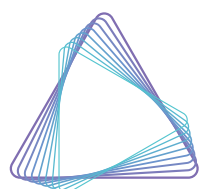
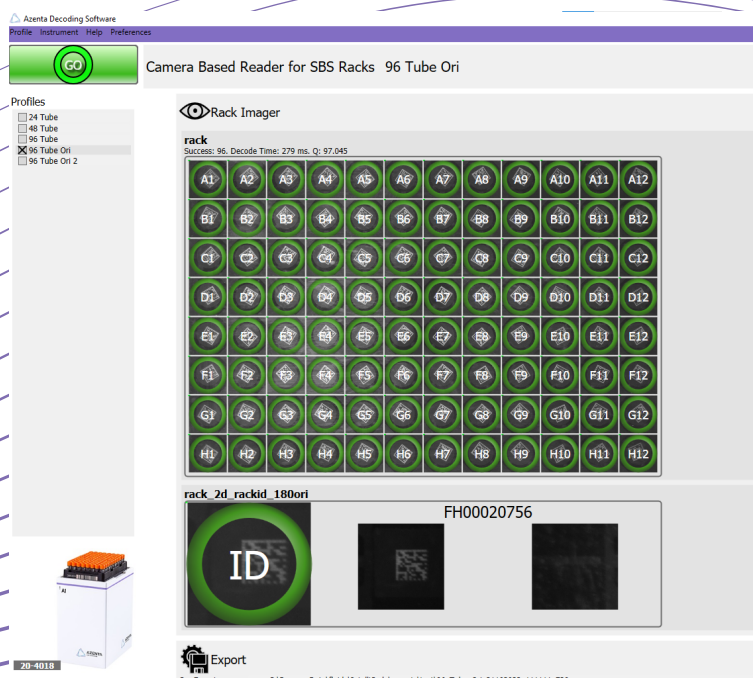


Azenta Decoding Software V15

User Manual



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LIFE SCIENCES

Azenta, Inc.

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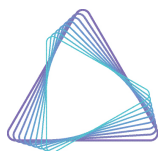
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Original manual printed in English.

These are the original instructions for the Azenta Decoding Software.



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1. Introduction



Azenta Decoding Software™ is designed to have no or very little user input. It's pre-configured for use with 24, 48, and 96 format racks. The built-in generator customizes the export file so that it is compatible with almost any LIMS or Database system.

Alternatively, the auto-generate function can create a file in standard export format. The user can design a Word or PDF template with a designated logo, add images, and customize the format. Azenta Decoding Software™ automatically uses this template to create reports ready for internal and external customers. Profiles and export files can be shared between users on a single PC as well as across a network, which reduces set-up time.

Azenta Decoding Software™ keeps an audit trail of all the decoding performed. To recreate any export files, change the format, or make a backup copy, simply set the date range required and Azenta Decoding Software™ can generate the export files as required using a unique audit trail.

Azenta Decoding Software™ can be remotely controlled using a console or TCIP Winsock, and is also compatible for use in systems where FreezerPro has been previously integrated.

There is also a built-in database connector for secure transfer of scanned tube data to your corporate SQL database.

Azenta Decoding Software™ can distinguish between a tube with a barcode that cannot be decoded and a rack position with no sample present using the “no tube” function. With this feature on, it does not attempt to decode empty tube position, keeping vital data files “clean” of wasted data, which leads to faster rack reading.

Azenta Decoding Software™ can perform both 2D and 1D rack decoding. The manual input option is particularly useful when the scanner is unable to read the barcode (e.g. if rack is placed incorrectly or no barcode present) or if an independent linear barcode reader is to be used. Azenta Decoding Software™ can use either the 1D or 2D barcode as a rack identifier. The 2D rack ID can be used for auto-rack orientation.

Azenta Decoding Software™ can take as little as 3.1 milliseconds to decode a tube. With true Multi-Core optimization, Azenta Decoding Software™ is designed for use with modern PCs. This parallel processing enables a rack of 96 2D bar-coded tubes to be decoded in less than 300 ms.

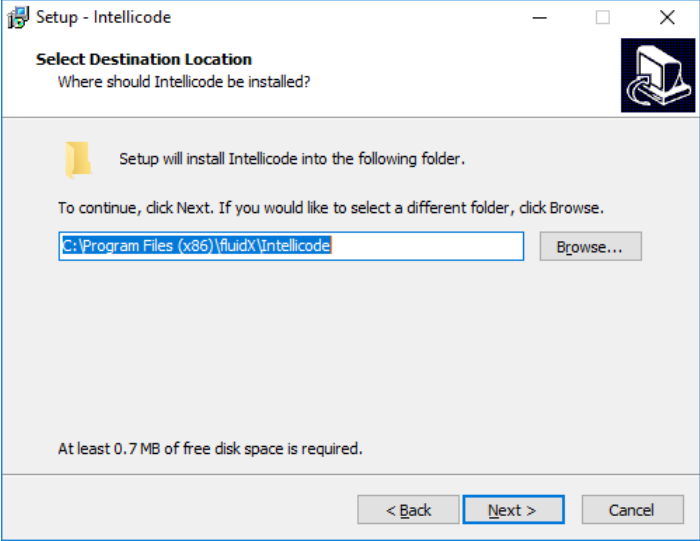
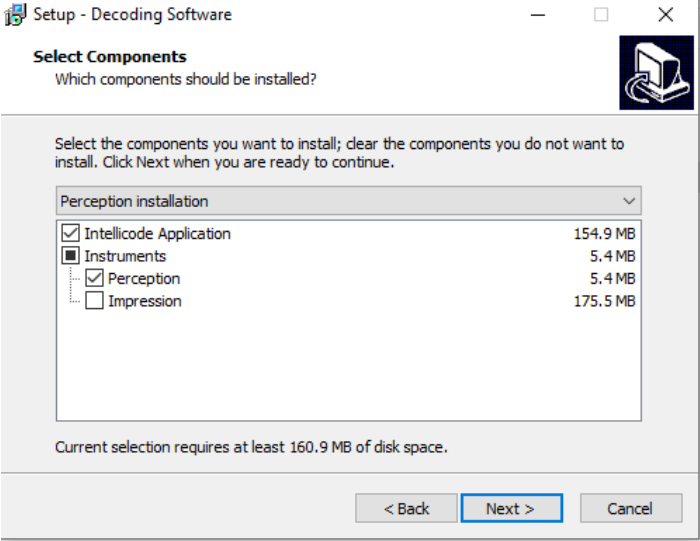
2. Installation

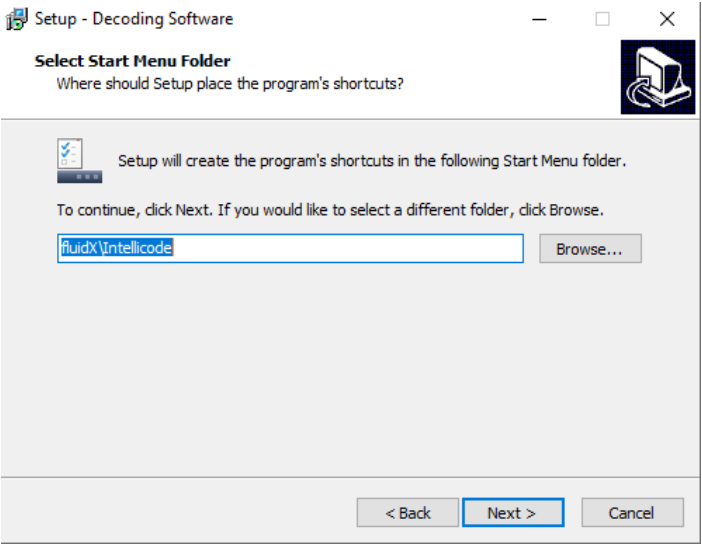
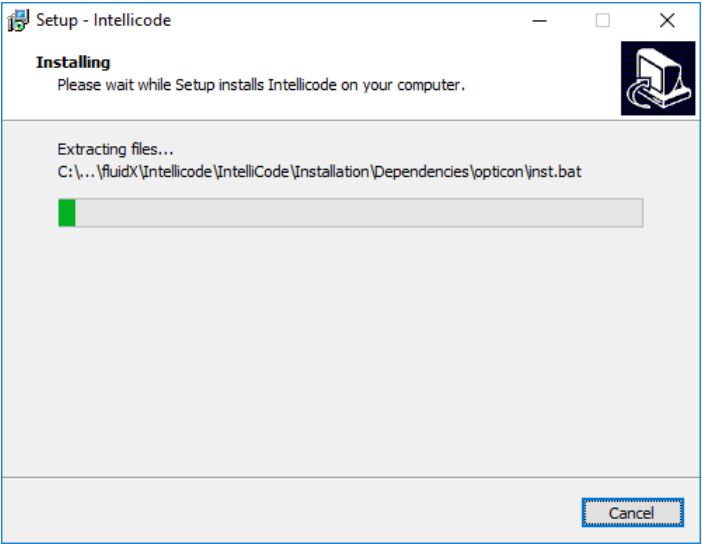
System Requirements

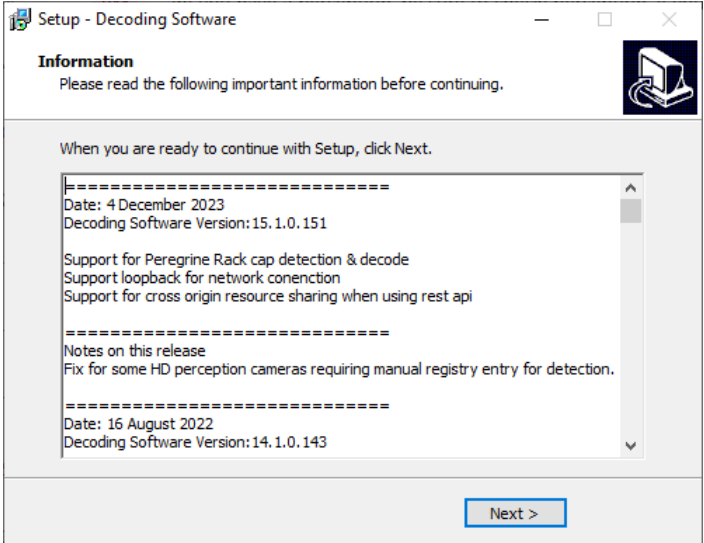
Specification	Value
Operating system	Windows 10
CPU	Intel i5 or greater
Memory	8GB
Hard disk	1GB free space approx.
Display	> 1024x768

Installing Azenta Decoding Software

Step	Action
1.	Power ON your PC and connect the provided USB stick to your PC. NOTE: Make sure your computer meets the minimum system requirements of the program. See "System Requirements" above .
2.	Ensure you have full admin rights (Read, Write, and Modify) to the registry. Close all other applications during the installation process. NOTE: Do not connect the IntelliXcap Acoustic to the PC at this stage.
3.	Open your file navigator and navigate to the connected USB drive.
4.	Right-click on <code>azenta_decoding_software_setup_15_xx</code> and select Run as administrator .
5.	Select the language to be used during the installation and click OK .

Step	Action
6.	After reading the terms and conditions, select the I accept the agreement check box and then click Next .
7.	<p>Verify the install path and click Next. The installation proceeds.</p>  <p>The <i>Select Components</i> window is displayed.</p>
8.	<p>Ensure the IntelliCode Application and Perception check boxes are selected and then click Next.</p> 



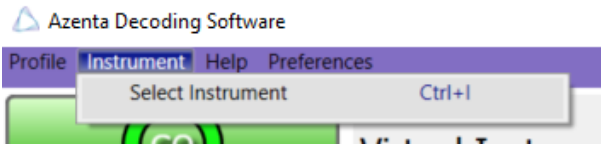
Step	Action
9.	<p>Select a shortcut location and then press Next.</p> 
10.	<p>Verify the install details and click Install. The installation proceeds.</p>  <p>The installation proceeds. This may take a few minutes.</p>

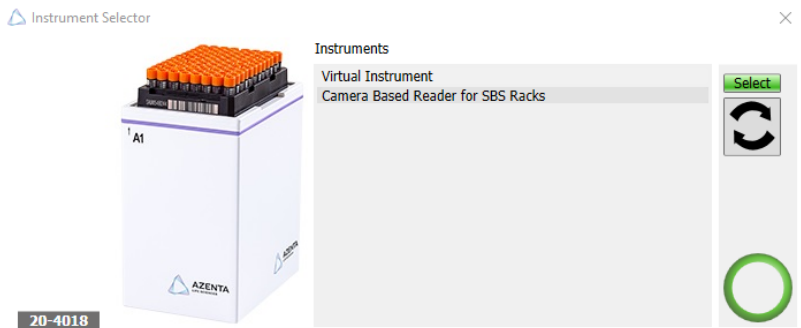
Step	Action
11.	<p>Read the release note information and click Next.</p> 
12.	To finish the installation, select the <i>Yes, restart the computer now</i> option, and then click Finish .
13.	Confirm the Azenta Decoding Software is successfully installed on the PC.
14.	Power on and plug the IntelliXcap Acoustic device into an available port on the PC using the provided cable and wait for the device to be recognized.
15.	Open the Decoding Software. The instrument should now be detected in the software application.

Installing a Camera Reader SBS/Cryo

NOTE: License activation is not required when using Camera Readers (Product codes: all 20-40xx instruments).

Step	Action
1.	Install the Azenta Decoding Software as described in the previous process.

Step	Action
2.	<p>Connect the USB-C connector to the underside of the Camera Reader unit.</p> <p>NOTE: Camera based readers must be switched off when not in use.</p> 
3.	<p>Connect the USB cable from the unit to a USB 3.0 port on the PC.</p> <p>NOTE: This must be a USB3 SS socket.</p> 
4.	<p>Navigate to Instrument > Select Instrument.</p> 

Step	Action
5.	<p>Highlight the Camera Based Reader for SBS Racks or Camera Based Reader for Cryo option and then click the Select button.</p> 

3. Activation



NOTE: For all readers that require activation, please email your details and system serial number to Service.Products@azenta.com and request your account credentials. You can still complete the installation and use Azenta Decoding Software without a license during 30 days.

NOTE: License activation is not required when using Camera Readers (Product codes: all 20-40xx instruments).


4. Operation

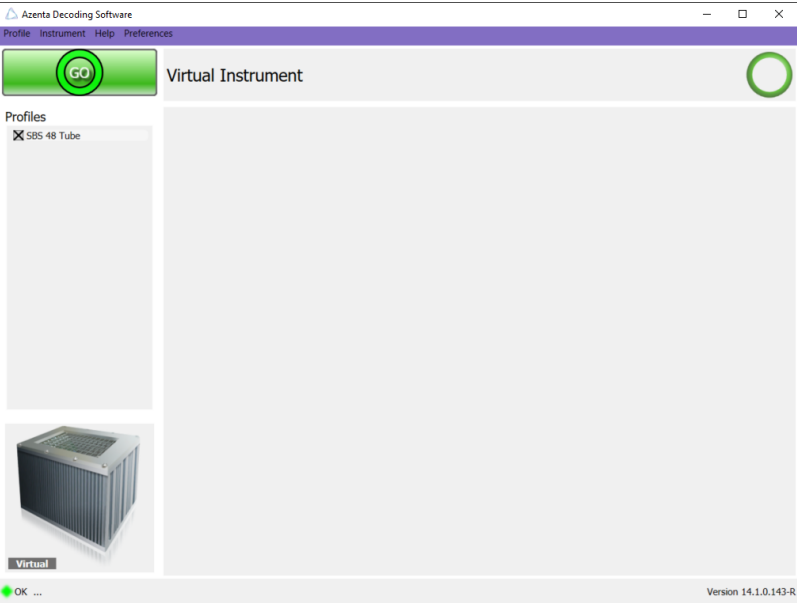
Getting Started


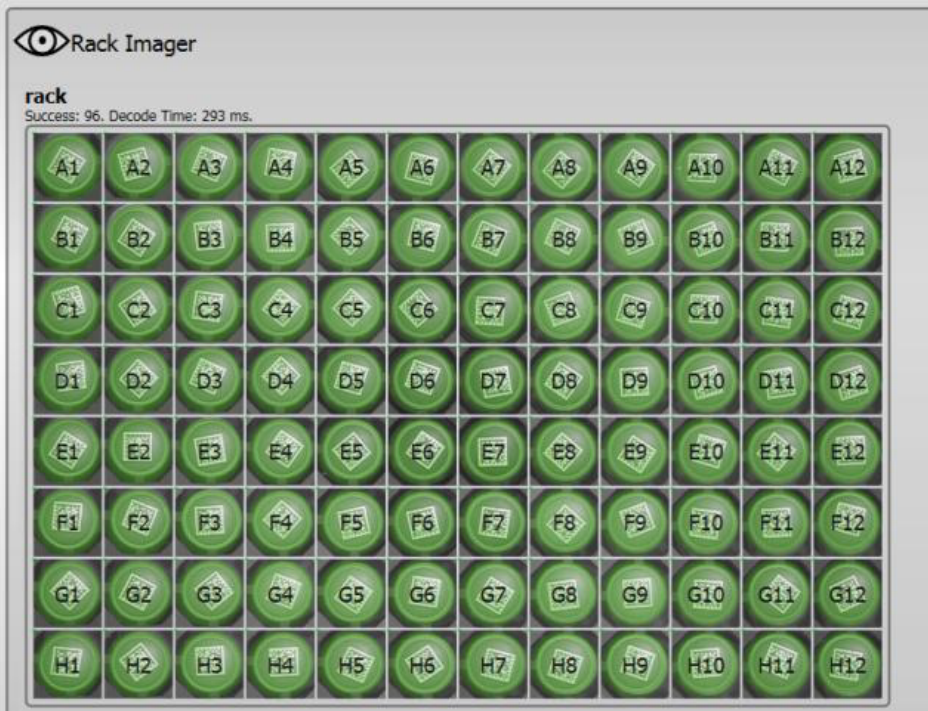
The Azenta Decoding Software is designed to have no or very little user configuration.

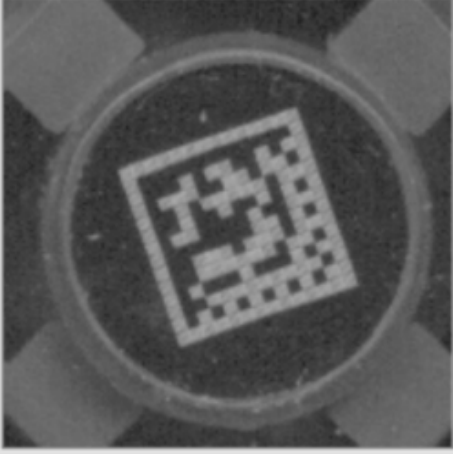
There are three default profiles for Azenta Tube consumables, and others can be set up using the Wizard option.


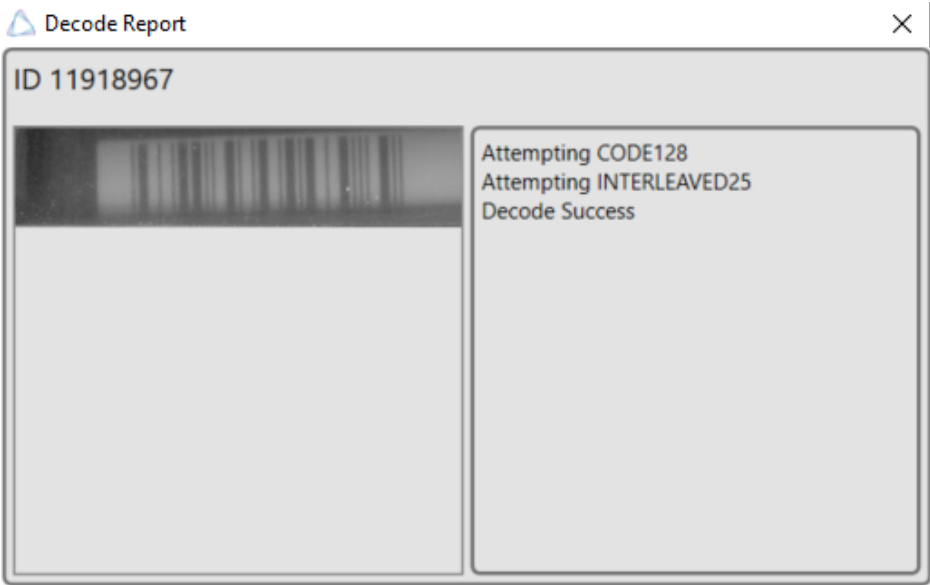
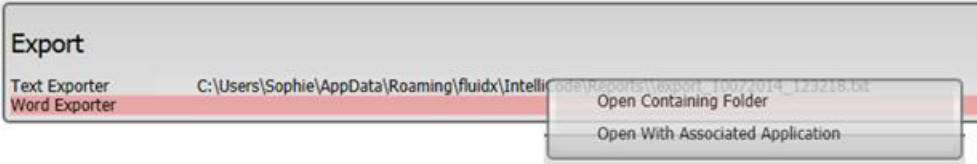
NOTE: Camera based readers must be switched off when not in use.

