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Batteries**

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# Ballard Launches New Outdoor Hydrogen Fuel Cell Solutions for Telecom Backup Power Market

Ballard Power Systems has announced the launch of a standardized fuel cell backup power cabinet solution suitable for outdoor deployment as part of the ElectraGen™ product portfolio for telecom network operators. The new outdoor enclosures are designed to accommodate Ballard's direct hydrogen backup power systems, and feature modular construction and options enabling customization.

"We continue to expand our portfolio of telecom backup power solutions in response to growing market demand," said Tony Cochrane, Ballard Director – Product Management, Telecom Backup Power. "The flexibility of this new outdoor modular power solution, using direct hydrogen fuel, further increases the range of applications in which we can offer unique advantages to telecom operators."

Ballard's new outdoor enclosure is available in two versions, standard and compact. This new enclosure features flat-pack construction, enabling on-site assembly, and permits customizable configuration of Ballard's ElectraGen™ -H2 direct hydrogen fuel cell backup power system. In addition, the standard cabinet includes an optional cold weather kit allowing operation in temperatures to -40 degrees.

ElectraGen™ -H2 system features include:

- Customizable power output; up to 10kW in the standard cabinet, and up to 5kW in the compact cabinet
- Battery-free bridging energy available through the use of ultracaps
- Fully integrated power management
- Extended duration runtime
- Simplified plug and play integration
- Small footprint
- Zero emissions
- Attractive lifecycle cost compared to incumbent solutions

The ElectraGen™ -H2 system and new outdoor enclosure are developed, manufactured and distributed by Ballard's backup power subsidiary, Dantherm Power based in Denmark.

Today's launch of an integrated outdoor solution for telecom backup power is further evidence of Ballard's fuel cell product leadership, underpinned by acknowledged excellence in technology and validated by a growing base of commercial customers and systems.

The new outdoor ElectraGen™ -H2 backup power solution will be on display at "Intelec 2013" ([www.intelec2013.org](http://www.intelec2013.org)) in Hamburg, Germany, October 14-17. For more information please visit [www.ballard.com](http://www.ballard.com).

Ballard also offers ElectraGen™ - ME methanol-fuelled systems designed for high reliability, long life and minimal preventive maintenance. They include a fuel reformer that converts HydroPlus™ (a methanol-water liquid fuel mixture) into hydrogen gas to power the fuel cell.



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• Lightweight, 4 x 7 inch 19.4 oz unit allows logging in limited space

• Harmonic especially compliant with IEC 61000-4-7 2002

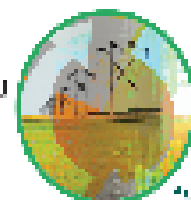
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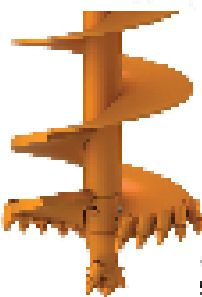
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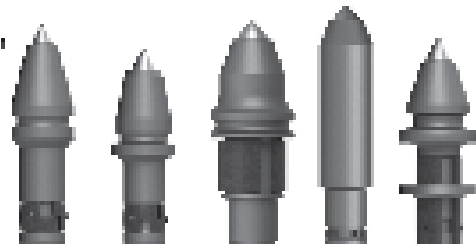
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Two in a row white enclosure



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### ElectraGen™ H2 Outdoor Enclosure

Ballard's new outdoor ElectraGen™ H2 enclosure is the modular solution that can be fully customized for customers' specific application requirements. Incorporating the 1.7kW or 3kW stack-mountable fuel cell modules, this outdoor enclosure offers reliable power for outdoor telecom applications. The cabinet comes in both standard and compact versions and houses a variety of system configurations including battery-free operation and optional cold weather or anti-icing protection.

Ballard Energy provides more complete fixed hydrogen-based power solutions designed for telecom and related networks applications. ElectraGen H2 systems are durable, reliable, quiet, economical and have been deployed worldwide for critical backup power applications.

#### FEATURES

- Scalable up to 10kW
- Flat back construction – allows for on-site assembly
- Standard and compact versions available
- Optional cold weather kit – enables operation down to -40°C
- Small footprint
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- Single 30" track
- AC, DC and signal line exit cabinets for 7G unions
- Total base energy storage in the system – optional

Please contact us for product availability and pricing.



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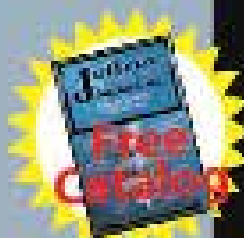
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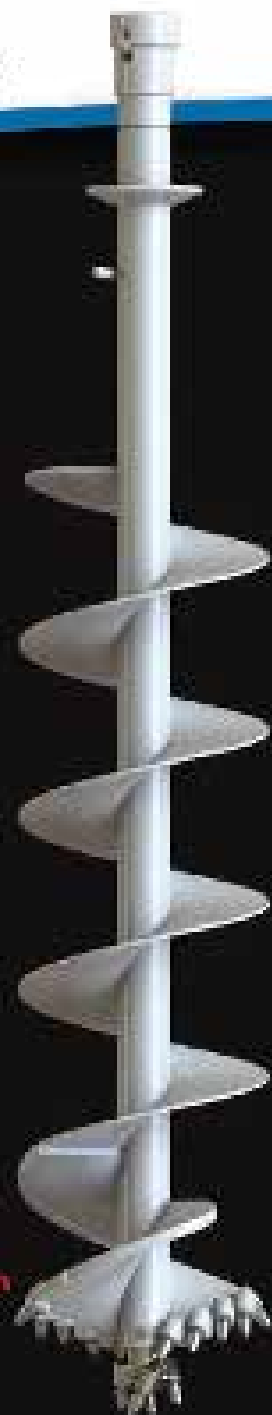
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**PRODUCT SPECIFICATIONS**

		Standard Unit (kW)	Compact Unit (kW)
Voltage	AC Voltage	208V/240V	208V/240V
	AC Voltage Range	180V-260V	180V-260V
Voltage	DC Voltage	48Vdc	48Vdc
	DC Voltage Range	47Vdc-49Vdc	47Vdc-49Vdc
Power	AC Power (kW)	1.0kW/1.5kW/2.0kW	1.0kW/1.5kW/2.0kW
	AC Power (kW) Range	0.5kW-2.5kW	0.5kW-2.5kW
Temperature	Operating Temperature	20°C to 40°C (68°F to 104°F)	20°C to 40°C (68°F to 104°F)
	Storage Temperature	-20°C to 60°C (-4°F to 140°F)	-20°C to 60°C (-4°F to 140°F)
Humidity	Operating Humidity	10% to 90% (non-condensing)	10% to 90% (non-condensing)
	Storage Humidity	5% to 95% (non-condensing)	5% to 95% (non-condensing)
Air Flow	Operating Air Flow	1.0m³/min (35.3ft³/min)	1.0m³/min (35.3ft³/min)
	Storage Air Flow	0.5m³/min (17.7ft³/min)	0.5m³/min (17.7ft³/min)
Dimensions	Standard Unit (mm)	400 x 400 x 150 mm	400 x 400 x 150 mm
	Compact Unit (mm)	300 x 300 x 100 mm	300 x 300 x 100 mm
Weight	Standard Unit (kg)	2.5kg (5.5lb)	2.5kg (5.5lb)
	Compact Unit (kg)	1.5kg (3.3lb)	1.5kg (3.3lb)
Material	Standard Unit	Aluminum	Aluminum
	Compact Unit	Aluminum	Aluminum
Fuel	Standard Unit	Hydrogen	Hydrogen
	Compact Unit	Hydrogen	Hydrogen
Fuel Flow	Standard Unit (l/min)	0.15 l/min (0.04 gpm)	0.15 l/min (0.04 gpm)
	Compact Unit (l/min)	0.15 l/min (0.04 gpm)	0.15 l/min (0.04 gpm)
Connections	Standard Unit	1/2" NPT	1/2" NPT
	Compact Unit	1/2" NPT	1/2" NPT
Certification	Standard Unit	UL 1004	UL 1004
	Compact Unit	UL 1004	UL 1004
Other	Standard Unit	1.0kW/1.5kW/2.0kW	1.0kW/1.5kW/2.0kW
	Compact Unit	1.0kW/1.5kW/2.0kW	1.0kW/1.5kW/2.0kW



