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RF Exposure Technical Brief for ISED RSS-102 (issue 5) section 2.5

Product name	: PTO-Controller
Applicant	: Zuidberg Frontline Systems B.V.
IC	: 8017A-MDBT42Q

Test report No. : P000056040 005 Ver 1.00

Laboratory information

Accreditation

Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2017. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie).

Telefication is designated by the FCC as an Accredited Test Firm for compliance testing of equipment subject to Certification under Parts 15 & 18. The Designation number is: NL0001.

Telefication is a Wireless Device Testing laboratory recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements.
The Industry Canada company number for Telefication is: 4173A.

Telefication is a registered Conformity Assessment body (CAB) under the Japan-EC MRA (Agreement on Mutual Recognition between Japan and the European Community). The registration number is: 201.

Documentation

The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at Telefication Netherlands.

Testing Location

Test Site	Kiwa Telefication BV
Test Site location	Wilmersdorf 50 7327 AC Apeldoorn The Netherlands Tel. +31 88998 3393
Test Site FCC	NL0001
CABID	NL0001

Revision History

Version	Date	Remarks	By
v1.00	22-07-2022	Release version	R.T

Table of Contents

1.1 Applicant

Client name:	Zuidberg Frontline Systems B.V.
Address	Buitenveld 5, 8307 DE, Ens, The Netherlands
Telephone:	+31527253550
E-mail:	zwaan@zuidberg.nl
Contact name:	Gerrit de Zwaan

1.2 Manufacturer

Manufacturer name:	Zuidberg Frontline Systems B.V.
Address:	Buitenveld 5, 8307 DE, Ens, The Netherlands
Telephone:	+31527253550
E-mail:	zwaan@zuidberg.nl
Contact name:	Gerrit de Zwaan

1.3 Tested Equipment Under Test (EUT)

Product name:	PTO-Controller
Brand name:	Zuidberg
Product type:	Power Take Off Controller
Variant model(s):	“See Table below”
Software version:	-
Hardware version:	-
Date of receipt	01-07-2022
Tests started:	04-07-2022
Testing ended:	04-07-2022

Overview variants

Type	Product description	Trademark	Type designation
Variant	PTO_CONTROLL ER_UNI_3-PINS	Zuidberg	8002006 0
Variant	PTO_CONTROLL ER_INT_4-PINS	Zuidberg	8002007 0
Main	PTO_CONTROLL ER_UNI_8-PINS	Zuidberg	8002008 0

1.4 Calculation of the exemption limit for routine RF exposure evaluation

Introduction

The device is equipped with a certified radio module (8017A-MDBT42Q).

SAR evaluation

According to RSS-102 – Issue 5 March 19, 2015, clause 2.5 Exemption Limits for Routine Evaluation — SAR Evaluation, SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation — Exemption limits for routine evaluation based on frequency and separation distance

	Exemption Limits (mW)				
Frequency (MHz)	**At separation distance of ≤5 mm**	**At separation distance of 10 mm**	**At separation distance of 15 mm**	**At separation distance of 20 mm**	**At separation distance of 25 mm**
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

	Exemption Limits (mW)				
Frequency (MHz)	**At separation distance of 30 mm**	**At separation distance of 35 mm**	**At separation distance of 40 mm**	**At separation distance of 45 mm**	**At separation distance of ≥50 mm**
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiated element is greater than 20 cm, except when the device operates as follows:

Operating frequency range	Maximum source-based, time averaged maximum e.i.r.p	Calculated range exemption limit
< 20 MHz	1 W	1W
≥ 20 MHz to < 48 MHz	$4.49/f^{0.5}$ W	1 W to 0.648 W
≥ 48 MHz to < 300 MHz	0.6 W	0.6 W
≥ 300 MHz to < 6 GHz	$1.31*0.01*f^{0.6834}$ W	0.646 W to 5.0 W
≥ 6 GHz	5 W	5 W

Note: in the equations above, f is the operating frequency in MHz

1.5 **Conclusion**

The maximum radiated power including tune-up tolerance is shown as below.

Mode	Max power level	Max power level	Calculated exemption limit
BLE	-1.66 dBm[1]	0.68 mW	0.02 W

Notes

1) From ic 8017a-mdbt42q certificate