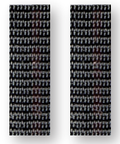
WHAT IS IN THE BOX

R029

APEX timer

The device mount is GoPro mount compatible.



3M Dual Lock SJ3551 400 density strips

Device mount base with silicone pad

Device mount plate with 3M Dual Lock SJ3550 250 density pads

Device mount extension arm

Bolts

Hex key

Device mount velcro

Aluminum sensor plate

Sensor

3M VHB tabs for sensor

3M VHB tabs for cable head

Stickers

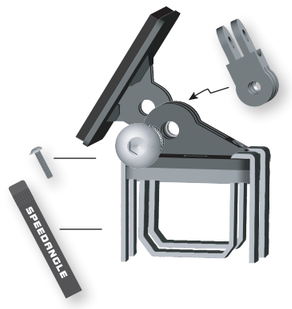
User manual

APEX INSTALLATION

Very easy. No drilling required.

DEVICE

1. Assemble the device mount and fasten it on the triple clamp with velcros. Add the extension arm if needed.



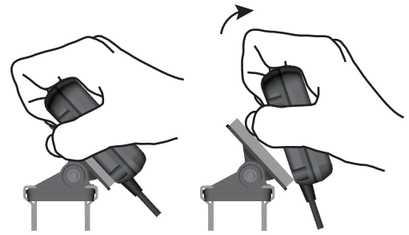
2. Adhere the two 3M Dual Lock 400 strips to the back of APEX.

APEX timer mount uses 3M Dual Lock 400 strips and 250 pads, which is the strongest bonding combination of the Dual Lock system. DO NOT replace the 400 strips with 250 strips or pads.

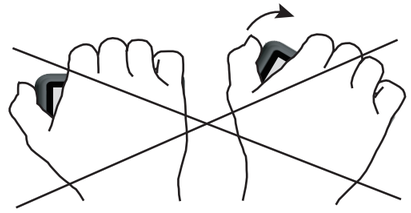
3. With both hands holding the sides of APEX and the upper mount plate, squeeze until you hear a click.

DO NOT press on the screen.

4. To remove APEX from the mount, wrap your fingers around its upper front. Use your thumb base as a pivot and prise the upper end up.

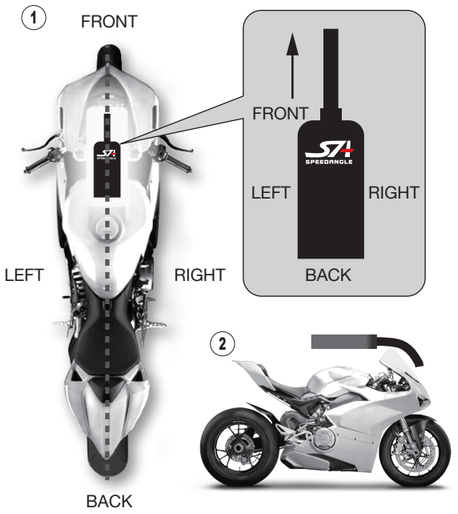


DO NOT twist the timer off the mount.



SENSOR - TWO WAYS TO DO IT!

HORIZONTAL



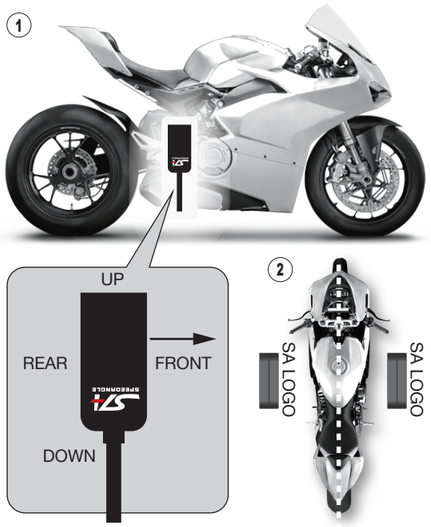
Keep both bike wheels on a horizontal ground.

Use the 3M double-sided tab to attach your sensor to a flat surface on your bike frame that is
- horizontal to the ground, and
- parallel to the bike longitudinal center line.

The air duct is fine if the vibration is not too much. Fuel tank is recommended only if it is firmly fastened on the bike frame.

Use the 3M double-sided tab to secure the sensor cable head to your bike.

VERTICAL



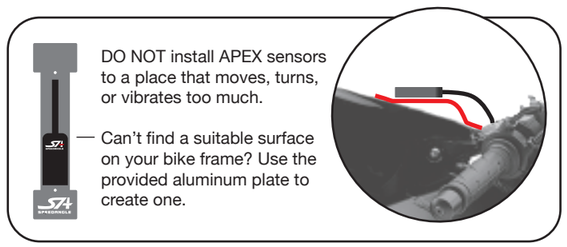
Keep both bike wheels on a horizontal ground.

Attach your sensor to a flat surface on the bike frame that is
- vertical to the ground, and
- parallel to the bike longitudinal center line.

Above foot peg is recommended.

Use the 3M double-sided tab to secure the sensor cable head to your bike.

Use a USB extention cable (not included) if the installation location is too far.



DO NOT install APEX sensors to a place that moves, turns, or vibrates too much.

Can't find a suitable surface on your bike frame? Use the provided aluminum plate to create one.

Connect the sensor with device BEFORE powering the device on.

SETUP

1. Press ⏻ to turn the power on.
2. Press ⏻ for 2 sec: ***MAIN MENU***
3. Press ☰ select ***SYSTEM SETTING*** ↵
4. Press ☰ select ***SENSOR*** ↵
5. ***DETECT ORIENTATION?*** press ↵
6. Press ⏻ x 2 to exit menu.

HANDS-FREE TIMER

The best way to use it is DO NOTHING.

POWER ON


```
PLEASE CHOOSE SAFETY OVER
PERFORMANCE WHILE RIDING.
BY USING THIS DEVICE, YOU
AGREE TO ASSUME ALL RISK
AND RESPONSIBILITY RELATED
TO ITS USAGE.
```

AUTO SEARCH

```
SEARCHING FOR TRACKS...
SENSOR:HORIZONTAL
```

```
NO TRACK FOUND
PRESS ANY KEY TO AUTO SET
```

```
NEARSET TRACKS:
 SA CIRCUIT E
NOT LISTED, USE AUTO-SET
```

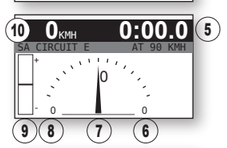
```
PLEASE SELECT ONE:
 SA CIRCUIT E
 SA CIRCUIT W
 08_17_17-05_51
NOT LISTED, USE AUTO-SET
```

STANDBY

Display 1
Lap time + Speed

Display 2
Lap time + Sector L / S
* L: Lap time at main area. S: Sector time at main area.

Display 3
Lap time + G/angles

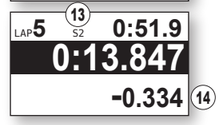


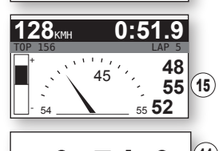
Display 4
Lap time only + real time gap
*

Display 5
No Distraction (LED will keep flashing)

1. Speed
2. Lap time
3. L: Sector time, S: Lap time
4. L: Lap time, S: Sector time
5. Lap time
6. Max right angle
7. Current angle
8. Max left angle
9. Longitudinal G
10. Speed
11. Lap time, real time gap from Start against best lap updated at sectors.
12. Predictive time gap in bar (Bar = the progression of your bike, 0 mark = the best lap bike. The gap between Bar and 0 mark = the seconds you are ahead of or behind best lap)
13. The line ahead
14. Predictive time gap in digits
15. Max angles of the last three turns (Only max angles greater than 16 will be updated.)

AUTO START/AUTO SET





AUTO START: Once the Starting Speed (90KMH/60MPH by default, configurable) is reached, APEX will start timing and logging automatically.

AUTO SET: If Auto set was selected at Search Result, APEX will set a Finish Line where the starting speed is reached before starting timing.

FREEZE TIME: The lap/sector time will be static for a period of time (configurable) everytime a line is crossed.

BEST LAP: If a best lap/sector is created, the screen color will be reversed to black for the freeze time period.

PREDICTIVE TIME GAP: After finishing a complete lap, APEX will keep comparing your location with that of your **best lap** at an 1 second to 25 second interval, depending on the lap length, and predict the time gap in digits or with the progress of a bar.

To stop timing manually, press ☰ to stop and enter menu, or press ↵ to stop and see session summary.

