

ASPiON ■ L-Track

Multisensor data logger with live tracking

Transport monitoring in all dimensions

Live. Worldwide. Sustainable.



User manual

ASPiON L-Track and ASPiON Cloud

FAQs, updates and useful
information can be found at
www.aspion.de/en/aspion-l-track-faq-support

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ASPION L-Track IoT transport data logger

1. General description - overview

The ASPION L-Track records sensor data such as shocks, vibrations and climate data and sends them in real time via cellular transmission to the ASPION Cloud IoT platform. The IoT device has many different sensors such as a 3-axis accelerometer for shock detection, temperature, humidity, pressure, tilt and light sensors, etc. and can collect a variety of measurements. These are logged on an interval and/or event basis with a time stamp, depending on the setting and requirement, and temporarily stored in a buffer memory until transmission on the battery-powered device. The device can trigger a transmission with self-defined threshold values or event triggers to inform the user immediately in the event of critical events.

The worldwide transmission of data in more than 140 countries is wireless via mobile radio using LTE-M and 2G as fallback. The transmission interval is independent of the measuring interval and can be selected by the user via predefined profiles depending on the application and requirements. If the device is unable to establish a radio connection, the buffer memory provides sufficient capacity for intermediate storage of the measured values and events. The location information is usually determined cellularly with a deviation of a few kilometres. Localisation to the nearest metre can also be carried out via satellite positioning (GPS). The current location and tracking history are displayed in the ASPION Cloud.

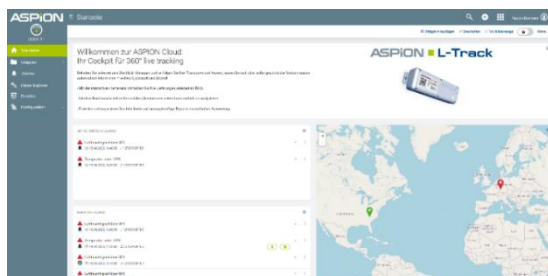
Thanks to the energy-optimized, finely tuned components and the sophisticated design, the ASPION L-Track can be used autonomously for several years with one set of batteries. With the robust, flame-proof, UV-resistant and waterproof housing and the easy battery change by the user, a permanent use is also given for many different transport monitoring applications and up to 10 years.

The ASPION Cloud is used to visualize the sensor data as well as location information. The sensor data is visible immediately after transmission, processed further and continuously supplemented with new data automatically. Via the ASPION Cloud, the user sets threshold values, sets up alarms, receives data analyses and creates reports. The ASPION L-Track can be easily activated independently and directly, regardless of location and without cloud access.

Each device has a unique ID that is on the label and stored as a barcode. The ASPION L-Track can be screwed on with the help of the mounting straps, alternatively fixed with adhesive tape or flexibly attached with already mounted magnets.



ASPION L-Track IoT data logger for attachment to the transported goods.



ASPION Cloud: IoT platform for 360° Grad live monitoring for location, sensor data, alarms, and reports.

2. Technical data ASPION L-Track

The following table contains all the information on the sensors available in the device. It also contains information on functions that have not yet been implemented but are planned for further development soon.

	Description	Details
Accelerometer	3 axes: x, y and z up to ±24 g per axis Sampling rate DIN EN IEC 60721-3-2	<ul style="list-style-type: none"> up to ± 16 g calibrated, 2.5% accuracy, extendable up to ± 24 g approx. 3.5% accuracy, verified by accredited testing lab 0.2 g resolution Adjustable threshold from 2 g to 12 g Adjustable between 25 Hz and 1,600 Hz Shock/vibration testing 2M4 / 2M5 / 2M6 additional extensions planned
Temperature sensor	Calibrated by manufacturer Adjusted during production	<ul style="list-style-type: none"> -40°C ... +125°C with accuracy of ± 0.2°C 0.1°C resolution Lower and upper threshold freely selectable
Humidity sensor	Calibrated by manufacturer Adjusted during production	<ul style="list-style-type: none"> 0% rH ... 100 % rH non-condensing 2% rH accuracy; 0.1% rH resolution Adjustable thresholds
Pressure sensor		<ul style="list-style-type: none"> 10 to 2000 mbar, 0,13 mbar accuracy 0,1 mbar resolution Threshold adjustable
Light sensor	For initial activation, opening detection or ambient light	<ul style="list-style-type: none"> 0 to 7550 lux, accuracy 0,12 lux With the use of a light guide, the light values deviate from the actual values Alternative opening detection
Tilt detection	Function not available (planned)	<ul style="list-style-type: none"> Tilt range +- 90° Accuracy 1°
Memory/logging	Non-volatile ring memory	<ul style="list-style-type: none"> Capacity: 50.000 measurements
BLE	Bluetooth Low Energy	<ul style="list-style-type: none"> Max. 10m range (line of sight) Min. Bluetooth 5.0 spec., can be disabled Bluetooth declaration ID: D060231
Mobile radio	LTE-M (2G) GSM	<ul style="list-style-type: none"> LTE Bands: B1/2/3/4/5/8/12/13/18/19/20/25/26/27/28/66/85 850/900/1800/1900 MHz Worldwide use, 140 countries supported
Localization	Cell localization GNSS with passive antenna	<ul style="list-style-type: none"> Via mobile phone cell, accuracy is up to several kilometers GPS, GLONASS, Beidou, accuracy a few meters (in exceptional cases up to approx. one hundred meters)
Battery	4x AA 1,5V Alkali 2Ah Battery replaceable by user, Lithium also possible	<ul style="list-style-type: none"> Battery power level at delivery: full No labeling requirement for alkaline batteries for transport; DGR compliant

Battery life	Long running times depending on ambient conditions	<ul style="list-style-type: none"> Example: With a transmission interval of 8 hours approx. 3 years (without GPS & shock) possibly shorter runtime at low temperatures / poor reception
Battery replacement	Housing opening via Torx screws (T10)	<ul style="list-style-type: none"> Maximum tightening torque 0.5 Nm
Measuring interval	Temperature, humidity, pressure, light	<ul style="list-style-type: none"> Standard: Every hour Configurable: 10 minutes ... 3 days
Transmission interval	Mobile connection and data transmission	<ul style="list-style-type: none"> Standard: Every 8 hours Configurable: Every hour ... 3 days
GPS tracking interval	Two independent configurable intervals	<ul style="list-style-type: none"> At standstill: Every 8 hours ... 30 days When moving: Every 15 minutes ... 3 days
Operating and storage conditions	Operating temperature range Temperature for data transmission Storage temperature range Humidity range	<ul style="list-style-type: none"> -30°C ... +60°C -10°C ... +60°C 5°C ... +40°C, avoid direct sunlight during storage 0 % rH ... 100 % rH
Housing and mounting	ABS housing; Screw mounting M4 ISO 7380 FL; optional: industrial adhesive tape, cable ties, magnetic mounting available	<ul style="list-style-type: none"> Dimensions: 184 mm x 55 mm x 31,5 mm Distance of mounting holes: 174 mm Tightening torque: 0.5 Nm
Version	IP 67 protection	<ul style="list-style-type: none"> Sensor protected by membrane Dustproof / waterproof Flame retardant and UV resistant Weight approx. 250 g incl. batteries
Approvals/Standards	Declarations of conformity and directives	<ul style="list-style-type: none"> CE / ROHS / REACH / WEEE RED (EU) FCC (USA) IC (Canada) WPC (India) SRRC (China, in preparation) DO160 (IATA) (in preparation)

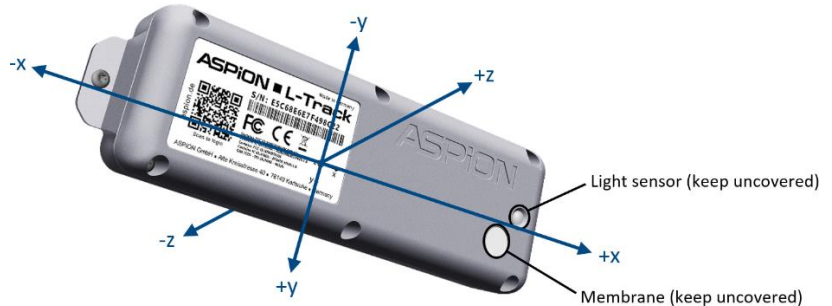
3. Export data (preliminary - all under review)

Export information	Product tariff code Country of origin Markings	<ul style="list-style-type: none"> 9031 8080 DE (EU) AI = no, ECCN = no (in preparation) Standard AA batteries not subject to labeling on delivery
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4. Mounting

4.1 Mounting direction

The mounting direction is decisive for the assignment of the axes in the event of shock events. It is best to mount the data logger directly on the transported goods in a sensitive location, preferably in the upper third.



Recommended Mounting

- Tightening torque 0.5 Nm
- on steel: M4 ISO 7380 FL
- on wood / sheet metal: Flat-head screws with max. 3.9 mm thread diameter (e.g. DIN 7981)
- Alternatives: Industrial adhesive tape (e.g. from 3M), cable ties or magnets (available as an assembled magnet set)

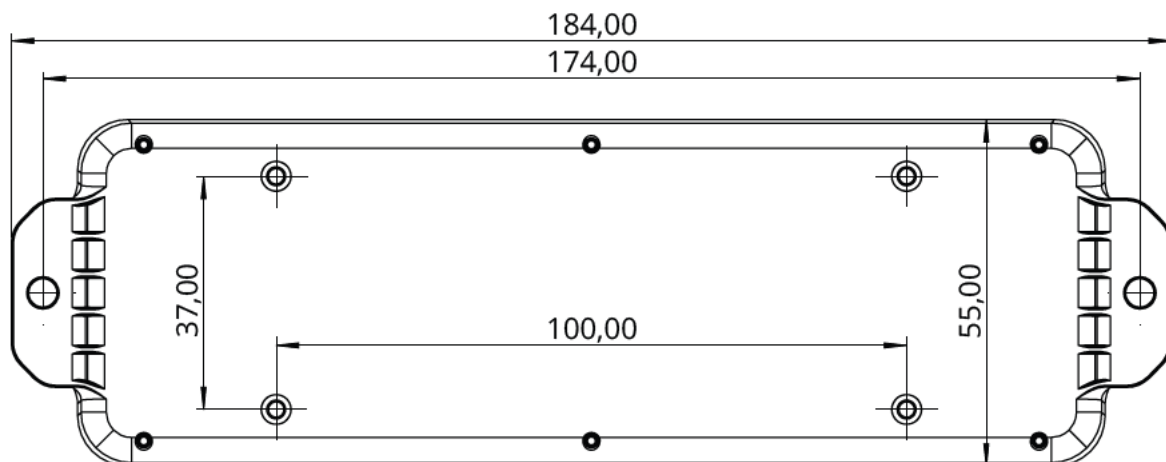
4.2 Packaging instructions (restrictions on mobile radio transmission)

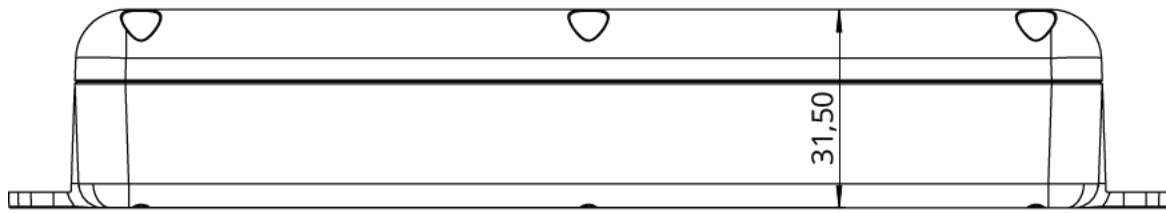
- To record temperature and humidity, make sure that the white membrane (red border) on the top of the ASPION L-Track is not covered when packing the device. If lux values are to be recorded via the light sensor, keep the adjacent light sensor uncovered.
- If you use corrosion protection packaging made of shielding material (such as aluminum composite foil), this creates a Faraday cage, which prevents mobile phone transmission. You can prevent this by excluding a small area, ideally close to the device, from the shielding, for example by installing a viewing/inspection window (e.g. Hermann window). This is the only way to **ensure mobile radio transmission when using corrosion protection packaging**.

