

# **Operations Manual**

## **Touch Panel**

Medium Shaker

Medium Remote Shaker

Multi Shaker

Combination Shaker

**(NB-T101M, MRC, MT, MC)**






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# 1. General Information and Precautions





Safety Symbols:



## 1.1. Precautions related to the power cable

-  Always allow at least 3cm between the power cable and the back wall to prevent the back wall from causing pressure on the power cable.  
Compliance
-  Always use the electrical plug that was supplied with this instrument.  
Compliance
-  Never touch the power cord with wet hands. (This can result in electric shock.)  
Prohibition
-  Never use a damaged power cord or power outlet.  
Prohibition
-  In the event of smoke or a burning smell, immediately remove the power cord from the outlet.  
Remove plug

## 1.2. Precaution for use

-  Do not attempt to disassemble this instrument. If service is required, please contact your local representative.  
No disassemble
-  Never operate a flammable spray near this instrument. (This can result in a fire hazard.)  
Prohibition
-  Always use caution when using flammable substances such as benzene, alcohol and LP gas. (Failure to do so can result in a fire hazard.)  
Prohibition
-  Prevent foreign substances from contacting the door seal. (The inflow of outside air can negatively impact the temperature in chamber.)  
Compliance



Compliance

Permissible ambient temperature range for transport: -10°C to 60°C.



Compliance

**ALWAYS ensure that the instrument is connected to an outlet with specifications that match those of the serial number label.**

(Over-voltage or under-voltage can damage the product and result in poor performance.)



Compliance

When installing the instrument, always allow a distance of at least 30cm from the back wall.

Install the unit in the way that the power plug is easily accessible

and can be easily pulled in case of danger.



Compliance

Install the instrument on a flat and stable surface, free from vibration and in a well-ventilated location. (If the surface is not level, it can cause an excessive vibration of the product.)

## 2. FEATURE & SPECIFICATION

### 2.1 Feature

- Magnetic induction drive & Brush less DC motor provides less vibration and maintenance.
- No interference with uniformity for cell culture by BLDC motor
- User friendly, intuitive LCD touch panel
- Moisture resistant structure by Epoxy – coated
- Wire remote control box
- No access port needed by flat cable between shaker and control box
- Selectable control box position (Attach or Hang)
- Non-volatile memory for operation.

### 2.2 Specification

| ITEMS          | NB-T101M                                      | NB-T101MRC | NB-T101MT                   | NB-T101MC                                     |
|----------------|-----------------------------------------------|------------|-----------------------------|-----------------------------------------------|
| Motion         | Orbital                                       |            | Orbital<br>or Reciprocating | Dual or Orbital                               |
| Speed Range    | 30 to 300 rpm                                 |            |                             |                                               |
| Accuracy       | ±1 rpm                                        |            |                             |                                               |
| Increment      | 1 rpm                                         |            |                             |                                               |
| Time Range     | Up to 99h 59min 59sec or continuous operation |            |                             |                                               |
| Accuracy       | ±1 %                                          |            |                             |                                               |
| Increment      | 1 min                                         |            |                             |                                               |
| Control        | Microprocessor digital (PID)                  |            |                             |                                               |
| Motion control | -                                             |            | Lever operate               |                                               |
| Display        | Touch Control Display (3.2")                  |            |                             |                                               |
| Motor          | Plate type BLDC Motor                         |            |                             |                                               |
| Orbit Size     | 22 mm                                         |            |                             |                                               |
| Platform size  | 460(W) x 455(D)mm with Rubber Pad             |            |                             | 220(W)x455(D) x 2ea                           |
| Load capacity  | up to 4 x 2L flasks or 20kg                   |            |                             | Depend on spring rack                         |
| Dimensions     | 460(W)x540(D)x125(H)                          |            | 460(W)x540(D)x145(H)        | 460(W)x540(D)x240(H)<br>including spring rack |
| Power          | 100-120V or 210-230V / 50 or 60Hz             |            |                             |                                               |
| Weight         | 29kg                                          | 35kg       | 34.5kg                      | 38.5kg                                        |
| Cable          | -                                             | Flat type  | -                           |                                               |

