Dear MyChron 3 Plus/Gold/Gold XG Owner

Your **MyChron 3 Plus/Gold/Gold XG** represents the newest generation of Aim data acquisition systems for car/bike racing that provide the driver with a wide, easy to use and multifunctional display.

MyChron 3 Plus/Gold/Gold XG monitors and displays RPM, four analog inputs (temperatures and pressures for Plus version, temperature, pressures, potentiometers, Lambda sond for Gold versions), speed, gear number and lap (split) times. It has a backlight, which can be switched on during night racing, and a huge internal flash memory (512 kbyte for **Plus** version and 2 Mbyte for **Gold** ones) which guarantees the capacity to record up to 315 laps. The gauge is equipped with an USB port, used to interface the instrument with a PC. The new software **Race Studio 2** will allow you to easily configure the instrument, to download data to a PC and to analyse them. Finally, the internal lateral G-force sensor (standard equipment for **Gold CAR** versions) or the external gyroscope (optional equipment for **Gold BIKE** versions) will allow you the ability to create a circuit map, in order to correlate your data to your track position.

Our Customer Service is available every day from 9 to 5 and at most all the major races throughout the country to provide you with personal service. If you have any questions, need help, or want to give us feedback, please call us or visit our website **www.aim-sportline.com**.

Thank you for your **MyChron 3 Plus/Gold/Gold XG** purchase.

Table of contents

Getting Started with MyChron 3 Plus/Gold/Gold XG

Aim has developed and tested your **MyChron 3 Plus/Gold/Gold XG** to provide precise and accurate results.

Here are the parts of your system:

- **MyChron 3 Plus/Gold** Display Unit. **MyChron 3 Gold XG** display unit and Junction box.
- Gear tooth speed sensor (CAR installations) or magnetoresistive speed sensor (BIKE installations).
- Temperature sensor: you may choose among Water thermocouple, Water thermoresistance, Exhaust Gas Sensor or Under-spark thermocouple.
- Standard harness (available, on request, as specifications).
- RPM cable (only for MyChron 3 Gold XG).
- USB data download cable and **Race Studio 2** CD-ROM.

Optional accessories:

- M5 inline fitting for water thermocouple/thermoresistance.
- External gyroscope for **MyChron 3 Gold** (BIKE installations).
- Oil/fuel pressure sensor.
- Linear and angular potentiometers (Gold versions only).
- Sensors' extension cables.
- Optic lap receiver and transmitter.

MyChron 3 Plus/Gold/Gold XG and its parts

Before installing **MyChron 3 Plus/Gold/Gold XG**, please read carefully these installation instructions.

It is very important that your MyChron 3 Plus/Gold/Gold XG is correctly installed to capture consistent and accurate data. Incorrect installation may result in system malfunction.

In the following drawing it is represented your **MyChron 3 Gold** display unit: in the middle of the picture it is visible the wide display, in the lower part there is the keyboard, on the left and on the right there are 4 coloured alarm led (labelled from AL.1 to AL4) and, in the upper part, you can find the gear number display and 10 fully configurable RPM led.
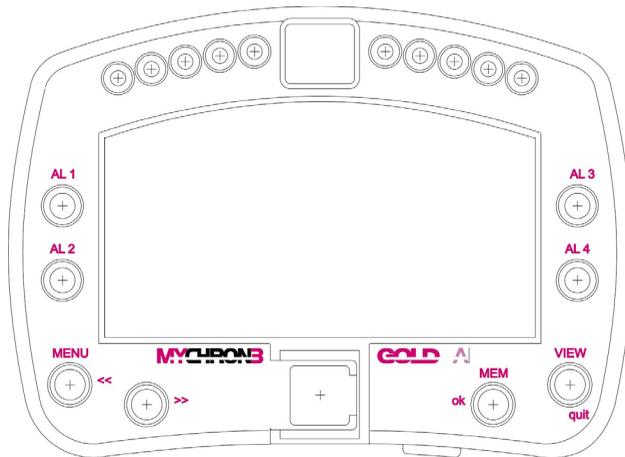
In the following pages it will be described the different parts of **MyChron 3 Plus/Gold/Gold XG** system.

The Display
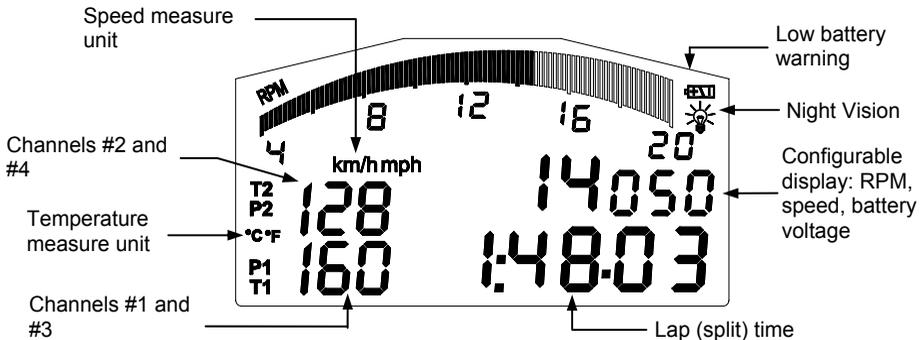
The wide display with backlight shows RPM (graphical bar), temperature and pressure analog inputs, test and lap number and, when the vehicle passes in front of the beacon, it shows the Lap Time (or Split Time). It is also possible to configure a second display page (using button **VIEW**) in order to see the RPM digital value (as shown in the previous drawing), the vehicle speed (in km/h or Mph) or the best lap time. When you are not running it is also possible to see the battery voltage.

The display also shows some small icons, showing the configured *Temperature* unit of measure (Celsius [°C] or Fahrenheit [°F]), the *Speed* unit of measure (km/h or Mph), the current displayed measure (P1 → P4 for pressures, T1 → T2 for temperatures, 1 → 4 for custom sensors) the backlight option and the Low Battery Warning, that appears when the battery voltage is low.

The Keyboard

The Keyboard is composed of four push-buttons and it is used to configure the instrument, to recall recorded data and to clear the internal memory.

The four pushbuttons are used for:

MENU/<< Used to enter configuration mode and to switch to previous configuration option; also used to turn on/off backlight during a test.

>> Used in configuration to switch to next option; also used to switch between the 4 analog inputs (temperatures and pressures).

MEM/OK Used to confirm a configuration, to retrieve recorded data and to see the best lap time.

VIEW Used to exit configuration mode without saving, or to switch the display from "digital RPM" value to "battery voltage", to "best lap time" or to "vehicle speed".

The gauge automatically switches ON/OFF when the user switches on/off the car's (bike's) electric switchboard.

To run the system in DEMO MODE, while holding down button **MENU/<<** and **>>**, press button **VIEW**.

In the middle of the keyboard, protected by a plastic cover, it is located the instrument's USB port (used to connect the instrument to a PC).

The alarm led and the gear display

In the following picture it is reported a drawing of **MyChron 3 Gold Car** display unit.
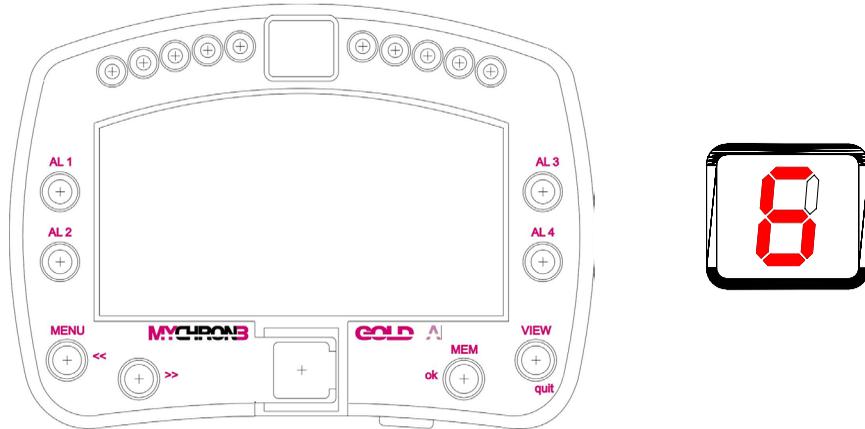
- The *alarm led* are placed on the left and right of the main display: on the left there are the led 1 and 2 and, on the right, there are the led 3 and 4. The four led are red colored.

- The *RPM led* are placed in the display unit upper part: this fully configurable led turn on two-by-two, advising the driver to shift gear. The 4 external led (2 on the left and 2 on the right) are green colored, the 2 middle ones are orange colored and the 4 remaining ones are red colored.

- The *Gear display* is placed in the middle of the RPM led. This digital display shows the current gear number; the instrument is able to display up to 9 gears.

The Speed sensor for CAR installations

MyChron 3 Plus/Gold/Gold XG is equipped with a speed sensor, which allows the pilot to measure vehicle's speed.

The wheel speed sensor for gear tooth belongs to the "non contact" devices and it needs a ferrous metal trigger to pass the sensor face.

The instrument's measure range is included between 0.5 and 2 mm: the optimum sensing distance is 1 mm.

Optimum sensor performance is dependent on the following variables, which must be considered in combination: trigger material, geometry and speed, sensor trigger gap, magnetic material in close proximity. Please refer to the "Installing the CAR speed sensor" paragraph for further information.

The speed sensor is supplied with an 80 mm long cable.

In the following drawing you can see the gear tooth speed sensor side view (on the left) and a 3D view (on the right).
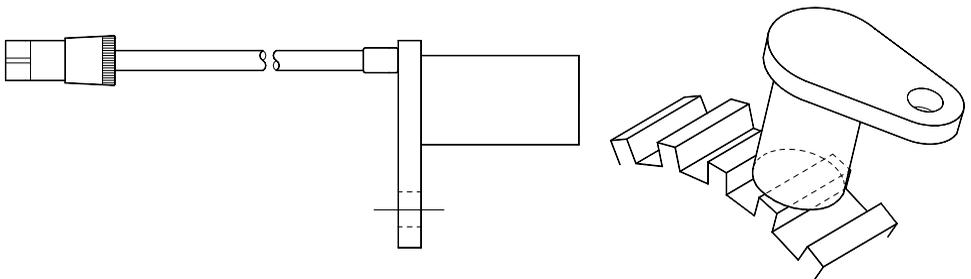
The Speed sensor for BIKE installations

The wheel speed sensor for bike installations belongs to the "magnetoresistive – non contact" devices and it needs a magnetic metal trigger to pass the sensor face.

The magnetoresistive speed sensor is a high sensing distance instrument: its measure range goes from 8 to 15 mm and the optimum sensing distance is 10 mm.

Please refer to the "Installing the BIKE speed sensor" paragraph for further information.

The speed sensor is supplied with a 1700 mm long cable.

In the following drawing you can see the bike speed sensor and, on the right, the magnetic trigger (supplied together with the sensor).
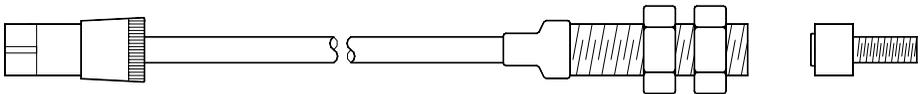
The Temperature sensors

MyChron 3 Plus/Gold/Gold XG supports up to 4 temperature sensors. There are 4 types of temperature sensors that are available for selection or subsequent purchase:

1. H_2O - Water thermocouple or thermoresistance: M5 type.
2. EGT - Exhaust gas thermocouple.
3. CHT - Cylinder head thermocouple.

All temperature sensors are supplied with a 0.25 m long connection cable. Thermocouple or thermoresistance extension cables are available with lengths included between 0.5 and 2 m and, on request, as specified dimensions.

The LAP receiver

The *infrared* lap receiver is used to recognise a signal, called "lap marker", emitted from an infrared transmitter (Beacon).


The **Infrared receiver** has to "see" the transmitter placed on the trackside, so remember to install it with the receiver eye (the grey point in the photo on the left) pointed to the beacon transmitter.

The LAP transmitter (Beacon)

The optical Beacon Transmitter has to be placed on the trackside to mark laps. Ensure the infrared receiver eye faces the side of the track where the Beacon has been placed, otherwise the system will not record lap time.

The Beacon transmitter is powered using 8 AA batteries or an external 12V power cable. If you are using 8 AA batteries, unscrew the back cover of the Beacon transmitter and place the battery pack into the transmitter casing.
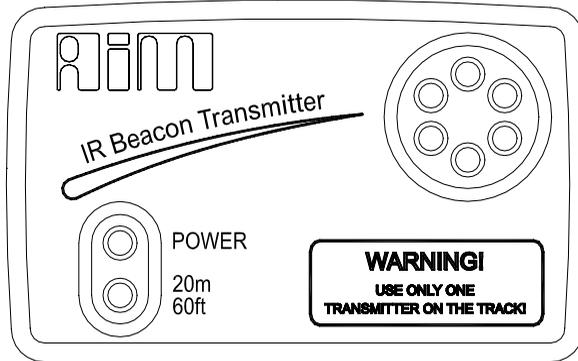
The transmitter has two operating modes: *Low* power and *High* power. The Low Power Mode has to be used when the track is less than 10 meters wide, while the High Power mode has to be used when the track is wider than 10 meters.

To activate the *High/Low Power* function, please open the Beacon transmitter with a corkscrew and place the clip (located directly below where the battery pack is attached to the beacon transmitter board) either over one of the two connectors (for *low power* mode) or over the two connectors (for *high power* mode).