4.3 Housing dimensions and cross-section

Housing without magnets

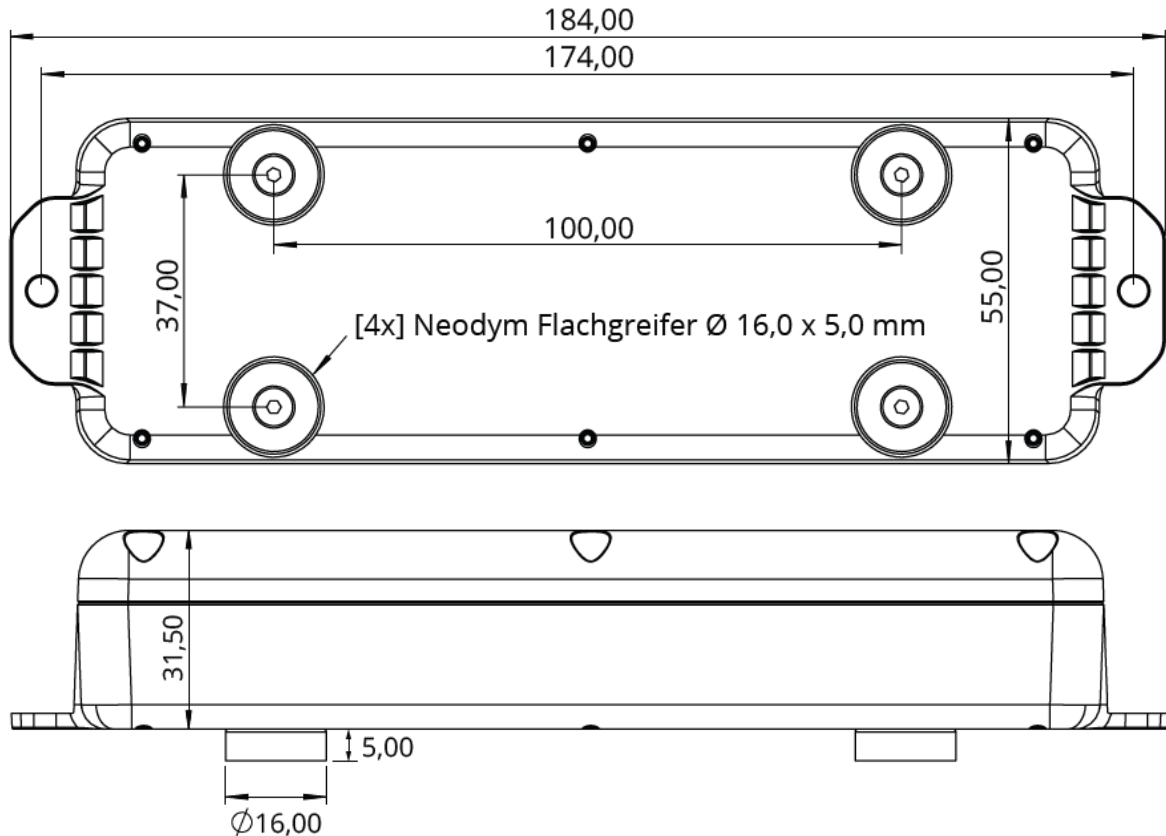
Dimensions in millimeters - not to scale





Housing with magnets

Dimensions in millimeters - not to scale



5. Battery replacement

The ASPION L-Track uses four AA 1.5V alkaline batteries. These can be replaced by the user. Alternatively, lithium AA 1.5V batteries can be used (hazardous goods guidelines must be observed). Change the batteries as follows:

1. Open the housing on the top: To do this, loosen the screws with a Torx T10 screwdriver.
2. Remove the batteries from the holder using a blunt non-metallic object (e.g. plastic ballpoint pen) from the holder. Avoid contact with the electronics.
3. Insert four new AA 1.5V batteries (alkaline or lithium) into the holders. Observe the correct polarity.
4. Screw the housing tight with a maximum tightening torque of 0.5 Nm. Improper handling will invalidate the warranty; in addition, the housing may start to leak and water ingress may destroy the device.

6. Firmware updates

The ASPION L-Track firmware is updated automatically "over the air". A manual update process is not necessary. If the ASPION L-Track is connected to the mobile network, all available firmware updates are automatically downloaded to the device and installed.

7. Commissioning

When an ASPION L-Track is delivered, it is in the delivery state with low power consumption. Activate a device by pulling off the red "Remove Label".

Note: Make sure that sufficient light falls on the light sensor so that the device is activated. In poor lighting conditions, shine a flashlight on the light sensor for a few seconds.

The initial synchronization of the device with the ASPION Cloud takes a few minutes. After that, a measurement is taken at every full hour and the first data transfer to the ASPION Cloud takes place after 8 hours.

Then, you can view the measured values via the ASPION Cloud and configure the device. Please note that a device must be activated within 3 months of delivery. Otherwise the billing period begins automatically.

8. Disposal



In accordance with the Waste Electrical and Electronic Equipment Directive, the ASPION L-Track must not be discarded with normal household waste, but only taken to the appropriate disposal sites. You can therefore return devices that are no longer required to the manufacturer free of charge at any time to the following address:

ASPION GmbH
Old Appliances Acceptance
Alte Kreisstraße 40
76149 Karlsruhe, Germany

9. Safety instructions

- The ASPION L-Track IoT data loggers are not designed for safety-relevant applications.
- An obviously damaged device must not be put into operation. Devices that do not function properly or are damaged should be returned to your source of supply.
- Make sure that no liquids penetrate the device, as this can cause corrosion damage or short circuits.
- The ASPION L-Track is suitable for battery replacement by the user. When changing the battery, take care not to cause any short circuits and follow the instructions.
- Never use a device with a leaking battery. If possible, do not touch this device with your bare hands. If you have come into contact with the leaking components, wash your hands thoroughly. Wipe up the electrolyte residue with a damp cloth. Wash any clothing that has come into contact with the electrolyte.
- The manufacturer is not liable for damage caused by improper use or incorrect operation.
- The devices comply with the safety standard *EN IEC 62368-1:2020+A11:2020*.

10. FCC / ISED Warnings

- Contains FCC ID: XMR202004BG600LM3 ; Contains IC: 10224A-20BG600LM3.
- Contains FCC ID: X8WBT840 ; Contains IC: 4100A-BT840
- Class A - Industrial use
- This equipment has been tested and was found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

Interference statement

- This device complies with Part 15 of the FCC Rules and Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Wireless notice

- This device complies with FCC/ISED radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines and RSS-102 of the ISED radio frequency (RF) Exposure rules. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- Le présent appareil est conforme à l'exposition aux radiations FCC / ISED définies pour un environnement non contrôlé et répond aux directives d'exposition de la fréquence de la FCC radiofréquence (RF) et RSS-102 de la fréquence radio (RF) ISED règles d'exposition. L'émetteur ne doit pas être colocalisé ni fonctionner conjointement avec à autre antenne ou autre émetteur.

11. RED Declaration of Conformity

- ASPION GmbH confirms that the L-Track complies with the essential requirements and other relevant provisions of Directive 2014/53/EU. This product can be used in all EU member states.

ASPION Cloud

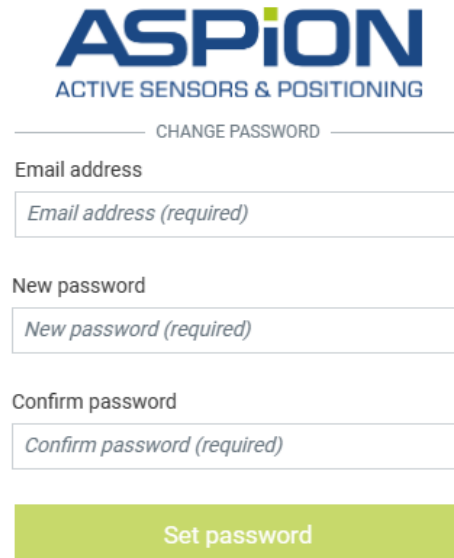
The ASPION Cloud is used to visualize the sensor data and location information. The sensor data is visible immediately after transmission, processed and constantly updated with new data automatically. You can use the ASPION Cloud to set threshold values, set up alarms and evaluate the data.

12. User login

To log in to the ASPION Cloud for the first time, click on the link you received by email from the ASPION Cloud. Enter your own password for your login there. Also check your spam folder if you have not received an e-mail. The link in the e-mail is only valid for 24 hours. If it has already expired, click on "Forgot your password?" in the ASPION portal and follow the instructions in the email.



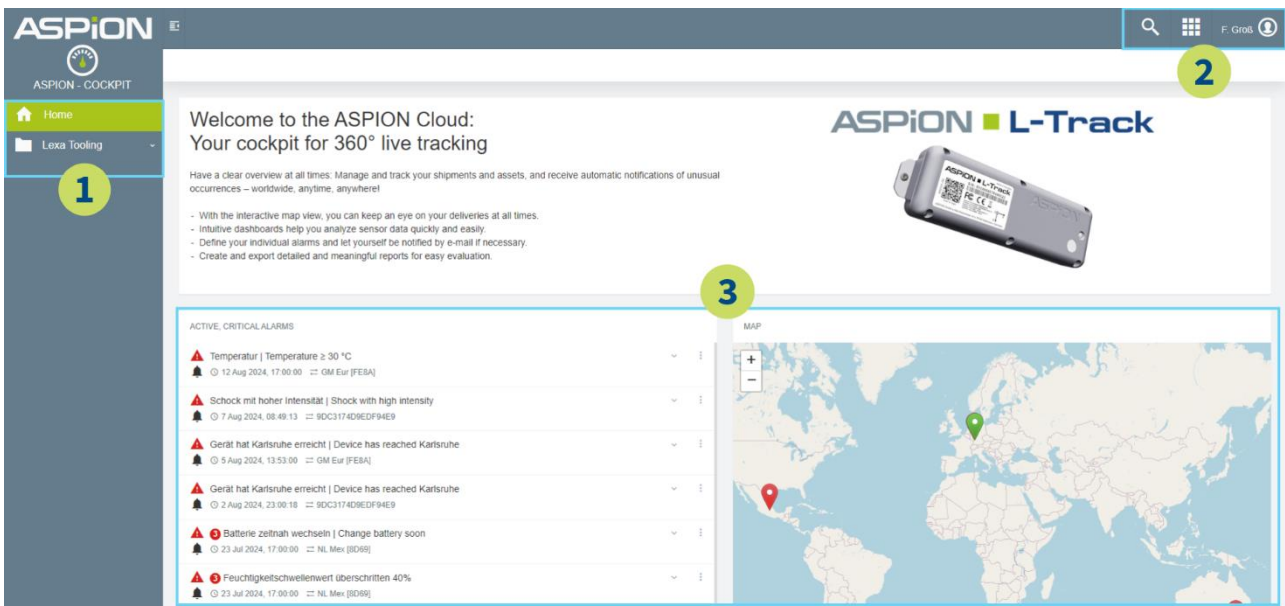
The login form features the ASPION logo at the top, followed by the text "ACTIVE SENSORS & POSITIONING". Below this is a "LOGIN" header. The form includes a "Username" field with a placeholder "e.g. joe or joe.doe@example.com", a "Password" field, and a green "Log in" button. At the bottom, there are links for "Forgot password?" and "Help & Service".




