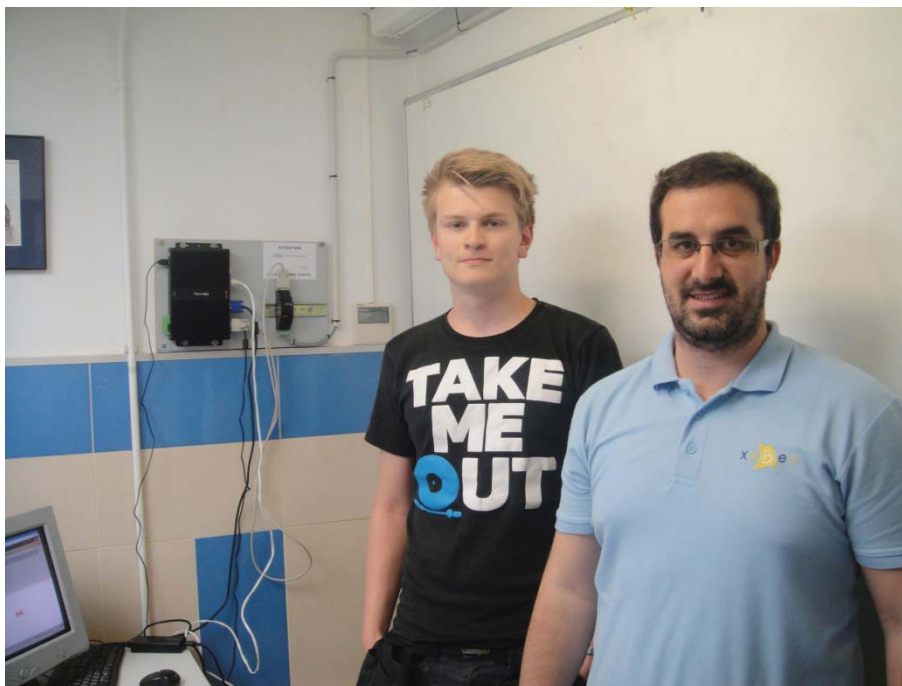


PROJECTX Nº 024

“COMPUTER CONTROL OF A REFRIGERATION SYSTEM”

PRESENTATION



Promoting school:

XABEC, Vocational Training Centre
Spain



A. GENERAL DESCRIPTION

Title of the ProjectX

COMPUTER CONTROL OF A REFRIGERATION SYSTEM

Core area

GENERAL / KNOWLEDGE **ELECTRONIC, REFRIGERATION**

PARTICULAR / ACTIVITY: **DESIGN, DRAWING AND ASSEMBLY**

Promoting school

XABEC

Schools participants in the revision of the ProjectX

SAVO

Reference to ECVET Credit System and EQF / NQF

ECVET	EQF	REFERENCE TO NATIONAL QUALIFICATIONS (NQF)						
		Spain	Finland	Romania	Portugal	UK	Turkey	France
2	3	4	4	3	4	3	4	4

Learning Outcomes achieved (to be developed in the future related with ECVET credit system)

- 38.5-Draw diagrams of electrical facilities by applying the rules and conventions of graphic representation.
- 38.9-Mount simple automatic systems with PLCs, interpreting diagrams and verifying the implementation of control programs
- 39.5-Draw maps and diagrams of the facilities, interpreting and applying the specific symbols and conventions for graphic representation.
- 123.3-Draw blueprints of thermal and liquid installations, applying conventional symbology and design programmes.

Time that is necessary to do the ProjectX (in hours)

Theory: 10 hours
Practice: 50 hours

Link to real companies in your region (it is just informative)

- | | |
|---------------------|-----------------------|
| 1. NAME: CARRIER | WORKPLACE: TECHNICIAN |
| 2. NAME: HWANSUNG | WORKPLACE: TECHNICIAN |
| 2. NAME: ART HORECA | WORKPLACE: TECHNICIAN |



B. THEORY

Objectives of the theoretical Knowledge

At the end of the theoretical part of this ProjectX, the student will be able to:

1. Identify the components of a refrigeration control system
2. Know the operation parameters, control and protection of a refrigeration system
3. Identify the characteristics of electrical connection of the control elements
4. Design the connection of the cooling and control elements

