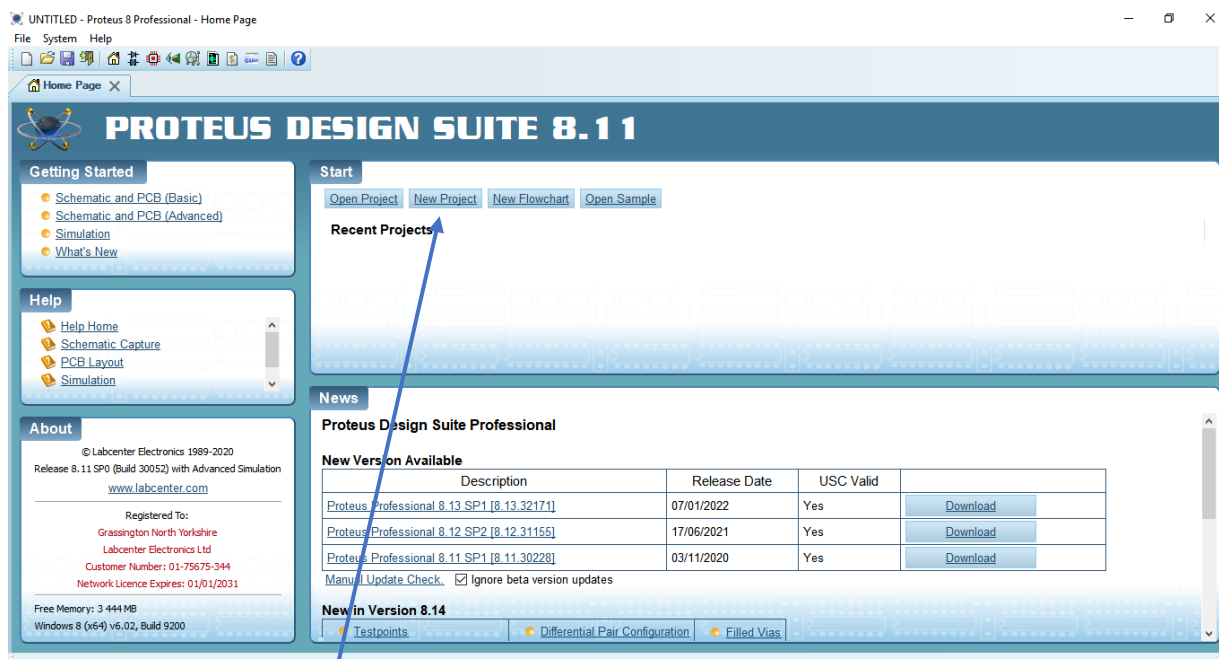
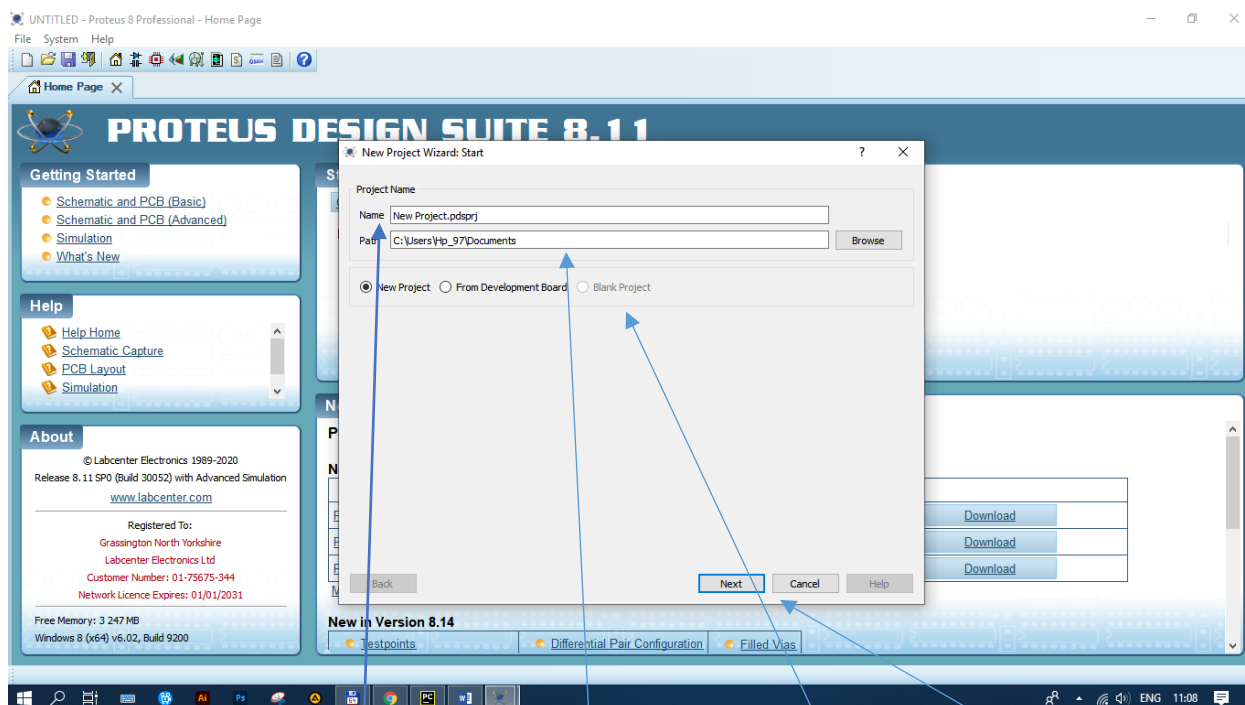


Mavzu: Bluetooth HC-05 qurulmasi orqali qurulmalarga buyruq berish va ularning holati qaqida ma'lumot olish.



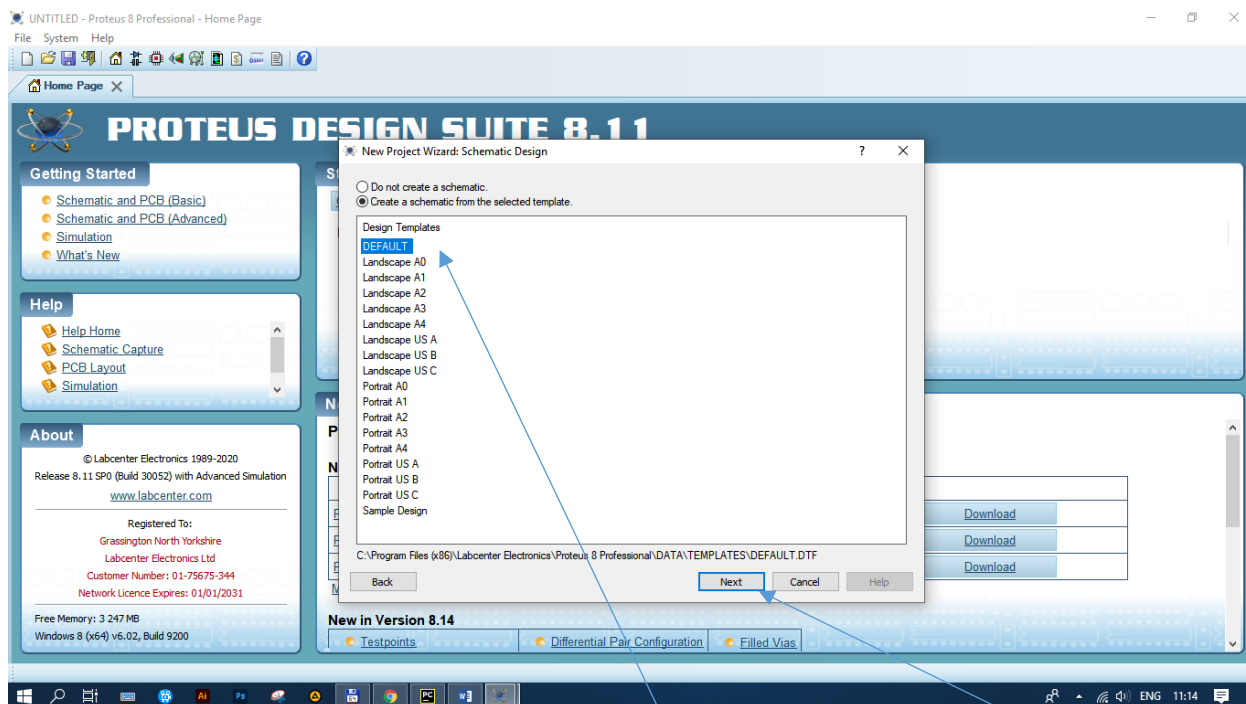
4.1 – rasm. Proteus bosh sahifasi.

Boshlang'ich ishimiz yangi loyiha yaratib olamiz. Buning uchun **Start** oynasidagi **New Project** bo'limiga murojat qilamiz.



