Suzuki GSX-R K3 Plug&Play kit User Manual







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PRESENTATION

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

Established in 1976, AIM is today a world leader in the production of high performances instruments for racing environment: dashes, data loggers, digital displays, lap timers.

AIM set new standards in various motor sports: from kart to car, bike, dragster, Formula 1 boat, Offshore and even snowboards!

AIM products merges the functionalities of traditional tachometers, RPM indicators, temperature, pressure and lap timers with compact high performing friendly using units. Different products for different applications but with one shared characteristic: great innovation.

Each **AIM** system is completely designed, produced and tested by its technicians. The research and development board is made of electronic and mechanical engineers, physics and other specialists that develop firmware, software, hardware and the related documentation.

Our fame is build on quality products, innovative technology and faithful commitment in supporting our customers.



Preface

MXL Plug & Play kit for **Suzuki GSX-R K3** is the dashboard (with data logger function in **Pista** version) designed for an easy and quick installation: with a minimum effort a straight connection with the bike ECU is made and a lot of different information (depending on the logger model) are displayed with no need of additional sensors:

MXL STRADA

- RPM
- Speed
- Water temperature
- Oil Pressure Signal
- Fuel level
- Turning lights
- High beam
- Engaged gear
- 2 free channels

MXL PISTA

- RPM
- Speed
- Water temperature
- Engaged gearl
- 6 free channels

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

MXL Strada and **Pista** for **Suzuki GSX-R K3** kits have been developed for the following bike models:

Cubic capacity	Year 2003	Year 2004	Year 2005
600	\checkmark	\checkmark	\checkmark
750	\checkmark	\checkmark	\checkmark
1000	\checkmark	\checkmark	See K5 manual

 $\sqrt{=}$ supported

Note: thanks to the optical IR transmitter/receiver (included in **MXL Pista** kit, optional to **MXL Strada**), lap times will be displayed/recorded.

For any additional information not expressly handled in this tutorial, always refer to **MXL** user manual and/or to **Race Studio Configuration** user manual.



1 – Kit description



Suzuki GSX-R K3 Plug & Play kits differ depending on the version of **MXL**. Each type of kit includes some of the objects shown in the above picture, recognizable by their numbers:

MXL Strada kit:

- N.1 MXL Strada (1)
- N.1 Suzuki GSX-R K3 interface wiring (2)
- N.1 USB cable for **MXL** (6)
- N.1 Leaflet MXL Suzuki GSX-R K3(7)
- N.1 Race Studio 2 software CD (8)
- N.1 Bracket kit (10) that includes:
 - n° 4 Phillips 4*8 mm recess screws
 - n° 2 Phillips 5*12 mm recess screws
 - n° 4 Grover washers Ø 4 mm
 - n° 4 washers Ø 5 mm
 - n° 4 Phillips threading forming recess screws 40*12





MXL Pista kit:

- N.1 MXL pista (1)
- N.1 Suzuki GSX-R K3 interface wiring (2)
- N.1 IR Transmitter (3)
- N.1 IR receiver (4)
- N.1 Transmitter power cable (5)
- N.1 USB cable for MXL (6)
- N.1 Leaflet AIM products (7)
- N.1 Race Studio 2 software CD (8)
- N.1 TPS throttle position sensor cable (9)
- N.1 Bracket kit (10) that includes:
 - n° 4 Phillips 4*8 mm recess screws
 - n° 2 Phillips 5*12 mm recess screws
 - n° 4 Grover washers Ø 4 mm
 - n° 4 washers Ø 5 mm
 - n° 4 Phillips threading forming recess screws 40*12



Universal kit (for customers that already have an MXL Strada, Pista):

- N.1 Universal interface cable for Suzuki GSX-R K3 (2)
- N.1 Bracket kit (10) that includes:
 - n° 4 Phillips 4*8 mm recess screws
 - n° 2 Phillips 5*12 mm recess screws
 - n° 4 Grover washers Ø 4 mm
 - n° 4 washers Ø 5 mm
 - n° 4 Phillips threading forming recess screws 40*12

MXL Strada optional

- N.1 IR transmitter (3)
- N.1 IR receiver (4)
- N.1 Transmitter power cable (5)
- N.1 TPS throttle position sensor cable (9)

Note: before starting kit installation it is suggested to carefully verify that the kit contains all listed items.

1.1 – Part Numbers (see Appendix "A")

MXL Strada Plug&Play kit for Suzuki GSX-R600-750 K3 - code X10MXLSGS3467:

- only CAN connection + analog channels;
- technical draw code 04.554.14.

MXL Strada Plug&Play kit for Suzuki GSX-R1000 K3 - code X10MXLSGS3410:

- only CAN connection + analog channels;
- technical draw code 04.554.14.

MXL Pista Plug&Play kit for Suzuki GSX-R600-750 K3 - code X10MXLCGS3467

- only CAN connection + analog channels;
- technical draw code 04.554.13.

MXL Pista Plug&Play kit for Suzuki GSX-R1000 K3 - code X10MXLCGS3410

- only CAN connection + analog channels;
- technical draw code 04.554.13.

Universal kit for MXL Strada Suzuki GSX-R K3 (wiring + bracket) - code V02554140

- to transform an MXL Strada into a Plug&Play application for Suzuki GSX-R K3;
 - technical draw code: 04.554.14

Universal kit for MXL Pista Suzuki GSX-R K3 (wiring + bracket): code V02554130

- to transform an MXL Pista in Plug&Play application for Suzuki GSX-R K3;
- technical draw code 04.554.13

Optional to MXL Strada Suzuki K3 kit

- IR receiver: code X41RX12090
- IR transmitter: code **X02TXKMA01**
- transmitter power cable: code V02POWTX0
- TPS cable throttle position sensor Suzuki GSX-R K3: code V02550690



2 – Plug & Play kits installation

Suzuki GSX-R K3 Plug and Play kits have been expressly designed to be real plug and play systems.

WARNING: these kits have been developed and tested to guarantee maximum compatibility with the stock bike sold by the manufacturer.

The anchor plugs mounted on the back of the logger allows the user to replace the stock dash in an easy and quick way with no need of cutting, bending or punching anything: each component is "Plug and Play".