Ballard Power Systems, Inc. is recognized as a world leader in the design, development, manufacture and production of high efficiency fuel cells for the Dantherm<sup>®</sup> family of backup power products. Power cells are complex devices which require a high level of expertise. Visit us at [www.ballard.com](http://www.ballard.com) for more information.

Learn more about fuel cells and more contact us at [www.ballard.com](http://www.ballard.com) or call (877) 817-7464.

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# CertainTeed Teams Up with Penn State University to Drive Training in Contemporary Solar Roofing Technologies



CertainTeed Corporation has partnered with Penn State University in the construction of a solar power training facility. The project is the second phase of the groundbreaking, new smart energy campus GridSTAR Center at The Navy Yard in Philadelphia. Functionally designed with input from CertainTeed, the building will showcase the manufacturer's line of innovative solar roofing products and provide an outlet for training students and building professionals in contemporary solar roofing system installation.

“This facility will provide real-life solar installation training on a variety of solar products including our Apollo II and Solstice

systems,” says Mark Stancroff, director of CertainTeed Solar. “And, since it's located right in our back yard, it offers us an opportunity to display our photovoltaic roofing products to potential customers while helping increase the awareness and acceptance of solar energy in the residential building field. We are delighted to be a part of this project.”

The steep-slope portion of the facility's roof will feature a 2-kilowatt Apollo II™ solar roofing system integrated among Landmark Solaris™ Gold premium designer shingles in Max Def Weathered Wood and a 2-kilowatt Solstice® rack-mounted solar roofing system. The GridSTAR Center also features a

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net zero energy demonstration home with Landmark Solaris shingles and a host of other exterior and interior CertainTeed building products.

Solar Grid Storage, a developer of solar energy storage technology for backup power also partnering with Penn State on the project applauds the forward-thinking contributions of materials and technical expertise from CertainTeed and other manufacturer partners.

“This project really is a great partnership between industry, new technology and academia,” says Don Bradley, senior vice president of business development at Solar Grid Storage. “It’s through these efforts that contemporary technologies deployed at the GridSTAR Center will eventually become mainstream.”

Expected to be completed by the end of this summer, the GridSTAR Center will serve as a valuable hub for workforce training, building performance testing, energy management research and “smart” microgrid modernization deployments. For more information, visit [www.gridstarcenter.org](http://www.gridstarcenter.org).

The Apollo II system features high-performance 54-watt monocrystalline photovoltaic panels designed to integrate discreetly into standard shingled roofs, unlike rack-mounted solar roofing systems. The panels are lightweight, durable, resistant to wind uplift, and can easily be integrated into either an existing roof or installed as part of a new roof. Apollo II’s low-profile design does not require structural reinforcement or evaluation, and the sleek black frame, cells and backsheet visually blend with surrounding shingles. The system also features an open space under the modules to allow for easier electrical wiring. Features such as water channels and raised fastener locations further improve roof deck integrity.

Solstice is a rack-mounted solar roofing system featuring highly efficient, monocrystalline photovoltaic panels. The

system’s modules are attractive, durable, and can easily be installed onto either a low-slope or steep-slope roof. Solstice is also backed by CertainTeed’s electricity output and installation workmanship warranty – one of the most comprehensive in the industry. The system showcases an aesthetically pleasing style with black cells laminated to a black back sheet and a black mounting frame and is available in AC and DC versions. All CertainTeed solar roofing systems are eligible for state rebates and incentives listed at [www.dsireusa.org](http://www.dsireusa.org). Additional incentives may also be available through local utility providers. For more information, visit [www.certainteedsolar.com](http://www.certainteedsolar.com).

