# Key Questions

## Smart and Keen Factory – My Trolley Chip

**What is the module about?**

The module SMART AND KEEN FACTORY will enable teachers and students to create an intelligent factory, where trolley chips can be produced on demands of the customers.
This module is characterized by the fact that a trolley chip assembly machine is envisioned to be constructed, manufactured, built, programmed and used by students of interdisciplinary training courses themselves. This distinguishes it from the work with 4.0 training stations which are on the market available.

**Which previous knowledge is required to use this module?**

Basic knowledge in ICT software designing, mechanics and electronics. Work with an 3D-Printer and with pneumatic and electrical components.

**Which target group is the module addressing?**

Teachers, Instructors and Students working on a vocational college or training center in the field of mechatronics and electronics.

**What am I going to learn?**

Students will be able to:

- read mechanical drawings
- assemble basic mechanical skills
- read electrical and termination drawings
- have basic wiring skills
- maintain hardware Projection
- manage PLC fieldbus connection
- read EN60848 Grafcet

code in FUP,LADDER oder AWL,SCL

# Internet of Things – Plant Irrigation

**What is the module about?**

Intelligent real time plant irrigation controlled by web or mobile (manually or automatically)
Subdivided in 5 integrated submodules:

- Electronics
- Linux operating system and sensors data exchange
- Real time Database
- Hybrid Application
- Statistics

**What previous knowledge is required to use this module?**

Depending of each submodule basic knowledge of:

- Electronics
- Linux operating system and programming
- Database
- Mobile and web development
- Javascript frameworks

In each submodule there is a guide to start learning the basics of each.

**Which target group is the module addressing?**

Vocational Education and Training students and teachers of:

- Technician in Telecommunications Installations
- Technician in Microcomputer Systems and Networks
- Higher Technician in Development of Web Applications
- Higher Technician in Multi-platform Applications Development

**What am I going to learn?**

Electronics, Sensors data and interaction, Microcontrollers, Connections, Raspberry Pi, Python, E-Cloud, Internet Of Things, Real time database, Mobile and web app development , Angular, Ionic, CharJs.
Web page with all the content.

# Intelligent House 4.0 – Smart Light Control

**What is the module about?**

In this module the students install and configure a Smart Light Control unit. After finishing the basic task the light can be switch on and off via web or mobile app.
Additional tasks are:

- Integration of color light
- Voice control
- Integration of sensor signals like daylight, intrusion

**What previous knowledge is required to use this module?**

Basics of Networking:

- Topology of Networks
- Structure of Local Area Networks, Wide Area Networks and the Cloud
- Different ways to connect the participants of a network (TP, optical wireless)

Structure and function of a conventional wired one-way or two-way switch circuit for lamps

**Which target group is the module addressing?**

Main target groups are Electronics Technician – specializing in Energy and Building Technology
But also:

- Information Technology and Telecommunications System Electronic Technician (m/f)
- Plant Mechanic for Sanitary, Heating and Air Conditioning Systems
- Information Technology and Telecommunications System Electronic
- Technician (m/f)

**What am I going to learn?**

The students will be able to

- configurate the control unit by using a smartphone and Internet
- install a radio controlled smart switch
- connect the switch with the control unit
- progam the control unit for different settings
- program the control unit for different conditions, including the needs of the customers (daylight, geodata, intrusion protection)

# Digital Factory for Individualized Products

What is the module about?

Due to digitalization it is possible to produce common mass products considering individual demands. In this module you will learn how to set up and operate a digital production chain for simple, customizable, die-cast plastic objects. This module is Subdivided in 5 integrated submodules:

- Product development
- Production
- Data Processing
- Rapid Protoptyping
- CAD & CAM systems

**Which previous knowledge is required to use this module?**

- Basic knowledge handling of windows
- Experience with technical documentations (drawings, work-plans etc.)
- Knowledge and skills dealing with manufacturing processes like bring, milling etc.
- Handling of metal-cutting machines
- Basic knowledge of handling raw materials, tooling equipment and tensioning mean.

**Which target group is the module addressing?**

Target groups are all trainees who are working in developing and producing industrial goods in the occupation areas of Mechanical Engineering and Plastics Engineering:

- Industrial Mechanic
- Machine and plant operator
- Milling machine operator
- Technical product designer specialising in machinery and plant construction
- Tools mechanic
- Precision machinist

**What am I going to learn?**

In this module you will learn how to set up and operate a digital production chain for simple, customizable, die-cast plastic objects. You learn to understand the digital processes by assembling an individualized mass-product. You are able to assemble an individualized product on basis of a mass-produced article. You are able to control the production by cloud-computing application.

# Internet of Things - The Intelligent LED-Sign

**What is the module about?**

- Intelligent LED sign interacting with mobile apps
- Subdivided in 5 integrated submodules:
- Programming and Simulation
- Electronics
- Microcontroller applications
- IoT specialities (WIFI and MQTT)

**Which previous knowledge is required to use this module?**

The modules build on each other. Special prior knowledge is not required. Basic knowledge of electronics and programming is advantageous.Depending on the level of previous knowledge, only different time approaches have to be selected and, if necessary, accompanying exercise phases have to be provided.

**Which target group is the module addressing?**

Students and teachers who are involved in programming and electrical engineering. These could be, for example, apprentices of devices and system technicians as well as students of vocational grammar schools.

**What am I going to learn?**

- Basics of programming
- Basics of microcontroller programming
- Basics of electronics
- Implementation of analog and digital sensors
- Integration of network devices into a WIFI environment
- Establish a client-server communication by means of the MQTT protocol