The change password form features the ASPION logo at the top, followed by the text "ACTIVE SENSORS & POSITIONING". Below this is a "CHANGE PASSWORD" header. The form includes three input fields: "Email address" with a placeholder "Email address (required)", "New password" with a placeholder "New password (required)", and "Confirm password" with a placeholder "Confirm password (required)". A green "Set password" button is located at the bottom.

Then enter the access data you received by e-mail in the login screen. Please note that the password is case-sensitive. If you forget your access data, you can reset your password at any time using the "Forgot your password?" function.



13. ASPION Cockpit – Home page



After logging in, you will be redirected to the "ASPION Cockpit" on the home page.

① The **main navigation bar** is located on the left-hand side. Here you will find your groups and the associated devices as well as the function for data exports. Note: The main navigation bar can be shown or hidden. If you do not see the main navigation bar, you can expand it by clicking on the white symbol  at the top left of the screen.

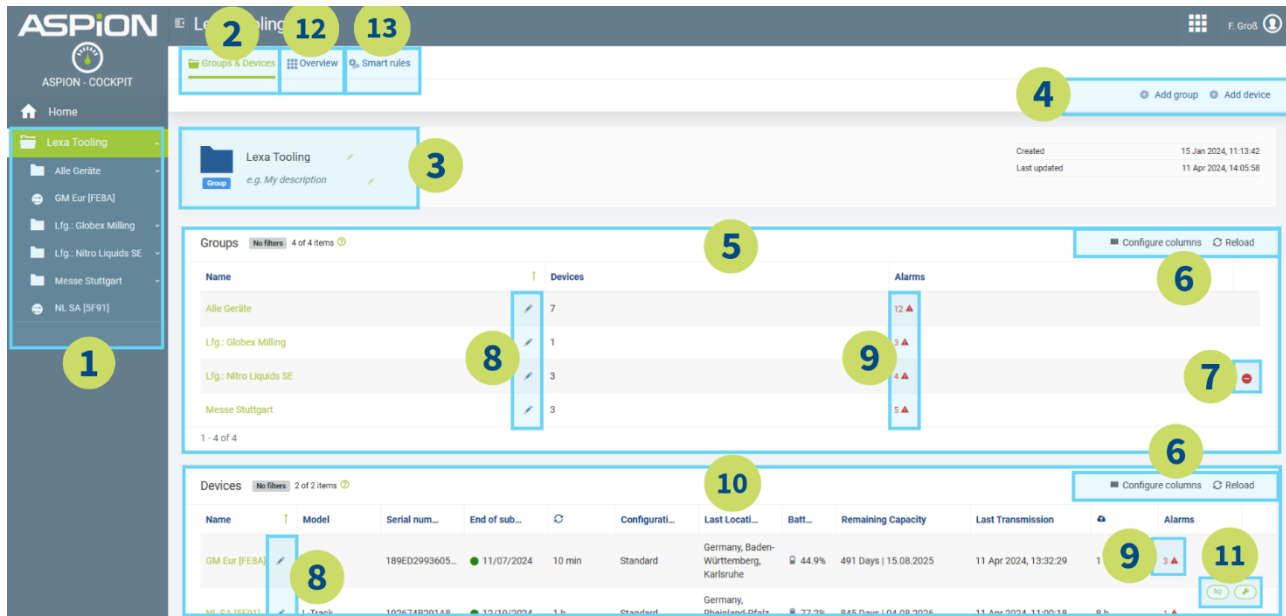
② The **top menu bar** shows which area of the cockpit you are currently in (here: " Home page"). You will find the following functions on the right-hand side:

- **Suche:** Click on the magnifying glass to search for devices or groups. The entry in the search bar is checked for an exact match by default. Alternatively, you can click on one of the green buttons to search for a partial match only. Pay attention to upper and lower case. 
- **Application switcher:** Use the application switcher (tiled symbol)  to switch between the "Cockpit" and "Administration" areas. Note: The Administration area is only shown if you have the rights to do so.
- **User:** After clicking on the user icon or your user name, you can log out of the ASPION Cloud or edit your user data (e.g. e-mail address, login data, password).

③ At the bottom of the screen you will find a map with the latest position of all currently active devices. Devices with active alarms are marked in red. Devices without active alarms are shown with a green symbol. If configured, you will also find an overview of all currently active alarms for all devices. By clicking on the device name, you will be forwarded to the device overview.

14. Navigation & Groups

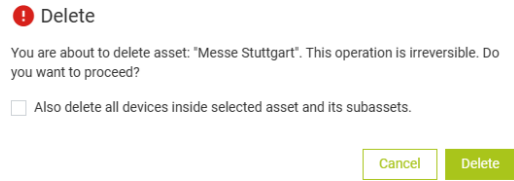
In the ASPION Cloud, you can use groups - like folder structures in a file system - to sort and manage your devices easily and clearly, e.g. to assign multiple devices to a delivery. The groups allow you to set up views and alarms (via Smart Rules) for all devices in a group. At the same time, all alarms in a group are displayed together, for example. Groups can also be nested so that complex structures can be mapped. Each group has a tab for "Groups and devices". All subordinate groups and devices are displayed here.



- ① Use the main navigation bar on the left to navigate to the groups and devices. Groups are represented by a folder and devices by a circle with two arrows.
- ② In the **Groups and devices** tab, you will find general information about the current group and the devices and groups in it.
- ③ Edit the name and description of the current group.
- ④ Create a new group using the **Add group** button. This is subordinate to the current group. Assign a name and then add devices to the group (activate via selection box) [14.1]. You can update the assignment of devices at any time using the **Add devices** button. A device can be assigned to any number of groups.
- ⑤ The group list shows a table with all selected attributes of the groups. By clicking on the arrow on the right-hand side of each attribute, you can sort it in ascending or descending order. Only ever select one attribute for sorting. The default sort order is by name. Note: Only ever select one attribute to sort by. If you have activated the sort function for several attributes, it only works for the attribute named first in the table. The sort function is activated when an arrow is visible. It is not possible to sort by all attributes.
- ⑥ Which attributes are displayed in which order can be edited using the **Configure columns** button.

⑦ On the right-hand side you will find red buttons for deleting groups when you move the mouse over the line. Deleting a group is irreversible!

Warning: A prompt appears when you delete a group. If you check the box, you will also delete all devices in the group.



⑧ Use the pencil icon to edit the names of the groups and devices. The name must be between 3 and 40 characters long and may contain any special characters.

⑨ Displays a list of active alarms for each subgroup and device. By clicking on the alarm icon in the device list, you can jump to the alarm overview of the selected device.

⑩ The device list behaves similarly to the group list. The device list includes the following attributes:

- Name: self-selected name for the device
- Model: Version of the L-track
- Serial number: Unique number for assigning the device
- Measurement interval: Regular interval at which the environmental parameters are recorded
- Configuration: Shows the status of the configuration and whether shock and GPS tracking are activated [15]. Example: "Standard, shock, GPS" -> Both shock and GPS are activated.
- Last location: Last detected location during the last transmission
- Battery: Remaining battery capacity from 0 to 100%,
- Remaining battery capacity: Estimated remaining time and date until the last transmission with the current battery. The calculation of the remaining battery capacity is based on alkaline batteries from Panasonic. Other manufacturers and especially lithium batteries change the actual battery capacity and thus the runtime.
- Note: If the GPS location is active when moving, it is assumed that the device is in motion 50% of the time. More frequent movement reduces battery life.
- Last transmission: Time of the last data transfer of the device data to the ASPION Cloud
- Transmission interval: Regular interval at which the measurement data of the L-Track is transmitted to the ASPION Cloud
- Alarms: Number of active alarms on the device

⑪ If you move the cursor to the right-hand edge of the line, you will find the **Configure** and **Unassign** buttons.

- **Configure:** Configuration view for shock detection opens.
- **Unassign:** Removes the device from this group.

⑫ The **Overview** tab shows all alarms from this and all subordinate groups as well as a map with all locations of devices that are directly in this group.

⑬ You can use Smart Rules to create alarms and e-mail notifications.

14.1 Create a new group

To create a new group, use the **main navigation bar** on the left-hand side to navigate to the group under which the new group is to be created. Now use the tabs at the top to switch to the **"Groups and devices"** view. Here you can see all subordinate groups and devices of the currently selected group. At the top right, you can use the **Add group** button to create a new group and assign devices to the currently displayed group.

When adding a group, you will be asked to enter the name and optionally a description. Click on the **Next** button to assign devices to this group.

