

ARISTA

User Manual

Project Name	ARNI_C400
Revision	A0_01
Date	

Revision History

Date	Rev No.	Description	By
	A0-01	Initial Draft Release	VVDN Technologies

System Overview

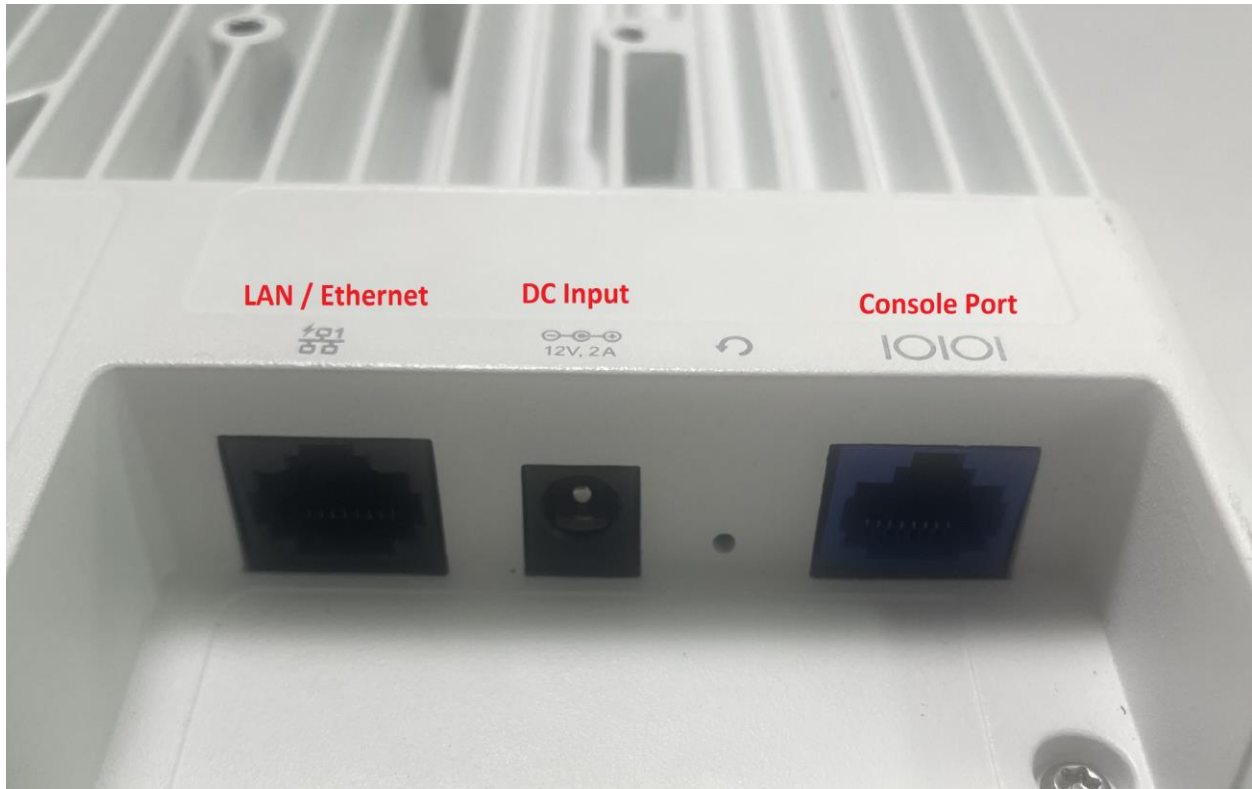
The Wi-Fi 7 Tri-Band Indoor Access Point would provide next-generation Wi-Fi 7 connectivity at reliable and high speeds to wireless devices and is designed based on Qualcomm's IPQ5322 chipset also known as Miami. The product supports connectivity on three radio bands: 2.4 GHz, 5 GHz & 6 GHz. It is backward compatible with previous generations of Wi-Fi (IEEE 802.11ax/ac/n/g/b/a). The AP design will be based on Integrated Antennas. The AP will be powered with a single PoE+ IEEE802.3at Type-2 compliant switch/injector or using an external AC to 12 V DC Power adapter.

