Kit Plug&Play – Suzuki GSX-R K5

GSX-R 600 2006/2007

GSX-R 750 2006/2007

GSX-R 1000 2005/2006

User Manual

SUMMARY

PRESENTATION

AIM: a world leader in data acquisition for racing applications.

Established in 1976, nowadays AIM is a world leader in producing high performing loggers for racing application: dashboards, data loggers, digital displays, lap timers.

AIM established new standards in a lot of motor sports: from karts to car, bikes, dragsters, Formula 1 Boat, offshore and even snowboards!

AIM products merges the functionalities of traditional tachometers, RPM, temperature and pressure indicators and lap timers with compact units, high performing and easy to use. Different products for different applications but with a shared characteristics: the great innovation.

Each AIM system is completely designed, realised and tested by its technicians. The Research and Development board is made of Electronic and mechanic engineers, physics and other specialists that develop software, firmware and the related documentation. Our reputation is build on quality products, innovative technologies and on the steady engagement in customer support.

Introduction

MXL Plug&Play kit for Suzuki GSX-R K5 is the dashboard, with data acquisition in Pista version, designed for an easy and quick installation: with the minimum effort it will be possible to connect directly to the bike ECU and show - without additional sensors and depending on the model:

MXL Strada

- RPM
- Speed
- Water temperature
- Oil pressure Alarm
- Fuel level alarm
- Turning Lights
- High Beam ON/OFF
- Engaged gear
- 4 free channels

MXL Pista

- RPM
- Speed
- Water temperature
- Oil pressure alarm
- Engaged gear
- Lateral acceleration
- 6 free channels

The logger, like the stock dashboard, is powered by the bike master switch.

MXL Strada/MXL Pista kits for Suzuki GSX-R K5 have been developed for the following bike models:

Displacement	Year 2005	Year 2006	Year 2007
600	See K3 Manual	✓	✓
750	See K3 Manual	✓	✓
1000	✓	✓	See K7 manual

✓ = supported.

Note: thanks to the infrared transmitter/receiver (included in **MXL Pista** kit, optional to **MXL Strada** kit), it is possible to sample/record lap times.

For anything not expressly explained in this user manual, please refer to **MXL** or to **Race Studio Configuration** user manual.

WARNING: the information concerning installation and configuration of MXL Strada/MXL Pista Plug&Play kits for Suzuki GSX-R K5 included in this user manual distinguish the kits depending on their wiring codes. Kit identified by 04.554.54 and 04.554.55 wiring codes are currently produced and sold while kits identified by 04.554.13 and 04.554.14 wiring codes are not produced and sold anymore: these instructions have an only explicative function. This means that any kit bought after the publishing of this user manual, release 1.07 or later, includes a wiring whose identification code can only be 04.554.54 or a 04.554.55.

1 – Plug&Play kit content

The composition of Plug&Play kits for Suzuki GSX-R K5 varies depending on the chosen MXL version and on the bike production year. Each kit includes only some of the items showed in the figure here above, numbered to be more clear.

MXL Strada kit

N.1 – MXL Strada (1)
N.1 – Wiring for MXL Strada Plug&Play GSX-R K5/K7 (2)
N.1 – USB cable for MXL (5)
N.1 – Accessories/optional leaflet (8)
N.1 – Race Studio 2 Software CD (9)
N.1 – Bracket kit (10), including:
- 1 – MXL bracket
- 2 – Spacing collars for Suzuki GSX-R
- 4 – M4*8 Phillips recess cup head screws
- 2 – M5*20 Phillips recess cup head screws
- 1 – Black EPDM washer
- 2 – M5 washer

MXL Pista kit

N.1 – MXL Pista (1)
N.1 – Wiring for MXL Pista Plug&Play GSX-R K5/K7 (2)
N.1 – Infrared transmitter (3)
N.1 – Infrared receiver (4)
N.1 – Transmitter Power cable (6)
N.1 – TPS – throttle position sensor – cable (7)
N.1 – USB cable for MXL (5)
N.1 – Accessories/optional leaflet (8)
N.1 – Race Studio 2 Software CD (9)
N.1 – Bracket kit (10), including:
- 1 – MXL bracket
- 2 – Spacing collars for Suzuki GSX-R
- 4 – M4*8 Phillips recess cup head screws
- 2 – M5*20 Phillips recess cup head screws
- 1 – Black EPDM washer
- 2 – M5 washer

Universal kit (for customers that already own an MXL Strada/Pista):

N.1 – Wiring for MXL Strada/MXL Pista Plug&Play GSX-R K5/K7 (2)
N.1 – Bracket kit (10), including:
- 1 – MXL bracket
- 2 – Spacing collars for Suzuki GSX-R
- 4 – M4*8 Phillips recess cup head screws
- 2 – M5*20 Phillips recess cup head screws
- 1 – Black EPDM washer
- 2 – M5 washer

Optional to MXL Strada kit:

N.1 – Infrared transmitter (3)
N.1 – Infrared receiver (4)
N.1 – Transmitter power cable (6)
N.1 – TPS – throttle position sensor – cable (7)

Note: before installing the kit it is suggested to check that the kits contains all specified items.

1.1 – Part Numbers (see also appendix "A")

Plug&Play kit **MXL Strada for Suzuki GSX-R600/750 K5**: code: **X16MXLSGS0567** (CAN connection and analog channels; technical drawing nr. 04.554.55 – f1/f2).

Plug&Play kit **MXL Strada for Suzuki GSX-R1000 K5**: code: **X16MXLSGS5610** (CAN connection and analog channels; technical drawing nr. 04.554.55 – f1/f2).

Universal kit MXL Strada Suzuki GSX-R600/750/1000 K5 (wiring+bracket) codes: **V02554550K5**+**DNKTSTMXLK5** (to transform an MXL Strada in a Suzuki GSX-R K5 application; technical drawing 04.554.55 f1/f2).

Plug&Play kit **MXL Pista for Suzuki GSX-R600/750 K5**: code: **X16MXLCGS0567** (CAN connection and analog channels; technical drawing nr. 04.554.54 – f1/f2).

Plug&Play kit **MXL Pista for Suzuki GSX-R1000 K5**: code: **X16MXLCGS5610** (CAN connection and analog channels; technical drawing nr. 04.554.54 – f1/f2).

Universal kit MXL Pista Suzuki GSX-R600/750/1000 K5 (wiring+bracket) codes: **V02554540K5**+**DNKTSTMXLK5** (to transform an MXL Strada in a Suzuki GSX-R K5 application; technical drawing 04.554.54 f1/f2).

Optional to MXL Strada Suzuki GSX-R600/750/1000 K5 Plug&Play kit:
Infrared transmitter with 90 cm cable: code: **X41RX12090**
Infrared transmitter: code: **X02TXKMA01**
Transmitter power cable: code: **V02POWTX0**
TPS – Throttle Position Sensor – cable: code: **V02550690**.

2 – Plug&Play kit installation for MXL Strada wiring code 04.554.55 and MXL Pista wiring code 04.554.54

The instructions included in this user manual are intended for an MXL Strada/MXL Pista with **firmware version 14.86.33 or later** and **Race Studio 2** release **2.30.04 or later**.

Suzuki GSX-R K5 Plug&Play wiring has been expressly designed and developed to be absolutely easy to install.

Warning: this kit has been tested to be absolutely compatible with a bike identical to the stock one sold by the manufacturer.

Thanks to the back fixing points of MXL it is possible to replace the stock dash in an easy and quick way.

The logger has to be connected to the chassis of the stock front screen using the bracket included in the kit. The bracket is in black anodized aluminium light weight and mechanically resistant.

GENERAL NOTES – Read these notes before installing the system.

- Do not cut any cable: the cable supplied with the kit is Plug&Play.
- Pay attention not to damage the stock connectors while plugging/unplugging them. In the following pages it's described how to correctly manage them.
- Do not install the system when the engine is hot. The stock connectors are near to the engine and there is burning risk.
- The space under the fuel tank is quite small: pay attention while demounting/ mounting it.
- Pay attention not to loose screws and washers.
- Pay attention not to damage the fairing while demounting/mounting them.

2.1 – Removing the lateral mirrors and fairings and the front fairing.

To disconnect the stock dash and install **MXL** on Suzuki GSX-R K5 bike it is necessary to remove:

- front screen
- lateral mirrors
- lateral fairings
- fuel tank

Note: refer to the bike user manual for further information concerning this step.

2.2 – Removing the stock dash, unplugging the stock connectors

The second installation step is removing the stock dash and disconnecting the stock connectors.

The stock dash is fixed through 3 fixing points red circled in **Figures 1a** and **1b**.

Figure 1a: stock dash fixing points rear view.

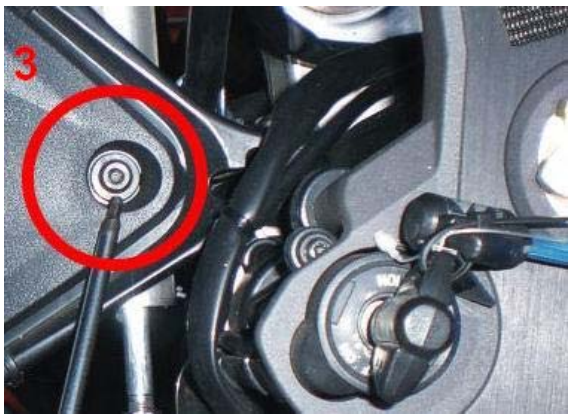


Figure 1b: particular of fixing point labelled “3” front view.

Once the stock dash has been removed, unplug the 16 pins AMP bike stock connector from the dash back.

Remove the cover as shown in **Figure 2** and pull down the tongue (highlighted in red): unthread the dash connector.

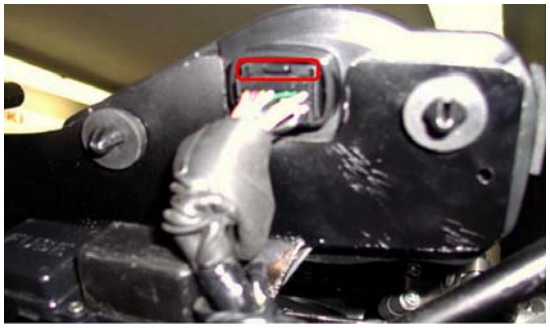


Figure 2: unplugging the 16 pins AMP connector from the stock dash.

2.3 – Milling the chassis that supports the stock dash

The lap connector is under the chassis that supports the stock dash. This is why the third installation step is milling a part of this chassis to connect “Lap” cable to the stock connector. In **figure 3** the part of the chassis to be milled is highlighted (2). Pay attention not to damage the anti-vibration mounting (1) while milling the chassis.

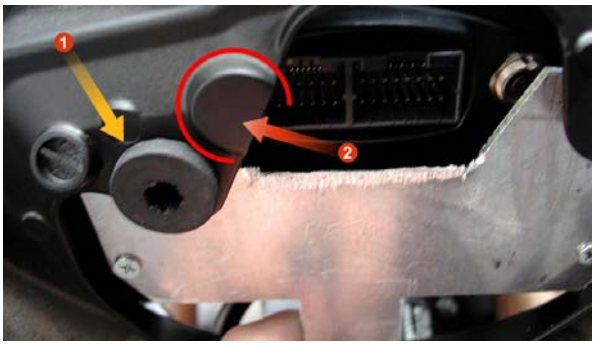


Figure 3: chassis to be milled (2) and anti-vibration mounting (1).

2.4 – Assembling the kit

The fourth installation step is assembling the kit. It has four anti-vibration mounting already mounted on the back of **MXL**. Install **MXL** on its bracket and fix this last one in correspondence of the four anti-vibration mountings using the Phillips recess cup head screws and the washers included in the kit.

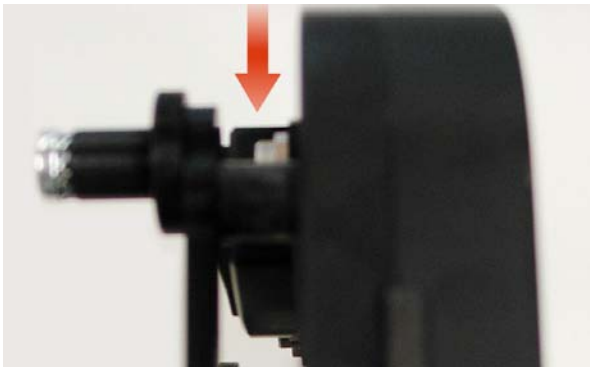


Figure 4: anti-vibration mounting particular.

Figure 5 shows **MXL** correctly assembled with bracket and washers (rear view).

Figure 5: MXL and bracket – rear view.

2.5 – Connecting the cables

The fifth installation step is installing the wiring supplied with the kit.
The wiring is wrapped in a plaited protective covering. Bent it and let it pass on the bike right side.

Figure 6: wiring installation.

Connect the 16 pins connector (previously unplugged from the stock dash) to the male connector placed in the black aluminum box of **MXL** wiring as shown in **figure 7**: press until you hear a click.
Use the stock dash plastic cover to make the connection waterproof.

Figure 7: wiring connection.

Let the wiring run between the high beam and the front fairing (figure 8).

Note: the 2 AMP connectors, the wiring labelled “Lap” and the stock wiring (ending with a channel interface wiring) are too big to pass between the high beam and the front fairing. It is suggested to insert the wiring from above.

Figure 8: kit installation.

2.6 – Installing the wiring

To install the wiring follow this procedure. It shows a black ground cable labelled “GND” that needs to be directly connected to the negative pole of the bike battery, as shown in the images below.

The cable highlighted by the arrow in **figure 14** is external to the wiring.

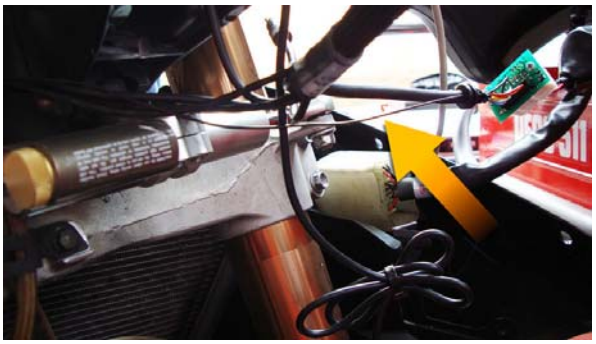


Figure 9: the ground black cable.

Let it run along the bike chassis, as indicated in **figure 10**, until the bike battery.

Figure 10: the ground cable runs along the chassis.

Once reached the battery connect it to the negative pole (**figure 11**).

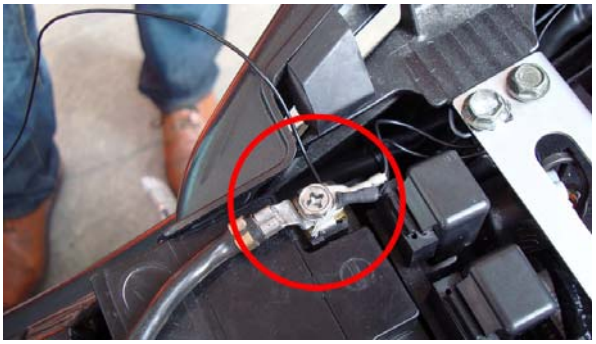


Figure 11: the connection of ground cable to the battery negative pole.

In **figure 12** the external ground cable correctly connected to the battery negative pole is shown.

Figure 12: ground cable correctly connected.

2.7 – Installing the TPS cable (included in the kit for MXL Pista)

Warning: before installing this cable it is necessary to demount the bike fuel tank. Refer to the bike user manual for further information on the subject.

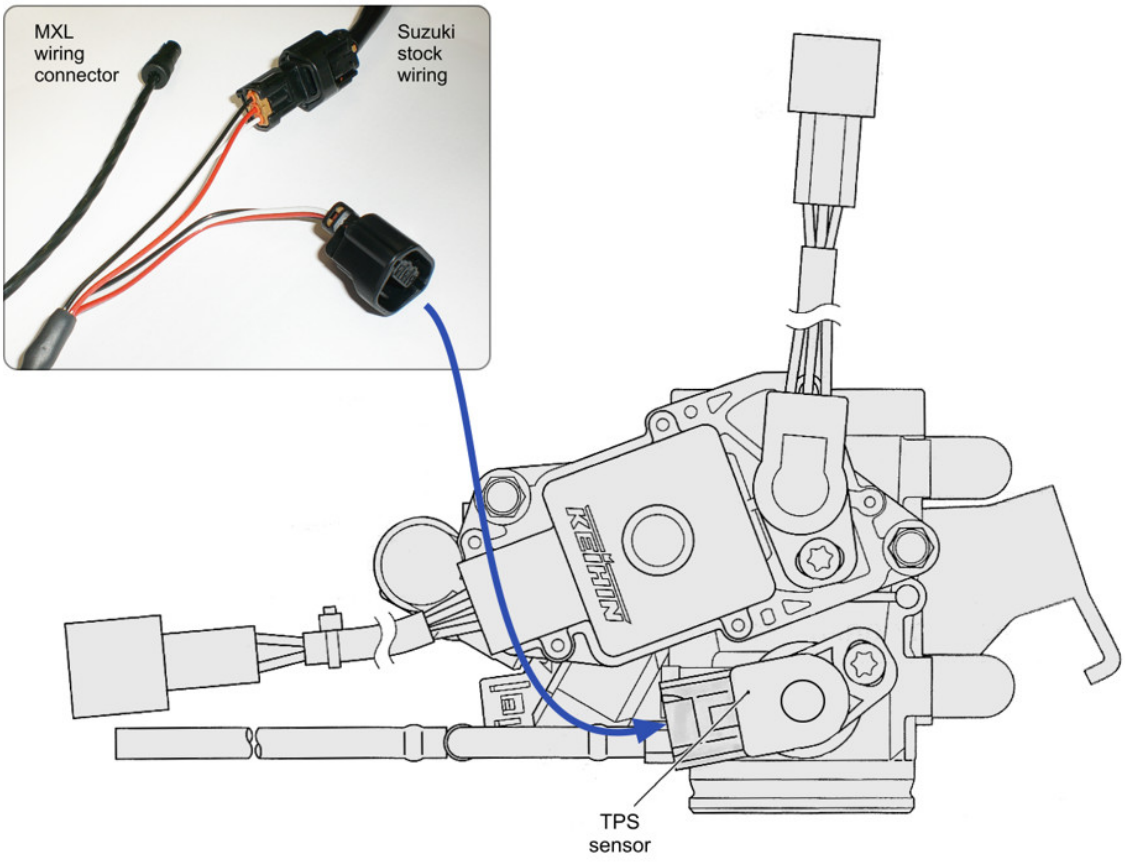


Figure 13: TPS cable installation.

Unplug the original Suzuki wiring from TPS sensor and connect it to the male connector of MXL wiring for TPS sensor (as indicated in the box of figure 13).

Connect the female connector of MXL wiring for TPS sensor to the same sensor (as highlighted by the blue arrow).

Connect the 4 pins male plastic Binder connector to one of the free channels depending on the model of MXL (see “Channels” chapter).

For further information concerning the configuration of the channel the TPS sensor is installed on, refer to the related chapter of this user manual.

3 – Plug&Play kit installation for MXL Strada wiring code 04.554.14 and MXL Pista wiring code 04.554.13

WARNING: kit whose wiring is identified by codes 04.554.13 and 04.554.14 is no more in production and this chapter - like the one concerning the logger configuration - has just an explicative function for customers owning this kit.

Suzuki GSX-R K5 Plug&Play wiring has been expressly designed and developed to be absolutely easy to install.

Warning: this kit has been tested to be absolutely compatible with a bike identical to the stock one sold by the manufacturer.

Thanks to the back fixing points of MXL it is possible to replace the stock dash in an easy and quick way: each component is Plug&Play.

The logger has to be connected to the chassis of the stock front screen using the bracket included in the kit. The bracket is in black anodized aluminum light weight and mechanically resistant.

GENERAL NOTES – Read these notes before installing the system.

- Do not cut any cable: the cable supplied with the kit is Plug&Play.
- Pay attention not to damage the stock connectors while plugging/unplugging them. In the following pages it's described how to correctly manage them.
- Do not install the system when the engine is hot. The stock connectors are near to the engine and there is burning risk.
- The space under the fuel tank is quite small: pay attention while demounting / mounting it.
- Pay attention not to loose screws and washers.
- Pay attention not to damage the fairing while demounting/mounting them.

3.1 – Removing the lateral mirrors and fairings and the front fairing.

To disconnect the stock dash and install **MXL** on Suzuki GSX-R K5 bike it is necessary to remove:

- front screen
- lateral mirrors
- lateral fairings
- fuel tank

Note: refer to the bike user manual for further information concerning this step.

3.2 – Remove the bike seat and the fuel tank

To reach stock connectors (water, gear and TPS) it is necessary to remove the bike seat and the fuel tank.

Note: refer to the bike user manual for further information concerning this subject.

3.3 – Removing the stock dash, unplugging the connectors

The third installation step is removing the stock dash and unplugging its connectors.

The stock dash is fixed to the bike through three fixing points.

In **figure 14** the back and the front anchor points of the stock dash are red circled.

Figure 14: the stock dash has been removed

When the stock dash has been removed it is needed to unplug the 16 pins AMP connector from the same dash back side.

Remove the protective cover as shown in **figure 15** and pull down the tongue (highlighted in red): unthread the connector from the dash.

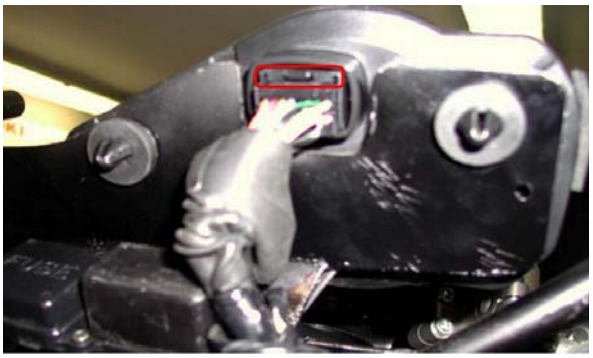


Figure 15: unplug the stock dash.

Figure 16 shows the position of gear and water temperature stock connectors.
For further information concerning the stock connectors refer to **figures** from **17** to **19**.

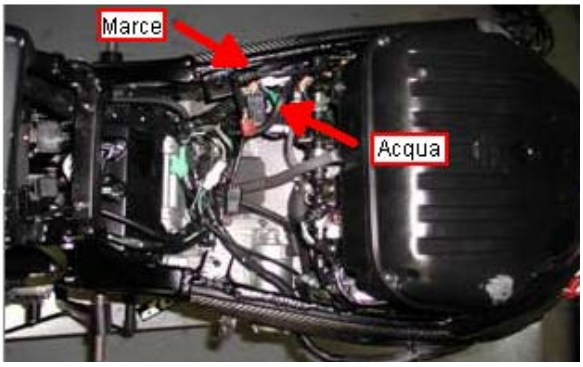


Figure 16: stock connectors position.

The stock gear connector is a 3 pins white one placed on the bike left side (**figure 16**). Here below male and female gear connectors are drawn.
Note: cable colours correspond to the real ones.

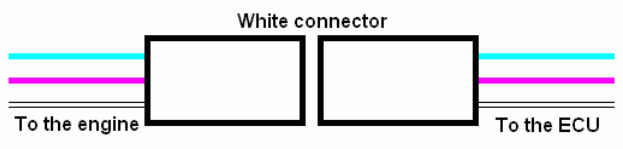


Figure 17: gear connector – particular.

How to unplug a 3 pins connector.
3 pins male and female connectors are strictly fixed. To disconnect the male from the female use a flat screwdriver: pull down the tongue and unplug the connectors.
Warning: to unplug the connectors unplug the plastic cases and not the cables, that could disconnect seriously damaging the wiring.

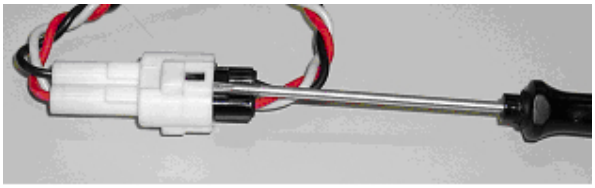


Figure 18: how to unplug a connector.

Stock water temperature connector, shown in **figure 19**, is green, has 2 pins and is placed on the left part of the engine cylinder block of the bike. (**figure 16**).
Here below the stock water temperature connector is drawn.
Note: cable colours correspond to the real ones.

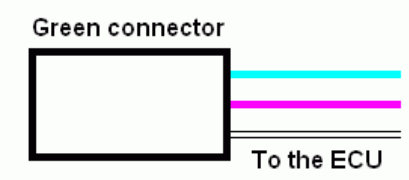


Figure 19: water temperature connector – particular.

3.4 – Milling the chassis that supports the stock dash

The lap connector is under the chassis that supports the stock dash. This is why the fourth installation step is milling a part of this chassis to connect “Lap” cable to the stock connector. In **figure 20** the part of the chassis to be milled (2) is highlighted. Pay attention not to damage the anti-vibration mounting (1) while milling the chassis.

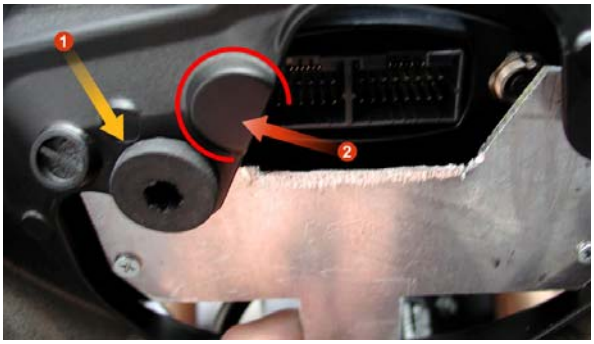


Figure 20 - chassis to be milled (2) and anti-vibration mounting (1).

3.5 – Assembling the kit

The fifth installation step is assembling the kit for Suzuki GSX-R. It has four anti-vibration mounting already installed on the back of **MXL**.

Install the logger on its aluminium bracket in correspondence of the four anti-vibration mounting, using screws and washers included in the kit.

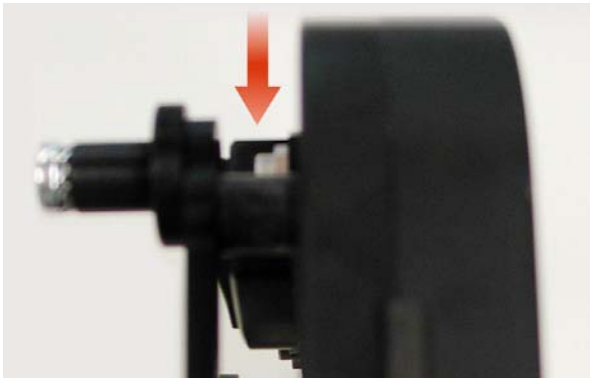


Figure 21 – anti-vibration mounting particular.

Figure 22 shows **MXL** correctly assembled with bracket and washers (rear view).

Figure 22 – MXL and bracket – rear view.

3.6 – Connecting the cables

The sixth installation step is installing the wiring included in the kit.
The wiring is all wrapped in a plaited protective covering. Bent it and let it run along the bike right side.

Figure 23 – Wiring installation.

Connect the 16 pins black AMP connector (previously unplugged from the stock dash) to the male one placed in the black aluminum box of **MXL** wiring shown in **figure 24**: press until you hear a click.
Use the plastic cover of the stock dash to make the connection waterproof.

Figure 24 – wiring installation – particular of AMP connector.

Connect male and female water and gear connectors (these green and white previously disconnected) to the related connectors of **MXL** wiring.
Let cables labelled “Gear”, “Water Temp” etc… run along the bike chassis as shown in **figure 25**. Use plastic wrappers to fix them to the bike stock wiring.
“Gear” and “water temperature” stock connectors are under the fuel tank: let them enter the engine compartment as shown in **figure 25**.

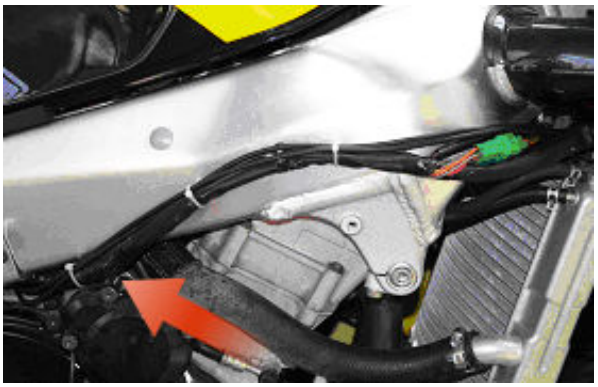


Figure 25 – wirings running along the bike chassis.

Let all cables (except for “Lap” one”) run between the high beam and the front fairing (**figure 26**).

Note: the 2 AMP connectors, cable labelled “Lap” and stock wiring (the one ending with a black channels interface box) are too big to pass between the high beam and the chassis. It is suggested to insert the wiring from above.

Figure 26 – kit installation.

3.7 – Installing TPS cable (included in the kit for MXL Pista)

Warning: before installing this cable it is necessary to demount the bike fuel tank. Refer to the bike user manual for further information on the subject.

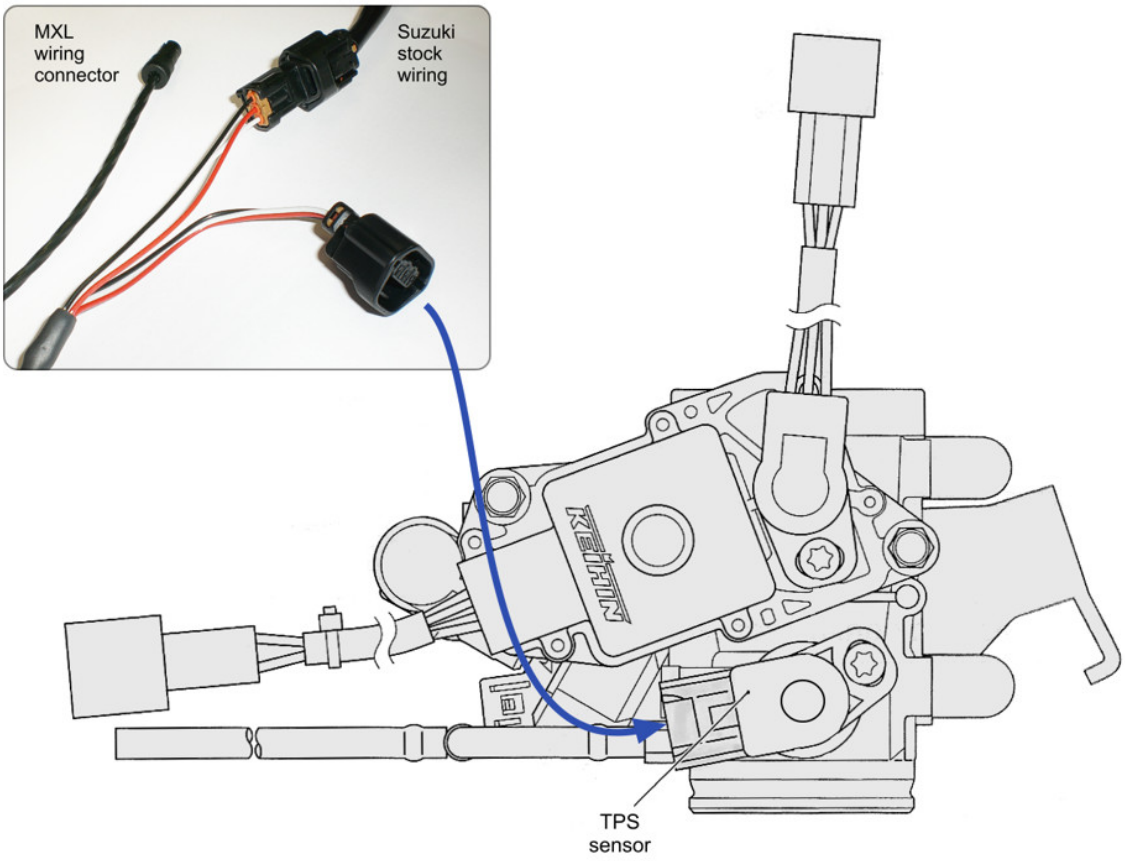


Figure 27: TPS cable installation.

Unplug the original Suzuki wiring from TPS sensor and connect it to the male connector of MXL wiring for TPS sensor (as indicated in the box of figure 27).

Connect the female connector of MXL wiring for TPS sensor to the same sensor (as highlighted by the blue arrow).

Connect the 4 pins male plastic Binder connector to one of the free channels - depending on the model of MXL (see “Channels” chapter).

For further information concerning the configuration of the channel the TPS sensor is installed on, refer to the related chapter of this user manual.

4 – MXL inputs

Thanks to interface cables included in Suzuki GSX-R K5 Plug&Play kit, data acquisition is really easy and quick. The image below shows all inputs that allow data visualization on **MXL**.

Figure 28: MXL Strada/MXL Pista: rear view.

- Lap connector (1): allows lap time detection;
- External expansion Modules connector (2): allows the connection with all expansion modules that communicate through the CAN bus (GPS, lambda probe);
- AMP 12 pins female connector (3) AIM wiring supplied with the kit;
- AMP 16 pins female connector (4) AIM wiring supplied with the kit.

5 – MXL Suzuki GSX-R firmware

MXL Strada/MXL Pista for Suzuki GSX-R K5 is equipped with a special firmware version that supplies the logger with a second virtual dashboard.

Note: **MXL firmware** version has to be **14.86.33 or later**.

On the street the display is set on “street mode” and shows the following parameters:

- Bar graph with configurable scaling: **black**;
- RPM digital value/ battery voltage/ total and partial odometer/ date and time: **fuchsia** (use VIEW/QUIT button to switch between the options).
- Speed: **red**
- Engaged gear: **green**.
- Analog channels always on top, depending on **MXL** model: **bleu**.
- Up to 4 fields shown on demand and selectable by the drop down menu of System Configuration window of **Race Studio 2**. Use “>>” button to switch between the fields.

Figure 29 – Display on street mode.

On track, passing by a switched on transmitter, the display switches automatically on “track mode” and shows lap time in spite of odometer.

Figure 30 – Display on track mode.

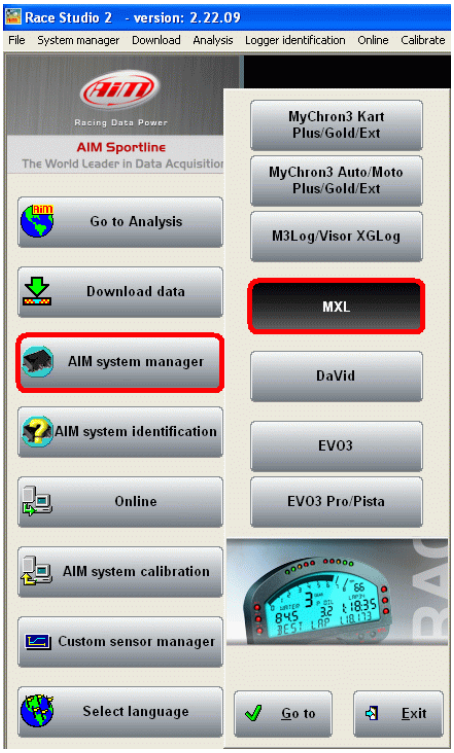
Visualization mode (street/track) is set via software and stored by the logger. Default setting is show odometer (street mode). If user sets show lap time (track mode) via software, this setting is restored at each switch on, no matter if the bike is on track or not.

Note: for further information concerning display management and its configuration refer to **MXL** and/or **Race Studio Configuration** user manual.

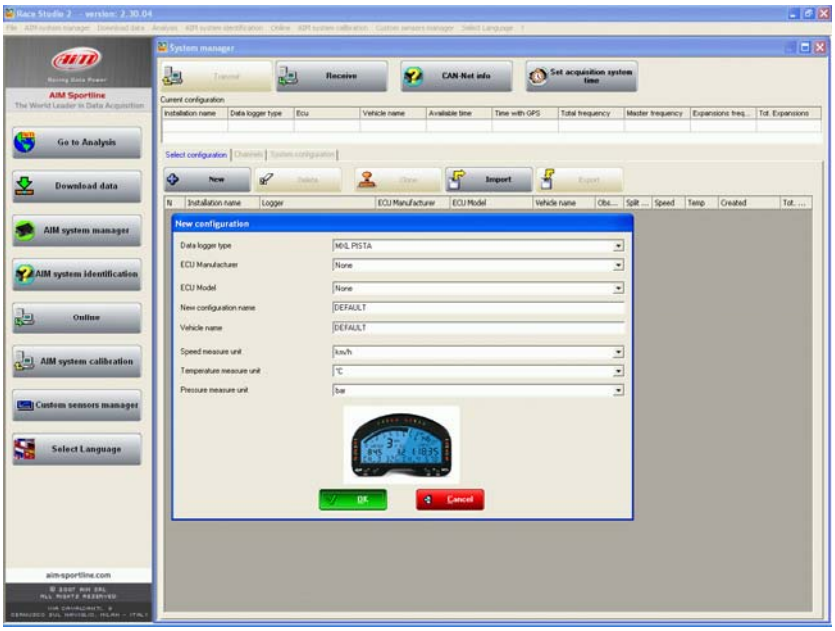
6 – Suzuki GSX-R kits configuration: MXL Strada wiring code 04.554.55 and MXL Pista wiring code 04.554.54.

When **MXL** has been installed it is ready to work thanks to the default configuration. In case a custom configuration is needed, follow these instructions.

- Run **Race Studio 2 software** (release **2.30.04 or later**).
- Press “AIM system manager” button on the left vertical toolbar.
- Select **MXL** icon from the panel that appears on the right of the vertical keyboard.

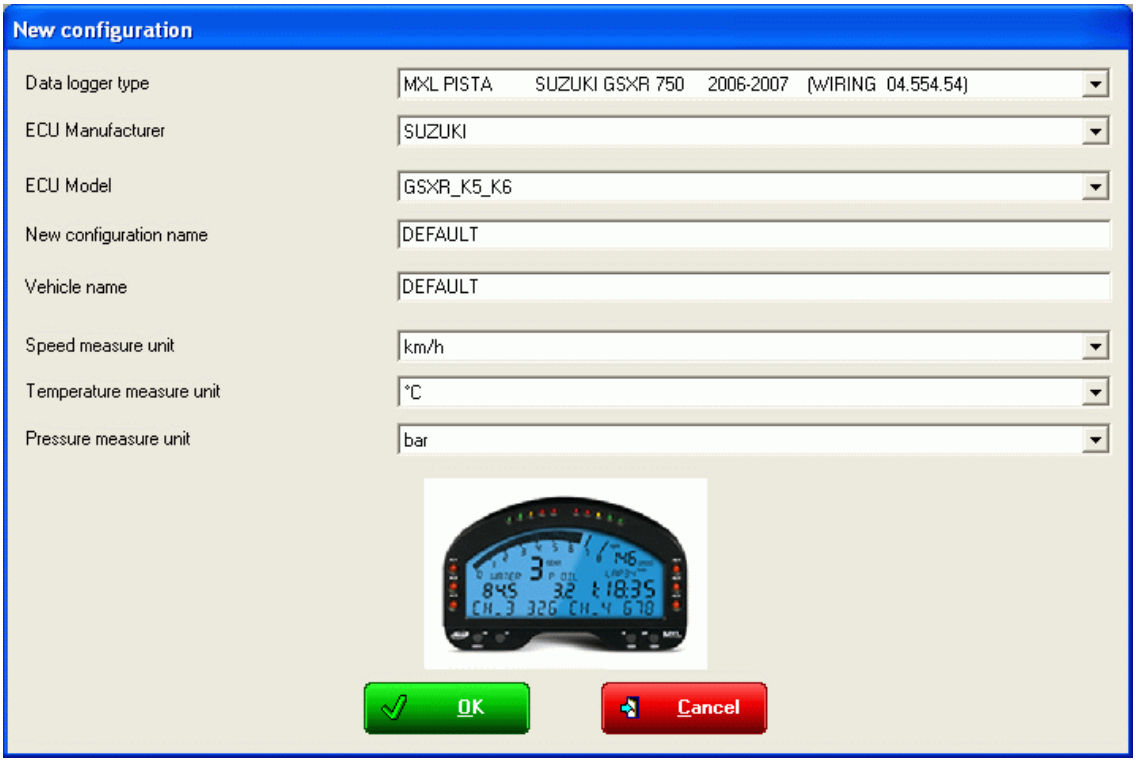


Press “new” and this window appears.

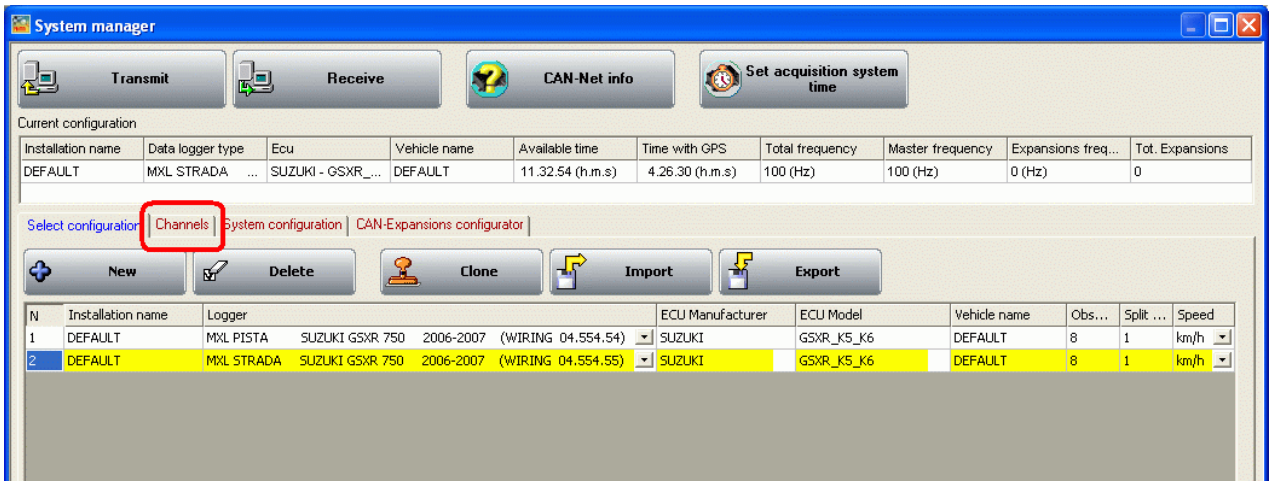


Fill in the window below with:

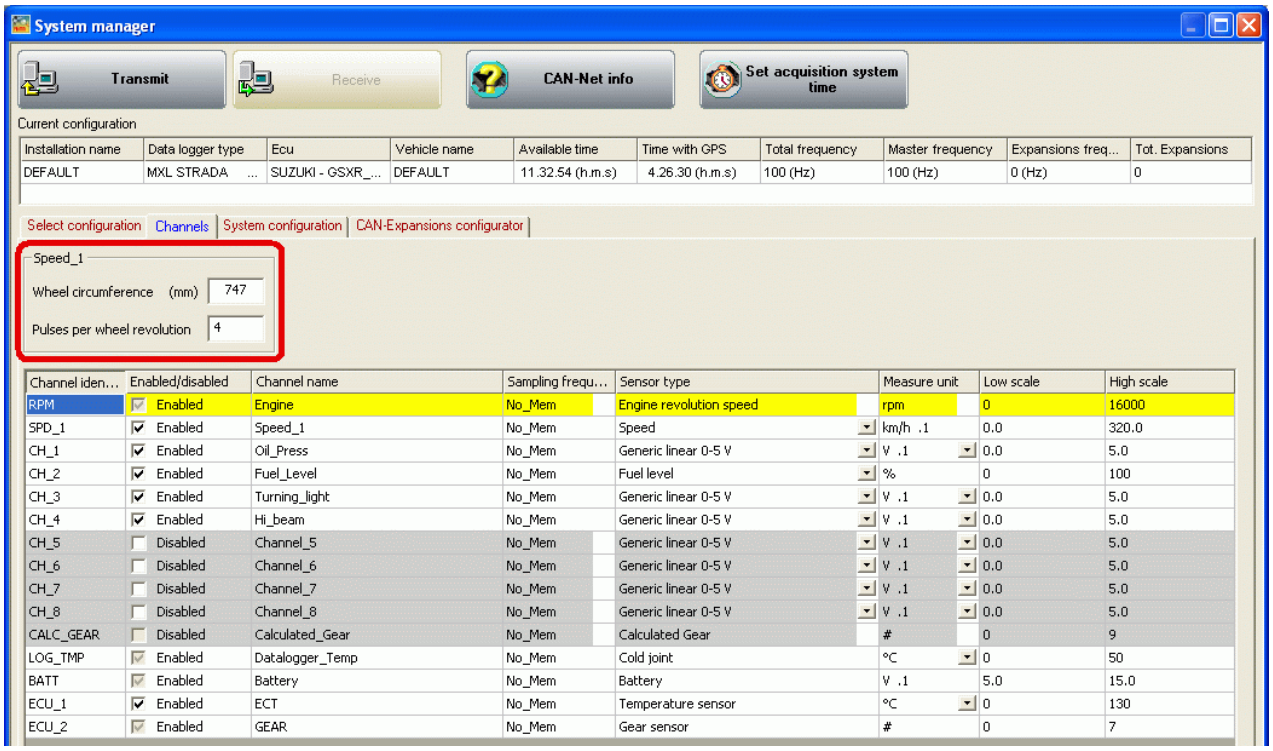
- **Data logger type**: select **MXL Pista** (or **MXL Strada**) depending on the owned logger and paying attention to select the correct displacement (600, 750 or 1000) and the correct wiring identification code.
- **New configuration name**: fill in a name for the new configuration.
- **Vehicle name**: fill in a vehicle name.
- **Unit of measure**: select the desired units of measure for speeds, temperatures and pressures.



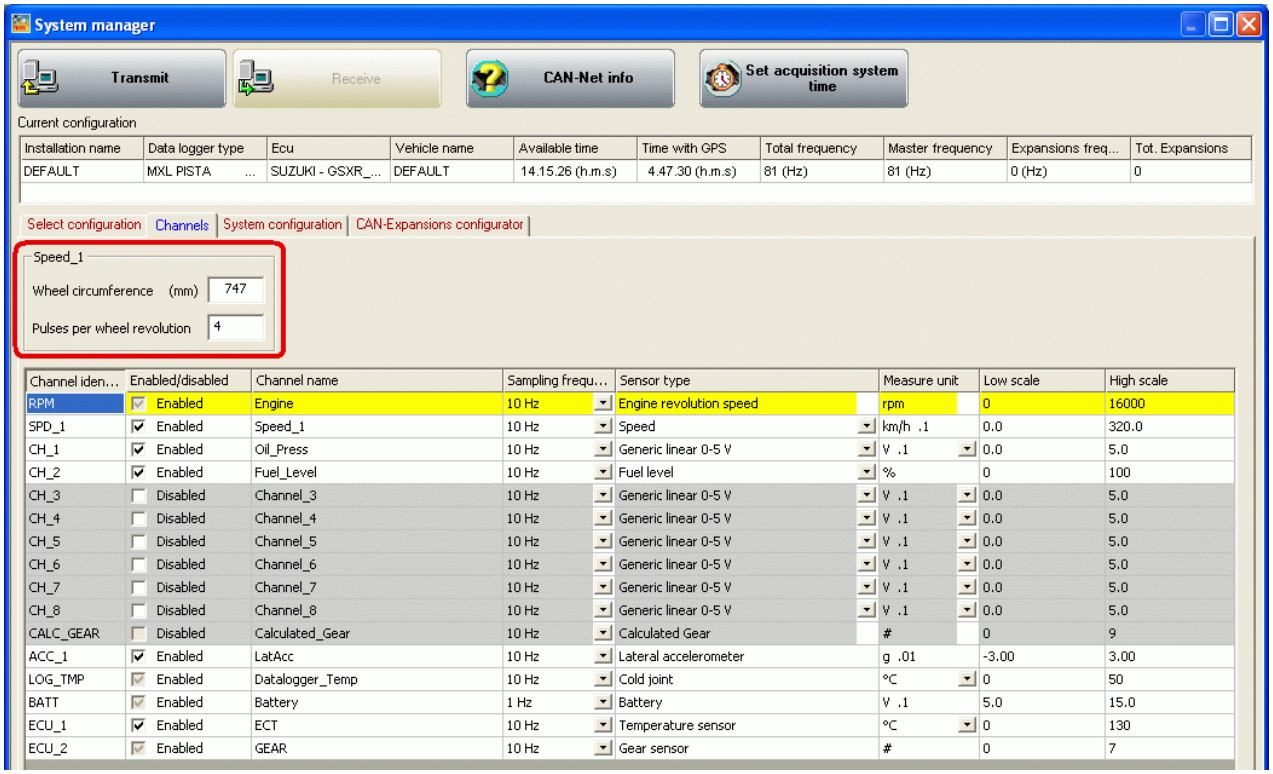
Click on “OK” to create the new configuration.
Select “Channels” layer to enter the configuration of **MXL** sampled channels.



In case an **MXL Strada** is being configured this window appears:



In case an **MXL Pista** is being configured this window appears:



Both show the channels sampled by the logger and speed panel labelled “Speed” and highlighted in the images above.

Note: all additional channels are disabled by default; for any information concerning their configuration refer to **Race Studio Configuration** user manual.

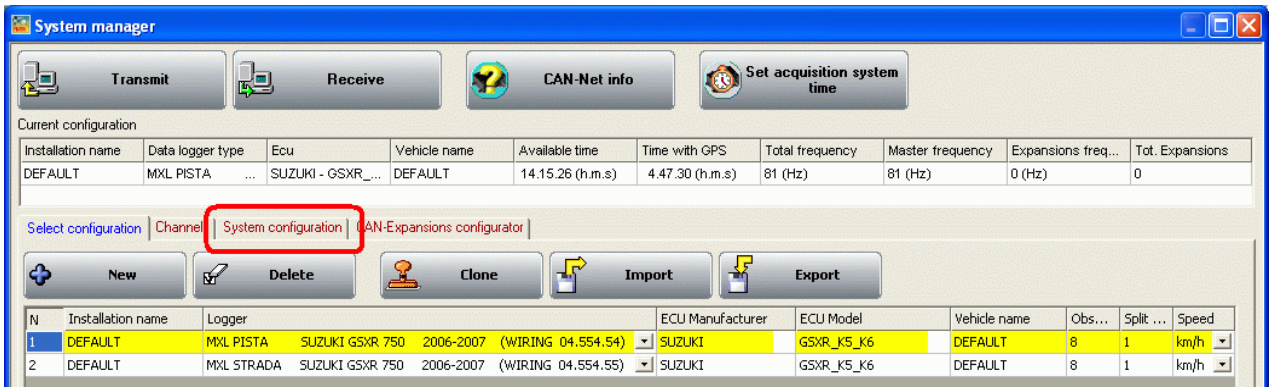
Speed panel: Suzuki GSX-R speed sensor is installed on the jackshaft that connects the gearbox to the pinion. The number of magnets installed on this jackshaft is 4.
The wheel circumference used in this panel is an “Equivalent Circumference” computed using this formula:

$$EquivCircumf = \frac{WheelCircumf * Np}{Nc}$$

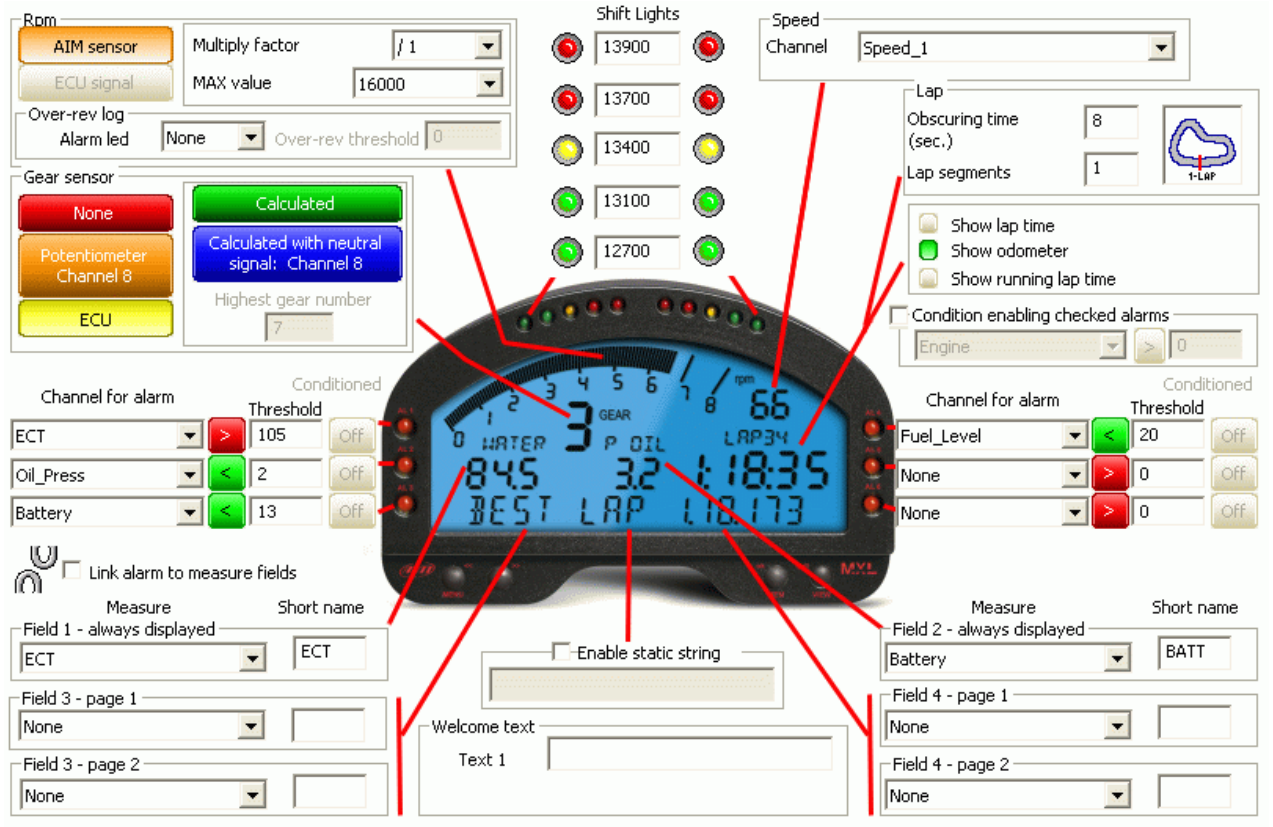
Np = pinion teeth number
Nc = Crown teeth number

Using default values computed for a Suzuki GSX-R750, the equivalent circumference value is 747 mm (29.4 inches). Changing the pinion or the crown with one that has a different teeth number equivalent circumference needs to be re-computed. For further information on this computation refer to the related chapter of this user manual.

