automation technology

ISaGRAF

Stay ahead of the curve with the most flexible and powerful automation software on the market

ISaGRAF is a comprehensive set of software technologies used to develop leading-edge local or distributed control products. The technology is designed to be scalable, allowing for the development of a range of solutions from tiny controllers to large automation systems without having to compromise. ISaGRAF gives you the flexibility to use it in combination with the hardware platform and operating system of your choice, thereby permitting the development of automation products that exactly meet your requirements.

ISaGRAF not only addresses the technical aspects in the design of the automation product, but also addresses the usability, meeting the industrial market expectations for standards, performance and functionality. ISaGRAF, with its compliance with IEC 61131 and IEC 61499, allows products to meet international automation standards, facilitating certification towards IEC 61508 and critical application safety levels such as SIL 3.

ISaGRAF is the premier choice of all the major automation vendors worldwide. Discover how this unique product can help you build the very best industrial automation products on the market.

ISaGRAF

the foundation of modern automation

Product elements

ISaGRAF consists of two main components: the Application Workbench and the Runtime Target ("Virtual Machine").

The Runtime Target is a portable execution engine that runs the developed applications. The portability of the applications generated by the Workbench enables the Runtime Target to execute them without modification, regardless of operating system or processor. Because only one development environment is needed, users leverage the full benefits of a true automation approach. ISaGRAF Runtime Targets can run on any operating system. Examples include Linux®, VxWorks®, OS-9®, INtime®, RTX®, QNX®, μC/OS-II,™ CMX®, Evolution®, DOS®, Windows® 7/Vista/XP/CE/2000, INTEGRITY®, and many more. ISaGRAF can also run on any hardware platform or processor including Intel®, Motorola®, ARM®, SHx®, PowerPC®, NetSilicone®, etc.

The Application Workbench is a complete programming environment used to develop highly portable applications. It fully supports IEC 61131 and IEC 61499 programming languages. The Workbench also provides tools for editing, debugging, code generation, documentation, library management, archiving, on-line monitoring, off-line simulation and on-line changes.

What you can do with it

The ISaGRAF technology complies with the principles of the IEC 61131 software architecture for distributed control systems. ISaGRAF's innovative implementation of these principles makes it the right choice to build automation products such as embedded controllers, PLCs, DCS, RTUs, CNCs, Motion Controllers etc.

leaders in industrial software innovation

ISaGRAF Automation Collaborative Platform

The ISaGRAF Automation Collaborative Platform (ACP) is an innovative technology to help create industrial automation configuration environments and programming tools.

It is a "Managed Open plug-in Environment"

The ACP provides users with an extensible abstraction layer in which common interfaces providing generic functionality can be selectively enhanced or specialized to provide specific functionalities.

Targeted at Automation Vendors, OEMs, System Integrators, and Research Institutes, the ACP helps software designers focus on their core competencies instead of the infrastructure.

The ACP comprises

- The Microsoft® Visual Studio Shell in Isolated Mode

- The Abstract Automation Model (AAM)

- A suite of plug-ins for configuration and programming

- One or several Concrete Automation Models (CAM)

The ACP supports multiple CAMs simultaneously, thereby providing the ability to integrate heterogeneous products into the same IDE.

The AAM is the common meeting point for editor tools (plug-ins) and device implementations (CAMs), while interfacing with Visual Studio's UI, tools, and services. Both plug-ins and CAMs use and implement the general AAM model, so that plug-ins can work with any CAM without knowledge of implementation details.

