

IGP 2 - Game Cocktail Board documentation

© 2011 «IGROSOFT», LLC

Features

- 16 independent games, each one is a five-reel video slot machine game with bonus and super-bonus games (not all of them), with an additional possibility of increasing the reward during a risk-game.
- Operator can select games, available to players
- The player chooses the game
- Credit and in/out credit statistics is common for all games
- Game statistics is independent for each game.
- Protocol IGT SAS 6.02 is supported (only accounting is available at the moment)
- Installing of the bill acceptors and coin slots under the protocols ICT-002, ID-003 и S.S.P. is supported¹.
- Detector of the intrusion works without power supply.
- Full electrical and physical compatibility of the connectors with the IGROSOFT boards of the IGP 1 series (old board).

¹ For IGP 2 board of the revision lower than 2.0 a soldering of the additional connector is required, the pattern is appended as Appendix Г in the technical description.

Contents

IGP 2 - Game Cocktail.....	1
Board documentation.....	1
Features.....	2
Contents.....	3
Instructions for amusement arcade operator.....	4
Switching on and off of the machine.....	4
Entering and canceling of the credit.....	4
Short statistics.....	4
Instructions on service and setup of the machine.....	5
Operation Statistic.....	5
Total Settings.....	5
Main Parameters.....	6
Credit settings.....	6
Game selection.....	6
COM Port Setup.....	6
SAS Settings.....	7
Security.....	7
Initialization of the machine (INIT).....	7
Event Logs.....	7
Set Clock.....	8
Game statistic.....	8
Game options.....	8
Tests.....	9
Game select.....	10
Appendix I: problems solution.....	11
Appendix II: events.....	12
Appendix III: possible settings values.....	13
Global settings.....	13
Main Parameters.....	13
Equipment.....	14
SAS Settings.....	15
Ticket Settings.....	15
Security.....	15
Game Options.....	15
Appendix IV: diagrams of connectors.....	16
Connector X1.....	16
Connector X2.....	16
Appendix V: supported SAS exceptions.....	17
Appendix VI: Supported SAS commands.....	19
Appendix VII: Supported SAS meters.....	22
History of changes.....	24

Instructions for amusement arcade operator

Switching on and off of the machine

To set up the machine it is necessary to connect it to the **alternating** current with the **220 V** voltage. After the giving of power supply the board will start the system condition check, which will be accompanied by the illumination of game -machine buttons. That is necessary for preliminary diagnosis of board faultinesses. If the testing is successful, an inscription “**HARD TEST PASSED**” will appear, which means that the board is in order and is ready for work.

After the accomplishment of actions stated above the machine should launch a playing or a demonstration mode. If that does not occur, go to appendix 1: problems solution. **It is strongly prohibited to allow customers to use the machine that have not launched a playing or a demonstration mode!**

If there is an inscription «CALL ATTENDANT» on the screen, then, probably, one of the buttons “sticked”. To enter the buttons test mode, one should push the button (turn the key) “short statistic”. Exiting the text is in a few seconds after the releasing of all the buttons or after the reset.

If the credit has been equal to zero before the machine switching off, after the switching on it should launch a demonstration mode. Besides, the machine enters this mode if there is a zero credit during some period of time. A playing mode is launched immediately after the entering of credit.

If a three-color indicator of working mode is connected to the machine, then:

red – technical mode (setup and statistics);

yellow – an interference of an attendant is required (an exceeding credit, absence of coins in the hopper);

green – demonstration mode; a credit entering is awaited

all are extinguished – playing mode.

The game machine can be switched off at any moment – after switching on it will reestablish the condition, in which it was before switching off. **If the machine needs to be switched off, it is recommended to do this while there is no player.**

Entering and canceling of the credit

Credit can be entered with the coin slot, bill acceptor, or credit key. It should be remembered, that a credit key has two work modes – direct (if turned, a appointed in settings value is added to credit) or key-driven (the amount of credit entered while the key is turned depends on button, pressed by the player: **1LINE**=1000, **3LINES**=100, **5LINES**=10, **7LINES**=1, **9LINES** – canceling of the credit; there is a mode, in which the canceling is only working). For each bill acceptor or coin slot there is a setting – a value of a bill (a coin) in credits. To enter the credit with the help of the computer one should follow the instructions to its software.

The payout of credit is accomplished with the service button “CREDIT CANCEL”, a credit key in a key-driven mode by the **9LINES button**, or a button **PAYOUT**, which is used by player for a payout of prize by a hopper.

Short statistics

The short statistics is entered with a short statistics key. After the transfer to a short statistics mode there will be a picture on the screen, the example of which is adduced below.

CREDIT	– current credit value;
TOTAL IN	– the number of credits entered;
TOTAL OUT	– the number of credits paid out;
PROFIT	- the machine income (Total_In - Total_Out - Credit);
KEY IN	– credits, entered with a credit key;
COINS IN	– credits, entered in all coin slots;
BILL IN	– credits, entered in all bill acceptors, and coin slots, installed under the protocol;
KEY OUT	– credits, withdrawn with a credit key;
HOPER OUT	– credits, paid out by hopper;
DOOR#1 OPEN	– amount and date of last first door opening;
DOOR#2 OPEN	– amount and date of last second door opening;
SHORT STAT. CLEAR	– amount and date of last short statistics cleaning;
LAST VIEW SHORT	– date of last statistics browsing.

Besides, important data from the operation statistics, such as **TOTAL IN**, **TOTAL OUT** and **ACTUAL PERCENTAGE** are adduced below.

