



"Produced by the original makers of
SMITHS Instruments"

Instructions for Programmable Tachometers

For Petrol *and* Diesel Engines

Independently tested and approved to 95/54/EC

Designed and manufactured under ISO9001:2000
quality standard

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Installation Guide

For all programmable tachometers **except** Recall & Shift types.

Application Notes

- For fitment to **negative earth** vehicles **only**.
- Operating voltage: 11 – 17volts DC
- Input signal:
 - Petrol Engines
 - Contact breaker ignition (coil)
 - ECU tachometer output
 - Diesel Engines
 - Alternator (W terminal)
- 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 red/blue wire instead of white/black (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

PPR - Pulses per Revolution

Number of Cylinders	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.

Switch settings							PPR No.	1	1	1	1	0	1	0	11.9
sw1	sw2	sw3	sw4	sw5	sw6	sw7		Switch settings							PPR No.
								sw1	sw2	sw3	sw4	sw5	sw6	sw7	
0	0	0	0	0	0	0	0.5								
1	0	0	0	0	0	0	1	0	0	0	0	1	1	0	12
0	1	0	0	0	0	0	1.5	1	0	0	0	1	1	0	12.1
1	1	0	0	0	0	0	2	0	1	0	0	1	1	0	12.2
0	0	1	0	0	0	0	3	1	1	0	0	1	1	0	12.3
1	0	1	0	0	0	0	4	0	0	1	0	1	1	0	12.4
0	1	1	0	0	0	0	5	1	0	1	0	1	1	0	12.5
1	1	1	0	0	0	0	6	0	1	1	0	1	1	0	12.6
0	0	0	1	0	0	0	8	1	1	1	0	1	1	0	12.7
1	0	0	1	0	0	0	8.1	0	0	0	1	1	1	0	12.8
0	1	0	1	0	0	0	8.2	1	0	0	1	1	1	0	12.9
1	1	0	1	0	0	0	8.3	0	1	0	1	1	1	0	13
0	0	1	1	0	0	0	8.4	1	1	0	1	1	1	0	13.1
1	0	1	1	0	0	0	8.5	0	0	1	1	1	1	0	13.2
0	1	1	1	0	0	0	8.6	1	0	1	1	1	1	0	13.3
1	1	1	1	0	0	0	8.7	0	1	1	1	1	1	0	13.4
0	0	0	0	1	0	0	8.8	1	1	1	1	1	1	0	13.5
1	0	0	0	1	0	0	8.9	0	0	0	0	0	0	1	13.6
0	1	0	0	1	0	0	9	1	0	0	0	0	0	1	13.7
1	1	0	0	1	0	0	9.1	0	1	0	0	0	0	1	13.8
0	0	1	0	1	0	0	9.2	1	1	0	0	0	0	1	13.9
1	0	1	0	1	0	0	9.3	0	0	1	0	0	0	1	14
0	1	1	0	1	0	0	9.4	1	0	1	0	0	0	1	14.25
1	1	1	0	1	0	0	9.5	0	1	1	0	0	0	1	14.5
0	0	0	1	1	0	0	9.6	1	1	1	0	0	0	1	14.75
1	0	0	1	1	0	0	9.7	0	0	0	1	0	0	1	15
0	1	0	1	1	0	0	9.8	1	0	0	1	0	0	1	15.25
1	1	0	1	1	0	0	9.9	0	1	0	1	0	0	1	15.5
0	0	1	1	1	0	0	10	1	1	0	1	0	0	1	15.75
1	0	1	1	1	0	0	10.1	0	0	1	1	0	0	1	16
0	1	1	1	1	0	0	10.2	1	0	1	1	0	0	1	16.25
1	1	1	1	1	0	0	10.3	0	1	1	1	0	0	1	16.5
0	0	0	0	0	1	0	10.4	1	1	1	1	0	0	1	16.75
1	0	0	0	0	1	0	10.5	0	0	0	0	1	0	1	17
0	1	0	0	0	1	0	10.6	1	0	0	0	1	0	1	17.25
1	1	0	0	0	1	0	10.7	0	1	0	0	1	0	1	17.5
0	0	1	0	0	1	0	10.8	1	1	0	0	1	0	1	17.75
1	0	1	0	0	1	0	10.9	0	0	1	0	1	0	1	18
0	1	1	0	0	1	0	11	1	0	1	0	1	0	1	18.25
1	1	1	0	0	1	0	11.1	0	1	1	0	1	0	1	18.5
0	0	0	1	0	1	0	11.2	1	1	1	0	1	0	1	18.75
1	0	0	1	0	1	0	11.3	0	0	0	1	1	0	1	19
0	1	0	1	0	1	0	11.4	1	0	0	1	1	0	1	19.25
1	1	0	1	0	1	0	11.5	0	1	0	1	1	0	1	19.5
0	0	1	1	0	1	0	11.6	1	1	0	1	1	0	1	19.75
1	0	1	1	0	1	0	11.7	0	0	1	1	1	0	1	20
0	1	1	1	0	1	0	11.8	1	0	1	1	1	0	1	20.25

0	1	1	1	1	0	1	20.5
1	1	1	1	1	0	1	20.75
Switch settings							PPR No.
sw1	sw2	sw3	sw4	sw5	sw6	sw7	
0	0	0	0	0	1	1	21
1	0	0	0	0	1	1	21.25
0	1	0	0	0	1	1	21.5
1	1	0	0	0	1	1	21.75
0	0	1	0	0	1	1	22
1	0	1	0	0	1	1	22.25
0	1	1	0	0	1	1	22.5
1	1	1	0	0	1	1	22.75
0	0	0	1	0	1	1	23
1	0	0	1	0	1	1	23.25
0	1	0	1	0	1	1	23.5
1	1	0	1	0	1	1	23.75
0	0	1	1	0	1	1	24
1	0	1	1	0	1	1	24.25
0	1	1	1	0	1	1	24.5
1	1	1	1	0	1	1	24.75
0	0	0	0	1	1	1	25
1	0	0	0	1	1	1	25.25
0	1	0	0	1	1	1	25.5
1	1	0	0	1	1	1	25.75
0	0	1	0	1	1	1	26
1	0	1	0	1	1	1	26.25
0	1	1	0	1	1	1	26.5
1	1	1	0	1	1	1	26.75
0	0	0	1	1	1	1	27
1	0	0	1	1	1	1	27.25
0	1	0	1	1	1	1	27.5
1	1	0	1	1	1	1	27.75
0	0	1	1	1	1	1	28
1	0	1	1	1	1	1	28.25
0	1	1	1	1	1	1	28.5
1	1	1	1	1	1	1	28.75

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.