



Health and Safety Characteristics: **Dialog 3G AMR**

RF Exposure

Three primary factors contribute to RF exposure from a transmitting device:

1. **SIGNAL DURATION:** the term "duty cycle" refers to the duration of time a transmitter device can be actively transmitting signal versus the amount of time it is required to remain in a non-transmitting state. By design a Dialog 3G endpoint's duty cycle is limited to less than 1%, meaning its transmitter is dormant over 99% of the time.
2. **RF POWER:** The output power from a Dialog 3G AMR endpoint transmission is significantly less than RF emissions from typical household items such as laptops, cell phones, & wireless routers.
3. **DISTANCE FROM TRANSMITTING DEVICE:** Dialog 3G AMR endpoints will be installed in the same location as the existing meter & in many cases will be entirely underground, covered by the meter pit lid.

Dialog 3G AMR standard mechanism for data aggregation from end units is based on short, low power bursts of communication occurring throughout the day. Due to an innovative communication scheduling method, 3G endpoint transmissions are minimized during non-working hours throughout the week resulting in reliable meter data delivery and a minimal RF power density.

Dialog 3G AMR endpoints & communication equipment operate in the 902-928 MHz radio band over unlicensed frequencies that have been utilized for many years in RF emitting consumer devices such as remote-controlled toys and baby monitors for example. US Regulatory agencies have provided the following guidelines to limit the potential negative effects on health resulting from exposure to RF emissions.

Power Density

- I. ICNIRP (*International Commission on Non-Ionizing Radiation Protection*) whose guidelines were adopted by WHO (*World Health Organization*), sets a level of maximal radiated power at 700mW. This results in a power density of: **140uW/cm² at a distance of 20cm.**
- II. The FCC part 1.1307 (*Environmental Assessments*) and part 2.1091 (*Radiofrequency Radiation Exposure Evaluation*) sets the limits for power density at: **307uW/cm² at a distance of 20cm.**
- III. The Dialog 3G AMR endpoint power density is a mere fraction: **0.019uW/cm² at a distance of 20cm**

For comparison, the radiated power densities of common commercial products are listed below – all of which greatly exceed the power output of the Dialog 3G AMR Endpoint meter transmitter:

A. Smart Phone:	(10 minutes / 20cm)	=	0.98uW/cm ²
B. Wireless Router:	(20 cm)	=	7.72uW/cm ²
C. Microwave Oven:	(5 minutes / 20 cm)	=	9.39uW/cm ²

RF Immunity

According to the U.S. FDA, pacemakers must be immune to radiation of handheld wireless transmitters at a distance of 15cm. Because of the high level of RF shielding required by the FDA, RF emissions from the Dialog 3G AMR endpoints will have no impact on FDA approved Pacemakers.

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