Status	Name	Model	Serial number	Group	Registration date	System ID	IMEI	Alarms
<input type="checkbox"/>	9DC3174D9EDF94E9	L-Track	9DC3174D9EDF94E9	Messe Stuttgart	24 Jan 2024, 17:53:59	4396		3 ▲
<input type="checkbox"/>	GM Eur [FE8A]	L-Track	189ED2993605FE8A	Lexa Tooling, Lfg.: Glob...	26 Feb 2024, 12:26:51	9364		3 ▲
<input type="checkbox"/>	NL SA [5F91]	L-Track	1926748291A85F91	Lexa Tooling, Lfg.: Nitro...	26 Feb 2024, 12:26:51	5815		1 ▲

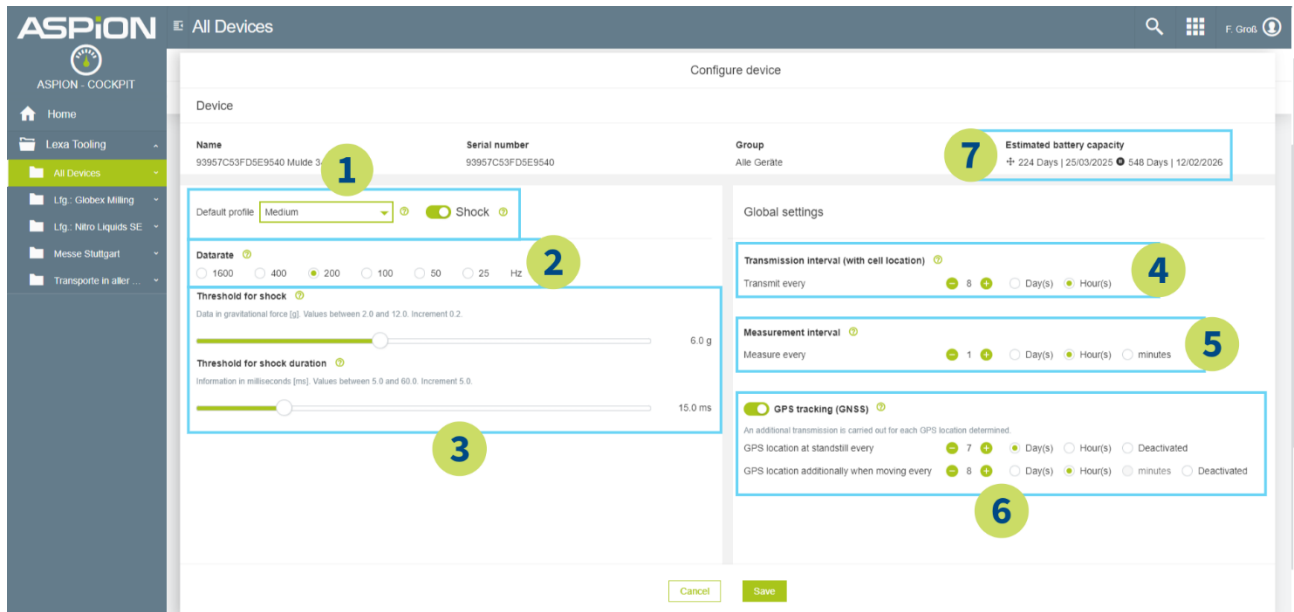
Select the devices by clicking in the selection box on the left. You can also assign individual devices to several groups. You can change the assignment of a device to a group at any time in the list view in the **Groups and devices** tab using the **Assign devices** button. Complete the creation of the group by clicking on the **Create** button.

15. Device configuration & shock activation

In the device configuration, activate shock detection and GPS tracking if required and configure the transmission and measurement interval. You can access the configuration by selecting a group that contains the device (e.g. the All devices group). In the Groups & devices tab, the **Configure** button [14, step 11] appears in the device list on the right. Click to open the device configuration view.



Note: Wait a few hours after receiving the invitation email to the ASPION Cloud before setting up the device configuration.



The device configuration is divided into two sections. The shock configuration is located on the left-hand side, while global settings can be changed on the right-hand side.

① Default profile (shock): Shock detection is deactivated by default. To activate it, select a profile from the drop-down menu or make your own settings. Recommendation: Start with one of the predefined profiles and gradually adapt it to your own needs. The following three standard profiles are available to choose from:

- 0,3 t to 1 t: Profil high – 8 g at 20 milliseconds shock duration
- 1 t to 8 t: Profil medium – 6 g at 15 milliseconds shock duration
- 8 t to 15 t: Profil low – 4 g at 10 milliseconds shock duration

Generally, the heavier the transported goods, the lower the threshold values. For lighter or heavier goods, select correspondingly higher or lower values.

② Data rate: The data rate is used to determine the measuring frequency of the accelerometer. A high data rate has a negative effect on battery life. At the top right, the remaining battery life is updated when a change is made.

③ Threshold value for shock and shock duration: Set the threshold values (g-force and duration in ms) for shock detection. Note: Use the standard profiles as a guide to avoid recording a large number of events.

④ **Transmission interval (with cell location):** Select the interval at which the device transmits data and determines rough location information when there is a cellular connection. The transmission interval is a multiple of the measurement interval and can be between one hour and 3 days.

⑤ **Measurement interval:** Select the interval at which the device regularly saves the measurement data. The measurement data includes temperature, humidity, light, pressure, battery capacity and battery voltage. The measurement interval can be set between 15 minutes and 3 days.

⑥ **GPS tracking (GNSS):** GPS tracking is deactivated by default. By clicking on the switch, you can activate GPS tracking and obtain a more precise location than just by locating the mobile phone masts for each data transmission. GPS tracking can be set with two different intervals:


- The GPS location at **standstill** is a regular interval that determines a precise location via GPS at the selected interval. This interval is particularly suitable for permanent, precise monitoring of the device location. The GPS location at standstill is a multiple of the transmission interval and is between 8 hours and 30 days.
- The GPS location when **moving** determines the GPS location (if activated) when the device is moving at the selected interval.


Example: GPS location when moving is activated hourly -> No GPS location is determined based on this setting until the device moves. As soon as the device moves, a GPS location is determined every hour until the device is at rest again. The GPS location at standstill also regularly determines a GPS location regardless of movement (if activated).

This makes the GPS interval when moving suitable for transport monitoring where precise location tracking is required. This interval leads to additional data transmission if the GPS interval is smaller than the transmission interval.

⑦ **Remaining battery life:** The battery life adapts directly to the selected device configuration and applies to the selected device, based on past battery consumption. If the GPS location is active when moving, two expected battery lives are indicated:

- On the left, the lower value indicates the battery life ⊕ 224 Days | 25/03/2025 Ⓜ 548 Days | 12/02/2026 when the device is permanently in motion.
- On the right, the higher value indicates the battery life when the device is permanently at rest.

Click on the Save button to update the configuration status in the device list [14, point 10]. In the Configuration column, a blue clock  indicates that the new configuration will be adopted with the next data transfer. As soon as the blue symbol disappears, the configuration is active on the device. Note: The settings are synchronized with the device during the next transfer. Until then, the old device configuration remains on the device.

A red cloud  indicates that the device configuration has failed. In this case, repeat the process.

16. Smart rules, alarms & notifications

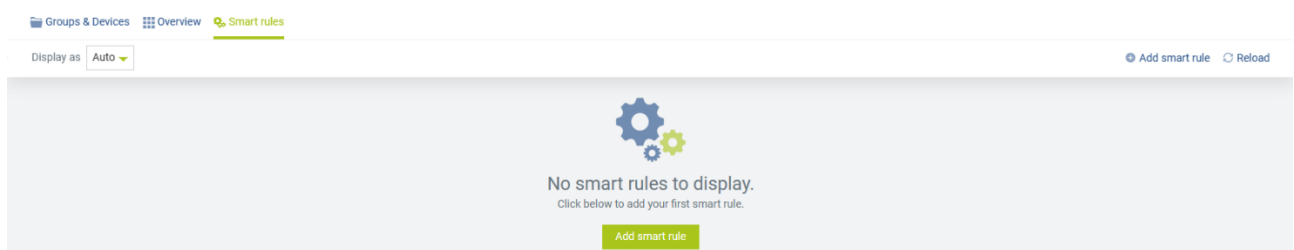
Smart Rules allow you to automatically monitor the data of your devices and generate alarms and send email notifications for events that you specify. Alarms are displayed in the ASPION Cloud both for groups containing the affected device and for devices directly. Email notifications make it possible to be informed without having to open the ASPION Cloud and are suitable if there is an immediate need for action.

16.1 Smart Rules

To create a Smart Rule for a device, navigate to a group that contains the device (for example, the "All devices" group). Newly created or activated Smart Rules monitor all future measurements and do not create alarms or emails for measurements in the past. Tip: To make it easier to create Smart Rules, there are some templates in the "All devices" folder [16.1.4]

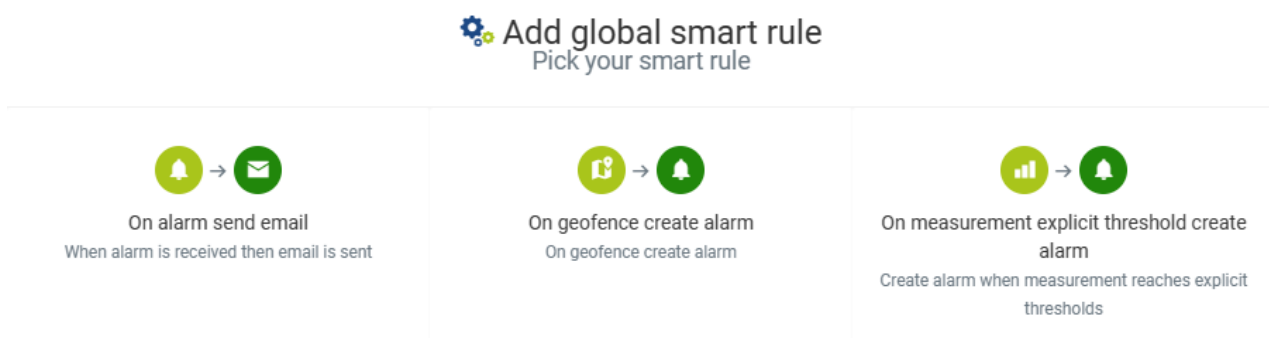
Note: If new devices are added to the group, all previous Smart Rules are not active for these devices and must be changed manually.

Note: Smart Rules are NOT applicable for entire groups. The rule is only active for selected devices.



If no Smart Rules exist, create a new Smart Rule using the **Add Smart Rule** button. If there are already any, add a Smart Rule using the button of the same name at the top right-hand edge. The ASPION Cloud offers the following three types of smart rules:

- **On measurement explicit threshold create alarm** [16.1.1]: Allows you to set self-selected threshold values for any measured values. For example, an alarm can be generated if the temperature exceeds 30 degrees Celsius.
- **Generate alarm on geofence violation** [16.1.2]: Monitors a self-selected geographical area. An alarm is generated when entering or leaving the geographical area.
- **Send e-mail on alarm** [16.1.3]: Sends emails in the event of an alarm occurring that was triggered due to one of the two Smart Rules described above.



16.1.1 On measurement explicit threshold create alarm

This Smart Rule can be applied to all measurement data. They can be used to monitor the following parameters:

- Temperature: in degrees Celsius; suitable for detecting temperature overshoots/undershoots
- Relative humidity: in %; suitable for creating corrosion warnings
- Light: in lux to detect, an opening of the delivery for example
- Pressure: in mbar; suitable for recording flight events; normal pressure at sea level is around 1,013 mbar, normal pressure in aircraft usually drops to below 810 mbar
- Battery voltage: in V; data transmission is no longer possible below a voltage of 4.3 V
- Used battery capacity: in mAh; Based on the battery capacity already used, conclusions can be drawn about the battery life. 1,500 mAh is the available capacity for alkaline batteries.

This type of smart rule includes the following elements:

At the top is the button for activating or deactivating the Smart Rule with the text "Switched on". The newly created Smart Rule can initially be deactivated here by clicking on the button. This can be adjusted later at any time in the Smart Rules overview.

1 Rule name: Here you assign a name for the smart rule that is as descriptive and easy to understand as possible, e.g. "Temperature has risen above 30 °C"

2 On threshold: Select from the drop-down menu which value of a device is to be checked (e.g. "Temperature (°C) - Climate sensor"). The *Fragment* and *Series* fields are filled in automatically and **should not be edited**.

In the two fields displayed below, you determine the threshold values. The first field defines the **lower** limit value, the field below it the **maximum value**. Alarms are generated if the measured values lie between the **two threshold values**.

