TEST REPORT CONCERNING THE COMPLIANCE OF A PROXIMITY CARD READER, OPERATING ON 125 KHZ AND 13.56 MHZ, BRAND HID, MODELS 810xD INCORPORATING THE SMARTREADERII V01.03 PLUS THE SMARTEXTENSION 125 V02.00 (MODEL DIFFERENCES EXPLAINED ON PAGE 2 AND APPENDIX 1)

47 CFR PART 15 (SEPTEMBER 20, 2007).
THE REQUIREMENTS OF INDUSTRY CANADA:
RSS-GEN AND RSS-210

FCC listed :	90828
Industry Canada :	IC3501
VCCI Registered :	R-1518, C-1598
R&TTE, LVD, EMC Notified Body :	1856

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MEASUREMENT/TECHNICAL REPORT

HID Global Corporation

Model : This report covers only 1 of 2 transmitter models – the applicant states: differences are explained within the HID Attestation of Similarity found in Appendix 1. Both models incorporate the identical circuitry and integral RF Section and PWB embedded antenna housed on the SmartReaderII V01.03 PWA plus the SmartExtension125 V02.00 (a PWA with Integral RF section and Antenna). Prescans were completed on all product geometric differences and the worst case unit was tested and shown in this report. Specific notes have been inserted in each section of this report to better clarify the data shown and its applicability to both units covered. Refer to Appendix 1 for more information.

FCC ID: JQ6-SmartID & IC ID: 2236B-SmartID

March 26, 2008

This report concerns:	Original grant/certification	~~Class 2 change~~	~~Verification~~
Equipment type:	125 kHz and 13.56 MHz Inductive Proximity Card Reader		
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?		~~Yes~~	~~No~~ n.a.

Report prepared by:		
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	Company name	: TÜV Rheinland EPS B.V.
	Address	: Smidshornerweg 18
	Postal code/city	: 9822 ZG Niekerk
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (September 20, 2007), RSS-GEN AND RSS-210 and the measurement procedures of ANSI C63.4-2003. TÜV Rheinland EPS B.V. at Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: March 26, 2008 Signature:

H.J. Pieters
Project Manager TÜV Rheinland EPS B.V.

Description of test item

Test item	:	Proximity Card Reader, operating on 125 kHz and 13.56 MHz, brand HID, 2 8101D(SmartTrans ASK/PSK Mullion Reader and additional passive keypad)
Manufacturer	:	HID Global Corporation
Brand	:	HID
Model	:	810xD Incorporating SmartReaderII V01.03 Main PWA and the SmartExtension125 V02.00
Serial number(s)	:	n.a.
Revision	:	n.a.
Receipt date	:	January 22, 2008

Applicant information

Applicant's representative	:	Mr. T. Seeley (USA - Denver, CO Compliance)
Company	:	HID Global Corporation
Address	:	9292 Jeromino Road
Postal code	:	92618-1905
City	:	Irving, CA
PO-box	:	-
Postal code	:	-
City	:	-
Country	:	USA
Telephone number	:	1+ 949 598 1600 (Main Office), 303-404-6700 (Denver, CO)
Telefax number	:	1+ 949 598 1680 (Main Office)

Test(s) performed

Location	:	Niekerk
Test(s) started	:	January 21, 2008
Test(s) completed	:	February 22, 2008
Purpose of test(s)	:	Equipment Authorization (Original grant/certification)
Test specification(s)	:	47 CFR Part 15 (September 20, 2007), RSS-GEN AND RSS-210
Test engineers	:	M. Edwards van Muyen / R. van der Meer
Report written by	:	R. van der Meer
Report date	:	March 26, 2008

Table of contents

1 General information.

1.1 Product description.

1.1.1 Introduction.

The EUT is an inductive proximity card reader intended to be used in access control systems, parking systems and other applications using RFID readers. It is capable of reading 125 kHz and 13.56 MHz inductive tags.

In the case of this test report – 1 of 2 different models is covered. The manufacturer states that the tested model is representative for other 2 models as noted in the AoS, but it's outside the scope of TÜV Rheinland EPS B.V. to have any judgement on this. Prescans were completed and the worst case model tested – there are additional notes in each section to further clarify the applicability of the testing data shown to each of the covered models.

