



# GE&EL+ vAC/DC

The most **versatile converter** in the regenerative energy testing market





## The All-Terrain AC/DC Regenerative

The GE/EL+ vAC/DC is the most complete and versatile converter in the regenerative energy testing market. The whole CINERGIA's catalogue in a single unit. A Grid Emulator (GE), an Electronic Load (EL) and a DC Bidirectional (B2C). This All-Terrain converter is suitable for the majority of test applications in the field of Renewable Energies, Smartgrids, Batteries and Electrical Vehicles.



## GE&EL Product Family

CINERGIA has ingeniously combined the functionalities of several products in a single cabinet to offer the most flexible and unique testing equipment. The GE&EL product family is the aggregation of Grid Simulators, Electronic Loads and Bidirectional DC Converters in one product. The All-in-One AC GE&EL includes, in one single cabinet, an AC Grid Simulator and an AC Electronic Load without any limitation. The All-Terrain GE&EL vAC/DC is all CINERGIA catalogue in one system: Grid Simulators, Electronic Loads and Bidirectional DC.

# Local Interface

## Analogue and Digital IO ports

The isolated digital and analogue inputs/outputs permit the connection of the unit to External Controllers and Power Hardware in the Loop systems (option).

## 4.3" Touchscreen

Allows the local parameterization and command of the device, configuration of the communications link, plots the main signals and enables the local datalogging.

## Safety First

The units integrate a local Emergency Stop pushbutton and two signals (input + output) to be connected to the laboratory interlock system. Additionally, the digital outputs can be interfaced to safety tower lights.



## Bidirectional and Regenerative

### Clean grid current

THDi < 3% and PF > 0.98

### 13 Models

from 7.5kW to 160kW

Parallelization of units to increase the power



## Operation Modes

- Complete DC Load/Source
- Full 4Q AC Grid Emulator
- Power Amplifier for Power HiL
- Full 4Q AC Electronic Load
- Battery Emulation and Testing
- PV Panel Emulation

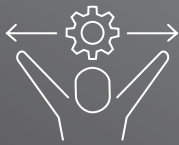
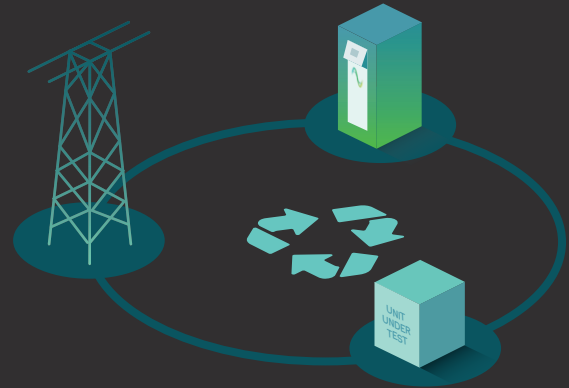
## Intuitive User Interface

Modbus/Ethernet Open protocol, Labview drivers

# REGENERATIVE TECHNOLOGY

Thanks to our bi-directional topology, the All-Terrain AC/DC Converter are regenerative, resulting in a reduction of both the consumed energy during the tests and the power required from the electrical installation.

This technology allows us to work in both directions, as power generators or offering a consumption for the realization of all types of tests.



