

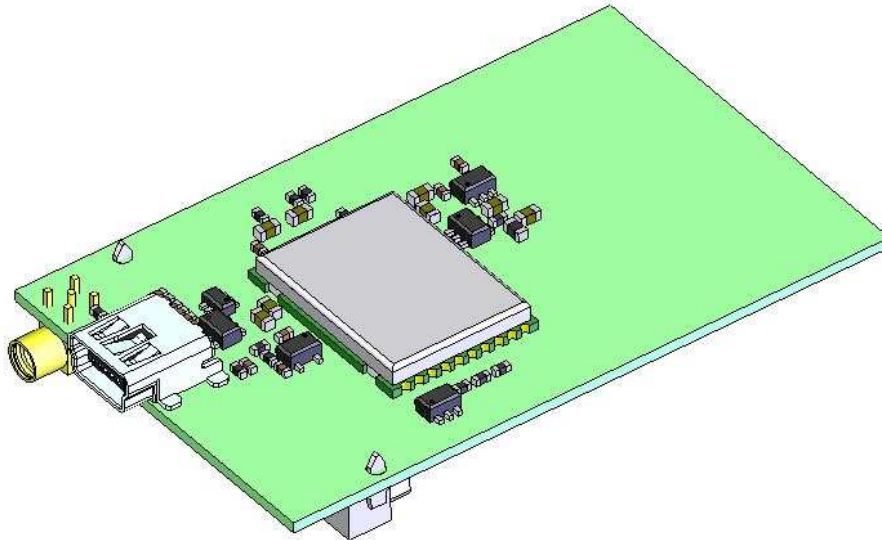
# Plug and Play Fastrack Supreme Wireless CPU®

## IESM-GPS+USB User Guide

Reference: WA\_DEV\_Fastrk\_UGD\_002

Revision: 001

Date: 27 February, 2007



## Document History

Revision	Date	List of revisions	
001	12 February, 07	First Issue	

Preliminary

## Overview

The Internal Expansion Socket Module (IESM) is a Plug & Play device to expand the functionality of a standard Fastrack Supreme 10 and Fastrack Supreme 20 into a state of the art GPS + USB device for machine to machine applications.

With the IESM it is possible to utilize the Internal Expansion Socket (IES) which opens wide applications for Fastrack Supreme 10 and Fastrack Supreme 20 by simply plugging in.

Fastrack Supreme with IESM-GPS+USB plugged-in may utilize one or more Open AT Plug-Ins of the powerful open AT<sup>®</sup> software suite. Open AT<sup>®</sup> is the world's most comprehensive cellular development environment, which allows embedded standard ANSI C applications to be natively executed directly on the Wireless CPU<sup>®</sup>.

Topics covered by this document;

- General description
- Functional description
- Basic services available
- Technical characteristics
- Installing and using the IESM-GPS+USB
- User-level troubleshooting
- Recommended accessories to be used with the product

### **Note:**

This document covers the IESM-GPS+USB Plug & Play alone and does not include;

- The programmable capabilities provided via the use of Open AT<sup>®</sup> Software Suites.
- The development guide for IESM for expanding the application feature through the IES interface.

For details, please refer to the documents shown in the "Reference documents" section.

### **RoHS Directive**

The Fastrack Supreme and IESM-GPS+USB are now compliant with RoHS Directive 2002/95/EC, which sets limits for the use of certain restricted hazardous substances. This directive states that "from 1st July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)".

Plug & Plays which are compliant with this directive are identified by the RoHS logo on their label.



### **Disposing of the product**

This electronic product is subject to the EU Directive 2002/96/EC for Waste Electrical and Electronic Equipment (WEEE). As such, this product must not be disposed off at a municipal waste collection point. Please refer to local regulations for directions on how to dispose off this product in an environmental friendly manner.




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## Cautions

Information furnished herein by WAVECOM is accurate and reliable. However, no responsibility is assumed for its use. Please read carefully the safety recommendations given in Chapter 9 for an application based on Fastrack Supreme Plug & Play.

## Trademarks

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## Web Site Support

General information about Wavecom and its range of products:	<a href="http://www.wavecom.com">www.wavecom.com</a>
Specific support is available for the Fastrack Supreme Plug & Play Wireless CPU®:	<a href="http://www.wavecom.com/Fastrack">www.wavecom.com/Fastrack</a> Supreme
Carrier/Operator approvals:	<a href="http://www.wavecom.com/approvals">www.wavecom.com/approvals</a>
Open AT® Introduction:	<a href="http://www.wavecom.com/OpenAT">www.wavecom.com/OpenAT</a>
Developer support for software and hardware:	<a href="http://www.wavecom.com/forum">www.wavecom.com/forum</a>

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# 1 References

## 1.1 Reference Documents

For more details, several reference documents may be consulted. The Wavecom reference documents are provided in the Wavecom documents package contrary to the general reference documents, which are not Wavecom owned.

### 1.1.1 Open AT<sup>®</sup> Software Documentation

- [1] Getting started with Open AT<sup>®</sup> (Ref.WM\_ASW\_OAT\_CTI\_001)
- [2] Open AT<sup>®</sup> Tutorial (Ref.WM\_ASW\_OAT\_UGD\_001)
- [3] Tools Manual (Ref. WM\_ASW\_OAT\_UGD\_003)
- [4] Open AT<sup>®</sup> Basic Development Guide (Ref. WM\_ASW\_OAT\_UGD\_002)
- [5] Open AT<sup>®</sup> ADL guide (Ref. WM\_ASW\_OAT\_UGD\_006)
- [6] Open AT<sup>®</sup> Customer Release Note (Ref. WM\_ASW\_OAT\_DVD\_00062)

### 1.1.2 AT Software Documentation **(TB updated with X.61)**

- [7] AT commands interface Guide for X51 (Ref. WM\_ASW\_OAT\_UGD\_00016)
- [8] Customer Release Note X51 (Ref. WM\_ASW\_OAT\_DVD\_00120)

### 1.1.3 Firmware Upgrade Documents

- [9] Firmware upgrade procedure (Ref. WM\_SW\_GEN\_UGD\_001)

### 1.1.4 Fastrack Supreme Related Documents

- [10] Fastrack Supreme User Guide (Ref. WA\_DEV\_Fastrk\_UGD\_001)

#### **Note:**

New versions of software may be available. Wavecom recommends customers to check the web site for the latest documentation.

