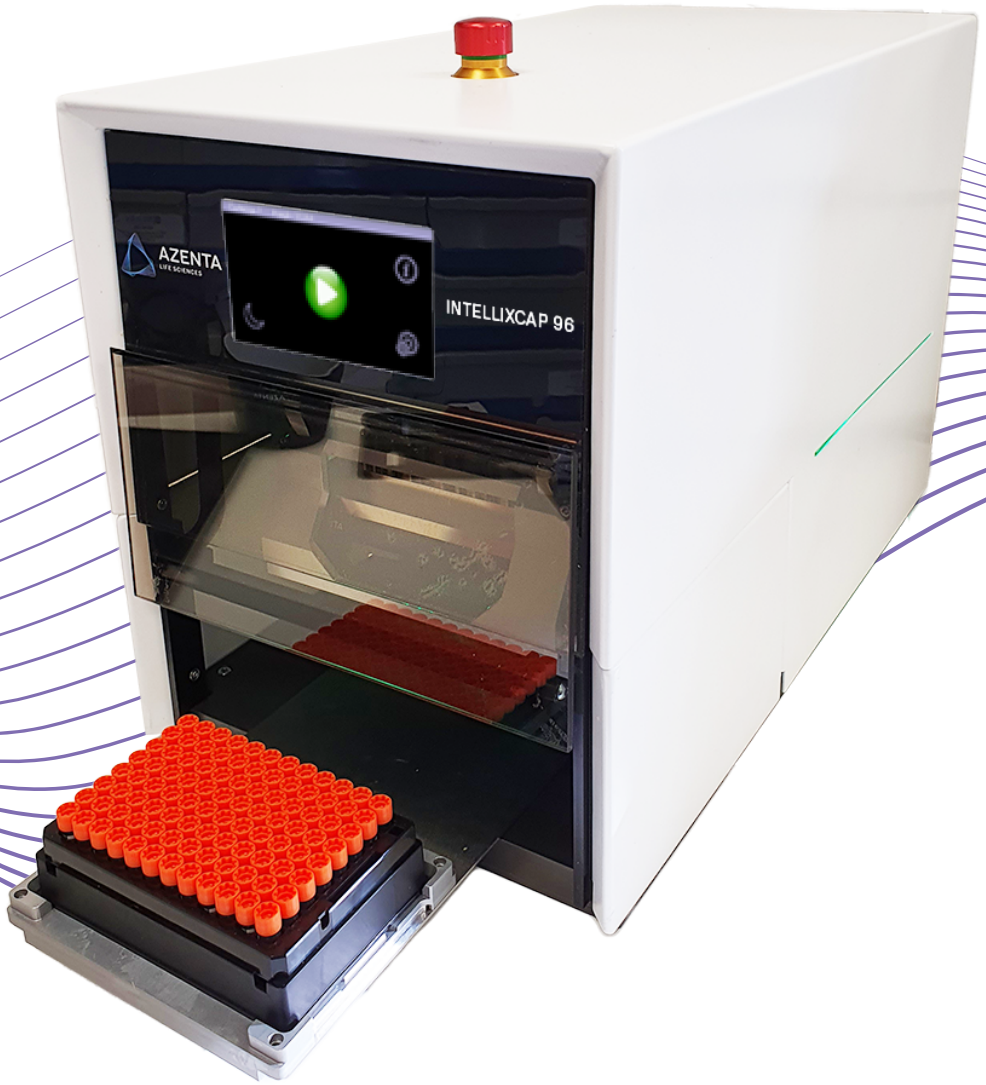
IntelliXcap Automated Screw Cap Decapper Re-Capper User Manual

24, 48, 96 and Extended Height



AZENTA
LIFE SCIENCES

319430 Revision C

Azenta US, Inc.

Information provided within this document is subject to change without notice, and although believed to be accurate, Azenta US, Inc. assumes no responsibility for any errors, omissions, or inaccuracies.

BioStore™, BioWarehouse™, SampleStore™, Strata™, Tube Auditor™, Azenta™, Azenta Life Sciences™, and the Azenta logo are trademarks of Azenta US, Inc.

CryoExchange®, CryoPod®, FrameStar®, FreezerPro®, and IntelliXcap® are registered U.S. trademarks of Azenta US, Inc.

All other trademarks are properties of their respective owners.

This technology is subject to United States export Administration Regulations and authorized to the destination only; diversion contrary to U.S. law is prohibited.

Original manual printed in English. Translation of the original manual from English.

These are the original instructions for the IntelliXcap.

Corporate Headquarters
200 Summit Drive, 6th Floor
Burlington, MA 01803 U.S.A.

European Union Representative
Im Leuschnerpark 1B
64347 Griesheim, Germany

For Technical Support:

Location	Contact Number	Website
North America	+1-800-379-7221	www.azenta.com
Europe	+41-31-770-7373 +44-161-777-2107	
Japan	+81-3-6628-2950	

Revision History

Part Number: 319430

IntelliXcap User Manual

Revision	Date
Revision A	19 DEC 2018
Revision B	25 AUG 2021
Revision C	30 JAN 2023

Table of Contents

1. Safety

WARNING

Read the Safety Chapter

Failure to review the *Safety* chapter and follow the safety warnings can result in death or serious injury.

- All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.
- Follow all applicable safety codes of the facility as well as national and international safety codes.
- Know the facility safety procedures, safety equipment, and contact information.
- Read and understand each procedure before performing it.

NOTICE

It is the responsibility of each person working on this product to know the applicable regulatory safety codes as well as the facility safety procedures, safety equipment, and contact information.

This product is intended for use by industrial customers and should be serviced only by Azenta or Azenta trained representatives. The service manuals and related materials are provided in English at no charge and are intended for use by experienced technicians. It is the responsibility of the user to obtain and assure the accuracy of any needed translations of manuals. If you require assistance please contact Azenta service department. Contact information can be found at azenta.com.

If additional safety related upgrades or newly identified hazards associated with the IntelliXcap are identified, Azenta Technical Support notifies the owner of record with a Technical Support Bulletin (TSB).

Explanation of Hazards and Alerts

This manual and this product use industry standard hazard alerts to notify the user of personal or equipment safety hazards. Hazard alerts contain safety text, safety icons, signal words, and color.

Safety Text

Hazard alert text follows a standard, fixed-order, three-part format.

- Identify the hazard,
- State the consequences if the hazard is not avoided,
- State how to avoid the hazard.

Safety Icons

- Hazard alerts contain safety icons that graphically identify the hazard.
- The safety icons in this manual conform to ISO 3864 and ANSI Z535 standards.

Signal Words and Color

Signal words inform of the level of hazard.

	Danger indicates a hazardous situation which, if not avoided, **will result in death or serious injury**. Danger signal word is white on a red background with an iconic exclamation point inside a yellow triangle with black border.
	Warning indicates a hazardous situation which, if not avoided, **could result in death or serious injury**. Warning signal word is black on an orange background with an iconic exclamation point inside a yellow triangle with black border.
	Caution indicates a hazardous situation or unsafe practice which, if not avoided, **may result in minor or moderate personal injury**. Caution signal word is black on a yellow background with an iconic exclamation point inside a yellow triangle with black border.
	Indicates a situation or unsafe practice which, if not avoided, **may result in equipment damage**. Notice signal word is white on blue background with no icon.

Alert Example

The following is an example of a *Warning* hazard alert.

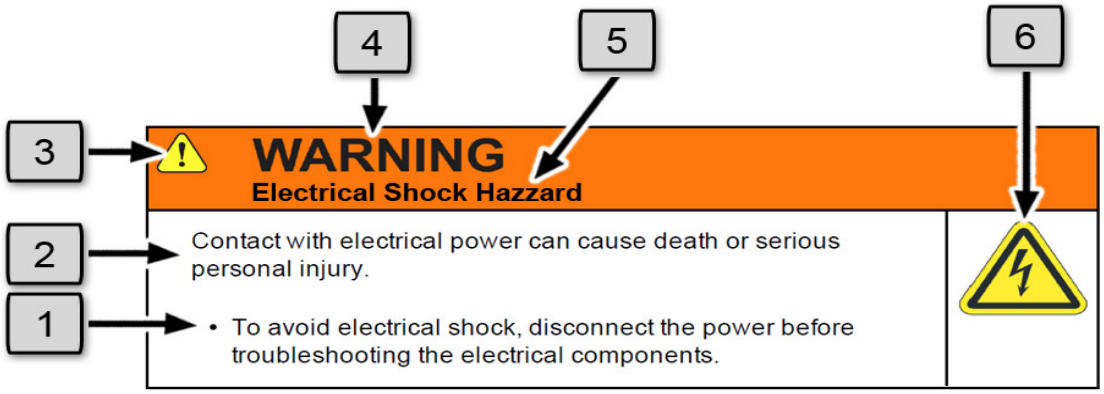


Figure 1-1: Components of a Safety Alert

Number	Description
1.	How to Avoid the Hazard
2.	Source of Hazard and Severity
3.	General Alert Icon
4.	Signal Word
5.	Type of Hazard
6.	Hazard Symbol(s)

Regulatory Compliance and Declaration of Conformity

The IntelliXcap meets the requirements of the European Union's Machinery Directive 2006/42/EC and 2014/30/EU as a completed machine. In accordance with the Directive, Azenta Life Sciences has issued a Declaration of Conformity and the IntelliXcap has a CE mark affixed.

DOCUMENT NUMBER:	TITLE:	
297745	Declaration of Conformity, Machinery Directive	AZENTA LIFE SCIENCES
REVISION: E	DOCUMENT CLASSIFICATION:	
ECO# EC132455	04-Form, Template or Other	

DECLARATION OF CONFORMITY

Description: IntelliXcap Automated Screw Cap Decapper

Function: The IntelliXcap is designed to remove and replace caps from tubes with screw caps in a rack on closed set tubes in specific rack types.

Product code: 46-8010, 46-8011, 46-8012, 46-8014, 46-8112

Business name and full address of the manufacturer of the machinery:
Azenta Life Sciences, Northbank, Irlam, Manchester M44 5AY, United Kingdom

Name and address of the person, established in the Community, authorized to compile the relevant technical documentation:
Azenta Life Sciences (Germany) GmbH, Im Leuschnerpark 1B, 64347 Griesheim, Germany

The manufacturer declares:

- That this machinery fulfills all the relevant provisions of Directive 2006/42/EC (Machinery Directive)
  - EN 12100:2010 Safety of machinery. General principles for design. Risk assessment and risk reduction
  - ISO/TR 14121-2:2012 ED2 Safety of machinery. Risk assessment. Practical guidance and examples of methods
  - EN 61010-1:2010+A1:2019. Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements
- That this machinery fulfils all the relevant provisions of Directive 2014/30/EU (EMC Directive)
  - EN 61326-1:2021 Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements
- That this machinery is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment and amendment 2015/863/EU.
  - BS EN IEC 63000:2018. Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Year CE Marking Affixed to Product: 2018

Signed for and on the behalf of Azenta Life Sciences:

Rob Woodward

Rob Woodward (Oct 25, 2021 05:58 GMT+1)

Print name: Rob Woodward
Position: Senior Vice President, Global Quality Executive Management
Place: Irlam, Manchester

Date Printed: Saturday, October 23, 2021	This is uncontrolled when printed	PAGE 1 OF 1

General Safety Considerations

WARNING

Electrical Shock Hazard

Contact with electrical power can cause death or serious personal injury.

- To avoid electrical shock, disconnect the power before troubleshooting the electrical components.

WARNING

Chemical Hazard

The IntelliXcap may be used to de-/recap samples that expose users to chemical hazards which, if not properly handled, may result in death or serious injury.

- Read and understand the safety information for the equipment where the IntelliXcap is used.
- Know the location of the Safety Data Sheets (SDS)in your facility. (also known as Material Safety Data Sheets - MSDS)
- Become familiar with the proper handling of material in the environment of the decapper.

CAUTION

Inappropriate Use

Use of this product in a manner or for purposes other than for what it is intended may cause equipment damage or personal injury.

- Only use the product for its intended application.
- Do not modify this product beyond its original design.
- Always operate this product with the covers in place.

CAUTION

Damaged Components

The use of this product when components or cables appear to be damaged may cause equipment malfunction or personal injury.

- Do not use this product if components or cables appear to be damaged.
- Place the product in a location where it will not get damaged.
- Route cables and tubing so that they do not become damaged and do not present a personal safety hazard.

CAUTION

Pinch Point

Moving parts of the product may cause squeezing or compression of fingers or hands resulting in personal injury.

- Do not operate the product without the protective covers in place.

NOTICE

Moving parts are subject to pressure and weight. Do not rest a hand on the stage or twist the rack as it may pull the machine out of position or damage moving parts.

NOTICE

The IntelliXcap should be kept clean at all times, please see "Cleaning" on page 89 for information on cleaning requirements.

NOTICE

The IntelliXcap can only be used with tubes and cartridges that have been configured and tested. Do not use alternative tubes and cartridges that have not been configured and tested.

NOTICE

Untrained or Improperly Equipped Personnel

Untrained or improperly equipped personnel performing this procedure may cause damage to the equipment.

- Only Azenta Life Sciences trained personnel should perform this procedure.
- Personnel performing this procedure must read and understand this procedure and have the proper tools and supplies ready before starting.
- Personnel performing this procedure must know the applicable safety codes, facility safety procedures, safety equipment, and emergency contact information.

Safety Functions

The use and operation of the machine must only be initiated when all safety functions are fully present and in an operable condition. Defective safety functions and protection equipment may lead to unsafe and hazardous situations. In case that a risk to safety is found, do the following:

a. Stop the machine immediately: it can be brought to a safe stop by either the touch screen, activating the Cancel-function, or by the emergency stop button.

b. Disconnect the supply sources to prevent the IntelliXcap from restarting.

E-Stop

The emergency stop button is a safety device designed for use as a complementary protective measure. As an example, the operator can press the emergency stop function to cease all mechanical movement of the IntelliXcap if a hazardous situation arises that could cause personal injury, or damage to the machine or equipment.

