Project Name: Healthometer nuyu Activity Monitor
# Product No.: HNY100

PRODUCT SPECIFICATION

Battery : Lithium cell CR2032 (220mAh)
Bluetooth distance : max. 8m
Display : OLED dot matrix (resolution : 64 x 32)

MAIN FEATURES

- Daily step taken, distance traveled;
- Daily Calories burnt (including RMR);
- Goal achieved Progress;
- Real Time Clock;
- Low Battery Indicator
- Bluetooth 4.0
- Sleep Quality (Auto sleep and manual function done APP)
- Exercise mode. (Walking/Running)
- 30 days memory summary for step, time traveled, time traveled, calories and recent 7 days detailed data with 15 minutes interval.
- Auto synchronization at certain time everyday (In Battery Saver Mode)
- Auto sleep algorithm calculated by APPs.

OLED DISPLAY

OLED Display (64x32 dots)
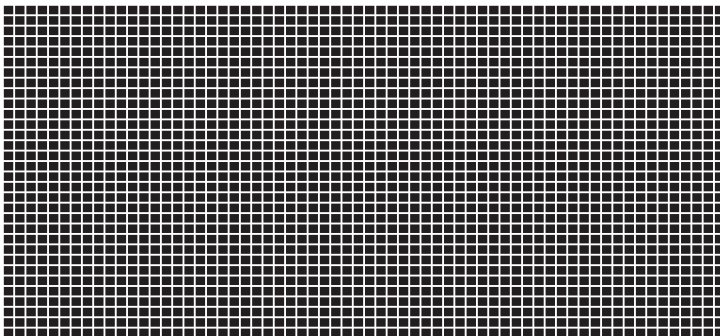
DAILY DATA RANGE (ACTIVITY)

Daily step   : 0 - 999999 steps
Step Distance   : 0 – 599.99km
Active Time Duration : 00:00 – 23:59 (hr:mm)
Calories   : 0 – 59999 kcal
Age   : 5 - 99
Weight   : 30 – 200kg
Height   : 100 cm – 250cm
Step length   : 30 cm – 200cm

Note:
The step accuracy is varied which is dependent on different testing conditions. (eg, wearing positions, pace, movement pattern of a person…..).

DEFAULT SETTING

Time & Date   : 12:00am (12hr Format) 2015/1/1
Gender   : Female
DOB   : 1/1/1980 (Age : 35)
Weight   : 150 lbs (68 kg)
Height   : 5' 5" (165cm)
Step length   : 27" in (female = Height x 0.413)
Corrected RMR   : 1.10 kcal/min (By Mufflin equation)
Unit display   : Imperial Unit
Broadcast device name : HNY100
Auto synchronization times: 7:00am & 6:00pm (Configurable)

BUTTON FUNCTION

There are button functions inside the device: Swipe function and Tap function

Swipe function : Swipe Right to Left to turn on the display, and then swipe Right to Left to scroll to next display.
Double Tap   : Double tap to for command / confirmation. (Exercise only & manual sleep only)

POWER ON RESET (INITIALIZATION)

➢ When new battery is inserted, there is a nuyu logo which shows on the display for 3s,

➢ Then enter to the step mode, the default step time is 0 step.
➢ Swipe from right to left to scroll the next display.
➢ Default scroll sequence :

Steps → Clock → Distance → Calories → Goal achieve → Step
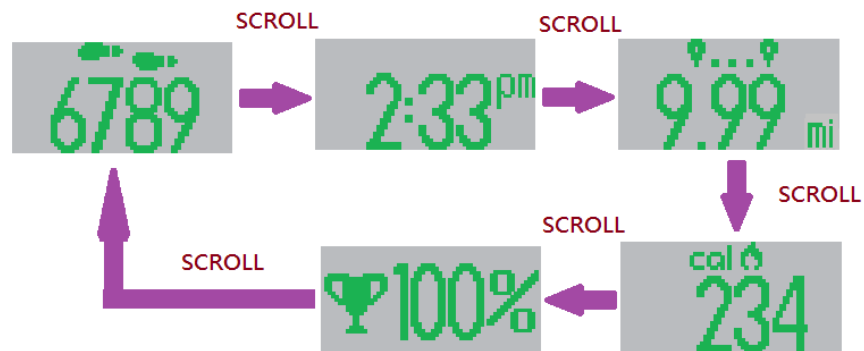
Note : When there is no any swipe within 5s, it will exit and OLED will be off.

STEP MODE

➢ When scroll to the **STEP** mode, it will show current daily step below

➢ Measuring Range : 0 – 999,999 steps
➢ If the step exceeds to the maximum range, it will show the maximum display.
➢ The daily step data will be reset at midnight.

