Dear MyChron 3 660 owner

Dear customer,

Your **MyChron 3 660** is an evolution of the worldwide known **MyChron 3 Basic**, a small, complete and high-tech data acquisition system.

Our technicians' on-track experience allowed AIM to develop the ideal gauge for NHRA Junior Dragster competitions.

Its configurable graphic RPM display, the 2 separate temperature inputs (Cylinder head and Exhaust gas), the magnetoresistive speed sensor, several properly engineered firmware features and a completely new data analysis software, make **MyChron 3 660** the best tool for monitoring the dragster's engine as well as dragster and driver performances.

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. Please call our toll free number or visit our website if you have any questions, need help, or want to give us feedback.

Thank you for your **MyChron 3 660** purchase.

Data acquisition system description

Before installing **MyChron 3 660**, please read carefully these installation instructions. It is very important that your **MyChron 3 660** is correctly installed, in order to capture consistent and accurate data. Incorrect installation may result in system malfunction.

The Display
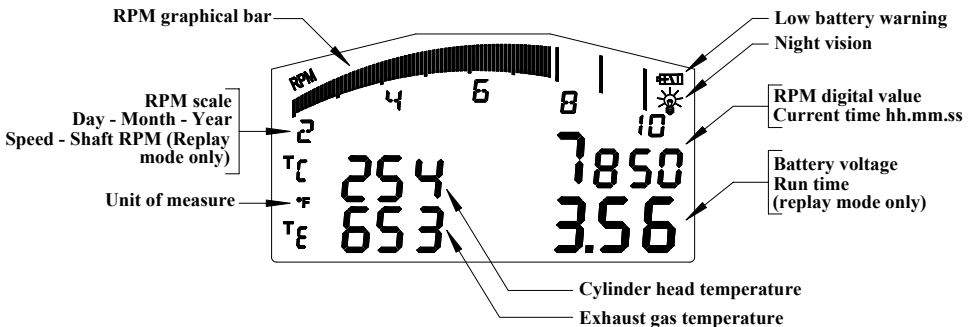
The wide display with backlight shows a large amount of information, such as RPM (graphical bar and digital value), cylinder head temperature (upper left corner of the display) or exhaust gas temperature (lower left corner)

Moreover, the digits in the lower right corner display battery voltage or run time, while the digits in the upper right corner display RPM digital value or current time (hh.mm.ss). The user may set the displayed measurements using button **VIEW**.
The display also has some small icons, showing the configured Temperature unit of measure (Fahrenheit [°F] degrees), the Night Vision option and the Low Battery Warning, that appears when the batteries are low-charged.

The Keyboard

<< >> USB MEM VIEW ok off on quit

The Keyboard is composed of four rubber push-buttons and is used to turning ON/OFF the gauge, to configuring the system, to recall recorded data from memory and to clear the internal memory.

In the middle of the keyboard, protected by a plastic cover, it is located the gauge's USB port, used to connect your **MyChron 3 660** to the PC.

The four pushbuttons are used for:

MENU/<< Used to enter configuration mode, to switch to the previous configuration option and to turn on backlight during a test.

>> Used to switch to the next configuration option and to enter Check mode.

MEM/OK Used to CONFIRM a configuration and to retrieve recorded data.

VIEW Used to switch ON the gauge, to exit configuration menu, or to switch the display from "RPM digital value" to "Current time".

How to switch ON/OFF the gauge

If you wish to **switch ON** the gauge, press button **VIEW**, while if you wish to switch it **OFF**, press at the same time **MEM/OK** and **VIEW.**

Your **MyChron 3 660** has an automatic power down feature that turns the power off after 10 minutes of inactivity

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

How to install MyChron 3 660

Now you may begin installing **MyChron 3 660** on your Junior Dragster.

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

How to install and replace the batteries

Your **MyChron 3 660** is powered by 2 AAA alkaline batteries.

When the internal batteries require replacement a battery indicator will appear in the upper right corner of the display and the following text will be displayed under the RPM bargraph:

LOW BATTERY

If you do not replace the batteries and keep on running, the system might shut down during a test.

Replace both batteries when the battery indicator appears.

To change batteries, remove the two screws on the back of the display unit. To remove the battery pack, hold each corner of the circuit board and pull the board away from the display unit. When inserting the battery pack, ensure that the batteries face the centre bolt and the circuit board faces the side of the unit. The white connector should be positioned in the top right hand corner of the display unit, if looking at the display unit from behind.

Do not over-tighten the screws when mounting the battery cover to the back of the display unit.

How to install MyChron 3 660 on the Junior Dragster

One of the main uses of the gauge is to allow the mechanics to fix the engine's carburetion immediately before the race start.

For such a reason, it is suggested to install the gauge in a place where the mechanics may see the display and, meanwhile, work on the engine's fix the carburetion.

It is suggested to install the gauge behind the body cell on the vertical metal bulkhead which separates the driver's seat from the engine. In particular, as shown in the following drawing, AIM recommends all **MyChron 3 660** users to install the gauge under the engine's ON/OFF switch.
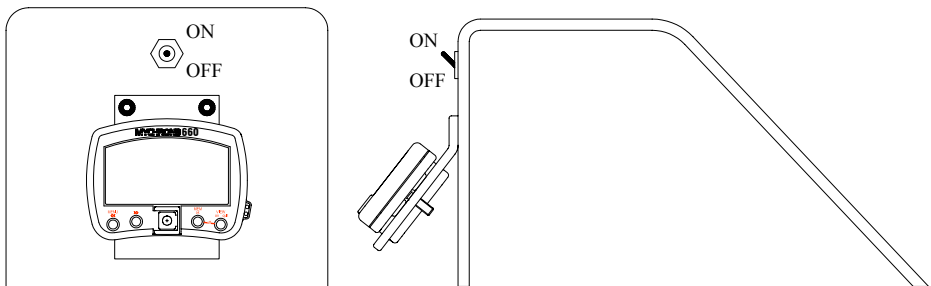
The gauge has to be mounted on a self-made bracket: in the previous drawing it is shown an example of mounting bracket.

The bracket has to be made in aluminium or steel; its thickness must be 2.5 mm (0.1 ") or more in order to have a high stiffness and not to vibrate when the engine is turned on.

Please, firmly fix the bracket to the vertical metal bulkhead and, then, fix your **MyChron 3 660** to the bracket.

Do not over-tighten the 8 mm nut. Over-tightening the nut may cause damage to the display unit casing.

How to install the RPM wire

The RPM wire has to be connected to the ON/OFF switch. This switch is, usually, a 2-poles switch (some switches are a single pole, but most are two): one pole is COIL, the other one is RPM.

The RPM wire has to be connected to the switch's RPM pole (some are soldered, some use a screw eyelet).

As the ON/OFF switch is mounted on the opposite side of the bulkhead respect to the gauge, it is necessary to drill a 5 mm hole (0.2 ") inside the bulkhead.

It is reminded to insert the rubber wire-holder in order to protect the RPM wire against tears and cuts.

While connecting the RPM wire to your MyChron 3 660, please keep the cable as far as possible from the temperature ones. In case the RPM and temperature wires are wrapped together, the temperature channels might be very noisy.

