

## Come join us!

You will be provided with a course booklet and material to take back with you when you completed the class. Training classes begin at 8:00 am. Computers, hardware and software are provided for your use during the course.

We provide a continental breakfast (pastries, fruits, juices, coffee and tea). Lunch will be sandwiches from our local deli or instructor's choice. You'll be given menus to choose from. Evening meals are on your own. Choose from Auburn's local selection of restaurants, or from Sacramento or the Nevada City/Grass Valley area.

Please let us know if there are any other accommodations needed.

Hotel information and a map showing our location are available on our website. From New Airport Road turn left and go approximately a quarter mile to 12840 Earhart Ave. We are between Preserva-Wood and Century Lighting on the left side of the street.

We look forward to your visit!

# ISaGRAF and C/C++ COURSE OUTLINES

## ISaGRAF Course Description

### Day 1

#### Hardware Overview (1.5 hrs)

ICL-4300 Standard Hardware, Optional Hardware, I/O cards, Standard and Optional Communication Interfaces.

#### Software Overview (1hr)

Available Software Environments, CSDK, C/C++ Language, ISaGRAF (covered in depth later), ESP Environment.

#### Communications Overview (3-4 hrs)

(Including Modbus and BrickNet, TUI Interface, Sample Programs, Exercises). Protocols Available, Hardware Available, Design (master-slave versus peer-to-peer), Implementation (I/O points and Store and Forward).

### Day 2

#### ISaGRAF Programming Environment (8 hrs)

Setting up a development system, Setting up I/O cards in ICL-4300, Memory allocation, Using nonvolatile RAM, General language overview, User project requirements covered as well.

- Development Environment.
- Sequential Function Charts, Function Blocks, Structured Text, Ladder Logic. Advantages and disadvantages of the above.
- User programs and Function Blocks, Using Configuration Files (Compatible and incompatible ESP functions).
- Sample Programs, Exercises, Simulator Use and Abuse.
- Communications Setup.
- Modbus.
- BrickNet.
- TUI Interface, Sample Programs, Exercises.

### Day 3

#### Hands-On Programming

Small classes and personalized instruction allows courses to be tailored to your needs beyond these basics. Contact us for more information.

## C/C++ Course Description

### Day 1

#### Hardware Overview (1.5 hrs)

ICL-4300 Standard Hardware, Optional Hardware, I/O cards, Standard and Optional Communication Interfaces.

#### Software Overview (1hr)

Available Software Environments, CSDK, C/C++ Language, ISaGRAF, ESP Environment.

#### Communications Overview (3-4 hrs)

(Including Modbus and BrickNet, Sample Programs, Exercises). Protocols Available, Hardware Available, Design (master-slave versus peer-to-peer), Implementation (I/O points and Store and Forward).

### Day 2

#### C/C++ Programming Environment (8 hrs, must have previous C/C++ experience)

Setting up a development system, Setting up I/O cards in ICL-4300, Using Configuration files (ESP), Memory Allocation (ICL-4300 Registers and Banks), Using Nonvolatile RAM, Process control and Execution, Samples and Exercises, General language overview, user project requirements covered as well.

- Modbus
- BrickNet
- TUI Interface, Sample Programs, Exercises.

### Day 3

#### Hands-On Programming

### Day 4

#### Hands-On Programming (if necessary)



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