

FCC PART 22H, PART 24E
TEST REPORT

For

**THE TRUSTEE FOR RADIO DATA
COMMS TRUST**

Unit 5 20 - 30 Stubbs Street, Silverwater NSW 2128, Australia

FCC ID: QNHPM1025-18000-7

Report Type: Original Report	Product Type: Permaconn GPRS/IP Communicator
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Report Number:	<u>RSZ11050452-00</u>
Report Date:	<u>2012-11-20</u>
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★"

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *THE TRUSTEE FOR RADIO DATA COMMS TRUST*'s product, model number: *PM1025* (FCC ID: *QNHPM1025-18000-7*) or the "EUT" in this report is a *Permaconn GPRS/IP Communicator*, which measures approximately: 23.3 cm (L) x 17.7 cm (W) x 5.5 cm (H), rated input voltage: DC 14V adapter or 12V battery.

Adapter information:

Model: WT1401750

Input: AC 100-240 V, 50/60 Hz, 1.6A

Output: DC 14.0 V, 1.75A

**All measurement and test data in this report was gathered from production sample serial number: 50367(Assigned by applicant). The EUT supplied by the applicant was received on 2012-11-15.*

Objective

This type approval report is prepared on behalf of *THE TRUSTEE FOR RADIO DATA COMMS TRUST* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

No Related submittal.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-D, ANSI C63.4-2009.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-D.
The final qualification test was performed with the EUT operating at normal mode.

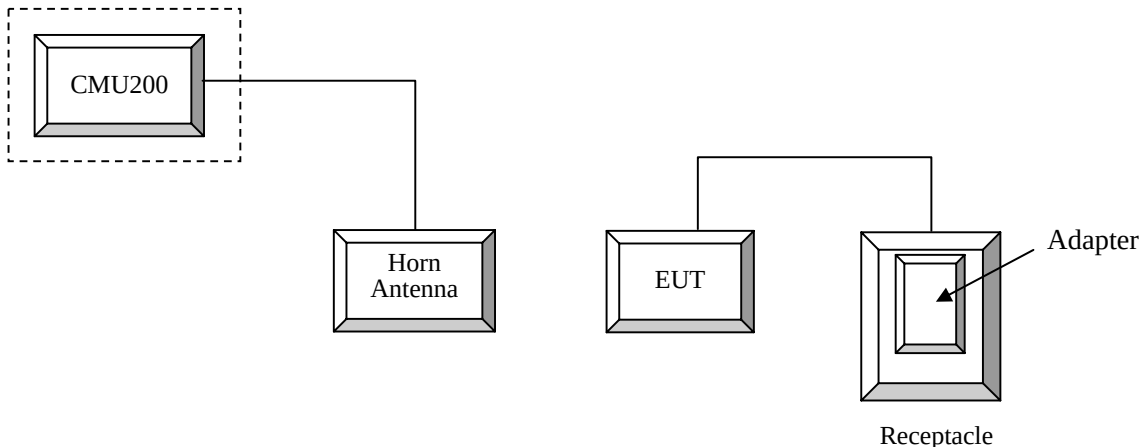
Equipment Modifications

No modifications were made to the EUT.

