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文档版本号：20251118-0-(Windows)V1.0.0.1

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Document Version No.: 20251118-0-(Windows)V1.0.0.1

HTX 衡天下

说明书 Instruction Manual

标准型X光异物检测机软件使用说明

Operation Manual for the Foreign Object Detector

说明文档适用机型 Applicable Models of the Documentation

衡天下品牌的标准型X光异物检测机适用, 部分定制型亦适用。

Applicable to the Standard and Some Customized Models of HTX X-Ray Foreign Object Detector.

说明书目录 catalogue 2

1.软件界面布局与功能简介 Layout and Function Brief Introduction

软件界面可以自适应不同的屏幕分辨率。

The software interface can automatically adapt to different screen resolutions.

(1-1)

1.主功能菜单区域;

2.子功能菜单区域;

3.子功能数据显示、操作区域;

4.工具栏:

- 点击执行用户切换操作;
- 从左向右依次为变频器状态、探测器状态、X射线源状态和 PLC 状态;
- 点击执行关闭软件的操作;
- 点击 执行关闭计算机的操作;
- 工具栏中间部分显示当前应用产品的产品名称;
- 工具栏最右侧显示的是当前系统时间。

1. Main Function Menu Area;

2. Sub-function Menu Area;

3. Sub-function Data Display and Operation Area;

4. Toolbar:

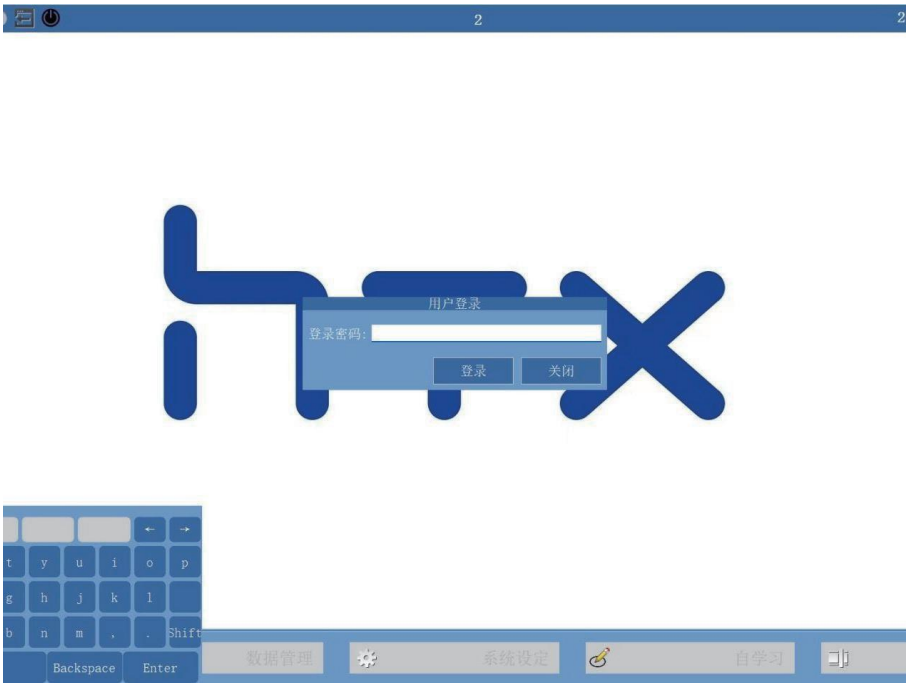
- Click to perform user switching operation;
- From left to right are the inverter status, detector status, X-ray source status and PLC status in sequence;
- Click to perform the operation of closing the software;
- Click to perform the operation of shutting down the computer;
- The middle part of the toolbar displays the product name of the currently applied product;
- The far right of the toolbar displays the current system time.

2.软件启动 Software Startup

异物检测软件默认开机自启动, 也可以通过鼠标双击桌面的【Scanner】快捷方式来启动软件。

The foreign object detection software starts automatically by default when the device is powered on, or it can be launched by double-clicking the [Scanner] shortcut icon on the desktop with the mouse.

3.登录系统 System Login



登录页面

Login Page

(3-1)

软件启动后显示的是登录页面, 如图 3-1 。输入正确的登录密码, 点击【用户登录】对话框的【登录】按键, 完成登录操作。登录成功后显示的页面如图 3-2 所示。系统软键盘操作说明详见 12 章节。

After the software is launched, the login page is displayed, as shown in Figure 3-1. Enter the correct login password and click the [Login] button in the [User Login] dialog box to complete the login operation. The page displayed after successful login is shown in Figure 3-2. For detailed instructions on the operation of the system on-screen keyboard, refer to Chapter 12.

登录后页面
Page After Login

(3-2)

如果设备已经超过3天没有开启，登录成功后将自动执行X 光源预热的操作。

如图 3-3 所示，在 X 光源预热过程中，点击【取消】按键可以终止 X 光源预热。

If the equipment has not been turned on for more than 3 days, the X-ray source preheating operation will be automatically performed after successful login.

As shown in Figure 3-3, during the X-ray source preheating process, click the [Cancel] button to terminate the X-ray source preheating.

X 光源预热
X-ray Source Preheating

(3-3)

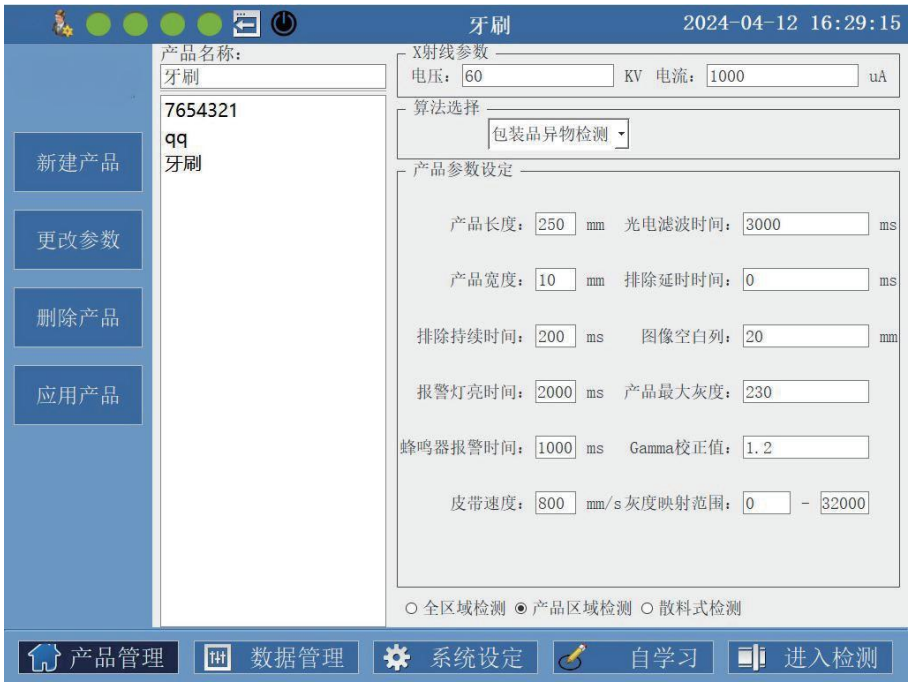
4.产品管理 Product Management

点击主功能菜单区域的【产品管理】按键，进入产品管理页面，如图 4-1。

在产品管理页面中可以进行新建产品、更改参数、删除产品、应用产品和查看产品参数等操作。

Click the [Product Management] button in the main function menu area to enter the product management page, as shown in Figure 4-1.