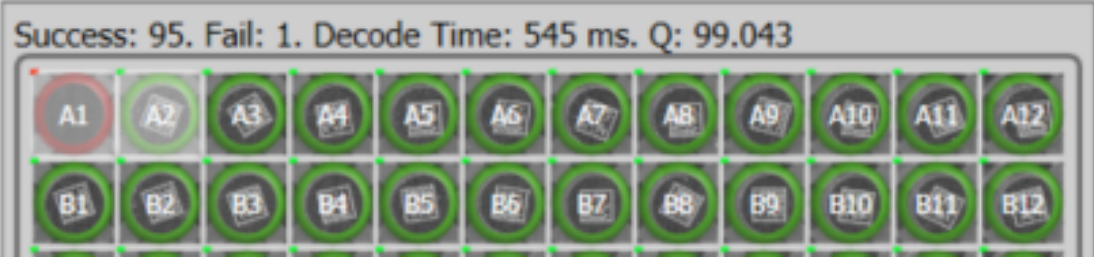
Step	Action
1.	<p>Open the Azenta Decoding Software software by double-clicking the shortcut on the desktop.</p>  The image shows a desktop shortcut icon for the Azenta Decoding Software. It features a stylized logo consisting of a triangle formed by three curved lines in shades of blue and green. Below the logo, the text 'Azenta Decoding Software' is written in a white, sans-serif font. The entire icon is set against a dark, semi-transparent background.
2.	<p>Select an instrument. See "Select an Instrument" on page 35.</p>

Step	Action
3.	<p>Place a rack on the reader and select the profile that matches the manufacturer and configuration of the rack. If the manufacturer or configuration is not known, select the profile that best represents what you have (i.e. Azenta_96 if it is a 96-format SBS rack). The rack must be placed with the A1 /1 position corresponding to the indicated position on the top of the instrument if marked.</p> 

Step	Action
4.	<p>Click the GO button.</p> <p>The grid box positions turn green when all the tubes are decoded.</p> <div data-bbox="305 344 617 441">  </div> <p>The number of successful, failed, and no tube output is reported at the top of the grid with the decode time.</p> <div data-bbox="305 514 1227 1220">  </div>

Step	Action
5.	<p>Select a single cell to see more detailed information of the code.</p> <div><div>Decode Report</div><div><div>D5 1012380482</div><div><div>Decode Process</div><div></div><div><div>Attempt method Decode Process</div><div>Attempt Datamatrix Read</div><div>Cascade: Attempt 3</div><div>Cascade: Success at speed 3</div><div>Success: 1012380482</div><div>CellNumberX: 12</div><div>CellNumberY: 12</div><div>DotSize: 4.98</div><div>White on black: False</div><div>Grade Ec/Contrast 4/1</div><div>Decode Success</div></div></div></div></div>
6.	<p>Select 1d_rackid_1 tab for more detailed information of the linear barcode.</p> <p>NOTE: Below the <i>grid table</i> is the destination directory for the exported data.</p>

Step	Action
7.	<p>Select the ID cell to see more detailed information of the code.</p>  
8.	<p>Right-click the Export line to see the following options:</p> <ul style="list-style-type: none"> a. Open Containing Folder: Opens the Export destination folder. b. Open With Associated Application: Open the Export data file. 

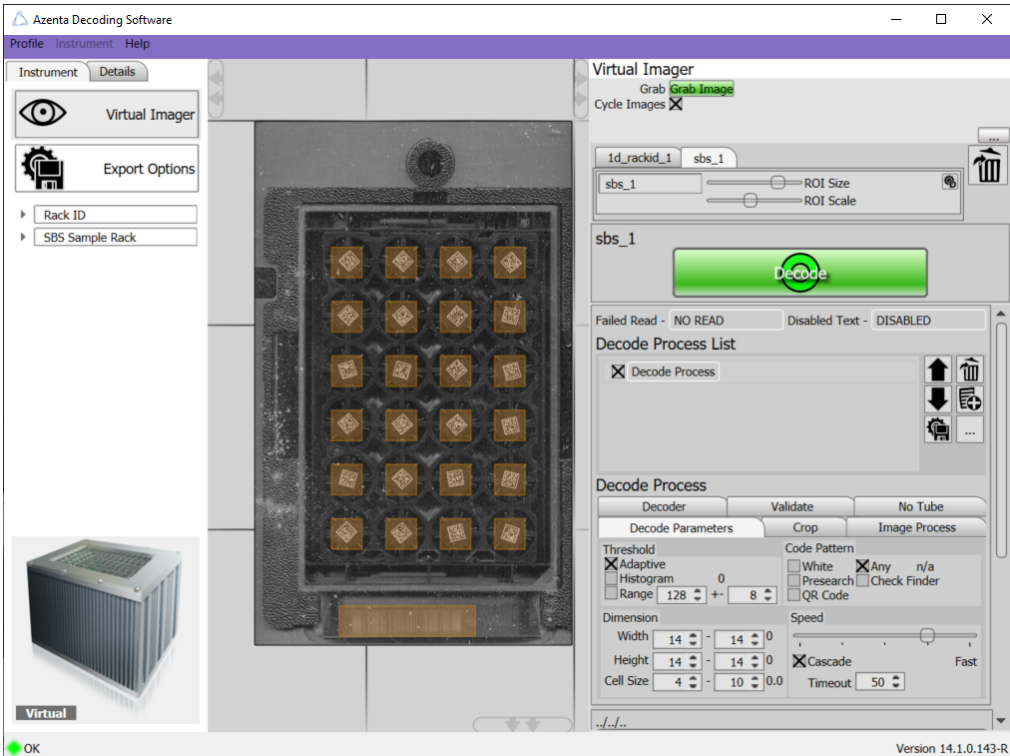
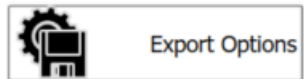
Step	Action
9.	<p>In the event that a tube cannot be read as shown in the image below, go to "No Tube" on page 55.</p> 


Export Files

Azenta Decoding Software™ allows the user to export data in the following ways:

1. Text
2. Document
3. PDF
4. DB (Database)
5. Image
6. Audit.

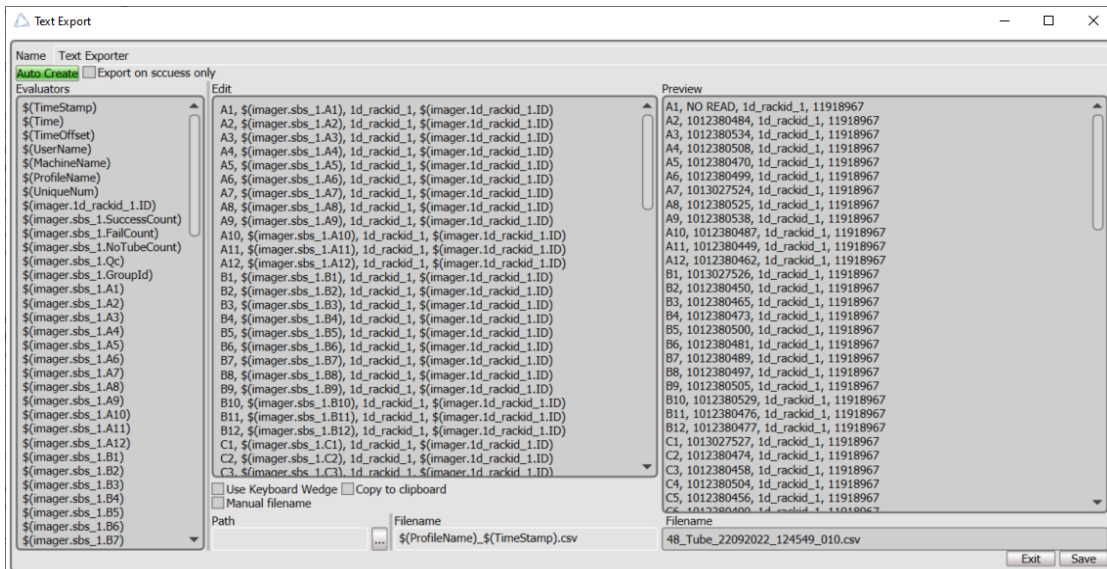
To access these options, see the following steps.

Step	Action
1.	<p>Double-click a profile to edit it and access the Export options.</p> <p>Profiles</p> <p><input checked="" type="checkbox"/> SBS 48 Tube</p> <p>The editing screen is displayed.</p> 
2.	<p>Select Export options from the list on the left.</p> 

Step	Action
3.	<p>Select the relevant tab then the relevant button to delete, create new, copy, or edit an exporter.</p> 

Export to Text

Double-click an exporter from the list, create, or copy an exporter to open the *Text Export* window.



The export file can be given a custom name in the **Name** field at the top; this helps to identify the exporter among other exporters that are set up.

Once the exporter has been named, click the **Auto Create** button to generate a standard format for the rack type.

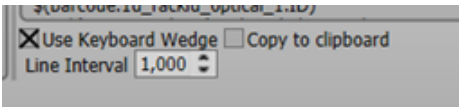
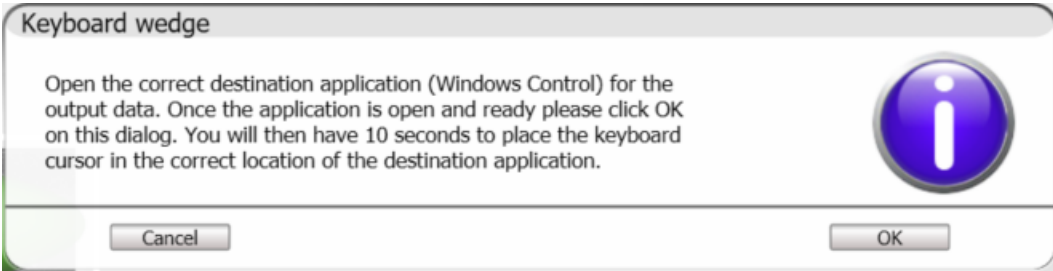
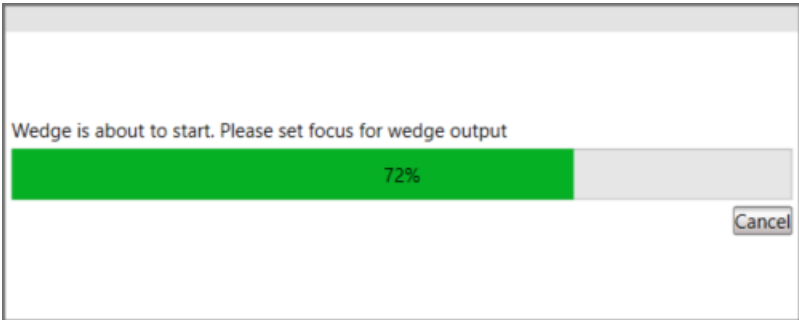
To customize the export information, copy and paste the selection from the *Evaluators* column to the *Edit* column.

The evaluators from the Edit column can also be used in the filename box to designate the name of the file that will be used. The file type can also be chosen by changing the extension on the end of the filename. For example, changing the extension to .txt results in the exported file being a .txt file.

Exporting Data using Keyboard Wedge

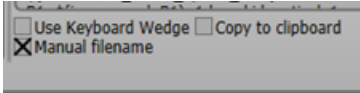
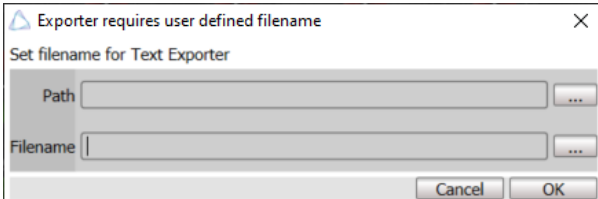
The keyboard wedge feature automatically 'types' data on a line-by-line basis. This can be useful in situations where there may be a web interface to a database for example.

Each line of the export is automatically typed. The line interval specifies a delay between lines. At export time, Azenta Decoding Software™ prompts to select a window to have focus. Click where to start typing.

Step	Action
1.	<p>Select the Use Keyboard Wedge option at the bottom of the <i>Edit</i> column to see the "Line Interval". If used with a profile for racks of tubes, the time interval between lines of data can be set. This allows each line to be typed at a configurable time interval.</p> 
2.	Save and exit by clicking Close Edit Mode .
3.	Select Go .
4.	<p>In the <i>Keyboard Wedge</i> window, select OK and open the destination application.</p> 
5.	<p>Place the cursor in the correct location for the data. The information from the scan and decode will be imported into the open application.</p> 

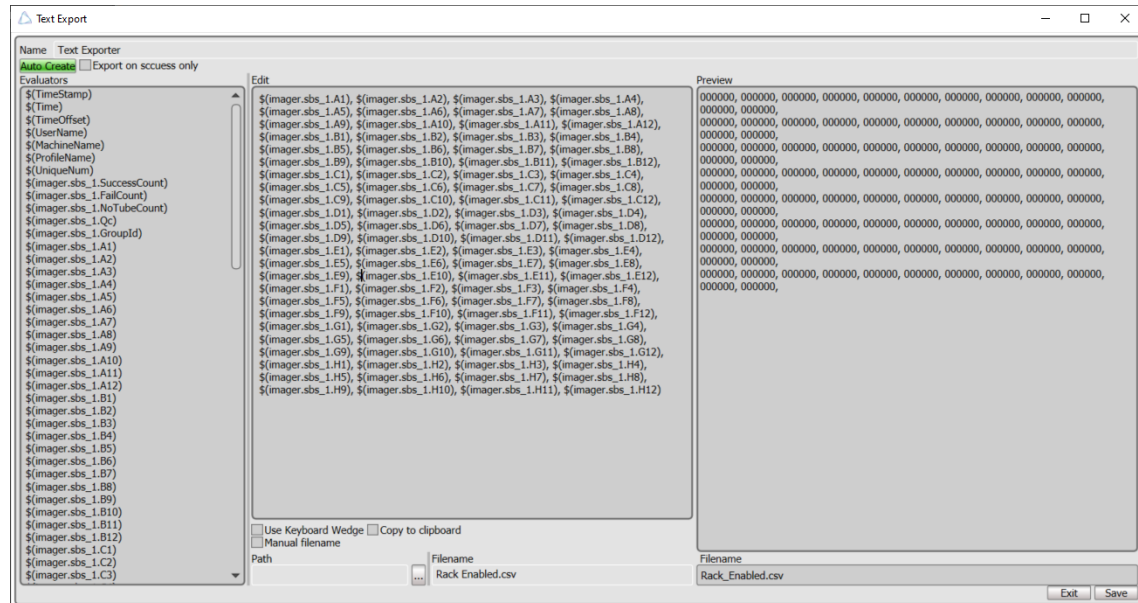
Exporting Data with Manual Filename

Using this feature causes Azenta Decoding Software™ to prompt the user to supply a filename for the export.

Step	Action
1.	Select the Manual filename option at the bottom of the <i>Edit</i> column. 
2.	Save and exit this screen.
3.	Select Go .
4.	A path and filename box appears. 

Customizing Export Format

Data export can be customized for specific formats. Below is an example of how to export a 96 well plate to a grid format in Excel.



The export information can also be customized into a standard plate layout by copying and pasting the required evaluator from the *Evaluators* column to the *Edit* column. Use a comma between evaluators in the *Edit* column to put values in adjacent columns (see [Figure 4-1](#)), or use a carriage return to place the data in the next row. The *Preview* column shows how the output will look.

P10														:													
	A	B	C	D	E	F	G	H	I	J	K	L	M														
1	FC12798817	FC12798825	FC12798833	FC12798841	FC12798849	FC12798857	FC12798865	FC12798873	FC12798881	FC12798889	FC12798897	FC12798905															
2	FC12798818	FC12798826	FC12798834	FC12798842	FC12798850	FC12798858	FC12798866	FC12798874	FC12798882	FC12798890	FC12798898	FC12798906															
3	FC12798819	FC12798827	FC12798835	FC12798843	FC12798851	FC12798859	FC12798867	FC12798875	FC12798883	FC12798891	FC12798899	FC12798907															
4	FC12798820	FC12798828	FC12798836	FC12798844	FC12798852	FC12798860	FC12798868	FC12798876	FC12798884	FC12798892	FC12798900	FC12798908															
5	FC12798821	FC12798829	FC12798837	FC12798845	FC12798853	FC12798861	FC12798869	FC12798877	FC12798885	FC12798893	FC12798901	FC12798909															
6	FC12798822	FC12798830	FC12798838	FC12798846	FC12798854	FC12798862	FC12798870	FC12798878	FC12798886	FC12798894	FC12798902	FC12798910															
7	FC12798823	FC12798831	FC12798839	FC12798847	FC12798855	FC12798863	FC12798871	FC12798879	FC12798887	FC12798895	FC12798903	FC12798911															
8	FC12798824	FC12798832	FC12798840	FC12798848	FC12798856	FC12798864	FC12798872	FC12798880	FC12798888	FC12798896	FC12798904	FC12798912															
9																											
10																											
11																											
12																											

Figure 4-1: Export Information

Saving Data

Path: Destination path for the data, selecting the “...” option allows the user to browse the directory.

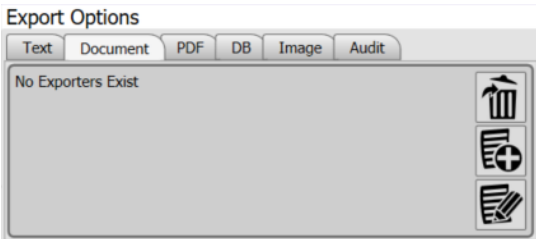
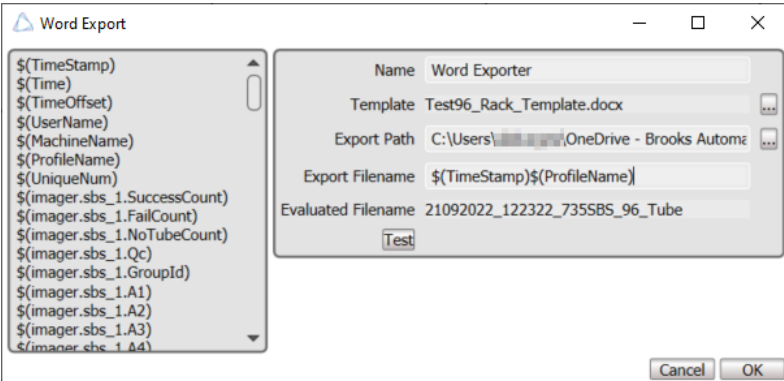
Default path = C:\ProgramData\fluidx\IntelliCode\exports

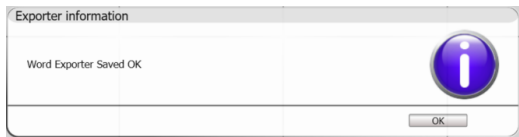
Filename(under Edit column): Sets the name of the file when saved

Filename(under Preview column): Example of how the file name will look when exported.

Export to Word Document

To create a Microsoft Word document, select **Document** in the *Export Options* window and select the **Enable** option.