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# Trojan Battery Ships New 2-Volt Industrial Line Batteries

## *New Battery Design Enhances Transport and Installation*

Trojan Battery Co., the world's leading manufacturer of deep-cycle batteries, is now shipping its new 2-volt Industrial batteries. The latest deep-cycle battery additions for renewable energy and backup power applications include two new sizes, and feature a unique design making transport and installation of the batteries easier for a variety of solar applications.

"As installations of off-grid solar applications for applications such as off-grid telecom networks, micro grids, island and rural electrification and backup power increase worldwide, so will the need for reliable, deep-cycle batteries for energy storage," said Bryan Godber, Trojan executive vice president of renewable energy. "To address this demand, Trojan continues to put its more than 85 years of battery expertise to work developing innovative battery technologies to effectively meet the growing

need for reliable access to power around the world."

The new Industrial batteries include the IND27-2V model featuring a 1457Ah capacity at C20, and the IND33-2V version that offers a 1794 Ah capacity at C20. Trojan also includes a 4/O cable and hardware with each of its Industrial batteries for series connections. These Industrial battery cables provide the link between the batteries, equipment and charging system.

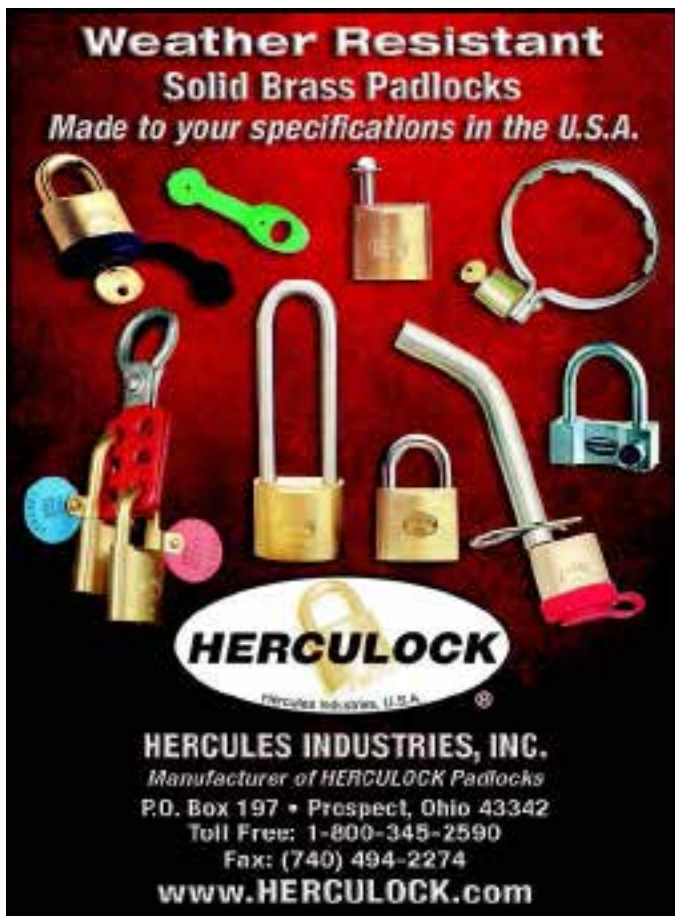
To enhance safety, the new Industrial batteries also feature customizable terminal protectors which increase protection against shock or short circuiting and terminal corrosion. The protectors feature perforated cut-outs along the sides and top enabling them to be customized to fit the specific cable configuration required by customer.

The Industrial line supports large daily loads where the batteries are cycled regularly in a range of photovoltaic systems, including off-grid and unstable grid situations. Specifically designed for deep-cycle use, Trojan's Industrial line is optimized for deep discharge and recharge cycles characteristic of renewable energy systems. It is engineered for high-energy requirements delivering 1,500 cycles at 80

Trojan Battery Ships New 2-volt Industrial Line Batteries percent depth-of-discharge, and features advanced battery technologies that provide optimum performance. The Industrial line features the following unique design elements.

