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DesignNews

Raspberry Pi 4B Application Development Using the C Programming Language

DAY 5: Coding a Raspberry Pi 4B Serial IoT Application

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Webinar Logistics

- Turn on your system sound to hear the streaming presentation.
- If you have technical problems, click “Help” or submit a question asking for assistance.
- Participate in ‘Group Chat’ by maximizing the chat widget in your dock.
- Submit questions for the lecturer using the Q&A widget. They will follow-up after the lecture portion concludes.

Fred Eady

Visit ‘Lecturer Profile’ in your console for more details.

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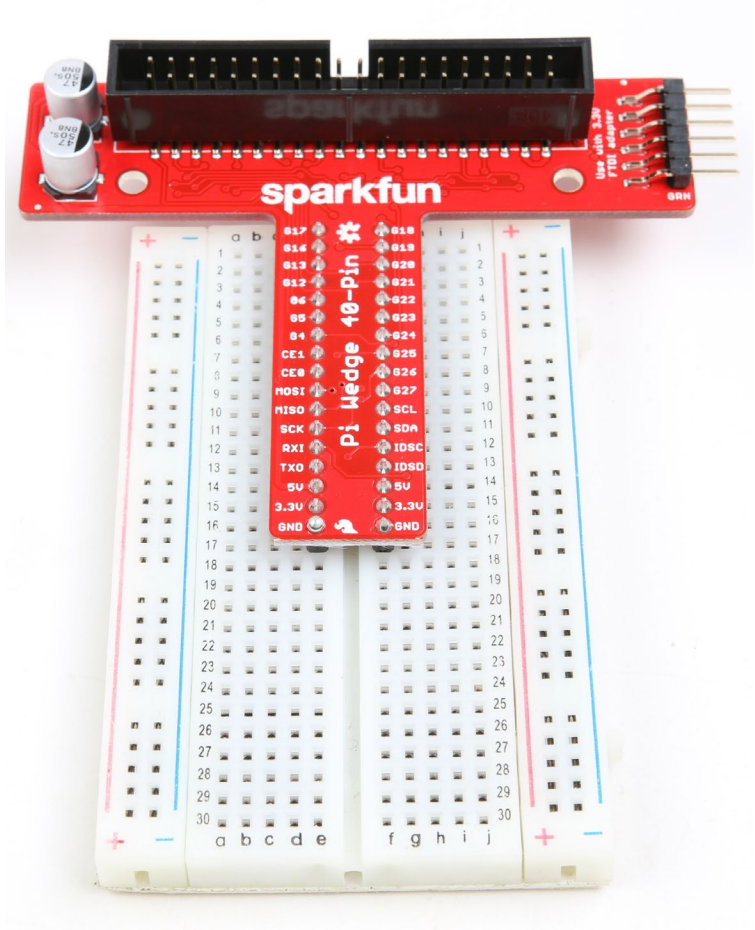
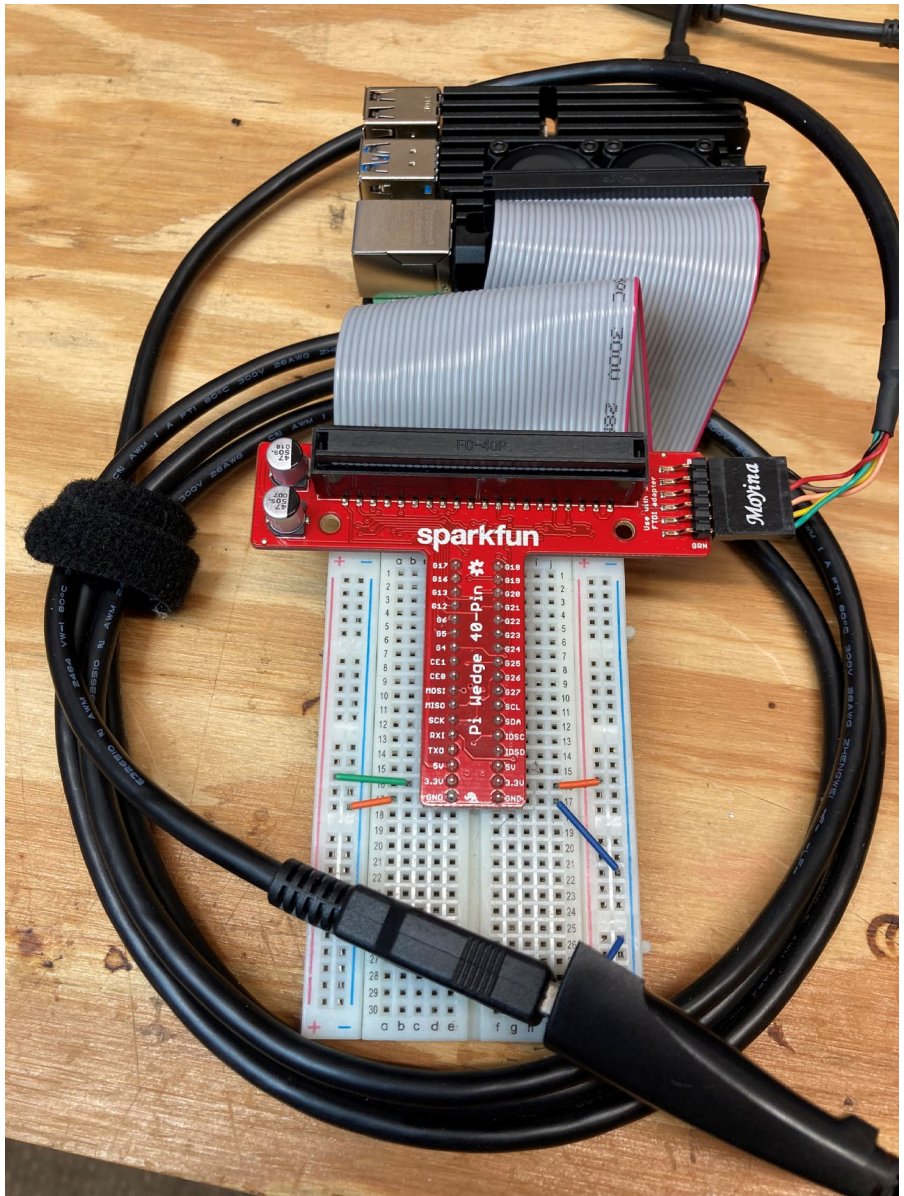
AGENDA

