

# GMOS

## J100S



## J100 SERIES USER MANUAL

Version 0320 2015  
for Firmware .59 and above

## **IMPORTANT! PLEASE READ!**

SpeedAngle Lap Timer is a device with high technology and powerful algorithm. It is capable of calculating and producing lean angle measurement real time, and then listing the results in the Angle History and the Max Angle fields. However, there are times when the real time lean angle measurement might be exaggerated, such as when:

- You are maneuvering your bike in a way that is outside normal sportsbike motion, such as moving the bike backwards, having a highside/lowside, or pulling a wheelie, etc..
- You are curving around a bend by turning your handle bar at a great angle (especially at a low speed),
- The wheel hits an obstacle or a pothole and causes the bike to bounce,
- You are curving around a bend whose slope changes midway,
- The vibration is too much.

More often than not, this is because the G-force behavior is not one of normal bike movement, or the long axis of the motorcycle body does not point to the traveling direction ahead due to twist. The GMOS Core is constantly examining if such interaction exists every time a turn is completed. If the answer is yes, it will compensate the interaction and re-produce measurement results after the calibration. As the records of the Angle History and Max Angle fields are updated after the calibration process, while the pointer of the lean angle meter is in sync with the real time measurement, you might see the reading of the latter larger than the former when the calibration is in effect. In such cases, the reading of the Angle History and Max Angles should be taken as valid.

Please note that all the logged data have been calibrated.

Please also note that, in the rare cases where the interaction is too severe to be compensated by the calibration mechanism, the calibrated lean angle measurement might still be exaggerated (sometimes to as high as 69 degrees) or be discarded as invalid by the GMOS Filter.

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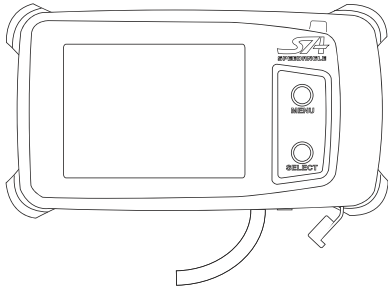
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# 1 GMOS OVERVIEW

## What Is in the Package

Thank you for purchasing GMOS JI100S. Your box contains the following items:

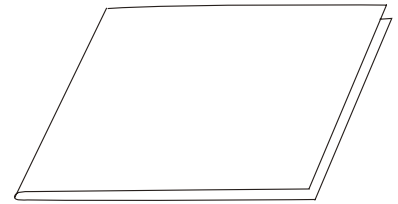
1. Dashboard unit and Bracket



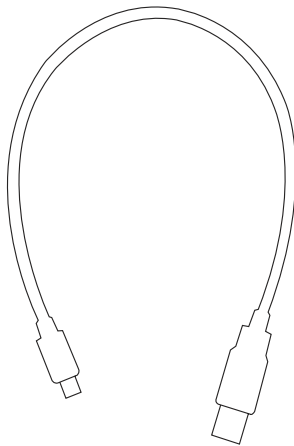
2. Sensor unit



3. GMOS JI100S Quick Manual



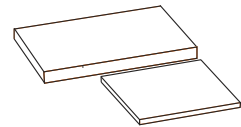
4. USB Cable



5. SpeedAngle Logo Stickers



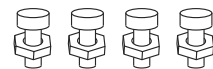
6. Adhesive Tapes



7. Hex Key Wrench



8. Bolts and Nuts



If any of these items is missing from your box, please contact your local dealer. If you purchased your GMOS directly from [www.speedangle.com](http://www.speedangle.com), please email [custserv@speedangle.com](mailto:custserv@speedangle.com) with your registration number. The registration number can be found at the back of your GMOS dashboard unit or on the Welcome Screen.

## Introduction and Functions

GMOS JI100S is a state-of-the-art data logger developed for motorcycle enthusiasts. It is capable of recording not only your track performance, but also the motion and trace of your ride. Equipped with cutting edge 10Hz GPS module and aero

technology, plus our processing algorithm optimized for motorcycles, GMOS JI100 series features:

### **Motion and Trace:**

- Real time lean angle up to 69 degrees
- Max degree of left / right lean angles
- Max angles of the last three turns
- Real time longitudinal G of acceleration / deceleration up to  $\pm 1.5G$
- Real time GPS speed up to 255 MPH / 410 KMH
- Top GPS speed
- 10Hz GPS trace mapping
- PC analysis

### **Lap Timer:**

- 1/1000 second lap time resolution
- Lap time
- Best lap (whole screen reversed in color) with time gap
- Last lap
- Session time
- Sector time
- Auto Track search
- Auto Finish Line setup
- Auto Timer start
- Auto Timer stop
- Auto data logging
- Auto Lap Record Display
- Up to 7 Sector Lines in one Track (uploaded via software SpeedAngle R4)
- Up to 15 Tracks
- Track editable via software
- Lap time record report with motion data
- Google 3D replay (with SAtoKML converter)

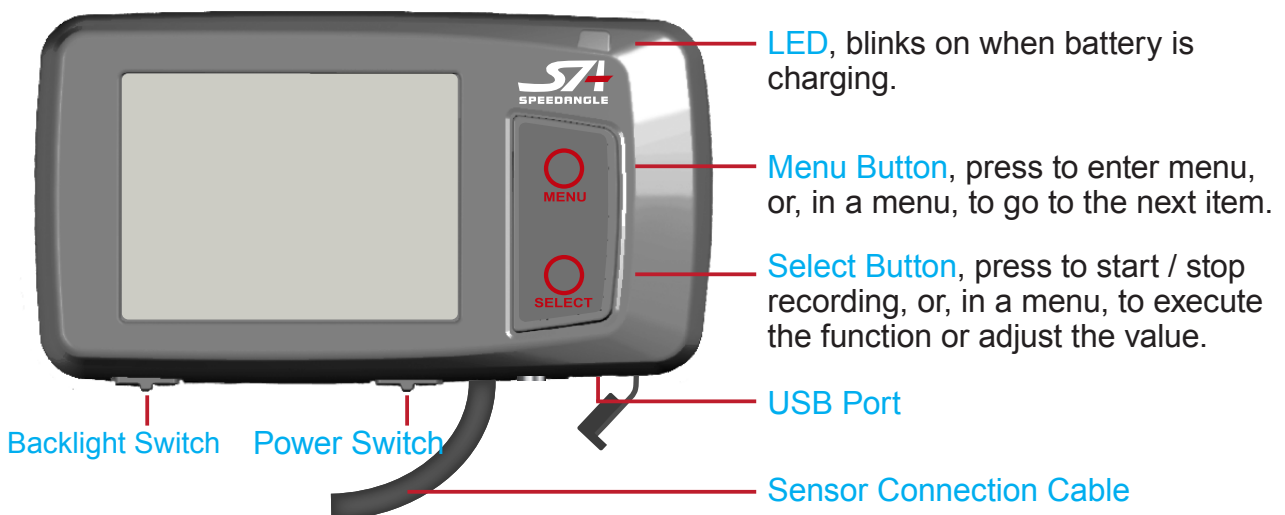
All the data can be recorded in the built-in memory for up to 7 hours or 254 logs, whichever is reached first. After your ride, connect the GMOS dashboard unit to your PC to have the logged data downloaded. Our user-friendly software SpeedAngle R4 makes it easy to relive your rides on the computer, with the lean angle, G and track sectors mapped onto your GPS traces. Open the graph plot in lean angle, G-force, or speed, or open your lap time report to have your ride further analyzed. You can load one log at a time, or load up to 5 logs and have them replayed simultaneously to have a virtual race. This allows you to have a deeper insight into your riding style

and skill, find your braking points and best line, or even compare your ride with others' for further improvement.

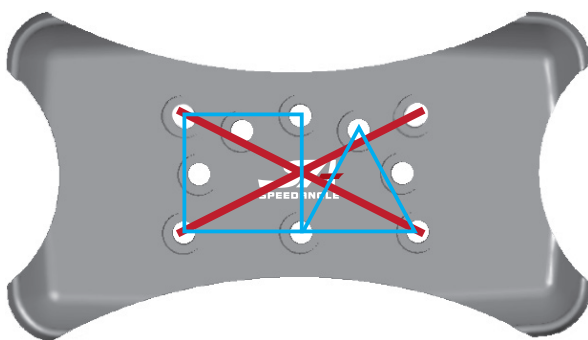
## GMOS at a Glance

Your GMOS comes with a dashboard unit and a sensor. The dashboard unit receives GPS signals, processes and stores the data transmitted from the sensor, and communicates with the computer. The sensor is responsible for sensing the lean angles of the motorcycle, and transmits them to the dashboard. Below are overviews of the dashboard unit and the sensor.