AUTO STOP/REVIEW

Session summary
*

```
LOG 33          EXIT PGUP PGDN
LAP COUNT 10. BEST AT L4
     BEST  0:50.381  117 164
      AVE  0:52.467
IDEAL LAP  0:49.433
  SESSION  0:43.116
TOP SPEED  169KMH
AVE SPEED  115KMH
```

lap detail

```
                EXIT PGUP PGDN
 1  0:55.001      130  162
 2  0:53.030      137  166
 3  0:52.675      136  164
 4  0:51.749      140  169
 5  0:50.381      139  169
 6  0:51.216      136  168
 7  0:52.805      140  168
```

Log list

```
LOG 037~031    EXIT PGUP PGDN
2308 0954 SA CIRCUIT E
2308 1120 SA CIRCUIT E
2308 1333 SA CIRCUIT E
2308 1441 SA CIRCUIT E
2208 1008 SA CIRCUIT W
2208 1138 SA CIRCUIT W
2208 1426 SA CIRCUIT W
```

AUTO STOP / AUTO REVIEW: Once SA timer has been idle for a preset period of time, it will stop timing and logging automatically, and then display the summary of this session.

To view the detail of each lap, press ↵ at PGDN.

To view other logs, press ☰ to go to EXIT, and press ↵ to confirm, or just press ⏻. This will bring you to the log list.

You can always press ⏻ to exit to the upper level.

Wherever you are, once the starting speed is reached, APEX will start timing/logging automatically again.

POWER OFF

You will see Main Menu when you have pressed ⏻ for 2 seconds. Keep pressing to power the device off.

* New features of firmware ENGR018

⏻ : Press to turn the power on,
or, in a menu, to exit immediately.
Press for 2 sec to enter MAIN MENU.
Press for 4 sec to power off APEX.
☰ : Press to enter LAPTIMER MENU / PERFORMANCE MENU,
or to go to the next menu item.
↵ : Press to change menu item values,
or to confirm selection.

You can press ☰ or ↵ to skip the welcome screen and liability screen.

Except for the step marked with an asterisk, you don't have to do anything or press any key to run APEX. It will enter the next stage automatically. Just focus on your ride. APEX will take care of itself.

APEX will enter the display mode you used last time and start GPS positioning.

Then APEX will search for and list the tracks nearby as Search Result (5 at most) for 60 seconds.

Press any key or make a selection to skip the wait. Or, do nothing. APEX will enter Standby after the 60 seconds.

For best GPS signal strength, turn APEX on at least 5 minutes before riding.

No track found
APEX will Auto set an FL before starting timing.

One track found
APEX will use it directly when timing.

Multiple tracks found
Press ☰ to go to the track you want.
Press ↵ to confirm.

If none has been selected, APEX will Auto set a new FL before starting timing.

If starting speed is reached during Search Result, APEX will use the track found or Auto set a new one according to the rules above and start timing immediately.

FAQ and Troubleshooting:
www.speedangle.com/FAQ

TIMER MENU

Press ☰ to enter Laptimer Menu.
Press ↵ to adjust item value.
Press ☰ to go to the next menu item.
Press ⏻ to save and exit immediately.

```
[LAPTIMER MENU]
REVIEW LATEST RECORDS
DISPLAY: LAP TIME + SPEED
START TIMER AT 10KMH
STOP TIMER AT 180s IDLE
FREEZE TIME 10s
FREEZE UNTIL:TIME ENDS
TIME GAP PREDICTOR: BAR
LINE LENGTH: 100M
66 LOGS, 93% LEFT.CLEAR
TRACK LIST
SET TRACK MANUALLY
SAVE SETTINGS AND EXIT
```

Select to enter log list. Then select a log to see its summary or detail.

to select a display mode:
- lap time + speed
- lap time + sector time L / S
- lap time + angle and G
- lap time in large fonts
- no distraction (blank screen).

to set timer starting speed at:
- 10, 30, 60, 90, 120, 150, 180, or 210.

to set timer to stop when the speed stays below 6 for:
- 10, 20, 30, 60, 90, 180, or 240 sec.

to set the length of time the display is to stay frozen when a line is crossed.
- 10, 20, 30, 45, 60, 90 sec

(available only for lap time + sector time mode) to unfreeze freeze time:
- only when freeze time ends, or earlier if passing a line

to set to show predictive time gap in:
- bar, or digits

to set the line length Auto Set is to use when setting a Finish Line:
- 10M, 20M, 30M, 40M, 60M or 100M (Use 20 or 30 for kart tracks.)

