

energia

Load management module

Installation guide



KSI2700001.300

INTRODUCTION

energia peripheral BUS must be linked to the lares 4.0 control panel via the KS-BUS. It becomes the ideal completion when lares 4.0 is used in the home & building automation field, it allows to manage the power used in your single-phase electrical system, on each one of its two output lines where an electrical overload is controlled by two programmable thresholds.

Each **energia** module can be connected to a single current generator (national electricity grid system, photovoltaic system, etc.) and has two distinct output lines on which it measures both voltage and current, each line can support loads up to 6kW.

To connect several current generators, several **energia** modules are required, one per generator.

Each **energia** module also has 4 outputs relays (220V, 1A) which can be used both to drive external relays for disconnecting loads and as generic outputs of the control panel.

FUNCTIONS

- **energia** can measure and manage the power consumption on each of its two output lines (L1 and L2);
- it can control the power consumption trend through displaying bar charts for an immediate analysis on user App lares 4.0;
- it can program the disconnection of loads upon exceeding two thresholds (the first sends notification and sound notifications, the second starts disconnection after a programmable delay time of maximum 2 minutes);
- the outputs configured with “manageable loads” mode can be inserted in the list of outputs that the **energia** module can automatically disconnect.

Power consumption management is implemented starting from the configuration of entities called “meters” that measure the power absorbed or produced, for example in the presence of a photovoltaic system, to obtain useful charts for the analysis of power consumption.

The “meters” can be associated to partitions and rooms and displayed in the lares 4.0 App, as well as the charts can be displayed in the App.

In the context of **Load Management**, the “meter” carries out the **controlled disconnection of loads** to avoid blackouts when the electric system is getting overloaded.

Each “meter” provides two thresholds:

1. **maximum power consumption threshold** expressed in Watt, beyond this value an alert is generated (ergo-T keypads also offer sound and push notifications);
2. **maximum power disconnection threshold** (greater than the previous one), beyond this value the loads disconnection of the outputs personalized as “Manageable load” start.

According to the control panel model, the maximum number of outputs configurable is the following:

- no. 8 for lares 4.0 - 644 wls and lares 4.0 - 140 wls;
- no. 4 for all the other models (lares 4.0 - 16 excluded).

The configured outputs (washing machine, dishwasher, oven, etc.) are visible in real-time as connected/ disconnected household appliances, on the Smart Home page of the lares 4.0 App, in the “Household appliances” category and on Maps.

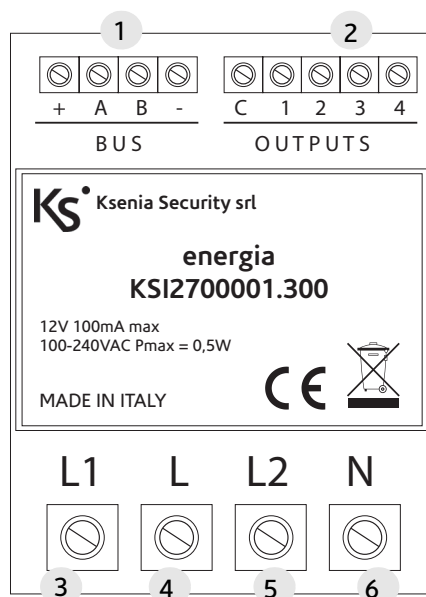
Events and notifications that can be configured are

- Excess power consumption: the event will be generated upon exceeding the “Consumption threshold” configured in “Consumption management”.
- Normal power consumption: the event will be generated when the consumption falls below the thresholds configured in “Consumption management”.
- Load disconnection risk: the event will be generated upon exceeding the “Disconnection threshold” configured in “Consumption management”.
- End risk of load disconnection: the event will be generated when the disconnection risk falls below the “Disconnection threshold” configured in “Consumption management”.

Note: The “end risk of load disconnection” and “normal power consumption” events have an hysteresis of 100W with respect to the value set.

e.g. If with disconnection threshold is at 1000W, at 1001W the “disconnection risk” event occurs, the “end risk of load disconnection” event will occur at 899W (100W+1W).

DESCRIPTION OF THE PRODUCT



TERMINALS DESCRIPTION		
1.	+ A B -	Connection terminals to the BUS of lares 4.0 control panel
2.	C	Common terminal
	1 / 2 / 3 / 4	Relay outputs
3.	L1	Phase power supply output L1
4.	L	Single current generator input (phase)
5.	L2	Phase power supply output L2
6.	N	Mains power supply (neutral)

OUTPUTS SWITCHING

The following tables describe the behaviour of the relay outputs on the module, in the following cases:
module FW update, control panel FW update or reset.

All the relay outputs

Output setting	Output status before reset	In case of module update, control panel update or reset
NO (Normally open)	Open (IDLE)	1 bounce
	Close (ACTIVE)	1 bounce
NC (Normally closed)	Open (ACTIVE)	1 bounce
	Close (IDLE)	Output doesn't move

Note: Starting from FW version 13 of "energia", the output configuration default is NC; when the device is off, they are closed to the common.

TECHNICAL CHARACTERISTICS

- Power supply 100-240Vac - Maximum consumption 0.5W
- Power supply 12V - Maximum absorption 100mA
- DIN rail mounting
- Maximum power: 2x6kW (if 220Vac) - 2x3kW (if 110Vac)
- Number of output relays: 4 (250V - 1A)
- KS-BUS interface
- Dimensions: 3 DIN modules (90x53x62 mm)

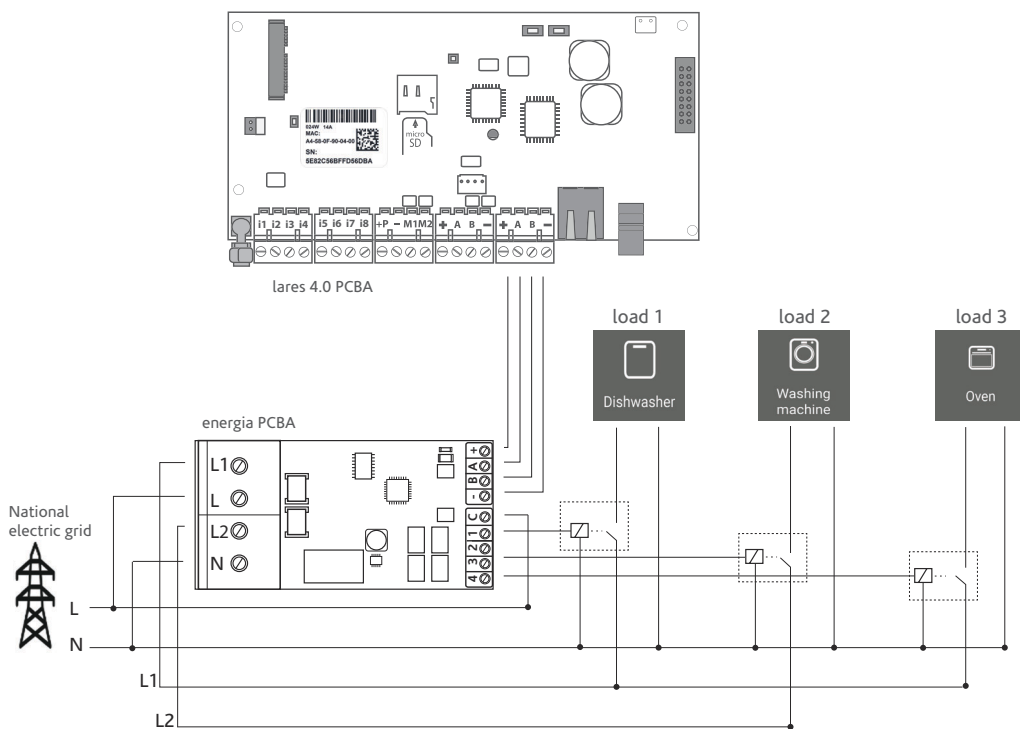
CONNECTION DIAGRAM OF A SINGLE CURRENT GENERATOR TO **energia** MODULE

The following connection diagram is an example of **energia** module connection to a single current generator and to the BUS of the lares 4.0, with 3 relay outputs used to drive as many external relays for the disconnection of 3 loads (dishwasher, washing machine and oven).

To connect incoming several electric lines (e.g. national electricity grid system and photovoltaic system), several **energia** modules are required, one per generator (see ["NATIONAL ELECTRICITY GRID SYSTEM AND PHOTOVOLTAIC SYSTEM CONNECTION" on page 6](#)).

SAFETY WARNINGS!

- The installation of **energia** must ensure the inclusion in a protective, fireproof, electrical and mechanical box. Arrange outside the **energia** module an isolating device. An omnipolar power supply switch must be incorporated into the electrical installation of the building. Install the board inside an enclosure that guarantees protection against fire propagation (UL 94 V-0 metal or plastic material).
- It is necessary to install a magnetothermic circuit breaker device suitably sized for the connected electrical loads (to simplify, the diagram does not show the necessary magnetothermic circuit breaker device which must be installed according to the provisions of the law).



With reference to the diagram, it is possible to display the dishwasher and oven consumptions on line L1 and the washing machine consumption on line L2, on user App lares 4.0.

