



**DIFFCOUNT™**

# **USER MANUAL**

**(model 10-412M)**

**Manufactured in the USA by**

**modulus**  
data systems

**[www.modulusdatasystems.com](http://www.modulusdatasystems.com)**

v12.25

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Please Scan the QR code for online access to our manual and how-to videos for setup and use of your DIFFCOUNT™.



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# 1. WELCOME

**1.1** Congratulations on the purchase of your DIFFCOUNT™ manual differential cell counter from Modulus Data Systems, Inc. It combines a modern touchscreen interface, print and barcode scanning options, and extensive user customization, with a familiar layout for current users of our earlier models.

Please take a few minutes to familiarize yourself with the new menus and basic functions in the Quick Start guide (in Section 3). The Quick Start guide will show you how to use familiar 8 or 12-channel quick-start modes for an easy transition to our newest generation DIFFCOUNT™. The manual also covers basic functions to set up custom users, modes, and comments based on your lab's unique needs. Your new DIFFCOUNT™ has extensive customization options based on user feedback, though most users will be able to quickly make a few basic customizations to meet their needs.

A standard USB keyboard and mouse will be helpful when doing custom programming and setup, but not needed on for day-to-day function.

**1.2** Before we get started please review the following definitions for important terms used in the manual and your DIFFCOUNT™.

- CHANNEL – A custom named item or other observation being counted on 1 of up to 12 individual assigned keys (lower two rows on keypad). Channels are created/named in the settings menu and assigned to their counting location on the screen/keypad when creating or editing a mode.
- MODE – A saved custom mode where names and number of channels are set, function keys are assigned for quick access during counting, multiple group totals can be created, print layout is assigned, and if needed WBC correction can be applied. Unused channels will be blocked from counting allowing a specific number of active channels depending on use case.
- USER – A saved custom user preference profile where audio feedback, lockout frequency, and a default mode (if desired) can be set. This is independent of mode settings, allowing different users or generic facility user preferences to be applied to the same custom mode. For instance, one user may prefer to work without audio feedback while another user prefers audio feedback while counting.
- DYNAMIC OVERLAY – Whenever a mode is loaded for counting operation, the assigned channels will be reflected on the touchscreen. This will change depending on the mode, and thus dynamic based on the current use case. This removes the need for a physical overlay that can only be relevant for a single mode.
- QUICK SELECT – 5 Function keys (F1-F5) on the home screen that allows rapid loading of a USER-MODE combination using a single keypress. These can be

assigned to the 5 most common use case combinations, rather than having to select a user and mode each time.

- **COMMENT** – A set of 3 sequential words (group, description, and quantifier) describing a general observation. For instance, in the hematology lab this can refer to a group (red blood cell), description (anisocytosis), and quantifier (2+). Another custom example outside of the lab setting could be a group (apples), description (red), quantifier (low yield), showing the flexibility of comments.

## **2. WHAT'S INCLUDED**

- DIFFCOUNT™ (10-412M)
- Power Supply (USB-C connector)

Not included DIFFCOUNT™ compatible accessories:

- Barcode/QR code scanner with stand (P/N 14500)
- Thermal Ticket Printer (P/N 24700)

### 3. QUICK START GUIDE

#### 3.1 SETTING UP AND TURNING ON

Inspection: Carefully unpack and examine your new DIFFCOUNT™ for any accidental shipping damage. If damaged, contact the carrier for claim filing instructions. Save all packing materials until all claims are settled.

#### 3.2 PHYSICAL OVERVIEW

##### Touchscreen Display

**Function Keys** (F1-F6, top row of 6 keys) which map to the 6 functions listed at the bottom of the screen (e.g. yellow arrows). Depending on what screen and function is being performed these will update dynamically.

**Channel Counting Keys** (bottom 2 rows of 6 keys) which map to the channels in the same position on the screen. Numerical values for data entry and Up/Down arrows for navigation on certain screens.



##### Rear Connections:

- 1 x USB-C port Power Supply Connection (not used for data)
- 2 x USB 3.0 ports (for accessories or connecting a keyboard or mouse for programming/setup)
- Ethernet Port (unused, for service and repairs)

**3.3 CONNECT THE POWER ADAPTER** – Remove the USB-C power adapter and plug into the rear left of the unit. The 90° left-right angle allows the user to route the power cable in their desired direction, either toward the side of the unit, or toward the USB cables for attached peripherals, which can then be bundled together based on user preference for cable management (e.g. zip ties).

**3.4 TURN ON THE DIFFCOUNT™** – The power switch is located on the power adapter cable. Once the unit is turned on, the internal computer takes about 20 seconds to boot. Intermittent notifications will appear on the blank screen as the DIFFCOUNT™ is booting up, letting you know that it is getting ready.

### 3.5 HOME SCREEN (numbers correspond to purple numbering in blue shaded boxes)

1 – SETTINGS

2 – SHUTDOWN

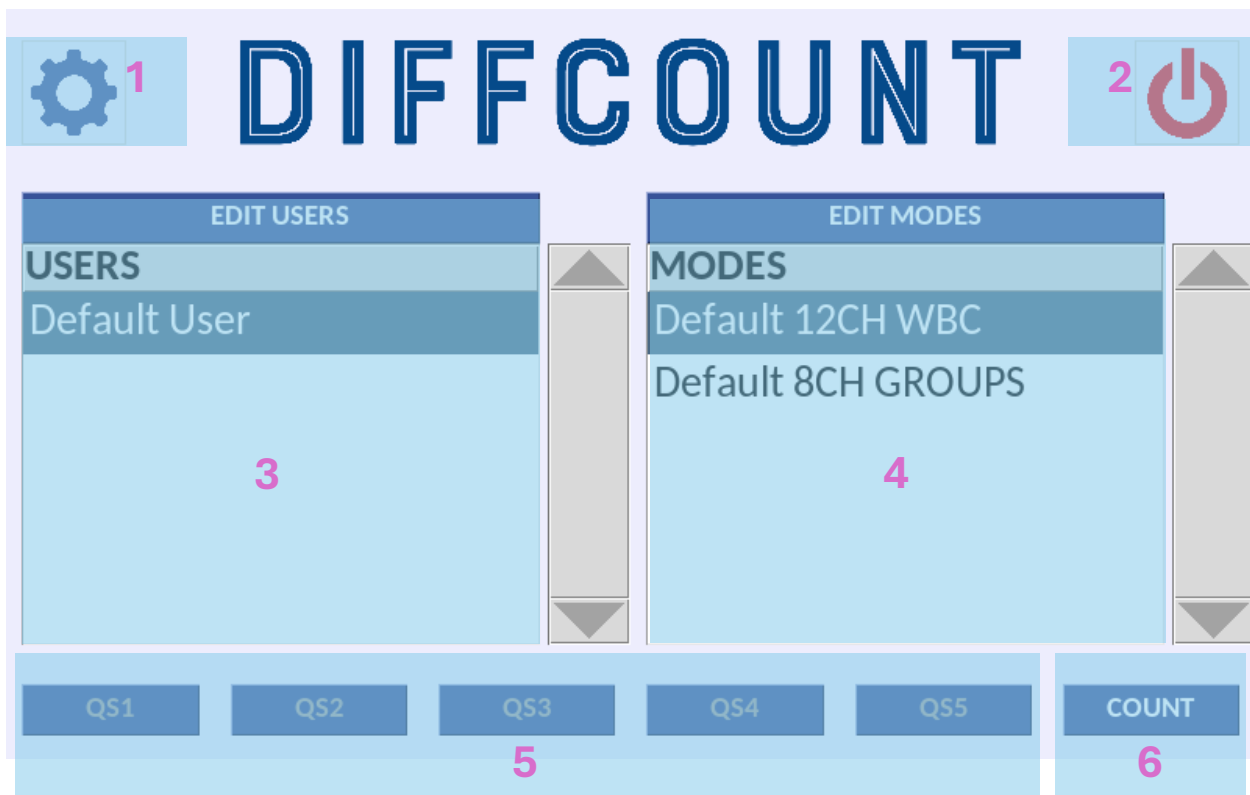
3 – USERS

4 – MODES

5 - QUICK SELECT USER/MODE (can be selected using the F1-F5 function keys)

6 – COUNT\* (can be selected using the F6 function key)

\*COUNT will take the user to the differential counting screen using the last selected User/Mode.



**NOTE:** Once configured, the DIFFCOUNT™ has been designed so that users will be able to navigate and use the DIFFCOUNT™ using primarily the keypad, rarely needing to use the touchscreen.

### 3.6 START COUNTING

- Select the Default User and Default 12CH WBC Mode on the touchscreen and explore.
- Users of the prior generation should find the layout and function familiar. New users should take some time familiarizing themselves with operation (see In-Depth Operation, Section 4), though should find the DIFFCOUNT™ intuitive to rapidly learn and apply to any differential counting application.
- Before beginning a new count, the contents of the COUNT memory must be erased. By pressing the CLEAR key, the operator erases the COUNT memory and prepares the unit for the next specimen count\*.

During customization, a USB Keyboard is necessary to enter text into the DIFFCOUNT. A USB mouse is optional though recommended for easier screen navigation and selection while customizing the DIFFCOUNT™. USB ports for connection are located on the rear of the DIFFCOUNT™.

**TIP:** If more than 2 USB ports are need at one time during programming or use, a generic USB hub can be used to expand the number of ports.

### 3.7 ADDITIONAL OPTIONS AND CUSTOMIZATION

- Quick Launch – Accessed in Settings. If you only use one user and mode for your application, you can bypass the home screen when turning on the DIFFCOUNT™ and go directly COUNT using the specified User and Mode (Section 5).
- Quick Select – Accessed in Settings, you can assign function keys (F1 through F5) on the home screen to rapidly load one of 5 User/Mode combinations (Section 5).
- Creating Custom Channel Names – Accessed from the Settings Menu ([Section 5](#))
- Creating a Custom User (Section 6)
- Creating a Custom Mode with Custom Channel Names (Section 7)

## 4. IN-DEPTH OPERATION

4.1 Default 12CH WBC Mode – note USER 1 and USER 2 are customizable via Mode customization

14	17	17	03	11	05
ATYP LYMPH	META	MYELO	USER 1	USER 2	NRBC
00	00	08	08	04	09
BASO	EOS	MONO	LYMPH	BAND	SEQ
COUNT	TOTAL		091		
DECREASE	%	WBC ABS	HOME	COMMENT	CLEAR

4.2 In this example, the lowest row of buttons on the touchscreen display corresponds to the Function keys (F1-F6) directly below on the physical keypad:

F1 – DECREASE / COUNT / UNLOCK – changes based on selection/lockout

F2 – % (Percent) – changes to % screen

F3 - WBC ABS – changes to absolute count screen

F4 - HOME – returns to home screen

F5 – COMMENT – changes to comment entry

F6 – CLEAR – clears numerical values

Note: Function keys can be reassigned in different order or substituted for other available functions when editing a custom mode (e.g. replace COMMENT with PRINT or GROUP, depending on the use case. This section uses the Default 12CH WBC Mode for instructional purposes.

