

## RI-ENERGYFLOW-3P-Modular 10K

## G100 Compliance Certificate for Export Limitation Systems (ELS)

### Compliance Statement:

This certificate confirms that the RI-ENERGYFLOW hybrid inverter, manufactured by RAYLEIGH INSTRUMENTS LIMITED, meets the regulatory requirements outlined in the Technical Guidelines for Customer Export Limiting Schemes G100. These guidelines pertain to photovoltaic systems utilizing our hybrid inverters whether in DC coupled or AC coupled configuration.

To implement export limitation, the RI-ENERGYFLOW utilizes the RI-D140-C meter with its split core current transformer via a Modbus communication interface.

It is crucial to establish fail-safe communication links between the components (inverters and electricity meter) of the export limiter scheme, as mandated by UK DNOs (Distribution Network Operators), to ensure specific power quality.

### **Requirement 1: The scheme necessitates hard-wired communication links among the various components.**

Communication is achieved through a hard-wired Modbus RS485 output.

### **Requirement 2: The export limitation scheme must transmit signals to the generation system to reduce output within 1 second.**

The current transformer measures current values, and the energy meter RI-D140-C calculates the active power, sending the measured data to the RI-ENERGYFLOW inverter. The inverter controls the AC output power, while the built-in MPPT controller adjusts the power transfer from the panels to the inverter output.

### **Requirement 3: The scheme must operate in a fail-safe manner and limit export if the export limiter fails or loses its power supply.**

In the event of a failure of the Rayleigh Instruments local controller, meter, or current transformer, the exported energy will be maintained at or below the agreed level initially set.

- Current Transformers
- Energy Monitoring
- Inverters and Batteries
- Relays & Timers
- Safety
- Temperature & Pressure
- Instrumentation
- Energy Metering
- Monitoring and Control Software

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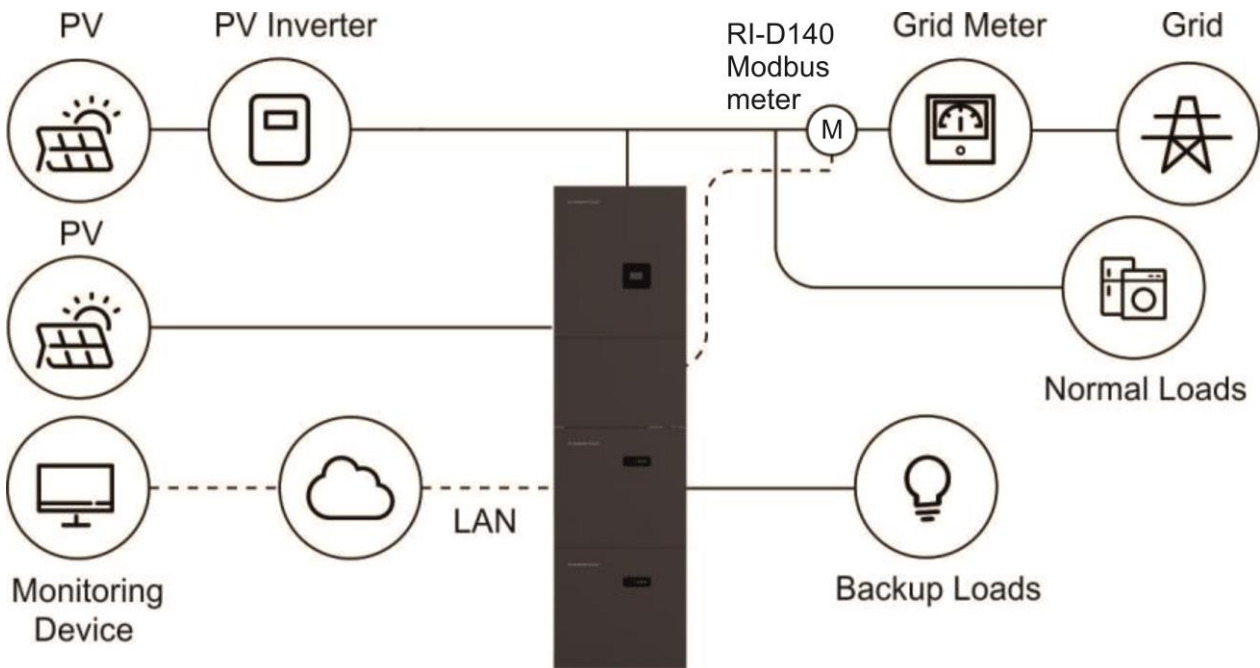
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**Requirement 4: When the export limitation scheme is active, it will reduce the exported active power to a value equal to or lower than the agreed export capacity.**

The export control circuit limits power export peaks of typical load steps within 5 seconds.



**Figure 1 illustrates the configuration of the ENERGYFLOW-3P-MODULAR 10K Hybrid Solar Inverter.**

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The RI-D140-C meter serves as the power measurement unit, while the export limitation is solely calculated by the hybrid inverter. The solar inverter adjusts the power from the PV modules by controlling the operating points, ensuring that excess energy is not generated from the solar PV panels. Rayleigh Instruments inverters do not employ resistive, inductive, or any other form of load to dissipate excessive energy, including water heaters. Therefore, no additional harmonics are introduced due to the functioning of the Export Limitation System. The harmonics generated by the inverters are specified in the respective G98/G99 certifications. The ELS can be programmed with a site export limit in watts, and only advanced setting access levels can adjust it to prevent unauthorized overrides. Setting the limit to zero will cause the inverters' output relays to open circuit, resulting in a true zero output.

Additionally, there is an option to set P (U) limits if specifically requested by the DNO to prevent exported power from exceeding statutory voltage limits. The regulation states that the ELS must detect any excursion.

*Ryan Welshman*

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Sales Director

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