When the Beacon transmitter operates in high power mode, both the power led lights will light up when the transmitter is turned on.

High power / low power switch

Battery pack
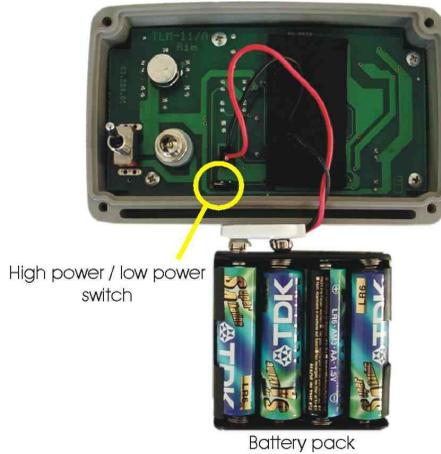
Please, remember that, in High Power Mode, the transmitter has to be powered by an external 12 Volts battery.

How to install MyChron 3 Plus/Gold/Gold XG

Now you can start installing your **MyChron 3 Plus/Gold/Gold XG** on your car/bike.

It is recommended to follow these instructions in order to preserve your instrument and to capture consistent and accurate data.

We remind you that your **MyChron 3 Plus/Gold/Gold XG** is not equipped with internal batteries, and so it needs to be powered by an external power source (the car / bike battery).

The first installation step consists in mounting the Gauge in your car's (motorbike's) cockpit. It is recommended to choose a place where the instrument will not be in contact with oil or fuel, make sure that the gauge is not installed too close to heat sources and protect the instrument from vibrations.

In order to correctly measure the lateral g-force using the internal accelerometer (**MyChron 3 Gold** only), it is suggested to install the gauge with the display perpendicular to the vehicle's speed.

Installing MyChron 3 Gold XG

Your **MyChron 3 Gold XG** is composed of two separate objects (the display unit and the Junction box) connected by a pig-tail cable.

It is recommended to choose a place where both the display unit and the Junction box are not in contact with oil or fuel, make sure that the gauge is not installed too close to heat sources and protect the instrument from vibrations.

In particular, pay attention when installing the Junction box:

- Avoid rigid connections between the Junction box and the chassis. It is suggested to use anti-vibration mountings (Silent Blocks).

- We remind you that your **MyChron 3 Gold XG** is not equipped with internal batteries, and so it needs to be powered by an external power source (i.e. the car battery).

- In order to correctly measure the lateral g-force using the lateral accelerometer (mounted inside the Junction box), it is suggested to install the gauge with the Junction box's front panel perpendicular to the car's speed, as shown in the following image.
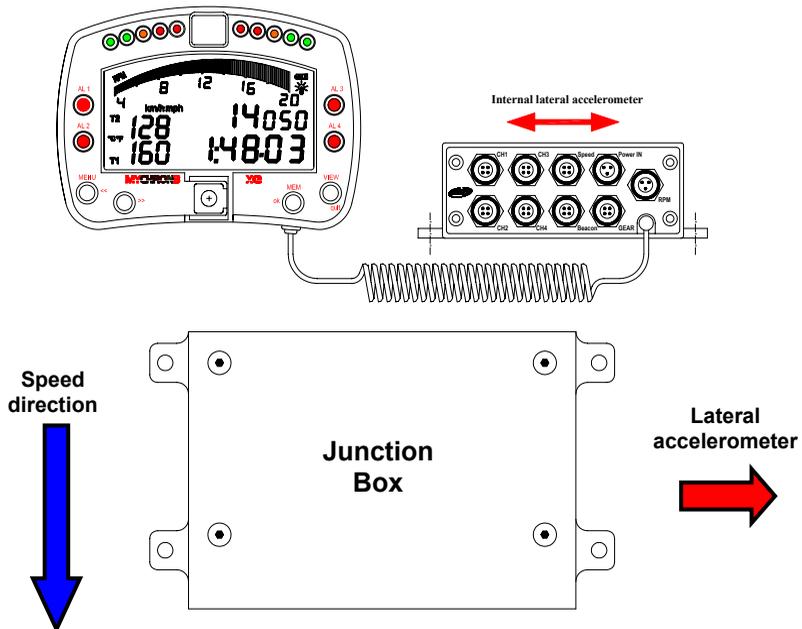
Installing the H$_2$O thermocouple (thermoresistance)

The H$_2$O thermocouple and the thermoresistance can be installed in the inline water fitting (sold separately).

In the following drawing it is represented how to correctly install the water thermocouple (thermoresistance) for the M5 type.

SEZ A - A

The water thermocouple must be placed here

Water thermocouple

A   A

Junction must be hanged here with two wiring wraps
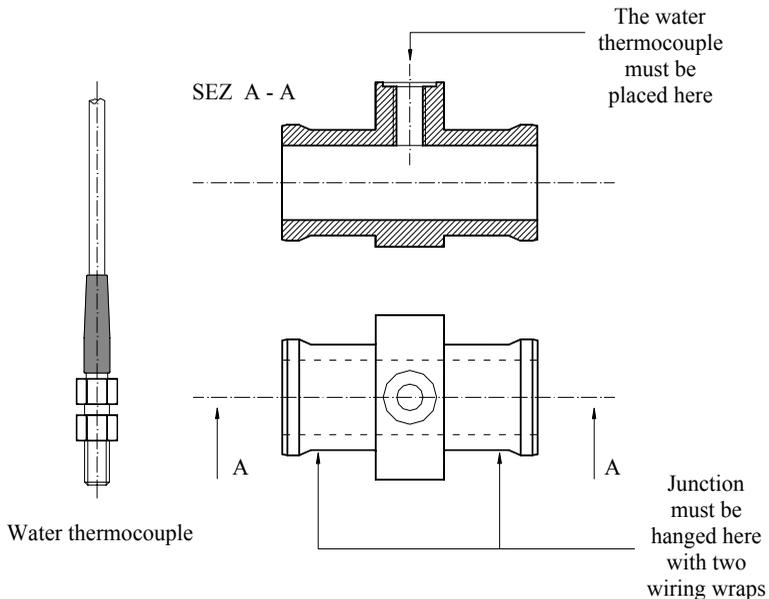
Installing the EGT thermocouple

The Exhaust Gas Thermocouple (EGT) should be positioned inside the exhaust header pipe at a distance of 150 mm (5.9 inches) from the exhaust port.

In the following drawing it is represented a correct installation of the EGT thermocouple.

It is recommended that the probe be inserted between 25% and 50% inside the exhaust gas header.

150 mm
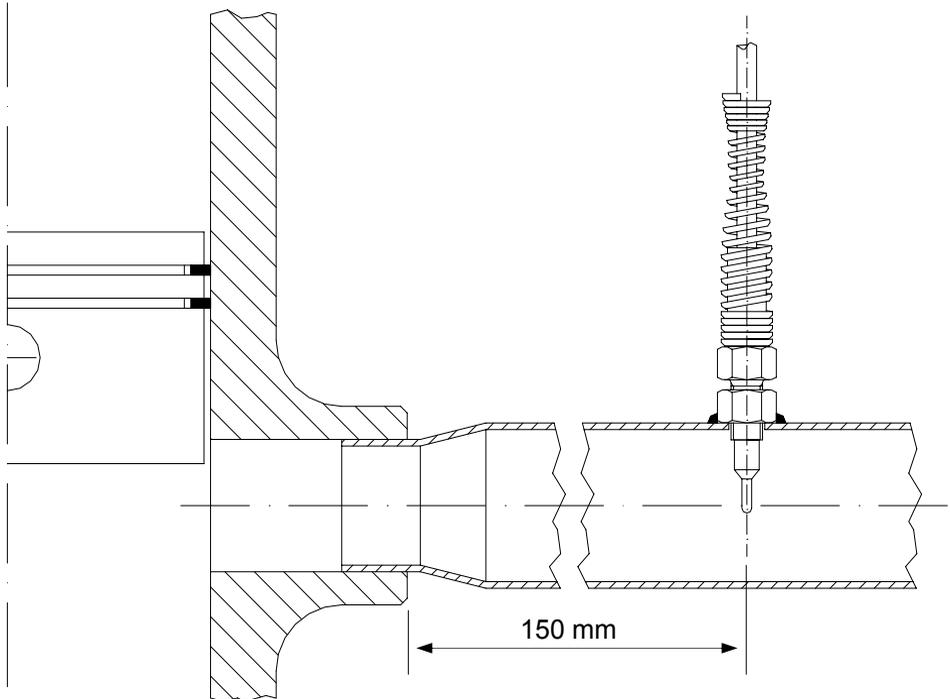
To install the EGT thermocouple, please follow these instructions:

1. Make a 5 mm (0.2 inches) hole inside the exhaust header;
2. Weld the little nut to the exhaust header in the place where the hole has been drilled;

3. Connect the remaining part of the thermocouple and fix it to the exhaust header by screwing it.
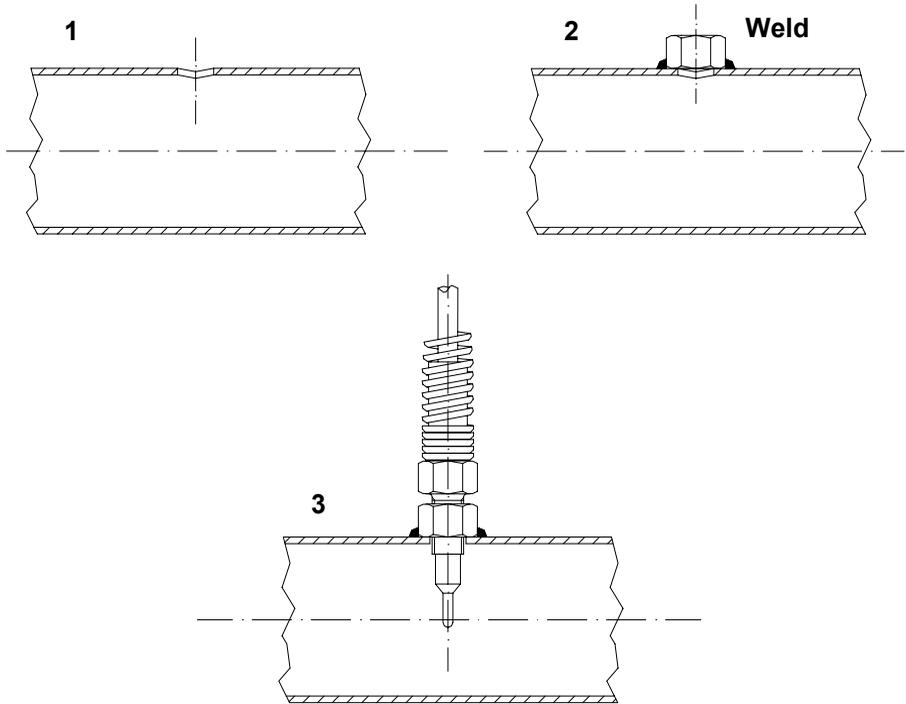
Installing the under-spark thermocouple

When using a Cylinder Head Thermocouple (CHT) sensor, always remove the spark plug washer before inserting the spark plug into the sensor.

When tightening and loosening the spark plug, minimise movement of the sensor to avoid damage.

In the following drawing it is represented the correct installation of the under-spark thermocouple.

CHT thermocouple

Spark

Cylinder head
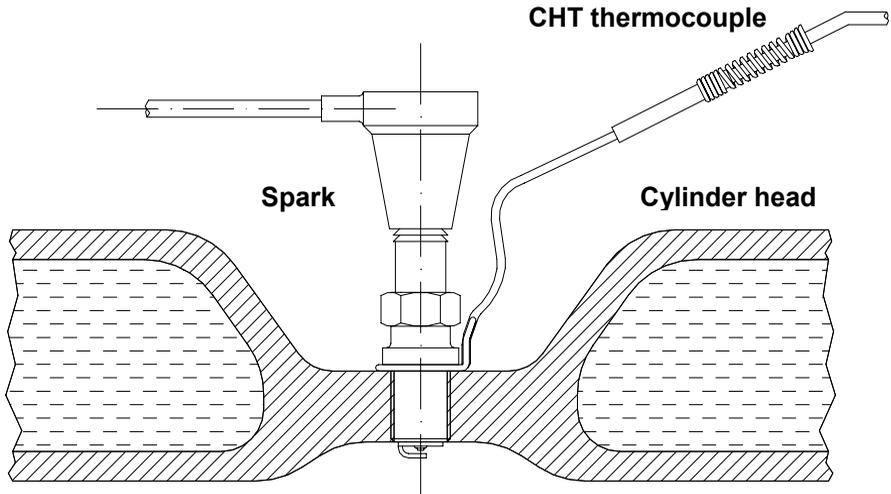
Installing the "CAR" speed sensor

The wheel speed sensor for phonic wheel belongs to the "non contact" devices and it needs a ferrous metal trigger to pass the sensor face.

When mounting the sensor, please firmly install it on a self-made iron bracket and make sure that the distance between the sensor and the phonic wheel is included between 0.5 and 2 mm (1 mm is the optimum value). Once the sensor has been installed, please plug the sensor's Binder connector in your **MyChron 3 Plus/Gold/Gold XG**.

