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Product Whitepaper

iBonus Terminal Main Functions

iBonus Terminal is the heart of the loyalty operation. It compactly contains an embedded web server, journal database with built-in software applications that operates independently without the need of an extra PC. Operation is carried out using a keypad for input and a built-in smart card reader to transfer information to and from the Member Card. Transaction records stored in the Terminal can be collected by iBonus Server software through TCP/IP network.



Issuing new Member Cards

New Member Cards are issued by first presenting a Master Card supplied by the factory to assign a Company Code and a range of unique Card ID's. The Company Code is used to identify a particular operator. Member Cards will not be able to operate on Terminals if the Company Code of the Member Card is different from that of the Terminals.

Issuing staff cards

Staff Card is basically a conversion of Brand New Card (Newly formatted card) to Staff Card. Staff Card login is required for the Terminal to accept the Member Card operation such as addition and deduction of bonus points. Staff Card logout is recommended when the staff is not attending the Terminal. Staff login and logout action are recorded as transaction in the Terminal, and they provide trails for auditing purpose.

Doing Card Transactions

iBonus Terminal provides generic transaction types for performing calculations of stored values, such as, Purchase, Reload, Bonus Point Addition and Redemption. The behavior of all transactions types are consistent with the combinations of card status, system setting and system status, like, decryption keys, expiry settings, decimal mode, bonus rate, blacklist, card sector usage, card value limits. Without the need of redeveloping the sophisticated algorithm behind, any one who is new to smart card systems can make use of them and quickly deploy a loyalty system.

Sending Transactions back to iBonus Server

After finishing a transaction, such as adding bonus points, redemptions, staff login, the transaction record is stored in the Terminal's transaction queue. There are 5,000 buffers in the transaction queue. The records in the transaction queue are sent to server as soon as the network connection is ready. The terminal stops accepting transaction when the queue is full.

Advanced Card Handling

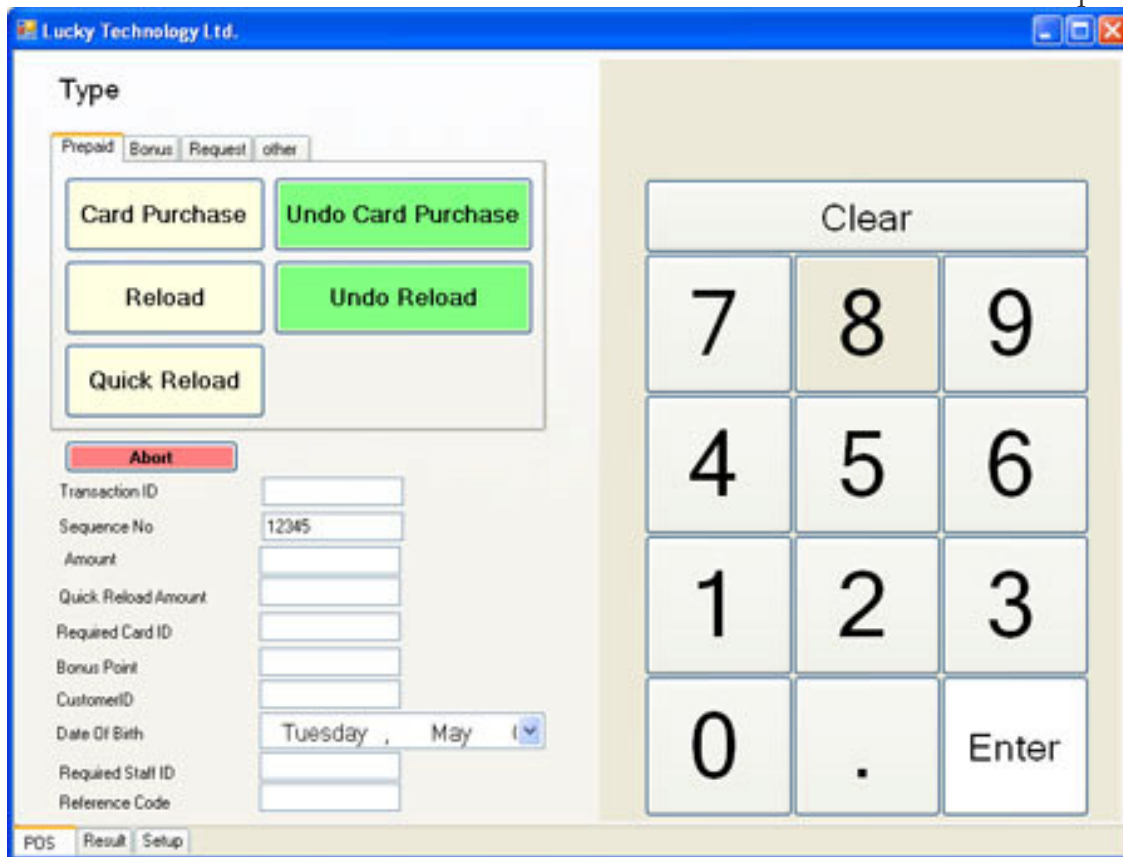
iBonus Terminal provides advanced card handling function which allows card expiry date extension (Card Renew), Lost card replacement and Corrupted card repair at Terminals of any branches. It saves up the establishment of central call center for card control purpose.

Receipt Reprint and Auto Reprint

When printer is connected, a receipt is printed whenever any transaction is made. Press the button A if you wish to reprint the receipt of the last transaction. If auto reprint is on, two receipts will be print for every transaction.

Connects to POS System (Cash Machines)

iBonus System unifies the smart card system with the POS system. All the transaction types in iBonus Terminal are accessible by POS through RS-232 serial port. Coming with a ready made Windows based API, all the generic transaction set and advanced card handling functions can be accessed with ease. In addition, with the help of read member card and read staff card functions, POS can command the most suitable transaction based on the POS side member profile.



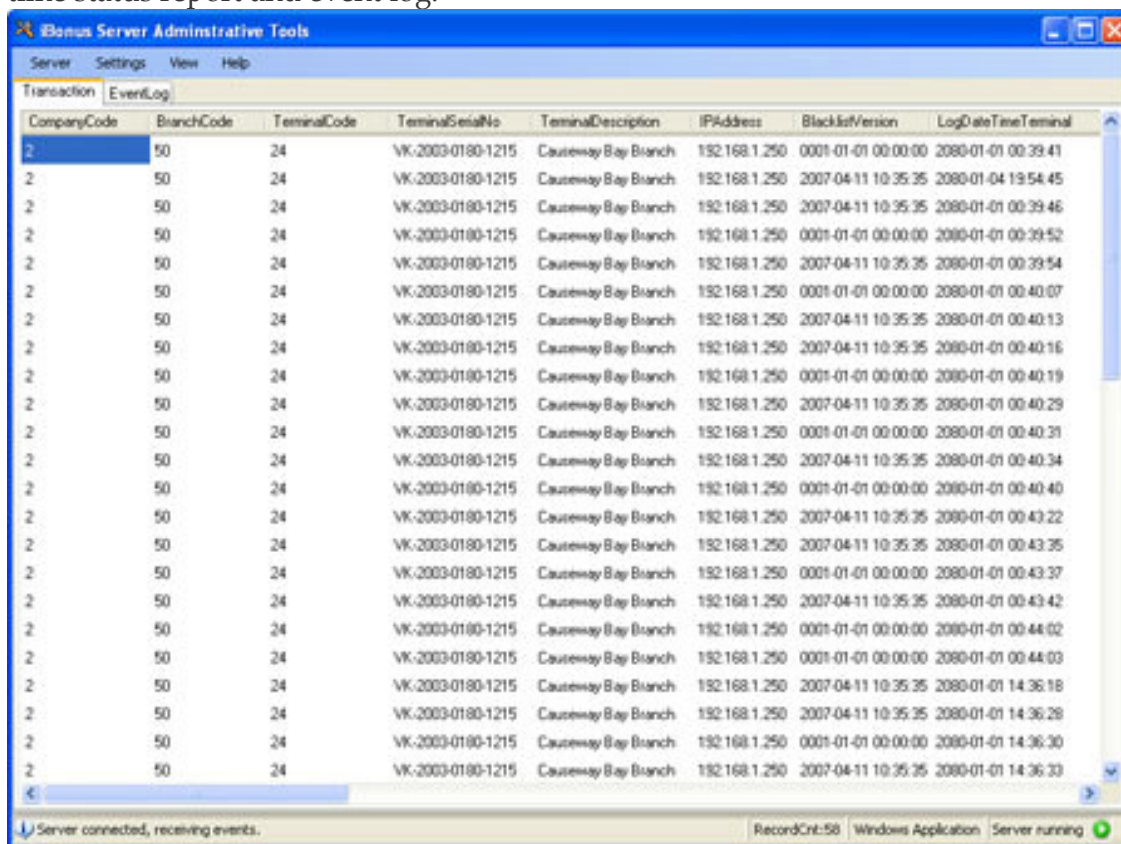
iBonus Server Overview

Overview

iBonus Server is bundled for free with iBonus Terminal. It is a windows based software, which collects transaction records from Terminals and stores them in Microsoft Access or Microsoft SQL Server 2005, and manages the card renew, repair and replace queries from all the Terminals.

