Cryo.s™ Rack Scanner

Instructions for Use
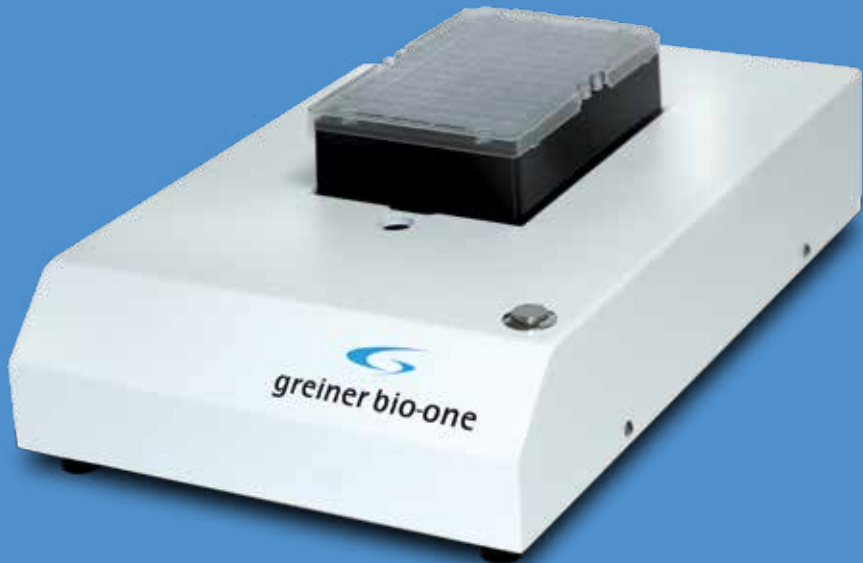

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TABLE OF CONTENT

1. INTRODUCTION

Cryo.s™ Rack Scanner

1.1 General information

The Cryo.s™ Rack Scanner is a bench top barcode scanner designed to scan and decode the datamatrix barcode on cryogenic sample tubes of the Cryo.s™ with Datamatrix and Cryo.s™ Biobanking Tubes series.

Furthermore, the Cryo.s™ Rack Scanner is capable of reading integrated datamatrix codes on the bottom of complementary storage packs.

In particular the Cryo.s™ Rack Scanner is compatible with:

REF	Product description
123263-2DG	Cryo.s™ 1 ml with datamatrix coding, internal thread
122263-2DG	Cryo.s™ 2 ml with datamatrix coding, internal thread
126263-2DG	Cryo.s™ 2 ml with datamatrix coding, external thread
127263-2DG	Cryo.s™ 4 ml with datamatrix coding, external thread
123263-2D3	Cryo.s™ 1 ml with datamatrix coding, internal thread
122263-2D3	Cryo.s™ 2 ml with datamatrix coding, internal thread
126263-2D3	Cryo.s™ 2 ml with datamatrix coding, external thread
127263-2D1	Cryo.s™ 4 ml with datamatrix coding, external thread
803277	48way rack for 1, 2 and 4 ml Cryo.s™ w/o lid
803202	48way rack for 1 and 2 ml Cryo.s™ with low profile lid
803270	48way rack for 4 ml Cryo.s™ with high profile lid
976570	96 uncapped 300 µl tubes in rack
977570	96 uncapped 600 µl tubes in rack
978570	96 uncapped 1000 µl tubes in rack
976580	96 capped 300 µl tubes in rack
977580	96 capped 600 µl tubes in rack
978580	96 capped 1000 µl tubes in rack
976561	96 capped 300 µl tubes in rack
977561	96 capped 600 µl tubes in rack
978561	96 capped 1000 µl tubes in rack

Key features
- Scans 2D codes and creates output file of rack ID, tube position, and 2D code
- Auto-rescan feature provides quick re-scan of hard to scan 2D codes
- Single tube scan permits scan and decode of one tube
- Scans racks with 48 and 96 well tubes. Also compatible with other rack formats such as honeycomb or high density racks.

Condensation Reduction System features
- Anti-fog coating and insulation for passive condensation reduction
- Optional active Condensation Reduction System (CRS)

Typical operation
- Place tube rack on scanner deck
- Click Scan & Decode software button or the button on the scanner hardware
- 2D codes are scanned
- Click Output button
- Software prompts for rack ID code entry (Example: Rack ID: 1234)
- Output file is created with file name based on rack ID code (Example: 1234.CSV)

1.2   2D barcodes & test tubes

2D Code for 123456789   2D tube example   2D code with 14 x 14 grid

The 2D barcode on most storage tubes is a two-dimensional pattern made from a grid of black and white marks called cells. This type of 2D barcode is called Data Matrix code, which can be recognised by an L shape pattern that is part of the code.

Data Matrix 2D barcode information

- Data Matrix 2D mark has two solid borders that appear as an L shape. This is the finder pattern.
- Rows and columns of cells represent the tube ID data encoded barcode information.
- Quiet zone area outside of the code should be a plain background color.
- Error correction codes are incorporated into the 2D data pattern which may allow decoding partially obscured or damaged 2D marks.
- As data size increases the number of cells (rows and columns) can increase to a maximum of 144×144 grid.

Data Matrix code and 2D marked sample tubes
- 2D mark on a 1mL sample tube is approximately 3mm square.
- Sample tube 2D mark is usually a 12 x 12 cell grid or a 14 x 14 cell grid.
- Sample tubes with a 2D code and small alphanumeric print area may have limited quiet zone area around the 2D mark.
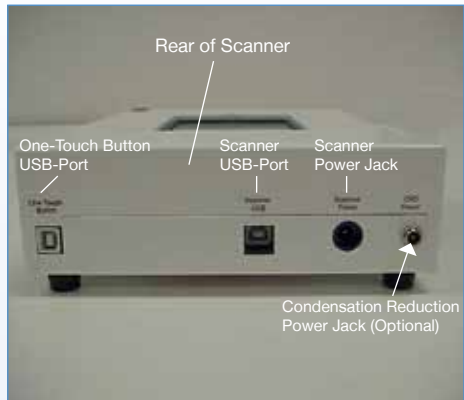
2. CRYO.S™ RACK SCANNER HARDWARE

2.1 Contents of shipment

Included with shipment:

- Cryo.s™ Rack Scanner Unit
- Two USB Cables
- Two Power Supplies

Scanner has four connections located at rear of scanner unit

- Scanner USB
- One Touch Button USB
- Scanner Power
- Condensation Reduction Power (CRS)

Scan Window
Rack Orientation: A01
Single Tube Scan WIndow
One-Touch Button

Rear of Scanner
One-Touch Button USB-Port
Scanner USB-Port
Scanner Power Jack
Condensation Reduction Power Jack (Optional)

Scanner Power

Optional Condensation Reduction Power (CRS)

2.2 Scanner Condensation Reduction System (CRS)

The Cryo.s™ Rack Scanner includes features to help reduce condensation from developing on the scanner glass imaging area. Scanning multiple 2D tube racks from -20 °C or -80 °C freezers can chill scanner glass causing condensation to form on the inside area of the scanner glass. Too much condensation can interfere with the scan and decode process; the scanner includes several anti-condensation features.

2.2.1 Types of anti-condensation features

The Cryo.s™ Rack Scanner has two types of anti-condensation features: passive and active. The passive feature operates at ambient temperature, while the active feature increases the scanner's internal temperature. For most tube rack scanning the passive feature will prevent condensation and allow for completion of a tube rack scanning project. For extended scanning with large numbers of tube racks, the active feature (internal heater) will prevent or reduce condensation.

Listed below are strategies for processing tube racks and to minimise scanner heater usage.

Anti-condensation feature	Implementation
Passive condensation reduction features	• Anti-fog treatment on inside area of scanner imaging surface • Additional insulation between tube rack and scanner
Active condensation reduction feature	• Internal heating element assembly with two fans and a fixed thermostat • Note: The heater system is set to maintain a 37.7 °C (100 °F) internal scanner air temperature. The heater system includes two fans to provide even temperature distribution throughout the scanner.

2.2.2 CRS internal heater feature

CRS Heater Info
- Heater is ON when power cable connected.
- Internal fans circulate air.
- Fixed thermostat limits internal temperature to 37.7 °C (100 °F).