Examples:

- Temperature (°C) – climate sensor, 30 and 999 → Alarm at any temperature above 30°C
- Temperature (°C) – climate sensor, -999 and 0 → Alarm at any temperature below 0°C
- Temperature (°C) – climate sensor, -10 and 0 → Alarm at any temperature between -10°C and 0°C (**no** alarm at below -10°C and above 0°C)

Note: An alarm is only triggered the first time if the temperature is initially outside the threshold value and then exceeds it.

3 Create alarm: Here you define the information displayed for the alarm to be generated. The first field is the alarm type, the second is the name of the alarm. The name of the alarm should be as self-describing and distinguishable as possible.

New global smart rule

On measurement explicit threshold create alarm
Fields marked * are required.

Enabled

1 Rule name

Create alarm when measurement reaches explicit thresholds

2 On threshold:

Select data point to prefill inputs below

Fragment (required)

90
Default: 90

100
Default: 100

Cancel Create

Alarm type: The alarm type is primarily relevant for a possible e-mail dispatch. Optionally, it is possible to assign the same alarm type to different Smart Rules and thus group the alarms (example description: "Temperature exceeded" -> An e-mail notification can be set up for all alarms with this alarm type).

Important: The alarm type is required for e-mail notification.

Alarm name: The name of this alarm should indicate which threshold value has been exceeded or fallen below and is displayed in the alarm overview as the title of the alarm. You should therefore use clear descriptions and no duplications (example: "Temperature > 30°C").

Click on the "Create" button to activate the Smart Rule. The Smart Rule automatically applies to all devices in the folder in which the Smart Rule was created. Chapter 16.1.4 describes how created Smart Rules can be edited so that the rule only applies to individual devices.



3 Create alarm:

c8y_ThresholdAlarm

Threshold exceeded

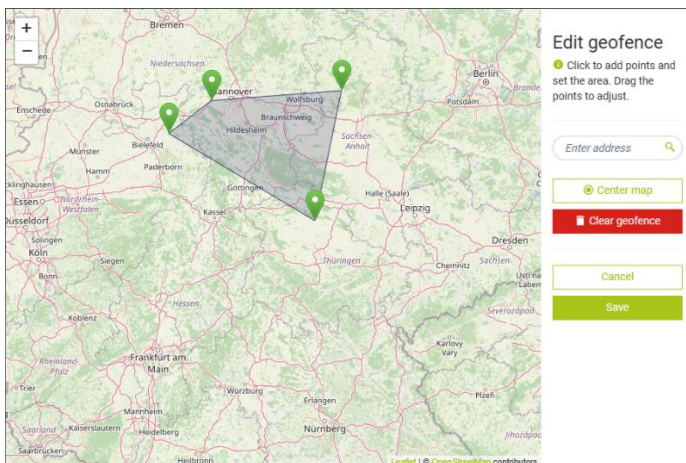
16.1.2 Generate alarm on geofence violation

Create this smart rule to check whether a device has entered or left a certain area. This type of Smart Rule contains the following elements:

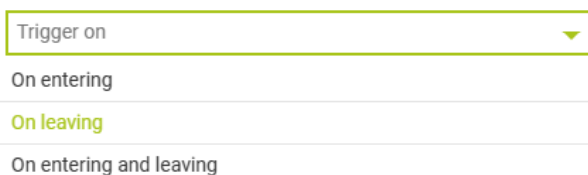
At the top is the button for activating or deactivating the Smart Rule with the text "Switched on". The newly created Smart Rule can initially be deactivated here by clicking on the button. This can be adjusted later at any time in the Smart Rules overview.

① **Rule name:** Here you assign a name for the smart rule that is as descriptive and easy to understand as possible, e.g. "Enter geofence area"

② **On geofence violation:** The **Edit geofence** button below the map opens a new view for defining the geofence.



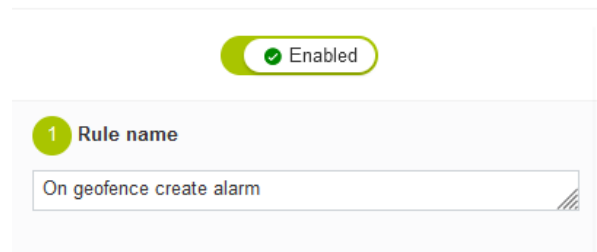
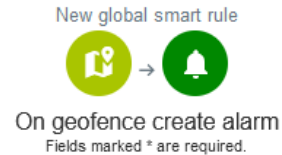
③ **Create alarm:** In the first drop-down menu, select whether the alarm is triggered when entering, leaving or both scenarios.



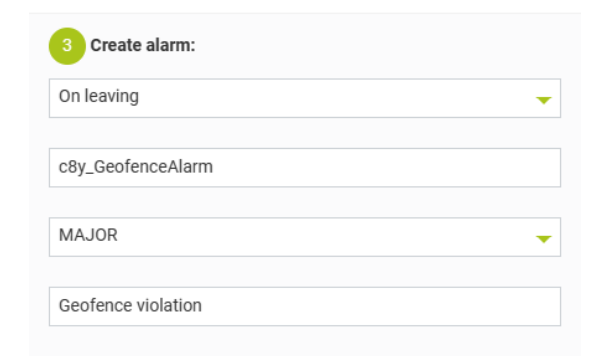
Alarm type: The second line of the "Created alarms" area is the alarm type. It is primarily relevant for a possible e-mail dispatch. Optionally, it is possible to assign the same alarm type to different Smart Rules and thus group the alarms (example description: "Theft warning" -> An e-mail notification can be set up for all alarms with this alarm type)

Important: The alarm type is required for e-mail notification.

The severity of the alarm provides you with a better overview of the importance of the alarms.



You can use the search function on the right to navigate to a desired address and then add points by clicking on the map. Frame the desired area with the points you have set. Use the buttons in the top left-hand corner to zoom in and out. You can move the map by clicking and holding. Click on the **Save** button to create the geofence.



Alarm name: The name of this alarm should show which threshold value has been exceeded or fallen below and is displayed in the alarm overview as the title of the alarm. You should therefore use unique names and no duplications (example: "Warehouse left Karlsruhe").

Click on the "Create" button to activate the Smart Rule. The Smart Rule automatically applies to all devices in the folder in which the Smart Rule was created. Chapter 16.1.4 describes how created Smart Rules can be edited so that the rule only applies to individual devices.

16.1.3 On alarm send email

The third type of smart rule allows an e-mail to be sent automatically when an alarm occurs. The prerequisite for this smart rule is another smart rule that generates an alarm for an event (either "Generate alarm at explicit threshold value" (16.1.1)) or "Generate alarm on geofence violation" (16.1.2)).

At the top is the button for activating or deactivating the Smart Rule with the text "Switched on". The newly created Smart Rule can initially be deactivated here by clicking on the button. This can be adjusted later at any time in the Smart Rules overview.

① **Rule name:** Here you assign a name for the Smart Rule that is as descriptive and easy to understand as possible, e.g. "Email when temperature is exceeded"

② **On alarm matching:** Here you select the alarm type for which the e-mail is to be sent. **You chose the alarm type yourself when you created the other Smart Rule.** For example, if you have created a Smart Rule that generates an alarm when the temperature exceeds 30°C and has the type "Temperature exceeded", you must enter "Temperature exceeded" here in order to receive an e-mail for each of these alarms.

Attention: The e-mail dispatch only works if the type is entered correctly. Differences in upper and lower case letters must be taken into account.

Several types can be entered simultaneously using the "Add alarm type" button, and individual types can be removed again using the minus sign on the right.


③ **Send email:** In this area, you set the details of the email to be sent. For "Send to", "CC to" and "BCC to", several email addresses can be entered separated by commas. Under "Reply to", you can specify to whom e-mails created in response to the alarm e-mail should be addressed.

This is followed by the subject line and the content of the email. Here you can use specific keywords in the format „#{keyword}“ to insert certain data of the underlying alarm into the texts. Next to the character sequence
 for a paragraph the following keywords are available:

Status of the alarm: **#{status}**

- **ACTIVE:** Alarm is still active at the time of data transmission
- **ACKNOWLEDGED:** Alarm has already been confirmed in the ASPION Cloud
- **CLEARED:** Alarm has either been manually cleared or is no longer active

New global smart rule



On alarm send email
Fields marked * are required.

Enabled

1 Rule name

2 On alarm matching:

Alarm type (required)
-

+
Add alarm type

3 Send email:

Send to

1 Enter one or more valid email addresses, separated with a comma.

Send CC to

1 Enter one or more valid email addresses, separated with a comma.

Send BCC to

1 Enter one or more valid email addresses, separated with a comma.

Reply to

New #{severity} alarm from #{source.name}

New #{severity} alarm has been received from #{source.name}.
Alarm text is: " #{text} ".

Severity of the alarm: **#{severity}**

- CRITICAL: Alarm with critical severity. Is the default value for Smart Rules with an explicit threshold value.
- MAJOR: Alarm with important severity
- MINOR: Alarm with less important severity
- WARNING: Alarm with warning as severity level

Alarm name: **#{text}**

- Individually definable alarm name when creating the Smart Rule in section 3 of the Smart Rule (example: "Temperature > 30°C" or "Exit Karlsruhe warehouse").

Time of the alarm: **#{time}**

- Date and time of the alarm UTC in the following format: Year-Month-Day Hour:Minute:Second

Device name: **#{source.name}**

- Device name (can be changed in the device list)

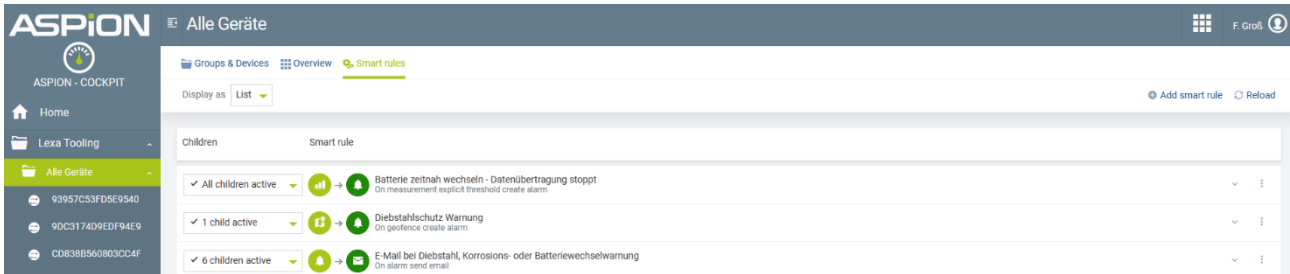
Alarm type: **#{type}**

- Individually definable alarm type when creating the Smart Rule in section 3 of the Smart Rule (example: "Theft warning" or "Temperature exceeded")

Click on the "Create" button to activate the Smart Rule. The Smart Rule automatically applies to all devices in the folder in which the Smart Rule was created. Chapter 16.1.4 describes how created Smart Rules can be edited so that the rule only applies to individual devices.