How to install the EGT thermocouple

The Exhaust Gas Thermocouple (EGT) has to be installed inside the exhaust header pipe at a distance of approximately 150 mm (5.9 ") from the exhaust port. In the following drawing it is shown a correct installation of the EGT thermocouple and of the installation wrapper.
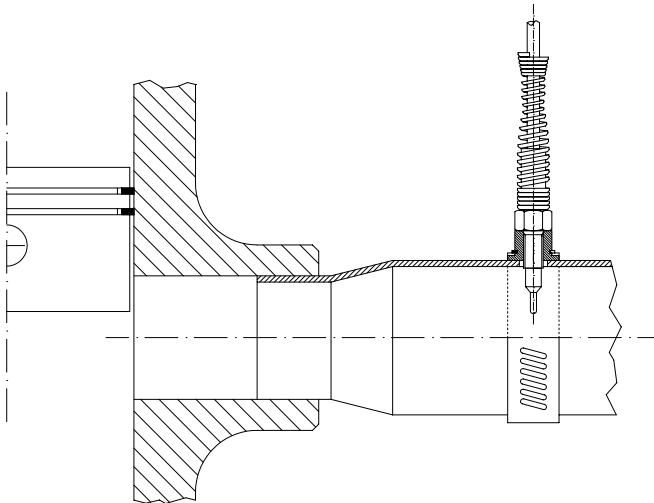
It is recommended to insert the sensor between 25% and 50% inside the exhaust gas header.

In order to correctly install the EGT thermocouple, please follow these instructions:

1. Make a 5 mm (0.2 ") hole inside the exhaust header;
2. Fix the metal wrapper to the exhaust header pipe in correspondence of the hole you have drilled. It is reminded that the pipe's hole and the wrapper's threaded nut must be coaxial;

3. Screw the EGT thermocouple in the wrapper's nut and firmly fix it;

4. Plug the thermocouple's male Mignon connector to the EGT input wire of the "2 temperatures split cable".

The EGT thermocouple may also be installed using a steel adapter which has to be weld to the exhaust header pipe, as described in the following drawing and explained below.
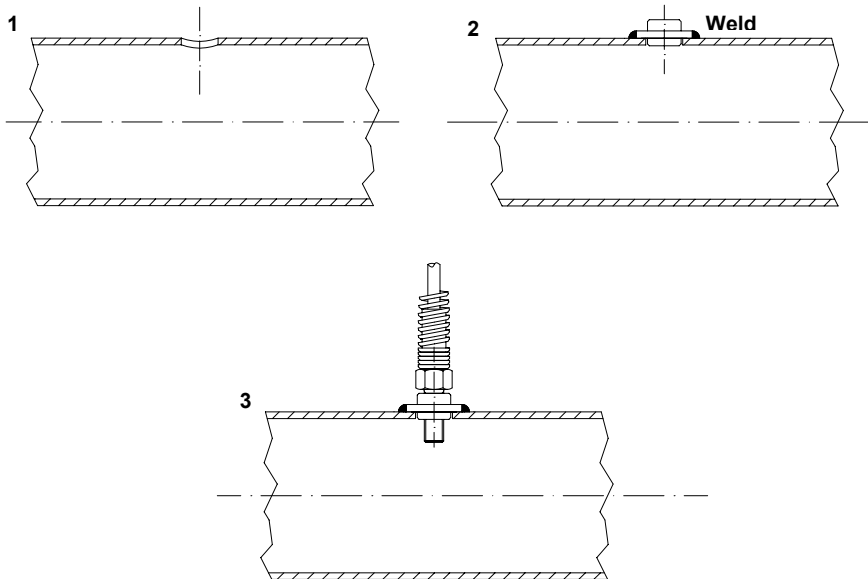

1. Make a 10 mm (0.4 ") hole inside the exhaust header;
2. Weld the EGT adapter inside the hole;
3. Screw the EGT thermocouple inside the EGT adapter;
4. Plug the thermocouple's male Mignon connector to the EGT input wire of the "2 temperatures split cable".

How to install the underspark 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 shown the correct installation of the underspark thermocouple.
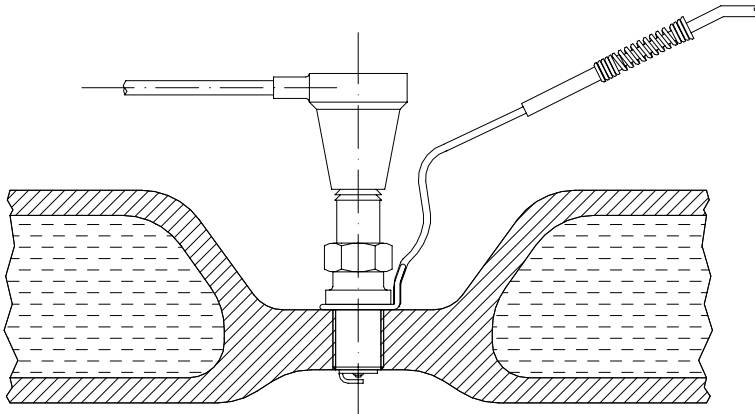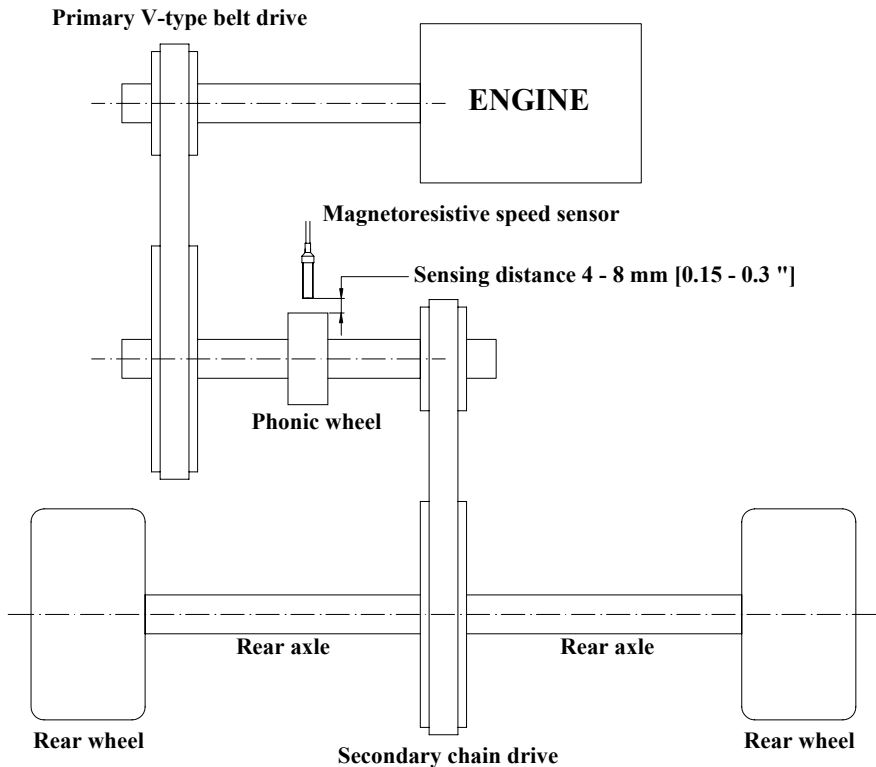

Once the sensor has been correctly installed, plug the thermocouple's male Mignon connector to the CHT input wire of the "2 temperatures split cable".