Operating the internal scanner heater
The scanner heater is controlled by external power supply. The scanner heater is set to maintain a 37.7 °C (100 °F) internal air temperature. While it can operate in a continuous manner, it is recommended that heater is operated only as needed.

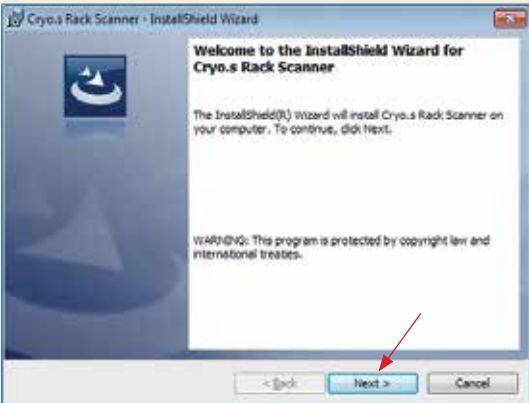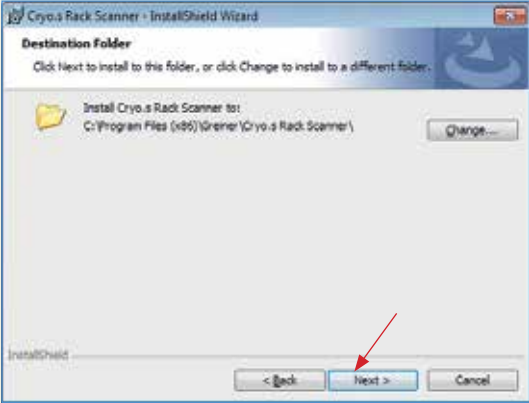| Control of		
Power ON	• Plug in power cable into CRS connector at rear of scanner box. • Connector is located near rear edge of case.	• A low fan noise will indicate heater is powered on.
Power OFF	• Unplug power cable.	• Fan noise stops at power off.
An alternate method to control the scanner heater is to use a power strip to power cycle the heater power supply.		

3. CRYO.S™ RACK SCANNER SOFTWARE AND SET UP

3.1 Installation setup sequence:

1. Installation Cryo.s™ Rack Scanner software
2. Connection of cables to computer
3. Selection of scanner driver in software
4. Aligning of scanning template
5. Confirmation of output settings
6. Passcode registration

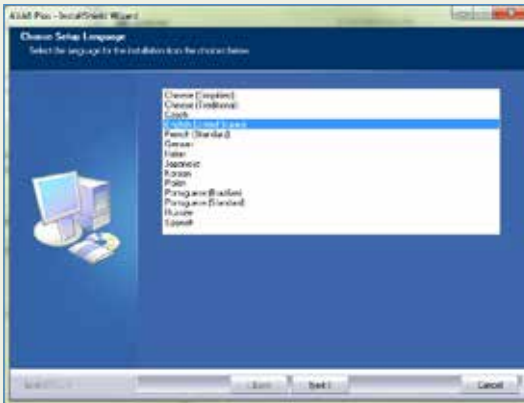### 3.1.1 Installation Cryo.s™ Rack Scanner software

To install the software the following steps need to be carried out:

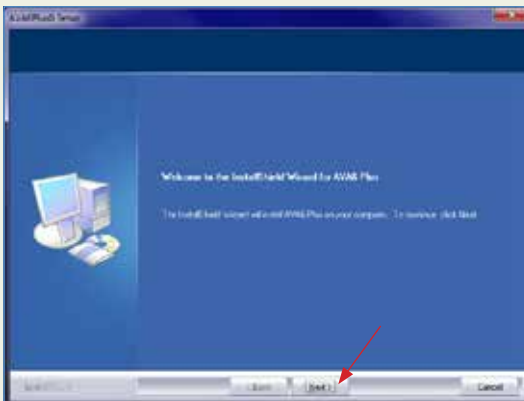| 1	• From the install CD. • Select the folder called software. • Run the setup.exe.
2	• Confirm the destination folder. • Click Next.

3	• Click Install.
4	• Select language.
5	• Click Next.

6	• Click Yes to accept license agreement.
7	• Select features. • Select TWAIN and WIA. • Click Next.
8	• Click Install
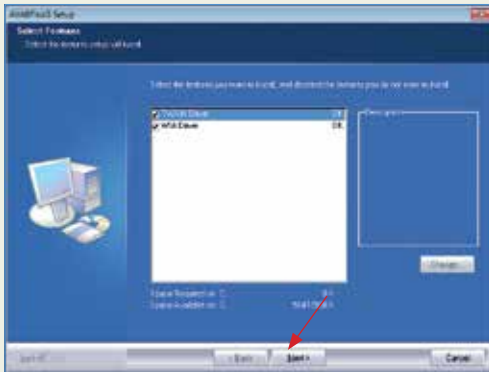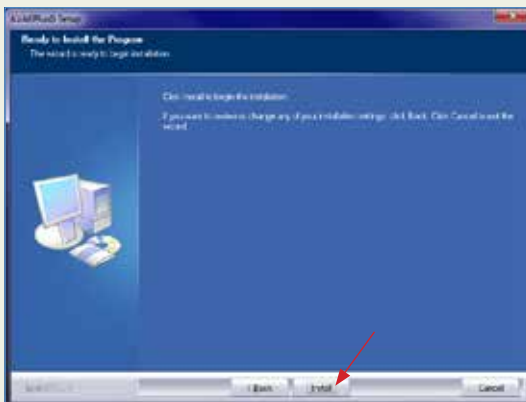
9	• Click "Install this driver software anyway".

10	• Installation complete.
	• Click Finish.
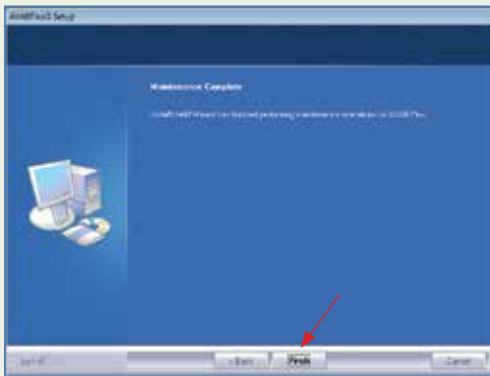
11	• CopyPro USB driver installer.
	• Click Next.

12	• Wizard Completed. • Click Finish.
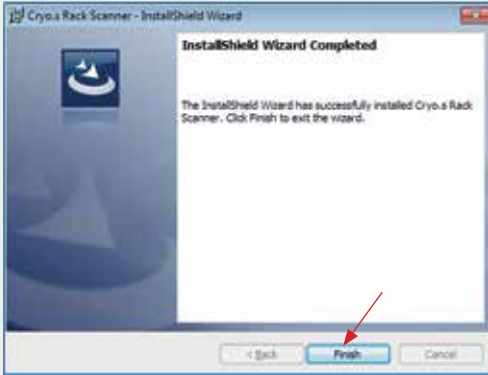
3.1.2 Connection of cables to computer

For the connection of cables follow the scheme below:

Connections for Cryo.s™ Rack Scanner:

A. USB Cable for One-Touch Button
B. USB Cable for scanner
C. Power cable for Scanner
D. Optional power cable for
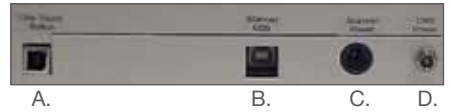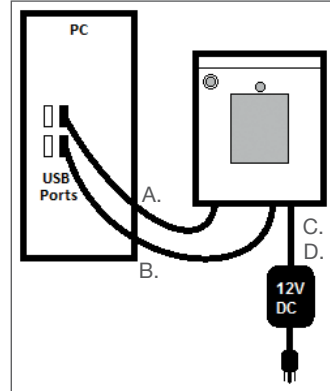   Condensation Reduction System

Rear of Scanner

A.   B.   C.   D.

Schematic Diagram of Cables

Connection Scheme

3.1.3 Selection of Scanner Driver in Software

> **!** The scanner will not work with the software unless this procedure is performed. This is a one-time setup, assuming you always use the same type of scanner. The enabled scanner type is displayed at the top of the software frame (see below).

