

Rectiverter  
a new word – and a new world – in power conversion

Introducing the world's first bidirectional power conversion module. The Rectiverter is a new concept in power conversion. It combines the functionality of a rectifier, an inverter and a static transfer switch in one bidirectional power module.

This opens up for a new power flow architecture and a new way of designing power systems, meeting the needs for both AC and DC output, in one modular system.

With the same dimensions and mechanical design as Eltek's other modules, the Rectiverter is the main building block in scalable systems for a wide range of applications.



# Rectiverter

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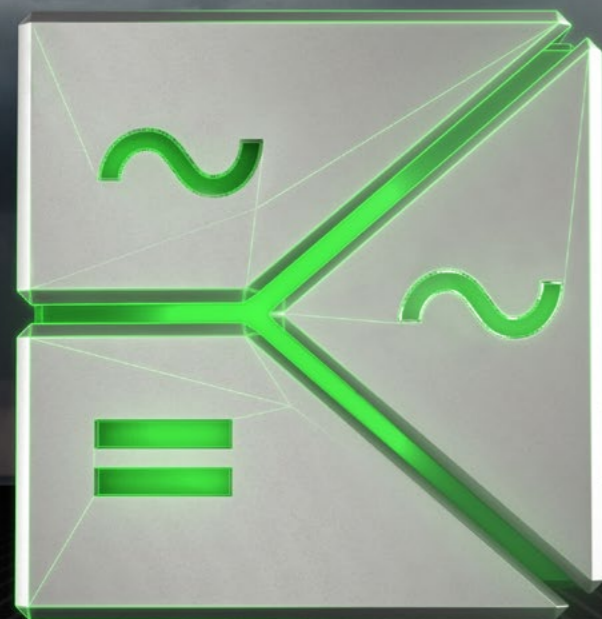
## Noun

1. A new word – and a new world – in power conversion
2. The world's first bidirectional, 3 port power conversion module

The Rectiverter is so unique – we had to make a new word for it. It is the only word you need to remember if your requirement is efficient, compact, reliable and scalable supply of both AC and DC power.

# Bidirectional power flow

with freedom and full flexibility



## This is how it works



The Rectiverter has three ports - one AC input, one AC output and one bidirectional DC port for both input and output.

During normal operation, the Rectiverter provides both AC and DC power with a total load of up to 2000W per module.

The AC input is first rectified, then fed to a built-in inverter for AC output. The rectified AC input is fed to a DC/DC converter for appropriate DC load output, and to batteries for charging.

