NICOS – an Instrument Control Framework

N. Biyani[4], G. Brandl[2], E. Faulhaber[1], C. Felder[2], L. Fleischhauer-Fuss[3], **J. Krüger**[1], B. Pedersen[1], S. Rainow[2], A. Steffens[3]

[1]Heinz Maier-Leibnitz Zentrum (MLZ), Lichtenbergstr. 1, D-85748 Garching, Germany

[2]Jülich Centre for Neutron Science at Heinz Maier-Leibnitz Zentrum (MLZ), Forschungszentrum Jülich GmbH, Lichtenbergstr. 1, D-85748 Garching, Germany

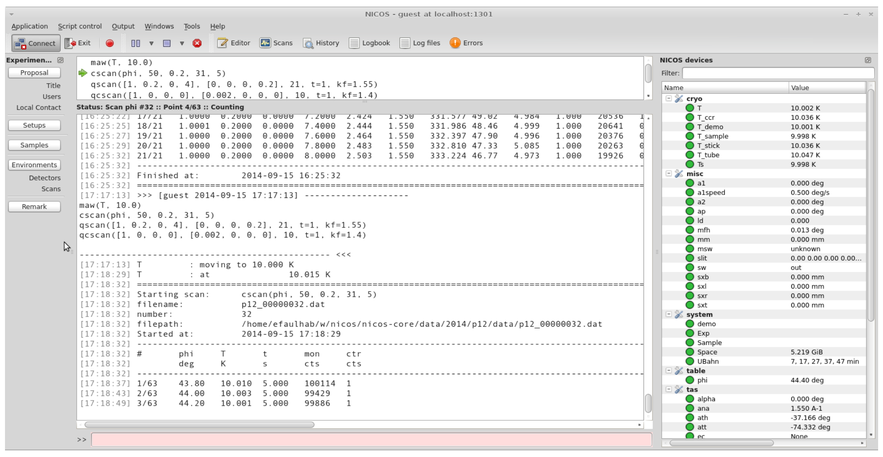
[3]Jülich Centre for Neutron Science, Forschungszentrum Jülich GmbH, Wilhelm-Johnen-Str., D-52428 Jülich, Germany

[4]Paul-Scherrer-Institut (PSI), Forschungsstraße 111, CH-5232 Villingen, Switzerland

Features

GUI

- Highly configurable user interface
- Overview of scans
- Convenience functions, e.g. plot, fit, print
- Graphical script editor
- Basic data treatment capabilities



Open Source Development

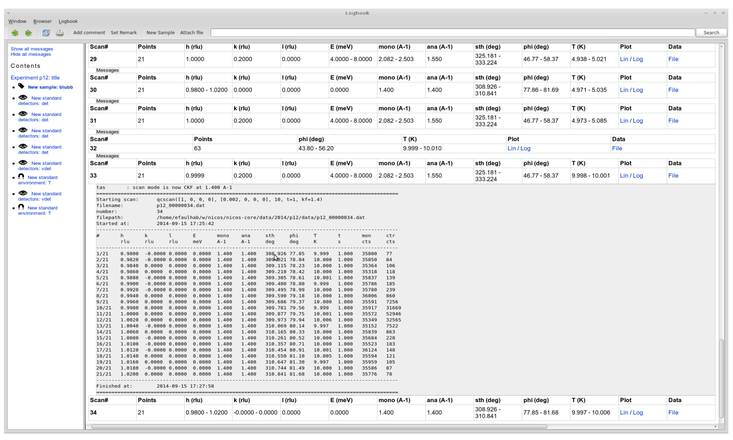
- Version Control (git)
- Code review (gerrit)
- Ticket system (redmine)
- Automated tests (jenkins)

Hardware access

- Different middleware support (**TANGO/TACO, EPICS, SECoP**)
- Serial line and network support

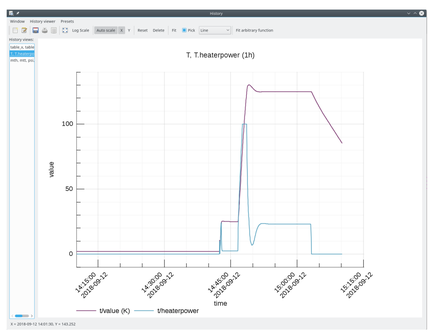
Electronic Logbook

- Archive user activities and outputs
- Add comments, plots, and external docs



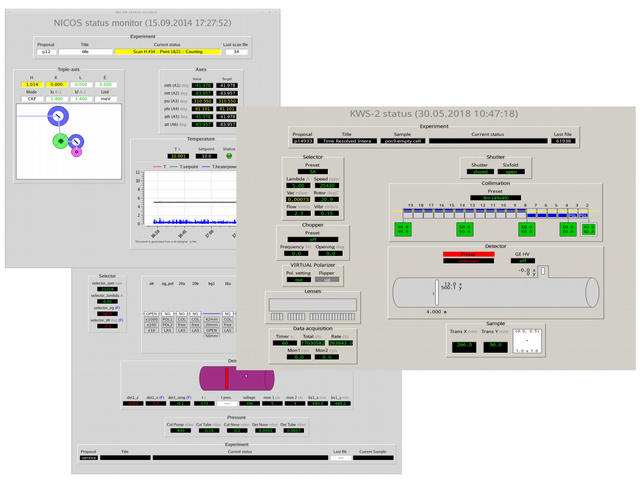
History database

- History plots
- Automatic logging of **instrument parameters** during the experiment