### Dashboard



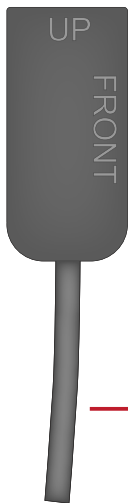
### Bracket



The holes marked at the ends of the red lines conform to AMPS hole pattern (a pattern adopted by many mount manufacturers) diagonally. Other holes form squares and equilateral triangles. This makes it easy to adjust fitting angles if you are making your own mount.

The left claws are taller than the right claws to fit the dashboard profile. Please make sure the SA logo is right side up before clicking the dashboard into place.

# Sensor



## Sensor

The sensor must be installed parallel to the bike body, vertical to the ground, with “UP” pointing upward and “FRONT” toward the front of the bike.

## Sensor Connection Cable

**WARNING:** DO NOT CONNECT THE DASHBOARD AND/OR SENSOR WITH ANY DEVICE OTHER THAN COMPUTERS. OTHERWISE, THEY MIGHT BE HARMED.



# 2 INSTALLING GMOS

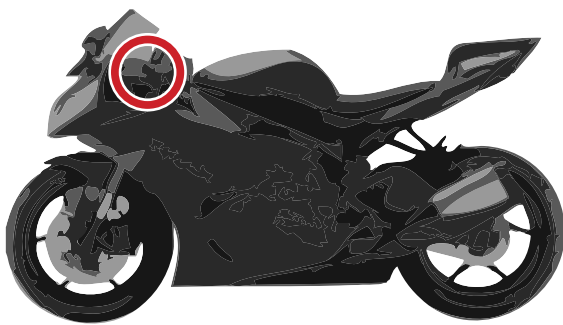
The installation of the GMOS dashboard unit and sensor unit is easy. No drilling or wiring is required. After the installation, please remember to align the sensor as instructed, and then you are ready to go.

## Installing Dashboard Unit

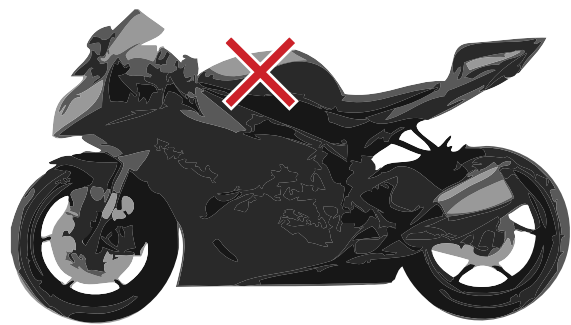
### Location

Please install the dashboard at the front beyond the steering stem area and keep it clearly visible to the sky.

Best



Might be obstructed from the sky



### Installation

To install the dashboard, please install the bracket first. You can either use the supplied 3M Dual Lock tape and adhere the bracket to a place you like, or buy an AMPS hole pattern mount from the market and bolt the bracket to the mount.

#### With 3M Dual Lock Tape

To use, clean the mounting surface and the back of the bracket with alcohol and wipe dry. Keep the SA logo rightside up. Apply the joined pieces to the back of the bracket and press the bracket to the mounting surface. Let sit for at least 24 hours after the application to obtain the best bonding strength.

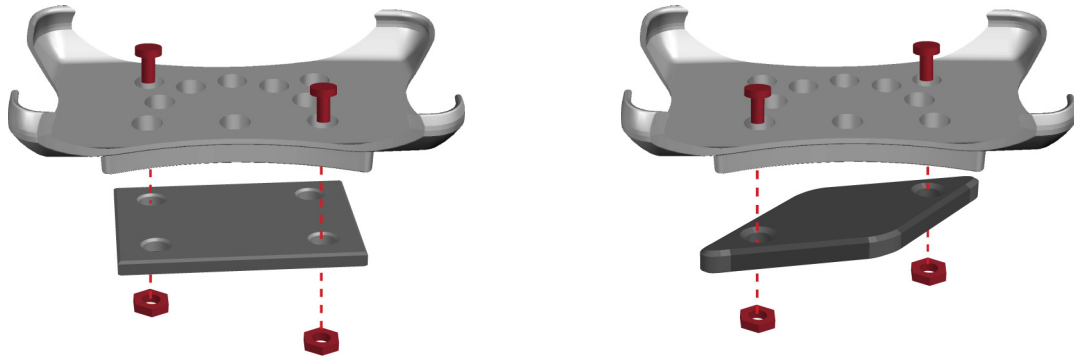
Bracket Back



#### With AMPS pattern Mount

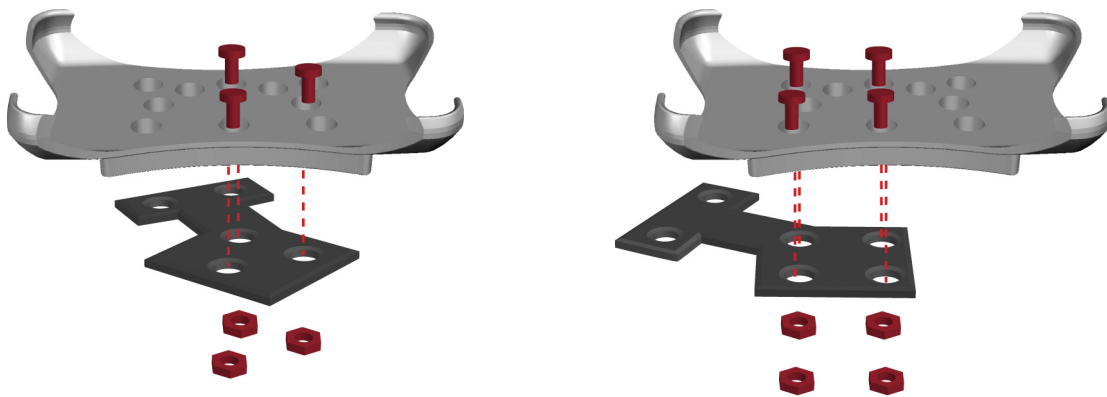
If you are using an AMPS hole pattern mount (many mounts available in the market fit in this category), please find the diagonal holes on the bracket and fit them with

the corresponding holes on the mount plate. Then bolt them together.

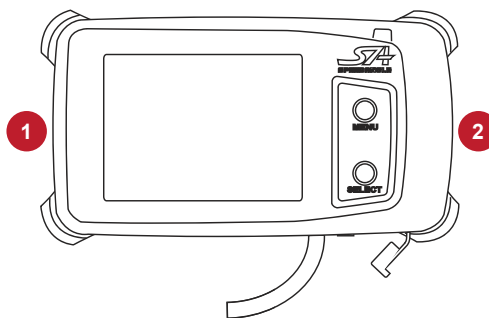


### With a Hand-made Mount

If you would like to make your own mount plate, no problem. The hole pattern on the bracket is designed to form as many equilateral triangles and squares as possible to allow you the maximum freedom when adjusting fitting orientations. Below are two examples:



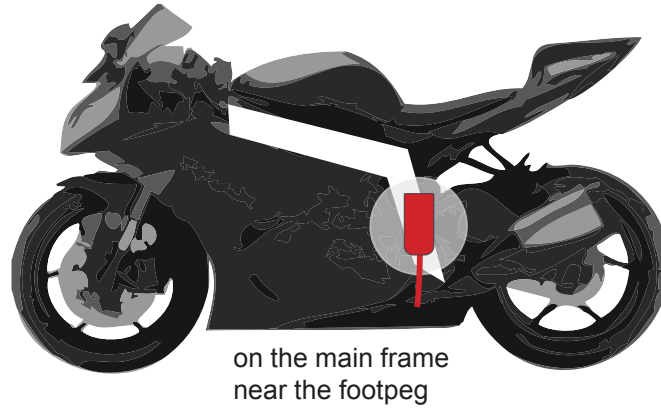
After the bracket is installed, insert the left end of the device into the bracket, then click the right end into place.



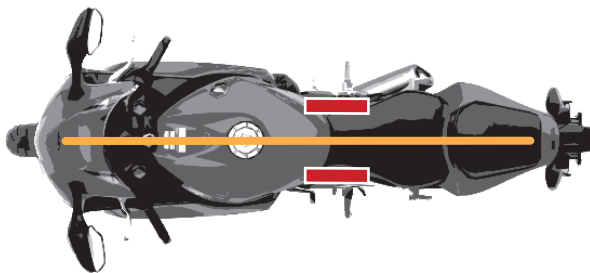
# Installing Sensor

## Location

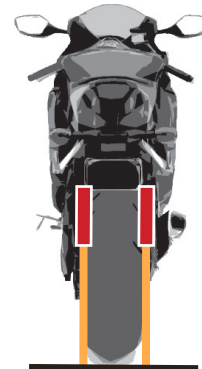
Find a plane on either side of the main frame near the footpeg that is parallel to the bike body longitudinal center line, and vertical to the ground.