ISaGRAF
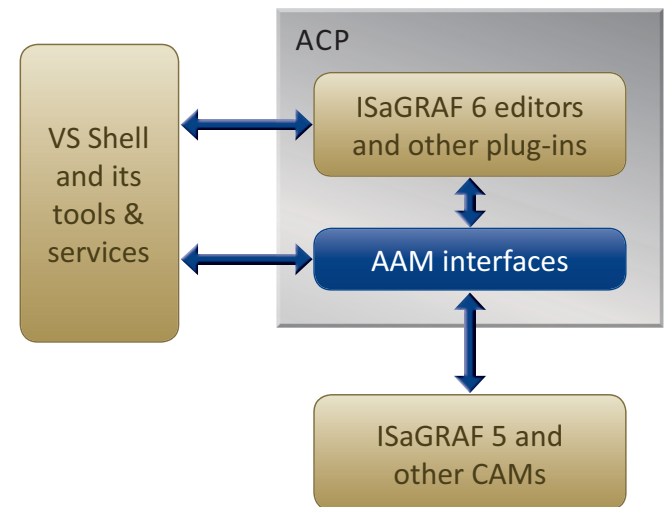
IEC 61499 - the emerging standard that will revolutionize the way you build your control products

Developed by the International Electrotechnical Commission (IEC), IEC 61499 presents guidelines for the use of function blocks in distributed industrial process, measurement and control systems. This emerging standard provides a number of remarkable benefits that ease the development and maintenance of robust control systems.

With the integration of IEC 61499 into ISaGRAF, users have the ability to build traditional control systems where the interactions between devices are automatically regulated and synchronized by the IEC 61499 function block diagrams rather than through the use of manually implemented algorithms.
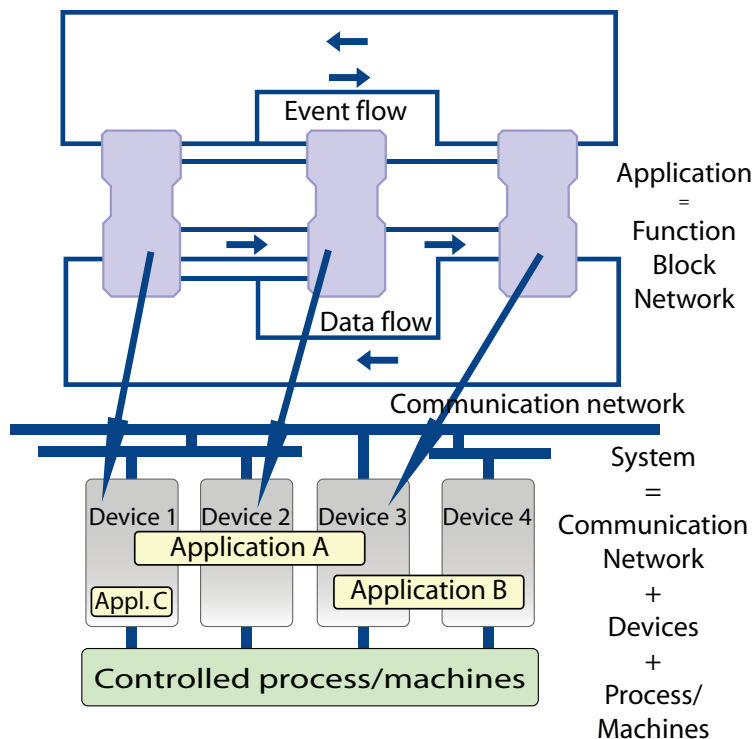
In using the IEC 61499 standard, one can design an application distributed over multiple resources and spread over multiple devices (known as Configs under IEC 61131).

These applications are regulated through IEC 61499 function block diagrams and their collaboration is then clearly and rigorously defined. The devices can be PLCs, micro-controllers or intelligent field instrumentation such as flow meters or valves.

Event flow

Application
=
Function
Block
Network

Data flow

Communication network

System
=
Communication
Network
+
Devices
+
Process/
Machines

Device 1 Device 2 Device 3 Device 4

Application A

Appl. C

Application B

Controlled process/machines

Our policy of backward compatibility for our entire product line is an integral part of our commitment to supporting you over the long-term with the development of your automation products.

technologies for your automation needs

Failover/Redundancy

The failover mechanism is a fault-tolerant technique where a secondary controller takes over when the primary controller fails within a maximum timespan of one PLC scan cycle, so that control logic can continue uninterrupted. It is a means to increase the availability and reliability of control applications used in mission-critical environments.

