Using the 1 Wire Weather Station with the Sarian MR2110

Application Note 16

Introduction

The Sarian MR2110 has the ability to read telemetry data courtesy of its Exp (expansion) port. A GPS receiver is available which plugs directly into this socket, but to add telemetry sensors it is necessary to order the optional 1-Wire telemetry POD. This is a small device which attaches to the Exp port with a short (supplied) cable and allows up to 100ft of *untwisted* cable to be attached.

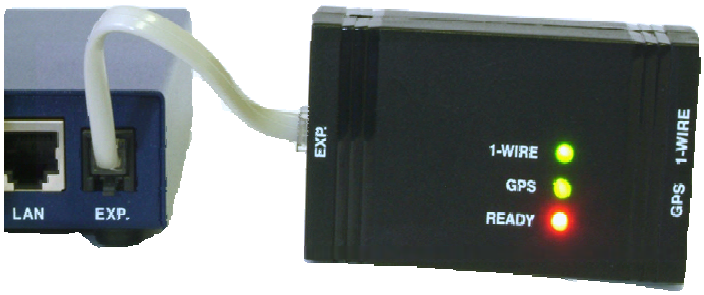

Figure 1 1 Wire Telemetry POD

Up to 24 sensors can be attached anywhere along the 1-Wire cable, but in may applications just a single device is connected. In this case it is convenient to use RJ11 (telephone) type connectors to attach the sensor onto the bus.

A number of customers are using this system to read wind direction, speed and temperature simply by adding the 1 Wire Weather Station (1WWS) onto the bus.

Figure 2 1 Wire Weather Sation (1WWS)

Weather Station Device

The 1WWS has an anemometer and a wind direction sensor external to the case (see fig 2 above) and internally has a temperature sensor accurate to ± 0.5^{o} C.

The anemometer measures from 0 to 100mph and the wind direction sensor measures to the nearest 1/16th compass point.

The case is made of a high impact polypropylene material and the stainless steel shafts run on high quality roller bearings.

Reading the Data

The MR2110 now has the ability to run internally user programs written in a version of the BASIC language called ScriptBASIC. This is a powerful extension to the BASIC language of old and now includes the ability to do trignometric functions, arrays etc. Sarian specific extensions to the language allow the user to control the communications functions of the router e.g. to snd SMS messages or to send a data packet to a specific IP address on the internet.

A simple program might be constructed to read the wind speed and if it was greater than, say, 50MPH, BASIC would cause the MR2110 to send a warning SMS message to a specific mobile number (or numbers).

Although reading of the sensors is quite a complex business, this is mainly hidden from the user by the BASIC functions provided by Sarian. The user therefore only needs to call these functions and format the data in the required manner using the extensive string functions. e.g. as « 25.3^{o}C » or «25.3 Degrees Centigrade ». The formatted string can then be sent either by SMS or toa host on the internet via GPRS.

Note that BASIC also has control of the serial port and therefore can be used to read any ancillary telemetry equipment on the site, such as water level meters.

This function can also be used to drive a small printer, this can be useful for continuous logging of temperature / wind speed with local hard copy.

Programming

The 1 Wire POD is provided with example applications on a CD ROM which can be transferred to the MR2110 and either run from the command line or as a macro on unit power up.

End User Requirements

As telemetry applications are typically different from one application to the next, the end user will normally need to provide some input to customise the basic devices to his specific application. In the case of the one wire weather station, in addition to the Sarian supplied equipment, the user will need to provide :

A GPRS enabled SIM card

Cabling from the Telemetry POD to the 1WWS

Customisation of the appropriate BASIC application

A host system designed to collect and display the data (e.g. a web server)

Additionally, although the 1WWS is provided with a mounting arm, the end user will need to provide a means to affix this to his chosen location e.g. bolts or U clamps.