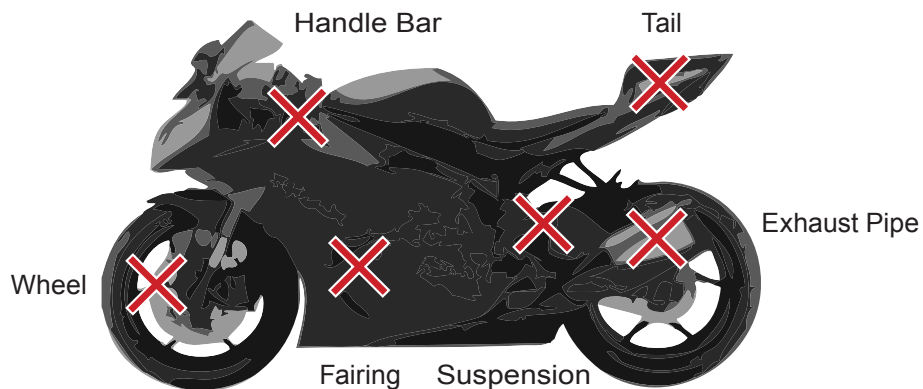
Top View



Rear View

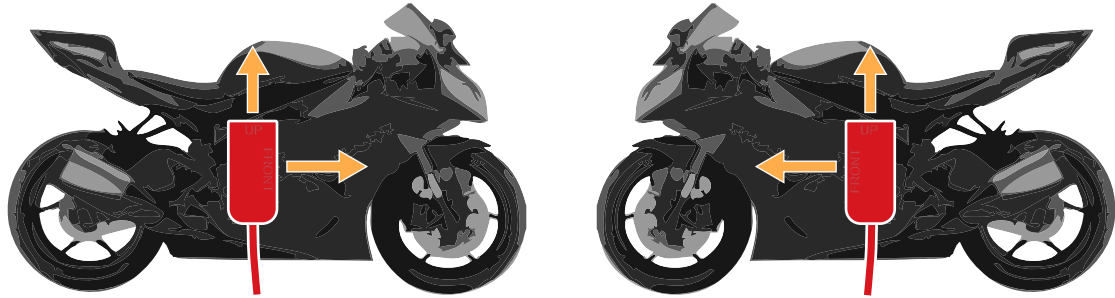


If you would like to install it elsewhere, follow the principles above and avoid places that may move, swing, wag, turn, or vibrate, such as handle bar, bike tail, and fairing, etc..



## Installation Orientation

Clean the mounting surface with alcohol and let dry. Make sure the “UP” lettering is pointing upward, and “FRONT” to the front. With the supplied red sponge tape, adhere the sensor to the installation location. Please also make sure the sensor cable is secured.

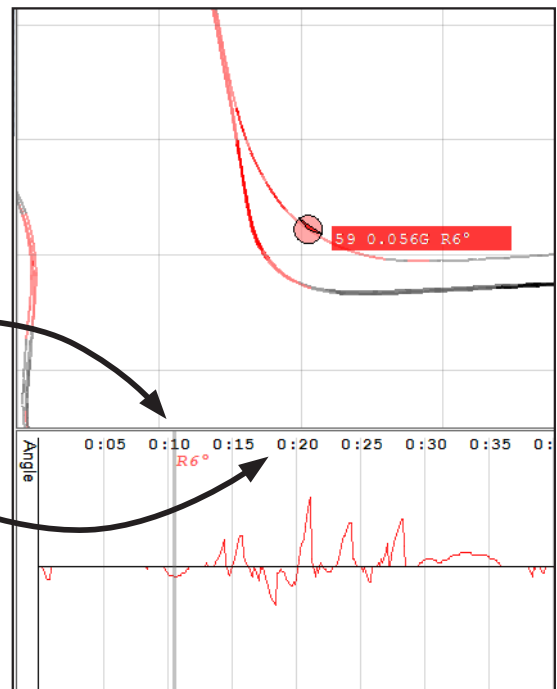


## Signs That the Installation Is Not Correct

Consider changing the installation location if you see the lean angle meter needle moving erratically during a turn in Drive Mode, or you see such lean angle graph pattern as the figure to the right in the analysis software SpeedAngle R4:

The bike is leaning into a turn, but the angle degree measured is near 0: too much vibration.

These peak-like lean angle patterns are also a result of too much vibration.



If your angle shows a similar graph pattern in R4 as below, the sensor is installed in a wrong direction. Make sure the “FRONT” on the sensor case is pointed to the front of the bike.



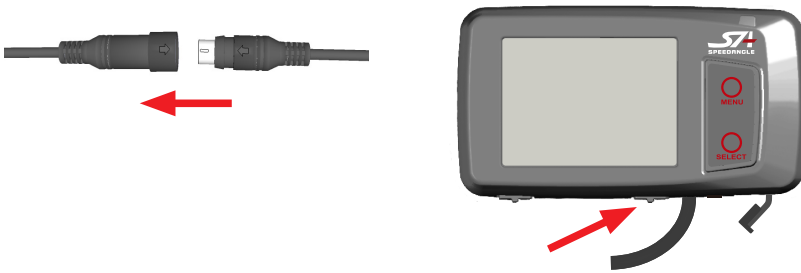
## Installation Checklist

After installation, please use this checklist to help ensure the installation is correct.

- Is the sensor installed to a location that will not move, swing, wag, or turn?
- Is the sensor installed to a location with least vibration?
- Is the sensor parallel to the longitudinal center line of the bike and vertical to the ground when the bike is upright?
- Is the “UP” lettering pointing upward and “FRONT” to the front of the bike?

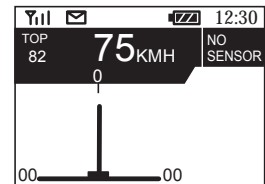
## Connecting Sensor to Dashboard

When connecting the sensor to the dashboard unit, make sure the arrows on the cable heads align with each other. Insert the plug into the receptacle until you hear a click. Connect the sensor before you turn the device power on.



**NOTE:** If the sensor is connected AFTER the power is on, it will not be recognized by the device.

You can choose not to connect the sensor and use the dashboard alone as a simple lap timer. In this case, no lean angle data will be collected. As a reminder, a “NO SENSOR” message will appear where the G-force bar is. If later you would like to reconnect the sensor, remember to turn the power off before the connection.



**WARNING:** For your safety, please check and make sure the device, sensor, antenna, and cables are all properly secured.

# 3

# USING GMOS

## Charging GMOS

For safety purposes, the battery that comes with your GMOS has just enough charge to sustain a working voltage. Please charge the battery before starting using your GMOS.

To charge the battery, please use the supplied USB cable to connect your GMOS with a computer, an external battery pack charger, or an AC-USB converter plug, and then insert the plug to a wall outlet.

Once the charging starts, you will see a red light blink on on the top right corner. Please make sure both the power and the backlight are off during charging; otherwise, the battery will never be full. The red light will go off once the the charging is complete. Normally, this will take about 2.5 hours.

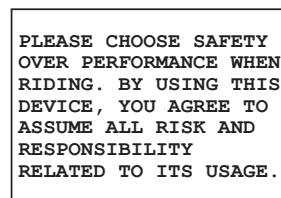
If you are going to put GMOS away for a couple of months or more, DO NOT store it on an empty battery. Keep it in an environment near 20°C (68°F). Otherwise, the battery life might be reduced severely.

## Getting Started

When GMOS is powered on, you will see the Welcome Screen appear, displaying your User ID (can be edited via SpeedAngle R3), GMOS model, and its registration number for 5 seconds. You can press any key to skip the wait.



Then GMOS will display the Liability Screen. Please read it carefully. Then GMOS will enter Drive mode or Timer Mode automatically, depending on which Mode you were in when you turned GMOS off last time. Please note that data are not shared between modes.

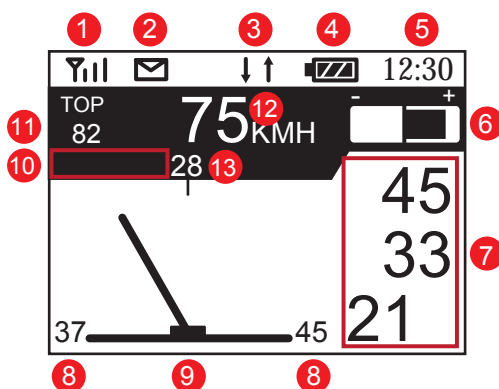


In Drive mode, GMOS displays your speeds, lean angles, and G's, and record these data plus GPS traces. In Timer Mode, GMOS displays the speeds, G's, and lap times, and records these data plus lean angles and GPS traces.

# Drive Mode

Drive Mode is suitable for open road cruising. Start your ride after you enter Drive Mode. GMOS will display the riding motion data collected real time, including GPS speed, top GPS speed, acceleration/deceleration G, real time lean angle, max left/right lean angle, and show the max angle history of the last three turns.

