

User Guide



XC-BM603

24-Hour Self-Service Library

www.invengo.cn

Welcome to become a user of Invengo Self-Service Library!

We are very glad that you have chosen this XC-BM603 24-hour self-service library. Hope that our equipment can bring confidence for your work and life.



Foreword

This guide applies to the following product:

XC-BM603 24-Hour Urban Block Self-Service Library

This guide provides installation, use, maintenance and other feature information of the product for installers, users and maintenance personnel to read and use.

The version of this guide is V1.0, with revision recorded in the table below:

November 30, 2015	First Draft V1.0

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All of introductions and descriptions about product features and functions, as well as other information contained in this guide, are the latest and effective information at that time, and all the information is accurate without error when printed. Invengo reserves the right to correct or alter information and descriptions herein without notice and without bearing any liability.

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Safety Notes



Warning Sign

If operated improperly, it might cause harm to your health.

If operated improperly, it might cause damage to the equipment.



Attention Sign

If ignored, it might cause failure of your operation to go smoothly.

If ignored, it might bring results you don't want.

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1 Product Overview

Welcome to use the XC-BM603 24-hour urban block self-service library (hereinafter referred to as “the equipment”) produced by Shenzhen Invengo Information Technology Co., Ltd., which provides such functions as self-service borrowing and return of books, self-service putting-on-shelf after return of books, self-service stocktaking, etc. The equipment can be placed in crowded areas like library, metro, community, business zone, airport or station, suitable for self-service book borrowing and management of various libraries, government agencies, enterprises and public institutions.

1.1 Environmental Conditions

The XC-BM603 24-hour urban block self-service library system has the following environmental requirements:

- Storage Temperature: $-10^{\circ}\text{C} \sim +60^{\circ}\text{C}$
- Working Temperature: $0^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- Humidity Range: 20%~80% (without condensation)
- Supply Voltage: AC $220\text{V} \pm 10\%$ 50Hz~60Hz
- Overall Power Consumption: Average Power $\leq 350\text{W}$

2 Appearance & Structure



Figure 2-1 Structure Diagram

Notes: This picture is provided for reference only, as the actual equipment might vary slightly due to customization for clients.

——Front Image Camera

Take a snapshot of readers when who are applying for a library card, for future verification.

——Book Display Zone

It refers to a book display window of the equipment. Bookshelves within the book display zone are divided into 352 shelf positions, each of which allows to place one book

and corresponds to the unique shelf position number.

——LCD Touch Module

It refers to the main operating platform for use of the equipment, which adopts a capacitive touch screen, and supports 10-point touch at maximum.

——Slip Exit

After the end of operation, a printed slip can be obtained from here.

——Cash Entry (Optional)

In the case of self-service certificate binding and recharging, paper money at the designated par value can be put into this entry, with no changes.

——ID Card Identification Zone (Optional)

It refers to the information reading area for second-generation ID cards of the People's Republic of China.

——High Frequency Card Swiping Zone

It refers to the identification area for high frequency library cards.

——Book Borrowing/Return Gate

It refers to the entry/exit for book borrowing and return. When returning any book, such book shall be put in as

required; otherwise, it cannot be identified by the system.

——Barcode Scanner (Optional)

Identify a library card via barcode.

——Card Dispenser (Optional)

Issue a library card of the designated type to readers.

——Loudspeaker

Output the system's voice prompts.

——Light Box

Provide illumination for operating areas.

——Environmental Monitoring Camera

Cooperate with the hard disk VCR to monitor the environment around the equipment.

——Contact IC Card Identification Zone (Optional)

It can identify contact IC cards of the designated type.

——Borrowing/Return Gate Status Indicator lamp

If the borrowing/return gate is closed, the corresponding indicator lamp will go out.

If the borrowing/return gate is open, the corresponding indicator lamp will keep flashing.

3 Equipment Overview

3.1 Basic Composition

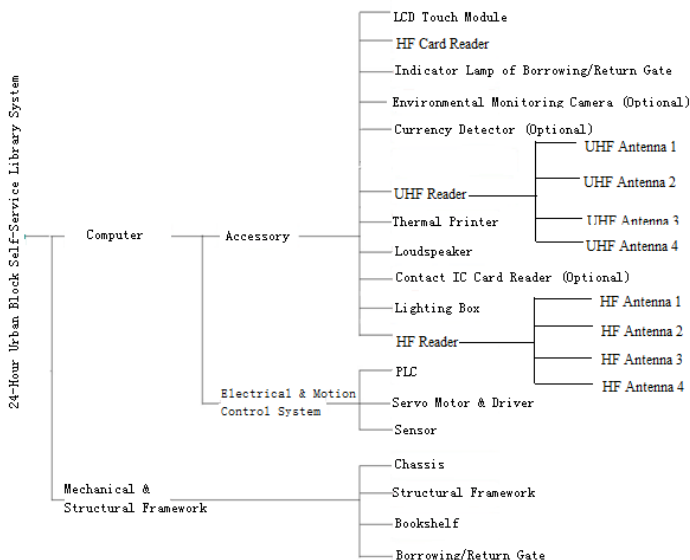


Figure 3-1 Equipment Function Modules

3.2 Basic Functions

1) Main Controller: Equipment control centre, responsible for all information calculation and processing.

2) Thermal Printer: Printout of various slips.

3) Loudspeaker: System prompt voice information output.

4) Front Image Camera: Take a snapshot of the

operator's front image.

5) Lighting System: Provide illumination for bookshelves and operating areas.

6) LED Screen: Display book information, equipment status, publicity information, etc.

7) LCD Touch Module: System information output and input.

8) High Frequency Card Reader: Read information of high frequency library cards.

9) Borrowing/Return Gate Status Indicator Lamp: Indicate the borrowing/return gate is open or closed.

10) Environmental Monitoring Camera: Image monitoring over the environment around the equipment.

11) Currency Detector: Identify paper money and collect money.

12) Contact IC Card Reader: Read information of contact IC cards.

13) Barcode Scanner: Read information of barcode cards.

14) Card Dispenser: Issue a library card of the designated type.

15) Second-Generation ID Card Reader: Read

information of second-generation ID cards.

- 16) PLC: Realize electrical and drive control.
- 17) Servo Motor & Driver: Complete the specified drive action.
- 18) Sensor: Complete the specified information sensing.
- 19) Chassis: Equipment installation benchmark.
- 20) Structural Framework: Realize the system structure installation function.
- 21) Bookshelf: Complete the book display.
- 22) Borrowing/Return Gate: Cooperate with the operator to complete the self-service book putting-in or taking-out action.

4 Performance Parameters

4.1 Basic Parameters

- a) Book Specifications: 16 Kaiben or smaller, thickness 5~30mm
- b) Book Tag Requirements:
 - Conform to ISO/IEC18000-6C book tags
 - Conform to ISO/IEC15693 book tags
- c) Bookshelf Capacity: 352 books

4.2 Main Functions

1) Identify valid certificates, including second-generation ID card (optional), HF library card, UHF library card (optional), barcode library card (optional), contact IC card (optional), etc., and provide book borrowing/return services.

2) Support self-service book borrowing and return in accordance with the library's management process requirements.

3) Automatically send the designated books to the borrowing/return gate as per the request of readers.

4) Automatically identify the books returned by readers, and put them on shelf.

5) Finish putting-on-shelf in batch, dynamic display of books on shelf, and automatic stocktaking.

6) Retrieve books displayed by the equipment and books collected by the library, and finish book borrowing in advance.

7) Support self-service deposit payment to bind second-generation ID cards and contact IC cards as reader cards.

8) Realize data exchange with the central library via network.

9) Automatically detect the equipment status, and automatically realize the monitoring and control over internal equipment.

- 10) Have the network video monitoring function.
- 11) Slip printing function.
- 12) Touch screen operation.

4.3 Technical Indicators

1) Power Supply Requirements: AC 220V \pm 10% 50Hz~60Hz, 20A

2) Power: Average Power \leq 350W

3) Working Temperature: 0 $^{\circ}$ C ~+40 $^{\circ}$ C

4) Storage Temperature: -10 $^{\circ}$ C ~+60 $^{\circ}$ C

5) Relative Humidity: 20%~80% (without condensation)

6) Dimension: 1800mm \times 1450 mm \times 2180 mm (length x width x height)

7) Level of Protection: IP31

8) Unit Shell Grounding Resistance: \leq 4 Ω

9) Running Noise: The running noise at 1m of the equipment shall be smaller than 30dB

5 System Features

The XC-BM603 24-hour urban block self-service library

can provide such functions as self-service book borrowing/return, renewal, borrowing query, etc.

The XC-BM603 24-hour urban block self-service library, according to the function modules and composition, can be divided into rotational positioning subsystem, information retrieval system, RFID subsystem – book identification and borrowing/return management subsystem, management software, unit shell, etc., with the integral logic structure shown in Figure 5-1.

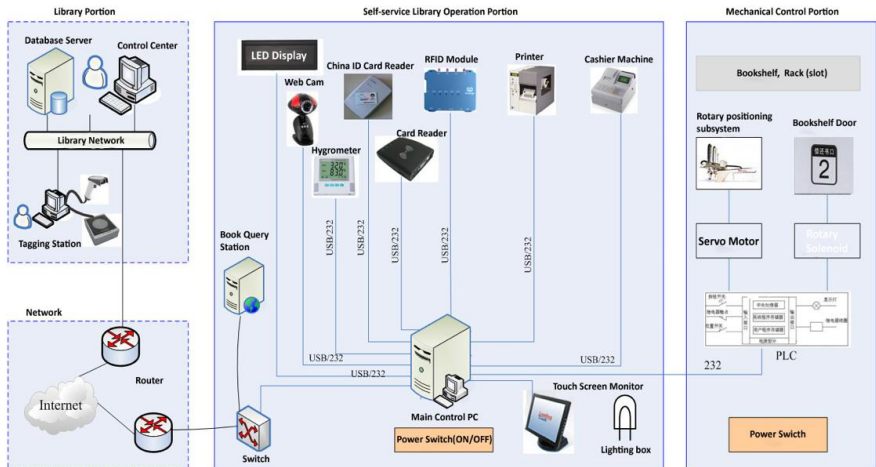


Figure 5-1 System Logic Structure

1) Self-service putting-on-shelf/off-shelf

The rotational positioning subsystem, by way of original point determination, servo-driven positioning, etc., completes

the accurate positioning of bookshelves, and sends the designated shelf positions to the borrowing/return gate precisely, so that readers can finish the self-service putting-on-shelf/off-shelf action.

