



ALLERIO MOBILE HUB

User Manual

Model Number: AMH100



May 2020
Version 7.0

HEADQUARTERS:

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Duluth, MN 55802

Support

For help and support, visit <https://allerio.com/index.html#contact>. You can submit your request/query online or email info@allerio.com, or call 833 – COMMHUB(266-6428).

For additional information, visit www.allerio.com

Regulatory & Compliance

For regulatory compliance information, visit www.allerio.com

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Table of Contents

SUPPORT	2
REGULATORY & COMPLIANCE	2
TRADEMARKS	2
POLICY & TERMS OF USE	2
1. GETTING TO KNOW YOUR HUB	5
1.1. ACCESSORIES YOU’LL FIND IN THE BOX	5
1.2. TOP FRONT VIEW.....	6
1.2.1. User Interface.....	6
1.2.2. Power Button.....	7
1.2.3. USB Type-C port.....	7
1.3. REAR VIEW	7
2. GETTING STARTED	8
2.1. POWER PROCESS FOR YOUR HUB.....	8
2.1.1. Power ON Process:	8
2.1.1.1. Boot Sequence:.....	8
2.1.2. Power OFF Process:	8
2.1.2.1. Shutdown Sequence:.....	8
2.2. CHARGING.....	8
2.3. SETTING UP YOUR PERIPHERALS.....	9
2.3.1. Wi-Fi Access Point.....	9
2.3.1.1. Offline Setup.....	9
2.3.1.2. Available connection Setup	9
2.3.2. Wi-Fi Client	9
3. WHAT DOES YOUR LED STATUS MEAN?	10
3.1. LTE LEDs:.....	10
3.2. WI-FI AP LED:	10
3.3. WI-FI CLIENT LED:	10
3.4. BLUETOOTH LED:	10
3.5. BATTERY LEDs:	11
4. INTERNET CONNECTION & MANAGEMENT	12
4.1. ONBOARDING.....	12
4.2. NETWORK MANAGEMENT	12
5. HUB USAGE, CHARGING MANAGEMENT & PORTABILITY	13
5.1. DEVICE STANDARD USE.....	13
5.2. RECHARGE THE HUB	13
5.3. ORIENTATION & MOUNTING.....	13
6. TROUBLESHOOTING & FAQs	14
6.1. REBOOT	14
6.2. FACTORY RESET	14
7. SPECIFICATIONS	15
7.1. FCC SPECIFICATIONS	16

8. DATA USAGE 17

8.1. GET DATA ANALYTICS REPORT.....17

8.2. VIEW YOUR DATA USAGE ON WEB BROWSER.....17

9. MAINTENANCE 18

9.1. EXTEND BATTERY LIFE.....18

9.2. RECOMMENDATION & TIPS.....18

9.3. SAFETY.....19

9.4. HUB DISPOSAL19

9.5. CAUTION.....19

10. CUSTOMER CARE – CONTACT INFORMATION..... 19

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1. Getting to know your hub

This section provides an overview of the Allerio Mobile hub Model AMH100 and instructions on how to set up the hub and connect to internet.

The Allerio mobile hub is a mobile wireless communications hub that supports various agencies by providing ubiquitous connectivity in the field.

The Allerio mobile hub lets you create a Wi-Fi access point with expanded cellular network coverage of three configured carriers. The hub also has the capability to act as a Wi-Fi client when Wi-Fi is available in situations needed.

1.1. Accessories you'll find in the box

Allerio Hub



USB Cable – Type C



External Plug-in Adapter



Quick Start Guide

1.2. Top Front View

The following figure shows the top front view of the Allerio mobile hub










Number	Description
1	User Interface
2	Power Button
3	USB type C port

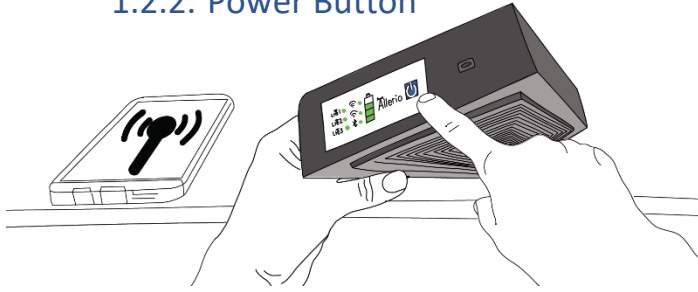
1.2.1. User Interface



The Allerio hub has a very simple user-friendly interface with several LEDs displaying the system status.

