ISSPRO 3 3/8" PROGRAMMABLE TACHOMETER
Microprocessor Version

GENERAL INFORMATION:

Operating Voltage: 11 - 30 VDC: NOTE - Instrument comes equipped with a 12V lamp. Replace lamp with one of proper voltage when installing instrument on 24V systems. 24V Lamp Part # is GE-656

Input: 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 PROCEDURE:

Remove the hole plug by pressing above the center enough to allow a small coin, screwdriver, etc., to be inserted in the slot behind the upper edge. Twist to remove.

Each of the eight switches has a different value as shown in the table at the right. Add the switch values to equal the number of pulses per engine revolution. These switches will be set "on". All others will be off. **NOTE**: The switch setting must be done with the power "OFF". If power is left "ON", changing the switch setting will have no effect on calibration until the 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 for each successive step. For example, set the following switches "on" for a gear with 103 teeth:

Rear View of Tachometer

			Switch Value		New Remainder	Switch Number
Start:	103	-	64	=	39	#7
Remainder of:	39	-	32	=	7	#6
Remainder of:	7	-	4	=	3	#3
Remainder of:	3	-	2	=	1	#2
Remainder of:	1	-	1	=	0	#1
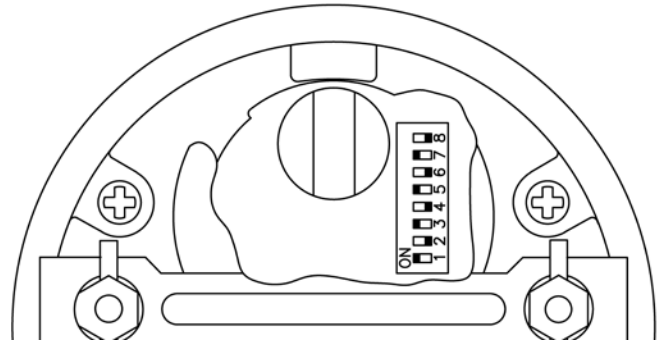
Switch		Value
#1	=	1
#2	=	2
#3	=	4
#4	=	8
#5	=	16
#6	=	32
#7	=	64
#8	=	128

Or use the calibration chart provided (pages 3 and 4)

IMPORTANT! **When changing switch settings on an installed tach, the power to the unit must be cycled either by turning the ignition switch off and then back on, *OR* by momentarily disconnecting the "hot" (red) wire.**

SIGNAL GENERATOR (Sender Unit): Generator is installed on tachometer cable drive of engine: NUMBER OF PULSES PER REV = (Number of sender pulses per turn) X (Ratio of take off RPM to engine RPM). **NOTE:** 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: The number of sender pulses per turn is 15, and the take off ratio is 0.5 to 1 (.e. cam drive).

Number of Pulses per 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 number of pulses per revolution will then be a whole number, in this case, 15.

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

ALTERNATOR TAP INPUT: If a tap from the alternator has been provided, it can be used to provide the input signal.

$$\text{\# PULSES PER REV} = \frac{\text{Number of Poles on Alternator}}{2} \times \frac{\text{Diameter of Crank Pulley}}{\text{Diameter of Alternator Pulley}}$$

INSTALLATION: Mount the tachometer in the dash panel and connect the wires as described below:

**Make all of your connections to the Black plug supplied and then
plug it in to the tachometer's white connector.**

Magnetic Sensor & signal Generator Applications		Alternator Tap Application
Connect to ignition switched power source	← Red →	Connect to ignition switched power source
Connect to ground along with one of the sensor wires	← Black →	Connect to ground
Connect to other sensor wire	← White →	Connect to alternator tap
Connect to dash lamp power	← Green →	Connect to dash lamp power
Optional – see note 5	← Violet →	Optional – see note 5

INSTALLATION HINTS:

1) Magnetic sensors only: Bring both sensor wires back to the connector. Don't connect the sensor ground wire to a point which is physically different from the tachometer ground.

2) When power is applies, 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 in the 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.

3) Low voltage (below 10.5 volts) will cause an inaccurate reading. Determine accuracy by comparing the reading with a phototach. If a problem exists, measure voltage with 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 connecting the voltmeter leads to the red and black wires where they enter the tach's white connector.

