

elog

An electronic Logbook by Stefan Ritt

Presented by
Kenneth Nielsen
2017-03-01



What do we think of as an electronic logbook?

- A place for chronological entries
- 0, 1 or more entries per day
- An entry can contain:
 - A free text field
 - Metadata (date, operator, setup or experiment specifics, data ID, etc.)
 - Attachments

Our requirements

- Digital version of the traditional logbook
- Key motivation is searchable entries and metadata
- Entries for experiments and setup changes and maintenance
- Preferably user configured
 - Especially metadata fields
- Support for attachments
- Must be open source and with transparent and/or easily parseable data format

A brief detour past Red Notebook

- <http://rednotebook.sourceforge.net/>
- A journal application (i.e. for travel and day-to-day accounts)
- Entries and searchable
- No notion of metadata :(
- An actual (cross platform) application that ran on lab computers
 - Unfortunately not very easy to share and move data
- Ultimately a bad decision

Our requirements

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- Key motivation is searchable entries and metadata
- Entries for experiments and setup changes and maintenance
- Preferably user configured
 - Especially metadata fields
- Support for attachments
- Must be open source and with transparent and/or easily parseable data format
- **Easily available from multiple locations ---> web based**

Brings us to elog

● <https://midas.psi.ch/elog/>

Several logbooks are defined on this host.
Please select the one to connect to:

Logbook	Entries	Last submission
Theta-Probe Angle Resolved XPS	137	Thu Feb 16 14:48:09 2017
XRD X-Ray Diffraction Spectrometry	75	Thu Feb 16 14:05:59 2017
Time Of FlightMS Time Of Flight Mass Spectrometer	148	Mon Feb 27 17:32:18 2017 by Ann-Louise
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Ammonia Synthesis Ammonia Synthesis	174	Tue Jun 10 09:42:49 2014 by Tobias
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Muffle Furnace 307 CINF muffle Furnace	0	-
Tower Tower	701	2016-08-11 13:36

Theta-Probe | XRD | Time Of FlightMS | STM 312 | PS | omicron | Microreactor | MicroreactorNG | Ammonia Synthesis | FurnaceRoom307 | Muffle Furnace 307 | Tower

Angle Resolved XPS, Page 1 of 7

New | Find | Select | Import | Config | Last day | Help

Full | Summary | Threaded | Hide attachments

-- All entries -- | -- Customer -- | 137 Entries

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ID	Date	Record date	Operator	Technique	Project Root	Project Name	Measurement Name	Customer	Sample
137	Thu Feb 16 14:48:09 2017	Thu Feb 16 14:45:45 2017	Eriend	XPS	C:\Data\Eriend	Cu-poly	20170116-Cupoly_foils		6xCu-poly foil
XPS * Point 1 - Survey. * Point 2 (initial Z 1829.0 µm) - Survey. * Point 3 (initial Z 2184.0 µm) - Survey. * Point 4 (initial Z 1583.0 µm) - Survey, Cu2p, C1s, Si2p, Au4f, Cl2p, Pb4f, Fe2p, Co2p. * Point 5 (initial Z 2002.5 µm) - Survey. * Point 6 (initial Z 1928.5 µm) - Survey.									
136	Mon Feb 6 15:40:47 2017	Mon Feb 6 15:27:11 2017	Thomas Hogg (supervised by Kenneth)	XPS Sputtering Sputter Profile	C:\Data\Student exercises\SurfSci2017	group9	Electropolished Cu poly		Electropolished Cu poly
Electropolished polycrystalline Cu (90s each side) in 30 % H3PO4 and rinsed with Ar bubbled milli Q water. * Copper center 1 (for SurfSci exercise)(on 01-02-2017) - Survey - Ion beam etch (600 s) - Survey after sputtering - C1s scan - Cu2p scan * Point (new point for research)(on 06-02-2017) - Survey - EX05 Depth Profile (40 layers of 20 s each) > C1s scan > O1s scan > Cu2p scan									
135	Thu Jan 12 17:40:58 2017	Thu Jan 12 17:35:15 2017	Eriend	XPS	C:\Data\Eriend	Cu-poly	201712-Cupoly_foils-Cu110_disks		7xCu-poly foils, 2xCu110 disks
XPS * Point 1 (initial Z 1883.0 µm) - Survey, Cu2p, C1s, Si2p, Au4f, Cl2p. * Point 2 (initial Z 1456.0 µm) - Survey, Cu2p, C1s, Si2p, Au4f, Cl2p. * Point 3 (initial Z 1219.5 µm) - Survey, Cu2p, C1s, Si2p, Au4f, Cl2p. * Point 4 (initial Z 1864.0 µm) - Survey, Cu2p, C1s, Si2p, Au4f, Cl2p. * Point 5 (initial Z 1154.5 µm) - Survey, Cu2p, C1s, Si2p, Au4f, Cl2p.									

