

# TINE Release 5.2.7 News

(Nov 28, 2023: inching toward perfection ...)

It's been a while, but ...

**“Remember:** *Only the dead fish go with the flow ...”*



# [ Release 5.2.7 ]

- Officially Open Source !
- Fixes, Features, and Issues ...
  - *exotica* : diagnostic improvements
  - *new features*
  - some doocs/jddd issues
  - Bug-of-the-Year !

# [ Release 5.2.7 ]

## ■ Diagnostic improvements

- Commands.log -> prints more input to log file (up to 512 chars) ...
- e.g. BPM (Libera) server :

```
tail commands.log
24.11.23 16:19:04.987 CET[COMMAND] (LBREQM)/BPM_OL_72[FLAGDISA] called by PETRACON from
131.169.151.55:8061; input: 0
24.11.23 16:21:13.903 CET[COMMAND] (LBREQM)/BPM_SWR_13[envagc] called by PE.TOPUP from
131.169.151.126:8053; input: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0
25.11.23 07:01:32.058 CET[COMMAND] (LBREQM)/BPM_SWR_13[envagc] called by PE.TOPUP from
131.169.151.126:8053; input: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1
25.11.23 07:03:52.194 CET[COMMAND] (LBREQM)/BPM_SWR_13[envagc] called by PE.TOPUP from
131.169.151.126:8053; input: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0
```



# Release 5.2.7

CMDs icon on Acop Status Bar collects commands log entries ...

**379.2 MeV**  
**0.16 mA**

**73.59 kV**  
RF 125 MHz

**0.30 kV**  
RF 10.4 MHz

Cycles : 0

IMD-PIA20

Kickers

Inj2 M M2 C2 PIA M C

Linac2 M C BH BV M1 C1

RF (MW) 10.1 0.0

Kly. V (kV) 209.0 0.0

PFN (kV) 29.4 0.0

Phase 74.1 21

interback Servo SLED bend klystron

**- LINAC II Cockpit -**

PETRA PETRA TOPUP TESTBEAM BKR **Kein Bedarf**

7  
6  
5

Recent Commands List

depth : 100 lines highlight : last access : 11/27/2023 11:20:16 AM Refresh Print

```
27.11.2023 11:20:14.112 : (RFGU2)/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:20:14.112 : /LINAC2/RFGun2/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:20:12.848 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 1
27.11.2023 11:19:43.458 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 0
27.11.2023 11:19:20.925 : (RFGU2)/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:19:20.925 : /LINAC2/RFGun2/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:19:19.636 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 1
27.11.2023 11:18:49.404 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 0
27.11.2023 11:18:26.128 : /LINAC2/RFGun2/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:18:26.128 : (RFGU2)/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:18:25.231 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 1
27.11.2023 11:17:55.647 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 0
27.11.2023 11:17:33.435 : (RFGU2)/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:17:33.435 : /LINAC2/RFGun2/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:17:32.396 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 1
27.11.2023 11:17:01.999 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 0
27.11.2023 11:16:39.257 : (RFGU2)/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:16:39.257 : /LINAC2/RFGun2/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:16:38.099 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 1
27.11.2023 11:16:08.436 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 0
27.11.2023 11:15:46.015 : /LINAC2/RFGun2/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:15:46.015 : (RFGU2)/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:15:45.196 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 1
27.11.2023 11:15:16.316 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 0
27.11.2023 11:14:54.288 : /LINAC2/RFGun2/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:14:54.288 : (RFGU2)/Gun W/BiasPulseVoltage1 called by UMSMA.5 from addr 131.169.154.35:8057 : 1 FLOAT element; input: 135.0
27.11.2023 11:14:53.443 : (STR001)/Strahlbedarf PetraBedarf called by PE.TOPUP from addr 131.169.151.126:8053 : 1 INT32 element; input: 1
```

Server	Time Last Command	User
/LINAC2/RFGun	27.11.2023 11:20:14.112	77
/LINAC2/RFGun2	27.11.2023 11:20:14.112	77
/LINAC2/Modulator	26.11.2023 13:34:33.140	99

Linac2 / PIA  
Bereit

ID 3911

Beam DESY PIA

Pcls. 0.10

Pwr.Con. 622.28 kW

beam permission

mag. curr. perm.

year: 99 2847

Print Expert MCS10DUVAL01 Acop.net 3.8.13 27-Nov-2023 11:21:53

# Release 5.2.7

## New stuff ...

- Remember the *umlaut problem*?
  - Umlaut killer now applied to structure fields !
- *Boolean parser* (strtobool()) now accepts a number as the input string
  - any pure number != 0 is TRUE.
  - any string != 'true', 'yes', 'on' is FALSE.
- Useful C routines:
  - char \***GetRegisteredExportName**(char \*eqm);
  - char \***GetRegisteredContext**(char \*eqm);
  - int **GetFormatSizeInBytesFromDataType**(DTYPE \*d);
- ***Some problems aren't bugs ....***
  - Acop Chart (*java*) now checks when an attempt to draw > 16000 points whether the screen display parameter = 100% or not !