## 1.2 Abbreviations

<b>Abbreviation</b>	<b>Definition</b>
<b>AC</b>	<b>A</b> lternating <b>C</b> urrent
<b>ACM</b>	<b>A</b> ccumulated <b>C</b> all <b>M</b> eter
<b>AT</b>	<b>A</b> Ttention (prefix for Wireless CPU <sup>®</sup> commands)
<b>CLK</b>	<b>C</b> Lo <b>C</b> K
<b>CMOS</b>	<b>C</b> omplementary <b>M</b> etal <b>O</b> xide <b>S</b> emiconductor
<b>CS</b>	<b>C</b> oding <b>S</b> cheme
<b>CTS</b>	<b>C</b> lear <b>T</b> o <b>S</b> end
<b>dB</b>	<b>D</b> ecibel
<b>dBc</b>	<b>D</b> ecibel relative to the <b>C</b> arrier power
<b>dB<sub>i</sub></b>	<b>D</b> ecibel relative to an <b>I</b> sotropic radiator
<b>dBm</b>	<b>D</b> ecibel relative to one <b>m</b> illiwatt
<b>DC</b>	<b>D</b> irect <b>C</b> urrent
<b>DCD</b>	<b>D</b> ata <b>C</b> arrier <b>D</b> etect
<b>DCE</b>	<b>D</b> ata <b>C</b> ommunication <b>E</b> quipment
<b>DCS</b>	<b>D</b> igital <b>C</b> ellular <b>S</b> ystem
<b>DSR</b>	<b>D</b> ata <b>S</b> et <b>R</b> eady
<b>DTE</b>	<b>D</b> ata <b>T</b> erminal <b>E</b> quipment
<b>DTMF</b>	<b>D</b> ual <b>T</b> one <b>M</b> ulti- <b>F</b> requency
<b>DTR</b>	<b>D</b> ata <b>T</b> erminal <b>R</b> eady
<b>EEPROM</b>	<b>E</b> lectrically <b>E</b> rasable <b>P</b> rogrammable <b>R</b> ead- <b>O</b> nly <b>M</b> emory
<b>EFR</b>	<b>E</b> nhanced <b>F</b> ull <b>R</b> ate
<b>E-GSM</b>	<b>E</b> xtended <b>G</b> SM
<b>EMC</b>	<b>E</b> lectro <b>M</b> agnetic <b>C</b> ompatibility
<b>EMI</b>	<b>E</b> lectro <b>M</b> agnetic <b>I</b> nterference
<b>ESD</b>	<b>E</b> lectro <b>S</b> tatic <b>D</b> ischarges
<b>ETSI</b>	<b>E</b> uropean <b>T</b> elecommunications <b>S</b> tandards <b>I</b> nstitute
<b>FIT</b>	<b>S</b> eries of <b>c</b> onnectors ( <b>m</b> icro- <b>F</b> IT)
<b>FR</b>	<b>F</b> ull <b>R</b> ate
<b>FTA</b>	<b>F</b> ull <b>T</b> ype <b>A</b> pproval
<b>GCF</b>	<b>G</b> lobal <b>C</b> ertification <b>F</b> orum
<b>GND</b>	<b>G</b> rou <b>N</b> D
<b>GPIO</b>	<b>G</b> eneral <b>P</b> urpose <b>I</b> nput <b>O</b> utput
<b>GPRS</b>	<b>G</b> eneral <b>P</b> acket <b>R</b> adio <b>S</b> ervice

<b>Abbreviation</b>	<b>Definition</b>
<b>GPS</b>	<b>G</b> lobal <b>P</b> ositioning <b>S</b> ystem
<b>GSM</b>	<b>G</b> lobal <b>S</b> ystem for <b>M</b> obile communications
<b>HR</b>	<b>H</b> alf <b>R</b> ate
<b>I</b>	<b>I</b> nput
<b>IEC</b>	<b>I</b> nternational <b>E</b> lectrotechnical <b>C</b> ommission
<b>IES</b>	<b>I</b> nternal <b>E</b> xpansion <b>S</b> ocket
<b>IESM</b>	<b>I</b> nternal <b>E</b> xpansion <b>S</b> ocket <b>M</b> odule
<b>IMEI</b>	<b>I</b> nternational <b>M</b> obile <b>E</b> quipment <b>I</b> dentification
<b>I/O</b>	<b>I</b> nput / <b>O</b> utput
<b>LED</b>	<b>L</b> ight <b>E</b> mitting <b>D</b> iode
<b>MAX</b>	<b>M</b> A <b>X</b> imum
<b>ME</b>	<b>M</b> obile <b>E</b> quipment
<b>MIC</b>	<b>M</b> I <b>C</b> rophone
<b>Micro-Fit</b>	<b>F</b> amily of connectors from <b>M</b> olex
<b>MIN</b>	<b>M</b> I <b>N</b> imum
<b>MNP</b>	<b>M</b> icrocom <b>N</b> etworking <b>P</b> rotocol
<b>MO</b>	<b>M</b> obile <b>O</b> riginated
<b>MS</b>	<b>M</b> obile <b>S</b> tation
<b>MT</b>	<b>M</b> obile <b>T</b> erminated
<b>NOM</b>	<b>N</b> O <b>M</b> inal
<b>O</b>	<b>O</b> utput
<b>Pa</b>	<b>P</b> ascal (for speaker sound pressure measurements)
<b>PBCCH</b>	<b>P</b> acket <b>B</b> roadcast <b>C</b> ontrol <b>C</b> Hannel
<b>PC</b>	<b>P</b> ersonal <b>C</b> omputer
<b>PCL</b>	<b>P</b> ower <b>C</b> ontrol <b>L</b> evel
<b>PDP</b>	<b>P</b> acket <b>D</b> ata <b>P</b> rotocol
<b>PIN</b>	<b>P</b> ersonal <b>I</b> dentify <b>N</b> umber
<b>PLMN</b>	<b>P</b> ublic <b>L</b> and <b>M</b> obile <b>N</b> etwork
<b>PUK</b>	<b>P</b> ersonal <b>U</b> nblocking <b>K</b> ey
<b>RF</b>	<b>R</b> adio <b>F</b> requency
<b>RFI</b>	<b>R</b> adio <b>F</b> requency <b>I</b> nterference
<b>RI</b>	<b>R</b> ing <b>I</b> ndicator
<b>RMS</b>	<b>R</b> oot <b>M</b> ean <b>S</b> quare
<b>RTS</b>	<b>R</b> equest <b>T</b> o <b>S</b> end
<b>RX</b>	<b>R</b> eceive
<b>SIM</b>	<b>S</b> ubscriber <b>I</b> dentification <b>M</b> odule

