IGP 2 - Game Cocktail Board documentation

© 2011-2019 «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
- Installing the bill acceptors using the protocols Pulse (up to 8 channels), ID-003 (BDP) , EBDS and S.S.P. is supported[1].
- Installing coin slots using the protocol Pulse (up to 8 channels)
- Installing the hopper using the protocol Pulse
- Detector of the intrusion works without power supply.
- Support for ticket printers (currently printers FutureLogic GEN2 and Ithaca Epic 950 are supported)
- Support for credit charging via TITO (bill acceptor supporting Bar Code is required)
- Support for accounting denomination from 0.01 to 100.00
- Support for promo credits (cashable and non-cashable)
- 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 Γ in the technical description.

Contents

Features.....2
Contents.....3
Instructions for gaming machine operator.....4
Switching on and off of the machine.....4
Entering and canceling of the credit.....4
Accounting.....4
Instructions on service and setup of the machine.....5
Accounting.....6
Page 1.....6
Page 2.....7
Page 3.....8
Page 4.....9
Page 5.....10
Global Settings.....11
Main Parameters.....11
Equipment Settings.....12
Game selection.....13
SAS Settings.....13
Ticket settings.....13
Security.....14
Initialization of the machine (INIT).....15
Event Logs.....16
Set Clock.....16
Game statistic.....16
Game options.....16
Tests.....17
Game Selection.....18
Appendix I: problems solution.....19
Appendix II: events.....20
Appendix III: possible settings values.....21
Global settings.....21
Main Parameters.....21
Equipment.....22
SAS Settings.....23
Ticket Settings.....23
Security.....23
Game Options.....23
Appendix IV: diagrams of connectors.....24
Connector X1.....24
Connector X2.....24
Appendix V: supported SAS exceptions.....25
Appendix VI: Supported SAS commands.....27
Appendix VII: Supported SAS meters.....29
Appendix VIII: Connecting bill acceptors.....32
History of changes.....33

Instructions for gaming machine 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 added by a coin acceptor (only pulse protocol is supported), bill acceptor (protocols supported: ID-003 (BDP), S.S.P., EBDS and pulse), credit key, tickets and AFT.

A credit key has two work modes – direct (appointed in settings value is added to credit when key activated) or key-driven (the amount of credit entered while the key is activated depends on player button, pressed by the operator: **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 – value of a bill or a coin/token in credits.

The payout of credit is accomplished with the service button **KEY OUT** (only when player pressed **PAYOUT** button), 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.

Accounting

Using the **STATISTIC KEY** the operator can access the Periodic Accounting. It can even be reset if this is allowed in the Security settings.

Instructions on service and setup of the machine

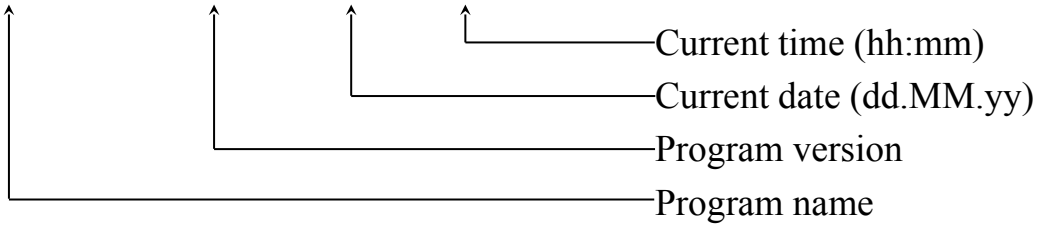
To enter the service mode a operation statistics key should be used. The offsetting over the menu is accomplished with buttons **HOLD1**[2] – up and **HOLD2** – down. The necessary entry is chosen with the button **START**, exit – with the button **CANCEL** (**BET**).

The Menu contains the following entries:

ACCOUNTING – long statistics;
GLOBAL 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);
MACHINE LOCKED – lock/unlock the machine (similar to the operation SAS Lock Out Play)

At the top of the screen is an information line with the name and version of the game, and the current date-time. Below is an example of decoding an information line:

GAMECOCKTAIL GCM-xxxxxx 19.09.16 12:00



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**.

If support of devices which require authorization prior to usage (e.g. bill acceptor using protocol S.S.P) is turned on and the device connected at the moment is not authorized, instead of the main menu there will be the requirement to confirm the device. The identifier of this device and the protocol used will be indicated. The operator is to choose one of two items: **CONFIRM** or **INHIBIT.** After this the main menu will be opened and the question will not be set anymore. In addition, the operator has the opportunity to get to the main menu without having to decide whether to allow or ban the device work - for this just click on the button **BET**. In this case the request will appear at the next entry into service mode.