# [ Release 5.2.7 ]




The screenshot shows the Windows Settings application with the 'Display' category selected in the left-hand navigation pane. The main content area is titled 'Display' and includes a 'Get help' link. Under the 'Color' section, the 'Night light' toggle is turned off, with a link to 'Night light settings'. The 'Windows HD Color' section provides information about HDR support and a link to 'Windows HD Color settings'. The 'Scale and layout' section is expanded, showing a dropdown menu for 'Change the size of text, apps, and other items' with options: 100% (Recommended), 125%, 150%, 175%, and 200%. Below this, the 'Display orientation' dropdown is set to 'Landscape'.



# Release 5.2.7

The screenshot shows the 'Transient Recorder Viewer: PETRA' application window. The main plot area displays a signal trace with a vertical red line at approximately 0.25 seconds. A dialog box titled 'plot data ...' is overlaid on the plot, containing the following text:

 The data to be plotted (209715 points) is very large and the monitor display scale is NOT set to 100%! This can result in a significant wait. Consider adjusting the display settings so that windows are displayed at 100%.

continue ?

The background interface includes a menu bar (File, Navigate, Options, Help), a configuration panel on the right with sections for 'Local Configurations', 'Central Configurations', and 'Events', and a table of event data at the bottom right.

<input checked="" type="checkbox"/>	OK	PE_O_FB/Verstaerker5/V...	1948	7.26	W
<input checked="" type="checkbox"/>	OK	PE_O_FB/Verstaerker6/V...	1948	11.85	W
<input checked="" type="checkbox"/>	OK	PE_O_FB/Verstaerker7/V...	1948	10.29	W
<input checked="" type="checkbox"/>	OK	PE_O_FB/Verstaerker8/V...	1948	10.49	W

At the bottom of the window, a status bar reads: 12:04:10: Event data for selected channels loaded.



# [ Release 5.2.7 ]

- On to the Bug/Problem of the year ...  
(well ... maybe of the summer ...)



# [ Release 5.2.7 ]

## Short review :

- **How to make the most efficient use of your server CPU and the network ...**
  - use ***publish-subscribe*** (a client-side monitor)
    - Server only sees 1 contract for data of interest for all its N clients
    - a server can coerce this !
  - make use of ***multi-channel arrays*** where applicable!
    - Server only sees 1 contract for e.g. all vacuum pumps instead of e.g. 600.
    - a server can coerce this !
  - make use of ***multicast access***
    - Server sees only 1 client instead of N clients
    - a server can coerce this !
  
- And a VxWorks server (LTG-VXW) was doing all of this !

# [ Release 5.2.7 ]

- **The problem:**
  - **Popular (VxWorks) server** (with lots of clients) !
  - **Upgrade** from **Release 4** to **Release 5**
    - (and with all of those clients still up and running)
    - n.b. *The protocol headers are different!*
  - **As a Release 4** server:
    - a multicast contract only saw R4 headers
  - **As a Release 5** server:
    - saw multiple re-connections from all of those clients
    - tried to make a decision whether to use R4 or R5 headers
    - Multiple simultaneous contract renewals could end up seeing the wrong protocol level for the multicast contract and misinterpreted the request
    - Attempted to allocate a crazy number (several gigabytes) of data
    - VxWorks has different memory management than e.g. Linux or Windows and 'took issue' with this !

# [ Release 5.2.7 ]

- The solution:
  - A **Release 5** server now only multicasts with **Release 5** headers !!!
    - No more 'Mr. Nice Guy' ...
    - Clients attempting to establish a multicast contract and using **Release 4** headers receive will now receive a *not\_accepted* status code !
  - A true **Release 4** client (are there still any?) will just have to upgrade!

