Katedra telekomunikační techniky

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Technology LoRaWAN

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Předmět: Telecommunication Network

Target:

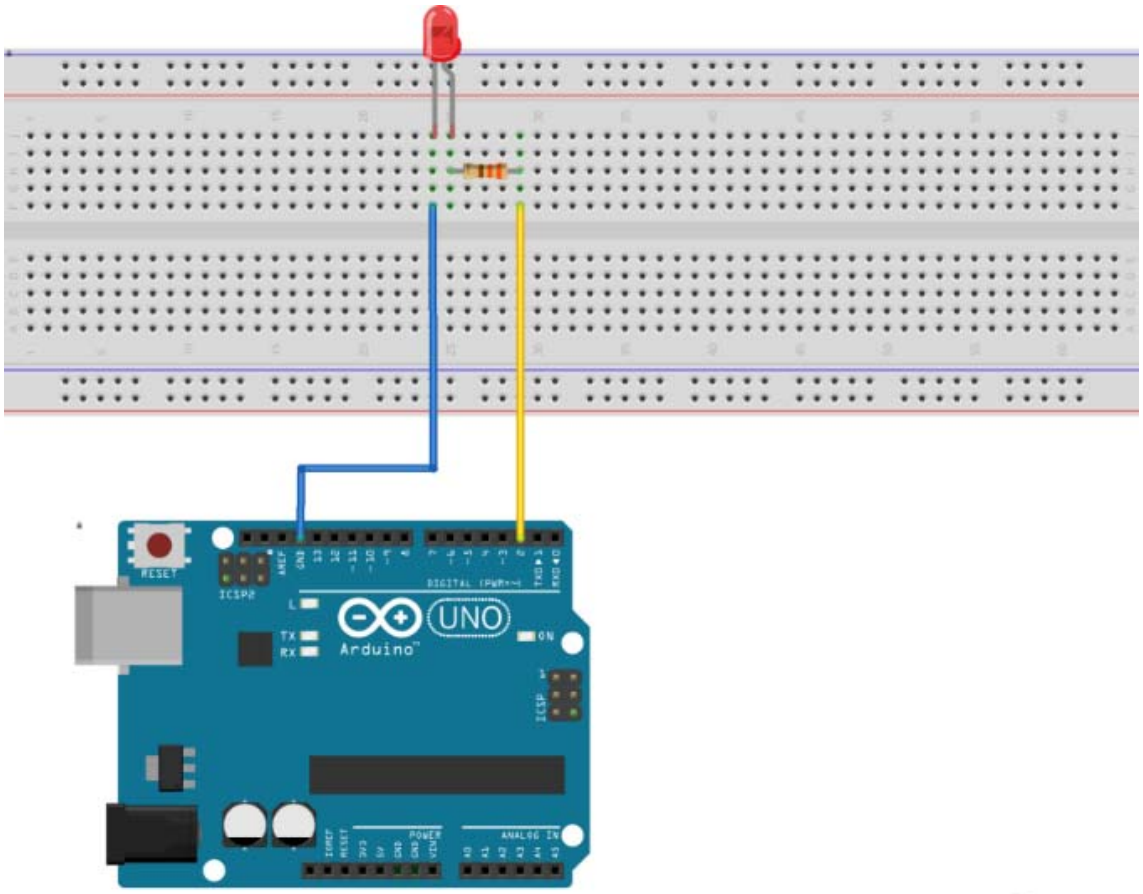
- ✓ known with Arduino platforms and Arduino IDE
- ✓ known technology LoRaWAN
- ✓ set sensor by Arduino IDE a configure data transfer over LoRaWAN to LoRa server

Before lecture see and find information from presentation or recommended publications

- basic feature of LoRaWAN technology

Task:

1. Seznamte se s platformou Arduino UNO a vývojovým prostředím Arduino IDE.
2. Connect board Arduino UNO to USB port of PC.
3. Open Arduino IDE (icon on desktop).
4. Verify on menu *Nástroje* → *Port* , if choosing port is connected to board Arduino.
5. Verify communication between board and PC – simple application for light of LED.
6. See the picture below and connect LED with resisrot to digital output „2“.



