



BATTERY & ENERGY PRODUCTS
FROM ULTRALIFE

***ULTRA*LiFE[®]**

SUBSEA & OCEANOGRAPHIC

POWER SOLUTIONS FOR UNDERWATER VEHICLES AND SUBSEA EQUIPMENT



FIVE BATTERY VARIATIONS DESIGNED TO SERVE A WEALTH OF NEEDS

DESIGNED TO WITHSTAND THE HARSH CONDITIONS OF SUBSEA

PRESSURE TOLERANT UP TO 6,000M DEPTH

SWE SeaSafe® Smart Subsea Battery Modules are designed to be autonomous (self-sufficient), easy-to-use battery system building blocks specifically developed for subsea vehicles, oceanographic systems, and deep-sea oil and gas infrastructure. Most modules consist of pressure tolerant, high performance Li-Polymer cells, a SWE Battery Management System (BMS) with patented safety protection and current path boosters, a thermally potted enclosure, and connectors for power and communications. The modules have a proven record of delivering longer life and longer missions than lead acid batteries.



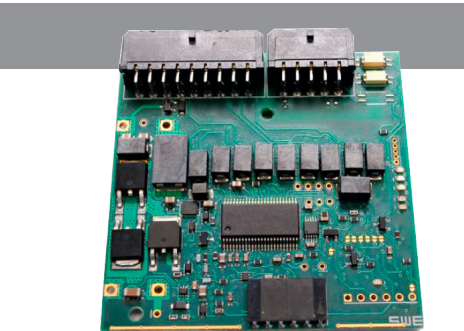
Higher Performance

- 4X Longer Run Time Endurance (vs SLA)
- 100% Condition Based Monitoring
- High Current, High Power Versions



Lower Risk

- ABS Certified & 2nd Generation Learned
- 6000M Pressure Tolerant Tested
- UN 38.3 Certified and Safety Tested
- ISO 9001 Quality Manufactured
 - [Electronic Test Datasheets](#)



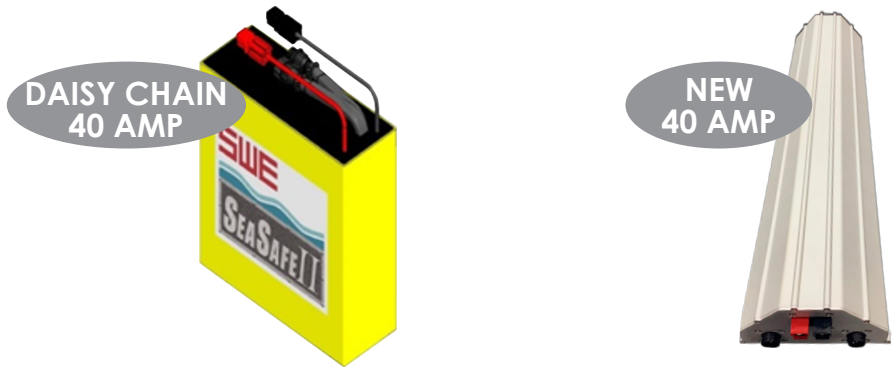
Patented Battery Management System

- Automatic Cell Balancing
- Automatic Module-to-Module Balancing
- Continuous, Redundant Safety Protection
- Ability to Balance High Capacity Packs
- Subsea Application Proven

