

# **Fronius Grid and System Protection: Save costs by controlling the inverter-integrated interface switch**

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Feature Guide

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## **1 WHAT IS A GRID AND SYSTEM (GS) PROTECTION?**

Grid and system protection is a protective device which constantly monitors the voltage and frequency of the supply network for the specified switch-off conditions. The grid and system protection activates the interface switch. The interface switch usually consists of two electrical switchgear connected in series. The GS protection is used for safe disconnection of the generating plant if the voltage and frequency limits in the power supply network are not observed because of unwanted conditions in the grid or if an isolated system has formed.

## **2 VARIANTS FOR GRID AND SYSTEM PROTECTION**

The normative requirements for GS protection vary from country to country. Grid operators, too, sometimes require different designs or settings. For the sake of simplicity, the subject of GS protection is described in this document using the example of Germany (according to VDE-AR-N 4105:2018), as this country often plays a pioneering role with regard to norms and standards.

## 2.1 Inverter integrated grid and system protection

Grid and system protection is integrated in every typical inverter. The GS protection measures the grid voltage and grid frequency and switches off the PV system via the integrated interface switches as soon as the switch-off conditions are fulfilled. The GS protection and the redundant interface switches are both located in the inverter. For PV systems with an output of up to 30 kVA, this GS protection inside the inverter is sufficient. No external GS protection is required.

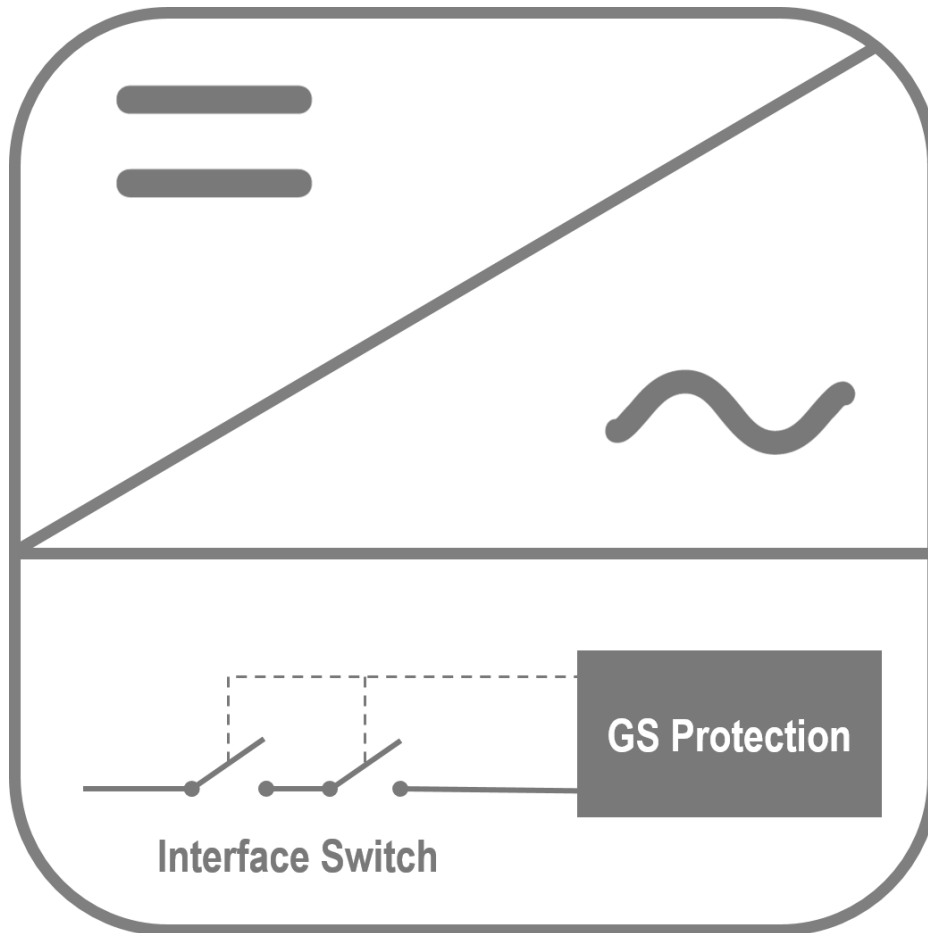


Figure 1: Inverter-integrated GS protection for systems up to 30 kVA

## 2.2 Centrally realised grid and system protection relay and interface switch

According to the German Low Voltage Directive VDE AR-N 4105:2018, a central GS protection at the central meter location must be implemented instead of the integrated GS protection for systems in the power range between  $\geq 30$  kVA and  $< 135$  kW. One possibility to comply with this standard is a central GS protection relay at the central meter location (6.2 4105:2018), which acts on the also central interface switch. Both components must be installed additionally.