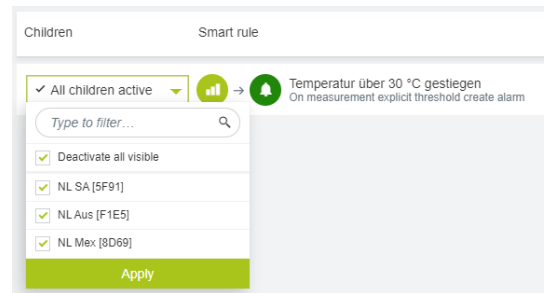
16.1.4 Editing smart rules:

To make it easier to create **Smart Rules**, there is a selection of templates in the "All devices" group on the Smart Rules tab that you can adapt to your requirements and activate for individual devices. You can edit or delete the templates using the three dots on the right.



To activate Smart Rules for individual devices, click on the drop-down menu in the "Children" column. A list of all devices subordinate to the group will appear. Select all devices to which the rule should apply and confirm your selection by clicking on the **Apply** button.

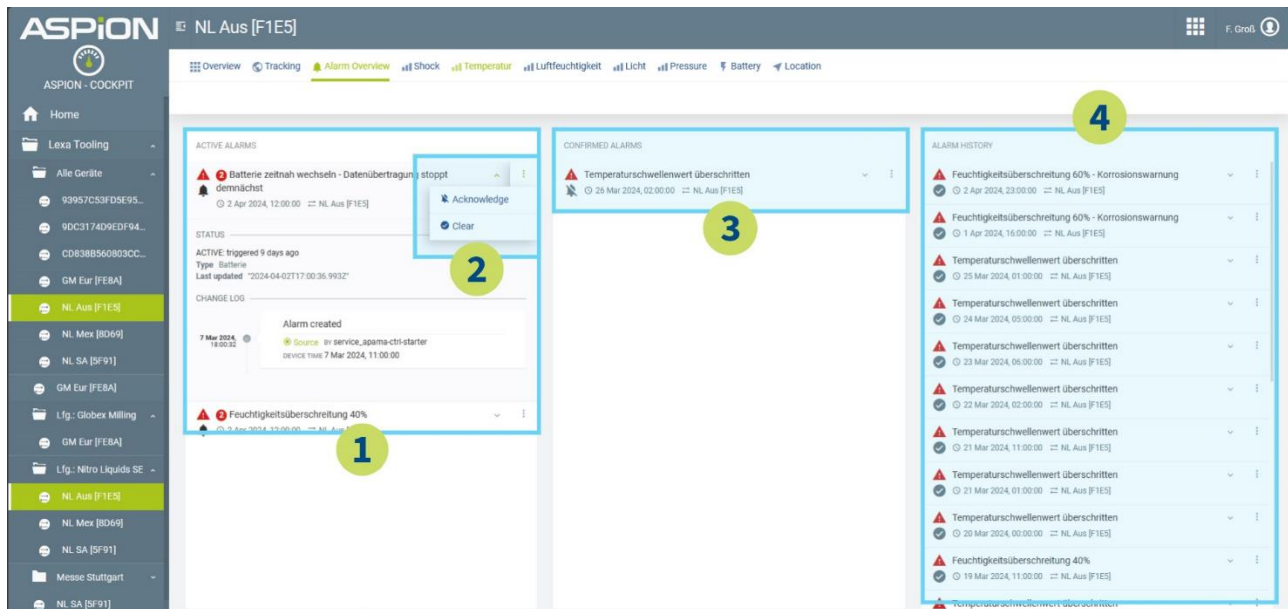
When the Smart Rule is created, it initially applies to all devices in the group. Devices that are added to the group after the Smart Rule has been created are NOT automatically assigned to the Smart Rules, but must be added manually if required.



16.2 Alarms

Alarms generated due to the threshold values set in the Smart Rules [16.1.1 and 16.1.2] are displayed in detail at device level in the **Alarm overview** tab. In addition, all active alarms from directly assigned devices are visualized at group level.

Note: Alarms that persist over a longer period of time without interruption are combined into one alarm.



The detailed alarm overview at device level consists of 3 areas:

- ① **Active Alarms:** All alarms that are still within the range defined (in the Smart Rules) at the time of the last data transmission are listed here. These alarms require an action on your part ②. For each alarm, you can see the name of the device and the alarm, the time it occurred and the type of alarm.
- ② Use the three dots on the right-hand side of the alarm to move the alarm to another area. Clicking on the **Acknowledge** button moves the alarms to the "Confirmed alarms" area ③, while the **Clear** button moves the alarm directly to the "Alarm history" area and ends it ④.
- ③ **Confirmed alarms:** All alarms that have been confirmed by a user and are still active are displayed here. The alarms have been acknowledged and recognized but are still relevant as the values were still within the threshold values at the time of the last transmission. It is not yet moved to the alarm history.
- ④ **Alarm history:** All alarms that have either been canceled by the user or are outside the threshold values again due to changing environmental parameters are listed here. It is therefore possible for an alarm to appear directly in the alarm history.

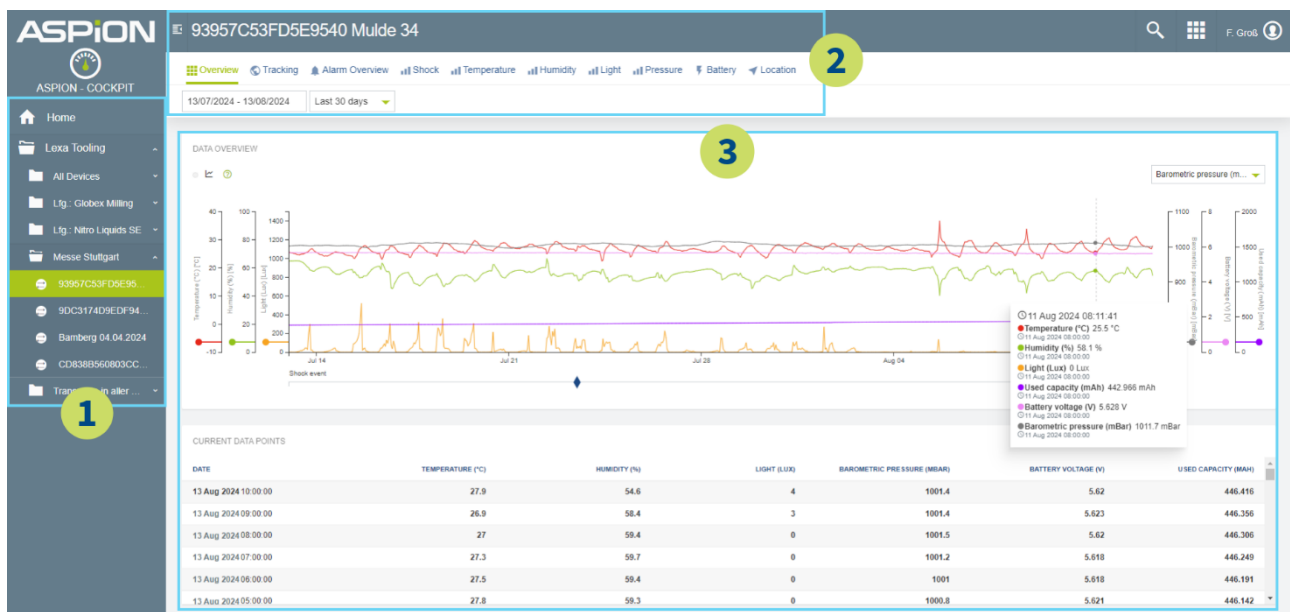
Example: A smart rule for monitoring a temperature exceeding 30 degrees Celsius has been set up for the device. The L-Track carries out the following measured values and data transmissions:

- 8:01 a.m.: Last data transmission
- 2:00 p.m.: 29,5 °C
- 3:00 p.m.: 30,3 °C

- 4:00 p.m.: 29,8 °C
- 4:01 p.m.: Next data transmission

In this case, the alarm that was active at 15:00 is added directly to the alarm history with the data transmission at 16:01 and does not appear in the active alarms. This is because the temperature is already below the defined threshold value at the time of data transmission.

17. Device details & analysis

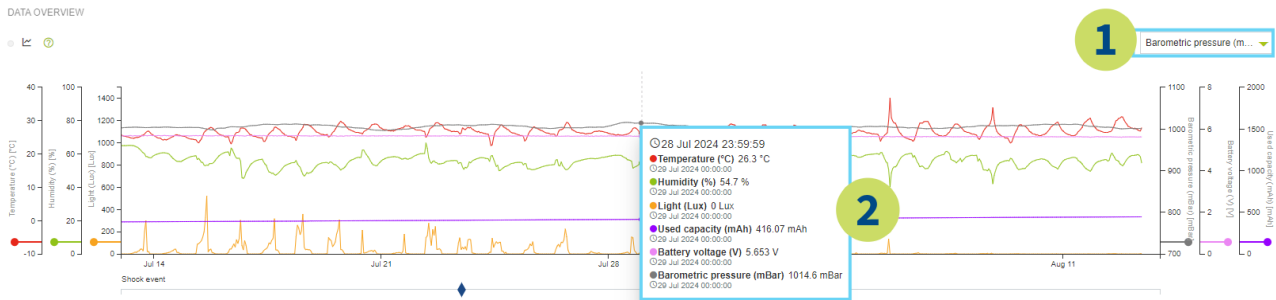


Clicking on a device takes you to the **Overview** page for that device.

- ① The main navigation is located on the left-hand side. The selected device is highlighted in green.
- ② The top menu bar shows the name of the selected device and the various dashboards, divided into tabs, in which all the measured data and information of the device are displayed:
 - **Overview:** Shows an overview of all measured values recorded by the device in a diagram and table.
 - **Tracking:** All the location information recorded for the device in the selected time period is visualized on a map [17.2].
 - **Alarm overview:** Active and confirmed alarms and alarm history [16.2]
 - **Shock:** Visualizes all shocks that lie above the configured threshold level [17.1]
 - **Temperature/Humidity/Light/Pressure/Battery:** Shows the respective measured values in the individual view
 - **Location:** Displays the last recorded location of the device.

Below the menu bar, the period for which data is displayed can be adjusted. The period applies to the entire tab and by default the last month is selected.

- ③ **Device overview:** All selected measured values are displayed in a diagram for the selected time period. Shock events are visualized below the diagram as a blue rectangle. The table below displays all data points for a separately adjustable time period.



① Use the selection list on the right to determine which data is displayed in the **Data Overview**. The axes with the units for all selected measured values are located to the left and right of the graph.

