< Hicare Hub User's Manual >

2021. 7. 20.

0. Hicare Hub Overview

1) Overview

- Dedicated telehealth mobile communication and Wi-Fi hub device

- A base station with a portable hot spot concept that can extend the network function of remote patient monitoring service by connecting to an existing tablet PC, etc.

2) Function

- Hub device function for interworking with multiple USB-based medical devices

- Mobile communication Wi-Fi wireless router dedicated to telemedicine

- perates as WiFi-PPP AP based on mobile communication 2G/3G/LTE/5G/PSTN in areas where the local Internet environment is not established

  (This function is available when an external modem is connected to the rear USB port (Modem) of this product. (Example: USB PSTN modem, USB LTE egg, etc.)

- Fast charging of Tablet PC through USB of base station and automatic switching of wired USB communication
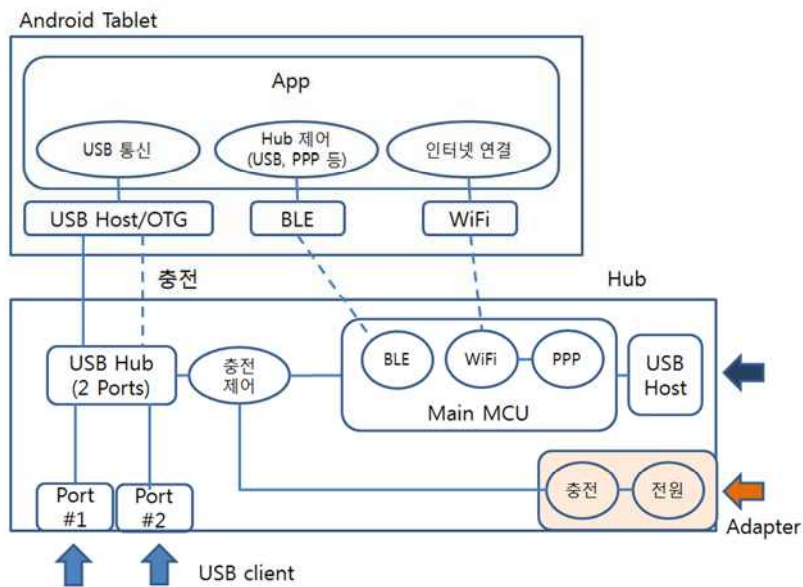
1. Product Components

- Main Body, AC Adapter(5V/3A), C to C Cable

2. Specification

1) Block Diagram

2) Specification

Main MCU	ESP32 (Built-in WiFi, BT)
- MCU	Single core 32 bit Microprocessor
- Memory	448 KB ROM
	520 KB SRAM
	4MB FLASH Memory
- Peripheral Interface	34 x Programmable GPIOs
	4 x SPI
	2 x I2C
	3 x UART
- WiFi	802. 11 b/g/n
	802.11 n(2.4GHz) up to 150Mbps
- BT	Compliant with Bluetooth v4.2 BDR/EDR and
	BLE Specification
	+12 dBm Transmitting power
	NZIF receiver with -94 dBm BLE sensitivity
USB Controller	USB2412
- Client	2 Ports
- Function	Tablet fast charging mode (~ 1.5A)
	Data communication with USB device (USB Host Mode)
USB Host	STM32 USB Host Support model
- USB host	MODEM Connection

LED Display function	
- Power	Power input status
- USB	USB device connection status
- WiFi	Internet connection status
인터넷 연결기능	Works as a WiFi router
- LAN	WiFi AP
- WAN	PPP-PSTN Modem
- IP Forward, NAT	
F/W Download	Wired, wireless (OTA) download support
Power	AC Adapter (5V/3A)
Dimension (WDH)	280x130x25(88) mm

3. Operation Description

0. preparations

   A. Hub power connection

   B. Modem connection

   C. Step A and Step B do not need to be in any order

1. Hub Status check & Control

   A. Current status and hub control with BLE communication

   B. Action scenario

      i. BLE Scan

      ii. hicare_BLE_... Find anf connection

      iii. Send status check command to BLE

         1. Example) at+status?

         2. Response content (Example)

            A. Internet connection related status

               i. Internet: Not connected

               ii. WiFi: Off

               iii. PPP: Not Connected

                  1. Server tel: 1234

                  2. User: hicare

                  3. Password: 5678

          iv.   Modem: Ready

        B.   USB Status

          i.   Mode: Charging

          ii.   Tablet: Connected

          iii.   USB Device #1: Connected

          iv.   USB Device #2: Not connected

   C.   You can keep the BLE connection, or you can connect and use it only when necessary.

2.   Internet connection scenario

   A.   After BLE connection

   B.   Send internet connection command

      i.   Example) at+internet=start

   C.   Subsequent state change monitoring

   D.   When the Internet connection is ready, the status changes to:

      i.   Example)

          1.   Internet: Ready

          2.   WiFi: On

          3.   PPP: Connected

          4.   Modem: Ready

   E.   WiFi Scan

   F.   hicare_AP.. Find and connection

   G.   Current password is not set.

3.   USB usage scenarios

   A.   After BLE communication connection

   B.   Send communication command with USB device

      i.   Example) at+usbmode=com

   C.   Check status afterwards

      i.   USB Status

          1.   Mode: Comm

          2.   Tablet: Connected

          3.   USB Device #1: Connected

          4.   USB Device #2: Not connected

   D.   USB device usage

E. When you want to return to again charge mode

    i. Example) at+usbmode=charging

4. (Note) PPP Server preparation

  A. Run the following command on the server side: sudo pppd /dev/ttyACM0

  B. A few AT commands are being performed and waiting

    i. ...

    ii. AT S0=1

    iii. OK

  C. (Precautions)

    Since there is a timeout, if you stay in this state for a long time, it exits to the shell prompt from waiting. In this case, you have to run it again.

  D. Check server connection

    i. Looking at the PPP server side,

    ii. After RING, related logs are uploaded,

    iii. Ip-up ... If it goes up to finished , it means that the PPP is connected.

      1. Script /etc/ppp/ip-up finished (pid 69802), status = 0x0

FCC compliance information

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.

Note: This equipment 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 equipment 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 communications. 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, the user is 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 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/TV technician for help.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter.
A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements.