

# HYBRID ADVANCED

Universal controller for Energy Management Systems



## HYBRID ADVANCED complex in control

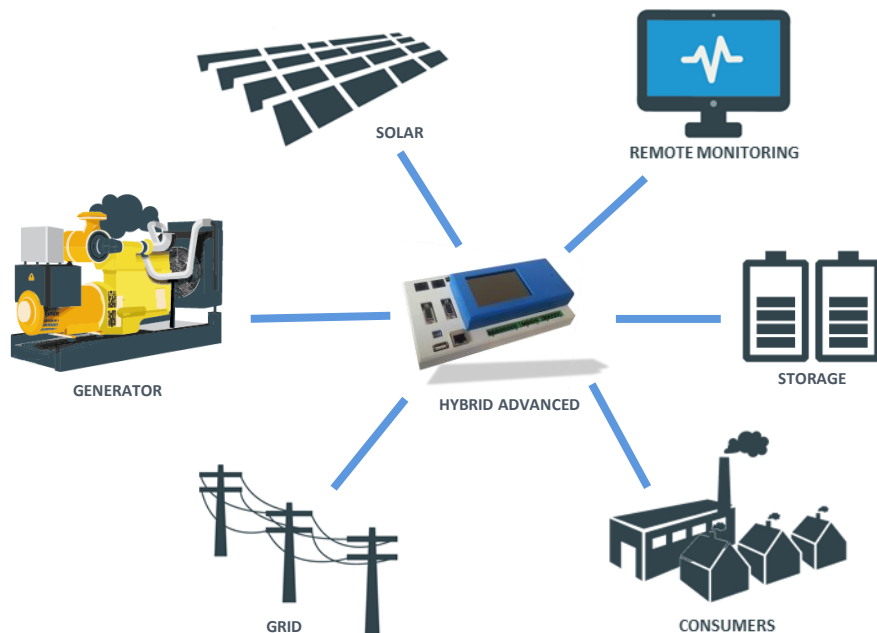
With the HYBRID ADVANCED controller, elgris offers an easy to use, but high quality control system targeting HYBRID applications. Not only for prime power generator applications but also grid connected applications with a standby generator can be easily upgraded to a Solar – Diesel – Hybrid systems and benefit of the unique features of the elgris HYBRID ADVANCED controller.

- ✓ Peak shifting
- ✓ Maximum demand control
- ✓ Zero export
- ✓ Power quality
- ✓ Generator cycling
- ✓ Battery storage ready

The unique features of the elgris controller define new standards in terms of commissioning time, durability and performance. Based on the inhouse developed HYBRID control algorithm, the elgris controller determines the optimum operating point of the HYBRID system and adjusts the photovoltaic and battery system accordingly.

**With the elgris HYBRID ADVANCED controller, any generator can be turned into a Solar – Diesel – Hybrid system.**

# Flexible EMS controller



The elgris HYBRID ADVANCED controller controls the power flow from the grid or generator, photovoltaic system, battery storage and appliances.

Depending on the selected mode based on pre-defined thresholds, the controller automatically adjust the power consumes form the grid or generator and makes sure that the renewable energy source is prioritized. By integrating a storage system, such a battery, the fluctuation of the output of the solar system can be balanced thus a higher renewable energy share can be reached.

In fact, the elgirs HYBRID ADVANCED controller supports a wide range of batteries and battery management systems.

With the system connected to the grid, it can reduce the consumption from the grid either by peak-shaving, peak shifting or base load management.