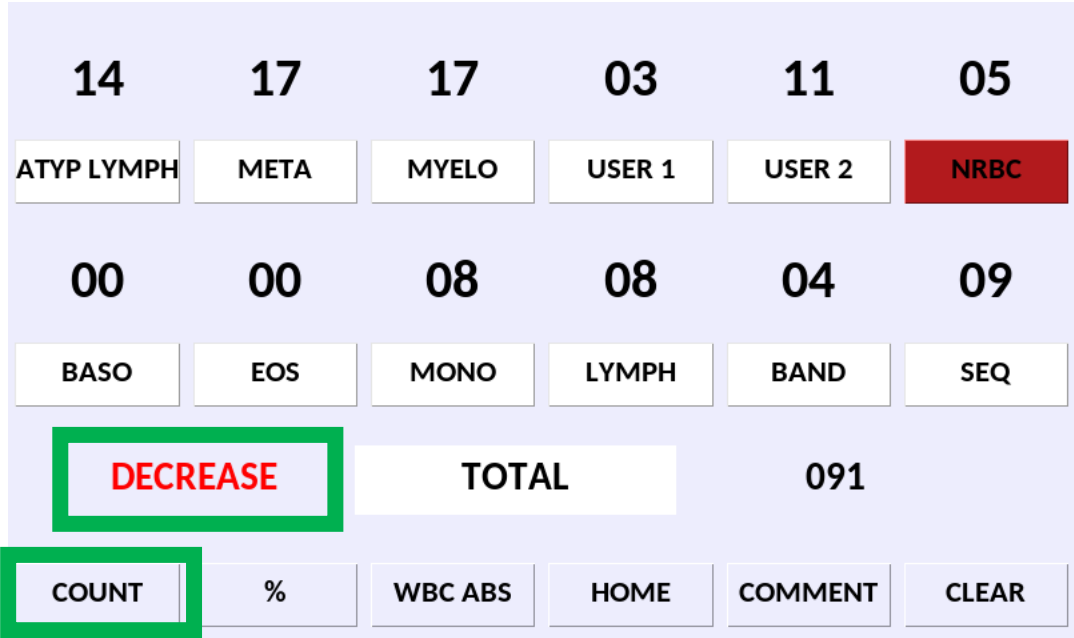
### 4.3 CHANNEL COUNTING KEYS

There are 12 counting keys (bottom two rows on the keypad), one for each channel, and marked by numerals 0-9 for data entry, and up and down arrows for navigation within certain screens.

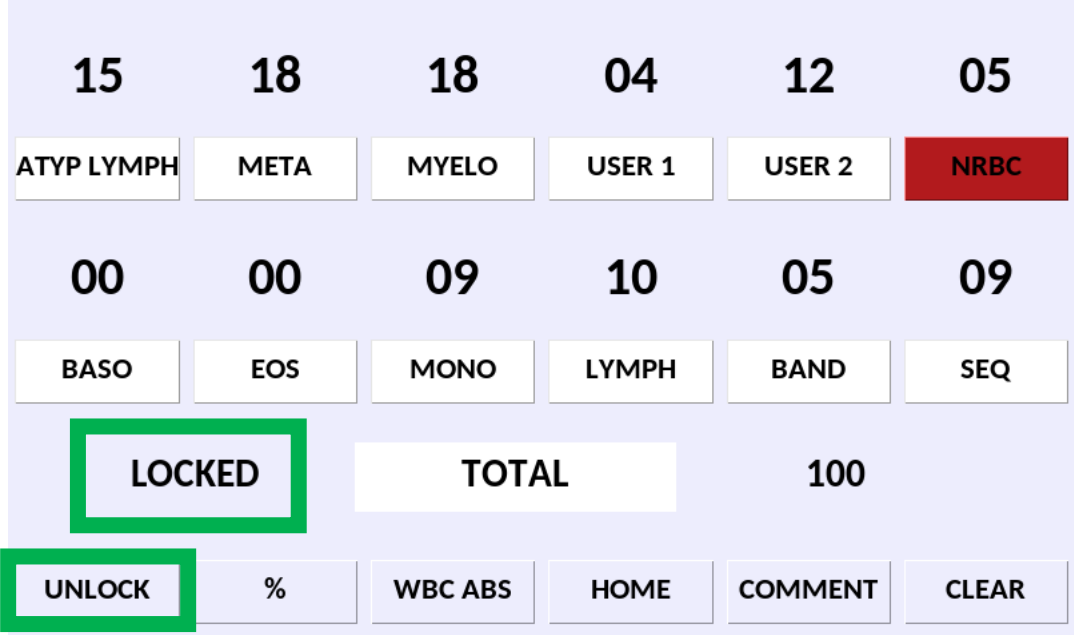
Each time a counting key is pressed, the corresponding display is increased by one and a short tone "click" will be heard. A longer "alert tone" will be heard at the user defined lockout value (Default User value of 100).

### 4.4 COUNT/DECREASE/UNLOCK FUNCTION (F1 in example below)

While in COUNT mode, the F1 key allows you to switch between COUNT and DECREASE. To subtract one count from any channel, Press F1 (DECREASE) and then press the key for the channel or channels you wish to decrease. The screen will display DECREASE in red to notify the user that values will be decreasing. To return to the normal function of adding counts, press F1 (displays COUNT) again. These are highlighted in the green boxes below.



If lockout is enabled under the user's settings, the count will lock out when the total reaches that number. In this example, the lockout is set to 100. The user then has the option to unlock the count. To unlock the count, the UNLOCK button will appear at the F1 location. LOCKED will display on the bottom left of the screen until F1 (UNLOCK) is pressed to continue counting. These are highlighted in the green boxes below.



Counting will then resume until the next increment of the lockout value is reached (for instance if the lockout value is 100, after being unlocked, the DIFFCOUNT™ will continue counting and lock at a value of 200, 300, 400, and so forth).

**NOTE:** If multiple group totals exist within a mode, lockout will occur when the selected group total reaches the lockout value (not the total for all channels present, unless the selected group includes all channels). In other words, non-totaling channels in the selected group are not included in the displayed total.

#### 4.5 PERCENT FUNCTION (F2 in COUNT screen example)

By pressing the PERCENT (%) key the percentage of counted cells appears on each channel display. The percentages are given in rounded integers to the single digit, whose aggregate is always 100%. Pressing F2 (XX.X%) will change the % values to the tenth decimal place if desired. Percentages are assigned based on channels included in the selected group. Channels which are not included in the group total will not display a percent value. Further discussion on Group totals can be found in Section 7. The user returns to the counting function by pressing F1 (COUNT), or other available options listed above the respective function F-keys. Note that F6 (CLEAR) is greyed out as it is not selectable on this screen.

15	19	19	03	12	
ATYP LYMPH	META	MYELO	USER 1	USER 2	NRBC
00	00	09	09	04	10
BASO	EOS	MONO	LYMPH	BAND	SEQ
% TOTAL					
COUNT	XX.X %	WBC ABS	HOME	COMMENT	CLEAR

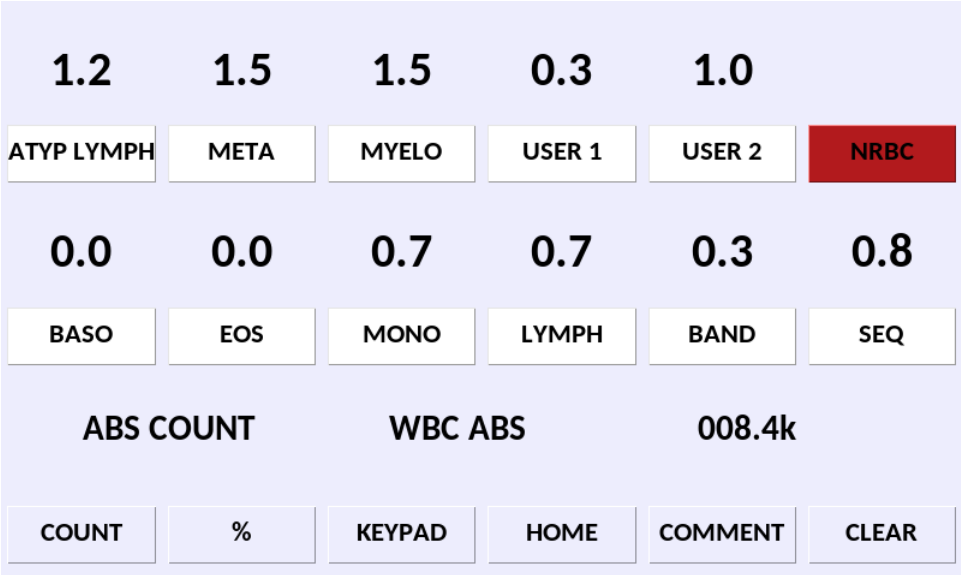
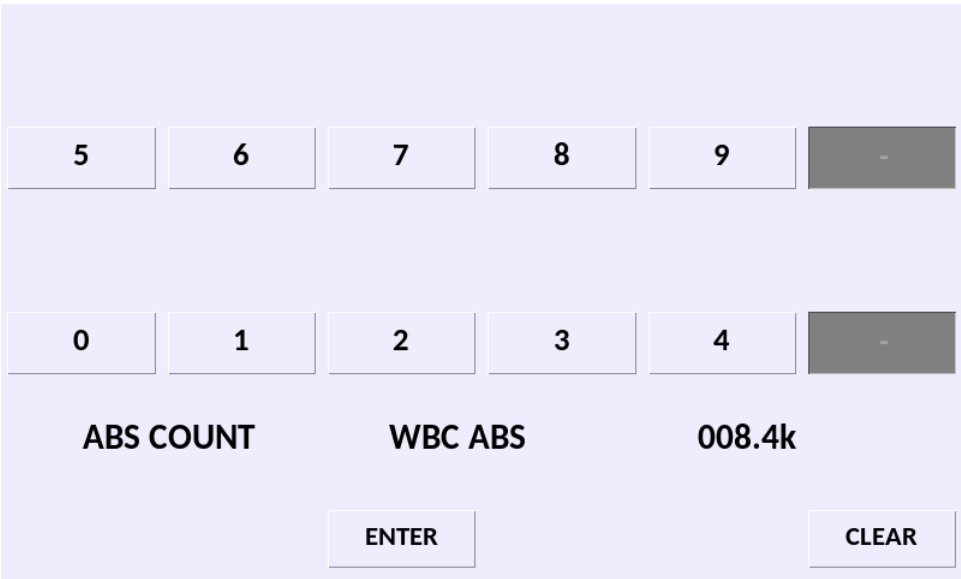
15.4	18.7	18.7	3.3	12.1	
ATYP LYMPH	META	MYELO	USER 1	USER 2	NRBC
0.0	0.0	8.8	8.8	4.4	9.9
BASO	EOS	MONO	LYMPH	BAND	SEQ
% TOTAL					
COUNT	XX %	WBC ABS	HOME	COMMENT	CLEAR

#### PERCENT CALCULATION

To arrive at a two-digit percentage calculation for each channel, the DIFFCOUNT™ (1) divides each counter channel by the total count and multiplies it by 100, then (2) rounds to the nearest integer (single digit or tenth value as determined by F2 (XX.X%))

**4.6 WBC ABS (WBC Absolute Values) / USER DEFINED ABS (F3 in COUNT screen example)**

By pressing the WBC ABS key, a WBC value in the range 0.0 - 999.9k (thousand) may be entered using the keyboard numbers or touch screen, followed by F3 (ENTER). If you make a mistake, numbers will continue to populate in order, or you may press F6 (CLEAR) to reset to 0.0k.



