



Operating instructions
Addition
Application example

GB

**MN20xS/
MN50xS
with
G1501S**

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1 Application example

Protective guard monitoring with 3x MN201S and G1501S

The dangerous part of a machine is protected by 3 protective guards. Each guard is monitored by a magnetically coded fail-safe sensor of type MN201S. There is a logical series connection between the three sensors and a fail-safe evaluation unit of type G1501S.

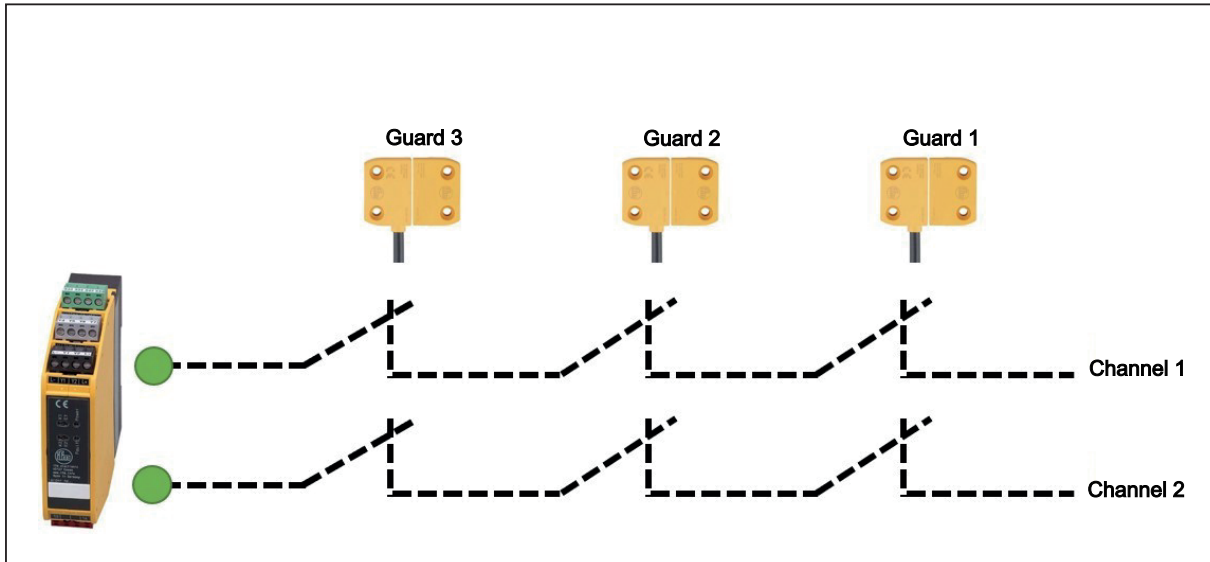


Fig. 1: Schematic diagram of the safety system

When a guard is opened, the corresponding contacts of the sensor are disconnected and the current flow is interrupted.