## 2.3 Configuration of Medium Shaker



## 2.4 Configuration of Multi Shaker



## 2.5 Configuration of Combination Shaker



## 3. INSTALLATION OF REMOTE SHAKER

### 3.1 Installation

- Choose a location that is free from rapidly changing temperature conditions (it must be away from a heating or cooling vent).
- To assure proper ventilation, allow a minimum of 5 Cm of the clearance between the rear and side of the unit and the adjacent wall.
- Always ensure that the machine is installed on a level surface.
- In case of cable connection on remote control box, please find hollow from both cables as below. Both hollows should be connected otherwise both connectors are not well fit to each other.
- Do not connect or disconnect when remote box power is on.



### 3.2 Strap installation



\* Insert the both edge of plastic strap into vent hole of remote control box.



<Hanging with Hook>



<Attachment with magnetics>

\*Hook is not a standard component.



## 4. OPERATION



### ► Booting

Press the power switch into the ON position, the display illuminates and the booting screen is displayed for 2 seconds before showing the "Basic View" screen.

**NOTE:** If the shaker has been powered off before the completion of a run, the unit will automatically power on to the previous settings.

And if shaker stop running and turn off, no matter any mode shaker will turn on as Basic View.

### 4.1 Basic View Screen

#### ► Basic View Screen

- ① RUN LED: indicates if the shaker is running.
- ② Time setting: Indicates the set or remaining time.  
(To adjust, TOUCH the time value)
- ③ RPM setting: Displays the set or current RPM  
(To set the desired shaking speed, TOUCH the RPM value)
- ④ **Alarm Mute** : The audible alarm can temporarily deactivated by TOUCHING the key when the audible alarm is active (beeping). This silences/mutes the alarm for 10 minutes and the icon is displayed as . Following the 10 minute mute, if alarm event continues, audible alarm is unmuted.

To unmute the alarm, TOUCH the key to toggle to the unmuted setting, .

**Alarm Disabled** : The alarm can be disabled by TOUCHING and holding the key for 3~5 seconds. To reactivate the alarm setting, TOUCH the once.

- ⑤ Menu: TOUCH to activate the main menu
- ⑥ Shaker Start/Stop Button  
TOUCH to start or to stop the shaker.
- ⑦ Shaker end: Indicates that the setting time has expired and the shaker stops running.

#### ► RPM setting change

- ① TOUCH the RPM value, The numbers become red
- ② "SET MODE" is displayed (flashes)
- ③ Input the desired value by pressing UP(▲)/DOWN(▼) buttons

**NOTE:** Press and hold the buttons to increase or decrease the value quickly.

- ④ Apply: To store the newly set value TOUCH

(Or wait 5 seconds for the value to store automatically)

- ⑤ Exit: If you press after changing any values, the values are not saved and the screen returns to the previous screen




### ► Time setting change

a) TOUCH the time value, The numbers become red


b) "SET MODE" is displayed (flashes)




c) Input the desired value by pressing UP(▲)/DOWN(▼) buttons

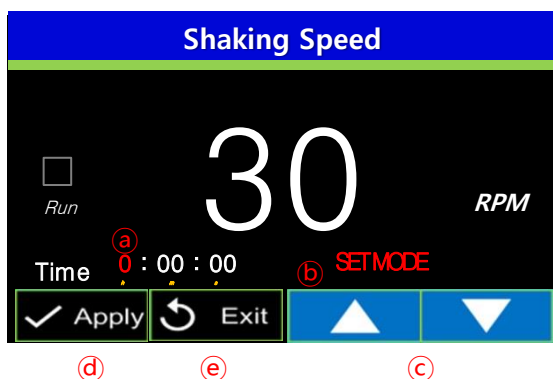
NOTE: Press and hold the buttons to increase or decrease the value quickly.