The content of this report and measurement results have not been changed other than the way of presenting the data.

1.2 Related submittal(s) and/or Grant(s).

1.2.1 General.

This test report supports the original grant/certification in equipment authorization files under FCC ID: JQ6 – SmartID & IC ID: 2236B-SmartID

1.2.2 FCC ID

This report supports the results of the 125 kHz and 13.56 MHz Inductive Card Reader (FCC ID: JQ6 – SmartID & IC ID: 2236B-SmartID).

1.3 Tested system details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

EUT	:	Inductive Proximity Card Reader 125 kHz and 13.56 MHz with and without keypad
Manufacturer	:	HID Global Corporation
Brand	:	HID
Model	:	8101D (SmartTRANS ASK/FSK Mullion Reader with Keypad) was found to be the worst case model
Serial number	:	n.a.
Voltage input rating	:	+5 to +24 VDC (any DC power supply)
Current input rating	:	Not provided
Remarks	:	The EUT contains a SmartreaderII/8pin V01.03 with SmartExtension125 V02.00 and a passive keypad overlaying the 2 integral boards on the outside of the plastic housing

Auxiliary equipment 1	:	Linear AC/DC Power Supply
Manufacturer	:	Topward electric instruments Co.,LTD.
Brand	:	Topward electric instruments Co.,LTD.
Model	:	TPS-2000
Serial number	:	920035
Voltage input rating	:	100-120V ~ 50-60Hz
Current input rating	:	--
Voltage output rating	:	0-30 Vdc
Current output rating	:	0-6.4A
Remarks	:	-

1.3.1 Description of input and output ports.

Number	Ports	From	To	Shielding	Remarks
1	AC mains	AC mains	AE1	~~yes~~ / no	None
2	DC power input port	AE1	EUT	~~yes~~ / no	None
3	Serial port	EUT	--	yes ~~/ no~~	None

AE = Auxiliary equipment

1.4 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (September 20, 2007), sections 15.207, 15.209 and 15.225.

The test methods, which have been used, are based on ANSI C63.4: 2003.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters.
Radiated emission tests below 30 MHz were performed at a measurement distance of 3 meters and 10 meters. To calculate the field strength level from these results to the appropriate distance at which the limit is specified, the calculation in appendix 1 has been applied.

The receivers are switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

1.5 Test facility.

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at TÜV Rheinland EPS B.V., located in Niekerk, 9822 TL Smidshornerweg 18, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per October 23, 2000.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at http://www.fcc.gov.

1.6 Test conditions.

Normal test conditions:

Temperature (*) : +15°C to +35°C
Relative humidity(*) : 20 % to 75 %
Supply voltage : 110VAC/60Hz to the AC/DC Power Supply – the DC output was varied across the voltage range specified by the manufacturer
Air pressure : 950 – 1050 hPa

*** When is was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.**

2 System test configuration.

2.1 Justification.

The system was configured for testing in a typical fashion (as a customer would normally use it).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 2003.

2.2 EUT mode of operation.

The EUT has been tested in active mode, i.e. the EUT is ready to detect a card. To assess the behavior of the EUT while reading the card, the EUT is tested with a card presented such that it continuously reads the card, and continuously sends data to the serial port of the EUT.

The intentional radiator tests (47 CFR Part 15 sections, 15.207, 15.209 and 15.225) have been performed with a complete functioning EUT and interconnections.

2.3 Special accessories.

No special accessories are used and/or needed to achieve compliance.

2.4 Equipment modifications.

No modifications have been made to the equipment in order to achieve compliance .
Only for the Conducted Emissions testing (section 4) test, the test unit was modified to add a resistive termination in lieu of the antenna. Pictures are available to show the modifications. For all other tests no modifications have been made to the equipment.

2.5 Product Labelling.

The product labeling information is available in the technical documentation package.

2.6 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

2.7 Schematics of the EUT.

The schematics are available in the technical documentation package.

2.8 Part list of the EUT.

The part list is available in the technical documentation package.

