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INSTRUCTIONS MANUAL for the Display 'MOD7 Copilot'

Thank you for purchasing this instrumentation MOD7CE® for your racing car.
We hope you will be pleased to advise you about !
You are eager to try it, so jump to page 4 to begin installation.

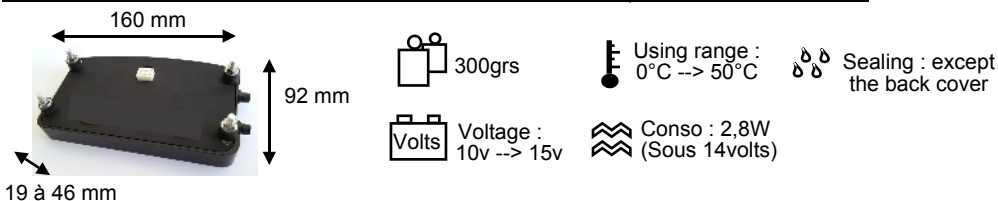
This multi-functions display **MOD7 Copilot** is intended to the rally Copilots.
It enables you to :

- take times during the rally stages thanks to its remote control,
- follow the road-book thanks to its trip function with an accuracy up to 10 meters
- monitor the remaining fuel quantity and the battery voltage
- add the distances traveled in order to manage the services

Additionally, a 'night' mode can reduce the backlight for your comfort and security



TECHNICAL SPECIFICATIONS for the Display 'MOD7 Copilot' :



- **Time of the day - 'CLOCK'**

24h clock with 1 second accuracy

Operate with a lithium internal battery even when the battery voltage is released

- **Stopwatch - 'TIMER'**

Stopwatch up to 1h with 1/100 second accuracy

Start - Intermediate Times - Stop with the remote control button

Up to 16 recordable and recording times during stages

Intermediate times with frozen screen during 10 seconds and reminder display on the left

Summary table for all recorded times on a special page

Return to Zero (Reset) + Stop of the stopwatch during the stage is possible

- **Trip distance - 'TRIP'**

Trip distance with an accuracy of 10m from 0.00 to 255.99km

Reset to 0 with a pulse on the remote control button

- **Total Distance Counter - 'DIST'**

Total distance with an accuracy of 100m from 0.0 to 9999.9km

Reset to 0 possible in the setting menu

- **Total Distance Counter during Stages - 'RACE'**

Total distance during stages with an accuracy of 100m from 0.0 to 9999.9km

Reset to 0 possible in the setting menu with a protected mode

- **Fuel Gauge - 'FUEL'**

Display with an accuracy of 1 liter from 00 to 60 liters

Programmable on the car fuel sender with steps of 4 liters

Programmable alert with yellow led from 5 to 20 liters

- **Voltmeter - 'BATT'**

Direct reading of the battery voltage with an accuracy of +/- 0.1 volt

Low level (<12v) and High level (>15v) alert with orange led

- **4.3" color TFT display**

'Day' and 'Night' modes with manual selection

White numbers and characters on a blue to night background when 'Day' mode selected

Grey numbers and characters on a black background when 'Night' mode selected

- **Housing**

CNC manufactured POMC housing with a 3D ABS printed black cap

Industrial Scratch as mounting system

CAUTIONS and Warnings :

The Display **MOD7 Copilot** is only reserved for use in racing cars.
It is not approved for a road use.

The Display **MOD7 Copilot** is intended to be used inside the car (back cover unsealed)

The Display **MOD7 Copilot** is only designed to equip cars with a 12v battery.

A battery voltage above 16v might cause irreparable damages to the product.

The Display **MOD7 Copilot** needs a fuel sender with a decreasing resistor value when the fuel quantity increases. When the tank is full, this resistor needs to be near 0 to 10 ohms...

Safety Warnings for installation and during wiring :

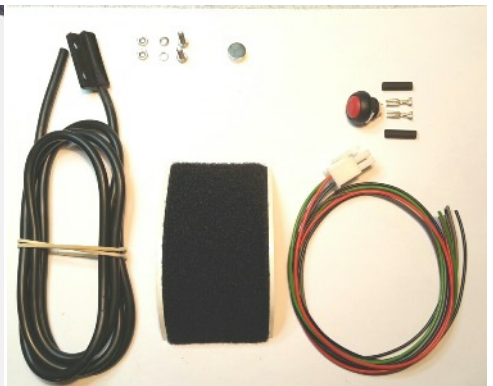
- Switch off the ignition and disconnect the ground terminal of the battery
- Keep the wiring loom far from hot spots of the engine (i.e. temperature)
- Install a 2A fuse on the '+' power wire

Warnings for reliability :

