

Spreadsheet		Interfaces on the initial (engineering) MOOS deployment		Copyright © 2002 MBARI
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- Purpose**
1. Reliability of data/power cable & mooring mechanical hardware
 2. Reliability/feasibility of ROV operations in connection to mooring

Items to monitor

1. Loads
2. Visual wear
3. Sea keeping ability
4. Riser strain relief
 - a. length
 - b. connection position
 - c. connection wear
 - d. connection movement
5. Meteorology using M2 or local NOAA

Engr.	Signal Description	Supply voltage & current	Sensor interface	Input Sensor range / units	Desired Precision	Desired Accuracy (% error)	Desired ADC resolution	Software Sample frequency	Log Interval			ADC	ADC Range	ADC Precision	Software Conversion	Log/Display range	Log / Send/Event	Software Channel	Notes
Surface side									min	max	avg								
Ed Mellenger	Power System -- 0.1% accuracy & resolution (desired)																		
Ed Mellenger	Seawater Battery (prototype)																		
Ed Mellenger	Battery Voltage 1 - chemistry type A	n/a	Analog	0 to 2 VDC	1mV	1%	11-bit	1/min	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 2 VDC	Log/Send	ADC via DPA	0 to 1VDC, up to 4 batteries, simple voltage across a resistor
Ed Mellenger	Battery Voltage 2 - chemistry type B	n/a	Analog	0 to 2 VDC	1mV	1%	11-bit	1/min	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 2 VDC	Log/Send	ADC via DPA	0 to 1VDC, up to 4 batteries, simple voltage across a resistor
Ed Mellenger	Battery Voltage 3 - chemistry type C	n/a	Analog	0 to 2 VDC	1mV	1%	11-bit	1/min	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 2 VDC	Log/Send	ADC via DPA	0 to 1VDC, up to 4 batteries, simple voltage across a resistor
Ed Mellenger	Battery Voltage 4 - chemistry type D	n/a	Analog	0 to 2 VDC	1mV	1%	11-bit	1/min	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 2 VDC	Log/Send	ADC via DPA	0 to 1VDC, up to 4 batteries, simple voltage across a resistor
Ed Mellenger	Battery (possibly two battery banks up to 8 batteries)																		
Ed Mellenger	Battery Current 1	n/a	Analog	TBD	7.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	-10 to +20 A	Log/Send	ADC via DPA	Current to voltage measurement
Ed Mellenger	Battery Current 2	n/a	Analog	TBD	7.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	-10 to +20 A	Log/Send	ADC via DPA	Current to voltage measurement - leave if we can
Ed Mellenger	Battery Current 3	n/a	Analog	TBD	7.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	-10 to +20 A	Log/Send	ADC via DPA	Current to voltage measurement - leave if we can
Ed Mellenger	Battery Current 4	n/a	Analog	TBD	7.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	-10 to +20 A	Log/Send	ADC via DPA	Current to voltage measurement - leave if we can
Ed Mellenger	Battery Current 5	n/a	Analog	TBD	7.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	-10 to +20 A	Log/Send	ADC via DPA	Current to voltage measurement - leave if we can
Ed Mellenger	Battery Current 6	n/a	Analog	TBD	7.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	-10 to +20 A	Log/Send	ADC via DPA	Current to voltage measurement - leave if we can
Ed Mellenger	Battery Current 7	n/a	Analog	TBD	7.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	-10 to +20 A	Log/Send	ADC via DPA	Current to voltage measurement - leave if we can
Ed Mellenger	Battery Current 8	n/a	Analog	TBD	7.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	-10 to +20 A	Log/Send	ADC via DPA	Current to voltage measurement - leave if we can
Ed Mellenger	Battery Voltage	n/a	Analog	0 to between 8 & 16 VDC	10mV	0.10%	11-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to between 8 & 16 VDC	Log/Send	ADC via DPA	
Ed Mellenger	Water detection 1	n/a	Digital	0 to +5V	100mV	5%	6-bit	1/sec	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	Is there moisture in the battery case
Ed Mellenger	Water detection 2	n/a	Digital	0 to +5V	100mV	5%	6-bit	1/sec	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	Is there moisture in the battery case
Ed Mellenger	Water detection 3	n/a	Digital	0 to +5V	100mV	5%	6-bit	1/sec	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	Is there moisture in the battery case
Ed Mellenger	Water detection 4	n/a	Digital	0 to +5V	100mV	5%	6-bit	1/sec	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	Is there moisture in the battery case
Ed Mellenger	Water detection 5	n/a	Digital	0 to +5V	100mV	5%	6-bit	1/sec	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	Is there moisture in the battery case
Ed Mellenger	Water detection 6	n/a	Digital	0 to +5V	100mV	5%	6-bit	1/sec	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	Is there moisture in the battery case
Ed Mellenger	Water detection 7	n/a	Digital	0 to +5V	100mV	5%	6-bit	1/sec	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	Is there moisture in the battery case
Ed Mellenger	Water detection 8	n/a	Digital	0 to +5V	100mV	5%	6-bit	1/sec	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	Is there moisture in the battery case
Ed Mellenger	Solar panels (each of four)																		