d) Apply: To store the newly set value TOUCH 

(Or wait 5 seconds for the value to store automatically)

e) Exit: If you press  after changing any values, the values are not saved and the screen returns to the previous screen

NOTE: The time cannot be adjusted during a run. To change the time during a run, you must TOUCH . Change the time value and press  and 



d

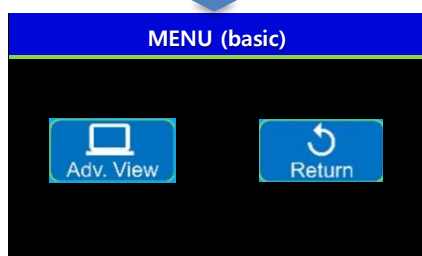
e

c

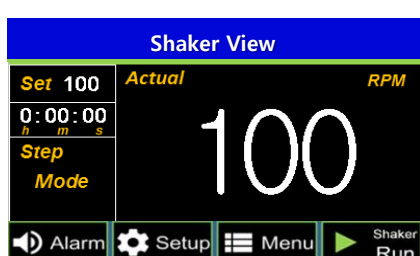
#### BASIC to ADVANCED



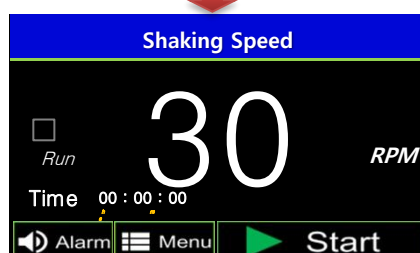
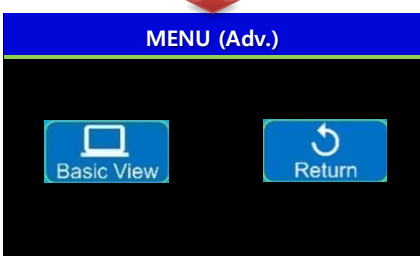
#### MENU (basic)



#### ADVANCED to BASIC



#### MENU (Adv.)



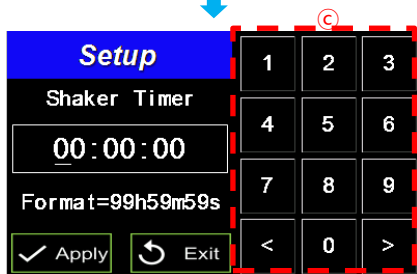
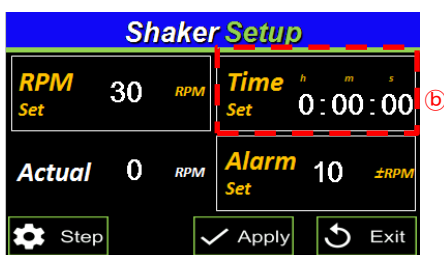
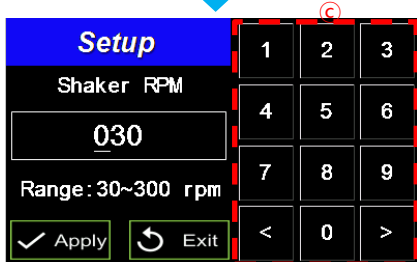
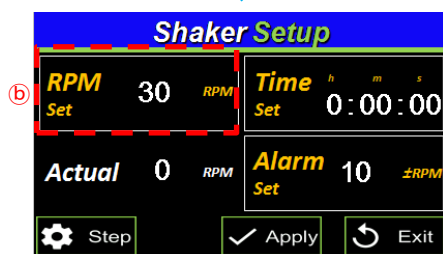
## 4.2 Advanced View Screen

### ► Advanced Mode

To switch from the standard BASIC view to the ADVANCED view, the shaker must be off. TOUCH "MENU" and choose ADVANCED View.

**NOTE:** To return to the BASIC View, TOUCH "MENU" and choose the BASIC View.

The ADVANCED View provides the user with access to the STEP mode for linking consecutive mixing cycles.




