Radio Frequency Hazard Information

As per Section 1.1310 and Section 2.1091 certification of this transmitter is sought using the Controlled / Occupational exposure limits as detailed in OST/OET Bulletin Number 65.

This transmitter is a fixed digital transmitter that uses two transmitters that transmit identical modulation with one transmitter transmitting using a horizontally polarised antenna and the other transmitter transmits using a vertically polarised antenna.

Radio Frequency Hazard measurements and calculations were made using the antenna with the highest gain supplied by the client for this device.

The Radio Frequency Hazard assessment has been carried out using a peak detector as this gave the worst case result.

The transmitters have a rated average output power of 1 watt (+30.0 dBm) with the highest power measured being 1.02 watts (+30.1 dBm).

The supplied antenna has a gain of 2 x 16 dBi (2 x 39.8) however no coax loss has been accounted for.

The theoretical average radiated power, without any coax attenuation accounted for, would be of +46.1 dBm (40.7 watts peak).

As this transmitter uses MIMO techniques with digital modulation measurements were made at the test site at a distance of 10 metres to determine the peak radiated power when transmitting on 928.9875 MHz.

A peak detector was used as this would give the worst case levels as digital modulation has been used.

Two identical 10 metre lengths of coax cable were used to attach the antenna to the transmitter

The following results were recorded.

Frequency (MHz)	Level (dBuV/m)	Level (dBm)	Power (watts)	Polarity	Detector
928.9875	138.0	53.2	210.3	Vertical	Peak
928.9875	138.3	53.5	225.4	Horizontal	Peak

The worst case EIRP power of the transmitter was measured in horizontal polarization to be +53.5 dBm or 225.4 watts peak.

Calculations have also been made using the General Public/Uncontrolled Exposure limits.

The minimum distance from the antenna at which the MPE is met is calculated from the equation relating field strength in V/m, measured maximum radiated transmit power in watts and the separation distance in metres.

The maximum radiated transmitter measured was = 225.4 watts.

Power density, $mW/cm_2 = E_2/3770$

E, V/m = (√ (30 * P * G * DC)) / d

Transmitting on 928.9875 MHz

Occupational limit: 3.10 mW/cm^2 (f/300 = 929 MHz/300)

General Population: 0.62 mW/cm^2 (f/1500 = 929 MHz/1500)

Occupational

$E = 3.10\ mW/cm^2 = E_2/3770$

E= √ 3.10 * 3770

E = 108.1 V/m

General Public

$E = 0.62\ mW/cm^2 = E_2/3770$

E= √ 0.62 * 3770

E = 48.3 V/m

Occupational

d = √ (30 * P * G*DC) / E

d = √ (30 * 225.4) / 108.1

d = 0.76 metres

General Public

d = √ (30 * P * G*DC) / E

d = √ (30 * 225.4) / 48.3

d = 1.7 metres

Result: Complies if the user is advised of the above safe distances in the appropriate