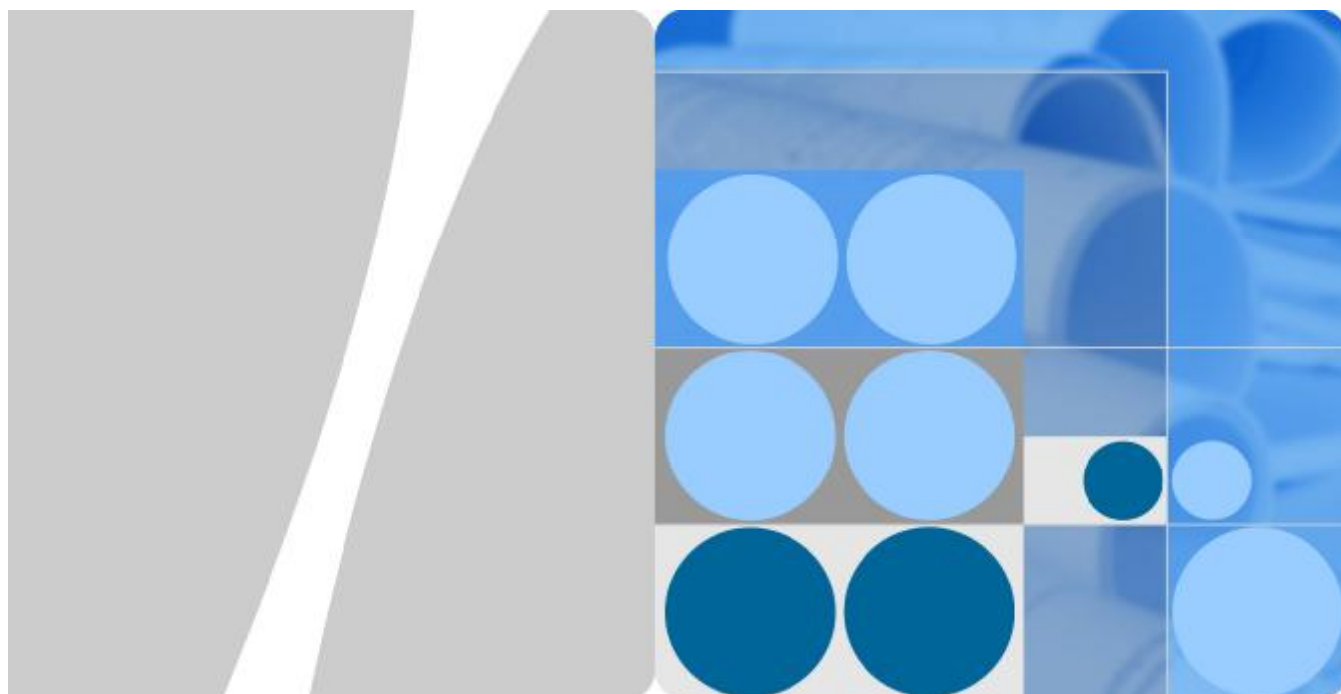


Product Specification



HUAWEI EM770 HSPA Embedded PC Module
V100R001

Issue 02
Date 2008-07-18

HUAWEI TECHNOLOGIES CO., LTD.



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Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: <http://www.huawei.com>

Email: support@huawei.com

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About This Document

Author

Prepared by	Tan Xiao An	Date	2008-07-18
Reviewed by	Xie Cong Long	Date	2008-07-21
Approved by	He Jin Jun	Date	2008-07-25

Summary

This document provides information about the major functions, supported services, system architecture, and technical references of HUAWEI EM770 HSPA Embedded PC Module (hereinafter referred to as the EM770).

The following table lists the contents of this document.

Chapter	Describes
1 Overview	The supported network modes, basic services and functions, and the appearance of the EM770.
2 Features	The supported features and technical specifications of the EM770.
3 Services and Applications	The services and applications of the EM770.
4 System Architecture	The architecture of the EM770.
5 Technical Reference	The technical references of the EM770.
6 Packing List	The items contained in the package of the EM770.
A Acronyms and Abbreviations	The acronyms and abbreviations mentioned in this document.

History

Issue	Details	Date	Author	Approved by
01	Initial draft completed.	2008-03-20	Tan Xiao An 43652	XieConglong
02	Add some technical specification description	2008-07-18	Tan Xiao An 43652	XieConglong

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1 Overview

HUAWEI EM770 HSPA PC Embedded Module (hereinafter referred to as the EM770) is a high-speed packet access (HSPA) WWAN PC module. It is a multi-mode wireless terminal for business professionals.