When activating the emergency stop button, the status will appear on the operator monitor: *Error 238 – Emergency stop*

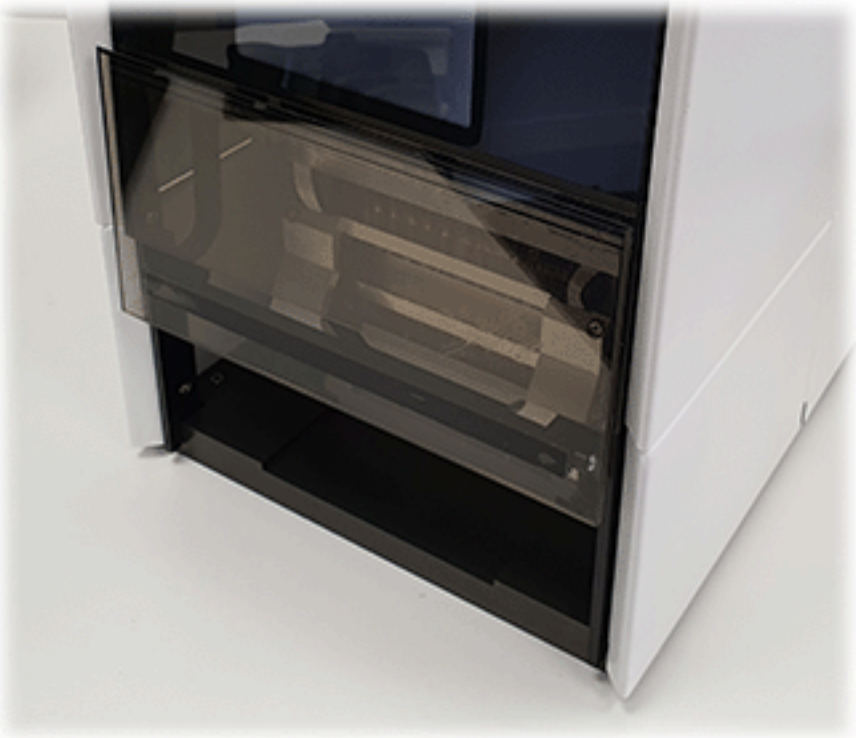
Test the emergency stop function before commissioning the IntelliXcap for use and after each installation or re-installation.

At minimum, the function must be visually checked and activated at least every six months.

Safety Door

There is a safety switch installed on the access door that prevents the unit from running if the door is not completely closed. Opening of the access door while tool is in use initiates an immediate stop function of all moving parts.

This function protects operators against hazardous moving parts accessible through the front of the IntelliXcap.



The access door can be disabled by navigating to *Settings* > *Safety Door*, if the user makes sure that another safety measure takes over.

For example, when the IntelliXcap is integrated into a robotic cell with its own safety system. See "Integrating the IntelliXcap" on page 101 for further information on using the IntelliXcap in an integrated system.

When the IntelliXcap is commissioned and starts functioning, the automated door closes and the *Initializing please wait* status message is displayed on the operator monitor.

The safety door must be activated and tested before commissioning the machine for use.

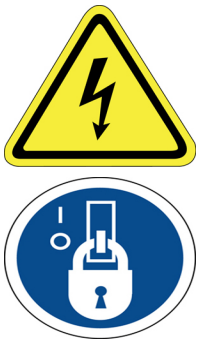
NOTE: At minimum, the safety door should be visually checked and activated at least once a day.

WARNING

Lockout / Tagout

Working with energized equipment may cause sudden movement or electrical shock and may result in death or serious injury.

- All energy must be removed from the equipment per the facility's Lockout/Tagout procedure before servicing.
- If local procedures are not available, follow the procedure for Lockout/Tagout in **OSHA Standard 29CFR 1910.147**.



2. Overview

This manual describes the proper use of the machine.

The IntelliXcap is a new generation of sample-tube de-/re-capper, which is comprised of a basic chassis assembly and a screwing-head module. This includes interchangeable cap-driver cartridges that allow the user to change the tube type that needs to be decapped.

The IntelliXcap is equipped with a light curtain which reduces the risk of damage to tubes, samples and the instrument that could be caused by failed de-capping / capping or the use of incorrect consumables. The IntelliXcap can be controlled manually or can be integrated into an automated robotic system using a serial command set. The IntelliXcap can work with a range of tube types – a specific cartridge is required for each different cap design format. The current list of available cartridges can be seen in "Manage the Cartridges" on page 68 or contact your local sales representative to request a cartridge for your specific storage tube.

NOTE: The IntelliXcap is not intended to be used with frozen tubes.

Using this Manual

WARNING

Read the Safety Chapter

Failure to review the *Safety* chapter and follow the safety warnings can result in death or serious injury.

- All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.
- Follow all applicable safety codes of the facility as well as national and international safety codes.
- Know the facility safety procedures, safety equipment, and contact information.
- Read and understand each procedure before performing it.

The IntelliXcap is intended for use in a laboratory environment by trained laboratory personnel and should be serviced only by Azenta or Azenta trained representatives. The manuals and related materials are intended for use by trained and experienced technical personnel.

The manufacturer accepts no liability for any other use of the equipment or its individual parts and components. This also applies to service and repair work carried out by unauthorized service personnel. All warranties are declared null and void in the event of non-compliance with these instructions. This also applies to parts not directly affected by any unauthorized repair work.

This manual contains information on safety, specifications, and operation as well as troubleshooting and maintenance of the IntelliXcapIntelliXcap Automated Acoustic Cap Decapper. If there are any questions regarding this manual or use of this system or to order additional copies of this publication, contact Azenta Life Sciences Service. See "Technical Support" on page 97.

Concepts and Terminology

The concepts and terminology defined in this section may be used in this document. Users should read this section first before continuing with the manual.

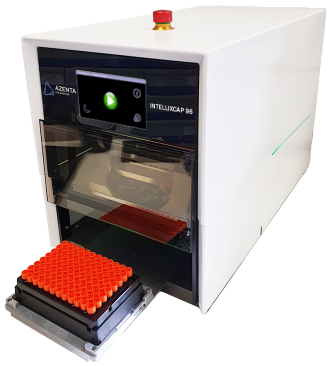
Word	Definition
Cap motor	Small DC motor with an integral gearbox which can be driven in either direction to remove or refit a test tube caps. Couples to the caps via ejector pin and adaptor within the cartridge.
Caps	Screw caps
Cartridge	A set of adaptors which couple the ejector pins to the tube caps
Cartridge ID Number	The electrical ID number of the cartridge encoded by 4 pin switches. Can be 1–15.
Cartridge Number	The actual number of the cartridge which corresponds to a physical profile.
Cartridge profile	Collection of setpoints which define machine operation for a particular set of labware. Often just referred to as a profile.
Common Setpoints	Those setpoints which are common to all types of labware.
Controller (board)	The main controller module within the IntelliXcap. This has all I/O as well as stepper motor drivers.
CRC16	Cyclic redundancy check, used for profile verification and the CRC algorithm used shall be CRC16-CITT-FALSE.
CSV	Comma separated values. However, in this context it is a semicolon delimited text file which contains a specific cartridge profile.
Cycle	The process of first de-capping and then re-capping a rack of tubes = 1 cycle.
Datalogger	Software application provided by LS Controls which allows configuration of the IntelliXcap via the USB port.

Word	Definition
Decap	Unscrew the caps of the sample tubes.
EEPROM	Electrically erasable programmable read only memory. Used for non-volatile storage in the instrument.
Ejector pin	Couples the cap motor to the cartridge adaptor, and hence in turn to the tube cap.
Extended profile Number	Profile number for use with cartridge ID 15 - numbered 16–96.
Extended stage	That part of the mechanism which adjust the height of the cap drivers, relative to the head assembly. It is driven by stepper motor M3, and mechanically is made possible by the fact the cap drivers are slotted and slide up and down on the ejector pins.
Head	The main moving assembly, which comprises the cap motors and drivers, along with light curtain. It is driven by stepper motor M1.
I/O	Input/Output
Instructed person	A person having received the necessary training to carry out a task in a safe and responsible way.
IntelliXcap 96/48/24	Various Intellixcap variants (i.e. 96, 48 or 24 tube).
Labware	Rack and test tube vials.
LCD Display	480 x 272-pixel touch screen display on the IntelliXcap front panel. It communicates with the controller board via modbus.
Light curtain	System for detecting the height of the tube rack on the stage.
Loaded profile	The profile currently loaded into the machine's working memory area, usually this is copied from EEPROM storage according to the cartridge number, however it could also be a profile that was loaded in using datalogger.
M1	Main Z motor
M2	Stage/Nest motor
M3	Cartridge motor
M4	Safety Door motor
Microcontroller	Microprocessor with integrated memory, I/O and other special purpose peripherals. Runs fixed (embedded) application firmware.
MLA	Microchip Libraries for Applications. A set of drivers and middleware libraries containing such items as USB stacks, graphics frameworks and LCD drivers. Provided by Microchip Technology.
Modbus	Master/slave data communications protocol originally developed for PLCs.
Modbus address	16-bit address for a particular register, which is also a 16-bit value.
MPLABX	Development environment by Microchip Technology, used for developing firmware for their range of PIC microcontrollers
Profile	See 'Cartridge profile'.
Profile number	Numbered profile which corresponds to cartridge number.

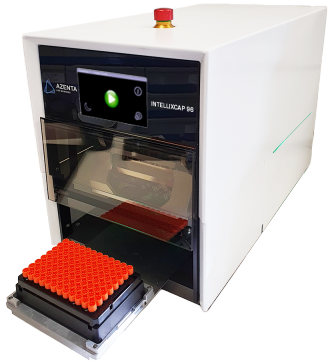
Word	Definition
Profile Setpoints	The setpoints that are included in a profile.
PSU	Power supply unit. Two are fitted in the IntelliXcap: 24V and 7.5V.
Rack	Set of labware consisting of tray and a number of tubes/vials.
Recap	Screw the caps back onto the sample-tubes.
Regular profile number	Automatically loaded profile number for cartridges 1–14.
Setpoint	Configurable parameter which defines machine operation. In modbus parlance it is a holding resister.
Setpoint Number	Unique number for each setpoint, which corresponds to the modbus holding register address.
Volatile Setpoints	Setpoints which do not need to be stored in non-volatile memory, e.g. commands.
Waste	Mode of operation where caps are not refitted but dropped off into a carrier.
Working profile	See 'Loaded profile'.

Product Illustration

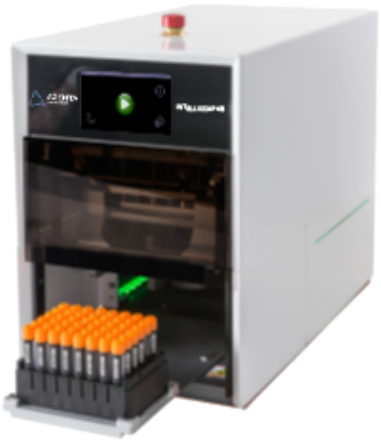
46-8018 – IntelliXcap 96 Extended Height



46-8012 – IntelliXcap 96



46-8011 – IntelliXcap 48



46-8010 – IntelliXcap 24

3. Specifications and Site Requirements

Specifications

Unit Software and Firmware

Table 3-1: Software and Firmware

Software/Firmware	Version
Controller	50
Display	23
Light curtain	20

Site Requirements

Space Requirements

Ensure enough space is available to accommodate the ejected stage platform. The machine has a rectangular footprint and is regarded as highly stable. Place the IntelliXcap in a well-ventilated area on top of an even surface that is solid enough to carry its weight. The surface must comply with 1.3.1 of Annex I of 2006/42/EC.

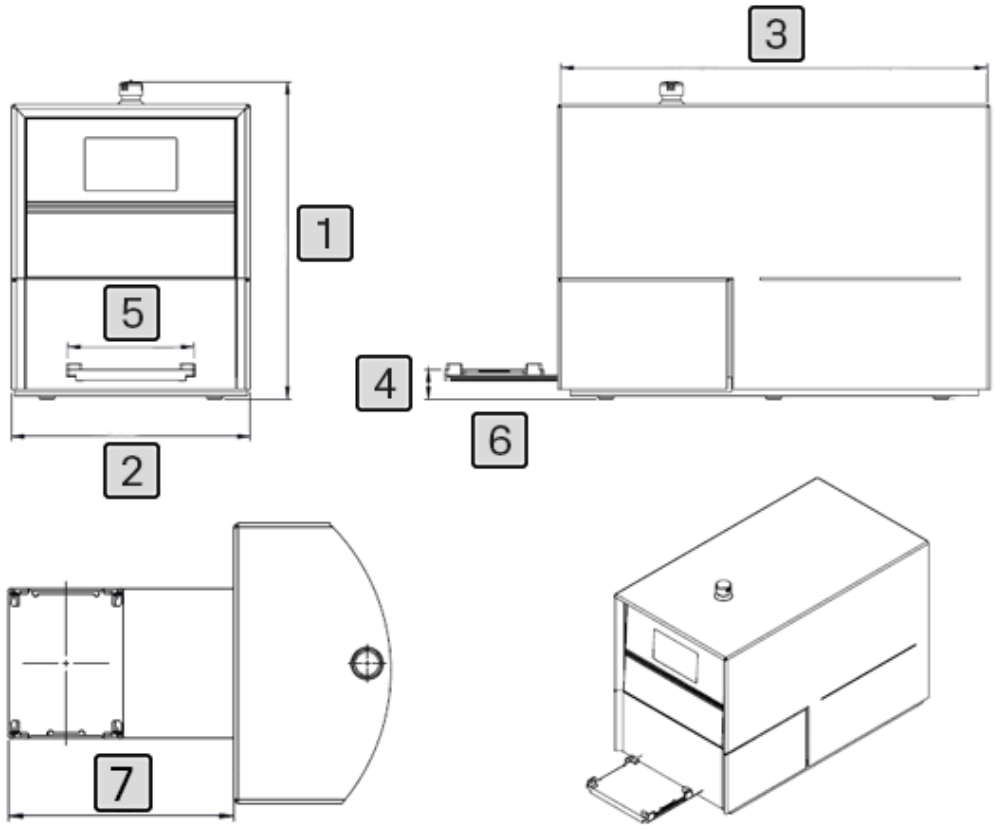


Figure 3-1: Machine Dimensions

Table 3-2: Space Requirements

Reference Number	Parameter	IntelliXcap 24	IntelliXcap 48	IntelliXcap 96	IntelliXcap 96 Extended Height
1.	System Height (including E-stop)	413 mm	413 mm	340 mm	370 mm
2.	System Width	256 mm	256 mm	256 mm	256 mm
3.	System Depth	464 mm	464 mm	468 mm	468 mm
4.	Stage Height	31.5 mm	31.5 mm	31.5 mm	31.5 mm
5.	Stage Width	138 mm	138 mm	138 mm	138 mm
6.	Standard Stage Distance (when ejected)	121 mm	121 mm	121 mm	121 mm
7.	Extended Stage Distance (when ejected)	207 mm	207 mm	207 mm	207 mm
N/A	System Weight	27 kg	28 kg	22 kg	24 kg

Environmental Requirements

The IntelliXcap shall be used within the rule set of the Good Laboratory Practices, GLP.