For scanner driver installation follow the steps below:

1	• Double click the desktop shortcut to start Cryo.s™ Rack Scanner software. • Open the File menu. • Click on Select Scanner…

2	• Click NEXT.
	 Select Scanner Driver For Cryo.s Rack Scanner Select : AVA6PlusG Hint: If "wrong" scanner driver is selected, scanner may not scan and software may display an error. If this occurs, restart software and select correct scanner driver Click NEXT to continue NEXT EXIT
3	• For Cryo.s™ Rack Scanner, select AVA6PlusG and click Select Select Source Sources: AVA6PlusG 6.0 (32-32) EPSON Perfection V37/V370 3.92 (32-32) WIA-AVA6PlusG #2 1.0 (32-32) Select Cancel

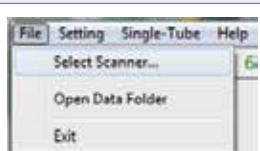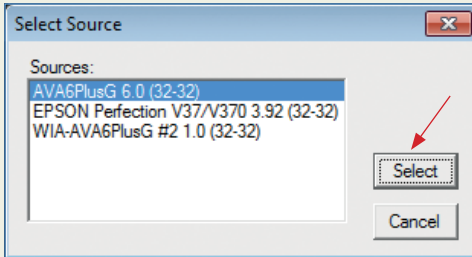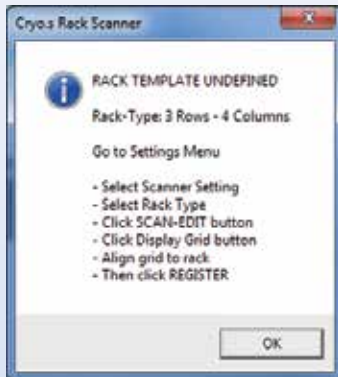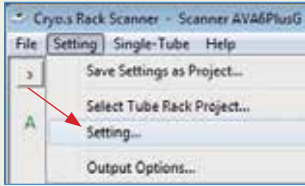### 3.1.4 Aligning of scanning template

! The scanner will not work with the software unless this procedure is performed. This is a one-time setup, assuming you always use the same type of scanner. The enabled scanner type is displayed at the top of the software frame (see below).
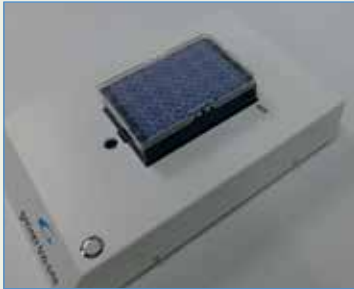

Cryo.s Rack Scanner

RACK TEMPLATE UNDEFINED

Rack-Type: 3 Rows - 4 Columns

Go to Settings Menu

- Select Scanner Setting
- Select Rack Type
- Click SCAN-EDIT button
- Click Display Grid button
- Align grid to rack
- Then click REGISTER

OK

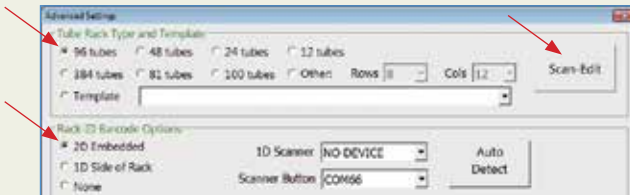For aligning the template follow the steps below:

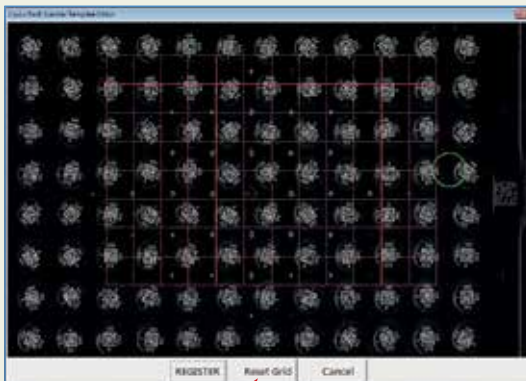|	
1	• In Cryo.s™ Rack Scanner software, open the Setting menu. Click on Setting…
2	• Place a rack on the Cryo.s™ Rack Scanner.
3	• Click on the 96 tube radio button. • If using the embedded 2D barcode click on the 2D embedded radio button. • Click the Scan-Edit button.
4	• A new window will open with a scanned image of the rack. • Click on Reset Grid.

5	• A new window will open with a scanned image of the rack. • Click on Reset Grid.
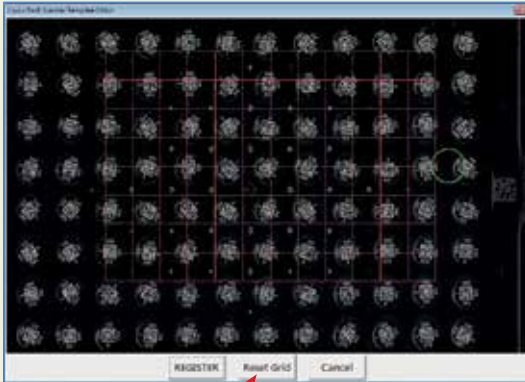
6	• In the Template Editor window click inside the red grid and drag the grid until tube barcodes are aligned within the grid.
	• For 2D embedded barcode find the green circle:
	  Click on the circumference and drag to re-size the circle.
	  Click on the center of the circle and drag to re-position the circle.
	  Place the green circle around the rack identification barcode.
	  The circle should fully contain the barcode.
	
	  a) When finished, click REGISTER.
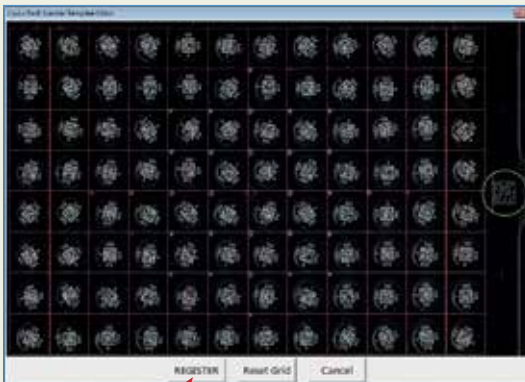
7	Additional settings are required:

A. Click on the Auto Detect button. The COM port for the One-Touch button should be detected.

B. Set Resolution (dpi) to 600.

C. (Optional) If the scanned image is too dark or too bright, adjust brightness setting.

D. To start, use Standard decoding options. If tubes fail to decode, switch to Power setting.

E. (Optional) Custom settings:
- Post Process Image – applies filters, such as sharpening, to scanned images.
- Maximise Post Processing – gives the best results, but takes more time.
- Quick-reject empty rack positions – speeds recognition of missing tubes.
- Hi-Power mode – used for barcodes with solid square borders.
- Extend Tube Image – compensates for poor scan grid alignment; 5 % is usually adequate.
- Auto-rescan - triggers additional scan if numeric criterion below is met. Stronger filters are applied with each rescan.

F. Click OK.
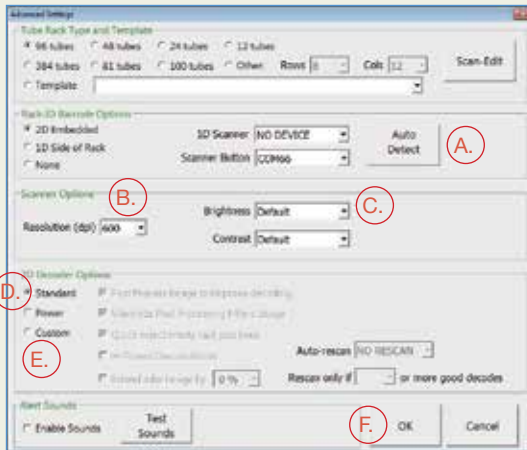
## 3.1.5   Confirmation of Output Settings

Introduction

Cryo.s™ Rack Scanner output is saved in a comma delimited (.csv) format. Headers, column names, and output fields are all customizable. Below is a sample output file as seen in a text editor:

Date & time of Trace = 10 Jul 2015 06:22:09 PM
Rack Base Name: Rack012235
RACK,POS,BARCODE,YDIM,XDIM,STATUS,RSERR,NOISE,MATRIX,TUBENUM,DATETIME,Column,Row,RowNum
Rack012235,A01,1072719050,12,12,0,0,0,,01,07/10/2015 18:22:09,01,A,01
Rack012235,A02,1072718956,12,12,0,0,0,,02,07/10/2015 18:22:09,02,A,01
Rack012235,A03,1072718957,12,12,0,0,0,,03,07/10/2015 18:22:09,03,A,01
Rack012235,A04,1072718958,12,12,0,0,0,,04,07/10/2015 18:22:09,04,A,01
Rack012235,A05,1072718959,12,12,0,0,0,,05,07/10/2015 18:22:09,05,A,01