The statistics is zeroed, if it is permitted in settings, after pressing and holding for five seconds of the button **BET**. **The zeroing of short statistics will not change the condition of long statistics and will not affect the percentage of payout of the machine.**

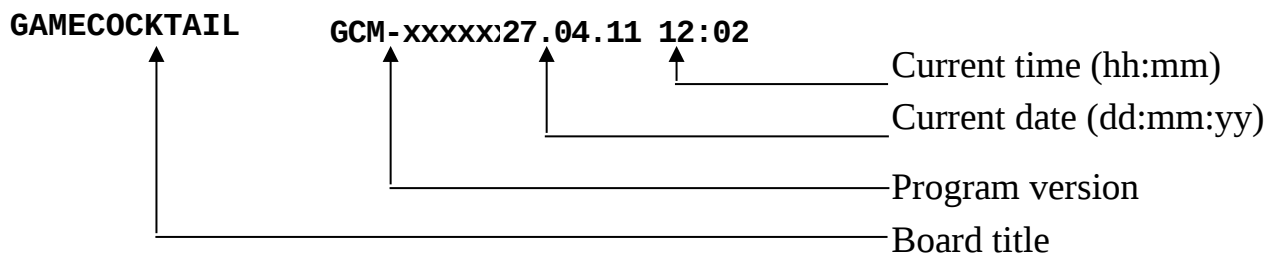
Instructions on service and setup of the machine

To enter the service mode a operation statistics key should be used. The offsetting over the menu is accomplished with buttons **HOLD1**² – up and **HOLD2** – down. The necessary entry is chosen with the button **START**, exit – with the button **CANCEL (BET)**.

The Menu contains the following entries:

OPERATION STATISTIC	– long statistics;
TOTAL SETTINGS	– general settings;
INIT	– machine initialization;
EVENT LIST	– register of events;
SET CLOCK	– date and time adjustment;
GAME STATISTIC	– the statistics of plays;
GAME OPTIONS	– game adjustment;
TESTS	– tests of sound, connector contacts and event register;
EXIT	– exit to playing or demonstration mode (depends on credits available).

At the very top of the screen there is an information line with the title and version of the game, and current date. Below an example of information line deciphering is given:



Controls in all menus of lower level are similar to those of the main one, and the parameters are changed with buttons **HOLD3** and **HOLD4**.

Operation Statistic

Operation statistics, or long statistics, consists of two pages. The pages are changed with the button HOLD2.

On the first there is information about credit (how much and where it is entered and where it is paid out, see short statistics), and besides:

HOPPER UNLOAD — amount of coins, given out by hopper, being unloaded.

On the second page there is information about the following system events:

INIT MACHINE	– board initialization;
CHANGED TOT. SET.	– changing of general parameters;
CHANGED GM. PREF.	– changing of game options;
DOOR#1 OPEN	– opening of the first door;
DOOR#2 OPEN	– opening of the second door;
PREVIOUS SERVICE	– turning on of the service mode;
SHORT STAT. CLEAR	– clearing of short statistics;
OPER. STAT. CLEAR	– cleaning of operation statistics;
POWER ON	– switching on of the machine;
LAST VIEW SHORT	– last view of short statistics;
LAST VIEW OPER.	– last view of operation statistics;

After a title of the events their amount since the last cleaning of statistics and the date of the last are given. The statistics is cleared with pressing of the button CANCEL (BET) and holding it for five seconds. Cleaning of the statistics does not affect the percentage of payout of the machine.

On the third page the information from the short statistics is repeated.

Total Settings

After entering this section of the main menu, you will get to a sub menu, which contains seven entries:

MAIN PARAMETERS	- options for the main parameters;
CREDIT SETTINGS	- installing of the coin slots and bill acceptors, credit key and external counters;
GAME SELECTION	- selection of the games, available to the player;
COM PORT SETUP	- settings of the serial ports options ³ ;

² Here and further **HOLD1** corresponds with button **1LINES**, **HOLD2 – 3LINES... HOLD5 – 9LINES**

³ available from the version 110825

SAS SETTINGS	– SAS parameters settings;
SECURITY	– security setting (access to the statistics entries);
EXIT	– exit to the main menu.

Main Parameters

This page of parameters is intended for the settings of common features of all games on the board.

CREDIT LIMIT	– the maximum magnitude of the credit, if it is exceeded, there will be a corresponding inscription on the screen and the machine will not let play until the credit is unloaded. Used for setting limit of maximum winning, paid out to a player, corresponding to the game arcade rules;
BARRIER	– game events with a parameter below the one, assigned by this setting are not recorded into the event list. Do not assign this setting too low – this can lead to the clog of the list with unnecessary information;
MAX TOTAL BET	– maximum bet. Limits the diapason of changing of other parameters, which assign the magnitudes of bets. Changing of this parameter can lead to the modification of other parameters;
BILL INHIBIT LEVEL	– level of the signal of blockage of coin slots and bill acceptors;
BILL RECEPTION LIMIT	– magnitude of credit, after the exceeding of which coin slots and bill acceptors are blocked;
HOPPER INHIBIT LEVEL	– level of error signal of the hopper;
HOPPER SW EDGE	– edge of the signal, due to which coins, given out by the hopper, are counted.
HOPPER CAPACITY	– amount of coins, the hopper can give out for one time.
CLOCK AUTOCORRECTION	– switching on/off of the clock autocorrection (it will be off in some time);
SPEAKER VOLUME	– volume of the speaker;
SWITCH GAME MODE	– means of switching to the select game display (always two ways are available: SWITCH GAME button and BET in the reference mode; but in addition the regime can be activated in which you can switch by pressing of the two buttons HOLD2 and HOLD4 in the main screen.

Credit settings

Eight points (four for the coin slots and four – for the bill acceptors) impose the correspondence between one response of indicated machine and the amount of credits, entered at the time (for example, if coin slot COIN B, credit goes twice, and if BILL ACCEPTOR 4 – 100 times).

HOPPER OUT COIN	– coin slot, corresponds to hopper;
CREDIT KEY	– credit key receives several numerical and one special value. As it was described above, credit key is able to work in two modes – direct and key-driven. By default, the key-driven mode is on, but it can be changed to direct.
COUNTERS RATE	– an adjustment for three mechanical counters of credits entered (credit key + computer, coin slot + bill acceptor and general), and also for tree counters of credits unloaded (key + computer, hopper + ticket distribution device and general);
BET COUNTER RATE	–an adjustment for counter of bets lost.

Two these parameters assign the value of a counter unit in credits. I.e., if **BET COUNTER RATE** is assigned equal to 50, then the corresponding counter will change only if the amount of bets collected increase not less then 50.

