Abbott

Remover Module

Supplemental Manual

For use with the GLP systems Track Laboratory Automation System and the Remover Module

80004212-101 DRAFT

Table of contents

Foreword

This supplemental manual is intended for the relevant laboratory staff operating the Remover Module.

Ensure that this supplemental manual is read and understood before startup is performed.

This supplemental manual contains information on the Remover Module properties and handling, and instructions and measures for maintaining its operational readiness.

The GLP systems Track laboratory automation system is a modular, customer-specific design. This supplemental manual refers only to the Remover Module. Ensure that the manuals relating to each single component are observed. In addition, observe the manuals for the connected analyzers.

The Remover Module may not be available in all countries. Contact your local representative for more information.

The features in this supplemental manual were introduced in software 2.0.0.

NOTE: An X in the software version number represents software changes that have no impact on this manual.

Original instructions of this manual are written in English. Other languages are translations of the original instructions.

For an electronic copy of this manual, go to corelaboratory.abbott/ifu.

For laboratory professional use only.

This manual is supplemental to the GLP systems Track Operations Manual. Refer to the GLP systems Track Operations Manual for the following information:

- System security
- Customer service
- Intended use
- Disclaimers
- GLP systems Track warranty statement for USA customers only
- GLP systems Track agency approvals
- Intellectual Property statement
- Key to symbols
- Manufacturer and distributor
- Covers, hoods, and sensors
- Requirements for handling the specimens
- Operator responsibility
- Biological hazards

- Precautions
- Spill cleanup
- Requirements for decontamination
- Glossary

Only use the operating instructions in the GLP systems Track Operations Manual with an Input/Output Module with list number (LN) 04Z96-02 or higher or a Tube Assessment Module with LN 04Z99-02 or higher. If necessary, contact an Abbott Laboratories representative or an authorized service representative.

Related information...

General safety information, page 7

Proprietary statement, page 8

General safety information

Before operating the Remover Module, read and understand the safety information in this manual.

For information about actions or conditions that can affect system performance, carefully review the operational precautions and limitations in the GLP systems Track Operations Manual.

To become familiar with safety icons on the module and in this manual that indicate potentially hazardous situations, review the hazards in the GLP systems Track Operations Manual. Comply with the hazard and safety information to minimize the potential for harm to personnel and damage to the laboratory environment.

The sections for operational precautions and limitations and for hazards in the GLP systems Track Operations Manual contain supplemental information. Do not use the supplemental information to supersede workplace safety requirements. Review any significant differences between the supplemental information and the workplace safety requirements with management or a workplace safety representative.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause unwanted operation.

This device complies with Industry Canada license-exempt RSS standards. Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause unwanted operation of the device.

The Remover Module is state-of-the-art. However, residual dangers exist. The safety instructions must be read and observed. The manufacturer accepts no liability for failure to observe the safety instructions.

Refer to the GLP systems Track Operations Manual for the complete listing of all safety information.

Related information...

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Proprietary statement

The software and manual were developed solely for use with the laboratory automation system as specified in the operating instructions.

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Related information...

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Introduction

The GLP systems Track is a modular laboratory automation system (LAS) designed to automate pre-analytical and post-analytical processing in clinical laboratories. The system consolidates multiple analytical instruments into a unified workflow. This module includes a built-in touchscreen, a user interface that functions as a central operating and display element. The Remover Module is a module of the GLP systems Track that may be included in an LAS configuration.

Related information...

Remover module overview, page 10

Remover module overview

The Remover Module (REM) removes the caps from sample tubes from the laboratory automation system which have been capped with Recaps in the Recapper Module. The Remover Module SL has two Remover robots. The robots can be configured to remove (S) small sample caps or (L) large sample caps.

Related information...

Use or function, page 9

Design and function, page 10

Descriptions of module statuses, page 14

Design and function

The Remover Module has the following components:

Figure 1: Exterior front view of the Remover Module

Legend:

1. Front module cover: Protects the operator from injury and keeps the loading area free from dust. The module cover can be opened from the front.

   CAUTION: Mind or watch your hands. The front and rear module covers can be opened **only** with the key and **only** by a trained operator. Before opening the module cover and reaching into the module, place the module offline. This action prevents the robot from moving after its initiated movement is completed. If the module is online when the module cover is opened, the robot slows down but does not stop. **Keep away from the moving robot and close the module covers as soon as possible.**
2. Monitor: Functions as the central operating and display element. The monitor is located on the front module cover.
3. Online/Offline push button with pause function: Transitions the module status to Online, Offline, or Pause. The Online/Offline push button is located on the front of the module.
4. On/Off push button: Powers on and powers off the module. The On/Off push button is located on the front of the module.
5. Drawer: Collects the Recaps.
6. Housing: Upper part of housing contains the sample platform.
7. Track: Composed of lane elements and serves as the structure along which CARs move to transport samples to modules.
8. Rear module cover: Protects the operator from injury and keeps the loading area free from dust. The module cover can be opened from the rear.

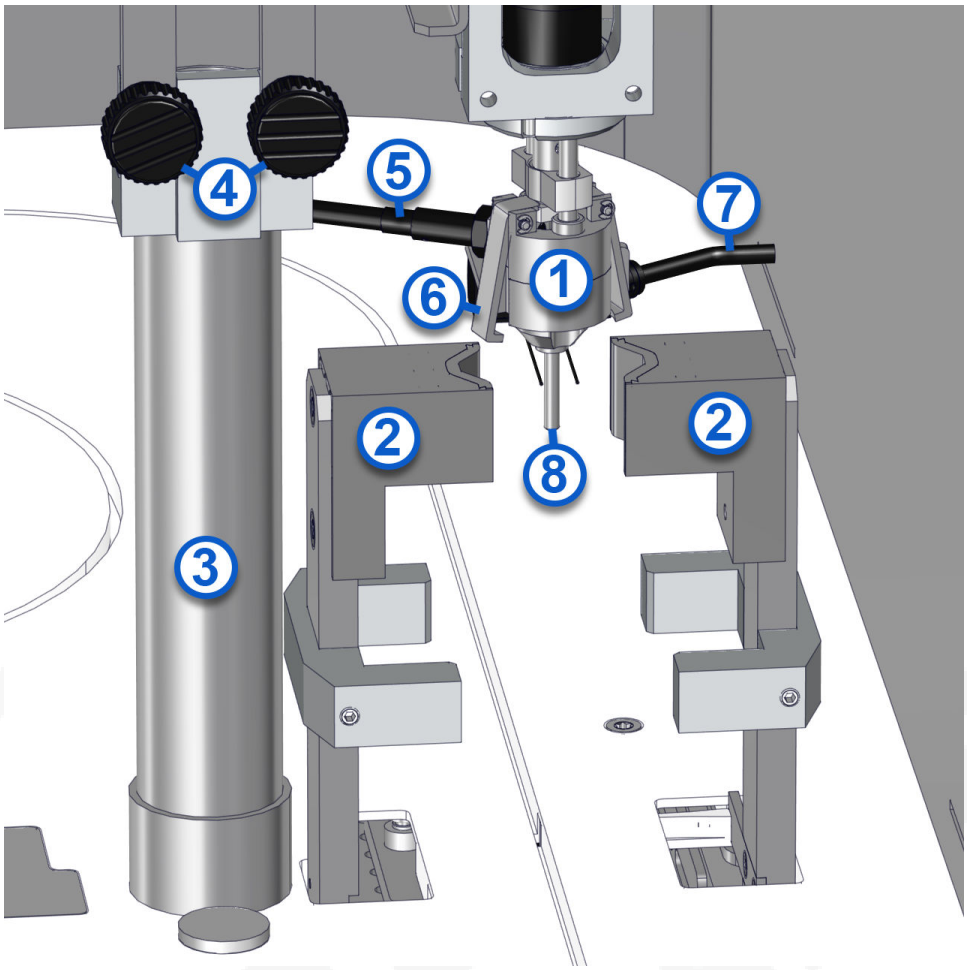
   CAUTION: Do not reach inside. The module covers can be opened **only** with the key when the module is offline. **Never reach into the module when it is online. Exposure to potentially harmful crushing by the robots can occur.**
9. Module serial number label: Located in the interior of the module.