It is now necessary to configure **MXL** display.
Select “System Configuration” layer.



The window shown here below appears. Default values differ depending on the model of **MXL** selected when creating the configuration.



Set fields are: RPM, Shift lights, Speed, Lap; some alarms and the gear sensor.

RPM: high scale can be set to a value included between 14000 and 16000 RPM depending on the bike displacement.
Lap: obscuring time 8 seconds and 1 lap segment (no split times).
Shift Lights: each displacement has different threshold values, computed considering the stock engine limiter threshold value. In case the bike engine limiter has an higher threshold value than the stock one, default values need to be modified so that the last red light switches on just before limiter intervention.

Default visualization is:

- **ECT**: water temperature; threshold value “>” (more than) 105 °C.
- **OIL PRESS**: oil pressure; threshold value “<” (less than) 2 bar.
- **BATTERY**: battery voltage; alarm threshold value “<” (less than) 13 volts.
- **FUEL LEVEL**: fuel level: threshold value “<” (less than) 20. This value is expressed in percentage and corresponds to the bike reserve value (around 4.5 litres – 1 gallon).
- **ODOMETER**: run kilometres. This default setting changes automatically once on the track (with infrared transmitter and receiver). The logger switches on “show lap time” if detects a lap signal. Switching OFF/ON the logger it shows again odometer.

Note: to modify and customize the shown channels with the related alarms, refer to **Race Studio Configuration** user manual.

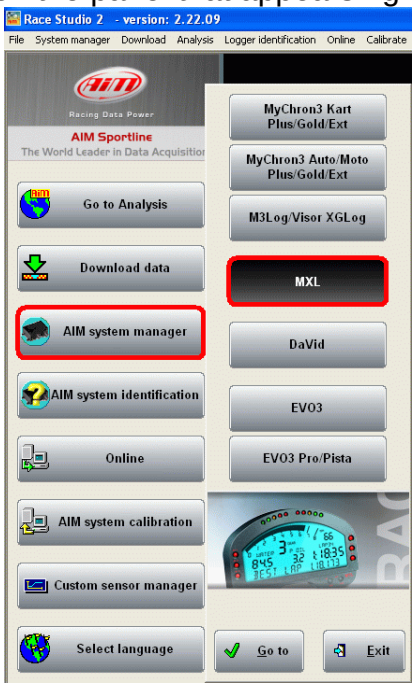
The configuration is now ready to be transmitted to the logger. Press “Transmit” button on the software top keyboard.

7 – Suzuki GSX-R kits configuration: MXL Strada wiring code 04.554.14 and MXL Pista wiring code 04.554.13

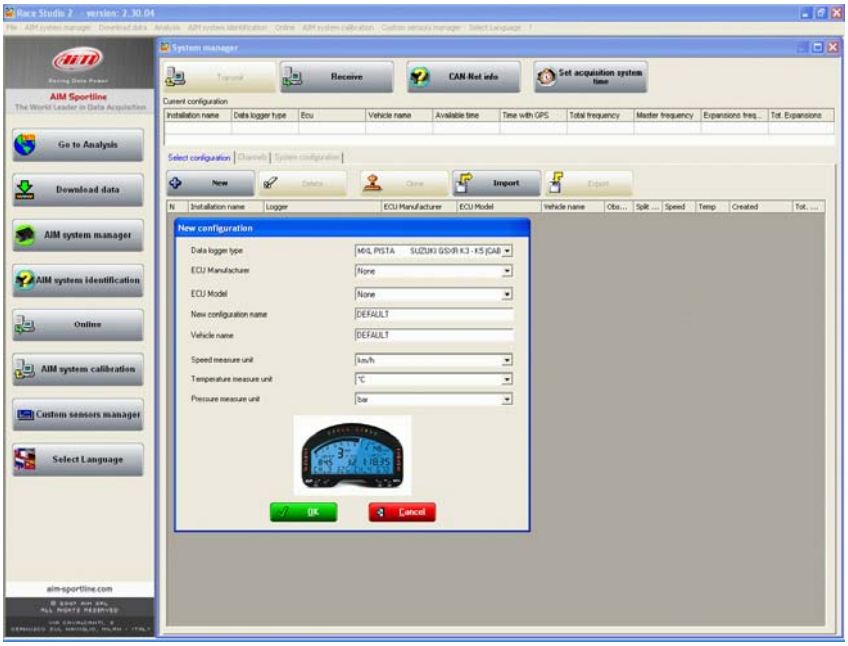
WARNING: this kit version is not produced anymore: these instructions have just an explicative function for customers that already own the kits.

When **MXL** has been installed it is ready to be used thanks to the default configuration. In case a custom one is needed, follows these instructions.

- Run **Race Studio 2** software.
- Press “AIM system manager” button on the left vertical keyboard.
- Select **MXL** icon on the panel that appears right of the vertical keyboard.

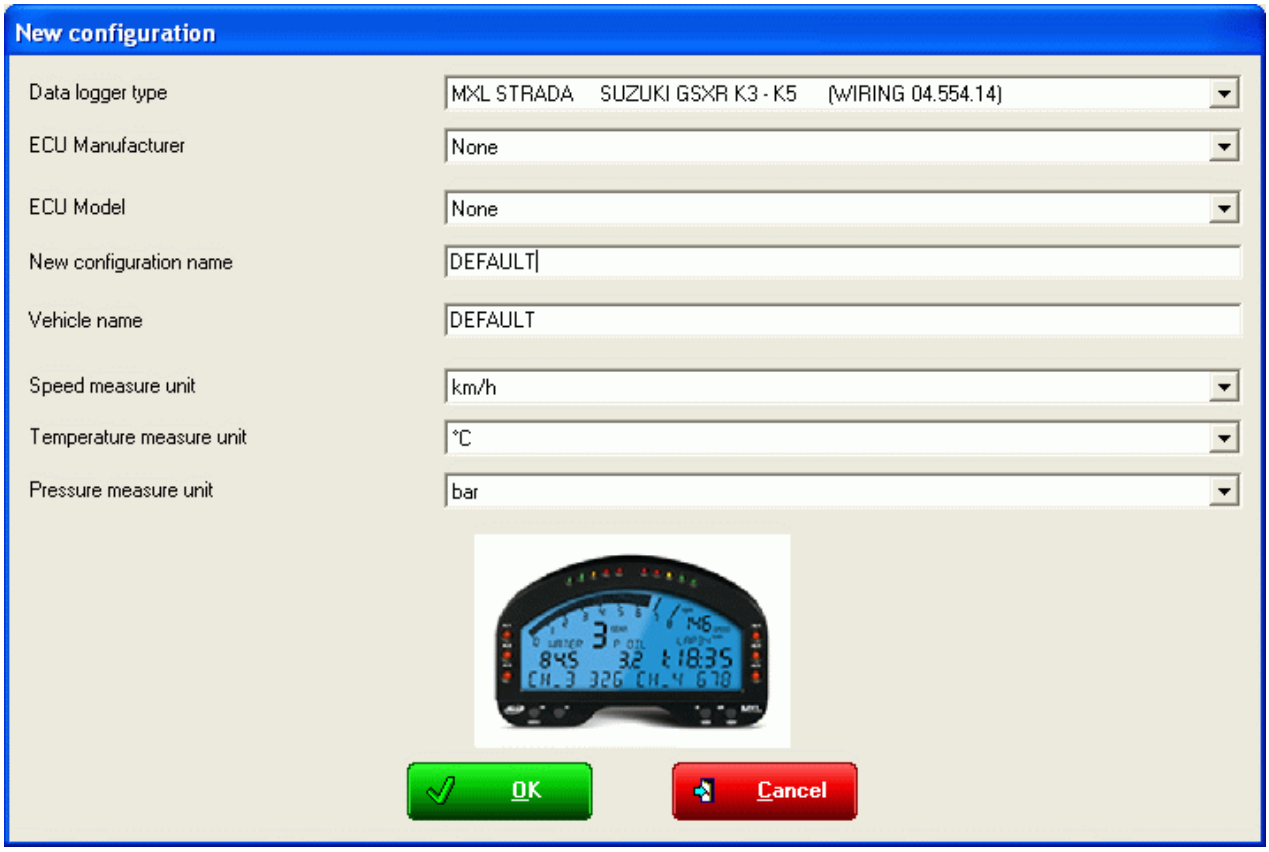


Press “New” and this window appears:

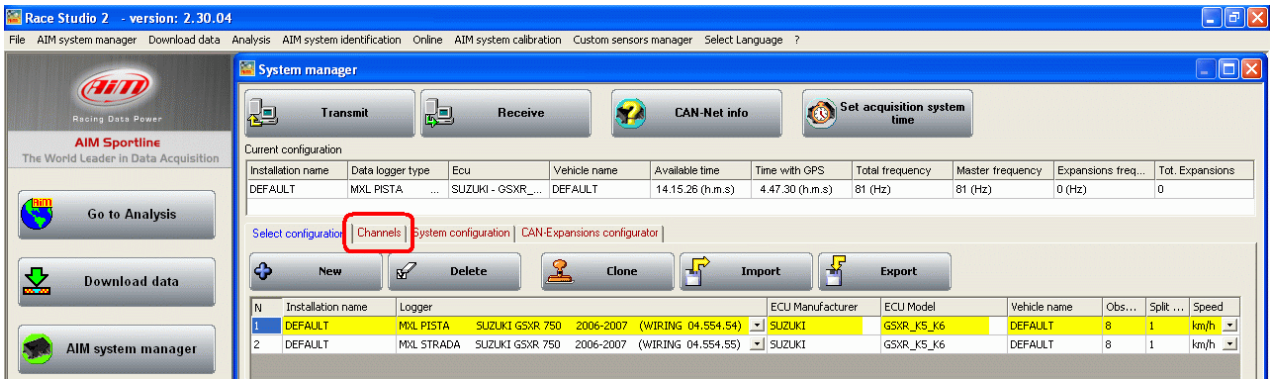


Fill in the window below with:

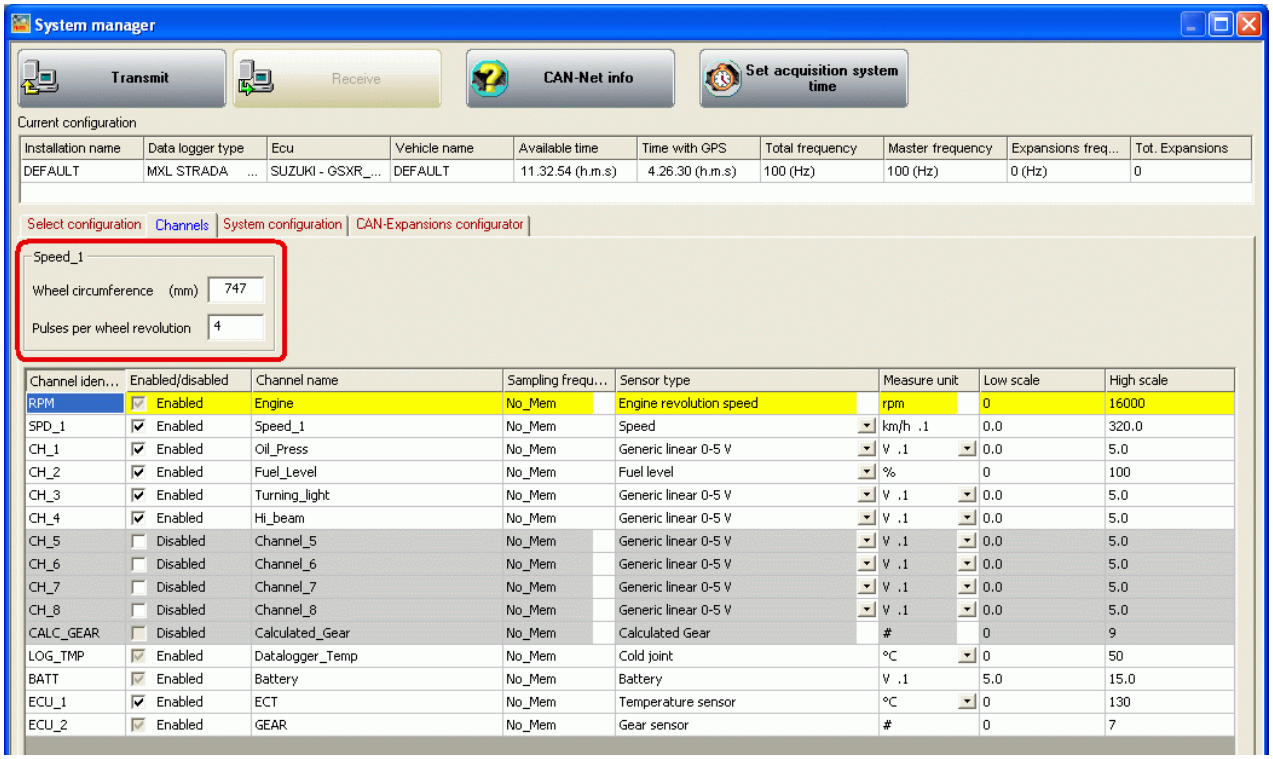
- **Data logger type**: select **MXL Pista** (or **MXL Strada**) depending on the owned logger and paying attention to select the correct displacement (600, 750 or 1000) and the correct wiring identification code.
- **New configuration name**: fill in a name for the new configuration.
- **Vehicle name**: fill in a vehicle name.
- **Unit of measure**: select the desired units of measure for speeds, temperatures and pressures.



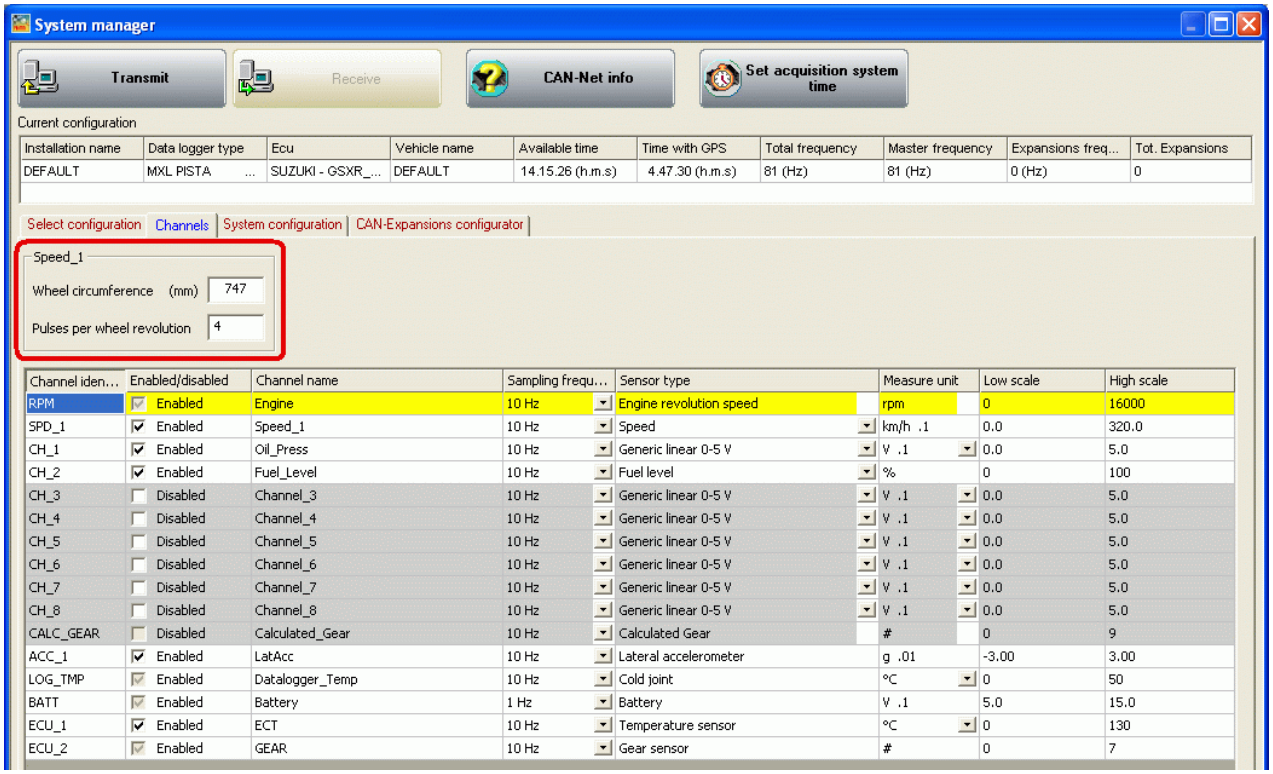
Press “OK” to create the new configuration.
Select “Channels” layer to configure the channels sampled by **MXL**.



In case an **MXL Strada** is being configured, this window appears:



In case an **MXL Pista** is being configured, this window appears:



Both show the channels sampled by the logger and speed panel – labelled “Speed” and highlighted in the figures above.

Note: additional channels are disabled by default. Refer to **Race Studio Configuration** user manual for further information concerning their configuration.