POWER		Turn hub ON and OFF
BATTERY		Status of battery charge
USB-C		Connect USB for Charging purposes
LTE 1, 2, 3		Status of hub Connected to Cellular Networks using LTE
WI-FI CLIENT		Status of hub connected to external device(s) using Wi-Fi
WI-FI ACCESS POINT		Status of external device(s) connected to the hub using Wi-Fi
BLUETOOTH		Feature available in the future

1.2.2. Power Button



Press and hold the power button for 3 seconds to power ON/OFF the hub.

1.2.3. USB Type-C port



The Allerio Mobile hub has the capability to receive power using any of the following sources:

- USB cable plugged to the Wall socket through provided external plug-in adapter
- USB cable plugged to the USB port of power source

1.3. Rear View

The following figure shows the rear view of the Allerio mobile hub.



Number	Description
1	Heat Sink
2	Feet
3	FCC Sticker

2. Getting Started

2.1. Power process for your Hub

2.1.1. Power ON Process:

- 1) All LEDs will show solid green for 1 second.
- 2) During core board boot the battery LEDs will cycle one LED at a time from the bottom LED to the Top. Refer to Boot sequence for further details.
- 3) Once the connectivity components begin to boot, the LEDs will start to display in their operating state (Refer to What does your LED status mean?)
- 4) The Wi-Fi access point will begin to broadcast it's SSID and will be available for connection requests from available devices (Refer to Wi-Fi access point connections under Internet connection & management for further details)
- 5) The Wi-Fi client will search for configured Wi-Fi access points (Refer to Wi-Fi client connections under Internet connection & management for further details). If a connection is available, the Wi-Fi client will automatically connect and establish a secure connection.
- 6) All available LTE modems will search for their configured networks, establish a connection then establish a secure link to the Allerio Cloud.

2.1.1.1. Boot Sequence:

- 1) When the system initiates booting all LEDs flash green for 1 second
- 2) Battery LEDs will flash one at a time from bottom to top
- 3) When the core system has booted the LEDs all transition to the operating states.

2.1.2. Power OFF Process:

- 1) The system will terminate all wireless connections – Wi-Fi and LTE.
- 2) All Wi-Fi and LTE LEDs will turn off.
- 3) The Battery LEDs will flash one at a time starting from the top to the bottom what the electronics all shutdown. Refer to shutdown sequence for further details.
- 4) Once shutdown is complete all LEDs will turn off.

2.1.2.1. Shutdown Sequence:

- 1) When the system initiates shutdown the LTE and Wi-Fi lights will all turn off.
- 2) The battery LEDs will flash from top light to bottom during shutdown
- 3) When shutdown is complete all lights will turn off.

2.2. Charging

When the charger is plugged in the battery LEDs will flash (Refer to battery LEDs section for further details).

2.3. Setting up your peripherals

2.3.1. Wi-Fi Access Point

2.3.1.1. Offline Setup

If your device provides an offline setup (Medical Device with a UI, Ex. Patient Monitor):

1. Access the Wi-Fi setup page on your peripheral device.
2. Enter the following information:
 - SSID = Serial Number of your Allerio Mobile Hub
 - Password = Device secure password
3. Set your Allerio Mobile Hub to be the highest priority Wi-Fi network if option is available
4. Your device will automatically search and connect to the hub Wi-Fi when both are active.

2.3.1.2. Available connection Setup

If you are selecting the hub from a list of available connections (Ex. Mobile Devices or Laptops):

1. Access you list of available Wi-Fi devices
2. Enter the following information:
 - SSID = Serial Number of your Allerio Mobile Hub
 - Password = Device secure password
3. Your device will connect to the Allerio Mobile Hub
4. Set your Allerio Mobile Hub to be the highest priority Wi-Fi network to ensure connection when available

2.3.2. Wi-Fi Client

To connect your hub as a Wi-Fi Client, please contact customer care.