The implementation and utilization of this technology has the following two advantages:

① After a reader has chosen to return a book, the system will automatically allocate a spare shelf position and rotate it to the borrowing/return gate for the reader to finish the putting-on-shelf action. The book returned by this reader can keep in circulation to the next reader, so as to effectively reduce the times and quantity of replenishments to be made by librarians, and effectively lower operation and maintenance costs of the self-service library.

② The self-service opening/closing, relative to the traditional complex mechanical opening/closing, enables the system to provide higher reliability.

2) Closing safety protection

Grating Safety Detection: The equipment has set up industrial safety protection gratings on two sides (up and down) of the borrowing/return gate. When a reader is putting

any book, as long as the book is not completely put into the bookshelf, the bookshelf will not rotate, and the system will keep giving prompts to the reader through voice and image, until the book is completely put into the bookshelf, and then the gate will be open.

The window glass is made of safe materials to ensure the safety of the equipment and users.

3) Round window for dynamic book display

The round window is used for dynamic book display. All the books that can be borrowed via the system can be displayed in a dynamic manner, without cumbersome query or time-consuming waiting. Readers can browse such information as book name, author, size, thickness and packaging in the most intuitive way, so that they can choose their favorite books.

4) Internal environment & safety detection

The XC-BM603 24-hour urban block self-service library system terminal and interior part are equipped with temperature and humidity sensors for remote real-time monitoring over the temperature and humidity status inside the equipment.

5) Realize the graphical interface-based remote control

function in the control center

In the control center, create a simulated image for each self-service library system terminal to determine the working status of the self-service library system according to the image color changes. Each image corresponds to a remote self-service library system terminal; just by clicking on the corresponding icon, readers can easily check the details of a self-service library system terminal, including all component information, component operation, etc., and can also remotely close or restart any self-service library system terminal equipment.

6) System process protection & automatic restoration functions

To ensure its long-term operation on a safe and reliable basis, the system has been equipped with process protection and automatic restoration functions. When the host restarts or the process exits unexpectedly, the process can automatically restart, with no need for human intervention, so as to greatly improve the system's service efficiency. The system also provides the automatic restoration function against hardware faults. When any equipment of the system suffers a fault, the system will give a prompt of the fault information and stop

service processing, and meanwhile, will attempt to automatically restore the aforesaid equipment. When the equipment is restored successfully, the system will resume the business processing function; if the system's attempt to automatically restore the aforesaid equipment fails, the system will power on for restart after data backup, so that upon occurrence of any common fault, automatic restoration can be realized without maintenance personnel appearing on site, which can strengthen the system's stability and reliability, and effectively lower operation and maintenance costs.

7) Remote monitoring & system self-inspection functions

The system has been equipped with the equipment self-inspection function to, on a fixed time, obtain equipment information and send to the control center, and the control center can also make active request for self-inspection information of the equipment. The self-inspection information enables an understanding of the detailed working status of each self-service library system terminal, such as whether the printer is out of paper, whether the temperature or humidity is abnormal, etc., so that the management personnel can perform remote monitoring over the working status of equipment hardware, and can develop appropriate maintenance strategies

according to the working status.

8) Flexible configuration requirements

The single self-service library system terminal structure adopts modular design, which can split or assembled quickly, can support overall or partial deployment according to the implementation site, and can, as per the request of the managing party, add publicity and advertising functions such as display, instruction, framework, etc., on the basis of the existing equipment.

6 Use & Operation

6.1 Connection

- 1) The use site must be equipped with a distribution box, in which an electrical leakage protection switch (rated residual current: 30mA) and an air switch are required, with power demand of AC220V \pm 10%, 50Hz ~ 60Hz, 20A, and reliable grounding shall be available.
- 2) When there is a need for networking with the central library, a network interface will be required, and the network bandwidth shall be not lower than 100M.

6.2 Installation & Maintenance

The front operating area of the equipment has a width of 0.7m available for use as the user operation area and maintenance access line;

left and right sides shall be at least 0.7m away from barriers; the wall side of the equipment shall be at least 0.5m away from the wall; the roughness of the ground on which the equipment is placed shall not exceed 10mm; and the net space height shall be not smaller than 2.7m. The full-shelf weight of the equipment shall be about 1500kg, and the ground where the equipment is placed shall be able to bear 500kg/m² pressure, as shown in Figure 6-1.



To keep the equipment running well, please clean the borrowing/return gate on a regular basis. Never use any wet cloth to clean the outer electrical surface of the equipment, and never use any corrosive substance to clean the surface of the equipment.