3 Radiated emission data.

3.1 Radiated field strength measurements (30 MHz – 1 GHz, E-field).

Frequency (MHz)	Measurement results dB(µV)/m @ 3 metres Quasi-peak		Limits dB(µV)/m @ 3 metres Quasi-peak	Result
	Vertical	Horizontal		PASS/FAIL
30.0-88.0	< 20.0	<<	40.0	PASS
88.0-216.0	< 20.0	<<	43.5	PASS
except for:				
149.2	18	16	43.5	PASS
162.7	18	14	43.5	PASS
176.3	15	13	43.5	PASS
189.87	17.5	13	43.5	PASS
216.0-950.0	< 25.0	<<	46.0	PASS
except for:				
216.99	14.8	12	46.0	PASS
> 950.0	< 30.0	<<	54.0	PASS

Table 1

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.209 & RSS-210, section 6.2.1 and 6.2.2, with the EUT tested in active mode and while detecting a card are depicted in table 1.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. "<<" means that measurement values are much lower than the value determined for the other polarization.
3. The test data shown above is of the worst case EUT (8101D).
4. Measurement uncertainty is ±5.0dB
5. Taking into account the worst case measurement uncertainty, that would be +5dB, the tested item still passed the test.

Test engineer

Signature : 

Name : Richard van der Meer

Date : January 25, 2008

E-field Radiated Emissions Test Setup Photos:

8101D Shown in Setup Photos

3.2 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field).

Frequency (MHz)	Measurement results dBµV		Antenna factor	Cable loss	Measurement results dB(µV)/m for 30 m (calculated)	Limits Part 15.209 & Part 15.225 dB(µV)/m
	3 meters	10 meters	dB	dB		
0.009 - 0.490	25.0	n.i.	20.0	1	6	48.5 – 13.8 (300 m)
0.490 - 1.705	13.0	n.i.	20.0	1	n.i	33.8 - 22.9 (30 m)
1.705 – 30.0	15.0	n.i.	20.0	1	n.i	29.5 (30 m)
13.56	40	23	19.6	1	20.6	84.0 (30m) (FCC15.225-(a)

Table 2

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15, sections 15.205, 15.209 and 15.225 and RSS-210, section 6.2.1 and 6.2.2 with the EUT operating in continuous transmit mode on 13.562 MHz, are depicted in table 2.

Notes:

1. Calculated measurement results are obtained by using the distance extrapolation factor of 40dB/decade, antenna factor and cable loss. For example at 13.56 MHz: 40 + 19.6 + 1 – 40 = 20.6 dB(µV)/m
2. Frequency range:
   a. 9-90 kHz Average detector used during measurements
   b. 110-490 kHz Average detector used during measurements
3. n.i. indicates that no field strength values could be measured on the listed frequencies or in the listed frequency range.
4. Field strength values of radiated emissions at frequencies not listed in table 3 are more than 20 dB below the applicable limit
5. The EUT was varied in three positions, the loop antenna was varied in in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency.
6. The EUT was tested in both normal mode (i.e. without a label in its proximity) and in activated mode (i.e. with a label in its proximity.
7. The test data shown above is of the worst case EUT (8101D).
8. Measurement uncertainty is ±5.0dB
9. Taking into account the worst case measurement uncertainty, that would be +5dB, the tested item still passed the test.
10. **The 125kHz fundamental and all spurious harmonics were ≥40dB below the limit and therefore meets the requirements for the <490MHz exemption.**

Test engineer

Signature : 

Name : R. van der Meer

Date : January 25, 2008

H-Field Radiated Emissions Test Setup Photos:

8101D Shown in Setup Photos

3.3 Carrier stability under special conditions.

The following testing in this section was conducted on test sample model number 8101D.

5.3.1 Bandwidth of the emission at 125 kHz in accordance with RSS-210, section 5.9.1.

Limit: 20 dB of the bandwidth of the emission shall be within the specified frequency band.
Bandwidth of the emission is determined at the points 20 dB down from the modulated carrier.
Specified frequency band: None. See Table 3 for results.

