Sonair

ADAR Designer User manual

SDN161
Version 1.0

Sonair

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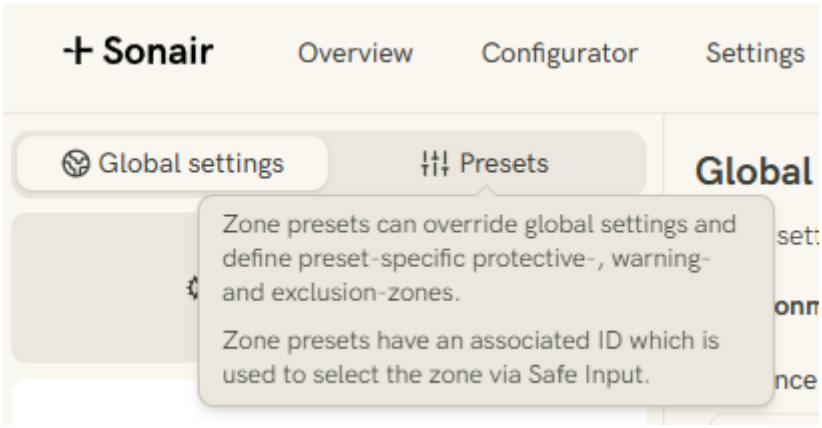
1. Get started

ADAR Designer is a software tool (for Windows and Linux) developed by Sonair specifically for configuration of ADAR devices.

ADAR Designer connects to the device over Ethernet using the **CoAP over UDP** protocol. The tool provides a graphical user interface for:

- Preparing configurations
  - Manage zone presets for dynamic selection
  - Edit protective and warning zones
  - Edit exclusion zones
  - Adjust signal processing behavior
- Device management
  - Upload/download device configuration
  - Configure network settings
  - Monitor device state

Tip: Hovering over UI elements may display helpful hints about their functions.



1.1. Installation

The latest version of ADAR Designer can be downloaded from the ADAR Designer GitHub repository.

Operating system	Installer name
Windows*	`ADAR.Designer_<version number>_x64-setup.exe`
Debian based Linux distributions* (e.g. Ubuntu)	`ADAR.Designer_<version number>_amd64.deb`

* Only recent versions supported

Windows

Execute the installer and follow the instructions

Linux

Open the terminal, navigate to the folder containing the installer. Run the following command (replace <installer name> with the specific name of the downloaded installer):

```
sudo dpkg -i <installer name>
```

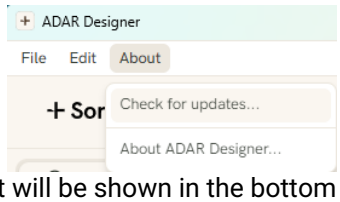
Follow the instructions in the terminal.

When the installation is complete, you can type `adar-designer` to start the program or start it from the GUI.

1.2. Update

> Automatic updates are currently only supported on Windows. Linux users should regularly check for updates by visiting the link at the beginning of the Installation section.

ADAR Designer comes with an automatic update feature that checks for updates every time the program is started. To manually check for updates, click `About->Check for updates…` .



If a new update is found, a green prompt will be shown in the bottom right corner, urging the user to “update now”. Make sure to save any unsaved changes before initiating an update.

Upgrades should be installed when available. Under normal circumstances, an upgrade takes less than a second.

1.3. Preparing configurations

The main purpose of ADAR Designer is to prepare **generic configurations.** These configurations do not contain any device specific parameters and can therefore safely be uploaded to any devices that are intended to have the same behavior. For device specific configuration like network address and certain inter-device time-synchronization options, see Device management.

When a configuration has been created or modified and is ready to be uploaded to a sensor, it must first be saved to a file (File->Save, or File->Save as).

Editing a configuration means working on a **file** (not live on a device). The configuration file has to be uploaded to a connected device to take effect.

2. Factory reset procedure

If you have a brand-new device in front of you, proceed to Chapter 3.
If you have a used device in unknown condition in front of you, it is recommended that you perform a factory reset.