Game selection

This screen allows to select games, available to the player. On default all games are available. At any moment any amount of games can be selected, starting from one. Switched off games will be highlighted in red and won't be available for the player. If only one game is selected, than the Game selection screen will be unavailable.

COM Port Setup

The menu allows to adjust the work of serial ports:

COM2 PROTOCOL	– specifies the protocol of the device, connected to the COM2 ⁴ ;
COM1 PROTOCOL	– specifies the protocol of the device, connected to the COM1;
ICT002 DENOMINATION	– price setting for each type of the note for the ICT-002 protocol;
ID003 DENOMINATION	– price setting for each type of the bill for the JCM ID-003 protocol;
SSP SETTINGS	– setup of the SSP protocol - Smiley® Secure Protocol.

⁴ COM2 is available on the board IGP 2 of the revision 2.0 and higher

SSP Settings

SLAVE DEVICE ID	– connected device identification number (usually, 0 or 1);
AUTO DENOMINATION	– if switched on, information on the bill value in credits is got from the device;
DENOMINATION CH. 1-8	– price setting for the first eight bill types;
DENOMINATION CH. 9-15	– price setting for the rest seven bill types;

SAS Settings

This parameters screen allows to adjust the SAS (IGT Slot Accounting System) settings.

MACHINE ADDRESS	– address of the machine, available values: 0 (off), 1, ... 127 (on default any non-zero value used, usually, 127);
DOOR #1 ROLE	– role of the first door (slot , drop, card, cashbox, belly);
DOOR #2 ROLE	– role of the second door (slot, drop, card , cashbox, belly);
BILL COUNTRY	– country, issuer of the received bills.

Security

Set-up of the permissions and passwords to the system screens.

CLEAR SHORT	– permission to clear short statistics;
CLEAR LONG	– permission to clear operation statistics;
MAKE INIT	– type of the access to the initialization;
SET TIME	– type of the access to the time set;
CHANGE TOTAL SCALES	– type of the access to the screen of installation of coin slot and bill acceptor and counters;
CHANGE TOTAL PARAMETERS	– type of the access to the general settings screen;
ENABLE/DISABLE GAMES	– type of the access to the available to players games selection screen;
CHANGE GAME OPTIONS	– type of the access to the game settings screen;
CHANGE COM PORT SETTINGS	– type of the access to the serial ports settings screen;
CHANGE SAS SETTINGS	– type of the access to the SAS settings screen;
PASSWORD	– setting of the password, which will be required to gain access to the protected screen. Can be removed by setting of an empty password.
DOOR #1 LATENCY	– latency to the opening/closure of the door №1;
DOOR #2 LATENCY	– latency to the opening/closure of the door №2.

If there is a serious failure, and if to remediate it an initialization is required, the access will be free. After the initialization of the board there is no password.

To restrict the access to any of the entries, you shall:

- Set the type of access to it «PAROLE»;
- To enter the password, different from empty.

Password – is not more than eight figures from 1 to 5, entered with **HOLD1**, **HOLD2**, ... **HOLD5** buttons.

Initialization of the machine (INIT)

Before the receipt into the sale every board is initialized by the manufacturer and therefore a buyer does not need to conduct this operation himself. But in case of some mistakes, caused by wrong adjustment or influence of external factors, it can be necessary.

Initialization (full nulling) – is an adjustment of all settings by default, some of which can be set only before the first start of the game, then they are blocked until the next initialization.

Initialization is invoked from the main menu of the service mode. Then, pressing button BET and holding it for five seconds it is possible to null the board.

Attention! All information about settings, credit and winnings is lost at the same time. All settings drop by default.

Event Logs

Event logs are intended to control the work of the machine. All events, satisfying some conditions, for example game events, numerical parameter of which is not less than a value assigned, are written down in it.

It is possible to view four types of lists:

ALL EVENTS	– all happened events;
PAYOUT EVENTS	– entering and canceling of credit;
PAY AND SYSTEM EVENTS	– entering and canceling of credit and system events;
GAME EVENT	– register of game events;
DOOR #1 EVENTS	– last 50 events of the door №1 (do not clear during initialization);
DOOR #2 EVENTS	– last 50 events of the door №2 (do not clear during initialization);

the log;

TICKET IN EVENTS	– detailed log of last accepted tickets;
TICKET OUT EVENTS	– detailed log of last printed tickets, operator can print copy of ticket in
EXIT	– exit to the main menu.

All events have the following structure:

<event title> [<numerical parameter>] <date> <time>

Numerical parameter can be lacking for some types of events (for example: switching on/ off of the machine). The whole list of events and their deciphering is appended as appendix №2 events.

Set Clock

In this menu time and date are set.

The position of editing is changed with HOLD1 and HOLD2 buttons, forward and backward correspondingly. The value is changed with the HOLD3 and HOLD4 buttons– previous and next value. The changes are cancelled with the BET button. Exit with the saving of adjusted time is accomplished with the button START.

Game statistic

Menu contains the list of games, which has the statistics, and in the heading there is following.

PLAYED BET	– sum of all bets;
TAKEN WIN	– sum of winnings taken and win/bet relation;
GAMES	– amount of games played

Each entry in the menu allows access to the statistics of the corresponding game. The first page contains the following (depending on the game, counters can vary):

TOTAL GAMES	– amount of games;
TOTAL BETS	– amount of bets made;
MAIN GAME WIN	– sum of all winnings in the main game;
TAKEN WIN	– sum of winnings taken (including risk- and bonus-games);
RISK IN	– sum of winnings, with which the doubling was entered;
RISK OUT	– sum of winnings in doubling;
BONUS QUANTITY	– quantity of bonuses hit;
BONUS WINNING	– sum of all winnings in the bonus-game;
SBONUS QUANTITY	– quantity of entrances of the super bonus game;
SUPER BONUS WIN	– sum of all winnings in the super bonus game;
SBNS WIN COUNT	- amount of winning super bonuses.

On the pages from second to forth the information about winnings is given: an amount, sum of winnings, date and time of the last hit.

