INTEGRATION MANUAL

microScan3, nanoScan3

CDS configuration transfer to Safety Designer

SICK
Sensor Intelligence.

Described integration
Transferring a safety laser scanner CDS configuration to a Safety Designer configuration.

Manufacturer
SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Germany

Legal information

Original document
This document is an original document of SICK AG.

Contents

1 About this document

1.1 Purpose of this document

This integration manual contains the information needed to transfer a CDS safety laser scanner configuration to a Safety Designer configuration. The steps described may differ depending on the configuration to be transferred.

Note: This document describes the transfer of an S3000 CDS configuration to a microScan3 Safety Designer configuration. The procedure for S300 and S300 Mini to nanoScan3 is comparable and transferable.

Note: This document supports the transfer and shows the relevant steps. Please note that settings can be transferred. However, settings must be adapted to the new safety laser scanner and the application. The operating instructions for the respective device remain valid.

Legal notes

SICK is not liable for damage caused by or in connection with the replacement of the device. All instructions and information have been compiled with the utmost care and to the best of our knowledge, but do not claim to be complete. The replacement must always be checked, planned, and validated for each individual case. This is the responsibility of the person carrying out the work.

Note: This document does not replace the operating instructions. In the event of discrepancies between this document and the operating instructions for a product, the information in the operating instructions shall apply.

Complementary information

Information on the individual products can be found at www.sick.com.

1.2 Scope

Product

This document applies to the following product families:

- S3000, S300 or S300 Mini, configured by CDS
- microScan3, nanoScan3, configured by Safety Designer

The respective operating instructions can be found at www.sick.com.

1.3 Target groups of this integration manual

This integration manual is intended for professionals supporting or executing the transfer of a CDS configuration to a Safety Designer configuration.

2 Configuration - Preparation

Configuration software

The CDS configuration software is used to configure the S3000. The microScan3 devices are configured using the Safety Designer configuration software. To transfer the configuration from S3000 to microScan3 it is necessary to

- install the newest configuration software CDS and
- install the newest Safety Designer in advance.

The software can be downloaded at: **www.sick.com**

It is recommended to open both CDS and Safety Designer in shared screen. This makes it easier to transfer the S3000 configuration from CDS to the Safety Designer for the microScan3.

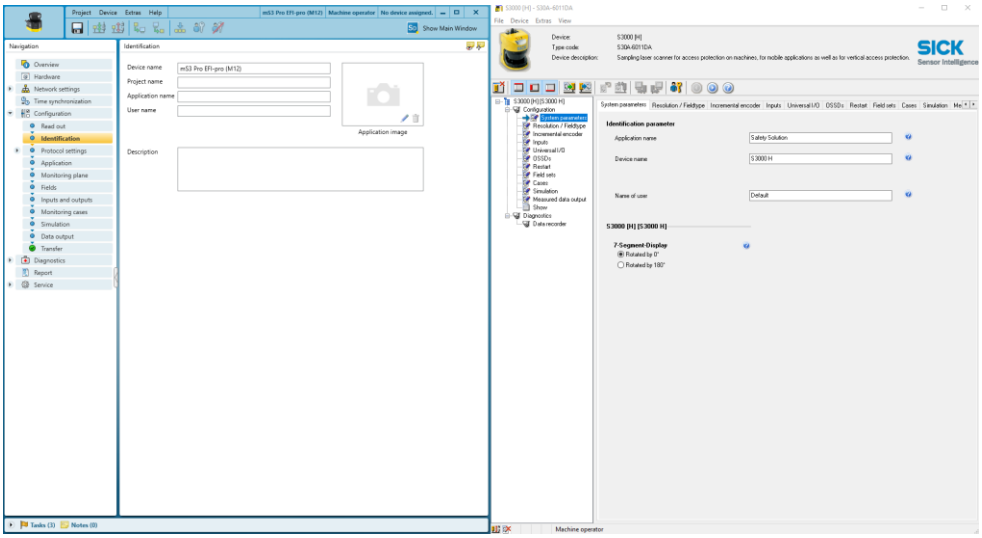

Figure 1: Split your screen for Safety Designer and CDS.

S3000 project file

In addition, it is necessary to have access to the

- existing CDS project file (.skp) or
- to the still installed S3000 device to download and save the CDS project file.

To download the CDS project file from a device, the electrical connection must be in place and the orange service cable must be connected (e.g., **www.sick.com/6034574**).

2.1 Start CDS configuration software

Start the CDS configuration software to whether open an existing project file or download a configuration from a still installed S3000 device.

2.1.1 Open an existing project file

In the following steps it is described how to open an existing CDS project.

1. Start CDS.
2. Open your project file (.skp).

Figure 2: CDS, Open project.

3. In the navigation area, double click your S3000 device.

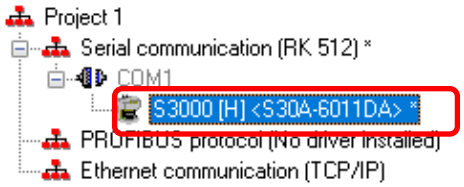

Figure 3: S3000 inside the CDS navigation area.

4. The project file is opened successfully if the Device window opens.

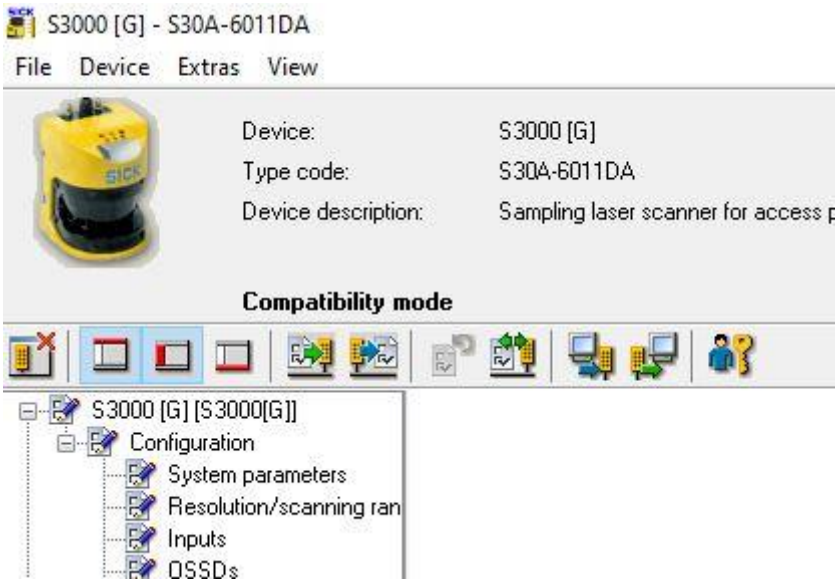

Figure 4: CDS, S3000 device window

2.1.2 Download the project file from a S3000 device

In the following steps it is described how to download a configuration from a S3000.

1. Power-up / Switch on the S3000.

2. Connect your PC with the configuration cable to the configuration connection of the S3000.

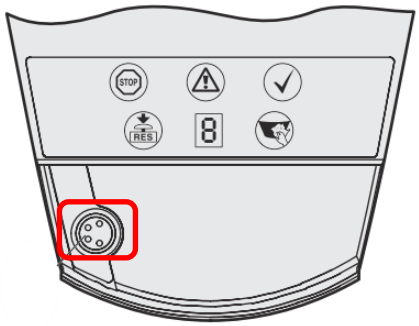

Figure 5: S3000 configuration connection M8x4 Pin.

3. Start CDS

4. Right click the COM-Port and click Identify.

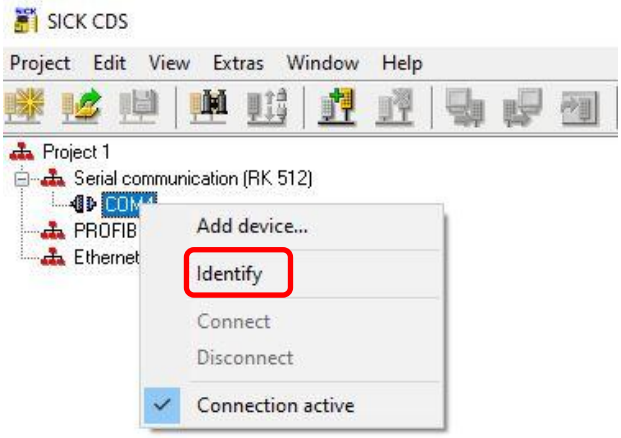

Figure 6: CDS, identify a connected device.

5. Confirm with Yes to read to configuration from the S3000.

Figure 7: CDS, confirm with "Yes" to read the configuration.

6. Once the configuration is red, the device window is shown.

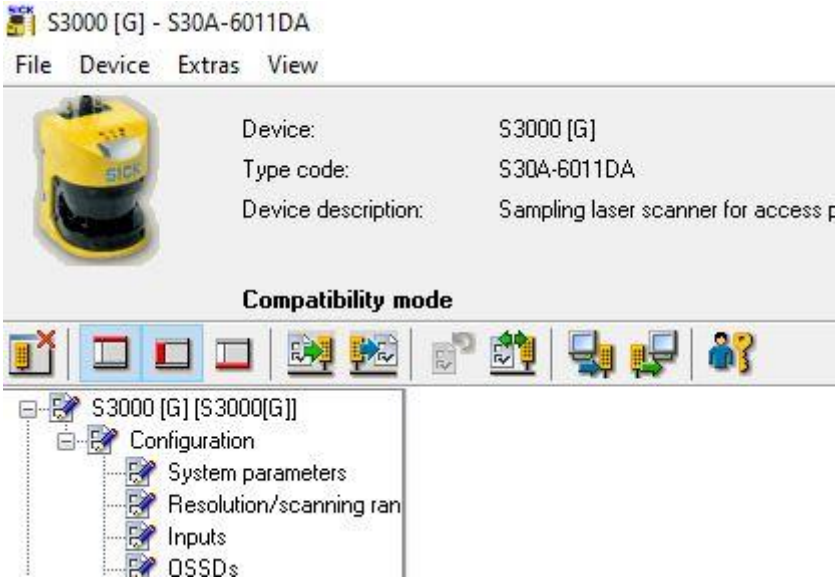

Figure 8: CDS, S3000 device window.

2.2 Start the Safety Designer configuration software

Start the Safety Designer configuration software to create a new miroScan3 project file.

1. Open the Safety Designer.
2. Create a New project.

Figure 9: Safety Designer, create a new project.

3. Click Configuration to add a device to the Safety Designer project.

Figure 10: Safety Designer, select configuration to add a device.

a) Double click on the microScan3 listed in the Device catalog.

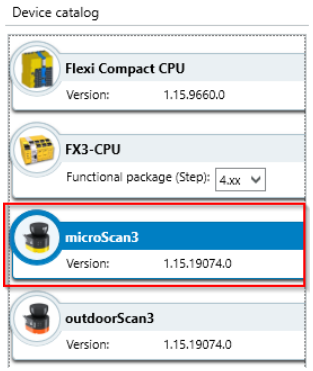

Figure 11: Safety Designer, device catalog, selecting a microScan3.

b) In the Selection wizard, select/enter the device type and click Apply.

