



DASY-X

User manual

Version 1.00 – August 2015

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BASIC PROCEDURE

- Read carefully the instruction before starting to use the system
- Install the data acquisition on the bike
- Identify the configuration parameters for each one of the chosen sensors
- Install the USB driver (required at first connection)
- Configure the hardware parameters through the DANAS2 software

ATTENTION:

In order not to alter the signals to the junction box, UNCONNECT the DASY inputs if the bike is used with DASY not powered up

ATTENTION:

DO NOT rigidly fasten DASY to the bike in order to avoid damage to the internal electronics.

ATTENTION:

If a previous version of DANAS has already been installed, run the uninstall tool and then manually remove the 'Danas' folder before installing DANAS2.

ATTENTION:

DASY and DANAS systems have been designed only for use in motorsport race tracks, and are not homologated for street use.

DASY & DANAS SYSTEM

The data acquisition system produced by *I2M srl* is composed of two inseparable parts: the acquisition box DASY-X and the data analysis software DANAS2.

In this document you can find instructions on the installation and use of DASY-X system. Please refer to the DANAS2 instruction manual for any doubts on installation and use of the software package.

BOX CONTENT

In the DASY-X box you will find:

- Data acquisition main box
- 10 Hz GPS receiver
- USB cable
- Main wiring
- Secondary wiring (with eventually the lambda connector)
- Lambda sensor (in the lambda version)
- Instruction
- I2M usb key

The box content of the DASY (Data Acquisition System) is shown in Figure 1.

We advise to connect the cables for signal acquisition by soldering and insulating. In fact, while Quick Slide or T-Taps connector are fast and easy ways to join cables, on the long run the connection can fail due to vibrations or tarnishing.



Fig. 1 – Box content

DASY INSTALLATION

The Dasy-X system is delivered with a main wiring to connect to the 16 way front connector. Thanks to this wiring it is possible to power the Dasy, give it the ignition signal (under key), connect a usb key for the automatic download and connect the gps receiver.

On the wiring there is the 3 way white connector and the free wires with connector to connect to. At this connector is possible to connect a plug&play wiring for the bikes that have this kit available. On this connector infact are available the unfer key and can bus connections.

3 way white connector:

- 1) Orange= +12V under key
- 2) white/black= Can Bus Low
- 3) white/red= Can Bus High



Fig. 2 – main wiring

The black and red cables must be connected **DIRECTLY** to the vehicle battery, and a 1 A fuse is included in series with the cable to protect both the bike and DASy from any accidental short circuits. This way, the DASy system will always be powered in order to guarantee the successful conclusion of write operations even if the system is accidentally turned off. Once the key-on power has been turned off, DASy absorbs **NO** power, and so does not cause any battery discharge. The orange wire must be connected to the key-on power, or to a separate switch, in order to easily turn on or off DASy.

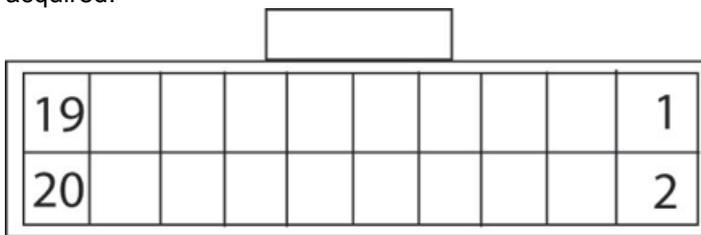
ATTENTION: under **NO CIRCUSTANCES** disconnect DASy form the battery before the write operation is concluded (green LED lighted up). Removing power at those times could not only corrupt recorded data, but could **IRREPARABLY** damage the memory itself.

DASy is designed with versatility in mind, so it can work with no sensors connected with only the GPS signals.