On the product management page, operations such as creating a new product, modifying parameters, deleting a product, applying a product, and viewing product parameters can be performed.



产品管理
Product Management

(4-1)

4.1 新建产品 Create New Product

在【产品名称:】编辑框中输入新产品的名称，点击【新建产品】按键，当系统弹出【新建产品操作完成】的提示框时，新建产品操作完成。新建产品的产品名称将显示在产品列表框的最后一个。

Enter the name of the new product in the [Product Name:] input box and click the [Create New Product] button. The new product creation operation is completed when the system pops up the prompt box [New Product Creation Completed]. The name of the newly created product will be displayed at the end of the product list box.

4.2 更改参数 Modify Parameters

在产品列表中选择要进行参数修改的产品，此时产品名称编辑框中显示当前选择的产品名称，页面右侧参数编辑区域显示当前选择产品的参数数据。在修改完参数后，点击【更改参数】按键，当系统弹出【更改参数操作完成】的提示框时，更改参数操作完成。

Select the product whose parameters need to be modified in the product list. At this time, the name of the currently selected product will be displayed in the product name input box, and the

parameter data of the currently selected product will be displayed in the parameter editing area on the right side of the page. After modifying the parameters, click the [Modify Parameters] button. The parameter modification operation is completed when the system pops up the prompt box [Parameter Modification Completed].

4.3 删除产品 Delete Product

在产品列表中选择要删除的产品，此时产品名称编辑框中显示当前选择的产品名称，页面右侧参数编辑区域显示当前选择产品的参数数据。点击【删除产品】按键后系统弹出删除产品确认提示框，点击【确认】按键执行删除产品的操作，当系统弹出【删除产品操作完成】的提示框时，删除产品操作完成；点击【取消】按键取消删除产品的操作。

Select the product to be deleted in the product list. At this time, the name of the currently selected product will be displayed in the product name input box, and the parameter data of the currently selected product will be displayed in the parameter editing area on the right side of the page. After clicking the [Delete Product] button, the system will pop up a product deletion confirmation prompt box. Click the [Confirm] button to execute the product deletion operation, and the product deletion operation is completed when the system pops up the prompt box [Product Deletion Completed]; click the [Cancel] button to cancel the product deletion operation.

4.4 应用产品 Apply Product

在产品列表中选择要应用的产品，此时产品名称编辑框中显示当前选择的产品名称，页面右侧参数编辑区域显示当前选择产品的参数数据。点击【应用产品】按键，当系统弹出【应用产品操作完成】的提示框时，应用产品操作完成。

Select the product to be applied in the product list. At this time, the name of the currently selected product will be displayed in the product name input box, and the parameter data of the currently selected product will be displayed in the parameter editing area on the right side of the page. Click the [Apply Product] button, and the product application operation is completed when the system pops up the prompt box [Product Application Completed].

4.5 参数说明 Parameter Description

X 射线参数：

(1) 电压：设置检测产品时 X 光机的电压值。

(2) 电流：设置检测产品时 X 光机的电流值。

X-ray Parameters:

(1) Voltage: Set the voltage value of the X-ray machine when inspecting products.

(2) Current: Set the current value of the X-ray machine when inspecting products.

算法选择：

算法选择包含药品检测、胶囊检测、包装品异物检测和散料异物检测。

(1) 药品检测：负责检测药品的裂片、少片以及药片的完整性

(2) 胶囊类检测：负责检测胶囊的缺粒。

(3) 包装品异物检测：针对包装产品的异物检测。

(4) 散料异物检测：针对散料产品的异物检测。

Algorithm Selection:

Algorithm selection includes pharmaceutical detection, capsule detection, packaged product foreign object detection, and bulk material foreign object detection.

(1) Pharmaceutical Detection: Responsible for detecting splits, missing tablets, and the integrity of tablets.

(2) Capsule Detection: Responsible for detecting missing capsules.

(3) Packaged Product Foreign Object Detection: Targeted at foreign object detection of packaged products.

(4) Bulk Material Foreign Object Detection: Targeted at foreign object detection of bulk materials.

产品参数设定：

Product Parameter Settings:

产品参数 Product Parameters (4-5-1)

(1) 产品长度：主要决定散料模式下切图大小，单位为毫米。

(2) 排除持续时间：是指排除机构开始动作的时间到排除机构结束动作的时间。单位为毫秒。

(3) 报警灯亮时间：是指设备检测到 NG 产品时报警灯发出黄色灯光的持续时间。单位为毫秒。

(4) 蜂鸣器报警时间：是指设备检测到 NG 产品时蜂鸣器报警持续的时间。单位为毫秒。

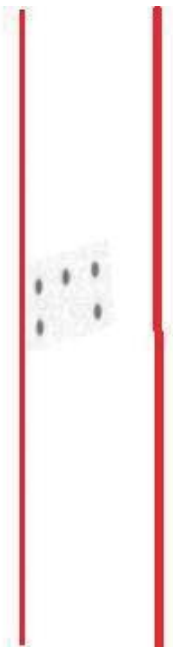
(5) 皮带速度：指定产品检测的速度。单位为毫米每秒。

(6) 光电滤波时间：是指 X 光源照射或产品检测中，检测到人体的时间。设备检测过程中，达到光电滤波时间，则设备停机，检测停止，需要手动启动继续运行。单位为毫秒。

(7) 排除延迟时间：是指从产品被检测出 NG 的时间点到排除机构开始动作的时间间隔。单位为毫秒。排除延迟时间的设定决定了 NG 产品被排除时机是否精确。

(8) 图像空白列：如图 4-5-6，产品图像尺寸为 800，图像空白列数为 200，

如图 4-5-6 产品“药品”过包图像为例，检测到有效产品列之前（红线之前）的属于图像空白列数。



图像空白列

Image Blank Column （4-5-6）

(9) 产品最大灰度：该参数取值范围为 0~255，产品通过时能够呈现的最大灰度阈值，只有小于这个阈值才能够成像，大于这个阈值无法成像。对于产品比较薄，阻挡射线能力弱的产品，该值的设置应趋近 255。

(10)Gamma 校正值：该参数负责成像时对成像进行 gamma 校正，提高对比度。当 gamma 值设置为 1 时，不进行校正。

(11)灰度映射范围：控制将归一化值映射到[0,255]区间的灰度值时候的灰度边界设置。

(1) Product Length: Mainly determines the image cropping size in bulk material mode, with the unit being millimeters (mm).