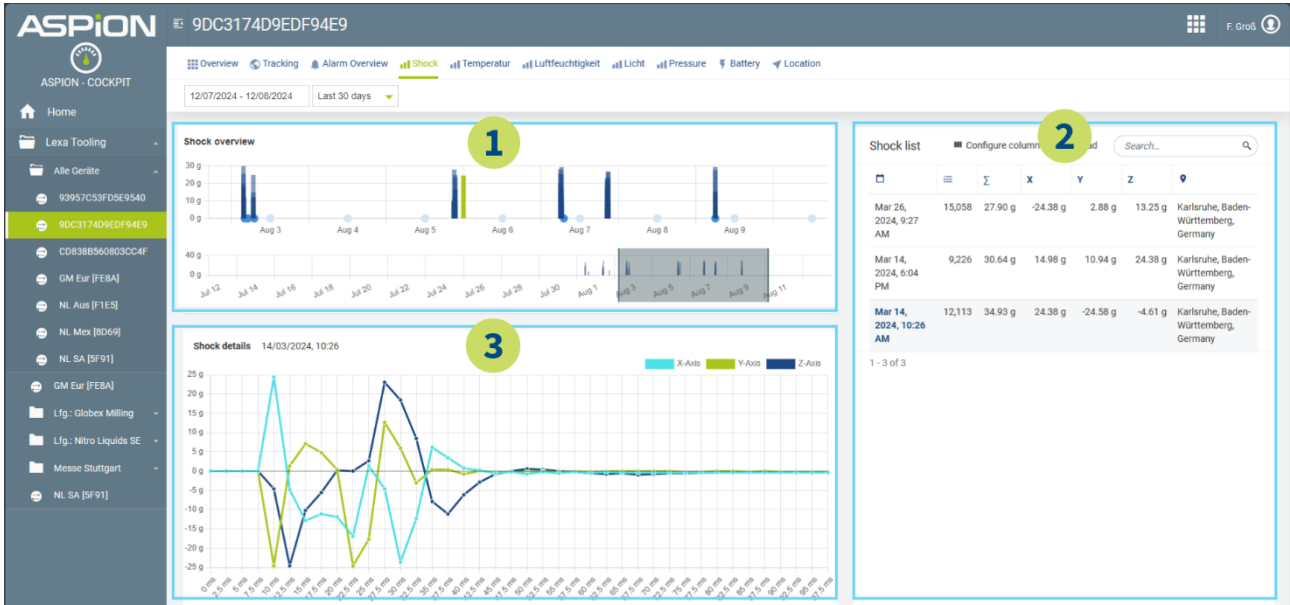
② If the cursor is moved over the diagram, the details of the selected time appear.

Navigate in the Data Overview:

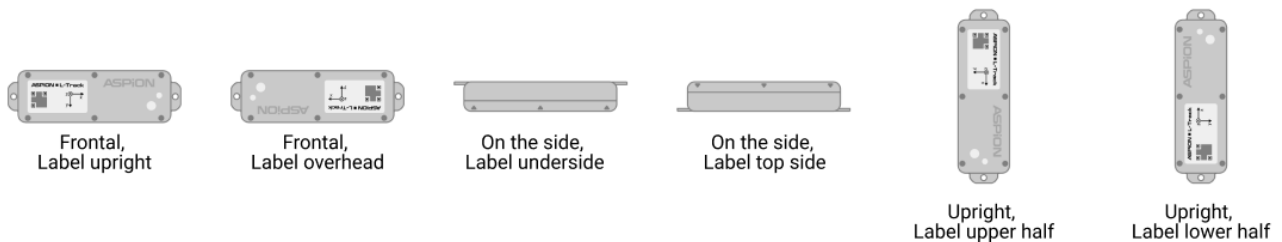
- Set the period: You can use the date field below the menu bar to adjust the period displayed. To move the period, move the X-axis by holding down the left mouse button and moving it to the left or right.
- Reduce the time period: In the diagram of the data overview, left-click on the start point of the period and hold the mouse button until the end point of the desired period. The selected range is now displayed.
- Enlarge period: Double-click in the diagram of the data overview

17.1 Shock, shock details and evaluation

Clicking on the **Shock** tab displays a diagram with data on all shocks and an extended list with the associated shock details. These are important for the evaluation of a shock event, taking the location into account.



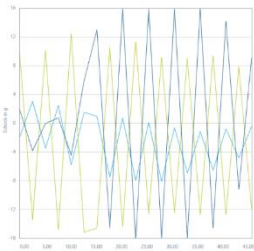
1 Shock overview: Visualizes all shocks in a bar chart over time. The height of the bar shows the vector sum of all axes in g. A mouse-over provides further details on the time, height and direction of the axes. The orientation of the device becomes visible when you move the mouse over the blue circles. The dark blue circles indicate a change in the basic orientation. There are 6 basic orientations and the orientation that best corresponds to reality is always displayed. The rotation parallel to the acceleration due to gravity is not noted.



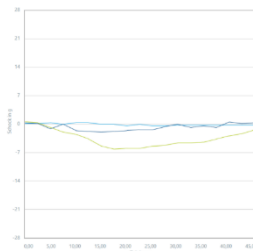
2 Shock list: The table on the right provides further details on each shock event and shows the columns from left to right:

- The exact time of the shock with date and time.
- The shock intensity: A meaningful indicator of the severity of the shock. Rule of thumb: The higher the value in comparison to the other shocks, the more intense.
- The maximum acceleration/force effect per axis in g.
- The recorded location closest in time to the recorded shock event with further details on the time of the recorded location on mouse-over.

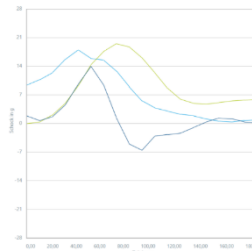
③ **Shock details:** Selecting a shock in the bar chart or on the right-hand side of the table opens the respective shock details. These show the course of all three axes in milliseconds. They are decisive for the shock evaluation. Example:



Progression of a vibration



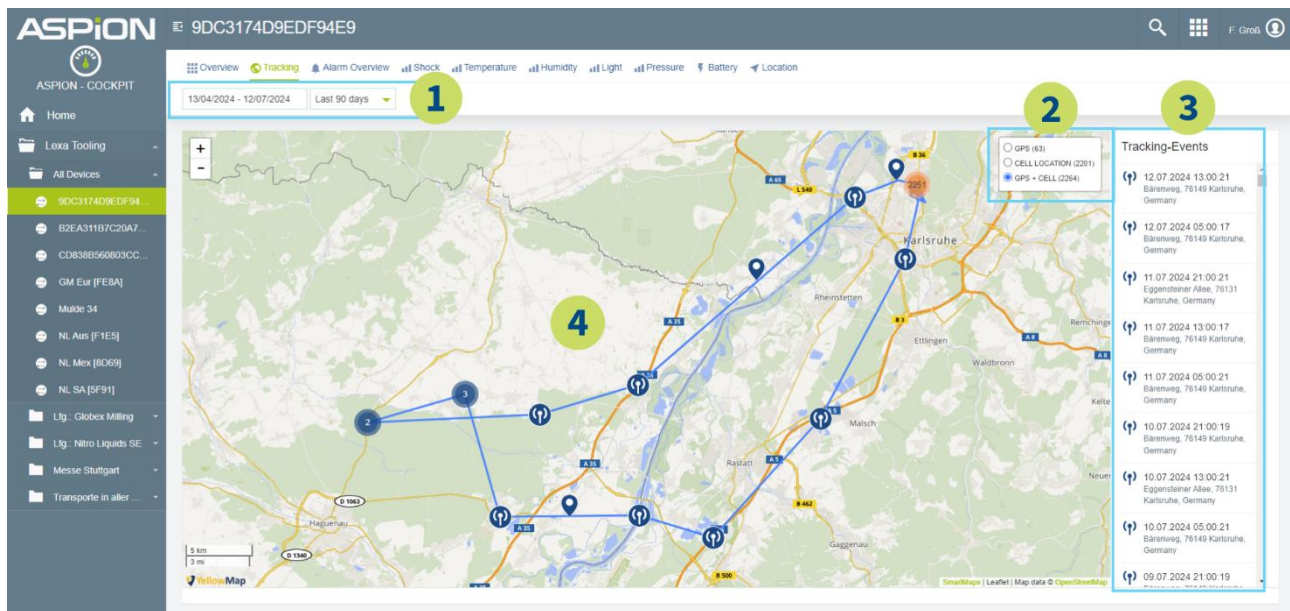
Air freight transport



prolonged shock

17.2 Tracking with map

Click on the **Tracking** tab to display a map view with the location history.



① In the top bar on the left, set the time period to be displayed on the map. To do this, either select a freely selectable period on the left or a time span on the right starting from today's date (e.g. last 90 days). The last 30 days are selected by default.

② Filter the tracking events displayed in the top right-hand corner. By default, both mobile and GPS locations are displayed. By deselecting a type of tracking event, these are hidden. Example: Select GPS to only display locations that were recorded via GPS.

③ **Tracking events:** Tracking events: The list shows all tracking events depending on the selected time period and filter. The entries in the list contain the type of tracking event, the time and the location with address. The most recent event is always displayed at the top of the list. You can select an event by clicking on it and it will be displayed on the map with its location. The locations on the map have different symbols for the different types of events:

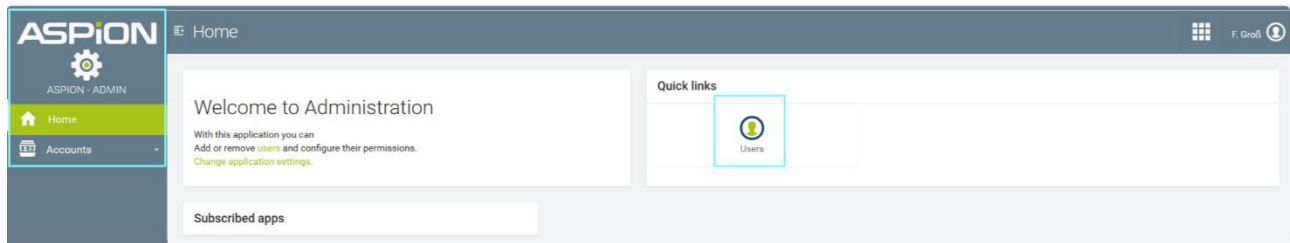
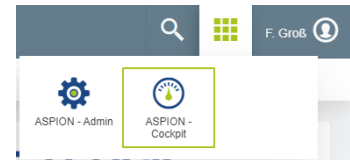
- Recorded location via GPS (high accuracy) 📍
- Recorded location via mobile phone cell (low accuracy) 📶

④ The transport history for the selected period is visualized on the map. The map section can be enlarged or reduced using the mouse wheel or the +/- buttons in the top left-hand corner of the map. Clicking on a tracking event opens a pop-up with the location of the event. You can open the location directly in Google Maps via a link. If several locations are close together, they are summarized in a circle with a number. This describes how many tracking events are grouped together.

18. Administration

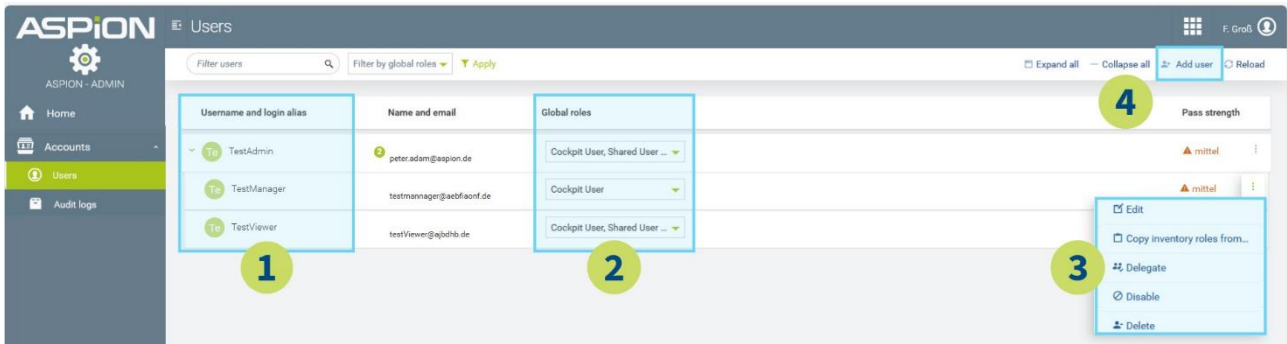
At the start of using the ASPION Cloud, there is only one administrator for each company. His or her email is provided to the manufacturer in advance. The initial login link for the ASPION Cloud is sent to this email. As an administrator, you can set your own password for the ASPION Cloud in this step. Check the spam folder if you have not received an email. The administrator remains the superordinate administrator for the entire period of use and cannot be deleted or edited by other users. As an administrator, you can create further subordinate administrators with the same rights.

