



Test Report

Product Name : Mini Reader Module
Model No. : GD-MINRD-1-GNN REV. 1.51 / GEM-PX
FCC ID. : AD8GEMPX

Applicant : NAPCO Security Systems Inc.
Address : 333 Bayview Avenue Amityville, NY 11701 USA

Date of Receipt : 2004/08/31
Issued Date : 2004/09/17
Report No. : 049H008FI

The test results relate only to the samples tested.

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Test Report Certification

Test Date : 2004/09/17

Report No. : 049H008FI



Product Name : Mini Reader Module

Applicant : NAPCO Security Systems Inc.

Address : 333 Bayview Avenue Amityville, NY 11701 USA

Manufacturer : Honyi Precision Industry Co., Ltd.

Model No. : GD-MINRD-1-GNN REV. 1.51 / GEM-PX

FCC ID. : AD8GEMPX

Rated Voltage : DC 12V

Trade Name : NAPCO

Measurement Standard : FCC CFR Title 47 Part 15 Subpart C 15.209: 2003

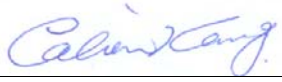
Measurement Procedure : ANSI C63.4: 2001

Test Result : Complied

The test results relate only to the samples tested.

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Documented By : 
(Carol Tsai)

Tested By : 
(Calien Kang)

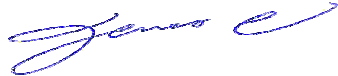
Approved By : 
(James Chang)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Mini Reader Module
Trade Name	NAPCO
Model No.	GD-MINRD-1-GNN REV. 1.51 / GEM-PX
FCC ID	AD8GEMPX
EUT Voltage	DC 12V
Frequency Range	125kHz
Type of Modulation	ASK
Antenna Type	Soldered on PCB (Loop)
Channel Number	1
Channel Control	Non-Applied

Component	
Signal Cable	Shielded, 0.45m

Frequency of Each Channel:

Channel	Frequency
Channel 1:	125 kHz

Note:

1. This device is a 125kHz device included a 125kHz receiving function, and 125kHz transmitting function.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.209.
3. This device is a composite device in accordance with Part 15 regulations. The function receiving was measured and made a test report that the report number is 049H008F under Declaration of Conformity.

1.2. Operational Description

The EUT is a Mini Reader Module. The operation frequency is 125kHz with ASK modulation. The signal will be transmitted through 125kHz ASK RF signal from the soldered on PCB antenna from EUT to receiver. DC 12V shall be provided for EUT operation.

The GEM-PX is a NAPCO proprietary proximity card reader which combines with the GEM-PXCV cover to provide complete system status using indicator LED's. The GEM-PX reader can only be used with GEM 36-bit proprietary proximity cards. The GEM-PX reader consists of the proximity reader module, which is fully encapsulated in weather resistant potting and the snap on GEM-PXCV cover which houses additional LED's. The multicolored LED on the GEM-PX provides standard visual feedback as to access condition (door "locked" or "unlocked"), and the additional LED's in the GEM-PXCV cover provide feedback as to system condition system "armed" or "disarmed"). Together, the GEM-PX and GEM-PXCV is an indoor/outdoor proximity card reader providing potted electronics, low power consumption and durability all in a small, easy to install package.

1.3. Test Mode

Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Pre-Test Mode	
EMI	Mode1: Normal Operation
Final Test Mode	
EMI	Mode1: Normal Operation

1.4. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	GD210NT2 Controller (Multi-Function 2 door controller)	HPI	GD210NT2-TSN	N/A	DoC	--
2	Rechargeable Sealed Lead-Acid Battery	Kung Long	WP7.2-12	N/A	DoC	--
3	DC Power Supply	TAIHSAN	304B	N/A	DoC	Non-shielded, 1.8m
4	Proximity Card	HPI	GD-PROX-1-WNN	N/A	DoC	--

1.5. Configuration of tested System

Test Mode		Mode1: Normal Operation	
Connection Diagram			
Signal Cable Type		Signal cable Description	
A	Signal Cable	Shielded, 0.45m	
B	Telecom Cable	Non-shielded, 3.75m	
C	Power Line	Non-shielded, 0.4m, 4pcs	

1.6. EUT Exercise Software

Test Mode		Mode 1: Transmit
1	Setup the EUT and simulators as shown on 1.4.	
2	Enable RF signal and confirm EUT active.	
3	Modulate output capacity of EUT up to specification.	

