

**ISSPRO 3 3/8" Programmable Tachometer
High Performance EV Line
Part Numbers R5535M, R6535M**

General Information:*Operating Voltage:*

11-30VDC (12V or 24V system configurable): NOTE-Instrument comes equipped with 12 volt lamps. Replace lamps with ones of proper voltage when installing instrument into 24V system (Typical 24V bulb P/N GE-656).

Input Signal:

Magnetic Gear tooth sensor, AC generator, Alternator tap, 5 volt signal from computer.

Programming Range:

1 TO 280 Pulses per engine revolution (gear teeth, magnets, etc.).

Transient Protection:

Conforms to SAE J1399 specifications for steady state and electrical transient testing.

This part is reverse polarity protected.

Calibration:

The tachometer is configured by setting a 10 position dip-switch to the calibration number. The switch is located under a plate on the rear of the unit and is accessible by removing two screws.

Note: Power must be cycled OFF to ON before the tachometer will accept a change in calibration.

Calibration Number:

Calibration number is the number of pulses per engine revolution from the alternator, magnetic sensor or signal generator.

Alternator Input:

The tachometer is connected to the "W" terminal (stator tap) on the alternator. Note that some alternators may use "S" or "T" to indicate the tachometer tap. Some alternators do not have a connection to the stator to give a tachometer output. These alternator types must be modified or replaced for use with this tachometer.

Calibration number for an alternator application is:

$$\text{Calibration number} = \frac{\# \text{ Poles of Alternator} \times \text{Dia. of crank pulley}}{2 \text{ Dia. of alternator pulley}}$$

Note: The poles of an alternator are the metal fingers around the rotating field winding in the center of the alternator.

Magnetic Sensor Input:

(Variable Reluctance type)

These sensors give a voltage pulse whenever a gear tooth is detected. If a flywheel is used, the calibration number is number of teeth on the flywheel. If a different gear is used, it is important to know how fast the gear rotates in relation to the engine. If the gear runs half the speed of the engine, the calibration number is half the number of teeth. On these types of sensors, it is important that the sensing portion of the sensor (round or square portion in the middle of the sensing end) be smaller than the distance between the gear teeth for adequate output. Installation requires that the sensor be set as close to the gear teeth as possible. Usually (with engine OFF) screw the sensor in until it touches the gear then back off 1/2 turn.

Proximity Sensor Input:

There are a number of different types of these sensors. The simplest is two magnets glued to the vibration damper with the sensor mounted near the magnets. Calibration number is determined the same way as the magnetic sensors. The two-magnet device gives a calibration number of two.

Signal Generator Input:

Generator is installed on tachometer cable drive of engine.

These come in a number of different configurations and styles. The ISSPRO R8940 and R8970 are typical sensors and give 30 pulses per their revolution. To determine calibration number, multiply the pulses per turn times the drive ratio. Example: Cam drive of 0.5 revolutions per engine revolution and an R8970 give a calibration number of 15.

It is important to use a sensor that gives a whole calibration number. Fractions will make the tachometer inaccurate.

If it is not possible to determine the calibration number by any method described above, it is possible to use an optical tachometer to get the actual RPM. Use the following method to set the tachometer:

$$\text{New calibration number} = \frac{\text{switch setting number} \times \text{Correct RPM reading}}{\text{Indicated tachometer reading}}$$

Setting the Tachometer:

Remove the switch access cover, located at the rear of the unit, by removing the two hold down screws. (See illustration)

Locate the calibration number on the Calibration Chart to determine switch position. Example: For a 3500RPM FSD (Full Scale Deflection) tachometer, a calibration number of 45 gives a switch setting of 2,3,4,5 and 8 ON. All other switches are OFF.

Note that the switch setting will only be accepted when power is cycled from OFF to ON.

Replace the switch access cover and screws. Do not over tighten screws.

Installation:

Make all connections to the supplied plug before connecting to the tachometer. When mounting, the recommended hole size is 3.39" diameter.

Connect the tachometer wiring as follows:

- Red wire: Battery positive.
- Black wire: Ground wire and one sensor wire.
- Blue wire: Ignition voltage (Only has power when Ignition switch is ON).
- Green wire: Tach signal from sensor or alternator.
- White wire: Dashboard illumination.

