



**Plextek**

## **GSM/GPRS Rapid Development**



**Multimedia terminal for AlphaCell Wireless Ltd**

**Plextek offers proven design services for GSM/GPRS Multi-media handsets and terminals and bespoke applications.**

- **Electronics design and firmware integration**
- **MMI and applications software**
- **Industrial and mechanical design**
- **Type approval support**
- **Factory selection**
- **Production engineering**
- **Production test equipment**

**We also offer a fast-track route to market via our reference designs that are already proven in product applications for handsets, PC cards, and bespoke modems.**

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Plextek Limited, London Road,  
Great Chesterford, Essex, CB10 1NY, UK  
Telephone: +44 (0)1799 533200  
Fax: +44 (0)1799 533201  
Website: <http://www.plextek.com>  
Email: [mktg@plextek.co.uk](mailto:mktg@plextek.co.uk)

**Communications Technology  
Consultants**

Plextek's capabilities in radio engineering, software development and mechanical design combine to give turn-key product design services to manufacturers.

We are able to work with a wide range of silicon and software vendors, to create the optimum product for the target markets and manufacturing base.

However, we recognise that today's telecoms market is fiercely competitive and manufacturers have to bring ever-increasingly sophisticated products to market in ever-shorter timescales. To accelerate and de-risk the development of complex technologies such as GSM, we have for many years invested in developing a series of reference designs embodying the core technology. We now offer reference designs for a range of PC Card products and the core platform for feature-rich GSM/GPRS handsets and multi-media terminals.

### **Technology Platform**

The design provides multi-band GSM/GPRS Class B up to Multi-slot Class 12, providing up to 53.6kbps throughput.

The baseband employs Analog Devices' SoftFone™ family. A number of architecture variants are available to suit the feature-set required. The radio is Plextek's proven RF design based on the Hitachi Bright™ family of direct-conversion (Zero-IF) architectures.

The GSM/GPRS protocol stack is provided by TTPCom Ltd and together we can develop the MMI and application software or assist our customers to develop this in-house.

According to customer requirements our handset designs can incorporate:

- Bluetooth sub-system for peripherals connection
- GPS sub-system
- Camera
- Polyphonic audio
- USB interface
- IrDA optical interface
- 802.11 WLAN sub-system
- Handset MMI
- Drivers and Windows-based applications for PC and PDA hosts



Plextek's Marvel range of PC Cards

### Potential Applications

Our GSM/GPRS technology has been embodied in a wide range of products covering handsets, PC/PDA modems and bespoke items addressing such applications as:

- voice and multi-media
- location and mapping
- security monitoring
- telemetry
- e-cash and purchasing

Specifically, we have developed a range of PC Card modems that are also available under design licence.

The latest in this range is our "Red Marvel" which provides concurrent operation of GPRS, GSM voice, and IEEE802.11b Wireless LAN, targeting the overlay of Cellular and WLAN network deployments.

With the increasing requirement for E-911 location and other personnel location/tracking applications, we are also now integrating our GSM technology with GPS or Assisted GPS sub-systems within hand-held products.

### Production Support

Plextek's comprehensive product design packages can be accompanied by bespoke production test suites, to enable rapid transfer to volume production. These systems provide all the calibration and test required for volume manufacture of today's complex GSM/GPRS-based products. We have developed extensive custom libraries which operate on National Instrument's "Test Stand" Executive and interface with test equipment from Agilent and Rohde & Schwarz.

### Product Certification

Plextek can manage the process of product qualification, in conjunction with appropriate test laboratories.

For GSM this can encompass GERAN 51.010, GCF CCV3.5.0 and PTCRB 2.3.0, and operator network trials.

In addition we support Bluetooth, IEEE802.11 WiFi Compliance, IrDA and USB Certification.

### Terminal Specifications

The following illustrates the typical feature-set of a Handset employing our reference design.

#### Feature-set

- Feature-rich MMI and applications support
- Polyphonic audio synthesis (up to 48kHz)
- High power stereo output
- Hands-free operation
- IrDA optical interface up to 4Mbps
- USB interface
- Colour camera
- TFT Display
- Bluetooth headset and hands-free support

#### GSM Class and Performance

- Variants for :
  - Dual Band: GSM1800/1900MHz

- Tri-band: (850/1800/1900MHz) or (900/1800/1900MHz)

- EGSM900 Power class 4(2W)
- GSM1800/1900 Power class 1(1W)
- GPRS Class B (simultaneous registration on GPRS and GSM but single-mode operation at any one time)
- Multi-slot Type 1 Class 12 (up to 4 Tx or 4 Rx slots per frame; max. 5 slots per frame)
- Data rates up to 53.6kb/s (GPRS), 14.4kb/s (circuit switched)
- GSM Phase 2+ voice, SMS and circuit switched data (TDS and NTDS)
- Full Rate, Enhanced Full Rate (EFR), Half Rate, and Adaptive Multi-rate voice codecs

- GPRS session management: NSAPI-7 connections, V.24bis and TCP/IP header compression
- -107dBm receiver sensitivity
- GSM/GPRS SIM and PIN security

#### Bluetooth Sub-system

- Class 2
- Maximum output power 0dBm
- Minimum sensitivity -80dBm

#### Interfaces

- IrDA
- USB
- Audio jack socket
- Bluetooth
- RF auxiliary connection for test 3 Volt SIM.

For further information, please contact the Marketing Department:  
Telephone: +44 (0)1799 533200  
Email: info@plextek.co.uk



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