# Release 5.2.7

- TINE/DOOCS issues => see [TINE Control System \(desy.de\)](https://tine.desy.de)

The screenshot shows a web browser window with the URL <https://tine.desy.de/doocs2tine.html>. The browser's address bar and navigation icons are visible at the top. Below the address bar is a navigation menu with links: [Main Page](#) | [Features](#) | [Central Services](#) | [csv-Files](#) | [Types](#) | [Transfer](#) | [Access](#) | [API-C](#) | [API-.NET](#) | [API-Java](#) | [Examples](#) | [Downloads](#). Below the navigation menu, the page is dated "page generated on 27.11.2023 - 04:45". The main heading of the page is "Running DOOCS Servers via TINE / Accessing TINE Servers from DOOCS". The text below the heading discusses the challenges of using DOOCS servers and interfacing with them using TINE server and clients, mentioning "impedance mismatches" and "setup configuration parameters". A "Note" section states: "This page is a work in progress." The next section is titled "Some Rules about Names" and explains the DOOCS naming hierarchy (facility / device / location / property) and how it differs from the TINE naming hierarchy (/context/server/device[property]). It also discusses the mapping of DOOCS facility to TINE context and the use of slashes in addresses. The final section is titled "Subsystems".

← ↻ 🏠 🔒 <https://tine.desy.de/doocs2tine.html> 📄 📱 🔍 🌟 📄 📌 📄 📄 ..

[Main Page](#) | [Features](#) | [Central Services](#) | [csv-Files](#) | [Types](#) | [Transfer](#) | [Access](#) | [API-C](#) | [API-.NET](#) | [API-Java](#) | [Examples](#) | [Downloads](#)

page generated on 27.11.2023 - 04:45

## Running DOOCS Servers via TINE / Accessing TINE Servers from DOOCS

If you are more used to using doocs servers and/or interfacing with them using doocs clients than using TINE server and clients, then you may encounter *impedance mismatches* concerning expected systematics or otherwise be unaware of *setup* configuration parameters which could make life easier.

We will try to address some of the most common questions and issues below.

**Note**  
This page is a work in progress.

## Some Rules about Names

The DOOCS naming hierarchy follows the pattern *facility / device / location / property*. At first glance this appears to be a good match to the TINE naming hierarchy, which follows the pattern */context/server/device[property]*, with the notable points of possible confusion. i.e. what DOOCS calls a **device** is what TINE calls a **server**. And what DOOCS calls a **location** is what TINE calls a **device**.

The DOOCS **facility** maps to the TINE **context**, with a caveat (discussed below) concerning the *subsystem*.

Both DOOCS and TINE refer to a **property**, which is a coverall term for an *attribute*, a *method*, or a *command*, i.e. something which can be *called*, and as a point of fact, is the *purpose* of the call. To this end, a TINE *address key* will likely enclose the *property* in *brackets*, as opposed to merely placing at the end of an address hierarchy with the *'/'* separator. However (please note!) most if not all TINE API calls which take a *full* address will also accept the address key with only *'/'* separators.

And about those slashes (*'/'*) ? ...

The DOOCS APIs expect an address name to begin with *facility*, without a leading *'/'*, and all addresses must be fully qualified, i.e. of the form *facility/device/location/property*. The TINE APIs on the other hand expect a fully qualified address name to begin with a leading *'/'*, i.e. of the form */context/server/device[property]* (or */context/server/device/property* if you insist). This is in loose analogy with a unix file system file name, where the leading *'/'* indicates an absolute path. If you omit the leading *'/'*, then the address specification is not *fully qualified* and the initial address name is taken to be a *server* name and the *context* is assumed to have been omitted, thereby signaling the TINE ENS to find this server independent of *context*. This will work if the server in fact exists in only a single context. If the same server name appears in multiple contexts (as for instance as the central alarm server CAS might), then such an incomplete address will result in the error: *ambiguous*. Otherwise it is occasionally useful to omit the context name in certain APIs.

### Subsystems

# Release 5.2.7

## ■ PyTine news ...

- PyTine.register\_server()
  - now takes more parameters !
    - description, location, hardware, responsible, port
  - can skip PyTine.register\_fec() !

```
Python 3.8.5 Shell
File Edit Shell Debug Options Window Help
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:57:54) [MSC v.1924 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> import PyTine
>>> PyTine.register_server()
Traceback (most recent call last):
  File "<pyshell#1>", line 1, in <module>
    PyTine.register_server()
  File "<string>", line None
SyntaxError: PyTine.register_server(name='str',[,context='str',eqm='str',capacity=val, fec='str', subsystem='str'
,description='str',location='str',hardware='str',responsible='str',port=val])
>>> |
```