What makes elog special

more or less from the web page

- **It's simple**
 - No need for an experienced server operator or a relational database
 - Simple text based configuration file
 - Just a single executable (no server setup)
- **It's versatile**
 - Flexible configuration of fields and display
 - Means that it can be setup for many different purposes

Possible applications

also more or less from the webpage

- Personal log books
- Shared log books
- Shift log books (append only log book)

Behind the scenes, the database

- elog writes entries out to one file per day, where the main text is either plain text, html or elogs own plain text format
- No relational database is involved
- Backup is thus a simple file backup
- “Data escape” is very simple and always possible

```
$@MID@S: 1
Date: Wed, 21 Jan 2015 10:47:40 +0100
Record date: 1421833034
Operator: Kenneth
Technique: XPS | Flood Gun
Project Root: c:\Data\Rasmus
Project Name: MnTiOx
Measurement Name: MnTiOx_21-1-2015
Customer: Rasmus Frydendal
Sample: Various MnTiOx and Mn2O3 with Au
Attachment:
Encoding: plain
=====
Flood gun with setting "Charge neutralization delicate sample" at 1.0E-7 mbar Ar for surveys. Argon pressure ~6.5E-8 mbar for all remaining spectra.
XPS

* Mn2O3 12% Au on GC as prep #1
  - Survey, (survey smaller pressure*), Mn2p, Mn3s+Au4f, 01s, C1s, Au4d
* MnO3 on GC as prep #2
  - Survey, Mn2p, Mn3s+Au4f, 01s, C1s, Hg4f
* Mn2O3 on GC tested KOH #3
  - Survey, Mn3s+Au4f, 01s, C1s, Hg4f
* MnTiOx on Au as prep #10
  - Survey, Mn3s+Au4f, 01s, C1s, Ti2p
* Mn2O3 23%Au as prep #9
  - Survey, Mn3s+Au4f, 01s, C1s, Au4d, Hg4f
* Mn2O3 23%Au testek KOH #8
  - Survey, Mn3s+Au4f, 01s, C1s, Au4d, Hg4f

* The smaller pressure is a floodgun Ar pressure of 3.0E-8
```

Behind the scenes, the configuration file

```
Theme = default
Comment = Angle Resolved XPS
Attributes = Record date, Operator, Technique, Project Root, Project Name, Measurement Name, Customer, Sample
MOptions Technique = XPS, AR-XPS, ISS, UPS, Sputtering, Sputter Profile, Flood Gun, Maintenance/Repair, Bake, Other
Type Record date = datetime
Preset Record date = $date
Date format = %Y-%m-%d %H:%M
Required Attributes = Record Date, Operator, Technique, Project Root, Project Name, Measurement Name
Page Title = ELOG - $subject
Reverse sort = 1
Quick filter = Date, Customer
RSS Title = $Technique on $Sample for $Customer, entered by $Operator on $entry time
Default encoding = 1
```

XPS AR-XPS ISS UPS Sputtering Sputter Profile Flood Gun Maintenance/Repair Bake Other

- Simple text based configuration file format
- Used to configure attributes names (metadata fields) and formats
- Attribute types and default values
- Attribute selection
 - free
 - select from multiple, (dropdown)
 - select multiple from multiple (checkboxes)

Different faces

[Demo!](#) [Discussion Forum](#) [Config Examples](#) | [Contributions](#) | [Vulnerabilities](#)
 Discussion forum about ELOG, Page 1 of 166 Logged in as "Stefan Ritt" [ELOG](#)

[New](#) | [Find](#) | [Select](#) | [Import](#) | [Config](#) | [Logout](#) | [Last day](#) | [Help](#)

[Full](#) | [Summary](#) | [Threaded](#) | [Collapse](#) | [Expand](#) All entries -- Category -- Text -- 1923 Entries