4) Magnetic sensors only: If the tach reads zero, then "jumps" to a normal reading after a repeatable RPM, adjust the sensor so that it is closer to the gear (generators cannot be adjusted).

5) If the tach operates erratically, disconnect signal wire from the white input wire and connect it to the violet input wire. The violet input has additional electrical noise filtering.

Common Applications Microprocessor Tachometer Calibration

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.

	ENGINE	# RING GEAR TEETH	SWITCHES SET "ON"
CUMMINS:	L10	103	1,2,3,6,7
	475, K6	118	2,3,5,6,7
	*NTC. FORMULAS (855 series)	103	1,2,3,6,7
	*Some models of cabover Freightliners use SAE #1 flywheels and have 118 ring gear teeth.		
CAT:	3208	134	2,3,8
	3306	156	3,4,5,8
	3406, 3408	113	1,5,6,7
DDA-DETROIT:	8V71, 8V92, 6-71, 12-71, 6V-92	118	2,3,5,6,7
	4-53	138	2,4,8
MACK:	ALL (domestic)	118	2,3,5,6,7
GM:	8.2 liter – SAE #2 flywheel	138	2,4,8
	(4 ¾" bolt centers on flywheel housing)		
	8.2 liter – SAE #3 flywheel	126	2,3,4,5,6,7
	(4 ⅜" bolt centers on flywheel housing)		

3 3/8" MICROPROCESSOR TACHOMETERS
SWITCH SETTINGS TO PULSES PER REVOLUTION

SWITCHES SET "ON"

Pulse per rev	1	2	3	4	5	6	7	8
1	X							
2		X						
3	X	X						
4			X					
5	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		

SWITCHES SET "ON"

Pulse per rev	1	2	3	4	5	6	7	8
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	
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	
73	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	

SWITCHES SET "ON"

Pulse per rev	1	2	3	4	5	6	7	8
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	
128								X
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

3 3/8" MICROPROCESSOR TACHOMETERS
SWITCH SETTINGS TO PULSES PER REVOLUTION

SWITCHES SET "ON"

Pulse per rev	1	2	3	4	5	6	7	8
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

SWITCHES SET "ON"

Pulse per rev	1	2	3	4	5	6	7	8
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
193	X						X	X
194		X					X	X
195	X	X					X	X
196			X				X	X
197	X		X				X	X
198		X	X				X	X
199	X	X	X				X	X
200				X			X	X
201	X			X			X	X
202		X		X			X	X
203	X	X		X			X	X
204			X	X			X	X
205	X		X	X			X	X
206		X	X	X			X	X
207	X	X	X	X			X	X
208					X		X	X
209	X				X		X	X
210		X			X		X	X
211	X	X			X		X	X
212			X		X		X	X
213	X		X		X		X	X
214		X	X		X		X	X
215	X	X	X		X		X	X
216				X	X		X	X
217	X			X	X		X	X
218		X		X	X		X	X
219	X	X		X	X		X	X
220			X	X	X		X	X
221	X		X	X	X		X	X
222		X	X	X	X		X	X
223	X	X	X	X	X		X	X
224						X	X	X

SWITCHES SET "ON"

Pulse per rev	1	2	3	4	5	6	7	8
225	X					X	X	X
226		X				X	X	X
227	X	X				X	X	X
228			X			X	X	X
229	X		X			X	X	X
230		X	X			X	X	X
231	X	X	X			X	X	X
232				X		X	X	X
233	X			X		X	X	X
234		X		X		X	X	X
235	X	X		X		X	X	X
236			X	X		X	X	X
237	X		X	X		X	X	X
238		X	X	X		X	X	X
239	X	X	X	X		X	X	X
240					X	X	X	X
241	X				X	X	X	X
242		X			X	X	X	X
243	X	X			X	X	X	X
244			X		X	X	X	X
245	X		X		X	X	X	X
246		X	X		X	X	X	X
247	X	X	X		X	X	X	X
248				X	X	X	X	X
249	X			X	X	X	X	X
250		X		X	X	X	X	X
251	X	X		X	X	X	X	X
252			X	X	X	X	X	X
253	X		X	X	X	X	X	X
254		X	X	X	X	X	X	X
255	X	X	X	X	X	X	X	X