THE FULL PRODUCT LINE-UP



USE DIRECT IN WATER



USE IN PBOF CASE

USE IN 1 ATM PV

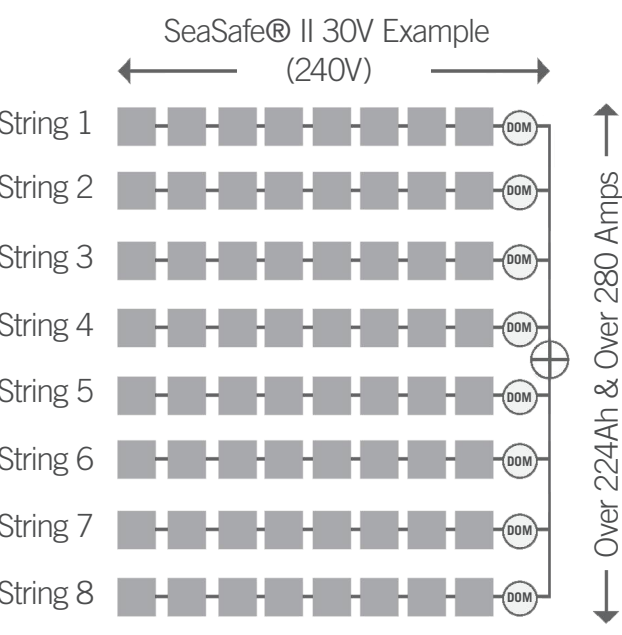
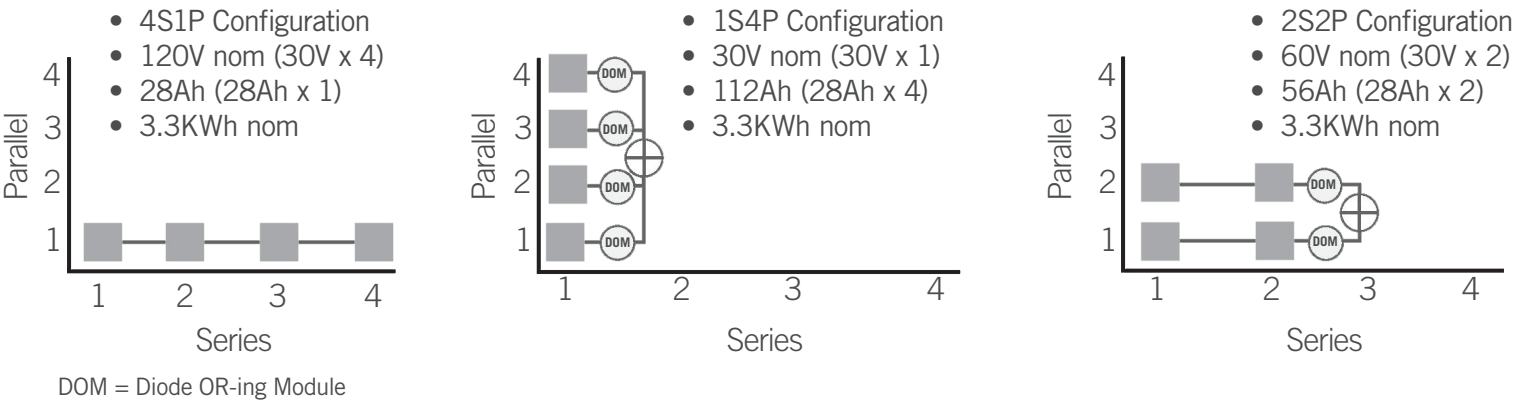
- 24V, 30V and 37V Versions
- Battery System Sizing Flexibility
 - Connect in Series - System Voltage Increments
 - Connect in Parallel - System Endurance Capacity or Power Increments
- Three Versions for Best Battery Application Fit
 - Direct in Water - Pressure Tolerant - SeaSafe® Direct
 - In Oil Filled Case - Pressure Tolerant - SeaSafe® II
 - In Pressure Vessel - 1 Atmosphere - SeaSafe® Endurance

POWER SOLUTIONS FOR UNDERWATER VEHICLES AND SUBSEA EQUIPMENT

SWE SeaSafe® - Smart Subsea Battery Modules																PRELIMINARY		
SPEC	FEATURE	UNIT		SeaSafe® II - Daisy Chain			SeaSafe® Direct			SeaSafe® Direct - 40 Amp			SeaSafe® Direct - Low Profile			SeaSafe® Endurance		
																		