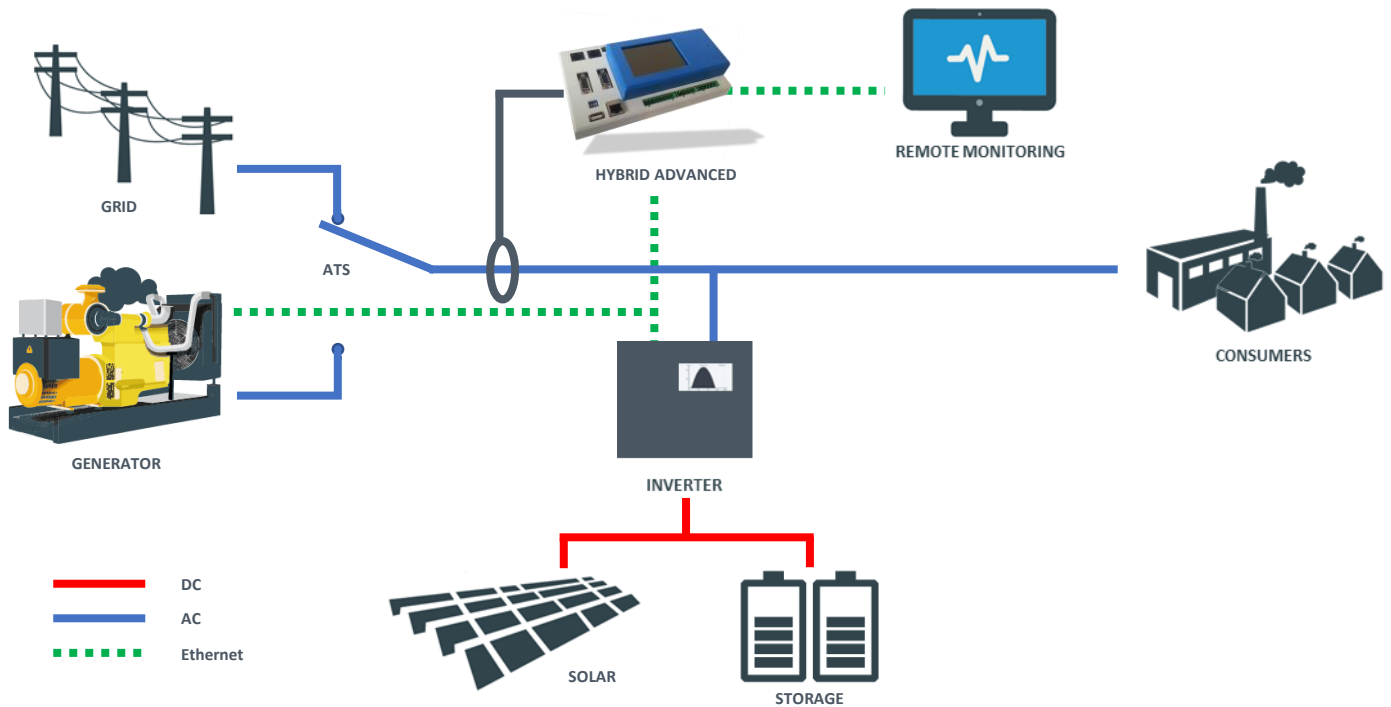
When the generator is running, the Fuel Save Mode is triggered and becomes active. As soon as the generator is synchronized and delivering power to the mini-grid, the controller prevents the generator from running in a non optimum point of load and thus from high fuel consumption and avoids serious damages due to the low load.

In case that there is enough surplus power available, this can be used for fast charging of the batteries. By charging the batteries from the generator, the absolute fuel consumption is lower due to the higher efficiency at higher loads and the generator can be stopped when the batterieis are fully charged and can take over the load. This is often referred as generator cycling.

As a standard feature, the HYBRID ADVANCED controller is capable of managing a mini grid without other AC grid forming sources or master's available.

For example in case the grid is down, or enough power from the solar system and storage is available to stop the generator, this is possible. The elgris HYBRID ADVANCED controller automatically disconnects the grid or stops the generator and the load is solely powered by the solar system.