The EM770 supports the following standards:

- | High speed uplink packet access (HSUPA)
- | High speed downlink packet access (HSDPA)
- | Universal Mobile Telecommunications System (UMTS)
- | Enhanced data rates for global evolution (EDGE)
- | General packet radio service (GPRS)
- | Global system for mobile communications (GSM)

The EM770 provides the following services:

- | HSUPA/HSDPA/UMTS packet data service
- | EDGE/GPRS packet data service
- | WCDMA/GSM Short Message Service (SMS)
- | WCDMA/GSM voice service

You can connect the EM770 with the Mini PCI Express interface of a computer. In the service area of the HSUPA/HSDPA/UMTS/EDGE/GPRS/GSM network, you can surf the Internet and send/receive messages/emails cordlessly. The EM770 is fast, reliable, and easy to operate. Thus, mobile users can experience many new features and services with the EM770. These features and services will enable a large number of users to use the EM770 and the average revenue per user (ARPU) of operators will increase substantially.

Figure 1-1 shows the profile of the EM770.

Figure 1-1 EM770 profile



2 Features

2.1 Main Features

The EM770 mainly supports the following features:

- | HSUPA/HSDPA/UMTS 2100/1900/850 MHz, GSM/GPRS/EDGE 850/900/1800/1900 MHz
- | HSPA Equalizer and receive diversity
- | HSUPA data service of up to 2 Mbps (can be upgraded to 5.76 Mbit/s)
- | HSDPA data service of up to 7.2 Mbps
- | UMTS PS domain data service of up to 384 kbps
- | EDGE packet data service of up to 236.8 kbps
- | GPRS packet data service of up to 85.6 kbps
- | CS domain data service based on UMTS and GSM
- | SMS based on CS/PS domain of GSM and WCDMA
- | WCDMA/GSM voice service
- | USSD
- | EAP-SIM
- | Personal computer/Smart card (PC/SC) Driver
- | USB Extension Cable, easy to connect
- | Mini PCI Express interface
- | Windows 2000/ Windows XP/ Windows Vista/ Linux 2.6.18 or above

2.2 Technical specifications

2.2.1 Hardware

Table 2-1 lists the hardware specifications.

Table 2-1 Hardware specifications

Item	Specifications
Technical standard	<ul style="list-style-type: none"> ▮ WCDMA/HSDPA R5 ▮ GSM/GPRS/EDGE R99
Operating frequency	<p>HSDPA/UMTS 2100 MHz:</p> <ul style="list-style-type: none"> ▮ Uplink: 1920–1980 MHz ▮ Downlink: 2110–2170 MHz <p>HSDPA/UMTS 1900 MHz:</p> <ul style="list-style-type: none"> ▮ Uplink: 1850~1910 MHz ▮ Downlink: 1930~1990 MHz <p>HSDPA/UMTS 850 MHz:</p> <ul style="list-style-type: none"> ▮ Uplink: 824~849 MHz ▮ Downlink: 869~894 MHz <p>EDGE/GPRS/GSM 1900 MHz:</p> <ul style="list-style-type: none"> ▮ Uplink: 1850–1910 MHz ▮ Downlink: 1930–1990 MHz <p>EDGE/GPRS/GSM 1800 MHz:</p> <ul style="list-style-type: none"> ▮ Uplink: 1710–1785 MHz ▮ Downlink: 1805–1880 MHz <p>EDGE/GPRS/GSM 900 MHz:</p> <ul style="list-style-type: none"> ▮ Uplink: 880–915 MHz ▮ Downlink: 925–960 MHz <p>EDGE/GPRS/GSM 850 MHz:</p> <ul style="list-style-type: none"> ▮ Uplink: 824–849 MHz ▮ Downlink: 869–894 MHz
External interfaces	Mini PCI Express interface: supporting PCI Express Mini Card Specification 1.2
	Antenna interface: Hirose U.FL-R-SMT
Maximum transmitter power	HSUPA/HSDPA/UMTS 850/1900/2100 MHz: +24dBm (Power Class 3)
	GSM/GPRS 850/900 MHz: +33 dBm (Power Class 4)
	GSM/GPRS 1800 MHz/1900 MHz: +30 dBm (Power Class 1)

