RGS EVALUATION TESTING REPORT

Reference regulation:

Republic of Latvia

Gambling and Lotteries Law

In force from 01.01.2006

(with amendments adopted by Parliament on 26.09.2013)

Game: Flux
Version: 1.6.1, (HTML5 interface, desktop and mobile)
Server release: 3.7.0, RNG: 3.5.0

31/05/2016

QUINEL M Limited
Marina Court, Flat 8, Triq Giuseppe Cali', XBX 1421 Ta'Xbiex - Malta
info@quinel.com.mt

INTRODUCTION

The findings reported in this summary are the results of a broader set of documents and testing activities results archived in Quinel M's facilities. It is intended that the requester declares that:

- Any Hardware provided or described for analysis and testing is configured identically to hardware in commercial use
- Game software/ function provided for the testing and code review is declared by the customer to have the same behavior to the software/code in commercial use
- Functionality made by the software in automatic test mode has a realistic behavior

and that

- all the files and modules,
- the database schemas and all the specific programming resources,
- all the parameters contained into any databases and/or configuration file

that have been subject to the audit process guarantee the same behavior of what is going to be published/deployed according to this audit results.

The Recipient, by accepting and using this Report, declares to be aware and accept unconditionally all the terms and conditions set forth. If the Applicant and / or the Recipient does not agree on the terms and conditions set forth, Quinel M Ltd reserves the right to cancel the certification provided with this Report, it follows therefore that the Recipient must immediately return all copies to Quinel M Ltd of this Report and cannot use them nor refer to.

Any copy of this test reports and calibration certificates must also include the page number and total number of pages.

Copy of this test report must not be reproduced except in full, without written approval of the laboratory.

A) Audit ID

J16030075 – Latvia G012_HTML5_RGS rev. 1

B) Scope / Document type

GAME evaluation testing report

C) Reference regulation

Technical and functional requirements for the game software and communication equipment for remote gambling:

1) Republic of Latvia - Gambling and Lotteries Law In force from 01.01.2006 (with amendments adopted by Parliament on 26.09.2013)

2) Regulation No 853 (prot. No 54 13.§), 17 October 2006

"*Procedure whereunder Information on Programs of Organizing Interactive Gambling and Lotteries, Measures of Security and of Physical Person Data Protection shall be submitted*", Issued pursuant to paragraph 2 of Section 47 of the Gambling and Lotteries Law

3) Regulation No 854 (prot. No 54 14.§), 17 October 2006

"*Procedure for Registration and Identity Checking of Gamblers of the Interactive Gambling"*, *"*, Issued pursuant Section 54 of the Gambling and Lotteries Law

D) Test methods

Ref. to Operative Instruction IO 02-02 for definitions

Randomness:

Refer to report ID: *J15010013 – Latvia RGS rev. 1*

Visual inspection

QIVI001

Software Source Inspection:

QISI001

Accounting And Financials:

QIAF001

E) Auditor / Test lab

Quinel M. LTD

Reference contact:
Mr Isacco Ceci
Email: isacco.ceci@quinel.com.mt
Marina Court, Flat 8, Triq Giuseppe Cali',
XBX 1421 Ta'Xbiex - Malta
info@quinel.com.mt

F) Audit subject

Description: compliance of the following test items (games and/or RNG)

Test Items

Games (video slot games)

Test Item	*Game Name*	*Version*	*Interface*
G012	Flux	release: 1.6.1 Server release: 3.7.0, RNG: 3.5.0	HTML5 Desktop and mobile

Receipt date:

07/03/2016 – submission for testing against current regulation as per Section (B) of all items

Inspection date:

02/05/2016 – 31/05/2016 (against current regulation as per Section (B)) for all items

NOTE: RNG tests described into report ID: *"MD 02-15 RNG Report rev.1.pdf"* signed and issued by Quinel M. LTD dated March 25th, 2016.

G) Requester

Thunderkick Malta LTD
Level 5, The Mall Complex,
Floriana, Malta

H) Owner of the system/software

Tabrake AB
EKBACKSVÄGEN 59 A
184 32 Åkersberga

Stockholms län - Sweden

I) Companies and organizations involved in the process

Producer(s) / Integrator(s): Ref. to Section H)

Requester: Ref. to Section G)

Licensee/Operator: N.A.