Easy System Administration

System administrator can conveniently monitor and exports the status of all Terminals thru a real time status report and event log.



The screenshot shows the 'iBonus Server Administrative Tools' window. It has a menu bar with 'Server', 'Settings', 'View', and 'Help'. Below the menu bar are two tabs: 'Transaction' and 'EventLog'. The 'Transaction' tab is active, displaying a table with the following columns: CompanyCode, BranchCode, TerminalCode, TerminalSerialNo, TerminalDescription, IPAddress, BlacklistVersion, and LogDateTimeTerminal. The table contains 20 rows of data, all with CompanyCode '2' and TerminalDescription 'Cauteway Bay Branch'. The status bar at the bottom indicates 'Server connected, receiving events.', 'RecordCnt:50', 'Windows Application', and 'Server running'.

CompanyCode	BranchCode	TerminalCode	TerminalSerialNo	TerminalDescription	IPAddress	BlacklistVersion	LogDateTimeTerminal
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:39:41
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-04 19:54:45
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:39:46
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:39:52
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:39:54
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:40:07
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:40:13
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:40:16
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:40:19
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:40:29
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:40:31
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:40:34
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:40:40
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:43:22
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:43:35
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:43:37
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 00:43:42
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:44:02
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 00:44:03
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 14:36:18
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 14:36:28
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	0001-01-01 00:00:00	2080-01-01 14:36:30
2	50	24	VK-2003-0180-1215	Cauteway Bay Branch	192.168.1.250	2007-04-11 10:35:35	2080-01-01 14:36:33

Basic Reporting

Reporting functions are provided. Administrator can apply filters and grouping on member info, branch, terminal and transaction type. to make query on iBonus Database. Administrator can find out at what time, what kind of customers make purchase the most frequently. All result can be exported to Microsoft Excel .csv file for further analysis.

iBonus Report

File Check Help

Date Time Member Member Info Terminal Transaction Type

Time

From: 23 May 2007 04:19:02 PM Quick Date: May, 2007

To: 23 May 2007 04:19:02 PM

Period: None

Summary Group By

Date

Card ID

Staff ID

Branch Code

Terminal Serial No.

Item Description

Record View Count: 1000

Go

TerminalSerialNo	BranchCode	TerminalCode	IPAddress	TerminalDescription	Time Last Visit	Time Last Transaction	Terminal Status
VK-2003-016A-1234	30	78	192.168.1.252	Mong Kok Branch	4/10/2007 1:51 PM	4/10/2007 1:11 PM	Active
VK-2003-0180-1215	50	24	192.168.1.250	Causeway Bay Branch	4/10/2007 1:46 PM	4/10/2007 1:11 PM	Active
VK-2003-01A8-1108	15	100	192.168.1.254	iBonus Terminal System	5/23/2007 1:10 PM	5/23/2007 1:05 PM	Active
VK-2003-018D-1239	15	88	192.168.1.65	Tsim Sha Tsui Branch	5/2/2007 11:28 AM	5/2/2007 11:20 AM	Active
VK-2003-0229-12EF	155	100	192.168.1.152	iBonus Terminal System	5/2/2007 11:33 AM	5/2/2007 11:20 AM	Active
VK-2003-19A8-1239	158	101	192.168.1.153	Beijing Branch	5/2/2007 11:33 AM	5/2/2007 11:20 AM	Active
VK-2003-19A8-1240	159	101	192.168.1.153	Shanghai Branch	5/2/2007 11:33 AM	5/2/2007 11:20 AM	Active
VK-2003-19A8-1241	160	101	192.168.1.153	London Branch	5/2/2007 11:33 AM	5/2/2007 11:20 AM	Active

Transactions Type Summary Terminal Status

Records:

iBonus Report

File Check Help

Date Time Member Member Info Terminal Transaction Type

Card ID:

Customer ID:

Ref Code:

Age Range
Age from: To:

Expiry Date

Before: Friday, May 25, 2007

After: Friday, May 25, 2007

No Expiry

Date Of Birth

From: Friday, May 25, 2007

To: Friday, May 25, 2007

Summary Group By

Date

Card ID

Staff ID

Branch Code

Terminal Serial No.

Item Description

Record View Count: 1000

Go

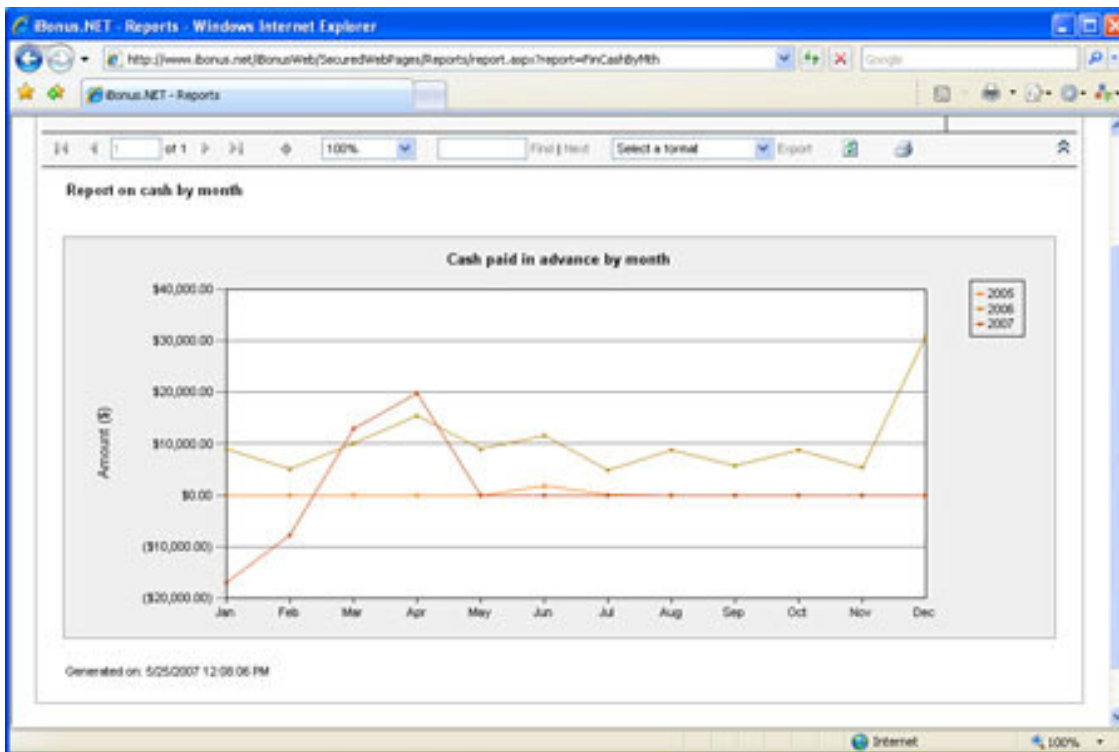
TransactionTypeName	MemberInfo	MemberInfo	RCDID	TerminalSerialNo	CardID	CustomerID	LogDateTimeTerminal	LogDateTimeTer
Issue Staff Card	0		1	VK-2003-0180-1215	150	0	2080-01-01 00:39:41	20800101
Request Message List	0		2	VK-2003-0180-1215	0	0	2080-01-04 19:54:45	20800104
Staff Login	0		3	VK-2003-0180-1215	150	0	2080-01-01 00:39:46	20800101
Staff Logout	0		4	VK-2003-0180-1215	150	0	2080-01-01 00:39:52	20800101
Staff Login	0		5	VK-2003-0180-1215	150	0	2080-01-01 00:39:54	20800101
Staff Logout	0		6	VK-2003-0180-1215	150	0	2080-01-01 00:40:07	20800101
Staff Login	0		7	VK-2003-0180-1215	150	0	2080-01-01 00:40:13	20800101
Card Purchase	15457		8	VK-2003-0180-1215	133	10005	2080-01-01 00:40:16	20800101