DASY-X has the following connection:

- 8 10bit analogue inputs, maximum frequency 100Hz
- 10 multiplexed (Multi) inputs with 1/10 of the main frequency (only with can bus bike)
- 2 speeds input
- 1 RPM input
- Out 5V
- Out 12V
- LED outs
- GPS channels

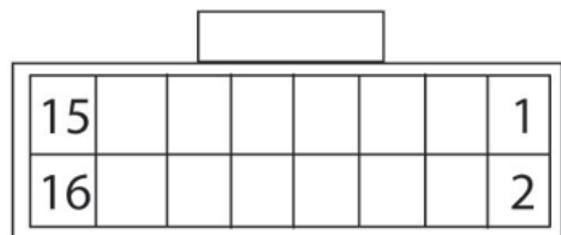
Below you can find the pinout of the two multilock connectors used to connect DASY-X to the signals to be acquired.



Rear view (wires side) – 20 way connector

20 way connector

- | | |
|----|---------------------|
| 1 | Front speed (green) |
| 2 | Analogue ground |
| 3 | 12V out (Orange) |
| 4 | Analogue1 |
| 5 | Can Bus 2 High |
| 6 | Analogue2 |
| 7 | Can Bus 2 Low |
| 8 | Analogue3 |
| 9 | Lambda |
| 10 | Analogue4 |
| 11 | Lambda |
| 12 | Analogue5 |
| 13 | Lambda |
| 14 | Analogue6 |
| 15 | Lambda |
| 16 | Analogue7 |
| 17 | Lambda |
| 18 | Analogue8 |
| 19 | Lambda |
| 20 | 5V out (red) |



Rear view (wires side) – 16 way connector

16 way connector

- | | |
|----|---------------------------|
| 1 | 12V direct to battery |
| 2 | Led 1 |
| 3 | 12V under key (orange) |
| 4 | Led 2 |
| 5 | battery ground |
| 6 | NC |
| 7 | ground battery (analogue) |
| 8 | Trigger out |
| 9 | Can Bus High |
| 10 | USB |
| 11 | Can Bus Low |
| 12 | USB |
| 13 | RPM (green) |
| 14 | 5V out (USB e GPS) |
| 15 | Rear speed 1 (white) |
| 16 | GPS IN |