CLOCK MODE

➢ When scroll to the **CLOCK** mode, it will show current clock below

- ➤ The real time clock was synchronized by Apps
- ➤ 12/24 hour mode format was also selected by Apps
- ➤ Low Battery icon will only be displayed when battery is low.

  Low Battery indication

DISTANCE MODE

- ➤ When scroll to the **DISTANCE** mode, it will show current daily distance traveled below

- ➤ The display unit can be selected Imperial or Metric unit by Apps
- ➤ Measuring Range : 0 – 600.00km (0 – 372.80 miles)
- ➤ The measured result in miles or km will be with 2 decimal places.
- ➤ If the step exceeds to the maximum range, it will show the maximum display.
- ➤ The daily step data will be reset at midnight.
- ➤ The daily distance data will be reset at midnight.

TOTAL CALORIES BURNT MODE

- ➤ When scroll to the **CALORIES** mode, it will show current daily calories burnt below

- ➤ Measuring Range : 0 – 60000 kcal (No decimal place)
- ➤ Sum up all calories burnt --- RMR (updated every minute), walk/running (steps), extra exercise.
- ➤ The activity calories is calculated using the METs.
- ➤ The daily calories data will be reset at midnight.

GOAL ACHIEVE MODE

- ➤ When scroll to the **TARGET ACHIEVE** mode, it will show current daily goal achievement of progress below:

- ➢ Default Goal steps: **7000** steps. The goal steps can be configured by Apps.
- ➢ Display range : 0 – 100+ (%)
- ➢ Maximum range : 999%

CONFIGURABLE DISPLAY

- ➢ In Home Mode, the display of "**DISTANCE**", "**TOTAL CALORIES**" and "**GOAL ACHIEVED**" is configurable ON/OFF by APPs.
- ➢ If the modes of display are configured to be OFF, it will not show this mode on the device.

SYNCHRONIZATION

a.) SYNCHRONIZATION MODE (NORMAL MODE DEFAULT)

- ➢ The device will automatically broadcast signal every 10s (to be confirmed later on), if the APP gets the signal from device, it can connect the device itself.

Note: If the device is being connected, it will not broadcast anymore, it will broadcast again when the connection is disconnected by APPs.

b.) SYNCHRONIZATION MODE (BATTERY SAVER MODE)

- ➢ The APP can be configured to the device into "Battery Saver Mode".
- ➢ When the connection is disconnected, it will enter into "Battery Saver Mode".
- ➢ During "Battery Saver Mode", the auto broadcast will be stopped. The device will be broadcasting every 10 sec for 1 minute when consumer swipe the display to wake up the display.
- ➢ If the APP gets the signal from the device, it can connect the device itself.
- ➢ If no connection is established for 1 minute, it will stop broadcast the signal until the customer swipe the display to wake up the display next time.

Note : If the device is being connected, it will not broadcast anymore, it will broadcast again when the connection is disconnected by APPs.

AUTO SYNCHRONIZATION (ONLY AVAIABLE WHEN BATTERY SAVER MODE IS SELECTED)

- ➢ The device will automatically broadcast the signal at certain time every day.
- ➢ The auto synchronization time can be adjusted by App.
- ➢ At the auto synchronization time, the device will broadcast its signal every 10s for 1 minutes.
- ➢ If the APP gets the signal from the device, it can connect the device itself.
- ➢ If no connection is established for 1 minute, it will stop broadcast the signal until next auto synchronization time arrived.

Note : If the device is being connected, it will not broadcast anymore, it will broadcast again when the connection is disconnected by APPs.

BATTERY LEVEL INDICATION

➢ There is 1 levels of battery indication. If the battery is low, it will show on the real time clock screen.


➢ If the battery is almost empty, there is an empty battery icon shown when swipe to turned on OLED

➢ The swipe function is disabled, but the other functions (Bluetooth, step count..) are still working. The customer needs to synchronize the data before replacing new battery in order to prevent the data lost.
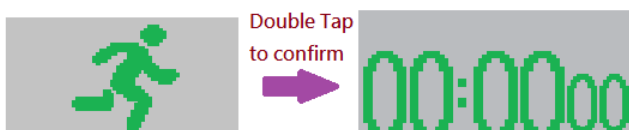
EXERCISE MODE

➢ When the **EXERCISE MODE** is configured and enabled by App, the EXERCISE display will be shown on the display when scrolling to change the mode.