Transactions Type Summary

RecordCount:61

iBonus Report (Sample Code)

By using iBonus Report (Sample Code), web based report can be easily deployed. Please check out below for more detail



Supports Latest Microsoft .NET technology

Written on Microsoft .NET technology, iBonus Server can be installed in any Windows PC and collects transaction records from multiple Terminals through computer network. Microsoft Access .MDB or Microsoft SQL Server 2005 can be selectively chosen for transaction storage.

Maintains Advanced Card Control Security

iBonus Server is part which manages the security of all advanced card control functions. It makes sure that every card renewal, repair and replace operation to be done securely among all distributed Terminals without compromising the system integrity.

Manages Card Blacklist

iBonus Server maintains a blacklist of the member card and staff card. iBonus Terminal download the blacklist periodically. Having a serial number match with an entry on the blacklist, the card is rejected at the Terminal.

Unify Settings on Terminals

Some settings can be adjusted at server. Terminal will follow the setting defined in server. Settings include:

- Expiry Mode Settings (Can be overridden by terminals.)

- Request and blacklist downloading period

7 Reasons to choose iBonus Terminal

- Very easy to deploy
- Complete transactions types and card control features
- Work with your cashier and receipt printer
- High Scalability
- High Reliability
- High Security
- Localizable
- Cost effective

Very easy to deploy

Unattended Server Design

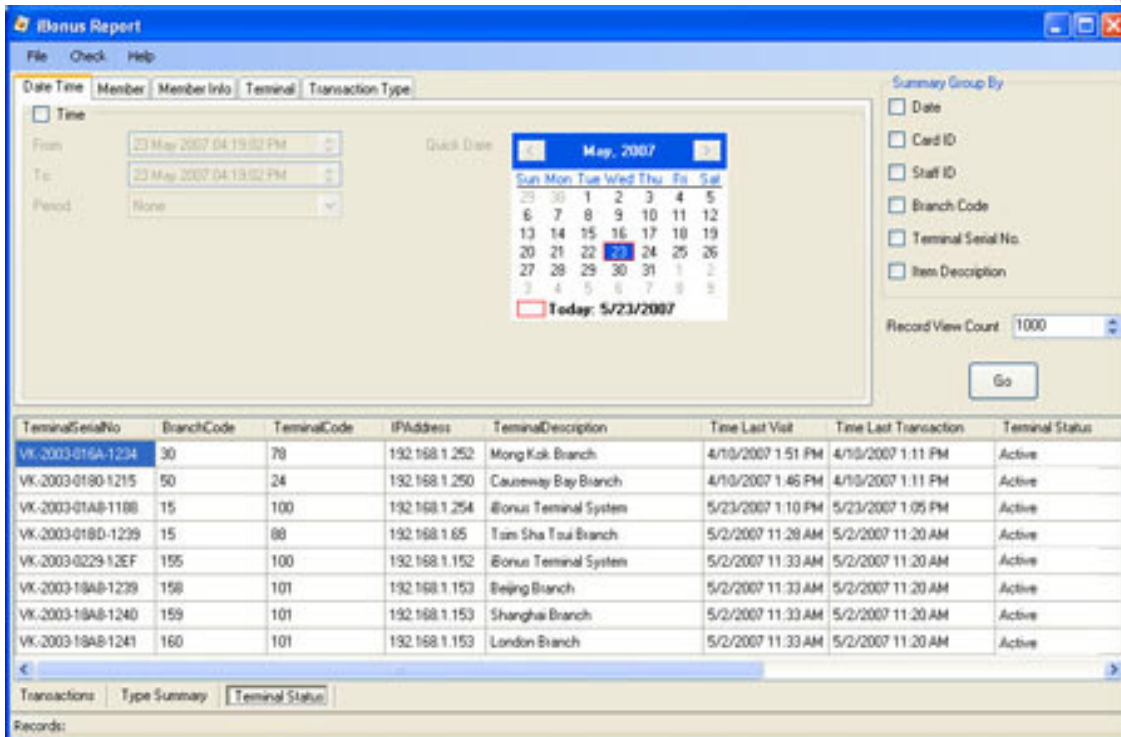
When deploying iBonus Terminal at each outlet, it only needs to enter the Server IP and Server port at each Terminal. iBonus Server automatically register the Terminal when the Terminal connects to the server the first time. Deregistration is also to be done at Terminal side. The setup process can be done even there is no one attending the iBonus Server. It saves up the man power during deployment.

Dynamic Virtual IP Operation

Every TCP/IP connections between iBonus Terminal and iBonus Server is initiated at Terminal side. With the simplicity of the protocol, Terminals can work perfectly with just a dynamic virtual IP. Port forwarding at the Terminal side is not necessary. It saves the effort on configuring the tricky router settings.

System Health Monitoring

The system health can be monitored at server side. Administrator can make use of the information shown at the monitor screen to track the Terminal which needs maintenance.



iBonus Report

File Check Help

Date Time Member Member Info Terminal Transaction Type

Time

From: 23 May 2007 04:19:02 PM Quick Date: May, 2007

To: 23 May 2007 04:19:02 PM

Period: None

Summary Group By:

- Date
- Card ID
- Staff ID
- Branch Code
- Terminal Serial No.
- Item Description