> ⚠ Performing a factory reset will erase all network and device configuration settings, restoring the unit to its default state.

1. **Locate the reset button**
   The factory reset button is concealed beneath the yellow sticker on the device. Below the sticker there is a Ø1 mm access hole, as shown in the image below.

2. **Access the button**
   The reset button is positioned approximately 10 mm inside this hole.
3. **Activate the reset**
   - Use a pin or similar pointed object to reach the button through the hole.
   - Press and **hold** the button for **5 seconds**.
   - You will feel **tactile feedback** when the button is depressed.

A successful factory reset is indicated by alternating LED blinking pattern for about 4 seconds.

4. **Re-attach** or replace the sticker after having performed the reset.

2.1. Default settings

Network config	Default value
Network config flags	Static IP enabled
Static IP address	10.20.30.40
Subnet mask	255.0.0.0
Gateway	10.20.30.1

3. Overview (device management)

Any configuration that is device specific, like network configuration, must be modified directly on the device by opening the overview page and connecting to it. This is also where new configuration or firmware can be uploaded to the device.

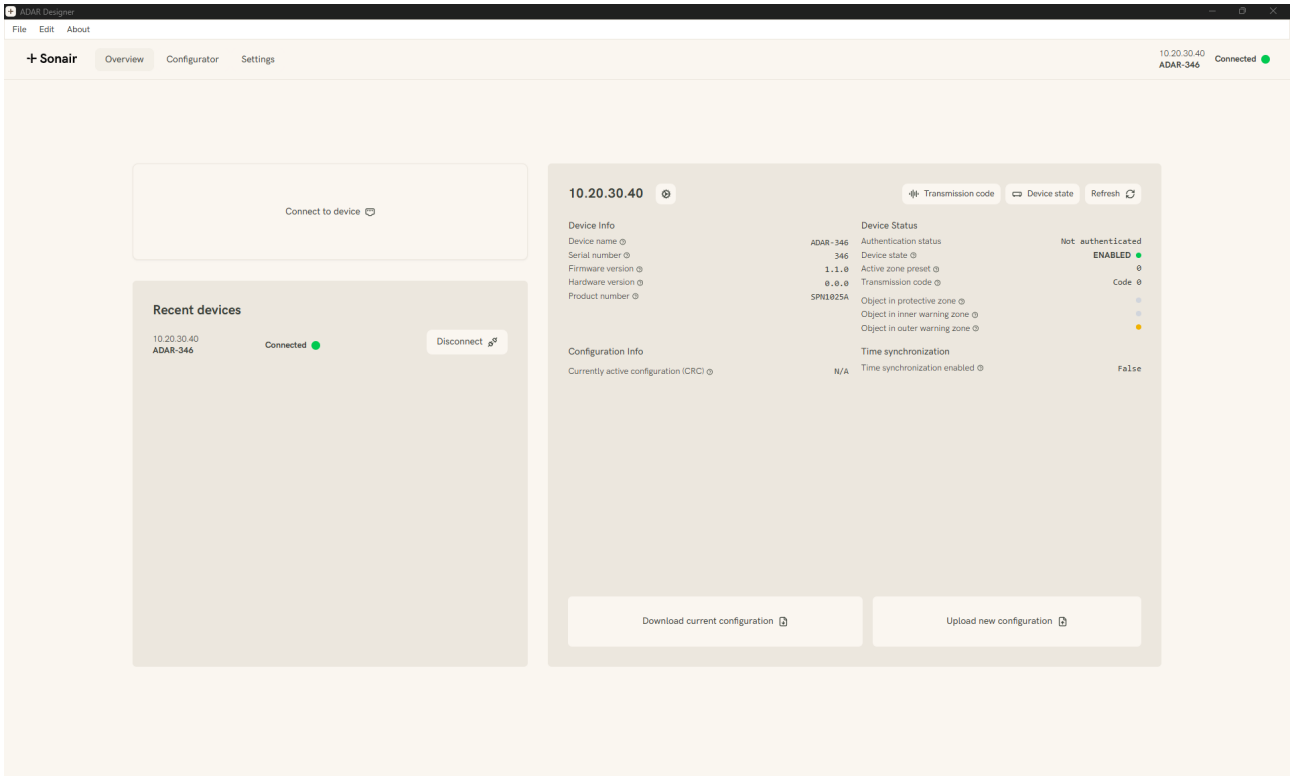


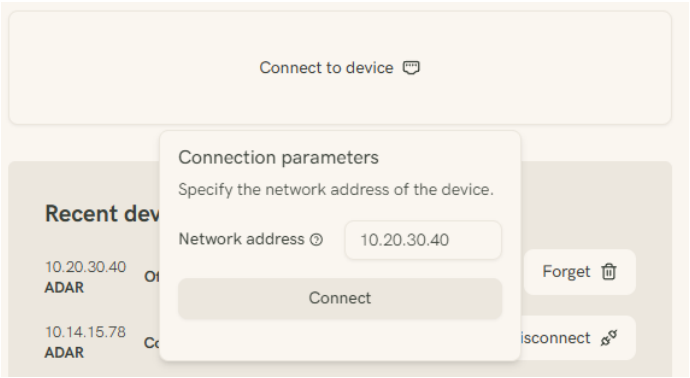
Figure 1: "Overview" screen

3.1. Network configuration