3. What does your LED Status mean?

3.1. LTE LEDs:

<i>LED Status</i>	<i>Description</i>
<i>Slow Flashing Red</i>	Initiating Modem/Searching for Network
<i>Solid Green</i>	Connected to network but not the active data channel
<i>Fast Flashing Green (4 times per second)</i>	Active data channel
<i>Solid Red</i>	Modem Error
<i>Off</i>	Powered Off

3.2. Wi-Fi AP LED:

<i>LED Status</i>	<i>Description</i>
<i>Slow Flashing Red</i>	Initializing
<i>Slow Flashing Green</i>	Available
<i>Solid Green</i>	Connected to at least one device (pattern does not change with multiple devices being connected)
<i>Fast Flashing Green (4 times per second)</i>	Actively receiving data
<i>Solid Red</i>	Error
<i>Off</i>	Powered Off

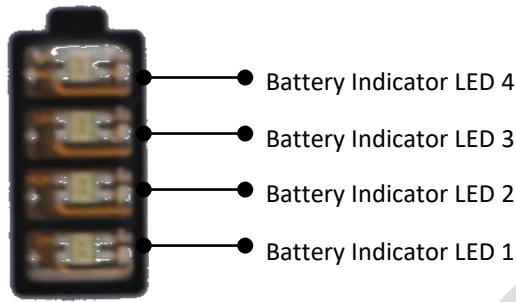
3.3. Wi-Fi Client LED:

<i>LED Status</i>	<i>Description</i>
<i>Slow Flashing Red</i>	Initializing
<i>Slow Flashing Green</i>	Searching
<i>Solid Green</i>	Connected to a Wi-Fi network as client
<i>Fast Flashing Green (4 times per second)</i>	Actively transmitting data
<i>Solid Red</i>	Error
<i>Off</i>	Powered Off

3.4. Bluetooth LED:

<i>LED Status</i>	<i>Description</i>
<i>Off</i>	Powered Off

3.5. Battery LEDs:



<i>Battery Indicator LED #</i>	<i>LED Status</i>	<i>When in Charging Description</i>	<i>When Not in Charging Description</i>
1	Solid Green	Powered ON	
	Slow Flashing Green	Charge <97	-
	Fast Flashing Red	Low Power Mode	
	Quick Flash	Charge >= 97	-
	Solid Red	Error	
2	OFF	Powered OFF	
	Solid Green	-	Charge >25 & Charge <97
	Slow Flashing Green	Charge >25 & Charge <97	-
	Quick Flash	Charge >= 97	-
	Solid Red	Error	
3	OFF	Powered OFF	
	Solid Green	-	Charge >50 & Charge <97
	Slow Flashing Green	Charge >50 & Charge <97	-
	Quick Flash	Charge >= 97	-
	Solid Red	Error	
4	OFF	Powered OFF	
	Solid Green	-	Charge >75 & Charge <97
	Slow Flashing Green	Charge >75 & Charge <97	-
	Quick Flash	Charge >= 97	-
	Solid Red	Error	
	OFF	Powered OFF	

4. Internet Connection & Management

4.1. Onboarding

- At onboarding you will get to select 3 cellular networks for operations from the available certified networks and the hub will be configured to support these networks.
- You will also select the prioritization of the cellular networks based on the operating environment.
- Allerio will source and install SIM cards during assembly.
- The SIM cards cannot be modified with sending the hub to Allerio for service.
- Allerio will also interface with the carriers to manage the data plans on the 3 carriers and ensure that your hub is operating as efficiently as possible.

4.2. Network Management

The Allerio Mobile Hub will actively monitor the configured mobile networks. The device will select the network for active transmissions based on the configured priorities and the quality of service that the available networks are providing.

The core goal of Allerio is to provide you the best available data throughput in any connection environment. Network transmission are seamless to the user and will occur as necessary. If the network does not provide any data throughput it will not be selected for data transmissions. If there is not data connection available on any network, then no data will be able to pass through the hub. The hub will continue to search on all networks and reenale data transmissions as soon as it is available.

The hub has the ability to connect to a Wi-Fi access point for data transmission. Wi-Fi access points that you would like to connect to must be provided to Allerio during onboarding. To connect the hub will need the SSID and Password of that network. (Please refer to setting up your peripherals section for further details.) The hub does not support Wi-Fi networks that require enterprise level connection setup or keys. If the hub connects to a Wi-Fi access point it will prioritize this as the target network and as long as acceptable data throughput is available that will become your active network for data transmissions.

Please ensure that if a hub is in a location with no coverage on any of the configured carriers than it make take 1 - 2 minutes for the hub to reestablish a data connection when returned to an area with coverage.

5. Hub Usage, Charging Management & Portability

5.1. Device Standard Use

- When network connectivity is desired, power ON the hub and ensure all necessary peripherals are connected.
- To shut down the hub, press and hold the power button for 3 seconds and then allow 15 seconds to completely power down.
- When hub is not in use, keep charger plugged in and hub powered OFF.

5.2. Recharge the Hub

The battery of the Allerio hub is located inside the hub and is not removable. To maximize battery life, charge the hub when battery is down to <25%. Refer to battery LEDs under What does your LED status mean section for further details.

