

PowerDrive Wireless Simulator Box



Revision & Date		Description	CR/CN	Approvals
A		PowerDrive Wireless Simulator Box	N/A	Originator: Jack Rader Reviewed By: Approved By:

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1 Overview

This document provides an overview of the PowerDrive Wireless Simulator Box. The details of how to set it up and what to expect when in use will be detailed. This device is not designed to be a calibration tool and is only meant to validate that real time communication with a Babel Fish, XHOP, HHOP, or CLPS is functional.

The simulator box does transmit the same signal type as a PowerDrive would for the real time probe to receive. It should be noted that the frequency of changes in the data are not what a typical PowerDrive cycle would consist of, but the values provided for each data point are within the realm of possible values for a downhole tool.

2 PowerDrive Wireless Simulation Box Contents

2.1 Pelican case containing Simulation Box



External view of Pelican case



The Pelican case only contains foam and the simulation box which features an attached power cord.

2.3 Simulation Box Layout

The simulator box has two operational buttons with LED indicators that show the present state.

- Green Off – Simulation box is powered off and no data is being transmitted
- Green On – Simulation box is powered on and data is being wirelessly transmitted
- Blue Off – XHOP/HHOP data is being transmitted
- Blue On – CLPS/Babel Fish data is being transmitted



Enabled

3 Test Setup

3.1 Steps for Testing Baber Fish / CLPS

- A. The PD-WSB box should be parallel to the probe antenna
- B. Place the PD-WSB next to the probe in the middle of the silver antenna section of the BBF probe as pictured below.



- C. RXCT should increment every 30-60s
- D. SNR should be greater than 25

4 Expected Values

4.1 Default Babel Fish / CLPS Values

When the Babel Fish or CLPS probe is not receiving any real time communication data the following values are default. Most, but not all, of the recorded data points are listed below.

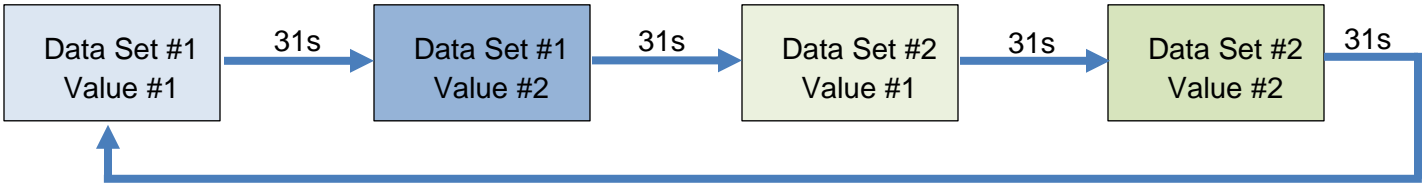
Data Point	Default	Data Point	Default	Data Point	Default
AZI_TARGET	409.5	INCLINATION	204.75	PDTEMP	215
AZIMLO	409.2	INCLQ	12	POSSUM	154
AZIMQ	24	LTRPM	6300	PRDS	150
AZIMUTH	409.5	MTOT	98256	PROPEFF	150
CCRPM	510	PD3B1	7	RT_STAT	20
DLNK	511	PD3B2	7	RT_UHSTAT	64
DTF_OFFSET	128	PD3B3	7	RTSTAT	4095
GAMMA_AV	127	PD3B4	7	RTSTAT2	4095
GAMMA_AV_EXT	511	PD3B5	7	RTSTAT3	63
GAMMA_DN	127	PD4B1	15	RTSTAT4	63
GAMMA_DN_EXT	511	PD4B2	15	SHK_AMPL	5040
GAMMA_LF	127	PD4B3	15	SHKRSK	3
GAMMA_LF_EXT	511	PD4B4	15	SS_AMPL	508
GAMMA_RT	127	PD6B1	340	STEER	255
GAMMA_RT_EXT	511	PD6B2	68	STKSLP	15
GAMMA_UP	127	PD6B3	66	TF	378
GAMMA_UP_EXT	511	PD6B4	66	TF_TARGET	510
GTOT	1015.5	PD6B5	63	TFDS	378
IH_TRGT	204.75	PDSTAT	16	TFHI	409.5
IH_TURN	152			UTRPM	6300