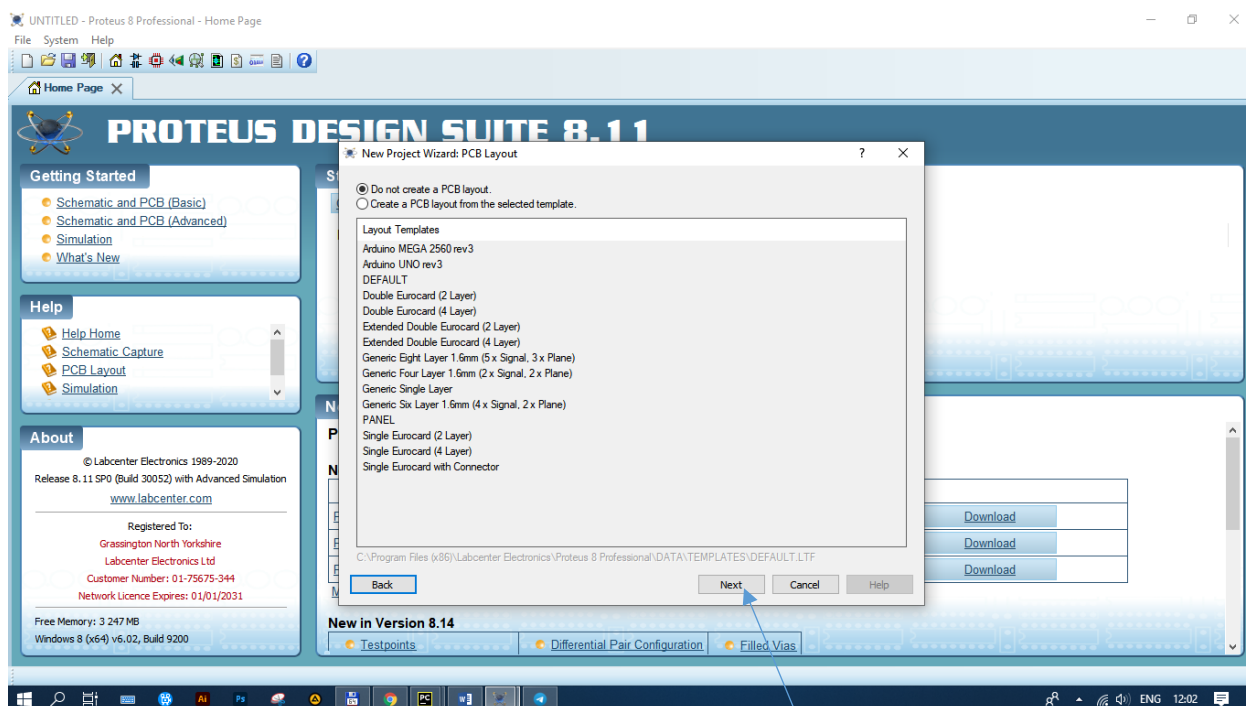
4.2 – rasm. Loyihani nomlash.

Bu yerda Loyiha nomi, qayerga saqlanishi, loyiha turini belgilash imkoniyati bor. O'zingizni maqsadingizga qarab toifalarni tanlaysiz. Shundan so'ng **Next** tugmasini bosasiz.



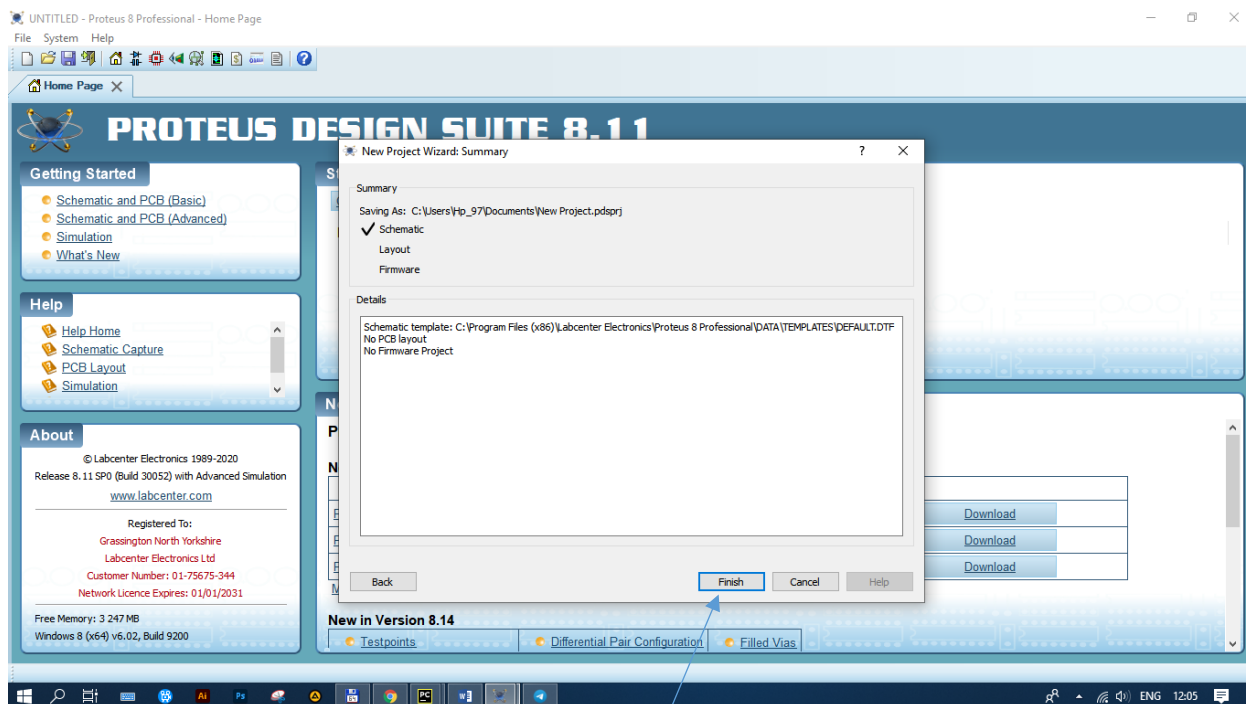
4.3 – rasm. Ishchi oyna turlarining ro'yxati.

Bu qismida loyiha ishchi oynasi qanday holatda bo'lishini tanlaysiz va **Next** tugmasini bosasiz.



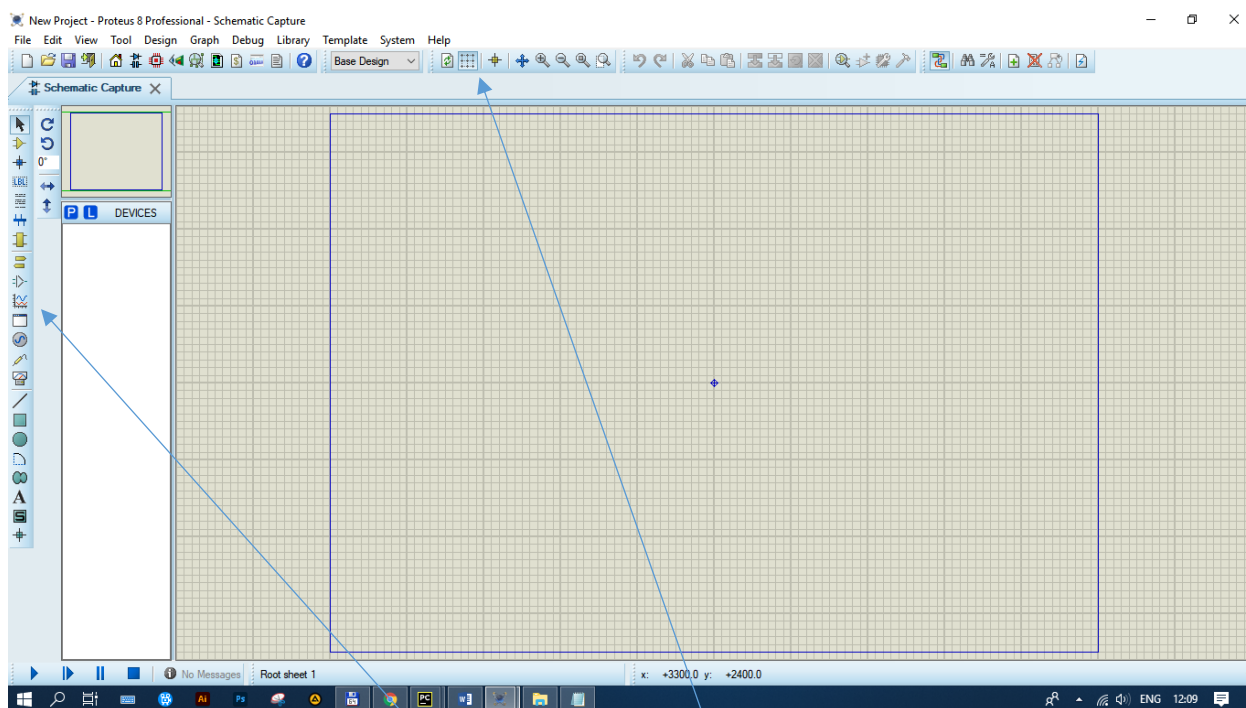
4.4 – rasm. Yig'ilgan loyihaning plata turini tanlash.

Yig'gan loyihangizni plata ko'rinishiga o'tkazganingizda u qanday holatda bo'lishini istasangiz ro'yhatdan o'sha turni tanlaysi va **Next** tugmasini bosasiz.



4.5 – rasm. Loyihaning sozlamalari.

Loyihangizning o'zingiz tanlagan sozlamalar ro'yhati oynasi. Bularni ko'rib chiqib sozlamalar o'zingizga yoqsa **Finish** tugmasini bosasiz.



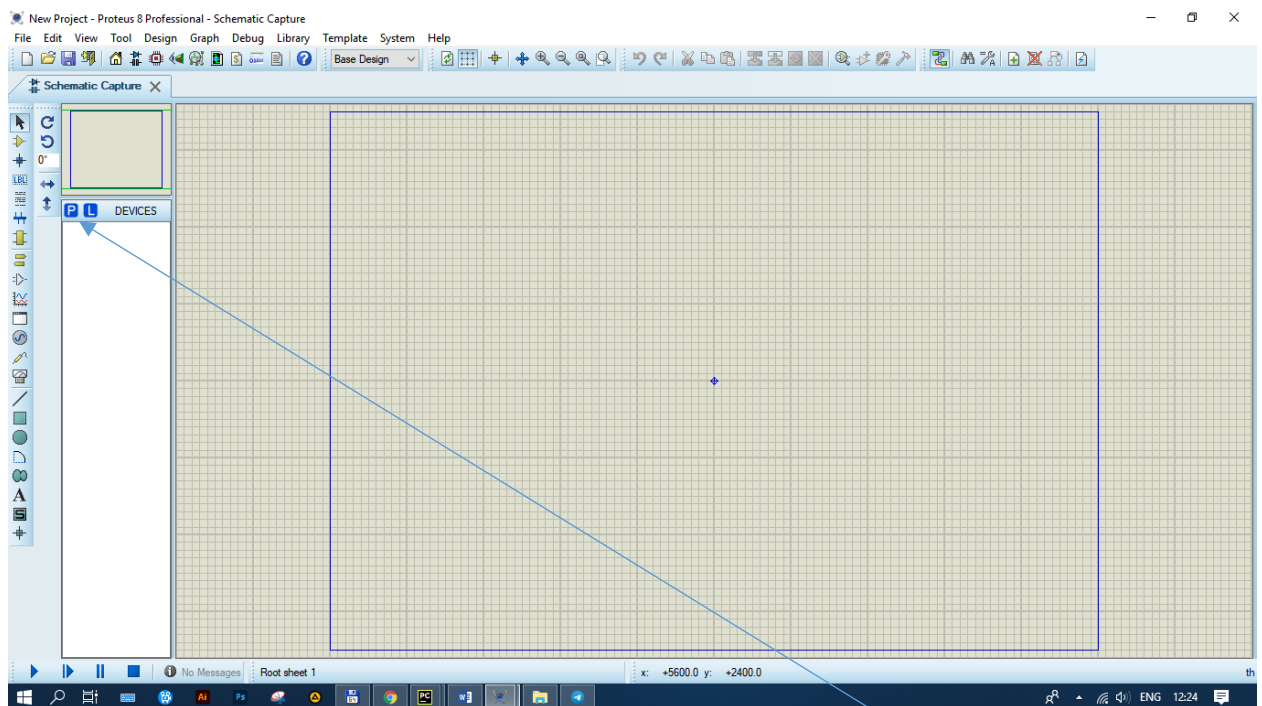
4.5 – rasm. Ishchi yna.