New or factory-reset devices will be configured with a static IP address (`10.20.30.40`). To communicate with the device, wire it with an Ethernet cable to a network that provides the default address space (`10.20.30.0/24`). This is usually simplest to do by connecting it directly to the computer running ADAR Designer, but can also be done via a correctly configured router. The ADAR Quick start guide provides detailed instructions for the direct connection approach.

Once the computer running ADAR Designer and the ADAR device is on the same network do the following steps:

1. Click the “Connect to device” button and providing the default IP address (`10.20.30.40`).
2. Click connect



3. **Change device state** to “disabled”.
4. Go to “device settings” > “Edit network configuration”
5. **Configure network** as needed
6. If multiple ADAR devices are used in close proximity to one another, select **time synchronization** to stag the transmission cycles of the ADAR devices.

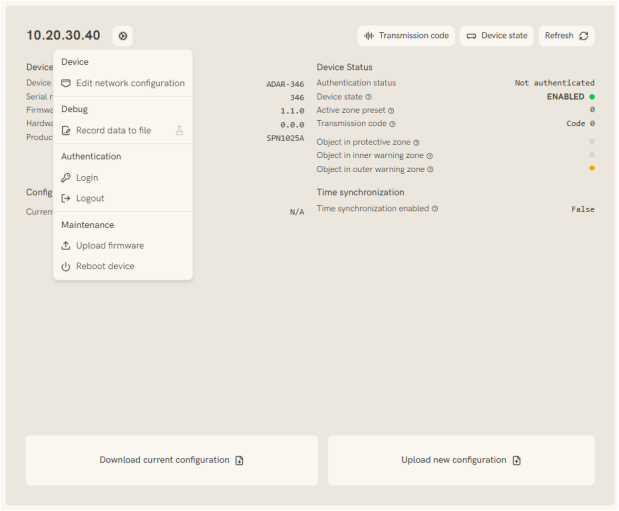


Figure 2: Device settings

Figure 3: Network configuration

Uploading an unintended or incorrect network configuration might make it difficult to reconnect to the device, so make sure everything is correct before pressing “Upload new network configuration”. If an invalid configuration is accidentally uploaded, and all attempts at communication fails, it may be necessary to perform a factory reset to re-establish communication.

