EMITECH GROUPE

RR051-20-103208-6-A Ed. 0

Certification Radio test report

According to the standard:

CFR 47 FCC PART 15

Equipment under test:

RS430 READER

FCC ID: NQY-30020

Company:

Allflex USA, Inc.

Distribution: Mr LANGOUET **(Company:** Allflex USA, Inc.**)**

Number of pages: 17 with 2 appendixes

Ed.	Date	Modified Page(s)	Technical Verification and Quality Approval Name and Function / Visa
0	13-Oct-20	Creation	M. DUMESNIL, Laboratory Manager

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This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole manufactured products of the tested sample.

S51 RTY 000 INT 00001 [03]

DESIGNATION OF PRODUCT:	**RS430 READER**
Serial number (S/N):	C151 00002
Reference / model (P/N):	RS430
Software version:	1.00.15 – Sep 24 2020
MANUFACTURER:	Allflex USA, Inc.

COMPANY SUBMITTING THE PRODUCT:

Company:	Allflex USA, Inc.
Address:	2805 East 14th Street P.O. Box 612266 75261-2266 Dallas Texas – USA
Responsible:	Mr LANGOUET
DATES OF TEST:	From 2-Oct-20 to 8-Oct-20
TESTING LOCATION:	EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE FCC Accredited under US-EU MRA Designation Number: FR0009 Test Firm Registration Number: 873677
TESTED BY:	T. LEDRESSEUR ***VISA:***
WRITTEN BY:	T. LEDRESSEUR

CONTENTS

1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: **RS430 READER**, in accordance with normative reference.

The equipment under test integrates:

- Bluetooth radio module, already certified
- RFID radio module operational at 134.2 kHz,
- NFC radio module operational at 13.56 MHz.

This report concerns only the RFID part.

2. PRODUCT DESCRIPTION

Class:	B
Utilization:	Handheld control terminals
Antenna type and gain:	0 dBi / integral antenna
Operating frequency:	134.2 kHz
Number of channels:	1
Channel spacing:	Not concerned
Modulation:	ASK
Power source:	7.4Vdc Ni-MH batteries, Rechargeable by a AC/DC power source

The applicant declares that the highest local oscillator used is 24MHz.

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below.
They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 FCC Part 15 (2020)	Radio Frequency Devices
ANSI C63.10	2013 Procedures for ComplianceTesting of Unlicensed Wireless Devices.

4. TEST METHODOLOGY

Radio performance tests procedures given in CFR 47 part 15:

Subpart C – Intentional Radiators

Paragraph 203: Antenna requirement
Paragraph 205: restricted bands of operation
Paragraph 207: Conducted limits
Paragraph 209: Radiated emission limits; general requirements

5. TEST EQUIPMENT CALIBRATION DATES

Emitech Number	Model	Type	Last calibration	Calibration interval (years)	Next calibration due
0	BAT-EMC V3.17.0.25	Software	/	/	/
1406	EMCO 6502	Loop antenna	24/04/2020	1	24/04/2021
5275	R&S ESPC	Test receiver	10/01/2019	2	09/01/2021
6796	R&S FSP7	Spectrum Analyzer	21/08/2019	2	20/08/2021
7566	Testo 608-H1	Meteo station	22/09/2020	2	22/09/2022
8508	California instruments 1251RP	Power source	(1)	(1)	(1)
8528	Schwarzbeck VHA 9103	Biconical antenna	09/03/2019	3	08/03/2022
8578	N-2GHz	Cable	11/06/2020	2	11/06/2022
8590	RG214 N-5m	Cable	25/02/2020	2	24/02/2022
8635	R&S EZ-25	High-pass filter	02/08/2018	3	01/08/2021
8707	R&S ESI7	Test receiver	29/06/2020	1	29/06/2021
8719	Thurbly Thandar Instruments 1600	LISN	26/02/2020	2	25/02/2022
8732	Emitech	OATS	03/07/2019	3	02/07/2022
8750	La Crosse Technology WS-9232	Meteo station	22/09/2020	2	22/09/2022
8783	EMCO 3147	Log periodic antenna	09/03/2019	3	08/03/2022
8855	EMITECH	Turntable and mat controller	/	/	/
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
9489	Absorber sheath current	Emitech	20/04/2020	2	20/04/2022
10788	Emitech	Outside room Hors cage	/	/	/
14831	Fluke 177	Multimeter	25/02/2020	2	24/02/2022

(1) The equipment is not verified; instead, the output voltage is checked before each measurement with the calibrated multimeter.

