



Learning Outcomes for the Allen Bradley SLC500 PLC course

The following pages detail the Learning Outcomes delivered on the course :-



Allen Bradley SLC500 Programming and Maintenance Course

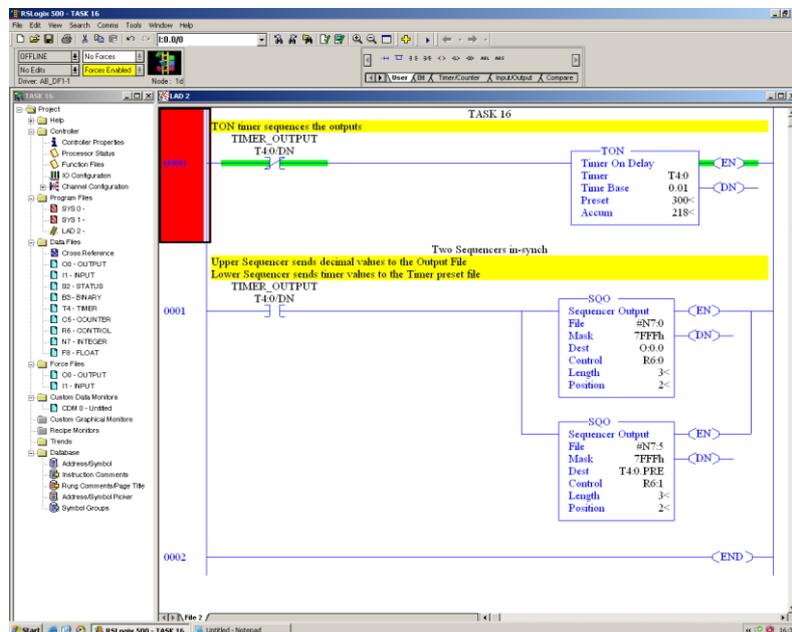
This is a very popular 4day course of programming and project work.

The course is suitable for people needing knowledge, understanding and practical experience of working with PLCs used within Factory Automation systems.

You will retain your course portfolio with its marked assessments, completed tasks and signed learning outcomes providing evidence of your achievement, valuable to an employer.

The course benefits from having External Verification and Certification by an external body.

Small groups to maximise learning, this course is carried out at Blackburn BTMC.



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Learning Outcomes for Allen Bradley SLC500 Programming and Maintenance Course

On completion of this 4day course, the delegate can:-

- + Identify components of a basic Control System to be Inputs, Outputs, Timers, Counters
- + Recognise the function and operation of inputs as N/O, N/C, PBs, Limit Switch, Sensor
- + Recognise the function and operation of outputs as Electromagnetic Relays and Solenoids
- + Recognise the function and operation of the timer to introduce time-based control
- + Recognise the function and operation of the counter to introduce count-based control
- + Identify basic control circuit symbols including N/O, N/C, Output coil and state operation
- + Recognise the terminology and drawing for a Ladder Diagram containing circuit symbols
- + Identify Ladder Diagrams using AND and OR configuration using N/O contacts to a coil
- + Describe the operation of a Latching Circuit and suggest the outcome of a failed H/O contact
- + Recognise the structure of Timer and Counter relays and their basic control strategies
- + Discuss Hardwired V PLC based systems in terms of Eg Reliability, Maintenance, cost etc
- + Draw a representation of the cyclical operation of a typical PLC
- + Recognise early fixed I/O PLCs and describe their format for I/O addressing
- + Recognise the range of Rack Based SLC systems and range of CPUs and slot based I/O modules
- + Describe arrangement and equipment required to communicate between PLC and programming devices
- + Determine the address of nominated Inputs and Outputs located within modules in the rack
- + Identify Micrologix 1200 components and I/O modules including analogue card
- + Determine the address of nominated Inputs and Outputs for the Micrologix configuration
- + Describe arrangement and equipment required to communicate between PLC and programming devices
- + Recognise the two SLC500 software packages and their icons required for programming SLC500 devices
- + Describe the function of these two packages, RS Linx and RS Logix. Open these applications.
- + Select an appropriate lead and set up the driver in Linx for an SLC Rack Based PLC. Use auto-configure
- + Select an appropriate lead and set up the driver in Linx for a Micrologix PLC. Use auto-configure
- + Prove communication has taken place between PLC and programming device

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On completion of this 4day course, the delegate can:-

- ✚ State the need for input and output isolation via opto coupling
- ✚ Discuss advantages / disadvantages of transistor and relay output types
- ✚ Open the RS Logix software and identify the Menu Tree and its file components
- ✚ Select the appropriate driver within RS Logix to match the driver created in Linx
- ✚ Setup the PLC processor type in RS Logix and auto-configure the connected PLC system
- ✚ Confirm the system is ready for programme editing

Delegate can create the following Projects, print out and store as numbered Tasks in the Portfolio :-

For each of these Tasks, the delegate can transfer the completed program to the PLC, can monitor the program in real time on the screen and can use simulator switches to confirm correct operation of the program.