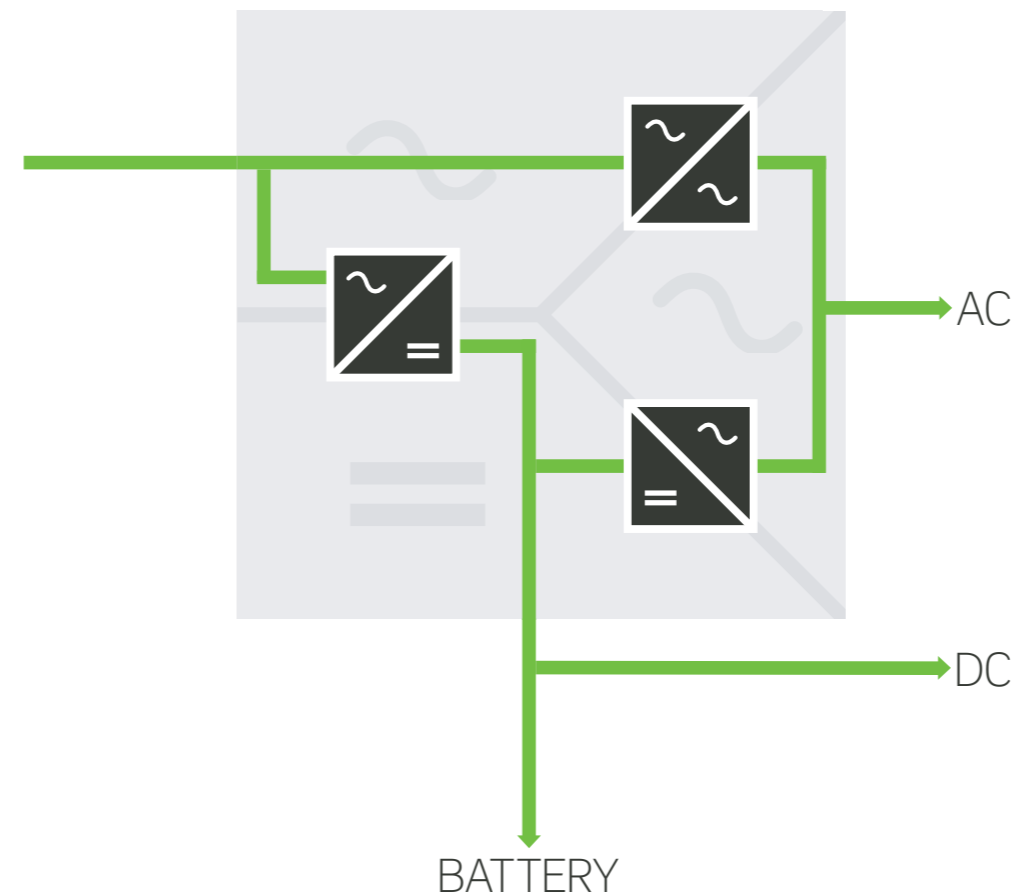


In case of AC (mains) failure, the DC flow is reversed from the batteries to feed the inverter for conversion to AC, and to take over the DC load. The transition from AC to DC feed is instantaneous and with no load disturbance.

The Rectiverter is a combined AC UPS and DC power supply, but can also be used as a pure inverter.

## 3-in-1 functionality

The Rectiverter combines the functions of a rectifier and an inverter, and eliminates the need for a static transfer switch.