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

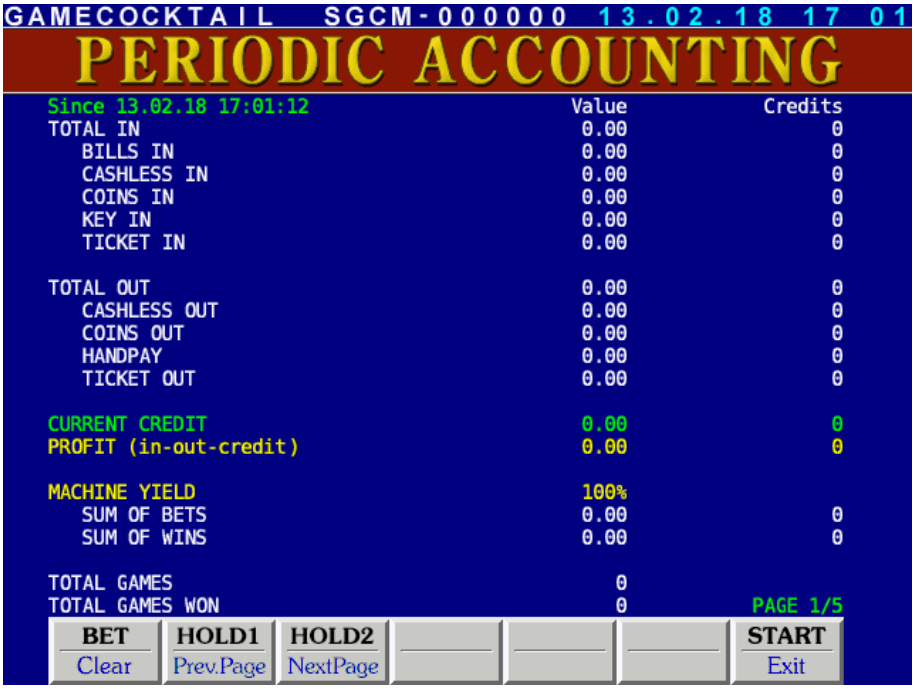
Accounting

The board supports two accounting - Master and Periodic. The Master one is maintained since the initialization of the gaming machine, and the periodic one can be reset at any time (for example: collection, new shift, once a month ...) if this is not prohibited in the security settings. There are no other differences.

The entrance to the accounting is carried out through the service menu, but in the periodic one you can directly access using the **ACCOUNTING KEY**.

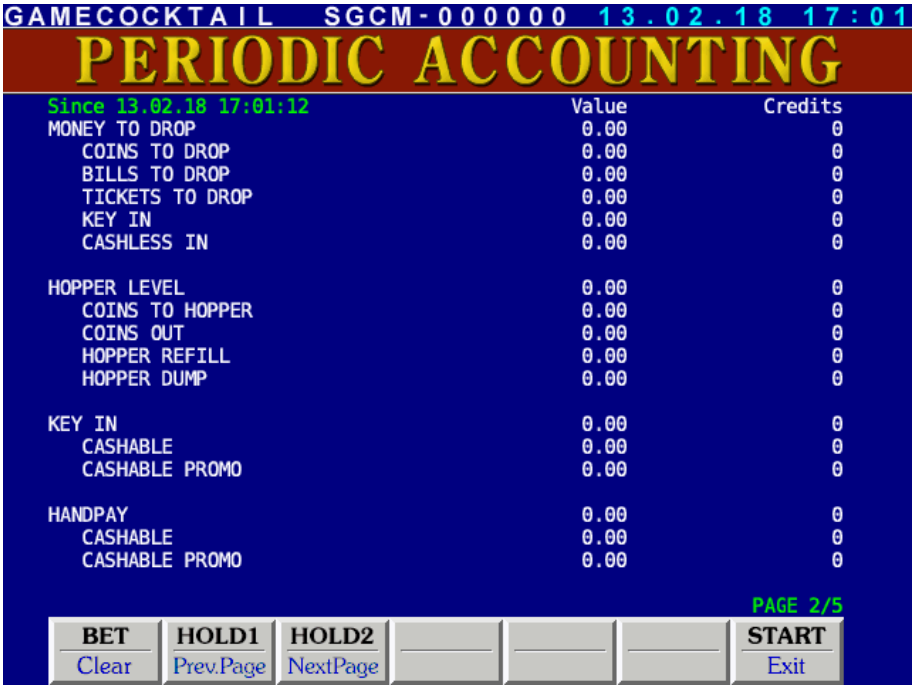
The accounting department consists of five pages, which are switched by means of the buttons **HOLD1** and **HOLD2**, and the output by the **START** button. The zeroing of periodical accounting is done with the **BET** button. All pages display the date-time of the last zeroing of the accounting department. All values are presented in two forms - in credits and in currency (if denomination and country/currency are set in the machine settings).

