Installation of electronic components and assemblies

MD 05
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Module description

Training module: Installation of Electronic Components and Assemblies

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Background

There are many separate assembling projects in this module. Each project is a part of the general project. This module is practice-oriented, as a result, learners gain skills about making plans, assembling and testing.

Prerequisites

To study this module, learner must have finished the following modules/subjects:
- MH13
- MH14
- MH15
- MH16
- MD 04

Module objectives

Learners are able to install and test function of components and electronic devices; process printed circuit boards; build up an electronic circuit; find out, analyse and repair errors in the circuit.

Relationship to competency standards (as described in the DACUM chart)

For detail tasks and works, please refer to the DACUM chart:
A4
B4
C3, C4, C33, C35, C39
D2, D3, D25, D31
E6, E7, E8, E9
F2, F6
G2, G5, G6
H31
I3, I8
J1, J3, J4
## Learning outcomes

After finishing the modules, the learners will be able to:

- Understand and apply technical documents.
- Explain structures, operating principle and application of electronic components.
- Analyze functions relationship of electronic circuits.
- Make a list, select and test electronic components based on requirements.
- Prepare necessary measurement instruments, tools and materials.
- Assemble components on an existing printed circuit board
- Solder a printed circuit board
- Measure and test function of a circuit.
- Find out and repair failures in a circuit
- Follow safety rules at work
- Work in groups.

## Module contents

**Electronic components and basic circuits:**

- Power circuits, function modules
- Switch, buttons
- Diode, transistor, thyristor, triac, Diac and other components
- Warning instruments (light, buzzer, etc.)

**Technical documents:**

- Technical guide
- Sketch, diagrams
- Electronic components handbook

**Circuits:**

- Schematic circuit.
- Pins connection circuit
- Components list.

**Work planning:**

- Pre-process: Prepare necessary components, tools.
- While-process: Practice
- Post-process: Show the result

**Assembling:**

- Choose and test electronic components qualities.
- Assemble components in a circuit.
- Test functions and find out error

**Measuring:**

- Current
- Voltage
- Resistance
- Signal

**Troubleshooting:**
- Observe on the whole
- Follow the connections
- Supply signals for testing.
- Analyze the result
- Repair faults

**Work safety:**
- Use safety working tools.
- Use safety methods (electrical insulations, grounding)

### Assessment

Evaluation of result of the module includes the following parts:

1) Results of individual exercises in module.
2) Written examination at the end of module:
   Learner takes a written examination at the end of module following module objective in maximum time of 90 minutes.
3) Practice examination at the end of module:
   In maximum time of 240 minutes, learners take a practice examination of assembling a basic electronic circuit. This circuit is part of general project.
4) Check practice results:
   Learner check result of practical examination. Including analysis, find out and repair error created by teacher in the maximum time of 60 minutes.

### Necessary Infrastructure

**Practice Laboratory:** We suppose that there are 16 students in a class and students work in groups of two.
- Minimum square is 80 m²
- Teachers’ working place, cabinet for learning and teaching materials.
- Magnetic board with minimum size of 2,5 x 1,2m
- Projector and screen
- AC power supply: 220V/50 Hz, DC power supply: 0V÷24V.
- Power supply distribution with NOT-OUT button at each practice place.

**Equipments of each practice place:**
- Standard working table.
- Industrial electronic tools.
- 02 ergonomic chairs.

**Materials**
- Necessary electronic components
- Panel and printed circuit board
- Related materials

**Teaching and learning materials**
- Task assignment papers
- Instruction for practice exercises.
- Folie sketchs
Examples of equipment:
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