SONOTRONICS

Depth
Telemetry
Transmitters

SONOTRONICS

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Understanding ACT Coding:

Sonotronics has developed a proprietary coding scheme called "ACT", aural coded transmission. This technique aids in the avoidance of duplicate transmitters from one order to the next, or in the case of overlapping projects in a geographic area. ACT coding also improves the quality of data collected by SUR (submersible ultrasonic receivers). It is also important to note that the transmitters still contain simple code, interval, and frequency sets as in all historic Sonotronics transmitters. ACT coding lies in the organization of these sets. Please see our document on ACT coding for more information.

ACT Depth Transmitter Algorithm:

The basic depth transmitter algorithm consists of an ACT code, followed by a pause, followed by *11 pings,* followed by a pause, then it repeats. During the 11 pings, the pulse interval (time between pings) is directly related to the last pressure measured. Note the pressure (depth) is measured just before the first ping of this 11 ping pulse train, hence the depth refresh rate is simply the time that it takes to repeat the entire ping pattern, typically between 30 and 40 seconds.

Getting into more detail about the 11 pings containing the depth information: Surface pressure (0 psi, 0 feet, 0 meters) is measured when the magnet is taken off the transmitter. This is always assigned to 550ms in the ACT depth transmitter algorithm. Full scale pressure, a maximum value determined by the customer when ordering, is always assigned to 850ms. There are 101 3ms "slots" from 550ms to 850ms: for a transmitter with a 100psi full scale pressure, it would report the following:

Reported Interval	Corresponding Pressure
550ms	0psi
553ms	1psi
556ms	2psi
.	.
.	.
850ms	100psi

Note any pressure above the requested full scale pressure will always read 850ms. It is important that the appropriate full scale pressure is chosen at the time of ordering, and that it is a little bit greater than the deepest point of interest.

Based upon the above, the lookup table for reported intervals can be generated by the equation:

Corresponding pressure = (Full Scale Pressure / 100) * ((Reported Interval - 550ms) / 3ms)

Another important note is that due to the initial pressure reading being taken when the magnet is taken off, if it is taken off in one environment with the transmitter being deployed in another environment at a different elevation there will be an offset in pressure due to the different atmospheric pressures. This can be solved by either adding/subtracting the difference from the reported pressure values, or taking care to remove the magnet at the site they will be deployed.

Another tip for using depth telemetry transmitters:
An advantage of the 11 ping pulse train used to relay depth information is that a stopwatch can be used to calculate the interval quickly. If the stopwatch is started when the first ping of the 10 ping train is heard, and stopped when the last (eleventh) ping is heard, this value can be divided by 10 and the result will be the interval.

Note that USR08 and USR96 (firmware 4.0 and higher) receivers will automatically decode this telemetry by selecting "%FS" as an RxMODE selection during setup.

Specifications Related to Depth Telemetry

Accuracy:	**+/- 1% of full scale pressure**
Resolution:	**1% of full scale pressure**
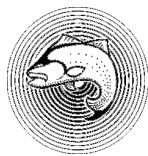
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