To record the data, press **SELECT**. The envelope-shaped REC Icon will start flashing, and a “**START LOGGING**” message will be displayed. To stop recording, press **SELECT** again. Below are a diagram and a table of the Drive mode features:



## Icons and Their Functions:

<b>1</b>	<p><b>GPS Antenna Icon</b></p> <p>indicates the quality of GPS signal reception. The more vertical lines the icon displays, the better the reception, and thus the higher the positioning accuracy.</p> <ul style="list-style-type: none"> <li>If there are less than 4 satellites locked, the GPS Antenna Icon will not be displayed. This will not interrupt ongoing log recording. However, if this happens when you are pressing <b>SELECT</b> to start a new log, the system will not start recording. Instead, a “<b>POSITIONING</b>” message will appear for about 2 seconds in the Message Area. The GPS Antenna Icon will reappear when the positioning process is completed. Then you can press <b>SELECT</b> again to start recording a new log.</li> </ul>
<b>2</b>	<p><b>REC Icon</b></p> <p>flashes when GMOS is recording. The icon will flash faster when there is about 50 minutes of memory left, at double speed when there is about 10 minutes left, and stays visible when the memory is full.</p>

- The max log time is 7 hours or 254 logs.
- If the REC Icon does not appear after you press **SELECT** to start recording, this means the system can not record logs. A message will be displayed in the Message Area indicating the reason: the GPS module is still positioning; the memory is full; or the number of logs has reached 254. Please refer to 10. Message Area (p.14) for more information.
- Entering System Menu will not interrupt recording, unless you go on to enter Timer Mode.
- To clear the logs, you can either download and clear them with the Speed-Angle R3 software, or go to System Menu and select “**CLEAR MEMORY**” to clear them directly.

### 3 Temperature Alert

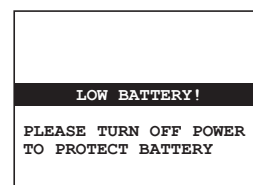
flashes when the environmental temperature is below or above the operating temperature range of the sensor (36°F ~ 140°F or 2°C ~ 60°C). ↓ flashes when the temperature is below 36°F (2°C), while ↑ flashes when the temperature is above 140°F (60°C).

- Environmental temperature below or above the sensor’s operating temperature range might affect measurement accuracy.

### 4 Battery Icon

indicates the charge of the battery.

- When the battery is almost empty, a “**LOW BATTERY!**” message will be prompted. Please recharge GMOS as soon as possible.



### 5 Current Time

indicates the current time of the preset Time Zone.

- To set the Time Zone, please go to System Menu and select “**TIMEZONE GMT**”.

### 6 G-force Bar

indicates the real time G. A right-going bar indicates acceleration, while a left-going bar deceleration.

- if the bar is not back at center when the bike is stationary, the sensor is not horizontal. Please adjust till the bubble of the bubble level is in the center circle.



## 7 Lean Angle History

lists the max angles of the last three turns. Updated every time a new turn is completed. A right-aligned number represents a right turn angle degree, while a left-aligned number a left turn angle degree.

- Lean angle degrees less than (including) 15 will not be displayed in Lean Angle History.

## 8 Max Right / Left Angle

shows the max right/left lean angle degrees measured since GMOS is powered on.

- Lean angle degrees less than (including) 15 will not be displayed in Max Right / Left Angle.
- To clear the record, please go to System Menu and select “**RESET MAX ANGLE**”.

## 9 Lean Angle Meter

shows real time lean angle up to left / right 69 degrees.

## 10 Message Area

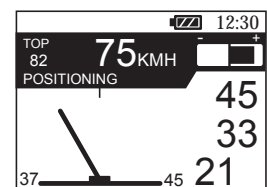
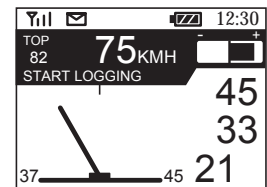
displays messages about log recording. The message will be displayed for about 2 seconds. There are five messages that may appear in the Message Area:

### START LOGGING / END LOGGING

displayed when GMOS starts / ends data recording. This is an additional reminder besides the REC icon.

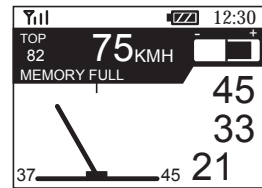
### POSITIONING:

displayed when **SELECT** is pressed to start recording, but there are not enough satellites to provide all the GPS positioning data necessary for starting a new log, such as location, time, and date. The system will continue searching for more satellites. Sometimes this may take up to a few minutes. During this process, the GPS Antenna Icon will not be displayed. When you see the GPS Antenna Icon reappear, press **SELECT** to start recording.



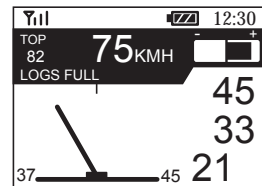
### MEMORY FULL:

displayed when **SELECT** is pressed to start recording, but the system memory is already full, or during data logging when the memory is full. In the latter case, the system will continue to function except that the recording will stop. Please download your logs and then clear the memory to release the memory space.



### LOGS FULL:

displayed when **SELECT** is pressed to start recording, but the number of logs recorded has reached 254, which is the maximum number of logs the system can record. Please download your logs and then clear the memory to release the memory space.



## 11 Top Speed

shows the top speed measured since GMOS is powered on.

- To clear the record, go to System Menu and select “**RESET TOP SPEED**”.

## 12 Current Speed

shows the current GPS speed up to 255 MPH / 410 KMH.

- To switch the measuring system from MPH to KMH or vice versa, please go to System Menu and select **UNIT MPH/KMH**.

## 13 Current Lean Angle

shows real time lean angle degree reading up to 69.

## System Menu

In System Menu, you can:

- clear the maximum lean angles recorded since GMOS is powered on,
- clear the top speed recorded since GMOS is powered on,
- set the built-in GPS clock to your local Time Zone,
- change the measuring system,
- Change screen brightness,

- clear the logs in the memory, and
- enter Lap Timer Mode

To enter System Menu, press **MENU** while you are in Drive mode. As a rule, in System Menu, pressing **SELECT** will execute the function or adjust the value of the menu item. Pressing **MENU** will go to the next item.

SYSTEM	JAN/01/11
12LOGS, 85% MEM LEFT	
RESET MAX ANGLE	37,42
RESET TOP SPEED	108
LANGUAGE	ENGLISH
TIMEZONE GMT	-8
UNIT MPH/KMH	KMH
CLEAR MEMORY	
LCD BRIGHTNESS	7
GO TO TIMER MODE	
SAVE SETTINGS AND EXIT	

## SYSTEM MENU

Press **SELECT** to clear the record.

Press **SELECT** to clear the record.

Press **SELECT** to set the Liability in English or German (other languages to be added).

Press **SELECT** to set your local time zone offset from GMT at a number between 12 and -12.

Press **SELECT** to set the speed unit as MPH or KMH.

Press **SELECT** to clear the memory. A "SURE?" message will be prompted. Press **SELECT** again to confirm, or press **MENU** to cancel.

Once the memory is cleared, the number of logs displayed at the top of the menu will be down to 0, and the memory left be back to 100%.

Press **SELECT** to change the LCD brightness.

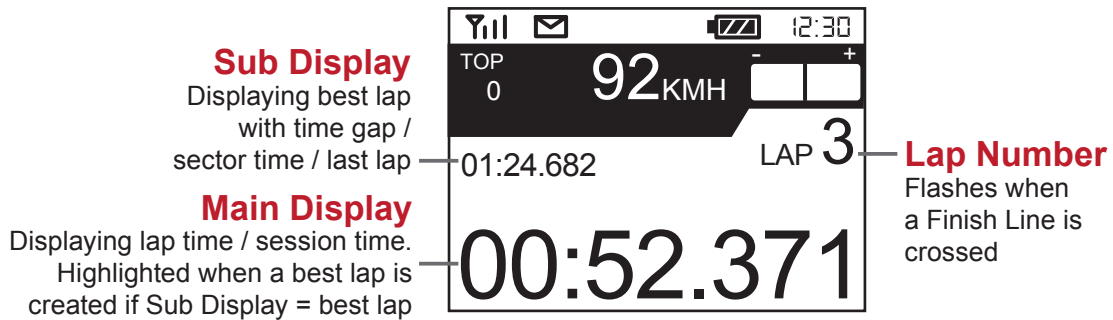
Press **SELECT** to enter Lap Timer Mode. A "SURE?" message will be prompted. Press **SELECT** again to confirm, or press **MENU** to cancel. Please note that if you enter Timer Mode while GMOS is recording data, the logging will be terminated automatically.

Press **SELECT** to save the settings and exit Menu.

