New South Wales

Jackpot Technical Standard

Revision 1.3

10 May 2013

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1 NSW Jackpot Technical Standard

1.1 General

Introduction

1.1.1 This New South Wales (NSW) Technical Standard lists the technical requirements for:

a) Integrated Standalone Progressive Gaming Machines;

b) Linked Progressive Jackpot Systems; and

c) Standard Linked Progressive Gaming Machines.

Integrated Standalone Progressive Gaming Machines are gaming machines with the integrated progressive jackpot function. Standard Linked Progressive Gaming Machines are gaming machines supporting the standard linked progressive jackpot function. Most of their requirements have already been defined in the technical standards for approved gaming machines:

i) Gaming Machine National Standard;

ii) NSW Appendix to the National Standard; and

iii) NSW Gaming Machine Communications Protocol Technical Standard.

For that reason, of all the requirements for the Integrated Standalone Progressive or Standard Linked Progressive Gaming Machines, only those that have not been listed in other standards are defined in this document.

1.1.2 Refer to the NSW Jackpot Technical Standard Version 1.3 “Redline” document for details of significant changes between this document and the NSW Jackpot Technical Standard Version 1.2.

Legislation

1.1.3 The requirements specified in this document are supplementary to and do not take the place of any of the requirements of the *Gaming Machines Act* 2001 (referred to as “the Act”).

Supporting Regulations

1.1.4 The requirements specified in this document are supplementary to and do not take the place of any of the requirements of the *Gaming Machines Regulation* (referred to as “the Regulations”).

NSW Technical Standards

1.1.5 The following technical standards are in use in NSW (see the department’s website for the latest revisions):

a) NSW Appendix to the National Standard;

b) NSW Gaming Machine Communications Protocol;

c) NSW Jackpot Technical Standard; and

d) Ticket In – Ticket Out (TITO) technical standard.

Purpose

1.1.6 This document contains the technical requirements against which progressive gaming machines and progressive systems will be evaluated prior to being submitted for approval for operation in Clubs and Hotels in NSW.

Communication Requirements

1.1.7 Chapter 3 of this document defines the requirements for communication between linked progressive jackpot systems, the Centralised Monitoring System (CMS) and subsidiary equipment.

1.1.8 NSW Gaming Machine Communications Protocol Technical Standard defines the requirements for the communication between gaming machines (including integrated standalone progressive gaming machines), the CMS and subsidiary equipment.

1.1.9 CMS Compliance Test (CCT) Plans, which detail the minimum requirements for verifying the ability of a gaming machine and an LPJS controller to communicate adequately with the CMS, are available to be utilised by gaming equipment developers prior to the equipment being submitted for approval.

The Independent Liquor and Gaming Authority

1.1.10 The Authority has the responsibility of approving gaming equipment and technical standards for gaming equipment to be used in the Casino, Clubs and Hotels in NSW. State Wide Link jackpot equipment is approved by the Minister.

The Office of Liquor, Gaming and Racing

1.1.11 The Office of Liquor, Gaming and Racing (OLGR) has the responsibility of administering the Authority's approval process in NSW. Contact the OLGR's Gaming Technology Unit for information regarding technical standards, and submissions for approval of gaming equipment.

1.1.12 Matters arising from the testing of gaming equipment which have not been addressed in this document (e.g. due to omissions or new technology) will be resolved by the Authority or its delegates as part of the approval process.

1.1.13 Gaming equipment, which is outside the scope of this standard, may be submitted for evaluation and approval. However approval is at the discretion of the Authority which will assess each application on its own merits. Note that the Gaming Technology Unit should be advised prior to the lodgement of the application, and that a 'field trial' approval from the Authority can be sought.

Dispensations

1.1.14 In cases where new gaming equipment does not meet the technical standards due to new or advanced technology, there may be reason to seek a dispensation. The manufacturer is advised to seek approval for any dispensation early in the development cycle.

2 Specifications For Progressive Gaming Machines and Progressive Systems

2.1 Introduction

General Principles

2.1.1

1. **Integrated Standalone Progressive Gaming Machine (iSAP-GM)**

   An iSAP-GM is an approved gaming machine (AGM) which is integrated with the standalone progressive jackpot function and contributes a percentage of its turnover to the standalone progressive jackpot pool or pools.

   There are two fundamentally different types of iSAP-GM:

   a) A **STANDARD** iSAP-GM, in which the AGM generates a specific jackpot winning combination, as indicated by the prize table on that machine.

   b) A **MYSTERY** iSAP-GM, in which the win occurs when the AGM turnover contribution to the jackpot causes the progressive jackpot amount to coincide with a randomly generated value within the programmed minimum and maximum jackpot values.

   The probability of winning an iSAP jackpot level must be directly and linearly proportional to the amount bet.

   In the event of iSAP-GM failure, decommissioning or “false jackpot”, the prize disbursement must take place using approved methods.

   After a gaming machine RAM reset and if the configured progressive parameters before and after the RAM reset are identical, the last known valid progressive jackpot amount can be entered for the corresponding current and hidden jackpot pools using the set-up facility.

2. **Linked Progressive Jackpot System (LPJS)**

   An LPJS consists of two or more AGMs which are linked electronically to an LPJS controller unit with all connected AGMs contributing a percentage of their turnover to the LPJS jackpot pool or pools.

   There are two fundamentally different types of LPJS:

   a) A **STANDARD** LPJS, in which the jackpot winning AGM generates a specific jackpot winning combination, as indicated by the prize table on that machine, and informs the LPJS controller that it has done so. Each AGM must be of the same base credit value.

   b) A **MYSTERY** LPJS, in which the jackpot winning AGM is the machine whose turnover contribution to the jackpot causes the progressive jackpot amount to coincide with a controller generated random value within the programmed minimum and maximum jackpot values.

   For the same amount wagered, the probability of winning each corresponding LPJS jackpot level must be the same for each connected AGM.

The probability of winning an LPJS jackpot level must be directly and linearly proportional to the amount bet.

Each AGM must contribute the same percentage of its turnover to each corresponding LPJS jackpot level.

If a jackpot is not yet reset after it has been won, the link controller must continue to accumulate the turnover contributions from the connected AGMs for the subsequent jackpots and no subsequent jackpots are to be impeded.

In the event of a link failure, link decommissioning or “false jackpot”, the prize disbursement must take place using approved methods.

After a link controller RAM reset and if the configured progressive parameters before and after the RAM reset are identical, the last known valid progressive jackpot amount can be entered for the corresponding current and hidden jackpot pools using the set-up facility. The configured progressive parameters include the per-level Set Increment Percentage, Reset Value, Jackpot Limit, Progressive Hit Probability and Base Credit Value. (Note that the Progressive Hit Probability and Base Credit Value only apply to standard link controllers.)

All gaming equipment connected to the LPJS controller must themselves be approved. The configuration of any LPJS must also be approved (i.e. the overall system and AGMs connected).

The Authority may consider other progressive systems or variations of existing systems.

Gamble must not be available for any jackpot prizes (including iSAP jackpot prizes).

Each iSAP-GM and each AGM connected to the link must have a sign clearly indicating that in the event of the progressive equipment failure, play must be discontinued and that any progressive prizes won after the “Progressive equipment Failure” may not be paid.

Prohibited Features

2.1.2 The prohibited features are:

(i) Any feature or combination of features which may be utilised to avoid the payment of any or all duties due is prohibited.

(ii) Any feature or combination of features which can be used to deliberately mislead or deceive any person is prohibited.

(iii) Any features which are deliberately designed to misrepresent the possible outcome(s) of a game are not permitted. As an example, deliberate presentation of game results in a manner that suggests to a player that “they just missed out on a prize” are not permitted.

(iv) Any feature or combination of features which is likely to impede or restrict the maintenance or installation of the approved gaming equipment by any licensed technician is prohibited.

(v) No function which will permit an illegality if activated will be permitted. Approved gaming equipment software must not allow illegal game/system parameters (e.g. bet limits or prizes which exceed permitted maximums), features or combinations to be selected at the time of installation unless the Authority is provided with sufficient reason and grants specific approval.

(vi) Any facility built into an AGM connected to the link or an iSAP-GM that would permit direct or indirect linking of the equipment for the purpose of transferring funds

electronically from a bank or other similar institution into or out of the machine is prohibited.

Number of Progressive Systems Permitted

2.1.3 A maximum of two LPJSs may be connected to the ports provided on an AGM or an iSAP-GM.

Maximum Prize Limit

2.1.4 Maximum LPJS Prize Limit

The sum of all linked jackpot prizes that can be won from 'one play' of a gaming machine connected to an LPJS must not exceed $100,000.

However for standard LPJS jackpots that are awarded in 'free games', the $100,000 maximum in-venue jackpot limit may be exceeded in exceptional circumstances as long as the probability for exceeding this limit is less than 0.5 occurrences in 5 years, using the following:

The parameters used to calculate the probability are: 10 gaming machines on a link for 5 years at 2,700 games played per day (each machine) and at maximum bet.

2.1.4a Maximum Standalone Progressive Prize Limit

(a) If a free or bought game triggers a standalone progressive jackpot win and the triggered jackpot win is paid in the same game element that triggered it, the sum of the standalone progressive jackpot wins can be up to $10,000 (and these are progressive – not bonus, consolation, fixed jackpot or other non-progressive prizes). Non-progressive wins in the trigger game element can be up to $10,000.

(b) If the standalone progressive jackpot win is paid in a second screen feature game element, the sum of the standalone progressive jackpot wins, bonus, consolation, fixed jackpot and other non-progressive prizes in the same second screen feature game element can total up to $10,000. Non-progressive wins in the free or bought game that triggered the second screen feature can be up to $10,000.

It is not permitted where both the above results are from a progressive trigger.

Progressive Contribution

2.1.5 An AGM connected to a link or an iSAP-GM must contribute to the corresponding jackpot pool(s) on every credit that is wagered and causes the gaming machine turnover meter to be incremented. The contribution must be directly proportional to the number of credits wagered.

For example, an AGM connected to a link will contribute to all the LPJS jackpot pools. An iSAP-GM will contribute to all the standalone progressive jackpot pools. And an iSAP-GM connected to a link will contribute to all the standalone progressive jackpot pools and all the LPJS jackpot pools.

Random Number Generation

2.1.6 The requirements in this section apply to mystery link controllers only.

(For iSAP-GMs, the existing random number generation mechanism of the AGM is used for the progressive function as well. These random number generator requirements are defined in the Gaming Machine National Standard.)

Mystery Jackpot Value Determination

2.1.6.1 Mystery link controller software must generate random mystery jackpot values from a Random Number Generator (RNG) algorithm and mapping algorithm.

Fundamental RNG Requirement

2.1.6.2 The fundamental requirement is that the use of an RNG results in the selection of mystery jackpot values which are able to be proven to:

a) be statistically independent;

b) be uniformly distributed over their range;

c) pass various recognised statistical tests; and.

d) be unpredictable.

2.1.6.3 RNG tests that may be applied include:

a) chi-square test;

b) equi-distribution (frequency) test;

c) gap test;

d) poker test;

e) coupon collector's test;

f) permutation test;

g) run test (Patterns of occurrences should not be recurrent);

h) spectral test;

i) serial correlation test potency and degree of serial correlation (outcomes should be independent from the previous mystery jackpot game); and

j) test on subsequences.

Choice of Algorithm

2.1.6.4 The choice of algorithm is at the discretion of the supplier of equipment; however, it must comply with the requirements of this document.

Background RNG Activity Requirement

2.1.6.5 The RNG must be cycled continuously between jackpot hits.

RNG Seeding

2.1.6.6 The method of seed-set generation must be approved.

The method of seed generation must ensure that:

a) the same sequence of random numbers is never used in more than one device at the same time (i.e. there is to be a method whereby each mystery link controller can have a unique seed generation technique or RNG startup values); and

b) the "next" mystery jackpot outcome is not able to be predicted.

Seeding and re-seeding must be kept to an absolute minimum. Both the method of re-seeding and the instances when it may occur must be approved. Re-seeding should not in general be under operator control. Re-seeding should not be a routine or regular practice.

If for any reason the background RNG activity is interrupted (e.g. link controller power down), the next input variable(s) for the RNG must be a function of the value(s) produced by the RNG immediately prior to interruption.

Minimum Period for Prize Determination using One RNG Value

2.1.6.7 Where a jackpot outcome is represented by only one RNG value or a small number of RNG values, it is important that subsequent jackpot outcome on that link controller is unpredictable. The intent here is to ensure that the link controller does not subsequently go through one defined sequence of jackpot outcomes, or one of only a few possible sequences of jackpot outcomes, and that jackpot outcomes are consistent with the mathematical model of the mystery jackpot game. Thus in such implementations, the 'Period' of the RNG must be a factor greater than its 'Range'.

Minimum Range Requirement

2.1.6.8 The range of values produced by the RNG must be adequate to provide sufficient precision and flexibility when setting event outcome probabilities, (i.e. so as to accurately achieve a desired expected return to player).

Mapping

2.1.6.9 Mapping of random numbers into mystery jackpot values should observe the following principles:

a) the output resulting from the mapping of an RNG to mystery jackpot values must not be predictable;

b) any outcome derived from the random number generator are uniformly distributed;

c) any mappings to convert random numbers into mystery jackpot values are linear, and the distribution of the mapped values is identical to the distribution of the unmapped random number from which they were derived;

d) the mapped random number sequence must demonstrate that they are statistically random when subject to the same statistical tests for randomness specified for the base random number generator; and

e) the jackpot outcomes which are derived from either a combination of mapped values or directly from the unmapped random numbers must have the same distribution and probability for each of the possible jackpot outcomes within the jackpot range (i.e. reset value to maximum jackpot limit).

Scaling Algorithms

2.1.6.10 If a random number with a range shorter than that provided by the RNG is required for some purpose within the link controller, the method of re-scaling, (i.e. converting the number to the lower range), is to be designed such that all numbers within the lower range are equally probable.

If a particular random number selected is outside the range of equal distribution of re-scaling values, it is permissible to discard that random number and select the next in sequence for the purpose of re-scaling.

Sensitive Components and Sensitive Functions

2.1.7 As a guide, sensitive components can be considered to perform the following functions:

(i) Interpret and act on the inputs from the gaming machines and equipment.

(ii) Interpret and act on input from authorised persons like test procedures, reset etc.

(iii) Generation and awarding of jackpot prizes.

(iv) Accounting and auditing (metering).

(v) Monitoring of the iSAP-GM and link controller status and security (e.g. any alarm, tilt or error conditions).

(vi) Data communication functions with approved subsidiary equipment.

(vii) Any other functions that may be considered sensitive in view of the design and implementation of the iSAP-GM and link controller.

Any changes to sensitive operating parameters (e.g. “reset values”, “set increment percentages”), system configuration or software must be approved by the Authority.

There must not be any internal switches or equivalent techniques capable of altering any sensitive functions or parameters other than a participating gaming machine configuration change or a system reset. Consequently, no sensitive function or parameter of the LPJS can be modified without a memory reset (RAM reset) of the LPJS controller.

Verifiability and Reproducibility

2.1.8 -

2.1.8.1 -

2.1.8.2 Refer to section 2.2 of the NSW Appendix to the Gaming Machine National Standard for requirements on verifiability and reproducibility.

Security and Construction

2.1.9 The requirements in sections 2.1.9 to 2.1.9.3 apply to link controllers only.

General Construction Principles

2.1.9.1 The construction and installation of the link controller must ensure that the security of the system is established and maintained.

The construction and location of the link controller will depend on the manufacturer, however the following requirements must be borne in mind when designing and installing progressive equipment:

a) The need to locate the “main controller board” and any other sensitive components in a security cage or cages (see “Security Cage” below).

b) The need to provide a secure area in which security cages, subsidiary equipment interfaces and (depending on the design) other components may need to be located. A secure area would be accessed by a specially assigned security key.

c) The need to perform audit functions without any specific access being required to a security cage or cages.

d) The need to locate the equipment in an area not accessible to the public but one that facilitates inspection by authorised persons at any time.

Note: A security cage may provide the secure area space required to install sensitive components such as communication interface boards and other components (in addition to the "main controller board" and other sensitive components), provided that the above guidelines are observed.

Security Cages

2.1.9.2 A security cage must be manufactured from metal and must be in the form of a cage/box totally enclosing the "main controller board" and any other sensitive components.

The cage must be capable of being sealed with an approved seal.

When the cage is closed and sealed it must not be possible to gain access to or remove any components within the cage.

A security cage must incorporate a sensor to detect a cage open condition.

Where the security cage also provides secure area space for components other than the "main controller board", then it must also be secured by a security lock unless the security cage is located in a secure area.

Other Requirements

2.1.9.3

(i) In the case of a mystery type link controller, the random prize value must be re-calculated when a cage closure is detected (after a cage open). The re-calculation must allow for the current accumulated values and the set limits.

(ii) All cabling to and from the link controller must be protected from public access. The cabling must be accessible, however, to determine its integrity when required.

All cable connections must be secure from accidental or intentional disconnection by persons other than those authorised to do so. This will mean that, if required, cable connections must be made within a secure enclosure.

(iii) All circuit boards must be identifiable by a Product Code Number, Version or Revision number and possibly a Patch Number e.g. Mark/Revision/Patch Number or some equivalent technique that is capable of adequately identifying the board.

The identification is to be permanently displayed on the board. The circuit boards must correspond in all details with the documentation and the boards submitted to the Authority for approval.

Each circuit board must be readily identifiable in the field.

Printed circuit boards must be of production quality and must have a minimum of track cuts and patch wires. Where any "patches" are made they must be consistent, easily verifiable and robust in nature e.g. if approved, a patch wire must be applied in consistent manner to all boards, be secured to the board and installed in a neat tradesman like manner. The board must also indicate the new revision or patch level.

Components must not have "shorted" (e.g. soldered together) pins or pins that are "lifted" from the socket or board to make a connection. In extreme cases

where due to unforeseen circumstances security becomes a consideration, application may be made to the Authority to relax this requirement.

The manufacturer must bear in mind that any alterations in the form of patches must be fully documented and approved by the Authority.

2.1.10 -

2.1.10.1 -

2.1.10.2 -

Firmware and Memory

2.1.11 The requirements in this section apply to link controllers only.

a) Any component that contains sensitive program or data information must be located within a security cage.

b) The entire contents of all program storage devices (approved primary storage media) in the executable address space of a critical processor must be validated at least every time the CPU is reset. Parity and checksum methods are not acceptable. The link controller must be capable of detecting change in primary storage media contents.

c) Settable (configurable) parameters specific to each link controller must not be implemented in a manner that compromises the byte by byte compatibility with the “master” file(s) or image(s). As an example, this would mean that the program and data information stored on EPROM’s installed in the field are byte by byte compatible with the “master” supplied to the Authority and hence controller specific configurable parameters must not be stored in these components.

d) The integrity of the operation of the link controller must be protected from nefarious or accidental use of all the storage locations of the approved primary storage media.

e) The design of the link controller must be such that it is not possible for the approved primary storage media to be “reprogrammed” or altered whilst in the gaming equipment unless it is performed using a software upgrade method authorised by the Authority.

f) Program execution from the approved primary storage media (e.g. PROM or EPROM) is preferred. However, execution from a secondary storage media, for example, RAM or DRAM is acceptable provided that the program executed from the secondary storage media is derived (originates) from the program/data stored in the primary storage media and that the only possible source for the program being executed from the secondary storage media at any time is the approved primary storage media.

g) For a link controller supporting program execution from a secondary storage media, it (the link controller) must be capable of preventing or detecting unexpected or malicious changes to program code being executed from the secondary storage media. Upon detection of unexpected or malicious changes, the controller must enter a memory error (RAM error) condition.

Critical Memory

2.1.12 The requirements in sections 2.1.12 to 2.1.12.2 apply to link controllers only.

a) Sufficient Random Access Memory (RAM) must be installed in the link controller to allow the recording and logging of all information required by section 2.1.12.1 below.

b) RAM data storage must be capable of reliably preserving its memory contents for at least 90 days with the mains power switched off.

c) Critical Memory is to be maintained in at least three (3) logically and two (2) physically separate and distinct devices at all times.

Note: Critical Memory may be maintained in two (2) logically and two (2) physically separate and distinct devices if the manufacturer can demonstrate that the method of validation of critical memory provides reliability and recoverability equal to or exceeding that of the above requirement. (Refer to section 2.1.12.2 Maintenance of Critical Memory).

Contents of Critical Memory

2.1.12.1 Critical memory is to store all data that is considered vital to the continued operation of the link controller. This includes, but is not limited to:

a) All auditing meters;

b) Current jackpot amounts, one for each level;

c) Attached gaming machine configuration data (GMID, BCV);

d) Link controller configuration data (progressive settings, GMID, etc);

e) Software state (the last normal state the link controller software was in before interruption);

f) RNG seed(s) (Mystery LPJS only); and

g) Jackpot history pertaining to the last two jackpot hits.

Maintenance of Critical Memory

2.1.12.2 All critical data must be stored using a fault tolerant methodology with multiple logical and physical storages.

a) Critical memory storage must be maintained by a methodology that enables errors to be identified and acted upon.

b) The link controller is required to update the critical memory whenever a valid jackpot hit is detected or the “total turnover accumulated from all gaming machines” meter has incremented by an amount of $100 since the last update, whichever occurs first. When updating meters in Critical Memory, the software is to ensure that the update was successful and that any error(s) in one logical copy of the meters are not propagated through to the other good copies.

c) To cater for disruptions occurring during the update process of Critical Memory, at any point in time during an update there must exist sufficient information that will allow the software to fully cater for such disruptions (e.g. the software must be able to identify the state of update of each copy of Critical Memory and recover from the most appropriate good copy to complete the update in case of a disruption).

2.1.13 -

Electronic Jackpot Payment

2.1.14 The link controller must support the electronic jackpot payment facility and transfer jackpot prizes to the winning gaming machine via the approved CCCE protocol for amounts that do not exceed the CCCE Transfer Limit (refer to section 2.2.14).

For the CCCE protocol specification, refer to the NSW Gaming Machine Communications Protocol Technical Standard.

2.2 Link Controller Identification

The requirements in sections 2.2 to 2.2.14 apply to link controllers only.

Compliance Plate

2.2.1 A compliance plate must be attached to the security cage containing the main controller board. The following guidelines will apply:

(i) Contents: Serial Number, Date of Manufacture, Dealers Name, Dealers Licence Number;

(ii) Dimensions: The compliance plate must be made of metal of a thickness not less than 0.2 millimetre. The width of the compliance plate must not be less than 80 millimetres and the height not less than 40 millimetres. The compliance plate must be securely fixed at the corners to the link controller.

(iii) Location: The plate must be located in a position that can be readily inspected without requiring access into the security cage.

Serial Number

2.2.1.1 The number will consist of three alpha characters plus a six digit numeric string. The first alpha character will be “X” followed by a two character dealer code, “DD”. The dealer code is allocated by the Authority.

The serial number will therefore appear as:

“XDDnnnnnn”, where nnnnnn is a **unique number** allocated by the dealer. Note that “nnnnnn” must always have six digits including leading zeros if required.

Compliance Plate Change

2.2.1.2 The compliance plate must remain with the link controller until it is delicensed.

At the time of delicensing the plates must be disposed of in the manner specified by the Authority.

In the case of delicensing followed by “rebuilding”, new compliance plates must be attached to the controller.

Note that “rebuilt” controllers are subject to evaluation and approval by the Authority.

GMID (Link Controller Identification Number)

2.2.2 GMID is a six-digit number allocated by the Authority to each link controller. The technique used to set this number must bear in mind the requirement of byte for byte compatibility between the link controller program and the “master program” held by the Authority as well as the need for flexibility and security to change the GMID if it becomes necessary. It will not be permissible to store this parameter in any link controller program storage devices (EPROMS) as this will violate the byte for byte compatibility requirement.

Prior to commissioning, written advice stating the GMID number must be received from the Authority.

A link controller is not permitted to operate without a valid GMID number. Zero GMID or non-BCD coded GMID are not valid GMIDs.

Note: GMID also refers to Gaming Machine Identification Number.

Data Block Version Number

2.2.3 A four digit (4) number allocated by the Authority and permanently stored with the link controller program storage device. Each data block will have a separate Data Block Version Number.

The storage locations and the technique used to store the information must be consistent for all link controllers (pertaining to a particular family of platforms) produced by the manufacturer. The Authority must be capable of using standard commercially available techniques to verify the information stored.

Progressive Levels Supported

2.2.4 A one byte number indicating the number of progressive levels supported by a link controller. A maximum of four progressive levels is permitted.

The number is to be permanently stored in the link controller program storage device. The following data is to be stored:

1 level	01
2 levels	02
3 levels	03
4 levels	04

The storage location and technique used to store the information must be consistent for all link controllers (pertaining to a particular family of platforms) produced by the manufacturer. The Authority must be capable of using standard commercially available techniques to verify the information stored.

Where new technology or features are implemented, exceptions to the requirements listed in this section may be considered via receipt of a security report submitted by the testing facility conducting the evaluation of the gaming equipment. A letter from the Regulator to the tester accepting the contents of the security report will indicate if there is compliance with this section.

Note: Where multiple progressive levels are supported by a link controller, level numbers (starting with number 1) must be allocated in the following order:
a) descending order of the maximum jackpot limit, then by
b) descending order of the reset value, then by
c) ascending order of the set increment percentage.
A progressive level is also referred to as a jackpot level or simply a level.

Manufacturer Identification

2.2.5 Two unique characters permanently allocated to each manufacturer by the Authority. These characters will be stored in each link controller program storage device. They are to be stored as an ASCII string. The information stored must be verifiable.

Note: The Manufacturer Identification is not transmitted on the communication ports but is included here since it affects the link controller's program storage devices audit display.

Firmware Identification (Program Identification)

2.2.6 All firmware defining the link controller must be identified.

A unique eight character identifier must be allocated by the manufacturer.

The identifier is used to identify the link controller program or data that can be executed or accessed by the processor or any other fixed data that is accessed by the processor either directly or indirectly, and is related to the security of the link controller.

Character or shape storage component (e.g. EPROMs) that are not accessed by the processor need not be included.

Note that each storage component submitted to the Authority for approval must be byte for byte compatible with the corresponding component installed in the field and it must contain the unique 8 character identifier stored as an ASCII string.

The storage locations must be consistent in all controllers (pertaining to a particular family of platforms) produced by the manufacturer and must be advised to the Authority. The identifier will be left justified and the unused storage locations will contain 20H (spaces).

The manufacturer must ensure that suitable techniques are used that will guarantee the firmware identifier stored within the component is consistent with that displayed in the audit mode and a label attached to the component. In cases of “interleaved” memory the complete string must be stored in each component.

The Audit Screen (also see Audit) must display all of the program identifiers that apply to the link controller. The following are examples of the requirements:

(i) A link controller contains three functionally different EPROM sets, ABCD1234 which is link specific and XYZW2345 which is link base and IOSW3456 which is I/O software used in many links produced by the manufacturer.