The absolute calculation can be programmed to calculate other absolute values, and as such can be renamed (up to 4 characters + ABS) for clarity in the Settings menu and assigned when creating a new Mode (Section 7). Only one absolute count at a time is supported.

The white blood cell absolute value calculation is described below. Note that for the default 12CH WBC mode, NRBC correction is selected using a threshold of 5.\* This is only supplied as a reference template.

**\*SAFETY NOTE:** Please confirm your user/institutional preference and create a new mode prior to using the DIFFCOUNT™ for absolute value calculations if your threshold differs from 5.

## WHITE BLOOD CELL ABSOLUTE VALUE CALCULATION

This refers to a specialized clinical lab application determining manual absolute WBC values by individual channel counts is available using standard methodology, as with prior DIFFCOUNT™ generations. This is performed by correcting the patient's uncorrected lab WBC value entered by the user, with manually counted NRBC's (nucleated red blood cells) counted during specimen evaluation.

$$\text{Corrected WBC} = (\text{uncorrected WBC count} \times \text{total manual WBC count}) / (\text{NRBC} + \text{total manual WBC count})$$

- The uncorrected WBC count is the value entered by the user when entering WBC mode or via F3 (KEYPAD), reflecting the value in thousands (k).
- Note that standard laboratory practice has the user typically count to 100 cells for the total WBC count, hence the standard user setting of 100 for lockout of additional counts
- NRBC – nucleated red blood cells, a non-totating channel, is used to correct the WBC ABS values. Since there is no accepted standard for correction threshold value, this can be applied and threshold value designated when creating a new mode. The default NRBC threshold is 5, a commonly accepted threshold value. Please refer to your local laboratory director for clarification of your institutional preference.

$$\text{ABS Count (k) per Channel} = \text{Channel Total Percent (decimal value)} \times \text{Corrected WBC count (k)}$$

#### 4.7 COMMENT FUNCTION (F5 in COUNT screen example)

This function allows the user to enter user defined qualitative observations for a specimen, such as cell morphologies, artifacts, or microorganisms. Given institutional and user preferences for how these values may be described or quantified (for instance, 1+, 2+, 3+, Present, Few, Moderate, Marked, etc.), comments or descriptions can be modified to meet an institution or user's needs. Detailed instruction on editing and defining custom values within the comments can be found in Section 9.

The screenshot displays the 'COMMENT ENTRY' interface. At the top right is a blue 'REVIEW' button. Below it is a 'QUICK SELECT' section containing a list of five items:

F1	RBC Morphology	↑
F2	WBC Morphology	↓
F3	PLT Morphology	
F4	Artifacts	
F5	Microorganisms	

At the bottom of the screen are six blue function keys: RBC, WBC, PLT, ARTIF, MICRO, and COUNT.

F1-F5 corresponds to the Quick Select Function key options, arranged on the screen from top to bottom, displayed in shorthand form above their respective Function keys for rapid keyboard selection. By pressing the up or down arrow keys or on the right of the touchscreen, the user can navigate between pages of comments, 5 at a time. If the user wants to exit the Comment Entry, pressing COUNT (F6) will return them to the Counting page where they left off. If the User would like to skip entering the comment, they can directly go the REVIEW page by pressing REVIEW on the top right of the screen, described below.

**RBC** **REVIEW**

**QUICK SELECT**

F1	Normal	<div style="border: 2px solid green; padding: 5px;"> <span>↑</span>  <span>↓</span> </div>
F2	Poikilocytosis	
F3	Polychromasia	
F4	Hypochromasia	
F5	Anisocytosis	

**NORMAL**
**POIKIL**
**POLYCH**
**HYPOCH**
**ANISO**
**GO BACK**

Pressing the up or down arrows on the right of the physical keypad will perform the same function as the up and down arrows on the screen, without having to move your hand off the keyboard. If the up or down arrow is greyed out, the user is at the beginning or end of the available options respectively. If the down arrow is pressed, as in this example, the next screens populate as Quick Select (Function key) options.

**RBC** **REVIEW**

**QUICK SELECT**

F1	Microcytosis	<span>↑</span> <span>↓</span>
F2	Macrocytosis	
F3	Acanthocytes	
F4	Bite Cells	
F5	Blister Cells	

**MICROC**
**MACROC**
**ACANT**
**BITE**
**BLISTR**
**GO BACK**

**RBC** [REVIEW](#)

**QUICK SELECT**

F1	Burr Cells	<a href="#">↑</a>
F2	Erythrocytes with Overlying Platelets	<a href="#">↓</a>
F3	Schistocytes	
F4	Helmet Cells	
F5	Keratocytes	

[ECHINO](#) [PLT/RBC](#) [SCHIST](#) [HELMET](#) [KERATO](#) [GO BACK](#)

**RBC** [REVIEW](#)

**QUICK SELECT**

F1	Triangular Cells	<a href="#">↑</a>
F2	Round Macrocytes	<a href="#">↓</a>
F3	Oval Macrocytes	
F4	Microcytes	
F5	Nucleated Red Blood Cells	

[TRIANG](#) [RNDMCYT](#) [OVLMCYT](#) [MICROC](#) [NRBC](#) [GO BACK](#)

**RBC** **REVIEW**

**QUICK SELECT**

F1	Ovalocytes (Elliptocytes)	↑ ↓
F2	Agglutinates	
F3	Rouleaux	
F4	Sickle Cells	
F5	Spherocytes	

**OVALO** **AGGLUT** **ROULX** **SICKLE** **SPHERO** **GO BACK**

**RBC** **REVIEW**

**QUICK SELECT**

F1	Stomatocytes	↑ ↓
F2	Target Cells	
F3	Teardrop Cells	
F4	Basophilic Stippling	
F5	Fine Basophilic Stippling	

**STOMAT** **TARGET** **TEARDP** **STIP** **STIPFIN** **GO BACK**

RBC REVIEW

QUICK SELECT

F1	Coarse Basophilic Stippling	↑
F2	Hemoglobin C Crystals	↓
F3	Howell-Jolly Bodies	
F4	Pappenheimer Bodies	
F5	Siderocytes	

STIPCOA   HGC CRY   HWL-JOL   PAPPEN   SIDERO   GO BACK

RBC REVIEW

QUICK SELECT

F1	Heinz Bodies	↑
		↓

HEINZ               GO BACK

At the top of the screen, you will see RBC as the first general category (in this case the cell type Red Blood Cell). The user can then select the description of RBC from the Quick Select options (in the example below F2 from the first screen of options for Poikilocytosis).

The user will then be offered a list of quantifiers, which can be customized (both values and available options for a given descriptor) based on institutional preference.

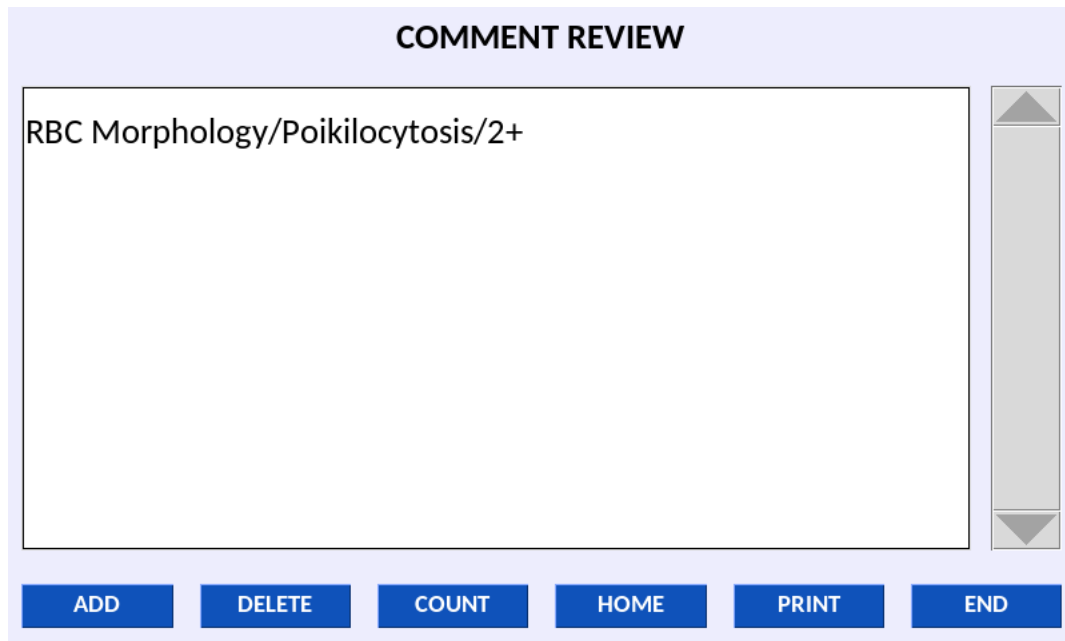
The screenshot displays a software interface for selecting quantifiers. At the top, the text "RBC/POIKIL" is centered, and a blue "REVIEW" button is in the top right corner. Below this, the heading "QUICK SELECT" is centered. A list of four options is shown in a table-like format:

F1	1+
F2	2+
F3	3+
F4	4+

The second row (F2 2+) is highlighted with a grey background. To the right of the list are two vertical arrow buttons: an upward-pointing arrow above a downward-pointing arrow. At the bottom of the interface, there are five buttons: "1+", "2+", "3+", "4+", and "GO BACK". The "2+" button is highlighted in blue, matching the selected row above.

When the quantifier is selected (in this case 2+ by pressing F2), the entire comment Category (RBC Morphology), Descriptor (Poikilocytosis), and Quantifier (2+) will be saved, and the user will be automatically taken to the review page. To abort the entry, press GO BACK (F6) until reaching the desired screen or press REVIEW on the top right of the touch screen which takes you to all entered comments - for review.

## 4.8 COMMENT REVIEW PAGE



The Function keys allow direct access to various functions as follows:

F1 – ADD – adds a new comment

F2 – DELETE – deletes a comment (first select the comment to be deleted on the touchscreen)

F3 – COUNT – returns the user to the count page for continuation or modification of the current active count. The comments will be saved when the user returns to COMMENT.