J) Individuals involved in the process

On the Producer(s) / Integrator(s) side: Mr. Sven Grip (CEO), Stéphane Redon (Software architect and developer), Johnny Aspelin (Software architect and developer), Daniel Gjörwell (Software architect and developer)

On the Requester side: same as for Producer

On the Licensee/Operator side: N.A.

On Quinel M Ltd side: Matteo Ferrarini (COO), Gianmarco Dall'Asta (Engineer), Enrico Piccinini (Engineer), Amit Har-Mor (Engineer), Nazar Polovyi (Auditor).

K) Processes, rules and parameters of the games (if applicable)

Rules of the games/test are reported with details into Annex II.
Here follows the theoretical payout of the test items:

Test Item	*Test Item / Game name*	*Theor. RTP [%]*
G012	Flux, release: 1.6.1 Server release: 3.7.0, RNG: 3.5.0	96.20

L) Protocols and specifications of the gaming system (if applicable)

Both games (server side logic) and platform are developed entirely with the Java Language.

Games were provided through the following URLs on a QA environment:
- http://game.thunderkick.com:9090/static/games/index.html (player's interface)
- https://qa-int-backoffice.thunderkick.com (Back office / Admin interface)
- http://ext-qa-gameservice.thunderkick.com (Runtime game configuration)

The QA environment used for Level 2 testing relies on a Linux environment hosted by Amazon's cloud services and runs on Oracle Java JDK 1.7.0_09, Apache Tomcat application server 7.0.42

Live environment is reachable at the following IPs (primary site, secondary site omitted):

Game traffic:	37.114.73.113
API:	37.114.73.114
Back office	37.114.73.115
Firewall	37.114.73.120

Live environment servers are running Linux "Ubuntu 12.04.5 LT; Precise Pangolin", with Oracle Java JDK 1.7.0_51, Apache Tomcat application server 7.0.50.

Simulation environment used a virtualized server with the same Linux distribution "Ubuntu 12.04.5 LT; Precise Pangolin" with Oracle Java JDK 1.7.0_76 – no application server was required.

The difference between the Java JDK is negligible considered the change log and that the source code inspection couldn't find any specific binding to those releases nor dependencies on system APIs. Same considerations apply with regards to differences between QA and Live environment

The simulation tool verified (class '*com.thunderkick.game.simulation.Boot*', package '*thunderkick-game-simulation.jar*') extracts the configurations for the games for a repository synchronized with the live production environment and uses the same Java archives subject to deployment.

It was verified that the environment used for testing and the live one were using the same Java classes to ensure the objectives of the testing strategy. Checksums can be verified here:

QA environment:
http://ext-qa-gameservice.thunderkick.com/hash?output=plain&algorithm=SHA1&rng=true&jar=true&properties=true

Live environment:
http://37.114.73.113/hash?output=plain&algorithm=SHA1&rng=true&jar=true&properties=true

M) Security of the system

N.A.

N) Evaluation performed

The test evaluation, required by the Requested, was completed against the following requirements:

- *Remote gambling and software technical standard*
- *Information provision annex (chapter 4)*

Refer to the Annex report for a full detailed list of requirements tested.

O) Evaluation auxiliary informations

N.A.

P) Testing activities applied and product / test items references

Internal procedure followed:
Rif. "IO 02-02 TEST METHODS"

Tests were performed against the following files :

SHA1	*Critical*	*Type (Game)*	*Test item*	*Filename*
58ad3629cb44c82d1208f1aad26006045f5c3722	Yes	Configuration	G012	game.slot.vanilla.starvector.json
d5e01a5f41deae3b63b46b2ccb7125278e3ebc29	Yes	RNG (*)	N.A.	gp-rng\...\MersenneTwister32.java
ea8940a1cd7d561eb944c42f101ddfcd7cce2ec7	Yes	RNG (*)	N.A.	gp-rng-api\...\RandomNumberGenerator.java
ca246a57ccfcd9bd310a0fff58ec0e0aebcf0168	No	Simulator	All	gp-game-vanilla-simulation-3.7.0-RELEASE.jar
a8fb2357b95263d7cc8dd5417832410b8bcdc3f1	Yes	Game logic	G012	gp-game-vanilla-starvector-3.5.0-RELEASE.jar
f2dcd4e8ed46eb5653d99ff54f60c4e4047ad4ec	Yes	RNG	All	rng-implementation\gp-rng-3.5.0-RELEASE.jar
ea01386be069745202580bd50c3de32c33f3553f	Yes	RNG	All	rng-interface\gp-rng-api-3.5.0-RELEASE.jar

Notes:

(*) – Files are the sources reported into previous report ID: *J15010013 – Latvia RGS rev. 1* related to RNG.