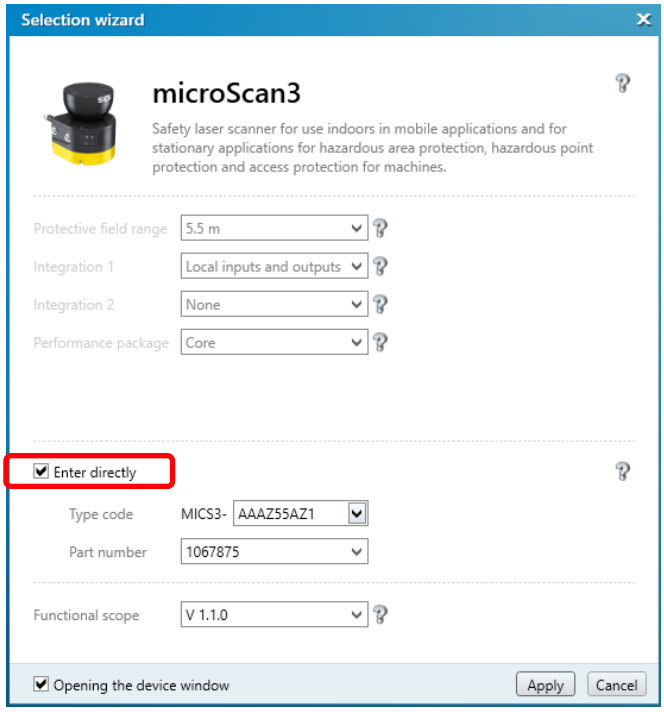

Figure 12: Safety Designer, selection wizard, select the appropriate microScan3.

Note: It is highly recommended to select the device by enter directly the type code or the part number. Another really important point is to select the correct functional scope shown on the label of the present microScan3 device.

c) The selected device is now added to the Device overview and the device configuration opens automatically.

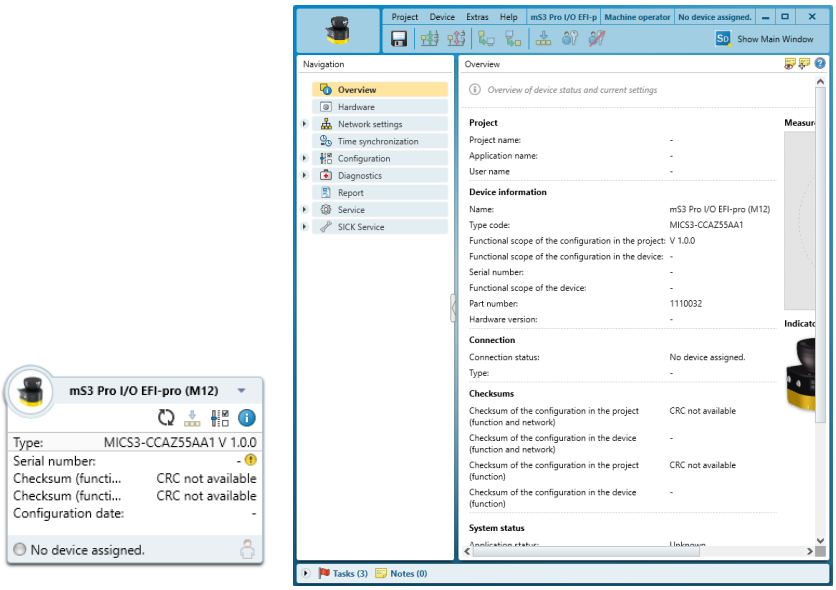

Figure 13: Safety Designer, device overview, finally added microScan3.

3 Configuration – General steps

In this chapter the general transfer of the configuration is described.

Note: It is recommended to split your screen to have both applications side by side.

3.1 Identification and System parameters

The parameters of the Identification (Safety Designer) and System parameters (CDS) pages are transferred as follows:

CDS:

1. Open the device window by double click the device seen in the Navigation area.
2. Expand the menu Configuration and click System parameters.

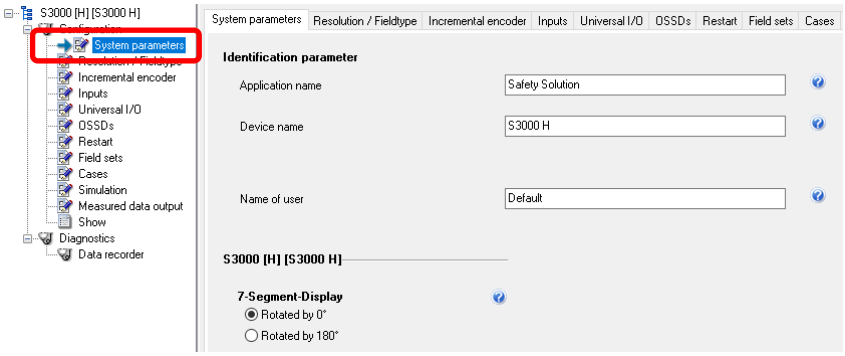

Figure 14: CDS, System parameters.

Note: The rotation direction of the 7-Segemt-Display is also be set inside the system parameters.

Safety Designer:

3. Open the device window by double clicking the device you see in the Device overview.
4. In the navigation area, expand the Configuration menu and click Identification.

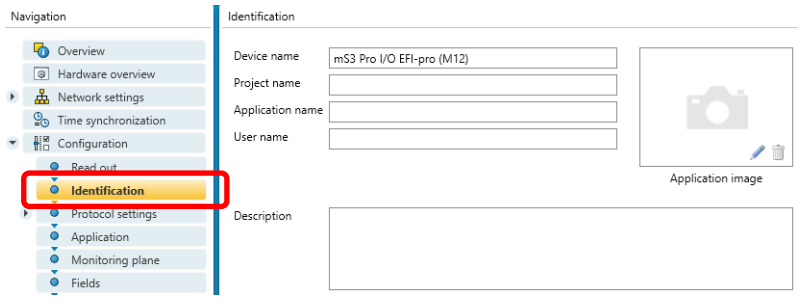

Figure 15: Safety Designer, Identification

5. Copy the respective names from the CDS.

6. And paste it into the specific fields of the Safety Designer.

3.2 Application and Resolution / Fieldtype

The parameters of the Application (Safety Designer) and Resolution / Fieldtype (CDS) pages are transferred as follows:

CDS:

7. In the navigation area, click Resolution / Fieldtype.

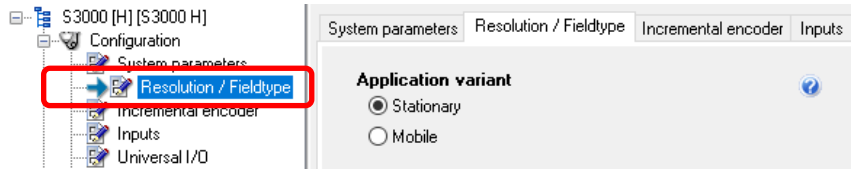

Figure 16: CDS, Resolution / Fieldtype.

Safety Designer:

8. In the navigation area, click Application.

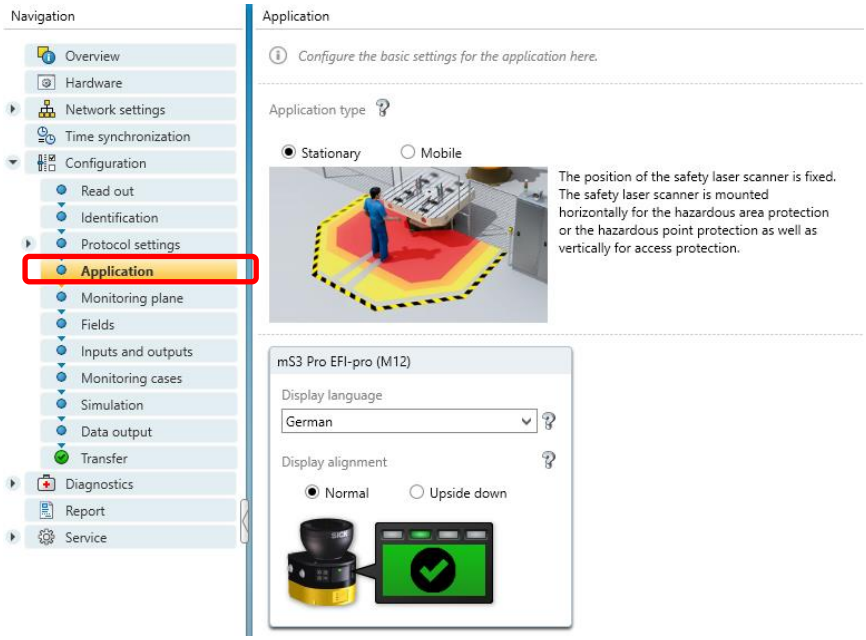

Figure 17: Safety Designer, Application.

9. Select the Application type.

10. Align the display, in accordance with the register System parameters in CDS.

3.3 Monitoring Plane and Resolution / Fieldtype

The parameters of the Monitoring Plane (Safety Designer) and Resolution / Fieldtype (CDS) pages are transferred as follows:

CDS:

11. Remain in the chapter Resolution / Fieldtype. Focusing on the settings Resolution protective field and Resulting range protective field.

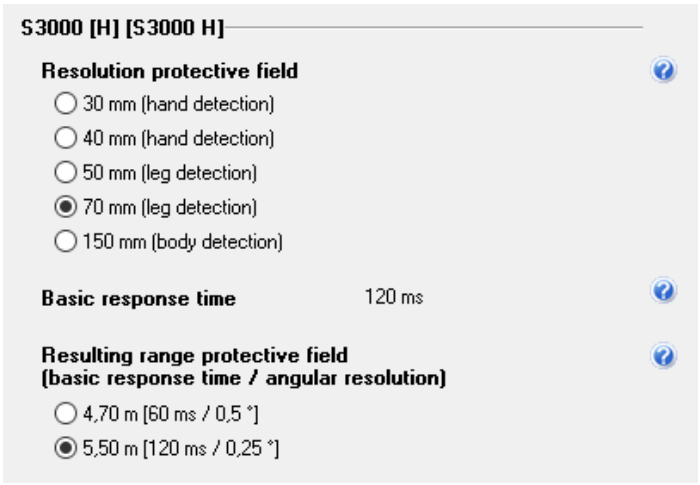

Figure 18: CDS, Resolution protective field.

Safety Designer

12. Click Monitoring plane.

13. Set the Object resolution.

Figure 19: Safety Designer, Object resolution

14. Set the Scan cycle time.

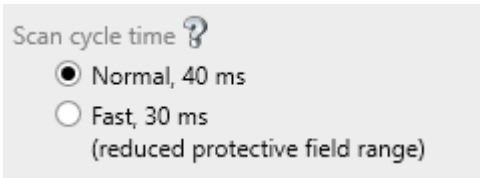

Figure 20: Safety Designer, Scan cycle time.

3.3.1 Multiple Sampling

By defining the monitoring plane, the multiple sampling could be set within the Safety Designer. This setting is intended to be a global setting for every single field, also including expert functions (pencil).

Compared to CDS, this option is new, as in CDS multiple sampling was set for each specific case.

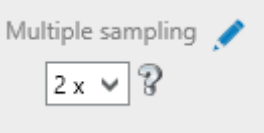

Figure 21: Safety Designer, Multiple sampling.

3.4 Fields and Field sets

To create a field for a S3000, the field mode must be set in the Resolution / Field Type register. For microScan3, this setting is made directly by creating a field set and is therefore not restricted. This means that it is possible to set up to eight different fields in one field set.