In addition a set of “character proms” CHAR4567 and accessed by the main controller processor are used.

The audit display must indicate the following:

Program ID:
1. ABCD1234
2. XYZW2345
3. IOSW3456
4. CHAR4567

(ii) A link controller uses “distributed processing” where one processor performs certain functions using EPROM sets LINK1234 (link specific) and AUDT2345 (system software) and another processor performs functions using EPROM set IOBT6789.

The audit display will indicate the following:

Program ID:
1. LINK1234
2. AUDT2345
3. IOBT6789

As a general guide, the complete set of program and data information that is stored in the link controller and is related to the security of the device needs to be identified on the audit screen. There are four (4) sets of identifiers allocated for this purpose and the manufacturer must ensure that all of the link firmware can be identified using these four identifiers.

Set Increment Percentages

2.2.7 The percentage of the AGM turnover that is added to the pool of funds available for jackpots.

The Set Increment Percentage will have a value for each progressive level supported. It will be displayed on the audit screen and also will be output from the ports.

It is to be reported in the PDB1 output by the link controller.

Theoretical Link Controller Percentage Return To Player

2.2.8 For mystery links, the theoretical link progressive percentage return to player must be calculated using progressive parameters such as Set Increment Percentage, Reset Value and Jackpot Limit.

For standard links, the theoretical link progressive percentage return must be calculated using progressive parameters such as Set Increment Percentage, Reset Value, Progressive Hit Probability and Base Credit Value. Note that the Progressive Hit Probability is the probability of winning a progressive jackpot.

The total theoretical link progressive percentage, which is reported in the PDB1, must be calculated using or based on the actual parameters set in the link.

Reset Value (Level 1 - 4)

2.2.9 The minimum increment-free amount that is added to the jackpot pool after a jackpot reset. A separate reset value is applicable for each progressive level supported.

The reset values will be displayed on the audit screen and also will be output from the ports.

Where new technology or features are implemented, exceptions to the requirements listed in this section may be considered via receipt of a security report submitted by the testing facility conducting the evaluation of the gaming equipment. A letter from the Regulator to the tester accepting the contents of the security report will indicate if there is compliance with this section.

Jackpot Limit (Level 1 - 4)

2.2.10 The maximum amount that can be won from one play of an AGM connected to the link must not exceed the maximum prize limit (see “Maximum Prize Limit” above).

The limits set for each level must never exceed this amount and must take into account any prize that can be simultaneously won on any other level of that system or another linked system connected to the gaming machine.

The jackpot limits set for each level will be displayed on the audit screen and also will be output from the ports.

Initial Jackpot Value (Level 1 – 4)

2.2.11 The current jackpot value configured after a RAM reset prior to any gaming machine turnover contribution. The initial jackpot value for each level must be displayed on the audit screen.

Note: In the case where the last known valid progressive jackpot amount is re-inserted into the corresponding current jackpot level after the link controller’s RAM reset, the initial jackpot value represents the re-inserted current jackpot value. Otherwise, the initial jackpot value is the reset value of the corresponding jackpot level.

Refer to section 2.1.1 for the requirements that must be met prior to entering the last known jackpot amount for the initial jackpot value using the set-up facility provided by the link controller.

Initial Hidden Jackpot Value (Level 1 – 4)

2.2.12 The hidden jackpot amount "re-inserted" after a RAM reset prior to any gaming machine turnover contribution. The initial hidden jackpot value for each level must be displayed on the audit screen.

Note: Refer to section 2.1.1 for the requirements that must be met prior to entering the last known jackpot amount for the initial hidden jackpot value using the set-up facility provided by the link controller.

Hidden Set Increment Percentage (Level 1 – 4)

2.2.13 The percentage of the gaming machine turnover that is added to the pool of funds available for hidden jackpots.

The hidden set increment percentage for each level must be displayed on the audit screen.

CCCE Transfer Limit

2.2.14 The maximum amount of a jackpot prize payment that the link controller is permitted to transfer electronically to the winning gaming machine utilising the CCCE protocol, must not exceed $3,000. The CCCE transfer limit must be displayed on the audit screen.

2.3 Link Controller Status

The requirements in sections 2.3 to 2.3.2.8 apply to link controllers only.

The link controller must be capable of determining, storing and reporting the status conditions listed below. The status conditions are grouped into two categories broadly based on the effect they have on the linked system.

The status conditions are output from the communication ports as well as being reported on the audit display. A status condition output on the communication ports can be a summary of a number of conditions e.g. communication failure status can indicate one or more AGMs fail to communicate. The exact nature of the error will be reported on the display.

Group 1 Status – Non Error

2.3.1 These status indicators which do not affect the normal functions of the link controller are listed below.

Normal

2.3.1.1 This is the normal function mode i.e. turnover inputs are accepted from the gaming machines in the configuration, the jackpot pool is incremented as a result of the turnover inputs received and the awarding of prizes is not impeded.

This status condition is turned on when the above conditions apply and is turned off by conditions which prevent the link controller from operating normally i.e. “memory error”, “security cage open”, “power save” and “test mode” status (see below for details regarding these status conditions).

If a normal status condition does not apply, the link controller must suspend operation of all gaming machines connected to the link. The subsidiary equipment functional (SEF) signal is to be used for this purpose.

In addition, the LPJS must be designed to suspend play on gaming machines when power to the LPJS fails in a manner that prevents normal operation.

Jackpot Hit

2.3.1.2 This status condition is turned on when the linked system has detected a valid jackpot win in any of the progressive levels supported.

The status condition is turned off when the jackpot is reset.

If more than one jackpot is waiting to be reset (multiple hit), the status condition remains turned on until all the jackpots are reset.

Standard LPJS Jackpot Hit and Reset

2.3.1.2.1 The link controller detects a valid jackpot win on an attached gaming machine when the received Standard and Function Data Blocks (SDB, FDB) that are output by the attached gaming machine, report the following:

a) The SDB Progressive Win status condition (SDB Byte 10 bit #3) is set to 1; and

b) A valid win level is indicated in the FDB jackpot win level indicator (FDB Byte 11).

If the link controller that does not support any CCCE Command Class C, it must cause play to be suspended on the winning gaming machine once a valid hit is detected. The subsidiary equipment functional (SEF) input signal to the winning machine is to be used for this purpose.

If the link controller does support the CCCE Command Class C, it must not cause any play to be suspended on the winning gaming machine once a valid hit is detected unless an error status condition applies.

The link controller detects a successful jackpot reset when the received SDB and FDB output by the attached winning gaming machine, report the following:

c) Both the SDB Progressive Win status condition and the FDB jackpot win level indicator are reset to 0. Note that the jackpot reset checking criteria listed below only apply if the jackpot reset is by means of the CCCE jackpot win payment facility.

d) The SDB CCCE Transfer Completed status condition is set to 1.

e) The SDB Credit and Money In meters have incremented by the amount of the CCCE jackpot win payment that the link controller requested.

In the case where the winning gaming machine in response to the Phase 2 command of the CCCE jackpot win payment from the link controller, outputs an SDB indicating that the requested CCCE Transfer has been completed but the Credit and Money In meters have not correctly incremented, the link controller must cause play to be suspended on the winning machine via the SEF signal and report a “CCCE Mismatch” message on the audit screen. The CCCE Mismatch message

may be cleared by executing an appropriate manual key-off procedure at the link controller. Once the CCCE Mismatch message is cleared, the link controller may then complete the associated jackpot win transaction.

Mystery LPJS Jackpot Hit and Reset

2.3.1.2.2 The link controller detects a valid jackpot win when the current jackpot amount coincides with the mystery jackpot trigger value (which is a random value generated within the range of the reset value and the maximum jackpot limit).

The link controller must cause play to be suspended on the winning gaming machine once a valid hit is detected. The subsidiary equipment functional (SEF) input signal to the winning machine is to be used for this purpose.

The link controller detects a successful jackpot reset when:

a) A valid manual Jackpot Reset key-switch procedure is executed either at the link controller or remote reset device; or

b) It (the link controller) receives a Standard Data Block (SDB) from the winning gaming machine confirming that the requested jackpot win payment transfer has been accepted and processed (ie the SDB CCCE Transfer Complete status condition is set to 1 and the SDB Credit and Money In meters have incremented by the amount of the CCCE jackpot win payment that the link controller requested).

In the case where the winning gaming machine in response to the Phase 2 command of the CCCE jackpot win payment from the link controller, outputs an SDB indicating that the requested CCCE Transfer has been completed but the Credit and Money In meters have not correctly incremented, the link controller must cause play to be suspended on the winning machine via the SEF signal and report a “CCCE Mismatch” message on the audit screen. The CCCE Mismatch message may be cleared by executing an appropriate manual key-off procedure at the link controller. Once the CCCE Mismatch message is cleared, the link controller may then complete the associated jackpot win transaction.

Power Up

2.3.1.3 Refers to the condition where the link controller is powered up from a condition where all power was removed from the link controller.

This implies that the link controller must store information about being powered down.

The complete state of the link must be saved when power down is detected and must be restored when the link controller powers up.

The power up status condition is set when power up is detected and is cleared when the first valid turnover contribution is received from an AGM after the power up is commenced.

Reset

2.3.1.4 The purpose of reset is to indicate any abnormal conditions, which result in the program being “restarted” and as a result of this process, significant state or parameter information of the link controller is partially or completely lost.

The following events summarise typical actions that would lead to the reset status condition being set:

(i) The processor(s) is “reset” by a hardware action. Normally this will mean that a “reset” line is activated.

(ii) The program performs a “cold start or initialisation procedure” and the current state is partially or completely lost.

(iii) Memory is cleared or it is restored from known “uncorrupted” values.

Note: A memory reset (clear) or a memory restore can only be initiated **manually** by an authorised person and **then only** if the link controller detects the appropriate memory error.

A reset will require access to the main controller security cage and will only be performed by an authorised licensed technician.

The reset status condition is set when a reset is executed and is cleared when the first valid turnover contribution is received from an AGM after the reset.

Audit Mode

2.3.1.5 The status condition indicates that the link controller has entered into an audit mode.

The audit mode is to be accessible to any authorised person typically by use of a security key or any other acceptable technique.

The status condition is set when the link controller enters audit mode and is cleared when it leaves audit mode.

Test Mode

2.3.1.6 The status condition indicates that the link controller has entered into a test mode (if provided by the manufacturer).

The test mode will be accessed through the use of a security key or any other acceptable technique by an authorised licensed technician (see also Test mode section for further details).

Play on AGMs connected to the link must be suspended when test mode is turned on. The SEF signal to each gaming machine will be used for this purpose.

The status condition is set when the test mode is turned on and is cleared when the test mode is turned off.

Group 2 Status – Error

2.3.2

Memory Error

2.3.2.1 The link controller must implement a technique for checking the integrity of all memory that is accessed by the processor(s) either directly or indirectly.

The memory checking process must be implemented at least on each power up or “reset” of the link controller (see “Reset” status above). Note that validity checking requirements for the critical memory are listed in section 2.3.2.1.1 ‘Detection of Corrupted Critical Memory’.

The checking process must always check for valid memory contents and where practical it should also check for correctly functioning memory storage components.

The link controller must also implement a technique to detect a change in link program(s). This will have the same status as a memory error and result in a RAM

reset being performed. The link controller program must further ensure that all "option" settings that apply with the new program are correctly set.

The link controller must suspend operation of all the connected gaming machines when a memory error status condition is detected. The SEF signal is to be used for this purpose.

The status condition is set when a memory error is detected and is cleared when a reset procedure is performed by an authorised person.

Detection of Corrupted Critical Memory

2.3.2.1.1 A validity check of the entire contents of the link controller critical memory must be undertaken at least after every restart of the link controller and transaction of significance. After a restart (e.g. power off and on), the link controller must complete its validity check of the critical memory area and then perform a comparison check of all good logical copies of critical memory.

Transactions of significance include (but are not limited to) prior to updating of critical memory, upon jackpot hit, jackpot reset, logic door closed, memory reset, parameter change (progressive settings, link controller GMID etc), and gaming machine configuration change.

Any failure of a validity check is to be considered either a:

a) Recoverable Memory Corruption (optional) if at least one copy of the critical memory is established to be good, or

b) Unrecoverable Memory Corruption.

Communication Failure

2.3.2.2 The link controller should receive a Standard Data Block from each AGM connected to the link at least every 15 seconds (+/- 1.5 seconds).

The link controller must scan the gaming machines (i.e. each subsidiary equipment interface) in a sequence that covers all the AGMs connected to the link.

If the link controller do not receive a valid Standard Data Block from an AGM after four successive scans then a communication failure has occurred, the link controller must suspend operation of the AGMs from which the communication has failed. The subsidiary equipment functional (SEF) input signal to the machine is to be used for this purpose.

The status condition reported on PDB1 (Byte 12, bit #2) is set when a communication failure is detected from one or more AGMs and is cleared when communication is restored from all AGMs.

The time for disabling an AGM due to lack of valid Standard Data Blocks received from the machine by the link progressive interface card must not exceed 64 seconds. The valid Standard Data Block must pass the checksum verification and the self-audit meter verification.

The time for disabling an AGM due to communication failure between the link progressive interface card and the link controller must not exceed one second.

Security Cage Open

2.3.2.3 Refers to any security cage being opened.

The link controller must suspend operation of all the connected AGMs when a security cage open condition is detected. The subsidiary equipment functional (SEF) input signal to each connected gaming machine is to be used for this purpose.

The status condition is set when the open condition is detected and is cleared when a closed condition is detected.

Meter Disconnect

2.3.2.4 The status condition is turned on when a meter disconnect condition is detected and is turned off when a meter connect condition is detected. This status condition is reserved for use by legacy LPJS controllers with hard meters.