➢ When scroll to the **EXERCISE MODE**, it will show activity exercise icon showing the type of activity below
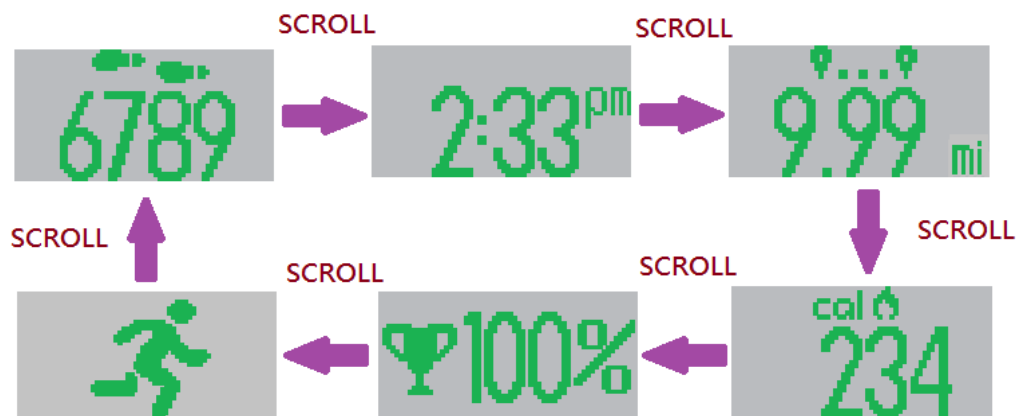

➢ 1 types of Exercise is defined by the APPs : Walking /Running.
  ● Walking / Running   ---- with Step, Distance and Calories count.
➢ The above Exercise count values will be counted and sum into daily record as well.
➢ The Exercise will be auto exit and saved until 24 hours.

START EXERCISE TRACKING

➢ To start the Exercise tracking, double tap to confirm to start Exercise tracking. The exercise timer will start to count the time of session.

➢ During Exercise tracking, swipe to scroll the displays in the Exercise tracking shown below
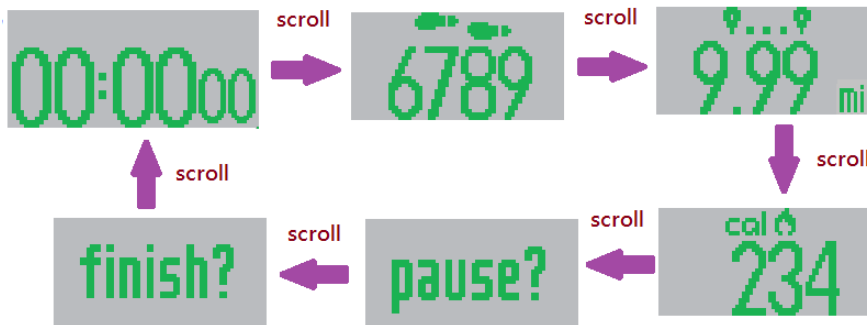
➢ Entering to the Exercise mode, there are some manuals inside: Exercise timer, Exercise step, Exercise distance, Exercise calories burnt during this session, pause and finish
➢ The Exercise session will be auto exit and saved after 24 hours.

PAUSE EXERCISE TRACKING

➢ During Exercise mode, scroll the "**PAUSE**" display, double tap to confirm the pause the Exercise tracking.

Double Tap to pause the Exercise Tracking
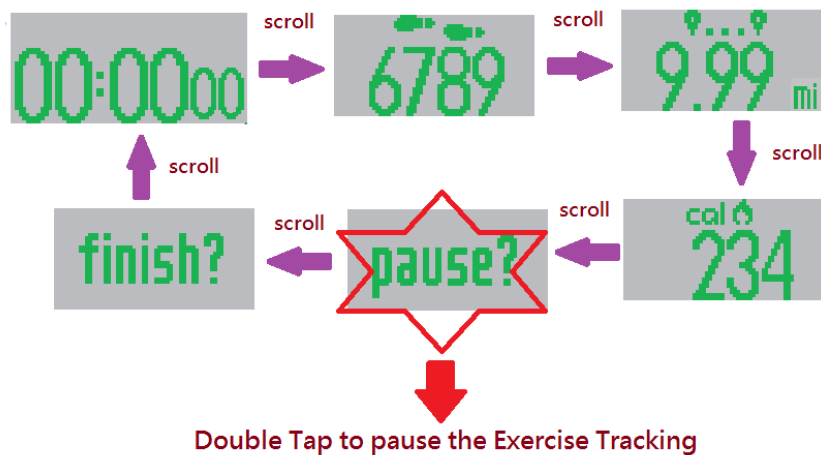
➢ When the Exercise tracking is paused, the display will be shown "**RESUME**", and the Exercise tracking is Pausing
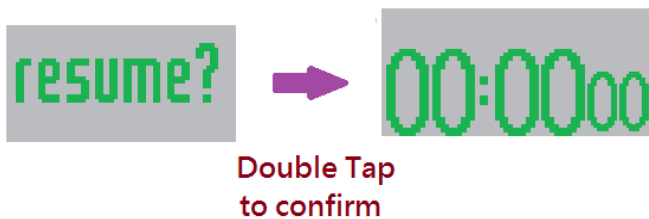

