

Overview and Functional Description

The Wireless Interface Box (WIB) is a radio / antenna assembly designed for mounting on vehicles as part of a vehicle telematics system. The box connects into the rest of the system via a single cable utilising a USB interface with separate power supply.

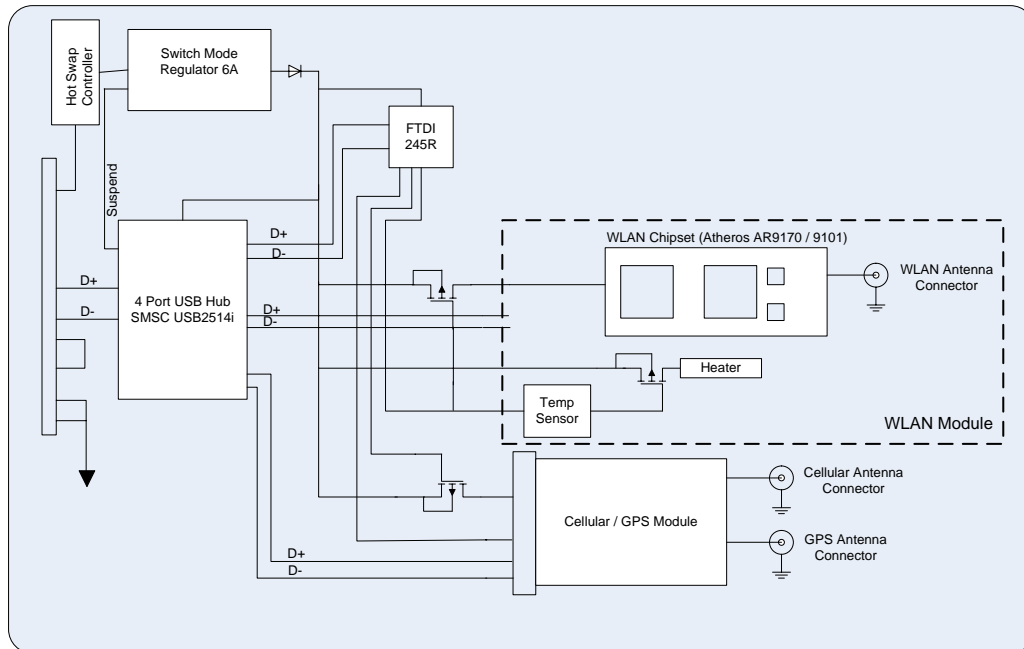
The box contains an 802.11b/g wireless LAN module and a multi-standard cellular module which also provides GPS functionality. The box is designed with full communications flexibility in mind and concurrent operation of all radio systems is allowed.

The WIB is controlled by an embedded computer within the vehicle which runs embedded Windows XP. Control of the radio modules is achieved using standard Windows XP drivers. In all cases the operating firmware for the modems is downloaded by the driver as part of the driver instantiation process.

To minimise power consumption of the device the power supply to both the WLAN and cellular modules can be switched using an FTDI USB / parallel port device. By default, at power up, both the WLAN and Cellular modems are disabled and remain disabled until commanded by a driver application running on the embedded computer.

To achieve the full operating temperature range for the WLAN device, a heater is used to raise the temperature of the WLAN baseband device when the unit is operating at low temperatures (below 0°C). Due to this, there is a delay of up to 2 minutes following switch on of the WLAN module before it will attempt to connect to the embedded computer. Operation of the heater is automatic and it operates to raise the temperature of the baseband chip and maintain it above 0°C without intervention from the host computer.

Block Diagram



Specifications

Feature	Implementation																								
Wireless LAN																									
Standards Supported	802.11b/g																								
Operating Frequency	US: 2.400 – 2.462GHz Europe: 2.412 – 2.472GHz																								
Tx Power	<table border="1"> <thead> <tr> <th>Data Rate</th> <th>Channel 1</th> <th>Channel 2-10</th> <th>Channel 11</th> </tr> </thead> <tbody> <tr> <td>11b (all rates)</td> <td>16dBm</td> <td>17dBm</td> <td>16dBm</td> </tr> <tr> <td>11g (6Mbps – 24Mbps)</td> <td>14dBm</td> <td>16dBm</td> <td>14dBm</td> </tr> <tr> <td>11g (36Mbps)</td> <td>14dBm</td> <td>15dBm</td> <td>14dBm</td> </tr> <tr> <td>11g (48Mbps)</td> <td>14dBm</td> <td>14dBm</td> <td>14dBm</td> </tr> <tr> <td>11g (54Mbps)</td> <td>13dBm</td> <td>13dBm</td> <td>13dBm</td> </tr> </tbody> </table>	Data Rate	Channel 1	Channel 2-10	Channel 11	11b (all rates)	16dBm	17dBm	16dBm	11g (6Mbps – 24Mbps)	14dBm	16dBm	14dBm	11g (36Mbps)	14dBm	15dBm	14dBm	11g (48Mbps)	14dBm	14dBm	14dBm	11g (54Mbps)	13dBm	13dBm	13dBm
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Data Rates:	802.11b: 1,2,5,11Mbps 802.11g: 6,9,12,18,24,36,48,54Mbps																								
Modulation Schemes	802.11b – BPSK, QPSK, CCK, DSSS 802.11g – BPSK, QPSK, 16-QAM, 64-QAM, OFDM																								
Cellular Modem																									
CDMA2000 Standards	1X, 1x EV-DO																								
CDMA2000 Frequencies	Band class 0: 869 – 894MHz (Rx), 824 -849MHz (Tx) Band class 1: 1930 – 1990MHz (Rx), 1850 – 1910MHz (Tx)																								
CDMA 2000 Tx Power	24dBm																								
UMTS Standards	WCDMA R99, HSDPA and/or HSUPA																								
UMTS Frequencies	Cellular band V: 869 – 894MHz (Rx), 824 – 849MHz (Tx) PCS band II: 1930 – 1990MHz (Rx), 1850 – 1910MHz (Tx) IMT band I: 2110 – 2170MHz (Rx), 1920 – 1980MHz (Tx)																								
UMTS Tx Power	24dBm																								
GSM Standards	GSM, GPRS (class 10), Edge (class 10)																								
GSM Frequencies	GSM850: 869 – 894MHz (Rx), 824 -849MHz (Tx) GSM900: 925 – 960MHz (Rx), 880 – 915MHz (Tx) GSM1800: 1805 – 1880MHz (Rx), 1710 – 1785MHz (Tx) GSM1900: 1930 – 1990MHz (Rx), 1850 – 1910MHz (Tx)																								
GSM Tx Power	32.5 (850/900), 29.5 (1800/1900)																								
Approvals	FCC ID: J9CUNDP-1 IC: 2723A-UNDP1																								
GPS Receiver																									
Operating frequency	1575.42MHz																								
Sensitivity	-156.5dBm																								
USB Interface																									
USB Standard	USB 2.0																								
Operating Conditions																									
Supply Voltage	7V – 12V (nominal 10V)																								
Operating Temperature Range	-30°C - +70°C																								