VK011 Instruction Manual

Draft Ver 1.02, March 16th, 2005

Specifications

Power Requirements

- 9 - 15vDC (from adaptor or through the serial port)
- 4mA@12vDC, 6mA@9vDC (with LED disabled)
- 8mA@12vDC, 7mA@9vDC (with LED power indicator)
- Screw terminals for easy connection of up to four Dallas temperature sensors (DS18S20)

Additional

- Measures in both degrees C (Celcius), and degrees F (Fahrenheit)
- Adjustable sample rate from 1 second to 99 seconds, or 1 minute to 99 minutes
- Advanced CRC error checking
- Will alert you to a short or disconnection in a sensor, and which one
- User settings stored in onboard eerom

Parts

PCB	1		
PreProgammedMicro	1	DS18S20	1
3K9	5	104	2
1K2	1	100uF	1
360	1	78L05	1
Jumper	2	3mm LED	1
8pin socket	1	3pin Terminals	4
2pin Terminals	1	DB9 female	1

This module connects to your serial port through a female DB9 serial connector, and allows you to easily communicate with the device through Hyperterminal, or through your own software.

It reads the temperature from up to four sensors, and keeps track of the high and low temperatures for each. It can record in Celcius, Fahrenheit, or both at the same time. You can also set it up to display all data in the Comma Separated Value form (CSV), for easy handling of the information. You can also switch between short and extended mode of display.

The module uses CRC error checking, and - when you switch over into extended mode - will tell you when there has been a problem with a sensor (or sensor-cable). It also knows the difference between a short and a sudden disconnect. If anything happens, it'll remove that sensor from the list, then when you go back to the menu prompt, it'll tell you which case it is. If everything is running smoothly, each sensor will report "OK" along with its serial number, and the CRC check results. If there has been a CRC error (meaning an inaccurate number or data sent back from a particular sensor), then it will say "BAD" instead, as well as report the number of CRC errors recorded from that sensor.

Here's an example of short mode:

Sensor 1 +20.06 DegC

And extended mode:

Sensor 1 +17.87 DegC Hi+20.18 DegC Low+17.87 DegC

And here's an example of CSV mode:

Sensor 1 +17.93 , DegC, Hi,+20.18, DegC, Low,+17.87, DegC,

How to open up your serial port using Hyperterminal:

- Open Hyperterminal from (windows) Programs – Accessories – Communication – Hyperterminal
- Select Com1, or whichever serial port you have connected the device to

- Set the baud rate for 9600
- Set the data bits to 8
- Set the parity to none
- Set the stop bits to 1
- Set the flow control to none

It will display “Qkits.com” to let you know it has successfully connected. It will then begin to display the data from your connected sensors in the format previously selected.

Press the question mark.

It will print a list of the four sensor ports. It will say Open next to a sensor port that you are not connected to, whereas if there is a short in the wires, it will say Short, and if you have successfully connected your sensors, it will display each one’s unique serial number, the result of the CRC check (any number other than zero means the data is corrupt), whether the data is intact (OK means not corrupt), and the number of CRC errors (if any).

There are three choices when navigating the menu.

Displayed at the bottom is “Set Next eXit ?” and above is the currently selectable mode, for example DegC. This means that if you press S, then it will cycle through the various degrees settings (Fahrenheit, celcius, and both). Press X when you have the one you want selected. To view the next mode option, press N. The choices are degrees system display, CSV (for comma separated values mode, for easy handling if you write your own software, for entry into databases or arrays), short or extended data mode (extended data mode will print the high and low recorded temperature for each sensor, as well as the current temperature), and the sampling rate, which can be set for every second, minute, or a settable amount of seconds, all the way to 99 seconds!

Clearing the Hi and Low temperature values.

First access the settings menu using “?” at the prompt :

Set Next eXit

Answer it with an “!” character. This will initialize the Hi and Lo temperature values with the current readings from the sensors. It will also clear any CRC errors that have been recorded and reset them to zero.

Restoring defaults is done by inputing an uppercase “D” at the prompt.

Don’t hesitate to write us an email at tech@qkits.com with any questions. Put VK011 in the subject.

