

# UniGo One Laptimer User Guide

**WORK IN PROGRESS !!!**  
**RED TEXT MEANS "NOT DONE"**  
**SUBJECT TO CHANGE**  
**24-12-2022**

## Important safety instructions

### PLEASE READ THE SAFETY INSTRUCTIONS CAREFULLY

- Read the instructions.
- Keep these instructions.
- Follow all instructions.
- Be careful not to drop it on the ground.
- Do not leave it under heavy objects.
- Be careful not to cut the cables with sharp objects.
- Clean only with a dry cloth.
- Refer all servicing to approved service personnel.

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# Copyright and acknowledgments

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[www.instagram.com/uniprolaptimer](https://www.instagram.com/uniprolaptimer)

## INTERNATIONAL DEALERS

You can find our International dealers on the web site:  
[www.uniprolaptimer.com](http://www.uniprolaptimer.com)

## DESIGN AND PRODUCTION

Designed and manufactured in Denmark by Unipro ApS.

The UniGo One Laptimer was designed by Palle Schultz, Denmark:  
[www.palleschultz.dk](http://www.palleschultz.dk)

Unipro reserves the right to make changes and improvements to any of the products described in this document without prior notice.

Part numbers:  
03-05-001 UniGo One kit 1  
03-05-002 UniGo One kit 2  
03-05-003 UniGo One kit 3

## ABOUT THIS USER GUIDE

This guide was written and produced by Unipro ApS.

UniGo One User Guide version 1.00

Made for UniGo One firmware version 1.0x.xxx

## DISCLAIMER

Some of this user guide might contain information on future features. It might turn out that it is not possible to implement these features, but then they will be removed from this guide.

## COPYRIGHT

Copyright © 2022 Unipro ApS

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# Introduction

This User Guide contains all relevant information about your new UniGo Laptimer.

Get started with the UniGo in 5 minutes with the Quick Guide.  
Read all about the advanced features and functions in the Reference Guide.

Before you start, please check that your UniGo package contains the accessories described below.

## CONTENT OF PACKAGE

The UniGo package contains the following:

- UniGo One Laptimer.
  - RPM wire.
  - USB data / charge cable.
  - USB power adapter.
  - Power socket for your country.
  - This User Guide.
  - Registration card.
- Intuitive user interface with only four buttons. Help text to explain what each function does.
  - Direct connection of analog/digital sensors.
  - Trig directly from magnet stripes.
  - High capacity battery built-in.

If any of these items are missing please contact your dealer.

Note: You should retain the packaging in case you need to transport the unit.

## UNIQUE UNIGO ONE IDEAS

UniGo One combines many new ideas not seen before in a Unipro Laptimer:

- Big high resolution display with gray tones. Providing more than 40000 pixels with 16 gray levels makes text and graphics easy to read.
- Wi-Fi for fast and easy upload of data to a PC or Mac.
- Very high brightness, fully programmable warning LEDs. Clearly visible in full daylight.

## EASY TO USE

Even with all the advanced features, the Laptimer is very easy to use.

The graphical display makes it effortless to see and analyze the lap times and data values saved in the Laptimer. Data analysis can be done directly on the Laptimer without the need to transfer the data to a computer.

A unique GPS antenna enables a very thin and slick design. This antenna design is less sensitive to movement of the antenna, and ensures a perfect reception of GPS signal all the time.

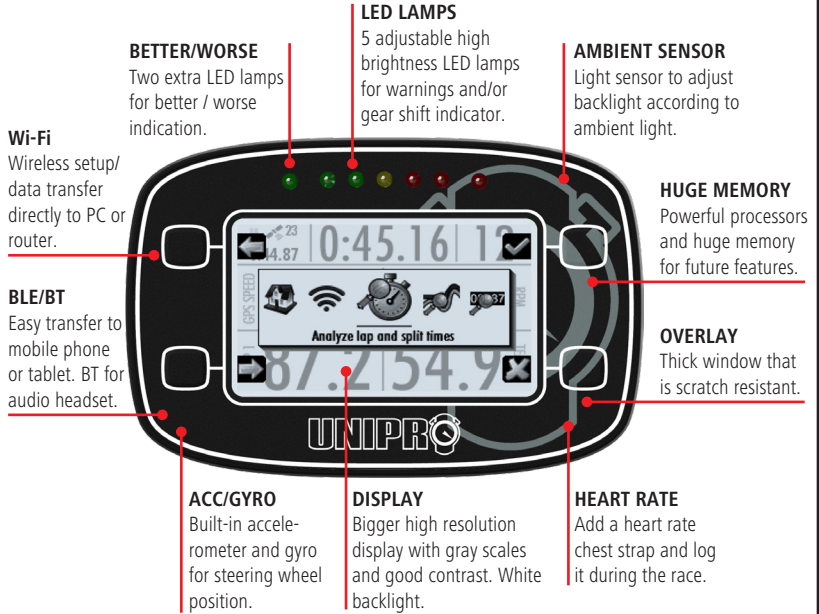
Several sensors are built in UniGo One, including environment temperature, ambient light, steering wheel position, steering wheel turn rate, RPM analyzer and magnet receiver.

The built-in Li-Ion battery gives 40 hours of operation and with the powerful charger, it can be charge at different speeds, including

# Overview

fast charge. The fuel gauge will give precise information on capacity left in percent, and even time to empty calculation.

Please note that this user guide is intended for UniGo One only.



## CHARGE / COMM

Charge. USB, external power and expansion.

## FLEX

Trigger, speed, analog, Lambda, IR box etc.\*

## TEMP

Thermocouple or PT1000 temperature sensors.\*

## UNIGO BOX

Lightweight plastic casing with sensors connected directly or through the optional UniBox.

## RPM

Wire to the engine ignition cable. Software adjustable.

## LI-ION BATTERY

High capacity rechargeable battery gives you 40 hours of use.

**Actual size**  
1:2

\* Two inputs with optional cable splitter.



# Specifications

<b>Lap memory</b>	Virtual unlimited (4GB)
<b>Log memory</b>	Virtual unlimited
<b>Channels logged</b>	Lap time, RPM, 2 x temperature, speed, gear, battery voltage, 2 x Flex, GPS speed, GPS position, environment temp, steering wheel angle, steering wheel turn rate. Max. 128 channels with the UniBox expansion box
<b>Resolution</b>	1/10000 sec, 1 mm, 1 RPM, 0.01 °C, 0.01 km/h, 0.01 V
<b>Logging frequency</b>	1 - 60 Hz (programmable)
<b>Sensor inputs</b>	RPM, 2 x temperature*, 2 x Flex*, BLE
<b>GPS</b>	Built-in. Supports 10Hz from GPS, Glonass, Galileo and Beidou
<b>Trigger</b>	GPS, magnet (built-in) or infrared (external)
<b>Split times</b>	Magnet or GPS
<b>Communication</b>	Wi-Fi (access point or client), BLE, USB, NFC
<b>Real-time-clock</b>	Yes (automatically set by GPS)
<b>Power supply</b>	Built-in Li-Ion battery. 3400 mAh
<b>External supply</b>	5-17 volt DC. From charger, USB power bank or LiPo battery
<b>Expandable</b>	Yes
<b>Display</b>	256 x 160 pixels, 16 gray tones, top view
<b>Backlight</b>	Yes, white, automatic light adjustment
<b>LED warnings</b>	7 high-brightness, 5 fully programmable, 2 better / worse indicators
<b>Audio feedback</b>	Yes (via Bluetooth headset)
<b>CPU</b>	2 x 32-bit low-power
<b>Data upload</b>	USB full-speed with included USB cable, Wi-Fi or BLE
<b>Buttons</b>	4 software defined with icons
<b>Software included</b>	Unipro Analyser analyze software. Both Windows and Mac version
<b>Casing</b>	Lightweight plastic
<b>Waterproof</b>	Yes
<b>Dimensions</b>	136.7 x 89.7 x 18.3 / 30.4 mm (5.38" x 3.53" x 0.72"/1.20")
<b>Weight</b>	350 g (12.35 ounces)**

\* **Shared connector:** Optional cable splitter needed.

\*\* **Weight:** Includes Laptimer, RPM cable and fittings.

## Examples



# Installing the Laptimer

A good installation is key to get good and reliable operation of UniGo. Read this installation guide and learn how to:

Install the Laptimer, attach cables and sensors and see how to mount it all on the go-kart.

**You will be ready to go in 20 minutes...**

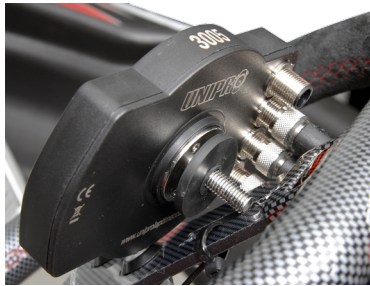
## MOUNTING ON STEERING WHEEL

The first step of the installation is the mounting of the Laptimer on the steering wheel. The Laptimer should be mounted at the top of the steering wheel to make it easy to read during driving and to operate it in the pit.

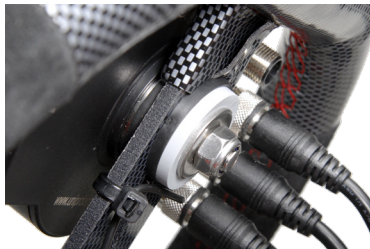


*UniGo mounted at the top of the steering wheel for easy reading and operation.*

The Laptimer is mounted using the included bracket and you need to be carefully mount all the hard and soft discs in the right order to avoid vibrations and to ensure the correct distance from the steering wheel.



*Start the installation with a soft disc.*



*Finish with a soft disc, hard disc, washer and the nut.*

# Installation



*UniGo mounted at the correct distance to the steering wheel.*

Before tightening the nut, make sure that all the cables can be connected without conflicting with the steering wheel or other obstacles.



*RPM wire attached with cable ties.*

The RPM wire needs to run all the way from the Laptimer to the engine on the back. Secure the wire all the way with cable ties.

## CONNECTING RPM WIRE

The RPM wire is used to pick up the engine's revolution count by sensing the pulses on the ignition cable going from the ignition coil to the spark plug.

The ignition is a very noisy signal and extra care should be paid on installing the RPM wire.

The wire can be removed from the Laptimer and attached again if needed. It is simply a wire going through two holes with a loop.

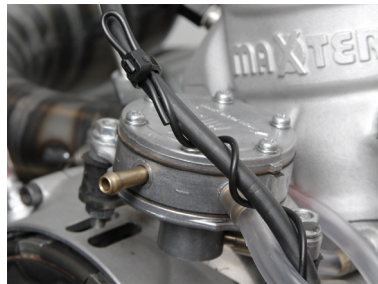


*The RPM wire is running alone all the way to the ignition.*



*Run the RPM wire away from other cables.*

To make the best possible installation, keep the RPM wire away from all other cables.



*RPM wire mounted to pick up the ignition signal from the ignition wire.*

The RPM wire is attached to the ignition cable in a way that gives a good pick up of the signal. Twist the wire around the cable and make a loop at the end like shown on the picture.

# Installation

## RUNNING CABLES

The installation of the Laptimer should be seen as a permanent installation on the go-kart and the time to run the cable in a nice way is time well spend.



*Cable fixed to frame. Run RPM wire separately.*

Use plenty of cable ties and make sure to use nice soft bends on the cable. When tightening the cable ties, make sure not to tightening them too hard to avoid squeeze the cable.



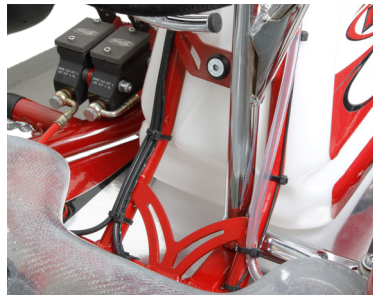
*Cable fixed to the frame with cable ties.*

Running the cables from the Laptimer on the steering wheel is the biggest challenge. The cable need to be mounted in a way that the steering wheel can be moved freely.