<b>Abbreviation</b>	<b>Definition</b>
<b>SMA</b>	<b>S</b> ub <b>M</b> iniature version <b>A</b> RF connector
<b>SMS</b>	<b>S</b> hort <b>M</b> essage <b>S</b> ervice
<b>SNR</b>	<b>S</b> ignal-to- <b>N</b> oise <b>R</b> atio
<b>SPL</b>	<b>S</b> ound <b>P</b> ressure <b>L</b> evel
<b>SPK</b>	<b>S</b> pea <b>K</b> er
<b>SRAM</b>	<b>S</b> tatic <b>R</b> AM
<b>TCP/IP</b>	<b>T</b> ransmission <b>C</b> ontrol <b>P</b> rotocol / <b>I</b> nternet <b>P</b> rotocol
<b>TDMA</b>	<b>T</b> ime <b>D</b> ivision <b>M</b> ultiple <b>A</b> ccess
<b>TU</b>	<b>T</b> ypical <b>U</b> rban fading profile
<b>TUHigh</b>	<b>T</b> ypical <b>U</b> rban, <b>H</b> igh speed fading profile
<b>TX</b>	<b>T</b> ransmit
<b>TYP</b>	<b>TYP</b> ical
<b>USB</b>	<b>U</b> niversal <b>S</b> erial <b>B</b> us
<b>VSWR</b>	<b>V</b> oltage <b>S</b> tationary <b>W</b> ave <b>R</b> atio

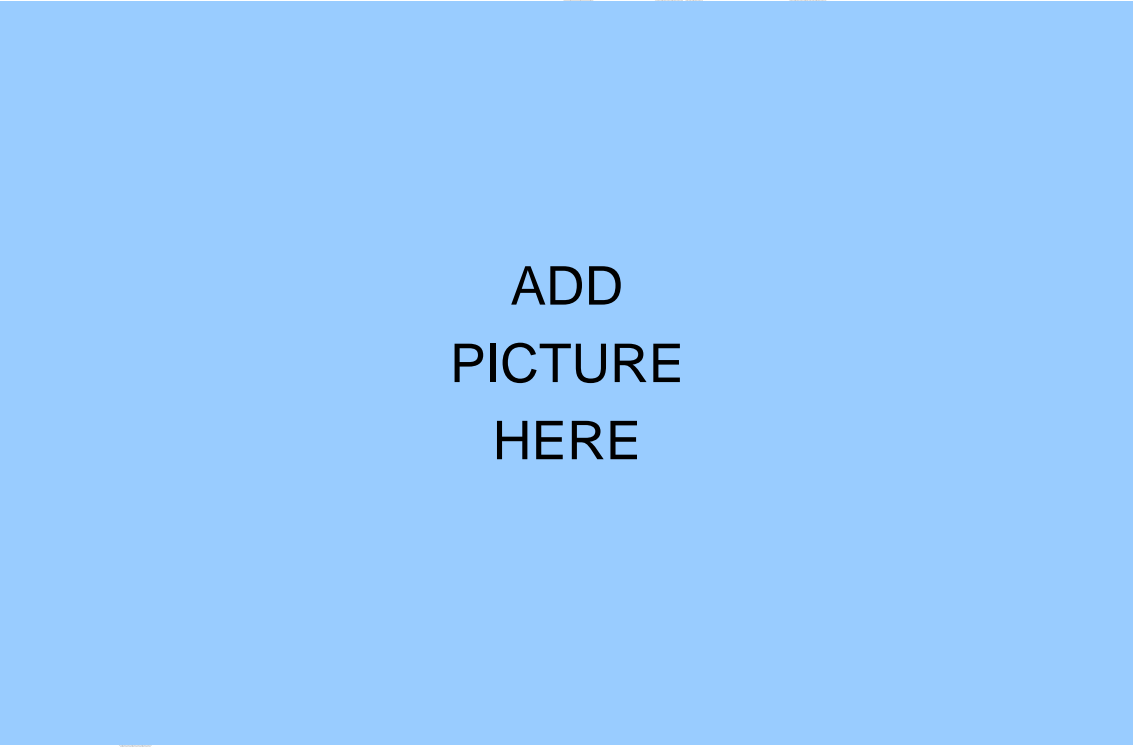
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## 2 Packaging

### 2.1 Contents

The complete package contents of the Fastrack Supreme IESM-GPS+USB consists of the following:

- One packaging box (A),
- One IESM-GPS+USB (B),
- One Backplate (C),
- Short notice (E) with:
  - a summary of the main technical features,
  - safety recommendations,
  - EC declaration of conformity.



ADD  
PICTURE  
HERE

**Figure 1: Complete package contents**

### 2.2 Packaging Box

The packaging box external dimensions:

- width: xx.xx mm
- height: xx.xx mm
- length: xx.xx mm

Label placed indicates:

- WAVECOM logo
- Product reference (IESM-GPS+USB)
- CE marking (CEXXXX→TBC)
- RoHS logo
- WEEE logo

ADD  
PICTURE  
HERE

**Figure 2: Packaging box**

The packaging label dimensions are:

- height: XX mm
- length: XX mm

### **2.3 Production Sticker**

A production sticker (see Figure 3) located at the back side with the following information:

- product reference (IESM),



- part number (WMxxxxx),
- CE marking (CEXXXX → TBC),
- RoHS logo,
- WEEE logo.

**ADD PICTURE HERE**

**Figure 3: Production sticker**

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### 3 General Information

#### 3.1 Description

The IESM-GPS+USB graphical description is shown below.