The logger needs to be connected to the bike high beam using the bracket that comes with the kit. The bracket is in black anodized aluminium, lightweight and mechanically resistant.

GENERAL NOTES – Read carefully these instruction before installing the kit.

- Do not cut any cable: the wiring supplied with the kit is **Plug & Play**.
- Be careful not to damage the stock connectors while plugging/unplugging them; in the following pages is described how to correctly manage them.
- Do not install the system when the engine is hot: stock connectors are quite near to the engine and there is burning danger.
- The space under the fuel tank is quite reduced: be careful plugging/unplugging the connectors.
- Be careful not to lose screws and washers.
- Be careful not to damage the fairings while installing/uninstalling them.



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

The first installation step is removing lateral mirrors and front and lateral fairings.

Lateral mirrors are fixed to the bike chassis with two hex screws that have a plastic cover. To remove the covers see **Figure 1**.

It is then possible to remove the hex screws shown in **Figure 2**.

Both mirrors need to be removed.

Afterwords remove the front screen and the right lateral fairing.

It is suggested to remove the front screen to uninstall the stock dash and install the new one.

The fairing is fixed to the bike with four Phillips thread forming screws.

In **Figure 3** the position of the screws is shown: remove them.

The logger wiring is to be installed on the bike right side.

It is only required removal of the right lateral fairing, fixed to the chassis through 6 hex screws and four plastic pins. Screws are red circled in **Figure 4** while pins are highlighted by red/yellow arrows in **Figures 4** and **5**.

The plastic pin on **Figure 4** is only visible looking at the bike frontally.



Figure 1: plastic covers removal.



Figure 2: hex screws.



Figure 3: front screen – 4 Phillips thread forming screws.



Figure 4: right lateral fairing – screws and pins.



The remaining three plastic pins are on the bottom part of the bike.

To correctly remove them refer to **Figures 6** and **7**.



Figure 5: Right and left fairings junction – pins position.



Figure 6: release the central clip of the plastic pin.



Figure 7: removal of the plastic pin

Insert a tip in the central hole of the pin and press until you hear a click. This way the pin is released.

Once the pin released it is possible to remove it. Use a flat screwdriver: insert under the pin and rotate it.

All the three pins have to be removed. When all hex screws and pins are removed the right lateral fairing is released.



2.2 – Removing the bike seat and lifting the fuel tank.

Some bikes connectors are very near to the engine and placed under the fuel tank; it is then required to lift the latter.

To lift it remove the bike seat, which is fixed to the bike with two screws. In **Figure 8** the left screw is indicated.

Remove the two lateral screws of the bike seat as shown in **Figure 9**.

It is now possible to remove the bike seat.

The fuel tank is hinged to the chassis near to the seat and fixed with two hex screws placed close to the fork. Unscrew them as shown in **Figure 10**.

Once the screws are removed, it is possible to lift the fuel tank using the bike standard equipment as shown in **Figure 11**.



Figure 8: bike seat



Figure 9: unscrew the bike screws



Figure 10: how to remove the fuel tank



Figure 11: lifting the fuel tank



2.3 – Releasing the high beam and the front fairing screws.

The 3rd installation step is releasing the high beam and the front fairing screws, to install more easily the kit. These screws are self threading Phillips.

In **Figure 12** is highlighted one of the two remaining screws of the fairing.

Note: in the Figure the screws has already been removed.

Once released these screws, pull (softly) the front fairing onwards to fix the lateral screws of the new dash (see **Figures 28** e **30** for further information).

While pulling the fairing, pay attention not to disconnect the high beam that may fall down.

Note: to pull the fairing onwards, screws and pins should have been removed.



Figure 12: front fairing and high beam screws position



Figure 13: front fairing and high beam screws released.

2.4 – Removing the stock dash; unplugging the connectors

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

The stock dash is fixed to the bike in four points: with two 5 mm hex screws in the first two and through a bracket in the other two.

Remove the hex screws highlighted in **Figure 14**.



Figure 14: stock dash front screws position.



MXL P&P SUZUKI GSX-R K3 User Manual Release 1.07

Once removed the screws, it is possible to uninstall the stock dash and rotate it towards himself and unplug it from the high beam.

Once removed the stock dash, unplug the 16 pins AMP connector from the back of the dash.

Remove the plastic cover, press the tongue (highlighted by an arrow **Figure 16**) and unplug the connector from the dash.

Figure 17 shows gear and water temperature stock connectors default position.

For further information concerning the stock connectors refer to **Figures** from **18** to **19**.

The **gear** connector, shown in **Figure 18** is a 3 pins white connector, usually placed on the left part of the bike (see **Figure 17**). Here below are shown the two gear connectors: male and female.

Note: cable colours correspond to real ones.





Figure 15: stock dash removal



Figure 16: unplugging the stock dash conector.



Figure 17: stock connectors position



Figure 18: gear connector - particular





Water temperature stock connector, Figure 19, is a 2 pins green connector placed on the left part of the bike (see Figure 17).

Here below is the water temperature connector.

NOTE: cable colours corresponds to real ones.



3 pins male/female connector are inserted one in the other.

To unplug male connector from female one use a flat screwdriver: push down the locking tongue and unplug the connectors.

Attention: pull the connectors and not the cables (they me be seriously damaged) and unplug each cable from the connector.

2.5 – Assembling the kit.

The 5th installation step is assembling the kit for **Suzuki GSX-R**.

It has four anti-vibration mountings already fixed on the back of **MXL**;

Install **MXL** on the aluminium bracket: the bracket needs to be fixed to **MXL** in correspondence of the 4 anti-vibration mountings and with 4 screws and 4 Grover washers.

Figure 22 shows the correct assembling of MXL, bracket and washers (rear view).



Figure 19: water temperature connector - particular



Figure 20: how to unplug a connector.



Figure 21: anti-vibration mounting – particular



Figure 22: MXL and bracket - rear view



2.6 – Cables connection

The 6th installation step is installing the wiring supplied with the kit.

The entire wiring is wrapped in a rubber girdle. Bend it 90 degrees and let it run along the bike right side.

Follows these instructions to correctly install the wiring.

Let the wiring (except cable labelled "Lap") pass between the high beam and the front fairing.