WARNING Gauge has 12V light bulbs installed, 24V applications need to follow lamp replacement instruction

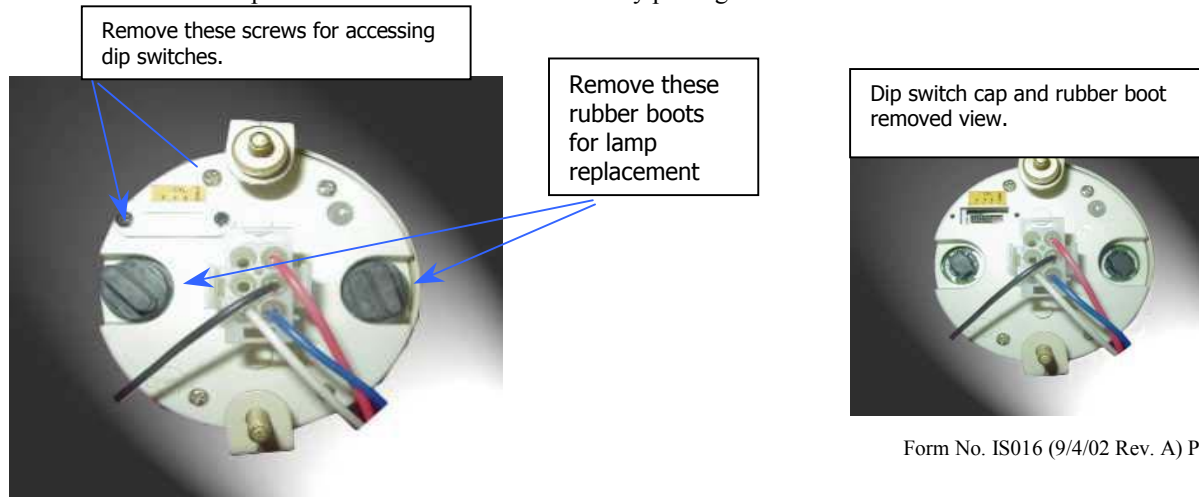
Mount the tachometer into the dash panel.

Testing:

Confirm operation of the tachometer by starting the engine. When the ignition is "OFF" the pointer is free to move to any position. When ignition is applied, the pointer will move to its appropriate position.

Lamp Replacement:

Remove the two rubber boots by pulling while gently rotating. Remove the lamp holders by rotating counter clockwise. The lamp can be removed from the holder by pulling it.