Dasturning asosiy qismi ishchi oynadan tashkil topgan bo'lib unda ikkita menu (sarlavha) mavjud. Bular Vertikal va Gorizontal. Gorizontal menu da ishchi oynadagi holatlarni boshqarish vazifasidagi tugmalar joylashga. Vertikal menu da esa loyihada foydalanuvchi qurilmalar va elektron elementlar joylashgan.


Loyihani bajarishda birinchi qiladigan ishimiz: foydali qurilmalar va ishlatiladigan elementlarni tanlab olish.

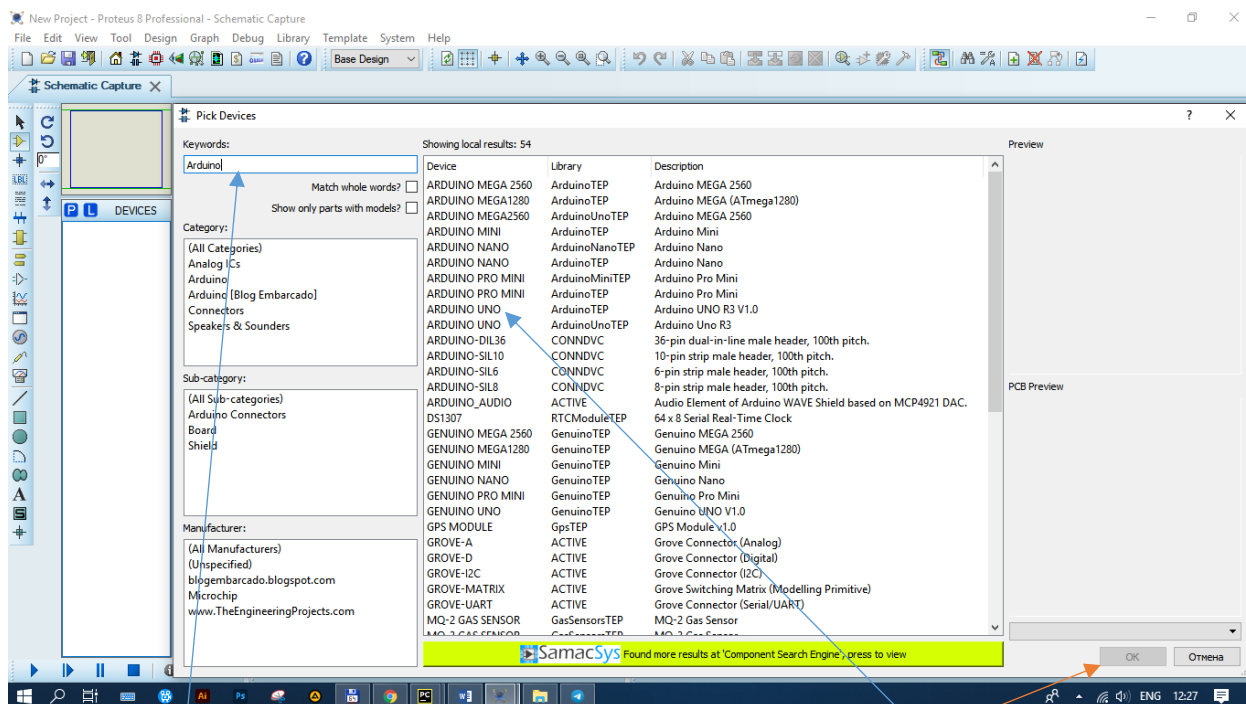
Bular:

- Arduino Uno.
- Bluetooth HC-05.
- Qarshiliklar (res).
- Bipolyar transistor (2N2222).
- Diod (1N4007).
- Avto uzib ulagich (Relay).
- Lampa.
- Led chiroq.
- Motor.
- O'zgaruvchan tok manbasi (Alternator).
- Tok manbasini yutuvchi vosita (Yer - Ground).
- Sozlanuvcha doimiy elektr tokimanbai (DC).



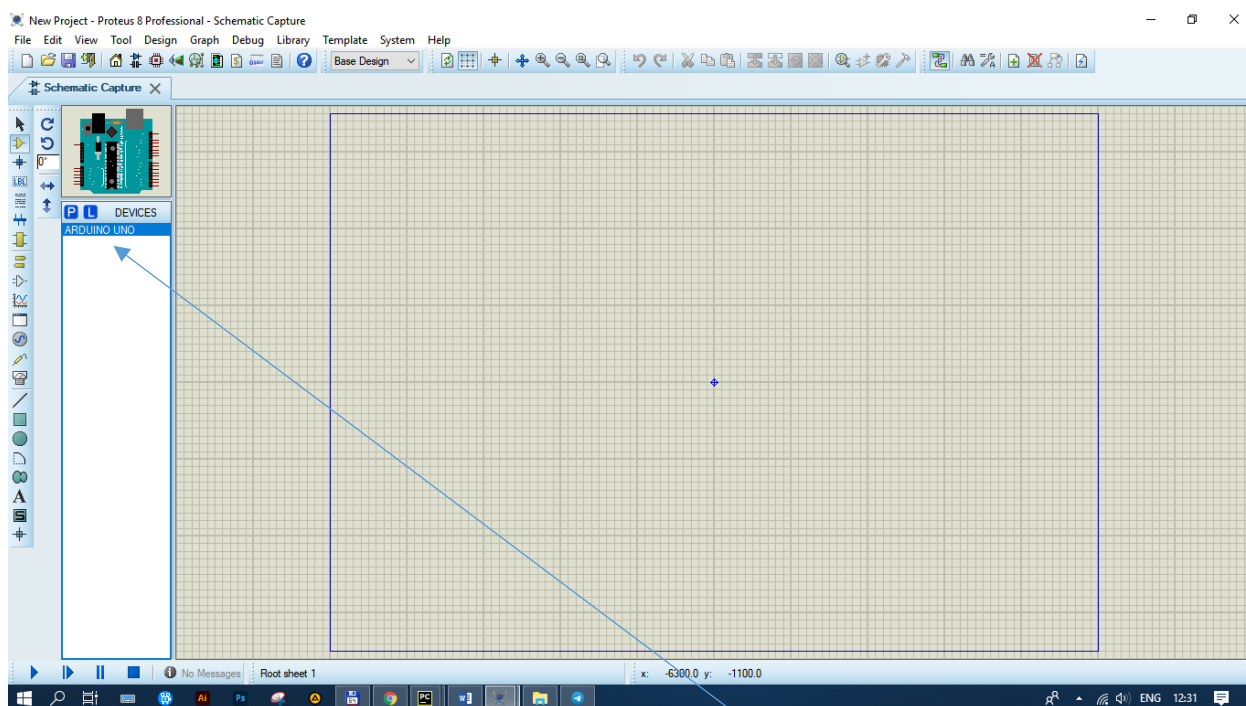
4.6 – rasm. Komponentlarni yig'ish jarayoni.

Ground va **DC** boshqa hamma komponentlarni  shu bo'limdagi **P** ning ichidan yig'ib olamiz.



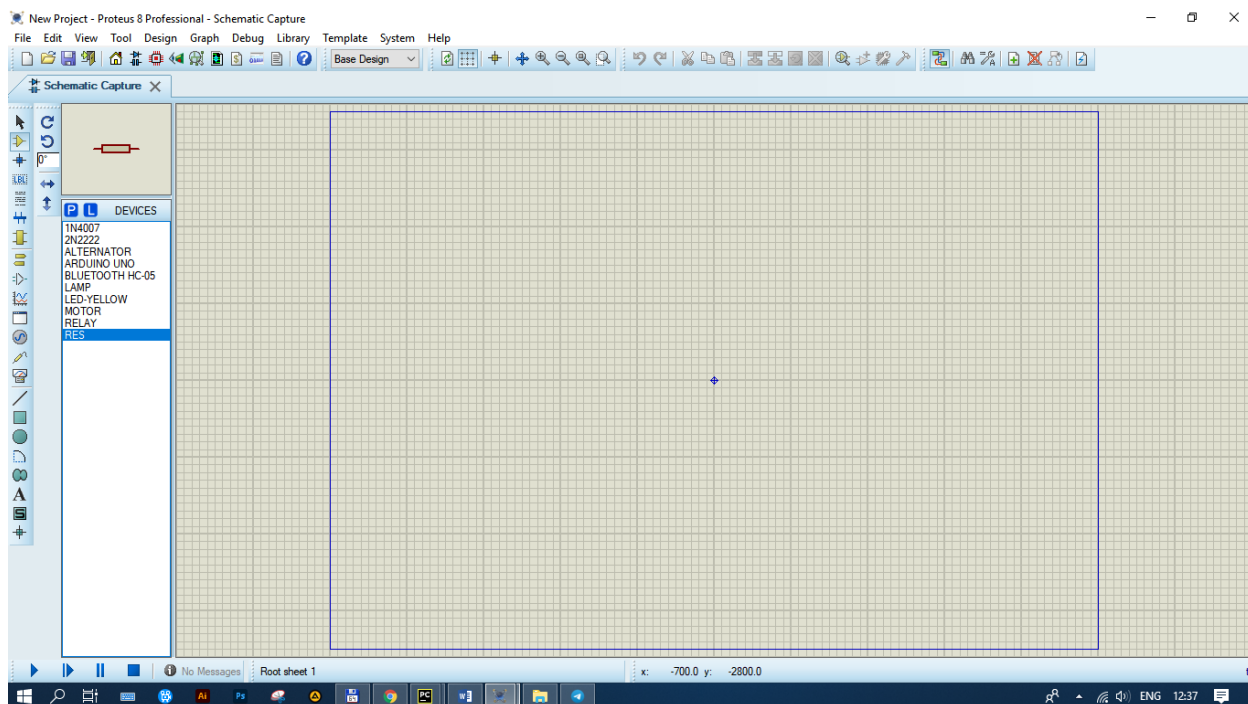
4.7 – rasm. Qidirish jarayoni.

