



ISaGRAF v5.1

Introducing ISaGRAF 5.1 Service Pack 1

This latest version of the ISaGRAF IEC 61131-3 and IEC 61499-compliant technology takes the concept of IEC 61499 one step further. Some of the key enhancements are listed below:

- IEC 61499: Composite functions blocs (embedded objects) are now designed graphically. This allows the building of composite function blocks by encapsulating existing function blocks with the function block diagram editor.
- The product library now includes IEC 61499 Service Interfaces (SI) for IXL access and Holobloc. They can be used in an application to read or write variable values from any ISaGRAF controller or Holobloc system.
- The firmware has been successfully used with the latest hardware platforms including the Motorola Coldfire 5272 and the Hitachi H8 Processor, in addition to other popular hardware platforms such as Motorola 68302, Intel x86, Beck DK40 @ chip, and Motorola PowerPC, under operating systems such as Win32, QNX, CE, Linux, CMX, RTXC, DOS, etc.

Coming Soon! ISaGRAF version 5.3

The ICS Triplex ISaGRAF team has been developing some key enhancements to the popular ISaGRAF 5. ISaGRAF 5.3 will provide a unified development environment for the ISaGRAF installed base. Users will have the ability to program and support the entire range of ISaGRAF controllers (controllers from ISaGRAF versions 3, 4 & 5) using the same development environment. With ISaGRAF 5.3, an ISaGRAF 3 application can be created, compiled, debugged, simulated, downloaded and monitored. No modification to the ISaGRAF 3.x controller is required.

ISaGRAF 5.3 will also include the new μ Firmware Development Toolkit to address the microcontroller market.

Stay tuned for more news on the upcoming release of ISaGRAF 5.3!

success stories

Standard ISaGRAF Runtime Target for using C++ and ACE libraries

Fiord Company

Fiord Company has developed a new ISaGRAF 5.1 Runtime Target, based on original version target source code, using C++ and ACE (Adaptive Communication Environment) libraries. The new target supports all original target functionality and has several additional features, some of which are listed below:

- All system-dependant functions in the new target are replaced by ACE library function calls. For this reason the new target source code is the same for various OS. At the moment the new target has been ported and tested on Linux, QNX4, QNX6, Windows XP, WinCE, FreeBSD, OpenSolaris.
- Platform independency - all ISaGRAF targets have equal features and the same PLC description in the Workbench environment, allowing the transfer of projects from one ISaGRAF target to another (configuration) without requiring recompilation.
- High execution speed of real-time cycle in the mode of operation without preset cycle time (from 5 microsecond).
- ACE library and C++ availability during development of embedded ISaGRAF target functions and drivers. Many functions for the fast manipulation with ISaGRAF arrays, matrices, vectors are developed and embedded to the new target.
- Support of FDA (Fast Data Access) - fast data exchange with remote clients (FDA is an open UDP based protocol). FDA client program sample and FDA-OPC server (as a stand-alone product) are

ICS Triplex ISaGRAF presents IEC 61499 standard and ISaGRAF 5.1 at the ARC Forum

ICS Triplex ISaGRAF was a silver sponsor at the ARC 11th Annual Forum in Orlando, FL (Feb. 12-15) where ARC Advisory Group analysts as well as CIOs, manufacturing, and automation executives addressed some of the crucial challenges that manufacturers are currently facing.



Stefan Mizera, Americas / Pacific Rim Sales Manager, presented demos of ISaGRAF 5.1 at the ICS Triplex ISaGRAF table.

upcoming events

ICS Triplex ISaGRAF is organizing a user's conference

ICS Triplex ISaGRAF is planning a user's conference in the coming months.

We would like to know what topics are of interest to you so that we can plan an interesting and educational conference for you. So drop us an email at info@icstriplex.ca and tell us what you want to learn about!

extras

ICS Triplex ISaGRAF sponsors one of their own at the Taekwon-Do World Cup

ICS Triplex ISaGRAF was a proud sponsor of the team representing Quebec/Canada at the International Taekwon-Do Federation World Cup. They came in 3rd place with 2 gold and 3

available. High speed of data exchange in FDA protocol is attained by sending all changed values in a single packet to client on its request.

Tests show the delivery speed to a client of 100'000 changed values per second and more.

- Support of target fast data archives (FIFO) and fast archive data transfer to a client on demand.

The new target, therefore, provides a full, complex solution for high-speed processing, control and delivery of information for high-level Automatic Control Systems.

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Mahkota Building Automation System for the AIMST University in Malaysia

Mahkota Technologies

Mahkota Technologies is in the final stages of completing the Mahkota Building Automation System for the new AIMST University in Malaysia.

The project involves the deployment of 96 controllers installed in 5 different 4-storey buildings – Medical Faculty, Engineering and IT Faculty, Student Building, Library and Administrative Building.

