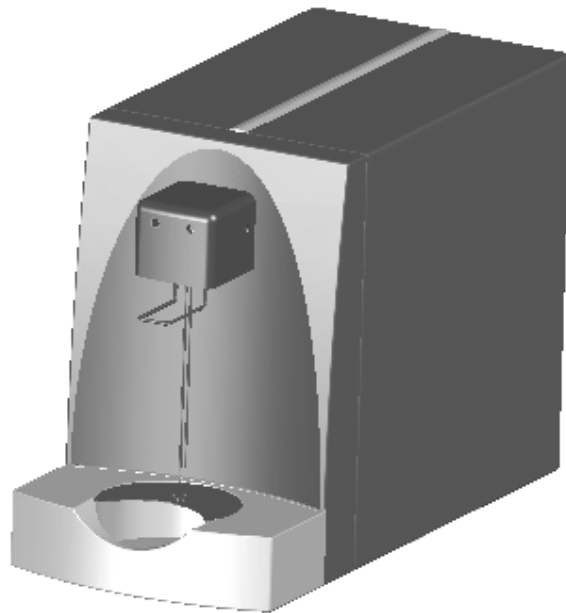


YeastCyte[®]

YeastCyte[®] User Handbook
January 2007



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1 IMPORTANT

PLEASE READ THIS MANUAL, PARTICULARLY THE SAFETY INFORMATION, BEFORE ATTEMPTING TO USE THE INSTRUMENT. IT IS ALSO IMPORTANT THAT YOU RETAIN THE MANUAL FOR FUTURE REFERENCE. BIODETECT AS CANNOT BE HELD RESPONSIBLE FOR ANY DAMAGE CAUSED AS A RESULT OF ANY USER NEGLECTING TO READ THE MANUAL.

1.1 DISCLAIMER

Your YeastCyte® has been carefully designed, constructed and tested and is supplied in good faith. However, attention is drawn to *BioDETECT AS's* Terms and Conditions of Sale.

BioDETECT AS shall have no liability or responsibility to the customer or any other person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by equipment or software sold or furnished by us, including, but not limited to, any interruption of service, loss of business or anticipatory profits or consequential damages resulting from the use or operation of the equipment or software.

This manual is for guidance only. The information in this manual is subject to change without notification and additional pages may be inserted in future editions. *BioDETECT AS* assumes no responsibility for any omissions or errors in the present edition.

1.2 SAFETY INFORMATION

1.2.1 General

The YeastCyte® flow cytometer is designed for use only by suitably trained persons, in a laboratory or industrial environment and must never be used for household, diagnostic or therapeutic purposes. For safety reasons, the YeastCyte® should not be operated in ambient temperatures above 30°C, and must never be used in potentially explosive atmospheres.

1.2.2 Electrical and Optical Safety

The YeastCyte® uses an external mains power unit – MASCOT, model 2020. This unit meets the requirements of EN60950 and is CE marked by the manufacturer. No other mains power supply should be used. The power supply is for indoor use only, and must be kept dry. There are no user-serviceable parts inside the power supply - do not open. Use the mains lead provided to connect to a suitably fused mains supply in the range 100-240 V AC. The power unit is double insulated, so an earth connection is not essential.

The YeastCyte® itself have one external fuse (3.15 A (T)), and only this type should be used as replacement. The YeastCyte® must not be operated with the cover removed. The instrument generates high internal voltages, and contains a LASER, both of which could be hazardous without the cover. The YeastCyte® is a CLASS 1 LASER PRODUCT when cover is on.

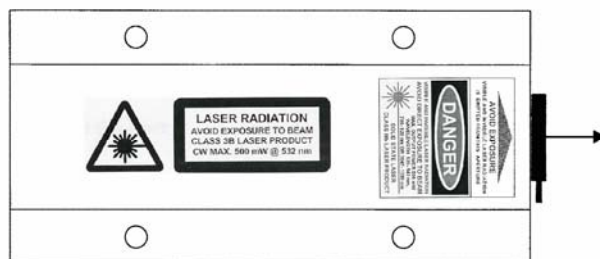


Figure 1 Laser with position of warning

The internal optical block is classified as a CLASS 3B laser product. No parts should be removed or replaced and no modifications or adjustments should be made without the approval of *BioDETECT AS*. Do not continue using a damaged or faulty instrument.

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1.2.3 Biological Hazards

If hazardous micro-organisms are used with the YeastCyte[®], the whole instrument must be treated as potentially hazardous. The fluid system cannot be considered safe until it has all been thoroughly cleaned with a suitable disinfecting fluid. It is the responsibility of the user to check the suitability of the disinfecting method used. The possibility of leaks in the fluid system should also be taken into account when disinfecting the instrument.