Game options

In this menu each game can be selected and adjusted. There are the following settings here:

PAYOUT RATE	– generosity of the game (very low – very greedy, low, normal , high, very high – very generous);
MIN BET	– minimum bet;
MAX BET	– maximum bet;
MIN BET FOR ****	– minimum bet for the special equipment (helmet, mushroom, extinguisher) to appear.

Tests

After entering of this unit of the menu, you get to the sub menu, in which you can choose:

KEYS TEST	– ports test;
SOUND TEST	– sound test;
HOPPER UNLOAD	– unload of the hopper;
20 LAST ERRORS	– list of the last twenty errors;
FIRMWARE CRC32	– account of the control sum of the firmware (CRC32 method);
EXIT	– exit to the main menu.

Choosing **the ports test**, you will get to the screen, where all board ports are listed (title and location on the connector), and also their current condition. If you think, that you have some external device or button unable to work, then after entering of this mode, you will be able to check your supposition.

After choosing **the sound test**, there will be three inscriptions: “**CHANNEL 1**”, “**CHANNEL 2**” and “**CHANNEL 3**” appearing consequently on the screen. At that time the sound will be given through, correspondingly, the first, the second and the third channels.

Unload of the hopper is accomplished with the simultaneous display of the coins thrown out. With the help of this function efficiency and accuracy of the adjustment of this device can be checked, and besides, the quantity of coins can be counted.

Error list is needed for the registration of not established situation. If the machine behaves itself in a “strange” way or suddenly demanded an initialization, then, probably, a situation of that type has occurred. A type of the error can be learnt from this list. This list is necessary only for the producer. If there is no serious reason, do not pay attention to the errors.

Initialization does not clear this list. To clear it, it is necessary, while the list is on the screen, to press the button **BET** and then hold it for five seconds.

Attention! If some inscription has appeared in your error list, that is a ground for contact with the support service of the machine seller.

Game select



If more than one game is switched on in the settings menu, then player can choose. There is a screen with 16 icons. With the buttons **3LINES** and **7LINES**, the player can sequentially go over them counter-clockwise or clockwise. When he chooses, he shall press **START**, to launch it.

If machine configured denomination is not 1:1, currency is not default or denomination show forced then player can see current machine denomination and his balance in currency.



Appendix I: problems solution

Q: The machine does not enter the demonstration or the game modes. It drops itself constantly and writes «INIT MACHINE».

A: Probably, a serious error has occurred. It is necessary to initialize the board. It is possible to learn about an error from the error list (see “Instructions on service and setup of the machine” chapter “Tests”).

Q: The machine gave out an inscription «HARD TEST PASSED» and one or several more from the list: «SHORT STATISTIC ERROR», «LONG STATISTIC ERROR», «MAIN SETTINGS ERROR», «INTERNAL ERROR», «ERROR: FAILED MEMORY! INIT NEEDED!» and did not enter game/demonstration mode.

A: A memory failure has occurred in the corresponding domain of data. It is recommended to clear corresponding statistics, if an error occurred in it, or, having entered the service menu, change damaged settings. In any case, it is better to accomplish an initialization of the board and if it repeats again, contact the organization that sold the board/the machine.

Q: After switching on there is an inscription: «CALL ATTENDANT» at the bottom of the black screen.

A: Probably, one or several game buttons are out of order or got “sticked”. It is necessary to press “short statistic”. The machine will enter the mode of buttons test, an exit from which is accomplished in a few seconds after all the buttons get free or after a reset (switching off and repeated switching on of the machine).

Q: A just bought machine gives a large amount of winnings. Its percentage of exit exceeds 100%.

A: Such behavior is peculiar for any new machine. That is kind of advertising and attracts customers. In some time it will start to maintain specified percentage. If that does not suit you, play yourself and when the machine reaches the necessary percentage, start its usual exploitation.

Q: Players do not play games on this machine.

A: Probably, too low percentage of winnings was established. Increase it to the maximum value. If after that people will not play, than, obviously, the game does not suit their taste.

Q: During an attempt to give out the credit by the hopper, an inscription HOPPER ERROR appeared.

A: The sum demanded was too high. The inscription is removed with any key, including the credit one.

Q: The hopper started to give out money, but did not give them all. An inscription CALL ATTENDANT appeared.

A: The hopper ran out of coins. It is necessary to add them there. The inscription is removed with any service key.

Q: One or several players constantly win more, than lose.

A: Probably, these players have found a method of breaking through the game security system. Check, if the producer has new versions of micro programs. If not or the upgrade did not solve the problem, it is highly recommended to observe the actions of the players (methods of playing, bets made, lines used, etc), contact the seller and pass your observations. The earlier and the more accurate information will get the developer, the faster he will be able solve the problem: usually, during 7 days after the localization of the error (i.e. the discovery of the reason of the error). The cases of external interrupting into the program with the help of service stuff of the game arcade are known. To avoid such situations, it is recommended to establish twenty-four-hour surveillance for the machines.

Appendix II: events

System events

POWER ON/OFF	– switching on/off of the machine
INIT MACHINE	– initialization of the machine
CLOCK CHANGED	– time and date setting
TIME BEFORE CLOCK CHANGED	– time before changing of the current time;
OPENED DOOR #<n>	– the door <n> was opened;
CLOSED DOOR #<n>	– the door <n> was closed;
SETTINGS CHANGED	– the settings were changed;
SHORT STATISTIC CLEARED	– short statistics were cleared;
LONG STATISTIC CLEARED	– long statistics were cleared;
EVENT LIST CLEARED	– emergency clearance of the event list;
HOPPER UNLOAD	– hopper was unloaded;
START GAME <gm>	– the game <gm> was launched;
SAS SETTINGS CHANGED	– SAS settings were changed;
SERVICE MENU ENTERED	– service menu was entered;
SERVICE MENU EXITED	– service menu was exited;
SHORT STATISTIC ENTERED	– short statistics was entered;
SHORT STATISTIC EXITED	– short statistics was exited;
SAS SETTINGS CHANGED	– SAS settings were changed;
FIRMWARE VERSION CHANGED	– firmware version was changed .