Other notes about the behavior of the Babel Fish probe:

- When there is no communication between the Babel Fish board and the MWD tool all values will most likely be 0 though some 3rd party software may act differently.
- Immediately after Babel Fish reboot, it will provide the default/maximum values (raw binary 1s)
- When wireless data is received, Babel Fish provides the most recently received PowerDrive Data
- If received data stops for less than 20 minutes, Babel Fish will provide the last received data repeatedly
- If received data stops for more than 20 minutes, Babel Fish will provide default values
- When the Babel Fish probe is first provided power, it can take 40-100s before data is no longer 0.
- Babel Fish are set to record data every 20s. Requested data from the probe will only provide what the most recently recorded value is, which may not be the most recently received value.

4.2 Values when receiving simulated data with Babel Fish / CLPS

The PD-WSB will transmit all the data points in two separate data sets. Each set contains alternating and static data. The alternating data changes between two values that are sent in two sets. When a data set is sent the RXCT will increase by 1 and overwrite the previously stored value. Below are the details of the data points in each set, the values transmitted, and the timing of alternation and looping. The data shown in the tables is the recorded values found inside the Babel Fish memory.



Data Set 1: Is associated with BF_PD_PACKET_TYPE 1032

Data Point	Value 1	Value 2	Default	Data Point	Value 1	Value 2	Default
GAMMA_AV	50	100	127	GAMMA_AV_EXT	100	200	511
GAMMA_UP	60	110	127	GAMMA_UP_EXT	120	220	511
GAMMA_LF	70	120	127	GAMMA_LF_EXT	140	240	511
GAMMA_DN	80	126	127	GAMMA_DN_EXT	160	260	511
GAMMA_RT	90	126	127	GAMMA_RT_EXT	180	280	511
POSSUM	-80	60	154	RTSTAT3	5	20	63
UTRPM	800	5200	6300	RTSTAT4	5	20	63
LTRPM	800	5200	6300	AZI_TARGET	.1	35.9	409.5
PDTEMP	-15	120	215	POSSUM	-80	60	154

Static Data that is part of this set:

Data Point	Value	Default	Data Point	Value	Default
RT_STAT	4	20	PD6B4	7	66
RT_UHSNR	20	20	PD4B1	10	15
RT_UHSTAT	0	64	PD4B2	2	15
PDSTAT	0	16	PD4B3	3	15
AZIMQ	22.4	24	PD4B4	4	15
DTF_OFFSET	109	128	PD3B1	1	7
TF_TARGET	246	510	PD3B2	2	7
PD6B1	30	340	PD3B3	3	7
PD6B2	7	68	PD3B4	4	7
PD6B3	6	66	PD3B5	5	7

Data Set 2: Is associated with BF_PD_PACKET_TYPE 1028

Data Point	Value 1	Value 2	Default	Data Point	Value 1	Value 2	Default
INCLINATION	.5	5.1	204.75	STKSLP	1	3	15
AZIMUTH	.4	34	409.5	IH_TRGT	.15	3.5	204.75
RTSTAT	10	2000	4095	DLNK	170	402	511
RTSTAT2	2	8	4095	CCRPM	40	88	510
STEER	74	82	255	PROPEFF	40	60	150
TFDS	60	264	378	INCLQ	3.2	4.8	12
PRDS	100	0	150	AZIMLO	.4	34	409.2
TFHI	1	20	409.5	TF	0	18	378
SHKRSK	1	2	3				

Static Data Set:

Data Point	Value	Default	Data Point	Value	Default
GTOT	1015	1015.5	PD6B5	55	63
MTOT	49200	98256	PD4B1	10	15
SS_AMPL	100	508			
IH_TURN	40	152			
SHK_AMPL	2000	5040			