Figure 2: Exterior rear view of the Remover Module

Legend:

1. Module flap: Used to access the track inside the module.

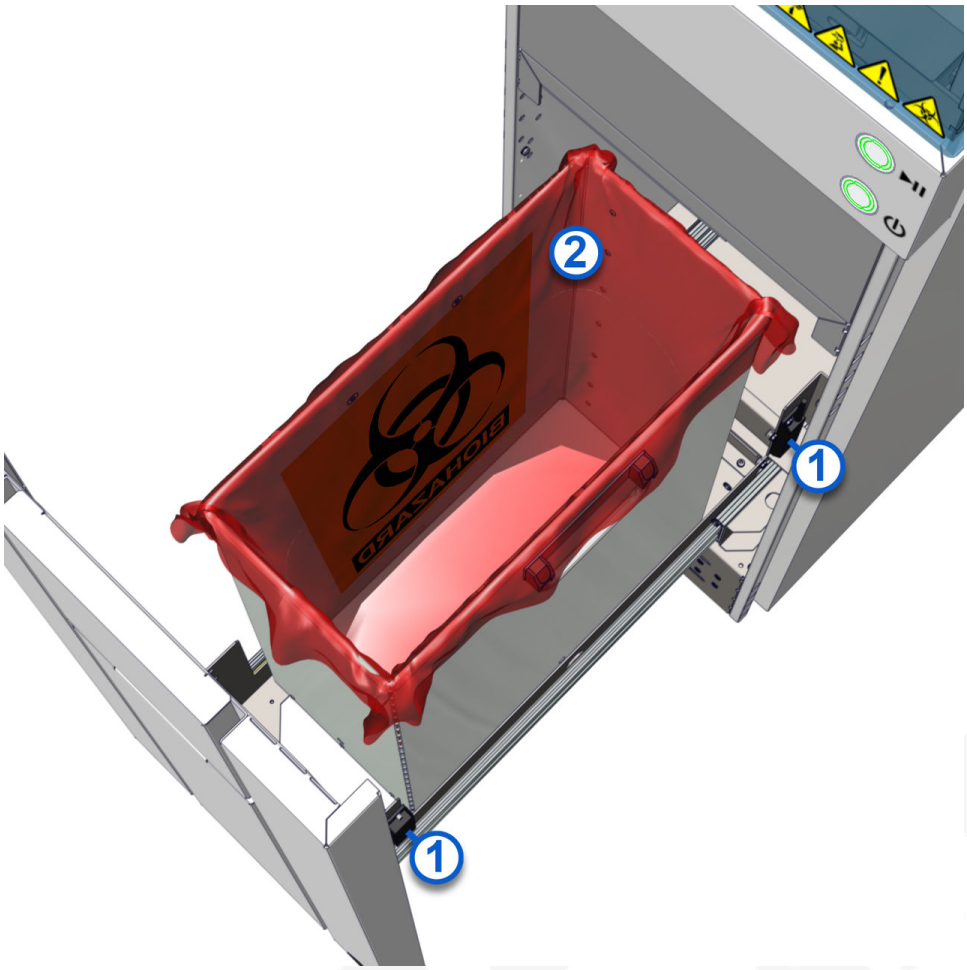
Figure 3: Interior view of the Remover Module



Legend:

1. Robot gripper: Grips the Recap on the sample tube using the gripper, pulls them upwards, and then disposes of them through the waste shaft.
2. AccessPoint with clamping jaws: Grips the sample with its clamping jaws while the sample tube is opened.
3. Waste shaft: Guides the Recaps into the waste container.
4. Knurled-head screws: Fixes the waste shaft in position.
5. Sensor for Recap identification: Records whether there is a Recap on the sample tube.
6. Gripper clamp: Grips below the Recap collar and pulls it upwards from the sample tube.
7. Sensor for height detection of the sample tube: Scans the upper edge of the sample tube and records its height.
8. Recap probe: Records whether there is a Recap on the sample tube.

Figure 4: Waste container view of the Remover Module



Legend:

1. Drawer sensor: Monitors whether the drawer is closed during operation. If the drawer is open, the current process is stopped.
2. Waste container: Collects Recaps. The waste container fill level is displayed on the touchscreen user interface.

Related information...

Remover module overview, page 10

Descriptions of module statuses

Module status refers to the operational modes of the module. The module has the following statuses:

On	The On/Off push button is illuminated steady green.

Off	The On/Off push button is illuminated blinking green.
Online	The module is in automatic mode. The Online/Offline push button is illuminated steady green and the arrow area of the **Online/Offline** button is green.
Offline	The module is in standby mode. The Online/Offline push button is illuminated steady yellow and the arrow area of the **Online/Offline** button is gray.
Pause	The module is briefly inactive. The Online/Offline push button is illuminated blinking green and the arrow area of the **Online/Offline** button is blinking green.
Error	An error has occurred on the module. The Online/Offline push button is illuminated steady red.

Related information...

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NOTES

Introduction

For optimal system performance, the Remover Module must be correctly installed. After the system has been installed, it must be configured to meet individual laboratory requirements.

Related information...

Remover Module installation requirements, page 18

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Main menu screen, page 22

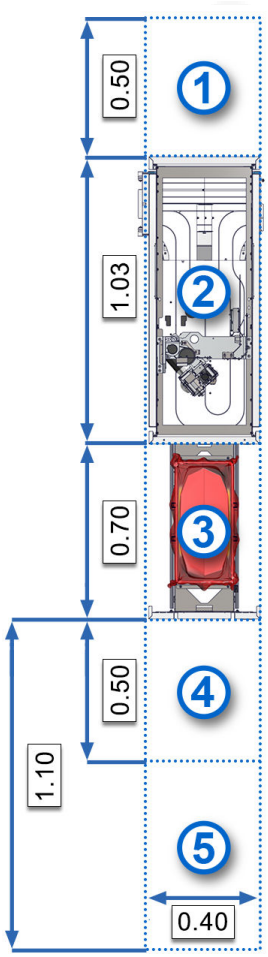
Remover Module installation requirements

The Remover Module may only be installed indoors. The floor must have a nonslip, load-bearing surface. The system is freestanding and is not fixed to the floor. Water connections are not required. Facilities must fulfill the floor area and space requirements.

Table 1: Floor area requirements

Load-bearing capacity including service area	
Evenness tolerance (permissible deviation)	
Compensation with adjustable feet	
Material	

Figure 5: Floor area measurements in meters

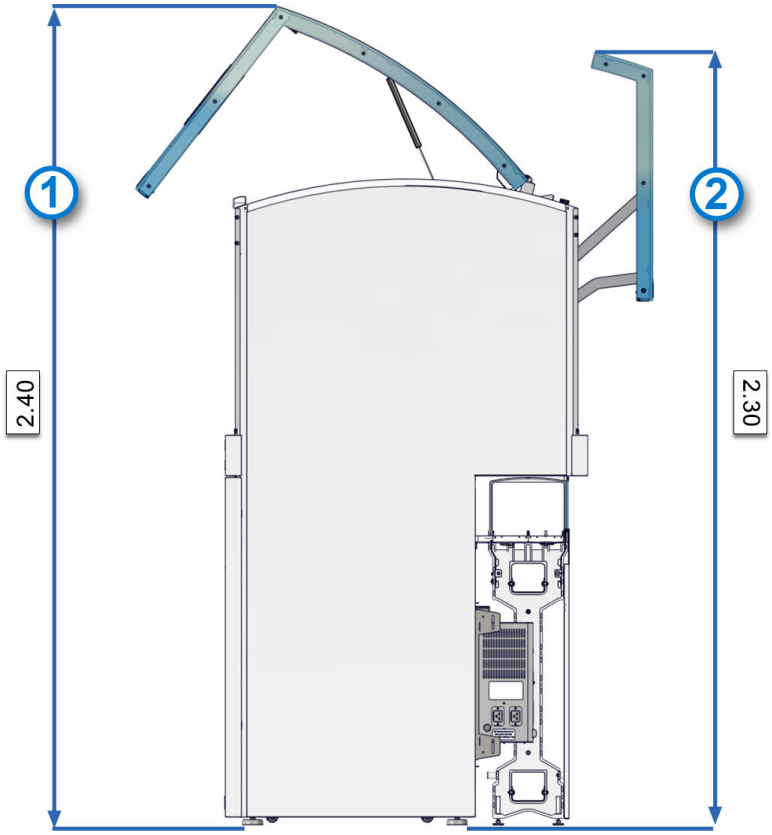


Legend:

1.