Example of output setting

1	• In Cryo.s™ Rack Scanner software, open the Setting menu. Click on Output Options…
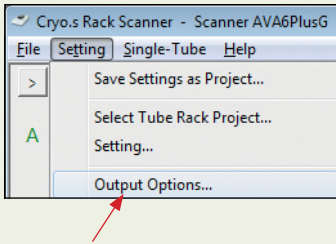
2	Quick Output Setup
	A. Select an output directory by clicking on the Output Folder button.
	  Note: Output file directory must be on a drive where the user has access privileges.
	B. Check the box to create an output file for each individual rack.
	C. For faster output file creation, check the box to automatically display output dialog after scanning.
	D. Standard one-tube per row creates a list of tubes and their barcodes.
	E. When using a template, data is output in the order specified by the template. Row-wise and column-wise are not relevant.
	F. Output Fields
	  Output Header is optional.
	  Column names are optional.
	  For most applications, DEFAULT fields will be sufficient.
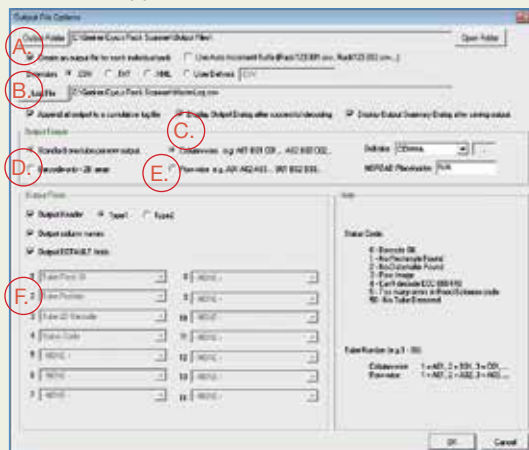
3.1.5.1 Detailed Description of Output Settings

These settings are listed as they appear in the output settings window (see above), from top to bottom, and left to right.

Output settings	
Output folder button	Click on this to set the output folder. Default directory is Documents\Greiner\Cryo.s™ Rack Scanner.
Open folder button	Click this button to open the output folder in a new window.
Create an output file for each individual rack - this is the default output file.	These files are typically named using the barcode on the side of the rack. If the same rack name is used twice, the previous output file will be over-written (unless auto-incrementing is enabled).
Use auto-increment suffix	When the same rack name is used twice, a new file name is created using a numeric suffix. For example, the files would be named Rack.001, Rack.002, Rack.003, etc.
Extension	This refers to the name of the output file. This is typically set to .csv, but any extension can be defined by the user by clicking on the User Defined button and typing a new extension. The .xml option creates an output file in XML format.
Log file	This is available only when appending to a log file is enabled. Click on this button to choose a directory and a name for your log file.
Append all output to a cumulative log file	This enables the creation of a log file that saves all scans into one file.
Display output dialog after successful decoding	Automatically opens an output dialog if any tubes are decoded. You may manually enter the rack barcode, or use a handheld barcode scanner.
Display output summary dialog after saving output	After saving an output file, this will display a summary window with a button to open the output folder.
Standard one-tube-per-row output	All data for each tube occupies one row in the output file. Each field is separated by a comma (or other delimiter).
Column-wise	For a rack organised in a rectangular grid, output is listed by column order. For example, A01, B01, C01… H01 are listed before A02, B02, C02…etc.
Delimiter	Default setting is comma. Tab and space can also be used to separate output fields, as well as any user defined character.
Barcode-only 2D array	This option will output barcodes only in a two-dimensional table. This is only for racks organised in a rectangular grid.
Row-wise	For a rack organised in a rectangular grid, output is listed by row order. For example, A01, A02, A03… A12 are listed before B01, B02, B03…etc.
NOREAD Placeholder	The text entered in this box will be saved in place of a barcode if a tube cannot be read. Normally, the barcode is left blank.

Output header	This can be switched on or off.
	 • Type 1:
	   Date & Time of scan = 23 Mar 2015 08:43:23
	   File Name = C:\Greiner Bio-One\SampleScan Output\Rack0001.csv
	   Rack Identifier = Rack0001
	 • Type 2:
	   Date & time of Trace = 10 Jul 2015 11:34:12 AM
	   Rack Base name: Rack0001

Output column names	This can be switched on or off. When enabled, each column begins with the output field name. For example "RACK," "POS," or "BARCODE."
Output default fields	When checked, this enables four output fields: Tube rack ID, Tube position, Tube 2D barcode, and Status code. When unchecked, this allows the user to customise output fields. Descriptions of output fields: • Tube rack ID – This is the barcode label on the side of the rack, or a manually entered name • Tube position – This is the position of the tube expressed as a single piece of text. For example, "A01." • Tube 2D Barcode – This is the decoded barcode from the tip of the tube. In demo mode, the barcode will contain "DEMO_" as a prefix. • Vertical Dimension of 2D Barcode – This is the size of the barcode (in pixels) in the vertical direction. • Horizontal Dimension of 2D Barcode – This is the size of the barcode (in pixels) in the horizontal direction. • Status Code – Indicates the success or failure mode of barcode reading. A description of the codes is located on the right of the output file options window. • Reed Solomon Error Count – Indicates the fidelity of the scanned image. • Noise Percentage – Do not use. • Mapping Matrix – Do not use. • Tube Number – This will start at 1 and increase by an increment of 1 until the final number of tubes is reached. • Date-Time – This will output the date in mm/dd/yyyy format, followed by the time in 24 hour format. • Column - Is the column number of the tube position • Row – is the letter indicating the row of the tube position. • Row Number – is a number indicating the row, where A=1, B=2, C=3, etc.

```
RACKD_3234.csv - Notepad
File  Edit  Format  View  Help
Date & Time of scan = 28 December 2009   12:20:09
File Name = C:\Documents and Settings\User1\My Documents\BioMicroLab\s
Rack Identifier = RACKID#3234
RACK,TUBE,BARCODE,STATUS
RACKID#3234,A01,1018568986,0
RACKID#3234,A02,1018568995,0
RACKID#3234,A03,1018568985,0
RACKID#3234,A04,1018568972,0
RACKID#3234,A05,1018568984,0
RACKID#3234,A06,1018568973,0
RACKID#3234,A07,1018568974,0
RACKID#3234,A08,1018569044,0
RACKID#3234,A09,1018568982,0
RACKID#3234,A10,1018566927,0
RACKID#3234,A11,1018568976,0
```

Output file example with:
- Header option selected
- Column names selected
- Row-wise data ordering

```
RACK_ID..._4567.csv - Notepad
File  Edit  Format  View  Help
RACK,TUBE,BARCODE,STATUS
RACK ID# 4567,A01,1018568986,0
RACK ID# 4567,A02,1018568995,0
RACK ID# 4567,A03,1018568985,0
RACK ID# 4567,A04,1018568972,0
RACK ID# 4567,A05,1018568984,0
RACK ID# 4567,A06,1018568973,0
RACK ID# 4567,A07,1018568974,0
RACK ID# 4567,A08,1018569044,0
RACK ID# 4567,A09,1018568982,0
RACK ID# 4567,A10,1018566927,0
RACK ID# 4567,A11,1018568976,0
RACK ID# 4567,A12,1018568977,0
RACK ID# 4567,B01,1018569059,0
RACK ID# 4567,B02,1018568987,0
```

Output file example with:
- Column names selected
- Row-wise data ordering

```
RACK_ID..._ABCD.csv - Notepad
File  Edit  Format  View  Help
RACK ID# ABCD,A01,1018568986,0
RACK ID# ABCD,A02,1018568995,0
RACK ID# ABCD,A03,1018568985,0
RACK ID# ABCD,A04,1018568972,0
RACK ID# ABCD,A05,1018568984,0
RACK ID# ABCD,A06,1018568973,0
RACK ID# ABCD,A07,1018568974,0
RACK ID# ABCD,A08,1018569044,0
RACK ID# ABCD,A09,1018568982,0
RACK ID# ABCD,A10,1018566927,0
RACK ID# ABCD,A11,1018568976,0
RACK ID# ABCD,A12,1018568977,0
RACK ID# ABCD,B01,1018569059,0
RACK ID# ABCD,B02,1018568987,0
RACK ID# ABCD,B03,1018568994,0
```