The delegate can write a correct description of the operation of each program and complete questions set up for each Task

- ✚ Task 1 Setup the comms link to program a given AB SLC500 PLC system
- ✚ Task 2 Create, Document and Download a simple program
- ✚ Task 3 Create a functional Start/Stop program
- ✚ Task 4 Create a program using the B3 file (bits) as internal relays
- ✚ Task 5 Create a program to evaluate Latch and Unlatch operations using ONS
- ✚ Task 6 Create a program using a TONTIMER and evaluate its operation
- ✚ Task 7 Create a program using a TOFTIMER and evaluate its operation
- ✚ Task 8 Create a program using a RETIMER and evaluate its operation
- ✚ Task 9 Create a program using a CTU Counter and evaluate its operation
- ✚ Task 10 Create a program using a CTU counter and Comparators and evaluate their operation
- ✚ Task 11 Create a program using the MOVE instruction and evaluate its operation
- ✚ Task 12 Create a program using the MOVE instruction with data picked from the N7 file
- ✚ Task 13 Create a program using the MOVE instruction with data moved through the MASK to Outputs

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- ✚ Task 14 Create a program using the MOVE instruction with data moved through the MASK to B3 file
- ✚ Task 15 Create a program using the BSL instruction to shift a bit "left" through a B3 file (shift register)
- ✚ Task 16 Create a program using the SQO instruction to demonstrate a simple sequencer
- ✚ Task 17 Create a program using the SQO instructions to demonstrate a timed sequencer

Programming and Fault Finding on Conveyor Rig

✚ **Complete a programming and fault finding Assessment on a Conveyor Rig**

This uses a prepared industrial training conveyor rig.

- Identify the components of the conveyor rig Eg Motor, Encoder, Solenoid Valves, Reed Sws Indicators, Push buttons, Photo Sensors
- Wire-up the above components to the I/O terminals of the PLC and connect appropriate PSUs
- Use the LEDs on the PLC to prove the Inputs for correct wiring destinations
- Use the software Monitor/Force screen to Force PLC outputs on to prove correct wiring destinations
- Enter symbols and comments for all I/O devices into the software project file
- Devise a Ladder Rung program to create automated control for sizing / ejecting components
- Create the program in Ladder Rung format using appropriately named Subroutines
- Prove correct operation of the programmed system compared with desired strategy
- Printout all Ladder Rungs and all system documentation for the project and locate in Assessment file
- Modify the system operation as requested by the Trainer for Assessment purposes
- Use the software cross ref. table to locate trainer nominated elements used in the program
- Locate and describe each of 8 hardware faults placed on the conveyor system by the Trainer

Cont over:-

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Delegate can create the following Projects, printed out and stored as numbered Tasks in the Portfolio :-

- + Task 18 Not Required
- + Task 19 Create a program using Master Control Reset to demonstrate its operation
- + Task 20 Create a program using JSR, SBR and RET to demonstrate their operation
- + Task 21 ... Not Required
- + Task 22 ... Not Required
- + Task 23 Create a program to demonstrate the Temporary End instruction (TND)
- + Task 24 Create a program to demonstrate the Suspend Instruction (SUS)
- + Task 25 Create a program to demonstrate the ADD instruction
- + Task 26 Create a program to demonstrate the SUB instruction and use it to cause an Arithmetic Overflow
- + Task 27 Not Required
- + Task 28 Not Required
- + Task 29 Not Required
- + Task 30 Create a program to demonstrate the AB analog Outputs. Use modulating valve motor
- + Task 31 Create a program to demonstrate the AB analog Outputs (Retentive). Use modulating valve motor
- + Task 32 Create a program to demonstrate the AB analog Outputs (Non-Retentive) Use modulating valve motor

An EAL certificate of verified achievement is available on satisfactory completion of this course