How to set up a security project with 3D LiDAR

From planning
to deployment
in 5 steps

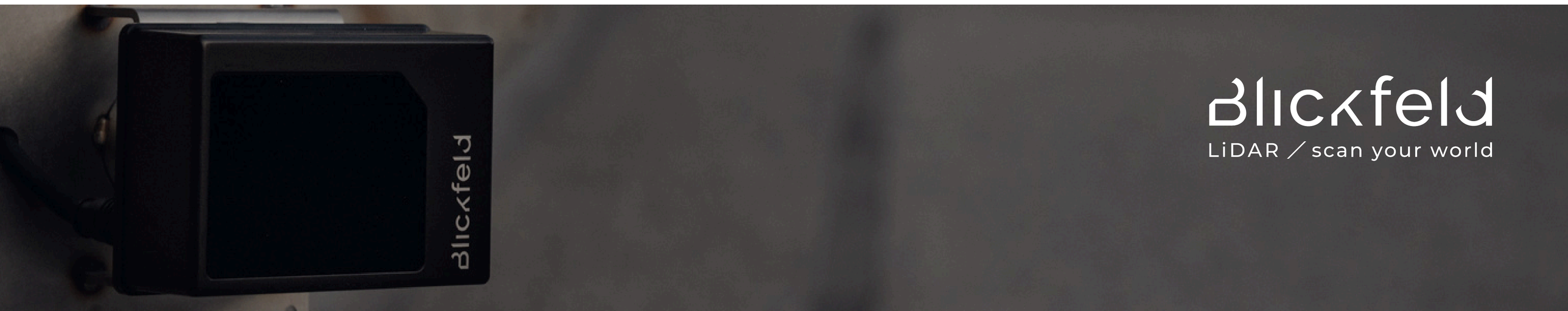
3D LiDAR technology (“Light Detection and Ranging”) has made its way from automotive and industrial applications into the security industry. By precisely capturing the environment in a high-resolution 3D point cloud, it enables reliable detection of people, vehicles, and objects, independent of lighting or weather conditions. In security applications, this capability provides a major advantage: volumetric object detection makes it possible to identify relevant events at an early stage and significantly reduce false alarms.

The five steps

1. **Project Assessment**
2. **Application Simulation**
3. **Sensor Installation**
4. **Security Zone Configuration**
5. **Data Integration**

As a result, an increasing number of companies and system integrators are recognizing the potential of LiDAR for modern security solutions.

This guide walks you through the essential steps for implementing a LiDAR-based security project: from initial analysis and planning to seamless integration into existing security systems.



1 PROJECT ASSESSMENT

1. VALIDATION OF SYSTEM REQUIREMENTS

Are there specific requirements for the security system regarding range, field of view, or installation height?

2. WHICH AREA OR OBJECT SHOULD BE SECURED?

What is the size of the site or object to be protected? Is it an indoor or outdoor area? Which types of objects and movement patterns typically occur?

3. WHICH EVENTS SHOULD BE DETECTED, AND WHAT SHOULD TRIGGER AN ALARM?

Which types of events should trigger an alarm? For example, unauthorized access, movements, or the placement of objects? Under which conditions should an alarm be considered relevant? For instance, if a zone is entered outside operating hours, or if objects remain in the detection area longer than expected?

4. ARE THERE POTENTIAL SOURCES OF FALSE ALARMS?

Are there known triggers such as small animals, moving vegetation, passing pedestrians, or environmental effects that should be ignored?

5. ANALYSIS OF EXISTING SECURITY INFRASTRUCTURE

Which systems are already in use, and how can LiDAR complement them effectively?

Is sensor mounting on existing infrastructure possible? Should detected events be forwarded to existing VMS or intrusion detection systems?

2 APPLICATION SIMULATION

1. VIRTUAL SIMULATION OF SENSOR POSITIONING AND COVERAGE

The site is modeled virtually to plan optimal sensor positioning. This ensures full coverage of all security-relevant areas without potential obstructions or blind spots.

2. DETERMINING THE NUMBER OF SENSORS

Based on the simulation results, the optimal number of sensors is defined. Factors such as detection range, mounting height, and the desired overlap between sensor fields of view are considered to achieve full coverage with minimal hardware.

3 SENSOR INSTALLATION

1. PHYSICAL SENSOR MOUNTING AND INSTALLATION

Blickfeld LiDAR sensors can be flexibly installed in single or dual configurations and aligned either vertically or horizontally. Integration into existing infrastructure, including cabling and mounting, is already considered during the planning phase.

2. SENSOR ALIGNMENT

Thanks to the high-resolution, camera-like 3D point cloud of the environment, sensor alignment can be carried out easily and without expert knowledge.

3. SCAN PATTERN CONFIGURATION

The LiDAR scan pattern can be individually adjusted e.g., with a wide field of view for open areas or a focused scanning along a fence line. Parameters such as frame rate or laser energy can be configured depending on the desired detection depth and scene dynamics.

