
Home Hub™ - HSPA+/LTE/5G

Release 0.0.1

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Wave® Home Hub™ - HSPA+/LTE/5G



RELEASE NOTES AND NOTICES

This section provides information about what is new or changed, including urgent issues, Software & documentation updates, maintenance and new releases.

- ‘Updates’ are the term used to describe significant changes to our public source code. These technical documents are now contained within our public source code.

1.1 Version 0.0.1

This is the first release/ draft of this technical document.

1.1.1 Older Versions

There are no older versions of this document, however a table has been made so that enteries can be made. We’re also still exploring how exactly we will make links to the older versions possible. Perhaps a PDF snapshot will do, before the directory is overwritten with the next version. The sphinx methodology is new to our team, we’re still exploring this and other options for maintaining technical documents for this project:

Table 1: Table 1.0 - Older Versions of this Document

archive date	version	description	download link
no date	0.0.0	N/A	N/A

1.1.2 Version 0.0.0

N/A

1.2 Known and Corrected Issues

Below is a table of pending issues which have been reported to our team. These issues will be cleared from this list as and when they are remedied.

Table 2: Table 1.1 - Known Issues

date	version	subject	description
01-11-2018	0.0.1	N/A	no doubt many issues to report - first draft only

Comments - none

1.3 Recently Updated Topics

Nothing significant to report

GUIDELINES & SAFETY

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FCC Information


FCC compliance: This equipment has been tested and found to comply with the limits for a digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Conditions This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference. 2. This device must accept any interference received, including interference that may cause undesired operation.


EU Conformity Statement

	European Standard
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This product and if applicable, the supplied accessories too are marked with “CE” and comply therefore with the applicable harmonized European standards listed under the EMC Directive 2014/30/EU, the RoHS Directive 2011/65/EU

	WEEE Directive
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2012/19/EU (WEEE directive) Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info

	Battery Directive
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2006/66/EC (Battery Directive) This product may contain a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product specific section of this document for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg).


For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: www.recyclethis.info

Industry Canada ICES-003 Compliance

This device meets the CAN ICES-3 (A)/NMB-3(A) standards requirements.


2.2 Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss. The precaution measure is divided into “Warnings” and “Cautions”

	Warnings
---	-----------------

Warnings: Safeguards to prevent serious injury or death. Serious injury or death may occur if any of the warnings are neglected. Follow these safeguards to prevent serious injury or death.

- Proper configuration of all passwords and other security settings is the responsibility of the installer and/or end-user.
- In the use of the product, you must be in strict compliance with the electrical safety regulations of the nation and region.
- Input voltage should meet both the SELV (Safety Extra Low Voltage) and the Limited Power Source with 24 VAC or 12 VDC according to the IEC60950-1 standard.
- Do not connect several devices to one power adapter as adapter overload may cause over-heating or a fire hazard.
- Please make sure that the plug is firmly connected to the power socket. When the product is mounted on wall or ceiling, the device shall be firmly fixed.
- If smoke, odor or noise rise from the device, turn off the power at once and unplug the power cable, and then please contact the service center.

	Cautions
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Cautions: Injury or equipment damage may occur if any of the cautions are neglected. Follow these precautions to prevent potential injury or material damage.

- Make sure the power supply voltage is correct before using the product.
- Do not drop the product or subject it to physical shock.
- If cleaning is necessary, use clean cloth with a bit of ethanol and wipe it gently. If the product will not be used for an extended period, please repackage it to protect the sensor from dirt.

- Do not place the product in extremely hot, cold (the operating temperature shall be -30°C ~ +60°C, or -40°C ~ +60°C if the product model has an “H” in its suffix), dusty or damp locations, and do not expose it to high electromagnetic radiation.
- To avoid heat accumulation, good ventilation is required for operating environment.
- Keep the product away from liquid while in use.
- While in delivery, the product shall be packed in its original packing, or packing of the same texture.
- Improper use or replacement of the battery, if required, may result in hazard of explosion. Replace with the same or equivalent type only. Dispose of used batteries according to the instructions provided by the battery manufacturer.
- If the product does not work properly, please contact your dealer or the nearest service center. (We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.)

THE WAVE® HOME HUB™

The Wave® Home Hub™ is a Single Board Computer e.g. Raspberry Pi , operated by the Wave® operating system: WaveOS™. To receive internet access the Home Hub™ uses one of 3 cellular modules: HSPA+ USB Dongle, 4G/LTE HAT or 5G/mmWave Receiver. This user guide is for the Home Hub™ only. To understand the cellular modules please reference their user guides.