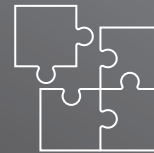
Efficiency and Flexibility



Save Energy, Power  
and Time



Versatility All-Terrain



Smooth Integration

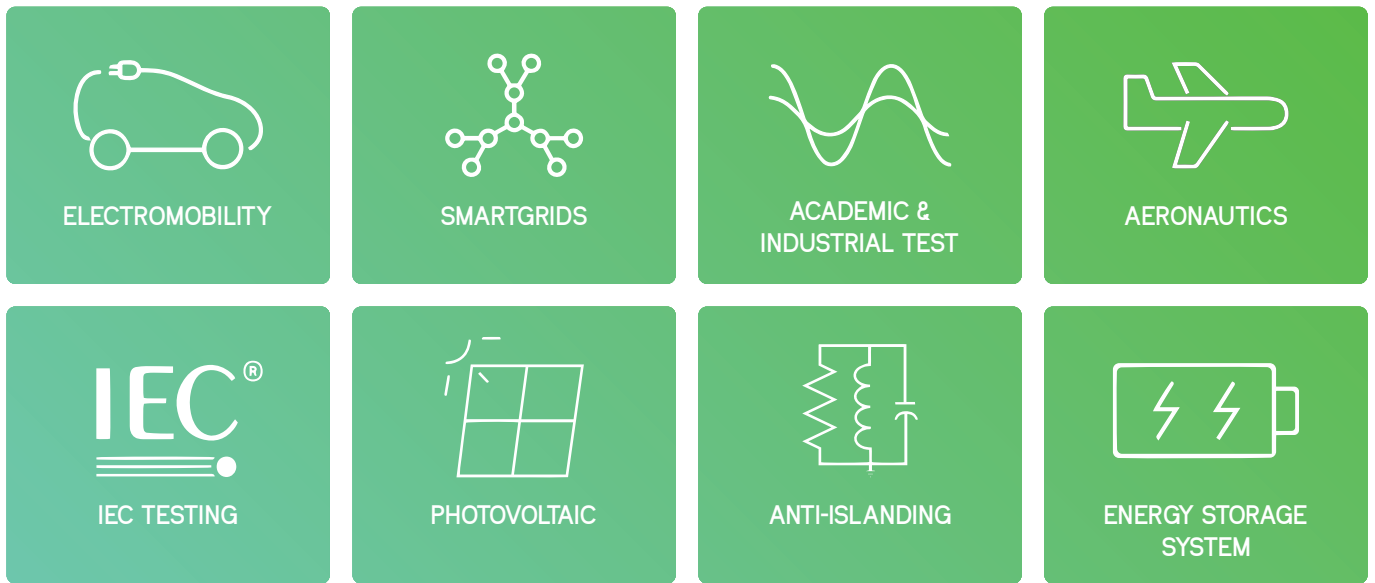


High-Resolution and  
Dynamics

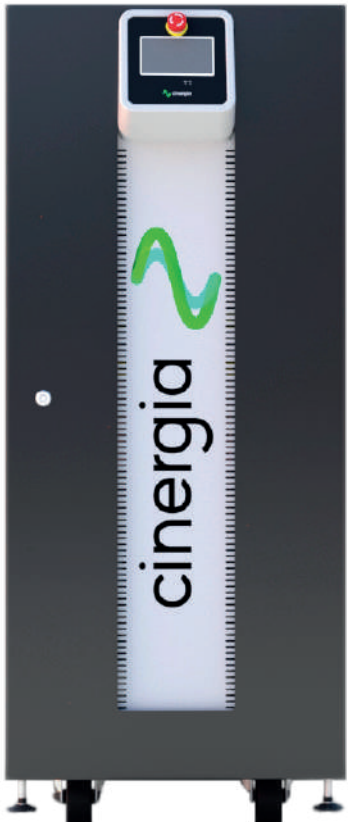
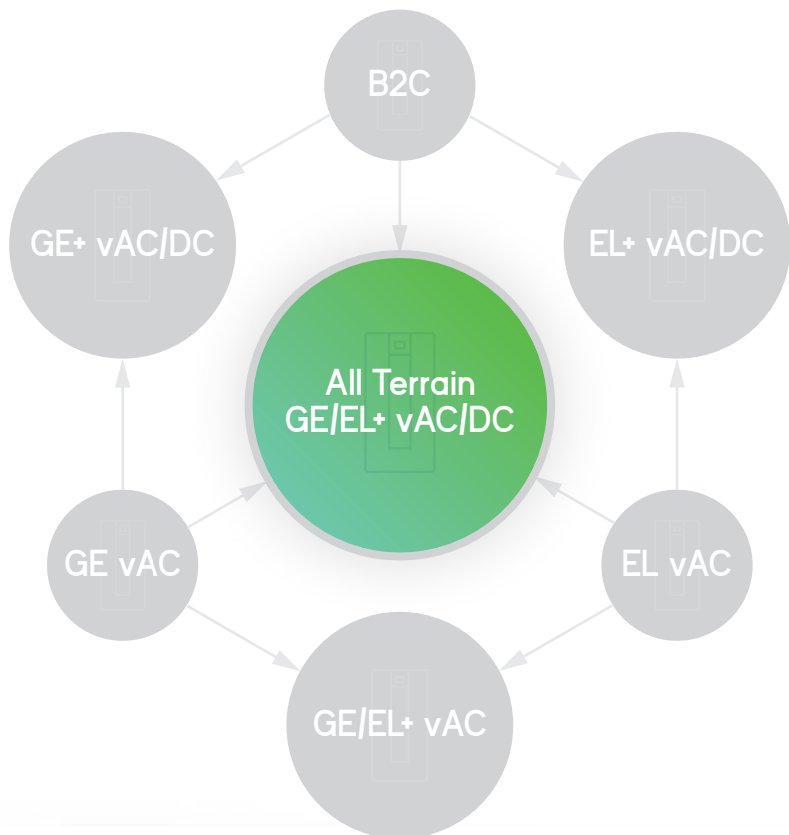