Parameters	Description
Processor	Qualcomm's Miami Platform-based IPQ5322 Wi-Fi 7 SoC
IEEE Wi-Fi Standard Support	6 GHz - 802.11be 2x2:2/320 MHz 5 GHz - 802.11be 2x2:2/160 MHz 2.4 GHz - 802.11be 2x2:2/40 MHz - Backward compatibility to 802.11 a/b/g/n/ac/ax
Wi-Fi Peak Theoretical Data Rate	5765 Mbps for 6 GHz at 802.11be 2x2/320 MHz, MCS13 2882 Mbps for 5 GHz at 802.11be 2x2 /160 MHz, MCS13 688 for 2.4 GHz at 2x2/40 MHz, MCS11* *Note: Miami supports up-to 1k QAM or up-to MCS11 only for internal 2.4 GHz radio band
Wi-Fi Max Tx Power	Per Chain RF Output Tx Power 2.4 GHz(With iPA)* @MCS0: 21dBm +/- 1.5 dBm @MCS13: 15 dBm +/- 1.5 dBm 5 GHz(With iPA) @MCS0: 19 dBm +/- 1.5dBm @MCS13: 13.5 dBm +/- 1.5dBm 6 GHz(With iPA) @MCS0: 18.5 dBm +/- 1.5dB @MCS13: 13 dBm +/- 1.5dB
Tx Power adjustment step size	1 dBm

Antenna & RF Cable	● Internal (Stamped metal Antenna) ○ Frequency ▪ 2400 MHz – 2483 MHz ▪ 4900 MHz – 5850 MHz ▪ 5925 MHz – 7125 MHz ○ Peak Gain ▪ ≥ 4 dBi@ 2.4~2.4835 GHz ▪ ≥ 5 dBi@ 4.9~5.85 GHz ▪ ≥ 5 dBi@ 5.925~7.125 GHz ○ Return loss ▪ ≥ 10 dB ○ Efficiency ▪ Single band efficiency of $\geq 75\%$ at all frequencies for internal antennas ○ Voltage Standing Wave Ratio (V.S.W.R) ▪ ≤ 2.0 @ 2.4~2.4835 GHz ▪ ≤ 2.0 @ 4.9~5.85 GHz ▪ ≤ 2.0 @ 5.925~7.125 GHz ○ Polarisation ▪ Linear ● RF Cable Insertion loss between module and antenna ○ $\leq 0.5\text{dB}$@2.4~2.4835 GHz ○ $\leq 1\text{dB}$@4.9~5.85 GHz ○ $\leq 1\text{dB}$@5.925~7.125 GHz
MIMO Support	● 2X2 MIMO for 6 GHz band ● 2X2 MIMO for 5 GHz band ● 2X2 MIMO for 2.4 GHz band
Channel BW Support	● 6 GHz : 20/40/80/160/320 MHz for 2X2 ● 5 GHz : 20/40/80/160 MHz for 2X2 ● 2.4 GHz : 20/40 MHz for 2X2
Visual Indicators	● Status LED: 5x Bi-color LEDs (Red/Green) ● RJ45 LED : Green & Yellow Bi color LEDs
Powering	● 12 V / 2 A = 24 W, External AC to DC Power Adapter ● IEEE 802.3at/ 802.3af * PD
Power Consumption	● 21 W(<i>approx</i>) (with Full functionality)
Interfaces	● 5 Giga-bit Single Port Copper Ethernet - RJ45 Connector with Discrete Magnetics supporting 802.11at/af* PD ● Real-time clock with battery

	● RS232 Single Port Serial Console - RJ45 Connector ● DC power connector - Center +, 12V DC Plug 5.5mm*2.1mm*L9.5mm plug ● Pin-hole reset
Environmental	● Operating Temperature: 0 °C to 45 °C ● Relative Humidity: 5% to 95% non-condensing
Min. Volatile Memory Support	● 2 GB DDR4
Min. Non-Volatile Memory Support	● 8 GB eMMC Flash ● 16 MB SPI NOR Flash

Device User accessible Connectors in C400 device



How to take SSH Access of the device:

- 1.Power on the device.
- 2.Connect the LAN client to the C400 device to LAN/Ethernet Port.
- 3.Go to a LAN client.
- 4.Check whether from the LAN Client are we able to ping C400 device (ping <device IP>
- 5.Take the SSH of the device. (**ssh root@<device IP>**)