Events of the entering/canceling of the credit

COIN IN	– credit is entered through the coin slot;
HOPPER OUT	– credit gave out by the hopper;
KEY IN	– credit entered with the credit key;
KEY OUT	– credit cancelled with the credit key;
BILL IN	– credit is entered through the bill acceptor;

Game events

<gm>: □□□□ LINE #<n>	– winning on the line <n> is a specified combination and compile an specified number;
<gm>: SEVERAL LINES	– winning on several lines;
<gm>: FREE GAMES	– free games produced a winning, which compile the specified number;
<gm>: RISK WIN STEP <n>	– winning in a risk-game on the <n> step compiles the specified number (not obligatory, chosen by the player);
<gm>: BONUS WIN	– winning in a bonus game compiles the specified number;
<gm>: BOX BONUS WIN	– in a “box” bonus game (Garage) winning compiles a specified number;
<gm>: LOCK BONUS WIN	– in a “lock” bonus game (Garage) winning compiles a specified number;
<gm>: CHEST BONUS WIN	– in a “chest” bonus game (Pirate and Pirate 2) winning compiles a specified number;
<gm>: BARREL BONUS WIN	– in a “barrel” bonus game (Pirate and Pirate 2) winning compiles a specified number;
<gm>: SUPER PRIZE WIN	– super prize (Garage, Rock Climber) compiles a specified number;
<gm>: SUPER BONUS WIN	– winning in a super bonus game compiles a specified number.

Appendix III: possible settings values

Global settings

Main Parameters

Name	List of possible values
MACHINE NUMBER	0 - 4294967295
ASSET NUMBER	0 - 4294967295
COUNTRY/CURRENCY	DEFAULT , ARGENTINA, ... EURO, ... UNITED STATES
DENOMINATION	0.01, 0.02, 0.05, 0.10, 0.20, 0.25, 0.50, 1.00 , 2.00, 2.50, 5.00, 10.00, 20.00, 25.00, 50.00, 100.00
SHOW DENOMINATION	NEVER, AUTO , ALWAYS
CREDIT LIMIT	1000, 5000, 10000, 20000 , 50000, 100000, 200000, 500000, 900000
EVENT LIST BARRIER	0, 2, 5, 10, 20, 50, 100, 200 , 500, 1000, 2000, 3000, 4000, 5000, 7000, 10000, 20000, 50000
MAX TOTAL BET	10, 50, 100, 250 , 500, 1000
BILL RECEPTION LIMIT	DISABLED , 100, 200, ..., 1000, 1500, ..., 5000, 6000, ..., 10000, 20000, 50000, 100000, 200000, 500000
CLOCK AUTOCORRECTION	ON , OFF (mode switches to OFF when correction finished)
SPEAKER VOLUME	1%, 13%, 25%, 38%, 50%, 63%, 75% , 88%, 100%
SWITCH GAME MODE	SW GAME ONLY , 3LINES+7LINES
DEMO TYPE	STANDARD, SELECTOR ONLY

Key in and handpay settings

Name	List of possible values
<i>CREDIT KEY FUNCTION</i>	10, 20, 50, 100, 200, 500, 1000, BUTTONS , OUT ONLY
EVEN HANDPAY	0.01 , 0.02, 0.03, 0.04, 0.05, 0.10, 0.20, 0.25, 0.30, 0.40, 0.50, 1.00, 2.00, 2.50, 3.00, 4.00, 5.00, 10.00, 20.00, 25.00, 30.00, 40.00, 50.00, 100.00, 200.00, 250.00, 300.00, 400.00, 500.00, 1000.00, 2000.00, 2500.00, 3000.00, 4000.00, 5000.00
HANDPAY LIMIT	DISABLED , 100, 200, 300, 400, 500, 1000, 2000, 3000, 4000, 5000, 10000, 20000 , 30000, 40000, 50000, 100000, 200000, 300000, 400000, 500000
PERMIT HANDPAY CANCEL	YES, NO

Equipment

Bill acceptor

Name	List of possible values
PROTOCOL	DISABLED , PULSE, ID-003, S.S.P.
SERIAL PORT	COM1, COM2 ¹
DENOMINATION для каждого канала	0 , 1, 2, 3, 4, 5, 10, 20, 25, 30, 40, 50, 100, 200, 250, 300, 400, 500, 1000, 2000, 2500, 3000, 4000, 5000, 10000, 20000, 25000, 40000, 50000, 100000, 200000, 250000, 300000, 400000, 500000
STACKER	STACKER-1 , STACKER-2
INHIBIT LEVEL ²	HIGH , LOW
AUTO DENOMINATION ³	ON , OFF
SLAVE DEVICE ID ⁴	0 - 127
BEZEL COLOR ⁴	DEFAULT , NAVY, GREEN, TEAL, MAROON, PURPLE, OLIVE, GRAY, SILVER, BLUE, LIME, AQUA, RED, FUCHSIA, YELLOW, WHITE
TICKET DIRECTION ⁴	ANY , TOP, BOTTOM

Coin acceptor

Name	List of possible values
PROTOCOL	DISABLED , PULSE, ID-003, S.S.P.
DENOMINATION для каждого канала	0 , 1, 2, 3, 5, 10, 20, 25, 30, 50, 100, 200, 250, 300, 500, 1000, 2000, 2500, 3000, 5000, 10000, 20000, 25000, 50000, 100000, 200000, 250000, 300000, 500000
INHIBIT LEVEL ²	HIGH , LOW

Ticket Printer

Name	List of possible values
PROTOCOL	DISABLED , FL TCL, ESC/P
SERIAL PORT	COM1, COM2 ¹

Hopper

Name	List of possible values
PROTOCOL	DISABLED , PULSE
COIN CHANNEL	1 - 15
CAPACITY	100, 200, 300 , 400, 500, 600, ..., 3000
COIN OUT PULSE EDGE	FRONT , BACK

Mechanical counters

Name	List of possible values
COUNTERS RATE	1 , 10, 100
BET COUNTER RATE	1 , 10, 100

¹ Only if COM-EXPANDER daughter board is connected

² Only for PULSE protocol.