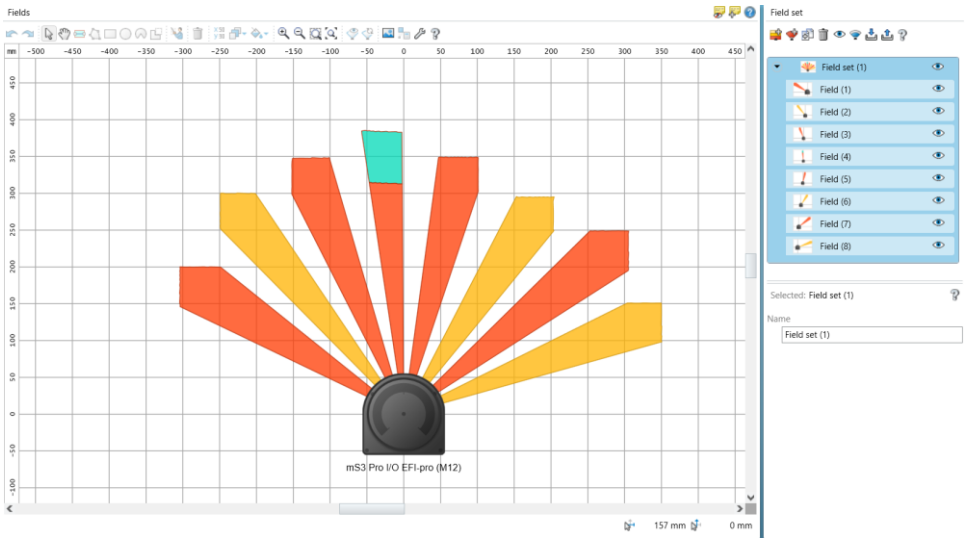

Figure 22: Safety Designer, example of one field set with eight different fields.

3.4.1 CDS - Export of the fields

In this chapter it is described, how fields are exported from CDS.

15. Inside the device window, navigate to Field sets and select a field set e.g., Field set

16. Within the toolbar, click the button Export fieldsets to XML file.

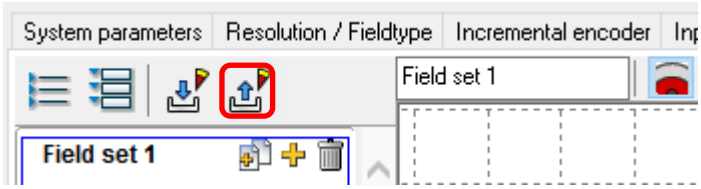

Figure 23: CDS, exporting the field set.

17. Choose a storage location, enter a file name, and click Save.

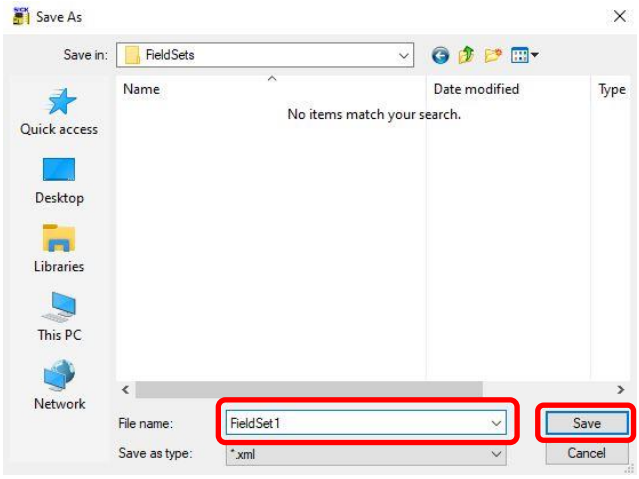

Figure 24: CDS, save the field set in xml format.

Note: It is recommended to save each field set in the same file path/folder.

18. Repeat the described steps for every field set.

3.4.2 Safety Designer - Import of the fields

A field set (Field Set (1)) has been created automatically by default. This can be deleted or even used, if required. For this example, the default Field Set (1) has been deleted.

19. In the device window, navigate to Configuration and then click Fields.

20. In the Field set area, click Import fields and field sets.

Figure 25: Safety Designer, importing the field sets.

21. The window Import fields and field sets opens. Select the file path.

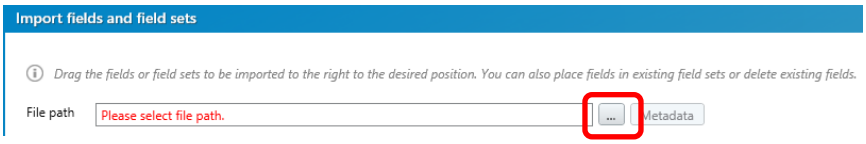

Figure 26: Safety Designer, select a file path.

22. In the Open dialog box, it is necessary to change the file format to CDS format with point per beam. Select a file and click Open.

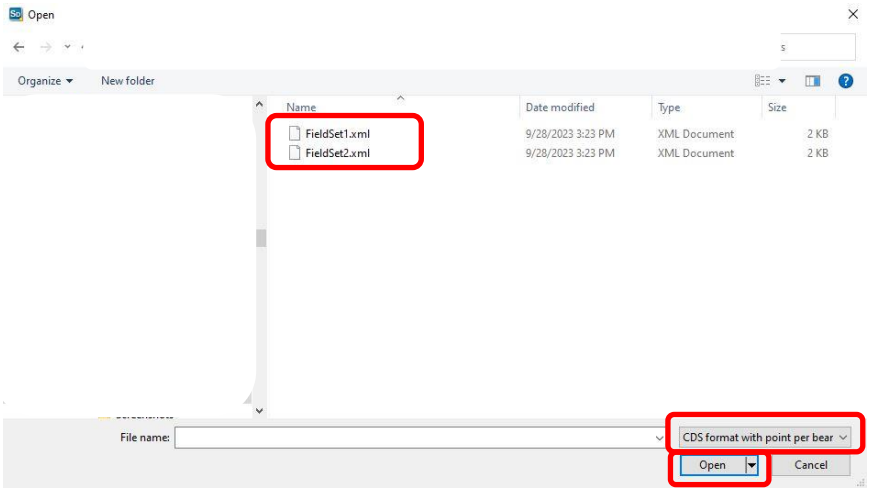

Figure 27: Safety Designer, selecting field set xml.

23. With the selected path, all the fields available should be visible in the area Importable fields and field sets. Click Add all field sets.

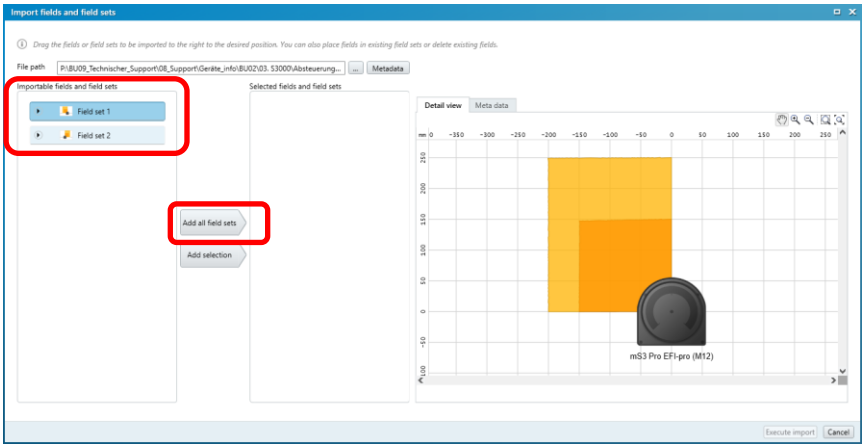

Figure 28: Safety Designer, import fields and field sets.

24. The fields and field sets that can be imported, now appear in the Selected fields and field sets area. Click Execute import.

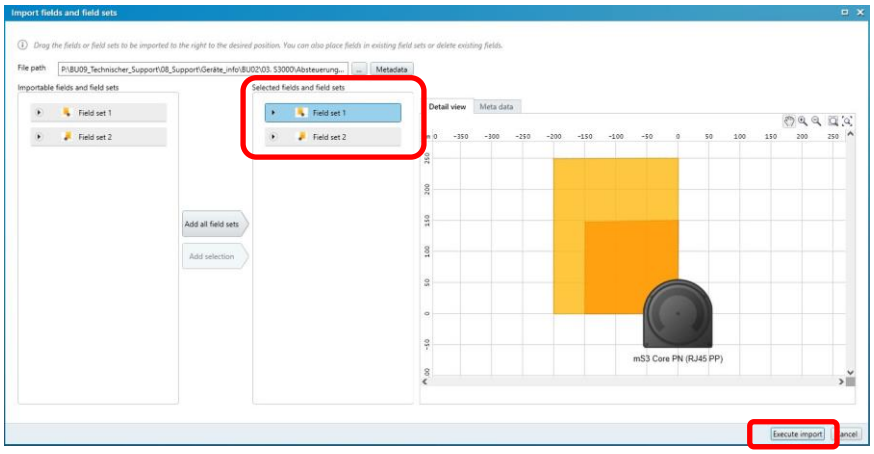

Figure 29: Safety Designer, execute import.

25. The field sets of the S3000 are now finally imported in the Safety Designer project.

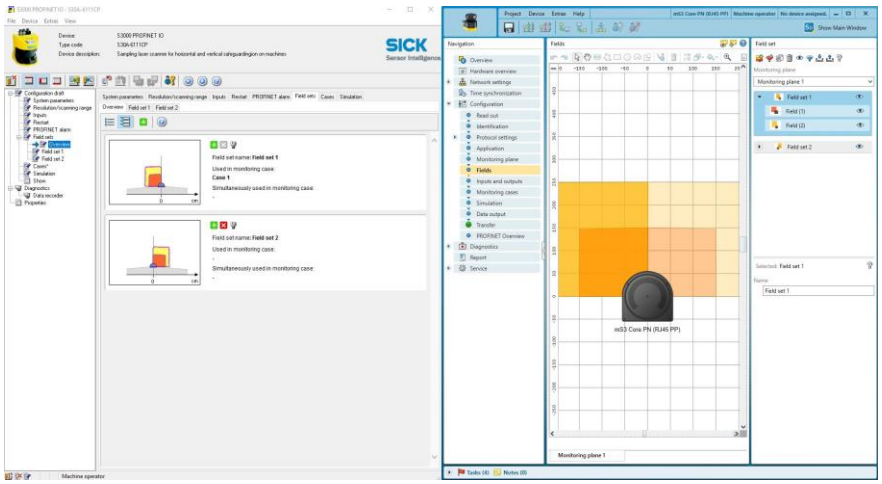

Figure 30: Overview of the finally imported field sets from CDS into Safety Designer.

Note: By importing the fields, the original shape (e.g., rectangle) will be lost. **All fields are imported in a polygon shape** (“CDS format point per beam”).

3.4.3 Verify fields

Fields are exported in the coordinate type polar. This would **require a check of the fields, as they may differ**.

26. Within the field editors of CDS and Safety Designer, open the edit numerical tool inside the specific toolbar.

CDS:

27. Select a field set, e.g., Field set 1

28. In the toolbar, select Edit numerical.

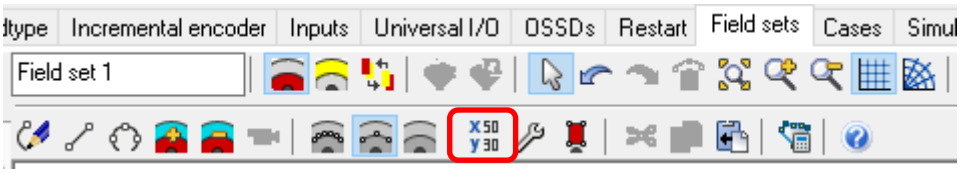

Figure 31: CDS, edit field coordinates.

