



RC 1421267

 **ZIP AUTOMATIONS**

*....no such thing as impossible*

CONTROL ENGINEERING TRAINING INSTITUTE AND CONSULTANTS

## **AUTM 102**

### **PLC SET-UP, PROGRAMMING, TROUBLESHOOTING AND MAINTENANCE-LEVEL 1**

**(Allen Bradley PLC)**

**4 days**

Fee- N70, 000

This course is designed to introduce the trainee to control systems with programmable logic controllers (PLCs). It includes intensive practical classes with live PLCs, modules, field devices and industrial process simulator systems.

At the end of this training, trainees will be able to

- Set up and wire Allen Bradley PLC control systems from scratch
- Set-up, wire and program Allen Bradley PLC control systems from scratch
- Establish communication with PLCs using RS links software.
- Troubleshoot basic programs trace faulty SLC 500 PLC/modules and replace them.
- Perform basic PLC programming(discrete signals) and download to PLCs
- Modify existing programs for different applications.
- View the status of SLC-500 input and output data tables
- Configure the I/O for a PLC project

#### **COURSE CONTENT**

- Introduction to PLCs
- PLC set-up and wiring
- Establishing communication with PLCs
- PLC programming with ladder logic
- Establishing communications with Allen Bradley PLCs using RS links
- Introduction to PLC programming using ladder logic
- I/O configuration (Hardware configuration)
- Downloading and uploading to PLCs
- Data types and files
- Programming applications and navigation through Allen-Bradley Logix 500 software
- Introduction to IEC 1131 standards
- Electrical continuity versus logical continuity
- Applications of discrete inputs with PLC's
- PLC timer and counter concepts, programming and applications
- Programming applications using sequencers
- Hands on practical exercises and simulations
- Wiring, set-up, programming and operation of field devices such as sensors and VFDs
- PLC troubleshooting

**Requirement** – Basic technical knowledge

**Software's** - RS Logix 500, RS Logix 5000 and RS Links

## **AUTM 103**

### **PLC SET UP, PROGRAMMING, TROUBLESHOOTING AND MAINTENANCE-LEVEL 1 (Siemens S7 300,400 PLCs)**

**4 days**

**Fee- N70, 000**

This course is designed to introduce the trainee to control systems with programmable logic controllers (PLCs). It includes intensive practical classes with live PLCs, modules field devices and industrial processes simulator systems.

At the end of this training, trainees will be able to

- Set-up, wire and program Siemens PLC control systems from scratch
- Troubleshoot basic programs, trace faulty Siemens s7 PLC/modules and replace them.
- Perform basic PLC programming(discrete signals) and download to PLCs
- Modify existing programs for different applications.

#### **COURSE CONTENT**

- Introduction to PLCs
- PLC set-up and wiring
- Establishing communication with PLCs
- PLC programming with ladder logic
- STEP 7 installation techniques & components
- Hardware configuration & addressing of Signal Modules.
- CPU Properties.
- Symbolic notation & symbols table handling.
- Organization Blocks (OBs) , Data blocks(DBs) Function Blocks (FBs)
- Data types
- Commissioning & Monitoring /. Modifying Variables.
- Linear / Structured Programming Techniques.
- Debugging (troubleshooting) a program.
- Binary operations & gates.
- Downloading and uploading a program
- Configuration & addressing of modules
- Creating projects in LAD/STL/FBD.
- Basic functions (timers, counters, comparators , jumps etc)
- Data handling including arrays & structures.
- Diagnostics with B, I, L stacks.
- Wiring, set-up, programming and operation of field devices such as sensors and VFDs
- Basic PLC troubleshooting and maintenance

**REQUIREMENT** – Basic technical knowledge

**Software** –Simatic manager (Step 7)

## **AUTM 104**

### **PLC SETUP, PROGRAMMING, TROUBLESHOOTING AND MAINTENANCE-LEVEL 2 (Allen Bradley PLC)**

**4 days**

**Fee- N80, 000**

This course is designed to take the trainee into depths of control systems, set up, programming and maintenance. It includes intensive practical classes with live PLCs, modules field devices and industrial process simulator systems.

At the end of this training, trainees will be able to

- Design and execute automation projects
- Program, troubleshoot and maintain continuous signal field devices such as level meters, VFDs, temperature sensors, pressure sensors, modulating valves etc
- Establish communication between two or more PLCs
- Design process control systems with PID controls

Course content

- Set up, wiring and operation of continuous signal devices such as VFDs, flow meters, temperature sensors to PLCs
- Continuous signal(analog) programming
- Introduction to SLC 500 advance functions such as JSR, SCP and MCR and their applications.
- Connecting and communicating between two or more PLCs
- PLC extensions
- Process control using PID loop programming(with practical sessions)
- Introduction to process controls
- Open and close loop controls
- Introduction to PID concept and applications
- PID programming
- PID tuning
- Introduction to HMIs(RS view)

**Requirement** – Basic knowledge of the course contents of level 1 (AUTM 102)

**Softwares** – RS logix 500, 5000 and RS view

## **AUTM 105**

### **PLC SET UP, PROGRAMMING, TROUBLESHOOTING AND MAINTENANCE-LEVEL 2**

**(Siemens S7 300,400 PLCs)**

4 days

**Fee- N80, 000**

This course is designed to take the trainee into depths of control systems, set up, programming and maintenance. It includes intensive practical classes with live PLCs, modules field devices and industrial process simulator systems.