The machine must be operated indoors and under the following environmental specifications only:

Table 3-3: Environmental Requirements

Parameter	Specification
Temperature - Transport and Storage	15–40°C (59–104°F)
Temperature - Operation	0–40°C (32–104°F) Using the IntelliXcap in an environment where the temperature is 40°C (104°F) or higher for an extended period may cause the screen contrast level of the monochrome LCD to decrease from its original level of brightness.
Storage Humidity	10–70% RH Wet bulb temperature 39°C (102°F) max., no condensation
Relative Humidity	10–90% RH Wet bulb temperature 39°C (102°F) max., no condensation
Storage Lighting	All external surfaces are resistant to UV-light. Over time UV-light might affect LCD-panels: LCD screens may fade.
IP 30	Protection against small foreign bodies > 2.5 mm (e.g. a screwdriver), and no protection against water
Dust	0.1 mg/m^3 and below (non-conductive levels)
Pollution Degree	For use in Pollution Degree 2 environment Decontamination treatment with Hydrogen Peroxide Gas needs to be avoided as it will damage the electronic parts.

Electrical Requirements

The system must only operate with the power supply and frequency specified on the system identification stickers mounted on the side of the device. Operating the system with any other power supply or frequency can result in damage to the equipment.

Table 3-4: Electrical Requirements

Parameter	Specification
Supply Voltage	100–120 VAC 1/N/PE / 220-240 VAC 1/N/PE Use IEC 320 plugs only Ground must be connected at all times
Maximum Power Consumption	500W
Idle Power Consumption	100W
Supply Frequency	The machine operates below the noise emissions level: < 70 dB(A)
Fuses	Two fuses: 250 V, 5A (5x20 mm) IEC 60127 fuse only
Insulation Resistance	Not less than 1MΩ at 1,000V Phase 1 = 50GΩ Neutral = 50GΩ
UI Connection	RS 232 cable

4. Installation

WARNING

Read the Safety Chapter

Failure to review the *Safety* chapter and follow the safety warnings can result in death or serious injury.

- All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.
- Follow all applicable safety codes of the facility as well as national and international safety codes.
- Know the facility safety procedures, safety equipment, and contact information.
- Read and understand each procedure before performing it.

NOTICE

It is the responsibility of each person working on this product to know the applicable regulatory safety codes as well as the facility safety procedures, safety equipment, and contact information.

The system is supplied fully assembled from the manufacturer and no further mechanical assembly is necessary.

Before proceeding, ensure that all items listed in "Electrical Requirements" on page 27 were delivered inside the Peli Case.

Unpacking

Safety Requirements

CAUTION

Two-Person Lift Recommended

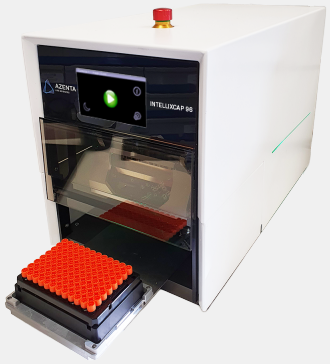
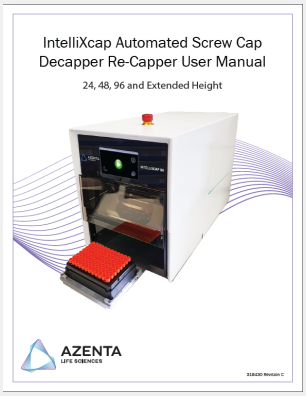
This product weighs up to 28 kg (61.7 lbs). Improper lifting may result in personal injury.

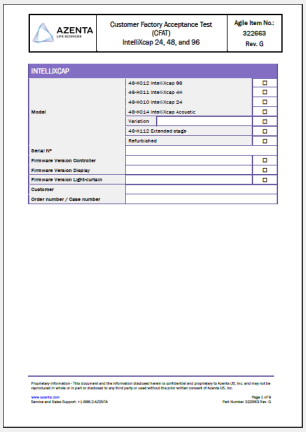
- Do not attempt to lift this product alone. Always use 2-person lift techniques or a lift aid to unpack and install the equipment.
- Use the provided straps installed around the unit when removing the IntelliXcap from the packaging.

Preparation

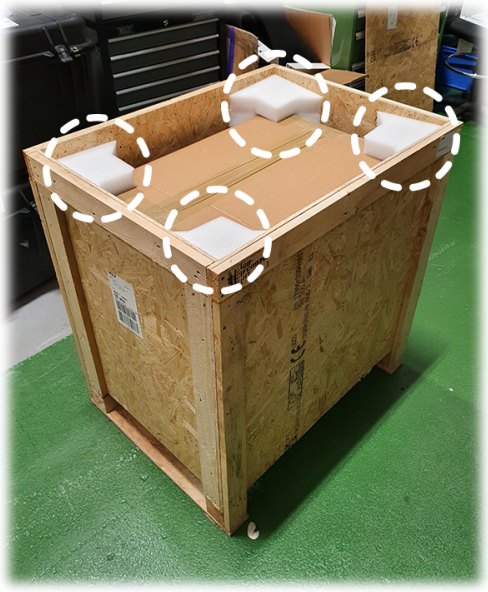
Step	Action
1.	Review "Site Requirements" on page 23 for a full list of environmental, electrical, and space requirements.
2.	Move the crate to an appropriate unpack area. 
3.	Review the procedure (as described in "Procedure" on page 33) and confirm that you have the proper items required to do the job.
4.	Unpack the kit (as described in "Procedure" on page 33) and inspect and confirm the contents (as described in "Package Contents" on the facing page) are present and correct.
5.	Report any missing or damaged items to Azenta Life Sciences.

Package Contents

Product Code	Description	Quantity	Part Image
46-8012	IntelliXcap™ Automated Screw Cap Decapper/Recapper 96-format	1	
46-8011	IntelliXcap™ Automated Screw Cap Decapper/Recapper 48-format		
46-8010	IntelliXcap™ Automated Screw Cap Decapper/Recapper 24-format		
46-8018	IntelliXcap™ Automated Screw Cap Decapper/Recapper Extended Height		
323304	POWER CORD, C13 TO UK PLUG,2M,250V,10A	1	N/A
323305	CABLE ASSY,POWER,RIGHT ANGLE,C13,3 POLE,US	1	N/A
323306	CABLE ASSY,POWER,RIGHT ANGLE,C13,3 POLE,EU	1	N/A
334125	CABLE ASSY,PWR CORD,AUS/NZ PLUG TO 90°C13,10A,1.8M	1	N/A
323307	Cable USB A-A	1	N/A
323308	Cable Serial RS 232	1	N/A
319430	IntelliXcap Automated Screw Cap Decapper Re-Capper User Manual	1	

Product Code	Description	Quantity	Part Image
354817	FORM,FACTORY ACCEPTANCE TEST,INTELLIXCAP 96	1	
322663	CUSTOMER CFAT,INTELLIXCAP 24, 48 AND 96	1	

Procedure

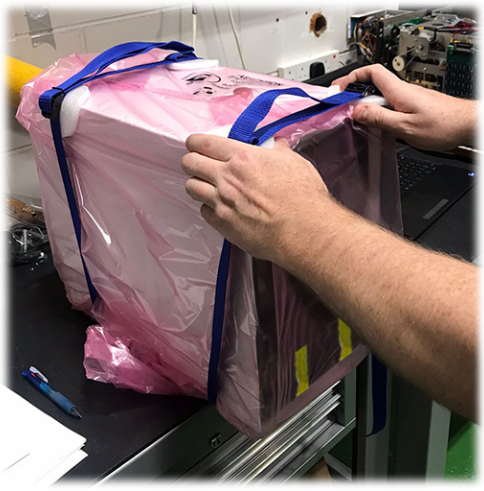
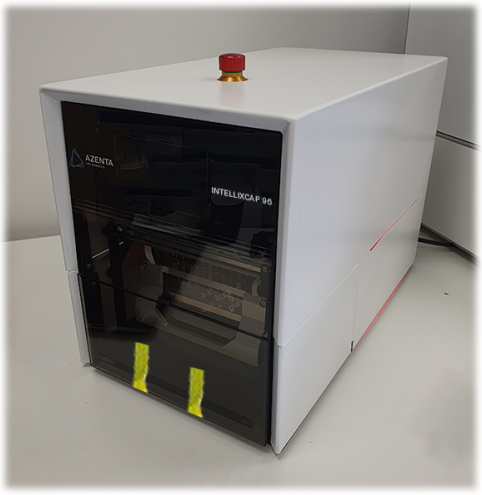
Step	Action
1.	Unscrew the lid and remove it from the wooden crate. 
2.	Remove the foam support from each top corner. 

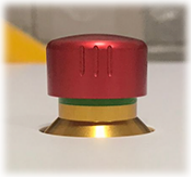
Step	Action
3.	With two people, remove the outer cardboard box. 
4.	Open the outer cardboard box. 

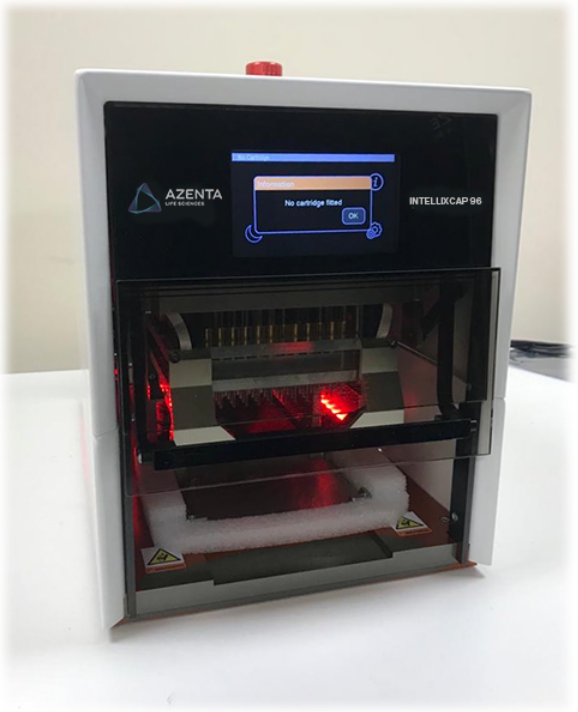
Step	Action
5.	Remove the foam support from each top corner. 

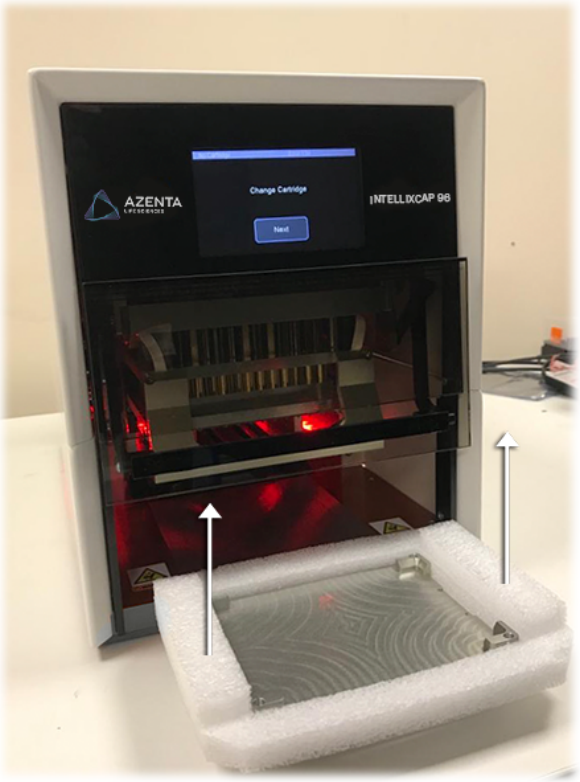
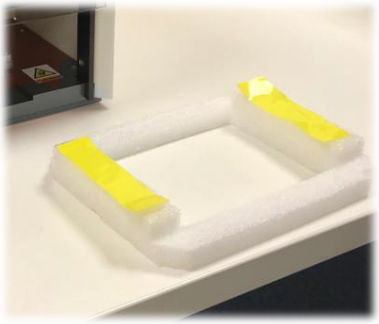
Step	Action
6.	Remove the box that is located down the side of the outer cardboard box.  The box contains documentation, cables and any cartridges. 
7.	Ensure that all parts are included as described in "Package Contents" on page 31.

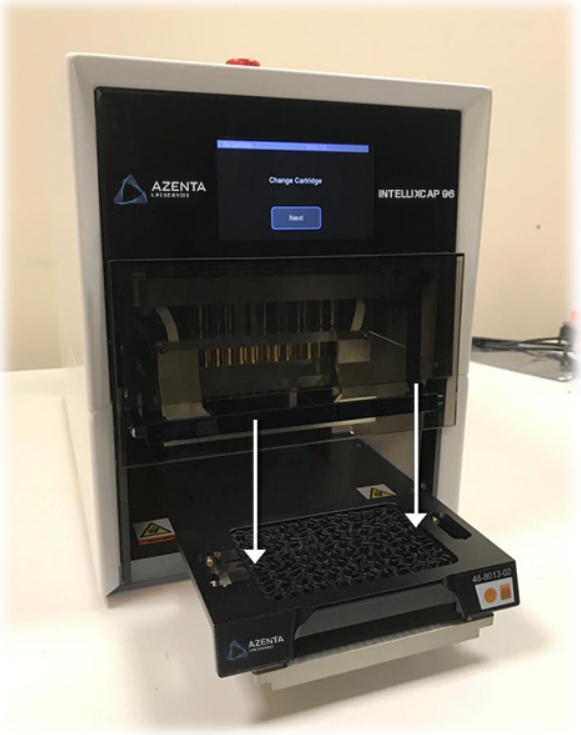
Step	Action
8.	Open the inner cardboard box. You do not need to remove the box first. 
9.	Remove the foam supports from the top of the IntelliXcap.
10.	With two people, carefully lift the IntelliXcap system out of the inner cardboard box by the blue straps and place it on a flat surface that can hold 30 kg. 

