EmStation 2.0 Datasheet

Product Name: EmStation 2.0

Model No.: EMGL-A20-915A-08A-0-G0

Edition: V2.0

Content

1 Product Introduction

1.1 EmStation Production

EmStation is Relay Station for End-device and Internet sever. LoRa EmStation is in the central of LoRa star network, which is multi-channels receiver and sender, and it's a communication bridge for End-devices with Server. End-devices communicate with EmStataion by LoRa, and EmStation communicate with Server by standard IP communication.

LoRa Network Structure Chart as follows,
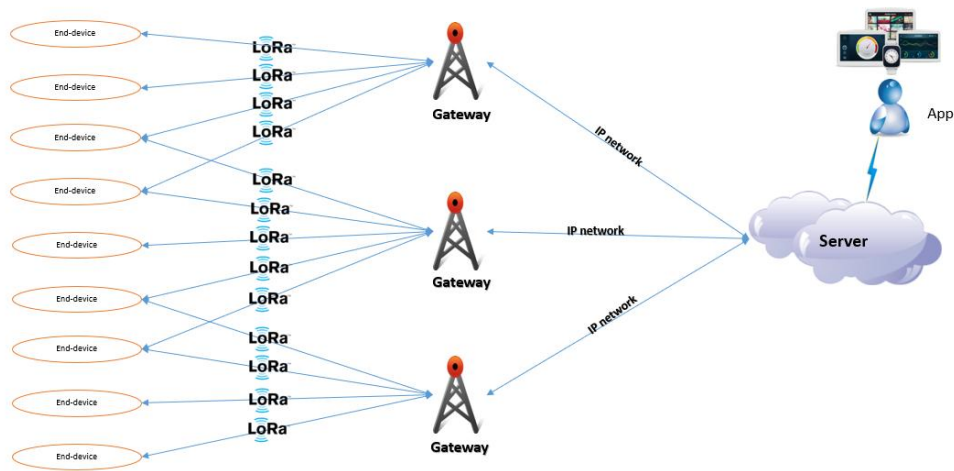
Picture 1-1 LoRa Network Structure Chart

LoRa EmStation 2.0 is self-developed, produced and sold by Emaga. EmStation2.0 Communication channels quantity increased to 16 and can implement double channels communication, which can improve communication rate greatly compare to V1.0. Size of EmStation 2.0 is 30mmX200mmX60mm, which is the half size of V1.0, which can save much more installation space. Meanwhile, EmStation 2.0 retain the long range and low power consumption features. Power consumption is only 8W for double-channels EmStation 2.0, and the transmit range can up to be 10 KM.

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1.2 EmStation Interface Definitation

