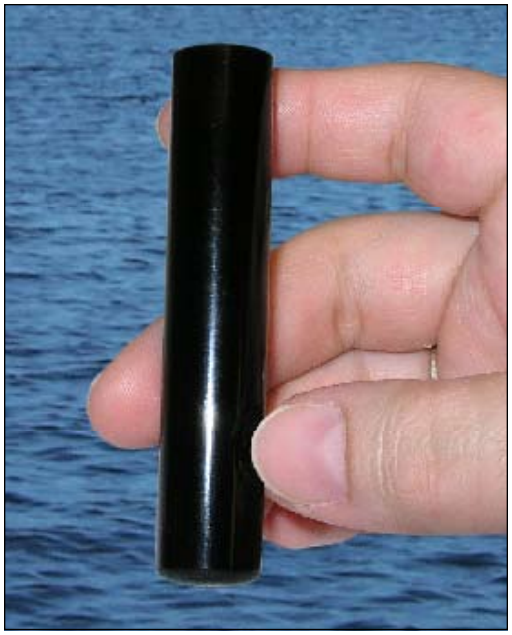
TRANSMITTERS

V16 Coded Transmitter

Multi-purpose transmitter for medium and large species

The V16 coded tag, with its 16 mm diameter, is a multi-purpose transmitter. Developed for medium and long term tracking studies, it can function as a simple pinger giving location only, or for more detailed research it can be equipped with a depth and/or temperature sensor. Depending on the battery size, the tag will last between one month and several years and give a transmission range in excess of several hundred meters (this varies significantly with environmental conditions). Given its size, the coded V16 tag is best suited for studies involving medium to large species types. When V16 transmitters are used with the VR2W and/or VR3 receiver, they can help meet the challenges of tracking large numbers of fish over large areas. The V16 can also be tracked using the VR2, VR28, the VR100, or VR60 (with Option 07 version 2.01) receivers, or the VRAP system.



V16 transmitter.

Coded Mode

"Coded mode" V16 tags send acoustic pings at 69kHz that are infrequent and random about an average delay. This ping train includes an ID number which permits identification of the specific tag.

For applications such as site residency studies and automated monitoring of migrations, coded transmissions are desirable because of significantly increased battery life and the large number of tags that can be used on the same frequency.

Physical Specifications

The physical measurements of the V16 vary with battery option and if pressure sensors are included. Specifications are shown in the table below. (Note that this table is for internally implanted tags only).

		Silver Oxide				Lithium					
Battery Option:		**1L**	**1H**	**3L**	**3H**	**4L**	**4H**	**5L**	**5H**	**6L**	**6H**
V16/V16T	Length (mm)	54	54	64	64	68	68	95	95	95	95
V16P/ V16TP	Length (mm)	57	57	67	67	71	71	98	98	98	98
All V16s	Power Output (dB re 1uPa @1m)	150	159	157	165	152	158	157	165	153	160
V16/V16T	Weight in air (g)	19		25		24		36		34	
V16P/ V16TP	Weight in air (g)	20		26		26		37		36	

Stated tag length, weight and output power are nominal. Small manufacturing variations can be expected.

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V16 Coded Tag Sensor Options

For research requiring temperature and depth information, V16 tags can be equipped with temperature, V16T, or depth, V16P, or both temperature and depth sensors, V16TP. V16P pressure transmitters are available in the following full scale pressure options: 17, 34, 68, 136, 204, 340, and 680 meters. V16T temperature transmitters are available in four temperature ranges: -5 to 35°C, -4 to 20°C, 0 to 40°C and 10 to 40°C.

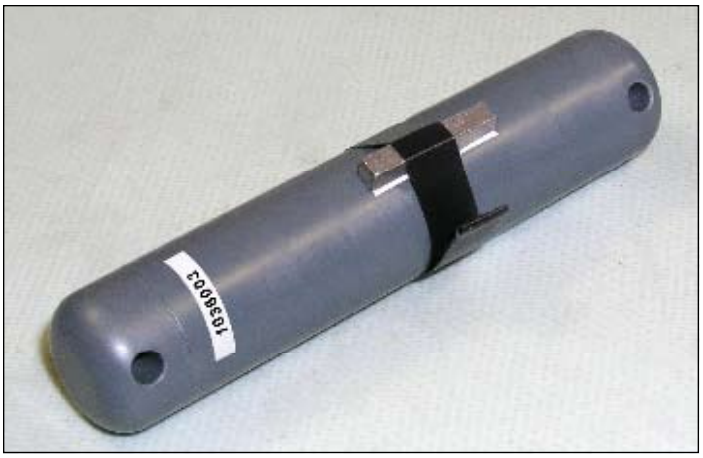
Temperature Sensor		
Range	**Accuracy**	**Resolution**
-5 to 35 °C	±0.5 °C	0.15 °C
-4 to 20 °C	±0.5 °C	0.1 °C
0 to 40 °C	±0.5 °C	0.15 °C
10 to 40 °C	±0.5 °C	0.12 °C

Pressure Sensors (at room temperature)		
Max Depth	**Accuracy**	**Resolution**
17 m	±1.7 m	0.08 m
34 m	±1.7 m	0.15 m
68 m	±3.4 m	0.3 m
136 m	±6.8 m	0.6 m
204 m	±10 m	0.9 m
340 m	±17 m	1.5 m
680 m	±34 m	4.1 m

Case Options

The V16 comes in two case styles. The internally implanted unit comes in an epoxy case with rounded ends. The externally mounted unit is made of PVC with attachment holes at either end. The externally mounted unit is approximately 20mm longer than the internal V16 model. All V16 tags come with an external magnet to activate or deactivate the tag.