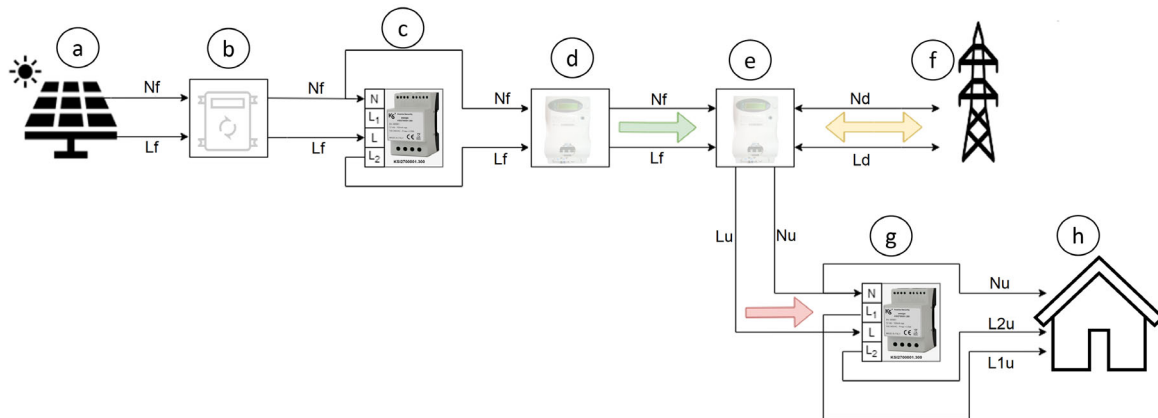
In order to display electricity consumption, a "meter" must be created in the system, where L1 and L2 lines of energia module must be entered in the "Power absorbed" field.

NATIONAL ELECTRICITY GRID SYSTEM AND PHOTOVOLTAIC SYSTEM CONNECTION

The connection diagram shows an example of two **energia** modules, each one of them connected to two current generators: photovoltaic and national electricity grid systems.

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Legend:

- a. photovoltaic module
- b. inverter DC/AC
- c. **energia 1** measures production on L2
- d. solar meter
- e. bidirectional meter
- f. national electricity grid system
- g. **energia 2** measures consumption on L1 and L2
- h. utilities

Nf/Lf = Photovoltaic Neutral (N) /Phase (L)
Nd/Ld = Distribution Neutral (N) /Phase (L)
Nu/Lu = Utilities Neutral (N) /Phase (L)

With reference to the previous diagram, for monitoring the **energy balance** between absorbed power and produced power on the user App lares 4.0, it is necessary to create a "meter" in the system configuration with:

- a) L1 and L2 lines of energia 2 in "Absorbed power" field;
- b) L2 line of energia 1 in "Produced power" field.

For monitoring the **consumption** it is necessary to create one more "meter" and configure L1 and L2 lines of energia 2 in "Absorbed power" field.

CONFIGURATION

The configuration of **energia** module and **meters** is performed by "Installer" configuration program as described in the "Programming Manual" of the lares 4.0 platform.

QUANTITY DATA

lares 4.0 models	wls 96	16	40	40 wls	140 wls	644 wls
Maximum number of energia modules	1	-	1	3	6	6
Maximum number of programmable meters	2	-	3	6	12	18
Maximum number of outputs programmable as "Load management" (each energia has 4 programmable relay outputs)	4	-	4	4	8	8

COMPLIANCE

Europe - CE, RoHS



Technical specification, appearance, functional and other product characteristics may change without notice.

ENVIRONMENTAL CARE

energia has been specifically designed and manufactured for the environment respect as follows:

1. No PVC
2. Halogen-free laminates and lead-free PCBA
3. Low consumption
4. Packaging realized mainly with recycled fibres and materials

*Installation of these systems must be carried out strictly in accordance with the instructions described in this manual, and in compliance with the local laws and bylaws in force. **energia** has been designed and made with the highest standards of quality and performance adopted by Ksenia Security. Is recommended that the installed system should be completely tested at least once a month. Test procedures depends on the system configuration. Ask to the installer for the procedures to be followed. Ksenia Security srl shall not be responsible for damage arising from improper installation or maintenance by unauthorized personnel. The content of this guide can change without prior notice from KSENIA SECURITY.*

Information for users: Disposal (RAEE Directive)

Warning! Do not use an ordinary dustbin to dispose of this equipment.

Used electrical and electronic equipment must be treated separately, in accordance with the relative legislation which requires the proper treatment, recovery and recycling of used electrical and electronic equipment.

Following the implementation of directives in member states, private households within the EU may return their used electrical and electronic equipment to designated collection facilities free of charge. Local retailers may also accept used products free of charge if a similar product is purchased from them.*

If used electrical or electronic equipment has batteries or accumulators, these must be disposed of separately according to local provisions.

Correct disposal of this product guarantees it undergoes the necessary treatment, recovery and recycling. This prevents any potential negative effects on both the environment and public health which may arise through the inappropriate handling of waste.

** Please contact your local authority for further details.*