Step	Action
1.	<p>Templates have been pre-configured and are stored at C:\ProgramData\fluidX\IntelliCode\profiles\Perception. To delete, edit, or create a new document, select the option from the icons in the right panel.</p> 
2.	<p>Ensure that the export filename contains the '.doc' extension.</p> 


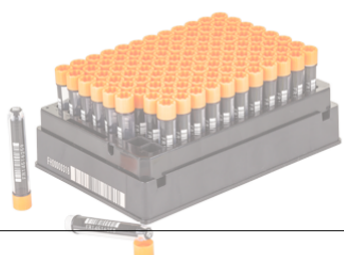
Step	Action
3.	<p>Select Test for an example of the output, or select OK to save and move to the <i>Export</i> page.</p> 

Standard 96 Report Template

ComputerID: MM-000000

UserID: MM-000000

Number of Tubes DecodeFails: 0

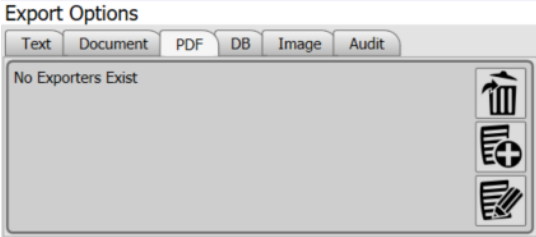
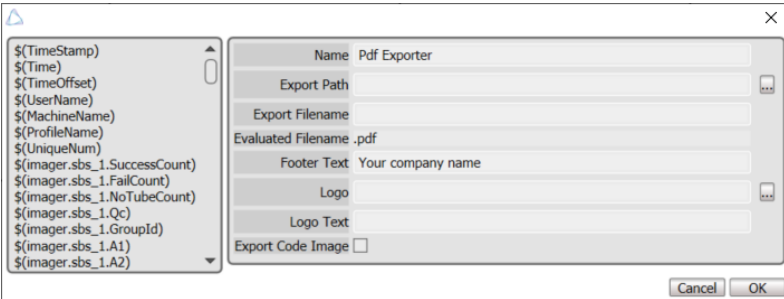
Rack Id:												
	1	2	3	4	5	6	7	8	9	10	11	12
A	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
B	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
C	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
D	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12
E	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12
F	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
G	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
H	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12

Date

Figure 4-2: Word Export Example

Export to PDF Document

To create a PDF document, select **PDF** in the *Export Options* window and select the **Enable** option.

Step	Action
1.	<p>To delete, edit, or create a new document, select the option from the icons in the right panel.</p> 
2.	<p>Fill out the following fields. The Export Filename field can be completed using evaluators if required.</p> <p>In addition, unique customization of a report is available using the following options:</p> <p>Footer text: The company name could be inserted here as an example. Logo: Select the location of a .bmp / .jpeg / .png file to add the company logo to the PDF. Logo Text: Allows additional information to be included if required. Export Code Image: Check this option to include images of each of the codes on the .PDF report.</p> 
3.	<p>Select OK to save the exporter.</p>

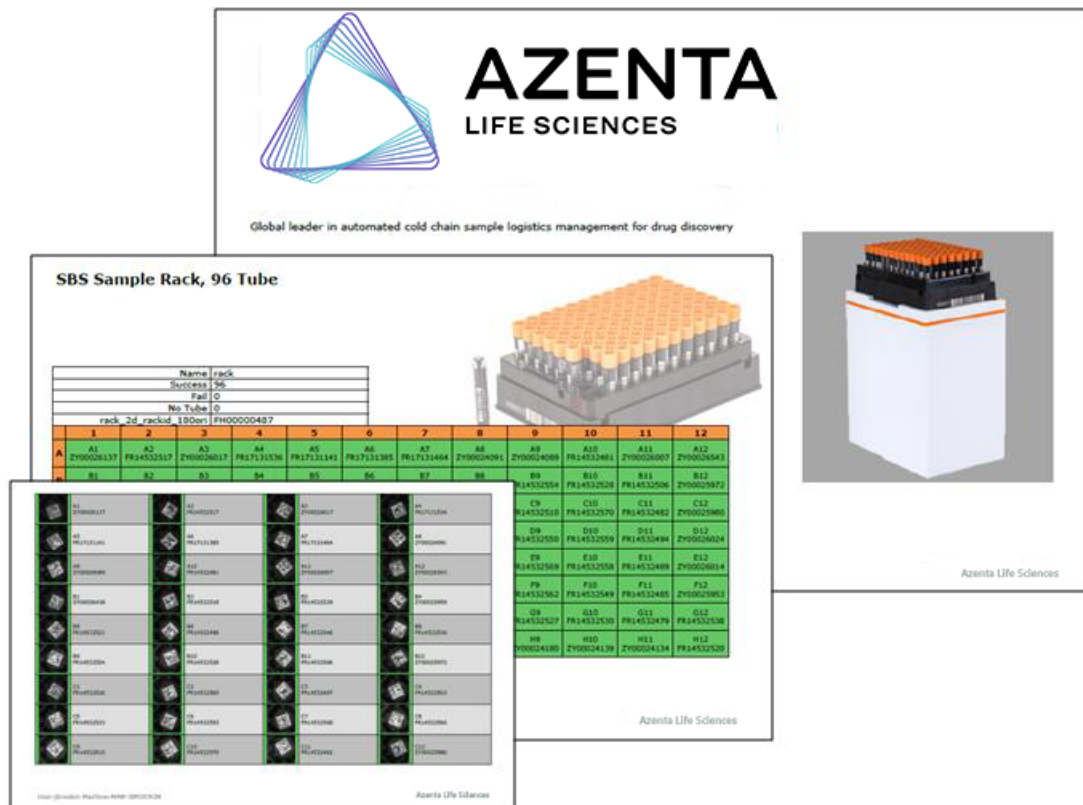
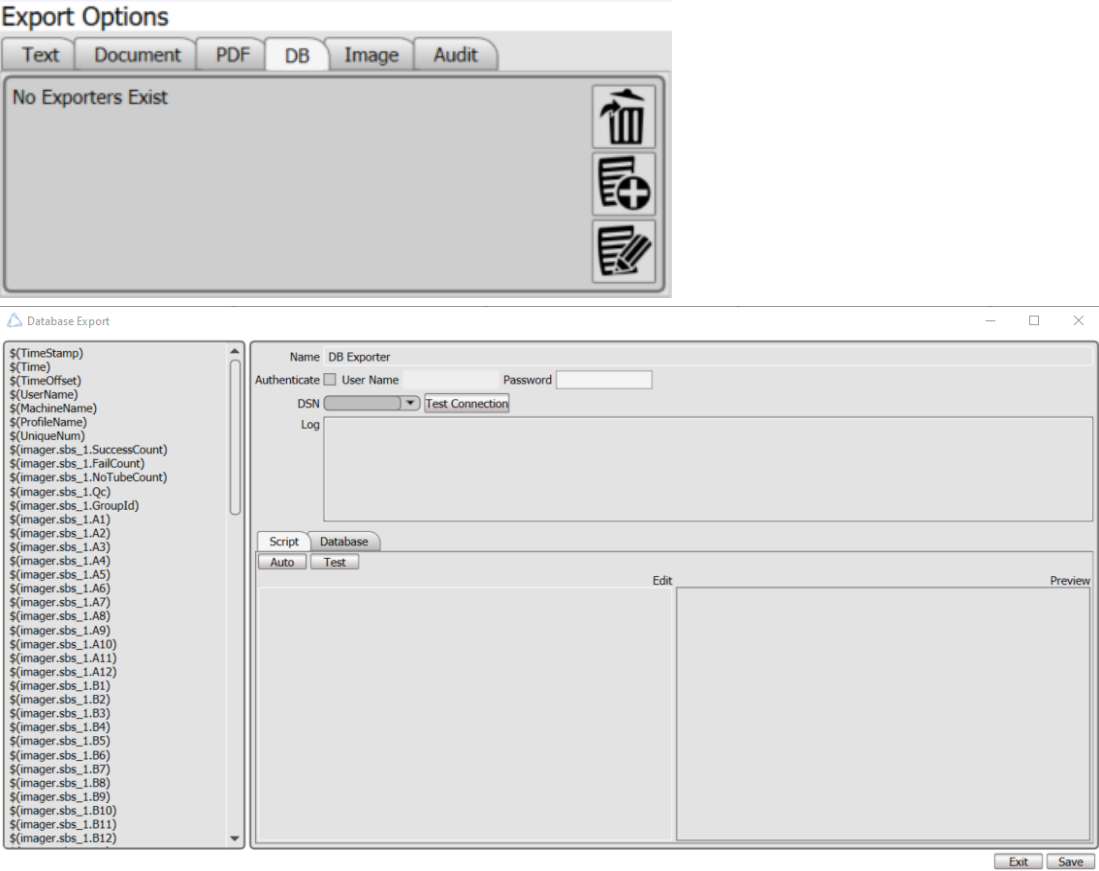
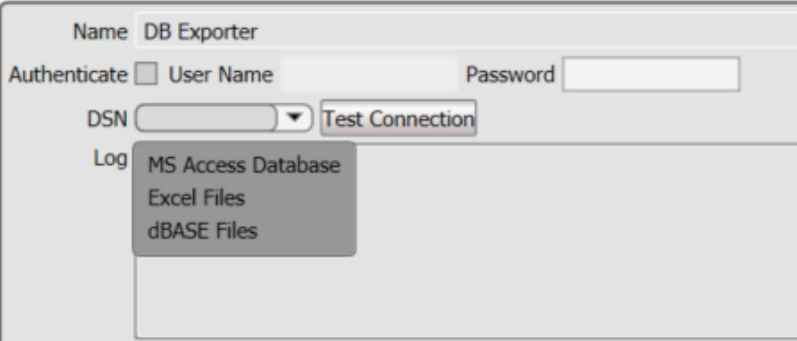
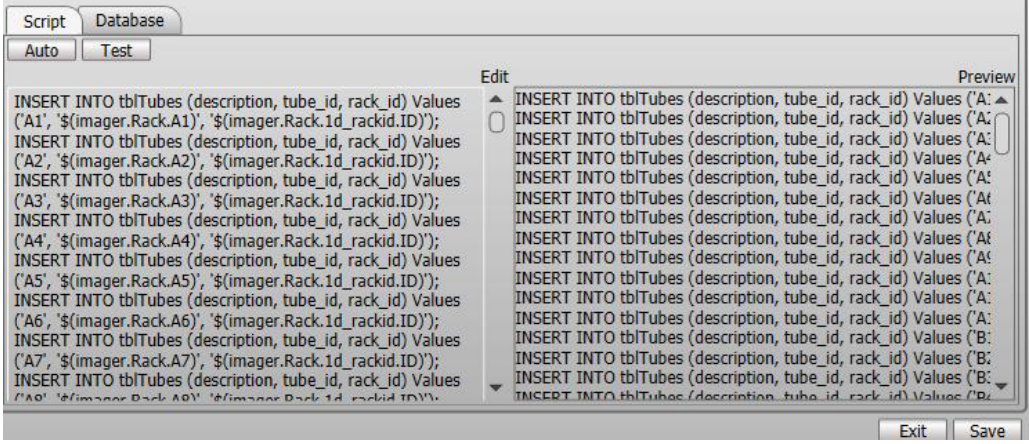



Figure 4-3: Example of a PDF Export

Export to Database (DB)

Databases allow data transfer with ODBC (Open DataBase Connectivity).

Step	Action
1.	<p>In the <i>Export Options</i> window, click the DB tab and select New DB Exporter.</p> 
2.	<p>Navigate to the DSN drop-down list and select the connection type.</p> 

Step	Action
3.	<p>a. Use either copy and paste or click the Auto button to move the evaluators to the <i>Edit</i> column.</p> <p>b. Use a comma between evaluators in the <i>Edit</i> column to put values in adjacent columns, or use a carriage return to place the data in the next row. The <i>Preview</i> column shows how the output will look.</p> <p>c. Click Save.</p> 
4.	<p>The process is complete.</p> 

Export to Audit

The audit feature allows for data to be restored from previous scans.

This can be useful when a previously scanned rack data is accidentally deleted and needs to be recovered, or if a duplicate of all previously scanned rack data is needed.

To use the audit feature, enter a start date and end date, and then click the **Audit** button. The software runs through all the scans taken between these two dates and exports the data using the current export settings.

Export Options

Text Document PDF DB Image **Audit**

Metrics
First Audit Entry 9/21/2022 8:12:51 AM
Last Audit Entry 9/21/2022 9:20:06 AM
Total 3

Re Export
Start 21 September 2022 08:12:51
End 21 September 2022 09:20:06
Audit FileCount 3

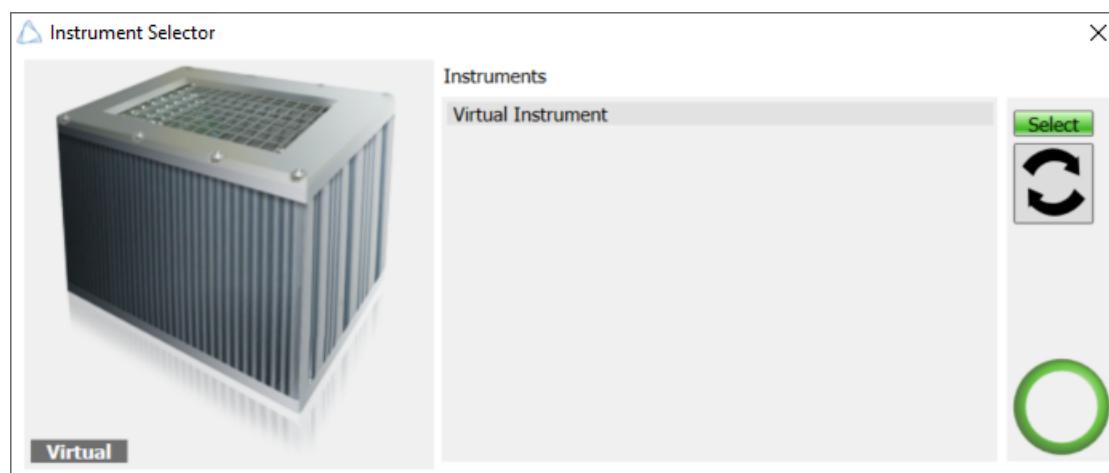
Select an Instrument

The Azenta Decoding Software™ is compatible with all Azenta SBS rack readers.

Available instruments can be chosen from the instrument selector, accessed by selecting **Instruments**.

NOTE: Camera based readers must be switched off when not in use.

The chosen instrument is denoted by an icon on the left.



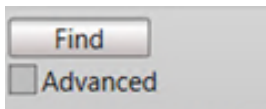
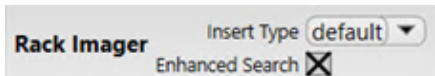
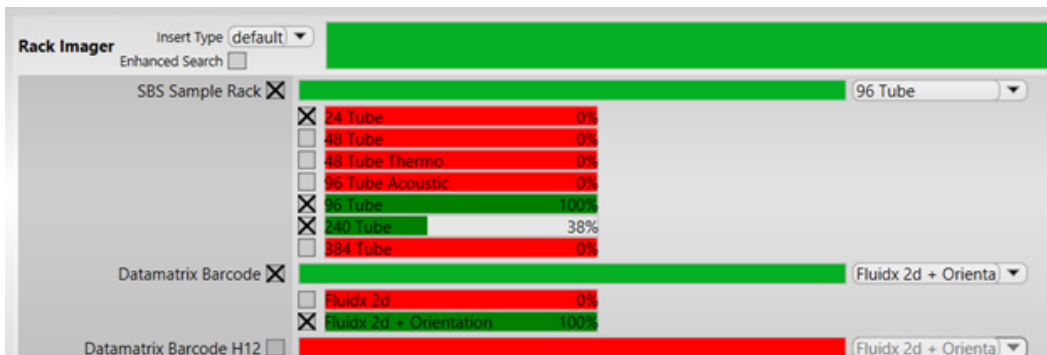
Virtual Instrument: This option can be used in the instance when an integrator or prospective purchaser would like to try the software.

Select the **Refresh** icon to display the available devices, select **Reader Device**, and press **Select**.

Create a New Profile

Auto Detect a New Profile

The Azenta Decoding Software allows for automatic profile detection.

Step	Action
1.	<p>Place a rack (or racks) on the reader and click Find. NOTE: It is ideal to place racks that are fully populated.</p> 
2.	<p>The Azenta Decoding Software attempts to determine the best profile settings. If profile detection is incorrect, enable the Enhanced Search option. This takes longer but is more accurate.</p> 
3.	<p>The Advanced options show confidence in each rack type. Uncheck the rack layout types to speed up and improve detection.</p> 

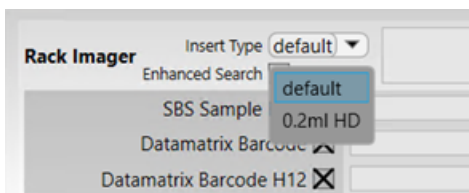
Manually Create a New Profile

To create a profile, the user must understand the following concepts.

Inserts

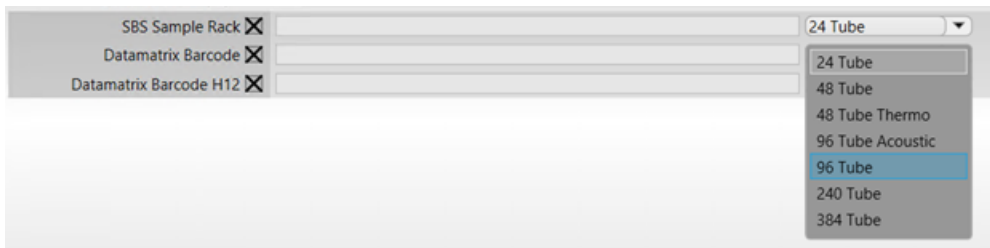
An insert is an attachment to the reader. The rack is placed onto the insert. If the instrument has an insert attached, then set it here. If there is no insert attached, then set it as the default.

NOTE: Some instruments do not have inserts. If this is the case, then no option to select an insert type are listed.



Rack Layouts

This is the arrangement of tubes in the rack (E.g., 24 well, 48 well, 96 well). Select the arrangement here.



The rack may contain rack ID barcodes. If so, select the method to use here.

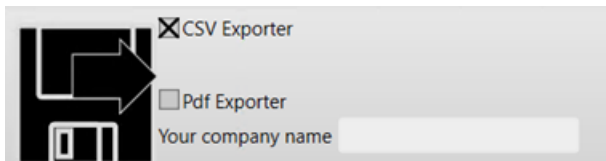


NOTE: The rack maintains a hierarchical structure whereby the rack is the parent and rack ID are children. A rack can often have one child only, so selecting two rack ID methods may not be possible.

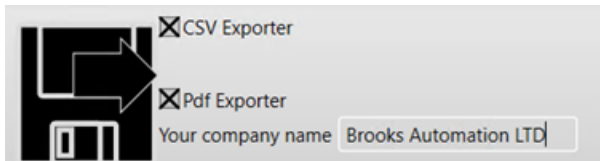
Datamatrix barcodes can be used for rack orientation correction as well as rack identification. Some racks have different positions for these barcodes. They are usually located next to the A12 tube or the H12 tube. For racks with a 2d rack ID at the H12 position, check "Datamatrix Barcode H12."

Exporter

Check the **CSV Exporter** option to export a default text file in CSV format.

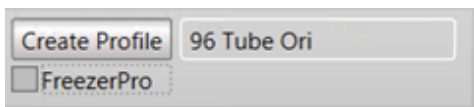


Check the **PDF** option to export a pdf document. The document has the option for a company name which will be shown in the document footer.