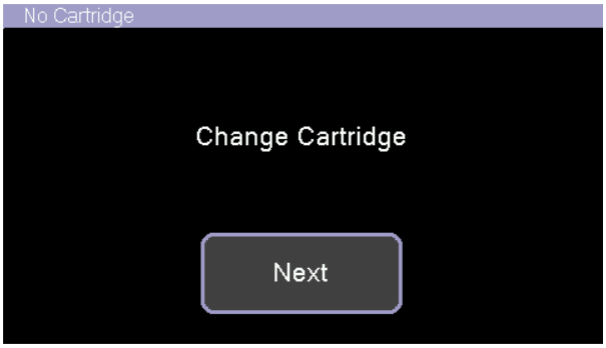
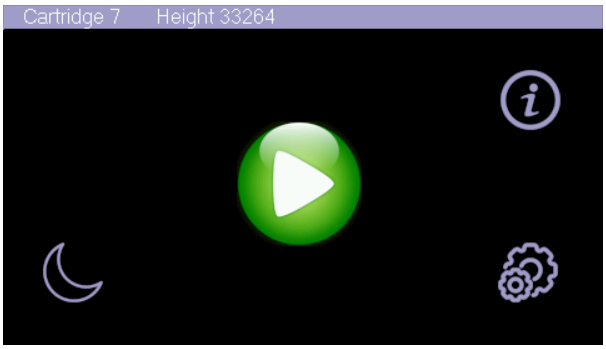
Step	Action
11.	Remove the blue straps and set them aside. 
12.	Remove the anti-static bag and set it aside as it is required for Step 20. 

Step	Action
13.	Remove the shipping tape securing the door and set the tape aside as it is required for Step 20. 
14.	Twist to release the e-stop button so that a green ring is visible below the red knob. 
15.	Connect the power cable from the instrument back to the electrical power socket (100/240VAC). ***NOTE:*** *Ensure that the door is free from obstructions, and that there is nothing in front of the instrument.* 

Step	Action
16.	Turn the IntelliXcap on, using the switch at the rear of the system.  The system initializes and displays the *No cartridge fitted* pop-up. 
17.	Press the **OK** button. The door closes and the system initializes the sequence of installing a cartridge. The door then opens and the tray extends.

Step	Action
18.	Remove the foam block used to secure the IntelliXcap stage in place. 
19.	Stick all provided plastic shipping tape to the foam block. 
20.	Place the straps, foam block and shipping tape inside the anti-static bag and save them. They will be needed if shipping the system.

Step	Action
21.	Load the required cartridge onto the stage. 

Step	Action
22.	Press the **Next** button.  Once initialization is completed, the *Home* screen is displayed. 
23.	Keep the original packing material in a dry/low humidity location in case the IntelliXcap needs to be transported for service or repair. Follow all local regulations while disposing the original packing solution.

Repacking

Safety Requirements

CAUTION

Two-Person Lift Recommended

This product weighs up to 28 kg (61.7 lbs). Improper lifting may result in personal injury.

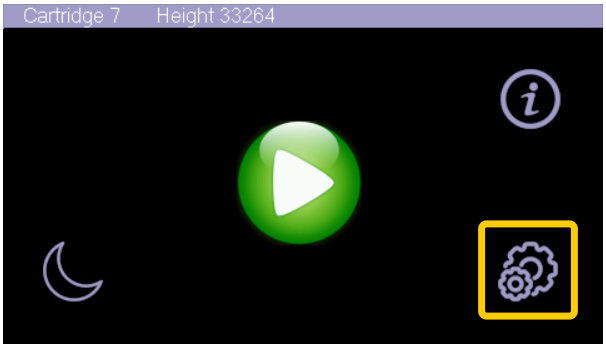
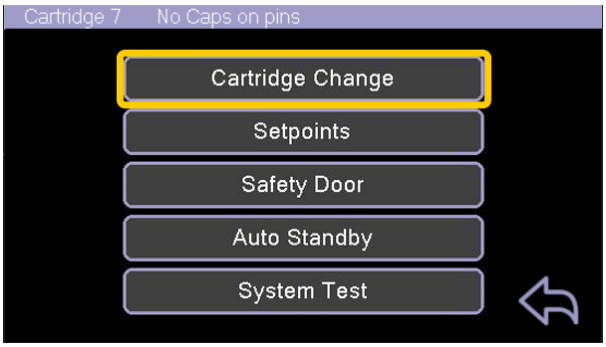
- Do not attempt to lift this product alone. Always use 2-person lift techniques or a lift aid to unpack and install the equipment.
- Use the provided straps installed around the unit when removing the IntelliXcap from the packaging.

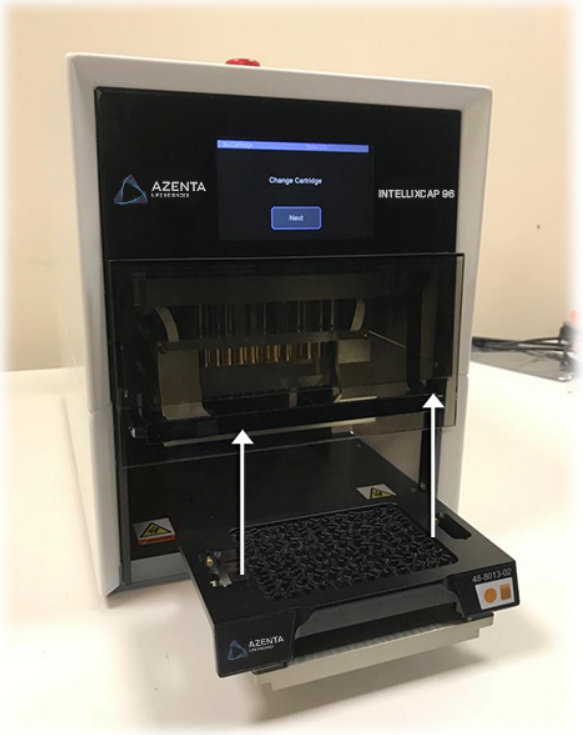
When lifting the IntelliXcap, use the cavity in its back and tilt the IntelliXcap to secure the bottom front of the instrument.

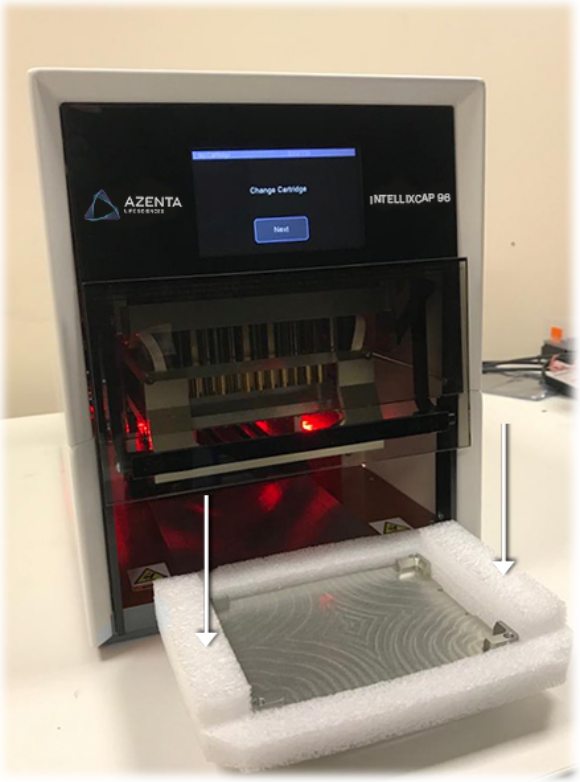
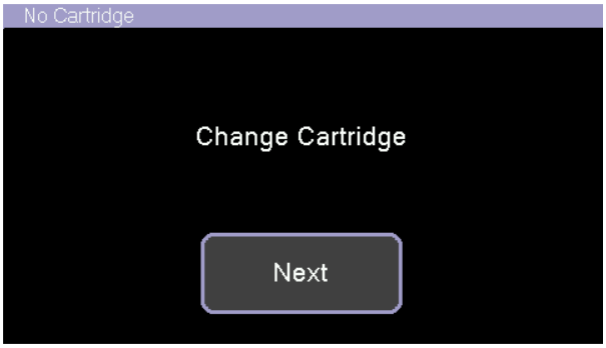
Figure 4-1: Lifting the IntelliXcap

Procedure

Step	Action
1.	Power on the IntelliXcap. 

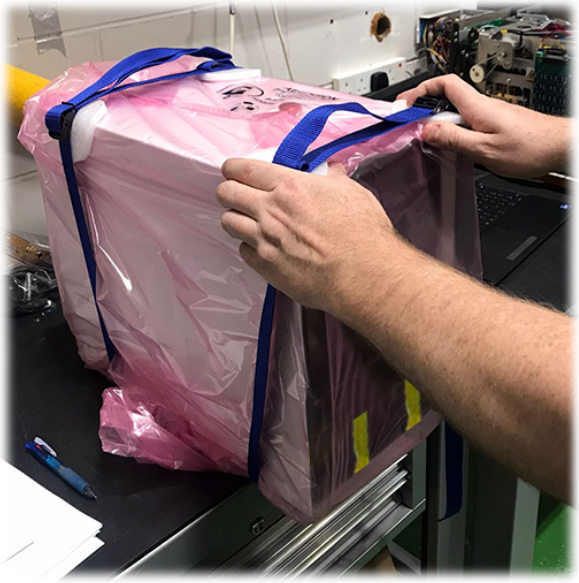
Step	Action
2.	Press the **Settings** button. 
3.	Press the **Cartridge Change** button. 

Step	Action
4.	Remove the cartridge. 

Step	Action
5.	Remove and set aside any shipping plastic tape from the foam block, then place the foam block on the stage. 
6.	Press the **Next** button.  The tray retracts and the head lowers.

Step	Action
7.	When the head lowers to the position shown below and begins to compress the foam block, press the E-Stop button to stop the process and lock the head in place. 
8.	Release the E-stop button.
9.	Power off the IntelliXcap. 
10.	Disconnect all cables from the equipment.

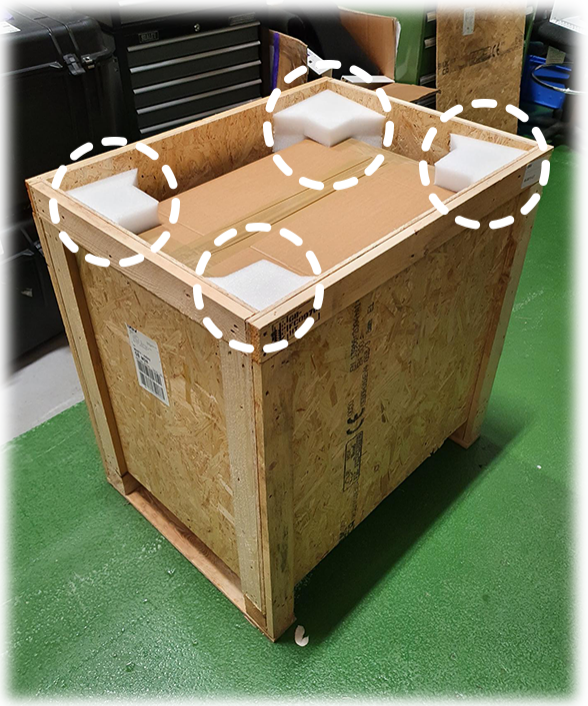
Step	Action
11.	Close the door and apply the plastic shipping tape from the base to the door (as shown below) to lock the door. 
12.	Move the crate and provided packaging equipment (straps and foam blocks) to an appropriate packaging area.
13.	Place the IntelliXcap inside the provided anti-static bag. 

Step	Action
14.	Wrap both straps around the equipment using the provided foam pads to protect the case from the metal strap buckles. 
15.	With two people, carefully lift the IntelliXcap system and place it inside the provided cardboard box. 

Step	Action
16.	Add the foam blocks that lock the instrument in place. 
17.	Seal the box with parcel tape.

Step	Action
18.	Pack all cables in the small box. 

Step	Action
19.	Slide the small box down the side of the larger one. 
20.	Place the foam supports in each top corner. 

Step	Action
21.	Seal the box with parcel tape.
22.	With two people, place the cardboard box into the crate. 
23.	Place the foam supports in each top corner. 

Step	Action
24.	Screw the lid onto the crate. 

5. Operation

Overview

This chapter provides complete operation directions for the Azenta Life Sciences IntelliXcap. The operation of the IntelliXcap is covered for both normal operating conditions and emergency conditions.

The IntelliXcap shall be screened off appropriately before operation and it must only be used to remove and replace screw caps on micro tubes in specific, SBS-footprint rack types.

The IntelliXcap has been designed and constructed to allow safe access to all areas where intervention could be necessary during operation.

The settings must not be changed.

Only trained individuals should monitor the IntelliXcap while in use.

NOTICE

It is the responsibility of each person working on this product to know the applicable regulatory safety codes as well as the facility safety procedures, safety equipment, and contact information.

CAUTION

Inappropriate Use

Use of this product in a manner or for purposes other than for what it is intended may cause equipment damage or personal injury.

- Only use the product for its intended application.
- Do not modify this product beyond its original design.
- Always operate this product with the covers in place.
- Do not change settings.

WARNING

Read the Safety Chapter

Failure to review the *Safety* chapter and follow the safety warnings can result in death or serious injury.

- All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.
- Follow all applicable safety codes of the facility as well as national and international safety codes.
- Know the facility safety procedures, safety equipment, and contact information.
- Read and understand each procedure before performing it.

Theory of Operation

Basic Process

Step	Action
1.	The operator places a rack fully or partially filled with capped tubes onto the instrument's stage.
2.	The IntelliXcap confirms that the consumables match the expected height. ***NOTE:*** *If the instrument detects that the tube rack is of a height different to that expected, it returns an error message.*
3.	The IntelliXcap de-caps or caps all of the tubes. ***NOTE:*** *The time for required to de-cap or re-cap varies from 20–40 seconds.*

LED Indicators

Table 5-1: LED Indicators and Definitions

LED Color	Definition
Green	Operation ready. Main menu is displayed.
Green Flashing	Operation in progress.
Orange	Standby status. Press button to leave standby. Message appears on the screen
Red	Error code is displayed on screen.