To recharge the hub, plug one end of a USB Type C cable into the USB-C port of the hub and the other end can be plugged into any one of the below:

- Into the provided external plug-in adapter



- Directly into a computer USB-C port



The Allerio hub also supports charging with any USB-C connection that provides power. Please refer to general specifications section for further details about charging time/wattage.

5.3. Orientation & Mounting

- For best performance, keep the Allerio logo facing away from any metal surfaces or equipment.
- The hub will be provided with case and carabiners (Deployment: TBD) that could be used to mount the hub.
- The carabiners could be attached to any front or end handles of the stretcher, medical bag or patient monitor for easy handling.

6. Troubleshooting & FAQs

ITEM	SYMPTON	CAUSE	CORRECTIVE ACTION
Data Transfer Failure	All LTE LED indicators are red	The hub is not able to connect to any cellular network	Data throughput should return when hub reconnects to a cellular network
	Wi-Fi Access Point LED is <i>SLOW</i> flashing green	The hub does not have any connection to a Wi-Fi device	Ensure that your external Wi-Fi device is also showing no connection. If not, disconnect your external Wi-Fi device, then reconnect to the hub.
	Data Connectivity remains unavailable	System is in error state	Restart the hub. If problem persists, contact Allerio customer care.
Connection Failure	Hub not detecting the Wi-Fi hotspot or router	Not within Wi-Fi hotspot or router range of 50m.	Ensure you are within range of the Wi-Fi hotspot or router and Restart the hub. If problem persists, contact Allerio customer care.

6.1. Reboot

To reboot when the hub is powered ON, follow the below instructions:

- Hold the power button for 3 secs
- Wait for the power OFF process
- Hold the power button for 3 secs or until the LEDs turn ON
- It may take up to 2 minutes for a stable secure network connection to establish. (Please refer to Power ON process for further details.)

6.2. Factory Reset

If all other troubleshooting actions have not resolved your issue, please contact the customer care for a Factory reset. Refer to the Customer care – contact information at the end of the manual for further details.

7. Specifications

Name	Allerio Mobile Hub
Model	AMH100
Processor	Qualcomm APQ8016E Application Processor
FCC ID	2AV60-AMH100
LTE	Embedded Sierra Wireless EM7455 (FCC ID: N7NEM7455) and EM7511 (FCC ID: N7NEM75S), Cat-6 & Cat-12 LTE Advanced Pro Modem with HSPA fallback
Wi-Fi	jjPlus Module 802.11ac MU-MIMO: WMU6202 (IEEE 802.11 a/b/g/n/ac + BT4.2) (FCC ID: W23-WMU62XX)
Cloud	Amazon Web Services (AWS)
Carriers/Operators	FirstNet, Verizon, T-Mobile, Sprint, US Cellular
Ruggedization	IP55, Impact/Water/Drop Resistant
GPS	Active GPS
Tri-Modem Capable	3 independently operating modems operating on Independent networks customized to field dynamics
External Connectors	USB-C (Charging)
Operating Temperature	-20°C to 50°C
Storage Temperature	-20°C to 25°C (Do not exceed 60°C)
Operating Time	~6 hrs. at regular use
Charging Temperature	0°C to 45°C at maximum power with reduced power from 45°C to 60°C
Charging Time	<3 hrs. at 25°C (with 2700 mA and 8.70 V)
Dimensions	225.5 (L) mm x 189.2 (W) mm x 30 (H) mm
Weight	~ 2 lbs.
Material	Plastic with aluminum heatsink
Input Range	5-20 VDC
Accessories	USB-C Cable and Fast Charging Adapter

7.1. FCC Specifications

As a committed Allerio customer, you are entitled to information regarding the FCC specifications that Allerio is obliged to.

This device complies with part 15 of the FCC Rules for use with cable television service. 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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

As an intentional or unintentional radiator user any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The Allerio mobile hub will be shipped with the USB-C type cable and external plug-in adapter in adherence to FCC guidelines. (Refer to Hub Usage, Charging Management & Portability section for further details). The Allerio hub also supports charging with any USB-C connection that provides power. Please refer to general specifications section for further details about charging time/wattage.

As the Allerio Mobile hub is classified as Class A digital device (A digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home), the following is adhered:

This equipment has been tested and found to comply with the limits for a Class 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. (Refer to section 2.1091 - Radiofrequency radiation exposure evaluation: mobile devices of the FEDERAL COMMUNICATIONS COMMISSION Rules for further details).