3.2. Upload device configuration

Clicking the “Upload new configuration” button, and selecting a valid configuration file, will initiate a reconfiguration of the connected device. The new configuration will be saved on the device and the device will switch into “disabled” state. The device needs to be enabled:

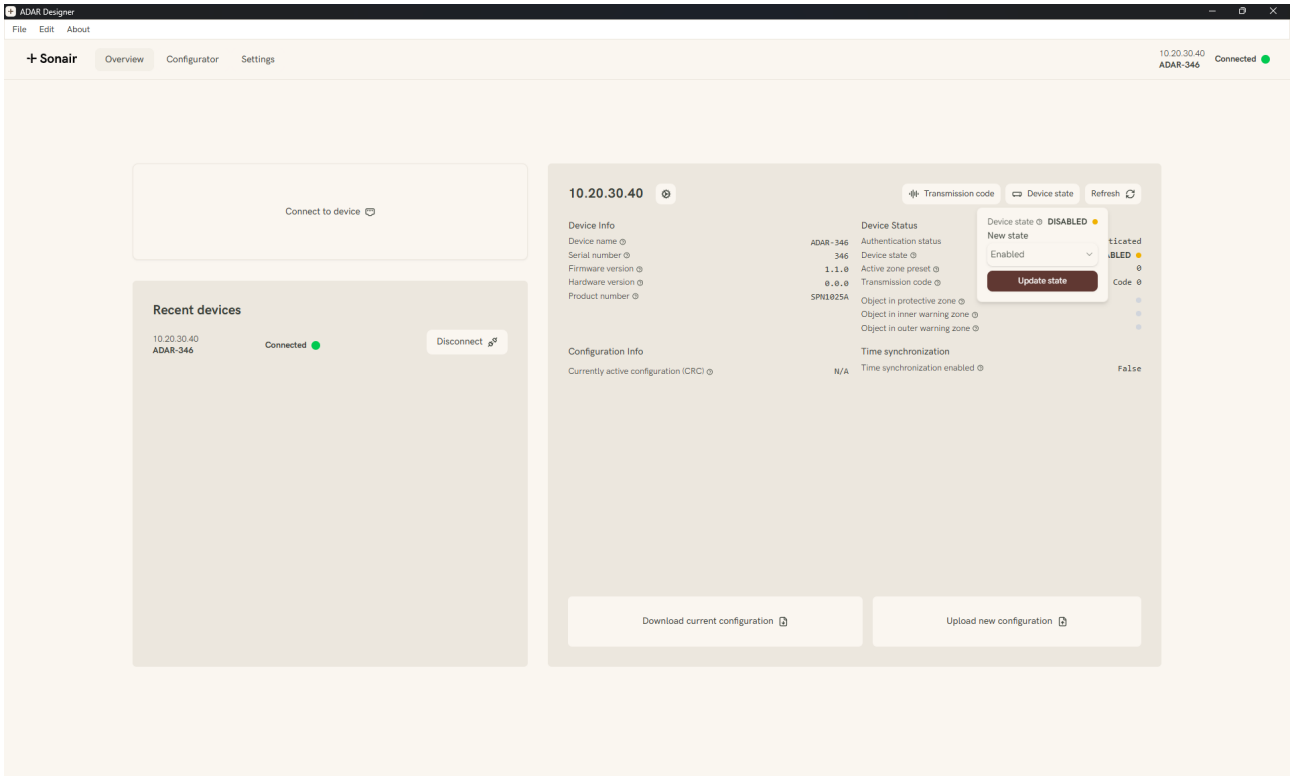


Figure 4: Change device state

It is also possible to download the configuration and saving it to a file. This file can in turn be opened (File->Open…) in ADAR Designer to ensure that everything still looks correct.

3.3. Record data to file

For debugging purposes, data can be logged to a file over a specific period of time. The corresponding function can be found in the “Device Settings” window.

3.4. Firmware update

1. Download a firmware binary file from sonair.com or GitHub.
2. Go to device *settings* > *Upload firmware*
3. Select the binary