1.2.4 Other hazards

Suitable precautions should be taken when using radioactively-labelled organisms or particles. Some chemicals used in sample preparation are hazardous and will accumulate in the fluid system. Some fluorescent dyes are potential carcinogens and are not destroyed by autoclaving. Take suitable precautions in all cases and confer with your local regulations. For electromagnetic compatibility information, see Appendix 1.

1.3 Symbols and abbreviations

CV	Coefficient of variation
PI	Propidium iodide
LED	Light-emitting diode
PBS	Phosphate buffered saline

2 DESCRIPTION OF THE INSTRUMENT

2.1 General working principle

The YeastCyte® system consists of three parts: (i) a built in liquid handling system that mixes the yeast sample and the dye buffer (PI). (ii) A built in optical system (flow cytometer) that measures the light scatter and fluorescence from the stained yeast cells and (iii) a computer system analysing and presenting the measurements. A schematic presentation of the working principle is illustrated in Figure 2.

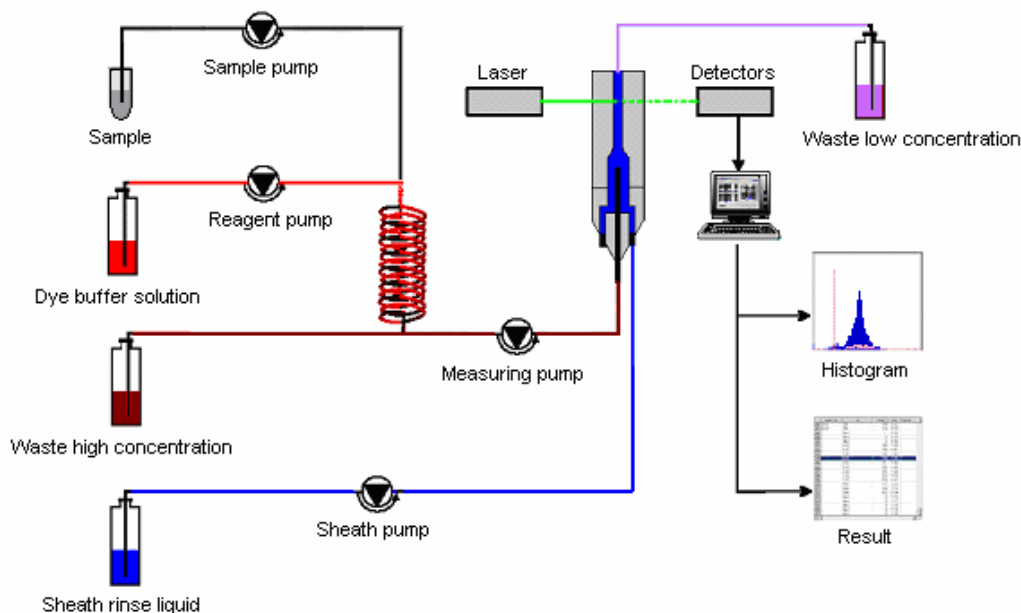


Figure 2 A schematic illustration of the working principle of the YeastCyte® system

1. The sample (approx. 5 ml) is pumped through the pipette and the Dye Buffer Solution is pumped from the Dye Buffer container and mixed at a ratio of 1:2, one part sample and two parts Dye Buffer.
2. The mixture is passed through the reaction loop.
3. A small amount of the sample/Dye Buffer mixture is pumped to the flow cell by the measuring pump. This pump delivers a known volume (1.5 µl per second) to the flow cell.
4. The majority of the mixture is collected in the *high concentrated waste* container (see section 2.5.1).
5. In the flow cell the sample/Dye Buffer mixture is deposited in a laminar stream of Sheath liquid and hit by a laser beam (excitation wavelength 532 nm).
6. When the cells pass the beam they give off scattered - and fluorescent light (>570 nm), which is detected by two detectors. The signals are processed by the computer to generate the counts and histogram of the sample.
7. The spent sheath liquid containing the analysed yeast sample is delivered as *low concentrated waste* (see section 2.5.2).
8. The pumping of Sheath liquid is controlled by a differential pressure transducer. In this way, the flow through the flow cell is stable and not effected by the fluid levels of the Sheath liquid and the Waste containers.

