

November 15th 2010

Monterey Bay Aquarium Research Institute
7700 Sandholdt Road, Moss Landing
CA 95039-9644, USA

For the attention of: Hans Thomas
Quote for new product development - 28.8V Battery

Dear Hans,

Many thanks for your enquiry; Inspired Energy is pleased to quote prices and terms of sale for the following products.

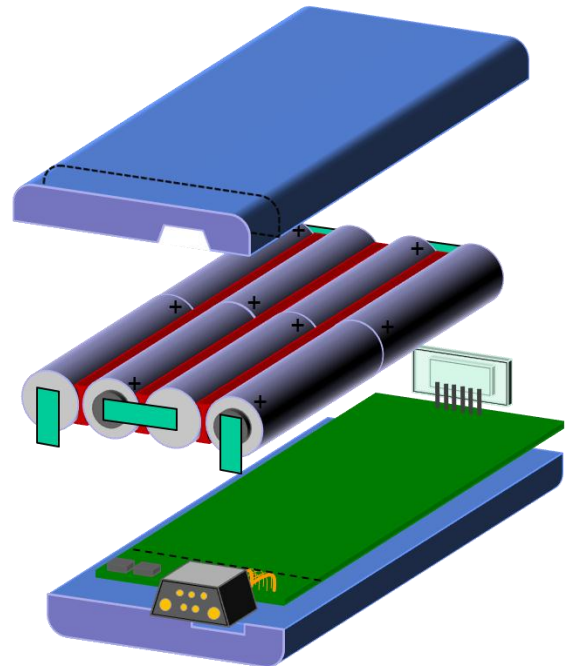
Outline Scope Of Work:

Inspired Energy shall design, develop, tool and manufacture a battery pack with the following general specifications:

- Vmax = 33.6V
- Vnom = 28.8V
- Vmin = 16.0V
- Case material Sabic EXL 9112 Polycarbonate (UL94V-0)
- Mating Connector: Amphenol L177TWA7W2PMP3SVC745
- Cell Used: Li ion 18650 2.9Ah
- Approximate battery dimensions: 25mm thick x 165mm long x 82mm wide (not including the connector)
- Peak current = 4A
- Nom Capacity = 2.9Ah
- Pack Energy = 83.5Wh

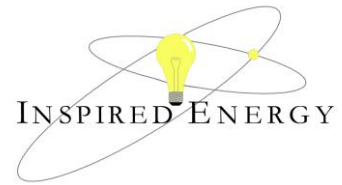
Outline sketch of the proposed battery pack:

- 8 cells in series with each cell separated by a physical insulator in addition to the cell sleeving.
- passive and active electronic safety protection
- an on-board fuel gauge circuit with SMBus battery communications and an LCD on-board visual fuel gauge
- FETS are located at the front of the board & the case top has an internal wall separating the main board components from the cell array & aiding heat dissipation.
- Voltage taps made directly into the board which lies immediately below the cells. This requires a larger-than-normal board & contributes to battery pack thickness, but creates a much stronger, more reliable & robust product.
- Compliant to SMBus Specification rev1.0 or higher, and Smart Battery Data specification rev1.0 or higher
- Designed to pass IEC62133 2010 revision. (Not tested to this standard)
- Tested to current FCC & CE emissions & immunity requirements
- Tested to the UN/DOT transportation requirements
- Provision for a battery enable / disable signal line on one of the unused connector pins. Note - this may not be suitable for external high-frequency switching of the FETs due to thermal limitations, therefore it may not be possible to use this as a PWM-form of speed controller.



Development Notes:

The battery described above would serve its purpose in the MBARI application. It would also represent a potential addition to the Inspired Energy range of standard products. Accordingly we would like to propose to share the development costs. At the conclusion of the development, MBARI would have a battery to suit your needs & Inspired Energy would have a new standard product to add to our existing portfolio. The version purchased by MBARI could still be custom labeled & if required, we could install firmware locks to prevent the



standard Inspired Energy version being used in your application. In this way you could gain the benefits of a custom battery unique to your application, but with greatly reduced development costs.

The production pricing shown below is for a standard battery with a standard label without firmware locks etc. If you prefer we could increase the piece-price slightly & use a custom MBARI label & modify the firmware to implement a lock. If needed, please contact me for a quote for NREs & piece-pricing.

Development Timing:

The latest impedance-tracking fuel gauge chips represent the current state of the art for this type of product. Their use enables more accurate fuel gauging, & minimizes the need for fuel gauge recalibration as the battery pack ages. It also enables the use of secondary electronic protection & upgrades the system compatibility to SMBus rev 1.1 & SBDS rev1.1. The advantages of this new technology are such that Inspired Energy has deployed it across all our current standard products.

Unfortunately these chips are not yet available in versions which can accommodate 8 cells in series. Texas Instruments have plans to expand their range of impedance tracking products to allow their use in 8-series applications, early in 2011 - but as with all development programs their introduction date may be subject to change.