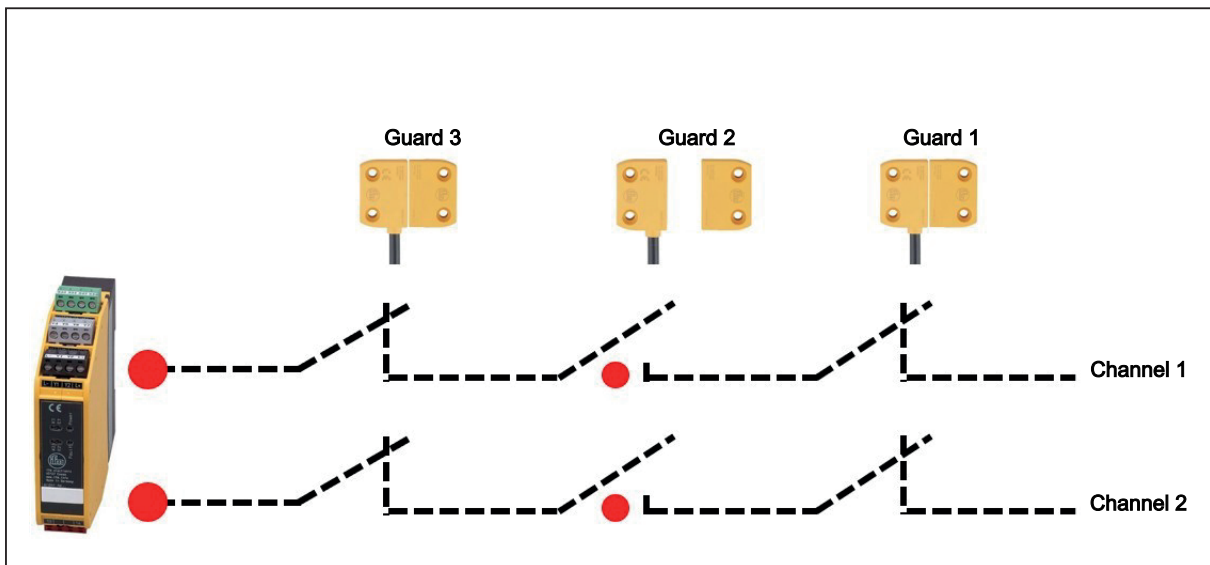


Fig. 2: Opening of a protective guard

2 Use of the VDMA library

The VDMA library “VDMA66413_Lib_ifm_systems_Reihenschaltung” can be used to determine the max. obtainable performance level (PL)/safety integrity level (SIL) and the corresponding PFH_d value.

In the following, it will be explained how the library is structured and how to use it.

To ensure trouble-free use of the library, SISTEMA version v2.0.8 or higher is required.

2.1 Language selection

After opening the library in SISTEMA, you can select the desired language under “Library Language”.

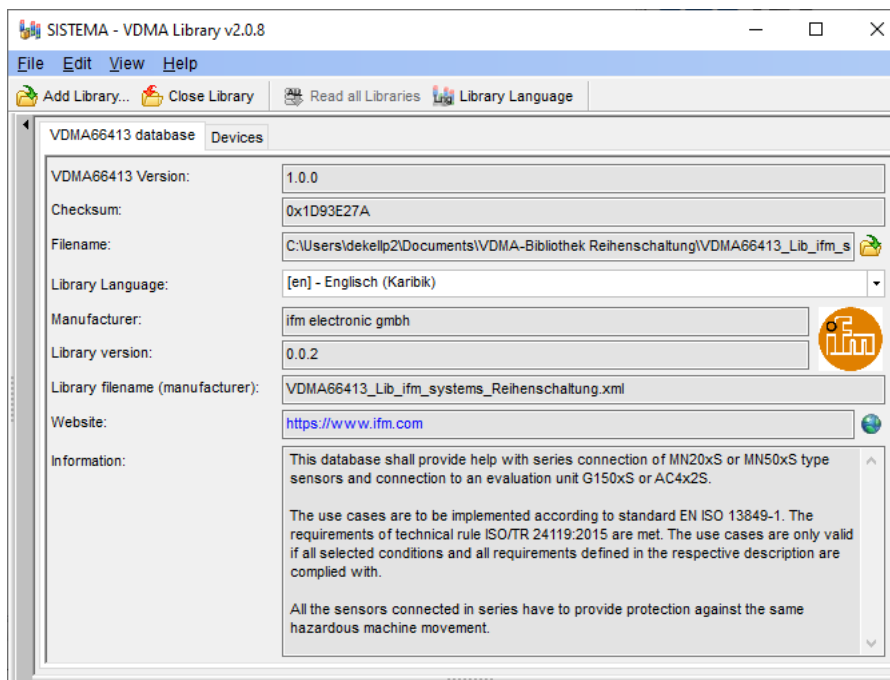


Fig. 3: Start screen of the library

2.2 Opening the library

- ▶ Open tab [Devices]
- ▶ Right mouse click on the library
- ▶ Select [Show]

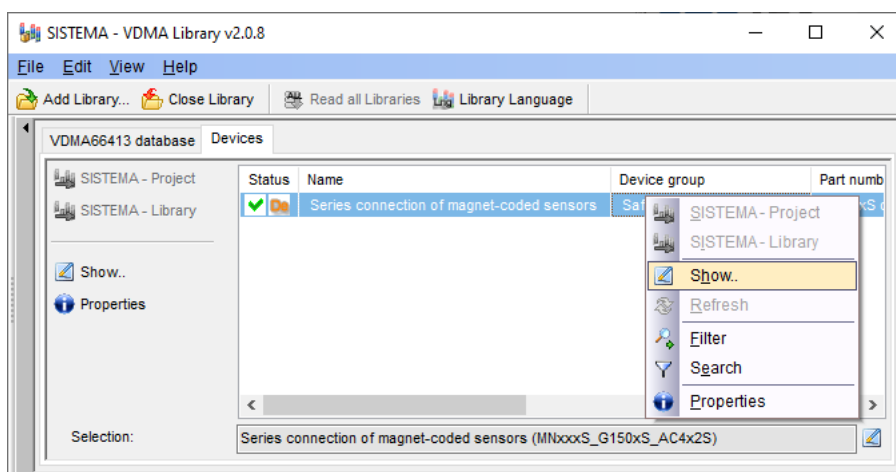


Fig. 4: Opening the library

2.3 Use cases

The use cases tab shows possible use cases.

