

BEDs Preliminary Budgets;
Enter values in blue, other values are calculated

Operation modes and variables	Value	Value	Value	Value	Value	Value	Notes
Deployment info							
Total event recording, Hours	0.0	0.5	1.0	1.5	2.0	2.5	
Deployment length, days	524	418	313	207	101	-4	Calculated from all other data
Transmit Baud Rate, bits/sec	800	800	800	800	800	800	was set at 1200; full range 300-2400
Transmit per hour, kB/hour	360.000	360.000	360.000	360.000	360.000	360.000	calculated from baud rate
Watch cycle (mode)							
Acoustic modem power, W	0.6	0.6	0.6	0.6	0.6	0.6	Standby 40mA at 15V (dvk data)
Acoustic modem duty cycle, %	10%	10%	10%	10%	10%	10%	amount of time the modem is powered
Inertial sensor & microcontroller power, W	0.16	0.16	0.16	0.16	0.16	0.16	Invensense board with sensor without code running, test 3/29/2012, 20mA @ 5V; or Persistor board 160mW
Peripherals power, W	0.04	0.04	0.04	0.04	0.04	0.04	
Peripherals and sensor duty cycle, %	20%	20%	20%	20%	20%	20%	
Watch cycle average power, W	0.100	0.100	0.100	0.100	0.100	0.100	
Duration in mode, hrs	12570.000	10035.450	7500.900	4966.350	2431.800	-102.750	calculated from watch mode energy and power
Watch cycle energy, WHr	1257.0	1003.5	750.1	496.6	243.2	-10.3	calculated from energy budget minus energy on 2 other modes
Recording cycle (mode)							
Acoustic modem power, W	0.6	0.6	0.6	0.6	0.6	0.6	Standby 40mA at 15V (dvk data) do we disable listening in recording mode?
Acoustic modem duty cycle, %	10%	10%	10%	10%	10%	10%	
Inertial sensor & microcontroller power, W	0.4	0.4	0.4	0.4	0.4	0.4	Eventsense board with sensor at full power
Peripherals power, W	0.2	0.2	0.2	0.2	0.2	0.2	Periferals activated
Peripherals and sensor duty cycle, %	100%	100%	100%	100%	100%	100%	
Watch cycle average power, W	0.660	0.660	0.660	0.660	0.660	0.660	
Duration in mode, hrs	0.000	0.500	1.000	1.500	2.000	2.500	
Recording cycle energy, WHr	0.0	0.3	0.7	1.0	1.3	1.7	
Command mode (data transfer)							
Acoustic modem power, W	21	21	21	21	21	21	1A ave, 3A peak, @ 21V; or 1.5 @ 15V; 12-36V range
Acoustic modem duty cycle, %	100%	100%	100%	100%	100%	100%	
Inertial sensor power, W	0.4	0.4	0.4	0.4	0.4	0.4	Eventsense board with sensor
Controller power, W	0.2	0.2	0.2	0.2	0.2	0.2	Periferals activated
Controller and sensor duty cycle, %	100%	100%	100%	100%	100%	100%	
Cycle average power, W	21.600	21.600	21.600	21.600	21.600	21.600	
Duration in mode, hrs	0.139	11.858	23.576	35.295	47.014	58.733	
Data transfer energy, WHr	3.0	256.1	509.3	762.4	1015.5	1268.6	
Deployment Energy budget, WHr	1260.0	1260.0	1260.0	1260.0	1260.0	1260.0	Calculated from cell capacity and number of cells
Number of Alk D cell (12Whr); 1.3V							
LI DD cell capacity (Electrochem CSC93), W*H	90	90	90	90	90	90	
NN of Li DD cells (30AH, 100 WHr nominal @0.25A; tested 26Ah and 87WH at 0.25A, old batteries at 6C); Discharge rate 3.9 to 2.5V	14	14	14	14	14	14	Number of cells fixed by mechanical constrains
Deployment data to be transmitted							
Bytes/data point (event), bytes	24	24	24	24	24	24	3 angle values and 3 acceleration values
Data rate for event recording, 1/sec	100	100	100	100	100	100	
Event data, kB	0.0	4218.8	8437.5	12656.3	16875.0	21093.8	
Bytes/data point for Watch mode recording, bytes	6	6	6	6	6	6	3 angle values; temperature, humidity etc?
Data rate (Watch) 1/Hour	1	1	1	1	1	1	
Watch data total, kB	73.7	58.8	44.0	29.1	14.2	-0.6	
Communication Overhead	50	50	50	50	50	50	Check system status, request low-res data, etc
Data total, kB	50.0	4268.8	8487.5	12706.3	16925.0	21143.8	Sum of event data, watch data, and overhead