### **Rugged Construction & Intelligent Design**

The 2-volt cells of the new Industrial line additions are assembled in a rugged polypropylene housing designed to protect the internal plates from damage that may occur during transport and installation. The cells are enclosed in a larger polyethylene outer case that protects against damage caused by harsh environmental conditions such as moisture and dirt buildup, as well as safeguards against potential acid leaks.



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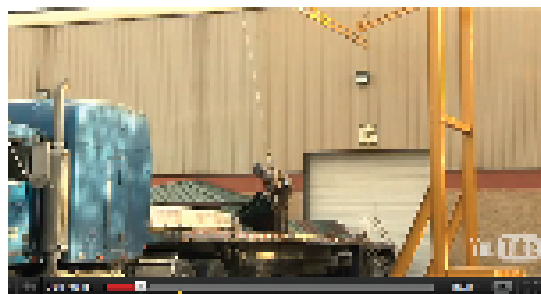
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For added protection the thick-walled case features a lattice-design that reinforces the outer case's structural integrity. This dual container construction provides added protection against extreme temperatures.

### Trojan Advanced Battery Technologies

Engineered for high-energy requirements, the Industrial line features the following advanced battery technologies that provide optimum performance.

#### Alpha Plus® Paste with T2 Technology™ & DuraGrid™ Design

Trojan's Alpha Plus Paste is a proprietary, high-density paste formulation precisely engineered to deliver outstanding battery performance. This high-density paste optimizes porosity development in the active material utilizing the active material more effectively resulting in sustained battery performance over a longer period of time. Trojan's T2 Technology features a patent-pending T2 metal agent which is incorporated into Trojan's Alpha Plus Paste further strengthening the electrochemical processing capabilities of the paste. Together the Alpha Plus Paste with T2 Technology

increase both sustained capacity and total overall ampere-hours resulting in more operating power.

Combined with the innovative DuraGrid design, which provides a thick grid structure that resists corrosion, the Alpha Plus Paste with T2 technology increases overall battery life. The Industrial line's low-profile grid configuration also optimizes current flow throughout the grid network and maximizes the amount of electrolyte that can be added resulting in longer intervals between watering.

#### Reinforced Protection Wrap

Trojan's Industrial batteries are engineered with a robust positive plate construction that enhances overall performance. Trojan's DuraGrid technology combined with Alpha Plus paste securely locks the active materials to the grid creating an exceptionally strong positive plate. The Industrial line includes a five component wrapping and insulating system comprised of a stranded vertical slyver, which are filaments of glass wrapped around the positive plate's active mass surface, a 20 mil backing bat and a secondary 20 mil horizontal compres-

sion mat. The entire mat is wrapped with edge-protecting Koroseal that is heat bonded as well as bonded to the plastic boot to protect the bottom of the plate and to keep the Koroseal in place. The advanced plate construction protects against shedding and assures the electrochemical performance of the battery's active materials.

#### Trojan Battery Adds New Models to Industrial Line

##### Maxguard® XL Separator

Exclusively available in Trojan's Industrial and Premium line batteries is the Maxguard XL separator. Featuring a wide-channel design, the Maxguard XL separator increases acid flow for optimum battery performance. Thirty percent thicker than our standard flooded battery separators, the Maxguard XL provides even greater resistance to stratification which is a typical mode of failure in batteries used in renewable energy systems.

Trojan's Industrial product line is available worldwide. To order Trojan's Industrial line, please visit [www.trojanbatteryRE.com/order](http://www.trojanbatteryRE.com/order).



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# Hioki Releases iPad App for Memory HiCorders

## Wireless Application Streamlines and Enhances Analysis of Waveform Data

Test and measurement equipment leader Hioki E.E. Corporation announces the development and release of the HMR Terminal to the App Store, a free iPad-only app that empowers users of the company's Memory HiCorders to analyze waveform data on their tablets. Hioki is the first company in the industry to release a software tool capable of analyzing waveforms on a tablet PC. The app supports the MR8740 (54-channel model), MR8741 (16-channel model), and MR8847 series (with models capable of measuring up to 16 channels).

