

AN EMBEDDED PLATFORM FOR SEAMLESS WIRELESS COMMUNICATIONS

→ i_OBU



i_OBU – Internet Onboard Unit

Universal Mobile Data Access becomes an important feature of electronic systems. People wish to communicate outside of homes and offices, and machines become connected to the communications infrastructure, like the Internet, known as M2M (Machine-to-Machine) communications.

Beside fixed access technologies (DSL, TV cable, or fiber optics), wireless access technologies are rapidly growing. The advantage of wireless access is the inherent feature of portability or even mobility support.

To connect nomadic users or portable equipment to the fixed infrastructure, different wireless access technologies are used. There are short range technologies, as Wireless LAN, or even DECT and Bluetooth, fixed wireless access technologies, as WiMAX or proprietary Wireless Local Loop systems, and finally mobile radio systems, as GSM, CDMAone, or even 3G systems, as UMTS and its high speed extensions HSxPA.

The rapidly changing world of telecommunications and IT requires a high degree of flexibility of these devices. New radio technologies and modules as well as different sensors should be easily supported – ideally in a Plug & Play manner. This requirement of flexibility also plays an important role if integration of these access devices together with the mobile equipment (e.g. different embedded systems) is required.

IMST has developed a flexible software framework for embedded devices supporting seamless wireless communications.

A reference implementation is available on an automotive enabled embedded system from BMC Messsysteme GmbH (i_OBU automotive). This framework can be easily ported to different embedded platforms. It can be adopted for solution in different markets, like telecommunications and IT, automation technology, automotive technology, and medical technology.

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→ SOFTWARE FEATURES**Radio Access Networks**

2G/3G GPRS/UMTS/HSDPA
IEEE 802.11a/b/g WLAN
(simultaneous client and AP)
IEEE 802.16 WiMAX*

Routing

NAT
DHCP
DNS relay
Roaming between access networks

Profiles

Fastest data connection
Cheapest data connection
Securest data connection
Data connection with highest availability
Black and white list of service providers

Security

WEP, WPA (TKIP, AES)
Support of different EAP (802.1x) for flexible authentication (PSK, PEAP, TTLS, EAP-SIM*)
VPN (IPsec, PPTP)

Logging

Logging into files and over-the-air
Location based logging (GPS optional)
syslog*

Management

Web based
SMS
SNMP*

Other features

NTP client
Integration of Bluetooth framework*
Support of positioning using radio*
SIP support*
Java based plug-ins for embedded applications*

Extensibility

Support of new radio technologies and modules as well as different sensors
Plug & Play

→ HARDWARE FEATURES**Generic**

Power supply: Input 10...36 V DC, typical 10 W without additional consumer loads, max. 25 W, galvanic isolated with DC/DC converter
Fuse: 2 A multi fuse
Housing: Aluminum housing
Mechanical dimensions: 220 x 116 x 44 mm³
CE certification: EN 61000-6-1, EN 61000-6-3, EN 61010-1
Max. allowable potentials: 60 V DC acc. VDE, max. 1 kV ESD on open circuits
ElektroG // ear-Registration: RoHS and WEEE conform WEEE-Reg.-Nr. DE75472248
Temperature range (controlled): -20 °C...75 °C (working temperature)
Humidity: 0...90 % (not condensing)
Optional modules (internal): WLAN card, CF up to 2 GB; GSM/UMTS/HSDPA module*
Optional modules (external): GSM/UMTS/HSDPA module, AC-supply

PC board

CPU-Module: ETX PC-Module (factory mounted)
PC-Interfaces: LAN, 2x USB external, 2x RS232 (COM2 internal); 2x IDE, PS2, VGA
Memory: RAM 256 MB, CF internal on IDE
Plug in interfaces: 1x Mini PCI

Carrier board

External interfaces: LAN (Twisted-Pair or LEMO compatible plug socket), 2x USB, 1x RS232, PS2, VGA
Internal interfaces: battery, COM2
Digital outputs: 2x digital out: optoelectronic coupler with semiconductor switch, 10...36 V DC, max. 0.5 A DC

Microcontroller

LED: 3 LED for status indication
Microcontroller functions: Voltage/temperature control with indication during switch-on of PC, on/off control, integrated fan control
Interface to PC board: 1x RS232 (COM2: 8 bit, no parity, 1 stop bit, baud rate 38.4 kB, no hand shaking) and I/O-circuits

* Feature under development