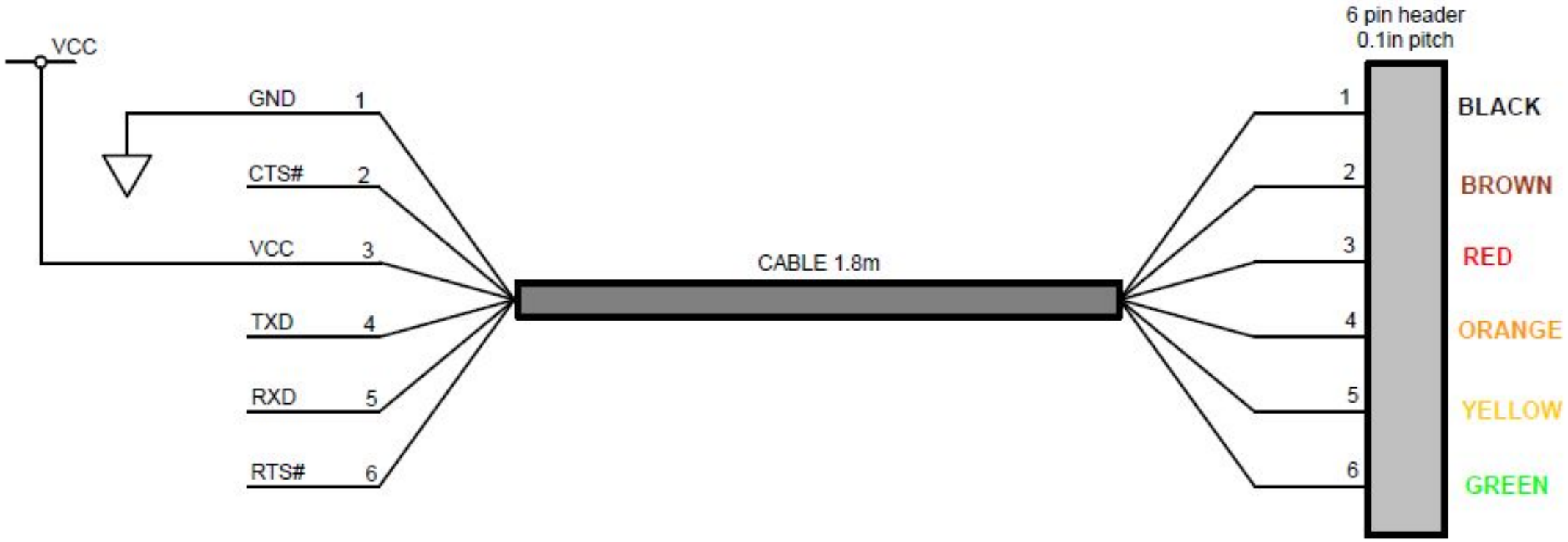
- Serial Interfacing



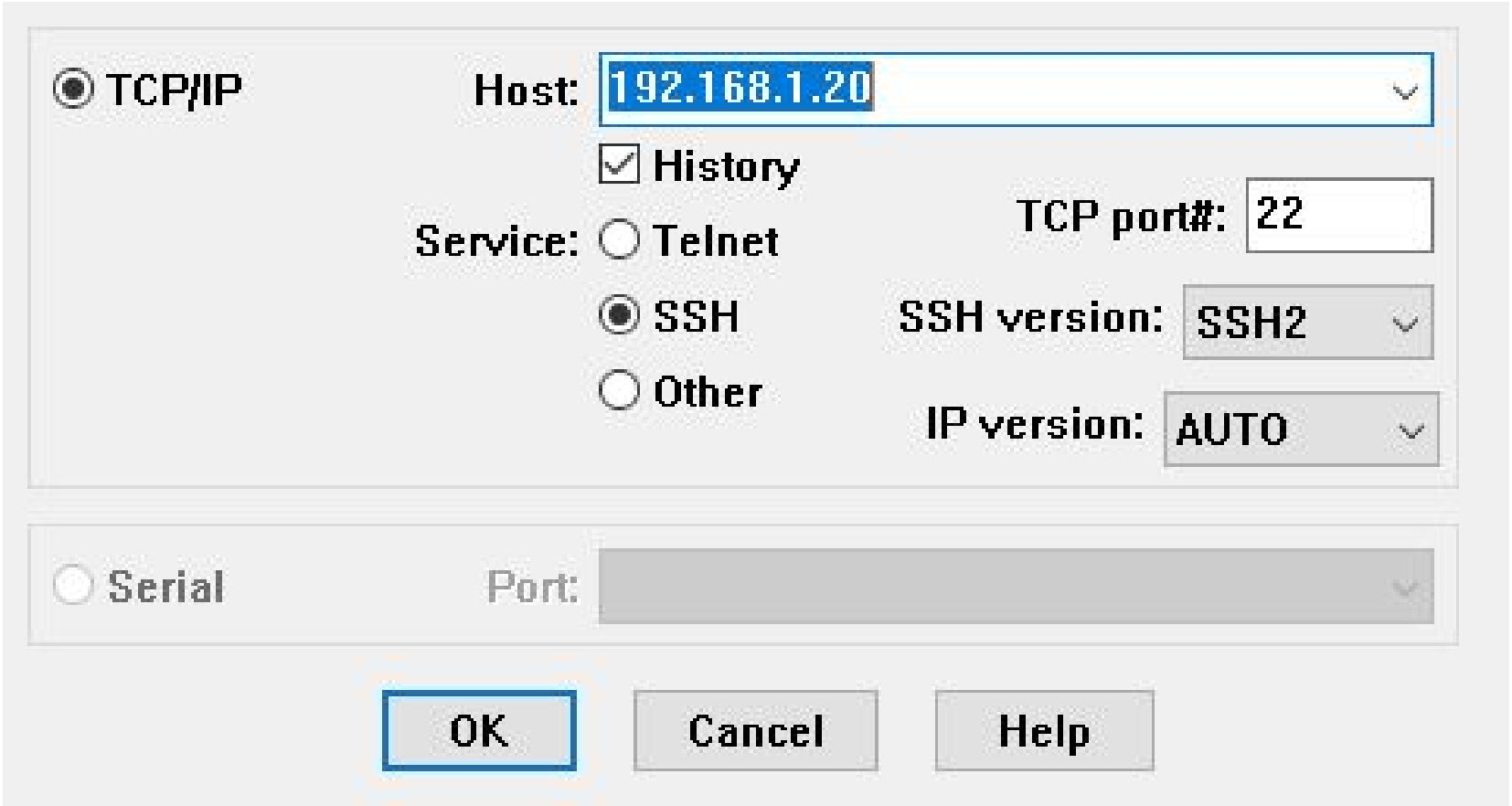
Serial Interfacing – Hardware