For LPJS controllers that do not support any hard meter, the meter disconnect status condition is turned off at all times.

Link Controller Power Save

2.3.2.5 In the power save state the link controller will do most of the normal functions including security monitoring and communication output (if the power save mode facility is supported).

This requires that power to the logic board(s), security sensors and subsidiary equipment interface boards is maintained. (see Mains Power - Power Save below).

The link controller must suspend operation of all the connected AGMs in power save mode. The subsidiary equipment functional (SEF) input signal to each gaming machine is to be used for this purpose.

The status condition is turned on when the power save condition is activated by an authorised person and is turned off when the condition is removed.

A display message will also appear in the audit screen when the link controller has normal power applied.

Gaming Machine Power Down

2.3.2.6 The link controller should monitor the “power good” output signal from the interface port of AGMs connected to the link.

If the “power good” signal fails from one or more of the machines connected then a machine power down has occurred and the link controller must suspend operation of the AGMs from which the “power good” signal has failed.

The status condition is set when the “power good” signal from one or more machines has failed and is cleared when “power good” signal is restored from all AGMs.

Configuration Change

2.3.2.7 Any linked system must be set up using a configuration procedure performed by an authorised technician.

From the configuration procedure, the link controller has to set up and maintain, a configuration table about the AGMs connected to the link. This table will contain AGM details like GMID, Base Credit Value etc., and has to be updated with any configuration procedure. (see “Configuration Procedure” below for details)

The link controller, with power up or reset has to verify the GMID and Base Credit Value of the connected AGMs with the existing data in the configuration table. Also, after a gaming machine power down/up or a security cage open status condition is

detected the link must verify the GMID and Base Credit Value received from the gaming machine.

If there is any mismatch then a configuration change error has occurred and the link controller must not operate with the “non-configured” machine(s). To achieve this the link controller will use the Subsidiary Equipment Function (SEF) input signal to the interface port of the gaming machine to suspend play.

The status condition is turned on when a configuration change has been detected and is turned off when a new “configuration set up procedure” is performed by an authorised person.

Manufacturer Specific Errors

2.3.2.8 Any error condition that is not mentioned above and causes the link controller to assume an error condition.

The status condition is turned on when the error is detected and is turned off when an authorised person executes the specified reset procedure.

Depending on the nature of the error the link controller may suspend play on connected gaming machines by using the SEF signal to each gaming machine.

2.4 Metering

The requirements in sections 2.4 to 2.4.6 apply to link controllers only.

Soft Meters (Electronic Meters)

2.4.1

1.	Number of Jackpot Resets	Level 1
2.	“	Level 2
3.	“	Level 3
4.	“	Level 4
5.	Total Value of Jackpots Won	Level 1
6.	“	Level 2
7.	“	Level 3
8.	“	Level 4
9.	Total Turnover accumulated from all AGMs since start up.	
10.	Current Jackpot Value	Level 1
11.	“	Level 2
12.	“	Level 3
13.	“	Level 4
14.	Hidden Jackpot Value	Level 1
15.	“	Level 2
16.	“	Level 3
17.	“	Level 4
18.	Total CCCE Transfers	Level 1

19. " Level 2
20. " Level 3
21. " Level 4
22. Total CCCE Adjustments Level 1
23. " Level 2
24. " Level 3
25. " Level 4
26. Total Turnover accumulated from all AGMs since last configuration change
27. Turnover accumulated from each AGM since last configuration change
28. Total Security Cage Door Opens
29. Total Power Ups

Other meters may be specifically required for LPJS.

Note: A soft meter is also referred to as an electronic meter.

2.4.2 Soft meters previously listed in this section are now given at section 2.4.1.

Meter Function, Digits and Incrementation

2.4.3

Number of Jackpot Resets (Level 1 - 4)

2.4.3.1 This 10-digit meter represents the cumulative total of the number of times the Jackpot has been reset. (separate total for each level)

Incrementation takes place when a valid Jackpot hit is reset.

Total Value of Jackpots Won (Level 1 - 4)

2.4.3.2 This 10-digit meter represents the cumulative total of the value of Jackpot won (separate total for each level). It is expressed in terms of dollars and cents.

Incrementation takes place once a valid jackpot is hit and the reset is completed.

Total Turnover accumulated from all AGMs since Start Up

2.4.3.3 This 10-digit meter represents the cumulative total of all turnover accumulated from all AGMs connected to the link since start up of the link. It is expressed in terms of dollars and cents.

Incrementation takes place when a valid turnover contribution is received from any of the connected AGMs.

Note that "Start up of the link" occurs once the link controller RAM reset is initiated and the link controller is configured and ready to accurately output all relevant data block information (reflecting the identification, the metering and the current state of the link).

Current Jackpot Value (Level 1 - 4)

2.4.3.4 This 10-digit meter indicates the “reset” value plus the current accrued Jackpot Value, available to be won as it is accrued since the last jackpot hit (separate value for each level). It is expressed in terms of dollars and cents.

Incrementation takes place when a valid turnover contribution is received from any of the AGMs. This meter will be re-initialised with the “reset” and any “hidden” values once a valid jackpot hit is detected.

Where new technology or features are implemented, exceptions to the requirements listed in this section may be considered via receipt of a security report submitted by the testing facility conducting the evaluation of the gaming equipment. A letter from the Regulator to the tester accepting the contents of the security report will indicate if there is compliance with this section.

Hidden Jackpot Value (Level 1 - 4)

2.4.3.5 This 10-digit meter indicates the value of a jackpot accruing concurrently with the current jackpot or accruing after the current jackpot reaches the prescribed limit, but unavailable to the player until the current jackpot has been hit (ie., until a valid jackpot hit is detected), at which time all or a preset portion of the hidden jackpot is transferred to the new current jackpot. Separate value for each level. It is expressed in terms of dollars and cents.

Where new technology or features are implemented, exceptions to the requirements listed in this section may be considered via receipt of a security report submitted by the testing facility conducting the evaluation of the gaming equipment. A letter from the Regulator to the tester accepting the contents of the security report will indicate if there is compliance with this section.

Total Turnover accumulated from all AGMs since last configuration change

2.4.3.6 This 10-digit meter represents the cumulative total of all turnover accumulated from all AGMs connected to the link since the last configuration change. It is expressed in terms of dollars and cents.

Incrementation takes place when a valid turnover contribution is received from any of the connected AGMs after a configuration set up. This meter must be reset to zero when a configuration set up procedure is performed.

Turnover Accumulated from each AGM

2.4.3.7 This 10-digit meter represents the cumulative total of all turnover accumulated from an AGM connected to the link since a configuration set up. It is expressed in terms of dollars and cents.

Incrementation takes place when a valid turnover contribution is received from the corresponding gaming machine. This meter is to continue to increment (not to be reset to zero) after the RAM reset on the corresponding AGM. These meters must be reset to zero when a configuration set up procedure is performed.

Note that these meters must correspond to and be arranged in order of the gaming machine GMID.

Total Security Cage Door Opens

2.4.3.8 This 10-digit meter represents the cumulative total of the number of times the security cage door(s) has been opened.

Incrementation takes place when a cage open condition is detected.

Total Power Ups

2.4.3.9 This 10-digit meter represents the cumulative total of the number of times the link has been powered up.

Incrementation takes place when a power up from a power down (power off) condition is detected.

Total CCCE Transfers (Level 1 – 4)

2.4.3.10 This 10-digit meter represents the cumulative total of all the completed electronic jackpot win payments made via CCCE transfer (separate total for each level). It is expressed in terms of dollars and cents.

Incrementation takes place when the link controller detects that a CCCE transfer of the jackpot win payment has successfully been completed.

Total CCCE Adjustments (Level 1 – 4)

2.4.3.11 This 10-digit meter represents the cumulative total of all rounding adjustments made to any electronic jackpot win payments utilising the CCCE protocol (separate total for each level). It is expressed in terms of dollars and cents.

A rounding adjustment occurs when the jackpot win payment amount which the link controller transfers to the winning gaming machine utilising the CCCE 'Increment In Credits' commands (A1/A2), is not divisible by the base credit value of the winning machine. In such circumstances, the link controller must round up the CCCE transfer amount to the nearest multiple of the base credit value of the winning machine.

Incrementation takes place when the link controller performs an adjustment to the CCCE transfer amount of the jackpot win payment and detects that the requested CCCE transfer has successfully been completed.

Number of Pending Jackpots (Level 1 – 4)

2.4.3.12 This 2-digit meter represents the total number of all the valid jackpot hits pending to be reset. Separate total for each level.

Incrementation takes place when a valid jackpot hit is detected and the hit is pending to be reset.

Decrementation takes place once a valid jackpot hit has been reset (ie when the 'Number of Jackpot Resets' meter for the corresponding jackpot level is incremented).

This meter is reset to zero when there is no jackpot hit waiting to be reset.

Note: The above-defined meter 'Number of Pending Jackpots', which is on a per jackpot level basis, is used in the jackpot level self audit check. However, it is the total number of all the valid jackpot hits waiting to be reset for level 1 to level 4 transmitted in the PDB1 byte 71.

Total Pending Jackpot Wins (Level 1 – 4)

2.4.3.13 This 10-digit meter represents the total value of all the valid “current” jackpot wins pending to be reset. Separate total for each level. It is expressed in terms of dollars and cents.

Incrementation takes place when a valid jackpot hit is detected and the hit is pending to be reset.

Decrementation takes place once a valid jackpot hit has been reset.

This meter is reset to zero when there is no jackpot hit waiting to be reset.

Note: The above-defined meter ‘Total Pending Jackpot Wins’, which represents the total value of all the valid jackpot wins pending to be reset on a per jackpot level basis, is used in the jackpot level self audit check. However, it is the “current” jackpot win first waiting to be reset for the jackpot win level which is indicated in the PDB1 byte 62, transmitted in the PDB1 bytes 66 to 70.

2.4.4 -

2.4.5 -

Jackpot Level Self Audit

2.4.6 The link controller must perform a meter self audit check on each jackpot level whenever a transaction of significance occurs.

Transactions of significance include (but are not limited to) prior to updating of critical memory, upon jackpot hit, jackpot reset, logic door closed, memory reset, parameter change (progressive settings, link controller GMID, etc), and gaming machine configuration change.

The Jackpot Level Self Audit check formula is defined as

Initial Jackpot Value
+ Initial Hidden Jackpot Value
+ (Total Gaming Machine Turnover * Set Increment Percentage)
+ (Total Gaming Machine Turnover * Hidden Set Increment Percentage)
+ (Number of Jackpot Resets * Reset Value)
+ (Number of Pending Jackpots * Reset Value)
- Total Pending Jackpot Wins
- Total Value of Jackpots Won
- Current Jackpot Value
- Hidden Jackpot Value
= $0.00 (+/- $0.05)

Note that a tolerance of +/- $0.05 is allowed to facilitate the various rounding or truncation methods used by the link controller to calculate the jackpot pool values.

Failure of the Jackpot Level Self Audit must cause the link controller to enter an unrecoverable memory error.

2.5 Audit Mode and Display

The manufacturer must ensure that all operating procedures and features are well documented. The manufacturer must bear in mind that the audit facility will be operated by “non technical” persons.

For LPJSs, a suitable display must be provided so that authorised persons can access the audit information without interrupting the operation of the LPJS.

For iSAP-GMs, the AGM display is also used for audit display purposes.

The facility to move forwards and backwards through the display information must be provided. The presentation of the data must be unambiguous and easily understood.

Entry to Audit mode

2.5.1 The requirements in this section apply to link controllers only.

(i) Entry is restricted to authorised personnel only.

It must be possible to enter the audit mode any time, including times when the link is operational. This requirement does not apply if the link is in a power off condition.

The audit mode will be accessed through the use of a security key or any other suitable method.

(ii) In the audit mode, it is not permitted to alter any link meters or status conditions (other than audit status) or any other sensitive parameters.

Information Display

2.5.2 In addition to the display messages required by the section “Audit Screen Display Messages”, the audit mode must present the information listed below.

These represent the minimum information required and presentation may be varied to suit, provided that the messages are clear, unambiguous and follow the order given.

Link Controller Identification and Metering Information

2.5.2.1 The requirements in this section apply to link controllers only.

<u>Link Controller Identification to be displayed</u>

- Link Controller Identification Number (GMID)
- Manufacturer Identification
- Communication Data Block Version Numbers
- Program Identifications
- Progressive Levels Supported
- Link Controller Theoretical PRTP
- Set Increment Percentage, one for each level
- Jackpot Limit, one for each level
- Reset Value, one for each level
- Hidden Set Increment Percentage, one for each level
- Initial Jackpot Value, one for each level
- Initial Hidden Jackpot Value, one for each level
- CCCE Transfer Limit

<u>Link Controller Metering Information to be displayed</u>

- Current jackpot values, one for each level

- Accrued hidden jackpot values, one for each level
- Total value of jackpots won, one for each level
- Number of jackpot resets, one for each level
- Total turnover accumulated from all AGMs since start up
- Total turnover accumulated from all AGMs since last configuration change
- Total security cage door opens
- Total link power ups
- Total turnover accumulated from each AGM in the current configuration
- Total CCCE Transfers, one for each level
- Total CCCE Adjustments, one for each level

iSAP-GM Machine Identification and Metering Information

2.5.2.2 The requirement in this section applies to iSAP-GMs only. It is supplementary to the NSW Appendix to the Gaming Machine National Standard.

