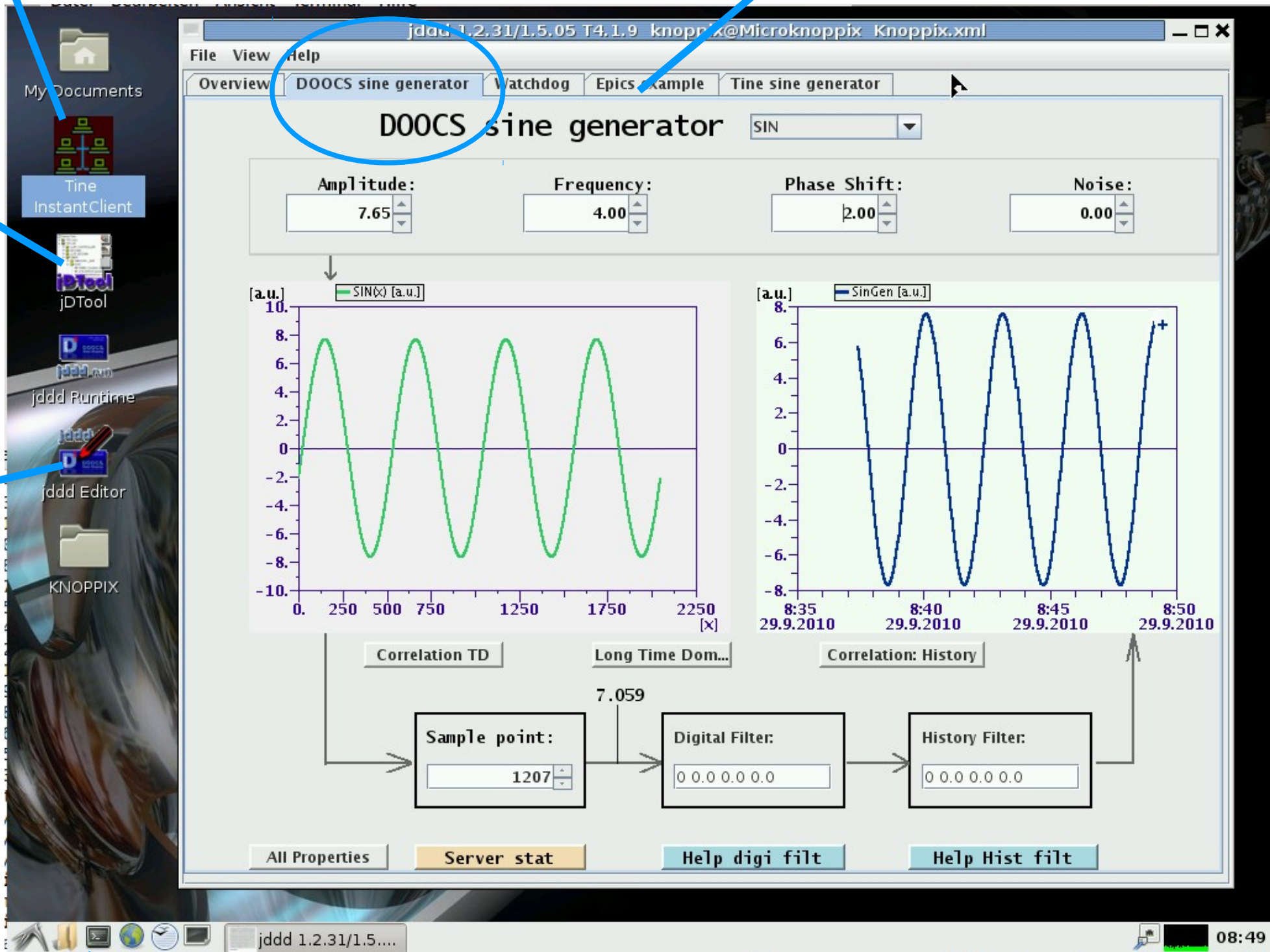
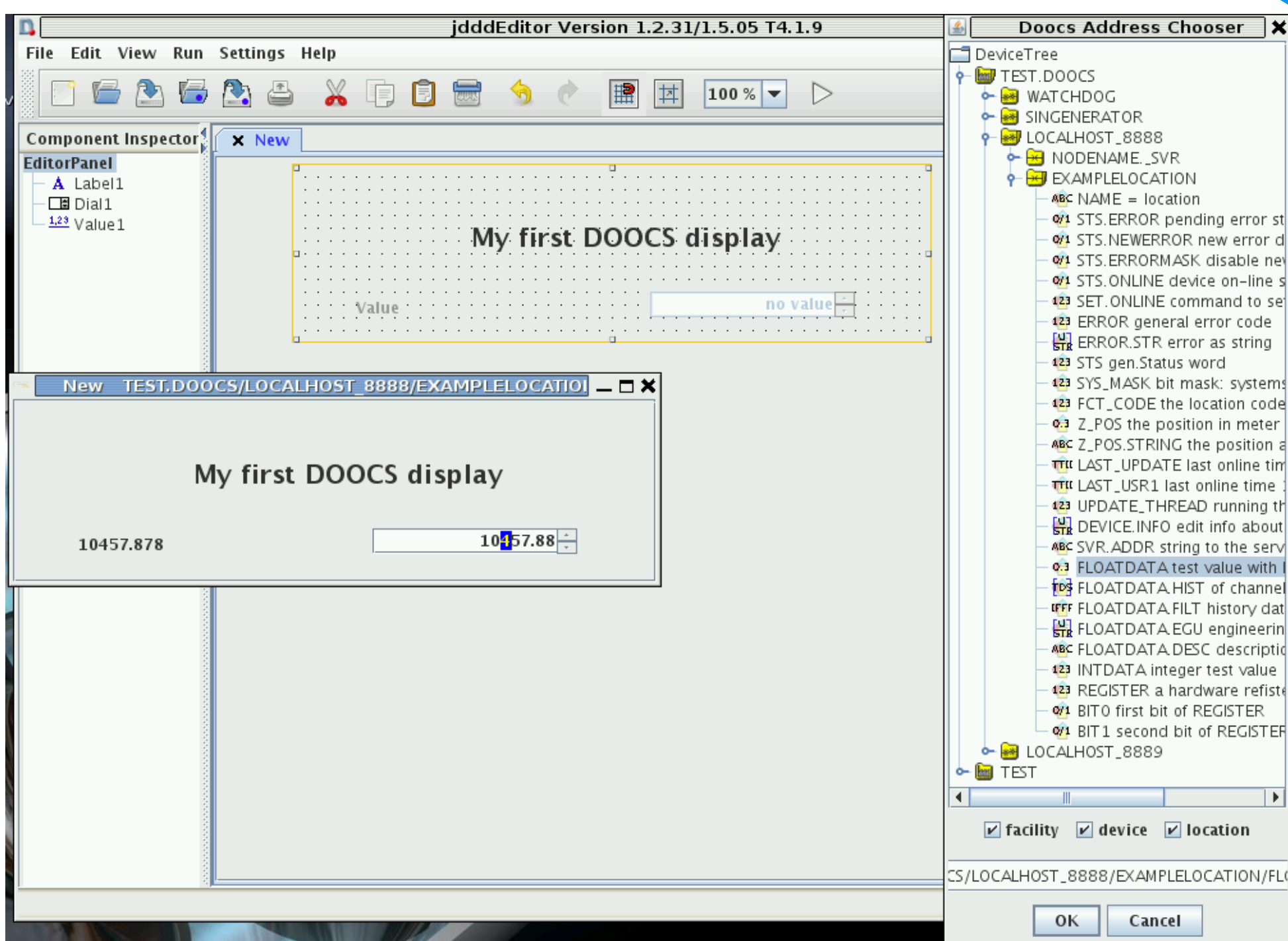
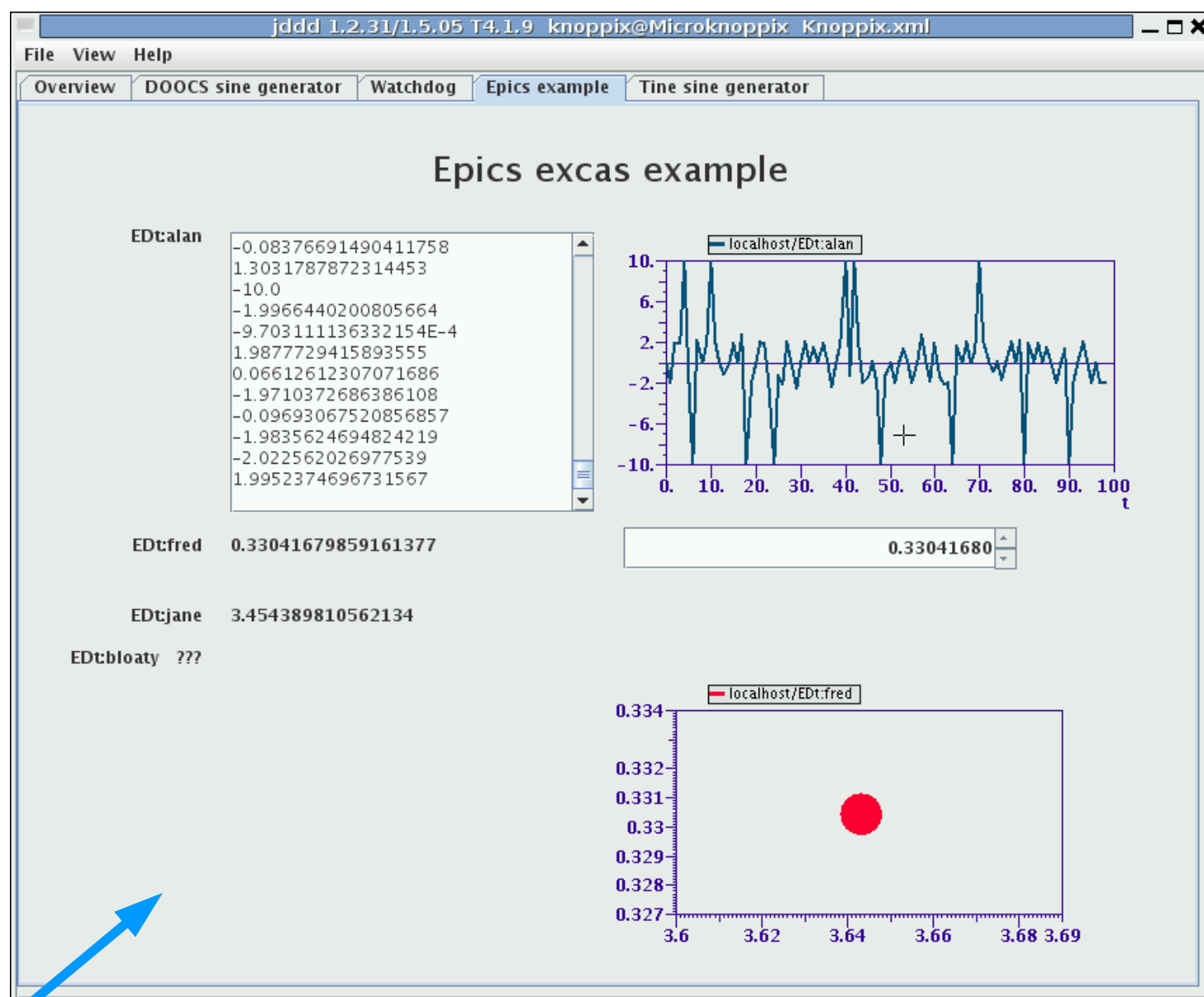
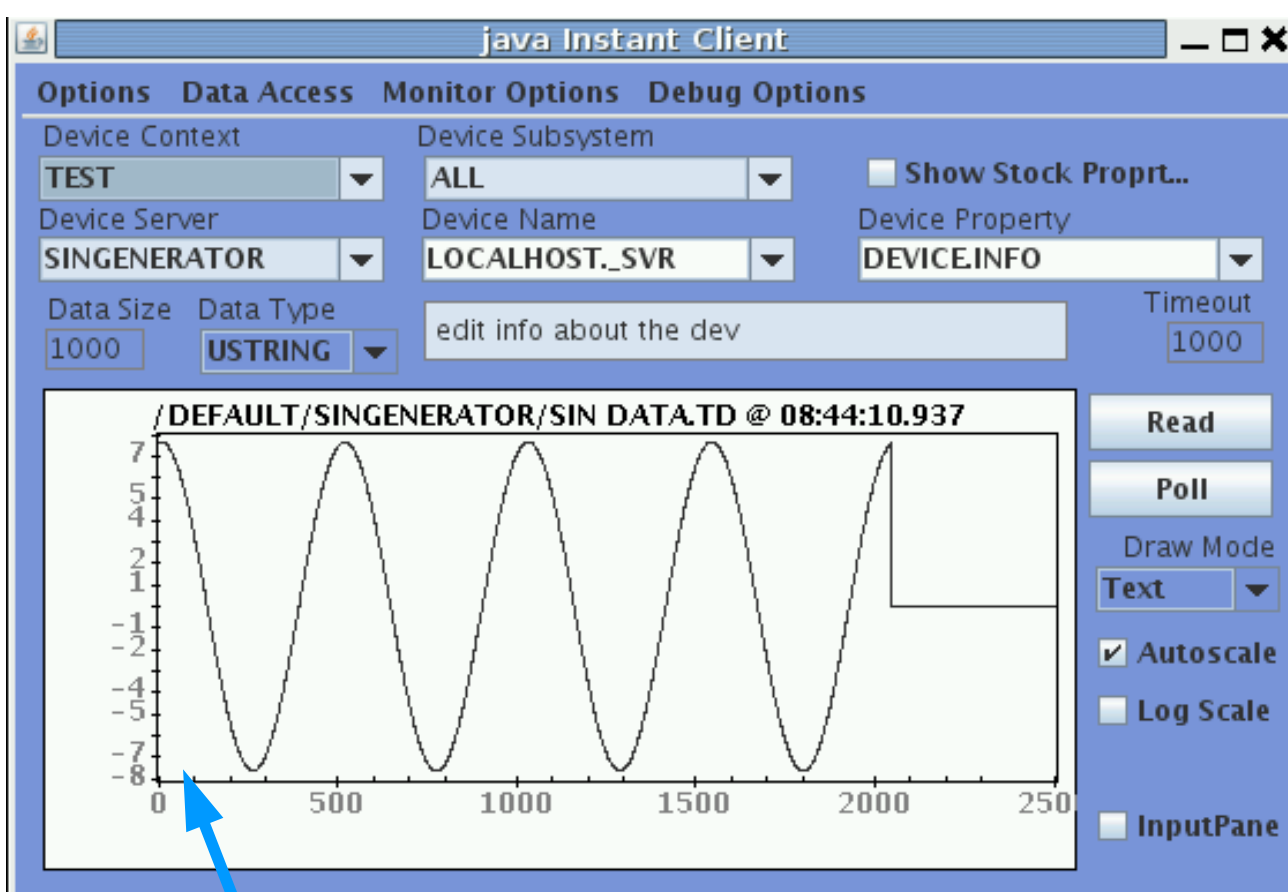
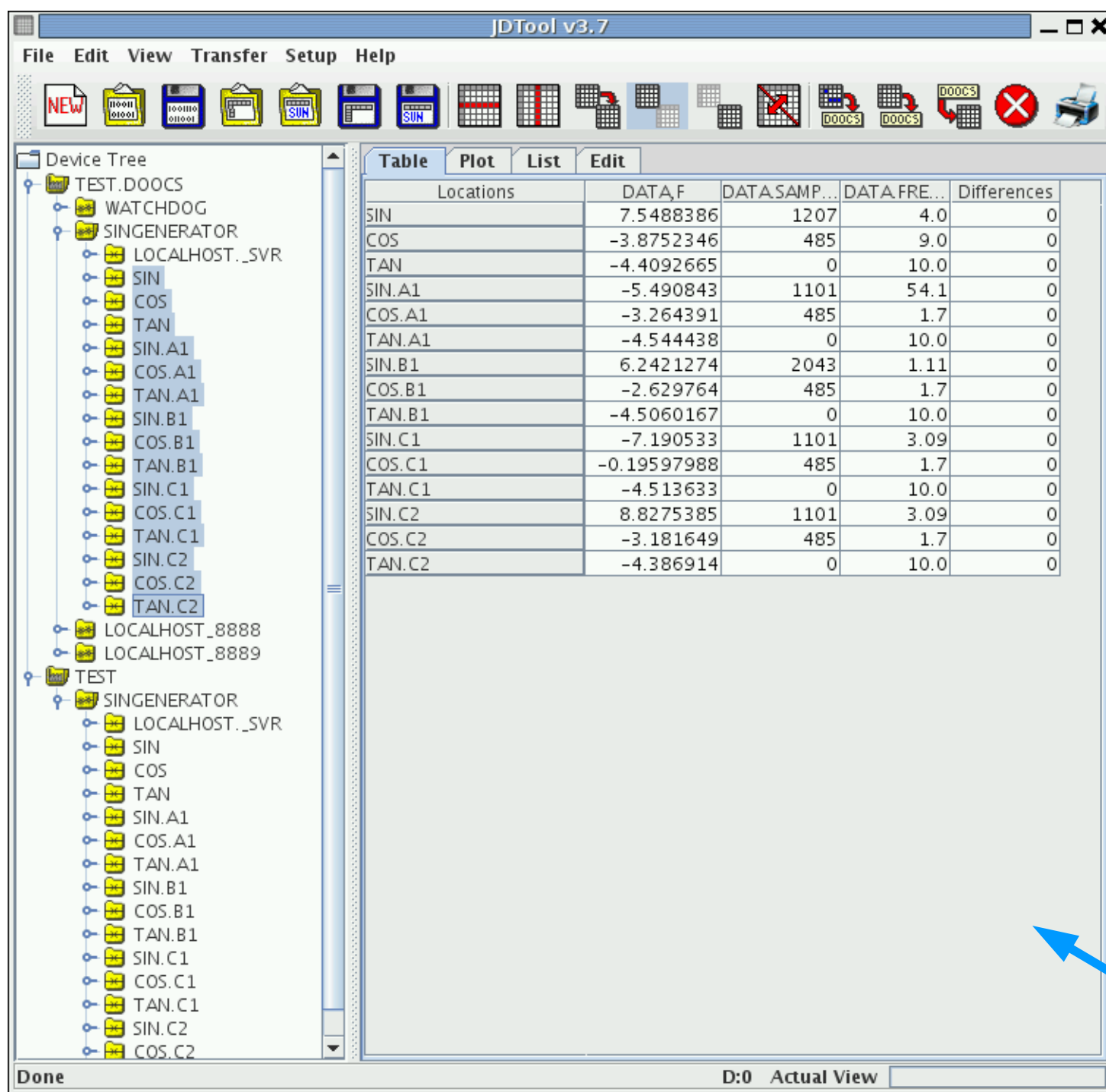
Features of the CD are:

- Any time, every where available.
- Quick start for beginners.
- Debug tool for experts.
- Demonstrates the whole chain, from the name service, device servers, up to the display.