Item	Specifications
	EDGE 850/900MHz: +27 dBm (Power Class E2)
	EDGE 1800MHz/1900MHz: +26 dBm (Power Class E2)
Static receiver sensitivity	HSUPA/HSDPA/UMTS 850/1900/2100 MHz: compliant with 3GPP TS 25.101 (R5)
	EDGE/GPRS/GSM 850/900/1800/1900 MHz: compliant with 3GPP TS 05.05 (R99)
Maximum power consumption	≤ 2.5 W
Power supply	3.3 V/1100 mA
Dimensions (D × W × H)	51 mm × 30 mm × 5 mm
Weight	<40g
Temperature	<ul style="list-style-type: none"> ▮ Operating: -10°C to +65°C ▮ Storage: -20°C to +70°C
Humidity	5% to 95%
Notes: 3GPP = The 3rd Generation Partnership Project EGPRS = enhanced GPRS MSC = mobile switching center TS = technical specification	

The EM770 physical connections and signal levels will follow PCI Express Mini CEM specification. Device representation and operation follows USB v2.0 specifications.

Table2-2 lists the Mini PCI Express connector PIN out of the EM770

Table 2-2 Mini PCI Express PIN Define

Huawei EM770 Mini PCI Express PIN Define			
PIN #	Mini PCI standard description	HUAWEI pin description	Additional Description
1	WAKE#	NC	No Connect
2	3.3Vaux	VCC_3V3	3.3V DC supply rail from the PC side.
3	COEX1	NC	No Connect
4	GND	GND	Mini Card ground.
5	COEX2	NC	No Connect.
6	1.5V	NC	No Connect
7	CLKREQ#	Pull up	Pull up
8	UIM_PWR	UIM_PWR	Power source for external UIM/SIM.

9	GND	GND	Mini Card ground.
10	UIM_DATA	UIM_DATA	External UIM/SIM data signal.
11	REFCLK-	NC	No Connect
12	UIM_CLK	UIM_CLK	External UIM/SIM clock signal.
13	REFCLK+	NC	No Connect
14	UIM_RESET	UIM_RESET	External UIM/SIM reset signal.
15	GND	GND	Mini Card ground.
16	UIM_Vpp	NC	No Connect
17	Reserved	NC	No Connect
18	GND	GND	Mini Card ground.
19	Reserved	NC	No Connect
20	W_DISABLE#	W_DISABLE_N	For close wireless communications
21	GND	GND	Mini Card ground.
22	PERST#	PERST#	Force a hardware reset on the card.
23	PERn0	NC	No Connect
24	3.3Vaux	NC	No Connect
25	PERp0	NC	No Connect
26	GND	GND	Mini Card ground.
27	GND	GND	Mini Card ground.
28	1.5V	NC	No Connect
29	GND	GND	Mini Card ground.
30	SMB_CLK	NC	No Connect
31	PETn0	NC	No Connect
32	SMB_DATA	NC	No Connect
33	PETp0	NC	No Connect
34	GND	GND	Mini Card ground.
35	GND	GND	Mini Card ground.
36	USB_D-	USB_D-	USB signal D-.
37	GND	GND	GND
38	USB_D+	USB_D+	USB signal D+.
39	3.3Vaux	3.3Vaux	3.3V DC supply rail from the PC side.
40	CPUSB#	NC	No Connect
41	3.3Vaux	3.3Vaux	3.3V DC supply rail from the PC side.
42	LED_WWAN#	LED_WWAN	Active-low LED signal for indicating the state of the card.
43	GND	GND	GND
44	LED_WLAN#	NC	No Connect.
45	Reserved	NC	No Connect.
46	LED_WPAN#	NC	No Connect.
47	Reserved	NC	No Connect.
48	1.5V	NC	No Connect
49	Reserved	NC	No Connect
50	GND	GND	Mini Card Ground
51	Reserved	NC	No Connect
52	3.3Vaux	VCC_3V3	3.3V DC supply rail from the PC side.