# Timer Mode

## Introduction

To enter Lap Timer Mode from Drive mode, please enter System Menu, press **MENU** to go to “GO TO **LAPTIMER MODE**”, and press **SELECT**. If you were in Timer Mode when you turned off GMOS last time, the system remembers it and will enter Timer Mode directly after the Liability Screen. The Timer Mode screen looks like:



The upper half is the same as Drive mode, displaying top speed, current speed, and longitudinal G. Angles are not displayed. The lower half consists of three components: Main Display, Sub Display, and Lap number.

## Auto Features

Your SpeedAngle lap timer is basically hands-free. The best way to use it is turn on the power and then DO NOTHING, unless you have multiple settings available for the track and need to choose one. Focus on your ride; It will take care of itself.

With convenience in mind, the SpeedAngle lap timer auto features include:

Auto features	What it does
Auto Track Search	searching for Track settings available within 3KM automatically after GPS positioning is complete
Auto Finish Line Setup	drawing a Finish Line automatically where the Timer starting speed is reached when no track settings can be found or when being designated to. (This setting will be saved to Track 15 only)
Auto Timer Start	starting the Timer automatically when the pre-set starting speed is reached,

Auto Timer Stop	stopping the Timer automatically when it has been idle for a pre-set length of time,
Auto Data Logging	starting and stopping data logging automatically and synchronically with Timer,
Auto Lap Report Display	displaying the record of your newly finished laps once the Timer stops, and back to Timer automatically once you reach the starting speed again.

## Knowing the Buttons

In Timer Mode and Laptimer Menu, pressing the button will:

- **MENU**: enter Laptimer Menu, or go to the next item.
- **SELECT**: adjust the value of the menu item, or execute the function.

## GPS Positioning and Auto Search

Once you enter Timer Mode, the system will check the GPS signal quality until more than 4 satellites are locked, and then search for available tracks settings (either by Auto Set or by preloading) whose reference point is within 3 KM (1.8 mile) of your location.

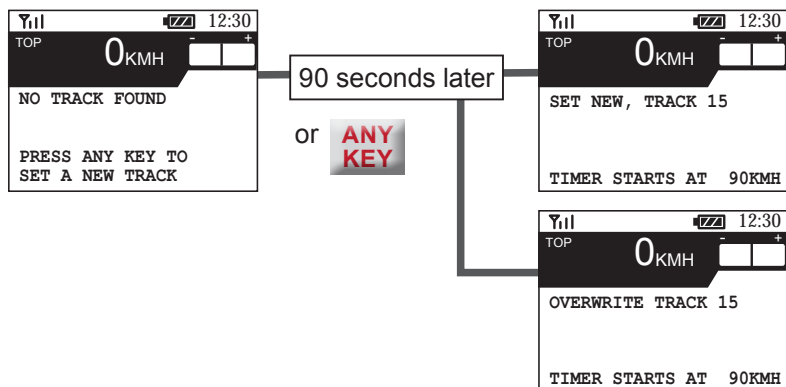


- During this process, you can press **MENU** to enter Laptimer Menu and edit settings, but this is not recommended until you are familiar with the Menu.
- Auto Search will be executed only once. To run Auto Search again, please reboot GMOS and enter Timer Mode again.

## If No Track Is Found

If there are no Track settings available, GMOS will prompt “**NO TRACK FOUND**” on the screen and wait for 90 seconds before entering Standby Screen. You can either do nothing and let it enter automatically or press any of the keys to skip the wait.

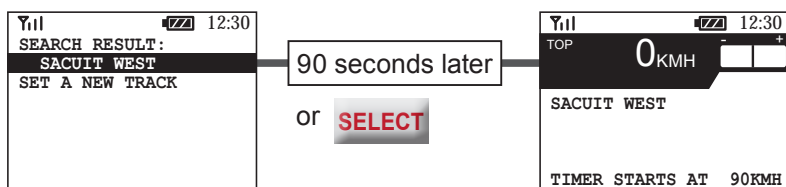
Once in Standby Screen, GMOS will prompt “**SET NEW, TRACK 15**”, meaning it will automatically set a new Finish Line later and save it at Track 15. If track 15 has already been taken, GMOS will prompt “**OVERWRITE TRACK 15**” and overwrite it later.



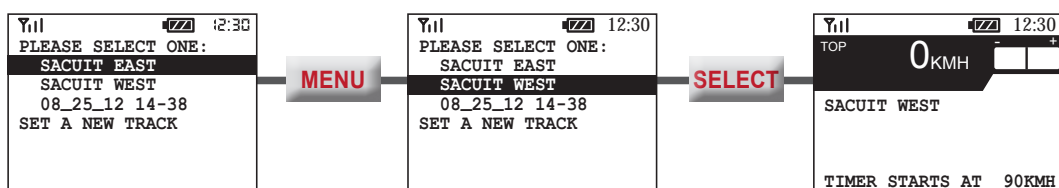
## If There Are Tracks Found

If there are Track(s) found, you will see them listed as the Search Result.

- If there is only one Track found, GMOS will list it and wait 90 seconds. Do nothing, or press **SELECT** to confirm and skip the wait. GMOS will display this Track setting on Standby Screen, preparing to use it to produce lap times later.

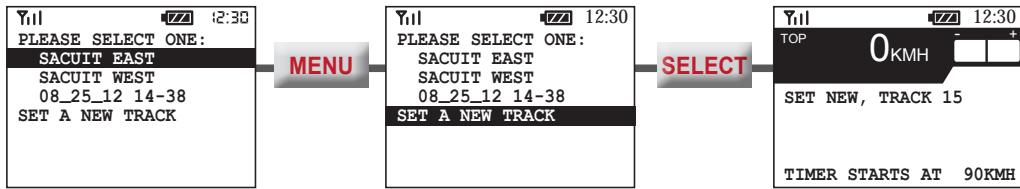


- If there are more than one Track found, GMOS will list them and wait 90 seconds so that you have time to select one. Press **MENU** to go to the Track you want, and then press **SELECT** to confirm. Then GMOS will enter Standby Mode.



If none of them is selected in 90 seconds, as GMOS will not be able to know which one to use, it will automatically prepare to set a new Track at Track 15, or overwrite it if it has already been taken.

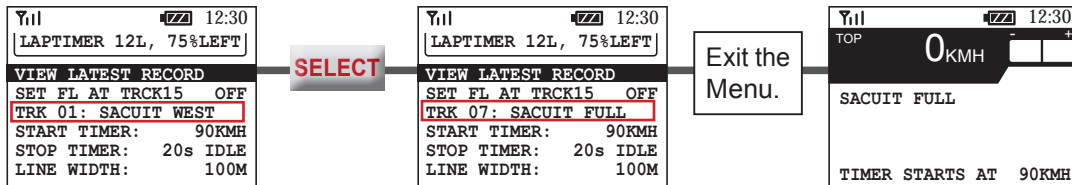
In either case, if you don't want to use the track found and would like to set a new Track instead, please press **MENU** to go to "SET A NEW TRACK", and then press **SELECT** to confirm. GMOS will enter Standby Screen, preparing to set a new Track at (or overwrite) Track 15.



## Selecting A Track To Use Manually

If you regret your choice and would like to select a Track manually, press **MENU** in Standby Screen to enter Laptimer Menu. Then follow the steps below.

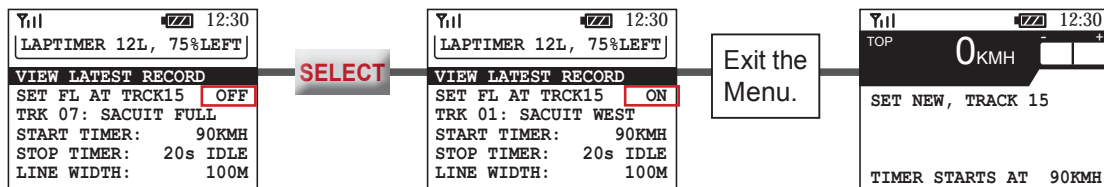
- Make sure “SET FL AT TRACK15” is off.
- Press **MENU** to go to “TRK #”.
- Press **SELECT** till you find the Track that you want.
- Exit the Laptimer Menu. GMOS will list your selection on the Standby Screen.



## Activatng Auto Set Track 15 Manually

If you regret your choice and would like GMOS to set a new Track, press **MENU** in Standby Screen to enter Laptimer. Then follow the steps below.

- Press **MENU** to go to “SET FL AT TRACK15”.
- Press **SELECT** to switch it on.
- Exit the Menu. GMOS will prepare to set a new Track at (or overwrite) Track15.



## Starting Timer and Data Logging

Start your session when GMOS is in Standby Screen. Just ride along. Once the starting speed is reached, GMOS will set a new Finish Line (only when designated to), start the Timer and data logging automatically, and then use the Track selected or newly set to produce lap times every time a Line is crossed.

