



**RF Exposure Exhibit  
for the  
Control Chief Corporation  
Train Chief II Lightweight OCU**

**FCC ID: CBF-LTOCU-M  
IC: 1339A-R222991**

The Control Chief OCU is considered for general population RF exposure levels. A  $\frac{1}{4}$  wave whip antenna is located inside the enclosure of the unit and provides greater than 9cm of separation from the user during operation. With the use of tilt sensors, only one orientation of the device is possible thus maintaining the separation distance.

The maximum output power of the unit at a 100% continuous operation is 422mW operating from 450 – 470MHz. The average power, however, based on the duty cycle of operation is significantly less than this maximum output power.

The OCU system requires a heart beat for all control functions, meaning that all control functions must be refreshed at least once every 1.25 seconds or the controller will initiate a safe stop mode. At every 1.25 seconds the unit sends a continuous packet rate of 250mSec and packet duration of 112mSec. Using the formula below yields an average power output of <200mW.

$$P_{avg} = P_{pk} * (\text{packet duration}/\text{packet rate}) = 422\text{mW} * (112\text{mSec}/250\text{mSec}) = 190\text{mW}$$

Per the TCB Exclusion list published on 17 July 2002 the following calculation is used for determining the applicability of TCB approval and routine SAR evaluation:

Exposure category	low threshold	high threshold
general population	$(60/fGHz) \text{ mW}, d < 2.5 \text{ cm}$ $(120/fGHz) \text{ mW}, d \geq 2.5 \text{ cm}$	$(900/fGHz) \text{ mW}, d < 20 \text{ cm}$
occupational	$(375/fGHz) \text{ mW}, d < 2.5 \text{ cm}$ $(900/fGHz) \text{ mW}, d \geq 2.5 \text{ cm}$	$(2250/fGHz) \text{ mW}, d < 20 \text{ cm}$



The OCU is being evaluated to the general population exposure category and is >2.5cm from the body when in use. Therefore the following calculation is made for determining the low threshold power:

$$120/0.46 = 260\text{mW}$$

The OCU average power is 190mW which is below the low threshold and therefore routine SAR evaluation is not required and the unit qualifies for TCB approval.