Page 1



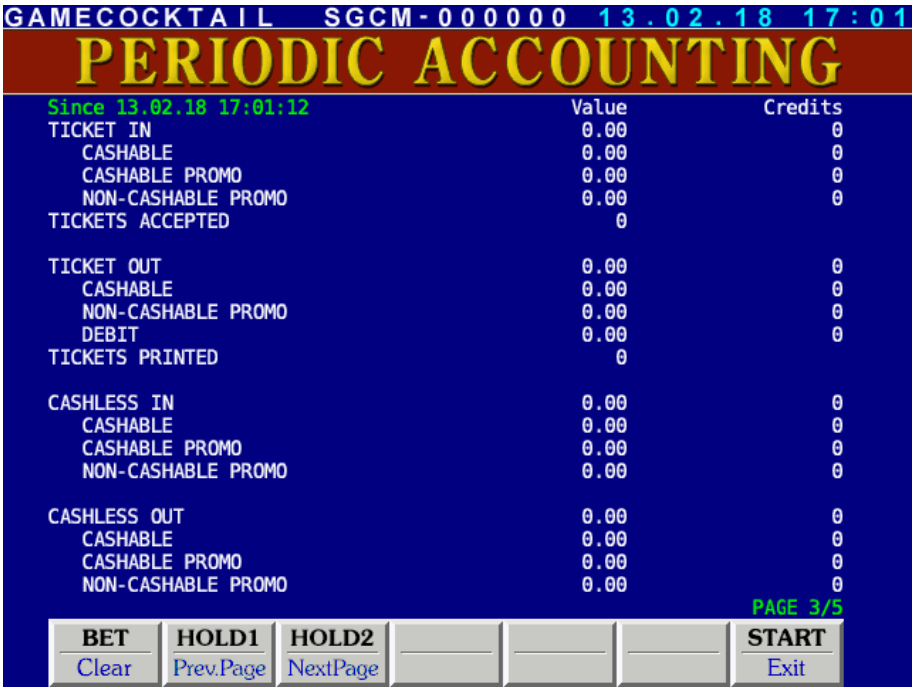
TOTAL IN	– total in credits;
BILLS IN	– credits in by bill acceptor;
CASHLESS IN	– credits in through SAS AFT (except bonuses);
COINS IN	– credits in by coins/tokens;
KEY IN	– credits in by operator (also known as “remote in”) using **CREDIT KEY**;
TICKET IN	– credits in by tickets/vouchers;
TOTAL OUT	– total out credits
CASHLESS OUT	– credits out through SAS AFT;
COINS OUT	– credits payed by coins/tokens;
HANDPAY	– credits canceled by operator using **CREDIT KEY** or **KEY OUT**;
TICKET OUT	– credits payed by tickets/vouchers;
CURRENT CREDIT	– current credit value;
PROFIT	– gaming machine profit (Total_In - Total_Out - Credit);
MACHINE YIELD	– current payout rate;
SUM OF BETS	– sum of all bets;
SUM OF WINS	– sum of all wins;
TOTAL GAMES	– total number of games (spins) played;
TOTAL GAMES WON	– total number of games with wins.

Page 2



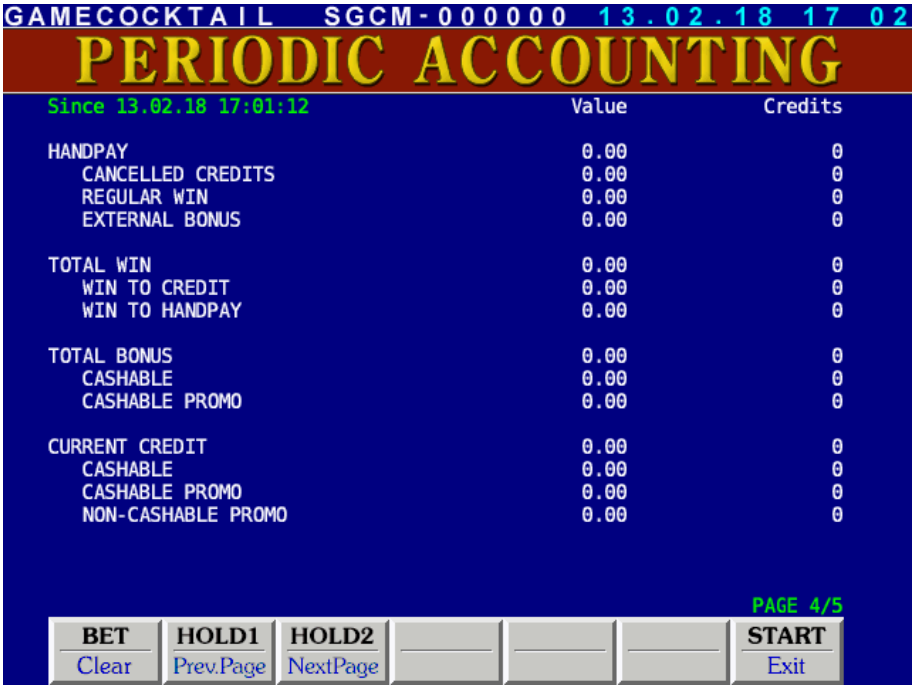
MONEY TO DROP	– total credits diverted to the drop box;
BILLS TO DROP	– banknotes (all banknotes);
CASHLESS IN	– electronic transfers via SAS AFT;
COINS TO DROP	– coins/tokens (all except which diverted to the hopper);
KEY IN	– credits in by operator using **CREDIT KEY**;
TICKETS TO DROP	– tickets/vouchers (all tickets);
HOPPER LEVEL	– current hopper level;
COINS TO HOPPER	– credits diverted to hopper from coin acceptor;
COINS OUT	– credits payed by hopper;
HOPPER REFILL	– credits added to hopper;
HOPPER DUMP	– credits dumped from hopper;
KEY IN	– credits in by operator using **CREDIT KEY**;
CASHABLE	– cashable credits;
CASHABLE PROMO	– cashable promo credits (always 0);
HANDPAY	– credits canceled by operator using **CREDIT KEY** or **KEY OUT**;
CASHABLE	– cashable credits;
CASHABLE PROMO	– cashable promo credits.