More than  
**1,2 MW**

of power supplied in All-Terrain AC/DC  
Regenerative Converter since 2014



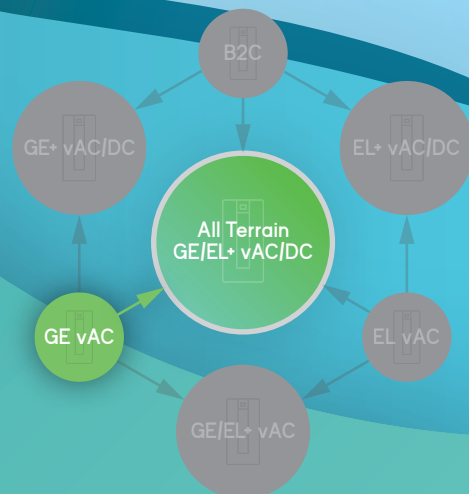
# The whole CINERGIA's catalogue in a single unit



# Grid Simulator

Grid Simulators are power electronic devices that emulate AC electrical grids in both normal (voltage, frequency, phase angle...) and disturbed conditions (voltage dips, frequency, voltage fluctuations, flicker...) These powerful equipments are designed to generate voltage sources and set up different type of grids that allow the assessment of all type of scenarios.

Because of the flexibility of the equipment, CINERGIA's Grid Simulators are widely used in the field of renewable energies to test generators that are connected to the grid and their compliance with grid codes.



# Electronic Load

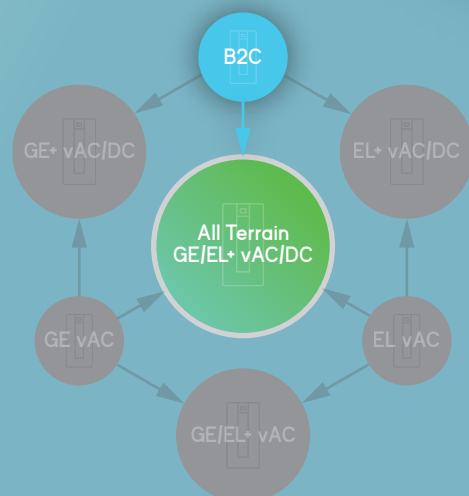
Electronic Loads are power electronic devices specifically designed to emulate AC electrical loads. These devices are powerful enough to test electrical and electronic equipments in both linear and non-linear consumptions. In addition, CINERGIA's electronic Loads have the capability to recover energy during the testing procedures and return it to the grid.

These devices allow the verification of power sources or electrical equipments under test in both normal and failure operations. Smart grids, Testing UPS, Electrical Vehicles, Renewable Inverters, AC and DC sources and electrical equipment in Industrial and R&D environments are the main applications of an Electronic Load.



# Regenerative DC Converter

B2C+ is CINERGIA's solution for Regenerative and Bidirectional DC Test Platforms. The efficiency, multichannel flexibility and high-resolution and dynamics of this device make it convenient in multiple applications like: Renewable Energy Sources, Energy Storage Systems, Smart grids, Battery Testing and Characterization, Electrical Vehicles, EV Charging Infrastructures, Traction Converters, Power HiL and Aeronautic.