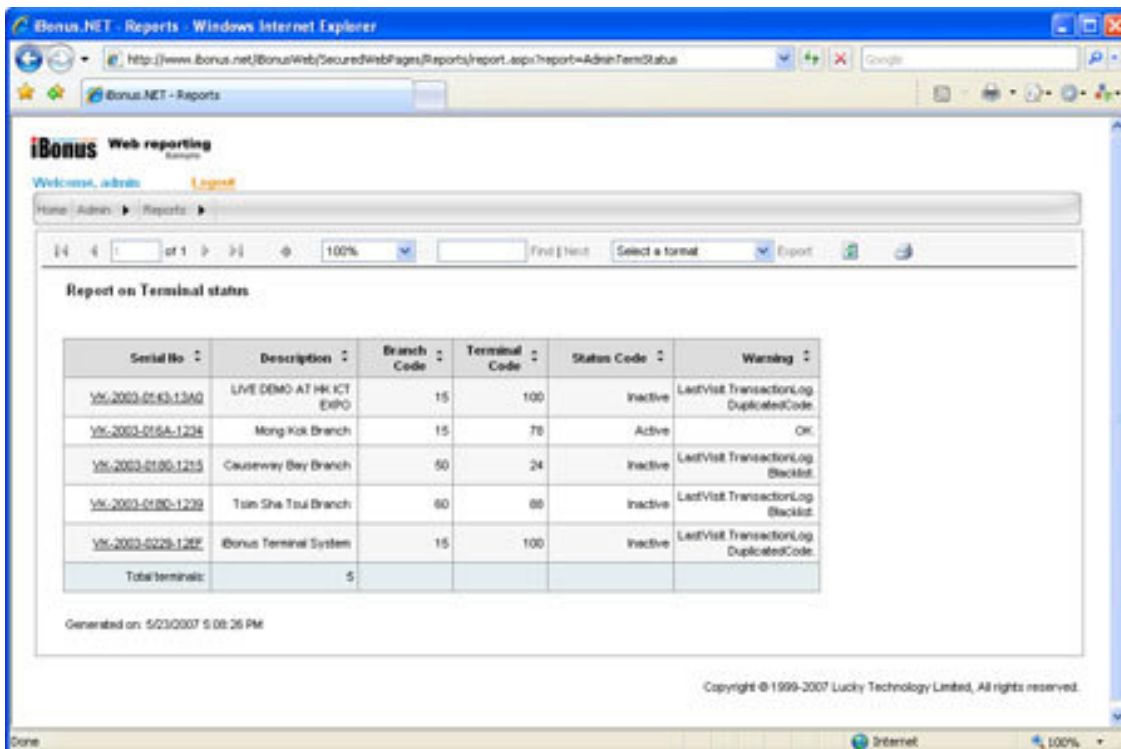
Record View Count: 1000

Go

TerminalSerialNo	BranchCode	TerminalCode	IPAddress	TerminalDescription	Time Last Visit	Time Last Transaction	Terminal Status
VK-2003-016A-1234	30	78	192.168.1.252	Mong Kok Branch	4/10/2007 1:51 PM	4/10/2007 1:11 PM	Active
VK-2003-0180-1215	50	24	192.168.1.250	Causeway Bay Branch	4/10/2007 1:46 PM	4/10/2007 1:11 PM	Active
VK-2003-01A8-1108	15	100	192.168.1.254	iBonus Terminal System	5/23/2007 1:10 PM	5/23/2007 1:05 PM	Active
VK-2003-0180-1239	15	88	192.168.1.65	Tsim Sha Tsui Branch	5/2/2007 11:28 AM	5/2/2007 11:20 AM	Active
VK-2003-0229-12EF	155	100	192.168.1.152	iBonus Terminal System	5/2/2007 11:33 AM	5/2/2007 11:20 AM	Active
VK-2003-19A8-1239	158	101	192.168.1.153	Beijing Branch	5/2/2007 11:33 AM	5/2/2007 11:20 AM	Active
VK-2003-19A8-1240	159	101	192.168.1.153	Shanghai Branch	5/2/2007 11:33 AM	5/2/2007 11:20 AM	Active
VK-2003-19A8-1241	160	101	192.168.1.153	London Branch	5/2/2007 11:33 AM	5/2/2007 11:20 AM	Active

Transactions | Type Summary | Terminal Status

Records:



iBonus Web reporting

Home Admin Reports

Report on Terminal status

Serial No	Description	Branch Code	Terminal Code	Status Code	Warning
VK-2003-0143-13A0	LIVE DEMO AT HK ICT EXPO	15	100	Inactive	LastVisit TransactionLog DuplicatedCode
VK-2003-016A-1234	Mong Kok Branch	15	78	Active	OK
VK-2003-0180-1215	Causeway Bay Branch	50	24	Inactive	LastVisit TransactionLog Blacklist
VK-2003-0180-1239	Tsim Sha Tsui Branch	60	88	Inactive	LastVisit TransactionLog Blacklist
VK-2003-0229-12EF	iBonus Terminal System	15	100	Inactive	LastVisit TransactionLog DuplicatedCode
Total terminals:		5			

Generated on: 5/23/2007 5:08:26 PM

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Complete transactions types and card control features

Generic Transaction Set

iBonus Terminal sets the standard of transaction types of prepaid and loyalty system. It provides generic transaction types for performing calculations of stored values, such as, prepaid, bonus point and accumulated spending balance. The behavior of all transactions types are consistent with the combinations of card status, system setting and system status, like, decryption keys, expiry settings, decimal mode, bonus rate, blacklist, card sector usage and card value limits. For example, transaction limit is defined in Staff Card. It limits the maximum prepaid transaction amount of all money transactions. Blacklisted card is detected and expiry date in Last Visit mode is extended in all operations. Without the need of redeveloping the complex and sophisticated algorithm behind, system integrators can make use of them and quickly deploy a loyalty system.

Table of Generic Transaction Types

Name	Description	Member Card Calculations	Function Available at
Card Purchase	Purchasing goods by card stored value while adding bonus values	- Prepaid Balance + Bonus Points + Accumulated Purchase	Prepaid Mode
Cash Purchase	Purchasing goods by cash while adding bonus point.	+ Bonus Points + Accumulated Purchase	Bonus Mode
Reload	Adding stored value	+ Prepaid Balance	Prepaid Mode
Redeem	Exchanging bonus points for gifts	- Bonus Points	Bonus Mode
Quick Reload	Do Reload and Card Purchase at the same time.	+ Reload amount to Prepaid Balance Then - Prepaid Balance + Bonus Points + Accumulated Purchase	Prepaid Mode

Undo Card Purchase	Undoing a Card Purchase operation. (Staff Card reconfirmation is required.)	+ Prepaid Balance - Bonus Points - Accumulated Purchase	Prepaid Mode
Undo Reload	Undoing a Reload operation (Staff Card reconfirmation is required.)	- Prepaid Balance	Prepaid Mode
Undo Cash Purchase	Undoing a Cash Purchase operation. (Staff Card reconfirmation is required.)	- Bonus Points - Accumulated Purchase	Bonus Mode
Undo Redeem	Undoing a Redeem operation. (Staff Card reconfirmation is required.)	+ Bonus Points	Bonus Mode
Carry Forward	Setting a new member card to certain values	In prepaid mode, set Bonus Points and Prepaid Balance In Bonus mode, set only Bonus Points	Prepaid Mode and Bonus Mode

Advanced Card Control

Lost card replacement, expiry date extension and card repair can be done at any branches.

Real Time Balance Checking

Members can enjoy real time balancing by simply presenting their card to iBonus Terminal. If the Terminal is connected to POS, the balance is also sent to POS.

Receipt Reprint and Auto Reprint

When printer is connected, a receipt is printed whenever any transaction is made. Press the button A if you wish to reprint the receipt of the last transaction. If auto reprint is on, two receipts will be Print for every transaction.

Customizable Customer ID

Card issuing company may like their card number to be in their own format. Administrator can customize the customer ID of each member card. In case of customers losing their member card, the replaced member card can have the same customer ID. The range of customer ID is 0 – 9999999999999999.

4 Expiry Date Calculation Modes

There are 4 different choices of Member Card expiry schemes:

1. Always Valid
In scheme 1, member card never expires. This is simple. However card replace and blacklisting feature cannot be used.
2. Fixed Month
In scheme 2, Fixed Month, you simply decide which month of the year you want the Member Card to be expired. For example, the current month is February and the expiry month is set as January. The Member Card will not be able to use in January of next year.
3. Relative to Card Initializing Date
In scheme 3, Relative to Card Initializing Date, you have to define the number of months relative to the Member Card Initializing Date. For example, if you set 12 months and the Member Card is initialized on January 2002, the Member Card will be expired on January 2003.
4. Automatic expiry extension based on the last visit.
In scheme 4, Automatic Expiry Extension Based on the Last Visit, the expiry date will be automatically extended by the administrator defined periods (months) if Members purchase, redeem, or reload before the card expires.

Staff Card Reconfirmation

Staff card is needed to be presented to the Terminal again for some transaction types which are less frequently used. It will ensure staff intention on using those transaction types.

Staff Card Transaction Auditing

Staff Card ID is logged for every transaction. It will facilitate auditing at the server report. iBonus Report can summarize the amount collected by each individual staff.

Maximum Prepaid Limit

iBonus Master Card defines the maximum prepaid amount to be stored in each card. This safety measure enhances the safety for the card users.