2.2.2 RF specifications

Table 2-3 EM770 conducted Rx sensitivity and Tx power

GSM850				
Channel	128	192	251	
Transmitter power	32.1	32.0	32.3	dBm
Receiving sensitivity	-108	-108	-109	dBm
GSM900				
Channel	62	124	975	
Transmitter power	32.3	32.1	31.9	dBm
Receiving sensitivity	-109	-109	-109	dBm
GSM1800				
Channel	512	698	885	
Transmitter power	29.1	29.0	29.2	dBm
Receiving sensitivity	-109	-109	-109	dBm
GSM1900				
Channel	512	698	810	
Transmitter power	29.1	29.3	29.2	dBm
Receiving sensitivity	-108	-109	-109	dBm
WCDMA850				
Channel	4132	4183	4233	
Transmitter power	22.1	22.2	22.2	dBm
Receiving sensitivity	-110	-110	-110	dBm
WCDMA1900				
Channel	9262	9400	9538	
Transmitter power	21.6	21.7	21.3	dBm
Receiving sensitivity	-110	-110	-110	dBm
WCDMA2100				
Channel	9612	9750	9888	
Transmitter power	21.6	21.4	21.5	dBm
Receiving sensitivity	-110	-110	-110	dBm

2.2.3 Power supply and consumption

The EM770 complies with PCI express Mini CEM specifications v1.2. This means, only one 3.3Vaux power rail is used. All 3.3V and 3.3Vaux power pins are internally connected.

PCI express Mini CEM specifications define as the Table 2-4.

Table 2-4 Power requirements

Power	Voltage Tolerance	Peak (max)	Normal(max)
3.3V	±9%	2750mA	1100mA

Notes:

- The host power must be capable of sourcing enough current to accommodate the max power in case of burst transmits by the module. This can be done by adding a large bulk capacitor on the power input on the host side.
- To improve RF performance, and to minimize radiation through the power lines, ceramic capacitors of 10pF, 27pF and 100nF to the ground should be placed close to the PCI Express mini card connector on the host side.

The power consumption of EM770 in different scenario is described as Table2-5, Table2-6 and Table2-7.

Table 2-5 HSPA/WCDMA talk/data DC power consumption

Description	Band	Typ	Max	Units	Power(dBm)
WCDMA	Band I(IMT2100)	260	--	mA	1dBm Tx Power
		391	--		10dBm Tx Power
		602	--		24dBm Tx Power
	Band II (PCS 1900)	260	--	mA	1dBm Tx Power
		370	--		10dBm Tx Power
		578	--		24dBm Tx Power
	Band V (850M)	267	--	mA	1dBm Tx Power
		367	--		10dBm Tx Power
		575	--		24dBm Tx Power
HSPA	Band I(IMT2100)	323	--	mA	1dBm Tx Power
		453	--		10dBm Tx Power
		632	--		24dBm Tx Power
	Band II	322	--	mA	1dBm Tx Power

	(PCS 1900)	423	--		10dBm Tx Power
		605	--		24dBm Tx Power
	Band V	330	--	mA	1dBm Tx Power
	(850M)	435	--		10dBm Tx Power
		607	--		24dBm Tx Power

Table 2-6 GSM/GPRS/EDGE talk/data DC power consumption

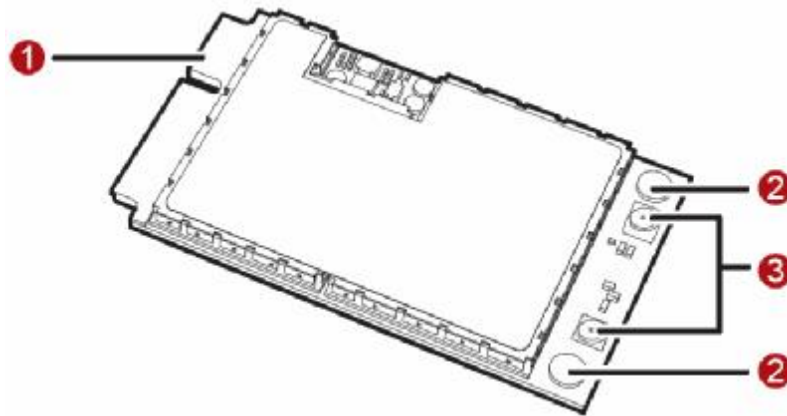
Description	Typ	Max	Units	PCL	
Quad GSM	410	--	mA	5	1 RX/1 TX Slot
	563	--			2 RX/1 TX Slot
	651	--			4 RX/2 TX Slot
Quad GSM	226	--	mA	11	1 RX/1 TX Slot
	320	--			2 RX/1 TX Slot
	453	--			4 RX/2 TX Slot
	203	--	mA	13	1 RX/1 TX Slot
	269	--			2 RX/1 TX Slot
	372	--			4 RX/2 TX Slot
	180	--	mA	19	1 RX/1 TX Slot
	230	--			2 RX/1 TX Slot
	275	--			4 RX/2 TX Slot

Table 2-7 RF disable and Module operational mode power consumption

Power	Normal current
3.3V	110mA

2.2.4 Mechanical specification

The appearance of the EM770



① Mini PCI Express connector

It is used to connect the EM770 to the WWAN Mini PCI Express interface of the PC.