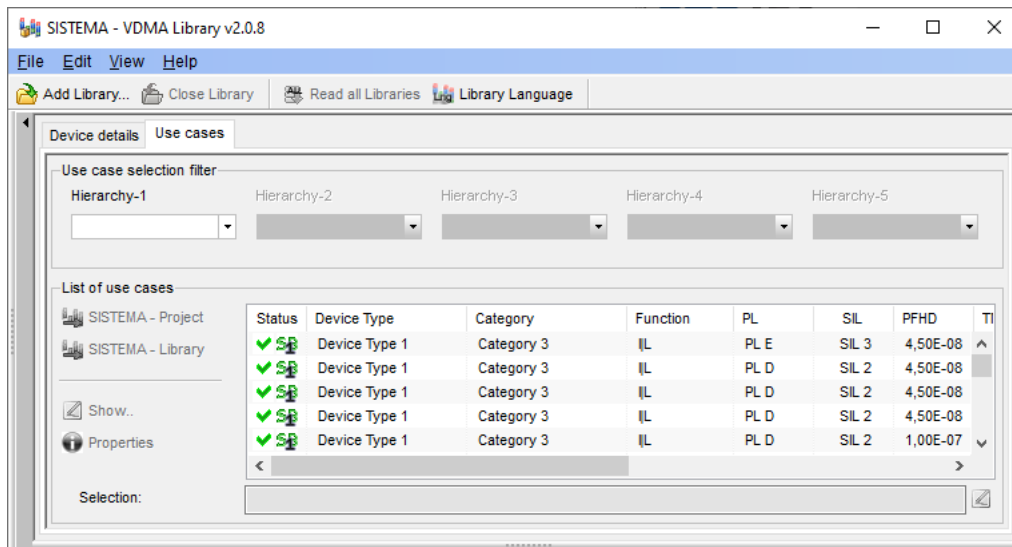


Fig. 5: Use cases

Via the use case selection filter, up to five conditions (hierarchies 1-5) can be selected to filter out the corresponding use case.

2.4 Hierarchy levels

The hierarchies are structured according to the following pattern.