Q) Critical modules affecting the behavior of the test items

Refer to Section P, column "*Critical*"

R) Additional information

N.A.

S) Setup and application/system architecture tested

Refer to section L.

T) **Payout** (if applicable)

Refer to section L.

No specific conditions / strategy to obtain the declared payout are to be considered.

U) CERTIFICATION

Date: 31/05/2016 Total Number of Pages: **21**
Requester: Thunderkick Malta LTD - Level 5, The Mall Complex - Floriana, Malta
Licensee: N.A.

QUINEL M LTD certifies that the games

G012: "**Flux**" 1.6.1, (HTML5 interface, Desktop and Mobile)
Server release: 3.7.0**, RNG:** 3.5.0

examined and identified at Section F) comply with the Gambling and Lotteries Law issued by the Republic of Latvia in force from 01.01.2006 with amendments adopted by Parliament on 26.09.2013(ref. to Section C for full regulatory scope).

Refer to Annex I for the full list of requirement satisfied.

V) CONDITIONS AND VALIDITY

Conditions: none
Extents set by the State Gambling Commission: none
Validity period: upon next changes to critical files listed in section P)

W) CONCLUSIONS

QUINEL M LTD certifies that the games tested complies with the Technical Standards requested and recommends for approval.

No non-compliances nor mismatch between declared and tested payouts were found during testing. (*in case of non – compliances, as specified in Section 49, point 2.2 or Section 77, point 2.2 of the Law, the wrong payout is to be reported*).

Date: 31/05/2016

Signed:

_____
Matteo Ferrarini – COO (QUINEL M LTD)

DEFINITIONS:

1) **Gambling** - a game where a natural person upon payment of deposit stake may get a gain fully or partially depending on the winning occurrence or circumstances being previously unknown. Such a game on the automatic slot machine where the only gain being free game on the said automatic slot machine, as well as a game on the automatic slot machine with a gain of property nature (save for gain in cash) value whereof being within 15 EUR shall be deemed not to be gambling;
2) **Automatic gambling slot machine** – electronic, mechanic or electromechanical device having special program or machinery for the purpose of determination of gain volume intended for gambling arrangements;
3) **Gambling organizer –** capital company incorporated in the Republic of Latvia having received licenses required for gambling arrangements pursuant to the procedure provided by this Law;
4) **Bingo** - gambling, where a player by guessing accidental combination of numbers from preset combinations of numbers has a possibility to get a gain and where the gain volume is conditional upon the drawn or the guessed combination of numbers and total amount of deposit stakes;
5) **Bet** - gambling, where interested person deposit stake and strike a bargain about the possibility or impossibility of any event, and amount of the gain depends on the accuracy of the player's forecast, deposited stake, as well as on the index for calculation of the gain, which is fixed by the rules of game;
6) **Interactive gambling or lottery** - gambling, where the player may take part by using the electronic communication services: the Internet, telephone, television, radio or any other types of electronic communications;
7) **Lottery or raffle** (hereinafter referred to as the lottery) is a game having nature of an agreement of chance and where gains acquired by participant thereof are fully or partially occasional ones.
8) **Lottery organizer -** capital company incorporated in the Republic of Latvia or in special cases also an association or religious organization having received licenses required for lottery arrangement pursuant to the procedure provided by this Law;
9) **Dice game** - gambling, where the gain is depending on the shaken dice number and the gain factor provided by the rules of game and which is not equipped with special electronic program for the purpose of game control and determination of the gain volume;
10) **Game of cards** - gambling, where gain is depending on the cards laid (combination thereof) and the gain factor provided by the rules of game and which is not equipped with special electronic program for the purpose of game control and determination of the gain volume.
11) **Table for the game of cards and dice** – table manufactured in an industrial manner having an equipped place for the game manager, places for distribution of players' stakes and layer.
12) **Winnings –** allowance paid out by the gambling organizer to the player under the gambling rules in event of winning, as well as allowance or property paid out by the lottery organizer to the player under the lottery rules in event of winning.
13) **Roulette** (cylindrical game) - gambling, where gain is depending on numbers, symbols or other signs or combination of signs, as well as on the deposit stake and the gain factor stipulated by the game rules and which is not equipped by special electronic program for the purpose of game control and determination of the gain volume;
14) **Additional game of games of roulette, cards or dice** – game derived directly from gambling rules, which upon compliance with certain conditions shall provide for additional winning possibilities, upon exclusion of the lottery elements.