Default C400 IP - 192.168.1.1

Default login details:

User Name: root

Password : arista@123

For your reference:

```
vvdn@2608--QA--C:~$ ssh -o KexAlgorithms+=diffie-hellman-group1-sha1 root@192.168.1.1

BusyBox v1.36.1 (2025-01-13 12:02:35 UTC) built-in shell (ash)

      MM      NM      MMMMMMMM      M      M
    $MMMMM    MMMMM    MMMMMMMMMMMM    MMM    MMM
    MMMMMMMM    MM    MMMM    MMMMM:MMMMMM:    MMM    MMMMM
    MMMM= MMMMMMM    MM    MMMM    MMMMM    MMMM    MMMMM'
    MMMM= MMMMM    MMMM    MM    MMMMM    MMMM    MMMMM
    MMMM= MMMM    MMMMM    MMMMM    MMMM    MMMM    MMMMM
    MMMM= MMMM    MMMMM    MMMMM    MMMM    MMMM    MMMMM
    MMMM= MMMM    MMMMM,    NMMMMMMMMM    MMMM    MMMM    MMMMMMMMMMMM
    MMMM= MMMM    MMMMM    MMMMMMMMM    MMMM    MMMM    MMMM    MMMMM
    MMMM= MMMM    MM    MMMM    MMMM    MMMM    MMMM    MMMM    MMMM
    MMMM$ ,MMMMM    MMMMM    MMMM    MMM    MMMM    MMMMM    MMMM    MMMM
    MMMMMMM:    MMMMMMM    M    MMMMMMMMMMMM    MMMMMMM    MMMMMMM
    MMMMMMM    MMMMMN    M    MMMMMMMMMMM    MMMM    MMMM
    MMMM      M      MMMMMMMM      M      M

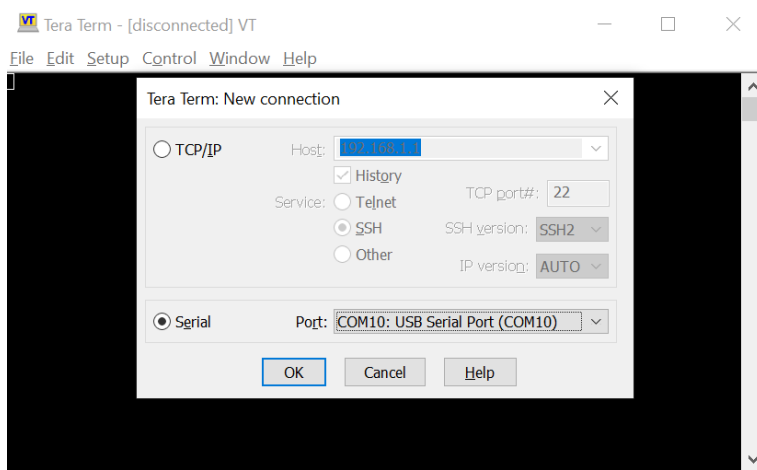
-----
For those about to rock... OpenWrt 23.05-SNAPSHOT, r0-3b4224a00
-----
=== WARNING! =====
There is no root password defined on this device!
Use the "passwd" command to set up a new password
in order to prevent unauthorized SSH logins.
-----
root@OpenWrt:~#
```

How to take Console Access of the device:

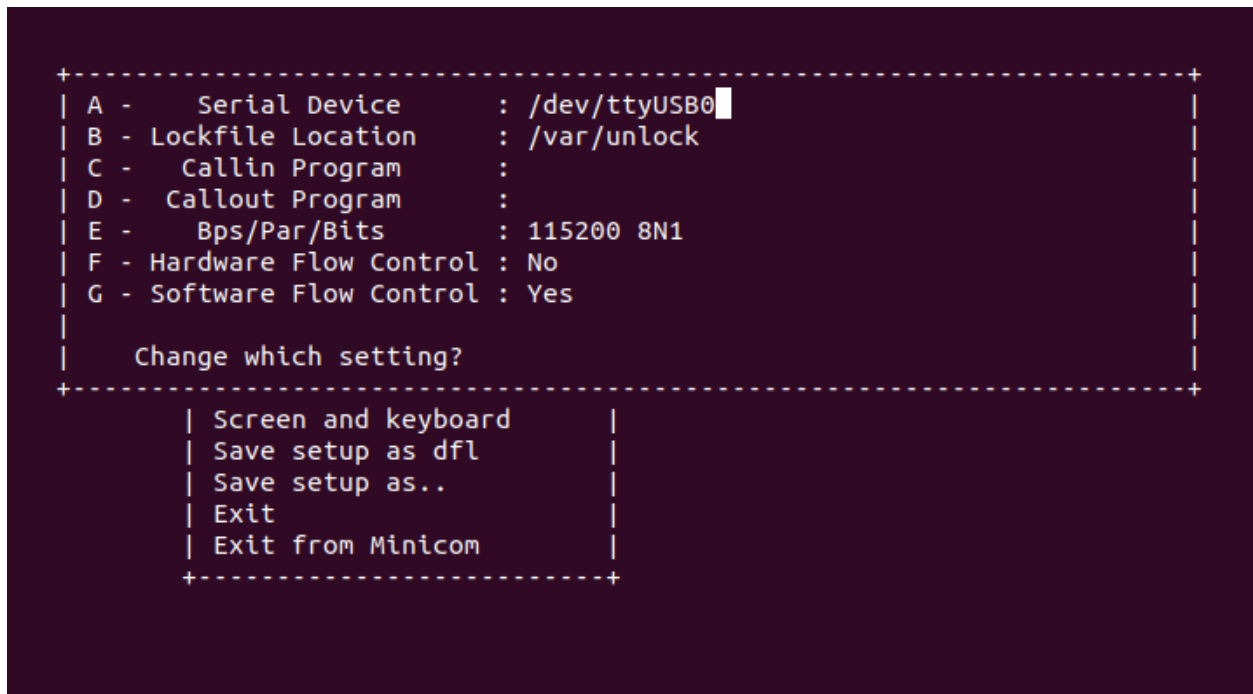
1. Power on the device using DC Power or POE
2. Connect the console cable from C400 device console port to PC or Laptop.
3. Go to PC or Laptop terminal.
4. [Linux]Execute the “sudo minicom -s” and give the password of the laptop or pc.

```
vvdn@2608--QA--C:~$ sudo minicom -s
[sudo] password for vvdn:
```

[windows] use Teraterm or Putty for Console access and select the COM PORT



5. Configure the minicom [Linux]



Tera Term: Serial port setup and connection

Port:	COM10	New setting
Speed:	115200	
Data:	8 bit	Cancel
Parity:	none	
Stop bits:	1 bit	Help
Flow control:	none	