2.
3.
4.
5.

Figure 6: Height measurements in meters



Legend:

1. Front module cover opened
2. Rear module cover opened

Related information...

Installation procedures and special requirements, page 17

Typical floor loading

Floor loading conditions must be taken into account when planning the laboratory. Typical floor loads at each pad are provided in the following tables.

NOTE: Floor loading is the distribution of force at the pads on a leveled system. Distributed loads vary with the mechanical linking of modules and pad adjustment.

Figure 7: Remover Module

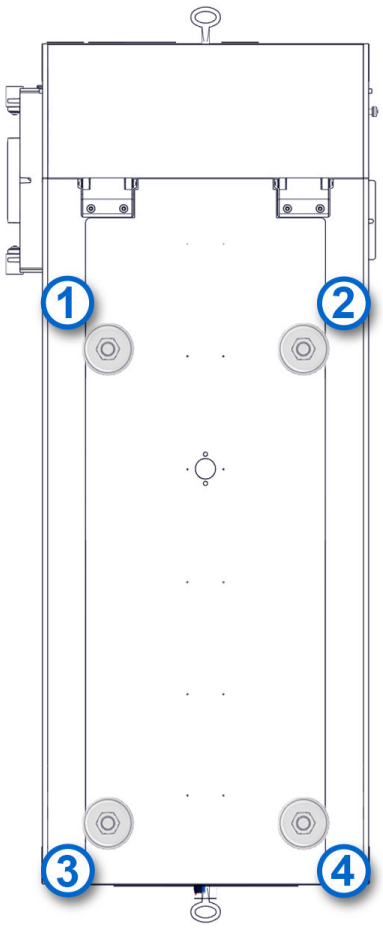


Table 2: Remover Module weight specifications

Load at each pad	1. 2. 3. 4.

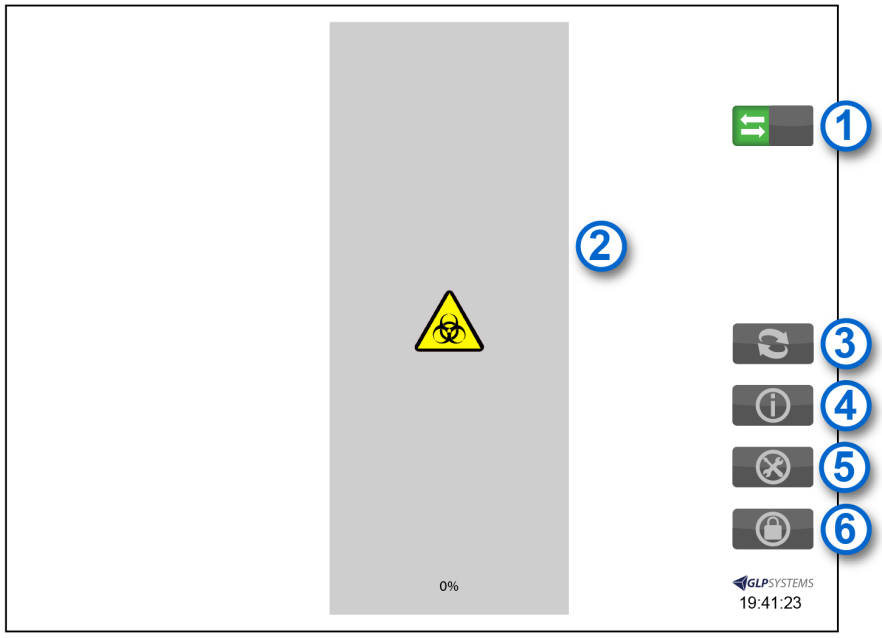
Related information...

Installation procedures and special requirements, page 17

Main menu screen

After successful initialization of the Remover Module (REM), the Main menu screen is displayed with the following screen elements.

Figure 8: Main menu screen



Legend:

1. **Online/Offline** button with pause function: Places the module online and offline and pauses the module.
2. Module waste level meter: Displays the fill level of the waste container.
3. **Waste bin emptying confirmation** button: Confirms the waste bin is empty.
4. **Information** button: Navigates to the Information screen.
5. **Configuration** button: Navigates to the Configuration screen.
6. **Login** button: Navigates to the Login screen.

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Installation procedures and special requirements, page 17

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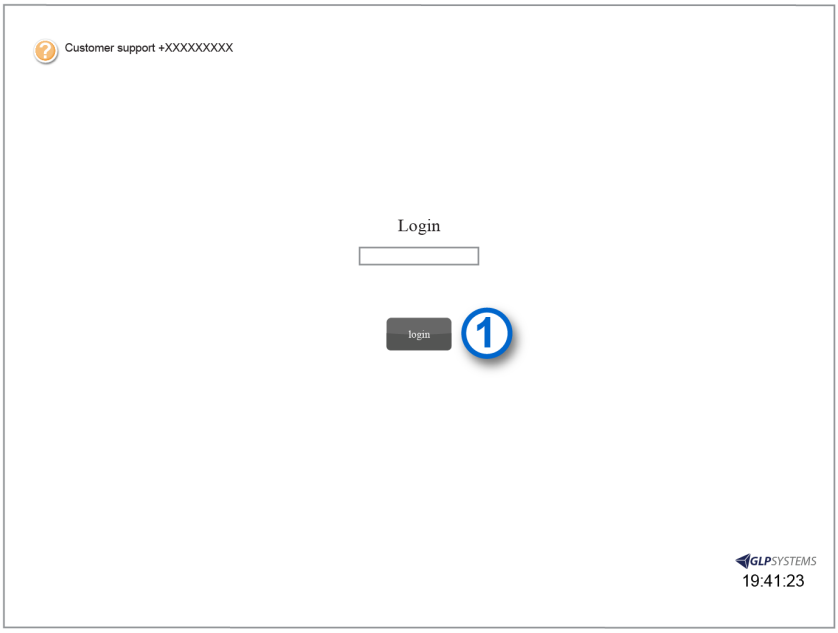
Login screen

The Login screen for the configuration manager is displayed if a login and password have been defined during installation.

NOTE: Configuration of the operator login is performed by an Abbott Laboratories representative or an authorized service representative.

Figure 9: Login screen



Legend:

1. **Login** button

Related information...

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Access the Login screen, page 23

Access the Login screen

Prerequisite	A password was defined during installation. **NOTE:** The **Login** button is available only to an Abbott Laboratories representative or an authorized service representative.
Required module status	Online or Offline

Perform this procedure to access the Login screen on the module.

NOTE: Configuration of the operator login is performed by an Abbott Laboratories representative or an authorized service representative.

1. On the Main menu screen, tap the **Login** button .
2. On the Login screen, enter a user name and password.
3. To return to the Main menu screen, tap **Login**.

Related information...

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Information screen

The Information screen on the module displays the following module status information:

Module build	The firmware version of the module controller.
Module MAC	The MAC address of the module controller Ethernet port.
Module IP	The IP address of the module controller.
ControllerId	The ID of the module controller.
ControllerName	The name of the module controller.
Module up - time in minutes	The time elapsed since the start.
Module samples managed	The current number of samples being managed by the module.
Module input operations	The number of samples placed on the track since the start.
Module output operations	The number of samples moved from the track since the start.
Module controller status	The current internal status of the module controller.
Active Error	The message code of the currently active error.
Last active error	The message code of the last active error.
Barcode read enabled	The indicator for whether a bar code reader has been activated.