15) **Roulette gaming-table** – table manufactured in an industrial manner having an equipped place for the game manager, players' places, table layer divided into game fields and mechanically rotating cylinder with red and black numbered fields.
16) **Automatic slot machine game** - gambling, where participant's winning possibilities and gain volume is determined by the automatic gambling slot machine.
17) **Additional automatic slot machine game** – possibility upon occurrence of specific conditions to play a game for free but with winning opportunities on exclusion of lottery elements provided by the game rules of automatic gambling slot machines and automatic gambling slot machines connected in a system.
17) **Totalizator** - gambling, where participants are taking part upon depositing stake and forecasting occurrence, possible or impossible occurrence of one event or several events, or anything that may prove to be true or false and the gain depends on the total amount of the deposit stakes, factor and forecast results. Arrangement of totalizator shall be forbidden as concerns events having already occurred or events known to one or another betting party or to both parties.
18) **Game of chance by the telephone** - gambling, where results partly or absolutely depends on an accident and where participant thereof responding to a question or in other way participating in the game, using telephone and paying participation fee in accordance with the tariff for additional services being set up by the game organizer.

ANNEX REPORT - I

Republic of Latvia - Gambling and Lotteries Law In force from 01.01.2006 (with amendments adopted by Parliament on 26.09.2013)

Requirements		Test method	Notes	Result (PASS / FAIL / N.A.)
Article	**Req.**			
Chapter VII ***Section 53***	***Requirements for organization of the interactive gambling***			
1	**1**			**Not applicable.** Certification of games only. In charge to the Operator
	2			
	3			
	4			
2	**1**			**Not applicable** Certification of games only. In charge to the Operator
	2			
	3			
	4			
	6			
3	**-**			**Not applicable** Certification of games only. In charge to the Operator
4	**-**			**Not applicable** Certification of games only. In charge to the Operator
5	**-**		Gaming platform infrastructure is located in Malta.	**Not applicable**
6	**-**			**Not applicable** Certification of games only. In charge to the Operator

Regulation No 853 (prot. No 54 13.§), 17 October 2006

"*Procedure whereunder Information on Programs of Organizing Interactive Gambling and Lotteries, Measures of Security and of Physical Person Data Protection shall be submitted*", Issued pursuant to paragraph 2 of Section 47 of the Gambling and Lotteries Law

Requirements		Test method	Notes	Result
Article	**Req.**			**(PASS / FAIL / N.A.)**
III	***Data protection of physical persons and security measures***			
11	**-**	QIVI001	Evaluation limited to the gaming platform of the Requested only. Winnings are maintained regardless of the amount won. The requester is operating by less than 5 years, nevertheless all data from the beginning of operations are actually kept.	***PASS***
12	**1**	QISI001 QIVI001 QIRT000 QIRT001 (UD01 / SI01 / RT01) ERT001 ERT002 QIRT002 (SS01 / AC01 / CC01)		***PASS*** ***(ref. to report ID:*** MD 02-15 RNG Report rev.1.pdf)
	2	QISI001 QIVI001		***PASS***
13	**1**	QISI001 QIVI001		***PASS***
	2	QISI001 QIVI001		***PASS***
14	**1**	QISI001 QIVI001	14.1: as a 3rd party gaming provided to Latvian Operators, the Requester do not store any personal/sensible data but receives and uses unique ID provided by Operators to uniquely identify the players.	***PASS*** *(ref. to notes)*
	2	QISI001 QIVI001		***PASS***
	3			*N.A* *(in charge to the Operator)*
	4	QISI001 QIVI001		***PASS***
	5	QISI001 QIVI001		***PASS***
	6	QISI001		***PASS***

Requirements		Test method	Notes	Result
Article	**Req.**			**(PASS / FAIL / N.A.)**
		QIVI001		
	7	QISI001 QIVI001		***PASS***
	8	QISI001 QIVI001		***PASS***
	9			***N.A.*** ***(in charge to the Operator)***
15	**-**			***N.A.*** *(in charge to the Operator)*
16	**-**	QISI001 QIVI001	14.1: as a 3rd party gaming provided to Latvian Operators, the Requester do not store any personal/sensible data but performs regular backups of gaming data	***PASS*** *(ref. to notes)*
17	**1**			**Not applicable** Certification of games only.
	2			
	3			
	4			
18				**Not applicable** Certification of games only. In charge to the Operator

Regulation No 854 (prot. No 54 14.§), 17 October 2006

"*Procedure for Registration and Identity Checking of Gamblers of the Interactive Gambling*", ", Issued pursuant Section 54 of the Gambling and Lotteries Law

Requirements		Test method	Notes	Result
Article	**Req.**			**(PASS / FAIL / N.A.)**
II	***Registration of gamblers of the interactive gambling***			
5	**1**			**Not applicable** Certification of games only. In charge to the Operator
	2			
	3			
6	**-**			
7	**-**			
8	**1**			
	2			
9	**-**			
10	**-**			
11	**-**			
12	**-**			
13	**-**			
III	***Registration of gamblers for lotteries and for games of chance by telephone***			
14	**1**			**Not applicable** Certification of games only. In charge to the Operator
	2			
15	**-**			
16	**1**			
	2			
16	**-**			
17	**-**			

ANNEX – III

Game Rules / Pay Table

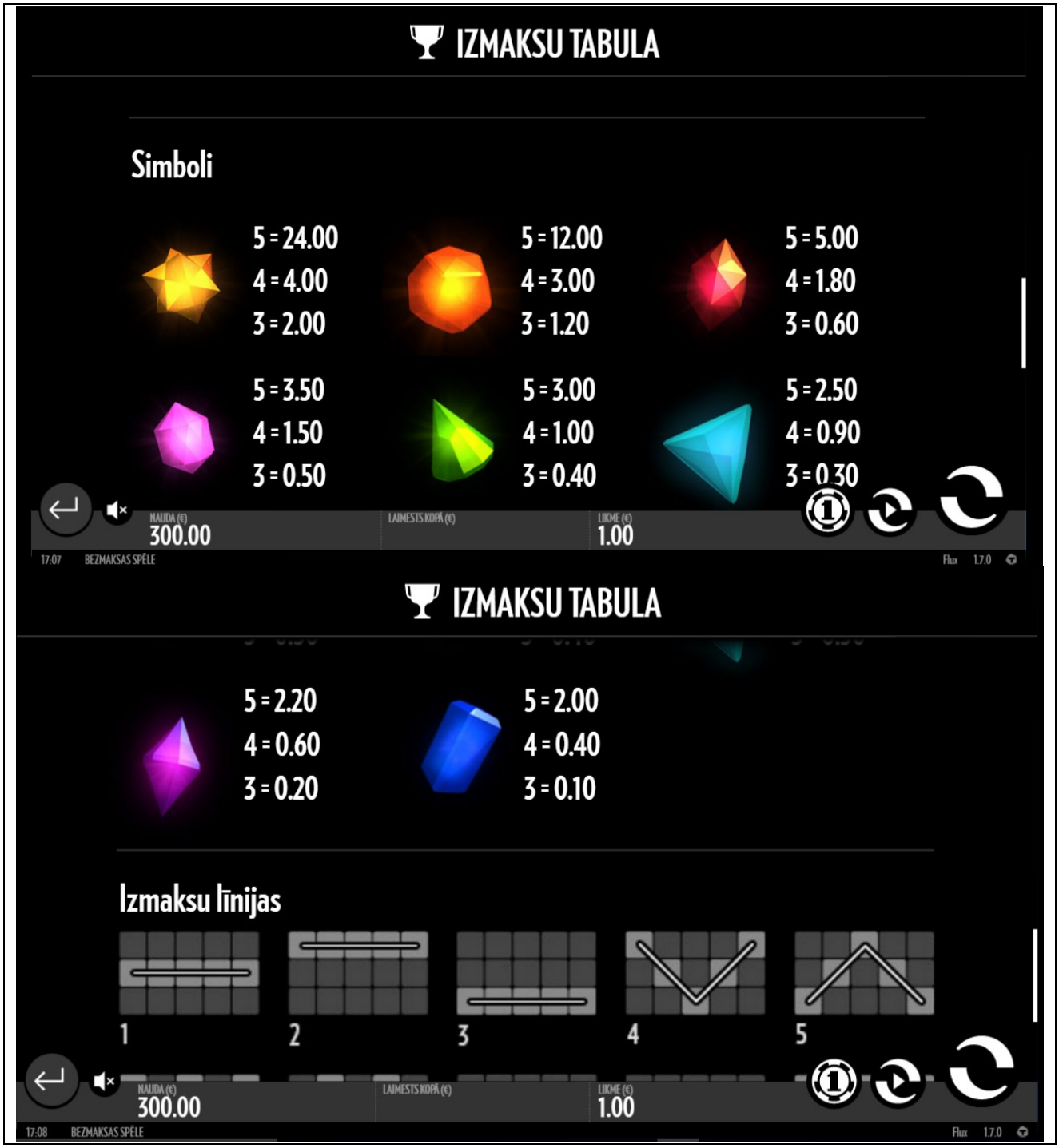
Note: screenshots reported along the annex are referring to a single bet of € 1.00.

