



RFx Exhibit Serial No.  
020510SDB-T1005-S24D

RFx Exhibit Issue Date  
March 10, 2010

RFx Exhibit Revision No.  
Rev. 1.1 (2nd Release)



**RF EXPOSURE SUMMARY PER FCC KDB INQUIRY TRACKING NUMBER 878623**

**Sensus Metering Systems Inc. Model: CommandLink CL100 Body-worn Flexnet Transceiver FCC ID: SDBCL100**

**FCC Response to KDB Inquiry Tracking Number 878623**

This device has been excluded from SAR testing requirements based on the source-based time-averaged conducted output power is less than 60/f. This document serves as the RF exposure exhibit in the FCC Form 731 application in lieu of a SAR report and has been reviewed and accepted by the FCC prior to submittal to the TCB.

Device Description

The CommandLink CL100 is a wireless utility meter reader containing FlexNet and Bluetooth Transceivers. The CL100 employs a Bluetooth link to communicate with any third party handheld PC. It contains FCC ID: ED9LMX9838 National Semiconductor model number LMX9838 Bluetooth transceiver. The CL100 is a battery operated device operated from three "AA" NiMH cells. The device can be operated in the following three configurations:

- 1) The CL100 is used to program Smart Point Meters via the "Mag Loop" interface; the CL100 will be strapped to a meter during this use and not attached to the user. The user will link to the CL100 via a third party PC over Bluetooth. In this operating configuration the FlexNet radio is in standby mode and is not utilized - the mag loop is active in addition to the Bluetooth transceiver.
- 2) The CL100 will be used as a handheld wireless device operated in the field by a utility technician to acquire meter data from a Smart Point Meter for utility service purposes. When operated in this manner, the third party PC will be connected to the CL100 via Bluetooth and the CL100 will be communicating with the Smart Point Meter via the FlexNet radio.
- 3) The CL100 will be contained in a pouch that is clipped to a belt-loop on the technician for the purpose of collecting meter readings from Smart Point Meters for customer billing. When operated in this manner, the CL100 will communicate to the Smart Point Meter via the FlexNet radio and will communicate with the third party PC via Bluetooth.

Operating Modes

The CL100 is capable of the following transmissions and types:

- 5 kb/s 2FSK mPass data, Po = +20dBm, 896 to 959MHz RF
- 10Kb/s 2FSK mPass data, Po = +20dBm, 896 to 959MHz RF
- 12.5Kb/s 2FSK mPass WakeUp Tone, Po = +20dBm, 896 to 959MHz RF
- 2700 bit/s ASK Data, Po = +20dBm PEP, 896 to 959MHz RF
- Magloop Interface - 896KHz low frequency Inductive interface transmitter, 9600 baud data



Duty Cycle (FlexNet)

The duty cycle is hardcoded in the operating firmware of the CL100 and cannot be changed. The CL100 will transmit interrogation packets once every three seconds. There will be a maximum of 36 packets transmitted per interrogation. The duty cycle is calculated as follows:

Packet length = 88 bytes  
 Data rate = 5kbps  
 Min Time between Packets = 3 seconds  
 % duty cycle = 4.48%  
 $(88 * 8 * (1/5000)) = .1408s \quad .1408 / 3.1408 = 4.48\% \text{ duty cycle}$

The packet length of 140.8 mS and the minimum time of 3 seconds between packets transmitted are hard coded into the firmware of the CL100 and cannot be altered by the end user. When operating a CL100, a technician can perform various tasks on a Smart Point Meter. The technician will interrogate a single Smart Point Meter at a time via the CL100. These tasks will result in a minimum packet transmission of six packets and a maximum transmission of 36 packets via the FlexNet radio. This includes six unique packets with the ability to transmit five retries for each packet. Essentially, the FlexNet radio in the CL100 is interrogating the Smart Point Meter and is looking for a specific response. Since there may be more than one meter in range, the particular meter being interrogated may have its transmission garbled with the influence of other Smart Point Meter transmissions. In this case, should the CL100 not receive a response from the interrogation of the Smart Point Meter, it will retransmit the Packet, expecting a response from the Smart Point Meter. The CL100 will perform this step until a successful response has been received, but no more than five times per packet transmission.

<b>Applicant:</b>	<b>Sensus Metering Systems, Inc.</b>	<b>FCC ID:</b>	<b>SDBCL100</b>	<b>IC:</b>	<b>2220A-CL100</b>	
<b>DUT Type:</b>	<b>Body-worn Flexnet Transceiver with Bluetooth</b>	<b>DUT Model:</b>	<b>CommandLink CL100</b>			
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RF Output Power

The maximum source-based time-averaged conducted power is calculated to be 4.48 mW (6.5 dBm) based on a +20 dBm maximum peak conducted output power from the FlexNet radio with a maximum source-based time-averaged duty cycle of 4.48%.

(Flexnet)

Manufacturer's Rated Maximum Peak Conducted Power = +20 dBm (100 mW)

Manufacturer's Specified Source-Based Time-Averaged Duty Cycle = 4.48%

Source-Based Time-Averaged Conducted Output Power = 6.5 dBm (4.48 mW)

$60/f_{(GHz)}$  mW = 63.8 mW

Source-based time-averaged conducted output power = < 60/f

(Bluetooth)

Manufacturer's Certified Maximum Peak Conducted Power = 1.63 mW


$60/f_{(GHz)}$  mW = 24.2 mW

Maximum Conducted output power = < 60/f

RF Exposure Exhibit Revision No.s

Revision 1.1 - Revised/added operational descriptions - March 10, 2010

Revision 1.0 - Initial Release - March 08, 2010

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