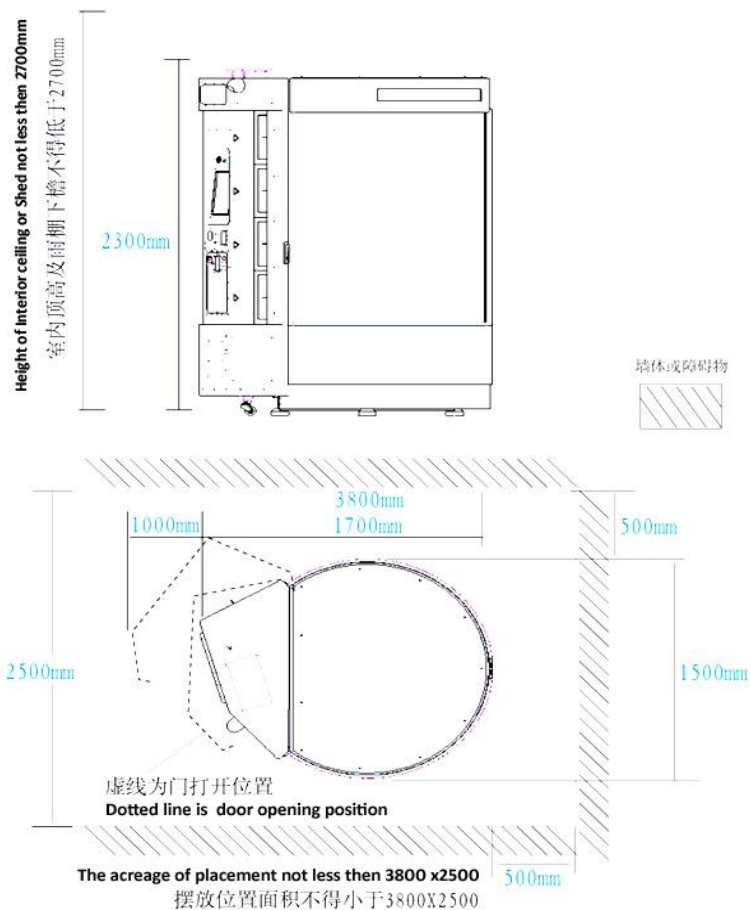


Figure 6-1 Equipment Installation Position

6.3 Mode of Book Processing Before Use of Equipment

To avoid any abnormal situation during operation of the equipment, try to use new books wherever possible, at least ensuring there is no damage, folding or severe deformation. The book size,

according to the needs, shall be limited to a thickness of 5~30mm, and big 32~16 Kaiben.

Paste an ISO/IEC18000-6C electronic tag at the center of spine, trying to ensure installation in the middle of book pages wherever possible; if a book has already been installed with an anti-theft magnetic strip, the electronic tag shall be installed in a position away from the anti-theft magnetic strip as far as possible, as shown in Figure 6-2.

When pasting an ISO/IEC15693 book tag, it's recommended to paste the tag at the center of back cover, close to the position of spine.

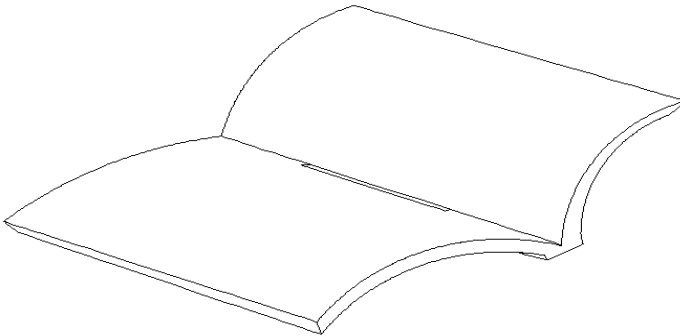


Figure 6-2 Book Tag Pasting

6.4 Basic Operation & Process of Equipment

1) Self-service application for a reader card

To use this function, the operator must have a second-generation ID card of the People's Republic of China. See the equipment structure diagram (Figure 2-1), put the ID card close to the ID card reading zone, and if reading successfully, the equipment will display the ID card information. After entering the contact phone and confirmation on

applying for a library card, the system will prompt the operator to put in the designated amount of money. After putting in sufficient money in the money entry/exit gate and making confirmation, the equipment will handle card issues, and print a slip.

2) Book borrowing

When the operator puts a reader card close to the reader card reading zone, the system will read the reader information and then enter the selection interface. At the corresponding position of the touch screen, by clicking on the book borrowing button, the system will show the keypad and the shelf position number entry window. Perform a light touch on the keypad to enter the shelf position number of the book to be borrowed and make confirmation; perform a light touch on the book borrowing button to enter the borrowing process, which will need to the user to wait some time patiently, and then the system will automatically rotate the book to the borrowing/return gate and will automatically open for the user to take out the book and manually close the gate; otherwise, the system will give an alarm and cancel this operation. After the end of borrowing, a slip can be printed for keeping.

3) Book return

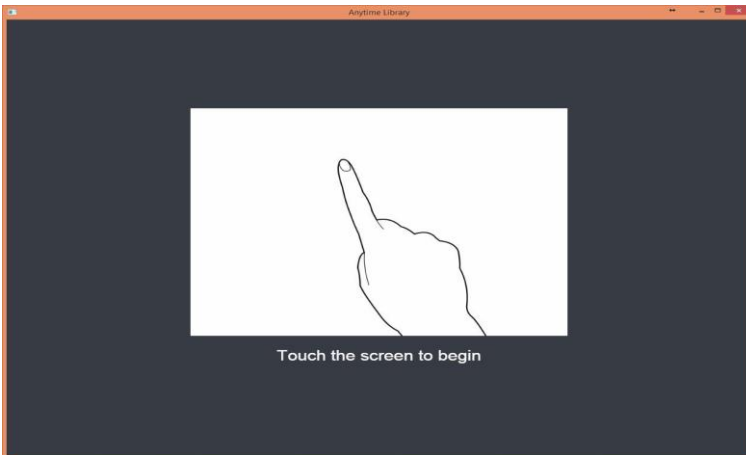
When the operator selects a borrowing/return service in the main interface, the system will verify the reader's identity. At the corresponding position of the touch screen, by clicking on the book return button, the system will automatically allocate a spare shelf position and rotate it to the borrowing/return gate, which will need to

the operator to wait some time patiently, and then the system will automatically open the borrowing/return gate for the operator to put in the book to be returned (must ensure the book is not damaged, and the tag is in good condition), with attention given to the basic requirements (spine facing outside, putting in on a flat basis), and close the borrowing/return gate in a timely manner. After the end of return, a slip can be printed for keeping.