## ► Shaker setting (Advanced)

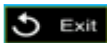
### ▷ RPM setting change

Ⓐ TOUCH the RPM Shaker value, the screen turns to the Shaker setting screen

Ⓑ TOUCH the “RPM Set” Value to adjust the set speed.

Ⓒ Input the desired value by using the key pads in the setup screen

Ⓓ Apply: When you press  , the changed setting values are saved and the screen turns to the previous screen

Ⓔ Exit: If you press  button, the changed setting values are not saved and the screen turns to the previous screen

Ⓕ The RPM setting range is 30~300rpm

When entering a value out of this range and

Pressing  , the message


“Incorrect range” is displayed.


## ► Shaker setting (Advanced)

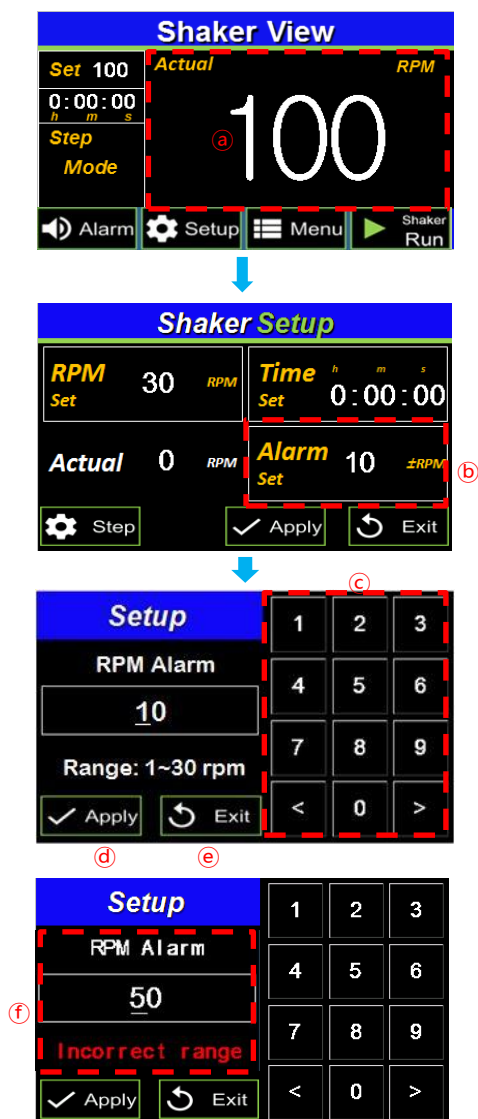
### Adjusting the Shaking Time

Ⓑ TOUCH the “Time Set” Value to adjust the set shaking time.

Ⓒ Input the desired value by using the key pads in the setup screen

Ⓓ Apply: When you press  , the changed setting values are saved and the screen turns to the previous screen

Ⓔ Exit: If you press  button, the changed setting values are not saved and the screen turns to the previous screen.



### ► Shaker setting (Advanced ONLY)

#### ▷ Alarm setting change

The alarm value is the difference between the set speed and the measured (displayed) speed. If the difference exceeds this value (once the temperature has been reached) the alarm will trigger.

① TOUCH the RPM Shaker value, the screen turns to the Shaker setting screen

② TOUCH the “Alarm Set” Value to set the timer

③ Input the desired value by using the key pads in the setup screen

④ Apply: When you press , the changed setting values are saved and the screen turns to the previous screen

⑤ Exit: If you press button, the changed setting values are not saved and the screen turns to the previous screen

⑥ The RPM setting range is 1~30rpm

When selecting the value out of this range and pressing , the message “Incorrect range” is displayed.