*Cable fixed to the frame with cable ties.*

Attach the cables together with a cable tie and attach the bundle to the steering column. Make a soft bend with a suitable length and check the steering wheel have total freedom in turning. The cables should not pull at the connectors when turning and no sharp bend should be allowed.



*Professional installation will ensure professional results.*

## SPLITTERS

Cable splitters are used to increase the number of sensor that can be connected to the Laptimer.



# Installation

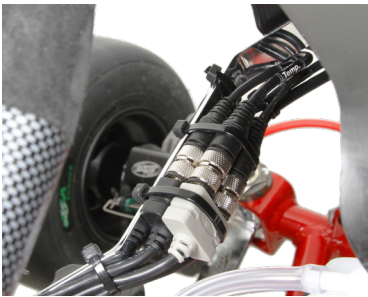


*Gray splitter for temperature and black for receiver and speed.*



*Two splitters mounted to increase number of sensors.*

Two different cable splitters are used. A gray version is used for temperature and a black version for everything else.

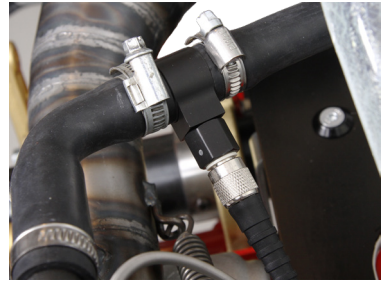


*The splitters reduce the number of cables to the steering wheel.*

The splitters reduces the number of cables to the steering wheel and is part of the permanently installation. Make sure that splitters are securely fasten to the frame.

## WATER TEMPERATURE

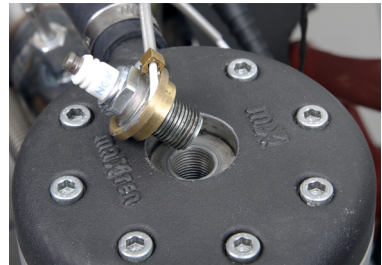
The water temperature sensor is typically mounted in the T-junction that goes into the cooling water hose. First mount the sensor in the T-junction and then mount the T-junction the hole. Make sure the hose is waterproof by tightening the clamps.



*T-junction mounted in the cooling water hose with a temperature sensor.*

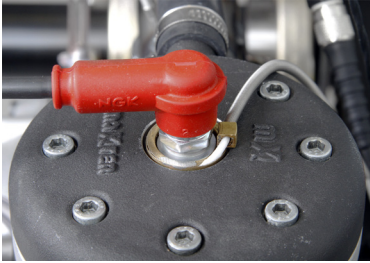
## CYLINDER TEMPERATURE

The cylinder head temperature is measured just below the spark plug. The cylinder temperature sensor is available in two different sizes and it is important to order the right one.



*Sensor mounted instead of the washer on the spark plug.*

# Installation



*Cylinder head temperature sensor mounted below the spark plug.*

Before mounting the cylinder sensor, remove the washer from the spark plug.

## EXHAUST TEMPERATURE

The exhaust sensor is mounted in the exhaust pipe. The fitting for the exhaust sensor is welded to the exhaust 12 cm (4.7 inch) from the backside of the piston. That way the sensor measures the temperature of the gas and not the flames.

Start by welding the exhaust fitting to the exhaust pipe and then drill a  $\varnothing 4.5$  mm hole through the fitting for the sensor.

**Always check if local regulation might prevent you from using an exhaust temperature sensor in the race.**



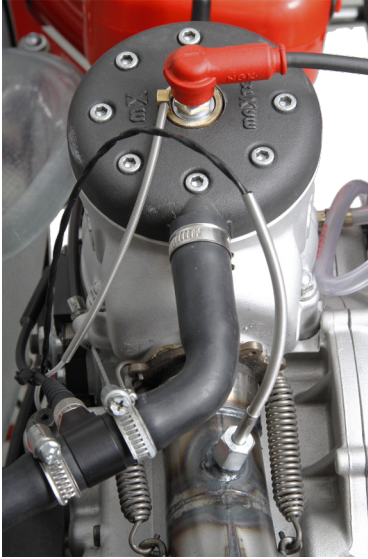
*Drill a  $\varnothing 4.5$  mm hole for the sensor through the exhaust fitting.*



*Exhaust fitting welded on the exhaust pipe.*

Place the exhaust sensor in the fitting and fasten the nut. Do not tightening it too much.

# Installation



*Exhaust sensor mounted with a big soft bend on the cable.*

Make sure the cable is not touching the exhaust pipe and make a soft bend on the cable like shown on the picture.



# Quick Guide





Read the Quick Guide and learn how to use the basic functions of the UniGo One:

Turn UniGo One on and off, start logging data, analyze them on UniGo One and transfer them to a computer with the included USB cable or Wi-Fi.

**You will be ready to go in 5 minutes...**

## FOUR BUTTONS

For easy operation we made four software programmable buttons on UniGo One. If the button have any function, it will clearly be shown with a small icon next to the button. Icons use less space than text and it should be obvious what each button does. But here are some examples:

-  Brings up the rolling menu.
-  Change to run mode.
-  Change to the last analyze screen.
-  Edit the current selected preference.

The buttons are either roll-out or fixed buttons. If we have space enough on the screen, they will be fixed, but if there are a lot of information on the screen, they will roll-out on the screen when needed. The top right button is almost **always** a menu button. The three other buttons might have a specific function depending on what screen you are on. If it is roll-out buttons, they will roll in again after a few seconds. This is to give you the full screen again for information.

## MENU SYSTEM

The typically way of doing an user interface is with menus and then navigate between them and select what you want. But with only four buttons this gets complicated so we designed a brand new user interface without the classic menus!



It is important to understand the thoughts behind it.

Instead of the traditional menus, you will find an popup icon list. This list is dynamic, and the content depends on where you are. We call this the rolling menu.



*Rolling menu when activated from the min/max analyze screen.*


The icon list shows 5 icons directly. The one in the center is priority number 1, meaning it is most likely the one function you need. To the right and left for the center icon, you will find priority 2 and 3, and the next two icons are priority 4 and 5. You will then be able to scroll the list to get priority 6 and up. It does not matter if you scroll right or left. You will find

## Quick guide



the same icons in the list. At the end of the list you will get back to the first 5 icons.

This way you do not need to navigate through several menus, but can jump directly to what you want. Some icons will be direct functions, and others will change the icon list to give you more choices.

The center icon will be enlarged and a help text is shown below it. This way it should be easy to learn the icons. We use a common way of combining icons into one.

-  Analyze
-  Setup
-  Information
-  Select

The combination can then be like this:

-  Information about GPS satellites.
-  Analyze lap times.

### TURNING UNIGO ON

There are 4 different ways to turn UniGo on:

1. Press one of the two buttons on the right shortly to start the Laptimer manually.
2. Start the engine and UniGo will start when it detects the RPM signal.
3. Connect the USB / charger cable into a charger or computer.
4. Start the engine if the RPM wires is connected to a UniBox.

UniGo starts by turning on the backlight at 25% and shows a Unipro splash screen. This is shown as fast as it is possible, and it will stay there until UniGo is fully booted.

After booting up, UniGo starts by showing the startup screen including information about

firmware version number, serial number, battery capacity, the environment temperature, GPS satellites fixed, and the time of day. If the driver's name is entered, it will show that below the Unipro logo.



*Startup screen with information about firmware version and serial number*


### TURNING UNIGO OFF

There are different ways to turn UniGo off.

Press the top right button and hold it down to turn UniGo off. When you see "TURN OFF" in the display, you can release the button again.



*Power off screen when UniGo is turning off.*

UniGo will also turn itself off if no button is pressed and no RPM, speed or trigger is detected after a preselected time. Please see "AUTO POWER OFF TIME" on page 31. You can also turn it off from the rolling menu by pressing the  icon.

### BUILT-IN HELP

When you move around in menus, UniGo will display one line of help text at the bottom of the display. Use this line to get familiar with the different settings in UniGo.

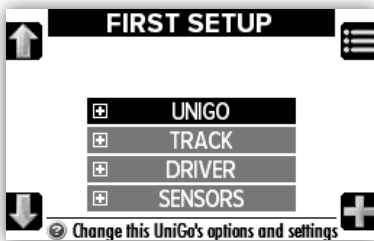
## Quick guide



Example on the help text describing the current selection.

### FIRST SETUP

When UniGo starts for the first time it will show the setup screen shown below. This contains essential setup of the most important settings. It included settings like user interface language, country you are driving in and what type of units to use.



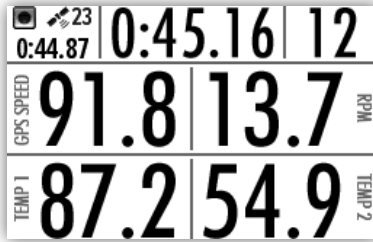
First setup. Essential settings needed to get started with UniGo One.

Please set "AUTO TRACK SELECT" to Yes and then select the country you are in.

To read more information about the first setup settings, please look in the "Configuring the Laptimer" chapter.

### DRIVING

When UniGo detects a RPM signal from the engine, it will automatically go to run mode. It will automatically start to log all data from sensors and measure lap and split times.



Typically run mode 1 when driving.

There is not much you can do in run mode except concentrating on driving! You will be able to change between three predefined layouts by pressing the **mode** button (⏏). This will toggle through the different run modes. UniGo will remember the one you prefer and it will start in the same mode as the last time.

- Run mode 1 is for four data fields.
- Run mode 2 is for gear karts with two data fields and last lap data.
- Run mode 3 is for two data fields with best lap information and last lap data.

### ANALYZING

When analyzing you will typically start with the overview screen. This screen will give you the quick overview of the three best laps with the minimum and maximum values for the most important sensors.

THEO: 0:47.17		21-11-21 15:38:07		
LAPS: 16				
LAP	LAP TIME	RPM	GPS SPEED	TEMP 1
12	0:47.28	13.7 7.1	88.9 42.6	628 458
13	0:47.35	13.7 7.0	88.9 42.4	633 452
10	0:47.37	13.6 7.3	88.6 43.1	625 464

SESSION: 211121 1538 Klend GPS ONE

Quick overview of three best laps in analyze mode.

You can toggle around different analyze screens by pressing the **mode** button (⏏). Another important screen is the lap and split times screen.

## Quick guide

BEST TIME: 0:47.28		21-11-21 15:38:07		
THEO: 0:47.17		ROLLING: 0:47.28		
LAP	LAP TIME	SPLIT 1	SPLIT 2	SPLIT 3
1	0:52.91	0:16.16	0:23.74	0:13.02
2	0:47.76	0:11.95	0:23.02	0:12.79
3	0:47.49	0:11.87	0:22.90	0:12.73
4	0:47.45	0:11.84	0:22.88	0:12.73
5	0:49.88	0:13.73	0:23.57	0:12.58
6	0:47.79	0:11.96	0:23.27	0:12.56
7	0:47.65	0:11.97	0:23.04	0:12.64

SESSION: 211121 1538 Klean GPS ONE

Overview of split and lap times.

You can scroll the screen by using the **up** (↑) and **down** (↓) buttons.

### TRANSFER WITH USB

It is very easy to transfer data to the Unipro Analyser program. Just insert the included USB/charge cable in the top connector (named COMM).