How to install the Speed sensor

In order to sample the dragster's speed, you have to install a phonic wheel on the jackshaft (3/4 " diameter) moved by the clutch. The movement of the jackshaft and the movement of the wheel is related to the crown/pinion ratio.

In the following drawing it is shown an installation layout of the speed sensor and of the magnetic phonic wheel.

Primary V-type belt drive

ENGINE

Magnetoresistive speed sensor

Sensing distance 4 - 8 mm [0.15 - 0.3 "]

Phonic wheel

Rear axle   **Rear axle**

Rear wheel   **Rear wheel**

Secondary chain drive

The speed kit is composed of the following objects: 1 phonic wheel and 1 magnetoresistive speed sensor.

The phonic wheel is made in Teflon and is composed of two separate parts: an internal ring, which includes 4 magnets, and an external bush, which protects the internal ring. The external bush is fixed to the internal one using 2 hex-key screws.

The magnetoresistive speed sensor is composed of a sensing end, included inside the brass threaded cylinder, and of a 250 mm (10 ") long cable which has to be plugged inside the gauge's BEACON/SPEED input.

In order to correctly install the speed kit, please follow these instructions:

1. In order to mount the phonic wheel on the jackshaft, please remove the pinion and insert the phonic wheel (internal diameter 3/4 ") on the jackshaft;

2. Fix the phonic wheel to the jackshaft by screwing the M5 locknut (use the hex key supplied with the kit);

3. Install the magnetoresistive speed sensor on a self-made bracket. It is reminded that the **sensing distance** (i.e. the distance between the sensor and the phonic wheel) **must be 4 - 8 mm (0.15 – 0.3 ")**;

4. Plug the speed sensor's male connector inside the gauge's BEACON/SPEED input.

How to connect cables to MyChron 3 660

Once you have correctly installed all the sensors previously described, you need to connect them to your **MyChron 3 660**.

On the backside of the display unit you have to plug the "2 temperatures split cable" to the connector labelled as "TEMPERATURE" and the speed cable to the connector labelled as "BEACON/SPEED". The RPM wire, instead, has to be placed inside the two holes on the left of the display unit (backside view).
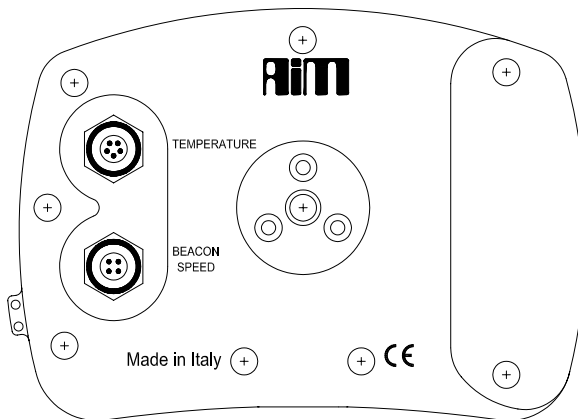
While connecting the cables to the main display unit, it is strongly recommended to keep as separate as possible the RPM wire from the thermocouple ones, in order to minimize interference between cables.

How to use MyChron 3 660

As you power on your **MyChron 3 660**, the display shows the following information (described in the same order as they appear):

1. AIM V 4.yZ Firmware version.

2. MYCHRON 3 660 Instrument name.

3. MEMORY TOTAL FREE / run **#‑**date   Memory status warning message: if the first message is displayed it means that your **MyChron 3 660** has no previously recorded data in its memory, otherwise it shows the progressive number and the date of the last recorded run.

Configuration functions

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

Please, switch ON the gauge (press button **VIEW**) and enter CONFIGURATION MODE (push **MENU/<<** button) in order to set the configuration parameters (RPM scale, RPM factor, Wheel circumference, etc…).

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 may set in CONFIGURATION MODE are explained here below in the same order they appear clicking **MENU/<<** button.

Night Vision   The gauge's display can be set to backlight display so that it is visible during night racing or in low-visibility conditions.

To set the Night Vision ON or OFF, press button **MENU/<<** until the following text is displayed

<p align="center">Night vision on/off</p>

Press button **MEM/OK** until the required selection appears. 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 upper right corner.

To activate Night Vision mode during a test press button **MENU/<<**.

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

To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

<p align="center">CLEAR TEST DATA</p>

Then press button **MEM** twice to erase data or press **VIEW** to discard the changes.

Runs since month - day

MyChron 3 660 includes an internal run-counter which lets the user know the gauge's runs number.

The date shown in the function name represents the month-day when you erased the run-counter.

To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

Runs since month - day

Then press button **MEM** twice to erase the run-counter or press **VIEW** to discard the changes.

EGT alarm temperature

This function sets the threshold temperature for the EGT (exhaust gas thermocouple) sensor that triggers an alarm when the engine's exhaust gases reach a set temperature. This alarm temperature is a MINIMUM alarm, i.e. the digits on the display start flashing when the EGT temperature reaches a value lower than the threshold one.

To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

EGT ALARM

Then push **MEM/OK** to enter EDIT MODE: use buttons **MENU/<<** or **>>** to increase or decrease the threshold value.

When the required temperature has been set, press button **MEM** to save changes or press button **VIEW** to discard them. The EGT temperature alarm can be set between 0 and 1999 Fahrenheit degrees.

When the gauge displays a temperature lower than the threshold value, the temperature on the display will start flashing. When the thermocouple temperature becomes greater than the alarm value, it will cease flashing.

CHT alarm temperature
This function sets the threshold temperature for the CHT (Cylinder head thermocouple) sensor that triggers an alarm when the cylinder's head reaches a set temperature.

This alarm temperature is a MINIMUM alarm, i.e. the digits on the display start flashing when the CHT temperature reaches a value lower than the threshold one.

To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

CHT ALARM

Then push **MEM/OK** to enter EDIT MODE: use buttons **MENU/<<** or **>>** to increase or decrease the threshold value.

When the required temperature has been set, press button **MEM** to save changes or press button **VIEW** to discard them.

The CHT temperature alarm can be set between 0 and 1999 Fahrenheit degrees.

When the gauge displays a temperature lower than the threshold value, the temperature on the display will start flashing. When the thermocouple temperature becomes greater than the alarm value, it will cease flashing.

Max RPM value   This function sets the maximum scale for the graphical RPM display and the maximum acceptable RPM value sampled by your **MyChron 3 660**.

MyChron 3 660 has four levels for the maximum RPM: 8,000 / 10,000 / 12,000 / 16,000 RPM.

To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

MAX RPM VALUE

Then push **MEM** to enter EDIT MODE and use buttons **MENU/<<** or **>>** to scroll between the four standard RPM values.

When the desired RPM value is displayed, press button **MEM** to save the changes or button **VIEW** to quit.

Wheel circumference

This function allows the user to set the wheel circumference in inches.

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

To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

$$\text{WHEEL CIRCUMFEREN}$$

Then push **MEM/OK** to enter EDIT MODE: use buttons **MENU/<<** or **>>** to increase or decrease the wheel circumference (step 1/8 inches).

The wheel circumference value can be set in a range included between a minimum value of 20" and a maximum one of 200". **The default value is 57 ¼".**

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

Drive gear (pinion) teeth number

This function allows the user to set the "Drive gear" (i.e. Pinion) teeth number. This parameter, together with the "Driven gear" (i.e. Crown) teeth number and the wheel circumference, are fundamental to correlate the jackshaft angular speed and the dragster's linear speed.

