



Vizable Technologies

SupaBrake-3 Tail Light Modulator

User Guide

Rev 1.3

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WARRANTY & SPECIFICATION:

10 Year Limited Warranty!

We take pride in our products. As such we stand 100% behind our design, workmanship and most importantly customer satisfaction. We offer a full 10 year limited warranty.

Firmware History:

02/12/15: [v3.40] Ported over from v2.1e to new chipset and new PCB. SB2 engine.

12/20/15: [v3.5a] New codes to access the >108K profiles. New features. SB3 engine.

12/26/15: [v3.5b] Tweak profile variables.

Mechanical Dimensions:

Unit body:

H = 8mm (0.315 inches)

L = 24mm (0.945 inches)

W = 35mm (1.378 inches)

Wire length:

175mm +/-10mm (7 inches +/-0.5) *Exclude connectors

Electrical Dimensions:

Wire gauge = 20 AWG or 18 AWG depending on connector used.

Red = Input brake signal

Yellow = Running light also known as "+12V"

Black = Ground

White = Modulated output

Input Voltage = 9VDC to 15VDC

Constant load current = 5.3 Amps

Quiescent current = 0.001 Amps

Operating Temperature = -40C to +80C

Storage Temperature = -40C to +95C

Fully compatible with all OEM light devices (bulbs or LEDs) 2 or 3 wire configuration when applicable. And/or third party integrated lights.

CANBus compliant

FEATURES:

Smart Algorithm:

(Standard)

(Usage = Automatic)

Upon applying the brake(s), the unit will send a burst of pulses to the vehicle's brake light(s). The duration of the burst is a function of the time elapsed between the current braking cycle and the previous brake cycle. After this initial burst, the unit allows the brake light(s) to function normally (solid brake light). This algorithm is designed to eliminate target fixation as found in cheaper, passive products that continuously "blink" the brake light(s) even though the vehicle is at a complete stop. A time domain chart can be viewed at the end of the document or at www.vizi-tec.com. The duration of the burst varies based on the profile selected. The SupaBrake-3 offers over 108K different profile combination. Yes that is over 108 thousand profiles!! You read it right.

108,001 Profiles:

(Standard)

(Usage = Manual)

User can select from over one hundred thousand profiles on the fly! No need to unplug the unit from the bike. Nor is there a need to plug in a USB cable or any external hardware. Full access to all of the variables inside the algorithm is granted. All this is done via the motorcycle's brakes. See page 6 on how to go into the Profile Select Mode and change the modulation, grace period, slope and frequency etc. of the internal algorithm of the SB-3.

Easy Plug and Ride:

(Standard)

We have been making these for over 10 years and offer a wide selection for many popular motorcycles. Chances are we have a kit for your bike. If you don't see one for your bike. Contact us at email@vizi-tec.com and we'll work with you to make a custom kit. No need to cut, splice your bike's harness. Just unplug the stock connector that interfaces the tail light to the main harness. Plug the SupaBrake-3 (SB3) in series. Done.

Grace Period:

(Standard)

(Usage = Automatic)

The SB3 will not activate if brake(s) are applied more than once within a certain time period. This is very useful in heavy traffic to not annoy the person in the vehicle following behind. Grace Period varies based on the profile selected. There are 10 preset levels for this. Ranges from 0 seconds to 60 seconds. If 0 seconds is selected the Grace Period is defeated. See page 9 for more details.

Force-Flash Retrigger:

(Standard)

(Usage = Manual)

This standard function offers the ability to automatically induce a burst of flashes. It is useful when stopped at an intersection to warn a fast approaching vehicle on your six. This is also a great way to test the tail light and the SB3 module.

Instructions:

1. Under normal riding condition if the brakes have been depressed for longer than 3.5 seconds.
2. Quickly release and reapply the brakes within 500mS. (Half second).
3. The SupaBrake-3 will output a burst of flashes.

Input de-bounce:

(Standard)

(Usage = Automatic)

The rider can quickly “tap” the brake lever or pedal without the algorithm inducing its flash routine. In an event of a "tap", the brake light will function normally and will appear as an ordinary tap of the brakes. Another aspect to this feature is that it allows the user to initiate a quick speed check on the rear brakes before a full application of the front brakes. In this case the algorithm will trigger a burst after full brake application.

Decaying Flash Routine:

(Standard)

(Usage = Automatic)

The burst of pulses is such that the period of the first pulse is slightly shorter than the subsequent pulse and so on. This means that the initial pulses will be faster whereas the later pulses towards the end of the burst will be slower. When viewed at speed and following from behind, the impression of decreasing speed is enhanced. There are 10 preset levels for this. Ranges from NONE to roughly 20% compounded decay. If 'None' is selected the Decay level is defeated. Thus all pulse will have same period. See profile attribute for more details on page 12.

Defeat (Stock Mode):

(Standard)

(Usage = Manual)

Turns off all the features of the SB3 and reverts the tail light to stock mode. This is like un-installing the device from your motorcycle. Great for MOT/DMV test. See page 12 for more details.

Active Profile Verification:

(Standard)

(Usage = Manual)

User can induce a profile feedback verification on the fly. This is a new feature on the SB3. It allows user to see what the settings on each of the attributes are. This can be done without the need to unplug the device from the motorcycle, nor need of a USB cable or any other external hardware or interface. The SB-3 is a self-contained device. Once installed forget about it.

FUNCTIONS:

Profile Select Mode:

(Usage = Manual)

This function allows the user to reconfigure the profile by allowing access to the six internal attributes; Thus making it possible to tweak the profile 108001 ways. Upon selecting a preferred variable for a given attribute, the information is written into flash memory. The variables will determine how the SB3 algorithm behaves.

From factory the attributes are loaded with a default variable setting. Thus creating the Profile* of the algorithm.

GRACE PERIOD = '12 seconds'
 FREQUENCY = '8 Hz'
 MODULATION = 'Standard'
 SLOPE = 'Slope5'
 DECAY = 'Decay2'
 STOCK MODE = 'Application = ON'

* Occasionally we run tests and perform profile configurations on certain units before shipment. Settings may vary slightly.

Below is the order of the 6 attributes and number of variables associated within each attributes:

	X	Y	
#1	GRACE_PERIOD	10 variables	(Page 11)
#2	FREQUENCY	12 variables	(Page 12)
#3	MODULATION	10 variables	(Page 13)
#4	SLOPE	9 variables	(Page 14)
#5	DECAY	10 variables	(Page 15)
#6	STOCK_MODE	2 variables	(Page 16)

To see a detailed listing of their variables go to page number as listed above.

To select and reconfigure an attribute. Follow steps below. Note only one attribute can be configured at a time.

Caution:

<<< Testing and saving the attributes can cause the battery to discharge. Consider running the engine while doing such configuration. Make sure to have good air ventilation when performing such tests inside >>>

Instruction:

- 1) While the motorcycle is turned OFF. Press and continue to hold the front or rear brake lever/pedal.
- 2) Turn ON the electrical system of the motorcycle so that the tail light is on.
 - a) Continue to depress and hold the brake for a minimum period of **30 seconds**. (Do not release the brakes just yet). After **30 seconds** the brake light(s) will flash once followed by a slight pause. It will then flash twice and again followed by another slight pause. It will do this up to a total of **six** times representing the six attributes of the internal algorithm. Then loop back again to repeat the cycle starting from **one** flash.
- 3) To select and modify the "X" attribute. Release the brake lever/pedal after "X" flash(es) during the pause period. Where "X" denotes the attribute number to be reconfigured.

- 4) Now press and hold brakes again. Continue to press the brakes. Do not release.
 - a) The SB-3 will now flash the brake light(s) once followed by a slight pause. It will then flash twice and again followed by another slight pause. It will do this up to the total number of variables quantities in the "X" attribute field. It will then loop back again to repeat the whole cycle starting from one flash.
- 5) To select the "Y" variable within the above "X" attribute. Release the brake lever/pedal after "Y" flash(es) during the pause period. Where "Y" denotes the variable number.
- 6) Now press and hold brakes again to get a feedback Profile Verification.
 - a) The SB3 is now programmed with new information. It will give a quick burst of flashes. This is a courtesy to indicate that you have successfully edited an attribute. It will then do a feedback verification by outputting 6 sets of slow pulses on the tail light. Each set indicates a digit. Representing the variable of an attribute. The first set represent the first attribute and so on. The output will loop with a long 6 seconds pause in between the 6 data pulses to signify the start and end of each data set. See below on how to decode this.
- 7) Release brakes. This will send the application into regular run mode with it new settings in memory and loaded ready to go.

Example:

To change the third attribute (MODULATION) to "Aggressive B". See page 11 for it definitions of the MODULATION attribute.