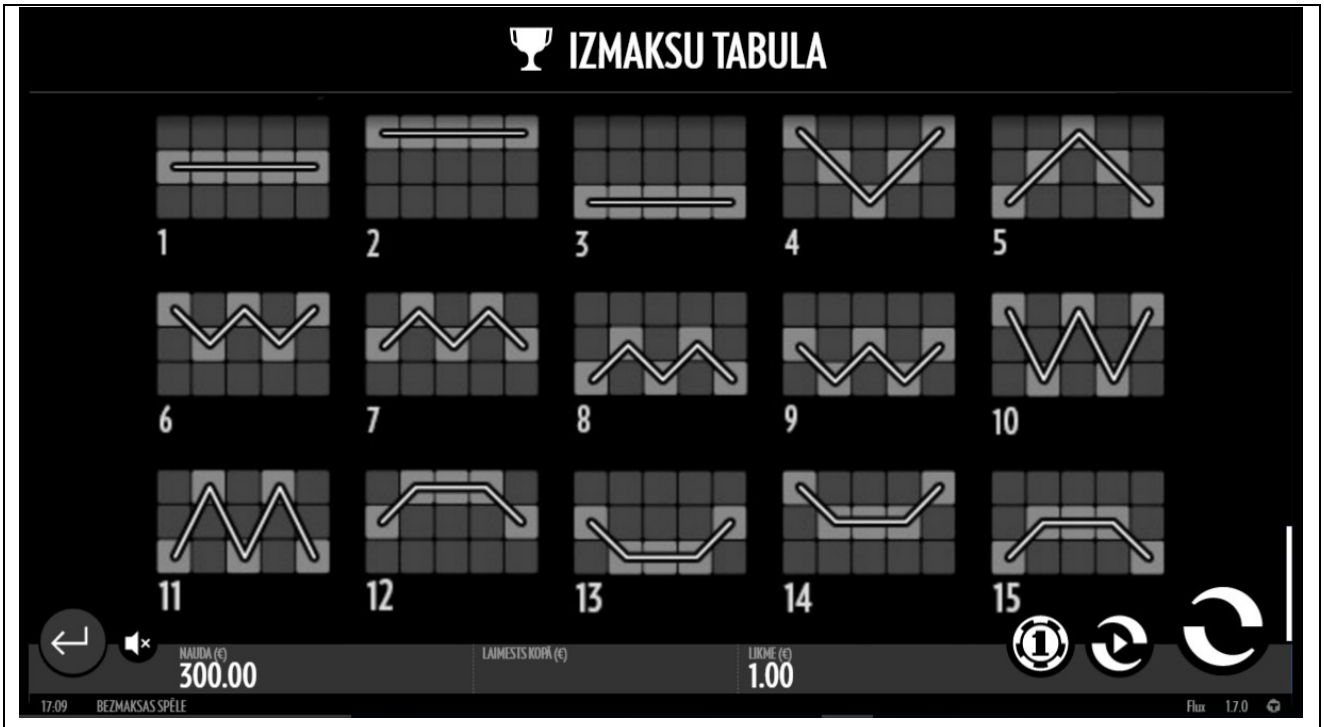
GAME: Flux

Spēles noteikumi (2016-05-04)
Piezīme: Flux video slotu spēle tiek dēvēta par Flux vai spēli.
1. Flux ir video slotu spēle ar 5 spolēm un 15 fiksētām izmaksu līnijām. Spēlē ir pieejamas bonusa spēles ar papildu simbolu rindām un izmaksu līnijām, kas ir aktīvas divos virzienos. Teorētiskā atdeve spēlētājam ir 96,2%.
2. Spēle piedāvā līdz 15 likmju līmeņiem izvēlētajā valūtā.
3. Spēles raundu sāk ar vadības pogu, un spēle tiek izspēlēta ar atlasīto likmes līmeni.
4. Automātiskās spēles laikā tiek automātiski izspēlēts automātiskās spēles lapā izvēlētais spēles raundu skaits.
5. Visas spēles izmaksu un laimestu kombinācijas tiek izmaksātas atbilstoši izmaksu tabulai.
6. Visi laimesti tiek parādīti un izmaksāti izvēlētajā valūtā.
7. Ja laimestu secība ir no malējās, kreisās uz labo pusi atbilstoši izmaksu tabulas kombinācijām, tiek izmaksāts tikai lielākais laimests uz izmaksu līniju. Divās bonusa spēlēs izmaksu līnijas darbojas abos virzienos, kas var nozīmēt papildu laimestu kombinācijas no labās uz kreiso pusi.
8. Aizstājējsimbols aizstāj jebkuru citu simbolu tikai tādā gadījumā, ja tas kopā ar vismaz vēl vienu simbolu, ko tas aizstāj, veido laimestu līniju.