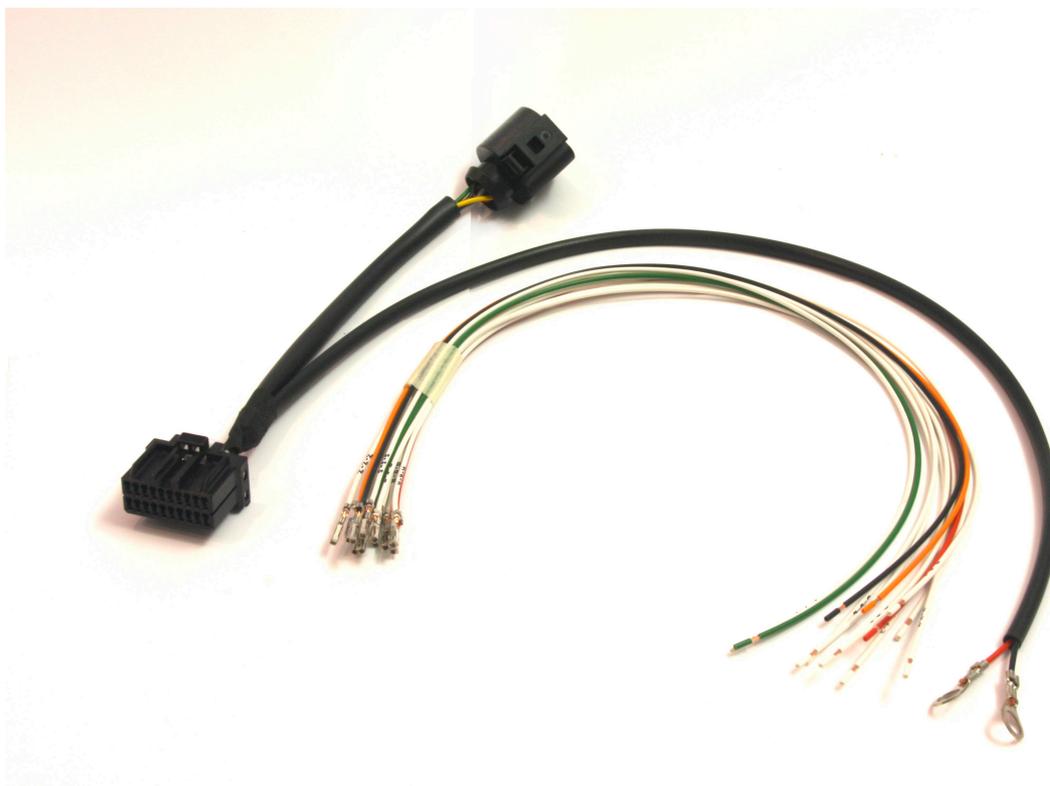


Fig. 3 – Secondary wiring

- **Analog 1-8:** these are 10-bits, 0-5 V analog inputs, to be connected to various sensors such as throttle position, brake pressure, tire temperature, suspensions...
- **RPM:** this input is specifically intended to record the engine RPMs, obtainable by tapping into the signal sent by the junction box to the dashboard. *Attention: the number of pulses for each engine turn varies from bike to bike and MUST BE CONFIGURED in DANAS.* The pulse voltage on this input can be as high as 20 V.
- **SPEED:** connect these inputs, for example, to speed sensors on each wheel. These can be ad-hoc inductive sensors or, for the rear wheel, the signal can be taken directly from a factory-mounted sensor that counts the RPMs of the pinion or, in some cases, of an internal shaft directly connected to the pinion. *Attention: the number of pulses for each turn varies from bike to bike and MUST BE CONFIGURED in DANAS.*
- **SYNC OUT:** the system can give a sync signal when the finish line is crossed (not yet implemented)
- **LED1 e LED2:** at these two output is possible to connect e bi-color led in order to replicate the led on the main box
- **LAMBDA:** These output are reserved to the lambda with the connector you can find in the kit (lambda version)

First of all choose which input are to be connected and choose where to place DASY.

The RPM, Speed and Throttle aperture signals can be taken directly from the signals reaching the dashboard (the first two) and the junction box (the latter).

If you buy the “sensor wiring kit” (that is not specific for the lambda version) it will be necessary to move the connection wires of the lambda wiring from the secondary wiring to the generic sensor wiring kit.

LEDs

On DASY's front side there is a bicolor LED indicator. During the ignition (under key) the led emit a red light for a short period, if the turn on of the system is via USB connection the led emit green light for a short period.

Normally the led is off and turns on when the GPS receiver is connected and remains fixed red on or blinking when the receiver make the fix of the gps position. When the Dasy start to save data the led goes fixed green or blinking green depending on the fix of the gps position.

HARDWARE CONFIGURATION

Before starting the configuration, make sure DANAS2 (refer to the DANAS installation manual) and the USB driver have been successfully installed on the PC: download and uncompress the driver zip file; connect DASY-X to the PC through the USB cable; when the operating system asks for the driver, choose the directory created uncompressing the zip file; then wait for the end of the installation.

Before DASY-X can be used, it is necessary to set the Hardware parameters. For example, it is necessary to set the sampling frequency for the data, under which conditions the sampling will start, the number of pulses relative to the Speed and RPM inputs (for no-can bus bike) and the kind of bike (for can bus bike)

First of all, configure the COM port on Danas, please follow the instruction on “download” section.

The parameters can then be configured by connecting directly the system to the PC through a USB cable. The function “DASY-X settings” under the “Settings” menu in DANAS2 allows to set these parameters. The window shown in figure 3 will open. Use the buttons “Read from DASY_X” or “Write to DASY-X”.

