



Advanced Siemens PLC

Category: Mechatronics · Model reference: MZM-2017



SPECIFICATIONS

1.0 ADVANCE MODULE SIEMENS PLC

1.1 PLC Devices

Modular training system for PLC devices. The freely accessible profile rail can be equipped with various input and output modules. The system bus integrated in the training system allows straightforward connection of the modules.

- SIMATIC S7-300 with CPU 314C-2 PN/DP
- Stable desktop console with non-slip feet
- Integrated power supply: 24V/6A DC
- Sockets for EMERGENCY-OFF loop (voltage isolation of output components)
- Main memory: >256KByte
- Loading memory: micro memory card > 4GB
- Programming language
- Processing times: 0.1µs for bit operation, 0.5µs for word operation
- 256 counters
- 256 time markers
- MPI interface
- Integrated BUS-DP master/slave interface
- Ethernet

- 16 digital inputs DC 24V on 4mm safety sockets
- 16 latched, pushbutton switches for the simulation of digital inputs
- 4 analog inputs 0-10V on 4mm safety sockets
- 1 potentiometer to simulate analog inputs
- 16 digital outputs DC 24V on 4mm safety sockets
- 2 analog output 0-10V on 4mm safety sockets
- Real-time clock

- Operating voltage: 230V AC-250V AC

1.2 Module for PLC CPU, 16 x DI on safety sockets, 8 x simulator. Switches - Digital - input – module to extend the basic unit for PLC devices control functions. 16 digital inputs DC 24V on 4mm safety sockets 16 latched, pushbutton switches for the simulation of input signals Input module , LED status display

1.3 Module for PLC CPU, 16 x DO on safety sockets - To extend the basic unit for PLC device control functions. 16 digital outputs DC 24V / 0.5A on 4mm - safety sockets Output module , status indicated using LEDs

1.4 PLC-PC-adaptor with USB/MPI converter - For coupling the PC to the PLC devices via the USB port including MPI and USB cable

2.0 PLC MODULE

2.1 Traffic lights module (24V DC)

Model of a traffic lights system at a main road junction with side road and pedestrian crossing. The pedestrian crossing requests are made by switches S1, S2: car traffic on the side road is registered by an inductive loop (switch S3). A total of 13 red, yellow, and green LEDs indicate the operating states of the individual lights.

- 8 digital inputs
- 2 digital outputs
- Connection: via 2mm sockets
- Power supply: 24V/200mA

2.2 Stepping motor with encoding disc (24V DC)

Stepping motor with coupled incremental disc. The operating states of the four motor windings are indicated by 4 LEDs to graphically demonstrate the generation of rotating fields. Two light barriers generate 2 pulses sequences displaced by 90° to detect position and rotation direction. The encoding disc is exchangeable.

- 4 digital inputs
- 2 digital outputs
- Connection: via 2mm sockets
- Stepping motor: full step 15° half step 7.5°
- 2 incremental discs with various resolutions
- Power supply: 24V/300mA

2.3 Star-Delta circuit (24V DC)

Model of a star/delta reversing circuit.

The contactor settings are indicated by LEDs and trigger signals are fed back for check back indication.. This also incorporates a fault circuit switch for the feedback contactor K2. Forward, reverse and stop functions are selected via pushbuttons and the relevant signals are program-polled.

- 4 digital inputs
- 7 digital outputs
- Connection: via 2mm sockets
- Power supply: 24V/150mA

2.4 Set point (reference) / Actual value comparison (24V DC)

Model to set a 4-digit set point value as well as to display the 2-digit actual value. Using this module, static and multiplex operation can be demonstrated. Four coding switches can be read out individually according to selected values (i.e. set point value defined in multiplex operation). An actual value display is realized by direct control of two 7-segment displays (static operation).

- 18 digital inputs
- 4 digital outputs
- Connection: via 2mm sockets
- Power supply: 24V/300mA

2.5 Tunnel/ventilation module (24V DC)

Model of a motorway tunnel with 3 ventilation turbines (indicated via 3 LEDs). Air pollution levels in the tunnel are monitored by 4 sensors (switches). Furthermore, traffic density can be monitored via an inductive loop (push-button) at the tunnel entrance. The ventilation system reacts to various situations by switching on 1, 2 or 3 ventilation turbines and in an emergency, the traffic can be stopped at the entrance and the flow controlled by a traffic light system (3 LEDs).