Speed panel: Suzuki GSX-R speed sensor is installed on the jackshaft that connects the gearbox to the pinion. The number of magnets installed on this jackshaft is 4.
The wheel circumference used in this panel is an “Equivalent Circumference” computed using this formula:

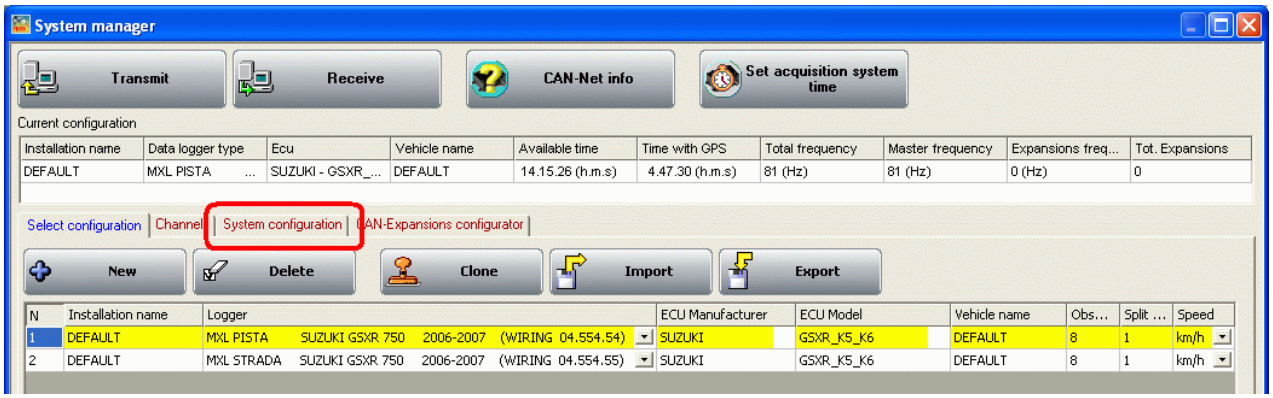
$$EquivCircumf = \frac{WheelCircumf * Np}{Nc}$$

Np = pinion teeth number
Nc = Crown teeth number

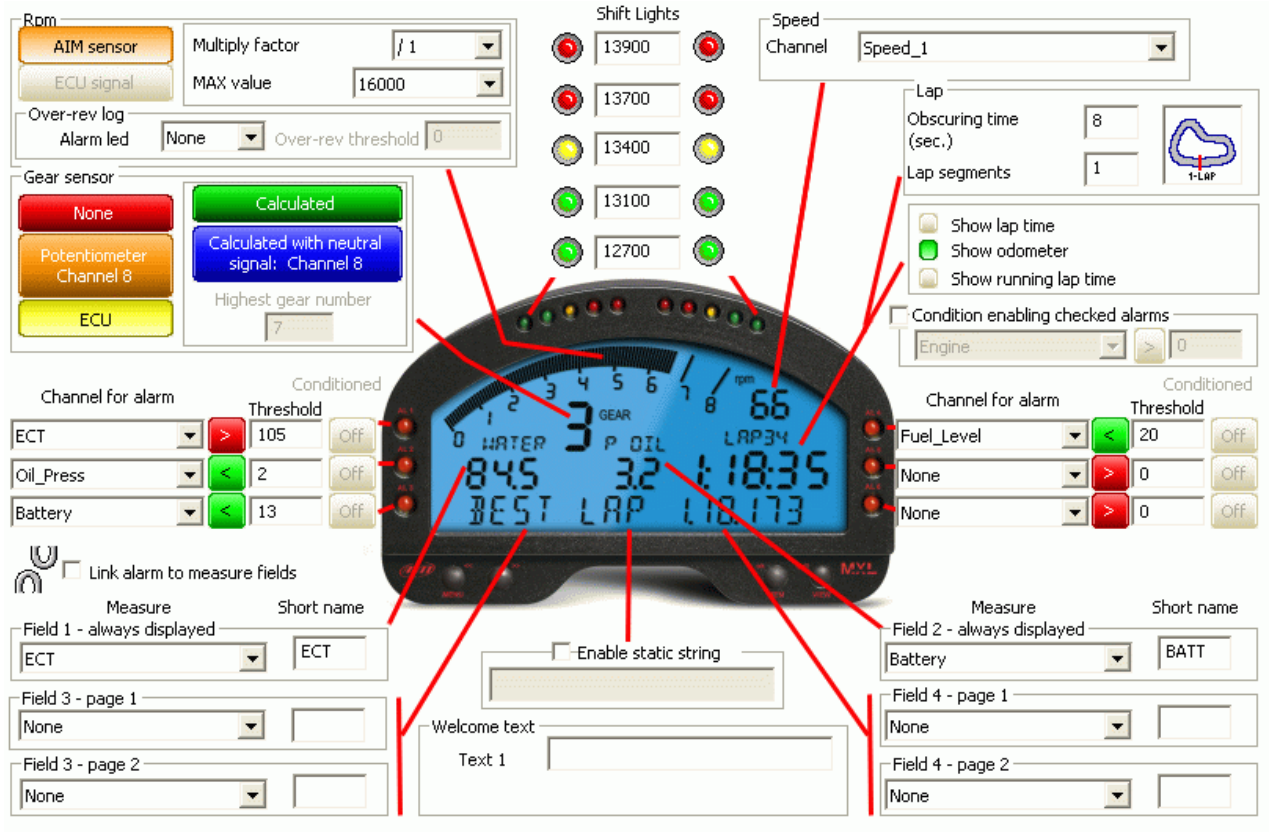
Using default values computed for a Suzuki GSX-R750, the equivalent circumference value is 801.4 mm (31.55 inches). Changing the pinion or the crown with one that has a different teeth number equivalent circumference needs to be re-computed. For further information on this computation refer to the related chapter of this user manual.

It is now necessary to configure **MXL** display.

Select “System configuration” layer:



The window below appears. Default values are different depending on the model of MXL selected while creating the configuration.



Set fields are: RPM, Shift lights, speed, lap, some alarms and the gear sensor.

RPM: high scale value is set on 14000 RPM.
Lap: obscuring time: 8 seconds and number of segments: 1 (no split times).
Shift lights: each displacement has different threshold values, computed considering the stock engine limiter threshold value. In case the bike limiter has a threshold value higher than the stock one, default values need to be modified so that the last red light switches on just before limiter intervention.

Default visualization is:

- **ECT**: water temperature alarm threshold values: “>” (max) 90°C; “<” (min) 50°C.
- **ODOMETER**: run kilometres. This default setting changes automatically once on the track (with infrared transmitter and receiver). The logger, in fact, switches on “Show lap time” if detects a lap signal. Switching OFF/ON the logger it shows again odometer.

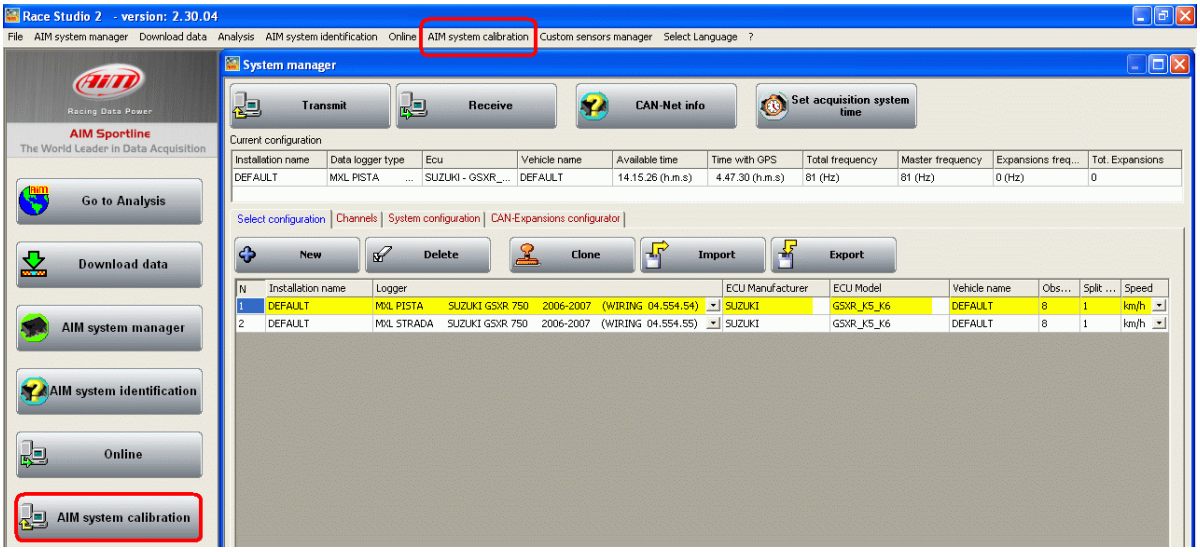
Note: refer to **Race Studio Configuration** user manual for further information about the modification and customization of sampled channels.

The configuration is now ready to be transmitted to **MXL**: press “Transmit” button on the software top keyboard.

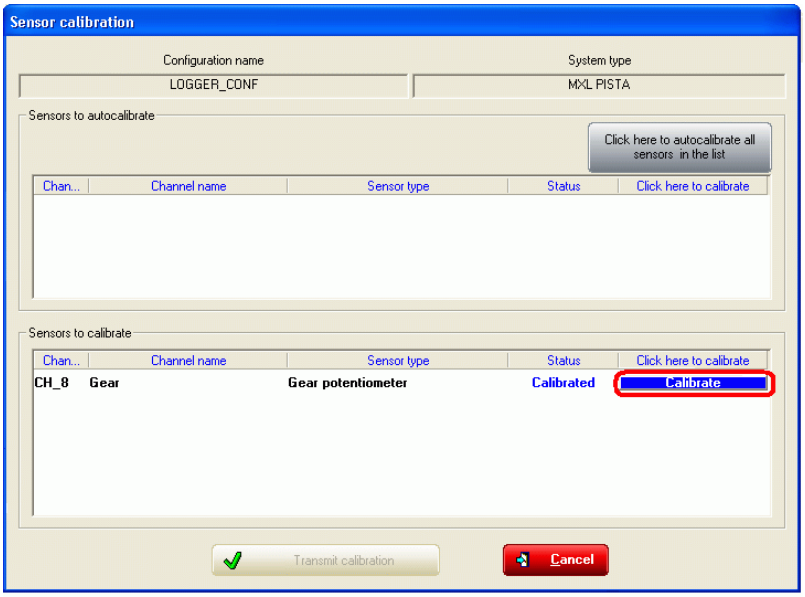
7.1 – Gear Calibration

Gear calibration is the last step to finish system configuration; it is to perform only in case the default one does not allow visualization of the correct engaged gear number and can be done only through a PC with Microsoft Windows XP or Microsoft Window Vista 32 bit operating system and **Race Studio 2** software (included in the kit).
The logger needs to be connected to the PC using the proper USB cable included in the kit.
Connect **MXL** to the PC and switch both on (firstly the PC and then **MXL**); run **Race Studio 2** and follow this procedure:

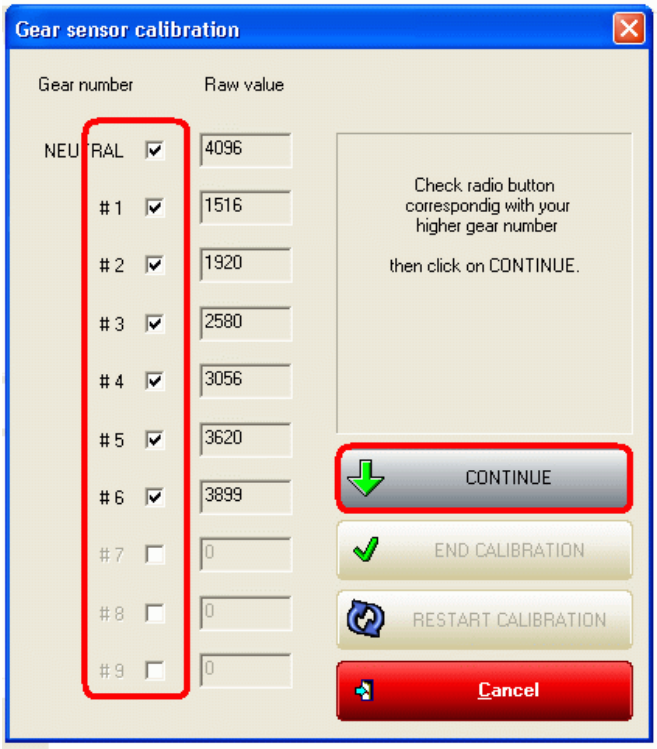
- press “AIM System manager” button on the left vertical keyboard and select “MXL” on the panel that appears right of the vertical keyboard (MXL Strada/MXL Pista Susuki GSX-R).
- press “Calibration” button on the menu bar or on the vertical keyboard (highlighted in the figure below).



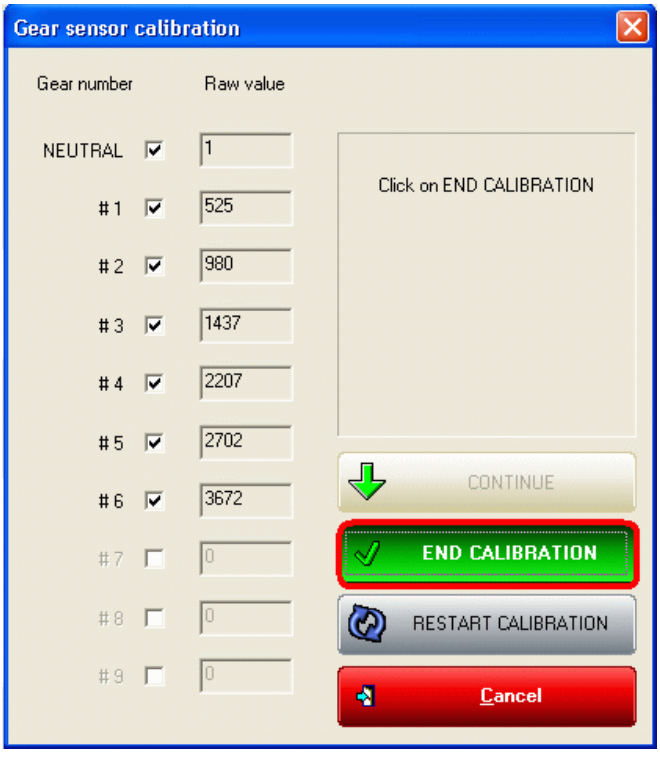
This window appears: press “calibrate” button corresponding to the sensor to calibrate (in this case gear potentiometer).



Calibration panel appears.



- Select the higher gear number enabling the corresponding checkbox and press “CONTINUE”.
- engage one by one all gears, also with the engine off but with the ignition on and click on “CONTINUE” after each gear, as for the instruction that appears on the panel right to “raw value” column.
- When calibration is over the window below appears. Press “END CALIBRATION”.

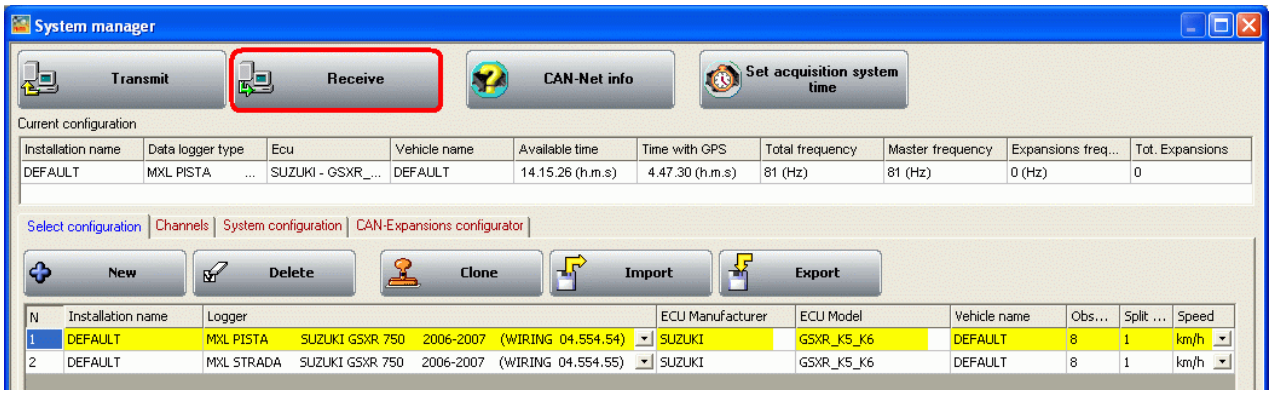


- The system comes back to the previous window and shows sensor status “calibrated” in red and “Transmit calibration” button enabled. Press it to transmit the calibration to the logger.

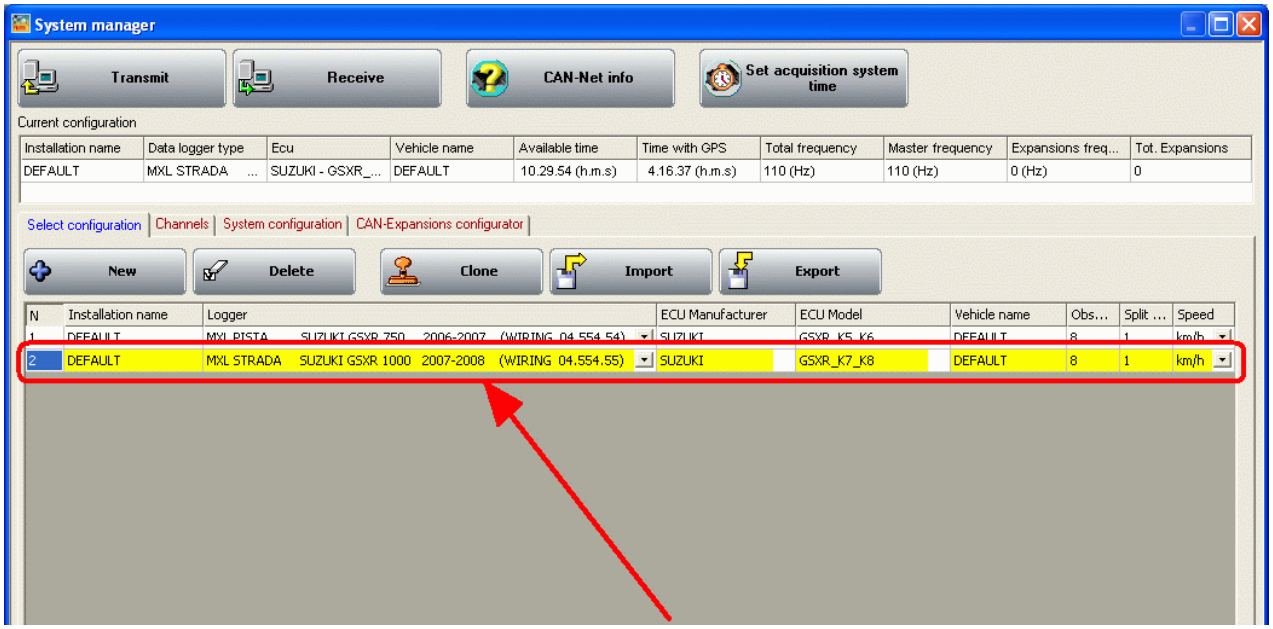
Warning: the configuration transmitted to the logger is not automatically stored in the software configurations database. This means that, once transmitted to the logger, the configuration is not inserted in the available configurations database.