In the following drawing it is reported the speed sensor installation.
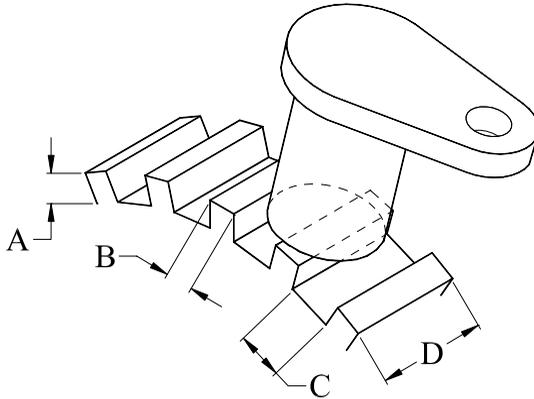
In the following table it is reported a short description of the minimum values for the trigger dimensions A, B, C and D required for a correct sensor's working.

Description	Value (Minimum)
Tooth height (A)	5.06 mm
Tooth width (B)	2.54 mm
Tooth spacing (C)	10.16 mm
Thickness (D)	6.35 mm

In short, optimum sensor performance is dependent on the following variables, which must be considered in combination: trigger material, geometry and speed, sensor trigger gap, magnetic material in close proximity.

Installing the "BIKE" speed sensor

The wheel speed sensor for bike installations belongs to the "magnetoresistive – non contact" devices and it needs a magnetic trigger to pass the sensor face.

When mounting the sensor, please firmly install it on a self-made iron bracket and make sure that the distance between the sensor and the magnetic trigger is included between 15 and 8 mm (10 mm is the optimum value). Once the sensor has been installed, please plug the sensor's Binder connector in your **MyChron 3 Gold**.

How to power the gauge

The gauge must be powered by an external **9-15 VDC** power source. Do not exceed these limits.

Connect the red wire to the battery's positive pole (+) and the black one to the negative pole (-).

How to sample the RPM

The RPM signal may be sampled either from the ECU or from the coil.

- The RPM signal sampled from the ECU is a square wave signal (from 8 up to 50 V);
- The RPM signal sampled from the coil is a high voltage RPM input (from 150 to 400 V) and must not be connected on the "RPM from ECU" input (this event may seriously damage the gauge).

It is also reminded to connect either the RPM signal from the coil or the RPM signal from the ECU, NOT both (this event creates shortcuts).

On track

As you power on your **MyChron 3 Plus/Gold/Gold XG**, some information is displayed: here they are described in the same order as they appear:

1. AIM   1_xy Firmware version.
2. MYC 3 PLUS/GOLD/GOLD XG CAR/BIKE Instrument name.

Configuration functions

Before getting started, please configure your gauge in order to get correct data from your system.

Enter CONFIGURATION MODE (push **MENU/<<** button) to set the parameters.
Buttons **MENU/<<** (back to previous option) and **>>** (forward to next option) are used to scroll through the configuration menu.
To exit CONFIGURATION MODE and return to MAIN DISPLAY MODE, press button **VIEW**.

The parameters you can set in CONFIGURATION MODE are here above explained in the same order they appear by clicking the **MENU/<<** button.

Night Vision **MyChron 3 Plus/Gold/Gold XG** display can be set to backlight display so that it is visible during night racing.

To set the Night Vision ON or OFF, press button **MEM/OK** until you see

NIGHT VISION ON/OFF

and then push button **MEM/OK**. To return to main display mode press button **VIEW**. When the Night Vision option is activated, a light globe will be displayed in the display's top right corner.

To activate Night Vision mode during a test, it is enough to press button **MENU/<<**.

The backlight setting is stored by the logger: each time the logger is switched on, the setting used before switching off the gauge is automatically restored

Clear test data The "Clear test data" option clears the data stored in system's memory.

To run this function, after having entered the CONFIGURATION MODE, push **MENU/<<** until you see

CLEAR TEST DATA

Then press button **MEM/OK** twice to erase data or press **VIEW** to quit.

Beacon obscuring time and split's number

These 2 functions are fundamental in order to acquire the correct lap and split time.

The first function is used to set the Beacon's obscuring time, which is a time period during which the optic receiver, after having acquired the lap marker, is "blind" and can't detect other lap markers.

The second function, instead, allows the user to set the track's split number. In fact, it is possible that a circuit is equipped with more than one Beacon transmitter along the track: additional transmitters than the first one installed on the straight line give "split time".

In the following paragraph, it is reported three examples of obscuring time/split's number configurations.

Example 1) The track is equipped with only one lap transmitter

Start/Finish
Lap time 1' 25"
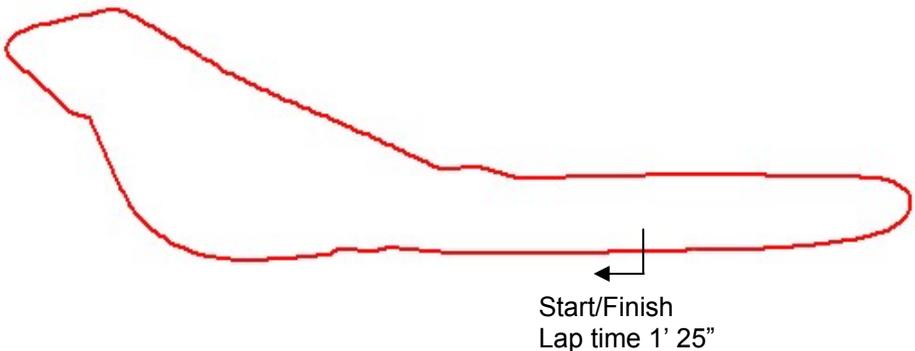
- In this case you cannot acquire split times because the track is not equipped with additional lap transmitters. It is recommended to set the following values:
  - o Split's number = 0;
  - o Beacon obscuring time: please set a time lower than your best lap time. **In this example**, the best lap time is 1' 25": you should set, for instance, 1' 10".

Example 2) The track is equipped with more than one lap transmitter but you do not wish to capture split times

Intermediate 2:
Time 50"

Intermediate 1:
Time 30"

Start/Finish
Lap time 1' 25"
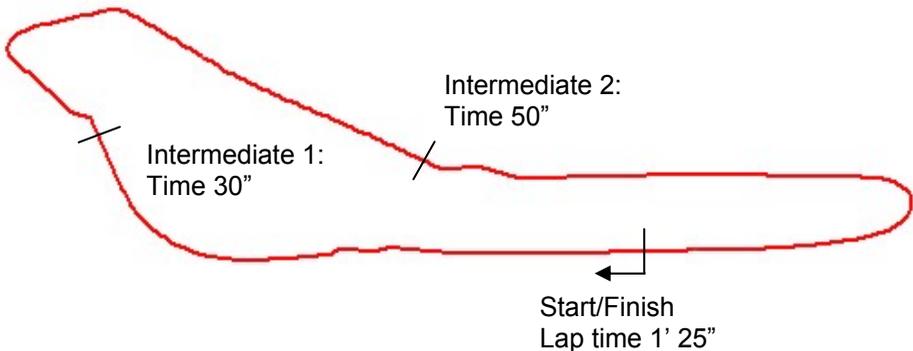
- As the track is equipped with more than one transmitter and you do not wish to capture split times, please set the following parameters:
  - o Split's number = 0;
  - o Beacon obscuring time: please set a time lower than your best lap time and greater than the time elapsed at the last

intermediate before the finish line. **In this example**, you should set a value included between 50" and 1' 25".

Example 3) The track is equipped with more than one lap transmitter and you wish to capture split times
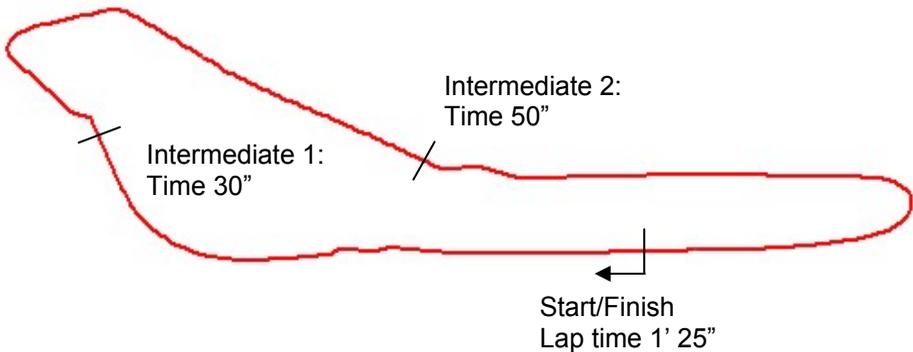
Intermediate 2:
Time 50"

Intermediate 1:
Time 30"

Start/Finish
Lap time 1' 25"

- As the track is equipped with more than one transmitter and you wish to capture split times, please set the following parameters:
    - Split's number = total number of lap transmitters installed on the track excluded the one installed on the finish line. **In this example**, set 2 split's number.
    - Beacon obscuring time: the obscuring time must be lower than the minimum split time. **In this example**, as the minimum split time elapsed is the one from the first intermediate to the second one (split time 20"), please set the beacon obscuring time to 15".

To set the split's number, after having entered the CONFIGURATION MODE, push **MENU/<<** until you see

NUMBER OF SPLITS

Then push **MEM/OK** to enter EDIT MODE: use button **MENU/<<** to change numbers and button **>>** to change digit. The blinking number identifies the digit that can be edited.

Press button **MEM/OK** to save the changes or button **VIEW** to discard the changes.

To set the Beacon obscuring time, after having entered the CONFIGURATION MODE, push **MENU/<<** until you see

Obscuring time

Now push **MEM/OK** to enter EDIT MODE, then press button **MENU/<<** until the correct number of splits appears on the display's lower right corner. The obscuring time can be set up to a maximum value of 100 seconds.

Press button **MEM/OK** to save the changes or button **VIEW** to discard the change

Distance and total time

This function shows the total instrument working time (in hours and minutes) and the distance covered by the vehicle (in km or in miles) during a test.

To run this function press button **MENU/<<** until you see

TOTAL RUNNING

To delete the total working time and the distance covered by the vehicle, please press twice button **MEM/OK**; press **VIEW**, instead, if you do not wish to delete these information.

It is reminded that this function computes only time and distance corresponding to a single test: if you wish to know the total distance covered by the vehicle, please run function "Odometer".

Odometer   This function computes the total distance covered by the vehicle during all the tests made.

To run this function press button **MENU/<<** till you see

ODOMETER

Unlike the previous function, this parameter cannot be erased.

Gears   Your gauge is able both to detect the engaged gear by using
calibration an on-board sensor (for those vehicles equipped with a sensor installed inside the gearbox) or by calculating them (using an algorithm based on engine's **RPM** and **Speed**). If no sensor is installed and the driver does not wish to see the gear number on the display, the gauge allows the user to disable the gear channel.

To run this function press button **MENU/<<** until you see

GEAR CALIBRATION

Press button **NEXT/MEM** to activate one of the gears calibration functions here above described:

GEAR computed
Gear is disabled
Gear with sensor

1) Compute gears

Once selected the "Gear computed" option, pressing button **MEM/OK,** it will appear the following text:

Higher gear

Enter the higher gear number (up to 9) using button **MENU/<<**; then press button **MEM/OK** to save the changes or **VIEW** to discard them.

Once set the higher gear number, you have to run at least 2 track laps in order to let the gauge "learn" the threshold values for the different gears.

It is strongly recommended to run these laps engaging all gears. If a gear is not engaged during these "learning laps", the gauge will not be able to show all gears.

During these "learning laps", no gear value will be shown.

Once finished the "learning laps", return to the pit lane and, before switching the gauge off, please ensure that the vehicle is completely stopped (i.e. the speed value is 0). It is reminded that there is no problem if you switch off the gauge together with the engine (MyChron 3 Plus/Gold/Gold XG with firmware 1.55 or later).

Case 1: if you turned off the engine and stopped the vehicle without switching off the gauge, the red led AL 1 starts blinking, informing the driver that the gauge is calculating the threshold values.

Case 2: otherwise, if you switched off the gauge together with the engine, the gear calculation procedure starts once you re-switch on the gauge (the red led AL 1 blinks).

Once the red led AL 1 stops blinking, the gear calculation procedure is completed: now you will be able to see the gear value inside the gauge's gear display.

If the gear values displayed do not correspond to the engaged gears, please repeat the gear calibration procedure.

It is reminded that the threshold values are saved in the gauge's internal memory and the user will not have to calculate them each time the gauge is switched on.

The algorithm is able to detect the engaged gear as it calculates the engine's RPM vs. speed ratio. If the speed is acquired from a non-driving wheel, the algorithm may return incorrect gear values.

The RPM vs. speed ratio is directly proportional to the transmission/gearbox ratio and to the wheel circumference: if one of them (or both) is changed, the gear calibration procedure may have to be repeated.

2) Gear is disabled

Select this option if you do not have a gear sensor installed inside the gearbox or you do not wish to see the gear number.

3) Gear with sensor

Once selected the "Gear with sensor" option, you will see the following sentence

INSERT GEAR

Meanwhile, in the gear display, you will see the gear number blinking.

Please engage the "neutral gear" and then press button **>>** to step to next gear calibration. The procedure to be followed is similar to what has just been explained: you have to engage the next gear and to press the **>>** pushbutton.

The gauge supports gearboxes with a gear number up to 9.

If your vehicle's gearbox has a gear number lower than 9 (typical values are 5, 6 or 7 gears), once you have engaged the last gear you have to press button **MEM/OK** to save the current calibration.

To restart the calibration procedure, press button **MENU/<<**.