Qidirish joyiga komponentning nomini yozsangiz dastur sizga ularning turlanini ko'rsatadi va o'zingizga yoqqanidan foydalanasiz. Biz **Arduino Uno** dan foydalanamiz. Tanlab bo'lib **OK** tugmasini bosasiz.



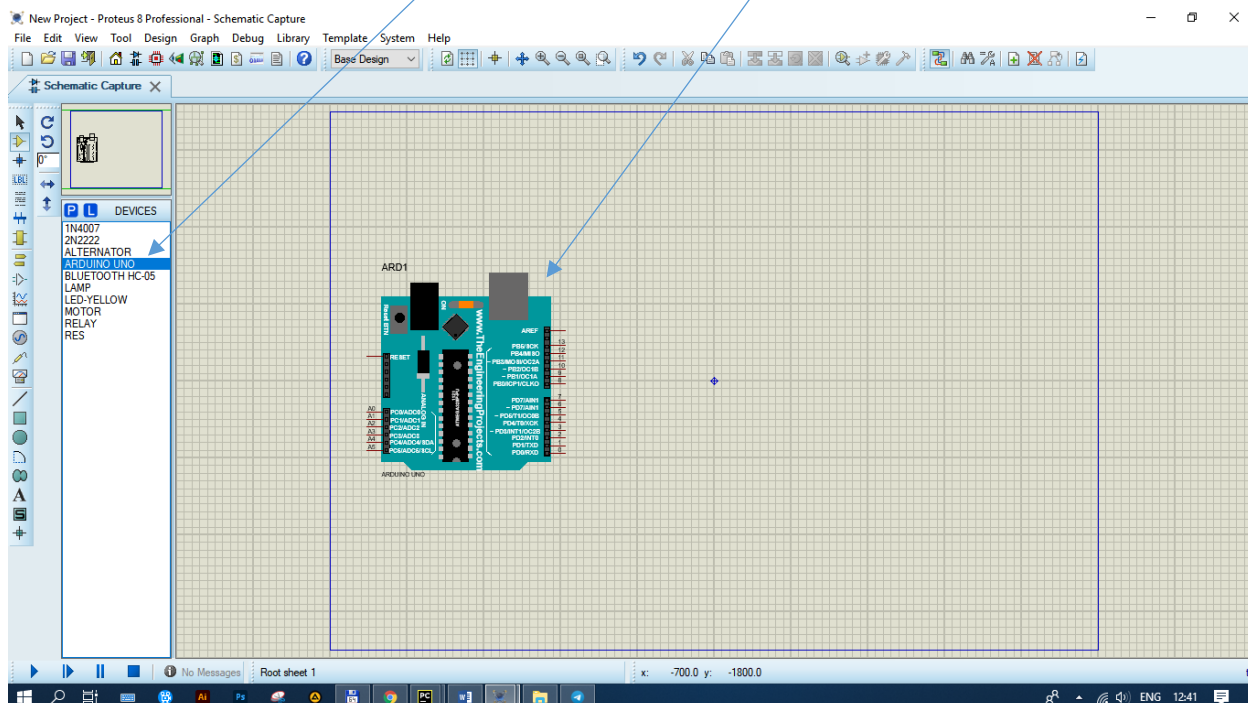
4.8 – rasm. Qurulmalar ro'yxati.

Siz tanlagan component Vertikal menu yonidagi **qurulmalar** oynasidan o'rin oladi. Shu tartibda hamma kerakli Ground va DC dan tashqari hamma komponentlarni qurulmalar ro'yhatiga qo'shib olamiz.



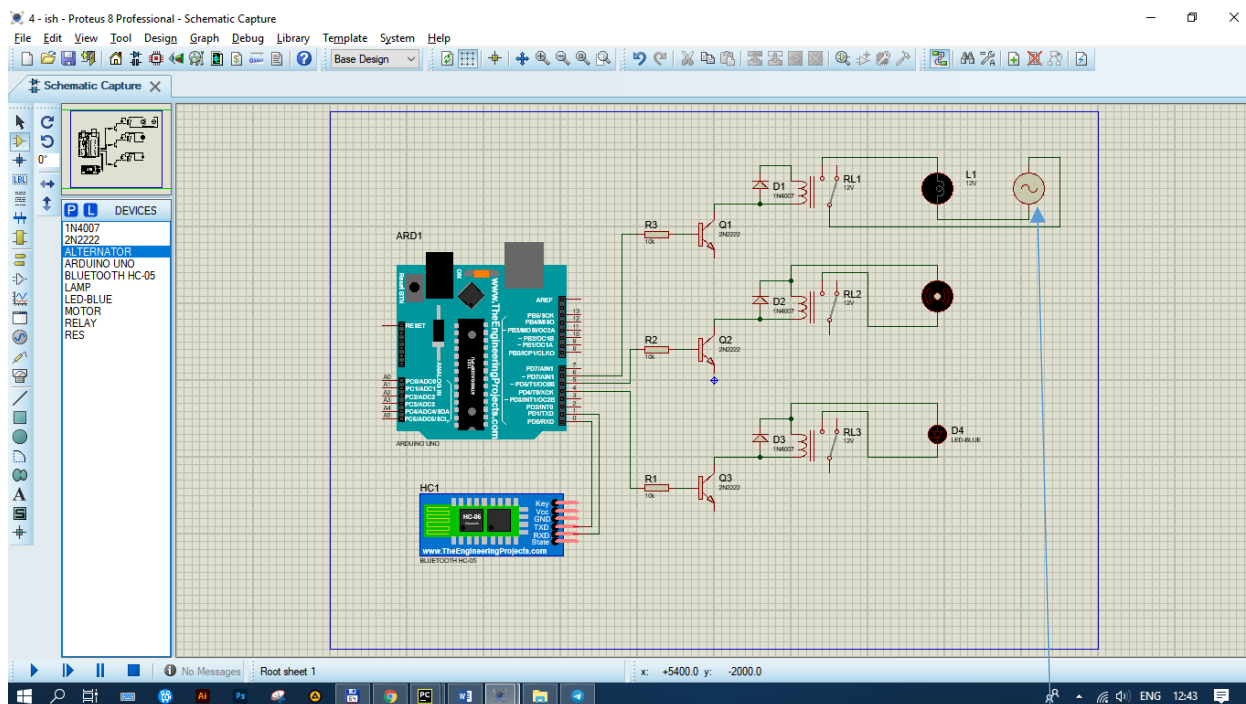
4.9 – rasm. Loyihani yig'ishni boshlash.

Loyihani yig'ishda nimani ishlatmoqchi bo'lsangiz qurilmalar ro'yxatidan shu komponentni sichqonchani chap tarafini ekrandagi ko'rsatgich strelkasini uni ustiga olib borir bir marta bosasiz. Shundan so'ng ishchi oynaning komponent joylashishi kerak bo'lgan yeriga yana bir marta bosasiz.



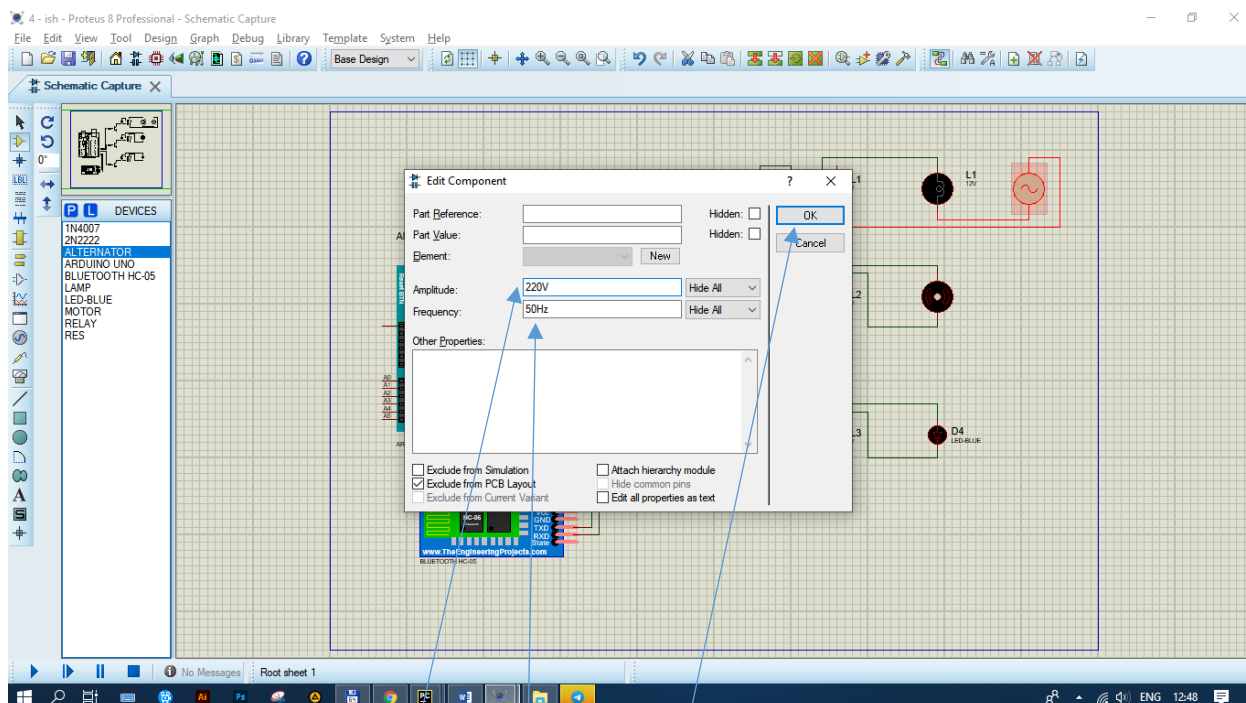
4.10 – rasm. Loyihani yig'ish jarayoni.