To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

<div align="center">

drivegear

</div>

Then push **MEM/OK** to enter EDIT MODE: use buttons **MENU/<<** or **>>** to increase or decrease the teeth number.

The pinion's teeth number value can be set in a range included between a minimum value of 5 and a maximum one of 49.

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

Driven gear (crown) teeth number
To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

<div align="center">

drivengear

</div>

Then push **MEM/OK** to enter EDIT MODE: use buttons **MENU/<<** or **>>** to increase or decrease the teeth number.

The pinion's teeth number value can be set in a range included between a minimum value of 5 and a maximum one of 199.

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

Set date and time

Your **MyChron 3 660** is equipped with an internal clock which allows the user to see the current date and time on the display. Moreover, this information is saved inside the test file in order to time and date stamp every run made.

To run this function, after having entered the CONFIGURATION MODE, press button **MENU/<<** until the following text is displayed

Set date and time

Then push **MEM/OK** to enter "date and time" setting mode. It will be displayed the following text

Set hour

Now use buttons **MENU/<<** (decrease) or **>>** (increase) to set the current hour. Press **MEM** to save the changes and to step forward in the "date and time" setting mode (the user will be requested to set the current minute, year, month, day and week day) or press **VIEW** to discard the changes.

The internal clock is powered by the 2 AAA alkaline batteries: if the 2 batteries are removed from the battery pack for more than 60 seconds (approximately), the clock will reset to January 1st 2003 12.00.00.

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, press button **MENU/<<** until the following text is displayed

<div align="center">

FIRMWARE info

</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 3 660 records RPM, 2 temperature inputs and speed at a sampling rate of 20 Hertz (20 times per second). This data can be retrieved at a later stage for analysis.

MyChron 3 660 segments data for runs: each run includes a few seconds before your launch, your pass and your coast down.

View data in Normal mode

The gauge's display may be set to 2 different modes: a "Normal" and a "Check" one.

When the gauge is set to "Normal" mode, the display shows the following parameters/channels:

- RPM bargraph;
- Exhaust gas temperature (lower left corner);
- Cylinder head temperature (upper left corner);
- Digital RPM value / Date and Time (upper right corner);

Use button **VIEW** to switch the display from "Digital RPM value" to "Date and Time".

View data in Check mode

If you wish to switch the display from "Normal" to "Check" mode, press button **>>**.

The "Check" mode window is described in the following drawing:
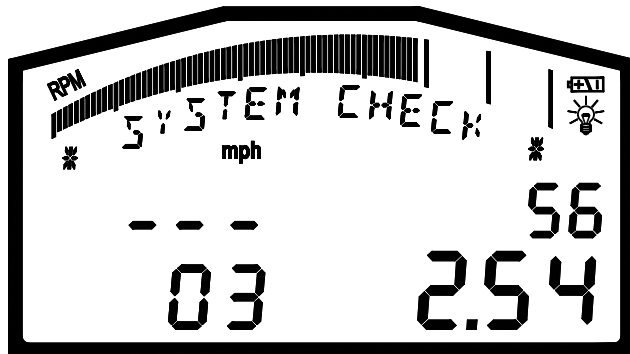
The display shows the following information:

- Total number of recorded runs (lower left corner);
- Speed (upper right corner) and speed unit of measure (mph);
- Battery voltage (lower right corner).

The "Check" mode will be displayed for 10 seconds, after while the display will automatically switch back to the previous "Normal" mode.

Post run review

Your **MyChron 3 660** is equipped with 192 kbytes of non-volatile RAM memory which guarantees the capacity to record up to 30 minutes at a sampling frequency of 20 Hz per channel (gauge's total sampling frequency = 80 Hz).

Using button **MEM** you will access the data stored in the gauge's memory. Let's now see how to retrieve data after the completion of a run (or a series of runs).

How to display the maximum values for the last run

Press once button **MEM** to enter the "Recall data from memory" firmware feature. The last completed run will be displayed.

In particular, the display shows the following parameters:

- Maximum engine RPM (upper right corner);
- Total recorder run time (lower right corner);

- Maximum EGT temperature value (Lower left corner);

- Maximum CHT temperature value (Upper left corner);

- RPM range: from Minimum to Maximum (bargraph);

- Run number – Maximum jackshaft RPM (under the bargraph).
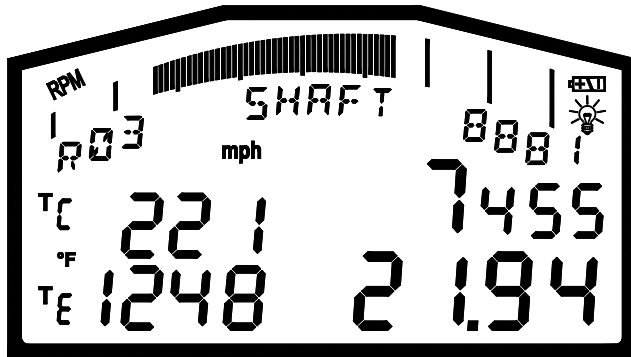
Press button **VIEW** to exit the "Recall data from memory" feature and to return to the display's "Normal" mode.

How to display the maximum values for other runs Once entered the "Recall data from memory" (press button **MEM**, as explained in the previous paragraph), if your **MyChron 3 660** has recorded more than 1 run, you may switch among them using buttons **MENU/<<** (switch to previous run) and **>>** (switch to next run).

Once a new run is loaded, the text under the bargraph changes for a while and shows the run number and the run

date (day – month and hour – minute AM/PM).

After approximately 3 seconds, the information displayed under the bargraph will return to run number and maximum jackshaft RPM.

How to replay detailed data for the recorded runs If you wish to replay detailed data for a run, you may choose between an AUTOMATIC run replay and a MANUAL one.

Automatic run replay: while in "Normal" mode, press button **MEM**; then, using buttons **MENU/<<** or **>>**, choose the run you wish to see (if more than one run has been recorded). When the desired run is selected, press button **MEM**.

Now the gauge automatically inserts the zero point into your data (i.e. the gauge recognizes when the race started and sets that data to 0 seconds) and plays the data back in real time.

The gauge automatically replays the following parameters:

- Time replay at 10 Hz(lower right corner)
- Engine RPM (bargraph and upper right corner)
- EGT and CHT temperatures
- Speed (under the bargraph)
- Jackshaft RPM (under the bargraph).
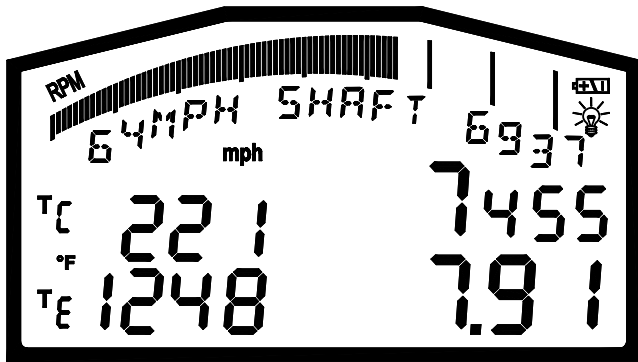
To stop the automatic lap replay press **MEM**. To return to general display mode press **VIEW** again.

Manual run replay: to manually step through the recorded run data, while the system is in "automatic lap replay" mode, press button **>>** or **MENU/<<** to stop the automatic replay.