Image 1.0 - Wave® Home Hub™



The Wave® Home Hub™ is not only the worlds first free internet solution. This product is also a highly affordable, all-in-one, **Smart Home Solution**. It works right out of the box, making it today's easiest and fastest way to transform any house into a fully-intergrated digital smart home. Smart Home features of this product include;

- Media Center (DLNA - Music, Movies & IPTV Streaming etc)

- Wireless Home Control (IoT) e.g. Smart Plug Sockets, Lights etc
- IP Camera Monitor for up to 25 IP Cameras
- Statistics - Self-Labeling, simple interface & Analysis
- Multi-User Support (access the Wave® Dashboard™ from multiple devices, simultaneously, through any web-browser)
- Remote Access - Access the Wave® Dashboard™ from Anywhere in the world using the Free Wave® Remote (Remote Access) Mobile App

The Wave® Home Hub™ is also the worlds first free internet solution. By using a cellular module to receive internet access the Home Hub™ is able to convert advertising and cryptocurrency mining revenue into credits which autonomously pay the internet service provider.

3.1 Wave® Hardware

3.1.1 Hardware Features

3.1.2 Powering Up

3.1.3 Factory Reset

3.1.4 Power/Activity LED

3.1.5 Handling Precaution

Safe Power Down & Disconnect

General Maintenance & Care

3.2 Wave® Operating System

For simplicity each product in the Wave® Smart Home™ uses the exact same hardware device and operating system. The core hardware solution is known as a Single Board Computer (SBC). The software is known as the Wave® Operating System (WaveOS™) and runs all of the devices in the Wave® Smart Home™.

WaveOS™ is Free, Open-Source and is held on a Micro SD Card inside of every Wave® Smart Home™ product. WaveOS™ makes initial boot and configuration of the device very simple, by establishing an internet connection and generating a Wi-Fi Hotspot autonomously. The operator can then connect their device to the Wi-Fi Hotspot and complete initial set-up via their web-browser.

To complete initial set-up, the operator must simply select which Edition of WaveOS™ they'd like installed to the device. The Edition of WaveOS™ installed will determine which product the device will become (or which function the device will serve within the Smart Home™). For example, if the operator selects the HSPA+ Home Hub™ Edition of WaveOS™, it will transform the SBC a HSPA+ Home Hub™. The initial installation is done via a web browser menu (no programming skills required). Initial installation is made one-click, fully autonomous and takes only a few minutes.

3.3 Wave® Enhancement Products

With the exclusion of the Home Hub™, all products from Wave® are considered **Enhancement Products** since they are designed to enhance the experience and performance of the Home Hub™. The quantity and configuration of these enhancement products will depend on the size of the users home, occupants and their personal preferences. Below is a list of the full range of Wave® Enhancement Products:

Table 1: Table 1.0 - Wave's 'Enhancement' Products

Name	Description
Wave® Energy Monitor™	Deep Analysis of Energy Consumption
Wave® Vehicle Tracker™	Real-Time Location of Vehicle (USSD - FREE Cellular Channel)
Wave® Multi-Room™ Link	Wirelessly sends the Home Hub™ Dashboard to any TV Display. HDMI Connection
Wave® Signal Booster™	Extends Wi-Fi Signal Strength - Re-broadcasts Home Hub™ SSID
Wave® Storage Device™	4TB of Raid 10 NAS Storage - for use with the Home Hub™

NOTES:

- The products above are to enhance the Home Hub™ Experience <<https://makeitwave.com/data/docs/products/3g-homehub/build/html/index.html>> __, . They **DO NOT** function independantly of the Home Hub™. Please ensure you have the Home Hub™ in place before expecting full enjoyment and use of the above Enhancement Products.

3.4 Wave® Home Hub™

A Wave® Smart Home™ describes, at the very least, a Wave® Home Hub™ and/or at least one Wave® Enhancement Product connected to it. The Home Hub™ is effectively Wi-Fi Hotspot with a built in server, which hosts a number of smart home applications. Any device connected to the hotspot (locally and remotely) may access these applications via any modern web browser. For convenience and ease of use, all of the applications hosted on the Home Hub™ are embedded into one interface called The Dashboard™.