Qolgan komponentlarni ham shu tartibda joylashtirib chiqasiz.



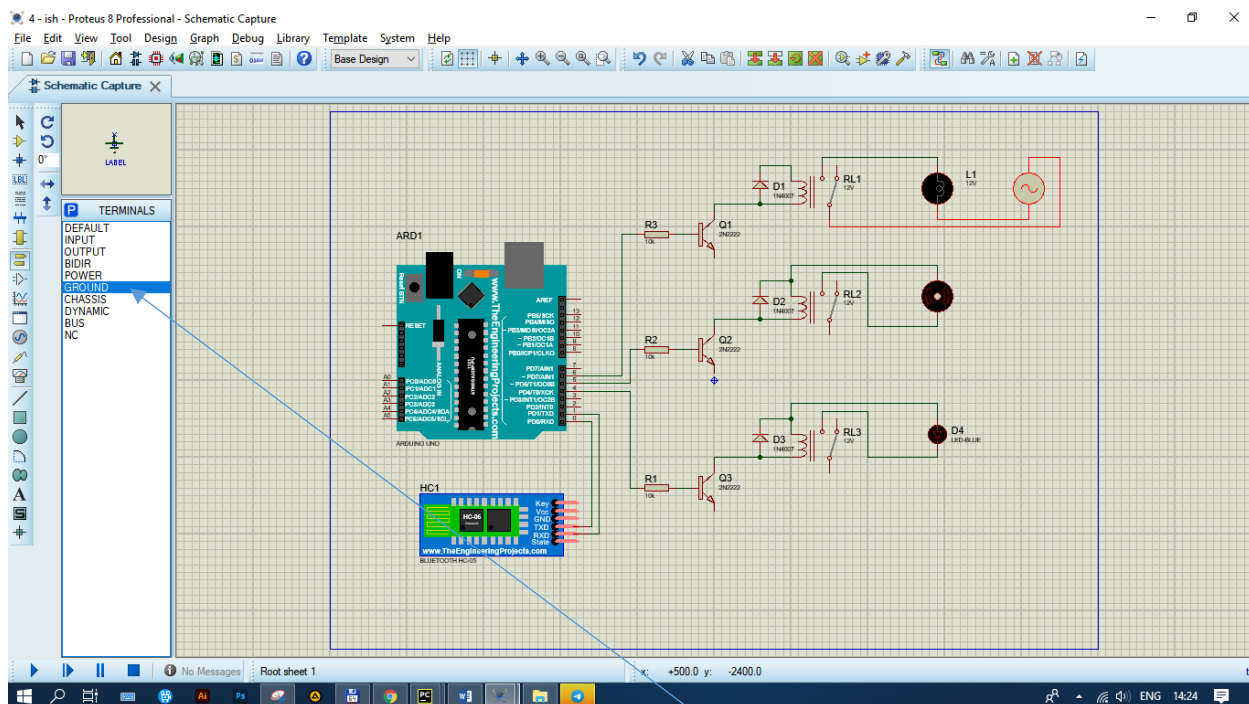
4.11 – rasm. Loyihani yig'ish jarayoni.

Ham komponentlarni joylashtirib bo'lganingizdan so'ng Alternatorga 220 volt o'zgaruvchan to'k qiymatini berasiz. Buning uchun **Alternator** ustiga sichqonchani chap tomonini ikki marta bosib uchun sozlamalar oynasini ochib olasiz.




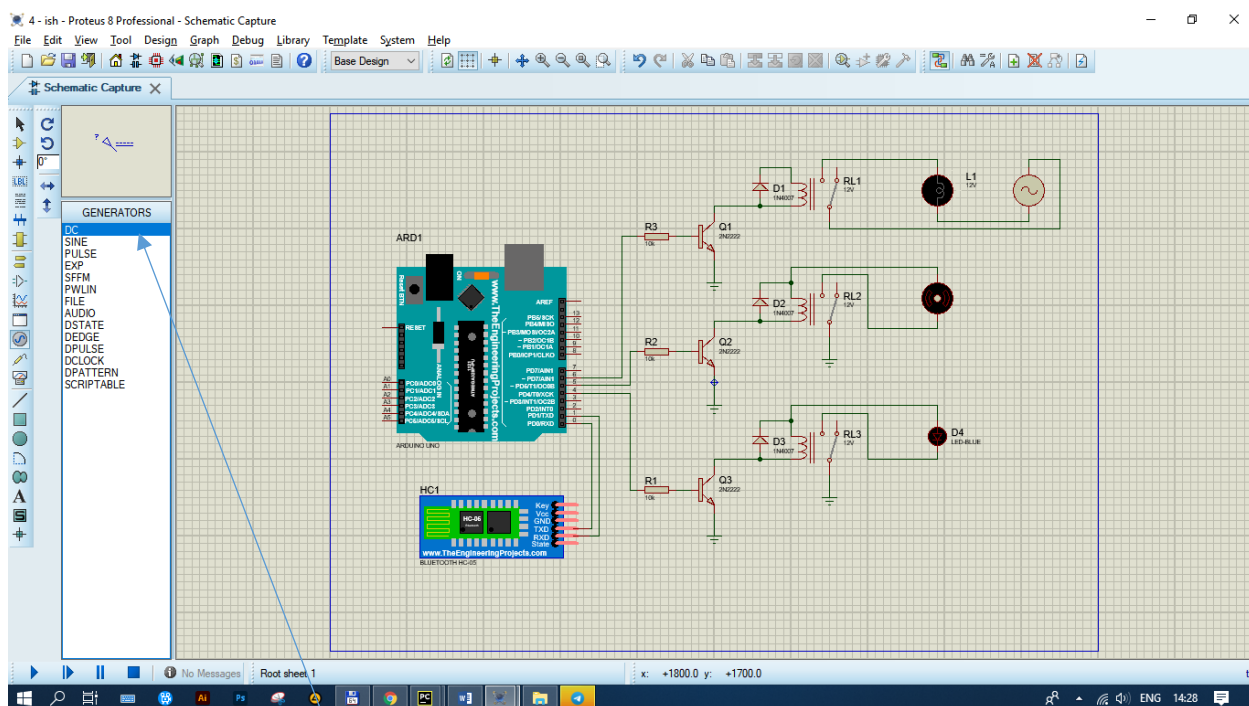
4.12 – rasm. Alternator sozlamalari.

Alternatorga **220 Volt** va **50Hz** standart qiymat beriladi. Qiymatni kiritib bo'lganingizdan so'ng uni saqlash uchun **OK** tugmasini bosasiz.




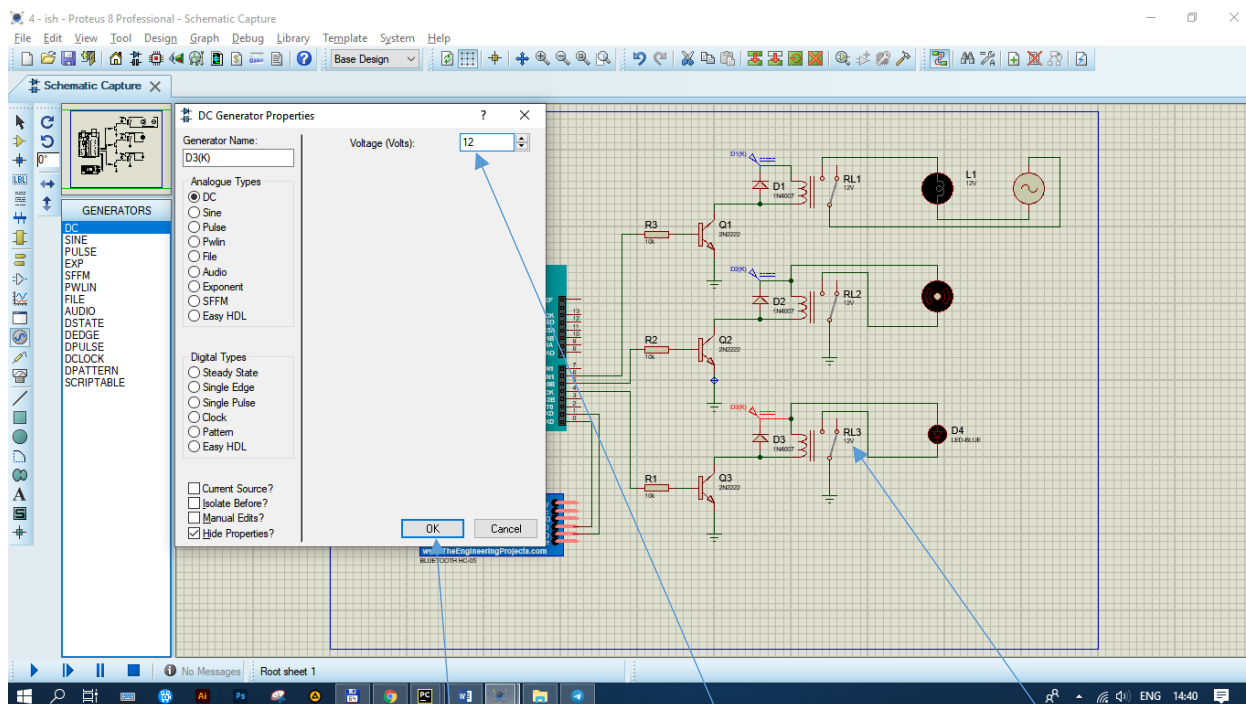
4.13 – rasm. Groundlarni

Loyihadagi tok quvvatlarni yutuvchi Groundlarni joylashtirib chiqamiz. Buning uchun **Vertikal** menudagi  shu bo'limdan **Ground**ni tanlab har bir manba chiqish joylariga ulab chiqiladi.