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2.2 The front

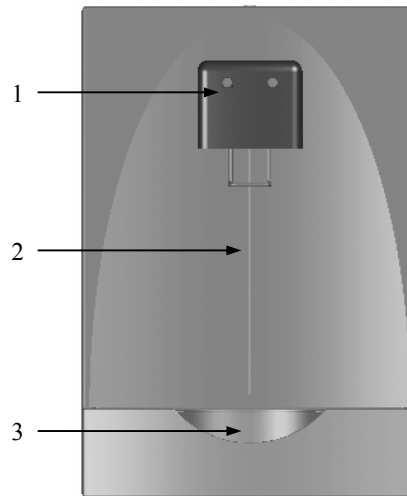


Figure 3 Front of YeastCyte[®]

- (1) Light Emitting Diodes:
GREEN: Ready, insert sample
RED: Busy, processing a sample, washing or in stand by mode.
GREEN/RED FLASHING: Waiting, sample must be removed before proceeding with the analysis.
- (2) Pipette with liquid sensor.
- (3) Tray for collection of effluent from the pipette.

2.3 The rear panel

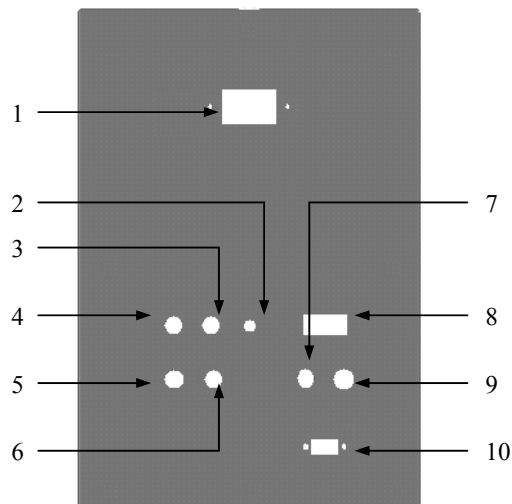


Figure 4 The rear panel of YeastCyte[®]

- (1) Timer.
- (2) Button for manually draining of the drawer in the front.
- (3) Connection of tubing for dye buffer (Dye buffer solution).
- (4) Connection of tubing for high concentrated waste (Waste high conc.).
- (5) Connection of tubing for low concentrated waste (Waste low conc.).
- (6) Connection of tubing for sheath liquid (Sheath rinse liquid).
- (7) Jack for 12 V DC supply.
- (8) Main switch.
- (9) Mains fuse (3.15 A (T)).
- (10) RS232 C serial port for connection to PC.

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2.4 Liquid input

2.4.1 Sheath rinse liquid

Deionised and sterile filtered water supplemented with Tween 20 (0.1%) and Na-acid (0.1%) is used as sheath rinse liquid. Mix *e.g.* 10.0 l of water with 10.0 ml of Tween 20 and 10.0 g Na-acid. Connect tubing to the rear panel (point 6 in Figure 4).

2.4.2 Dye buffer solution

Propidium iodide (PI) is used as fluorescent labelling substance. The dye is dissolved in PBS. Protect the dye buffer solution from light (dark bottles) and connect to the rear panel (point 3 in Figure 4).

2.5 Waste output

2.5.1 High concentrated waste

The sample and the dye buffer solution are mixed in the reaction loop. Only a small fraction of the mixture (approx. 6%) is actually pumped further to the flow cell for measurement. Thus most of the reaction mixture (approx. 94%) is pumped directly to waste. This is collected as high concentrated waste (point 4 in Figure 4). This waste consists of 33% yeast sample and 66% dye buffer solution. Dispose off according to local regulations.

2.5.2 Low concentrated waste

The low concentrated waste (point 5 in Figure 4) consists mainly of the spent sheath liquid containing some yeast and only traces of dye buffer solution. The drain from the drawer in the front (liquid from pipette washing) is also collected in the low concentrated waste, and may normally be drained to the sink.

3 DESCRIPTION OF THE SOFTWARE

3.1 Program window

3.1.1 General

The program window of YeastCyte[®] (Figure 5) consists of a menu bar, tool bar, and frames for data, histogram, id and status.