Ln: 10 Col: 4

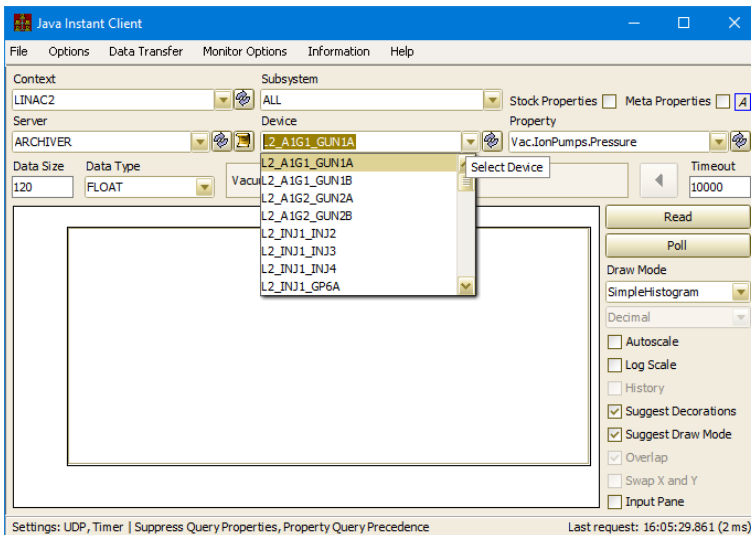


# Release 5.2.7

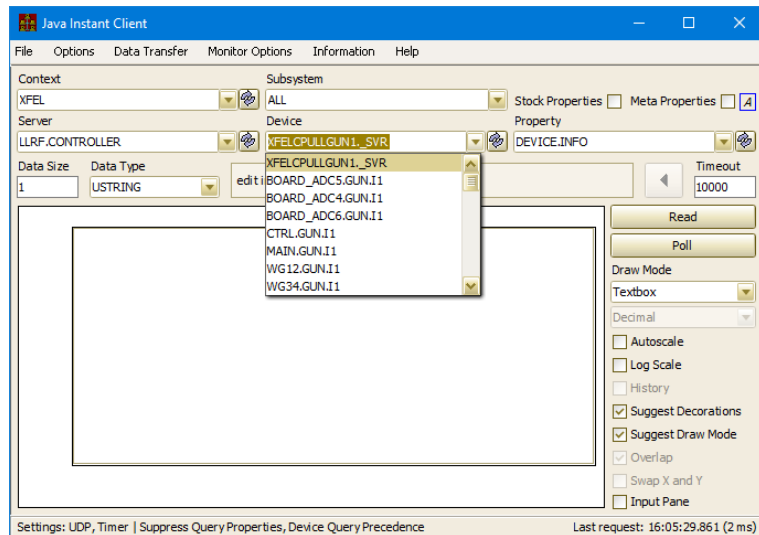
## ■ Repeater news :

- Learns about Device or Property Query Precedence
  - Most servers are 'flat' : each device supports all properties; each property is valid for all devices.