Temperature (°C)	Minimum frequency (kHz)	Maximum frequency (kHz)
+20.0	124.9840	124.9840
-20.0	124.9840	124.9840
+50.0	124.9840	124.9840
Bandwidth	124.9840	124.9840

Table 3

5.3.2 Frequency stability (on 13.56 MHz) in accordance with 47 CFR Part 15, section 15.225 (e) & RSS-210, section 6.2.2 (e): at –20 °C and +50 °C:

1) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 °C to +50 °C at normal supply voltage (see table 4).

Stability under special conditions Temperature (°C)	Measured frequency (MHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
20.0	13.562072 (reference)	N.A.	N.A.
-20.0	13.562128	< 0.01	PASS
50.0	13.562016	< 0.01	PASS

Table 4.

5.3.3 Frequency stability in accordance with 47 CFR Part 15, sections 15.225 (e): Temperature = 20 °C

5.3.3.1 At 85% and 115% of rated voltage supply level

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency at 85% and at 115% of the rated power supply voltage at 20 °C environmental temperature. The results are stated in Table 5.

Stability under special conditions % variation U	Measured frequency (MHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
100.0	13.562072 *(reference)*	N.A.	N.A.
85.0	13.562128	< 0.01	PASS
115.0	13.562016	< 0.01	PASS

Table 5

5.4 Amplitude stability on 13.56 MHz in accordance with RSS-210.

No particular requirements other than in section 3 of this report.
From measurements performed as indicated below, the amplitude stability will not cause non-compliant situations with respect to exclusion bands or emissions outside permissible bands (band edges)

Stability under special conditions Supply Voltage (Vdc)	Amplitude deviation (dB)
12 (100%)	N.A.
5 (-15%)	-0.21
24 (+15%)	-0.19

Table18
Amplitude stability of the EUT due to voltage variations.

Note (Section 2.2.1 through 2.2.3):
The manufacturer wants to state:
Since the 2 models incorporated the SmartReaderII V01.03 Main PWA and SmartExtension 125 V02.00 housed in identical plastic enclosures – the carrier stability testing was completed on a potted 8101D only and is representative of both models.