Antenna ports

GPS

4G

LoRa
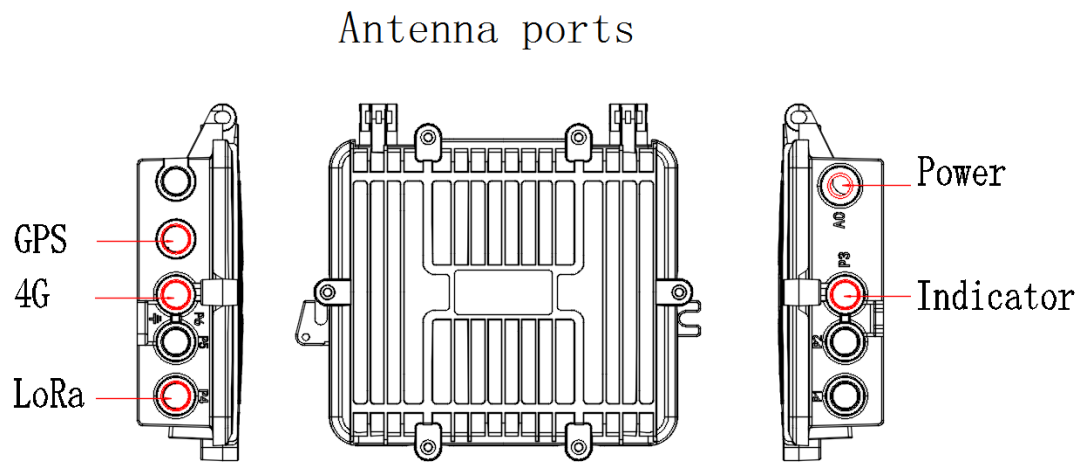
Power

Indicator
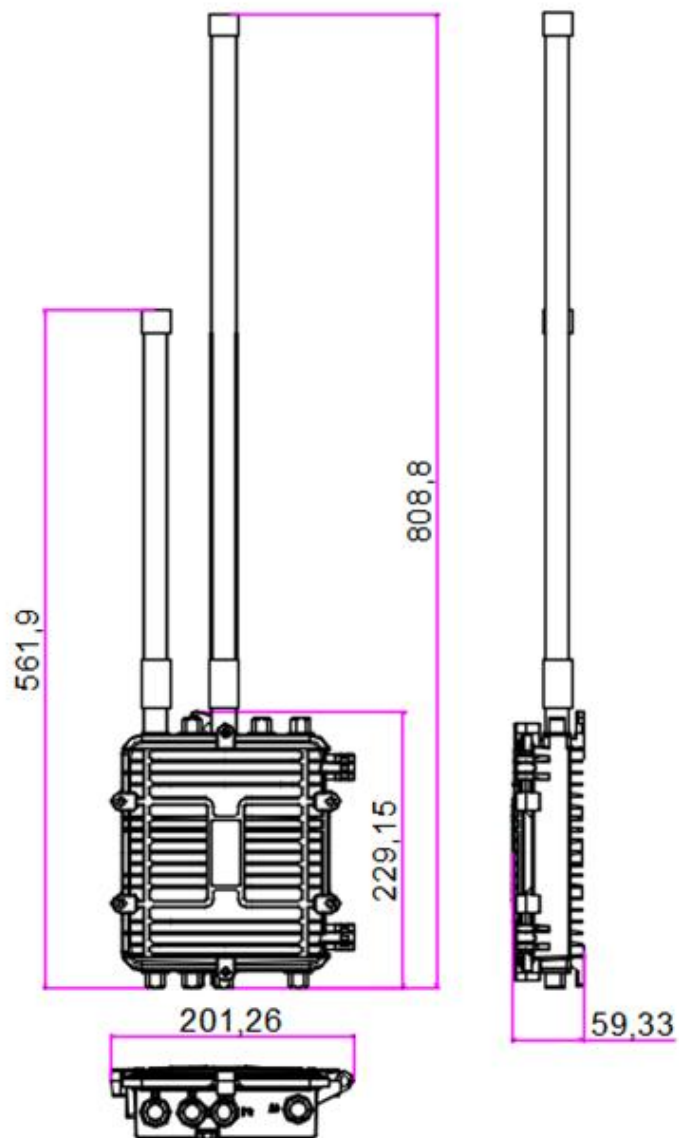
Picture 1-2 EmStation Interface Definition

GPS: GPS Interface
4G: 4G Main Antenna Interface
LoRa: LoRa Antenna Interface
Power: Power Interface
Indicator: Indicator

1.3 EmStation Structure

EmStation 2.0 Dimension Before Antenna Installation: 230mmX200mmX60mm
EmStation 2.0 Dimension After Antenna Installation: 810mmX200mmX60mm.

Picture 1-3 EmStation 2.0 Structure Dimension

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1.4 EmStation Features

✧ EmStation 2.0 is in smaller size, dimension before antenna installation is only 230mmX200mmX60mm, needed space for installation is small which it's convenient to installation.

✧ EmStation 2.0 communication channels is 16, and can implement double-channels communication, which means gateway can send and receive data in the same time.

    ✧ Add Indicator. Check indicator to get the gateway status:

Green Indicator:

Slow Flash (1 time per second): System start

Quick Flash (10 times per second): Connect to Internet successfully

Indicator Light keeps on: Lora start successfully

Red Indicator:

Slow Flash (10 times per second): sim card identification unsuccess.

Slow Flash (1 time per second): Bad 4G RSSI

✧ EmStation 2.0 acceptable power types: POE, Internal AC-DC Power module, External AC-DC Power module.