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	ANSI.C63.4 CE	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	ANSI.C63.4 RE	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description: June 22, 2001 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2



0914

ILAC MRA

July 03, 2001 Accreditation on NVLAP
NVLAP Lab Code: 200533-0



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2. Conducted Emission

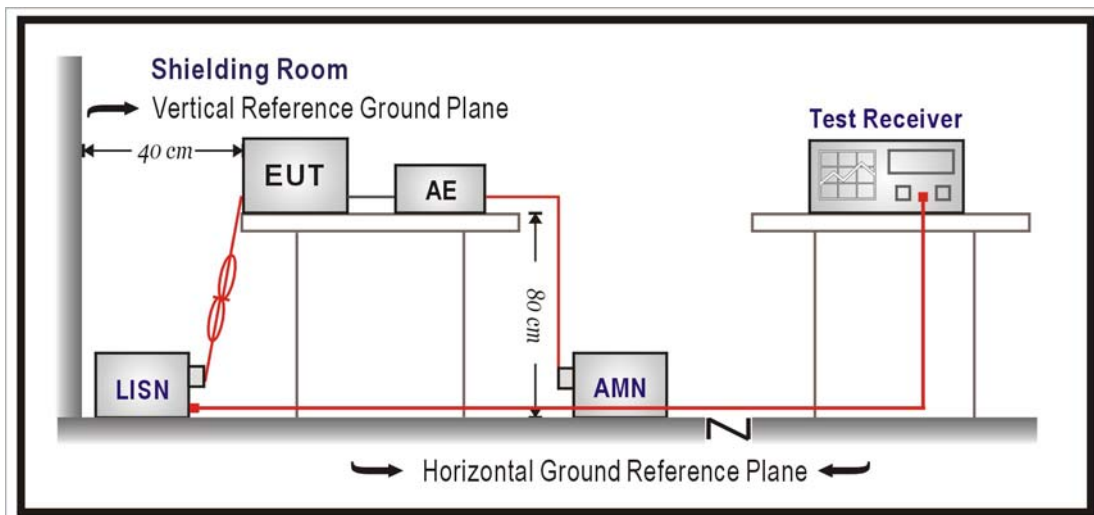
2.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/018	Sep., 2004	
2	Artificial Mains Network	R & S	ENV4200/848411/10	Feb., 2004	Peripheral
3	LISN	R & S	ESH3-Z5/825562/002	Feb., 2004	EUT
4	Pulse Limiter	R & S	ESH3-Z2/357.8810.52	Feb., 2004	
5	No.2 Shielded Room			N/A	

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2001 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207: 2003

2.6. Test Result

Product	Mini Reader Module		
Test Item	Conducted Emission		
Test Mode	Mode1: Normal Operation		
Date of Test	2004/09/17	Test Site	No.2 Shield Room

Frequency	Cable	Probe	Reading	Emission	Limits
	Loss	Factor	Level	Level	
MHz	dB	dB	dBuV	dBuV	dBuV
=====					
LISN 1					
Quasi-Peak					
* 0.274	0.10	0.16	52.26	52.52	61.00
0.449	0.10	0.20	44.10	44.41	56.89
1.205	0.11	0.30	29.46	29.87	56.00
3.599	0.15	0.40	20.26	20.81	56.00
10.798	0.24	0.50	15.42	16.17	60.00
28.060	0.47	0.59	19.12	20.19	60.00
Average					
* 0.274	0.10	0.16	20.80	21.06	51.00
0.449	0.10	0.20	12.20	12.51	46.89
1.205	0.11	0.30	2.50	2.91	46.00
3.599	0.15	0.40	12.30	12.85	46.00
10.798	0.24	0.50	9.20	9.95	50.00
28.060	0.47	0.59	12.10	13.17	50.00

Note:

1. All Reading Levels are Quasi-Peak and Average value.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product	Mini Reader Module		
Test Item	Conducted Emission		
Test Mode	Mode1: Normal Operation		
Date of Test	2004/09/17	Test Site	No.2 Shield Room

Frequency	Cable	Probe	Reading	Emission	Limits
	Loss	Factor	Level	Level	
MHz	dB	dB	dBuV	dBuV	dBuV
=====					
LISN 2					
Quasi-Peak					
* 0.189	0.10	0.12	60.40	60.62	64.08
0.412	0.10	0.20	44.66	44.96	57.61
0.869	0.11	0.27	34.24	34.62	56.00
2.357	0.13	0.36	19.34	19.83	56.00
6.331	0.18	0.45	18.70	19.34	60.00
24.087	0.42	0.58	19.84	20.84	60.00
Average					
* 0.189	0.10	0.12	29.10	29.32	54.08
0.412	0.10	0.20	13.70	14.00	47.61
0.869	0.11	0.27	15.50	15.88	46.00
2.357	0.13	0.36	12.50	12.99	46.00
6.331	0.18	0.45	11.60	12.24	50.00
24.088	0.42	0.58	12.90	13.90	50.00