USE CASE	PRESSURE TOLERANT		<6,000M	YES			YES			YES			YES			NO		
	IN CASE, DIRECT, OR PV			USE IN PBOF CASE IN OIL			USE DIRECT IN WATER			USE DIRECT IN WATER			USE DIRECT IN WATER			USE IN 1 ATM PV		
MODULE SIZE				24V	30V	37V	24V	30V	37V	24V	30V	37V	24V	30V	37V	24V	30V	37V
PART NUMBER		Main		46792428	46793028	46793728	46792428	46793028	46793728	46792428	46793028	46793728	46792428	46793028	46793728	39792447	39793047	39793747
		Ext		.3412			.3402			.3442			.3405			.3352		
CELLS IN SERIES				7	8	10	7	8	10	7	8	10	7	8	10	7	8	10
VOLTAGE	OCV	VDC	NOM	25.9	29.6	37.0	25.9	29.6	37.0	25.9	29.6	37.0	25.9	29.6	37.0	25.9	29.6	37.0
	OCV @ 93% SOC	VDC	MAX	28.6	32.7	40.9	28.6	32.7	40.9	28.6	32.7	40.9	28.6	32.7	40.9	28.7	32.8	41.0
	OCV	VDC	MIN	21.0	24.0	30.0	21.0	24.0	30.0	21.0	24.0	30.0	21.0	24.0	30.0	21.0	24.0	30.0
CURRENT	DISCHARGE (CONTINUOUS)	A	MAX	40			10			40			20			40		
	DISCHARGE (60 usec)	A	MAX	90			54			90			54			90		
	CHARGE	A	MAX	40			10			40			20			40		
POWER	DISCHARGE (CONTINUOUS)	W	MAX	1036	1184	1480	259	296	370	1036	1184	1480	518	592	740	1036	1184	1480
CAPACITY	93% SOC	Ah	NOM	28			28			28			28			47		
	100% SOC	Ah	NOM	30			30			30			30			52		
	93% SOC	Wh	NOM	725	829	1036	725	829	1036	725	829	1036	725	829	1036	1217	1391	1739
	100% SOC	Wh	NOM	777	888	1110	777	888	1110	777	888	1110	777	888	1110	1347	1539	1924
TEMPERATURE	DISCHARGE	°C		-20 to +60			-20 to +60			-20 to +60			-20 to +60			-20 to +60		
		°F		-4 to +140			-4 to +140			-4 to +140			-4 to +140			-4 to +140		
	CHARGE	°C		0 to +45			0 to +45			0 to +45			0 to +45			0 to +45		
		°F		+32 to +113			+32 to +113			+32 to +113			+32 to +113			+32 to +113		
DIMENSIONS	HEIGHT		NOM	10in (254mm)			10in (254mm)			10in (254mm)			10in (254mm)			2.8in (71mm)		
	LENGTH		NOM	8in (203mm)			8in (203mm)			8in (203mm)			8in (203mm)			Varies by Configuration (Contact Us)		
	WIDTH		NOM	2.9in (74mm)		3.2in (81mm)	2.9in (74mm)		3.2in (81mm)	2.9in (74mm)		3.2in (81mm)	2.9in (74mm)		3.2in (81mm)	5.6in (142mm)		
WEIGHT		lbs	+/- 0.2lbs	15.6	16.2	17.3	15.8	16.3	17.4	15.8	16.3	17.4	15.4	15.9	17.0	17.7	20.2	25.3
		kg	+/- 0.1kg	7.1	7.3	7.8	7.1	7.4	7.9	7.1	7.4	7.9	7.0	7.2	7.7	8.0	9.2	11.5
ENERGY DENSITY	VOLUMETRIC	Wh/l	100% SOC	205	233	265	205	234	265	205	234	265	205	234	265	250	256	266
	GRAVIMETRIC	Wh/kg	100% SOC	110	121	149	109	120	142	109	120	142	112	123	144	168		

CONFIGURATIONS AND FEATURES FOR A WIDE VARIETY OF APPLICATIONS

SAFE, RELIABLE AND COST-EFFECTIVE POWER - FAILURE IS NOT AN OPTION!