### Development Background of HMR Terminal

Because Memory HiCorders are used to record multiple channels of high-resolution data over extended periods of time, they have always posed challenges in terms of how to best facilitate easy viewing of large volumes of recorded data. The volume of data generated by these devices continues to increase, with recent models capable of capturing 54 channels. At the same time, the method used to view waveforms, which typically involves moving to the location the user wishes to view on the instrument's display, is essentially unchanged. Consequently, ever-larger amounts of time and effort must be expended in order to find and analyze areas of interest in recorded waveforms.

HIOKI developed HMR Terminal based on the concept of dramatically improving the efficiency of waveform analysis by taking advantage of the manner in which tablets such as the iPad, whose popularity has exploded in recent years, are used to radically reassess how users view waveform data.

Drag-based waveform scrolling and pinch-based zooming in and out allow users to view enormous waveform spaces in an intuitive, stress-free manner just as if they were interacting with a map. Once memorized, a diverse selection of gestures such as swiping in from the right side of the screen to display the cursor and flicking between screens offer such profound advantages in terms of ease of use and convenience that users typically find themselves unable to return to their previous practice of using the Memory HiCorder or a computer to analyze data.

### Principal HMR Terminal Features

#### 1. Intuitive Waveform Manipulation Like a Map App

Just enlarging one portion of a waveform for viewing on a Memory HiCorder used to require an extremely large amount of time and effort. By empowering users to scroll freely and

zoom in and out by manipulating waveforms on the iPad's touch screen, HMR Terminal eliminates the stress of operations such as enlarging a waveform to view part of it at a high level of detail and zooming out to view the waveform in its entirety.

#### 2. Simple Display of Measured Values by Freely Placing Measured Value Cursors

Users can easily display as many measured value cursors as they wish by swiping in from the right side of the touch screen. Cursors can be dragged around and placed freely and intuitively anywhere on the screen the user desires.

#### 3. Simple Display of Waveform Data Calculation Values in List Form

Users can easily switch to a screen displaying a list of calculated values for the displayed waveform including maximum, minimum, and average values simply by flicking the screen. The ability to instantly switch to the screen of calculation values while viewing dozens of channels of waveform data streamlines analysis.

#### 4. Quick, Batch Adjustment of Channel Positions

Tasks such as grouping channels and aligning their zero-positions or tweaking the display so that channels do not overlap used to involve manipulating one channel at a time, making them extremely time-consuming. HMR Terminal lets users group channels intuitively simply by connecting their zero-positions with their fingers and then change the position or zoom factor of each, all at once. Users can also quickly and easily space channels evenly and position them as desired in the waveform space.



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**Dual Rear Fall Indicators**

**Dual Lanyard Pouch for proper storage of unused twin leg energy absorber connector**

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# Chipper Pivoting Winch Now Available on DC1317

Altec Industries, Inc., announces a new winch package option on the DC1317 chipper, which offers greater maneuverability at the work site.

DC1317“Altec strives to find solutions to meet our customer needs,” says Andy Price, Altec Tree Care Market Manager. “This new winch features the ability to pivot 25 degrees in each direction, making it easier for pulling side loads and more flexibility to position the material for chipping.”

The newly designed pivoting winch is available on both the Altec DC1317 and DC1317HP chippers and offers three operating positions: parallel to the feed direction, 25 degrees to the curbside, and 25 degrees to the street side.

Other features include:

- 7/16" diameter rope with 9,900 lb breaking strength and abrasion-resistant polyester cover
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To learn more about Altec chippers and other tree care equipment, contact 800-958-2555 or visit [www.altec.com/treecare](http://www.altec.com/treecare).

Altec is a leading equipment and service provider for the electric utility, lights and signs, telecommunications, contractor, and tree care markets. The company provides products and services in more than 100 countries throughout the world. Altec, Inc. is the holding company for Altec Industries, Global Rental, Altec NUECO, Altec Worldwide, Altec Capital, Altec Supply, and Altec Ventures, LLC.