7.1.1 – Saving the configuration with calibrated gears

To save the new configuration with calibrated gears in **Race Studio 2** configurations database, activate “Select Configurations” layer and press “Receive” button on the top keyboard.



The configuration of the logger connected to the PC, previously transmitted, is received, saved as the last one on bottom of available configurations database and highlighted in yellow.



Note: for any further information concerning **Race Studio 2** installation and configuration refer to the related user manual.

8 – Equivalent circumference compute

The equivalent circumference can be computed using “Bike.exe” software, included in **Race Studio 2** CD, utilities folder. Browse the CD and double click on “Bike.exe” icon.

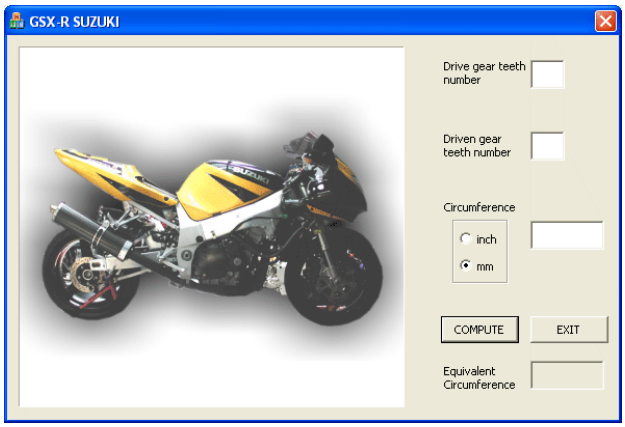
Fill in “Drive gear teeth number”.

Fill in “Driven gear teeth number”.

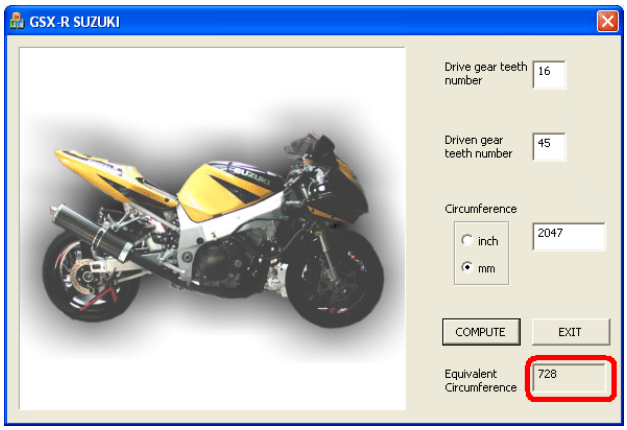
Select the circumference unit of measure.

Fill in the circumference value.

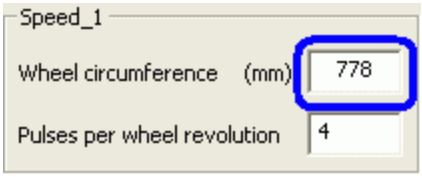
Press “Compute”.



The software computes the equivalent circumference value and shows it in the related cell (red circled here on the right).



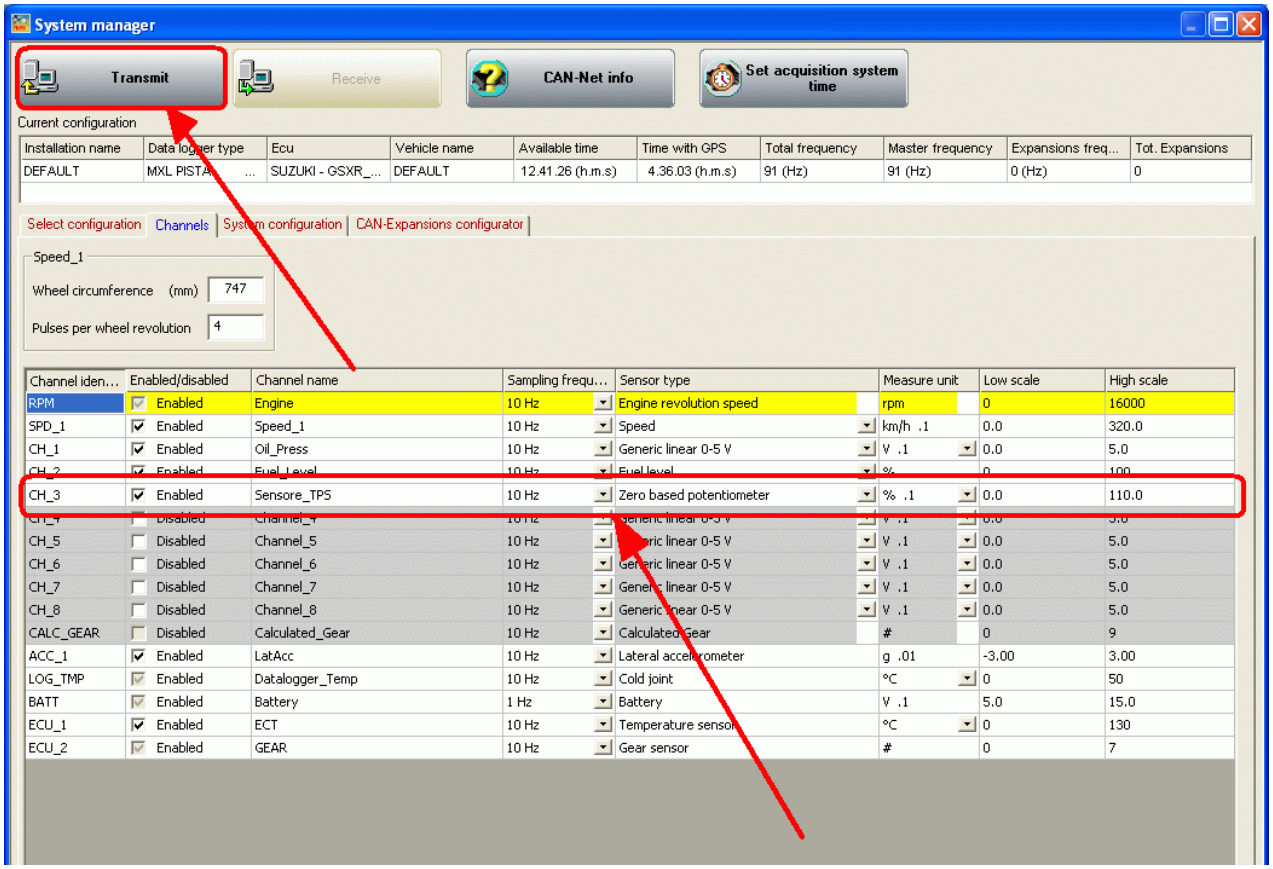
Fill in this value in the related case of **Race Studio 2** “Channels” layer.



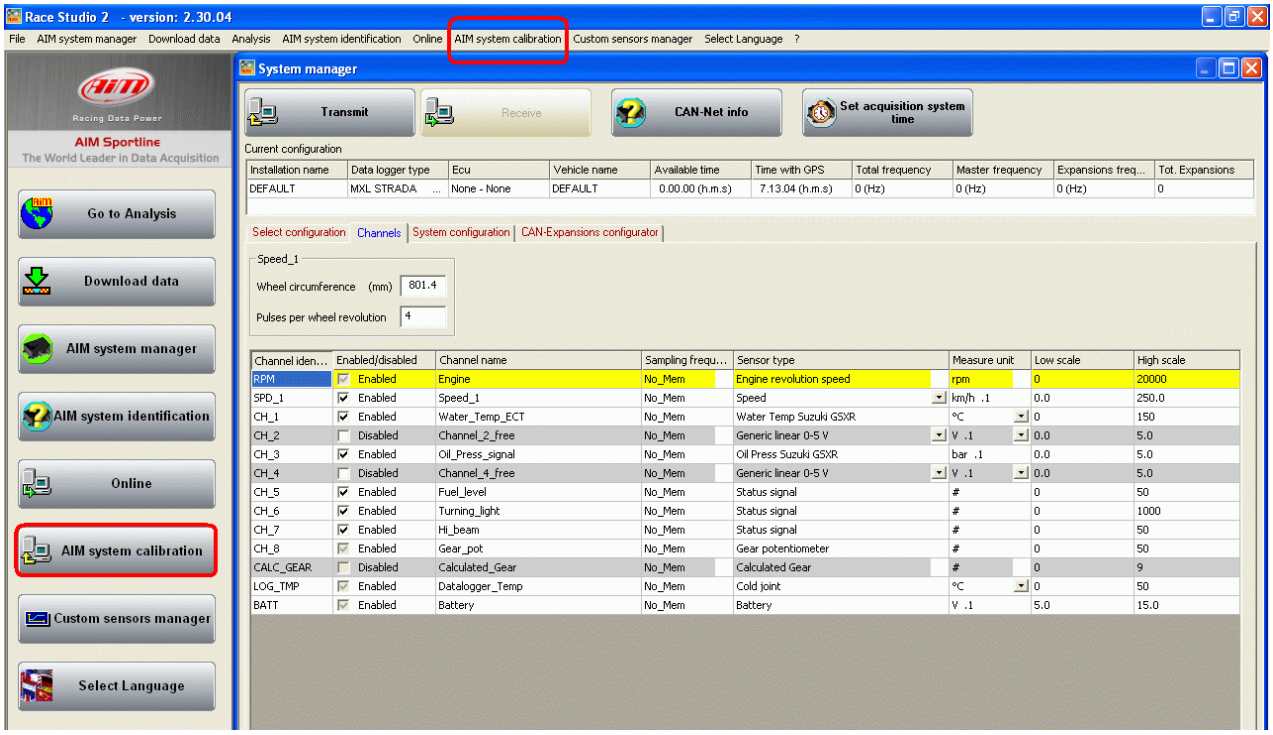
9 – TPS Sensor configuration

After having installed the sensor on the bike (see the related chapter for further information), it is necessary to calibrate it so that it samples correct data.
This procedure can be performed only using a PC with Microsoft Windows Xp or Microsoft Windows Vista 32 bit operating system and **Race Studio 2** software (included in the kit).
The logger needs to be connected to the PC through the USB cable supplied with the kit and switched on.
Run **Race Studio 2** software and press “AIM system manager” button on the left vertical keyboard. Select “MXL” on the panel that appears right of the vertical keyboard.
To set TPS sensor on a channel follow this procedure.

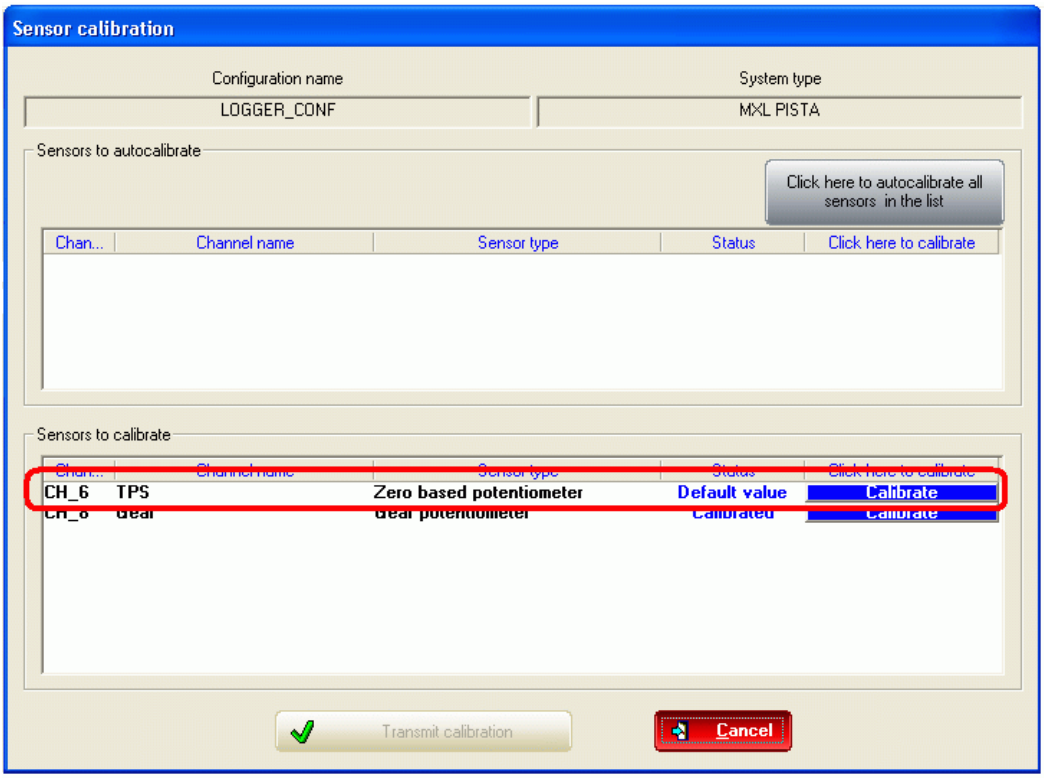
- Activate “Channels” layer.
- Select the channel where the sensor has been physically installed on.
- Enable the checkbox corresponding to it in “Enable/Disable” column.
- Set, if desired, a channel name.
- Select “Zero based potentiometer” in the drop down menu of “Sensor Type” column.
- Set the desired unit of measure in “Unit” column
- Set high scale value (recommended 110%)
- Press “Transmit” button on the top keyboard to transmit the configuration to the logger.



When TPS sensor has been set on a channel, it needs to be calibrated. Click on "Calibration" button on the left vertical keyboard or on the menu bar (red circled in the figure below).

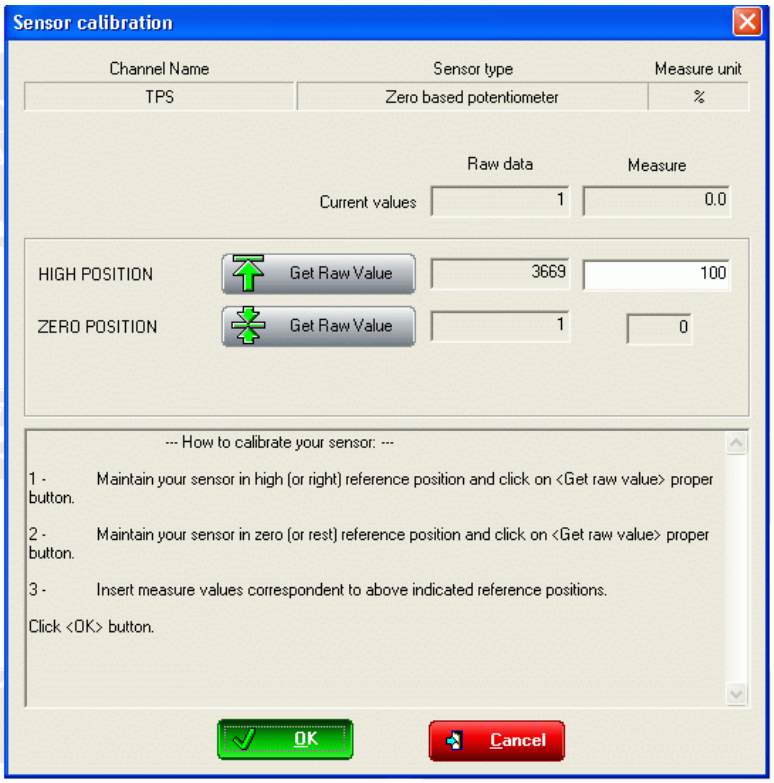


This window appears.



Click on "Calibrate" button corresponding to the sensor to calibrate (in this case "Zero based potentiometer").

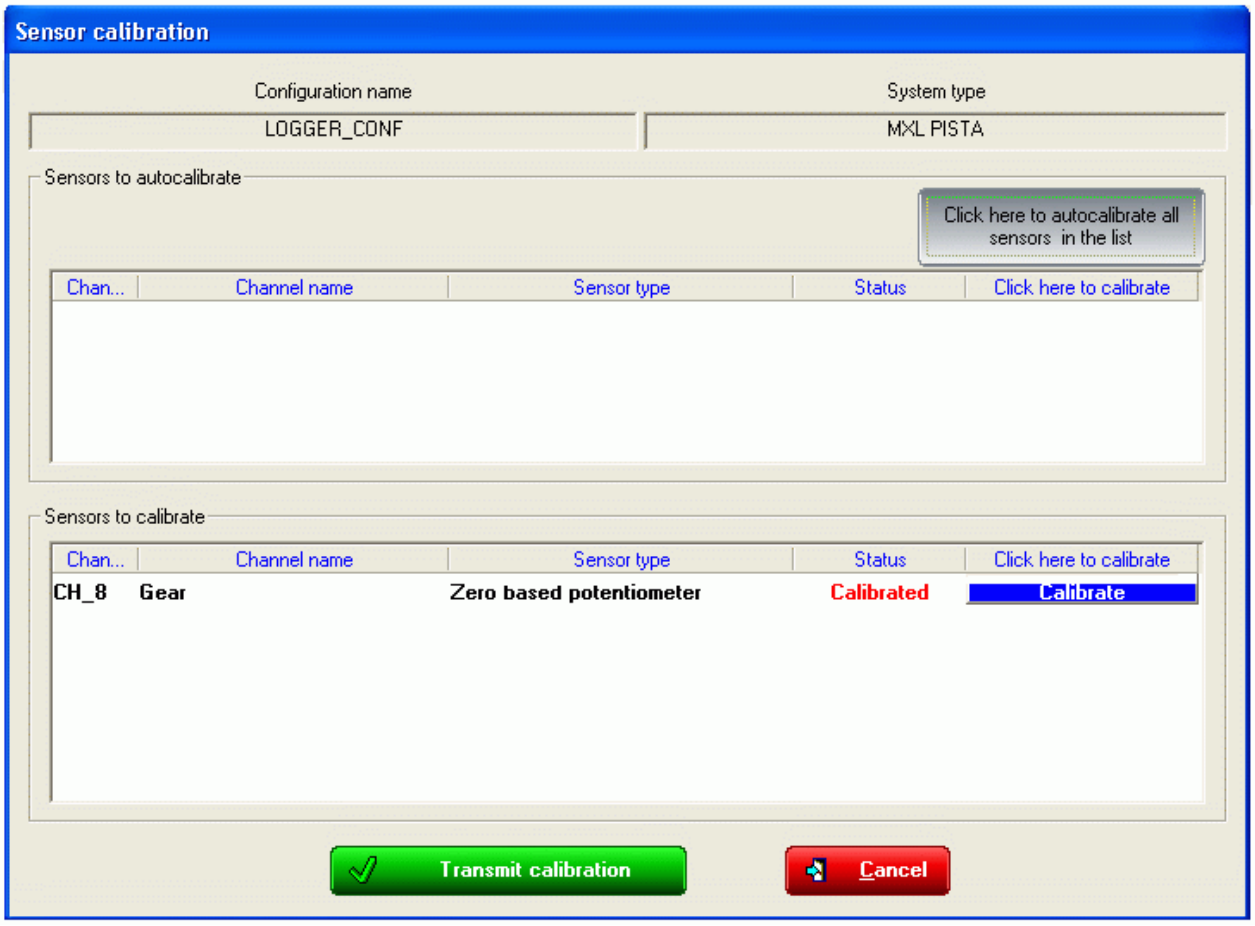
This window appears:



Follow the instruction that appears on the PC monitor.

