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LAB N° 1347 L

RAPPORTO DI PROVA

TEST REPORT

Rif. / Ref. n.	**MPETR_180163-2**	Data Emissione /Issue Date:	**19/05/2022**	Pagine / Pages:	**12**

Scopo delle prove *Test object*	Prove di tipo in accordo alla Norma *Type test according to standards* **FCC Cfr 47 part 2 - §2.1093** **RSS-102 Issue 5**
Richiedente *Applicant*	**DATALOGIC S.r.l.** Via S. Vitalino 13 - 40012 Lippo Di Calderara Di Reno - Bologna - Italy Phone. +39 051 3147196 Fax +39 051 3147561
Marchio commerciale *Trade mark*	DATALOGIC™
Fabbricante *Manufacturer*	DATALOGIC S.r.l.
Prodotto *Product*	Radio module
Modello testato *Testing model*	**MIZAR RADIO MODULE 915MHZ**
Identificativo FCC *FCC ID*	**U4F0022**
Data ricevimento campioni *Date of test samples receipt*	08/07/2021
Campioni verificati *No. of tested samples*	1 – Sampled by the manufacturer
Data verifiche *Testing date*	From 12/11/2021 to 18/11/2021
Sito di prova *Testing site*	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy
Esito delle valutazioni *Assessment results*	**CONFORME / COMPLIANT**

Verifiche effettuate da *Verifications carried out by*	**Daniele AOSANI** Tecnico Laboratorio *Laboratory Engineer*	Daniele Aosani
Approvato *Approved by*	**Riccardo PFEIFFER** Responsabile Laboratorio *Laboratory Manager*	Riccardo Pfeiffer

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati.
The test results reported in this test report shall refer only to the samples tested
Il campione è stato fornito dal cliente ed i risultati si riferiscono al campione così come ricevuto
The sample has been provided by the customer and the results apply to the sample as received

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0. RELEASE CONTROL RECORD

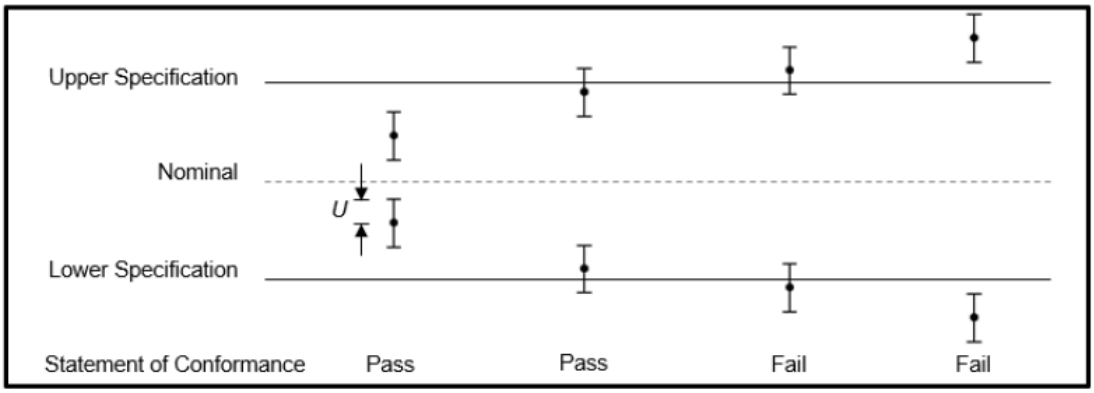
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_180163-0	Original release	30/11/2021
MPETR_180163-1	Adding portable equipment evaluation Added RSS-102 evaluation	21/03/2022
MPETR_180163-2	Updated RSS-102 evaluation	19/05/2022

This document is valid in last revision that deletes and replaces the previous one

1. DECISION RULE

PRS LAB specifies that, if the decision rules of conformity of the test results are not indicated in detail in the standard/s object of tests, it takes as a decision rule for the declaration of conformity the simple binary system (w = 0) stated in the ILAC-G8-09:2019 document.

The decision rule is applicable for all parts of standard



U = 95% expanded measurement uncertainty

Statements of conformity are reported as:

- Pass: the measured value is below the acceptance limit, $AL{=}TL$.
- Fail: the measured value is above the acceptance limit, $AL{=}TL$.

Definitions

- Guard Band (w): interval between a tolerance limit and a corresponding acceptance limit where length $w{=}|TL{-}AL|$.
- Tolerance Limit (TL) (Specification Limit): specified upper or lower bound of permissible values of a property.
- Acceptance Limit (AL): specified upper or lower bound of permissible measured quantity values.

2. INFORMATION PROVIDED BY CUSTOMER

- The tested module can be used with two different (same type) antennas:

1.Wire Antenna (Model: Helical) → Max Gain declared 0,5dBd

2.Wire Antenna (Model: Folded) → Max Gain declared -5dBd

The ratings and measurements shown in this report take into consideration the antenna with the highest gain.