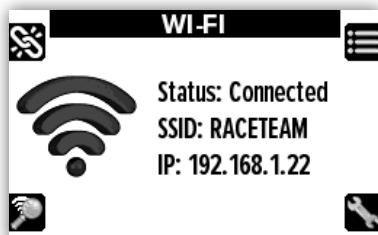
USB mode when connected to a computer.

When the cable is attached, UniGo cannot be operated because the computer use the Flash drive. The Unipro Analyser program can then transfer the data files.

**Like any other Flash drive you need to eject the drive safely before removing the cable from the computer.**

### TRANSFER WITH WI-FI

We would always recommend to use Wi-Fi for data transfer instead of USB cable.



Wi-Fi screen when not connected..

You can toggle around different analyze screens by pressing the **connect** button (📶). Another important screen is the lap and split times screen.

### CTRL+ALT+DELETE

Because the battery is inside UniGo One and the box is sealed, there is no way of "power cycling" if something goes wrong. We therefore had to build in a reset function also known from a computer like ctrl + alt + delete.

On UniGo One, you just press the two right buttons and keep pressing them until UniGo restarts. It takes around 10 seconds. Even though this is a complete reset, you will not lose data or settings.

**That's how easy it is!** If you are ready for some more advanced features, then read the Reference Guide later in this manual.

Also check [www.uniproLaptimer.com](http://www.uniproLaptimer.com) for news and updates.

# Configuring the Laptimer



This chapter will learn you all about the configuration of UniGo One.

Entering setup, most often settings, and every single setting.  
A correct setup is essential for the maximum performance of your  
Laptimer so make sure to read this chapter carefully.

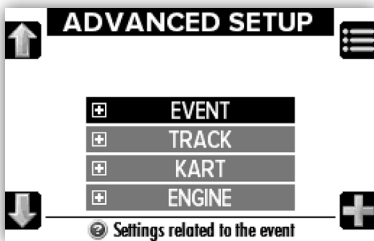
**You will be ready to go in 5 minutes...**

## ENTER SETUP MODE

You enter the Setup menu directly from the rolling menu. UniGo One have two different setups indicated by the following icons:

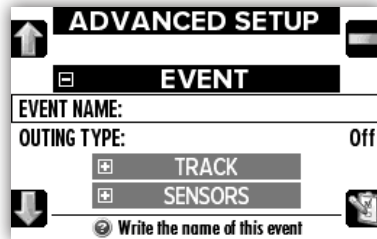
-  Simple setup. Only often used settings.
-  Advanced setup. All available settings.

When entering setup you will see the setup menu as shown below. Here you will find all settings divided into different collections. These collections are explained in this chapter. A collection is by default collapsed. This way it is very fast to move between the different collections.



*The advanced setup contains different collections of settings.*

If you want to expand a collection you simply press the **expand** button (+).



*The event collection is expanded to show the settings.*

Two new buttons are now visible. To collapse the collection again, press the **collapse** button (☐).

### GENERAL SETUP FEATURES

In Setup mode you use the **up** (↑) and **down** (↓) buttons to move around in the menu and press the **edit** button (✎) on the relevant line to change the value. To accept the changes press the **ok** button (✓) again or press **cancel** (✕) to cancel the changes and revert to the original value.

If a menu line is ending with ":" it means the value can be changed directly by pressing the **edit** button (✎). If the line is ending with (☐) it will go into another screen, and finally a line ending with (+) will expand another menu.

## Setup mode

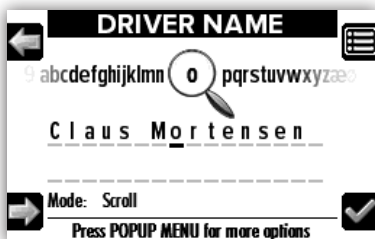
### ENTERING TEXT

You always use the same way to enter text in UniGo. When starting, it is in "letter" mode. Use the **left** (←) and **right** (→) buttons to change the current character. You will be able to select both characters, numbers and a lot of special characters. Each time you press the **ok** button (✓) you accept the selected character and move the cursor in the text.



Entering text starts in letter mode. Press OK after selecting the character you want.

When pressing the **popup menu** button (☰) a menu is shown. From this menu the mode can be changed to "scroll". This mode is used to move the cursor in the text. Use the **left** (←) and **right** (→) buttons to move.



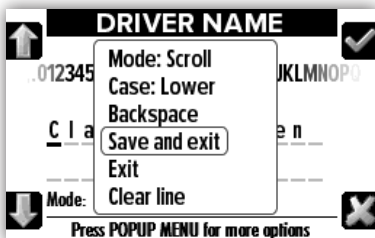
Moving cursor around in the text using the LEFT and RIGHT buttons in scroll mode.

To toggle between upper and lower case, simply press the top right button twice. First press to show the **popup menu** and second press to change the case.

If you make a mistake you can either delete the last character you entered with the "Backspace" command, or clear the complete line

from the **popup menu**.

The Backspace menu line is only visible if you are at the end of the text.



When finished with the text, press the **menu** button (☰) to save it.

When you are finished editing the text press the **popup menu** button (☰) and select "Save and exit" to save the new text and exit the previous screen. It is also possible to exit without saving the text using the "Exit" function.

# Setup mode

## EVENT SETUP

Text missing.

### EVENT NAME

Text missing.

### OUTING TYPE

Text missing.

## TRACK SETUP

The track menu contains all the settings related to the track.

### TRACK DATABASE

UniGo One can use two different track databases. Factory tracks are all the tracks that Unipro made and this is a growing database with more and more tracks. The Unipro Analyser program is able to update the factory tracks loaded onto UniGo One.

The User database on the other hand is tracks you made from Unipro Analyser. Using this database you are able to define your own tracks. This is useful if you want another set of split points for example.

### AUTO TRACK SELECT

Normally you want auto track select enabled. When enabled, UniGo One will automatically select the closest track when you have a solid GPS fix. If you chose "No" to this option, you will be able to select the track from a list instead.

### COUNTRY

The factory tracks are divided into databases for individual countries. So first thing you have to do is selecting the country you are in. We use a 3-letter standard called Alpha-3. Please see the [complete list of countries](#).

### SELECT TRACK

When auto track select is not enabled, you can manually select a track from a list.



Select a track from the list of saved tracks.

## Setup mode

Use the **up** (↑) and **down** (↓) buttons to move around in the list and press the **ok** button (✓) to select a track.

### TRACK NAME

It is much easier to identify data if you enter for instance the track name. The track name is simply a text used to identify the track. Enter it as described here: "ENTERING TEXT" on page 33.

### TRIGGER

The receiver is used to trigger the Laptimer at the start/finish line. The Laptimer can use all types of triggers. Chose between GPS, IR (infrared), Loop, and Magnet (magnet stripe in the track). Each receiver is a different kind of hardware and the setting need to match the physical receiver connected to the Laptimer.

**If the trigger is connected through the black cable splitter, it must be connected to splitter input 1.**

### MAGNET COUNT

If the receiver is set to magnet, the Laptimer need to know the number of magnets on the track. This is the total number of magnets the kart will pass on one lap.

### MAGNET DELAY

This is the number of magnets you need to skip when going from the pit to the start/finish line. If the delay is set to 2, it means that on the out lap (or first lap) the Laptimer ignores the first two magnets and then start the Laptimer when passing the third one.

### IR OR LOOP DELAY TIME

If the receiver is set to infrared or loop, you can chose a minimum delay from one trig to the next. This is the minimum time allowed between two trigs. This is primarily used if an infrared transmitter can reach across the track and then trigger the Laptimer more than once on the same lap.

## KART SETUP

The kart menu contains all the settings related to the kart.

### WHEEL CIRCUMFERENCE

The wheel circumference is entered in either millimeters or inches and you need to measure this quite often to keep the system accurate. The best is to use a soft tape measure and do it every time you go out from the pit. It will have influence on the speed and the tire wear counters.

**Remember to measure the wheel where the speed sensor is mounted!**

When running without a wheel sensor, the Laptimer is using the GPS information for speed and distance instead.

### TIRE WEAR MENU

The tire wear menu contains all the settings related to the tire wear counters.

TIRE WEAR	
COUNTER 1:	216 km
COUNTER 2:	0 km
COUNTER 3:	83 km
COUNTER 4:	0 km
COUNTER 5:	0 km
CURRENT COUNTER:	1
⊕ Shows tire wear counters in kilometers or miles	

*Tire wear menu with counter no. 2 active.*

Use the **up** (↑) and **down** (↓) buttons to move around in the menu and press the **ok** button (✓) on the relevant line to change the value. To accept the changes press the **ok** button (✓) again or press **back** (⌫) to cancel the changes and revert to the original value.

### USE COUNTER NUMBER

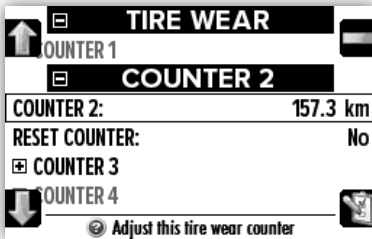
UniGo have five independent tire wear counters. Each counter can keep track of the distance each set of tires has driven. Only one of the wire wear counters are used at a time.



## Setup mode

### COUNTER no.

The counter number 1 - 5 menu contains each of the tire wear counters. Here you can see the counter, adjust it and reset it. There is one counter menu for each tire wear counter.



Screen showing menu for tire wear counter number 2.

The line with the tire wear counter is used to see the counter value and manually adjust it. If you forget to change the tire wear counter number when changing the tires, you can add the distance to the correct counter manually.

### RESET COUNTER

If the tires are changed you can reset the tire wear counter here. Change the value to Yes and press the **ok** button (✓). When you press the **ok** button (✓) it will automatically change back to No again. This is normal, and used as an indication of the action taken.

### KART NAME / TYPE

It is possible to enter a text describing the kart or its type. Please enter the text as described under "ENTERING TEXT" on page 33.

### WHEEL MAGNETS

The standard wheel sensor disc for karting includes 6 magnets per revolution. But if you use UniGo on other racing machines, you might use less magnets per revolution. An example could be a motorbike with only one magnet mounted on the wheel. The number of magnets can be adjusted from 1 to 6.

### NUMBER OF GEARS

When driving a gear kart, you need to enter the correct number of gears and then learn them afterwards.

### LEARN GEARS

UniGo use the relation between the speed and the RPM to calculate the current gear number.



Learn gears popup ready to learn 1st gear.

When the learning is started, it is important to drive slowly in the gear indicated on the display. When the kart speed is steady, press the **ok** button (✓) to learn that gear and to move on to the next.



All gears are learned and will be saved.

When all the gears are learned they will be saved in memory and it is not required to learn them again until the kart's setup is changed.

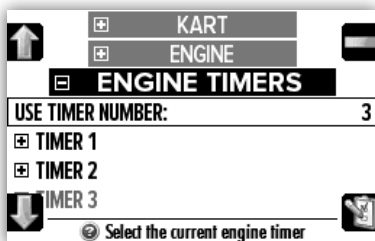
## Setup mode

### ENGINE SETUP

The engine menu contains all the settings related to the engine.

### ENGINE TIMERS MENU

The engine timer menu contains all the settings related to the five engine timers.



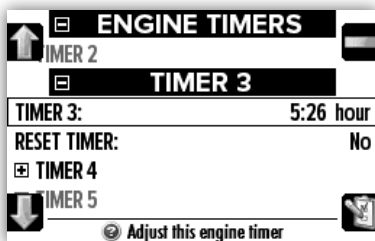
*Engine timers menu with timer no. 3 active.*

### USE TIMER NUMBER

UniGo have five engine timers, but only one of them is active at a time. You can use one timer for each of your engines to keep track of the number of hours used. Remember to change the timer number when changing engine.

### TIMER no. MENU

The timer number 1 - 5 menu contains each of the engine timers.