To disable the gear channel, press button **MEM/OK** when you see the number 0 blinking in the gear display; it will also appear the following sentence

GEAR IS DISABLED

To exit calibration mode without saving press button **VIEW**.

Shift lights configuration

This function allows the user to configure the 10 colored led placed in the right upper part of the instrument's display. These led get switched on when the engine reaches a set RPM value, indicating the pilot to shift gear.

To run this function, press button **MENU/<<** until you see

SHIFT LIGHT

By pressing button **MEM/OK** you will switch on the first led on the left and the first one on the right, both green colored, and it will appear the RPM value correspondent to that led lighting.

Press **MEM/OK** to enter EDIT MODE: use button **MENU/<<** to change numbers and button **>>** to change digit. The blinking digit identifies the digit that can be edited.

When the correct RPM value is displayed, press button **MEM/OK** to save the changes and to step to second led configuration; otherwise press button **VIEW** to quit without saving.

The 10 led are colored in the following way: the first two on the left and the first two on the right are green, the middle ones are orange and the remaining ones led are red colored. When the engine reaches the RPM value set for the 5th led, all the 10 led will start flashing, advising the pilot to shift gear.

The RPM value can be set between 0 and 29999; if you set an alarm value of 0, that led will be disabled.

Wheel circumference

This function sets the wheel circumference (in mm or in inches).

This parameter is fundamental to correlate the wheel's angular speed and the vehicle speed.

To run this function press button **MENU/<<** until you see

WHEEL CIRCUMFEREN

Then push **MEM/OK** to enter EDIT MODE: use button **MENU/<<** to change numbers and button **>>** to change digit. The blinking digit identifies the digit that can be edited.

The wheel circumference value can be set in a range included between a minimum value of 0 and a maximum one of 9999 mm (0 and 399.99 inches).

When the correct circumference value has been set, press button **MEM/OK** to save changes or press button **VIEW** to quit without saving.

Phonic wheel's teeth number

This option allows the user to set the phonic wheel's teeth number in order to measure the wheel's angular speed.

The speed sensor, passing by a gear tooth, generates an electric pulse which gets acquired by the instrument: if the phonic wheel is made up of just one tooth, the instrument will measure one pulse per lap, while, if it is made up of more than one tooth, the number of pulses per lap will be greater than one.

In order to capture the correct wheel's angular speed, it is necessary to set the correct teeth number.

To run this function press **MENU/<<** until you see

PULSES ON WHEEL

Then push **MEM/OK** to enter EDIT MODE: use button **MENU/<<** to change numbers and button **>>** to change digit. The blinking digit identifies the digit that can be edited.

This parameter is included between a minimum value of 0 and a maximum of 199.

Press button **MEM/OK** to save the changes and button **VIEW** to quit without saving.

Max RPM value

This function sets the maximum scale for the graphical RPM display and the maximum acceptable RPM value acquired by your **MyChron 3 Plus/Gold/Gold XG**.

MyChron 3 Plus/Gold/Gold XG has seven levels for the RPM scale: 8,000 / 10,000 / 12,000 / 16,000 / 20,000 / 22,000 and 25,000 RPM.

To run this function, after having entered the CONFIGURATION MODE, push **MENU/<<** until you see

MAX RPM VALUE

Then push **MEM/OK** to enter EDIT MODE and use buttons **MENU/<<** or **>>** to scroll between the seven standard RPM values. When the required RPM value is displayed, press button **MEM/OK** to save the changes or button **VIEW** to quit.

Spark for Revs This option represents the number of spark signals, acquired from the coil or the ECU, per engine revolution.

To set the Spark for Revs, after having entered the CONFIGURATION MODE, push **MENU/<<** until you see

SPARK FOR REVS

Then push **MEM/OK** to enter EDIT MODE and use buttons **MENU/<<** or **>>** to scroll between six standard values: x1, x2, /2, /3, /4 and /6. For instance, the correct value for a 4 strokes 4 cylinder engine is /2.

Press button **MEM/OK** to save the changes or button **VIEW** to discard the changes.

Temperature unit of measure This function sets the temperature's unit of measure: the user may choose between Celsius [°C] and Fahrenheit [°F] degrees.

To run this function, after having entered the CONFIGURATION MODE, push **MENU/<<** until you see

FAHRENHEIT/CELSIUS

Then push **MEM/OK** to enter EDIT MODE and use button **MENU/<<** till you don't see the proper Temperature unit of measure, and confirm it pushing **MEM/OK**. Press button **VIEW** to discard the changes.

The symbols °C or °F will appear on the left of the display.

Speed unit of measure

This function sets the speed's unit of measure; the user can choose between **km/h** and **Mph**.

To run this function, after having entered the CONFIGURATION MODE, push **MENU/<<** until you see

SPEED UNIT

Then push **MEM/OK** to enter EDIT MODE and use button **MENU/<<** till you don't see the proper unit of measure.

To confirm your choice push button **MEM/OK**; press button **VIEW** to discard the changes.

Pressure unit of measure

This function sets the speed's unit of measure; the user can choose between **Bar** and **PSI**.

To run this function, after having entered the CONFIGURATION MODE, push **MENU/<<** till you see

Pressure unit

Then push **MEM/OK** to enter EDIT MODE and use button **MENU/<<** till you don't see the proper unit of measure.

To confirm your choice push button **MEM/OK**; press button **VIEW** to discard the changes.

Message language

MyChron 3 Plus/Gold/Gold XG text can be displayed in English, Italian, German or French.

To run this function, after having entered the CONFIGURATION MODE, push **MENU/<<** until you see

MESSAGE LANGUAGE

Then push **MEM/OK** to enter EDIT MODE and use **MENU/<<** or **>>** to change language.

Press button **MEM/OK** to save the changes or button **VIEW** to discard the changes.

Firmware version   This function shows three numbers, which represent, respectively, the firmware version, the firmware upgrade date and the gauge's serial number.

To run this function, after having entered the CONFIGURATION MODE, push MENU/<< until you see

<div align="center">

FIRMWARE version

</div>

The firmware management window is organized on two different rows: in the upper one it is shown the firmware version, on the left, and the firmware upgrade date, on the right (dd/mm/yy). In the lower row, instead, it is shown the gauge's serial number.

Utility functions

Once configured your system, you are ready to manage the data acquired with your gauge. **MyChron 3 Plus/Gold/Gold XG** records RPM, 4 analog inputs (pressures or temperatures for **Plus** version, pressures, temperatures, potentiometers, Lambda sond for the **Gold/Gold XG** ones), speed, gear number, lateral g-force (**Gold CAR** and **Gold XG** versions) or Gyroscope (**Gold BIKE** versions) at a maximum sampling rate of 200 Hertz (200 times per second) per channel. These data can be retrieved at a later stage for analysis.

MyChron 3 Plus/Gold/Gold XG segments data for a session as a test and each test includes the laps completed in that session. To begin recording a new test you may switch off your instrument and then switch it back on, or you may press the **MEM** button: once you exit the "retrieve data from memory" function, your **MyChron 3 Plus/Gold/Gold XG** will record data in a new test session.

Viewing data while driving   **MyChron 3 Plus/Gold/Gold XG** will display "Test 01" or the current test number if memory has not been cleared, and "Lap 001" once the infrared receiver passes the beacon transmitter.

If the system has been configured to capture back segments using the number of splits option, the system will display "Split Number x", up to the number of splits selected. Once the system records times for each split, the final segment is displayed as a completed lap.

At the same time the system displays the time gap between the current split time and the split time of the previous lap.

When the system records the best lap time for a test, the text

BEST LAP TIME

will appear on the display under the RPM graphical bar.

By pressing button **VIEW** it is possible to visualize, instead of lap time, the RPM digital value or vehicle's speed.

The four analog inputs are shown on the left of the display: the system will display, as a default, channels number 1 and number 2.

By pressing button **>>** it is possible to shift your **MyChron 3 Plus/Gold/Gold XG** to another display page, where you can see the other two analog inputs.

Moreover, together with the channel's values, the display shows two further information:

- an icon (**T** or **P**), to identify the sensor type: "T" stands for "temperature sensor", while "P" stands for "Pressure sensor". If you connected a temperature or pressure "custom sensor" (please refer to paragraph "Customize sensor"), the display will show the corresponding icon (T or P). Otherwise, if you connected a generic "custom sensor" (i.e. a custom sensor which does not belong to the temperature/pressure sensors), no icon "T" or "P" will be shown.
- A number (from 1 to 4), which identifies the sensor number.

For instance, if you connected a temperature sensor on channel 1, a "generic custom sensor" on channel 2, a pressure sensor on channel 3 and another temperature sensor on channel 4, your **MyChron 3 Plus/Gold/XG** will show, in the first display page, **"T1"** for channel 1 (it is the first temperature channel), **"1"** for channel 2 (it is the fist "generic custom sensor"), **"P1"** for channel 3 (it is the first pressure channel) and **"T2"** for channel 4 (it is the second temperature channel).

When the gauge is switched on, the display shows the last selected measures during race time: for instance, if you were visualizing speed, temperature 1 and temperature 2, the display will show these channels. Moreover, the gauge saves the backlight status (switched on or off) and restores the previously saved status when the gauge was switched on.

Your gauge's memory is divided into two separate parts. In the first one it is stored the sampled channels and it has 45 minutes (**MyChron 3 Plus**) or 3 hours (**MyChron 3 Gold/Gold XG**) maximum storage time. In the second one it is only stored the lap times, the split times and the maximum / minimum values of speed, RPM and channels number 1 and 2 for each lap.

If during race the "sampled channels" memory fills up, the following text will be displayed:

<div align="center">Measures mem full</div>

The gauge will keep on recording the lap/split times and the channels' maximum/minimum values.

If, otherwise, the "maximum/minimum values" memory fills up, the following text will be displayed:

<div align="center">Lap Memory full</div>

The gauge will keep on recording the channels' values.

When both memories are full, the following text will be displayed:

<div align="center">Memory full</div>

In this situation, the data logger works only as a "dash" and does not samples any more data. It is recommended to download the data stored in the gauge's memory and to clear it.

When a test is completed, the system displays the last lap number and last lap time. Using button **MEM/OK** you will access the data stored in system's memory. Let's now see how to retrieve data after the completion of a test.

Viewing data per best lap time

To view the data for the lap with the best lap time, press **MEM/OK** while in general display mode.

The best lap time is displayed for the most recent test. The lap time will be flashing, signaling that this is the best time for the current test.

The instrument will also show the test and lap number and the maximum values corresponding to channels number 1 and 2 for the current lap.

If button **MEM/OK** is pressed a second time, it will appear the minimum values corresponding to channels number 1 and 2 and minimum RPM for the best lap.

If you press button **VIEW** in one of the two previously described display pages, the display will show the maximum values corresponding to speed and to channels number 1 and 2.

Press button **VIEW** again to quit replay mode or press button **MEM/OK** to view the minimum values corresponding to speed and to channels number 1 and 2.

View other completed lap data

To view completed lap data, while in general display mode, press button **MEM/OK** to view the best lap time. Then press button **MENU/<<** to view a previous lap or button **>>** for a following lap. If you have configured your **MyChron 3 Plus/Gold/Gold XG** to capture splits, buttons **MENU/<<** and **>>** will also scroll through the split times within each lap.

To retrieve previous test data (when more than one test has been recorded) press button **MENU/<<** until the required test and lap details (or split details) appear on the display.

Buttons **MEM/OK** and **VIEW** will allow you to switch between the different display pages, as previously described in the "Viewing data per best lap time" paragraph.

Maintenance

Your MyChron 3 Plus/Gold/Gold XG does not require any special maintenance.

Provided adequate care is taken with the display unit and components, the only maintenance will be to upgrade the firmware when upgrades are released by Aim (periodically check **www.aim-sportline.com**).

Upgrading the firmware

To upgrade the firmware, please visit to our website **www.aim-sportline.com** and download the latest firmware version. The file you have to download is an EXE file, and it is called "**FIRMUP.EXE**" (**FIRM**ware **UP**grade).

Connect **MyChron 3 Plus/Gold/Gold XG** to your PC using the USB cable furnished as equipment.

Now you can launch the **FIRMUP** file by double-clicking on it and the system will automatically upgrade your instrument's firmware.

MyChron 3 Plus/Gold/Gold XG and the computer

MyChron 3 Plus/Gold/Gold XG is equipped with an internal non volatile flash RAM memory (512 kbyte for **Plus** version and 2 Mbyte for **Gold/Gold XG** ones) which guarantees the capacity to record up to 315 laps and a total amount of 45 minutes (**Plus** version) or 3 hours (**Gold/Gold XG** ones) full analog inputs record.

MyChron 3 Plus/Gold/Gold XG has been designed and developed to be interfaceable with a PC: through an USB cable it is possible to connect the gauge to a PC in order to both download the data stored in memory and configure your instrument.

Aim reminds all MyChron 3 Plus/Gold/Gold XG owners that, for a correct, complete and easier instrument configuration, it is <u>absolutely</u> necessary to use a PC and the software Race Studio 2.

This software has been properly developed by Aim in order to interface all its products (**Drack, EVO 3, MyChron 2, MyChron PRO, Dash ST1, MyChron 3 standard/Plus/Gold**) with the PC.