- Use the mounting system supplied with the display ('scratch' system)
- Make sure that the positive power supply will always stay below 16 volts
- Do not pull on wires or loom and
- Do not spray the counter even at low pressure
- Do not open the display

PACKAGE contents of the Display MOD7 Copilot :

- 1 Display **MOD7 Copilot**
- 1 Wiring loom with a 6 way connector
- 1 Speed magnetic sensor + 1 magnet
- 1 Remote control button
- 1 Scratch mounting system
- 1 Instructions manual



FIXING the Display MOD7 Copilot :

- **Choose** the best place for your **Display MOD7 Copilot** in order to see the full screen
- **Make** a flat bracket or a aluminium square in order to receive the scratch pad
- **Drill** your bracket with 2 to 4 holes and rivet it on the dashboard
- **Scratch** the Display on your bracket
- **Make** an other bracket for the remote control button on the door or on the cradle

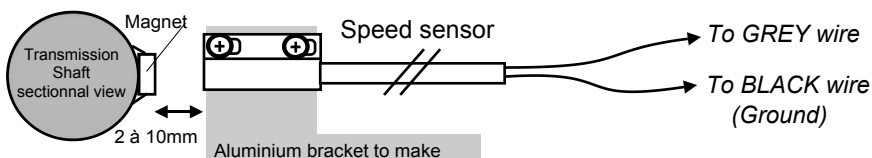


Installation of the Speed Sensor :

- **Paste** the cylindrical magnet on the half-transmission shaft near the gearbox output
Use a good epoxy glue and even a non-metallic clamp
- **Install** the 'PLA' speed sensor on a aluminium bracket (don't use steel) attached at one hand to the engine block.
- **Connect** one of the sensor wires to the GREY wire of the Display **MOD7 Copilot**
- **Connect** the other wire to the BLACK ground wire of the Display **MOD7 Copilot**