F4 – HOME – returns the user to the HOME screen. The user can return to counting in the last selected mode by pressing F6 COUNT and then return to COMMENT using the assigned Function key. These are stored until the workflow for the mode is ended and cleared out (see F6 below).

F5 – PRINT - takes you to the print screen

F6 – END - ends the counting analysis and resetting the count to 0, resetting any Patient ID or specimen numbers for a new sample (F6 – END, pressed twice to ensure count and comment efforts not erased accidentally and user loses their work).

Comment customization (Comment Database) is addressed in Section 9.

#### **4.9 CLEAR FUNCTION (F6 in COUNT screen example)**

Resets all values to 0 and prepares DIFFCOUNT™ for a new count. This includes all other entered information such as the uncorrected WBC ABS value and comments if present.

#### **4.10 GROUP FUNCTION**

If a Function key is assigned to GROUP, different group totals can be cycled through using the corresponding Function key. This is useful for when a user needs to toggle between different groups easily on both the COUNT and % screens. If a Function key is not assigned, then the user can still cycle through the different group totals by pressing TOTAL on the COUNT touch screen. The active group color will be highlighted on TOTAL along with included totaling channels. If more than one group is present, the group total name will be displayed to the right of the TOTAL count number or % TOTAL.

#### **4.11 PRINT FUNCTION**

If a Function key is assigned to PRINT, the user can directly access printing without having to go to the COMMENT REVIEW page. This is useful for when a user needs to print without the use of comments. The COMMENT Function key can be substituted for PRINT by copying and replacing the F5 key, or while creating a new mode.

**NOTE:** An example of assigned GROUP and PRINT Function keys can be seen in the default mode [Default 8CH GROUPS].

Printing can be accessed (once a printer is setup in SETTINGS) under the COMMENT REVIEW page or directly if assigned to a function key when creating a custom Mode.

PRINT	
Patient ID:	12345678
Specimen ID:	0123412341234
Specimen Date:	11/27/25
Review Date:	11/27/25

SELECT    DELETE    CLEAR    PRINT    GO BACK    END

**SAFETY NOTE:** It is the responsibility of the user to ensure accurate data entry during this step and ensure the user or organization has a process to avoid errors of assigning printing output. The DIFFCOUNT™ is compatible with our USB barcode/QR scanner (P/N 14500) if used at your site to track specimens.

- F1 – SELECT – toggles between the 4 entry fields
  - F2 – DELETE – deletes characters from left to right (like backspace)
  - F3 – CLEAR – clears the selected field
  - F4 – PRINT – sends the previously entered comments (if present) with current entered 4 fields to the configured printer (selected in Settings). 1 of 2 available print layouts (see Section 8) is assigned during mode creation.
  - F5 – GO BACK – returns to the previous screen
  - F6 – END – ends the current specimen analysis and returns user to a new cleared Count screen. This must be pressed twice before the prompt disappears to END (just a quick double tap of F6 to avoid losing your work if F6 is pressed once by accident).
- This is the only recommended workflow for ending any advanced workflows incorporating comments or printing.**

Patient ID: This can refer to the medical record number or other identifier. A numerical input can be entered using the keypad or our barcode/QR scanner (P/N 14500). A USB keyboard attached to the DIFFCOUNT™ can also be used if text input is desired.

Specimen ID: This can refer to the specific specimen being analyzed. As with the patient ID numerical input can be entered using the keypad or our barcode/QR scanner. A USB keyboard attached to the DIFFCOUNT™ can also be used if text input is desired.

Specimen and Review Date: After clearing the value (CLEAR - F3) these can be entered in sequence as ##-##-## to display as ##/##/20##. Alternatively, the user can DELETE one number at a time (F2) like backspace to edit.

**Note:** Given differences in order of Month and Day between different sites/countries, the Month and Day should be entered in the sequence appropriate to your location.

The last date entries will be preserved for your current mode after ending your analysis and starting a new specimen analysis to help minimize entry time between multiple specimens on the same dates. **Please verify the date before printing subsequent analyses.** If you change modes, you may need to re-enter your dates.

There are two ways to physically print your counts and comments:

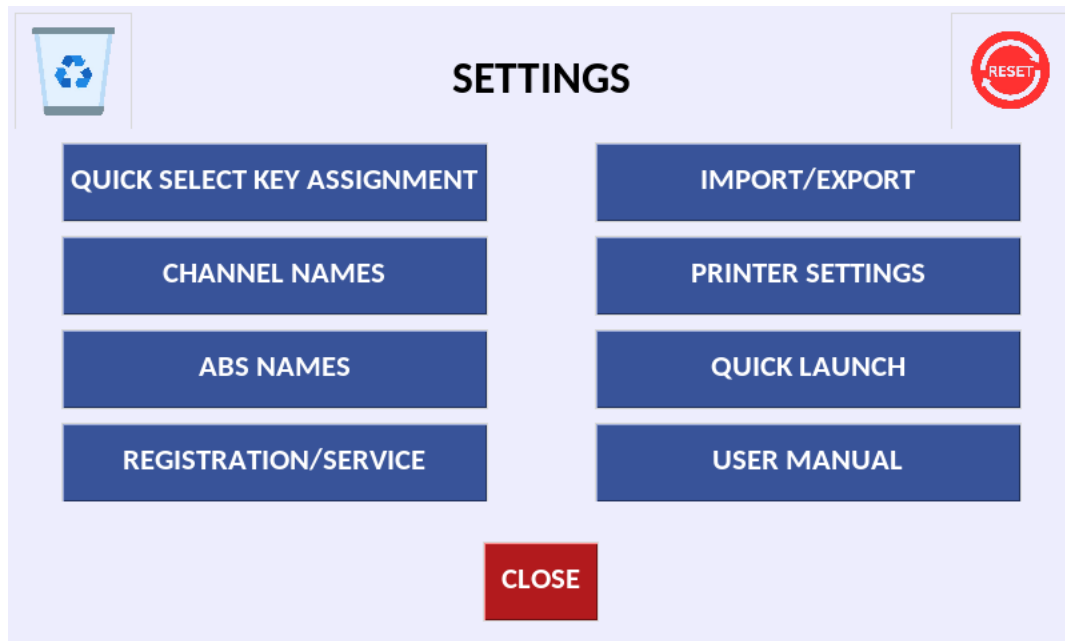
- Our DIFFCOUNT™ compatible countertop space-saving ticket printer (P/N 24700)
- A user-provided Postscript compatible USB printer

There are two different available print layouts selectable during mode creation:

- NAME/%/ABS COUNT (focused on absolute count output e.g. WBC)
- NAME/% (focused on multiple counting group outputs)

Both print layouts incorporate Patient ID, Specimen ID, Dates, and Comments. Example of print outputs are provided in Section 8.

## 5. SETTINGS



**5.1** The following actions are available from the SETTINGS screen:

- **5.1.1** RECYCLE BIN (top left icon)- Stores users and modes that have been deleted. These can be permanently deleted or restored. CLOSE to return to Settings page.
- **5.1.2** SYSTEM RESET (top right icon) - Returns the DIFFCOUNT™ to factory settings. All user entered settings will be lost, use with caution!
- QUICK SELECT KEY ASSIGNMENT – See section below
- CHANNEL NAMES – See section below
- ABS NAMES – Create an Absolute Count Custom Name – See section below
- IMPORT/EXPORT – See section below
- PRINTER SETTINGS – See section below
- QUICK LAUNCH – See section below
- **5.1.3** REGISTRATION/SERVICE – QR codes for online registering or submitting a service request your DIFFCOUNT™
- **5.1.4** USER MANUAL – QR code for accessing the online manual and how-to videos for setup and use of your DIFFCOUNT™
- CLOSE – Return to Home screen

## 5.2 QUICK SELECT KEY ASSIGNMENT

Quick Select (QS) refers to 5 Function keys (F1-F5) that can be assigned on the HOME screen, allowing rapid loading of a USER-MODE combination using a single keypress. These can be assigned to the 5 most commonly used USER-MODE combinations, rather than having to select a user and mode each time a new workflow is required. QS1 = F1, QS2 = F2, etc. Press the QS blue button to enter desired settings, and press SAVE, CLEAR, or CLOSE (to return without saving) respectively. Enter the QS name (keyboard required) before closing. To remove a QS assignment, delete the name of the QS key, press the same QS button, and press CLEAR and SAVE. It will now be grayed out on the HOME screen Function Key.

### QUICK SELECT KEY ASSIGNMENT

CLOSE

QS1	NAME: <input style="width: 80%;" type="text"/>
QS2	NAME: <input style="width: 80%;" type="text"/>
QS3	NAME: <input style="width: 80%;" type="text"/>
QS4	NAME: <input style="width: 80%;" type="text"/>
QS5	NAME: <input style="width: 80%;" type="text"/>

SAVECLEAR

### QUICK SELECT QS1

CLOSE

USER NAME	MODE NAME
Default User	Default 8CH GROUPS
	Default 12CH WBC

**NOTE:** Both a user and mode needs to be selected for a QS assignment. The selected QS mode will override a previously designated user default mode.

In this example, two Quick Select users have been designated, users Jack and Jill who have specific individual preferences assigned to their user profiles and a specific mode they always use. Universal Quick Select assignments that multiple users access for a standard institutional workflows can also be designated and shared under a generic name. Jack and Jill are then displayed as QS options for F1 and F2 on the home screen (green box). QS names are limited up to 8 characters. Note that depending on the width of characters, the name may not fit on the width of the button. The QS name can be modified to fit to user preference.

### QUICK SELECT KEY ASSIGNMENT

**CLOSE**

QS1	NAME: Jack
QS2	NAME: Jill
QS3	NAME:
QS4	NAME:
QS5	NAME:

# DIFFCOUNT

**EDIT USERS**

**USERS**

Default User

**EDIT MODES**

**MODES**

12CH WBC

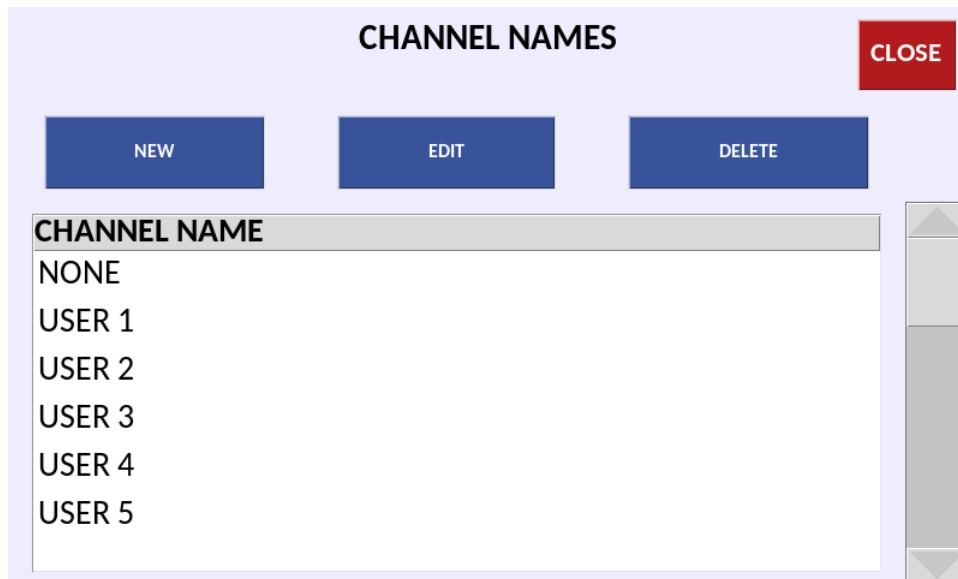
Default 12CH WBC

Default 8CH GROUPS

Jack Jill QS3 QS4 QS5 COUNT

### 5.3 CHANNEL NAMES

A channel refers to a custom named item or other observation being counted on 1 of up to 12 individual assigned keys (lower two rows on keypad). Channels are assigned to their counting location on the screen/keypad when creating or editing a mode.