6. TESTS RESULTS SUMMARY

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	ANTENNA REQUIREMENT	X				*Note 1*
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.207	CONDUCTED LIMITS	X				
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				

NAp: Not Applicable NAs: Not Asked

Note 1: Integral antenna.

7. MEASUREMENT UNCERTAINTY

To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the result(s)

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for normal distribution corresponds to a coverage probability of approximately 95%.

Parameter	Emitech Uncertainty
RF power, conducted	± 0.75dB
Radiated emission valid to 26 GHz F < 62.5 MHz: 62.5 MHz < F < 1 GHz: 1 GHz < F < 26 GHz:	 ± 5.14 dB ± 5.13 dB ± 5.16 dB
AC Power Lines conducted emissions	± 3.38 dB
Temperature	± 1 °C
Humidity	± 5 %

8. CONDUCTED LIMITS

Temperature (°C) : 22 **Humidity (%HR):** 46 **Date :** October 8, 2020

Technician : T. LEDRESSEUR

Standard: FCC Part 15

Test procedure: Paragraph 15.207

Software used: BAT-EMC V3.17.0.25

Test set up:

The EUT is isolated and placed on a wooden table, 0.8 m over an horizontal reference plane and 0.4 m from a vertical reference plane. It is powered by an artificial main network placed on the ground reference plane.
The equipment is powered with the AC power operating voltage of 120 V / 60 Hz.

See photos in appendix 2

Frequency range: 150 kHz - 30 MHz

Detection mode: Peak / Quasi-peak / Average

Bandwidth: 10 kHz / 9 kHz

Equipment under test operating condition:

The equipment under test is blocked in alternance of emission and reception mode.

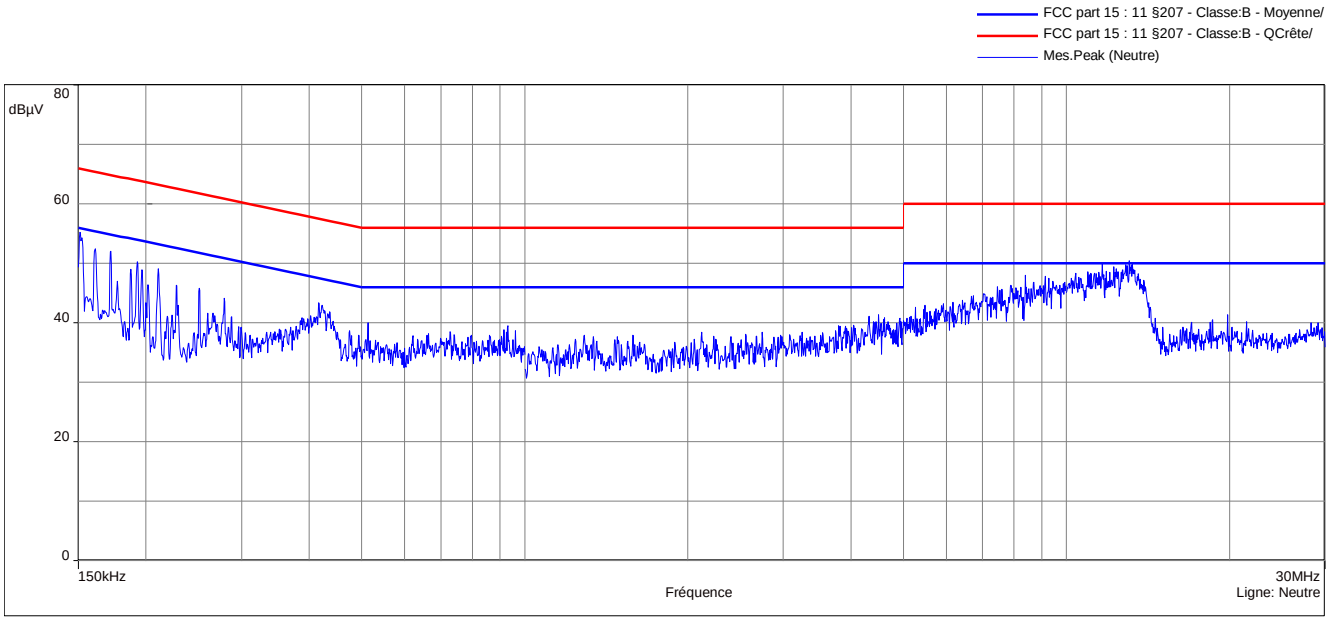
Results:

Sample N° 1

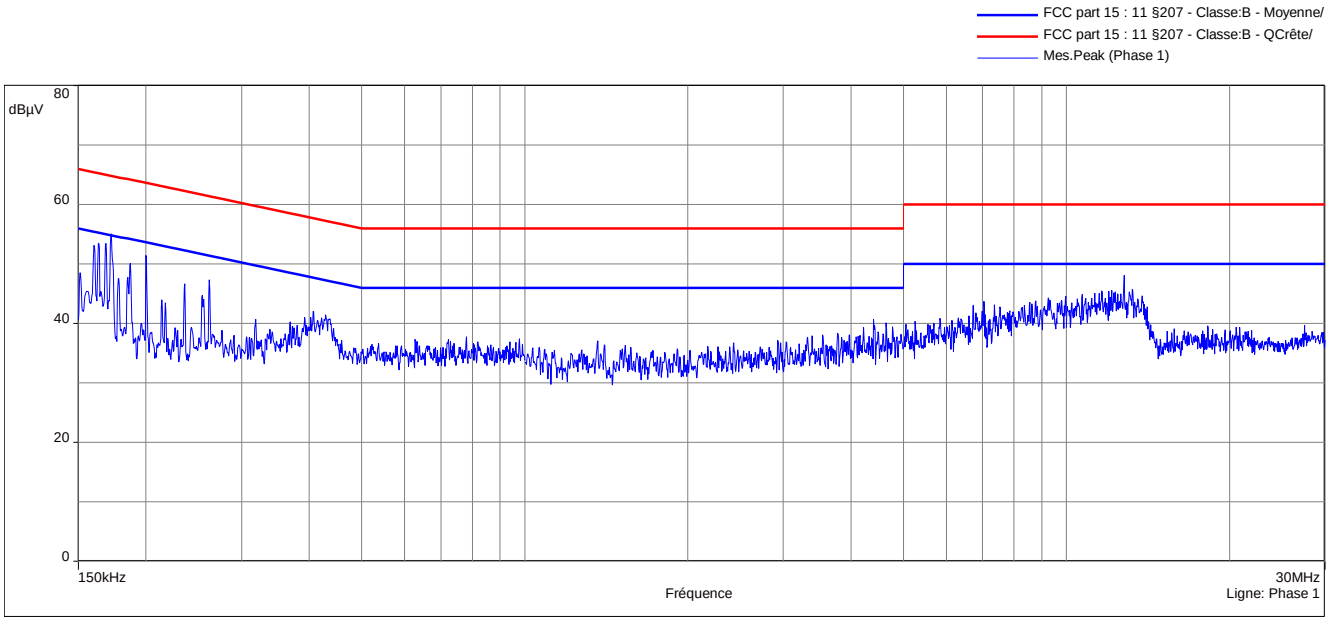
Measurement on the mains power supply:

The measurement is first realized with Peak detector.

