

One-Wire examples in C using DS18B20 temperature sensors

one_wire.c contains the 1-wire routines specific to Propeller

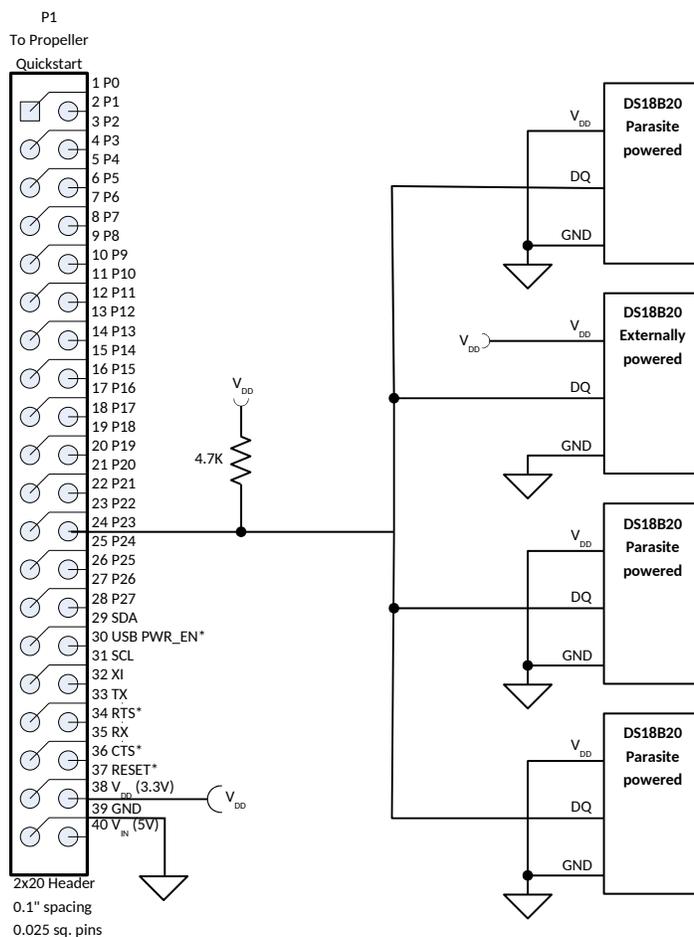
ownet.c contains 1-wire routines from Maxim that have been placed in the public domain. Some minor modifications have been made for Propeller

ownet.h contains function prototypes and general definitions from Maxim that have been placed in the public domain. Some minor modifications have been made for Propeller

ReadTemp.side and ReadTemp.c give an example of reading multiple temperature sensors with all the code running in the main cog. Note that the I/O line used for 1-wire communication is defined by the line:

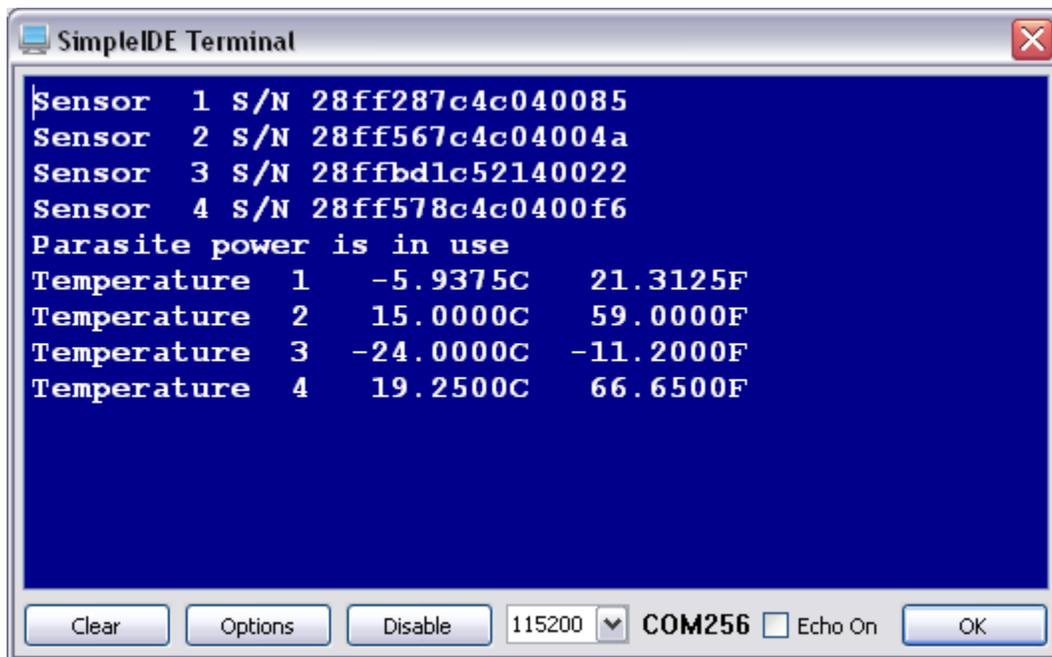
```
int portnum=23; //the I/O number used for one wire communication
```