### Classic property server :

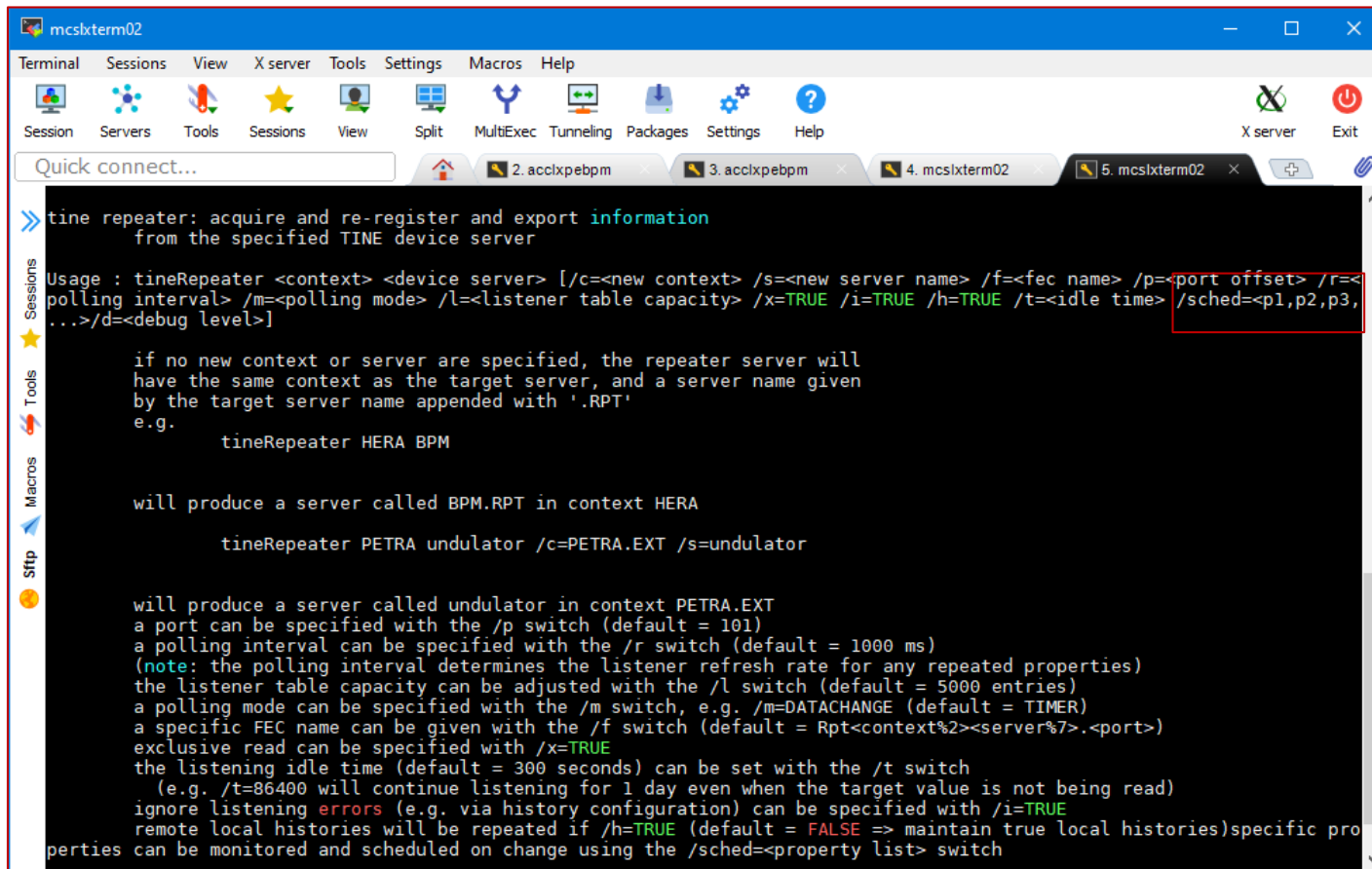


### Classic device server :



# Release 5.2.7

- Repeater news :
  - BTW: can also repeat doocs servers ...
  - Can now schedule properties :



```
>> tine repeater: acquire and re-register and export information
    from the specified TINE device server

Usage : tineRepeater <context> <device server> [/c=<new context> /s=<new server name> /f=<fec name> /p=<port offset> /r=<
polling interval> /m=<polling mode> /l=<listener table capacity> /x=TRUE /i=TRUE /h=TRUE /t=<idle time> /sched=<p1,p2,p3,
...>/d=<debug level>]

if no new context or server are specified, the repeater server will
have the same context as the target server, and a server name given
by the target server name appended with '.RPT'
e.g.

    tineRepeater HERA BPM

will produce a server called BPM.RPT in context HERA

    tineRepeater PETRA undulator /c=PETRA.EXT /s=undulator

will produce a server called undulator in context PETRA.EXT
a port can be specified with the /p switch (default = 101)
a polling interval can be specified with the /r switch (default = 1000 ms)
(note: the polling interval determines the listener refresh rate for any repeated properties)
the listener table capacity can be adjusted with the /l switch (default = 5000 entries)
a polling mode can be specified with the /m switch, e.g. /m=DATACHANGE (default = TIMER)
a specific FEC name can be given with the /f switch (default = Rpt<context%2><server%7>.<port>)
exclusive read can be specified with /x=TRUE
the listening idle time (default = 300 seconds) can be set with the /t switch
(e.g. /t=86400 will continue listening for 1 day even when the target value is not being read)
ignore listening errors (e.g. via history configuration) can be specified with /i=TRUE
remote local histories will be repeated if /h=TRUE (default = FALSE => maintain true local histories)specific pro
perties can be monitored and scheduled on change using the /sched=<property list> switch
```