# Better than ever, the enhanced Plus family

## **Master/slave connection**

for up to 8 units using a fiber optic link to increase power capabilities

## **Improved control**

30kHz closed control loop frequency with 300kHz oversampling technique

## **More harmonics**

50 per phase with 20 free harmonics in AC models

## **Delta connection**

added to the star connection, for the EL mode in AC

## **Optimized RLC Mode**

RMS or instantaneous RLC model for anti-islanding test

## **Selectable slew rate for DC**

for the fastest transients and highest stability

# Friendly Interface

## SOFTWARE

The user interface used by CINERGIA devices has been developed by our R&D team, to offer total control of the device, with a comfortable and intuitive design. This allows us to take full advantage of the capabilities of the device, as well as the programming and execution of standardized or self-created tests.

### Remote Control port

- ~ LAN Ethernet with Modbus/TCP protocol.
- ~ Labview Drivers
- ~ RS485 (optional)

### Digital IO port

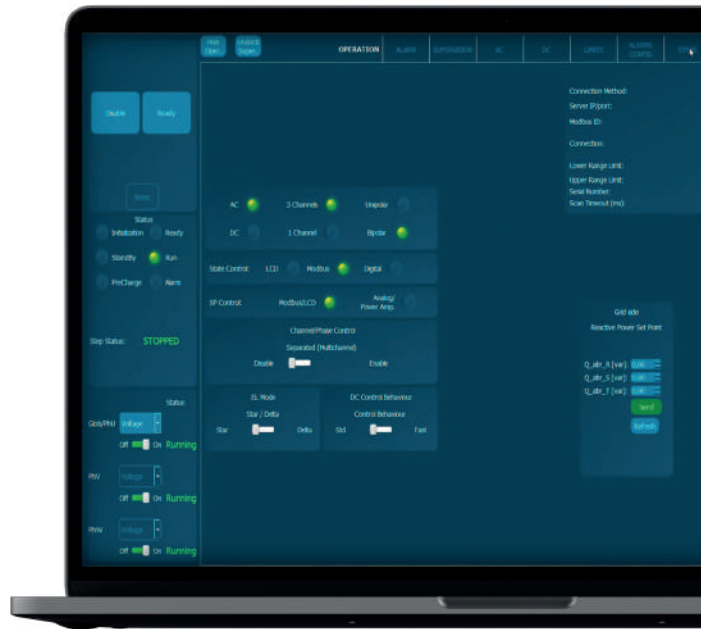
- ~ 4 digital inputs
- ~ 3 relay outputs
- ~ 1 emergency stop

### Optional Analogue port

- ~ 6 analogue input 0-10V
- ~ 6 analogue output 0-10V




Windows 7/10 user interface for remote operation and data acquisition.



## FEATURES AND CAPABILITIES

- AC Operation
- Disturbance Generation
- Sequence
- PV Panel Emulation
- Harmonics
- Linear & Non-Linear
- Multichannel
- IEC Testing
- Power and Impedance
- Parallel Mode
- Battery Pack Testing
- Steps Mode
- DC Operation
- Battery Emulation

## Related Products




**GE&EL+ vAC**

The GE&EL product family is the aggregation of Grid Simulators, Electronic Loads.

AC Power  
**7.5 kW - 160 kW**

AC Current  
**11 A - 232 A**




**GE+ vAC/DC Full**

Grid Simulators are power electronic devices that emulate AC and DC electrical grids in both normal and disturbed conditions.

AC Power  
**7.5 kW - 160 kW**

AC Current  
**11 A - 232 A**



**EL+ vAC/DC Full**

The EL+ family is power electronic device designed to emulate AC and DC electrical loads.

AC Power  
**7.5 kW - 160 kW**

AC Current  
**11 A - 232 A**

for more information about available models consult the datasheet of this product. (models from 7.5 to 160 kW)

Regenerative  
Power Electronic  
Solutions

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