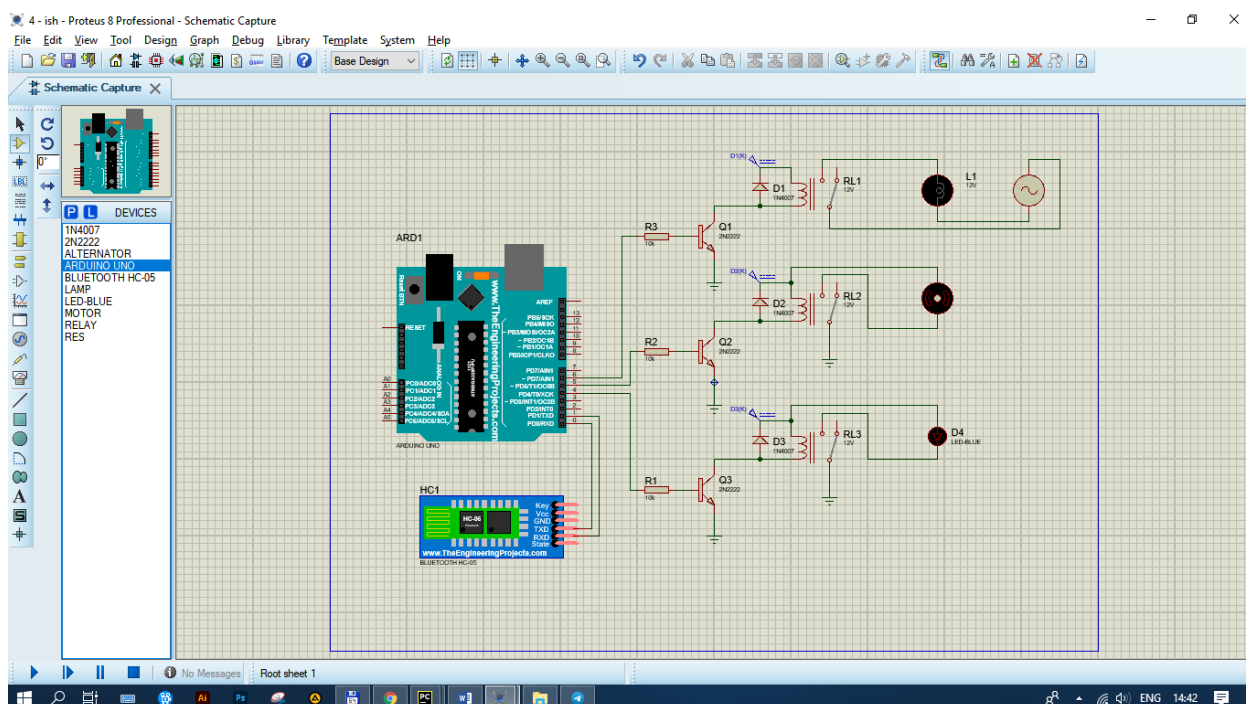
4.14 – rasm. Doimiy manbalarni ulash.

Graundlarni joylab bo'lganingizdan so'ng avto uzib-ulagichning qancha volt tokda ishlashiga qarab doimiy manba ulanadi. Buni uchun vertikal menudan  shu bo'limga kirasiz va **DC** manbani tanlab relaning kirish zanjirlariga ulab chiqasiz.



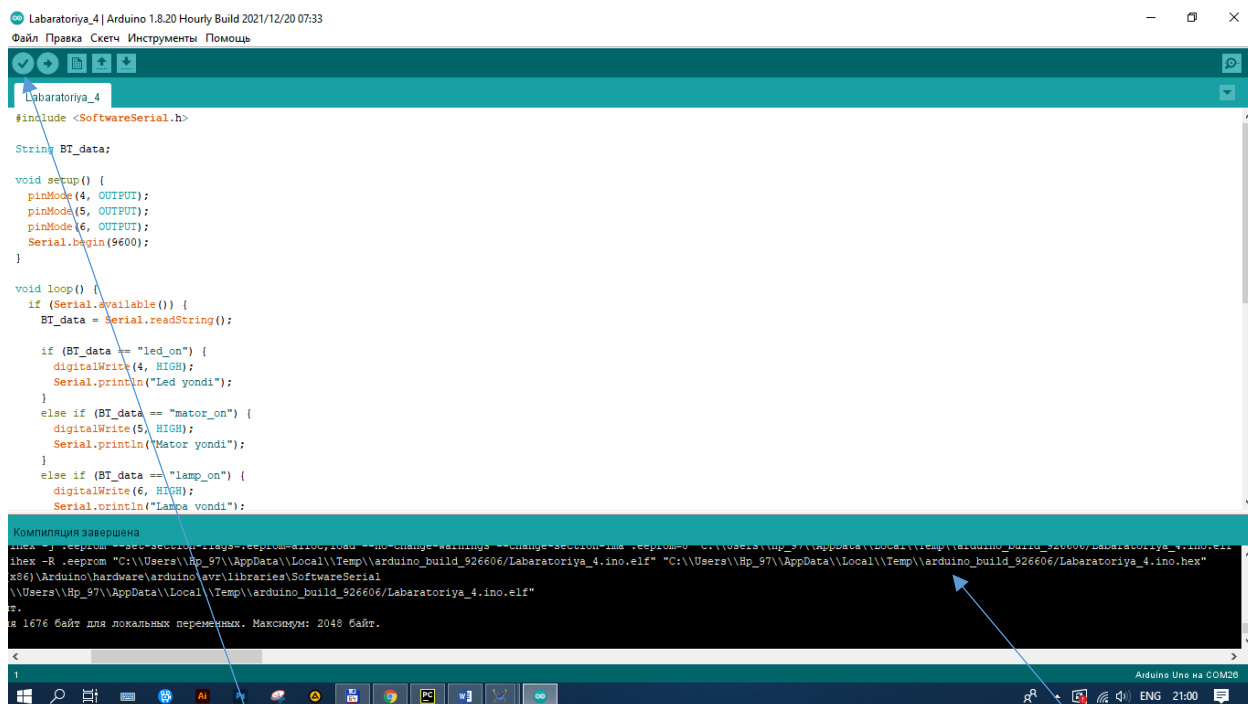
4.15 – rasm. DC sozlamalari.

Doimiy manba joylashtirib olinganidan so'ng uni sozlamalarini **reley** talab qilayotgandek qilib to'g'irlab olinadi. Yani **12 volt** doimiy tok belgilanadi. Sozlamalarni saqlash uchun **OK** tugmasi bosiladi.



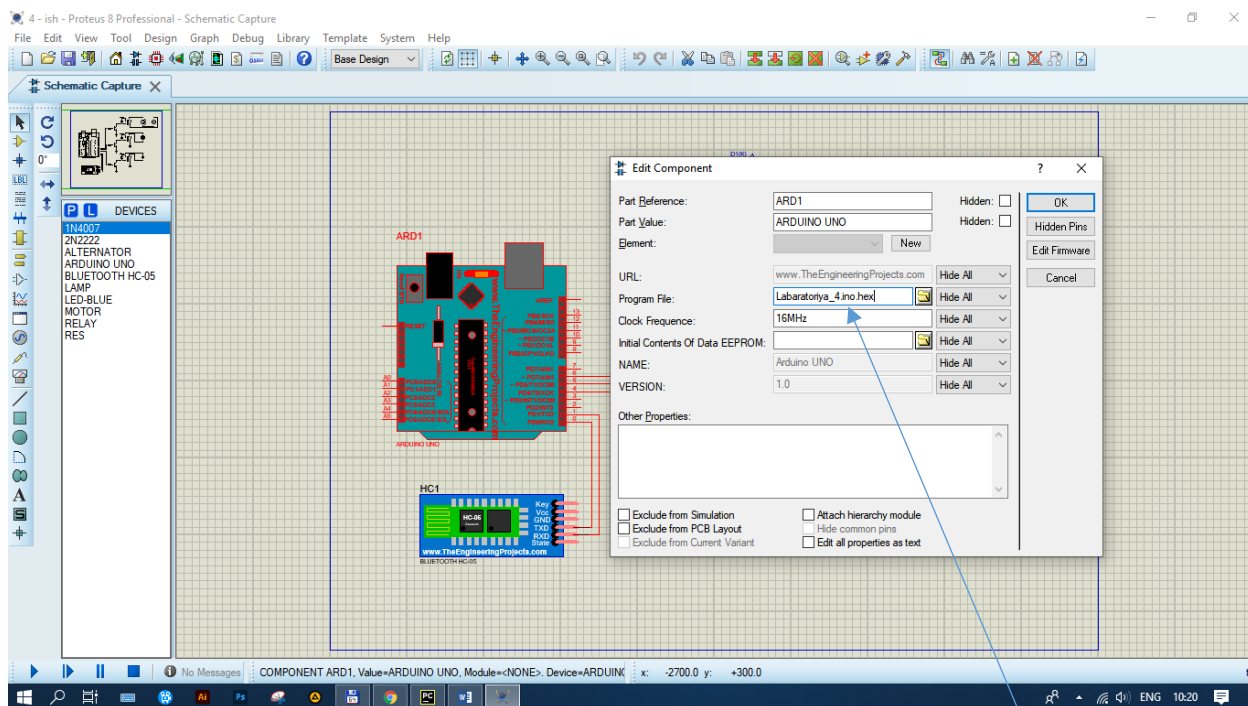
4.16 – rasm. Loyihaning tayyor ko'rinishi.

Loyiha to'liq yig'ildi. Endi buni ishga tushurish uchun C++ dastrulash tilidan foydalanib Aduino muhitida yozilgan dasturini qurilma tiliga o'tkazib loyihada yuklaymiz.