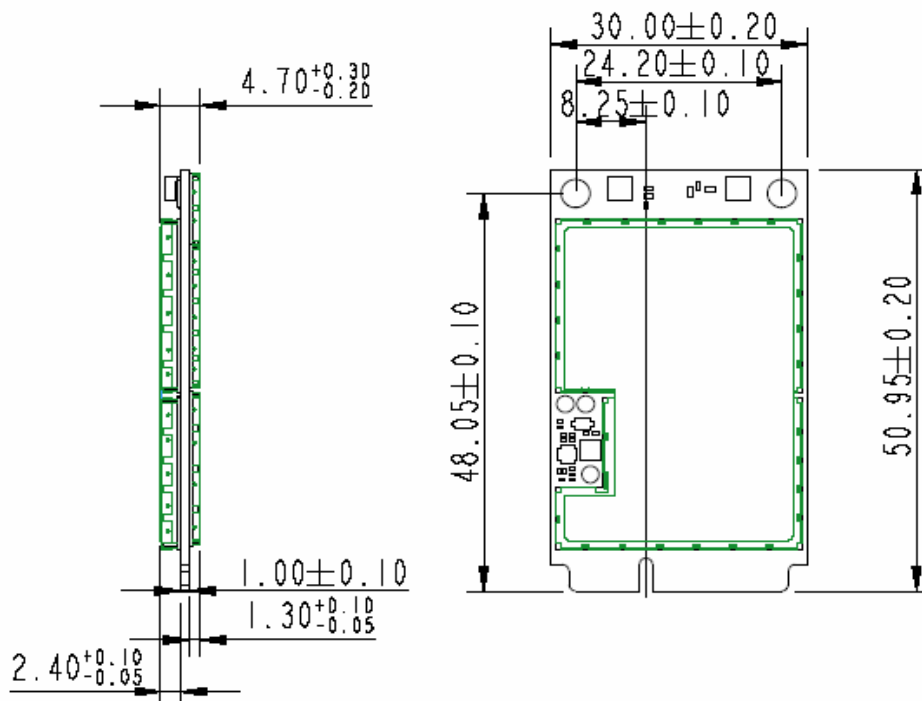
② Screw holes

They are used to fix the EM770 on the main board of the PC with screws.

③ Antenna interfaces

They are used to connect antennas. The connector with M remark is for main antenna, and the connector with A remark is for Aux antenna.

Dimension view of EM770



2.2.5 Reliability

Table 2-8 Operation temperatures

Test case			Standard	Parameters
Temperature	Operational	High	DKBA 1529-2006.12	T=65°C t=72h
Temperature	Operational	Low	DKBA 1529-2006.12	T=-10°C t=72h

Table 2-9 Storage temperatures

Test case			Standard	Parameters
Temperature	Non Operational	High	DKBA 1529-2006.12	T=70°C t=72h
Temperature	Non Operational	Low	DKBA 1529-2006.12	T=-30°C t=72h
Temperature	Non Operational	High/Humidity	DKBA 1529-2006.12	T=65°C to 25°C RH=95% t=72h
Temperature	Non Operational	Shock	DKBA 1529-2006.12	-40°C to +70°C. the holding time is 1h, transform time < 20s, the cycle times is 24
Vibration	Non Operational	Random	DKBA 1530-2006.12	Acceleration=0.04g 20Hz to 2000Hz t=1h
Vibration	Non Operational	Shock	DKBA 1530-2006.12	Acceleration=0.04g

			TIA/EIA 603 3.3.5 GB/T15844.2 4.1	t=11ms Semi sine Wave N=18 times
Vibration	Non Operational	Sine	DKBA 1530-2006.12 TIA/EIA 603	Amp=0.38mm 10Hz to 30Hz T=5min Amp=0.19mm 30Hz to 60Hz T=5min
Salt-fog	Non Operational	/	DKBA 1530-2006.12 RD 45.194-02 GOST16019-01	35°C, 5% salt-fog, the holding time is 8h, then 16 hours airing
Insert	Non Operational	/	DKBA 1530-2006.12	Repeat insert and pull out the data card N=50 times

2.2.6 Dashboard

Table 2-10 lists the dashboard specifications.