- NEW – create new Channel Name
- EDIT - select Channel Name on touch screen
- DELETE - select Channel Name on touch screen
- CLOSE - return to settings page

Channel names are limited up to 10 characters. Note that depending on the width of characters, the name may not fit on the width of the button. The channel name can be modified to fit to user preference. When creating or editing a channel, enter the channel name (KB required) and either ADD to save the channel name or CANCEL to return to the channel name page without saving. Deleting a channel will not remove it from an already created mode, but it will no longer be available when creating or modifying a mode. Selecting NONE will create a null greyed out channel when creating a mode (hint: if you accidentally delete the NONE channel, just recreate it as a new NONE channel in ALL CAPS). The default 12 channel WBC layout has USER 1 and USER 2 as defaults. Note that these can be easily populated with a name of your choice by:

- 1) Creating 2 new channel names here in the settings
- 2) Going to EDIT MODE on the Home Screen and Copying the default mode Default 12CH WBC
- 3) Editing the Copy Default 12CH WBC\_Copy, changing User 1 and User 2 channel names selecting the newly created channel names in their respective drop-down menus, and renaming the mode to user preference before saving and exiting.

## 5.4 ABS NAMES

For defining a different name or application for absolute count calculations, limited to 4 characters maximum e.g. “ABCD” ABS rather than the default WBC ABS. These can now be selected in EDIT MODE for assignment to the function key instead of WBC ABS. Only one absolute count at a time is supported.

## 5.5 IMPORT/EXPORT

Once your DIFFCOUNT™ is setup to your or your institution’s preferences we highly recommend a full backup of your DIFFCOUNT™ using USER-MODE EXPORT. If only editing your comments (comment table), these can be managed separately using the dedicated COMMENT IMPORT/EXPORT buttons. The USER-MODE EXPORT file can also be used to duplicate standardized settings across numerous DIFFCOUNT™ units within your facility or organization.

A USB key needs to be placed into one of the two USB 3.0 ports during these operations. The file sizes are small so most standard USB keys will be adequate. Press IMPORT or EXPORT on the touchscreen. Please wait for a confirmation message that the process is complete before removing the USB drive.

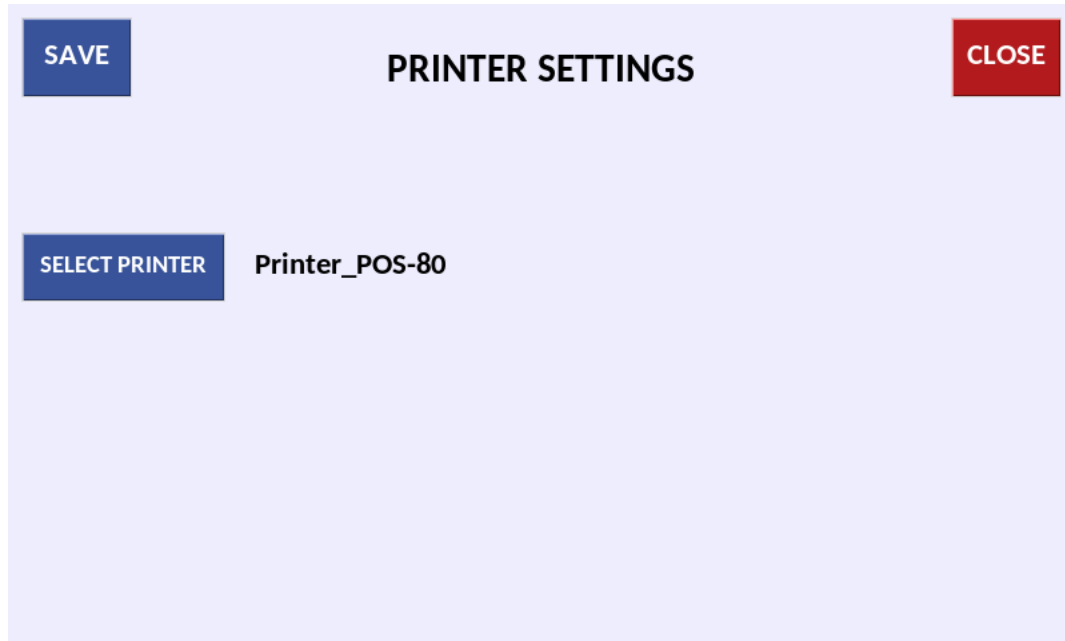
COMMENT IMPORT/EXPORT – imports or exports the user edited comment table. To avoid overwriting a preexisting comment table, please rename the file on the USB drive before exporting a new comment file. The file for import should be named “**comments\_database.xlsx**”. If the DIFFCOUNT™ is unable to import your new comment database, there is an issue that was introduced into the database during editing that is blocking the import. Try exporting a clean database, and copying selectively the new value ranges from the desired corrupted databases and pasting into the clean recently exported database. Then retry importing the database. This should fix any comment table database import issues.

USER-MODE IMPORT/EXPORT – comprehensive import or export of all user/mode settings that were created including users, modes, ABS names, channel names, and the comment table. To avoid overwriting a preexisting user-mode system backup, please rename the file before exporting a new user-mode system backup file. The file for import should be named “**modulusdata\_backup.sql**”.

CLOSE – return to Settings.

## 5.6 PRINTER SETTINGS

Plug in our DIFFCOUNT™ compatible ticket printer (ticket printer name: Printer\_POS-80, as listed in the screenshot below, P/N 24700) or a USB Postscript compatible printer (please verify Postscript or Postscript level 3 emulation with manufacturer) and press SELECT PRINTER into one of the 2 USB 3.0 ports on the back of the DIFFCOUNT™. The printer should be recognized and can be selected, saved (SAVE) as default. CLOSE to return to Settings.



**NOTE:** Custom printer driver installation onto the DIFFCOUNT™ is not allowed for security reasons.

If the printer is not recognized check the cable connection and power to your printer. Try rebooting the DIFFCOUNT™ with the printer disconnected. Enter the Printer Settings screen and press Select Printer. No printer should be recognized at this point, and press Save. Then reconnect the printer and try again to select your printer.

## 5.7 QUICK LAUNCH

This is helpful if you have a single use case and do not wish to select a user and mode each time you boot the DIFFCOUNT™. Enable by selecting the ENABLED/DISABLED toggle button in the center of the upper screen. The displayed button value is the active selection (e.g. in the screenshot below, Quick Launch is enabled). Then select the user and mode for quick launch. SAVE your selection or CLOSE to return to settings without saving. Upon booting, the DIFFCOUNT™ will launch into the selected user and mode.

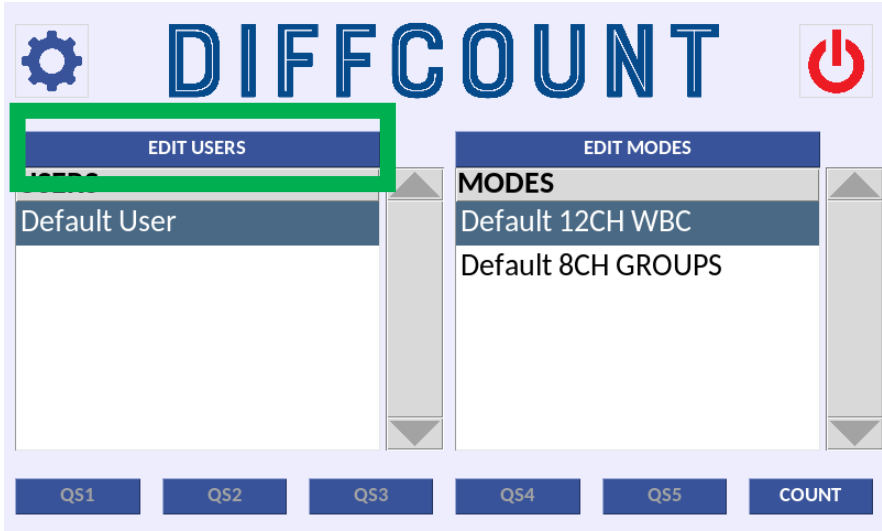
USER NAME	MODE NAME
Default User	Default 8CH GROUPS
	Default 12CH WBC

**NOTE:** Return to the Home screen (HOME function key or through COMMENTS - REVIEW page – HOME function key) to select a different user or mode if desired. HOME or COMMENT must be assigned to a function key when creating a new mode so that the user can return to the Settings menu and disable Quick Select if desired in the future. Otherwise, the DIFFCOUNT™ would get locked out and only be functional under the Quick Launch setting.

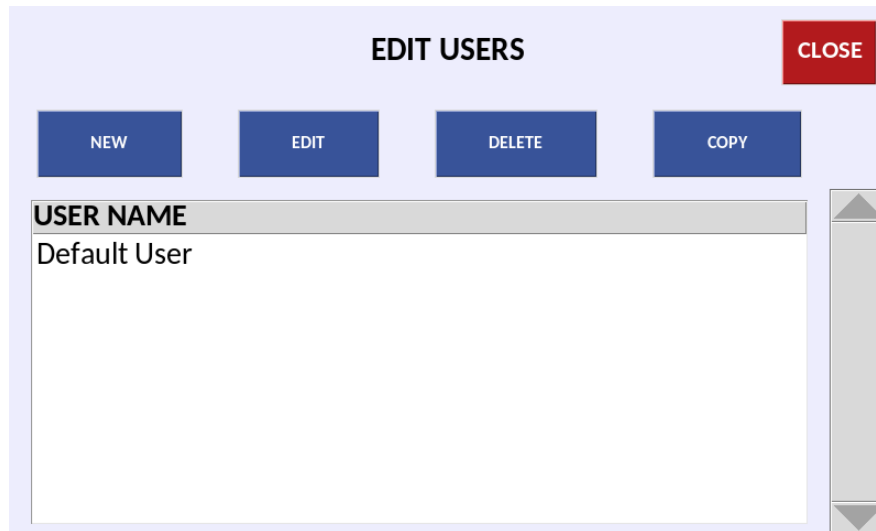
# 6. USER CUSTOMIZATION

A user is a saved custom user preference profile where audio feedback, lockout frequency, and a default mode (if desired) can be set. This is independent of mode settings, allowing different users or generic facility user preferences to be applied to the same custom mode. For instance, one user may prefer to work without audio feedback while another user prefers audio feedback while counting.