RobotSample X Script Version	The script version for one of the two robot controllers.
RobotSample YZRG Script Version	The script version for the other robot controller.
Barcode Read Errors	The number of samples with failed bar code readings since the start.
RobotSample operations	The number of movements the robot has performed since the start.
Module total operation time	The time elapsed since the start in seconds.
Display ID	The name of the display component.
Display IP address	The IP address of the display component.
Display MAC address	The MAC address of the display component Ethernet port.
Display sms4display build	The firmware version of the display component.
Display libsms4json build	The version of the JSON library of the display component.
Display Qt version executable/ environment	The version of the Qt framework library used by the display component.
Display OS/Kernel	The operating system version of the display component.
CAN available	The indicator for whether the display has a CAN connection.
Display memory total/ free MB	The free memory of the display component.
Exit button 	Navigates to the Main menu screen.

Related information...

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Access the Information screen, page 25

Access the Information screen

Required module status	Online or Offline

Perform this procedure to access the Information screen on the module.

1. On the Main menu screen, tap the **Information** button .
2. On the Information screen, tap the **Exit** button to return to the Main menu screen.

Related information...

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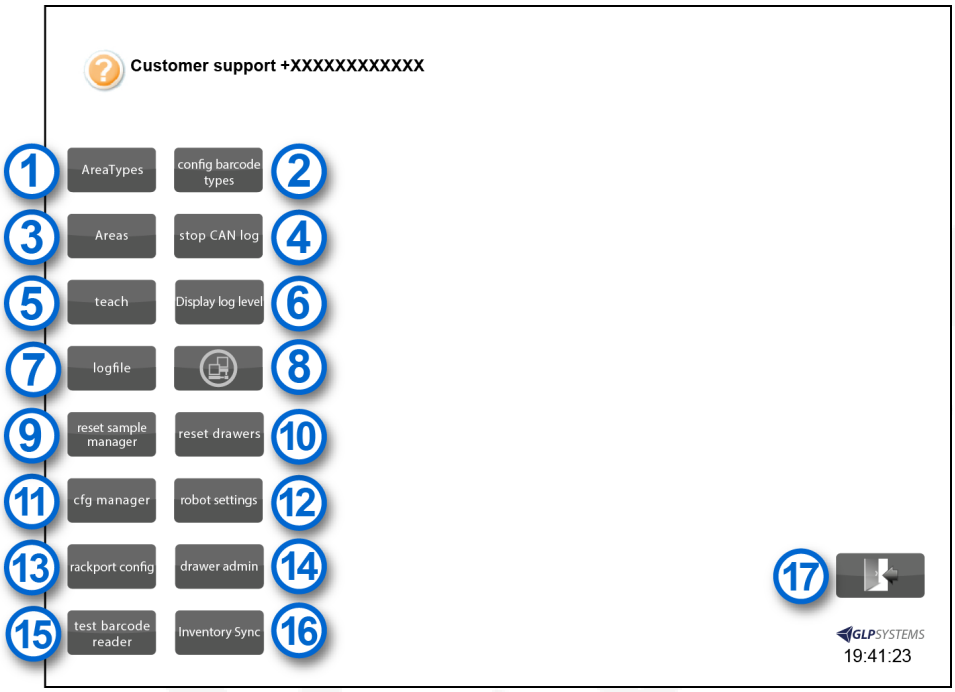
Configuration screen

The Configuration screen on the module displays the following screen elements.

NOTE: Only the **AreaTypes** and **Areas** buttons are available to the operator. The other buttons are available only to an Abbott Laboratories representative or an authorized service representative.

Figure 10: Configuration screen



Legend:

1. **AreaTypes** button: Navigates to the Create AreaTypes screen.
2. **config barcode types** button: Navigates to the Barcode type settings screen.
3. **Areas** button: Navigates to the Create and Configure Areas screen.
4. **stop CAN log** button: Stops or starts the recording of one or more log files. The button toggles between **stop CAN log** and **start CAN log**.
5. **teach** button: Navigates to the Teaching screen.
6. **Display log level** button: Navigates to the Display logfiles level settings screen.
7. **logfile** button: Navigates to the log files.
8. **Network** button: Navigates to the Network setting screen.

9. **reset sample manager** button: Resets the samples from the module.
10. **reset drawers** button: No functionality is available.
11. **cfg manager** button: Navigates to the Configuration settings screen.
12. **robot settings** button: Navigates to the Robot settings screen.
13. **rackport config** button: No functionality is available.
14. **drawer admin** button: Navigates to the Drawer settings screen.
15. **test barcode reader** button: Navigates to the Barcode reader test screen.
16. **Inventory Sync** button: Synchronizes the sample database between the Track Sample Manager and the module.
17. **Exit** button: Navigates to the Main menu screen.

Related information...

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Access the Configuration screen, page 27

Access the Configuration screen

Required module status	Online or Offline

Perform this procedure to access the Configuration screen on the module.

1. On the Main menu screen, tap the **Configuration** button  .
2. On the Configuration screen, tap the **Exit** button  to return to the Main menu screen.

Related information...

Configuration screen, page 26

NOTES

Introduction

The Remover Module (REM) removes Recaps from sample tubes. Recaps are conic plastic caps for sample tube storage. The Recaps are removed from the samples in the upper interior of the Remover Module. CARs with samples are stopped at the AccessPoint. The robot removes the Recap from the sample tube by pulling it upwards using the gripper. Removed caps are discarded to the waste bin using the waste shaft.

The Remover Module SL has a removing unit for small and large tubes, hence a throughput of 640 Recaps (320 Recaps S and 320 Recaps L) per hour. S stands for small sample tubes and L for large sample tubes.

The functions of the module are centrally controlled by the Track Sample Manager.

The waste container, which collects the Recaps, is located in the lower interior.

NOTES

Introduction

Before operating the Remover Module, become familiar with system performance characteristics.

Related information...

Technical data, page 32

Technical data

Table 3: Remover Module SL Technical data

Throughput	640 Recaps per hour (320 Recaps S and 320 Recaps L) **NOTE:** The specified performance of the module is based on measurements taken in a given test environment. The actual performance may vary significantly depending on the use scenario of the laboratory automation system.
Waste capacity	Minimum of 2000 Recaps per Remover Disposable Bag
Approved tube type	Refer to base manual
Supported cap type	Recaps only
Dimensions	40 cm (width) x 103 cm (depth) x 188 cm (height)
Altitude	30.8 m (100 ft) below sea level to 2000 m (6561 ft) above sea level
Ambient temperature	During operation: +15°C to +30°C During transport and storage: -30°C to +60°C
Relative humidity	During operation: 30% to 80% (non-condensing)
Supply voltage	230 V AC (+/-10%)
Supply frequency	50 Hz/60 Hz
Power requirement	1.22 kW
Power	Standby: 41 W Average at full load: 46 W Short-time peak at full load: 55 W
Weight	212 kg
Waste heat	Average at full load: 166 kJ/h
Acoustic level	Minimum of 65 dBA

Related information...

Performance characteristics and specifications, page 31

Introduction

This section provides instructions on how to perform normal operating procedures on the Remover Module. Before operating the system, become familiar with hardware components of the system.

Related information...

Remover Module operation, page 34

Remover Module operation

The module-specific function selection for the Remover Module is displayed on the Main menu screen. The operator selects the corresponding function and follows the instructions. Ensure that the module covers are closed and locked before operating the module.

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Operating instructions, page 33
Open and close the front and rear module covers, page 34
Cycle power to the module, page 36
Power on the module, page 37
Power off the module, page 38
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Pause the module, page 40
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Empty and reset the waste container, page 41

Open and close the front and rear module covers

Required materials	Key
Required module status	Offline

Perform this procedure to open and close the front and rear module covers.

CAUTION: Overhead obstruction. Operators may hit their heads on open module covers.

- Be aware that injury can occur when module covers are opened and closed.
- Protect the head when working on modules with open module covers.
- Frequently observe the functionality of the opening mechanism. Regular inspection of the covers is necessary during maintenance to ensure proper operation.