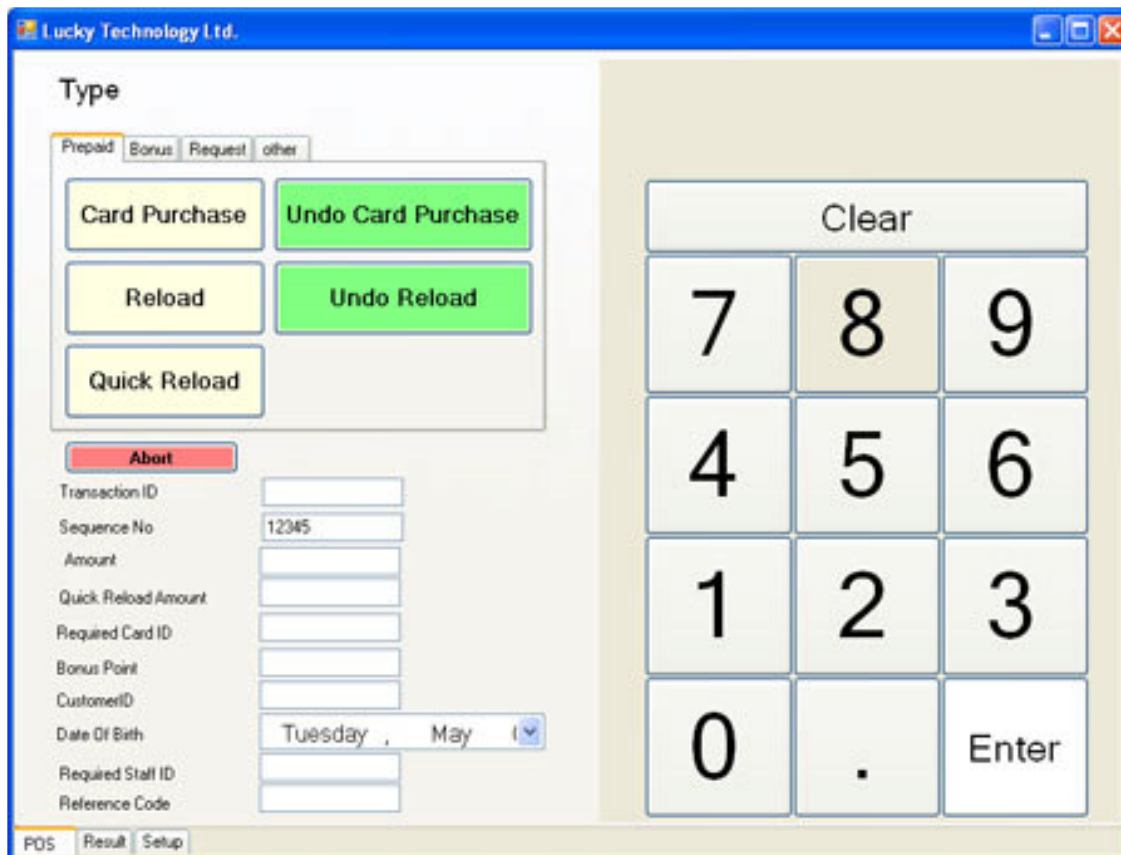
Maximum Transaction Limit

Maximum transaction limit must be defined in each staff card. All transaction that alters the accumulated spending or prepaid balance is limited by this value.

Work with your cashier and receipt printer

Full Point of Sales (POS) Functions Coverage

iBonus System unifies the smart card system with the POS system. All the transaction types in iBonus Terminal are accessible by POS through RS-232 serial port. Coming with a ready made Windows based API, all the generic transaction set and advanced card handling functions can be accessed with ease. In addition, with the help of read member card and read staff card functions, POS can command the most suitable transaction based on the POS side member profile.



Receipt Printer Connectivity

When printer is connected, a receipt is printed whenever any transaction is made. Press the button A if you wish to reprint the receipt of the last transaction. If auto reprint is on, two receipts will be print for every transaction.

iBonus Terminal generally work with printer with the following specifications:

- Connector: Parallel port
- Protocol: ESC/POS
- Paper Width: 42 Characters per line

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High Scalability

Microsoft SQL Server 2005 support

iBonus Server also connects to Microsoft SQL Server 2005 through ADO .Net technology. For a large deployment with sophisticated reporting or clusters for database, Microsoft SQL Server 2005 can fit in to such purpose. Also by using the reporting service feature in SQL Server 2005, iBonus Reports – a web based report can be leveraged. The iBonus System instantly becomes a hub for generating sales a financial report centre.

Microsoft Access Support

iBonus Server connects to Microsoft Access database through ADO .Net technology. Microsoft Access is supported for deployment of smaller scale. As Microsoft Access database is freely built in Windows XP. This is useful for system evaluation, or system with small number of member.

Batch Operation

iBonus Server writes each record into its journal transaction queue at its local database, and sends back notify signal to Terminal. The server side transaction queue is optimized for data collection. The data stored in the queue will later on be processed by the batch. The replies for the request are stored in indexed tables. When the Terminals are querying the Server, the server can get the reply by simple table look up. This design radically reduces the demand of server processing power and therefore allowing a large amount of Terminals to connect to and large amount of member to use the system.

Branch Code and Terminal Code

Branch code and terminal code can be defined in each Terminal. These codes are useful for maintenance and for reporting.

High Reliability

5000 Transaction Buffer

In case of temporary network failure, transaction is stored in the flash memory of iBonus Terminal. Up to 5000 transaction can be stored in the memory. As soon as the network is reestablished, the transaction is sent back to server.

Journal Database

iBonus Terminal temporary stores transactions. In case of network congestion, iBonus Terminal has transaction buffer which stores up to 5000 records. As the database in iBonus is used as buffer, the data integrity of the database is taken into great care. Journal database is implemented at iBonus Terminal. During Terminal start-up the flash memory copy of the database is decompressed to RAM. During the transaction, each updating SQL command is recorded at the journal file after successful execution on the RAM copy of the database. The database is committed either periodically or when the journal file reaches a certain size. During write back, the RAM copy is written back to the Flash memory. In case of unexpected power shutdown, all the commands in the journal file are re-executed against the flash memory copy of database.

Ordering of Card Transactions Done in Distributed Terminal

It is possible that transactions that are done in different terminals for the same card are not reaching the server chronologically due to temporary network instability. In the need of updating server side member's latest card value correctly, each member card has a transaction counter that is incremented after each transaction. By attaching the value onto each transaction, server can serialize the transaction collected from different Terminals in order to update the member record correctly. There is a side benefit for using transaction counter. In case of record loss, it is still possible to tell what transaction has been done based on the sequence of the transaction record of each card.

Record Duplication Detection

iBonus Server ensures that no record is recorded twice in the database. This is done by recording the last record of that terminal in the Server. If the acknowledgement of the transfer of the last record is missed, the Terminal may send back the same record again. By comparing the record being transferred with the last record, Server can tell whether there is duplication and reject the record accordingly.

Blacklist Overflow Protection

Each iBonus Terminal is capable to store 32767 card serial numbers in the blacklist. To further ensure the size of the blacklist will not grow indefinitely, blacklisting is allowed only when the member card has an expiry date. The serial number is removed from the blacklist when the card is expired; thereby freeing up space in blacklist.

High Security

Anti-fraud Card Control feature

- the newly replaced card will reflect the pre-blacklist salvage value of the lost card even it is used at any other Terminals after reported loss,
- only one replaced card is issued even the user intentionally report card loss in more than one terminal within a short time,
- the repaired card must reflect the latest card information even the card has done a transaction at another branch a short time before needing to repair,
- the blacklist will not be grown to an unlimited size by allowing only the card having expiry date to be blacklisted, only the valid card are blacklisted, and
- the card being renewed must not be a blacklisted card.

iBonus Master Card Key Loading

iBonus Terminal guarantee to operate only with the card issue by the same company. This is achieved by loading key from iBonus Master Card. As the key and company code of iBonus Master Card delivered to each company is different. iBonus Terminal can only recognize the member card with the same key.

Staff Card Transaction Auditing

Staff Card ID is logged for every transaction. It will facilitate auditing at the server report. iBonus Report can summarize the amount collected by each individual staff.

Card Blacklisting

In case of losing member card, the lost card can be blacklisted by using Request Replace function. Within 1/4 day, all terminals will collect the newest blacklist from the server.

Maximum Prepaid Limit

iBonus Master Card defines the maximum prepaid amount to be stored in each card. This safety measure enhances the safety for the card users.

Maximum Transaction Limit

Maximum transaction limit must be defined in each staff card. All transaction that alters the accumulated spending or prepaid balance is limited by this value.