³ Only for ID-003 and S.S.P. protocols.

⁴ Only for S.S.P. protocol.

SAS Settings

Name	List of possible values
MACHINE ADDRESS	0 (выкл), 1, 2, ... 127 (при инициализации не меняется)
DOOR #1 ROLE	NONE, SLOT , DROP, CARD, CASHBOX, BELLY, STACKER, G. TILT
DOOR #2 ROLE	NONE, SLOT, DROP, CARD , CASHBOX, BELLY, STACKER, G. TILT
DOOR #3 ROLE	NONE , SLOT, DROP, CARD, CASHBOX, BELLY, STACKER, G. TILT
DOOR #4 ROLE	NONE , SLOT, DROP, CARD, CASHBOX, BELLY, STACKER, G. TILT
ADV. FUNDS TRANSFER	ON , OFF
HANDPAY REPORTING TYPE	QUEUED, LEGACY
BONUSING	DISABLED , LEGACY

Ticket Settings

Name	List of possible values
CASHOUT TO TICKET MODE	DISABLED , SYSTEM
REDEEM TICKETS	NO , YES
EXPIRATION (DAYS)	NEVER, 1 - 31
DATE FORMAT	DD/MM/YY, MM/DD/YY , DD/MM/YYYY, MM/DD/YYYY, "MON DD, YYYY", "DD MON YYYY", YY/MM/DD, YYYY/MM/DD
DATE FIELD SEPARATOR	SLASH , PERIOD, HYPHEN
THOUSAND SEPARATOR	NONE, SPACE, COLON , PERIOD, APOSTROPHE
DECIMAL MARK	PERIOD , COLON

Security

Name	List of possible values
CLEAR SHORT	YES , NO
INITIALIZE	FREE , PASSWORD
SET TIME	FREE , PASSWORD
CH. MAIN PARAMETERS	FREE , PASSWORD
ENABLE/DISABLE GAMES	FREE , PASSWORD
CH. GAME OPTIONS	FREE , PASSWORD
CH. EQUIPMENT SETTINGS	FREE , PASSWORD
CH. SAS SETTINGS	FREE , PASSWORD
HOST CAN CHANGE ASSET NUMBER	YES , NO
HOST CAN CHANGE FLOOR LOCATION	YES , NO
RESET ERRORS BY CREDIT KEY	YES, NO
PASSWORD	Any combination of not more than 8 digits from 1 to 5. Not set by default.

Door settings

Name	List of possible values
DOOR #n LATENCY	DISABLED, 0.25 SEC, 0.50 SEC , 0.75 SEC, 1.00 SEC, 1.25 SEC, 1.50 SEC, 1.75 SEC, 2.00 SEC
ALLOW PLAY ON CLOSE DOOR #n	YES, NO

Game Options

Name	List of possible values
PAYOUT RATE	VERY LOW ¹ ("greedy game"), LOW, NORMAL , HIGH, VERY HIGH ¹ ("lavish game")
MIN BET	1 , 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60
MAX BET	8, 9, 10, 15, 20, 25 , 30, 35, 40, 45, 50, 60, 70, 80, 90
BET FOR <object>	10, 20, 30, 40 , 50, 60, 70, 80, 90, 100, 150, 200, 250, 300, 400, 500, 600, 700, 800, 900

Default values are **highlighted**.

¹ Not all firmware support it (for example, disabled in GC-xxxxxx)

Appendix IV: diagrams of connectors

Connector X1

Component Side(A)	Contact	Printed Side(B)
GND	1	GND
GND	2	GND
+5V	3	+5V
+5V	4	+5V
+12V	5	+12V
	6	
	7	
	8	
GND	9	GND
GND	10	GND

Connector X2

Component Side (A)		Contact	Printed Side (B)	
Description	Direction		Direction	Description
		1		
		2		
SPEAKER	OUT	3		GND
HOLD1	IN	4	IN	BILL ACCEPTOR 1
HOLD2	IN	5	IN	BILL ACCEPTOR 2
HOLD3	IN	6	IN	BILL ACCEPTOR 3
HOLD4	IN	7	IN	BILL ACCEPTOR 4
HOLD5	IN	8	IN	HOPPER INHIBIT
START	IN	9	IN	RESERVED
BET	IN	10		
SWITCH GAME	IN	11		
		12		
		13		
MAX BET	IN	14		
HELP	IN	15	IN	RESERVED
DOOR #1	IN	16		
DOOR #2	IN	17	IN	CALL ATTENDANT
COIN A	IN	18	IN	COIN B
COIN C	IN	19	IN	COIN D
SHORT STATISTIC	IN	20	IN	SERVICE (LONG STATISTIC)
PAYOUT	IN	21	IN	KEY OUT
		22	IN	HOPPER COIN OUT
		23	OUT	COIN LOCK
KEY IN COUNTER	OUT	24	OUT	BILL INHIBIT
TOTAL IN COUNTER	OUT	25	OUT	TOP GREEN LAMP
TOTAL OUT COUNTER	OUT	26	OUT	TOP RED LAMP
KEY OUT COUNTER	OUT	27	OUT	TOP YELLOW LAMP
		28	OUT	TOTAL BET COUNTER
HOLD1 LAMP	OUT	29	OUT	BET LAMP
HOLD2 LAMP	OUT	30	OUT	MAX BET LAMP
HOLD3 LAMP	OUT	31	OUT	PAYOUT LAMP
HOLD4 LAMP	OUT	32		
HOLD5 LAMP	OUT	33	OUT	HOPPER MOTOR
START LAMP	OUT	34	OUT	HELP LAMP
CREDIT KEY	IN	35		
GND		36		GND