QKits Ltd 613 544 6333

Connecting the DS18S20

You can connect the DS18S20 right up to the screw terminal connector, or through a cable. The location of the sensor is not important. You can start with one and add others later, or start with four, doesn't matter. If a sensor is not installed it is just skipped. A sensor can be installed while the power is on but this will result in a recorded high temperature of +85.00 C, which is automatic on detection of a new sensor. However, if you turn the power off, install the sensor, and power on, you will not get the recorded +85.00 C reset value.

You can connect up to 100 feet of wire to the sensors, and they'll still work with little or no error. You will get multiple CRC errors once you exceed the maximum wire length. Solder all connections to the device, and be sure not to stress the sensor by over-heating it when attaching leads.

If you are going to use this in a damp place, it's a good idea to use some silicon sealent to seal the leads coming from the device. You must connect the sensor with regards to the right polarity. Pin one of the sensor must correspond to pin one of the screw terminal. There is a half moon diagram on the board to tell you how to position it: with the curve pointing towards the board.

The PC Connection

Even though this device connects to the RS232 port of any PC or RS232 type device, the interface is not RS232, so locating this device any distance from the physical machine that it's connected to isn't a good idea. If a greater distance is required, use an LM75 to provide true RS232 line level signals through hundreds of feet of cable.

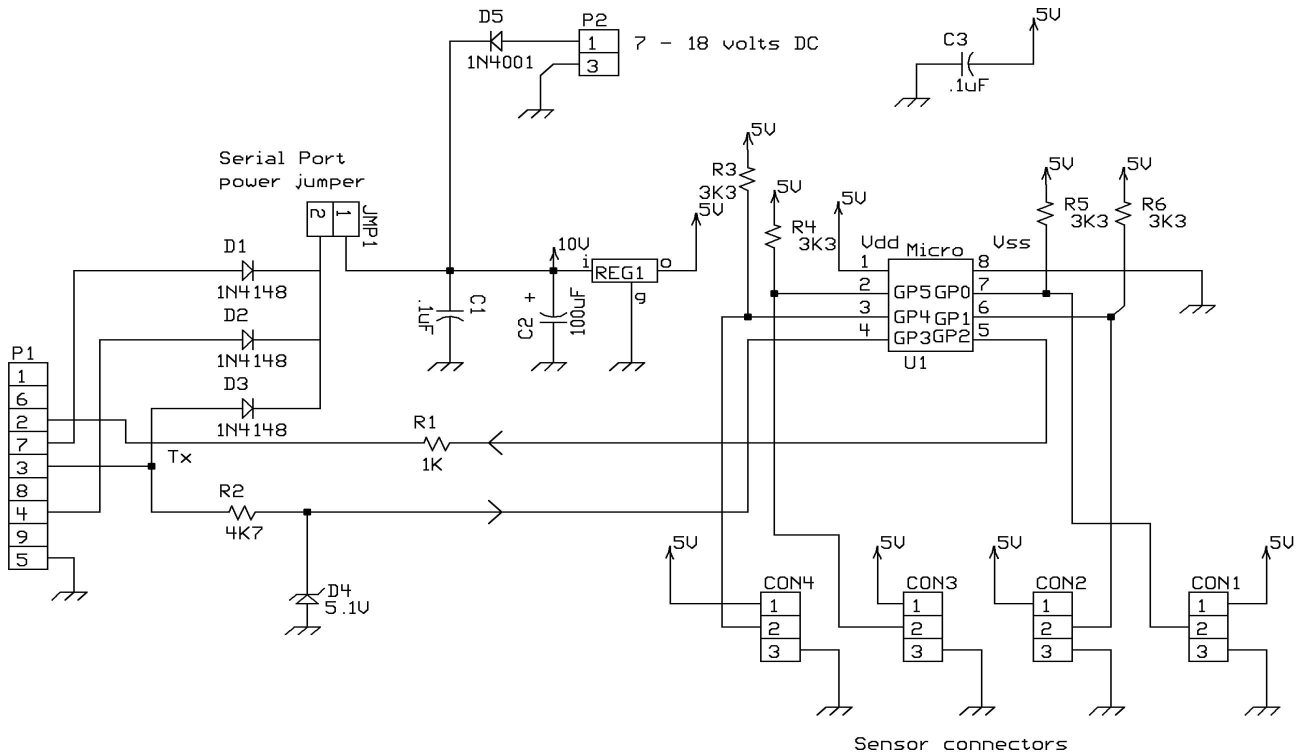
The board can be powered from the serial port of most PC's but the serial port power capacity has been scaled back, so it may be possible the your port cannot deliver enough current to the unit. In this case, we have provided a connection for an external power source. This can be anywhere from 7 volts to 18 volts DC.