Safety Designer:

29. Select Fields and then, e.g., field Set (1).

30. In the toolbar, select Edit object numerically.

Figure 32: Safety Designer, edit field coordinates.

31. Verify the X and Y positions for every point of every specific field.

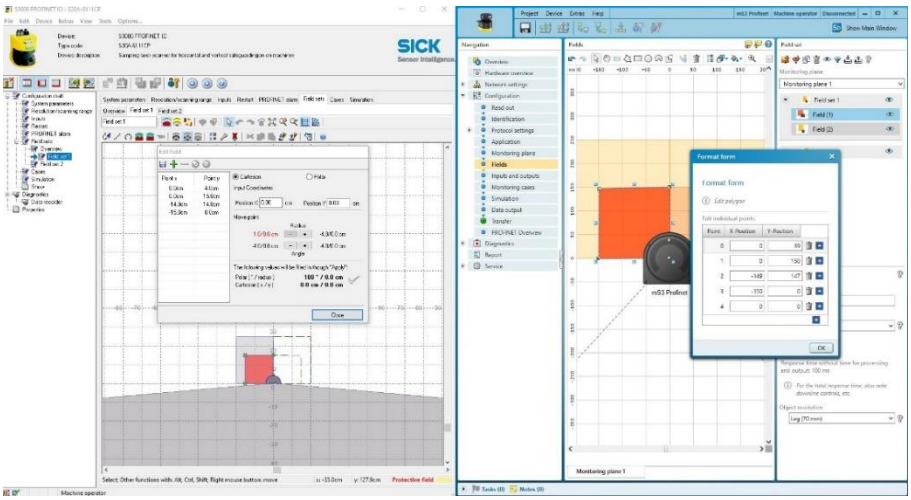

Figure 33: Verifying the coordinates between CDS and Safety Designer.

3.4.4 Contour fields

If a contour field has been used in a S3000 application, it must be created completely new for microScan3 inside the Safety Designer project.

On the S3000, the contour field was a part of the protective field. Compared to microscan3, the contour field is a separate field within a field set. When importing the S3000 contour field, the contour will be cutted out.

Further information on how to configure fields for micorScan3 can be found in the chapter “Fields” in the respective microScan3 operating instructions (see www.sick.com).

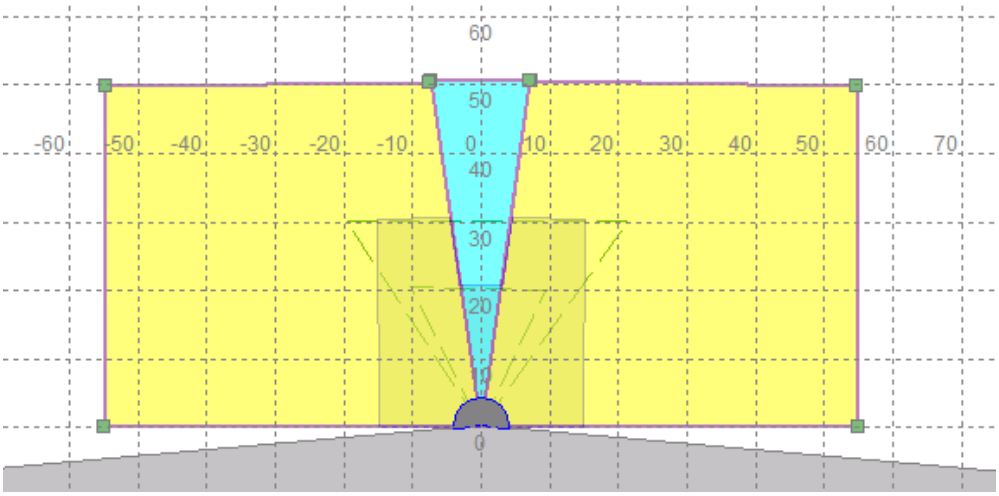

Figure 34: CDS, contour field.

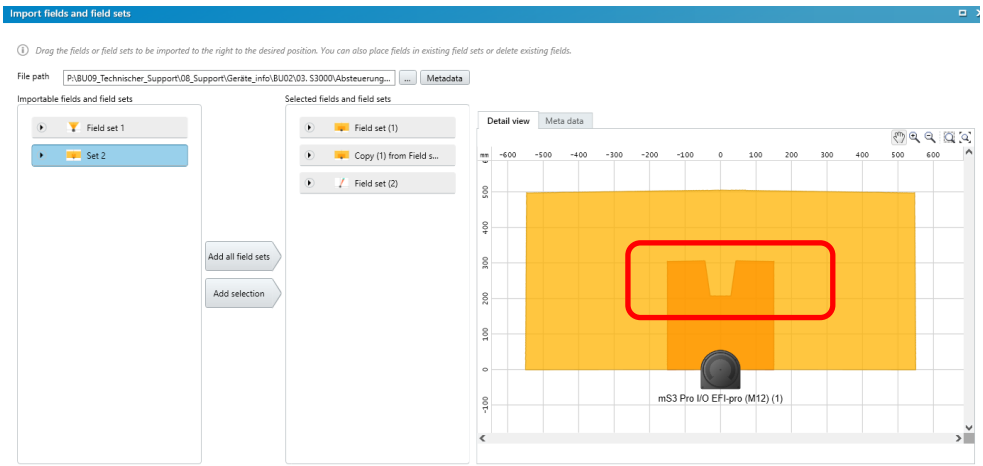

Figure 35: Safety Designer, import of a used contour field of an CDS project.

3.4.5 Anti Collision

There is a special S3000 Anti Collision variant available. This variant could be implemented with an additional Flexi Soft component and therefore needs to be configured with the Flexi Soft Designer.

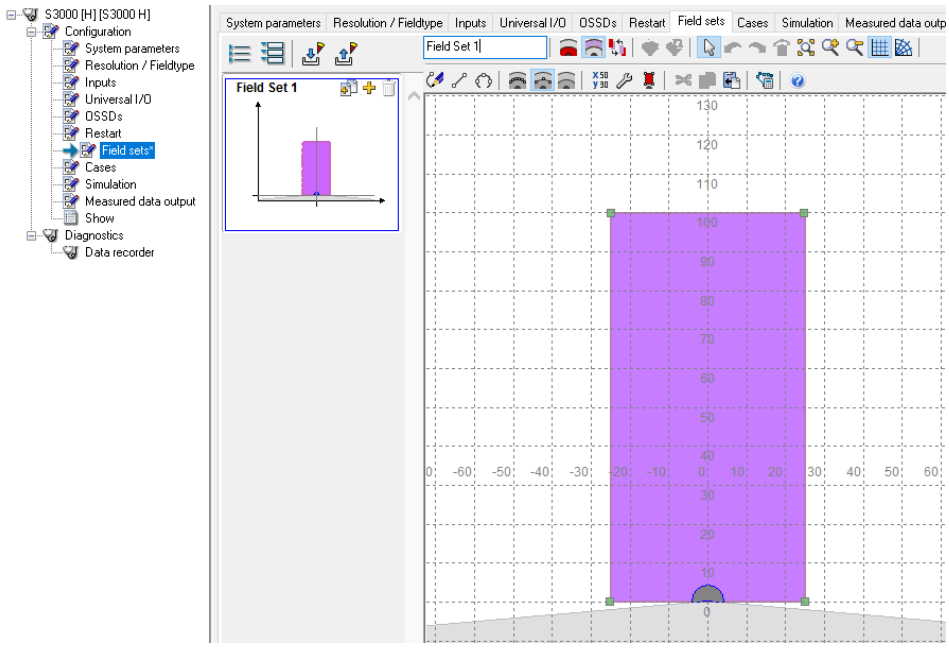

Figure 36: CDS, anti collision field.

For all microScan3 Pro 9m variants, it is possible to easily create a 'collision protective field' within a field set in the Safety Designer. This field can be added to a monitoring case and to a specific cut-off path.

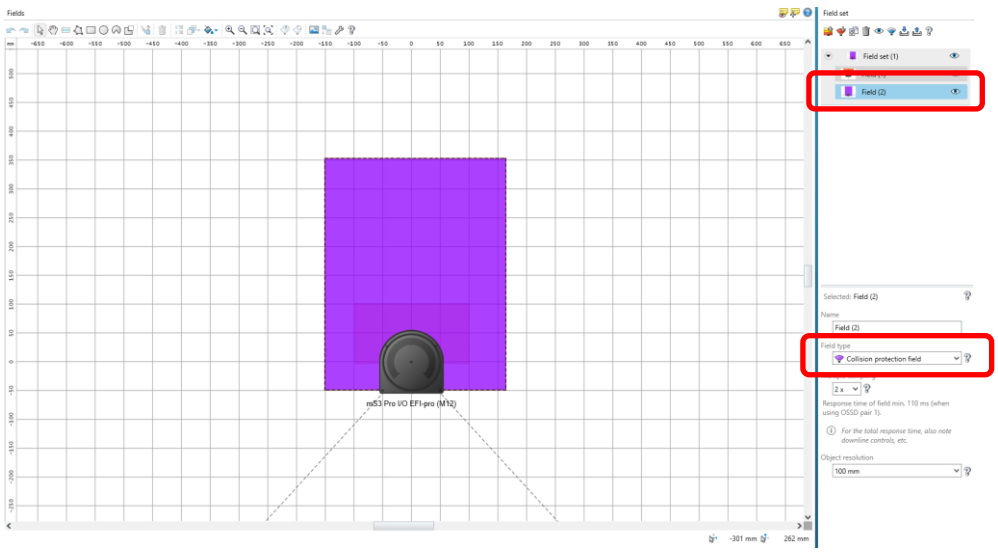

Figure 37: Safety Designer, Collision protective field.

3.5 Monitoring Cases – Cases

It is recommended to split your screen to have both applications on one screen.

This example is made with at least one input condition and a possible dynamic input. How static and dynamic inputs are configured, could be found in chapter ***Inputs and outputs, local***.

CDS:

32. In the navigation menu, click Cases.

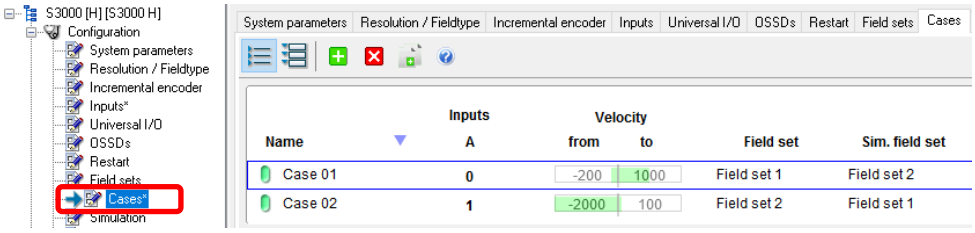

Figure 38: CDS, overview cases.

