HM Quickshifter SABS v3a
Stand Alone Blipper Shifter

User Guide
2019/07/15
www.hmquickshifter.com

for HARDWARE VERSION 3

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As with any new technology, you must read and follow all set-up and usage instructions in the applicable user guide enclosed or provided electronically. If you fail to do so, this product may not function properly and you may not get results advertised.

While **HM Quickshifter** has made every effort at the time of publication to ensure the accuracy of the information provided herein, such information is subject to change without notice.

The HM Quickshifter Stand Alone Blipper Shifter (SABS)

Introducing the Next Generation in Quick Shifting/Auto Blipper

The HM Quickshifter Stand Alone Shifter Blipper (SABS)
Congratulations on your purchase of an HM SABS System

The HM Quickshifter Stand Alone Shifter Blipper (SABS) is a revolutionary
product that, in essenece, allows a rider to change gear up and down
the gearbox seamlessly in the fastest and smoothest manor possible.

Available in two versions: **LITE** and **PRO**

The **LITE** version already outperforms any other system on the
market. It is a simple plug and play system that is fully adjustable.

The **PRO** version is taking shifting / back shifting to the ultimate level. It is the
only system on the market that communicates with your ECU to get many
vital parameters allowing the shifter blipper to give perfect shifts whatever the load, SPEED, RPM,
Gear or throttle position. It is also completely plug and play in a small, waterproof and compact unit.
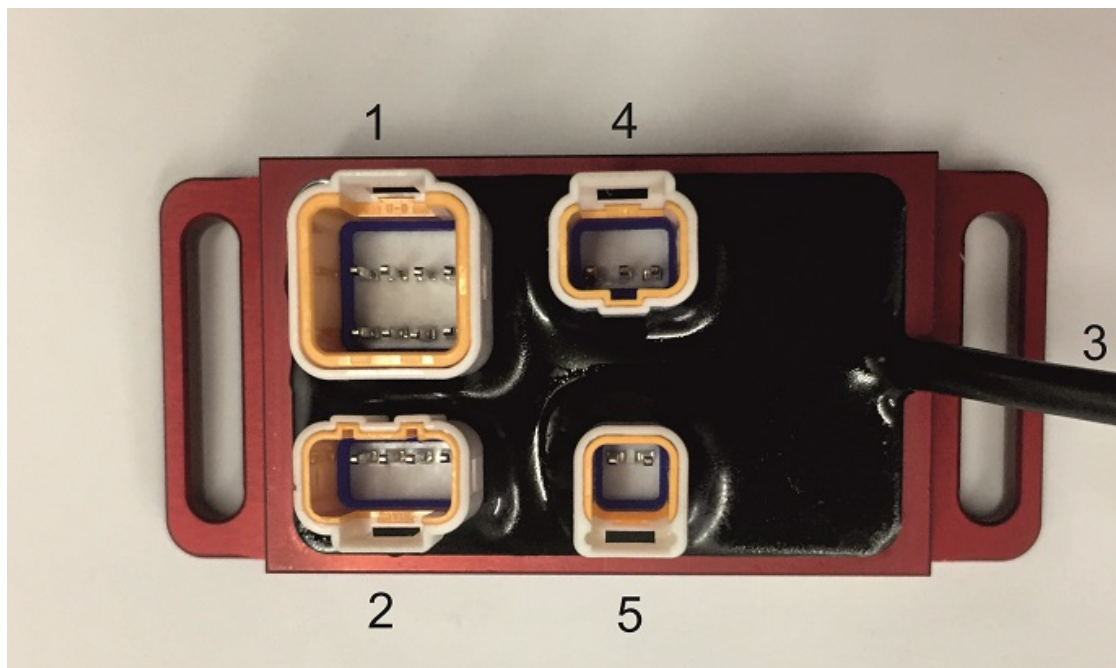
The **PRO** version also adds intelligent auto warmup, a Pit Lane limiter and Launch control.

How it Works

The SABS **LITE** and **PRO** system simply sits between your grip position sensor and the OE loom. It is plug and play and suitable connectors are supplied with your unit for your bike.

Other connections are on the SABS unit, but these are not required for shifter / blipper operation and indeed the **LITE** version does not use any other connections.

For reference here is the list of connections:

1. **OE Twist Grip Sensor Connectors** - (**Lite** and **Pro** Version)
	To be connected in between original OE Twist Grip Sensor Connector

2. **Comms Connector** - (**Lite** and **Pro** Version)
	Plugs into the PC via the HM USB Interface lead for setting adjustments and updates

3. **HM QS Sensor** - (**Lite** and **Pro** Version)
	Plugs directly into the HM Quickshifter Sensor

4. **CAN Connector** - (Only used for **Pro** version)
	Plugs into the HM CAN Inferface Loom, which plugs into the bikes OE diagnostics connector on your bike

5. **HM Button Assembly** - (Only used for **Pro** version)
	Connects to the HM Pitlane limit/Warmup procedure bar mounted button

Safety

Due to the fact that this product sits between your accelerator (twist grip) sensor and the ECU, it has the theorestical potential to add uncommanded throttle inputs. This can be exemely dangerous.

Because of this reason, the **HM SABS** has been designed form the ground up to be ultra safe. Its design phylosophy is that of mission critical systems such as primary flight controls of commercial aircraft.

This is how it works:

1. **Normal Operation**
The SABS is phycially disconnected from throttle circuit during normal operation. I.E. there is a direct connection between the twist grip sensor and the ECU just as if the system was not there.

2. When a SHIFT or BLIP (or warmup / pit limit etc) operation is requested by the user applying pressure to the gear lever, then the SABS performs a full and detailed systems test in less than a millisecond and if, and only if every test passes then it configures a deadman timer suitable to the operation, inserts itself into the circuit and performs the operation. If, during the operation, there is any fault for any reason then the SABS instantly removes itself form the circuit and logs the error. It will then no longer operate as a shifter / blipper until the fault has been acknowleged by the user and rectified.
This means that, whatever the fault, the bike will continue to run in a safe manor.
This design phylosophy means that it should be impossible for uncommand throttle input to ever occur - unlike any other system on the market.

Installation

If you are confident and capable of changing the spark plugs on your bike, then you are capable of fitting this product. If you are unsure, then please take to a dealer to fit.

NOTE:
While the fitting is simple, you will be working with safety critical systems on your bike, so it is very important that care and diligence is used. Take your time and make sure that everything is fitted correctly and that there is no possibility of cables causing any throttle mechanism to jam or that the cables can be abraded or damaged.

Whats in the Box:

The box contains the following depending on version purchased:

LITE Verison

- HM Quickshifter SABS Control module
- HM Quickshifter Sensor
- HM QS PC Interface Lead
- HM QS Sticker pack
- HM QS Grub Screw Set

PRO Version

- HM Quickshifter SABS Control module
- HM Quickshifter Sensor
- HM QS CAN Interface Lead
- HM QS PC Interface Lead
- HM QS Button Kit
- HM QS Sticker pack
- HM QS Grub Screw Set

Installing the Control Module and Sensor

Installing the Control Module:

The control module must be fitted between the Original Loom and the twist grip sensor.
In most cases, the twist grip sensor connector is located under the airbox next to or on the throttle bodies.
Remove your fuel tank and airbox and locate the twist grip sensor.

NOTE: Many bikes use the same connector for the TWIST GRIP Sensor and the THROTTLE POSITION Sensor.
It is vital that you connect to the TWIST GRIP Sensor.

Installing the Sensor:

Remove the standard linkage arm, making a note of the position of the shift lever. Now fit together the
HM Quickshifter Sensor with an HM Linkage Kit (available separately) to achieve the same overall length as the
standard linkage.

Re-install the shift linkage making sure that the HM Sensor and the cable exiting the Sensor will not foul the gear
lever or any other mechanism.

It is preferred to fit the HM Sensor nearest the gearbox.

Depending on your bike, you will need a suitable length shift rod. These can be ordered from HM Quickshifter or
your dealer.
The length of the shift rod is simply the length of your existing shift rod (shift rod only, not to nclude grub screws /
rose joints etc).
Take this length and subtract 55mm.

I.E. SHIFT ROD LENGTH = Existing shift rod - 55mm

A Universal shift rod kit is also available that will fit virtually any requirement.

You may also perhaps need rose joints.

Important Points:

1. The Sensor and Shift rod must be free on the rose joints. This means that you should be able to rotate
the sensor and linkage rod at least a small amount on the rose joints.

2. The sensor and linkage rod must not hit or foul anything. Move the lever through its entire range of
travel and make sure that the sensor and linkage rod are free to move without touching anything or
straining the attached cable.

NOTE: Do not tighten the linkage rod through the sensor - you may damage the sensor.

Setting up your Quickshifter/Autoblipper

One you have plugged your HM Sensor into the HM Sensor connector you are on you way.
All Kill times and strategies are controlled by the motorcycles ECU all adjustments can be made via the SABS PC
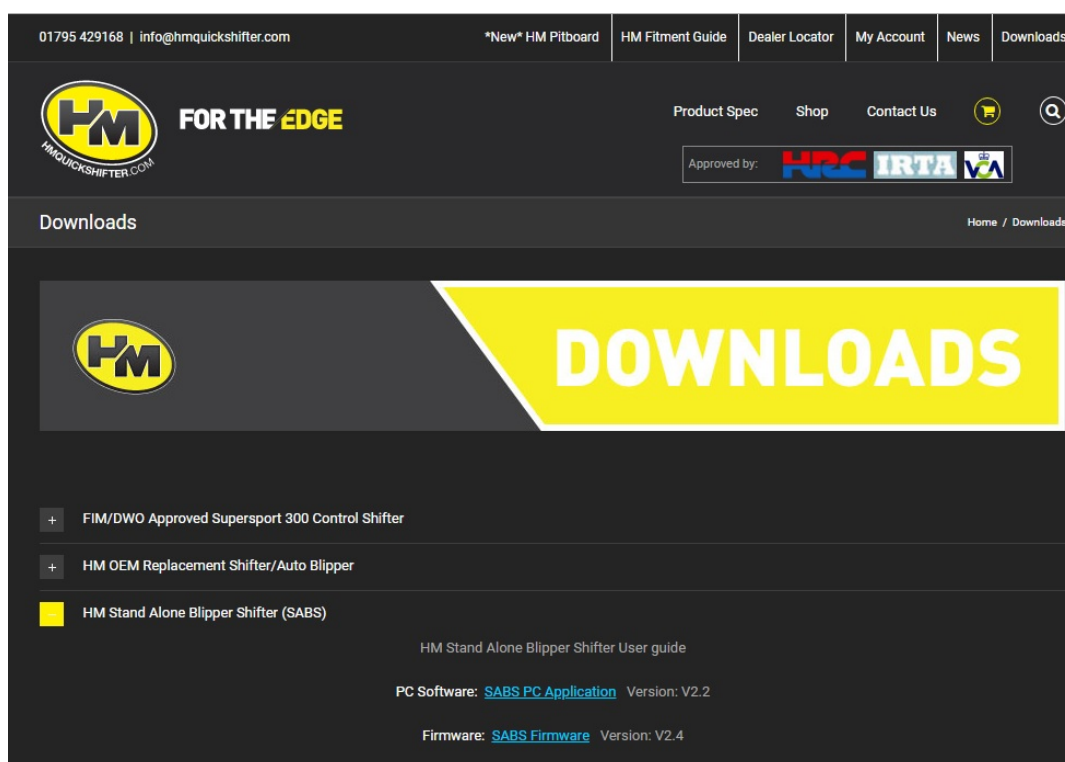software downloadable from our website.

www.hmquickshifter.com/download

Setup / PC Application

The PC application is available to download at

www.hmquickshifter.com/download/

Please download it and install the software.
Software is compatable with Windows only operating systems.

Plug in your interface lead supplied with the SABS and the drivers will be automatically installed.

IT IS VERY IMPORTANT TO CALIBRATE
THE THROTTLE BEFORE YOU PROCEED

This only needs to be done once after install.
On the GENERAL tab click on "Start Throttle Calibration" A pop up window will
open and say "Move throttle from min to max a few times AFTER clicking Okay",
open and close the throttle a few times all the way to the stop and back, 3 times should be enough.

Once you have done this, click on "End throttle calibration"

If you click on DASH in the top right of the program you will now see your throttle position
displayed under TPS%. If you do not, repeat the Throttle Calibration Process again.

SABS PC Software - Overview

Software Version

Real Time Info

SABS V3.1

File   Tools   Import/Export

| General | Shifter | Blipper |

SHIFT Direction

- ⦿ Compression (PUSH)
- ◯ Extension (PULL)

Auto Detect

- ☑ Use RPM
- ☑ Use GEARS
- ☑ Use HMSS

Shifter Sensitivity %	50
Blipper Sensitivity %	50
Cut Off RPM	1000
Band 1 RPM	4000
Band 2 RPM	6000
Band 3 RPM	8000
Band 4 RPM	10000
Band 5 RPM	12000
WARMUP	
Warmup Program (0=OFF, C=Custom)	1
Warmup Target Temperature (°C)	75
Pit Lane Limiter	
Pit Lane Limiter Program (0=OFF)	1
Pit Lane Limit Speed (KPH)	60
Pit Lane Adjust Rate	10
Pit Lane Resume Time	10
Launch Control	
Launch Control TPS (0=OFF)	0.0
Launch Control Release Speed (KPH)	0
Auto Launch(0 = OFF)	0
Launch Resume Time	10
Advanced	
Throttle Shut Threshold (%)	10
Deam Time (ms)	100
Throttle Body Cycle Time (ms)	0
Throttle Body Offset Time (ms)	0

Calibrate Throttle

| Read | Write | Exit |

MODE	NORMAL
TPS	0%
Temperature	0°C
Gear	0
RPM	0
RPM Band	0
Warmup Target Temperature	0°C
Speed	0 KPH
Shift Time	0 ms
Blip Time	0 ms
Blip Throttle	0%
Shifts this session	0
Service Time	00H02M
Total Time	00H02M
SHIFT Status	0
BLIP Status	0

1413070809170A   1994 3.0   Calibration Required!   PRO

Serial Number

Data Transfer Indicator

Firmware Version

Status Bar

Type

SABS PC Software - Menus

File Menu

The SABS PC tool will automatically save a copy of your setting to c:\ProgramData\HM_SABS. Please note that this folder is usually hidden.

When a SAVE is performed, all of the configuration data is saved, including ECU configuration.
When an OPEN is performed all data EXCEPT ECU configuration is opened.
To also open ECU configuration, use "Import ECU config only"

Open

> This will open a configuration file, it does NOT import the ECU settings. This is so that settings can be used from different models without upsetting the communication configuration for your model.

Save

> This will save the configuration file to the default folder as mentioned above: c:\ProgramData\HM_SABS

Save as

> This will allow you to save the configuration file to any location.

Import ECU config only

> This will import the ECU configuration from a configuration file only. It will not import any other setting.

Tools Menu

Reset Service Counter
> This will reset the hours counter to zero, for example after an oil change.

Update firmware

> This is used to update the firmware version of your SABS

Import/Export Menu

Custom Warmup Program

> This allows sharing of custom Warm Up programs

SABS PC Software - General TAB

Shift Direction

It is required that you configure the SABS for correct direction. Different bikes and rear set options mean that in some cases (road or race pattern) the shift direction for an UP shift is compression and other configurations it is extension. To set this correctly, simply look at the sensor whilst simulating an UP shift. If the sensor is being compressed, then select compression otherwise if extended choose extension.
Alternatively, you may use the Auto Detect wizard to help with this setting.

Use RPM

This setting enables or disables any RPM based feature of the SABS. These include:
- RPM Blip Inhibit
- RPM Bands and BIASing

Use GEARS

This setting enables or disables any GEAR based features, such as different Shift / Blip times for different gears

Use HMSS

If checked, this turns on HM Seamless Shift (HMSS). This function detects whent he next gear is mechanicaly engaged and overrides the shift time where appropiate.

Shifter Sensitivity

This sets the sensitivity for the UP SHIFTING operations. the higher the percentagfe the more sensitive. Be careful not to set too sensitive.

Blipper Sensitivity

This sets the sensitivity for the DOWN/BACK SHIFTING operations. the higher the percentagfe the more sensitive. Be careful not to set too sensitive.

Cut Off RPM

During operation, no feature of the SABS will enabled under this RPM. This is usefull for example if you do not use gears (or have a LITE) and do not want the engine to blip when selecting 1st Gear from Neutral.

RPM BANDS

For different RPMs the ideal shifter / blipper would have different KILL / BLIP times. These BANDS allow you to free configure this. So choose bands that broadly match your motorcycle and your riding style.

WARM UP

Warmup Program

The choice here is 0,1,2 or C for custom. Selecting a value of 0 will turn the Auto Warmup Procedure off and selecting 1 or 2 will give slightly different warmup routines that suit different engine configurations.

If selecting 1 or 2 then following configuration is applied:

1.   The COLD temperature is 30 degrees Celsius (when the engine is under the COLD temperature the engine will simply idle in these two programs)

2.   The WARMING temperature is 50 degrees Celsius (when the engine is above the COLD temperature but below the WARMING temperature then the bike will rev slowly and gently to start moving oil and coolant around the engine)

3.   The TARGET temperature is user selectable. If your bike has a thermostat then we recommend 80 degrees Celsius so that the thermostat can open and allow all of the coolant to reach a common temperature.

If selecting C (CUSTOM):

All of the parameters are user selectable, including COLD, WARMING and TARGET temperature, and each of the temperature bands has a fully programmable program of up to 50 elements / instructions per band.

HOW to Engage WARMUP:
> Press and Hold the PIT LIMTER / WARMUP BUTTON while the bike is off, then turn on the bike and start it.
> Some bikes leave the ignition circuit on for a period of time after turning the bike off. You will have to wait for this. For example, most Triumphs take about 2 minutes to fully turn off.

PIT LANE LIMITER
Pit Lane Limiter Program
> Selecting 0 here will disable this feature, selecting 1 will enable it. Simply holding down the Pit Limiter / Auto Warmup button during riding will limit the speed to the selected Pit Lane Limit Speed.

Pit Lane Limiter Speed (KPH)
> This setting is obviously the speed (in KPH) that the SABS will limit speed to. It is suggested that the speed entered here is a few KPH below the actual limit to allow for overshoot.

Pit Lane Limit Adjust Rate
> Different motorcycle engine configurations respond to throttle inputs differently. This setting allow fins tuning of the Pit Lane Limiter to suit a particular engine.

Pit Lane Resume Time
> Once the put lane button is released - if the current thottle position was instantly applied then there would be a very harsh acceleration. This setting allows for a smooth ramp up to the current throttle position to resume normal operation.

LAUNCH CONTROL
Launch Control TPS
> Selecting 0 here will turn off launch control. Otherwise this setting is the throttle position that the engine will be held at (as long as rider input exceeds it). Note that as the clutch is engaged, the engine will rev freely and so tenths of a throttle position an be entered, for example "5.7".

Launch Control Release Speed (KPH)
> Once this speed is reached, then Launch Control will disengage

Auto Launch

> Setting this to 1 will mean that Launch Control is engaged EVERY TIME the motorcycle is running, at a standstill and hasd a gear engaged.
> Setting to a 0 will mean that the Warmup/Pit Limit/Launch button will need to be pressed once the motorcycle has the engine running, at a stand still and a gear engaged.

Launch Resume Time
> This is a period of time that allows the throttle to be gently ramped up to the current rider throttle position.

ADVANCED
Throttle Shut Threshold

This is a throttle position, above which the auto blipper will not function. Be careful with this setting as logging and experience shows that many riders actualy have a little throttle on whilst braking and back shifting. A setting of 10% will suffice for most riders.

Dead Time

To disallow continuous shifting / blipping, this setting blanks off a shift or blip operation for a sertain amount of time. 100ms will suffice for most.

Throttle Body Cycle Time

All ride by wire systems use a servo motor to open and close the throttle bodies / butterflies. These servo motors take a certain amount of time to go from one extreme to another (eg fully open to fully shut). This setting defines this time. In most cases this can be left as 0.

Where is will make a difference is to shift times. For example, if a throttle body cycle time is 10ms, then for a shift operation 10ms must be added to the shift time for full throttle shifts as the actual throttle shut time will be a factor of this cycle time. In most cases, this is set to 0 and the shift times are adjusted for perfect shiting by adding an appropiate amount to the shift time. However if shiting during a part throttle condition then such a system will be rather inaccurate.

In short, use this setting to fine tune the up shifting.

Throttle Body Offset Time

Some ride by wire thottle bodies have a mechanical lag. This setting overcomes this. Be very careful about inputting any value here whatever value is used will effectively be added to the shift time.

SABS PC Software - Shifter TAB

Use SHIFTER

If this is unchecked, then all Shifter functionality is disabled.

Kill Times

This is the chosen Kill Time based on Gear position.
I.E. The amount of time taken to shift for each gear.

Band BIAS%

In the General TAB, RPM Bands were defined.
These BIAS% Settings allow you to BIAS (augment / modify) the Kill Time from -100% to 100% for different RPMs.

For example:

Given the following settings:
RPM Band in the General TAB is 4000
Under Band BIAS is -10%
Kill Time 1 > 2 is 60ms

Then, when riding, if the current RPM is say 3000 and you are in first gear then when you change to 2nd gear the kill time will NOT be your chosen Kill Time of 60ms,
instead this time will be BIASED by -10% which means it will be 60ms - (10% of 60ms=6ms) = 54ms

SABS PC Software - Blipper TAB

Use BLIPPER

If this is unchecked then all blipper functionality will be disabled

Inhibit Over REV

If this is unchecked, then the blipper will function regardless of RPM

WIZARD

This is for easy calculation of inhibiting RPM to prevent engine over rev on a downshift.
Simply input the maximum desired RPM and then the gear ratio's out of the bike manual.

Throttle Blip %

This is the amount that the throttle will open to initiate a down shift.

Blip Times

This is the length of time that the throttle will be held at the Throttle Blip %

Time BIAS%

This is the BIAS for the amount of time the throttle is held at Throttle Blip %
Please see Shifter TAB of explanation or BIASing.

Throttle BIAS%

This is the BIAS for the amount of throttle.

Inhibit RPM

This is used to prevent over revving on downshifting.
The value here are used to determine when it is safe to allow a down shift.
When the RPM is over the RPM in these settings, then the blipper functionality will not work.

Contact Us

If you need an assistance, we are always here to help.

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Trouble Shooting

The BLIPPER / SHIFTER does nothing...

1. Have you calibrated the throttle? Can you see 0% to 99% on the PC software when you twist the throttle?

2. Have you selected the correct direction for shifting? use the wizard to help (Auto Detect). Temperoarily turn off "Use RPM" and "Use Gears" then operate the gear lever and watch the PC app to see the shift / blip status.

3. Is the sensitivity set too high or too low? Try 50% and test with your foot as testing with you hand always makes it feel too hard.

4. If you have a PRO and you are NOT getting RPM or GEAR and you have use RPM checked, then it will not work. This is because there is a Cut Off RPM setting below which the system will be prevented form working. To fix, simply turn "Use RPM" and "Use GEAR" off, or plug in the PRO lead to the diagnostics port and make sure that the correct ECU config is selected for your bike.

Shifter issues

1. If jumping out of gear or false neutrals then the sensitivity of the shifter is too light, reduce the %

2. If the cut can be felt, but the gear is not actually changing, then the cut time is not long enough, either increase General->Advanced->Throttle Body OffSet Time a bit (5 at a time) or increase Shift Times or increase Shift Time BIAS if this onnly occurs at a certain RPM band.

3. If the shift is harsh then the SHift Time may be too long - reduce shift time or use HMSS

Shifter issues

1. If jumping out of gear or false neutrals then the sensitivity of the shifter is too light, reduce the %

Blipper issues

1. The Bike lurches or 'jumps' on a back shift / blip:
   Is this happening at all RPM? If yes then reduce the Throttle % and/or Blip Time
   Is this only happening at certain RPM? If so then use the Throttle and/or Time BIAS to get the correct setting for that RPM Band

2. Instead of being super smooth, the blipper actuall unsettle the bike on corner entry.
   This is very unusual and the only thing that can cause this is too must throttle %

Setup Guide

SABS Configurations are available for most models onour web site. There are two elements to a configuration file:

    1. The Actual recommended starting point for all settings
    2. The configuration to allow communication to/from the ECU to get RPM, Gear, Temperature and Wheel Speeds

When a configuration file is SAVED, both of the above are saved to a single file.

However, when a configuration is opened, only the user settings are used. ECU configuration settings are NOT used. This is so that configurations / settings can be shared without affecting the way the SABS works with the ECU.
Importing an ECU configuration will open an dimport the ECU configuration only.