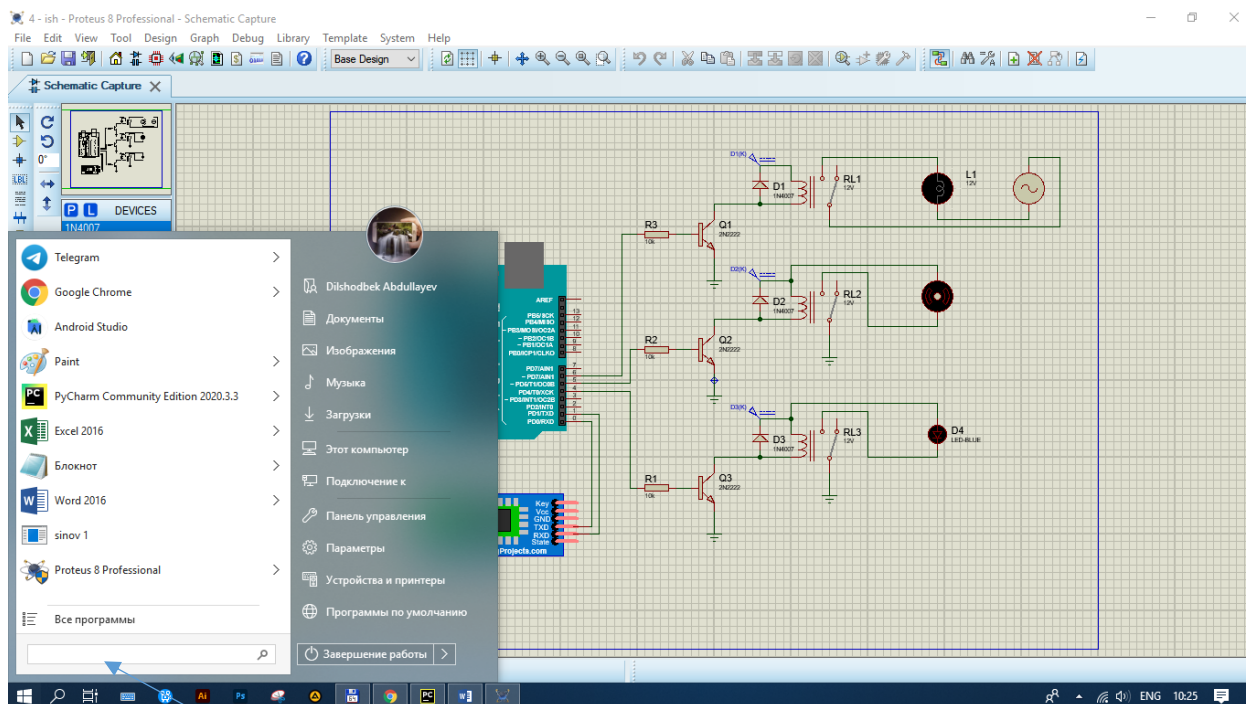
4.17 – rasm. Arduino muhiti.

Dasturda **start** berib dasturning qurilma tiliga o'tkazilgan faylini **manzilini** olib yig'ilgan yuklaymiz.



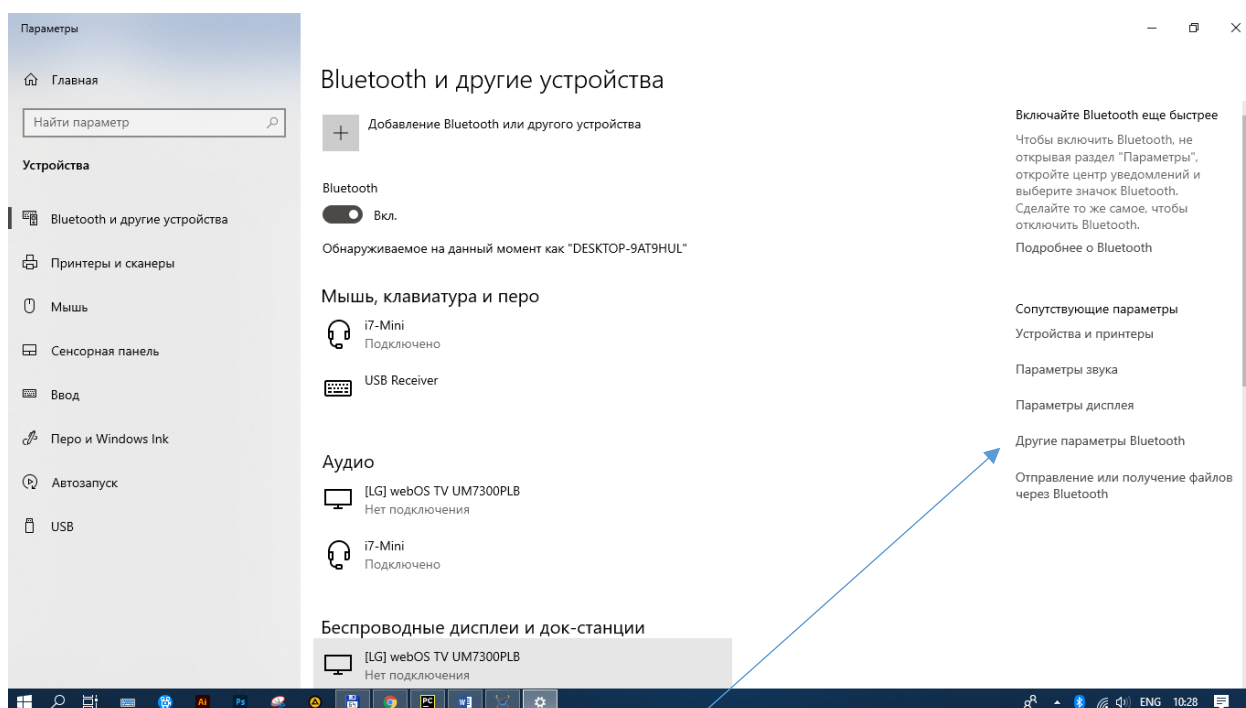
4.18 – rasm. Arduino Uno sozlamalari.

Nushalab olgan manzilimizni Arduino Uno sozlamasidagi **Program file** ga joylaymiz.



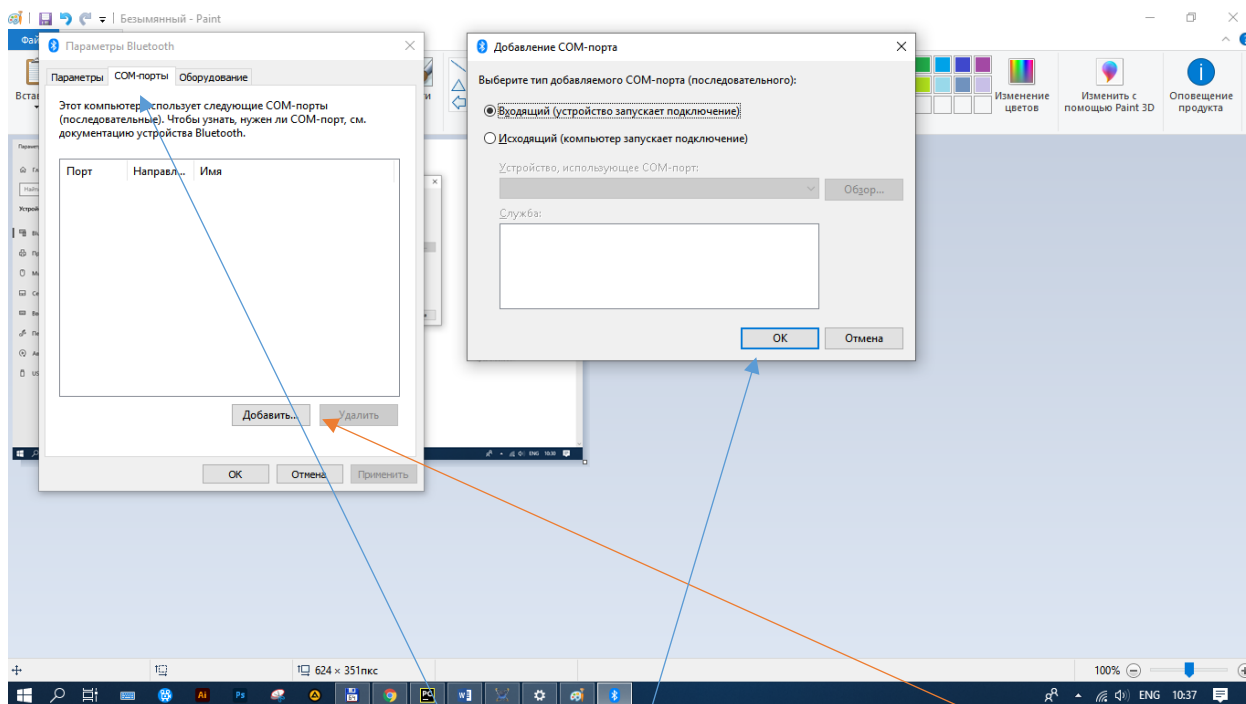
4.19 – rasm. Kompyuter qidiruv bo'limi.

Qidiruv joyiga **Bluetooth** deb qidiruvni amalga oshiramiz va Bluetooth sozlamalariga kiramiz.