Features	Benefits				
Continuous, Redundant, Safety Protection	AUTOMATIC SAFETY	RELIABILITY, AVAILABILITY	COTS-CTO-FLEXIBILITY		
Automatic, Configurable Charge Control					
Three Types of Balancing					
SOC/SOH Gas Gauge					
Hassle Free Module Replacement					
Modularity = V, Ah Choice & Redundancy					

CHOOSE YOUR PREFERRED SEASAFE BATTERY FOR YOUR APPLICATION					
	AUV/UV	MUV	ROV	OIL & GAS	OCEANOGRAPHY
SeaSafe® II	●	●		●	●
SeaSafe® Direct	●	●	●		●
SeaSafe® Direct (40 amp)	●		●	●	
SeaSafe® Direct (Low profile)	●	●	●	●	●
SeaSafe® Endurance	●			●	●

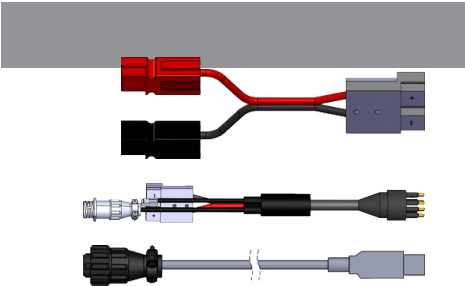
CHARGERS AND ACCESSORIES TO COMPLEMENT THE BATTERIES

ALSO DESIGNED TO WITHSTAND THE HARSH CONDITIONS OF SUBSEA



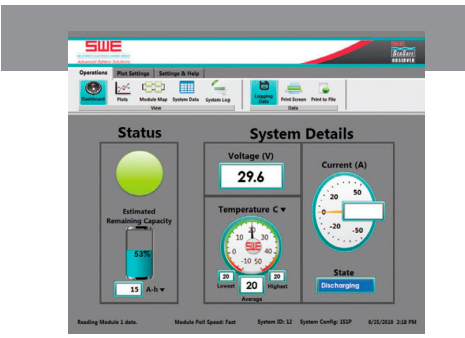
SWE SeaSafe® 24V Battery Module Charger

- **Ease-of-use**
- **Harnesses available that mate with each battery model**
- **Connect it and forget it**
- **Monitor battery charge status using SeaSafe Observer® Software**



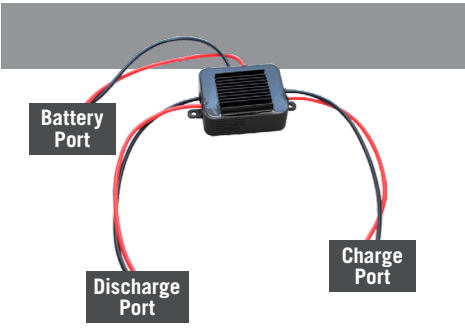
SWE SeaSafe® Charger Cables

- **Power connection from charger to battery**
- **Y cable from SeaSafe® Direct to charger and comms**
- **Comms cable from battery to PC USB**



SWE SeaSafe Observer® Support Software

- **Graphical user interface**
- **Voltage**
- **Capacity**
- **Current**
- **Temperature**
- **Status, State of Health**
- **Data logging on CSV file**



SWE SeaSafe® Diode OR-ing Module (DOM)

- **Parallel connects module strings into a battery system**
- **Parallel integrates module string outputs into a single discharge bus**
- **Enables increased current and capacity via. SeaSafe® Battery Modules in parallel**
- **Electrically isolates module string charge ports**
- **Provides additional battery safety and reliability, with potential for faster charge times**
- **Supports high voltage – up to 600V Battery System**



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