- 1) While the motorcycle is turned OFF. Press and continue to hold the front or rear brake lever/pedal.
- 2) Turn ON the electrical system of the motorcycle so that the tail light is on.
 - a) Continue to depress and hold the brake for a minimum period of **30 seconds**. (Do not release the brakes just yet). After **30 seconds** the brake light(s) will flash once followed by a slight pause. It will then flash twice and again followed by another slight pause. It will do this up to a total of **six** times representing the six attributes of the internal algorithm. Then loop back again to repeat the cycle starting from **one** flash.
- 3) Release the brake lever/pedal after you see 3 pulses during the pause period. 3 pulses because the MODULATION attribute is the third of the six attributes within the algorithm.
- 4) Now press and hold again. Continue to press the brakes.
 - a) The SB3 will now flash the brake light(s) once followed by a slight pause. It will then flash twice and again followed by another slight pause. It will do this up to **10**. It will then loop back again to repeat the whole cycle starting from one flash. It is cycling 10 because the MODULATION attribute#3 has 10 variables to choose from.
- 5) To select the 4th variable within the MODULATION attribute. Release the brake lever/pedal after the 4 flashes during the pause period.
- 6) Now press and hold brakes again.
 - a) The SB3 is now programed with new information. #4 into the MODULATION attribute. It will give a quick burst of flashes. This is a courtesy to indicate that you have successfully edited an attribute. It will then do a feedback verification. It will output 6 sets of slow pulses on the tail light. Each set indicates a digit. Representing the variable of an attribute starting from the first attribute to the sixth. The output will loop with a long 6 seconds pause in between the 6 data pulses to signify the start and end of each data set.

On the tail light you will see: ...

< n pulses>...< n pulses>...< 4 pulses>...< n pulses>...< n pulses>...< n pulse>.. < 6 sec pause>... repeat...

Decoding the pulses:

Attribute#1	Attribute#2	Attribute#3	Attribute#4	Attribute#5	Attribute#6
GRACE PERIOD	FREQUENCY	MODULATION	SLOPE	DECAY	STOCK MODE
X	X	4	X	X	X

Note that the third set of pulses is now 4. Third attribute has 4 loaded into it. Meaning the MODULATION attribute is set to "Aggressive B". See page 12 to details on MODULATION attribute.

Release brakes. This will send the application into regular run mode with its new settings in memory and loaded ready to go with MODULATION attribute set to 4.

What is a profile select feedback verification?

A user verification output is implemented to acknowledge to the user how the profile is configured in memory. By observing and counting the number of pulse(s) in this slow burst. The number counted corresponds to the attribute setting. The verification burst is done with a 1.5 Hz burst so that the human eye can see and count the individual pulses. Tapping the brakes or releasing the brakes midway thru the verification burst will stop and send application to normal operation mode.

The Profile Feedback Verification can also be induced manually. See below for Active Profile Feedback Verification routine.

Active Profile Feedback Verification:

(Usage = Manual)

(Available on the SupaBrake-3 only)

This function routine allows the user to read the setting of each of the six attributes without changing anything in memory. The data is outputted (displayed) in terms of long slow looping pulse on the tail light.

To induce an Profile Feedback Verification routine follow steps below.

Caution: Continued viewing of the selected stored profile settings can cause the battery to discharge. Consider running the engine while doing such tests. Don't forget to have good air ventilation when performing such tests inside.

Instruction/Example:

- 1) While the motorcycle is turned OFF. Press and continue to hold the front or rear brake lever/pedal.
- 2) Turn ON the electrical system of the motorcycle so that the tail light is on. Watch the tail light!
- 3) Continue to depress and hold the brake for a minimum period of **15 seconds**. (Do not release the brakes just yet). If brake(s) is releases before the 15 seconds mark, the application will exit and return to normal operation mode.
 - a) After 15 seconds the brake light(s) will give you two quick flashes. This is a courtesy to indicate that you can now induce an Active Profile Feedback Verification routine or continue to a Profile Selection Mode to program a new profile by editing one of the six attributes. You can only go into a Profile Feedback routine between 15-30 seconds while holding the brakes down. After 30 seconds the SupaBrake-3 automatically kicks the application into the Profile Select Mode.
- 4) Between **15 seconds** and **30 seconds**, release the brakes. Then press and hold again and continue to hold brakes.
 - a) Watch the tail light. The SB-3 will now place 6 slow burst of pulses on the tail light. Each burst represents an attribute of the selected profile. The number of pulse in the burst indicates a digit. Representing a variable value. The output will loop with a long 6 second pause in between the 6 data pulses(burst) to signify the start and end of each data set.

(continued next page...)

Instruction:

Assume the factory default settings are in place. The table below shows what the six attributes and their data(variable).

See page 10 -15 for detailed information about the attributes.

Attribute#1	Attribute#2	Attribute#3	Attribute#4	Attribute#5	Attribute#6
GRACE PERIOD	FREQUENCY	MODULATION	SLOPE	DECAY	STOCK MODE
5	4	2	5	3	1

On the tail light you will see the six <bursts>:

< 5 pulses>... <4 pulses>...< 2 pulses>...< 5 pulses>...< 3 pulses>...< 1 pulse>.. < 6 sec pause>... repeat.