External Case



Range Testing Tag

Range testing tags can be provided, at the same output power as your proposed study, to be used to conduct in situ range testing. Range test tags are configured with a FIXED delay and an on-time of two weeks. This is a precautionary measure to ensure that the tag will expire within a reasonable period of time if accidentally dropped. The tag on-time can be reset using the external magnet.

Expected Battery Life

The life span of the V16 coded tag depends on battery type/size (either 1, 3, 4, 5, or 6), power output (high or low), and the delay between code transmissions (in seconds). There are six standard ping train delay times, which are found in the battery life tables on page 3. The larger the battery, the greater the life and/or power output. Larger batteries increase transmitter length and weight.

The power level refers to the output power level. The higher power allows for a greater acoustic range but reduces the life of the tag. This can be seen by comparing the data in the table below. The high power option is designated by an H next to the battery size while a L indicates low power. For example, a V16-1L pinger has the same battery as the V16-1H but is low power.

Tag Shelf Life

V16 pingers incur a small current drain prior to activation. Tag life will be reduced if tags are shelved for a significant period of time (months). Contact VEMCO for information. V16 pingers should be activated within one (1) years of delivery. V16 tags should be stored at room temperature.

V16 Battery Life Estimates

Nominal Delay (seconds)	V16-1L Life (days)	V16-1H Life (days)	V16-3L Life (days)	V16-3H Life (days)	V16-4L Life (days)	V16-4H Life (days)	V16-5L Life (days)	V16-5H Life (days)	V16-6L Life (days)	V16-6H Life (days)
30	211	66	115	36	1542	444	816	258	2865	876
60	395	125	207	68	2779	815	1448	482	3650	1630
90	571	184	289	98	3650	1157	1992	696	3650	2339
120	739	242	363	128	3650	1472	2463	900	3650	3005
180	1053	355	489	183	3650	2034	3238	1279	3650	3650
240	1342	465	594	235	3650	2518	3650	1626	3650	3650

Nominal Delay (seconds)	V16TP-1L Life (days)	V16TP-1H Life (days)	V16TP-3L Life (days)	V16TP-3H Life (days)	V16TP-4L Life (days)	V16TP-4H Life (days)	V16TP-5L Life (days)	V16TP-5H Life (days)	V16TP-6L Life (days)	V16TP-6H Life (days)
30	200	65	112	36	1458	440	796	258	2716	868
60	373	124	201	67	2623	805	1408	480	3650	1608
90	538	181	281	98	3650	1140	1937	691	3650	2305
120	697	238	353	127	3650	1451	2399	893	3650	2959
180	995	349	477	182	3650	2005	3161	1269	3650	3650
240	1271	456	580	233	3650	2484	3650	1612	3650	3650

Nominal Delay (seconds)	V16P-1L Life (days)	V16P-1H Life (days)	V16P-3L Life (days)	V16P-3H Life (days)	V16P-4L Life (days)	V16P-4H Life (days)	V16P-5L Life (days)	V16P-5H Life (days)	V16P-6L Life (days)	V16P-6H Life (days)
30	189	64	108	36	1377	432	771	255	2572	853
60	353	121	195	67	2485	791	1367	475	3650	1580
90	510	178	273	97	3472	1122	1885	684	3650	2266
120	662	233	343	125	3650	1428	2338	884	3650	2911
180	947	342	465	180	3650	1976	3090	1257	3650	3650
240	1210	448	567	231	3650	2450	3650	1598	3650	3650

Nominal Delay (seconds)	V16T-1L Life (days)	V16T-1H Life (days)	V16T-3L Life (days)	V16T-3H Life (days)	V16T-4L Life (days)	V16T-4H Life (days)	V16T-5L Life (days)	V16T-5H Life (days)	V16T-6L Life (days)	V16T-6H Life (days)
30	212	67	116	36	1550	448	823	261	2878	884
60	395	126	208	68	2777	819	1452	485	3650	1637
90	570	184	289	99	3650	1160	1993	698	3650	2344
120	737	242	363	128	3650	1474	2463	901	3650	3009
180	1050	355	489	184	3650	2035	3236	1281	3650	3650
240	1337	465	594	236	3650	2518	3650	1627	3650	3650

Notes: The transmission rate varies randomly ±50% about the nominal delay value. For example, a 30 second nominal delay indicates that the tag transmits randomly every 15 to 45 seconds.

The projected battery life is an estimate and users will experience a decrease in battery life if their tags are operating in extreme warm or extreme cold temperatures.

VEMCO transmitters are programmed to stop transmitting when they reach their stated battery life. This ensures that tags will operate at published specifications until expiration.

VEMCO tags are warranted to be free from defects in material and workmanship for one year from date of delivery.

Tags can be programmed for shorter lives, if required.

The tables above are for our most popular nominal delay settings. Please contact VEMCO for more information regarding battery life for other nominal delay settings.

How to Order V16 Coded Transmitters

When ordering V16 coded tags, specify the following:

[1] Battery type (1,3,4,5,6).
[2] Output Power (H or L).
[3] Nominal random repeat interval.
[4] If a depth sensor (V16P) is required, what is the operating range?
[5] If a temperature sensor (V16T) is required, what is the operating range?
[6] Will the tags be implanted or externally attached?
[7] Is this a Range Test tag?
[8] Quantity of tags

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