Page 3



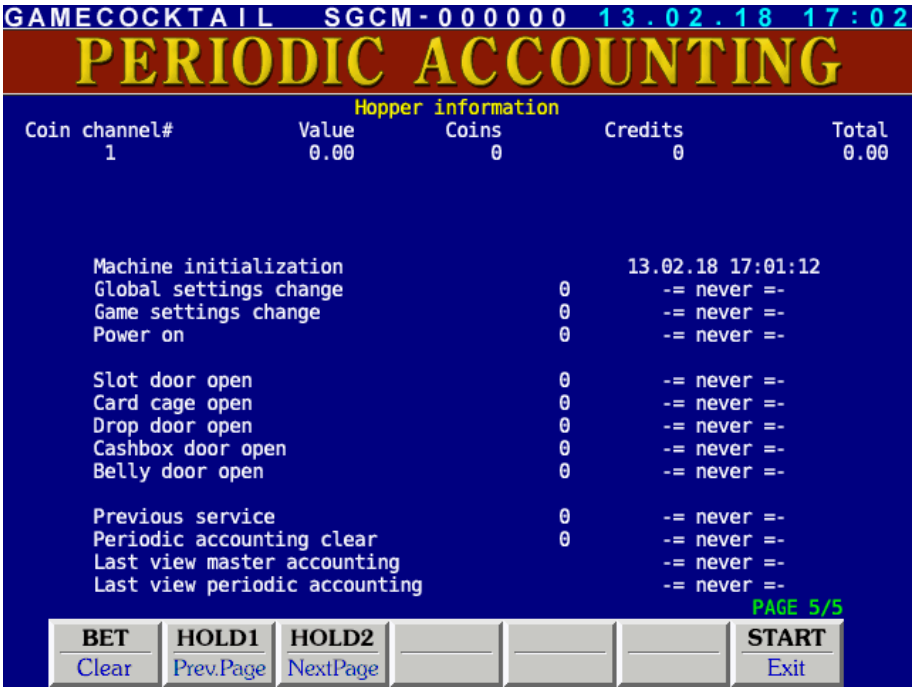
TICKET IN	– credits in by tickets/vouchers;
CASHABLE	– cashable credits;
CASHABLE PROMO	– cashable promo credits;
NON-CASHABLE PROMO	– non-cashable promo credits;
TICKETS ACCEPTED	– total number of tickets/vouchers accepted;
TICKET OUT	– credits out by tickets/vouchers;
CASHABLE	– cashable credits;
NON-CASHABLE PROMO	– non-cashable promo credits;
TICKETS PRINTED	– total number of tickets/vouchers printed;
CASHLESS IN	– total credit in through SAS AFT transfers;
CASHABLE	– cashable credits;
CASHABLE PROMO	– cashable promo credits;
NON-CASHABLE PROMO	– non-cashable promo credits;
CASHLESS OUT	– total credits out through SAS AFT transfers;
CASHABLE	– cashable credits;
CASHABLE PROMO	– cashable promo credits;
NON-CASHABLE PROMO	– non-cashable promo credits.

Page 4



HANDPAY	– total credits payed by operator using **CREDIT KEY** or **KEY OUT**;
CANCELLED CREDITS	– cancelled credits payed by operator;
REGULAR WIN	– regular win payed by operator (always 0);
EXTERNAL BONUS	– external bonus payed by operator;
TOTAL WIN	– total win generated by this gaming machine;
WIN TO CREDIT	– win added to credit;
WIN TO HANDPAY	– win payed by operator;
TOTAL BONUS	– total external bonus credits in;
CASHABLE	– cashable credits;
CASHABLE PROMO	– cashable promo credits;
CURRENT CREDIT	– total current credit;
CASHABLE	– cashable credits;
CASHABLE PROMO	– cashable promo credits;
NON-CASHABLE PROMO	– non-cashable promo credits.

Page 5



Contains table with hopper information:

Coin channel# – coin acceptor channel (if coins from this acceptor drops to hopper);
Value – currency cost of coin/token;
Coins – current quantity of coins/tokens in the hopper;
Credits – total cost of all coins/tokens in credits;
Total – total cost of all coins/tokens in currency.

And information about some critical events (quantity and date-time of most recent):

Machine initialization
Global settings change
Game settings change
Power on
Door #1 open
Door #2 open
Door #3 open
Door #4 open
Previous service
Periodic accounting clear
Last view master accounting
Last view periodic accounting

Global Settings

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;
EQUIPMENT – options for coin- and bill acceptor and other equipment;
GAME SELECTION – selection of games, available to the player;
SAS SETTINGS – SAS parameter settings;
TICKET SETTINGS – ticket parameter 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.

MACHINE NUMBER – machine number printed on all tickets;
ASSET NUMBER – property number of the machine used in AFT;
COUNTRY/CURRENCY – current country (currency), if it is set, it is displayed on the screen of game selection;
DENOMINATION* – denomination of the machine (for transference of monetary items into credits and back), **it is possible to change only after initialization and before credit entering**;
SHOW DENOMINATION – enables or disables machine denomination showing on game selection screen;
LIMITS – settings related to some limits;
KEY IN AND HANDPAY – settings related to handpay and credit key;
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.

Limits

CREDIT LIMIT – maximum amount of credit, if it is exceeded, the corresponding announcement will be displayed on the screen and the machine will not let play until the credit is loaded. It is used for limiting maximum winning prize, paid out to a player according to the game arcade rules.
WIN LIMIT – maximum amount of win, which can be doubled in the risk game;
EVENT LIST BARRIER – game events with credit parameters which are less than ones specified by this setting are not fixated in the journal. **Do not set the amount of this setting very low – this can lead to fouling of journal with excess information.**
MAX TOTAL BET – maximum bet. Limits the diapason of changing of other parameters, which assign possible amounts of bets. **Changing of this parameter can lead to modification of other parameters**;
CREDIT IN LIMIT – the maximum amount of the credit, at the time of which all sources of credit replenishment are blocked (if disabled then **CREDIT LIMIT** settings is used);
EVEN HANDPAY – the multiplicity of handpaid credit (if 20 is set, after hand payout of 153 credit, 13 left and the statistics will indicate payout of 140 credits);
HANDPAY LIMIT – limit of credit cancel by handpay operation.