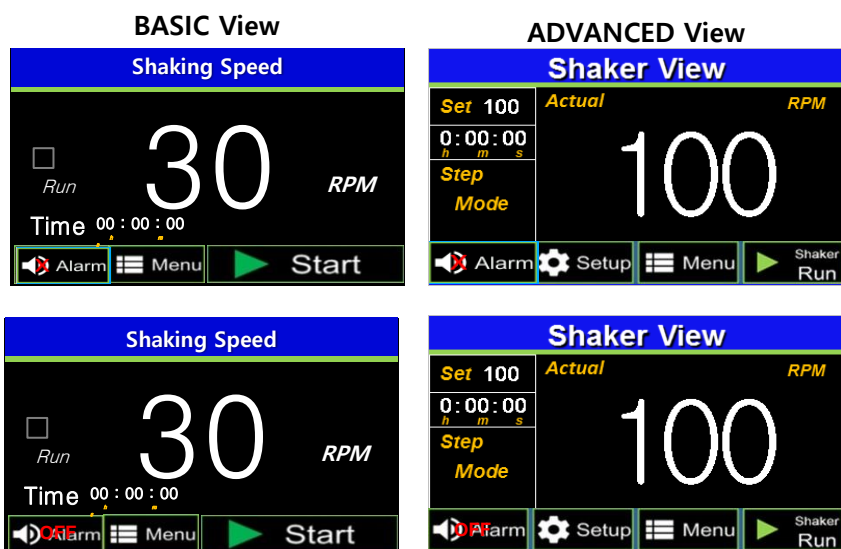
#### ▷ Alarm Mute

The audible alarm can temporarily deactivated by TOUCHING the key when the audible alarm is active (beeping). This silences/mutes the alarm for 10 minutes. and the icon is displayed as . Following the 10 minute mute, if alarm event continues, audible alarm is unmuted.

To unmute the alarm, TOUCH the key to toggle to the unmuted setting, .

#### ▷ Alarm Disabled


The alarm can be disabled by TOUCHING and holding the key for 3~5 seconds. To reactivate the alarm setting, TOUCH the once.





### 4.3 Shaker Step Setting

#### ▷ RPM, time setting

- ① TOUCH the RPM Shaker value to enter the shaker setup screen.
- ② Select , the screen moves to the shaker step & setup screen
- ③ You can select/link up to 4 desired shaking speeds.


Choose each of the 4 desired speeds by pressing on the speed value.


(If less than 4 linked speeds are desired,

leave the time and speed values as "0" to skip.)

- ④ Once a RPM step is selected, use the keypad in the setup screen

to select the desired RPM value

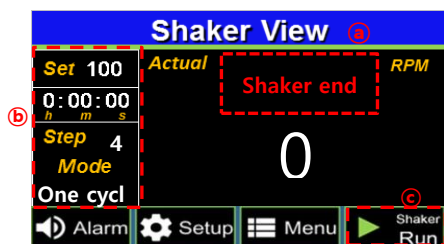
- ⑤ Apply: When you press , the changed setting values are saved and the screen turns to the previous screen

- ⑥ Exit: If you press , the changed setting values are not saved and the screen turns to the previous screen

- ⑦ Once the desired RPM speeds have been chosen, adjust the time values by following the same steps.

- ⑧ There are 3 modes available for Step Operation :  
"One cycle", "Repeat Cycle", "Step off"

**NOTE:** Repeat cycle will result in continue repeating of all programmed steps until the stop button is pressed.




### ► Step Cycle Ending Screen

a When the time for each step has expired, the “Shaker End” message is displayed

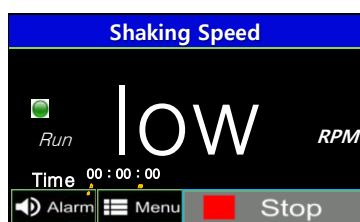
b “Set” displays the setting value of 1<sup>st</sup> step

(Default value is displayed when Step Off)

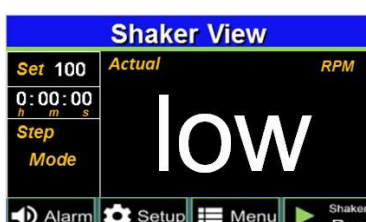
Time is displayed as 0

c  is displayed as the instrument can be restarted at any time.

BASIC View



ADVANCED View



### ▷ Shaker Alarm

The message “low” or “high” is displayed on the display when the measured value is deviating from the set value.