✧ EmStation 2.0 power consumption is low, power is less 8W when using 2 pieces of 1301 modules.

✧ Long transmission range:

Urban area in 20m height: 3km

Suburb area in 30m height: 5km

Open space in 50m height: 10km

2 Technical Specification

2.1 EmStation 2.0 Technical Specification

Table2-1 EmStation 2.0 Technical Specification

Mater Control	Mater Control	Industrial CPU
	Internal Storage	1GB
	GPS	Active GPS, 1575.4Mhz Cold Start=29s，Hot Start=1s， Tracking=-166dBm，Reacquistion=-156dBm，
	LoRa	Band 902MHz-928MHz
	4G	FDD Band Ⅱ，Band Ⅳ，Band Ⅴ，Band Ⅶ
	LoRa Wireless reception sensitivity	Max -140dbm @LoRa; -95dbm
	Communication Channels	communicationChannels：8CH
	Antenna Type	External Antenna N type
Hardware Specification	Internet Interface	1 100Mbps Ethernet, 1 4G Module
	Power Voltage	POE Power, Internal AC-DC Power Module, External AC-DC Power Module
	Work Current	Power On: < 5V/500mA
		Max: < 5V/1.5A
		GPS and 4G Start:< 5V/800mA
	Local Storage	Internal 32GB Memory Card
	Work Condition	Work Temperature: -30℃~+50℃
		Humidity: 10%~90%RH No Condensation
Structure Specification	Dimension	230mmX200mmX60mm
	Weight	1.8 kgs

2.2 Antenna Technical Specification

Table2-2 Antenna Technical Specification

Electrical Specification		
RF Range	470MHz	806-960/1710-2690MHz
Input Impendence	50Ω	50Ω
SWR	≤2.0	≤3.0
Power Capacity	50W	50W
Transmission Gain	4dBi	4dBi
Horizontal Beam Width	360°	360°
Polarization Mode	Vertical Polarization	Vertical Polarization
Radiation Direction	All-around	All-around
Connector	N-J	N-JW
Mechanical Specification		
Antenna Length	700±5mm	400±3mm
Antenna Housing Color	Grey	White
Coaxial cable	/	/
Condition Specification		
Work Temperature	-40~55℃	-40~55℃

3 Installation Instruction

3.1 Sim Card Installation

A. Anticlockwise unscrew the six screws on the EmStation by hexagonal screwdriver.

B. Push the metal 4G clip in the indicator way to pull the metal clip.

Push Direction

C. Put the 4G card to the card holder in a right way. Nick of 4G card should be in the same way of nick of card holder.

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D. Push the 4G metal clip in the opposite way of indicator , then installation of 4G card is finished.

Push Direction

E. Clockwise screw the screws by hexagonal screwdriver.

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3.2 Antenna Installation

A. EmStation main antenna: 4G, LoRa, GPS, picture as follows,

B. Align the glass head of antenna to the relative interface in the gateway, rotate clockwise the sleeve and fix to the gateway.

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3.3 CMS Control Management System

