



# **Random Number Generator Evaluation Report for CTXM**

**28 August 2009**



## 1. Software provider

CTXM	URL: <a href="http://www.ctxm.com">www.ctxm.com</a>
Attention: Maxim Terehovich	e-mail: ( <a href="mailto:maxim.terehovich@ctxm.com">maxim.terehovich@ctxm.com</a> )

## 2. Test house

iTech Labs Australia	URL: <a href="http://www.itechlabs.com.au">http://www.itechlabs.com.au</a>
Suite 24, 40 Montclair Ave Glen Waverley VIC 3150, Australia	e-mail: <a href="mailto:info@itechlabs.com.au">info@itechlabs.com.au</a>

## 3. System/Module tested

System: N/A	URL: N/A
Module: Random Number Generator Scaling.	
Date Completed: 28 August 2009	

## 4. Previous history of items under test

CTXM RNG was previously certified on 01 June 2007 and scaling for additional games were tested on 14 Oct 2008. The current round of evaluation is for scaling tests for more games.
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## 5. Request for evaluation

CTXM has requested the following games to be added to the certificate:	
Game type	Game name
Roulette	Roulette PRO
Scratch Game	Bingo Scratch
Video Poker	4-Line Coliseum Poker
Video Poker	4-Line Face the Ace
Video Poker	4-Line Jacks or Better
Video Poker	4-Line Joker Wild
Video Poker	10-Line Coliseum Poker
Video Poker	10-Line Deuces Wild
Video Poker	10-Line Face the Ace
Video Poker	10-Line Jacks or Better
Video Poker	10-Line Joker Wild
Video Poker	25-Line Coliseum Poker
Video Poker	25-Line Deuces Wild
Video Poker	25-Line Face the Ace
Video Poker	25-Line Jacks or Better
Video Poker	25-Line Joker Wild
Video Poker	50-Line Coliseum Poker
Video Poker	50-Line Deuces Wild
Video Poker	50-Line Face the Ace
Video Poker	50-Line Jacks or Better



Video Poker	50-Line Joker Wild
Video slots	Freaky Wild West
Video slots	Freaky Gym
Video slots	Summer Dream
Mini Games / Classic Slots	Pirate Slots
Mini Games / Classic Slots	Mexican Slots
Mini Games / Blackjack	Blackjack
Mini Games / Poker	Casino Hold'em
Mini Games / Roulette	European Roulette
Mini Games / Scratch game	Bingo Scratch
Mini Games / Video Poker	Deuces Wild
Mini Games / Video Poker	Jacks or Better

## 6. Evaluation performed

### 6.1 Source code evaluation & Chi square tests

iTech Labs has conducted the following evaluation:

#### 1. Source code examination

Source code comparison was performed between the last certified version and the new version of certified files (listed in appendix A). As a result of the comparison it was found that only scaling for the Scratch Game was needed. All other games were covered by previous shuffling and scaling tests. A small number of source code changes were identified - none of the changes was related to the RNG functionality or scaling functions. The changes were mostly cosmetic and a bug fix in an area unrelated to cards shuffling.

In addition to source code comparison, the following source code evaluation was conducted:

a) Scaling for Scratch Game;

#### 2. Tests conducted

a) Chi-squared tests were applied to scaled numbers for Scratch Game

The RNG tests were conducted for compliance to relevant Alderney Gambling Control Commission (AGCC) and Isle of Man Gambling Commission requirements.



## 6.2 Games

iTech Labs has conducted evaluation of scaling for the games listed in the table below:

Game type	Game name
Scratch Game	Bingo Scratch

## 7. Evaluation results:

1. Source code examination  
The source code modification performed for the certified files have been reviewed and no changes have been identified that require re-evaluation of the already certified games.  
No issues were found during source code evaluation and compilation for the new game.
2. Test Results
  - a) Chi-squared tests for Scratch games  
The results were satisfactory.

## 8. Observations

None

## 9. Certification

Date of Certification: 28 August 2009	Total number of pages: 7
Software provider: CTXM RNG	
iTech Labs certifies that the RNG (listed in Appendix-A) comply with relevant Alderney Gambling Control Commission (AGCC) and Isle of Man Gambling Commission technical requirements.	