Machine Identification

The following additional machine identifications are to be displayed:

- Standalone Progressive Levels Supported
- Standalone Progressive Theoretical PRTP
- Set Increment Percentage, one for each level
- Jackpot Limit, one for each level
- Reset Value, one for each level
- Hidden Set Increment Percentage, one for each level
- Initial Jackpot Value, one for each level
- Initial Hidden Jackpot Value, one for each level

Metering Information

The following additional machine metering information is to be displayed:

- Current jackpot values, one for each level
- Accrued hidden jackpot values, one for each level
- Total value of jackpots won, one for each level
- Number of jackpot resets, one for each level
- Total turnover accumulated from the iSAP-GM since start up (optional)
- Total turnover accumulated from the iSAP-GM since last configuration change (optional)

Link Configuration Information

2.5.2.3 The requirement in this section applies to link controllers only.

Total number of machines communicating

Total number of machines not communicating

History Information

2.5.2.4 For link controllers, the last 1000 jackpots, each indicating value of win, jackpot level, GMID of the winning gaming machine, date and time (when the link controller detects the hit) and the method of payment (ie., Manual Pay or CCCE Transfer).

For iSAP-GMs, the last 100 jackpots, each indicating value of win, jackpot level, date and time (when the machine detects the hit).

Progressive Specific Information

2.5.2.5 The Authority may request that additional information regarding the iSAP-GM and the link is stored and made available for audit purposes.

Manufacturer Specific Information

2.5.2.6 As documented by manufacturer.

2.6 Test Mode

The requirements in sections 2.6 to 2.6.1 apply to link controllers only.

The manufacturer must ensure that all operating procedures and features are well documented. A set of standard procedures must be followed to put the link into the “test mode”.

The “test mode” functions must not be capable of altering any meters, audit mode, history information or significant parameters and must be incapable of emulating a jackpot win on any of the displays or of compromising the security of the controller in any way.

The manufacturer must bear in mind that the test mode procedures must utilise techniques and components that can be easily applied and readily available to all licensed technicians.

Entry to Test Mode

2.6.1 Entry is to be restricted to licensed technicians.

Entry into the test mode can only take place when the controller ascertains that all the connected machines are not being played (idle status). The link controller must “poll” all of the gaming machines (i.e. the subsidiary equipment interfaces within the gaming machines) to ascertain an idle status condition.

The test mode can only be accessed through the use of a security key or other suitable method.

Once the link controller is placed into the test mode, it must suspend operation of all the connected AGMs and the main link display must clearly indicate that normal operation of the controller has been suspended.

Test mode procedures must utilise techniques and components that can be easily applied and are readily available to all licensed technical personnel.

2.7 Configuration And Validation Procedures

The requirements in sections 2.7 to 2.7.3 apply to link controllers only.

Configuration Procedure

2.7.1 A linked progressive system has to be set up by following a configuration procedure. This procedure should ensure that the information about all the AGMs connected (configuration) to the link is known to the controller before the link starts operating.

The link controller will scan the interface cards that are attached to the AGMs for any valid standard and function data blocks. All the information about the connected AGMs can be derived from the standard and function data blocks. A configuration table has to be set up identifying the connected AGMs.

This table will be used by the controller to verify the machines connected whenever certain events occur (see “configuration change error” above).

The configuration procedure has to be followed to make any change to the link configuration, i.e. connecting new machines or disconnecting existing machines from the link. After the configuration procedure the updated table will hold the information about all the current machines connected to the link.

The configuration procedure can only be performed by a licensed technician, with the proposed change in the Linked Progressive Jackpot System having been approved by the Authority. Also the configuration change has to be performed when the link is idle i.e. all AGMs connected to the link are not being played.

The manufacturer can provide a hardware technique to activate the configuration procedure e.g. a switch. Access to the hardware for this purpose will require entry to the security cage containing the main controller board.

Validation For Standard Link Controllers

2.7.2 Prior to allowing the link to operate, the standard link controller must perform the following validation whenever:

(i) Any link controller power up

(ii) Any link controller RAM reset

(iii) Any link controller configuration change

(iv) Any link controller logic cage access

The validation consists of the following checking:

1) Ensure that only the approved progressive settings can be configured in the link controller. The setting for each level consists of five parameters. They are the reset value, the set increment percentage, the progressive hit probability, the jackpot limit and the base credit value. As an example, a four-level link will have four progressive settings that together are approved as a “progressive setting combination”.

   If the “progressive setting combinations” are contained within the link controller program, each progressive setting combination should be allocated a progressive setting combination code which is to be output in a spare “Program id” field in PDB1.

2) Ensure that each attached AGM supports “secondary functions”.

3) Ensure that each attached AGM supports the identical number of levels to those configured in the link controller.

4) Ensure that all attached AGMs are reporting identical progressive hit probabilities (PHPs) associated with each jackpot level (as reported in FDB from each AGM).

The link controller must also verify that the per jackpot level PHPs that are transmitted by the attached AGMs, are identical to that of the approved progressive setting configured at the link controller for the corresponding jackpot level.

5) Ensure that all attached AGMs are reporting identical Base Credit Values.

The link controller must also verify that the Base Credit Values that are transmitted by the attached AGMs, are identical to that of the approved progressive setting configured at the link controller.

Once the above checking is completed, the link controller should calculate the "Total Theoretical Percentage Return To Player" for transmission in PDB1 (PDB1 Bytes 32 to 35). This value reflects the sum of PRTP for all the progressive levels configured and operating (i.e. it must be based upon the actual parameters configured in the system).

Note that when detecting a power up or a RAM reset on an AGM connected to the link, the link controller must appropriately perform steps 2 to 5 of the above configuration validation on that machine. If any of those conditions is not satisfied, the link controller must suspend operation of that machine.

PRTP Validation (Link Controllers)

2.7.3 Prior to allowing the link to operate, the link controller supporting the extended CCCE command class 6 and/or class E must perform the following PRTP validation upon every power up, RAM reset, configuration change, logic case access and gaming machine memory reset.

The PRTP validation consists of the following checking:

Standard link controllers must perform a PRTP validation check for each attached gaming machine to ensure that the sum of the gaming machine PRTP (SDB Bytes 120 – 121) and the Total LPJS PRTP (PDB1 Bytes 32 – 35) is 85% or greater.

Mystery link controllers must perform a PRTP validation check for each attached gaming machine that does not support any secondary function (SDB Byte 122 = 0) to ensure that the sum of the gaming machine PRTP (SDB Bytes 120 –121) and the Total LPJS PRTP (PDB1 Bytes 32 – 35) is 85% or greater.

2.8 Audit Screen Display Messages

The requirements in sections 2.8 to 2.8.10 apply to link controllers only.

The following messages are to be displayed on the audit screen whenever the appropriate event occurs.

The messages represent the minimum information required and may be varied to suit, provided that the message is clear and unambiguous.

Jackpot Hit

2.8.1 Display message: "Jackpot Win", Gaming Machine Identification, Amount Won, and Level

The messages are cleared after a jackpot reset is performed.

Note: The machine GMID must always be displayed even though the manufacturer may provide a facility to also display "in house" identification of machines.

Audit Mode

2.8.2 Audit Display Messages: See audit mode

Security Cage Open

2.8.3 Display Messages: “Security Cage Open ##########”

########## may be replaced by appropriate cage.

Exit from lockup: Valid closure of all monitored security cages.

The display message is removed and replaced by “Security Cage Closed” when closure is detected. The Security Cage Closed message is removed at the reception of a valid turnover contribution.

Memory Error

2.8.4 Display Messages: “ Memory Error - #########”

######### will be replaced by the appropriate memory type e.g. EPROM, RAM, EEPROM etc.

Or “Program Mismatch”

The message is removed after a reset/restore function is successfully performed. Note that a “Reset” message must be displayed after memory reset/restore (also see Status, Reset and Memory Reset- Restore).

2.8.5 -

Communication Failure

2.8.6 Display Message: “Communication Failed Machine ###### “

represents the gaming machine GMID

The message is cleared when the communication is restored from the gaming machines. If the communication failure occurs from more than one gaming machine then all should be displayed in the order of GMID.

Gaming Machine Power Down

2.8.7 Display Message: “Machine Power Down ###### “

represents AGM GMID

The message is cleared when the “power good” signal is restored from the AGM interface. If the “power good” signal fails from more than one gaming machine, all should be displayed in the order of GMID.

Configuration Change

2.8.8 Display Message: “Configuration Change existing Machine ###### “

or “Configuration Change New Machine ######”

GMID as per configuration table (this is intended for situations where the relevant progressive parameters have changed e.g. Base Credit Value.

GMID received

The message is cleared when a new “configuration set up procedure” is performed by an authorised person. If the error is caused by more than one machine, all should be displayed in the order of GMID.

Power Save

2.8.9 In this condition a message will not normally appear since the display and other "lighting" has power removed. However, when full power is reapplied the audit screen will show a "Power Up - Save" message. This message is removed when the first valid turnover contribution is received.

Manufacturer Specific Error

2.8.10 Display Message(s): As specified by manufacturer.

The display should attempt to show all messages that apply. However, where more than one message applies and the display cannot show all of them, the messages should be "gathered" and displayed sequentially. A message type need only be displayed once.

Each message must be displayed for approximately 5 seconds before the next is displayed.

2.9 Memory Reset – Restore (RAM Reset)

The requirements in sections 2.9 to 2.9.2 apply to link controllers only.

Conditions For Reset - Restore

2.9.1 A memory reset or restore can only be performed if the appropriate error condition has been detected by the link controller e.g. a RAM reset can only be executed if a RAM error condition has been detected.

A RAM reset will cause all audit meters to be restored with known uncorrupted values from the backup facility provided in the link controller (see also Recoverable Memory Corruption given in section 2.3.2.1.1 "Detection of Corrupted Critical Memory" above).

Procedures For Reset - Restore

2.9.2 The memory reset or restore procedure can only be performed by a licensed technician. Typically, the procedure would require access to the link controller secure enclosure and the application of a set procedure e.g. activating a "reset" switch.

The manufacturer should not make use of any special tools or procedures that would not normally be available to all licensed technicians. An example of this would be specialised EPROMs that are inserted once only for the reset-restore function.

2.10 Power Failure - Power Up

The requirements in sections 2.10 to 2.10.2 apply to link controllers only.

Power Supply Back Up, Retention Of Data, Retention Period

2.10.1 The link controller must have a power supply backup facility and associated firmware to prevent power interruptions from affecting the retention of data.

The power backup facility must enable the storage of all data for a period of at least 3 months without external power.

Resumption of Normal Power Conditions

2.10.2 The link controller must restore the link to the state that applied just prior to the power failure, providing other status conditions permit this to take place e.g. power fails, security cage is opened and power is resumed while the security cage is opened. Upon resumption, the security cage open status applies.

The link controller must be capable of determining that a power up condition has taken place and the power up status condition must be set.

2.11 Mains Power

The requirements in sections 2.11 to 2.11.4 apply to link controllers only.

Connection at Link Controller

2.11.1 The connection of mains power at the link controller must be made in a manner that allows only authorised personnel to remove the connection. This will require the link controller secure area or security cage to be accessed before power can be disconnected.

Switching Of Mains Power - Power States

2.11.2 The link controller must be capable of the following power states unless it is indicated otherwise:

Full Power

2.11.2.1 In this condition power is available to all components of the link controller including subsidiary equipment interfaces.

Power Save

2.11.2.2 In this condition power is available to the logic board(s), subsidiary equipment interfaces and all security sensing devices whilst the display and other “lighting” may have power removed.

The method used to enter and exit the power save condition must be available to authorised persons only. Typically the power save mode would be activated by using a key switch or similar technique that avoids the use of a bi-directional communication channel into the main logic board.

Note that the power save mode facility is an optional function for the link controller. Ie, it does not have to be implemented. However, if it is implemented, the implemented power save mode facility must satisfy all the defined requirements in the standard.

Power Off

2.11.2.3 In this condition all power is removed from the link controller, including power to subsidiary equipment interfaces. This will require that the controller is completely isolated from the mains supply i.e.” active” and “neutral” of the mains supply are disconnected by the switch.

The method used to achieve a power off condition must use a manually operated switch. The switch must be located within the secure enclosure of the link controller and must be designed to prevent accidental operation. For example, a cover must be

opened before gaining access to the switch. Only authorised technical personnel should need to access this switch.

Where new technology or features are implemented, exceptions to the requirements listed in this section may be considered via receipt of a security report submitted by the testing facility conducting the evaluation of the gaming equipment. A letter from the Regulator to the tester accepting the contents of the security report will indicate if there is compliance with this section.

Protection

2.11.3 The link controller must have the following protection provided:

(i) Adequate filtering of the mains input and protection against mains voltage “spikes” or “surges”.

(ii) Fuses or other equivalent techniques that protect the mains supply from excessive current demand by the link controller.

Power for Subsidiary Equipment

2.11.4

(i) The link controller must provide a facility for subsidiary equipment interfaces installed within the link controller to derive power for their operation. Provision must be made for at least three subsidiary equipment interfaces to derive power.

The exact implementation will be of each manufacturers design. However, a minimum requirement would be that each connection must supply 12V DC +/-10% @ 0.5 AMP. Each connection must be protected by an appropriate fuse or equivalent.

Power supply for each subsidiary equipment interface must be maintained within defined specifications at all times during link controller operation and must not be affected by any power conditions on the other subsidiary equipment outputs.

For example, a configuration with three independent transformers, each providing its own isolated output, would be a suitable implementation.

(ii) The link controller manufacturer must make available details of the provision made to derive power for the interfaces.

(iii) The method of deriving power for subsidiary equipment located within the link controller must conform to relevant safety standards.

2.12 Subsidiary Equipment Interfaces Within Link Controller

The requirements in sections 2.12 to 2.12.4 apply to link controllers only.