6.5 Detailed Operating Instructions

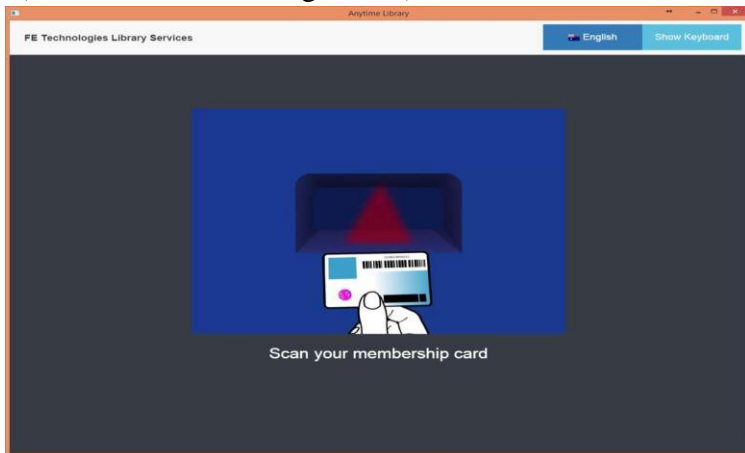
6.5.1 Patron Borrowing Process

The Anytime Library uses SIP2 to communicate with the LMS. All borrowing rules are automatically followed including blocked borrower lists, loan limits etc. Patrons can borrow multiple items from the Anytime Library – the carousel holds 336 items, but the library can circulate many more items than this through the unit depending on demand. Borrowed items are checked out to the patron’s account automatically. The unit is designed to be simple to use and intuitive. The patron touches the screen to begin:

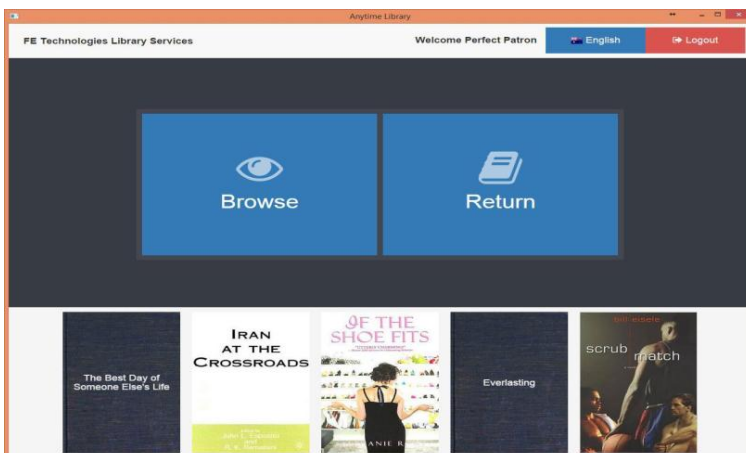


The patron then scans their membership card. A

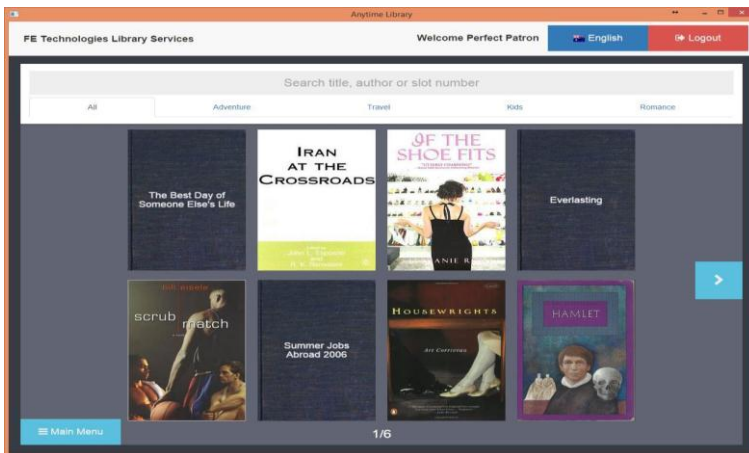
language selection button and keyboard option is available also (a PIN feature is configurable).



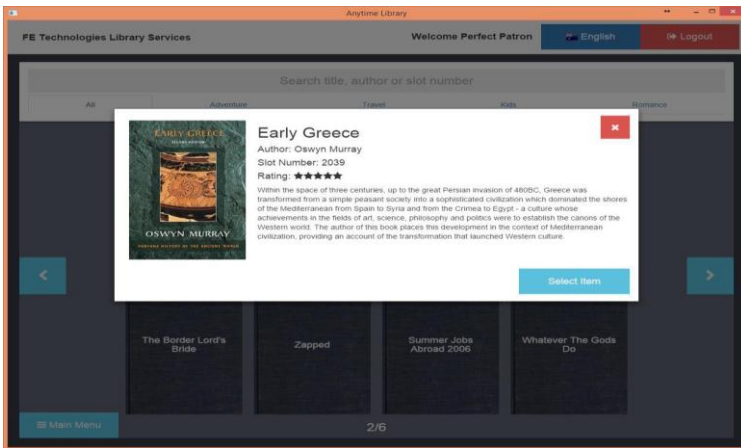
Upon membership recognition, the patron can either browse items to borrow, or return items. The panel below can be customised to show featured items such as latest releases etc.