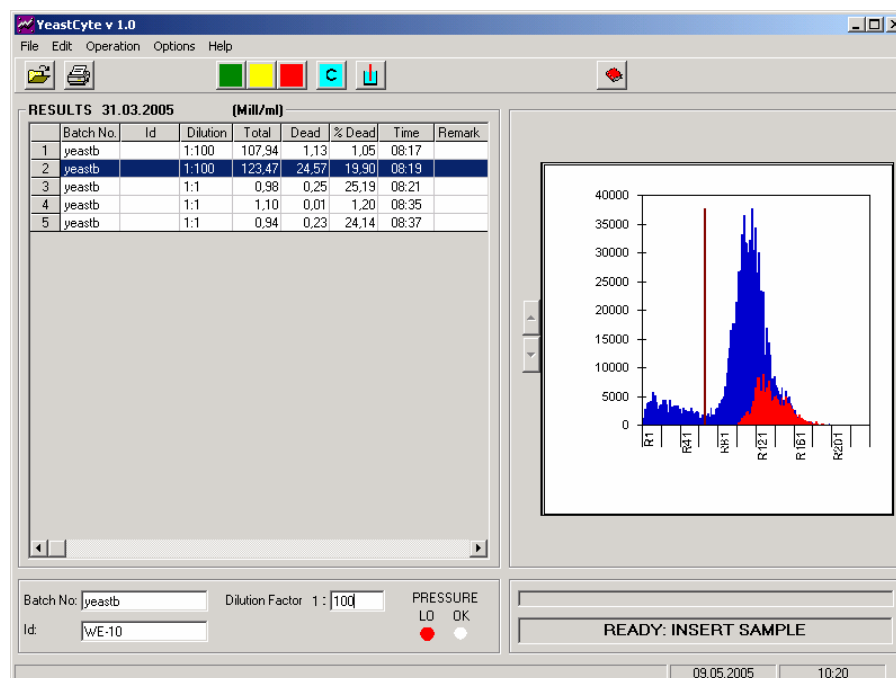


Figure 5 The YeastCyte[®] program window

3.1.2 Data Frame

The **Data Frame** contains a grid where results stored in the database files are displayed. The grid displays eight columns and a number of rows, one for each sample (see Figure 5). The last sample is listed at the bottom whilst the oldest will appear at the top. The grey column to the left holds the index of the sample. The column holds the following information:

- **Batch No**
The operator provides this information via the **Batch No** field in the **Id Frame**. The maximum length of this field is 8 characters.
- **Id**
The operator provides this information via the **Id** field in the **Id Frame**. The maximum length of this field is 12 characters.
- **Dilution**
The operator provides the information via the **Dilution Factor** field in the **Id Frame**. The maximum length of this field is 5 characters.
- **Total**
This column shows the total yeast cell count x 1 million (cells/ml) of the original sample, this calculation is based on the information given in the **Dilution Factor** field. The program calculates this value when the sample is analysed.
- **Dead**
This column shows the number of stained cells (dead cells) x 1 million (cells/ml). The program calculates this value when the sample is analysed.

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- **% Dead**
This column shows the number of dead yeast cells divided by the total number of cells x 100.
- **Time**
This column shows the time when the sample is started. Format is HH:MM.
- **Remark**
The operator may provide this information via the Edit Result Line dialogue. The maximum length of this field is 30 characters.

The date of the results in the grid is displayed in the title of the **Data Frame**. The sample currently highlighted will be displayed in the histogram.

3.1.3 Histogram Frame

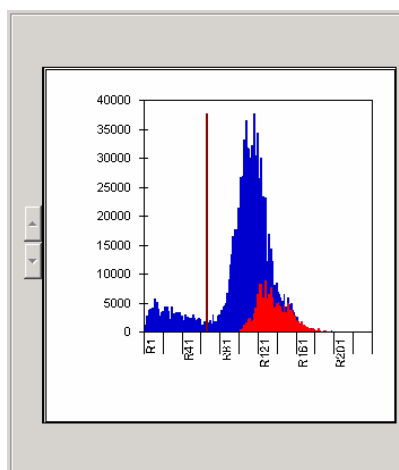


Figure 6 Histogram Frame

The **Histogram Frame** shows the histogram of the yeast cells in the sample. The red colour indicate cells that have been stained with PI (dead cells) whilst the blue part of the histogram indicates unstained cells (light scatter only). From the *Options Chart* menu, it is possible to show or hide the scale on the Y and X-axis. There is also an option to select between automatic or fixed scaling. When *Options Chart* ► *Auto Scale* is not selected, it will be possible to change the scale with the up/down control arrows.