Starting the Product

CAUTION

Inappropriate Use

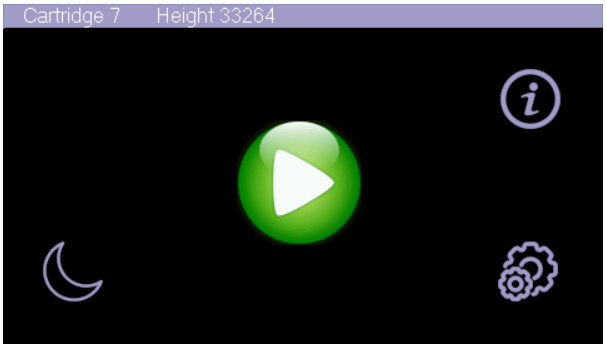
Use of this product in a manner or for purposes other than for what it is intended may cause equipment damage or personal injury.

- Only use the product for its intended application.
- Do not modify this product beyond its original design.
- Always operate this product with the covers in place.
- Do not change settings.

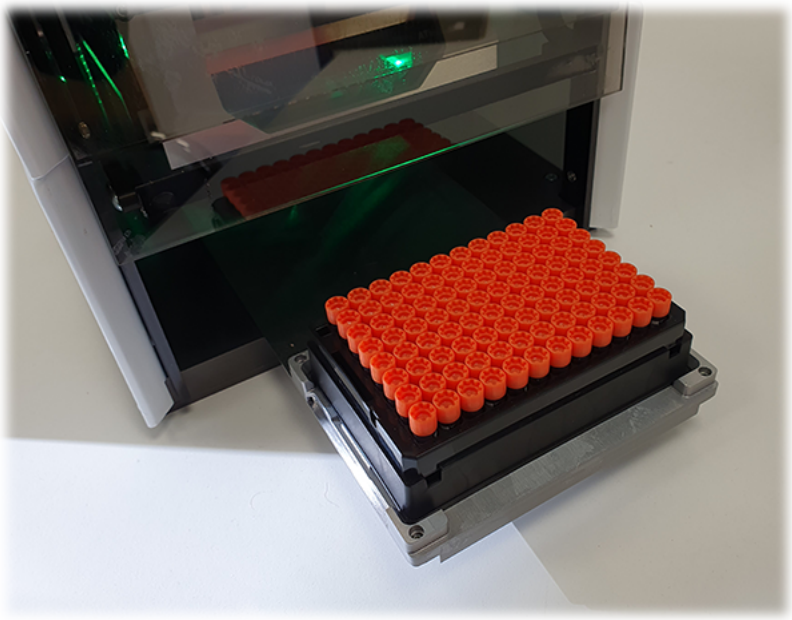
NOTICE

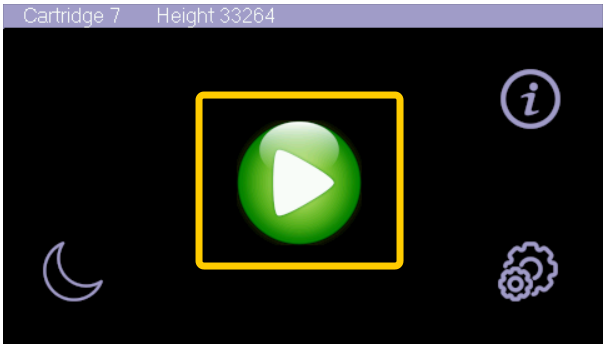
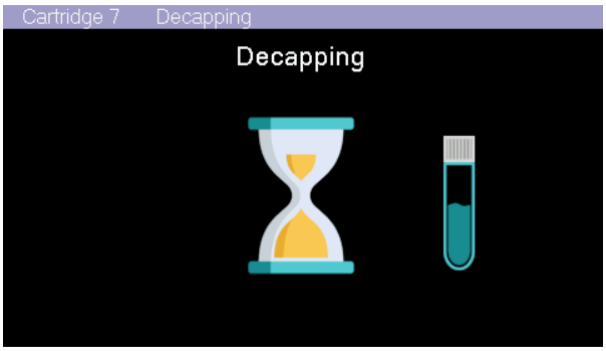
It is the responsibility of each person working on this product to know the applicable regulatory safety codes as well as the facility safety procedures, safety equipment, and contact information.

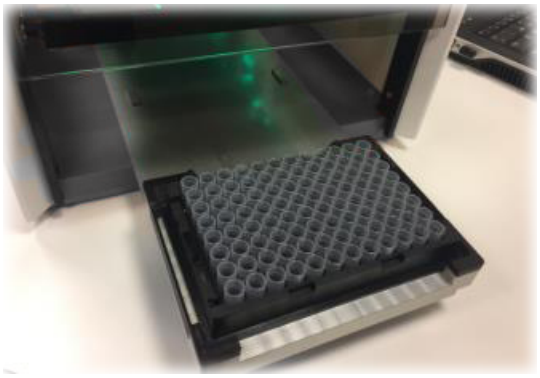
Step	Action
1.	Connect the power cable into the electrical power socket (100/240VAC) on the back of the device. 
2.	Ensure that the door is free from obstructions, and that there is nothing in front of the instrument.

Step	Action
3.	Turn the IntelliXcap on, using the switch at the rear of the system.  The IntelliXcap starts up and begins the Initialization process. ***NOTE:*** *During this process, the door opens and the stage moves into its extended position.*  Once initialization is complete, the *Home* screen is displayed. 

De-Capping the Tubes

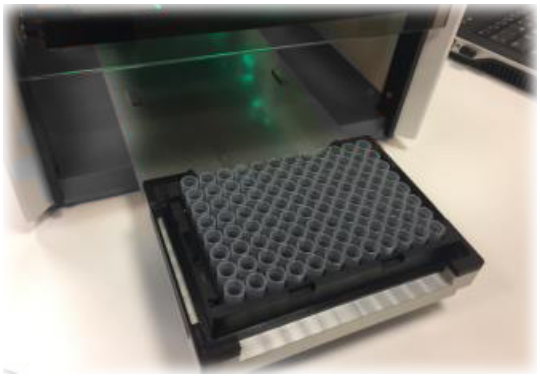
Step	Action
1.	Ensure that the correct cartridge for the tray is inserted. See "Manage the Cartridges" on page 68
2.	Place the rack of capped tubes on the tray. 

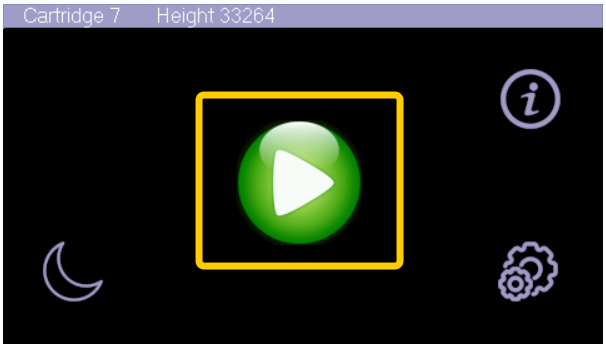
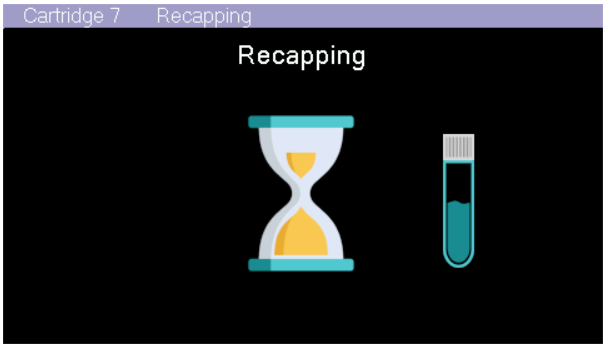
Step	Action
3.	Press the **Start** button on the screen.  The instrument confirms the height of the tubes.  If the height scan is successful, the machine begins de-capping. ***NOTE:*** *If the instrument detects that the tube rack is of a height different to that expected, it returns an error message.* 

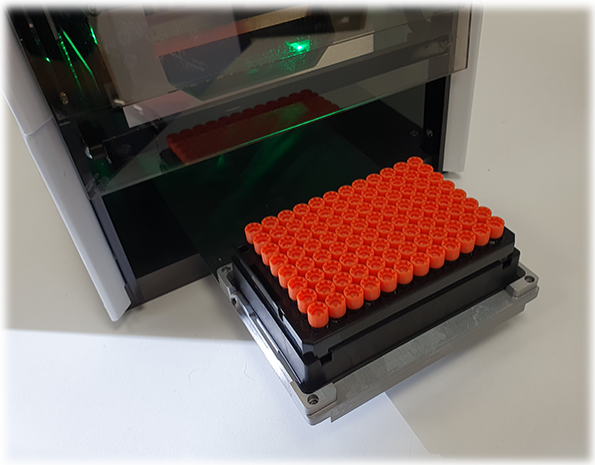
Step	Action
4.	If required, you can stop the current process by pressing the E-Stop button on the top of the unit.  ***NOTE:*** *You can continue to de-cap after pressing the E-stop.*
5.	On completion, the de-capped tubes are returned via the tray. 

Re-Capping the Tubes

Once the de-capping process has finished, the IntelliXcap is ready to start the re-capping process.

Step	Action
1.	When ready, place the rack of uncapped tubes back on the tray. 

Step	Action
2.	Press the **Start** button on the screen.  The instrument scans and detects the correct height of the tubes.  The machine begins the recapping process. ***NOTE:*** *If the instrument detects that the tube rack is of a height different to that expected, it returns an error message.* 

Step	Action
3.	If required, you can stop the current process by pressing the E-Stop button on the top of the unit.  ***NOTE:*** *You can continue to re-cap after pressing the E-stop.*
4.	On completion, the re-capped tubes are returned via the tray. 

Manage the Cartridges

The IntelliXcap can work with a range of tube types - a specific cartridge is required or each different cap design. See below for a list of available cartridges.

Additional cartridges are released occasionally. To check the current list or to request a cartridge for your specific storage tube, contact your local sales representative or see "Technical Support" on page 97.

Table 5-2: IntelliXcap 96

Part Number	IntelliCartridges for IntelliXcap 96 Description (single cartridge)
48-8013-01	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Azenta Life Sciences internal thread
48-8013-02	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Azenta Life Sciences external thread
48-8013-03	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Azenta Life Sciences Internal o-Ring thread
48-8013-04	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Azenta Life Sciences Acoustic Tube thread
48-8013-05	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Thermo Matrix 200ul low profile internal thread
48-8013-07	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Micronic internal thread. ***NOTE:*** *Not compatible with Micronic low profile caps.*
48-8013-08	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Micronic external thread
48-8013-09	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for LVL Technologies internal thread
48-8013-10	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for LVL Technologies external thread
48-8013-11	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Thermo Matrix internal thread
48-8013-12	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Azenta Life Sciences 0.2ml Tube thread
48-8013-13	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Greiner Cryo.s Biobanking internal thread
48-8013-16	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Sofra external thread
48-8013-17	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Avicena external thread
48-8013-18	IntelliXcap Automated Screw Cap Decapper Cartridge, 96 format, for Rhinostic Swab internal thread

Table 5-3: IntelliXcap 48

Part Number	IntelliCartridges for IntelliXcap 48 Description (single cartridge)
48-8015-01	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Azenta Life Sciences external thread
48-8015-02	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Azenta Life Sciences and Greiner internal thread
48-8015-03	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Azenta Life Sciences and Greiner external thread
48-8015-04	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Nunc cryo internal and external thread
48-8015-07	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for LVL external thread
48-8015-08	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Nunc external thread
48-8015-09	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Corning internal thread
48-8015-10	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Thermo nunc external thread
48-8015-11	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Cryogenic Storage internal thread labware
48-8015-12	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Cryogenic Storage external thread labware
48-8015-14	IntelliXcap Automated Screw Cap Decapper Cartridge, 48 format, for Micronic external thread

Table 5-4: IntelliXcap 24

Part Number	IntelliCartridges for IntelliXcap 24 Description (single cartridge)
48-8017-01	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Azenta Life Sciences external thread
48-8017-02	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Azenta Life Sciences and Greiner internal thread
48-8017-03	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Micronic 6ml internal thread
48-8017-04	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Nunc cryo internal and external thread
48-8017-05	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Nalgene external thread
48-8017-06	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Thermo nunc 1.8ml external thread
48-8017-07	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Thermo 9mm glass vials
48-8017-08	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Sarstedt external thread
48-8017-09	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Azenta Life Sciences 2ml glass vials

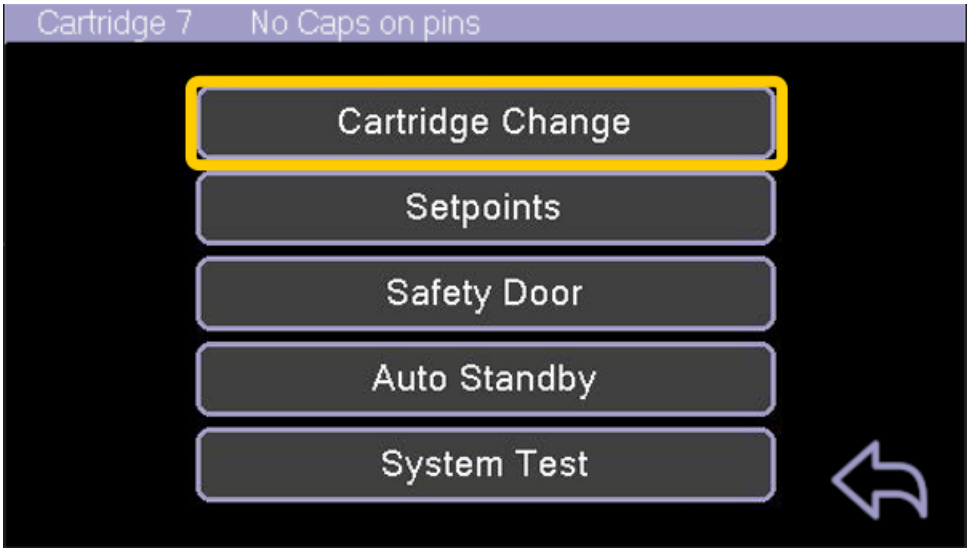
Part Number	IntelliCartridges for IntelliXcap 24 Description (single cartridge)
48-8017-10	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Azenta Life Sciences 4ml glass vials
48-8017-11	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Azenta Life Sciences 6ml glass vials
48-8017-12	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for NAST external thread
48-8017-13	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Hologic tubes - Panther Fusion external thread
48-8017-16	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Bioplastics 2ml, requires custom rack
48-8017-17	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for NXTBIO 2.0 ml, requires custom rack
48-8017-18	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for ZYMO external thread, requires custom rack
48-8017-19	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for 14.8mm glass vials, requires custom rack
48-8017-20	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for Deltalab external thread
48-8017-21	IntelliXcap Automated Screw Cap Decapper Cartridge, 24 format, for LVL external thread

