



CaerbonT Automotive Instruments

"The original makers of SMITHS instruments"

Instructions for 80mm & 100mm 12volt Smiths Programmable Tachometers

Caution

Disconnect the negative battery cable prior to any installation

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Products designed and manufactured under ISO 9001:2008 quality standard.

Installation Guide

For all programmable tachometers **except** SMITHS Flight, Prism and Motorsport types.

Application Notes

- For fitment to **negative earth** vehicles **only**.
- Operating voltage: 11 – 17volts DC
- Input signal:
 - Contact breaker ignition (coil)
 - ECU tachometer output
- Petrol Engines
 - Alternator (W terminal)
- Diesel Engines
 - Calibration switch 8 should always be in the 'on' position.

Caution Disconnect The Negative Battery Cable Prior To Any Installation

Harness connections		
Wire Colour	Pin No.	Connect to
Brown/slate	1	Pull up for open collector ECU output
Red/white	2	Illumination 12volt supply (side light feed)
Red/blue	3	Tacho output from ECU or contact breaker or alternator 'W' terminal
White/black	4	If your tacho fails to operate smoothly, the signal may be of a high sensitivity. Use the white/black wire instead of red/blue wire (above).
Black	5	Ground/Chassis or battery negative
Green	6	Switched ignition positive 12volt supply (via 3A fuse)

Calibration

The tachometer is calibrated/programmed by setting a combination of seven switches located under the grommet on the back case. Remove the grommet to access the switches.

Notes:

- The switch setting **must** be completed with the power off.
- Set the switches prior to installing the tachometer.

The table overleaf shows the switch settings relative to the number of pulses per engine revolution.

To assist with the switch setting, the table below shows the number of pulses per engine revolution versus the number of cylinders for both single spark and 'wasted' spark ignitions.

Petrol Engines Only

Number of Cylinders	PPR - Pulses per Revolution	
	Single Spark Ignition	Wasted Spark Ignition
1	0.5	1
2	1	2
3	1.5	3
4	2	4
6	3	6
8	4	8
10	5	10
12	6	12

Diesel Engines Only

Pulses per engine revolution (PPR) is equal to the number of alternator pole pairs multiplied by the crank to alternator pulley ratio.

PPR No.	Switch settings							PPR No.	Switch settings							PPR No.
	sw1	sw2	sw3	sw4	sw5	sw6	sw7		sw1	sw2	sw3	sw4	sw5	sw6	sw7	
21	0	0	0	0	0	0	1	12	0	0	0	1	1	0		
21.25	1	0	0	0	0	0	1	12.1	1	0	0	1	1	0		
21.5	0	1	0	0	0	0	1	12.2	0	1	0	1	1	0		
21.75	1	1	0	0	0	0	1	12.3	0	0	0	1	1	0		
22	0	0	1	0	0	0	1	12.4	0	0	1	1	1	0		
22.25	1	0	1	0	0	0	1	12.5	1	0	0	1	1	0		
22.5	0	1	1	0	0	0	1	12.6	0	1	0	1	1	0		
22.75	1	1	1	0	0	0	1	12.7	1	1	0	1	1	0		
23	0	0	0	1	0	0	1	12.8	0	0	1	1	1	0		
23.25	1	0	0	1	0	0	1	12.9	1	0	1	1	1	0		
23.5	0	1	0	1	0	0	1	13	0	1	0	1	1	0		
23.75	1	1	0	1	0	0	1	13.1	1	1	1	1	1	0		
24	0	0	1	1	0	0	1	13.2	0	0	1	1	1	0		
24.25	1	0	1	1	0	0	1	13.3	1	0	1	1	1	0		
24.5	0	1	1	1	0	0	1	13.4	0	1	1	1	1	0		
24.75	1	1	1	1	0	0	1	13.5	1	1	1	1	1	0		
25	0	0	0	0	1	0	1	13.6	0	0	0	0	0	1		
25.25	1	0	0	0	1	0	1	13.7	1	0	0	0	0	1		
25.5	0	1	0	0	1	0	1	13.8	0	1	0	0	0	1		
25.75	1	1	0	0	1	0	1	13.9	1	1	0	0	0	1		
26	0	0	1	0	1	0	1	14	0	0	0	0	0	1		
26.25	1	0	1	0	1	0	1	14.25	1	0	1	0	0	1		
26.5	0	1	1	0	1	0	1	14.5	0	1	0	0	0	1		
26.75	1	1	1	0	1	0	1	14.75	1	1	0	0	0	1		
27	0	0	0	1	1	0	1	15	0	0	0	0	0	1		
27.25	1	0	0	1	1	0	1	15.25	1	0	1	0	0	1		
27.5	0	1	0	1	1	0	1	15.5	0	1	0	0	0	1		
27.75	1	1	0	1	1	0	1	15.75	1	1	0	0	0	1		
28	0	0	1	1	1	0	1	16	0	0	1	0	0	1		
28.25	1	0	1	1	1	0	1	16.25	1	0	1	0	0	1		
28.5	0	1	1	1	1	0	1	16.5	0	1	1	0	0	1		
28.75	1	1	1	1	1	0	1	16.75	1	1	1	0	0	1		

Switch setting '1' signifies on
Switch setting '0' signifies off

Setting example:
Four cylinder, single spark engine
PPR is 2
From table, switch setting is:
Sw1 sw2 sw3 sw4 sw5 sw6 sw7
1 1 0 0 0 0 0
on on off off off off off

Note: Switch number 8 should always be in the 'on' position.