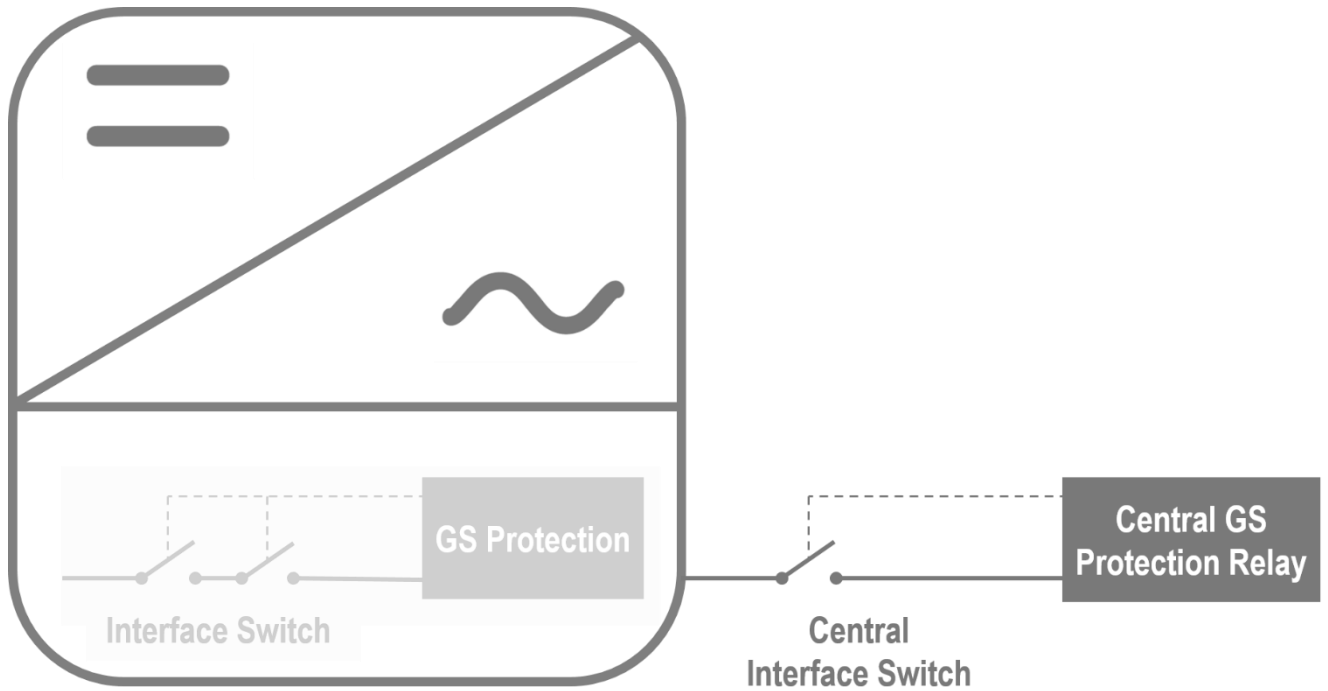


Figure 2: Centrally realised GS protection relay and interface switch

### 2.3 Central grid and system protection relay controls inverter-integrated interface switch

The second way to fulfil the requirement for central GS protection is a central GS protection relay at the central meter location, which acts on the interface switch integrated in the inverter. With this variant, no additional interface switch needs to be installed.