33. Double click a single case, for example Case 01.

Safety Designer:

34. Navigate to Monitoring cases.

35. From the Field set area, drag a field set and drop it to the Monitoring case 1.

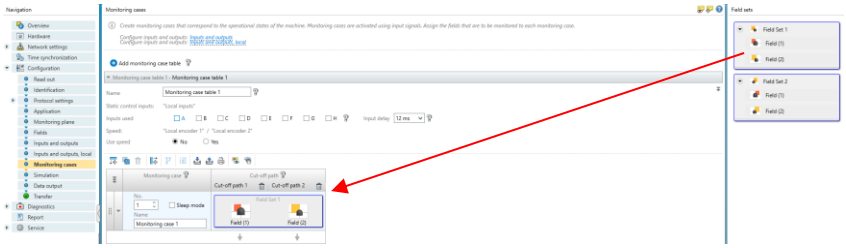

Figure 39: Safety Designer, overview monitoring cases.

36. Inside the Monitoring case area, click Add monitoring case to add a new monitoring case.

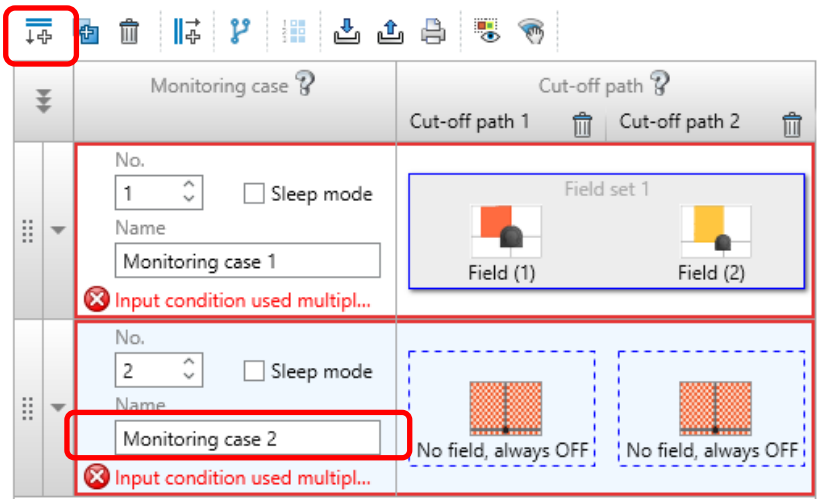

Figure 40: Safety Designer, multiple used input condition for multiple monitoring cases.

37. Inside the Monitoring case area, enable the Inputs used (see **Inputs**) to define the input condition for every monitoring case.

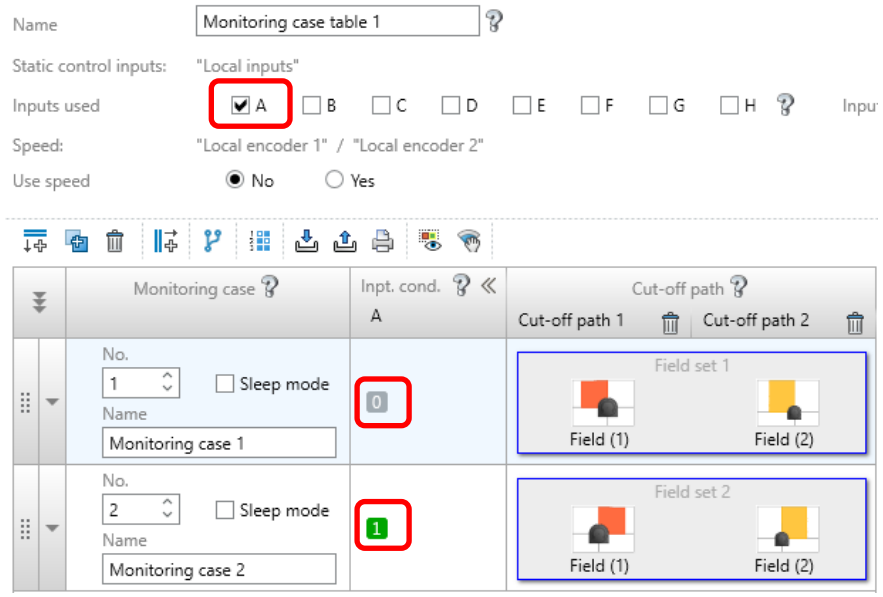

Figure 41: Safety Designer, assign the input condition for multiple monitoring cases.

38. Repeat these steps for at least every created case/ field set in your CDS project file.

39. Assign the OSSDs to the appropriate cut-off path (Protective field).

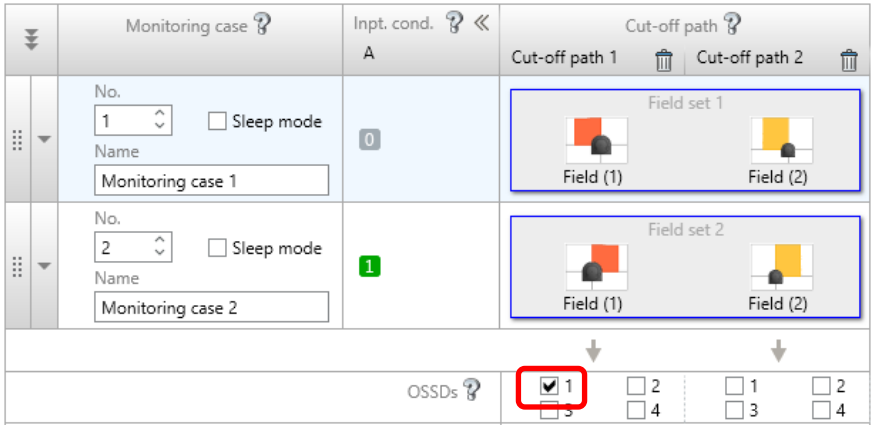

Figure 42: Safety Designer, assign the OSSDs to the appropriate cut-off path.

40. Assign the configured Universal outputs to the appropriate cut-off path (e.g., to the warning field).

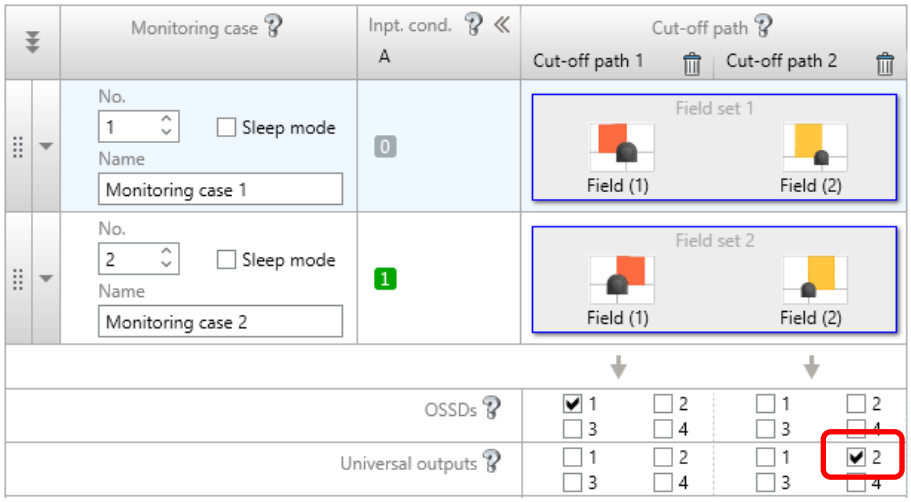

Figure 43: Safety Designer, assign the Universal outputs to the appropriate cut-off path.

41. If the configuration is meant to be used with speed limit / range, this could be set for each specific monitoring case, by selecting Yes in the line Use speed

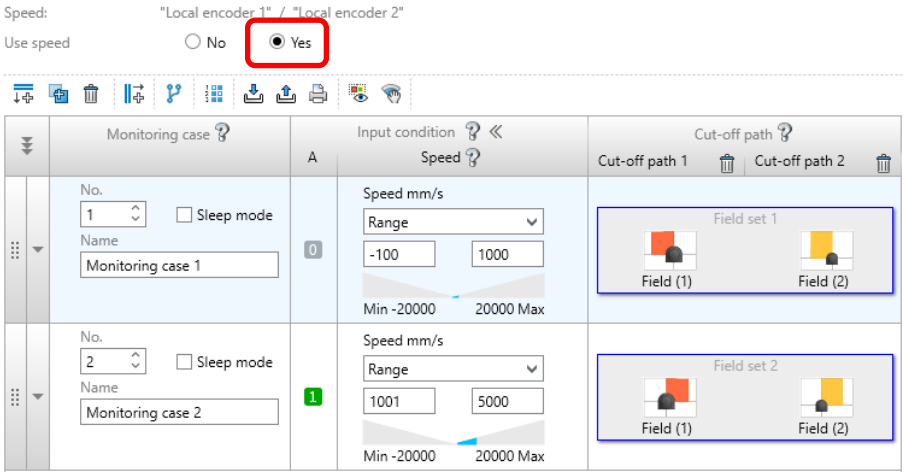

Figure 44: Safety Designer, input condition with possible used speed / range limit.

3.5.1 Simultaneous field sets

The evaluation of simultaneous fields for S3000 was only possible under specific settings.

Comparing to microScan3, the evaluation of simultaneous field sets could be set inside the monitoring cases area. Depending on the variant, up to eight fields could be monitored simultaneously.

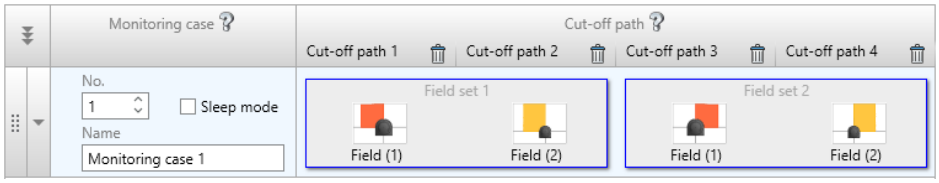

Figure 45: Safety Designer, fields of a field set are monitored simultaneously.

4 Configuration – Device specific steps

4.1 microScan3 I/O variants - Local inputs and outputs

For this example, a **microScan3 Pro I/O - EFI-Pro** variant is used.

4.1.1 Inputs

CDS:

Check the configuration for used inputs. Possible inputs could be set in the following example screenshots.

Control inputs

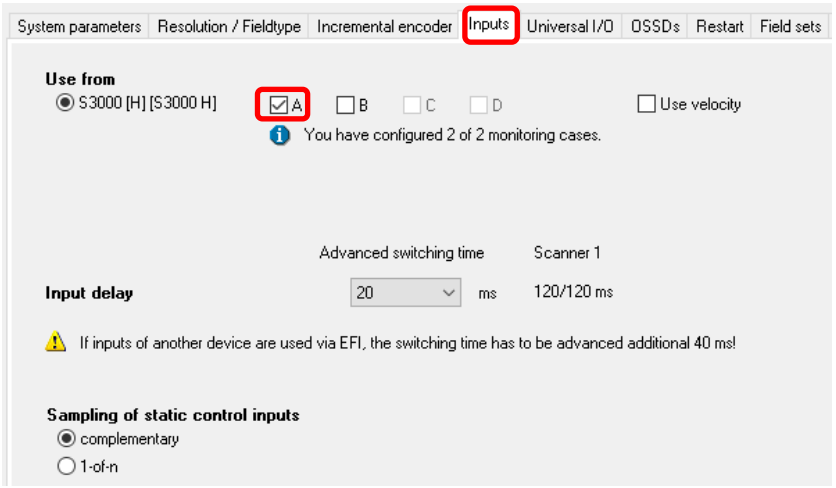

Figure 46: CDS, inputs.