Curve N° 1: measurement on the Neutral with peak detector



Curve N° 2: measurement on the Line with peak detector



The highest frequencies are then analyzed with Quasi-peak detector and Average detector

Table N° 1: measurement on the Neutral, for the frequency range:

Frequency	Quasi-peak	QP Limit	QP margin
(MHz)	(dBµV)	(dBµV)	(dB)
0.151	43.7	65.9	22.24
0.172	40.62	64.9	24.24
0.193	38.23	63.9	25.68
0.211	36.36	63.2	26.82
0.251	33.33	61.7	28.40
0.417	38.42	57.5	19.09
8.399	37.61	60.0	22.39
11.640	39.48	60.0	20.52
13.060	40.6	60.0	19.40

Frequency	Average	Average Limit	Average margin
(MHz)	(dBµV)	(dBµV)	(dB)
0.151	33.95	55.9	21.99
0.172	30.81	54.9	24.05
0.193	29.28	53.9	24.63
0.211	28.16	53.2	25.02
0.251	26.35	51.7	25.38
0.417	29.13	47.5	18.38
8.399	28.75	50.0	21.25
11.640	30.95	50.0	19.05
13.060	32.49	50.0	17.51

Table N° 2: measurement on the Line, for the frequency range:

Frequency	Quasi-peak	QP Limit	QP margin
(MHz)	(dBµV)	(dBµV)	(dB)
0.163	42.5	65.3	22.80
0.172	41.1	64.8	23.74
0.187	38.99	64.2	25.18
0.200	37.55	63.6	26.06
0.236	34.1	62.2	28.15
0.262	33.06	61.4	28.32
0.429	36.05	57.3	21.22
12.772	37.1	60.0	22.90

Frequency	Average	Average Limit	Average margin
(MHz)	(dBµV)	(dBµV)	(dB)
0.163	32.72	55.3	22.58
0.172	31.43	54.8	23.41
0.187	30.19	54.2	23.98
0.200	28.99	53.6	24.62
0.236	26.79	52.2	25.46
0.262	26.47	51.4	24.91
0.429	29.59	47.3	17.68
12.772	29.73	50.0	20.27

Test conclusion:

RESPECTED STANDARD

9. RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS

Temperature (°C) : 20 **Humidity (%HR):** 60 **Date :** October 7, 2020
Technician : T. LEDRESSEUR

Standard: FCC Part 15

Test procedure: paragraph 209

Test set up:

First an exploratory radiated measurement was performed. During this phase the product is oriented in three orthogonal planes.

Then the final measurement is realized with the product on the most critical orientation.

The system is tested in an open area test site (OATS). The EUT is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

See photos in Test setup document

Frequency range: From 9 kHz to 1 GHz

Detection mode: Quasi-peak(F < 1 GHz)
Except for the frequency bands 9-90kHz, 110-490kHz. Radiated emission limits in these three bands are based on measurements employing an average detector

Bandwidth: 200Hz (9 kHz < F < 150kHz)
9 kHz (150 kHz < F < 30MHz)
120 kHz (30 MHz < F < 1 GHz)

Distance of antenna: 10 meters (in open area test site)

Antenna height: 1 to 4 meters (in open area test site)

Antenna polarization: vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

The equipment under test is blocked in alternance of emission and reception mode.

Charging mode:

Power source: 120 Vac by an external power supply
Percentage of voltage variation during the test (%): ± 1

Battery mode:

We used for power source the internal battery of the equipment and we noted:
Voltage at the beginning of test (Vdc): 7.4Vdc
Percentage of voltage drop during the test (%): ± 1

Results:

Sample N° 1:

Measure realized in charging mode and repeated with the battery only

Charging mode

Sample N° 1: Carrier = 134.2 kHz

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dBµV/m (1)	Field strength at 300 meters dBµV/m (2)	Limits 300m dBµV/m	Margin (dB)
134.2	P	85.12	26.04	45	18.96
134.2	Av	84.01	24.93	25	0.07

With antenna height: 100 cm; Azimuth: 275°; Polarization antenna: Parallel° - Position 2

(1) Field strength measured at 10 meters

(2) Field strength extrapolated at 300 meters using 40dB/decade fall off

Sample 1: Harmonics and spurious:

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dBµV/m (3)	Field strength at 300 meters dBµV/m (4)	Limits 300m dBµV/m	Margin (dB)
268.4	P	42	-17.08	39	56.08
268.4	Av	40	-19.08	19	38.08
402.7	P	42.46	-16.62	35.5	52.12
402.7	Av	41.12	-17.96	15.5	33.46