Localizable

Language localization

All the wordings and currency signs at the LCD display and receipt can be localized*. Customer can have iBonus Terminal adapted to their language by submitting their translating table to us. Translated wordings are limited by the characters available at the LCD display and receipt printers

Decimal and Integral Currency Support

iBonus System supports both integral currency and currency with two places. If decimal mode is chosen the maximum prepaid value is 83,886.07. If integer mode is chosen, the maximum prepaid value is 8,388,607. This setting is unified by the iBonus Master Card.

Specifications - iBonus Terminal

Power	12VDC, 600mA
Web and Database Server	Built-in
Transaction Buffer	5,000 records
Flash memory	32MB
Display	16 x 2 LCD with Backlight
Receipt Printer Connectivity	ESC/POS compatible, 42 CPL, Parallel Port
Communications	Ethernet (10-Base T), RS232 at 57600 bps, Parallel Port
Real Time Clock	Last for approx. 2 days without power
Supported Card Type	ISO 14443A Mifare 1k Classic, Mifare 512bit Ultralight
RF Frequency	13.56Mhz
Housing	Ploycarbonate
Operating Environment	Temperature: 0-45 degree C/ 32-115 degree F Humidity: Max 95%, non-condensing
Foot print	4.22(W) x 7.63(D) x 2.56(H) (in) 106(W) x 190(D) x 65(H) (mm)
Weight	0.35 kg.

System Requirements

Recommended System Specification

As iBonus Server is not needed to handle real time response regularly. iBonus System has low requirements on network connection and server hardware.

Server

For a system with up to 50,000 members, iBonus Server can be run without Microsoft SQL Server 2005. iBonus Server can make use of the built in Microsoft Access database for data storage. For any system with customer base larger than that, Microsoft SQL Server 2005 should be deployed. The following is the recommended specification of the server platform for a system with up to 1,000,000 members.

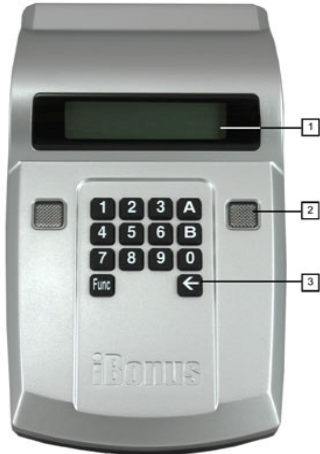
CPU	Intel duo core 2GHz or above
RAM	DDR2 1G byte or above
Hard Disk	80GB or above
Operating System	Windows XP Professional Windows Server 2003 Windows Vista
Microsoft SQL Server	<50,000 Member, optional 50,000+ Member, recommended
Network Card	100Mbps network card

Report generation using Microsoft SQL 2005 Reporting Services might generate heavy work load on the iBonus Server. To avoid affecting the server performance, it is suggested to schedule the work during non-peak hours or scale out the reporting work on to another computer.

Network Connection

LAN or broad band TCP/IP connection should be used between iBonus Terminal and iBonus Server.

Product Outline - iBonus Terminal



1. 2 x 16 character LCD display with green backlight
2. Red and green status indicator light
3. Key pad and smart card antenna underneath

Back



1. RS 232 Serial port for cashier connection
2. DC 12 volts power jack
3. Receipt printer parallel port
4. RJ 45 Ethernet port.

iBonus Report Overview

iBonus Reports (Sample Code) is distributed for free with iBonus Server Software CD. It is provided for system developer to get an idea how the data in iBonus System be used to provide web based reports. it leverages latest Microsoft ASP. Net and Reporting Service Technology to offer web based reporting functionality. Role capability can be defined and let people with different responsibility see the most relevant reports tailored for them.

iBonus Reports (Sample Code) is bundled with iBonus Server package. Microsoft SQL Server 2005 and Microsoft Reporting Services is required. If Microsoft SQL Server is not expected to be used in the iBonus System, the report application bundled with iBonus Server can be used for generating report without any further development. Please click [here](#) for more detail.

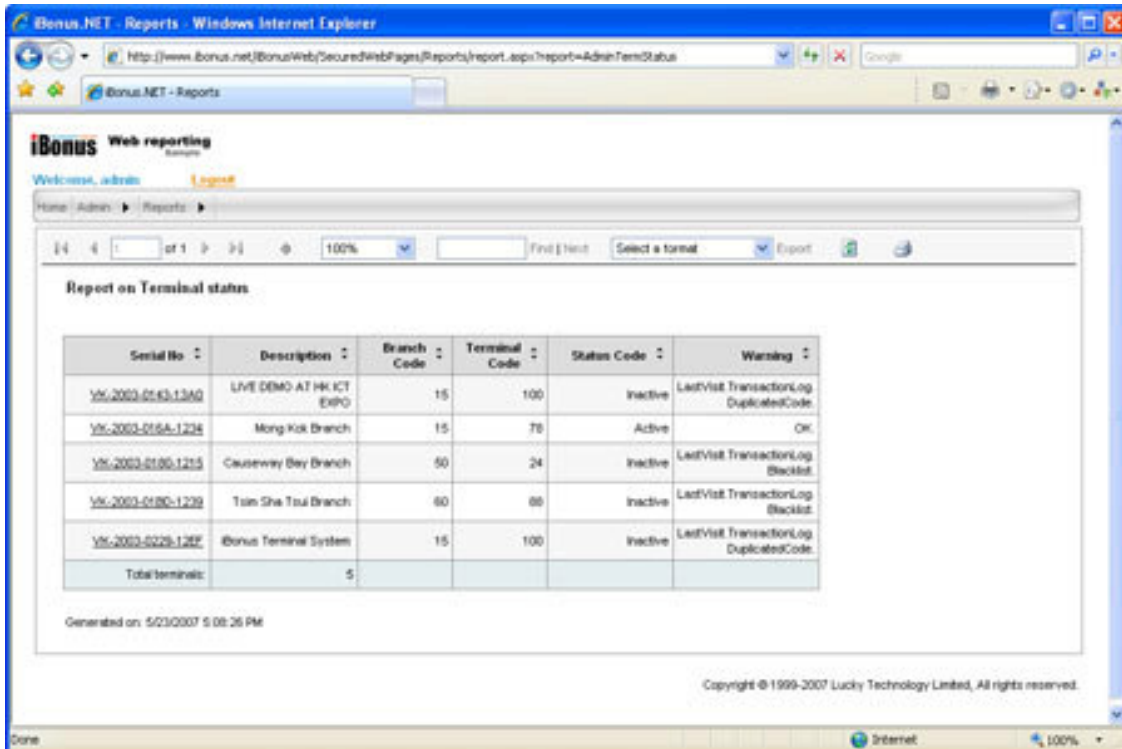
Available Reports

User and Role Administration

Administrator can create, delete and disable user. They can also add, remove and change user's roles. By default, iBonus Report defines the role as follows:

Reports for Administrator

- Add User Account
- Remove Account
- Manage Account
- Manage Role
- Manage Pages
- Change User's Password
- Report on Blacklist
- Report on Card Request
- Report on Database Size
- Report on Issue Card
- Report on Member Status
- Report on Terminal Status



The screenshot shows a web browser window titled "iBonus.NET - Reports" displaying a report titled "Report on Terminal status". The report contains a table with the following data:

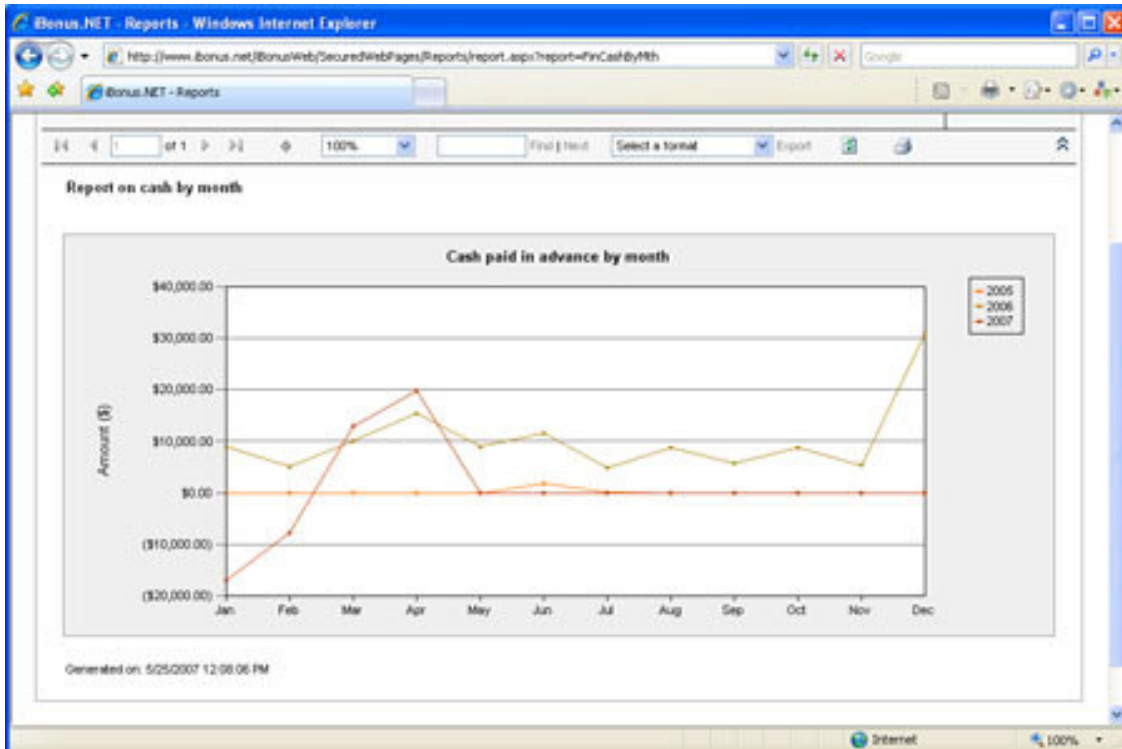
Serial No	Description	Branch Code	Terminal Code	Status Code	Warning
YK-2003-0143-1360	LIVE DEMO AT HK ICT EXPO	15	100	Inactive	LastVisit TransactionLog DuplicatedCode
YK-2003-0154-1234	Mong Kok Branch	15	78	Active	OK
YK-2003-0180-1215	Causeway Bay Branch	50	24	Inactive	LastVisit TransactionLog Blacklist
YK-2003-0180-1229	Tsim Sha Tsui Branch	60	68	Inactive	LastVisit TransactionLog Blacklist
YK-2003-0228-1267	iBonus Terminal System	15	100	Inactive	LastVisit TransactionLog DuplicatedCode
Total terminals:		5			

Generated on: 5/23/2007 5:08:26 PM

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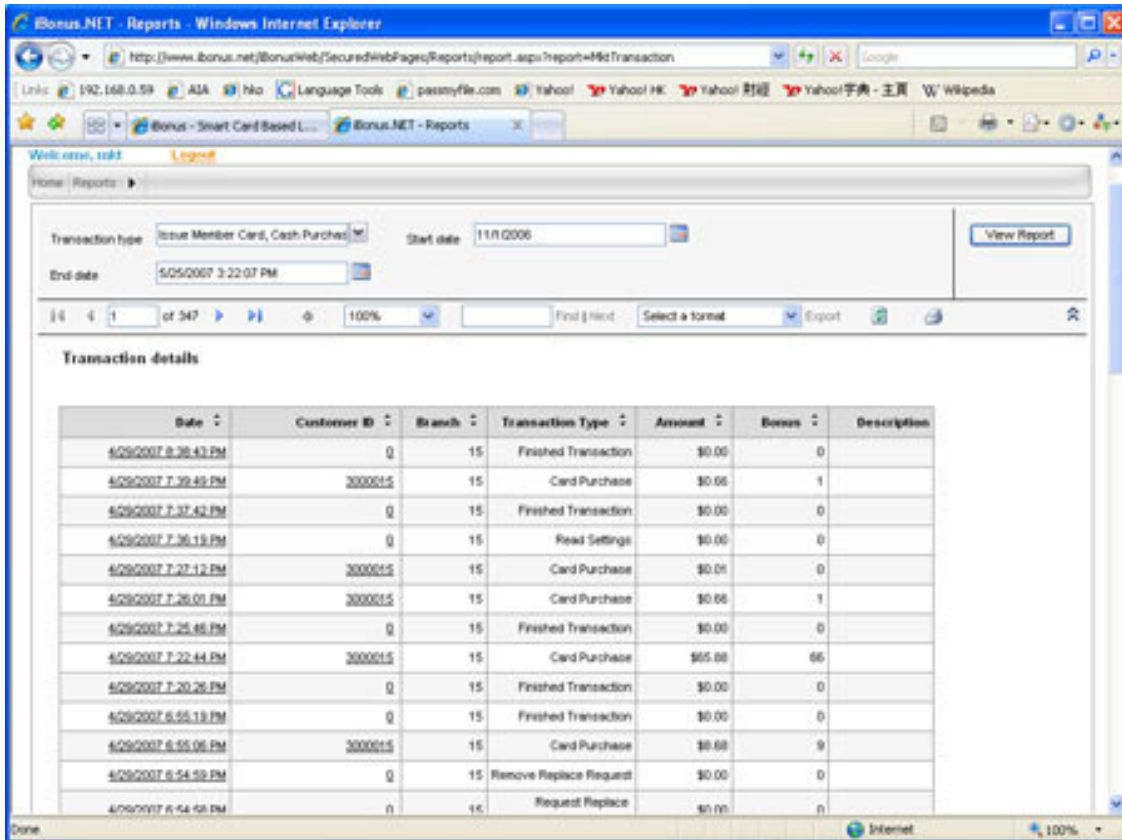
Reports for Financial Controller

- Total cash from member retained
- Cash paid by member in advance in any particular month
- Cash Clearing by Branch
- Sum of the bonus of all member cards retained
- Bonus point monthly balance in any particular month
- Summary of balance prepaid and bonus by branch which can be used for clearing



Reports for Marketing Manager

- Average days from last visit by Accumulated spending
- Purchase frequency by Accumulated spending
- Customers reload range per transaction
- Sales by Branch
- Daily Sales
- Hourly Sales
- Monthly Sales
- Weekly Sales
- Yearly Sales
- Number of transaction by month
- Number of transaction whose amount is within a specified range
- Transaction Detail
- Member Detail



Reports for Branch Manager

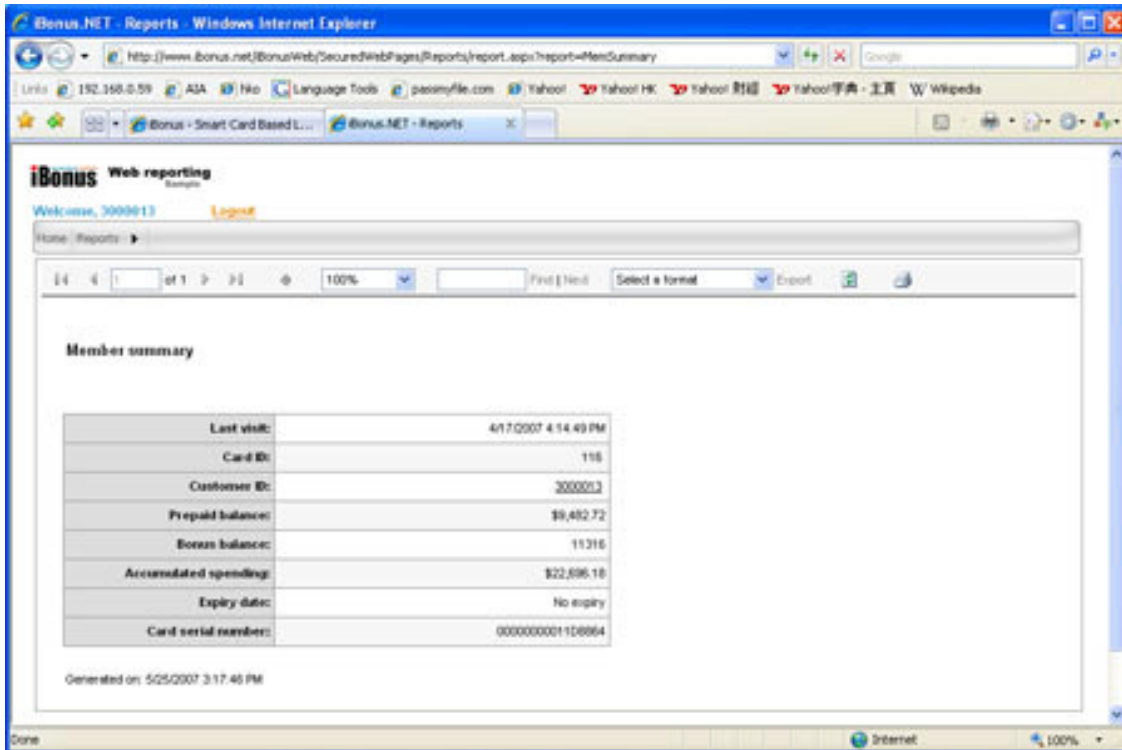
- Branch sales by month
- Replace card detail
- Repair card detail
- Renew card detail
- Replace count of branch
- Cash collected by Terminal
- Terminal Status