Decoding yields:

5, 4, 2, 5, 3, 1 ... repeat

The first digit denotes attribute#1 of the profile. The GRACE PERIOD. It is set to 5; which is '12 seconds' per page 11.

The second digit denotes attribute# 2 of the profile. FREQUENCY is set to 4; which is '8 Hz' per page 12.

The third digit denotes attribute#3 of the profile. MODULATION is set to 2; which is 'Standard' per page 13.

The forth digit denotes attribute#4 of the profile. SLOPE is set to 5; which is 'Slope5' per page 14.

The fifth digit denotes attribute#5 of the profile. DECAY is set to 3; which is 'Decay3' per page 15.

The sixth digit denotes attribute#6 of the profile. STOCK MODE. It is set to 1; which is 'Application = ON' per page 16.

To put it simply:

GRACE PERIOD = '12 seconds'
 FREQUENCY = '8 Hz'
 MODULATION = 'Standard'
 SLOPE = 'Slope5'
 DECAY = 'Decay3'
 STOCK MODE = 'Application = ON'

See page 10 thru 15 for detailed information about the attributes.

ATTRIBUTE DEFINITIONS:

Attribute#1 – GRACE PERIOD definitions:

1	0 seconds (~280 mS)
2	3 seconds
3	6 seconds
4	9 seconds
5 *	12 seconds
6	15 seconds
7	20 seconds
8	30 seconds
9	45 seconds
10	60 seconds

* Factory set

This is the first of the six attributes of the profile. It determines the offset of the algorithm. Meaning the delay at which the first pulses will appear after the previous brake cycle. Setting it to “0 seconds” removes the offset and allows the modulation (pulses) to be generated right away. So you’ll get something each and every time you press the brakes. Setting it to “9 seconds” will not allow the modulation to happen until a period of 9 seconds has elapsed. We recommend keeping this value above “3 seconds” to not annoy the vehicle behind. From factory this is set to “12 seconds”. This is a great feature for heavy stop and go traffic. Use it!

◇ Number of pulses is based on Attribute#3(Modulation).

Quick Example: To change this attribute (GRACE PERIOD) to “6 seconds”. Number 3 from above table.

1. While the motorcycle is turned OFF. Press and continue to hold the front or rear brake lever/pedal.
2. Turn ON the electrical system of the motorcycle so that the tail light is on.

Continue to depress and hold the brake for a minimum period of **30 seconds**. (Do not release the brakes just yet). After **30 seconds** the brake light(s) will flash once followed by a slight pause. It will then flash twice and again followed by another slight pause. It will do this up to a total of **six** times representing the six attributes of the internal algorithm. Then loop back again to repeat the cycle starting from 1 flash. Since you are changing the first attribute, release the brake lever/pedal after you see 1 pulse.

4. This puts the application in Attribute#1 edit mode. Now press and hold brake again. Continue to press and hold.

The SB3 will now flash the brake light(s) once followed by a slight pause. It will then flash twice and again followed by another slight pause. It will do this up to **10** times. It will then loop back again to repeat the whole cycle starting from 1 flash. It is cycling 10 because the GRACE PERIOD attribute has 10 variables to choose from. Since we want to select 3 for a “6 seconds” variable, release the brake lever/pedal after you see **3** pulses.

5. The device is now set to GRACE PERIOD = 3 (6 seconds) and application running and ready to go.

Attribute#2 - FREQUENCY definitions:

1	2 Hz
2	4 Hz
3	6 Hz
4 *	8 Hz
5	10 Hz
6	12 Hz
7	14 Hz
8	16 Hz
9	18 Hz
10	20 Hz
11	22 Hz
12	24 Hz

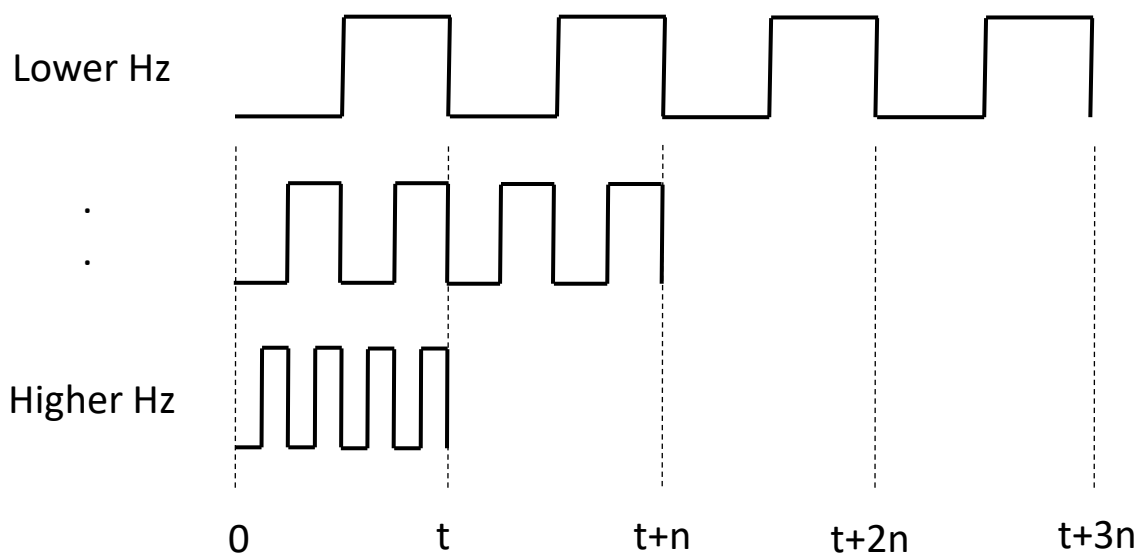
* Factory set

The second attribute speaks for itself. It determines how fast or slow the modulation will be. The lower the “Hz” the slower the modulation. The higher the “Hz” the quicker the pulse. Where 1 Hz = 1 pulse per second. 8 Hz = 8 pulses per seconds.

Note: If using filament bulbs such as the 1156 or 1157, best select the lower end of this spectrum due to the internal delay of the bulbs turning on/off. If running LEDs then you are free to play with all these variables.

Example:

Selecting a lower frequency setting will take 4 segments of time ($t+3n$) to output 4 pulses. When a higher frequency is selected the 4 pulses can be done in only one segment of time. Faster.



Attribute#3 - MODULATION definitions:

1	Relaxed
2 *	Standard
3	Aggressive A
4	Aggressive B
5	Aggressive C
6	Aggressive D
7	Berserk A
8	Berserk B
9	Berserk C
10	Berserk D

* Factory set

The third attribute. This can also be called the *gain* or *rise* of the profile. It is linear if one were to plot it. The lower the variable, the less modulation for a given profile. The higher the variable, the more modulation. See *appendix B* for a table of how the pulse number varies with the profile time segments.

Example:

If set to "2=Standard" as in factory default and wait 36 seconds into the profile. 4 pulses will happen.

If attribute is set to "5=Aggressive C" and repeat above. 6 pulses will show.

From factory attribute is set to "2=Standard". This setting was carried over from SB1 and SB2 product default.

Attribute#4 - SLOPE definitions:

1	Slope 1
2	Slope 2
3	Slope 3
4	Slope 4
5 *	Slope 5
6	Slope 6
7	Slope 7
8	Slope 8
9	Slope 9

* Factory set

Attribute #4. Changes how much the 7 time segments of the profile will stretch out.

The lower the variable, the more compressed or sooner the modulation happens.

The higher the variable, the more stretched out over time the profile becomes. This takes longer for the modulation to reach its max. See *appendix A* for a detailed view of how the time segments (T1 – T7) play out depending on Grace Period selected.

Example:

Assume profile attributes are:

GRACE PERIOD = '12 seconds'

MODULATION = 'Standard'

SLOPE = 'Slope5'

The algorithm profile will max out at 84 seconds.

GRACE PERIOD = '12 seconds'

MODULATION = 'Standard'

SLOPE = 'Slope7'

The algorithm profile will max out at 120 seconds.

We recommend keeping this in the middle for the chart. If you wish to experience the entire profile sooner then set to lower value or higher to stretch it out.

Attribute#5 - DECAY definitions:

1	None
2	Decay 1
3 *	Decay 2
4	Decay 3
5	Decay 4
6	Decay 5
7	Decay 6
8	Decay 7
9	Decay 8
10	Decay 9

* Factory set

This is where the MODULATION period gets compounded. Stretched out. This attribute helps to give the appearance of a slowing down of the motorcycle when brakes are applied. The frequency decreases as the motorcycle slows down.

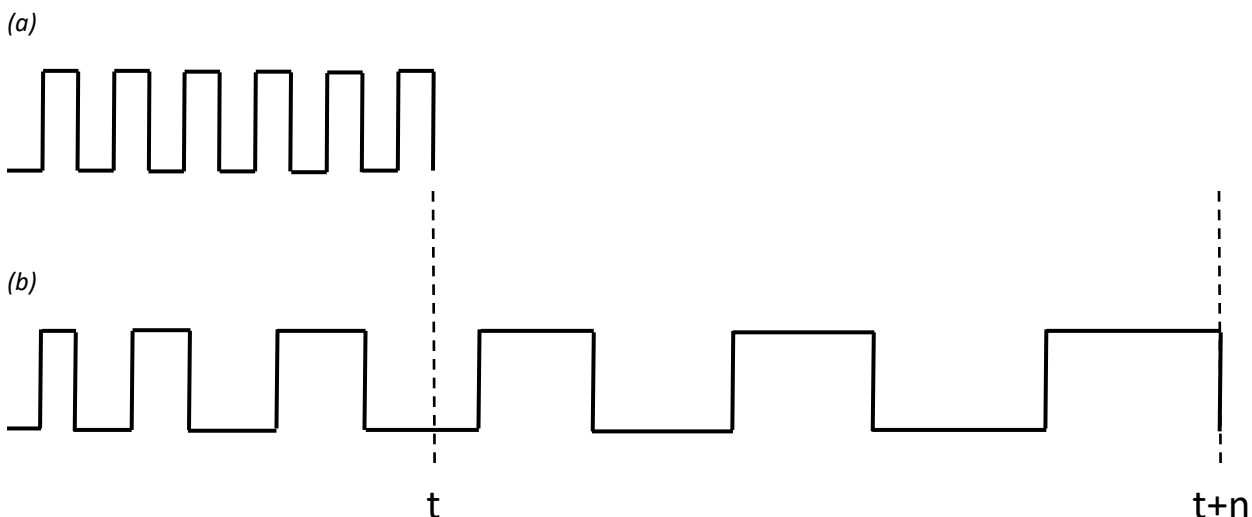
The lower the variable, the less the decay on the frequency. The higher the variable the longer the pulses will seem to be during the end of its burst.

Choose "1" to keep the frequency constant. 10 for max decay. Note that selecting a high DECAY variable and high MODULATION variable can cause the pulses on the brake light to take a much longer time to play out.

Example:

Figure (a) shows how a burst of 6 pulses will look without decay when attribute is set to "1". The period of wave form (burst) is constant.

Figure (b) shows same burst when attribute is set between 2-10. The higher the number the longer the decay ratio. Notice how each pulse is longer than the previous to give a faster frequency at the start of the burst and slower towards end. (Figures below not to scale).



Attribute#6 – STOCK MODE definitions:

1 *	Application ON
2	Application OFF (defeat)

* Factory set

The last of the attributes. This feature allows the rider to quickly defeat all the functions of the SupaBrake-3 without having to physically remove the device from the motorcycle. When this attribute is set to "2", the functionality of the tail light system will revert to stock condition. This is like un-installing the device from your motorcycle. Great for MOT/DMV test.

Example:

Set to "1" to use all the features of the SB3.

Set to "2" to disable all the features of the SB3 application. Reverts the tail light to stock.

Appendix A:

Time Segments vs. Grace Period (seconds)

	0 sec	3 sec	6 sec	9 sec	12 sec	15 sec	20 sec	30 sec	40 sec	60 sec
Slope1										
T0	0	3	6	9	12	15	20	30	45	60
T1	2	5	8	11	14	17	22	32	47	62
T2	4	7	10	13	16	19	24	34	49	64
T3	6	9	12	15	18	21	26	36	51	66
T4	8	11	14	17	20	23	28	38	53	68
T5	10	13	16	19	22	25	30	40	55	70
T6	12	15	18	21	24	27	32	42	57	72
Slope2										
T0	0	3	6	9	12	15	20	30	45	60
T1	4	7	10	13	16	19	24	34	49	64
T2	8	11	14	17	20	23	28	38	53	68
T3	12	15	18	21	24	27	32	42	57	72
T4	16	19	22	25	28	31	36	46	61	76
T5	20	23	26	29	32	35	40	50	65	80
T6	24	27	30	33	36	39	44	54	69	84
Slope3										
T0	0	3	6	9	12	15	20	30	45	60
T1	6	9	12	15	18	21	26	36	51	66
T2	12	15	18	21	24	27	32	42	57	72
T3	18	21	24	27	30	33	38	48	63	78
T4	24	27	30	33	36	39	44	54	69	84
T5	30	33	36	39	42	45	50	60	75	90
T6	36	39	42	45	48	51	56	66	81	96
Slope4										
T0	0	3	6	9	12	15	20	30	45	60
T1	9	12	15	18	21	24	29	39	54	69
T2	18	21	24	27	30	33	38	48	63	78
T3	27	30	33	36	39	42	47	57	72	87
T4	36	39	42	45	48	51	56	66	81	96
T5	45	48	51	54	57	60	65	75	90	105
T6	54	57	60	63	66	69	74	84	99	114

Slope5

T0	0	3	6	9	12	15	20	30	45	60
T1	12	15	18	21	24	27	32	42	57	72
T2	24	27	30	33	36	39	44	54	69	84
T3	36	39	42	45	48	51	56	66	81	96
T4	48	51	54	57	60	63	68	78	93	108
T5	60	63	66	69	72	75	80	90	105	120
T6	72	75	78	81	84	87	92	102	117	132

Slope6

T0	0	3	6	9	12	15	20	30	45	60
T1	15	18	21	24	27	30	35	45	60	75
T2	30	33	36	39	42	45	50	60	75	90
T3	45	48	51	54	57	60	65	75	90	105
T4	60	63	66	69	72	75	80	90	105	120
T5	75	78	81	84	87	90	95	105	120	135
T6	90	93	96	99	102	105	110	120	135	150

Slope7

T0	0	3	6	9	12	15	20	30	45	60
T1	18	21	24	27	30	33	38	48	63	78
T2	36	39	42	45	48	51	56	66	81	96
T3	54	57	60	63	66	69	74	84	99	114
T4	72	75	78	81	84	87	92	102	117	132
T5	90	93	96	99	102	105	110	120	135	150
T6	108	111	114	117	120	123	128	138	153	168

Slope8

T0	0	3	6	9	12	15	20	30	45	60
T1	21	24	27	30	33	36	41	51	66	81
T2	42	45	48	51	54	57	62	72	87	102
T3	63	66	69	72	75	78	83	93	108	123
T4	84	87	90	93	96	99	104	114	129	144
T5	105	108	111	114	117	120	125	135	150	165
T6	126	129	132	135	138	141	146	156	171	186

Slope9

T0	0	3	6	9	12	15	20	30	45	60
T1	24	27	30	33	36	39	44	54	69	84
T2	48	51	54	57	60	63	68	78	93	108
T3	72	75	78	81	84	87	92	102	117	132
T4	96	99	102	105	108	111	116	126	141	156
T5	120	123	126	129	132	135	140	150	165	180
T6	144	147	150	153	156	159	164	174	189	204

Appendix B:

**Time Segments vs. Modulation
(pulses)**

	Relaxed	Standard	Aggressive A	Aggressive B	Aggressive C	Aggressive D	Berserk A	Berserk B	Berserk C	Berserk D
T0	1	2	3	4	5	6	3	4	5	6
T1	2	3	4	5	6	7	5	7	9	11
T2	3	4	5	6	7	8	7	10	13	16
T3	4	5	6	7	8	9	9	13	17	21
T4	5	6	7	8	9	10	11	16	21	26
T5	6	7	8	9	10	11	13	19	25	31
T6	7	8	9	10	11	12	16	22	29	36

INSTALLATION:

Plug & Ride version - Very simple

1. Before removing or opening your motorcycle please verify your brake light(s) are functioning.
2. Locate the stock connector that interfaces the main wire harness to the tail light. Most of the time you will find this under the seat or one of the side panels. Open this connector and plug the SupaBrake-3 in series. Replace the seat or side panel and you're done. No need to take to dealer!

Installation examples can be found at <http://www.vizi-tec.com/sb-docs/> for download. You may not find one specific to your vehicle. Reason being that we stopped making model specific installation as these are very simple; Read one and you've read them all. If you have questions or comments please send us an email at email@vizi-tec.com.

Universal version – A little bit more complex

1. Before removing or opening your motorcycle please verify your brake light(s) are functioning.
2. See above wire color scheme. Use included Posi-Locks connector to quick secure interface.

FAQ:

The SB3 is a somewhat complex device. It has many functions and features. But very easy to use once understood. It is strongly recommended that you read this manual before installation and/or ordering. Understanding its simplicity is the beauty of it. Installation is simple. Designed to be fully Plug and Play. You do not need to visit your local dealership to install it. VIZI-TEC LLC cannot and will not be responsible for charges incurred if installed at dealership.

- **Why isn't the SB3 modulating?**

Firstly you must remember that the SB3 has an algorithm (with grace period). The number of blinks (modulation) and frequency will be determined by the profile attributes selected. If the Grace Period has been set between 2 and 10 as in the case of factory default, the unit will NOT FLASH EACH AND EVERY TIME you pull the brakes. See page 10 for more details on the attribute of the Grace Period.

Or it could mean Attribute#6 is set to 2. Application=OFF (Stock mode). See page 5 for details.

Troubleshoot:

- 1) Turn on the bike power. No need to start the engine. (Let's assume the Grace Period is set to 12 seconds.)
 - a) Do not touch any brakes.
- 2) Wait about 15 seconds.
- 3) Press and hold the brakes. The longer you don't use your brakes the more it will flash the next time you use it.

If you don't see modulation check to make sure the profile is not defeated by doing an Active Profile Feedback Verification. See page 8 for more details.

- **Why is it only flashing about 3 times?**

The time period between usage of the brakes will determine the length of the modulation burst. The longer the brakes are not used. The more modulation the output will be the next time around.

- **If am riding along and I come to a complete stop on a hill for a duration of >1 minute with the brakes applied for this period of time. Does this affect profile programming mode?**

No. Programming can only be accessed at the initial power-up of the bike - only if brakes=ON before and during the entire first 30 seconds. If at any time during power-up the SB3 sense brake=OFF. It will set the application to normal operation and stay there until the next power-up cycle.

- **I don't see a kit for my motorcycle? How do I get one made?**

Send us an email at email@vizi-tec.com and let us know the year/model of your bike. If the bike model is 5 years or newer we'll work with you to make a custom kit for half the price.

- **What is “T” and when is the 7 time segments? What is its maximum?**

Each profile is segmented into 7 parts. Hence (T0 - T6). Only one segment can be active at a given time. After a successful modulation burst the profile resets to (T0) during its GRACE_PERIOD and SLOPE attribute. Then moves on to T1.. T2.. and so forth up to T6 and stays there(T6) until next braking cycle.

Example:

Grace Period = ‘12 seconds’

Slope = ‘Slope5’

Modulation = ‘Standard’

Page 17 shows that with SLOPE_5 with a 12s Grace Period. The max values are T0=12s, T1=24s, T2=36s.. T6=84s. That means during T0(between 0s to 12s) there will be no modulation. Hence “grace period”. T0 expires at >12s. Next segment T1(>12s to 24s) there will be 2 pulses if brake is pressed based on the ‘Standard’ modulation attribute. T1 expires at 24s. Next segment between T2(>24s to 36s) pulses goes up to 3. Last segment T6 and above there will 8 pulses.

- **How can I get more modulation?**

Change attribute#3. See page18 for a chart.

Example:

From above question. Profile had attribute#3 = ‘Standard’. If it was set to ‘Aggressive B’. Then at T1 it would have generated 4 pulses instead of the 2 from a ‘Standard’ setting.

- **What if a full burst of a particular profile ends up being 6 flashes that takes 2 seconds to complete. But the brakes was only applied for 1 second. What happens to the “unused” flashes?**

The SB3 can only send out a burst on the tail light when the brakes are active. Therefore it will run through half of the above scenario. The remaining “un-used” flashes are saved onto the next time segment. Basically you’ll see 3 flashes and remaining 3 flashes accumulated on to next braking cycle.

- **How is this different than other modulators out there?**

The low down is that the output is NOT based on a fixed set of pulses as seen on other modulators on the market. But rather how much, how fast, how soon and when you program it to burst.

- **Lost or have any questions?**

Send us an email at email@vizi-tec.com

CHEAT SHEET:

* Factory set

	Attribute #1	Attribute #2	Attribute #3	Attribute #4	Attribute #5	Attribute #6
Variable	GRACE PERIOD (sec)	FREQUENCY (Hz)	MODULATION	SLOPE	DECAY	MODE
1	0 (no delay)	2	Relaxed	Slope 1	None	Application ON
2	3	4	*Standard	Slope 2	Decay 1	Application OFF
3	6	6	Aggressive A	Slope 3	*Decay 2	
4	9	*8	Aggressive B	Slope 4	Decay 3	
5	*12	10	Aggressive C	*Slope 5	Decay 4	
6	15	12	Aggressive D	Slope 6	Decay 5	
7	20	14	Berserk A	Slope 7	Decay 6	
8	30	16	Berserk B	Slope 8	Decay 7	
9	45	18	Berserk C	Slope 9	Decay 8	
10	60	20	Berserk D		Decay 9	
11		22				
12		24				

Programming:

Press and hold brake.

Power-up the bike. (Don't need start engine)

Hold for >30 seconds. (The profile selection sequence will start automatically after 30s)

Verify:

Press and hold brake.

Power-up the bike. (No need to start engine)

Hold for >15 seconds. (You'll see a quick burst)

Release and reapply brakes. Continue to hold. (The *Profile Feedback Verification* will start. See pg. 9 for more details)

Release brakes again to go into normal application.