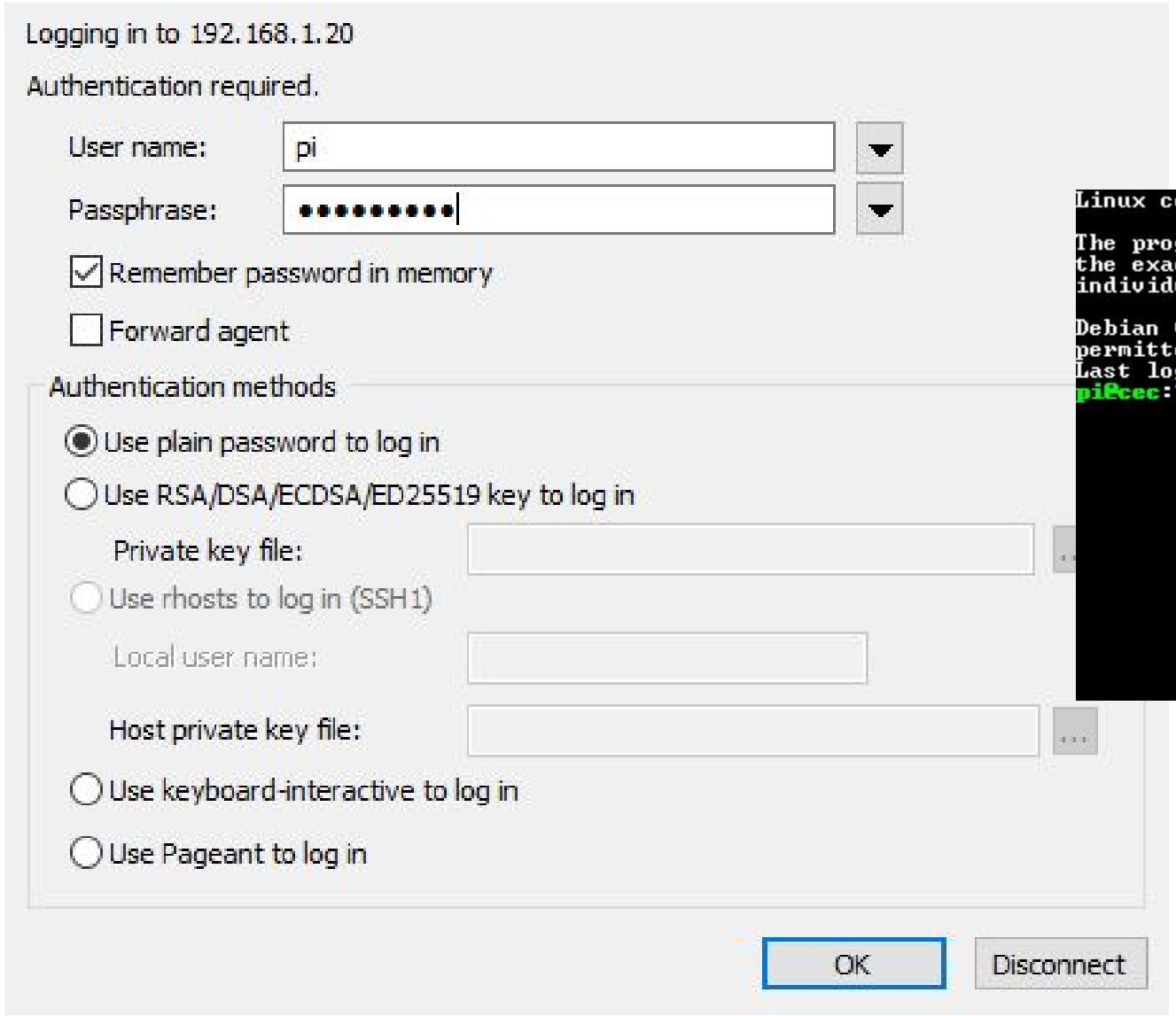
Serial Interfacing – FTDI Cable

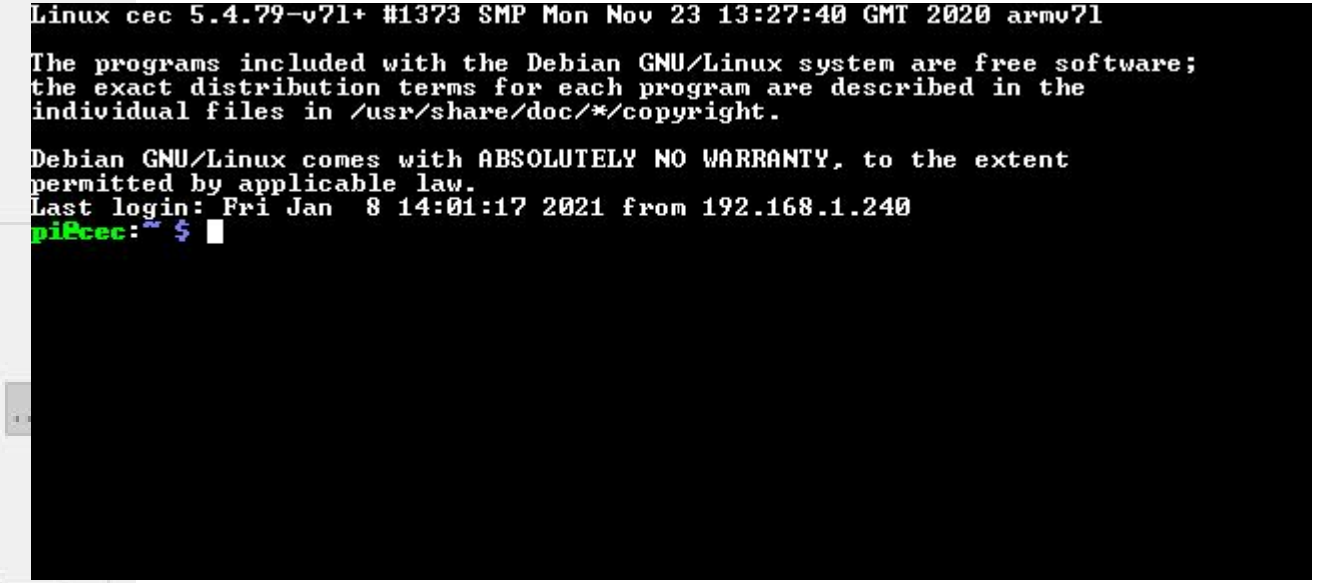


Serial Interfacing – SSH via Tera Term