The 2 AMP connectors, "Lap" cable and stock wiring (the one terminating with a black aluminium box), should remain over the high beam chassis.

Both AMP connector and black box are too big to pass between the chassis and the high beam. It is suggested to insert the wiring from top.

Let the cable labelled "Gear", "Water temp" etc... pass along the bike chassis like in **Figure 25**. Use plastic wrappers to fix them to the bike stock wiring.

"Gear" and "Water temp" stock connectors are under the fuel tank and it is better to let them enter in the engine compartment as in **Figure 25**.

"Gear" and "Ch. 1 Water temp" cables have two connectors, male and female.

Connect **AIM** male connectors to female stock ones and vice versa.

Connect the 16 pins black connector to the male one in the black aluminium box (press until a click is heard). Refer to **Figure 26** for further information.

Once the 16 pins connector has been connected, use the stock dash plastic cover to make the connection water resistant.



Figure 23: wiring installation



Figure 24: kit installation



Figure 25: the wiring runs along the chassis



Figure 26: particular of AMP connector



2.7 – Installing the kit

The 7th installation step is connecting the 26 pins MS connector to **MXL**. Once installed the connector, place the black aluminium box between the bracket and the high beam.

When the channels interface box has been placed (using Velcro or plastic wrappers), install the kit on the high beam.



Figure 27: 4 screws position.



Figure 28: position of lateral and bottom wings of the bracket.



Figure 29: lateral screws fixing

Before remounting lateral fairing, front screen, bike seat and fuel tank, switch the bike on and check system integrity, its correct installation and proper working.

The new dash needs to be fixed in four points: two of them frontally visible and two lateral.

Use the M5 screws supplied with the kit to fix the new dash in the two frontal points and the Phillips thread forming screws to fix it laterally.

Use the thread forming screws supplied with the kit to fix the new dash laterally (**Figure 29**). The screws have to be inserted in the hole circled in **Figure 29**.

Note: the front fairing has already been pulled onwards like in Figure 13.

It is possible to use plastic wrappers to fix the new wiring to the chassis.



2.8 – Installing the TPS cable

Warning: before installing the cable it is necessary to remove the fuel tank, as recommended in the previous pages.



Unplug the Suzuki stock cable form TPS sensor and connect it to **MXL** wiring male connector labelled as TPS (as shown in the image above).

Connect female connector of **MXL** TPS cable to the TPS sensor (as shown by the blue arrow).

Connect the 4 pins male plastic Binder connector to one of the free channels depending on **MXL** model (See chapter "Channels").

To configure the channel the TPS sensor is installed on, refer to the related chapter in the following pages.



3 – MXL connection inputs

Thanks to interfaces cable supplied with **Plug & Play Suzuki GSX-R K3** kit, data acquisition is really easy and fast.

Here below all connectors that allows the user to display data on MXL are shown:

- Lap connector (left connector), which allows lap time acquisition
- **Expansion modules connector** (right connector), for all CAN expansion modules (GPS, Lambda probe) connection
- 2 AMP connectors (12 and 16 pins), which allow communication between the logger and Suzuki GSX-R K3 ECU.





4 – MXL GSX-R K3 firmware

MXL Strada/Pista for **Suzuki GSX-R K3** is equipped with a special firmware version, that provides the user with a second virtual dashboard.

On the road, the display is set on "street mode" and shows these parameters:

RPM graph bar configurable scaling: black

digital RPM value / battery voltage / total and partial odometer, date and time: **fuchsia** (VIEW/QUIT button to switch the options);

Speed: red

Engaged gear: green

Always on top analog inputs depending on **MXL** version: **blue**

Field, until 4 fields displayed two by two: light blue

To switch the visualization, use ">>" button.

On the track, when passing by a switched on transmitter, the display switches automatically on "track mode".

Lap time takes the place of odometer on the display (**Figure 31**).



Figure 30: Display in modalità strada

			Mm	
1 8 S	10 11 GEAR	ין 13 בו 21	יייי ריייייייייייייייייייייייייייייייי	SPEED
O ECT	J BI		LRP 34	km/h mph
84.5	13.		18:	כב
LH_J	366	LH_	чь	18

Figure 31: Display in modalità pista

Visualisation mode (street/track) set via software is stored by the logger. Default setting is "show odometer". If user sets via software "Show lap time" this visualisation mode is restored at each switch on, no matter if the bike is on the road or on track.

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



5 – Configuration

After **MXL** installation, the logger is ready to work thanks to the default configuration. In case a custom configuration is needed, here follows the correct procedure. Run **Race Studio 2** software.

Press "AIM system manager" button on the left vertical keyboard; the panel showing all AIM systems managed through this software appears: select **MXL**.

📓 Race Studio 2 — version: 2.30.	18
File AIM system manager Download data	a Analysis AIM system identification Only
AM Sporting	MyChron3 Kart Plus Gold Ext
The World Leader in Data Acquisition	MyChron3 Auto Moto Plus/Gold Ext
Download data	M3Log Visor XGLog
All system manager	MXL
AIM system identification	DaVid
Doline	EV03 EV03 Pro/Pista
AIM system calibration	EV04
Custom sensors manager	ECU Bridge
Select Language	
	So to Exit

Press **New** button in system configuration window:

🎇 Race Studio 2 🗉 version: 2.30.12														
File AIM system manager Download data	Analysis	AIM system in	dentification	n Online i	AIM system calibra	ion	Custom sensors	manage	er Select La	nguage	2			
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	DEFA	ULT	MXL PISTA	A S	UZUKI - GSXR	DEF	AULT	12.41.	26 (h.m.s)	4.36.03	(h.m.s	s) 91 (Hz)		91 (1
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AIM system manager	2	DEFAULT		MXL PRO 05		•	BOSCH	-	M53		- DE	FAULT	8	1
	3	DEFAULT		MXL PISTA	SUZUKI GSXR		None		None		DE	FAULT	8	1
	4	DEFAULT		MXL STRAD	A SUZUKI GSX		None		None		DE	FAULT	8	1
Alla sustam identification														



Fill in the window here below.

New configuration		
Data logger type	MXL PISTA SUZUKI GSXR K3 · K5 (harness 04.554.13)	J
ECU Manufacturer	None	J
ECU Model	None	•
New configuration name	DEFAULT	
Vehicle name	DEFAULT	
Speed measure unit	km/h	•
Temperature measure unit	°C	•
Pressure measure unit	bar	•
	Image: State of the	

- Data logger type: select **MXL Pista** or **MXL Strada Suzuki GSX-R** depending on the kit.
- New configuration name: fill in a configuration name.
- Vehicle name: fill in a vehicle name.
- Select speeds, temperatures and pressures unit of measure.
- Click on OK button to create the configuration.

Select Channels layer to enter MXL channels configuration:

🔛 Race Studio 2 🛛 - version: 2.30.12										
File Gestione sistema AIM Scarico dati Anal	isi Identificazione sist	ema AIM Online C	alibrazione sistema Al	IM Gestione sensori	personalia					
	🏭 System manag	er								
Racing Data Power	Trasmi	ssione) Lettura		Informaz					
AIM Sportline	Configurazione selezionata									
The World Ceader in Data Acquisition	Nome installazione	Tipo centralina	Ecu	Nome veicolo	Tempo di					
	DEFAULT	MXL PISTA	SUZUKI - GSXR	DEFAULT	12.41.26					
Avvia Analisi	Scegli configurazion	e Canali Configura	azione sistema Confi	guratore espansioni vi	a CAN					



If an MXL Pista is being configured this window appears:

	Becm	·	CAN-Ne	t info	Set acquisition sys	teni		
1								
Data logger type	er type Ecu Vehicle name		Available time	Time with GPS	Moster freque	ncy Expansions fro	rg Tot. Expansion	
n Channels Sys	rem configuration CA	N-Expansions configu	rantor					
Enabled/disabled	Channel name		Sampling frequ.	Sensor type		Measure unit	Low scale	High scale
Enabled	Engine		10 Hz	· Engine revolution spe	ed	rpm	0	20000
Enabled	Speed_1		10 Hz	* Speed		kn/h .1	0.0	250.0
Enabled	Water_Temp		10 Hz	· Water Temp Suzuki Q	SIR	*C	0	150
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T Disabled	channel_3		10 Hz	Generic Inear 0-5 V		V.1 2	0.0	5.0
Disabled	Channel_4		10 Hz	• Generic linear 0-5 V	2	J V .1 2	0.0	5.0
Disabled	Channel_5		10 Hz	Generic Inear 0-5 V		V.1	0.0	5.0
Disabled	Channel_6		10 Hz	Generic Inear 0-5 V		V.1 2	0.0	5.0
Disabled	Channel_7		10 Hz	Generic linear 0-5 V		JV .1 2	0.0	5.0
Enabled	Gear		10 Hz	Gear potentiometer			0	6
Disabled	Calculated_Gear		10 Hz	Calculated Gear			0	9
Disabled	LatAcc		10 Hz	 Lateral accelerometer 		9 .01	-3.00	3.00
Enabled	Datalogger_Temp		10 Hz	Cold toint		°C 2	0	50
Enabled	Battery		1 Hz	 Battery 		¥ .1	5.0	15.0
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FISTA Farme - None DEFALLT Internet: System configuration CALE Internet:	Debit logger type Eou Vehicle name Available time MDL_PDTA_S None - Nore DEFAULT 2236.36 (h.m. Incomposition System configuration DEFAULT 2236.36 (h.m. Incomposition System configuration CANEEspansions configurator Incomposition General name Sampling freque Incomposition Channel name Sampling freque Incompos	Data logger type Bou Vehicle name Available time Time with CPS Mol. FIGTA 5 None - None DEFAULT 22.58.38 (hm.s) 5.28.23 (hm.s) n Determining System configuration CANEE paintions configurator 5.88.23 (hm.s) n Determining System configuration CANEE paintions configurator 5.89.23 (hm.s) no (mm) 901.4	Data logger type Ecu Vehicle name Available time Time with 04% Total trequency Mol. FISTA Flore - None DEFAILT 22.38.36 (h.m.s) 5.28.23 (h.m.s) 51 (htt) In Channel, System configuration CANE-Expansions configurator 5.88.23 (h.m.s) 5.88.23 (h.m.s) 51 (htt) In Channel, System configuration CANE-Expansions configurator 5.88.23 (h.m.s) 5.88.23 (h.m.s) 51 (htt) In Channel, System configuration CANE-Expansions configurator 5.88.23 (h.m.s) 5.88.23 (h.m.s) 51 (htt) Included South Channel, Grantel Sampling Imgs Sensor type Sensor type 5.88.23 (h.m.s) 51 (htt) Included South Channel, Grantel Channel, South GSR 5.88.23 (htm) 5.88	Othe logger type Ecu Vehicle name Available time Time with OPS Total frequency Master frequency MdL FISTA 5 More - None DEFAULT 22.35.38 (h.m.s) 5.28.23 (h.m.s) 51 (htc) 51 (htc) </td <td>Detail togget type Ecu Vehicle name Available time Three web/CPES Total frequency Measure frequency Expansions for MoL_FESTA 5 Arme - None DEFAULT 22.39.39 (hum.s) 51 (htc) 51 (htc) 0 (htc) In Charmel System configuration CAH-Expansions for 538.23 (hum.s) 51 (htc) 0 (htc) 0 (htc) In Charmel System configuration CAH-Expansions configuration Image: System configuration Measure unit Low scale Includid/adation Obunded Sampling frequility Sensor type Measure unit Low scale Includid/adation Obunded Sensor type Y Y N Includid/adation Obunde</td>	Detail togget type Ecu Vehicle name Available time Three web/CPES Total frequency Measure frequency Expansions for MoL_FESTA 5 Arme - None DEFAULT 22.39.39 (hum.s) 51 (htc) 51 (htc) 0 (htc) In Charmel System configuration CAH-Expansions for 538.23 (hum.s) 51 (htc) 0 (htc) 0 (htc) In Charmel System configuration CAH-Expansions configuration Image: System configuration Measure unit Low scale Includid/adation Obunded Sampling frequility Sensor type Measure unit Low scale Includid/adation Obunded Sensor type Y Y N Includid/adation Obunde

If an MXL Strada is being configured this window appears:

adailation pages	1	Sada January Burns	(Env)	Mahlela name	Augustable time	Time with COF	Total from unners	Adventure dan		Engenetaria fana	Tel Europeine
FEALS T		AND STRADA	None None	DEFAULT	Available time	7.13.04 (h m s)	0.04x)	O (Hz)	anency	Expansions treg	1 of Expansion
er muen	-1	In Street		DO NOL1	0.00.00 ((100.0)	1.10.01 (1.11.0)	10040	10040		10040	
alact configurat	inn.	Character Sur	ten continuation CAN	Expansions contra	enter I						
elect corregords		charries sys	ten congoosti Con	Caparisons correg	(World)						
Speed_1											
wheel croumfer	ence	(mm) 801	.4								
Delensorshan	, and	-									
ruses per wisee	10	ooden 1.									
Jhannel iden	Ene	bled/disabled	Channel name		Sampling frequ	Sensor type		Measure un	e Lo	w scale 1	ligh scale
(FM	9	Enabled	Engine		No_Mem	Engine revolution spee	id .	rpm	8	2	0000
5PD_1	[Enabled	Speed_1		No_Mem	Speed	2	kn/h .1	0.0	0 2	50.0
1_H3	₽	Enabled	Water_Temp_ECT		No_Mem	Water Temp Suzuki GS	XR.	°C	- 0	1	50
CH_2	Г	Disabled	Channel_2_free		No_Mem	Generic linear 0-5 V	-	V .1	- 0.	0 5	.0
э.	V	Enabled	OI_Press_signal		No_Mem	Oil Press Suzuki GSVR		ber .1	0.	0 5	.0
2H_4	Г	Disabled	Channel_4_free		No_Mem	Generic linear 0-5 V	-	I. V		0. 5	.0
:H_S	V	Enabled	Fuel_level		No_Mem	Status signal		*	0	5	0
3H_6	V	Enabled	Turning_light		No_Mem	Status signal		1	0	1	000
CH_7	V	Enabled	H_beam		No_Mem	Status signal		*	0	5	0
CH_8	14	Enabled	Gear_pot		No_Mem	Gear potentiometer		*	0	5	0
CALC_GEAR	Г	Disabled	Calculated_Gear		No_Mem	Calculated Gear		1	0	9	<u>,</u>
LOG_TMP	R	Enabled	Datalogger_Temp		No_Mem	Cold joint		°C	- 0	5	0
SATT	P	Enabled	Battery		No_Mem	Battery		V .1	5.	0 1	5.0

Both of them show the channels sampled by the logger.

<u>Note</u>: all additional analog channels are disabled by default. To configure them refer to **Race Studio Configuration** user manual.



It is now necessary to configure the display.

Select System configuration layer:



This window appears:

Rom	Shift Lights	eed
AIM sensor Multiply factor	🔘 11000 🔘 Ch	annel Speed_1
ECU signal MAX value 14000		Lap
Alarm led None Over-rev threshold		Obscuring time 8 (sec.)
Gear sensor		Lap segments 1
Calculated	9800 💿	
Calculated with neutral	A 0500	Show lap time
Potentiometer signal: Channel 8	9500	Chaw weeping lag time
Highest gear number		
ECU 6	11 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Condition enabling checked alarms
		Engine 🗾 🚬 🖸
Channel for alarm Conditioned		Conditioned Channel for alarm Threshold
Water_Temp_ECT - 90 Off Water_Temp_ECT		Fuel_level 🔍 < 100 off
	5 3.2 🔨 18:3	5 🚰 Turning_light 🖃 250 🛛 🕅
Battery 💽 13 off 🚭 🖊 🖁 🖻 S	T LAP LINIT	Hi_beam 🔽 🔁 250
Link alarm to measure fields		MYL
Measure Short name		Measure Short name
Field 1 - always displayed		Field 2 - always displayed
Water_Temp_ECT	Enable static string	Battery
Field 3 - page 1		Field 4 - page 1
None Velcome tex	t	None 🗸
Field 3 - page 2 Text 1		Field 4 - page 2
None		None

The following fields have already been set:

RPM: RPM Max value is set on 14000;

Gear sensor: the procedure explained in chapter 6 is required;

Shift light: an engine limiter at 11000 Rpm is expected. If the engine has a limiter with an higher max value, users need to modify threshold values inserted in the shift lights cases, so that the last red led switches on just before the limiter intervention.

Speed: the speed sensor of **Suzuki GSX-R K3** bike 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 written in the proper cell is an "equivalent circumference" calculated using the following formula:

$$Equiv Circumf = \frac{Wheel Circumf * N_p}{N_c}$$

Np = pinion teeth number **Nc** = crown teeth number

Using the default values for crown/pinion teeth number and wheel circumference for a **Suzuki GSX-R K3 750**, the equivalent circumference is **801.4 (31.55inches)**.

If the pinion or the crown are changed and the new one has a different teeth number, equivalent circumference needs to be re-computed.

For the automatic compute of the wheel circumference, please refer to "Equivalent circumference compute" paragraph.



Displayed channels are:

ECT: water temperature; threshold value: Low (Min) 50° / High (Max) 90°.

ODOMETER: by default it is set on show odometer. Once on the track (with optical lap receiver and transmitter) the logger switches automatically on "Show lap time" mode. Switching on/off the **MXL** the logger shows again odometer.

Note: To modify and customize displayed channels refer to Race Studio Configuration user manual.

This way the configuration is ready and can be transmitted to **MXL**: to do so press "Transmit" button on the top keyboard.



6 – Gear calibration

Gear calibration is the last system configuration step.

This procedure is to be done only if the default one does not allow correct visualisation of the engaged gear number.

This procedure can only be done using a PC with Microsoft XP or Microsoft Vista operating system and **Race Studio 2** software (included in the kit) installed. The logger has to be connected to the PC through the proper USB cable supplied with the kit and switched on.

Once the PC connected to MXL and this last one switched on, run Race Studio 2 and:

select the logger (MXL Strada / Pista GSX-R);

 press "Calibrate" button on the menu bar or "AIM System calibration" button on the left vertical keyboard

(man)	📓 Sy	stem mana	ger											
Haring Sala Press	2	j, Tra	insmit		Beceive				'AN-Net info		0	Sel acquir ti	ition sys	tem
AIM Sportline	Curren	t configuration	n		167							VN.		_
RE WORLD DEBOET HIT DIRUK PACQUISICION	Insta	astion name	Data logg	er type	Ecu	Vet	icle name	Avail	sble time	Time with 0	PS	Total free	quency	Mast
	DEFA	NULT	MOL PISTA	A	EMV - EMV MN	DEF	AULT	3.29	.20 (h.m.s)	2.21.07 (h	m.s)	331 (Hz)		331
Go to Analysis	Sele	ct configuratio	n Channel	s Syste	m configuration CAN	Expa	ntions configure	Ace						
Download data	4	New	-	R	Delete	2	Clone		5	mport		Dij	ort	
	N	Installation	name	Logger			ECU Manufact	urer	ECU Model		Vehic	le name	Obs	Split
1	1	DEFAULT		MD1_PIST	rA	-	BMW	2	BHW_MINI	1	DEFA	ULT	8	1
AlM system manager	2	DEFAULT		MOL PIS	ra -	-	BMW	-	BMW_PT6	-	DEFA	ULT	8	1
	3	DEFAULT		MDL PIS	TA	-	BMW	-	ZIMCOUPE	-	DEFA	ULT	8	1
	4	DEFAULT		MDL PRO	05	-	FERRARI		430612	-	DEFA	ULT	8	1
AIM sastem identification	2	DEPAULT		MUL PRO	105		PERKARI	-	1 4300		DUPA		0	1
	Þ	DEFAULT		MDL PIS	А	-	STRELE		J CAN		Dera	OL1	0	1
Guiline AlM system calibration														

This window appears: press 'calibrate' button corresponding to the sensor to calibrate

Sensor calibratio	on			
	Configuration name		System ty	pe
	LOGGER_CONF		MXL PIST	A
- Sensors to autoca	alibrate		Cli	ck here to autocalibrate all sensors in the list
Chan	Channel name	Sensor type	Status	Click here to calibrate
- Sensors to calibra	ste			
Chan	Channel name	Sensor type	Status	Click here to calibrate
LH_8 Gear		Gear potentiometer	Lanbrated	Laiidrate



This window appears:

Gear sensor	calil	pration	
Gear number		Raw value	
NEUTRAL		0	
#1		0	Check radio button correspondig with your higher gear number
#2		0	then click on CONTINUE.
#3	Γ	0	
# 4		0	
#5	Γ	0	
#6	Γ	0	
# 7	Γ	0	V END CALIBRATION
# 8		0	RESTART CALIBRATION
#9		0	ancel

- Select highest gear number enabling the related checkbox and press "Continue" button;
- engage progressively all gears also with the bike switched off but the master switch on and press "Continue" button after each gear engagement as for the instructions that appear on the PC monitor. New values are stored automatically by the system.





Once the calibration is over this window appears.

Gear sensor	calil	pration		
Gear number		Raw value		
NEUTRAL	◄	1		
#1	•	237	CI	ick on END CALIBRATION
#2	•	661		
#3	•	1437		
# 4	•	2207		
#5	•	2702		
#6	•	3672	4	CONTINUE
# 7		0	~	END CALIBRATION
#8	Γ	0	Ø	RESTART CALIBRATION
#9	Γ	0	-	<u>C</u> ancel

To finish this procedure press "End calibration" button. This window appears:

	upration				
		Configuration name		System ty	ре
		LOGGER_CONF		MXL PIS	ΓA
- Sensors to	o autocalibr	ate		Ci	ck here to autocalibrate all sensors in the list
Chan	.	Channel name	Sensor type	Status	Click here to calibrate
- Sensors to	o calibrate-				
		Characterization and a second	Constant lines	Chattan	CEally have be a silver to
CH_8	Gear	Channel name	Sensor type Gear potentiometer	Status Calibrated	Click here to calibrate Calibrate
CH_8	Gear	Channel name	Sensor type Gear potentiometer	Status Calibrated	Click here to calibrate Calibrate

Press "Transmit calibration" button and the new configuration is transmitted to the logger.



6.1 – Saving the configuration with custom gear calibration

To save the new configuration in **Race Studio 2** database, activate "Select configuration" layer in system configuration window and press "**Receive**" button.

📓 System mana	ger								
Tra	nsmit] Receive		CAN-Net info		Set acquisition sy time	stem S	martyCam Function setting	•
Current configuration	1								
Installation name	Data logger type	Ecu	Vehicle name	Available time	Time with GPS	Total frequency	Master frequency	Expansions freq	Tot. Expansions
DEFAULT	MXL PISTA	LIFE - F88_CAN	DEFAULT	3.04.17 (h.m.s)	2.09.16 (h.m.s)) 376 (Hz)	376 (Hz)	0 (Hz)	0
Select configuratio	n Channels System	configuration CAN-	Expansions configural	tor					
New New	s and the second s	Delete	🧘 Clone		mport	Export			
N Installation	name Logger		ECU Manufactu	urer ECU Model	Ve	hicle name Obs	. Split Speed	Temp Created	Tot
1 DEFAULT	MXL PIST/	4	LIFE	F88_CAN	🖃 DE	FAULT 8	1 km/h 💌	°C 🔄 July 01, 2	0 0
2 DEFAULT	MXL STRA	DA SUZUKI GSX	None	None	DE	FAULT 8	1 km/h 💌	°C 🗾 July 24, 2	0 009

The configuration of the logger connected to the PC (the **MXL** whose configuration was previously transmitted) is read and saved as the last on bottom of configurations database (highlighted in yellow).

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



7 – Equivalent circumference compute

To compute the equivalent circumference, to be inserted in the correspondent cell of **Race Studio 2** software "Channels" layer, is possible to use "**Bike.exe**".

It is placed in "X:\Utilities" folder -. Race Studio 2 software CD To do so browse the Cd:

Double click on "**Bike.exe**" icon and the following window appears. Please: insert "Drive gear teeth number" (1) insert "Driven gear teeth number" (2) select circumference unit of measure (3) insert circumference value (4)

press compute button



Please insert this value in the related cell of **Race Studio 2** Configuration window.









8 – TPS sensor configuration

Once the TPS sensor is installed on the bike (see the related chapter for further information), it is necessary to calibrate it so to sample correct data.

This procedure needs a PC with Microsoft XP or Microsoft Vista operating system and **Race Studio 2** software (included in the kit).

The logger has to be connected to a switched on PC through the proper cable supplied with the kit.

- run Race Studio 2;
- select the proper logger (MXL Pista GSX-R K3-K5);
- activate Channels layer;
- select a free channel depending on MXL model;
- enable the channel checking the related checkbox in "Enabled/Disabled" column;
- set, if desired, a channel name;
- select "Zero based Potentiometer" through the menu of "Sensor Type" column;s
- set the sensor unit of measure in the cell of "Measure Unit" column;
- set high scale value (suggested 110%);
- click on "Transmit" button to transmit the configuration to the logger.

📓 System manager							
Transmit Receive		CAN-Net info	1	et acquisition syst time	em Sma	artyCam Functions setting	
Installation name Data logger type Ecu	Vehicle name	Available time	Time with GPS	Total frequency	Master frequency	Expansions freq	Tot. Expansions
DEFAULT MXL PISTA LIFE - F88_CAN D	DEFAULT	3.04.17 (h.m.s)	2.09.16 (h.m.s)	376 (Hz)	376 (Hz)	0 (Hz)	0
Select configuration Channels System configuration CAN-Ex	kpansions configurato	л]					
🔶 New 📝 Delete	🔒 Clone	In and	nport	Export			
N Installation name Logger	ECU Manufactur	er ECU Model	Vehicle	name Obs	Split Speed 1	Femp Created	Tot
1 DEFAULT MXL PISTA	✓ LIFE	F88_CAN	DEFAU	LT 8	1 km/h 🗾 °	C 🔄 July 01, 20	09 0
2 DEFAULT MXL STRADA SUZUKI GSX	✓ None	None	DEFAU	LT 8	1 km/h 🗾 °	°C 📃 July 24, 20	09 0
3 DEFAULT MXL PISTA SUZUKI GSXR	✓ None	None	DEFAU	LT 8	1 km/h 🗾 °	°C 📃 July 24, 20	09 0

Click "Calibrate" on the left vertical keyboard or on the menu bar.

lie AIM system manager. Download data A	nalysis: AIM system	identification Only	AIM system calbr	ation Custom sensors	manager Select L	enguaga 7						
	📓 System mana	ger.										_ 0
Races Des Reser	-	i fann	Beceiv	-	CAN Not inf		Set acqu	otion syste		SnartyCar ter	n Functions lling	
AIM Sportline The World Leader in Data Administra	Cuneri conigastio	10 A	15			11	16.5	_	100	201		á –
	Installation name	Data logger type	Ecy	Vehicle name	Available time	Time with GPS	Total fre	squency	Master trequer	cy Expan	sions trea	Tot. Expansions
Go te Analysis	Select configuration	MAL PISTA	UPE-PS8_CAN	N Expansion: configurat	304.17 (h.m.s)	2.09.16 (h.m.s) 376 (Hz		376 (H2)	0 (Hz)		0
Download data	<u>م</u>	e e	Delete	Chone	F	Import	F	port				
No. of Concession, name	N Installator	name Logger		ECU Manufactu	arer ECU Model	Ve	hicle name	Obs	Split Speed	Temp	Created	Tutom
	DEFAULT	960. PD	TA	-1 mr	I FOR_CAN	10	FALLT	0	l km/h	≝ ≮ .	1 May 01, 25	09 0
AlM system manager	2 DEFAULT	MOL ST	RADA SUZUKI GSK.	Mone	None	DC	FAULT	8	L km/h	<u> 기</u> ~ 그	J July 24, 20	09 0
the second se	3 DEFAULT	MOL PE	TA SUDUKI GSIR	Liu 💌 None	None	30	FAULT	8	i imh	1 2 2	My 24, 20	07 0
Cunton calibration Cuntom semiors manager Select Language												
Elmisperfiline.com B 200 visit de Marcologia de Composition Ref de Statemento L. P. CENDERE 3 (K. ANDROLE) - CENTRE CENDERE 3 (K. ANDROLE) - CENTRE												



This window:

	Configuration name			Sustem I	tune
	LOGGER CONE			MXL PIG	STA
ensors to autocal	brate				
				C	lick here to autocalibrate all sensors in the list
Chan	Channel name	Sensor ty	/pe	Status	Click here to calibrate
ensors to calibrat	3				
ensors to calibrate	e Channel name	Sensor It	ine	Status	Click here to calibrate
ensors to calibrate Chan CH_8 Gear	e Channel name	Sensor I Gear potentiometer	ine	Status Calibrated	Click here to celibrate
ensors to calibrat Chan CH_8 Gear	9 Channel name	Sensor In Gear potentiometer	Ine	Status Calibrated	Click here to calibrate Calibrate
ensors to calibrat Chan CH_8 Gear	9 Channel name	Sensor In Gear potentiometer	ine l	Status Calibrated	Click bere to calibrate Calibrate
ensors to calibrate Chan CH_8 Gear	9 Chennel name	i Sensor I Gear potentiometer	ine	Status Calibrated	Click here to calibrate Calibrate
ensors to calibrate Chan CH_8 Gear	e Channel name	Gear potentiometer	ine I	Status Calibrated	Click here to calibrate Calibrate
ensors to calibrate Chan CH_8 Gear	9 Charpel name	Sensor h Gear potentiometer	ine I	Status Calibrated	Click bere to calibate Calibrate

Click "calibrate" (as shown in the image below). This window appears:

Sensor calibration		
Channel Name	Sensor type	Measure unit
TPS	Zero based potentiometer	%
	Raw data Me	easure
HIGH POSITION 1 🚹	Get Raw Value 3669	3 100
	Get Raw Value 1 🔥	0
… How to calibrate 1 . Maintain your sensor in high (r button. 2 . Maintain your sensor in zero (r button. 3 . Insert measure values corresp Click <0K> button.	your sensor: or right) reference position and click on <get raw="" valu<br="">or rest) reference position and click on <get raw="" value<br="">pondent to above indicated reference positions.</get></get>	e> proper
		~
	OK Cancel	

Follow the instruction that appears on the PC monitor:

- with gas completely opened press "Get raw value" button;
- with the gas in zero position, press on the corresponding "Get raw value" button;
- match acquired values with custom values to be inserted in "Measure" box;
- press OK button.

The calibration is transmitted to the logger.



9 – Channels

Channels set in MXL Strada/ Pista for Suzuki GSX-R default configurations are:

MXL Pista Suzuki

Channel Identifier	Channel name	Function
RPM	Engine	RPM Value
SPD_1	Speed1	Speed value
Ch_2	Channel_2	Free channel
Ch_3	Channel_3	Free channel
Ch_4	Channel_4 (12V)	Free channel
Ch_5	Channel_5 (12V)	Free channel
Ch_6	Channel_6 (12V)	Free channel
Ch_7	Channel_7 (12V)	Free channel
Ch_8	Gear	Engaged gear number
CALC_GEAR	Calculated Gear	Calculated gear
ACC_1	LatAcc	Lateral Acceleration
LOG_TMP	Datalogger_Temp	Data logger temperature
BATT	Battery	Battery voltage

MXL Strada Suzuki

Sigla Identificativa	Nome canale	Funzione
RPM	Engine	RPM Value
SPD_1	Speed_1	Speed value
Ch_1	Water_Temp_ECT	Water temperature
Ch_2	Channel 2	Free channel
Ch_3	Oil_Press_signal	Oil pressure
Ch_4	Channel 4	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	Gear potentiometer
CALC_GEAR	Calculated_gear	Calculated gear
LOG_TMP	Datalogger _Temp	Data logger temperature
BATT	Battery	Battery Voltage

There are other channels that, depending on the wiring the user bought, can be used to connect additional sensors like suspension potentiometers, brake pressure sensors, etc...

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



10 – Data download and analysis

When 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 are only available on MXL Pista. For further information on this subject refer to Race Studio Configuration and Race Studio Analysis user manual.

11 – MXL optional expansions

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

GPS Module allows the user to sample a lot of important information: brake and suspensions analysis, information concerning the vehicle chassis and analysis of the pilot behaviour in each point of the track.

This allows the user to see the track, position and related speed and even to evaluate his mistakes, exporting all information in Google Earth[®]. Sport performances will be reviewed through real images.

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

To obtain maximum engine performance, **LCU-ONE** uses a Bosch LSU 4.9 wide band probe and can detect punctual Lambda values in a range 0,65 - 1,6.



















I.rev. / Rev. N.	Descrizione	/ Description						Data / date	Firma / Sign	Contr. da / Ckd. by
			10 pins	Hirose fe	male co	nnect	or table)		
	[Channel	AMP 12 pins pin	cable colour	Hirose pin	coni	nection	cable len	ght	
		On-board rev counter	2 1 11 12 8	Red Black Green Grey bleu	1 2 3 4 5 6 7 8 9 10	12V / 12V / G	n.c. / +Vbext n.c. SND n.c. +Vb peed n.c. n.c. 2PM	420 mr	n	
			Bir	nder 719		ors tal	ble			7
	Chanr Ch.2		Cable colour whie black red bleu	ANIP 12 pins	5 7 6		Analog inp Analog G V referer	on conce	330 mm	_
	Ch.3	3 2 3 3 2	White black red bleu		4 3 6		Analog inp Analog G V referer	nce	330 mm	
	Ch.4	4 2 3 2	white black red bleu	9	1 3 2		Analog inp Analog G +VB V referer	out 4 ND nce	380 mm	
	Ch.5		l white 2 black 3 red 4 bleu	9	16 15 2		Analog inp Analog G +VB V referer	ND	380 mm	
	Ch.6		White black red bleu	11	13 15 2		Analog inp Analog G +VB V referer	out 6 ND nce	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. / Ref. C	l.tà / Q.ty	Materiale / Material	1			N.	. articolo /	Item N.	
tif. / Ref. C	l.tà / Q.ty Designed by	Materiale / Material Contr. da / Ckd. by	Approvate	o da / Approved by	Nome file / File name	N. Da	. articolo / ata / Date 06/09/20	Item N.	Scala / Scale
if. / Ref. C	Ltà / Q.ty Designed by	Materiale / Material Contr. da / Ckd. by	Approvate Titolo / Tit	o da / Approved by	Nome file / File name Cablaggio per kit Pi	N. De ug&Play MXL Pista Suzu	. articolo / ata / Date 06/09/20 uki K3	Item N.	Scala / Scale











.rev. / Rev. N. Descrizione	Description				Da	ata / date	Firma / Sign	Contr. da / Ckd
	10) pins Hiros	se female	e conecto	or table			
Channels	AMP 12 pins pin	AMP 16 pins pin	cable colour	Hirose pin	conection	n c	able lenght	
On-board	2	4	Red	1 2 2	n.c. 12V / +Vbe	ext	420 mm	
	1	12	Black	3 4 5	GND High beam /	Ch 7		
rev counter	11 12	12	Green Grev	6 7	+VB Speed			
		13 16	Purple White	8 9	Dir Light / C Fuel / Ch.	h. 6 5		
	8		Bleu	10	RPM			

Binder 719 connectors table

Channel	Binder pin	Cable colour	AMP 12 pins pin	AMP 16 pins pin	connection	cable lenght	
Ch.2	1 2	white black		5 7	Analog input 2 Analog GND	330 mm	
	3 4	red bleu		6	V reference		
Ch.4	1 2 3	white black red	9	1 3 2	Analog input 4 Analog GND	380 mm	
USB	1 2 3 4	white black red	10 7	10	USB D+ GND USB D-	1080 mm	

Rif. / Ref. Q	.tà / Q.ty	Materiale / Material	lateriale / Material				N. articolo / Item N.			
Progettato da /	Designed by	Contr. da / Ckd. by	Approvato da / Approved by	Nome file / File name	Data / Date 06/09/2	005	Scala / Scale			
AM			Titolo / Title Cablaggio per kit Plug&Play MXL Strada Suzuki K3							
Racing Data Power			N. disegno / Drawing N. 04.554.14			Rev. / Rev. 3	Foglio / Sheet 3 of 3			



11.2 – Appendix "B" TPS Cable