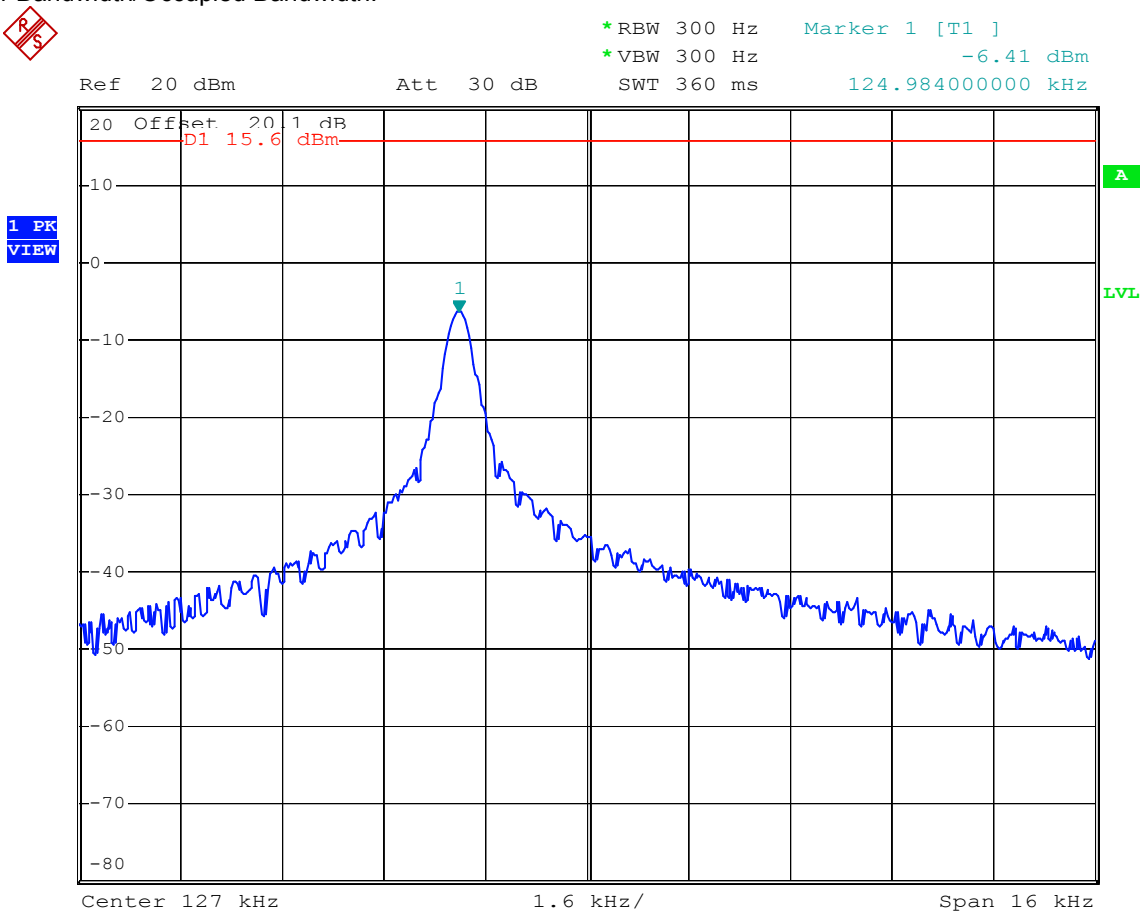
Test engineer

Signature :

