

RF exposure assessment by calculation

BRU3 base stations mounting instructions assume tower or roof mounting of the connected antenna(s). Relevant distances for RF exposure in practice exceed the range of the RF near-field range, thus MPE (not SAR) is addressed.

TX maximum output power is 6 W (37.8 dBm) at 100% duty cycle. According to formula [1] below, power density at R=1 m distance is approximately $0.048 \text{ mW} / \text{cm}^2 \ll 0.6 \text{ mW} / \text{cm}^2$, assuming unity gain isotropic antenna and ideal feed line (lossless).

$$(TX_{Pmax} * G_{TX}) / (4 * \pi * R * R) \quad [1]$$

TX _{Pmax}	maximum TX output power
G _{TX}	combined transmitter antenna gain and feeder loss
π	3.1415
R	distance to point checked for RF exposure

The product is marketed without antenna and it is to be installed by professional personnel. The installation manual contains a warning note requiring the installation responsible to maintain an antenna safety distance from general public to meet RF exposure limits, considering feeder loss and antenna gain in every case.

Above example shows margin to the commission's exposure limit⁽¹⁾ in excess of 10 dB. Any installation using higher than 10 dB combined antenna gain and feeder loss arrangements and/or closer distances than 1 m to general public shall require the installation responsible to prove RF exposure performance of his installation meets applicable limits.

⁽¹⁾ Regulative reference: CFR 47, chapter 1, part 1, subpart I, item 1.1310,
 Radio frequency radiation exposure limits,
 table 1 Limits for maximum permissible exposure,
 part (B) Limits for general population, uncontrolled exposure
 Power density $f [\text{MHz}] / 1500 [\text{mW} / \text{cm}^2] = 900 / 1500 = 0.6 [\text{mW} / \text{cm}^2]$