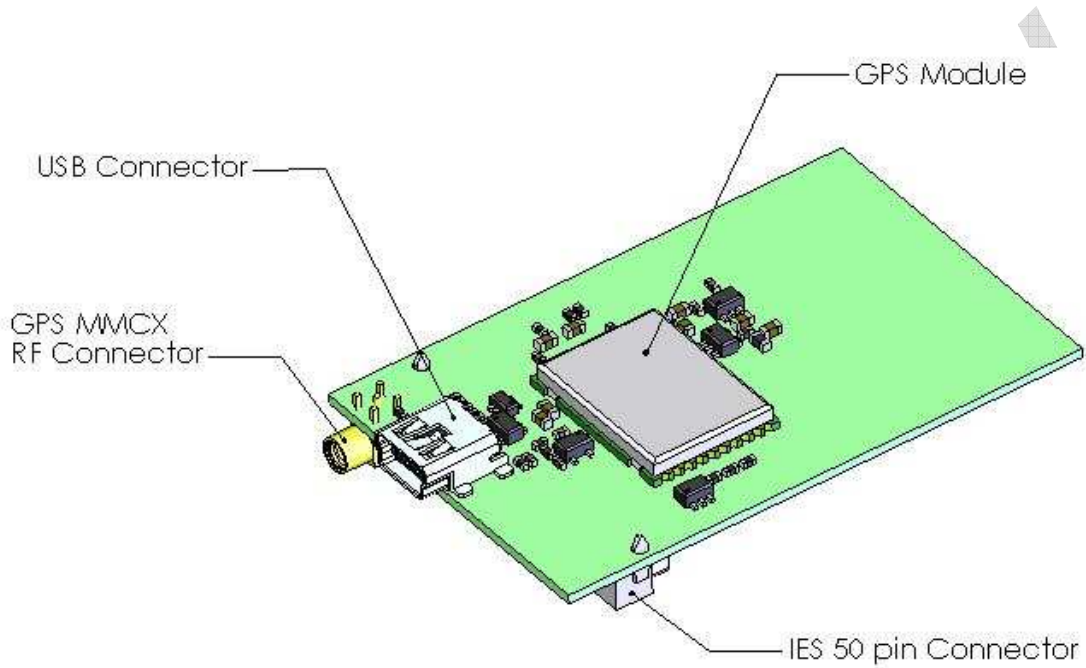


Figure 4: IESM general description

## 3.2 External Connections

### 3.2.1 Connectors

#### 3.2.1.1 GPS Antenna Connector

The GPS antenna connector is an MMCX type connector for a 50  $\Omega$  RF connection. 4VDC is available on this connector for supplying GPS active antennas.

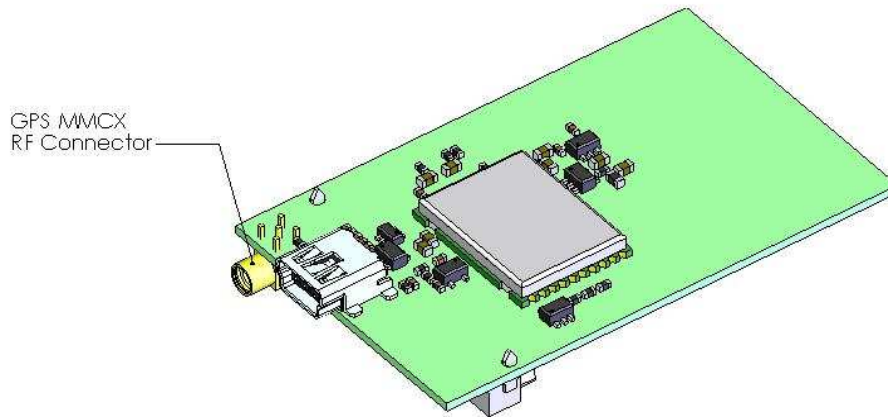


Figure 5: MMCX connector for antenna connection

#### 3.2.1.2 Mini-USB Connector

Standard Mini-USB connector for communicating with:

- Wireless CPU
- GPS **[TBD]**

This port is USB 2.0 compliant.

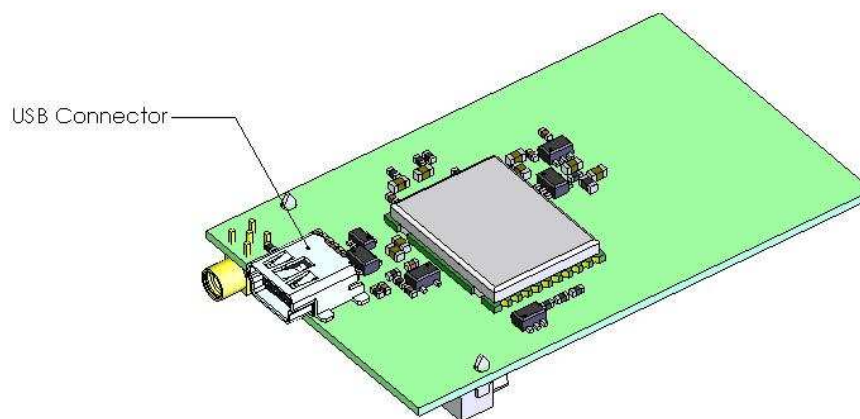
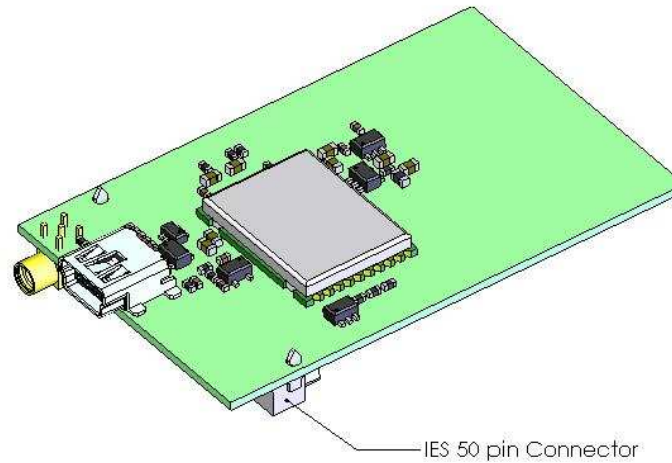


Figure 6: USB connector

**3.2.1.3 IES 50-pin Connector**

IESM high density 50-pin connector is used for:

- IESM Interface with Fastrack Supreme motherboard



**Figure 7: IESM 50-pin connector**

**Table 1: IESM 50-pin connector description**

Pin #	Pin Description	Pin #	Pin Description
1	GND	26	RTS2
2	GND	27	UART2-EN
3	Reserved	28	GPIO26
4	Reserved	29	GPIO19
5	Reserved	30	GPIO27
6	Reserved	31	GPIO20
7	VPAD-USB	32	INT0/GPIO3
8	USB-DP	33	GPIO23
9	USB-DM	34	GPIO22
10	GSM-1V8	35	DTR1-CT108/2
11	GSM-2V8	36	PCM-SYNC
12	BOOT	37	PCM-IN
13	RESET	38	PCM-CLK
14	AUX-ADC	39	PCM-OUT
15	SPI1-CS	40	AUX-DAC
16	SPI1-CLK	41	VCC-2V8

17	SPI1-I	42	GND
18	SPI1-IO	43	DC-IN
19	SPI2-CLK	44	DC-IN
20	SPI2-IO	45	GND
21	SPI2-CS	46	4V
22	SPI2-I	47	4V
23	RXD2	48	GND
24	TXD2	49	GND
25	CTS2	50	GND

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## 4 Features and Services

### 4.1 Basic Features and Services

Basic features of the IESM-GPS+USB are summarized in the table below.

**Table 2: Basic features of IESM-GPS+USB**

Features	Description
<b>Open AT<sup>®</sup></b>	Open AT <sup>®</sup> programmable: Native execution of embedded standard ANSI C applications, Custom AT command creation, Custom application library creation, Standalone operation.
<b>GPS Standard</b>	GPS L-Band (1575.42MHz) C/A Code
<b>Interfaces</b>	USB 2.0 Compliant AT command set based on V.25ter and GSM 07.05 & 07.07. Open AT <sup>®</sup> interface for embedded application.

