



RF Exposure Evaluation Report

For:
Elster Solutions, LLC

Model:
NXCMR300

Product Description:
900MHz ISM radio, LTE Cat-M1 MODEM, gas & water metering metrology

FCC ID: QZC-NXCMR300
IC: 4577A-NXCMR300

Per:
CFR Part Part1 (1.1307 &1.1310), Part 2 (2.1091),
FCC KDB 447498 D04 Interim General RF Exposure Guidance v01
ISED RSS-102 Issue 5

Report number: EMC_HONEY_229_23001_FCC_ISED_RF_Exposure_Rev1

DATE: 2023-10-23



A2LA Accredited

IC recognized #
3462B

CETECOM Inc.

411 Dixon Landing Road • Milpitas, CA 95035 • U.S.A.
Phone: + 1 (408) 586 6200 • Fax: + 1 (408) 586 6299 • E-mail: Contact@cetecom.com • <http://www.cetecom.com>
CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

TABLE OF CONTENTS

1 Assessment.....3

2 Administrative Data4

 2.1 Identification of the Testing Laboratory Issuing the EMC Test Report4

 2.2 Identification of the Client.....4

 2.3 Identification of the Manufacturer4

3 Equipment under Assessment.....5

4 RF Exposure Limits and FCC and ISED Basic Rules.....6

 4.1 FCC.....6

 4.2 ISED RSS 1026

5 Evaluations.....7

 5.1 FCC RF Exposure (Standalone)7

 5.2 ISED RF Exposure (Standalone)7

6 Revision History8

1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the equipment (as identified in section 3 of this test report) with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1.1307, Part 2 (2.1091) and ISED standard RSS-102 issue 5 under worst case conditions (measured or rated RF output power including tune-up tolerance, antenna gain, the distance towards the human body, multiple transmitter information as presented by the applicant).

In addition, maximum antenna gain or minimum distance towards the human body is calculated respectively, where relevant.

The device meets the limits stipulated by the above given FCC and ISED rule parts based on available specifications for worst-case conditions at a separation distance greater than 20cm to the body.

Company	Description	Model No.
Elster Solutions, LLC	900MHz ISM radio, LTE Cat-M1 MODEM, gas & water metering metrology	NXCMR300

Responsible for Testing Laboratory:

		Arndt Stoecker	
2023-10-23	Compliance	(Director of Regulatory Services)	
Date	Section	Name	Signature

Responsible for the Report:

		Art Thammanavarat	
2023-10-23	Compliance	(Senior EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3. CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Arndt Stoecker
Responsible Project Leader:	Cathy Palacios

2.2 Identification of the Client

Client Firm/Name:	Elster Solutions, LLC
Street Address:	208 South Rogers Lane
City/Zip Code	Raleigh, NC 27610
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment under Assessment

Model No:	NXCMR300
HW Version :	1.0
SW Version :	1.0
FCC-ID :	QZC-NXCMR300
IC-ID:	4577A-NXCMR300
PMN:	NXCMR300
Product Description:	Provides metrology for gas and water meters, communicates metering data over LTE Cat-M1. 900MHz ISM radio used for initial setup/configuration, or walk-by metering in areas of poor cellular coverage.
Frequency Range / number of channels:	902 – 928 MHz, 25 channels frequency hopping Data rate: 35.5 kbps or 142.2 kbps
Radios included in device	ISM: <ul style="list-style-type: none"> • SiLabs EFR32FG28 SoC • FSK modulation • 25 channels frequency hopping
Other Radios included in the device:	Sequans GM02S
Antenna Information as declared:	Max Gain 1.5 dBi
Max. declared output Powers:	6.05 dBm
Power Supply/ Rated Operating Voltage Range:	3.2 VDC – 3.8 VDC
Operating Temperature Range	-40° to 85° C
Sample Revision	<input checked="" type="checkbox"/> Production Unit; <input type="checkbox"/> Pre-Production
EUT Dimensions	17.78 x 11.43 x 7.62 cm
Weight	544.31 grams
EUT Diameter	<input checked="" type="checkbox"/> < 60 cm <input type="checkbox"/> Other _____

4 RF Exposure Limits and FCC and ISED Basic Rules

4.1 FCC

4.1.1 § 2.1091(c)(1)

Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for mobile devices with single RF sources having either more than an available maximum time-averaged power of 1 mW or more than the ERP listed in Table 1 to § 1.1307(b)(3)(i)(C), whichever is greater. For mobile devices not exempt by § 1.1307(b)(3)(i)(C) at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 of this chapter is necessary if the ERP of the device is greater than ERP_{20cm} in the formula below. If the ERP of a single RF source at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP) in comparison with the following formula only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

4.1.2 § 2.1091(c)(2)

For multiple mobile or portable RF sources within a device operating in the same time averaging period, routine environmental evaluation is required if the formula in § 1.1307(b)(3)(ii)(B) of this chapter is applied to determine the exemption ratio and the result is greater than 1.

4.1.3 § 1.1307(b)(3)(ii)(B)

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure \ Limit_k} \leq 1$$

4.2 ISED RSS 102

4.1.4 Clause 2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

5 Evaluations

5.1 FCC RF Exposure (Standalone)

Radio	Modulation	Freq-Low _[GHz]	Pwr _[dBm]	Power _[W]	Ant-G _[dBi]	ERP _[W]	ERP _[mW]	Threshold ERP _[W]	ERP < Threshold ERP _[W]	FCC 2.1091(c)(1) Pth _{[mW] = ERP_{20cm}}
LoRa	FSK	0.9020	6.05	0.0040	1.50	0.003	3.47	0.46	Yes	1840.08

5.2 ISED RF Exposure (Standalone)

										RF Exposure	
										RSS-102 2.5.2 D>20 cm (300 ≤ Freq < 6000 MHz)	
Radio	Modulation	Freq-Low [MHz]	Pwr _[dBm]	Power _[W]	Ant-G [dBi]	Ant-G [lin]	EIRP _[W]	EIRP _[mW]	Exemption limit for Routine Evaluation	Exemption (Y/N)	
LoRa	FSK	902.00	6.05	0.00	1.50	1.41	0.01	5.69	1.37	Yes	

Conclusion:

- The maximum RF emissions from this equipment fulfill the SAR exclusion threshold limits for separation distance between the antenna and the human body greater than 20 mm. SAR is not required.

6 Revision History

Date	Report Name	Changes to report	Prepared by
8/31/2023	EMC_HONEY_229_23001_FCC_ISED_RF_Exposure	Initial Version	Art Thammanavarat
10/23/2023	EMC_HONEY_229_23001_FCC_ISED_RF_Exposure_Rev1	Updated Company Name	Art Thammanavarat

<<< The End >>>
