



Transient

[illegible]**MICROTEC S.r.l.**

Sede Legale Via Avris 3/A – 21032 CARAVATE (VA) ITALY

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Capitale Sociale € 10.200 i.v Reg. Imprese di Varese n. 02356120127 REA n. 251455


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General description:

Advance and injection transient– correction in function of the TPS derivative during the time. It's possible to add (subtract) extra fuel or advance during opening/closing throttle. Extra correction can be added in function of rpm and water temperature.

Advance Transient		1 (lower)	2	3	4	5	6	7	8 (upper)	
Time Base [ms]	100	Thresholds [deg]	0.0	5.0	10.0	20.0	30.0	50.0	70.0	100.0
Filter Depth	4	Gain	1.30	1.20	1.10	1.00	1.00	0.90	0.80	
Noise Threshold	1.2	Decay [deg/s]	100	120	150	180	200	230	260	
Clipping [deg]	+ 5.0	Thresholds [deg]	0.0	5.0	10.0	20.0	30.0	50.0	70.0	100.0
	- 5.0	Gain	0.70	0.80	0.90	1.00	1.10	1.20	1.30	
		Decay [deg/s]	100	100	110	120	130	140	150	

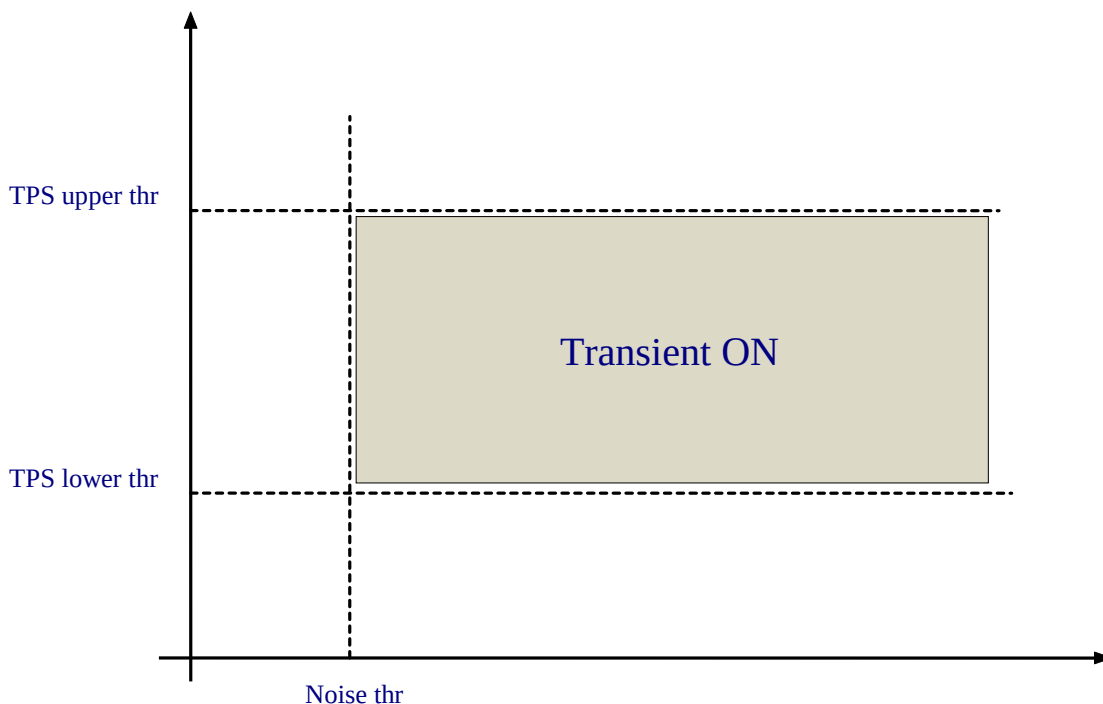
Coefficient by RPM		rpm	900	1150	1800	2700	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
Interpolate	KA+	1.000	1.000	0.950	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Interpolate	KA-	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000

