Remote Data Monitoring and Signal Control for a Scanning Microwave Radiometer

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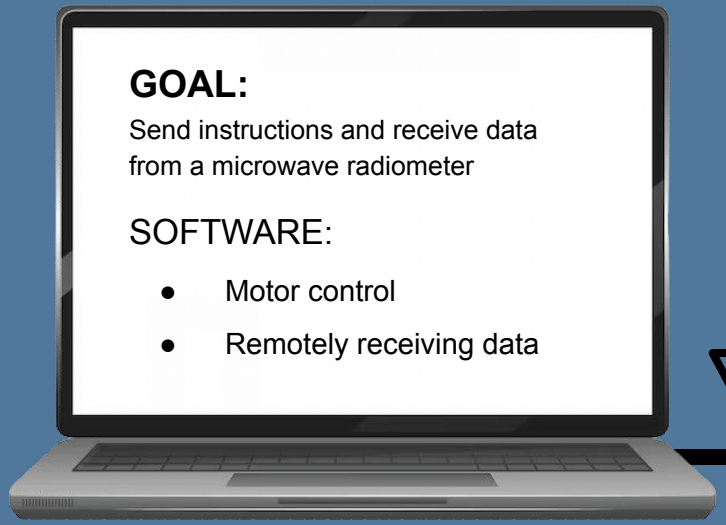
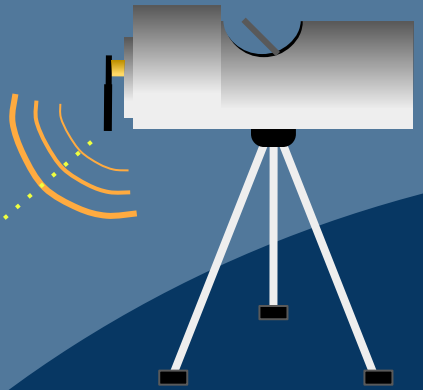




HARDWARE:

- Radiometer
- Microcontrollers
- Allow wireless data transfer

Motor Control Block Diagram

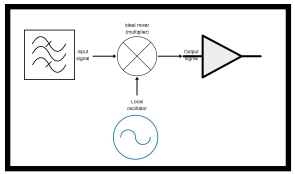
(Hardware)

- Revolves around using the radiometer
- Uses microcontrollers (Arduino, LoRa, etc) to communicate between devices
- Transmitting and receiving

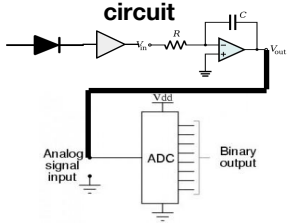
Radiometer parts

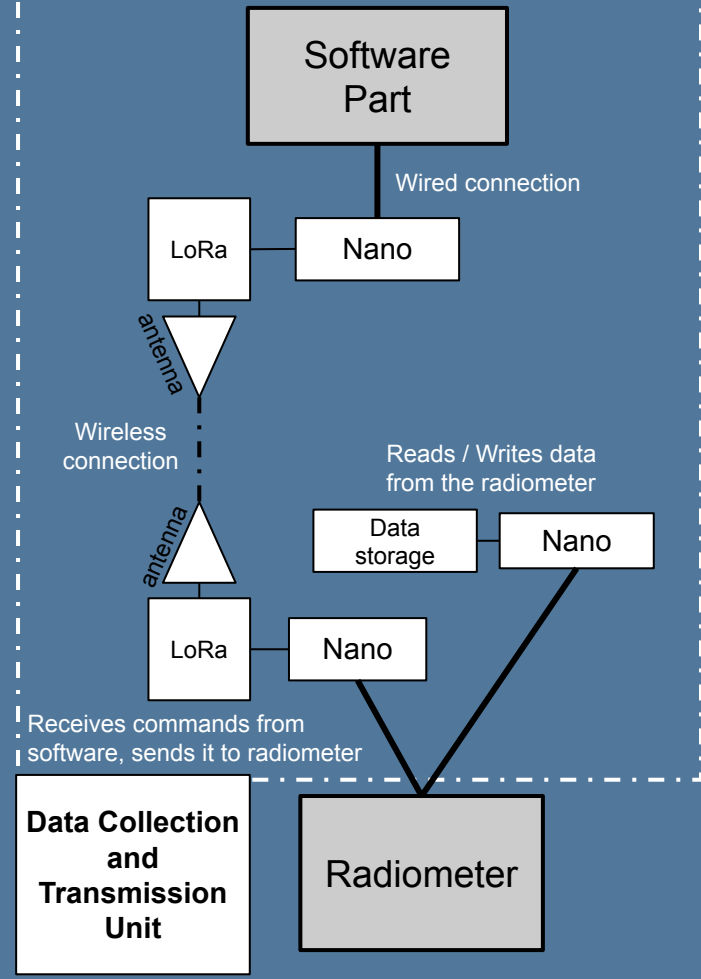
Radio Frequency (RF) Front End

Intermediate Frequency (IF) Down Converter

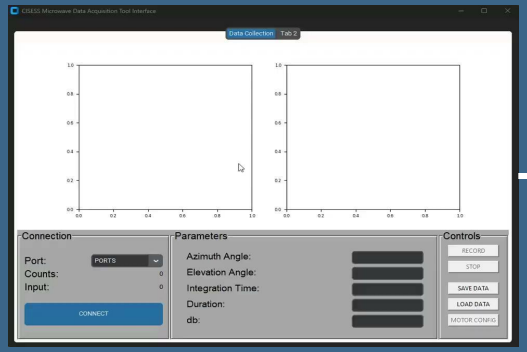


Power detector/back-end circuit





Software Demonstration



Communicates with the connected Arduino

Arduino Nano

```
  byte angle = 0;                    // 0-180;
} commands;

struct countsStruct {
  long counts;
} countStruct;

String confirmMsg = "RECEIVED";
String failMsg= "FAILED";
boolean valid = true;
boolean received = false;

void setup() {
  pinMode(RFM95_RST, OUTPUT); //set reset pin as output to config radio on/off
  digitalWrite(RFM95_RST, HIGH); // writing high to enable lora

  Serial.begin(115200);
```

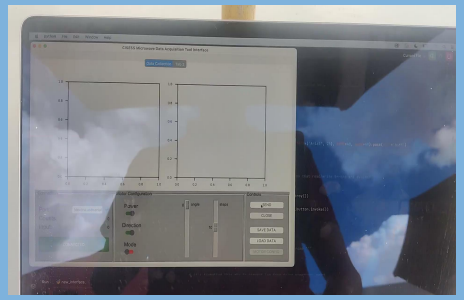
Output Serial Monitor

Message (Enter to send message to 'Arduino Nano' on '/dev/cu.usbserial-1420')

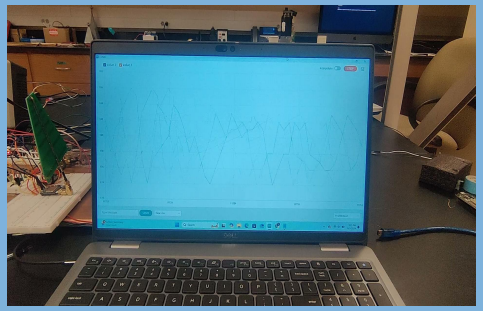
RECEIVED

Communicates with the radiometer and other devices

System Demonstrations



Signal Control



Remote data monitoring