Table 2-10 Dashboard specifications

Item	Description
SMS	Writing/Sending/Receiving
	Sending/Receiving extra-long messages
	Group sending

Item	Description
	<p>Storage: The messages are saved in the hard disk of the PC.</p> <p>Sorting</p> <p>Importing: You can import messages from the SIM/USIM card to a laptop.</p> <p>New message prompt (visual prompt/audio prompt)</p>
Flow display and statistics (data services)	<p>Current connection:</p> <ul style="list-style-type: none"> ▮ Duration ▮ Send/Receive flow ▮ Send/Receive rate <p>Traffic statistics: You can view the traffic information of the day, the month, or the year.</p>
Phonebook	<p>Capacity: It depends on the SIM/USIM card capacity or the hard disk space.</p> <p>Messages can be sent from the phonebook.</p> <p>Importing/Exporting: Import/Export contacts between the SIM/USIM card and a laptop or a file of supported formats.</p>
Network connection setup	<ul style="list-style-type: none"> ▮ APN management: create, delete, edit, import, and export. ▮ Set up network connection.
Software installation	CDROM installation
Other	<p>Network connection settings:</p> <ul style="list-style-type: none"> ▮ Automatic network selection and registration ▮ Manual network selection and registration <p>Network status display: signal, operator name, system mode, and so on.</p> <p>Selection of network connection types, for example:</p> <ul style="list-style-type: none"> ▮ 3G preferred ▮ GPRS preferred <p>PIN management: activate/deactivate PIN, PIN lock, changing PIN, unblocking by using the PUK.</p>
System requirement	<ul style="list-style-type: none"> ▮ Windows 2000 SP4, Windows XP SP2, Windows Vista and Linux 2.6.18 or above ▮ Your computer's hardware system should meet or exceed the recommended system requirements for the installed version of OS ▮ Display resolution: 800 × 600 or above



Item	Description
<p>Notes: CPU = central processing unit PIN = personal identification number PUK = PIN unblocking key</p>	

3 Services and Applications

3.1 Packet Data Service

The EM770 supports the PS domain data service based on HSDPA/UMTS /EDGE/GPRS

After you connect the EM770 to a PC with Mini PCI Express interface, the EM770 driver and the client software are installed on the PC. You can configure APN through the EM770 application (or directly use the default settings) and set up a network connection. Then you can send or receive E-mail, access the network through wireless connection, and download files through wireless data channels.

To use the data service, perform the following steps:

1. Enter ***99#** or ***98#** to launch the packet data service.
2. In the **Choose Connection Type** dropdown box, choose a network type, for example: 3G preferred, GPRS preferred.

3.2 SMS

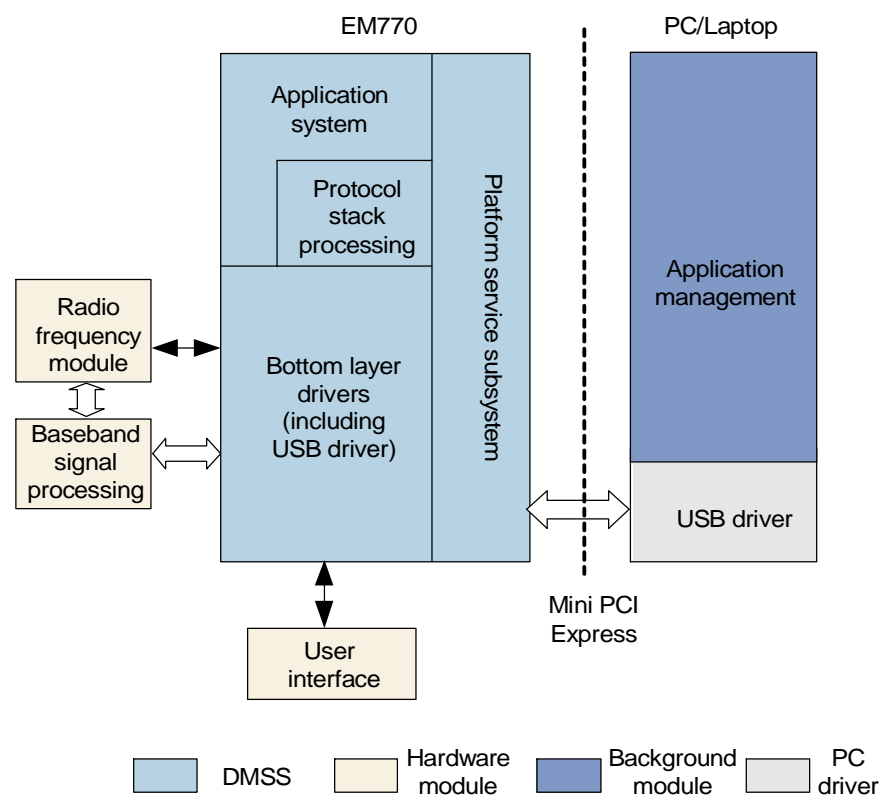
The EM770 supports message writing/sending/receiving and group sending (up to 20 contacts at a time). You can manage messages through the dashboard, such as sorting the messages by telephone number or time. You can also import/export messages between the SIM/USIM card and a laptop.