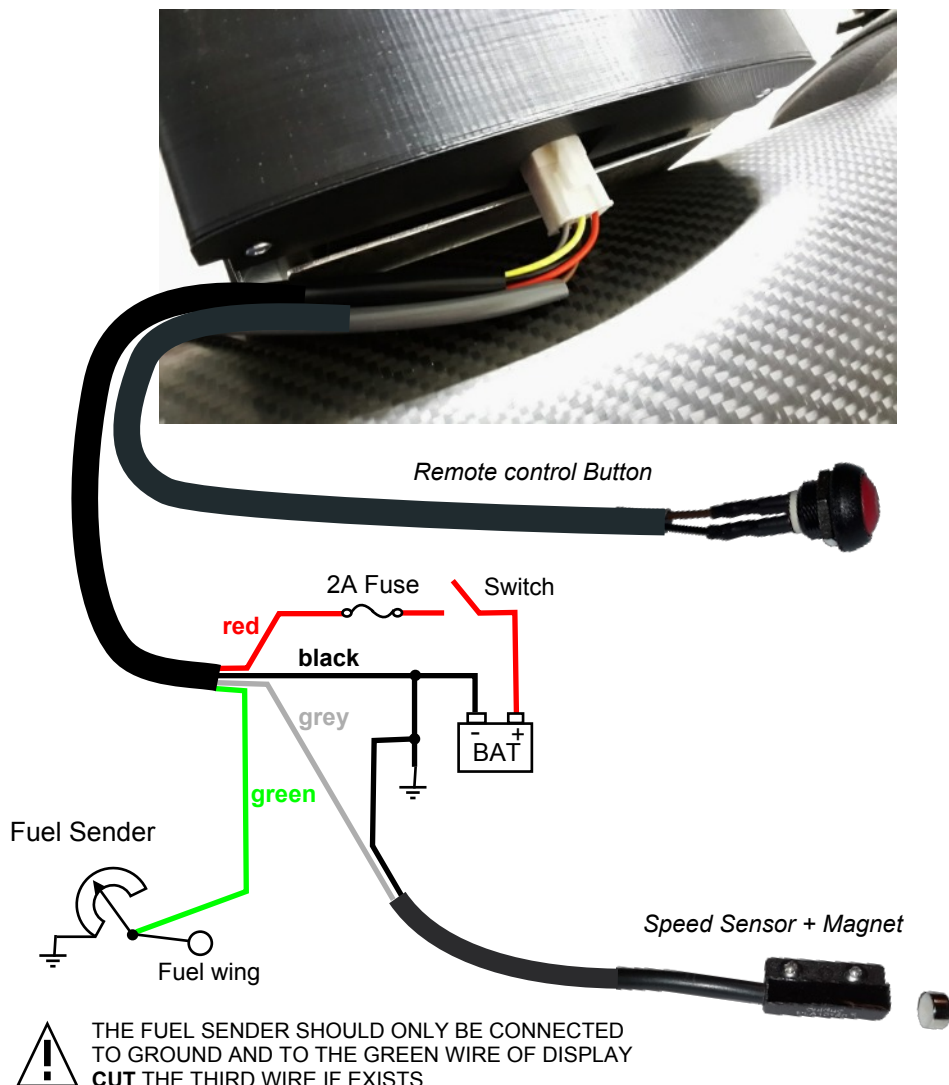
Speed Sensor + Magnet

Caution : Sensor is fragile. Avoid hitting the sensor during installation



WIRING of the Display MOD7 Copilot :

- **Connect** the BLACK wire of the MOD7 loom directly to the battery ground
- **Connect** the RED wire to a battery +12v after the main switch and a fuse of 2A
- **Connect** the GREEN wire to the fuel sender
- **Weld or Connect** the 2 thimbles of the remote button to the ORANGE & BLACK wires
- **Insert and Lock** the connector on the back side of the Display **MOD7 Copilot**
- **Switch ON the main switch** in order to verify that the Display **MOD7 Copilot** is displaying its welcome page (after approx. 4 seconds)



SETTINGS of the Display MOD7 Copilot :

Before the first use of your Display **MOD7 Copilot** during a rally, take some time to set it properly. It will then display the right values for distances and fuel gauge. You will need 1 or 2 hours for that

When you turn on the contact, the Display **MOD7 Copilot** generates an initialization sequence : The display and the 2 alert leds turns on after 4 sec, at the bottom of the screen you can see the product and date codes, then the different functions are displayed.

As long as the stopwatch is not running, you can access to the 'Config' menu :
For your security, it's better to access the Config menu when the car is stopped....

- **Push and Hold during 1sec** the 'CLEAR ES / CONFIG' button.

A rectangle named 'Config' appears, with the 1st function to be configured and its value.

General action on the 2 buttons while in 'Config' mode :

- **Each short press** on the top button passes to the next parameter
- **A long press of 1 sec.** on the top button clears the times of the stopwatch, or the distances when these parameters are displayed
- **Each short press** on the bottom button increases the value of the displayed parameter or reads the fuel level if you are setting this parameter
- **A long press of 1 sec.** on the bottom button exits from 'Config' and saves your parameters

- 1) **NIGHT MODE** => Toggle between day mode and night mode to change backlight intensity

• A short press on the bottom button changes from 00 (day) to 01 (night) and vice-versa
Use the night mode only during night stages in order to reduce the screen backlight

- 2) **CLEAR ALL ES** => Clear all stages times from the memory of the **MOD7 Copilot**

• A long press on the top button allows you to reset to 00'00"00 all the recorded times and to restart to stage #01 (ES01) : **MOD7 Copilot** confirms your action by displaying 'OK'
NOTE : It's important to do that before your next rally !!

- 3) **CLEAR RACE DST** => Clear the Race distance (distance traveled during stages)

• A long press on the top button resets to 0000.0km this distance counter, but only if you entered the config menu while stage ES16 was displayed : It's a security system !
This action cannot be canceled. **MOD7 Copilot** confirms your action by displaying 'OK'
NOTE : You can use this race distance to follow your maintenance interventions

- 4) **CLEAR DISTANCE** => Clear the total distance

• A long press on the top button resets to 0000.0km the total distance counter
This action cannot be canceled. **MOD7 Copilot** confirms your action by displaying 'OK'

- 5) **WHEEL CIRCUMF** => Wheel circumference for the increment of the distance functions

• Each short press on the bottom button increases the circumference by 1cm.
• Beyond 230 cm, it returns to 140 cm

In order to measure precisely the circumference of a wheel, push the car so that the wheel makes a complete turn and measure the displacement on the ground : It's the circumference to program

- 6) **WHEEL PULSE NB** => Number of triggering of the speed sensor during one wheel revolution

With one magnet installed, the speed sensor will trigger only one time per wheel revolution, so let the 01 number to have correct values for the distances
• Each short press on the bottom button increases the value by 1. Beyond 60, it returns to 01

- 7) **CLOCK ADJUST 1** => Setting of the hours of the clock
 • Each short press on the bottom button increases by one hour. Beyond 23h, it returns to 00
NOTE : The clock should be set to the official clock of the rally you participate

- 8) **CLOCK ADJUST 2** => Setting of the minutes of the clock
 • Each short press on the bottom button increases by one minute. Beyond 59', it returns to 00

Important note : When you modify the hours or the minutes of the clock, the new time is written in a small autonomous clock of the **MOD7 Copilot** which works on a little battery cell
 When you pass to the next parameter (ALERT FUEL), the seconds are resetted to 00, so change to this next parameter when the official clock clears seconds !