to clear ALL memory.

press ↵ to enter track list: ᵘ indicates user track.

```
AVAILABLE TRACK LIST
  1ᵘSA CIRCUIT
  2ᵘ02_14_18-10_22
  3 MISANO
  4 THE AMERICAS
  5 SILVERSTONE
  6 VALENCIA
PAGE DOWN
```

- User upload track
- User Auto Set track
- Factory preload track

press ↵ to use this track later or to delete this track permanently from this device.

```
USER TRACK 1
SA CIRCUIT
 USE THIS TRACK
 DELETE FROM MEMORY
 BACK TO LIST
```

press ↵ to use this track later or to disable this track so that it will not show in Search Result.

```
PRELOAD TRACK
MISANO
 USE THIS TRACK
 DISABLE FOR AUTO SEARCH
 BACK TO LIST
```

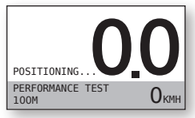
Please see the separate sheet.

HANDS-FREE PERFORMANCE METER

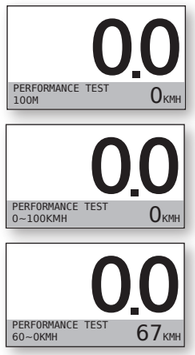
POWER ON

PLEASE CHOOSE SAFETY OVER PERFORMANCE WHILE RIDING. BY USING THIS DEVICE, YOU AGREE TO ASSUME ALL RISK AND RESPONSIBILITY RELATED TO ITS USAGE.

POSITIONING

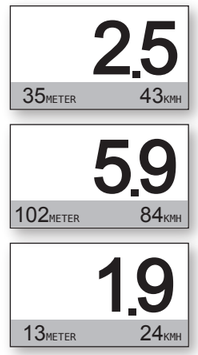


STANDBY



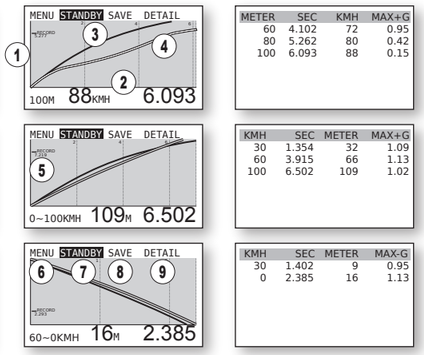
Test type can be selected in Performance Menu.

AUTO START



Timer starts automatically when a valid acceleration has been detected or a speed threshold has been fallen through, even when you are in Review.

AUTO STOP / REVIEW



A graph will be shown when a test is done, comparing the current result with the best or saved record in memory.

Press ↵ on DETAIL to enter.

POWER OFF

1. Speed
2. Time
3. Best or saved record if available.
4. Current result
5. Best/saved record time
6. Select to enter Performance Menu.
7. Select to exit to Standby.
8. Select to save the current result and overwrite the record in memory.
9. Select to see the detailed breakdown of the current test result.

Any newly created best record of a test item will be saved in the memory and be displayed for comparison automatically. In this case, the old best or saved record will be overwritten.

Test logs are not download-able for the time being.

PERFORMANCE MENU

```
[PERFORMANCE MENU]
TEST ITEM: 100M
REVIEW RECORD
ERASE RECORD
BACK TO STANDY: AUTO
SAVE SETTINGS AND EXIT
```

Tests available:

KMH:

Distance	Acceleration	Braking
100M	0~60KMH	60~0KMH
150M	0~100KMH	100~0KMH
200M		
400M		

MPH:

Distance	Acceleration	Braking
330FT	0~60MPH	60~0MPH
1/8Mile	0~100MPH	100~0MPH
1000FT		
1/4Mile		

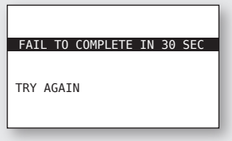
to view the best or saved record of the test above

to erase the best or saved record of the test above

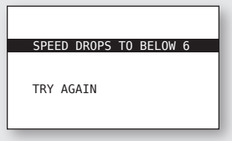
to set if APEX is to exit Review to Standby and Start automatically when the speed has dropped to 0, or only after the ☰ or ↵ key is pressed.
Use AUTO unless you would like to see the Review later.