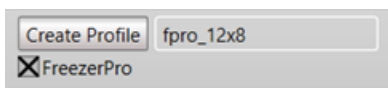


Create

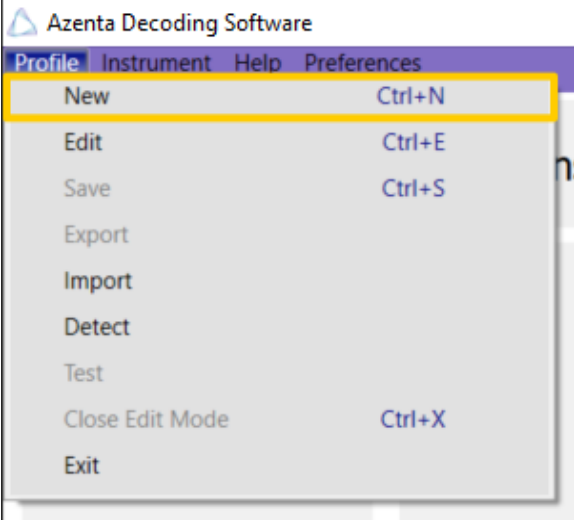
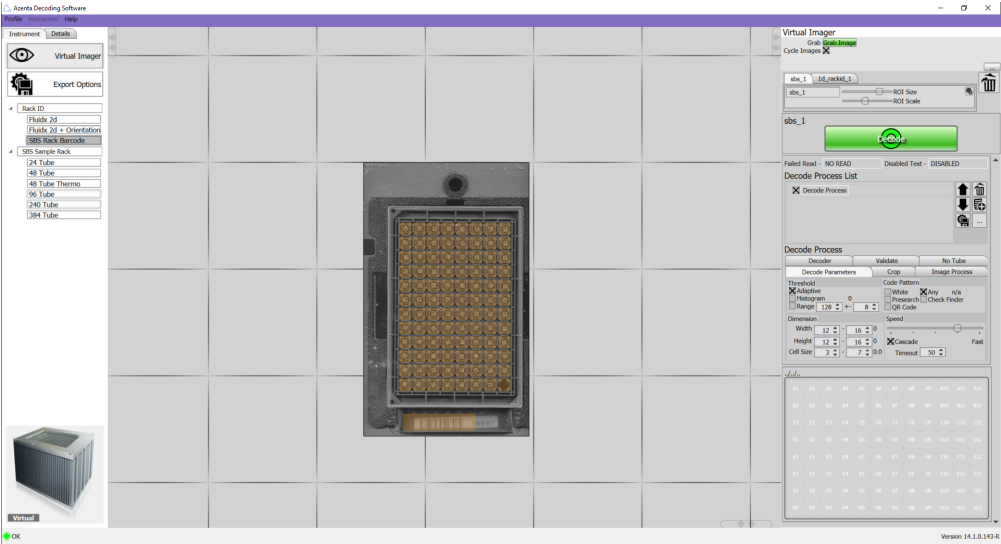
Once all options are set, a default profile name is generated. This name can be altered if necessary. Click the **Create Profile** button to generate the profile.

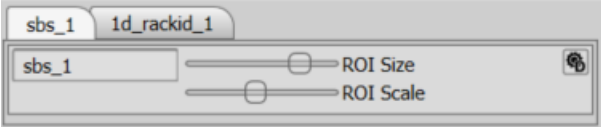

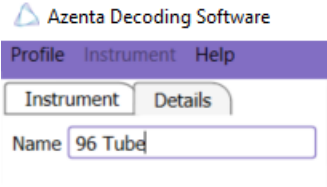
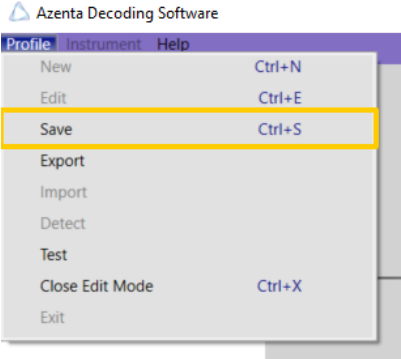


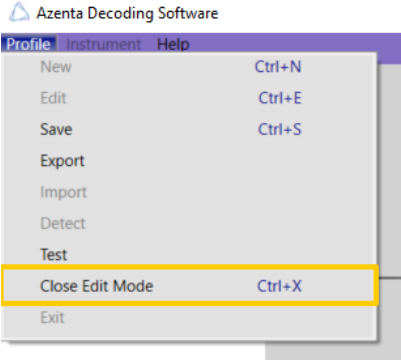
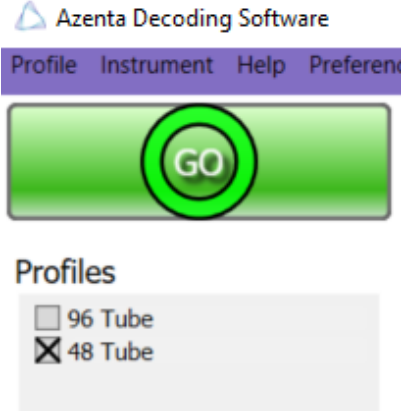

Check FreezerPro to generate a profile compatible for integration to the FreezerPro system. This is essentially a profile naming convention. If no profile name shows, then a FreezerPro-compatible profile is not possible.



Complete the following steps to manually create a new profile:

Step	Action
1.	<p>Click the Profile tab and select New.</p> 
2.	<p>On the next screen, use the mouse to drag the desired SBS Sample Rack over the rack image. Use the mouse to change the size of the image, or to move the image around the page.</p> 

Step	Action
3.	<p>Refine the Region of Interest (ROI). This improves the decode time and optimizes decoding for difficult to read codes. ROI Size: The size of the area around the code image. ROI Scale: The spacing between the squares of the grid. D: Returns the setting to factory default. Bin Icon: Deletes the settings.</p> 
4.	<p>Click Decode.</p> 
5.	<p>In the <i>Details</i> tab, create and save the name of the rack.</p> 
6.	<p>To save the new profile, select Profile and click Save.</p> 

Step	Action
7.	<p>The file is saved in the default folder: C:\ProgramData\fluidX\IntelliCode\profiles\Virtual Instrument. Once the file is saved, select Profile and click Close Edit Mode.</p>  <p>Azenta Decoding Software Profile Instrument Help New Ctrl+N Edit Ctrl+E Save Ctrl+S Export Import Detect Test Close Edit Mode Ctrl+X Exit</p>
8.	<p>The new profile is added to the list on the main screen.</p>  <p>Azenta Decoding Software Profile Instrument Help Preferences GO Profiles <input type="checkbox"/> 96 Tube <input checked="" type="checkbox"/> 48 Tube</p>
9.	<p>To select the profile, select the box next to the required profile. Multiple profiles can be selected and Azenta Decoding Software™ will determine the rack profile (96, 48 or 24), automatically decode each tube, and save the data.</p>  <p>Profiles <input type="checkbox"/> 96 Tube <input checked="" type="checkbox"/> 48 Tube</p>

Create a New AcoustiX Profile for Camera Reader SBS AcoustiX Users

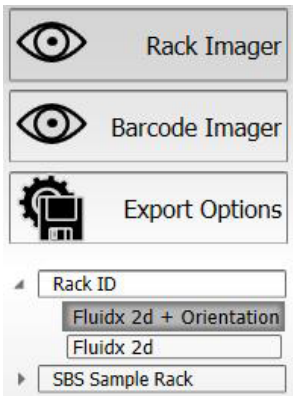
The Labcyte Echo® Qualified AcoustiX tubes utilize a unique 2D4 code that features additional redundancy.

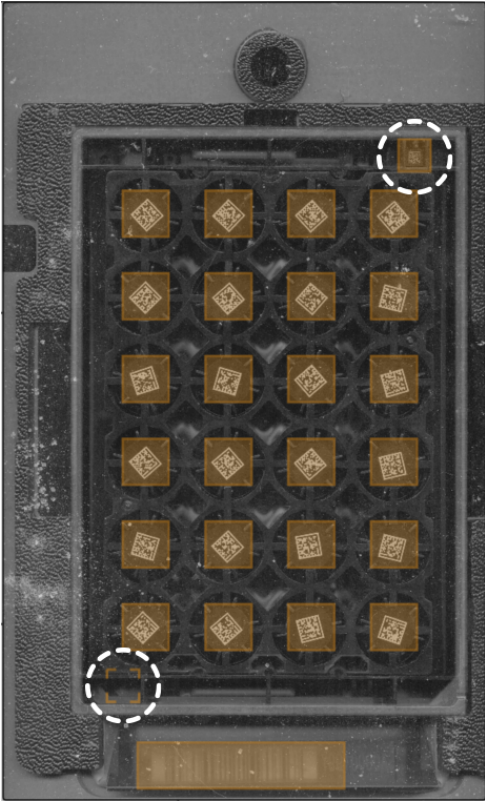
For Camera Reader SBS AcoustiX users, an AcoustiX tube profile appears as default and therefore it is not be necessary to create a unique profile.

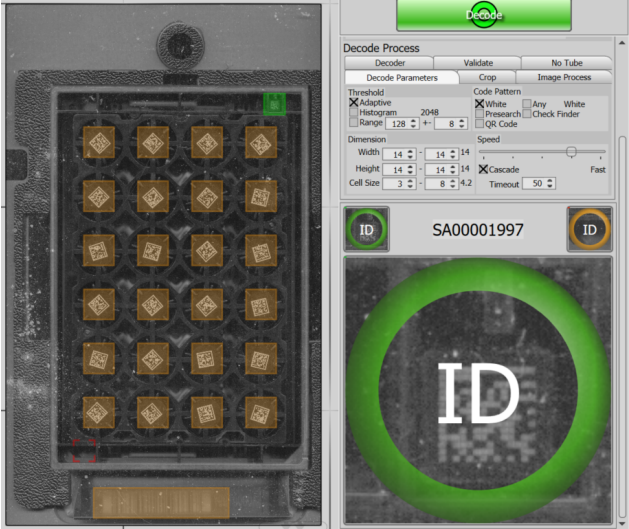
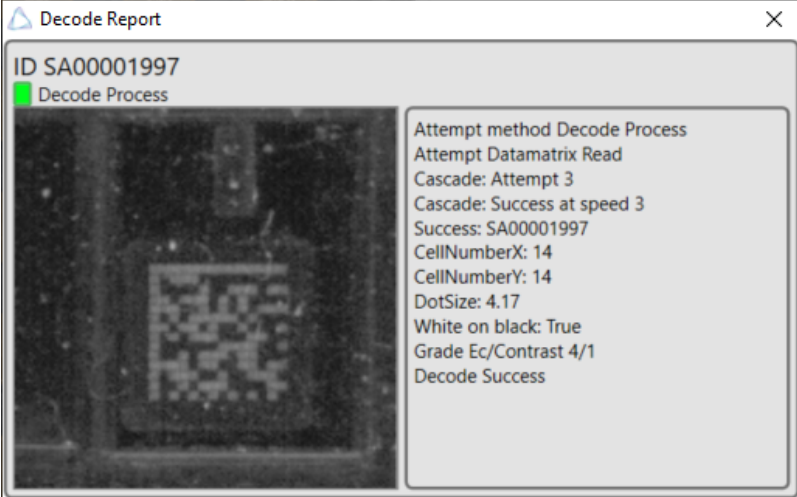
In the unfortunate situation where the AcoustiX profile is deleted, the automatic detect feature enables the user to set up a new AcoustiX profile.

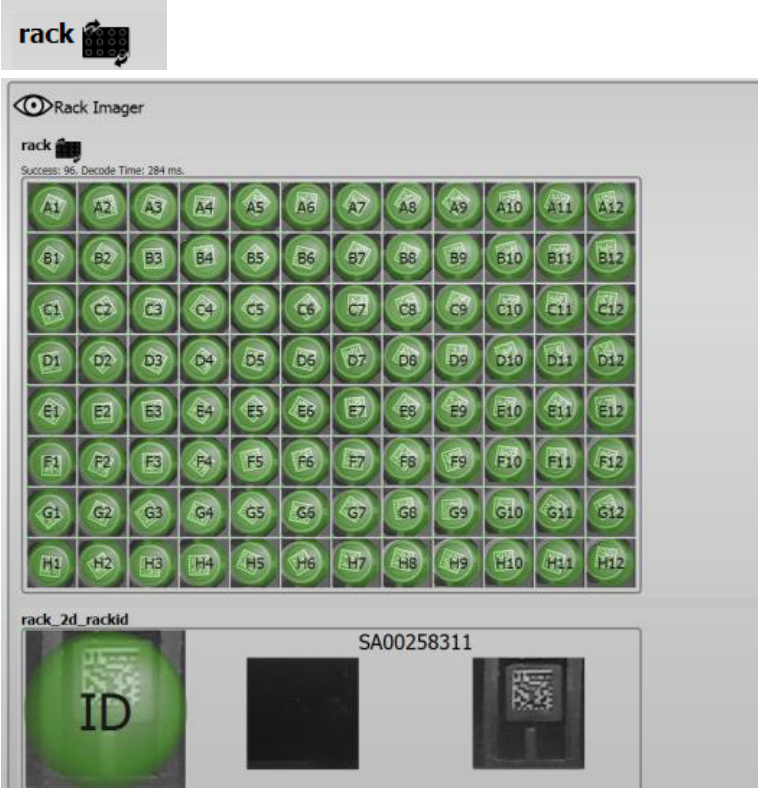

Refer to ["Auto Detect a New Profile" on page 36](#) for more information.

Select FluidX 2D Rack ID with Orientation

Step	Action
1.	<p>Drag and drop the FluidX 2D Rack ID onto the grid of the rack and you will see 2 boxes.</p>  <p>The screenshot shows a vertical sidebar on the left side of the software interface. It contains several icons and labels: an eye icon for 'Rack Imager', another eye icon for 'Barcode Imager', a gear icon for 'Export Options', a folder icon for 'Rack ID', a folder icon for 'Fluidx 2d + Orientation' (which is highlighted with a dark background), a folder icon for 'Fluidx 2d', and a folder icon for 'SBS Sample Rack'.</p>

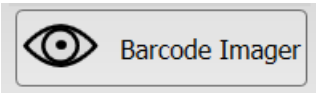
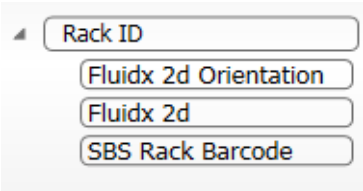

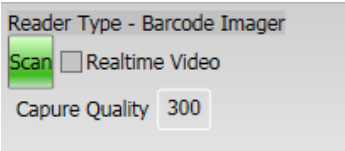
Step	Action
2.	<p>The solid box (top-right) should be placed over the rack ID when a rack is placed with the correct standard orientation (A1 rack position aligned with the indicator on the instrument).</p> <p>As the solid box is moved, the other hollow box (bottom-left) will move automatically and mirror its position.</p>  <p>If the user places the rack on the instrument rotated 180 degrees, the hollow box (in red) should provide a successful read automatically in the orientated position.</p>

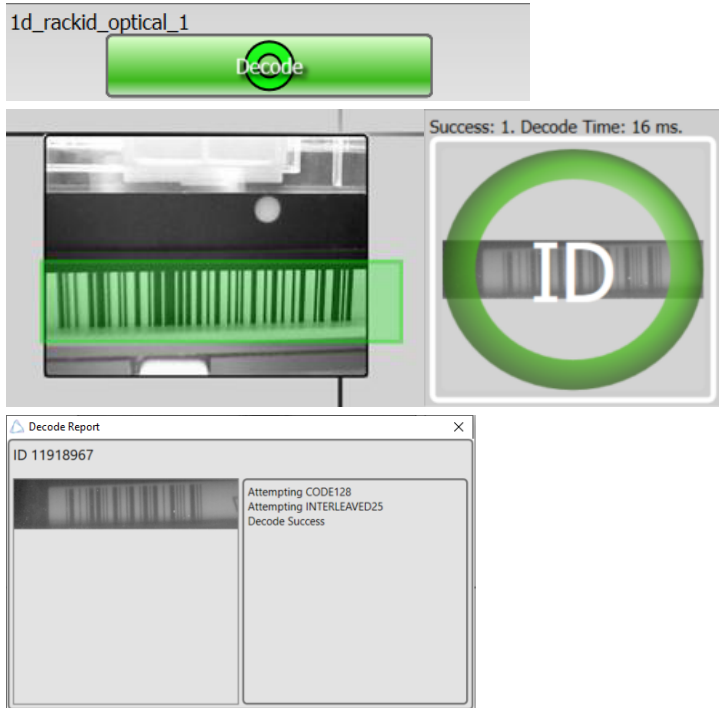
Step	Action
3.	<p data-bbox="310 262 1230 289">Selecting the ROI (Region Of Interest) of an individual tube code generates a Decode Report.</p> <div data-bbox="310 317 935 842"></div> <div data-bbox="310 856 1102 1350"></div>

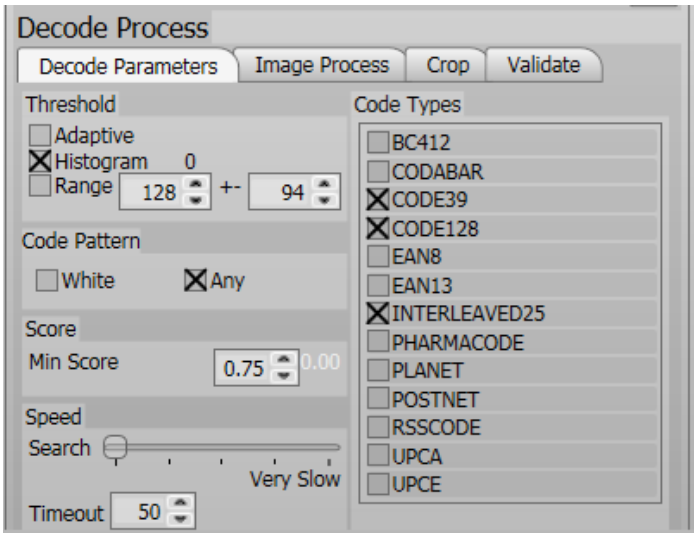
Step	Action
4.	<p>If the image has been orientated, the switch icon will be shown above the image of the rack.</p> 
5.	<p>In the event that the 2d_rack_1.ID cannot be read, a dialogue box will appear so the value can be manually entered.</p> 

Set up a Linear Barcode Reader

When an external Linear Barcode Reader (LBR) is being used on the *Settings* screen, the **Barcode Imager** icon appears under the Rack Imager.

