



## Word Clock

Countries:	Poland 	Slovakia 
Suitable for grade:	3 - 4	3 - 4
Specialization:	Mechatronics or IT	Technical lyceum Electrotechnics
Responsible teacher:		Michal Copko

### Project description:

Goal of the project is to construct word clock (you can find picture on the internet) that will display the time as words in two languages - one side Polish and another side Slovak. Clock will be driven by microcontroller and synchronized with internet through NTP protocol. Clock should have RTC module to store the time if internet synchronization is not available and also serial (or web) interface to set up initial time, timezone and NTP time server. Whole project will be divided into two parts - display and control.

### Project tasks:

#### Student #1 (PL):

- Design and make case (panel) of word clock for two languages - [Polish and Slovak \(SK in cooperation with a Slovak student\)](#)
- Prepare circuit for switching LED stripe/LEDs/bulbs under the words
- Design and make PCB for connecting lights to power source
- Test displaying time in two languages
- Interconnect lights PCB with outputs of microcontroller

#### Student #2 (SK):

- Prepare program for microcontroller to:
  - o get data from NTP server and synchronize time with local RTC module
  - o set time through serial line or internet
- Prepare circuit to send output to display module made by student #1
- Design and make PCB based on circuit
- Test displaying time

### Success criteria:

Project will be successful after construction of working two-languages word clock that will display time in word form (e.g. quarter to six p.m.) synchronized by internet or locally set. All project parts should be cost efficient and computer code should be well designed (time and memory efficient, without bugs). Project documentation has to be prepared based on given template in the range of 15-25 in English and native language.

### Developed hard skills:

Programming, debugging, soldering, drilling, designing and making PCB, electronics, mechanical treatment of materials, computer graphics, computer networks, CAD systems

### Developed soft skills:

Cooperation, working with computer, planning, teamwork, tracking progress, communication in foreign language, responsibility, compliance with agreements, respect deadlines, problem solving, finding and processing information, design thinking, following safety and ergonomic rules