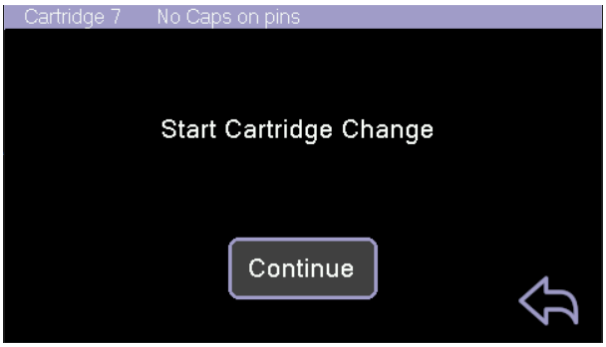
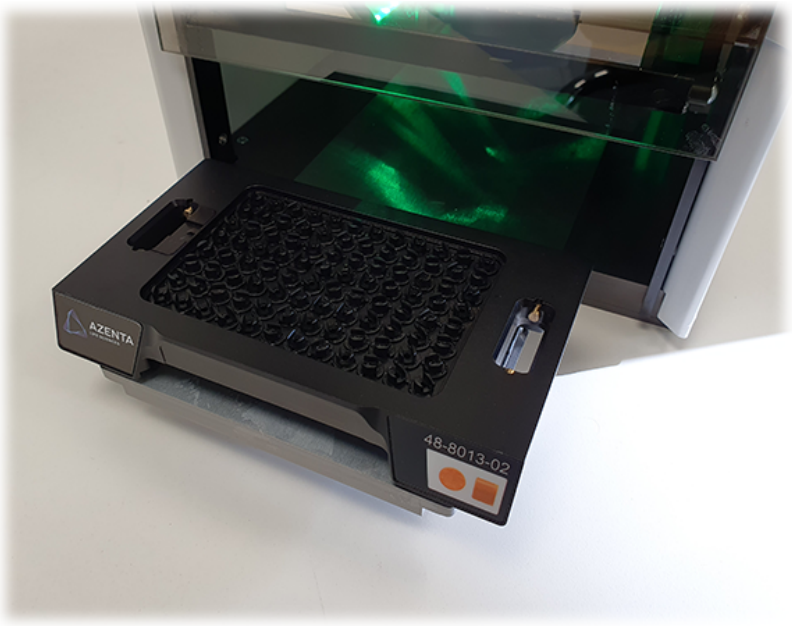
Change Cartridge

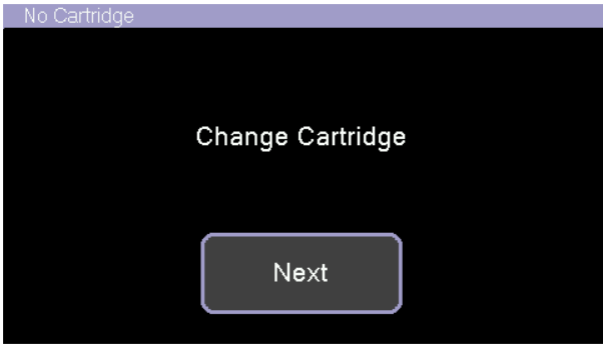
Table 5-5: Cartridge Numbers

Cartridge Number	Cartridge ID Number	Profile Number Range	Usage
0	0	N/A	No cartridge fitted, loads default values to allow machine homing.
1–14	1–14	1–14	Profile loaded automatically based on cartridge ID number (provided a profile exists in EEPROM).
N/A	15	N/A	There is no cartridge 15. Instead, this is a wildcard for cartridges 16–96.
16–96	15	16–96	The cartridge ID is always 16. The actual number must be entered by the user.

If a cartridge must be replaced, use the following procedure.

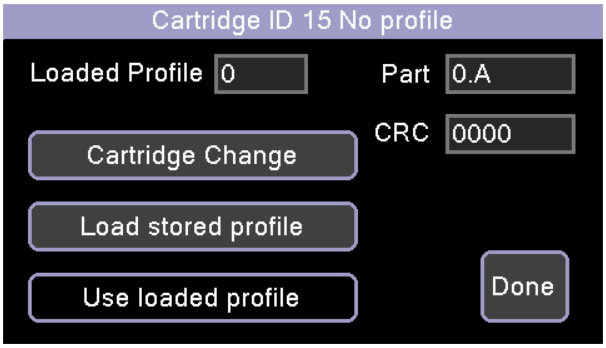
Step	Action
1.	Ensure there is nothing on the stage.
2.	Press the **Settings** button on the *Home* screen. 
3.	Select **Cartridge Change**. 

Step	Action
4.	Press **Continue**.  The stage moves inside the unit and the cap-driver cartridge is lowered and placed onto the stage.
5.	When the homing process is complete, place the new cartridge on the stage. ***NOTE:*** *Verify the cartridge fits the alignment inserts on the sides of the stage's frame.* 

Step	Action
6.	Press **Next**.  The stage returns to the home position. The stage with the cartridge moves inside the unit and the cap-driver cartridge is collected and attached to the de-capping head. The head carries out a re-initialization process which needs to be completed before the first de-capping process can be carried out.

Cartridge ID is 15

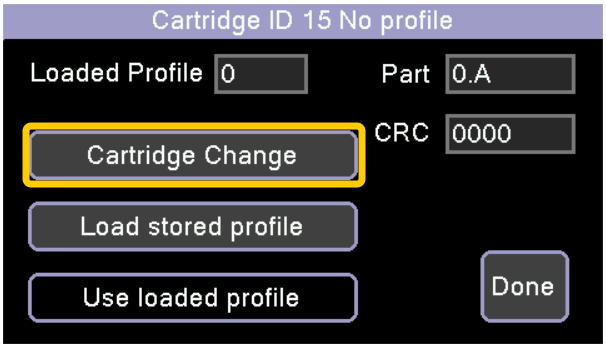
If the cartridge ID number is 15, the following screen is displayed.



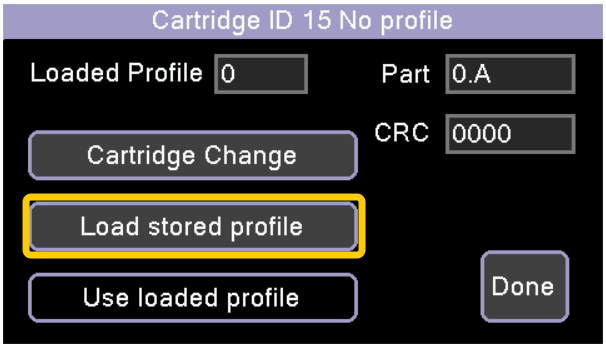
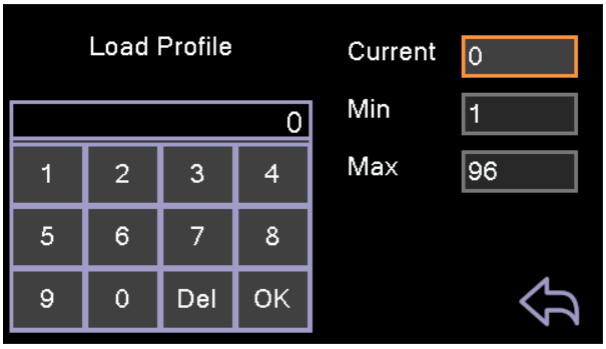
This screen allows you to do the following.

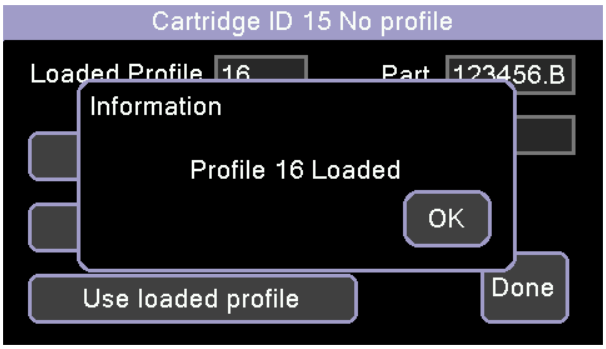
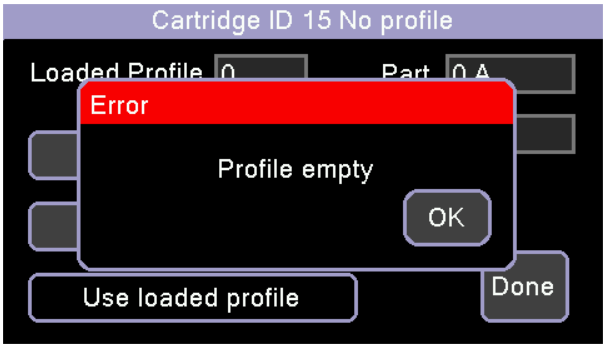
Change the Cartridge

If you have inserted the wrong cartridge, press the **Cartridge Change** button to eject it.

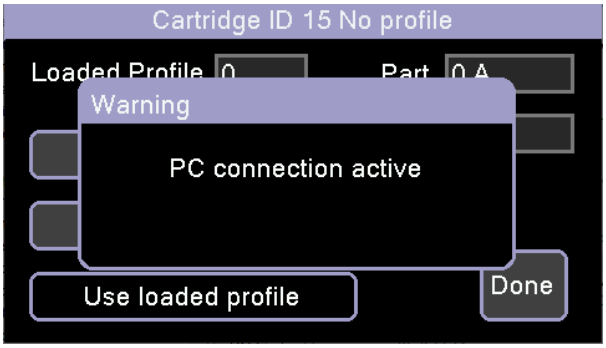


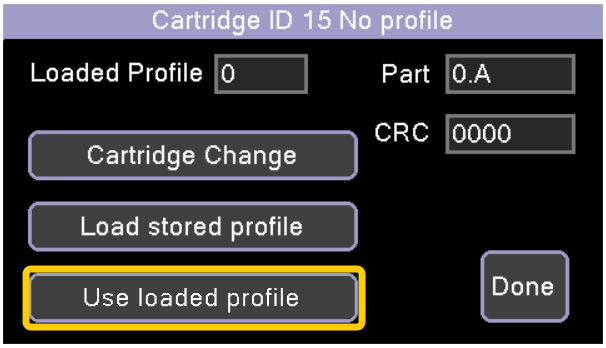
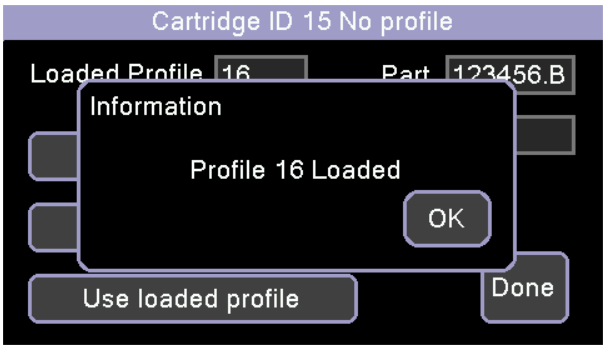
Load a Stored Profile

Step	Action
1.	Press the **Load stored profile** button. 
2.	Enter an extended profile number (between 16–96). 

Step	Action
3.	Press **OK**. If a profile with that number exists, it is loaded.  An error is displayed if, for example, a profile with that number does not exist, or the profile does not match the cartridge. 

Load and Use a New Profile

Step	Action
1.	Connect the USB. ***NOTE:*** *When the USB lead is plugged in, the LCD display is disabled and a warning dialog is displayed.* 
2.	Load in the profile using Datalogger.

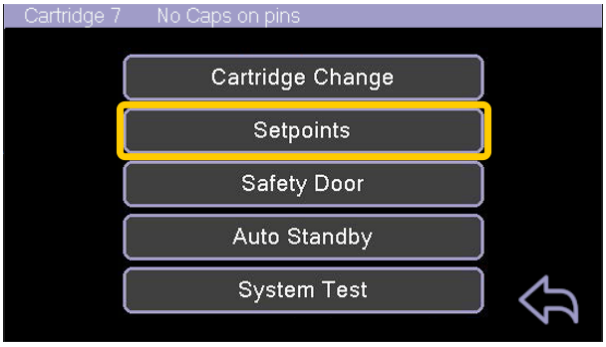
Step	Action
3.	Unplug the USB.
4.	Press the **Use loaded profile** button.  A confirmation message is displayed. 
5.	Press **OK**.
6.	Press **Done**.

Manage Setpoints

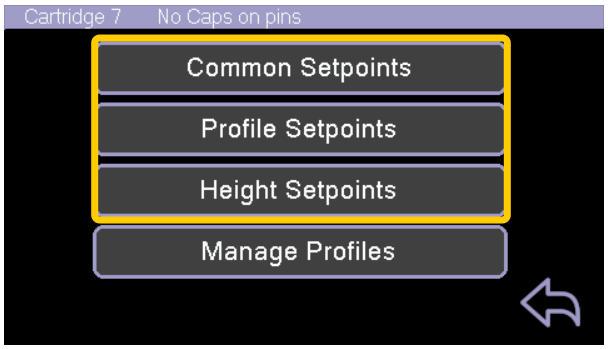
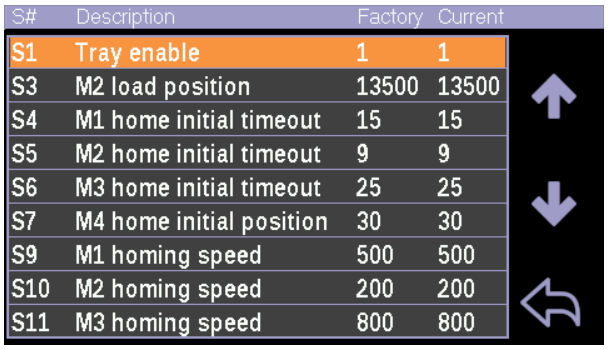
Setpoints are configurable parameters which define machine operation.

There are occasions when you might change setpoints under the instruction of Azenta service or engineering staff. For example, if the IntelliXcap is not behaving correctly, changing a setpoint to see what effect it has can assist in diagnostics.