(2) Rejection Duration: Refers to the time from the start of the rejection mechanism's operation to the end of its operation. The unit is milliseconds (ms).

(3) Alarm Light On Time: Refers to the duration for which the alarm light emits yellow light when the equipment detects a non-conforming (NG) product. The unit is milliseconds (ms).

(4) Buzzer Alarm Time: Refers to the duration for which the buzzer sounds an alarm when the equipment detects a non-conforming (NG) product. The unit is milliseconds (ms).

(5) Conveyor Belt Speed: Specifies the speed of product inspection. The unit is millimeters per second (mm/s).

(6) Photoelectric Filtering Time: Refers to the time when a human body is detected during X-ray source irradiation or product inspection. During the equipment's inspection process, if the photo-

electric filtering time is reached, the equipment will shut down, inspection will stop, and manual restart is required to resume operation. The unit is milliseconds (ms).

(7) Rejection Delay Time: Refers to the time interval from the moment a product is detected as non-conforming (NG) to the start of the rejection mechanism's operation. The unit is milliseconds (ms). The setting of the rejection delay time determines the accuracy of the timing for rejecting NG products.

(8) Image Blank Column: As shown in Figure 4-5-6, the product image size is 800, and the number of image blank columns is 200.

Taking the packaging image of the product "Pharmaceutical" in Figure 4-5-6 as an example, the columns before the effective product columns are detected (before the red line) are the image blank columns.

(9) Maximum Product Gray Level: The value range of this parameter is 0~255. It is the maximum gray level threshold that can be presented when the product passes through. Only values less than this threshold can be imaged, while values greater than this threshold cannot be imaged. For products that are relatively thin and have weak X-ray blocking ability, this value should be set close to 255.

(10) Gamma Correction Value: This parameter is responsible for performing gamma correction on the image during imaging to improve contrast. When the gamma value is set to 1, no correction is performed.

(11) Gray Level Mapping Range: Controls the setting of gray level boundaries when mapping normalized values to gray levels in the [0,255] interval.

5.数据管理 Data Management

5.1 生产管理 Production Management

点击子菜单区域中的【生产管理】按键, 显示生产管理子页面, 如图 5-1-1。

选择查询的开始日期、结束日期后, 点击“查询”按钮, 进行生产数据查询。可以显示一段时间内的生产资料情况, 包括生产总数、合格品数量、不合格品数量以及不合格率等。

Click the [Production Management] button in the sub-menu area to display the production management sub-page, as shown in Figure 5-1-1.

After selecting the start date and end date for the query, click the "Query" button to perform the production data query. It can display the production data within a period of time, including the total production quantity, number of qualified products, number of unqualified products, and unqualified rate, etc.

生产管理
Production Management

(5-1-1)

5.2 设备管理 Equipment Management

点击子菜单区域中的【设备管理】按键, 显示生产管理子页面, 如图 5-2-1。

Click the [Equipment Management] button in the sub-menu area to display the equipment management sub-page, as shown in Figure 5-2-1.

设备管理
Equipment Management

(5-2-1)

选择查询的开始日期、结束日期后, 点击“查询”按钮, 可以查看设备运行时间、工作时间、待机时间等数据信息。

1. 运行时间: 为每天检测系统处于开启状态的总时间。
2. 工作时间: 为每天检测系统处于自动检测状态的总时间。
3. 待机时间: 为每天检测系统处于开启状态但不是自动检测状态的总时间, 即运行时间减去工作时间。
4. 开工率: 为每天工作时间与运行时间的比值。

After selecting the start date and end date for the query, click the "Query" button to view data such as equipment operation time, working time, and standby time.

1. Operation Time: The total time the inspection system remains turned on each day.
2. Working Time: The total time the inspection system is in automatic inspection mode each day.
3. Standby Time: The total time the inspection system is turned on but not in automatic inspection mode each day, which is calculated as Operation Time minus Working Time.
4. Operation Rate: The ratio of daily Working Time to Operation Time.

5.3 设备历史 Equipment History

点击子菜单区域中的【设备历史】按键, 显示设备历史子页面, 如图 5-3-1。

Click the [Equipment History] button in the sub-menu area to display the equipment history sub-page, as shown in Figure 5-3-1.

设备历史
Equipment History (5-3-1)

在日历中选择查询的日期, 下方表格会显示选择日期的设备开启和关闭的历史记录。点击【删除当前记录】按键执行删除选择日期的设备开启和关闭的历史记录。系统弹出删除当前记录确认对话框。点击【确定】按键, 完成删除当前记录的操作; 点击【取消】按键, 取消删除当前记录的操作。

点击【删除所有记录】按键执行删除所有日期的设备开启和关闭的历史记录。系统弹出删除所有记录确认对话框。点击【确定】按键, 完成删除所有记录的操作; 点击【取消】按键, 取消删除所有记录的操作。

Select the query date in the calendar, and the table below will display the historical records of the equipment's power-on and power-off for the selected date. Click the [Delete Current Records] button to delete the power-on and power-off historical records of the selected date. The system will pop up a confirmation dialog box for deleting current records. Click the [Confirm] button to complete the operation of deleting current records; click the [Cancel] button to cancel the operation.

Click the [Delete All Records] button to delete the power-on and power-off historical records of the equipment for all dates. The system will pop up a confirmation dialog box for deleting all records. Click the [Confirm] button to complete the operation of deleting all records; click the [Cancel] button to cancel the operation.tion.

5.4 生成报表 Generate Report

点击子菜单区域中的【生成报表】按键, 显示生成报表子页面, 如图 5-4-1。

Click the [Generate Report] button in the sub-menu area to display the generate report sub-page, as shown in Figure 5-4-1.