PPR No.	Switch settings							PPR No.	Switch settings							PPR No.
	sw1	sw2	sw3	sw4	sw5	sw6	sw7		sw1	sw2	sw3	sw4	sw5	sw6	sw7	
0.5	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0		
1	1	0	0	0	0	0	0	1	0	0	0	0	0	0		
1.5	0	1	0	0	0	0	0	1.5	0	1	0	0	0	0		
2	1	1	0	0	0	0	0	2	1	1	0	0	0	0		
3	0	0	1	0	0	0	0	3	0	0	1	0	0	0		
4	1	0	1	0	0	0	0	4	1	0	1	0	0	0		
5	0	1	1	0	0	0	0	5	0	1	1	0	0	0		
6	1	1	1	0	0	0	0	6	1	1	1	0	0	0		
8	0	0	0	1	0	0	0	8	0	0	0	1	0	0		
8.1	1	0	0	1	0	0	0	8.1	1	0	0	1	0	0		
8.2	0	1	0	1	0	0	0	8.2	0	1	0	1	0	0		
8.3	1	1	0	1	0	0	0	8.3	1	1	0	1	0	0		
8.4	0	0	1	1	0	0	0	8.4	0	0	1	1	0	0		
8.5	1	0	1	1	0	0	0	8.5	1	0	1	1	0	0		
8.6	0	1	1	1	0	0	0	8.6	0	1	1	1	0	0		
8.7	1	1	1	1	0	0	0	8.7	1	1	1	1	0	0		
8.8	0	0	0	0	1	0	0	8.8	0	0	0	0	1	0		
8.9	1	0	0	0	1	0	0	8.9	1	0	0	0	1	0		
9	0	1	0	0	1	0	0	9	0	1	0	0	1	0		
9.1	1	1	0	0	1	0	0	9.1	1	1	0	0	1	0		
9.2	0	0	1	0	1	0	0	9.2	0	0	1	0	1	0		
9.3	1	0	1	0	1	0	0	9.3	1	0	1	0	1	0		
9.4	0	1	1	0	1	0	0	9.4	0	1	1	0	1	0		
9.5	1	1	1	0	1	0	0	9.5	1	1	1	0	1	0		
9.6	0	0	0	1	1	0	0	9.6	0	0	0	1	1	0		
9.7	1	0	0	1	1	0	0	9.7	1	0	0	1	1	0		
9.8	0	1	0	1	1	0	0	9.8	0	1	0	1	1	0		
9.9	1	1	0	1	1	0	0	9.9	1	1	0	1	1	0		
10	0	0	1	1	1	0	0	10	0	0	1	1	1	0		
10.1	1	0	1	1	1	0	0	10.1	1	0	1	1	1	0		
10.2	0	1	1	1	1	0	0	10.2	0	1	1	1	1	0		
10.3	1	1	1	1	1	0	0	10.3	1	1	1	1	1	0		
10.4	0	0	0	0	0	1	0	10.4	0	0	0	0	0	1		
10.5	1	0	0	0	0	1	0	10.5	1	0	0	0	0	1		
10.6	0	1	0	0	0	1	0	10.6	0	1	0	0	0	1		
10.7	1	1	0	0	0	1	0	10.7	1	1	0	0	0	1		
10.8	0	0	1	0	0	1	0	10.8	0	0	1	0	0	1		
10.9	1	0	1	0	0	1	0	10.9	1	0	1	0	0	1		
11	0	1	1	0	0	1	0	11	0	1	1	0	0	1		
11.1	1	1	1	0	0	1	0	11.1	1	1	1	0	0	1		
11.2	0	0	0	1	0	1	0	11.2	0	0	0	1	0	1		
11.3	1	0	0	1	0	1	0	11.3	1	0	0	1	0	1		
11.4	0	1	0	1	0	1	0	11.4	0	1	0	1	0	1		
11.5	1	1	0	1	0	1	0	11.5	1	1	0	1	0	1		
11.6	0	0	1	1	0	1	0	11.6	0	0	1	1	0	1		
11.7	1	0	1	1	0	1	0	11.7	1	0	1	1	0	1		
11.8	0	1	1	1	0	1	0	11.8	0	1	1	1	0	1		
11.9	1	1	1	1	0	1	0	11.9	1	1	1	1	0	1		