Output file example with:
- No header or column name options selected
- Row-wise data ordering

Output file example with:
- XML Example


```xml
<?xml version="1.0"?>
- <OUTPUT>
  - <HEADER>
      <DATE>2015-05-20</DATE>
      <TIME>11:13:31</TIME>
      <RACKID>FR04269498</RACKID>
      <RACKID_SOURCE>EMBEDDED</RACKID_SOURCE>
      <TEMPLATE>Meso Rack With Embedded ID</TEMPLATE>
    </HEADER>
  - <TUBES>
    - <P_1>
        <RACK>FR04269498</RACK>
        <POS>1</POS>
        <BARCODE>4004051391</BARCODE>
        <YDIM>14</YDIM>
        <XDIM>14</XDIM>
        <RSERR>1</RSERR>
        <STATUS>0</STATUS>
      </P_1>
    - <P_2>
        <RACK>FR04269498</RACK>
        <POS>2</POS>
        <BARCODE>4000224086</BARCODE>
        <YDIM>14</YDIM>
        <XDIM>14</XDIM>
        <RSERR>1</RSERR>
        <STATUS>0</STATUS>
      </P_2>
```
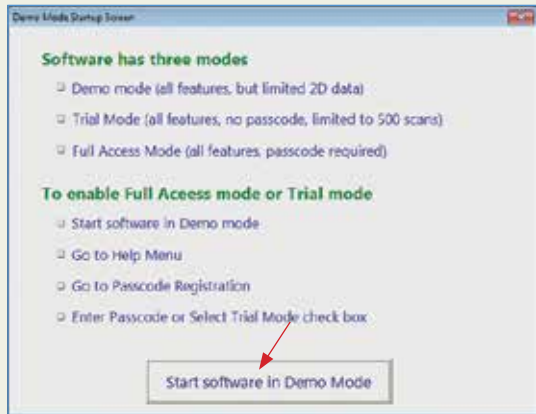
3.1.6 Passcode registration

! Passcode registration is a one-time process. The passcode is unique to each Cryo.s™ Rack Scanner. A passcode is required each time you install your Cryo.s™ Rack Scanner on a new computer.

For passcode registration the following steps need to be carried out:

| 1 | • Open Cryo.s™ Rack Scanner software
• Select: Start software in Demo Mode |

Demo Mode Startup Screen

Software has three modes

- Demo mode (all features, but limited 2D data)
- Trial Mode (all features, no passcode, limited to 500 scans)
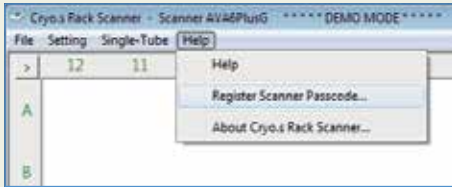- Full Access Mode (all features, passcode required)

To enable Full Access mode or Trial mode

- Start software in Demo mode
- Go to Help Menu
- Go to Passcode Registration
- Enter Passcode or Select Trial Mode check box
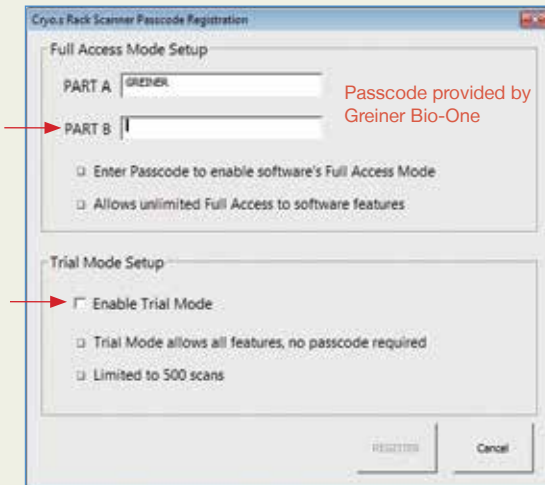
[Start software in Demo Mode]

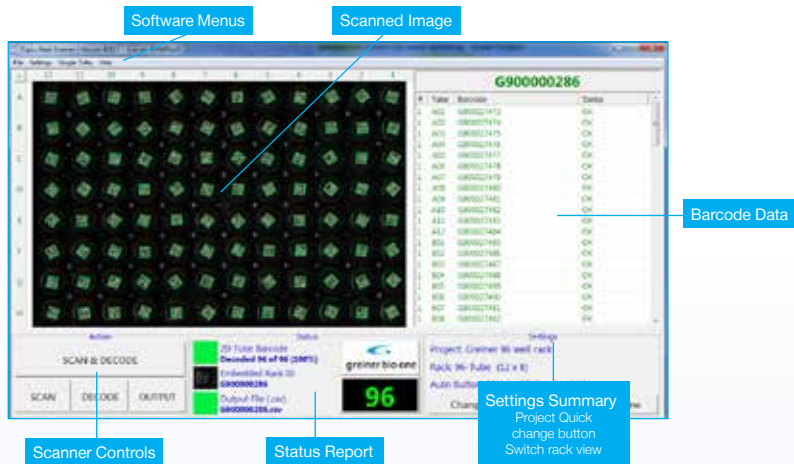| 2	• Open Cryo.s™ Rack Scanner software • Open the Help menu and select Register Scanner Passcode…

| 3	Passcode Options:
	• Enter Part A and Part B
	    • Provides full access
	    • Provided by Greiner Bio-One
	• Select Enable Trial Mode
	    • Limited demo mode
	    • Provides up to 500 scans

4.   BASIC USE

4.1   Main processing screen

Software Menus

Scanned Image

Barcode Data

Scanner Controls

Status Report

Settings Summary
Project Quick
change button
Switch rack view

4.2   Scanning a rack of tubes

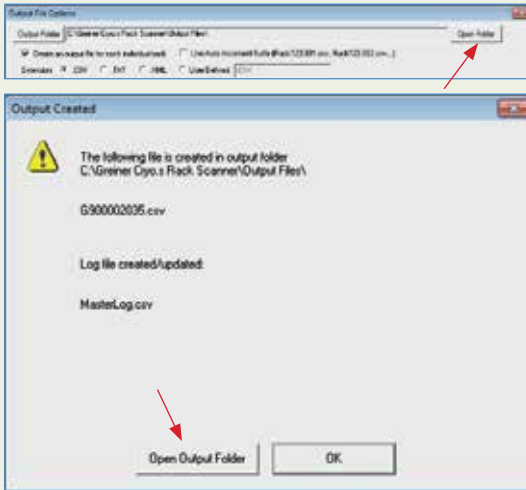| 1	• Place a rack of tubes on the scanner window. Things to be careful of: A. Tubes racks should be aligned with A01 label on the scanner. B. The rack should be fully seated within the window of the scanner.

A01

A.

B. No Gaps
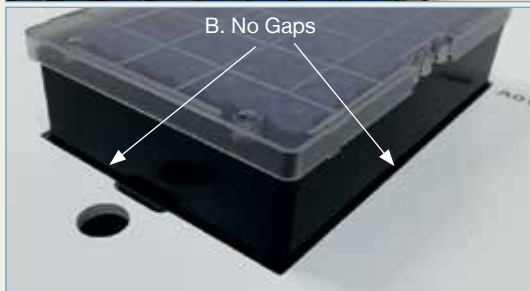
2	To start scanning:
	A. Press the One-Touch button,
	OR
	B. Click on the SCAN and DECODE button.