CAUTION: Mind or watch your hands. The front and rear module covers can be opened and closed **only** by a trained operator. Finger pinches can occur between two adjacent modules if module covers are closed by holding their sides. Use caution when opening and closing the front and rear module covers.

1. At the lower end of the front or rear module cover, insert the key [1] into the lock [2].

   NOTE: Images of the rear module cover and the module flap cover are not shown.

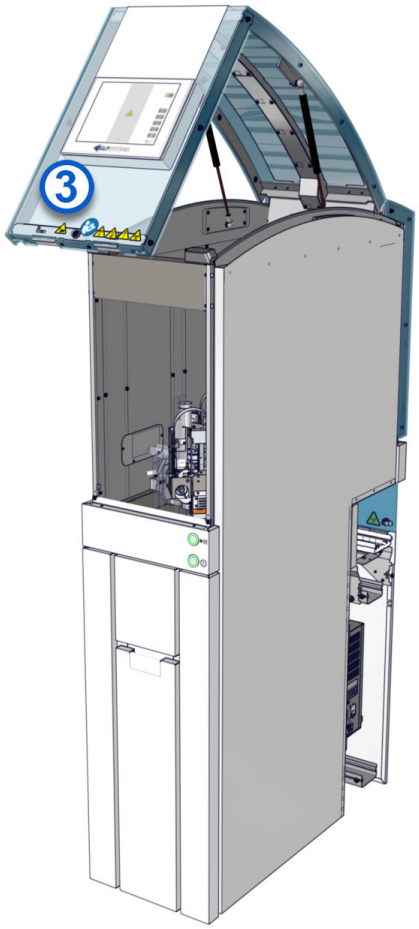
Figure 11: Front module cover lock

2. While turning the key [1] counterclockwise a quarter turn, begin lifting the front module cover [3] or rear module cover.

Figure 12: Key

3. Remove the key [1] from the lock [2].
4. Fully lift open the front module cover [3] or rear module cover.

Figure 13: Front module cover opened



5. To close the front module cover [3] or rear module cover, carefully pull down the cover.
6. Press lightly on the cover until it is secured.
7. Place the module online.

Related information...

Remover Module operation, page 34
Replace clamping jaws at the AccessPoint, page 55

Cycle power to the module

Prerequisite	The module has completed all processing and no samples are present on the module.

Perform this procedure to cycle power to the module to reestablish communication among the system components or to troubleshoot the module.

1. To power off the module, press the On/Off push button for a minimum of 3 seconds.
2. Wait for the module to power off.
3. After the module is powered off, wait for a minimum of 1 minute.
4. To power on the module, press the On/Off push button for a minimum of 3 seconds.

   The On/Off push button blinks green at a higher rate and the module starts.

   The Start screen is displayed. The **Start** button [1] turns from gray to green when the module is ready for initialization.

   Figure 14: Start screen

5. Tap the **Start** button [1] to initialize the module.

   A screen with a rotating animation is displayed. After the module is initialized, the Main menu screen is displayed.

Related information...

Remover Module operation, page 34

Power on the module

Prerequisite

- The module is connected to the power supply.
- The On/Off push button is illuminated blinking green.
- Front and rear module covers must be closed and locked.

Required module status	Off for more than 1 minute

Perform this procedure to power on the module.

1. Press the On/Off push button for a minimum of 3 seconds.

   The On/Off push button blinks green at a higher rate and the module starts.

   The Start screen is displayed. The **Start** button [1] turns from gray to green when the module is ready for initialization.

   Figure 15: Start screen

2. Tap the **Start** button [1] to initialize the module.

   A screen with a rotating animation is displayed. After the module is initialized, the Main menu screen is displayed.

The On/Off push button is illuminated steady green.

Related information...

Remover Module operation, page 34
Replace clamping jaws at the AccessPoint, page 55

Power off the module

Prerequisite	• The On/Off push button is illuminated steady green.

- The module has completed all processing and no samples are present on the module.

Required module status	On

Perform this procedure to power off the module.

1. Press the On/Off push button for a minimum of 3 seconds.
2. Wait for the module to power off.

The On/Off push button is illuminated blinking green.

Related information...

Remover Module operation, page 34
Replace clamping jaws at the AccessPoint, page 55

Place the module online

Prerequisite	The Online/Offline push button is illuminated steady yellow and the arrow area of the **Online/Offline** button is gray.
Required module status	Offline

Perform this procedure to place the module online.

NOTE: Samples may be present in the module if the module was placed offline during processing.

1. Briefly press the Online/Offline push button or tap the gray arrow area of the **Online/Offline** button on the touchscreen user interface.
2. Wait for the module to transition to a status of Online.

The Online/Offline push button is illuminated steady green and the arrow area of the **Online/Offline** button is green.

Related information...

Remover Module operation, page 34

Place the module offline

Prerequisite	The Online/Offline push button is illuminated steady green and the arrow area of the **Online/Offline** button is green.

Required module status	Online

Perform this procedure to place the module offline. All processes running in the module stop. CARs are no longer routed to the module.

NOTE: Samples in the module are not processed until the module is transitioned back to a status of Online.

1. Press the Online/Offline push button for a minimum of 3 seconds or tap the green arrow area of the **Online/Offline** button on the touchscreen user interface.
2. Wait for the module to transition to a status of Offline.

The Online/Offline push button is illuminated steady yellow and the arrow area of the **Online/Offline** button is gray.

Related information...

Remover Module operation, page 34

Pause the module

Prerequisite	The Online/Offline push button is illuminated steady green and the arrow area of the **Online/Offline** button is green.
Required module status	Online

Perform this procedure to pause the module. When the module is paused, all processing of new samples stop. No new samples in CARs route to the module. Empty CARs continue to route to the module for sample tubes that have completed processing in the module. The Track Sample Manager indicates that the module status is Online.

1. Briefly press the Online/Offline push button or tap the gray area of the **Online/Offline** button on the touchscreen user interface.
2. Wait for the module to transition to a status of Pause.

The Online/Offline push button is illuminated blinking green and the arrow area of the **Online/Offline** button is blinking green.

NOTE: If the module is paused for longer than 5 minutes, the module automatically transitions to a status of Offline.

Related information...

Remover Module operation, page 34

Deactivate pause mode

Prerequisite	The Online/Offline push button is illuminated blinking green and the arrow area of the **Online/Offline** button is blinking green.
Required module status	Pause

Perform this procedure to deactivate pause mode on the module.

1. Briefly press the Online/Offline push button or tap the gray area of the **Online/Offline** button on the touchscreen user interface.
2. Wait for the module to transition to a status of Online.

The Online/Offline push button is illuminated steady green and the arrow area of the **Online/Offline** button is green.

Related information...

Remover Module operation, page 34

Empty and reset the waste container

Required instrument status	Offline

CAUTION: Risk of infection. Pulling the waste bag out over the edge of the waste container can cause the waste bag to tear, and the operator can come into contact with infected sample matter.

- Wear personal protective equipment.
- Always lift waste bags out vertically. Do not drag the waste bag over the edge of the waste container.