## 5 Using IESM-GPS+USB

### 5.1 Getting Started

#### 5.1.1 Installing IESM-GPS+USB

To install the IESM-GPS+USB please follow the procedures below. It is important to remove the power to Fastrack Supreme when performing this installation;

1. Remove the screws and the original backplate cover of the Fastrack Supreme
2. Insert the IESM-GPS+USB board. Replace the original backplate with the IESM-GPS+USB backplate provided and place back the screws.

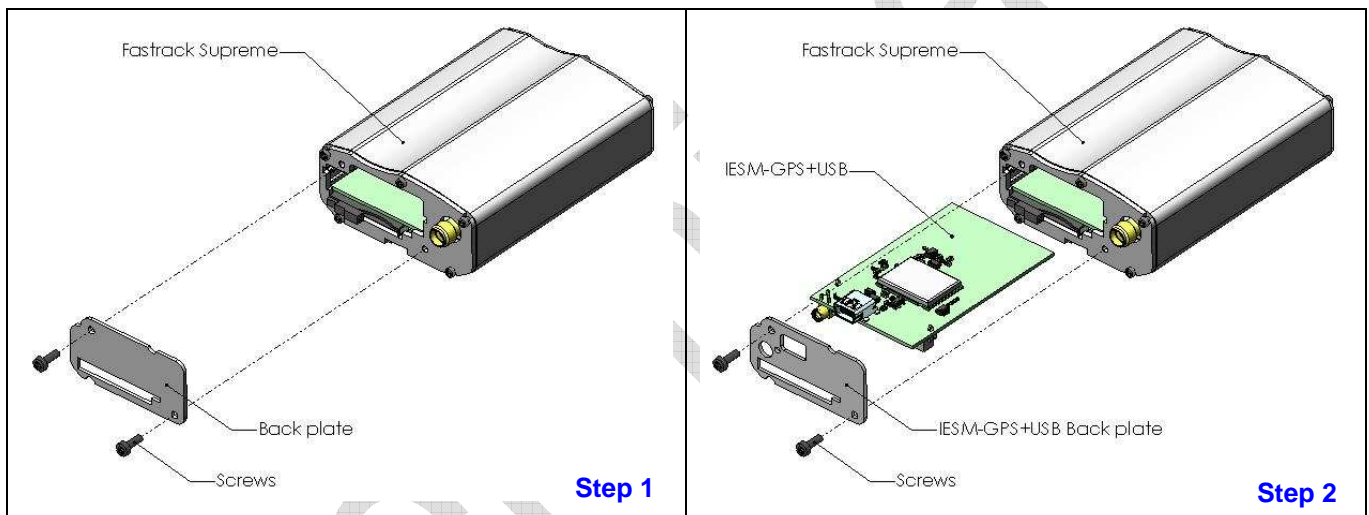


Figure 8: IESM-GPS+USB Mounting

#### 5.1.2 Check the communication with the IESM-GPS+USB

To check the communication with the Fastrack Supreme, do the following operations:

**Note:** IESM-GPS+USB must be run with Open AT<sup>®</sup>. Wavecom provides a sample Open AT<sup>®</sup> applications to demonstrate how to interface with the IESM's GPS.

▪ TBD

For further information on these AT commands and their associated parameters, refer to "AT Commands Interface Guide" [7].

## 5.2 IESM-GPS+USB Operational Status

The IESM-GPS+USB operational status could be interpreted by the green LED status located near the GPS RF connector.

LED Status	LED light activity	M1306B status
ON	LED ON	GPS fix has not been achieved
	LED Blinking	GPS Fix has been achieved
OFF	LED OFF	Fastrack Supreme is switched OFF.

**Table 3: IESM-GPS+USB operational status**

## 6 Troubleshooting

This section of the document describes possible problems encountered when using the IESM-GPS+USB.

To review other troubleshooting information, refer the 'FAQs' (Frequently Asked Questions) page at [www.wavecom.com](http://www.wavecom.com) or use the following link:  
<http://www.wavecom.com/support/faqs.php>

### 6.1 No Communication with Fastrack Supreme through the Serial Link

If the Fastrack Supreme does not answer to AT commands through the serial link, refer to the table below for possible causes and solutions.

**Table 4: Solutions for no connection with Supreme through serial link**

If the Fastrack Supreme returns	Check if	Action
Nothing	The IESM-GPS+USB powered correctly?	Make sure the IESM-GPS+USB is plugged securely to the IES connector.
	The serial cable is connected on both sides?	Check the serial cable connection



## Fastrack Supreme IESM-GPS+USB User Guide

WA\_DEV\_Fastrk\_UGD\_002

Nothing or non-significant characters	<p>Open AT<sup>®</sup> application running? The communication program properly configured on PC?</p>	<p>Run the Open AT<sup>®</sup> application</p> <p>Ensure the setting of the communication program is fit to the following settings;</p> <p>Supreme UART 1 factory setting is:</p> <ul style="list-style-type: none"> <li>▪ Data bits = 8</li> <li>▪ Parity = none</li> <li>▪ Stop bits = 1</li> <li>▪ Baud = 115 200 bps.</li> <li>▪ Flow control = hardware</li> </ul> <p>UART 2 setting are;</p> <ul style="list-style-type: none"> <li>▪ Data bits = 8</li> <li>▪ Stop bits = 1 stop bit</li> <li>▪ Parity = Odd</li> <li>▪ Baud: 57600 bps</li> <li>▪ Flow control= none</li> </ul>
	<p>There is another program interfering with the communication program (i.e. Conflict on communication port access)</p>	<p>Close the interfering program.</p>

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## 7 Functional Description

The IESM-GPS+USB is interfaced to the Fastrack Supreme mother board through the 50 pin connector. All the DC supplies are applied through this connector so no external supply is necessary.