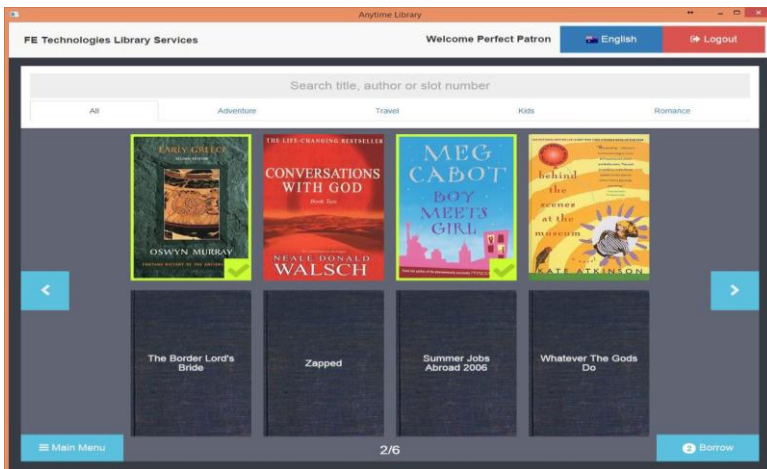
When the patron selects “Browse” they are presented with a search screen. The patron can search by typing in the title, author or slot number of the required item, or they can perform a manual search via the image of the cover of each item by touching the right arrow to page through all items.



When an item is selected a full view of the cover is presented along with a synopsis of the item. The patron can either exit this screen or touch “select” to borrow the item.

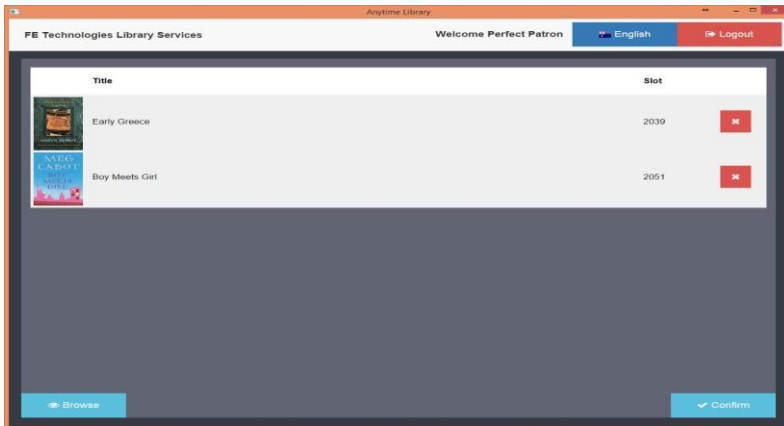


The selected items are highlighted and indicated with a green check mark:

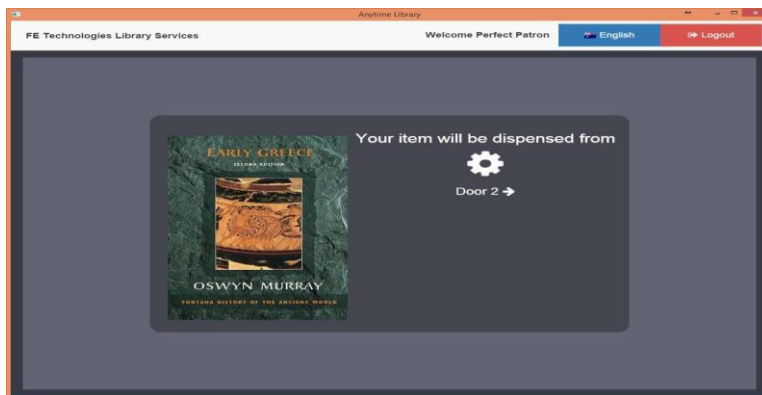


When the patron selects “borrow”, they are presented with the confirmation screen. Selecting “confirm” completes

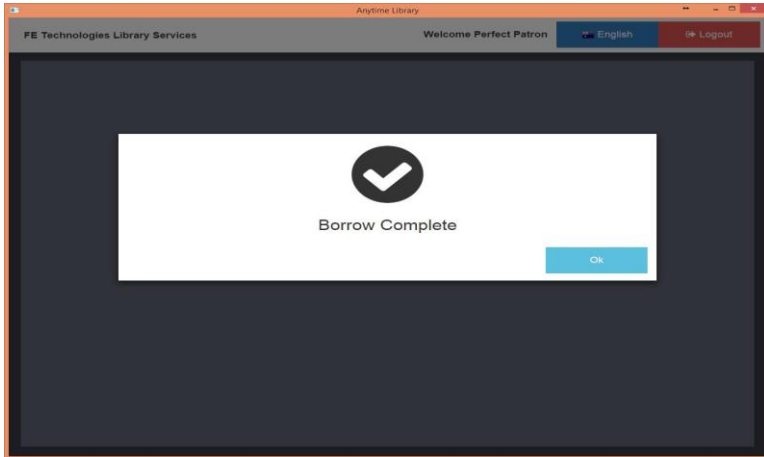
the transaction.