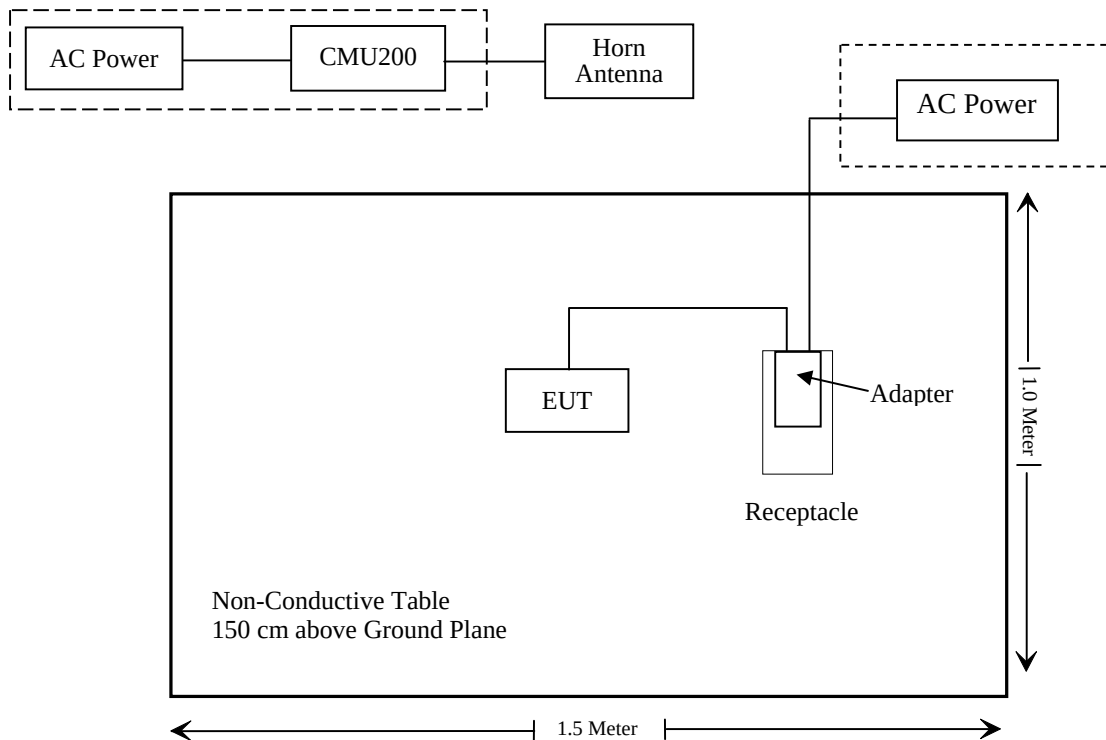
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Undetectable DC Cable	0.8	EUT	Adapter

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307, §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§2.1046; § 22.913 (a); § 24.232 (c)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049; § 22.905 § 22.917; § 24.238	99% & -26 dB Occupied Bandwidth	Compliance*
§ 2.1051, § 22.917 (a); § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliance*
§ 2.1053 § 22.917 (a); § 24.238 (a)	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a)	Out of band emission, Band Edge	Compliance*
§ 2.1055 § 22.355; § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance*

Note: The uncertainty of any radiation emissions measurement is ± 4.0 dB.

* Please refer to FCC ID: QIPMC55I granted on 2008-01-23, report number: 2-20722858c/07-C1, which is issued by CETECOM GmbH.

FCC §1.1307 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mw/cm ²)	Averaging Time (Minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

MPE Calculation

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally **numeric** gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Table: Maximum Permissible Exposure (MPE) Calculations

Band	Ant. Gain (dBi)	Ant. Gain (numeric)	Max Conducted Power		Duty Cycle	Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
			(dBm)	(mW)				
GSM 850 (GPRS Multi-solt class 8)	3	2	32.48	1770.11	12.5%	20	0.088	0.549
GSM 850 (GPRS Multi-solt class 10)	3	2	32.40	1737.80	25%	20	0.173	0.549
PCS 1900 (GPRS Multi-solt class 8)	3	2	29.55	901.57	12.5%	20	0.045	1.0
PCS 1900 (GPRS Multi-solt class 10)	3	2	29.50	891.25	25%	20	0.089	1.0

Result: EUT meets the mobile device 20cm separation distance as specified in section 2.1091 of the FCC rules. An appropriate RF exposure compliance statement will be placed in the User's Guide.

Result: Compliance

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c) - RF OUTPUT POWER**Applicable Standards**

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (c), in no case may the peak output power of a base station transmitter exceed 2 watt EIRP.

Test Procedure

Radiated method:

TIA 603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
BIZI	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
HP	Synthesized Sweeper	8341B	2624A00116	2012-05-17	2013-05-16
COM POWER	Dipole Antenna	AD-100	041000	2012-06-06	2013-06-05
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2013-02-10
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	1100.0008.02	2011-12-16	2012-12-15

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Gardon Zhang on 2012-11-15.