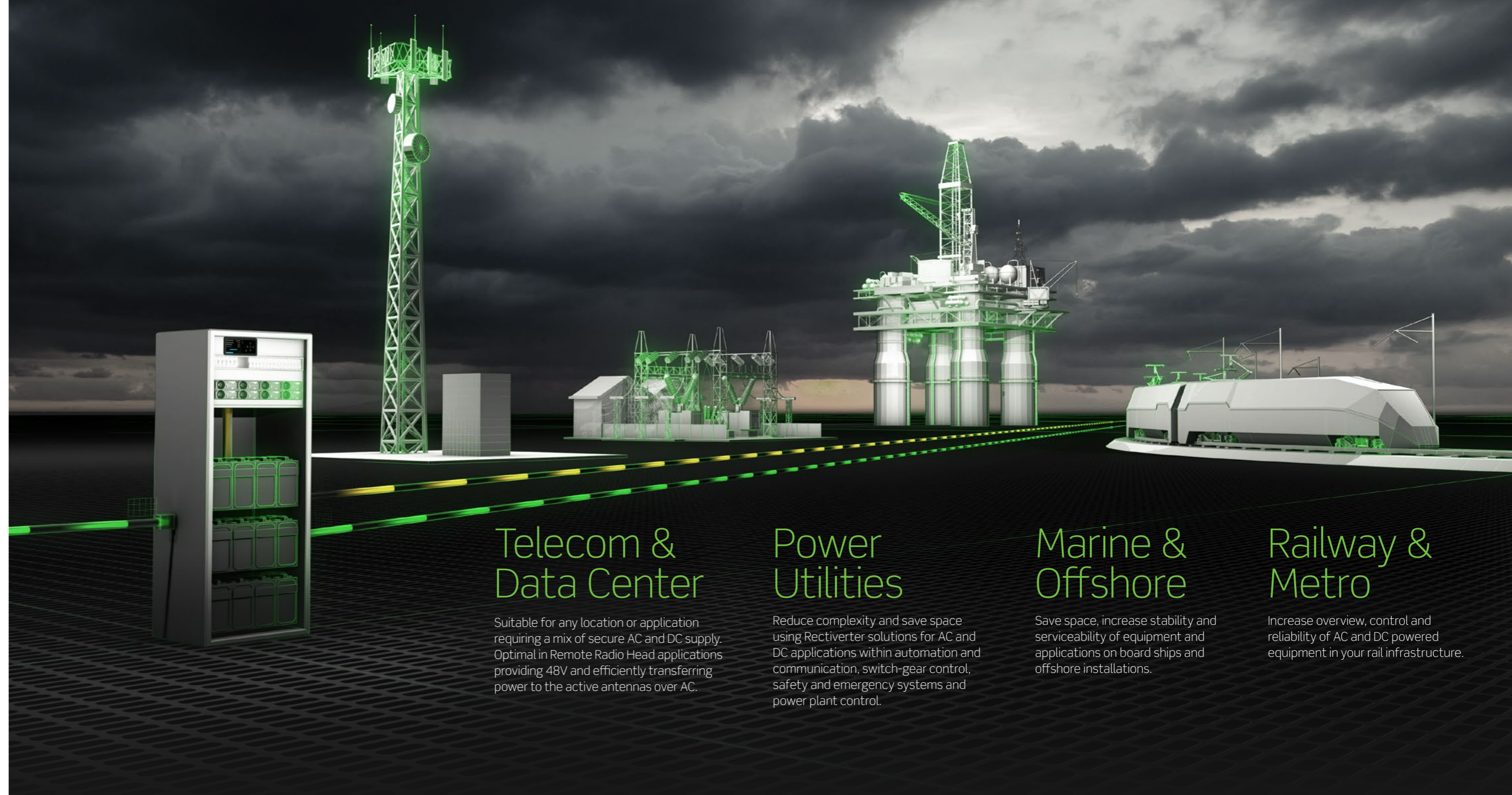
## Rectiverter systems

The modular and scalable Rectiverter system, including batteries, distribution and other system components, is controlled by a single Smartpack 2 or Smartpack S controller.



A Rectifierter power system is an ideal solution for mixed AC and DC environments, in any industry.

It provides a new level of flexibility and lower total cost of ownership.



## Telecom & Data Center

Suitable for any location or application requiring a mix of secure AC and DC supply. Optimal in Remote Radio Head applications providing 48V and efficiently transferring power to the active antennas over AC.

## Power Utilities

Reduce complexity and save space using Rectifierter solutions for AC and DC applications within automation and communication, switch-gear control, safety and emergency systems and power plant control.

## Marine & Offshore

Save space, increase stability and serviceability of equipment and applications on board ships and offshore installations.

## Railway & Metro

Increase overview, control and reliability of AC and DC powered equipment in your rail infrastructure.

## Meet an Eltek expert

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Product Manager and Rectiverter expert Gunnar Hedlund comments on the implications of the Rectiverter on power system topology and usage.

### Beyond higher efficiency

For decades, research and development concerning basic power conversion technology has focused on squeezing ever higher efficiency out of rectifiers and inverters. But with efficiency already approaching the 100% limit, any increase carries a high cost and limited benefits. Consequently, the industry's focus has shifted to monitoring and control and other aspects of power conversion where the R&D impact is greater.

Now, the Rectiverter has taken power conversion technology above and beyond the quest for higher efficiency. There used to be two worlds, AC and DC; there used to be one type of converter for DC-based applications, and another for AC applications. Now there's only one. Conversion both ways, AC and DC output from the same module - it is a completely new concept and the Rectiverter is a newcomer that does things no other module can do.

### Bidirectionality is the enabler

The ability to change the direction of the power flow inside the module and the same power conversion stage, is what sets the Rectiverter apart from any other power module.

This is the technological breakthrough that allows the module to feed AC and DC loads at the same time (with input feed from AC), fully backed up. It also ensures uninterrupted operation in case of a mains failure. In this case, the flow at the DC port is reversed and fed through the built-in inverter to maintain the AC load, and the DC load is taken over by the batteries, in a seamless transition.