With the Open AT<sup>®</sup> application running, the Fastrack Supreme motherboard communicates to IESM-GPS+USB on UART2. For proper communication UART2 must be set to the following;

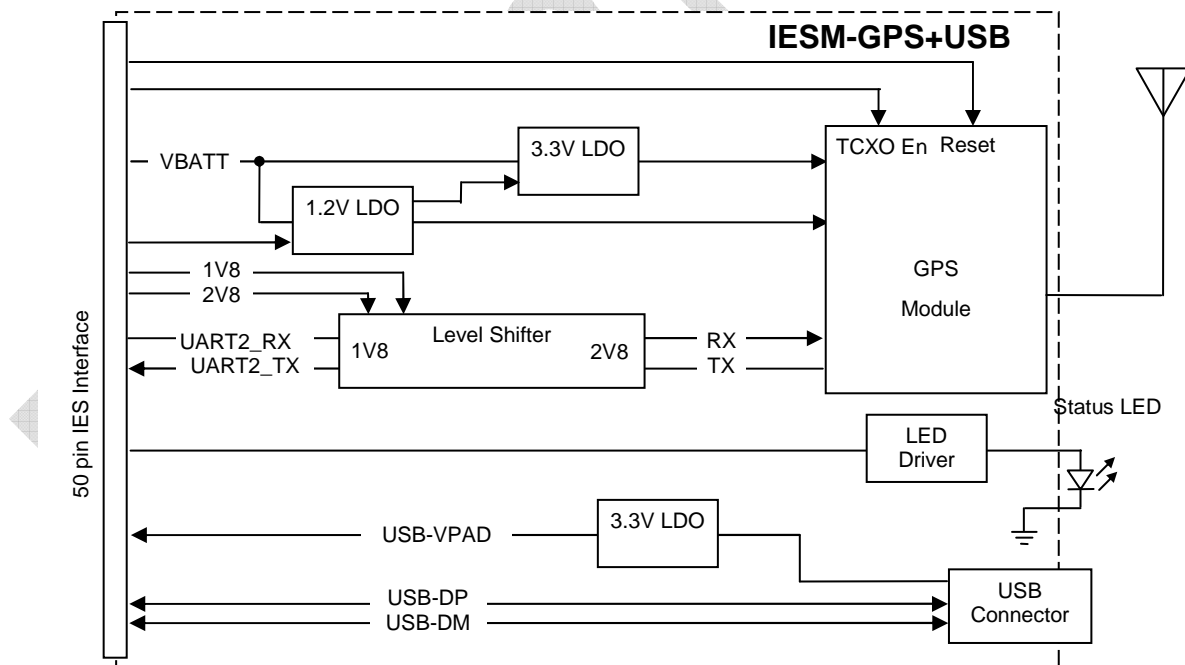
- baud rate: 57600 bps
- character framing: 8 Data bits
- parity: 1 stop bit and Odd Parity
- Flow Control: No Flow control

Open AT<sup>®</sup> application controls the following;

- Enables/disables the internal LDOs of the IESM to power-up the GPS
- Enables/disables the RF block of the GPS
- Enables a trigger to reset the GPS module
- GPS status indicator output which is connected to an LED driver

USB is a four wire slave interface that complies with USB 2.0 protocol signaling. This can be used to communicate with the Wireless CPU or GPS module.

### 7.1 Architecture



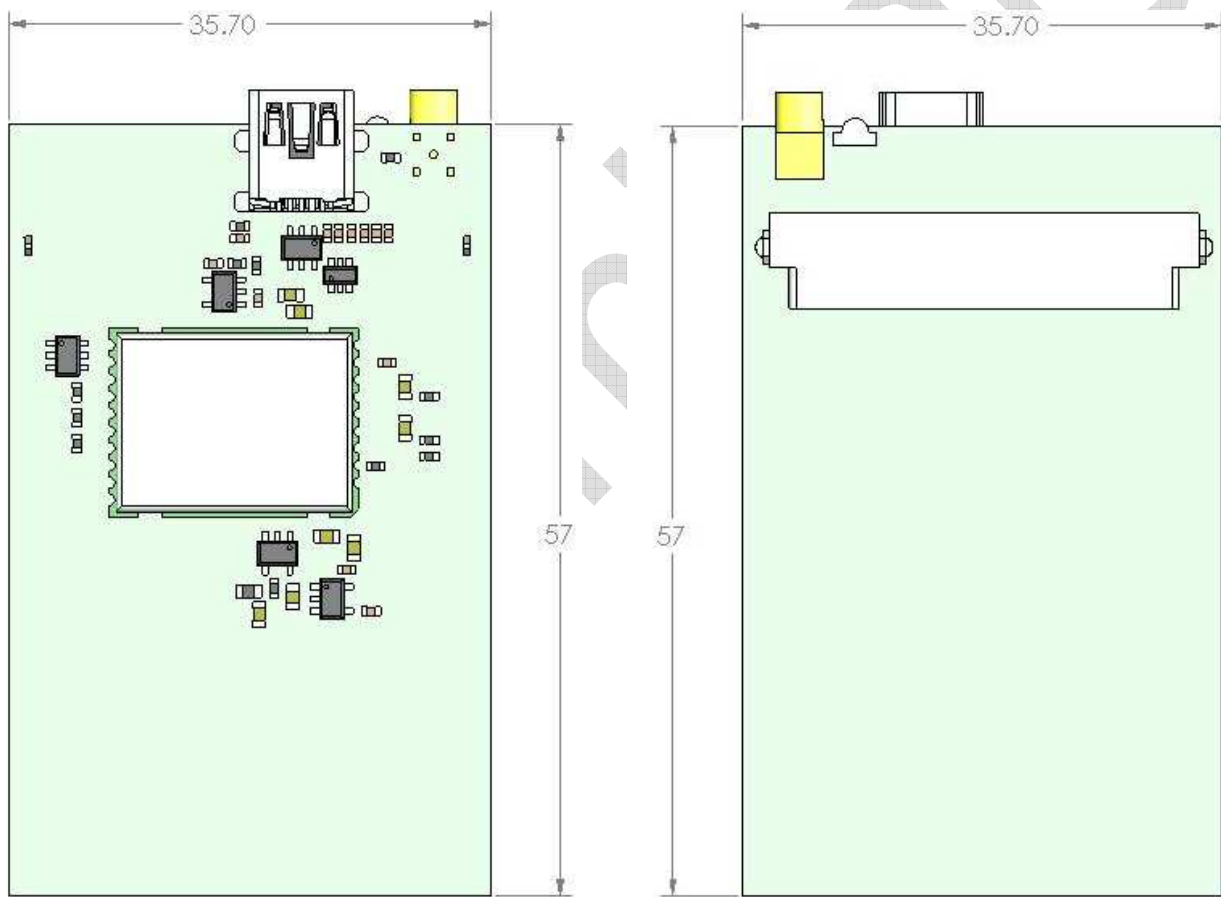
**Figure 9: Functional architecture**

## 8 Technical Characteristics

### 8.1 Mechanical Characteristics

**Table 5: Mechanical characteristics**

<b>PCB Dimensions</b>	57mm x 35.7mm x 1mm
<b>Overall Dimension</b>	59.5 x 35.7 x 10.01mm (including connectors)
<b>Weight</b>	≈ TBD grams



**Figure 10: IESM-GPS+USB Dimensions**

## 8.2 Electrical Characteristics

### 8.2.1 Power Supply

Table 6: Electrical characteristics

Operating Voltage	4VDC
	1.2VDC
	2.8VDC
Maximum current	(TBC)

**Note:**

The IESM-GPS+USB is powered once the power enable pins are activated by the Open AT<sup>®</sup> application. The following table describes the consumption based on operating conditions.

