AEROTECH AUTOMATION1

Drivers for Distributed Control Systems
EPICS & TANGO

Developed with Labs, for Labs.

We developed EPICS and TANGO drivers for the Automation1 motion control platform in partnership with laboratory control system experts at Argonne National Laboratory and Observatory Sciences. This means the motor drivers are ready to use and have an open source interface. Automation1 also has .NET, C and Python APIs for building Windows and Linux applications.

EPICS and TANGO provide a common language for scientists using experimental science facilities. Our Automation1 motion control platform is the premier standard in precision motion control and includes new PWM and linear amplifier technology, superior configuration and setup tools, absolute encoder support, the innovative fiber-optic HyperWire motion bus, and our Position Synchronized Output (PSO) feature that provides process triggers based on actual position—making detector triggering and position capture easy.

Automation1

The Automation1 EPICS & TANGO drivers are part of the user-friendly Automation1 motion control platform, which includes the following:

- ◆ **Development Software**
- ◆ **Controls**
- ◆ **Motor Drives**
- ◆ **Fiber-Optic HyperWire® Communication Bus**

KEY FEATURES:

- ◆ **READY TO USE** device drivers developed in partnership with Argonne National Laboratory & Observatory Sciences

- ◆ Motion control **MADE SIMPLE**—tested & verified

- ◆ **OPEN SOURCE** drivers

- ◆ **POSITION SYNCHRONIZED OUTPUT (PSO)** position-based process control

- ◆ **ABSOLUTE ENCODER & ETHERCAT** support

- ◆ Powerful **CONFIGURATION & TUNING** tools

EPICS & TANGO SPECIFICATIONS

Feature	EPICS	TANGO
Home Page	Epics Controls	Tango Controls
Development Partners	Argonne National Labs Observatory Sciences	Observatory Sciences
GitHub Repository	https://github.com/epics-motor/ motorAutomation1	TBD
Open Source	Yes	Yes
Step-Scan Control	Yes	Yes
On-the-Fly Scanning Control	Yes (PSO)	Yes (PSO)
Backup & Restore Controller Data (MCD files)	Yes	Yes
Run Any Command via the Interface	Yes	Yes
Command, Control & Synchonize Axes	Yes	Yes

BUILT FOR SMALLER BEAM SIZES

The superior performance of Automation1 drive hardware, coupled with PSO control, makes Automation1 the natural choice for beamline applications. Automation1 drives also contain large memory arrays and the capability to store—in real-time—the feedback positions at each PSO firing event. This data is later downloaded and synchronized with experimental data. This approach enables continuous scanning, optimizing experimental time and beamline profitability.

ETHERCAT + HYPERWIRE SUPPORT

Automation1 supports EtherCAT at the controller level, enabling the controller to be networked into larger controller architectures—like the ones required to control light sources or telescopes. Motion control is still managed over the innovative HyperWire motion bus, which operates at 100kHz, has 2 Gbps throughput and can manage up to 32* axes of servo control trajectories at 20 kHz. HyperWire also contains patented jitter reduction technology enabling <1 nanosecond of jitter for 16 axes of control, giving you the best multi-axis synchronization in motion control.

*Note: EtherCAT connectivity is only available for drive-based controllers. Drive-based controllers can control a maximum of 12 axes. To control up to 32 axes you must use a PC-based controller. See Automation1-iSMC for more information.

BUILT-IN CLIENT:SERVER MODEL

Automation1 has a client:server model built into the controller. The controller is available to be deployed to a Linux-based servo motor drive (which can network up to 12 axes of motion together) or to a Windows-based PC (which can network up to 32 axes of motion). Each controller can be accessed remotely by any of the available Automation1 APIs.

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