- 9) **ALERT FUEL** => Setting of the fuel level alert
The yellow led at the bottom right of the screen is the fuel programmable alert
 • Each short press on the bottom button increases the value by 1 liter. Beyond 20L, it returns to 00L

- 10) **FUEL PROG xx L** => Programmation of the fuel gauge
 where 'xx' represents the step of fuel to be programmed

General principle :

A short press on the bottom button 'reads' the value of the fuel sender and displays it in a 'lsb' value
 The step 'xx' starts from 00 (empty tank) and ends to 60 (maximum quantity) by 04 liters steps

The 'lsb' value must start from 200-220 (empty tank) and decrease to 150-130 (full tank)

A 255lsb indicates an error : Fuel sender not connected or a bad ground return

If your Display **MOD7 Copilot** stops working when you fill more than 20 liters, it means that you've not cut the third wire coming from +12v battery on the fuel sender. This can damage the processor !

- **Empty** the tank **completely** for the 00L step and be sure that FUEL PROG 00L is displayed
- **A short press** on bottom button memorizes this first step of 0 liter
- **A short press** on the top button passes to the next step : 4 liters. FUEL PROG 04L is displayed
- **Add** 4 liters in the tank
- **A short press** on the bottom button memorizes this step of 4 liters
- **A short press** on the top button passes to the next step : 8 liters. FUEL PROG 08L is displayed
- Etc... until you cannot add any fuel in the tank because it is full.
- **Memorise** all the steps from your full tank up to 60L without adding fuel

Then, Push on the bottom button during 1 second to save parameters and exit from config.

Note : You can exit from the config menu whenever you want to save your parameters, then you can re-enter the config menu to finish the programmation or to change one or more parameters

USING of the Remote Control :

In a rally race, there is 2 sections : the performance stages (ES) and the road liaisons
 The **MOD7 Copilot** and its remote control allows you to control these 2 modes or sections
 The remote control controls either the stopwatch (start, intermediate, stop), or the road trip (reset to 0) depending on the position of the logo ' ● ' on the screen.

This logo is displayed, either to the right of the name 'TIMER', and, in this case, the remote control acts on the stopwatch, or to the right of the name 'TRIP', and in this case, the remote control acts on the trip.
 You can change from one mode to the other (only if the stopwatch is not running) by a **short press on the top button** = 'ES <-> ROAD'

A) Control of the trip in liaison sections :

When the logo ● is displayed at the right side of 'TRIP', each short press on the remote control, resets the trip to 00.00km. You can clear the trip distance at each point mentioned on your road book

B) Control of the stopwatch in performance stage sections :

When the logo ● is displayed at the right side of 'TIMER'

- The first **short press** on the remote control starts the stopwatch.

-> *You can note that the hundredth of second remain to 0 when the stopwatch is running...*

- If you want to catch an intermediate time, a **short press** on the remote control freezes the stopwatch during 10 seconds (the number of the stage 'ES' is displayed in GREEN).

Then the stopwatch restarts and the intermediate time is displayed in green at the left side.

-> This zone can display up to 4 times than can be copied on a notebook at the end of the stage...

-> *If you catch more than 4 intermediate times, they will be displayed over the previous...*

- In order to stop the stopwatch at the end of the stage, the **first short press** on the remote control freezes the stopwatch during 10 seconds (like to catch an intermediate time), and during these 10sec, a **second short press** on the remote control stops definitively the stopwatch and records the time in the memory of the **MOD7 Copilot** (the number of the stage 'ES' is displayed in RED).

C) Access to the next stage :

When the stopwatch is not running, give a **short press on the bottom button** = 'NEXT ES'

D) Clear a running stage :

If you start the stopwatch by mistake, give a **long press of 1 second on the bottom button** = 'CLEAR ES' and the stopwatch will be stopped and cleared without changing the stage number

E) Access to the special page with all the recorded stages :

When the stopwatch is stopped, a **long press of 1 second on the top button** = 'TABLE ES' changes screen to a table with the 16 values of the 16 stages (maximum)

Just a **long press of 1 second on the top button** returns to the normal screen.

-> The upper ligne of the table displays the total distance 'DIST' and the race distance 'RACE'

WARNINGS and ALERTS :

The lower ligne of the normal screen displays the battery voltage (Volts) and the fuel gauge (Liters)

If the battery voltage falls under 12v or raises over 15v, an orange warning light comes on

If the fuel quantity in the tank falls under your programmed level, a yellow warning light comes on