There is a local HMI panel linked to a Master Controller in each building and the Master Controller, which interfaces to an average of 20 controllers per building via RS485, uses the Modbus serial protocol. Functions include automatic lighting, environment temperature control, chiller water pump room control, monitoring backup generators, and power metering at the respective buildings Main Switch Board rooms.

All of the controllers are ISaGRAF target machines using ISaGRAF Enhanced Ver 2.4.

Embedded Controllers used to control railway safety functions in mining transport system

ICP DAS / Saltec SA

Installation site: Altamira iron ore mining facility, Chile

Project executed by : Saltec SA, an international leader in large scale surveying equipment and industrial contracting solutions

Purpose of the project: To control railway safety functions for the mining facility's ore transport system. With this system, Saltec is able to monitor and control an emergency "run-away track", in the event of a brake failure of any of the facility's locomotives.

Description of the project: Saltec selected the ICP DAS I-7188XGD controller for its performance (40MHz AMD CPU, with 512Kb of static RAM, 512Kb of flash memory), as well as its wealth of features (real time clock, battery back up, optional 10BASE-T Ethernet port, remote configuration diagnostics, 14 user defined I/O lines).

The ICP DAS I-7188XGD use a proprietary version of ISaGRAF control software; enabling them to function redundantly as reciprocal fail safes, ensuring consistent and dependable safety on the facility's ore transport system.

Result: Saltec was elated with ICP's abilities to produce a product which was able to withstand the harsh exposure of the elements, while offering phenomenal control and reliability in a PLC.

[Click to read the full success story](#)



bronze medals.



One of the team members, shown below receiving a medal, is Frederic V.S. Nguyen, an ICS Triplex ISaGRAF software engineer.



The team has recently qualified to represent Canada in the next world championships.

We would like to congratulate the team on a job well done!

[contact us](#)

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Tech Note #4 - IEC 61499 Function Block Model

Overview

A Function Block Model represents parts included in a measurement and control function block. Figure 1 below shows these parts of a measurement and control function block. Many function blocks are connected together with a data/event interface and are part of an application.

A function block is a functional unit of software comprising an individual instance or copy within a resource. The algorithms contained within a function block are hidden from the outside of the function block and are scheduled according to the Execution Control Chart state machine (ECC).

Event inputs and outputs are used to synchronize function blocks within an application and to schedule the algorithms within the function block.

Data inputs and outputs are the interface with the external of the function block since internal data is hidden. The data may be part of the algorithms and may also be state information for the Execution Control Chart (ECC).

Function blocks are created by defining their ECC and programming their algorithms. These function blocks are called basic function blocks (see Figure 1). The ECC is a state machine processing events and scheduling algorithms. It defines the behavior of the function block upon receiving events. The algorithms operate on internal variable values, input values, and output values. Each basic function block can run on any resource.

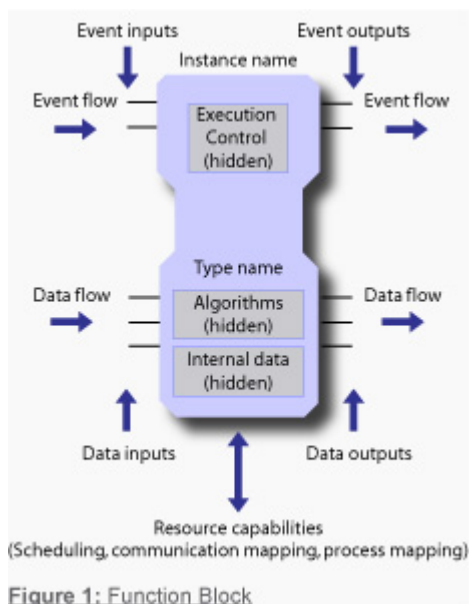


Figure 1: Function Block



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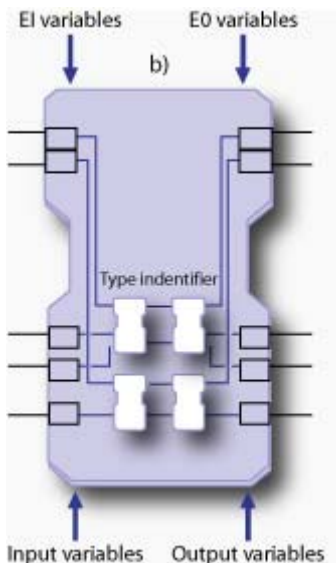


Figure 2: Composite Function Block

When function block algorithms and the control of their execution are expressed entirely in terms of interconnected function blocks, these are called composite function blocks (see Figure 2). These are created by interconnecting existing basic and composite function blocks. No ECC or algorithm is created. A composite function block runs on any resource. However, the basic and composite function blocks making up a composite function block run on the same resource as the main composite block.

An application is defined by function block (Basic and Composite) networks specifying event and data flows throughout function block instances. The event flow determines the scheduling and execution of the function blocks' algorithms. Each function block within the application can be distributed across resources and devices.

In ISaGRAF, an application can be created using custom function blocks or function blocks from libraries.

[Click to read the full tech note \(.pdf\)](#)