It is reminded that the new software installation does not either cancel or influence the functionalities of **Race Studio 1**. Once installed the program, the user will be able to choose if to use the new software even with his old Aim products (all supported by **Race Studio 2**) or if to keep on using the previous program. It is also reminded that Aim newest products (**MyChron 3, MyChron 3 Plus/Gold/Gold XG and Dash ST1**) are only supported by **Race Studio 2**.

In the following pages it will be shown how to install the software on your PC and how to correctly configure your MyChron 3 Plus/Gold/Gold XG by using a PC.

Software installation

Inside **MyChron 3 Plus/Gold/Gold XG** packaging you will find a CD containing **Race Studio 2**, software properly developed to download and analyse the data stored in your **MyChron 3 Plus/Gold/Gold XG** memory.

To install the software, insert the CD inside the CD-ROM drive: if the *autorun* option is enabled (most of cases), the software installation will automatically start, otherwise click twice on the *SETUP* icon.

The 1st screenshot that will appear on your PC's monitor concerns the installation language choice. Through a pop-up menu it will be possible to choose the preferred language.
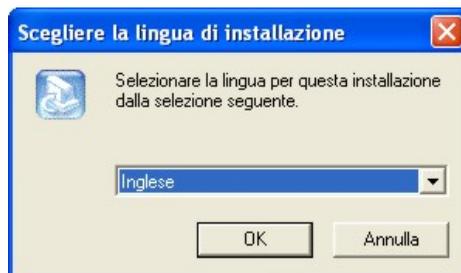
It is reminded that the installation language choice does not entail the software's working with only that language.

MYCHRON3

If on your PC you have installed a previous version of **Race Studio 2**, it will appear the following screenshot:
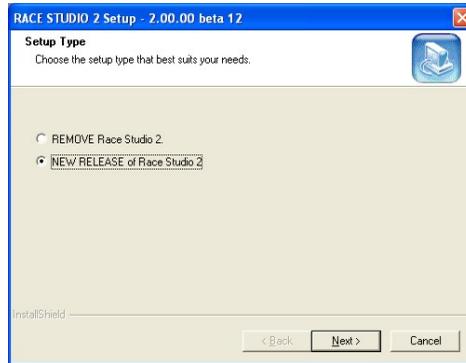
It is possible to choose whether to *Remove* the previous version or to *Install* the new release. By choosing this second option, the software will automatically uninstall the previous version and install the new one.

Otherwise, if you do not have older versions of **Race Studio 2** on your PC, it will appear the standard installation window:
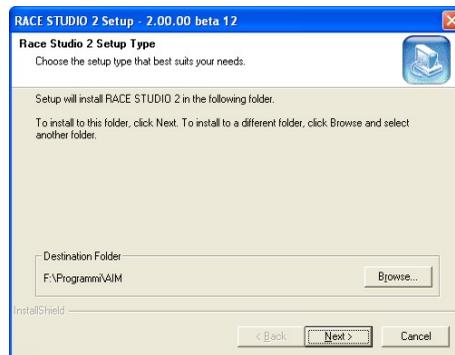
By using button *Browse*, it is possible to choose the software installation folder: if you click on the *Next* button without choosing the installation folder, the software will be installed in the default folder "X:\Program files\AIM", where "X" represents the Hard Drive in which you installed the operative system.

The following screenshot is the final one: please click on Finish button and, then, run the program.

To run the program, click twice on **Race Studio 2** icon, located directly on your computer desktop, once the installation has finished.

To uninstall **Race Studio 2** from your computer, please insert the CD-Rom containing the software inside the CD-ROM drive and run the installation procedure. It will appear a dialog box where the user will be allowed to "Remove Race Studio 2" or to "Install a new release of Race Studio 2". Please, select the first option and press "Next" button: **Race Studio 2** will be automatically removed from your computer.

If you wish to update **Race Studio 2**, please connect to our website **www.aim-sportline.com** and go to "Download" page, where it is possible to download the latest updates. To install the update, click twice on the downloaded file and follow the instructions you see on your PC's monitor.

Race Studio 2 program has been designed and developed to guarantee the maximum working reliability and its proper working has been tested with the following operative systems: Microsoft Windows 98 ™, Windows 2000 ™, Windows Me ™, Windows Xp ™. Microsoft Windows 95 ™, Windows NT ™ and other operative systems (Linux, Unix, Macintosh ™) are not supported.

If you have troubles during installation or normal working time, please check out our website or contact Aim.

Installing the USB drivers

Please, read carefully these instructions in order to correctly install the USB drivers: an incorrect installation may cause system's malfunctions.

To connect your **MyChron 3 Plus/Gold/Gold XG** to the PC's USB port, please use the USB cable furnished as equipment.

When the PC and the instrument are **switched off**, connect your **MyChron 3 Plus/Gold/Gold XG** to the PC's USB and then switch on both computer and **MyChron 3 Plus/Gold/Gold XG** (it is suggested to switch on before the PC and later on the gauge).

During restart time, the operative system will recognize a new hardware and will ask you to install the proper driver, driver that is included either in **Race Studio 2** installation CD-ROM or in the "X:/Program files/AIM/USB_DRIVER" folder on your PC".

The driver file name is *WDUSB522.inf*.

In the following pages it will be reported two examples concerning the USB drivers' installation for the Microsoft **Windows 98 ™,** Microsoft **Windows 2000 ™** and Microsoft **Windows XP ™** operative systems.

How to install the USB Driver for Windows 98 ™:

1. Press [Next] button when the "Add new Hardware wizard" window appears.
2. Select [Search for the best driver for your device] and press the [Next] button again.
3. Place the **Race Studio 2** disk in the computer's CD-ROM drive if it is not already there.
4. If the *autorun* option is enabled the system will try to install **Race Studio 2**. As you have already installed it, please exit installation menu. If the *autorun* option is enabled, go directly to next installation step.
5. Place a check beside [CD-ROM drive] and click the [Next] button.
6. Click the [Next] button again.
7. The installation software has to search for *WDUSB522.inf*.
8. Click the [Finish] button once reached the end of the installation.
9. Restart the computer if prompted.

How to install the USB Driver for Windows 2000 ™:

1. Press [Next] button when the "Found new Hardware wizard" window appears.
2. Select [Search for a suitable driver for my device] and press the [Next] button again.
3. Place a check beside [Specify a location] and click the [Next] button.
4. Browse the path until you find the driver file **WdUSB522.inf** located in the directory X:\Program files\AIM\USB_DRIVER.
5. Click [Next] when the correct driver has been selected.
6. Click [Yes] if the "Digital Signature Not Found" window appears.
7. Click the [Finish] button once reached the end of the installation.
8. Reboot the system in order to install the **Virtual Device** driver.
9. Press [Next] button when the "Found new Hardware wizard" window appears.
10. Select [Search for a suitable driver for my device] and press the [Next] button again.
11. Place a check beside [Specify a location] and click the [Next] button.
12. Browse the directory path until you find the driver **wd_virtual.inf**, located in the directory X:\Program files\AIM\USB_DRIVER, and then click [OK].
13. Click [Next] when the correct driver has been selected.
14. Click [Yes] if the "Digital Signature Not Found" window appears.
15. Click the [Finish] button once reached the end of the installation.
16. Restart the computer if prompted.

How to install the USB Driver for Windows XP ™:

1. Press [Next] button when the "Found new Hardware wizard" window appears.
2. Select [Install from a list or specific location (Advanced)] and press the [Next] button again.
3. Place a check beside [Include this location in the search] and click the [Browse] button.
4. Browse the path until you find the driver file **WdUSB522.inf** located in the directory X:\Program files\AIM\USB_DRIVER.
5. Click [Next] when the correct driver has been selected.
6. Click [Yes] if the "Digital Signature Not Found" window appears.
7. Click the [Finish] button once reached the end of the installation.
8. Reboot the system in order to install the **Virtual Device** driver.
9. Press [Next] button when the "Found new Hardware wizard" window appears.
10. Select [Install from a list or specific location] and press the [Next] button again.
11. Place a check beside [Include this location in the search] and click the [Browse] button.
12. Browse the directory path until you find the driver **wd_virtual.inf**, located in the directory X:\Program files\AIM\USB_DRIVER, and then click [OK].
13. Click [Next] when the correct driver has been selected.
14. Click [Yes] if the "Digital Signature Not Found" window appears.
15. Click the [Finish] button once reached the end of the installation.
16. Restart the computer if prompted

If the USB drivers have been correctly installed, when your **MyChron 3 Plus/Gold/Gold XG** is switched on, in your PC's Device management window (click Start \ Settings \ Control Panel \ System \ Device management) you will find the voice **HID (Human Interface Device) Class** and, in subnode, **AIM logger**, as shown in the following screenshot.
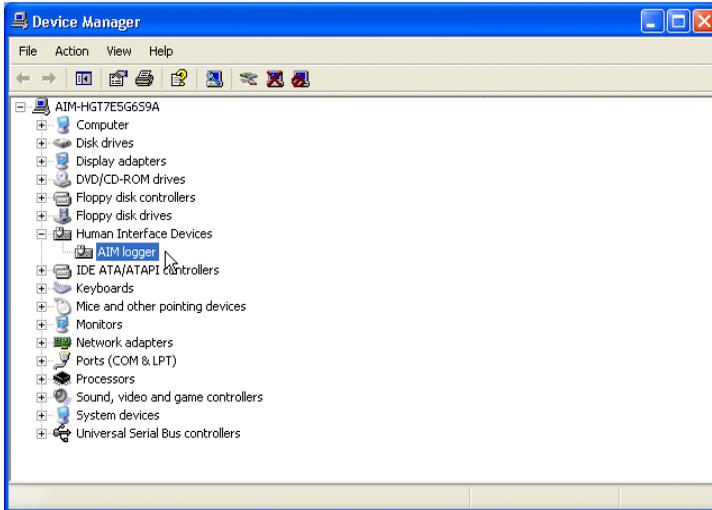
USB drivers troubleshooting

In this paragraph it will be described the possible solutions to the mostly common USB drivers installation troubles encountered.

1. Once connected **MyChron 3 Plus/Gold/Gold XG** to a switched on PC, the automatic USB drivers installation does not start:

a. Control that the instrument is correctly plugged in the PC's USB port.

b. Verify that both PC and **MyChron 3 Plus/Gold/Gold XG** are switched on.

c. If **MyChron 3 Plus/Gold/Gold XG** does not turn on, verify that the external battery charge status is good.

d. If the instruments switches on but the automatic USB drivers installation does not begin, try to plug the USB cable into another USB port (if a second USB port is available).

e. If available, try to use another USB cable to plug **MyChron 3 Plus/Gold/Gold XG** in a PC's USB port.

2. The automatic USB drivers installation starts but the USB driver is not properly installed:

a. Control your PC's Control Panel (click Start \ Settings \ Control Panel \ System \ Device management): if you see a voice like **Unknown Peripheral** or **Unknown USB device** with a yellow question mark (or a red cross), please select that voice and remove it (click the mouse right button and select the "Remove" option). Then switch off your **MyChron 3 Plus/Gold/Gold XG**, unplug the USB cable from the PC's USB port, re-plug the USB cable in the PC's USB port and repeat the previously described installation procedure.
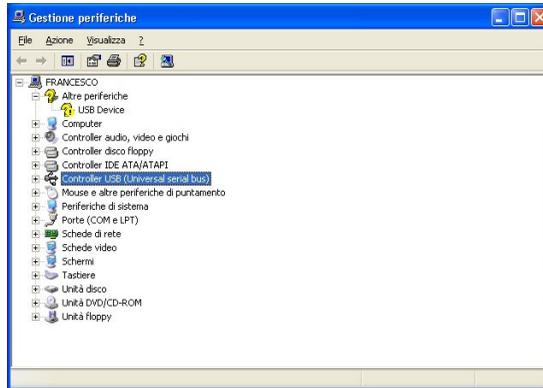
b. If you see a yellow question mark again, please select the voice and, instead of removing it, click on the "Property" option; then choose the "Driver" tab and finally select the "Driver Update" option. It is now possible to repeat the installation procedure described in the "How to install the USB Driver for Windows" paragraph. Please remember to specify the correct path for the USB drivers, which is the **Race Studio 2** CD-ROM drive.

3. In case your PC has not been able to automatically recognize your **MyChron 3 Plus/Gold/Gold XG** or the two procedures previously described had not succeeded in solving your problems, you have to install the driver **manually** as here above explained:

- Go to Control panel window.
- Select the "New Hardware" icon.
- Click twice button "Next".
- Place a check beside "No, I want to select the hardware from list".

- Select "HID class" (or "Human Interface Device").

- Specify the correct path for the USB driver (i.e. **Race Studio 2** CD-ROM drive).

4. The USB driver *WDUSB522* does not have a "digital signature". In some cases (very rare) **Windows XP ™** or **Windows 2000 ™** operative systems have some default settings which do not allow the driver *WDUSB522* to be installed. These settings may be removed following this procedure:

- Go to Control panel window.

- If you have a **Windows XP ™** operative system, select the "Performance and maintenance" option.

- Click the "System" button (both for **Windows XP ™** and **2000 ™**).

- Select the "Hardware" flag and, then, press button "Driver signing".

- Select the "Ignore" option and press button "OK", as showed in the following image.

Configuration via software

For a correct, complete and fast MyChron 3 Plus/Gold/Gold XG configuration, it is <u>absolutely</u> necessary to use a PC and the software Race Studio 2.