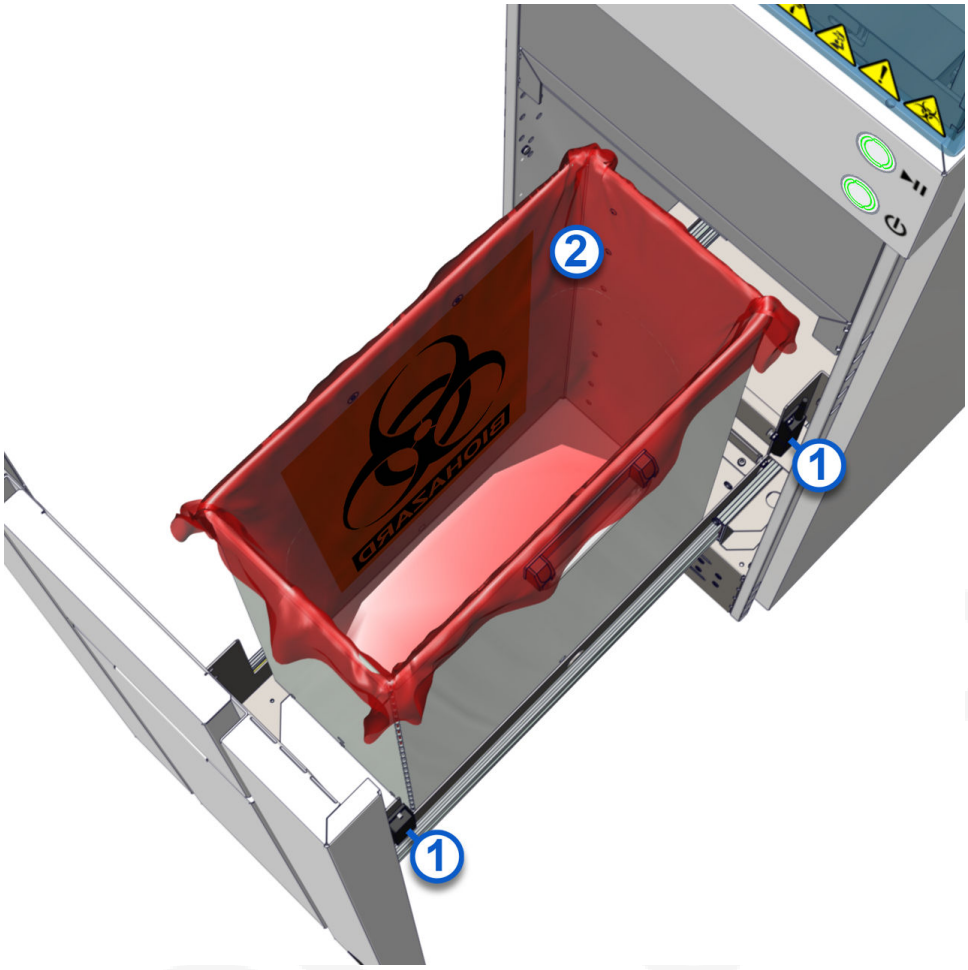
Perform this procedure to empty and reset the waste container.

1. Fully open the pull-out compartment that contains the waste container.
2. Carefully lift the waste bag out of the waste container with both hands and dispose of it according to local regulations.
3. Insert a new waste bag in the waste container.

   NOTE: Ensure the waste bag is open and recaps can fall to the bottom of the waste container. Ensure that the sensor is not covered by the waste bag. The top of the waste bag should be flush with the waste container so the pull-out compartment can open and close freely.
4. Close the pull-out compartment.

NOTE: Ensure that the pull-out compartment is closed correctly after waste disposal. If the pull-out compartment is not closed correctly, a warning dialog is displayed on the touchscreen user interface.

5. Press Waste bin emptying confirmation.



6. Confirm that the waste was emptied.

   The main menu is displayed.

7. Press the Online/Offline push button.

   The Online/Offline push button and the **Online/Offline** button is illuminated steady green.

   The module is online.

Related information...

Remover Module operation, page 34

Introduction

For optimal operator safety and accurate test results, comply with operational requirements, precautions, and limitations. Operators must be trained before they are allowed to operate the system. Failure to comply can affect system performance, and may cause damage to the system or may adversely affect test results.

For more information regarding operational precautions and limitations, refer to the GLP systems Track Operations Manual.

NOTES

Introduction

To minimize the potential for harm to personnel and damage to the laboratory environment, comply with the hazard and safety information.

This section contains supplemental information. Do not use the supplemental information to supersede workplace safety requirements. Review any significant differences between the supplemental information and the workplace safety requirements with management or a workplace safety representative.

For more information regarding hazards, refer to the GLP systems Track Operations Manual.

Related information...

Safety icons, page 46

Safety icons

Safety icons are used on the system and in the system documentation to identify potentially dangerous conditions. Become familiar with these icons to know the type of potential hazard.

CAUTION: Radio-frequency identification (RFID) devices. The operator should not change or modify RFID devices without approval by the party responsible for compliance. This action could void the operator's authority to operate the equipment.

CAUTION: Radio frequency exposure. The operator should be at least 20 cm from all RFID devices.

Table 4: Safety icons and descriptions

Icon	Description
	**CAUTION: Biological RISKS** Identifies an activity or an area where the operator may be exposed to potentially infectious material.
	**CAUTION: Class 2 Laser radiation when open. Avoid eye exposure to light. Do not stare into the beam.** Warns against the direct viewing of the beam or reflections from the beam.
	**CAUTION: Mind or watch your hands** Identifies an activity or an area where the operator may be exposed to hand injuries.
	**CAUTION: Overhead obstruction** Identifies an activity or an area where the operator may be exposed to overhead obstructions.
	**CAUTION** When used in this manual, this icon is accompanied by a description of the hazard and a related-information reference to safety content in this section. Examples include the following condition: **CAUTION: Moving Parts** Identifies an activity or an area where the operator may be exposed to moving parts.
	**CAUTION: Possibility of electric shock** Indicates the possibility of electric shock if procedural controls or engineering controls are not observed.
	**CAUTION: Power off mains disconnect switch from electrical supply** Indicates that the mains disconnect switch must be powered off from the electrical supply for the maintenance of electrical equipment when a malfunction occurs or when left unattended. If more than one disconnect switch is provided, power off all switches to disconnect from electrical supply.

Icon	Description
	**CAUTION: Do not reach inside** Identifies an activity or an area where the operator may be exposed to injury.
	**CAUTION: Protective conductor terminal** Identifies an area where a terminal is connected to an external conductor or the terminal of a ground electrode.
	**Observe operations manual** Indicates that the operations manual must be read.
	**WEEE: Waste Electrical and Electronic Equipment** Indicates that the item needs to be disposed of in a separate waste collection for electrical and electronic equipment and must not be disposed of in the general waste or trash.

Related information...

Hazards, page 45

NOTES

Introduction

The appropriate service, maintenance, and diagnostics of the system are some of the most important aspects of a complete quality assurance program. A thorough service, maintenance, and diagnostic program:

- Minimizes downtime.
- Maintains records for inspection and accreditation.
- Maintains system performance to provide optimal test results.

NOTE: Only approved customer-replaceable components are permitted to be used.

Related information...

Cleaning and maintenance checks, page 50

Cleaning, page 51

Maintenance, page 55

Cleaning and maintenance checks

Dust can cause system malfunctions. The following maintenance checks are required daily on the Remover Module to maintain optimal system performance:

Maintenance check	Activity	Interval
Verify that the surfaces of lane elements inside the module are free of dust.		Daily
Verify that the AccessPoints are free of dust.		Daily
Verify that the monitor is not damaged or the touchscreen user interface is not displaying error messages.		Daily

Related information...

Service, maintenance, and diagnostics, page 49

Cleaning

Some system components may need to be cleaned because of normal use from daily system operations or because of spills.

IMPORTANT: Incorrect cleaning procedures may cause sample contamination. Inappropriate cleaning agents may cause damage to the Remover Module. Only allow trained operators to clean the Remover Module. Only use the recommended cleaning agents.

CAUTION: Wear personal protective equipment while operating the laboratory automation system.

CAUTION: Biological RISKS. This activity or area may expose the operator to potentially infectious material.

CAUTION: Overhead obstruction. Operators may hit their heads on open module covers.

- Be aware that injury can occur when module covers are opened and closed.
- Protect the head when working on modules with open module covers.
- Frequently observe the functionality of the opening mechanism. Regular inspection of the covers is necessary during maintenance to ensure proper operation.

NOTE: Ensure that all samples have completed processing on the module to prevent contamination of samples.

Related information...

Service, maintenance, and diagnostics, page 49
Weekly cleaning procedures, page 51
As-needed cleaning procedures, page 52

Weekly cleaning procedures

Weekly cleaning procedures are required on the Remover Module.

Related information...

Cleaning, page 51
Clean the monitor, page 51
Clean the module covers, page 52

Clean the monitor

Required materials

- Laboratory-grade surface disinfectant
- Lint-free cloth

Required module status Off

Perform this weekly procedure to clean the monitor.