Step	Action
1.	<p>Click the Barcode Imager icon to make an image from the LBR appear.</p> 
2.	<p>Expand the Rack ID section, and use the mouse to drag the SBS Rack Barcode button over the image of the linear barcode on the rack.</p> 
3.	<p>Ensure that there is a clear white area on both sides of the code.</p> 
4.	<p>a. To adjust the ROI, alter the Capture Quality field. b. Select the Realtime Video option to enable live video from the camera. c. To alter the focus, rotate the camera lens on the LBR. d. To attain a better image of the barcode, move the camera on the fixing bracket. e. There is a dial on the back of the camera that adjusts the light contrast.</p> 

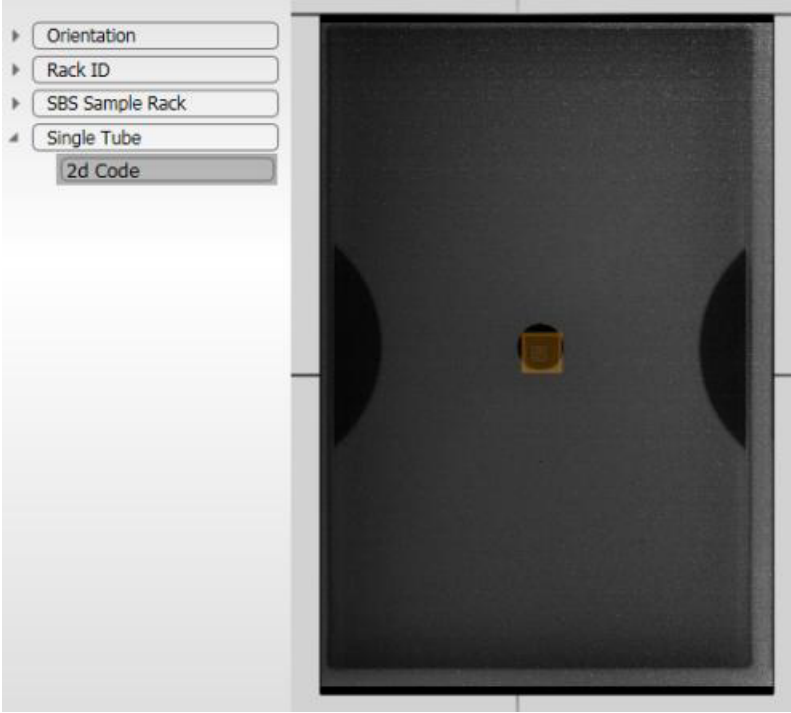
Step	Action
5.	<p>When the Decode option to the right of the screen is selected, the ROI will turn green if the decode is successful.</p>  <p>The screenshot displays the software's barcode decoding interface. At the top left, the text '1d_rackid_optical_1' is visible. A green 'Decode' button with a circular icon is positioned to its right. Below these, a camera feed shows a barcode with a green rectangular region of interest (ROI) overlaid. To the right of the camera feed, a message reads 'Success: 1. Decode Time: 16 ms.' accompanied by a large green circle containing the letters 'ID'. At the bottom, a 'Decode Report' window is open, showing the ID '11918967' and a list of decoding attempts: 'Attempting CODE128', 'Attempting INTERLEAVED25', and 'Decode Success'.</p>

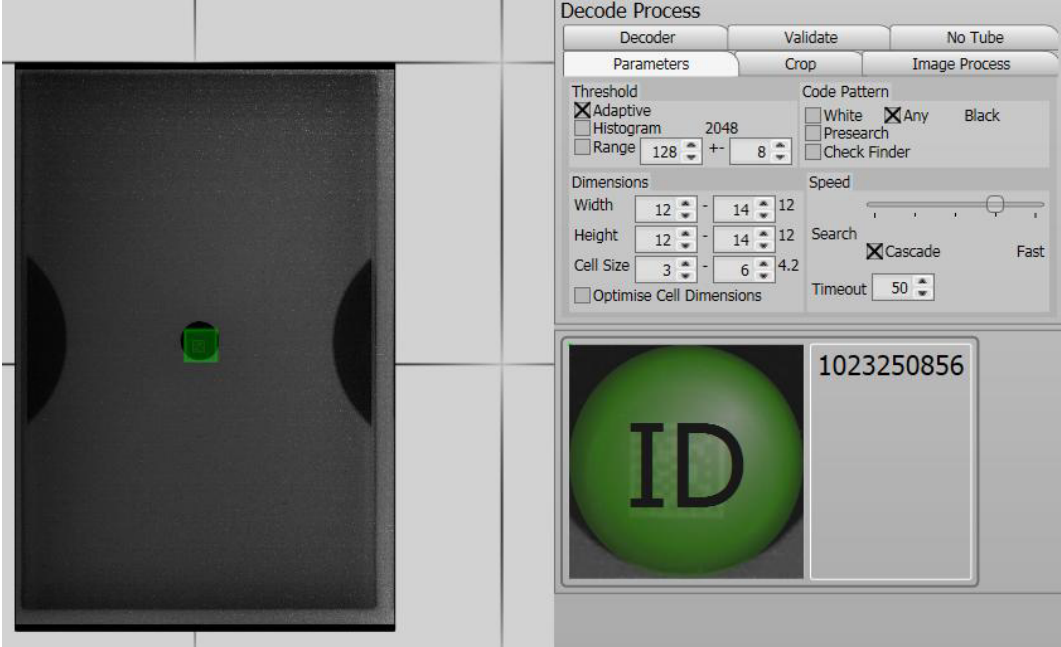
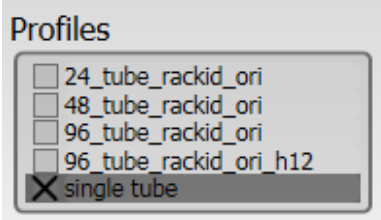
Step	Action
6.	<p>a. Select the image to open a new screen with the Rack ID and code type.</p> <p>b. Check the code type for the linear code.</p> <p>c. The majority of codes are Code39, Code128, or Interleaved.</p> <p>d. If the code is not decoding, select different code types and try selecting the Adaptive option in the Threshold field.</p> <p>e. Increase the Timeout field to allow the software more time to decode.</p> <p>f. Change the Code Pattern field from Any to White.</p> <p>g. Adjust the Speed field.</p> <p>h. In the <i>Export</i> screen, enter \$(barcode.id_rackid_optical_1.ID) to edit the field and add the rack to the file export. This can also be added to the file at the bottom of the export page so that the rack ID is an identifier for the file name.</p> 

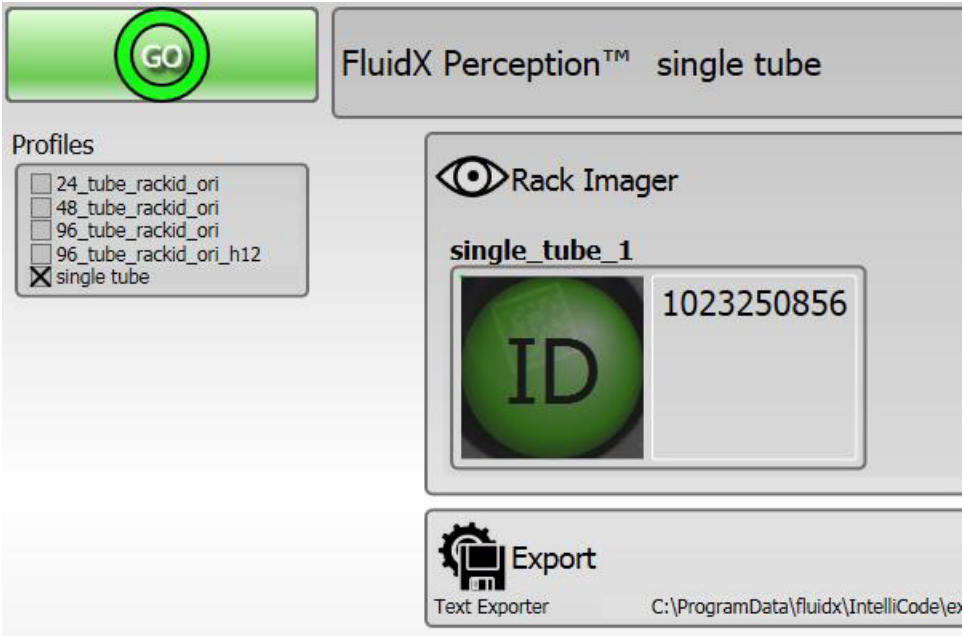
Create a Single Tube Profile

Camera Reader SBS and Camera Reader Cryo

Step	Action
1.	Place the cover with the single tube opening on the reader.
2.	Select Profile >New .

Step	Action
3.	<p>Expand the Single Tube drop-down list and drag the 2d Code button over the circle shown in the image.</p> 
4.	<p>Hold a tube in the opening and select Scan to gain a new image.</p>

Step	Action
5.	<p>Select Decode.</p> <p>The ROI around the tube will turn green and decoded tube image will appear at the bottom right.</p> <p>NOTE: If it does not decode, adjust the <i>Parameters</i> under the <i>Decode Process</i>.</p> <p>Steps to create an export can be found in "Export Files" on page 20.</p> 
6.	Save the settings and navigate to Profile > Close Edit Mode .
7.	<p>Select the single tube check box from the main page.</p> 

Step	Action
8.	<p>Click GO.</p>  <p>The screenshot displays the 'FluidX Perception™ single tube' software interface. At the top left is a green 'GO' button. Below it is a 'Profiles' section with a list of profiles: '24_tube_rackid_ori', '48_tube_rackid_ori', '96_tube_rackid_ori', '96_tube_rackid_ori_h12', and 'single tube' (which is selected with a checked checkbox). To the right of the profiles is a 'Rack Imager' section containing 'single_tube_1' and an 'ID' field with the value '1023250856'. At the bottom is an 'Export' section with a 'Text Exporter' icon and a file path 'C:\ProgramData\fluidx\IntelliCode\ex'.</p>

Impression Reader

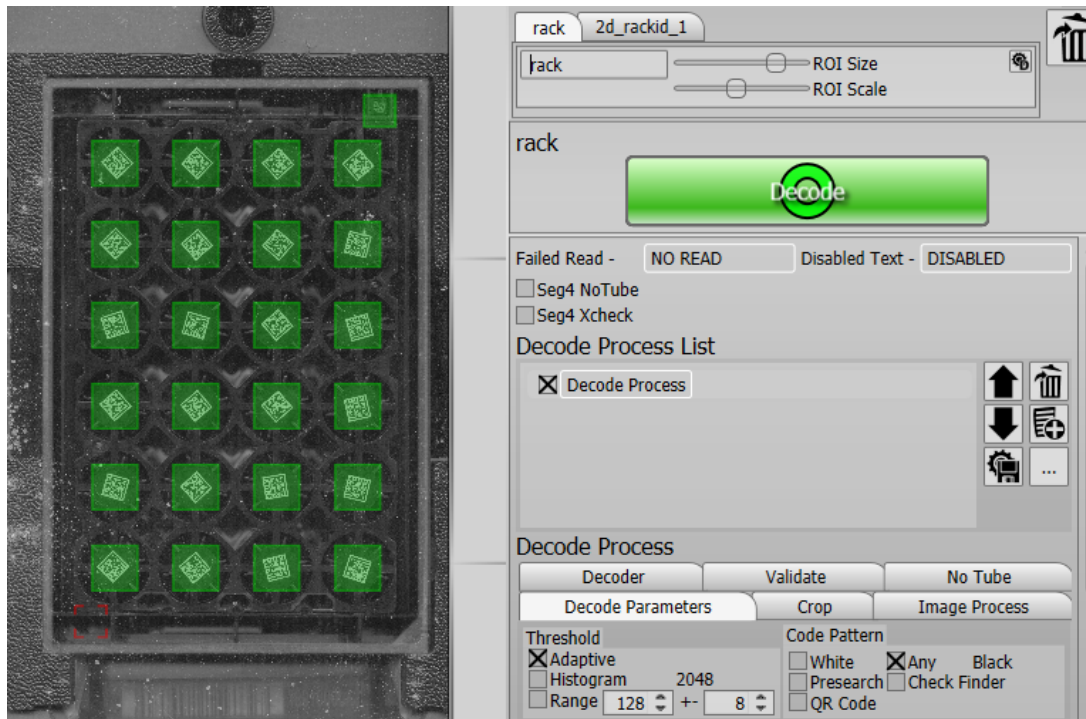
Follow the steps above, but use the single tube aperture on the impression to scanner to align the ROI.

Adjust Settings

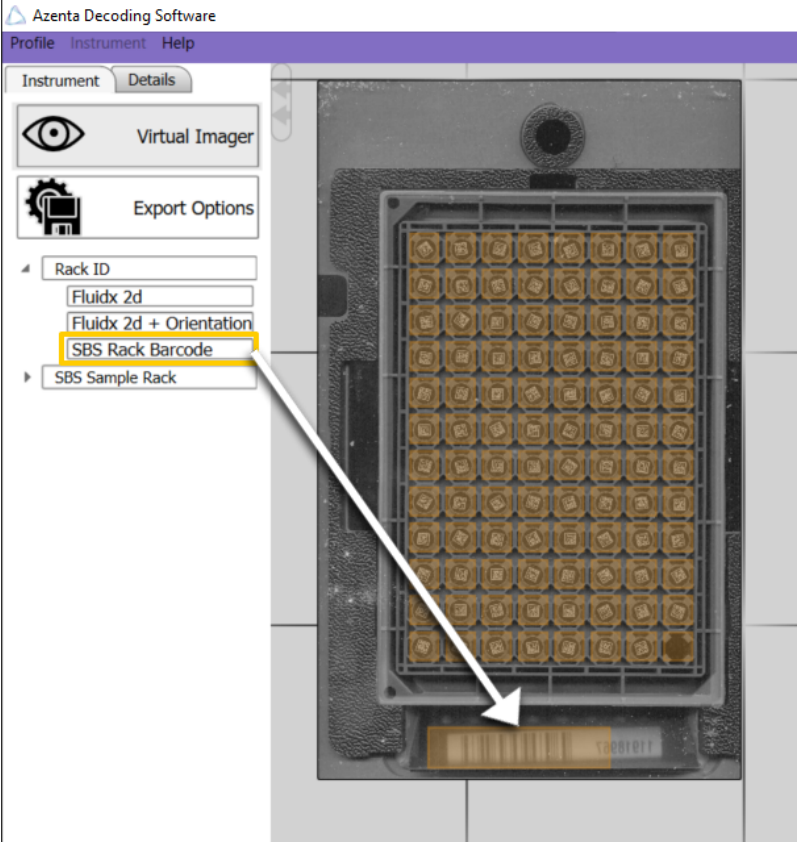

Double-click the profile to adjust the settings in the *Edit* page.

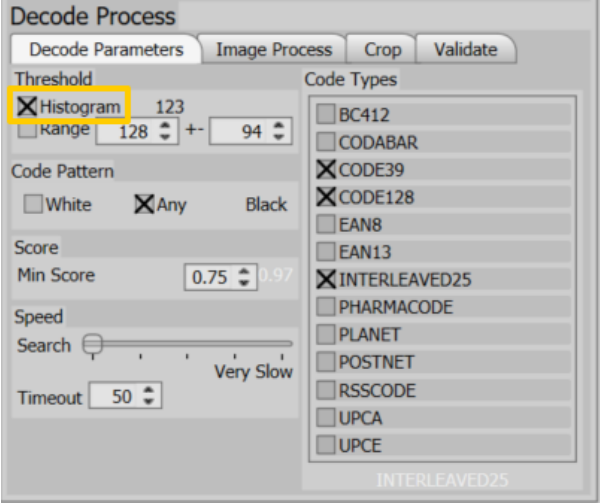
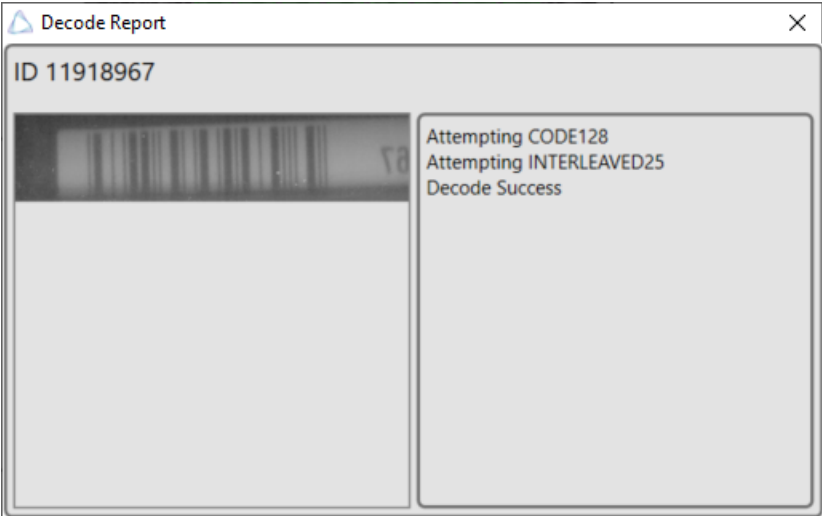
To adjust the rack or orientation settings, select the **Rack** tab.

To adjust the 2d ID, select the **2d_rackid_1** tab.



Select SBS Rack Barcode

Step	Action
1.	<p>Expand the Rack ID tab, and drag the SBS Rack Barcode option over the linear barcode.</p> 
2.	<p>Select 1d_rackid_.</p> 

Step	Action
3.	<p>Select the Histogram option for 1d rack id. The majority of linear barcodes are CODE39, CODE128, or INTERLEAVED25.</p> <p>NOTE: The user may need to adjust the Decode Parameters for non-standard codes.</p> 
4.	<p>Click the decode image to open a dialogue box with a detailed Decode Report.</p> 

Common Errors

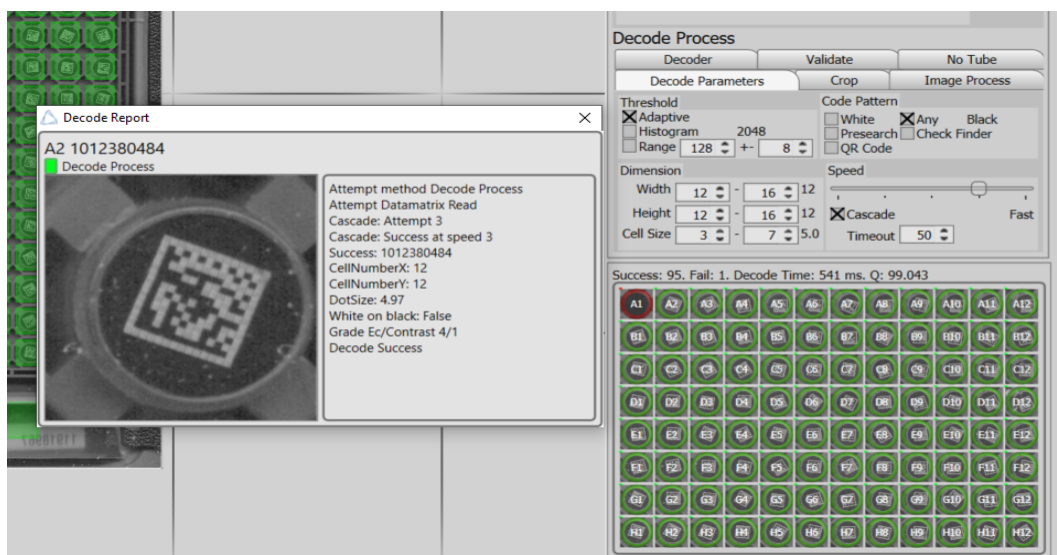
No Tube

If tubes are not being read, check the decode process.

To determine the parameters of a code, click on a green cell in the grid under the Decode Process List and compare the parameters to a code that has not been read.

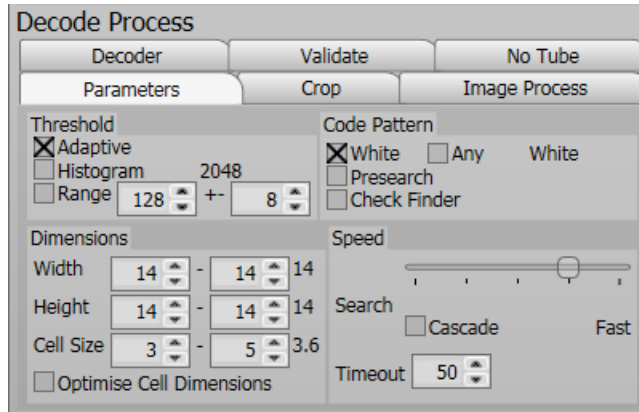
Cell Number, Width, Height, and Foreground Color are the most common things to change.

Ensure that the code is within the ROI and is not damaged and free from frost or debris on the glass.

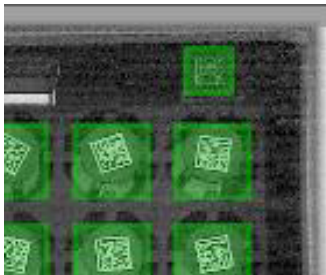


2d ID Cannot be Decoded

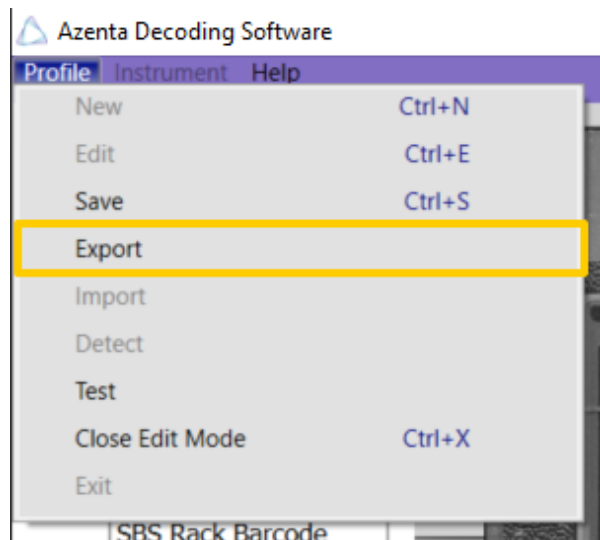
- Ensure that the parameters are correct and that the area is properly aligned and sized.
- Ensure that the ID was dropped on the world before relocating over the rack id.



