

Soil NPK Sensor

The following is the Arduino code for the sensor and it has been tested

```
#include <SoftwareSerial.h>

#define RO 5

#define DI 4

//#define RE 6

//#define DE 7

const uint32_t TIMEOUT = 800UL;

const byte N_cmd [] = {0x01, 0x03, 0x00, 0x00, 0x00, 0x01, 0x84, 0x0A};

const byte P_cmd [] = {0x01, 0x03, 0x00, 0x01, 0x00, 0x01, 0xD5, 0xCA};

const byte K_cmd [] = {0x01, 0x03, 0x00, 0x02, 0x00, 0x01, 0x25, 0xCA};

uint16_t getData (const byte* cmd, byte length);

void printHexByte (byte b);
```

```
byte values[7] = {0};

SoftwareSerial mod(RO, DI); // Rx pin, Tx pin

void setup() {

  Serial.begin(9600);

  mod.begin(9600);

  //pinMode(RE, OUTPUT);

  //pinMode(DE, OUTPUT);

  Serial.println();

  Serial.println(sizeof(values));

  delay(500);

}

void loop() {

  uint16_t val1=0.0, val2=0.0, val3=0.0;

  Serial.print("N content: ");

  val1 = getData(N_cmd, sizeof(N_cmd) );

  Serial.print(val1);

  Serial.println(" mg/Kg");
```

```
delay(1000);

Serial.print("P content: ");

val2 = getData(P_cmd, sizeof(P_cmd) );

Serial.print(val2);

Serial.println(" mg/Kg");

delay(1000);

Serial.print("K content: ");

val3 = getData(K_cmd, sizeof(K_cmd) );

Serial.print(val3);

Serial.println(" mg/Kg");

delay(1000);

delay(5000);

}

uint16_t getData( const byte* cmd, byte length) {

    uint32_t startTime = 0;

    uint8_t byteCount = 0;

    uint16_t val_out = 0;
```

```
//digitalWrite(DE, HIGH);

//digitalWrite(RE, HIGH);

delay(10);

mod.write(cmd, length);

mod.flush();

//digitalWrite(DE, LOW);

//digitalWrite(RE, LOW);

//Serial.println();

startTime = millis();

while ( millis() - startTime <= TIMEOUT ) {

    if (mod.available() && byteCount < sizeof(values) ) {

        values[byteCount++] = mod.read();

        //printHexByte(values[byteCount - 1]);

    }

}

//Serial.println();
```

```
//TODO: you have to cast from values array the selected value to print it out
```

```
// and return in val_out
```

```
val_out = (uint16_t)((values[3]&0x00ff)<<8 | (values[4]&0xff));
```

```
return val_out;
```

```
}
```

```
void printHexByte(byte b)
```

```
{
```

```
Serial.print((b >> 4) & 0xF, HEX);
```

```
Serial.print(b & 0xF, HEX);
```

```
Serial.print(' ');
```

```
}
```