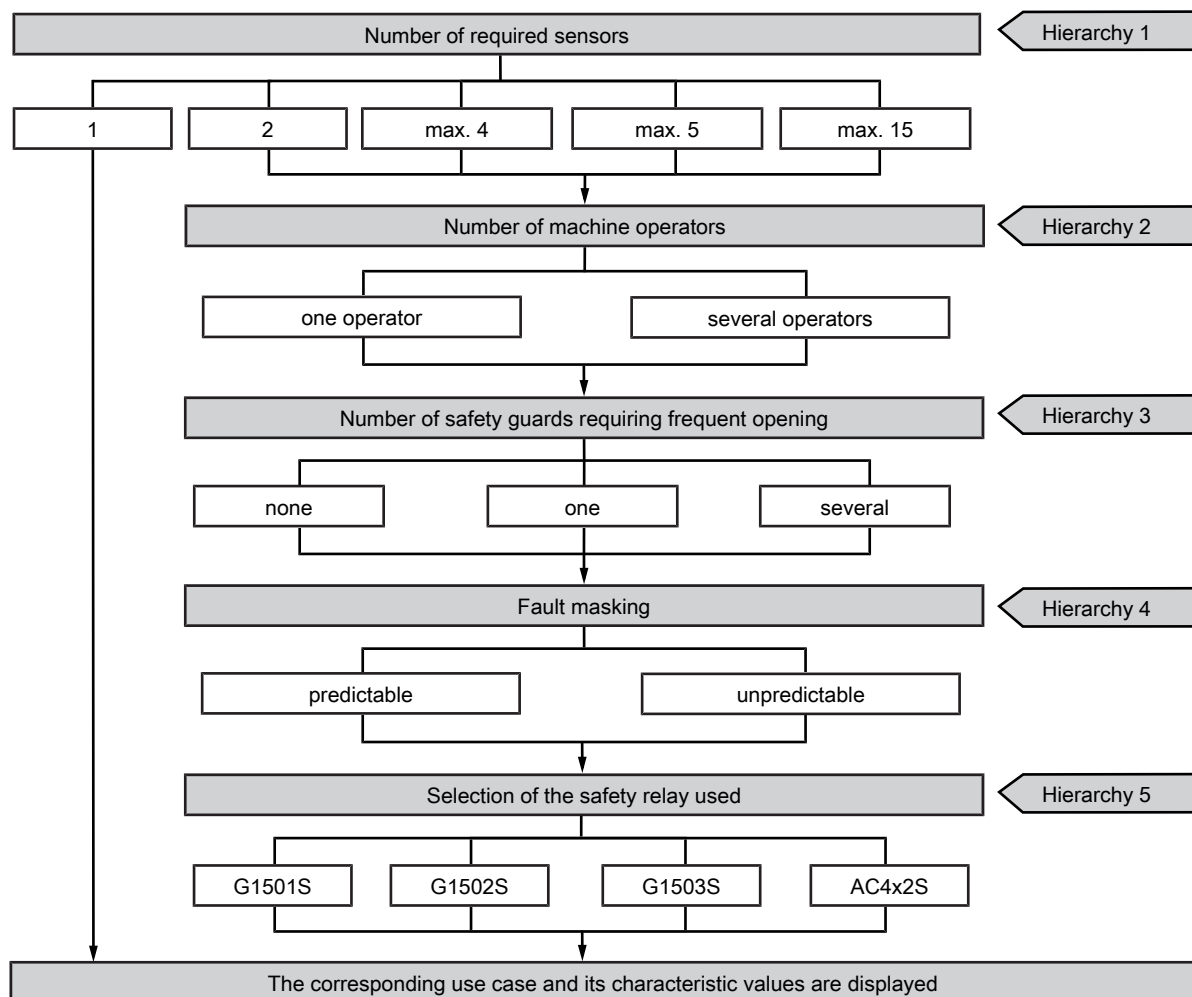


Fig. 6: Hierarchy levels

Depending on the use case, a selection must be made for each hierarchy level. In some cases, no selection [-] must be made.

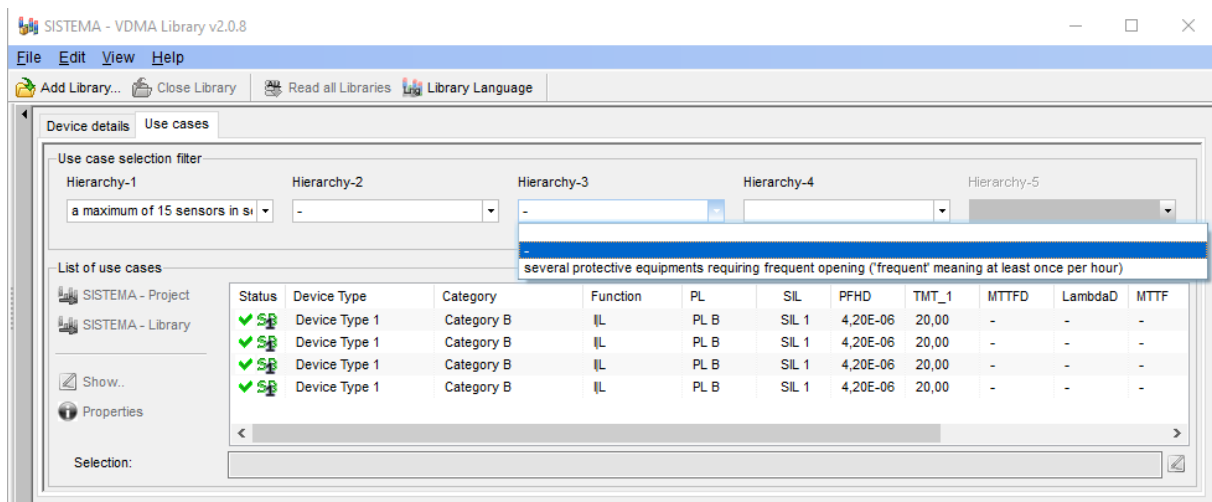


Fig. 7: Selection for the hierarchies

When filtering, the values suitable for specific applications are displayed.