Key in and handpay settings

CREDIT KEY FUNCTION – credit key takes several numerical and two special values. Credit key can operate in two modes: direct and button. By default the button mode is set ("**BUTTONS**"), but it can be changed to any other;
KEYOUT BEYOND HANDPAY – enabling/disabling the **KEYOUT** key out of handpay mode (entered by player's **PAYOUT** button).
EVEN HANDPAY – the multiplicity of handpaid credit (if 20 is set, after hand payout of 153 credit, 13 left and the statistics will indicate payout of 140 credits);
HANDPAY LIMIT – limit of credit cancel by handpay operation;
PERMIT HANDPAY CANCEL – permits player to cancel handpay mode by pressing **PAYOUT** button.

*Hereinafter parameters highlighted by *italic font* requires initialization for changing.

Equipment Settings

In this section the equipment the board works with can be set. Each type of equipment is set in its own section:

BILL ACCEPTOR – bill acceptor settings;
COIN ACCEPTOR – coin acceptor settings;
TICKET PRINTER – ticket printer settings;
HOPPER – hopper settings;
MECHANICAL COUNTERS – mechanical counter settings.

Bill Acceptor Settings

This section is intended for bill acceptor settings. To do this it is necessary to choose work protocol and port (at pulse connection port does not matter). Then it is possible to specify the denomination and stacker number for each channel.

PROTOCOL – used protocol;
SERIAL PORT – used serial port;
TOKENIZATION – denomination of channels (all values are in credits; if the advanced parameter auto-denomination is turned on, the original denomination of bill acceptor has priority);
STACKER SETTINGS – setting of used stacker for each channel (only ID-003);
ADVANCED SETTINGS – advanced settings depending on selected protocol.

Coin Acceptor Settings

This section is intended for coin acceptor settings. To do this it is necessary to choose work protocol. Then it is possible to specify the denomination for each channel.

PROTOCOL – used protocol (only pulse protocol is available);
TOKENIZATION – denomination of channels (**set in credits**, but not in currency!);
ADVANCED SETTINGS – advanced settings depending on selected protocol

Ticket Printer Settings

To activate the device it is necessary to select protocol and a serial port that is connected to the printer.

PROTOCOL – used protocol;
SERIAL PORT – used serial port;
PRINT TEST TICKET – printing the ticket of chosen type for checking the printer.

Hopper Settings

PROTOCOL – used protocol (only pulse protocol is available);
COIN CHANNEL – coin acceptor channel number, whose coins get to the hopper (it is possible to set some unconnected coin channel if no coins diverted to hopper);
CAPACITY – maximum amount of coins which the hopper can pay out without replenishment;
COIN OUT PULSE EDGE – pulse front according to that coin output from the hopper must be accounted;
HOPPER REFILL – this function must be selected at direct inserting coins in the hopper (for adequate account of available coins number);
HOPPER DUMP – this function must be selected at direct dumping from the hopper (for adequate account of available coins number);
HOPPER UNLOAD – automatic unloading of all coins from the hopper (the hopper turns on and works until it unloads all or the operation is not stopped by the operator).

In addition in this section the number of coins that are in the hopper (computed value) is displayed for convenience. If coins are inserted or dumped directly, the actual number of coins may be different. To do this it is necessary to use the functions Refill or Dump.

Mechanical Counters Settings

COUNTERS RATE – settings for two mechanical counters of entered credits (credit key and general one) and two taken credits (key and general one);
BET COUNTER RATE – settings for the counter of lost bets.

Parameters set the price of counter item in credits. I.e., if **BET COUNTER RATE** is set equal to 50, the corresponding counter rate increases by an item only after the sum of stored bets increase not less than by 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.

SAS Settings

This section of parameters is intended for SAS settings (IGT Slot Accounting System). Some items may not be available depending on the board configuration.

MACHINE ADDRESS – SAS channel address (at setting different address from 0 for the second channel, port COM4 is not available for connected devices);

ADVANCED FUNDS TRANSFER – turn on/off SAS AFT support;

HANDPAY REPORTING TYPE – type of handpay reporting (old or with turn);

BONUSING – type of supported external bonus;

ADD BONUS TO TOTAL WIN – turn on/off adding external bonus to Total Won number in the statistics;

DISABLE LOCK OUT PLAY – turn on/off accepting SAS lock out play and enable play commands;

START AFT REGISTRATION – start AFT registration (if while registration the operator's confirmation is needed, the item will be called **CONFIRM AFT REGISTRATION** — confirm AFT registration. After successful completing registration, the item changes its name to **CANCEL AFT REGISTRATION** – cancel AFT registration).

Ticket settings

This section is intended for setting parameters necessary for work with tickets.