Name : M. Edwards van Muyen

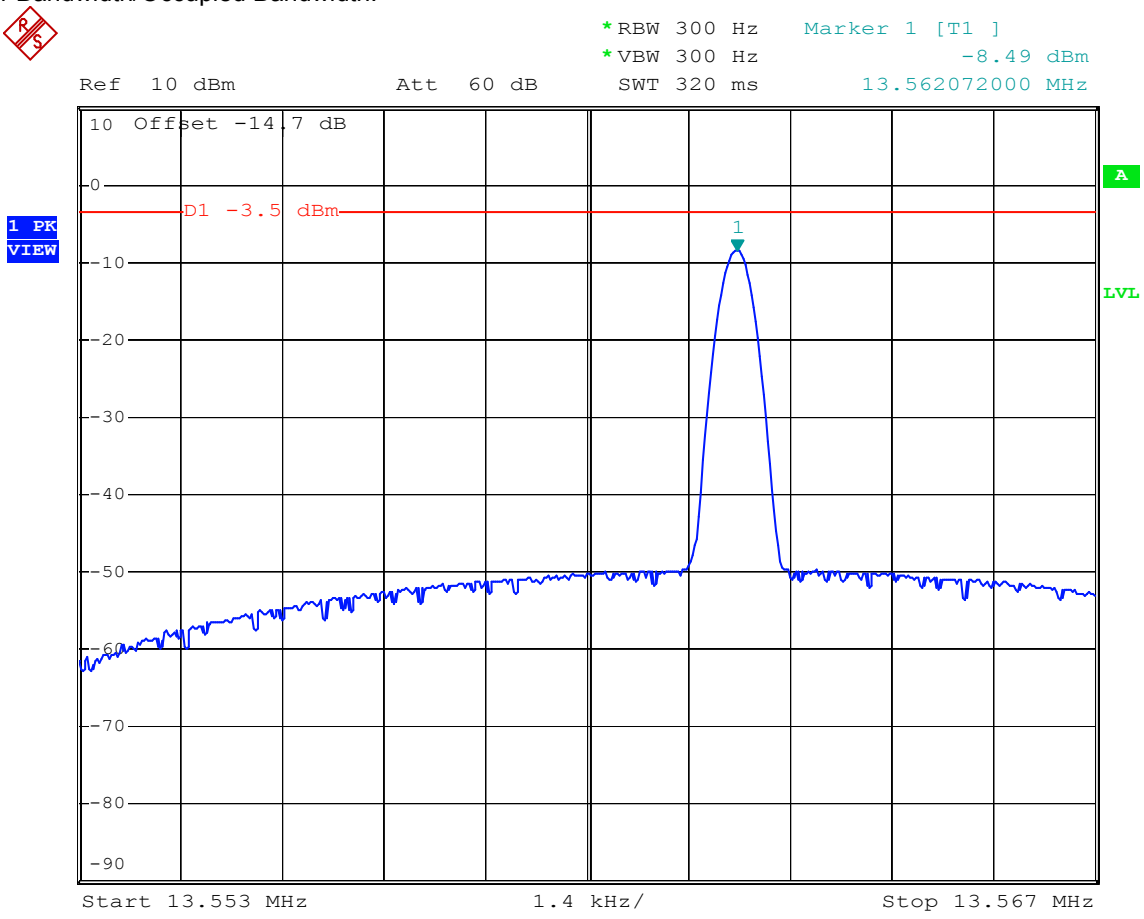
Date : February 22, 2008

Carrier Bandwidth/Occupied Bandwidth:



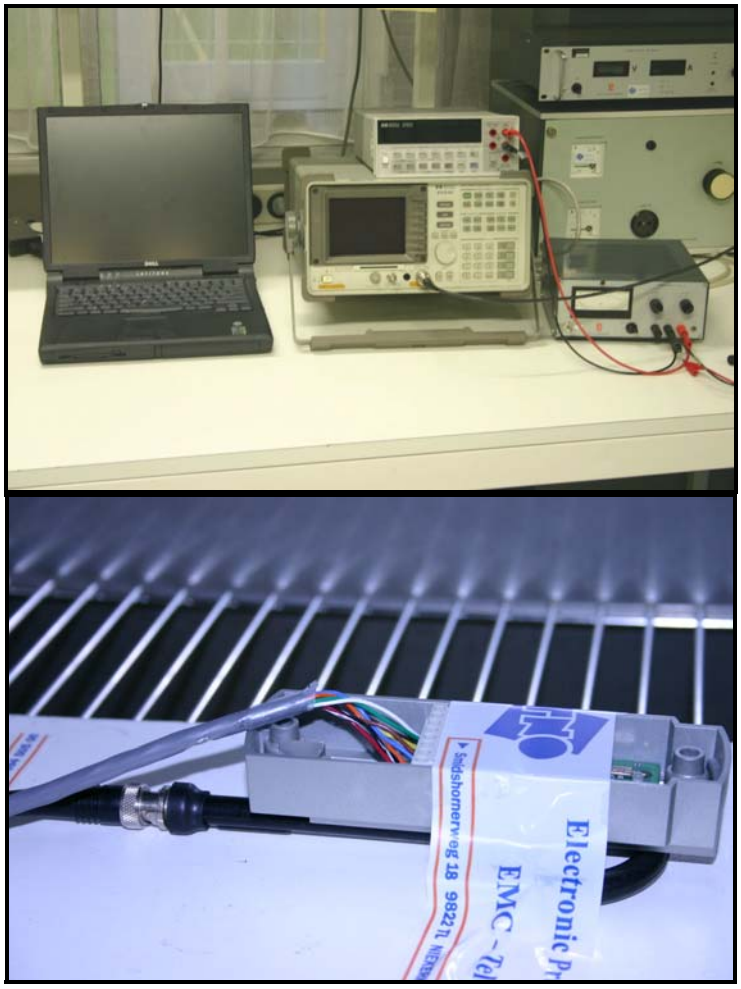
Plot 1 – Bandwidth of the emission at 125 kHz (Fundamental Carrier), for IC Occupied Bandwidht is 0 kHz

Carrier Bandwidth/Occupied Bandwidth:



Plot 1 –Bandwidth of the emission at 13562 kHz (Fundamental Carrier), for IC Occupied Bandwidth is 56Hz

Carrier/Frequency Stability Test Setup Photos:



6. Conducted emission data.

6.3 Conducted emission data of the EUT.

Supply Voltage (V)	Frequency (MHz)	Measurement results dB(µV) Neutral		Measurement results dB(µV) Line 1		Limits dB(µV)		Result
		QP	AV	QP	AV	QP	AV	
	5.095	20.5	20	26.2	22	60.0	50.0	PASS
	5.513	23.4	22	27.9	27.4	60.0	50.0	PASS
5	5.986	22.1	22	31.0	29	60.0	50.0	PASS
	6.4586	35.4	35.3	27.2	26	60.0	50.0	PASS
	6.873	33.5	32.7	29.0	27	60.0	50.0	PASS
	8.357	31.5	30	28.7	27	60.0	50.0	PASS
	8.771	31.0	30	27.3	24	60.0	50.0	PASS
	9.244	30.5	28	28.8	28	60.0	50.0	PASS
	5.474	33	33	30.5	29	60.0	50.0	PASS
	6.009	33.2	32	30.5	29	60.0	50.0	PASS
12	6.486	33	32	31.0	30	60.0	50.0	PASS
	6.904	32.5	31.9	31.6	30	60.0	50.0	PASS
	8.392	30	29	30.5	29	60.0	50.0	PASS
	4.943	25	25	25.5	24	60.0	50.0	PASS
	5.599	22	18	30.7	29.5	60.0	50.0	PASS
24	6.017	30	28	32.2	32	60.0	50.0	PASS
	6.134	34	33	26.0	22	60.0	50.0	PASS
	6.431	31	30	22.1	17	60.0	50.0	PASS
	6.849	29	28	21.0	16	60.0	50.0	PASS
	8.396	29.3	28	28	25.5	60.0	50.0	PASS
	8.876	25.7	24	30.6	28	60.0	50.0	PASS
	9.290	24	22	29	26	60.0	50.0	PASS

Table 6

Conducted emission measurements. The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15, section 15.207, at the 110 Volts AC mains connection terminals of the AC/DC power supply which was connected to the EUT, are depicted in table 6. The EUT was tested in both active mode, and while detecting a card. Maximum values recorded.

Notes:

1. The test unit was modified to add a resistive termination in lieu of the antenna.
2. The test data shown above is of the worst case EUT (8101D).
3. Measurement uncertainty is ±3.5dB

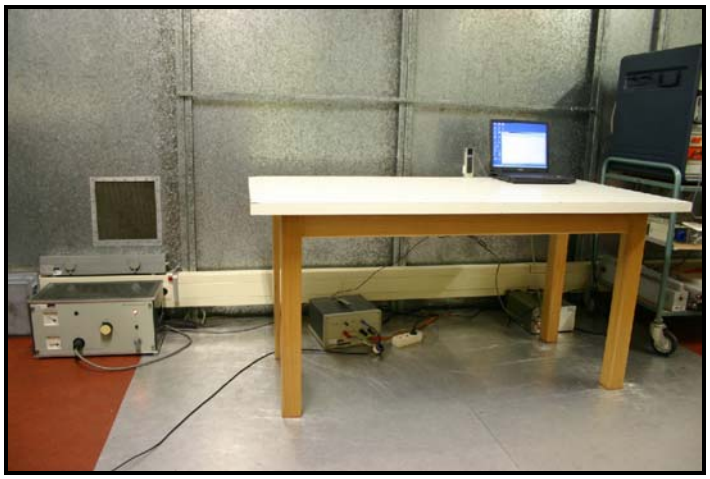
Test engineer

Signature : 

Name : R. van der Meer

Date : January 30, 2008

Conducted Emissions Test Setup Photos:



8101D Shown in Setup Photos

7. List of utilized test equipment.

Inventory number	Description	Brand	Model	Last cal.	Next cal.
12476	Antenna mast	EMCO	TR3	NA	NA
12477	Antenna mast 1-4 mtr	Poelstra	NA	NA	NA
12482	Loop antenna	EMCO	6507	04/2007	04/2008
12640	Temperature chamber	Heraeus	VEM03/500	01/2008	01/2009
99538	Spectrum analyzer	R&S	FSP40	04/2007	04/2008
99580	Open Area testsite	Comtest	NA	09/2006	09/2009
14051	Anechoic room	Comtest	NA	NA	NA
15633	Biconilog Testantenna	Chase	CBL 6111B	02/2007	02/2008
15667	Measuring receiver	R&S	ESCS 30	04/2007	04/2008
99045	Power supply	Delta	E030-3	03/2007	03/2008
99318	Digital multimeter	HP	34401A	10/2007	10/2008
99596	Preamplifier 0.5 GHz - 18 GHz	Miteq	AMF-5D-005180-28-13p	07/2006	07/2008