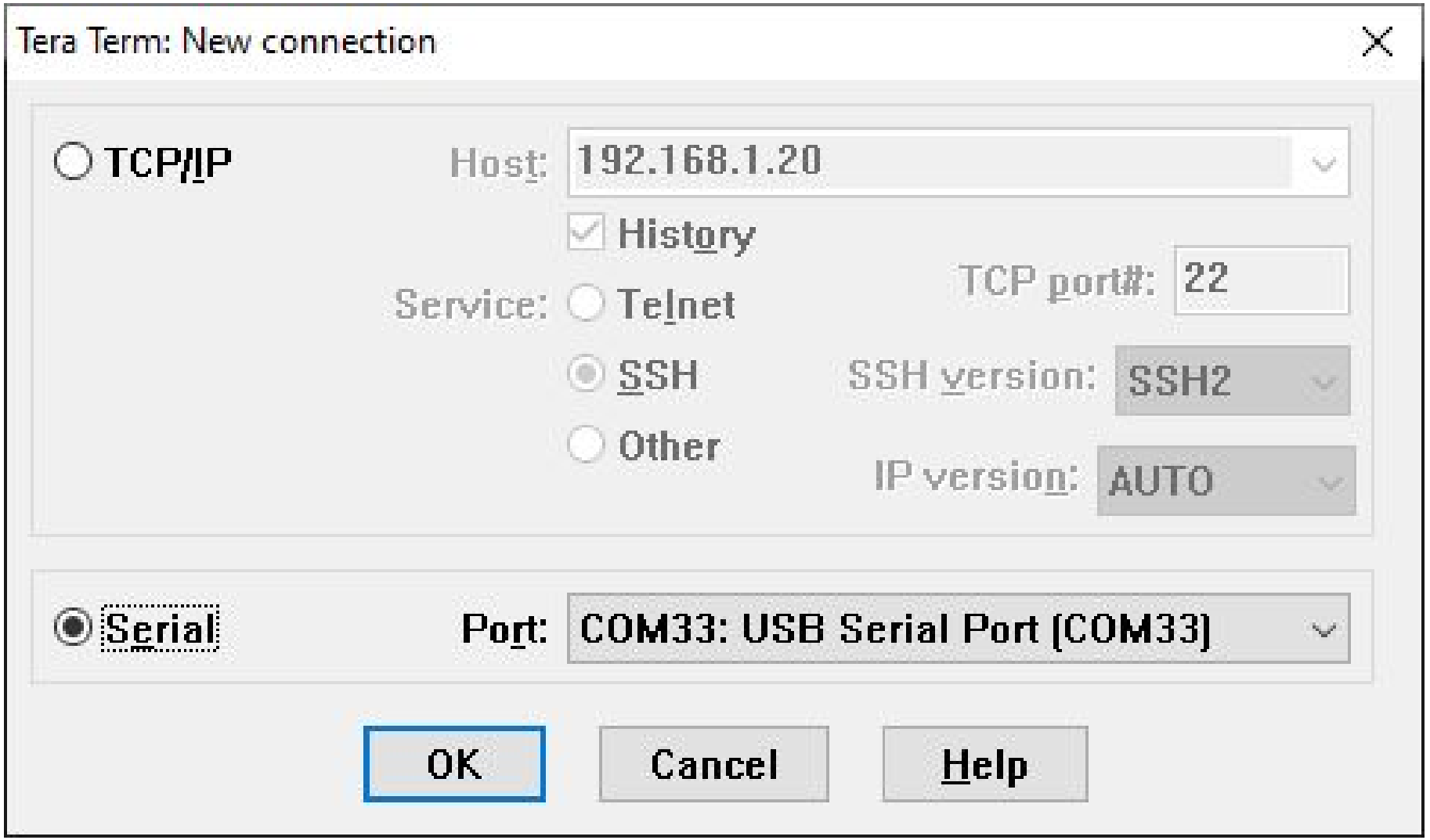


Serial Interfacing – SSH via Tera Term





Serial Interfacing – Echo Example



Serial Interfacing – Echo Example