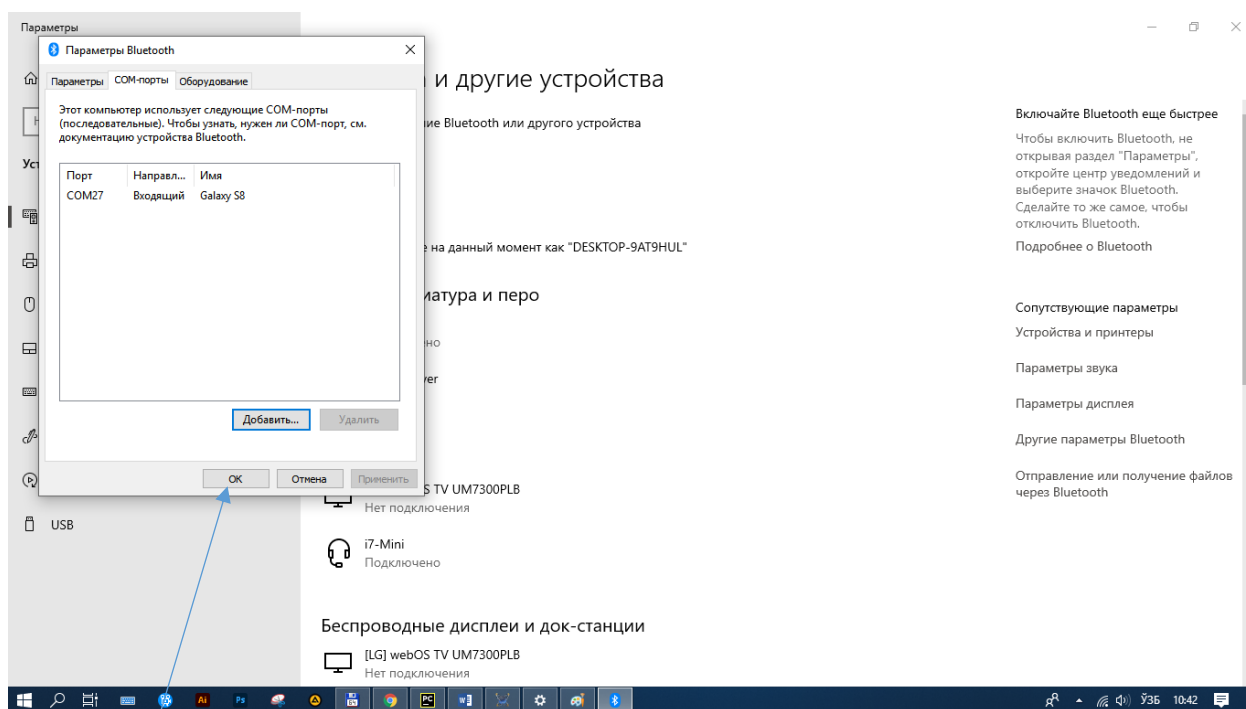
4.20 – rasm. Bluetooth.

Bluetooth **qo'shimcha sozlamalariga** kiramiz. U yerda Proteusdagi loyihadagi Bluetooth uchun yangi port ochib olamiz.



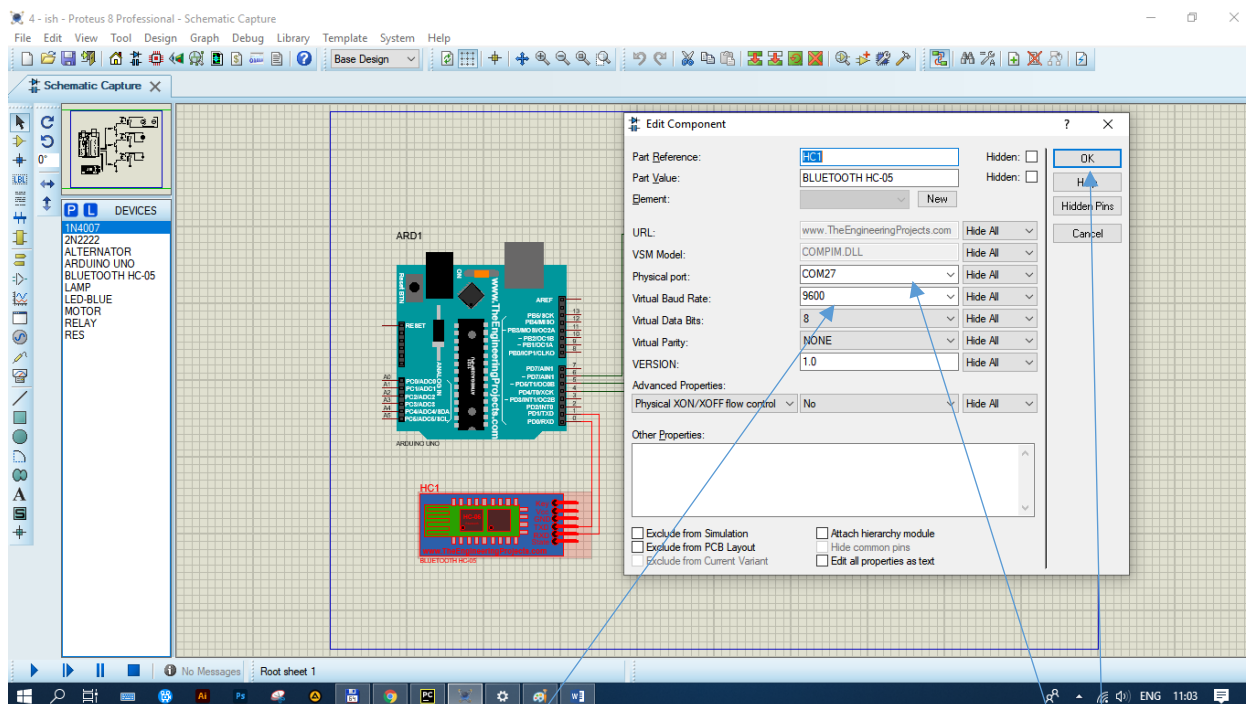
4.21 – rasm. Qo'shimcha sozlamalar.

Ochilgan oynaning **COM-port** bo'limiga o'tamiz. U yerdan **Добавить** tugmasini bosamiz. Yangi port yaratish joydagi sozlamalarni standart holatdagidek qoldiramiz. Yangi port ochish uchun **OK** tugmasini bosamiz.



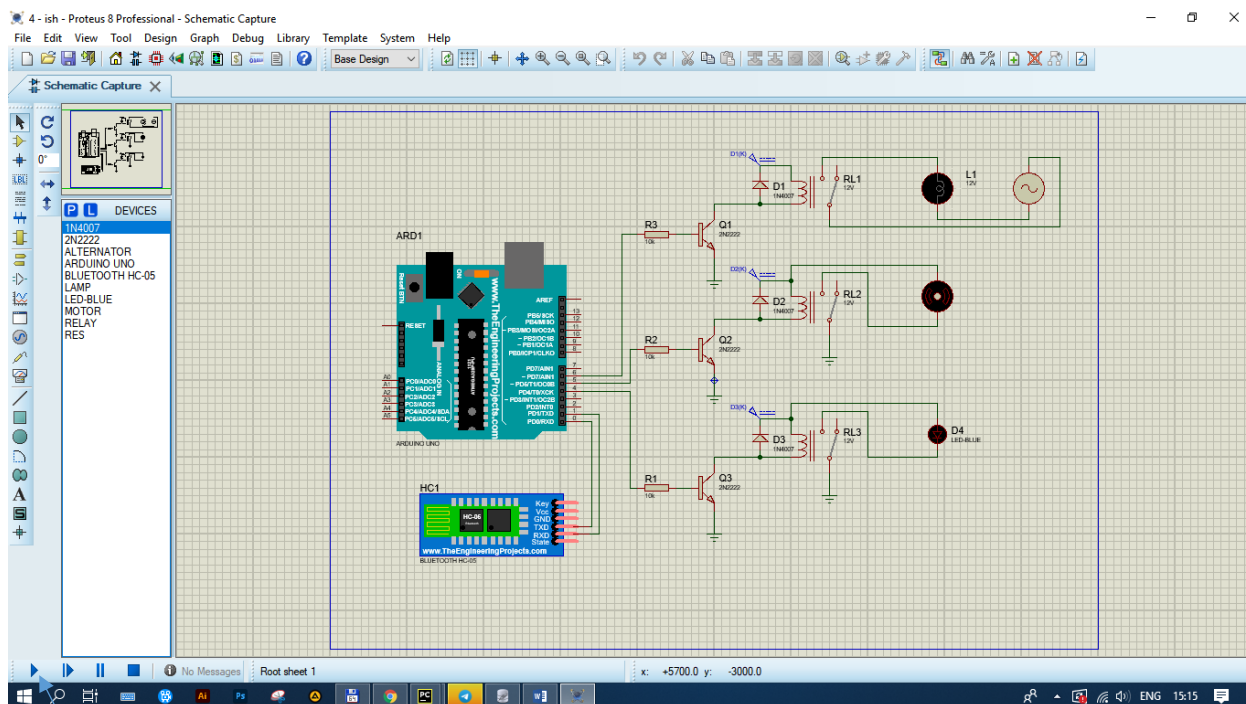
4.22 – rasm. Yangi COM27 port.

OK tugmasini bosib tasdiqlab yuborasiz.




4.23 – rasm. Bluetooth sozlamalari.

Yangi yaratilgan portni proteusdagi Bluetooth qurulmasiga ulanadi va malumot almashinish tezligi belgilanadi. Sozlamalarni saqlash uchun **OK** tugmasi bosiladi.



4.24 – rasm. Loyiha tayyor.

Endi loyihamizni start tugmasini bosib ishlatib ko'rishimiz mumkun. Buning uchun  shu tugmani bosasiz.

Dastur kodi:

```
#include <SoftwareSerial.h>
```

```
String BT_data;
```

```
void setup() {
```

```
    pinMode(4, OUTPUT);
```

```
    pinMode(5, OUTPUT);
```

```
    pinMode(6, OUTPUT);
```

```
    Serial.begin(9600);
```

```
}
```

```
void loop() {
```

```
    if (Serial.available()) {
```

```
        BT_data = Serial.readString();
```

```
        if (BT_data == "led_on") {
```

```
            digitalWrite(4, HIGH);
```

```
            Serial.println("Led yondi");
```

```
        }
```

```
        else if (BT_data == "mator_on") {
```

```
            digitalWrite(5, HIGH);
```

```
            Serial.println("Mator yondi");
```

```
        }
```

```
        else if (BT_data == "lamp_on") {
```

```
            digitalWrite(6, HIGH);
```

```
            Serial.println("Lampa yondi");
```

```
        }
```

```
        else if (BT_data == "led_off") {
```



```
    digitalWrite(4, LOW);
    Serial.println("Led o'chdi");
}
else if (BT_data == "mator_off") {
    digitalWrite(5, LOW);
    Serial.println("Mator o'chdi");
}
else if (BT_data == "lamp_off") {
    digitalWrite(6, LOW);
    Serial.println("Lampa o'chdi");
}
else if (BT_data == "all_on") {
    digitalWrite(4, HIGH);
    digitalWrite(5, HIGH);
    digitalWrite(6, HIGH);
    Serial.println("Hammasi oyondi");
}
else if (BT_data == "all_off") {
    digitalWrite(4, LOW);
    digitalWrite(5, LOW);
    digitalWrite(6, LOW);
    Serial.println("Hammasi o'chdi");
}
}
}
```