NA= Not Applicable

Appendix 1
HID Attestation of Similarity
(added on request of the applicant)
(Photos of Products on Following Pages)

HID Global
[illegible]

Attestation of Similarity

The SmartID product family consists of different models that incorporate an identical main CCA (SmartReaderII V01.03) that has integral, Power Section, I/O Section, Digital Processing Section, RF Section and Antenna. This main board is then placed within different plastic enclosure that do not impact compliance for Safety, Radio, Emissions and most immunity requirements. In addition, other CCA's may be added to the main CCA integral to the plastic enclosure to add functionality to the device (E.g. a passive Keypad, 125kHz Prox and biometrics). In cases where the basic geometries may affect compliance – prescans are performed in order to identify the worst case model. All Engineering justifications and or compliance impacts are addressed within the report in the form of additional testing and/or or notes.

The following 2 readers share the same basic product configuration geometry – the only difference between the 2 is one has a passive keypad overlaid across the main CCA on the outside of the enclosure.

Reader Type	Mullion – 13.56MHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	N/A	N/A
Part Number	8030D			

Reader Type	Mullion with Keypad – 13.56MHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	Membrane Keypad V01.00	N/A
Part Number	8031D			
Difference Description From 1st Model	The only difference of this Model from the 8030D above is that a passive keypad is added – changing the product mechanical geometry that may effect emissions and immunity. Everything else is identical.			

Reader Type	Desktop – 13.56MHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic	SmartReaderII V01.03	N/A	N/A
Part Number	8032D			
Difference Description From 1st Model	The only difference of this Model from the 8030D above is that it is placed in a differently molded plastic enclosure. Everything else is identical. There is no other board (passive or active) within this product – therefore testing the 8030D applicable to the 8032D and does not need redone. However, ESD testing shall be done on this unit for the plastic housing is different than the 8030D.			

Page 1 of 3

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An ASSA ABLOY Group brand

ASSA ABLOY

HID Global
10383 Westminster Drive, Ste. 300
Westminster, CO 80021

The following 2 readers share the same basic product configuration geometry – the only difference between the 2 is one has a passive keypad overlaid across the main CCA on the outside of the enclosure.

Reader Type	Mullion – SmartTRANS – 13.56MHz&125kHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	SmartExtension125 V02.00	N/A
Part Number	8100D			
Difference Description From 1st Model	The only difference of this Model from the 8030D above is that it has an add on CCA "SmartExtension125" that adds the ability to read 125kHz proximity cards that sits above the SmartReaderII board within the potting and plastic enclosure. In addition, the buzzer and back LED are relocated – straight through to the SmartExtension125 CCA. Everything else is identical.			

Reader Type	Mullion with Keypad – SmartTRANS – 13.56MHz&125kHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	SmartExtension125 V02.00	Membrane Keypad V01.00
Part Number	8101D			
Difference Description From 1st Model	The only difference of this Model from the 8031D above is that it has an add on CCA "SmartExtension125" that adds the ability to read 125kHz proximity cards that sits above the SmartReaderII board within the potting and plastic enclosure. In addition, the buzzer and back LED are relocated – straight through to the SmartExtension125 CCA. Everything else is identical.			

Supporting product photos are on the following pages after the signature below.

Company Representative Signature:
Todd Seeley – Manager/Compliance Engineer

2-10-2008
Statement Date:

Phone: 303-404-6700
Fax: 303.404.6840
Web: www.hidcorp.com

An ASSA ABLOY Group brand

ASSA ABLOY

HID Global
[illegible]

From Right to Left (Products in Plastic Enclosures)

1. 8030D Mullion Reader – Also Represents the 8100D
2. 8031D Mullion Reader with Keypad – Also Represents the 8101D
3. 8032D Desktop Reader/Programmer
4. SmartReaderII V01.03 Main CCA (the main active CCA incorporated in every product addressed by this AoS).

Phone: 303.404.6700
Fax: 303.404.6840
Web: www.hidcorp.com

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ASSA ABLOY