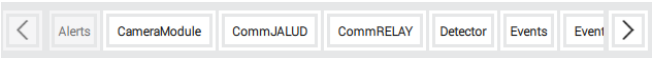
This guide informs users about the options for setting up a sound detector or camera with SED software in the SED Control application, and provides more detailed information about the different event types and setup options.

Settings

The **Settings** tab in the device database displays and controls device settings. Settings cannot be displayed unless the device is in the “Connected” state. The current settings are automatically downloaded from the device when the tab is displayed. The user can edit the settings and upload them back to the device.

Note: If the device uses a GSM connection, it may take up to two minutes to send the response. This is because GSM is usually in airplane mode to reduce power consumption and avoid microphone interference. The request is sent to the device when it reconnects.

Device settings are organised into tabs by topic. The settings displayed are dynamic and reflect device settings regardless of the firmware version on the device, but may vary depending on the firmware version.



Picture 1: Settings tabs

Alerts

Alert settings allow the user to enable or disable alerts based on their type. The difference between alerts and events is that alerts indicate sounds of dangerous or unwanted events. Events, on the other hand, indicate sounds of events that are common in most environments and, in most cases, do not indicate anything special. However, they can be interesting in some scenarios - for example, detecting people in places where no one should be present.

The recordings of examples for each alert type can be downloaded here. The set of alerts differs based on the SW version - full or basic.

The **basic** SW version includes:

Gunshot: The sound of gunfire from pistols, rifles, and other common types of weapons.

Glass break: The sound of breaking glass. SED focuses on detecting the sound of a broken window or glass storefront, but it can also detect the sound of a broken bottle in public spaces.

Glass Tester: The sound of a glass tester (GBT-212 tester, Resideo FG-701) is added to simplify device testing and is turned off by default.

Scream: Panic-screaming of women and children. Sound detection may indicate (sexual) assault, kidnapping, etc.

Male Scream: Panic-stricken male scream. Detection of this sound may indicate an attack. May overlap with aggression detection.

Child Scream: Children screaming in panic. Sound detection may indicate an assault, attempted kidnapping, etc.

Aggression: Aggressive shouting, sounds of fighting or assault, aggressive patients in the central or emergency department and waiting rooms, etc.

The following warnings are only present in the **full** version:

Spray: The sound of preparing and mixing the spray before actual painting starts.

Spraying: The sound of actual spraying. The detection range is much lower and much less characteristic than the detection of a spray product, so the main attention is paid to the above sound.

Grinder: The sound of a grinder cutting, e.g. a boundary fence or cutting a lock when stealing a bicycle.

Vehicle: The sound of a passing motor vehicle engine. Protection against unauthorised entry into a remote protected area, e.g. a national park.

Traffic: The sound of the rolling resistance of the tires of a passing vehicle. The purpose is the same as the vehicle warning.

Tire Squeal: Sounds of tires squealing, drifting. Detection enables e.g. identification of illegal street racing or dangerous driver behaviour.

Drone: The sound of a flying drone - the purpose of the detection is to prevent smuggling contraband into prisons, invasion of privacy, etc.

Fireworks: The sound of fireworks and firecrackers. Detection can be enabled even in areas where its use is prohibited.

Siren: This class includes the sound of an ambulance, police, or fire department siren, or the detection of a city or mine alarm siren. It also includes the sound of a car alarm.

Events

This feature is only available in the full SW version. Example records for each alert type can be downloaded here.

Animal: Sounds of animals such as dogs, cats, goats and more.

Bird: Sounds of all kinds of birds.

Children: Sounds of children playing, crying, etc.

People: Sounds of people - speech, laughing, sneezing, coughing, whistling, etc.

Door Slam: The sound of slamming doors e.g. in public toilets, warehouses, underground garages etc.

Music: Sounds of musical instruments or singing.

Attention: Vehicle bells, beeps, city bells and all similar sounds that should attract attention.

Horn: The sound of a car or train horn.

Transport: Specific sounds for tram, train, bus, etc.

Construction: The sound of construction work, including work with tools such as drilling, welding, circular saw, etc.

Children Cry: The sound of a baby crying. It helps to identify situations where a child is distressed, lost or unsupervised, for example.

Creak: Squeaking, creaking and squealing tires.

Others: All sounds not included in any of the above categories.

Events Archive

If archiving is enabled, the device stores all events that have been classified, regardless of their class. This feature provides the ability to analyse false negative events if such a case is detected.

Enabled: Enable/disable archiving

MaxSpaceUsed [MB]: Defines the maximum size of archived events on the hard disk in MB. If a new event is saved that exceeds this value, the oldest event is deleted from the archive first, and the latest event is saved only after that.

MinSpaceLeft [MB]: Defines the minimum space in MB that must remain on the hard disk. The behaviour when saving a new event that would violate the minimum hard disk space size is identical to that described above.

Detector

!DO NOT CHANGE WITHOUT PRIOR CONSULTATION!

The settings affect the detector's behaviour in the classification process and therefore significantly impact the number of events detected. The default settings are suitable for most environments.

AdaptingPeriod [s]: After starting the application, the detector adapts the energy threshold to the ambient noise level. At that time, no alerts are generated for a period defined by the adaptation time.