# Typical application – DC Coupled

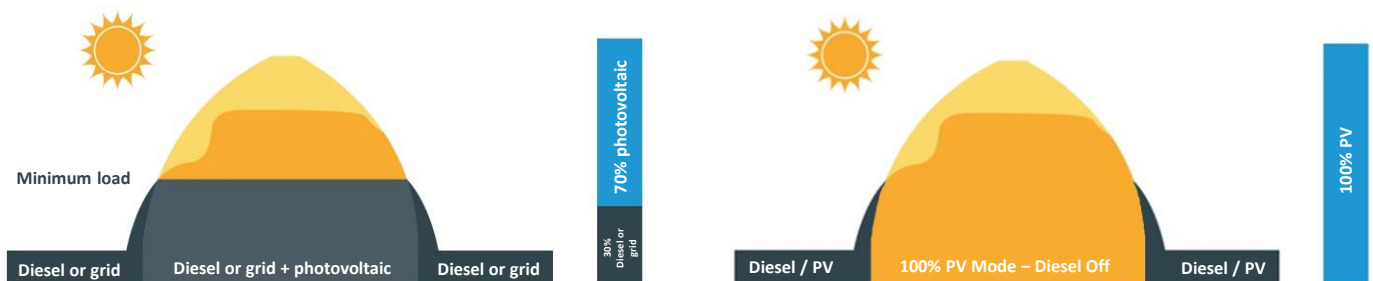


In a typical DC coupled application, the renewable energy source and also the storage is coupled on the DC side. Both solar and batteries are DC power thus there is no losses in converting back and forth between DC and AC power when charging the batteries from solar power. An other advantage is that there is only one inverter need to both support the battery and solar. This safes enormous on the total costs and enables a lot of possible applications.

The elgris HYBRID ADVANCED controller supports a wide range of batteries, battery management systems and storage technologies. By using a high speed open protocol interface the controller is future proof to support new technologies.

The elgris HYBRID ADVANCED controller measures the power from the grid or generator. Depending on the selected mode based on pre-defined thresholds, the controller reduce the output of the solar system by adjusting the setpoint of the inverter. The remaining power is used to charge the batteries.

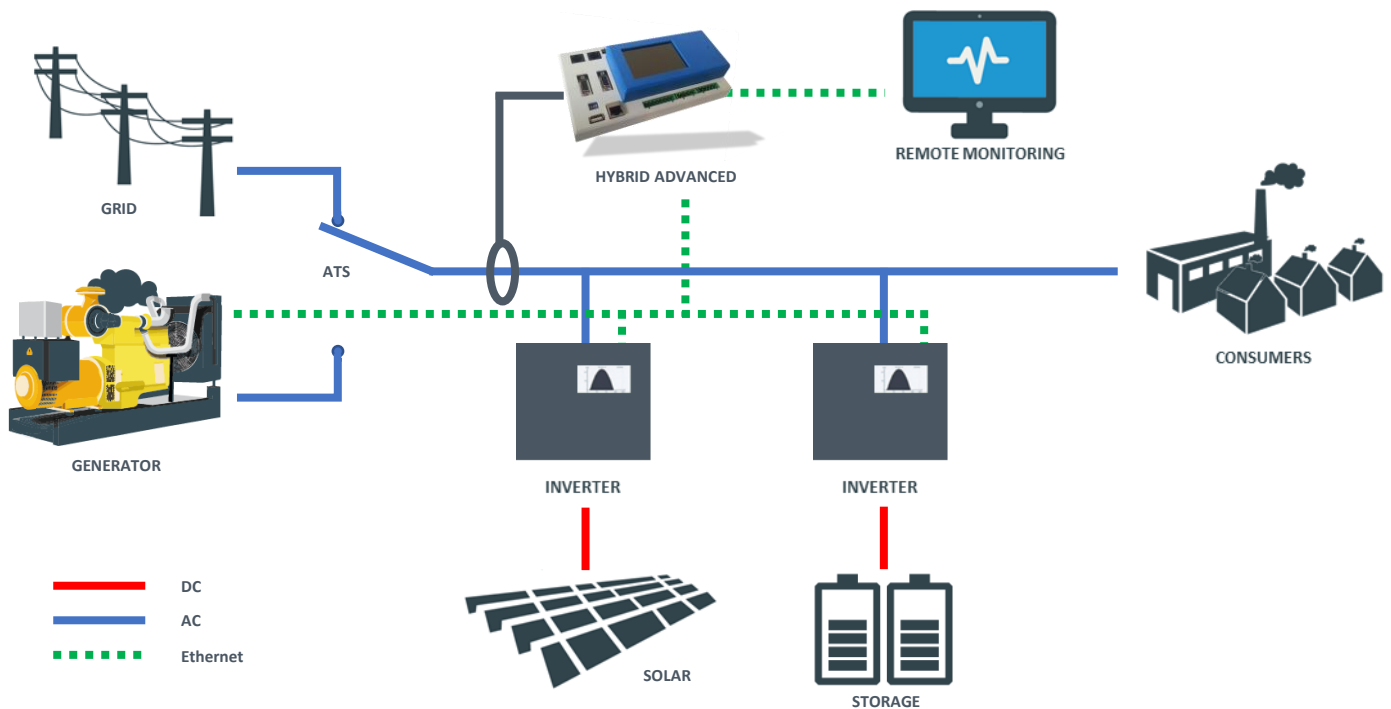
As a standard feature, the HYBRID ADVANCED controller is capable of managing a mini grid without other AC grid forming sources or master's available. For example in case the grid is down, or enough power from the solar system and storage is available to stop the generator, this is possible. The elgris HYBRID ADVANCED controller automatically disconnects the grid or stops the generator and the load is solely powered by the solar system.