生成报表
Generate Report (5-4-1)

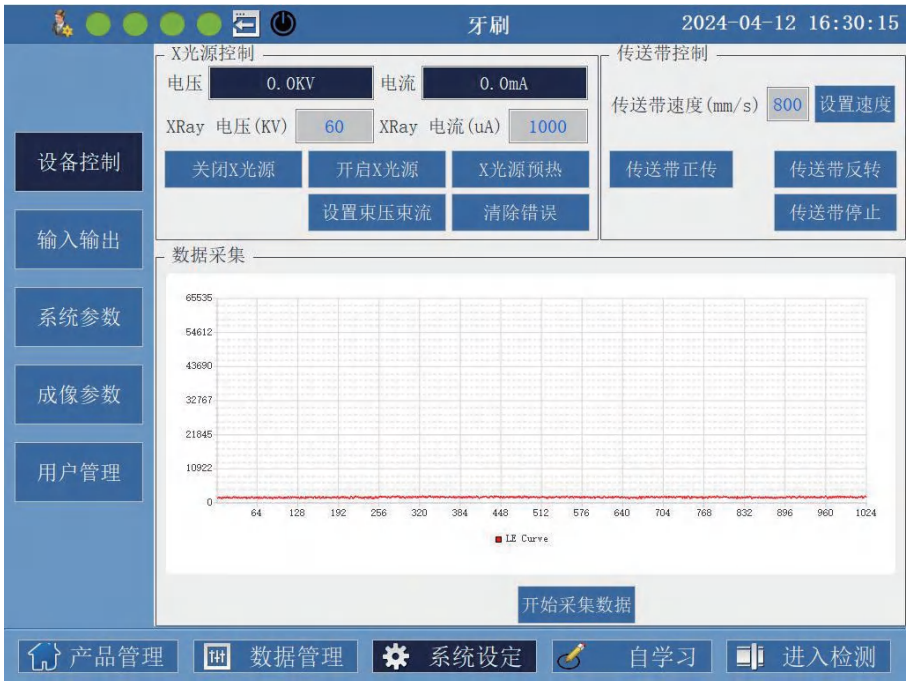
在日历中选择查询的日期, 下方 4 个表格中会显示选择日期的详细信息。点击【生成报表】按键, 系统弹出选择保存报表 Excel 文件路径的对话框。选择报表保存路径, 点击保存文件对话框右上角的【Save】按键, 完成报表导出操作; 点击左上角【Cancel】按键, 取消报表导出操作。

Select the query date in the calendar, and detailed information for the selected date will be displayed in the 4 tables below. Click the [Generate Report] button, and the system will pop up a dialog box for selecting the save path of the Excel report file. Select the report save path and click the [Save] button in the upper right corner of the file save dialog box to complete the report export operation; click the [Cancel] button in the upper left corner to cancel the report export operation.

6.系统设定 System Settings

点击主功能菜单区域的【系统设定】按键, 进入系统设定页面, 如图 6-1 。

Click the [System Settings] button in the main function menu area to enter the system settings page, as shown in Figure 6-1.

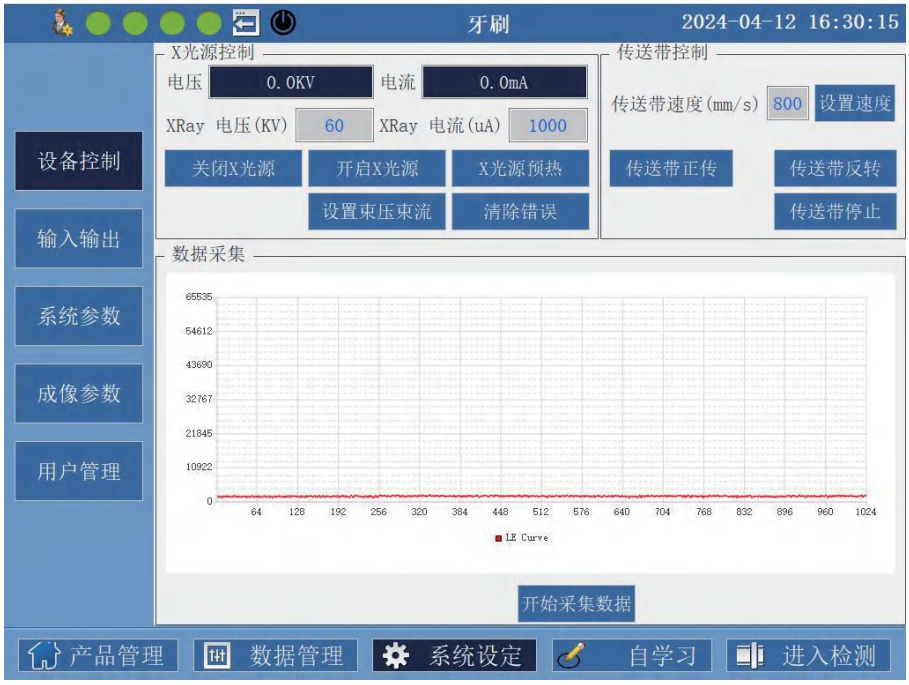


系统设定 System Settings (6-1)

6.1 设备控制 Equipment Control

点击子菜单区域中的【设备控制】按键, 显示设备控制子页面, 如图 6-1-1。

Click the [Equipment Control] button in the sub-menu area to display the equipment control sub-page, as shown in Figure 6-1-1.



设备控制 Equipment Control (6-1-1)

X 光源控制：

(1) 设置束压束流：在 X 光源工作电压、电流值编辑区域中录入电压、电流值后，点击【设置束压束流】完成设置操作。

(2) 开启 X 光源：点击【开启 X 光源】按键，X 光源将按照设置的束压束流值开始工作。

(3) 关闭 X 光源：点击【关闭 X 光源】按键，关闭 X 光源。

(4) 清除错误：点击【清除错误】按键，X 光源设备执行清除错误的指令。

(5) X 光源预热：点击【X 光源预热】按键，执行 X 光源预热的操作。如图 6-1-2 ，点击【取消】按键可终止 X 光源预热的操作。

X 光源预热
X-ray Source Preheating

(6-1-2)

X-ray Source Control:

(1) Set Beam Voltage and Current: Enter the voltage and current values in the X-ray source working voltage and current input area, then click [Set Beam Voltage and Current] to complete the setting.

(2) Turn On X-ray Source: Click the [Turn On X-ray Source] button, and the X-ray source will start working according to the set beam voltage and current values.

(3) Turn Off X-ray Source: Click the [Turn Off X-ray Source] button to shut down the X-ray source.