- 6 digital inputs
- 5 digital outputs
- Connection: via 2mm sockets
- Power supply: 24V/150mA

2.6 Washing machine (24V DC)

Module used to simulate the control and monitoring of a washing machine. Program control with a selector switch for On/Off, fine and standard washing cycles and temperature setting. Processes such as washing and spin-drying (2 speeds), heating On or Off, water inflow and draining are all simulated. Signal feedback after water intake reaches various water levels or upon reaching temperatures after heating periods during simulation.



- 5 digital inputs
- 7 digital outputs
- Connection: via 2mm sockets
- Power supply: 24V/100mA

2.7 Burglar alarm module (24V DC)

Model of building with an alarm system, incorporating switches for two window contacts, a door contact and building security. The alarm system is activated by a main switch (with LED indication). The alarm state is signaled acoustically by a buzzer and/or optically via an LED.

- 3 digital inputs
- 5 digital outputs
- Connection: via 2mm sockets
- Power supply: 24V/100mA

2.8 Handbook : Control Technology with PLC Process Simulators

Exercise descriptions, including instructor information, assembly plans and student worksheets

2.9 Adapter -

1. connection cable 2mm (50cm red)
2. connection cable 2mm (50cm blue)
3. connection cable 2mm (50cm white)

3.0 LITERATURE

3.1 PLC Fundamentals, Programming Basics, (5 Handbooks)

Documentation package, printed version, consisting of:

- Programming software simple to assemble and program
- User handbook
- Program handbook
- Converter handbook
- Index

3.2 PLC Fundamentals, Programming Reference Book

Documentation package in printed form, consisting of:

- Statement List handbook and CD
- Ladder Diagram handbook
- Sequence Function Chart handbook
- Reference handbook for standard and system functions of PLC

3.3 Table-top frame, 1 level, W 1230 x H 400mm,

3.4 Programming Software - Basic

The programming software is the standard tool for the PLC automation systems. The user receives convenient tools and functions for all phases of an automation project:

- Hardware configuration and parameter setting
- Defining the communication
- Programming in the proven and standard PLC programming languages statement list (STL), ladder logic diagram (LAD) and sequential function chart (SFC)
- Testing, putting into operation and service
- Documentation and archiving
- Operating and diagnostics functions
- Hardware configuration: for the configuration of the automation system and to set the parameters of all component settings
- Symbol editor: to define the symbolic designations, data types, and commentaries on global variables
- Program editor: for easy program generation in STL, LAD and SFC. Easy, intuitive control with such standard functions as Drag& Drop, Cut& Paste as well as a library with prefabricated, complex program functions or self-made standard solutions.
- Communication: for project planning of connections, for defining the time-controlled cyclic data transmission between automation components via MPI or for result-dependent data transmission via MPI, BUS or industrial Ethernet.
- System diagnosis: for rapid overview of CPU data and to trace cause of disturbances while running a user program.

4.0 PLC APPLICATION MODEL – AXES POSITIONING UNIT

1. PLC application model, 3-axes positioning unit

Overview

This training device can achieve plane position control in the movement, in the PLC control, can be realized plane rear wing position control, and through the pneumatic institutions to grab and put, through the DC reduction motor (high performance servo motor, step motor) to control precision instrument in the movement, this equipment is for research PLC system design special develop and design, complete the inspection, control, and implement of the three major module training. Let the students understand and master mechanical and electrical integration knowledge.

This training device is two dimension motion control model, and combine with sensors, PLC, pneumatic, electric motor control, and grab the workpiece by Magnetic Disk

- Practice-oriented 3-axes application model for simulating transport processes. A small magnetic disk can be picked up from the base-plate by a magnet, lifted by one axis and placed at any x,y position. The model is ideally suited to learning the sequence control of a PLC. The programming of end-switches is taught in a realistic manner.

- 15 Digital inputs-latest
- 10 Digital outputs-latest
- Integrated control pult with all pushbuttons, switches and signal lamps necessary for operation
- 1 SUB-D 37-pin plug (input signals) for connecting PLC via system connector
- 1 SUB-D 37-pin socket (output signals) for connecting PLC via system connector
- 1 SUB-D 25-pin socket for connecting a fault simulation box

- Positioning accuracy: approx. ±1mm
- Power supply: DC 24V via system connector
- Max. current consumption: 250mA
- 2. Handbook : Real Process Model with CD
- 3. Safety connection cable (4mm) 150cm red
- 4. Safety connection cable (4mm) 150cm blue
- 5. Safety connection cable (4mm) 150cm white

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