**CONTROL SYSTEM STUDIO FOR MUSCADE**

K.Saintin, L.Caouën, P.Lotrus

*CEA/DRF/IRFU*1 *– France (Saclay)*

The LDISC2 software control team is involved from feasibility studies to the deployment of equipment, covering low level (hardware, PLC) to high level (GUI supervision). For their experiments, the LDISC team is deploying two mains’ frameworks:

* **MUSCADE3**, a full Java in-house solution, a micro embedded SCADA (µ SCADA) dedicated to small and compact experiments controlled by PLCs (Programmable Logic Controller)
* **EPICS4**, a distributed control systems designed to operate devices such as particles accelerators, large facilities and major telescopes.

EPICS framework provides tools developed in Java such as Archive Appliance (the archiving tool), Phoebus Control-Studio4 (GUI), and Display Web Runtime (Web Client), and Phoebus Alarm service. Regarding graphical interfaces, and according to the "GUI Strategies" workshop at ICALEPCS 2023 (Cap Town), CS-Studio, CSS or Phoebus software are the most commonly used solutions for EPICS clients. Several institutes, including IRFU, are progressively migrating to Phoebus.

Currently, MUSCADE users require intuitive tools to build their GUIs. The initial developer provided a tool to convert AutoCAD documents into Java Swing applications. In 2018, LDISC developed a conversion tool to generate CSS and Phoebus GUIs from AutoCAD. Additionally, LDISC has developed a Muscade to EPICS bridge to connect the GUI with the Channel Access protocol.

In 2023, the Muscade roadmap defined a new strategy to use a common set of client tools with EPICS, to streamline development efforts. Since then, IRFU realizes several developments to adapt Phoebus for Muscade. Phoebus architecture offers a plugin mechanism to integrate new data sources, new historical sources, and the software is perfectly suited for this purpose.

**References**

# [1] IRFU <https://irfu.cea.fr/en/>

# [2] LDISC <https://irfu.cea.fr/dis/en/Phocea/Vie_des_labos/Ast/ast_groupe.php?id_groupe=4616>

[3] MUSCADE [https://irfu.cea.fr/dis/products/www/muscade/](https://irfu.cea.fr/dis/products/www/muscade/index.php)

# [4] Phoebus Control-Studio <https://control-system-studio.readthedocs.io/>