This also makes the static transfer switch redundant. The Rectiverter can also be used as a pure inverter feed from DC (without any connection to AC input).

### From module to system

The Rectiverter module has the same dimensions and mechanical design as Eltek's other modules, and it is the main building block of modular, hence scalable, systems. The latest version of Eltek's Smartpack controllers include functionality to manage Rectiverter systems. The Smartpack controllers also enable system combinations with other Eltek modules, adding to the tremendous flexibility of Rectiverter systems.

### A noticeable difference

The benefits and advantages are numerous. First and foremost, a Rectiverter system offers unprecedented flexibility in mixed AC and DC environments. Whatever the need (within our predefined output ranges), a Rectiverter system can be set up with the appropriate mix of AC and DC output, and it can be easily reconfigured to meet new needs.

Another significant advantage is simplicity. Compared with traditional inverter systems, the Rectiverter significantly reduces the amount of equipment and greatly simplifies the architecture and requires less space. In short, it is a new type of power supply that is more versatile and more reliable, without compromising efficiency. The bottom line is reduced total cost of ownership.

### Endless possibilities

Rectiverter systems are perfect for any application where a mix of AC and DC loads are required, where additional DC capacity is required for fast recharge or where the modularity and serviceability are important - across all industries.

### A bidirectional, smarter future

The ability to change the direction of the flow of power is an important requirement for a sustainable future. The bidirectional power technology points towards a smarter future where energy flow can be optimized, energy stored, and used how and when it is needed. It feels like we are rewriting the power conversion "text book".

At Eltek, we see ourselves as a leader in power technology, always pushing the limits of technology further. The Rectiverter is an example of this commitment.



Watch the documentary and learn more about the Rectiverter

“The bidirectional Rectiverter changes our understanding of how power systems work.”

# The power of innovation brings the future on

The world is going electric and renewable.  
Power generation will decentralize and power needs  
to be stored and managed intelligently.

Flexible, efficient, compact and smart power conversion systems are required to make this happen. Eltek enables this transition. Eltek was founded on expert knowledge on power conversion, and has been fuelled by a strong ambition and determination to be up front ever since. We have a long track-record of innovations.

We have made power flatter, denser, smaller and neater - we removed half of the energy waste, we put power online and we have made power do things power couldn't do before. The Rectiverter is a new milestone in our journey of systematic innovation. It has the power to change the way people think about power.



**PROF TORE M. UNDELAND**  
Department of Electric Power  
Engineering, NTNU

*"Having a bidirectional power flow inside one module, while retaining high efficiency, is a great achievement."*



**DR OLE JAKOB SØRDALEN**  
Director Research, Eltek

*"Our ambition is to be a technology leader. Bidirectional power modules are something new. We have written a new chapter in the power conversion text book."*



**SATVIR SINGH PARMAR**  
Vice President Innovation, Eltek

*"The bidirectional power module is a significant step. It is an innovation that makes things redundant. Such innovations are powerful."*



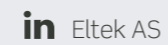
**NILS BÄCKMAN**  
Manager R&D, Eltek

*"It started with a crazy idea. The rest was hard work and persistence."*



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- Behind-the-scene information
- Questions and answers
- Expert interviews
- Events and exhibitions
- Webcasts & webinars  
and more...