(3) Noise Floor measured at 10 meters

(4) Noise Floor extrapolated at 300 meters using 40dB/decade fall off

Above 30 MHz

Frequencies (MHz)	Detector P QP Av	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 10 m (dBµV/m)	Field strength Computed at 3 m (dBµV/m)	Limits at 3 m (dBµV/m)	Margin (dB)
197.562	QP	120	H	32.65	43.11	43.5	0.39
203.826	QP	120	H	31.97	42.43	43.5	1.07
255.828	QP	120	H	28.45	38.91	46	7.09
276.807	QP	120	H	30.16	40.62	46	5.38
283.422	QP	120	H	32.88	43.34	46	2.66

P= Peak, QP=Quasi-peak, Av=Average

Battery mode

Sample N° 1: Carrier = 134.2 kHz

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dBµV/m (1)	Field strength at 300 meters dBµV/m (2)	Limits 300m dBµV/m	Margin (dB)
134.2	P	85.07	26.09	45	18.91
134.2	Av	83.89	24.81	25	0.19

With antenna height: 100 cm; Azimuth: 274°; Polarization antenna: Parallel° - Position 2

(1) Field strength measured at 10 meters
(2) Field strength extrapolated at 300 meters using 40dB/decade fall off

Sample 1: Harmonics and spurious:

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dBµV/m (3)	Field strength at 300 meters dBµV/m (4)	Limits 300m dBµV/m	Margin (dB)
268.4	P	42	-17.08	39	56.08
268.4	Av	40	-19.08	19	38.08
402.7	P	41.7	-17.38	35.5	52.88
402.7	Av	40.35	-18.73	15.5	34.23

(3) Noise Floor measured at 10 meters
(4) Noise Floor extrapolated at 300 meters using 40dB/decade fall off

Above 30 MHz

Frequencies (MHz)	Detector P QP Av	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 10 m (dBµV/m)	Field strength Computed at 3 m (dBµV/m)	Limits at 3 m (dBµV/m)	Margin (dB)
154.59	QP	120	V	33.1	43.46	43.5	0.04
171.78	QP	120	V	30.13	40.59	43.5	2.91
188.955	QP	120	H	28.88	39.34	43.5	4.16
206.13	QP	120	H	31.05	41.51	43.5	1.99
249.09	QP	120	V	27.59	38.05	46	7.95
283.44	QP	120	H	30.28	40.74	46	5.26

P= Peak, QP=Quasi-peak, Av=Average

Applicable limits: for 9 kHz ≤ F ≤ 490 kHz : 2400/F(kHz) at 300 meters
for 490 kHz < F ≤ 1.705 MHz : 24000/F(kHz) at 30 meters
for 1.705 MHz < F ≤ 30 MHz : 29.5 dBµV/m at 30 meters
for 30 MHz < F ≤ 88 MHz : 40 dBµV/m at 3 meters
for 88 MHz < F ≤ 216 MHz : 43.5 dBµV/m at 3 meters
for 216 MHz < F ≤ 960 MHz : 46 dBµV/m at 3 meters
Above 960 MHz : 54 dBµV/m at 3 meters

Note: any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

Test conclusion:

RESPECTED STANDARD

□□□ End of report, (2) appendixes to be forwarded □□□

APPENDIX 1: Test equipment list

Conducted limits

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	10788
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESPC	Rohde & Schwarz	5275
Spectrum Analyzer FSP7	Rohde & Schwarz	6796
LISN 1600	Thurbly Thandar Instruments	8719
High-pass filter EZ-25	Rohde & Schwarz	8635
Absorber sheath current	Emitech	9489
Cable N-5m RG214	GYL Technologies	8590
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC V3.17.0.25	0000

Radiated emission limits; general requirements

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Turntable and mat controller	EMITECH	8855
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Loop antenna 6502	EMCO	1406
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna 3147	EMCO	8783
Cable	EMITECH	8578
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station 608-H1	Testo	7566
Software	BAT-EMC V3.17.0.25	0000

APPENDIX 2: 99% bandwidth