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- [Link to full resolution image attachments](#), posted by Eric Quintero on Mon Jan 26 23:13:47 2015
- [calculate the value of one attribute depending upon the value of other attribute](#), posted by dev on Thu Jan 22 17:27:47 2015
 - Re: calculate the value of one attribute depending upon the value of other attribute, posted by Andreas Luedeke on Mon Jan 26 15:56:41 2015
 - Re: calculate the value of one attribute depending upon the value of other attribute, posted by dev on Mon Jan 26 19:24:02 2015
- [how to calculate the time](#), posted by dev on Mon Jan 26 15:46:04 2015
- [Kerberos auth not available on 3.0 ?](#), posted by Malcoik Kein on Mon Jan 26 10:30:40 2015
 - Re: Kerberos auth not available on 3.0 ?, posted by Andreas Luedeke on Mon Jan 26 15:04:38 2015
 - Re: Kerberos auth not available on 3.0 ?, posted by Malcoik Kein on Mon Jan 26 15:06:49 2015
- [Configure default time range in 'Find'](#), posted by Eoin Butler on Fri Jan 16 13:41:18 2015
 - Re: Configure default time range in 'Find', posted by Stefan Ritt on Fri Jan 16 14:29:58 2015
 - Re: Configure default time range in 'Find', posted by Eoin Butler on Mon Jan 19 11:09:31 2015
- [Configure default time range in 'Find'](#), posted by David Pilgram on Mon Jan 19 17:17:32 2015
 - Re: Configure default time range in 'Find', posted by David Pilgram on Tue Jan 20 00:58:58 2015
 - Re: Configure default time range in 'Find', posted by Stefan Ritt on Thu Jan 22 16:30:07 2015
 - Re: Configure default time range in 'Find', posted by Eoin Butler on Thu Jan 22 17:04:03 2015
 - Re: Configure default time range in 'Find', posted by David Pilgram on Thu Jan 22 17:32:16 2015
- [filter with or operation/TIME DURATION CALCULATION](#), posted by dev on Wed Jan 21 02:15:12 2015
 - Re: filter with or operation/TIME DURATION CALCULATION, posted by Andreas Luedeke on Thu Jan 22 08:35:23 2015
- [Problem with embedded iframes](#), posted by Eric Quintero on Mon Jan 12 23:26:18 2015
 - Re: Problem with embedded iframes, posted by Stefan Ritt on Tue Jan 13 10:10:56 2015
- [notification error services in CentOS 6.5](#), posted by Banata on Tue Jan 13 04:11:33 2015
 - Re: notification error services in CentOS 6.5, posted by Stefan Ritt on Tue Jan 13 10:07:02 2015

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ELOG V3.0.0-930be07

Shift Check List

Tick check boxes when completed - Follow code for each item placed close to item in zone etc.

Author: *Andrey Korenchenko* **Date:** 26 August 2013 **Shift:** Morning

Zone Inspection Hardware Check

AREA (Part1)

(A1) No water leaks, irregular noises, etc. **If yes, please make ELOG entry.**

(A2) BTS flow-meters on wall (Xe-gas tanks) are mid-range ~ **(100+/-20)**

(A3) TC N₂-bag compressed-air pressure on wall is **~0.1 bar (barely visible)** (left of Xe-1000l dewar)

(A4) CEX LH₂-target, 50 l He gas cylinder pressure (must be **>20 bar**) (back-end of area attached to support of COBRA/air-conditioning platform)

DETECTOR HUT

Upstream door

(H1) TC APD low voltage no blinking green lights, **CV: >7.2V, I: ~25-30A** (US-side)

(H2) TC bars HV 2,362 kV

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Not logged in [ELOG](#)

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[Full](#) | [Summary](#) | [Threaded](#) All entries -- Type -- System -- Author -- 3030 Entries

