

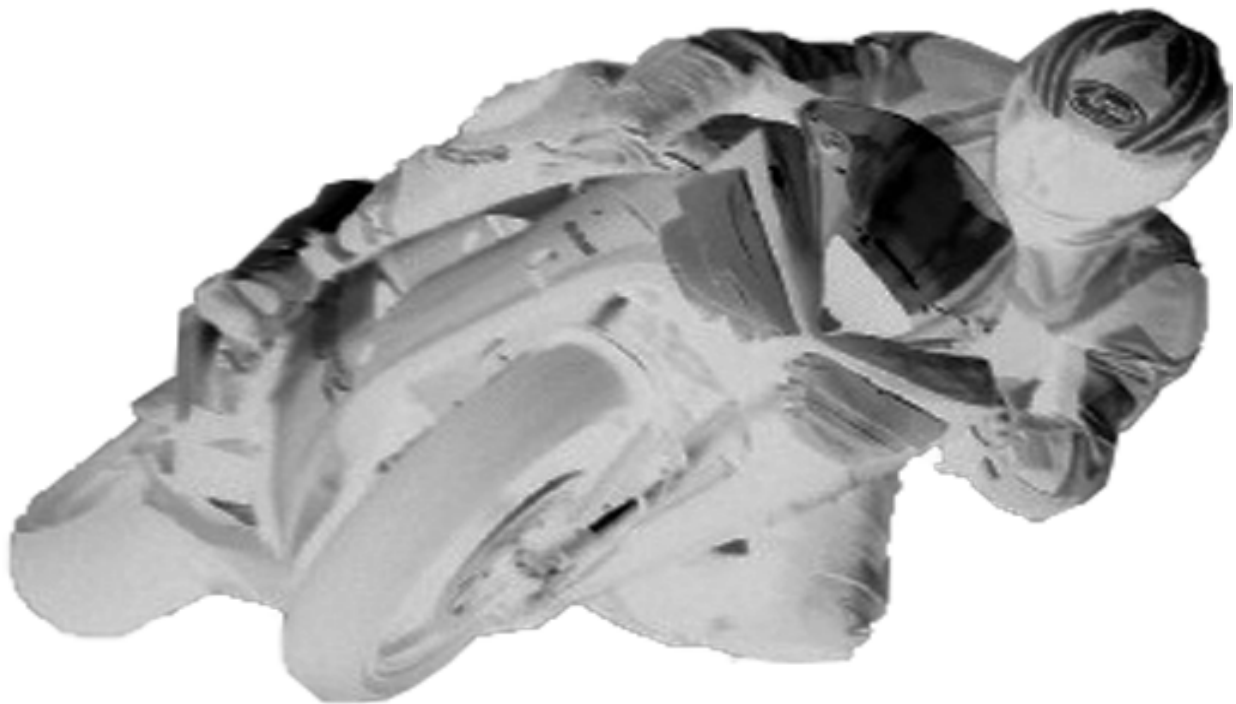


PRESENTS

POWER-SLIDE CONTROL



An **NDT MOTO** Product





POWER-SLIDE CONTROL

1. INTRODUCTION

Traction Control is very common on motorcycles' races and is going to be used even by not professionals drivers, for both track and road use.

Traction Control aim is to avoid loose of traction during acceleration. People think it is useful only to reduce the lap time and not that it can affect even the day by day drive.

People think that having a Traction Control they can open full throttle everywhere, but, analyzing MotoGP videos, the top drivers don't do in this way.

Ducati, since 1098R, introduced its DTC in all sports bike, and not only (Street-Fighter)

Kawasaki introduced, on ZX10R 08/09 its K.I.M.S. It sweetens the small throttle opening, reducing the on-off disease. Even Honda introduced a similar system on CBR 1000 RR 08/09. These are not optionals but series equipment. This reveals the importance Traction Control even in every day use. Everybody knows what means drive above a white stripe or find a wet slick just after a turn. Think even to tire conditions, not always at top in terms of performance and grip.

Modern sport bikes have very high power and torque and this creates trouble to normal users. This is the reason for the different power maps that had been introduced on these bikes. Electronic injection ECU is very sophisticated and the engines now are always very smooth, but traction losses depend on how much the throttle is opened and, more power and torque are available, more the traction losses' troubles are evident.

A Traction Control can be managed in 2 ways:

- Continuously check the rpm variations (like Bazzaz or Kawasaki KIMS).
- Check the slide difference between front and rear wheel. (like *Power-Slide Control*, Grip One or Ducati DTC).

Advantages of the first way is its easiness: no additional sensors are required. Moreover it is not affected by bike tilt angle.

The disadvantage is the not perfect identification of the traction loss condition. In fact, if it is quick (micro and macro spinning), the system is able to recognize and properly act on the engine power. In case of constant slide, like in the bend centre with mid throttle, the wheel accelerates in constant manner and the system is not able to properly recognize and act. Moreover the system is able to act only when the rpm variation is higher than engine physiological one and this creates a sort of delay and not perfect control of the traction losses.

Second way systems can immediately act when the traction loss rise because they read it through sensors.



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However even this solution has some disadvantages:

- Hall sensors, which measure the wheels speed, must be carefully installed to properly read this important data.
- Front and Rear tires, due to their shape, have a different rolling between bends and straights. This difference is even affected by the tire pressure and tire model.