Solar – Diesel – Hybrid with Mains or Generator as a grid forming unit

Solar – Hybrid without Mains or Generator as a grid forming unit. The system runs purely on PV

# Typical application – AC Coupled



In a typical AC coupled application, every source has a separate inverter. Not only the photovoltaic system, but also the storage is coupled on the AC side with a separate inverter.

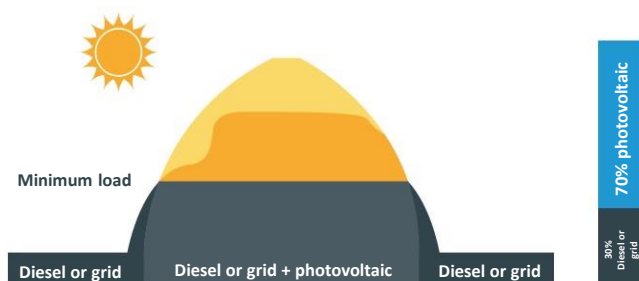
An advantage is that an existing renewable energy system can be easily upgraded with a battery system and elgris HYBRID ADVANCED controller to adopt to new appliances or changed requests.

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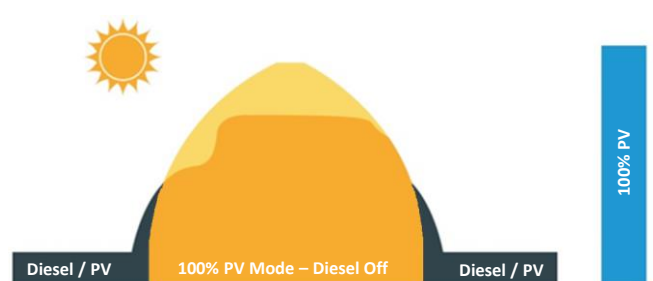
The elgris HYBRID ADVANCED controller measures the power from the grid or generator. Depending on the selected mode based on pre-defined thresholds, the controller reduce the output of the solar system by adjusting the setpoint of the inverter. Depending on the system layout, current operating mode, the remaining power is used to charge the batteries.

As a standard feature, the HYBRID ADVANCED controller is capable of managing a mini grid without other AC grid forming sources or master's available.

For example in case the grid is down, or enough power from the solar system and storage is available to stop the generator, this is possible. The elgris HYBRID ADVANCED controller automatically disconnects the grid or stops the generator and the load is solely powered by the solar system.



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# Technical overview – General

GENERAL DATA	
AC power supply	80 – 250 V
Data interfaces	Ethernet (RJ45) for inverter control and internet connection 2 isolated RS-485 (RJ45) for inverter control
Energy measurement	Double energy measurements (2 isolated metering inputs) 3 current inputs 0 – 5 A 4 voltage inputs (L1, L2, L3 N) 0 – 250 Vac Measurement interval: 1Hz
USB interface	Datalogging, Firmware update
CAN interface	CAN 2.0 isolated interface
RS 232 interface	For service
Digital inputs	4 isolated digital inputs with common ground and Vsupply
Digital outputs	4 dry contact outputs
Analog inputs	Single channel 0 – 20 mA
Analog output	Dual channel 0 – 20 mA
Enclosure	DIN rail mounting, ABS cover
Dimensions W x H x D	205 x 115 x 55 mm
Weight	350 g
Protection degree	IP20
Ambient temperature range	-25 – 60 °C

FEATURES	
Settling rate	20 ms
Sampling rate	8 kHz
Datalogging	Storage of measurement values each minute on USB stick USB memory usage: ~150kB/day Connection to monitoring portal Automatic internet time via SNTP protocol
Intergrated web pages	Graphic of solar power vs. Grid consumption Graphic of actual values (solar power, grid consumption) Configuration page
Certificates	CE