A. Login Address: http://www.loramind.com/

B. Choose the relative server location according to the server used. For instance, choose China when use in China.

C. Choose BaldurMind.
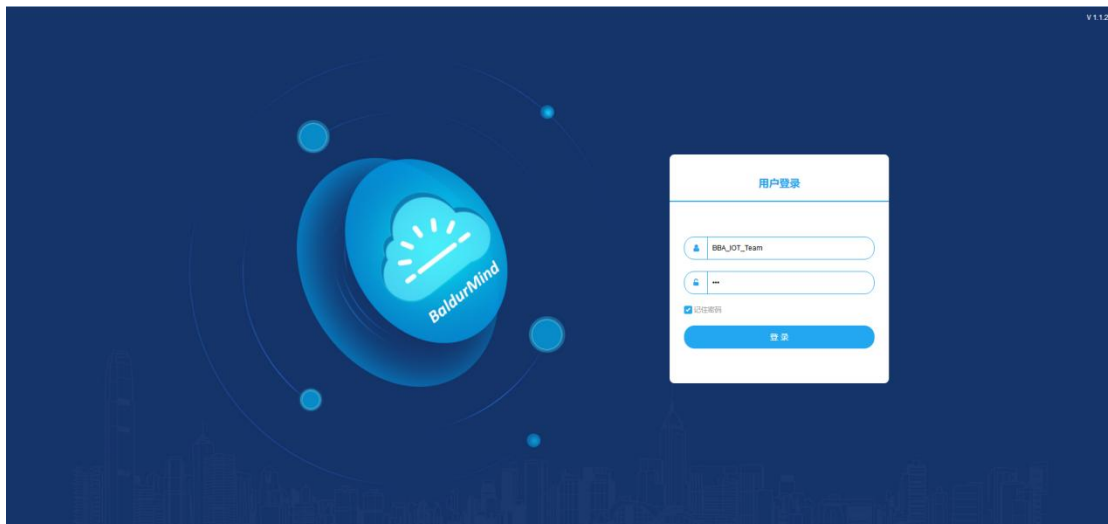
D. Input Account and Password, choose "Management-Assert-Import Gateway".
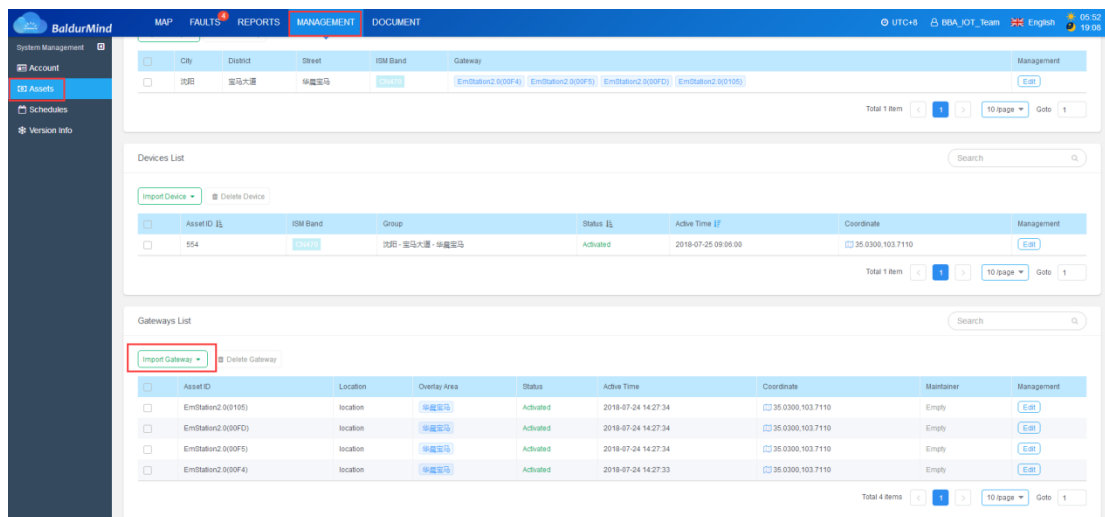
E. Add gateway individually, choose "Import Gateway-Single Gateway", input the details of gateway.

F. Add multi gateways, choose"Import Gateway-Multi Gateway"，input gateway details according to the sample. Upload gateway CVS file, then click "Upload "to add

G. Activating EmStation ， Base Station can be added to one light group in the"Management-Assets Management-Import Group".