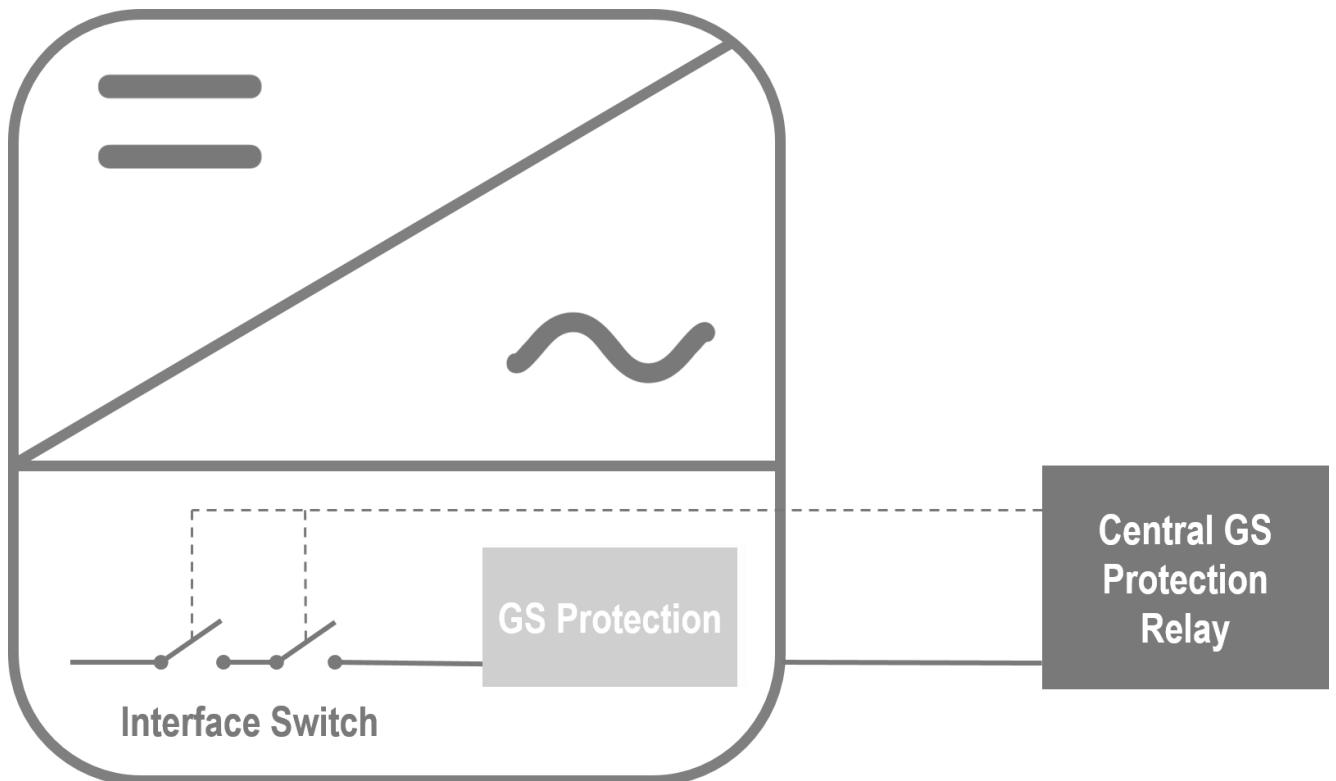


Figure 3: Central GS protection relay controls inverter-integrated interface switch

### 3 WHAT ADVANTAGES DOES FRONIUS OFFER IN TERMS OF GRID AND SYSTEM PROTECTION?

In all Fronius inverters, the integrated interface switch can be controlled via an interface from an external GS protection relay. For systems between  $\geq 30$  kVA and  $< 135$  kW output, no additional interface switch needs to be installed.

- / With the SnapINverters, the interface switch is controlled via the multifunctional current interface (designed as a signal contact on the "RECERBO")
- / With the GEN24/GEN24 Plus and Tauro inverters the interface switch is controlled by the WSD function (Wired Shutdown)
- / This solution can also be realised for mixws systems (SnapINverter and GEN24/GEN24 Plus/Tauro)
- / The external GS protection can also be realised together with an overvoltage protection. For this purpose, the individual components must be connected in series.

Detailed instructions can be found on our homepage in the document:

[Grid and System Protection Fronius Symo / Eco / Primo](#)

For the control of the inverter integrated interface switch (SnapINverter series) we recommend a coupling relay which can be mounted on the top-hat rail of the inverter.

Requirements for the relay:

- / Max. ambient temperature up to  $70^{\circ}\text{C}$
- / Dielectric strength between coil and contacts  $\geq 6\text{kV}$

The coil voltage and power of the relay must be coordinated with the manufacturer of the GS protection.

Fronius is the only manufacturer in this area with a certificate from an accredited testing institute for the control of the integrated interface switch. This ensures that the GS protection chain functions perfectly. Many competitors who can also control the inverter-integrated interface switch only have a manufacturer's declaration.

### 4 POTENTIAL SAVINGS WITH THE FRONIUS SOLUTION

The control of the inverter-integrated interface switch offers great savings potential for systems between  $\geq 30$  kVA and  $< 135$  kW. The greatest savings relate to the interface switch itself. Depending on the size of the system, this can amount to up to 2000€.

Furthermore, the control of the integrated interface switch can be implemented much more easily and quickly than the installation of a central interface switch - this in turn saves time and thus costs.



Lack of space can also become a problem during installation. Usually the space in the main distribution board is limited. The central GS protection relays and the interface switch often take up a lot of space. In the worst case, an additional switch cabinet must be purchased, which in turn leads to additional costs. With the inverter-integrated Fronius solution, the installer saves the space required for the interface switch.