Now, use button **MENU/<<** to decrease the progressive run time by 1 cent of second and button **>>** to increment the progressive run time by 1 cent of second (the manual run replay works at 100 Hz).

Negative time intervals will not be displayed: if the user wants to see data before the race start (remember that race start = 0 seconds) in the lower right corner it will be displayed – – –.

Through pressing button **MEM**, the system will return to the "automatic lap replay" mode.

To return to "Normal" mode press button **VIEW**.

Do you want to know what you engine and clutch numbers where at the 60'
mark? Do you want to know the speed on the finish line? Grab your time slip,
look at the time corresponding to the desired track position (60 feet, 330 feet,
etc…) and scroll your gauge to that time: that's the number you want.

Memory management
Your gauge is equipped with an internal 192 kbytes memory which allows you more than 30 minutes sampling time.

This memory is managed as "circular", i.e. the gauge stores the last 30 minutes. Once the memory is full, the gauge begins overwriting the first-sampled data.

For such a reason, it is strongly recommended to clear the logger's memory after each download (please, refer to chapter "Run download" for further information).

Maintenance

Your MyChron 3 660 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 and to change the display unit batteries when the low battery indicator appears on the top right hand corner of the display.

How to upgrade the firmware
To upgrade the firmware, please visit to our website and download the latest firmware version. The file you have to download is an EXE file, and it is called "**FIRMUP_DRAG_yymmdd.EXE**" (yymmdd = year – month - day).

Connect **MyChron 3 660** to your PC using the USB cable.
Now you may run **FIRMUP** by double-clicking on it and the system will automatically upgrade your instrument's firmware.

MyChron 3 660 and the PC

MyChron 3 660 has been designed and engineered to be interfaceable with a PC: through an USB cable it is possible to connect your **MyChron 3 660** to a PC in order to download the data stored in the gauge's memory.

AIM has written a new software specific for dragster racing data called **DragAnalyzer**. The software, free of charge and constantly updated, may be freely downloaded from our website.

DragAnalyzer has been designed and developed to guarantee the maximum working reliability and its proper working has been tested with the following OS: Microsoft Windows 98 SE ™, Windows 2000 ™, Windows Me ™, Windows XP ™.

Microsoft Windows 95 ™, Windows 98 First Edition ™, Windows NT ™ and other operative systems (Linux, Macintosh ™, etc…) are not supported.

In the following pages it will be shown how to install the software on your PC and how to correctly download data from MyChron 3 660 onto your PC.
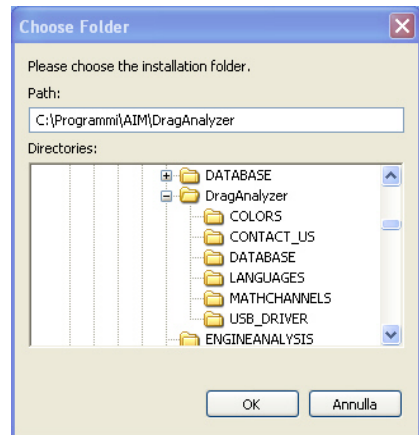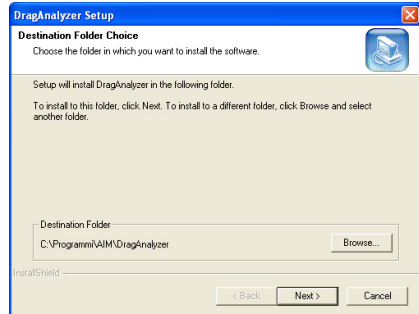
DragAnalyzer installation

To install **DragAnalyzer**, insert the CD-ROM inside the CD-ROM drive: if on your PC the *autorun* option is enabled (most of cases), the software installation will automatically start, otherwise browse your CD and click twice on the EXE file (DragAnalyzer_xxxxx_yymmdd.exe).

The 1st screenshot that will appear on your PC's monitor concerns the destination folder. If you click on [Next >] button, the software will be installed inside the default directory "C:\Program files\AIM\DragAnalyzer".

Otherwise, if you prefer to install the software in another directory, please press button [Browse], select the desired installation folder and press [OK].

It is strongly recommended to install DragAnalyzer inside the default directory.

Press [Finish] to complete the software installation.
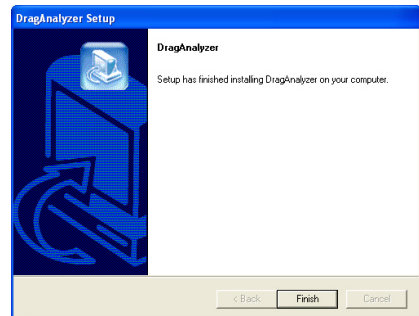
In order to run **DragAnalyzer**, click twice on the **DragAnalyzer** icon on your computer's desktop, or click "Start / Programs / AIM / DragAnalyzer".

If you wish to uninstall **DragAnalyzer** from your PC, enter Check Panel Mode (click Start / settings / Control Panel) and click on Software Installation icon. Now select **DragAnalyzer** from the program list and push button *Install / Remove*: the software will be automatically removed from your computer.

If you wish to update **DragAnalyzer**, please connect to our website and go to "Download" page, where it is possible to download the latest updates. To install the update file, click twice on the downloaded file and follow the instructions prompted on your PC's monitor.

USB drivers installation

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

Connect your **MyChron 3 660** to the PC's USB port using the USB cable furnished as equipment.

When the PC and the instrument are **switched off**, connect your **MyChron 3 660** to the PC's USB and then switch on both computer and **MyChron 3 660** (it is suggested to switch on before the PC and later on the gauge).

During the gauge's start-up, the operative system will recognize a new hardware and will ask you to install the proper driver, which is available either in the

DragAnalyzer installation CD-ROM or in the "C:/Program files / AIM / DragAnalyzer / USB_DRIVER" folder on your PC.

The driver file name is *WDUSB522.inf*.

In the following pages there are three examples concerning the USB drivers installation for the following Operative Systems: Microsoft **Windows 98 SE ™,** Microsoft **Windows 2000 ™** and Microsoft **Windows XP ™**.

How to install the USB Driver for Windows 98 SE ™:

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 **DragAnalyzer** 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 **DragAnalyzer**. 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 C:\Program files\AIM\DragAnalyzer\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 C:\Program files\AIM\DragAnalyzer\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 appears "Found new Hardware wizard".
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 C:\Program files\AIM\DragAnalyzer\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 C:\Program files\AIM\DragAnalyzer\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 3 660** is switched on, in your PC's Device manager window (click Start \ Settings \ Control Panel \ System \ Device manager) you will find the voice **HID (Human Interface Device) Class** and, in subnode, **AIM**