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ID	Date	Run number	Author	Type	System	Subject	Text	U
3211	Fri Apr 4 15:04:36 2014	236003	Stefan Ritt	Question	PCS	End of life for Window xp	Dear all, next week is the end of life for windows	
3210	Fri Jan 24 11:59:05 2014	236003	Stefan Ritt	Info	PIES Area	Electrical Work that may affect part of PIES area + barracks	[quote="Peter-Raymond Kettle"] I have been informed that next Monday 27th January part of the electrical distribution network	
3209	Fri Jan 24 11:46:30 2014	236003	Peter-Raymond Kettle	Info	PIES Area	Electrical Work that may affect part of PIES area + barracks	I have been informed that next Monday 27th January part of the electrical distribution network	
3208	Wed Nov 6 11:17:23 2013	235990	Ryu Sawada	Minor Error	DAQ	Some problems of DAQ	[quote="stefan ritt"] Actually better disable the beamline, otherwise	
3207	Wed Nov 6 10:39:49 2013	235990	Stefan Ritt	Minor Error	DAQ	Some problems of DAQ	[quote="Ryu Sawada"]Dear all I saw many error messages like,	
3206	Tue Nov 5 17:35:22 2013	235990	Ryu Sawada	Minor Error	DAQ	Some problems of DAQ	Dear all I saw many error messages like,	
3205	Sun Sep 1 15:27:50 2013	235556	Peter-Raymond Kettle	Run Coordinator Message	General	MEG 2013 Run Officially Finished	Dear colleagues,	
3204	Sat Aug 31 22:15:21 2013	235236	Peter-Raymond Kettle	Minor Error	Beamline	intermediate or high intensity beam?	[quote="Alessandro Baldini"]For the current set of ROC test runs the file MEG2013_high_tcentre.sp for the beamline configuration	
3203	Sat Aug 31 22:07:57 2013	235236	Alessandro Baldini	Minor Error	Beamline	intermediate or high intensity beam?	For the current set of ROC test runs the file MEG2013_high_tcentre.sp for the beamline configuration	
3202	Fri Aug 30 14:48:56 2013	234663	Matte Hildebrandt	Info	Gas System	dc flushing with pure He	I switched to pure helium (100 com) for the dc gas system in order to flush out the flammable ethane component. The ethane flow is set as the drift chambers are not needed anymore for the data taking the high voltage was ramped down!	
3201	Fri Aug 30 10:45:18 2013	234658	Matte Hildebrandt	Info	DC	DC high voltage off		

Images from presentation "Seminar at KIT, Karlsruhe, Jan. 2015. [Introduction talk](#) by Stefan Ritt."

http://midas.psi.ch/elog/talks/2015_1_intro.pptx

The way that we use it

- We have a logbook per setup or piece of shared equipment
- Users write one entry per experiment or equipment use
- 2727 entries, 9 MiB of data (attachments exclusive)

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Tower Tower	701	2016-08-11 13:36

It's open source

What does that mean for us?

- Besides from the ideology
- **Open source is the tool that you cannot lose**
 - Companies close, but if the tool is open source, you can take over maintenance
 - (Remember the big Origin scare of 2010'ish?)
- Data in an open format -> You can always get your data
 - Even without the actual tool
- Open source tools are empirically more likely to use standard formats
 - Plain text, XML, YAML, JSON, HDF etc.

It's open source

What does that mean for us?

A tool that does not store data in an open format is **completely unsuitable** for any kind of professional work, especially scientific!

A tool that isn't Open Source is a significant risk of loss of work and is therefore irresponsible!

DEMO

More things elog does

but that we don't use (yet)

Themes

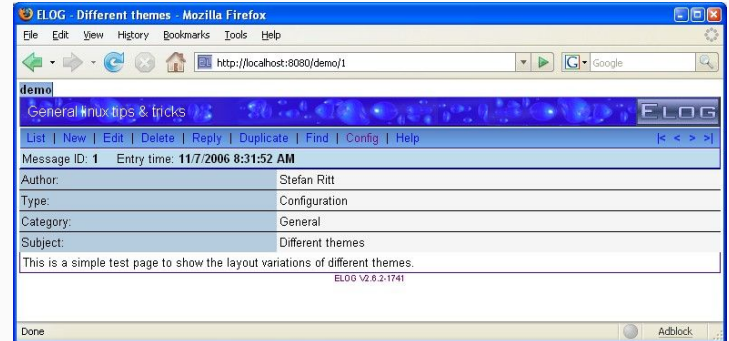
Standard web technology used for theming

CSS = <file.css>

```
/* default formatting */
body {
  margin:3px;
  color:black;
  background-color:white;
  font-family:verdana,tahoma,sans-serif;
  /* background-image:url(elog.gif); */
}
```

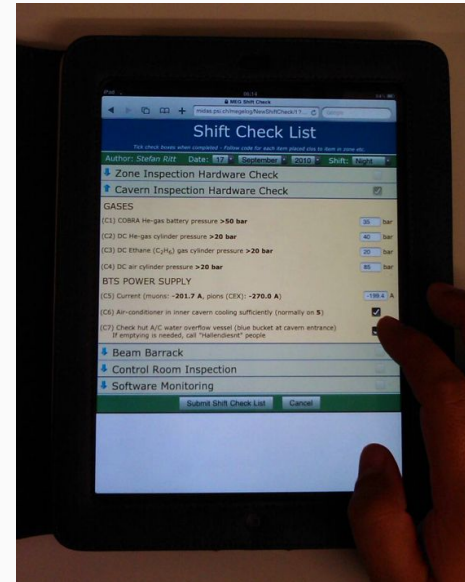
```
/* standard link colors and decorations */
a:link { color:#0000FF;text-decoration:none }
a:visited { color:#800080;text-decoration:none }
a:hover { color:#0000FF;text-decoration:underline }
a:active { color:#0000FF;text-decoration:underline }
a:focus { color:#0000FF;text-decoration:underline }
```

```
td {
  color:black;
  font-size:12px;
}
```