Introduction

2.12.1 The connection and communication between subsidiary equipment interfaces and the link controller is described in chapter 3 “Data Interface Specifications” of this document.

The model used involves an interface produced by the subsidiary equipment manufacturer and located within a secure area or a security cage of the link controller. The interface communicates with the link controller port.

The link controller manufacturer will be responsible for providing space within the link controller so that the interface can be securely mounted.

In addition, the link controller manufacturer will be responsible for providing a means of deriving power for the interface.

Power to Subsidiary Equipment Interface

2.12.2 Subsidiary equipment installed within the link controller must derive its power by using the facility described in 2.11.4 or some other acceptable method that will not interfere with the power supply to other link controller circuitry.

If the facility provided in 2.11.4 is used, the subsidiary equipment manufacturer must ensure that no interference is caused to other interfaces connected to the facility or the link controller.

The subsidiary equipment manufacturer must further ensure that the interface does not draw more than the maximum permissible current from the facility. It is the responsibility of the subsidiary equipment manufacturer to provide (on the interface boards) for "filtering, fuses and surge protection " of the type mentioned in 2.11.3.

Upon request from a subsidiary equipment manufacturer, the link controller manufacturer must provide details of the facilities available for accessing power.

Provision of Space For Subsidiary Equipment Interface

2.12.3 The physical location of the space provided will depend on the design of the link controller. Some of the issues concerning this space and the general security can be found in the section "Security and Construction" above. The specific requirements for allocating this space are listed below.

The link controller manufacturer must provide space for at least three interface cards. A minimum space of 120mmx120mmx40mm is to be allowed for each interface card.

In addition the following requirements apply:

(i) A clearance of at least 10 mm between adjacent spaces.

(ii) A stable internal structure must be available to secure an interface card. For this purpose the interface card may be secured by using any one of the space "faces".

(iii) Provision of cable entry to the interface space. For this purpose the link controller manufacturer must allow for cable entry along any two neighbouring sides of dimension 120mmx40mm.

(iv) The link controller manufacturer must provide details of the area(s) allocated and the method of attachment to the Authority and upon request, to subsidiary equipment manufacturers.

Connection of Subsidiary Equipment Interfaces to Link Controller Ports

2.12.4 The connection between the port (any of the link controller ports P1, P2 and P3) and the subsidiary equipment interfaces must consist of a continuous cable (no joints or connectors are permitted).The cable connection to the link controller can only be disconnected if the security cage is opened.

2.13 Connection of External Subsidiary Equipment and Provision of Cable Entry

The requirement in this section applies to link controllers only.

Typically, subsidiary equipment external to the link controller will require running cables that connect to the interface board located within a security cage or security area of the link controller. The following conditions will apply:

(i) External cabling that enters the security cage or area can only be disconnected by gaining access to the cage or area.

(ii) The design must make provision for subsidiary equipment cables to access the interface boards. The cable access entry must have a minimum area of 10cm^2.

The cable access entry should be designed so as not to affect the security of the cage or area and must be capable of being sealed when not required for use. If the entry is sealed, then removal of the seal can only take place by accessing the secure cage or area.

2.14 Port Management

The requirement in this section applies to link controllers only:

(i) Only approved subsidiary equipment may be connected to a port. The ports must be clearly identified, by non-removable signs displaying “Port1 or P1” etc. on the logic board.

(ii) Only one generic type or class of approved subsidiary equipment is permitted per port. The allocations are:

a) P1 – Centralised Monitoring System port (CMS port).

b) P2, P3 - General Purpose.
These ports are meant for general use.

(iii) An application must be made in writing to the Authority requesting permission to connect subsidiary equipment. The equipment must not be connected until permission is granted in writing by the Authority.

(iv) When subsidiary equipment ceases to be used the Authority must be informed in writing and all of the equipment removed, leaving the link controller in a secure state.

(v) Only equipment from one manufacturer is permitted to be connected to a port. i.e. a port is not to be “shared” in any way between subsidiary equipment from another manufacturer even if it is of the same generic type.

2.15 Electrical Safety and Interference

The manufacturer is reminded that it is their responsibility to ensure the safety of their equipment. Compliance with appropriate electrical safety standards as well as certification regarding compliance with electromagnetic interference standards should be obtained from the relevant recognised testing authorities or bodies. Proof of this certification should be kept by the manufacturer and is not required by the Authority when the equipment is submitted for approval.

2.16 Jackpot Display Signage

General Principles for Jackpot Display Signage

2.16.1 The following principles must be applied to all jackpot display signage:

a) The display content and access to display parameters must be implemented in a secure manner to prevent unauthorised access.

b) There is no prohibition on using the sign for advertising purposes as long as the overhead sign remains predominately a jackpot display device. The advertising material must not interfere with the primary purpose of the sign which is to display jackpot information to the player.

c) The jackpot pool values are to be displayed to the player generally most of the time (i.e. the display must keep players informed of the current state of the jackpot meters).

d) Deleted.

e) The display material must not be offensive and gambling harm minimisation MUST be considered. The display content of the overhead jackpot sign is to provide for the 'problem gambling notice' (while the current jackpot pool values are displayed). For the definition of 'problem gambling notice', refer to the Regulations, clause 25 (1).

f) Deleted.

Minimum Display Information

2.16.2 An LPJS or iSAP-GM must incorporate a method to display to players the following information:

a) The current jackpot values for each level. The display of the jackpot prize may be incremented from its previous resting value (e.g. odometer effect) however the display must accurately reflect the actual jackpot prize value within a reasonable period of time (e.g. 10 seconds since the last turnover contribution).

b) Jackpot level identification (i.e. the level number or level name).

c) The reset value for each level (optional)

d) The maximum jackpot limit for each level (for mystery jackpots or iSAP-GMs; but not standard LPJS). This may be implemented in a help screen.

d1) Explain the treatment of turnover contributions once the maximum jackpot limit has been reached (for iSAP-GMs only). This may be implemented in a help screen.

In addition, the following information is to be displayed in the event of a jackpot hit:

e) Identification of the jackpot level won (i.e. level number or level name).

f) The amount of the jackpot won (to be displayed on the overhead sign or the winning gaming machine only).

g) Identification of the winning gaming machine house number (for LPJS only).

Note: For 'standard LPJS', the in-machine jackpot displays of the winning gaming machine utilising the extended CCCE Progressive Win Notification command class 8 or 9, are exempt from displaying the house number.

Note that for jackpot pool values and/or prizes that are shown on two or more displays (eg., in-machine display as well as overhead jackpot signage), there must be clear messages indicating which specific display (the information shown on which display) the award is based on whenever a discrepancy exists between the information shown on the displays. These messages must be displayed to players in an upfront manner.

2.17 Awarding Stand-Alone Jackpot Wins with or without Rounding

Awarding Stand-Alone Jackpot Wins without any Rounding

2.17.1 When a stand-alone jackpot level is hit, the jackpot win amount (without any rounding) is awarded and added to all the relevant meters (CREDIT meter, TOTAL WINS meter, CURRENT JACKPOT WIN meter and TOTAL VALUE OF ALL JACKPOTS WON meter).

For a stand-alone progressive machine using the scheme 'Awarding Stand-Alone Jackpot Wins without any Rounding', any residual resulted from the stand-alone jackpot win amount being not a multiple of the machine BCV may be gambled via the residual removal gamble feature or collected via a book pay (e.g. cancel credit or printed ticket).

Awarding Stand-Alone Jackpot Wins with Rounding-Down

2.17.2 For a gaming machine whose BCV is not 1 cent, when a stand-alone jackpot level is hit, if the jackpot win amount is not a multiple of the machine BCV, the jackpot win amount is first rounded down to the nearest multiple of the machine BCV. The rounded-down jackpot win amount is then awarded and added to all the relevant meters. The rounded-down adjustment amount is added to the next jackpot pool (i.e. the newly initialised CURRENT JACKPOT VALUE) for the associated jackpot level.

For a stand-alone progressive machine using the scheme 'Awarding Stand-Alone Jackpot Wins with Rounding-Down', the machine artwork or on-screen rules must contain a clear message informing the player that the stand-alone jackpot win amount is rounded down to the nearest multiple of the machine BCV. The rounded-down adjustment amount is added to the next jackpot pool.

Awarding Stand-Alone Jackpot Wins with Rounding-Up

2.17.3 For a gaming machine whose BCV is not 1 cent, when a stand-alone jackpot level is hit, if the jackpot win amount is not a multiple of the machine BCV, the following applies:

a) The jackpot win amount (the jackpot win amount without any rounding) is to be reported in the CURRENT JACKPOT WIN meter and added to the TOTAL VALUE OF JACKPOTS WON meter.

b) The jackpot win amount is rounded up to the nearest multiple of the machine BCV. The rounded-up jackpot win amount is then added to the CREDIT meter and TOTAL WINS meter.

For a stand-alone progressive machine using the scheme 'Awarding Stand-Alone Jackpot Wins with Rounding-Up', the stand-alone progressive machine must record and display the cumulative total of all the stand-alone jackpots paid on the audit screen. Separate total for each jackpot level.

3 Data Interface Specifications

3.1 Introduction

This chapter describes the data communication interface facilities provided by ports P1, P2 and P3 of a linked progressive jackpot system controller.

This chapter should also be read in conjunction with the document ”NSW Gaming Machine Communications Protocol Technical Standard”. The implementation of certain functions or features is related to the communication facilities specified for gaming machines.

Subsidiary Equipment to Be Connected

3.1.1 The proposed communication interface facilities will allow communication between a link controller and the following classes of subsidiary equipment:

(i) Data Gathering or Monitoring Systems

(ii) General-purpose equipment

A minimum of three ports are to be provided for connection of subsidiary equipment.

General Requirements

3.1.2

(i) The link controller is a standalone device responsible for all aspects of its functioning. The subsidiary equipment will not directly control or influence the link controller and there is therefore no need and nor will it be permitted for the link controller to be capable of external signals to be input into it.

It should be noted that this does not include information collected from gaming machines as defined in the document “NSW Gaming Machine Communications Protocol Technical Standard”.

(ii) The interface specification is to be used for point-to-point communication between the link controller and a subsidiary equipment “interface” that is located within a security cage or secure area of the link controller.

(iii) Only equipment that is approved by the Authority may be connected to a port. The equipment connected must correspond to the intended port usage.

(iv) A change in data block version number will require a change in the link controller program.

3.2 Information Set For Link Controller

The link controller must be capable of communicating the following information from the ports.

Link Controller Identification

3.2.1 GMID (link controller identification number)

Data Block Version Number(s)

Program (Firmware) Identification

Progressive Levels Supported

Theoretical Link Controller Percentage Return

Set Increment Percentage	Level 1
"	Level 2
"	Level 3
"	Level 4
Jackpot Limit	Level 1
"	Level 2
"	Level 3
"	Level 4
Reset Value	Level 1
"	Level 2
"	Level 3
"	Level 4

(See chapter 2 of this standard for details)

Metering

3.2.2 Current jackpot value, one for each level

Accrued hidden jackpot value, one for each level

Total value of jackpots won, one for each level

Number of jackpot resets, one for each level

Total turnover accumulated from all AGMs since start up

Total turnover accumulated from all AGMs since last configuration change

(See chapter 2 of this standard for details)

Link Controller Status Indicators

3.2.3 Group 1 Status – Non Error

1) Normal
2) Jackpot Hit
3) Reset
4) Power Up
5) Audit Mode
6) Test Mode

Group 2 Status – Error

1) Memory Error
2) Communication Failure
3) Security Cage Open
4) Meter Disconnect
5) Link Controller Power Save

6) Gaming Machine Power Down

7) Configuration Change

8) Manufacturer Specific Errors

(See chapter 2 of this standard for details)

Note:

(i) Depending on the application, additional status indicators may be required.

(ii) The exact nature of the error(s) is provided by the LPJS audit display when the error condition is detected.

3.3 Communication Ports

Communication Ports to be provided

3.3.1 Three ports are to be provided:

P1 - Centralised Monitoring System Port (CMS Port)

P2 - General Purpose Port 2

P3 - General Purpose Port 3

Overview

3.3.2 These ports are only capable of one-way communication. In general terms, the link controller will output the “Progressive Data Block 1 and 2” (PDB1 and PDB2) and “Configuration Data Block” (CDB) whenever certain events occur.

These events are outlined below in the description of the Progressive and Configuration Data Blocks. The port may also output a “Manufacturer Data Block” (MDB) as described below.

All ports must be clearly identified to facilitate correct connection of subsidiary equipment.

Hardware

3.3.3 EIA RS422 Electrical specification is to be followed. This specification covers the areas of signal level, slew rate and so on.

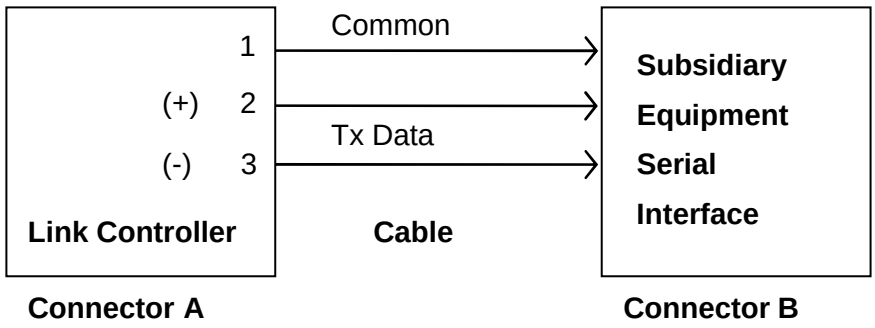
Speed of transmission is to be 9600 bps.