Injection Transient		1 (lower)	2	3	4	5	6	7	8 (upper)
Time Base [ms]	5	Threshold [deg]	20.0	50.0	100.0	100.0	100.0	100.0	100.0
Filter Depth	4	Gain	1.00	0.70	0.70	0.70	0.70	0.70	0.60
Noise Threshold [deg]	10.0	Decay [deg/s]	70	70	100	100	100	150	150
Clipping [ms]	+ 2.000	Threshold [deg]	20.0	50.0	100.0	100.0	100.0	100.0	100.0
	- 2.000	Gain	0.50	0.50	0.50	0.50	0.50	0.50	0.00
		Decay [deg/s]	100	100	100	100	100	100	100

Injection Coefficient by RPM		rpm	9000	9500	10000	10500	11000	11500	11750	12000	12250	12500	12750	13000	13250	13500	13750	14000
Interpolate	KJ+	0.970	0.970	0.970	0.970	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Interpolate	KJ-	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000

Injection Coefficient by Water Temperature		[°C]	-10.0	-4.8	0.3	5.5	10.6	15.8	21.0	26.1	31.3	36.5	41.6	46.8	51.9	57.1	62.3	67.4
Interpolate	KJ+	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Interpolate	KJ-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Enable condition :



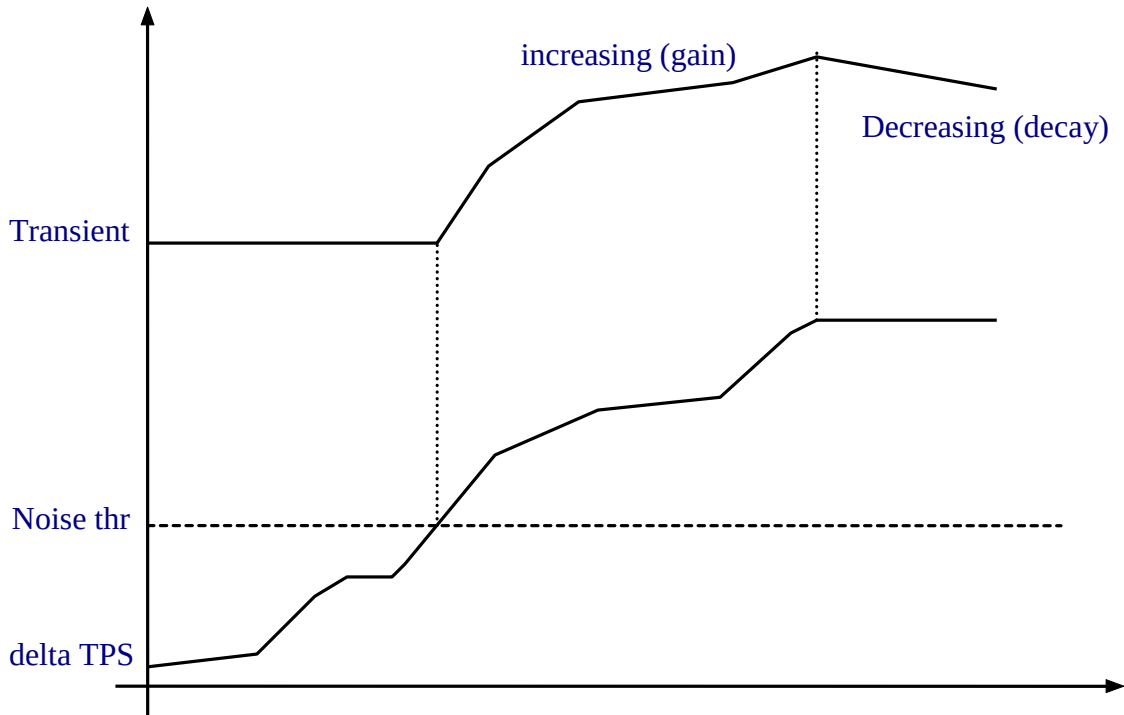
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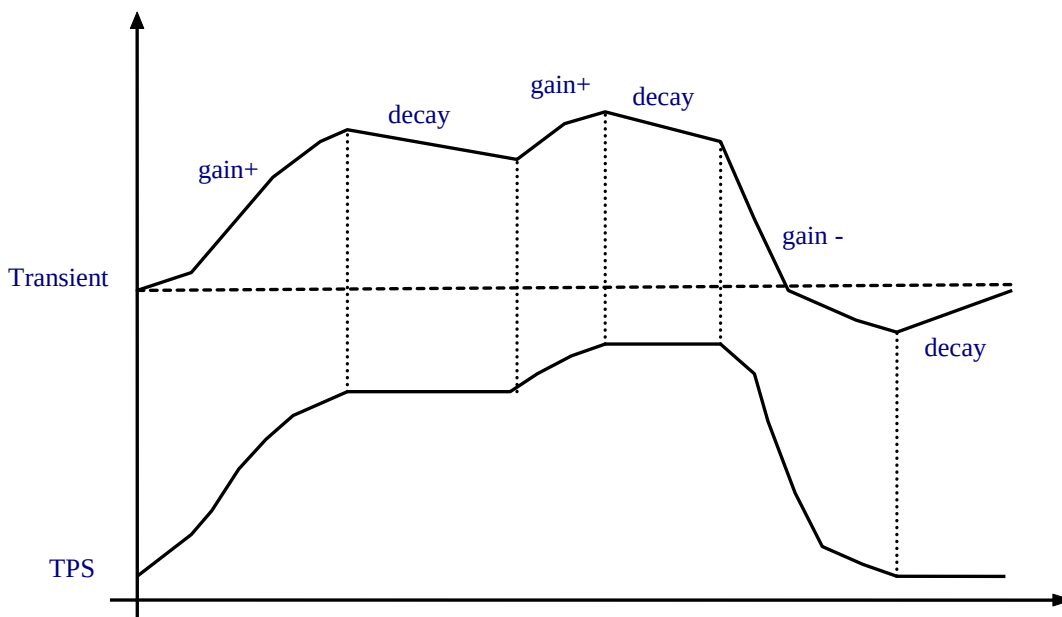

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General operation:

- If delta TPS is under noise threshold, transient is OFF or start to decreasing if a transient value was accumulate.



- If delta TPS is a positive value, transient is positive. If delta TPS is a negative value, transient is negative. If delta TPS is under noise threshold, transient is 0 or decreasing until 0 if a transient value was accumulate.



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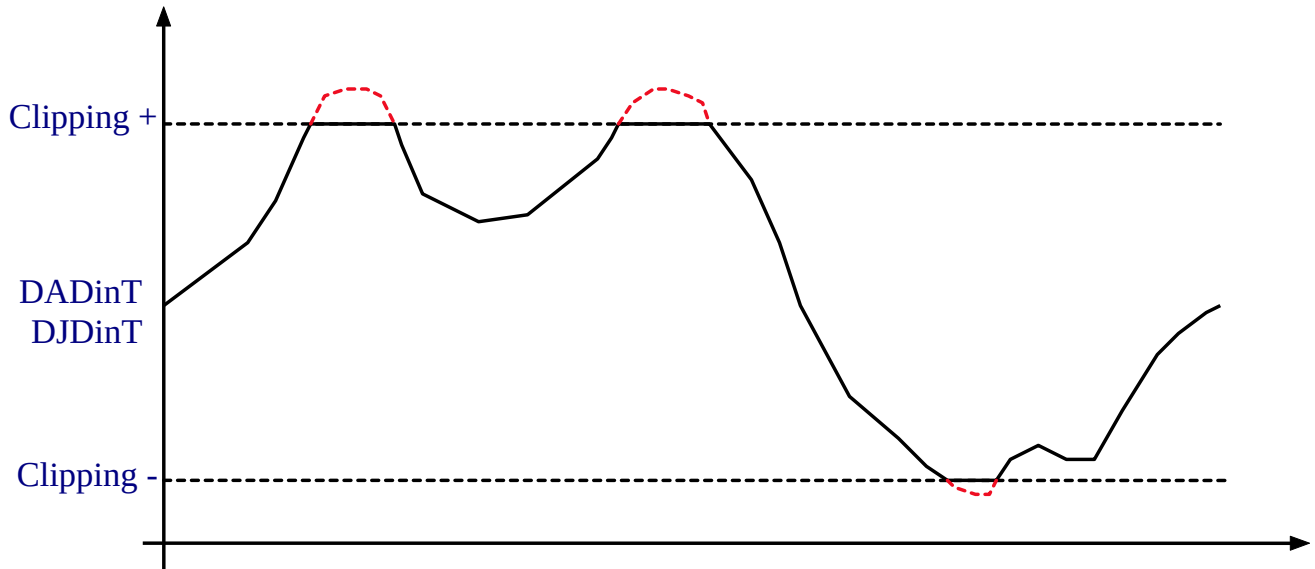
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- Final correction from transient value, can't be higher (lower) than clipping threshold. Transient is accumulated during clipping status.



- Correction from transient value can be positive or negative in function of the signs into coefficient correction table (1.000 means positive correction, -1.000 means negative correction). Transient value can have signs but into the calculation of the strategy is used like an unsigned value.

Detailed operation:

$$\text{Transient (T)} = \int (\Delta \text{TPS} * \text{GAIN})$$

$$T * K_{A/\pm \text{rpm}} = \text{DADinT}$$

$$T * K_{J/\pm \text{rpm}} = \text{DJDinTrpm}$$

$$T * K_{J/\pm \text{Th2o}} = \text{DJDinTth2o}$$

$$\text{DJDinTrpm} + \text{DJDinTth2o} = \text{DJDinT}$$

If $\Delta \text{TPS} \leq \text{noise threshold}$, $T = T - \text{decay}$

ΔTPS = is defined from the difference of TPS value with a sample of **Time Base** ms, for a number of sample definite with **Filter Depth**.

Gain+, decay+ and K+ are used if TPS is increasing

Gain-, decay- and K- are used if TPS is decreasing

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Software description:

Advance Transient		1 (lower)	2	3	4	5	6	7	8 (upper)								
Time Base [ms]	100	0.0	5.0	10.0	20.0	30.0	50.0	70.0	100.0								
Filter Depth	4																
Noise Threshold	1.2																
Clipping [deg]	+ 5.0 - 5.0																
		Threshholds [deg]	0.0	5.0	10.0	20.0	30.0	50.0	70.0	100.0							
		Gain	1.30	1.20	1.10	1.00	1.00	0.90	0.80								
		Decay [deg/s]	100	120	150	180	200	230	260								
		Threshholds [deg]	0.0	5.0	10.0	20.0	30.0	50.0	70.0	100.0							
		Gain	0.70	0.80	0.90	1.00	1.10	1.20	1.30								
		Decay [deg/s]	100	100	110	120	130	140	150								
Coefficient by RPM																	
Interpolate	[rpm]	900	1150	1800	2700	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
Interpolate	KA+	1.000	1.000	0.950	0.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Interpolate	KA-	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
Injection Transient																	
		Threshold [deg]	20.0	50.0	100.0	100.0	100.0	100.0	100.0	100.0							
Time Base [ms]	5	Gain	1.00	0.70	0.70	0.70	0.70	0.70	0.70	0.60							
Filter Depth	4	Decay [deg/s]	70	70	100	100	100	100	150	150							
Noise Threshold [deg]	10.0	Threshold [deg]	20.0	50.0	100.0	100.0	100.0	100.0	100.0	100.0							
Clipping [ms]	+ 2.000 - 2.000	Gain	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.00							
		Decay [deg/s]	100	100	100	100	100	100	100	100							
Injection Coefficient by RPM																	
Interpolate	[rpm]	9000	9500	10000	10500	11000	11500	11750	12000	12250	12500	12750	13000	13250	13500	13750	14000
Interpolate	KJ+	0.970	0.970	0.970	0.970	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Interpolate	KJ-	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
Injection Coefficient by Water Temperature																	
Interpolate	[°C]	-10.0	-4.8	0.3	5.5	10.6	15.8	21.0	26.1	31.3	36.5	41.6	46.8	51.9	57.1	62.3	67.4
Interpolate	KJ+	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Interpolate	KJ-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

The advance transient is defined by a series of parameters.

Time base Ms. – Time period over which the input change is considered.

Filter depth – Number of samples over which the filter is calculated.

Noise threshold – Value in throttle deg variation within which the transients are not considered. This is used to eliminate small fluctuations in throttle stability.

Clipping – Maximum (+) and Minimum (-) value in Degrees of spark advance that are permitted as a result of the transient strategy.

To enable differing transient values at different throttle values, 8 breakpoints for throttle may be defined in the upper row.

Within these throttle boundaries the rate of change of throttle is monitored as for previous settings and a positive **Gain** is applied to suit your needs. This output is known as the **Throttle Advance transient** and will be a value either Positive or Negative depending whether the throttle was opening or closing. For all of the Positive transient states the upper set of values will be applied.

Decay (deg/ms) – transient decay (decreases for positive values) allowed in a single time interval (as defined by the time base). This applies starting from the time the transients begins to decrease until it returns to 0. The effect is to limit the speed of the transient's decay (return to normal)

Similar settings are applied when the throttle is closing.

The throttle advance transient can be further modified by applying Gains as a function of different RPMs

DADInT as shown in this table below.

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Coefficient by RPM																		
Interpolate	[rpm]	1000	1500	2000	2500	3000	3500	4000	4250	4500	4750	5000	5250	5500	5750	6000	6250	
Interpolate	KA+	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Interpolate	KA-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

The KA+ is used to modify positive (increasing) throttle transients and the KA- is used to modify negative (reducing) throttle transients.

Injection transient

The Injection transient is defined by a series of parameters.

Time base Ms. – Time period over which the input change is considered.

Filter depth – Number of samples over which the filter is calculated.

Noise threshold – Value in throttle deg / mBar variation within which the transients are not considered. This is used to eliminate small fluctuations in throttle / Air pressure stability.

The choice of **mBar** or **Throttle** is defined with the Configuration page

Clipping – Maximum (+) and Minimum (-) value in mSec injector duration that are permitted as a result of the transient strategy.

To enable differing transient values at different throttle values / Air pressures, 8 breakpoints for may be defined in the upper row.

Within these boundaries the rate of change of Throttle / Air pressure is monitored as for previous settings and a positive **Gain** is applied to suit your needs. This output is known as the **Injection time transient** and will be a value either Positive or Negative depending whether the throttle was opening or closing. For all of the Positive transient states the upper set of values will be applied.

Decay (deg/ms) – transient decay (decreases for positive values) allowed in a single time interval (as defined by the Time Base). This applies starting from the time the transients begins to decrease until it returns to 0. The effect is to limit the speed of the transient's decay (return to normal)

Similar settings are applied when the throttle / Air pressure is reducing.

The injection time transient can be further modified by applying Gains as a function of different RPMs **DJDInTrpm** as shown in this table below.

Injection Coefficient by RPM																	
Interpolate	[rpm]	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
Interpolate	KJ+	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Interpolate	KJ-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Injection Coefficient by Water Temperature																	
Interpolate	[°C]	-10.0	-5.2	-0.3	4.5	9.4	14.2	19.0	23.9	28.7	33.5	38.4	43.2	48.1	52.9	57.7	62.6
Interpolate	KJ+	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Interpolate	KJ-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

It may also be adjusted by applying gains as a function of water temperature - **DJDInTth2o**

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