

# TC20™ Automated Cell Counter Quick Guide

The TC20 automated cell counter counts mammalian cells in one simple step, with or without trypan blue staining, and assesses cell viability via trypan blue exclusion.

The TC20 automated cell counter is designed to count suspended cells that have been grown as adherent or suspension cells. The TC20 counter demonstrates high reproducibility when counting cells within the ranges of  $5 \times 10^4$ – $1 \times 10^7$  cells/ml and 6–50  $\mu\text{m}$  cell diameter.

**Important:** Carefully read the safety information and instrument operating specifications provided in the TC20™ Automated Cell Counter Instruction Manual before using the system.

## Preparing Samples

**Important:** Handle the counting slides using the edges and avoid touching the optical surface of the slides. Counting slides cannot be reused. Dispose of used slides as biohazardous waste according to your local environmental health and safety regulations.

### Preparing Samples without Trypan Blue

Pipet 10  $\mu\text{l}$  of the cell suspension into the **outer opening** of either of the two chambers of the counting slide (Figure 1).

### Preparing Samples with Trypan Blue

1. Combine 10  $\mu\text{l}$  of the cell suspension with 10  $\mu\text{l}$  of trypan blue. When counting the sample in duplicate, combine 20  $\mu\text{l}$  of the cell suspension with 20  $\mu\text{l}$  of trypan blue. Gently pipet up and down ten times to mix the cells and dye.
2. Within 5 minutes of mixing, pipet 10  $\mu\text{l}$  of the mixture into the **outer opening** of either of the two chambers of the counting slide (Figure 1).

**Note:** Trypan blue is toxic to cells and prolonged exposure can introduce errors when attempting to determine live/dead ratios.

## Performing Cell Counts

1. Completely insert the slide into the slide slot (Figure 2). If the slide is not completely inserted, the instrument does not detect the slide and counting does not start.
2. The TC20 cell counter automatically detects the presence of the slide and initiates a count. The TC20 counter also automatically detects the presence of trypan blue.

**Important:** Do not remove the slide or interrupt the instrument while it is performing the count.

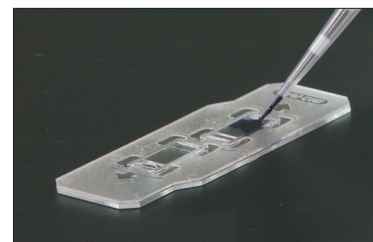


Fig. 1. Loading the sample onto a slide.

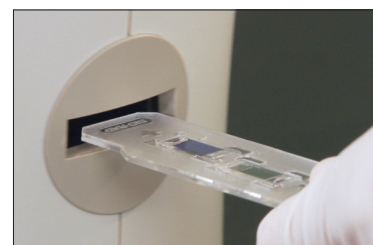


Fig. 2. Inserting the slide into the TC20 cell counter; counting automatically begins.

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3. **For samples without trypan blue** — on the Current count screen, the TC20 counter provides the total cell count per ml.
4. **For samples with trypan blue** — on the Current count screen, the TC20 counter provides the total cell count per ml, live cell count per ml, and percentage of live cells (Figure 3). It also accounts for a 1:1 dilution with the dye and provides a dilution calculation based on live cells.

**Important:** If the number of cells is above or below the range detected by the instrument, a “Value out of range” message appears on the Current count screen. Press the down arrow key to select **View image**, then press **Enter**. View the image of the cells and determine whether the sample should be diluted or concentrated. Repeat the cell count.

5. Once the instrument completes the cell count, remove the slide from the slide slot.

### Additional Analysis Options

Additional analysis options are available in the Current count screen. Use the up or down arrow keys and press **Enter** to access the following screens: Histogram/gating, Export image, Print count, Dilution calculator, and View image. Helpful tips for each screen are provided below.

#### Histogram/Gating

The histogram of the cell size distribution from the most recent count shows the approximate cell diameters ( $\mu\text{m}$ ) on the x-axis and the cell counts on the y-axis. To modify the position of the cell size gates, follow the instructions displayed under the histogram.

#### Export Image

If the automatic data export is disabled in the Autosave/sample name menu, then the Export image option is added to additional analysis options. Make sure the USB key is inserted in USB port A.

#### Print Count

The TC20 automated cell counter allows you to print the cell count using the thermal label printer (catalog #145-0005) connected to USB port A or USB port B on the cell counter.

#### Dilution Calculator

In the Dilution calculator, the current count is used as the starting cell concentration. The parameter that is ready to be modified is highlighted. Press the up or down arrow key to find the correct value, then press **Enter** to confirm the selection. To print the Dilution calculator screen, press the down arrow key and select **Yes**.



Fig. 3. Current count screen showing total cell count, live cell count, and percentage of live cells; cell viability is measured via trypan blue exclusion.

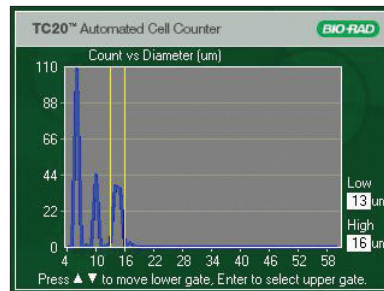


Fig. 4. When user-defined gates are enabled you can select the population of interest by adjusting the position of the cell size gates.

#### View Image

Use the up arrow key to zoom in on an image and examine cells in detail. Use the down arrow key to zoom out.

#### Gating Option

While most users will let the cell counting algorithm automatically identify cells and exclude debris, more complex samples, such as primary cells, may require user input to identify a cell population of interest. The Gating setup (Figure 4) is accessible from the Home screen.

#### Disabled User-Defined Gates

In this automatic mode, the TC20 counter will automatically identify cells and exclude debris, without any user input. This counting mode is suitable for immortal cell lines or samples with little cell size variation.

#### Enabled User-Defined Gates

In this user-defined mode, use the size gates on the histogram, which are displayed at the beginning of the count, to select the range of cell sizes to be counted. Select this counting mode for samples with a wide range of cell sizes, such as primary cells.



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