*Engine number 3 is used for 5 hours and 26 minutes.*

Here you can see the timer value, manually adjust it and reset it.

### TIMER no.

The line with the engine timer is used to see the timer value and manually adjust it. If you forget to change the engine timer number when changing the engine, you can add the time to the correct timer manually.

### RESET TIMER

If the engine is rebuild or a new engine is used, you can reset the engine timer here. Change the value to Yes and press the **ok** button .

### RPM SENSITIVITY

UniGo One have a unique feature to ensure the best possible RPM signal from the ignition. Different ignition systems gives different signals and the mounting of the RPM wire makes a huge impact on the signal. This can result in different levels of signals arriving at the Laptimer. The signal sensitivity in UniGo One can be adjusted in software.

If you experience drop-out in the RPM graph, then increase the RPM sensitivity level. If you experience a noisy RPM graph, then decrease the RPM sensitivity level.

The value can be adjusted between 0% and 100%. These values are does not reflect zero signal and full signal, but are adjusted to reflect the relevant signal range.

### RPM FACTOR

The engine stroke is typically only set once. Adjust it to the stroke of the engine. It can be set between 1- and 6-stroke. Please notice that some engines works differently than expected, so if you see the RPM showing uncorrected values, try to adjust the RPM factor setting.

### RPM SHIFT

When using gears the RPM shift setting is important. The gear shift indicator is depending on two settings. The RPM shift value and the RPM delta value. The RPM shift value is set to the engine revolution you want to shift gear at. If you want to shift at 12500 RPM, you need to

## Setup mode

set this value at 12500.

All five LEDs are used for gear shift indicator, but they have higher priority than normal LED warnings. This means, that even if the warning LEDs might be turned on or are blinking, the shift lift overrules this and turn all the LEDs into a shift light indicator when needed.

### RPM DELTA

The RPM delta value is the “distance” between the LEDs when used as a shift light indicator. If you for example want to shift at 12500 RPM and set the RPM delta value to 300, the shift light will turn on at 11900, 12200, 12500, 12800 and 13100 RPM. The smaller delta value, the faster reacts the shift light.

### RPM SHIFT TYPE

The RPM shift lights always blinks in a flashy way, but with this setting you can select if the indicator uses the LEDs as single LEDs or all at once. If set to all at once, all LEDs will flash when the RPM shift point is reached and the RPM delta value will not be used.


### RPM LIMITER LOG

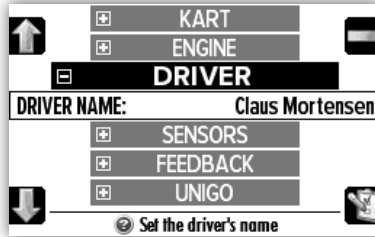
The RPM filter we use is very advanced and the purpose it to make the RPM graph look as good as possible without affecting the content. The filter will also filter out the drop-outs from the RPM limiter used in the RPM ignition system. Sometime there is a wish to actually see the drop-outs in the Unipro Analyser program. By enabling this setting, an extra unfiltered RPM channels is logged beside the normal RPM channel.

### RPM BAR GRAPH MAX






When using the RPM bar graph on the run mode 2 screen, you need to set the maximum RPM value that could be shown. The bar graph covers from 0 to 10000 RPMs. If you set the maximum value to 13000, the RPM bar graph will show values from 3000 to 13000 RPMs.

## DRIVER SETUP

 The driver menu contains all the settings related to the driver.



*All settings related to the driver are on the driver menu screen.*

Use the **up** () and **down** () buttons to move around in the menu and press the **ok** button () on the relevant line to change the value. To accept the changes press the **ok** button () again or press **back** () to cancel the changes and revert to the original value.

### NAME

To ease the identification of the files it is a very good idea to enter the driver's name. Please enter the name as a normal text like described next.

### NATIONALITY

*Text missing and feature not implemented yet.*

# Setup mode

## SENSORS SETUP

*Text missing.*

### FLEX INPUT

It is possible to connect a sensor directly to the Flex connector. There is not limitation when a single sensor is connected directly and there is a wide selection of analog, digital and "intelligent" sensors. If more than one sensor is to be connected, please select "Splitter". The splitter is an optional accessory that makes it possible to connect two different sensors to the Flex connector.

### SPLITTER #

If the Flex input is set to "Splitter" you will see "Splitter #1" and "Splitter #2" lines. Here it is possible to select different sensors to each input, but not all combinations are possible. It is not possible to connect two intelligent sensors like Lambda and IR Box at the same time. The intelligent sensor need to be connected to Splitter #2 and then a simple sensor to Splitter #1.

### FLEX INPUT VALUE

*Text missing.*

### SPLITTER # VALUE

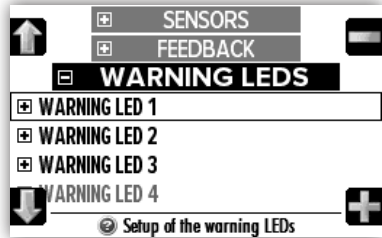
*Text missing.*

## FEEDBACK SETUP

The feedback menu contains all the settings related to the feedback on UniGo.

### WARNING LEDS MENU

The 5 LEDs are all programmable. This is done from the warning LED setup menu. There is one menu for each warning LED.



*Warning LED menu. LED blinking at the same time.*

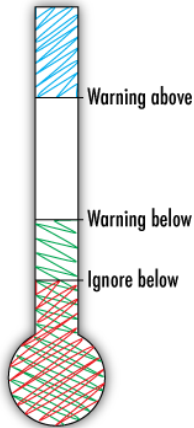
When moving around in the setup menu, the corresponding LED will blink to make it easy to identify each LED. When selecting a LED you will get to the sub-menu with all the settings for that specific LED.



*Simple setup of one warning LED.*

The setup of a warning LED consist of several settings. Here is a short explanation of each setting.

# Setup mode



This illustration shows the warning LED setting in a graphical way.

**Warning above** is the maximum value.

**Warning below** is the minimum value.

The **ignore below** value can be used to avoid constant low warnings.

**Channel:** The channel is the most important setting. A popup lets you select the channel you want to use for the warning.

**Warning above:** The maximum value of the channel before the warning LED is active. When the channel gets above this value, it will warn you.

**Warning below:** The minimum value of the channel before the warning LED is active. When the channel gets below this value, it will warn you.

**Ignore below:** If the minimum value is set, the ignore under value can be used too. To avoid a constant warning when the channel value is below the minimum warning, this setting will ignore the warning below a certain value. This is typically used for engine water temperature warning.

**LED warning:** The blink types are “constant”, “slow” and “fast”. Fast is typically used by the shift light, so if that is enabled, try to avoid it for the warnings.



*Example on a more complex warning LED setup. Here all the settings are used.*

In the example above, all the settings are used for the temperature 1 channel. Here we can see that this channel is used for the cylinder temperature. Programming the warning like this will give the following warning. The LED will blink slowly when the temperature is between 45 and 70 °C and then again if the temperature is above 85 °C.

**Please notice that the same channel can be used for more warning LEDs.**

## LED BRIGHTNESS

The LEDs' brightness can be adjusted from 0% to 100%.

The LEDs are very powerful and running them at high brightness can be dangerous for your eyes. Always keep them at the lowest brightness level, but still visible at full sunlight. Do never look directly into them!

## LAST LAP DATA

When the start/finish line is passed, the Laptimer can show different information on the last lap. Here is a short explanation on what the settings does.

**Off:** No special data values are shown when passing the start/finish line. Everything working like normal.

**Max. values:** The maximum values from the previous lap are shown when passing the start/finish line. Please notice that not all channels have maximum values. An example is the gear channel.

## Setup mode

**Delta time:** When passing the start/finish line the delta time is shown. That is the time from the lap just finished to the best lap time.

**Max & delta:** Both “max. values” and “delta time” is shown when passing the start/finish line.

**Min & max:** Both “max. values” and “delta

### DATA HOLD TIME

When the last lap data is used, the display will show the selected values for a certain time. This time can be set from 2 to 20 seconds.

### LAP TIME DISPLAY

Normally the lap time display is set to show lap time. But UniGo is capable of calculating the predictive lap time too. The predictive lap time is calculated based on the actual lap time at a given point of the track plus the rest of the best lap. This way it will calculate the total lap time based on the current pace and the remaining of the best lap. It will typically vary quite a bit at the start of the lap, and then get more and more steady towards the end of the lap. **Predictive lap time not implemented yet !**

### SPLIT TIME DISPLAY

When splits are being used the Laptimer can do different things when passing a split point. The options are “None”, “Split time”, “Delta split time”. Here is a short explanation on what the settings does.

**None:** Nothing special is done when passing a split point.

**Split time:** When a split point is passed, the split time and the split number is shown in the display. The time and number is shown until the next trigger is passed. When passing the start/finish line, the Laptimer will show the lap time and lap number instead.

**Delta split time:** When a split point is passed, the delta split time and the split

number is shown in the display. The delta split time is the difference between the current split time and the best split time. If the number is negative the split time is better. The time and number is shown until the next trigger is passed. When passing the start/finish line, the Laptimer will show the lap time and lap number instead.

### BETTER / WORSE FEEDBACK MENU

The settings related to the better / worse feedback is in a separate sub-menu.

UniGo will indicate if the lap time and split times are better or worse compared to the best time. The first green LED and the last red LED is used for this feedback. The red LED is indicating that the current time is worse compared to the best and the green LED is indicating a better time.

### BETTER / WORSE TRIGGER

It is possible to configure how the better / worse feedback should behave when passing a trigger.

**Off:** The two LEDs are not used for better / worse indication.

**Splits:** All split points are used for better / worse feedback. When the start/finish line is passed, the feedback is for “Split Last” and **not** the lap time.

**Lap:** When passing the start/finish line, the feedback is for the lap time. No feedback for the split points.

**Splits & lap:** All split points are used for better / worse feedback, but when passing the start/finish line, the feedback is for the lap time. No feedback for “split last”.

### LED ON TIME

The better / worse LEDs will stay on for this amount of seconds after a trigger is passed.

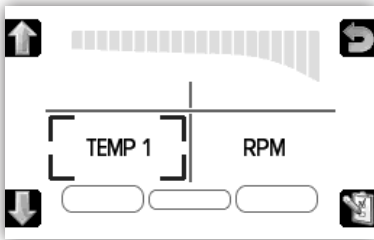
# Setup mode

## UNIGO SETUP

The UniGo menu contains all the settings related to the UniGo.

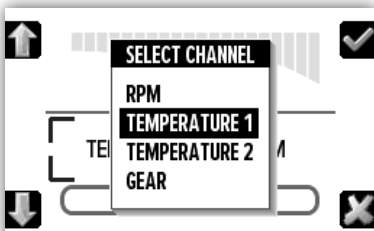
## RUN MODE SCREENS

The different run modes have different number of data fields. All of them are configurable. This is done from the "screen setup" screen.



Setup run mode screens. Run mode 2 shown here.

Move around between the different data fields with the **up** (↑) and **down** (↓) buttons. The active data field is clearly marked with a rectangle around it. To change the channel, simply press the **ok** button (✓) to bring up the channel select popup.



Select the channel from the popup window.

All available channels are listed including the not so typical ones like "engine timer" and "none". Accept the new channel by pressing the **ok** button (✓).

## LCD CONTRAST

Here you can set the screen contrast - that is the contrast between the screen and the text /

numbers on the screen.

The contrast can be set to a value between -15 and +15. You will see the contrast change when adjusting the value.

## BACKLIGHT BRIGHTNESS

The intensity of the display's backlight can be changed from 0% (off) to 100%. The backlight use a lot of power when turned on, so please use as low a setting as possible. When the Laptimer is out in the sun, the backlight is not visible at all and it can even make the contrast worse.