The schematic of the circuit used is shown below. A combination of externally powered and parasite powered devices has been used.



Single Bus Example

The terminal display is shown below. Freeze spray was used to lower the temperature of the devices.

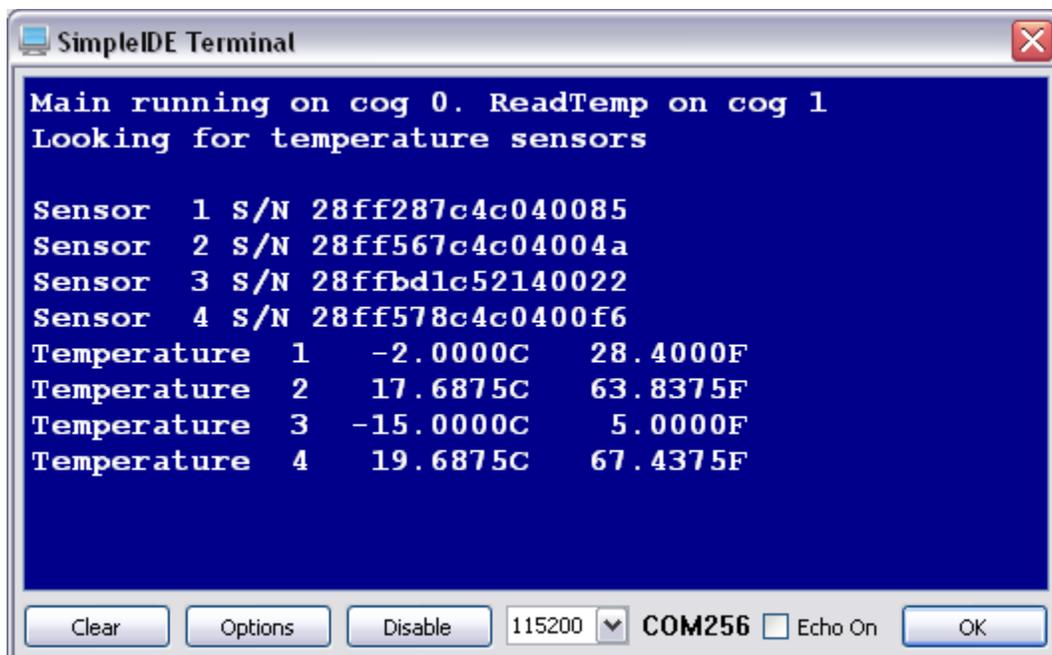


```
SimpleIDE Terminal
Sensor 1 S/N 28ff287c4c040085
Sensor 2 S/N 28ff567c4c04004a
Sensor 3 S/N 28ffbd1c52140022
Sensor 4 S/N 28ff578c4c0400f6
Parasite power is in use
Temperature 1 -5.9375C 21.3125F
Temperature 2 15.0000C 59.0000F
Temperature 3 -24.0000C -11.2000F
Temperature 4 19.2500C 66.6500F
Clear Options Disable 115200 COM256 Echo On OK
```