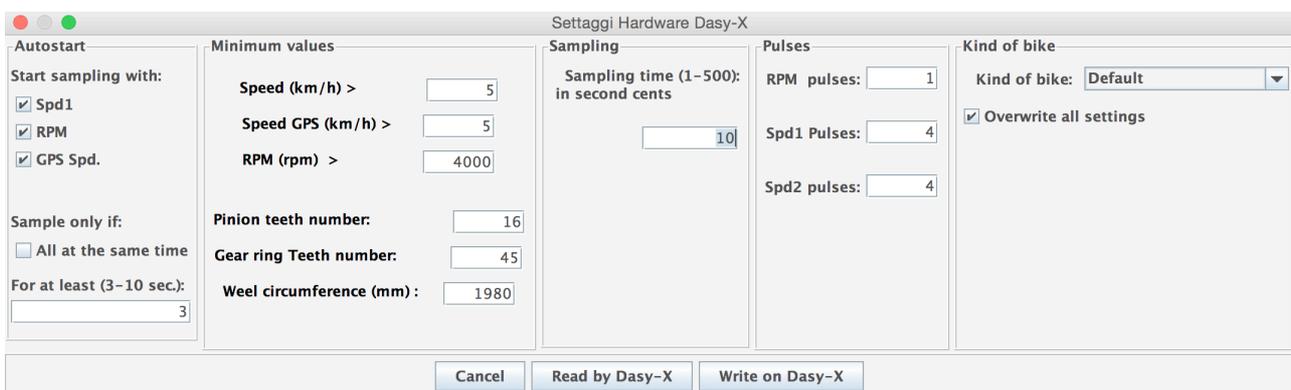


Fig. 3- DASY settings

- **AutoStart:** choose which of the inputs can cause the system to start sampling. The sampling can be started every time that a speed greater than zero is detected (either from a sensor or from the GPS), or an RPM signal is detected. The flag “all fulfilled” indicates whether all the above conditions must be fulfilled at the same time to start recording, or just one of them is sufficient. It is also possible to specify for how long the conditions must be fulfilled before the sampling is actually started.
- **Minimum Values:** these parameters set constraints for the AutoStart. Here it is possible to set the minimum speed and/or the minimum RPM that are considered valid for the sampling.
- **Sampling:** configures the sampling time. This indicates how much time passes between two consecutive samples. The inverse of the sampling time is the sampling frequency. In theory, the more frequent the sampling, the more ‘accurate’ the data. However, a too high sampling frequency will place too much burden on the system in terms of calculations, and will lead to very large data files. Admissible values are in the range $1 \div 500$ (meaning from 0.01 seconds to 5 seconds or, to put it another way, from 100 samples per second to 1 sample every 5 seconds).

- **Pulses:**

- **RPM pulses:** Indicates how many pulses are generated by the junction box for every engine revolution. This figure is usually 1 or 2, depending on the bike make and model, and can easily be set by trial and error. However, we advise to check the correct setting.
- **Speed 1-2:** Indicates the number of pulses for every pinion revolution. If the speed signal comes from a sensor connected to the pinion, this figure indicates the number of pulses generated by the sensor. If the sensor directly measures wheel turns, indicates the number of pulses for every wheel turn. This figure varies greatly from bike to bike, and can vary from 1 to 30 or 40; it is therefore very difficult to set this value correctly by trial and error, and we advise to check the correct setting.

- **kind of bike:** if the bike has a can bus and it is in the list, it is possible to select it in order to acquire in an automatic way some signals without connecting any sensor.

At the end of this manual you can find a table with the acquired signal for each bike

DOWNLOAD

It is possible to download the data in two different ways:

- via an USB pen drive
- by connecting DASY to a PC (after having installed DANAS2 and the USB driver)

When using a pen drive, it is sufficient to connect the pen drive to DASY. The system will create a new file containing all the new data. We advise to use a pen drive equipped with an LED, in order to easily determine the end of the write operation (usually the LED blinks when the pen drive is written to, please verify the LED behavior with a PC before use with DASY).