External device monitoring

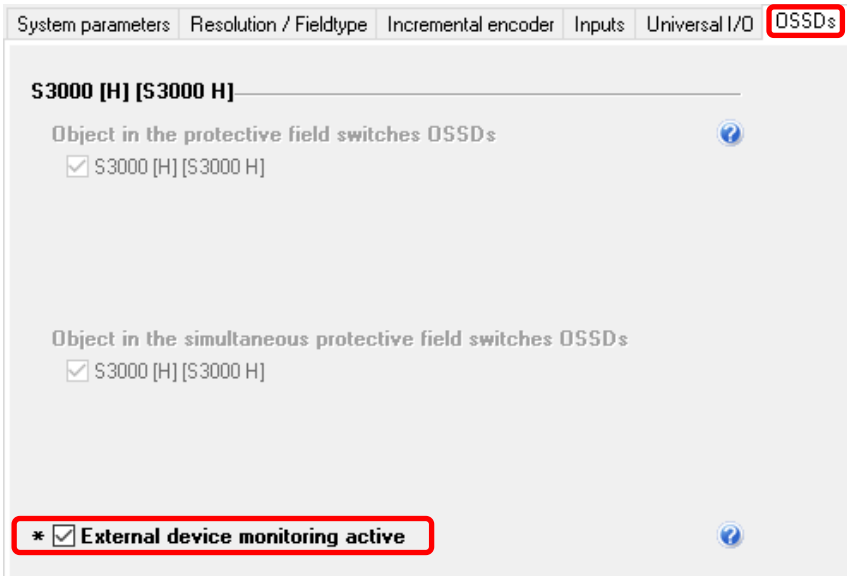

Figure 47: CDS, external device monitoring (EDM).

Restart

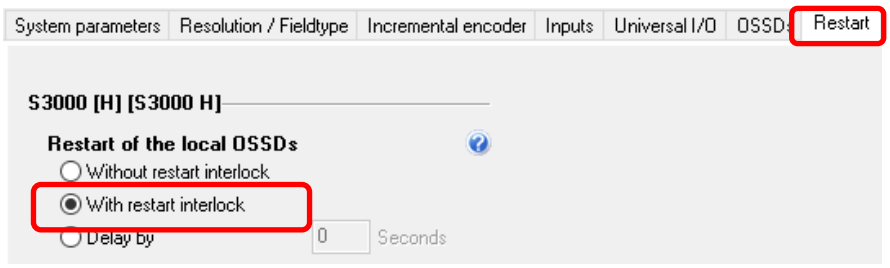

Figure 48: CDS, restart.

Encoders

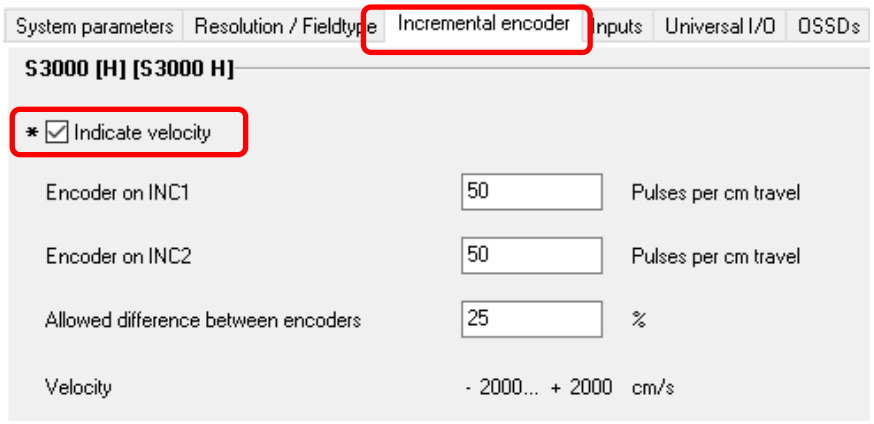

Figure 49: CDS, incremental encoders.

Safety Designer:

1. Navigate to Inputs and outputs, local.
2. Expand Inputs in the Signals area.

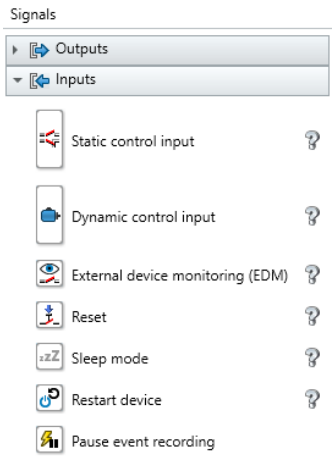

Figure 50: Safety Designer, inputs.

3. In this example, a Static control input, Reset and EDM are added, by drag and drop.

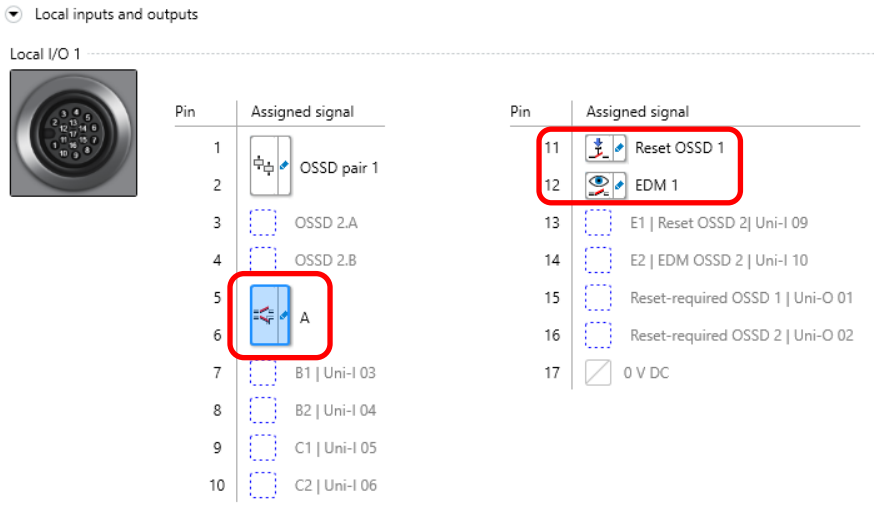

Figure 51: Safety Designer, example, how inputs could be assigned.

4. Add the Dynamic control inputs, by drag and drop.

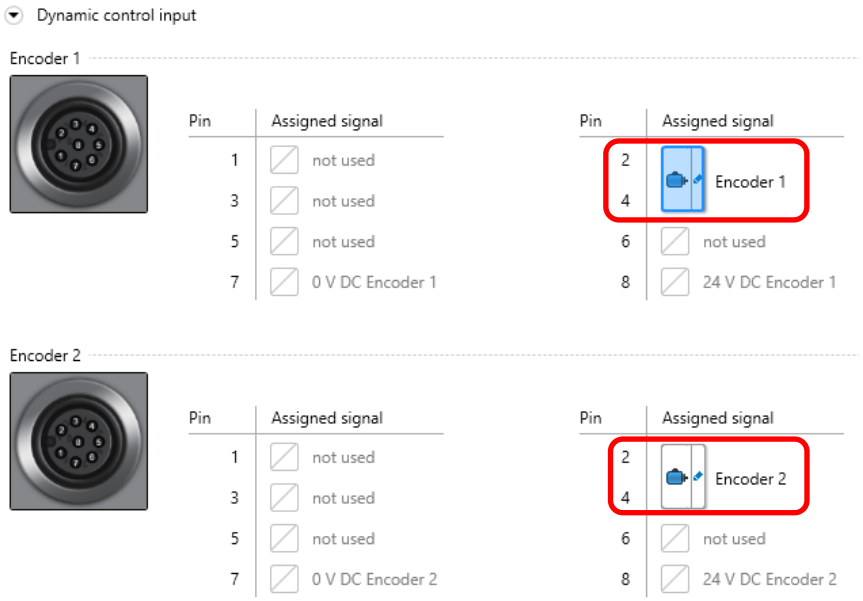

Figure 52: Safety Designer, example, how dynamic inputs could be assigned.

5. The properties of the inputs could be set inside the Properties area.

   a) Select the static inputs control “A” to set the type of Monitoring case switching.

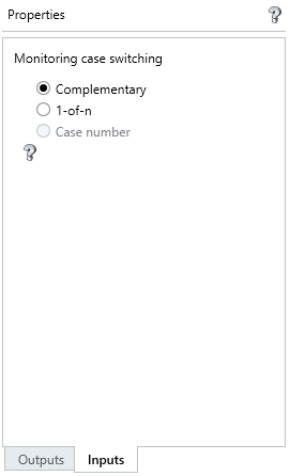

Figure 53: Safety Designer, properties of static control input.

   b) Select an encoder to set the Speed setting.

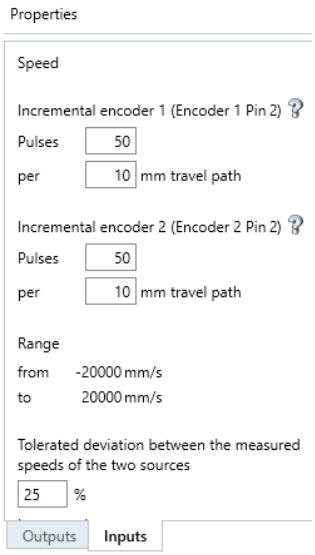

Figure 54: Safety Designer, properties of incremental encoders.

4.1.2 Outputs

When comparing the S3000 to the microScan3, it could be seen that the microScan3 only provides two outputs on one M12x17 pin connector (XG1).

To safe pins and therefore another M12x17 pin cable for the microScan3, it is **recommended to combine the possible used outputs**.

CDS:

6. Click Universal I/O.

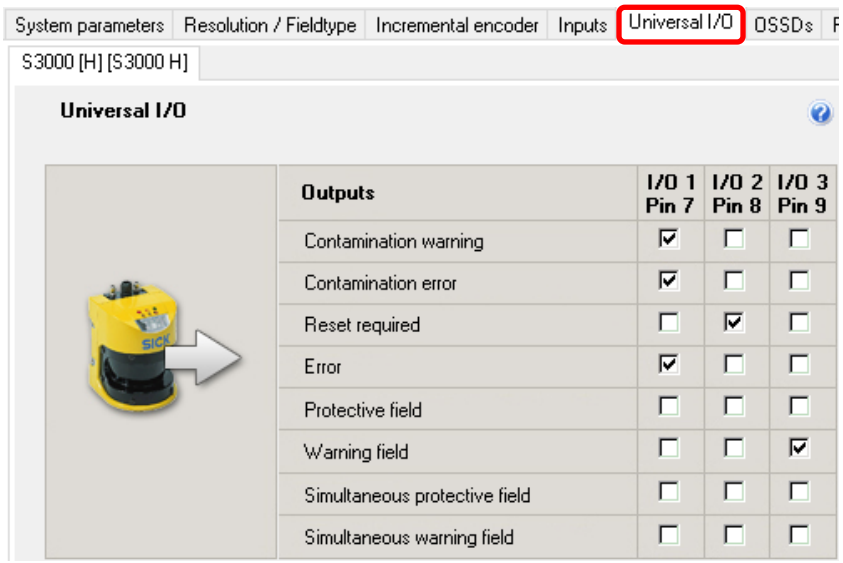

Figure 55: CDS, assign universal I/O.