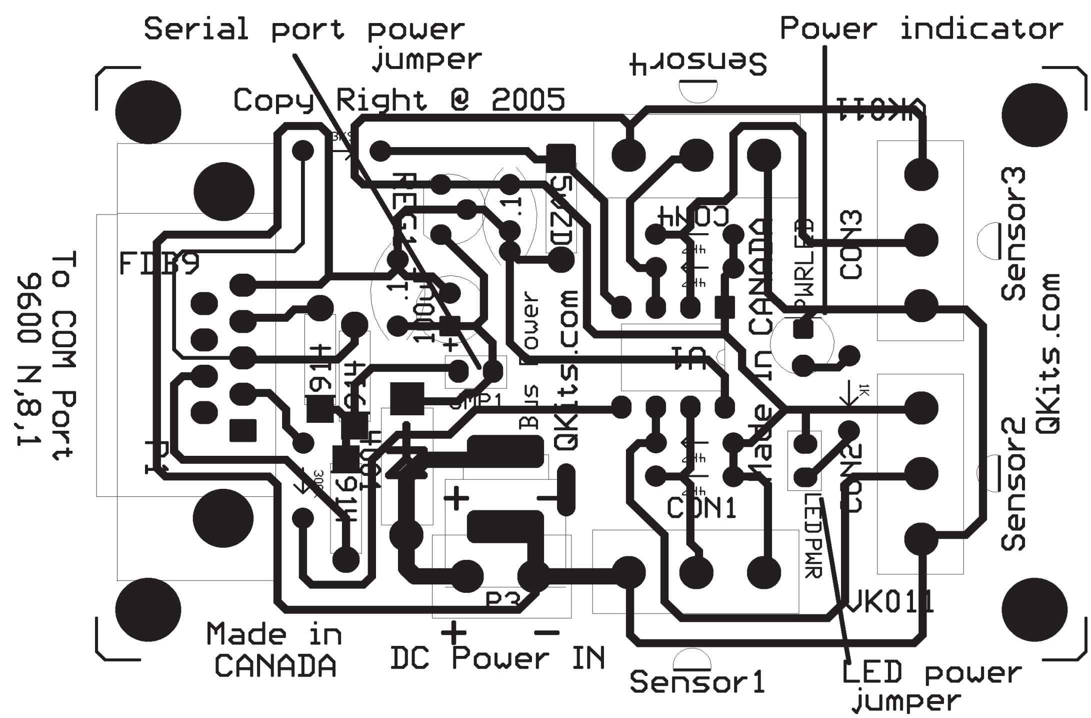
One of our small solar panels, and a rechargable battery, would allow the system to collect data unattended for months.

A jumper has been provided for the LED power indicator. Sometimes it is nice to be able to look and see if a unit is functioning, but if you need to save power, then being able to disable it makes sense and is a possibility!

Power Supply

Almost any DC source from 7 to 18 volts will work. You can supply the VK011 from the serial port if your port has ample power. You may connect your DC supply at any time as there are blocking diodes to prevent the voltage from flowing back into any connected device. To ensure the board is not drawing any power from the serial port, we have provided a jumper to disconnect the power supply from the port pins.


D5
1N4001
P2
7 - 18 volts DC
C3
.1uF
5V
Serial Port
power jumper
JMP1
D1
1N4148
D2
1N4148
D3
1N4148
P1
Tx
R1
1K
R2
4K7
D4
5.1V
C1
.1uF
C2
100uF
10V
REG1
R3
3K3
R4
3K3
R5
3K3
R6
3K3
Vdd
Micro
Vss
GP5
GP4
GP3
GP0
GP1
GP2
U1
CON4
CON3
CON2
CON1
Sensor connectors


Serial port power
jumper
Power indicator
Copy Right @ 2005
To COM Port
9600 N,8,1
Made in
CANADA
DC Power IN
Sensor1
Sensor2
Sensor3
LED power
jumper
QKits.com
VK011