# UP/DOWN SHIFT ASSIST

*Yamaha YZF R6  17-19*
*Yamaha YZF R1 / M  15-19*
*Yamaha MT-09 / FZ-09 / Tracer  13-20*
*Yamaha XSR 900  16-20*
*Yamaha MT-10 / FZ-10  16-20*

## INSTALLATION AND USE

MOTORBIKES

**Part number: K27-BLIP-002 / A / B / C / D / E / F / G**
**Description:** Digitally adjustable pressure/tension strain gauge/load cell quick shifter with automatic kill-time and auto-blip features.



## Features

- ❑ For either push or pull linkages
- ❑ Fixed or automatic kill-time
- ❑ Automatic blip for clutchless downshifting
- ❑ Adjustable preload
- ❑ Protection: IP66
- ❑ No movable parts
- ❑ Sensor's measures: Length 45mm – Diameter 14mm

**For use on racing vehicles on traffic-closed roads**

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**ATTENTION:**

Before using the device ensure **firmware** version of Rapid Bike module is equal or further than the following:

- **1.0.53** for Rapid Bike Evo
- **1.0.67** for Rapid Bike Racing

and **Rapid Bike Master software** version is equal or further than **2.1.1.3**.

In case firmware and/or software versions are older proper operating is avoided.

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# 1. Installation of the sensor

1.1. Turn off the engine.

1.2. Remove the stock shift rod, it must be replaced with the one indicated in the application list or an aftermarket one so that the length of the new shift rod with the sensor it equals the length of the stock shift rod.

*The shift rod indicated into applications list is meant to be a replacement for the OEM shift rod or an aftermarket shift rod of the same length. Dimsport srl can't advise what shift rod must be used to replace an aftermarket shift rod of different lenght.*

1.3. Install the sensor on one end of the shift rod.

1.4. Make sure the wire has a slight bend/loop so it does not tighten up and pull on the sensor at up-shift or down-shift and the shift rod has no interferences while moving.

# 2. Connection to twist grip position sensor

2.1. Remove seats, fuel tank and airbox.

2.2. Locate and disconnect the black 4 pin connector of the twist grip position sensor placed on the throttle body assembly.
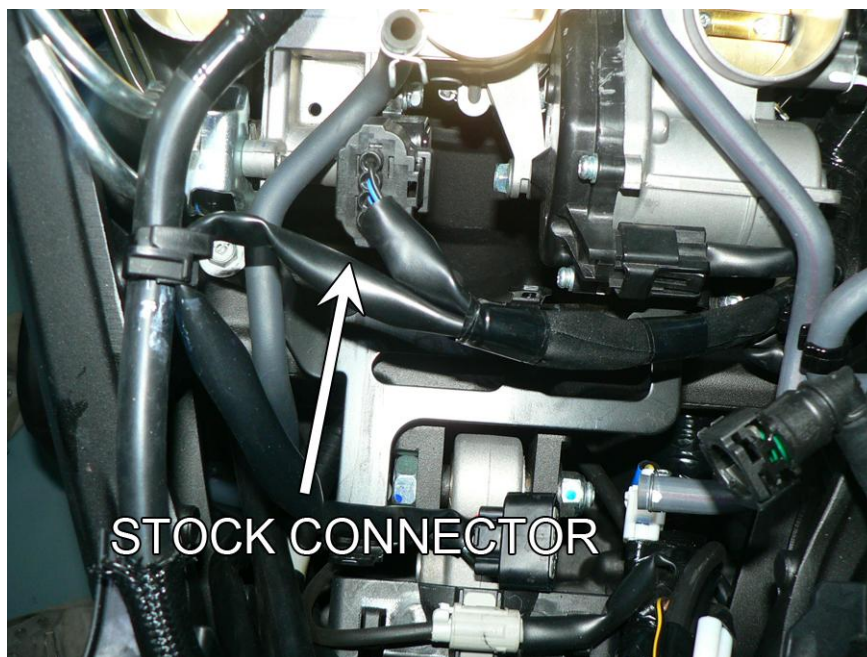


*Yamaha MT-09 / FZ-09 / Tracer 900 / XSR 900*
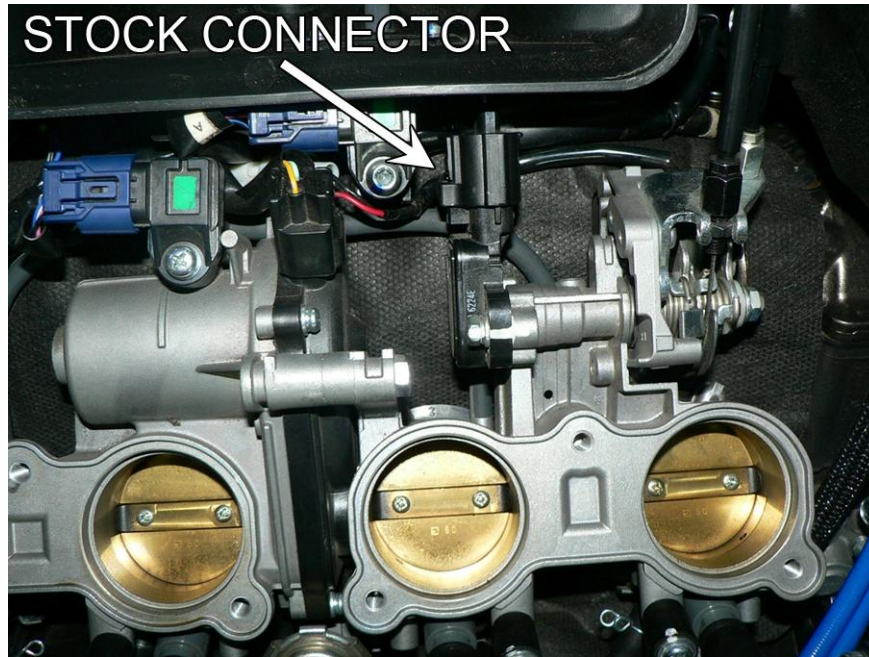
*Yamaha MT-10 – Yamaha R1 / M*
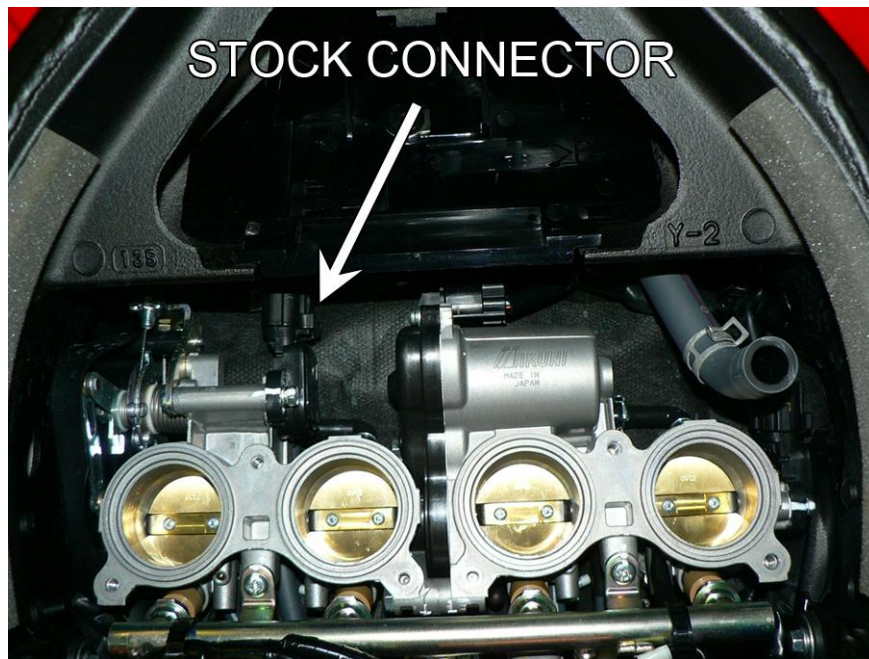


*Yamaha R6*

2.3. Connect Rapid Bike connectors in-line with the stock connector and the twist grip sensor.

## 3. Final steps

3.1. Place the Shift Assist unit under the fuel tank and plug it to the wiring harness.

3.2. Connect the wire of the quickshifter sensor to the white 2 pin plug of the Shift Assist's harness.

3.3. Connect the white 3 pin male plug to the white 3 pin female plug of Rapid Bike harness marked as **CAN**, or in-line with the accessories already plugged to it.
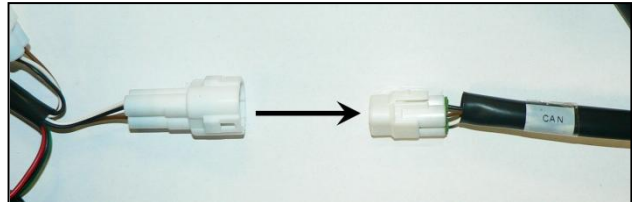


*If one or more My Tuning Bike are already installed, remove the **F27TERM1** and **F27TERM2** before installing Up/Down Shift Assist as they are not needed anymore.*

3.4. Connect the black 3 pin female plug to the black 3 pin male plug of Rapid Bike harness marked as **AUX IN**, or in-line with the accessories already plugged to it.
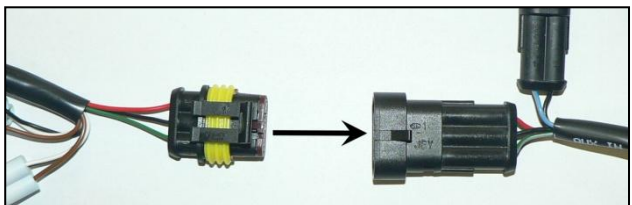


3.5. Place back fuel tank and seats.
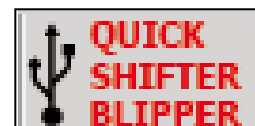
## 4. Initial setup

*The following procedure must be performed on the very first installation of the device and when it is necessary setting a new operating direction and/or calibrate the twist grip position sensor.*

4.1. Connect the computer to Rapid Bike module using the USB adapter and run Rapid Bike Master software. If data are not downloaded automatically from the module press **F6** key or click on the related icon.

4.2. Turn ignition ON

*In case it is the first installation, software advises automatically to proceed with the initial setup. Click **YES** to start automatically the procedure, otherwise proceed as follows.*

4.3. Ensure *Quick shifter Blipper* indication appears at the bottom of software's window.



4.4. Select section **Shift Assist**.

4.5. Click button **Initial Setup**, put neutral gear in and press **OK**.

4.6. Move the gear lever to simulate an up-shift and hold it until software confirms new operating direction has been stored.

4.7. Open handlebar twist grip completely and release it, then press **OK** to finish the initial setup.
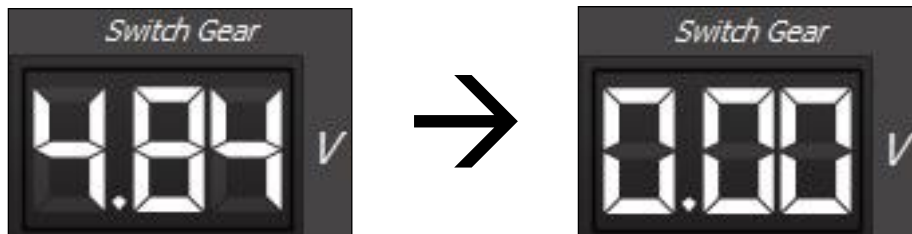
4.8. Turn ignition OFF.
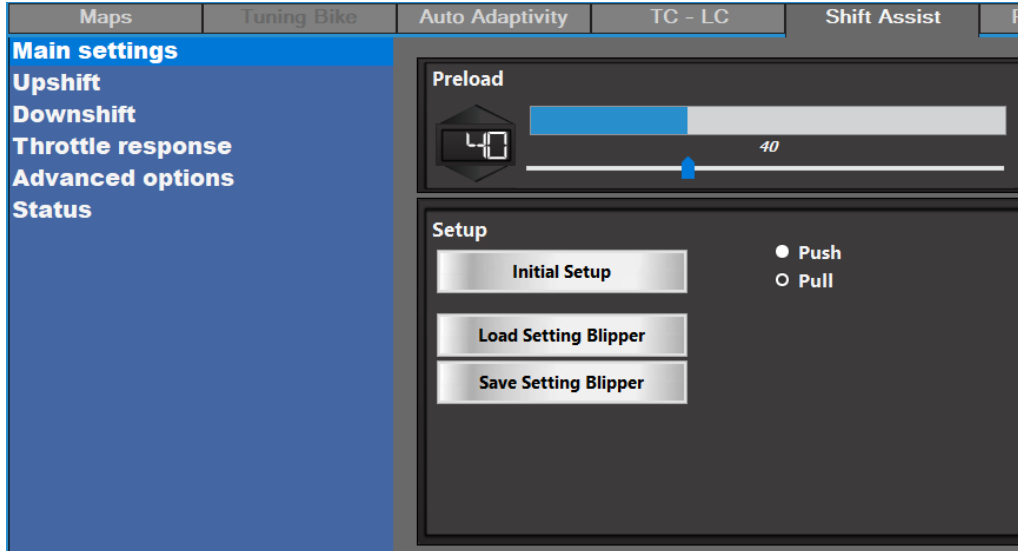


# 5. Testing operation

5.1. Connect the computer to Rapid Bike module using the USB adapter and run Rapid Bike Master software. If data are not downloaded automatically from the module press **F6** key or click on the related icon.

5.2. Turn ignition ON.

5.3. Select **Status** section.

5.4. Put 6$^{th}$ gear in and move again the gear lever to engage an imaginary 7$^{th}$ gear, check on software that display **Switch Gear** switches from almost **4.5 volt** to **0 volt** when resistance is felt. When gear lever is in rest position, display **Switch Gear** must display almost 4.8 volt.



If voltage on the display **Switch Gear** doesn't switch down to 0 volt check the connections and modify the preload setting as described in **section 6**.

5.5. Turn ignition OFF.

5.6. Test the bike on a dyno bench or riding in a racetrack and check the proper operating by changing gears from lower to higher rpm.

# 6. Modify sensor's preload

*Preload* setting represents how much force must be applied to the sensor to get a shifting signal. In other words, it represents the "hardness" of gear shifting.

*Adjustment of the preload settings must be done when verification in sections 5 fails.*

❑ *Tension shown in Switch Gear display commutes in advance from the actual gear up-shift → in this case the sensitivity is too low and needs to be increased.*

❑ *Tension shown in Switch Gear display doesn't commute when gear up-shift happens → in this case the sensitivity is too high and needs to be reduced.*

*The preload can be set in a range between 10 and 100, default setting is 40.*

*Preload can be set using Rapid Bike Master software or YouTune controller.*

### With Rapid Bike Master software:

6.1. Connect the computer to Rapid Bike module using the USB adapter and run Rapid Bike Master software. If data are not downloaded automatically from the module press **F6** key or click on the related icon.

6.2. Turn ignition ON.

6.3. Select section **Shift Assist**.

6.4. Increase or decrease the value accordingly.
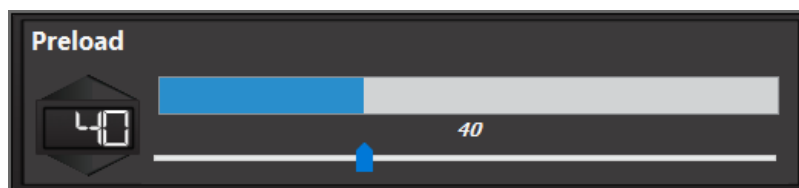


6.5. Click button **APPLY** to store new setting.

6.6. Turn ignition OFF.

6.7. Repeat verification at **section 5**.

### With YouTune controller:

6.1. Press **MODE** button to select **QS**.

6.2. The display shows the actual value of setting **Preload**, press buttons **+** and **–** to increase or decrease it.



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6.3. New value is automatically stored.

6.4. Repeat verification at **section 5**.

# 7. Software settings

*Rapid Bike Master software allows selecting different settings of quick shifter feature as well as for auto-blip feature and load sensor cell sensor.*
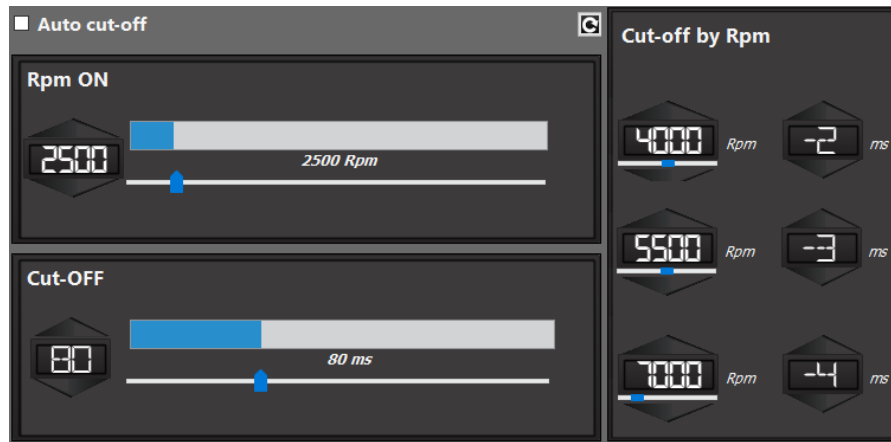
### Main settings

- **Preload** sets how much force must be applied to the sensor to prompt a shifting signal for Rapid Bike module.
- **Push / Pull** shows the actual operating direction for gear upshift.
- **Initial setup** sets operating direction and calibrate twist grip sensor as explained in **section 4**.
- **Load Setting Blipper** loads the setting file of the shift assist device, a file containing all settings of each feature.
- **Save Setting Blipper** saves the setting file of the shift assist device to backup all the settings of each feature.
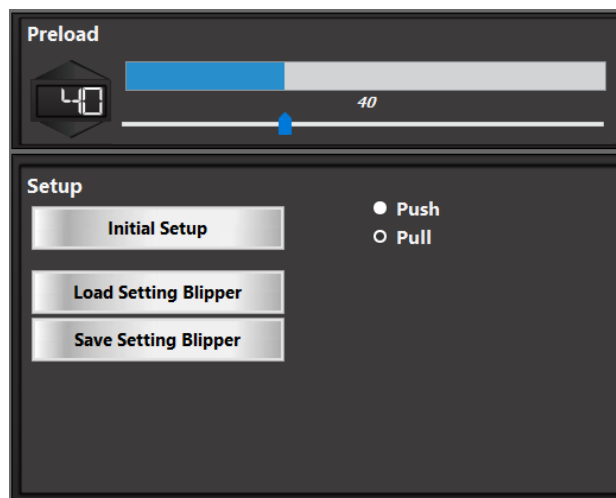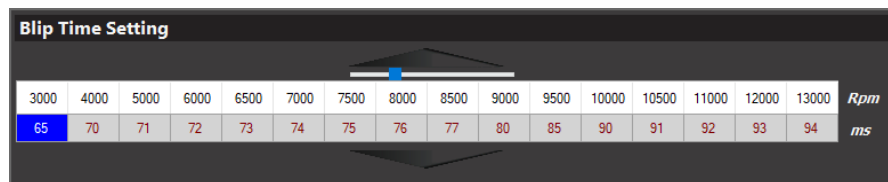


### Upshift

- **Auto cut-off** activates the automatic kill-time feature. This unique technology allows adjusting automatically the kill-time according to the sensor measurements, cutting injection signal just for the time actually required. The result is a much faster up-shift operation, avoiding useless power cut while ensuring total safety to every mechanical part
- **Rpm ON** sets number of rpm above which the shift assist works (shift assist is disabled once lowest value is selected).
- **Cut-off** sets the kill-time of injection signal allowing gear up-shift.
- **Cut-off by Gear** sets the cut-off time for every gear up-shift (only for applications including the gear position sensor reading).

- **Cut-off by Rpm** allows using different cut-off time, in three different ranges according to the rpm, by selecting a correction factor for the main cut-off time.



## Downshift

- **Blip Time Setting** sets the time (in milliseconds) of the blip duration, adjustable according to RPM.

| Rpm | 3000 | 4000 | 5000 | 6000 | 6500 | 7000 | 7500 | 8000 | 8500 | 9000 | 9500 | 10000 | 10500 | 11000 | 12000 | 13000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ms | 65 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 80 | 85 | 90 | 91 | 92 | 93 | 94 |

## Throttle response

*This feature allows to change the sensitivity of throttle opening by changing the twist grip sensor signal received by OEM ECU.*

- **Modify** changes the proportion between actual opening of throttle twist grip and signal sent to OEM ECU. For positive values throttle response will be more aggressive, for negative values it will be smoother.
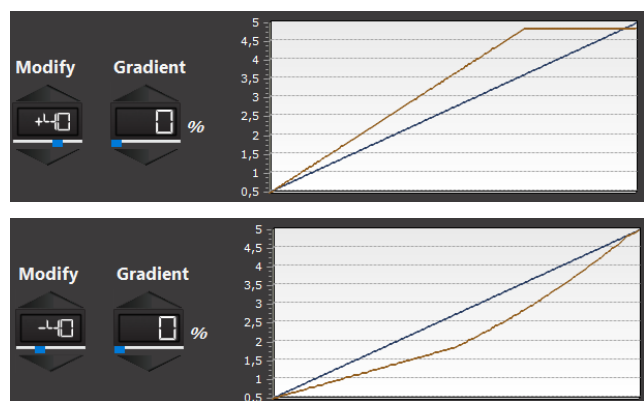


*By checking the related box this parameter is accessible into section QS of YouTune controller instead of the preload value.*

- **Gradient** sets the activation threshold of twist grip signal's modification. As a result, the amplitude of the modification is slightly lowered in order to avoid a sudden and dangerous change in throttle response.
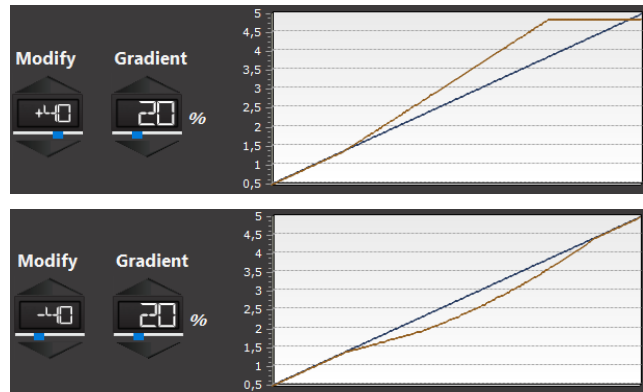


*On software' screen, blue line indicates original proportion (1:1) between actual twist grip signal and signal received by OEM ECU, orange line shows new proportion and changes according to settings.*

**Advanced options**

- **Upshift**
  - o **Hold-ON** is a safety filter activated by Rapid Bike module before cut-off, to avoid the dangerous situation of a too lean fuel mixture in the cylinder when the injection signal is cut. For values higher than 0 ms the module will wait the completion of actual injection to cut the next injection signal. With 0 ms the injection signal is cut as soon as the up-shift signal is received (dangerous situation).
  - o **Hold-OFF** is a safety filter (activated by Rapid Bike module for the time being set) that avoids false gear up-shift signals prompted after a real up-shift.
  - o **Threshold** sets voltage of the quick shifter sensor under which the module will cut the engine signals.
  - o **No Repeat Shift**: if the checkbox is ticked it won't enable a gear up-shift until the gear lever comes back to its rest position. In this way, riding in a racetrack, it would be possible to keep the lever pushed (or pulled, depending by the up-shift sense) without having additional power cuts (that would happen once timing set in Hold-OFF feature is over).
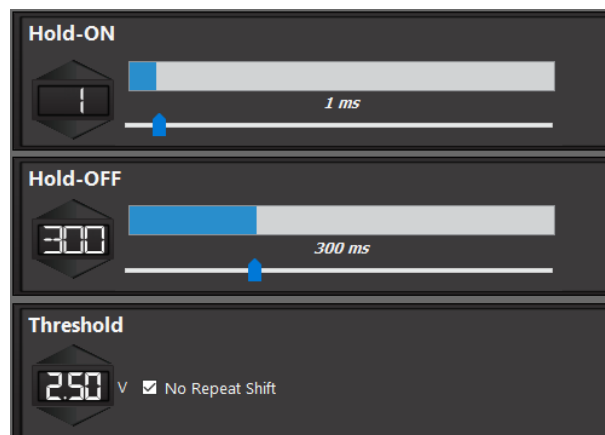
- **Auto cut-off**
  - o **Timeout Auto cut-off** is the maximum kill-time allowed for Auto cut-off feature.
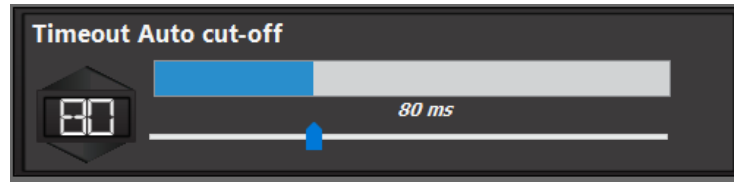


- **Ride by Wire**
  - o **T.G.S. calibration** sets maximum and minimum voltages of the two signals of twist grip position sensor. These values are set automatically during initial setup (**section 4**) and can be adjusted manually here if needed.
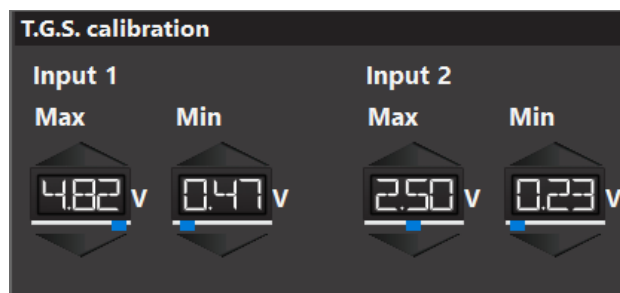


**Status**

- **Status** shows some information about the system, such as:
  - o **Battery**: power supply of the device
  - o **Firmware**: firmware version of the device
  - o Blue bar shows in real time the actual measurement of the sensor. It decreases pushing the sensor and increases pulling the sensor
- **Status Blipper T.G.S.** shows some information regarding the twist grip sensor, such as:
  - o Throttle opening expressed in percentage %.
  - o Voltage of the two signals of twist grip position sensor.
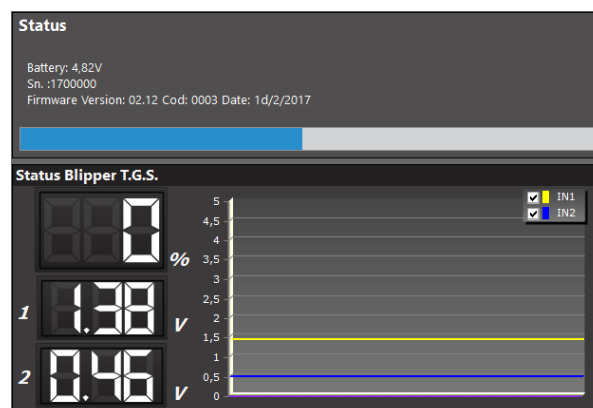
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