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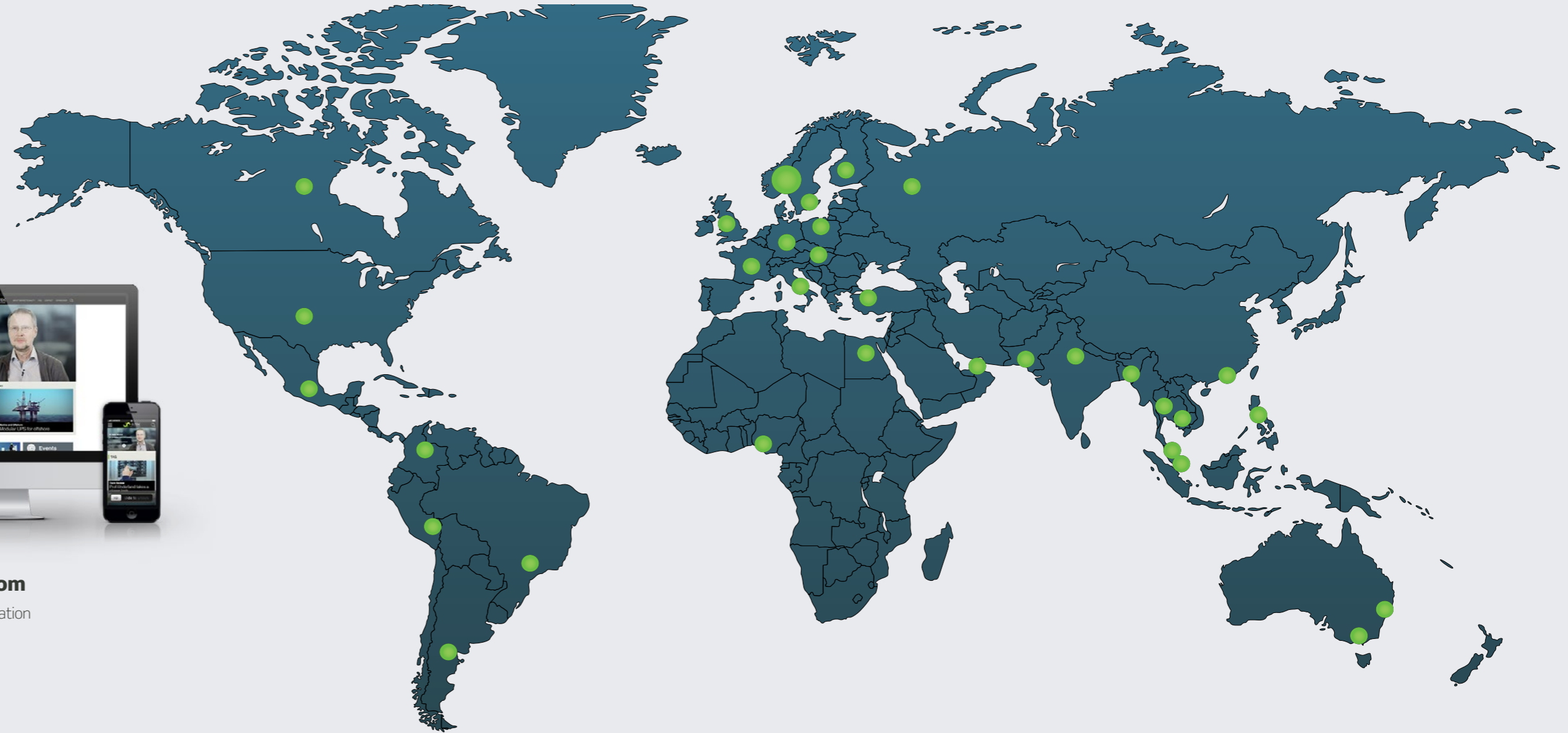
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## Local presence - global reach

Sales in more than 100 countries, offices in  
40 countries and 2500 employees

## Eltek Publications

always updated, all in one place

Get easy access to the Rectifier brochure, our product browser, films and other useful information. Download our app by searching the App Store or Google Play for Eltek.



# EXPERIENCE THE POWER.

At Eltek, we are power experts with a sharp focus; to develop and provide our customers all over the world with the greatest power solutions available for applications used in an industrial context - where stable, safe and efficient supply of power is crucial.

This has been our passion and motivation for more than 40 years: to innovate and lead the way in power conversion and control. Today we help our customers optimize and safeguard operation of business-critical equipment, reduce their carbon footprint, while at the same time reduce their total cost of ownership of power supply equipment.

Nordic by birth, we have grown to service all countries and cultures, offering the best global technology and solutions matched to local requirements.

The combination of superior expertise, advanced solutions, support and service, makes it possible for our more than 2500 passionate and proactive power experts world-wide to provide our customers with a unique, powerful experience.

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