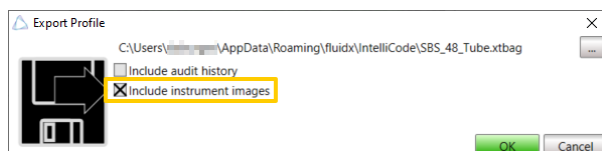
- Check the quality of the code. For assistance, the image can be exported and sent to Service.Products@azenta.com for assessment.



- Export the profile and send to Azenta for assistance:
 1. Select **Profile > Export**.



2. Create a file name for the information, and then click **Save**.
3. Ensure that the **Include instrument images** option is selected.

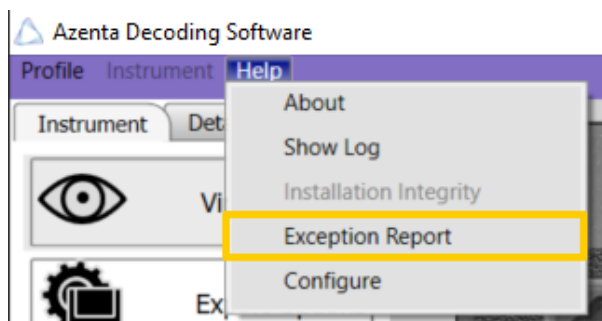


4. Click **OK**.

NOTE: The default location for the saved files is

`C:\Users\USERNAME\AppData\Roaming\fluidx\IntelliCode`

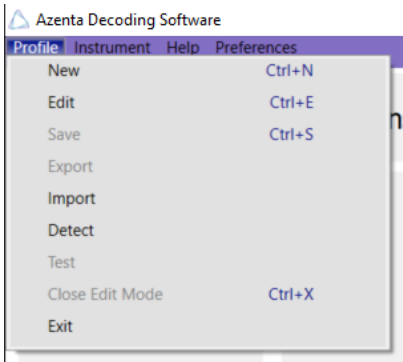
5. Send the .XTBAG file to Service.Products@azenta.com
- Use the Exception Report and send to Azenta for assistance:
 1. Navigate to **Help>Exception Report**.



2. Create a package file that features all crashes and logs.
3. Send this file to Service.Products@azenta.com.

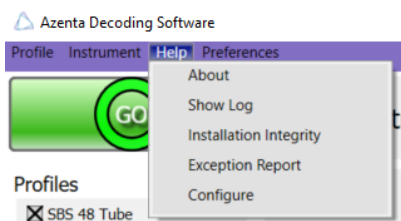
5. Features

Profile



Option	Description
New	Creates new rack configuration.
Edit	Makes changes to a current configuration.
Save	Saves a file.
Export	Exports profiles as a file for use on other computers or for support.
Import	Imports a profile from a file.
Detect	Creates a new rack profile of the tubes on the reader using an automatic decoding algorithm.
Test	Performs a decode so that the configuration can be checked before closing the edit mode.
Close Edit Mode	Saves and closes the settings. Returns to the main page.
Exit	Closes the software.

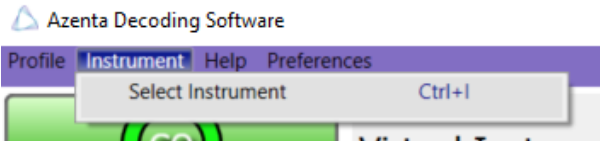

Help



Option	Description
About	Displays licensing, manufacturer, and software information.
Show Log	Displays a transcript of software activity. For problems encountered with Azenta Decoding Software™, this transcript should be copied and pasted, and sent to Service.Products@azenta.com
Installation Integrity	Checks that Azenta Decoding Software™ has been installed correctly with the right permissions.
Exception Report	Displays a package to send to Azenta Support if an error occurs.
Configure	Change CPU or language settings


Instrument

Shows installed devices.

Step	Action
1.	<p>If the device is currently plugged in and detected by the PC, it appears on the screen.</p> 
2.	<p>Select the unit on the right and click Select. If the unit is not listed, click the Refresh button.</p> 

Virtual Imager

Allows the Azenta Decoding Software™ to work without any hardware. Software can be used for evaluation with a virtual instrument.

Step	Action
1.	<p>Select the Virtual Imager icon.</p>  <p>A box is displayed on the right of the screen.</p>
2.	<p>Click the Grab Image button and scroll through the images until the correct format is shown the screen. When the Cycle Images option is selected, the images scroll on the main page once the profiles are complete.</p>

Export Options

Allows the user to export the reported values of the codes to various formats such as text file and excel.
See ["Export Files" on page 20](#).

Rack and Tube Arrangements

Orientation

2d orientation

Rack ID

Fluidx 2d Rack ID

SBS Sample Rack

24 Tube

48 Tube Thermo

48 Tube

96 Tube

240 Tube

384 Tube

Single Tube

2d Code

Option	Description
Orientation	Used to auto-orient the rack.
Rack ID	A selection can be made if the 2d rack is used or the 1d linear rack ID to record the rack number.
SBS Sample Rack	Different rack formats that can be selected.
Single Tube	Opportunity to configure the option of decoding a single tube.

6. Decode Process

Parameters

Decode Process

Decoder

Validate

No Tube

Parameters

Crop

Image Process

Threshold

☒ Adaptive

☐ Histogram

Range

128

0

+-

8

Code Pattern

☐ White

☒ Any

n/a

☐ Presearch

☐ Check Finder

Dimensions

Width

12

14

0

Height

12

14

0

Cell Size

3

6

0.0

☐ Optimise Cell Dimensions

Speed

Search

☒ Cascade

Fast

Timeout

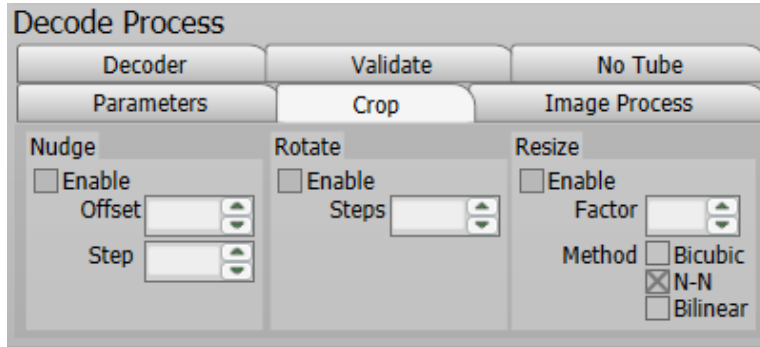
50

Parameter	Description
Threshold	Creates a binary image for the decoder. There are a number of methods that can achieve this.
Adaptive	Used in situations in which the lighting across the image may be uneven and/or the image to decode occupies a smaller region of the ROI.
Histogram	Best used in even lighting situations and/or the majority of the ROI contains the image to decode.

Parameter	Description
Range	<p>Uses a brute force method. Can cause a delay in decoding.</p> <p>Selecting this option will lock down the decoder to use the dimensions of the first successful decode. If a rack is guaranteed to contain codes of the same dimensions then checking this option can cause a decrease in overall decode time.</p> <p>NOTE: For racks with mixed code dimension, leave this option unselected.</p>
Dimensions	Information regarding the code to find. The set value to the right is the last recorded pixel value.
Width	The size range for the code width (in dots).
Height	The size range for the code height (in dots).
Cell Size	The size range for a code dot (in pixels). The value to the right is a successful value found by the decoder. The minimum and maximum values should be set to be integers above and below the set value.
Optimize Cell Dimensions	With this option unchecked, the decode process uses the same dimensions for each decode attempt.
Code Pattern	Contains information regarding the code matrix pattern.
White	Select this option if the code is white on black. Unselect for black on white.
Any	Check this option if the code can be either black on white or white on black. For racks containing mixed code patterns, ensure this option is checked.
Presearch	Check this option when there is a small code within a large ROI area.
Check Finder	A validation step to prevent code within code detection.
Speed	Reducing the speed uses more aggressive algorithms when deciphering a code. Decreasing the speed makes the decoding more robust at the cost of time.
Cascade	When checked, each decode attempt will start using the selected Decode Method. Retries with successively slower methods will occur until a successful decode has been achieved.
Time out	The maximum time (in milliseconds) allowed for each decode attempt.

Crop

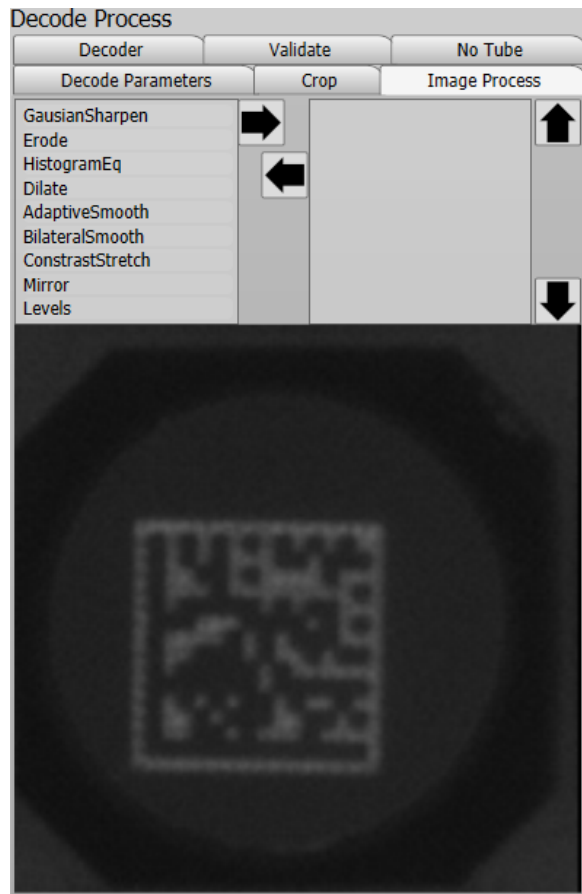
Cropping extracts the image to be used for the decode attempt.



Option	Description
Nudge	Offsets the extraction region by a number of pixels. Use when code positions can vary or if codes can fall slightly outside of the ROI.
Offset	+/- Maximum offset of region extraction.
Step	Iterates from -Offset to +Offset in these steps. Smaller values can increase decode time.
Rotate	Rotates the images by the number of increments set.
Re-size	Scales the cropped image. If codes are very small this can improve decode success.
Factor	Resizes the image by this factor.
Method	The scaling method.
Bicubic (slowest)	http://en.wikipedia.org/wiki/Bicubic_interpolation
N-N (fastest)	http://en.wikipedia.org/wiki/Nearest-neighbor_interpolation
Bilinear	http://en.wikipedia.org/wiki/Bilinear_interpolation

Image Process

In situations where image quality is reduced, image processing can enhance the image and improve read success.



Available filters are shown in the left panel. The current filter sequence is shown in the right panel. A preview of the final processed image is shown below these panels.

Move filters to/from the sequence by using the left/right arrows. Choose a filter in the filter list and click the right arrow to move it to the sequence list. To remove a filter from the sequence list, select the filter from the sequence list and press the left arrow. See [Figure 6-1](#).

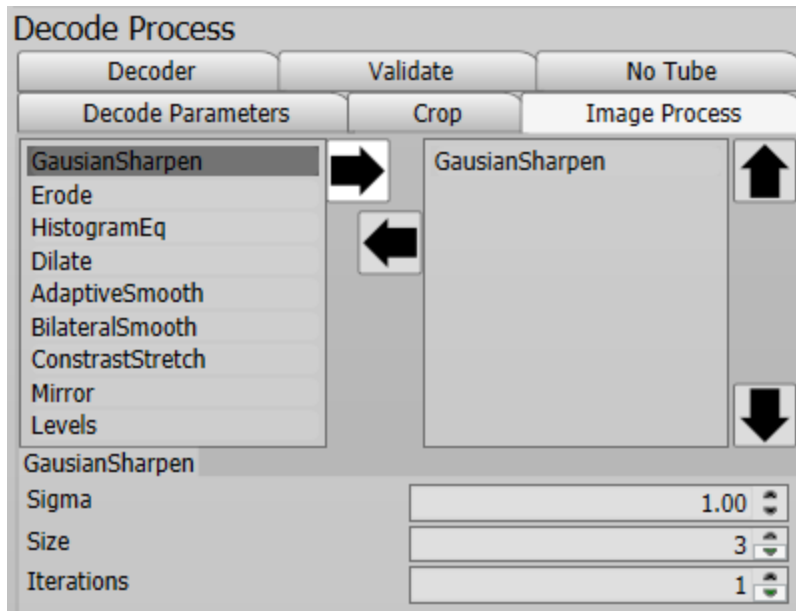


Figure 6-1: Select and Remove Filters

The order of the filters in the sequence list can be altered by selecting the filter and clicking the **Up** and **Down** arrows. The selected filter will move up and down within the sequence list. See [Figure 6-2](#).

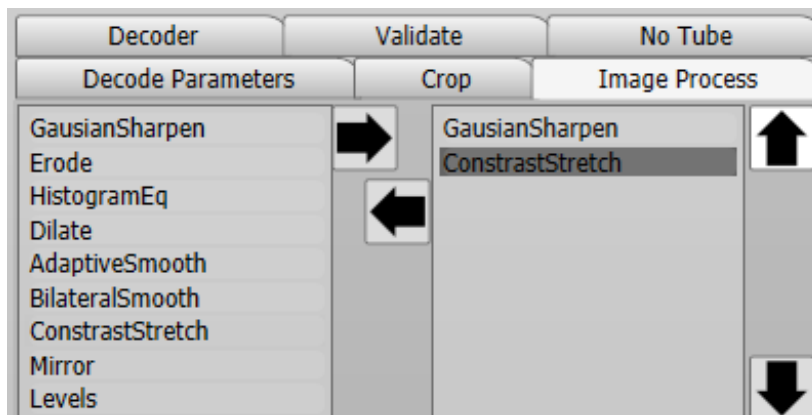


Figure 6-2: Change Order of Filters

The image processing filters are applied to the image in the order noted in the sequence list. A preview of the resultant image is shown at the bottom. See [Figure 6-3](#).

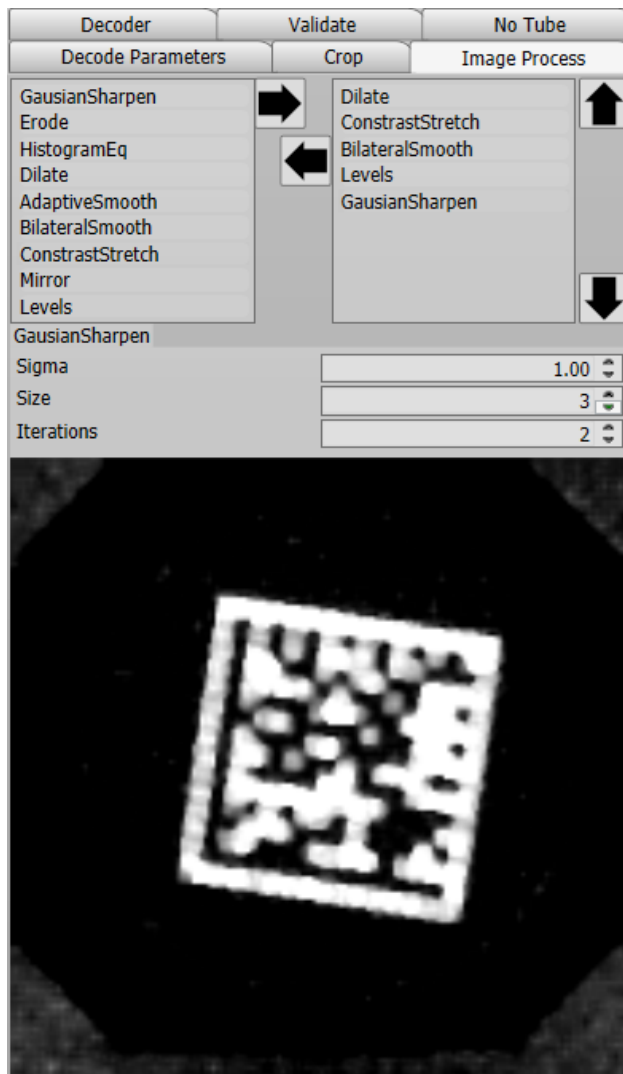


Figure 6-3: Preview of Filters

Filters

Gaussian Sharpen

- Sigma : Gaussian sigma value. 0.5-5.0.
- Size: Convolution kernel size.
- Iterations: Number of times to execute the filter.
- Used to sharpen an image.

Erode

- Iterations: Number of times to execute the filter.
- Erode is used to 'thin' or erode white areas. Can help if tube code is overmarked.

Histogram EQ

- Performs histogram equalization to increase contrast.

Dilate

- Iterations: Number of times to execute the filter.
- Dilate is used to "thicken" or dilate white areas. It can help if tube code is marked using spaced dots.

Adaptive Smooth

- Factor: Increase for more smoothing.
- This filter smooths images while retaining their sharp edges. Applicable for noise removal.

Bilateral Smooth

- Kernel Size: Convolution kernel size.
- Spatial Factor: Determines smoothing power within an intensity domain.
- Bilateral filter conducts "selective" Gaussian smoothing to areas of same intensity. It attempts to remove noise and contrast artifacts while preserving sharp edges.

Contrast Stretch

- Contrast stretching (often called normalization) is an image enhancement technique that attempts to improve the contrast in an image by "stretching" the range of intensity values it contains to span the full range of pixel values that the image allows.

Mirror

- This filter mirrors an image around the X and/or Y axis (horizontal and vertical mirroring). Some codes can be manufactured and mirrored about an axis.

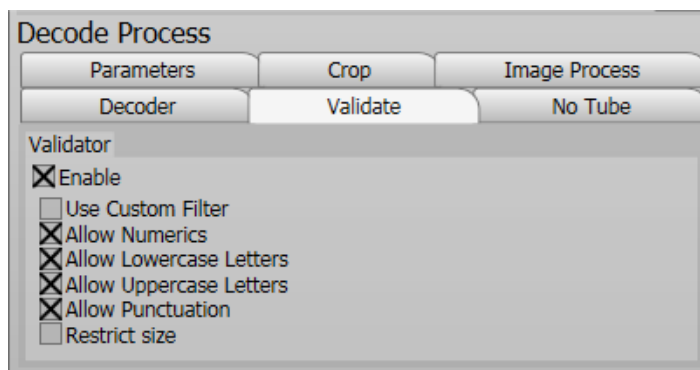
Levels

- Min: Input minimum range.
- Max: Input maximum range.
- The filter performs linear correction by mapping the input ranges to the full output range.

Validate

Enabling the Validator expands various code output options.

This stops codes from being read inside codes and allows only codes with letters or numbers.



No Tube

Azenta Decoding Software™ software can distinguish between tubes that cannot be decoded and empty spaces in the rack by signaling with different outputs: No Tube or No Read.

When the **No Tube** option is enabled, the parameters must be adjusted because different tubes need slightly different parameters due to manufacturer type, camera focus, and lighting conditions.

A series of sample lines at varying angles are taken across the cell image and checked for compliance with a set of rules defining a likely matrix code. If the criteria are met, the analysis finishes and a matrix code is deemed to be present.

The samples lines should be increased or decreased so that they can cross the image of the code.

No Tube/ No Read Configuration

After performing the initial scan and decode, select one of the tubes that decoded correctly on the full rack image. A closer image of the tube appears on the right of the screen with a table that includes the tube parameters (Transition, Area); lines highlighted in red mean that the parameters detected by the reader are out of the pre-set range. To fix this, complete the following steps:

Step	Action
1.	Select a few of the decoded and non-decoded tubes. The Transition and Area parameter values are quite similar between various tubes, but different than empty/no-tube spots.
2.	Adjust the values for the Transitions and Area so the values in the table are no longer red.
3.	After adjusting parameters, select Decode to check if the new setting works. It is possible that a red No-Read is in a place where there should be a yellow No-Tube. This can be triggered by ambient light, or the Azenta Decoding Software™ settings. Prevent ambient light interfering with the scan, and make sure that the lid is on the rack.
4.	Try another Scan/Decode and then rotate the rack around on the reader to make sure it is not a singled-out instance.
5.	Check ROI alignment on the full-rack image and make sure that each code is not positioned too close to the edge.
6.	Check the Transition and Area parameters. They need to be broad enough to decode the tube, but close enough together so a No Tube is not recognized with the parameters.