Safety Designer:

7. Click Inputs and outputs, local.
8. Expand Outputs in the signals area.

Note: OSSD pair 1 is by default set inside the pin layout.

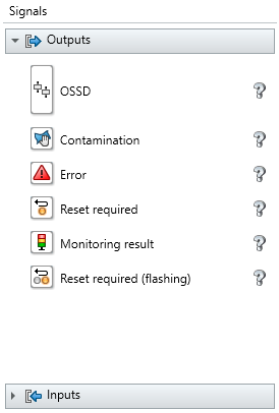

Figure 56: Safety Designer, outputs.

9. In this example, Contamination, Error and Monitoring Result is added, by drag and drop.

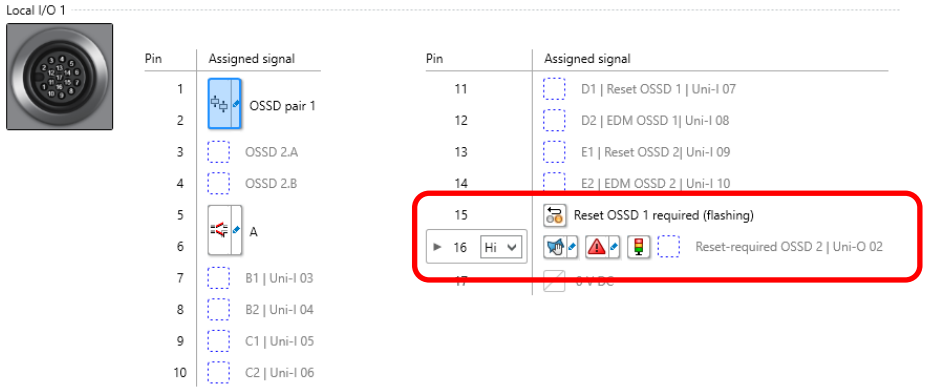

Figure 57: Safety Designer, example 1, how outputs could be assigned.

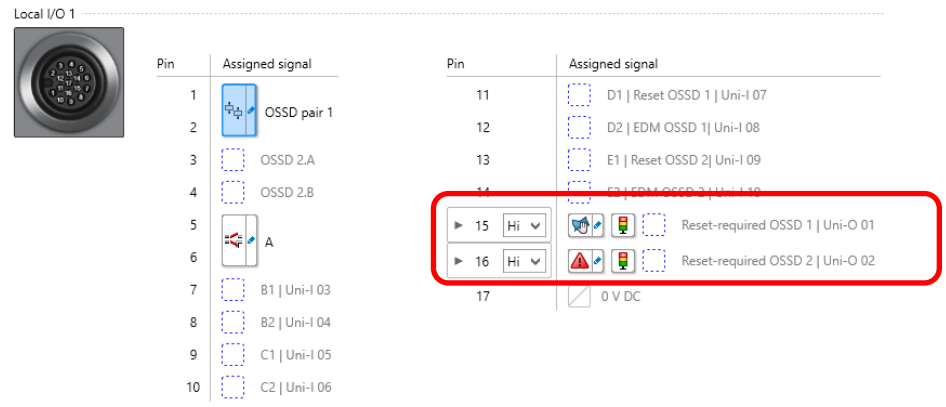

Figure 58: Safety Designer, example 2, how outputs could be assigned.

10. The properties of the outputs could be set inside the Properties area.

    a) Select OSSD pair 1 to set the Reset behavior and to Activate external device monitoring.

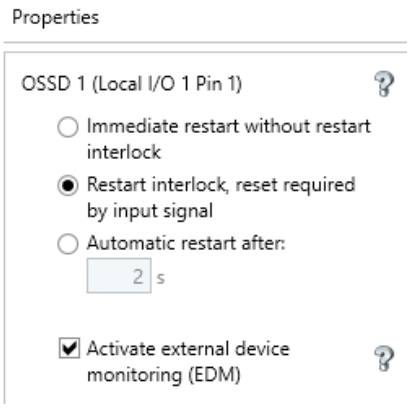

Figure 59: Safety Designer, properties of the OSSD pair 1.

b) Enable or disable the error output to issue the selected error message or not.

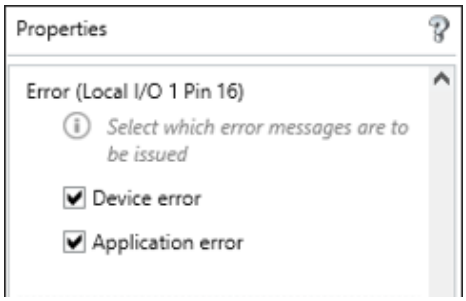

Figure 60: Safety Designer, properties of the output "Error".

c) In addition, the output type of the Contamination message could be selected.

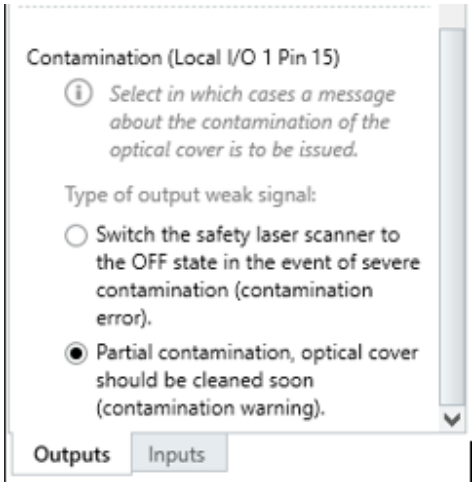

Figure 61: Safety Designer, properties of the output "Contamination".

4.2 microScan3 network variants - Inputs and outputs

The configuration of input sources (assembly data/local) is configured here. Select an input source as local, via an assembly or mixed, as well as numerous other functions.

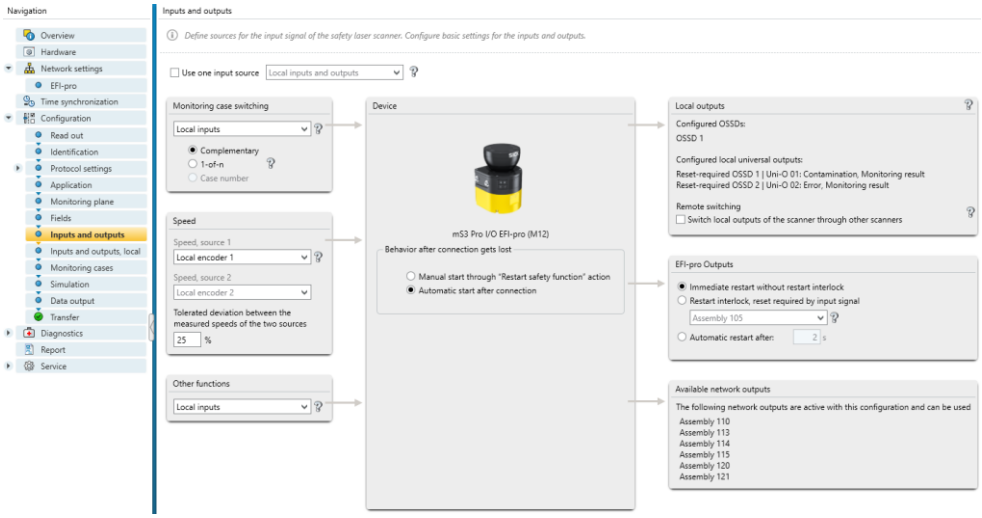

Figure 62: Safety Designer, overview of the tab inputs and outputs.

5 Configuration – Transfer to the device

The transfer of the configuration from CDS to Safety Designer is now completed. The configuration could now be downloaded from the Safety Designer to a connected device.

Note: It is recommended to drag and drop the connected device from the device list on the offline create device in the device overview.

1. Connect the microScan3 via USB to your PC.
2. Inside the Device overview, click Device search on the right-hand bottom side.

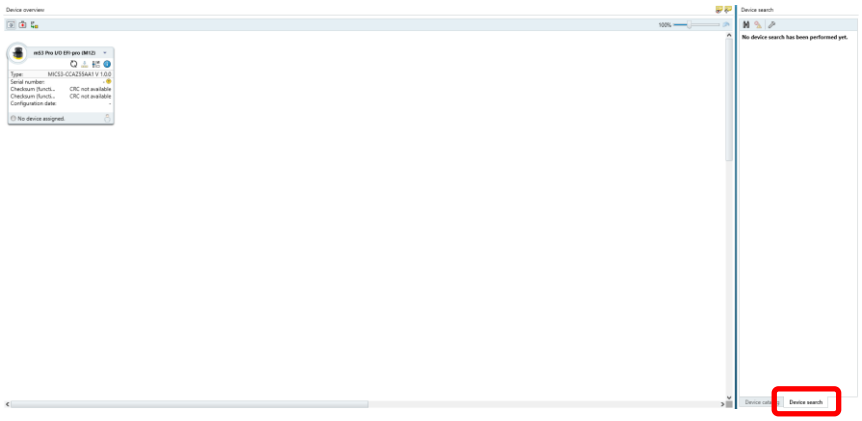

Figure 63: Safety Designer, Device overview.

3. Click on the button Search, to search for available devices.

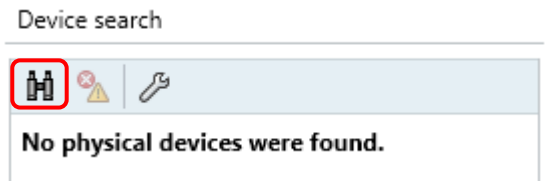

Figure 64: Safety Designer, Search once for devices.

4. The possible upcoming Info about unassigned devices could be acknowledge with Close.

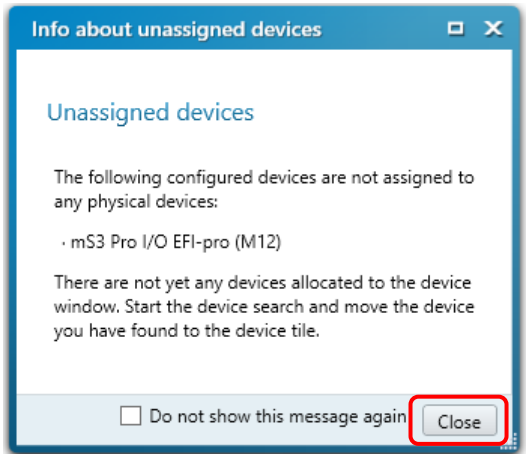

Figure 65: Safety Designer, Info about unassigned devices.

5. Drag and drop the Found device to assign it to the device configured in the project.

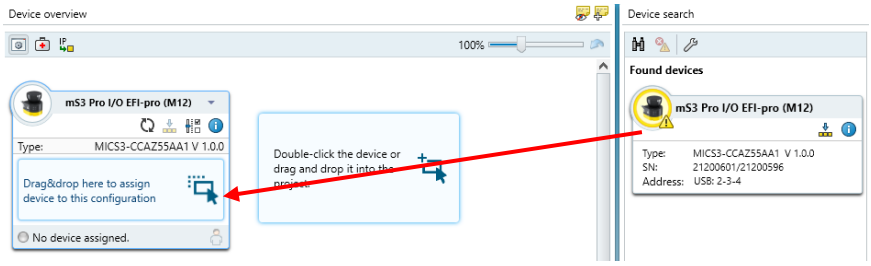

Figure 66: Safety Designer, Assign the found device to the configured device in the project.