You can control at what place the Timer is to start by adjusting the starting speed. Here are a few suggestions:

Timer start location	Suggested Starting Speed
Right close to where you are	10
After exiting the pit lane	90 or 120
On a straight	150 or more

- To set the starting speed, press **MENU** to enter Laptimer Menu.

Data logging starts automatically and simultaneously with the Timer. All your GPS traces, speeds, G's, angles and lap times will be recorded. Please note that if the memory is full during data logging, GMOS will stop logging and display “**MEMORY FULL**” in the Message Area. This will not affect any Timer functions.

## Stopping Timer and Data Logging

The Timer and data logging will stop automatically and simultaneously when the speed has stayed at 0 for a pre-designated period of time. You can control when the data logging is to end by setting a proper idle time. Here are a few suggestions:

Timer stop condition	Suggested Idle Time
Shortly after you stop riding	10 sec
Stay running even during your wait on the grid	180 or 240 sec

Please note that if your idle time is set at above 30, when you have been idle for more than 30 seconds after start riding, such as when you are waiting on the grid after warmup lap, the lap count will resume back to 1.

- To set the idle time, please press **MENU** to enter Laptimer Menu.
- You can press any of the keys to stop the Timer and data logging manually. If you press **MENU**, GMOS will stop the timer AND enter Laptimer Menu.

## Viewing Your Lap Time Report

Once the Timer stops, a summary of your latest session will be automatically displayed, listing its date, time, track setting, duration, best and average lap time, top speed, and average speed.

1123	1912	LOSAIL	2:30
28:09			9 LAPS
BEST	L007		
2:23.502	166	125	
AVERAGE			
2:44.750	171	111	
DETAIL			



To see the time, top speed, and average speed of each lap, press **SELECT** to enter **DETAIL**. To exit **DETAIL**, either press **MENU** to go to **EXIT** and press **SELECT** to confirm, or do nothing. Once you reach the starting speed again, GMOS will automatically exit and start the Timer.

				12:30
1	3:08.311	123	82	
2	2:56.972	156	107	
3	2:33.933	164	124	
4	2:34.107	162	124	
5	2:34.859	161	124	
6	2:33.311	165	125	
7	2:32.502	166	125	
PG.UP PG.DOWN EXIT				

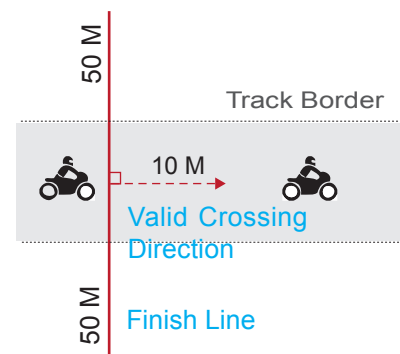
- If there were less than 3 full laps created, there will be no summary available. You will see “**NOT ENOUGH DATA**” instead.
- If no Finish Line was crossed at all, There will be no report available. GMOS will go back to Standby Screen directly.
- To view the reports of up to the previous 14 logs, please enter LapTimer Menu and go to “**VIEW LATEST RECORDS**”.

				12:30
1124	2028	LOSAIL		
2:43			0 LAPS	
NOT ENOUGH DATA FOR BEST LAP AND AVERAGE LAP				
EXIT				

## Advanced: Setting a Better Finish Line with Auto Set

### How A Finish Line Is Set with Auto Set

When GMOS is setting a new Track with Auto Set, it marks the location where the starting speed is reached as a reference point, uses the following 10 meter trace as a direction pointer, and draws a line extending 50M from the reference point to both sides perpendicular to your trace. This is your Finish Line. Then GMOS also marks your riding direction as the valid crossing direction of this Line. This is to prevent unwanted Lap times when the Line is crossed from a wrong direction. Then GMOS will go on to start the Timer.



### How to Control Your Finish Line Location

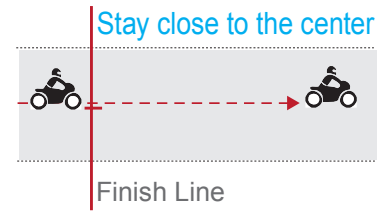
As the location where the Finish Line is set depends on where the starting speed is reached, you can control the location of the Finish Line by designating a proper starting speed. Here are a few suggestions:

Desired FL location	Suggested Starting Speed
Right close to where you are	10
On a straight	150 or more

The key is to keep your speed below the designated starting speed until you reach your desired Finish Line location.

## Stay Close to the Center Line

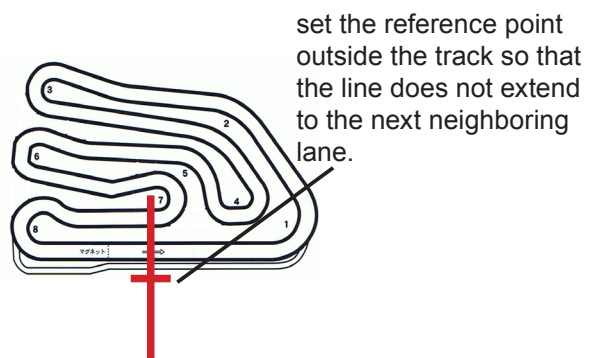
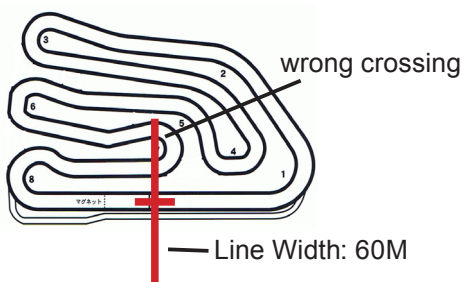
When setting a Finish Line, it is essential that you stay close to the center line of the track. This will ensure that the reference point is in the middle of the track so that the Finish Line will extend evenly to both sides and cover the width of the track lane.



## Adjust Line Width Beforehand If Necessary

If necessary, before setting the Track, enter Laptimer Menu to adjust Line Width according to the size of the course and the quality of GPS reception. The width is 100M by default. However, if your track is small and very winding, such as a go-kart course, adjust the width to 60M.

- In some very small circuits, you may even need to set the reference point outside the track lane to make sure the Line does not extend to the next neighboring lane and cause unwanted crossings.



This can be done with SpeedAngle R4 Track Manager. For more information, please see the tutorial video on [www.speedangle.com/download](http://www.speedangle.com/download), SpeedAngle R4 section.

## Linear Track

The way to set the Finish Line for a linear track is just a little bit different from setting for a closed track. The easiest way is to use Track Manager of SpeedAngle R4 to set and upload your Finish Line. Otherwise, ride to your Finish Line location, set the starting speed at 10 (recommended), and follow the steps below:

- Turn GMOS on. Ignore any Tracks found and select “**SET NEW**”.
- Speed up to above your starting speed.
- Keep riding till you see the Timer running. Now the Finish Line has been set.

Go back to your Start location. Enter Laptimer Menu, make sure “**SET FL AT TRACK15**” is off, and then select the Track you have just set (Track 15). Exit Menu.

GMOS will prompt the Track you designated in Standby Screen. Now you are ready to go. GMOS will start the Timer when you reach the starting speed, and produce lap times when you ride past the Finish Line location.

## Configuring the Timer

In the Laptimer Menu, you can:

- view the Lap Time Report of up to 14 latest logs,
- activate Auto Set to set a new Track at Track 15 later,
- designate a Track to use later,
- designate the Timer starting speed,
- designate at what idle time the Timer is to stop,
- designate the length of the Finish Line,
- designate what is to be displayed as Main Display or Sub Display, and
- designate how long the Main Display and Sub Display are to be held after updated.

In the Laptimer Menu, pressing **SELECT** will execute the function selected or adjust the value. Pressing **MENU** will go to the next item. Below we will show you how to configure the settings:

Log Count		Memory Left	
LAPTIMER 12L, 75%LEFT			12:30
VIEW LATEST RECORD			
SET FL AT TRACK15 OFF			
TRK 01: SACUIT FULL			
START TIMER: 90KMH			

# LAPTIMER MENU

Press **SELECT** to enter the list of your latest 14 logs. They are listed in the order recorded with their date, time and track setting.

- To view a log, move to the entry and press **SELECT**. You will see a summary of session duration, best lap and average lap information.
- Press **SELECT** on **DETAIL** to see the time, top speed, and average speed of every lap in this log.
- To exit, press **MENU** to move to **EXIT** and press **SELECT** to confirm.

Log Count		Memory Left	
0725 1330 LOSAIL			12:30
0725	1127	LOSAIL	
0614	1130	JEREZ	
0614	0713	JEREZ	
0613	1141	JEREZ	
0502	0925	SONOMA	
0502	1132	SONOMA	
MORE			

Log Count		Memory Left	
1123 1912 LOSAIL			12:30
28:09		9 LAPS	
BEST L007			
2:23.502	166	125	
AVERAGE			
2:44.750	171	111	
DETAIL			

Log Count		Memory Left	
1 3:08.311 123 82			12:30
2	2:56.972	156	107
3	2:33.933	164	124
4	2:34.107	162	124
5	2:34.859	161	124
6	2:33.311	165	125
7	2:32.502	166	125
PG.UP PG.DOWN EXIT			

Press **SELECT** to activate Auto Set at Track 15. This track will be named by the date and time it was set: MM\_DD\_YY hh-mm, such as 12\_20\_15 10-30.