A. Press

Action
B. Click

SCAN & DECODE
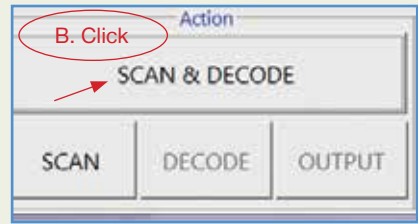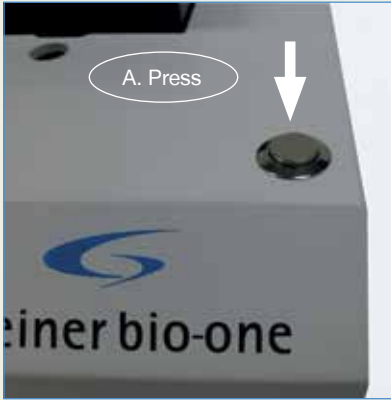
| SCAN | DECODE | OUTPUT |

3	After scanning and decoding, the output dialog should open (if not, click on the Output button). Scan the rack barcode with a handheld scanner, or manually enter the rack identification number.
	Note: Successful creation of output files is indicated by three green squares at the bottom of the main screen:

Status
2D Tube Barcode
Decoded 96 of 96 (100%)
Embedded Rack ID
G900002035
Output File (.csv)
G900002035.csv

greiner bio-one

96

Create Output

Current Output Options
Output Folder: C:\Greiner Cryo.s Rack Scanner\Output Files\
Number of Output Columns: 4

1. Tube Rack ID
2. Tube Position
3. Tube 2D Barcode
4. Status Code

Rack Status

RACK 1   96 of 96 tubes decoded (100%)

Enter Rack ID
Rack 1
C:\Greiner Cryo.s Rack Scanner\Output Files\G900002035.csv

Create   Cancel

| 4	To access the output file:
	A. Open the Output Options window and click on the Open Folder button.
	B. Open the Output Options window and enable Output Summary Dialog to display the window on the right.
5	Note:
	• Successfully decoded tubes are indicated by green squares.
	• Missing tubes are indicated by blue circles.
	• Unreadable barcodes are indicated by red circles.
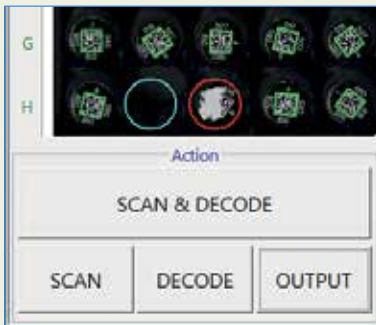
6	Switching Projects (Change rack formats)
	• Quick change menu
	• Click the Change Project button
	• Select desired rack format from the list
	Note: Original projects are created and stored in the settings menu
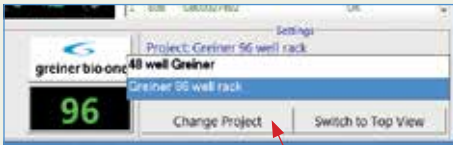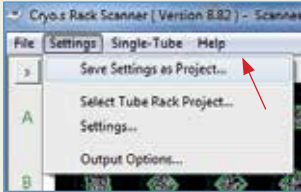
| 7	Troubleshooting barcodes:
	Go to Settings:
	A. Adjust brightness and contrast settings.
	B. Adjust 2D decoder options.
	- Test with Power setting.
	- Adjust and test with Custom setting.
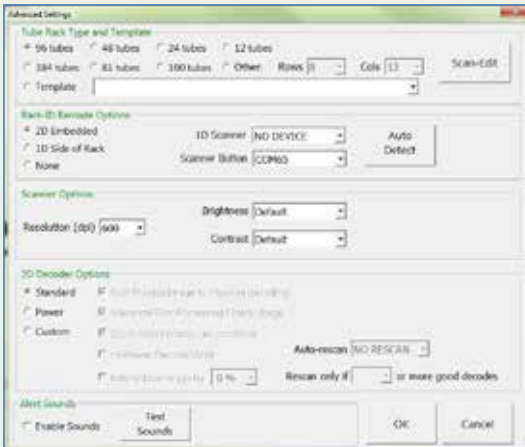
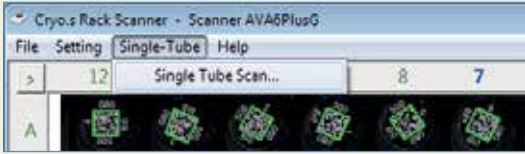| 8	To view a detailed image and barcode information for a tube, double-click on the tube in the scanned image.
	It is possible to edit the barcode for output by clicking on the Edit button (lower right of window).
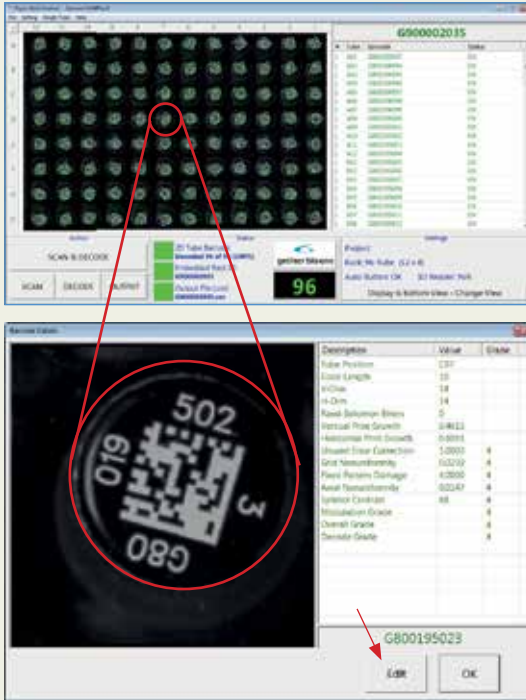
4.3 Single tube scanning

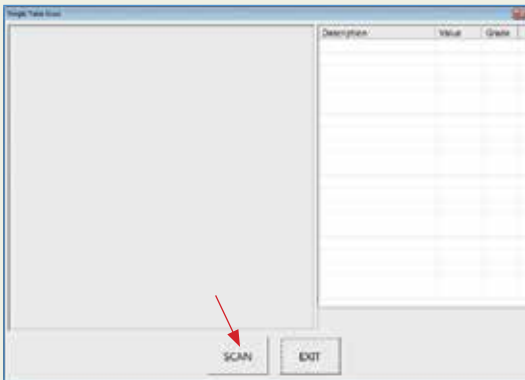| 1	To scan a single tube, place the tube in the small round window on the scanner.
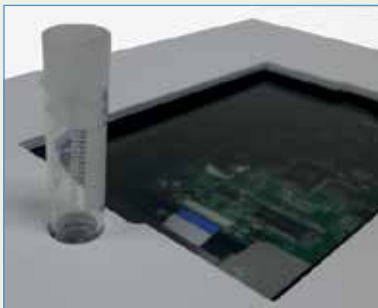
2	Open the Single-Tube menu and select Single Tube Scan…

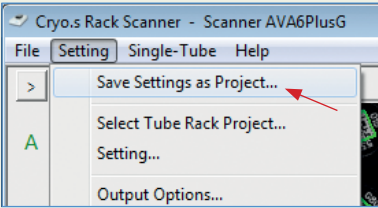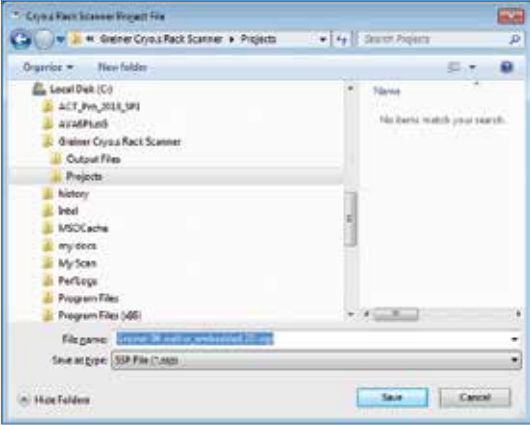| 3	Click SCAN.
	Scanned image and barcode details of single tube will appear. The barcode is automatically copied to the clipboard. Simply paste it into any application.
	Click EXIT when finished.

5. SYSTEM SOFTWARE AND HARDWARE CONFIGURATION

5.1 Using projects

Once settings have been tested and finalized for a type of labware, it is highly recommended to save these settings as a project. This is especially true if you work with multiple labware, where setting changes can be easily confused between one labware and another. Changing projects allows a user to change all settings in one action.

1	To save a project, click on the Setting menu and select Save Settings as Project…
2	Enter a name for the project.
3	Click Save. You may rename the project if desired.

