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## Context

WP 2	Design of the AIISM-PBL methodology
WPLLeader	Universitat Politècnica deValència (UPV)
Task 2.5	Development of the AIISM teaching resources - Industrial Process Controllers and Simulators
Task Leader	TU Sofia
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## History

Version	Date	Author	Comments
0.1	xx/xx/2014	TU Sofia Team	Initial draft

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# 1 Executive summary

WP 2.5 details the learning materials of the Advanced Industrial Informatics Specialization Modules (AIISM) related to the “Industrial Process Controllers and Simulators” Module.

The content of this package follows the guidelines presented in the TU Sofia documentation of the WP 1 (Industrial Process Controllers and Simulators Module)

- The PBL methodology was presented in WP 1.1
- The list of the module’s chapters and the temporal scheduling in WP 1.2
- The required human and material resources in WP 1.3
- The evaluation in WP 1.4

During the development of this WP a separate document has been created for each of the chapters of the Industrial Process Controllers and Simulators Module (list of chapters in WP1.5).

In each of these documents, section 2 introduces the chapter; sections 3, 4, 5 and 6 details the Lecture, Laboratory, Seminar and Mini-project of the chapter; section 7 lists the bibliography and the references.

## 2 Introduction

The chapter #01 covers the overall introduction to the “Classification and characteristics of the Computer Control Systems (CCS): embedded (specialized) systems; control systems for industrial applications with standardized functions.”

## 3 Lecture

### *Subject*

This lecture discusses the general classification, characteristics and comparison between different types of Computer Control Systems (CCS). It introduces the common, general and specific characteristics of the industrial CCS.

### *- Goal*

To present a general knowledge about industrial CCS, to enable understanding of the common parts/functions and how different applications can be generalized..

### *- Contextualization*

Introductory material. Connections with the other courses.

### *- Motivation*

Students already know about microcontrollers, industrial computers, industrial network. They have to get collected all this knowledge and to go the upper level – how to combine all of this to implement a control system.

### *- Bibliography*

- References to CCS.

- *Concepts*

- The necessity of understanding of information flow through the control system.
- The concepts of discrete by time and by level signals.
- The concept of logical and computational system modelling.

- *Examples*

- The signal from the sensor of the actual liquids-level in the tank is used as an example of an analog input signal.
- The alarm signal from the overflowing sensor is used as an example of a digital input signal.
- The signal to the heater in the tank is used as an example of a digital output signal.
- The signal to the liquids pump in the tank is used as an example of an analog output signal.

- *Control Questions and Recommended Further Reading*

Question Example:

Describe what possible technics and hardware solutions for multichannel analog sensor signals reading. References to data sheets of microcontrollers.

Do you know which type of digital input signals can be interpreted as pseudo-analog?

## **4 Lab**

## **5 Seminar**

## **6 Mini-project**

## **7 References**