## BACKLIGHT OFF TIME

To save battery power, the backlight can automatically be turned off. If the Laptimer is not active in run mode, and the buttons are not pushed, the backlight will turn off after some time. This time can be set between 0:30 and 30:00 minutes and always on.

If the backlight is automatically turned off, the Laptimer still reacts to button pushes, but the backlight is turned on at the same time.

## AUTO TURN OFF TIME

When no buttons are pressed and the Laptimer is not detecting any signals from RPM, speed and the trigger it will automatically power off to save the battery. This time can be set between "always on" and 30 minutes in steps of 30 seconds. If set to "always on" it will never turn off.

## SET TIME

The time and date is normally set automatically by the GPS signal. Each time UniGo gets a GPS lock, it will adjust the time and date to the very precise time received by the GPS receiver. When there is no GPS signal, the internal clock will continue to run, even when UniGo is turned off. But if you want to manually set the time, this can be done from this collapsed menu.

**Hour:** Enter the hour of the day.

## Setup mode

**12-hour clock:** If the time format is set to a 12h clock, then you can choose between am and pm here.

**Minutes:** Enter the minutes of the hour.

**Time format:** Select either 12h (am/pm) or 24h clock here.

**GPS UTC correction:** The time received from the GPS receiver is always the UTC time (coordinated universal time). To make this fit your local time, please adjust this setting. This setting is also used to correct the time for summer or winter time.

**Store new time:** Change this to "Yes" and hit the **ok** button . Then the time will be updated with the new values you entered.

### SET DATE

The time and date is normally set automatically by the GPS signal. Each time UniGo gets a GPS lock, it will adjust the time and date to the very precise time received by the GPS receiver. When there is no GPS signal, the internal clock will continue to run, even when UniGo is turned off. But if you want to manually set the date, this can be done from this collapsed menu.

**Year:** Enter the year here.

**Month:** Enter the month.

**Day:** Enter the day.

**Date format:** Select date format between "DD-MM-YY", "MM-DD-YY" or "YY-MM-DD" here.

**Store new date:** Change this to "Yes" and hit the **ok** button . Then the date will be updated with the new values you entered.

### TEMPERATURE UNIT

UniGo might be used with temperature displayed in either Celsius or Fahrenheit. With this

setting you can choose between the two.

### SPEED / DIST. UNIT

When using UniGo in different countries, it might be necessary to change the different units between Metric and Imperial. Metric will set speed to kmh, length to meters, sizes to mm. Imperial set speed to mph, length to yards and sizes to inches.

### LANGUAGE

UniGo can speak several different languages. Here you can choose between the available languages. All text is changed to the new language as soon as it is selected. The name of the language is always a three letter abbreviation. Even if you select a language you cannot read, you can still see the names of the languages.

### RESTORE FACTORY SETTINGS

If you want to go back to the default settings select "Yes" and accept the warning popup by selecting "Yes" again. This will set all the settings back to the default factory settings. When you press the **ok** button  it will automatically change back to "No" again. This is normal, and used as an indication of the action taken.



# Setup mode

## WI-FI SETUP

The UniGo menu contains all the settings related to Wi-Fi.

### WI-FI MODE

*Text missing.*

### POWER MODE

*Text missing.*

### WI-FI STATUS

*Text missing.*

### CLIENT MENU

Typically client mode will be used by a bigger team having its own Wi-Fi network running. The benefit with client mode is several Laptimers can be on the network at the same time, and it is easy to access each Laptimer from the Unipro Analyser program. There are no settings for client mode. You simply do a scan for available networks, and connect to one of them.

### CLIENT SSID NAME

In client mode, the SSID name is the network you connected to after scanning.

### CLIENT IP ADDRESS

The IP address in client mode is supplied by the Wi-Fi router.

### ACCESS POINT MENU

If you use a single UniGo and a single computer, access point mode is the best option. In this mode, UniGo One will act as a network master, and your computer will then connect to this like any local Wi-Fi network. There are some settings related to access point mode.

### AP SSID NAME

The SSID name is the name of the network you are making. By default it is "unigo-xxxx" where

xxxx is the serial number. So if your UniGo One have serial number 1234, the SSID name will be "unigo-1234".

You can rename this to your own network name.

### WI-FI PASSWORD

The password is by default empty. This means your network will be open for everyone to join, and this might not be the best idea! So please enter a password and make sure it is a least 8 characters long. If you enter a password, the connection will use WPA2 encryption.

### AP IP ADDRESS

At the moment this is fixed to 192.168.4.1 and cannot be changed.

### CHANNEL

Wi-Fi can use several different channels. If you have a lot of Wi-Fi running, you should try to select a channel that is not used by the other networks. Not all channels are legal in all countries. Please check what channels can be used in the country you are in.

### SCAN NETWORK

*Text missing.*

### DEFAULT WI-FI SETTINGS

*Text missing.*

# Setup mode

# Reference Guide

In the reference guide you can find detailed information about all features and functions of the UniGo.

**To get the most from your UniGo, we recommend that you read this guide in full.**

The UniGo is optimized for ease of use, while also incorporating many useful, advanced features.

## BASIC INFORMATION

### Li-Ion battery

When we designed UniGo One, we decided to make an “all-in-one” Laptimer. The ultimate goal is a “mount and drive” experience.

To enable that, we based it on a high capacity internal battery. It is a rechargeable Li-Ion battery. A Li-Ion battery is kind of complicated, and this section contains information on what it is, and how to take care of it.

A Li-Ion battery is having high capacity for its size and weight, but at the same time there are some pitfalls we would like to mention.

The battery includes a safety protection circuit. This circuit is to prevent over voltage, under voltage, over current and short circuit conditions.

A Li-Ion lifetime is typically 500 recharge cycles. After 500 cycles the battery has lost 20% of its capacity. This is called aging. It will not stop working, but if you had 40 hours use when it was new, it can now only run for 32 hours.

There are some basic rules that can help you reduce this aging.

- Do not charge the battery if it is too cold.
- Do not discharge the battery to 0%
- Do not charge the battery to 100%
- Do not fast charge the battery.

To help you do this we added some features to

UniGo One.

We included a very precise fuel gauge. A fuel gauge can tell how much charge you have left on the battery. It is simply a number between 0 and 100%. If it is 0% it is completely empty and 100% is fully charged.

The fuel gauge also takes care of the aging, so you will be able to trust the number, even when the battery gets old.

To help you save the battery, we added three different charging schemes.

- **ECO:** In this mode we do use a smaller charge current and we charge it more gentle to 95%. And the battery warning starts at 10% and at 5% it will show the battery is empty.
- **NORMAL:** Here we use standard charge current. This is the current specified by the battery supplier. We charge to 100% and discharge to 0% with warning starting at 5%.
- **FAST:** This mode is not remembered when you turn UniGo One off. It is intended to give you some battery charge fast. It will fast charge the battery at a high current all the way to 100%. When the battery is fully charged, it will revert back to the last charge mode used.

The software is optimized to be energy-efficient

# Operating UniGo

for long battery life (typically more than 40 hours).

## Low battery symbol

When the batteries reach 5% remaining capacity, the low battery symbol will be shown at the bottom of the display:

## Communication and power cable

The COMM connector on UniGo One is used for external power/charging, expansion and USB communication. The expansion is typically with the UniBox. UniGo One is capable of powering the UniBox using its internal battery or you can connect an external battery to UniBox and then UniGo One will be powered (and charged) at the same time. Using the supplied power/communication cable, you can connect it directly to the supplied charger, or any other kind of power source like a computer or a USB power bank.

## Display, casing and buttons


The UniGo has a custom made, 256 x 160 pixel graphical display with 16 gray tones and adjustable contrast.


The casing is made of plastic with model number and text printed on it.

## FOUR BUTTONS


For easy operation we made six buttons on UniGo. They are clearly marked with a small icon, but here is the basic description of each button.


 The **up** button is used to move up in menus and for increasing values.

 The **down** button is used to move down in menus and for decreasing values.

 The **ok** button is used to go to the next menu, open up a setting for changing and for accepting the changes made.

 The **menu** button is used to go to the main menu and to bring up the pop-up menu.

 The **back** button is used to go back to the previous menu and to cancel any changes made.

 The **mode** button is used to change between different modes. That could be different run mode screens, analyze screens etc.

## 2 WAYS TO PRESS BUTTONS

To use UniGo, you need to know how to press the buttons in 2 different ways:

1. A short press -      
2. A long press -      


For the general use of UniGo, it is only necessary to use the short press.

When changing values, it is possible to keep pressing a button to speed up the change. After a short while, the key will start to repeat and after a little while more, it will start to accelerate in the change.

## TURN UNIGO ON

There are 2 different ways to turn UniGo on:

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1. Press the **mode** button  shortly to start the Laptimer manually.
2. Start the engine and UniGo will start when it detects the RPM signal.




UniGo starts by showing the startup screen including information about firmware version number, battery voltage, memory used and the environment temperature. It will also show the temperature sensors connected and what type they are.

The startup screen will show an animated UniGo logo and the owners name. It is possible to add your own logo instead of the UniGo version.




*Startup screen with information about UniGo and temperature sensors.*

When UniGo is starting up you can press different buttons to go directly to different screens. Pressing a button will also skip the startup screen.

- Press the **mode** button  to go directly to run mode.
- Press the **back** button  to go directly to analyze mode with the latest session selected.
- Press the **menu** button  to go directly to the main menu.

**You can add your own startup picture. Just copy a 4 bpp bitmap files called "startup.bmp" into the /Pictures folder. The size should be 135 x 160 pixels.**

## TURN UNIGO OFF

 Press the **top right** button and hold it down to turn UniGo off. When you see "POWER OFF" in the display, you can release the button again.



*Power off screen when holding down the top right button.*

UniGo will also turn itself off if no button is pressed and no RPM, speed or trigger is detected after a preselected time. Please see "AUTO POWER OFF TIME" on page 31.

## BUILT-IN HELP

When you move around in menus, UniGo will display one line of help text at the bottom of the display. Use this line to get familiar with the different settings in UniGo.



*Example on the help text describing the current selection.*

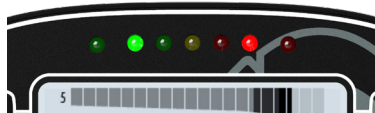
## WARNING LEDS

The warning LEDs are an important features of the Laptimer. A total of five LEDs are located at the top, and the idea is to warn the driver about something that needs attention.

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Each LED is totally programmable and flexible. Please see how to do it under "WARNING LED SETUP" on page 28.

The LEDs can either be constant on, blink slowly or blink fast. If the RPM shift light is used, it will use the fast blink, and the warning LEDs should use constant or slow to avoid any confusions. The warning LEDs do have the lowest priority and if shift lights are used, the warnings are not active until gear is shifted.



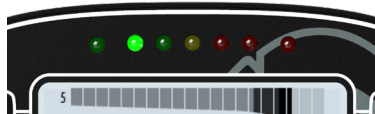
*Warning LEDs 1 and 5 are active.*

showing which buttons to press to use the different functions.

**WARNING. Do not look directly into the LEDs when they are set to high brightness. They are very bright!**

## SHIFT LIGHT

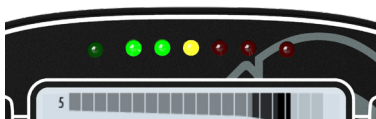
Unigo can use the five LEDs as gear shift light. Even if warning lights are active, the shift light have priority and will take control of the LEDs.