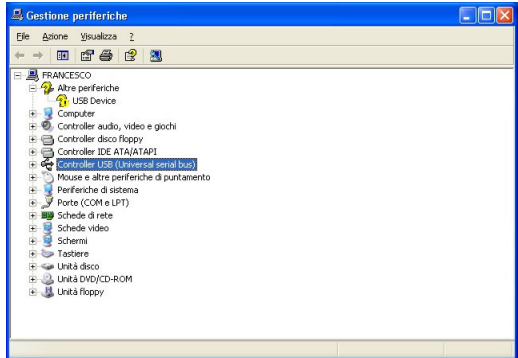**logger**, as shown in this screenshot.
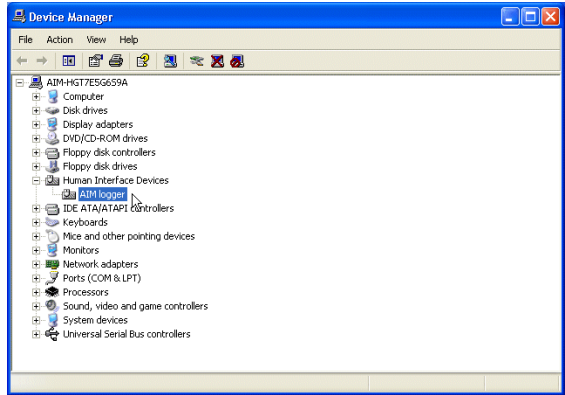
USB drivers troubleshooting

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

1. Once connected **MyChron 3 660** 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 3 660** are switched on.
    c. If **MyChron 3 660** 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 3 660** 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 manager): 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 3 660**, 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 **DragAnalyzer** CD-ROM drive.

3. In case your PC has not been able to automatically recognize your **MyChron 3 660** 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. **DragAnalyzer** CD-ROM drive).

4. The USB driver **WDUSB522** does not have a "digital signature". In some cases **Windows XP ™** or **Windows 2000 ™** 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 ™** OS, 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" and press "OK".
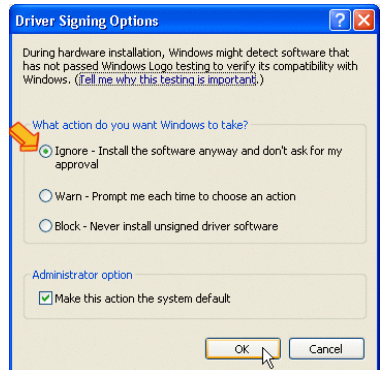
5. If you have a PC (both laptop or desktop) equipped with **Microsoft Windows XP ™** operative system, it is strongly suggested to disable the USB root Hub power management feature. In order to disable this function, proceed as follows:

- Click Start / Settings / Control Panel / System / Device manager.
- Left click on the "+" aside of "Universal serial bus controller".
- Right click on the "USB root hub" feature. (**This procedure has to be repeated for all the "USB root hub" features**).
- Select the "Properties" function.
- Select the "Power management" tab.
- If enabled, please DISABLE the checkbox "Allow the computer to turn off this device to save power".
- Click *OK*.
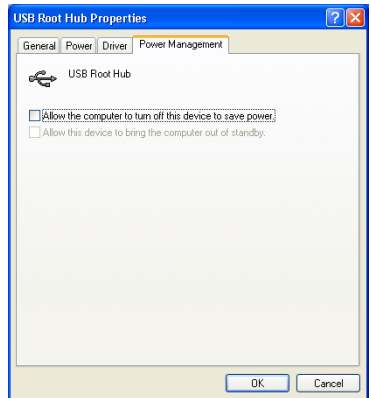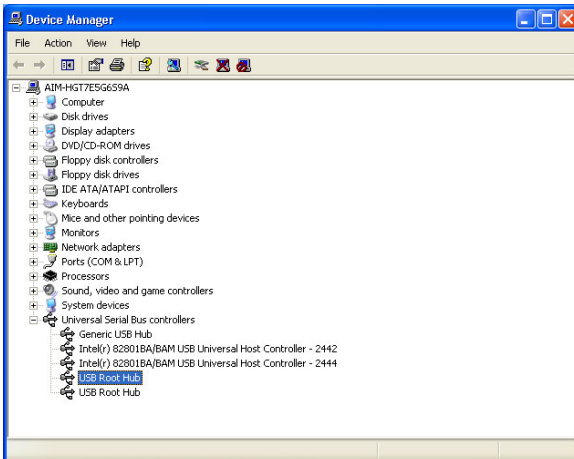
How to download a run on your PC

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

In order to correctly download these data, please connect your **MyChron 3 660** to the PC's USB port and switch on the gauge.

Run download

If you wish to download the recorded runs on your PC, please run **DragAnalyzer** and, then, click on the "Download" button, located in the buttons toolbar (or click File / Download): the file download will automatically start and it will appear this screenshot.
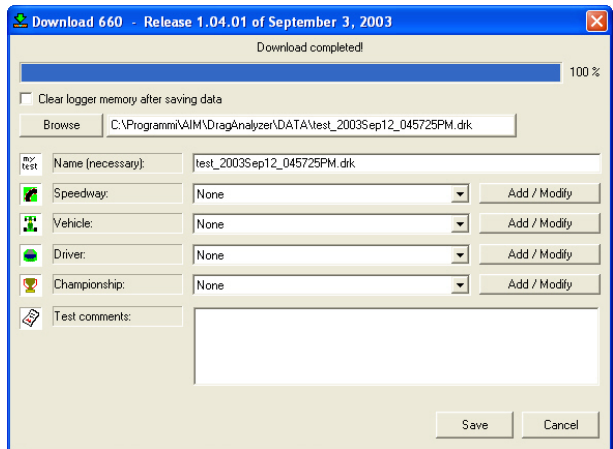
- In the window's upper part you can see a "wait-bar" which informs you on the download percentage status;

- Right below the wait-bar there is a checkbox (checked as a default) which strongly recommended to clear the logger's memory after each download;

- Once the download has completed, the *Save* button, located in the lower right corner of the window, will become enabled. If you press this button

without specifying the file name and the download folder, the file will be automatically saved in the default folder "C:\Program files\AIM\DATA\ \DragAnalyzer\ DATA". The default file name specifies the download date (year – month – day and hour – minute – seconds – PM/AM).

- If you wish to save the file with another name, please write the file name inside the "Name" textbox. Moreover, if you wish to save the file in custom folder, press button "Browse" and choose the destination folder.

How to insert a test in the database

DragAnalyzer has inherited from the worldwide-known software **Race Studio 2** a new and innovative data storing system based on databases.

This storing system allows the user to save the file 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, for instance, to the *Speedway* 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 Speedway 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.
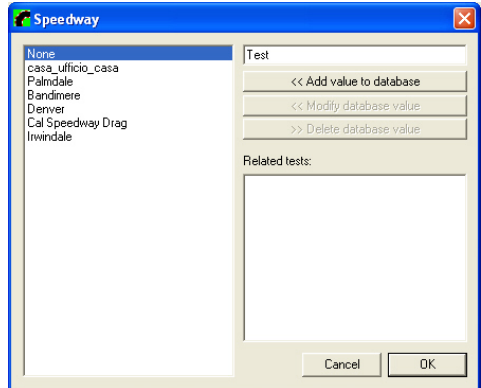
How to use DragAnalyzer

This chapter describes how to use **DragAnalyzer** in order to obtain the maximum amount of information from the test file.

This software has been designed focusing our attention on usability and ease of use, minimizing the number of clicks it takes for you to get the information you need, and get it quickly.

If you wish to update **DragAnalyzer**, please connect to our website where it is possible to download the latest updates free of charge. To install the update, click twice on the downloaded file and follow the instructions prompted on your PC's monitor.

If you wish to run **DragAnalyzer**, please double click on the corresponding icon (shown on the right) located on your PC's desktop.

