What is ISaGRAF

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ISaGRAF is a complete industrial software package consisting of Soft Logic Programming Tools, a Runtime execution engine and custom VAR/OEM development tools for automation control applications. ISaGRAF is designed to turn any industrial computer into a high performance, yet inexpensive Soft Logic Controller. ISaGRAF is based on the only internationally recognized industrial automation control language, the IEC61131-3. ISaGRAF was the first Windows-based development environment to fully support all five of the PLC languages : Ladder Diagram (LD), Function Block Diagram (FBD), Sequential Function Chart (SFC), Structured Text (ST), and Instruction List (IL). Additionally, for the ultimate in power and flexibility, ISaGRAF supports functions and function blocks written inIEC61131-3 languages. Applications for ISaGRAF range from simple machine control to complex processes with high speed, high performance, and high reliability tasks.

ISaGRAF and I-8xx7 / I-7188EX controllers

The ISaGRAF application can be easily applied to the **I-8417 / 8817 / 8437 / 8837** and the **I-7188EX-ISaGRAF** embedded controllers. When adding ISaGRAF programming, there are three distinct advantages. The first is that the PLC language is easy to design. Instead of C language, ISaGRAF supports all five IEC61131-3 languages plus Flow Chart language (FC).

The second advantage is the powerful communication ability. There are 4 communication ports on the I-84X7 / 88X7 controllers. COM1 is a simple RS232 device that is linked to PC running ISaGRAF Workbench. It supports Modbus protocol. For the I-8x17 controller, COM2 is a 2-wire RS485 device that is constructed as a Modbus network system for up to 255 controllers. For the I-8x37 controller, COM2 is a ethernet port supporting Modbus TCP/IP protocol that takes your control system to the Internet world. COM3 is a RS232/RS485 device. It can be user-designed or can be constructed as a RS485 Fbus network so that each I-84X7 / 88X7 controller can access the data from other I-8xx7 controllers on the same Fbus network, therefore becoming a Distributed Control System. COM4 is a RS232 device that can be user-designed.

The I-7000 and I-87K series are also supported by the I-8xx7 and I-7188EX-ISaGRAF controllers. Through the RS485 port of the I-8xx7 (COM3) and I-7188EX-ISaGRAF (COM2) controllers, I-7000 / I-87K series modules can be used as remote I/Os, controlled by the I-8xx7 and I-7188EX-ISaGRAF.

The third advantage is that integration with HMI software and MMI become easy and powerful when using the Modbus protocol. Iconics, Intouch, FIX, Wizcon, Citect, Labview, Lablink, Modbus OPC server ... are all examples of HMI software. MMI is similar to the Touch 506/509/510 touch panel or any hardware or software that support Modbus protocol.<Network Diagram>

ISaGRAF Overview

ISaGRAF is the most powerful Soft Logic package on the market. ISaGRAF software is composed of two parts:

- The workbench provides the PLC programmer a complete programming environment.
- The target runs the application generated by the workbench on any hardware such as the I-8xx7 series.

ISaGRAF Workbench

The ISaGRAF workbench, which is a Windows 95, 98, NT or Windows 2000 PC compatible, runs the ISaGRAF workbench software. The ISaGRAF workbench software includes:

Graphical Editors for programming:

- Quick Ladder Diagram
- Function Block Diagram
- Sequential Function Chart
- Flow Chart

Text Editors for programming:

- Instruction List
- Structured Text

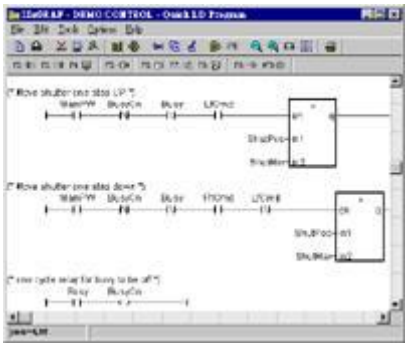
Powerful tools for:

- Application download
- On-line debugger and control
- Simulation
- Cross referencing
- Project management
- Document generation
- Backup and Restoration of applications
- Graphic debugging animation

Quick LD Editor

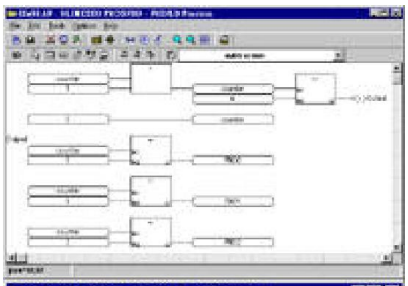
The Ladder Diagram (LD) is one of the most familiar methods of representing logical equations and simple actions. Furthermore contacts representing input arguments and coils representing output results are utilized.