Dip Switch Settings for Programmable Tachometers Full Scale Deflection 3500 RPM

Pulses/ Rotation	FSD Freq @ 3500RPM(HZ)	Dip Switch Settings										Pulses/ Rotation	FSD Freq @ 3500RPM(HZ)	Dip Switch Settings									
		1	2	3	4	5	6	7	8	9	10			1	2	3	4	5	6	7	8	9	10
1	58	0	0	1	0	0	0	0	0	0	0	61	3558	0	1	1	0	1	0	1	1	0	0
2	117	1	1	1	0	0	0	0	0	0	0	62	3617	1	0	0	1	1	0	1	1	0	0
3	175	1	1	0	1	0	0	0	0	0	0	63	3675	1	0	1	1	1	0	1	1	0	0
4	233	0	1	1	1	0	0	0	0	0	0	64	3733	0	0	0	0	0	1	1	1	0	0
5	292	0	1	0	0	1	0	0	0	0	0	65	3792	0	0	1	0	0	1	1	1	0	0
6	350	1	0	1	0	1	0	0	0	0	0	66	3850	1	1	1	0	0	1	1	1	0	0
7	408	1	0	0	1	1	0	0	0	0	0	67	3908	1	1	0	1	0	1	1	1	0	0
8	467	0	0	1	1	1	0	0	0	0	0	68	3967	0	1	1	1	0	1	1	1	0	0
9	525	0	0	0	0	0	1	0	0	0	0	69	4025	0	1	0	0	1	1	1	1	0	0
10	583	1	1	0	0	0	1	0	0	0	0	70	4083	1	0	1	0	1	1	1	1	0	0
11	642	1	1	1	0	0	1	0	0	0	0	71	4142	1	0	0	1	1	1	1	1	0	0
12	700	0	1	0	1	0	1	0	0	0	0	72	4200	0	0	1	1	1	1	1	1	0	0
13	758	0	1	1	1	0	1	0	0	0	0	73	4258	0	0	0	0	0	0	0	0	1	0
14	817	1	0	0	0	1	1	0	0	0	0	74	4317	1	1	0	0	0	0	0	0	1	0
15	875	1	0	1	0	1	1	0	0	0	0	75	4375	1	1	1	0	0	0	0	0	1	0
16	933	0	0	0	1	1	1	0	0	0	0	76	4433	0	1	0	1	0	0	0	0	1	0
17	992	0	0	1	1	1	1	0	0	0	0	77	4492	0	1	1	1	0	0	0	0	1	0
18	1050	1	1	1	1	1	1	0	0	0	0	78	4550	1	0	0	0	1	0	0	0	1	0
19	1108	1	1	0	0	0	0	1	0	0	0	79	4608	1	0	1	0	1	0	0	0	1	0
20	1167	0	1	1	0	0	0	1	0	0	0	80	4667	0	0	0	1	1	0	0	0	1	0
21	1225	0	1	0	1	0	0	1	0	0	0	81	4725	0	0	1	1	1	0	0	0	1	0
22	1283	1	0	1	1	0	0	1	0	0	0	82	4783	1	1	1	1	1	0	0	0	1	0
23	1342	1	0	0	0	1	0	1	0	0	0	83	4842	1	1	0	0	0	1	0	0	1	0
24	1400	0	0	1	0	1	0	1	0	0	0	84	4900	0	1	1	0	0	1	0	0	1	0
25	1458	0	0	0	1	1	0	1	0	0	0	85	4958	1	1	0	1	0	1	0	0	1	0
26	1517	1	1	0	1	1	0	1	0	0	0	86	5017	1	0	1	1	0	1	0	0	1	0
27	1575	1	1	1	1	1	0	1	0	0	0	87	5075	1	0	0	0	1	1	0	0	1	0
28	1633	0	1	0	0	0	1	1	0	0	0	88	5133	0	0	1	0	1	1	0	0	1	0
29	1692	0	1	1	0	0	1	1	0	0	0	89	5192	0	0	0	1	1	1	0	0	1	0
30	1750	1	0	0	1	0	1	1	0	0	0	90	5250	1	1	0	1	1	1	0	0	1	0
31	1808	1	0	1	1	0	1	1	0	0	0	91	5308	1	1	1	1	1	0	0	0	1	0
32	1867	0	0	0	0	1	1	1	0	0	0	92	5367	0	1	0	0	0	0	1	0	1	0
33	1925	0	0	1	0	1	1	1	0	0	0	93	5425	0	1	1	0	0	0	1	0	1	0
34	1983	1	1	1	0	1	1	1	0	0	0	94	5483	1	0	0	1	0	0	1	0	1	0
35	2042	1	1	0	1	1	1	1	0	0	0	95	5542	1	0	1	1	0	0	1	0	1	0
36	2100	0	1	1	1	1	1	1	0	0	0	96	5600	0	0	0	0	1	0	1	0	1	0
37	2158	0	1	0	0	0	0	0	1	0	0	97	5658	0	0	1	0	1	0	1	0	1	0
38	2217	1	0	1	0	0	0	0	1	0	0	98	5717	1	1	1	0	1	0	1	0	1	0
39	2275	1	0	0	1	0	0	0	1	0	0	99	5775	1	1	0	1	1	0	1	0	1	0
40	2333	0	0	1	1	0	0	0	1	0	0	100	5834	0	1	1	1	1	0	1	0	1	0
41	2392	0	0	0	0	1	0	0	1	0	0	101	5892	0	1	0	0	0	1	1	0	1	0
42	2450	1	1	0	0	1	0	0	1	0	0	102	5950	1	0	1	0	0	1	1	0	1	0
43	2508	1	1	1	0	1	0	0	1	0	0	103	6009	1	0	0	1	0	1	1	0	1	0
44	2567	0	1	0	1	1	0	0	1	0	0	104	6067	0	0	1	1	0	1	1	0	1	0
45	2625	0	1	1	1	1	0	0	1	0	0	105	6125	0	0	0	0	1	1	1	0	1	0
46	3683	1	0	0	0	0	1	0	1	0	0	106	6184	1	1	0	0	1	1	1	0	1	0
47	2742	1	0	1	0	0	1	0	1	0	0	107	6242	1	1	1	0	1	1	1	0	1	0
48	2800	0	0	0	1	0	1	0	1	0	0	108	6300	0	1	0	1	1	1	1	0	1	0
49	2858	0	0	1	1	0	1	0	1	0	0	109	6359	0	1	1	1	1	1	1	0	1	0
50	2917	1	1	1	1	0	1	0	1	0	0	110	6417	1	0	0	0	0	0	0	1	1	0
51	2975	1	1	0	0	1	1	0	1	0	0	111	6475	1	0	1	0	0	0	0	0	1	0
52	3033	0	1	1	0	1	1	0	1	0	0	112	6534	0	0	0	1	0	0	0	0	1	0
53	3092	0	1	0	1	1	1	0	1	0	0	113	6592	0	0	1	1	0	0	0	0	1	0
54	3150	1	0	1	1	1	1	0	1	0	0	114	6650	1	1	1	1	0	0	0	0	1	0
55	3208	1	0	0	0	0	0	1	1	0	0	115	6709	1	1	0	0	1	0	0	0	1	0
56	3267	0	0	1	0	0	0	1	1	0	0	116	6767	0	1	1	0	1	0	0	0	1	0
57	3325	0	0	0	1	0	0	1	1	0	0	117	6825	0	1	0	1	1	0	0	1	1	0
58	3383	1	1	0	1	0	0	1	1	0	0	118	6884	1	0	1	1	1	0	0	0	1	0
59	3442	1	1	1	1	0	0	1	1	0	0	119	6942	1	0	0	0	0	1	0	1	1	0
60	3500	0	1	0	0	1	0	1	1	0	0	120	7000	0	0	1	0	0	1	0	1	1	0