TEST FAIL MESSAGES

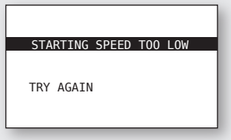
A test will fail if it is not completed in 30 seconds, or



the speed has dropped to below 6 mid-test (braking tests excluded), or



the speed in the first two seconds is too low.



In such cases, stop the bike to allow the timer to go back to Standby and try again.

SWITCH MODE SYSTEM SETTING

Press ⏻ for 2 seconds to enter Main Menu

Press ⏻ for 2 seconds to enter Main Menu. There you can switch between modes and change system settings.

```
[MAIN MENU]
GO TO PERFORMANCE MODE
LCD BACKLIGHT: 1
SYSTEM SETTING >>
POWER OFF
EXIT
```

to switch to Performance Mode or Timer Mode.

to set the screen backlight level at:

1, 2, 3, or off.

Press ↵ to enter System Menu:

```
[SYSTEM MENU]
GLONASS: ON
GPS SBAS: ON
SENSOR: HORIZONTAL
VIBRATION FILTER: LOW
SPEED UNIT: KMH
LCD CONTRAST: 5
TIME ZONE GMT: -08
SAVE SETTINGS AND EXIT
```

GLONASS on for faster positioning,
off for better trace consistency across sessions.

SBAS on for Europe, the US, and Japan.

shows the orientation the system uses to interpret sensor data.

with dual orientation sensor:
HORIZONTAL, VERTICAL, or NOT CONNECTED

with old single orientation sensor (has to be installed horizontally):
CONNECTED or NOT CONNECTED .

If the system orientation does not match your sensor installation orientation, press ↵ to reset.
If it shows NOT CONNECTED, reconnect sensor and then reboot APEX.

to set sensor vibration filter level. Default is LOW.

If your angles are unreasonably small, change to MID or even HIGH.
If the angles are unreasonably large, please check if the sensor installation is correct. If yes but the problem persists, find another installation location with less vibrations.

MORE

BATTERY CHARGING

APEX can be charged with a certified smart phone charger or a computer.

Just plug the device cable to the charger or a USB port of a computer. The screen will light up, showing “USB CONNECTED, CHARGING BATTERY”. APEX will go to sleep after charging for 10 minutes automatically.

It may take up to 4 hours for an empty battery to be fully charged.

DO NOT charge APEX with a quick charger.

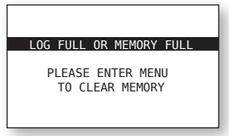
ICONS

GPS reception quality
REC Flashes when data is logging.
Flashes when the environmental temperature is above or below working range (2°C ~60°C).
Battery icon
10:36 Current time

MEMORY FULL

The max memory capacity of APEX is 50 hours or 254 logs, whichever is reached first.

If the memory is full, APEX will display



Please enter Laptimer Menu and go to
“# LOGS, #% LEFT. CLEAR”
to clear ALL memory.

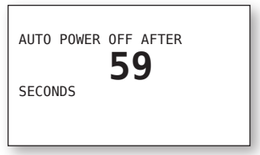
WARMUP LAP

If you are in lap 2 but your speed stays below 5 for more than 20 seconds, APEX will assume that lap 1 is your warmup lap and you are now waiting in the grid to start racing. It will then set the lap count back to 1 so that you will start from lap 1. The logging will not be interrupted to make sure that your start will be captured.

Please note that if you stay idle for longer than your idle time (180 sec by default), AEPX will stop timing and logging. If you may wait in the grid for more than 180 sec, change the idle time to 240 sec.

AUTO POWER OFF

If APEX has been idle for 60 minutes, it will start counting down for 60 seconds and then switch the device off automatically.



If you wouldl like to use it again, press ⏻ to turn it on.

SPECIFICATION

- Device dimension: 94.5*70.5*30.5mm
- Device weight: 150g
- Sensor dimension: 34.5*16.5*7mm
- Sensor weight: 25g
- 10 Hz GPS sampling rate
- GPS speed range up to 255 mph (410 kmh)
- Lean angle range up to R/L 69°
- Longitudinal G range up to ±1.5G
- LCD resolution 256*128, readable in sunlight
- Water resistant
- GPS and GLONASS dual systems
- Sensitivity -167dBm, 92 channels
- Log time up to 50 hrs or 254 logs
- 3.7V Li-ion battery
- Battery life up to 17 hrs (backlit off)
- USB 2.0 compatible
- Dual sensor installation orientations