Transitions: A transition occurs when the pixel value crosses the mean. A minimum and maximum value for the number of transitions on a sample line is required.

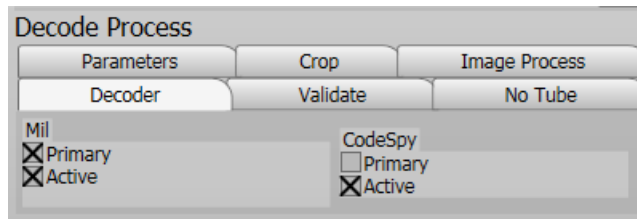
Area: The modular area under the binaries for each sample line must fall between a minimum and maximum value to indicate that a matrix code may be present. The reported Transitions and Area parameters can be filtered numerically, ascending or descending, by selecting the **Transition** or **Area** white box. The set value for each should allow the range to cover the min and max for each variable.

Noise: Non-matrix code images often have many transitional lines scattered close to the mean (noise). These should be filtered out using the Noise Level parameter, defined as a percentage of the range of pixel values in the sample.

Margin: The width of a strip of pixels to be discarded around the edge of each cell image and is applied at decoding time. This should be set so that the lines cross over the code and not the whole tube base.

Decoder

Option to select different decode methods.



The screenshot shows the 'Decode Process' dialog box with the 'Decoder' tab selected. The dialog has three tabs: 'Parameters', 'Crop', and 'Image Process'. The 'Decoder' tab contains two columns of settings. The first column, labeled 'Mil', has two checked options: 'Primary' and 'Active'. The second column, labeled 'CodeSpy', has two options: 'Primary' (unchecked) and 'Active' (checked).

Decode Process		
Parameters	Crop	Image Process
Decoder	Validate	No Tube
Mil	CodeSpy	
<input checked="" type="checkbox"/> Primary	<input type="checkbox"/> Primary	
<input checked="" type="checkbox"/> Active	<input checked="" type="checkbox"/> Active	

The default settings should have the **Primary** and **Active** options checked, and the default settings in the CodeSpy column should only have the **Active** option checked.

7. Command Line Options

Command shell control: Azenta Decoding Software™ can be controlled via command shell. Execute Azenta Decoding Software™ with -c on the command line for the command shell interface.

Getting Started

IntelliCode-c

Alternatively use CmdLine1.exe.

The following command shell appears:

```
ipc created intellicode_ipc
IntelliCode Shell
IntelliCode
%t96
Intellicode Command scope was added
:>
```

Command	Explanation	Example
-c	Execute command shell.	Intellicode-c
-i	Azenta Decoding Software runs and select the Camera Reader instrument.	Intellicode-i Perception

Command	Explanation	Example
-p	<p>Enables profile(s)</p> <ol style="list-style-type: none"> Azenta Decoding Software runs and ensures 96well profile is selected. If the profile does not exist, it will be ignored. Azenta Decoding Software runs and ensures that the 96well and 48well profiles are selected. Azenta Decoding Software runs and selects the Impression™ Instrument. The 96well and 48well profiles are selected. 	<ol style="list-style-type: none"> -p 96well -p 96well -p 48well Intellicode-I Impression -p 96well -p 48well

The command shell has an auto complete feature. Press the **Tab** key attempt to auto complete a command.

To test, see a list of system, commands, and type, press the **Tab** key.

```

Ipc created intellicode_ipc
IntelliCode Shell
IntelliCode
Xt96
Intellicode Command scope was added
:>sys
sys.List
sys.Exit
sys.Run
sys.Remote
sys.WaitTime
:>sys_

```

Once a command is complete, press the **Tab** key again to provide information about the command.

```

Ipc created intellicode_ipc
IntelliCode Shell
IntelliCode
Xt96
Intellicode Command scope was added
:>sys
sys.List
sys.Exit
sys.Run
sys.Remote
sys.WaitTime
:>sys.List
List
  Displays list of all commands from root scope
List(v)
  Displays verbose list of all commands from root scope
:>sys.List_

```

System Commands

Command	Explanation	Example
Sys.List	Lists all available commands.	
Sys.List(v)	A verbose list of all available commands.	
Sys.Exit	Exit the command shell.	
Sys.Run	Executes a command list. You can place many commands within a file and execute them as a batch of commands. This can help in situations where you may have a list of commands that are used often.	<p>a. Sys.run (<command list filename>)</p> <p>b. This commandlist would scan a 96 well profile using the Camera Reader instrument:</p> <pre>Intellicode.Instrument.use(Perception) Intellicode.Instrument.Profile.load (96.xtprof) Intellicode.Instrument.Profile.scan</pre>
Sys. Remote	<p>Allows remote control via network.</p> <p>a. Use legacy interface. Legacy support for xtr96. b. Use winsock interface.</p>	<p>a. sys.Remote (legacy, <port>)</p> <p>b. sys.Remote (winsock, <port>)</p>
Sys. WaitTime	Waits for a specified time.	Sys. WaitTime (<time>)

Azenta Decoding Software Commands

Commands control the Azenta Decoding Software application directly. The command set is accessed from the Azenta Decoding Software™ command scope.

Azenta Decoding Software<tab>

```
ipc created intellicode_ipc
IntelliCode Shell
IntelliCode
&#x96
Intellicode Command scope was added
:>Intellicode
Intellicode.Instrument
Intellicode.Instrument.list
Intellicode.Instrument.use
Intellicode.Instrument.Profile
Intellicode.Instrument.Profile.list
Intellicode.Instrument.Profile.load
Intellicode.Instrument.Profile.scan
Intellicode.Instrument.Profile.Exporter
Intellicode.Instrument.Profile.Exporter.list
Intellicode.Instrument.Profile.Exporter.getResults
:>Intellicode
```

Instrument Commands

An instrument needs to be selected before a profile can be loaded. Instrument selection and enumeration are as follows.

Command	Explanation	Example
Intellicode.Instrument.list	Lists available instruments.	
Intellicode.Instrument.use	Sets an instrument to use. NOTE: <i>Instrument names are case-sensitive.</i>	Intellicode.Instrument.use (<instrument name>)

Instrument Profile Commands

Once an instrument has been selected you can load a profile for scanning.

Command	Explanation	Example
Intellicode.Instrument.Profile <tab>	Lists all profile commands.	<pre> ipc created intellicode_ipc IntelliCode Shell IntelliCode ^t96 Intellicode Command scope was added ->Intellicode.Instrument.use(Perception) One moment.. Using instrument Perception ->Intellicode.Instrument.Profile Intellicode.Instrument.Profile.list Intellicode.Instrument.Profile.load Intellicode.Instrument.Profile.scan Intellicode.Instrument.Profile.Exporter Intellicode.Instrument.Profile.Exporter.list Intellicode.Instrument.Profile.Exporter.getResults ->Intellicode.Instrument.Profile </pre>
Intellicode.Instrument.Profile.list	Lists available profiles.	-
Intellicode.Instrument.Profile .load	Loads a profile. NOTE: Profile names are case-sensitive.	Intellicode.Instrument.Profile. load (<profile name>)
Intellicode.Instrument.Profile .scan	Issues a scan using the loaded profile. This is the equivalent of clicking GO from the instrument control screen. The profile is scanned and any active exports are executed.	-

Profile Exporter Commands

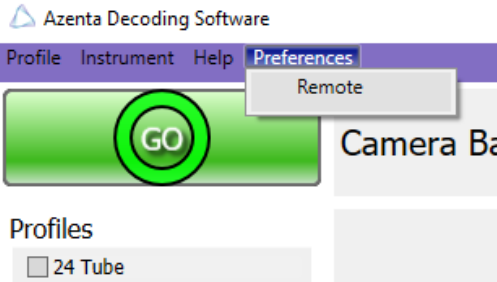
Once results are available, an exporter can be manually invoked.


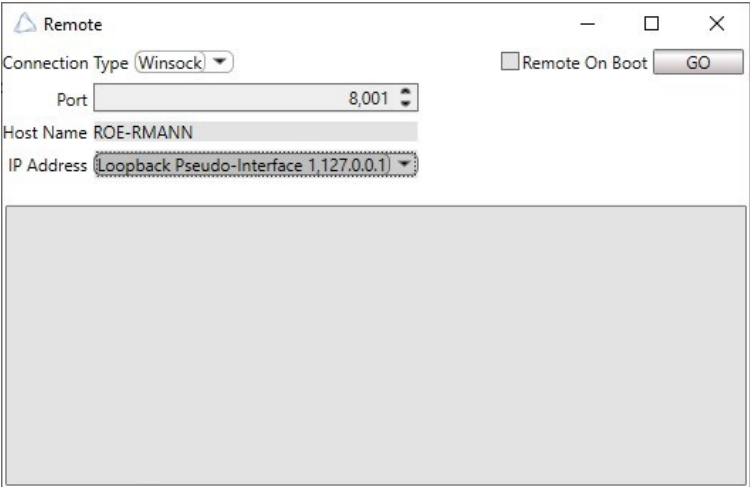
Command	Explanation	Example
Intellicode.Instrument.Profile.Exporter .list	Lists available profile text exporters.	-
Intellicode.Instrument.Profile.Exporter .getResults	Returns the results. Output can be xml or formatted by the current profile exporter. Output as xml. Output is formatted by the profile exporter.	Intellicode.Instrument.Profile.Exporter .getResults (<exporter name>) Intellicode.Instrument.Profile.Exporter .getResults <exporter name>

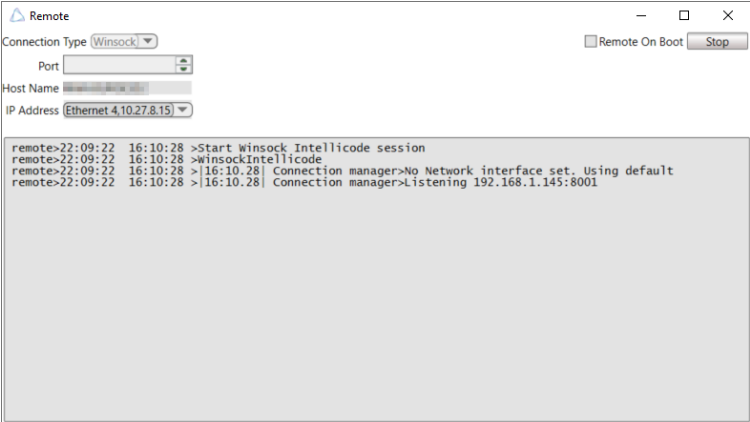
8. Remote Access

Azenta Decoding Software Remote Access

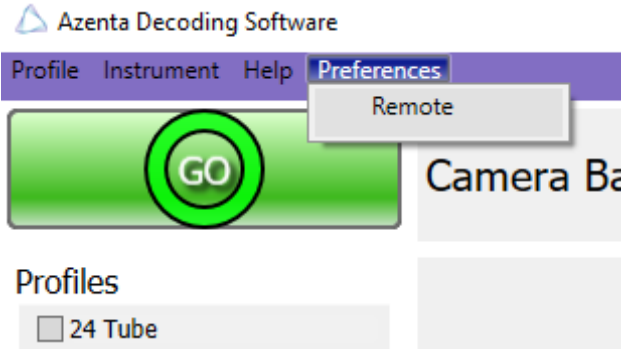
Azenta Decoding Software™ is equipped with UI for establishing the remote connection.

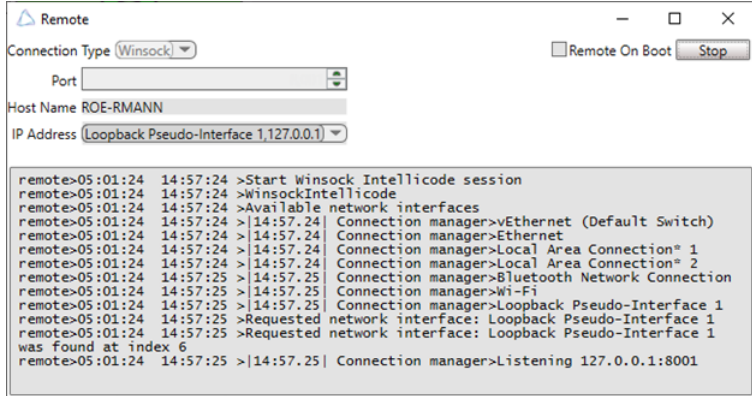
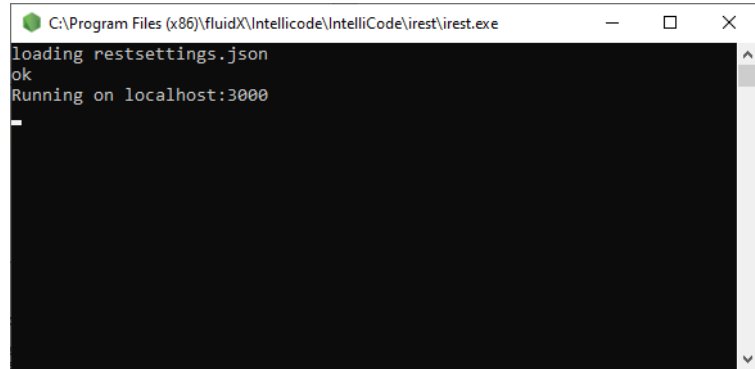
Step	Action
1.	<div><div>Navigate to Preferences > Remote.</div><div>A screenshot of the Azenta Decoding Software interface. At the top, there is a menu bar with 'Profile', 'Instrument', 'Help', and 'Preferences'. The 'Preferences' menu is open, showing a 'Remote' option. Below the menu bar, there is a large green button with a white 'GO' text. To the right of the button, the text 'Camera Ba' is partially visible. Below the button, there is a section titled 'Profiles' with a checkbox labeled '24 Tube'.</div></div>

Step	Action
2.	<p>Select the connection type (Winsock or Winsock Legacy for supporting XTR96 interface), select a port and then click GO.</p> 
3.	<p>Select the IP address. You can use loopback for local connections.</p>  <p>NOTE: The term "loopback" generally refers to a mechanism where data is sent back to the source without any processing. In networking, a "loopback" interface is a virtual network interface that allows a network connection to communicate with itself. It is used mainly for testing and debugging, network services testing and aids with communication between processes. To summarize, the loopback option (or interface) is a valuable tool for testing and debugging network-related functionalities within a local system, allowing processes on the same machine to communicate as if they were on a network.</p>

Step	Action
4.	<p>In case of local connections, select Loopback.</p> <p>The software now listens for incoming commands.</p>  <p>The screenshot shows the 'Remote' configuration window with 'Winsock' selected as the connection type. Below it, a terminal window displays the following commands and output:</p> <pre>remote>22:09:22 16:10:28 >Start Winsock Intellicode session remote>22:09:22 16:10:28 >WinsockIntellicode remote>22:09:22 16:10:28 > 16:10:28 Connection manager>No Network interface set. Using default remote>22:09:22 16:10:28 > 16:10:28 Connection manager>Listening 192.168.1.145:8001</pre>

Webservice Remote Access

Step	Action
1.	<p>Select Preferences>Remote.</p>  <p>The screenshot shows the 'Azenta Decoding Software' interface. The 'Preferences' menu is open, and the 'Remote' option is highlighted. Below the menu, a large green 'GO' button is visible, along with a 'Camera Ba' label and a 'Profiles' section showing '24 Tube'.</p>

Step	Action
2.	<p>In the <i>Remote</i> window, select Winsock as connection type, select Loopback for the IP address and then click GO.</p> <p>The Decoding Software then listens for commands.</p>  <pre> remote>05:01:24 14:57:24 >Start Winsock Intellicode session remote>05:01:24 14:57:24 >WinsockIntellicode remote>05:01:24 14:57:24 >Available network interfaces remote>05:01:24 14:57:24 >14:57.24 Connection manager>vEthernet (Default Switch) remote>05:01:24 14:57:24 >14:57.24 Connection manager>Ethernet remote>05:01:24 14:57:24 >14:57.24 Connection manager>Local Area Connection* 1 remote>05:01:24 14:57:24 >14:57.24 Connection manager>Local Area Connection* 2 remote>05:01:24 14:57:25 >14:57.25 Connection manager>Bluetooth Network Connection remote>05:01:24 14:57:25 >14:57.25 Connection manager>Wi-Fi remote>05:01:24 14:57:25 >14:57.25 Connection manager>Loopback Pseudo-Interface 1 remote>05:01:24 14:57:25 >Requested network interface: Loopback Pseudo-Interface 1 remote>05:01:24 14:57:25 >Requested network interface: Loopback Pseudo-Interface 1 was found at index 6 remote>05:01:24 14:57:25 >14:57.25 Connection manager>Listening 127.0.0.1:8001 </pre>
3.	<p>Navigate to the installation folder and execute <code>irest.exe</code> (in folder <code>\fluidX\Intellicode\IntelliCode\irest\</code>).</p> <p>NOTE: <code>irest.exe</code> is developed using Node.js and packaged as a Windows executable. Should you require running it on non-Windows platforms, like Linux, the source code is available upon request. Please contact service.products@azenta.com.</p>  <pre> C:\Program Files (x86)\fluidX\Intellicode\IntelliCode\irest\irest.exe loading restsettings.json ok Running on localhost:3000 </pre>

RESTful Web Interface

This section provides a detailed overview of the RESTful web interface used for managing connected instruments and their profiles.

It includes descriptions of various API endpoints, their usage, and expected responses.

NOTE: Base URL Overview: For illustrative purposes, the examples in this section use `http://localhost:3000` as the base URL. In practical application, replace `localhost` with the actual address of the webservice where the API is hosted.

Connect to Reader Instance

Description	Establish a connection between the webservice and a reader instance.
URL	/connect
Method	PUT
Query Parameters	<ul style="list-style-type: none">address (required): The IP address of the reader. Example: 127.0.0.1.port (required): The port number on which the reader is running. Example: 8001.
Success Response	<pre>{ "status": "success", "data": { "msg": "connected to intellicode version 15.1 build 151 R", "version": { "major": "15", "minor": "1", "build": "151", "candidate": "R" }, "state": { "instrument": "LE-SBS Perception", "profile": "" } } }</pre>

List Instruments

Description	Retrieve a list of all connected instruments.
URL	/instruments
Method	GET
Query Parameters	N/A
Success Response	<pre>{ "status": "success", "data": { "instrument_list": [{ "instrument": "Virtual-Instrument", "active": false }, { "instrument": "LE-SBS Perception", "active": false }] } }</pre>

Get Instrument Profiles

Description	Retrieve profiles for a specific instrument.
URL	/instruments/{instrument_name}/profiles
Method	GET
Query Parameters	instrument_name (required): Name of the instrument.
Success Response	<pre>{ "status": "success", "data": { "profile_list": [{ "profile": "24-Tube", "active": false }, { "profile": "48-Tube", "active": false }, // More profiles...] } }</pre> <p>NOTE: Replace {instrument_name} with the name of the instrument obtained from the /instruments endpoint.</p>

Read a Profile

Description	Retrieve details of a specific profile from an instrument.
URL	<code>/instruments/{instrument_name}/profiles/{profile_name}</code>
Method	GET
Query Parameters	<ul style="list-style-type: none">instrument_name (required): Name of the instrument. Example: 'LE-SBS Perception'.profile_name (required): Name of the profile. Example: '96-Tube'.
Success Response	<p>The response includes detailed information about the profile. The full output can be quite extensive, detailing each tube and rack. For brevity, only a partial output is shown here:</p> <pre>{ "status": "success", "data": [{ "part": "imager", "group": [// Group details...] }] }</pre> <p>NOTE: To use this endpoint, you must first obtain the <code>instrument_name</code> and <code>profile_name</code> from the <code>/instruments</code> and <code>/instruments/{instrument_name}/profiles</code> endpoints, respectively.</p>

Disconnect from Reader Instance

Description	Terminate the connection between the webservice and a reader instance.
URL	/disconnect
Method	PUT
Query Parameters	<ul style="list-style-type: none">• address (required): The IP address of the reader. Example: localhost.• port (required): The port number on which the reader is running. Example: 8001.
Success Response	<pre>{ "status": "success", "data": { "msg": "disconnected OK" } }</pre> <p>NOTE: Make sure to specify the correct IP address and port number in the query parameters. This endpoint is used for safely disconnecting from a reader instance.</p>

Understanding Rack IDs

Rack IDs play a crucial role in identifying and tracking racks in different instrument setups. Their integration and export in the system's data output can vary depending on the configuration and capabilities of the specific instrument.