Dip Switch Settings for Programmable Tachometers Full Scale Deflection 3500 RPM

Pulses/ Rotation	FSD Freq @ 3500RPM(HZ)	Dip Switch Settings										Pulses/ Rotation	FSD Freq @ 3500RPM(HZ)	Dip Switch Settings									
		1	2	3	4	5	6	7	8	9	10			1	2	3	4	5	6	7	8	9	10
121	7259	0	0	0	1	0	1	0	1	1	0	181	10558	0	1	0	1	1	1	1	0	0	1
122	7117	1	1	0	1	0	1	0	1	1	0	182	10617	1	0	1	1	1	1	1	0	0	1
123	7175	1	1	1	1	0	1	0	1	1	0	183	10675	1	0	0	0	0	0	0	1	0	1
124	7234	0	1	0	0	1	1	0	1	1	0	184	10733	0	0	1	0	0	0	0	1	0	1
125	7292	0	1	1	0	1	1	0	1	1	0	185	10792	0	0	0	1	0	0	0	1	0	1
126	7350	1	0	0	1	1	1	0	1	1	0	186	10850	1	1	0	1	0	0	0	1	0	1
127	7409	1	0	1	1	1	1	0	1	1	0	187	10908	1	1	1	1	0	0	0	1	0	1
128	7467	0	0	0	0	0	0	0	1	1	0	188	10967	0	1	0	0	1	0	0	1	0	1
129	7525	0	0	1	0	0	0	1	1	1	0	189	11025	0	1	1	0	1	0	0	1	0	1
130	7584	1	1	1	0	0	0	1	1	1	0	190	11083	1	0	0	1	1	0	0	1	0	1
131	7642	1	1	0	1	0	0	1	1	1	0	191	11142	1	0	1	1	1	0	0	1	0	1
132	7700	0	1	1	1	0	0	1	1	1	0	192	11200	0	0	0	0	0	1	0	1	0	1
133	7759	0	1	0	0	1	0	1	1	1	0	193	11258	0	0	1	0	0	1	0	1	0	1
134	7817	1	0	1	0	1	0	1	1	1	0	194	11317	1	1	1	0	0	1	0	1	0	1
135	7875	1	0	0	1	1	0	1	1	1	0	195	11375	1	1	0	1	0	1	0	1	0	1
136	7934	0	0	1	1	1	0	1	1	1	0	196	11433	0	1	1	1	0	1	0	1	0	1
137	7992	0	0	0	0	0	1	1	1	1	0	197	11492	0	1	0	0	1	1	0	1	0	1
138	8050	1	1	0	0	0	1	1	1	1	0	198	11550	1	0	1	0	1	1	0	1	0	1
139	8109	1	1	1	0	0	1	1	1	1	0	199	11608	1	0	0	1	1	1	0	1	0	1
140	8167	0	1	0	1	0	1	1	1	1	0	200	11667	0	0	1	1	1	1	0	1	0	1
141	8225	0	1	1	1	0	1	1	1	1	0	201	11725	0	0	0	0	0	0	1	1	0	1
142	8284	1	0	0	0	1	1	1	1	1	0	202	11783	1	1	0	0	0	0	1	1	0	1
143	8342	1	0	1	0	1	1	1	1	1	0	203	11842	1	1	1	0	0	0	1	1	0	1
144	8400	0	0	0	1	1	1	1	1	1	0	204	11900	0	1	0	1	0	0	1	1	0	1
145	8459	0	0	1	1	1	1	1	1	1	0	205	11958	0	1	1	1	0	0	1	1	0	1
146	8517	1	1	1	1	1	1	1	1	1	0	206	12017	1	0	0	0	1	0	1	1	0	1
147	8575	1	1	0	0	0	0	0	0	0	1	207	12075	1	0	1	0	1	0	1	1	0	1
148	8634	0	1	1	0	0	0	0	0	0	1	208	12133	0	0	0	1	1	0	1	1	0	1
