

Module number: M2

Name of the module: IEC 61131-3 Programming**Responsible:** P11-KMUTNB
 (P10-RRU, P8-BUU)

ID	Didactic modules (Teaching materials)	Comments	THEO (D3.4)	PRAC (D3.5)	THEO hours	PRAC hours	Total of Hours	LEADER	Contributor	Interested
M2	IEC 61131 programming	PLCs and IEC 61131-3 programming	5	9				P11-KMUTNB	P10-RRU	P8-BUU

Total number of hours: 14h (Theory: 5h, Practice: 9h)

Aims:

The goal of the module is to give theoretical and practical information about technology of Programmable Logic Controllers (PLCs), industrial standard for programming PLCs, hardware configuration and programming. The students also will have the chance to program simple control exercises with the ETAT Smart Lab.

Programme:

Lecture:

- (0.5h) Overview of programmable logic controllers (PLCs) and the IEC 61131
- (1h) IEC 61131-3: data types (e.g. analog, digital, boolean), and programming structure
- (1h) Ladder diagram (LD)
- (1h) Function block diagram (FBD)
- (1h) Structured text (ST)
- (0.5h) Sequential function chart (SFC)

Practice:

- (1h) PLC hardware configuration
- (2h) IEC 61131-3 programming in LD with ETAT Smart Labs
- (2h) IEC 61131-3 programming in FBD with ETAT Smart Labs
- (2h) IEC 61131-3 programming in ST with ETAT Smart Labs
- (1h) PLC hardware configuration (basic network communication setting)
- (1h) IEC 61131-3 programming in SFC with ETAT Smart Labs

Assessment method:

- Questionnaire for learning contents and using ETAT Smart Labs
- Results of theoretical pre-/post test
- Results of practical work

Prerequisites:

- Fundamentals of electric circuits
- Fundamentals of computer programming

Expected Learning Outcomes (ELOs):

- Knowing technology of PLCs and its programming standard for industry
- Can configuring PLC hardware for important functions
- Selecting and using IEC 61131-3 properly
- Design and implementation of real-world practice