The ISaGRAF Quick LD Editor offers you the best compromise between high level graphic capabilities and easy to use keyboard driven programming.
With the ISaGRAF graphic editing tools the user can mix LD and FBD programming on the same chart. Any function or function block of the library can be called from this editor.



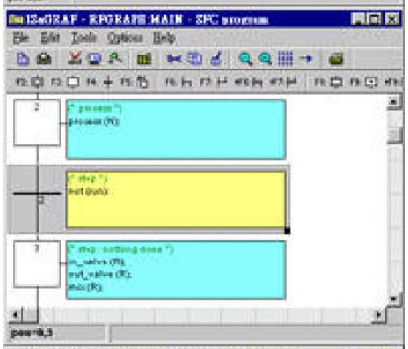
FBD Editor

The Function Block Diagram (FBD) is a graphics-based language which allows the user to build complex procedures by taking existing function blocks from the ISaGRAF library, and wiring them together on the screen. ISaGRAF includes a library with more than 60 standard blocks ready to use. And others are available from each target's blocks. For ex. The ICP 8xx7 series.



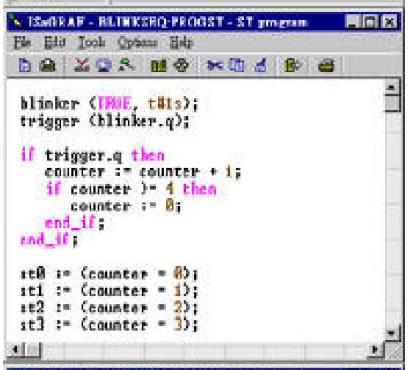
SFC Editor

The Sequential Function Chart (SFC) divides the process cycle into a number of well-defined steps, separated by transitions. SFC is the core language of the IEC61131-3 standard. The other languages are used to describe the actions performed within the steps and the logical conditions for the transitions. Parallel processes can be easily described using SFC.



Structured Text Editor

Structured Text (ST) is a high level structured language with a syntax similar to Pascal but more intuitive to the automation engineer. This language is mainly used to implement complex procedures that cannot be easily expressed with graphics-based languages (IF / THEN / ELSE, FOR, WHILE...).



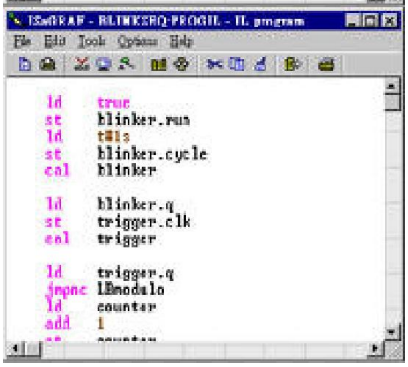
```
blinker (TRUE, t#1s);
trigger (blinker.q);

if trigger.q then
   counter := counter + 1;
   if counter >= 4 then
      counter := 0;
   end_if;
end_if;

st0 := (counter = 0);
st1 := (counter = 1);
st2 := (counter = 2);
st3 := (counter = 3);
```

Instruction List Editor

Instruction List (IL) is a low-level language, similar to the simple- text PLC languages. In August 1996, the ISaGRAF IL editor received the certificate of PLCopen compliance with a class-rating of IEC61131-3.



```
    ld    true
    st    blinker.run
    ld    t#1s
    st    blinker.cycle
    cal   blinker

    ld    blinker.q
    st    trigger.clk
    cal   trigger

    ld    trigger.q
    jmpnc LBmodulo
    ld    counter
    add   1
```

Flow Chart Editor

Flow Chart (FC) is a non-IEC61131-3 language. It was added into ISaGRAF in 1998 beginning with Version 3.3. FC is a graphics-based language. It combines "test" , "action" , "flow", and other mechanisms to perform a control process