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Control System at SOLARIS Synchrotron

W. T. Kitka[1]*, Ł. J. Dudek[1], P. Gałuszka[1], P. P. Goryl[1], A. Kisiel[1], M. Kopeć[1], P. Kurdziel[1], M. Ostoja-Gajewski[1], M. J. Stankiewicz[1], A. I. Wawrzyniak[1], K. Wawrzyniak[1], Ł. Żytniak[1,2], V. Hardion[2], J. Jamróz[2], D. Spruce[2], I. Dolinsek[3] and U. Legat[3]

[1]*National Synchrotron Radiation Centre Solaris, Kraków, Poland*
[2]*MAX IV Laboratory, Lund, Sweden*
[3]*Cosylab, Ljubljana, Slovenia*

Keywords: control system

*e-mail: wojciech.kitka@uj.edu.pl

A National Synchrotron Radiation Centre Solaris is a synchrotron light source in Krakow, Poland. The control system is fully operational and is used in the commissioning process of the accelerator.

Software platform for the control system is Tango Controls [1]. It is popular framework used in other European synchrotron facilities. The control system based on Tango Controls has a lot of elements: Tango Host server with database, archiving system, high level and low level software. At Solaris are three instances of Tango: one for a linac and a storage ring and one per each of two beamlines. They are responsible for acquisition of more than 5000 signals. An archiving system is using TDB and HDB tools from Soleil [2]. At Solaris low level applications developed in the Python programming language using an API to the Tango core – the PyTango package. Device servers are used for connection of hardware to the control system. There are 61 device servers at Solaris. The Taurus and the Sardana packages from ALBA (Barcelona, Spain) are used for writing a high level software, like GUIs. For browsing Tango database and checking each device operators use an open source application ControlProgram. It was developed and delivered by commercial company Cosylab (Ljubljana, Slovenia). The ControlProgram is also used for running Tango tools and another GUIs. The Matlab Midlayer is used for accelerator physics control.

There are two different PLC systems at Solaris. The first is MPS (Machine Protection System). It is used for protection of the machine against work in unwanted conditions. It is based on Rockwell Automations solutions. The second one is PSS (Personal Safety System). It provides radiation safety. It is based on Siemes S7-300 fail-safe controller.

The timing system at Solaris is based on Micro Research Finland (MRF) hardware. It consists of event generators (EVG) and event receivers (EVR). The EVGs generate a stream of events and send them to the EVRs. After receiving an event EVR performs action.

IcePAP drivers are used for high-precision movement control. They are configured with IcePAP Control Management System from ALBA.

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[1] Tango Controls website: http://www.tango-controls.org/
[2] G. Abeille et al., "Tango Archiving Service Status", ICALEPCS'11, Grenoble, 2011.