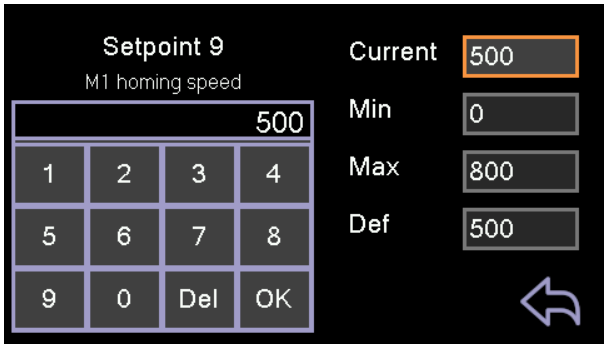
They can be viewed by navigating to *Settings* > *Setpoints*.



Edit Setpoints

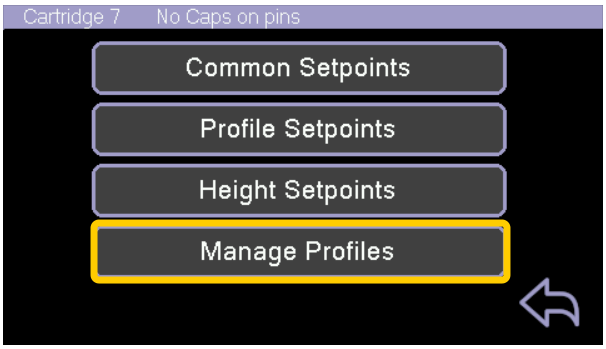
Step	Action
1.	Select the relevant setpoint category from the *Settings* > *Setpoints* menu. • Common setpoints are those which are common to all types of labware. • Profile setpoints define setpoints that are included in a profile. • Height setpoints are those which relate to height measurements. 
2.	Press a record to open it. ***NOTE:*** *Use the up and down arrows to find the relevant record, if required.* 

Field	Description	Notes
S#	The setpoint ID.	
Description	A description of the setpoint.	M1—Main Z motor M2—Stage/Nest motor M3—Cartridge motor M4—Safety Door motor
Factory	The factory (default) value.	
Current	The currently set value.	

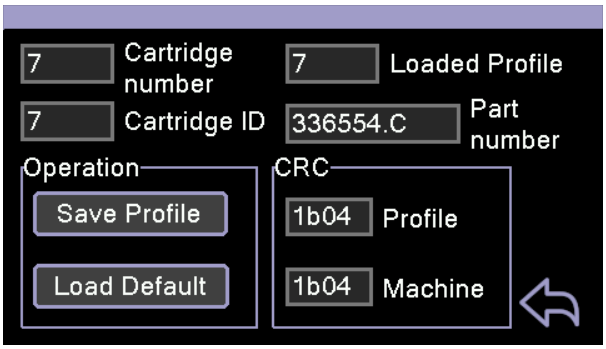
Step	Action
3.	Use the keypad to edit the value, if required. The minimum and maximum values that can be entered are displayed on the right-hand side, along with the default (Def) value. 
4.	Press **OK**.

Manage Profiles

You can view the details of the currently loaded profile by pressing the **Manage Profiles** button.



The profile information is displayed.



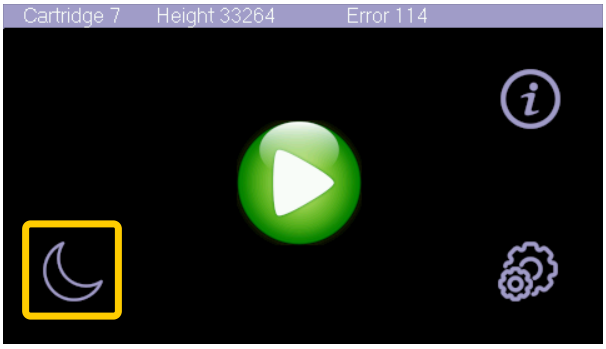
Field/Button	Meaning
Cartridge number	The actual number of the cartridge which corresponds to a physical profile.
Cartridge ID	The electrical ID number of the cartridge encoded by 4 pin switches. Can be 1–15.
Loaded Profile	The profile currently loaded into the machine's working memory area, usually this is copied from EEPROM storage according to the cartridge number, however it could also be a profile that was loaded in using datalogger.
Part number	The Azenta part number.
Operation > Save Profile	This is to be used by Azenta service personnel only.
Operation > Load Default	This is to be used by Azenta service personnel only.
CRC > Profile	A cyclic redundancy check for the profile and the machine, in hexadecimal form. This allows you to see whether a profile has had any of its values changed from original. If so, the values will not match.
CRC > Machine	

Standby Mode

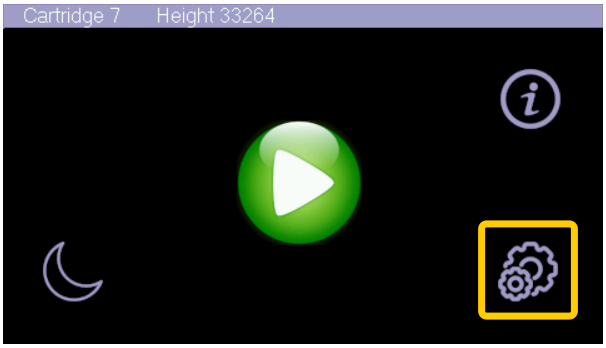
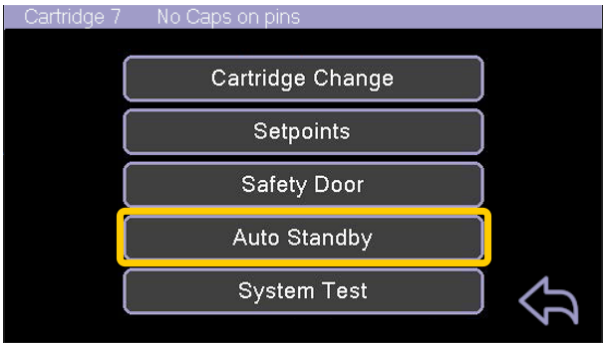
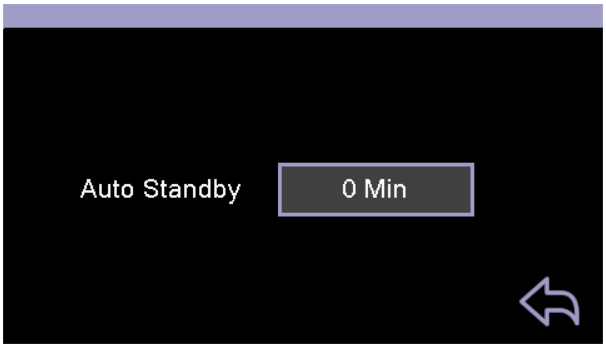
You can set the IntelliXcap to close the tray and enter a reduced-power standby mode, either manually or automatically.

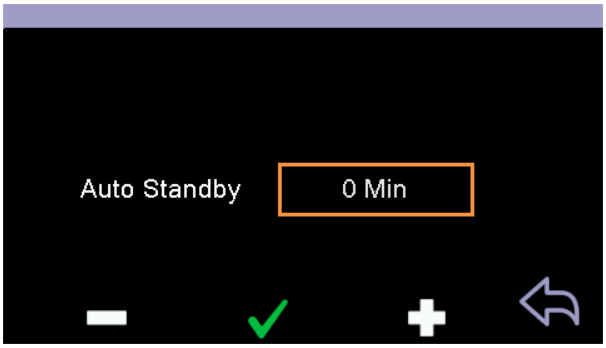
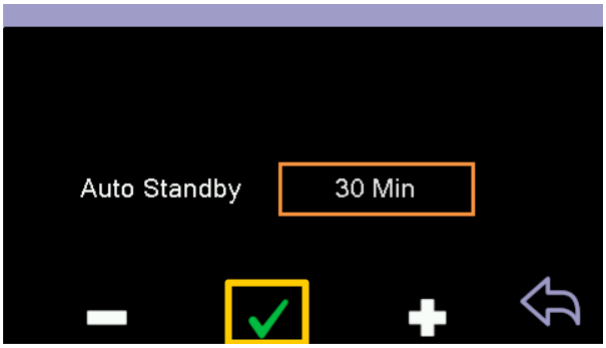
Manually Enter Standby Mode

To enter standby mode, press the **Standby** (moon) button on the *Home* screen.



Configure Automatic Standby Mode Entry after Inactivity

Step	Action
1.	Press the **Settings** button on the *Home* screen. 
2.	Press the Auto Standby button.  The Auto Standby screen is displayed. 

Step	Action
3.	Press in the field to display the buttons at the bottom of the screen. 
4.	Press the – and + buttons to change the amount of time of inactivity before the machine enters standby mode. ***NOTE:*** *You can press and hold each button to speed up the process.* 
5.	Press the tick button to confirm. 

Exit Standby Mode

To exit standby mode, press anywhere on the screen.

6. Preventative Maintenance

Overview

This chapter provides complete maintenance schedules and procedures for the Azenta Life Sciences IntelliXcap.

Preventative Maintenance

This section provides the schedule and procedures for routine preventative maintenance (PM) of the IntelliXcap to reduce unscheduled downtime. The IntelliXcap is designed to require very little routine maintenance. However, it is recommended that the preventative maintenance procedures and schedule provided in this section be followed to extend the operating life of the IntelliXcap. If additional procedures are required, they will be supplied along with their maintenance schedules by Azenta Life Sciences.

All preventative maintenance procedures and schedules provided here assume that the IntelliXcap is operating in a clean, dry, inert environment. Any deviation from this basic environment will affect the scheduling of PM and may also require additional PM procedures be performed. The user should adjust the preventative maintenance schedule as appropriate to account for any deviations from this environment.

DANGER

Read the Safety Chapter

Failure to review the *Safety* chapter and follow the safety warnings can result in death or serious injury.

- All personnel involved with the operation or maintenance of this product must read and understand the information in this safety chapter.
- Follow all applicable safety codes of the facility as well as national and international safety codes.
- Know the facility safety procedures, safety equipment, and contact information.
- Read and understand each procedure before performing it.

CAUTION

Unauthorized Service

Personal injury or damage to equipment may result if this product is operated or serviced by unauthorized personnel.

- Only qualified personnel are allowed to transport, assemble, operate, or maintain the Product.
- Properly qualified personnel are those who have received certified training and have the proper qualifications for their jobs.

Maintenance Schedule

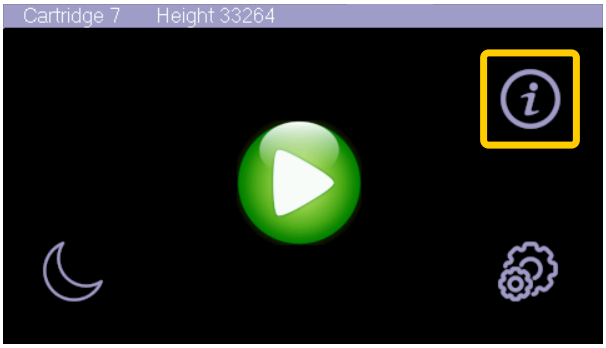
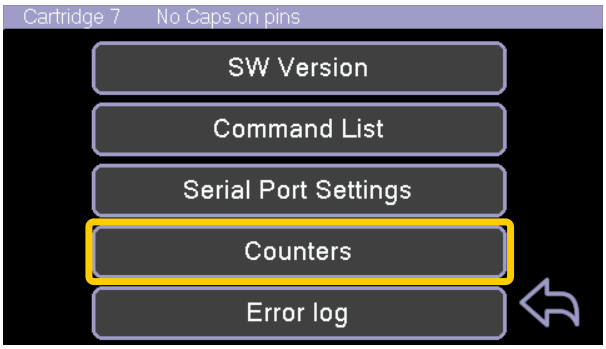
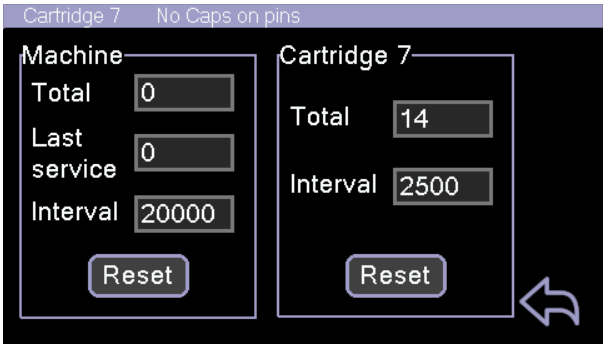
Servicing the machine must only be carried out by qualified personnel. Tasks may require skills and training. These instructions are a minimum requirement and must be carried out according to the plan below.

Keep a logbook, or similar, to document the maintenance and cleaning schedules.

Table 6-1: Preventative Maintenance Schedule

Task	Recommended Service Interval	
	Cap-Driver Cartridge	IntelliXcap
General Visual Inspection	2,500 cycles	N/A
Preventative Maintenance Visit	N/A	20,000 cycles or 12 months, whichever comes sooner
Exchange	5,000 cycles	At 40,000 cycles, it is recommended that the cap drive motors are replaced

Viewing Machine Servicing and Cartridge Replacement Intervals

Step	Action
1.	Press the **Info** button on the *Home* screen. 
2.	Press the **Counters** button.  The Counters screen is displayed. 

Section	Field/Button	Description
Machine	Total	The total number of cycles completed by the machine in its lifetime.
	Last service	The number of cycles completed by the machine since the last service.
	Interval	The recommended number of cycles between services. Every 20,000 cycles, a service warning is displayed to prompt the user to arrange a service visit for the entire machine. If the machine needs servicing, contact Azenta service. Refer to "Technical Support" on page 97.
	Reset	Resets the *Last service* counter to 0. This is reset as part of a service visit.
Cartridge	Total	The total number of cycles completed by the inserted cartridge. ***NOTE:*** *If the user operates the IntelliXcap with two different kinds of cartridges, it counts and records the cycles separately for each type.*
	Interval	The recommended number of cycles between inspecting the cartridge. Every 2,500 cycles, a warning is displayed to prompt the user to replace the cartridge. Cartridges are expected to last around 5,000 cycles. If the cartridge requires cleaning, gently wipe it over with a lint free cloth and isopropyl alcohol to remove any dust. If the cartridge needs replacing, refer to "Change Cartridge" on page 70.
	Reset	Resets the *Total* counter to 0. Press this button after replacing the cartridge.