9. Bonusa simbols ir izkaisīts simbols, kas piešķir vienu no bonusa spēlēm, ja tiek laimēti trīs (3) vai vairāk bonusa simboli. Laimēto bonusa simbolu skaits atbilst bonusa spēlēs piešķirto bezmaksas griezienu skaitam pēc izmaksu tabulas.
10. Spēlē ir pieejami trīs dažādi bonusa spēļu tipi; bezmaksas griezieni ar papildu simbolu rindām, bezmaksas griezieni ar izmaksu līnijām abos virzienos un bezmaksas griezieni ar papildu simbolu rindām un izmaksu līnijām abos virzienos.
11. Bonusa spēle tiek izspēlēta ar tādu pašu likmi kā griezienā, kas iedarbināja bonusa spēli.
12. Spēles raunda laikā nav iespējams izmainīt nevienu likmi.
13. Spēles disfunkcijas gadījumā visas atbilstošās likmes un izmaksas tiek uzskatītas par nederīgām.

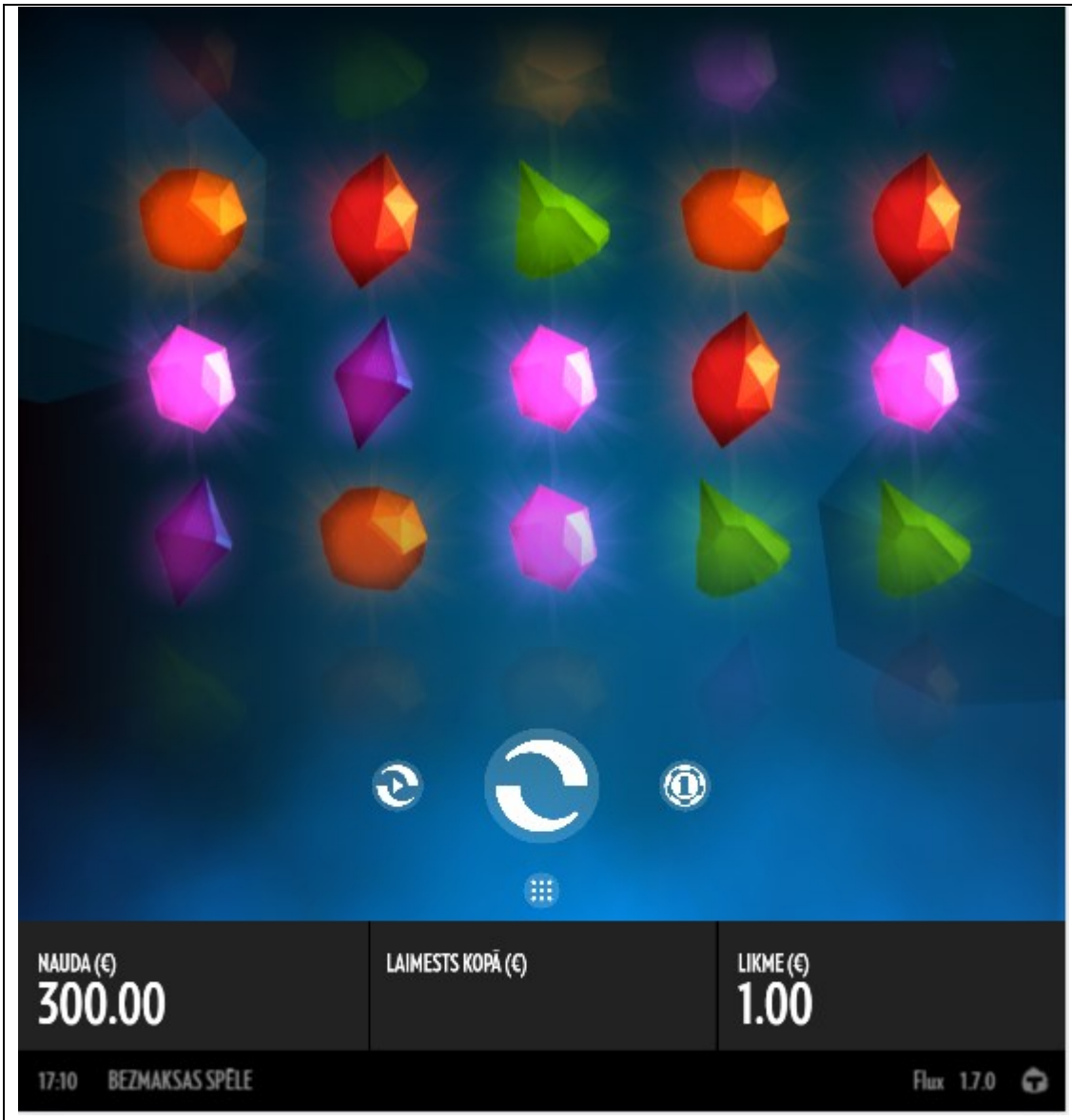
NAUDA (€)
300.00
LAIMESTS KOPĀ (€)
LIKME (€)
1.00
16:57
BEZMAKSAS SPĒLE
Flux 1.7.0
IZMAKSU TABULA
Bonusa simbols
Iegūsti 3 bonusa simbolus, lai laimētu bonusa spēli. Jebkur papildu bonusa simbols piešķir bezmaksas papildgriezienus bonusa spēlē. Jūs varat izvēlēties no trim bonusa spēļu veidiem.
B
Bezmaksas griezieni bonusa spēlēs
LAIMĒSTI ABOS
NAUDA (€)
300.00
LAIMESTS KOPĀ (€)
LIKME (€)
1.00
17:05
BEZMAKSAS SPĒLE
Flux 1.7.0