Ed Mellenger	Array Current North	n/a	Analog	TBD	2.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 10 A	Log/Send	ADC via DPA	Current to voltage measurement
Ed Mellenger	Array Current East	n/a	Analog	TBD	2.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 10 A	Log/Send	ADC via DPA	Current to voltage measurement
Ed Mellenger	Array Current South	n/a	Analog	TBD	2.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 10 A	Log/Send	ADC via DPA	Current to voltage measurement
Ed Mellenger	Array Current West	n/a	Analog	TBD	2.5mA	0.10%	12-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 10 A	Log/Send	ADC via DPA	Current to voltage measurement
Ed Mellenger	Array Voltage North	n/a	Analog	0 to 50 VDC	25mV	0.10%	11-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 50 VDC	Log/Send	ADC via DPA	
Ed Mellenger	Array Voltage East	n/a	Analog	0 to 50 VDC	25mV	0.10%	11-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 50 VDC	Log/Send	ADC via DPA	
Ed Mellenger	Array Voltage South	n/a	Analog	0 to 50 VDC	25mV	0.10%	11-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 50 VDC	Log/Send	ADC via DPA	
Ed Mellenger	Array Voltage West	n/a	Analog	0 to 50 VDC	25mV	0.10%	11-bit	1/sec	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Linear Scale	0 to 50 VDC	Log/Send	ADC via DPA	
Ed Mellenger	Load resistor (lost potential energy)	n/a	Analog	0 to 16 VDC	10mV	0.10%	11-bit	1/sec	1hr	1hr	1hr	12-bit	10V	2.441mV	Linear Scale	0 to 16 VDC	Log/Send	ADC via DPA	simple voltage across a resistor after a 12V zener
Ed Mellenger	Light sensor (PAR or pyrometer)	n/a	Analog or serial?	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	12-bit	10V	2.441mV	TBD	TBD	Log/Send	ADC via DPA	Top mounted Hemispheric light meter (Mike Kelley) (Biospherical or LI-COR) Need wavelength parameters.
Ed Mellenger	Wind Turbine																		
Ed Mellenger	Load resistor (lost potential energy)	n/a	Analog	0 to 16 VDC	10mV	0.10%	11-bit	1/sec	1hr	1hr	1hr	12-bit	10V	2.441mV	Linear Scale	0 to 16 VDC	Log/Send	ADC via DPA	simple voltage across a resistor after a 12V zener
Ed Mellenger	Power Feed (NIMC)																		
Ed Mellenger	Current	n/a	Analog	TBD	2mA	TBD	12-bit	10/sec	1hr	1hr	1hr	12-bit	10V	2.441mV	Linear Scale	0 to 5 A	Log/Send	ADC via DPA	Current to voltage measurement
Ed Mellenger	Cable Feed																		
Ed Mellenger	Cable Current	n/a	Analog	TBD	0.25mA	TBD	12-bit	10/sec	1hr	1hr	1hr	12-bit	10V	2.441mV	Linear Scale	0 to 1 A	Log/Send	ADC via DPA	Current to voltage measurement
Ed Mellenger	Cable Voltage	n/a	Analog	0 to 500 VDC	1V	0.10%	9-bit	10/sec	1hr	1hr	1hr	12-bit	10V	2.441mV	Linear Scale	0 to 500 VDC	Log/Send	ADC via DPA	
Ed Mellenger	Ground fault	n/a	Analog	0 to +5V	5mV	0.10%	10-bit	interrupt	instantaneous	instantaneous	instantaneous	12-bit	10V	2.441mV	Linear Scale	0 to +5V	Log/Send/Event	ADC via DPA	
Ed Mellenger	Environmental (power housing)																		
Ed Mellenger	Pwr Hsq Temp	n/a	Analog	TBD	2c	1%	6-bit	1/min	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	Calib. Lkup Tbl	-25 to +75c	Log/Send	ADC via DPA	
Ed Mellenger	Pwr Hsq Humidity	n/a	Analog	TBD	5%	1%	5-bit	1/min	1 hr	1 hr	1 hr	12-bit	10V	2.441mV	???	0 to 100%	Log/Send	ADC via DPA	
Ed Mellenger	Controller with data storage																		
Ed Mellenger	Pwr Sys Control Functions																		
Ed Mellenger	- Dummy Loads																		
Ed Mellenger	- 1 W	n/a	Digital		n/a	n/a	n/a	1/day?	n/a	n/a	n/a					On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling
Ed Mellenger	- 2 W	n/a	Digital		n/a	n/a	n/a	1/day?	n/a	n/a	n/a					On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling
Ed Mellenger	- 2 W	n/a	Digital		n/a	n/a	n/a	1/day?	n/a	n/a	n/a					On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling
Ed Mellenger	- 5 W	n/a	Digital		n/a	n/a	n/a	1/day?	n/a	n/a	n/a					On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling
Ed Mellenger	- 10 W	n/a	Digital		n/a	n/a	n/a	1/day?	n/a	n/a	n/a					On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling
Ed Mellenger	- 20 W	n/a	Digital		n/a	n/a	n/a	1/day?	n/a	n/a	n/a					On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling
Mark Chaffey	Heave Wave sensor	12-14 VDC @ 45mA	Serial															Serial via DPA	Triaxys
Mark Chaffey	• Spectral Analysis Statistics																		
Mark Chaffey	Significant Wave Height (Hmo)			not specified	not specified	2%	n/a	35 minutes	n/a	n/a	35 minutes					0.000 to 9.999m	Log/Send	n/a	See Triaxys manual
Mark Chaffey	Peak Period (Tp, Tp5)			not specified	not specified	2%	n/a	35 minutes	n/a	n/a	35 minutes					0.000 to 9.999s	Log/Send	n/a	See Triaxys manual
Mark Chaffey	Mean Spectral Period (Tz)			not specified	not specified	2%	n/a	35 minutes	n/a	n/a	35 minutes					see manual	Log/Send	n/a	See Triaxys manual
Mark Chaffey	• Zero Crossing Statistics																		
Mark Chaffey	Significant Wave Height (Hs)			not specified	not specified	2%	n/a	35 minutes	n/a	n/a	35 minutes					0.000 to 9.999m	Log/Send	n/a	See Triaxys manual
Mark Chaffey	Maximum Wave Height (Hmax)			not specified	not specified	2%	n/a	35 minutes	n/a	n/a	35 minutes					0.000 to 9.999m	Log/Send	n/a	See Triaxys manual
Mark Chaffey	Height of Highest 10% of Waves (H10)			not specified	not specified														