**6.1** To create a new user or edit a current user, select EDIT USERS using the touchscreen (green box in screenshot below). Note that entering text for naming or editing a user will require a temporary connection of a USB keyboard to the back of the DIFFCOUNT™ during programming.



From the main EDIT USERS menu, use the blue buttons to create a NEW user, select a custom user on the touch screen and EDIT or DELETE a user (deleted users can be found in the recycle bin on the Settings page), or select a user on the touchscreen and create a COPY of the current user. Press CLOSE to exit back to the HOME screen.



**6.2** Users can be assigned a Name, a Default Mode for the user, turn on/off audio feedback for that user, and control lockout and lockout frequency (default audio feedback enabled, lockout enabled, default lockout frequency value 100)  
Workflow for creating or editing a user:

- **6.2.1** Create or edit the name by typing in the desired name (using an attached USB keyboard)
- **6.2.2** Select Audio Feedback to be enabled or disabled using the adjacent toggle button. Audio Feedback includes a short audible click for each keypress and a longer tone once the DIFFCOUNT™ has reached the designated lockout frequency. The button will display ENABLED or DISABLED depending on the active state.
- **6.2.3** Select Lockout to be enabled or disabled using the adjacent button. The button will display ENABLED or DISABLED depending on the active state. When the lockout value is reached (for instance if the lockout value is 100, after being unlocked, the DIFFCOUNT™ will continue counting and lock at a value of 200, 300, 400, and so forth).

**NOTE:** If multiple group totals exist within a mode, lockout will occur when the selected group total reaches the lockout value (not the total for all channels present, unless the selected group includes all channels).

- **6.2.4** A default mode can be selected to automatically launch when selecting a user from the HOME touchscreen. Note that a User and Mode selected using the Quick Select rapid launch workflow using the Function keys from the HOME screen will override the default mode selected here.

SAVE **CREATE USER** CLOSE

NAME:

AUDIO FEEDBACK  ENABLED

LOCKOUT  ENABLED

LOCKOUT FREQUENCY:

DEFAULT MODE:

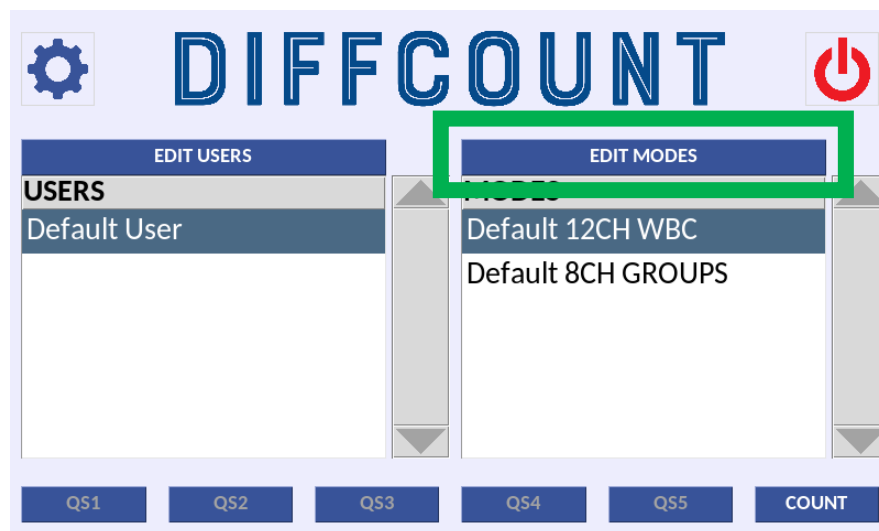
New or Copied Users will be placed on the top of the list. Copied users will be appended with the [USER NAME]\_COPY

**TIP:** To reorganize the order of users, create a copy of the user you wish to appear on top. First rename and then delete the old user (the old user will exist in the recycle bin after being deleted and cannot have the same name as an active user). Then, rename the newly copied [USER NAME]\_COPY user to the original user name by deleting \_COPY that was added to the end of the copied mode name.

## 7. MODE CUSTOMIZATION

A mode is a saved custom counting profile where names and number of channels are set, function keys are assigned for quick access during counting, multiple group totals can be created, print layout is assigned, and if needed WBC correction can be applied. Unused channels will be blocked from counting allowing a specific number of active channels depending on use case.

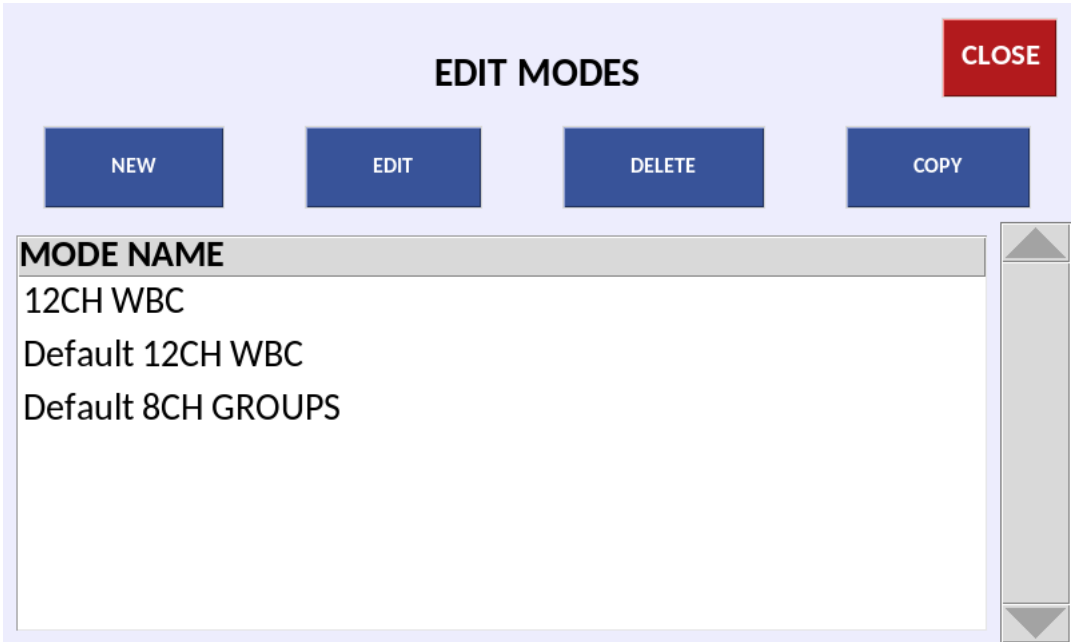
**7.1** To create a new mode or edit a current mode, select EDIT MODES using the touchscreen (green box in screenshot below). Note that entering text for naming or editing a mode name will require a temporary connection of a USB keyboard to the back of the DIFFCOUNT™ during programming. Also, the user may find it more efficient and prefer using a connected USB mouse for selecting and navigating the various selectable components rather than using the touchscreen during mode programming though this is not required.



While there are many selectable options and fields to be assigned on the CREATE MODES screen below, the creation of a mode can be done quickly once familiarized with the workflow, within a couple minutes or less (if a copied mode is just being modified). New or Copied modes will be placed on the top of the list. Copied modes will be appended with the [MODE NAME]\_COPY.

**TIP:** To reorganize the order of modes, create a copy of the mode you wish to appear on top. First rename and then delete the old mode (the old mode will exist in the recycle bin after being deleted and cannot have the same name as an active mode). Then, rename the newly copied mode and rename the [MODE NAME]\_COPY mode to the original mode name by deleting \_COPY that was added to the end of the copied mode name.

## 7.2 Creating, Editing, and Copying a New Mode



From the main EDIT MODES menu, use the blue buttons to create a NEW mode, select a custom mode on the touch screen and EDIT or DELETE a user (deleted modes can be found in the recycle bin on the Settings page), or select a mode on the touchscreen and create a COPY of the current mode. Press CLOSE to exit back to the HOME screen. In this example a new mode has been created [12CH WBC] by copying the [Default 12CH WBC] mode and assigning new names to channels USER 1 and USER 2.

**MODE NAME:**

**CREATE MODES** **WBC CORRECTION** DISABLED

**SELECT PRINT LAYOUT:** NAME/%/ABS COUNT **NRBC THRESHOLD:**

**FUNCTION KEYS:** COUNT % WBC ABS HOME COMMENT CLEAR

**CHANNEL KEYS (Row 1):** CH1 CH2 CH3 CH4 CH5 CH6

**CHANNEL KEYS (Row 2):** CH7 CH8 CH9 CH10 CH11 CH12

**DEFAULT GROUP TOTAL:** [ ] NEW/EDIT GROUP TOTAL

SAVE CANCEL

- First make sure all channel names have been created using the CHANNEL NAMES workflow within the SETTINGS menu prior to creating a mode.
- Type in a mode name (yellow shaded box)
- Assign the Function and Channel Counting Keys (green shaded box) for the dynamic overlay that will be shown on the display. The Function keys (top row), and the Channel Counting keys (bottom two rows) are mapped in the same position/orientation as shown on the display during use and mapped to the keyboard in the same location.

**7.3 CHANNEL COUNTING KEYS:** Names of channels are mapped on the screen according to their layout and relationship on the keyboard. Previously this was accomplished by directly writing on the unit bezel or overlay. The current DIFFCOUNT™ allows real time flexibility and visual feedback of channels without having to lift your hand off the keyboard to be able to see the channel names. Only assign required Channels Counting Keys required for the mode. Anywhere from 1 to 12 channels can be assigned and active for counting. A channel can be mapped anywhere on the keyboard. If a channel is not assigned (e.g. CH1, CH6, CH7, and CH 12 are not assigned), the DIFFCOUNT™ will function as an 8-channel differential counter. On the COUNT screen, unassigned channels will be greyed out and will not respond to counting. *If while programming, the user would like to go back to having a channel as unused/unassigned, select NONE as the channel name.*

**7.4 FUNCTION KEYS:** 6 functions are accessible for each mode using the screen or adjacent Function keys. These can be organized in any order with the following options:

- COUNT
- % (percent)
- WBC ABS (or user defined ABS name if created in Settings)
- HOME
- COMMENT
- CLEAR
- PRINT
- GROUP

Note that HOME or COMMENT needs to be assigned to at least 1 function key to be able to return to the HOME page and not get locked out if the unit is inadvertently set to Quick Launch without the ability to return to the Home and thus Settings page to disable Quick Launch.

**7.5** Assign the default GROUP TOTAL (see workflow below for creating groups). One or several group totals can be assigned allowing for more robust counting options.