4. Configurator

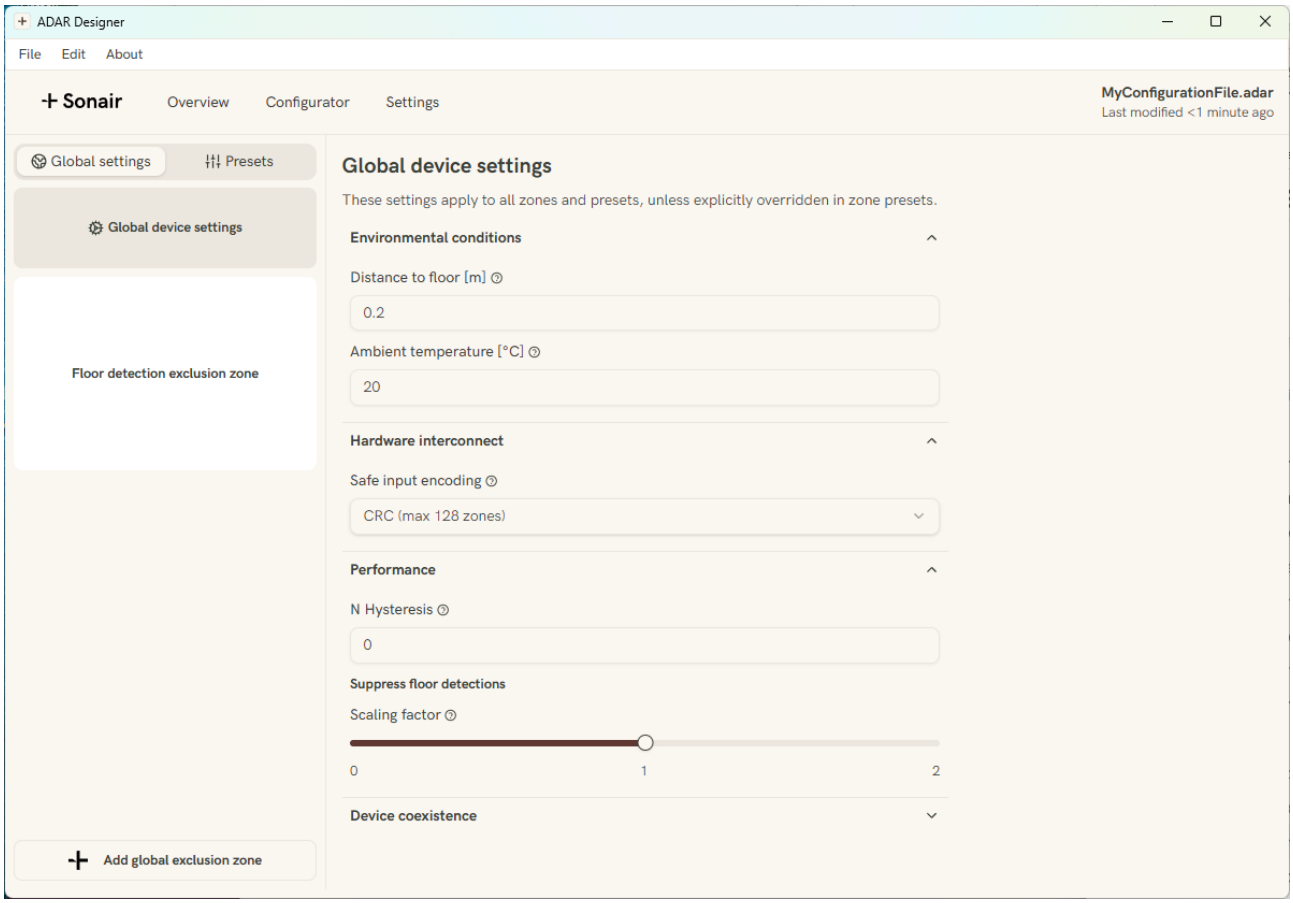
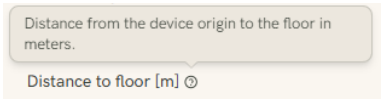


Figure 5: Global settings

Configuration parameters are structured hierarchically in ADAR Designer and divided into two main contexts: **global settings** and **presets**.

4.1. Global settings

Tip: All parameters have a short description that can be seen by hovering over the "?"-icon



Global settings can be considered the "default" settings for a device, meaning that everything configured in the global context will take effect in **all zone presets** that don't explicitly apply an override.

In the left sidebar, there are two menus by default: **global device settings** and **floor detection exclusion zone**. It is possible to add *up to three* more global exclusion zones.