Status monitor

- Configurable status display
- Reacts on configuration changes
- Standard and instrument specific widgets



User highlights

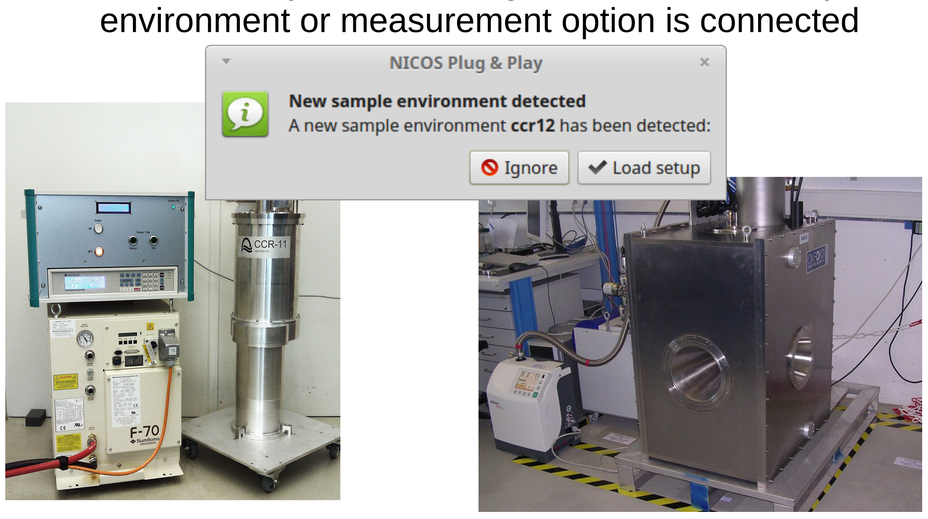
- Scripting language (Python)
- **Self-explanatory** command and device parameter names
- **Few basic** commands needed, e.g. **move**, **read**, **count**, **scan**
- Instrument specific commands, e.g. **tomo**

- **Dry Run** to check scripts incl. limit checks and runtime estimation
- Interactive online **help system**

- **On-the-fly** configuration change
- **Flexible configuration** system to reflect hardware setup

Plug and Play of mobile components

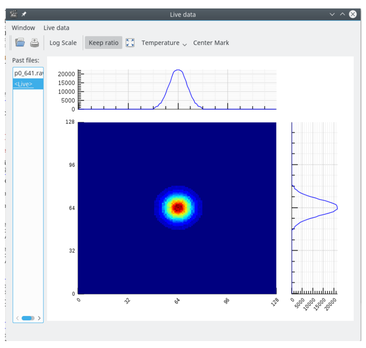
Automatically loaded configuration when a sample environment or measurement option is connected



Script execution daemon

- Configurable transport layers: tcp sockets, zmq
- Selectable messaging formats: json, python-pickle

Live data view



Data writing

- Different data formats simultaneously
- Easy adding of new data formats

Misc

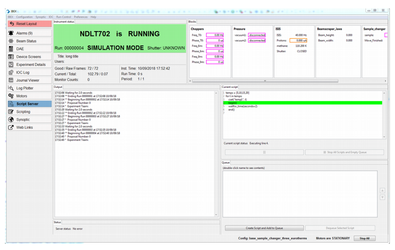
- **Client Server** architecture
- Optimized device access via cache and device polling
- **Watchdog** with alarms and actions

In use at

Science & Technology Facilities Council ISIS Neutron and Muon Source

14 instruments

used together with IBEX-GUI

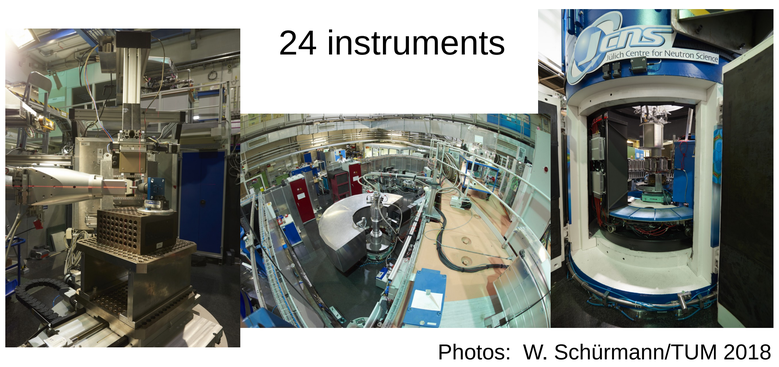


EUROPEAN SPALLATION SOURCE

selected as standard instrument control system

MLZ Heinz Maier-Leibnitz Zentrum

24 instruments



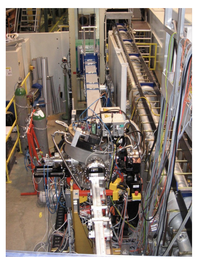
Photos: W. Schürmann/TUM 2018

INL Idaho National Laboratory

1 instrument

PAUL SCHERRER INSTITUT

1 instrument



http://www.nicos-controls.org

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