It is also possible to run DragAnalyzer clicking the following shortcut "Start \ Program \ AIM \ DragAnalyzer \ DragAnalyzer"."

How to load a test

Once you started **DragAnalyzer**, it will be prompted the "Test/Run manager" screenshot, shown in the following page.

In order to load a run you may

- double click on the desired one;

- select one run and click the "LOAD" button in the upper toolbar

- Select the desired run, right click and choose the "LOAD" function.
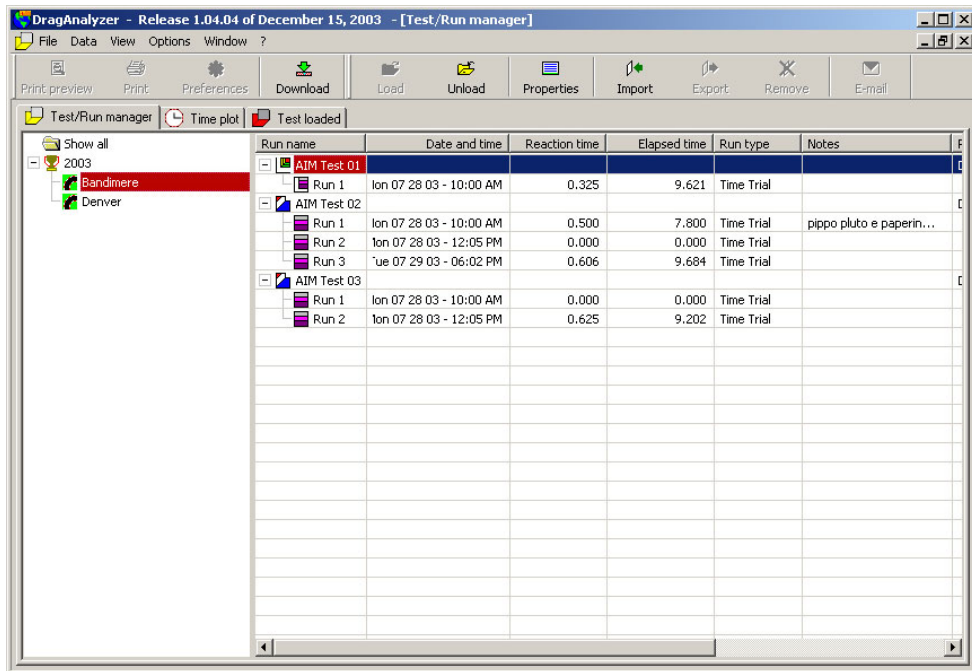
As shown in the previous screenshot, the "Test/Run manager" layer is divided into 2 separate parts: on the left it is shown the track name (left click on the track name to select the desired one) while on the right there's a list of all the runs which belong to that track.

How to plot a run

Once a run has been loaded, it will be prompted the "Time Plot" window, shown in the following screenshot.
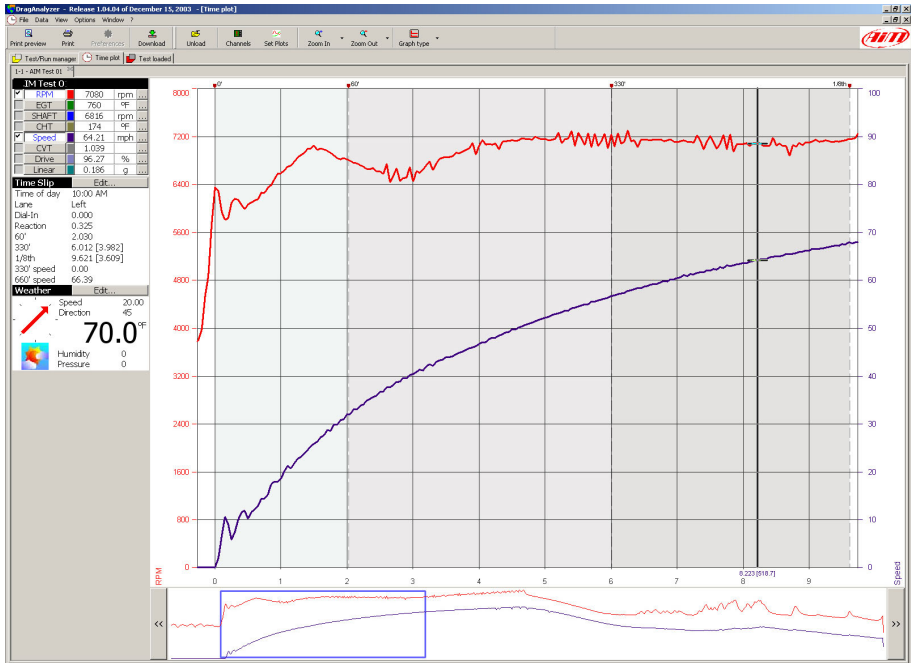
The "Time plot" feature allows the user to plot an input channel (Engine RPM, Jackshaft RPM, EGT or CHT temperature, clutch slip or linear acceleration) vs. time.

The user may choose the channel to be plot on the graph left-clicking on the channel name inside the "available measurements" toolbar (located in the upper left corner of the "Time plot" window).

In order to plot the scale together with the input channel, please enable the checkbox aside the desired channel inside the "available measurements" toolbar.

Left click inside the graph to show a vertical cursor. Along the abscissa axes it will be shown the time and distance (calculated from the start line) value corresponding to that position. Moreover, the measurements displayed inside the "available measurements" toolbar are linked to the cursor movement, showing the current value corresponding to the selected track position.

In the lower part of the "Time plot" window it is displayed the "Run toolbar", which is a graph showing the complete time history of the loaded run.
The user may drag and drop the blue square drawn inside the "Run toolbar": the graph displayed inside the "Time plot" window will move together with the dragged window.

How to modify a plot

DragAnalyzer has been designed to guarantee the maximum ease of use, minimizing the number of clicks it takes for you to get the information you need.

For instance, if you wish to **change the graph color** you may left click on the coloured-boxes column aside of the channel names: you may set the desired colour for each recorded run and for each sampled channel.
Moreover, if you wish to zoom in or zoom out the graph, you may click the 2 buttons located inside the buttons toolbar. DragAnalyzer allows the user to

choose among 7 predefined zooms: **2** seconds window, **4**, **6**, **8**, **10**, **14** and **20** seconds. For instance, if you were looking a graph inside a 10 seconds window and you click the "Zoom in" button, the "Time plot" will change to an 8-seconds window.

Otherwise, if you wish to change other run parameters, you may right click on the channel name inside the "Available measurements" toolbar or click the "Channels" button inside the buttons toolbar. The "Measure information" window (shown here aside) will be displayed.

This function allows the user to change the channel name, the plotting scale, 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).