At the end of this training, trainees will be able to

- Design and execute automation projects
- Program, troubleshoot and maintain continuous signal field devices such as level meters, VFDs, temperature sensors, pressure sensors, modulating valves etc
- Establish communication between two or more PLCs
- Design process control systems with PID controls

Course content

- Set up, wiring and operation of continuous signal devices such as VFDs, flow meters, temperature sensors to PLCs
- Continuous signal(analog) programming
- Introduction to s7 function blocks (FBs),function Calls(FCs), special function Blocks(SFBs) and Special function Calls(SFCs) and their applications.
- Connecting and communicating between two or more PLCs
- Profibus connections and programming
- Process control using PID loop programming(with practical sessions)
- Introduction to process controls
- Open and close loop controls
- Introduction to PID concept and applications
- PID programming
- PID tuning
- Introduction to HMIs(winCC)

**Requirement** – Basic knowledge of the course contents of level 1 (AUTM 103)

**Software's** – step 7 and winCC

Trainees after this training will have an opportunity to secure and pursue careers in manufacturing industries, oil and gas and any other industry with automated systems

AUTM 203

## **HMI/SCADA WITH RS VIEW 32 & FACTORY TALK VIEW**

(Allen Bradley PLCs)

**3 days**

**Fee- N50, 000**

At the end of the course, trainees will be able to:

- Design user friendly Human Machine Interfaces(HMI) using Rs view 32/Factory Talk view software
- Connect a Rs view/Factory Talk design(file) into a Rs Logix 500 project
- Understand basic concept of tags etc and communications with the PLC
- Backup and restore a Rs view program when required.
- Perform basic system diagnostics on Rs view 32/Factory Talk when a problem occurs.
- Add basic functions to screens, Pushbuttons, Numeric Display, Bar graphs, Trends etc

### **COURSE CONTENT**

Getting Started on Rs view 32/Factory Talk

- Connecting a Rs view32/Factory project to a Rs logix 500/5000 project
- Navigating the Rs view 32/Factory Talk software
- Defining communication Parameters
- Using the Tool bar
- Object properties
- Object Animations
- Creating a Tag Database
- Bar graphs and sliders
- Trends
- Alarms
- Creating a Report for a Rs view/Factory Talk Application
- Troubleshooting a Rs view Terminal and Application

**Requirement** – Basic knowledge of the course contents of level 1 (AUTM 102)

**Software's** – RS VIEW/FACTORY TALK VIEW

## **AUTM 106**

### **HMI/SCADA USING SIMATIC WINCC (Siemens S7 300,400 PLCs)**

**3 days**

**Fee- N50, 000**

At the end of the course, trainees will be able to:

- Design user friendly Human Machine Interfaces(HMI) using simatic winCC software
- Integrate a WinCC design(file) into a step 7 project
- Understand basic concept of tags etc and communications with the PLC
- Backup and restore a WinCC program when required.
- Perform basic system diagnostics on winCC when a problem occurs.
- Add basic functions to screens, Pushbuttons, Numeric Display, Bar graphs, Trends etc

### **COURSE CONTENT**

- Getting Started on winCC
- Integrating a winCC project into a Step 7 project
- Defining communication Parameters
- Using the Tool bar
- Object properties(Events, animations etc)
- Creating a Tag Database
- Security and password of screens
- Adding Screens
- Text lists
- Recipes
- Bar graphs and sliders
- Trends
- Alarms
- Faceplates
- Creating a Report for a WinCC Application
- Troubleshooting a WinCC Terminal and Application

**Requirement** – Basic knowledge of the course contents of level 1 (AUTM 103)

**Softwares** – Simatic winCC

## **AUTM 300**

**Weekdays (daily)- 2weeks, weekends-2 months**

**Fee- N130, 000**

This training module covers all the course contents of level 1-2 and the HMI courses. It is designed to bring trainees to a point of mastery of automated systems. Experts with industry experience will take you through practical sessions and programming exercises.