1. Ensure that the module covers are closed and locked before the monitor is cleaned.
2. Dampen a lint-free cloth with a surface disinfectant.
3. Carefully wipe the entire surface area of the monitor to remove any dust.
4. Wait until the monitor is dry to power on the module.

Related information...

Weekly cleaning procedures, page 51

Clean the module covers

Required materials

- Antistatic plastic cleaner
- Lint-free cloth

Required module status Offline

Perform this weekly procedure to clean the module covers.

1. Ensure that the module covers are closed and locked before the module covers are cleaned.
2. Dampen a lint-free cloth with an antistatic plastic cleaner.
3. Wipe the entire surface area of the module cover.
4. Let the module cover air-dry to allow an antistatic film to form.

Related information...

Weekly cleaning procedures, page 51

As-needed cleaning procedures

As-needed cleaning procedures are required on the Remover Module.

CAUTION: Risk of contamination and injury. During operation of the laboratory automation system (LAS), sample tubes and components may be damaged due to failure to comply with safe-use instructions. Spilled sample matter may cause infections due to contact with non-intact skin or mucous membranes.

- Wear personal protective equipment while operating the LAS. Avoid direct contact with the sample matter.
- Follow all hygiene regulations applicable to laboratory work.
- Only allow trained operators to operate the LAS.

Related information...

Cleaning, page 51

Clean the interior, page 53

Clean the waste shaft, page 53

Clean the AccessPoint, page 54

Clean the interior

Required materials

- Handheld vacuum cleaner (recommended)
- Laboratory-grade surface disinfectant
- Lint-free cloth

Required module status Offline

Perform this as-needed procedure to clean the interior.

1. Open the module cover.
2. Vacuum the surface of the lane elements.
3. Vacuum the guiding slot.
4. Dampen a lint-free cloth with a surface disinfectant.
5. Carefully wipe the surfaces of the interior to remove any dust.
6. Close the module cover.

Related information...

As-needed cleaning procedures, page 52

Clean the waste shaft

Required materials

- Handheld vacuum cleaner (recommended)
- Laboratory-grade surface disinfectant
- Lint-free cloth

Required module status Offline

Perform this procedure to clean the waste shaft.

1. Open the module cover.
2. Dampen a lint-free cloth with a surface disinfectant.
3. Carefully wipe the waste shaft to remove any dust.
4. Close the module cover.

Related information...

As-needed cleaning procedures, page 52

Clean the AccessPoint

Required materials

- Laboratory-grade surface disinfectant
- Lint-free cloth

Required module status Offline

Perform this as-needed procedure to clean the AccessPoint.

1. Open the module cover.
2. Dampen a lint-free cloth with a surface disinfectant.
3. Carefully wipe the AccessPoint to remove any dust.
4. Close the module cover.

Related information...

As-needed cleaning procedures, page 52

Maintenance

The laboratory staff may perform procedures that are included in this manual. Procedures not included in this manual may only be performed by an Abbott Laboratories representative or an authorized service representative.

CAUTION: Risk of infection. The operator may be exposed to potentially infectious materials, such as patient samples, through contact with non-intact skin or mucous membranes. Wear personal protective equipment while operating the laboratory automation system.

CAUTION: Overhead obstruction. Operators may hit their heads on open module covers.

- Be aware that injury can occur when module covers are opened and closed.
- Protect the head when working on modules with open module covers.
- Frequently observe the functionality of the opening mechanism. Regular inspection of the covers is necessary during maintenance to ensure proper operation.

NOTE: Ensure that all samples have completed processing on the module to prevent contamination of samples.

Related information...

Service, maintenance, and diagnostics, page 49

As-needed maintenance procedures, page 55

As-needed maintenance procedures

As-needed maintenance procedures are required on the Remover Module.

Related information...

Maintenance, page 55

Replace clamping jaws at the AccessPoint, page 55

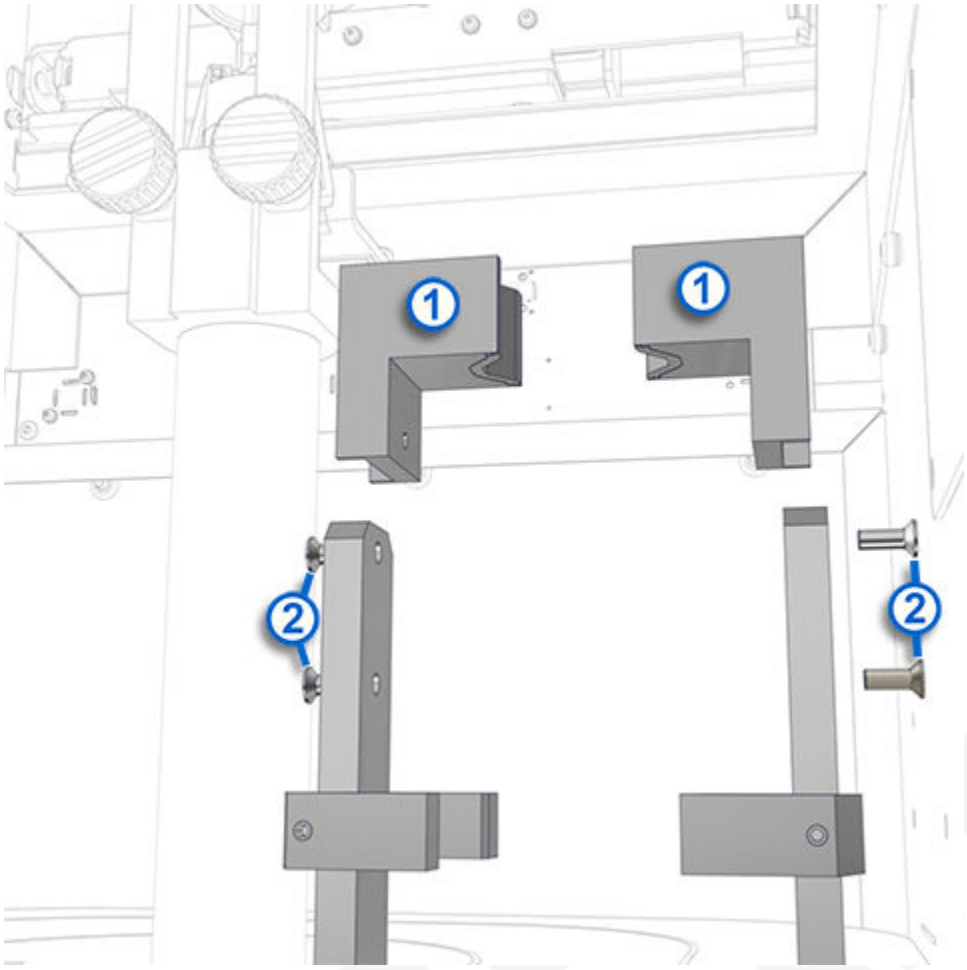
Replace clamping jaws at the AccessPoint

Required materials	Tx10 Torx screwdriver, angled
Required module status	Off

Perform this procedure to replace the clamping jaws at the AccessPoint.

CAUTION: Wear personal protective equipment while operating the laboratory automation system.

Figure 16: Replacing the clamping jaws at the AccessPoint



1. Open the module cover.
2. Loosen both bolts [2] on the clamping jaws [1] with the Torx screwdriver and remove them.
3. Remove the clamping jaws [1] from the mounts.
4. Push a new clamping jaw into the mount.
5. Insert new bolts into the replaced clamping jaws and tighten with the Torx screwdriver.
6. Close the cover on the module and allow it to engage.
7. Switch on the module.

Related information...

As-needed maintenance procedures, page 55
Power off the module, page 38
Open and close the front and rear module covers, page 34
Power on the module, page 37

Introduction

Problems with the Remover Module are characterized by symptoms. Troubleshooting tools, references, and suggested techniques help to trace the symptom to one or more root causes.

After determining the root cause, perform the corrective actions to resolve the problem.

Before troubleshooting is performed for system errors, the module status must be Offline.