Double Tap to resume Exercise Tracking
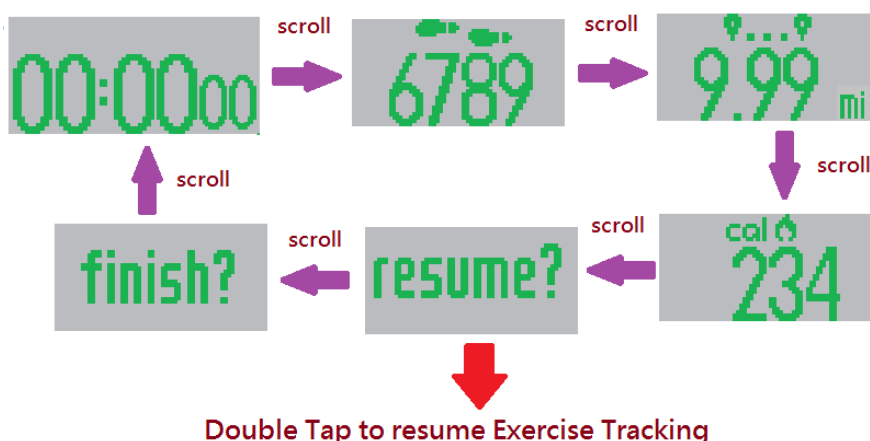
➢ In the "**RESUME**" display, double tap to resume the Exercise tracking, and start from count up timer display.

Note :
1.) When OLED is off after 4s, the first display will be shown "**RESUME?**" when the user swipe to wake up

the display.

2.) Double tap in "**RESUME**?" display, it will go to count up timer display.

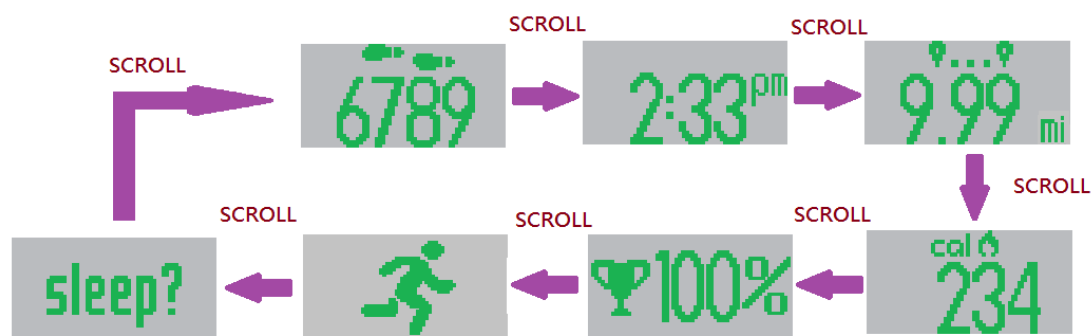
Double Tap
to confirm

FINISH EXERCISE TRACKING

➤ During Exercise mode, scroll the "**FINISH?**" display, double tap to save and exit the Exercise tracking, and return to Home Page (Step mode).

Double Tap
to confirm

Exit the Exercise and
save the record
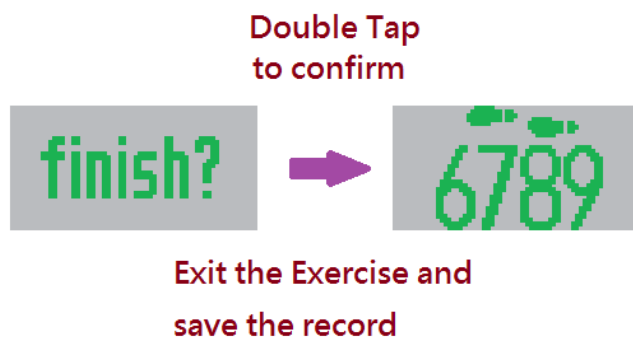
➤ Once the Exercise session was saved and exit, it will create exercise session record.