IZMAKSU TABULA
Bezmaksas griezieni bonusa spēlēs
Bonusa simbolu skaits
LAIMESTI ABOS VIRZIENOS
3 PAPILDRINDAS
LAIMESTI ABOS VIRZIENOS 3 PAPILDRINDAS
X5 48 36 24
X4 32 24 16
X3 16 12 8
NAUDA (€) 300.00
LAIMESTS KOPĀ (€)
LIKME (€) 1.00
17:06 BEZMAKSAS SPĒLE
Flux 1.7.0
IZMAKSU TABULA
Aizstājējsimbols
Aizstājējsimbols aizstāj visus simbolus, izņemot bonusa simbolu.
W
Simboli
NAUDA (€) 300.00
LAIMESTS KOPĀ (€)
LIKME (€) 1.00
17:07 BEZMAKSAS SPĒLE
Flux 1.7.0


IZMAKSU TABULA
Simboli
5 = 24.00
4 = 4.00
3 = 2.00
5 = 12.00
4 = 3.00
3 = 1.20
5 = 5.00
4 = 1.80
3 = 0.60
5 = 3.50
4 = 1.50
3 = 0.50
5 = 3.00
4 = 1.00
3 = 0.40
5 = 2.50
4 = 0.90
3 = 0.30
NAUDA (€)
300.00
LAIMESTS KOPĀ (€)
LIKME (€)
1.00
17:07
BEZMAKSAS SPĒLE
Flux 1.7.0
IZMAKSU TABULA
5 = 2.20
4 = 0.60
3 = 0.20
5 = 2.00
4 = 0.40
3 = 0.10
Izmaksu līnijas
1
2
3
4
5
NAUDA (€)
300.00
LAIMESTS KOPĀ (€)
LIKME (€)
1.00
17:08
BEZMAKSAS SPĒLE
Flux 1.7.0


IZMAKSU TABULA
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
NAUDA (€)
300.00
LAIMESTS KOPĀ (€)
LĪKME (€)
1.00
17:09
BEZMAKSAS SPĒLE
Flux
1.7.0

Mobile:


NAUDA (€)
300.00
LAIMESTS KOPĀ (€)
LIKME (€)
1.00
17:10
BEZMAKSAS SPĒLE
Flux 1.7.0

END

OF

DOCUMENT