



**ISSPRO 5" Programmable Tachometer**  
 Microprocessor Aircore Version

**General Information:**

Operating Voltage: 11-16VDC (24 VDC versions available)  
 Input Signal: Gear tooth sensor, AC generator, alternator tap  
 Programmable Range: 1-255 pulses per engine revolution (gear teeth, magnets, etc.)  
 Transient Protection: +100 V, -400 V  
 Reverse Voltage Protected  
 Hourmeter (optional) operates only when engine runs

**Calibration:**

Remove the calibration switch cover. Each of the first eight switches has a different value as shown in the table on the right. Add the switch values to equal the number of pulses per engine revolution. These switches will be set "on" (up.) All others will be off.

Switch #	Value
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128
9	Off
10	Off

**Important:** Switches 9 and 10 are always off.

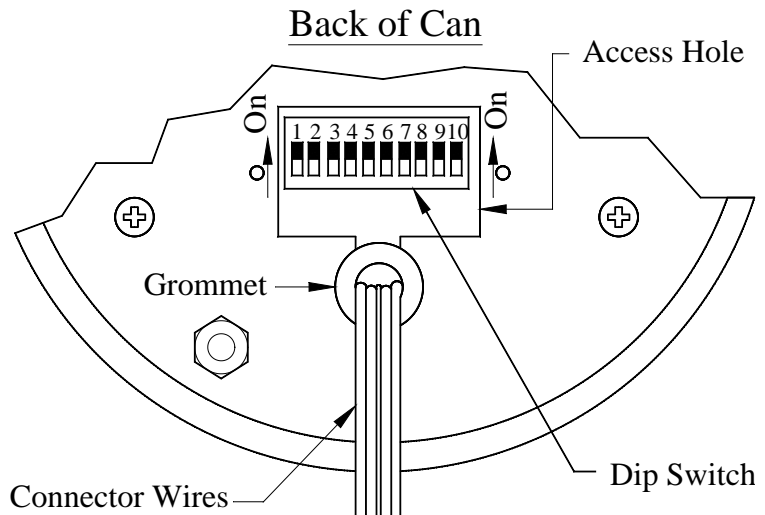
**Note:** Power must be cycled when changing switch settings. If power is left "On", changing the switch will have no effect on calibration until power is interrupted.

**Example:** Find switch numbers by subtracting the switch value from the remaining number. Always use the largest value that can be subtracted from the remainder of each successive step. For gear with 103 teeth:

	Sw Value	=	New Remainder	Sw.#
Start	103-64	=	39	#7
Remainder	39-32	=	7	#6
Remainder	7-4	=	3	#3
Remainder	3-2	=	1	#2
Remainder	1-1	=	0	#1

Or use the calibration chart provide on pages 3 and 4.

**Signal Generator (Sender unit):** Generator is installed on tachometer cable drive of engine:



$$\#Pulses/Rev = (\# \text{ sender pulses/turn}) \times (\text{ratio of takeoff rpm to engine rpm})$$

If the number of pulses per revolution (from equation) is not a whole number the tach will not be accurate. In this case, select a generator so that this number is non-fractional.

Example: # sender pulses per turn = 15, takeoff ratio = 0.5:1 (i.e. cam drive);  
 # Pulses / Rev = 15 X 0.5 = 7.5. This will result in an error in the tachometer reading. Select a sender with an even number of pulses per turn (e.g. ISSPRO R8970). The # pulses per revolution will then be a whole number, in this case 15.

**FREQUENTLY USED SENDERS****#PULSES PER TURN**

DATCON 4-D-C 71267	8
DIXSON SG201A, SG201A1, SG202	2
ENGLER 870-0588	15
ISSPRO R8970, R8940	30
KIENZLE-ARGO 8-161-237008	8
MOTOROLA 4-100 (7SG100), 4-111 (7SG100B)	30
ROCKWELL 240R02-001	30
SUN Model CP7643	6
SYNCHRO-START Minigen	30
TELEFLEX 9604276	8
VDO (Old Style Engler) ISSPRO 300092	4
ZEMCO 4710	8
ZEMCO 6314	5

**Alternator Tap Input:** If a tap from the alternator has been provided, it can be used to provide the input signal.

$$\# \text{ Pulses / Rev} = \frac{\# \text{ Poles of Alternator}}{2} \times \frac{\text{Dia. of crank Pulley}}{\text{Dia. of alternator pulley}}$$

**# Pulses Per Engine Rev Not Known:** Switches #9 and #10 are to remain OFF at all times. Run the engine at a constant speed with an assistant monitoring RPM with a phototach. Start with only switch #8 ON. If the tach reads LOW, turn OFF switch #8 and turn ON switch #7. If the tach still reads LOW, turn OFF switch #7 and turn ON switch #6. If the tach reads HIGH, leave that switch ON and go to the next lower switch. Repeat the sequence for all remaining switches. (Note: Power must be cycled for different switch setting to be recognized.)