## 10. Conditions of Certification

1. The source code provided to iTech Labs (as per Appendix-A) must be used for compilation of the RNG module.
2. Any change to the RNG source files listed in Appendix-A must be verified by iTech Labs.



## 11. Conclusion

While it is not possible to test all possible scenarios in a laboratory environment, iTech Labs has conducted a level of testing appropriate for a submission of this type.

Accordingly, subject to the above comment, iTech Labs certifies that the items under test comply with the relevant Technical Standards, unless otherwise stated.

A handwritten signature in black ink, appearing to read "Ian Manning".

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**Ian Manning**  
Principal Consultant  
iTech Labs Australia

28 August 2009

A handwritten signature in black ink, appearing to read "Kiren Sreekumar".

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**Kiren Sreekumar**  
Principal Consultant  
iTech Labs Australia

28 August 2009



## Appendix – A

### 1. Md5sum\* of CTXM RNG source files

Md5sum	Date last modified	Size	File Name
34f034f0787260d91d42e7fe7aff7823	5/06/2009	878	MonitorableRandomizerFactoryImpl.java
368A3C2E7CE0A95BAA07FF8277EEDC8E	5/06/2009	15,469	MTRandom.java
13f135cd24238f4ab1a380e63ff597a1	5/06/2009	1,368	Randomizer.java
e4b04566a3ffd2a628dbb977c9784054	5/06/2009	3,407	RandomizerFactory.java
C6302A09F3FB8E96F28522320372E9F0	5/06/2009	1,559	RandomizerFactoryImpl.java
18FA59F469F646065E6F710BDF9BB54C	5/06/2009	8,434	RandomizerImpl.java
29b9f92e85cce84c8e0880e323696361	5/06/2009	2,380	RandomSelector.java
1401de017282390c1781fab902fc519b	5/06/2009	3,341	RandomSelectorImpl.java
395D691D3F6FE254E6EE8726A653F878	5/06/2009	2,583	RandomWrapper.java
e1a3edfbda6aac7b03277ac06dc987e2	5/06/2009	949	Shuffler.java
e2424ca964cae3fa27fab614b2ff4d1	5/06/2009	1,257	ShufflerImpl.java
1D528E43756D39264A6D3E07A40E56C9	16/07/2009	3,098	Card.java
3cf4621e7b4d74c68c3fd09890f434c7	16/07/2009	7,036	CardsLUT.java
B0A8E00F1E2D17D3BC66FF513C75A550	16/07/2009	4,288	Pack.java
aad5fe19154ea4adbb8a30b2d704c10c	17/07/2009	1,673	RandomizerServiceImpl.java
36a23b24168ae11ff96db3cf61d986d5	17/07/2009	1,177	RandomizerService.java

Note: No new source files have been added to the above previously certified list of files. Although some of the above files have changed, the changes were minor so that re-certification of the RNG was not necessary. Some of the above md5sums were updated due to changed files.

### 2. Md5sum\* of jar file

Md5sum	Date last modified	Size	File Name
157625645A706657E5BB9E3DA4F1AB19	2/07/2009	13,976	randomizer-1.8.0.6.jar

Note: New jar file was provided.

\* Md5sum is calculated using the Linux program md5sum

### 3. Applicable games

During the current round of testing, correct usage of the RNG was evaluated for the following games:

Game type	Game name
Roulette	Roulette PRO
Scratch Game	Bingo Scratch
Video Poker	4-Line Coliseum Poker
Video Poker	4-Line Face the Ace
Video Poker	4-Line Jacks or Better
Video Poker	4-Line Joker Wild
Video Poker	10-Line Coliseum Poker
Video Poker	10-Line Deuces Wild
Video Poker	10-Line Face the Ace



Video Poker	10-Line Jacks or Better
Video Poker	10-Line Joker Wild
Video Poker	25-Line Coliseum Poker
Video Poker	25-Line Deuces Wild
Video Poker	25-Line Face the Ace
Video Poker	25-Line Jacks or Better
Video Poker	25-Line Joker Wild
Video Poker	50-Line Coliseum Poker
Video Poker	50-Line Deuces Wild
Video Poker	50-Line Face the Ace
Video Poker	50-Line Jacks or Better
Video Poker	50-Line Joker Wild
Video slots	Freaky Wild West
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