MANUAL SLEEP MODE

➤ When Auto sleep is set to be OFF by APPs, manual sleep mode is enabled and will be configured on the display.

➤ "**SLEEP?**" will be show on the screen.

➤ When go to bed, go to sleep mode, scroll the mode to SLEEP mode, "**SLEEP**?" will be displayed and double tap to confirm starting sleep and "Sleeping icon?" will be shown 2s and then OLED off.

Double Tap
to confirm   **2s later**
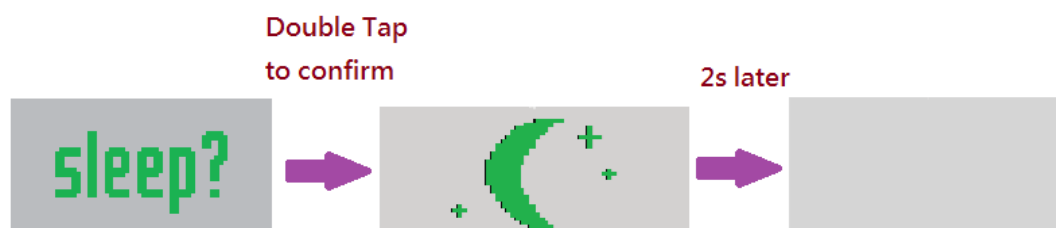
➤ During sleep Tracking mode, swipe to wake up to display current time, swipe again to show

"**WAKE UP?**",

SCROLL   SCROLL

➢ During "**WAKE UP?**" display modes, double tap to confirm to stop the sleep tracking and return to home mode (Step mode).

Double Tap   2s later
to confirm

1.) Mufflin Equation for Resting Metabolic Rate (RMR)

The Mufflin Equation for RMR (in kcal/day):

Note: Weight is in kg, height is in cm, age is in year.

2.) Activity calories Equation using METs Table

METs is calculated by getting the average speed over 10 seconds and looking up in the METs table for the relevant METs value. (Refer to below table for METs reference)

2011 METs	Category	Description
1.0	Inactivity	Sleeping
1.3	Inactivity	General
2.0	Walking	Level floor walking, very slow, <3.2km/h
2.8	Walking	Level floor walking, slow, 3.2 - <4.0km/h
3.0	Walking	Level floor walking, 4.0 - <4.5km/h
3.5	Walking	Level floor walking, moderate pace, 4.5-<5.6km/h
4.3	Walking	Level floor walking, 5.6 - <6.4 km/h, walking for exercise
5.0	Walking	Level floor walking, very brisk pace, 6.4 <7.2km/h
7.0	Walking	Level floor walking, very, very brisk, 7.2 <8.0 km/h
8.3	Walking	Level floor walking, 8.0 - <8.4km/h
9.0	Running	Running, 8.4 - <9.7 km/h
9.8	Running	Running, 9.7 - <10.8 km/h
10.5	Running	Running, 10.8 - <11.3 km/h
11.0	Running	Running, 11.3 - <12.1 km/h
11.5	Running	Running, 12.1 - <12.9 km/h
11.8	Running	Running, 12.9 - <13.8 km/h
12.3	Running	Running, 13.8 - <14.5 km/h
12.8	Running	Running, 14.5 - <16.1 km/h
14.5	Running	Running, 16.1 - <17.7 km/h
16.0	Running	Running, 17.7 - <19.3km/h
19.0	Running	Running, 19.3 - <20.9km/h
19.8	Running	Running, 20.9 - <22.5km/h
23.0	Running	Running, >= 22.5km/h

3.) Step Length Calculation

Step length is varies by step frequency with below equation

REAC WRIST BAND PROTOCOL

GATT Service Profile :

Summary :

REAC Wrist Band service exposes step, exercise time, calorie burned, distance walked or run, sleep activities, time from REAC.
Wrist Band series device for fitness applications.

Bluetooth Protocol

Bluetooth 4.0 LE Protocol - GAP, GATT

GATT Service Characteristic :

GATT Service Characteristic :

REQUEST COMMAND FORMAT FROM SMARTPHONE TO DEVICE

Rev 0.9a	1.) Modify the scrolling display of manual sleep during manual sleep. (Page 11)	REAC	2015-5-9

FCC statements:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a

particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

IC statements:

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada RSS exemptes de licence standard(s).

Son fonctionnement est soumis aux deux conditions suivantes:

(1) cet appareil ne peut pas provoquer d'interférences, et

(2) cet appareil doit accepter toute interférence, y compris celles pouvant causer un mauvais fonctionnement de l'appareil.

Power is so low that no RF exposure calculation is needed.