Adjusting Detection levels in the ESN series.

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Introduction

The ESN System may change characteristics over time, or from area to area. The Auto system can be optimized for different conditions

The ESN has some parameters which instruct the systems bottom detection algorithm of how sensitive the system should be. The main factor for this is Signal to Noise Ratio limit (SNR) This value in dB results in smaller signal being rejected or allowed.

If set too low the algorithms may jump to noise, fish or other unwanted signals. If set too high it can miss the bottom pulses when the signal is weak.

The signal might be weak due to the bottom type (Rocks gives strong, Mud gives weak signals) the water quality (amount of particles/pollution to block the sound).

The system can be made to detect the current optimal values using a calibration procedure. The values can also be adjusted manually in the diagnostic scope screen.

The effect of lowering the value is to give more sensitivity, both to the algorithm, but also to the screen echogram. Raising this level will block more signals, and give less noise on the screen.

SKIPPERs current recommendation for limits for this parameter is 28 (very sensitive) to 42 (least sensitive) with a normal average being from 30-38dB

If the calibration is run and gives values above this, we recommend to use values within the limits.

If the system is losing the bottom often (other than during thrusters) we recommend lowering the value.

From experience Changing TVG in manual mode, may make the screen picture better, but does not help detection.

SNR limit calibration

To do a calibration place the vessel in the area with bad signal, preferably stopped.

Go to diagnostic screen and press SNR Calibrate 'START'

22.9.2022 Written for SW version 1.1.0.4 or below (PC)

Back 1	2:49	S	DBT: 5.1 m	ES DI	agnostics Setup
	Measurement Measurement			Simulate Depth	off
Display 3V3 JB 24V Meas	Measurement urement			Depth	0.0 m
JB 5V Measu JB 3V3 Meas	rement urement			Test Alarm	Start
				Noise Self Test (Run in Shallow)	Start
				SNR Calibration (Run in Shallow)	Start
				Show Noise and Calib Results	Show Results
Simulation Setup	Echo Scope				

Enter the current depth to help the system find the real signal

Config	12:49		S ESN20	00 EchoSounder	Aft /38 kHz	Config 12:51 S ESN200 EchoSounder Aft /38 kHz	
		unuinen ununu			TVG Aft (A)	TVG AR(A) 65 %	
ST AFT 38kHz	/DBT_(P)	25 C.C. (200)	te distant		🕈 Gain Aft (A) 🕴	Cain Aft (A)	1
m					Power AR(A)	- m	
Enter Manual	Depth Ch 2 :			20	60 %	60 %	
m			+	20	DPTH Blw Surface	DPTH Blw Surfac	
1	2	3	Cancel		-/-		, 7
4	5	6		active channel(s).	2.0 <i>m</i>	Please enter the current depth for active channel(s).	Į,
7	8	9	Enter	ansducer Depth	÷ 4	Click to enter depth below transducer Ch 1 Depth Ch 2 Depth	ł
-	0		ABC	⁻ Depth	Cancel Calibration	Enter Depth 4.6 m Cancel Calibration	

Press start calibration

Skipper Multi Series - ESN 200	-		×
Config 12 51 SN200 EchoSounder	Aft /38	kHz	
4.4	тус. 65	Aft (A)	
	Gain	Aft (A)	
	2	2	
	Power	Aft(A)	
n and a star and a star a s	30	%	
An in the chiefe Count of Countains on a Counterful and a start of the second second second second second second	DPTH BI	w Surfa	R
	6.4	m	1
Calibration is running, please wait If system starts showing incorrect depth on selected channel(s), please restart c calibration.	or cancel	the]
21%			1
Restart Calibration	Cano Calibra	el tion	

The system will try many different ping types and in the end suggest a new level

r	The median of	n staat	de chel I		T. 0	PTH Blw Surface
		Old SNR	New SNR	Status	Comment	177
	Aft / 38 kHz	37.0	40.0	Good	Good signal	
	Accept Calibration			472	Restart Calibration	Reject Calibration

If this level is lower than the old, accept it. If higher then it does not need changing unless you see the system is making false detections in normal use (Fish etc.)

Manually adjusting SNR limits

If you wish to adjust manually to see the difference, go to the Diagnostics - scope screen



And press Show options until you see the SNR value. This can be changed manually.



Noise test

Another reason for lost bottom issues is that the system has too high noise, Noise should be checked by

Running the noise Self test in the diagnostics page



The test is best run in <45m depth



Results will be shown on diagnostic screen or by pressing the the Show results, for more details



nlav 5V					
Prai Sv	FIGUDULCHICH		lus		
	Min [mV]	Avg [mV]	Max [mV]	Peak [mV]	
Aft / 38 kHz		5.18	7.11	54.65	Noise Type
	3.09				External
	est Start				

Noise below 10mV is good, the peak mV is showing some acoustic spikes coming from a different system)

External or internal, give a different range of values internal showing values that are measured internally, external includes cabling, transducers and acoustics

If support is required take a picture of these values

Manually checking noise

To manually check the noise levels, put the system in auto functions OFF, set the gain to 12 and power to max. Range to max.



In Diagnostics - Scope screen, look at the level of noise in the deep water region (in shallow you will see acoustic signals

	Ba	ck	13 06				DB	T: 4.8 m		ES Dia	agnostics Se	tup
		Peal	k value: 1144	1.87 mV				Channel	Set Def Sensor Se	fault ettings	Show Opti	ons I cer
45	1	Nois	e value: 2.88	3 mV	Eraguana			Campling roo	alution, 40 d		Depth Rai	nge 🦊
<mark>4</mark> 0	-	SNR	: -33.50 dB-		Pulse wid	th: 3000 us		Ultrasonic sr	olution: 40 c	m/s	1000	m
35	-	SNR	Correction:	Not Used	Power: 1	00 %		Measureme	nt of 5V: 4.9	90 V	12	u 🔻
20		Dep	th: 4.80 m		Gain: 12			Power supply	y: 26.80 V			vd
30					Starting p	oos.: 0		Transmit DC	voltage: 29	9.10 V	Pulse Width	Fwd
25					" "Nr. of sa	mples: 2500)	Measurment	t of 30V: 29	.85 V	3000	us
20	-										Blanking Distar 100 C	nce Fwd
15	-	ţ.										
		1	\									
10			T T									
5	1	-1-										
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	0.0)	100.0	200.0	300.0	400.0	500.0	600.0	700.0	800.0	900.0	1000

The red area in the bottom of the screen shows the detected noise range.

We expect noise to be <10mV with this test. If above try changing grounding on the cabling to reduce, or use AC power.