- Demonstrates the interaction of the various control systems (DOOCS, TINE, EPICS).

Live-CD Creation

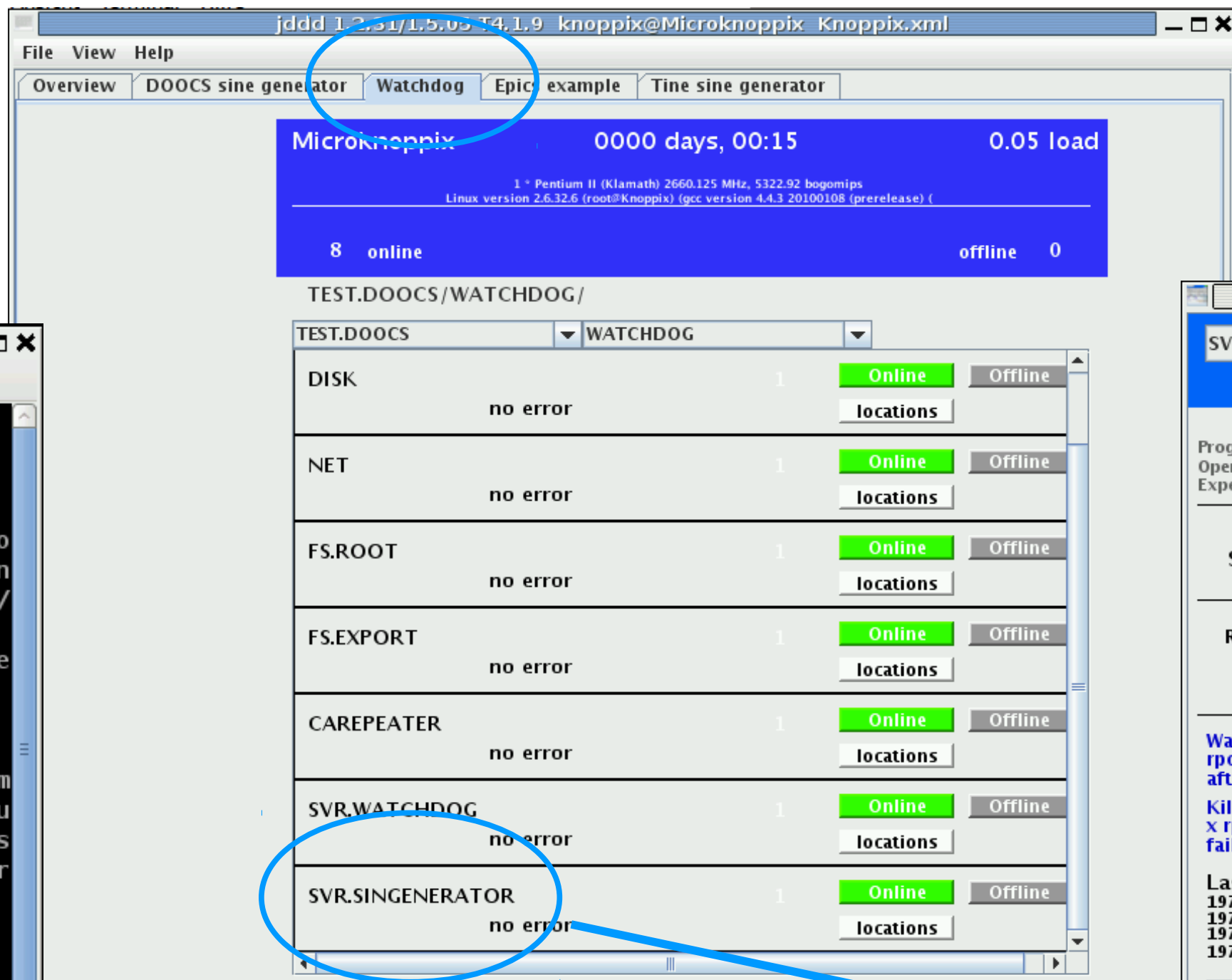
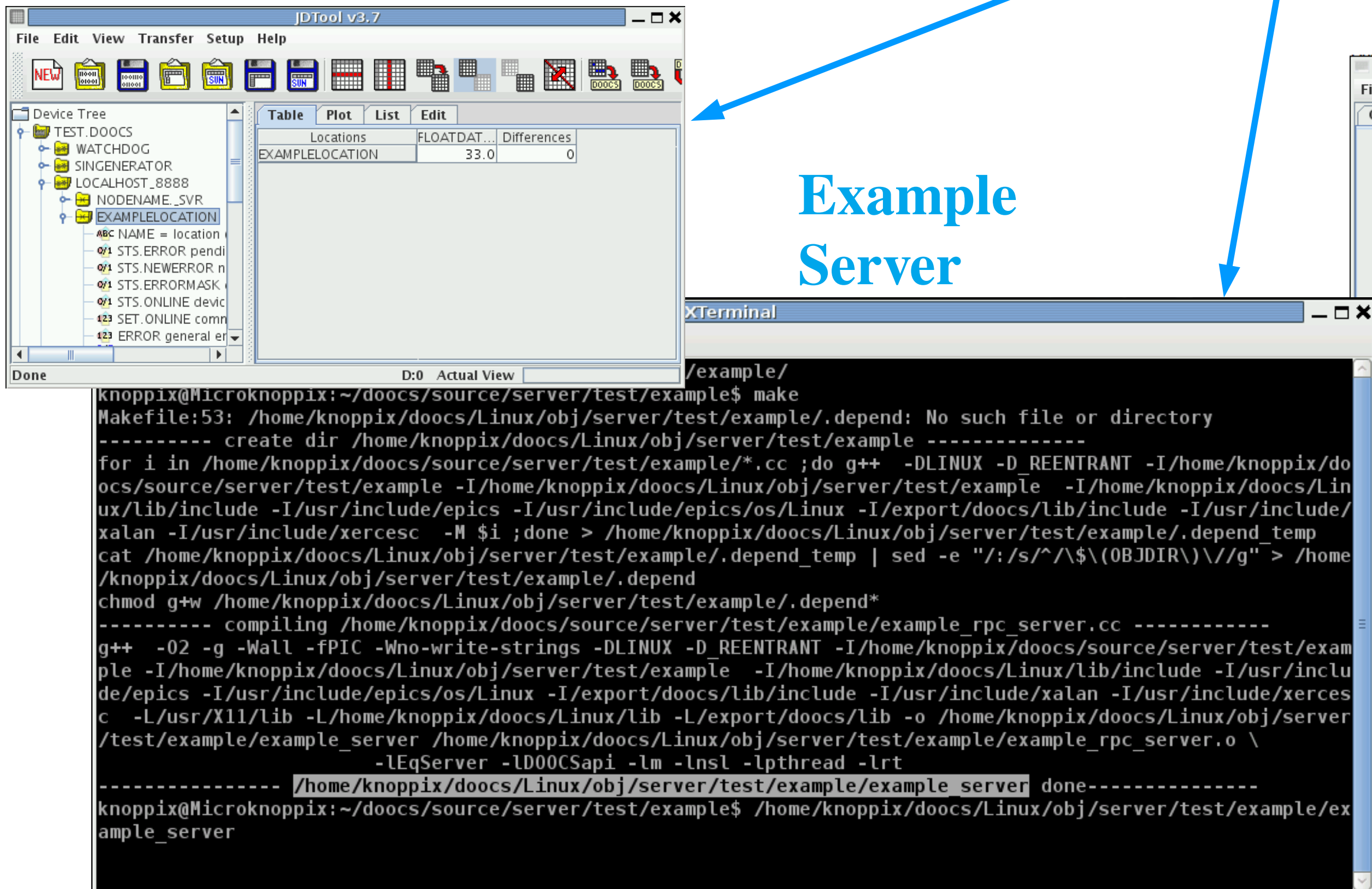
- Setting up for remastering
 - Boot from the KNOPPIX CD
 - Open a root shell
 - Copy the content to an existing disk directory
