Design laboratory

Project - Weather station

EEPROM and Bluetooth module

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1. EEPROM memory

Atmega328pb have 1KB EEPROM memory which we can use to save data. The measurement results were divided into an integer and a fractional part instead of float type.

The data is written to the data structure which is then sent to the EEprom memory.

```
12  typedef struct{
13      char I_Humidity;
14      char D_Humidity;
15      char I_Temperature;
16      char D_Temperature;
17      char I_sensor1;
18      char D_sensor1;
19      char I_sensor2;
20      char D_sensor2;
21  }DATA;
```

photo no.1 - definition of struct DATA (source: own code in file EEPROM.h)

```
46  void write_all_to_EEPROM(unsigned int uiAddress, DATA * pomiary )
47  {
48      EEPROM_write(uiAddress*8,pomiary->I_Humidity);
49      EEPROM_write(uiAddress*8+1,pomiary->D_Humidity);
50      EEPROM_write(uiAddress*8+2,pomiary->I_Temperature);
51      EEPROM_write(uiAddress*8+3,pomiary->D_Temperature);
52      EEPROM_write(uiAddress*8+4,pomiary->I_sensor1);
53      EEPROM_write(uiAddress*8+5,pomiary->D_sensor1);
54      EEPROM_write(uiAddress*8+6,pomiary->I_sensor2);
55      EEPROM_write(uiAddress*8+7,pomiary->D_sensor2);
56  }
```

photo no.2 - function to send all data do EEprom memory (source: own code in file EEPROM.c)

in the main program loop, we don't need to send all data (it is too often), so we use timers and interruptions to send data approximately every 10 minutes.

```
121         cli();
122         if(ten_min == 1) // if 10 minutes have passed
123         {
124             LED_TOG; // change of state to the opposite diode
125             write_all_to_EEPROM(EEPROM_ADDRESS,&Data_Measurements); // send data
126             read_all_from_EEPROM(EEPROM_ADDRESS); // display the data that has been sent
127             ten_min = 0;
128         }
129         sei();
```

photo no.3 - the part of the code responsible for deciding whether to send the data (source: own code in file main.c)

2. Bluetooth

3. Testing

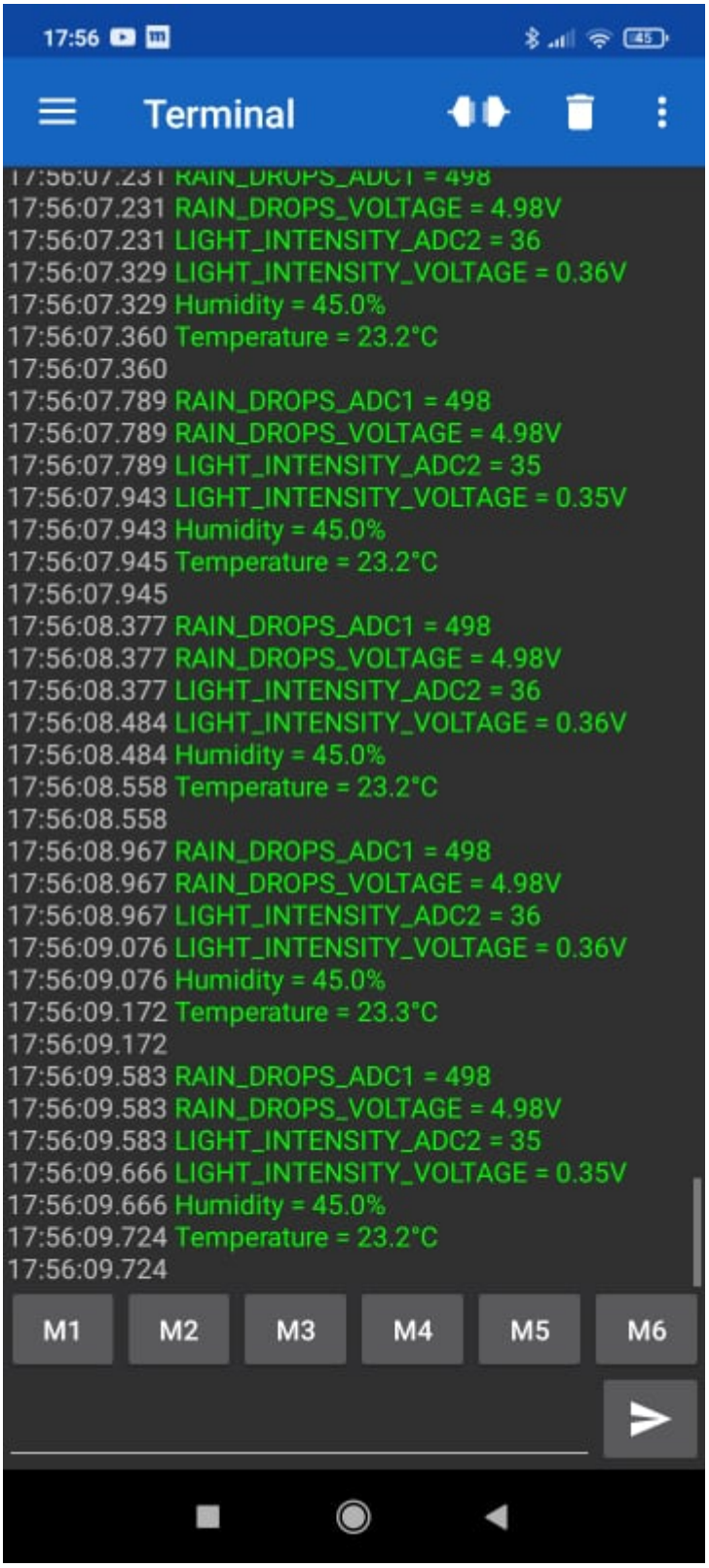

Photo no. 4 - Results displayed in the mobile application (source: own photo)

We can see that all dates are sent properly. In this case, we don't have the display options such as we have when we were using the terminal.

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