At the end of this training, trainees will be able to

- Set-up, wire and program Siemens PLC control systems from scratch
- Troubleshoot basic programs, trace faulty Allen Bradley PLCs /modules and replace them.
- Perform basic and advanced PLC programming
- Setup- program and operate field devices such as level meters, flow meters, VFDs, modulating valves etc
- Design process control systems with PID loop programming
- Modify existing programs for different applications.
- Design user friendly Human Machine interfaces

### **COURSE CONTENT**

- Introduction to PLCs
- PLC set-up and wiring
- Establishing communication with PLCs
- PLC programming with ladder logic
- RS Logix 500,5000 installation techniques & components
- Creating projects
- Hardware configuration(basic and Advanced)
- CPU Properties.
- Symbolic notation & symbols table handling.
- Data types
- Programming Functions and their applications(timers, counters, comparators , jumps etc)
- Continuous(Analog) signal programming
- Commissioning & Monitoring /. Modifying Variables.
- Linear / Structured Programming Techniques.
- Debugging (troubleshooting) a program.
- Binary operations & gates.
- Downloading and uploading a program
- Configuration & addressing of modules
- Data handling including arrays & structures.
- Diagnostics with B, I, L stacks.



- Program, troubleshoot and maintain continuous signal field devices such as level meters, VFDs, temperature sensors, pressure sensors, modulating valves etc
- PLC troubleshooting and maintenance
- Process control using PID loop programming(with practical sessions)
- Introduction to process controls
- Open and close loop controls
- Introduction to PID concept and applications
- PID programming
- PID tuning
- HMI using Rs View
- Introduction to HMI systems
- Security and passwords
- Object properties and animations
- Alarms
- Bars and trends
- Tags e.tc

**SOFTWARE:** Simatic Manager(step 7),Simatic WINCC, TIA Portal

**P.S With the inclusion of pneumatic systems, the training is 12days and the cost is one hundred and fifty thousand naira(N150,000)**

**REQUIREMENT:** Basic technical knowledge

## **EPN 400 ELECTRO-PNEUMATICS**

### **Outcome**

At the end of this training the participant would:

- Be able to Interpret electro-pneumatic drawings
- Know the fundamentals of compressed air generation and distribution
- Understand the structure and function of pneumatic devices
- Be capable of designing an electro-pneumatic system
- Write basic PLC pneumatic programs for industrial standards and safety applications
- Troubleshoot and fix an electro-pneumatic system
- Build an HMI/SCADA monitoring system for a pneumatic set-up

### **COURSE DETAILS**

- Basics of electro-pneumatics
- Basic principles of compressed air supply, production, and distribution
- Structure and function of pneumatic devices
- Basic principles pneumatic valves, cylinders and solenoid coils
- Reading pneumatic diagrams
- Fundamentals of control and modulating valves
- Design of electro-pneumatic systems
- Writing a basic pneumatic PLC(Siemens or Allen Bradley) program for industrial standards and safety applications
- Pneumatic system faults identification and elimination
- Building an HMI/SCADA for a pneumatic system with alarms and data acquisition
- Hands-on exercises and simulations for all the listed above

## **AUTM 301**

### **CERTIFICATE IN CONTROL SYSTEMS/AUTOMATION ENGINEERING (Allen Bradley)**

**Weekdays (daily)- 2weeks, weekends-2 months      Fee- N130, 000**

This training module covers all the course contents of level 1-2 and the HMI courses. It is designed to bring trainees to a point of mastery of automated systems. Experts with industry experience will take you through practical sessions and programming exercises.

At the end of this training, trainees will be able to

- Set-up, wire and program Siemens PLC control systems from scratch
- Troubleshoot basic programs, trace faulty Allen Bradley PLCs /modules and replace them.
- Perform basic and advanced PLC programming
- Setup- program and operate field devices such as level meters, flow meters, VFDs, modulating valves etc
- Design process control systems with PID loop programming
- Modify existing programs for different applications.
- Design user friendly Human Machine interfaces

#### **COURSE CONTENT**

- Introduction to PLCs
- PLC set-up and wiring
- Establishing communication with PLCs
- PLC programming with ladder logic
- RS Logix 500,5000 installation techniques & components
- Creating projects
- Hardware configuration(basic and Advanced)
- CPU Properties.
- Symbolic notation & symbols table handling.
- Data types
- Programming Functions and their applications(timers, counters, comparators , jumps etc)
- Continuous(Analog) signal programming
- Commissioning & Monitoring /. Modifying Variables.
- Linear / Structured Programming Techniques.
- Debugging (troubleshooting) a program.
- Binary operations & gates.
- Downloading and uploading a program
- Configuration & addressing of modules
- Data handling including arrays & structures.
- Diagnostics with B, I, L stacks.

- Program, troubleshoot and maintain continuous signal field devices such as level meters, VFDs, temperature sensors, pressure sensors, modulating valves etc
- PLC troubleshooting and maintenance
- Process control using PID loop programming(with practical sessions)
- Introduction to process controls
- Open and close loop controls
- Introduction to PID concept and applications
- PID programming
- PID tuning
- HMI using Rs View/Factory Talk View
- Introduction to HMI systems
- Security and passwords
- Object properties and animations
- Alarms
- Bars and trends
- Tags e.tc

SOFTWARE: RSLogix 500,5000, RsLink, RSView, FactoryTalk View

**P.S With the inclusion of pneumatic systems, the training is 12days and the cost is one hundred and fifty thousand naira(N150,000)**

Requirement: Basic technical knowledge