- Setup and work in the Chroot environment
 - Internet access is available
 - Install all control system and other software
 - Modify user settings, change KNOPPIX auto-config
 - Change startup text, boot graphics, autostart programs
- Build compressed CD/DVD boot image
- Burn the image to CD or DVD
- http://www.knoppix.net/wiki/Knoppix_Remastering_Howto

jddd GUI with Examples



Properties Table	
TEST.DOOC/S/GENERATOR/SIN	
common display	SIN
TEST.DOOC/S/GENERATOR/SIN	Value
STS NEWERROR	0
STS ERRORMASK	0
STS ONLINE	1
SET ONLINE	1
ERROR	0
ERROR_STR	OK
STS	8
SVS_MASK	1
FCT_CODE	100
Z_POS	0.0
Z_POS_STRING	September 29, 2010 8:54:2...
LAST_UPDATE	January 1, 1970 12:00:00 A...
UPDATE_THREAD	1009
DEVICE INFO	D4
SVR_ADDR	TEST.DOOC/S/GENERATOR...
DATA	-3.0293717
DATA_DESC	SINGEN
DATA_T	SIN(X)
DATA_T LIST	
DATA_T SAVE	
DATA_T COMMENT	SIN(X)
DATA_T ECU	a.u.
DATA_T YEGU	a.u.
DATA_IN	1.0
DATA_AMPL	7.65
DATA_FREQ	4.0
DATA_PHASESHIFT	2.0
DATA_NOISE	0.0
DATA_SAMPLE	1207
DATA_HST	TDS array/length = 1004
DATA_FILTER	0.0 0.0 0.0 0.0

Example Server



WatchdogSvr.xml TEST.DOOC/WATCHDOG/SVR.SI	
SVRS/GENERATOR	1 Online
no error	
Program: 486 486	PID: NICE: PRI: STAT: 2205 msec
Operator: 0 0	2470 0 20 2
SIZE: 126940 kb	RSIZE: 5872 kb
START-SIZE: 126776 kb	RESET STARTUP-SIZE
CPU-UTIL: 4.40 %	time
Restarts (RPC: 2 Nr.	rpc check: true
SVR Errors: 0	rpc check svr errors: true
RPC_LIBNO: 610489824	SVR LOC: LOCALHOST_SVR
Waittime for	120 Min
after start	150 Min
Kill after	2 Min
% RPC check	tail log
fails	show log
Server authorisation	Start Server
Server stat	Kill Server
Last Start Times:	
1978-01-01 00:00:00	/export/doors/server/singenerator_server
1978-01-01 00:00:00	TEST.DOOC/S/GENERATOR/LOCALHOST_SVR/
1978-01-01 00:00:00	/export/doors/server/doors start singenerator_server
1978-01-01 00:00:00	/export/doors/server/singenerator_server/singenerator_server PID