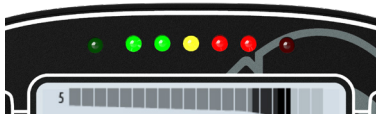
*First LED turned on in the shift light.*

If RPM Shift Type is set to "single LED" (see "RPM SHIFT TYPE" on page 27) each LED will turn on individually. Two different settings are needed. The first is the optimal engine revolution at which gear should be shifted. This will be indicated with the yellow LED. The second is the distance between the LEDs. If you set the RPM shift point at 12000 RPM, and the RPM delta value to 200 RPM, the first LED will turn on at 11600 RPM. Then 11800 RPM, 12000 RPM etc. Please see "RPM SHIFT" on page 26 and "RPM DELTA" on page 27 for more

information.



*Yellow LED means optimal gear shift point.*



*Shift light when all LEDs are flashing.*

If "RPM SHIFT TYPE" on page 27 is set to "All LEDs", all five LEDs will flash rapidly when the RPM shift point is exceeded. The RPM delta value will not be used.

**WARNING. Do not look directly into the LEDs when they are set to high brightness. They are very bright!**

## BETTER / WORSE LIGHT

Unigo have two extra LEDs for better / worse time indication. If this is enabled, then a new lap or split time will be compared to the best time, and then either a green LED (better) or red LED (worse) will light up for x seconds. This is a very fast indication if you are doing better for the segment or lap.



*Worse LED turned on to show the laptimer is worse than the best lap time.*

## LOW BATTERY

When the battery voltage get too low, a warning icon will be show in the headline and in the help text. The icon in the headline is showing how close to empty the battery is. To see more about the warning levels, please look

# Operating UniGo

at "BATTERY EMPTY" on page 33.



*Low battery warning in headline and in the help text.*

## HOME SCREEN

The home screen contains several different screens with common information needed. Press the **mode** button (🎮) to toggle between the different home screens. UniGo will always start with home screen 1.

The footer is shown on all screens and it contains information about the battery capacity remaining, the environment temperature, the number of satellites fixes by the GPS and the current time.

### HOME SCREEN 1

All the information on UniGo One is shown on the first home screen. Here you can see the firmware version, serial number and the driver's name.



*Home screen with information on UniGo.*

If no driver name is entered, it will show "Unipro Aps" instead.

### HOME SCREEN 2

This home screen will show the information on the selected track. It contains the name of the track and the trigger used.

At the bottom you can see if the track is selected automatically or manually.

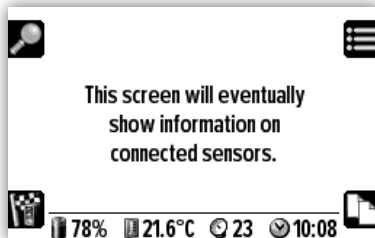


*Home screen with information on the selected track.*

If the track is automatically selected, UniGo will look for a track within 10 km after getting 3d GPS fix.

### HOME SCREEN 3

The third home screen will show information on all sensors. **This is not implemented yet !**



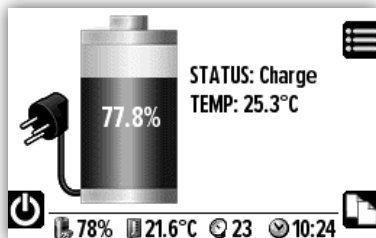
*This screen will contain information on all connected sensors..*

### HOME SCREEN 4

The last home screen is dedicated for the battery status. The fuel gauge keeps track of the remaining capacity remaining on the battery. The status shows the following states: discharge, pre-charge, charge and fully charged. The battery temperature is important

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because a Li-Ion battery can only be charged if the temperature is between 0 and 40 °C.






*Battery being charged.*


Remember that Li-Ion battery is lasting longer if you keep it between 10% and 90% charge. For long time storage, for instance during the winter, store it at 50%.

## RUN MODE

 UniGo logs data into sessions. Each session contains all the information about the race and each time the engine is started, a new session is made.

A session can be automatically deleted. That happens if the sessions is less than 2 minutes long. This is to prevent a lot of sessions being generated if the go-kart is warmed up on the pit trolley.

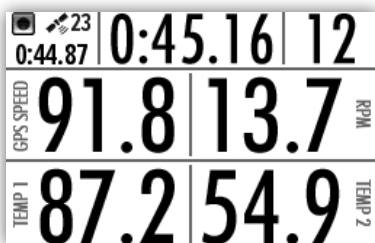
A session can be started or stopped manually. To do this, simply press the **record** button () to toggle recording on or off. If recording is started a record icon () is shown, otherwise a pause icon () is shown.

It is also possible to jump directly to analyze mode with the **analyze** button (). Please notice that this will bring you to the latest analyze screen used with the current session selected.

## RUN MODE 1

This run mode is used to show the maximum number of data channels. The lap time and lap number will always be shown on the top line. You will also find information about the recording status and the best lap time. If the current lap time is the best, it will be highlighted with

inverted text.



*Run mode 1 provides four different data channel values at the same time.*

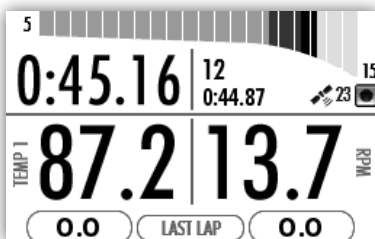
The four data channel fields are programmable. Please see "SET UP SCREENS" on page 30. A small text will help you identify which channel is shown in each location. The data fields are updated twice per second.

If the last lap data is enabled (see "LAST LAP DATA" on page 32) the screen will show the maximum values for the last lap. This is shown for some seconds, but at the same time, the current values are updated just above them.

## RUN MODE 2

This run mode is primarily used for gear karts. It will include a gear indicator and a RPM bar graph. The bar graph shown at the top will be updated 10 times per second.

You will also find the lap time, the lap number and the best lap time in the top row. The typical icons are use to show the recording status.



*Run mode 2 is used for gear kart and it includes the gear number and bar graph.*

Two big data channel values are shown on the display. The two channels are configured under "SET UP SCREENS" on page 30. A small



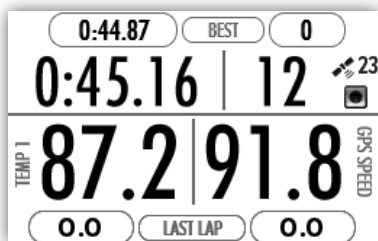
# Operating UniGo

text next to the value will help you identify the channel.

The bottom line will show the last lap maximum value for the two channels. This is updated every time the start/finish line is passed.

## RUN MODE 3

The last run mode is used to show only two data channel values on a kart without gears.




Run mode 3 will show two channel values and best and max values.

Above the lap time, the lap number and the recording icon, the best lap time and the best lap number are shown permanently.

Two big data channel values are shown on the display. The two channels are configured under "SET UP SCREENS" on page 30. A small text next to the value will help you identify the channel.

The bottom line will show the last lap maximum value for the two channels. This is updated every time the start/finish line is passed.


## ANALYZE MODE

 The analyze menu contains everything needed to analyze the data directly on UniGo. Analyzing data will always be faster and better using a computer though!

The general analyze icon shown above will bring you to the last analyze screen you were on. That could be time analysis, min/max or counters.




It is also possible to jump directly to the analyze screen you wish from the rolling menu.

## SESSION SELECT

 UniGo logs data into sessions. Each session contains all the information about the race and each time the engine is started, a new session is made.





List of sessions. Select the one you want.

Use the **up** () and **down** () buttons to move around in the list and press **ok** button () to either select the session or delete it. The scrollbar to the right shows where you are in the total list of files.

The header shows information on the best lap time, the sessions' date and time, the track name and finally the driver's name.

## TIME ANALYSIS

 Several screens can be used to analyze the timing of the race. These screen are listed in the following section. To change between the different screens, simply press the **mode** button () until you get to the screen you want. Different people have different preferences. Therefore the time analysis screen is remembered so it will start on the same screen each time.

## OVERVIEW

When starting analyzing a new session, the overview screen is a good place to start. This screen will show the three best laps including the minimum and maximum of three data channels. It also provides information about the theoretical best lap time, number of laps and the average RPM for the whole session and the starting time and date.

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LAP	LAP TIME	RPM	GPS SPEED	TEMP 1
12	0:47.28	13.7 7.1	88.9 42.6	628 458
13	0:47.35	13.7 7.0	88.9 42.4	633 452
10	0:47.37	13.6 7.3	88.6 43.1	625 464

THEO: 0:47.17      21-11-21 15:38:07  
LAPS: 16  
SESSION: 211121 1538 Klepp GPS ONE

Overview screen with the most important information for the 3 best laps.

Use the **mode** button (⏏) to change to the next analyze screen.

## LAP AND SPLIT TIMES

The lap and split times screen will provide all the details about the lap and split times including the theoretical best lap time and the best running lap time.

LAP	LAP TIME	SPLIT 1	SPLIT 2	SPLIT 3
1	0:52.91	0:16.16	0:23.74	0:13.02
2	0:47.76	0:11.95	0:23.02	0:12.79
3	0:47.49	0:11.87	0:22.90	0:12.73
4	0:47.45	0:11.84	0:22.88	0:12.73
5	0:49.88	0:13.73	0:23.57	0:12.58
6	0:47.79	0:11.96	0:23.27	0:12.56
7	0:47.65	0:11.97	0:23.04	0:12.64

BEST TIME: 0:47.28      21-11-21 15:38:07  
THEO: 0:47.17      ROLLING: 0:47.28  
SESSION: 211121 1538 Klepp GPS ONE

Lap and split times screen. Including theoretical best lap time and best rolling time.

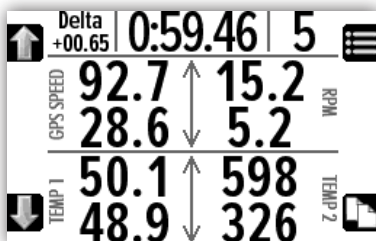
Use the **up** (⬆) and **down** (⬇) buttons to change the laps visible on the screen. The **up** (⬆) button will increase the lap number, e.g. scroll the screen up.

Use the **mode** button (⏏) to change to the next analyze screen.

## RUN MODE VIEW

If you want to analyze the data on a screen that looks something like run mode 1, this is the way to do it. This screen will show the same channels as shown in run mode 1 and you can see both the minimum and maximum

values for that lap. The delta time compared to the best lap time will be shown all the time.



Analyze data with a screen like run mode 1.

The maximum is the top value and the minimum value is below it.

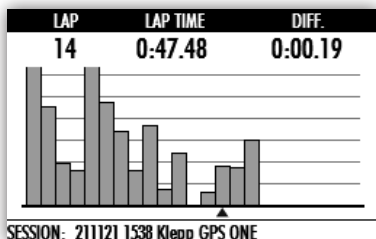
Run mode view will automatically start with the best lap selected.

Use the **up** (⬆) and **down** (⬇) buttons to change the lap number shown on the screen.

Use the **mode** button (⏏) to change to the next analyze screen.

## LAP TIME GRAPH

To get a graphic overview of the lap times, the lap time graph can be used. It will show the lap times as bars with the height indicating the difference compared to the best lap. The best lap time will not show any bars. The graph do automatically scale so very slow laps will have a bar that is cut off at the top.



Lap time graph with all lap times shown graphically. Lap 14 selected.

The lap number, the lap time and the difference to the best lap time is clearly shown at the top of the screen. The horizontal lines are

# Operating UniGo

at steps of 0.1 second in this example.

Use the **up** (↑) and **down** (↓) buttons to change the lap highlighted on the screen with the small triangle below it.

Use the **mode** button (⏏) to change back to the first analyze screen.

## MIN/MAX ANALYSIS

To analyze important minimum and maximum values, use this screen.