Each character or digit is to be represented by 11 bits (1 start bit + 8 data bits (generally, packed BCD format) + 1 parity bit (even parity) + 1 stop bit). The data byte is transmitted with LSB first, parity being transmitted after the MSB.

The ports must be electrically independent from each other to prevent any interference (malfunction) that could arise due to the connection of subsidiary equipment on another port.

In practice the minimum requirement is for separate “line drivers” for each port. The “line drivers” must be socketed to facilitate replacement if required.

Connection Diagram



Connector A is to be either a 10-pin straight or right angle header (standard 0.05" pitch). Each connector must have latch/eject levers with a centre polarisation slot. An example of this type of connector is the Amphenol 816 series.

It should be noted that even though a 10-pin connector is not a standard connector for RS422, it will satisfy this requirement.

Standard ribbon cable, 0.05", to a maximum length of 1.5 metres is to be used.

The interface will always be in the communication mode.

3.4 Data Transmission

Overview

3.4.1 At this time four types of data block (128 bytes each) can be output by ports P1, P2 and P3 of the link controller. These data blocks are:

1. Progressive Data Block 1 (PDB1).
2. Progressive Data Block 2 (PDB2). PDB1 and PDB2 are to be output as a pair (PDB1 is always followed by PDB2). They will output the full status and metering information of the link controller. At any time a PDB1-PDB2 pair is output, it must hold the same data as the equivalent electronic meters and status variables in the link controller.
3. Manufacturer Data Block (MDB). It is intended for manufacturer specific use and its output is optional.
4. Configuration Data Block (CDB). It is defined to output the configuration, turnover and communication status information of all the gaming machines connected to the link.

Note

The output of PDB1-PDB2 pair must take precedence over the output of CDBs and MDBs.

Progressive Data Block 1 (PDB1) and Progressive Data Block 2 (PDB2)

3.4.2 A PDB1-PDB2 pair is to be transmitted by the link controller whenever:

(i) A status change occurs. Status changes that cause an output are defined by the bits of the PDB1 Status Bytes 1, 2 and 3. The PDB1-PDB2 pair is output when the status condition is turned on and when the status condition is turned off (i.e. low level to high level [0 – 1] and high level to low level [1 – 0] transition of the status bits).

(ii) Any power up or reset procedure. This condition is necessary because a reset or power up may be performed a number of times without the status bits being cleared from the previous occasion.

(iii) A continuous period of 15 seconds (+/- 1.5 seconds) has elapsed since the last transmission and 1.5 seconds (+/- 0.15 seconds) under selected status conditions (i.e. while any of the Jackpot Hit, Meter Disconnect, Logic Cage Open and Memory Error status indicators is being set to one).

If a change in state occurs during a transmission, the current block being output is to be completed before the next block is sent.

If any one or more status bits change “at the same time” then the progressive data block is output once only provided that it accurately reflects the current status and metering information of the link controller.

For example, the “Normal” status bit is set and the “Reset” and “Power Up” status bits are cleared at the same time then the block need only be transmitted once.

The recommended range of the time interval between the last byte of transmission of PDB1 and the first byte of transmission of PDB2 is from 20 to 40 milliseconds.

Note: The PDB1-PDB2 pair will have the same block sequence counter, i.e. any change of information in PDB1 causing the PDB1 block sequence counter to increment will automatically cause the PDB2 block sequence counter to increment to the same value. In this way it will be ensured that PDB1 and PDB2 are always synchronised and provide full status and metering information of the link controller at the time of the PDB1-PDB2 pair output.

Progressive Data Block 1 Structure

Information is to be encoded in packed BCD format except in cases where it is impractical to apply this technique e.g. Start of block and status bytes 1, 2 and 3.

Byte 1 (FF) - Start of block (this is a unique code and must not appear anywhere else in the block)

Byte 2 (10) - Progressive Data Block 1 Identifier

Byte 3 (02) - PDB1 version number Least Significant Digit (LSD) and LSD+1. The LSD is to be in the lower nibble.

Byte 4 (01) - PDB1 version number LSD+2 and Most Significant Digit (MSD). LSD+2 in the lower nibble.

Byte 5 (XX) - Block Sequence Counter. This counter is incremented only if any data in the block has been modified when compared to the previously transmitted block. That is, if the same block is being repeated the counter remains unchanged. BCD code is to be used. This will give a range of 0 to 99, which is automatically “wrapped around” to 0.

It is to be incremented synchronously with PDB2 but independently of any other blocks.

The counter is initialised to zero whenever a power up or reset takes place.

Byte 6 - GMID LSD and LSD+1. LSD in the lower nibble.

Byte 7 - GMID LSD+2 and LSD+3. LSD+2 in the lower nibble.

Byte 8 - GMID LSD+4 and MSD. LSD+4 in the lower nibble.

Byte 9 - 00 (Spare)

Byte 10 - 00 (Spare)

Byte 11 - Status byte 1 (non lockup)

#0 - Normal
#1 - Jackpot Hit * (see Note)
#2 - Reset
#3 - Power Up
#4 - Audit Mode
#5 - 0 (spare)
#6 - 0 (spare)
#7 - 0

Byte 12 - Status byte 2 (non lockup)

#0 - Gaming Machine Power Down
#1 - Meter Disconnect * (see Note)
#2 - Communication Failure
#3 - Configuration Change
#4 - 0 (spare)
#5 - 0 (spare)
#6 - 0 (spare)
#7 - 0

Byte 13 - Status byte 3 (lockup)

#0 - Logic Cage Open * (see Note)
#1 - Memory Error * (see Note)
#2 - Power Save
#3 - Test Mode
#4 - Manufacturer Specific Error (0 if not used)
#5 - Manufacturer Specific Error (0 if not used)
#6 - 0 (spare)
#7 - 0

Note: "*" indicates that more frequent (every 1.5 second) output of the PDB1-PDB2 pair is required when any of these status conditions is turned on.

Byte 14 - 00 (Spare)

Byte 15 - Progressive Levels Supported
(1 =01, 2 = 02, 3 = 03, 4 = 04)

Byte 16 - Set Increment Percentage Level 1 (Expressed in percentage, BCD. Right to decimal LSD and LSD+1. LSD in the lower nibble)

Byte 17 - Set Increment Percentage Level 1 (Right to decimal LSD+2 and LSD+3. LSD+2 in the lower nibble)

Byte 18 - Set Increment Percentage Level 1 (Right to decimal LSD+4 and LSD+5. LSD+4 in the lower nibble)

Byte 19 - Set Increment Percentage Level 1 (Left to decimal LSD and MSD. LSD in the lower nibble)

e.g. Set Increment Percentage = 1.987654%

Byte XX	54
Byte XX+1	76
Byte XX+2	98
Byte XX+3	01

Byte 20 - Set Increment Percentage Level 2 (format as for level 1)
.
Byte 23

Byte 24 - Set Increment Percentage Level 3 (format as for level 1)
.
Byte 27

Byte 28 - Set Increment Percentage Level 4 (format as for level 1)
.
Byte 31

Byte 32 - Total Theoretical Percentage Return (Expressed in percentage, BCD. Right to decimal LSD and LSD+1. LSD in the lower nibble.)
.
Byte 35 - Total Theoretical Percentage Return (Left to decimal LSD and MSD. LSD in the lower nibble)

Byte 36 - Number of machines communicating (Expressed in BCD. LSD and LSD+1. LSD in the lower nibble)

Byte 37 - Number of machines communicating (LSD+2 and MSD. LSD+2 in the lower nibble)

Byte 38 - 00 (Spare)

Byte 39 - Number of machines not communicating (Expressed in BCD. LSD and LSD+1. LSD in the lower nibble)

Byte 40 - Number of machines not communicating (LSD+2 and MSD. LSD+2 in the

lower nibble)

Byte 41 - 00 (Spare)

Byte 42 - Current Jackpot Value Level 1. Amount expressed in Dollars and Cents (Cents LSD and LSD+1). LSD in the lower nibble.

Byte 43 - Dollar LSD and LSD+1. LSD in the lower nibble.
.
Byte 46 - Dollar LSD+6 and MSD. LSD+6 in the lower nibble.

Example: Current Jackpot = $5432.98

Byte XX = 98
Byte XX+1 = 32
Byte XX+2 = 54
Byte XX+3 = 00
Byte XX+4 = 00

Byte 47 - Current Jackpot Value Level 2 (format as for level 1)
.
Byte 51

Byte 52 - Current Jackpot Value Level 3 (format as for level 1)
.
Byte 56

Byte 57 - Current Jackpot Value Level 4 (format as for level 1)
.
Byte 61

Byte 62 - Current Jackpot Win Progressive Level (1 =01, 2 = 02, 3 = 03, 4 = 04, 00 = no win) i.e. first waiting to be reset.

Byte 63 - Gaming Machine GMID of Current Jackpot Winning Machine (i.e. first waiting to be reset). LSD and LSD+1. LSD in the lower nibble.

Byte 64 - Gaming Machine GMID LSD+2 and LSD+3. LSD+2 in the lower nibble.

Byte 65 - Gaming Machine GMID LSD+4 and MSD. LSD+4 in the lower nibble.

Byte 66 - Current Jackpot Win (first waiting to be reset). Amount Expressed in Dollars and Cents (Cents LSD and LSD+1). LSD in the lower nibble.

Byte 67 - (Dollar LSD and LSD+1). LSD in the lower nibble.
.
Byte 70 - (Dollar LSD+6 and MSD). LSD+6 in the lower nibble.

Byte 71 - Number of jackpots waiting to be reset/cleared (Expressed in BCD. LSD and MSD. LSD in the lower nibble)

Byte 72 - Program identification 1. 8 ASCII characters. The most significant character is to be in byte 79. Unused bytes are to contain spaces (20H). Refer to section 2.2.6

“Firmware Identification” of this standard for further details.

.
Byte 79

Byte 80 - Program identification 2 (format as for Program Id 1)

.
Byte 87

Byte 88 - Program identification 3 (format as for Program Id 1)

.
Byte 95

Byte 96 - Program Identification 4 (format as for Program Id 1)

.
Byte 103

Byte 104 - 00 (spare)

.
Byte 126 - 00 (spare)

Byte 127 - Checksum lower nibble (0XH)

Byte 128 - Checksum upper nibble (X0H)

The PDB1 will have a total of 125 data bytes. A checksum is generated by modulo 2 addition applied to bytes 2 to 126. The checksum is to be split into two bytes each containing one nibble. i.e. 0Xh (checksum lower nibble) and X0h (checksum higher nibble) are respectively reported in bytes 127 and 128. This is required to avoid generating the unique start of block character (FF).

In the PDB1, the data is to be interpreted by the receiver depending on its position in the data stream. A time period of approximately 140 ms is required to complete the transmission of 128 bytes (9600bps).

The link controller must ensure that the transmission of the PDB1 is completed in a period not exceeding 200 ms. The timing will commence with the transmission of the first bit.

Progressive Data Block 2 Structure

Information is to be encoded in packed BCD format except in cases where it is impractical to apply this technique e.g. Start of block.

Byte 1 (FF) - Start of block (this is a unique code and must not appear anywhere else in the block)

Byte 2 (11) - Progressive Data Block 2 Identifier

Byte 3 (02) - PDB2 version number Least Significant Digit (LSD) and LSD+1. The LSD is to be in the lower nibble.

Byte 4 (01) - PDB2 version number LSD+2 and Most Significant Digit (MSD). LSD+2 in the lower nibble.

Byte 5 (XX) - Block Sequence Counter.

This two byte BCD coded counter is to be incremented, “wrapped around” to 0 and initialised to 0 synchronously with PDB1 but independently of any other blocks. (i.e. For each PDB1-PDB2 pair, the Block Sequence Counter of the PDB2 must have the same value as that of the PDB1.)

Byte 6 - GMID LSD and LSD+1. The LSD in the lower nibble.

Byte 7 - GMID LSD+2 and LSD+3. LSD+2 in the lower nibble.

Byte 8 - GMID LSD+4 and MSD. LSD+4 in the lower nibble.

Byte 9 - 00 (spare)

Byte 10 - 00 (spare)

Byte 11 - Reset Value Level 1. Amount Expressed in Dollars and Cents (Cents LSD and LSD+1). LSD in the lower nibble.

Byte 12 - Dollar LSD and LSD+1. LSD in the lower nibble.
.
Byte 15 - Dollar LSD+6 and MSD. LSD+6 in the lower nibble.
.
Example: Reset value = $5432.00

Byte XX = 00
Byte XX+1 = 32
Byte XX+2 = 54
Byte XX+3 = 00
Byte XX+4 = 00

Byte 16 - Reset Value Level 2 (format as for level 1)
.
Byte 20

Byte 21 - Reset Value Level 3 (format as for level 1)
.
Byte 25

Byte 26 - Reset Value Level 4 (format as for level 1)
.
Byte 30

Byte 31 - Jackpot Limit Level 1. Amount Expressed in Dollars and Cents (Cents LSD and LSD+1). LSD in the lower nibble.

Byte 32 - Dollar LSD and LSD+1. LSD in the lower nibble.
.
Byte 35 - Dollar LSD+6 and MSD. LSD+6 in the lower nibble.

Byte 36 - Jackpot Limit Level 2 (format as for level 1)
.

Byte 40

Byte 41 - Jackpot Limit Level 3 (format as for level 1)
.
Byte 45

Byte 46 - Jackpot Limit Level 4 (format as for level 1)
.
Byte 50

Byte 51 - Accrued Hidden Jackpot Value Level 1. Amount Expressed in Dollars and Cents (Cents LSD and LSD+1). LSD in the lower nibble.