Downloading to the pen drive will start automatically when the pen drive is inserted, the system is powered up and the dashboard is on (key-on power to 12 V). To stop the download, just turn off the dashboard, and the system will stop downloading data. The created file will not be valid, and we advise to delete it.

When using a direct connection to a PC instead, use the “Online” menu in DANAS2.

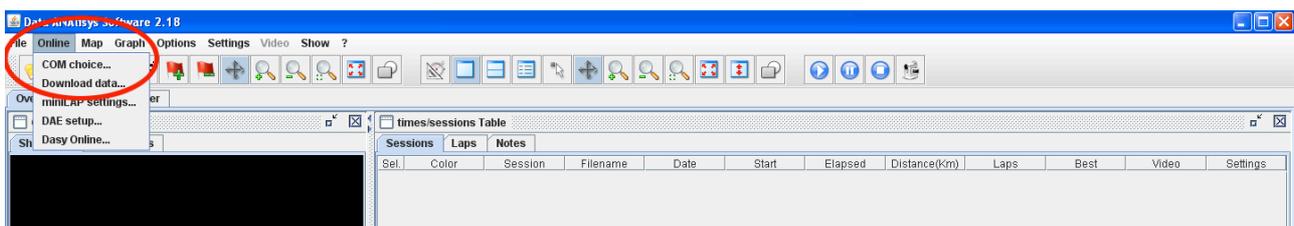


Fig. 5 – Online Menu

-**COM Selection:** With this option, it will be possible to choose the COM port to use for the connection. By selecting this option, the window shown in figure 6 will appear. Choose the correct COM port through the drop down menu, and confirm by clicking “OK”. If the correct port is not known, click on “Find”, and the system will automatically choose the first COM port it finds with an I2M device connected. If the search is successful, just click “OK” to accept the selection.

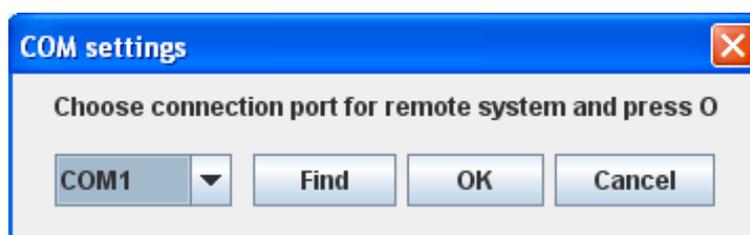
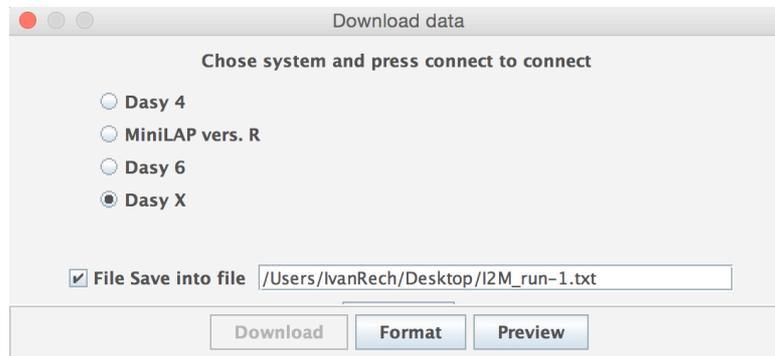


Fig. 6 – COM selection



-Data Download: with this option it will be possible to download the data from a device, or erasing its memory. It will be possible to download the data, by clicking on “Download”, or to erase the memory by clicking on “Format”. Checking the box “Save on file” allows to specify a file name for the saved data (the file name must be chosen *before* downloading the data).

As soon as the connection is established a preview dialog will show a list of all the sessions recorded by the system and still present in its memory. If the GPS is present, for each session the track name (if recorded), and the date and time will be listed.