(4) Clear Errors: Click the [Clear Errors] button, and the X-ray source equipment will execute the error-clearing command.

(5) X-ray Source Preheating: Click the [X-ray Source Preheating] button to perform the preheating operation. As shown in Figure 6-1-2, click the [Cancel] button to terminate the X-ray source preheating.

传送带控制：

(1) 设置速度：在传送带速度编辑框中输入速度数值，点击【设置速度】按键，完成传送带速度设置操作。

(2) 传送带正转：点击【传送带正转】按键，执行传送带正转的操作。

(3) 传送带反转：点击【传送带反转】按键，执行传送带反转的操作。

(4) 传送带停止：点击【传送带停止】按键，执行传送带停止的操作。

Conveyor Belt Control:

(1) Set Speed: Enter the speed value in the conveyor belt speed input box and click the [Set Speed] button to complete the speed setting.

(2) Conveyor Belt Forward Rotation: Click the [Conveyor Belt Forward Rotation] button to start the forward rotation of the conveyor belt.

(3) Conveyor Belt Reverse Rotation: Click the [Conveyor Belt Reverse Rotation] button to start the

reverse rotation of the conveyor belt.

(4) Conveyor Belt Stop: Click the [Conveyor Belt Stop] button to stop the conveyor belt.

探测器数据采集：

点击【开始采集数据】按键，开始采集探测器数据，并以曲线的形式呈现出来。X 光源处于关闭状态时，显示的是本底状态的曲线；X 光源处于打开状态时，显示的是满度状态的曲线。点击【停止采集数据】按键，停止探测器的数据的刷新显示。

Detector Data Acquisition:

Click the [Start Data Acquisition] button to begin collecting detector data, which will be displayed in the form of a curve. When the X-ray source is off, the curve shows the background state; when the X-ray source is on, the curve shows the full-scale state. Click the [Stop Data Acquisition] button to halt the real-time refresh and display of detector data.

6.2 输入输出 Input and Output

点击子菜单区域中的【输入输出】按键，显示输入输出子页面，如图 6-2-1 。

指示灯显示输出信号和输入信号各部件的状态，绿灯表示正常，红色表示故障。

Click the [Input and Output] button in the sub-menu area to display the Input and Output sub-page, as shown in Figure 6-2-1.

The indicator lights show the status of each component for output signals and input signals. A green light indicates normal operation, and a red light indicates a fault.

输入输出
Input and Output (6-2-1)

6.3 系统参数 System Parameters

点击子菜单区域中的【系统参数】按键，显示系统参数子页面，如图 6-3-1 。

Click the [System Parameters] button in the sub-menu area to display the System Parameters sub-page, as shown in Figure 6-3-1.

系统参数 System Parameters (6-3-1)

1. 界面语言：目前支持中文、英文。
2. 传送带运行方向：设置检测产品时传送带的运行方向。
3. 探测器选择：目前只支持 SF MCD Detector 探测器。
4. 加密狗信息：显示软件的使用期限。
5. 通信串口：设置 PLC、变频器和射线源的串口号。
6. 系统设置：

- 软件开机自启：设置异物检测软件是否执行开机自启动。
- 保存原始数据：检测产品时图像是否保存原始的图像数据。
- 垂直镜像显示：检测产品时图像是否做垂直镜像。
- 水平镜像显示：检测产品时图像是否做水平镜像。

7. 图像保存设置：

- 保存图像类型：所有图像；NG 图像；OK 图像；不保存图像。
- 保存图像路径：点击 ... 按键，弹出图像保存路径选择对话框，选择检测图像保存路径。
- 图像保存天数：设置图像保存天数。系统在启动时会清理过期的图像数据。
- 日常点检：在检测产品时是否开启日常点检的功能。

1. Interface Language: Currently supports Chinese and English.
2. Conveyor Belt Running Direction: Sets the running direction of the conveyor belt during product inspection.
3. Detector Selection: Only supports the SF MCD Detector at present.
4. Dongle Information: Displays the software's service period.

5. Communication Serial Port: Sets the serial port numbers for the PLC, inverter, and X-ray source.

6. System Settings:

- Software Auto-Start on Boot: Sets whether the foreign object detection software starts automatically when the device is powered on.
- Save Raw Data: Sets whether to save the original image data during product inspection.
- Vertical Mirror Display: Sets whether to display the image in vertical mirror during product inspection.
- Horizontal Mirror Display: Sets whether to display the image in horizontal mirror during product inspection.

7. Image Saving Settings:

- Image Saving Type: All images; NG images; OK images; Do not save images.
- Image Saving Path: ... Click the button to pop up the image saving path selection dialog box, and select the storage path for inspection images.
- Image Retention Period (Days): Sets the number of days to retain saved images. The system will clear expired image data on startup.
- Daily Inspection: Sets whether to enable the daily inspection function during product inspection.

6.4 成像参数 Imaging Parameters

点击子菜单区域中的【成像参数】按键, 显示成像参数子页面, 如图 6-4-1 。修改成像参数后请点击【保存】按键, 新参数才能生效

Click the [Imaging Parameters] button in the sub-menu area to display the Imaging Parameters sub-page, as shown in Figure 6-4-1.After modifying the imaging parameters, click the [Save] button for the new parameters to take effect.

成像参数 Imaging Parameters (6-4)

1. 单块探测版探测点数：不同型号的探测器，探测点数不同。根据实际使用的探测器进行设置。

2. 探测点数：不同型号的探测器，探测点数不同。根据实际使用的探测器进行设置。

3. 像素间距：探测器的成像精度。根据实际使用的探测器进行设置。

4. IP 地址：探测器的 IP 地址。

5. 远程端口：探测器的网络通讯端口号。

6. 本地端口：工控机的网络通讯端口号。

7. 有效起始像素点、终止像素点：指的是在图像上有效的成像范围，如果产品成像超出范围可以设置报警。

8. 坏道索引：探测器中损坏的探测点序号。如果没有坏点不用输入。如果只有一个坏点直接输入坏点的序号，如“30”；如果有多个坏点请用“-”间隔坏点序号，如“30-40”。

1. Number of Detection Points per Detector Board: Different detector models have different numbers of detection points. Set according to the actually used detector.

2. Total Number of Detection Points: Different detector models have different total numbers of detection points. Set according to the actually used detector.