BEST TIME: 0:47.28 21-11-21 15:38:07						
LAP	LAP TIME	MAX RPM	MAX SPEED	MAX TEMP1	MAX TEMP2	MAX ENV.
1	0:52.91	13560	88.2	570	-	5.2
2	0:47.76	13608	88.7	615	-	5.0
3	0:47.49	13642	88.7	621	-	4.9
4	0:47.45	13654	88.6	626	-	4.9
5	0:49.88	13615	88.5	605	-	4.8
6	0:47.79	13632	88.4	608	-	4.8
7	0:47.65	13636	88.4	623	-	4.9

SESSION: 211121 1538 Klepp GPS ONE

List of laps with min and max values shown.

The session's best lap time is shown at the top of the screen, and the best lap is highlighted with a bold lap number and lap time.

Use the **up** (↑) and **down** (↓) buttons to change the laps visible on the screen. The **up** (↑) button will increase the lap number, e.g. scroll the screen up.

Use the **mode** button (⏏) to change between minimum and maximum values.

## COUNTERS AND TIMERS

The counters and timers do include information about the tire wear counters, engine timers, and the lap length.

### TIRE WEAR COUNTERS

All the tire wear counters are shown on one single screen. This is an overview of all the counters's value and the current selected tire wear counter.

Please notice that this is for analyze only. The tire wear counters cannot be changed from here. To change the counters, please see "TIRE WEAR MENU" on page 24.

TIRE WEAR	
COUNTER 1:	216 km
COUNTER 2:	0 km
COUNTER 3:	83 km
COUNTER 4:	0 km
COUNTER 5:	0 km
CURRENT COUNTER:	1

Shows tire wear counters in kilometers or miles

A list of all tire wear counter values.

Use the **mode** button (⏏) to change to the next analyze screen.

### ENGINE TIMERS

All the engine timers are shown on one single screen. This is an overview of all the timers's value and the current selected engine timer. Please notice that this is for analyze only. The engine timers cannot be changed from here. To change the timers, please see "ENGINE TIMERS MENU" on page 26.

ENGINE TIMERS	
ENGINE TIMER 1:	31:43
ENGINE TIMER 2:	11:36
ENGINE TIMER 3:	0:00
ENGINE TIMER 4:	5:04
ENGINE TIMER 5:	0:00
CURRENT TIMER:	2

Shows engine timers in hours:minutes

A list of all engine timer values.

Use the **mode** button (⏏) to change to the next analyze screen.

### LAP LENGTH

When a speed sensor is attached to UniGo, this sensor is used to measure the length of each lap.

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LAP LENGTH	
LAP 7:	1925.0 m
LAP 8:	1926.1 m
LAP 9:	1938.5 m
LAP 10:	1927.4 m
LAP 11:	1930.6 m
LAP 12:	1928.2 m
LAP 13:	1930.6 m

Shows the lap lengths in meters or yards

A list of the lap length for each lap.

Use the **up** () and **down** () buttons to scroll through the laps.

Use the **mode** button () to change back to the first counter analyze screen.

## DELETE MENU

When using UniGo, the memory will be filled with data. The more sessions you have, the slower and more unmanageable it gets. From the delete menu, you can delete sessions in different ways.



Delete menu. Used to clear sessions.

Use the **up** () and **down** () buttons to move around in the menu and press **ok** button () on the relevant line to execute that function.

## DELETE MOST RECENT SESSION

If the session just recorded was not one you want to keep, you can use this command to delete the most recent session from the memory. You will have to confirm this before the session is deleted.

## DELETE >30 DAYS OLD SESSIONS

This command will delete all sessions older than 30 days. You will have to confirm this before all old sessions are deleted.

## DELETE ALL SESSIONS

If all the sessions in memory are already transferred to a computer, you might want to delete them all at once.

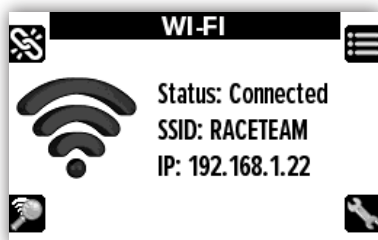
You will have to confirm this before all sessions are deleted.



Confirmations popup. To avoid deleting by mistake.

## WI-FI

UniGo use Wi-Fi as the main connection to a computer.




Wi-Fi screen with direct buttons for fast operation.

Connect. If Wi-Fi is already set up, then simply press the connect button to start the Wi-Fi and connect.

Disconnect. If UniGo is already running Wi-Fi, press the disconnect button to stop Wi-

# Operating UniGo

Fi and power it off.

 **Network scan.** To search for available networks within reach, press the scan button to start the scan.

 **Wi-Fi setup.** All settings related to Wi-Fi client mode and Access Point mode.

## WI-FI ACCESS POINT

If you use a single UniGo and a single computer, access point mode is the best option. In this mode, UniGo One will act as a network master, and your computer will then connect to this like any local Wi-Fi network. There are some settings related to access point mode.



*Access Point setup. Settings used for AP mode.*

### SSID NAME

The SSID name is the name of the network you are making. By default it is "unigo-xxxx" where xxxx is the serial number. So if your UniGo One have serial number 1234, the SSID name will be "unigo-1234".

You can rename this to your own network name.

### WI-FI PASSWORD

The password is by default empty. This means your network will be open for everyone to join, and this might not be the best idea! So please enter a password and make sure it is a least 8 characters long. If you enter a password, the connection will use WPA2 encryption.

### IP ADDRESS

At the moment this is fixed to 192.168.4.1 and

cannot be changed.

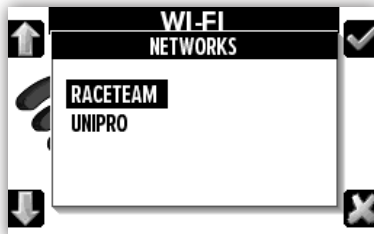
### CHANNEL

Wi-Fi can use several different channels. If you have a lot of Wi-Fi running, you should try to select a channel that is not used by the other networks. Not all channels are legal in all countries. Please check what channels can be used in the country you are in.

## WI-FI CLIENT MODE

Typically client mode will be used by a bigger team having its own Wi-Fi network running. The benefit with client mode is several Laptimers can be on the network at the same time, and it is easy to access each Laptimer from the Unipro Analyser program.

There are no settings for client mode. You simply do a scan for available networks, and connect to one of them.



*Popup menu shows result of network scan.*

It is possible to start the scan directly from the Wi-Fi screen, or by selecting "SCAN NETWORK" from the Wi-Fi setup screen.




*Client mode setup is actually just information on the network and IP address used.*

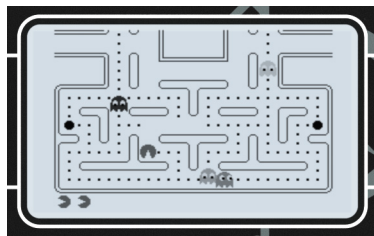
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When client mode is enabled and connected, the client part of Wi-Fi setup will show the SSID name of the connected network and the IP address assigned. Normally this is not used, but it is possible to connect directly to UniGo by entering this IP address in a browser. In some browsers it is necessary to add `http://` in front of the IP address like `http://192.168.0.159`.

From the built-in web server it is possible to update the firmware and transfer sessions to your computer, but we do recommend to use the UniPro Analyser program for this.


## UNIMAN GAME

 UniGo includes a couple of simple games - just for fun.



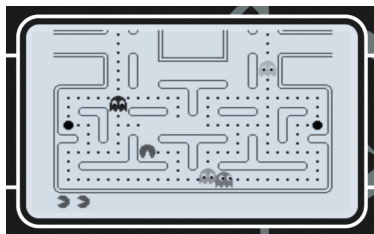
*Uniman in action. Just a small game for fun.*

When the game is started, you can use the buttons shown on the intro screen to control the game.

A long press on the **left** button () will bring up the rolling menu.

## SPACE INVADERS GAME

 UniGo includes a simple game - just for fun.




*Space Invaders in action. Just a small game for fun.*

When the game is started, you can use the buttons shown on the intro screen to control the game.

Press the **menu** button () to bring up the rolling menu.

## INFO UNIGO

 For more information about your UniGo, press the information icon on the main menu. This will bring the information menu shown next.

INFO UNIGO	
UNIGO MODEL:	UniGo One
SERIAL NUMBER:	1293
SOFTWARE VERSION:	V1.01.001
SOFTWARE RELEASED:	Mar 28 2022
MANUFACTURE DATE:	15-1-22
TOTAL LAPS:	372

INFO UNIGO	
TOTAL HOURS:	209:54
AMBIENT LIGHT:	136

*Info screens showing all information about this UniGo.*

The information is divided into two different screens. This is a short description on each line

# Operating UniGo

of information.

## UNIGO MODEL

In the UniGo series, there are four different models. This number will be on the top edge of the Laptimer box too. It should show either 3005 or 5005.

## SERIAL NUMBER

The serial number is an important piece of information. It is unique for each UniGo and it will be used to identify sessions and for licensing of Off Camber Data software.

## SOFTWARE VERSION

The software version is also shown at the first home screen. The number is build up like this: major.minor.build. The example shows a version number of V1.01.001.

## SOFTWARE RELEASED

The build date for the software is shown on this line. It makes it easy to see in plain text when Unipro made this firmware release.

## MANUFACTURE DATE

This is the date this UniGo was manufactured at the Unipro production. It is a good indication on how old the Laptimer is.

## TOTAL LAPS

UniGo counts all the laps driven. This number is never cleared so the number is the total number of laps measured since the Laptimer was made.

## TOTAL HOURS

UniGo measures the total time the Laptimer has been turned on. This number is never cleared so the time is the total since the Laptimer was made.

## AMBIENT LIGHT

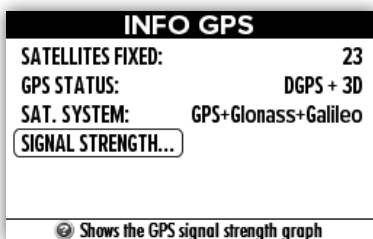
UniGo measures the ambient light with a built-in sensor. This sensor is used to auto adjust the backlight.

## INFO GPS

The GPS reception is very important for the overall operation and accuracy of UniGo One. The GPS signal is typically used to trigger the lap times, and the better signal, the more precise lap times. The GPS info screen is to help you understand the current GPS signal being received.

You cannot do anything with the quality of the GPS signal being received, but you can still do something to help the accuracy of the lap times. The most important thing is to turn on UniGo **before** in good time before driving. This will give UniGo a better chance to get more satellites fixed from different systems and even get a differential GPS signal.

Even though you have a fix, it does not necessary mean that you have a good and accurate position. The standard accuracy for a GPS receiver is 2.0 meters CEP. This means that if the GPS receiver is placed in open air with full view of the sky, 50% of all positions will be within radius of 2.0 meter during a test of 24 hours.



*GPS info screen with the overview of GPS receiver status.*

## SATELLITES FIXED

The number of satellites the receives simultaneous. The higher the number, the better accuracy you could expect. Out in open air it will typically be more than 20 satellites.

## GPS STATUS

This can either be 2D, 3D and then you can have DGPS on top of that. It should at least be 3D to have a good fix. DGPS means differential GPS and it use some fixed ground-based reference stations that broadcast correction

# Operating UniGo

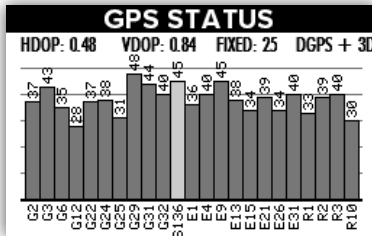
information to the GPS system. If you see DGPS + 3D it cannot get any better.

## SAT. SYSTEM

The GPS received used in UniGo One can track three different GPS systems at the same time. They are GPS (American), Glonass (Russian), Galileo (European) and BeiDou (Chinese). If the GPS receiver locks to more systems it will be able to combine them to give a more accurate position.