VALIDATION MODE – mode of creating ticket validation code (necessary for ticket printing);

REDEEM TICKETS – permission/ban of ticket reception;

EXPIRATION (DAYS) – the number of days that the ticket is valid;

ESTABLISHMENT – the name of establishment that hands out tickets (e.g. casino name);

ADDRESS #1 – local address (building, street);

ADDRESS #2 – general address (city, district, postcode);

MAJOR CURRENCY UNIT – the full name of base currency in singular(e.g. "EURO", "DOLLAR");

MINOR CURRENCY UNIT – the full name of currency for change in singular (e.g. "CENT");

VALUE PREFIX – text preceding sum of money (e.g. "$");

VALUE SUFFIX – text following sum of money (e.g. "USD");

ADVANCED SETTINGS – this sub-menu includes the following additional settings:

DATE FORMAT – date format (some printer firmware can change date format);

DATE FIELDS SEPARATOR – date fields separator;

THOUSAND SEPARATOR – thousand separator;

DECIMAL MARK – separator of integer and decimal;

MAJOR CURRENCY UNIT (PLURAL) – the name of base currency in plural (e.g. "DOLLARS");

MINOR CURRENCY UNIT (PLURAL) – the name of currency for change in plural (e.g. "CENTS");

TITLE FOR CASHOUT RECEIPT – title for cashout receipt (a ticket not accepted by the bill acceptor);

TITLE FOR RESTRICTED TICKET – title for restricted ticket (means which cannot be cased from);

TITLE FOR DEBIT TICKET – title for debit ticket;

MACHINE# TEXT – text of the ticket "MACHINE# ";

TICKET# TEXT – text of the ticket "TICKET# ";

VALIDATION TEXT – text of the ticket "Validation";

EXPIRATION TEXT – text of the ticket "Ticket Void after";

NEVER EXPIRATION TEXT – text of the ticket "Ticket never expire";

DAYS TEXT – plural form of the word "day" (used to specify the expiration date);

DAY TEXT – singular form of the word "day" (used to specify the expiration date).

Security

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

CLEAR PERIODIC ACCOUNTING – permission to clear periodic accounting;
INITIALIZE – type of access to the initialization;
SET TIME – type of access to the time set;
CHANGE MAIN PARAMETERS – type of the access to the general settings screen;
ENABLE/DISABLE GAMES – type of access to selection screen of games available to players;
CHANGE GAME OPTIONS – type of access to the game setting screen;
CHANGE EQUIPMENT SETTINGS – type of access to the equipment setting screen;
CHANGE SAS SETTINGS – type of access to the SAS setting screen;
CHANGE TICKET SETTINGS – type of access to the ticket setting screen;
HOST CAN CHANGE ASSET NUMBER – the computer is permitted to change asset number or house-id (used by AFT);
HOST CAN CHANGE FLOOR LOCATION – the computer is permitted to change machine location;
RESET ERRORS BY CREDIT KEY – permission to reset error condition by the means of the credit key;
PASSWORD – setting of the password that will be asked while trying to access a protected page. Password reset is accomplished by entering an empty password;.
BOOTUP PASSWORD – setting of the password that will be asked before enabling screen on startup;
DOOR SETTINGS – setting menu of door security.

If there is a serious failure and initialization is required to fix it, the access will be free. After an initialization of the board there is no any passwords.

To restrict the access to any of the entries it is necessary to set the type of access to it "**PASSWORD**" and to enter the password, different from an empty.

Password is not more than eight digits (from 1 to 5), entered by **HOLD1**, **HOLD2**, … **HOLD5** buttons.

Door Security Settings

xxxxx DOOR LATENCY – latency to the opening/closure of the corresponding door;
RESUME ON CLOSE xxxxx DOOR – if it is on, after closing the corresponding door the machine starts the play mode, otherwise the operator is to start the play mode.

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 then 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);
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 the log;
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 described in **Appendix II: events**.

Door events have the following structure:

<date> <time> - <event title>

Ticket in/out events have the following structure:

<ticket#> <validation code> <date> <time> <type> <credits> <currency>

Each tickets may be one of following type: C – regular cashable, c – cashable promotional, P – non-cashable promotional.

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.

TOTAL BET – sum of all bets;
TOTAL WON – 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;
TOTAL WON – 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;

APPLY CHANGES – apply changes to all games (without it settings of games are not changed) – present in **COMMON SETTINGS** only.

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.

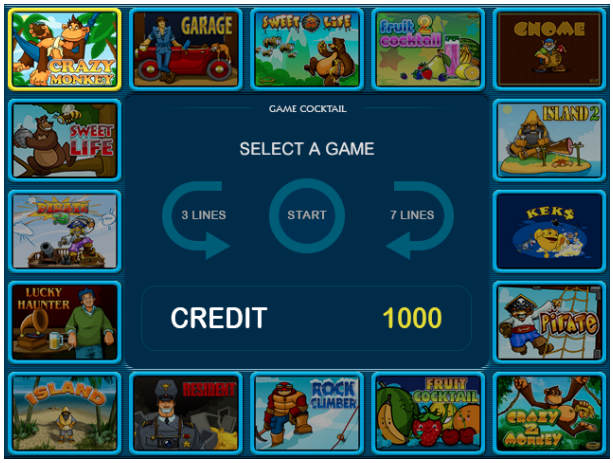
Unload of the hopper is accomplished with the simultaneous display of the coins thrown out. With the help of this function efficiency and accuracy of the adjustment of this devise can be checked, and besides, the quantity of coins can be counted.

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.