Table 7: GPS Power consumption

Mode	Min	Typ	Max	Unit
Acquisition Indoor	-	TBC	TBC	mW
Satellite tracking after a fix	-	TBC	TBC	mW
RTC standby	-	TBC	TBC	mW
Deep Sleep Mode				
	Without control pf TCXO supply power	-		mW

### 8.2.2 RF Characteristics

#### 8.2.2.1 GPS Receiver Frequency

Table 8: GPS Receiver Frequency

Characteristic	GPS
Frequency RX	1575.42 MHz

**8.2.2.2 GPS RF Performance**

The GPS RF performance for receiver is given in the table below.

**Table 9: Receiver performances**

Receiver	
Receiver Sensitivity	-xxx.xxdBm [TBD]

**8.2.2.3 External Antenna**

The external antenna is connected to the IESM's GPS via the MMCX connector.

The external antenna must fulfill the characteristics listed in the table below.

**Table 100: External antenna characteristics**

Antenna frequency range	1.57542GHz ± 1.023MHz (L1-Band)
Impedance	50 Ohms nominal
Voltage Supply	3V~5V ± 0.5VDC
Gain (antenna + cable)	2dBi

**8.3 Environmental Characteristics**

The IESM-GPS+USB is compliant with the following operating class. To ensure the proper operation of the IESM-GPS+USB, the temperature of the environment must be within a specific range as described in the table below.

**Table 11: Ranges of temperature**

Conditions	Temperature range
Operating Class A	-20 °C to +55°C
Operating / Storage / Class B	-40 °C to +85°C

Function Status Classification:

**Class A: [TBD]**

The IESM-GPS+USB remain fully functional across the specified temperature range.

**Class B: [TBD]**

The IESM-GPS+USB remain fully functional, across the specified temperature range. Some parameters may occasionally deviate from the specified requirements and this deviation does not affect the ability of the IESM-GPS+USB to function fully, as it does within the Class A range.

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The detailed climatic and mechanics standard environmental constraints applicable to the Fastrack Supreme are listed in the table below:

**Table 12: Environmental standard constraints**

Environmental Tests (IEC TR 60721-4)		Environmental Classes (IEC 60721-3)			
Tests	Standards	Storage (IEC 60721-3-1) Class IE13	Transportation (IEC 60721-3-2) Class IE23	Operation	
				Stationary (IEC 60721-3-3) Class IE35	Non-Stationary (IEC 60721-3-7) Class IE73
Cold	IEC 60068-2-1 : Ab/Ad	-25°C, 16 h	-40°C, 16 h	-5°C, 16 h	-5°C, 16 h
Dry heat	IEC 60068-2-2 : Bb/Bd	+70°C, 16 h	+70°C, 16 h	+55°C, 16 h	+55°C, 16 h
Change of temperature	IEC 60068-2-14 : Na/Nb	-33°C to ambient 2 cycles, t1=3 h 1 °C.min <sup>-1</sup>	-40°C to ambient 5 cycles, t1=3 h t2<3 min	-5°C to ambient 2 cycles, t1=3 h 0,5 °C.min <sup>-1</sup>	-5°C to ambient 5 cycles, t1=3 h t2<3 min
Damp heat	IEC 60068-2-56 : Cb	+30°C, 93% RH 96 h	+40°C, 93% RH 96 h minimum	+30°C, 93% RH, 96 h	+30°C, 93% RH, 96 h
Damp heat, cyclic	60068-2-30 : Db Variant 1 or 2	+40°C, 90% to 100% RH One cycle Variant 2	+55°C, 90% to 100% RH Two cycles Variant 2	+30°C, 90% to 100% RH Two cycles Variant 2	+40°C, 90% to 100% RH Two cycles Variant 1
Vibration (sinusoidal)	IEC 60068-2-6 : Fc	1-200 Hz 2 m.s <sup>-2</sup> 0,75 mm 3 axes 10 sweep cycles	1-500 Hz 10 m.s <sup>-2</sup> 3,5 mm 3 axes 10 sweep cycles	1-150 Hz 2 m.s <sup>-2</sup> 0,75 mm 3 axes 5 sweep cycles	1-500 Hz 10 m.s <sup>-2</sup> 3,5 mm 3 axes 10 sweep cycles
Vibration (random)	IEC 60068-2-64 : Fh	-	10-100 Hz / 1,0 m <sup>2</sup> .s <sup>-3</sup> 100-200 Hz / -3 dB.octave <sup>-1</sup> 200-2000 Hz / 0,5 m <sup>2</sup> .s <sup>-3</sup> 3 axes 30 min	-	-
Shock (half-sine)	IEC 60068-2-27 : Ea	-	-	50 m.s <sup>-2</sup> 6 ms 3 shocks 6 directions	150 m.s <sup>-2</sup> 11 ms 3 shocks 6 directions
Bump	IEC 60068-2-29 : Eb	-	250 m.s <sup>-2</sup> 6 ms 50 bumps vertical direction	-	-
Free fall	ISO 4180-2	-	Two falls in each specified attitude	-	2 falls in each specified attitude 0,025 m (<1kg)
Drop and topple	IEC 60068-2-31 : Ec	-	One drop on relevant corner One topple about each bottom edge	-	One drop on each relevant corner One topple on each of 4 bottom edges

**Notes:**

**Short description of Class IE13 (For more information see standard IEC 60721-3-1)**

"Locations without controlled temperature and humidity, where heating may be used to raise low temperatures, locations in buildings providing minimal protection against daily variations of external climate, prone to receiving rainfall from carrying wind".

**Short description of Class IE23 (For more information, see standard IEC 60721-3-2)**

"Transportation in unventilated compartments and in conditions without protection against bad weather, in all sorts of trucks and trailers in areas of well developed road network, in trains equipped with buffers specially designed to reduce shocks and by boat".

**Short description of Class IE35 (For more information see standard IEC 60721-3-3)**

"Locations with no control on heat or humidity where heating may be used to raise low temperatures, to places inside a building to avoid extremely high temperatures, to places such as hallways, building staircases, cellars, certain workshops, equipment stations without surveillance".

**Short description of Class IE73 (For more information see standard IEC 60721-3-7)**

"Transfer to places where neither temperature nor humidity are controlled but where heating may be used to raise low temperatures, to places exposed to water droplets, products can be subjected to ice formation, these conditions are found in hallways and building staircases, garages, certain workshops, factory building and places for industrial processes and hardware stations without surveillance".