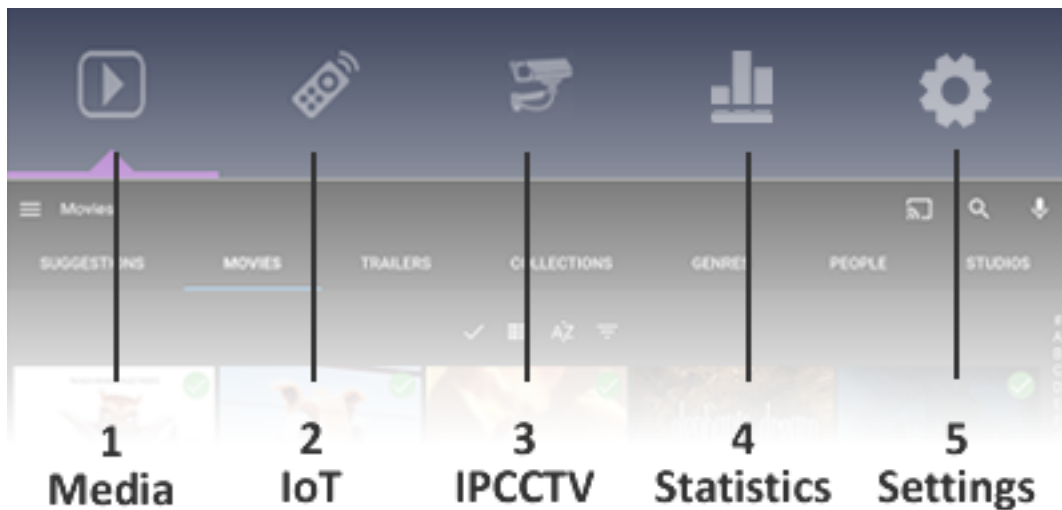
Image 1.1 - The Wave® Home Hub™



3.5 Wave® Dashboard™

- Tab 1 - Media Library: Featuring Movies, Music, IPTV, Latest Trailers, TV Shows
- Tab 2 - IoT Home Control: Scan your Wi-Fi for Things to Control, Add buttons to control your Things
- Tab 3 - IP Camera Monitor: Scan your Wi-Fi for IP Camera Monitor to monitor. Includes Motion Detect and loopback recording.
- Tab 4 - Statistics: Receives info from the device including statistic, temperature etc.
- Tab 5 - Settings: Wi-Fi SSID & Password, Change Software Editions, Change Time & Date etc.

Image 1.1 - Wave® Home Hub™ - Dashboard™



3.5.1 Tab 1 - Media Library

Featuring Movies, Music, IPTV, Latest Trailers, TV Shows

3.5.2 Tab 2 - Home Control

Scan your Wi-Fi for Things to Control, Add buttons to control your Things

3.5.3 Tab 3 - IP Camera Monitor

Scan your Wi-Fi for IP Camera Monitor to monitor. Includes Motion Detect and loopback recording.

3.5.4 Tab 4 - Statistics

Receives and displays info from the device including statistic, temperature etc.

3.5.5 Tab 5 - Settings

Wi-Fi SSID & Password, Change Software Editions, Change Time & Date etc.

Key Facts about the Wave® Home Hub™:

- Primarily a Wi-Fi Hotspot with cellular module add-on (HSPA+, LTE or 5G). Features a built in Media Center (with IPTV), IoT Smart Device Controls and IP Camera Monitor (using WaveOS™)
- Connects to an existing DSL Router via Ethernet (Initial Setup Only)
- Works independantly as a Wave® Smart Home™ solution or in conjunction with enhancement products and/or accessories
- Functions most effectively when all wireless devices in the home, connect **exclusively** to the Wave® Home Hub™
- The cellular Home Hub™ is designed to replace existing sole sources of internet access.

3.6 Getting Started

3.6.1 Accessing the devices menu

3.6.2 Selecting Edition/ Completing Initial Installation

ABOUT THIS PRODUCT

This section provides information about this specific product. Coming soon

4.1 Package Content

4.2 Software Edition Features

4.3 Settings & Preferences

4.4 General Usage

4.5 Troubleshooting

SERVICE AND SUPPORT

This section provides information about what is new or changed, including urgent issues, Software & documentation updates, maintenance and new releases.

5.1 Accessing Online Support

5.2 Contacting Wave® Technical Support

LEGAL COMPLIANCE & WARRANTY

This appendix includes the following topics:

- Regulatory Compliance
- Warranty Information

6.1 Regulatory Compliance

6.1.1 FCC Class B Information

Operation of this device is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Any changes or modifications not expressly approved by Wave® could void your authority to operate this device.

6.1.2 Safety Compliance

Approved for Global Usage (Ref: Pending). Safety of Information Technology Equipment.

