

Reference FCC ID:AS5CU232V200WANUS
Correspondence reference number: 13810
731 conformation number: EA97431

subject: Response to FCC MPE exposure questions and concerns.

Attn: Mr. K. Chan

Dear Mr. Chan

We hereby respectfully acknowledge and respond to your questions and concerns in your email dated 3 May.

1. Please provide a list of all antennas applicable for this filing. Test report indicates a 13 dBi internal antenna and an 8 dBi Omni antenna. User manual has many other antennas for this Central Unit and associated remote modem. It is unclear which antennas are applicable for the current filing.

Response: See below table for antennas applicable for this filing. The manual has been revised to clearly show the antenna information applicable to the country where the equipment is being marketed.. See manual page iv and 7-6.

CU232 Antenna type	Model	Gain (dBi)
Internal Sector (embedded panel antenna)	N/A	12
External Omni	OM08	8

2. The users manual has included a warning statement requiring the antenna installers to provide a separation distance of 30 cm between the antenna and persons. Please provide supporting information and estimated calculations to verify the appropriateness of this proposed distance for ensuring MPE compliance.

Response: The manual has been revised to include a MPE boundary table of minimum separation distances between any persons and the antenna in use. See manual page iv, vi, and 7-9.

The rationale used to determine the MPE distance is based on the conventional formula:

$$S = PG/4\pi R^2$$

Where:

S = power density

P = power input to the antenna (0.250 watts)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator (see Table 1)

R = distance to the center of radiation of the antenna.

Based on a maximum antenna input power of 0.250 watts¹ and setting S to 1 mW/cm² the resulting minimum distances for the various antenna available for use becomes:

$$R = (PG/S4\pi)^{\frac{1}{2}}$$

CU232 Antenna type	Numeric gain over isotropic	MPE distance (cm)
Internal Sector (embedded panel antenna)	16	18cm
External Omni	6.3	11.2

3. The proposed installer warning statement has some suggested language for responsible parties to post caution signs when antenna installation cannot provide the needed separation distance. To satisfy RF exposure compliance requirements, the antennas should be installed so that the minimum separation distance is there for satisfying compliance. It should not be left up to the installers to post caution signs to satisfy compliance unless precise Warning/Caution labeling requirements are available, including label size, posting locations etc. The second paragraph in this section (page 7-9 of manual, appears to be the proposed caution sign languages), asks for 1 ft separation between the unit. The separation distance should be between the unit's antenna and all persons. Based on separation distance determined in item # 2 above, please revise manual pages accordingly and upload relevant pages. If signs are used, it should indicate it is for FCC RF exposure compliance requirements.

Response: The CU232 has an EIRP £4 watts and is installed and used in such a way that generally there is a separation distance of at least 20 centimeters normally maintained between the antenna and the body of the user or all nearby persons. The installation manual has been revised to contain a user cautionary statement concerning radiation exposure for the WaveACCESS NET devices. (See manual pages iv, vi, 7-9.) The statement for the CU 232 is as follows:

CAUTION

FCC Radiation Exposure Statement

This equipment generates and radiates radio-frequency energy. In order to comply with FCC radio-frequency radiation exposure guidelines for an uncontrolled environment, this equipment has to be installed and operated while maintaining a minimum body to antenna distance shown in table below. Based on continuous exposure of 30 minutes.

WaveACCESS NET System	Antenna in use	Minimum separation distance
Central Unit (CU232)	Internal Sector (embedded panel antenna)	8 inches (20cm)
	External Omni (OM08)	8 inches (20cm)

¹ Power as measured at the unit external antenna port.

4. The specs in the users manual (pg 1-9) indicates device has 50 mW output. This is substantially different than the 250 mW requested for this filing, please clarify and revise accordingly.

Response: The specified power output in the manual has been corrected to indicate 250 milliwatts. Please see manual page 1-9. Also, please note that the RF output power is referenced to the unit antenna jack port, not at the cable far end.

Further MPE amendments have been made in exhibit 6 concerning 15.247(b)(4) on report pages 6 - 7 and are resubmitted.

We hope this response satisfies your questions and concern regarding the CU232 transmitter.

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