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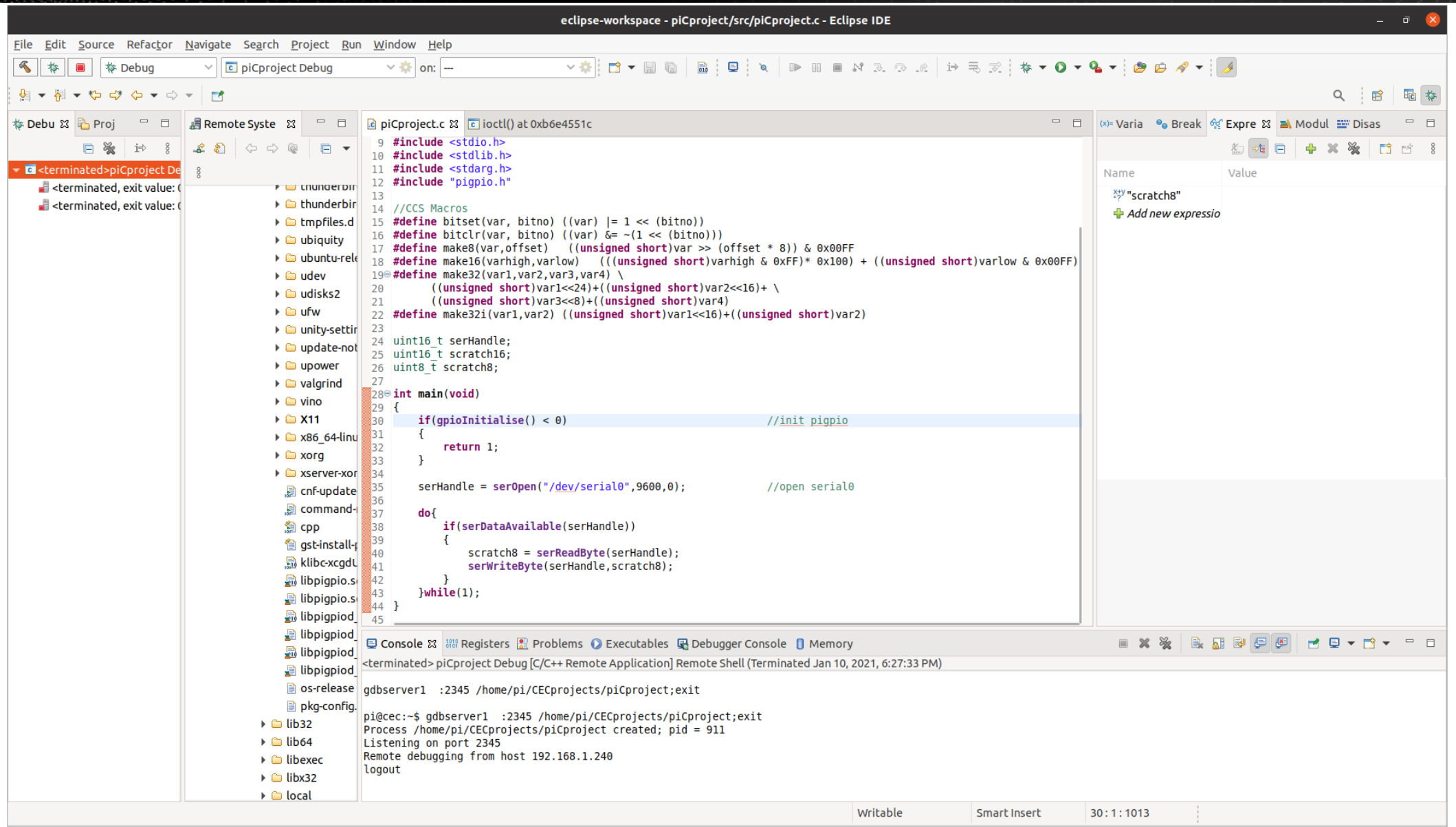
Serial Interfacing – Echo Example