The Anytime Library will dispense each item one at a time and advise the patron from which door each can be retrieved:

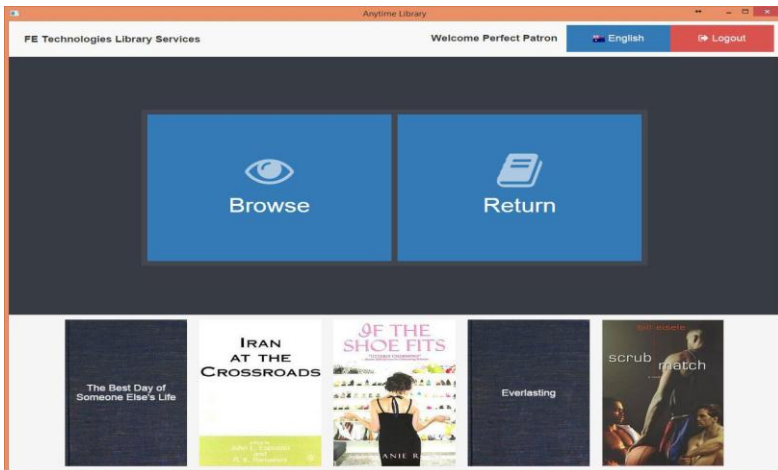


The final screen indicates that the borrow transaction is complete.

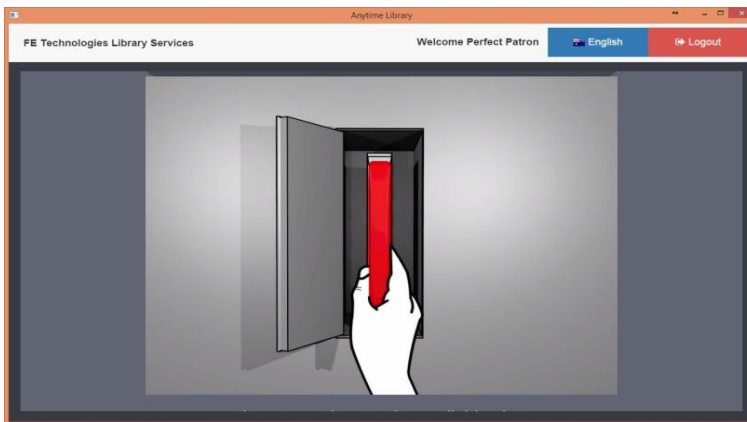


6.5.2 Patron Return Process

The patron touches the screen, scans their membership card and selects “Return” from the welcome screen.

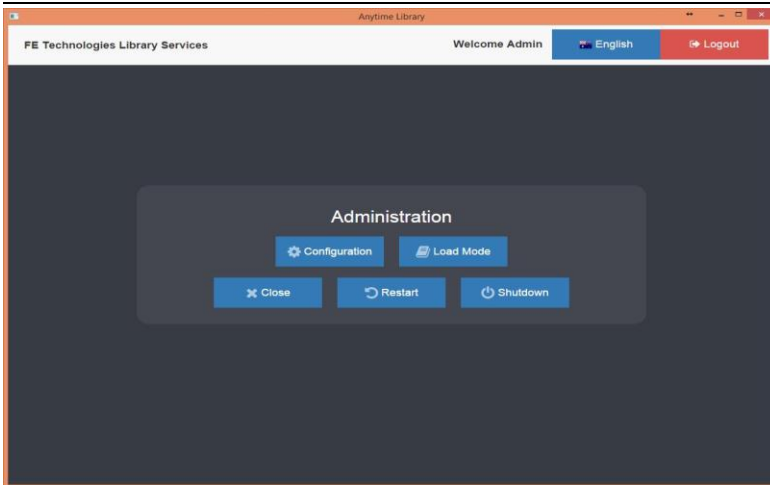


The screen demonstrates to the patron how to return the item into the return slot. The Anytime Library will then automatically pick a location and store and register the returned item, removing it from the patron's account, and checking it back into the LMS. It is then available for other patrons to borrow immediately.



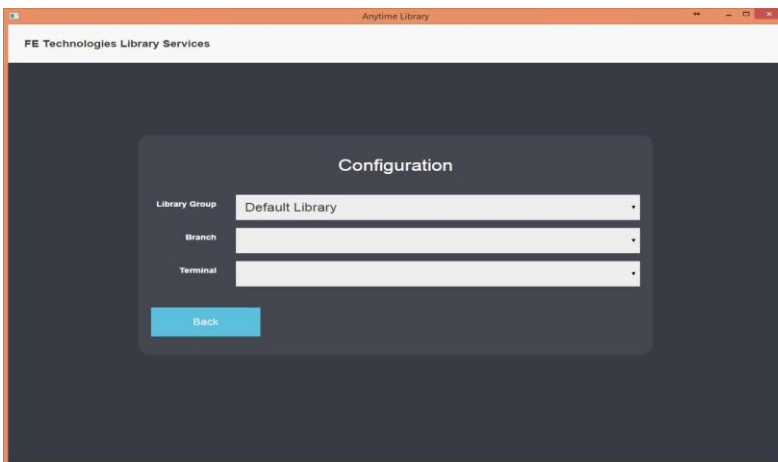
6.5.3 Administrative Functions

Library staff can access the administrative functions of the Anytime Library by scanning their Administrator Access Card (supplied at installation.) The Administration screen allows access to Configuration, Load Mode, and Close, Restart and Shutdown options.