ISaGRAF offers a failover mechanism combining software and hardware. When you enable a failover mechanism for a device (controller), you automatically instantiate the duplication of all resources attached to this device. The duplicated resources are attached to a second device that will run on a secondary mirror target controller, completely independent of the primary controller.

Ethernet

Primary Controller **Secondary Controller**

Hard Real Time Network
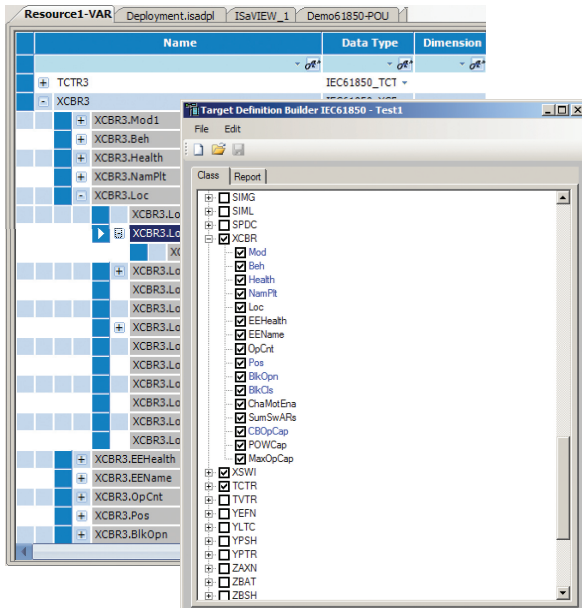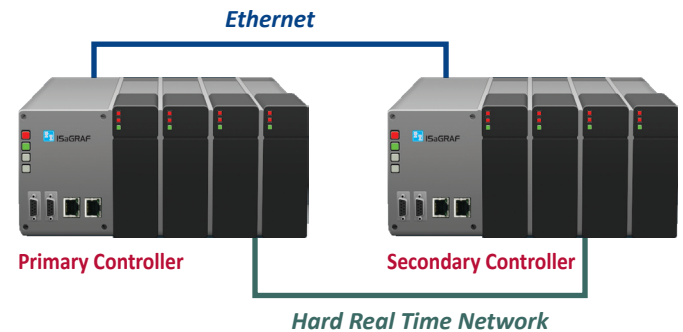
IEC 61850 integrated into your IEC 61131 & IEC 61499 control system

IEC 61850 is a global standard for the design of electrical substation automation. It enables the creation of systems built from multi-vendor Intelligent Electronic Devices (IEDs) for the automation, protection, monitoring, metering, and control of substations. IEC 61850 defines requirements for interoperability between IEDs from different vendors, establishes standards for object models, device behavior, naming conventions, and services.

ISaGRAF offers support for IEC 61850 and provides a dedicated tool called the *Target Definition Builder for IEC 61850* that allows users to select the logical nodes they wish to implement on their IED and select mandatory or optional data for each logical node.

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ISaGRAF for Motion Control

The ISaGRAF Motion Control Toolkit is designed to provide an interface between the ISaGRAF IEC 61131-3 environment and the manufacturer's hardware. The PLCopen standard-compliant function blocks are an integral part of ISaGRAF's IEC 61131-3 set of functions blocks. The OEM has the opportunity to integrate its proprietary commands in the standard function blocks and the overall logic is then implemented within the IEC 61131 environment.

The Motion Control Toolkit can be implemented on any OS as well as any hardware platform.

The ISaGRAF Motion Control solution is certified compliant to the PLCopen Motion Control specification.

Connecting with Fieldbus Devices

ISaGRAF also includes interfaces to field equipment using standard protocols such as ModbusTCP, CANopen, and EtherCAT. Since I/O drivers are implemented as C functions linked to the ISaGRAF firmware, OEMs have the flexibility of developping their own drivers with ISaGRAF's easy-to-use I/O development kit, which includes step-by-step instructions and various samples.

In addition, ISaGRAF can develop new drivers according to custom specifications.

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