Appendix V: supported SAS exceptions

Number (hex)	Support level	Description
11	depends on settings	Slot door was opened
12	depends on settings	Slot door was closed
13	depends on settings	Drop door was opened
14	depends on settings	Drop door was closed
15	depends on settings	Card cage was opened
16	depends on settings	Card cage was closed
17	full	AC power was applied to gaming machine
19	depends on settings	Cashbox door was opened
1A	depends on settings	Cashbox door was closed
1B	depends on settings	Cashbox was removed
1C	depends on settings	Cashbox was installed
1D	depends on settings	Belly door was opened
1E	depends on settings	Belly door was closed
20	depends on settings	General tilt
23	full	Hopper is empty
27	for ID003 and SSP	Cashbox full detected
28	for ID003 and SSP	Bill jam
29	for ID003 and SSP	Bill acceptor hardware failure
2A	for ID003 and SSP	Reverse bill detected
2B	for ID003 and SSP	Bill rejected
32	full	CMOS RAM error (no data recovered from EEPROM)
36	full	EPROM error (different checksum - version changed)
3B	full	Low backup battery detected
3C	full	Operator changed options
3D	full	A cash out ticket has been printed (may has priority)
47	full	\$1.00 bill accepted (non-RTE only)
48	full	\$5.00 bill accepted (non-RTE only)
49	full	\$10.00 bill accepted (non-RTE only)
4A	full	\$20.00 bill accepted (non-RTE only)
4B	full	\$50.00 bill accepted (non-RTE only)
4C	full	\$100.00 bill accepted (non-RTE only)
4D	full	\$2.00 bill accepted (non-RTE only)
4E	full	\$500.00 bill accepted (non-RTE only)
4F	full	Bill accepted (In non-RTE mode, for all bills without specific exception. In RTE mode, for all bill denom)
50	full	\$200.00 bill accepted (non-RTE only)
51	only canceled credits	Hand pay is pending
52	full	Hand pay was reset
57	full	System validation request (has priority)
60	full	Printer communication error
61	full	Printer paper out error
66	full	Cash out button pressed
67	full	Ticket has been inserted (has priority)
68	full	Ticket transfer complete (has priority)
69	full	AFT transfer complete (has priority)
6A	full	AFT request for host cashout (has priority)
6C	full	AFT request to register (has priority)
6D	full	AFT registration acknowledged (has priority)
6E	full	AFT registration canceled

Number (hex)	Support level	Description
6F	full	Game locked (has priority)
70	full	Exception buffer overflow (has priority)
74	full	Printer paper low
78	full	Printer carriage jammed
7A	full	Gaming machine soft (lifetime-to-date) meters reset to zero
7C	full	A legacy bonus pay awarded and/or a multiplied jackpot occurred
7E	full	Game has started
7F	full	Game has ended
82	full	Display meters or attendant menu has been entered
83	full	Display meters or attendant menu has been exited
84	full	Self test or operator menu has been entered
85	full	Self test or operator menu has been exited
8C	full	Game selected
8E	full	Component (peripheral) list changed
98	depends on settings	Power off card cage access
99	depends on settings	Power off slot door access
9A	depends on settings	Power off cashbox access
9B	depends on settings	Power off drop door access

Appendix VI: Supported SAS commands

Number (hex)	Support level	Description
01	full	Shutdown (lock out play)
02	full	Startup (enable play)
03	full	Sound off
04	full	Sound on
06	full	Enable bill acceptor
07	full	Disable bill acceptor
09	full	Enable/disable game n
0A	full	Enter maintenance mode
0B	full	Exit maintenance mode
0E	full	Enable/disable Real Time Event Reporting
0F	full	Send meters 10 through 15
10	full	Send total canceled credits meter
11	full	Send total coin in meter
12	full	Send total coin out meter
13	full	Send total drop meter
14	full	Send total jackpot meter
15	full	Send games played meter
16	full	Send games won meter
17	full	Send games lost meter
18	full	Send games since last power up and games since last slot door closure meters
19	full	Send meters 11 through 15
1A	full	Send current credit
1B	only canceled credits	Send handpay information
1C	full	Send meters: total coin in, total coin out, total drop, total jackpot, games played, games won, slot door open, power reset
1E	full	Send total bill meters (# of bills)
1F	full	Send gaming machine ID & information
21	full	ROM signature verification
2A	full	Send true coin in
2B	full	Send true coin out
2D	full	Send total hand paid canceled credits
2F	full	Send selected meter for game N
31	full	Send \$1.00 bills in meter
32	full	Send \$2.00 bills in meter
33	full	Send \$5.00 bills in meter
34	full	Send \$10.00 bills in meter
35	full	Send \$20.00 bills in meter
36	full	Send \$50.00 bills in meter
37	full	Send \$100.00 bills in meter
38	full	Send \$500.00 bills in meter
39	full	Send \$1,000.00 bills in meter
3A	full	Send \$200.00 bills in meter
3B	full	Send \$25.00 bills in meter

Number (hex)	Support level	Description
3C	full	Send \$2,000.00 bills in meter
3D	full	Send cashout ticket information
3E	full	Send \$2,500.00 bills in meter
3F	full	Send \$5,000.00 bills in meter
40	full	Send \$10,000.00 bills in meter
41	full	Send \$20,000.00 bills in meter
42	full	Send \$25,000.00 bills in meter
43	full	Send \$50,000.00 bills in meter
44	full	Send \$100,000.00 bills in meter
45	full	Send \$250.00 bills in meter
46	full	Send credit amount of all bills accepted
48	full	Send last accepted bill information
4D	only the last record	Send Enhanced Validation Information
50	full	Send validation meters
51	full	Send total games implemented
52	full	Send game n meters
53	full	Send game n configuration
54	full	Send SAS version ID and gaming machine serial number
55	full	Send selected game number
56	full	Send enabled game numbers
57	full	Send pending cashout information
58	full	Receive validation number
6F	full	Send extended meters for game n
70	full	Send ticket validation data
71	only cashable ticket	Redeem ticket
72	in-house + debit	AFT transfer funds
73	full	AFT register gaming machine
74	full	AFT game lock and status request
7B	full	Extended validation status
7C	full	Set extended ticket data
7D	full	Set ticket data
7E	full	Send current date and time
7F	full	Receive date and time
8A	full	Initiate a legacy bonus pay
90	full	Send legacy bonus win amount
94	full	Reset handpay
9A	full	Send legacy bonus meters
A0	full	Send enabled features
AF	full	Send extended meters for game n (alternate)
B3	full	Send token denomination
B5	full	Send extended game n information