The "via software configuration" allows the user to set some parameters that cannot be set using the keyboard. For instance, the temperature sensors (thermocouples, thermoresistances, VDO sensors) or the pressure ones, cannot be set via keyboard and so, if you wish to measure temperature or pressure, you have to configure your **MyChron 3 Plus/Gold/Gold XG** using **Race Studio 2**. Moreover, if you bought a **MyChron 3 Gold/Gold XG** and you wish to measure the lateral g-force (or the gyroscope input), in order to create a track map, you have to autocalibrate the gauge via software.

Before starting the via software configuration, it is reminded to install Race Studio 2 and the USB drivers, as mentioned in the previous chapter. It is also reminded that, before configuring the instrument, you have to connect it to a PC and to switch it on.

Once launched the program, by double-clicking on the **Race Studio 2** icon on your PC's desktop or by selecting the **Race Studio 2** shortcut in your PC's *Start* toolbar, it will appear the software's main window, reported here above:
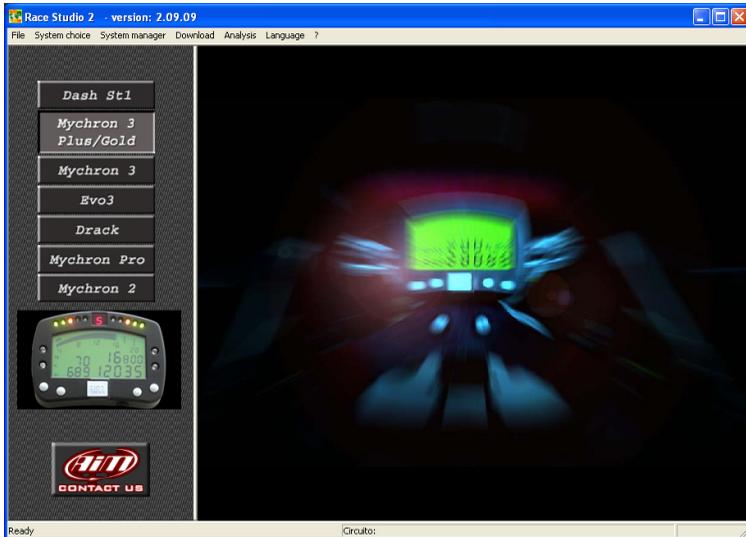
On the left of the window you may see the icons corresponding to all the Aim instruments supported by **Race Studio 2**: **Dash ST1**, **MyChron 3 Plus/Gold, MyChron 3, Evo 3**, **Drack**, **MyChron Pro**, **MyChron 2**.

To select **MyChron 3 Plus/Gold/Gold XG**, please click on the corresponding icon (as showed in the previous image).

Creating a new configuration

It is now possible to configure the instrument: in order to start the configuration procedure, please click on the *Logger manager* icon, located in **Race Studio 2** toolbar. It will appear the following screenshot:
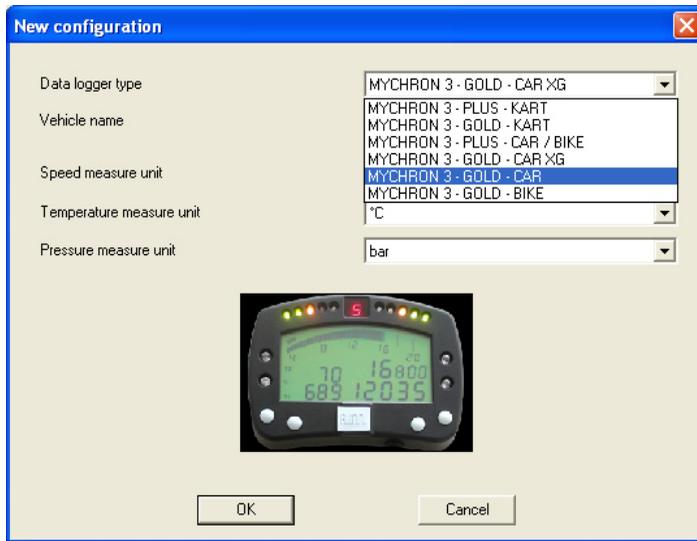
The user will have to set some parameters, listed here above:

- Data logger type: choose among **MyChron 3 Plus/Gold/Gold XG** and **Kart/Car/Bike**. It is reminded NOT to select the KART version;
- Vehicle name;
- Speed unit of measure: choose between km/h and Mph;
- Temperature unit of measure: choose between °C and °F;
- Pressure unit of measure: choose between Bar and PSI.

Once filled all the boxes of the previous screenshot, click on the *OK* pushbutton to save the settings. On your PC's monitor it will appear the *Logger manager* main window:
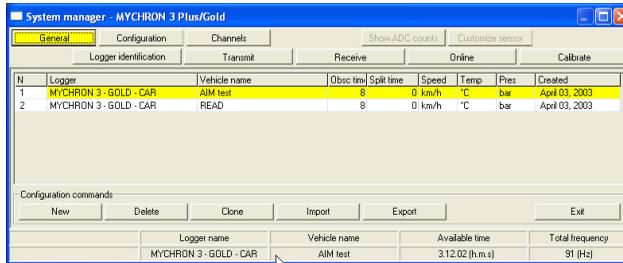
Here above you can see a short description of all the pushbuttons that can be used to configure your **MyChron 3 Plus/Gold/Gold XG**:

- *General*: with this pushbutton you activate the *Logger manager* main window;

- *Configuration*: this pushbutton will open a very useful dialog box, where the user is allowed to set the temperature and pressure alarm values, the RPM shift light threshold values, the RPM and speed parameters and the measure units;

- *Channels*: by using this option you may visualize the sensors installed on your vehicle;

- *Customize sensor*: this pushbutton allows the user to customize a sensor, setting the sensor's calibration curve;

- *Logger identification*: this button allows the user to detect the characteristics of the data logger connected to the PC;

- *Transmit*: once configured the data logger, the parameters have to be transmitted to the instrument by clicking this button;

- *Receive*: if you connect to a PC a data logger of whom you do not know the configuration, you may detect its configuration, by clicking the *Receive* button, and to save it in the configuration's database;

- *Online*: the *Online* button allows the user to make a data acquisition simulation, in order to verify if the new configuration is correct and if it has been correctly transmitted to the data logger;

- *Calibrate*: this button allows the user to calibrate both the lateral accelerometer and the gear sensor;

- *New / Delete / Clone*: these three buttons allows the user to create a new configuration, to delete an old one or to clone an existing one;

- *Import / Export*: these 2 functions are used to export the selected configuration (among the available ones) into a ".cfn" file or to import a configuration (saved into a ".cfn" file) into the configuration database.

- *Exit*: this button is used to exit the "Logger manager" menu.

Channels

Clicking on the *Channels* pushbutton it will appear the following screenshot:

In the window previously shown, it is possible to set the channels acquired by your **MyChron 3 Plus/Gold/Gold XG**.

- Channels labelled as CH_1 ÷ 4 may be used to acquire a temperature or a pressure input, if you are using a **MyChron 3 Plus**, or may be used to sample temperature, pressure, potentiometer or Lambda sond, if you are using a **MyChron 3 Gold/Gold XG**. The user may choose the sensor among a long list of Aim standard sensors or, otherwise, may set a *custom* sensor by selecting the "Custom sensor management" (see *Customize sensor* paragraph).

- If your **MyChron 3** is a **Gold** version one, you may also install an external gyroscope (for BIKE installations), labelled as CH_7, which will allow you to create the circuit map.
- Your **MyChron 3 Gold/Gold XG** (CAR versions) has an internal lateral g-sensor, labelled as ACC_1, which will allow you to create the circuit map.

Customize sensor

By using this function, the user can configure a "custom" sensor, setting the sensor's calibration curve. This option is very useful when the sensor (pressure, temperature or other) installed on the vehicle does not appear in the default sensors list.

It is reminded that the "Customize sensor" option is intended only for expert users.

To enter this function, please press button *Customize sensor*: it will appear the following screenshot:

In the window's left part there are three columns: in the first one it is possible to insert the instrument's output voltage (i.e. the *abscissa* values of the calibration curve), while in the second one it is possible to insert the temperature/pressure value corresponding to the previous voltage (i.e. the *ordinate* values of the calibration curve). These values will be interpolated using a polynomial. In the third column it is reported the "Curve Error", i.e. the difference between the computed curve and the experimental values.

To set how many experimental values you wish to use to create the calibration curve, please place a check in the column besides the abscissa values.

In the window's middle part it is reported both the sensor's calibration curve and the 5 coefficients (from a_0 to a_4) of the interpolation polynomial. Please, use button "Compute Curve" to refresh the calibration curve to apply any changes.

On the right of the calibration curve there are some boxes, where you can insert the sensor name, the desired measure units and the sensor type (Temperature, Pressure or Other).

Below these boxes there are some pushbuttons which allow the user to save or delete a customized sensor.

In the window's upper right corner you can see some default "custom" sensors. If you wish to load one, please click twice on the sensor's name.

Once correctly defined the new sensor, the user may exit *Customization sensor* mode, by clicking on the *OK* pushbutton, and has to set the new sensor on the desired channel (press button Channels and follow the instructions reported in the *channels* paragraph).

Channels configuration

Your **MyChron 3 Plus/Gold/Gold XG** is equipped with 14 fully configurable coloured led; the 4 ones placed on the left and right of the display unit represent the 4 analog inputs (temperatures and pressures) *maximum* alarms, while the other 10 led in the upper part of the display are called *Shift light*.

By clicking on the *Configuration* icon it will appear the following screenshot:
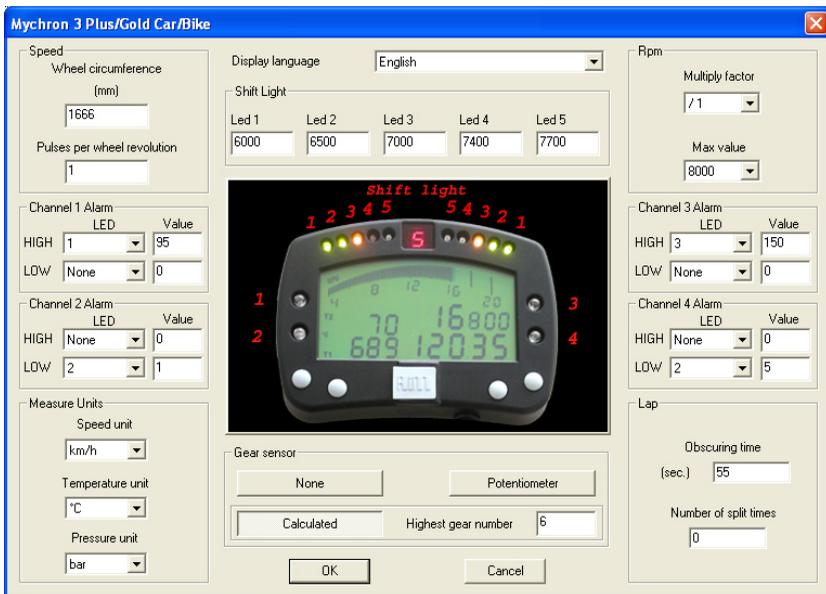
- *Wheel circumference*: this function allows the user to set wheel circumference (in mm or in inches); this value is fundamental to correlate the wheel revolution speed and the vehicle speed.

- *Number of pulses per wheel revolution*: this function allows the user to set the number of pulses per wheel revolution (i.e. the phonic wheel teeth number), in order to measure the wheel revolution speed. When the sensor passes by a gear tooth, it generates an electric pulse if the phonic wheel is made up of just one tooth, the instrument will measure one impulse per lap, while, if it is made up of more than one tooth, the number of pulses per lap will be greater than one.

- *Configuring the Shift light led*: in the window's middle part it is possible to set 5 RPM values, each one corresponding to a coloured led. The five led progressively turn on in order to indicate the pilot to shift gear.

  To set the proper RPM value, you have to modify the values in the different boxes.

  The 10 led are so coloured: the first two on the left and the first two on the right are green coloured, the middle ones are orange coloured and the last four are red. When the engine reaches the RPM value set in the 5th box, all the five led start blinking, informing the pilot to change gear.

  If a value is set to 0, the corresponding led will be disabled.

- *Number of pulses per engine revolution*: this option represents the number of pulses, acquired from the coil or from the ECU, per engine revolution. The user may choose the multiply factor among these values: /1, /2, /3, /4, /6 and *2. For instance, the correct value for a 4 strokes 4 cylinders engine is /2.

- *Maximum RPM value*: this option allows the user to set the Maximum RPM value acquired by the instrument.

- *Configuring the 4 alarms led:* the 4 alarms led may be configured as *Maximum* alarms, *Minimum* alarms or both for the 4 analog inputs. This means that led #1, for instance, may switch on when temperature 1 reaches a value greater and/or lower than a fixed value. It is reminded to select the led number inside the "High led" menu if you wish to set a *Maximum* alarm (max value 1999), otherwise, if you wish to set a *Minimum* alarm (min value -99), select the led number inside the "Low led" menu. If you do not wish to set an alarm, please choose the "None" option.

- *Configuring the unit of measure:* the user can set the Speed (Km/h or Mph), Temperature (°C or °F) and Pressure (Bar or PSI) unit of measure

- *Gear sensor*: the software allows you setting the gear sensor type. Select "None" if you do not wish to see the gear number, select "Potentiometer" if your vehicle is equipped with a gear sensor installed inside the gearbox or select "Calculated" if you wish to use a software algorithm to calculate the engaged gear. In this case, the "Higher gear number" box will become enabled: please insert the gear number.