3.1.4 Id Frame

Batch No: yeastb	Dilution Factor 1: 100	PRESSURE LO OK
Id: wE-10	<input checked="" type="radio"/> LO <input type="radio"/> OK	

Figure 7 Id Frame

- **Batch No field**
The *Batch No* field is writable. The maximum length is 12 characters. The content of this field is copied to the corresponding field in the **Results Frame** both when a sample is started and when the sample is finished.
- **Id field**
The *Id* field is writable. The maximum length is 8 characters. The content of this field is copied to the corresponding field in the **Results Frame** both when a sample is started and when the sample is finished.
- **Dilution Factor field**
The *Dilution Factor* field is writable; the maximum length is 5 characters. The content of this field is copied to the corresponding *Dilution* field in the **Results Frame**. The *Dilution Factor* field should contain the dilution factor used preparing the sample, the instrument uses this to calculate the amount of cells in the original sample. The result is shown in the **Results Frame**.
- **Pressure Indicators**
The pressure indicators will give information about the pressure of the pump system in the instrument.

3.1.5 Status Frame

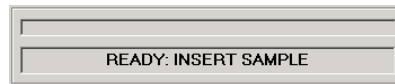


Figure 8 Status Frame

The **Status Frame** has a progress bar and a *Message* field. The *progress bar* shows the progress during the different sequences of the analysis. Status messages and instructions to the operator are displayed in the *Message* field.

3.1.6 Menu Bar

The **Menu Bar** contains menu entries to control the functionality of the program (see section 3.2).

3.1.7 Tool Bar

The **Tool Bar** contains buttons to access menu functions that are most commonly used. Each button has a tool-tip text that is displayed when the mouse pointer is placed over the button.

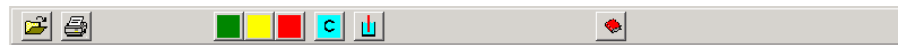


Figure 9 Tool Bar

3.2 Menus

3.2.1 File menu

The *File* menu will have the following sub-menus:

- **Open...**

The *Open* function will display the Open Results dialogue (Figure 10) giving access to the results stored in the Results directory. The dialogue will give information about the following items:

- The date of each result file.
- The number of samples in each file.

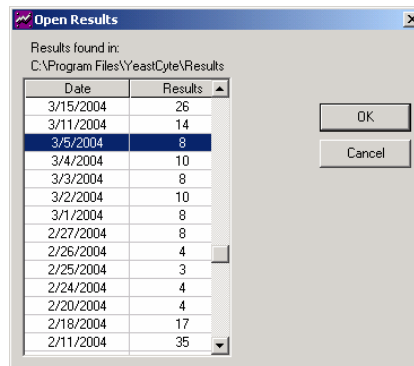


Figure 10 Open Results dialogue

The Open menu will not be available during a sample run.

- **Export Data...**

The *Export Data* function makes it possible to export results from the **Data Frame** to a file in separated xls format. The *Export Data* menu will not be available during a sample.

- **Print ►**

The *Print* menu gives access to the following print functions:

- **Results...**

This function prints out a result report. It is possible to select between print all or print the selected results in the **Data Frame**. More than one result can be selected by holding down the Shift-key and marking multiple

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results. This can also be done by simply holding down the left mouse button and then moving the mouse up or down the table.

- **Histogram...**
This function will print the displayed histogram together with the corresponding results from the **Data Frame**.
- **Screen...**
This function will print the program window.

The *Print* menu will not be available during a sample.

- **Print Setup...**
The *Print Setup* function will give access to the *Print Setup* dialogue. This function will not be available during a sample.
- **Exit**
The *Exit* function terminates the program immediately when only the software is started. The *Exit* menu will only be available when *User Access Level* is set to *Privileged User* and not during a sample. Ordinary users have to exit the program through the *Shut Down* procedure.

3.2.2 Edit menu

The *Edit* menu will have the following sub-menus:

- **Edit Result...**
The *Edit Result* menu entry will give access to the *Edit Result* dialogue. This dialogue will display information from the selected result line in the **Data Frame**. This can be done either by selecting the *Edit Results* menu, short-cut *Ctrl+E* or by double clicking the sample. Fields that can be edited is displayed with white background. Locked fields are displayed with grey background. The *Remark* field will always be open to edit. The *Batch No* and *Sample Id* fields will be open to edit if the last collected sample is opened.

3.2.3 Operation menu

The *Operation* menu will have the following sub-menus:

- **Start Sample**
The *Start Sample* menu will initiate the analysis if the pipette is immersed into liquid.
- **Fill**
The *Fill* menu will activate the *Fill* function. This function is only available for *Privileged User*.
- **Run**
The *Run* menu entry will activate the *Run* function. This function is only available for *Privileged User*. The pump for back-flushing the pipette must be disabled before activating the *Run* function.
- **Start Up**
The *StartUp* menu entry will activate the *Start Up* function (see section 4.2).
- **Stand By**
The *Stand By* menu entry will activate the *Stand by* mode (see section 4.5).
- **Shut Down**
The *Shut Down* menu entry will activate the *Shut Down* function (see section 4.6).
- **Clean**
The *Clean* menu entry will activate the *Clean* function. This is used if cleaning of the instrument is required during normal operation. Follow the instructions on screen.

