**Sensor Calibration Description**

**Humidity & Water Level Sensor Calibration**

The C++ code for calibrating the humidity and water level sensor describes the basic function of humidity and water level sensor. From the first line to the *void setup(){}* method, some parameters are declared. In this example, we use pin ‘*2’* on the Arduino board for data entrance on the humidity sensor and use pin ‘*A5’* for the water level sensor, and set an int value ‘resval’ for holding the water level value returned from the sensor. Then, the Arduino board starts by method *void setup(){}*. In the loop method, the first part is the loop for the humidity sensor. After declaring two-byte value *temperature* and *humidity,* the loop returns the value collected by the humidity sensor with the 1-second delay because the sample rate of the humidity sensor is 1 second. The second part of the loop is for the water level sensor, which retunes the water level ‘Empty,’ ‘Low,’ ‘Medium,’ or ‘High’ by the differentiation from the if-else statements. In the further implementation, we will calibrate it to make the return value correspond to the real-time water depth such as 1 cm, instead of Low or medium. Source code: <https://github.com/WKU-CPS4951/Intelligent-Manhole-Cover-System/blob/main/Sensor%20Test%20%26%20Calibration/humidity_water_level.ino>

**Wi-Fi & GPS Sensor Calibration**

The Wi-Fi module calibration describes the connection process and retunes the device's IP address. The loop method is left empty temporally for future implementation. First, two values are declared, one is the SSID of the Wi-Fi network, the other one is the corresponding password. The setup begins with the notification states the connection process has been initiated. If the password is correctly entered, a message will be displayed, and the IP address is returned. The calibration of the GPS module hasn’t started because we don’t have a SIM card with a proper size that fits into the module, we will test and calibrate it as soon as we get a SIM card with the right size. Source code: <https://github.com/WKU-CPS4951/Intelligent-Manhole-Cover-System/blob/main/Sensor%20Test%20%26%20Calibration/wifi.ino>