**7.6** Select the Print Layout option if planning to use this function (see Section 8). There are two different available print layouts selectable during mode creation:

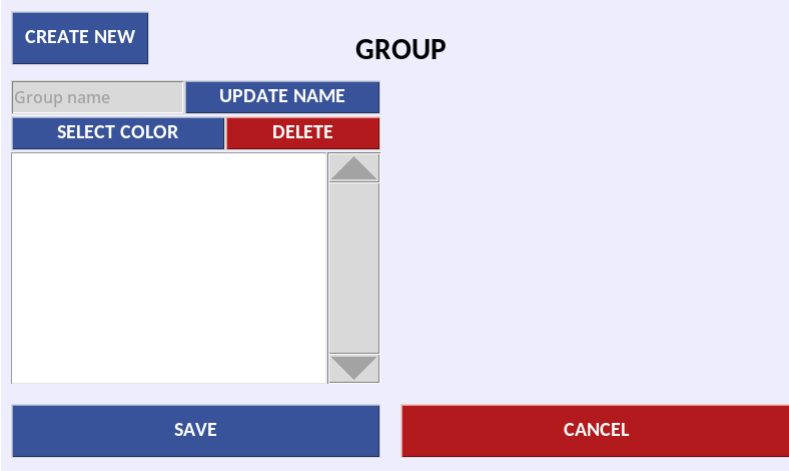
- NAME/%/ABS COUNT (focused on absolute count output e.g. WBC)
- NAME/% (focused on multiple counting group outputs)

**7.7** If NRBC correction is desired for WBC calculation, NRBC must be selected as a channel. This can be ENABLED/DISABLED using the toggle button on the top right under WBC CORRECTION, and a numerical value for NRBC THRESHOLD can then be entered. Note that for the default 12CH WBC mode, NRBC correction is selected using a threshold of 5.\* This is only supplied as a reference template.

**\*SAFETY NOTE:** Please confirm your user/institutional preference and create a new mode prior to using the DIFFCOUNT™ for absolute value calculations if your threshold differs from 5.

## 7.8 DEFINING GROUP TOTALS

Select NEW/EDIT GROUP TOTAL (purple shaded box) from the CREATE MODES screen.



**7.8.1** Select CREATE NEW to create a GROUP. The default name for the first will be Group 1. To change the group name, select the group in the white box to the left of the screen. The group name is limited to 12 characters. In the text box in the upper left corner of the screen, enter then new name and select UPDATE NAME to save the group name.

**7.8.2** Select a color for the group using the SELECT COLOR button. If no color is selected, the default is WHITE. The color will show on the COUNT screen for each channel assigned to that group whose total is displayed (TOTAL will also be highlighted with the same color of the active totaling channels).

**7.8.3** Channels can be assigned to a group using the list of assigned channels to the right of the screen when a group is selected. Channels should be selected using the touch screen. The channels will highlight with the assigned group color.

**NOTE:** NRBC default color is red and cannot be assigned to a group total (it is a non-totaling channel). This is done to avoid absolute WBC calculation error if the DIFFCOUNT™ is not programmed correctly.

A channel can be assigned to multiple different groups (included in different totals) or not included at all (a non-totaling channel).

Select SAVE to save your changes and select the DEFAULT GROUP TOTAL on the CREATE MODES screen to be used upon launching the mode. Select CANCEL to discard any changes and return to the CREATE MODES screen.

### 7.9 GROUP TOTAL EXAMPLES

On the following three screenshots from included mode [Default 8CH GROUPS], the user is toggling using F3 (GROUP) between different group totals. Notice how the color tracks with the total and included channels, the total value excludes non-totaling channels (grey), and the active group total name is displayed to the right. Note F3 and F5 are assigned to GROUP and PRINT rather than WBC ABS and COMMENTS for this particular use case.

	36	30	18	17	
NONE	USER 1	USER 2	USER 3	USER 4	NONE
	00	12	38	26	
NONE	USER 5	USER 6	USER 7	USER 8	NONE
COUNT	TOTAL	177	[ALL]		
DECREASE	%	GROUP	HOME	PRINT	CLEAR

	36	30	18	17	
NONE	USER 1	USER 2	USER 3	USER 4	NONE
	00	12	38	26	
NONE	USER 5	USER 6	USER 7	USER 8	NONE
COUNT	TOTAL	101	[TOP ROW]		
DECREASE	%	GROUP	HOME	PRINT	CLEAR

	36	30	18	17	
NONE	USER 1	USER 2	USER 3	USER 4	NONE
	00	12	38	26	
NONE	USER 5	USER 6	USER 7	USER 8	NONE
COUNT	TOTAL	076	[BOTTOM ROW]		
DECREASE	%	GROUP	HOME	PRINT	CLEAR

On the following three screenshots from included mode [Default 8CH GROUPS], the user is toggling using F3 (GROUP) between different group percentages (%). Notice how the color tracks with the relative percentages only of the included channels, the percentage values excludes the selected group's non-totalling channels (grey), and the active group total name is displayed to the right.

		<b>20.3</b>	<b>16.9</b>	<b>10.2</b>	<b>9.6</b>		
NONE	USER 1	USER 2	USER 3	USER 4	NONE		
		<b>0.0</b>	<b>6.8</b>	<b>21.5</b>	<b>14.7</b>		
NONE	USER 5	USER 6	USER 7	USER 8	NONE		
% TOTAL				[ALL]			
COUNT	XX %	GROUP	HOME	PRINT	CLEAR		

		<b>35.6</b>	<b>29.7</b>	<b>17.8</b>	<b>16.8</b>		
NONE	USER 1	USER 2	USER 3	USER 4	NONE		
NONE	USER 5	USER 6	USER 7	USER 8	NONE		
% TOTAL				[TOP ROW]			
COUNT	XX %	GROUP	HOME	PRINT	CLEAR		

NONE	USER 1	USER 2	USER 3	USER 4	NONE		
		<b>0.0</b>	<b>15.8</b>	<b>50.0</b>	<b>34.2</b>		
NONE	USER 5	USER 6	USER 7	USER 8	NONE		
% TOTAL				[BOTTOM ROW]			
COUNT	XX %	GROUP	HOME	PRINT	CLEAR		

On the following four screenshots from a custom mode renaming USER 1 and USER 2 from a copied mode [Default 12CH WBC], the user is toggling between groups using the touchscreen by pressing TOTAL, between green and orange totaling groups (left two screenshots)

When the [ALL] green group is selected, by pressing F2 (%), the user then displays the PERCENT function for all included totaling channels of that color (green). To display the orange channels (BOTTOM ROW) percentages, the user will need to return to the COUNT screen and press TOTAL until the orange group is selected, and then press F2 to return to the PERCENT function (bottom right). This is because the user has not assigned GROUP to one of the Function keys as in the prior example.

The count and percentage values exclude the selected group's non-totaling channels (grey or special case NRBC colored red), and the active group total name is still displayed to the right.

15	12	16	03	11	10
ATYP LYMPH	META	MYELO	IMM MONO	PLASMA	NRBC
02	02	14	14	07	04
BASO	EOS	MONO	LYMPH	BAND	SEQ
LOCKED	TOTAL	100	[ALL]		
UNLOCK	%	WBC ABS	HOME	COMMENT	CLEAR

15	12	14	03	11	
ATYP LYMPH	META	MYELO	IMM MONO	PLASMA	NRBC
02	02	14	13	07	04
BASO	EOS	MONO	LYMPH	BAND	SEQ
% TOTAL			[ALL]		
COUNT	XX.X%	WBC ABS	HOME	COMMENT	CLEAR

15	12	14	03	11	10
ATYP LYMPH	META	MYELO	IMM MONO	PLASMA	NRBC
02	02	14	13	07	04
BASO	EOS	MONO	LYMPH	BAND	SEQ
COUNT	TOTAL	042	[BOTTOM ROW]		
DECREASE	%	WBC ABS	HOME	COMMENT	CLEAR

ATYP LYMPH	META	MYELO	IMM MONO	PLASMA	NRBC
05	05	33	31	17	10
BASO	EOS	MONO	LYMPH	BAND	SEQ
% TOTAL			[BOTTOM ROW]		
COUNT	XX.X%	WBC ABS	HOME	COMMENT	CLEAR

## 8. PRINTING

A printer must first be selected in the PRINTER SETTINGS that can be located from the HOME screen – SETTINGS icon – PRINTER SETTINGS (Section 5). There are two different available print layouts selectable during mode creation:

### 8.1 NAME/%/ABS COUNT - focused on absolute count output e.g. WBC ABS

Patient ID: 0123456  
Specimen ID: 9876543210  
Specimen Date: 01/01/2026  
Review Date: 01/01/2026

NAME	PERCENTAGE (%)	ABSOLUTE COUNT [x1000]
ALL		
ATYP LYMPH	15%	1.1
META	15%	1.1
MYELO	14%	1.1
IMM MONO	3%	0.2
PLASMA	11%	0.8
BASO	2%	0.2
EOS	2%	0.2
MONO	14%	1.1
LYMPH	13%	1.0
BAND	7%	0.5
SEQ	4%	0.3
BOTTOM ROW		
BASO	5%	N/A
EOS	5%	N/A
MONO	33%	N/A
LYMPH	31%	N/A
BAND	17%	N/A
SEQ	10%	N/A
NON TOTALING CHANNELS:		
NRBC	N/A	N/A

TOTAL CELLS COUNTED: 100  
WBC ABS[x1000]: 008.4

Comments:  
RBC Morphology/Poikilocytosis/2+  
Artifacts/Basket/Smudge Cells/Present  
Artifacts/Hemolyzed Specimen/Present

## 8.2 NAME/% - focused on multiple counting group outputs with counts and percentages

Patient ID: 0123456  
Specimen ID: 9876543210  
Specimen Date: 01/01/2026  
Review Date: 01/01/2026

NAME	COUNT	PERCENTAGE (%)
ALL		
USER 1	39	20%
USER 2	36	18%
USER 3	23	12%
USER 4	18	9%
USER 5	4	2%
USER 6	13	6%
USER 7	39	20%
USER 8	28	14%
TOP ROW		
USER 1	39	34%
USER 2	36	31%
USER 3	23	20%
USER 4	18	16%
BOTTOM ROW		
USER 5	4	5%
USER 6	13	15%
USER 7	39	46%
USER 8	28	33%

NON TOTALING CHANNELS:

Comments:

# 8 COMMENT CUSTOMIZATION

## 9.1 Introduction to the Comment Table

The DIFFCOUNT™ can then be used to create comments about almost anything you are counting. A farmer with fruit orchards could create a spreadsheet with groups describing their crops (apples, oranges, bananas, pears, peaches, etc.) with descriptions of varieties (red delicious, granny smith, fuji, etc. for apples), and quantification (almost ripe, ripe, rotten, etc.) as they count a sample of their yield.

Since different laboratories and institutions may have specific preferences for nomenclature and quantification, editing the spreadsheet will allow ultimate customization to your preference.