If your needs are immediate, we would need to develop & tool the battery using the older generation colomb-counting chips, with the objective to upgrade the product to the better performing impedance tracking product when they become available. If we were to follow this track, Inspired Energy would tool the new board, ATE test pan & paste stencil, and we would share the development costs to re-design the circuit & re-layout the board.

The cost to MBARI for this would be a total of 30 hrs @ \$120/hr = \$1,800

If we have time to hold on until the new chips are available we can skip this interim step & design the product with the impedance tracking chips right from the outset.

Mating Connection:



The battery may be plugged into a fixed installation by using the Amphenol right angle PCB mount connector.

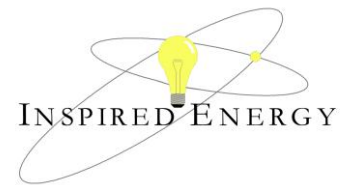
- Amphenol Part Number: L177TWA7W2PMP3SVC745
- Inspired Energy Part Number: 619017

Alternatively a straight male mating D-sub connector may be used with wires soldered to the connector pins. This installation will require the use of mounting nuts & bolts to fix the connector to your panel.

- Amphenol Part Numbers: 1 x L177TWA7W2P (chassis) + 2 x L17DM53745-1 (pins)
- Inspired Energy Part Number: 699013 (kit of parts)



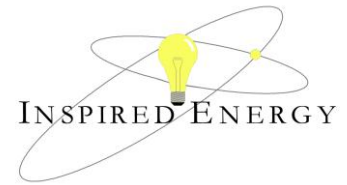
The battery may be converted to provide output via flying leads by the use of the Flying Lead kit: Inspired Energy Part number 699014. This consists of the straight connector with solder pins, a metal backshell enclosure kit (which comes with a variety of strain relief grommets & the thumbscrews for secure mounting) and two replacement mounting nuts which are used to enable the flying leads to be secured to the battery pack.



Non Recurring Expenses - including shared Development costs:

Electrical NRE:	Qty		Rate	Total	MBARI Share %	MBARI Share \$
Schematic Design	12	hrs	\$120	\$1,440	50%	\$720
PCB Layout Design	30	hrs	\$120	\$3,600	50%	\$1,800
IE Firmware Modification	5	hrs	\$120	\$600	50%	\$300
Design Validation	16	hrs	\$120	\$1,920	50%	\$960
Mechanical Modeling	2	hrs	\$120	\$240	50%	\$120
Pick & Place machine setup	2	hrs	\$120	\$240	50%	\$120
ATE Programming	2	hrs	\$120	\$240	50%	\$120
Paste Stencil(s)	1	@	\$760	\$760	0%	\$0
ATE Fixtures	1	@	\$970	\$970	0%	\$0
Circuit board Production Tooling	1	@	\$1,760	\$1,760	0%	\$0
Electrical NRE sub-total				\$11,770		\$4,140
Mechanical NRE:						
Plastics Design	32	hrs	\$120	\$3,840	50%	\$1,920
Ultrasonics Design	4	hrs	\$120	\$480	50%	\$240
Interconnect Design	4	hrs	\$120	\$480	50%	\$240
Component Specification	2	hrs	\$120	\$240	50%	\$120
Design Validation	2	hrs	\$120	\$240	50%	\$120
Mechanical Modeling	8	hrs	\$120	\$960	50%	\$480
Assembly drawing package	3	hrs	\$120	\$360	50%	\$180
Specification creation	4	hrs	\$120	\$480	50%	\$240
Ultrasonic Horn Tooling	1	@	\$1,500	\$1,500	0%	\$0
Ultrasonic Converter & Booster	1	@	\$2,000	\$2,000	0%	\$0
Plastics Tooling	1	@	\$7,500	\$7,500	0%	\$0
Custom label tooling	1	@	\$750	\$750	100%	\$750
Label die tooling	1	@	\$400	\$400	0%	\$0
Mechanical NRE Total				\$19,230		\$4,290
Production NRE:						
Assembly jigs & fixtures	1	@	\$100	\$100	50%	\$50
Pack calibration stations	25	@	\$16	\$400	50%	\$200
Final test station	1	@	\$150	\$150	50%	\$75
Go-no-Go Gauge	1	@	\$250	\$250	50%	\$125
Production NRE Total				\$900		\$450
Certification NRE:						
UN/DOT Transportation Testing (Mandatory)				\$8,500	50%	\$4,250
Samples for UN/DOT	24	@	\$129.81	\$3,115.36	50%	\$1,558
CE & FCC Emissions & Immunity Testing (recommended)				\$8,000	50%	\$4,000
Samples for CE & FCC	5	@	\$129.81	\$649.03	50%	\$325
Certification Testing Total				\$20,264		\$10,132
TOTAL				\$52,164		\$19,012