2.5 Characteristic values application example

In the case of the application example, the library provides the following characteristic values:

Category: category 3
 Performance level: PL d
 Safety integrity level: SIL 2
 PFHd: $4.50 \cdot 10^{-8}$ [1/h]

 These characteristic values only apply if the selected conditions are adhered to.

Hierarchy -1: *a maximum of 4 sensors in series connection*
 Hierarchy -2: *1 operator at the system*
 Hierarchy -3: *no protective equipment requiring frequent opening (frequent = min. 1x per hour)*
 Hierarchy -4: *there will never be two doors open simultaneously*
 Hierarchy -5: *MN20xS/ MN50xS with G1501S*

Tab. 1: Selection filter application example

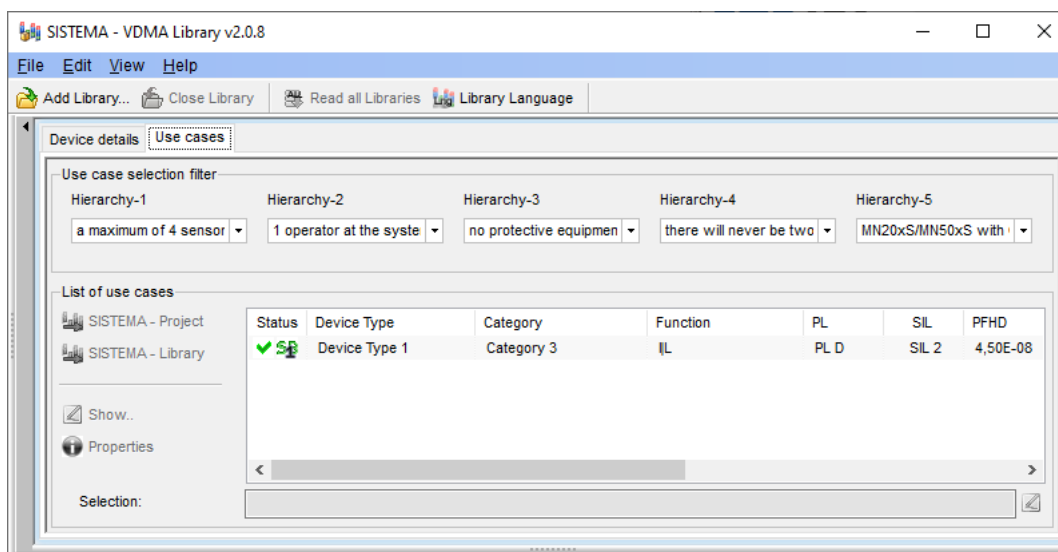


Fig. 8: Selection filter application example

2.6 Creating a safety function

In order to integrate the selected use case in a SISTEMA project, a new safety function must be created in the project.

- Right mouse click on the project
- [New]



Fig. 9: Creation of a new safety function

2.7 Integrating a use case

- Right mouse click on the newly created safety function
- Click on [Load from VDMA Library]
- Select the use case
- Right mouse click on the use case
- Click on [SISTEMA - Project]

