

ELECTRO-MAGNETIC INTERFERENCE (EMI) ISSUES FOR SPECTRALINK WIRELESS TELEPHONES

Occasionally concerns are raised about the use of wireless personal communications devices in the vicinity of sensitive equipment in healthcare and industrial environments. Some common wireless devices such as cellular telephones and two-way radios are known to cause certain equipment to malfunction from the electro-magnetic energy transmitted by the wireless device interfering with sensitive circuitry. In fact, some hospitals prohibit the use of cellular telephones by staff, patients, and visitors.

SpectraLink Wireless Telephones operate at significantly lower power levels than cellular telephones and two-way radios and have been field-proven to operate in the vicinity of sensitive industrial and bio-medical equipment without the risk of interference, malfunction, or alarms.

CELLULAR TELEPHONES VS. SPECTRALINK WIRELESS TELEPHONES

Conventional cellular telephones transmit with a maximum authorized output of 3 W (Watts) of radio frequency power. Handheld, portable cellular telephones typically operate at a maximum power output of 0.6 W (600 mW), although some units are rated as high as 1200 mW. Cellular telephones usually employ power control to allow lower power transmission whenever possible to conserve battery life, but typically require full power when used inside a building. Because cellular technology uses different frequencies for the transmit and receive signals, a cellular telephone is constantly transmitting when on a call. Cellular telephones may also transmit when not on a call and without knowledge of the user, as the handset activates itself to inform the cellular carrier's network as to its status and availability.

In contrast, SpectraLink Wireless Telephones transmit at a maximum authorized power output of 100 mW. The effective transmit power is actually much lower because Wireless Telephones use the same radio frequency for both transmitting and receiving signals. This means that the handset's transmitter is turned on only a fraction of the time, on the order of 10 – 15%, reducing the effective transmitted power to 10 – 15 mW. Link Wireless Telephones only transmit during an active telephone call or when ringing for an incoming call, so the user is always aware of when the handset radio is transmitting. NetLink Wireless Telephones infrequently transmit while not on an active call as required for the 802.11 wireless LAN network.

It is reasonable to conclude that SpectraLink Wireless Telephones are much less likely to cause harmful EMI with sensitive equipment based on the significantly lower transmit power utilized. SpectraLink Wireless Telephones operate at approximately 1/50th of the radio output power of a conventional cellular telephone.

EMPIRICAL COMPATIBILITY RESULTS

SpectraLink Wireless Telephones are used in more than 1,100 healthcare facilities and hundreds of industrial plants, including semiconductor, pharmaceutical, and bio-technology facilities without any interference issues or concerns. In a small number of instances SpectraLink Wireless Telephones have been deployed in areas where devices that are extremely susceptible to EMI are in use. Cases where there is a perceived risk or demonstrated evidence of Wireless Telephones interfering with a sensitive device have been resolved through equipment shielding, labeling, or user training.

SpectraLink recommends that cardiac pacemaker users avoid carrying the Wireless Telephone in a shirt or jacket pocket close to the pacemaker device. Although there have not been any known cases of pacemaker interference, pacemaker manufacturers recommend that no radio transmitting devices be placed in close proximity to the device.

CONCLUSION

The risk of SpectraLink Wireless Telephones causing harmful EMI with sensitive equipment is extremely low because of the extremely low radio output power. This is proven in many different types of customer applications. If necessary, SpectraLink will provide equipment and support for EMI testing and evaluation with devices of concern.

Information Resources:

1. Medical College of Wisconsin “Electromagnetic Fields and Human Health”:
<http://www.mcw.edu/gcrc/cop/cell-phone-health-FAQ/toc.html>
2. FDA and FCC Consumer Information on Wireless Phones: <http://www.fda.gov/cellphones/qa.html#32>
3. University of Oklahoma Center for the Study of Wireless Electromagnetic Compatibility:
<http://www.ou.edu/engineering/emc/>
4. Mayo Clinic Proceedings 2001 “Cellular Phone Interference With External Cardiopulmonary Monitoring Devices”: <http://www.mayo.edu/proceedings/2001/jan/7601a1.pdf>