- with the gas completely opened press “Get raw data” button corresponding to High Position.
- with the gas in its zero position press “Get raw data” button corresponding to Zero position.
- Match raw data with custom values to insert in “Measure” box. For example match raw data sampled with gas completely opened with 100 value and raw data sampled with gas closed to “0” value.
- Press “OK”
- The system comes back to the previous window.

The window shows sensor status turned to “calibrated” in red and “Transmit calibration” button enabled. Pressing it the calibration is transmitted to the logger.



Warning: the configuration with TPS sensor calibrated, once transmitted to the logger, is not saved in Race Studio 2 configurations database. This means that to have it stored it is necessary to receive it as previously explained.

10 – Channels

Default channels setting of **MXL Strada/MXL Pista** for Suzuki GSX-R is:

MXL Strada Suzuki GSX-R K5 (wiring code 04.554.55)

Channel identification	Channel name	Function
RPM	Engine	RPM Value
SPD_1	Speed1	Speed Value
Ch_1	Oil_Press	Oil Pressure
Ch_2	Fuel_level	Fuel level
Ch_3	Turning_Light	Turning_Lights ON/OFF
Ch_4	Hi_Beam	High Beam ON/OFF
Ch_5	Channel_5	Free Channel
Ch_6	Channel_6	Free Channel
Ch_7	Channel_7	Free Channel
Ch_8	Channel_8	Free Channel
LOG_TMP	Datalogger_Temp	Logger internal temperature
BATT	Battery	Battery voltage
ECU1	ECT	Temperature Sensor
ECU2	Gear	Gear Sensor

MXL Pista Suzuki GSX-R K5 (wiring code 04.554.54)

Channel identification	Channel name	Function
RPM	Engine	RPM Value
SPD_1	Speed1	Speed Value
Ch_1	Oil_Press	Oil Pressure
Ch_2	Fuel_level	Fuel level
Ch_3	Channel_3	Free Channel
Ch_4	Channel_4	Free Channel
Ch_5	Channel_5	Free Channel
Ch_6	Channel_6	Free Channel
Ch_7	Channel_7	Free Channel
Ch_8	Channel_8	Free Channel
Acc1	LatAcc	Lateral Accelerometer
LOG_TMP	Datalogger_Temp	Logger internal temperature
BATT	Battery	Battery voltage
ECU1	ECT	Temperature Sensor
ECU2	Gear	Gear Sensor

MXL Strada Suzuki GSX-R K5 (wiring code 04.554.14)

Channel identification	Channel name	Function
RPM	Engine	RPM Value
SPD_1	Speed1	Speed Value
Ch_1	Water_Temp_ECT	Suzuki Water temperature
Ch_2	Channel_2_free	Free Channel
Ch_3	Oil_Press_signal	Oil Pressure
Ch_4	Channel_4_free	Free Channel
Ch_5	Fuel_level	Fuel level
Ch_6	Turning_Light	Turning Lights ON/OFF
Ch_7	Hi_beam	High Beam ON/OFF
Ch_8	Gear_Pot	Calculated Gear
LOG_TMP	Datalogger_Temp	Logger internal temperature
BATT	Battery	Battery voltage

MXL Pista Suzuki GSX-R K5 (wiring code 04.554.13)

Channel identification	Channel name	Function
RPM	Engine	RPM Value
SPD_1	Speed1	Speed Value
Ch_1	Water_Temp	Suzuki Water Temperature
Ch_2	Channel_2	Free Channel
Ch_3	Channel_3	Free Channel
Ch_4	Channel_4	Free Channel
Ch_5	Channel_5	Free Channel
Ch_6	Channel_6	Free Channel
Ch_7	Channel_7	Free Channel
Ch_8	Gear	Calculated Gear
Acc1	LatAcc	Lateral Accelerometer
LOG_TMP	Datalogger_Temp	Logger internal temperature
BATT	Battery	Battery voltage

According to the wiring you got, free channels can be freely configured to connect additional sensors like suspension potentiometers, brake and pressure sensors, etc.

Note: for further information concerning additional sensors installation and configuration refer to **Race Studio Configuration** and to **MXL** user manual.

11 – Data download and analysis

Once a test session is over it is possible to download data stored in the logger memory and save them in a database.

Note: data download and analysis is only available on **MXL Pista**. For further information on these subjects refer to the related user manuals.

12 – MXL expansions

Thanks to the wide range of AIM products, expressly dedicated to the needs of any biker, **MXL** is a modular and expandable system.

GPS Module

GPS Module allows to sample a lot of important information: brake analysis, information concerning the chassis, analysis of the behaviour of the biker in any point of the track.

This allows to view trajectories, the related speed and evaluate driving errors. Exporting all the information on Google Earth® it will thereby be possible to over impose real images to the run trajectories.

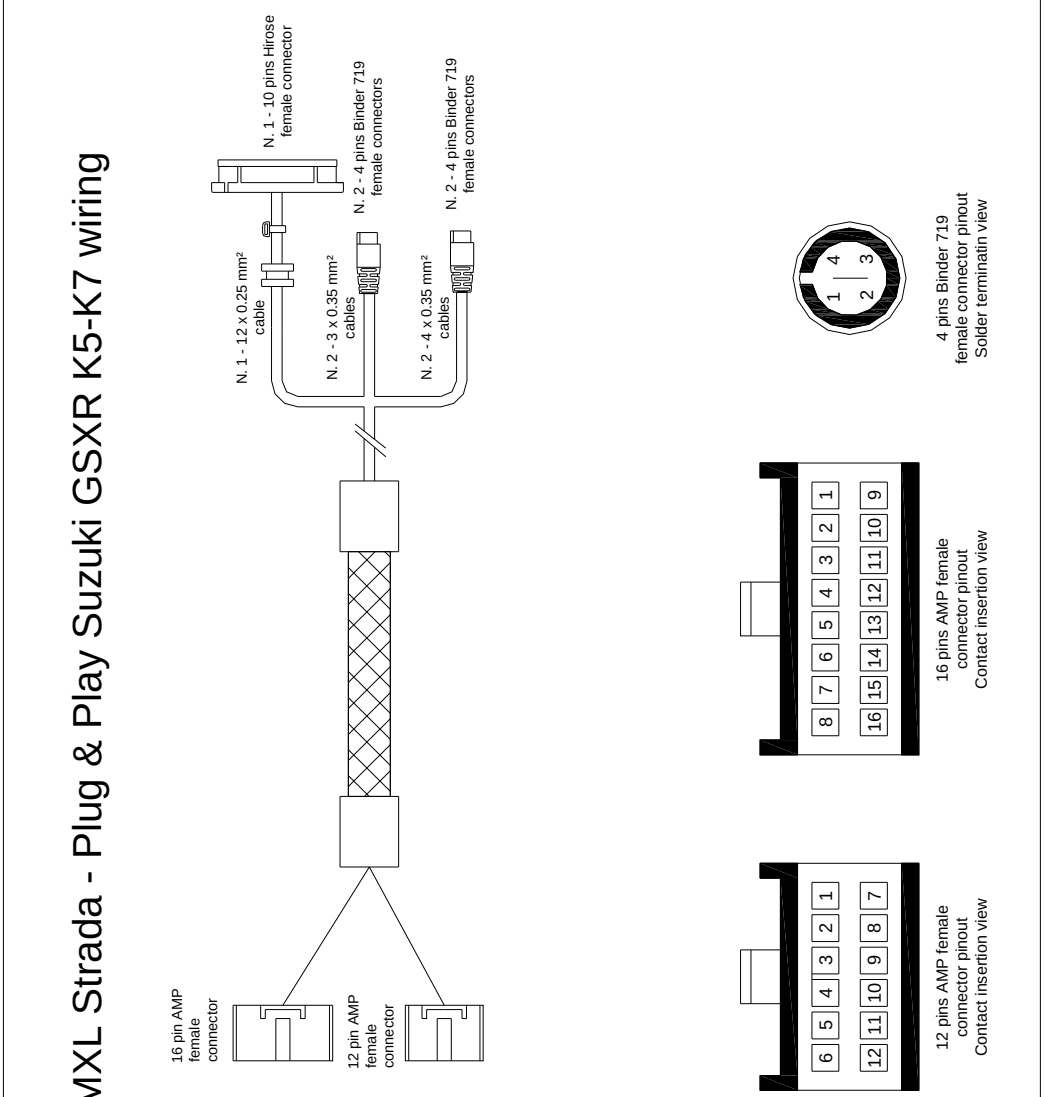
LCU-ONE CAN

LCU-ONE CAN controls and allows to optimize the Stoichiometric ratio (Air/Fuel) with extreme precision.

To obtain the maximum engine performance, LCU-ONE uses a wide band Bosch LSU 4.9 probe and can detect punctual Lambda values in a 0.65-1.6 range.

Appendix “A” – Suzuki GSX-R K5 wiring for MXL Strada with code 04.554.55 and MXL Pista with code 04.554.54

N.rev. / Rev. N.	Descrizione / Description	Data / date	Firma / Sign	Contr. da / Ckd. by



Rif. / Ref.	Q.tà / Q.ty	Materiale / Material		N. articolo / Item N.	
Progettato da / Designed by: DB	Contr. da / Ckd. by	Approvato da / Approved by	Nome file / File name	Data / Date	Scala / Scale
Racing Data Power		Titolo / Title: MXL Strada - Plug & Play Suzuki GSXR K5-K7 wiring			
		N. disegno / Drawing N.: 04.554.55		Rev. / Rev.	Foglio / Sheet: 1 di 2

N.rev. / Rev. N.	Descrizione / Description	Data / date	Firma / Sign	Contr. da / Ckd. by

Binder 719 female connector table

Label	Binder pin	Cable colour	Cable type	AMP 12 pin	AMP 16 pin	Connection	Length
Ch. 5	1 2 3 4	White Black Bleu	3 x 0.35 mm²		16 15 14	Analog Input 5 Analog GND V Reference	300 mm
Ch. 6	1 2 3 4	White Black Bleu	3 x 0.35 mm²		13 11 14	Analog input 6 Analog GND V Reference	340 mm
Ch. 7	1 2 3 4	White Black Red Bleu	4 x 0.35 mm²	9	12 3 6	Analog Input 7 Analog GND +VB V Reference	380 mm
Ch. 8	1 2 3 4	White Black Red Bleu	4 x 0.35 mm²	11	9 7 2	Analog Input 8 Analog GND +VB V Reference	400 mm

10 pins Hirose female connector table

Label	Pin AMP 12 pin	Pin AMP 16 pin	Cable colour	Pin Hirose	Connection	Length
ASG07 o ASG05/A Board	2 12 1 8 4 3	8 5 4 1	Green Red Yellow Brown Black Orange Pink Purple White Bleu	1 2 3 4 5 6 7 8 9 10	Oil P Ch. 1 VB Ext Fuel Ch. 2 Speed GND RPM Turn Ch. 3 High Beam Ch. 4 CAN+ CAN-	440 mm

Rif. / Ref.	Q.tà / Q.ty	Materiale / Material			N. articolo / Item N.	
Progettato da / Designed by		Contr. da / Ckd. by	Approvato da / Approved by	Nome file / File name	Data / Date	Scala / Scale
DB						

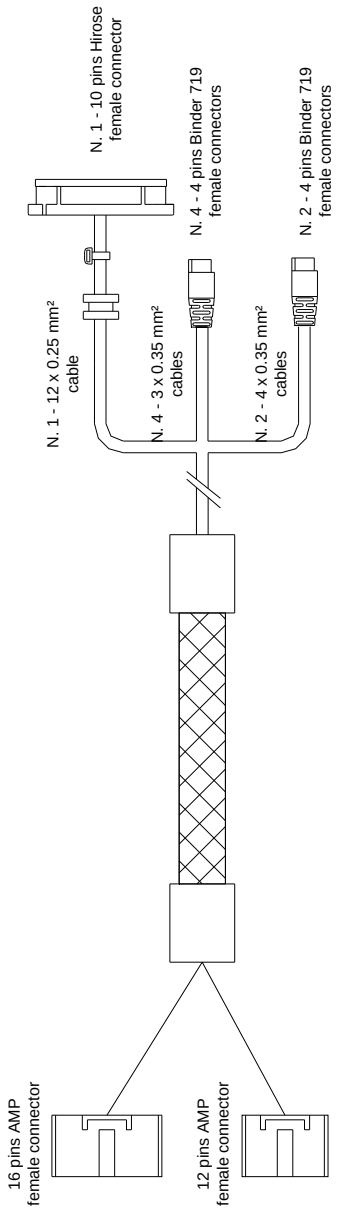
Racing Data Power

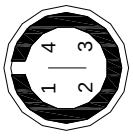
Titolo / Title: Cavo MXL Strada Plug & Play Suzuki GSXR K5-K7

N. disegno / Drawing N.	Rev. / Rev.	Foglio / Sheet
04.554.55		2 di 2

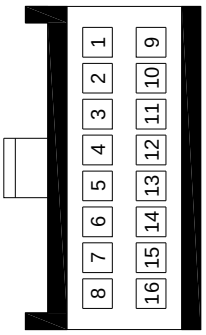
N.rev. / Rev. N.	Descrizione / Description	Data / date	Firma / Sign	Contr. da / Ckd. by

MXL Pista - Plug & Play Suzuki GSXR K5-K7 wiring

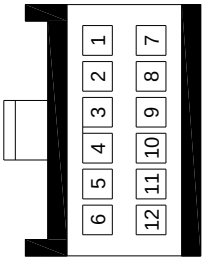




4 pins - Binder female connector pinout
Solder termination view



16 pins AMP female connector pinout
Contact insertion view



12 pins AMP female connector pinout
Contact insertion view

Rif. / Ref.	Q.tà / Q.ty	Materiale / Material		N. articolo / Item N.	
Progettato da / Designed by: DB	Contr. da / Ckd. by	Approvato da / Approved by	Nome file / File name	Data / Date	Scala / Scale
Racing Data Power		Titolo / Title: MXL Pista - Plug & Play Suzuki GSXR K5-K7 wiring			
		N. disegno / Drawing N.: 04.554.54		Rev. / Rev.	Foglio / Sheet: 1 di 2

N.rev. / Rev. N.	Descrizione / Description	Data / date	Firma / Sign	Contr. da / Ckd. by

Binder 719 female connector table

Label	Binder pin	Cable colour	Cable type	AMP 12 pin	AMP 16 pin	Connection	Length
Ch. 3	1 2 3 4	White Black Bleu	3 x 0.35 mm²		4 7 6	Analog Input 3 Analog GND V Reference	300 mm
Ch. 4	1 2 3 4	White Black Bleu	3 x 0.35 mm²		1 3 2	Analog Input 4 Analog GND V Reference	340 mm
Ch. 5	1 2 3 4	White Black Bleu	3 x 0.35 mm²		16 15 14	Analog Input 5 Analog GND V Reference	380 mm
Ch. 6	1 2 3 4	White Black Bleu	3 x 0.35 mm²		13 11 14	Analog Input 6 Analog GND V Reference	420 mm
Ch. 7	1 2 3 4	White Black Red Bleu	4 x 0.35 mm²	9	12 13 6	Analog Input 7 Analog GND +VB V Reference	460 mm
Ch. 8	1 2 3 4	White Black Red Bleu	4 x 0.35 mm²	11	9 7 2	Analog Input 8 Analog GND +VB V Reference	500 mm

10 pins Hirose female connector table

Label	AMP 12 pin pin	AMP 16 pin pin	Cable colour	Hirose pin	Connection	Length
ASG 07 o ASG 05/A Board	 2 12 1 8 -- -- 4 3	8 5	Green Red Yellow Brown Black Orange -- -- White Bleu	1 2 3 4 5 6 7 8 9 10	Oil P Ch. 1 VB Ext Fuel Ch. 2 Speed GND RPM n.c. n.c. CAN+ CAN-	540 mm

Rif. / Ref.	Q.tà / Q.ty	Materiale / Material			N. articolo / Item N.	
Progettato da / Designed by		Contr. da / Ckd. by	Approvato da / Approved by	Nome file / File name	Data / Date	Scala / Scale
DB						