Radiated Power:**ERP & EIRP (worst case)****ERP for Cellular Band (Part 22H)**

GPRS 850:

Frequency (MHz)	Receiver Reading (dBμV)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable Loss (dB)	Antenna Gain(dB)		Limit (dBm)	Margin (dB)
High Channel										
848.8	90.44	92	1.7	H	22.6	0.7	0.0	21.9	38.45	16.55
848.8	98.03	258	1.6	V	30.7	0.7	0.0	30.0	38.45	8.45

EIRP for PCS Band (Part 24E)

GPRS 1900:

Frequency (MHz)	Receiver Reading (dBμV)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable Loss (dB)	Antenna Gain(dB)		Limit (dBm)	Margin (dB)
Low Channel										
1850.2	85.37	36	1.5	H	11.3	1.0	9.4	19.7	33	13.3
1850.2	90.22	98	1.9	V	21.3	1.0	9.4	29.7	33	3.3

Note:

Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Corr. Amplitude

Conducted output power:

Please refer to FCC ID: QIPMC55I granted on 2008-01-23, report number: 2-20722858c/07-C1, which is issued by CETECOM GmbH.

FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS**Applicable Standards**

FCC § 2.1053, §22.917 and § 24.238.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log₁₀ (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
BIZI	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
SUPER ULTRA	Amplifier	ZVA-213+	N/A	2011-11-24	2012-11-23
HP	Amplifier	8447E	1937A01046	2011-11-24	2012-11-23
HP	Synthesized Sweeper	8341B	2624A00116	2012-05-17	2013-05-16
COM POWER	Dipole Antenna	AD-100	041000	2012-06-06	2013-06-05
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2015-02-10
Electro-Mechanics	Horn antenna	3116	9510-2270	2010-10-14	2013-10-13
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	1100.0008.02	2011-12-16	2012-12-15

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM)

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Gardon Zhang on 2012-11-16.

Test mode: Transmitting

Cellular Band (Part 22H)

GPRS 850(worst case at high channel)

30MHz-10GHz:

Frequency (MHz)	Receiver Reading (dBμV)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable Loss (dB)	Antenna Gain(dB)		Limit (dBm)	Margin (dB)
1697.6	77.10	47	1.6	H	-25.9	0.9	9.4	-17.4	-13	4.4
1697.6	74.29	55	1.9	V	-26.2	0.9	9.4	-17.7	-13	4.7
2546.4	61.66	258	1.9	V	-34.7	1.5	10.7	-25.5	-13	12.5
2546.4	60.38	25	1.6	H	-40.3	1.5	10.7	-31.1	-13	18.1
31.94	64.98	24	1.6	V	-32.0	0.2	0	-32.2	-13	19.2
3395.2	46.73	332	1.6	V	-46.8	2.0	10.8	-38.0	-13	25.0
3395.2	45.92	95	1.8	H	-48.5	2.0	10.8	-39.7	-13	26.7
31.94	47.45	89	1.8	H	-49.5	0.2	0	-49.7	-13	36.7
115.36	45.85	176	1.5	V	-51.1	0.2	0	-51.3	-13	38.3
239.52	39.26	47	1.5	H	-57.7	0.3	0	-58.0	-13	45.0

PCS Band (Part 24E)

GPRS 1900(worst case at low channel)

30MHz-20GHz:

Frequency (MHz)	Receiver Reading (dBμV)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable Loss (dB)	Antenna Gain(dB)		Limit (dBm)	Margin (dB)
31.94	65.58	234	1.6	V	-31.4	0.2	0	-31.6	-13	18.6
3700.4	49.63	45	1.9	V	-45.1	3.0	10.4	-37.7	-13	24.7
5550.6	41.22	15	1.8	V	-48.8	3.5	11.7	-40.6	-13	27.6
7400.8	37.65	6	1.5	H	-50.6	3.9	12.0	-42.5	-13	29.5
7400.8	38.43	145	1.6	V	-51.0	3.9	12.0	-42.9	-13	29.9
5550.6	41.83	85	1.6	H	-50.9	3.5	11.7	-42.7	-13	29.7
3700.4	44.69	26	1.6	H	-51.4	3.0	10.4	-44.0	-13	31.0
31.94	47.27	157	1.6	H	-49.7	0.2	0	-49.9	-13	36.9
117.30	45.81	49	1.5	V	-51.2	0.2	0	-51.4	-13	38.4
239.52	39.23	37	1.6	H	-57.8	0.3	0	-58.1	-13	45.1

Note:

Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

***** END OF REPORT *****