If you wish to change the plot settings, such as the line width, the plot background or the plot grid, please click the "Set plots" button inside the buttons toolbar.
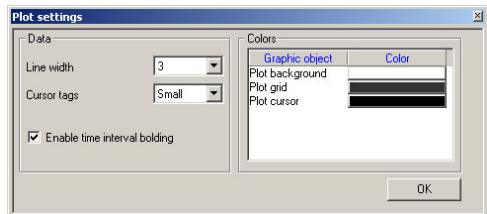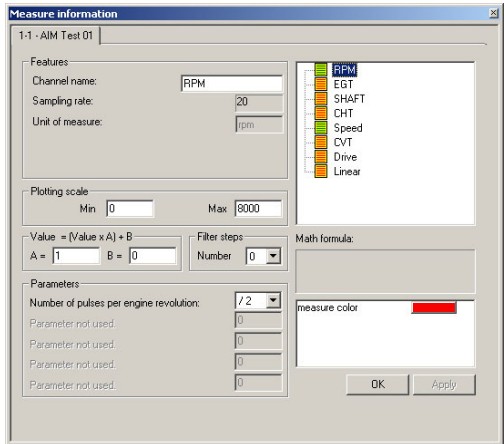
How to set the test parameters

Once you finish a run, a time slip will be handed to the pilot. DragAnalyzer has been designed to allow you to insert these data (reaction time, 60' – 330' time, $1/8^{th}$ time, 330' – 660' speed) inside the test file in order to let you improve the driver's performances and the dragster's setup.

If you wish to insert these data inside the test file, please left click on the "EDIT" button aside of the "Time Slip" toolbar (left column).
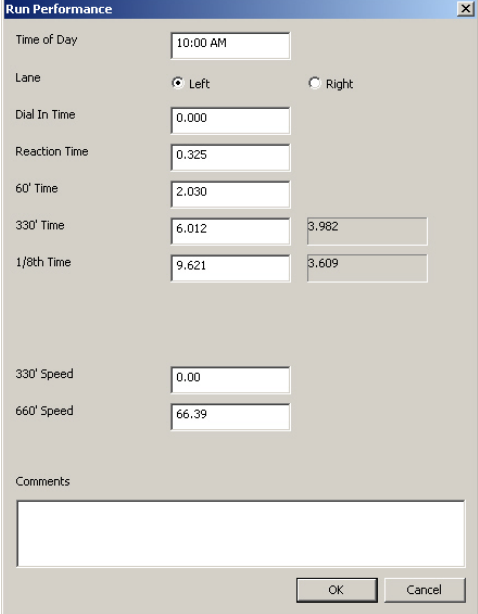
The "Run Performance" window will be prompted.

Please, fill all the boxes with the time of day, the reaction time, the 60' – 330' – 660' time, the 330' – 660' speed and, if you wish, some personal notes in the "Comments" box.

Once filled all the boxes, press button "OK" to save this information.

Now, please go to "Time plot" layer: you will see that the plot area is divided into 4 different-coloured parts:

- before and after the run, the plot background is white coloured;
- from the start line to the 60' line, plot background is green/grey coloured;
- from the 60' line to the 330' line, plot background is light grey coloured;
- from the 330' line to the finish line, plot background is medium grey coloured.
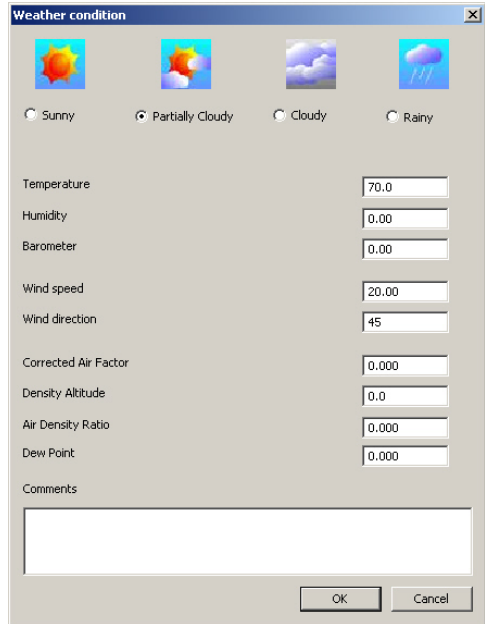
Moreover, the user is allowed to set the weather conditions, in order to be able to correlate the test performances (reaction time, linear acceleration, engine's setup) even to the atmospheric conditions.

If you wish to set these parameters, please press the "EDIT" button aside of the "Weather" toolbar (left column).

How to send the test file via E-mail

DragAnalyzer has been designed to be as easy as possible.

If, for instance, you have a problem with a test file (you can't open it, the recorded data do not seem to be correct or you simply need help) you may send us the file via e-mail just clicking one button.

Please, go to "Test/Run Manager" layer and select the test you wish to send us among the available one. The selected file will become red-highlighted.
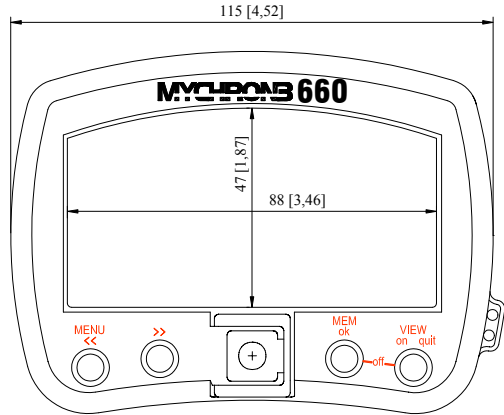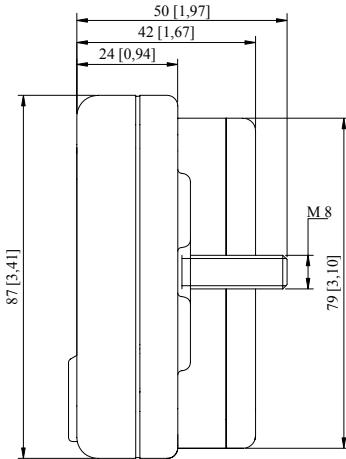
Now, before sending the DRK file, please ensure that your PC is connected to Internet and, then, press button "E-mail" (located inside the button toolbar).

NOTE: it is reminded that you may not send a file if it is loaded. In this case, please unload it and, then, send it via e-mail.

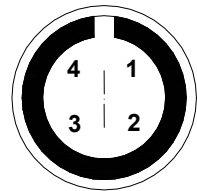# Appendix A: Technical characteristics

Dimensions

50 [1,97]
42 [1,67]
24 [0,94]
87 [3,41]
M 8
79 [3,10]

115 [4,52]
47 [1,87]
88 [3,46]

MYCHRON 660

MENU
<<
>>
+
MEM
ok
VIEW
on quit
off

Dimensions in millimetres [inches]
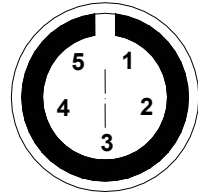
Connector details (Speed channel)

Pin	Function	Pin	Function
1	Speed	3	V battery
2	GND	4	n.c.

**Female 4-pins connector
pinout (external view)**

Connector details (Temperature channel)

Pin	Function	Pin	Function
1	+ TC1	4	- TC2
2	- TC1 / - TR1	5	+ TC2
3	+ TR1		

Female 5-pins connector pinout (external view)

Note: TC = ThermoCouple   TR = Thermoresistor

Technical characteristics

General characteristics	Value
Input channels	4: RPM, speed, 2 temperatures
Internal battery	2 AAA 1.5 V, alkaline
Working time	About 40 hours of use
Internal memory	192 kbytes
PC interface	USB port
Sampling freq. per channel	20 Hz
Total sampling frequency	80 Hz

Other characteristics	Value
MyChron 3 660 dimensions	115x87x42 mm
Display dimensions	88x47 mm
Environmental	IP 65
Weight	300 g (batteries included)