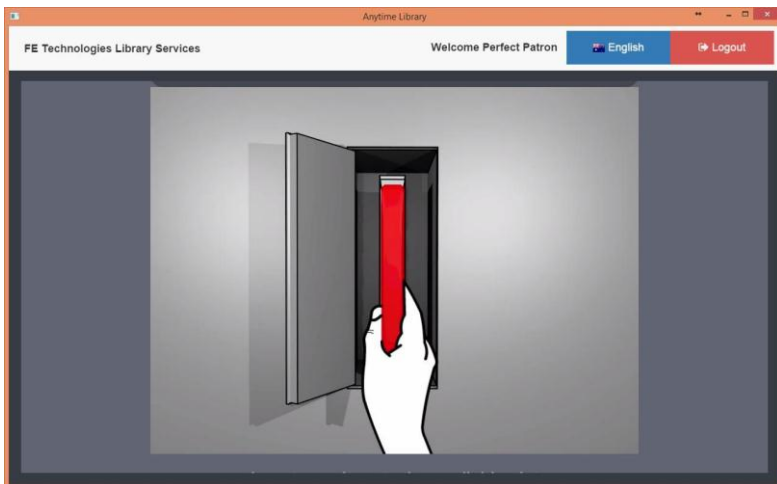
6.5.4 Configuration

This screen allows you to configure the Library Group, Branch and Terminal to allocate to the Anytime Library. This will allow you to access the unit from the Management Console for reporting requirements, for example. Reports will show transaction history for the unit by hour, day week and month.



6.5.5 Load Mode

By selecting “Load Mode” from the Administration screen, library staff can load the unit, one item at a time via the indicated access door. The unit will automatically place each item in the next available slot. The Anytime Library communicates with the LMS via SIP2 and will automatically read each loaded item and make it available for borrowing via the unit. A message will advise you once all available slots are occupied.



7 Analysis & Resolution of Common Faults

- 1) System connection fault
 - Please check whether the network router and network cable connection is normal;
 - The operator uses the operator card to enter the system for self-inspection on the computer network communication status.
- 2) The borrowing/return gate is not open or closed
 - Check whether there is any foreign object between the bookshelf and the borrowing/return gate;
 - Check whether there is any foreign object falling to the surface of grating.
- 3) Foreign object at the borrowing/return gate
 - Check whether the book has been completely put in the shelf;
 - Check whether there is any foreign object staying between the bookshelf and the borrowing/return gate.
- 4) The system prompts the tag is damaged and thus the book cannot be lent or returned
 - Check whether the corresponding book tag is damaged and replaced, and when checking, the operator may enter the system for maintenance, and

use the system's self-inspection program to carry out test.

- 5) Cannot print a slip
- If no slip comes out of the printing exit, check whether the printer lacks paper;
 - If a slip comes out but with no words, check whether the printing paper has been installed reversely.



For any issues that cannot be resolved by users themselves, please contact Invengo to talk about repair matters, see after-sale service information for details.

8 Transportation & Storage

8.1 Transportation Requirements

The self-service library equipment that leaves factory in a packaged form shall meet the requirements of relevant standards regarding highway transportation, railway transportation, water transportation, etc. During the transportation, make sure to avoid violent collisions, rains, corrosive drugs or noxious gas.

8.2 Storage Requirements

The warehouse for long-term storage of this equipment shall meet the following conditions:

- 1) Environment Temperature: $-10^{\circ}\text{C} \sim +60^{\circ}\text{C}$
- 2) Relative Humidity: No greater than 80%
- 3) No sharp temperature and humidity changes, and no acid or other noxious or corrosive gas in the air around.

9 Packing

- 1) Before leaving factory in a packaged form, the equipment shall be pasted with a sign indicating the model, serial number, manufacturer, ex-factory date, etc.
- 2) The equipment shall be packaged in a wooden carrying case to ensure no damage during the transportation, and on the carrying case, there should be the corresponding packaging marks, such as model, volume, weight, ex-factory date, direction, vibration-proof mark, rain-proof mark, etc.
- 3) The equipment that leaves factory in a packaged form shall be attached with a packing list indicating attachments (e.g. CD-ROM, accessories, manual, qualification certificate, etc.).

10 After-Sale Service & Contact Information

1) After-Sale Service

Within one year after product sales, the manufacturer will be responsible for routine inspection and maintenance once every six months. During this period, for non-man-made damage, maintenance will be free of charge; subsequent maintenance will be charged with accessory and labor costs.

After-Sale Service Hotline: 800-830-7036

Customer Complaint Hotline: 400-888-0058

2) Contact Information

Shenzhen Invengo Information Technology Co., Ltd.

Address: 3F, T2-B, South Zone, Shenzhen High-Tech Industrial Park

ZIP Code: 518057

Tel: 0755-26711633

Fax: 0755-26711693

<http://www.invengo.cn>

E-mail: sales@invengo.cn

11 Word of warning

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

The RS232 , USB ports are only use for inner circuit connecting.