- Timing resolution 1/1000s
- Auto track search
- Auto Start/Finish setup
- Auto timer start / stop
- Auto data logging
- Auto session summary display
- Auto sleep
- Best lap and sector time
- Predictive and real time gap
- 5 display modes
- Local tracks preloaded
- 15 custom tracks in memory
- Manual track setup on site

- Performance tests in distance, acceleration, and braking
- Auto test start / stop
- Auto review in graph against best result
- detailed breakdown by speed or distance

- Free analysis software
- Google Earth 3D replay

FAQ and Troubleshooting:
www.speedangle.com/FAQ

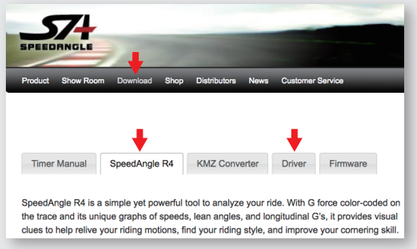
Specifications and package content subject to change without prior notice.

PLEASE CHOOSE SAFETY OVER PERFORMANCE WHILE RIDING. BY USING THIS DEVICE, YOU AGREE TO ASSUME ALL RISK AND RESPONSIBILITY RELATED TO ITS USAGE.

DOWNLOAD

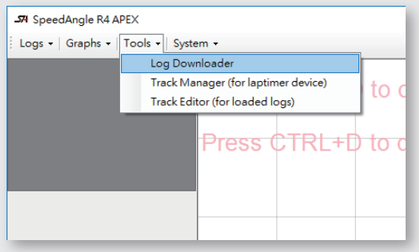
Please go to www.SpeedAngle.com/Download to download the following:

- USB driver
  (Double click to start installation.)
- companion software SpeedAngle R4
  (No installation required. Unzip before use.)

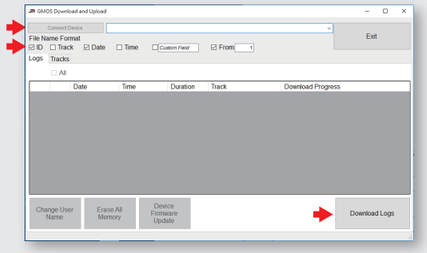


Connect APEX to your computer with the device cable. It will turn on automatically. If this is the first time you connect to this computer, wait till Windows displays “This device is ready for use”. Sometimes this may take a few minutes.

Launch SpeedAngle R4 and click on MENU -> TOOLS -> LOG DOWNLOADER to open the Download dialog.

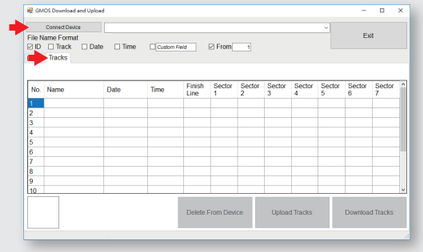


Click on CONNECT DEVICE to connect your timer. Select the items you would like to show in the filenames, and then click DOWNLOAD LOGS.



To upload/edit/download custom tracks to/from APEX, please click on the TRACK tab after device connection to use Track Manager.

Please note that preloaded tracks can not be viewed in R4 for the time being.



For more information, please watch the tutorial videos below or see the R4 user manual.

Connect and download
https://youtu.be/g08RyxMiObQ

Track Manager
https://youtu.be/IELW3Too5Z4

SPEEDANGLE R4 USER MANUAL

Download linK:
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The topics in SpeedAngle R4 User Manual include:

COMPUTER RELATED

COMPUTER CONNECTION
DOWNLOAD LOGS
MANAGE YOUR APEX
CONNECTION TROUBLESHOOTING

ANALYSIS RELATED

GRAPHS
USING GRAPHS TO SEE YOUR SKILL
MAP AREA
LAP REPORT AND AREA REPORT

OTHERS

SET SPEED UNIT
SA LOG FORMAT

REPLAY RELATED

LOAD / UNLOAD LOGS
LOG DASHBOARD
MAP AREA
REPLAY
SELECT SINGLE LAPS
TRACE SHIFT
(align traces that are off from others)

TRACK SETTING RELATED

TRACK MANAGER
(upload, download, create, edit, or save track setting to/from device)

TRACK EDITOR
(load, edit, create, or save a track setting directly on a trace in Map Area)

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A sample page from GRAPHS: