Yamaha R1 2007/2008/2009 – Yamaha R6 2006/2007/2008

Plug&Play kit

User Manual

Racing Data Power

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Presentation

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

Established in 1976, AIM is now world leader in the production of high performances data loggers for racing applications: dashboards, data loggers, digital displays, lap timers.

AIM set new standards in various motor sports: from karts to bikes, Dragsters, Formula 1 Boat, Offshore and even snowboard!

AIM products merge the functionalities of traditional tachometers, RPM indicators, temperature, pressure and lap timer, with compact units, high performing and easy to use. Different product for different applications but with one shared characteristic: the great innovation.

Each AIM system is completely designed, realised and tested by its technicians. The research and development board includes electronic and mechanical engineers, physics and other specialists that develop firmware, software, hardware and the related documentation. Our reputation is build on quality products, innovative technology and on the steady engagement in customer support.

Introduction

MXL Plug and Play kit for Yamaha R1/R6 is the dashboard (with integrated data logger in Pista version) designed for an easy and quick installation: with the minimum effort it is possible to connect to the bike Engine Control Unit (ECU) and see (with no need of additional sensors):

- RPM
- Speed
- Engaged gear (calculated)
- Water temperature
- Air temperature
- Oil level
- fuel level
- Turning lights signal
- High beam signal
- Neutral signal
- Battery charge level

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

MXL Strada, **Pista** kits for Yamaha have been developed for the following bike models:

Model	Year 2006	Year 2007	Year 2008	Year 2009
R1	●	✓	✓	✓
R6	✓	✓	✓	●

✓ = supported
● = not supported

Note: thanks to the infrared transmitter/receiver (included in **MXL Pista** kit, optional in **MXL Strada** one), it is possible to see/record lap times. Moreover **MXL Pista**, allows to manage and record data coming from 5 additional configurable channels (e.g. suspension potentiometer, throttle sensor, pressure sensor, brake, etc…).

For any additional information not explicitly explained in this tutorial refer to **MXL** and/or **Race Studio Configuration** user manual.

Chapter 1 – Plug&Play kit content

As specified here following Plug&Play kit content for Yamaha R1 changes according on the bike year of production. In the image here below kit components are numbered for more clarity.

MXL Strada for Yamaha R1 2007/2008 and Yamaha R6 2006/2007/2008 kit:

N.1 – MXL Strada (1);
N.1 – AMP wiring (2);
N.1 – USB Cable + Race Studio 2 Software Cd (4)
N.1 – Yamaha kit bracket (3) made up of:
- n°1 – bracket;
- n°3 – washers;
- n°4 – M4*8 screws;
- n°3 – M5*18 screws;

This user manual + MXL user manual (5).

MXL Strada for Yamaha R1 2009 kit:

N.1 – Yamaha R1 2007/2008 kit
N.1 – Adapter cable for Yamaha R1 2009 (X)

MXL Pista kit for Yamaha R1 2007/2008 and Yamaha R6 2006/2007/2008:

N.1 – MXL Pista (1);
N.1 – AMP wiring (2);
N.1 – USB cable + Race Studio 2 Software CD (4);
N.1 – Infrared receiver with 90 cm cable (6);
N.1 – Infrared transmitter (7);
N.1 – Infrared transmitter power cable (3)
N.1 – Yamaha bracket kit (3) made up of:
- n°1 – bracket;
- n°3 – washers;
- n°4 – M4*8 screws;
- n°3 – M5*18 screws;

This user manual + MXL user manual (5).

MXL Pista for Yamaha R1 2009 kit:

N.1 – Yamaha R1 2007/2008 kit;
N.1 – Yamaha R1 2009 adapter cable (X)

Note: before installing the kit check that it contains all specified items.

1.1 – Codici articolo

Plug&Play kit **MXL Strada** for **Yamaha R1 07/08** – **R6 06/07/09**: code **X15MXLSYR105**;
Plug&Play kit **MXL Strada** for **Yamaha R1 09**: code **X15MXLSYR109**;
Plug&Play kit **MXL Pista** for **Yamaha R1 07/08** – **R6 06/07/08**: code X15MXLCYR105;
Plug&Play kit **MXL Pista** for **Yamaha R1 09**: code **X15MXLCYR109**.

MXL Strada/Pista for **Yamaha R1 2009 adapter cable** (to switch from a Yamaha R1 2007/2008 Plug&Play kit to a Yamaha R1 2009 Plug&Play kit): code **V02554720**.

Optional to all MXL Strada Yamaha kits:

Infrared receiver: code **X41RX12090**;
Infrared transmitter: code **X02TXKMA01**;
Infrared transmitter power cable: **V02POWTX0**;
TPS cable (throttle position sensor): code **V02550690**.

Chapter 2 – Plug&Play kit installation

MXL Plug and Play kit for Yamaha R1/R6 is expressly designed and developed to guarantee the maximum installation easiness.

WARNING: this kit has been properly tested to guarantee total compatibility with a bike entirely according to the stock one sold by the mother house.

Through the fixing points on the back of the logger it is possible to substitute the stock dash in an easy and quick way with no need of bending or drilling anything: each component is “Plug&Play”.

The system is to be connected to the high beam chassis using the bracket included in the kit. The bracket is in black anodised aluminium lightweight and mechanically resistant.

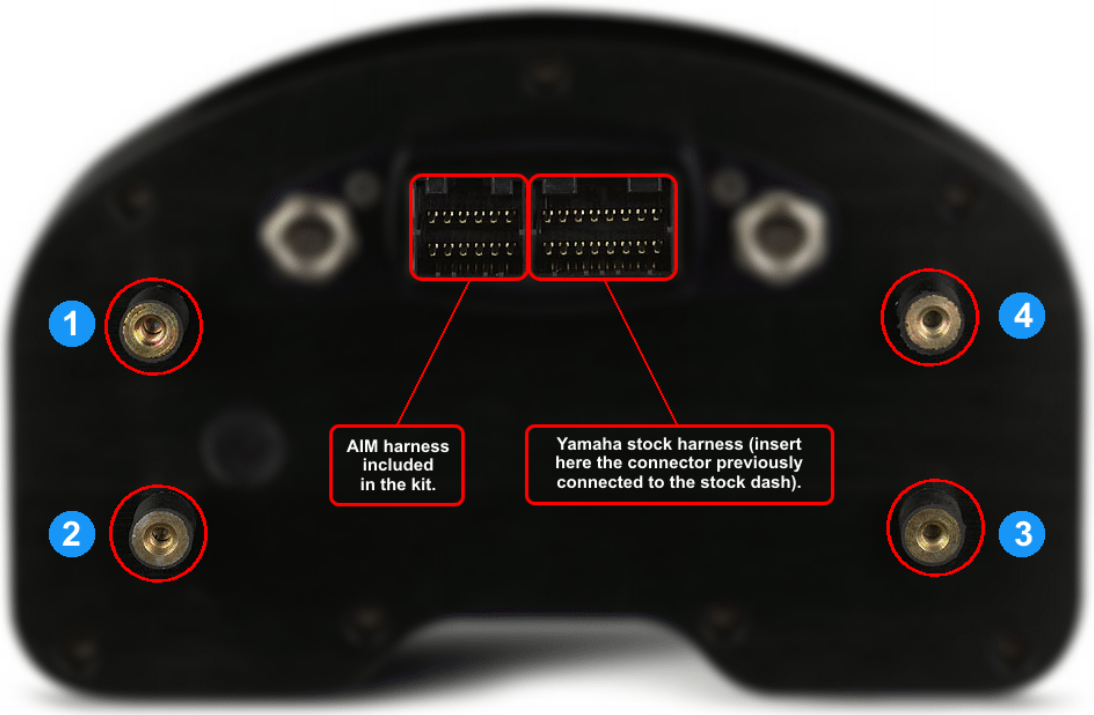
GENERAL NOTES – Read these notes before installing the system.

- 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;
- do not install the system when the engine is hot;
- be careful not to lose screws and washers.

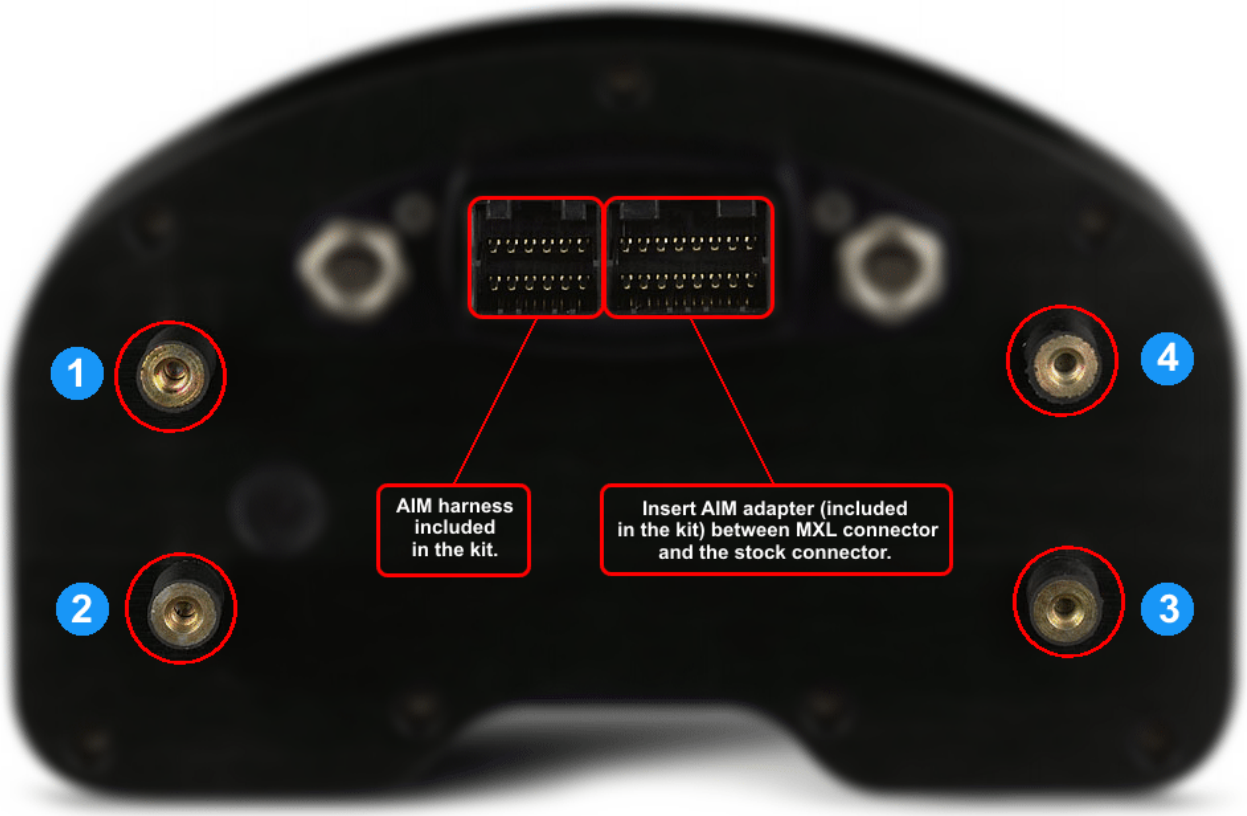
2.1 – Installation on Yamaha R1 2007/2008 – R6 2006/2007/2008

Once the stock dash removed:

- fix MXL to the bracket through the four fixing points highlighted in the image here below;
- connect the wiring to the connectors as shown here below.



2.2 – Installation on Yamaha R1 2009



Once the stock dash removed:

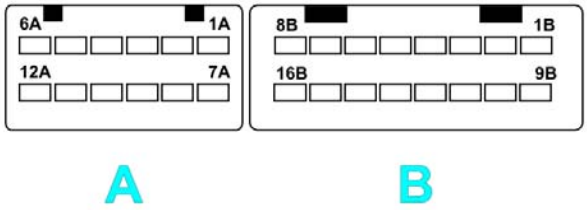
- fix MXL to the bracket using the 4 fixing points highlighted here above;
- connect 12 pins AMP connector (the one on the left in the image here above) to the AMP harness included in the kit;
- insert AIM adapter (included in the kit) between right MXL connector highlighted here above and the stock connector.

Chapter 3 –MXL and Yamaha connectors pinout

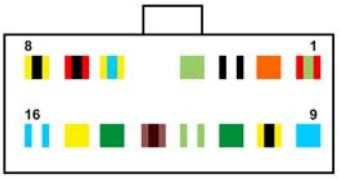
Up to 2008 Yamaha bikes used a 16 pins AMP female connector for both R1 and R6 while starting from 2009 Yamaha R1 mounts a 20 pins JAE male connector.

3.1 – MXL & Yamaha R1 2007/08 – R6 2006/07/08 AMP connectors pinout

The image here below shows MXL and Yamaha AMP connectors and their pinout.



MXL connectors
(12 pins "A" and a 16 pins "B" male)



Yamaha 16 pins AMP
female connector

AMP 12 pins connector pinout

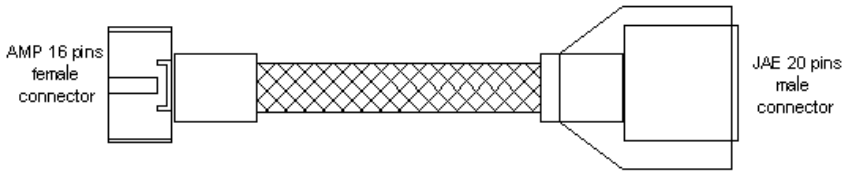
1A	Analog input 10 (free)
2A	+VB
3A	GND
4A	Lap (optical)
5A	+Vref
6A	GND
7A	Analog input 6 (free)
8A	Analog input 5 (free)
9A	Analog input 7 (free)
10A	Analog input 9 (free)
11A	+Vref
12A	GND

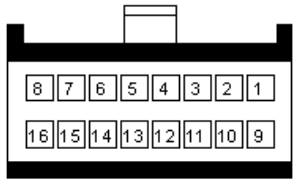
AMP 16 pins connector pinout

1B	+Vb
2B	+Vb EXT
3B	GND
4B	not used
5B	not used
6B	K-Line
7B	oil level
8B	RPM
9B	+Vb
10B	Hi-beam
11B	turning light
12B	Fuel
13B	turning light
14B	P1
15B	P2
16B	Neutral

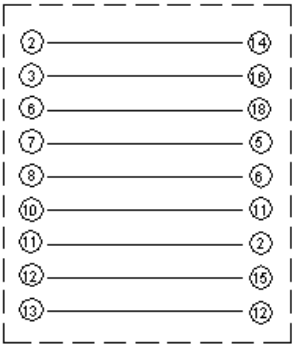
3.2 – MXL AMP and Yamaha R1 2009 JAE connectors pinout

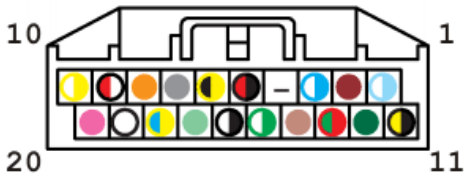
To connect Yamaha R1 2009 JAE 20 pins male connector to MXL AMP 16 pins female one it is necessary to use the adapter cable shown here below.





AMP 16 pins female
connector pinout
contact insertion view





20 pins JAE
male connector pinout
solder termination view

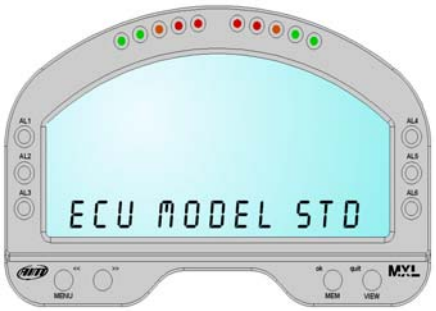
	MXL AMP 16 pins female connector pinout
1	+Vb
2	+Vb EXT
3	GND
4	not used
5	not used
6	K-Line
7	oil level
8	RPM
9	+Vb
10	Hi-beam
11	turning light
12	Fuel
13	turning light
14	P1
15	P2
16	Neutral

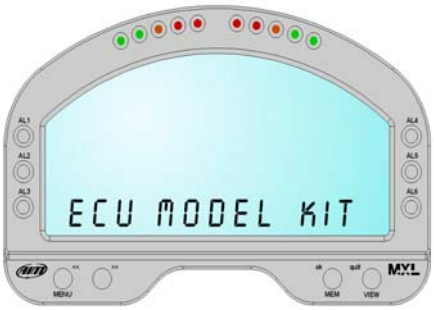
	Yamaha R1-2009 JAE 20 pins male connector pinout
1	Not used
2	Turn left
3	Not used
4	Not connected
5	Oil switch
6	RPM
7	6th gear
8	5th gear
9	4 th gear
10	3rd gear
11	Hi-beam
12	Turn right
13	VB dir
14	VB key
15	Fuel level
16	GND
17	immobilizer led
18	K line
19	1st gear
20	2nd gear

Chapter 4 – First start up

MXL for Yamaha R1/R6 can be installed both on a stock bike and on bikes equipped with the original YEC (Yamaha Engineering Corporation) kit. Once the bike started, MXL automatically recognizes and shows on the kind of ECU installed. ECU MXL can manage are:

- Standard ECU (stock ECU): the display shows “ECU MODEL STD” (image below on the left);
- YEC kit (YEC ECU): the display shows “ECU MODEL KIT” (image below on the right).





Once the ECU identified, MXL shows and manages, as default settings, different information according on MXL model.

MXL STRADA

RPM[1]	from the ECU	Shown
Rear wheel speed	from the ECU	Shown
Water temperature	from the ECU	Shown + alarm LED
Air temperature	from the ECU	Shown a + alarm LED
Oil level	from sensors	Alarm LED
Fuel alarm	from sensors	Alarm LED
Turning lights	from sensors	Alarm LED
High beam	from sensors	Alarm LED
Engaged gear (Neutral included)	automatically calculated	Shown
Yamaha error codes	from the ECU	Availables[2]

[1] RPM data can be obtained both from the bike ECU and from a stock sensor. To use the data supplied from the ECU set “RPM” box in **MXL** system configuration layer on “ECU”; to use the data supplied by the stock sensor set “RPM” box in **MXL** system configuration layer on “AIM sensor”. Refer to **Race Studio Configuration** user manual for further information concerning MXL configuration. In case a deep analysis of RPM channel is wished it is suggested to use data coming from the stock sensor whose sampling frequency is higher.

[2] Yamaha_ERR channel is not shown by the default configuration. To see it on **MXL** display configure the logger using **Race Studio Configuration** software. Refer to **Race Studio Configuration** user manual for further information concerning **MXL** channels configuration.

MXL PISTA

RPM[3]	from the ECU	Shown and recorded
Rear wheel speed	from the ECU	Shown and recorded
Water temperature	from the ECU	Shown and recorded + alarm LED
Air temperature	from the ECU	Shown and recorded + alarm LED
Oil level	from the sensors	Alarm LED
Fuel alarm	from the sensors	Alarm LED
Turning lights	from the sensors	Alarm LED
High beam	from the sensors	Alarm LED
Engaged gear (Neutral included)	calculated	Shown and recorded
Yamaha error codes	from the ECU	Alarm LED – Availables[4]

[3] RPM data can be obtained both from the bike ECU and from a stock sensor. To use the data supplied from the ECU set "RPM" box in **MXL** system configuration layer on "ECU"; to use the data supplied by the stock sensor set "RPM" box in **MXL** system configuration layer on "AIM sensor". Refer to **Race Studio Configuration** user manual for further information concerning MXL configuration. In case a deep analysis of RPM channel is wished it is suggested to use data coming from the stock sensor whose sampling frequency is higher.

[4] Yamaha_ERR channel is not shown by the default configuration. To see it on **MXL** display configure the logger using **Race Studio Configuration** software. Refer to **Race Studio Configuration** user manual for further information concerning **MXL** channels configuration.

Chapter 5 – Calibration and gear calculation

MXL is already calibrated to correctly show the engaged gear and is ready to use.

Warning: in case crown/pinion ratio has been modified it is necessary to perform a new calibration and a new gear computation.
Refer to Race Studio Configuration user manual for further information concerning the gear sensor calibration and the gear computation.

Chapter 6 – Configuration

MXL can be configured only using a PC and **Race Studio 2** software (included in the kit). To connect **MXL** to the PC use the proper USB cable that comes with the kit.

For any further information concerning **Race Studio 2** software and the USB driver installation and working mode refer to the related user manual.

Chapter 7 – Data downloads and analysis

Once a test session is over it is possible to download data recorded by the logger (**MXL Pista** only) and save them in a database integrated in **Race Studio 2** software.

For further information concerning data download refer to **Race Studio Configuration** user manual.

Chapter 8 – Error codes

Yamaha ECUs offer a diagnostic function of the errors that can occur on the bike. The table here below shows the meaning of the different error codes (YAMAHA_ERR channel):

11	Cam shaft sensor problem
12	Driving shaft sensor problem
13,14,20,23	Air pressure sensor problem
15,16	Throttle position sensor problem
17,18	EXUP engine valve problem
19	Side stand sensor problem
21	Water temperature sensor problem
22	Intake air temperature sensor problem
30,41	Roll over sensor problem
33	Ignition coil #1 problem
34	Ignition coil #2 problem
35	Ignition coil #3 problem
36	Ignition coil #4 problem
42	Speed sensor or neutral (N) switch sensor problem
43,46	Injection system problem
47	EXUP valve position problem
48	EXUP servomotor problem
50	Internal ECU problem

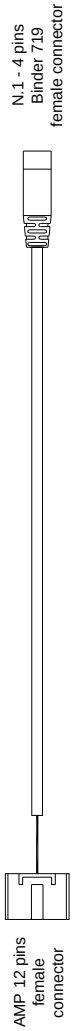
Warning: refer to Yamaha and YEC official documentation for the complete description of the errors.

In case diagnostic function detects more than one error, YAMAHA_ERR channel shows error codes in sequence.

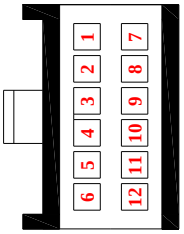
Chapter 9 – Wirings and pinout

N. rev. / Rev. N.	Descrizione / Description	Data / Date	Firma / Signature	Contr. da / Ckd. by

MXL Strada Plug&Play Yamaha R1 2007/2008 - R6 2006/2007/2008 optical lap cable



4 pins Binder 719 female
connector pinout
Solder termination view



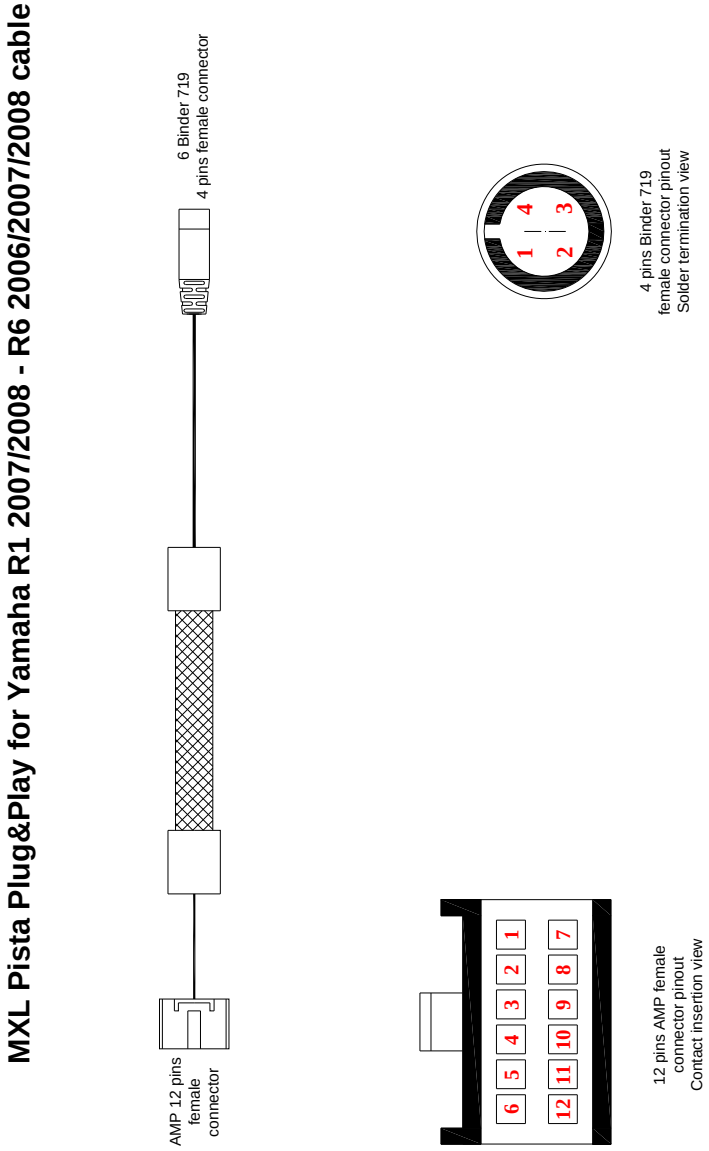
AMP 12 pins female
connector pinout
contact insertion view

Binder 719 connector table

Channel	Binder pin	Cable colour	AMP 12 pins pin	Connection	Lenght
LAP	1	white	4	Lap in	330 mm
	2	black	3	Analogic GND	
	3	red	2	+Vp	
	4	bleu	4	Lap in	

Rif. / Ref.	Q.tà/Q.ty	Material / Material		N. articolo / Item N.	
Progettato da / Designed by L.I.	Contr. da / Ckd. by	Approvato da / Approved by	Nome file / File name	Data / Date	Scala / Scale
Racing Data Power		Titolo / Title Cavo Lap ottico MXL Strada per Plug&Play Yamaha R1 2007/2008 - R6 2006/2007/2008			
		N. disegno / Drawing N. 04.554.35		Rev. / Rev.	Foglio / Sheet 1 of 1

N. rev. / Rev. N.	Descrizione / Description	Data / Date	Firma / Signature	Contr. da / Ckd. by



Rif. / Ref.	Q.tà/Q.ty	Material / 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
Racing Data Power		Titolo / Title: **Cavo MXL Pista per Plug&Play Yamaha R1 2007/2008 - R6 2006/2007/2008**			
		N. disegno / Drawing N.: **04.554.34**		Rev. / Rev.	Foglio / Sheet: **1 of 2**

N. rev. / Rev. N.	Descrizione / Description	Data / Date	Firma / Signature	Contr. da / Ckd. by

Binder 719 connector table

Channel	Binder pin	cable colour	AMP 12 pins pin	Connection	Lenght
Ch. 5	1 2 3 4	White black n.c. bleu	8 6 5	Analog input 5 Analog GND V reference 1	330 mm
Ch. 6	1 2 3 4	White black n.c. bleu	7 6 5	Analog input 6 Analog GND V reference 1	330 mm
Ch. 7	1 2 3 4	White black n.c. bleu	9 12 11	Analog input 7 Analog GND V reference 2	380 mm
Ch. 9	1 2 3 4	White black red bleu	10 12 2 11	Analog input 9 Analog GND + VB V reference 2	380 mm
Ch. 10 / Gyro	1 2 3 4	White black red bleu	1 3 2 11	Analog input 10 Analog GND + VB V reference 2	430 mm
Lap	1 2 3 4	White black red bleu	4 3 2 4	Lap in Analog GND + VB Lap in	430 mm

Rif. / Ref.	Q.tà/Q.ty	Material / 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
Racing Data Power		Titolo / Title **Cavo MXL Pista per Plug&Play Yamaha R1 2007/2008 - R6 2006/2007/2008**			
		N. disegno / Drawing N. **04.554.34**		Rev. / Rev.	Foglio / Sheet **2 of 2**