Moreover, it is possible to filter only the sessions of interest, and then open all the sessions listed or only those selected.

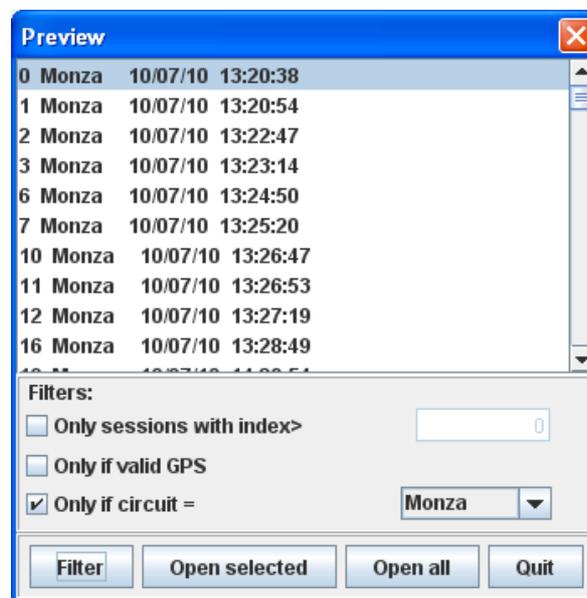


Fig. 7 – Data Download

ONLINE CONFIGURATION

Using DANAS2 it is possible to connecting directly to DASY in order to show its input configuration in real time.

Connect **DASY to the PC using the cable provided and power up the system.**

Select the “On-Line Connection” option from the “Online” menu in DANAS2. First of all, click on “Connect” to connect to the device. The window has three panels, one for the analog inputs, one for the digital and the last with all the input and the multiplexed input (for can bus bike)



Fig. 9 – Digital inputs DASY configuration

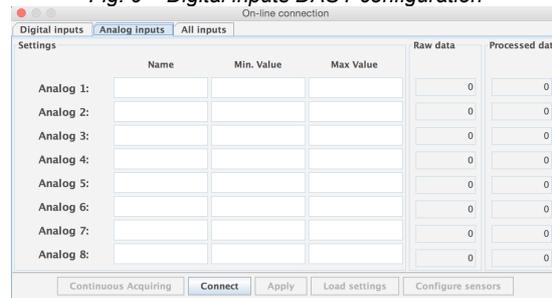


Fig. 10- Analog inputs DASY configuration

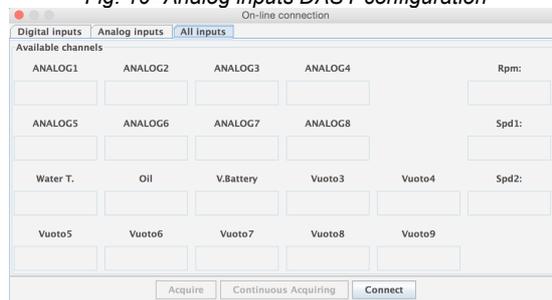


Fig. 11- All inputs DASY configuration

First two panels are divided in three sections:

- **Settings:** here DANAS will show all the configuration parameters read when DASY is connected (hardware parameters)
- **Raw Data:** the raw data acquired through DASY
- **Processed Data:** the data processed using the configuration parameters

To acquire the data, there are two buttons:

- **Sample:** carries out a single sampling through DASY and shows the acquired data (both raw and processed)
- **Continuous Sampling:** keeps on sampling the data through DASY and shows the data, both raw and processed, in real time, updating them about once per second.

It is possible to manually change the parameters and immediately see the effect of the change on the processed data by clicking on “Apply”.

Pressing “configure sensors” in the analogue tab it is possible to automatically configure some standard sensors like tps, fork and shock potentiometer, brake pressure or tyre temperature sensors.

LAMBDA VERSION

In the lambda version kit the 20 way connector will have a short wiring for the lambda sensor (included in the kit) connection. The wiring has also a direct connection to the battery in order to power the sensor. The lambda value will be available on the analogue channel number 5 that will be configured (on Danas) with a minimum value of 8 and a maximum of 22 in order to see the correct AFR values.