3.2.4 Options menu

The *Options* menu will have the following sub-menus:

- **Port Configuration...**
The *Port Configuration* menu will open the *Port Configuration* dialogue where it is possible to select which port to use and whether the port shall be open or closed. The program will remember the selected port and the port state, even if the computer is turned off. The *Port Configuration* menu will not be available during a sample.
- **Auto Start ✓**

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The *Auto Start* menu entry will enable/disable the *Auto Start* function. Enabled *Auto Start* will be indicated by a check mark (✓) in front of the menu entry. When *Auto Start* is check marked, the instrument will automatically start a sample when a liquid is placed at the pipette. The program will remember this setting, even if the computer is turned off.

- **Auto Numbering ✓**
The *Auto Numbering* menu entry will enable/disable the *Auto Numbering* function. Enabled *Auto Numbering* will be indicated by a check mark (✓) in front of the menu entry. When *Auto Numbering* is check marked, a number inserted in the *Id* field will automatically increase by one for each new sample. The program will remember this setting, even if the computer is turned off.
- **Chart ►**
The *Chart* menu will have the following sub-menus:
 - **Auto Scale ✓**
The *Auto Scale* menu entry will enable/disable the *Auto Scale* function. This function turns the *Auto Scale* function for the axis of the histogram on or off. Enabled *Auto Scale* will be indicated by a check mark (✓) in front of the menu entry. When *Auto Scale* is check marked, the size of the histogram will automatically adjust to the histogram frame. The program will remember this setting, even if the computer is turned off.
 - **Show X-Scale ✓**
The *Show X-Scale* menu entry enables/disables the *Show X-Scale* function. This function displays or hides the scale on the X-axis of the histogram. Enabled *Show X-Scale* will be indicated by a check mark (✓) in front of the menu entry. The program will remember this setting, even if the computer is turned off.
 - **Show Y-Scale ✓**
Same function as with the *Show X-Scale*, regarding the Y-axis.
- **Default Window Size**
This function restores the window to default size.
- **Discriminator...**
Discriminator Limit sets the level (channel number) at which the automatic discriminator starts operating. This can only be done by a *Privileged User*.
- **User Access Level...**
The *User Access Level* menu entry will open the *User Access Level* dialogue where it will be possible to select between *Ordinary* and *Privileged* user level. If a change from *Ordinary* to *Privileged* user level is selected, a *Password* will be required.
- **Change Password...**
The *Change Password* menu entry will open the *Change Password* dialogue, where it will be possible to change the password for access to the *Privileged User* level. The default password when the program is started the first time will be "**password**". This function is only available for *Privileged User*.

3.2.5 Help menu

The *Help* menu will have the following sub menus:

- **YeastCyte® User Handbook**
The *YeastCyte® User Handbook* menu will give access to this manual in a pdf file format. This requires that the YeastCyte CD-ROM is inserted in the computer's CD drive.
- **About**
The *About* menu will open the *About* dialogue where information about the program version will be available.

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4 ROUTINE ANALYSIS

A 'splash' screen with the *BioDETECT* logo will be displayed when the program is loaded and during the start-up sequence. The user will be requested to do certain tasks to prepare the instrument through dialogues as described in the following.

4.1 Selection of COM port

The very first time the YeastCyte[®] program is started, the user will be requested to select which COM port to use. The program will store the selected COM port number in the Windows registry for use next time the program is started.

4.2 Start up

In order to ensure proper working conditions, the YeastCyte[®] has to go through a certain start up procedure before analysis can be performed. This procedure lasts for 6 minutes. Before starting up the YeastCyte[®], perform the following operations:

- Prepare all solutions (sheath rinse liquid, dye buffer solution and rinsing solution) and connect the tubes to the instrument.
- Check that the computer is connected to the instrument and turn on both units.
- Select the YeastCyte[®] program from the START UP menu on the computer.
- Follow the instructions on the screen (see Figure 11)

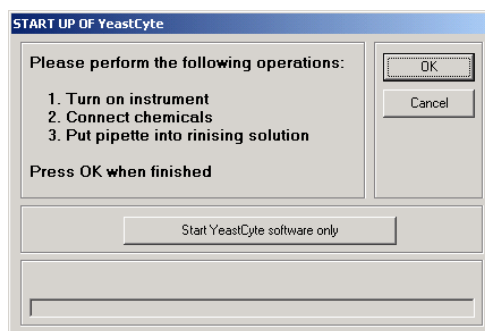


Figure 11 Start Up dialogue

4.3 Sample preparation

The yeast slurry must be diluted in an appropriate buffer (*e.g.* PBS) prior to measurement. The number of yeast cells in the sample to be measured should be in the range 2×10^5 - 1.2×10^6 cells/ml for best results. A standardised dilution factor of *e.g.* 1:1000 is recommended. Ensure that there are no lumps in the yeast to be measured, if necessary strain the sample through a 100 μ m filter before pouring it into an appropriate container.

4.4 Measurement

The total time for a measurement is approximately 60 seconds. This includes different phases of filling, priming and counting. After the filling phase the user will be asked to remove the sample. When this is done, the instrument continues the measurement for a while before presenting the results on screen. During the measurement perform the following operations:

- Fill in the *Batch No*, *Id* and *Dilution Factor* in the **Id Frame**.
- Tilt out the pipette and put the sample container under it. Hold the container by hand during the filling phase, or place it on the shelf by tilting the pipette back to the vertical position.
- Initiate measurement:
 - by clicking the *Start Sample* button on the **Tool Bar**, or
 - by selecting the *Start Sample* entry in the *Operation* menu.

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If *Auto Start* is selected from the *Options* menu, measurement will be initiated automatically when the pipette senses contact with liquid.

- Wait while the analysis is performed. When “Remove sample” appears on screen, remove the sample by tilting the pipette outwards and then leave it in this position. Do not insert the next sample until the message "Insert sample" appears on screen, informing that the instrument is ready for a new sample.
- When the counting phase is completed, the results will appear on the lowest unused row in the **Data Frame**. The corresponding histogram will appear in the **Histogram Frame** on the right side of the screen. Based on the information given in the *Dilution Factor* field, the system calculates the amount of cells in the original yeast sample.

4.5 Stand by

If the instrument is to be left without use for a short while, select *Stand By* from the *Operation* menu. In this mode the pipette will be rinsed and the main pump run for 30 seconds every 30th minute, keeping the instrument in a status ready to run new samples. If the instrument is left for 10 minutes without use, the stand by mode will be initiated automatically. The dialogue box in Figure 12 will be displayed.

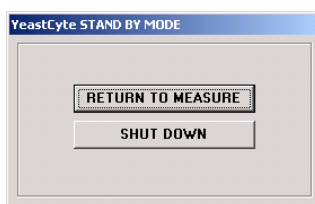


Figure 12 Stand By Mode dialogue

4.6 Shut down

At the end of the day, the YeastCyte[®] must be shut down according to a specified procedure. This is done to ensure proper cleaning of the instrument. This procedure lasts for 3 minutes. To shut down the instrument perform the following operations:

- Select *Shut Down* from the *Operation* menu.
- Put the pipette into rinsing solution
- Follow the instructions on the screen.
- When the cleaning cycle is completed, remove the chemicals and empty the waste containers. Then switch off the instrument (see Figure 13).

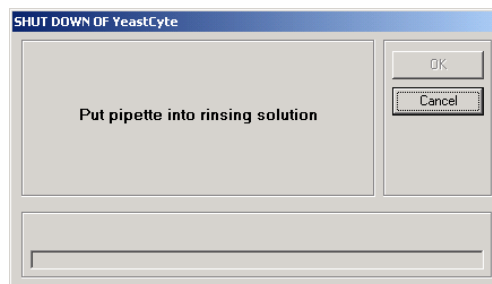


Figure 13 Shut Down dialogue

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5 WARRANTY

This Limited Warranty defines the restrictions and warranty period that apply to the *BioDETECT* instrument that you have purchased. The warranty provides free parts and labour for one year from date of product purchase (the "Warranty Period"). Contact *BioDETECT* AS (www.biodetect.no) if you have questions about this Limited Warranty.

5.1 Terms of the Warranty

BioDETECT warrants that the product you have purchased from *BioDETECT* or from a *BioDETECT* authorised reseller is free from defects in materials or workmanship under normal use during the Warranty Period, which commences on the date of purchase.

Should the product require service during the term of the Limited Warranty, *BioDETECT* will repair or replace the defective part(s) with a new part(s), or at *BioDETECT*'s discretion a used part(s) that meets or exceeds the performance specifications for new parts. In some cases, *BioDETECT* will ship a new user-replaceable part(s) direct to you, or at *BioDETECT*'s discretion a used part(s) that meets or exceeds the performance specification for new parts. All exchanged parts and products replaced under this warranty will become the property of *BioDETECT*. In the unlikely event that your product has a recurring failure, *BioDETECT* at its discretion, may elect to replace the product with a comparable replacement.

This product is covered by the *BioDETECT* World-wide Warranty for YeastCyte[®] instruments. Warranty Service may vary from country to country; warranty terms of the servicing country apply. *BioDETECT* is not responsible for any handling fees, import duties, or tariffs.

This Limited Warranty extends only to products initially purchased from *BioDETECT* or from a authorised reseller. This Limited Warranty does not extend to any product that has been damaged or rendered defective (a) as a result of accident, misuse, or abuse; (b) as a result of an act of God; (c) by operation outside the usage parameters stated in the product's user documentation; (d) by the use of parts not manufactured or sold by *BioDETECT*; (e) by modification of the product; or (f) as a result of service by anyone other than *BioDETECT* or a *BioDETECT* authorised service provider. *BioDETECT* is not responsible for damage to or loss of any programs, data, or removable storage media. Contact *BioDETECT* Services for geographic restrictions, response time commitments, and other specific service requirements or available services.

EXCEPT AS EXPRESSLY SET FORTH IN THIS WARRANTY, BIODETECT MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. BIODETECT EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED IN THIS LIMITED WARRANTY. ANY IMPLIED WARRANTIES THAT MAY BE IMPOSED BY LAW ARE LIMITED TO THE TERMS OF THIS EXPRESS LIMITED WARRANTY.

5.2 Limitations of Remedy

BioDETECT is not liable for any damages caused by the product or the failure of the product to perform, including any lost profits, lost savings, incidental damages, or consequential damages. *BioDETECT* is not liable for any claim made by a third party or made by you for a third party. This limitation applies whether damages are sought, or a claim made, under this warranty or as a tort claim, a contract claim, or any other claim. This limitation cannot be waived or amended by any person. This limitation of liability will be effective even if *BioDETECT* or an authorised representative of *BioDETECT* has been advised by you of the possibility of any such damages. This limitation of liability, however, will not apply to claims for personal injury.

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APPENDIXES

APPENDIX 1 Electromagnetic Compatibility

This equipment conforms to the requirements of the EC directive 89/336/EEC. The Radio Frequency emissions from the equipment are very small - below the limits set in EN55011, and should not cause any problems in a typical laboratory or industrial operating environment. The equipment also has good immunity to mains-borne interference and static damage as required by IEC801.

Because the YeastCyte[®] has extremely sensitive wideband detectors and amplifiers, it can be disturbed by very high local radio frequency fields. In certain circumstances, false peaks could appear on the display. Users should therefore avoid using mobile phones, or other transmitters, close to the instrument when making measurements. Without such local RF sources, typical RF background fields will cause no problems.

Screened cable should be used for the RS 232 C serial connection, with the shield grounded to the plug shell.

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APPENDIX 2 Technical specifications

Light source	5 mW laser diode, nominal wavelength 532 nm.
Light scatter detector	Photo diode, wavelength 536 nm+/- 5 nm.
Light scatter sensitivity	2-20 µm, measured with mono disperse particles.
Light scatter resolution	CV 5% at 500.000 cells/ml.
Fluorescence detector	Avalanche photo diode, wavelength 550-900 nm.
Fluorescence resolution	CV 5% at 500.000 cells/ml.
Flow cell	Closed flow channel 0.25 x 0.25 mm.
Sample	5 ml.
Concentration range	2x10 ⁴ – 1.2x10 ⁶ particles per ml.
Power supply	13.2 VDC, 4.5A, from mains adapter (100-240 VAC 50/60 Hz).
Connections	<ul style="list-style-type: none"> - One 2.5 mm jack for DC supply. - RS232C, 9 pin D-type (male). - Four tube connections for external containers for sheath fluid, dye buffer, high and low waste.
Dimensions	340x230x500 mm
Weight	14.2 kg
Trademarks	YeastCyte [®] is a registered trade mark of <i>BioDETECT</i> AS. Propidium iodide (PI) is trade marks of Molecular Probes, Inc.

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APPENDIX 3 Optionals and consumables list

3010	YeastCyte[®] Reagent Kit	For rapid and reproducible staining of dead yeast cells
3020	YeastCyte[®] bottle and tube kit	
3030	YeastCyte[®] service contract 1 year	