Racing Data Power

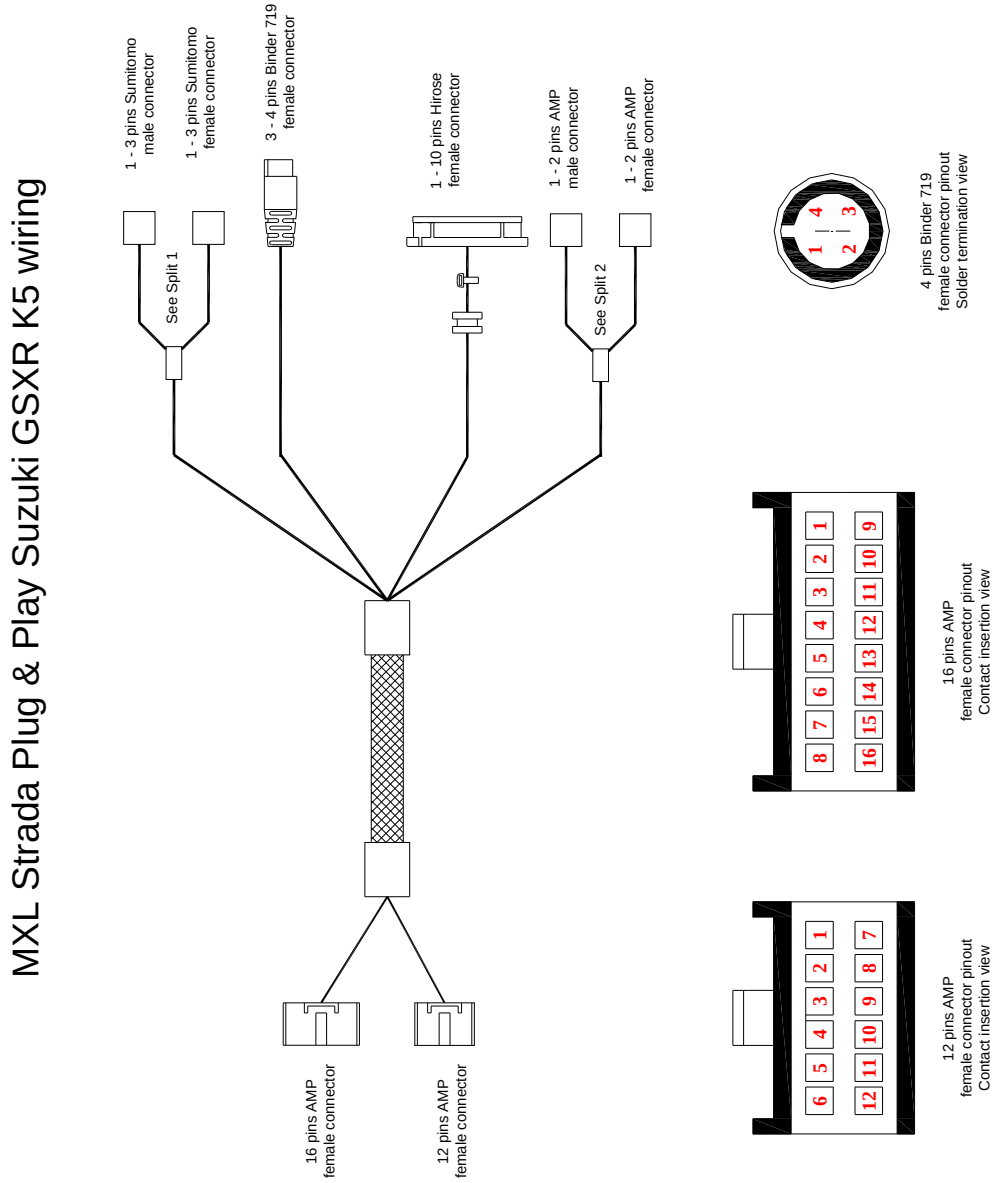
Titolo / Title: MXL Pista - Plug & Play Suzuki GSXR K5-K7 wiring

N. disegno / Drawing N.	Rev. / Rev.	Foglio / Sheet
04.554.54		2 di 2

Appendix “B” – Suzuki GSX-R K5 wiring for MXL Strada with code 04.554.14 and MXL Pista with code 04.554.13

WARNING: kits whose wiring identification codes are 04.554.14 (for MXL Strada) and 04.554.13 (for MXL Pista) are not produced anymore: this chapter - like these concerning MXL Installation and configuration - have just an explicative function for customers that already own these kits.

N.rev	Nota sulla revisione	Data	Firma	Controllo



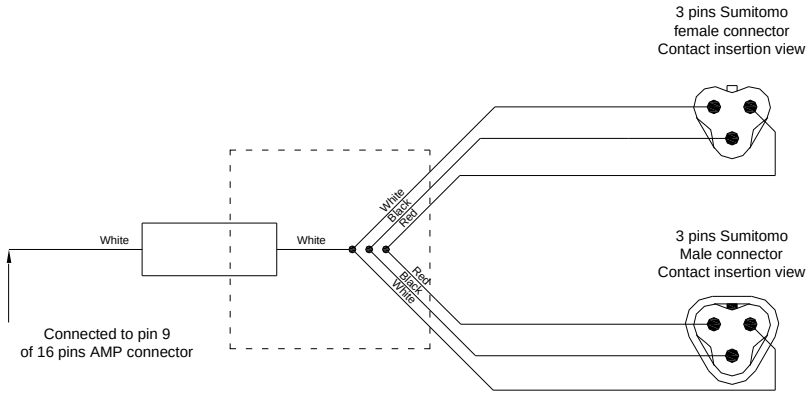
Rif.	Quantità	Titolo/Nome, materiale		N. articolo/Riferimento	
Progettato da	Controllato da	Approvato da - Data	Nome file	Data	Scala
Racing Data Power		Titolo / Nome: Cavo MXL Strada Plug & Play Suzuki GSXR K5			
		Numero disegno: 04.554.14		Modifica	Foglio: 1 of 3

N.rev	Nota sulla revisione	Data	Firma	Controllo

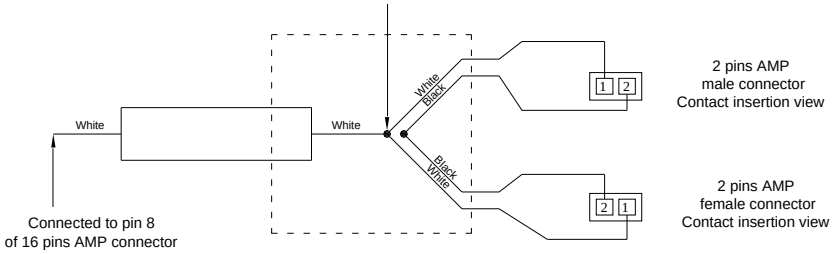
10 pins Hirose connector table

Channel	AMP 12 pin	AMP 16 pin	Cable colour	Hirose pin	Signal	Length
				1	n.c.	
	2		Red	2	12 V / +Vb Ext	
		4	Brown	3	Oil P / Ch.3	
	1		Black	4	GND	
On board rev counter		12	yellow	5	High Beam / Ch. 7	420 mm
	11		Green	6	+ VB	
	12		Grey	7	Speed	
		13	Violet	8	Turning Light / Ch. 6	
		16	White	9	Fuel / Ch. 5	
	8		Bleu	10	RPM	

Split 1: Gear channel - Cable label "Ch. 9 - Gear"



Split 2 Water temperature channel - Cable label "Ch.1 - Water T."



Rif.	Quantità	Titolo/Nome, materiale		N. articolo/Riferimento	
Progettato da	Controllato da	Approvato da - Data	Nome file	Data	Scala
Racing Data Power		Titolo / Nome	Cavo MXL Strada Plug & Play Suzuki GSXR K5		
		Numero disegno	04.554.14	Modifica	Foglio 2 of 3

N.rev	Nota sulla revisione	Data	Firma	Controllo

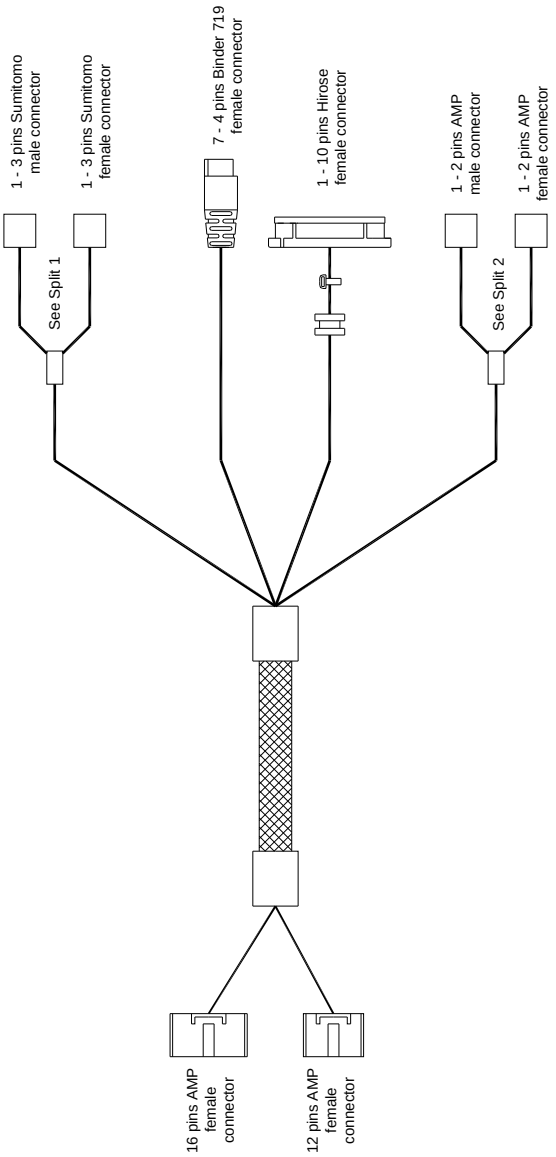
4 pins Binder 719 connector table

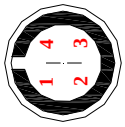
Channel	Binder pin	Cable colour	AMP 12 pin	AMP 16 pin	Connection	Length
Ch. 2	1 2 3 4	White Black Rosso Bleu	9	5 7 6	Analog input 2 Analog GND V reference	330 mm
Ch. 4	1 2 3 4	White Black Rosso Bleu	9	1 3 2	Analog input 4 Analog GND + VB V reference	380 mm
USB	1 2 3 4	White Black Rosso Bleu	10 7	10	USB D+ GND USB D-	1080 mm

Rif.	Quantità	Titolo/Nome, materiale		N. articolo/Riferimento	
Progettato da	Controllato da	Approvato da - Data	Nome file	Data	Scala
Racing Data Power		Titolo / Nome: Cavo MXL Strada Plug & Play Suzuki GSXR K5			
		Numero disegno: 04.554.14		Modifica	Foglio: 3 of 3

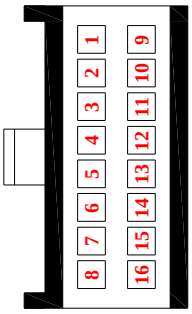
N.rev	Nota sulla revisione	Data	Firma	Controllo

MXL Pista - Plug & Play Suzuki GSX-R K5 wiring

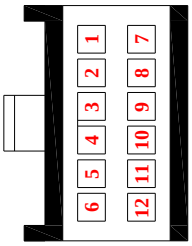




4 pins Binder 719
female connector pinout
solder termination view



16 pins AMP
female connector pinout
Contact insertion view



12 pins AMP
female connector pinout
Contact insertion view

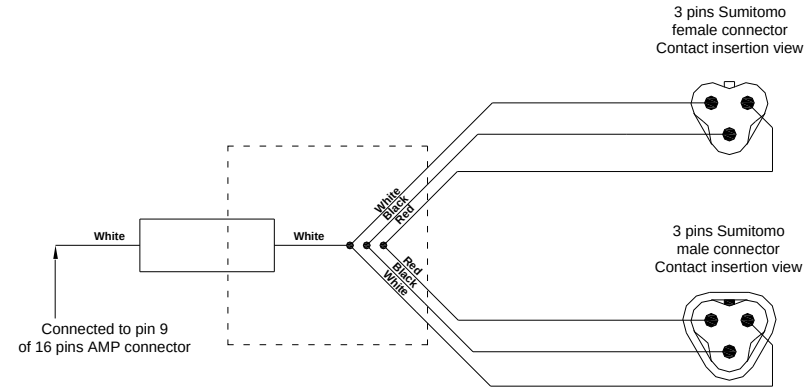
Rif.	Quantità	Titolo/Nome, materiale		N. articolo/Riferimento	
Progettato da	Controllato da	Approvato da - Data	Nome file	Data	Scala
Racing Data Power		Titolo / Nome: Cavo MXL Pista - Plug & Play GSXR-K5			
		Numero disegno: 04.554.13		Modifica	Foglio: 1 of 3

N.rev	Nota sulla revisione	Data	Firma	Controllo

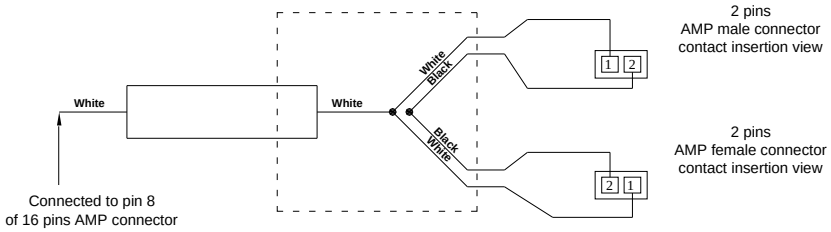
10 pins Hirose female connector table

Channel	AMP 12 pin	Cable colour	Hirose pin	Signal	Cable lenght
On-board rev counter	2	Red	1 2	n.c. 12 V/+Vb Ext.	420 mm
	1	Black	3 4	n.c. GND	
	11	Green	5 6	n.c. +Vb	
	12	Grey	7 8	Speed n.c.	
	8	Blu	9 10	n.c. RPM	

Split 1: Gear channel - cable label "Ch.8 - Gear"



Split 2: water temperature channel - cable label "Ch.1 - Water Temp."



Rif.	Quantità	Titolo/Nome, materiale		N. articolo/Riferimento	
Progettato da	Controllato da	Approvato da - Data	Nome file	Data	Scala
Racing Data Power		Titolo / Nome: Cavo MXL Pista - Plug & Play GSXR-K5			
		Numero disegno: 04.554.13		Modifica	Foglio: 2 of 3

N.rev	Nota sulla revisione	Data	Firma	Controllo

Binder 719 female connector table

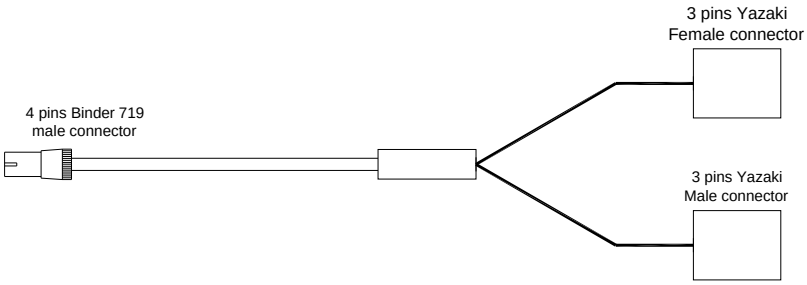
Channel	Binder pin	Cable colour	AMP 12 pin	AMP 16 pin	Connection	Lenght
Ch. 2	1 2 3 4	White Black Red Bleu		5 7 6	Analog input 2 Analog GND V Reference	330 mm
Ch. 3	1 2 3 4	White Black Red Bleu		4 3 6	Analog input 3 Analog GND V Reference	330 mm
Ch. 4	1 2 3 4	White Black Red Bleu	9	1 3 2	Analog input 4 Analog GND +VB V Reference	380 mm
Ch. 5	1 2 3 4	White Black Red Bleu	9	16 15 2	Analog input 5 Analog GND +VB V Reference	380 mm
Ch. 6	1 2 3 4	White Black Red Bleu	11	13 15 2	Analog input 6 Analog GND +VB V Reference	430 mm
Ch. 7	1 2 3 4	White Black Red Bleu	11	12 11 14	Analog input 7 Analog GND +VB V Reference	430 mm
USB	1 2 3 4	White Black Red n.c.	10 7	10	USB D+ GND USB D-	1080 mm

Rif.	Quantità	Titolo/Nome, materiale			N. articolo/Riferimento	
Progettato da		Controllato da	Approvato da - Data	Nome file	Data	Scala
Racing Data Power		Titolo / Nome	Cavo MXL Pista - Plug & Play GSXR-K5			
		Numero disegno	04.554.13		Modifica	Foglio 3 of 3

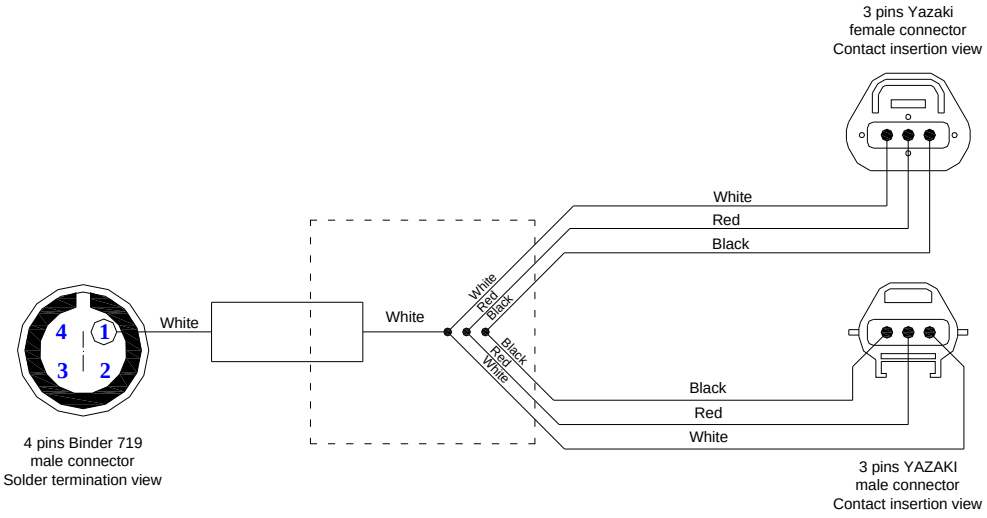
Appendix “C” –TPS cable for all MXL kits code 04.550.69

N.rev	Nota sulla revisione	Data	Firma	Controllo

TPS Cable



Cable split particular



Rif.	Quantità	Titolo/Nome, materiale		N. articolo/Riferimento	
Progettato da	Controllato da	Approvato da - Data	Nome file	Data	Scala
				01/02/2005	

Racing Data Power

Titolo / Nome: TPS cable for Plug & Play MXL kits

Numero disegno	Modifica	Foglio
04.550.69		1 di 1