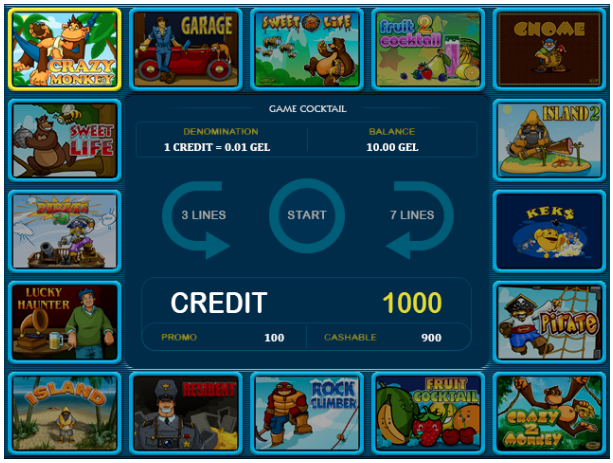
Initialization does not clear this list. To clear it, it is necessary, while the list is on the screen, to press the button **BET** and then hold it for five seconds.

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 Selection



If more than one game is switched on in the settings, the player can choose. There is a screen with 16 game icons. With the buttons **3LINES** and **7LINES**, the player can sequentially go over them clockwise and counterclockwise. When a game is selected it is necessary to press **START**, to launch the game.



If denomination of gaming machine is differs from 1:1, currency is not default or denomination showing is forced then user can see current denomination and balance in units of machine currency.

In the event that the player has promo credits on the balance sheet, a separate area appears in which he displays how much promo and regular (cashable) credits he has.

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: «PERIODIC ACCOUNTING ERROR», «MASTER ACCOUNTING ERROR», «GLOBAL 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 blue screen.

A: Probably, one or several game buttons are out of order or got "sticked". It is necessary to press "statistic" key. 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 <u>constantly</u> 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> were opened;
CLOSED DOOR #<n>	– the door <n> were closed;
SETTINGS CHANGED	– the settings were changed;
PERIODIC ACCOUNTING CLEARED	– periodic accounting were cleared;
LONG STATISTIC CLEARED	– master accounting were cleared;
EVENT LIST CLEARED	– emergency clearance of the event list;
HOPPER UNLOAD	– hopper were unloaded;
START GAME <gm>	– the game <gm> were launched;
SAS SETTINGS CHANGED	– SAS settings were changed;
SERVICE MENU ENTERED	– service menu were entered;
SERVICE MENU EXITED	– service menu were exited;
PERIODIC ACCOUNTING ENTERED	– short statistics were entered;
PERIODIC ACCOUNTING EXITED	– short statistics were exited;
SAS SETTINGS CHANGED	– SAS settings were changed;
FIRMWARE VERSION CHANGED	– firmware version were changed;
EXT. BONUS WIN	– an external bonus on the indicated amount has come;
EXT. BONUS WIN / 100 =	– a big external bonus has come, the indicated amount is less than the real one by 100 times;
MACHINE LOCKED	– machine was locked via service menu;
MACHINE LOCKED BY SAS	– machine was locked remotely via SAS.

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 canceled with the credit key;
TICKET IN	– credit entered with the ticket;
TICKET OUT	– credit canceled with the ticket;
AFT IN	– credit entered with SAS AFT;
AFT OUT	– the whole credit or its half is canceled with SAS AFT;
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) complies 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
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
CREDIT LIMIT	1000, 5000, 10000, **20000**, 50000, 100000, 200000, 500000, 900000
WIN LIMIT	100, 200, 500, 1000, 2000, 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
CREDIT IN LIMIT	**DISABLED**, 100, 200, ..., 1000, 1500, ..., 5000, 6000, ..., 10000, 20000, 50000, 100000, 200000, 500000
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

Key in and handpay settings

Name	List of possible values
CREDIT KEY FUNCTION	10, 20, 50, 100, 200, 500, 1000, **BUTTONS**, OUT ONLY
KEYOUT BEYOND HANDPAY	YES, **NO**
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., EBDS
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
ACCEPT ALL NOTES[5]	**ON**, OFF
HIGH SECURITY[5]	ON, **OFF**
ORIENTATION[5]	ONE WAY, TWO WAY, **FOUR WAY**

Coin acceptor

Name	List of possible values
PROTOCOL	**DISABLED**, PULSE
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, 1000
BET COUNTER RATE	**1**, 10, 100, 1000

[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.
[5] Only for the protocol EBDS

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, **AFT**, AFT&LEGACY
ADD BONUS TO TOTAL WIN	**YES**, NO
DISABLE LOCK OUT PLAY	YES, **NO**

Ticket Settings

Name	List of possible values
VALIDATION MODE	**DISABLED**, SEC.ENHANCED, 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 PERIODIC ACCOUNTING	**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
STATISTIC KEY	IN	20	IN	SERVICE KEY
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
08	full	Configure bill denominations
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
3C	full	Send $2,000.00 bills in meter