4 System Architecture

4.1 System Architecture

Figure 4-1 shows the system architecture.

Figure 4-1 System architecture



4.2 Functional Modules

Radio Frequency Module

It sends/receives radio signals and modulates/demodulates the radio frequency (RF) signals and baseband signals.

Baseband Signal Processing

It processes HSDPA/UMTS/EDGE/GPRS/GSM baseband digital signals, including:

- | Modulating/Demodulating HSDPA/UMTS baseband signals
- | Modulating/Demodulating EDGE/GPRS/GSM baseband signals
- | Encoding/Decoding HSDPA/UMTS channel
- | Encoding/Decoding EDGE/GPRS/GSM channel

Bottom Layer Driver

It drives peripherals, including USB, LED, and SIM/USIM.

Platform Service Subsystem

It initializes programs, diagnoses the running of the system, downloads data and serves as a watchdog.

Protocol Stack System

It processes protocols of HSDPA/UMTS/EDGE/GPRS/GSM.

Application System

It sends laptop commands to the bottom layer protocol for processing and returns the value to the laptop.

Existing applications include the following:

- | Call management
- | Message management
- | CS/PS domain service management

User Interface

It provides interfaces to connect peripherals. Interfaces are for LED and SIM/USIM.

Application Management

Through the application window, you can set the parameters of the EM770 and operate the EM770.

5 Technical Reference

5.1 Layer 1 Specifications (Physical)

- | Examples of Channel Coding and Multiplexing TR 25.944
- | Physical Layer–General Description TS 25.201
- | Physical Channels and Mapping of Transport Channels onto Physical Channels (FDD) TS 25.211
- | Multiplexing and Channel Coding (FDD) TS 25.212
- | Spreading and Modulation (FDD) TS 25.213
- | Physical Layer–Procedures (FDD) TS 25.214
- | Physical Layer–Measurements (FDD) TS 25.215
- | 3GPP HSDPA overall description 25.308
- | 3GPP UE radio access capabilities 25.306

5.2 Layer 2 Specifications (MAC/RLC)

- | MAC Protocol Specification TS 25.321
- | RLC Protocol Specification TS 25.322

5.3 Layer 3 Specifications (RRC)

- | UE Interlayer Procedures in Connected Mode TS 25.303
- | UE Procedures in Idle Mode TS 25.304
- | RRC Protocol Specification TS 25.331

5.4 Layer 3 NAS/Core Network (MM/CM)

- | Architectural Requirements for Release 1999 TS 23.121
- | NAS Functions Related to Mobile Station (MS) in Idle Mode TS 23.122
- | Mobile Radio Interface Signaling Layer 3–General Aspects TS 24.007

- | Mobile Radio Interface Layer 3 Specification–Core Network TS 24.008
- | PP SMS Support on Mobile Radio Interface TS24.011

5.5 GSM Protocol Specifications

- | Mobile Radio Interface Layer 3 Specification, Radio Resource Control Protocol TS 04.18
- | Mobile Station–Base Station System (MS–BSS) interface; Data Link (DL) Layer Specification TS 04.06
- | Digital Cellular Telecommunications System (Phase 2+); Multiplexing and Multiple Access on the Radio Path TS 05.02
- | Technical Specification Group GERAN; Channel coding TS 05.03
- | Digital Cellular Telecommunications System (Phase 2+); Radio Subsystem Link Control TS 05.08
- | Digital Cellular Telecommunications System (Phase 2+); Radio Subsystem Synchronization TS 05.10

