



Excellence in Compliance Testing

Certification Exhibit

FCC ID: QZC-REXU

FCC Rule Part: 15.247

ACS Project Number: 15-0255

Manufacturer: Elster Solutions, LLC
Model: REXU

RF Exposure

General Information:

Applicant: Elster Solutions, LLC
 Device Category: Mobile
 Environment: General Population/Uncontrolled Exposure
Required Separation Distance: 20 cm

The REXU module is a Printed Circuit Board Assembly (PCBA) that forms a complete electricity meter when installed in a housing and meter base. The REXU contains (1) 900 MHz LAN frequency hopping spread spectrum radio and (1) 2.4 GHz direct sequence spread spectrum Zigbee radio which are collocated and transmit simultaneously.

Technical Information:

Table 1: Technical Information

	LAN radio 900 MHz	Zigbee radio 2.4 GHz
Antenna Type	Embedded Slot / External Whip	Embedded Printed Inverted F
Antenna Gain	4.07dBi dBi / 5 dBi*	3.82 dBi
Conducted Power	986.28 mW	106.41 mW
Maximum EIRP	2517.68 mW*	256.45 mW

* The external whip antenna for the 900 MHz LAN radio is coupled to the EUT antenna via a passive coupling patch antenna attached to the host device. This antenna is not directly connected to the EUT and therefore with the expected coupling loss, the overall antenna assembly gain is expected to result in a much less overall gain than stated. For the purpose of determining the maximum EIRP and MPE, the gain of the embedded antenna is used.

MPE Calculation

The Power Density (mW/cm²) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Table 2: MPE Calculation (Including Collocated Devices)

Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)	Radio
927.9	29.94	0.62	986.28	4.07	2.553	20	0.501	A
2405	20.27	1.00	106.41	3.82	2.410	20	0.051	B

Summation of MPE Ratios – Simultaneous Transmissions

This device contains multiple transmitters which can operate simultaneously; therefore MPE compliance is determined by the summation of MPE ratios. The limit is such that the summation of MPE ratios is ≤ 1.0.

Table 3: Summation of MPE Ratios

	Scenario 1
Radio A (900 MHz LAN)	x
Radio B (2.4 GHz Zigbee)	x
Radio A MPE Ratio	0.81
Radio B MPE Ratio	0.05
MPE Ratio Summation:	0.86