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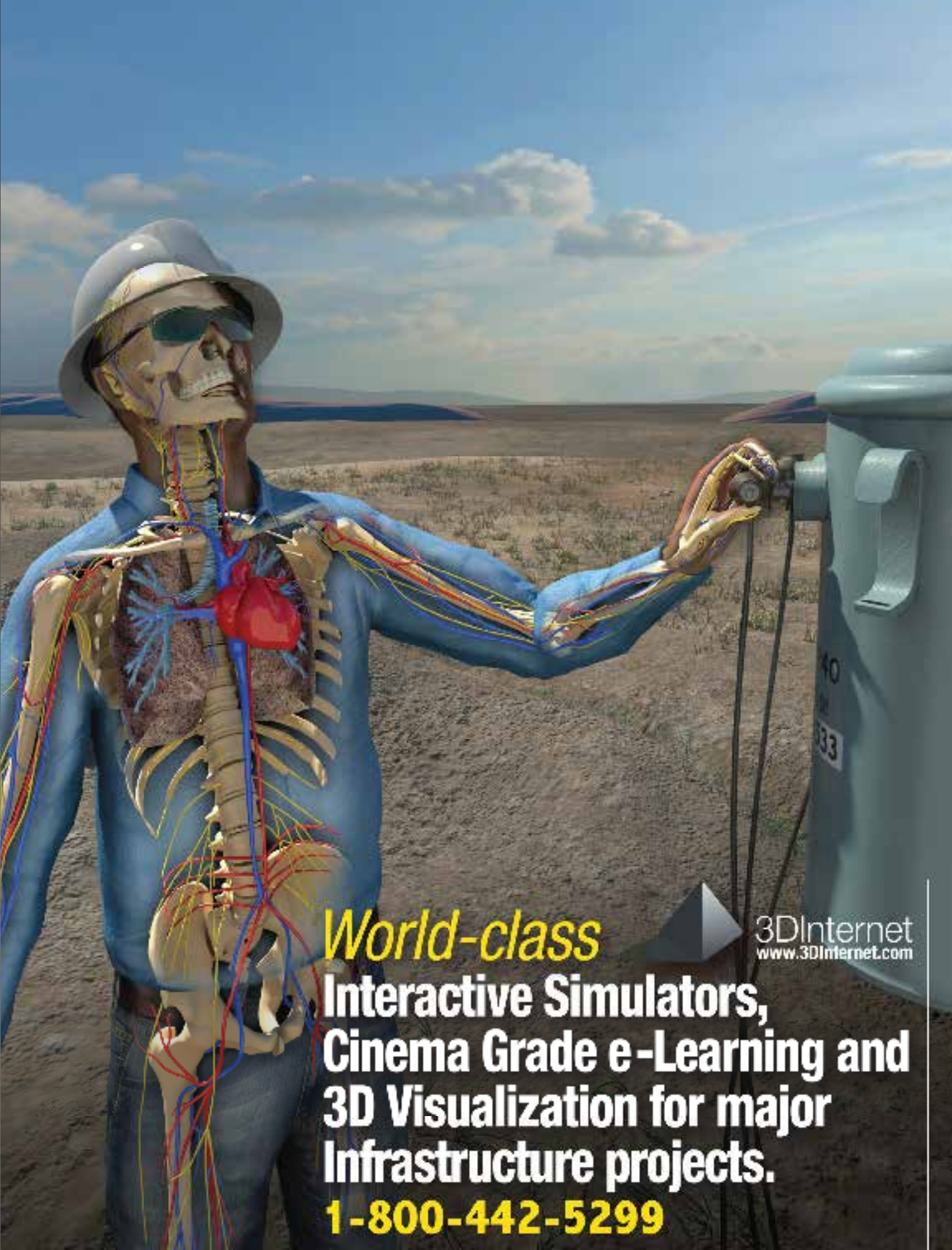
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