**9.2** You can export the comment table using a USB stick placed in the USB port under the IMPORT/EXPORT menu option in settings. A spreadsheet file will be exported called “**comments\_database.xlsx**” which can be edited in Microsoft Excel directly, or Google Sheets and exported as an .xlsx file. Other spreadsheet editors may be attempted at the user’s discretion if they have .xlsx export capability. The user needs to be familiar with basic spreadsheet navigation and editing functions to perform customization.

**BEFORE PROCEEDING IT IS HIGHLY RECOMMENDED TO EXPORT AND LOAD THE SPREADSHEET FILE ONTO YOUR COMPUTER FOR REFERENCE AS YOU REVIEW EACH COLUMN DESCRIPTION.**

**9.3** After loading the spreadsheet, while the layout may at first appear complicated, following a few basic rules will make it easy to program all comment options to your institutional preference.

From left to right, comments are organized by GROUP, then DESCRIPTION, then QUANTIFICATION. Each of these three categories is assigned a number, a long name (showed in the display columns, comment review, and print page), a short name for the function/quick select keys for rapid selection (recommend limiting to eight to ten characters to fit within the quick select box), and in the group and description categories additional columns for navigating to the user’s preferred list of descriptions and quantifiers.

Each Comment is assigned a 7-digit code. The first two digits are the Group, the next 3 digits are the Description, and the last 2 digits are the Quantification (GGDDDQQ). Therefore, you can assign 99 groups, 999 descriptions, and 99 quantifications. For example, 1234567 will refer to Group 12, Description 345, and Quantification 67 (GG=12, DDD=345, QQ=67). This will make more sense after going through each category below.

#### **9.4 GROUP (COLUMNS A through E) – First 2 comment code numbers ##XXXXX**

Column A – G Number (Group Number) – 1 through 99 in order of listing, for instance 1-5 will be the first 5 selections available for groups in the QUICK SELECT column.

Column B – GROUP LONG (long group name) – Full displayed or printed group name

Column C – GROUP SHORT (F1-5 Quick Select Key abbreviations)

Column D – User Annotation and Reference line (nonprogramming column)

GO TO – It is recommended that the user annotate and reference where in the description columns a group refers to. We recommend entering “GOTO ###” with the three numbers referring to the FIRST three-digit description code in description series assigned to that group. This column does not affect programming; however, it will help the individual programming in the future to rapidly locate which description code ranges the group refers to. The actual designation of the Descriptions to a particular group is done in Descriptions Column M, e.g. if a description is assigned to group 2, this number would be equal to 2 in column M. This will be further discussed in the Description category section.

STOP – this annotation can tell the programming user that Column E will be used to automatically enter the remaining description and/or quantification for that group. That is, the DIFFCOUNT™ will skip subsequent steps and automatically enter a Description as designated by the 5 digits for Description and Quantifier in Column E.

Column E – automatic selection of Description and/or Quantifier

VALUES IN COLUMN E MUST BE IN QUOTATIONS, e.g. “12345”

**000 and 00 are blank options.** If the user wants the group name to be the only Comment entered for that selection, Column D can contain “STOP” and Column E will contain “00000”. If the user would like Descriptor (D number 10) to be selected without a quantification, Column E will contain “01000” for the descriptor number 010 and the quantification 00 for not quantifier. Finally, if the user would like to also assign a quantification 99 for Description/D number 10, then Column E will contain “01099”.

For the full 7-digit code, the first two numbers the DIFFCOUNT™ will store will be the selected group, for instance if the user selects G number 9 for the last example, the complete comment code will be 0901099 (G number = 09 → D number = 010 → Q number = 99).

NOTE: There is no “00” option for Group as without a Group there is no comment. If a specific descriptor or quantifier is needed for saving at the group level, this can be assigned as a group. If there are only 10 comments that are used by your institution, these can be programmed at the Group level.

### **9.5 DESCRIPTION (COLUMNS G through M) – Middle 3 comment code numbers**

XX###XX

COLUMN G – D NUMBER (“XX###XX”) – 3-digit Description number

COLUMN H – Description Long Name

COLUMN I – Description Short Name (for Quick Select function key)

COLUMN J – Insert Automatically for Quantification Code (STOP) – 2-digit Value “##” in quotations referencing the Q NUMBER in Column O (see Group Column E discussion)

COLUMN K – Quantifier START range (Column O)\*

COLUMN L – Quantifier STOP range (Column O)\*

COLUMN M – Group assignment (Column A), Group to which Description Code is assigned (1-99)

\*COLUMN K value must be less than COLUMN L and be a continuous range

### **9.6 QUANTIFICATION (COLUMNS O through Q) – Final 2 comment code numbers**

XXXXX##

COLUMN O – Q NUMBER (“XXXXX##”) – 2-digit Quantifier number

COLUMN P – Quantifier Long Name (for Quick Select function key)

COLUMN Q – Quantifier Short Name (for Quick Select function key)

NOTE: A blank cell with a range is ignored with the next value listed next on the DIFFCOUNT™

**TIP:** After saving you are modifications, create a duplicate backup file using a unique name so that you do not accidentally overwrite your work, and to keep track of different versions of the comment table.

**TIP:** Limit Long Name descriptions to about 25 characters so it will fit (not get cutoff) in the display box while selecting values. You can edit the length as needed to user preference, and if the full name does not need to be visible when selecting.

A short Q&A tutorial can be found in the Appendix (Section 13).

# 10 WARRANTY AND SERVICE

## 10.1 ONE-YEAR LIMITED WARRANTY

Modulus Data Systems, Inc. (“Modulus Data Systems”) warrants that the DIFFCOUNT™ Digital Differential Counter (“Product”) will be free from defects in materials and workmanship under normal use and service for a period of **one (1) year from the date of original purchase** by the end user (“Warranty Period”).

If a defect covered by this warranty occurs during the Warranty Period, Modulus Data Systems’ sole obligation and the customer’s exclusive remedy will be, at Modulus Data Systems’ option, to **repair** the Product, **replace** the Product with a new or refurbished unit of equal or better functionality.

This warranty **does not** cover:

- Damage resulting from misuse, abuse, neglect, accident, improper installation, or improper operation.
- Damage caused by unauthorized repair, modification, or alteration of the Product.
- Damage caused by use of non-approved accessories, power supplies, or peripherals.
- Normal wear and tear, cosmetic damage, or consumables.
- Damage caused by transportation or shipping (unless packaged according to Modulus Data Systems’ instructions).

This warranty applies only to the original purchaser and is **not transferable**. Proof of purchase (dated sales receipt or invoice) and registration is required for all warranty claims.

To obtain warranty service, contact Modulus Data Systems or an authorized distributor for a return authorization and shipping instructions. The customer is responsible for properly packaging the Product and for shipping charges to the service location. Modulus Data Systems will pay return shipping for units repaired or replaced under warranty.

**LIMITATION OF LIABILITY:** To the maximum extent permitted by applicable law, Modulus Data Systems shall not be liable for any indirect, incidental, special, or consequential damages, including but not limited to loss of profits, loss of data, or loss of use, arising out of or related to the use of, or inability to use, the Product, even if Modulus Data Systems has been advised of the possibility of such damages. In no event shall Modulus Data Systems’ total liability exceed the original purchase price of the Product.

Some jurisdictions do not allow limitations on implied warranties or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply in all cases. This warranty gives you specific legal rights; you may also have other rights which vary by jurisdiction.

## **10.2 SERVICE**

IN THE UNITED STATES:

FILL OUT A SERVICE REQUEST FORM ONLINE by scanning the QR code in SETTINGS, REGISTRATION/SERVICE or using the link on our contact page:  
<https://modulusdatasystems.com/contact-us/>

DESCRIBE THE PROBLEM very specifically on the online form. Many problems are intermittent and may not be identified without this information. If we have questions, we will reach out to the point of contact for more information.

Package the unit securely, ship prepaid and insure for \$500. We are not responsible for units lost or damaged in the mail.

Units in warranty will be repaired and returned to the address on the purchase order at no charge. Out-of-warranty service is billed at shop rate plus return shipping costs.

OUTSIDE THE UNITED STATES:

1. CONTACT THE DEALER who sold you the unit. Your dealer is to provide warranty service to you.
2. DO NOT SHIP DIRECTLY to the manufacturer. Lack of proper identification can result in high customs charges and possible loss of the unit.

# 11 SPECIFICATIONS

## DIMENSIONS

Width: 6 in. (15 cm); Depth 9 in. (23 cm); Height: 4 in. (10 cm)

## ELECTRICAL

Input voltage (VAC): 100-240 V AC

Input frequency (Hz): 50-60 Hz

Power (watts): 27 W maximum output rating (25.5 W nominal at 5.1 V x 5 A)

## TEMPERATURE

32-120 Degrees F (0-50 Degrees C)

# 12 ADDITIONAL ACCESSORIES

Barcode/QR code scanner with stand (P/N 14500)



Thermal Ticket Printer (P/N 24700)



# 13. APPENDIX

## 13.1 COMMENT TABLE Q&A

Now that you have reviewed the logic of the Comment Code Table, using the default comment code spreadsheet you have imported, try answering the following questions. If you miss a question, the answer will refer back to the relevant section for review of the concept.

**Question 1:** What are the 3 parts of a Comment in order of entry?

*Answer 1:* Group, Description, Quantifier

**Question 2:** How are Comments tracked within the DIFFCOUNT™?

*Answer 2:* Using a 7 digit number (numerical code)

**Question 3:** What do the numbers in the Comment code number refer to?

*Answer 3:* Group (first 2 numbers), Description (next 3 numbers), and Quantification (last 2 numbers)

**Question 4:** Refer to the default Comment Spreadsheet and list the Comment output for the code: 0100609?

*Answer 4:* RBC / Microcytosis / 1+

**Question 5:** Refer to the default Comment Spreadsheet and list the Comment output for the code: 0315100?

*Answer 5:* Platelets / Normal.

Note the automatic skipping of the quantifier as designated in column J, row 153 (cell J153) as “00”, with the Quantification number in quotes. Careful: do not confuse the spreadsheet row number 153 with the D number 151 in cell G153.

**Question 6:** How would you change the Group a Description is assigned to?

*Answer 6:* Enter the G number listed in Column A into the Group Assignment Column M

**Question 7:** How would you change the Quantification to display:

Occasional  
Few  
Moderate  
Marked

in the Quick Select left window on the DIFFCOUNT™ after selecting a description?

*Answer 7:* Enter the Q number range into Columns K (first in Quantifier range) and Column L (last in Quantifier Range), So for the individual Description, Column K cell will contain 5 and Column L will contain 8, telling the DIFFCOUNT™ that Quantifiers Q numbers from 5 through 8 will be available to quantify the specific Description selected in the DIFFCOUNT™. Another example of this is for RBC morphologies D002-007 that use Q numbers 9 through 12 (see cells K2-L2 through K7-L7).