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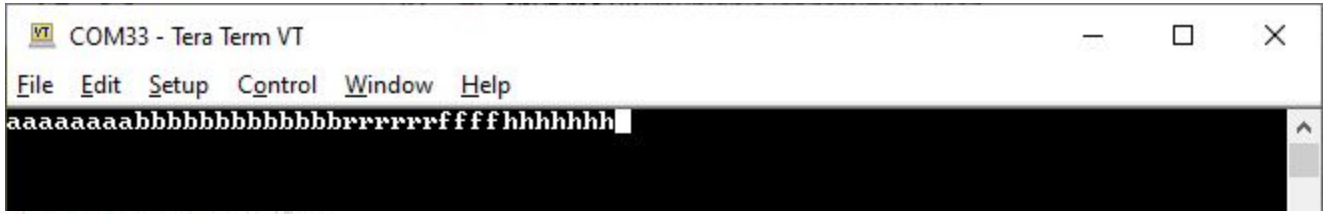
Serial Interfacing – Echo Example




```
24 uint16_t serHandle;
25 uint16_t scratch16;
26 uint8_t scratch8;
27
28 int main(void)
29 {
30     if(gpioInitialise() < 0)                    //init pigpio
31     {
32         return 1;
33     }
34
35     serHandle = serOpen("/dev/serial0",9600,0);  //open serial0
36
37     do{
38         if(serDataAvailable(serHandle))
39         {
40             scratch8 = serReadByte(serHandle);
41             serWriteByte(serHandle,scratch8);
42         }
43     }while(1);
44 }
```

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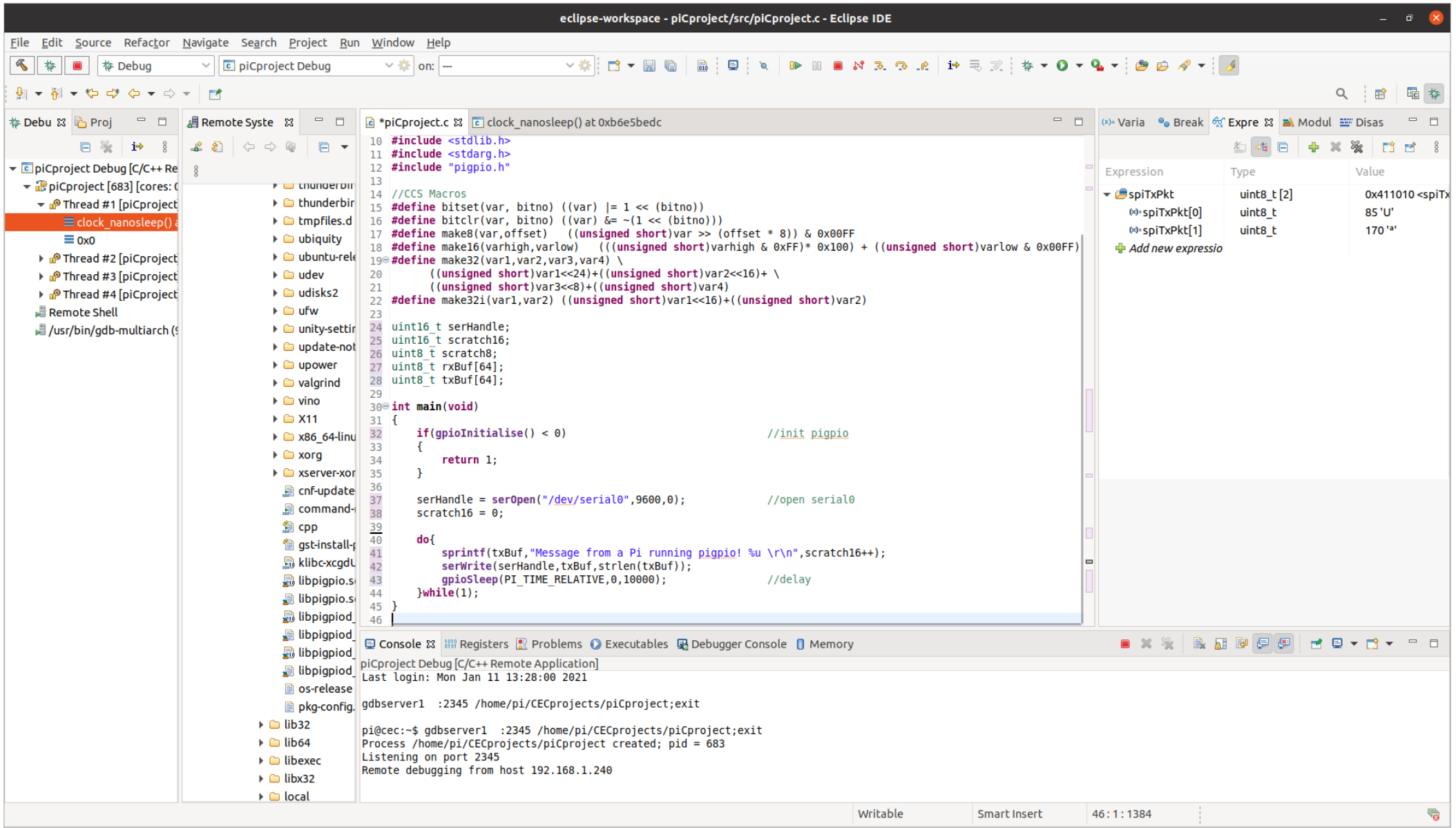
Serial Interfacing – serWrite Example