6. The connection is established.

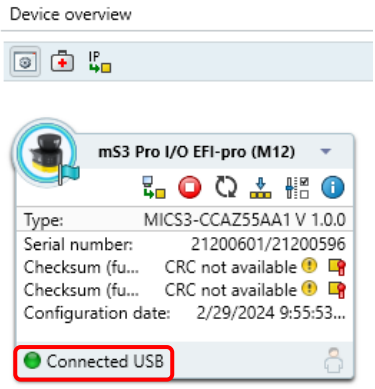

Figure 67: Safety Designer, device is connected via USB.

7. Transfer the configuration to the connected device.

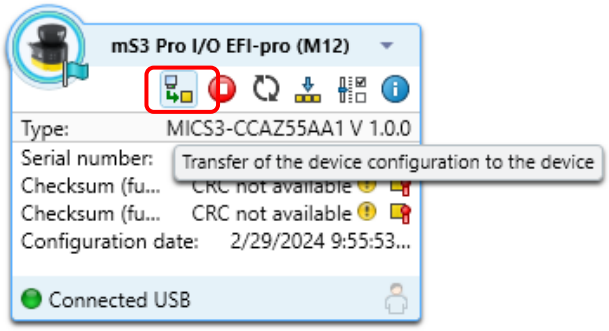

Figure 68: Safety Designer, transfer the configuration.

8. Select All to Transfer the configuration completely.

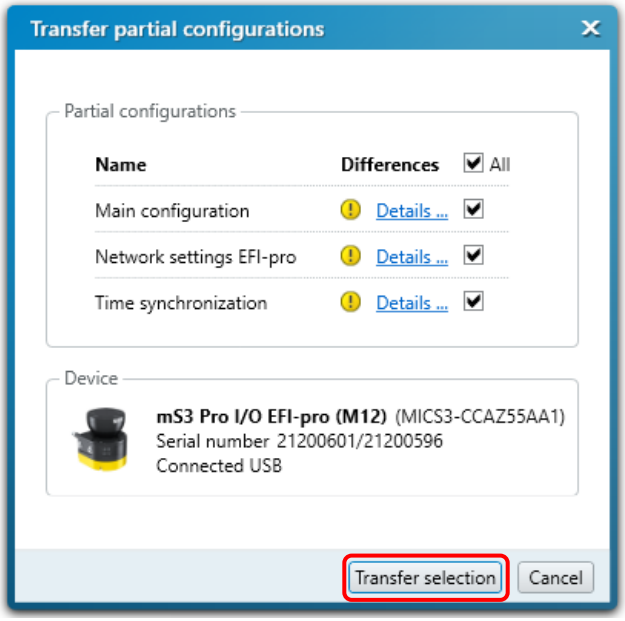

Figure 69: Safety Designer, transfer the selection.

9. Type in your Password and Login to the connected device.

Note: Depending on your device it could be necessary to set an administrator password first. Check the outstanding tasks.

Figure 70: Safety Designer, outstanding tasks

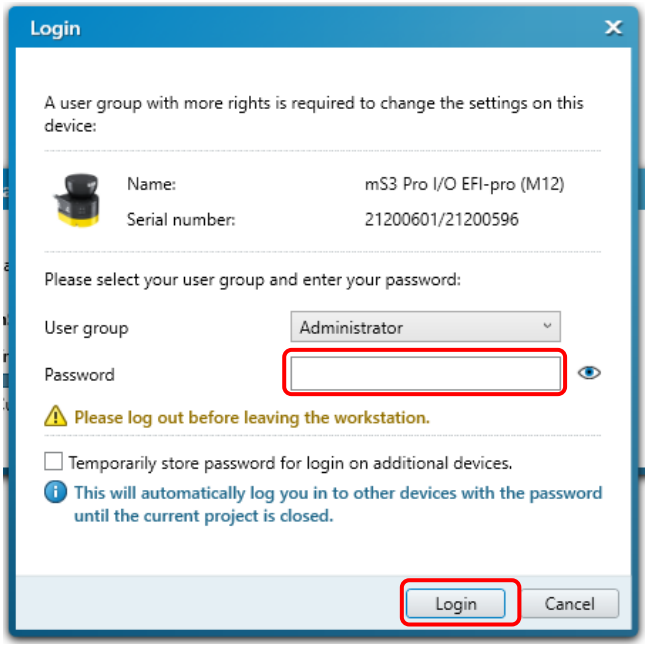

Figure 71: Safety Designer, Login to the connected device.

10. Acknowledge the information about possible outstanding tasks.

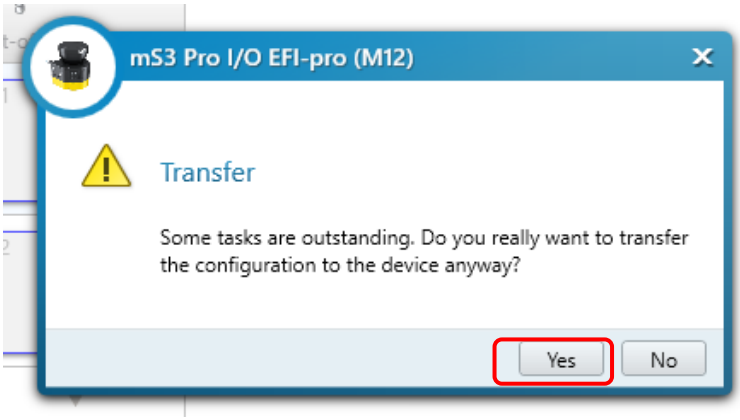

Figure 72: Safety Designer, Information about outstanding tasks.

11. Acknowledge the Time synchronization message.

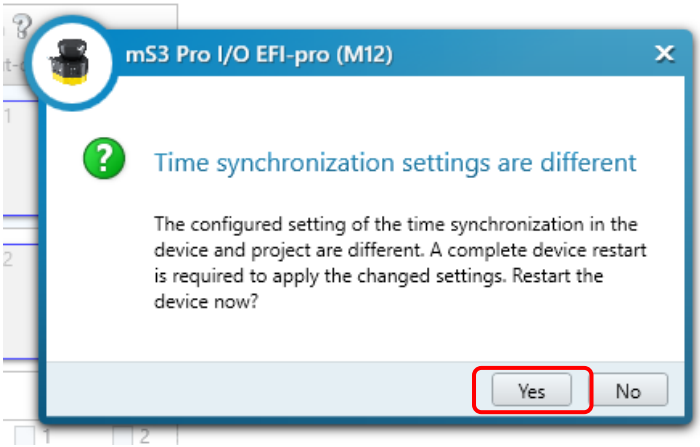

Figure 73: Safety Designer, Information about the time synchronization.

12. Verify the configuration.

Note: Before verifying the configuration, the function of the application must be check, as described in the operating instructions.

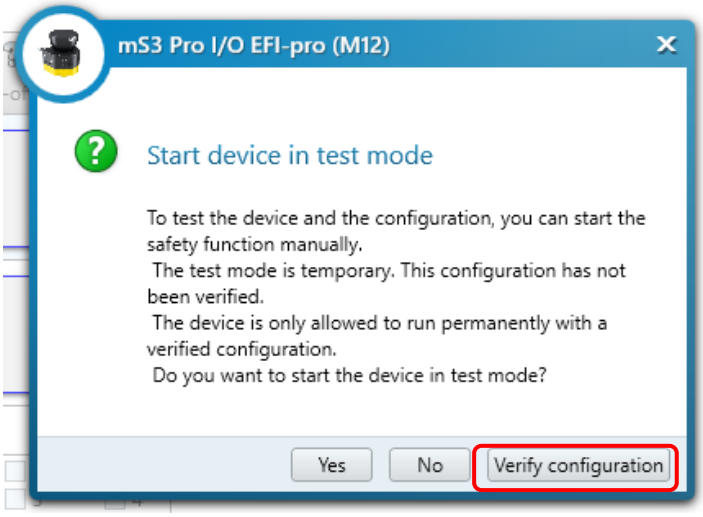

Figure 74: Safety Designer, Verify the configuration or start it in test mode.

13. Verify the Verification report.

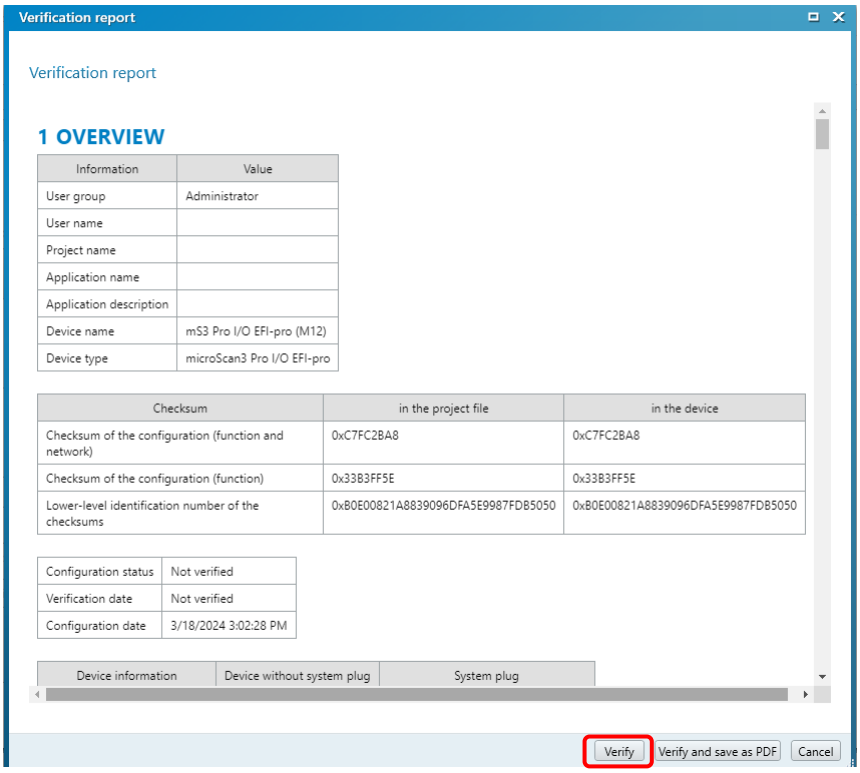

Figure 75: Safety Designer, Verify the verification report.

14. Acknowledge the information of the completed configuration.

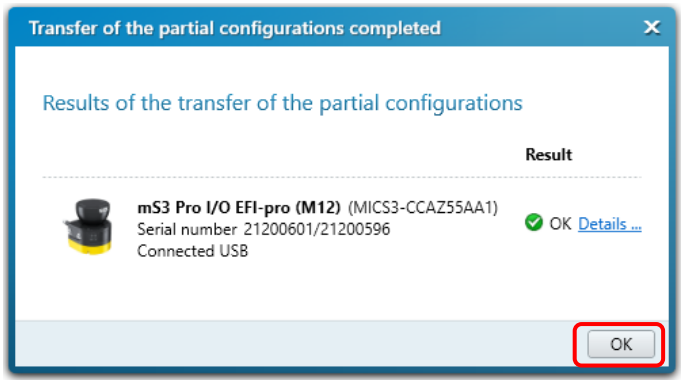

Figure 76: Safety Designer, Information about the completed transfer of the configuration.

15. The transfer of the configuration is now completed.

Note: Make sure that the microScan3 shows no error after the transfer of the configuration is completed.