- *Configuring the lap parameters:* by setting these two parameters, the user will be able to acquire the correct lap time and, if more than one optic transmitter is available, the split times. For further information on these parameters, please refer to the "Beacon obscuring time and split's number" paragraph reported in the "Configuration functions" paragraph.

- *Language selection:* the user may choose the display text language among 6 different languages: Italian, English, German, Spanish, French and Slovenian.

Transmitting the configuration

It is recommended, before transmitting the configuration, to switch on the instrument and to connect it to the PC's USB port.

Once set all the parameters, it is necessary to transmit the configuration to the instrument.

In order to transmit the configuration, you have to press the *Transmit* pushbutton and the system, automatically, will download the configuration from the PC to the instrument's Flash memory.

If the data logger is not correctly connected to the PC's USB port or if the data logger is switched off when transmitting the configuration, it will appear the following screenshot on your PC's monitor:

Please, ensure that the data logger is switched on and correctly connected to the PC and then retry to transmit the configuration.

Sensors calibration (Gold/Gold XG versions only)

Once the configuration has been transmitted to the instrument, it is absolutely necessary to autocalibrate the internal lateral g-sensor (or the Gyroscope) and the "potentiometer distance", and to calibrate the "mid zero potentiometer", the

"zero based potentiometer" and the gear sensor (for the gear sensor, please refer to paragraph "Gear sensor calibration").

In order to calibrate/autocalibrate, press button "Calibrate": the following screenshot will be prompted:
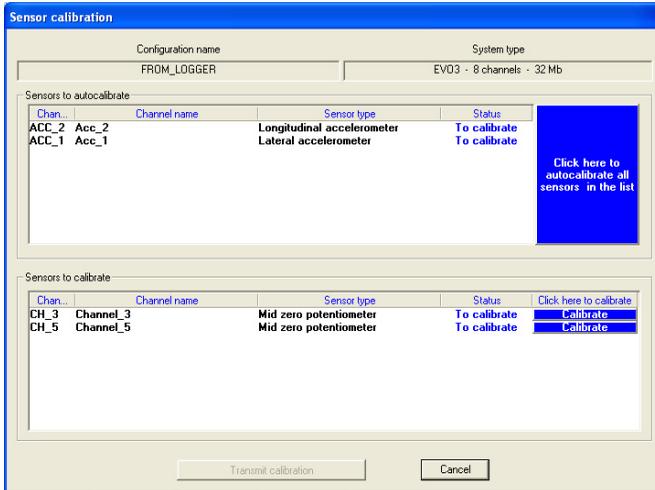
- The g-force sensor, the gyroscope and the "potentiometer distance" need to be autocalibrated pressing button "Click here to autocalibrate all sensors in the list". Once autocalibrated, the "calibration status" will turn from "To calibrate" in "Calibrated".

  In order to correctly autocalibrate the g-sensors (accelerometer and gyroscope), it is suggested to keep the car as horizontal as possible and to leave the bike on the prop-stand.

- The "mid zero potentiometer", the "zero based potentiometer" and the gear sensor need to be calibrated. Press the button "Calibrate" corresponding to the channel you wish to calibrate and follow the instructions prompted on your PC's monitor.

Once all the sensors have been calibrated, it is absolutely necessary to transmit the calibration to the logger pressing button "Transmit calibration".

It is reminded that the calibration/autocalibration procedure is fundamental to acquire correct data.

Gear sensor calibration

To calibrate the gear sensor, once entered calibration mode by clicking the "calibrate" button, to select the "Gear sensor calibration" button. It will appear the following screenshot:

Now, please follow the instructions listed here above:

- Check the box corresponding to the gearbox's gear number;
- Engage the neutral gear;
- Press the "Continue" button;
- Engage the first gear;
- Press the "Continue" button;
- Repeat this procedure until the last gear has been engaged (the instrument supports gearboxes up to 9 gears);
- Once the last gear has been engaged, press the "End Calibration" button;
- Once the gear calibration has finished, it is **absolutely** necessary to transmit the calibration to your **MyChron 3 Plus/Gold/Gold XG** by pressing the "Transmit calibration" button.

Online visualization

Once you finished calibrating/autocalibrating the sensors, it is suggested to enter the "Online" mode, by pressing the Online button in the "Logger manager" main window, in order to verify that each channel has been correctly configured.

The "Online" visualization mode will allow you to control if the temperature/pressure sensors have been correctly set and if the gear sensor and the accelerometers have been correctly calibrated. It is also possible to see the "Battery charge level" and to start a test data acquisition, in order to verify that the system is correctly working.

Attention: if the gear channel and the accelerometer one have not been correctly calibrated, it will not be possible both to acquire the current gear and, for MyChron 3 Gold/Gold XG only, to create the circuit map. It is recommended to pay a particular attention when calibrating/autocalibrating the channels.

How to download a test

Once a test session has finished, it is possible to download the data stored in the instrument's memory.

In order to correctly download these data, please connect your **MyChron 3 Plus/Gold/Gold XG** to the PC's USB port by using the USB cable and to switch on the instrument.

Downloading a test

To download the data, please run **Race Studio 2** and, then, click on the "Download" button, located in the commands toolbar: the file download will automatically start and it will appear the following screenshot:
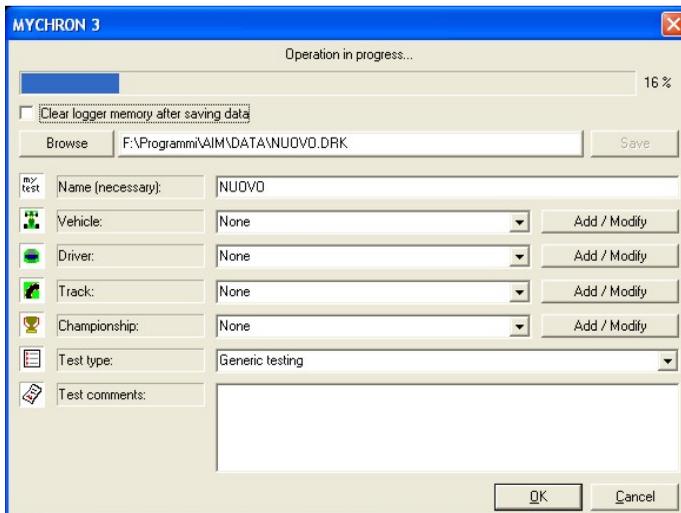
- In the window's upper part you can see a "wait-bar" which informs you on the download percentage status;

- In the line directly below the download wait-bar, there is a function which allows the user to *Clear* the logger memory after saving data or to leave data in the instrument's memory: if you wish to clear the memory after saving data, please place a check in the proper cell;

- Once downloaded the instrument's memory, the *Save* button, located on the right of the window, will become enabled. If the user presses this button without specifying the file name and the download folder, the file will be automatically saved in the default folder "X:\Program files\AIM\DATA" (where X represents the hard drive where you have installed **Race Studio 2**) with the default name "new.drk".

- If you wish to save the file with another name, please insert the file name in the "Name" box. Moreover, if you wish to save the file in custom folder, please press button "Browse": you will be allowed to choose the desired folder, as showed in the following image.
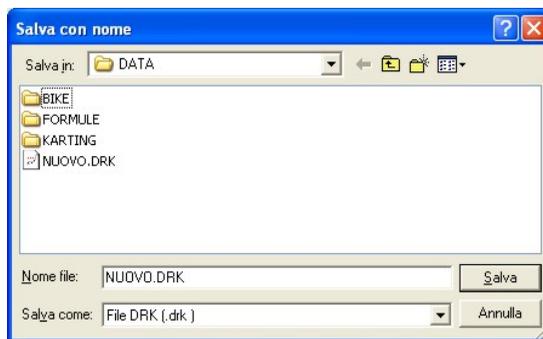
- If you have not placed a check besides the "Clear logger memory after saving data" option, once you press button OK to exit download window, it will appear a dialog box where the user is allowed to choose whether to clear the or not to clear the logger memory. Please, select the desired option and exit download.


Inserting the test in a database

Race Studio 2 has a new and innovative tests storing system based on databases.

This storing system allows the user to save the files specifying 5 characteristics, such as the vehicle name, the driver, the track, the championship and the test type. Such information are saved together with the test file and are very useful, as they allow the user to group the files into self-defined categories, each one characterized by 5 attributes (vehicle, driver, track, championship and test type).

- When saving a new test file, it will be possible to insert this file in the previously set database categories or to create a new category.
- When loading a test from database, the user may select the desired category from the database and all the tests which do not belong to that category will not be shown (in this case, the database works like a *filter*).

To insert a test in the database, please follow these instructions:

- Once the download has finished, please enter the file name;
- Then click on the "Add/Modify" button corresponding to the *Vehicle* attribute. It will appear the following window;
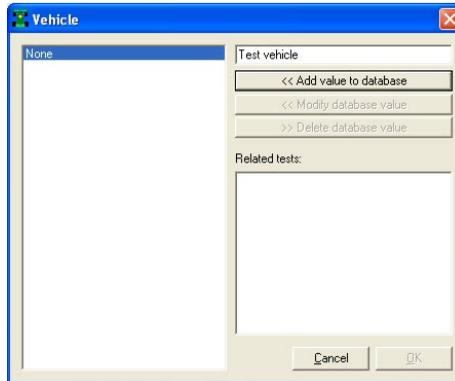
- If the database is empty or you wish to create a new category, please fill the upper right box with the new Vehicle category and then click the "Add value to database" button. The new category will appear in the left column and the "OK" button will become enabled. Then click the "OK" button;
- If the desired category appears in the previously set database categories (left column), you may select it by single-clicking on the name. Then click the "OK" button;
- It is reminded that, if you do not wish to specify any category, the file will be saved in the database and the attributes will be set to "None".
- Please, repeat this procedure until the 5 categories have been filled. Once all the attributes have been set, like in the following image, please click the "OK" button.

How to use Race Studio Analysis

Race Studio Analysis is software properly developed to analyse the data acquired with your gauge. The map creation option (available with **MyChron 3 Gold/Gold XG** versions only), the possibility to compare different laps, the data animation option, the possibility to plot channels VS time, VS distance or VS frequency, the histograms plotting option and the very useful math channels, make **Race Studio Analysis** a very powerful instrument to analyse and improve the driver performances.

It is reminded that all the ".drk" files, downloaded with the previous software **Race Studio 1**, are perfectly compatible with the new one.

If you wish to update **Race Studio Analysis**, together with **Race Studio 2**, please connect to our website **www.aim-sportline.com** and go to "Download" page, where it is possible to download the latest updates. To install the update, click twice on the downloaded file and follow the instructions you see on your PC's monitor.

To run **Race Studio Analysis**, please click twice on the corresponding icon (reported here above) that you can find on your PC's desktop.

It is also possible to run **Race Studio Analysis** while working with **Race Studio 2** clicking on the "Analysis" tab, using the "F5" function key

or clicking the following shortcut "Start \ Program \ AIM \ Race Studio 2 \ Race Studio 2 Analysis"."

Once run **Race Studio Analysis**, it will appear the following window:
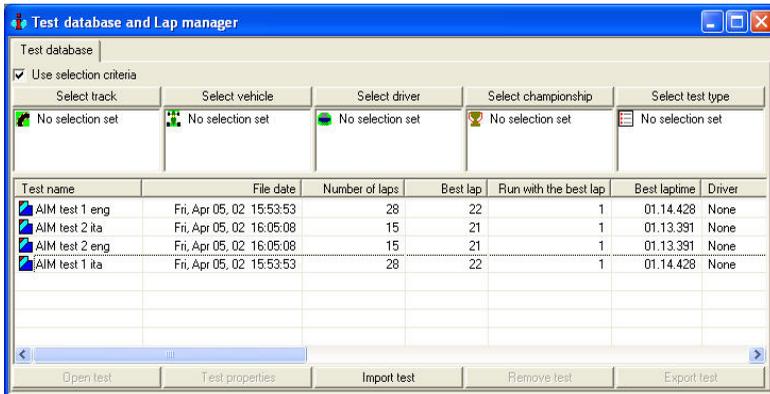
The "Test database and lap manager" window is organized on different layers and allows the user to load/unload a test and to manage both with the database and the loaded tests.

How to load a test

There are two possible ways to load a test: the first one (recommended) is based on 5 selection criteria (ensure that the "Use selection criteria" box is checked), while the second one does not use these criteria.

Open test from database using the selection criteria: **Race Studio 2** and **Race Studio Analysis** have been designed to manage the test files using a database. In the "Test database and Lap manager" window you can see, in the lower part, all the tests included inside the database and, in the upper part, the database

categories and sub-categories. To select a test from the database using the selection criteria, please left-click on the desired selection pushbutton (i.e. "Select track", "Select vehicle", etc…): it will appear the corresponding selection window. For instance, here below on the left it is shown the "Test type selection", corresponding to the "Select test type" pushbutton.
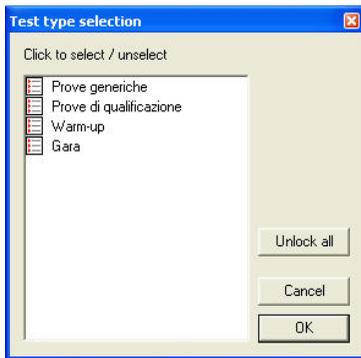
In order to choose a database's sub-category, place a check besides the desired one, as shown in the second "Test type selection" window's screenshot.