If you need battery packs immediately, before TI release their new 8-cell chips we will need to introduce the product using the Microchip PIC14000 & then re-tool to use the new TI chip when it becomes available. The cost to MBARI for this additional step is **\$1,800**



Production Pricing:

P.O. Quantity	1-11	12-23	24-71	72-239	240-999	1K-4,999	5K-9,999
Price per battery	\$162.43	\$137.76	\$123.71	\$114.04	\$105.56	\$99.16	\$96.23

Mating Connectors		1-499	500+
619017	"P" charger Connector - Right-Angle, PC mount	\$10.00	\$7.00
699013	Straight "P" Connector for Flying lead	\$9.00	\$7.00
699012	Backshell <u>Required</u> for 699013	\$9.00	\$7.00
699015	Replacement mounting nuts (each)	\$0.50	\$0.40
699014	699012+13+15 flying lead mating connector kit	\$18.50	\$14.40

The volume breaks on this quote are based on purchase order volumes. We welcome non-cancelable blanket purchase orders with multiple releases up to nine months in advance, as this enables us to schedule our manufacturing facility, advance-purchase the components at lower prices and to pass on the savings to you.

All Inspired Energy products are designed and built by Inspired Energy at our facility in Florida USA.

Lead times do vary depending on the current component availabilities at the time of the order and the size of your initial release. The lead-time estimates given are from receipt of order to the shipment of the initial release quantity & are valid at the time of quotation.

Shipping Terms: Ex-Works Newberry FL USA

Payment Terms: **NRE:** 50% In advance, 50% due on receipt of the initial samples

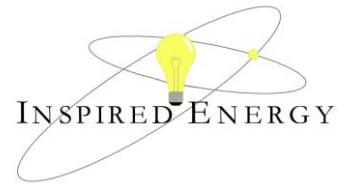
Production: 1% 10 Net 30 upon establishment of trade credit

We recognize that even the best plans may change and whenever possible, Inspired Energy will attempt to accommodate changes to orders. If this is not possible, order delivery schedule changes will be allowed according to the following limits:

- Order changes will not be accepted within **4 weeks** of the scheduled ship date.
- Push-outs up to **10 weeks** must be requested in writing at least **4 weeks** before the scheduled ship date.
- More than two push-outs of a single line-item order shall be deemed to be an order cancellation.
- A push-out more than **10 weeks** from the original scheduled ship date shall be deemed to be a cancellation.
- Cancellation charges, detailed below, will apply to any order or part thereof canceled.
- Upon receipt of a cancellation order, IE will provide a summary detailing the quantities of finished goods, sub-assemblies and components subject to cancellation charges..
- Any items not disposed of by the customer, 60 days after cancellation shall be disposed of by IE.
- All products are built to order & date coded on the date of packing/shipping. The product warranty is based on this date code. Any push-out or other shipping delay after the product has been date-coded, reduces the effective warranty on your product.

Item	Cancellation Action
Finished Goods - Custom Batteries	Invoice at full price. Disposal at customer's discretion.
Finished Goods - Circuit Boards	Invoice at full price. Disposal at customer's discretion.
Completed Custom Sub-Assemblies	Invoice at cost + 40%. Disposal at customer's discretion.
Unique Components	Invoice at cost + 40%. Disposal at customer's discretion.
Completed Standard Sub-Assemblies	15% re-stocking / inventory holding / handling charge
Common Components	15% re-stocking / inventory holding / handling charge

This quotation is valid for thirty (30) days from the date issued, and if not accepted in writing within this time, shall be void and of no effect. This quotation is subject to the Standard Conditions of Sale Inspired Energy available at www.inspiredenergy.com. This quotation applies to the full quantity of the above items purchased by you and ordered for delivery during the above delivery period. Inspired Energy is not responsible for performance or availability changes made by cell or component manufacturers.



Inspired Energy products are fully warranted against manufacturing defects based on our published specifications. Inspired Energy makes no claim of suitability for use in any customer-specific application. It is the responsibility of the device manufacturer to determine and confirm the suitability of these products for use in the device manufacturer's products, applications and markets under all operational conditions.

This quotation does not include any rights to any firmware, software or other intellectual property presently owned by Inspired Energy. All ownership rights to such intellectual property are and remain the sole property of Inspired Energy. Any software and firmware included in the product may not be reverse engineered, decompiled, disassembled, copied used or distributed at any time without prior written permission from Inspired Energy.

Please accept our thanks for considering an Inspired Energy product. If there are any questions concerning this quotation, or if you have any feedback regarding Inspired Energy's products or services, please don't hesitate to contact us.

Yours sincerely,

The Inspired Energy Sales Team:

Ann Hall
Customer Service

Dave Baggaley / Lex Jacobs / Dave Hellriegel
Technical Sales