**Installation:** Mount the tachometer in the dash panel and connect the wires as described below.

Red - Connect to ignition switched power source.

Black- Connect to ground.

White- Connect to signal (+).

Green- Connect to signal ground.

Installation Hints:

- 1.) When power is applied, the needle should go to mid scale, then to the zero position. If it does not, there may be a bad connection in the "Hot" (red wire) or ground wire circuit. Check power to the meter by measuring with a voltmeter at the plug (meter leads on the pins that attach to the red and black wires.) If there is power at the plug, the problem is in the gauge.
- 2.) Low voltage can cause an inaccurate reading. If inaccuracy is suspected, measure voltage with the vehicle operating and meter connected. This can be done by connecting a voltmeter to a power source (i.e. fuse block, etc.) and/or by piercing the red and black wire insulation with the meter leads.
- 3.) If tach reads zero, then "jumps" to normal reading after increasing RPM, adjust the sensor closer to gear to increase signal strength (generators cannot be adjusted).

**5" MPU Tachometers**  
**Switch Settings for Pulses Per Revolution**  
 (Note: Switches 9 & 10 must be "off.")

Pulses Per Rev	Switches Set "ON"							
	1	2	3	4	5	6	7	8
1	X							
2		X						
3	X	X						
4			X					
5	X	X	X					
6		X	X					
7	X	X	X					
8				X				
9	X			X				
10		X		X				
11	X	X		X				
12			X	X				
13	X		X	X				
14		X	X	X				
15	X	X	X	X				
16					X			
17	X				X			
18		X			X			
19	X	X			X			
20			X		X			
21	X		X		X			
22		X	X		X			
23	X	X	X		X			
24				X	X			
25	X			X	X			
26		X		X	X			
27	X	X		X	X			
28			X	X	X			
29	X		X	X	X			
30		X	X	X	X			
31	X	X	X	X	X			
32						X		
33	X					X		
34		X				X		
35	X	X				X		
36			X			X		
37	X		X			X		
38		X	X			X		
39	X	X	X			X		
40				X		X		
41	X			X		X		
42		X		X		X		
43	X	X		X		X		
44			X	X		X		
45	X		X	X		X		
46		X	X	X		X		
47	X	X	X	X		X		
48					X	X		
49	X				X	X		
50		X			X	X		
51	X	X			X	X		
52			X		X	X		
53	X		X		X	X		
54		X	X		X	X		
55	X	X	X		X	X		
56				X	X	X		
57	X			X	X	X		
58		X		X	X	X		
59	X	X		X	X	X		
60			X	X	X	X		
61	X		X	X	X	X		
62		X	X	X	X	X		
63	X	X	X	X	X	X		
64							X	

Pulses Per Rev	Switches Set "ON"							
	1	2	3	4	5	6	7	8
65	X						X	
66		X					X	
67	X	X					X	
68			X				X	
69	X		X				X	
70		X	X				X	
71	X	X	X				X	
72				X			X	
79	X			X			X	
74		X		X			X	
75	X	X		X			X	
76			X	X			X	
77	X		X	X			X	
78		X	X	X			X	
79	X	X	X	X			X	
80					X		X	
81	X				X		X	
82		X			X		X	
83	X	X			X		X	
84			X		X		X	
85	X		X		X		X	
86		X	X		X		X	
87	X	X	X		X		X	
88				X	X		X	
89	X			X	X		X	
90		X		X	X		X	
91	X	X		X	X		X	
92			X	X	X		X	
93	X		X	X	X		X	
94		X	X	X	X		X	
95	X	X	X	X	X		X	
96						X	X	
97	X					X	X	
98		X				X	X	
99	X	X				X	X	
100			X			X	X	
101	X		X			X	X	
102		X	X			X	X	
103	X	X	X			X	X	
104				X		X	X	
105	X			X		X	X	
106		X		X		X	X	
107	X	X		X		X	X	
108			X	X		X	X	
109	X		X	X		X	X	
110		X	X	X		X	X	
111	X	X	X	X		X	X	
112					X	X	X	
113	X				X	X	X	
114		X			X	X	X	
115	X	X			X	X	X	
116			X		X	X	X	
117	X		X		X	X	X	
118		X	X		X	X	X	
119	X	X	X		X	X	X	
120				X	X	X	X	
121	X			X	X	X	X	
122		X		X	X	X	X	
123	X	X		X	X	X	X	
124			X	X	X	X	X	
125	X		X	X	X	X	X	
126		X	X	X	X	X	X	
127	X	X	X	X	X	X	X	X
128								