The message is only displayed when the difference exceeds the user programmed value for the alarm

**NOTE:** The message is cleared when the equipment maintains the values for 1 minute following the activation of the alarm.

### ► Maintenance:

**The platform of the ALL MEDIUM SHAKERS WITH TOUCH PANEL<CE> should be cleaned regularly with a soft cloth dampened with water or alcohol. (Always ensure that the machine has been powered down prior to cleaning)**

In the event of a spillage: Power down the unit, remove the platform and dry the internal chamber with a soft cloth. DO NOT attempt to operate the unit until the spillage had been properly dried.

### ► Service and Contact

Service on the ALL MEDIUM SHAKERS WITH TOUCH PANEL<CE> should only be performed by qualified service personnel.

To request service or technical support, please contact your local N-BIOTEK representative.

## 5. HOW TO CHANGE THE FUNCTION (NB-T101MT, NB-T101MC)

1) You can change shaking motion with moving conversion lever to another poll like below.



<NB-T101MT>

**Reciprocating**

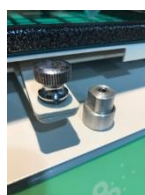


**Orbital Motion**



<NB-T101MC>

**Combination**



**Orbital Motion**



**MULTI SHAKER  
(NB-T101MT)**












**COMBINATION SHAKER  
(NB-T101MC)**



- In case of NB-T101MC, Reciprocating and Orbital Motion are working individually at same time and two plate.



## 6. Accessory Description

|                                                                                    |                                                                                    |                                                                                      |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|   |   |   |
| 101M-2S<br>2 Stairs<br>(4 Supporters with Platform)                                | 101M-PL<br>Universal platform                                                      | 101M-SR<br>Spring rack                                                               |
|   |   |   |
| 100ml Flask Holder x 36ea                                                          | 250ml Flask Holder x 23ea                                                          | 500ml Flask Holder x 16ea                                                            |
|  |  |  |
| 1000ml Flask Holder x 9ea                                                          | 2000ml Flask Holder x 5ea                                                          | 101M-MP<br>Microplate Rack<6ea>                                                      |

### \*ACCESSORIES FOR SHAKER SERIES\*





Thank you for purchasing N-BIOTEK product.

This operation manual describes practical information such as performance, usage, cautions and notices for use of the product. Prior to using the product, please read it carefully all the safety instructions described in this manual and keep this manual near equipment.

## WARRANTY

|                                 |                |                 |                             |
|---------------------------------|----------------|-----------------|-----------------------------|
| <b>ITEM</b>                     | MEDIUM SHAKERS | <b>MODEL</b>    | NB-T101M / MRC<br>/ MT / MC |
| <b>DATE OF<br/>INSTALLATION</b> | mm-dd-year     | <b>SUPPLIER</b> |                             |
| <b>SERIAL NO.</b>               |                | <b>PERIOD</b>   | One Year                    |

**N-BIOTEK** provides a warranty on all parts and factory workmanship. The warranty includes areas of defective material and workmanship, provided such defect results from normal and proper use of the equipment.

1. The free warranty service will be provided once the unit is proved to be defective by wrong workmanship after N-BIOTEK or reliable distributor's examination.
2. The warranty period is 1 year from date of installation or 18 Months year from the date of shipment from N-BIOTEK, whichever is sooner as indicated in above table. This period is proved by serial no.
3. N-BIOTEK will not be responsible of free warranty service for the faulty caused by user's improper operation, excessive use, use of incorrect voltage & frequency, storage in wrong environment mentioned in Manual.
4. Complete the above table after installation and keep this card. Then, present it to a dealer or N-BIOTEK when warranty repair is needed.



Phone number : +82-32-321-2100 Fax: +82-32-328-2372

E-mail : [export@n-biotek.com](mailto:export@n-biotek.com) Web : [www.N-BIOTEK.com](http://www.N-BIOTEK.com)

402-803 Techno-Park, YakDae-Dong, WonMi-Gu, BuCheon-Si,  
GyeongGi-Do, Korea Rep.