Standards in Laboratory Automation as an Enabler for the Smart Laboratory

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1. Introduction

This poster describes the emerging SiLA (Standards in Laboratory Automation) initiative. As a non-profit, global consortium, SiLA aims to create laboratory interoperability for optimal profitability and resource efficiency by bringing end users of lab equipment together with system, device and software suppliers to develop international standards for equipment communication, software interfaces and data exchange.

Industry-developed standards, such as SiLA, are the basis for increased integration of complex laboratory systems. Such standards are essential in the evolution of creating smart labs composed of interconnected software, instruments and robots which are easier to use, more efficient and are available remotely around the clock.

2. Role of standards and advantages

Many industries, including consumer technologies (smart phones, computers), manufacturing, and parcel transportation just to name a few, have made extensive use of standards in order to improve usability in the marketplace. Laboratories have also embraced standards, such as Ethernet, USB and the SBS microplate format, but still lack industry-wide data and device control standards, two areas that are quite laborious.

SiLA offers the following benefits:

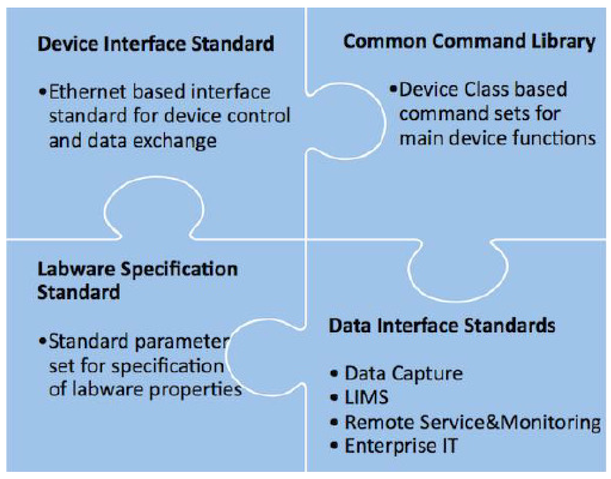
- Users: flexibility through plug-and-play and increased platform uptime
- Suppliers: simplification of integration tasks and ability to focus on improved equipment functionality
- Specialized instruments: broader utilization
- Start-ups / New technologies: faster time to market

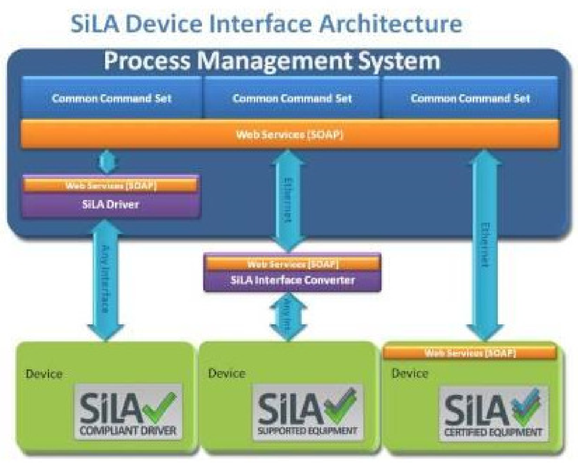
Since 2008, SiLA has grown to over 1500 Members. This includes many supplier and end-user organizations in the life sciences, as well as some academic Members.

3. What is SiLA?

SiLA standards include open formats in the following areas:

- Device Control and Data Interface Specification (DCDIS), including events and device properties
- Command Dictionary Specification (CDS)
- Labware Specification including geometric and physical properties
- Data Standard based on AnIML (Analytical Information Markup Language) using XML to format raw data, metadata and results
- Process Management System (PMS) Specification for system control, including data storage, resource sharing, and interactions with LIMS, sample management and order processing systems



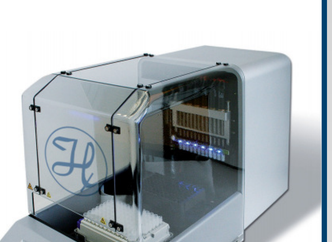


In order to ensure compliance with SiLA standards, the Consortium provides certification specifications for device testing.

4. Example supplier SiLA products

Over 60+ SiLA-compliant products (hardware and software) have been released by SiLA Members with many more in development. Non-Members have also used the free and open standards in their products.

Precise Automation PF400



HSR-ILT SiLAConverter

Open source code demonstrating applications of the standard is available on GitHub.

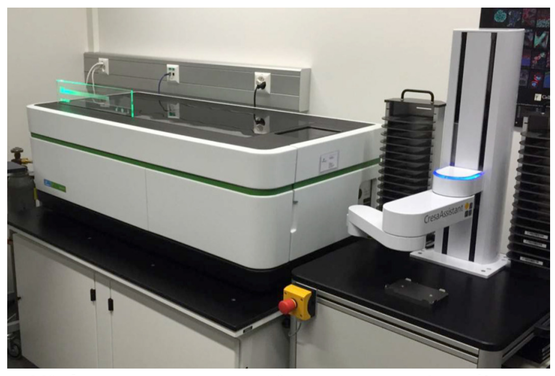
Promega GloMax®

Hamilton Decapper®

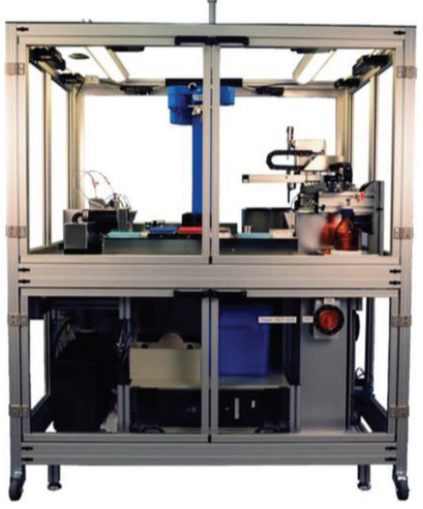
5. Example user utilization of SiLA

SiLA standards are already being used by end user organizations, and several systems have been presented at recent conferences and meetings.

RNA screening system Fraunhofer-IPA 18 devices from 15 suppliers



High content screening system Actelion



Sample preparation system Roche. 27 devices

6. How to get involved

- 7th annual SiLA Conference & MIPTEC 19th Sept. (Basel)
- Join SiLA as an individual or as an organization
- Training offered at SiLA basic and developer levels
- Tech Day in-person exchanges offered worldwide

Contact:
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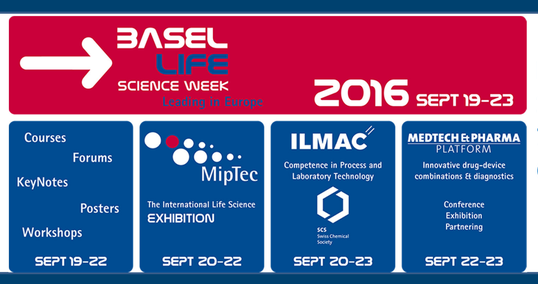
References and acknowledgements

The authors acknowledge all current SiLA Member companies and SiLA personal members for continued support, development and maintenance of the SiLA standards.

For further details on Laboratory Robotics in European Research programmes, please see "White paper on Laboratory Robotics in Europe: Status and prospects within Horizon2020", P. Courtney and F. Becchi, September 2015. Available on request.



Next meeting point:
19th Sept. 2016
7th annual SiLA Conference

Info

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