Custom handwritten HTML forms as input

Shift Check List	
<small>Tick check boxes when completed - Follow code for each item placed clos to item in zone etc.</small>	
Author: <i>Stefan Ritt</i>	Date: 17 September 2010 Shift: Night
↓ Zone Inspection Hardware Check	<input type="checkbox"/>
↑ Cavern Inspection Hardware Check	<input type="checkbox"/>
GASES	
(C1) COBRA He-gas battery pressure >50 bar	<input type="text"/> bar
(C2) DC He-gas cylinder pressure >20 bar	<input type="text"/> bar
(C3) DC Ethane (C ₂ H ₆) gas cylinder pressure >20 bar	<input type="text"/> bar
(C4) DC air cylinder pressure >20 bar	<input type="text"/> bar
BTS POWER SUPPLY	
(C5) Current (muons: -201.7 A, pions (CEX): -270.0 A)	<input type="text"/> A
(C6) Air-conditioner in inner cavern cooling sufficiently (normally on 5)	<input type="checkbox"/>
(C7) Check hut A/C water overflow vessel (blue bucket at cavern entrance) If emptying is needed, call "Hallen dienst" people	<input type="checkbox"/>
↓ Beam Barrack	<input type="checkbox"/>
↓ Control Room Inspection	<input type="checkbox"/>
↓ Software Monitoring	<input type="checkbox"/>
Submit Shift Check List Cancel	



Even more things that elog does

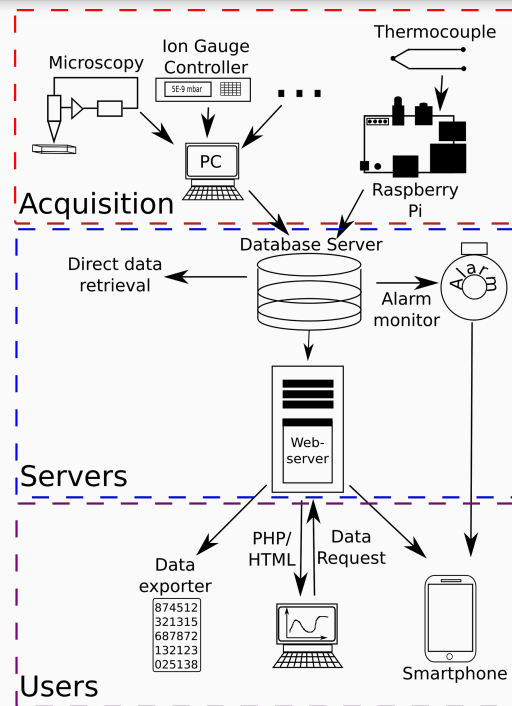
- Email notifications
- Access control
- RSS feed
- Log book mirroring
- Entry threads
- Command line tool to commit new entries

How do we store data and link?

How do we store data and link?

- Most data at SurfCat is stored in a local SQL database
- Data can be easily extracted for processing or be directly displayed in a web interface