4	To load or change projects, open the Settings menu and Select Tube Rack Project…
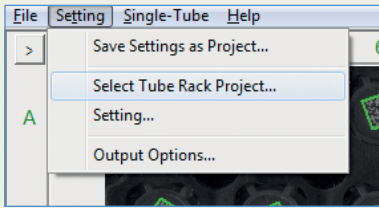
| 5	A. In the pop-up window, click on the Select Tube Rack Project button. B. Select your project in the drop-down menu. C. Click the Apply button All saved settings for the labware are now applied.
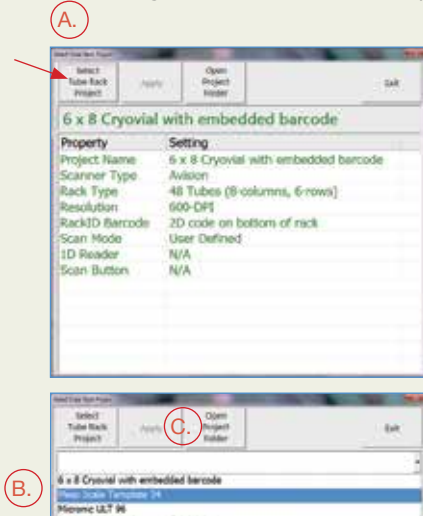
| 6	Switching Projects (Changing rack formats from the main screen) • From the Main Processing screen • Click the Change Project button • Select desired rack format from the list **Note: Projects are created and saved in the settings menu, save settings as a Project**
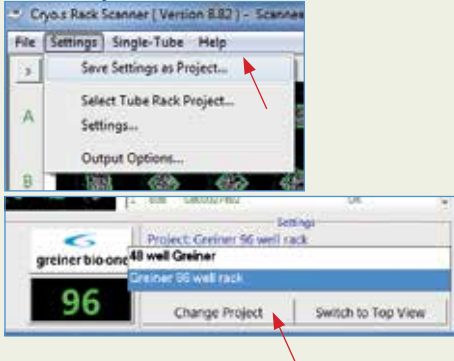
5.2   Sounds

Alert Sounds – enables audible alerts of key scanning features.

Sounds require speakers on computer system.
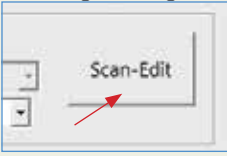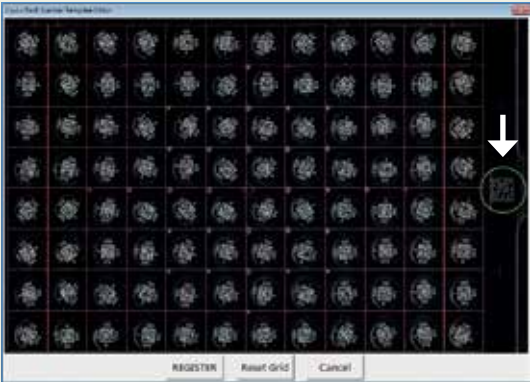
1	From the Settings menu • Select the Enable Sounds check box.
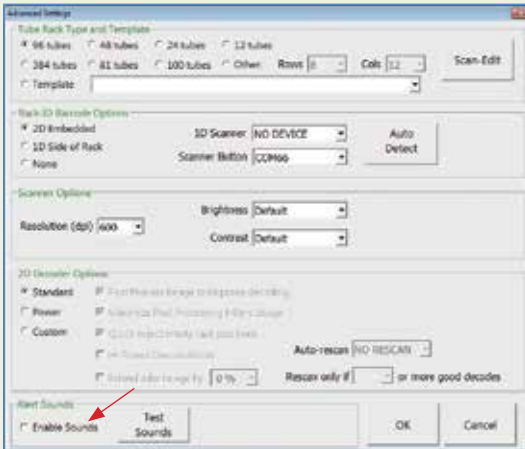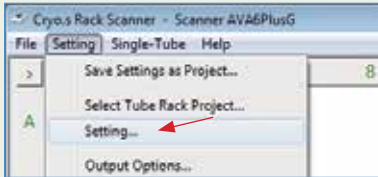
5.3   Set up and scanning embedded barcodes

Greiner Bio-One racks have an embedded data matrix barcode on the bottom of the rack, intended to be scanned as tube rack barcodes. This streamlines the creation and naming of output files. The setup for these embedded barcodes is accomplished during the SCAN-EDIT process.

1	In Settings\Setting… under "Rack-ID Barcode Options," select 2D Embedded Rack-ID Barcode Options • 2D Embedded ◦ 1D Side of Rack ◦ None
2	In Settings\Setting…… Click on the Scan-Edit button Scan-Edit
3	In the Template Editor window, find the green circle. • Click on the circumference and drag to re-size the circle. • Click on the center of the circle and drag to re-position the circle. Place the green circle around the rack identification barcode. The circle should fully contain the barcode. **Note: the red grid should also be aligned to the tube positions.** Click REGISTER when finished.

4	• After scanning a rack, an output file should be automatically generated if you use the One-Touch button. Otherwise, press ENTER to save in the dialog window • Success is indicated by three green squares in the main window. • Double-click on the green square next to the Embedded Rack ID to see an image of the rack identification barcode. You may edit the barcode in the close-up view.

5.4   How to operate the one-touch scanner button

• The one-touch scanning button allows fully automated scanning and output file creation.
• Press the one-touch button to initiate the scan and decode process.
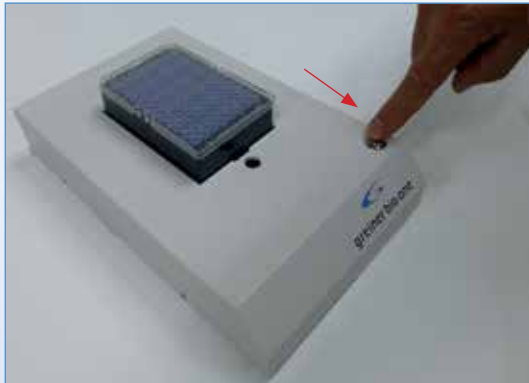
Start of Scan an Decode process

The output file is automatically generated and sends the output file to the designated output file folder.

On-screen prompts display the scanning results.

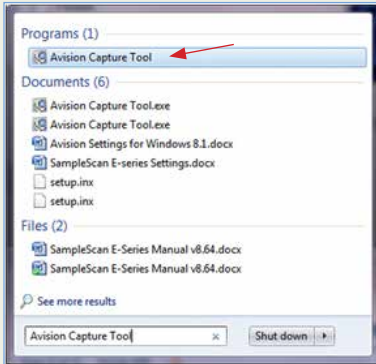**Example of Scanning results**

All green squares: 100 % success, Output file successfully created.

5.4.1 Advanced Scanner Driver Setup

1	A. Open the Start menu. B. Search for "Avision Capture Tool" C, Select the program above (see arrow).
2	A. Driver Type is set to TWAIN B. Scanner Model is set to AVA6PlusG C. Click OK
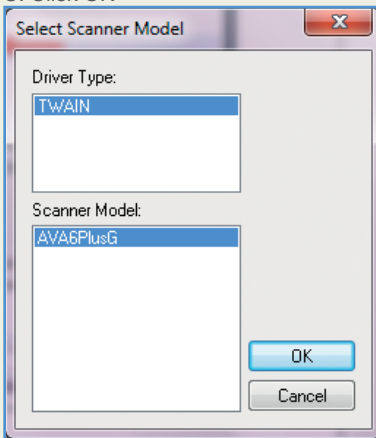
3	Click on Setup button (circled).
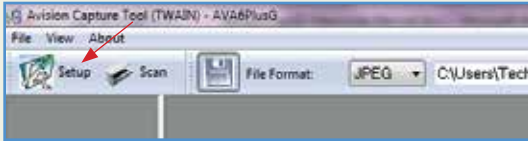
4	Select the Paper tab, A. Set "Cropping" to Fixed to Transport. B. Set "Scan Area" to Scanner Maximum.

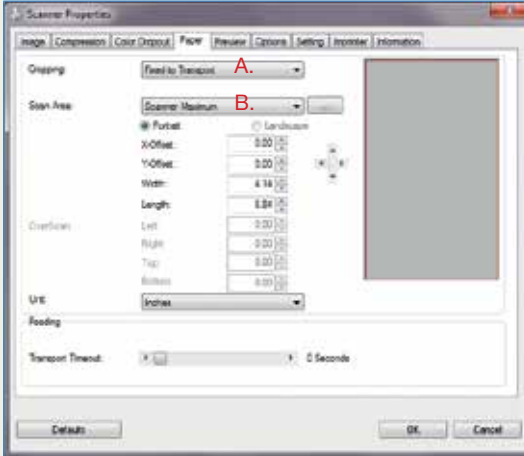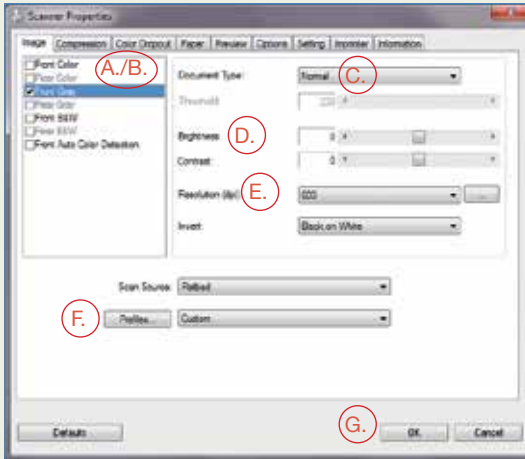| 5	Select the Image tab,
	A. Check the box in front of Front Gray.
	B. Click on Front Gray so it is highlighted.
	C. Set "Document Type" to Normal.
	D. Brightness can be left at zero for now. You can change brightness in Greiner Bio-One Cryo.s™ Rack Scanner Software if needed.
	E. Set resolution to 600 dpi.
	F. (Optional, but useful) To save settings for all tabs in one profile, click on the Profiles button. You can quickly recall your settings this way.
	G. Click OK when finished.
6	Close Avision capture tool

5.4.2   Editing Scanning Templates

Templates allow for scanning racks with non-standard tube alignment (e.g. honeycomb-like arrays of tubes) from labware suppliers other than Greiner Bio-One.

For adjusting non-standard templates chose from the pre-set templates found in the Advanced Settings Section. Chose templates which are closest to your non-standard rack type and fine-adjust the template applying a trial and error process involving the scan-edit function.
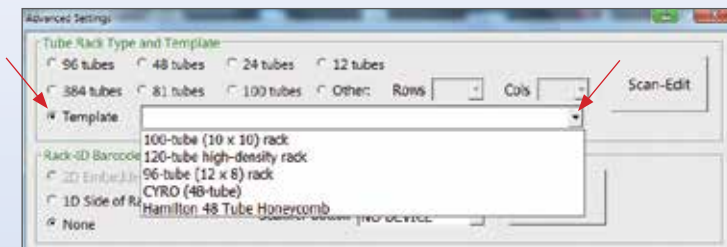
6. TROUBLESHOOTING TIPS

Symptoms	Causes and Cures
Error Code 129 Can't find the scanner	• Reboot computer • Review/Confirm the Advanced Scanner Settings section of this manual to ensure proper scanner set up. • Connect and disconnect USB cable to ensure connectivity.
	• Scanner warm up time needed. • Retry scan operations in one minute.
"RACK TEMPLATE UNDEFINED" error: 	1. SCAN-EDIT process needs to be completed for the selected rack: • Open Settings\Setting… • Click on SCAN-EDIT button. • After scanned image appears, click on Reset Grid button. • Align grid to tube positions by clicking and dragging on the grid or its corners. • Click REGISTER. • Try to scan again.
	• Error generated by the original scanner manufacturer. Does not affect scan or scan result data. Click Close to exit the notice.
Software closes when you try to scan a rack	1. Scanner driver is incorrectly selected. Make sure you choose the correct driver for your scanner. For Cryo.s™ Rack Scanner, it is the AVA6 driver. Scan-edit process must be completed. See the entry directly above. 2. Cryo.s™ Rack Scanner: make sure the Avision Capture Tool settings are correct.

Symptoms	Causes and Cures
Tubes are scanned, but do not decode	1. Make sure the rack is fully seated in the scan window. 2. Look for individual tubes that are not fully seated in the rack. 3. Wipe away condensation or dirt from the bottom of tubes. 4. Repeat the Scan-edit procedure in the Settings window to make sure the grid is properly aligned (barcodes are centered within spaces on the grid). 5. In the settings window, under 2D Decoding Options, choose the custom setup and check all boxes. Extend tube image by 10 %. 6. Enable re-scans. Set the number of rescans and number of decoded tubes to trigger a rescan. 7. Cryo.s™ Rack Scanner: a. Double click on the tube image to enlarge. If the image looks too bright, or if a crescent-shaped glare obscures the barcode, reduce brightness to -40 in the settings window. b. If the image looks too dark, increase the brightness in the settings window.
Scanned image is black, tube rack is the wrong size or off center.	1. Make sure the correct scanner driver is selected. AVA6 for Cryo.s™ Rack Scanner. 2. Cryo.s™ Rack Scanner: make sure the Avision Capture Tool settings are correct.
One-touch button is unresponsive	1. Open Device Manager. Under Ports (COM & LPT), make sure there is a listing for USB Serial Port. If one does not exist, make sure the USB cable for the One-Touch button is installed. 2. In Settings\Setting… click the Auto-Detect button. The COM port for the scanner button should appear.
Scanner driver is not an option when using File\Select Scanner…	1. Make sure power is connected to the scanner. 2. Check the USB cables are fully inserted. 3. Make sure scanner driver is installed.
Output files are not generated	1. In Settings\Output Options… make sure "Create an output file for each individual rack" is checked. 2. Make sure the Output folder is a valid directory. Click the Open Folder button, which will open a new explorer window if a valid directory is specified. If not, click on the Output Folder button to specify a valid directory. 3. User login must have file access privileges to output file destination.

7.   MAINTENANCE, SERVICE AND WARRANTY

7.1   Cleaning of the scanner

The device can be cleaned using a cloth damped with water, mild cleaning solution, commercially available RNase and DNA decontamination solutions or 70 % ethanol in water.

7.2   Software upgrades

Greiner Bio-One provides no-charge software upgrades to the original owner of the scanner system.

7.3   Product warranty

Greiner Bio-One warrants the scanner free from defects for a period of 60 months after purchase. A Warranty Certificate is part of this manual and must be kept during the entire period of product warranty. Within this 60-months period of product warranty Greiner Bio-One covers costs for shipping and repair of systems deemed defective. Greiner Bio-One reserves the right to charge repair costs to the customer in case misuse of the system was identified. Misuse not be covered by warranty includes:
• dropping of unit
• liquid overspill
• opening the device and
• manipulation of the device.

Furthermore, Greiner Bio-One reserves the right to replace non-functional scanners by new systems rather than repairing defective systems.
Greiner Bio-One issues an RMA number (Return Merchandise Authorization) for all cases of product repair within terms of warranty. Keep this RMA no. at hand for all communication within the context of a particular warranty case.
In case of warranty contact your local Greiner Bio-One representative who will guide you through all steps of this process.
For further information on GENERAL TERMS AND CONDITIONS FOR SCANNER REPAIR AND WARRANTY contact your local Greiner Bio-One representative.

7.4   Repair

Contact your local Greiner Bio-One representative in case you want your non-functional scanner be repaired after period of warranty has expired or scanner became non-functional for reasons that are not covered by warranty terms.

8. DECLARATION OF CONFORMITY

$C\,E$

Declaration of Conformity

Product: Cryo.s™ Rack Scanner
Manufacturer: Greiner Bio-One GmbH
Description: Rack Scanner

Greiner Bio-One GmbH declares with sole responsibility thet the Cryo.s™ Rack Scanner complies with the following directives and standards:
- DIRECTIVE 2006/42/EC on machinery Annex IIA
- DIRECTIVE 2014/30/EU electromagnetic compatibility
- DIRECTIVE 2006/66/EC on batteries and accumulators and waste batteries and accumulators
- DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS)
- DIRECTIVE 2006/95/EC relating to electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
- DIRECTIVE 2004/108/EC on electromagnetic compatibility
- Directive 2002/96/EC on waste electrical and electronic equipment (WEEE)
- EN ISO 12100-2: Safety of machinery - General principles for design - Risk assessment and risk reduction
- EN ISO 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements

EU Compliance

This product carries a CE mark. It meets the requirements as contained in the EU directives 89/336/EEC and 73/23/EEC.

Manufacturer:
Greiner Bio-One GmbH
Maybachstr. 2
72636 Frickenhausen
Germany

Signed for and on behalf of Greiner Bio-One GmbH:

_____
Dr. Alexander Ganser

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