6.2 CE Compliance For Europe

Marking by the CE symbol indicates compliance of this system to the applicable Council Directives of the European Union, including the EMC Directive (2004/108/EC) and the Low Voltage Directive (2006/95/EC). A “Declaration of

Conformity” in accordance with the applicable directives has been made and is on file at Make it Wave Ltd, United Kingdom.

6.3 GNU General Public Licence (“GPL”)

Firmware incorporated into this product may include third party copyrighted software licensed under the GPL or Lesser General Public License (“LGPL”) (collectively, “GPL Software”) and not Wave’s End User License Agreement. In accordance with the GPL, if applicable:

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6.5 Warranty Information

6.5.1 Obtaining Services

Wave® values your business and always attempts to provide you the very best of service. If this Product requires maintenance, either contact the dealer from whom you originally purchased the Product or visit our product support website at <https://makeitwave.com> for information on how to obtain service or a Return Material Authorization (RMA). If it is determined that the Product may be defective, you will be given an RMA number and instructions for Product return.

An unauthorized return (i.e., one for which an RMA number has not been issued) will be returned to you at your expense. Authorized returns must be shipped in an approved shipping container, prepaid and insured, to the address provided on your return paperwork. Your original box and packaging materials should be kept for storing or shipping your Wave® product. Wave® shall have no liability for lost data regardless of the cause, recovery of lost data, or data contained in any Product placed in its possession.

6.5.2 Limited Warranty

Wave® warrants that the Product, in the course of its normal use, will for the term defined below, be free from defects in material and workmanship and will conform to Wave's specification therefor. The term of your limited warranty depends on the country in which your Product was purchased. The term of your limited warranty is for 3 years in the North, South and Central America region, 3 years in the Europe, the Middle East and Africa region, and 3 years in the Asia Pacific region, unless otherwise required by law. The term of your limited warranty period shall commence on the purchase date appearing on your purchase receipt. Wave® shall have no liability for any Product returned if Wave® determines that the Product was stolen from Wave® or that the asserted defect a) is not present, or b) is attributable to misuse, improper installation, alteration (including removing or obliterating labels and opening or removing external enclosures, unless the product is on the list of limited user-serviceable products and the specific alteration is within the scope of the applicable instructions, as found at <https://makeitwave.com>), accident or mishandling while in the possession of someone other than Wave, Wave's licenced distributors and/or Wave's End-User. Subject to the limitations specified above, your sole and exclusive warranty shall be, during the period of warranty specified above and at Wave's option, the repair or replacement of the Product.

The foregoing limited warranty is Wave's sole warranty and is applicable only to products sold as new. The remedies provided herein are in lieu of a) any and all other remedies and warranties, whether expressed, implied or statutory, including but not limited to, any implied warranty of merchantability or fitness for a particular purpose, and b) any and all obligations and liabilities of Wave® for damages including, but not limited to accidental, consequential, or special damages, or any financial loss, lost profits or expenses, or lost data arising out of or in connection with the purchase, use, or performance of the Product, even if Wave® has been advised of the possibility of such damages. In the United States for example, some states do not allow exclusion or limitations of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.

DOCUMENT AUTHOR(S):

7.1 Siôn H. Buckler

Organisation	Role	Details
	Founder & CEO	Make it Wave Ltd, British Corporation (England & Wales), Company Director ID 11363386
	Head of Defence	Caribbean Communications Unit (CCU), Royal Corps of Signals, Life Member ID 55983
	Council President	Utilities as a Right (UaaR) Society, British Public Servant, Gov/Oath ID 25148537
	Military Theorist	Scottish Bay, Dominican Republic (Green Line & Treaty of Guarantee)

About Siôn Buckler - Science & Computer Science (Bachelors), Electronic Engineering, Industrial Electronics and Electronics & Computing (Advanced Diplomas), Cisco Certified Network Associate (CCNA), Microsoft Certified Solutions Expert (MCSE), Certified Project Management (Prince2 Practitioner), Institute of Electronic Engineering (IEEE), Siemens Certified Engineer, Certified Telecommunications Service Provider (NVQ3), Satellites & Full Spectrum Radio, Fixed Telecommunications Systems with Enhanced Capabilities , SKP01 Electrical Safety, NVQ2 IT, Defence Specialist LAN, TCP/IP, Subnetting, DHCP, Addressing, Routing & Browsing, Communications Equipment Room Design & Maintenance, Military Command & Leadership, Cyber Security, Electronic Warfare, SIP/ VOIP,

SEO, PPC, HTML5, CSS3, Java, Perl, Ajax, JQuery, MySQL, Unix, Python, Linux.