Press **SELECT** to rotate among the 15 Tracks available and designate one to use later.

Press **SELECT** to choose a speed at which GMOS is to set a Finish Line, start the Timer and start log recording. You can choose a value between 10 and 240 by an increment of 30.

For how to choose a proper starting speed, please refer to Advanced: Setting a Better Finish Line with Auto Set (P.21).

STOP TIMER:	10s IDLE
LINE WIDTH	100M
M.DISP:	LAP TIME
S.DISP:	BEST LAP
FREEZE TIME:	10 SEC
GO TO DRIVE MODE	
EXIT TO TIMER	

Press **SELECT** to choose the length of time the Timer is to be idle for before GMOS stops the Timer and log recording. You can choose a value among 0, 10, 20, 30, 180 and 240.

- You can stop the Timer any time by pressing either of the keys. If you press **MENU**, GMOS will stop the Timer AND enter Laptimer Menu.

Press **SELECT** to set the Finish Line at 60M or 100M long.

Press **SELECT** to designate what is to be used as Main Display between Lap Time and Session Time .

Press **SELECT** to designate what is to be used as Sub Display among Best Lap with time gap (time gap displayed after a lap is complete), Last Lap, and Sector Time (if there are Sector Lines available).

Press **SELECT** to choose a time length the Main Display and Sub Display are to be held when a record is updated. You can select a value among 10, 20, 30, 45, 60 and 90.

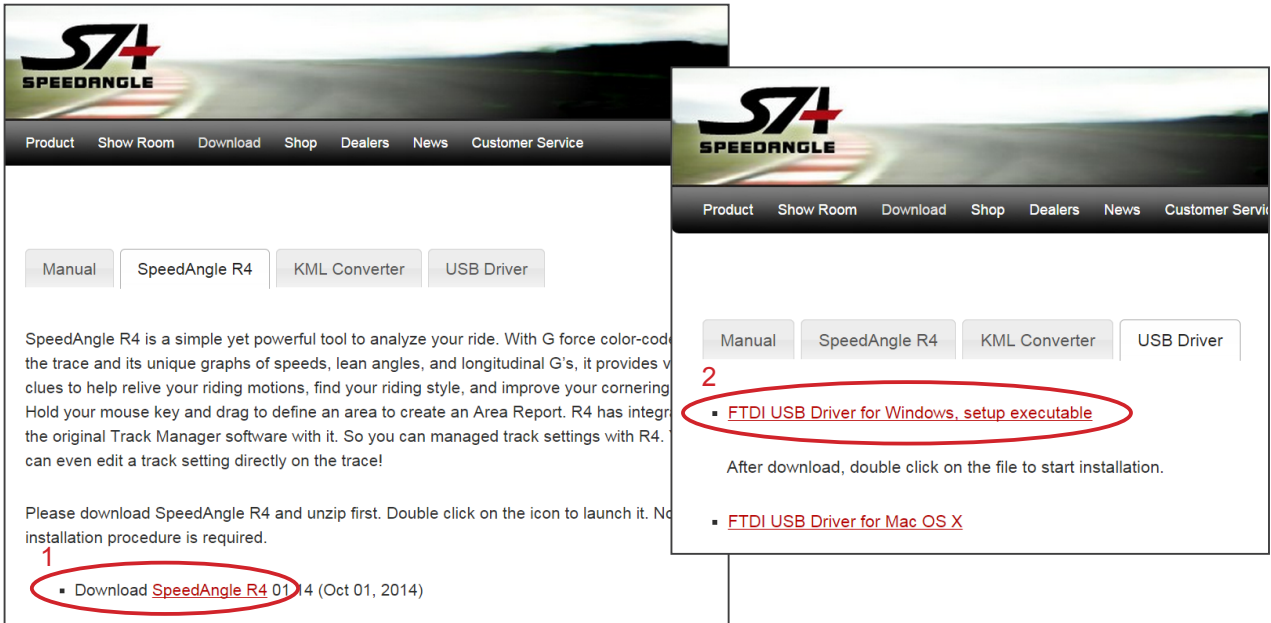
Press **SELECT** to go to Drive Mode. The system will ask you "SURE?". Press **SELECT** to confirm. Otherwise, press **MENU** to cancel.

Press **SELECT** to exit Laptimer Menu and go back to Timer.

# Connecting GMOS to a Computer

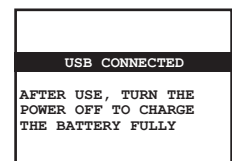
Before connecting GMOS to a computer for the first time, please go to [www.speed-angle.com/download](http://www.speed-angle.com/download), and

1. go to the SpeedAngle R4 section to download the latest version of SpeedAngle R4.zip, and then
2. go to the USB Driver section to download FTDI USB driver.

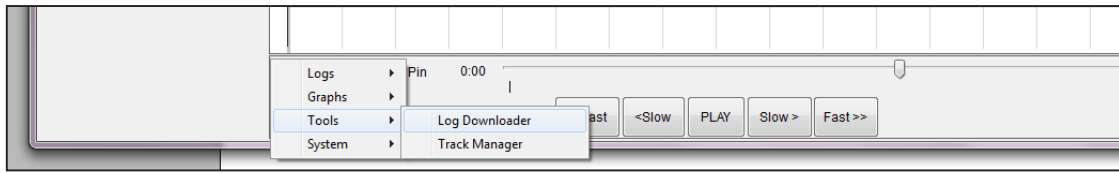


Then follow the steps below:

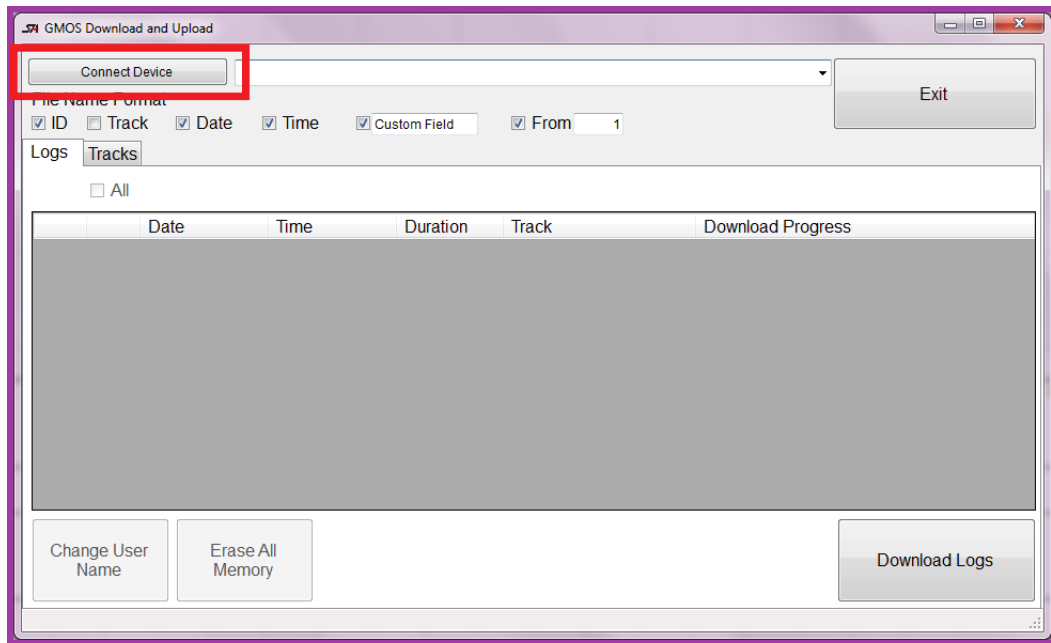
1. Unzip R4. Double click on the USB driver to start installation.
2. Connect the dashboard unit and your computer with the supplied USB cable. Power on your GMOS dashboard unit. GMOS will enter USB mode automatically and display “USB CONNECTED” on the device screen.
3. If this is your first time connecting to this computer, your Windows will search for the driver and install it automatically. Wait till it shows “Your Device Is Ready to Use”. Sometimes this may take up to a few minutes.



4. Double click on the SpeedAngle R4 icon to launch it.
5. Click on the MENU button at the bottom left, go to “Tools -> Log Downloader”.



6. Click on “Connect” to connect the device. Now you are ready to download logs.



For more information, such as preloading track settings or modifying Finish Line location after a log has been recorded, please watch the tutorial videos on [www.SpeedAngle.com/Download](http://www.SpeedAngle.com/Download), SpeedAngle R4 section.

