Principles of Operation

It is a well known principle that as microorganisms grow, they increase the turbidity of their growth medium. By measuring the turbidity of this medium over time, an optical density (OD) curve can be generated. The curve reflects the growth (increased concentration) of the organism of interest.

Bioscreen’s system provides a platform for these measurements to be made. The organism of interest and any growth medium may be selected. They are manually dispensed using a multichannel pipette into wells of a special microplate. This plate is designed to provide a uniform temperature across each of the 100 wells in the plate, and also to eliminate troublesome condensation on the plate lid which can interfere with OD readings.

The Bioscreen instrument includes an incubator to provide constant temperature (in 0.2 degree intervals from 1 to 60 C.), and a linear shaker to assure good mixing. The instrument is equipped with a sensitive reader that measures turbidity, a technique more sensitive than a spectrophotometer. The reader is equipped with 8 filters to measure specific wavelengths. Two 100 well sterile honeycomb plates with covers are handled by the instrument at one time, making it possible to run 200 samples simultaneously.

Turbidometric measurements are made kinetically during the course of the run. This information is processed to generate microbiological growth curves, plotting turbidity vs. time. Data is then exported to a PC for report generation.

The Bioscreen approach provides three significant advantages over conventional manual techniques. First, it is much faster: data collected over a short period of time can be reliably projected. Second, it is more accurate: errors that find their way into manual techniques are eliminated through automation. Third, growth curves are plotted automatically by the system, eliminating time and effort of manual techniques.
System Components

- Schematic
- Honeycomb Plates
- Instrument

Software: EZ Bioscreen Experiment software drives the workstation, records results, and displays growth curves. All experimental data (OD, test parameters, sample names, growth curves, and results) can be exported to Microsoft Windows 2000 or above (Excel, Word, etc.) for preparation of reports.

Specifications

- **Cuvette:** 10 by 10 honeycomb sterile plate plus lid.
- **Capacity:** 2 plates (200 wells) at one time.
- **Temperature:** 1.0 to 60.0 degrees C in steps of 0.1 degree.
- **Filters:** 8 filters from 405 to 600 nm, including wide band.
- **Computer:** Windows 2000 or higher.

Ordering Information

- 5101370  Bioscreen Analyzer 220.110 V
- 4222720  5 channel digital pipette, 50 to 200 µl
- 4222730  5 channel digital pipette, 200 to 1000 µl
- 4262710  10 channel digital pipette, 5 to 50 µl
- 9502550  Honeycomb 2 multiwell sterile plate with cover (100 pieces)

Typical Applications

- **Pharmaceuticals:** drug development, effects of antibiotics, microbial drug resistance.
- **Food:** new food development, developing new preservatives, QC.
- **Environmental:** effects of toxicants on bacteria, toxic chemical effects.
- **Research:** modeling microbiological processes, veterinary medicine.

Reference Publications: over 100 applications, available on request.