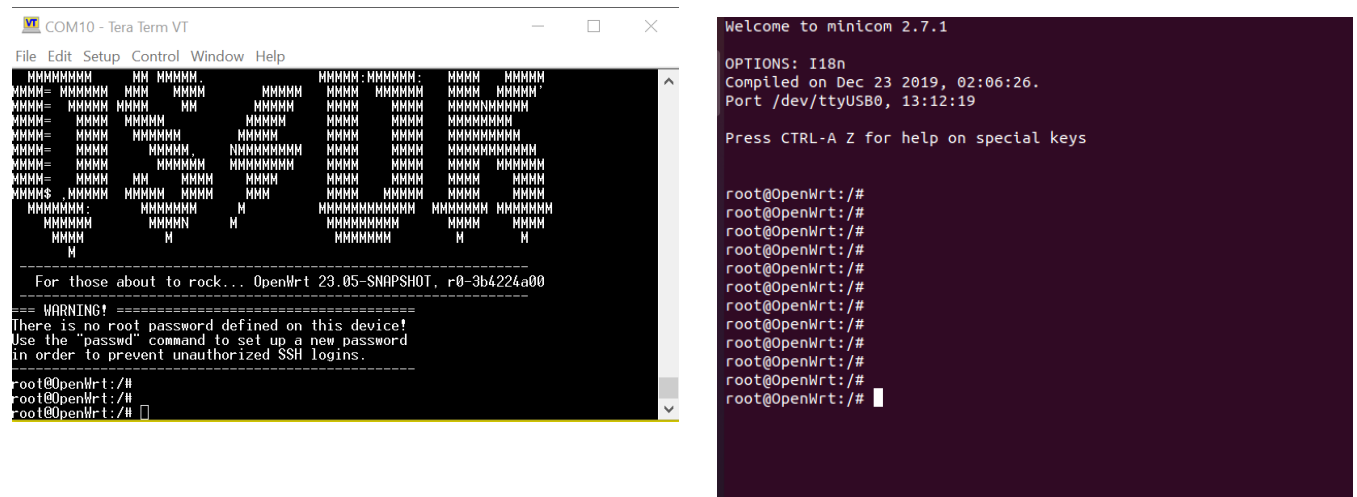
Transmit delay

0	msec/char	0	msec/line
---	-----------	---	-----------

Device Friendly Name: USB Serial Port (COM10)
Device Instance ID: FTDIBUS\VID_0403+PID_6001+FTB6SPL3A\00C
Device Manufacturer: FTDI
Provider Name: FTDI
Driver Date: 7-5-2021
Driver Version: 2.12.36.4

6. Save and exit.

Reference:



FTM Commands Steps and Procedure

Once the board gets boots up, then we need to run below commands to set FTM mode and transmit all chains in Full Power

// below commands for setting the board to FTM mode

```
uci set wireless.wifi0.disabled=1
uci set wireless.wifi1.disabled=1
uci set wireless.wifi2.disabled=1
uci set wireless.qcawifi=qcawifi
uci set wireless.qcawifi.testmode='1'
uci commit
sync
wifi load
```

// Below commands for setting full power in each radio

```
myftm -J -i wifi1 -l 0 -f 2442 -M 2 --rateBw 30 --gl 52 -r 20 --nss 1 -a 3 -k 1 -z 1 -p 24 -Y
00:03:7F:44:55:81 -s 64000 --dpdflag -t 3
```

```
myftm -J -i wifi0 -l 0 -f 5500 -M 2 --rateBw 30 --gl 52 -r 20 --nss 1 -a 3 -k 1 -z 1 -p 20 -Y
00:03:7F:44:55:81 -s 64000 --dpdflag -t 3
```

```
myftm -J -i wifi2 -l 0 -f 6515 -M 2 --rateBw 30 --gl 52 -r 22 --nss 1 -a 3 -k 1 -z 1 -p 16 -Y
00:03:7F:44:55:81 -s 64000 --dpdflag -t 3
```

//To turn off the Transmitter need to run below commands

```
myftm -J -i wifi1 -l 0 -f 2442 -M 2 --rateBw 30 --gl 52 -r 20 --nss 1 -a 3 -k 1 -z 1 -p 24 -Y
00:03:7F:44:55:81 -s 64000 --dpdflag -t 0
```

```
myftm -J -i wifi0 -l 0 -f 5500 -M 2 --rateBw 30 --gl 52 -r 20 --nss 1 -a 3 -k 1 -z 1 -p 20 -Y
00:03:7F:44:55:81 -s 64000 --dpdflag -t 0
```

```
myftm -J -i wifi2 -l 0 -f 6515 -M 2 --rateBw 30 --gl 52 -r 22 --nss 1 -a 3 -k 1 -z 1 -p 16 -Y
00:03:7F:44:55:81 -s 64000 --dpdflag -t 0
```

FCC Compliance 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.

2.1 OPERATING REQUIREMENTS AND CONDITIONS The design of Device complies with U.S. Federal Communications Commission (FCC) guidelines respecting safety levels of radio frequency (RF) exposure for Mobile devices.

2.2 RF Radiation Exposure Statement This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

2.3 FCC PART 15 STATEMENT § 15.105 (Class B digital device) 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.

FCC CAUTION STATEMENT FOR MODIFICATIONS CAUTION: Any changes or modifications not expressly approved by Arista could void the user's authority to operate the equipment.

IC Caution: This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device. RF exposure statement: The equipment complies with IC Radiation exposure limit set forth for uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. 5150-5250MHz is for indoor use only.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : 1. L'appareil ne doit pas produire de brouillage; 2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Déclaration d'exposition RF: L'équipement est conforme à la limite d'exposition aux radiations de la IC établie pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.