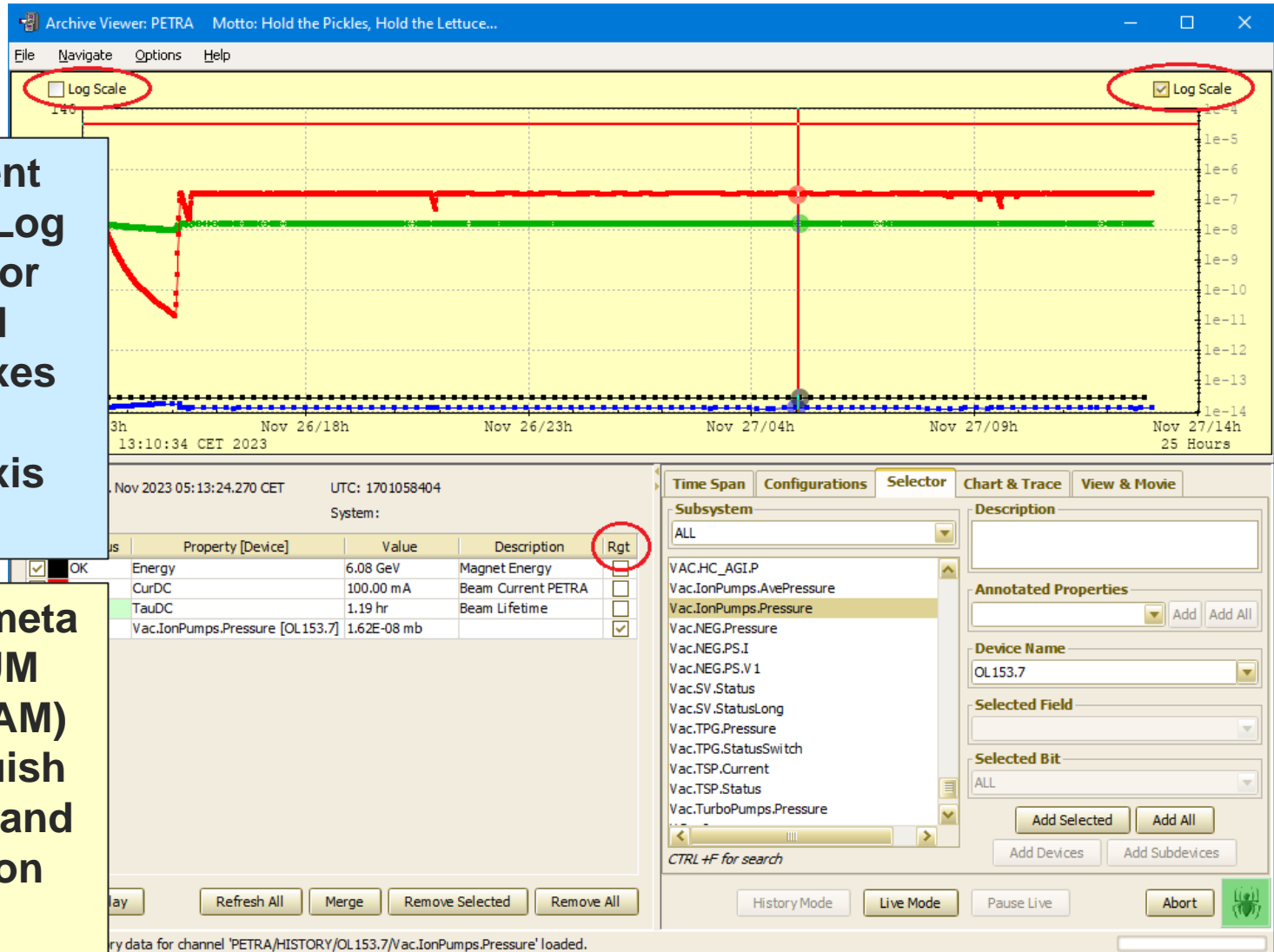


# TINE Studio : Archive Viewer

**Independent**

- Lin vs. Log option for Left and Right axes
- Left vs. Right axis option

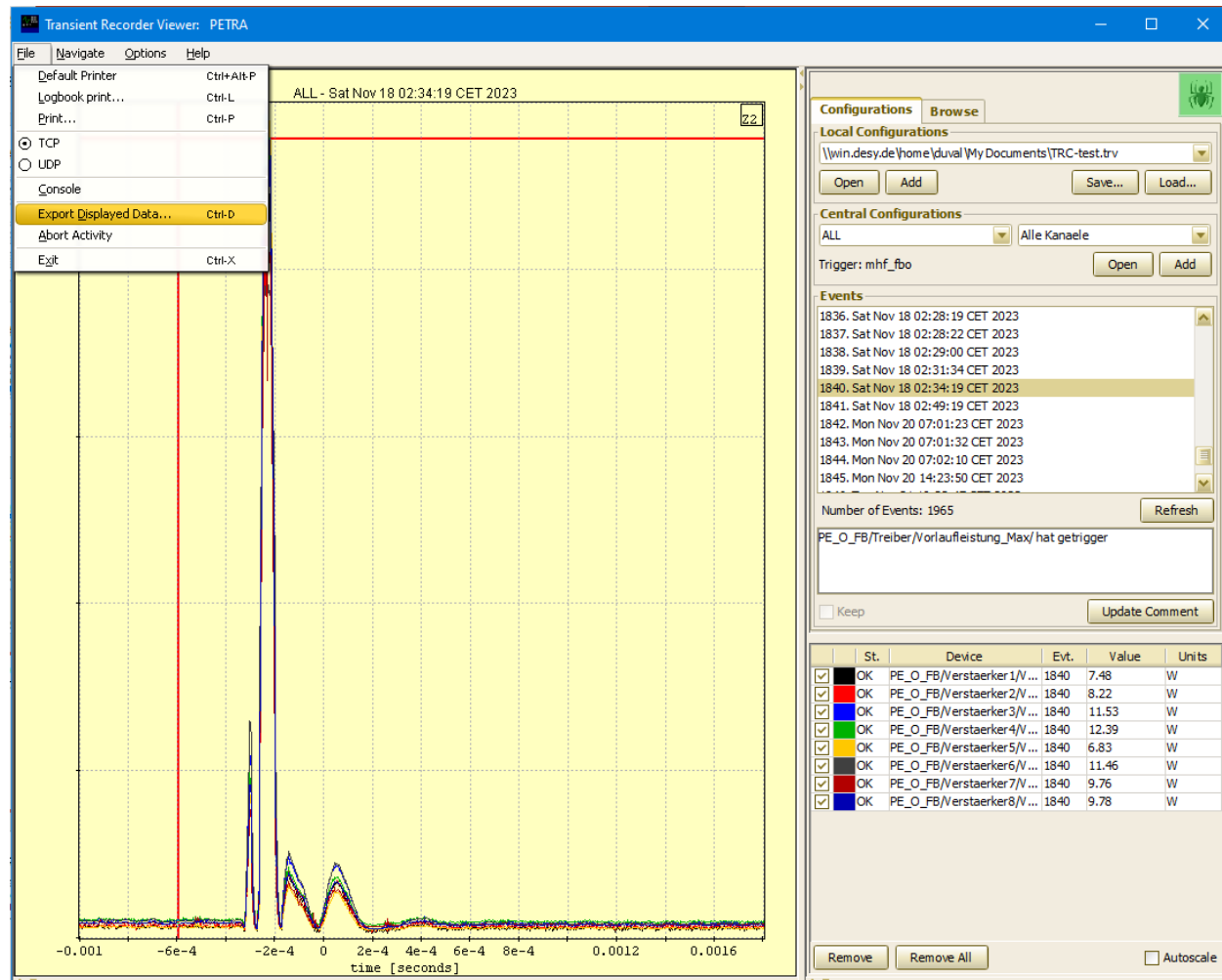
**Separate meta tags (.ENUM and .BITNAM) to distinguish bit names and enumeration names**





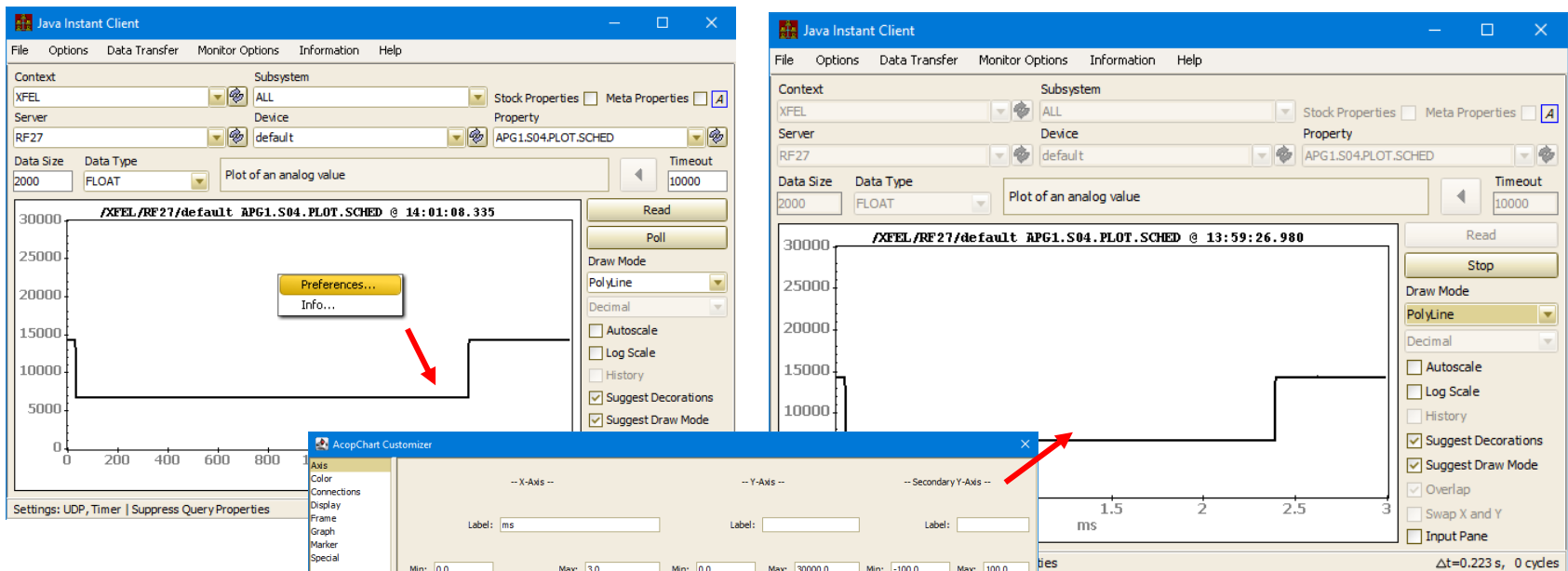
# TINE Studio : Transient Recorder Viewer