FCC Radiation Exposure Compliance Statement: This equipment complies with the FCC radiation exposure limits set forth for an (un)controlled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed to operate with a minimum distance of 20 cm between the radiator and the end-user's body. (Refer to section 7.1: Transmitters used in mobile device exposure conditions for standalone operations of the GENERAL RF EXPOSURE POLICIES FOR EQUIPMENT AUTHORIZATION for further details).

This device must not be disassembled by the user and hence, no instructions are provided for installation by the "assemblers".

8. Data Usage

As a committed Allerio customer, you are entitled to understand how much data you have used and how Allerio is performing by providing ubiquitous connectivity.

8.1. Get Data analytics report

To understand the data usage of your hub, please contact customer care.

A data analytics report will be shared with the client that will cover the following topics:

- Start and End time for the data captured
- Total duration the hub was powered ON
- Network Switches all cellular networks
- Network Statistics that will show network availability in % and in hours all cellular networks
- Cellular quality Metrics that will include SINR, RSRQ, RSSI and RSRP information for all cellular networks
- Latency statistics all cellular networks
- Data usage over time

8.2. View your Data Usage on web browser

This service is in implementation phase and not available yet for the public. Allerio will update all their clients once this service becomes available.

9. Maintenance

9.1. Extend battery life

The Allerio hub is configured to optimize the battery life, by default. It automatically reduces charging levels to protect the life of battery, if plugged in for extended period of time.

Below is a list of factors that impacts battery life:

- Number of connected devices (Wi-Fi and/or Bluetooth) – The more devices connected, the faster the battery power will usually drain
- Wi-Fi range – the better the range, the longer the battery will last
- Cellular carrier signal strength – The better the signal, the longer the battery will last
- Data throughput – Quick burst data transmission will last the battery longer than continuous data transmission
- Use of Allerio provided USB-C cable and external plug-in adapter

9.2. Recommendation & Tips

The following tips lists the best practices for battery usage and care:

- Use Allerio provided USB-C cable and external Plug-in adapter at all possible times
- Connecting large number of devices for streaming large amounts of data reduces the operating time
- To acquire optimum performance, ensure to connect only necessary devices
- Disconnect unused devices at all times for faster performance and longer battery life
- Hub must be stored at given storage temperature at all possible times. For details, please refer to specifications
- Hub must be charged at given charging temperature for given charging time at all possible times. For details, please refer to specifications
- For the following scenarios, if the performance is degraded compared to when the hub was new, please reach to the Allerio customer care for replacement
 - Battery exhibits shorter run time
 - Faster battery discharge at regular use
 - Significantly increased charging time
 - Failure to charge
- All hubs must eventually be replaced due to battery degradation
- Ensure to check updates for latest software and firmware

9.3. Safety

- Do not open the enclosure or disassemble the hub at any time unless otherwise instructed by a senior Allerio team member
- Remove all accessories and power OFF the hub while cleaning
- Hub can be cleaned using any standard disinfectant.
- Clean and dry your hub regularly using a clean, damp cloth. Do not wash under a faucet.
- The Allerio hub has been designed to be ruggedized considering the first responder field use, yet be careful at all times to ensure the hub is not crushed or undergoes high pressure
- Any damage to the hub could result in internal component failure and hence care must be taken at all possible times
- Do not store the hub exceeding storage temperatures for prolonged duration. The battery may explode
- Avoid placing the hub in non-operating temperatures or under direct sun for extended period of time

9.4. Hub Disposal

The Allerio hub is been offered as 'Platform as a service' and not as a product. Please follow the below guidelines when the need to upgrade or disposal of the hub has arrived:

- Contact Customer Care
- Request Customer care for upgrade or dispose
- Mention reasonable motive or list defects
- Follow the instructions given by the customer care agent



9.5. Caution

- Prolonged contact can cause skin irritation or allergies in some users. If you notice any signs of skin irritation, please discontinue use. If symptoms persist, please contact your doctor.
- The hub contains electrical equipment that can cause injury if not handled properly.
- The hub is not a medical device, it is not intended to treat, cure, diagnose or prevent any medical conditions.
- Do not allow children or pets to play with the hub. The hub is not a toy.
- Hub must be handled with care, although it is sturdy and shock resistant.

10. Customer Care – Contact Information

For any additional security vulnerabilities or information visit www.allerio.com and navigate to contact/Support to contact us directly.

You can also contact us directly with any known security or device vulnerabilities.

Email  customercare@allerio.com
Phone  833 – COMMHUB(266-6482)