To create and manage users in the administration, switch to the **ASPION Admin** area via the **application switcher** (tiled symbol) in the top right-hand corner. The admin app is only displayed to users with the rights of the user manager.



On the start page of the admin area, call up the user administration via the **Users** button on the right-hand side or via the left-hand navigation bar under Accounts and Users.

18.1 Manage users



The user administration shows your own user in the top entry. Click on the ">" arrow to the left of the username to display all subordinate users.

① Similar to the groups in the main navigation, you can see the structure of the subordinate users here. You can create new subordinate users [18.2], edit them [18.3] and delete them at any time. Superordinate or equivalent users are not displayed.

② The Global roles column shows the user's basic authorizations. The second point in section [18.2] describes how authorizations can be changed.

③ By clicking on the 3 dots on the right-hand side of a subordinate user, you can edit this user with the following options:

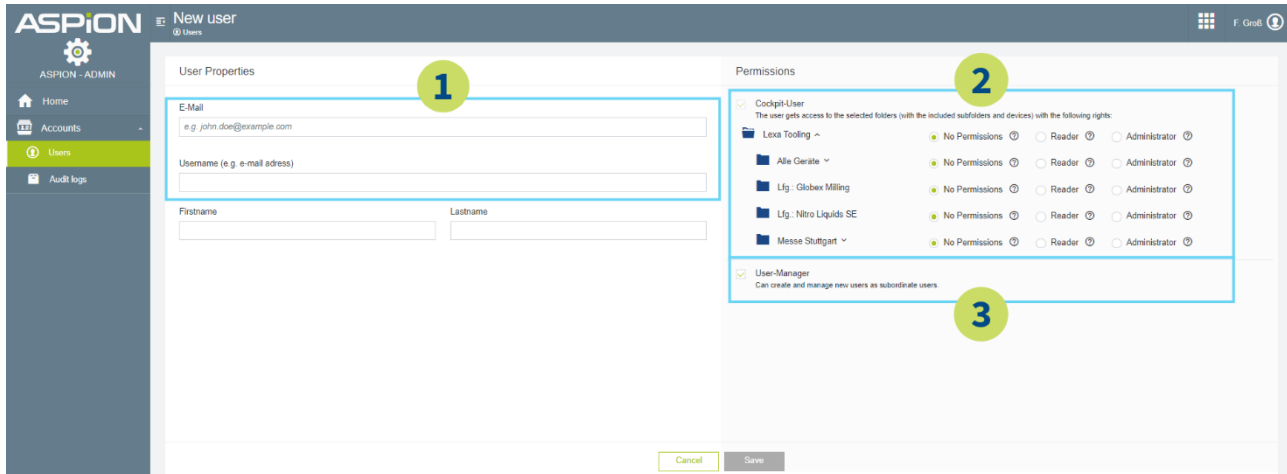
- **Edit:** Edit and change user rights and data [18.3].
- **Disable:** User is temporarily disabled
- **Delete:** User is permanently deleted

④ Use the **Add user** button to create a new user.

Note: You cannot delete, deactivate or change the authorizations of your own user.

18.2 Add new user & assign permissions

You can create new users via the **Add user** button in the user administration [18.1]. In the view that opens, enter at least the username and email address in the user properties on the left-hand side. On the right, assign the appropriate authorizations for the user.



You can create new subordinate users via the user administration [18.1].

1 Email and Username: Both are required. The email address is required to activate the account and to reset the password. Note: Pay attention to the spelling, otherwise the new user will not receive an invitation email and will not have access to the ASPION Cloud.

The username cannot be changed once the user has been created. The username cannot contain spaces or certain special characters (/ + : \$). The username is requested when logging into the ASPION Cloud. Note: For the automatically created administrator, the username is assigned automatically and consists of a combination of numbers. If a different username is required, create a new user.

2 Cockpit user: All created groups to which the logged-in user has access are displayed hierarchically in the left-hand area. Initially, only the top two levels of groups are listed. By clicking on a group with subordinate groups, these are also displayed in expanded form.

In the Cockpit user area, you select which groups and devices are displayed to the user and to which they have access. You can assign permissions for each group individually. However, the permissions of a superordinate group are always transferred directly to the subordinate groups. If the permissions of a subordinate group differ from those of a superordinate group, this is indicated by a blue dot.

You can choose between the following three permissions for each group:

- **No Permissions:** If this permission is selected for a group, this group and all devices assigned to it are not displayed to the user. **Important: If a user has not selected any rights for all groups, no groups and devices will be displayed in the ASPION Cloud.**
- **Reader:** With this permission, the group and all assigned devices are displayed to the user. The user can access the views of the group and all devices in this group. However, no changes can be made, such as creating or confirming alarms, creating groups, assigning devices to groups or configuring devices.
- **Administrator:** This permission allows the user further functions in addition to reading permissions. For example, confirming or canceling alarms, creating new groups, assigning devices to groups or creating and editing smart rules.

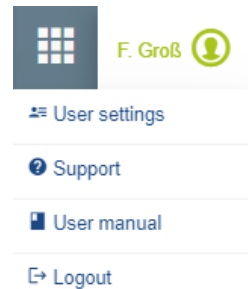
③ **User manager:** Users with the user manager permission have access to the ASPION Admin view and can create new users. A user can only assign permissions to new users that they themselves have. The email address, password and authorizations for subordinate users can also be edited. The user can also deactivate or delete subordinate users.

By clicking on the **Save** button, the user is created and automatically receives an email to the email address provided. The email contains an invitation link and instructions for assigning the password.

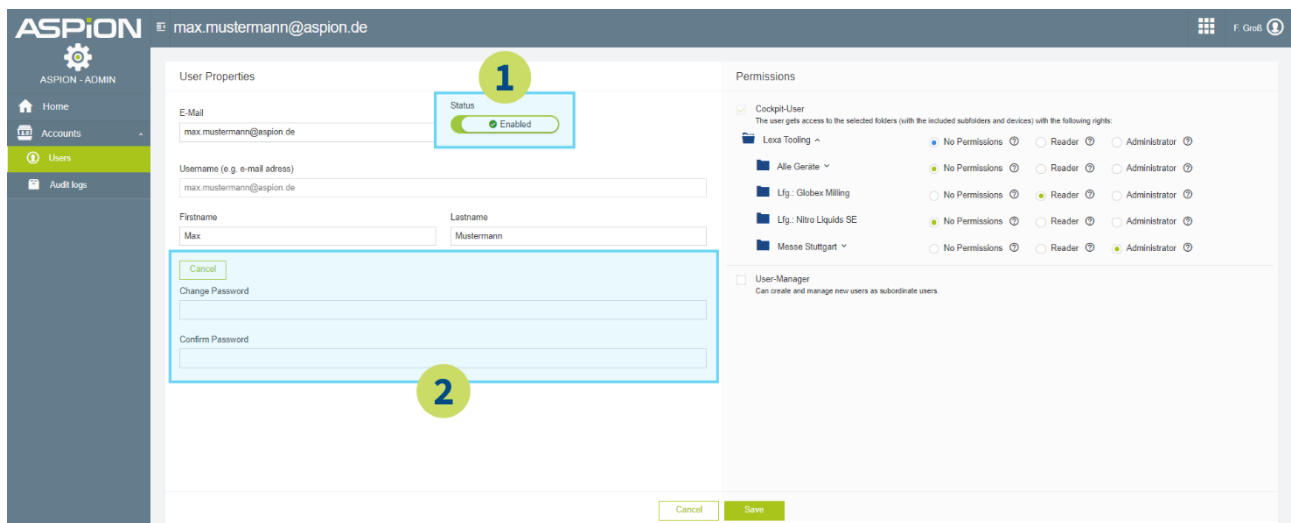
18.3 Edit users

Every user with the permission of the user manager [18.2] can edit subordinate users. Equal or higher-level users are not displayed and cannot be edited. All users are visible with the initial administrator account.

You can edit your own user via the user symbol in the top right corner. Click on the **User settings** button to edit the email, language or password. You can also assign or change a login alias. This replaces the user name when logging in.



You can edit other user via the user administration. To do this, either click on the user or navigate to the **Edit** button via the 3-dot menu on the right-hand side.



The view contains the same elements as the add user view [18.2]. In addition, there are two further setting options.

① **Status:** The user can be set to inactive via the status. Inactive users are temporarily deactivated and can no longer log in.

② **Password:** If you want to set or change the password for a user manually (not recommended), click on the **Change password** button at the bottom left. Enter the password in both text fields. The password must contain a minimum of 8 and a maximum of 32 characters. The user is not automatically informed of the password change.

18.4 Audit logs

Users with the user manager permission also have access to the audit logs. Here you can see all permanent changes that other users have made. For example, the creation and editing of alarms, users and Smart Rules. Users only see the changes in areas to which they have access. For example, if an administrator edits a user, the subordinate user cannot see these changes.

Time	Event	Description
11 Apr 2024, 13:30:17	Alarm created Source: BY service_apama-ctrl-starter	Device name: "GM Eur [FE8A]", alarm text: "Feuchtigkeitsüberschreitung 40%" DEVICE TIME 11 Apr 2024, 14:40:00
11 Apr 2024, 10:00:17	Alarm created Source: BY service_apama-ctrl-starter	Device name: "9DC3174D9EDF94E9", alarm text: "Feuchtigkeitsüberschreitung 40%" DEVICE TIME 11 Apr 2024, 03:00:00
11 Apr 2024, 14:44:46	Alarm updated Source: BY 2024011501	Device name: "GM Eur [FE8A]", alarm text: "Feuchtigkeitsüberschreitung 40%" Status: ACKNOWLEDGED > CLEARED DEVICE TIME 10 Apr 2024, 22:20:00
11 Apr 2024, 14:44:37	Alarm updated Source: BY 2024011501	Device name: "GM Eur [FE8A]", alarm text: "Feuchtigkeitsüberschreitung 40%" Status: ACTIVE > ACKNOWLEDGED DEVICE TIME 10 Apr 2024, 22:20:00
10 Apr 2024, 22:30:22	Alarm created Source: BY service_apama-ctrl-starter	Device name: "GM Eur [FE8A]", alarm text: "Feuchtigkeitsüberschreitung 40%" DEVICE TIME 10 Apr 2024, 22:20:00

19. Contact and support

If you have any questions or problems, please contact:

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