H. Check the status of EmStation，Choose"MAP-Light group-Gateway"，Online in green indicates connected, red indicates unconnected.
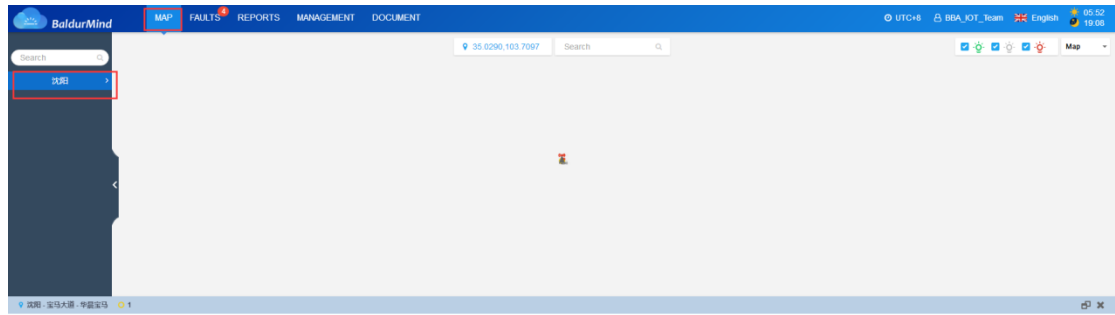
Name	Online	Type	RSSI
EmStation2.0(00F4)	📶	-	-
EmStation2.0(00F5)	📶	-	-
EmStation2.0(00FD)	📶	-	-
EmStation2.0(0105)	📶	-	-

4   Common Problems

4.1 EmStation Unconnected（1）

Reason：Incorrect Antenna Connection
Approach：Check if the antennas are installed correctly according to instruction, if not, please reconnect the antenna in right way, and reboot the base station.

4.2 EmStation Unconnected（2）

Reason：Poor 4G Network
Approach：Check if the 4G network connection is stable, if not,try to move gateway to another place with better 4G signal, or use POE cable to establish connection between gateway with IP network through LAN.

4.3 EmStation Unconnected（3）

Reason：No 4G SIM card, or Invalid 4G SIM card
Approach：If the gateway is still unconnected in a environment with stable 4G signal, please open the gateway, see if there is a 4G SIM card correctly placed. If 4G SIM card is correctly placed, try to check whether the 4G SIM card is still valid or has expired.

4.4 Unable to Boot EmStation

Reason：Wrong Power Cable Connection
Approach： Switch the position of Positive and Negative node of the gateway power supply, power wiring as below picture.