4 SECURITY ZONE CONFIGURATION

1. ZONE MANAGEMENT

Security zones are created directly within the Blickeld sensor's web interface via drag and drop in the scene. In addition to standard security zones, direction-sensitive zones can be configured for advanced movement analysis, and exclusion zones are used to ignore irrelevant areas.

2. FINE-TUNING OF PERCEPTION PARAMETERS

Precise configuration significantly helps reduce false alarms and improve detection accuracy. For example, the system can automatically learn which parts of the scene are background, so that only changes or moving objects trigger detection., while parameters such as object size and tracking behavior can be customized.

3. ALARM LOGIC CONFIGURATION

Alarm logic defines the conditions under which an alarm is triggered, such as the number of LiDAR data points that make up an object, the duration of an intrusion, or the length of a detected movement track.

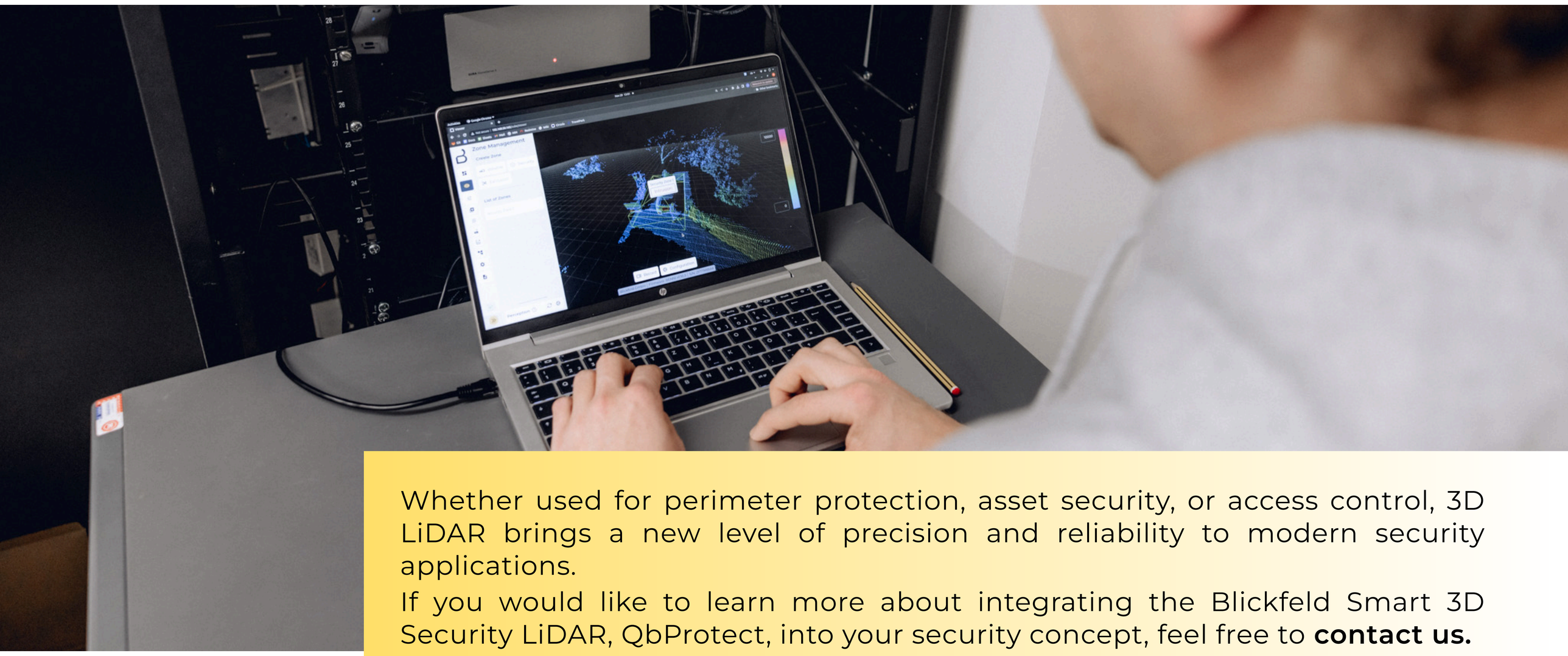
5 DATA INTEGRATION

1. DATA OUTPUT CONFIGURATION

In addition to supporting various standardized output formats and protocols, the sensors' integrated Rule Engine (Node-RED) enables the creation of custom logic. This allows the sensor output to be perfectly tailored to the specific application and IT environment.

2. INTEGRATION INTO VMS OR PSIM

Detected events can be transmitted via ONVIF interfaces to Video Management Systems (VMS) or Physical Security Information Management Systems (PSIM). Optionally, a 3D data stream can be integrated for visual alarm verification within existing systems.



Whether used for perimeter protection, asset security, or access control, 3D LiDAR brings a new level of precision and reliability to modern security applications.

If you would like to learn more about integrating the Blickfeld Smart 3D Security LiDAR, QbProtect, into your security concept, feel free to **contact us.**

Blickfeld
LiDAR / scan your world

International: +49 89 230 69 35 - 00 / North America: +1 (855)-335-4327 / sales@blickfeld.com / www.blickfeld.com

Doc.Nr. 55837_EN_V2