The laboratory staff may perform procedures that are included in this manual. Procedures not included in this manual may be performed only by an Abbott Laboratories representative or an authorized service representative.

NOTE: Corrective actions may involve hazardous activity. Use caution to minimize operator exposure and to prevent personal injury or system damage.

CAUTION: Do not remove samples from a CAR or the track. If samples are removed from the track, they must be deleted from the Track Sample Manager before they are placed back in the Input/Output Module for appropriate routing.

CAUTION: Risk of infection. The operator may be exposed to potentially infectious materials, such as patient samples, through contact with non-intact skin or mucous membranes. Wear personal protective equipment while operating the laboratory automation system.

Related information...

Message codes, page 58

Remover Module observed problems, page 60

Message codes

Message codes are displayed on the touchscreen user interface when errors occur. Message codes provide information about conditions or errors of system operation.

If a message code cannot be resolved, contact an Abbott Laboratories representative or an authorized service representative.

Related information...

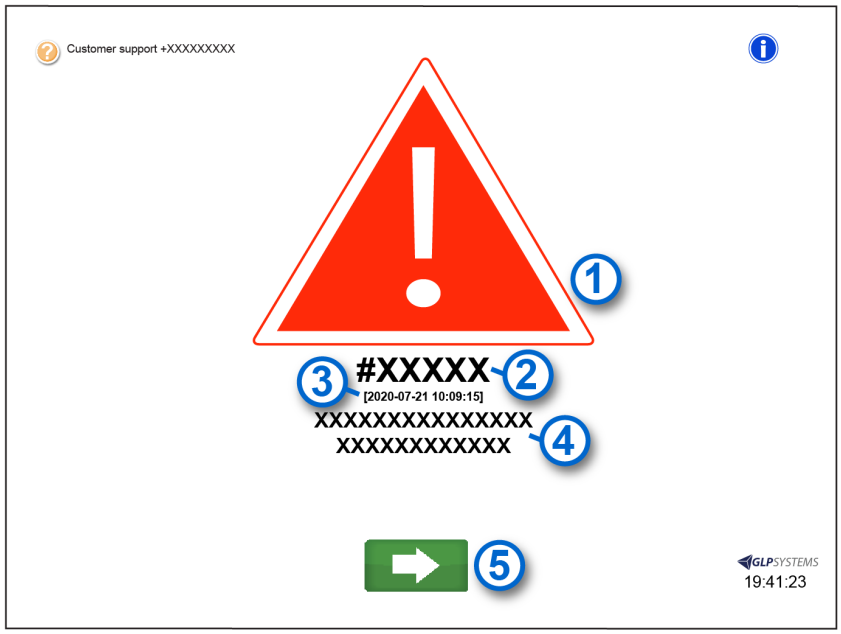
Troubleshooting, page 57

Message code screen, page 58

Message code screen

The Message code screen on the module displays the following screen elements.

Figure 17: Message code screen



Legend:

1. Warning symbol: Indicates that an error has occurred.
2. Message code: Displays the message code number.
3. Date and time: Displays the date and time that the message code was generated.
4. Information text: Displays the message code description.
5. **Next** button: Navigates to the Solutions screen.

Related information...

Message codes, page 58
Acknowledge a message code, page 59

Acknowledge a message code

Perform this procedure to acknowledge an error message on the module.

1. On the Message code screen, tap the **Next** button .
2. On the Solutions screen, select the appropriate option by tapping it.
3. Tap the **Next** button to confirm the selection.

Related information...

Message code screen, page 58

Remover Module observed problems

Observed problems provide information about problems that may occur on the system and provide corrective actions that help to resolve the problems.

If the corrective actions for an observed problem do not resolve the problem, contact the local representative or find country-specific contact information at corelaboratory.abbott.

Related information...

Troubleshooting, page 57
Cap does not release from robot gripper, page 60
CAR moves through the AccessPoint without stopping, page 60
CAR stops at the AccessPoint and then will not move, page 61
CAR with sample does not move to the module, page 61
Error message is displayed, page 61
Power to the module is interrupted, page 62
Robot does not respond, page 62
Sample is not decapped but is routed to the next destination, page 63
Sample tubes are not decapped, page 63

Cap does not release from robot gripper

Probable cause	Corrective action
The cap does not release from the robot gripper after the sample tube has been decapped.	1. Open the module cover. Perform *Open and close the front and rear module covers*, page 34. 2. To remove the cap from the robot gripper, secure the cap with one hand and press the release button with the other hand. 3. Close the module cover. Perform *Open and close the front and rear module covers*, page 34. 4. Follow the error dialog on the touchscreen user interface.

Related information...

Remover Module observed problems, page 60

CAR moves through the AccessPoint without stopping

Probable cause	Corrective action
An error occurred at the AccessPoint.	Contact an Abbott Laboratories representative or an authorized service representative.

Related information...

Remover Module observed problems, page 60

CAR stops at the AccessPoint and then will not move

Probable cause	Corrective action
An error occurred at the AccessPoint.	1. *Cycle power to the module*, page 36. 2. Contact an Abbott Laboratories representative or an authorized service representative if necessary.

Related information...

Remover Module observed problems, page 60

CAR with sample does not move to the module

Probable cause	Corrective action
A module error occurred.	Follow the error dialog on the touchscreen user interface.
Errors with the Track Sample Manager (TSM) or Track Workflow Manager (TWM) occurred.	1. Verify the TSM or TWM connection. 2. Contact an Abbott Laboratories representative or an authorized service representative if necessary.
An error or defect occurred involving the switch.	Contact an Abbott Laboratories representative or an authorized service representative.

Related information...

Remover Module observed problems, page 60

Error message is displayed

Probable cause	Corrective action
An error has been detected.	1. Follow the error dialog on the touchscreen user interface. 2. Contact an Abbott Laboratories representative or an authorized service representative if necessary.

Related information...

Remover Module observed problems, page 60

Power to the module is interrupted

Probable cause	Corrective action
The power source to the module is interrupted.	1. Open the module cover. Perform *Open and close the front and rear module covers*, page 34. 2. Remove all samples from the module.  **CAUTION: Danger due to power failure.** In the case of a power failure, the samples (including emergency samples) remain inside the laboratory automation system (LAS) and must be removed manually as required. – Only allow trained personnel to remove the samples manually. – If a sample is held by a robot gripper, manually remove the sample. – Observe the LAS for any remaining emergency samples and remove them manually. – Follow the information in the operations manuals for the modules. 3. On the Track Sample Manager (TSM) user interface, remove the samples from the TSM database. For more information on removing samples from the TSM, see the GLP systems Track Operations Manual. 4. Place the samples in the correct input area of the Input/Output Module. 5. Clean any spills if necessary. For more information, refer to the GLP systems Track Operations Manual. 6. Close the module cover. Perform *Open and close the front and rear module covers*, page 34. 7. *Place the module online*, page 39.

Related information...

Remover Module observed problems, page 60

Robot does not respond

Probable cause	Corrective action
A robot error or a mechanical problem occurred.	1. Follow the error dialog on the touchscreen user interface.

Probable cause	Corrective action
	2. *Cycle power to the module*, page 36. 3. Contact an Abbott Laboratories representative or an authorized service representative if necessary.

Related information...

Remover Module observed problems, page 60

Sample is not decapped but is routed to the next destination

Probable cause	Corrective action
The sample is not decapped but is routed to the next destination.	1. Verify that the waste bin is not full. Perform *Empty and reset the waste bin* if necessary. 2. Verify that the waste bin pullout compartment is closed correctly. Close the waste bin pullout compartment if necessary. 3. Follow the error dialog on the touchscreen user interface.

Related information...

Remover Module observed problems, page 60

Sample tubes are not decapped

Probable cause	Corrective action
The robot gripper fingers are damaged.	*Replace the robot gripper fingers*.
The robot gripper grips sample tubes too high or low.	Contact an Abbott Laboratories representative or an authorized service representative.

Related information...

Remover Module observed problems, page 60

NOTES

Revision history

Document control numbers	Revision date	Content revised
80004212-101	YYYY-MM-DD	Original release

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