Rack IDs from the Rack's Underside

In profiles configured to read rack IDs from the underside of the rack, these IDs are typically integrated into the rack group's export data. For example, when a rack ID is encoded as a 2D Datamatrix beneath the rack, it is included as part of the rack group data in the export. The following is an example of how this information might appear in the exported data:

```
{  
  "name": "rack_dm_rack_ID",  
  "value": "SA00189292",  
  "type": "rackid"  
  // Other attributes like success, fail, etc.  
}
```

This configuration ensures that each rack's unique identifier is directly associated with its corresponding group data.

Rack IDs via Optional Attachments

Some instruments may use optional attachments to read rack IDs. In these cases, the rack ID is read through a separate component, such as a laser barcode scanner, and is therefore exported as part of a different group. For example, an optional attachment might produce export data such as the following:

```
{
  "part": "opti",
  "group": [
    {
      "group": "laser_barcode_1",
      "roi": [
        {
          "name": "Barcode",
          "value": "11918967",
          "type": "rackid"
          // Other attributes like success, fail, etc.
        }
      ]
    }
  ]
}
```

This approach segregates the rack ID data from the main rack group, reflecting its separate acquisition method.

NOTE: It is important to be aware that the method of obtaining a rack ID and its subsequent integration into the export data can vary based on the instrument's configuration and design. Understanding these differences is essential for accurate data interpretation and usage in your workflows.

Configuring Cross-Origin Resource Sharing (CORS)

Cross-Origin Resource Sharing (CORS) is a critical security feature in web applications.

It allows you to control how resources in your RESTful web service are shared across different origins. To configure CORS settings for your application, you'll need to modify the `restsettings.json` file.

Setting	Definition
Port:	Specify the port number your web service will use. For example: "3000".
Origin:	Define the specific URL that is allowed to access your web service. For instance, if you want to restrict access to requests originating from <code>http://example.com</code> , you would set it as your origin.
allowPrivateNetwork:	This is a boolean setting (true or false). When set to true, it permits access from private networks. This can be crucial for internal testing or when the service needs to be accessible within a private network.

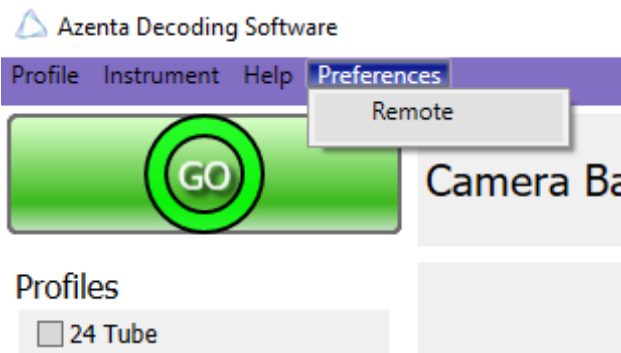
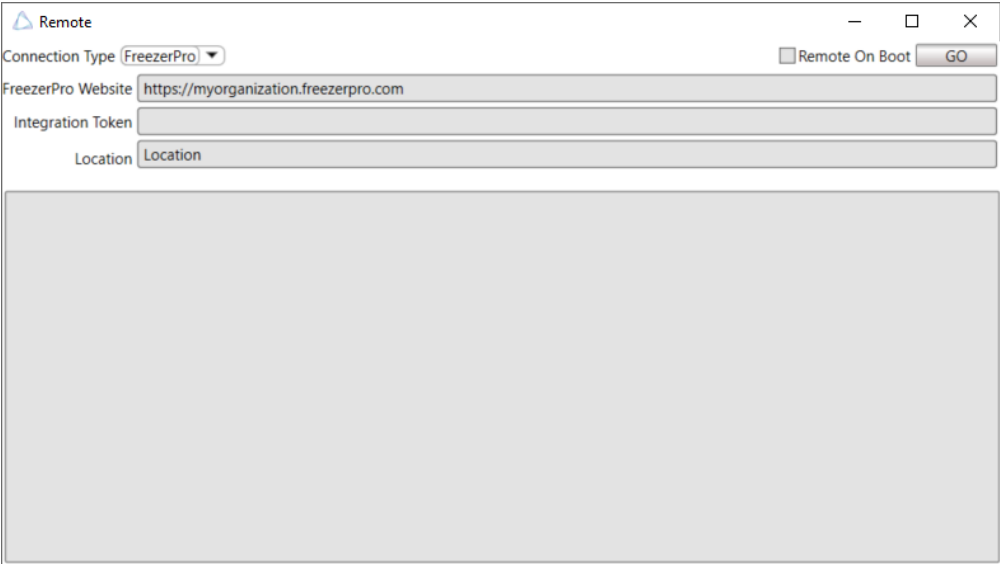
The following is an example of how your `restsettings.json` file might look:

```
{  
  "port": "3000",  
  "origin": "http://example.com",  
  "allowPrivateNetwork": true  
}
```

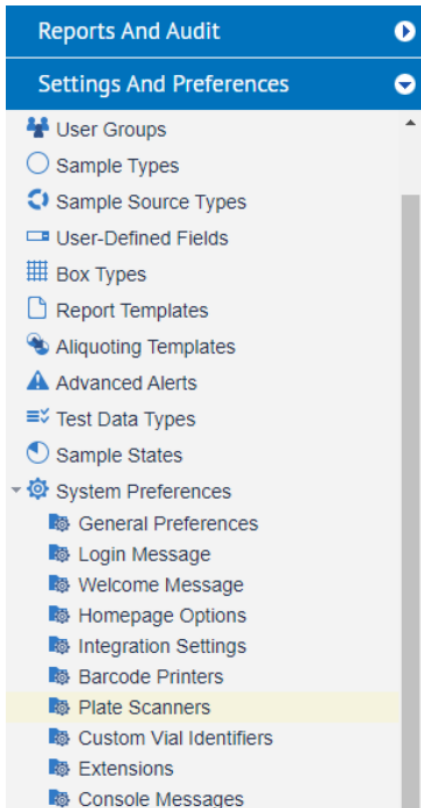
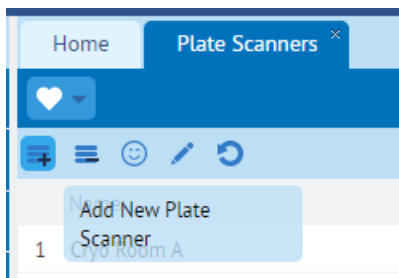
This configuration ensures that your web service is accessible on the specified port, with CORS restrictions tailored to your requirements. Setting `allowPrivateNetwork` to true is particularly useful for development environments or intra-organizational access.

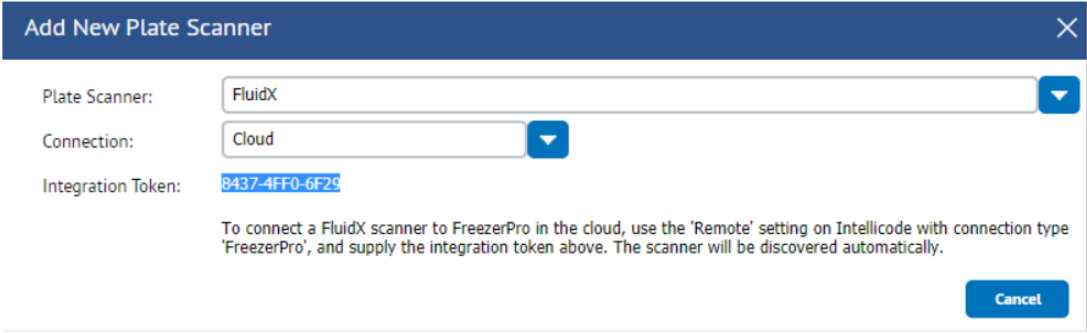
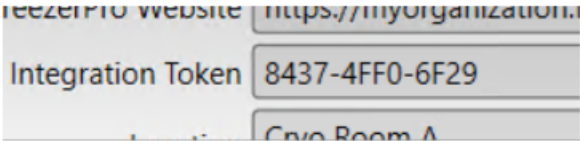
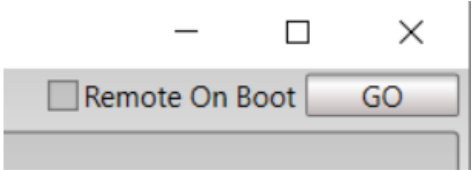
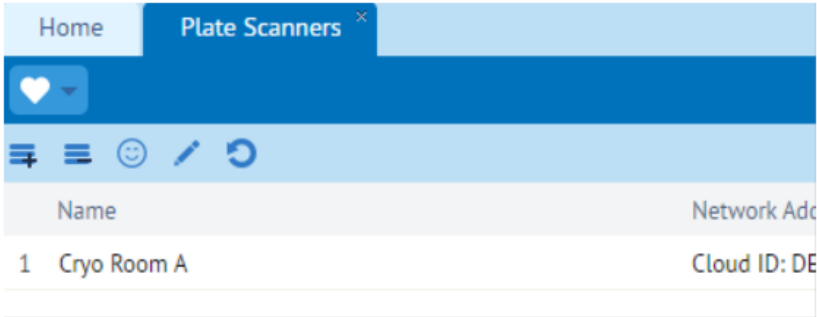
NOTE: Configuring CORS correctly is essential for the security and proper functioning of your web service.

FreezerPro Remote Access

Step	Action
1.	<p>Select Preferences>Remote.</p>  <p>The screenshot shows the Azenta Decoding Software interface. At the top, there is a menu bar with 'Profile', 'Instrument', 'Help', and 'Preferences'. The 'Preferences' menu is open, showing a 'Remote' option. Below the menu bar, there is a large green button with a 'GO' icon. To the right of the button, the text 'Camera Ba' is partially visible. Below the button, there is a section titled 'Profiles' with a checkbox labeled '24 Tube'.</p>
2.	<p>In the <i>Remote</i> window, fill out the FreezerPro Website, Integration Token, and Location fields.</p> <p>FreezerPro Website - This is the url of the freezerpro cloud instance.</p> <p>Integration Token - This token binds FreezerPro to the Azenta Decoding Software™ reader, which allows FreezerPro to communicate directly with Azenta Decoding Software™. See "Acquiring an Integration Token" on page 91.</p> <p>Location - Give the reader a location. This location will show in FreezerPro.</p>  <p>The screenshot shows the 'Remote' configuration window. It has a title bar with 'Remote' and standard window controls. Inside, there is a 'Connection Type' dropdown menu set to 'FreezerPro'. To the right of this is a checkbox labeled 'Remote On Boot' and a 'GO' button. Below these are three text input fields: 'FreezerPro Website' (containing 'https://myorganization.freezerpro.com'), 'Integration Token', and 'Location' (containing 'Location'). A large, empty rectangular area is at the bottom of the window.</p>

Acquiring an Integration Token

Step	Action
1.	<p>In FreezerPro, under the Settings and Preferences tab, select the Plate Scanners option.</p> 
2.	<p>Select Add New Plate Scanner.</p> 

Step	Action
3.	<p>Select an Azenta cloud scanner. Copy the integration token from here.</p> 
4.	<p>Paste the integration token into the Azenta Decoding Software.</p> 
5.	<p>Click GO.</p> 
6.	<p>The scanner should now be recognized in FreezerPro.</p> 

Appendix A: Date Value Format

Format Specifier	Description	Examples
"d"	The day of the month, from 1 through 31.	2009-06-01T13:45:30 -> 1 2009-06-15T13:45:30 -> 15
"dd"	The day of the month, from 01 through 31.	2009-06-01T13:45:30 -> 01 2009-06-15T13:45:30 -> 15
"ddd"	The abbreviated name of the day of the week.	2009-06-15T13:45:30 -> Mon (en-US) 2009-06-15T13:45:30 -> Пн (ru-RU) 2009-06-15T13:45:30 -> lun. (fr-FR)
"dddd"	The full name of the day of the week.	2009-06-15T13:45:30 -> Monday (en-US) 2009-06-15T13:45:30 -> понедельник (ru-RU) 2009-06-15T13:45:30 -> lundi (fr-FR)
"f"	The tenths of a second in a date and time value.	2009-06-15T13:45:30.6170000 -> 6 2009-06-15T13:45:30.05 -> 0
"ff"	The hundredths of a second in a date and time value.	2009-06-15T13:45:30.6170000 -> 61 2009-06-15T13:45:30.0050000 -> 00
"fff"	The milliseconds in a date and time value.	6/15/2009 13:45:30.617 -> 617 6/15/2009 13:45:30.0005 -> 000
"ffff"	The ten thousandths of a second in a date and time value.	2009-06-15T13:45:30.6175000 -> 6175 2009-06-15T13:45:30.0000500 -> 0000

Format Specifier	Description	Examples
"ffffff"	The hundred thousandths of a second in a date and time value.	2009-06-15T13:45:30.6175400 -> 61754 6/15/2009 13:45:30.000005 -> 00000
"fffffff"	The millionths of a second in a date and time value.	2009-06-15T13:45:30.6175420 -> 617542 2009-06-15T13:45:30.0000005 -> 000000
"fffffff"	The ten millionths of a second in a date and time value.	2009-06-15T13:45:30.6175425 -> 6175425 2009-06-15T13:45:30.0001150 -> 0001150
"F"	If non-zero, the tenths of a second in a date and time value.	2009-06-15T13:45:30.6170000 -> 6 2009-06-15T13:45:30.0500000 -> (no output)
"FF"	If non-zero, the hundredths of a second in a date and time value.	2009-06-15T13:45:30.6170000 -> 61 2009-06-15T13:45:30.0050000 -> (no output)
"FFF"	If non-zero, the milliseconds in a date and time value.	2009-06-15T13:45:30.6170000 -> 617 2009-06-15T13:45:30.0005000 -> (no output)
"FFFF"	If non-zero, the ten thousandths of a second in a date and time value.	2009-06-15T13:45:30.5275000 -> 5275 2009-06-15T13:45:30.0000500 -> (no output)
"FFFFF"	If non-zero, the hundred thousandths of a second in a date and time value.	2009-06-15T13:45:30.6175400 -> 61754 2009-06-15T13:45:30.0000050 -> (no output)
"FFFFFF"	If non-zero, the millionths of a second in a date and time value.	2009-06-15T13:45:30.6175420 -> 617542 2009-06-15T13:45:30.0000005 -> (no output)
"FFFFFFF"	If non-zero, the ten millionths of a second in a date and time value.	2009-06-15T13:45:30.6175425 -> 6175425 2009-06-15T13:45:30.0001150 -> 000115
"g", "gg"	The period or era.	2009-06-15T13:45:30.6170000 -> A.D.
"h"	The hour, using a 12-hour clock from 1 to 12.	2009-06-15T01:45:30 -> 1 2009-06-15T13:45:30 -> 1

Format Specifier	Description	Examples
"hh"	The hour, using a 12-hour clock from 01 to 12.	2009-06-15T01:45:30 -> 01 2009-06-15T13:45:30 -> 01
"H"	The hour, using a 24-hour clock from 0 to 23.	2009-06-15T01:45:30 -> 1 2009-06-15T13:45:30 -> 13
"HH"	The hour, using a 24-hour clock from 00 to 23.	2009-06-15T01:45:30 -> 01 2009-06-15T13:45:30 -> 13
"K"	Time zone information.	With DateTime values: 2009-06-15T13:45:30, Kind Unspecified -> 2009-06-15T13:45:30, Kind Utc -> Z 2009-06-15T13:45:30, Kind Local -> -07:00 (depends on local computer settings) With DateTimeOffset values: 2009-06-15T01:45:30-07:00 -> -07:00 2009-06-15T08:45:30+00:00 -> +00:00
"m"	The minute, from 0 through 59.	2009-06-15T01:09:30 -> 9 2009-06-15T13:29:30 -> 29
"mm"	The minute, from 00 through 59.	2009-06-15T01:09:30 -> 09 2009-06-15T01:45:30 -> 45
"M"	The month, from 1 through 12.	2009-06-15T13:45:30 -> 6
"MM"	The month, from 01 through 12.	2009-06-15T13:45:30 -> 06
"MMM"	The abbreviated name of the month.	2009-06-15T13:45:30 -> Jun (en-US) 2009-06-15T13:45:30 -> juin (fr-FR) 2009-06-15T13:45:30 -> Jun (zu-ZA)
"MMMM"	The full name of the month.	2009-06-15T13:45:30 -> June (en-US) 2009-06-15T13:45:30 -> juni (da-DK) 2009-06-15T13:45:30 -> uJuni (zu-ZA)
"s"	The second, from 0 through 59.	2009-06-15T13:45:09 -> 9
ss	The second, from 00 through 59.	2009-06-15T13:45:09 -> 09
"t"	The first character of the AM/PM designator.	2009-06-15T13:45:30 -> P (en-US) 2009-06-15T13:45:30 -> 午 (ja-JP) 2009-06-15T13:45:30 -> (fr-FR)

Format Specifier	Description	Examples
"tt"	The AM/PM designator.	2009-06-15T13:45:30 -> PM (en-US) 2009-06-15T13:45:30 -> 午後 (ja-JP) 2009-06-15T13:45:30 -> (fr-FR)
"y"	The year, from 0 to 99.	0001-01-01T00:00:00 -> 1 0900-01-01T00:00:00 -> 0 1900-01-01T00:00:00 -> 0 2009-06-15T13:45:30 -> 9 2019-06-15T13:45:30 -> 19
"yy"	The year, from 00 to 99.	0001-01-01T00:00:00 -> 01 0900-01-01T00:00:00 -> 00 1900-01-01T00:00:00 -> 00 2019-06-15T13:45:30 -> 19
"yyy"	The year, with a minimum of three digits.	0001-01-01T00:00:00 -> 001 0900-01-01T00:00:00 -> 900 1900-01-01T00:00:00 -> 1900 2009-06-15T13:45:30 -> 2009
"yyyy"	The year as a four-digit number.	0001-01-01T00:00:00 -> 0001 0900-01-01T00:00:00 -> 0900 1900-01-01T00:00:00 -> 1900 2009-06-15T13:45:30 -> 2009
"yyyyy"	The year as a five-digit number.	0001-01-01T00:00:00 -> 00001 2009-06-15T13:45:30 -> 02009
"z"	Hours offset from UTC, with no leading zeros.	2009-06-15T13:45:30-07:00 -> -7
"zz"	Hours offset from UTC, with a leading zero for a single-digit value.	2009-06-15T13:45:30-07:00 -> -07
"zzz"	Hours and minutes offset from UTC.	2009-06-15T13:45:30-07:00 -> -07:00
":"	The time separator.	2009-06-15T13:45:30 -> : (en-US) 2009-06-15T13:45:30 -> . (it-IT) 2009-06-15T13:45:30 -> ; (ja-JP)
"/"	The date separator.	2009-06-15T13:45:30 -> / (en-US) 2009-06-15T13:45:30 -> - (ar-DZ) 2009-06-15T13:45:30 -> . (tr-TR)
"string" 'string'	Literal string delimiter.	2009-06-15T13:45:30 ("arr:" h:m t) -> arr: 1:45 P 2009-06-15T13:45:30 ('arr:' h:m t) -> arr: 1:45 P
%	Defines the following character as a custom format specifier.	2009-06-15T13:45:30 (%h) -> 1
\	The escape character.	2009-06-15T13:45:30 (h \h) -> 1 h
Any other character	The character is copied to the result string unchanged.	2009-06-15T01:45:30 (arr hh:mm t) -> arr 01:45 A