```
numDataPoints = 30 ;
[t, data] = serial_reader(numDataPoints) ;
disp('Time')
disp(t)
disp( 'Data' )
disp(data)

T0 = 298.15 ;
T_room = 23.6+273.15 ;
B = 3950 ;
R0 = 10000 ;
%T = 1/( (1/T0) + (1/B)*ln(R/R0) )

Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Time
    0.9889
    1.9946
    3.0003
    4.0124
    5.0049
    6.0202
    7.0161
    8.0082
```

```
    9.0168
   10.0104
   11.0187
   12.0299
   13.0231
   14.0361
   15.0257
   16.0390
   17.0322
   18.0410
   19.0359
   20.0495
   21.0410
   22.0562
   23.0468
   24.0591
   25.0499
   26.0583
   27.0522
   28.0612
   29.0714
   30.0651

Data
   1.0e+04 *

    1.0460    0.0297
    1.0460    0.0297
    1.0460    0.0297
    1.0460    0.0297
    1.0419    0.0297
    1.0460    0.0297
    1.0460    0.0297
    1.0419    0.0297
    1.0419    0.0297
    1.0419    0.0297
    1.0378    0.0297
    1.0338    0.0297
    1.0378    0.0297
    1.0378    0.0297
    1.0378    0.0297
    1.0378    0.0297
    1.0378    0.0297
    1.0378    0.0297
    1.0378    0.0297
    1.0378    0.0297
    1.0419    0.0297
    1.0419    0.0297
    1.0419    0.0297
    1.0419    0.0297
    1.0460    0.0297
    1.0501    0.0297
    1.0501    0.0297
    1.0419    0.0297
```

```
    1.0338    0.0297
    1.0338    0.0297
```

Calibration

```
resistance = data(:,1) ;
R = mean(resistance) ; %resistance average
som = -(B*T0^2)/(R*(B+T0)*log(R/R0)^2) ; %sensitivity of measurement
temp = data(:,2) ; %temp in celcius
T_meas = mean(temp) ; %average measured temp in C
T_measured = T_meas-273.15 ;
offset = T_meas - T_room ; %Temperature offset
inaccuracy = offset/T_room ;
accuracy = 1 - inaccuracy ;
T_max = 125 ;
T_min = -55 ;
intervals = 1024 ;
resolution = (T_max-T_min)/intervals ;
```

Linearity

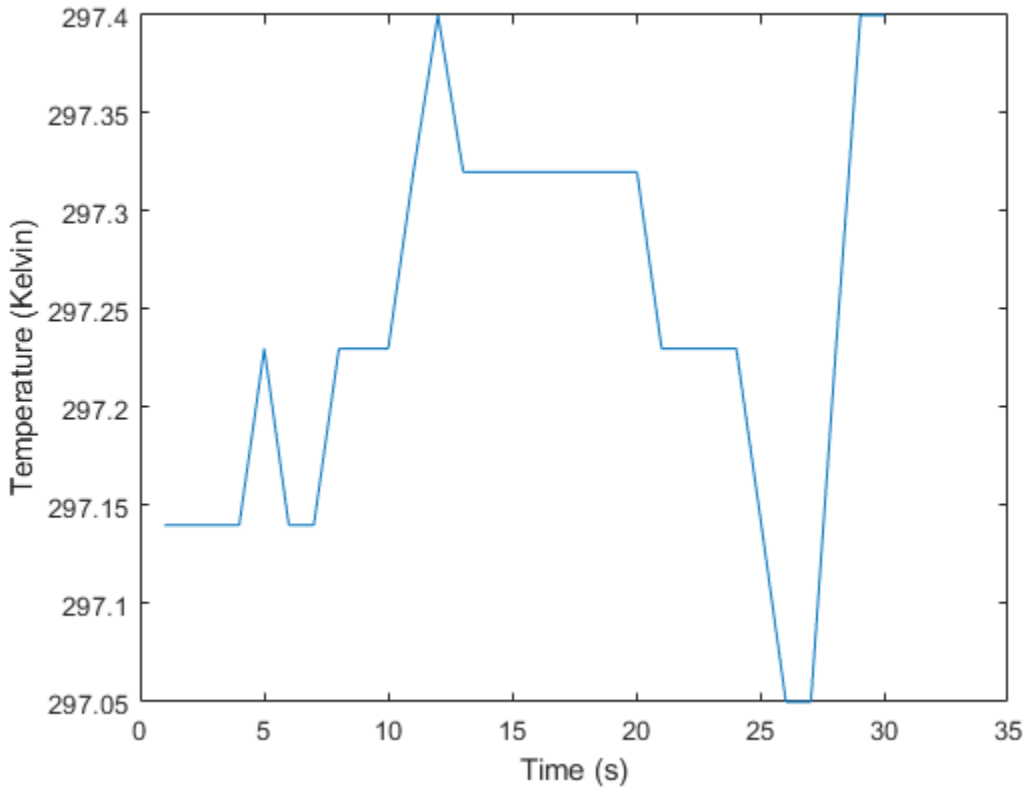
```
numDataPoints = 30 ;
[t, data] = serial_reader(numDataPoints) ;

figure
plot( t , temp )
xlabel('Time (s)')
ylabel('Temperature (Kelvin)')


range = max(temp)-min(temp) ;
temp_timeconstant = min(temp)+range*.632 ;
ii = 1 ;
    if temp < temp_timeconstant
        ii = ii+1 ;
    else
        timeconstant = t(ii) ;
        disp( 'The time constant is ' )
        disp(timeconstant)
    end
```

```
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
```

```
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
Reading Serial Data
The time constant is
    0.9890
```



Published with MATLAB® R2017b