

Practical

PROGRAMMING FOR INDUSTRIAL CONTROL

using IEC 1131-3 and OPC



YOU WILL LEARN HOW TO:

- Confidently work with the generic standard IEC 1131-3 for industrial programming
- Effectively utilise IsaGraf programming software to program PLCs
- Understand the concepts and common elements concerning the IEC 1131-3 programming model
- Program using languages such as: structured text, function blocks, ladder diagrams, instruction lists & sequential function charts
- Troubleshoot sequencing problems
- Define the scope and purpose of OPC
- Define OLE, COM, and DCOM
- Describe the attributes and interfaces of objects
- Use appropriate commands and processes to create and handle objects
- Boost productivity and enhance software quality

WHO SHOULD ATTEND:

This is an intermediate level workshop for:

- Technicians
- Project Managers
- Electrical Engineers
- Process Control Engineers
- Systems Engineers
- Maintenance Engineers
- Control Systems Sales Engineers
- Instrumentation and Control Engineers
- Senior Operators
- Project Engineers
- Design Engineers
- Consulting Engineers
- Electricians



Technology Training that Works

THE WORKSHOP

Programmable Logic Controllers (PLCs) have become part of the backbone of industrial automation. The International Electro-technical Commission (IEC) has developed a standard set of programming languages for industrial PLCs. The large number of major PLC manufacturers who are developing products that are IEC 1131-3 compliant is the measure of the success of these languages.

IEC 1131-3 is becoming the standard of choice in many industries and in this way it is boosting productivity and enhancing software quality.

This intensive and highly practical 2-day workshop offers you the opportunity to master this subject today, so that your programming knowledge will be applicable across brands of PLCs well into the future.

This knowledge could be vital to personal career development.

WORKSHOP OBJECTIVES

This practical 2-day workshop's objectives are to:

- go beyond the basic concepts and introduce you to the practical techniques and applications of IEC 1131-3 and object linking and embedding for Process Control (OPC).
- cut across apparent differences wherever PLCs are used and introduce standards that are widely applicable.
- introduce the latest developments in OPC, which provides a common link between field devices and automation systems through corporate information systems.

PRACTICAL SESSIONS

PLCs have become an integral part of industrial automation and it is for this reason that there are 7 practical exercise sessions in this workshop. This is to give you the vital hands-on experience you need to confidently work with IEC 1131-3 and OPC in your workplace.

“

*Clarified a number of issues,
and is very relevant to my
present line of work.*

Vicki Middleton-Cross

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THE PROGRAM

DAY ONE

INTRODUCTION

- What is IEC 1131-3
- Why the need for IEC 1131-3
- Deficiencies of current ladder logic
- IEC 1131-3 main features
- IEC 1131-3 major benefits

IEC 1131-3 CONCEPTS

- I/O interfaces
- Communication interfaces
- System interfaces
- IEC 1131-3 PLC software model main elements:
 - configuration, resource, programs, tasks
- Mapping software model to real systems

COMMON ELEMENTS

- Character set
- Identifiers
- Data types elementary: integer, floating point, date & time, strings, Boolean and generic
- Data typed derived: structured, enumerated and array
- Variables: input, output, input/output, global, external, directly represented and access
- * Functions: numerical, Bit string, Boolean, comparison and Bit string
- * Program: usage and instances
- * Resources and tasks: usage, scheduling - non-pre-emptive and pre-emptive
- Configuration

PROGRAMMING LANGUAGE: STRUCTURED TEXT

- Language
- Assignment statements
- Expressions
- Operators
- Statements: calling FBs, conditional, iteration

*PRACTICAL SESSIONS x 2:
Programming using Structured text*

PROGRAMMING LANGUAGE: FUNCTION BLOCK DIAGRAMS

- Methodology
- Signal flow
- Feedback paths
- Execution control: jumps and labels
- Network evaluation rules

*PRACTICAL SESSION: Programming using
Function Block Diagrams*

PROGRAMMING LANGUAGE: LADDER DIAGRAMS

- Concepts
- Symbols
- Methodology
- Connecting FBs
- Execution control: jumps and labels
- Network evaluation rules

*PRACTICAL SESSION: Programming using
Ladder Diagrams*

DAY TWO

PROGRAMMING LANGUAGE: INSTRUCTION LIST

- Language structure
- Instruction semantics: modifiers
- Comparison and jump operators
- Calling FBs

*PRACTICAL SESSION: Programming using
Instruction List*

PROGRAMMING LANGUAGE: SEQUENTIAL FUNCTION CHART

- Chart structure
- Main features
- Steps
- Transitions
- Actions
- Rules of evolution

*PRACTICAL SESSION: Programming using
Sequential Function Chart*

INTRODUCTION TO OPC

- What is OPC?
- Data: Where is it? How is it organised?
- Client architecture: current and custom
- The scope of OPC

COM AND COM FUNDAMENTALS

- What is COM?
- COM fundamentals: COM interfaces, major benefits, interface unknown
- COM client/server model: clients, servers, COM library and SCM
- What is DCOM?

OPC OBJECT MODEL AND CLIENT/SERVER LINKS

- * The OPC object model: server, group and item objects
- OPC client/server requirements
- Network issues
- Client applications

PRACTICAL DEMONSTRATION: OPC

WORKSHOP REVIEW AND QUESTIONS

ON-SITE TRAINING

- ✓ **SAVE** over 50% by having an IDC workshop presented at your premises.
- ✓ Customise the training to **YOUR** workplace.
- ✓ Have the training delivered when and where you need it.

Contact us for a
FREE proposal.