

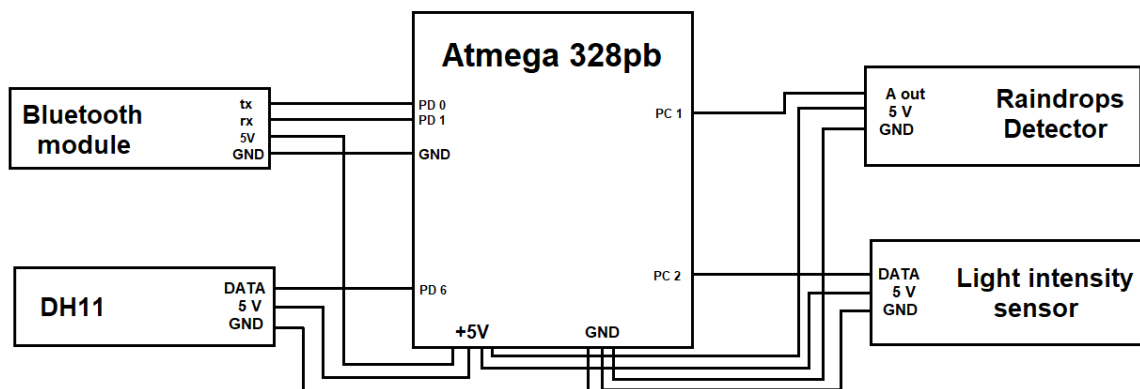
1. Documentation of design assumptions

Building a simple "weather station" to measure basic parameters such as temperature, humidity, light intensity and the occurrence of rainfall. The device will be based on a microprocessor and sensors. Current data can be viewed using a smartphone application using Bluetooth communication. Data can also be saved to non-volatile memory and read at a later date.

2. Work schedule

Deadline	stages	Supervisor
3.11.2021	design assumptions, work schedule, System block diagram,	Michał Hasior
17.11.2021	function to read data from humidity and temperature sensor (DHT11)	Mariusz Więclawek
1.12.2021	function to measure light intensity, UART communication on serial port	Michał Hasior
15.12.2021	function to read and write from EEPROM memory, communication to Bluetooth module	Mariusz Więclawek
5.01.2022	testing and debugging	Michał Hasior

3. System block diagram



4. Technical specification of electronic components

1. Evaluation board - ATmega328PB XPLAINED mini
 - High Performance, Low Power AVR® 8-Bit Microcontroller Family
 - Advanced RISC Architecture
 - 32KBytes of In-System Self-Programmable Flash program memory
 - 1KBytes EEPROM
 - 2KBytes Internal SRAM
 - By default, the ATmega328PB device and mEDBG (debugger) on Xplained MINI kit uses on-board **16MHz** crystal as the clock source.
2. Humidity and temperature sensor - DHT11
 - DHT11's power supply is 3-5.5V DC
 - Single-bus data format is used for communication and synchronization between MCU and DHT11 sensor. One communication process is about 4ms
3. Light intensity sensor ALS-PT19
 - Wide supply voltage range, 2.5V to 5.5V
 - Guaranteed temperature performance, -40°C to 85°C
 - Low sensitivity variation across various light sources
4. Raindrops Detection Sensor Module
 - The output in the form: digital switching outputs (0 and 1) and analog AO voltage output
 - Operating voltage: 3.3V-5V
5. Bluetooth module HC-06
 - Has a build-in 2.4GHz antenna; user needn't test antenna.
 - Has the external 8Mbit FLASH
 - Can work at the low voltage (3.1V~4.2V). The current in pairing is in the range of 30~40mA. The current in communication is 8mA.
 - Standard HCI Port (UART or USB)

5.Completing auxiliary materials (application notes, catalog data, materials source)

1. ATmega328PB complete datasheet
 - <http://ww1.microchip.com/downloads/en/DeviceDoc/40001906A.pdf>
2. Humidity and temperature sensor - DHT11
 - <https://www.mouser.com/datasheet/2/758/DHT11-Technical-Data-Sheet-Translated-Version-1143054.pdf>
3. Light intensity sensor ALS-PT19
 - https://cdn.sparkfun.com/assets/b/e/c/3/d/ALS-PT19_DS.pdf
4. Raindrops Detection Sensor Module
 - https://www.terraelectronica.ru/pdf/show?pdf_file=%252Fz%252FDatasheet%252FS%252FSnow%2B%2526%2BRaindrops%2BDetection.pdf
5. Bluetooth module HC-06
 - <https://www.olimex.com/Products/Components/RF/BLUETOOTH-SERIAL-HC-06/resources/hc06.pdf>