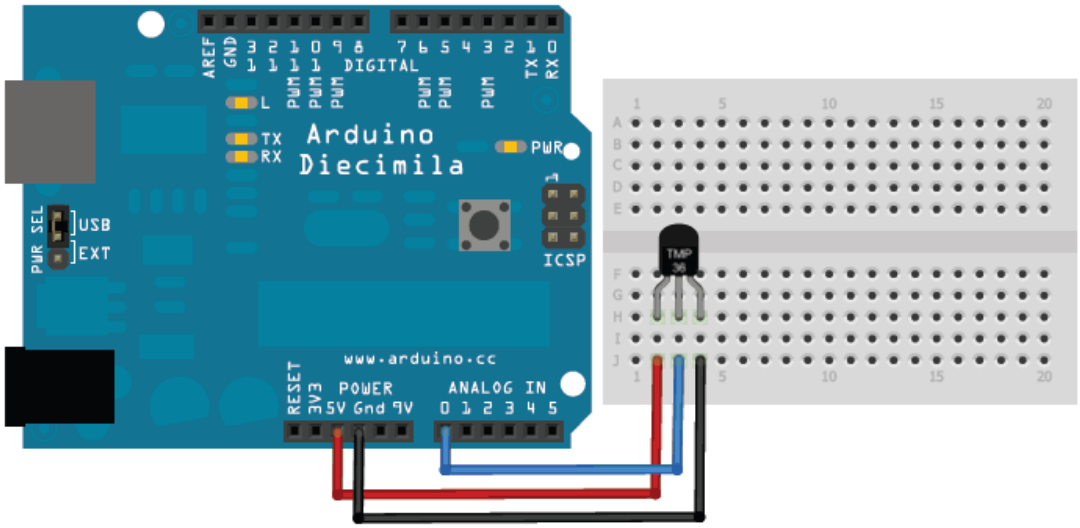
7. Create new *sketch* over menu *Soubor* → *Nový*

8. Write this code:

```
void setup()
{}

void loop()
{
digitalWrite(2, HIGH);
delay(100);
digitalWrite(2, LOW);
delay(1000);
}
```

9. Compile program over menu *Projekt → Nahrát*

10. Create a new connection for Arduino UNO temperature sensor by picture below:



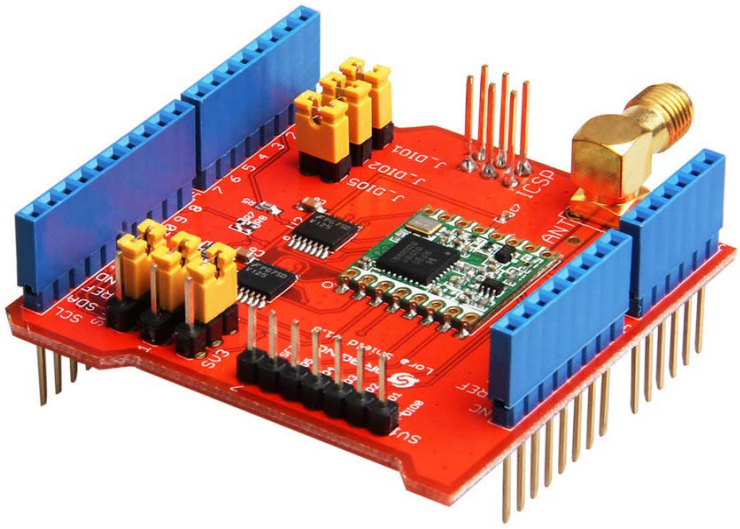
11. Create a new sketch over menu *Soubor → Nový*

12. Write this code:

```
void setup()
{
  Serial.begin(9600); // set serial port
}

void loop()           // infinite loop
{
    int reading = analogRead(0);   //to variable reading will save actual value from
analog input "0"
```

```
    float voltage = reading * 5.0; // voltage conversion

    voltage /= 1024.0; // voltage / 1024 --> conversion to one of 1024 layer

    Serial.print("Aktualni napeti na senzoru je: ");

    Serial.print(voltage);

    Serial.println(" V"); //  listing voltage from sensoru

    float temperature = (voltage - 0.5) * 100 ; //conversion voltage to Celsia
((voltage - 500mV) * 100)

    Serial.print("Aktualni teplota je: ");

    Serial.print(temperature); Serial.println(" C"); //  list of current temperature

    Serial.println("");

    delay(5000);                                        //wait 5 second
}
```

13. LoRaWAN shield



Download IDE:
https://www.arduino.cc/en/Main/Software

https://www.arduino.cc/en/Reference/HomePage

https://www.rfsolutions.co.uk/radio-modules-c10/hope-rf-modules-c238/lora-trx-module-20dbm-139dbm-300kbps-1-8-3-7v-p585