The “global device settings” menu exposes parameters that affect the signal processing done by the device. Many of the parameters are provided for fine-tuning specific trade-offs, like sensitivity and device interoperability, and can therefore be overwritten by individual zone presets. See the document “SDN108 ADAR User manual” for detailed description of all parameters.

The global “floor detection exclusion zone” is an automatically calculated exclusion zone that is meant to ignore detections from the floor directly below the sensor. It is dynamically linked to the “distance to floor” parameter.

It is possible to add *up to three* additional global exclusion zones. These are intended for ignoring specific physical features that are always present in the field of view of the device. On an AMR this can be some part of the robot itself that extends into the field of view of the device causing false positives. In an industrial setting, it can be features such as a stationary pole, wall or piece of machinery that is to be ignored by the device. See the section on Exclusion zones for more details.

Danger

Risk of severe injuries and even death.

The global settings have a safety critical impact on the sensor's function. It is essential to follow the ADAR user manual.

4.2. Presets

When working with a **zone preset,** zones and parameters will only take effect if the corresponding ID has been selected through the ZONE_SELECT inputs. The main functionality of a zone preset is to define a set of up to three 3D zone geometries to be monitored for intrusion (see the section on Protective, warning and exclusion zone settings). However, it is also possible to override a selection of the global settings on a preset-to-preset basis. This allows for use cases where the device can be configured to adapt its behavior based on dynamic zone selection inputs.

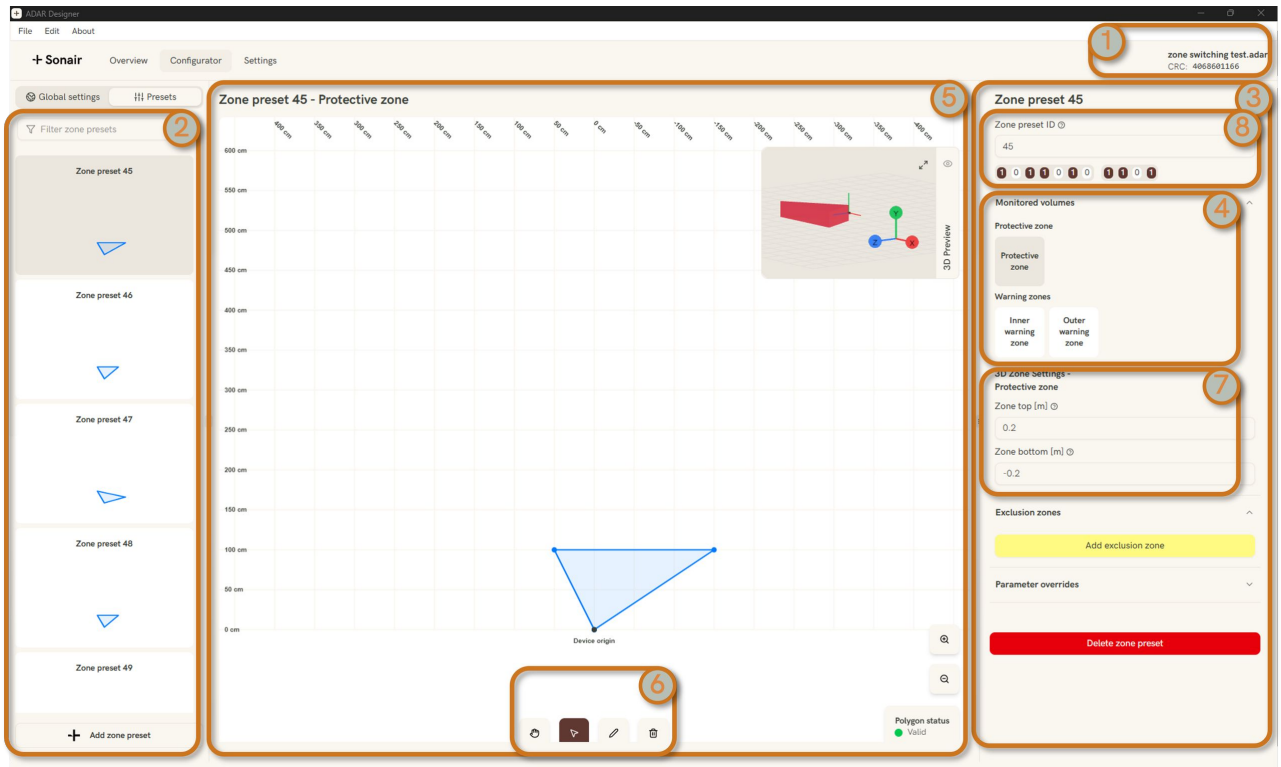
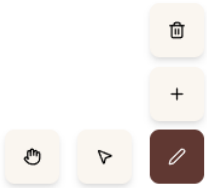