3. Pixel Pitch: Represents the imaging precision of the detector. Set according to the actually used detector.

4. IP Address: The IP address of the detector.

5. Remote Port: The network communication port number of the detector.

6. Local Port: The network communication port number of the industrial computer.

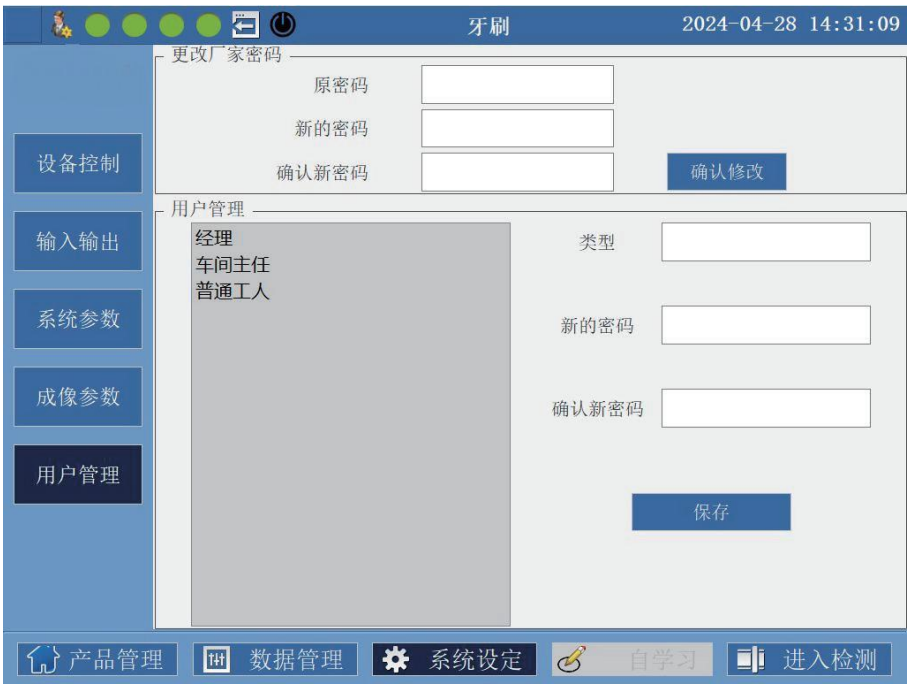
7. Effective Start Pixel & End Pixel: Refer to the effective imaging range on the image. An alarm can be set if the product imaging exceeds this range.

8. Bad Channel Index: The serial number of damaged detection points in the detector. No input is required if there are no bad points. Enter the serial number directly for a single bad point (e.g., "30"); use "-" to separate serial numbers for multiple bad points (e.g., "30-40").

6.5 用户管理 User Management

点击子菜单区域中的【用户管理】按键，显示用户管理子页面，如图 6-5-1。

Click the [User Management] button in the sub-menu area to display the User Management sub-page, as shown in Figure 6-5-1.



用户管理 User Management (6-5-1)

1. 更改厂家密码：只有使用厂家权限登录系统，才能修改厂家密码。

2. 用户管理：修改经理、车间主任、普通工人权限的登录密码。

(1)使用厂家权限登录系统后可以修改经理、车间主任、普通工人权限的登录密码；

(2)使用经理权限登录系统后只可以修改车间主任、普通工人权限的登录密码；

(3)使用车间主任权限登录系统后只可以修改普通工人权限的登录密码；

(4)使用普通工人权限登录系统后不能修改任何权限的登录密码。

1. Change Manufacturer Password: The manufacturer password can only be modified when logging into the system with manufacturer privileges.

2. User Management: Modify the login passwords for manager, workshop supervisor, and general worker privileges.

(1) After logging into the system with manufacturer privileges, you can modify the login passwords for manager, workshop supervisor, and general worker privileges;

(2) After logging into the system with manager privileges, you can only modify the login passwords for workshop supervisor and general worker privileges;

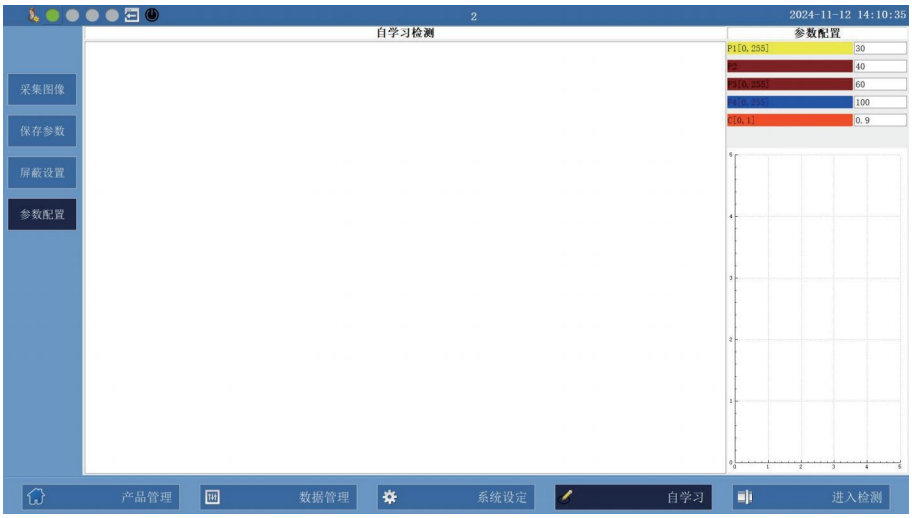
(3) After logging into the system with workshop supervisor privileges, you can only modify the login password for general worker privileges;

(4) After logging into the system with general worker privileges, you cannot modify the login password for any privileges.

7.自学习 Self-Learning

点击主功能菜单区域的【自学习】按键，进入自学习页面，如图 7-1 。利用自学习功能，可以根据检测结果的图像实时调整参数配置，从而为该产品确定合适的检测参数。

Click the [Self-Learning] button in the main function menu area to enter the Self-Learning page, as shown in Figure 7-1. The self-learning function allows real-time adjustment of parameter configurations based on the images of inspection results, thereby determining appropriate inspection parameters for the product.



自学习
Self-Learning （7-1）

不同的检测算法，对应的参数也是有所不同的。点击【采集图像】按键开始自学习。依次将产品过包，针对该产品自学习的参数自动填写在对应的参数项中（有部分参数需要手动设置），所有参数都支持手动修改。设置完最优参数后，点击【保存参数】按键使参数生效。

点击【屏蔽设置】弹出屏蔽设置对话框。屏蔽设置主要针对产品部分区域在检测过程中容易误检造成误判的区域进行屏蔽，屏蔽区域类型主要包含无屏蔽、四周屏蔽、左右屏蔽、上下屏蔽和干燥剂屏蔽，屏蔽区域的大小以 mm 为单位。

Different detection algorithms correspond to different parameters. Click the [Capture Image] button to start self-learning. Pass the products through the inspection one by one—parameters learned for the product will be automatically filled in the corresponding parameter items (some parameters need to be set manually), and all parameters support manual modification. After setting the optimal parameters, click the [Save Parameters] button to make the parameters take effect.