Alpha: Determines how quickly the detector adapts to changes in ambient noise levels. If the value is too low, the detector will not be able to adapt quickly enough to the changing environment. If the value is too high, the detector will be able to adapt too quickly to an unusual event and prevent it from being detected. The default value is tested in many environments to ensure optimal performance.

FrameSize [ms]: The length of the audio frame from which the noise level is calculated. Increasing the value decreases the accuracy of the timestamp of the start of the detected event. Decreasing the value increases the susceptibility to random noise.

Margin [dB]: The span value defines the threshold by which the event noise level must exceed the average ambient noise level in order to be detected and classified. Change the setting only when necessary and with caution. The detector's default settings are optimal for most environments.

Event:

- **Fixed Length**: If this option is enabled, each detected event has a fixed duration, defined by the Max Duration value. If this value is disabled, the duration may be shorter if the energy level drops below the threshold.
- **Min Duration [ms]**: The minimum time that an event's energy must remain above the threshold to be detected and classified.
- **Max Duration [ms]**: The maximum (or fixed) duration of the event. If the event has a longer duration, only the beginning of the maximum duration is classified.
- **Send Multiple Events:** This option defines what happens if the duration of an event exceeds the Maximum Duration value. If this option is disabled (default), the rest of the event is discarded - for most cases, this behaviour is sufficient. If enabled, the end of one event is the beginning of the next until the noise level drops below the threshold or the detector adapts to the new ambient noise. This

option is helpful in environments where a dangerous situation is likely to occur after a sudden increase in ambient noise:

- production hall after turning on the loud machine, etc.

Noise Measurement

Noise measurement is an additional feature of the SED application that calculates the ambient noise level around the device. The estimated value is sent to the user regularly at a defined interval.

Enabled: Enable/disable noise measurement.

Interval [s]: The time between two noise measurements.

Simulation

The simulation setting allows you to send simulated alerts instead of processing the audio signal. This option is especially useful when testing the system.

AlertsSimulationEnabled: When alert simulation is enabled, the app does not process microphone input and instead triggers alerts periodically. A triggered alert contains a valid timestamp, but does not contain any audio data or information about the energy level of the audio data. The simulation sequentially toggles all alerts enabled in the Alerts settings.

AlertsSimulationInterval [s]: The interval in seconds between two subsequent alerts.

AudioSimulationEnabled: When audio simulation is enabled, the application does not process input from the microphone and instead processes data from an audio recording stored on the hard drive. Using this simulation is complicated in the current version, as recordings need to be manually placed on the device (for example, via ssh). This will be fixed in a future version.

Camera Module

The settings on this tab are only relevant for SED devices with an integrated camera module. The device captures images in an infinite loop and when an alert is detected, it sends several frames before and several frames after the alert, in addition to the usual metadata.

Enabled: Enable/disable capturing images and sending them to the user.

AlertFramesGap [s]: The time interval between two subsequent images after an alert is detected.

AlertFramesStored: The number of images sent to the user after an alert is detected. These images contain information about the situation after the alert.

PieceFramesGap [s]: The time interval between two subsequent frames when no alert is detected.

PieceFramesStored: The number of images saved in memory when no recording is detected. These images contain information about the situation before the alert.

SendFramesSeparated: Specifies whether images are sent to the user along with the alert or in separate messages. If false is selected, only images taken before the alert is detected are sent.

CommJALUD

SED uses its own encrypted TCP protocol to communicate with the user via the SED server.

Enabled: Enable/disable TCP communication.

Server Address: The cloud server's IP address is set by default.

Server Port: The port on which the server listens for incoming connections.

Server Secured: Specifies whether communication with the server is encrypted or not. A cloud server requires a secure connection.

Send Alerts: Enable/disable sending of detected alerts (Gunshot, Glass Breaking, Scream).

Send Alerts Data: Enable/disable sending audio recordings along with alerts. By default, the length of the audio fragment is 1 second.

Send Events [index]: Enable/disable sending of SED events. Be aware that if all events are sent to the standard location, the user may be overwhelmed with up to several thousand events per day. To prevent this, there are multiple volume levels that an event must exceed to be sent:

- None (default): No events are sent.
- All: All detected events are sent.
- Above 60 dB: Above 60 dB: Only events that are louder than 60 dB are sent.
- Above 75 dB: Above 75 dB: Only events that are louder than 75 dB are sent.

Send Events Data: Enable/disable sending audio recordings along with events. For more details, see Sending Alert Data. If all events are sent and the SED cloud server is used, discuss enabling sending audio event data with us at support@jalud-embedded.com.

CommVAPIX

Communication with the user via the VAPIX protocol is only available for SW integrated into CCTV cameras from the manufacturer AXIS. See more details here.

Enabled: Enable/disable communication with VAPIX.

Send Alerts: Same as TCP communication

Send Events: Used to determine whether and, if so, which events are sent.

CommRELAY

Communication with the user via RELAY technology.

TBD

CommHEOP

Communication with the user via the HEOP protocol is only available for SW integrated into CCTV cameras from Hikvision. See more details here.

TBD