Figure 6: "Presets" screen

1. **Currently active file**: Shows which file is currently being edited, when it was last saved or whether there are unsaved changes.
2. **Zone preset navigator**: Add new zone presets or select a preset for editing
3. **Zone preset sidebar**: Select and edit zones, add exclusion zones, configure preset specific overrides
4. **Zone selection**: Select a zone for editing in the canvas (protective zone, inner- or outer warning zone)
5. **Editor canvas**: Edit one of the zones in the preset
6. **Editor toolbar**: A selection of tools for adding, moving, or deleting points in the editor canvas
7. **3D zone settings**: Extrude the currently active zone up and down (relative to the device origin) to define a 3D volume.
8. **Preset ID:** in decimal and binary format

Tip: Hovering over tools in the toolbar may reveal related tools.



4.3. Protective, warning and exclusion zone settings

To ensure the device's primary function, there must be no obstacles between the device and the **protective zone**. Therefore, zones are not permitted to be **disconnected from the sensor**.

4.3.1. Protective zone

A **protective zone** is a defined volume within the ADAR's field of view (FoV) and range. The active protective zone is monitored for detections. The state of the OSSD output reflects if there are detections in the zone.

A protective zone must be **well-formed**:
Any straight line from the device origin to a point inside the protective zone must remain entirely within the zone.
This restricts how much the zone can "bend" or deviate laterally.

4.3.2. Warning zone

See the definition of protective zones. The difference between warning zones and protective zones is that warning zones do not control any safe output signals.

4.3.3. Exclusion zones

Exclusion zones define volumes to be ignored by the system, typically to avoid unnecessary stops (e.g., due to the floor or objects that are in a fixed location within the device's field of view).

Unlike protective zones, **exclusion zones may be disconnected** from the device origin:
An imaginary line from the device origin **may enter** an exclusion zone, but **must not exit** it again.

Exclusion zones are **common** across all protective and warning zones within a given **zone preset**.

4.3.4. Zone presets

A **zone preset** includes:

- One **protective zone**
- Zero or more (max 2) **warning zones**
- Zero or more (max 6) **exclusion zones**
- Zero or more **parameter overrides**

Each preset must have a **unique ID**, which is shared with the controller. The controller can then select a zone preset by activating the ZONE_SELECT pins in correspondence with the configured safe input encoding.

Selecting a zone preset means that the device will be re-configured with the settings stored in the given preset. Zone presets can therefore be used to switch between different protective zones, warning zones, exclusion zones and parameter overrides - to accommodate for a large variety of applications and scenarios.

4.3.5. Zone shape constraints

The zone shapes are limited to polygons in the x-z plane, which is extruded upwards and downwards.

4.3.6. Configuration Responsibility

It is the **commissioner's responsibility** to ensure that each zone selection corresponds correctly to its **unique preset ID** and that configurations are consistent.

5. Contact details to supplier

In case of a safety or security related question or event;

In case of a feature request or a technical question;

When contacting support, provide the following information:

- **Device name** - serial number on lower side of ADAR, or read out from device configuration
- **Error log or behavior**
- **Installation details**
- **Firmware and configuration version**

Support Services May Include:

- Diagnosis and remote guidance
- RMA (Return Merchandise Authorization) for replacements or repairs
- Product documentation and update recommendations

Contact details:
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📧 Email: support@sonair.com
🌐 Website: sonair.com