Click [Shielding Settings] to pop up the shielding settings dialog box. Shielding settings are mainly used to shield areas of the product that are prone to false detection and misjudgment during inspection. The shielding area types include No Shielding, Surrounding Shielding, Left-Right Shielding, Top-Bottom Shielding, and Desiccant Shielding. The size of the shielding area is measured in millimeters (mm).

屏蔽设置
Shielding Settings

(7-2)

8.产品检测 Product Inspection

点击主功能菜单区域的【进入检测】按键，进入产品检测页面。

Click the [Enter Inspection] button in the menu area to access the Product Inspection page.

8.1 检测操作 Inspection Operation

点击子菜单区域中的【检测操作】按键，显示检测操作子页面，如图 2-8-1-1。点击【开始检测】，进行产品检测。

Click the [Inspection Operation] button in the sub-menu area to display the Inspection Operation sub-page, as shown in Figure 8-1-1. Click the [Start Inspection] button to begin product inspection.

检测操作
Inspection Operation

(8-1-1)

8.2 手动调参 Manual Parameter Adjustment

点击子菜单区域中的【手动调参】按键, 显示手动调参子页面, 如图 8-2-1。

用户可以手动调节自学习获取的参数来优化检测参数。修改参数后图像显示区域会实时显示新参数的检测结果, 以供操作者参考。

Click the [Manual Parameter Adjustment] button in the sub-menu area to display the Manual Parameter Adjustment sub-page, as shown in Figure 8-2-1.

Users can manually adjust the parameters obtained through self-learning to optimize the inspection parameters. After modifying the parameters, the image display area will real-time show the inspection results with the new parameters for the operator's reference.

手动调参
Manual Parameter Adjustment

(8-2-1)

点击【放大图像】按键, 图像放大显示; 点击【缩小图像】按键, 图像缩小显示。当鼠标停留在图像显示区域时, 拖拽鼠标可以移动图像。【屏蔽设置】功能与自学习的屏蔽设置功能相同。

点击【上一张图像】按键, 显示上一个检测产品的检测结果图像; 点击【下一张图像】按键, 显示下一个检测产品的检测结果图像。系统目前支持最多可以查看最后 5 个检测产品的检测结果图像。

点击【保存参数】按键, 修改后的检测参数生效。

【参数配置】按键功能与自学习【参数配置】按键功能相同。

Click the [Enlarge Image] button to display the image in an enlarged size; click the [Shrink Image] button to display the image in a reduced size. When the mouse hovers over the image display area, drag the mouse to move the image. The [Shielding Settings] function is the same as the Shielding Settings function in Self-Learning.

Click the [Previous Image] button to display the inspection result image of the previous inspected product; click the [Next Image] button to display the inspection result image of the next inspected product. Currently, the system supports viewing the inspection result images of up to the last 5 inspected products.

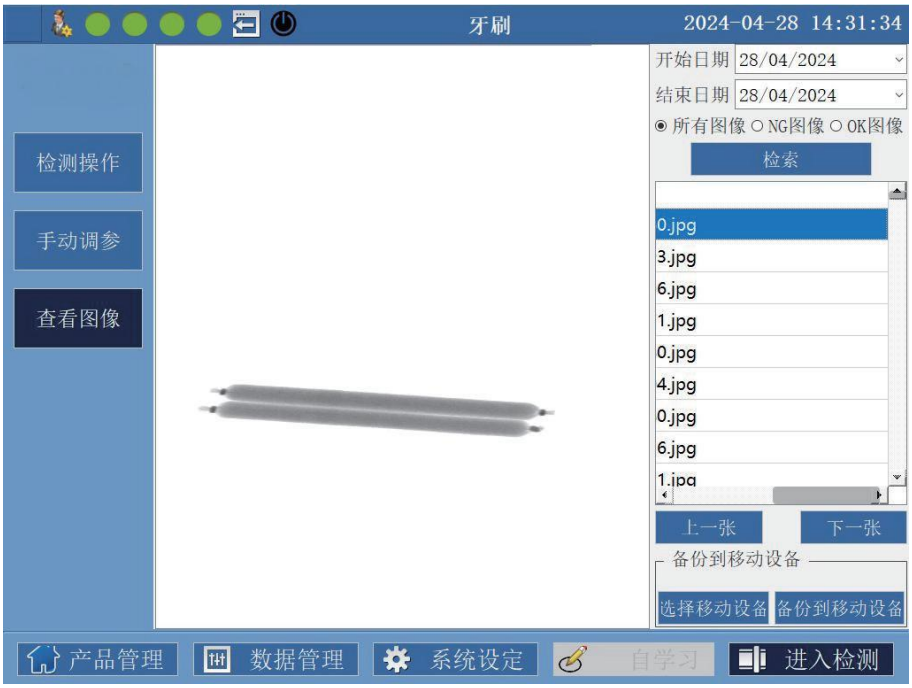
Click the [Save Parameters] button to make the modified inspection parameters take effect.

The function of the [Parameter Configuration] button is the same as the [Parameter Configuration] button in Self-Learning.

8.3 查看图像 Image Viewing

点击子菜单区域中的【查看图像】按键，显示查看图像子页面，如图 8-3-1。

Click the [Image Viewing] button in the sub-menu area to display the Image Viewing sub-page, as shown in Figure 8-3-1.



查看图像
Image Viewing (8-3-1)

8.4 查询图像 Image Query

在选择完开始日期、结束日期和查询图像类型（所有图像、NG 图像、OK图像）后点击【检索】按键，将对当前应用的产品按照设置的查询条件进行查询。查询结果列表中将显示符合查询条件的图像文件名。

After selecting the start date, end date, and query image type (All images, NG images, OK images), click the [Search] button to query the currently applied product based on the set search criteria. The query result list will display the filenames of the images that meet the search criteria.