Lance McBride	BIN (repeater for power/comms cable monitoring)																																
Lance McBride	Controller																																
Lance McBride	low data-rate communication	5-15VDC @ 300mA	Serial	Link functional/not-functional	n/a	n/a	n/a	1kHz	1hr	1hr	1hr						Link functional/not-functional	Log/Send	Serial via DPA	BER?													
Lance McBride	severed cable detection		Software	Severed/Not-severed	n/a	n/a	n/a	1kHz	1hr	1hr	1hr						Severed/Not-severed	Log/Send	n/a	Software function , monitor top/bottom strain gauge and comm. Ping to correlate time event (implies bottom storage).													
Ed Mellenger	Cable Voltage	n/a	Analog	0 to 500 VDC	1V	0.10%	9-bit	10/sec	1hr	1hr	1hr	12-bit	10V	2.441mV	Linear Scale	0 to 500 VDC	Log/Send	ADC via DPA	Not there for August deployment (requires further discussion)														
Ed Mellenger	- Dummy Loads																																
Ed Mellenger	- 1 W	n/a	Digital	n/a	n/a	n/a	n/a	1/day?	n/a	n/a	n/a						On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling													
Ed Mellenger	- 2 W	n/a	Digital	n/a	n/a	n/a	n/a	1/day?	n/a	n/a	n/a						On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling													
Ed Mellenger	- 2 W	n/a	Digital	n/a	n/a	n/a	n/a	1/day?	n/a	n/a	n/a						On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling													
Ed Mellenger	- 5 W	n/a	Digital	n/a	n/a	n/a	n/a	1/day?	n/a	n/a	n/a						On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling													
Ed Mellenger	- 10 W	n/a	Digital	n/a	n/a	n/a	n/a	1/day?	n/a	n/a	n/a						On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling													
Ed Mellenger	- 20 W	n/a	Digital	n/a	n/a	n/a	n/a	1/day?	n/a	n/a	n/a						On/Off	Log/Send	DIO via DPA	Switches a dummy load resistor in for power consumption modeling													
Lance McBride	SideKick																																
Lance McBride	ground fault	n/a	Digital	0 or +5V	n/a	n/a	n/a	interrupt	instantaneous	instantaneous	instantaneous						0 or +5V	Log/Send	Sidekick														
Lance McBride	moisture detection	n/a	Digital	0 or +5V	n/a	n/a	n/a	interrupt	instantaneous	instantaneous	instantaneous						0 or +5V	Log/Send	Sidekick														
		Total Analog	33			Maximum Resolution		12-bit																									
		Total Digital	24																														
		Total Serial	7																														