It is reminded that you may select more than one sub-category at the same time: for instance you may select both "Generic testing" and "Qualifying testing".

It is recommended to repeat this procedure for all the 5 database's categories (track, vehicle, driver, championship and test type).

All the tests which do not belong to the selected sub-categories will be filtered and will not be shown in the "Test database and Lap manager" window's lower part.

To load a file, once the desired database's categories have been checked, you may double-click on the file, you may select it and then press button "Open test" or you may right-click on the file name and choose the "Open test" function.

Open test from database NOT using the selection criteria: if you do not wish to use the selection criteria, it is suggested to remove the check besides the "Use selection criteria" checkbox.

To load a file, you may double-click on the file, you may select it and then press button "Open test" or you may right-click on the file name and choose the "Open test" function.

The "Test database and Lap manager" window also allows the user to insert a new test inside the database (please refer to the "*Inserting the test in a database*" paragraph), to delete a previously saved test from the database and to modify the test properties. Once a test has been loaded, it will appear the window shown here below, where you can find both the "Test database" layer and the "Loaded tests" layers.

It is reminded that you may load up to 4 different tests (i.e. files) at the same time (as shown in the previous screenshot), in order to make comparisons between many different laps.

If you wish to select a particular lap, you may double-click on the corresponding lap number or you may single-click and choose the "Show lap" function: when the lap is selected, the green icon located on the left of the lap number turns yellow coloured. To unselect a lap, click twice on the lap number.

How to plot a channel

Race Studio Analysis will allow you the ability to plot the recorded laps and the sampled channels versus time, distance and frequency.

For instance, if you wish to plot engine's RPM and the vehicle speed versus time, first of all you have to select these measures by clicking on them in the "Measures and laps" toolbar, located on the left of **Race Studio Analysis** window, and then you have to click on the "Plot vs. time" icon.

In order to plot a channel vs. time, it is also possible to use the shortcut "CTRL+F1" or to click "View \ Plot vs. time" command.

In the following graph, on the left, it is shown the speed (black) and the RPM (orange) diagram during a lap, while, on the right, it is shown the "Measures and laps" toolbar.

Left click on the desired channel name (inside the "Measures and laps" toolbar) in order to add a sampled channel to the graph.

Left click on the coloured-boxes column if you wish to change the graph colour: the user may set the desired colour for each recorded lap and for each sampled channel. If you wish to add the scale to the graph, left click in the checkbox corresponding to the desired channel name.

Left click on the pushbuttons of the last column of the "Measures and laps" toolbar to load the "Measure information" dialog box: this window allows the user to change the channel name, the plotting scale and the unit of measure.

It is also possible to amplify and shift the diagram by using the "Value=(Value*A)+B" option: A is the amplification factor (included between -1000 and +1000), while B is the shift factor (included between –500000 and +500000).

In the following picture it is reported the "Measure information" dialog box.
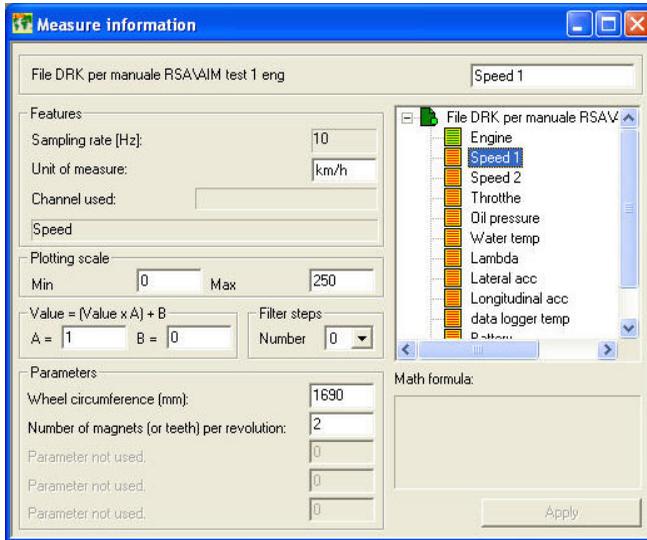
If you choose a channel from the channel list in the right upper corner list, it will also appear the parameters (in the lower left corner) that the user can set (i.e. RPM multiply factor, wheel circumference, pulses per revolution, etc…)

How to create your track map (Gold/Gold XG versions only)

The internal lateral g sensor or the external gyroscope allow you the ability to create a circuit map on your PC.

To create a circuit map, once loaded a test and selected a good lap (labelled as "Lap marker" in the Lap cause column of the Lap manager dialog box) please press "Map \ New" from the Command toolbar or "Shift+F4" keys: it will appear the following screenshot:
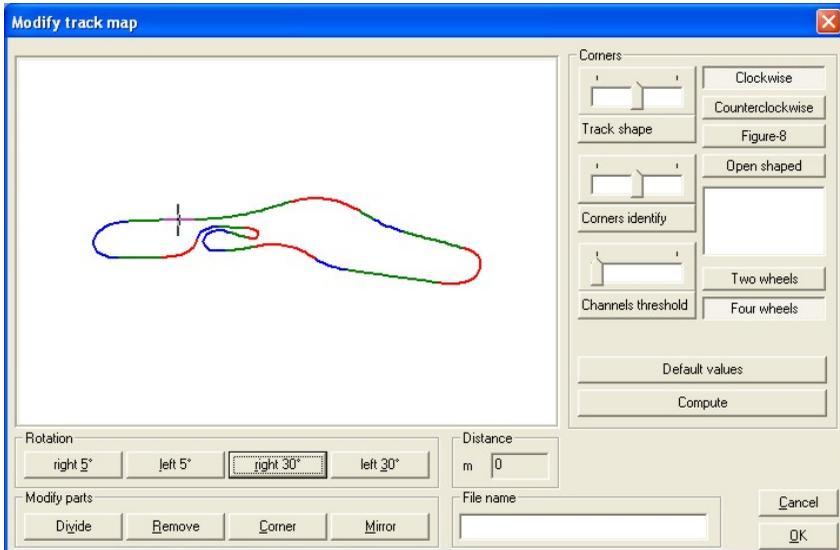
The user will be able to modify a large number of parameters by pressing the different pushbuttons, whose working is here above explained:

1. *Track shape* cursor: this button allows the user to modify the curves' radius of curvature, obtaining more or less open shaped curves.

2. *Track type:* it is possible to choose the track type between 4 choices: Clockwise, Counter Clockwise, Figure-8 and Open Shaped. Most of circuits belong to the first two types, while, for instance, the circuit of Suzuka (Japan) is a Figure-8 track type.

3. *Two Wheels / Four Wheels:* this option has to be set to "Four Wheels" if using a car or to "Two Wheels" if using a bike.

4. *Default values:* this pushbutton loads the default values for the different parameters that can be set during the map creation.

5. *File name:* once the map has been correctly created, it is possible to save it by choosing its "file name" and clicking the OK pushbutton.

6. *Rotation pushbuttons:* by using these buttons it is possible to right (Clockwise) or left (Counter Clockwise) rotate the circuit map of a 5 or 30 degrees angle.

7. *Modify parts pushbuttons:* these four buttons will allow the user to modify the track map just created. In particular it is possible to

   a. *Divide* a split in two separate splits;

   b. *Remove* an intermediate split;

   c. Change a circuit part from Straight (green line) to Corner (blue / red lines) or vice versa. It is reminded that it is not possible to have two consecutive straights but each straight has to be kept separate from another one by one curve at least.
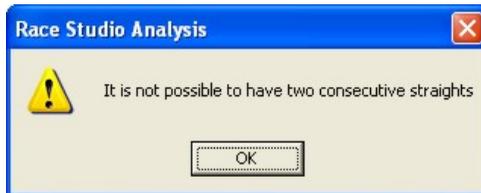
   d. *Mirror* the track map.

Once the map has been created and saved, it is possible to recall it from the "Map Manager" dialog box (shortcut "SHIFT+F2") by double clicking on the desired one.

Track map creation troubleshooting

In this paragraph it will be described the possible solutions to the mostly common map creation troubles encountered.

1. If it appears the following window

   please select a "Good lap, labelled as "Lap marker" in the Lap cause column of the Lap manager dialog box, and deselect the previously used lap (by double clicking on the lap number).

2. Select a lap without many skids.

3. Verify that it is set the correct vehicle type (2 or 4 wheels) in the "Modify track map" window.

4. Verify that the values stored in both speed channel and lateral acceleration one are sensible: lateral acceleration has to be near to 0 in the straight line, while speed must be greater than 0 and must not have high or low peaks.

5. If lateral acceleration, or the gyroscope signal, in the straight line is not quite near to 0, it is probable that the lateral accelerometer, or gyroscope, has not been autocalibrated. It is possible to solve this problem by summing or subtracting a fixed value (see "Measure Information" dialog box) in order to have 0 in the straight line. **Please, before starting a new test run, remember to calibrate the internal lateral accelerometer.**

Configuration via keyboard

- Press **MENU/<<** to activate the configuration mode.
- Press **MENU/<<** (previous option) or **>>** (next option) to scroll through the configuration menu.

Setting the number of splits

- Select the "Number of Splits" option.
- Press **MEM/OK** to enter edit mode.
- Press **MENU/<<** or **>>** to set the number of splits.
- Press **MEM/OK** to save or **VIEW** to quit.

Setting the obscuring time

- Select the "Obscuring Time" option.
- Press **MEM/OK** to enter edit mode.
- Press **MENU/<<** to set the correct number of seconds.
- Press **>>** to switch between digits.
- Press **MEM/OK** to save or **VIEW** to quit.

Gear calibration

- Select the "Gear calibration" option.
- If you have selected the "Gear with sensor" option, follow these instructions:
  - o Engage the NEUTRAL gear.
  - o Press **>>** pushbutton.
  - o Engage the first gear.

- o Press **>>** and repeat this procedure for all the gears.
- o Once the last gear has been engaged, press button **MEM/OK**.
- o To restart calibration procedure, press button **MENU/<<**.
- If you have selected the "Gear computed" option follow this procedure:
  - o Start for some "Learning laps".
  - o During these laps, engage all gears.
  - o Stop the vehicle and turn off the engine in order to let the gear calculation procedure start.
  - o If the calculated gears do not correspond to the engaged ones, run another "learning lap".

Setting the temperature alarms

- Select the "MAX/MIN TE1/TE2 Alarm" option.
- Press **MEM/OK** to enter edit mode.
- Press **MENU/<<** until the correct number appears.
- Press **>>** to switch between digits.
- Press **MEM/OK** to save or **VIEW** to quit.

Shift lights configuration

- Select the "Shift light" option.
- Press **MEM/OK** to enter edit mode.
- Press **MENU/<<** until the correct number appears.
- Press **>>** to switch between digits.
- Press **MEM/OK** to save and to configure the next led.
- Press **VIEW** to quit.

Setting the circumference wheel

- Select the "Wheel circumference" option.
- Press **MEM/OK** to enter edit mode.
- Press **MENU/<<** until the correct number appears.
- Press **>>** to switch between digits.
- Press **MEM/OK** to save or **VIEW** to quit.

Setting the pulses per wheel revolution

- Select the "Pulses on wheel" option.
- Press **MEM/OK** to enter edit mode.
- Press **MENU/<<** until the correct number appears.
- Press **>>** to switch between digits.
- Press **MEM/OK** to save or **VIEW** to quit.

Setting the maximum RPM value

- Select the "Max RPM value" option.
- Press **MEM/OK** to enter edit mode.
- Press **MENU/<<** or **>>** to select the desired RPM value.
- Press **MEM/OK** to save or **VIEW** to quit.

Setting the RPM factor

- Select the "Spark for revs" option.
- Press **MEM/OK** to enter edit mode.
- Press **MENU/<<** or **>>** to select the desired value.
- Press **MEM/OK** to save or **VIEW** to quit.

How to use MyChron 3 Plus/Gold/Gold XG

Viewing data per best lap time

- Press **MEM/OK** to see the best lap and the maximum RPM and temperatures values.
- Press **MEM/OK** to see minimum RPM and temperatures values.
- Press **VIEW** to switch from RPM to speed.
- Press **VIEW** twice to return to main display mode.

Viewing other completed lap data

- Press **MEM/OK**.
- Press **MENU/<<** to view a previous lap or **>>** to view a following lap.
- Press **VIEW** to return to main display mode.

Configuration via software

- Install **Race Studio 2** software (see "Software installation" paragraph).
- Connect the instrument to a "switched on" PC by using the USB cable.
- Switch on your **MyChron 3 Plus/Gold/Gold XG** and install the USB drivers (see "Installing the USB drivers" paragraph).
- Start **Race Studio 2**.
- Select **MyChron 3 Plus/Gold/Gold XG** and click "Logger manager" button.
- Set the correct values in the boxes of the "New configuration" dialog box.
- Click "Channels" button.

- Set the correct input channels by double-clicking in the "Sensor type" column.
- Click "Configuration" button and set the following parameters:
    - Message language;
    - Wheel circumference and pulses per wheel revolution;
    - Shift light led;
    - RPM multiply factor and RPM maximum value;
    - Channels' alarms;
    - Speed, temperature and pressure unit of measure;
    - Beacon receiver obscuring time and number of splits;
- Transmit the configuration to the instrument by pressing the "Transmit" button.
- Calibrate/autocalibrate the sensors (potentiometers, accelerometer, gyroscope and gear sensor).
- Transmit the calibration to the instrument by using button "Transmit calibration".