149	8692	0	1	0	1	0	0	0	0	0	1	209	12192	0	0	1	1	1	0	1	1	0	1
150	8751	1	0	1	1	0	0	0	0	0	1	210	12250	1	1	1	1	1	0	1	1	0	1
151	8808	1	0	0	0	1	0	0	0	0	1	211	12308	1	1	0	0	0	1	1	1	0	1
152	8867	0	0	1	0	1	0	0	0	0	1	212	12367	0	1	1	0	0	1	1	1	0	1
153	8925	0	0	0	1	1	0	0	0	0	1	213	12425	0	1	0	1	0	1	1	1	0	1
154	8983	1	1	0	1	1	0	0	0	0	1	214	12483	1	0	1	1	0	1	1	1	0	1
155	9042	1	1	1	1	1	0	0	0	0	1	215	12542	1	0	0	0	1	1	1	1	0	1
156	9100	0	1	0	0	0	1	0	0	0	1	216	12600	0	0	1	0	1	1	1	1	0	1
157	9158	0	1	1	0	0	1	0	0	0	1	217	12658	0	0	0	1	1	1	1	1	0	1
158	9217	1	0	0	1	0	1	0	0	0	1	218	12717	1	1	0	1	1	1	1	1	0	1
159	9275	1	0	1	1	0	1	0	0	0	1	219	12775	1	1	1	1	1	1	1	1	0	1
160	9333	0	0	0	0	1	1	0	0	0	1	220	12833	0	1	0	0	0	0	0	0	1	1
161	9392	0	0	1	0	1	1	0	0	0	1	221	12892	0	1	1	0	0	0	0	0	1	1
162	9450	1	1	1	0	1	1	0	0	0	1	222	12950	1	0	0	1	0	0	0	0	1	1
163	9508	1	1	0	1	1	1	0	0	0	1	223	13008	1	0	1	1	0	0	0	0	1	1
164	9567	0	1	1	1	1	1	0	0	0	1	224	13067	0	0	0	0	1	0	0	0	1	1
165	9625	0	1	0	0	0	0	1	0	0	1	225	13125	0	0	1	0	1	0	0	0	1	1
166	9683	1	0	1	0	0	0	1	0	0	1	226	13183	1	1	1	0	1	0	0	0	1	1
167	9742	1	0	0	1	0	0	1	0	0	1	227	13242	1	1	0	1	1	0	0	0	1	1
168	9800	0	0	1	1	0	0	1	0	0	1	228	13300	0	1	1	1	1	0	0	0	1	1
169	9858	0	0	0	0	1	0	1	0	0	1	229	13358	0	1	0	0	0	1	0	0	1	1
170	9917	1	1	0	0	1	0	1	0	0	1	230	13417	1	0	1	0	0	1	0	0	1	1
171	9975	1	1	1	0	1	0	1	0	0	1	231	13475	1	0	0	1	0	1	0	0	1	1
172	10033	0	1	0	1	1	0	1	0	0	1	232	13533	0	0	1	1	0	1	0	0	1	1
173	10092	0	1	1	1	1	0	1	0	0	1	233	13592	0	0	0	0	1	1	0	0	1	1
174	10150	1	0	0	0	0	1	1	0	0	1	234	13650	1	1	0	0	1	1	0	0	1	1
175	10208	1	0	1	0	0	1	1	0	0	1	235	13708	1	1	1	0	1	1	0	0	1	1
176	10267	0	0	0	1	0	1	1	0	0	1	236	13767	0	1	0	1	1	1	0	0	1	1
177	10325	0	0	1	1	0	1	1	0	0	1	237	13825	0	1	1	1	1	1	0	0	1	1
178	10383	1	1	1	1	0	1	1	0	0	1	238	13883	1	0	0	0	0	0	1	0	1	1
179	10442	1	1	0	0	1	1	1	0	0	1	239	13942	1	0	1	0	0	0	1	0	1	1
180	10500	0	1	1	0	1	1	1	0	0	1	240	14000	0	0	0	1	0	0	1	0	1	1