**Warning: The specification in the above table applies to the Supreme product only. Customers are advised to verify that the environmental specification of the SIM Card used is compliant with the Supreme environmental specifications. Any application must be qualified by the customer with the SIM Card in storage, transportation and operation.**

The use of standard SIM cards may drastically reduce the environmental conditions in which the Product can be used. These cards are particularly sensible to humidity and temperature changes. These conditions may produce oxidation of the SIM card metallic layers and cause, in the long term, electrical discontinuities. This is particularly true in left alone applications, where no frequent extraction/insertion of the SIM card is performed.

In case of mobility when the application is moved through different environments with temperature variations, some condensation may appear. These events have a negative impact on the SIM and may favor oxidation.

If the use of standard SIM card, with exposition to the environmental conditions described above, can not be avoided, special care must be taken in the integration of the final application in order to minimize the impact of these conditions. The solutions that may be proposed are:

- Lubrication of the SIM card to protect the SIM Contact from oxidation.
- Putting the Supreme Plug & Play in a waterproof enclosure with desiccant bags.

Lubrication of the SIM card had been tested by Wavecom (using Tutela Fluid 43EM from MOLYDUVAL) and gives very good results.

If waterproof enclosure with a desiccant solution is used, check with your desiccant retailer the quantity that must be used according to the enclosure dimensions. Ensure humidity has been removed before sealing the enclosure.

Any solution selected must be qualified by the customer on the final application.

To minimize oxidation problem on the SIM card, its manipulation must be done with the greatest precautions. In particular, the metallic contacts of the card must never be touched with bare fingers or any matter which may contain polluted materials liable to produce oxidation (such as, e.g. substances including chlorine). In case a cleaning of the Card is necessary, a dry cloth must be used (never use any chemical substance).

## 8.4 Conformity

The complete product complies with the essential requirements of article 3 of R&TTE 1999/5/EC Directive and satisfied the following standards:

Domain	Applicable standard
Safety standard	EN 60950 (ed.1999)
Efficient use of the radio frequency spectrum	EN 301 419-(v 4.1.1) EN 301 511 (V 7.0.1)
EMC	EN 301 489-1 (edition 2002) EN 301 489-7 (edition 2002)
Global Certification Forum – Certification Criteria	GCF-CC V3.13.0

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## 9 Safety recommendations

### 9.1 General Safety

It is important to follow any special regulations regarding the use of radio equipment due in particular to the possibility of radio frequency (RF) interference. Please follow the safety advice given below carefully.

Switch OFF your Wireless CPU®:

- When in an aircraft. The use of cellular telephones in an aircraft may endanger the operation of the aircraft, disrupt the cellular network and is illegal. Failure to observe this instruction may lead to suspension or denial of cellular telephone services to the offender, or legal action or both,
- When at a refueling point,
- When in any area with a potentially explosive atmosphere which could cause an explosion or fire,
- In hospitals and any other place where medical equipment may be in use.

Respect restrictions on the use of radio equipment in:

- Fuel depots,
- Chemical plants,
- Places where blasting operations are in progress,
- Any other area where signalization reminds that the use of cellular telephone is forbidden or dangerous.
- Any other area where you would normally be advised to turn off your vehicle engine.

There may be a hazard associated with the operation of your Supreme Plug & Play close to inadequately protected personal medical devices such as hearing aids and pacemakers. Consult the manufacturers of the medical device to determine if it is adequately protected.

Operation of your Supreme Plug & Play close to other electronic equipment may also cause interference if the equipment is inadequately protected. Observe any warning signs and manufacturers' recommendations.

The Supreme Plug & Play is designed for and intended to be used in "**fixed**" and "**mobile**" applications:

- "**Fixed**" means that the device is physically secured at one location and is not able to be easily moved to another location.
- "**Mobile**" means that the device is designed to be used in other than fixed locations and generally in such a way that a separation distance of at least 20 cm (8 inches) is normally maintained between the transmitter's antenna and the body of the user or nearby persons.

The Supreme Plug & Play is not designed for and intended to be used in portable applications (within 20 cm or 8 inches of the body of the user) and such uses are strictly prohibited.

### 9.2 Vehicle Safety

Do not use your Supreme Plug & Play while driving, unless equipped with a correctly installed vehicle kit allowing 'Hands-Free' Operation.

Respect national regulations on the use of cellular telephones in vehicles. Road safety always comes first.

If incorrectly installed in a vehicle, the operation of Supreme Plug & Play telephone could interfere with the correct functioning of vehicle electronics. To avoid such problems, make sure that the installation has been

performed by a qualified personnel. Verification of the protection of vehicle electronics should form part of the installation.

The use of an alert device to operate a vehicle's lights or horn on public roads is not permitted.

### **9.3 Care and Maintenance**

Your Fastrack Supreme Plug & Play is the product of advanced engineering, design and craftsmanship and should be treated with care. The suggestion below will help you to enjoy this product for many years.

Do not expose the FAstrack Supreme Plug & Play to any extreme environment where the temperature or humidity is high.

Do not use or store the Fastrack Supreme Plug & Play in dusty or dirty areas. Its moving parts (SIM holder for example) can be damaged.

Do not attempt to disassemble the Wireless CPU<sup>®</sup>. There are no user serviceable parts inside.

Do not expose the Fastrack Supreme Plug & Play to water, rain or spilt beverages. It is not waterproof.

Do not abuse your Fastrack Supreme Plug & Play by dropping, knocking, or violently shaking it. Rough handling can damage it.

Do not place the Fastrack Supreme Plug & Play alongside computer discs, credit or travel cards or other magnetic media. The information contained on discs or cards may be affected by the Wireless CPU<sup>®</sup>.

The use of third party equipment or accessories, not made or authorized by Wavecom may invalidate the warranty of the Wireless CPU<sup>®</sup>.

Do contact an authorized Service Center in the unlikely event of a fault in the Wireless CPU<sup>®</sup>.

### **9.4 Your Responsibility**

This Fastrack Supreme Plug & Play is under your responsibility. Please treat it with care respecting all local regulations. It is not a toy. Therefore, keep it in a safe place at all times and out of the reach of children.

Try to remember your Unlock and PIN codes. Become familiar with and use the security features to block unauthorized use and theft.

## 10 Recommended Accessories

Accessories recommended by Wavecom for the Fastrack Supreme IESM-GPS+USB are given in the table below.

**Table 13: List of recommended accessories**

Designation	Part number	Supplier
GPS antenna with MMCX connector	TBD	TBD

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## 11 Online Support

Wavecom provides an extensive range on online support which includes the following areas of Wavecom's wireless expertise:

- the latest version of this document
- new versions of our Operating System user guides
- comprehensive support for Open AT<sup>®</sup>
- regulatory certifications
- carrier certifications
- application notes

To gain access to this support, simply visit our web site at [www.wavecom.com](http://www.wavecom.com) and click on "Support". Privileged access via user login is provided to Wavecom authorized distributors.

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