3. GENERAL REMARKS

- None

4. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

4.1 EUT Identification

DESCRIPTION	Radio module
MODEL NAME	MIZAR MODULE 915MHZ
FCC ID	U4F0022
S/N	G19LBGEL000C59C0
PRS LAB INTERNAL REFERENCE	BC 239/2021
TRADEMARK	DATALOGIC
MANUFACTURER	DATALOGIC S.r.l.
COUNTRY OF MANUFACTURER	Italy
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	DC power from board
POWER SUPPLY NOMINAL VOLTAGE	3.3Vdc
OPERATING TEMPERATURE	-20°C ÷ +55°C
DIMENSIONS	See photography documentation
EUT STANDING	Table, wall or portable system

4.2 Radio module technical data

TYPE OF RADIO DEVICE	Transceiver		
MODULATION	Manchester RZ (for DXX and DSS) & NRZ (for DTS)		
DATA RATE	36.846 kbps (for DXX and DSS) 500 kbps (for DTS)		
TRANSMITTER FREQUENCY RANGE	From 902MHz to 928MHz		
TRANSMITTER CHANNELS TESTED for DTS	**Channel ID**	**Channel number**	**Channel Frequency (MHz)**
	Lowest	1	902,8005
	Default	8	910,0000
	Highest	25	927,4845
TRANSMITTER CHANNELS TESTED for DXX and DSS	**Channel**	**Channel Index**	**Channel Frequency (MHz)**
	Lowest	1	903,6490
	Default	4	910,0000
	Highest	12	926,9360
RECEIVER FREQUENCY RANGE	From 902MHz to 928MHz		
RECEIVER CHANNELS TESTED	**Channel ID**	**Channel number**	**Channel Frequency (MHz)**
	Default	8	910,0000
TESTED ANTENNA TYPE	Wire Antenna		
MAXIMUM ANTENNA GAIN	0.5dBd (2.65dBi)		
TESTED ANTENNA MODEL	Helical		

4.3 Ports identification

	PORT	DESCRIPTION	CONNECTION	NOTES
☐	Enclosure	Electronic board	Screws	---
☐	AC Power input	Port not present	---	---
☒	DC Power input	3.3Vdc	---	---
☐	Signal/Control port	Port not present	---	---
☒	Antenna	External	UFL	---

Note:
During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

4.4 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None.

4.5 Auxiliary equipment

- Laboratory laptop used to set radio channels.
- RJ485 to USB cable to provide power supply and communicate to the auxiliary PC.
- Electronic board.

5. REFERENCE STANDARDS

REFERENCE STANDARD	DESCRIPTION
Title 47 Part 1 Subpart I § 1.1310	Procedures Implementing the National Environmental Policy Act of 1969. Radiofrequency radiation exposure limits.
Title 47 Part 2 Subpart J § 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
ANSI C63.4: 2014	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
KDB 447498 D01 v06	
RSS-102 Issue 5	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

6. MEASUREMENTS AND CALCULATION RESULTS

6.1 RF Exposure Conditions

The **MIZAR RADIO MODULE 915MHZ** is a radio module operating in the frequency range 902-928MHz with three type of possible modulation: DXX (exempt from this evaluation), DSS and DTS.
The device has been evaluated as Portable equipment, the MPE is required.

6.2 Limits for Maximum Permissive Exposure (MPE)

SAR Test Exclusion Thresholds:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 (for 1-g body SAR) or 7.5 (for 10-g extremity SAR)

where respectively

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

6.3 Maximum Permissive Exposure (MPE) Evaluation

Conducted Output Power				
Modulation	**Frequency Range (MHz)**	**MAX Output Power (dBm)**	**MAX Output Power (mW)**	**Limit (dBm)**
DSS	902.801	15.15	32.73	30
	910.000	**15.50**	**35.48**	30
	927.485	15.33	34.12	30
DTS	903.649	14.18	26.18	30
	910.000	14.42	27.67	30
	926.936	14.46	27.93	30

6.4 MPE Prediction Calculation - FCC

The maximum output power for the device (including tune up tolerance) is 16dBm (40mW).
Applying the above data and using the given KDB 447498 D01 formula, the following results are achieved:

(40mW / 17mm) x $\frac{\sqrt{0.915GHz}}{}$ = 2,25 (i.e.: ≤ 3.0 for 1-g SAR)

(40mW / 7mm) x $\frac{\sqrt{0.915GHz}}{}$ = 5,46 (i.e.: ≤ 7.5 for 10-g SAR)

This demonstrates the device meets the criteria for 1-g head/body SAR test exemption with a head/body to antenna separation distance of 17mm.
This demonstrates the device meets the criteria for 10-g extremity SAR test exemption with a body extremity to antenna separation distance of 7mm.

6.5 MPE Prediction Calculation - IC

The maximum output power for the device (including tune up tolerance) is 18,65dBm (73,6mW).
this module is exempt from Head/Body SAR testing when installed in a host product with a Head/Body to antenna separation distance of >30mm.
In accordance with RSS-102, section 2.5.1, this module is exempt from Limb-Worn/Extremity SAR testing when installed in a host product with a Limb-Worn/Extremity to antenna separation distance of > 15mm

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END OF TEST REPORT