Byte 52 - Dollar LSD and LSD+1. LSD in the lower nibble.
.
Byte 55 - Dollar LSD+6 and MSD. LSD+6 in the lower nibble.

Byte 56 - Accrued Hidden Jackpot Value Level 2 (format as for level 1)
.
Byte 60

Byte 61 - Accrued Hidden Jackpot Value Level 3 (format as for level 1)
.
Byte 65

Byte 66 - Accrued Hidden Jackpot Value Level 4 (format as for level 1)
.
Byte 70

Byte 71 - Number of jackpot resets Level 1 (LSD and LSD+1). LSD in the lower nibble.
.
Byte 75 - Number of jackpot resets Level 1 (LSD+8 and MSD). LSD+8 in the lower nibble.

Byte 76 - Number of jackpot resets Level 2 (format as for level 1)
.
Byte 80

Byte 81 - Number of jackpot resets Level 3 (format as for level 1)
.
Byte 85

Byte 86 - Number of jackpot resets Level 4 (format as for level 1)
.
Byte 90

Byte 91 - Total value of all jackpots won Level 1. Amount Expressed in Dollars and Cents (Cents LSD and LSD+1). LSD in the lower nibble.

Byte 92 - Dollar LSD and LSD+1. LSD in the lower nibble.
.

Byte 95 - Dollar LSD+6 and MSD. LSD+6 in the lower nibble.

Byte 96 - Total value of all jackpots won Level 2 (format as for level 1)
.
Byte 100

Byte 101 - Total value of all jackpots won Level 3 (format as for level 1)
.
Byte 105

Byte 106 - Total value of all jackpots won Level 4 (format as for level 1)
.
Byte 110

Byte 111 - Total turnover accumulated from all AGMs since start up. Amount Expressed in Dollars and Cents (Cents LSD and LSD+1). LSD in the lower nibble.

Byte 112 - Dollar LSD and LSD+1. LSD in the lower nibble.
.
Byte 115 - Dollar LSD+6 and MSD. LSD+6 in the lower nibble.

Byte 116 - Total turnover accumulated from all AGMs since the last configuration change. Amount expressed in dollars and cents (cents LSD and LSD+1). LSD in the lower nibble.

Byte 117 - Dollar LSD and LSD+1. LSD in the lower nibble.
.
Byte 120 - Dollar LSD+6 and MSD. LSD+6 in the lower nibble.

Byte 121 - 00 (spare)
.
Byte 126 - 00 (spare)

Byte 127 - Checksum lower nibble (0XH)

Byte 128 - Checksum upper nibble (X0H)

The PDB2 will have a total of 125 data bytes. A checksum is generated by modulo 2 addition applied to bytes 2 to 126. The checksum is to be split into two bytes each containing one nibble. i.e. 0Xh (checksum lower nibble) and X0h (checksum higher nibble) are respectively reported in bytes 127 and 128. This is required to avoid generating the unique start of block character (FF).

In the PDB2, the data is to be interpreted by the receiver depending on its position in the data stream. A time period of approximately 140 ms is required to complete the transmission of 128 bytes (9600 bps).

The link controller must ensure that the transmission of the PDB2 is completed in a period not exceeding 200 ms. The timing will commence with the transmission of the first bit.

Manufacturer Data Block (MDB)

3.4.3 The MDB can be transmitted in according to the requirements of the manufacturer. However, the transmission of the MDB must not interfere with the transmission of the progressive data block as outlined by the transmission requirements above.

The transmission of the MDB must not compromise the security of the link controller in any way.

The Authority must be supplied with complete details of the block for evaluation, and approval must be given prior to use.

Manufacturer Data Block Structure

Byte 1 (FF) - Start of block (unique byte)

Byte 2 (23) - Manufacturer Data Block Identifier

Byte 3 (00) - MDB version number Least Significant Digit (LSD) and LSD+1. The LSD is to be in the lower nibble. (The MDB version number is to be determined by manufacturer, FF is not to be used).

Byte 4 (01) - MDB version number LSD+2 and Most Significant Digit (MSD). LSD+2 in the lower nibble.

Byte 5 - GMID LSD and LSD+1. LSD in the lower nibble.

Byte 6 - GMID LSD+2 and LSD+3. LSD+2 in the lower nibble.

Byte 7 - GMID LSD+4 and MSD. LSD+4 in the lower nibble.

Byte 8 - Manufacturer Specific
.
. (FF is not to be used in any of these bytes)
.
Byte 126 - Manufacturer Specific

Byte 127 - Checksum lower nibble (0XH)

Byte 128 - Checksum upper nibble (X0H)

The MDB will have a total of 125 data bytes. A checksum is generated by modulo 2 addition applied to bytes 2 to 126. The checksum is to be split into two bytes each containing one nibble. i.e. 0Xh (checksum lower nibble) and X0h (checksum higher nibble) are respectively reported in bytes 127 and 128. This is required to avoid generating the unique start of block character (FF).

In the MDB, the data is to be interpreted by the receiver depending on its position in the data stream. A time period of approximately 140 ms is required to complete the transmission of 128 bytes (9600 bps).

The link controller must ensure that the transmission of each MDB is completed in a period not exceeding 200 ms. The timing will commence with the transmission of the first bit.

Configuration Data Block (CDB)

3.4.4 The CDB is defined to output the complete configuration information of the LPJS. The block will output details such as GMID, Base Credit Value and Turnover accumulated for each AGM connected.

The data is output in the increasing order of gaming machine GMID. Information about ten machines can be included in one block.

Where more than one block is required to transmit information about the gaming machines connected, the different blocks are distinguished using a Configuration Block Identifier (Byte 2) and a Group Identifier (Byte 3).

The CDB(s) is transmitted by the link controller whenever (also see Note below):

(i) A status change corresponding to the Audit Mode (entry and exit), Configuration Change or link controller Logic Cage Access (open and close). The CDB is output when the status condition is turned on and off (i.e. low level to high level [0 - 1] and high level to low level [1 - 0] transition of these status bits.

(ii) Any power up or reset procedure. This condition is necessary because a reset or power up may be performed a number of times without the status bits being cleared from the previous occasion.

(iii) A continuous period of 60 minutes (+/- 6 minutes) has elapsed since the last transmission.

If a change in state occurs during a transmission, the current block being output is to be completed before the next block is sent.

Note:

A complete set of the CDBs should be output in cases of Audit Mode Entry, Configuration Change Detected and link controller Logic Cage Access Open. For example, if the complete set of the CDBs' output on the Audit Mode entry condition is not completed by the time the next PDB1-PDB2 pair is due in 1.5 seconds, the remaining CDBs' output should be postponed and to be completed before the "exit" condition (the end of the entry condition). A new PDB1-PDB2 pair and a new set of the CDBs are to be output on the "exit" condition.

Configuration Data Block Structure

Information is to be encoded in packed BCD format except in cases where it is impractical to apply this technique e.g. Start of block or Configuration data block identifier.

Byte 1 (FF) - Start of block (this is a unique code and must not appear anywhere else in the block)

Byte 2 (30 - 3F) - Configuration Data Block Identifier

Byte 3 (00 - 99) - Group number Identifier (For each Configuration Data Block Identifier, there can be 100 group identifiers)

Byte 4 (02) - CDB version number Least Significant Digit (LSD) and LSD+1. The LSD is to be in the lower nibble.

Byte 5 (01) - CDB version number LSD+2 and Most Significant Digit (MSD). LSD+2 in the lower nibble.

Byte 6 (XX) - Block Sequence Counter. This counter is incremented only if any data in the block has been modified when compared to the previously transmitted block. i.e If the same block is being repeated the counter remains unchanged. BCD code is to be used. This will give a range of 0 to 99 which is automatically “wrapped around” to 0.

It is incremented independently of other blocks.

The counter is initialised to zero whenever a power up or reset takes place.

Byte 7 - Link Controller GMID LSD and LSD+1. LSD in the lower nibble.

Byte 8 - Link Controller GMID LSD+2 and LSD+3. LSD+2 in the lower nibble.

Byte 9 - Link Controller GMID LSD+4 and MSD. LSD+4 in the lower nibble.

Byte 10 - 00 (spare)

Byte 11 - AGM 1 GMID LSD and LSD+1. LSD in the lower nibble.

Byte 12 - AGM 1 GMID LSD+2 and LSD+3. LSD+2 in the lower nibble.

Byte 13 - AGM 1 GMID LSD+4 and MSD. LSD+4 in the lower nibble.

Byte 14 - AGM 1 Base Credit Value (Expressed in units of cents, BCD. LSD and LSD+1. LSD in the lower nibble)

Byte 15 - AGM 1 Base Credit Value (LSD+2 and MSD. LSD+2 in the lower nibble)

Byte 16 - AGM 1 turnover accumulated. Amount Expressed in Dollars and Cents (Cents LSD and LSD+1). LSD in the lower nibble.

Byte 17 - Dollar LSD and LSD+1. LSD in the lower nibble.

.

Byte 20 - Dollar LSD+6 and MSD. LSD+6 in the lower nibble.

Byte 21 - AGM 2 GMID (format as for AGM 1)

.

Byte 23

Byte 24 - AGM 2 Base Credit Value (format as for AGM 1)

.

Byte 25

Byte 26 - AGM 2 turnover accumulated (format as for AGM 1)

.

Byte 30

Byte 31 - AGM 3 GMID (format as for AGM1)

.

Byte 33

Byte 34 - AGM 3 Base Credit Value (format as for AGM1)

.

Byte 35

Byte 36 - AGM 3 turnover accumulated (format as for AGM 1)
.
Byte 40

Byte 41 - AGM 4 GMID (format as for AGM1)
.
Byte 43

Byte 44 - AGM 4 Base Credit Value (format as for AGM 1)
.
Byte 45

Byte 46 - AGM 4 turnover accumulated (format as for AGM 1)
.
Byte 50

Byte 51 - AGM 5 GMID (format as for AGM1)
.
Byte 53

Byte 54 - AGM 5 Base Credit Value (format as for AGM 1)
.
Byte 55

Byte 56 - AGM 5 turnover accumulated (format as for AGM 1)
.
Byte 60

Byte 61 - AGM 6 GMID (format as for AGM1)
.
Byte 63

Byte 64 - AGM 6 Base Credit Value (format as for AGM 1)
.
Byte 65

Byte 66 - AGM 6 turnover accumulated (format as for AGM 1)
.
Byte 70

Byte 71 - AGM 7 GMID (format as for AGM1)
.
Byte 73

Byte 74 - AGM 7 Base Credit Value (format as for AGM 1)
.
Byte 75

Byte 76 - AGM 7 turnover accumulated (format as for AGM 1)
.
Byte 80

Byte 81 - AGM 8 GMID (format as for AGM1)
.
Byte 83

Byte 84 - AGM 8 Base Credit Value (format as for AGM 1)
.
Byte 85

Byte 86 - AGM 8 turnover accumulated (format as for AGM 1)
.
Byte 90

Byte 91 - AGM 9 GMID (format as for AGM1)
.
Byte 93

Byte 94 - AGM 9 Base Credit Value (format as for AGM 1)
.
Byte 95

Byte 96 - AGM 9 turnover accumulated (format as for AGM 1)
.
Byte 100

Byte 101 - AGM 10 GMID (format as for AGM 1)
.
Byte 103

Byte 104 - AGM 10 Base Credit Value (format as for AGM 1)
.
Byte 105

Byte 106 - AGM 10 turnover accumulated (format as for AGM 1)
.
Byte 110

Byte 111 - 00 (Spare)

Byte 112 - 00 (Spare)

Byte 113 - AGM Status byte 1
0 - not communicating
1 - communicating

#0 - AGM 1
#1 - AGM 2
#2 - AGM 3
#3 - AGM 4

#4 - AGM 5
#5 - AGM 6
#6 - 0 (spare)
#7 - 0

Byte 114 - AGM Status byte 2

#0 - AGM 7
#1 - AGM 8
#2 - AGM 9
#3 - AGM 10
#4 - 0 (spare)
#5 - 0 (spare)
#6 - 0 (spare)
#7 - 0

Byte 115 - 00 (spare)
.
Byte 126 - 00 (spare)

Byte 127 - Checksum lower nibble (0XH)

Byte 128 - Checksum upper nibble (X0H)

The CDB will have a total of 125 data bytes. A checksum is generated by modulo 2 addition applied to bytes 2 to 126. The checksum is to be split into two bytes each containing one nibble. i.e. 0Xh (checksum lower nibble) and X0h (checksum higher nibble) are respectively reported in bytes 127 and 128. This is required to avoid generating the unique start of block character (FF).

In the CDB the data is to be interpreted by the receiver depending on its position in the data stream. A time period of approximately 140 ms is required to complete the transmission of 128 bytes at 9600 bps.

The link controller must ensure that the transmission of the CDB is completed in a period not exceeding 200 ms. The timing will commence with the transmission of the first bit.

The configuration details of ten gaming machines can be included in one data block (128 bytes). The link controller should output as many CDBs as required to cover all the AGMs connected to the link. Apart from the block identifier (byte 2) and the group identifier (byte 3), the first ten bytes should remain the same in all CDBs.

The group identifier is to be incremented (00 - 99) in successive CDBs, and then if required the block identifier is to be incremented (30 - 3F) until details of all the connected AGMs are output.

Each block identifier can have up to 100 group identifiers, thereby details of 1000 gaming machines can be output under a unique block identifier.

The CDBs are output in a sequence starting with the information about AGM 1 to the last AGM connected to the link in an ascending order of the GMID. If the last CDB does not have enough machine information to complete a data block (128 bytes), the block is to be padded with “00”.

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