5   Cautions

otherwise gateway cannot work. Please refer to correct connection diagram as picture1.2；
✧ EmStation can support 3 kinds of different power input: POE,Interior AC-DC, External AC-DC. Please confirm with us the required power supply in advance；
✧ EmStation should be used at places as far away as possible from any metal environment, or it will affect the communication distance；
✧ If it has to open the gateway for module maintenance, maintainer must wear anti-static
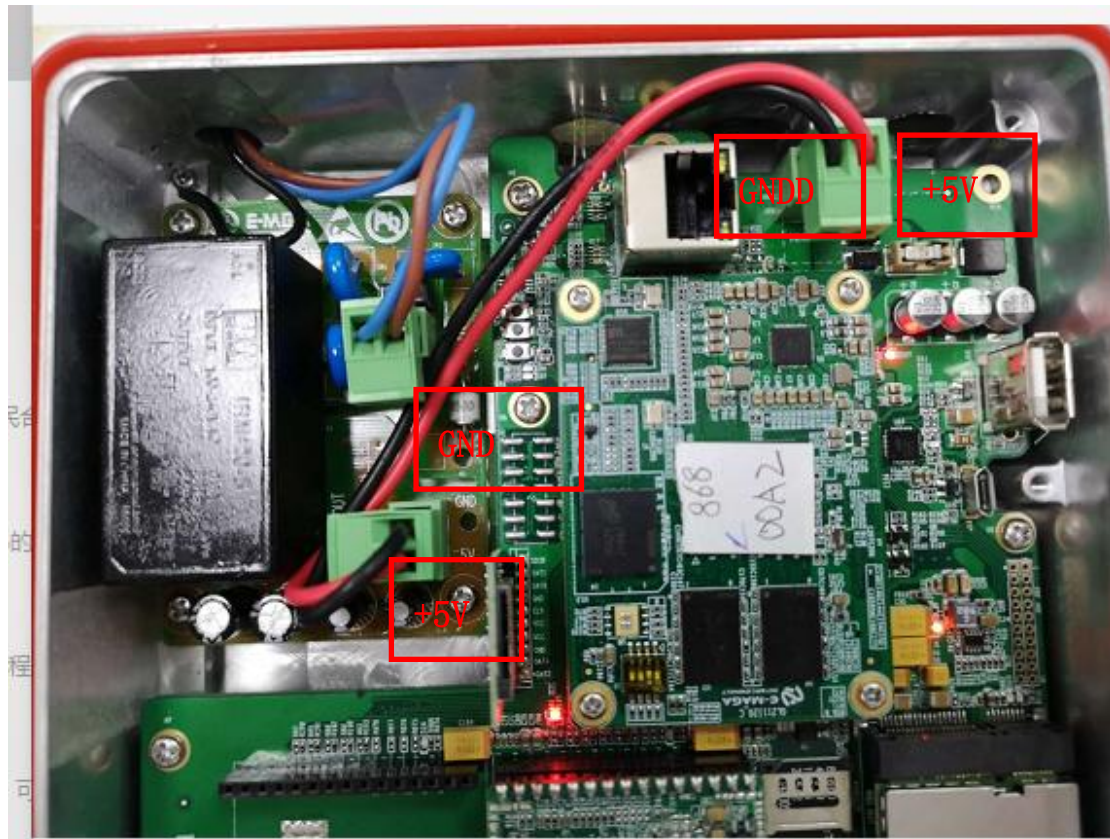
✧ wristband;
✧ Installing or removing antenna from gateway require power off in advance, otherwise may cause irreversible damage to LoRa module;
✧ Pulling or Plugging the modules(4G, Central Board, LoRa) in the gateway with power on is prohibited, other wise may cause irreversible damage to those modules;
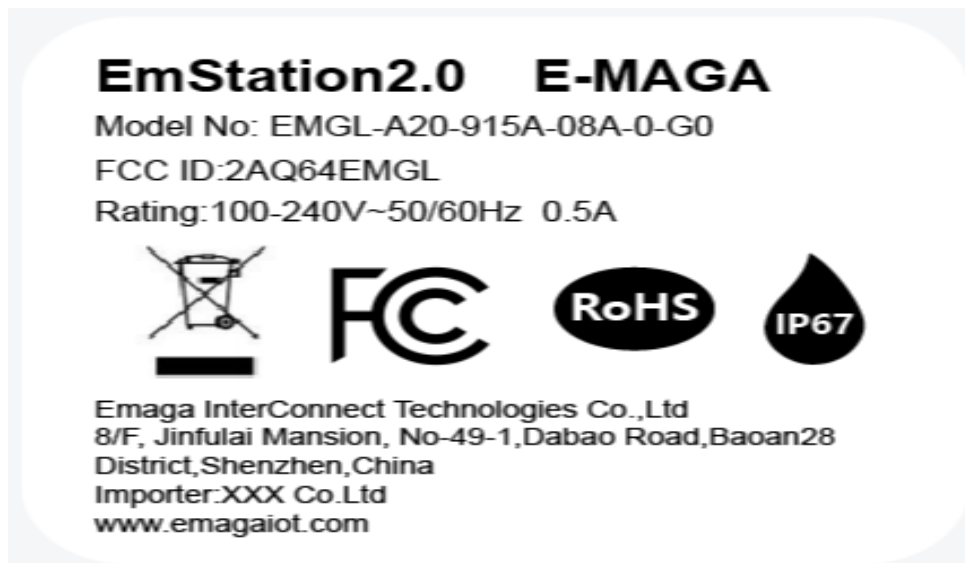✧ Must not pull or plug the 5V power cable with power on, otherwise may cause irreversible damage to 4G Module.

6   CE Label：

Size：L=60mm，H=30mm

EmStation2.0   E-MAGA
Model No: EMGL-A20-915A-08A-0-G0
FCC ID:2AQ64EMGL
Rating:100-240V~50/60Hz 0.5A

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7 Manufacturer

Manufacturer：

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9 Warning:

1, Before powering on the gateway, MUST make sure that antennas have been installed correctly, and screws have been tighten up.

2, MUST not dismantle any components of the gateway while power on, including replacement of antennas.

FCC Note:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

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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 followingmeasures:

-- 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.

To maintain compliance with FCC's RF Exposure guidelines, The 20cm is the minimum distance that has to be maintained between your body and the device.