Note:

1. All Reading Levels are Quasi-Peak and Average value.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

3. Radiated Emission

3.1. Test Equipment

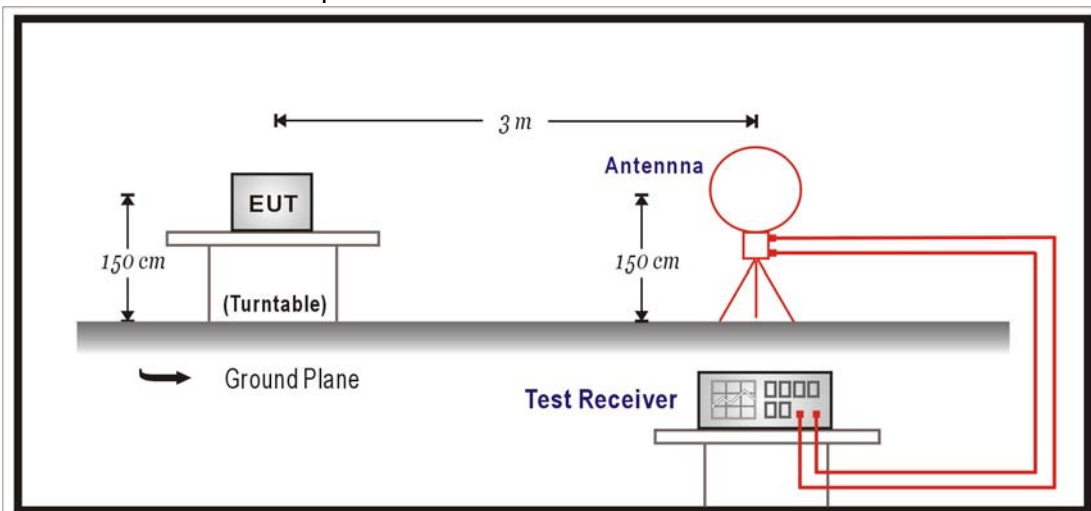
The following test equipment are used during the test:

Item		Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Test Receiver	R & S	ESCS 30 / 825442/017	Jan., 2004
2	X	Loop Antenna	R & S	HFH2-Z2 / 833799/004	Sep., 2004
3	X	Spectrum Analyzer	Advantest	R3261C / 81720266	N/A
4	X	Pre-Amplifier	HP	8447D / 2944A09276	N/A
5	X	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2004
6		No.1 OATS			Sep., 2004

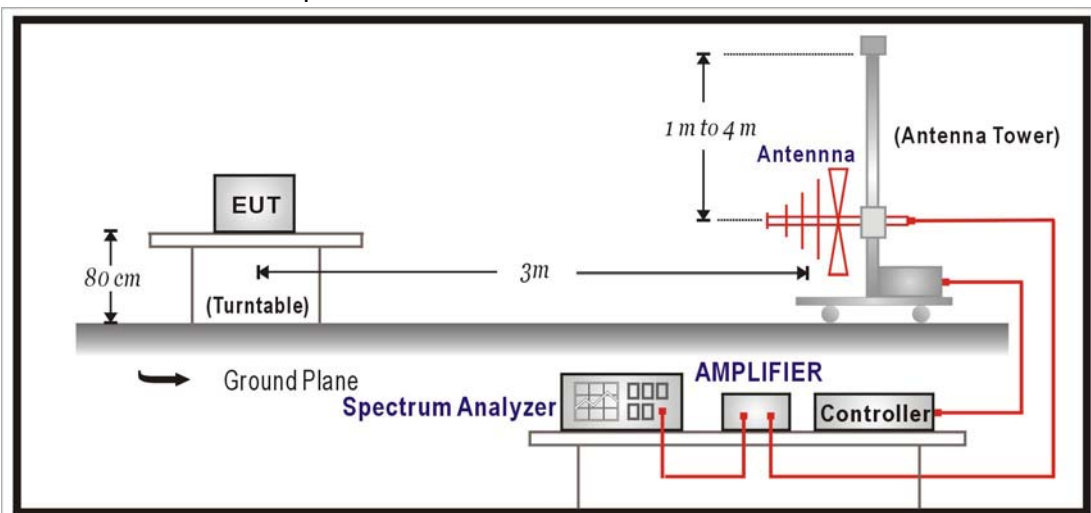
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

3.2. Test Setup

Under 30MHz Test Setup:



Under 1GHz Test Setup:



3.3. Limits

FCC Part 15 Subpart C Paragraph 15.209 Limits			
Frequency MHz	uV/m	dBuV/m	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	See Remark ¹	300
0.490-1.705	24000/F(kHz)	See Remark ¹	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Remarks : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV).