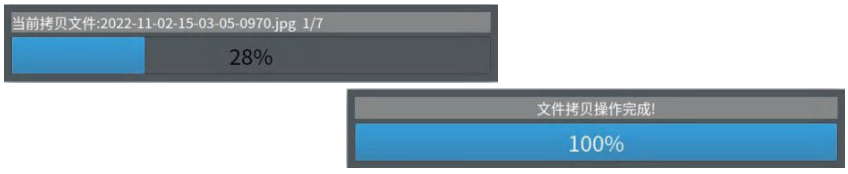
8.5 备份图像 Image Backup

1. 点击【选择移动设备】按键，弹出【选择图像备份路径】对话框，选择 U 盘路径；

2. 点击【备份到移动设备】按键，系统弹出备份进度对话框，备份操作完成后备份进度对话框自动关闭。

1. Click the [Select Mobile Device] button to pop up the [Select Image Backup Path] dialog box, then select the USB flash drive path.

2. Click the [Backup to Mobile Device] button. The system will pop up a backup progress dialog box, which will automatically close after the backup operation is completed.



备份进度对话框
Backup Progress Dialog Box (8-5)

9.切换登录与锁屏 Switch Login & Screen Lock

登录系统后, 如果需要切换登录用户, 可以点击工具栏  按钮, 系统会弹出用户登录对话框。

正确输入登录密码, 点击登录对话框的【登录】按键, 完成登录操作。

After logging into the system, if you need to switch the logged-in user, click the  button on the toolbar— the system will pop up the User Login dialog box.

Enter the login password correctly and click the [Login] button in the dialog box to complete the login operation.

10.软件退出 Software Exit

点击工具栏的  按钮, 系统执行退出异物检测软件的操作; 点击工具栏的  按钮, 系统执行关闭计算机的操作。

Click the  button on the toolbar, and the system will exit the foreign object detection software; click the  button on the toolbar, and the system will shut down the computer.

11.操作权限 Operation Permissions

系统分为 4 个等级权限, 权限从高到低依次为厂家权限、经理权限、车间主任权限和普通工人权限。

1. 厂家权限可以操作系统中的所有功能。

2. 经理权限不可以操作的内容有:

- (1) 【产品管理】中不可以设置【光电滤波时间】参数;
- (2) 【数据管理】中不可以操作【零级更新】和【设备历史】功能;
- (3) 【系统设定】中不可以操作【设备控制】中的【开启 X 光源】、【关闭 X 光源】和【设置束压束流】的操作;
- (4) 【系统设定】中不可以操作【成像参数】功能;
- (5) 不可以执行退出软件的操作。

3. 车间主任权限继承了经理权限不可以操作的全部内容, 新增的不可以操作的内容有:

- (1) 【数据管理】中不可以操作【设备管理】功能;
- (2) 【系统设定】中不可以操作【设备控制】中的传送带控制的所有功能。

4. 普通功能权限继承了车间主任权限不可以操作的全部内容, 新增的不可以操作的内容有:

- (1) 【产品管理】中不可以操作【新建产品】、【更改参数】和【删除产品】功能;
- (2) 【数据管理】中所有功能都不可以操作;
- (3) 【系统设定】中所有功能都不可以操作;
- (4) 【自学习】中所有功能都不可以操作。

The system is divided into 4 levels of permissions, ranked from highest to lowest as follows: Manufacturer Permission, Manager Permission, Workshop Supervisor Permission, and General Worker Permission.

1. Manufacturer Permission can operate all functions in the system.

2. Manager Permission cannot perform the following operations:

- (1) Cannot set the [Photoelectric Filtering Time] parameter in [Product Management];
- (2) Cannot operate the [Zero-Level Update] and [Equipment History] functions in [Data Management];
- (3) Cannot perform the operations of [Turn On X-Ray Source], [Turn Off X-Ray Source], and [Set Beam Voltage & Current] in [Equipment Control] under [System Settings];
- (4) Cannot operate the [Imaging Parameters] function in [System Settings];
- (5) Cannot perform the operation of exiting the software.

3. Workshop Supervisor Permission inherits all the restricted operations of Manager Permission, with the following additional restricted operations:

- (1) Cannot operate the [Equipment Management] function in [Data Management];
- (2) Cannot operate all conveyor belt control functions in [Equipment Control] under [System Settings].

4. General Worker Permission inherits all the restricted operations of Workshop Supervisor Permission, with the following additional restricted operations:

- (1) Cannot operate the [Create New Product], [Modify Parameters], and [Delete Product] functions in [Product Management];
- (2) Cannot operate any functions in [Data Management];
- (3) Cannot operate any functions in [System Settings];
- (4) Cannot operate any functions in [Self-Learning].

12.软键盘 On-Screen Keyboard

12.1 数字软键盘 Numeric On-Screen Keyboard

数字软键盘实现正负数的输入，用于参数数据的输入、修改，界面简洁，功能单一。如图 12-1-1 所示。

The numeric on-screen keyboard supports the input of positive and negative numbers, which is used for the input and modification of parameter data. It features a simple interface and single function, as shown in Figure 12-1-1.

数字软键盘
Numeric On-Screen Keyboard

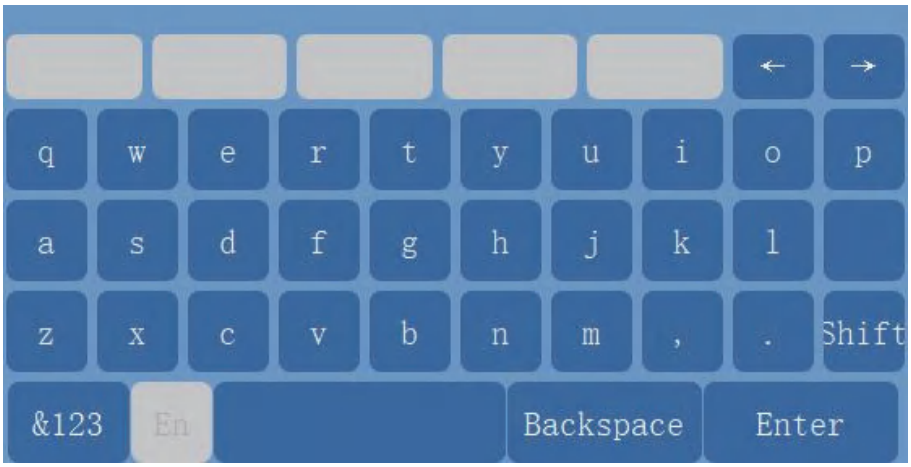
(12-1-1)

12.2 中英文输入软键盘 Chinese-English Input On-Screen Keyboard

中英文输入软键盘主要用在需要输入英文字母、数字、符号和中文的地方。

The Chinese-English input on-screen keyboard is mainly used in scenarios where the input of English letters, numbers, symbols, and Chinese characters is required.

中英文输入软键盘
英文小写输入
Chinese-English Input On-Screen Keyboard
English Lower-case Input



（12-2-1）