Number (hex)	Support level	Description
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
4C	full	Set Secure Enhanced Validation ID
4D	full	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	full	Redeem ticket
72	in-house in/out + bonus	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
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)
0F	full	Total SAS restricted ticket in (cents)
11	full	Total SAS cashable ticket in, including nonrestricted tickets (quantity)
12	full	Total SAS cashable ticket out, including debit tickets (quantity)
13	full	Total SAS restricted ticket in (quantity)
14	full	Total SAS restricted ticket out (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
19	full	Total restricted amount played (credits)
1A	full	Total nonrestricted amount played (credits)
1B	full	Current restricted credits
1C	full	Total machine paid paytable 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 non-restricted promotional tickets (credits)
29	full	Total regular cashable ticket in (credits)
2A	full	Total restricted promotional ticket in (credits)
2B	full	Total nonrestricted promotional ticket in (credits)
2C	full	Total cashable ticket out, including debit tickets (credits)
2D	full	Total restricted promotional ticket out (credits)
2E	full	Electronic regular cashable transfers to gaming machine, not including external bonus awards (credits)
2F	full	Electronic restricted promotional transfers to gaming machine, not including external bonus awards (credits)
30	full	Electronic non-restricted promotional transfers to gaming machine, not including external bonus awards (credits)
31	full	Electronic debit transfers to gaming machine (credits)
32	full	Electronic regular cashable transfers to host (credits)
33	full	Electronic restricted promotional transfers to host (credits)
34	full	Electronic nonrestricted promotional transfers to host (credits)
35	full	Total regular cashable ticket in (quantity)

Number (hex)	Support level	Description
36	full	Total restricted promotional ticket in (quantity)
37	full	Total nonrestricted promotional ticket in (quantity)
38	full	Total regular cashable ticket out (quantity)
39	full	Total restricted promotional 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
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)
82	full	Restricted ticket in (cents)
83	full	Restricted ticket in (quantity)
84	full	Non-restricted ticket in (cents)
85	full	Non-restricted ticket in (quantity)
86	full	Regular ticket out (cents)
87	full	Regular ticket out (quantity)
88	full	Restricted ticket out (cents)
89	full	Restricted 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	full	In-house restricted transfers to GM (cents)
A3	full	In-house transfers to GM that included restricted amounts (quantity)
A4	full	In-house non-restricted transfers to GM (cents)
A5	full	In-house transfers to GM that included non-restricted amounts (quantity)
A6	full	Debit transfers to gaming machine (cents)
A7	full	Debit transfers to gaming machine (quantity)
A8	full	In-house cashable transfers to ticket (cents)
A9	full	In-house transfers to ticket that included cashable amounts (quantity)

Number (hex)	Support level	Description
AA	full	In-house restricted transfers to ticket (cents)
AB	full	In-house transfers to ticket that included restricted amounts (quantity)
AC	full	Debit transfers to ticket (cents)
AD	full	Debit transfers to ticket (quantity)
AE	full	Bonus cashable transfers to GM (cents)
AF	full	Bonus transfers to GM that included cashable amounts (quantity)
B0	full	Bonus non-restricted transfers to GM (cents)
B1	full	Bonus transfers to GM that included non-restricted amounts (quantity)
B8	full	In-house cashable transfers to host (cents)
B9	full	In-house transfers to host that included cashable amounts (quantity)
BA	full	In-house restricted transfers to host (cents)
BB	full	In-house transfers to host that included restricted amounts (quantity)
BC	full	In-house non-restricted transfers to host (cents)
BD	full	In-house transfers to host that included non-restricted amounts (quantity)
FA	full	Regular cashable keyed-on funds
FB	full	Restricted promotional keyed-on funds
FC	full	Non-restricted promotional keyed-on funds
FD	full	Regular cashable keyed-off funds
FE	full	Restricted promotional keyed-off funds
FF	full	Non-restricted promotional keyed-off funds

Appendix VIII: Connecting bill acceptors

Model	Protocol Port	Connection
CashCode with RS-232 interface and CC-FLBDP protocol support	`ID-003` `COM1,COM2`	To any RS232-x socket of COM-EXPANDER
CashCode with “opto-isolated” interface and CC-FLBDP protocol support For example: FLP-1710	`ID-003` `TTL`	Uses TTL mode, connect via TTL-RS232 adapter
Innovative Technologies NV9, NV10, NV200	`S.S.P.` `TTL`	Uses TTL mode, connect via TTL-RS232 adapter
MEI Cashflow	`EBDS` `COM1,COM2`	To any RS232-x socket

There are more Bill Acceptors supported but we have tested only these ones.

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
2017-05-22	Added support for SAS Configure Bill Denominations long poll Added support for SAS AFT Bonus Coin Out and Bonus Jackpot transfers Added divisor 1:1000 for mechanical counters Fixed spelling errors in the help of some games Fixed the maximum bet value in responses to SAS requests 53 and B5
2017-06-13	Fixed errors in Fruit Cocktail and Fruit Cocktail 2 bonuses Fixed Call Attendant button behavior
2018-03-05	Fixed SAS AFT partial transfers to and from host huge amounts Added support for EBDS bill acceptor protocol (MEI Cashflow) Added support for loading bill denominations from S.S.P. bill acceptors Added support for promotional credits Refactored long/short statistics and renamed to master/periodic accounting Slightly changed main settings menu (some settings are moved to limits submenu) Fixed small errors
2018-04-05	Fixed processing of SAS long polls 0x0F and 0x19
2018-09-18	Added possibility to use KEYOUT key beyond handpay mode Added possibility to disable machine locking by SAS Messages about locking and unlocking the machine are added to the event log Fixed work of a hopper with coins with a price of 10 or more credits
2019-02-20	Added support for currencies CLP, GHS and PYG Fixed occasional machine locking after sending legacy bonus award long poll by some SAS-hosts
2019-03-28	Added support for Security Enhanced ticket validation mode