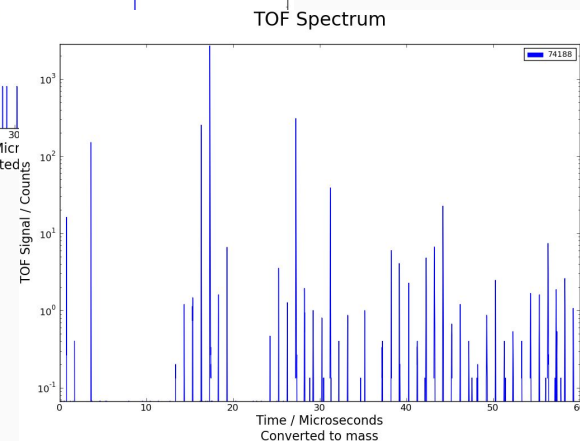
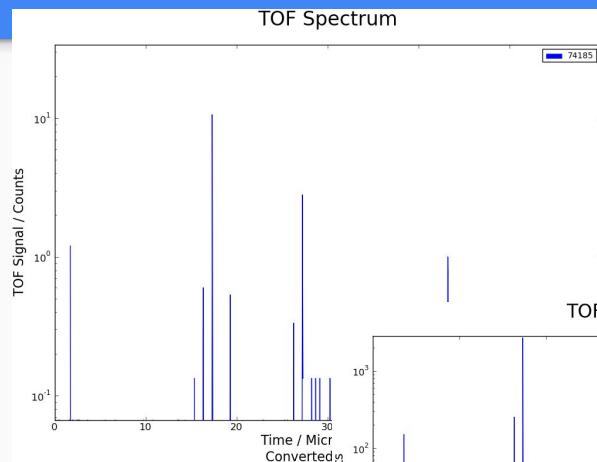
[http://orbit.dtu.dk/en/publications/an-opensource-data-storage-and-visualization-back-end-for-experimental-data\(7f5b18fa-97ac-4549-a829-e2fcc5feb7ad\).html](http://orbit.dtu.dk/en/publications/an-opensource-data-storage-and-visualization-back-end-for-experimental-data(7f5b18fa-97ac-4549-a829-e2fcc5feb7ad).html)



How do we store data and link?

- Linking from elog can now be done as simple as a database id

Theta-Probe	XRD	Time Of FlightMS	STM 312	PS	omicron	Microreactor	Microrea
Ammonia Synthesis	FurnaceRoom307	Muffle Furnace 307	Tower				
Time Of Flight Mass Spectrometer							
List New Edit Delete Reply Duplicate Find Config Help							
Message ID: 137 Entry time: Thu Jan 12 14:14:08 2017							
Headline:	Testing heating tape locations						
Record date:	2017 01 12						
Author:	Ann-Louise						
Type:	Test measurement						
Database ID:	74185						
ID 74185: Closed to TOF							
ID 74187: Open to TOF, no flow, 0 mbar in reactor							
ID 74188: 2 ml/min He, 800 mbar							
ID 74220: Heating QMS line 5 %							
ID 74263: QMS line 56 °C - increased power to 7.5 %							

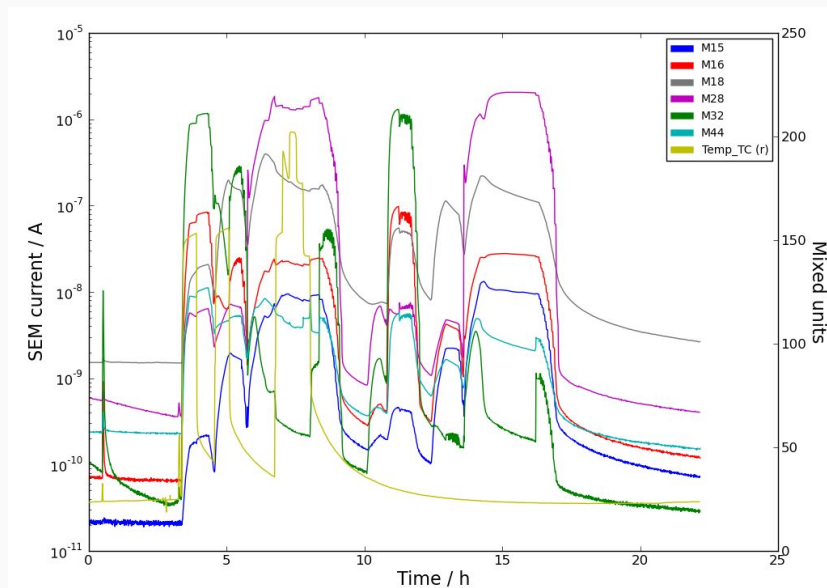


How do we store data and link?

- Referring to a group of measurements can be conveniently done with a unique timestamp

NG Microreactor Setup	
ELOG	
List New Edit Delete Reply Duplicate Find Config Help	
Message ID: 94 Entry time: Thu Aug 21 11:26:34 2014	
Headline:	Ni methanation Jakob MR11 5nm 10% step to 2X280C with oxidation
Record date:	2014 08 21
Author:	Jakob
Type:	Cluster measurement
Database ID:	2014-08-21 11:23:32
Turbo was spun down due to construction of new building. Chamber backed out by Nierhoff. Now running methanation on Ni	

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Questions?