TEHCNICAL SPECIFICATIONS

Power supply: 12-16 V

Maximum sampling frequency: 100 Hz per channel (except for GPS)

Size: 110 x 110 x 30 mm

Weight: 200 g + 90 g (GPS)

Current draw: 200 mA

Maximum current supply out 12V: 400mA

Maximum current supply out 5V: 100mA

Digital inputs:

Maximum voltage recognized as low logical level = 1 V

Minimum voltage recognized as high logical level = 4 V

Maximum input voltage = 14 V

DASY does not change in any way the signals present at its inputs, since all are high impedance inputs. However, the input impedance can decrease to about 2 k Ω when DASY is turned off. In some cases, this low value can affect the signal coming from the various sensors on the bike. Therefore we advise to disconnect DASY from the sensors when not in use.

ATTENTION: *The Dasy system provide the 5 V output; these output MUST NOT BE CONNECTED if the signal comes from an already powered sensor. Otherwise there will be short circuits! The 5 V pin is intended to power, for example, the potentiometers on the forks that are not already powered.*

READ CHANNELS

Biike	No Car-Bus	ZX10R 2001	ZX10R 2011 Race	1199/899	898/1198	BMW S1000RR	BMW Hp4	Rsv4 Abs	F3 675	R1 2015
Gps Speed	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
Rpm	Ext	CAN	CAN	CAN	CAN	CAN	CAN	CAN	CAN	CAN
Rear speed	Ext	CAN	CAN	CAN	CAN	CAN	CAN	CAN	CAN	CAN
Front speed	Ext	Ext	CAN	CAN	EXT	CAN	CAN	CAN	CAN	CAN
Analog1	Ext	TPS	TPS	TPS	TPS	TPS	TPS	TPS	TPS	TPS
Analog2	Ext	Ext	Ext	Ext	Ext	Ext	Fork	Ext	Ext	Ext
Analog3	Ext	Ext	Ext	Ext	Ext	Ext	Shock	Ext	Ext	Ext
Analog4	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext
Analog5	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext
Analog6	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext	Ext
Analog7	Ext	Ext	Ext	Ext	Ext	Dctot	Dcspn	Ext	Ext	RideByWire
Analog8	Ext	TC	TC	TC	Ext	Dct5pn	Dctot	Ext	Ext	RideByWire TC
Mult11	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Mult12	Oil	Oil	Oil	Oil	Oil	Oil	Oil	Oil	Oil	Oil
Mult13	Battery	Battery	Battery	Battery	Battery	Battery	Battery	Battery	Battery	Battery
Mult14	---	Air Temp	Air Temp	Air Temp	Air Temp	Air Temp	Air Temp	---	Air Temp	Air Temp
Mult15	---	TC Level	TC Level	TC Level	TC level	---	TC Level	TC Level	TC Level	SET1
Mult16	---	Power Level	Power Level	Map	---	Map	Map	Map	---	SET2
Mult17	---	Gear (Can)	Gear (Can)	Gear (Can)	---	Gear (Can)	Gear (Can)	Gear (Can)	Gear (Can)	Gear (Can)
Mult18	---	---	Pit Limiter	Brake	---	Angle	Angle	---	---	---
Mult19	---	---	---	RideByWire1	---	RideByWire	RideByWire	---	---	Fork set
Mult10	---	---	---	RideByWire2	---	---	---	---	---	Shock set

On R1 2015 the parameter set1 and set2 are obtained putting in line the values of mode,pwr,tcs scs for the set1 and lcs,qss,lif and ers for the set2. So a value of 1221 on set1 means mode=1, pwr=2, tcs=2 e scs=1. On the same way the TC channel include the action of LIF, SLIDE CONTROL and TC, so 101 means an action of LIF and TC.

Check on our website for the last updated table.