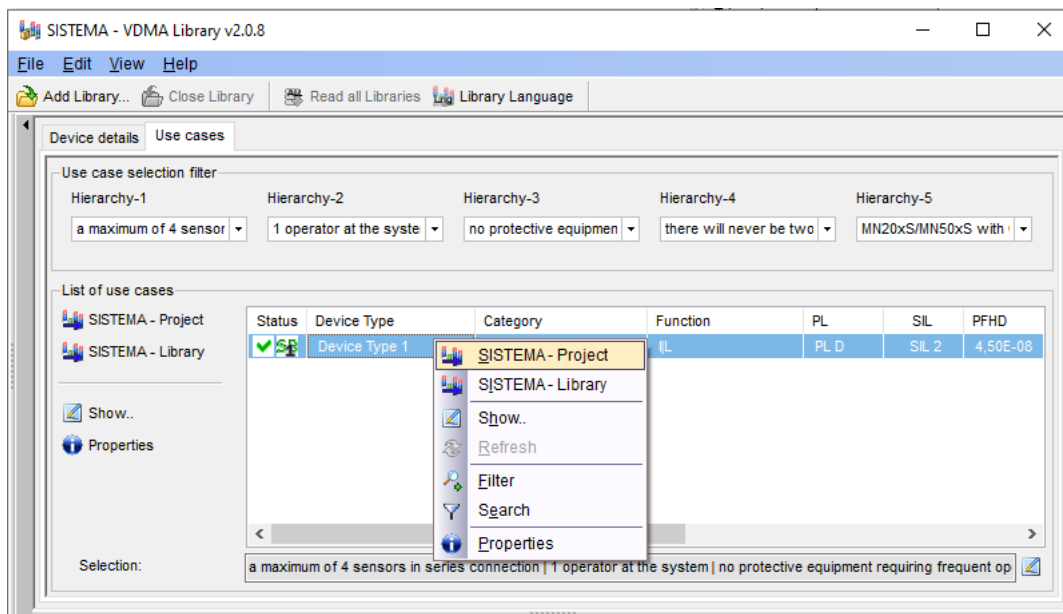


Fig. 10: Integration of the use case in a SISTEMA project

3 Creating a report

By clicking on [Report], you can create a report of the project as a PDF file.

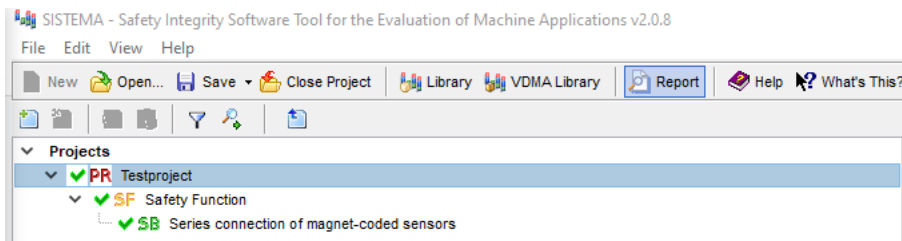


Fig. 11: Creating a report

Figure 12 shows the available report options.

The report is created via the buttons [Overview of safety function] or [Detailed reporting].

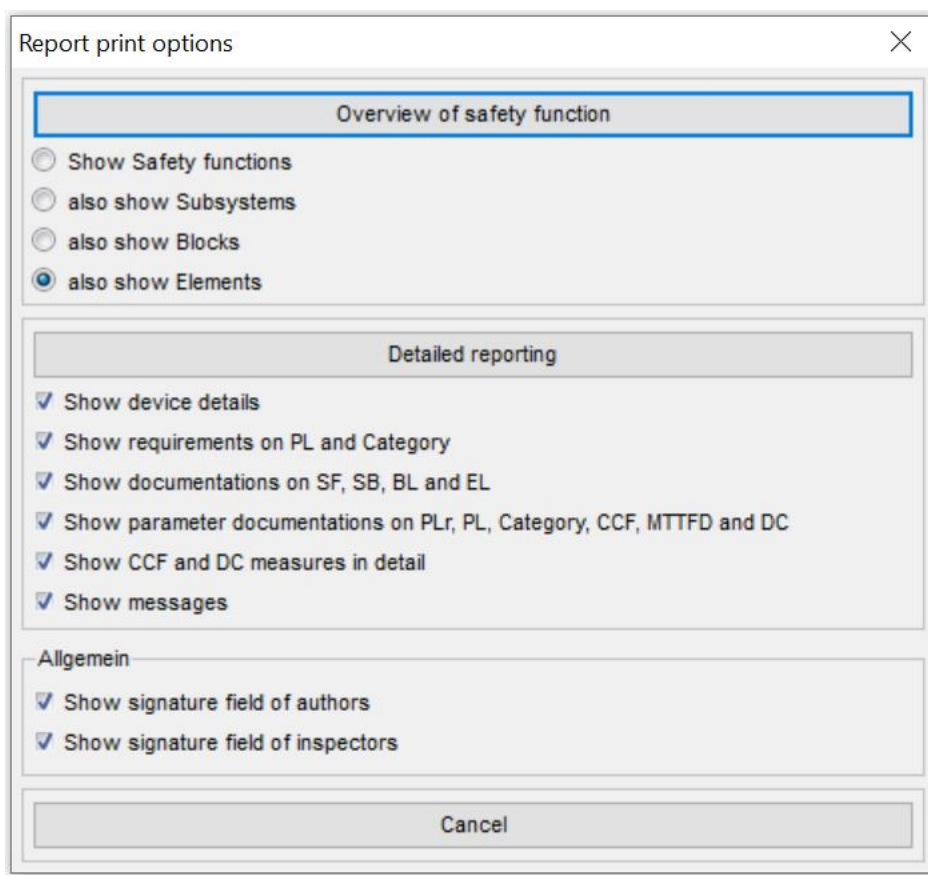


Fig. 12: Report options selection