Schedules and Procedures

The service life of the IntelliXcap is 20 years of a daily 8-hour operation (5 days per week). This is based on the presumption that all service and maintenance instructions described in this instruction manual are observed.

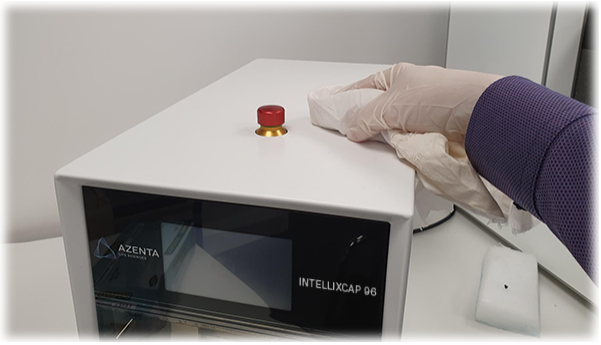
Parts

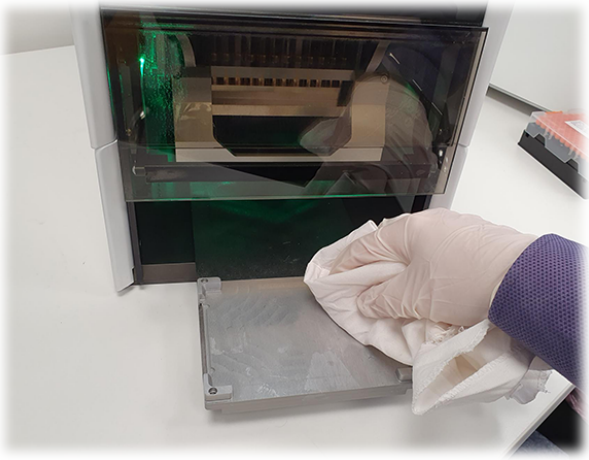
Azenta Life Sciences can provide all parts required for preventive maintenance. For a list of these parts, contact Azenta Life Sciences Technical Support. To obtain additional information about parts for preventative maintenance, contact your local Azenta Sales Representative, or call Azenta Life Sciences Technical Support. See "Technical Support" on page 97.

Cleaning

For cleaning tasks, follow safe work practices. This includes the use of personal protective equipment, that machinery and components are put in a safe condition before the task is initiated, and that the manufacturer instructions are complied with.

- Before the task is initiated, ensure that the power supply to the machine is safely disconnected.
- Obtain permission from the person responsible for the IntelliXcap before performing any repair work.
- Shield and/or keep the work area in a moist condition to prevent dust from flying around or smoldering.
- The operator, or specially trained cleaning staff, should tidy up and clean the IntelliXcap and its surroundings daily. During this work, the same requirements for the use of tools and personal protective equipment apply as for the operational work.
- Read and understand this instruction manual before the maintenance and cleaning of the machine is initiated.
- The machine requires no user maintenance other than cleaning with any 70% alcohol solution.
- Keep a logbook, or similar, to document the maintenance and cleaning schedules. If regular maintenance and cleaning of the machine cannot be shown, the manufacturer's warranty may lapse.
- Maintenance and cleaning must comply with 1.6 of Annex I of 2006/42/EC.

Step	Action
1.	Switch off the IntelliXcap to remove any risk of personal injury. Wipe the IntelliXcap externally with a microfiber or lint free cloth. 

Step	Action
2.	Wipe the machine drawer for plastic dust debris from the cap driver/tubes. A new cartridge can produce minor plastic dust when first used. 
3.	Wipe the Light curtain, front and back (image shows the rear screen as seen through the front of the system): It is important that the orange filter on the light source is always free of dust so it can always effectively identify the rack and cap carriage. 
4.	If necessary, use isopropyl alcohol to disinfect and further clean surfaces.

Inspecting the Cartridge

The cartridges used on the IntelliXcap have a limited life, generally expected to last around 5000 cycles.

After every 2500 cycles with a cartridge, the IntelliXcap gives a service counter warning.

Step	Action
1.	If you receive a service counter warning, remove the cartridge from the system.
2.	Gently wipe the cartridge over with a soft brush and isopropyl alcohol to remove any dust.
3.	Visually inspect for damage or excessive wear and tear. If you find damage, it is necessary to replace the cartridge following the procedure in "Change Cartridge" on page 70.

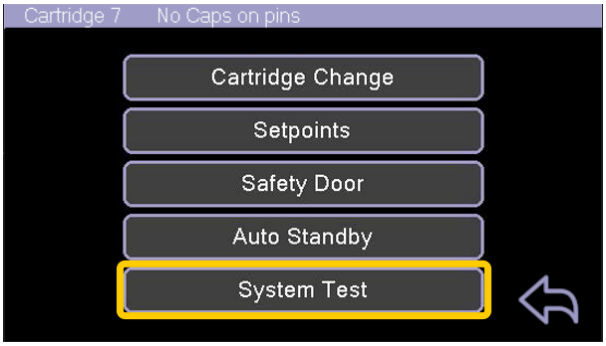
Waste Disposal

Switchboards, motors, cables and other electronics must be demounted and treated separately according to local law.

Metal parts are disposed of as scrap metal.

System Test

The System Test functionality is to be used by Azenta service personnel only.



7. Troubleshooting

CAUTION

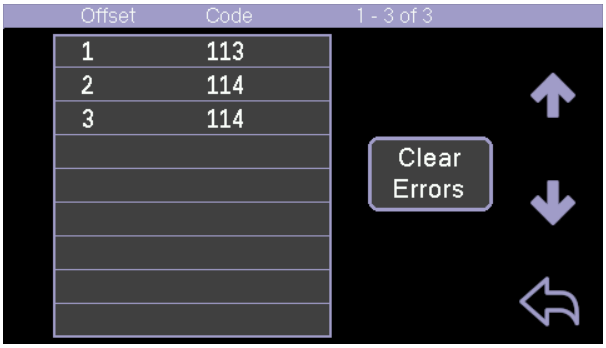
Unauthorized Service

Personal injury or damage to equipment may result if this product is operated or serviced by unauthorized personnel.

- Only qualified personnel are allowed to transport, assemble, operate, or maintain the Product.
- Properly qualified personnel are those who have received certified training and have the proper qualifications for their jobs.

Error Messages

The error codes are recorded in the Error Log screen, accessed from the system information menu. They are ordered in reverse chronological order (i.e. the most recent error is displayed first).



Error Code	Meaning
100	M1 top switch not detected during homing sequence. Could get overwritten by other error codes within higher level sequencing logic, therefore is most likely to be seen during startup sequence.
101	M2 initial homing failure. Likely to overwrite the other M1 homing error codes.
102	M1 top switch stuck closed during homing sequence.
103	M1 top switch 2nd trigger not detected during homing sequence
104	M4 homing error - top switch not detected
105	M3 topswitch not detected during homing sequence.Could get overwritten by other error codes within higher level sequencing logic, therefore is most likely to be seen during startup sequence.
106	M3 stop switch stuck closed during homing sequence
107	M3 top switch 2nd trigger not detected during homing sequence
108	M3 initial homing failure. Likely to overwrite other M3 homing error codes
109	M2 top switch not detected during homing sequence. Could get overwritten by other error codes within higher level sequencing logic, therefore is most likely to be seen during startup sequence.
110	M2 top switch stuck closed during homing sequence
111	M2 top switch 2nd trigger not detected during homing sequence
112	Door close failure
113	M1 moved to M1_SAFETY_LOW_POS (S33) . This basically means there was no light curtain trigger when scanning for caps
114	Invalid tube height detected
115	Door open failure
116	Door close failure - start of sequence
117	M1 moved to M1_SAFETY_LOW_POS (S33). This basically means there was no light curtain trigger when scanning for caps
118	Invalid tube height detected
119	Open door failure
120	Open door failure on entry to manual mode
121	Door close failure
122	M3 limit switch timeout on cartridge eject
123	Door open failure at end of cartridge eject sequence
124	Door close failure at end of cartridge eject sequence
125	M1 failed to reach waste position within S4, during auto-waste sequence. Not sure this will ever occur
133	M1 homing error

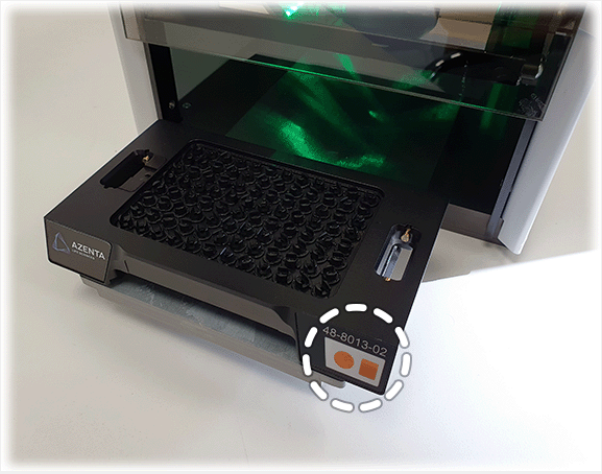
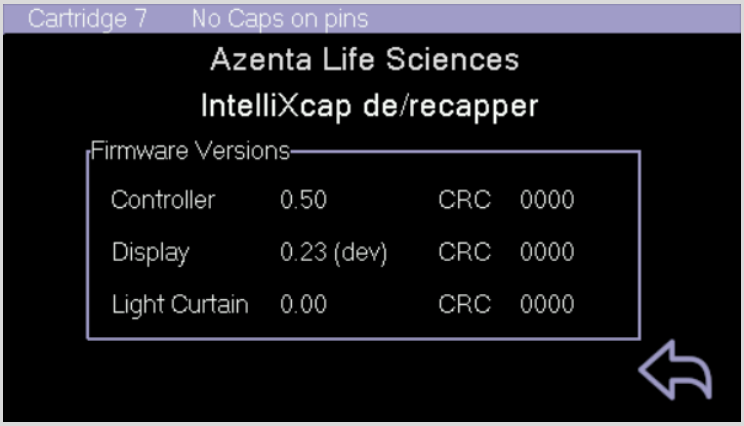
Error Code	Meaning
134	Open door failure
135	Cap detected at valid height. Not sure if this actually is an error, or is it used to communicate with display?
135	Maximum decap attempts exceeded (S46)
136	Maximum recap attempts exceeded (S45)
137	M3 bottom switch closed and motor is still moving. Protects against extended stage lead screws.
138	Open tray failure
139	No cartridge detected after initial homing
139	Not an error, used to tell display that cartridge is ejected
140	Door is supposed to be up but top switch not detected, applies in all operating modes
141	Door is supposed to be down but bottom switch not detected. Applies in all operating modes
142	Unexpected object on tray during cartridge eject
143	Cartridge not detected during cartridge load sequence
144	Cartridge detection height incorrect during cartridge load sequence. Specifically, detected height < (S73 - S59)
145	Light curtain calibration max retries exceeded
146	Light curtain calibration max retries exceeded
147	Light curtain calibration max retries exceeded
148	Light curtain calibration max retries exceeded
149	Tray open failure
150	M3 homing error during autowaste sequence
151	Tray close failure
152	Tube detected after decap retry (caps screwed back on)
153	Close tray failure
153	M3 homing error
154	Close tray failure
155	Open door failure
156	M1 homing error
157	M2 homing error
158	M3 homing error
159	M2 homing error
160	Door close failure -end of sequence

Error Code	Meaning
160	Tray open failure
161	M4 homing error
164	Tray open failure
165	Not sure this can ever occur as the same logic sequence sets error 167
166	M2 homing error during tray decap-quit
167	Logic looks broken, but is trying to detect whether there has been a door open or tray close failure during decap-quit
200	Light curtain communications failure (no modbus data received)
201	Light curtain signal failure (check wiring between controller and light curtain)
202	Limit switches fail i.e. top and bottom switches both showing as closed. Usually power supply failure or faulty switch (input reads closed when switch fails)
238	Emergency stop, low motor voltage

Technical Support

For technical support in connection with your IntelliXcap, please contact a technical representative at: Service.Products@azenta.com

Please include the following information to the representative at time of issue:

Information	Location / Instructions
Product Part Number and Serial Number	Can be found on a sticker on the rear of instrument.
Cycle Count for instrument and cartridge	See "LED Indicators" on page 59.
Cartridge type	Can be seen on the front right hand side of the cartridge. 
Any error messages	Error code shown at top of start screen. See "Error Messages" on page 93.
Is the unit part of an integrated system?	Yes/No
Firmware version	Information shown on the screen during initialization, and can be found by navigating to *Info* > *SW Version*. 

Error Recovery

Table 7-1: Typical Errors

Error	Symptom	Resolution
CAP ERROR	Tube is not de-capped properly, the IntelliXcap will automatically make a second attempt. If the IntelliXcap fails on the second attempt, an error message is shown on the screen, and the IntelliXcap stops.	Manually add a new cap to the tubes and perform a new decapping cycle.
RECAP ERROR (Error Code: 136)	Cap is improperly placed onto the corresponding tubes during the recapping process.	Select the **Initialization (Restart)** button and start the IntelliXcap.

Manual Recovery

Figure 7-1: Manual Recovery Screen

In any error situation, you have the option to cancel the process, after which, you are prompted to start a manual recovery process. Press the most relevant case available on the screen.

NOTE: Select the **Up** and **Down** arrows to access additional options.

Button	Description
Attempt recap	Attempts a recap if there are caps on the pins. This is used if the IntelliXcap has powered down, entered standby, or the E-stop has been pressed after decapping but before recapping.
Close Tray	Closes the tray
Eject Caps	If there are still caps attached to the ejecting pins, position a bowl to collect the falling caps, then press this button.

Button	Description
Initialization (Restart)	Restarts the system.
Open Tray	Once the caps have been ejected and collected, press this button.
Safety Door Up	Raises the access door.
Screwing head Up	Moves the screwing head up.
System Test	This is for use by Azenta service personnel only.

Appendix A: Integrating the IntelliXcap

The IntelliXcap can be integrated into an automated environment as well as robotic systems. A serial communication set RS 232 can fully control the entire system and eliminates the use of the touch-screen while operating. Commands for the IntelliXcap vary depending on the version of Firmware being used – to obtain the relevant command set, or for additional support please contact Azenta technical support at Service.Products@azenta.com with the details outlined in "Technical Support" on page 97.

Additionally, it is possible to run the IntelliXcap units in a legacy mode, emulating the commands used on the older XSD96,48 and 24 units – for support with configuration and commands please contact Azenta support as described above.