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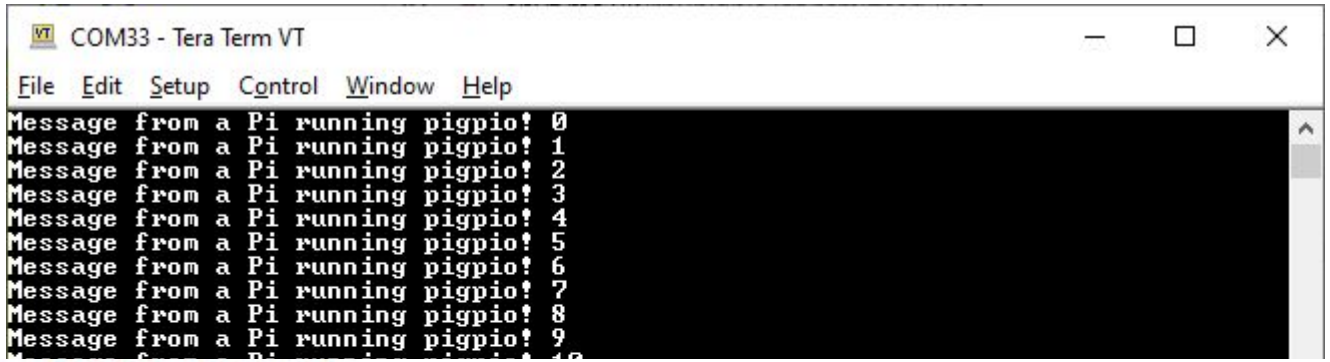
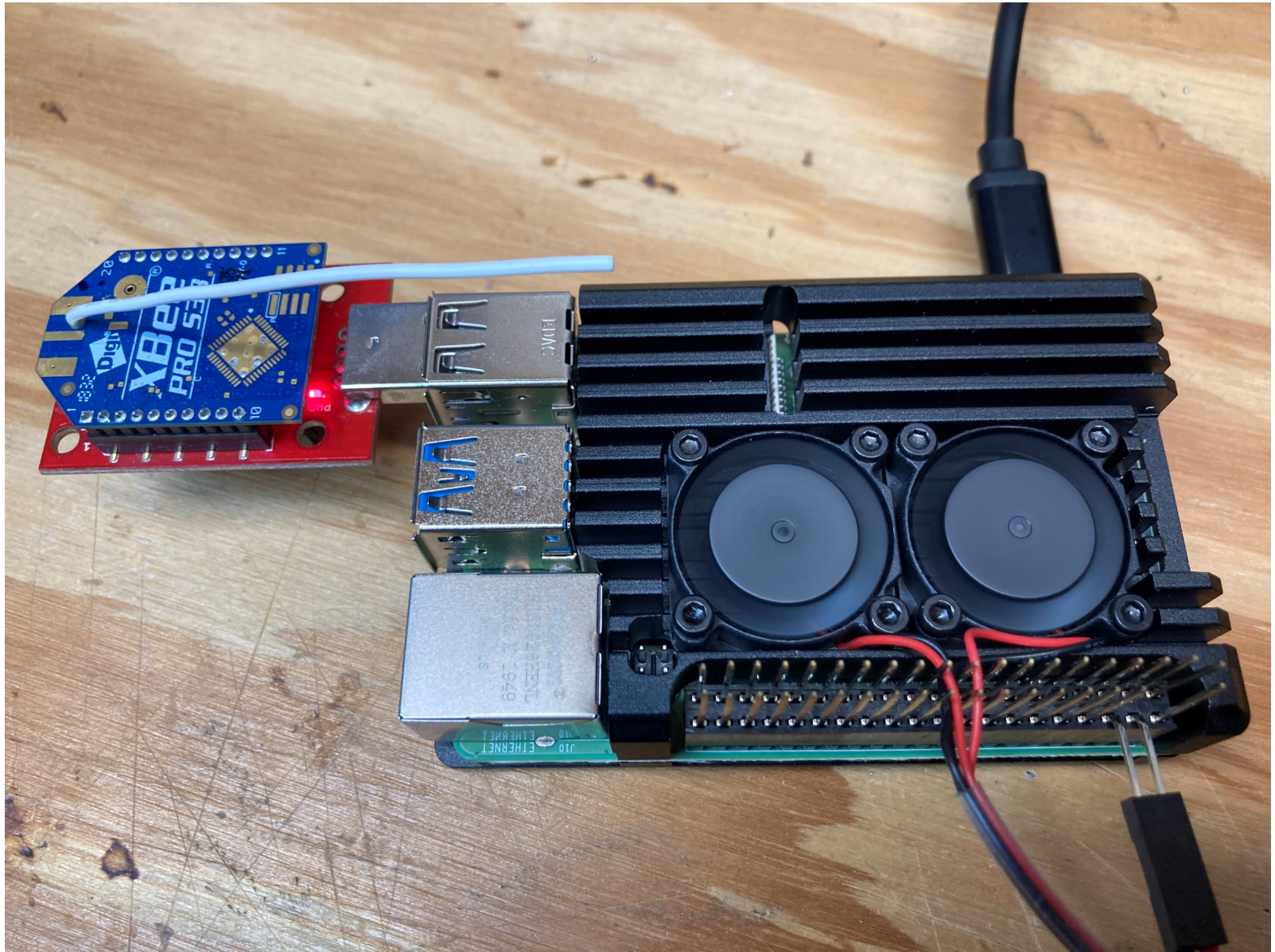
Serial Interfacing – serWrite Example




```
24 uint16_t serHandle;
25 uint16_t scratch16;
26 uint8_t scratch8;
27 uint8_t rxBuf[64];
28 uint8_t txBuf[64];
29
30 int main(void)
31 {
32     if(gpioInitialise() < 0)                    //init pigpio
33     {
34         return 1;
35     }
36
37     serHandle = serOpen("/dev/serial0",9600,0);  //open serial0
38     scratch16 = 0;
39
40     do{
41         sprintf(txBuf,"Message from a Pi running pigpio! %u \r\n",scratch16++);
42         serWrite(serHandle,txBuf,strlen(txBuf));
43         gpioSleep(PI_TIME_RELATIVE,0,10000);     //delay
44     }while(1);
45 }
```

Serial Interfacing – XBee Example



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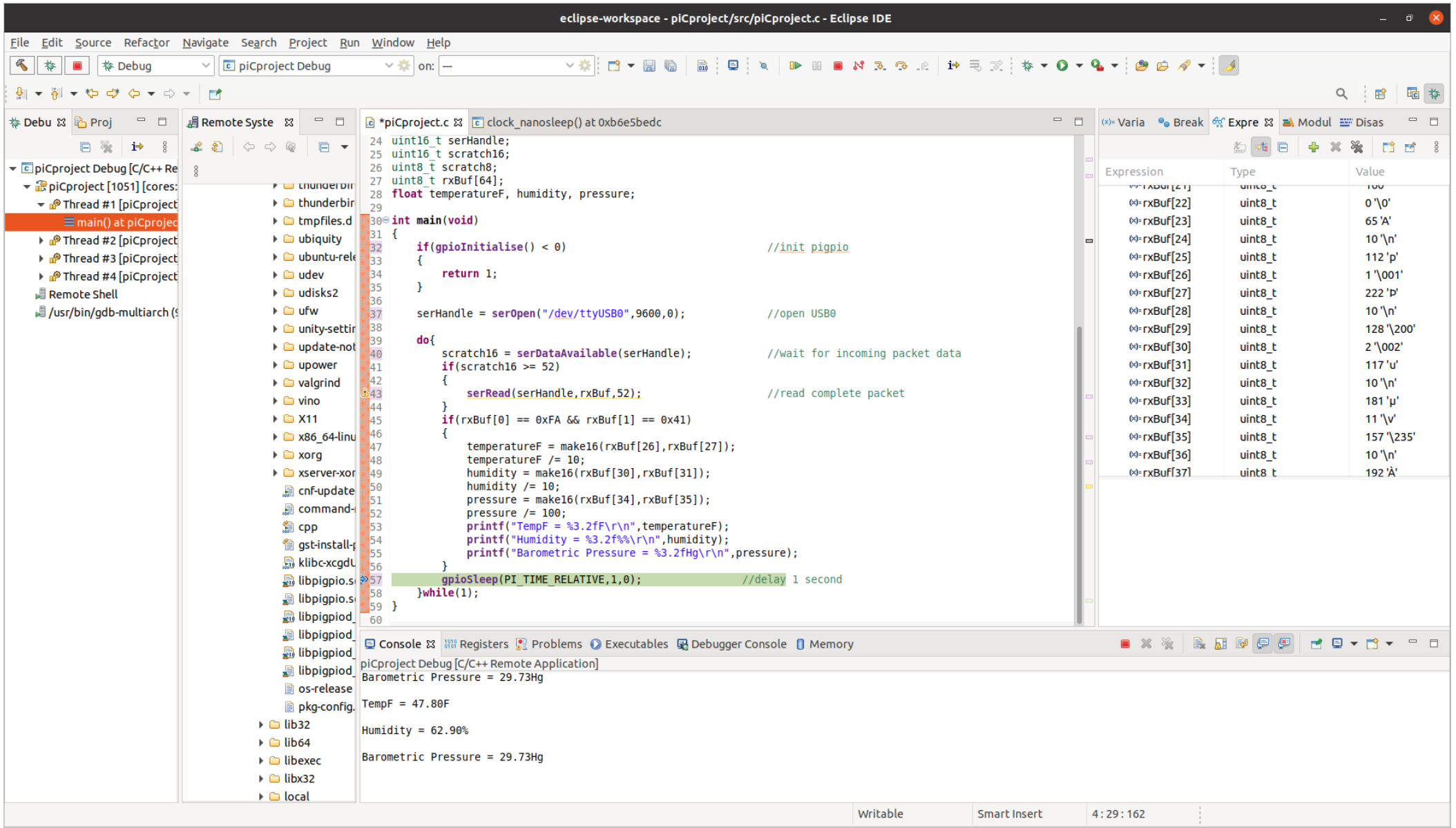
Serial Interfacing – XBee Example



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Serial Interfacing – XBee Example

*piCproject.c clock_nanosleep() at 0xb6e5bedc

```
24 uint16_t serHandle;
25 uint16_t scratch16;
26 uint8_t scratch8;
27 uint8_t rxBuf[64];
28 float temperatureF, humidity, pressure;
29
30 int main(void)
31 {
32     if(gpioInitialise() < 0)                          //init pigpio
33     {
34         return 1;
35     }
36
37     serHandle = serOpen("/dev/ttyUSB0",9600,0);       //open USB0
38
39     do{
40         scratch16 = serDataAvailable(serHandle);      //wait for incoming packet data
41         if(scratch16 >= 52)
42         {
43             serRead(serHandle,rxBuf,52);              //read complete packet
44         }
45         if(rxBuf[0] == 0xFA && rxBuf[1] == 0x41)
46         {
47             temperatureF = make16(rxBuf[26],rxBuf[27]);
48             temperatureF /= 10;
49             humidity = make16(rxBuf[30],rxBuf[31]);
50             humidity /= 10;
51             pressure = make16(rxBuf[34],rxBuf[35]);
52             pressure /= 100;
53             printf("TempF = %3.2fF\r\n",temperatureF);
54             printf("Humidity = %3.2f%%\r\n",humidity);
55             printf("Barometric Pressure = %3.2fHg\r\n",pressure);
56         }
57         gpioSleep(PI_TIME_RELATIVE,1,0);              //delay 1 second
58     }while(1);
59 }
```

Thank you for attending

Please consider the resources below:

- https://www.raspberrypi.org
- https://ubuntu.com
- https://www.eclipse.org
- https://mikroe.com

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Thank You

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