Advantages are more than disadvantages. The difference on rolling during the bends can be used for having a system more sensible at the max tilt angle, ie. when it's really necessary.

2. DESCRIPTION

Our technical department decided to follow the second way that, even if more complicated, gives the possibility of having a very fast and precise system in every traction loss condition, perfectly adapting to the driving condition.

Power-Slide Control parameters to be set up are:

- Circumferential difference between front and rear wheel.
- Number of reading point of both front and rear sensors.
- Driver can adjust the sensitivity through a proper trimmer, even during the running conditions.
- Driver can decide if activate or not the Launch Control.

Some systems use an external sensor: Ducati, on DTC, uses a gyroscope with aim of recognize if the bike is running straight or turning. In fact, an undesired activation of the TC during the straight, with consequent cut of engine power, can affect the racing position.

For the same reason, other systems use a sensor on front fork to understand if it is extended or not.

The *Power-Slide Control*, thanks to **4-PROGRESSIVE** algorithm, responsible of all calculations, does not require any additional sensor. It is able to auto adapt to both situations. It understand when the bike is turning or not, avoiding cut into the acceleration phase, with no effect on the top speed.

Thanks to the 2 cylinders management and to 4- PROGRESSIVE algorithm, the *Power-Slide Control* is auto adapting to bike needs, operating a power cut from 5% till 65% in a dynamic and progressive manner. This has several advantages:

- No penalization of top speed and acceleration.



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- System operates very smoothly at the beginning going to become stronger if needed.

This is the reason for which our system does not require the “CUT” set up. Competitors’ systems are based on constant “CUT” idea. This means an always constant acting, more noticeable than *Power-Slide Control One*.

The *Power-Slide Control* correctly acts either on fast and slow bends or straights. It’s not necessary to “cheat” the ECU with strange wheel ratio unless the driver wants a different answer of the system to slow and fast velocities.

The *Power-Slide Control* has the **Launch Control** feature. It is able to perceive when front wheel is not on the ground and consequently acting, always in a smooth and not hard manner. This is a big advantage in terms of performances and driver’s feeling. This feature acts not only during the start but even during the race so it can be considered a spin control.

The *Power-Slide Control* can be connected either coils or injectors. No working differences, however the **Plug& Play** harnesses provided with the kit, are only for coils connection. The coil connection, not cutting the ignition, allows to fuel to go into exhaust pipes, till catalyzer, damaging it step by step. However, the connection to injectors is not complicated, indeed in case of recent Ducati and MV it is provided a plug&play harness

In order to simplify the installation, a carbon plate, ready to be drilled and cut, is provided with the kit, to better positioning the lights, switches and trimmer.

3. CONTROL SYSTEMS

In order to dialogue with driver, several controls had been introduced.

On the carbon panel there are 2 LEDS. The first indicates errors on the system in order to notify the driver about the malfunctioning, The second led inform the driver that the *Power-Slide Control* is acting in that precise instant.

There are two microcontrollers. One manage the slide evaluation system through the wheels sensors, the other checks in real time that the first one is properly working and even eventual hardware troubles.

Both microcontrollers are redundant. This means that if one stops working, the other act for immediate putting back in operation. Through the led, the driver knows about this kind of trouble and can change his way of driving.

These micropocessors are controlled by an external circuit that, in case of failures, is able to putting back in operation the previous ones.



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To be mentioned, the use **Automotive hall wheels sensors**, not coming from an online seller! Our supplier gives same sensors to the biggest Italian motorcycle group. This choice is given by the awareness of the importance that sensors have on the control system.

Moreover there is an on/off switch in order to bypass in case of malfunctioning. In this manner the driver will be able to end the race in any case.

Harnesses are plug& play of all Japaneses sports bike, Ducati, MVAgusta, Aprilia, KTM and Triumph. This, as well as ease the fitment, guarantee the proper status of connections.

All connectors, switches and leds are waterproof.

In order to guarantee the proper distance between sensors and wheel bolts, proper calibrated plates are supplied with the kit.

It's possible to order a **Check System** to verify the proper mounting of all components, before use on track.

The *Power-Slide Control* is protected against wrong installation of connectors. The ECU will not burn in any case, only not working.

The ECU is protected against vibrations and heating,

The Power-Slide Control is conforming to required CE norms.

In order to better support the end user, a **Network of certified workshops** is on construction. IRC assures that these workshops knows the product and are able to properly install.

4. TELEMETRY SYSTEM – DATA ACQUISITION LOGGER

The *Power-Slide Control* has a connection for telemetry systems; in this manner it's possible analyze the behaviour of the system during the full race.

5. CONCLUSIONS

Our aim was a system with a very smooth acting. A system that follows the driver and gives him a very good feeling, not a system that requires to driver to trust blindly on it.



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6. PRO VERSION

The Pro version is in development. Some of the new features will be:

- **GPS Module**, for a proper setup of sensitivity in each point of the track.
- **Speed Limiter**: to maintain a proper speed on box lane.

These modules will be added to the standard system that will not require to be changed.

This product is not homologated for road use.

The *Power-Slide Control* is not a safety system. Its aim is to support the driver. Do not open full throttle hoping that the *Power-Slide Control* always helps you in not crashing.