5.6 GPRS Protocol Specifications

- | Overall Description of the GPRS Radio Interface; stage 2 TS 3.64
- | Mobile Radio Interface Layer 3 Specification TS 04.08
- | Mobile Radio Interface Layer 3 Specification: Radio Resource Control Protocol TS 04.18
- | General Packet Radio Service (GPRS): Mobile Station (MS)–Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol TS 04.60
- | Mobile Station–Serving GPRS Support Node (MS–SGSN) Logical Link Control (LLC) Layer Specification TS 04.64
- | Mobile Station–Serving GPRS Support Node (MS–SGSN); Subnetwork Dependent Convergence Protocol (SNDP) TS 04.65
- | Multiplexing and Multiple Access on the Radio Path TS 05.02
- | Channel Coding TS 05.03
- | Modulation TS 05.04
- | Radio Transmission and Reception TS 05.05
- | General Packet Radio Service (GPRS); Stage 1 TS 22.060
- | Mobile Execution Environment (MexE) TS 23.057
- | General Packet Radio Service (GPRS) Service description; stage 2 TS 23.060

5.7 General Specifications

- | UE Capability Requirements TR 21.904
- | UE Radio Access Capabilities TR 25.926
- | Vocabulary TR 25.990

- | Radio Interface Protocol Architecture TS 25.301
- | Services Provided by the Physical Layer TS 25.302
- | Synchronization in UTRAN Stage 2 TS 25.402

5.8 Performance/Test Specifications

- | UE Radio Transmission and Reception (FDD) TS 25.101
- | Common Test Environments for User Equipment (UE) TS 34.108
- | Special Conformance Testing Functions TS 34.109
- | Terminal Conformance Specification TS 34.121
- | User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance TS 34.123-1
- | User Equipment (UE) Conformance Specification; Part 2: Protocol Conformance TS 34.123-2

5.9 SIM Specifications

- | SIM and IC Card Requirements TS 21.111
- | 3rd Gen. Partnership Proj Tech. Spec. Group Terminals; SIM App. Toolkit (USAT) TS 31.111

6 Packing List

This chapter describes the items contained in the package of the EM770.

Table 6-1 lists the items contained in the package of the EM770.

Table 6-1 Packing list of the EM770

Item	Quantity	Remarks
HUAWEI EM770 HSPA PC Embedded Module	1	Standard

A Acronyms and Abbreviations

3G	The Third Generation
3GPP	3rd Generation Partnership Project
APN	Access Point Name
ARPU	Average Revenue Per User
BSS	Base Station Subsystem
CM	Connection Management
CPU	Central Processing Unit
CS domain	Circuit Switched domain
DTM	Digital Trunk Module
EDGE	Enhanced Data Rates for GSM Evolution
EGPRS	Enhanced GPRS
FDD	Frequency Division Duplex
GERAN	GSM/EDGE Radio Access Network
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HSDPA	High Speed Downlink Packet Access
IC	Integrated Circuit
LED	Light Emitting Diode
MAC	Medium Access Control
MexE	Mobile Execution Environment
Mini PCI Express	Mini Peripheral Component Interconnect Express
MM	Mobility Management
Modem	Modulator Demodulator
MS	Mobile Station

MSC	Mobile Switching Center
NAS	Non-Access Stratum
OS	Operating System
PC/SC	Personal Computer/Smart Card
PIN	Personal Identification Number
PnP	Plug and Play
PP	Point-to-Point
PS domain	Packet Switched domain
PUK	PIN Unblocking Key
RF	Radio Frequency
RLC	Radio Link Control
RRC	Radio Resource Control
SGSN	Serving GPRS Support Node
SIM	Subscriber Identity Module
SMS	Short Messaging Service
SNDCP	Subnetwork Dependent Convergence Protocol
TR	Technical Report
TS	Technical Specification
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
USAT	USIM Application Toolkit
USB	Universal Serial Bus
USIM	UMTS Subscriber Identity Module
UTRAN	UMTS Terrestrial Radio Access Network
WCDMA	Wideband Code Division Multiple Access
WWAN	Wireless Wide Area Network