Pulses Per Rev	Switches Set "ON"							
	1	2	3	4	5	6	7	8
129	X							X
130		X						X
131	X	X						X
132			X					X
133	X		X					X
134		X	X					X
135	X	X	X					X
136				X				X
137	X			X				X
138		X		X				X
139	X	X		X				X
140			X	X				X
141	X		X	X				X
142		X	X	X				X
143	X	X	X	X				X
144					X			X
145	X				X			X
146		X			X			X
147	X	X			X			X
148			X		X			X
149	X		X		X			X
150		X	X		X			X
151	X	X	X		X			X
152				X	X			X
153	X			X	X			X
154		X		X	X			X
155	X	X		X	X			X
156			X	X	X			X
157	X		X	X	X			X
158		X	X	X	X			X
159	X	X	X	X	X			X
160						X		X
161	X					X		X
162		X				X		X
163	X	X				X		X
164			X			X		X
165	X		X			X		X
166		X	X			X		X
167	X	X	X			X		X
168				X		X		X
169	X			X		X		X
170		X		X		X		X
171	X	X		X		X		X
172			X	X		X		X
173	X		X	X		X		X
174		X	X	X		X		X
175	X	X	X	X		X		X
176					X	X		X
177	X				X	X		X
178		X			X	X		X
179	X	X			X	X		X
180			X		X	X		X
181	X		X		X	X		X
182		X	X		X	X		X
183	X	X	X		X	X		X
184				X	X	X		X
185	X			X	X	X		X
186		X		X	X	X		X
187	X	X		X	X	X		X
188			X	X	X	X		X
189	X		X	X	X	X		X
190		X	X	X	X	X		X
191	X	X	X	X	X	X		X
192							X	X

**5" MPU Tachometers**  
**Switch Settings for Pulses Per Revolution**  
 (Note: Switches 9 & 10 must be "off.")

Pulses Per Rev	Switches Set "ON"								Pulses Per Rev	Switches Set "ON"								Pulses Per Rev	Switches Set "ON"							
	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8
193	X						X	X	217	X			X	X		X	X	241	X				X	X	X	X
194		X					X	X	218		X		X	X		X	X	242		X			X	X	X	X
195	X	X					X	X	219	X	X		X	X		X	X	243	X	X			X	X	X	X
196			X				X	X	220			X	X	X		X	X	244			X		X	X	X	X
197	X		X				X	X	221	X		X	X	X		X	X	245	X		X		X	X	X	X
198		X	X				X	X	222		X	X	X	X		X	X	246		X	X		X	X	X	X
199	X	X	X				X	X	223	X	X	X	X	X		X	X	247	X	X	X		X	X	X	X
200				X			X	X	224					X		X	X	248			X		X	X	X	X
201	X			X			X	X	225	X				X	X	X	249	X			X	X	X	X	X	
202		X		X			X	X	226		X			X	X	X	250		X		X	X	X	X	X	
203	X	X		X			X	X	227	X	X			X	X	X	251	X	X		X	X	X	X	X	
204			X	X			X	X	228			X		X	X	X	252			X		X	X	X	X	
205	X		X	X			X	X	229	X		X		X	X	X	253	X		X		X	X	X	X	
206		X	X	X			X	X	230		X	X		X	X	X	254		X	X		X	X	X	X	
207	X	X	X	X			X	X	231	X	X	X		X	X	X	255	X	X	X		X	X	X	X	
208					X		X	X	232			X		X	X	X										
209	X				X		X	X	233	X			X		X	X	X									
210		X			X		X	X	234		X		X		X	X	X									
211	X	X			X		X	X	235	X	X		X		X	X	X									
212			X		X		X	X	236			X	X		X	X	X									
213	X		X		X		X	X	237	X		X	X		X	X	X									
214		X	X		X		X	X	238		X	X	X		X	X	X									
215	X	X	X		X		X	X	239	X	X	X	X		X	X	X									
216			X		X		X	X	240			X	X		X	X	X									

**Common Applications**

The following table may be useful in calibrating the ISSPRO programmable tachometers in some ring gear sensing installations. This information is believed to be accurate, however, exceptions will occur and it is always best to verify the number of gear teeth when in doubt.

	<u>Engine</u>	<u># Ring Gear Teeth</u>	<u>Switches Set "On"</u>
<b>Cummins</b>	L10	103	1,2,3,6,7
	475, K6	118	2,3,5,6,7
	*NTC, Formula (855 series)	103	1,2,3,6,7
*Some models of cab over Freightliners use SAE #1 flywheels and have 118 ring gear teeth.			
<b>CAT:</b>	3208	134	2,3,8
	3306	156	3,4,5,8
	3406, 3408	113	1,5,6,7
<b>DDA-Detroit:</b>	8V71, 8V92, 6-71, 12-71, 6V-92	118	2,3,5,6,7
	4-53	138	2,4,8
<b>Mack:</b>	All (Domestic)	118	2,3,5,6,7
<b>GM:</b>	8.2 liter – SAE #2 flywheel (4 3/4" bolt centers on flywheel housing)	138	2,4,8
	8.2 liter – SAE #3 flywheel (4 3/8" bolt centers on flywheel housing)	126	2,3,4,5,6,7