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4. When the very low emission of EUT, the 3m measurement distance was performed. Regards to an inverse linear extrapolation 40dB/dec is adopted.

3.4. Test Procedure

Under 30MHz Test:

The EUT and its simulators are placed on a turn table which is 1.0 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum electric field strength. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna which is 1.0 meter above ground. All X-axis, Y-axis and Z-axis polarization of the antenna are set on measurement.

The emission limit shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. Radiated emission limit in these three bands are based on measurements employing an average detector.

Under 1GHz Test:

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2001 on radiated measurement.

On any frequency the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

The bandwidth below 30MHz setting on the field strength meter is 9kHz and above 30MHz is 120kHz.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.209: 2003

3.6. Test Result

Product	Mini Reader Module		
Test Item	Radiated Emission		
Test Mode	Mode1: Normal Operation		
Date of Test	2004/09/17	Test Site	No.1 OATS

Frequency	Cable	Reading	Emission	Peak Limit
MHz	Loss	Level	Level	
	dB	dBuV	dBuV/m	dBuV/m
=====				
Fundamental				
X-axis:				
0.126	0.04	71.70	71.74	125.60
Y-axis:				
0.126	0.04	82.90	82.94	125.60
Z-axis:				
0.126	0.31	83.00	83.04	125.60

Note:

1. All Reading Levels are Peak value.
2. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m).
3. Emission Level = Reading Level + Cable Loss.
4. Peak Limit = Average Limit + 20dB.

Product	Mini Reader Module		
Test Item	Radiated Emission		
Test Mode	Mode1: Normal Operation		
Date of Test	2004/09/17	Test Site	No.1 OATS

Frequency	Cable	Reading	Emission	QP Limit	Peak Limit
	Loss	Level	Level		
MHz	dB	dBuV	dBuV/m	dBuV/m	dBuV/m
=====					
Z-axis:					
0.018	0.04	38.20	38.24	--	142.50
0.031	0.04	38.90	38.94	--	137.77
0.073	0.04	42.20	42.24	--	130.33
0.224	0.04	32.40	32.44	--	124.60
0.373	0.04	47.10	47.14	--	116.17
0.871	0.04	29.90	29.94	68.80	--
* 1.619	0.04	26.20	26.24	62.42	--

Note:

1. All Reading Levels are Quasi-Peak value; except for the frequency bands 9-90kHz and 110-490kHz are performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst emission level.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m).
4. Emission Level = Reading Level + Cable Loss.
5. Peak Limit = Average Limit + 20dB.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	Mini Reader Module		
Test Item	Radiated Emission		
Test Mode	Mode1: Normal Operation		
Date of Test	2004/09/17	Test Site	No.1 OATS

Frequency	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit
	Loss	Factor		Level	Level		
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
=====							
Horizontal (Z-axis):							
* 154.160	1.53	9.58	20.90	37.60	27.81	15.69	43.50
198.780	1.71	9.28	20.81	31.60	21.77	21.73	43.50
222.060	1.80	7.55	20.80	36.00	24.55	21.45	46.00
287.050	2.07	13.37	20.50	31.20	26.15	19.85	46.00
309.360	2.16	13.89	20.41	30.20	25.84	20.16	46.00
329.730	2.25	14.64	20.25	31.00	27.64	18.36	46.00

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss - PreAMP.

Product	Mini Reader Module		
Test Item	Radiated Emission		
Test Mode	Mode1: Normal Operation		
Date of Test	2004/09/17	Test Site	No.1 OATS

Frequency	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit
	Loss	Factor		Level	Level		
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
=====							
Vertical (Z-axis):							
* 52.310	1.11	11.22	21.20	39.00	30.13	9.87	40.00
67.830	1.17	9.66	21.16	36.60	26.27	13.73	40.00
90.140	1.26	13.77	20.04	29.40	24.40	19.10	43.50
132.820	1.44	13.16	21.02	30.20	23.78	19.72	43.50
155.130	1.53	18.08	20.90	31.80	30.52	12.98	43.50
221.090	1.80	13.43	20.80	27.00	21.43	24.57	46.00

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss - PreAMP.