Number (hex)	Support level	Description
B7	full	Set machine numbers

Appendix VII: Supported SAS meters

Number (hex)	Support level	Description
00	full	Total coin in credits
01	full	Total coin out credits
02	always 0	Total JP credits
03	full	Total hand paid canceled credits
04	full	Total canceled credits
05	full	Games played
06	full	Games won
07	full	Games lost
08	full	Total credits from coin acceptor
09	full	Total credits paid from hopper
0A	full	Total credits from coins to drop
0B	full	Total credits from bills accepted
0C	full	Current credits
0D	full	Total SAS cashable ticket in, including nonrestricted tickets (cents)
0E	full	Total SAS cashable ticket out, including debit tickets (cents)
11	full	Total SAS cashable ticket in, including nonrestricted tickets (quantity)
12	full	Total SAS cashable ticket out, including debit tickets (quantity)
15	full	Total ticket in (credits)
16	full	Total ticket out (credits)
17	full	Total electronic transfers to gaming machine
18	full	Total electronic transfers to host
1C	full	Total machine paid payable win, not including progressive or external bonus amounts (credits)
1E	full	Total machine paid external bonus win (credits)
21	full	Total attendant paid external bonus win (credits)
22	full	Total won credits (sum of total coin out and total jackpot)
23	full	Total hand paid credits
24	full	Total drop
25	full	Games since last power reset
26	full	Games since slot door closure
28	full	Total cashable ticket in, including nonrestricted promotional tickets (credits)
29	full	Total regular cashable ticket in (credits)
2E	full	Electronic regular cashable transfers to gaming machine, not including external bonus awards (credits)
32	full	Electronic regular cashable transfers to host (credits)
35	full	Total regular cashable ticket in (quantity)
38	full	Total regular cashable ticket out (quantity)
40	full	Total number of \$1.00 bills accepted
41	full	Total number of \$2.00 bills accepted
42	full	Total number of \$5.00 bills accepted
43	full	Total number of \$10.00 bills accepted
44	full	Total number of \$20.00 bills accepted
45	full	Total number of \$25.00 bills accepted
46	full	Total number of \$50.00 bills accepted
47	full	Total number of \$100.00 bills accepted
48	full	Total number of \$200.00 bills accepted
49	full	Total number of \$250.00 bills accepted
4A	full	Total number of \$500.00 bills accepted
4B	full	Total number of \$1000.00 bills accepted

Number (hex)	Support level	Description
4C	full	Total number of \$2000.00 bills accepted
4D	full	Total number of \$2500.00 bills accepted
4E	full	Total number of \$5000.00 bills accepted
4F	full	Total number of \$10000.00 bills accepted
50	full	Total number of \$20000.00 bills accepted
51	full	Total number of \$25000.00 bills accepted
52	full	Total number of \$50000.00 bills accepted
53	full	Total number of \$100000.00 bills accepted
54	full	Total number of \$200000.00 bills accepted
55	full	Total number of \$250000.00 bills accepted
56	full	Total number of \$500000.00 bills accepted
57	full	Total number of \$1000000.00 bills accepted
80	full	Regular ticket in (cents)
81	full	Regular ticket in (quantity)
86	full	Regular ticket out (cents)
87	full	Regular ticket out (quantity)
8A	full	Debit ticket out (cents)
8B	full	Debit ticket out (quantity)
A0	full	In-house cashable transfers to GM (cents)
A1	full	In-house transfers to GM that included cashable amounts (quantity)
A2	always 0	In-house restricted transfers to GM (cents)
A3	always 0	In-house transfers to GM that included restricted amounts (quantity)
A4	always 0	In-house nonrestricted transfers to GM (cents)
A5	always 0	In-house transfers to GM that included nonrestricted amounts (quantity)
A6	full	Debit transfers to gaming machine (cents)
A7	full	Debit transfers to gaming machine (quantity)
A8	always 0	In-house cashable transfers to ticket (cents)
A9	always 0	In-house transfers to ticket that included cashable amounts (quantity)
AA	always 0	In-house restricted transfers to ticket (cents)
AB	always 0	In-house transfers to ticket that included restricted amounts (quantity)
AC	always 0	Debit transfers to ticket (cents)
AD	always 0	Debit transfers to ticket (quantity)
AE	always 0	Bonus cashable transfers to GM (cents)
AF	always 0	Bonus transfers to GM that included cashable amounts (quantity)
B0	always 0	Bonus nonrestricted transfers to GM (cents)
B1	always 0	Bonus transfers to GM that included nonrestricted amounts (quantity)
B8	full	In-house cashable transfers to host (cents)
B9	full	In-house transfers to host that included cashable amounts (quantity)
BA	always 0	In-house restricted transfers to host (cents)
BB	always 0	In-house transfers to host that included restricted amounts (quantity)
BC	always 0	In-house nonrestricted transfers to host (cents)
BD	always 0	In-house transfers to host that included nonrestricted amounts (quantity)
FA	full	Regular cashable keyed-on funds
FB	always 0	Restricted promotional keyed-on funds
FC	always 0	Nonrestricted promotional keyed-on funds
FD	full	Regular cashable keyed-off funds
FE	always 0	Restricted promotional keyed-off funds
FF	always 0	Nonrestricted promotional keyed-off funds

History of changes

2011-05-13	Initial version
...	...
2015-09-16	Fixed possible lost of mechanical meter pulses. Fixed Payout button in single game operation mode. Fixed some rare errors
2016-06-23	Fixed very rare failure of Fruit Cocktail and Fruit Cocktail 2 Fixed demo Added disable of bill acceptor when handpay is pending Added keeping shown bonus winnings on power failure Removed support for currencies of Latvia and Lithuania (they are use Euro) Added support for SAS meters 2E and 32 (electronic regular cashable funds transfers)
2017-01-11	Fixed error in chest bonus of Pirate and Pirate 2 games