Reports for Branch Operator

- Cash collected
- Transaction completed
- Expiry date and final card balance.

Reports for Member

- Card Balance
- Transaction history
- Renew, repair and replace status



The screenshot shows a web browser window displaying the iBonus Web reporting interface. The page title is "Member summary" and it contains a table with the following data:

Last visit:	4/17/2007 4:14:49 PM
Card ID:	118
Customer ID:	3000023
Prepaid balance:	\$9,492.72
Bonus balance:	11316
Accumulated spending:	\$22,696.16
Expiry date:	No expiry
Card serial number:	0000000011048664

Generated on: 5/25/2007 3:17:46 PM

Create Your Own Reports

You can always create your own report by writing reports on Microsoft Reporting Services .rdl format. You can utilize all the charts and tables provided.

iBonus Report Live Demo

Live Demo available on web site

<http://www.avi-infosys.com>



Connect your iBonus Terminal to the iBonus Server hosted by us.

If you have an iBonus Terminal and demo member cards in your hand, you can connect your Terminal to the iBonus server hosted by iBonus.net to see how our report present your data.

Please note that iBonus server hosted by iBonus.net is not intended to host production data. iBonus.net reserve to right to remove or modify the data. iBonus.net also reserve the right to forbid anyone to connect their Terminal to the server.

iBonus Smartcards

Philips Mifare® Technology

iBonus Master Card
iBonus Member Card
iBonus Staff Card

iBonus System supports the world most popular MIFARE® family ISO14443A contactless 1K Classic smart card and MIFARE® Ultralight 512 bits contactless smart card.

Mifare® Standard 1K

MIFARE® family ISO14443A contactless smart card ICs operating in the 13.56 MHz frequency range with read/write capability. MIFARE® Classic with 1 Kbytes EEPROM and MIFARE® Ultralight with 512 bits EEPROM.

- RF contactless operates at 13.56 MHz
- Standard Philips Mifare Card
- 1K bytes,15 sectors, 48 bytes each
- R/W is protected by encryption key. 48 bit triple DES.
- Raw data is scrambled by 64 bit DES.
- High Security, suitable for prepaid and loyalty applications.
- Free sectors can be reserved for multiple loyalty or for any other purposes.

Mifare® Ultralight 512 bit

- 512 bits. 48 bytes of which is available.
- Raw data is scrambled by 64 bit DES.
- Raw data is equivalent to that of the first sector in Mifare Classics.
- Suitable for loyalty applications.

iBonus Master Card

Purposes:

- To ensure unique card ID allocation of Member Card ID's
- To ensure the Terminal of different end users can only read their own cards
- To define maximum prepaid value for member cards
- To define sector usage for member cards and staff cards

To define whether Integer Mode or Decimal Currency is be used

To ensure unique allocation of Member Card ID's

Each Master Card carries a range of card ID (4 bytes). The number of unique values in the range is the quota that the Master Card has. Lucky Technology Ltd. ensures that the range of each of the ID in the quota is unique among all master card issued. Therefore, every member card issued by iBonus Terminals in the world has unique card ID.

For example, a Master Card can assign a range of Member ID from 1000004550 to 1000004650 with the quota of 100. With this Master Card, new Member Card can be issued from any Terminal. Each master card can carry up to 25500 quotas logically. Lost Master Card will not be replaced.

Card ID is normally used as a unique identification of each Member or staff, but some companies may prefer to use their existing member ID nomenclature. In this case customer ID can be set for this purpose. Please read the chapter Set Customer ID for more detail.

To ensure the Terminal of different end users can only read their own cards

Each master card carries a company code and two sets of keys for accessing and decrypting the data in Mifare cards. Terminal won't response to the card with different company code or keys. Therefore it ensures that the cards of different iBonus systems won't mix up with each others'. CAUTION: Demo master card can only be used for testing only. It and its quota must not be used for real deployment. Otherwise, the demo card used in different companies can be used in each others' Terminals.

To define maximum prepaid value for member cards

Each master card carries the maximum prepaid which can be stored in member cards. It limits the maximum possible loss of a member in case of losing cards.

The maximum possible value for maximum prepaid is as follows:

Decimal Currency Mode: 83,886.07

Integer Currency Mode: 8,388,607

To define sector usage for member cards and staff cards

For each Mifare 1K classic card used in iBonus Systems, sector 0 is used for storing serial number and other card factory information. Sector 1 is mandated to be used for storing iBonus Specific sector definition. Location of main sector, location and number of redemption sector(s) (item for storing redemption items or shopping items) can be customized. The unused sector will still be using the key FFFFFFFF. For the definition of card sector please check out the chapter Smart Card Format. Normally one main sector and 3 redemption sectors are defined for each master card.

To define whether Integer Mode or Decimal Mode should be used

There are some currencies which does not need decimal place during monetary transactions. For example: Japanese Yen. Master Card can set up the system to be decimal mode or integer mode.

In decimal currency mode, the maximum possible prepaid value in member card is 83,886.07. The accumulated spending in member card is 21,474,836.47.

In integer currency mode, the maximum possible prepaid value in member card is 8,388,607. The accumulated spending in member card is 2,147,483,647.

iBonus Terminal does not response to cards with different value mode even the key and company code are matching.

iBonus Member Card

Unique Company Key Loading

Each member card is protected by two unique key belongs to that company. The key is previously loaded from iBonus Master Card to iBonus Terminal. The key is loaded to the Member Card during card formatting. As a result, Member card can be operated by the iBonus Devices of the same companies.

Flexible Sector Definition

For each Mifare 1K classic card used in iBonus Systems, sector 0 is used for storing serial number and other card factory information. Sector 1 is mandated to be used for storing iBonus Specific sector definition. Location of main sector, location and number of redemption sector(s) (item for storing redemption items or shopping items) can be customized. The unused sector will still be using the key FFFFFFFF. For the definition of card sector please check out the chapter Smart Card Format.

Instant Profiling

iBonus Member card has 12 bit to store member profile. The profile can be customized by iBonus Display. iBonus Display can always show the customer the most desired gift or products based on their profile.

Multiple redemption sectors

Number and location of redemption sectors can be customized. As the sector definition is stored in iBonus Master Card. It has to be defined when iBonus Master Card is ordered. The main sector can store one bonus item. Each redemption sector can store up to three items.

iBonus Staff Card

Facilitate Staff Auditing

Staff card login is required to operate the iBonus Terminal. Staff ID is logged in all subsequent transactions. It facilitates staff card auditing.

Reconfirm less frequently used staff card transaction

Advanced staff card functions, for example, undo transactions require the staff card to be presented again to prevent staff from carelessly misusing those functions.

Limit Staff activity at a particular branch

Staff Card also protects the Terminal from being used by staff from different branches. The staff card can only be used on the Terminals of the same branch. The branch code can be defined or changed by Create Staff Card function.

Limits Maximum Transaction Values

Staff Card carries the maximum transaction limit that the staff can handle Or it can be defined.