Export the displayed data to .csv File :



# TINE Studio: Instant Client

- Sticky settings for repetitive reads of same address parameters



When the X-axis settings are not registered with property ...

# [ Odds and Ends ]

- TINE\_RESTful

- http, xml, JSON (returns text)

New !

- &content=JSONOBJECTS

- web apps using IONIC, REACT ...

- (will get to that in a minute)

- How rusty is your TINE ?



# [ Odds and Ends ]

## Short review :

### ■ Buffered Services

- (tbufsrv.dll / libtbufsrv.so)
- **client-side**
  - reflected memory strategy
  - synchronous call -> listener
- **server-side** (the buffered server!)
  - simple single-equipment module server
    - separately buffered input/output handling for all registered properties.
    - really easy-to-use API ...
- Used in interfaces to :
  - C/C++ directly (e.g. DESY2 Test Beam)
  - LabView (PETRA/DESY2 RF + ...)
  - MatLab (various)
  - Python (various)
  - Rust (?)

# Odds and Ends

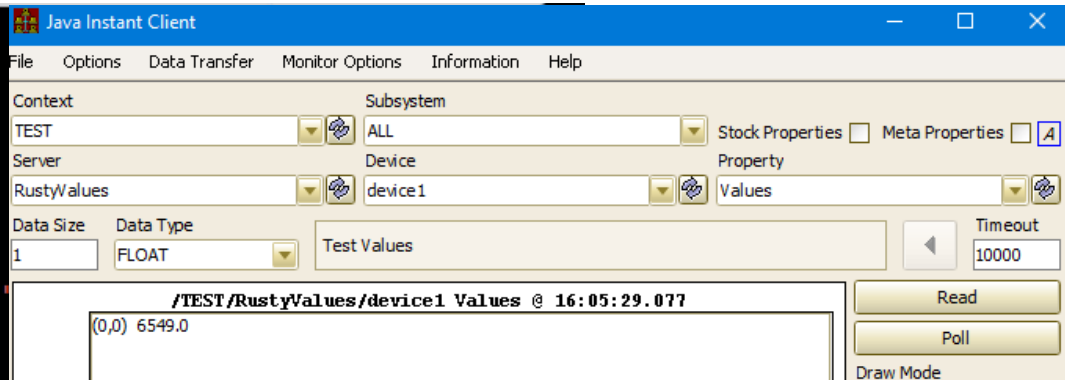
- Anybody interested in a RUST API ?

```
use std::io::{stdin, BufRead, Result};
use std::thread::sleep;
use std::time::{Duration, Instant};
use tiner::Get;
use tiner::GetKeyVal;
use tiner::attach_server;
use tiner::push_values;

fn main() {
    println!("crank up that rusty server!");
    let v: f32=0.0;
    let mut vec = Vec::new();
    vec.push(v);
    GetKeyVal::new("/TEST/SineServer/SineGen0[Amplitude]", &vec).get();

    for x in vec.iter() {
        println!("> {}", x);
    }
    attach_server();

    push_values("Values".to_string(),"device1".to_string(),&vec,1,1);
    let interval = Duration::from_secs(1);
    loop {
        sleep(interval);
        vec[0]= vec[0]+1.0;
        push_values("Values".to_string(),"device1".to_string(),&vec,1,1);
    }
}
```



## Reads fec.xml

- mhf (labview usually reads a set of .csv config files)
- many python servers register per API.

# [ Odds and Ends ]

- What's new at EMBL ?