List of activities

1. Evaluation questionnaire
2. Multi-choice test
3. Training exercises with a computer programme
4. Develop a user`s manual

C. PRACTICE

Brief description of the Practice

With a cooling system as a reference, the student will design and assemble the control system from a PLC and a commercial software (Eliwell), and he will make its implementation. He will also conduct performance tests, energy efficiency and control through a web application

Steps or activities to be performed by the student

- | | |
|---------|--|
| First: | Performance of the basic and operation diagrams of a refrigeration installation. |
| Second: | Development of the wiring diagram of this installation |
| Third: | Assembly of the system and interconnecting the different devices with the PLC |
| Fourth: | Assignment of the operating parameters to the computer diagrams |
| Fifth: | Test operation and control of the parameters |
| Sixth: | Data acquisition to evaluate the energy efficiency of the installation |



D. DETAILED DESCRIPTION OF LEARNING OUTCOMES.

Learning Outcome:	38.5. Draw diagrams of electrical facilities by applying the rules and conventions of graphic representation
Knowledge	
<ul style="list-style-type: none"> - The student knows PLC structure, programs editing, tests functions use, malfunction warnings - The student knows regulations for representation of general and domotic electrical systems - The student knows electric schemes drawing techniques 	
Skills	
<ul style="list-style-type: none"> - The student is able to adapt components and conductors following the technical disposition - The student is able to set and program an electronic installation - The student is able to carry out test techniques - The student is able to respect protocols and setting methods 	
Competences	
<ul style="list-style-type: none"> - The student is responsible assembling and testing control systems 	

Learning Outcome:	38.9. Mount simple automatic systems with PLCs, interpreting diagrams and verifying the implementation of control programs
Knowledge	
<ul style="list-style-type: none"> - The student knows kinds of PLC elements, units of automated control systems, robots and SCADA systems - The student knows how to read technical drawing shows the connections between the PLC and units of automated control systems, robots or SCADA systems - The student knows types of connections between the PLC and units of automated control systems, robots or SCADA systems 	
Skills	
<ul style="list-style-type: none"> - The student is able to read technical project document - The student is able to make connections between PLC and units of automated control systems, robots or SCADA systems 	
Competences	
<ul style="list-style-type: none"> - The student is responsible for applying the right strategy to make connections between the PLC and units of automated control systems, robots or SCADA systems - The student is responsible of planned work and good use of time - The student is responsible for cooperation with colleagues - The student is responsible for sharing Knowledge, experience and insights 	



Learning Outcome:	39.5 Draw maps and diagrams of the facilities, interpreting and applying the specific symbols and conventions for graphic representation
Knowledge	
<ul style="list-style-type: none"> - The student represents elements and equipment of heating systems and fluids with the standard symbols of drawings and diagrams - The student can make schematic diagrams of thermal and fluid installations using drawing programs - The student can draw draws of thermal installations according to the official standards of representation and design - The student can draw isometric drawings of installations describing the selected constructive solution 	
Skills	
<ul style="list-style-type: none"> - They have been established and order groups of different types of circuits - Sketches were drawn from installations of buildings - It has drawn the layout of the facility - They have joined indications and legends - It has been identified in the draw characteristic information - They have been applied the specific rules for each type of installations 	
Competences	
<ul style="list-style-type: none"> - The student can obtain the necessary data to program the installation and maintenance of the building - The student can control the parameters of operation of the automatic programming system of regulation and control systems - The student can maintain cleanliness and order in the workplace, to meet the standards of technical competence and occupational health requirements 	

Learning Outcome:	123.3. Draw blueprints of thermal and liquid installations, applying conventional symbology and design programmes
Knowledge	
<ul style="list-style-type: none"> - The student knows identify the symbolism relating it to the actual ítems - The student knows the characteristics of the elements involved in the electrical circuits taking into account its function and application - The student knows use design software customary in the industry 	
Skills	
<ul style="list-style-type: none"> - The student is able to plot wiring diagrams and control with the symbology of application and using drawing software - The student is able to verify the operation of the circuits using software simulation - The student is sable to apply the relevant electrical regulations 	
Competences	
<ul style="list-style-type: none"> - The student is responsible for plotting the terminal blocks and terminals with symbolism and correct numbering - The student is responsible for taking into account the rules of representation of the sector 	