GMOS utilizes high speed download to save download time. If you are downloading with a laptop and are encountering download errors, please set the battery management plan to HIGH PERFORMANCE. If you are using communication softwares such as Skype, close it as well.

# 4

# TROUBLE SHOOTING

**Q: Why did the “NO SENSOR” message appear even though my sensor was connected?**

Please check if the sensor cable and the device cable are properly and securely connected. Make sure that the arrows on the cable heads align with each other, and then insert the plug into the receptacle until you hear a click.

Also, the connection must be made before the power is switched on; otherwise, the sensor will not be recognized by the device.

**Q: How come the lean angle meter needle was not moving during the ride?**

Please make sure the sensor is connected. Check to see if the “UP” lettering is pointing upward and “FRONT” to the front of the bike. It must be parallel to the longitudinal center line of the motorcycle body and vertical to the ground.

**Q: The lean angle measured was smaller or larger than the actual angle?**

Please check to see if the sensor is installed with the correct orientation (see above). Make sure the installation location does not move, turn, swing, wag, or vibrate too much. For more information, please see the [Installing Sensor](#) section.

Make sure you are using the red sponge tape included in the box to install the sensor. Do not use the Dual Lock tape. It will create extra vibration.

Please also make sure that the environmental temperature is within 36°F ~140°F (2°C ~ 60°C). Using GMOS outside its operating temperature range might affect measurement accuracy.

**Q: Why was the lean angle history not updated after I finished a turn?**

There are two possibilities. The first is that your speed of the turn did not exceed your Angle Threshold. As a result, the angle was ignored and was not recorded. To adjust the Angle Threshold setting, please go to System Menu.

The other is that the vibration when you were leaning was too much. As a result, the angle was categorized as invalid by GMOS Noise Filter. If the vibration was not caused by road shock, please check if the sensor was installed securely and if the installation location swings or moves. If necessary, install the sensor to a location with less vibration.



**Q: Why did the GPS speed read 0 when I was riding?**

This happens when the GPS signal reception is poor and there are not enough satellites available to provide sufficient GPS positioning data. The GMOS GPS Core will continue searching for more satellites and will resume its function once the GPS signal reception improves.

**Q: Why was the GPS Antenna Icon not displayed?**

When the GPS reception is poor, it might take longer for the GPS Core to find enough satellites for GPS positioning. The GPS Antenna Icon will reappear once the positioning is complete.

If you have not had the GPS external antenna installed, please connect it with the dashboard to increase the reception sensitivity.

**Q: My GMOS can not record logs.**

The reason might be that the GPS Core was positioning, that the memory was full, or that the number of logs recorded had reached 254. Please refer to page 14 for more information.

**Q: Why was the G-force bar not back at zero when I was riding at a constant speed?**

Please check to see if the sensor is installed vertical to the ground securely. A tilted sensor might affect G-force and lean angle measurement.

If it stayed maxed out, the indicator inside the G sensor was stuck. Please give the sensor a few light taps and it will be back to zero.

**Q: Why was there no lap time produced when I passed through a Finish Line?**

This might be that the GPS reception is not good enough when the Finish Line was being set automatically. As a result, the GPS position of the Line “drifted” away from the actual location. To avoid such deviation, try to set the Track when at least two of the lines in the GPS Antenna Icon are shown. Also, make sure that your dashboard or external antenna is installed away from the fuel tank area with a clear view of the sky. If you would like to change the width after a Line has been set, please go to Track manager to configure the setting.

Another reason might be that the track orientation was set in reverse. As a result, the Finish Line crossing was viewed as invalid by GMOS. To change the orientation, please go to Track Manager to configure the setting.

The third reason might be that a wrong Track was selected. As the Finish Line location was not within the track area; hence, the Line was never crossed.

**Q: Why did the latest record list the record of my session before last instead of my latest session?**

The record will not be overwritten until you cross the Finish Line and produce a lap time in a new session. If you did not cross the Finish Line in the new session, there was no new lap, and thus no new record.

**Q: Why was the “USB CONNECTED” message not prompted when my GMOS was connected to my PC?**

Please make sure you use the supplied USB cable (5-pin male mini-USB) and that the USB cable is connected to the USB ports of the computer and the dashboard unit securely. Also make sure the power is on.

**Q: I cleared the logs by accident. Can I retrieve them?**

We are sorry, but once the logs are cleared, they can not be retrieved. Please remember to download the logs to your PC when you finish the ride.

# 5

# WARRANTY

Your GMOS comes with a limited one-year warranty with your purchase. Speed-Angle Inc. warrants the GMOS device against defects in materials and workmanship under ordinary use for one year from the invoice date. This limited warranty does not cover damage due to external cause, including but not limited to accident, abuse, misuse, improper installation, improper connections with devices or components other than specified, and unauthorized repair or alternation.

To request warranty service, please contact your local dealer. If you purchased GMOS directly from [www.speedangle.com](http://www.speedangle.com), please email [custserv@speedangle.com](mailto:custserv@speedangle.com). In the email, please include a problem description and your GMOS registration number. Your GMOS registration number is a combination of 1 letter followed by 7 digits. It can be found at the back of your GMOS dashboard unit and on the Welcome Screen. A Return Merchandise Authorization Number (RMA#) and a warranty service shipping label will be issued if the request is approved. The RMA# and shipping label are valid for 30 days from their issue date.

To ship the GMOS device back for warranty service, please follow the instructions below:

- Please ship the GMOS device in its original or equally protective package with a copy of the original packing slip or the PayPal invoice.
- Please print and cut out the issued shipping label and adhere it to the top of the package. A package without the issued shipping label or with an expired shipping label will be refused.
- Please send the GMOS device insured and postage prepaid or accept the risk of package loss or damage during shipment.
- The repaired or replaced GMOS device will be shipped back to you. Please contact your local customs office for information as to taxes, duties, or other brokerage fees that may be applied to returned goods.

Once our service center receives your GMOS device, we will either repair or replace the GMOS device at our option. The removed or replaced parts or device are property of SpeedAngle Inc.

Please remember to download the logs recorded on your GMOS device before you ship it to our service center. It is very likely that the logs will be damaged or lost during warranty service. SpeedAngle will not be responsible for such damage or loss.

# 6

# SPECIFICATION

Dashboard Dimension	: 2.4"*4.4"*0.8" (61.5 mm*111.5 mm*20 mm)
Dashboard Weight	: 4.8 oz. (135g)
Sensor Dimension	: 0.7"*0.3"*0.15" (17 mm*7 mm*3.6 mm)
Sensor Weight	: 0.7 oz. (20g)
Power	: 3.7V Li-Ion battery
Working Temp Range	: 36°F ~ 140°F (2°C ~ 60°C) guaranteed
LCD	: 132*64 STN display
Screen Refresh Rate	: 20 Hz
Interface	: USB 2.0 compatible
Battery Life Time	: 14 hrs, with backlit off
Logs	: 254 logs max
Max Log Time	: about 7 hrs
Log Resolution	: 20 pps for lean angle and G, 10 pps for GPS and speed
Lap Timer Resolution	: 1/1000 second
GPS Antenna	: built-in
GPS Update Rate	: 10 Hz
GPS Sensitivity	: -167 dBm tracking
GPS Channels	: 72 all-in-view
GPS Cold Start Time	: 26 sec average
GPS Speed	: 255 MPH (410 KMH) max
Longitudinal G Range	: +/- 1.5 G
Lean Angle Range	: R/L 69°



Features and specifications subject to change without notice.  
Please visit [www.SpeedAngle.com](http://www.SpeedAngle.com) for the latest update.  
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# 6

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Sensor Dimension	: 0.7"*0.3"*0.15" (17 mm*7 mm*3.6 mm)
Sensor Weight	: 0.7 oz. (20g)
Power	: 3.7V Li-Ion battery
Working Temp Range	: 36°F ~ 140°F (2°C ~ 60°C) guaranteed
LCD	: 132*64 STN display
Screen Refresh Rate	: 20 Hz
Interface	: USB 2.0 compatible
Battery Life Time	: 14 hrs, without backlit and external GPS Antenna
Logs	: 254 logs max
Max Log Time	: about 7 hrs
Log Resolution	: 20 pps for lean angle and G, 10 pps for GPS and speed
Lap Timer Resolution	: 1/1000 second
GPS Antenna	: built-in and external
GPS Update Rate	: 10 Hz
GPS Sensitivity	: -159 dBm tracking
GPS Channels	: 32 all-in-view
GPS Start Time	: 36 sec average
GPS Speed	: 255 MPH (410 KMH) max
Longitudinal G Range	: +/- 1.5 G
Lean Angle Range	: R/L 69°



Features and specifications subject to change without notice.  
Please visit [www.SpeedAngle.com](http://www.SpeedAngle.com) for the latest update.  
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