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Pulses/ Rotation	FSD Freq @ 3500RPM(HZ)	Dip Switch Settings										Pulses/ Rotation	FSD Freq @ 3500RPM(HZ)	Dip Switch Settings									
		1	2	3	4	5	6	7	8	9	10			1	2	3	4	5	6	7	8	9	10
241	14058	0	0	1	1	0	0	1	0	1	1	261	15225	0	1	0	0	1	0	0	1	1	1
242	14117	1	1	1	1	0	0	1	0	1	1	262	15283	1	0	1	0	1	0	0	1	1	1
243	14175	1	1	0	0	1	0	1	0	1	1	263	15342	1	0	0	1	1	0	0	1	1	1
244	14233	0	1	1	0	1	0	1	0	1	1	264	15400	0	0	1	1	1	0	0	1	1	1
245	14292	0	1	0	1	1	0	1	0	1	1	265	15458	0	0	0	0	0	1	0	1	1	1
246	14350	1	0	1	1	1	0	1	0	1	1	266	15517	1	1	0	0	0	1	0	1	1	1
247	14408	1	0	0	0	0	1	1	0	1	1	267	15575	1	1	1	0	0	1	0	1	1	1
248	14467	0	0	1	0	0	1	1	0	1	1	268	15633	0	1	0	1	0	1	0	1	1	1
249	14525	0	0	0	1	0	1	1	0	1	1	269	15692	0	1	1	1	0	1	0	1	1	1
250	14583	1	1	0	1	0	1	1	0	1	1	270	15750	1	0	0	0	1	1	0	1	1	1
251	14642	1	1	1	1	0	1	1	0	1	1	271	15808	1	0	1	0	1	1	0	1	1	1
252	14700	0	1	0	0	1	1	1	0	1	1	272	15867	0	0	0	1	1	1	0	1	1	1
253	14758	0	1	1	0	1	1	1	0	1	1	273	15925	0	0	1	1	1	1	0	1	1	1
254	14817	1	0	0	1	1	1	1	0	1	1	274	15983	1	1	1	1	1	1	0	1	1	1
255	14875	1	0	1	1	1	1	1	0	1	1	275	16042	1	1	0	0	0	0	1	1	1	1
256	14933	0	0	0	0	0	0	0	1	1	1	276	16100	0	1	1	0	0	0	1	1	1	1
257	14992	0	0	1	0	0	0	0	1	1	1	277	16158	0	1	0	1	0	0	1	1	1	1
258	15050	1	1	1	0	0	0	0	1	1	1	278	16217	1	0	1	1	0	0	1	1	1	1
259	15108	1	1	0	1	0	0	0	1	1	1	279	16275	1	0	0	0	1	0	1	1	1	1
260	15167	0	1	1	1	0	0	0	1	1	1	280	16333	0	0	1	0	1	0	1	1	1	1

Wiring Diagram 3 3/8" Electrical Tachometer (Diesel)