## SIGNAL STRENGTH

To better evaluate the reception of the signal from the satellites we have made a GPS signal strength graph showing the details for the satellites being tracked.



GPS signal strength screen. Detailed information on each satellite.

If the bar is dark the satellite is fixed and we are receiving data from it. If it is in light gray it is not fixed yet. The numbering systems are as follows:

- G1-G32: GPS satellites from the American system.
- R1-R32: Glonass satellites from the Russian system.
- E1-E32: Galileo satellites from the European system.
- B1-B37: BeiDou satellites from the Chinese system.
- S120-S158: Channels used for differential GPS.
- Q1-Q5: Channels used for differential GPS.

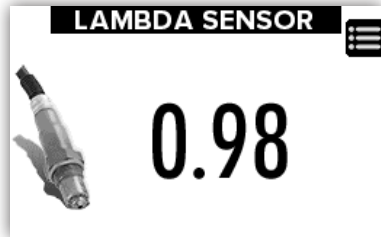
At the top status line HDOP and VDOP is shown. HDOP is the horizontal precision number and VDOP is the vertical precision. The lower number, the better.

## INFO SENSORS

The GPS reception is very important for the overall operation and accuracy of UniGo One.

## INFO LAMBDA

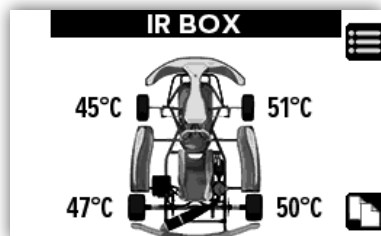
It is possible to see the current Lambda value from the optional Lambda controller. This is shown with big numbers to make it possible to read the number when working on the engine. The value is updated in real time, so any adjustments will be visible right away.



Lambda value updated in real time.

## INFO IR BOX

If the optional IR Box is connected, it will be possible to see live data from the channels it offers. The real-time information is shown on two different screen.

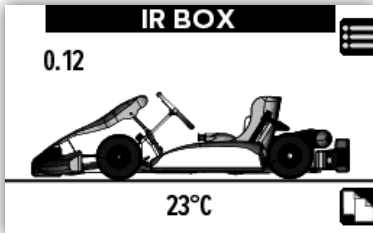


IR Box with 4 infrared tire temperatures showing values in real time.



# Operating UniGo

Change to the next screen by pressing the **mode** button (⏏).



IR Box with asphalt temperature sensor and **pressure sensor** showing real time values.

## LEARN TRACK

 This feature is not yet implemented !.

## RPM SENSITIVITY

 This feature is not yet implemented !.

## USB MODE

UniGo is using a full-speed USB connection to either a PC or a MAC computer. The good thing is, that you do **not** need to install any driver to communicate with UniGo One.

When the USB cable is connected, UniGo will show the following screen.



USB screen when the USB cable is connected.

**When UniGo is connected with USB, it cannot be operated anymore.**

To leave USB mode again, just unplug the USB cable. Please remember to safely eject

UniGo on the computer before removing the cable like any other USB flash drives. This will prevent the flash from being corrupted. The Unipro Analyser program do have an eject button to make this easy.

## FIRMWARE UPDATE

Updating the firmware is very easy on UniGo. You will not need any special software except the new firmware file from our homepage. The firmware file is called something similar to "unigo\_one\_release\_rev\_xxyyzzz.bin" where the xxyyzzz is the version number of the firmware. Simply copy this file into the folder called "Firmware" on UniGo when it is attached to the computer and it will start the update process when you unplug the cable again.

When UniGo detects this file in the firmware folder, it will show the following screen.



*Update screen when new firmware is found.*

If you want to upgrade (or downgrade) the firmware to the version shown on the screen, simply press the **ok** button (☑). If you want to keep the current firmware, press any other button will skip the firmware update process. This screen will only be shown for 20 seconds. If you do not push any buttons it will skip the update automatically.

If you chose to upgrade the firmware, UniGo will check the file and unpack all the files. When this is done the update of the firmware itself starts. When it is done UniGo turns off.

# Operating UniGo



*Update screen when new firmware is being programmed into the flash.*

The next time you turn it on, you should see the new firmware version displayed on the startup screen.

**Please do not disconnect the power to UniGo while the update is in progress.**

# Troubleshooting

We expect a smooth and pleasurable experience when using UniGo.

If you have any problems, either with the setup or with daily use, please check the following pages for suggested solutions.

If you don't find the answer to the problem here, please contact your Unipro dealer for further assistance.

## Weak and hard to read text

The contrast is set too low.

- Adjust the contrast to a higher value.

## One of the temperatures do not show up in run mode

The sensors are not detected at startup.

- Contact your dealer to order a new button as a spare part.

## Unstable data values in run mode

Excessive noise from the ignition system.

- Change to a noise reduced spark plug.
- Mount a ferrit bead on the cylinder plug sensor cable (contact Unipro).
- Run the ignition wire as far away from the other cables.

## UniGo is not turning on

Battery might be empty.

- Press and hold the two **right** buttons for at least 10 seconds.
- Charge the battery.

## The gear indicator is not working in run mode 2

The number of gears is not set correctly.

- Set the correct number of gears and then go through the learning process.

## No temperature shown when using a

## splitter

A wrong splitter is used.

- You need to use the **gray** splitter. A black splitter cannot be used for the temperature sensors.

# Maintenance

## Cleaning

### To clean the case, display, and buttons

The exterior surfaces of UniGo products are made from plastic box with a plastic overlay.

They are designed to be easily wiped clean with a dry, lint free cloth.

Greasy marks should be removed by light rubbing with a slightly damp cloth and a trace of proprietary glass cleaner.

**Do not use any other solvent or abrasive based cleaners.**

## Sensors and cables

### Special care on cable and sensors

The cables and connectors used are of high quality, but you still need to handle them with care.

- Never tighten the connectors using any tools. Only tighten them with you fingers.
- Do not tighten cable ties too hard. You do not want them to destroy the cable.
- Do not bend the cables too hard. A too hard bend might destroy a cable.
- Make sure not to pull the cable during driving. When the the steering wheel is turning, it might pull the cable. Make a loop on the cable to avoid this and make the steering wheel move freely.
- If the wire shield is damaged the cable or sensor needs to be replace. A destroyed shield is the same as letting a lot of electrical noise into the Laptimer, and that can affect its performance.

## Winter storage

### Special care of the battery

The battery need special care if not used for a long time.

A Li-Ion battery need to be charged regularly. If it is allowed to discharge completely it might get damaged. Please recharge the battery with regular intervals when not used. The best

charge for storage is between 40 and 60%.

It is also a good idea to dismount the UniGo and store it in the supplied box at room temperature during the winter period.

# Service and guarantee

## Service

The UniGo Laptimer has been carefully designed to give you many years of untroubled use. There are no parts inside the case which need service, nor do the units require any form of maintenance besides cleaning.

In the unlikely event that your product fails to function correctly, it should be returned in its original packaging to your Unipro dealer.

You can always find the updated list of worldwide dealers on [www.uniprolaptimer.com](http://www.uniprolaptimer.com).

**No responsibility can be accepted for the product whilst in transport to the factory or dealer. Customers are therefore advised to insure the unit during transport.**

When seeking service under guarantee, proof of the date of purchase will be required.

## Guarantee

The product is guaranteed against defects in material and workmanship for two years from the date of purchase.

The guarantee is void if the product has been subject to misuse, accident, or negligence, or has been tampered with or modified in any way without the written authorization of Unipro ApS.

Attempted servicing by unauthorized people may also invalidate this guarantee. Labor and carriage charges are not covered unless by local agreement.

Outside Denmark, local warranty liability is restricted to equipment purchased within the territory.

Our agents outside Denmark are only under contractual obligation to service under guarantee equipment sold through them.

Our agents are entitled to make a non-refundable charge for any service carried out on other equipment.

This guarantee does not limit your statutory rights within the country of purchase.

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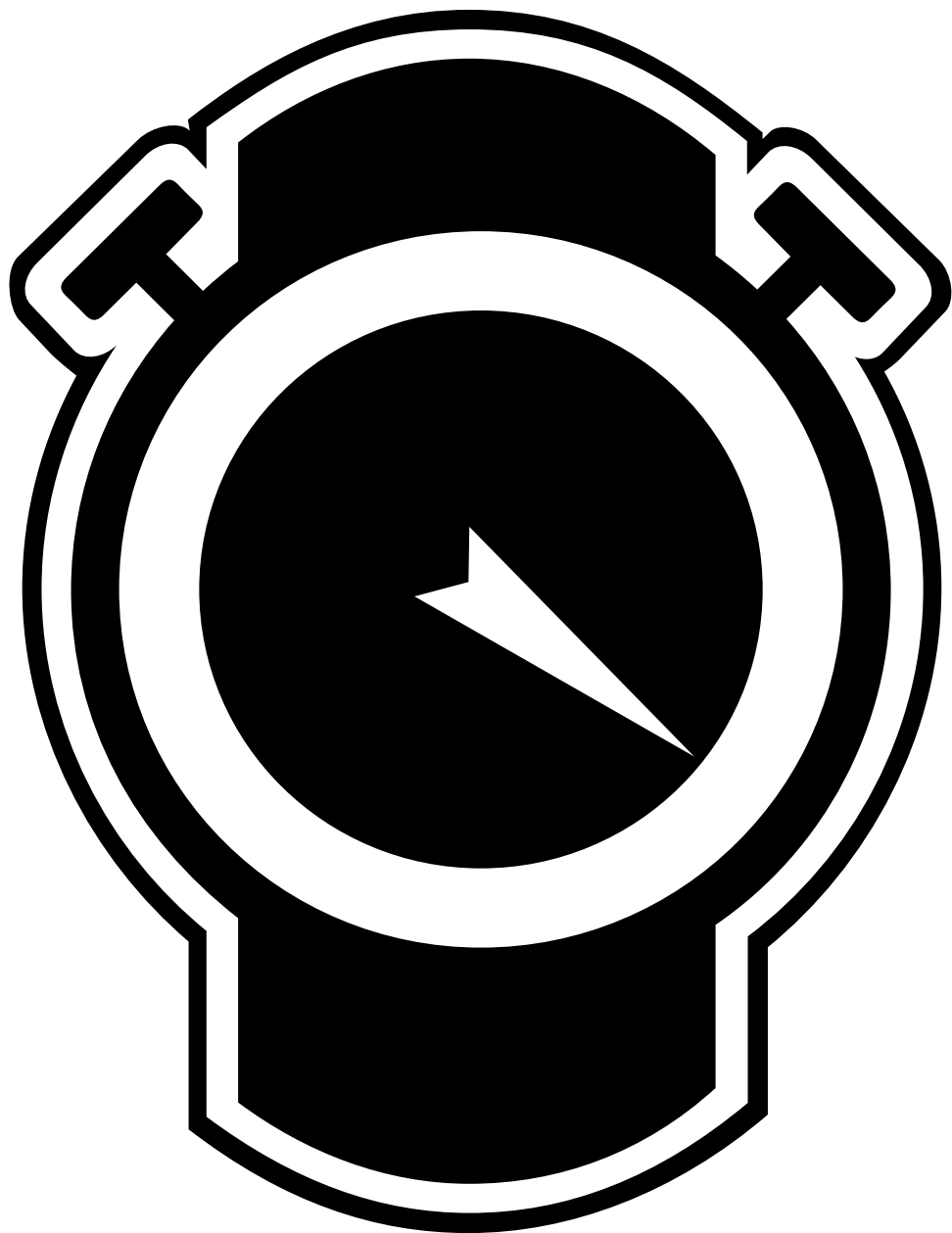
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