ReadTemp_cog.side and ReadTemp_cog.c give an example of reading multiple temperature sensors with the 1-wire communication code running in a separate cog. This would allow the code to do other tasks while waiting for a temperature measurement. Note that the I/O line used for 1-wire communication is defined by the line:

```
volatile int portNumber=23; //the I/O number used for one wire communication
```

The same schematic was used as in the first example and the terminal display is shown below.



```
SimpleIDE Terminal
Main running on cog 0. ReadTemp on cog 1
Looking for temperature sensors
Sensor 1 S/N 28ff287c4c040085
Sensor 2 S/N 28ff567c4c04004a
Sensor 3 S/N 28ffbd1c52140022
Sensor 4 S/N 28ff578c4c0400f6
Temperature 1 -2.0000C 28.4000F
Temperature 2 17.6875C 63.8375F
Temperature 3 -15.0000C 5.0000F
Temperature 4 19.6875C 67.4375F
Clear Options Disable 115200 COM256 Echo On OK
```

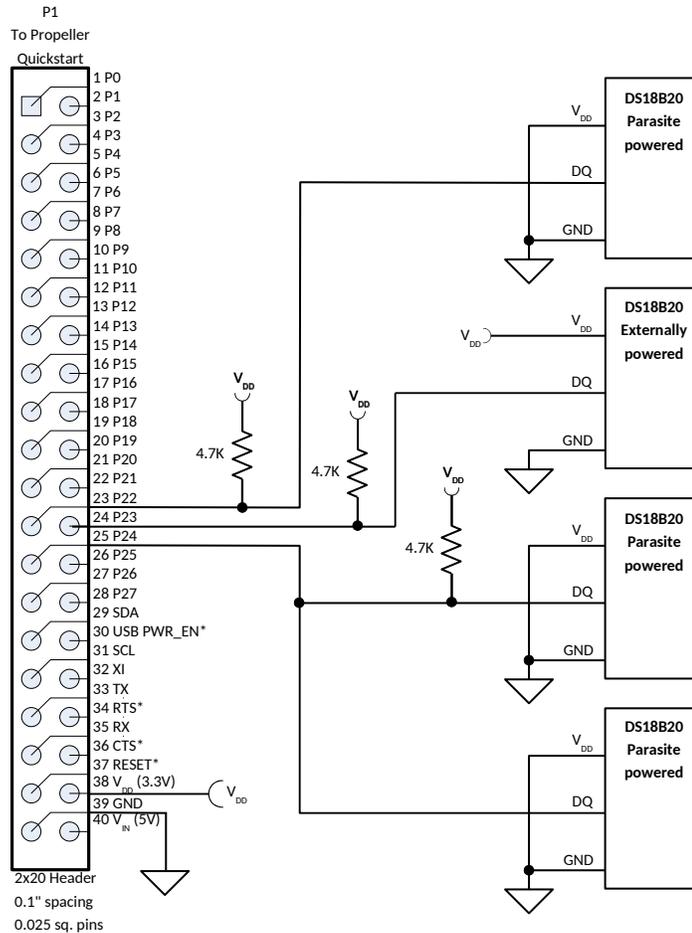
ReadTemp_multiple_cog.side and ReadTemp_multiple_cog.c give an example of using multiple 1-wire buses at the same time. Each bus is controlled by a separate cog. The number of buses (and number of I/O lines) used is defined by the line:

```
#define ONE_WIRE_BUSES 3 //the number of 1-wire buses we are using
```

The I/O lines used for the buses is defined by the line:

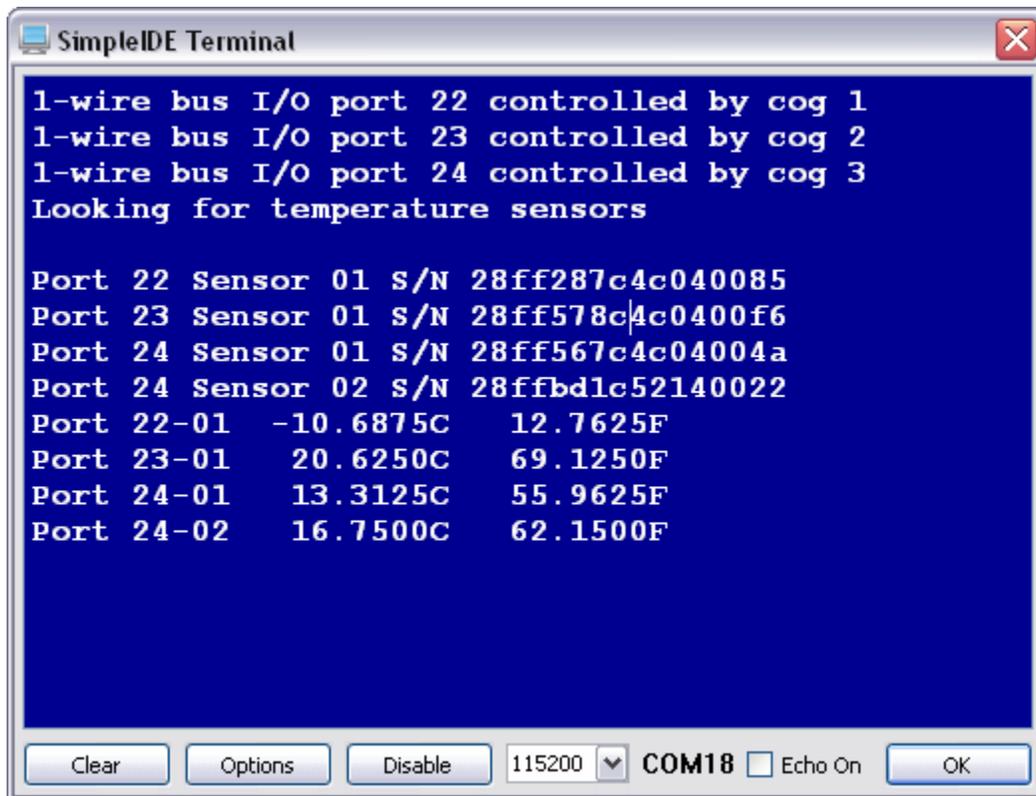
```
int portnum[ONE_WIRE_BUSES]={22,23,24}; //the I/O ports used for 1-wire communication
```

The schematic of the circuit used is shown below.



Multiple Bus Example

The terminal display is shown below.



A screenshot of a terminal window titled "SimpleIDE Terminal". The window has a blue background and white text. The text displays information about 1-wire bus I/O ports and temperature sensors. The first three lines indicate that ports 22, 23, and 24 are controlled by cog 1, cog 2, and cog 3 respectively. The next line says "Looking for temperature sensors". Following this, there are four lines of sensor identification: Port 22 Sensor 01 S/N 28ff287c4c040085, Port 23 Sensor 01 S/N 28ff578c4c0400f6, Port 24 Sensor 01 S/N 28ff567c4c04004a, and Port 24 Sensor 02 S/N 28ffbd1c52140022. The final four lines show temperature readings in Celsius and Fahrenheit: Port 22-01 (-10.6875C, 12.7625F), Port 23-01 (20.6250C, 69.1250F), Port 24-01 (13.3125C, 55.9625F), and Port 24-02 (16.7500C, 62.1500F). At the bottom of the window, there is a control bar with buttons for "Clear", "Options", "Disable", and "OK", along with a dropdown menu set to "115200", a port selection dropdown set to "COM18", and an "Echo On" checkbox.

```
1-wire bus I/O port 22 controlled by cog 1
1-wire bus I/O port 23 controlled by cog 2
1-wire bus I/O port 24 controlled by cog 3
Looking for temperature sensors

Port 22 Sensor 01 S/N 28ff287c4c040085
Port 23 Sensor 01 S/N 28ff578c4c0400f6
Port 24 Sensor 01 S/N 28ff567c4c04004a
Port 24 Sensor 02 S/N 28ffbd1c52140022
Port 22-01 -10.6875C 12.7625F
Port 23-01 20.6250C 69.1250F
Port 24-01 13.3125C 55.9625F
Port 24-02 16.7500C 62.1500F
```

Clear Options Disable 115200 COM18 Echo On OK